# START

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Office

Vol. 1130 Number 1

# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS
September 3, 1991



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
September 3, 1991 Volume 1130 Number 1

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O.G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees ( in U.S. dollars) is as follows:

| | |
|---|---|
| Transmittal fee: | 170.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 550.00 |
| —Corresponding prior U.S. national application filed | 380.00 |
| —Supplemental search fee, per additional invention | 150.00 |
| European Patent Office as ISA | 1320.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —Search fee paid to USPTO as ISA | 400.00 |
| —Additional examination fee, per additional invention | 130.00 |
| —ISA not the USPTO | 600.00 |
| —Additional examination fee, per additional invention | 200.00 |
| International fees | |
| Basic fee | 490.00 |
| Basic Supplemental fee (for each page over 30) | 10.00 |
| Designation fee per country or region for the first 10 national or regional offices | 119.00 |
| Designation fee for 11th and subsequent designations | No Charge |
| Handling fee | 150.00 |

U.S. National Stage fees

| | Small Entity | Regular |
|---|---|---|
| USPTO was IPEA | 165.00 | 330.00 |
| USPTO was ISA but not IPEA | 185.00 | 370.00 |
| USPTO was neither ISA nor IPEA | 250.00 | 500.00 |
| USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4) | 25.00 | 50.00 |
| —For each independent claim in excess of 3 | 18.00 | 36.00 |
| —For each claim in excess of 20 | 6.00 | 12.00 |
| —For each application containing a multiple dependent claim | 60.00 | 120.00 |
| —Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1) | 60.00 | 120.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) | 30.00 | 30.00 |

June 27, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks.*

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### Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on August 30, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,766,608 through 4,768,230
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 28, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,467,475 through 4,468,814
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:





37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00'

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

~~delisted~~

### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED JUNE 23, 1991*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| Re. 32,341 | 06/588,914 | 1/27/87 |
| (4,389,598) | (06/233,173) | (6/21/83) |
| 4,388,737 | 06/312,085 | 6/21/83 |
| 4,388,743 | 06/273.902 | 6/21/83 |
| 4,388,753 | 06/238,471 | 6/21/83 |
| 4,388,759 | 06/295,603 | 6/21/83 |
| 4,388,761 | 06/328,378 | 6/21/83 |
| 4,388,763 | 06/250,722 | 6/21/83 |
| 4,388,773 | 06/230.435 | 6/21/83 |
| 4,388,777 | 06/296,159 | 6/21/83 |
| 4,388,779 | 06/232,639 | 6/21/83 |
| 4,388,789 | 06/219,263 | 6/21/83 |
| 4,388,790 | 06/278,638 | 6/21/83 |
| 4,388,793 | 06/242,145 | 6/21/83 |
| 4,388,802 | 06/289.837 | 6/21/83 |
| 4,388,810 | 06/352,757 | 6/21/83 |
| 4,388,820 | 06/227,547 | 6/21/83 |
| 4,388,823 | 06/242,387 | 6/21/83 |
| 4,388,826 | 06/304,823 | 6/21/83 |
| 4,388,852 | 06/292,661 | 6/21/83 |
| 4,388,860 | 06/326,892 | 6/21/83 |
| 4,388,862 | 06/332,254 | 6/21/83 |
| 4,388,864 | 06/231,998 | 6/21/83 |
| 4,388,893 | 06/268,570 | 6/21/83 |
| 4,388,911 | 06/216,482 | 6/21/83 |
| 4,388,914 | 06/271,346 | 6/21/83 |
| 4,388,920 | 06/314,900 | 6/21/83 |
| 4,388,923 | 06/257,614 | 6/21/83 |
| 4,388,935 | 06/259,023 | 6/21/83 |
| 4,388,941 | 06/318,684 | 6/21/83 |
| 4,388,949 | 06/327,425 | 6/21/83 |
| 4,388,958 | 06/333,028 | 6/21/83 |
| 4,388,959 | 06/267,862 | 6/21/83 |
| 4,388,971 | 06/307,906 | 6/21/83 |
| 4,388,977 | 06/257,427 | 6/21/83 |
| 4,388,991 | 06/281,588 | 6/21/83 |
| 4,388,992 | 06/299,012 | 6/21/83 |
| 4,389,000 | 06/283,071 | 6/21/83 |
| 4,389,007 | 06/304,858 | 6/21/83 |
| 4,389,012 | 06/256,491 | 6/21/83 |
| 4,389,014 | 06/254,774 | 6/21/87 |
| 4,389,032 | 06/282,175 | 6/21/83 |
| 4,389,042 | 06/336.898 | 6/21/83 |
| 4,389,049 | 06/331,202 | 6/21/83 |
| 4,389,057 | 06/270,787 | 6/21/83 |
| 4,389,063 | 06/276,611 | 6/21/83 |
| 4,389,072 | 06/257.033 | 6/21/83 |
| 4,389,073 | 06/246.135 | 6/21/83 |
| 4,389,077 | 06/253.002 | 6/21/83 |
| 4,389,078 | 06/229,650 | 6/21/83 |
| 4,389,079 | 06/217.802 | 6/21/83 |
| 4,389,083 | 06/365,846 | 6/21/83 |
| 4,389,107 | 06/264.159 | 6/21/83 |
| 4,389,113 | 06/261,782 | 6/21/83 |
| 4,389,114 | 06/342,562 | 6/21/83 |
| 4,389,115 | 06/290,435 | 6/21/83 |
| 4,389,117 | 06/266.111 | 6/21/83 |
| 4,389,124 | 06/264,277 | 6/21/83 |
| 4,389,135 | 06/278,927 | 6/21/83 |
| 4,389,143 | 06/244,528 | 6/21/83 |
| 4,389,144 | 06/220.452 | 6/21/83 |
| 4,389,155 | 06/262.125 | 6/21/83 |
| 4,389,156 | 06/298,286 | 6/21/83 |
| 4,389,157 | 06/281.841 | 6/21/83 |
| 4,389,158 | 06/265,329 | 6/21/83 |
| 4,389,173 | 06/288,799 | 6/21/83 |
| 4,389,190 | 06/293,792 | 6/21/83 |
| 4,389,191 | 06/298,502 | 6/21/83 |
| 4,389,195 | 06/234.946 | 6/21/83 |
| 4,389,196 | 06/297,218 | 6/21/83 |
| 4,389,199 | 06/299,397 | 6/21/83 |
| 4,389,202 | 06/261.747 | 6/21/83 |
| 4,389,207 | 06/244,398 | 6/21/83 |
| 4,389,214 | 06/219.164 | 6/21/83 |
| 4,389,226 | 06/316,646 | 6/21/83 |
| 4,389,230 | 06/273,423 | 6/21/83 |
| 4,389,232 | 06/346,279 | 6/21/83 |
| 4,389,236 | 06/289,582 | 6/21/83 |
| 4,389,239 | 06/272,055 | 6/21/83 |
| 4,389,240 | 06/396,892 | 6/21/83 |
| 4,389,241 | 06/412,546 | 6/21/83 |
| 4,389,244 | 06/342,004 | 6/21/83 |
| 4,389,250 | 06/239,646 | 6/21/83 |
| 4,389,280 | 06/325.316 | 6/21/83 |

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| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,389,283 | 06/229,317 | 6/21/83 |
| 4,389,288 | 06/305,876 | 6/21/83 |
| 4,389,290 | 06/279,908 | 6/21/83 |
| 4,389,297 | 06/263,329 | 6/21/83 |
| 4,389,299 | 06/275,784 | 6/21/83 |
| 4,389,306 | 06/305,157 | 6/21/83 |
| 4,389,313 | 06/328,907 | 6/21/83 |
| 4,389,327 | 06/387,989 | 6/21/83 |
| 4,389,334 | 06/221,667 | 6/21/83 |
| 4,389,336 | 06/303,169 | 6/21/83 |
| 4,389,343 | 06/334,420 | 6/21/83 |
| 4,389,348 | 06/314,902 | 6/21/83 |
| 4,389,352 | 06/357,756 | 6/21/83 |
| 4,389,354 | 06/324,029 | 6/21/83 |
| 4,389,361 | 06/282,764 | 6/21/83 |
| 4,389,362 | 06/256,521 | 6/21/83 |
| 4,389,377 | 06/282,334 | 6/21/83 |
| 4,389,378 | 06/334,104 | 6/21/83 |
| 4,389,391 | 06/278,322 | 6/21/83 |
| 4,389,395 | 06/223,881 | 6/21/83 |
| 4,389,400 | 06/361,650 | 6/21/83 |
| 4,389,404 | 06/287,738 | 6/21/83 |
| 4,389,407 | 06/279,425 | 6/21/83 |
| 4,389,413 | 06/285,723 | 6/21/83 |
| 4,389,433 | 06/261,017 | 6/21/83 |
| 4,389,435 | 06/296,128 | 6/21/83 |
| 4,389,446 | 06/243,474 | 6/21/83 |
| 4,389,451 | 06/345,366 | 6/21/83 |
| 4,389,456 | 06/316,584 | 6/21/83 |
| 4,389,462 | 06/281,541 | 6/21/83 |
| 4,389,464 | 06/289,210 | 6/21/83 |
| 4,389,472 | 06/216,852 | 6/21/83 |
| 4,389,476 | 06/315,287 | 6/21/83 |
| 4,389,478 | 06/275,882 | 6/21/83 |
| 4,389,489 | 06/274,083 | 6/21/83 |
| 4,389,490 | 06/268,049 | 6/21/83 |
| 4,389,498 | 06/411,201 | 6/21/83 |
| 4,389,525 | 06/276,116 | 6/21/83 |
| 4,389,527 | 06/278,968 | 6/21/83 |
| 4,389,544 | 06/249,400 | 6/21/83 |
| 4,389,562 | 06/290,150 | 6/21/83 |
| 4,389,564 | 06/307,469 | 6/21/83 |
| 4,389,565 | 06/238,747 | 6/21/83 |
| 4,389,571 | 06/249,782 | 6/21/83 |
| 4,389,579 | 06/238,729 | 6/21/83 |
| 4,389,585 | 06/279,552 | 6/21/83 |
| 4,389,604 | 06/231,571 | 6/21/83 |
| 4,389,616 | 06/217,519 | 6/21/83 |
| 4,389,617 | 06/243,309 | 6/21/83 |
| 4,389,619 | 06/230,383 | 6/21/83 |
| 4,389,620 | 06/228,960 | 6/21/83 |
| 4,389,626 | 06/323,283 | 6/21/83 |
| 4,389,632 | 06/277,087 | 6/21/83 |
| 4,389,640 | 06/249,537 | 6/21/83 |
| 4,389,651 | 06/260,373 | 6/21/83 |
| 4,389,656 | 06/252,734 | 6/21/83 |
| 4,389,666 | 06/244,722 | 6/21/83 |
| 4,389,668 | 06/276,998 | 6/21/83 |
| 4,389,679 | 06/218,769 | 6/21/83 |
| 4,389,680 | 06/217,131 | 6/21/83 |
| 4,389,699 | 06/301,302 | 6/21/83 |
| 4,389,700 | 06/253,333 | 6/21/83 |
| 4,389,702 | 06/412,103 | 6/21/83 |
| 4,389,718 | 06/244,305 | 6/21/83 |
| 4,674,132 | 06/932,271 | 6/23/87 |
| 4,674,137 | 06/839,154 | 6/23/87 |
| 4,674,138 | 06/726,345 | 6/23/87 |
| 4,674,139 | 06/907,600 | 6/23/87 |
| 4,674,141 | 06/727,741 | 6/23/87 |
| 4,674,143 | 06/830,942 | 6/23/87 |
| 4,674,147 | 06/821,794 | 6/23/87 |
| 4,674,154 | 06/714,995 | 6/23/87 |
| 4,674,155 | 06/743,938 | 6/23/87 |
| 4,674,158 | 06/899,055 | 6/23/87 |
| 4,674,159 | 06/784,217 | 6/23/87 |
| 4,674,168 | 06/787,327 | 6/23/87 |
| 4,674,169 | 06/827,344 | 6/23/87 |
| 4,674,172 | 06/811,358 | 6/23/87 |
| 4,674,184 | 06/839,650 | 6/23/87 |
| 4,674,185 | 06/884,073 | 6/23/87 |
| 4,674,186 | 06/878,011 | 6/23/87 |
| 4,674,191 | 06/882,829 | 6/23/87 |
| 4,674,192 | 06/825,569 | 6/23/87 |
| 4,674,195 | 06/670,644 | 6/23/87 |
| 4,674,196 | 06/803,124 | 6/23/87 |
| 4,674,202 | 06/832,433 | 6/23/87 |
| 4,674,210 | 06/781,446 | 6/23/87 |
| 4,674,212 | 06/760,086 | 6/23/87 |
| 4,674,213 | 06/718,176 | 6/23/87 |
| 4,674,220 | 06/904,946 | 6/23/87 |
| 4,674,224 | 06/850,600 | 6/23/87 |
| 4,674,227 | 06/794,537 | 6/23/87 |
| 4,674,232 | 06/819,904 | 6/23/87 |
| 4,674,235 | 06/416,129 | 6/23/87 |
| 4,674,237 | 06/261,543 | 6/23/87 |
| 4,674,240 | 06/857,989 | 6/23/87 |
| 4,674,241 | 06/784,688 | 6/23/87 |
| 4,674,244 | 06/887,125 | 6/23/87 |
| 4,674,250 | 06/639,840 | 6/23/87 |
| 4,674,254 | 06/666,232 | 6/23/87 |
| 4,674,255 | 06/910,862 | 6/23/87 |
| 4,674,256 | 06/611,183 | 6/23/87 |
| 4,674,262 | 06/840,645 | 6/23/87 |
| 4,674,263 | 06/792,501 | 6/23/87 |
| 4,674,270 | 06/841,980 | 6/23/87 |
| 4,674,275 | 06/890,551 | 6/23/87 |
| 4,674,280 | 06/796,918 | 6/23/87 |
| 4,674,281 | 06/863,840 | 6/23/87 |
| 4,674,282 | 06/704,926 | 6/23/87 |
| 4,674,284 | 06/854,616 | 6/23/87 |
| 4,674,286 | 06/723,837 | 6/23/87 |
| 4,674,297 | 06/829,429 | 6/23/87 |
| 4,674,303 | 06/865,797 | 6/23/87 |
| 4,674,306 | 06/776,574 | 6/23/87 |
| 4,674,311 | 06/781,996 | 6/23/87 |
| 4,674,313 | 06/717,508 | 6/23/87 |
| 4,674,315 | 06/798,254 | 6/23/87 |
| 4,674,316 | 06/854,263 | 6/23/87 |
| 4,674,324 | 06/617,329 | 6/23/87 |
| 4,674,334 | 06/865,507 | 6/23/87 |
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| 4,674,348 | 06/765,054 | 6/23/87 |
| 4,674,352 | 06/687,272 | 6/23/87 |
| 4,674,355 | 06/778,608 | 6/23/87 |
| 4,674,359 | 06/465,018 | 6/23/87 |
| 4,674,365 | 06/517,673 | 6/23/87 |
| 4,674,367 | 06/851,283 | 6/23/87 |
| 4,674,386 | 06/747,807 | 6/23/87 |
| 4,674,395 | 06/658,541 | 6/23/87 |
| 4,674,401 | 06/758,489 | 6/23/87 |
| 4,674,402 | 06/724,002 | 6/23/87 |
| 4,674,406 | 06/817,640 | 6/23/87 |
| 4,674,415 | 06/876,471 | 6/23/87 |
| 4,674,417 | 06/881,253 | 6/23/87 |
| 4,674,425 | 06/871,496 | 6/23/87 |
| 4,674,428 | 06/809,185 | 6/23/87 |
| 4,674,430 | 06/824,524 | 6/23/87 |
| 4,674,456 | 06/768,358 | 6/23/87 |
| 4,674,466 | 06/756,229 | 6/23/87 |
| 4,674,472 | 06/735,255 | 6/23/87 |
| 4,674,476 | 06/557,414 | 6/23/87 |
| 4,674,487 | 06/759,745 | 6/23/87 |
| 4,674,493 | 06/877,608 | 6/23/87 |
| 4,674,494 | 06/732,680 | 6/23/87 |
| 4,674,503 | 06/240,728 | 6/23/87 |
| 4,674,507 | 06/263,751 | 6/23/87 |
| 4,674,535 | 06/785,700 | 6/23/87 |
| 4,674,539 | 06/831,976 | 6/23/87 |
| 4,674,559 | 06/823,452 | 6/23/87 |
| 4,674,560 | 06/709,269 | 6/23/87 |
| 4,674,561 | 06/717,190 | 6/23/87 |
| 4,674,564 | 06/854,077 | 6/23/87 |
| 4,674,570 | 06/803,020 | 6/23/87 |
| 4,674,580 | 06/770,147 | 6/23/87 |
| 4,674,581 | 06/850,752 | 6/23/87 |
| 4,674,585 | 06/813,867 | 6/23/87 |



| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,674,598 | 06/861,281 | 6/23/87 |
| 4,674,599 | 06/907,464 | 6/23/87 |
| 4,674,602 | 06/816,286 | 6/23/87 |
| 4,674,620 | 06/715,452 | 6/23/87 |
| 4,674,623 | 06/753,063 | 6/23/87 |
| 4,674,627 | 06/669,923 | 6/23/87 |
| 4,674,633 | 06/913,602 | 6/23/87 |
| 4,674,640 | 06/843,070 | 6/23/87 |
| 4,674,641 | 06/879,932 | 6/23/87 |
| 4,674,651 | 06/799,353 | 6/23/87 |
| 4,674,655 | 06/800,296 | 6/23/87 |
| 4,674,657 | 06/894,937 | 6/23/87 |
| 4,674,662 | 06/743,462 | 6/23/87 |
| 4,674,664 | 06/814,965 | 6/23/87 |
| 4,674,673 | 06/761,564 | 6/23/87 |
| 4,674,675 | 06/576,453 | 6/23/87 |
| 4,674,681 | 06/761,393 | 6/23/87 |
| 4,674,682 | 06/799,172 | 6/23/87 |
| 4,674,685 | 06/689,437 | 6/23/87 |
| 4,674,689 | 06/322,214 | 6/23/87 |
| 4,674,692 | 06/869,086 | 6/23/87 |
| 4,674,696 | 06/840,516 | 6/23/87 |
| 4,674,697 | 06/854,834 | 6/23/87 |
| 4,674,700 | 06/773,139 | 6/23/87 |
| 4,674,705 | 06/739,971 | 6/23/87 |
| 4,674,713 | 06/655,525 | 6/23/87 |
| 4,674,717 | 06/888,082 | 6/23/87 |
| 4,674,718 | 06/670,542 | 6/23/87 |
| 4,674,720 | 06/844,204 | 6/23/87 |
| 4,674,723 | 06/752,848 | 6/23/87 |
| 4,674,724 | 06/915,968 | 6/23/87 |
| 4,674,730 | 06/843,643 | 6/23/87 |
| 4,674,731 | 06/824,505 | 6/23/87 |
| 4,674,732 | 06/820,086 | 6/23/87 |
| 4,674,735 | 06/755,682 | 6/23/87 |
| 4,674,746 | 06/593,974 | 6/23/87 |
| 4,674,749 | 06/819,736 | 6/23/87 |
| 4,674,750 | 06/839,368 | 6/23/87 |
| 4,674,752 | 06/867,139 | 6/23/87 |
| 4,674,756 | 06/856,400 | 6/23/87 |
| 4,674,758 | 06/779,711 | 6/23/87 |
| 4,674,760 | 06/848,020 | 6/23/87 |
| 4,674,761 | 06/832,849 | 6/23/87 |
| 4,674,762 | 06/699,155 | 6/23/87 |
| 4,674,763 | 06/851,093 | 6/23/87 |
| 4,674,765 | 06/811,448 | 6/23/87 |
| 4,674,783 | 06/912,180 | 6/23/87 |
| 4,674,785 | 06/837,057 | 6/23/87 |
| 4,674,787 | 06/785,609 | 6/23/87 |
| 4,674,790 | 06/769,266 | 6/23/87 |
| 4,674,793 | 06/807,160 | 6/23/87 |
| 4,674,798 | 06/833,672 | 6/23/87 |
| 4,674,800 | 06/826,908 | 6/23/87 |
| 4,674,813 | 06/867,993 | 6/23/87 |
| 4,674,821 | 06/834,352 | 6/23/87 |
| 4,674,823 | 06/777,246 | 6/23/87 |
| 4,674,831 | 06/536,941 | 6/23/87 |
| 4,674,847 | 06/859,500 | 6/23/87 |
| 4,674,849 | 06/731,366 | 6/23/87 |
| 4,674,872 | 06/599,717 | 6/23/87 |
| 4,674,879 | 06/791,338 | 6/23/87 |
| 4,674,882 | 06/709,582 | 6/23/87 |
| 4,674,885 | 06/688,755 | 6/23/87 |
| 4,674,898 | 06/668,192 | 6/23/87 |
| 4,674,900 | 06/772,869 | 6/23/87 |
| 4,674,903 | 06/849,265 | 6/23/87 |
| 4,674,908 | 06/768,000 | 6/23/87 |
| 4,674,913 | 06/681,888 | 6/23/87 |
| 4,674,923 | 06/793,655 | 6/23/87 |
| 4,674,957 | 06/810,392 | 6/23/87 |
| 4,674,959 | 06/781,961 | 6/23/87 |
| 4,674,967 | 06/765,688 | 6/23/87 |
| 4,674,970 | 06/773,532 | 6/23/87 |
| 4,674,971 | 06/773,534 | 6/23/87 |
| 4,674,976 | 06/817,589 | 6/23/87 |
| 4,674,977 | 06/791,346 | 6/23/87 |
| 4,674,981 | 06/772,054 | 6/23/87 |
| 4,674,982 | 06/831,812 | 6/23/87 |
| 4,674,983 | 06/923,570 | 6/23/87 |
| 4,674,987 | 06/822,109 | 6/23/87 |
| 4,674,988 | 06/785,223 | 6/23/87 |
| 4,674,989 | 06/826,847 | 6/23/87 |
| 4,674,990 | 06/849,107 | 6/23/87 |
| 4,675,000 | 06/757,950 | 6/23/87 |
| 4,675,007 | 06/783,739 | 6/23/87 |
| 4,675,014 | 06/707,706 | 6/23/87 |
| 4,675,015 | 06/834,565 | 6/23/87 |
| 4,675,018 | 06/853,733 | 6/23/87 |
| 4,675,019 | 06/790,854 | 6/23/87 |
| 4,675,023 | 06/744,257 | 6/23/87 |
| 4,675,027 | 06/726,569 | 6/23/87 |
| 4,675,036 | 06/809,957 | 6/23/87 |
| 4,675,094 | 06/751,525 | 6/23/87 |
| 4,675,097 | 06/687,712 | 6/23/87 |
| 4,675,098 | 06/622,490 | 6/23/87 |
| 4,675,114 | 06/797,676 | 6/23/87 |
| 4,675,115 | 06/836,721 | 6/23/87 |
| 4,675,125 | 06/864,781 | 6/23/87 |
| 4,675,149 | 06/824,898 | 6/23/87 |
| 4,675,150 | 06/653,316 | 6/23/87 |
| 4,675,154 | 06/811,726 | 6/23/87 |
| 4,675,159 | 06/780,668 | 6/23/87 |
| 4,675,163 | 06/843,591 | 6/23/87 |
| 4,675,185 | 06/806,062 | 6/23/87 |
| 4,675,203 | 06/849,576 | 6/23/87 |
| 4,675,217 | 06/568,196 | 6/23/87 |
| 4,675,218 | 06/777,962 | 6/23/87 |
| 4,675,222 | 06/880,146 | 6/23/87 |
| 4,675,223 | 06/838,115 | 6/23/87 |
| 4,675,235 | 06/817,470 | 6/23/87 |
| 4,675,238 | 06/816,395 | 6/23/87 |
| 4,675,242 | 06/792,523 | 6/23/87 |
| 4,675,244 | 06/786,838 | 6/23/87 |
| 4,675,255 | 06/905,725 | 6/23/87 |
| 4,675,279 | 06/758,622 | 6/23/87 |
| 4,675,283 | 06/632,512 | 6/23/87 |
| 4,675,288 | 06/585,375 | 6/23/87 |
| 4,675,291 | 06/586,558 | 6/23/87 |
| 4,675,293 | 06/640,890 | 6/23/87 |
| 4,675,294 | 06/835,442 | 6/23/87 |
| 4,675,306 | 06/483,962 | 6/23/87 |
| 4,675,315 | 06/724,093 | 6/23/87 |
| 4,675,327 | 06/483,281 | 6/23/87 |
| 4,675,329 | 06/750,561 | 6/23/87 |
| 4,675,331 | 06/843,888 | 6/23/87 |
| 4,675,340 | 06/807,744 | 6/23/87 |
| 4,675,379 | 06/852,467 | 6/23/87 |
| 4,675,381 | 06/711,469 | 6/23/87 |
| 4,675,388 | 06/670,629 | 6/23/87 |
| 4,675,392 | 06/673,796 | 6/23/87 |
| 4,675,396 | 06/798,858 | 6/23/87 |
| 4,675,402 | 06/783,426 | 6/23/87 |
| 4,675,404 | 06/885,315 | 6/23/87 |
| 4,675,406 | 06/818,310 | 6/23/87 |
| 4,675,416 | 06/752,082 | 6/23/87 |
| 4,675,419 | 06/800,229 | 6/23/87 |
| 4,675,425 | 06/801,185 | 6/23/87 |
| 4,675,429 | 06/818,722 | 6/23/87 |
| 4,675,430 | 06/875,701 | 6/23/87 |
| 4,675,440 | 06/816,055 | 6/23/87 |
| 4,675,465 | 06/814,440 | 6/23/87 |
| 4,675,466 | 06/859,504 | 6/23/87 |
| 4,675,467 | 06/859,505 | 6/23/87 |
| 4,675,472 | 06/892,421 | 6/23/87 |
| 4,675,473 | 06/924,661 | 6/23/87 |
| 4,675,479 | 06/853,926 | 6/23/87 |
| 4,675,480 | 06/522,318 | 6/23/87 |
| 4,675,482 | 06/788,636 | 6/23/87 |
| 4,675,500 | 06/665,998 | 6/23/87 |
| 4,675,506 | 06/831,867 | 6/23/87 |
| 4,675,509 | 06/572,476 | 6/23/87 |
| 4,675,520 | 06/738,155 | 6/23/87 |
| 4,675,522 | 06/785,739 | 6/23/87 |
| 4,675,524 | 06/831,730 | 6/23/87 |
| 4,675,527 | 06/733,376 | 6/23/87 |
| 4,675,537 | 06/718,663 | 6/23/87 |

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| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,675,542 | 06/742,804 | 6/23/87 |
| 4,675,573 | 06/779,255 | 6/23/87 |
| 4,675,585 | 06/648,147 | 6/23/87 |
| 4,675,586 | 06/760,364 | 6/23/87 |
| 4,675,588 | 06/706,514 | 6/23/87 |
| 4,675,589 | 06/776,945 | 6/23/87 |
| 4,675,590 | 06/737,235 | 6/23/87 |
| 4,675,597 | 06/814,167 | 6/23/87 |
| 4,675,603 | 06/624,594 | 6/23/87 |
| 4,675,617 | 06/825,397 | 6/23/87 |
| 4,675,625 | 06/760,818 | 6/23/87 |
| 4,675,626 | 06/802,478 | 6/23/87 |
| 4,675,627 | 06/761,007 | 6/23/87 |
| 4,675,638 | 06/825,349 | 6/23/87 |
| 4,675,641 | 06/876,499 | 6/23/87 |
| 4,675,642 | 06/689,273 | 6/23/87 |
| 4,675,643 | 06/645,262 | 6/23/87 |
| 4,675,657 | 06/838,163 | 6/23/87 |
| 4,675,661 | 06/807,979 | 6/23/87 |
| 4,675,663 | 06/822,746 | 6/23/87 |
| 4,675,666 | 06/866,674 | 6/23/87 |
| 4,675,672 | 06/782,560 | 6/23/87 |
| 4,675,673 | 06/574,599 | 6/23/87 |
| 4,675,688 | 06/717,124 | 6/23/87 |
| 4,675,701 | 06/853,677 | 6/23/87 |
| 4,675,703 | 06/642,626 | 6/23/87 |
| 4,675,712 | 06/714,506 | 6/23/87 |
| 4,675,748 | 06/722,202 | 6/23/87 |
| 4,675,768 | 06/591,877 | 6/23/87 |
| 4,675,776 | 06/674,451 | 6/23/87 |
| 4,675,777 | 06/681,165 | 6/23/87 |
| 4,675,784 | 06/770,874 | 6/23/87 |
| 4,675,792 | 06/615,054 | 6/23/87 |
| 4,675,805 | 06/643,265 | 6/23/87 |
| 4,675,826 | 06/637,750 | 6/23/87 |
| 4,675,828 | 06/538,893 | 6/23/87 |
| 4,675,839 | 06/721,610 | 6/23/87 |
| 4,675,858 | 06/753,932 | 6/23/87 |
| 4,675,871 | 06/659,367 | 6/23/87 |
| 4,675,878 | 06/698,418 | 6/23/87 |
| 4,675,883 | 06/780,894 | 6/23/87 |
| 4,675,888 | 06/688,260 | 6/23/87 |
| 4,675,892 | 06/735,353 | 6/23/87 |
| 4,675,895 | 06/870,910 | 6/23/87 |
| 4,675,896 | 06/773,253 | 6/23/87 |
| 4,675,898 | 06/679,164 | 6/23/87 |
| 4,675,910 | 06/848,331 | 6/23/87 |

**4,790,399**, Re. S. N. 07/736,853, Filed July 29, 1991, Cl. 180/006.2, STEERING MECHANISM FOR A ZERO TURNING RADIUS VEHICLE, Tommy A. Middleworth, Owner of Record: *Simplicity Manufacturing, Inc., Port Washington, Wisc.*, Attorney or Agent: Michael D. Rechtin, Ex. Gp.: 314

**4,832,256**, Re. S. N. 07/704,345, Filed May 23, 1991, Cl. 229/023, WOOD REINFORCED CORRUGATED PAPER BOARD SHIPPING CONTAINER WITH ATTACHING STRIPS, John M. Grisby, Owner of Record: *North America Container Corp., Mableton, Calif.*, Attorney or Agent: Carl M. Davis, Ex. Gp.: 241

**4,834,810**, Re. S. N. 07/705,969, Filed May 28, 1991, Cl. 148/437, HIGH MODULUS Al ALLOYS, Raymond Christopher Benn, et. al., Owner of Record: *Inco Alloys International, Inc., Huntington, W. Va.*, Attorney or Agent: Blake T. Biederman, Ex. Gp.: 111

**4,848,994**, Re. S. N. 07/734,290, Filed July 17, 1991, Cl. 062/004, SYSTEM FOR LOW TEMPERATURE REFRIGERATION AND CHILL STORAGE USING AMMONIATED COMPLEX COMPOUNDS, Uwe Rockenfeller, Owner of Record: *Rocky Research, Boulder City, Nev.*, Attorney or Agent: Jerry R. Seiler, Ex. Gp.: 344

**4,852,556**, Re. S. N. 07/737,405, Filed July 29, 1991, Cl. 128/087R, ORTHOPEDIC RIGID SPLINT-PLATE ORTHOSIS, Jorge A. Groiso, Owner of Record: *Inventor*, Attorney or Agent: Louis C. Dujmich, Ex. Gp.: 331

**4,908,647**, Re. S. N. 07/712,693, Filed June 10, 1991, Cl. 354/402. LENS DRIVING DEVICE, Masayuki Ueyama, Owner of Record: *Minolta Camera Kabushiki Kaisha, Osaka, Japan*, Attorney or Agent: Richard J. McGrath, Ex. Gp.: 211

**4,909,121**, Re. S. N. 07/671,357, Filed Mar. 19, 1991, Cl. 084/606, TONE SIGNAL GENERATION DEVICE WITH RESONANCE TONE EFFECT, Satoshi Usa, et. al., Owner of Record: *Yamaha Corp., Hamamatsu-shi, Japan*, Attorney or Agent: David L. Fehrman, Ex. Gp.: 217

**4,985,093**, Re. S. N. 07/736,540, Filed July 26, 1991, Cl. 149/19.4, MELT CAST EXPLOSIVES, Charles McCulloch, Owner of Record: *Explosive Research and Deveopment Corp., Atlanta, Ga.*, Attorney or Agent: Donald C. Casey, Ex. Gp.: 224

**4,997,885**, Re. S. N. 07/736,274, Filed July 22, 1991, Cl. 525/092, POLYPHENYLENE ETHER-POLYAMIDE COMPOSITIONS FROM ARYLOXYTRIAZINE CAPPED POLYPHENYLENE ETHERS, Sterling B. Brown, Owner of Record: *General Electric Co., New York, N. Y.*, Attorney or Agent: William H. Pittman, Ex. Gp.: 151

**5,012,350**, Re. S. N. 07/732,905, Filed July 19, 1991, Cl. 358/335, TELEVISION LOCAL WIRELESS TRANSMISSION AND CONTROL, Donald A. Streck, et. al., Owner of Record: *Inventor*, Attorney or Agent: Donald A. Streck, Ex. Gp.: 262

### Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

**4,509,249** Re. S. N. 07/582,000, Filed Sept. 14, 1990, Cl. 437/067, METHOD FOR FABRICATING ISOLATION REGION IN SEMICONDUCTOR DEVICES, Hiroshi Goto, et. al., Owner of Record: *Fujitsu Ltd., Kawasaki-shi, Japan*, Attorney or Agent: H. J. Staas, Ex. Gp.: 114

**4,706,028**, Re. S. N. 07/732,359, Filed July 18, 1991, Cl. 324, METHOD FOR REDUCING IMAGE ARTIFACTS DUE TO PERIODIC SIGNAL VARIATIONS IN NMR IMAGING, Norbert J. Pelc, et. al., Owner of Record: *General Electric Co., New York, N. Y.*, Attorney or Agent: James O. Skarsten, Ex. Gp.: 265

**4,715,879**, Re. S. N. 07/736,284, Filed July 23, 1991, Cl. 065/60.2, METHOD FOR THE MANUFACTURE OF A TEMPERED AND/OR CURVED GLASS PANE WITH REDUCED TRANMISSION, Franz-Josef Schmitte, et. al., Owner of Record: *Inventors*, Attorney or Agent: Gerald S. Green, Ex. Gp.: 133

### Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**4,838,394** Reexam. No. 90/002,395, Requested July 31, 1991, Cl. 188/299, ADJUSTABLE SHOCK ABSORBER AND SYSTEM, Charles D. Lemme, et. al., Owner of Record: *Charles D. Lemme, Tuscon, Ariz, and Frederick J. Furrer, Wisconsin Dells, Wisc.*, Attorney or Agent: William A. Webb, Willian, Brinks, Olds, Hofer, et. al., Chicago, Ill., Ex. Gp.: 313, Requester: Owner



**4,965,717** Reexam. No. 90/002,393, Requested July 30, 1991, Cl. 364/200, MULTIPLE PROCESSOR SYSTEM HAVING SHARED MEMORY WITH PRIVATE-WRITE CAPABILITY, Richard W. Cutts, Jr., et. al., Owner of Record: *Tandem Computers, Inc., Cupertino, Calif.*, Attorney or Agent: Dennis S. Fernandez, Fenwick & West, Palo Alto, Calif., Ex. Gp.: 232, Requester: Owner

**5,021,983**, Reexam. No. 90/002,394, Requested July 31, 19991, Cl. 366/707, SUSPEND/RESUME APPARATUS AND METHOD FOR REDUCING POWER CONSUMPTION IN BATTERY POWERED COMPUTERS, Au H. Nguyen, et. al., Owner of Record: *Chips & Technologies, Inc., San Jose, Calif.*, Attorney or Agent: Paul C. Haughey, Townsend & Townsend, San Fransisco, Calif., Ex. Gp.: 242, Requester: Owner

### Department of Commerce
### Patent and Trademark Office
### [Docket No. 910235-1173]

*Agency:* Patent and Trademark Office, Commerce.
*Action:* Notice.

### Notice of Termination of Status of International Depository Authority under Budapest Treaty

*Summary:* Notice is hereby given that In Vitro International, Inc. s status as an international depository is terminated effective Sept. 25, 1991.

*Address:* Questions should be submitted to H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231.

*For Further Information Contact:* H. Dieter Hoinkes, Office of Legislation and International Affairs, (703) 557-3065.

*Supplementary Information:* Since Nov. 30, 1983, In Vitro International, Inc. (IVI) of Linthicum, Maryland, has been recognized as an international depository authority under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. The Patent and Trademark Office has received a letter from Dr. Rex A. D'Agostino, President of IVI, dated May 24, 1991, stating that IVI can no longer continue to perform its functions as an international depository authority under the Budapest Treaty.

By letter dated June 25, 1991, the Patent and Trademark Office has notified the Director General of the World Intellectual Property Organization that "the United States withdraws its declaration of assurances made on behalf of IVI on Sept. 9, 1983". As a consequence, the termination of the status of IVI as an international depository authority takes effect on Sept. 25, 1991.

All deposits stored with IVI under the Budapest Treaty were transferred on June 20, 1991, to a substitute authority, which is the American Type Culture Collection (ATCC), 12301 Parklawn Dr., Rockville, Md., 20852, (Telephone No. (301) 881-2600). All mail or other communications addressed to IVI regarding those deposits, including all files and other relevant information, have also been transferred to ATCC. In its capacity as a substitute authority, ATCC has agreed to store all deposits transferred from IVI for an initial period of not less than three months from July 5, 1991, the date of first notice in the Federal Register of IVI's termination as an international depository authority. Patent owners and applicants who wish to preserve their date of original deposit must contact ATCC by Oct. 5, 1991, to make arrangements to pay ATCC's fee for continued maintenance and storage of their deposits past the initial storage period. ATCC will not accept responsibility for continued storage of deposits in respect of which depositors have failed to make appropriate arrangements by Oct. 5, 1991.

For further information, contact H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231; telephone (703) 557-3065.

July 10, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks*

### Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Oct. 14, 1991.

Bunch, William D., 556 N. West St., Alexandria, Va. 22314
Reynolds, William C., 7713 Ridgecrest Dr., Alexandria, Va. 22308
Szczecina, Eugene L. Jr., 1869 Inglebrook Dr., Woodbridge, Va. 22192
Teskin, Robin L., 5409 Sour Gum Dr., Centreville, Va. 22020
Welsh, John D., 12826 Holiday Ln., Bowie, Md. 20716

Aug. 2, 1991

CAMERON WEIFFENBACH, *Director*
*Office of Enrollment and Discipline*

### Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,113,361, Harumi Nakano, LIQUID CRYSTAL DISPLAY DEVICE, Interference No. 102,384, decided Feb. 5, 1991, claims 1-16.

Patent No. 4,377,433, Ekkehard Merz, Robert Singer, LAMINATING AND COATING ADHESIVE, ITS MANUFACTURE AND USE, Interference No. 102,439, decided Mar. 7, 1991, claims 1-14.

Patent No. 4,428,941, Francis Galibert, Pierre Tiollais, Patrick Charnay, NUCLEOTIDIC SEQUENCE CODING THE SURFACE ANTIGEN OF THE HEPATITIS B VIRUS, VECTOR CONTAINING SAID NUCLEOTIDIC SEQUENCE, PROCESS ALLOWING THE OBTENTION THEREOF AND ANTIGEN OBTAINED THEREBY, Interference No. 101,793, decided Jan. 25, 1991, claims 1-10.

Patent No. 4,526,828, Kenneth E. Fogt, James D. Slosser, John A. Varos, Gopinath Radhakrishnan, PROTECTIVE APPAREL MATERIAL AND METHOD FOR PRODUCING SAME, Interference No. 102,402, decided Feb. 26, 1991, claims 1-5 and 7-19.

Patent No. 4,654,460, James B. Kimble, John H. Kolts, METHANE CONVERSION, Interference No. 101,898, decided Apr. 5, 1991, claims 1-12.

Patent No. 4,670,795, Eiichi Yamanishi, COLOR IMAGE FORMING APPARATUS AND METHOD, Interference No. 102,140, decided Dec. 18, 1990, claims 1-16.

Patent No. 4,700,563, Yasunari Iwata, Hirokazu Usui, ABNORMALITY DETERMINATION SYSTEM FOR REVOLUTION SPEED SENSOR, Interference No. 102,336, decided Feb. 21, 1991, claims 1, 3 and 7.

Patent No. 4,714,943, Kenji Sakakibara, Michitoshi Akao, Shigeyuki Hayashi, Jun Sakai, IMAGING DEVICE, Interference No. 102,151, decided Mar. 21, 1991, claims 1, 2, 12 and 13.

Patent No. 4,741,662, Kyoichi Suwa, Masaichi Murakami, METHOD AND APPARATUS FOR DETECTING DIVERRSION, Interference No. 102,276, decided Oct. 23, 1990, claims 1-20.

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Patent No. 4,746,196, Takao Umeda, Tetsuya Nagata, Yuzuru Simazaki, Tatsuo Igawa, Yasuro Hori, MULTIPLEXED DRIVING METHOD FOR AN OPTICAL SWITCHING ELEMENT EMPLOYING FERROELECTRIC LIQUID CRYSTAL, Interference No. 102,326, decided Feb. 6, 1991, claims 1-10.

Patent No. 4,797,139, Ralph Bauer, BOEHMITE PRODUCED BY A SEEDED HYDYOTHERMAL PROCESS AND CERAMIC BODIES PRODUCED THEREFROM, Interference No. 102,441, decided Mar. 12, 1991, claims 1-14, 19 and 20-27.

Patent No. 4,833,450, Charles Buccola, Lawrence M. Kolb, FAULT DETECTION IN COMBINATION INTRUSION DETECTION SYSTEMS, Interference No. 102,401, decided Apr. 4, 1991, claims 1-15.

Patent No. 4,837,343, Minoru Hatanaka, OPTICALLY ACTIVE BETA-AMINO ACID DERIVATIVES AND THEIR SALTS, AND PROCESSES FOR PRODUCING THE SAME, Interference No. 102,470, decided Apr. 18, 1991, claims 1-6.

NANNIE B. HENRY, *Deputy Clerk*
*Board of Patent Appeals and Interferences*
(703) 557-4005

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**Billing Code 3510-16**
**FEDERAL REGISTER NOTICE**
**U. S. DEPARTMENT OF COMMERCE**
**ADVISORY COMMISSION ON PATENT LAW REFORM**
**Notice of Open Meeting**

*Agency:* Patent and Trademark Office, Department of Commerce.
*Summary:* The Commission was chartered to advise the Secretary of Commerce on the state of and need for any reform in the United States patent system, as well as the need for any changes in the U.S. laws relating to the enforcement and the licensing of U.S. patents.
*Time & Place:* September 10, 1991, 9:30 to 5:00 p.m., U.S. Patent and Trademark Office, Crystal Park Two, Suite 912, Arlington, Va. 22202.
*Agenda:*
1. Briefing on Patent and Trademark Office procedures re National security subject matter applications.
2. Statistical profile of public comments received in response to May 16, 1991, notice (56 FR 22702).
3. Presentations from the four working groups of the Advisory Commission.
*Background:* On March 26, 1991, the Advisory Commission held its first meeting and created four working groups to address an agenda of thirteen issues. The issue assignments, using the labels given in the May 16 notice (56 FR 22702), are as follows:

| Working Group | Issues | |
|---|---|---|
| One | I. | Protection computer program-related inventions |
| | II. | Federal trade secret protection |
| Two | III. | Cost and complexity of patent enforcement |
| | IV. | Grounds for holding patents unenforceable |
| | V. | Licensee estoppel |
| Three | VI. | First-to-file |
| | VII. | Automatic publication |
| | VIII. | Patent term |
| | IX. | In re Hilmer |
| | X. | Deferred examination |
| Four | XI. | Reexamination |
| | XII. | Assignee filing |
| | XIII. | Patent and Trademark Office funding and fee structure |

*Public Observation:* The meeting will be open to public observation. Approximately 15 seats have been reserved for the public. Reservations for these seats will be available through the contact person indicated below. If time permits, the Chairperson may allow public comments and suggestions at the end of the meeting. Written comments and suggestions will be accepted before or after the meeting on any of the agenda matters.
*For Further Information Contact:* E. R. Kazenske, Executive Assistant to the Commissioner, Box 15, Patent and Trademark Office, Washington, D. C. 20231. Telephone: (703) 557-3071.

Aug. 9, 1991 HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks*

# PATENT NOTICES

**Certificates of Correction For Week of September 3, 1991**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| B1. 4,481,273 | 4,893,620 | 4,916,641 | 4,933,776 | 4,883,347 | 4,915,063 | 4,933,282 | 4,992,135 |
| D. 306,458 | 4,893,697 | 4,916,796 | 4,933,912 | 4,887,239 | 4,915,888 | 4,933,354 | 4,994,296 |
| D. 306,909 | 4,896,268 | 4,917,178 | 4,934,515 | 4,889,814 | 4,915,899 | 4,933,447 | 4,997,308 |
| D. 308,066 | 4,896,724 | 4,917,208 | 4,934,611 | 4,890,053 | 4,916,185 | 4,933,454 | 5,007,449 |
| 4,688,906 | 4,897,268 | 4,917,642 | 4,935,450 | 4,891,301 | 4,916,412 | 4,933,492 | 5,013,422 |
| 4,717,571 | 4,897,531 | 4,918,002 | 4,936,390 | 4,893,402 | 4,916,531 | 4,933,587 | 5,019,728 |
| 4,733,228 | 4,897,556 | 4,918,145 | 4,936,750 | | | | |
| 4,737,356 | 4,898,411 | 4,918,313 | 4,936,963 | | | | |
| 4,757,224 | 4,899,682 | 4,920,120 | 4,937,341 | | | | |
| 4,763,032 | 4,899,765 | 4,920,394 | 4,937,433 | | | | |
| 4,772,902 | 4,900,277 | 4,920,453 | 4,937,461 | | | | |
| 4,782,229 | 4,900,645 | 4,920,688 | 4,937,519 | | | | |
| 4,790,927 | 4,900,768 | 4,920,735 | 4,937,599 | | | | |
| 4,800,289 | 4,901,091 | 4,920,982 | 4,939,282 | | | | |
| 4,806,388 | 4,901,478 | 4,922,048 | 4,939,730 | | | | |
| 4,806,813 | 4,901,612 | 4,922,357 | 4,940,027 | | | | |
| 4,814,338 | 4,902,709 | 4,922,942 | 4,940,124 | | | | |
| 4,830,394 | 4,902,782 | 4,923,307 | 4,940,609 | | | | |
| 4,830,803 | 4,903,136 | 4,923,566 | 4,941,894 | | | | |
| 4,831,582 | 4,903,979 | 4,925,429 | 4,942,099 | | | | |
| 4,839,807 | 4,904,650 | 4,925,442 | 4,942,509 | | | | |
| 4,842,010 | 4,904,887 | 4,926,323 | 4,942,549 | | | | |
| 4,843,828 | 4,905,161 | 4,926,381 | 4,943,456 | | | | |
| 4,847,551 | 4,906,124 | 4,926,668 | 4,943,716 | | | | |
| 4,850,326 | 4,906,400 | 4,926,914 | 4,943,918 | | | | |
| 4,855,461 | 4,908,275 | 4,926,920 | 4,944,295 | | | | |
| 4,857,399 | 4,908,713 | 4,927,160 | 4,945,565 | | | | |
| 4,858,375 | 4,909,019 | 4,927,213 | 4,945,620 | | | | |
| 4,858,543 | 4,909,735 | 4,927,413 | 4,945,813 | | | | |
| 4,860,028 | 4,910,064 | 4,927,664 | 4,946,090 | | | | |
| 4,864,811 | 4,910,253 | 4,927,713 | 4,946,268 | | | | |
| 4,865,745 | 4,910,879 | 4,927,826 | 4,946,430 | | | | |
| 4,868,902 | 4,912,010 | 4,927,970 | 4,947,415 | | | | |
| 4,871,427 | 4,912,180 | 4,928,806 | 4,948,592 | | | | |
| 4,873,802 | 4,912,359 | 4,929,387 | 4,950,625 | | | | |
| 4,875,311 | 4,912,716 | 4,929,429 | 4,956,947 | | | | |
| 4,875,928 | 4,912,785 | 4,929,432 | 4,964,591 | | | | |
| 4,876,009 | 4,913,041 | 4,929,617 | 4,971,344 | | | | |
| 4,877,406 | 4,913,157 | 4,929,774 | 4,972,063 | | | | |
| 4,877,641 | 4,913,969 | 4,929,928 | 4,972,476 | | | | |
| 4,877,879 | 4,914,244 | 4,930,846 | 4,979,303 | | | | |
| 4,878,077 | 4,914,270 | 4,931,818 | 4,979,618 | | | | |
| 4,879,566 | 4,914,462 | 4,931,849 | 4,985,618 | | | | |
| 4,880,718 | 4,914,718 | 4,932,481 | 4,986,813 | | | | |
| 4,881,229 | 4,914,919 | 4,933,102 | 4,988,864 | | | | |

**Disclaimers**

4,663,089—*Jerry D. Lowry*; *Sylvia B. Lowry*, both of Thorndike, Me. DIFFUSED BUBBLE AERATION SYSTEM. Patent dated May 5, 1987. Disclaimer filed Jan. 7, 1991, by the inventors.

Hereby enters this disclaimer to claims 1-3, 5, and 8-13 of said patent.

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4,786,345—*Eric Wood*, Wellingborough, England. METHOD OF LINING A PASSAGEWAY. Patent dated Nov. 22, 1988. Disclaimer filed June 4, 1990, by the assignee, Instituform Licencees B.V.

Hereby enters this disclaimer to claim 5 of said patent.

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4,958,556—*Agostino Aquino*, Patterson, N. J.; *Karl U. Lang*, Port Javis, N. Y. FILLED CRACKER MAKING APPARATUS. Patent dated Sept. 25, 1990. Disclaimer filed June 17, 1991, by the assignee, Nabisco Brands, Inc.

Hereby enters this disclaimer to claims 1, 4, 5, and 7 of said patent.

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5,000,973—*Felice Scaglione*, Hasbrouck Heights; *Lorna C. Staples*, Teaneck, both of N. J. NUTRITIONALLY-BALANCED CANINE BISCUITS CONTAINING AN INORGANIC PYROPHOSPHATE. Patent dated Mar. 19, 1991. Disclaimer filed Nov. 8, 1990, by the assignee, Nabisco Brands, Inc.

The term of this patent subsequent to May 14, 2008, has been disclaimed.

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| GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director | 308-0651 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during August 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,827,085 to 3,832,735 inclusive
Plant Patents ..... 3,581 to 3,603

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# REEXAMINATIONS

SEPTEMBER 3, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 3,684,560 (1543rd)**
**METHOD OF FORMING REFRACTORY MASSES**
**Edgard Brichard, Ransart; Maurice Jaupain, Jumet; Emile Plumat, Gilly, and Pierre Deschepper, Marcinelle, all of Belgium, assignors to Glaverbel SA, Brussels, Belgium**
**Reexamination Request No. 90/001,895, Nov. 20, 1989.**
**Reexamination Certificate for Patent No. 3,684,560, issued Aug. 15, 1972, Ser. No. 86,532, Nov. 3, 1970.**
**Claims priority, application Belgium, Nov. 4, 1969, 59745**
**Int. Cl.[5] B05D** *1/08, 1/02*
**U.S. Cl. 427—140**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **8, 13** and **14** is confirmed.

Claims **1–7, 9–12** and **15–22** are cancelled.

8. A process according to claim **1** wherein said oxidizable substance is a metal.

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**B1 4,002,746 (1544th)**
**SYNTHESIS OF GON-4-ENES**
**Gordon A. Hughes, and Herschel Smith, both of Wayne, Pa.**
**Reexamination Request No. 90/002,043, Jun. 4, 1990.**
**Reexamination Certificate for Patent No. 4,002,746, issued Jan. 11, 1977, Ser. No. 337,823, Jan. 15, 1964.**
**Continuation-in-part of Ser. No. 228,384, Oct. 4, 1962, Pat. No. 3,850,911, which is a continuation-in-part of Ser. No. 57,904, Sep. 23, 1960, abandoned, Ser. No. 91,341, Feb. 24, 1961, abandoned, Ser. No. 137,535, Sep. 12, 1961, abandoned, Ser. No. 195,000, May 15, 1962, abandoned, Ser. No. 196,557, May 16, 1962, abandoned**
**Int. Cl.[5] A61K** *31/56;* **C07J** *31/00, 1/00, 44/00*
**U.S. Cl. 514—178**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

New claim **6** is added and determined to be patentable.

**1**. A therapeutic composition having progestational activity comprising as active ingredient a 17-aliphatic carboxylic acid ester of 17$\alpha$-ethynyl-18-methyl-19-nortestosterone and a pharmaceutically carrier for said compound.

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**B1 4,314,990 (1545th)**
**TOOTHPASTE COMPOSITION**
**William D. Denny, Jr., and Thomas A. Wetzel, both of Cincinnati, Ohio, assignors to The Proctor & Gamble Co., Cincinnati, Ohio**
**Reexamination Request No. 90/001,945, Feb. 27, 1990.**
**Reexamination Certificate for Patent No. 4,314,990, issued Feb. 9, 1982, Ser. No. 84,485, Oct. 15, 1979.**
**Int. Cl.[5] A61K** *7/18*
**U.S. Cl. 424—52**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** to **7** is confirmed.

**1**. A toothpaste composition comprising: (A) from about 6% to 45% of a silica dental abrasive; (B) from about 30% to 70% of a humectant; (C) from about 0.01% to 3% of a fluoride ion source; and (D) from about 10% to 45% of water, said composition additionally containing an amount of a phosphate buffering agent providing from about 0.1% to 1% $PO_4^{-3}$, the amount being sufficient to maintain the pH of a 3:1 water/composition weight ratio slurry in the range of about 6.8 to 8.0.

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**B1 4,742,142 (1546th)**
**METHOD OF PRODUCING SILICONE RUBBER POWDER**
**Koji Shimizu, and Mitsuo Hamada, both of Chiba, Japan, assignors to Toray Silicone Company, Ltd.**
**Reexamination Request No. 90/001,991, Apr. 9, 1990.**
**Reexamination Certificate for Patent No. 4,742,142, issued May 3, 1988, Ser. No. 34,368, Apr. 6, 1987.**
**Claims priority, application Japan, Apr. 17, 1986, 61-89063**
**Int. Cl.[5] C08G** *77/06*
**U.S. Cl. 528—15**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** to **5** is confirmed.

**1**. A method for preparing a cured silicone rubber powder in the form of microfine particles, said method comprising (1) emulsifying a curable liquid silicone rubber composition in a mixture comprising water and a surfactant where said mixture is maintained at a temperature of from 0 to 25 degrees C., (2) curing the liquid silicone rubber into a powder by dispersing the resultant emulsion into water maintained at a temperature of at least 25 degrees C., and (3) isolating the resultant cured powder.

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**B1 4,828,787 (1547th)**
**APPARATUS FOR SIMULATION OF THE OPERATION OF A PRESSURIZED WATER NUCLEAR REACTOR**
**Klaus Distler, Biblis; Rolf Enders, Worms, and Dieter Göhlich, Biblis, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft**
**Reexamination Request No. 90/001,897, Nov. 20, 1989.**
**Reexamination Certificate for Patent No. 4,828,787, issued May 9, 1989, Ser. No. 57,794, Jun. 3, 1987.**
**Claims priority, application Fed. Rep. of Germany, Jul. 17, 1986, 3624119**
**Int. Cl.[5] G21C** *17/00;* **G09B** *9/00*
**U.S. Cl. 376—245**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–5** are cancelled.

**[1**. In an apparatus for simulation of the operation of a pressurized water reactor comprising a reactor vessel having a heater, a steam generating vessel divided into a primary portion and a secondary portion, said reactor vessel and said primary portion of said steam generating vessel being connected in a primary feed loop equipped with a coolant pump and said secondary portion of said steam generating vessel and a condenser unit being connected in a secondary feed loop provided with a feed pump, the improvement wherein said reactor vessel and a primary part of an additional steam generating unit are combined in another primary feed loop parallel to said primary feed loop having said coolant pump, a secondary part of said additional steam generating unit is connected

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with the aid of at least two branch pipes to said secondary loop, a connector pipe with a valve for closing the pipe is installed between said primary feed loop and said secondary portion, and a pressure regulating system comprising a pressurized vessel communicating both with an expansion vessel and a spray pipe is connected into the primary feed loop.]

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**B1 4,917,465 (1548th)**
**COLOR DISPLAY SYSTEM**
**Arlie R. Conner, Portland, and Paul E. Gulick, Tualatin, both of Oreg., assignors to In Focus Systems, Inc., Tualatin, Oreg.**
**Continuation-in-part of Ser. No. 378,997, Jul. 12, 1989, and a continuation-in-part of Ser. No. 363,099, Jun. 7, 1989, and a continuation-in-part of Ser. No. 329,938, Mar. 28, 1989**
**Int. Cl. G02F** *1/13*
**U.S. Cl. 350—335**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1-23** is confirmed.

**1.** A display apparatus including a display subassembly, the display subassembly comprising:

first, second and third supertwisted nematic birefringent liquid crystal display panels, each of said panels exhibiting the characteristic wherein they switch rapidly between a deselected state and a selected state when an excitation voltage applied thereto exceeds a threshold value;

first, second, third and fourth polarizers;

the first panel being positioned between the first and second polarizers, the second panel being positioned between the second and third polarizers and the third panel being positioned between the third and fourth polarizers;

the birefringence of the first, second and third panels being selected, in cooperation with operation of the polarizers adjacent thereto, to pass light of first, second and third subtractive primary colors, respectively, when the panels are in first states, and to pass substantially all colors of light when the panels are in second states;

each of said panels having a plurality of electronically operable pixels, said panels being stacked so that corresponding pixels in each of said panels are aligned along an axis orthogonal thereto;

the apparatus further including:

illumination means for illuminating the display subassembly with substantially collimated light; and

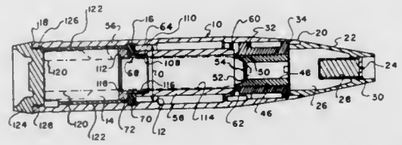
light processing means for processing the collimated light exiting the display subassembly to permit wide angle viewing.

# STATUTORY INVENTION REGISTRATIONS

## PUBLISHED SEPTEMBER 3, 1991

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

**H959**
**PROJECTILE TERMINAL DELIVERY VEHICLE ASSEMBLY**
**John E. Heckman, Shell Rock, and Joseph P. Van Dorn, Waterloo, both of Iowa, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**
**Filed Feb. 19, 1991, Ser. No. 657,595**
**Int. Cl.[5] F42B** *12/58*
**U.S. Cl. 102—489** **2 Claims**



**1.** Apparatus for permitting a sub-projectile of a defined diameter, length, aft end and nose end, to be carried within an essentially hollow, tubular projectile having a hollow front ogive portion, a defined projectile inside diameter, length, and aft end; and further having an inside groove essentially near said aft end of the projectile, said apparatus comprising:

a piston member axially fixed in said front ogive portion, said piston member having an axial hole therein of diameter smaller than that of said sub-projectile;

a hollow tubular member of inside diameter only slightly wider than said sub-projectile diameter, and outside diameter less than said projectile's inside diameter, and length equal to the distance between said groove and the aft facing end of said piston member;

a lock ring means fixed in said groove, said lock ring means having an inside diameter about equal to the inside diameter of said tubular member, said tubular member being mounted between said lock ring means and said piston member; said sub-projectile being inserted, nose end forward, in through said aft end of said tubular projectile and into said tubular member, until it is fixed in the hole of said piston member as far as the nose end will go in, the length of said sub-projectile such that its aft end essentially meets the aft end of said projectile when so mounted;

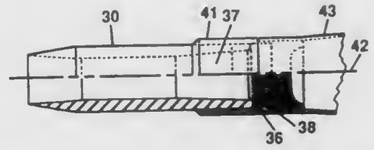
a base plug attached to the aft end of said projectile, to hold said sub-projectile snugly with the sub-projectile front end pressed against said piston member, and held within said tubular member; and

an O-ring means on said sub-projectile front end between said sub-projectile and said piston member, for cushioning the abuttment of the sub-projectile front end to said piston member.

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**H960**
**DISCARDING ROTATING BAND/OBTURATOR**
**Joseph Huerta, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**
**Filed Oct. 4, 1989, Ser. No. 417,615**
**Int. Cl.[5] F42B** *12/16*
**U.S. Cl. 102—522** **1 Claim**

**1.** A discardable apparatus for mating with a full-caliber hollow tubular projectile, said apparatus being discardable after expulsion from a cannon barrel, consisting essentially of a simple, one-piece discardable obturator having an outer cylindrically engravable surface for imparting spin to said projectile during passage through said cannon barrel, said obturator



having an interior cavity formed of a flat surface and a detachable pusher plate fitted on said flat cavity surface.

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**H961**
**HEAT EXCHANGER AND HEATER**
**Daniel K. Yu, University Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**
**Filed Oct. 22, 1990, Ser. No. 600,882**
**Int. Cl.[5] F41H** *9/06;* **F28D** *7/10*
**U.S. Cl. 165—163** **6 Claims**



**1.** A heat exchanger and heater, comprising, a housing, a vaporizer means located in said housing, and inlet and outlet means for a liquid.

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**H962**
**AUTOMATED STABILITY/COMPATIBILITY APPARATUS**
**Lawrence J. Kovach, Bloomington, Ind., assignor to United States of America, Washington, D.C.**
**Filed Aug. 29, 1989, Ser. No. 400,314**
**Int. Cl.[5] B01L** *9/00;* **G05D** *16/00*
**U.S. Cl. 422—68.1** **5 Claims**

**1.** Apparatus for measuring the stability and compatibility of sample materials, comprising:

a container for receiving selected quantities of said materials, said container having an open top,

a manifold for receiving said open top and sealing it therein,

transducer means coupled to said manifold for measuring the pressure generated within said container by the aging process of the sample within said container and providing an output signal thereof,

vacuum means coupled to said manifold for evacuating the interior of said container,

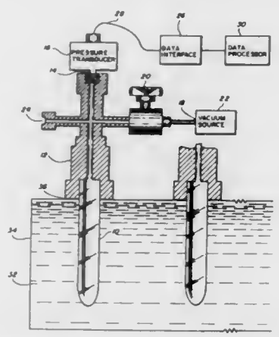
computer means coupled to the output of said transducer for receiving data developed by said transducer,

whereby when said container is heated to accelerate the

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aging process of the sample within said container, said transducer provides pressure data to said computer means,




such that the stability and compatibility of said materials within said container may be determined.

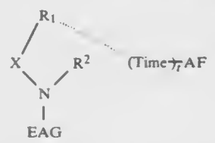
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**H963**
**COLOR LIGHT-SENSITIVE MATERIAL**

**Hiroyuki Hirai; Keizo Furuya, and Koki Nakamura, all of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 127,841, Dec. 2, 1987, abandoned. This application Oct. 2, 1989, Ser. No. 415,483**
**Claims priority, application Japan, Dec. 2, 1986, 61-287455; Apr. 3, 1987, 62-82284**
**Int. Cl.[5] G03C *5/54, 7/26***
**U.S. Cl. 430—559** **10 Claims**

1. A color light-sensitive material, comprising on a support at least a light-sensitive silver halide, a binder, a dye providing substance which provides a mobile dye in inverse relationship to the reduction reaction of silver ion to silver, and a development inhibitor precursor of the general formula (II):

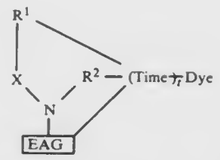



(II)

wherein AF represents a group which serves as a development inhibitor after being released; wherein EAG represents an electron accepting group; N represents a nitrogen atom; X represents an oxygen atom (—O—), sulfur atom (—S—), or a nitrogen atom-containing group,




$R^1$, $R^2$ and $R^3$ each represents a simple bond or a group other than a hydrogen atom, with the proviso that any two of $R^1$, $R^2$, $R^3$, and EAG may be bonded to each other to form a ring; Time represents a group which releases AF through a reaction triggered by the cleavage of the N—X bond; t represents an integer of 0 or 1; the solid lines indicate a bond; and the broken lines indicate that at least one thereof represents a bond; wherein the dye providing substance is a positive dye providing substance represented by general formula (CII); wherein the N—X bond is reduced by a reductive substance to undergo cleavage which causes the release of a mobile dye;




(CII)

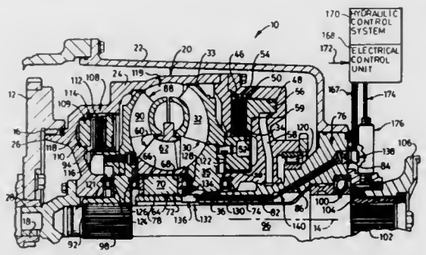
wherein Dye represents a group providing a compound which serves as a mobile dye after being reduced; and $R^1$, $R^2$, EAG, Time, t, N, X, broken lines, and solid lines have the same meanings as defined in the general formula (II), and wherein the amount of the compound of general formula (II) is from $1\times10^{-3}$ to $1\times10^{2}$ mols per mol of the positive dye providing substance.

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**H964**
**APPARATUS FOR SENSING THE SPEED OF AN ELEMENT WITHIN A TORQUE CONVERTER**

**Martin D. Olson, Washington, and Dwayne E. Arff, Peoria, both of Ill., assignors to Caterpillar Inc.**

**Filed Aug. 20, 1990, Ser. No. 569,793**
**Int. Cl.[5] G01P *3/48*; G01B *7/14***
**U.S. Cl. 324—174** **6 Claims**




1. An internal speed sensor apparatus for a mechanism including a carrier assembly, an element mounted on the carrier assembly for rotation about a central axis and having a radially inner portion defining an opening therethrough oriented along the axis, a pair of end faces individually located at either side of the opening, a radially outer periphery, and a rotating housing mounted at least in part on the carrier assembly in a generally encasing relationship to the outer periphery and end faces of the element, comprising:

a ring magnet connected to rotate with the element;

a sensor unit connected to the carrier assembly in juxtaposed proximity to the ring magnet and remote from any exterior surface portion of the carrier assembly; and

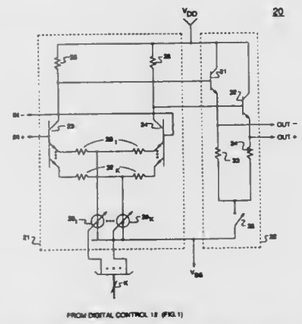
wherein the ring magnet and the sensor unit collectively define an electrical signal-generating device for generating at least one output signal related directly to the speed of rotation of the element, the ring magnet and the sensor unit being located generally radially inwardly of the element.



**H965**
**DIFFERENTIAL AMPLIFIER WITH DIGITALLY CONTROLLED GAIN**

**Paul C. Davis, Reading; Scott L. Forgues, Wyomissing, and Iconomos A. Koullias, West Lawn, all of Pa., assignors to American Telephone and Telegraph Company, New York, N.Y.**

**Filed Jan. 26, 1990, Ser. No. 471,185**
**Int. Cl.[5] H03F *3/45***
**U.S. Cl. 330—254** **8 Claims**




1. An amplifier having a plurality of gain stages connected in tandem, the gain of each stage being controlled by digital input signals, each gain stage characterized by:

at least one transistor having multiple emitters;

a plurality of resistors, coupling to corresponding emitters; and,

means, coupling to the plurality of resistors, for enabling current through selected ones of the plurality of resistors in response to the digital input signals;

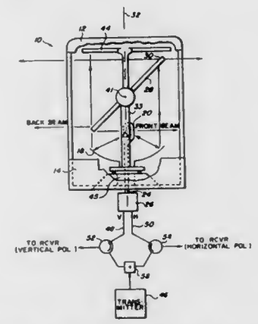
wherein the gain of the gain stage is substantially determined by the resistances of the plurality of resistors having current flowing therein.

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**H966**
**TWO-BEAM SCANNING ANTENNA REQUIRING NO ROTARY JOINTS**

**William M. Waters, Millersville, Md., and Clifford L. Temes, Alexandria, Va., assignors to The United States of America as represented by the Government of the United States, Washington, D.C.**

**Filed Nov. 30, 1990, Ser. No. 620,182**
**Int. Cl.[5] H01Q *21/06***
**U.S. Cl. 342—361** **6 Claims**




1. A system for generating two linearly polarized beams comprising:

transition means for producing electromagnetic wave energy;

a bidirectional parabolic antenna system with feed joint coupled to said transmitter means;

a supporting structure for said antenna system oriented to project a circularly polarized beam essentially upwardly of said antenna system and parallel to a vertical axis coincident with the center of said antenna system;

a primary reflector disposed to intercept said beam so constructed as to reflect vertically polarized energy while passing horizontally polarized energy unhindered, wherein vertically polarized energy reflected by said primary reflector is called a front beam, and horizontally polarized energy passed by said primary reflector is called a back beam;

a twist planar reflector mounted above said primary reflector in the path of said beam so constructed as to change the polarization of energy striking it by ninety degrees.

rotating means attached to said primary and twist planar reflectors for rotating said reflectors simultaneously about said vertical axis;

signal processing means coupled to said feed joint for linearly combining the vertically and horizontally polarized signals corresponding to said front and said back beams generated by said reflectors;

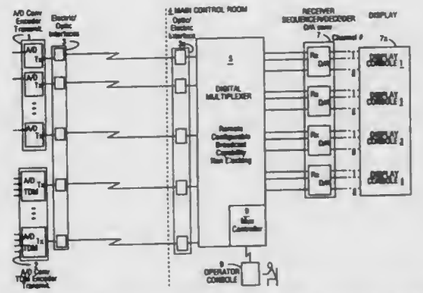
and scan control means for feeding the azimuth angle of said rotating means to said signal processing means.

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**H967**
**HIGH SPEED, LONG DISTANCE, DATA TRANSMISSION MULTIPLEXING CIRCUIT**

**Razvan Mariotti, Boulder, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jan. 30, 1990, Ser. No. 472,546**
**Int. Cl.[5] H04J *3/04***
**U.S. Cl. 370—112** **7 Claims**




1. A circuit for digital data capture at high speed, serial data transmission and multiplexing over long distance and for selecting and continously displaying real time analog signals, comprising; a plurality of data sampling A/D converting, encoding, framing and transmitting modules (1), a plurality of data sampling A/D converting, TDM encoding, framing and transmitting modules (2) for generating character frames for serial synchronous data transmission, a plurality of electric/optic Serial interfaces (3) each of which is operatively connected, respectively, to one of said modules (1 or 2), a plurality of optic/electric interfaces each of which is operatively connected by a fiber-optic data transmission means to one of said electric/optic interfaces, for electrical and optical line communication between said interfaces, a high speed digital multiplexer cross point switch module (5), a plurality of receiver sequencer/decoder and D/A converter circuits (7) each of which include a state machine (11) and is computer programmable, said multiplexing module (5) being made non-blocking

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and remotely configurable by predetermined computer program signal input from an operator console (6), whereby any input signal received by the multiplexing module can be selectively received and displayed at a display console (7A), and whereby the same input signal can be selected and displayed at the same time at different display consoles (7A/1-4) of said console; each of said sequencer/decoder and D/A circuits (7) being effective to use character frames of the captured data that is transmitted to it in order to detect the data characters and to synchronize such detection, and each of said receiver sequencer/decoder circuits also being made fault tolerant by a "flywheel" algorithm (Appendix C) that is programmed to tolerate one transmission error before the state machine of the sequencer/decoder circuit (4) is out of synchronization for decoding of the said transmitted frames.

# REISSUES

## SEPTEMBER 3, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### Re. 33,678

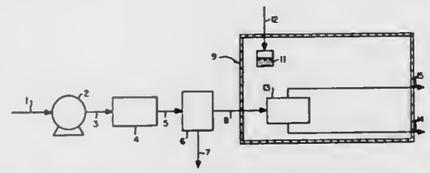
### MEMBRANE SEPARATION SYSTEM AND PROCESS

**Michael J. Campbell, Clarence Center; James Smolarek, Boston, and Timothy S. Van Lente, Buffalo, all of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.**

**Original No. 4,787,919, dated Nov. 29, 1988, Ser. No. 65,472, Jun. 23, 1987. Application for reissue Nov. 29, 1989, Ser. No. 442,572**

Int. Cl.[5] B01D *53/22*

U.S. Cl. 55—16 23 Claims



1. An improved air separation process comprising:

(a) compressing a feed air stream containing condensible water vapor to a desired feed air pressure;

(b) cooling *the* [said] compressed feed air stream to below the design operating temperature level of the air separation process, thereby supersaturating the feed air so that the feed air stream comprises [said] feed air saturated with condensible water vapor together with free water droplets;

(c) removing said free [liquid] *water* droplets from the feed air stream;

(d) passing the compressed, cooled feed air stream, free of water droplets, into an insulated enclosure adpated to control and/or minimize the lose of heat therefrom, without superheat of said feed air stream prior to its passage into said insulated enclosure and without predrying said feed air stream to a temperature dew point lower than said design operating temperature prior to said passage of the feed air stream into the insulated enclosure;

(e) supplying sufficient heat within said insulated enclosure so as to superheat the feed air stream therein to a temperature where the saturation temperature thereof at the feed air pressure, said insulated enclosure serving to control and/or minimize the loss of heat therefrom such that any loss of heat is not greater than that being supplied within said insulated enclosure, so that the feed air within said insulated enclosure is mintained under superheat conditions at a temperature below its dew point to avoid undesired condensation of water present in the feed air within a permeable membrane system positioned within said insulated enclosure to effect the desired air separation;

(f) passing the [thus-] superheated feed air stream to said permeable membrane system positioned within said insulated enclosure, said permeable membrane system containing at least one membrane module capable of selectively permeating oxygen together with condensible water vapor, as a more permeable component of the feed air stream from nitrogen as a less readily permeable component thereof, said membrane module or modules not being individually insulated for the retention of heat therein;

(g) withdrawing nitrogen from the membrane system and from said insulated enclosure as non-permeate gas at essentially said feed air pressure; and

(h) separately withdrawing oxygen and condensible water vapor from the membrane system and from said insulated enclosure as permeate gas at a lower pressure, whereby condensation of water from the feed air stream within the membrane system is effectively precluded.

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### Re. 33,679

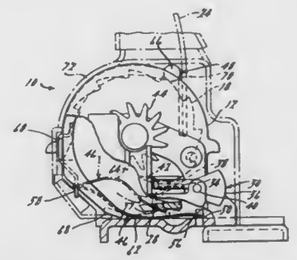
### COMBINATION SEAT BELT RETRACTOR MECHANISM

**Timothy J. Schmidt, Troy, Mich., assignor to General Safety Corporation, St. Clair Shores, Mich.**

**Original No. 4,518,132, dated May 21, 1985, Ser. No. 604,592, Apr. 27, 1984. Application for reissue Jun. 19, 1989, Ser. No. 368,189**

Int. Cl.[5] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107.4 A 8 Claims



*11. In a motor vehicle seat belt retractor which may be operated either as an emergency locking retractor which prevents seat belt webbing from being withdrawn when the retractor is subjected to deceleration above a predetermined level, or as an automatic locking retractor which acts to retract said webbing but does not permit substantial withdrawal of said webbing, including a retractor frame, a spool rotatable within said frame and having a spindle upon which said webbing is wrapped and a pair of toothed sprockets on opposite ends thereof, a locking bar engageable with said toothed sprockets for restricting withdrawal of said webbing from said spool, and an inertia sensitive actuator acting upon said locking bar to cause engagement of said locking bar with said toothed sprockets when a deceleration of said vehicle above said predetermined level is sensed, the improvement comprising*

*a leaf spring positioned between said toothed sprockets and having two ends and a center portion between said ends, each of said ends being mounted to said retractor frame at attachment points fixed with respect to said retractor frame and separated by a distance less than the free length of said spring, said spring being movable between a first state wherein said spring center portion is deflected away from said spool and disengaged from said locking bar wherein said locking bar is permitted to operate solely in response to said internal sensitive actuator whereby said retractor operates as an emergency locking retractor, and a second state wherein the center portion of said spring is deflected toward said spool and acts by direct contact with said locking bar biasing said locking bar into engagement with said toothed sprockets causing said locking bar to engage with said toothed sprockets to engage the teeth of said sprockets to restrict withdrawal of said webbing while allawing said locking bar to ride over said teeth upon retraction of said webbing whereby said retractor operates as an automatic locking retractor; and*

*a web sensing lever pivotably mounted to said retractor frame and defining first and second arms on either side of said pivot axis, said lever being pivotable between a first position and a second position, in said second position said first arm engaging said spring center portion and forcing said spring into said second state, said second arm positioned to engage said webbing when substantially all of said webbing has been with-*

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*drawn from said spool causing said lever to move to said second positian through contact with said webbing, and when said lever is in said second position and said webbing is being retracted onto said spool, said spring is oriented such that when the diameter af the total wraps of webbing on said spool reaches a predetermined diameter, said wraps directly contact said spring center portion forcing said spring to switch from said second state to said first state.*

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**Re. 33,680**

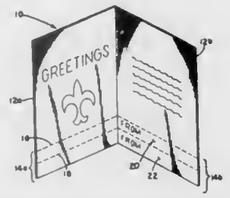
## REUSABLE GREETING CARD

**Steve Drabish, 7740 Dunham Rd., Walton Hills, Ohio 44146**

**Original No. 4,613,157, dated Sep. 23, 1986, Ser. No. 514,937, Jul. 18, 1983. Application for reissue Sep. 14, 1988, Ser. No. 244,032**

**Int. Cl.**[5] **B42D** *19/00, 1/00, 15/00;* **B41L** *1/20*

**U.S. Cl. 281—5** **12 Claims**




*11. A reusable greeting card ensemble comprising:*

*(a) a card proper formed of a plurality of layers of single sheets each bearing a message and arranged in superposed relationship releasably joined along one margin thereof and with the lower margin of each sheet indexed from the next adjacent sheet to provide a stack of sheets of progressively shorter length wherein the lower marginal portion of each sheet defines a signature portion for that sheet, wherein the sheets are removed successively by each subsequent user;*

*(b) an envelope sized to receive the plurality of marginally joined sheets and having therewith additional envelopes each sized to receive said sheets after successive removal of one of said sheets.*

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**Re. 33,681**

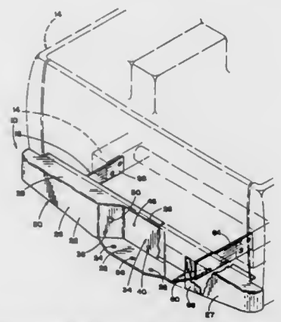
## APPARATUS FOR MOUNTING A TRAILER HITCH ON A VEHICLE

**Donald E. Bundy, Sapulpa, and Ronald W. Bundy, Sand Springs, both of Okla., assignors to Judd & Judd, Inc., Tulsa, Okla.**

**Original No. 4,634,163, dated Jan. 6, 1987, Ser. No. 766,589, Aug. 19, 1985. Application for reissue Mar. 18, 1988, Ser. No. 170,433**

**Int. Cl.**[5] **B60R** *19/48*

**U.S. Cl. 293—117** **13 Claims**



1. Apparatus for mounting a trailer hitch on a vehicle to enable the vehicle to tow a load on a surface supporting the vehicle, said apparatus being of the type which is securedly mountable on the vehicle and which is adapted to have a trailer hitch secured thereto, said apparatus comprising:

a substantially planar base having a hole therethrough for receiving a trailer hitch therein, said base being substantially parallel to the surface supporting the vehicle when said apparatus is mounted thereon, said base further having pair of opposing substantially parallel sides;

a substantially planar plate **[**mounted on**]** *connected to* each side of said base, each of said plates being at an angle of substantially less than ninety degrees to said base and extending upwardly and outwardly therefrom; and

an elongate support bracket **[**mounted on the outer end of**]** *connected to* each of said plates, the longitudinal axes of said brackets being substantially parallel to said base.

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**Re. 33,682**

## AUTO FOCUS CIRCUIT FOR VIDEO CAMERA

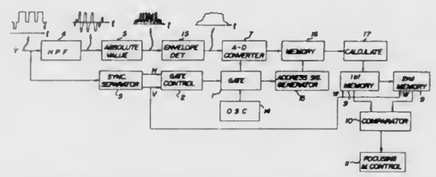
**Tatsuo Hiramatsu, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Original No. 4,638,364, dated Jan. 20, 1987, Ser. No. 791,843, Oct. 28, 1985. Application for reissue Jan. 19, 1989, Ser. No. 299,189**

**Claims priority, application Japan, Oct. 30, 1984, 59-228308**

**Int. Cl.**[5] **H04N** *5/232*

**U.S. Cl. 358—227** **10 Claims**




1. An autofocus circuit for a video camera including a focusing motor for focusing, comprising:

**[**a**]** high-pass filter **[**circuit**]** *means* to which a luminance signal of a video signal is applied **[**so that**]** *for extracting* a high frequency component higher than a predetermined frequency **[**is extracted**]** from said applied luminance signal,

**[**an absolute value calculating circuit connected to said high-pass filter circuit for obtaining an absolute value of the output of said high-pass filter circuit,**]**

**[**an**]** A-D converting **[**circuit**]** *means operatively* connected to said **[**absolute value calculating circuit**]** *high-pass filter means* for converting an analog **[**absolute value**]** output signal **[**provided**]** *derived* from said **[**absolute value calculating circuit to**]** *high-pass filter means into* a digital signal,

**[**a**]** calculating **[**circuit**]** *means* connected to said A-D converting **[**circuit**]** *means* for adding the converted digital signal with a predetermined period cycle,

**[**a**]** comparing **[**circuit**]** *means* connected to said calculating **[**circuit**]** *means* for comparing the output of calculation in one predetermined period and the output of calculation in **[**the predetermined period coming one**]** *another* predetermined period **[**ahead of said predetermined period**]**, and

**[**a**]** focusing motor control **[**circuit**]** *means* connected to said comparing **[**circuit**]** *means* for providing a signal for controlling the rotation of the focusing motor included in said video camera in the clockwise direction or in the counter-clockwise direction based on the output of said comparing **[**circuit**]** *means.*



**Re. 33,683**

## CATALYST COMPOSITION FOR POLYMERIZING ALPHA-OLEFINS

**Louanne M. Allen, Port Arthur, Tex.; Robert O. Hagerty, Metuchen, N.J., and Richard O. Mohring, Sour Lake, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Original No. 4,732,882, dated Mar. 22, 1988, Ser. No. 822,359, Jan. 24, 1986. Application for reissue May 26, 1989, Ser. No. 357,249**

**The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.**

**Int. Cl.**[5] **C08F** *4/645*

**U.S. Cl. 502—107** **60 Claims**

1. In a process for preparing an alpha-olefin polymerization catalyst composition *for polymerizing ethylene and at least one* $C_3$-$C_{10}$ *alpha-olefin to produce a linear low density capolymer having a density of about 0.940 gm/cc or less,* comprising, *a precursor composition which comprises* a *halogen-containing* transition metal compound *and* a magnesium compound, *which precursor composition is supported on a solid, porous carrier,* and a metal alkyl *activator,* the improvement comprising using trimethylaluminum as the metal alkyl *activator.*

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# PLANT PATENTS

## GRANTED SEPTEMBER 3, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,637

### MINIATURE POT ROSE NAMED DEVECLIPSAR

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed May 29, 1990, Ser. No. 529,315
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—7 1 Claim

1. The new and distinct variety of miniature pot rose, substantially as herein shown and described, particularly characterized by its profuse and continuous production of medium size flower of a generally Orient Pink petal body coloration with each petal body surrounded by a relatively wide margin of Greyed Purple which fades through Red Purple into the Orient Pink of each petal body, and the petals being closely imbricated, the flowers being borne singly on strong erect stems of a sturdy bush with moderately abundant foliage.

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7,638

### MINIATURE POT ROSE NAMED DEVAMARILLO

Stanley G. Marciel, Aptos, Calif., assignor to DeVor Nurseries, Inc., Watsonville, Calif.

Filed May 29, 1990, Ser. No. 529,314
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of miniature pot plant rose, substantially as herein shown and described, particularly characterized by its profuse and continuous production of relatively small Cadmium Orange flowers borne singly on strong upright stems of a bush having an average height of about 23 cm. at the age of about twelve weeks as grown in a 4 in. pot.

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7,639

### ALSTROEMERIA NAMED ERICA

Leonard E. Carrier, Encintas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah

Filed Apr. 20, 1990, Ser. No. 512,143
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large, pink colored flowers which are borne in attractive inflorescences on relatively dwarf flower stalks.

7,640

### ALSTROEMERIA NAMED CILLA

Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah

Filed Apr. 20, 1990, Ser. No. 512,158
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large violet-pink colored flowers which are borne in attractive inflorescences on relatively dwarf flower stalks.

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7,641

### VARIETY OF GERANIUM NAMED RED SATISFACTION

Scott C. Trees, Elburn, Ill., assignor to Geo J. Ball, Inc., West Chicago, Ill.

Filed May 4, 1990, Ser. No. 519,298
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of Geranium plant substantially as shown and described.

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7,642

### CHRYSANTHEMUM PLANT NAMED GRACE

Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, and Cornelis P. VandenBerg, Salinas, Calif., assignors to Grace H. Mack, New Canaan, Conn.

Filed May 21, 1990, Ser. No. 526,497
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct Chrysanthemum plant named Grace, as described and illustrated.

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7,643

### PEPINO PLANT, CASCADE GOLD

Ismael Gomberoff, P.O. Box 262, Lynden, Wash. 98264

Filed Nov. 3, 1989, Ser. No. 431,626
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—89 1 Claim

1. A new and distinct variety of *Solanum muricatum* (pepino) substantially as illustrated and described, broadly characterized as to novelty by its ability to set abundant amounts of fruits which begin ripening in early September under the ecological conditions prevailing at Lynden, Wash., and by its producing a fruit which is very sweet and lacks the typical astringent aftertaste of its species.

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# PATENTS

## GRANTED SEP. 3, 1991

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 081-430 | 5,044,225 |
| 427-248 | 5,044,315 |
| 114-090 | 5,044,410 |
| 152-208 | 5,044,411 |
| 224-042 | 5,044,577 |
| 180-219 | 5,044,646 |
| 385-011 | 5,044,713 |
| 385-005 | 5,044,714 |
| 385-042 | 5,044,715 |
| 385-051 | 5,044,716 |
| 385-033 | 5,044,717 |
| 385-076 | 5,044,719 |
| 385-088 | 5,044,720 |
| 385-053 | 5,044,721 |
| 385-113 | 5,044,722 |
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| 385-127 | 5,044,724 |
| 385-130 | 5,044,725 |
| 351-050 | 5,044,741 |
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| 351-163 | 5,044,743 |
| 356-005 | 5,044,744 |
| 385-016 | 5,044,745 |
| 356-155 | 5,044,746 |
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| 356-251 | 5,044,748 |
| 356-345 | 5,044,749 |
| 356-372 | 5,044,750 |
| 356-375 | 5,044,751 |
| 356-400 | 5,044,752 |
| 356-402 | 5,044,753 |
| 356-432 | 5,044,754 |
| 356-440 | 5,044,755 |
| 356-446 | 5,044,756 |
| 420-074 | 5,045,019 |
| 512-006 | 5,045,090 |
| 428-411 | 5,045,364 |
| 530-399 | 5,045,633 |
| 359-327 | 5,045,719 |
| 364-518 | 5,045,967 |
| 359-136 | 5,046,137 |
| 359-188 | 5,046,138 |
| 359-124 | 5,046,139 |

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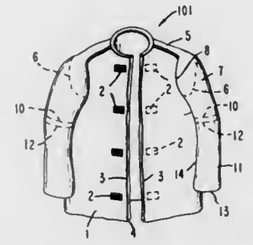

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# PATENTS

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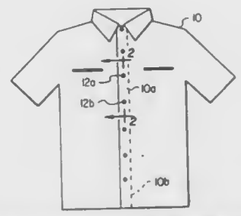
## GENERAL AND MECHANICAL

**5,044,011**
**ARTICULATED BODY ARMOR**
George Henderson, 1116 Jefferson Ave., Glendale, Ohio 45246
Continuation-in-part of Ser. No. 321,557, Mar. 10, 1989, abandoned. This application Mar. 23, 1990, Ser. No. 497,907
Int. Cl.[5] F41H *1/02*
U.S. Cl. 2—2.5 19 Claims




1. An improved body armor arrangement adapted to allow the user ease of bending, and comprising, in combination:
an upper body outer shell having openable overlapping front peripheral edges;
closure means mounted on said upper body shell peripheral edges;
a unitarily fabricated, flexible, layered protective material torso panel having openable overlapping front peripheral edges, shoulder peripheral edges and peripheral edges defining arm openings, said torso panel attached inside said upper body shell with said shoulder peripheral edges being essentially parallelly adjacent;
a pair of unitarily fabricated, flexible, layered protective material upper arm panels having an upper peripheral edge compatible with and mountable adjacent said arm opening peripheral edges and said shoulder peripheral edges, abutting upper arm peripheral edges and an elbow peripheral edge, said upper arm panels attached inside said upper body shell;
a pair of unitarily fabricated, flexible, layered protective material lower arm panels having an upper forearm peripheral edge compatible with and mountable adjacent said elbow peripheral edge, a wrist peripheral edge and abutting forearm peripheral edges extending from said upper forearm peripheral edge to said wrist peripheral edge, said lower arm panels attached inside said upper body shell;
a lower body outer shell having a waist band adapted to fit over the hips of the user;
a right and left unitarily fabricated, flexible, layered protective material thigh panel having upper and lower peripheral edges and abutting thigh peripheral edges attached inside said lower body shell;
a unitarily fabricated, flexible, layered protective material abdomen and buttocks panel having two abutting peripheral edges, and upper and lower peripheral edges attached inside said lower body shell with said abdomen and buttocks panel lower peripheral edge adjacent each said thigh panel upper peripheral edge; and,
a right and left unitarily fabricated, flexible, layered protective material shin and calf panels having two abutting peripheral edges, and upper shin peripheral edge and a lower ankle peripheral edge attached inside said lower body shell with said upper shin peripheral edge abutting said thigh panel lower peripheral edge.

**5,044,012**
**ASSEMBLY AND METHOD FOR PROTECTING ORNAMENTAL ACCESSORIES ON GARMENTS**
Tre R. Antonino, Dallas, Tex., assignor to Donna Hartley, Dallas, Tex.
Filed Oct. 31, 1990, Ser. No. 606,746
Int. Cl.[5] A41D *27/12*
U.S. Cl. 2—46 12 Claims




1. A padding assembly for protecting an ornamental accessory, such as a button, attached to a garment, said assembly comprising a first pad member extendable between the garment and the button, a second pad member engageable with at least a portion of said first pad member with said button sandwiched between said members, and means for attaching said pad members together.

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**5,044,013**
**CREASE RESISTANT INTERLINER AND METHOD OF MAKING THE SAME**
Myron H. Ackerman, 7209 Promenade Dr., Apt. D-201, Boca Raton, Fla. 33433
Filed Feb. 8, 1990, Ser. No. 476,752
Int. Cl.[5] A41D *25/16, 25/00*
U.S. Cl. 2—144 19 Claims

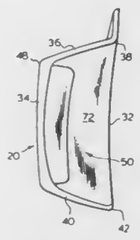



1. A necktie comprising:
an outer casing; and
an interliner disposed in said outer casing, said interliner comprising a warp and a filling that are interwoven, said warp including hard and soft yarns and said filling including hard and soft yarns, each hard yarn comprising a blend of fibers ranging in denier from about 8 to 15 and having a twist of about 7 to 10 turns per inch, each soft yarn comprising a blend of fibers ranging in denier from about 3 to 6 and having a twist of about 4 to 6 turns per inch.

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**5,044,014**
**EAR COVERING APPARATUS**
Michael A. Cornale, 1-47 Stanley Street, Hamilton, Ontario, Canada L9H 2K9, and Michael A. Cornale, 24 Highland Park Dr., Hamilton, Ontario, Canada L9H 3L9
Filed Sep. 5, 1990, Ser. No. 577,577
Int. Cl.[5] A61F *11/14*
U.S. Cl. 2—209 14 Claims




1. An ear covering apparatus intended to improve hearing in a rearward direction, comprising:
an outer shell having a front portion, a side portion, a top portion, and a bottom portion;
wherein said front portion is joined to said side, top and bottom portions, and has an inner edge for contacting the side of a wearer's head directly forward of the ear;
wherein said side portion is joined to said front, top and bottom portions and has a rear edge;
wherein said top portion is joined to said front and side portions, and said top portion has a rear edge and has an inner edge for contacting the side of a wearer's head,
wherein said bottom portion is joined to said front and side portions, and said bottom portion has a rear edge and has an inner edge for contacting the side of a wearer's head; and
wherein said three inner edges of said front, top, and bottom portions are connected one with another and are adapted to fit around a wearer's ear, and wherein said three rear edges of said side, top, and bottom portions are generally joined one to another and form a trailing edge of said ear covering apparatus, said trailing edge defining an opening in the rear of said ear covering apparatus, said opening being generally between said trailing edge and the side of a wearer's head.

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**5,044,015**
**GOLF JACKET WITH HAND COVER**
Gary Howard, 106 Leonard St., Canton, Mass. 02021
Filed Nov. 5, 1990, Ser. No. 610,133
Int. Cl.[5] A41D *27/10*
U.S. Cl. 2—269 3 Claims

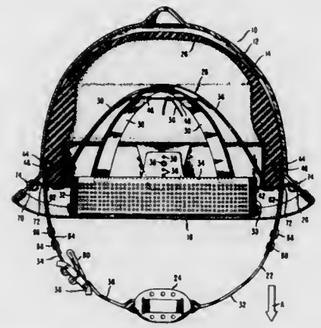
1. A protective structure for keeping a golfer's hands and golf club grip dry in the rain, comprising in combination:
a golf jacket having two sleeve members with open ends at the bottom of said sleeves through which open ends said golfer's hands and arms extend;
an extension member having an open top and an open bottom, said open top being attached to the inside of one of the open ends of said golf jacket sleeves, said extension member when not being used, being tucked up into said golf jacket sleeve with the golfer's arm being passed through both said sleeve and said extension member and when being used, said extension member is pulled out and extended downward to cover said golfer's hand, said extension member having said golf club grip inserted in said open bottom of said extension member; and
a slit defined in said extension member disposed near the end of said golf jacket sleeve and facing toward said golfer's opposite arm, said slit of a size sufficient to receive the other hand of said golfer therethrough for grasping said golf club grip when said grip is inserted up into the open bottom end of said extension member to protect and keep



said golfer's hands and golf club grip dry during use in the rain.

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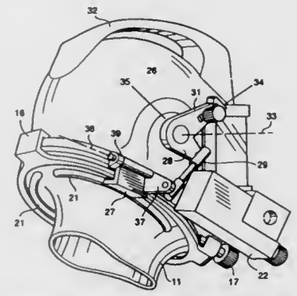
**5,044,016**
**PROTECTIVE HELMET ASSEMBLY INCLUDING RELEASABLE HEAD RETAINING ASSEMBLY**
Christopher E. Coombs, Boonton, N.J., assignor to Cairns & Brother, Inc., Clifton, N.J.
Filed Dec. 23, 1987, Ser. No. 137,378
Int. Cl.[5] A42B *3/02*
U.S. Cl. 2—414 7 Claims



1. A protective helmet assembly which comprises:
an outer shell defining an internal chamber;
an inner liner assembly including a strap means for engaging a user's head positioned within said internal chamber of said outer shell; and
clip members mounted to said outer shell, each of said clip members including an arm portion contacting said inner liner assembly for positioning said inner liner assembly within said chamber of said outer shell, for maintaining said inner liner assembly within said internal chamber below a predetermined load exerted on said inner liner assembly via said strap means engaging said user's head with respect to said outer shell.



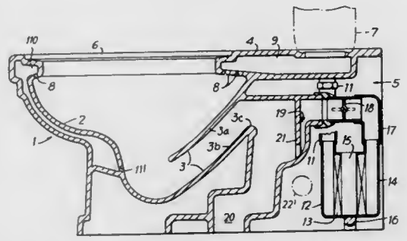
**5,044,017**
**HELMET RETAINERS OPERATED BY ROTARY HANDLES**
Robert R. Kirby, P.O. Box 665, and William S. Millard, 2866 Santa Barbara Ave., both of Santa Ynez, Calif. 93460
Filed May 14, 1990, Ser. No. 522,911
Int. Cl.[5] A42B *7/00*
U.S. Cl. 2—421 11 Claims



1. In combination with a rigid diver's helmet disposable over the head and jaw of a user and having a right side and left side and an axis transverse to the two sides, a helmet retainer comprising:
(a) a pair of hinges having a movable hinge part, a first movable hinge part mounted on the left side of the helmet and a second movable hinge part mounted on the right side of the helmet;
(b) a gripper bar secured to the movable part of each of the hinges;
(c) a handle secured to the outside of the helmet for rotation;
(d) and means for connecting the handle to at least one of the movable hinge parts for revolving at least one of the gripper bars under at least one side of the user's jaw when the handle is rotated to retain the helmet on the diver's head.

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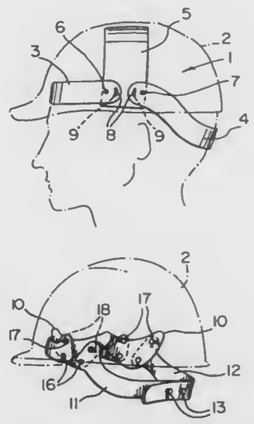
**5,044,018**
**TOILET WITH DEVICE FOR REMOVING UNPLEASANT ODORS**
Luigi Gandini, Cernusco Lombardone, Italy, assignor to American Standard Inc., New York, N.Y.
Continuation of Ser. No. 352,523, May 16, 1989, abandoned.
This application Jun. 29, 1990, Ser. No. 545,690
Claims priority, application Italy, May 16, 1988, 46849 A/88
Int. Cl.[5] E03D *9/052*
U.S. Cl. 4—216 3 Claims



1. A ventilating system in combination with a toilet having a bowl coupled to an outlet drain through a siphon passageway at the rear of said bowl which forms a water seal when water is in said bowl, the combination comprising a suction apparatus mounted within a housing at the rear section of said toilet proximate said siphon passageway; said siphon passageway having an ascending leg and a descending leg with said ascending leg having an upper wall and a lower wall, said lower wall having an uppermost portion defining the highest level of said water seal, said suction apparatus including at least one conduit connected at one end to the bowl of said toilet above the highest level of said water seal and its other end connected to an air intake opening of an electrically-powered suction device, an air discharge passage connected at a first end to the water discharge passage of said bowl having an air discharge opening at a point below the highest level of said water seal and at its second end to an outlet opening of said suction apparatus; said air discharge passage having at least a portion thereof above the highest level of said water seal; valve means mounted in said air discharge passage at a position above the highest level of said water seal; and said valve means being electrically operable from its closed to its opened positions simultaneously with the starting and stopping of said suction device so that when said suction device is operative, air containing foul odor is drawn from above the water seal and is discharged through the air discharge opening into the waste drain passage of said toilet, said air discharge passage including a partition wall formed integrally with said toilet bowl and disposed at the first end of said air discharge passage, said partition wall extending downwardly across the first end of said air discharge passage in said descending leg from a point above the highest level of said water seal to a position below the highest level of the water seal in said toilet to define said air discharge opening, said partition wall and valve means, when closed, preventing waste water in said waste drain passage from flowing into said suction apparatus.

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**5,044,019**
**HELMET RESTRAINING DEVICE**
Nicholas Shewchenko, Hull, and Bjarki Halgrimsson, Ottawa, both of Canada, assignors to Biokinetics and Associates Ltd., Ottawa, Canada
Filed Sep. 17, 1990, Ser. No. 583,651
Claims priority, application Canada, Sep. 28, 1989, 613848
Int. Cl.[5] A42B *7/00*
U.S. Cl. 2—421 3 Claims



1. A helmet restraining device for stabilizing a helmet on the head of a wearer comprising first bracket means for mounting on one interior side wall of a helmet near the center therefor; second bracket means for mounting on the other interior side wall of the helmet near the center thereof; first headband means for extending around the forehead of a wearer; second headband means for extending around the back of the wearer's head; first pin means pivotally connecting each said first and

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second headband means to said bracket means; second pin means extending through said first and second headband means; and slot means in said first and second bracket means for slidably receiving said second pin means for limiting rotation of said first and second headband means with respect to said first and second bracket means, whereby when the helmet lifts or rotates due to forward or rearward tilting forces, one said first or second headband means tightens against the wearer's head.

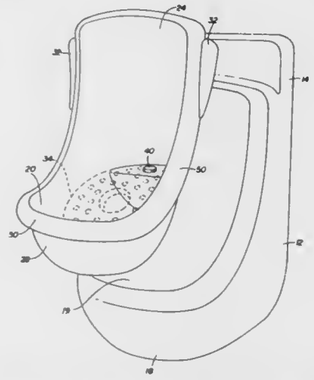
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**5,044,020**

## URINAL FOR CONVENIENCE AND TRAINING OF JUVENILE MALES

**David G. Lewandowski, 3030 N. 54th St., Milwaukee, Wis. 53210, and Edward J. Guard, 2480 McIntosh Way, Maitland, Fla. 32751**

**Filed Jul. 31, 1990, Ser. No. 560,376**
**Int. Cl.[5] E03D** *13/00*
**U.S. Cl. 4—301** **19 Claims**



1. A urinal provided for the convenience and training of juvenile boys and having no plumbing, comprising a support means having front and rear surfaces, said rear surface being adapted for attachment to a vertical surface, and said front surface having an upper portion as well as a receptacle-receiving lower portion, a dish shaped urine-receiving lower portion, a dish shaped urine-receiving receptacle of a configuration closely complementary to the lower portion of said support means, said receptacle having a full height rear wall extending up to a lesser height than said upper portion of said support means, as well as a front wall of abbreviated height, the upper portions of said wall portions terminating in a generally oval front opening, said receptacle being insertable at an angle into said lower portion of said support means into a retention position, and likewise being able to be withdrawn for emptying by lifting upwardly at an angle to the vertical, the rear wall of said receptacle adapted to be grasped for removal and emptying, with urine retained in said receptacle being able to be poured over said front wall, and into a toilet or the like, with there consequently being no occasion for the person emptying the receptacle to grasp a portion of the receptacle that has come directly into contact with urine.

**5,044,022**

## SWIMMING POOL COVER

**Fred Hess, Marbella, Spain, assignor to Penguin Swimming Pools, Ltd., Chelmsford, England**

**Continuation of Ser. No. 671,182, Nov. 14, 1984, abandoned. This application Jan. 29, 1987, Ser. No. 7,978**
**Claims priority, application United Kingdom, Nov. 14, 1983, 8330287; Feb. 8, 1984, 8403366; Feb. 24, 1984, 8404915; Nov. 12, 1984, 8428590**
**Int. Cl.[5] E04H** *4/10*
**U.S. Cl. 4—502** **14 Claims**

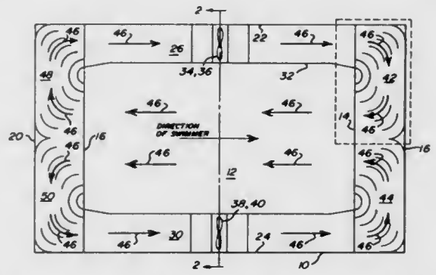
1. A cover for a swimming pool, the cover comprising: an awning of flexible sheet material; guide embers secured to opposite longitudinal edges of said awning; a pair of side rails along opposite longitudinal sides of said pool; channels in the side rails for receiving the guide members, said guide members being slideable longitudinally in said channel, slots extending along the channel on a pool facing side thereof, through which slots the awning extends; means preventing the guide members form exiting the channels through the slots a pair of pull lines secured to a transverse edge of said awning at opposite sides thereof by means of which pull lines said awning can be drawn over said pool with said guide members sliding in said side rails, said pull lines being joined to form a single pull line whereby tension applied to said single pull lines to move said awning is transmitted substantially evenly to the two sides of said awning.

**5,044,021**

## CONTINUOUS SWIMMING APPARATUS

**James Murdock, New York, N.Y., assignor to Endless Pools, Inc., New York, N.Y.**

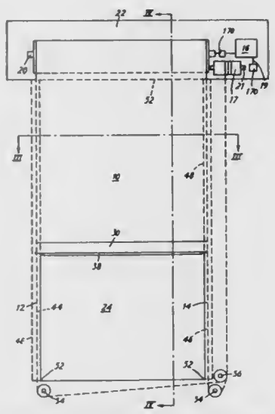
**Filed Aug. 18, 1989, Ser. No. 395,733**
**Int. Cl.[5] E04H** *4/00*
**U.S. Cl. 4—488** **15 Claims**



1. A swimming apparatus comprising: a tank adapted to contain water and having:
(a) a swimming area through which water flows from a water entrance end to a water exit end; and
(b) return means for directing water from said water exit end of said swimming area to said water entrance end of said swimming area; water circulation means in said return means for circulating water through said swimming area from said water entrance end of said swimming area and through said return means from said water exit end of said swimming area to said water entrance end of said swimming area; and a plurality of velocity gradient vanes in said return means at said water entrance end of said swimming area spaced in such a manner as to create a horizontal water velocity gradient across said swimming area in which water close to the center line of said swimming area has a higher velocity than water nearest the sides of said swimming area.

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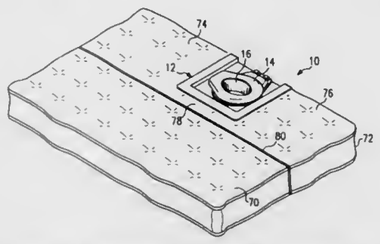


**5,044,023**

## INTEGRATED MATTRESS AND COMMODE WITH SEGMENTED MATTRESS/COMMODE SECTION

**Monte Carnahan, and Gayle A. Carnahan, both of 100 W. Cedar, Wilburton, Okla. 74578**

**Continuation-in-part of Ser. No. 439,849, Nov. 20, 1989, Pat. No. 4,944,058. This application Jan. 23, 1990, Ser. No. 468,853**
**The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.**
**Int. Cl.[5] A61G** *7/02*
**U.S. Cl. 5—90** **3 Claims**



1. A bed with an integrated commode, comprising:
a mattress and bed frame that comprise a primary sleeping surface, the primary sleeping surface being parallel with the floor on which said mattress and bed frame are disposed;
a flush commode having a commode bowl with a seat thereon;
a secondary support surface and associated support, said secondary support surface having a hole disposed therethrough to receive said commode such that the upper surface of said commode seat is proximate to the same plane as the upper surface of said secondary support surface, the hole approximately the same size as the outer peripheral edge of said commode, said secondary support surface having first and second support portions disposed on either of said commode and a bridging portion disposed in the front of said commode such that one side of said first and second portions and one side of said bridging portion provide an abutting surface that is operable to abut against one side of said mattress;
a sanitary insert for being disposed about the upper lip of the bowl of said commode, said sanitary insert having:
a flat surface for being disposed on the surface of said secondary support surface and about the hole therein and extending from points distal to the rim of the commode bowl to the interior of the rear edge of the commode bowl,
a downwardly extending surface being cylindrical in shape and extending from the interior edge of the rim of the commode bowl and downward into the bowl on the interior surface thereof, and
means for attaching said flat surface to the surface of said secondary sleeping surface on the outer peripheral edges of the flat surface;
said commode seat configured to fit over and proximate to the rim of the commode bowl and overlying the portion of said sanitary insert disposed over and proximate to the rim of the commode bowl;
a splash guard configured as a cylindrical shaped semi-rigid surface having the peripheral edges on one end thereof attached to the inner peripheral edge of said commode seat, the surface of said splash guard extending downward into said commode bowl; and
securing means for securing said secondary support surface to said mattress and bed frame.

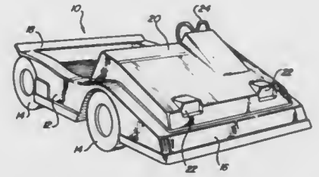
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**5,044,024**

## BED WITH COVERED FOOT PORTION

**Donald R. Del Rose, Harbor Woods, Mich., assignor to Baby World N' Teens, Westland, Mich.**

**Continuation of Ser. No. 50,781, May 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 652,712, Sep. 21, 1984, Pat. No. Des. 292,758. This application May 7, 1990, Ser. No. 520,136**
**Int. Cl.[5] A47D** *7/00*
**U.S. Cl. 5—400** **9 Claims**



1. A low profile bed adapted to resemble a low slung automobile, said bed comprising:
a base having a generally rectangular deck adapted to support a mattress, bedding and sleeper thereupon, said base including a plurality of legs adapted to support said deck in spaced apart relationship with a subjacent surface, and a low-rise frame surrounding said deck, said frame having the low-profile visual appearance of the lower body of a low slung automobile and including a plurality of simulated tires thereupon, said frame and deck cooperating to at least partially bound a rectangular space adapted to retain the mattress therein;
said bed further including a rigid, one piece cover having a width substantially equal to the width of the frame, a length less than the length of the frame and having the visual appearance of the hood and dashboard of an automobile, said cover supported by said low rise frame in spaced apart relationship with said deck so as to define a cavity having a height less than its width and length, said cavity being adapted to receive at least a portion of the mattress, bedding and sleeper, whereby said bed (a) protects and shields at least a portion of the sleeper's body and (b) resembles an automobile in external appearance.

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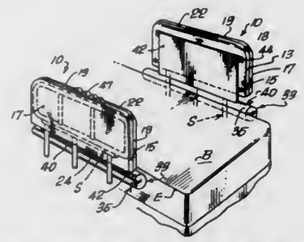


5,044,025

## SAFETY DEVICE FOR BEDS WITH SIDE RAILS

Charles J. Hunsinger, 6845 Laureen, Fresno, Calif. 93710, and Ralph G. Victor, 5518 Columbia Dr. S., Fresno, Calif. 93727

Filed Feb. 8, 1991, Ser. No. 654,293
Int. Cl.[5] A47C 21/08
U.S. Cl. 5—424 13 Claims



1. In a device for protecting a patient, in a bed having side rails, from contusions and other injuries resulting from inadvertent contact with the rails, comprising, in combination:

means defining a slip cover constructed to securably fit over and about said side rails;

bolster means depending from said slipcover means, said bolster means being disposed in a plane parallel with said rail;

said bolster means including an elongated tubular member composed of a pliable material reposing on the surface of the bed, in proximity to the patient so as to yieldably inhibit movement by the patient into said rail.

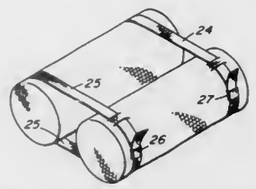
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5,044,026

## FACE PILLOW

Donald W. Matthews, 3818 Robertson St., Houston, Tex. 77009

Filed Jul. 16, 1990, Ser. No. 552,950
Int. Cl.[5] A47G 9/00
U.S. Cl. 5—435 10 Claims



1. A face pillow consisting of a pair of resilient cylinders of about the height of an adult human face, said pair of cylinders being co-planar and parallel, and a pair of straps each secured to both said cylinders and each in the form of an endless loop, said combinations of cylinders and straps being spaced from one another by a gap adapted to receive a human face contacting the two cylinders in such manner as to force the cylinders apart, with free space in the gap around the nose and mouth of the user and keeping them elevated from any surface on which the pillow may be resting.

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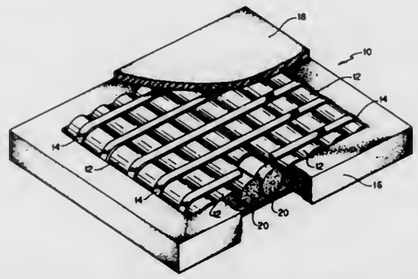
5,044,027

## CUSHION CONSTRUCTION

Benny C. Moon, 145 Ludwell Ct., Alpharetta, Ga. 30201

Filed Apr. 9, 1990, Ser. No. 506,263
Int. Cl.[5] A47C 27/00
U.S. Cl. 5—448 24 Claims

1. A cushion comprising a plurality of elongated tubular structures each having a longitudinal axis, the tubular structures being arranged in an array such that adjacent structures contact each other and the axes of adjacent structures are generally parallel to each other, each structure having an interior open to the atmosphere and having a strengthening element adjacent one end of the structure, the element having a length much less than that of the structure, each structure



also being resilient in nature and having an upwardly extending rounded surface, the upper portions of the tubular structures together defining a generally horizontal sleeping surface, and confining means for maintaining the tubular structures in the arranged array.

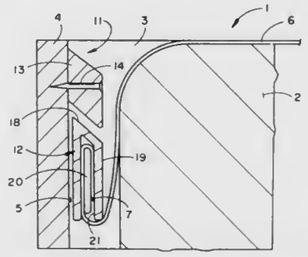
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5,044,028

## WATERBED SHEET RETENTION SYSTEMS

Raymond W. Sleeth, 35 Arvene Ct., Timonium, Md. 21093

Filed Sep. 28, 1990, Ser. No. 589,981
Int. Cl.[5] A47C 27/08; A47G 9/00
U.S. Cl. 5—451 23 Claims



1. In a waterbed including a water-filled mattress having respective sides and further including a pair of respective side frame members running lengthwise of the bed, such that a space is formed between each side frame member and a respective side of the water-filled mattress, and wherein the waterbed is provided with a sheet covering the mattress, the sheet having respective side edges, the improvement which comprises a stabilizing means carried by each side frame member and disposed above the space between the respective side frame member and the water-filled mattress, and a retaining means fitted over the side edge of the sheet and removably secured thereto lengthwise thereof, the retaining means with the side edge of the sheet carried thereby being received below the stabilizing means and in the space between the side frame member and the water-filled mattress, such that the retaining means can pivot slightly in the space below the stabilizing means to accommodate movement of the sheet due to stress thereon during normal use of the waterbed, and such that the retaining means will thereafter pivot back to its normal position under the influence of the water-filled mattress and once the stress on the sheet is removed, whereby the sheet will be retained on the mattress and will return to its normal smooth position without being



substantially creased, thereby enhancing the comfort and pleasure of the waterbed.

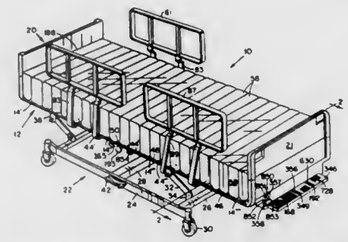
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5,044,029

## ALTERNATING PRESSURE LOW AIR LOSS BED

John H. Vrzalik, San Antonio, Tex., assignor to Kinetic Concepts, Inc., San Antonio, Tex.

Continuation of Ser. No. 181,922, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 57,965, Jun. 1, 1987, abandoned, which is a continuation-in-part of Ser. No. 905,553, Sep. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 784,875, Oct. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 683,153, Dec. 17, 1984, abandoned. This application Apr. 9, 1990, Ser. No. 512,570
Int. Cl.[5] A61G 7/06
U.S. Cl. 5—453 43 Claims



6. An alternating pressure low air loss bed comprising:

a frame having a plurality of sections pivotable with respect to each other, each section corresponding to a portion of the body of a patient supported thereon;

first and second sets of air bags mounted transversely to each of the sections of said frame, the air bags of said first set of air bags alternately mounted between the air bags of said second set of air bags on each section of said frame;

means for supplying air from an air source to said air bags;

means for separately sensing the pressure in the air bags of each of said first and second sets of air bags mounted to each section of said frame;

means for separately maintaining a selectable baseline pressure in the air bags mounted to each section of said frame;

means for alternately signalling said air supplying means to increase the pressure in said first set of air bags to a predetermined and selectable maximum pressure, above the baseline value, decrease the pressure in said second set of air bags to a predetermined and selectable minimum pressure below the baseline value and then to raise the pressure in said second set of air bags to said maximum pressure and lower the pressure in said first set of air bags to said minimum pressure.

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5,044,030

## MULTIPLE LAYER FLUID-CONTAINING CUSHION

James I. Balaton, Des Plaines, Ill., assignor to Fabrico Manufacturing Corporation, Chicago, Ill.

Filed Jun. 6, 1990, Ser. No. 534,173
Int. Cl.[5] A47C 27/10
U.S. Cl. 5—455 1 Claim

1. A fluid-containing cushion comprising:

at least three flexible chambers or containing fluid, said chambers including a top chamber, a bottom chamber, and a middle chamber disposed generally between said top and bottom chambers;

each said chamber including a plurality of interior flexible tubes arranged for communication to define flow paths within hat chamber;

said tubes in each said chamber being elongated and arranged in a parallel orientation in a generally horizontal row;

flexible wall means for defining said tubes and including four sheets of a fluid-impervious, thermoplastic material arranged in four, generally superposed layers;

said four sheets being sealed together at the cushion periphery with pairs of adjacent sheets also being sealed together along spaced-apart parallel lines within the periphery to define top, middle, and bottom rows of said tubes;

said parallel lines of sealing terminating short of the peripheral seal at two opposite ends of said cushion to provide communication between said tubes in each row at each end of the cushion;

each said tube in said top chamber being in substantially



vertical registry with, and adjacent to, one of said tubes in said bottom chamber at an interface region to define a vertically registered pair of tubes;

the tubes in said middle chamber being laterally offset from an adjacent pair of vertically registered top and bottom chamber tubes and being nested relative to said adjacent pair;

said middle chamber communicating with one of said top and bottom chambers; and

said middle chamber and said one top or bottom chamber containing a first fluid while the remaining chamber contains a second fluid that is different from said first fluid.

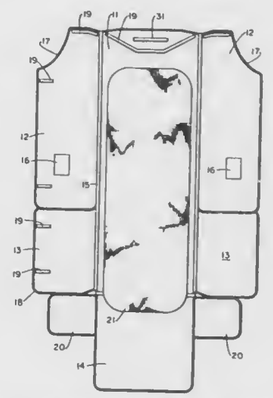
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5,044,031

## PASSIVE REWARMING ARTICLES

John J. Sherwood, Beloit, Ohio; David L. Thibodeau, 11662 Sharonwoods Ct., Cincinnati, Ohio 45241, and Philip R. Foster, 522 N. Greenlawn Ave., South Bend, Ind. 46617, assignors to Philip R. Foster, Cincinnati, Ohio and David L. Thibodeau, South Bend, Ind.

Filed Aug. 12, 1986, Ser. No. 895,723
Int. Cl.[5] A61G 1/01
U.S. Cl. 5—481 20 Claims



1. A passive rewarming article for use with an accident victim under a wide range of environmental conditions, said article constructed from a closed-call foam material having a

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thermal conductivity of less than about 0.30 BTU-/in./hr./°F./square ft. and ranging in thickness from about 0.10 inches to about 1.0 inches with a fibrous backing for adding strength and tear resistance to the article, further wherein the article is in a form capable of substantially completely encasing the victim with the closed- cell foam and having closure means permanently attached to the article for ensuring the article retains the shape it assumes when the victim is encased thereby.

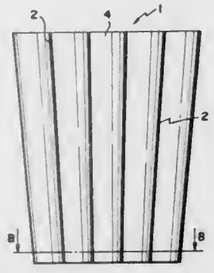
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5,044,032

## TRANSVERSELY ADJUSTABLE QUILT

Günter Tesch, Avenue Jean-Marie-Musy 15, Fribourg, Switzerland CH-1700

PCT No. PCT/EP88/00965, § 371 Date Oct. 31, 1989, § 102(e) Date Oct. 31, 1989, PCT Pub. No. WO89/06509, PCT Pub. Date Jul. 27, 1989
PCT Filed Oct. 27, 1988, Ser. No. 399,483
Claims priority, application Switzerland, Jan. 12, 1988, 083/88
Int. Cl.[5] A47G *9/02, 9/04*
U.S. Cl. 5—502 17 Claims



1. A blanket, in particular a quilt, with a rectangular covering comprised of two cover sheets and a loosely packed filling, whereby the blanket is provided with quilting seams, wherein the covering is designed so that it can be gathered essentially transversely to the direction of the quilting seams and the area of the covering can be reduced or increased again by at least one drawstring being arranged on the covering.

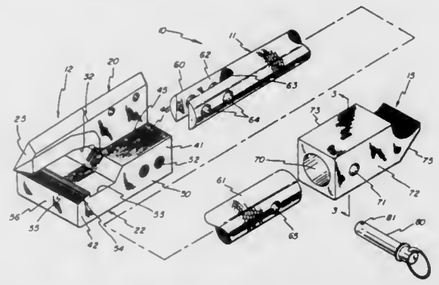
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5,044,033

## FORCIBLE ENTRY TOOL

Timothy A. Fosberg, 7719 Timber Hill, Huber Heights, Ohio 45424

Filed Jun. 15, 1990, Ser. No. 539,099
Int. Cl.[5] B66F *15/00;* B25F *1/00, 3/00;* B26B *11/00*
U.S. Cl. 7—166 19 Claims



1. An emergency forcible entry tool for cutting through sheet material, comprising:

an elongate pry bar having first and second ends;

pivot means extending from said first end of said bar;

a knife member comprising a mounting shank attached to said first end of said bar and a blade portion extending from said mounting shank longitudinally beyond said pivot means and essentially parallel to said bar, said blade portion having a sharpened inner edge facing said pivot means and a sharpened outer opposite edge, said inner and outer edges leading into a sharpened end tip, said sharpened inner edge comprising a first cutting edge extending rearwardly from said tip towards said mounting shank, and a second cutting edge extending from said first cutting edge and angled towards said mounting shank and said pivot means.

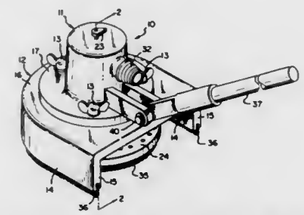
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5,044,034

## SWIMMING POOL VACUUM CLEANER WITH ROTARY BRUSH

Anthony A. Iannucci, 140 W. Ross Grove Rd., Shelby, N.C. 28150

Filed Oct. 29, 1990, Ser. No. 604,217
Int. Cl.[5] E04H *3/20*
U.S. Cl. 15—1.7 5 Claims



1. In a swimming pool vacuum cleaner having a turbine housing, a turbine within the turbine housing, a brush housing communicatively connected to the turbine housing, a passageway for water through the turbine and brush housings, an adaptor communicating with the turbine housing for connection to a source of suction, a circular brush holder within the brush housing and a rotatable shaft fixed to the turbine for rotation therewith and fixed to the brush holder to impart corresponding rotation to the brush holder about a substantially vertical axis in use, the improvement which comprises:

(a) a rotary brush of circular configuration fixed about the periphery of the brush holder in radially spaced relation to the axis of the brush holder for rotation with the brush holder,

(b) said brush housing being of generally U-shaped configuration,

(c) side walls on the brush housing extending about the leading edge of the brush holder and terminating at the rear of the brush housing to define an opening extending across the rear of the brush housing, and

(d) a stationary brush depending from and conforming with the configuration of the generally U-shaped brush housing.

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5,044,035

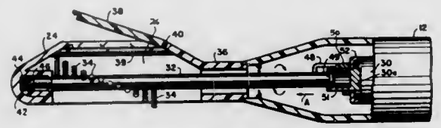
## DENTAL CLEANING DEVICE

George Barradas, 15 Riverview Ct., Greenwich, Conn. 06831

Filed Feb. 12, 1990, Ser. No. 478,957
Int. Cl.[5] A46B *13/00*
U.S. Cl. 15—23 5 Claims

1. A dental cleaning device for cleaning the teeth and interdental spaces comprising a handle, a motor mounted in said handle being provided with a shaft and a housing, a brush shaft operatively connected to said motor shaft for rotation, a plurality of brush tuft strips helically arranged on said brush shaft, a partial shield attached to said dental cleaning device for said brush tuft strips mounted adjacent thereto but spaced therefrom for collecting particles that are dislodged from said teeth when said rotating helical brush tuft strips contacts said teeth, means on said motor housing and brush shaft for causing a rectilinear movement of said brush shaft while said shaft rotates, said means being a ramp-like cam on the motor housing, a cam finger mounted on said brush shaft, a pin on said brush





shaft, a slot in said motor shaft, said pin being mounted in said slot and adapted for rectilinear movement in said slot when said cam finger engages said ramp-like cam during rotation of said brush shaft, and a compression spring to urge the cam finger into engagement with said ramp-like cam and thereby imparting both rotational and reciprocating movement to said brush shaft.

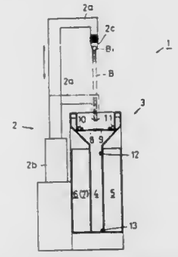
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5,044,036

## BLIND WASHING APPARATUS

Takenobu Fujimoto, Kamifukuoka; Michinobu Fujiwara, Ichikawa, and Naoto Sakaiya, Nerima, all of Japan, assignors to Aderans Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00527, § 371 Date Aug. 2, 1989, § 102(e) Date Aug. 2, 1989
PCT Filed May 30, 1988, Ser. No. 392,911
Claims priority, application Japan, Dec. 28, 1987, 62-197584[U]; Dec. 28, 1987, 62-197585[U]; Dec. 28, 1987, 62-197586[U]; Feb. 2, 1988, 63-13411[U]
Int. Cl.[5] A47L *4/00*
U.S. Cl. 15—88.1 20 Claims



8. An apparatus for washing a blind having a pair of upper and lower elements and a plurality of longitudinally extending blades arranged therebetween, said blind being movable between a collapsed configuration where said upper and lower elements are located close to each other with said blades closely spaced relative to one another therebetween and an extended position wherein said upper and lower elements are spaced apart from each other with said blades being spaced further from one another than when in said collapsed configuration, said apparatus comprising:

washing means for washing said blind, said washing means including a tank for containing a washing liquid and a pair of brushes mounted within said tank, said pair of brushes extending in a corresponding longitudinal direction as said elongated blades and being arranged in opposed relation to each other, means for moving said blades in said extended position of said blind between said pair of brushes and between a first position wherein said blades are within said tank and a second position wherein said blades are removed from said tank; and

means for supporting said blind in said extended position and reciprocating said blind relative to said washing means between said first and second positions to enable said brushes and said washing liquid to wash said blades; and

said support means comprising at least one upstanding support arm for supporting said blind in a suspended manner, and a drive unit for moving said support arm between said first and second positions defining a predetermined cycle of movement of said blind.

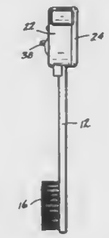
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5,044,037

## MUSICAL TOOTHBRUSH

Kenneth A. Brown, West Simsbury, Conn., assignor to U.S. Aqua Sports, Inc., Simsbury, Conn.

Filed Sep. 12, 1989, Ser. No. 406,296
Int. Cl.[5] A46B *9/04*
U.S. Cl. 15—105 7 Claims



1. A toothbrush comprising:

a set of bristles for cleaning a user's teeth;

a handle portion comprising an elongated portion with a series of aligned holes for receiving said set of bristles and a hollow compartment;

means for generating an audible sound located within said compartment;

an opening in a first wall of said compartment through which said sound emanates;

said sound generating means comprising an electrical circuit for generating musical sounds for a predetermined time period and a spring-like actuating switch for actuating said circuit;

said circuit and said switch being encased within an impermeable membrane to prevent water damage to said circuit and said switch; and

manual means for initiating the generation of said musical sounds, said manual means extending through a second wall of said compartment

said hollow compartment having a removable cover forming at least a portion of said first wall and a plurality of bores; and said cover having a plurality of spaced apart pin connectors for mating with said bores; and further wherein said cover has at least one inwardly projecting support for positioning and supporting said sound generating means in said compartment.

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5,044,038

## FOLDABLE PAINT BRUSH HOOK ASSEMBLY

Zvonko Matkovic, 1401 Mary Ave., Lansing, Mich. 48910

Filed Jan. 16, 1990, Ser. No. 465,430
Int. Cl.[5] A46B *11/00*
U.S. Cl. 15—159 R 9 Claims

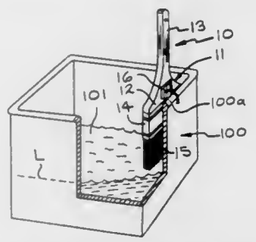
1. An improved paint applicator with a support hook which comprises:

(a) a paint applicator having opposed ends and having body means with a handle means as an extension of the body means at one of the ends of the applicator and having at least one side and paint means mounted at the other of the ends of the applicator and extending from the body means, wherein the handle means defines a longitudinal first axis through the body means;

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(b) a hook means pivotably mounted on the one side of the body means and moveable between a folded position adjacent to the body means and an upright position which extends from the body means to support the applicator in a vertical orientation on an edge of a container means with the paint means in a lowermost position wherein the hook means attaches to the body means on a connection portion of the hook means along a second axis which is parallel to the first axis and pivots between the folded and upright positions on the second axis and wherein the user can raise




and lower the hook means with a thumb of a hand while holding the handle means with the hand during painting; and;

(c) a retainer means mounted on the one side of the body means by fastening means with means mounted in the retainer means that frictionally engages the connection portion of the hook means so that the retainer means holds the hook means in position in the folded position and upright position upon movement from one of the positions.

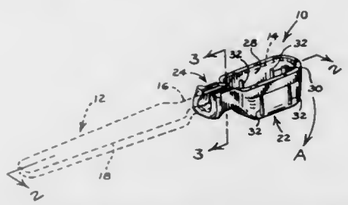
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**5,044,039**

**PROTECTIVE CAP FOR TOOTHBRUSH**

**Pierre E. Picard, 121; 9e Avenue Sud, Sherbrooke, Quebec, Canada J1G 2P9**

**Filed Sep. 24, 1990, Ser. No. 587,770**
**Int. Cl.[5] A46B** *9/02, 17/04*
**U.S. Cl. 15—184** **1 Claim**




1. A protective cap for the bristles of a toothbrush having a handle and bristles projecting perpendicularly from one side of said handle at one end thereof, said handle having a restricted section adjacent said bristles, said cap comprising a cover having a U-shaped cross-section adapted to fit over and around the bristles and to leave open the side of the handle opposite said one side, said cover having a contour dimensioned to have a peripheral air gap between the contour of the cover and the contour of said one end of the handle, a neck portion extending from said cover having a U-shaped cross-section smaller than the cross-section of the cover and extending therefrom, said neck portion having a longitudinal gap over said restricted portion of the handle, on the side opposite the bristles, said neck portion adapted to tightly fit over said restricted portion and to releasably grip the latter for longitudinally and angularly restricting movement of the cover, said cover having lateral walls adapted to surround the bristles, said walls being provided with slots for allowing air circulation across the bristles between said slots and said air gap, a bead internally projecting from said lateral walls at a location opposite said neck portion along a small portion of the contour of the cover, said bead forming a shoulder adapted to abut said one side of said one end of said handle for preventing the free end of the bristles to touch the cover.

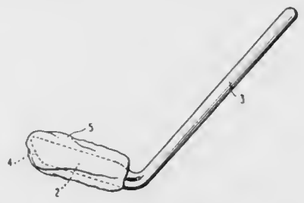
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**5,044,040**

**TOILETTING ASSIST DEVICE**

**Lise Tetrault, 213 Belle Isle Ct., Naples, Fla. 33962**

**Filed May 17, 1990, Ser. No. 524,549**
**Int. Cl.[5] A47K** *7/08*
**U.S. Cl. 15—210 R** **6 Claims**




1. A toiletting assist device for a patient having a body limitation causing inability to reach sufficiently for toiletting, comprising, a base member, a handle integrally connected to one end of said base member, said handle having a predetermined length extending at an obtuse angle from the base member, said base member being relatively narrow in width to enable it to fit between the buttocks of a patient, and having a rounded top portion, a bottom edge portion, and side portions extending downwardly from said rounded top portion to said bottom edge portion, said downwardly extending side portions having a height substantially greater than the relatively narrow width of said rounded top portion, a removable cleansing fabric wrapped around the base member, said downwardly extending side portions terminating in an outwardly flared enlarged portion on the free end of said base member for holding the cleaning fabric thereon, said enlarged portion has a smooth top portion in coplanar alignment with said rounded top portion, whereby the length of the handle and the angle thereof relative to the base member are such that the patient, while sitting on a toilet, can reach the anatomical areas to be wiped without bending or moving the torso laterally.

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**5,044,041**

**TOOTH CLEANER AND METHOD FOR THE MANUFACTURE THEREOF**

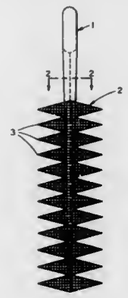
**Mats Ljungberg, Kryssgränd 4, Skåre, S-23100 Trelleborg, Sweden**

**PCT No. PCT/SE87/00202, § 371 Date Oct. 20, 1988, § 102(e) Date Oct. 20, 1988, PCT Pub. No. WO87/06452, PCT Pub. Date Nov. 5, 1987**
**PCT Filed Apr. 21, 1987, Ser. No. 263,791**
**Claims priority, application Sweden, Apr. 21, 1986, 8601814**
**Int. Cl.[5] A47K** *7/00*
**U.S. Cl. 15—210 R** **5 Claims**

1. A tooth cleaner, characterized in that it comprises an elongate thermoplastic body which is substantially triangular in cross-section, and a brush portion (2) connected with said body which are adapted to fit in and clean the space between two teeth, said brush portion consisting of a strip of a thermoplastic material, said strip of thermoplastic material being fused to one side surface of said triangular body portion and extending at least slightly beyond said body in opposite transverse



directions thereof, said strip also being coplanar with the side surface to which it is fused, said strip forming bristles along




each oppositely extending portion, and further wherein said strip and bristles extend lengthwise along said body.

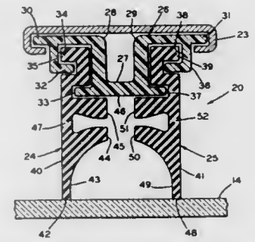
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**5,044,042**

**WINDSHIELD WIPER BLADE WITH DUAL WIPING EDGES**

**Donald W. Stratton, Scherervilie, Ind., assignor to The Anderson Company, Michigan City, Ind.**

**Filed Oct. 27, 1989, Ser. No. 428,141**
**Int. Cl.[5] B60S** *1/38, 1/28*
**U.S. Cl. 15—250.41** **5 Claims**




1. A vehicle windshield wiper blade comprising:

an elongated flexible backing strip,

first and second elongated wiping elements, each wiping element having a wiping edge, an attachment edge spaced from said wiping edge, an exterior surface extending substantially from said wiping edge to said attachment edge and being substantially planar in an unstressed condition, an interior surface, and a pair of spaced apart bumpers formed along said interior surface parallel to said wiping edge and spaced between said wiping edge and said attachment edge for allowing said wiping edge to pivot relative to said attachment edge, said bumpers being engageable with one another to limit such pivoting movement for the leading one of said wiping elements when said wiper blade is moved across a windshield, and

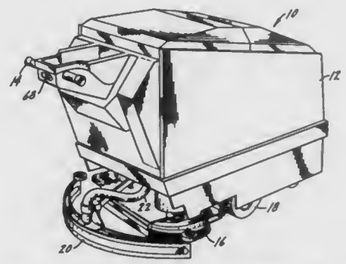
means for attaching said first and second wiping elements to said backing strip with said wiping edges parallel to one another, with said exterior surfaces facing outwardly, and with said interior surface on said wiping elements facing each other.

**5,044,043**

**SPEED AND STEERING CONTROL FOR A FLOOR MAINTENANCE MACHINE**

**Michael T. Basham, Maple Grove; Robert M. Berdahl, Plymouth, and Bruce E. Field, Minneapolis, all of Minn., assignors to Tennant Company, Minneapolis, Minn.**

**Division of Ser. No. 86,492, Aug. 17, 1987, Pat. No. 4,825,500, which is a division of Ser. No. 853,865, Apr. 21, 1986, Pat. No. 4,709,771. This application Feb. 6, 1989, Ser. No. 307,258**
**Int. Cl.[5] A47L** *5/12*
**U.S. Cl. 15—319** **3 Claims**




1. A drive control for a vehicle to be operated by an operator walking behind it, including,

motor drive means arranged to drive the vehicle wheels, means responsive to an operator command for providing an electrical signal representative of a desired speed and direction for the vehicle, means for translating the speed signal into drive motor signals, and

operator proximity reverse sensing means connected to said translating means to inhibit a reverse direction speed signal upon sensing the presence of an operator closely adjacent the rear of the vehicle.

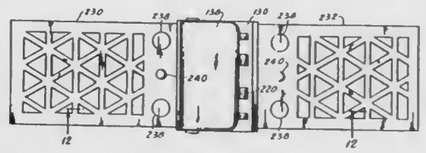
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**5,044,044**

**HINGED STRUCTURE AND METHOD OF INTEGRATION IN A STANDARD SKI CONSTRUCTION**

**John L. Young, West Hollywood; David B. Burns, Santa Barbara, and Joseph Mastroianni, Carpinteria, all of Calif., assignors to Gen-Fold Corporation, Santa Barbara, Calif.**

**Continuation-in-part of Ser. No. 38,848, Apr. 15, 1987, Pat. No. 4,780,929. This application Oct. 31, 1988, Ser. No. 264,599**
**The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.**
**Int. Cl.[5] E05D** *11/10*
**U.S. Cl. 16—323** **39 Claims**




1. A hinged structure comprising:

a forward body and a rear body, each said body having a surface face and a channel formed therein, said channels extending substantially normal to said surface faces;

a first hinge link and a second hinge link, said first hinge link having a fixed end pivotably affixed to said forward body and a sliding end pivotably and slideably affixed to said rear body and said second hinge link having a fixed end pivotably affixed to said rear body and a sliding end pivotably and slideably affixed to said forward body, said first hinge link and said second hinge link being pivotably affixed to one another at a location between said fixed ends and said sliding ends, and said sliding ends of each of

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said hinge links being pivotably and slideably affixed to their respective body by engaging a hinge slide fitted within said channel of their said respective body; and

locking means for locking said rear body and said forward body in a closed position.

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**5,044,045**

## METHOD OF, AND APPARATUS FOR, EXTRACTING FIBER FLOCKS FROM FIBER BALES

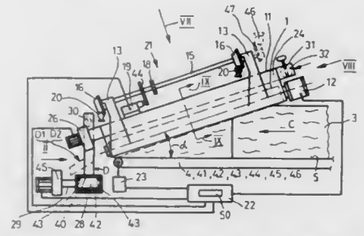
**Robert Demuth, Nuerensdorf; Jürg Faas, Dinhard; Peter Brütsch, Neuhausen; Paul Stäheli, Wilen b. Wil, and Janusz Konaszweski, Winterthur, all of Switzerland, assignors to Maschinenfabrik Rieter AG, Winterthur, Switzerland**

**Filed Mar. 5, 1990, Ser. No. 487,889**

**Claims priority, application Switzerland, Mar. 7, 1989, 834/89**

**Int. Cl.[5] D01G** *7/06, 7/10*

**U.S. Cl. 19—80 R** **45 Claims**



1. A method of extracting fiber flocks from fiber bales, comprising the steps of:

serially disposing on a supporting surface a plurality of fiber bales in a row which has a predetermined longitudinal direction by providing at least two rows of fiber bales disposed parallel to each other;

moving an extraction member to-and-fro over an extraction surface of the serially disposed fiber bales;

said step of moving the extraction member entailing moving a spiked opening roller which has tooth-like spikes and an axis of rotation and two directions of rotations according to said to-and-fro movement;

said step of moving the spiked opening roller entailing the step of extracting fiber flocks from the extraction surface by means of the tooth-like spikes in both directions of rotation and the further step of delivering extracted fiber flocks to a fiber-flock conveyance;

moving the plurality of fiber bales of each row of fiber bales by steps in a predetermined direction toward the extraction member;

orienting the axis of rotation of the spiked opening roller with respect to the supporting surface for the serially disposed fiber bales such that the axis of rotation forms with the supporting surface a predetermined nonzero, and non 90°, angle of inclination; and

said step of moving the extraction member to-and-fro over the extraction surface of the serially disposed fiber bales entailing determining the direction of to-and-fro travel of the extraction member over the extraction surface of the fiber bales such that the direction of to-and-fro travel of the extraction member is substantially transverse to the predetermined longitudinal direction of the row of the plurality of fiber bales;

transporting the fiber flocks in a direction parallel to the axis of rotation of said opening roller, directly to a further conveyor, and transporting the fiber flocks to a subsequent processing step.

**5,044,046**

## BLENDING DEVICE FOR SPINNING MATERIAL FIBERS

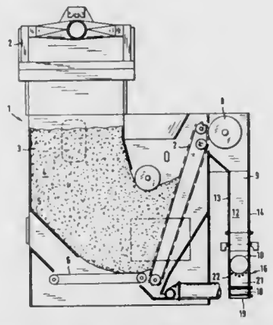
**Akiva Pinto, Duesseldorf-Wittlaer, and Guenter Lucassen, Haltern, both of Fed. Rep. of Germany, assignors to Hergeth Hollingsworth GmbH, Duelmen, Fed. Rep. of Germany**

**Filed Apr. 16, 1990, Ser. No. 510,343**

**Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912559**

**Int. Cl.[5] D01G** *23/02;* **B65G** *65/30*

**U.S. Cl. 19—145.5** **9 Claims**



1. A blending device for textile fiber material, comprising a fiber collecting device into which the disintegrated fiber flocks drop after blending, and a horizontal suction channel having an entrance arranged at a lower end of said collecting device, an airflow created in said suction chamber for transporting said fiber flocks, wherein said device comprises a waste collecting chamber communicating with said fiber collecting device and said suction chamber; said waste collection chamber being disposed generally vertically below said suction chamber and arranged opposite said entrance of said suction channel on a side opposite said fiber collecting device; a grate separating said waste collecting chamber from said suction chamber having a plurality of grid bars extending generally parallel to said airflow in the direction of said suction channel; and means for creating an impurities classifying airflow near said entrance of said suction channel which varies in its flow rate in the direction of said grate and suction channel to transport and sort said fiber flocks and impurities in said textile material so that the textile fibers are transported down said suction channel while said impurities are permitted to fall through said grate into said waste collection chamber.

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**5,044,047**

## CAN-FILLING APPARATUS FOR A TEXTILE MACHINE

**Martin Schwager, Winterthur, Switzerland, assignor to Maschinefabrik Rieter AG, Winterthur, Switzerland**

**Filed Apr. 5, 1990, Ser. No. 505,143**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3912029**

**Int. Cl.[5] B65H** *54/80*

**U.S. Cl. 19—159 R** **24 Claims**

1. A can-filling apparatus for a textile machine, comprising:

an upper part;

a filling head supported by said upper part;

a lower part constructed as an automatic coiler-can exchanger;

at least one upright supporting said upper part and extending between said upper part and said lower part;

said at least one upright constituting a telescopic pair of columns, said pair of columns including one column and an other column;

said telescopic pair of columns being structured such that telescoping displacement of said one column relative to said other column of said telescopic pair of columns is infinitely variable;

means for arresting said one column of said telescopic pair of columns at a selectable height;

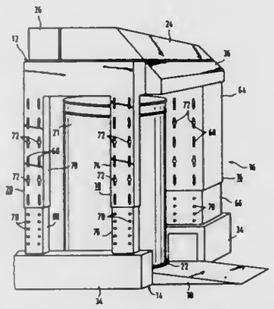
means for connecting said one column to said other column of said telescopic pair of columns at said selectable height;

said telescopic pair of columns each having a plurality of apertures;

said means for connecting said one column to said other column of said telescopic pair of columns constitutes a plurality of threaded connection means;

said plurality of threaded connection means extending





through respective apertures of said plurality of apertures of said columns of said telescopic pair of columns;

said plurality of apertures of said one column of said telescopic pair of columns constitute a plurality of oblong holes;

said plurality of apertures of said other column of said telescopic pair of columns constitute a plurality of round holes; and

said infinitely variable telescoping displacement of said one column relative to said other column of said telescopic pair of columns of said at least one upright is rendered possible by said plurality of apertures of said columns of said telescopic pair of columns.

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**5,044,048**

## COMBING MACHINE

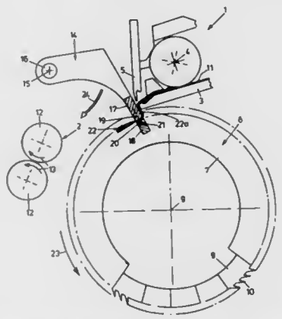
**Josef Egerer, Beim Biengarten 2b, D-854o, Schwabach, Fed. Rep. of Germany**

**Filed Jun. 25, 1990, Ser. No. 542,507**

**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, 3921868**

**Int. Cl.[5] D01G** *19/10, 19/16*

**U.S. Cl. 19—216** **6 Claims**



1. In a combing machine comprising a rotating combing roller with a comb segment, a feed device for a sliver to be combed, a gripper arrangement disposed in the vicinity of the comb segment which opens and closes in coordination with the passing movement of the comb segment and which holds the sliver while a front portion of the latter is being combed by the comb segment, and a draw-off device which moves the combed sliver away, a single transfer gripper arrangement (14) which is movable back and forth between the gripper arrangement (1) and the draw-off device (2) in a manner coordinated with the rotating motion of the comb segment (8) and the combing of said front portion of said sliver and the opening of the gripper arrangement (1), said single transfer gripper arrangement then gripping the comb sliver (22) and holding said sliver in such a way that during the next pass of the comb segment (8) the rear portion of said sliver (22), looking in the direction of movement, is combed by the comb segment (8), said single transfer gripper arrangement (14) then handing off said sliver (22) to the draw-off device (2), the improvement comprising:

said single transfer gripper arrangement (14) being pivotably supported between said gripper arrangement (1) and said draw-off device (2);

said gripper arrangement (1) having jaws,

one jaw of said jaws mounted in a stationary position in the vicinity of said comb segment.

a second jaw of said jaws pivotally mounted to open and close said jaws,

said jaws holding said sliver for combing of said front portion when said jaws are closed,

said single transfer gripper arrangement holding said sliver for combing of said rear portion after said jaws open and before transferring a combed sliver to said draw-off device.

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**5,044,049**

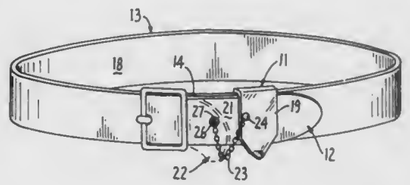
## LADIES BELT CLIP

**Leanne M. Owens, and Robert J. Owens, both of 2859 Via Cordoba Ct., San Ramon, Calif. 94583**

**Filed Jun. 26, 1990, Ser. No. 543,657**

**Int. Cl.[5] A44B** *11/00*

**U.S. Cl. 24—182** **2 Claims**



1. A device for releasably securing the free end of a belt to the body of the belt, comprising

a unitary spring clip adapted to fitting over the free end portion of a belt and a desired portion of the body of the belt and forcing such portions tightly together for releasably holding said free end portion of said belt from dangling; and

means for releasably securing said unitary spring clip to said body of said belt without encircling said belt,

said means for releasably securing said unitary spring clip to said body of said belt comprising a flexible ornamental chain having a first end secured to said clip and a second end adapted to pass through a hole in said body of said belt and retaining means on said second end of said chain formed for selectively preventing withdrawal of said second end of said chain from said hole in said body of said belt.

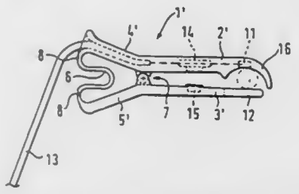
VOL 1130 ISS 1 SE 3 1991 UMI



**5,044,050**
**PLASTIC CLIP**

**Karl Trinkaus, Darmstadt, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 394,827, Aug. 16, 1989, Pat. No. 4,953,266. This application Apr. 30, 1990, Ser. No. 516,422**
**Claims priority, application Fed. Rep. of Germany, Aug. 26, 1988, 8810826**
**The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.**
**Int. Cl.[5] A41F *1/00*; A44B *21/00***
**U.S. Cl. 24—499** **12 Claims**

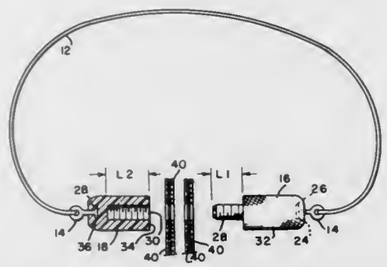


1. A plastic clip having one end and another end, comprising two clamping members at said one end and two spreadable handles at said other end, a pivot bearing structured for assembly by snapping-together, a U-shaped compression spring located inside said spreadable handles connecting said spreadable handles together, and a Reed-Contact located in one of said clamping members and a permanent magnet located in the other of said clamping members, said clamping members each having a free end portion and said Reed-Contact and said permanent magnet being positioned opposite and relative to each other in said clamping members so that, when said clamping members are touching, an alarm signal is generated by said Reed-Contact, indicating unintentional loosening of the plastic clip.

**5,044,051**
**PAIRER AND HOLDER FOR SOCK PAIRS, AND A METHOD OF PAIRING AND HOLDING SOCK PAIRS**

**Milton L. Klein, 30 E. 208th St., Bronx, N.Y. 10467**

**Filed Sep. 17, 1990, Ser. No. 583,729**
**The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.**
**Int. Cl.[5] A41F *1/00***
**U.S. Cl. 24—590** **8 Claims**

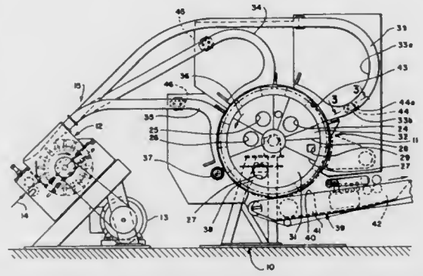


1. A pairer and holder for sock pairs during washing, comprising:
a dual-ended, wash-resistant loop; and
a clasp for securing ends of said loop together; wherein
said clasp comprises a pair of sections;
each of said sections has a first chamber therewithin; and including
a threaded screw, partially confined in said first chamber in one of said sections;
a portion of said screw projects, through a given length, from said one section;
said first chamber in the other of said sections is internally threaded to receive said portion of said screw threadedly and confiningly therein, and has a length greater than said given length;
confronting ends of said sections, which abuttingly close upon each other upon said screw portion being fully threaded into said first chamber of said other section, are flat; and further including
swivel couplings joined to each of said sections and to said ends of said loop;
each of said swivel couplings have a bead; and wherein
said sections further have second chambers therewithin; and
said beads are rotatably journalled in said second chambers in isolation from said first chambers to prevent wash water and detritus from entering said first chamber of said one section and reaching said screw.

**5,044,052**
**METHOD AND APPARATUS FOR FORMING FLUFF PADS FOR DIAPERS AND THE LIKE**

**James E. Hertel, and John Merkatoris, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.**

**Filed Apr. 25, 1990, Ser. No. 514,199**
**Int. Cl.[5] D04H *1/04*; D01G *23/08***
**U.S. Cl. 28—105** **6 Claims**



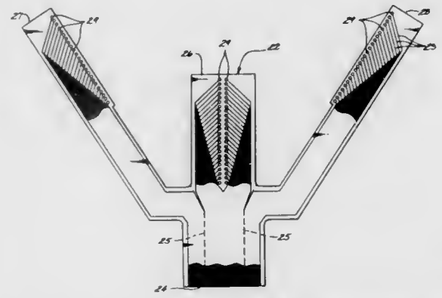
1. A fluff former comprising a frame providing a longitudinally extending path, a drum mounted in said frame having a circumferentially extending screen, means for rotating said drum one direction, a vacuum source associated with said frame for maintaining a vacuum inside said drum, fluff mill means in said path on one side of said drum to provide with said vacuum source a fluff particle stream, a take-away conveyor in said path on the other side of said drum, a plurality of longitudinally extending fluff delivery ducts on said frame in said path each having a first end connected to said mill means and a second end communicating with said screen, each said duct adjacent said second end including a generally C-shaped section to change the direction of flow of said stream, said generally C-shaped section having an inner side and an outer side, said inner side being elongated in the direction of drum rotation and said outer side extending generally perpendicularly of said screen whereby the outer side densifies the fluff particle stream thereagainst to achieve fluff particle deposit on said screen.



**5,044,053**
**METHOD OF MANUFACTURING A CURVED ARRAY ULTRASONIC TRANSDUCER ASSEMBLY**

**Leroy A. Kopel, Tempe, and Randy G. Plank, Mesa, both of Ariz., assignors to Acoustic Imaging Technologies Corporation, Phoenix, Ariz.**

**Filed May 21, 1990, Ser. No. 526,569**
**Int. Cl.[5] H01L *41/22***
**U.S. Cl. 29—25.35** **11 Claims**

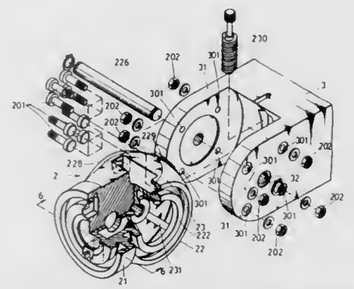


1. A method of connecting a flexible circuit board to a flexible array of ultrasonic transducer elements comprising the following steps in the sequence set forth:
bending the flexible array to a desired radius;
securing the array in a curved tooling form of the desired radius;
aligning conductive traces in the flexible circuit board with the elements of the array in the tooling form; and
electrically connecting the aligned traces to the elements of the curved array while in the tooling form.

**5,044,054**
**DRIVING HEAD HOLDER FOR TURRET MILLING MACHINE**

**Ming-Hong Lin, No. 23, Jenn Shing Rd., Tai Pyng Shiang, Taichung Shiann, Taiwan**

**Filed May 31, 1990, Ser. No. 530,861**
**Int. Cl.[5] B23B *39/16*; B23C *1/12***
**U.S. Cl. 29—39** **4 Claims**

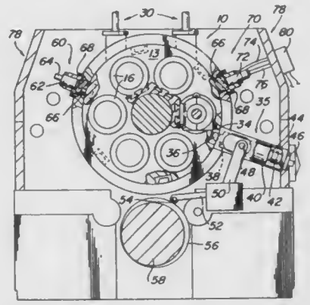


1. A driving head holder for a turret milling machine comprising a cantilevering coupling member cantilevered from said milling machine and having two side walls, a driving head holding member mounted between said side walls and adapted to connect thereto a driving head for said milling machine, and a shaft member penetrating through said side walls and said holding member for pivotally mounting said holding member between said side walls, characterized in that said holding member includes:
a middle web having an intermediate hub member having a through hole for passing through said shaft member;
two side portions respectively corresponding to said side walls and respectively having two cross sectionally T-shaped annular grooves opening outwardly to face said side wall each groove being capable of receiving and retaining therein a headed portion of a screw protruding beyond one of said side walls to threadedly engage with a nut; and
a curved peripheral portion integral to and attaching said web and said side portions.

**5,044,055**
**HYDRAULICALLY OPERATED SPINDLE CARRIER CLAMPING MECHANISM**

**Richard F. Howarth, Blue Bell; Robert A. DiDomizio, Lansdale, and W. Edward Johnston, Shillington, all of Pa., assignors to Parker Hannifin Corporation, Reading, Pa.**

**Division of Ser. No. 361,731, Jun. 2, 1989, Pat. No. 4,932,650, which is a continuation of Ser. No. 883,580, Jul. 9, 1986, abandoned. This application May 17, 1990, Ser. No. 534,023**
**Int. Cl.[5] B23B *9/04*; B23Q *17/00***
**U.S. Cl. 29—49** **3 Claims**



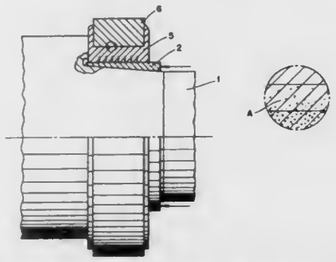
1. In an automated machining apparatus of the type having a rotatable cylindrical carrier for holding stock material in spindles spaced at regular intervals thereon, a means for clamping the rotatable stock carrier, comprising:
a) a controllable locking pin mechanism for selectable engagement and disengagement of a locking pin head into a slot on the carrier, said carrier having a plurality of such slots disposed on its circumference at regular intervals corresponding to the spacing of the spindles;
b) a passive brake located adjacent to and in pressure contact with the carrier, and aligned substantially diametrically opposite the locking pin mechanism;
c) a hydraulically actuated pressure brake located adjacent the carrier, positioned in an arc quadrant of the carrier's circumference in which the locking pin mechanism is located and having a controller means for controlling the actuation of said brake;
d) a programmable controller for receiving and storing control data with respect to the desired rotation of the carrier and for outputting control signals to the hydraulically actuated brake controller to cause the brake controller to release the brake prior to desired rotation and to engage the brake after the desired rotation.

5,044,056

## ROLL RING COMPRISING A RING OF CEMENTED CARBIDE METALLURGICALLY BONDED TO A CAST IRON BODY

Gert I. S. Sundstedt, Strängnäs, and Ingvar J. Carlsson, Johanneshoy, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Filed Dec. 13, 1989, Ser. No. 449,820
Claims priority, application Sweden, Dec. 13, 1988, 88045034
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—132 13 Claims



1. A roll ring comprising a graphitic cast iron body having a carbon equivalent of from 2.5 to 6.0 and a microstructure predominantly of bainite, at least some of the bainite having been formed by heat treatment of austenite, and a ring of cemented carbide on at least a portion of the outer surface of said cast iron body, the cemented carbide being metallurgically bonded to said cast iron body during casting of the iron about the inner portion of the said cemented carbide ring, the differential shrinkage during cooling after casting between the cast iron body and the ring of cemented carbide being at least partly eliminated by the transformation of austenite to bainite.

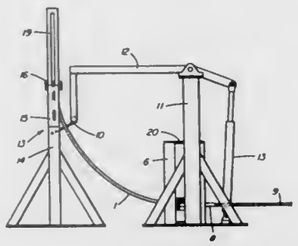
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5,044,057

## APPARATUS FOR MAKING BLASTING MATS

Robert Meagher, P.O. Box 293, Carrying Place, Ontario, Canada K0K 1L0

Filed Aug. 6, 1990, Ser. No. 562,819
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—241 5 Claims



1. An apparatus for assembling a blasting mat, comprising:
a) a plurality of arcuately curved longitudinally extending rod members arranged in spaced parallel relationship to each other, each having an upper vertically disposed end and a horizontally disposed lower end, for receiving mat segments at said upper end and discharging said mat segments at said lower end;
b) first frame support means arranged adjacent the lower ends of said rods;
c) first releasable clamping means mounted on said first support means to alternately grip and release said lower ends of said rods;
d) second frame support means arranged adjacent the upper ends of said rods;
e) second releasable clamping means mounted on said second support means to alternately release and grip said upper ends of said rods; said first and second releasable clamping means functioning such that at least one end of said rods is always clamped;
f) third frame support means adjacent said first frame support means;
g) lever means pivotatling mounted on said third support means;
h) means to move said lever means between a first and a second operating position;
i) rake means arcuately moveable between adjacent pairs of said curved rod members and mounted at one end of said lever means; and
j) flexible coupling means releasably mounted at the lower end of each of said rod members for releasably securing a flexible cable thereto.

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5,044,058

## BULB INSERTION AND REMOVAL TOOL

Barbara A. Voss, 2625 N. 118th St., Wauwatosa, Wis. 53226

Filed Aug. 24, 1989, Ser. No. 397,822
Int. Cl.[5] B23P *19/02*
U.S. Cl. 29—278 13 Claims



1. A hand operated tool for the removal and replacement of Christmas tree light bulbs which have a glass bulb and smaller adjacent bases insertable into bulb sockets, comprising;
a pair of opposed levers;
connecting means moveably connecting the levers for movement toward and away from each other;
a pair of opposed wedge means at respective and corresponding ends of each said lever having circularly relieved edges tapering to thin edges for wedging and gripping a light bulb while it is in a bulb socket and dimensioned to continue to close after said wedge means contact said glass bulb and said socket until said thin edges grip said base;
whereby the levers may be moved towards each other carrying the thin edges of the opposed wedge means against the area where the glass bulb and the light bulb socket meet to wedge the glass bulb and attached base outward with respect to said socket and separate the base of the light bulb from the socket while grasping the base of the light bulb and holding the light bulb securely and firmly thereby allowing the light bulb to be removed from its socket.

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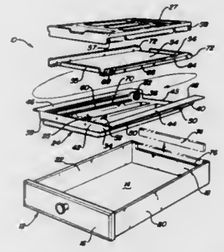
5,044,059

## METHOD AND APPARATUS FOR RETROFITTING A DRAWER WITH A MULTIPLE LEVEL CUTLERY TRAY OR A CUTLERY TRAY AND CUTTING BOARD

John P. De Giulio, 5915 Da Costa, Dearborn Heights, Mich. 48127

Continuation-in-part of Ser. No. 344,813, Apr. 28, 1989, Pat. No. 4,993,786. This application Mar. 30, 1990, Ser. No. 501,529
Int. Cl.[5] B21K *21/16*
U.S. Cl. 29—401.1 5 Claims

1. A method of retrofitting a drawer with a two-tiered storage apparatus, said drawer having a bottom wall, a front wall, a rear wall and two sidewalls, said method comprising:
removing at least an upper portion of the rear wall of the drawer to form an opening in the rear wall;
providing a base tray and an upper tray;
providing a guide means with a shiftable part and a stationary part;
placing said base tray in said drawer;



mounting said stationary part of said guide means in said drawer;
providing said shiftable part of said guide means on said upper tray; and
attaching said shiftable part to said stationary part, such that said upper tray is horizontally shiftable between a closed position and an open position wherein said upper tray is partially extended through the opening in the rear wall of the drawer and cantilevered over said rear wall.

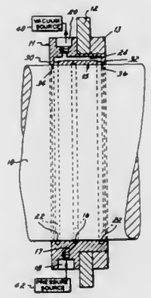
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5,044,060

## METHOD OF MOVING A HYDRAULICALLY EXPANDABLE HUB ALONG A SHAFT

John C. Eiting, 155 N. Garfield St., Minster, Ohio 45865, assignor to John C. Eiting, Minster, Ohio

Filed May 9, 1990, Ser. No. 521,314
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—446 7 Claims



1. A method for moving a hydraulically expandable hub on a shaft having an outside diameter and for preventing leakage of oil from the hub onto said shaft during said movement, said hub having first and second ends, an exterior, and an inside diameter, said method comprising:
expanding said hub by forcing oil under high pressure into an oil groove located along said inside diameter of said hub between said first and second ends of said hub;
moving said expanded hub on said shaft;
collecting oil escaping from said oil groove into a collection groove located between said oil groove and one of said first and second ends of said hub;
venting said oil collected in to said collection groove through a vent port to the exterior of said hub; and
terminating said forcing of said oil into said oil groove, thereby reducing said hub diameter to the outside diameter of said shaft so that said hub frictionally locks onto said shaft.

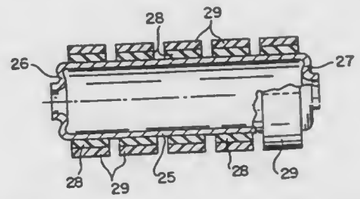
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5,044,061

## RUBBER-PLASTIC COMPOSITE

James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 794,896, Nov. 4, 1985, Pat. No. 4,768,761, which is a division of Ser. No. 592,031, Mar. 21, 1984, Pat. No. 4,585,215. This application Apr. 25, 1988, Ser. No. 185,578
Int. Cl.[5] B23P *11/02*
U.S. Cl. 29—447 2 Claims



1. The method of fabricating a torsion spring comprising the steps of molding a cylindrical sleeve of ultra high molecular weight polyethylene having an inner annular surface and molding an annular rubber sleeve having an outer annular surface and an inner annular surface, bonding said inner annular surface of said cylindrical sleeve of ultra high molecular weight polyethylene to said exterior outer surface of said rubber sleeve, curing said ultra high molecular weight polyethylene sleeve and said rubber sleeve simultaneously to place said rubber sleeve in compression, ad thence securing a shaft to said inner annular surface of said rubber sleeve.

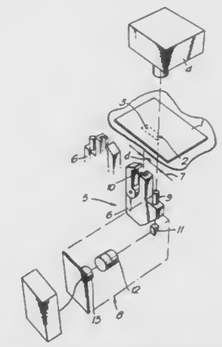
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5,044,062

## PRINTED CIRCUIT BOARD ASSEMBLY APPARATUS

Geoffrey D. Maskens, Wimborne, and Brian D. Doe, Kingston, Ne. Blandford, both of United Kingdom, assignors to Blakell Systems Limited, Blandford, England

Filed Oct. 24, 1990, Ser. No. 602,724
Int. Cl.[5] H05K *3/30*
U.S. Cl. 29—566.3 4 Claims



1. Printed circuit board assembly apparatus comprising: means for supporting a printed circuit board for assembly of components on one side of the board by inserting leads of the components into corresponding holes formed in the circuit board at predetermined locations; light projecting means for illuminating from the one side of the board the holes intended to receive the leads of a selected component: and cutting means

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for cropping and crimping a lead of the component projecting from the other side of the board after assembly of the component on the board, the cutting means comprising a cutter having a nip to be aligned with a corresponding hole in the board prior to the insertion of a corresponding component lead: the cutter comprising an optical sensing arrangement having an optical axis disposed at a predetermined spacing in a predetermined direction from the nip of the cutter; control means being provided for first aligning the optical sensing arrangement with a hole in the board with which the nip of the cutter is to be aligned and then displacing the cutter in the said predetermined direction by the predetermined spacing to bring the nip of the cutter into alignment with the hole in the board.

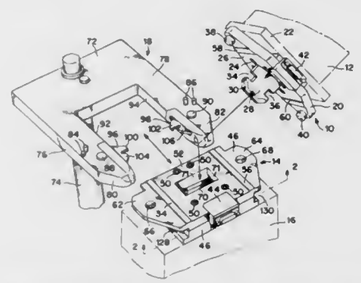
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**5,044,063**

## ROBOTIC TOOL CHANGE MECHANISM

**George M. Voellmer, Takoma Park, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Nov. 2, 1990, Ser. No. 608,657**
**Int. Cl.[5] B23Q *3/155***
**U.S. Cl. 29—568** **14 Claims**



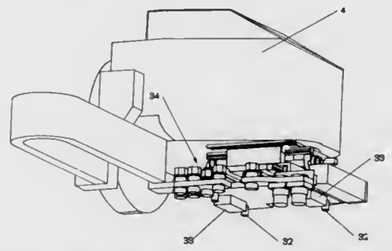
1. Tool changer apparatus for a robotic system, comprising:
first interface means attachable to a robotic arm;
second interface means attachable to a tool to be used by the robotic arm;
stowage means, including actuation means, for receiving and holding said second interface means when the respective tool is not in use;
said first and second interface means further including means for mutually engaging each other in response to movement from and to said stowage means, said means for engaging each other comprising a member including at least one notch therein extending from one of said first and second interface means, and a recess and notch engaging member in the other of said first and second interface means, said notch engaging member being movable in and out of said at least one notch in response to operation by said actuation means of said stowage means;
said member including at least one notch comprises a tongue extending from said first interface means and wherein said recess and notch engaging means are located in said second interface means;
said first interface means comprises a wrist interface plate attachable to an outer end portion of the robotic arm and said second interface means comprises a tool interface plate fastened to said tool;
said stowage means comprises a holster in the form of a yoke member having bifurcated outwardly extending arms for engaging said tool interface plate, and
said notch engaging means comprises a wheel rotatable in and out of said at least one notch of said tongue.

**5,044,064**

## MACHINE TOOL WITH END EFFECTOR REPLACEMENT

**Roberto Muselli, Piacenza, Italy, assignor to Jobs S.P.A., Piacenza, Italy**

**Filed May 24, 1990, Ser. No. 528,828**
**Claims priority, application Italy, Sep. 11, 1989, 44815 A/89**
**Int. Cl.[5] B23Q *3/155*; B66C *3/00***
**U.S. Cl. 29—568** **18 Claims**



1. An automatic machine tool of the type which uses end effectors, comprising:
a main support;
means for moving the main support on a set of three Cartesian axes;
an operating head mounted to said support;
means for rotating said head around a pair of rotational axes with respect to said main support;
equipment mounted to said operating head for movement on the three Cartesian axes and the pair of rotational axes, said equipment carrying at least one end effector;
means for automatically changing end effectors which are carried by said equipment; and
means for moving said equipment along two additional axes, in addition to the set of three Cartesian axes and the pair of rotational axes, by numerical control, to move an end effector carried by said equipment and to change end effectors carried by said equipment, without movement of said main support on the set of three Cartesian axes.

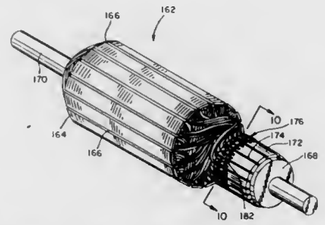
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**5,044,065**

## COIL WINDING ARMATURES WITH PARALLEL COILS

**Colin Dyke, North Augusta, and Carl Gifford, Chatham, both of Canada, assignors to Black & Decker Inc., Newark, Del.**

**Filed May 24, 1990, Ser. No. 528,970**
**Int. Cl.[5] H02K *15/06*; H01R *43/04***
**U.S. Cl. 29—597** **27 Claims**



1. A method of winding an armature of an electric motor, comprising the steps of:
producing a subassembly comprising an armature core and a commutator mounted on a shaft, the commutator having a plurality of bars each having a pair of wire securing devices;
winding pairs of electrically parallel coils on said core and connecting each pair of parallel coils between a respective pair of commutator bars;
said connecting comprising attaching one coil of a said pair of parallel coils to one of the pair of wire securing devices on a respective commutator bar and attaching the other coil of this pair of parallel coils to the other of the same pair of wire securing devices of the same respective commutator bar, and also attaching one coil of another said pair of parallel coils to said one wire securing device of this same respective commutator bar and attaching the other coil of said another said pair of parallel coils to said other of the same pair of wire securing devices of said same respective commutator bar; and
said winding and connecting steps continuing until each commutator bar has four coils attached thereto with two of the four coils being non-parallel coils and being attached by one wire securing device of that commutator bar and the remaining two coils of the four coils also being non-parallel coils and being attached by the other wire securing device of that commutator bar.



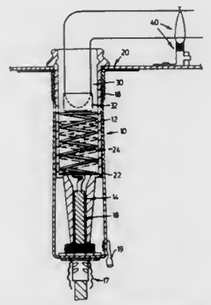
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**5,044,066**

## ELECTRODE RECEPTACLE

**Wasyl Slowski; Darrel Slowski, both of Islington, and David Slowski, Mississauga, all of Canada, assignors to Williams Sign Supplies Ltd., Mississauga, Canada**

**Continuation of Ser. No. 137,672, Dec. 24, 1987, abandoned. This application Aug. 23, 1990, Ser. No. 544,950**
**Int. Cl.[5] H01B *19/00***
**U.S. Cl. 29—631** **6 Claims**



1. In a method of producing electrode receptacle assemblies for resisting sudden heat increases comprising the steps of:
(a) selecting carbonate resin plastic having a density of 1.2 mg/m$^3$, melt flow rate of 9 to about 12 g/10 m at 300 degrees centigrade and 1,200 g load, and a tensile stress at yield of 63 MPa, a tensile stress at break of 68 MPa, a deflection temperature under load at 1.8 MPa of 133 degrees centrigrade and a dielectric stress of greater than 16 KV/mm;
(b) extruding said selected carbonate resin plastic to form said electrical receptacle with at least one hollow cylindrical section having two open ends;
(c) spinning a piece of PH bronze into a coil;
(d) subjecting said PH bronze coil to a temperature of 400 degrees centigrade for a period of one half hour;
(e) air cooling said PH bronze coil to room temperature;
(f) introducing high tension wire means through said one open end of said electrode receptacle and connecting same to said coil;
(g) locating said coil interiorally of said electrode receptacle at said one open end;
(h) introducing light means at said other open end for electrical connection to said coil and said high tension wire means to assemble said electrode receptacle capable of resisting sudden heat increases within said hollow cylindrical section.

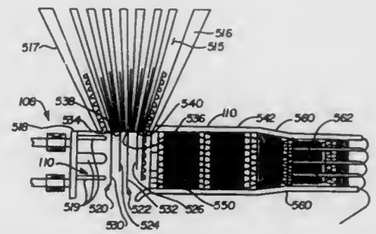
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**5,044,067**

## METHOD FOR THE MANUFACTURE OF LEAD ACID BATTERIES AND AN ASSOCIATED APPARATUS AND ASSOCIATED LEAD-ACID BATTERY

**Ellis G. Wheadon, Bernville, and Larry L. Forrer, Reading, both of Pa., assignors to Caltec International, Inc., Temple, Pa.**

**Division of Ser. No. 315,722, Feb. 24, 1989, Pat. No. 4,982,482. This application Sep. 12, 1990, Ser. No. 581,599**
**Int. Cl.[5] B23P *19/00***
**U.S. Cl. 29—730** **9 Claims**



1. Apparatus for fabricating a battery element comprising
means for supplying positive battery plate stock, negative battery plate stock and separator stock,
indexing means for advancing said positive battery plate stock, said negative battery plate stock and said separator stock to a predetermined position with said separator stock being interposed between adjacent stocks of negative battery plate and positive battery plate, and
cutting means for substantially simultaneously severing adjacent portions of said positive battery plate stock, said negative battery plate stock and said separator stock to create positive battery plates, negative battery plates and separators.

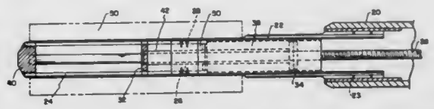
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**5,044,068**

## BLADE PACK EXTENSION AND WEDGE GUIDE SUPPORT

**Keith A. Witwer, Fort Wayne, Ind., assignor to Advanced Machine and Tool Corporation, Fort Wayne, Ind.**

**Filed Nov. 1, 1990, Ser. No. 607,907**
**Int. Cl.[5] B23P *19/00***
**U.S. Cl. 29—734** **18 Claims**



1. An apparatus for inserting coils and wedges into a dynamoelectric machine stator core, said apparatus comprising;
a generally tubular housing, said housing having an axis;
an array of circumferentially spaced, elongated wedge guides mounted on said housing;
a plurality of elongated blades disposed within said wedge guide array for axial movement relative to said wedge guides;
a blade holder means secured to said blades for supporting said blades;
a stripper movably mounted within said plurality of blades for axial movement relative to said blades; and
a wedge guide support means operatively associated with said wedge guides for laterally supporting said wedge

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guides when said blades have moved axially outside of said wedge guide array.

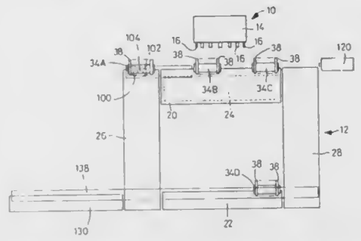
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5,044,069

## DEVICE FOR SUPPLYING ELECTRICAL COMPONENTS HAVING TWO CARRIERS FOR FEEDING THREE OR MORE COMPONENT SUPPLY TABLES

Koichi Asai, Nagoya; Mamoru Tsuda, Okazaki; Yasuo Muto, Chiryu, and Jiro Kodama, Nagoya, all of Japan, assignors to Fuji Machine Mfg. Co., Ltd., Aichi, Japan

Filed Aug. 31, 1990, Ser. No. 575,637
Claims priority, application Japan, Sep. 5, 1989, 1-229604
Int. Cl.[5] H05K 3/30
U.S. Cl. 29—740 13 Claims



1. A component supply device for supplying a component mounting device with electronic components at a supply position, so that the components are placed on a desired article by the component mounting device, said component supply device comprising,

at least three supply tables each having a plurality of supply units mounted, thereon such that said supply units have respective supply portions which are spaced from each other along a predetermined line, said supply units holding respective groups of electronic components of respective different kinds;

guiding means for guiding said at least three supply tables such that said supply tables are movable in a moving direction parallel to said predetermined line, said guiding means extending in said moving direction over a predetermined distance covering an operation area which includes said supply position and in which said supply tables are successively positioned to transfer said electronic components to said component mounting device, and a pre-operation area and a post-operation area which are located adjacent to said operation area and on opposite sides of said operation area in said moving direction, respectively, said supply tables being successively accommodated in said pre-operation and post-operation areas before and after said supply tables are positioned in said operation area;

table positioning means for positioning said at least three supply tables in said moving direction so that said supply portions of said supply units are selectively brought to said supply position at which said electronic components of the corresponding one of said groups are received by said component mounting device,

said table positioning means including a first and a second carrier which are selectively engageable with said at least three supply tables and which are reciprocable in said moving direction without an interference with each other, to move said supply tables over said predetermined distance of extension of said guiding means,

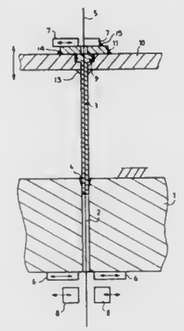
said table positioning means further including a first and a second feeding device for moving said first and second carriers, respectively.

5,044,070

## METHOD AND APPARATUS FOR THE FABRICATION OF WIRE ANODES FOR ELECTROLYTIC CAPACITORS

Francois Delalande, Saint Pierre de Bresse, France, assignor to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Mar. 19, 1990, Ser. No. 495,416
Claims priority, application France, Mar. 31, 1989, 89 04255
Int. Cl.[5] H01R 43/00; B23P 19/00
U.S. Cl. 29—825 3 Claims



1. A method for the fabrication of wire anodes for electrolytic capacitors, the anodes being obtained by the compression of a wire, made of anodizable material, in the cavity of a compression sleeve under the effect of a piston, the wire going through the piston from one side to the other along the axis of its movement and through the sleeve by passing into its cavity, the method comprising the following operations for the making of an anode:

a) blocking the bottom of the cavity and fixing the wire at this level;

b) securing the wire with respect to the piston, which is in its raised position;

c) compressing the wire in the cavity by pushing the piston in;

d) disconnecting the wire and the piston;

e) repeating the operations b) to d) until the desired anode length is obtained;

f) opening the bottom of the cavity and pushing the anode obtained out of the cavity by means of the piston;

g) raising the piston up to its raised position, with the previously obtained anode remaining in its pushed-out position, to start the fabrication of the next anode.

3. A device for fabricating wire anodes for electrolytic capacitors, the anodes being obtained by the compression of a wire made of anodizable material, the device comprising:

a sleeve having a cavity for receiving an axially movable piston;

a through-bore axially formed through the length of the piston for slidably receiving a length of anode wire therethrough;

first clamping means vertically fixed to the sleeve for clamping a lower end of an anode wire being formed thereby selectively fixing this end within the through-bore;

second clamping means vertically fixed to the piston for selectively clamping an upper end of the anode wire within the piston;

means coupled to the piston for axially reciprocating the piston several times consequently compressing the wire during multiple cycles in a free end of the cavity when the first and second clamping means are closed; and

third clamping means for clamping a released formed section of the wire anode at the end of a compression cycle thereby permitting the device to form another anode along the length of a wire.

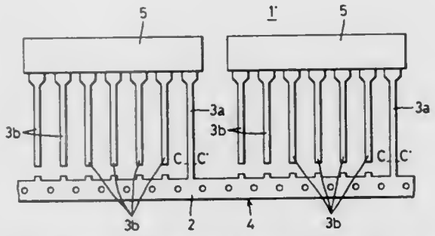


5,044,071

## MANUFACTURING METHOD FOR TAPING ELECTRONIC COMPONENT

Yasuhiko Toda; Moriyuki Hatta; Masao Okamoto, and Katsuyoshi Matsui, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 3, 1990, Ser. No. 504,135
Claims priority, application Japan, Apr. 3, 1989, 1-84563
Int. Cl.[5] H01R 43/00
U.S. Cl. 29—827 1 Claim



1. A method of manufacturing a tape of finished electronic components having long and short leads and in which the components project laterally from the tape and are supported on the tape by the long leads of the electronic components, comprising the steps, in the recited order, of:

preparing an electronic component set constituted by a plurality of electronic component bodies, a lead terminal member having an elongated connecting member and a plurality of lead terminals integral therewith and extending laterally from the connecting member and spaced at intervals along the length of the connecting member, said lead terminals being in groups with an electronic component body attached to each group of lead terminals;

cutting the lead terminals other than at least one designated lead terminal in each group at a position to separated the lead terminals the designated lead terminal from said connecting member;

measuring the electrical properties of each of said electronic bodies between the designated lead terminal still attached to said connecting member and the respective lead terminals which have been cut;

cutting the designated lead terminals for separating the electronic component bodies and lead terminals from said connecting member to form semi-finished electronic components, said respective cutting steps being carried out for cutting the lead terminals to a length at least slightly longer than the length of the longest lead terminal of a finished electronic component;

securing the semi-finished electronic components to a tape at desired intervals along said tape by attaching the free ends of the lead terminals of the semi-finished electronic components to the tape; and

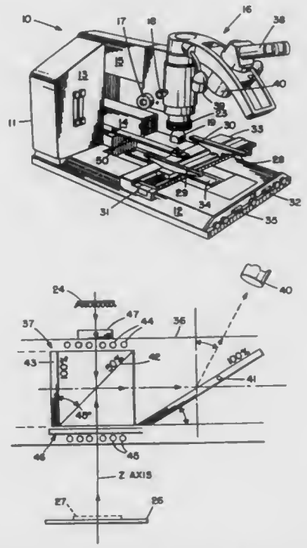
cutting only some of the lead terminals of the respective semi-finished electronic components between the tape and the electronic component bodies for forming short lead terminals; whereby there is produced finished electronic components having said some short lead terminals, and the finished electronic components are supported along said tape by the lead terminals remaining after the short lead terminals and which, when they are cut to separate the electronic components from the tape, become the long lead terminals of the finished electronic components.

5,044,072

## VISION SYSTEM APPARATUS AND METHOD FOR COMPONENT/PAD ALIGNMENT

Bruno Blais, and Urs Berger, both of Solothurn, Switzerland, assignors to Air-Vac Engineering Company, Inc., Milford, Conn.

Filed Apr. 13, 1990, Ser. No. 509,593
Int. Cl.[5] H05K 3/30
U.S. Cl. 29—834 13 Claims




1. In the method for the alignment and soldering of leads of an electrical component and the pad members of a printed circuit board to which said leads are to be soldered, comprising supporting a said electrical component in vertical elevation, along the z-axis above said printed circuit board, supporting said printed circuit board in horizontal position along said z-axis below said component on a carriage member which is adjustable along the X and Y directions, interposing a beam splitter cube along said z-axis between said electrical component and said printed circuit board for simultaneously splitting and reflecting an image, passed therethrough along a predetermined image path, against the undersurface of said electrical component and against the pad members on the upper surface of said printed circuit board to provide a simultaneous superimposed view thereof which can be aligned by adjustments of said carriage member in the X or Y directions, observing said superposed view through a microscope means along said predetermined path; making adjustments of said carriage member along the X and Y axes to obtain alignment, adjusting the theta position of said electrical component, and lowering said component vertically along said z-axis to place it into surface contact with the pad members of said printed circuit board with which it has been aligned, and soldering said leads to said pad members, the improvement which comprises interposing an adjustable polarizing filter horizontally across said z-axis, between said electrical component and said printed circuit board to filter the light reflected view of said pad members of the printed circuit board, and said adjusting said filter to vary the intensity of said light reflected view to produce a greater visual contrast between the leads of said electrical component and the pad members of said printed circuit board.

7. In an apparatus for the alignment of the leads of an electrical component and the pad members of a printed circuit board to which said leads are to be soldered, comprising component

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support means for supporting a said electrical component in vertical elevation above, and for moving a said component along the z-axis into contact with a said printed circuit board, carriage means for supporting a said printed circuit board in horizontal position along said z-axis below said component support means, means for adjusting said carriage means along the X, Y and theta directions, a beam splitter cube adjustably mounted to be interposed along said z-axis between said component support means and said carriage means for simultaneously splitting and reflecting images, passed therethrough along a predetermined image path, against the undersurface of a component supported by said component support means and against the pad members on the upper surface of a printed circuit board supported by said carriage member to provide a simultaneous superposed view thereof which can be aligned by adjustments of said carriage member in the X, Y and theta directions, microscope means enabling an operator to observe said superimposed view along said predetermined path for purposes of making said adjustments to obtain alignment, and means for lowering said component support means vertically along said z-axis to place a said electrical component into surface contact with the pad members of a said printed circuit board with which it has been aligned for soldering purposes, the improvement which comprises an adjustable polarizing filter positioned horizontally across said z-axis, between said component support means and said carriage member, for filtering the light reflected image of said pad members of a printed circuit board and which is rotatable for adjusting the contrast of said image to produce a greater visual distinction between the leads of said electrical component and the pad members of said printed circuit board.

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**5,044,073**

## PROCESS FOR PRODUCING PRINTED-CIRCUIT BOARD

**Shuichi Ogasawara, Ichikawa, and Kazuo Kawanishi, Chiba, both of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan**

**Continuation of Ser. No. 298,696, Jan. 19, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 624,539**
**Claims priority, application Japan, Nov. 26, 1988, 63-297218**
**Int. Cl.[5] H05K** *3/12*
**U.S. Cl. 29—846** **10 Claims**

1. A process for producing a printed-circuit board which consists essentially of forming a metal coating film on a polyimide resin board by electroless plating after activation, etching the metal coating film, thereby forming printed conductors, and lastly etching at least the exposed surface of the resin board which is not covered by the printed conductors with a solvent selected from the group consisting of hydrazine, ethylenediamine, dioxane, alcohol, and aqueous solution of alkali hydroxide.

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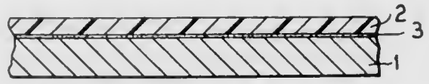
**5,044,074**

## METHOD FOR MANUFACTURING METAL CORE PRINTED CIRCUIT BOARDS

**Helmut Hadwiger, Munich, and Hans Schmidt, Eurasburg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Division of Ser. No. 291,119, Dec. 28, 1988, Pat. No. 4,924,590. This application Mar. 16, 1990, Ser. No. 495,740**
**Claims priority, application Fed. Rep. of Germany, Jan. 8, 1988, 3800348**
**The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.**
**Int. Cl.[5] H05K** *1/05*
**U.S. Cl. 29—848** **22 Claims**

1. A method for the manufacturing of a metal core pc board whose core is composed of a metal with good thermal conductibility, preferably one of aluminum, copper, brass or steel, the thermal expansion coefficients of the metal core and other pc board materials being substantially equal, comprising the steps of: laminating the metal core with a plastic foil at least on one side; placing the laminated metal core into a shaping tool; and enveloping the laminated metal core at least on one side




with an additional plastic layer and at least partially in a thermoforming process.

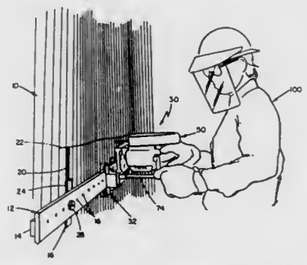
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**5,044,075**

## BOILER REPAIR

**Matthew T. Brennan, Wayland, and James A. Moruzzi, Millis, both of Mass., assignors to SMA Controls, Inc., Medfield, Mass.**

**Division of Ser. No. 131,202, Dec. 10, 1987, Pat. No. 4,830,551, which is a continuation-in-part of Ser. No. 916,302, Oct. 7, 1986, Pat. No. 4,739,688. This application Jan. 6, 1989, Ser. No. 294,181**
**Int. Cl.[5] B23P** *15/26*
**U.S. Cl. 29—890.031** **21 Claims**



1. A boiler repair system comprising
elongated guide rail structure for securing to a boiler tube panel adjacent a region to be replaced,
a first tool assembly for mounting on said guide rail structure, said first tool assembly including
first carriage structure with guide structure for engaging said guide rail structure and enabling said first tool assembly to be stably moved along said guide rail structure and,
first support structure secured to said first carriage structure and defining a plunge cutting axis extending transversely to said guide rail structure,
a first cutting tool mounted on said first support structure for movement about said plunge cutting axis in plunge cutting action to cut through a series of boiler tubes, said first cutting tool including a tube cutter disc disposed for rotation about an axis parallel to said plunge cutting axis and a first motor for driving said tube cutter disc in rotation, and
a second tool assembly for mounting on said guide rail structure, said second tool assembly including
second carriage structure with guide structure for engaging said guide rail structure so that said second tool assembly may be stably moved along said guide rail structure, second support structure secured to said second carriage structure and defining a membrane cutting axis extending parallel to said guide rail structure, and
a second cutting tool mounted on said second support structure that includes a membrane cutter disc disposed for rotation about an axis perpendicular to said membrane cutting axis, and a second motor for driving said membrane cutter disc in rotation for cutting membranes between boiler tubes cut by said first cutting tool; and
a third tool assembly for mounting on said guide rail structure, said third tool assembly including
third carriage structure with guide structure for engaging said guide rail structure so that said third tool assembly may be stably moved along said guide rail structure, third support structure secured to said third carriage structure and defining a reference axis extending perpendicularly to said guide rail structure,
said third tool assembly including a tube end prepping tool mounted on said third support structure for swiveling movement about said reference axis and including a cutter head mounted for rotation about an axis parallel to said reference axis, and a drive motor for driving said cutter head in rotation for end prepping boiler tubes cut by said first cutting tool.

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**5,044,076**

## METHOD FOR PRODUCING A METAL PRODUCT HAVING IMPROVED LUSTRE AFTER PAINTING

**Jean R. Crahay, Francorchamps, and Adolphe A. Bragard, Esneux, both of Belgium, assignors to Centre de Recherches Metallurgiques—Centrum Voor Research in de Metallurgie, Brussels, Belgium**

**Division of Ser. No. 77,812, Jul. 27, 1987, Pat. No. 4,917,962. This application Jan. 29, 1990, Ser. No. 471,930**
**Claims priority, application Luxembourg, Jul. 28, 1986, 86531**
**Int. Cl.[5] B21B** *1/00;* **B21D** *53/00*
**U.S. Cl. 29—895.3** **19 Claims**

1. A process for manufacturing a metal product exhibiting improved lustre after painting, comprising:
producing a surface of the product with a substantially uniform roughness comprising peaks and valleys; and
flattening the peaks by means of a substantially smooth tool to form flat and smooth facets lying in a common plane and separated by the valleys.

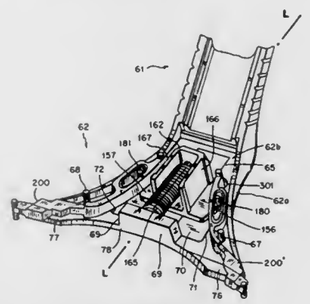
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**5,044,077**

## RAZOR MECHANISM

**Frank A. Ferraro, Trumbull, and Evan N. Chen, Fairfield, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Apr. 10, 1990, Ser. No. 507,269**
**Int. Cl.[5] B26B** *21/08, 21/14, 21/30, 21/00*
**U.S. Cl. 30—85** **20 Claims**



1. A razor mechanism comprising:
a base member having a central longitudinal axis;
means for attaching a flexible cartridge to said razor mechanism such that said cartridge is disposed substantially perpendicular to said longitudinal axis, wherein said attaching means is moveably connected to said base member;
means for moving said attaching means such that upon movement of said moving means said attaching means moves in a direction substantially toward said longitudinal axis; and
wherein said attaching means is freely moveable in a direction substantially toward said longitudinal axis in response to flexing of said flexible cartridge during shaving.

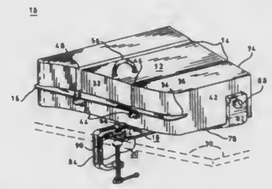
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**5,044,078**

## DOUBLE WELT TRIMMER

**Gordon T. Heaton, Sr., Rte. 1 Box 54, Friendsville, Tenn. 37737**

**Filed Oct. 4, 1990, Ser. No. 592,653**
**Int. Cl.[5] B26B** *21/40*
**U.S. Cl. 30—90.8** **13 Claims**



1. A double welt trimmer comprising:
a housing having forward and rearward ends;
a double welt receiving means carried by said housing for retaining and guiding at least one double welt, said double welt receiving means defining at least one through hole opening on said forward and rearward ends of said housing, each of said through holes including a substantially radial slot extending from said hole and opening on said housing, said hole being dimensioned to closely receive said double welt with a selected size and said slot being dimensioned to receive said selvage; and
a cutting blade for trimming said selvage from said double welt as said double welt is guided through said double welt receiving means.

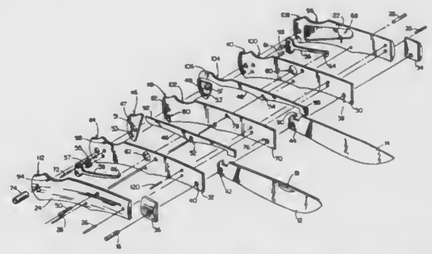
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**5,044,079**

## FOLDING KNIFE WITH OPEN LOCK FEATURE HAVING IMPROVED SPRING ELEMENT

**Philip W. Gibbs, Camillus, N.Y., assignor to Camillus Cutlery Co., Camillus, N.Y.**

**Filed May 7, 1990, Ser. No. 519,895**
**Int. Cl.[5] B26B** *03/06*
**U.S. Cl. 30—160** **18 Claims**



1. In a folding knife having a handle portion and at least one blade having a tang portion pivotally mounted for movement about an axis at one end of said handle for movement of said blade between closed and open positions, a locking and release mechanism for releasably securing said blade in the fully open position, said mechanism comprising, in combination:
(a) a lock lever mounted in said handle for limited pivotal movement with respect thereto about a pivot axis parallel to said blade tang pivot axis, and having a first end portion configured for engagement in a notch in the tang portion of said blade which is aligned with said lock lever first end portion when said blade is in its fully open position, wherein said lock lever and said blade are in substantially co-planar longitudinally aligned relation; and
(b) a beam spring mounted in said handle, and having a first end portion anchored to said handle in a plane laterally

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spaced from the plane in which said lock lever and said blade lie, and a second end portion laterally extending from said first end portion, said second end portion contacting said lock lever at a position on the opposite side of said lock lever pivot axis from said lock lever first end portion and exerting a biasing force urging said lock lever toward rotation in a direction moving said lock lever first end portion into engagement with said notch in said blade tang portion, said spring second end portion being flexibly movable against said biasing force by manual pressure exerted on a predetermined portion of said lock lever.

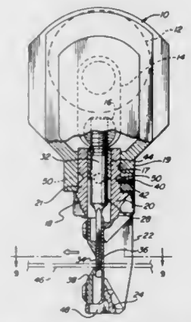
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**5,044,080**

## HAND HELD NIBBLING MACHINE

**Bruno Keller, Seewis, and Marco Allemann, Untervaz, both of Switzerland, assignors to Trumpf Gruesch AG, Gruesch, Switzerland**

**Filed Nov. 30, 1990, Ser. No. 621,750**
**Int. Cl.[5] B26B *15/00***
**U.S. Cl. 30—228** **14 Claims**



1. A hand-held nibbling machine comprising:
(a) a manipulatable housing;
(b) a motor in said housing;
(c) a transmission assembly within said housing connected to said motor for converting rotary motion to reciprocating linear motion, said transmission assembly including an output coupling;
(d) a tool assembly including a housing portion providing a passage therein, a ram reciprocable in said passage, a base portion with a die support for supporting a die in spaced relationship to the adjacent end of said housing portion, and a neck portion between said housing and base portions providing a throat into which a workpiece may extend between said ram and die support;
(e) disengageable ram attachment means for securing said ram to said output coupling;
(f) disengageable housing attachment means for securing said housing portion of said tool assembly to said manipulatable housing; and
(g) an extension assembly interposed between said tool assembly and manipulatable housing and operative to transmit reciprocal motion from said output coupling to said ram of said tool assembly, comprising an elongated sleeve providing a passage therethrough and a shaft reciprocable therewithin, the end of said sleeve adjacent said manipulatable housing being engageable with said housing attachment means and of said manipulatable housing the opposite end thereof having second housing attachment means engaged with said housing portion of said tool mounting assembly, the end of said shaft adjacent said coupling being engaged therewith by said ram attachment means and the opposite end thereof having second ram attachment means engaged with said ram, whereby said tool assembly may be alternately mounted directly upon said manipulatable housing by disassembling said extension assembly from said tool assembly.

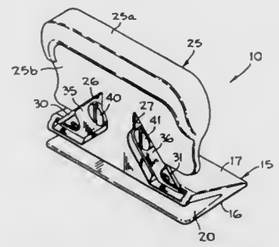
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**5,044,081**

## CARPET TRIMMER WITH A RECESSED GUIDE

**Tan D. Nguyen, Milpitas, Calif., assignor to Crain Cutter Co., Inc., Milpitas, Calif.**

**Filed Jul. 30, 1990, Ser. No. 560,096**
**Int. Cl.[5] B26B *21/00***
**U.S. Cl. 30—294** **10 Claims**



7. A carpet cutter for trimming a carpet edge to conform to the contour of an edge of a molding, the edge of the molding being formed with a recess extending in the direction of the carpet edge to be trimmed, said carpet cutter comprising:
(a) a base formed with a projection extending in the direction of the carpet edge to be trimmed to be received by the recess formed in the molding to guide the base along the edge of the molding, said base being formed with a bottom member forming said projection received by the recess formed in the molding to guide the base along the edge of the molding, said molding including a projection extending in the direction of the carpet edge to be trimmed, said base being formed with an upper member for sliding along said projection of said molding during the guided movement of said base along the edge of said molding;
(b) cutting means holder extending upwardly from said base for imparting movement to said base along the edge of the molding;
(c) a handle attached to said cutting means holder for moving said cutting means holder and said base in the direction of the carpet edge to be trimmed; and
(d) cutting means carried by said holder for trimming the carpet edge during the guided movement of the base.

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**5,044,082**

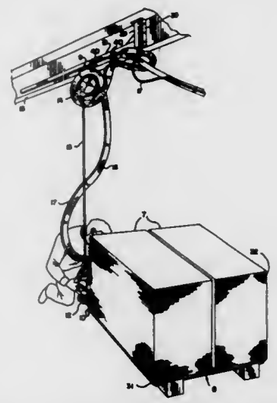
## METHOD AND MEANS OF NOTCHING SHEETS

**William A. Adair, Prospect Heights, Ill., assignor to Teledyne Industries, Inc., Los Angeles, Calif.**

**Division of Ser. No. 268,047, Nov. 7, 1988, Pat. No. 4,969,639.**
**This application Aug. 23, 1990, Ser. No. 572,708**
**Int. Cl.[5] B27G *17/02*; B25F *3/00***
**U.S. Cl. 30—476** **4 Claims**

1. Apparatus for planing off at a predetermined angle at least one vertical corner of a vertical stack of paper sheets so as to provide each sheet with at least one corner notched at a predetermined angle which comprises: a manual planer having guiding means for engaging each said vertical corner and cut off each said corner at a predetermined angle and having a debris discharge; debris removal collection means including a chamber and means for creating a vacuum within said chamber and a flexible conduit having one end communicating with the interior of said chamber and the other end communicating with said debris discharge; and a cable retractor supported above said vertical stack and including a retraction reel and a cable wound on said reel at one end and attached at its other end to said planer.





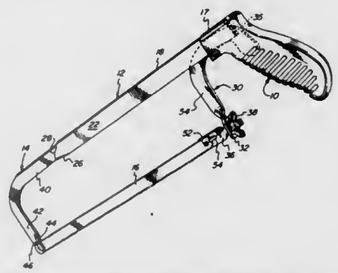
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**5,044,083**

## TELESCOPING HACKSAW FRAME

**Joseph P. DeCarolis, Bristol, Conn., and Allen F. Korfmacher, York, Pa., assignors to The Stanley Works, New Britain, Conn.**

**Filed Nov. 30, 1990, Ser. No. 621,292**
**Int. Cl.[5] B23D *51/03***
**U.S. Cl. 30—510** **12 Claims**



1. In a hacksaw having an adjustable frame, the combination comprising:
(a) a hand grip;
(b) an elongated rear frame member having an inverted U-shaped cross section defined by a top wall and depending side walls and providing a downwardly opening channel, said rear frame member having its rearward end portion secured in the upper portion of said hand grip, said side walls adjacent the forward end thereof having their lower portions extending inwardly and inclined upwardly towards said forward end to provide an upwardly inclined ramp substantially closing the channel and terminating in a lip at the forward end of said frame member, the top wall and side walls adjacent thereto being relieved above said ramp;
(c) a front frame member of generally vertically oriented bar-like configuration having an elongated bridge portion with its rearward end portion seated in said channel of said rear frame section, said front frame section having a depending leg portion at the forward end of said bridge portion and blade mounting means adjacent the lower end of said leg portion, said bridge portion having a multiplicity of spaced recesses in its bottom edge, said lip being seated in one of said recesses; and
(d) a rear leg member extending below said rear frame section forwardly of said hand grip, said rear leg member having its upper end portion seated in the upper end of said hand grip, said leg member having blade mounting means adjacent its lower end cooperating with that of said front frame member to secure a blade extending therebetween, the length of said frame being adjustable by pivoting upwardly the front end of said front frame member to disengage said lip from the recesses of said bridge portion and sliding said bridge portion within said channel of said rear frame member to align a desired recess therein with said lip and pivoting the bridge portion downwardly to effect engagement therewith.

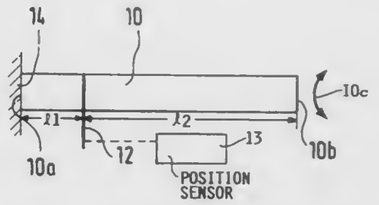
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**5,044,084**

## ANGLE SENSOR ELEMENT

**Walter Pfeiffer, Pliezhausen; Horst Lancht, Bruckmuehl, and Hans Spies, Pfaffenhofen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany**

**PCT No. PCT/EP88/01048, § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO89/05438, PCT Pub. Date Jun. 15, 1989**
**PCT Filed Nov. 18, 1988, Ser. No. 397,482**
**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1987, 3741821**
**Int. Cl.[5] G08C *19/10*; G01B *11/26***
**U.S. Cl. 33—1 PT** **6 Claims**




1. A sensor for sensing an angular movement, comprising a torsion elastic means for taking up torque, mounting means for rigidly securing one end of said torsion elastic means, said torsion elastic means having a free end for taking up a torque applied to said free end for twisting said torsion elastic means about its longitudinal axis, a tap secured to said torsion elastic means intermediate the fixed end and said free end in such a position that a ratio between the lengths from said tap to both ends provides a fixed reduction ratio indication of said angular movement, and means for sensing an angular excursion of said tap out of a rest position.

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**5,044,085**

## TABLE-TOP COPYING MACHINE

**Tian-Wang Wang, No. 45, Yi Chang E. Rd., Tai Ping Hsian, Taichung Hsien, Taiwan**

**Filed Feb. 20, 1991, Ser. No. 658,151**
**Int. Cl.[5] B43L *13/12***
**U.S. Cl. 33—23.03** **2 Claims**

1. A table-top copying machine, comprising:
a base frame assembly movably mounted on the top surface of a table for performing copying operation, comprised of two opposite side frames, a front cross bar and a rear cross bar;
a H-shaped sliding frame assembly comprising a cross rod having two T-shaped sliding connectors at two opposite ends respectively mounted on said two opposite side frames to move horizontally forward and backward thereon;

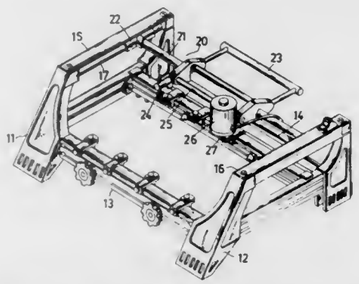
VOL 1130 ISS 1 SEP 3 1991 UMI



a copying mechanism carried by said H-shaped sliding frame assembly to move righward and leftward, comprising a balance bar mounted on said cross rod of said H-shaped sliding frame assembly, having connected thereto a copying rod, a connecting rod, a motor and a copying tool;

a movable cross bar movably secured between said two opposite side frames and said front and rear cross bars by lock screws;

a first positioning mechanism comprised of a plurality of tri-lock retained devices and a plurality of mono-lock retainer devices for holding a block-shaped working piece and model therebetween, said tri-lock retainer devices comprising each an adjusting knob having a bolt inserted through said front cross bar, a tri-lock locking member



connected to said bolt by a screw, said tri-lock locking member having three pins disposed at three angles and respectively projecting toward said movable cross bar, said mono-lock retainer devices comprising each a screw rod fastened in said movable cross bar, a lever fastened in said screw rod to drive it to rotate, and a cone connected to said screw rod by a screw with the sharp point thereof projecting toward said tri-lock locking member; and

a second positioning mechanism comprised of a plurality of pairs of locating plates symmetrically mounted on said front and movable cross bar for holding a flat working piece and model therebetween, said locating plates comprising each two unitary legs retained at the two opposite sides of said front or movable cross bar, and a clamping plate secured thereto at the top.

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**5,044,086**

**DRUM SCREW WITH MEASURING DRUM FOR A SEXTANT**

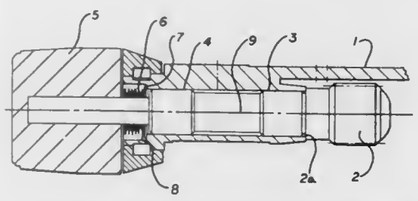
**Gerd Finnern, Hamburg, Fed. Rep. of Germany, assignor to C. Plath, Hamburg, Fed. Rep. of Germany**

**Continuation of Ser. No. 300,611, Jan. 23, 1989, abandoned. This application Feb. 8, 1991, Ser. No. 653,860**

**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 8800635**

**Int. Cl.[5] G01C *1/08***

**U.S. Cl. 33—282** **3 Claims**



1. In a sextant of the type that includes a limbus with toothing, a drum screw, drum screw bearing plate and a measuring drum mounted on an extended drum screw axis, the improvement comprising, in combination:

a) means for fine adjustment of the engagement of said drum screw into said limbus toothing;

b) said means comprising a spring element surrounding said axis to compensate for axial backlash between said measuring drum and said drum screw with low friction and insure predetermined contact pressure of said drum against the end of said drum screw bearing plate; and

c) said spring element comprises an annular spring assembly, said assembly being braced between an annular shoulder of said drum screw bearing plate and said measuring drum.

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**5,044,087**

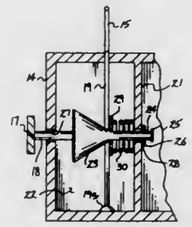
**LINE LEVEL APPARATUS**

**Brian McAuslin, 1050 Broad Rock Rd., South Kingstown, R.I. 02879**

**Filed Oct. 5, 1990, Ser. No. 594,422**

**Int. Cl.[5] G01C *9/28***

**U.S. Cl. 33—369** **5 Claims**



1. A line level apparatus comprising, in combination,

an elongate housing, the elongate housing including spaced parallel end walls, and

a top wall, with the top wall including a liquid level member mounted medially thereof, each end wall including an actuator member, each actuator member mounted through each end wall, and

the top wall including a plurality of slots, each slot positioned adjacent each end wall through the top wall, with each slot including a first and second "C" shaped hook projecting exteriorly thereof from within the housing cooperative with the actuator member to effect selective spreading of the first and second "C" shaped hooks from a first position defining an enclosed loop to a second position, wherein the first and second "C" shaped hooks define a gap therebetween to permit securement to a line member.

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**5,044,088**

**CONCENTRICITY MEASURING DEVICE**

**Fritz A. Peucker, Branford, Conn., assignor to Megacentric, Inc., Branford, Conn.**

**Filed Aug. 1, 1990, Ser. No. 561,133**

**Int. Cl.[5] G01B *5/20***

**U.S. Cl. 33—550** **12 Claims**

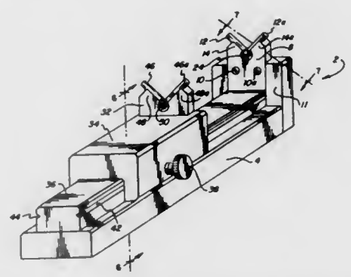
1. A device for supporting a workpiece comprising, in combination:

a table;

a first V-shaped support member mounted on said table;

a second V-shaped support member mounted on said table in symmetrical linear alignment with said first V-shaped support and spaced apart therefrom; and

pin members detachably mounted in channels traversing the surface of each arm of the crotches of said first and second V-shaped supports, said pin members each extending into the apex of the V in the V-shaped support in which they are mounted and having a portion of their longitudinal surfaces projecting above and parallel to the surface of said arm in which they are mounted so as to provide linear



contact with a workpiece whose concentricity or roundness is to be determined.

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**5,044,089**

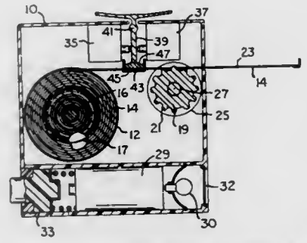
**POWER-OPERATED MEASURING TAPE**

**Andjelko Petkovic, 711 Napoleon St., Valparaiso, Ind. 46383, and George Pejoski, 1125 Devonshire St., Hobart, Ind. 46342**

**Filed Oct. 18, 1990, Ser. No. 599,400**

**Int. Cl.[5] G01B *3/10***

**U.S. Cl. 33—755** **2 Claims**



1. A measuring device, comprising: a housing; a spool rotatably mounted within said housing; a flexible measuring tape wound spirally on said spool for extension out of the housing or retraction into the housing; said tape having a plurality of evenly-spaced openings therealong; a sprocket wheel rotatably mounted within said housing, said sprocket wheel having evenly-spaced teeth extending into said tape openings whereby rotation of the sprocket wheel around its axis is effective to pull the tape off the spool and out of the housing; a first electric motor connected to the sprocket wheel for driving the sprocket wheel in the direction that will cause the tape to be pulled off of the spool; a second electric motor connected to the spool for rotating the spool in the direction that will cause the tape to be drawn onto the spool; a first switch means for energizing said first motor; a second switch means for energizing said second motor; said first and second switch means having opposed spaced operating plungers; and a manual operator (39) having an actuator portion located between the switch means plungers and a pivot axis for swinging said actuator portion in opposite directions, so that when the manual operator is swung in one direction the first switch means is operated to energize the first motor, and when the manual operator is swung in the other direction the second switch means is operated to energize the second motor.



**5,044,090**

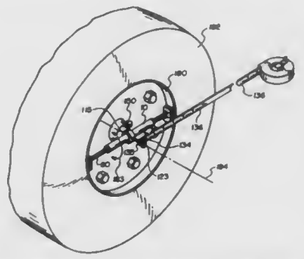
**TRUCK SPAN MEASURING APPARATUS**

**Mark A. Hunter, Box 1068, Afton, Wyo. 83110**

**Filed Oct. 15, 1990, Ser. No. 598,002**

**Int. Cl.[5] G01B *3/10***

**U.S. Cl. 33—760** **9 Claims**



1. A truck span measuring apparatus comprising:

a housing having a first female-threaded socket in a first end thereof;

a first shaft threadedly inserted into said first female-threaded socket, said first shaft extending outwardly from said housing, said first shaft having a free end;

a second shaft mounted on said housing to extend outwardly therefrom, said second shaft having a free end;

said first shaft and said second shaft being positionable within a truck wheel well to retain said housing in a selected position within said truck wheel well; a distance between said free ends of said first shaft and said second shaft being adjustable, permitting a user to bias said first and second shafts against said truck wheel well by adjusting said first shaft's position within said first female-threaded socket;

a collar, slidably mounted on said housing;

a retaining means mounted on said collar for releasably retaining said collar at a selected position on said housing; and

a securement means mounted on said collar for releasably securing an end of a measuring tape to said collar;

wherein said collar is releasably positionable on a longitudinal axis of a truck axle to provide a secure mounting for said end of said measuring tape, said measuring tape being usable to measure a truck's span.

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**5,044,091**

**METHOD OF PREPARING A FREEZE-DRIED FORMULATION CONTAINING A DRUG**

**Seigo Ueda; Kunio Hashi; Takashi Shiokari, and Akira Kusai, all of Shinagawa, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan**

**Filed Apr. 16, 1990, Ser. No. 509,967**

**Claims priority, application Japan, Apr. 18, 1989, 1-98561**

**Int. Cl.[5] F26B *5/06***

**U.S. Cl. 34—5** **34 Claims**

1. A method of preparing a freeze-dried preparation in which a first liquid is frozen, a second liquid is added to the frozen first liquid and is frozen thereon, and the frozen first and second liquids are freeze-dried together, in which at least one of said first and second liquids contains a pharmaceutical compound or preparation dissolved or suspended therein.

VOL 1130 ISS 1 SE 3 1991 UMI

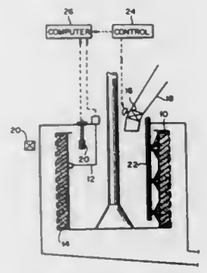


5,044,092

## AUTOMATED METHOD FOR THE CYCLIC OPERATION OF A CENTRIFUGAL DRIER

Gérard Journet, Coutiches, and Nicolas Francou, Heilemmes, both of France, assignors to Fives-Cail Babcock, Montreuil, France

Filed Jun. 21, 1990, Ser. No. 542,154
Claims priority, application France, Jun. 29, 1989, 89 08714
Int. Cl.[5] F26B *5/08*
U.S. Cl. 34—8 2 Claims



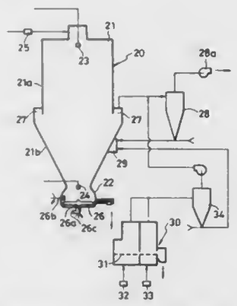

1. A method for the automatic operation of a centrifugal drier comprising a rotary screening basket having a cylindrical wall and which is operated cyclically in successive cycles, each cycle comprising the steps of rotating the basket to generate a centrifugal force, charging a product to be dried into the rotating basket through an open valve, the centrifugal force causing the product to form a layer of increasing thickness along the cylindrical wall, closing the valve to discontinue charging the product when the layer thickness has attained a first control value lower than that of the layer thickness corresponding to an imposed value of the charge in the basket, then measuring the maximum thickness of the layer, comparing said measured maximum layer thickness with a second control value corresponding to said imposed value of the charge in the basket, and generating a new value for the first control value as a function of the difference between the measured maximum layer thickness and the second control value.

5,044,093

## SPRAY-DRYING GRANULATION APPARATUS

Takashi Itoh; Masayuki Serizawa, and Masaaki Ohkawara, all of Yokohama, Japan, assignors to Ohkawara Kakohki Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 177,265, Apr. 4, 1988, abandoned. This application Apr. 25, 1990, Ser. No. 515,781
Int. Cl.[5] F26B *17/00*
U.S. Cl. 34—57 R 8 Claims



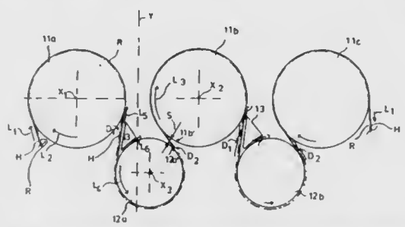
1. A spray-drying granulation apparatus comprising:
a chamber;
a spray drying section formed in said chamber at an upper portion thereof and including a feed liquid supply atomizer for supplying a feed liquid and means for supplying hot air to dry said feed liquid to a powder having a moisture content sufficiently low to prevent the powder from attaching to the chamber; and
a fluidized-bed granulation section formed in a lower portion of said chamber for fluidizing and moving powder discharged from said spray drying section, said granulation section including a spray nozzle for feeding a binder liquid to said powder in said fluidized-bed granulation section to increase the moisture content of the powder to control granulation thereof; and
means for discharging a granulated product from said fluidized-bed granulation section.

5,044,094

## DRYING SECTION APPARATUS FOR A PAPER MAKING MACHINE

Heikki Ilvespää; Reima Kerttula, both of Jyväskylä , and Allan Liedes, Palokka, all of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Aug. 20, 1990, Ser. No. 570,129
Claims priority, application Finland, Aug. 31, 1989, 894084
Int. Cl.[5] F26B *11/02*
U.S. Cl. 34—114 6 Claims



1. A drying section apparatus for a paper making machine comprising:
a plurality of drying cylinders, each of said drying cylinders located substantially at the same height;
a plurality of rolls, each of said plurality of rolls located at substantially the same height as each other and at a different height than said plurality of drying cylinders;
at least one of said rolls located such that its rotational axis is spaced away from a center plane between the center axes of two adjacent said drying cylinders such that a paper web supported by a drying fabric and outside of said drying fabric as it passes from the periphery of a first of said two adjacent drying cylinders to the periphery of a second of said two adjacent drying cylinders passes only a minimal distance between the surface of said roll and the surface of said second drying cylinder said minimal distance being between about 20 to 100 mm; and
means for producing an under pressure condition on said web and said drying fabric as they pass from said first of said two adjacent drying cylinders to the periphery of said roll.

5,044,095

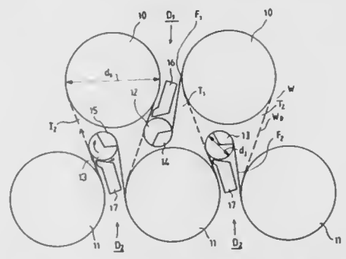
## METHOD AND APPARATUS FOR VENTILATION IN A MULTI-CYLINDER DRYER OF A PAPER MACHINE OR THE LIKE

Ilkka Eivola, Naantali, Finland, assignor to Valmet Paper Machinery Inc., Finland

Filed Mar. 27, 1990, Ser. No. 499,896
Claims priority, application Finland, Mar. 29, 1989, 891499
Int. Cl.[5] F26B *13/30, 13/04*
U.S. Cl. 34—117 10 Claims

1. In a twin-wire multi-cylinder dryer of a paper machine comprising upper and lower lines of drying cylinders and upper and lower wires, wherein said upper wires are guided by surfaces of said upper cylinders and upper guide rolls situated between them, and said lower wires are guided by surfaces of lower cylinders and lower guide rolls situated between them, and wherein a web is pressed by said upper wire into direct drying contact with the surfaces of said upper cylinders and is pressed by said lower wire into direct drying contact with the surfaces of said lower cylinders, and wherein the web runs





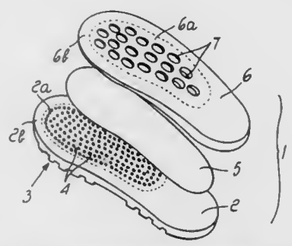
between said upper and lower cylinders over an open draw, the improvement comprising apparatus for ventilating pockets formed in the areas between said wires and surfaces of said cylinders, comprising:
said guide rolls being formed with perforations for directing air flows from their interiors into said pockets for ventilation of said pockets; and
blow boxes having nozzles for ventilation of said pockets by means of air flows.

5,044,096

## SOLE STRUCTURE FOR FOOTWEAR

Mario Polegato, Crocetta Del Montello, Italy, assignor to Pol Scarpe Sportive S.r.l., Biadene, Italy

Filed Dec. 11, 1989, Ser. No. 448,393
Claims priority, application Italy, Feb. 17, 1989, 41525 A/89
Int. Cl.[5] A43B *7/06, 13/00, 13/12*
U.S. Cl. 36—3 R 5 Claims



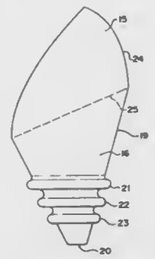
1. Sole structure for footwear, comprising an outsole which comprises at least one lower part and at least one upper part which are mutually united to form said outsole, said lower part defining an area at which a plurality of holes is provided which transverse said lower part, said upper part defining a zone at which through holes are provided which traverse said upper part, said outsole further comprising at least on microporous waterproof membrane means sandwiched between said mutually united upper and lower parts, wherein said lower part defines a lower part perimetric region encompassing said area and said upper part defines an upper part perimetric region encompassing said zone, said lower part perimetric region being a lower part coupling region and said upper part perimetric region being an upper part coupling region, said lower part and said upper part being mutually united at said upper part coupling region and said lower part coupling region in a manner to create a fluid-tight seal at said coupling regions, said membrane means being arranged between said upper part and said lower part inside said coupling regions thereof.

5,044,097

## PROTECTIVE COVERING DEVICE FOR THE HEEL OF A LADIES SHOE

Lori S. Young, 49 Home Street, Winnipeg, Manitoba, Canada R3G 1W7

Filed Feb. 26, 1990, Ser. No. 484,868
Int. Cl.[5] A43B *23/20*
U.S. Cl. 36—72 B 8 Claims



1. A combination of a ladies shoe and a protective covering device for the heel thereof, the shoe comprising an upper defining a toe covering portion and a heel cupping portion arranged to extend around the heel of the wearer, a sole, and a heel projecting downwardly from the heel cupping portion of the upper, the device comprising a unitary integrally molded body formed from an elastic material and having a heel engaging portion wrapped around the heel and an upper portion connected to an upper edge of the heel engaging portion so as to extend upwardly therefrom and engaging around at least a part of the heel cupping portion so that a rear edge of the device extends from the top of the heel to a position on the upper between the top of the heel and an upper edge of the upper at the rear of the heel, the hell engaging portion comprising a wall shaped to substantially surround the heel and extending from said upper end having an open mouth connected to said upper portion to a lower end which is reduced in transverse dimension relative to the open mouth, the wall converging in transverse dimension from said open mouth to said lower end in a plurality of steps so as to define at least three portions of the wall each of which forms a band surrounding the heel and each of which is reduced in transverse dimension relative to the next adjacent portion which lies closer to the open mouth, the bands being shaped and dimensioned relative to the heel such that at least two of the bands are stretched around the heel into contact with the heel at a cooperating band portion of the heel with the band portion being spaced along the length of the heel, the wall between the bands being flexible and spaced from the heel to allow compression and expansion of the heel engaging portion in a longitudinal direction.

5,044,098

## IMPLEMENT INTERFACE

Ray A. Berghefer, 435 Hecla St., Laurium, Mich. 49913

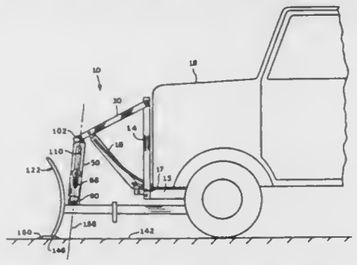
Filed Nov. 27, 1989, Ser. No. 441,752
Int. Cl.[5] E01H *5/06*
U.S. Cl. 137—232 3 Claims

1. An implement interface providing means for raising and lowering an implement pivotally attached to a vehicle and also applying variable downward and upward forces to said implement as desired under varying conditions, comprising:
a compression spring,
first and second spring actuators (58, 62) engaged with opposite ends of said spring to be urged apart thereby,
means (70) limiting separating movement of said actuators,

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a lift arm (**30**) pivotally secured at one end to the vehicle at a location vertically spaced from said implement attachment thereto,
means (**90**) pivotally securing said first actuator (**58**) to said implement forwardly of its pivotal attachment to the vehicle,
means (**102**) pivotally securing said second actuator (**62**) to the other end of said lift arm, and,
piston means, pivotally connected at one end to said lift arm and connected at the other end to said vehicle, (**18**) for



pivoting said lift arm with respect to said vehicle and toward and away from said first actuator, thereby selectively moving said second actuator downwardly and compressing said spring to apply added downward force to said implement, or, moving said actuator upwardly permitting said compression spring to separate said actuators and reduce downward force on said implement, or, upon operation of the means limiting separating movement of said actuators, thereby to cause elevation of said implement by pivotal movement with respect to said vehicle.

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**5,044,099**

**Patent Not Issued For This Number**

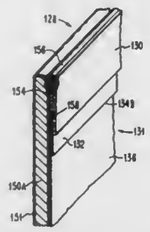
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**5,044,100**

## PHOTOGRAPHIC CASE WITH COVER WITH INTERLOCK MAT

**Mark H. Roberts, Port Washington, and Luis P. Troche, Elmhurst, both of N.Y., assignors to Art Leather Manufacturing Co., Inc., Elmhurst, N.Y.**

**Division of Ser. No. 305,736, Feb. 2, 1989, abandoned, which is a division of Ser. No. 861,352, May 9, 1986, Pat. No. 4,825,573, which is a continuation-in-part of Ser. No. 647,128, Sep. 4, 1984, abandoned. This application Nov. 20, 1990, Ser. No. 616,689**
**Int. Cl.[5] G09F *1/12***
**U.S. Cl. 40—159** **17 Claims**



1. A photograph mounting system, comprising,
at least one frame member including
cover means having opposed inner and outer sides and a cover peripheral edge,
a rim member secured to said inner side of said cover and having a rim inner peripheral edge and a rim outer peripheral edge, said rim outer edge being generally coextensive with said cover peripheral edge, said rim inner peripheral edge and said inner side defining a space,
a card member secured to said rim member and having card inner and outer edges, said card outer edge being generally coextensive with said rim outer edge, said card inner edge being configured the same as and extending less inwardly than said rim inner edge, said rim inner edge, said card member, and said inner side of said cover means forming an inner peripheral recess,
said inner peripheral recess extending around the entire length of the cover means,
mat means for holding the photograph for viewing said mat means having a peripheral edge and being adapted to be received within said space and positioned in locking relationship with said rim inner peripheral edge, said cover means providing a backing for said mat means,
slot means formed between said card member and said rim member for allowing passage of said mat means to and from said space, and
the entire peripheral edge of the mat matching and snugly mating with the entire length of the inner peripheral recess,
whereby said mat is locked into place along its entire peripheral edge within said inner peripheral recess.

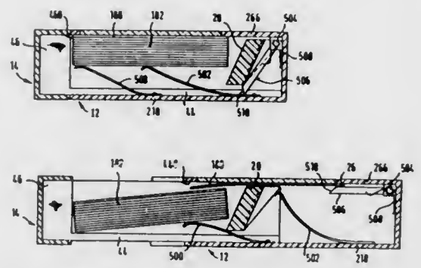
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**5,044,101**

## DEVICE FOR THE CYCLIC REARRANGEMENT OF A PILE OF RECTANGULAR OR SQUARE SHEETS

**Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland**

**Continuation of Ser. No. 901,532, filed as PCT EP85/00617 on Nov. 12, 1985, published as WO86/03031 on May 22, 1986, now Pat. No. 4,763,429**
**Claims priority, application Fed. Rep. of Germany, Nov. 12, 1985, 3441456**
**The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.**
**Int. Cl.[5] G09F *11/30***
**U.S. Cl. 40—511** **34 Claims**



1. Apparatus for cyclic rearrangement of a stack of substantially rectangular sheets, said apparatus comprising a first frame part and a second frame part, said frame parts being movable relative to each other in a predetermined reciprocation direction, and further comprising means for removing an individual sheet at a first stack end, leaving a stack remainder, and for adding said individual sheet at a second stack and upon each reciprocation, said removing and adding means including:
means for separating said individual sheet from said stack in a removal direction, leaving said stack remainer;
means for feeding sheets to said separating means;
first means for retaining said individual sheet in said first frame part;
second means for retaining said stack remainder in said second frame part; and
means for transferring said separated individual sheet from said first stack end to said second stack end; wherein:



said feeding means includes a hook-shaped transporter adapted to engage a transverse edge of said individual sheet, said transverse edge being a trailing edge in the removal direction of the individual sheet;
said first retaining means includes at least one retaining element separate from said transferring means and from said transporter; and
the transporter remains in engagement with said transverse edge at least until said first retaining means is effective.

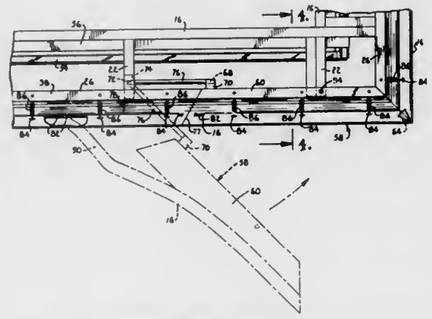
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**5,044,102**

## TENSIONED DISPLAY SIGN HAVING HINGED FRAME SECTION

**W. Dennis Finch, Mustang, Okla., and Jack W. Snyder, Wichita, Kans., assignors to Graphic Structures, Inc., Oklahoma City, Okla.**

**Filed Nov. 20, 1989, Ser. No. 440,643**
**Int. Cl.[5] G09F *17/00***
**U.S. Cl. 40—603** **11 Claims**



1. Display apparatus comprising:
a sign cabinet having a rigid frame comprising a plurality of interconnected frame members and including generally horizontal top and bottom members spaced apart from one another;
a flexible sign facing sheet extending between said top and bottom members and having top and bottom edge portions;
a plurality of rigid rods attached to each said edge portion of said facing sheet;
a plurality of tension springs spaced apart from one another along said top and bottom edge portions, each said spring having one end engaging an associated said rod attached to the corresponding edge portion of said facing sheet and an opposite end engaging said frame in a manner to maintain said facing sheet stretched between said top and bottom members in a taut condition;
a hinged frame section mounted on said frame at one end thereof for pivotal movement about a substantially vertical hinge axis between a first position wherein said frame section serves as part of said frame and a second position wherein said frame section is pivotally displaced from said first position;
means for attaching said facing sheet to said frame at an end thereof opposite said one end;
means for connecting said facing sheet to said hinged frame section with said frame section in said second position and with sufficient lateral slack in said facing sheet to effect a taut lateral condition of said facing sheet when said hinged frame section is subsequently pivoted to said first position; and
means for securing said hinged frame section in said first position to secure said facing sheet in a taut condition.

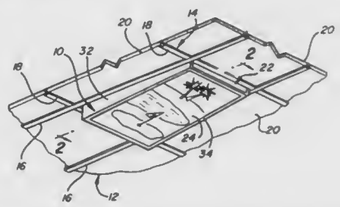
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**5,044,103**

## SIGN HOLDER FOR SUSPENDED CEILINGS

**Paul H. Izenberg, 1617 Morton, Ann Arbor, Mich. 48104**

**Continuation-in-part of Ser. No. 421,974, Oct. 16, 1989. This application Apr. 19, 1990, Ser. No. 512,432**
**Int. Cl.[5] G09F *7/22***
**U.S. Cl. 40—617** **8 Claims**



1. A holder for a sign for incorporation into the grid support system of a suspended ceiling including a cross network of support structures having horizontal surfaces for supporting rectangularly shaped ceiling panels positioned thereupon, said holder comprising:
a perimeter support frame for supporting the sign about its perimeter in a resting engagement thereon and defining an aperture centrally therein allowing the sign to be viewed through said aperture, said frame also having upwardly extending arms whereby when in place said arms closely fit inside of laterally separated elements of the ceiling support structure, said frame also having laterally extending support flanges projecting from said arms along at least two sides of said frame, one side of said frame having a laterally facing opening being open to permit the insertion of the sign into said holder and removal therefrom, whereby said laterally extending support flanges engage the horizontal surfaces of the grid support system for supporting said frame and said opening below one of said ceiling panels in a substantially planar orientation to display the sign in a corresponding substantially planar orientation.

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**5,044,104**

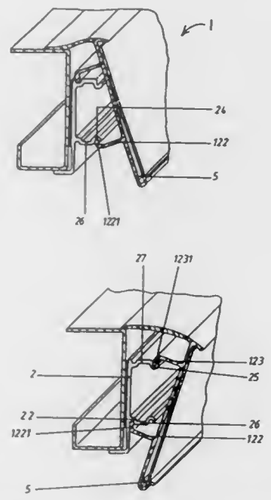
## LABEL MOUNTING APPARATUS

**Siegfried Hopperdictzel, Selb, Fed. Rep. of Germany, assignor to Rehau AG & Co., Rehau, Fed. Rep. of Germany**

**Filed Apr. 13, 1990, Ser. No. 508,635**
**Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 8904664**
**Int. Cl.[5] G09F *3/18***
**U.S. Cl. 40—642** **7 Claims**

1. An apparatus for mounting a label on a support, comprising:
a molding member connected to the support, the molding molding having first means for providing a plurality of molding detents; and
a carrier mounted on the molding member, the carrier having a rear wall with a bottom portion and an upper edge, a transparent front wall with a bottom portion that is connected to the bottom portion of the rear wall, and a pocket between the front and rear walls for receiving the label, the carrier additionally having second means extending from the rear wall for providing at least one carrier detent which is selectively engageable with one of the molding detents so as to selectively set the carrier at one of a plurality of angles, and a strip which is connected

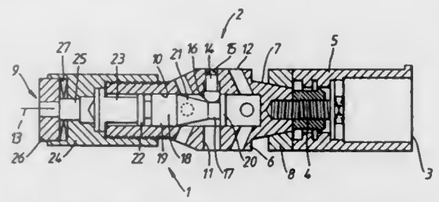
to the upper edge of the rear wall and which extends over the molding member to the support, the strip being made




in one piece with the rear wall and having a flexible portion.

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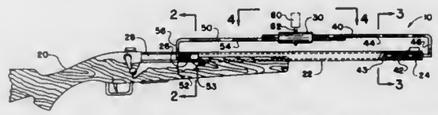
**5,044,105**
**LOCKING DEVICE**
Adrian Q. Lindley, Grantham, and Roger Bellamy, Loughborough, botb of England, assignors to Camloc (U.K.) Limited, Leicester, England
PCT No. PCT/GB90/01095, § 371 Date Mar. 15, 1991, § 102(e) Date Mar. 15, 1991, PCT Pub. No. WO91/01476, PCT Pub. Date Feb. 7, 1991
PCT Filed Jul. 17, 1990, Ser. No. 663,885
Claims priority, application United Kingdom, Jul. 17, 1989, 8916310
Int. Cl.[5] F41A *17/44*
U.S. Cl. 42—70.11 8 Claims




1. A locking device which, upon actuation, is locked to a hollow body within which the device is situated, the locking device comprising: a body having a central longitudinal bore and a plurality of radial passages extending from the bore radially outwardly to the surface of the body; a locking pin located in each passage with the radially inner end of each pin located extending into the bore; an actuating member located in the bore, the actuating member having a cylindrical region and a tapering region which tapers inwardly from the cylindrical region and being positioned such that upon axial movement of the actuating member the locking pins will be cammed radially outwardly by the tapering region and thereafter locked in a radial outward position by the cylindrical region; a piston mounted in a cylinder and coupled to the actuating member for axially moving the actuating member; an explosive charge for driving the piston; and means for detonating the explosive charge in response to application of axial force to one end of the device.

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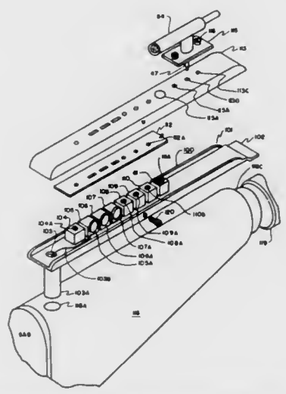
**5,044,106**
**SAFETY DEVICE FOR FIREARMS**
Timothy H. Slocum, 171 S. Cedar St., Geneva, Ohio 44041
Filed Oct. 25, 1990, Ser. No. 603,177
Int. Cl.[5] F41A *17/44*
U.S. Cl. 42—70.11 22 Claims




1. A safety device for obstructing the barrel of a firearm comprising:
an elongated first rod including a pin dimensioned to be received into the breech end of said barrel of said firearm and an elongated arm portion spaced apart from and generally parallel to said pin, said arm portion having a plurality of apertures therethrough; and
an elongated second rod including a pin dimensioned to be received into the muzzle end of said barrel and an elongated arm portion spaced apart from and generally parallel to said pin, said arm portion having a plurality of apertures therethrough, said first and second rods being dimensioned so that when said pins of said first and second rods are received in the barrel of said firearm, said elongated arm portions are in a side-by-side relationship wherein at least one of said apertures on said arm portion of said first rod may be aligned to be in registry with one aperture on said arm portion of said second rod.

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**5,044,107**
**TALKING RIFLE**
John E. Holford, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Aug. 23, 1990, Ser. No. 571,064
Int. Cl.[5] F41G *1/38*
U.S. Cl. 42—103 20 Claims



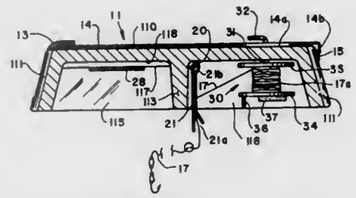
1. An aiming light for a weapon used in conjunction with a



communication radio having an input and an output terminal for audio modulated electrical signals comprising:
an aiming light housing;
a source of highly collimated light photons mounted in said housing;
a first electro-optical means within said housing to couple audio signals between said photons and electron carriers passing through at least one of said terminals; and
means to mount said aiming light housing on said weapon.

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**5,044,108**
**TIP-UP FISHING RIG FOR ICE AND OPEN WATER**
John R. Rinehart, Milton, Wis., assignor to American Institute of Taxidermy, Inc., Janesville, Wis.
Filed Nov. 3, 1990, Ser. No. 620,082
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—17 11 Claims

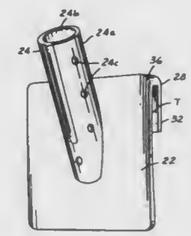



1. A tip-up fishing rig comprising:
an inverted dish-like body of light weight and heat-insulating material, having a top deck and a sidewall extending down about the perimeter of said deck defining a cavity under said deck and within said sidewall;
a flagpole;
a spring connecting said flagpole to said body and urging said flagpole to an upright position;
a reel spool in said cavity under said deck rotatably mounted to said deck, having a vertical axle shaft extending up through said deck, said shaft having a horizontal arm above said deck;
a fishline coiled about said reel spool which when pulled out therefrom rotates said axle shaft;
whereby said flagpole may be placed and held in a near horizontal fishing position under said arm; and
whereby when fishline is pulled out from said reel spool thereby rotating said axle shaft, said arm turns and releases said flagpole to said upright position;
said body when placed on ice over a hole therethrough, slows heat loss from the air in said cavity and in said hole to delay the icing over of the water in said hole; and
said body when placed on water, floats thereon with the bottom of said sidewall being only slightly submerged and being the only submerged part of the body.

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**5,044,109**
**FISHING ROD HOLDER**
Jacob B. Fast, 8150 Bernice, Center Line, Mich. 48015
Filed Jul. 2, 1990, Ser. No. 546,734
Int. Cl.[5] A01K *97/10*
U.S. Cl. 43—21.2 9 Claims

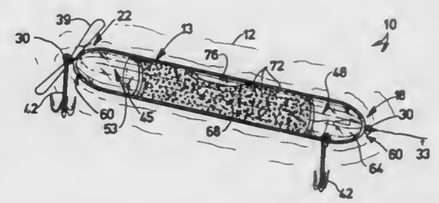
1. A fishing rod holder for selectively releasably connecting with respect to clothing worn by a fisherman for holding a fishing rod for use during fishing, said fishing rod holder comprising:
a back plate, said back plate having a front side and a back side, said back plate further having an upper end;
fishing rod receptacle means having a plurality of relief holes, said fishing rod receptacle rigidly connected to said front side of said back plate for releasably receiving a handle portion of a fishing rod in a preselected orientation relative to said back plate; and
clothing connection means connected with said back plate adjacent said back side thereof for releasably connecting with a selected portion of the clothing worn by the fisherman so as to thereby secure said back plate in a fixed relationship relative to the fisherman, said clothing connection means comprising a lip rigidly connected with said back plate, said lip connecting to said back plate




substantially along said upper end of said back plate, said lip extending relative to said back side of said back plate so that the selected portion of the clothing worn by the fisherman may be slipped between said lip and said back side of said back plate for releasably securing said back plate to the clothing worn by the fisherman.

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**5,044,110**
**REFLECTIVE LURE**
Joseph P. Henderson, P.O. Box 8532, Pine Bluff, Ark. 71611, and Edward P. Henderson, 2201 State St., Pine Bluff, Ark. 71601
Filed Aug. 31, 1990, Ser. No. 575,840
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.33 10 Claims

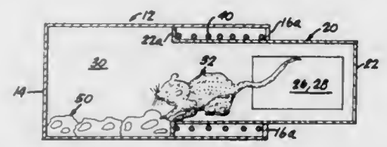



1. A variable-ballast, visually stimulating reflective fishing lure comprising:
an elongated generally tubular body having a leading end and a spaced-apart trailing end;
a pair of rigid walls, internally spaced apart between said leading and said trailing ends;
a hollow, transparent chamber defined between said walls;
a pair of hollow air-filled cavities internally defined between said walls and said ends of said body;
a viscous liquid contained by said chamber;
a plurality of reflective particles of varying colors and shapes suspended within said liquid;
a bubble entrapped within said chamber; and,
wherein manipulation of said body results in movement of said liquid and said bubble to agitate said particles, whereby said particles and said lure visually attracts fish.

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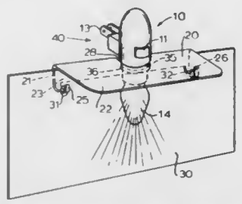


5,044,111
ANIMAL TRAP
Chester A. Lindros, Jr., 335 Woodruff Ave., Avenel, N.J. 07001
Continuation-in-part of Ser. No. 519,427, May 4, 1990, Pat. No. 5,005,313, which is a continuation-in-part of Ser. No. 359,639, May 30, 1989, Pat. No. 4,949,499. This application Aug. 16, 1990, Ser. No. 568,019
The portion of the term of this patent subsequent to Aug. 21, 2007, has been disclaimed.
Int. Cl.[5] A01M *23/02*
U.S. Cl. 43—61 6 Claims



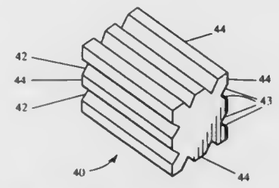
1. An animal trap, comprising:
a) an outer housing having a closed end and an open end;
b) an inner housing having a closed end and an open end mounted within and movable relative to said outer housing to define a trapping area within said inner and outer housings;
c) at least one trap opening in said inner housing for an animal to enter said trapping area;
d) expandable spring means for moving said inner housing into said outer housing to close off said trap opening to trap an animal in said trapping area; and
e) bait means for holding said trap opening in an open position so that when an animal in said trapping area eats said bait means, said expandable spring means moves said inner housing into said outer housing to close off said trap opening to trap an animal in said trapping area.

5,044,112
FLEA TRAP UTILIZING NIGHT-LIGHT
Clarence O. Williams, P.O. Box 7203, Rocky Mount, N.C. 27804
Filed Oct. 1, 1990, Ser. No. 590,678
Int. Cl.[5] A01M *1/04*
U.S. Cl. 43—113 6 Claims



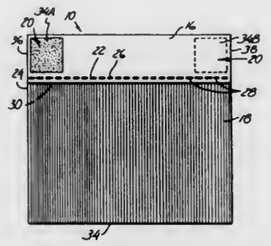
1. A trap for catching wingless, non-flying fleas, comprising:
(a) an electrically energized, visible light source having a pair of horizontal prongs through which the source is energized to produce a near-floor-level light source when said prongs are installed in a mating near-floor-level electrical receptacle, a bulb housing formed of electrically insulating material secured to and supported by said prongs and enclosing an electrically conductive bulb socket electrically connected to said prongs and a vertically oriented electric bulb installed in said socket and energized through said socket and prongs to produce said visible light source;
(b) a light reflector supported by said housing, having hook means and oriented with respect to the position of said bulb to provide a horizontal reflecting surface above said bulb to reflect light produced by said bulb downwardly and outwardly to mix with other non-reflected light radiated downwardly and outwardly by said bulb; and
(c) means providing a sticky landing surface located below said light source and in a position accessible to the fleas to be trapped, said means comprising a sheet of sticky substance supported by said hook means in a vertical plane below said reflecting surface and behind said bulb.

5,044,113
MULTI-EDGED RODENT BAIT
Malcolm G. Stack, Madison, Wis., and L. Dawn Brown, Richmond, Va., assignors to Bell Laboratories, Inc., Madison, Wis.
Filed Dec. 20, 1989, Ser. No. 456,101
Int. Cl.[5] A01M *25/00*
U.S. Cl. 43—131 10 Claims



1. A rodent bait unit, comprising:
(a) an extruded quantity of rodent meal and rodenticide formed into an extended article having at least three planar sides and a substantially constant cross-section along the length of the unit, wherein at least two sides have portions therein defining at least one V-shaped groove in each side with two inclined planar walls, and each side with a groove has planar faces which each intersect an inclined planar wall of a V-shaped groove at an included angle of not more than approximately 150 degrees, wherein the intersections of the planar faces and the inclined planar walls form gnaw edges which permit rodents to engage the intersecting planar faces and walls with their teeth in opposed fashion to facilitate gnawing of the bait unit, and wherein the bait unit has a front face and a rear face and the planar faces of the sides intersect the front and rear faces to form gnaw edges and the inclined planar walls of the grooves intersect the front and rear faces to form increased gnaw edges.

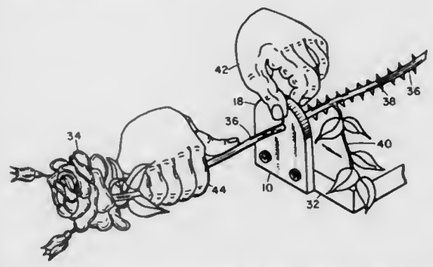
5,044,114
INSECTICIDAL DEVICE FOR ANIMALS
Merle D. Haberer, 316 S. Elm, #7, Aberdeen, S. Dak. 57401
Filed Oct. 2, 1989, Ser. No. 416,115
Int. Cl.[5] A01K *13/00*
U.S. Cl. 43—132.1 17 Claims



1. A device attachable to a tail of an animal for repelling insects comprising:
a plurality of fibrous strands impregnated with insecticide; and
means for attaching the strands to the tail of the animal wherein the means for attaching the fibrous strands includes a rigid, hinged support band having a plurality of apertures.



5,044,115
FLORAL STEM CLEANER AND METHOD OF CLEANING FLORAL STEMS
Robert L. Richardson, 17750 Fruitport Rd., Spring Lake, Mich. 49456
Filed Oct. 10, 1989, Ser. No. 419,518
Int. Cl.[5] A01G *1/04*
U.S. Cl. 47—1.01 17 Claims

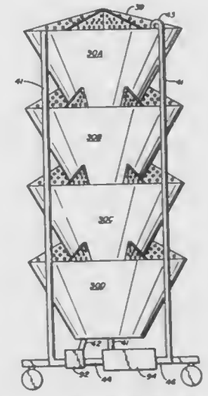


1. A device for removing thorns and leaves from a plant stem comprising:
a body;
a pair of jaws aligned in a plane and defining therebetween a substantially constant-size opening extending along an axis traversing said plane; and
means for mounting said jaws to said body in a manner that at least one of said jaws is movable away from the other one of said jaws in a direction generally parallel said axis and is biased toward said plane.

5,044,116
COATED SEEDS AND A PROCESS FOR THEIR OBTAINMENT
Ignace Gago, Braine-l'Alleud, and René Detroz, Ohain, both of, Belgium, assignors to Interox (Société Anonyme), Brussels, Belgium
Filed Dec. 7, 1984, Ser. No. 679,351
Claims priority, application France, Dec. 12, 1985, 83 19981
Int. Cl.[5] A01C *1/06*
U.S. Cl. 47—57.6 16 Claims
1. A process for preparing coated seeds, comprising applying, in the absence of water, a peroxy compound and a solution of a polyester in an organic solvent to uncoated seeds, and removing the organic solvent to produce dry, coated seeds.

5,044,117
METHOD FOR ROOT FERTILIZATION IN CULTIVATED PLANTS
Alexander Kückens, Gross Sarau, Fed. Rep. of Germany, assignor to Technica Entwicklungsgesellschaft mbH & Co. KG, Ratzeburg, Fed. Rep. of Germany
Continuation of Ser. No. 210,597, Jun. 23, 1988, abandoned. This application Aug. 31, 1990, Ser. No. 577,047
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1987, 3720621
Int. Cl.[5] A01G *31/02*
U.S. Cl. 47—59 4 Claims
1. A method for root fertilization in cultivated plants, employing an installation comprising a straight flow channel having an open exit at one end, a means for connecting to a water source at an opposite end, and means for introducing a gaseous mixture into said channel, said method comprising:
guiding an aqueous liquid through said straight flow channel;
impregnating into said aqueous liquid separate steams of carbon dioxide and oxygen in a ratio between 20:1 and 40:1 as measured at atmospheric pressure and room temperature, said aqueous liquid after impregnation containing from 0.05 to 2.5 g/l of carbon dioxide; and
supplying said impregnated aqueous liquid to roots of said cultivated plants.

5,044,118
METHOD AND APPARATUS FOR CUT FLOWER STORAGE AND DISPLAY
John Ferris, 7 Vineberg Ct., Oakhurst, N.J. 07755
Continuation-in-part of Ser. No. 250,362, Sep. 28, 1988, which is a continuation-in-part of Ser. No. 166,993, Mar. 11, 1988, which is a continuation-in-part of Ser. No. 927,648, Nov. 5, 1986. This application Jun. 22, 1989, Ser. No. 370,309
Int. Cl.[5] A01G *31/00*
U.S. Cl. 47—62 15 Claims

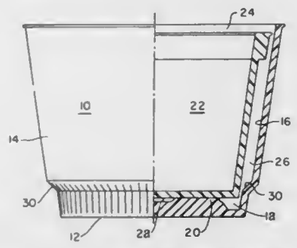


1. A cut flower storage and display arrangement comprising:
a plurality of cut flower storage and display containers defining a plurality of liquid reservoirs arranged in a vertically spaced relationship, each of said cut flower storage and display containers having liquid circulation means for circulating liquids among said liquid reservoir; and
a liquid circulation and disinfection system in operative communication with said cut flower storage and display containers, said liquid circulation and disinfection system including an ultraviolet disinfection unit;
wherein each of said containers comprises a generally bowl-shaped cut flower storage and display container having a generally planar circular bottom surface, a continuous side wall having a lower peripheral edge joined to a peripheral edge of said bottom surface and an upper peripheral edge having a greater circumference than said lower peripheral edge, and wherein said bottom surface and said side wall define said liquid reservoir for confining liquid and said upper peripheral edge serves as a cut flower supporting surface.

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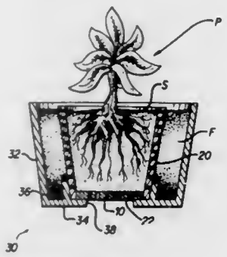


5,044,119
**FLOWERPOT BOWL**
Erling Hougård, 4, Sportsvej, Jyllinge, Denmark 4040
PCT No. PCT/DK87/00115, § 371 Date May 18, 1989, § 102(e) Date May 18, 1989
PCT Filed Sep. 21, 1987, Ser. No. 368,396
Int. Cl.[5] A01G 9/02
U.S. Cl. 47—66 8 Claims



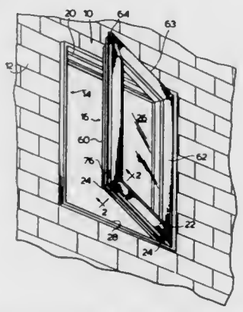
1. A flowerpot bowl (10) for use with a separate flowerpot, consisting of a closed bottom (12), an open top and an encircling closed side wall (14) connected with the bottom and extending to the open top, said side wall (14) at least in its upper part having a plane inner side extending in an axial direction, said bottom (12) being provided with at least one sunk part, which is in open communication with an intervening space defined by the side wall (14) of the flowerpot bowl (10) and a flowerpot (22) inserted in the flowerpot bowl (10), characterized in that the sunk part is shaped like a circumferential annular groove (18) in said bottom (12) extending along a perimetric portion of said bottom, said side wall (14) at its lower end having a decreased diameter starting at a distance substantially above said bottom, and downwardly defining an outer wall of said circumferential groove (18), so that said groove is capable of being substantially positioned below the bottom of a flowerpot (22), inserted in the flowerpot bowl (10) said decreased diameter being formed by a graduated stepping (30) of said side wall (14).

5,044,120
**DOUBLE-WALLED PLANT POT WITH GRADUATED FERTILIZER**
David M. Couch, General Delivery, Mattawa, Ariz. 99344
Filed Nov. 2, 1990, Ser. No. 608,483
Int. Cl.[5] A01G 25/00
U.S. Cl. 47—79 8 Claims



1. A plant pot comprising:
a water permeable inner container comprising
an inner sleeve having an open lower end and
a bottom plate adapted to close said open lower end, said bottom plate separable from said inner sleeve; and
an impermeable outer container body adapted to support said bottom plate and said inner sleeve, said body further comprising
an outer sleeve adapted to substantially surround said inner sleeve to define a fertilizer holding space therebetween, said outer sleeve having a lower edge,
a retaining ledge extending inwardly from said lower edge, said retaining ledge having an inner edge, said inner edge defining an open area therewithin, said open area adapted to be covered by said bottom plate, and
a lip extending upwardly from said retainer ledge, said lip adapted with said retaining ledge to closely encircle and support said bottom plate, said lip adapted to hold said inner sleeve in a position relative to said outer body to define said fertilizer holding space between said inner sleeve and said outer sleeve, said inner sleeve disposed above said bottom plate when in said position; whereby
when said inner sleeve is held in said position above said bottom plate and said bottom plate is encircled by said lip, said bottom plate closes said open lower end of said inner sleeve, and said bottom plate and said inner sleeve together define a soil space for holding soil and a plant or plants therewithin.

5,044,121
**IMPROVED WINDOW AND DOOR STRUCTURE**
John Harbom, Bolten, and Allan Skjodt, Caledon East, both of Canada, assignors to Plastmo Ltd., Brampton, Canada
Filed Feb. 5, 1991, Ser. No. 650,535
Claims priority, application Canada, Feb. 6, 1990, 2009435
Int. Cl.[5] E05D 7/00; E06B 7/14
U.S. Cl. 49—401 10 Claims

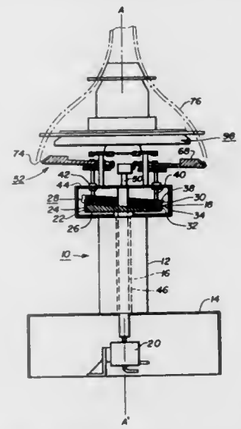


1. In a window or door unit including a sash, said sash having a sill, a header and a pair of side jambs, a glass pane retained within said sash by continuous and resilient mounting means defining with the pane a sealing gap about the perimeter of the said pane, said glass pane having an exterior side and an interior side, at least one drain hole in the sill communicating the sealing gap with the atmosphere on the exterior side of the glass pane, at least one vent opening in the sash on the exterior side of the sash above the sill for communication of exterior air with the interior of the sash and for equalization of air pressure about the perimeter and front portion of the interior of the sash with exterior air pressure.

5,044,122
**METHOD AND APPARATUS FOR BEVELING AN INSIDE EDGE OF A GLASS ARTICLE**
Meredith D. Ratcliff, Circleville, Ohio, assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.
Filed Dec. 31, 1990, Ser. No. 636,462
Int. Cl.[5] B24B 7/00, 9/00
U.S. Cl. 51—55 4 Claims

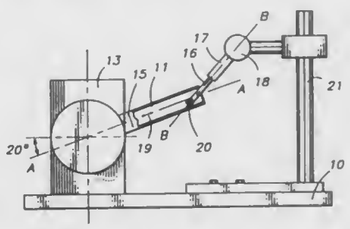
4. An apparatus for uniformly beveling an inside edge of a glass funnel for a cathode-ray tube, said funnel having a substantially rectangular opening at one end and a tubular neck at the other end, said apparatus comprising
a vertical column assembly having an outer housing with a primary rotatable shaft therein, said shaft being attached at one end to a first plate assembly,
said first plate assembly including a wobble plate having a first major surface and an oppositely disposed second major surface, said first major surface being inclined at an acute angle relative to said second major surface,
a wobble plate bearing assembly having a first bearing surface and a second bearing surface, said second bearing surface being disposed on said first major surface of said wobble plate,
a second plate assembly spaced from said first plate assembly, said second plate assembly including a bevel plate having a first major surface and an oppositely disposed second major surface, said bevel plate having a central aperture therethrough, said bevel plate having a peripheral shape generally corresponding to that defined by said seal edge of said glass funnel, said bevel plate having a beveled edge contiguous with at least said first major surface,
abrasive means detachably disposed against and projecting above said beveled edge of said bevel plate to contact and abrade said inside seal edge of said glass funnel,
a bevel plate bearing assembly having a first bearing surface





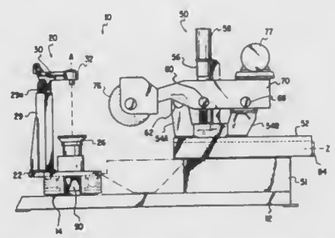
and a second bearing surface, said first bearing surface being disposed on said second major surface of said bevel plate; a secondary rotatable shaft extending through a top surface of said outer housing, said secondary shaft having a proximal end and a distal end, said proximal end being in communication with said first plate assembly and said distal end engaging a bearing having a cam eccentrically attached thereto, a hub circumscribing said cam, said hub being disposed within said central aperture of said bevel plate to orbitally move said second plate assembly in a plane normal to the longitudinal axis of said vertical column assembly,
a plurality of vertically movable pins disposed radially around and extending through said top surface of said outer housing, said pins being in contact with said first bearing surface of said wobble plate bearing assembly and with said second bearing surface of said bevel plate bearing assembly to provide an undulating motion to said second plate assembly, and
securing means attached by biasing means to said top surface of said outer housing, said securing means including at least one resilient seal in contact with an interior surface of said funnel to provide a closure to facilitate attachment of said funnel to said apparatus.

5,044,123
**CONCAVE-CONVEX FACETING METHOD AND APPARATUS**
Douglas Hoffman, P.O. Box 400, Clayton, Wash. 99110-0400
Filed Mar. 22, 1990, Ser. No. 498,355
Int. Cl.[5] B24B 5/00, 13/02
U.S. Cl. 51—73 R 15 Claims



1. A gem faceting apparatus for producing optically magnified facets about a gem, wherein each such facet is formed as a curved surface that is a section of a cylinder, comprising:
a base;
a mandrel having a cylindrical abrasive surface centered along a mandrel axis, the mandrel being movably supported on the base for both angular and axial motion with respect to the mandrel axis;
drive means operatively connected to the mandrel for angularly moving the mandrel about the mandrel axis and axially reciprocating the mandrel parallel to the mandrel axis; and
gem holding means on the base for supporting a gem in contact with the cylindrical abrasive surface of the moving mandrel.

5,044,124
**FINISHING MACHINE FOR CAST PRODUCTS**
Tatsuo Niimura, and Takenori Kitazawa, both of Nagano, Japan, assignors to Kabusbiki Kaisha Koyama, Nagano, Nagano, Japan
Filed Apr. 16, 1990, Ser. No. 510,306
Claims priority, application Japan, Apr. 20, 1989, 1-101195
Int. Cl.[5] B24B 49/00
U.S. Cl. 51—165.77 6 Claims



1. In a finishing machine for cast products comprising a rotary grindstone for removing unnecessary parts on a work while moving relatively close to said work, wherein the improvement comprises:
a clamp-base movable in the horizontal X-direction;
a clamping device for clamping said work, said clamping device being provided on said clamp-base and being rotatable on an A-axis that is perpendicular to the X-direction;
a grindstone-base movable in the horizontal Z-direction perpendicular to the X-direction so as to be movable toward and away from said clamp-base;
a support-shaft having a first end pivotably attached to said grindstone-base, said support-shaft being swingable in a vertical plane perpendicular to the X-direction;

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an elevating block movable on said support-shaft;
a link having a first end movable on said support-shaft by the movement of said elevating block, said first end of said link being pivotably attached to said elevating block and a second end opposite said first end pivotably attached to said grindstone-base said link having a length G;
a swing arm pivotably attached to said elevating block at a portion of said swing arm intermediate its ends so as to be swingable in a vertical plane perpendicular to the X-direction, means for mounting a first end of said swing arm to be movable along a guide section on the grindstone-base in the Z-direction, said rotary grindstone being rotatable on a rotary shaft extending in the X-direction and being movable in the Y-direction by the movement of said elevating block, said rotary grindstone being mounted at the end of said swing arm opposite said one end thereof, the distance P between the rotary shaft and elevating block, the distance B between the elevating block and said first end thereof, being related by the relationship G:B=B:P;
means for controlling drive units of said clamp-base, said clamping device, said grindstone-base and said elevating block so as to remove said unnecessary parts produced on the upper face and/or the circumferential faces of said work;
means for detecting the amount of abrasion of said rotary grindstone; and
means for correcting the amount of travelling said grindstone-base and/or said elevating block corresponding to the amount of abrasion of said rotary grindstone.

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**5,044,125**
**METHOD AND APPARATUS FOR CONTROLLING GRINDING PROCESSES**

**Edward L. Lambert, Jr., Westboro; Charles B. Matsor, Holden, and Bernard D. Vaillette, Leominster, all of Mass., assignors to Cincinnati Milacron-Heald Corp., Worcester, Mass.**

**Division of Ser. No. 400,733, Aug. 29, 1989, and a continuation-in-part of Ser. No. 240,021, Sep. 2, 1988, abandoned. This application Mar. 8, 1990, Ser. No. 490,415**
**Int. Cl.[5] B24B *41/00***
**U.S. Cl. 51—165.93** **13 Claims**

1. A grinding machine having a machine base, a wheelhead supported by said machine base and carrying a rotatable superabrasive grinding wheel having a peripheral grinding surface, a wheel shaping unit mounted on said base including feed means for relatively moving said grinding wheel and wheel shaping unit with respect to one another at a selected feed rate, and an apparatus for determining wheel topography during wheel reshaping operations, said apparatus comprising means for measuring the presence and magnitude of a normal force vector occurring between said wheel and said wheel shaping unit, said measuring means including a force transducer mounted adjacent said wheelhead, wherein said determined wheel topography is based upon normal force vectors measured at a plurality of points about said peripheral grinding surface, and means for automatically adjusting said feed rate in accordance with the value of said measured normal force vector to optimize the wheel shaping process and to minimize said normal force vector where reshaping is not needed.

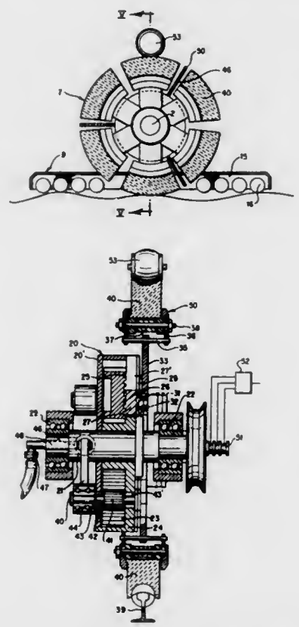
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**5,044,126**
**TANGENTIAL GRINDING MACHINE**

**Claudio Baldo, Mestre Venezia, Italy, assignor to Rotrafer S.p.A., Padua, Italy**

**PCT No. PCT/EP87/00560, § 371 Date May 11, 1989, § 102(e) Date May 11, 1989, PCT Pub. No. WO88/02300, PCT Pub. Date Apr. 7, 1988**
**PCT Filed Sep. 30, 1987, Ser. No. 335,670**
**Claims priority, application Italy, Oct. 1, 1986, 84140 A/86**
**Int. Cl.[5] E01B *31/17***
**U.S. Cl. 51—178** **26 Claims**

1. A tangential grinding machine provided with at least one grinding device (7) comprising a rotary member (20), a plurality of abrasive sectors (40) mounted on supports (30.33) radially mobile on said rotary member (20), and members (23,27) for radially shifting said supports (30,33) in order to cause said abrasive sectors (40) to move outwards by an amount suitable for compensating their wear characterised by comprising a plurality of sensors (50) which are activated when a predetermined degree of wear of the abrasive sectors (40) is reached and which act on the radially shifting members (23,27) and further comprising an electronic apparatus (52) which processes the signals originating from the sensors (50) and controls members (46) for radially shifting the supports (30,33) for the abrasive sectors (40).

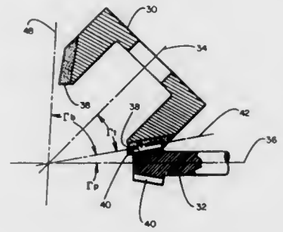


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**5,044,127**
**GEAR-SHAPED TOOL AND METHOD OF GENERATING GEARS**

**Thomas B. Ryan, Webster, N.Y., assignor to The Gleason Works, Rochester, N.Y.**

**Filed Jan. 16, 1990, Ser. No. 465,825**
**Int. Cl.[5] B24B *3/34, 1/00***
**U.S. Cl. 51—287** **21 Claims**



1. A method of finishing tooth surfaces in bevel and hypoid gears using a gear-shaped tool abrasive having stock-removing tooth surfaces comprising the steps of:
imparting relative rotation between said gear-shaped tool and a work gear about their respective axis in a timed relationship according to their respective tooth numbers; and superimposing relative motion between said gear-shaped tool and said work gear for generating desired tooth surfaces of said work gear in the manner of said work gear rolling in mesh with a theoretical generating gear which departs from requirements of a basic member defined by said relative rotation of the gear-shaped tool and work gear about their respective axes.

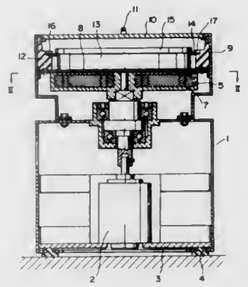


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**5,044,128**
**MAGNETICALLY-POLISHING MACHINE AND PROCESS**

**Osamu Nakano, Tokyo, Japan, assignor to Priority Co., Ltd., Tokyo, Japan**

**Filed Jun. 27, 1990, Ser. No. 544,310**
**Int. Cl.[5] B24B *31/00***
**U.S. Cl. 51—313** **14 Claims**



6. A process for magnetically-polishing an article by means of a magnetically-polishing machine, the machine comprising a high-speed rotatable magnet disc the top surface of which is divided by at least one diameter through the magnet disc into alternating south-polar zones and north-polar zones, a fixed plate made of a nonmagnetic material and provided above the magnet disc, a hollow cylindrical polishing vessel retainer provided above the fixed plate and including an elastic body made of a nonmagnetic material, the elastic body lining the inner cylindrical surface of the polishing vessel retainer, at least one polishing vessel made of a non magnetic material and removably retained in the polishing vessel retainer, and means for preventing the polishing vessel from rotating, the process comprising
placing in the polishing vessel at least one article to be polished, an abrasive in the form of pieces of a magnetic metal having dimensions of at least 0.2 mm and a liquid polishing assistant with a small amount of a surfactant; then
fastening the polishing vessel; and then
agitating the abrasive without translationally moving the abrasive by rotating the magnetic disc at high speed.

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**5,044,129**
**CRYOGENIC MECHANICAL MEANS OF PAINT REMOVAL**

**Albert Olevitch, Englewood, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jul. 5, 1990, Ser. No. 548,398**
**Int. Cl.[5] B24C *1/00***
**U.S. Cl. 51—322** **12 Claims**

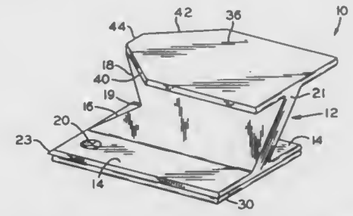
1. A method for removing coatings from surfaces, comprising the step of directing against a coating alternately pulsed streams of a cryogenic fluid and of solid particles, wherein the duration of each pulse of each alternate stream is less than one second.

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**5,044,130**
**ICE BREAKER AND RETAINER**

**Lonnel O. Chiddister, R.R. #3, Box 268-A, Angola, Ind. 46703**

**Filed Jul. 19, 1990, Ser. No. 555,720**
**Int. Cl.[5] E04D *13/00***
**U.S. Cl. 52—24** **9 Claims**



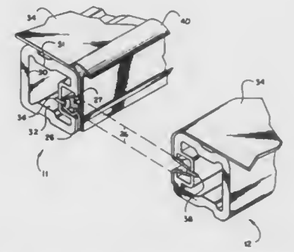
1. An ice breaker for attachment to the top surface of an inclined roof upon which sheets of ice may form and tend to move downwardly along the roof, said ice breaker comprising:
a body portion attachable to the top surface of the roof and having a leading edge facing upwardly on the roof and a trailing edge facing downwardly on the roof;
said leading edge including means for raising a first encountered edge of a sheet of ice above the surface of the roof in response to downward movement of the sheet of ice;
retaining means defined by said body and independent of said raising means for positively retaining the first encountered edge of the sheet of ice above the surface of the roof; and
shearing means defined by said body for shearing the first encountered edge of the sheet of ice in response to further downward movement.

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**5,044,131**
**FABRIC AWNING ASSEMBLY AND DIVIDER BEAD FOR USE THEREIN**

**Larry M. Fisher, 2316 Piedmond Ridge Ct., Marietta, Ga. 30062**

**Filed May 18, 1990, Ser. No. 525,869**
**Int. Cl.[5] E04B *1/12***
**U.S. Cl. 52—63** **23 Claims**



1. A flexible, water-impervious divider bead for forming a seal between adjacent sections of an awning assembly, comprising:
an elongate central shank including opposite side surfaces, a bottom edge and a top edge;
an elongate top member positioned along said top edge and extending outwardly beyond both of said side surfaces of said shank;
a first protrusion extending outwardly from one side surface of said shank intermediate said edges of said shank and including an elongate lip extending outwardly from one

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side surface of said shank so as to define an upwardly opening gutter capable of directing a flow of moisture along said gutter; and

a second protrusion defining an elongate support block extending outwardly from the other side surface of said central shank, for being retained by one of said awning sections.

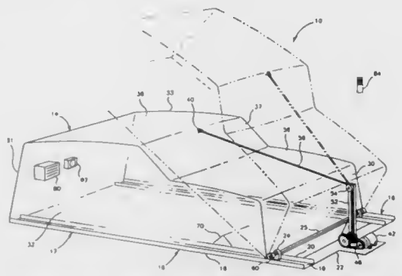
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**5,044,132**

**VEHICLE PROTECTIVE COVER ASSEMBLY**

**John T. Harman, 630 Elbert St., Sullivan, Mo. 63080**

**Filed May 24, 1990, Ser. No. 528,558**
**Int. Cl.[5] E04B** *7/16*
**U.S. Cl. 52—66** **4 Claims**



1. A vehicle protective cover assembly comprising:

a base frame formed from a pair of laterally spaced elongated U-shaped frame members each having a front end and a rear end, said U-shaped frame members having an outer upright wall, a bottom wall and inner upright wall and, a frame cross-member connecting the front ends of said U-shaped frame members;

an elongated vehicle shell-like cover having a front wall, a rear wall, laterally spaced side walls, and a top wall to form an enclosure open at its bottom;

means for pivoting the rear wall of said vehicle shell-like cover upwardly about its front wall so that a vehicle can be driven under said cover;

the top wall of said elongated vehicle shell-like cover having a hood cover section, a window cover section and a rear cover section

said means for pivoting the rear wall of said vehicle shell-like cover upwardly about its front end comprising a post having a top end and a bottom end, said bottom end being secured to the frame cross-member of said base frame, a pulley mounted adjacent the top end of said post, an eyelet bolt secured to the window cover section of said vehicle shell-like cover, and a cable having one end secured to said eyelet, said cable being passed around said pulley.

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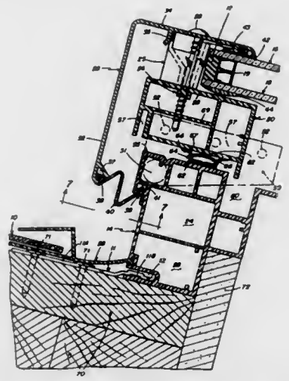
**5,044,133**

**SKYLIGHT CONSTRUCTION**

**Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.**

**Continuation of Ser. No. 283,797, Dec. 13, 1988, Pat. No. 4,926,594, and a continuation of Ser. No. 283,731, Dec. 13, 1988, Pat. No. 4,987,705, and a continuation of Ser. No. 283,803, Dec. 13, 1988, Pat. No. 4,928,455, and a continuation of Ser. No. 283,802, Dec. 13, 1988, Pat. No. 4,995,208. This application Dec. 5, 1989, Ser. No. 446,077**
**The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.**
**Int. Cl.[5] E04B** *7/18*
**U.S. Cl. 52—72** **11 Claims**

4. A skylight construction for an opening in a building comprising: a frame extending about the opening and including means for securing said frame about the opening, translucent or transparent glazing means covering the opening and extending at edges to overlie said frame, means for retaining said glazing means on said frame, said frame comprising a base frame and a support frame overlying the base frame, both said base frame and said support frame constructed of a rigid plastic



material, said base and support frames having associated therewith at least one flexible gasket adapted to be positioned therebetween, said at least one flexible gasket having multiple contact sealing locations to form multiple seal areas extending along a line from inside to outside of said frame.

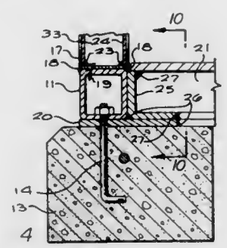
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**5,044,134**

**RELOCATABLE MODULAR BUILDING WALL AND FLOOR SYSTEM**

**Wilhelm W. Brockway, 4503 Coolhaven Ct., Westlake Village, Calif. 91361**

**Filed Feb. 27, 1989, Ser. No. 316,932**
**Int. Cl.[5] E04N** *1/00*
**U.S. Cl. 52—79.1** **18 Claims**



1. A modular building system, the steps comprising:

providing a foundation;

providing first metal plates positioned atop the foundation at locations where modular wall sections are to be erected;

providing modular wall sections positioned atop the first metal plates;

removably attaching the wall- sections directly to the foundation using anchor bolts which extend through the first metal plates;

providing modular floor sections; and

attaching the floor sections to the wall sections, wherein the wall sections can be detached from the foundation and relocated while the floor sections remain attached thereto.

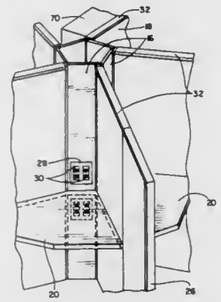


**5,044,135**

**CLUSTER WORK STATION SYSTEM**

**Robert J. Kroon, Kent, Wash.; Robert L. Russell, Kentwood, Mich., and Linn A. Steinbeck, Kent, Wash., assignors to Hon Industries Inc., Muscatine, Iowa**

**Continuation of Ser. No. 365,959, Jun. 13, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 617,919**
**Int. Cl.[5] E04H** *3/00*
**U.S. Cl. 52—239** **13 Claims**



1. A space partition system comprising:

at least one core element having five or more vertical side panels joined together along adjacent edges to form a hollow enclosure;

a plurality of elongated connecting brackets for interconnecting the edges of adjacent vertical side panels, each connecting bracket having a first portion disposed between adjacent lateral interior edges of adjacent vertical side panels and extending substantially the entire vertical height of said vertical side panels and having a second portion disposed along the lateral exterior surface of one of said adjacent side panels and also extending substantially the entire vertical height of said side panels;

a plurality of longitudinally extending slots disposed in said second portion of said connecting bracket;

a plurality of wall panels, each of said wall panels having a plurality of mounting brackets disposed along at least one lateral edge, said mounting brackets adapted to fit within said slots in said connecting bracket to position said wall panels along a common lateral edge of said side panels at a substantially right angle to said side panels.

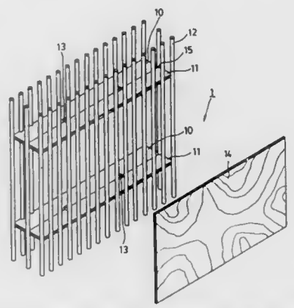
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**5,044,136**

**CONCRETE REINFORCEMENT DEVICE**

**Jen-Jui Liu, No. 253, Chueh-Min Rd., San-Min Dist., Kaohsiung, Taiwan**

**Filed Apr. 10, 1990, Ser. No. 507,393**
**Int. Cl.[5] E04B** *1/00, 1/18;* **E04C** *5/16*
**U.S. Cl. 52—252** **5 Claims**



1. A device for reinforcing a concrete construction comprising a plurality of spaced vertical reinforcement rods, and tiers of horizontal connecting plate means to space and interconnect the reinforcement rods, each of said connecting plate means having a peripheral edge provided with spaced notches which are engaged with said vertical reinforcement rods respectively and connected firmly thereto by welding means, each of said connecting plate means having a hole for the passage of concrete.

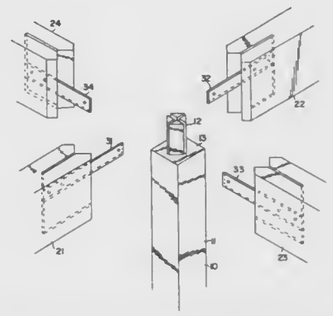
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**5,044,137**

**JOINING METHOD AND STRUCTURE IN A WOODEN BUILDING**

**Terada Shigeru, 1-20-31, Rokumanji-cho, Higashiosaka- Osaka, and Shu Terada, 3-602,22, Nishijuku 2-chome, Minoo-shi, Osaka, both of Japan**

**Filed Sep. 28, 1990, Ser. No. 589,700**
**Claims priority, application Japan, Sep. 29, 1989, 1-256743**
**Int. Cl.[5] E04H** *12/18*
**U.S. Cl. 52—286** **8 Claims**



1. A joining structure in a wooden building comprising:

a post comprising a main body of a square cross section and a joint projected on a step portion of a top or bottom of said main body, said joint having a square cross section and being axially shifted 45 degrees in relation to said main body, and deep downward or upward groove being provided along the diagonal line on the section of said joint;

first and second transverse members contacting at their ends to said step of said main body, said transverse members having a post joint surface, respectively, which comes into contact with two side surfaces of said joint and transverse joint surfaces respectively, formed horizontally next to said post joint surfaces, at the center of the horizontal direction of said post joint surface being provided with a groove which is deep in the longitudinal direction of said transverse members;

a first strip having first, second and third holes arranged on a straight line from one end to the other and inserted in said groove of said first transverse member, said first strip being securely fixed to said first transverse member by a first bolt-and-nut through said first hole which is near the bottom of said groove;

a second strip having first, second and third holes arranged on a straight line from one end to the other end inserted in said groove of said second transverse member, said second strip being securely fixed to said second transverse member by a second bolt-and-nut through said first hole which is near the bottom of said groove;

a first pin pointed at one end penetrating said second transverse member through said second hole of said first strip and through said third hole of said first strip; and

a second pin pointed at one end penetrating said second transverse members through said second hole of said second strip and through said third hole of said first strip;

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wherein said first and second transverse members are arranged in series with said joint in-between, each of said first and second strips is inserted through said groove of said joint parallel and next to each other and then placed in said groove of said transverse members, and said first and second pins are driven through said second holes and through said third holes of said first and second strips, respectively.

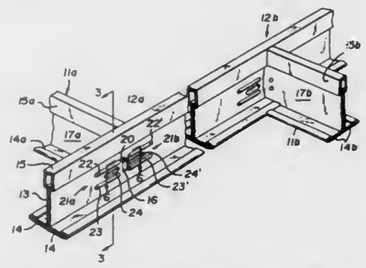
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**5,044,138**

**CEILING SUSPENSION STRUCTURE ADAPTED FOR UNOPPOSED INTERSECTIONS**

**Michael R. Zaccardelli, North Royalton, and Gerald L. Koski, Parma, both of Ohio, assignors to USG Interiors, Inc., Chicago, Ill.**

**Filed Oct. 13, 1989, Ser. No. 421,225**
**Int. Cl.[5] E04B** *9/06*
**U.S. Cl. 52—667** **8 Claims**



1. A suspended ceiling structure adapted for unopposed intersection comprising:

at least one longitudinal main runner having an elongated, generally vertical web, said web formed with slot means at an intermediate portion of said main runner for receiving a connector and embossment means for reinforcing said web adjacent said slot means; and

at least one transverse cross runner having an end intersecting said main runner with no colinearly opposing cross runner, said cross runner end having connector means engaging said slot means in said main runner web.

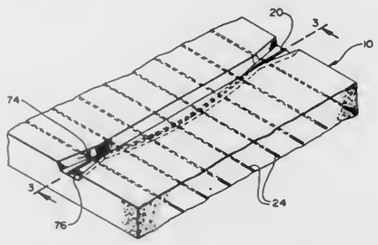
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**5,044,139**

**METHOD OF REPLACING POST TENSIONED BEAMS**

**Tyrone T. Mills, Ramsey, Minn., assignor to D. H. Blattner & Sons, Inc., Avon, Minn.**

**Continuation of Ser. No. 355,923, May 23, 1989, abandoned. This application Jul. 20, 1990, Ser. No. 554,966**
**Int. Cl.[5] E04C** *5/08*
**U.S. Cl. 52—741** **11 Claims**



1. A method for repairing a defective post or pretensioned concrete slab comprising the steps of:

(a) removing all original above said original defective tendon expose at least the upper surface of said original tendon while leaving an underlying portion of the original concrete along the length of the defective tendon;

(b) relieving any remaining tension in said exposed tendon and removing said tendon from the trench so formed;

(c) installing at least one tendon profile rebar retainer into said original solid concrete in the sidewall of said trench so as to extend at least partially across said trench adjacent the middle region of the length of the trench;

(d) constructing end anchorages where needed to replace defective original anchorages for the new tendon or tendons;

(e) weaving a new tendon or tendons into said trench, said tendon or tendons being supported by said at least one tendon profile rebar retainer, operatively positioning the ends of said tendon or tendons to said end anchorages

(f) coating the bonding surface of said trench with a curable epoxy bonding compound;

(g) filling the trench with new concrete to completely encase said new tendon in concrete, thereby forming a new concrete beam; and

(h) post-tensioning said tendon or tendons.

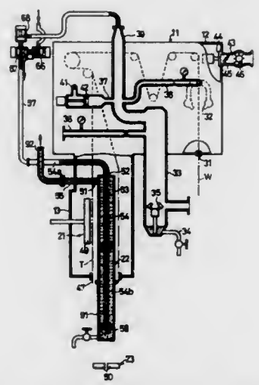
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**5,044,140**

**PACKAGING MACHINE**

**Fumiyuki Iwano, Tokushima, and Kazuo Sasaki, Tokyo, both of Japan, assignors to Shikoku Kakoki Co., Ltd., Itano and Jujo Paper Co., Ltd., Tokyo, both of, Japan**

**Filed Apr. 9, 1990, Ser. No. 506,041**
**Claims priority, application Japan, Apr. 10, 1989, 1-91583**
**Int. Cl.[5] B65B** *55/10*
**U.S. Cl. 53—167** **3 Claims**



1. A packaging machine for forming a web of packaging material into a vertical tube, filling contents into the tube, dividing the tube into lengths each corresponding to one container and forming each length into a bag-like container, the packaging machine comprising:

a filling means for filling a liquid into the tube to a specified level with the lower end of the tube closed; and

a cleaning means for cleaning a required portion of the filling means,

the filling means including:

a filling pipe having a vertical portion with an open lower end for the tube to be placed therearound, the vertical portion having a liquid contact portion at its lower part,

a first attaching means for removably attaching a control member to the liquid contact portion for controlling the level of the liquid to be filled into the tube by regulating the amount of liquid to be discharged from the open lower end of the liquid contact portion,

means for supplying the liquid into the filling pipe, and

a vertical tubular jacket provided around the vertical portion above the liquid contact portion inside the tube and having a top wall and a duct joint opening,

the cleaning means including:

a second attaching means for removably attaching a bottomed tubular cleaner provided around the liquid contact portion, the second attaching means removably connects an upper end of the bottomed tubular cleaner to the lower end of the jacket with the control member removed from the liquid contact portion, and

a cleaning liquid collecting duct removably attachable to the duct joint opening,

the supplying means supplies to the filling pipe a cleaning liquid in place of the liquid.

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**5,044,141**

**METHOD FOR STERILE PACKAGING AND WETTING OF ARTICLES**

**Richard M. Franchi, 264 Shagbark Dr., Derby, Conn. 06418**

**Filed Jul. 11, 1990, Ser. No. 551,066**
**Int. Cl.[5] B65B** *55/028*
**U.S. Cl. 53—431** **23 Claims**

1. A method of sterile packaging and wetting of articles comprising the sequential steps of partially filling a container with a solution of a standard anti-bacterial agent; then placing an article in the container so that the article is partially above the solution; then sealing said container to provide a gas space above the solution within the sealed container; then heating said container and its contents to a temperature substantially below the boiling point of the solution and at a pressure of about one atmosphere until all the surfaces inside the container above and below the solution, and the entire contents of the container, are sterilized; and thereafter cooling the container and its entire contents to a temperature at which condensation occurs on the surfaces inside the container that are above the solution until condensation occurs.

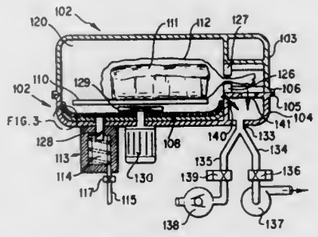
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**5,044,142**

**PACKAGING METHOD AND APPARATUS**

**Gian C. Gianelli, Milan, Italy, assignor to W. R. Grace & Co. - Conn., Duncan, S.C.**

**Continuation of Ser. No. 241,437 Sept. 7, 1988, abandoned**
**Filed Sep. 20, 1990, Ser. No. 587,499**
**Claims priority, application United Kingdom, Sep. 21, 1987, 8722201**
**Int. Cl.[5] B65B** *53/06, 31/02*
**U.S. Cl. 53—434** **3 Claims**



1. A method of making a package using a bag or pouch which is made from a heat shrinkable, flexible, thermoplastic material comprising the steps of:

a) filling the bag with a product;

b) evacuating the bag;

c) sealing the evacuated bag

d) reducing the pressure prevailing on the outside surface of the bag to below atmospheric pressure;

e) while maintaining said sub-atmospheric pressure, contacting the outside surface of the bag with steam generated under reduced pressure and at an initial temperature less than that required to generate steam at atmospheric pressure such that while under said sub-atmospheric pressure the steam will condense on the bag wall and its latent heat of condensation will transfer sufficient heat to the bag wall to shrink same; and, subsequently,

f) stopping flow of steam and restoring the pressure on the outside surface of the bag whereby a package made of heat shrunken material is produced.

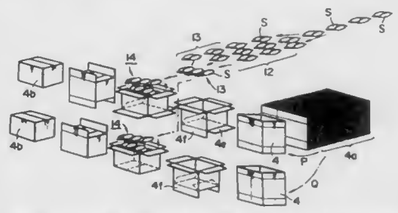
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**5,044,143**

**METHOD AND APPARATUS FOR PACKING FLEXIBLE PACKAGES**

**Shigeichi Ako, New South Wales, Australia; Kazuyoshi Fujio, Nishi-Sonogi, and Sbuzo Takenchi, Sasebo, both of Japan, assignors to S.S.A. Packaging Engineering & Consultant Pty. Ltd., Woolooware, Australia and Matsusima Electrical Machinery Co., Ltd., Fuknoka, Japan**

**Filed May 17, 1990, Ser. No. 524,742**
**Claims priority, application Japan, May 19, 1989, 1-124614; Apr. 16, 1990, 2-97560**
**Int. Cl.[5] B65B** *5/08, 35/38, 35/44*
**U.S. Cl. 53—448** **9 Claims**



1. Method for packing flexible packages in a carton comprising:

feeding a plurality of packages in a feeding direction;

aligning a plurality of said packages being fed in a row extending substantially transversely to said feeding direction;

centralizing said row of packages so that adjacent packages in said row partially overlap each other in a centralized position;

positioning an open top carton adjacent said centralized position;

engaging said overlapped packages with vacuum pads;

transferring said overlapped packages by said vacuum pads from said centralized position to a position over said carton;

removing said overlapped packages in said overlapped position from said vacuum pads;

lowering said overlapped packages into said carton in said overlapped position without dropping said packages by gravity while simultaneously returning said vacuum pads to said centralized position for engaging further overlapped packages; and

continuing said steps in series to fill said carton in tiers of overlapped packages.

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**5,044,144**

**APPARATUS AND METHOD FOR FORMING AND LOADING A MAGAZINE FOR PREWOUND SPOOLS OF WEB MATERIAL**

**James C. Foote, Jr., York; Robert F. Allen, Spencerport; Paul E. Bailey, Caledonia; Dean B. Campbell, Webster; Thomas A. Cipolla, Rochester; William G. Hoyt, Churchville; Robert L. Huseby, Fairport; Lyndon R. Huttemann, Rochester; David H. Lancy, Rochester; William C. Lebbon, Rochester; Stephen M. Reinke, Rochester, all of N.Y.; Thomas E. Stark, North Fort Myers, Fla., and Joseph A. Watkins, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 6, 1990, Ser. No. 622,985**
**Int. Cl.[5] B65B** *43/08;* **B23P** *11/02, 19/00*
**U.S. Cl. 53—456** **53 Claims**

1. A method of forming and loading a substantially cylindri-

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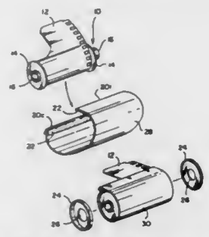
cal magazine for a prewound spool of a strip of material, comprising the steps of:

providing a prewound spool;

providing a substantially rectangular metal blank for the side wall of such substantially cylindrical magazine, said blank having an opposed pair of strip withdrawal lips and an opposed pair of end edges;

providing a pair of substantially circular end caps for such magazine;

providing a mandrel having an exterior surface about which said blank may be formed, said exterior surface being configured so that when said blank is formed about said exterior surface from near one strip withdrawal lip to near the other and said blank is then removed from said mandrel, said blank springs to an open form in which said strip



withdrawal lips are spaced sufficiently far apart to permit said prewound spool to pass laterally between said strip withdrawal lips;

forming said blank about said mandrel from near one strip withdrawal lip to near the other;

removing said blank from said mandrel following said forming;

laterally inserting said prewound spool between said strip withdrawal lips of said blank;

closing said blank about said prewound spool so that said end edges of said blank form substantially circular edges and said trailing end projects outwardly between said strip withdrawal lips; and

applying one of said end caps to each of said substantially circular edges to complete such magazine.

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**5,044,145**

**FILM PACKAGING**

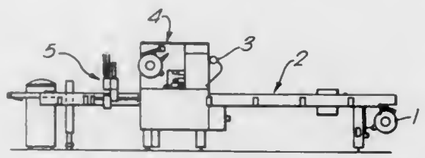
**Sandro Brembilla, Arese Milano, Italy, assignor to W. R. Grace & Co.-Conn., Duncan, S.C.**

**Filed Dec. 22, 1989, Ser. No. 455,462**

**Claims priority, application United Kingdom, Mar. 23, 1989, 8906713**

**Int. Cl.[5] B65B** *7/28, 47/02, 51/20*

**U.S. Cl. 53—478** **10 Claims**



4. A process for packaging articles between heat sealable thermoplastic films, comprising introducing product articles between first and second films, heating said first film by radiant heating means across at least the majority of said first film extending outwardly from a centre line of the first film, independently heating portions of said first film not adequately heated by said radiant heating means including the marginal regions of said first film by contact with a heat transfer medium, and subsequently contacting said first and second films with the product therebetween to seal the preheated first film to the second film.

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**5,044,146**

**OSCILLATING-TYPE MOWING APPARATUS**

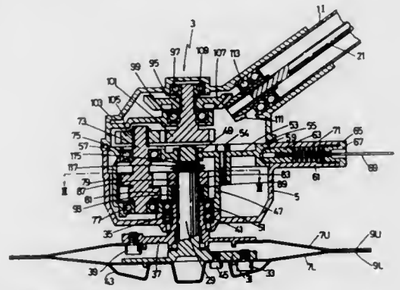
**Masaharu Nakamura, Tokyo, Japan, assignor to Komatsu Zenoah Company, Tokyo, Japan**

**Filed May 23, 1990, Ser. No. 527,322**

**Claims priority, application Japan, May 24, 1989, 1-128636**

**Int. Cl.[5] A01D** *34/68, 34/76*

**U.S. Cl. 56—11.3** **8 Claims**



1. A mowing apparatus comprising:

a motive power source for supplying rotating motion;

a mowing head;

shaft means for supporting a pair of cutting disks;

a pair of first and second cutting disks slidably superposed with respect to each other, each of said disks including a plurality of peripheral cutting teeth, said first and second cutting disks being oscillatably mounted to the mowing head through said shaft means;

means for reciprocatively oscillating said first and second cutting disks in opposite directions with respect to each other within a predetermined oscillating range through said shaft means, said reciprocatively oscillating means being provided in said mowing head and adapted to be driven by the rotational motion supplied from said motive power source; and

means for intermittently changing the mounting position of said first and second cutting disks about said mowing head in the circumferential direction of said cutting disks so that a portion to be used for mowing in said first and second cutting disks can be changed without removing said first and second cutting disks from said mowing head, said mounting position changing means being adapted to be driven by the rotating motion of said motive power source.

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**5,044,147**

**CROP HARVESTING APPARATUS AND METHODS**

**Wilfred E. Klinner, Milton Keynes, United Kingdom, assignor to National Research Development Corporation, London, England**

**Continuation of Ser. No. 198,461, May 24, 1988, Pat. No. 4,951,453, which is a division of Ser. No. 879,109, filed as PCT GB85/00442 on Sep. 26, 1985, published as WO86/01972 on Apr. 10, 1986, Pat. No. 4,790,128.**

**Claims priority, application United Kingdom, Sep. 27, 1984, 8424396**

**Int. Cl.[5] A01D** *45/00*

**U.S. Cl. 56—14.6** **16 Claims**

1. Apparatus for harvesting required crop parts from standing crop comprising;

a mobile frame for movement over the ground,

moveable support means mounted for driven movement relative to the frame,

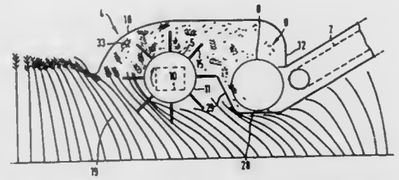


a plurality of outwardly projecting crop engaging elements mounted on the moveable support means,

a guide means co-operating with the crop engaging elements to form a crop flow passage, and

drive means for driving the moveable support means so as to detach from standing crop predetermined required parts of the crop and to move the detached crop parts along the crop flow passage, the moveable support means being arranged to carry the elements upwardly and rearwardly at a front region of the apparatus, and the crop engaging elements being arranged to engage standing crop while projecting forwardly relative to the direction of forward travel of the apparatus,

wherein at least some of the crop engaging elements have discrete distal tips for entering into and dividing crop and are shaped to provide in operation a plurality of crop gathering regions each including an intake region with converging boundaries for gathering crop,



at least some of the crop engaging elements being made of flexible resilient material, each such element having an impelling surface which extends across the direction of movement of the element by the moveable support means relative to the said frame for impelling detached crop parts along the crop flow passage, the said drive means being arranged to drive the crop engaging elements at a speed such as to propel the detached crop parts in a fast moving stream along the crop flow passage,

the said moveable support means comprising a rotor and the said guide means comprising a cover extending around at least part of the upper front quadrant of the rotor, the shape of the cover being such that, throughout the region where the cover extends around the upper front quadrant of the rotor, the distance from the center of the rotor to the inside of the cover increases along the cover in the direction of crop flow.

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**5,044,148**

**YARN SPLICING METHOD**

**Michiaki Fujiwara, Kameoka, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Jan. 24, 1990, Ser. No. 469,278**

**Claims priority, application Japan, Jan. 27, 1989, 1-18534**

**Int. Cl.[5] D01H** *1/115, 15/013*

**U.S. Cl. 57—22** **6 Claims**

1. A yarn splicing method for splicing two yarn strands being doubled and wound on a package from a spinning machine, said method comprising the steps of:

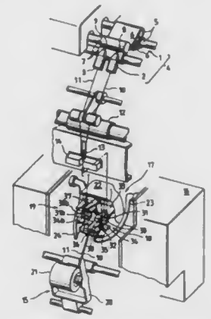
displacing a first splicing portion of one yarn strand of the two yarn strands associated with the package side and a second splicing portion of the one yarn strand associated with the spinning device side from third and fourth splicing portions of the other yarn strand of the two yarn strands associated with the package side and the spinning device side, respectively,

splicing the one yarn strand together with the first and second splicing portions,

splicing the other yarn strand together with the third and fourth splicing portions,

doubling the one yarn strand and the other yarn strand, and

winding the doubled yarn strands onto the package, wherein the displacing of the first and second splicing portions from the third and forth splicing portions enables a deviation in phase between the splice in the one yarn strand and



the splice in the other yarn strand when the spliced yarns are doubled.

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**5,044,149**

**APPARATUS FOR SELECTIVELY RESISTING THE ROTATION OF SPINDLES OF A TEXTILE MACHINE**

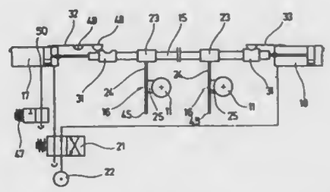
**Gerhard Grau, Müllheim, and Hermann Güttler, Uhingen, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany**

**Filed Nov. 17, 1989, Ser. No. 438,512**

**Claims priority, application Fed. Rep. of Germany, Nov. 18, 1988, 3839026**

**Int. Cl.[5] D01H** *13/14*

**U.S. Cl. 57—88** **10 Claims**



1. In a textile machine having a frame supporting a spindle bank and a plurality of spindles extending in a line along the spindle bank, each spindle supporting a tube onto which a yarn package is built and being rotatably supported on the spindle bank, a rotation preventing apparatus comprising:

a plurality of drive motors each being associated with a respective spindle for driving rotation thereof and each drive motor being selectively activated to drive its respective associated spindle and de-activated to cease driving of the spindle;

means acting individually on each spindle for resisting rotation of the spindles to prevent rotation of the yarn packages supported on the spindles when the drive motors of the spindles are de-activated;

means for commonly actuating said rotation resisting means to act on all spindles simultaneously, said commonly actuating means including a reciprocable member having opposite ends and supported on the textile machine for selected reciprocating movement and a device for reciprocating said reciprocable member; and

means for selectively opposing movement of said reciprocable member from said braking position to said non-braking position when said device for reciprocally moving said reciprocable member is de-activated, said means for selectively opposing movement including a recess formed in a selected one of said reciprocable member and the frame of

the textile machine and a recess engaging member mounted to the other of said reciprocable member and the frame of the textile machine, said recess engaging member having a portion movable transversely with respect to the direction of reciprocation of said reciprocable member and means for resiliently biasing said recess engaging member portion toward said reciprocable member to automatically engage said recess when said recess is aligned with said recess engaging member and resist movement of said reciprocable member.

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**5,044,150**

## ARRANGEMENT FOR PRODUCING PACKAGES USED AS FEEDING PACKAGES FOR TWISTING

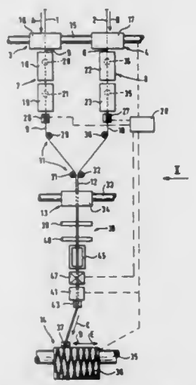
**Fritz Stahlecker, Bad Uberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Fed. Rep. of Germany, a part interest**

**Continuation of Ser. No. 361,321, Jun. 5, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 624,472**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1988, 3819858**

**Int. Cl.[5] D01H** *1/20, 13/18*

**U.S. Cl. 57—328** **17 Claims**



1. An arrangement for producing packages used as feeding packages for twisting and having two yarn components which are wound up side-by-side comprising:

drafting means for drafting the two yarn components,

prestrengthening means for prestrengthening the drafted yarn components,

guiding means for guiding together the two yarn components to form a double yarn,

withdrawing means for withdrawing the double yarn,

winding means including cross-winding means for cross-winding the double yarn on a package,

yarn component detection means arranged behind the prestrengthening means for detecting the respective yarn components, and

processing device means for processing the double yarn in such a manner as to assure disposition of the two yarn ends in position for a subsequent separate piecing operation involving locating and returning the two yarn ends to a piecing apparatus other than the processing device means, wherein the processing device means is disposed at a position substantially spaced from the detection means and directly in front of the winding means to thereby lengthen the time period for a broken yarn end to travel between the detection means and the processing device means, and wherein a yarn guide is arranged between the cross-winding means and the processing device means to limit cross-winding in the area of the processing device means.

**5,044,151**

## YARN DRAW-OFF PIPE TO DRAW OFF A YARN FROM AN OPEN-END SPINNING DEVICE

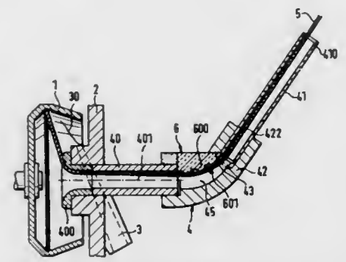
**Johann Pohn; Rudolf Oexler; Gottfried Schneider; Edmund Schuller, and Ernst Domke, all of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aftiengesellschaft, Ingolstadt, Fed. Rep. of Germany**

**Filed Jun. 16, 1988, Ser. No. 207,741**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 3720967**

**Int. Cl.[5] D01H** *4/40*

**U.S. Cl. 57—417** **74 Claims**



1. A yarn drawn-off pipe for guiding yarn from a yarn spinning device to a yarn take-up device, such yarn spinning device having a covering with an opening therein, comprising:

(a) a first pipe section connected to said yarn spinning device and received in said yarn spinning device covering opening for receiving and guiding said yarn through said covering opening;

(b) a second pipe section spaced from, and disposed with its longitudinal axis at an angle to, the longitudinal axis of said first pipe section, for guiding said yarn in a direction towards said take-up device;

(c) a connecting piece comprising a chamber including means for connecting said first and second pipe sections in adjustably fixed axial relationship, having a smooth arcuate surface for guiding said yarn from said first pipe to said second pipe when said yarn is blown through said draw-off pipe, said connecting piece being supported on said first pipe section;

(d) an insert adjustably associated in fixed axial relationship with said connecting piece and having a yarn deflection surface which extends into said chamber and comprises a yarn guiding surface for contacting said yarn as said yarn is pulled through said draw-off pipe; and

(e) means for directing said yarn from said second pipe to said take-up device;

wherein said insert may be adjusted in its fixed axial position or replaced without removing said first pipe section from said covering opening.

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**5,044,152**

## METHOD OF OPERATING A COMBINED PLANT

**Shinichi Hoizumi; Yoshiki Noguchi; Tadao Arakawa, and Kazusada Hoshino, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 8, 1989, Ser. No. 348,776**

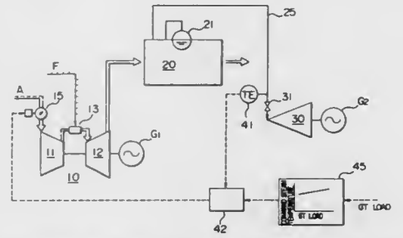
**Claims priority, application Japan, May 11, 1988, 63-112448**

**Int. Cl.[5] F02C** *6/18*

**U.S. Cl. 60—39.03** **3 Claims**

1. A method of operating a combined plant having a gas turbine system including a compressor into which air is introduced through an inlet guide vane, a combustor in which a fuel is burnt with the air compressed by said compressor, and a turbine into which the combustion gas is introduced to generate an output power, a waste heat recovery boiler which generates steam by the heat possessed by the combustion exhaust gas from said gas turbine system, and a steam turbine driven by the steam generated by said waste-heat recovery boiler, said method comprising the steps of:

setting a temperature of the steam generated in the waste-heat recovery boiler in relation to a level of load on said gas turbine system; and



controlling an opening of said inlet guide vane of the gas turbine system in accordance with a set temperature resulting from the setting step.

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**5,044,153**

## TURBOJET COMPRESSOR BLOW OFF VALVES WITH WATER COLLECTING AND DISCHARGE MEANS

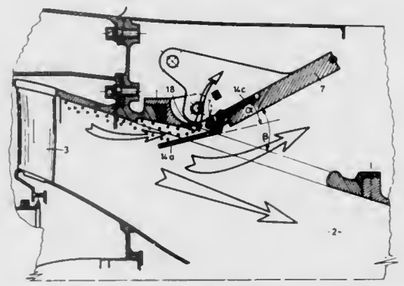
**Pierre C. Mouton, Grigny, France, assignor to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A." , Paris, France**

**Filed Dec. 6, 1989, Ser. No. 446,813**

**Claims priority, application France, Dec. 15, 1988, 8816525**

**Int. Cl.[5] F02K** *3/02*

**U.S. Cl. 60—39.093** **9 Claims**



1. In a turboshaft bypass engine, particularly a turbojet aero-engine of the bypass type, defining a primary air flow path and a secondary air flow path, said engine including in said primary air flow path a compressor having a casing wall delimiting a part of said primary flow path, a combustion chamber in which fuel is mixed with compressed air from said compressor and burned, and a turbine driven by gases from said combustion chamber and arranged to drive said compressor, said compressor including blow-off valves disposed in said casing wall so as to be pivotally adjustable between closed and open positions, said blow-off valves acting to discharge from said primary air flow path part of the air flow in said compressor when said valves are open, the improvement wherein said compressor also includes pivoted means associated with said blow-off valves such that said pivoted means lie against said casing wall whenever said blow-off valves are closed or are open below a predetermined angle of opening and, when said valves are opened beyond said predetermined angle of opening, said pivoted means are pivoted to project into said primary air flow path for collecting excess water carried by the air in said compressor and discharging said water from said primary air flow path.



**5,044,154**

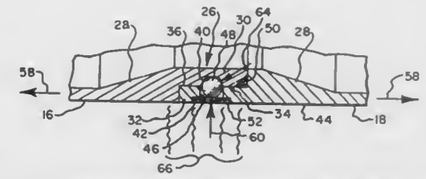
## SAFETY MECHANISM FOR RENDERING A ROCKET MOTOR NON-PROPULSIVE

**R. Hill English, Jr., and Hermann L. Miskelly, Jr., both of Huntsville, Ala., assignors to Thiokol Corporation, Ogden, Utah**

**Filed Nov. 27, 1989, Ser. No. 441,830**

**Int. Cl.[5] F02K** *9/00*

**U.S. Cl. 60—223** **20 Claims**



1. A rocket motor comprising an elongated generally cylindrical case having a first case segment, a second case segment, propellant material having an ignition temperature disposed within said case, means for attaching said first and second case segments, and means extending circumferentially about said case for retaining said attaching means in position for maintaining attachment of said first and second case segments, said retaining means including means throughout the circumference thereof for effecting loss of strength of said retaining means when said retaining means is subjected, at any location along the circumference of said retaining means, to a predetermined temperature greater than ambient temperature and less than said ignition temperature of said propellant material whereby said attaching means is released to render the rocket motor non-propulsive at said predetermined temperature.

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**5,044,155**

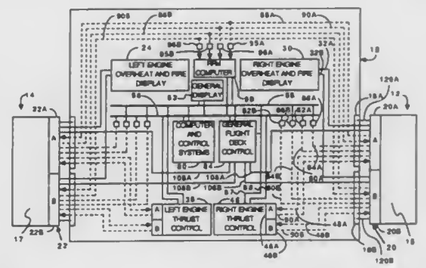
## AIRCRAFT PROPULSION CONTROL SYSTEM

**Ward H. Zimmerman, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Feb. 27, 1989, Ser. No. 317,292**

**Int. Cl.[5] F02C** *9/28*

**U.S. Cl. 60—224** **20 Claims**



1. An aircraft comprising:

an airframe including optic signal communication means;

a first propulsion module mountable upon said airframe and adapted for transmitting and receiving optic signals by way of said optic signal communication means, said first propulsion module including an engine and means for measuring engine speed,

a second propulsion module mountable upon said airframe and adapted for transmitting and receiving optic signals by way of said optic signal communication means, said second propulsion module including an engine and means for measuring engine speed, and

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means for exchanging engine speed information between said first and second propulsion modules by way of said optic signal communication means.

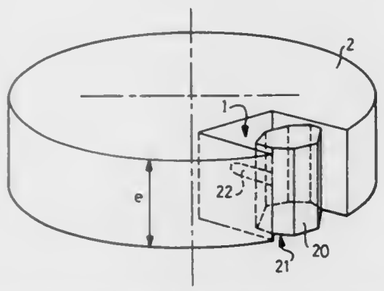
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5,044,156

## DEVICE DESIGNED TO MODIFY THE TRAJECTORY OF A PROJECTILE BY PYROTECHNICAL THRUSTERS

Jean Deffayet, Chaville, France, assignor to Thomson-Brandt Armements, Boulogne Billancourt, France

Filed Jun. 9, 1989, Ser. No. 363,856
Claims priority, application France, Jun. 10, 1988, 88 07768
Int. Cl.[5] F02K *9/00*; F24B *10/00*
U.S. Cl. 60—225 10 Claims




1. A device designed to modify the trajectory of a projectile by pyrotechnical thrusters, formed by several spaced thrusters, each of said thrusters containing a solid propellant load for forming combustion jets to give guidance thrusts that ensure that modification of the projectile trajectory, said thrusters being circumferentially arranged on a support shaped like a cylinder and centered with respect to a central axis of the projectile; wherein each of the thrusters positioned in a housing comprises a case with an interior surface, at least one face of which has a rectangular surface, said case containing a propellant load and an extruded nozzle center body connected to a rod going through the propellant load and fixed to the support, said extruded nozzle center body being spaced from said interior surface of said case for forming at least one nozzle enabling an orientation of a thrust.

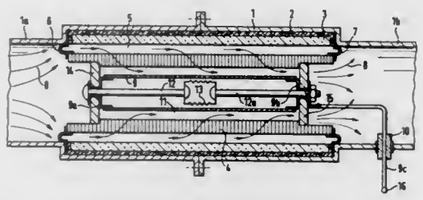
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5,044,157

## METHOD AND APPARATUS FOR ELIMINATING CARBON COLLECTED IN AN EXHAUST GAS FILTER OF AN INTERNAL COMBUSTION ENGINE

Dietmar Henkel, Neumarkt, Fed. Rep. of Germany, assignor to MAN Nutzfahrzeuge Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 420,268
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1988, 3834920
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—274 7 Claims



1. In a method of removing carbon from the exhaust gases of an internal combustion engine, especially a Diesel engine, including conveying said exhaust gases through the filter means of a carbon filter to remove said carbon, and burning the removed carbon during operation of said engine utilizing electrical energy that is introduced via an electrode arrangement, the improvement including the step of:

effecting thermal heating-up of said carbon in exhaust gas conveying chambers and said filter means with the aid of an electrostatic alternating field that is induced between said electrodes and produces radially directed, axially equalized discharge shift currents.

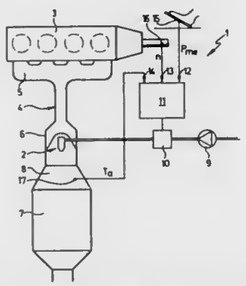
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5,044,158

## PROCESS AND DEVICE FOR CLOSED-LOOP AND OPEN-LOOP CONTROL OF THE OUTPUT OF A BURNER

Dieter Goerlich, Emmering, Fed. Rep. of Germany, assignor to Webasto Fahrzeugtechnik, Fed. Rep. of Germany

Filed Aug. 8, 1989, Ser. No. 390,891
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827402
Int. Cl.[5] F01N *3/02*
U.S. Cl. 60—274 16 Claims



1. Process for closed-loop and open-loop control of the output of a burner that is operated, at least in part, with exhaust gas from an internal combustion engine as an oxygen source for the regeneration of a particle filter, comprising continuously gradually closed-loop controlling the burner output during operation of the burner for regeneration of the particle filter as a function of a temperature occurring in an exhaust gas section located downstream from the burner and upstream of the particle filter in accordance with changing load conditions of the internal combustion engine.

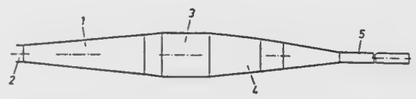
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5,044,159

## EXHAUST SYSTEM FOR TWO-STROKE CYCLE ENGINES

Klaus Landfahrer; Hans Alten; Diethard Plohberger; Christof D. Fischer, and Karl Wojik, all of Graz, Austria, assignors to AVL Gesellschart für Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Mar. 21, 1990, Ser. No. 496,639
Claims priority, application Austria, Mar. 23, 1989, 695/89; Aug. 31, 1989, 2058/89
Int. Cl.[5] F02B *27/02*
U.S. Cl. 60—314 13 Claims



1. An exhaust system for two-stroke internal combustion engines comprising at least one exhaust pipe with a front end, which is characterized by a constant cross-section, wherein said front end of said exhaust pipe is connected to a first and a second conical section, by means of first and second branch pipes of different lengths, wherein said conical sections are configured as diffusers which are connected to an exhaust header which in turn is connected to an exhaust tail pipe.



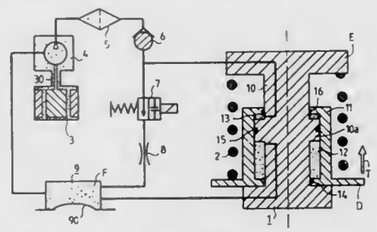
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5,044,160

## MECHANISM FOR OBTAINING A MOTION OF TRANSLATION IN A MARINE ENVIRONMENT

Francois Warnan, Rambouillet, and Alain Penain, Paris, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Dec. 12, 1989, Ser. No. 448,998
Claims priority, application France, Dec. 20, 1988, 88 16813
Int. Cl.[5] F16D *31/02*
U.S. Cl. 60—413 3 Claims



1. A mechanism for obtaining a motion of translation in a marine environment, comprising:

a hydraulic circuit comprising a given quantity of fluid;

a jack having a pull-back spring, said jack having a working position and an idle position;

a reservoir filled with a part of the fluid and having an external wall which is at least partially and equipotential wall; and

a pump driven by a motor, the pump and the motor being entirely enclosed in a common enclosure filled with another part of the fluid;

said motor actuating said pump to bring said jack to said working position and said pull-back spring being positioned so as to bring said jack from said working position to said idle position;

wherein said jack comprises a movable cylinder and a fixed piston having two ends, said two ends of said piston comprising conduits which longitudinally cross said piston and open at both ends of said piston.

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5,044,161

## DUAL EXTERNAL PIN RESERVOIR VALVES FOR TANDEM MASTER CYLINDER ASSEMBLY

Lothar Schiel, Hofheim, and Juergen Bauer, Wiesbaden, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 20, 1990, Ser. No. 482,377
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905917
Int. Cl.[5] B60T *11/20, 8/44*; F15B *7/08*
U.S. Cl. 60—589 37 Claims

1. A tandem master cylinder for hydraulic brake systems, said cylinder comprising:

a housing having a closed end longitudinal bore and adapted for attachment to a booster housing of a brake power booster;

a primary plunger piston within said longitudinal bore and movable along said longitudinal bore;

a secondary plunger piston within said longitudinal bore and movable along said longitudinal bore, the space between said primary plunger piston and said secondary plunger piston defining a primary pressure chamber and the space between said secondary plunger piston and the closed end of said longitudinal bore defining a secondary pressure chamber;

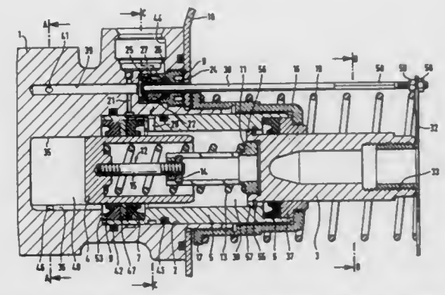
means for coupling said primary and said secondary plunger pistons together;

a return spring urging said primary plunger piston away from said housing;

a cylindrical bushing within said longitudinal bore and radially outward of said primary and said secondary plunger pistons;

a first sealing cup sealing said primary pressure chamber from the atmosphere;

second and third sealing cups fitted between said cylindrical bushing and said secondary plunger piston sealing said primary pressure chamber from said secondary pressure chamber;



first and second fluid passage means extending through said housing for conducting hydraulic fluid to said primary and said secondary pressure chambers, respectively;

means for connecting said first and said second fluid passage means to a hydraulic fluid supply tank;

and first and second valves respectively positioned within said first and said second fluid passage means and responsive independently of each other to movement of said primary plunger piston to control flow of hydraulic fluid to said primary and said secondary pressure chambers, said first and said second valves each having a component which projects to outside said housing and which is accessible outside said housing to adjust the closing travel of the associated valve.

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5,044,162

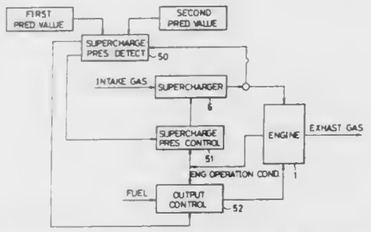
## CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH SUPERCHARGER

Hiroshi Kinoshita, Hiroshima, and Ikuo Okamoto, Hiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 15, 1989, Ser. No. 366,514
Claims priority, application Japan, Jun. 16, 1988, 63-149629
Int. Cl.[5] F02B *37/00*
U.S. Cl. 60—602 10 Claims

1. A control system for an internal combustion engine comprising supercharging means for supercharging intake gas introduced into the engine, pressure detecting means for detecting supercharging pressure of the intake gas, supercharging pressure control means for controlling the supercharging pressure to a first reference pressure provided in accordance with an engine operating condition, engine output control means for controlling an engine output by means other than the supercharging pressure control means, the engine output being restricted by the engine output control means when the super-

charging pressure is increased beyond a second reference pressure which is greater than the first reference pressure, the




second reference pressure being increased as the first reference pressure is increased.

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**5,044,163**

## PROCESS AND PLANT FOR GENERATING STEAM USING WASTE HEAT

**Hermann Bruckner, Uttenreuth, and Lothar Stadie, Höchstadt; Josef Pulec, Herzogenaurach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

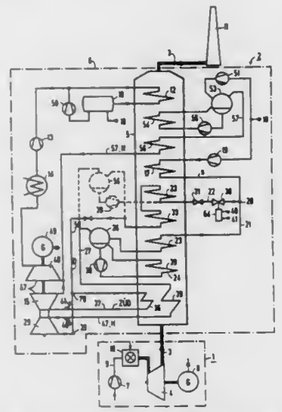
**PCT No. PCT/DE89/00081, § 371 Date Aug. 8, 1990, § 102(e) Date Aug. 8, 1990, PCT Pub. No. WO89/07700, PCT Pub. Date Aug. 24, 1989**

**PCT Filed Feb. 10, 1989, Ser. No. 555,398**

**Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804605**

**Int. Cl.[5] F01K *21/00***

**U.S. Cl. 60—677** **16 Claims**



1. A process for operating a steam turbine that has at least one medium-pressure part and one high-pressure part, with the aid of a waste heat steam generator through which hot gas flows, which comprises:

a) supplying superheated steam generated in a high-pressure heating surface system to the high-pressure part of the steam turbine;

b) admixing a smaller, adjustable quantity of steam with the exhaust steam of the high-pressure part of the steam turbine, which smaller quantity of steam is produced in medium-pressure evaporator heating surfaces in the waste heat steam generator from preheated feedwater supplied to it;

c) superheating the mixture of the smaller quantity of steam and the exhaust steam in intermediate superheater heating surfaces of the waste heat steam generator;

d) delivering the thus-superheated steam mixture to the medium-pressure part of the steam turbine; and

e) approximating the temperature of the steam at the outlet of the intermediate superheater heating surfaces to the temperature of the steam at the outlet of the high-pressure superheater heating surfaces.

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**5,044,164**

## METHOD OF PREPARING A CHEMICAL COMPOUND

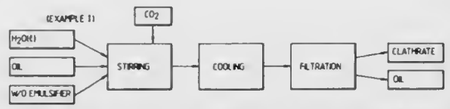
**Rodney D. Bee, St. Neots, Great Britain, assignor to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.**

**Filed Apr. 10, 1989, Ser. No. 335,618**

**Claims priority, application United Kingdom, Apr. 8, 1988, 8808330**

**Int. Cl.[5] F17C *11/00***

**U.S. Cl. 62—46.1** **12 Claims**




1. Method of preparing a clathrate of a gas-hydrate-forming material and water, the method comprising:

(i) preparing an emulsion of liquid water in a continuous fluid phase including the gas-hydrate-forming material while using a water-in-oil emulsifier; and

(ii) controlling the temperature and pressure of the emulsion such that the gas-hydrate-forming material is dissolved into liquid water and the clathrate is formed.

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**5,044,165**

## CRYO-SLAMMER

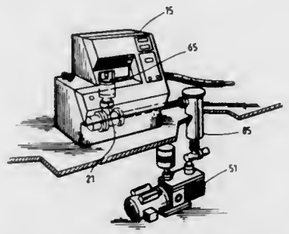
**John G. Linner; Stephen A. Livesey; Carmen Piunno; Mark Zaltsberg, all of Woodlands, and Frank Gibson, Spriog, all of Tex., assignors to Board of Regents, The University of Texas, Austin, Tex.**

**Continuation-in-part of Ser. No. 102,395, Sep. 29, 1987, which is a continuation-in-part of Ser. No. 989,701, Dec. 3, 1986, Pat. No. 4,707,998.**

**The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.**

**Int. Cl.[5] B01D *8/00***

**U.S. Cl. 62—55.5** **30 Claims**




1. Apparatus for cryo-slamming a tissue specimen comprising:

a. a cryogenic block comprising a detachable cryo-slam surface and a cryofinger, said cryo-slam surface comprising a highly polished and mirror-finished face adapted to receive a tissue specimen;

said cryofinger comprising:

(1) a thermally conductive tubular member and a thermally conductive closure member closing one end of said tubular member, said closure member being adapted to detachably secure said cryo-slam surface to said cryofinger;



(2) an orifice extending within the other open end of the tubular member and defining an inner cavity; said inner cavity conformed to enclose a heating unit;

b. a cooling jacket jacketing at least part of said tubular member but not the open end of the tubular member and capable of containing a fluid coolant;

c. an evacuatable chamber housing said cryogenic block and said cooling jacket;

d. a vacuum line connected to the evacuatable chamber and adapted to be connected to a source of vacuum;

e. a cryogenic condenser in the vacuum line adapted to cool fluids passing through the vacuum line; and

f. a molecular sieve trap in the vacuum line.

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**5,044,166**

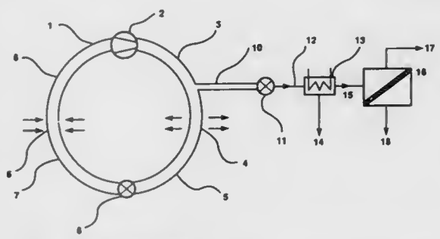
## REFRIGERATION PROCESS WITH PURGE AND RECOVERY OF REFRIGERANT

**Johannes G. Wijmans, Menlo Park, and Richard W. Baker, Palo Alto, both of Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.**

**Filed Mar. 5, 1990, Ser. No. 488,730**

**Int. Cl.[5] F25B *47/00***

**U.S. Cl. 62—85** **19 Claims**



1. A process, comprising:

a) a refrigeration step, comprising compressing and expanding a refrigerant, said step being carried out in a refrigeration system;

b) a purge step, comprising withdrawing from said refrigeration system a purge gas comprising said refrigerant and air;

c) a purge-gas treatment step, comprising (i) a condensation step, followed by (ii) a membrane separation step.

wherein said condensation step comprises;

bringing said purge gas to a condition characterized in that the concentration of said refrigerant is greater than its saturation concentration at said condition, so that condensation of a portion of said refrigerant occurs;

withdrawing a condensed stream comprising said refrigerant in liquid form;

withdrawing a non-condensed stream depleted in said refrigerant compared with said purge gas; and wherein said membrane separation step comprises; providing a membrane having a feed side and a permeate side; passing said non-condensed stream from said condensation step across said feed side;

withdrawing from said permeate side a permeate stream enriched in said refrigerant compared with said non-condensed stream.

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**5,044,167**

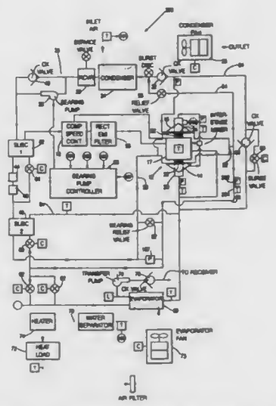
## VAPOR CYCLE COOLING SYSTEM HAVING A COMPRESSOR ROTOR SUPPORTED WITH HYDRODYNAMIC COMPRESSOR BEARINGS

**John M. Champagne, Seattle, Wash., assignor to Sundstrand Corporation, Rockford, Ill.**

**Filed Jul. 10, 1990, Ser. No. 550,433**

**Int. Cl.[5] F25B *1/00***

**U.S. Cl. 62—115** **11 Claims**



6. A method of operating a refrigeration system having a compressor with a rotor rotatably supported by a plurality of hydrodynamic bearings lubricated by oiless pressurized liquid refrigerant and pressurizing refrigerant which flows to a condenser providing liquid refrigerant which flows to an evaporator in fluid communication with the condenser and the compressor comprising:

providing pressurized liquid refrigerant flow to the hydrodynamic bearings from the compressor without flow through a subcooler; and

providing liquid refrigerant flow from the hydrodynamic bearings, through at least one subcooler, which cools the refrigerant flowing from the hydrodynamic bearings to the evaporator.

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**5,044,168**

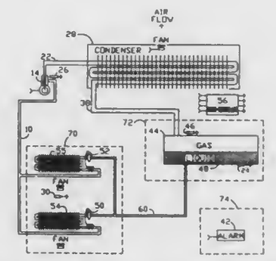
## APPARATUS AND METHOD FOR LOW REFRIGERANT DETECTION

**Lyman W. Wycoff, 827 Haymount Dr., Indianapolis, Ind. 46241**

**Filed Aug. 14, 1990, Ser. No. 567,314**

**Int. Cl.[5] F25B *49/00*; F24F *11/02***

**U.S. Cl. 62—126** **8 Claims**




1. A method of detecting a low refrigerant condition in a refrigeration system having a compressor for compressing the

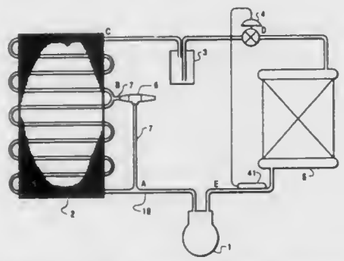
VOL 1130 ISS 1 SE 3 1991 UMI



refrigerant from a suction pressure to a discharge pressure, the method comprising the steps of:
(a) turning off the compressor for a time period;
(b) measuring the suction pressure while the compressor is off;
(c) measuring the discharge pressure while the compressor is off;
(d) computing the pressure difference between the discharge pressure and the suction pressure; and
(e) indicating a low refrigerant condition when the pressure difference is below a predetermined value.

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**5,044,169**
**CONTROL DEVICE FOR USE IN AN AUTOMATIVE AIR CONDITIONING SYSTEM**
**Atsuo Inoue, Isesaki, Japan, assignor to Sanden Corporation, Japan**
**Filed Jul. 12, 1989, Ser. No. 378,861**
**Claims priority, application Japan, Jul. 12, 1988, 63-171891**
**Int. Cl.[5] F25B *41/00***
**U.S. Cl. 62—196.4** **12 Claims**

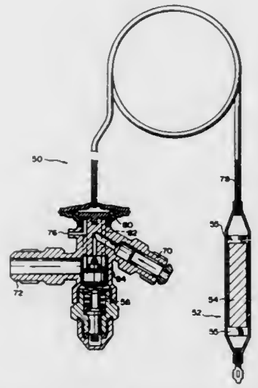


1. An automotive air conditioning system comprising:
a compressor having a variable displacement mechanism and an outlet side,
a condenser,
a decompression device,
an evaporator;
said compressor, condenser, decompression device and evaporator being serially arranged to form a closed refrigerant circulation path, and
a control device associated between the compressor and condenser, said control device comprising:
a bypass conduit connecting said outlet side of said compressor with an intermediate portion of said condenser; and
pressure adjusting means associated with said bypass conduit for adjusting the pressure of refrigerant in said condenser
said outlet side of said compressor having a first flow path and a second flow path, said first flow path being from an inlet of said condenser through the entire condenser, said second flow path being through said bypass conduit and thence through an intermediate portion of said condenser.

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**5,044,170**
**REFRIGERATION SYSTEM AND A THERMOSTATIC EXPANSION VALVE BEST SUITED FOR THE SAME**
**Hazime Tanaka, Yokohama, Japan, assignor to Fujikoki Mfg. Co., Ltd., Tokyo, Japan**
**Division of Ser. No. 321,351, Mar. 10, 1989, Pat. No. 4,979,372.**
**This application Sep. 11, 1990, Ser. No. 580,566**
**Claims priority, application Japan, Mar. 10, 1988, 63-55009**
**Int. Cl.[5] F25B *41/04***
**U.S. Cl. 62—225** **2 Claims**

1. A thermostatic expansion valve comprising:
a thermo-tube means for detecting superheated vapor temperature of a refrigerant at an outlet of an evaporator in a refrigeration system; and
a valve body being adapted to be driven by a pressure of a working fluid sealed in the thermo-tube means and serving to change a pressure thereof in accordance with the detected superheated vapor temperature;
said valve body also serving to control an amount of the refrigerant flowing into the evaporator in accordance with the superheated vapor temperature;
said thermo-tube means containing a gas adsorbent;
said working fluid in the thermo-tube means being constituted by at least two working fluids different in temperature-induced change of an amount of adsorption to the gas adsorbent;



said working fluid in the thermo-tube means driving the valve body and resisting a sum of a superheated vapor pressure of the refrigerant at the outlet of the evaporator and an urging force of a valve-body urging means; and
said pressure of the working fluid in the thermo-tube becoming greater than a resultant force to be resisted, thereby moving the valve body to an open position, when an evaporating temperature of the refrigeration system is lower than a predetermined value and a difference between the detected superheated vapor temperature and the evaporating temperature, that is a superheat, becomes lower than zero degrees K.

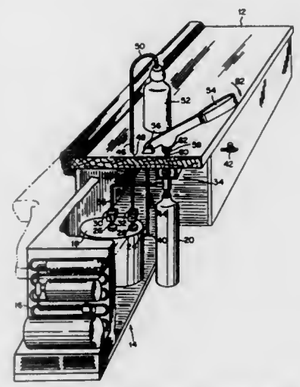
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**5,044,171**
**COUNTER WITH INTEGRAL CARBONATED BEVERAGE DISPENSER**
**Eli Farkas, 3842 Neptune Ave., Brooklyn, N.Y. 11224**
**Filed Nov. 6, 1989, Ser. No. 432,375**
**Int. Cl.[5] B01F *3/04***
**U.S. Cl. 62—306** **8 Claims**

1. A counter with internal carbonated beverage dispenser, comprising:
a) a counter with a bottom platform;
b) a cylindrical mixing drum containing three orifices and being disposed on said bottom platform and under said counter, said three orifices being a water inlet, a carbon dioxide inlet, and a carbonated beverage outlet, said carbon dioxide inlet containing a dispensing valve so that said carbon dioxide will flow to said mixing drum only when a drink is required;
c) a refrigerating unit disposed on said bottom platform and under said counter, said refrigerating unit being disposed adjacent to said mixing drum so that the contents of said mixing drum remain cold;



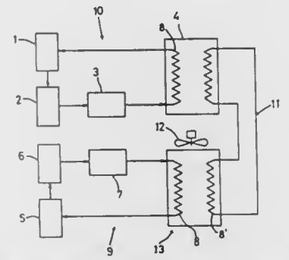
d) a separate carbon dioxide cylinder disposed on said bottom platform and under said counter so that all of the



unsightly components are hid under the counter out of site.

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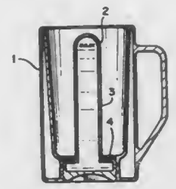
**5,044,172**
**AIR CONDITIONING APPARATUS**
**Yoshinori Inone, Takarazuka; Masao Endo, Sennan, and Shinji Miura, Suita, all of Japan, assignors to Takenaka Corporation, Osaka, Japan**
**PCT No. PCT/JP87/00842, § 371 Date Aug. 24, 1989, § 102(e) Date Aug. 24, 1989, PCT Pub. No. WO89/03962, PCT Pub. Date May 5, 1989**
**PCT Filed Oct. 30, 1987, Ser. No. 393,922**
**Int. Cl.[5] F25B *7/00***
**U.S. Cl. 62—335** **17 Claims**



1. An air conditioning apparatus utilizing a cold accumulating-cooling cycle, said apparatus comprising:
a cold accumulating cycle (**10**) including a first compressor (**1**), a first condenser (**2**), a first decompressing mechanism (**3**) and a heat accumulator (**4**) for accumulating coldness;
a cooling cycle (**9**) including a second compressor (**5**), a second condenser (**6**), a second decompressing mechanism (**7**) and an evaporator (**8**);
a cold transfer circuit (**11**) including a heat exchanger means (**8'**) utilizing the coldness accumulated in said heat accumulator (**4**);
said cold accumulating cycle (**10**), cooling cycle (**9**) and said cold transfer circuit (**11**) being provided independently of each other; and
a cooling device (**13**) utilizing said evaporator (**8**) and said heat exchanger means (**8'**) as cooling means thereof.

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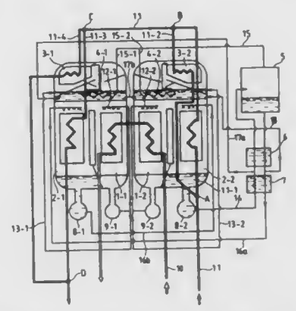
**5,044,173**
**COLD-PRESERVING CUP**
**Chuang S. Cheng, No. 199, Ta Chu Rd., Ta Chu Village, Lu Chu Hsiang, Tao Yuan Hsien, Taiwan**
**Filed Aug. 7, 1990, Ser. No. 563,719**
**Int. Cl.[5] F25D *3/08***
**U.S. Cl. 62—372** **2 Claims**



1. A cup for containing and cooling a beverage comprising:
a) a hollow body having an open top, an interior wall and a bottom wall;
b) an aperture formed in the bottom wall;
c) a hollow stick including an upper end and a base, the hollow stick being receivable through the aperture and disposable within the body to define an annular space between the hollow stick and the interior wall of the body for containing a beverage;
d) cooperating threaded portions formed in the bottom wall around the aperture and the base of the hollow stick to permit a detachable and liquidtight threaded engagement between the base of the hollow stick and the bottom wall of the body; and
e) means contained within the hollow stick for maintaining a refrigerated temperature to cool the beverage contained in the annular space.

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**5,044,174**
**ABSORPTION TYPE REFRIGERATING MACHINE**
**Masaji Nagao, Ami, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**
**Filed Sep. 8, 1989, Ser. No. 404,787**
**Claims priority, application Japan, Sep. 16, 1988, 63-229747**
**Int. Cl.[5] F25B *15/00***
**U.S. Cl. 62—476** **19 Claims**



1. An absorption type refrigerating machine comprising an evaporator means, absorber means, condenser means, a regenerator means, solution heat exchanger means, solution pump means, refrigeration pump means, and piping means for supplying chilled water into said evaporator means and cooling water into said absorber means and said condenser means, wherein each of said evaporator means, absorber means, condenser means, and regenerator means is divided into N stages, each of said Nth stages of said evaporator means are arranged so as to share a common enclosure with corresponding Nth stages of

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said absorber means, a first stage of said divided absorber means and a first stage of said divided evaporator means are combined so as to form a first unit, a second stage of said absorber means and a second stage of said evaporator means are combined to form a second unit, said first and second units are arranged in succession, and

each of said Nth stages of said regenerator means are arranged so as to be enclosed by said N stages of said evaporator means, a first stage of said condenser means and a first stage of said regenerator means are combined to form a third unit, a second stage of said condenser means and a second stage of said regenerator means are combined to form a fourth unit, and wherein said third and fourth units are arranged in succession.

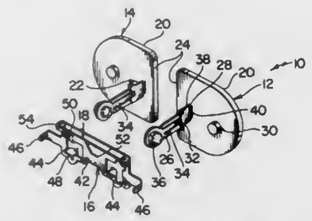
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**5,044,175**

## CONVERTIBLE BROOCH

Luca Razza, 29 Trellis Dr., West Warwick, R.I. 02893

Filed Sep. 19, 1990, Ser. No. 585,869
Int. Cl.[5] A44C *13/00*
U.S. Cl. 63—1.1 2 Claims




1. A convertible brooch comprising first and second earring elements, each of said earring elements including an ornament portion having front and rear sides and pressure clip type attaching means on the rear side of the ornament portion thereof for releasably attaching the earring element to an ear lobe of a wearer, each of said ornament portions having a mating edge portion, the mating edge portions of said ornament portions being receivable in mating engagement with each other, each of said pressure clip attaching means including a pivotable clip arm, a stationery clip pad, and means for resiliently biasing the clip arm thereof toward the clip pad thereof, connecting means engageable with the attaching means of each of said earring elements for securing said earring elements together so that the ornament portions thereof are positioned in substantially side-by-side relation with said mating edge portions in mating engagement and with the front sides thereof facing in substantially the same direction, said connecting means including a connecting plate which is receivable on said clip arms for connecting said earrings elements together, said clip arms being engageable with said connecting plate for retaining said connecting plate in a locked position wherein said connecting plate is operative for rigidly connecting said earring elements together in side-by-side relation, said connecting plate having a pair of rearwardly extending flanges at opposite ends thereof, said clip arms terminating in outer terminal ends, the outer terminal ends of said clip arms engaging said flanges for retaining said connecting plate in said locked position, and support means on said connecting means for releasably supporting said connecting means with said earring elements attached thereto on a wearer.

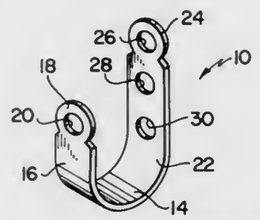
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**5,044,176**

## SUPPORT CRADLE FOR EARRING

Wendy J. King, Johnston, R.I., assignor to Winning Jewelry Company, Inc., Johnston, R.I.

Filed Jan. 22, 1990, Ser. No. 468,031
Int. Cl.[5] A44C *7/00*
U.S. Cl. 63—12 5 Claims




1. A support cradle for use with a pierced earring, comprising a body portion having a first leg that terminates in an upper portion having an opening formed therein and that is normally located on the front surface of a wearer's earlobe, a second leg extending upwardly in parallel relation with respect to said first leg and being joined to said first leg by an intermediate curved bight portion, a plurality of openings formed in said second leg in spaced vertical relation, said openings defining positions of adjustment for receiving a post of said earring therein, said post of said earring extending through the opening in said first leg and through the wearer's earlobe for being received in a selected opening in said second leg, said bight portion being received under the earlobe of the wearer to provide a support thereof when said earring is mounted on the earlobe of the wearer, and thereby reducing stresses on the wearer's earlobe as exerted by the earring mounted thereon.

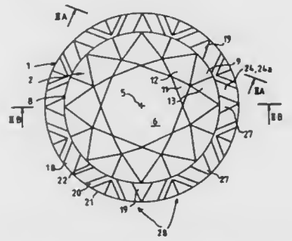
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**5,044,177**

## SETTING SUPPORT FOR A FINE ORNAMENTAL PRECIOUS STONE

Henri Favre, Saint Claude, France, assignor to Diamonts de Joaillerie Henri Favre, Saint-Claude, France

Continuation of Ser. No. 249,327, Sep. 26, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,481
Claims priority, application France, Sep. 30, 1987, 8713528
Int. Cl.[5] A44C *17/02*
U.S. Cl. 63—26 25 Claims



1. A metal setting support for an ornamental, precious stone having a diameter on the order of approximately one to a few millimeters, the stone having a longitudinal axis, a table perpendicular to the longitudinal axis, a crown, and a collet, the crown and the collet being cut to have a plurality of facets, at least some of the facets having substantially collinear edges, whereby the facets have a plurality of sets of substantially collinear edges, said setting support having a longitudinal axis and comprising:

an annular front transverse face lying in a general transverse plane P perpendicular to said setting support longitudinal axis, said annular front face having concentric circular inner and outer edges;

axial bore means extending through said front transverse face for coaxially receiving the stone, said bore means having a front end part forming a seat for axially receiving the collet of the stone;

a plurality of separate setting claw means extending from said annular front transverse face for assuming respective positions on the crown of the stone for ensuring the rigid retention of the stone in said setting support; and

a plurality of mirror facet means formed in said annular front transverse face along respective chords of said outer edge of said annular front transverse face for increasing the apparent dimension and brilliance of the stone, each of said mirror facet means extending in a direction D and being inclined relative to said plane P, and each of said mirror facet means having first and second edges parallel to each other and to said direction D, to a chord of said outer edge of said annular front transverse face, and to one of said sets of substantially collinear edges of the facets of the stone;

wherein a pair of said claw means separated by a single intermediate one of said claw means defines a pair of reference claw means, wherein a chord of said outer edge of said annular front transverse face which extends between a pair of said reference claw means defines a boundary chord, wherein said plurality of mirror facet means is divided into a plurality of groups of mirror facet means, and wherein each of said groups extends substantially from a boundary chord to said outer edge of said annular front transverse face.



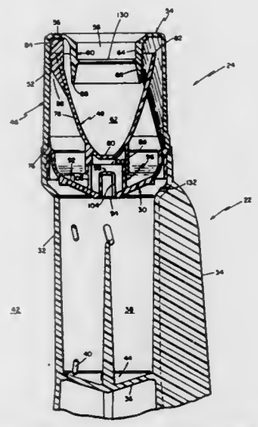
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**5,044,178**

## RINSE AID DISPENSER

Ronald L. Altnau, Sr., Ripon, Wis., assignor to Speed Queen Company, Ripon, Wis.

Filed Jan. 28, 1991, Ser. No. 647,335
Int. Cl.[5] D06F *39/02*
U.S. Cl. 68—17 A 17 Claims



1. A rinse aid dispenser adapted for mounting on top of an agitator post of an automatic washing machine that sequences through wash, spin, and rinse cycles, and dispensing a liquid rinse aid at the end of a spin cycle down into a chamber in the agitator post from where the rinse aid flows out through a slot in the agitator post into a spin basket, said dispenser comprising:

a cup for holding said rinse aid during said wash cycle, said cup having an outwardly sloped wall wherein said rinse aid is forced up and over said sloped wall by centrifugal force during said spin cycle;

a housing having a substantially cylindrical wall surrounding said cup wherein said rinse aid from said cup is retained against said cylindrical wall by centrifugal force during said spin cycle, said housing further having a cover comprising a horizontal top with a central fill hole surrounded by a cylindrical barrier that extends downwardly into said cup and has a lower edge that is proximately spaced from an interior portion of said cup; and

a bottom having a central drain opening and a peripheral portion sealed to said substantially cylindrical wall of said housing wherein said rinse aid retained against said cylindrical wall of said housing by centrifugal force during said spin cycle drains down through said drain opening into said agitator post by gravity at the completion of said spin cycle.

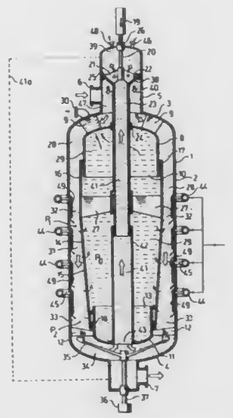
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**5,044,179**

## STABILIZING PRESSURE AND FLOW CONDITIONS IN A SCREENING APPARATUS

Finn Jacobsen, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Division of Ser. No. 423,245, Oct. 18, 1989. This application Aug. 23, 1990, Ser. No. 571,120
Claims priority, application Sweden, Nov. 11, 1988, 8804082
Int. Cl.[5] D21D *5/04*
U.S. Cl. 68—181 R 17 Claims

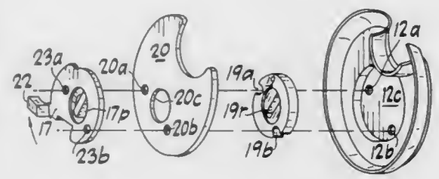


1. An apparatus for separating liquid from a fibrous cellulosic pulp mixture comprising a vessel having an axis, a screen body mounted inside said vessel for movement to and fro along said axis, a drive device for effecting said movement, said vessel having at one end an inlet for pulp to be treated and at an opposite end an outlet for treated pulp, said body and said vessel including between them a space along which the pulp moves in passing from said inlet to said outlet at least partially in response to a portion of the movement of said screen body in said vessel, said screen body defining a space to receive liquid extracted through said screen body, said vessel having a liquid outlet, said vessel having at one end a cylindrical housing and a piston movably mounted in said housing so as to define a first chamber for a liquid and a second chamber to be filled with the pulp mixture, said second chamber being in direct communication with said inlet for pulp, a connection channel for being filled substantially with liquid and disposed to extend between said first chamber and adjacent said outlet for treated pulp.

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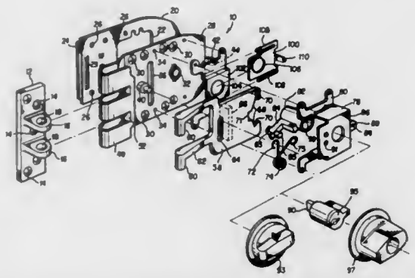


5,044,180
**REKEYABLE SHROUDED LOCK**
Horst Lebrecht, Reedsburg, Wis., assignor to Master Lock Company, Milwaukee, Wis.
Filed May 25, 1990, Ser. No. 529,059
Int. Cl.[5] E05B 67/02, 67/28
U.S. Cl. 70—48 9 Claims



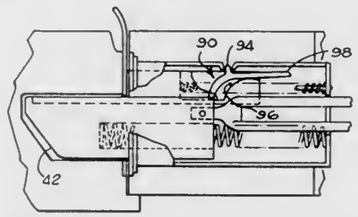

1. In a shrouded shackle lock having a shell with a front half portion and a rear half portion, a curved shackle, a lock cylinder, and a mechanism connecting the lock cylinder to the shackle, the improvement comprising
an opening in the rear half shell portion;
a removable cover plate shaped to cover a second opening in the front half portion;
fastener means for fastening such cover plate to the shell and aligned to permit a wrench tool to be inserted into the rear half shell opening to engage the said fastener means;
a fastener means holding means within the shell for capturing and holding the fastener means when the cover has been disengaged from the fastener means; and
rotatable blocking means positioned in the shell to block insertion of the wrench into fastener means when the lock is in its closed position.

5,044,181
**DROPBOLT LOCK ASSEMBLY**
Stevie C. Roop, Dugspur, and Peter H. Field, Salem, both of Va., assignors to Medeco Security Locks, Inc., Salem, Va.
Filed Mar. 22, 1990, Ser. No. 497,174
Int. Cl.[5] E05B 63/12
U.S. Cl. 70—131 15 Claims



1. A dropbolt lock assembly of the type including: a plurality of spaced apart knuckles, a movable dropbolt slidable within the spaced knuckles, a cam assembly operably connected to the dropbolt to move the dropbolt from a locked position to an unlocked position, the cam assembly being operable by a cylinder lock, a cover for the cam assembly, and means for securing the lock assembly to a door to be locked with improvements comprising: the spaced knuckles being formed integrally with an assembly plate formed of stamped and rolled steel, a mounting base plate flush with the assembly plate means, screw holes in the assembly plate and base plate for attachment of such plates flush with the surface of a door to which the lock is mounted, and screw means for attaching the cover to the lock assembly, the screw means positioned to be accessible between the spaced knuckles only when the dropbolt is in unlocked position.

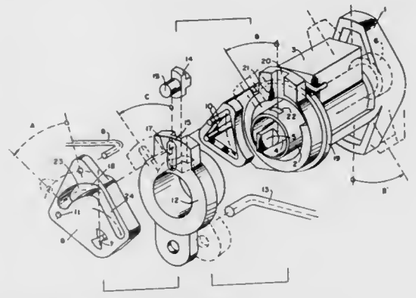
5,044,182
**AUTOMATIC DEADBOLT**
Clyde D. Totten, 31317 Unit F, The Old Rd., Castaic, Calif. 91384
Continuation of Ser. No. 249,575, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 216,074, Jul. 7, 1988, abandoned. This application Aug. 16, 1990, Ser. No. 568,632
Int. Cl.[5] E05B 55/00
U.S. Cl. 70—143 13 Claims




1. A door latch assembly comprising;
a latch bolt housing for mounting in a door with a first outer end thereof substantially flush with the edge of the door, said latch bolt housing having a first portion adjacent said first outer end thereof;
a latch bolt slidable within said first portion of said latch bolt housing between a latch bolt withdrawn position, through a latch bolt extended position to a deadbolt extended position;
a sensing pin within and slidable with respect to said first portion of said latch bolt housing and said latch bolt between sensing pin extended and sensing pin retracted positions corresponding to said latch bolt extended and withdrawn positions, respectively, said sensing pin being limited in motion with respect to said latch bolt so as to be forced to said sensing pin retracted position when said latch bolt is moved to the latch bolt withdrawn position, said sensing pin having a cam surface;
a latch bolt spring means yieldably encouraging said latch bolt to the deadbolt extended position;
a sensing pin spring means yieldably encouraging said sensing pin to the sensing pin extended position;
a cam member rotatably supported in said latch bolt housing by cam member support means adjacent a second opposite end of said latch bolt housing, said cam member when in a first position preventing said latch bolt from extending beyond said latch bolt extended position, said cam member being rotatable in a first direction to withdraw said latch bolt and rotatable in a second direction toward a second position to allow said latch bolt to move to said deadbolt position and to retain the same at said last named position until said cam member is again rotated in said first direction; and,
a latch bolt retaining member operatively connected to said latch bolt housing, said retaining member having a first portion adapted to engage said sensing pin cam surface such that said retaining member engages said latch bolt preventing said latch bolt from extending beyond the extended position when said sensing pin is in the extended position, said retaining member further having a second portion adapted to engage said sensing pin cam surface such that said retaining member is disengaged from said latch bolt when said sensing pin is in said retracted position allowing said latch bolt to extend into the deadbolt position.



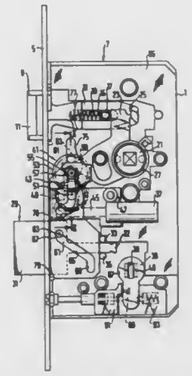
5,044,183
**SECURING LOCK MECHANISM HAVING A DISENGAGEABLE CONTROL DEVICE**
Guy Neyret, Oullins, France, assignor to Neiman S. A., Courbevoie, France
Continuation of Ser. No. 684,800, Dec. 21, 1984, abandoned. This application Jan. 21, 1988, Ser. No. 148,165
Claims priority, application France, Dec. 28, 1983, 83 20907
Int. Cl.[5] E05B 9/08
U.S. Cl. 70—223 10 Claims



1. A lock mechanism comprising
a) a housing,
b) a rotor mounted within a bore of the housing,
c) a lock opening lever rotatable between angularly spaced locking and unlocking positions,
d) a lock actuating element drivably connected to said lock opening lever for movement thereby into locking and unlocking positions,
e) manually operable means attached to said rotor for rotating the rotor,
f) a securing and release lever movable between angularly spaced securing and release positions and drivably connected with said rotor through lost motion means,
g) an actuator for effecting movement of said securing and release lever between its securing and release positions independently of said rotor,
h) a skirt attached to said rotor so as to be rotatable therewith, and
i) a slider movable by said securing and release lever between a first position on release to effect a driving connection between the rotor and the lock opening lever by engagement of said slider with an aperture in the skirt and a second position on securing to disconnect the drive between the rotor and the lock opening lever by withdrawal of the slider from the aperture in the skirt and to permit said rotor and manually operable means to rotate freely, wherein the slider comprises a lug cooperating with a slot formed in said securing and release lever, said slot having an arcuate portion coaxial with the pivotal axis of the lock opening lever and a rectilinear portion contiguous with said arcuate portion.

5,044,184
**LOCK**
Michael Herbers, Telgte; Karl-Heinz Spahn, Ostbevern; Anton Uekötter, Telgte, and Dieter Wienert, Senden, all of Fed. Rep. of Germany, assignors to Aug. Winkhaus GmbH & Co. Kg
Filed Oct. 16, 1989, Ser. No. 421,653
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1988, 3835349; European Pat. Off., Sep. 28, 1989, 89117975.6
Int. Cl.[5] E05B 47/00
U.S. Cl. 70—277 19 Claims

1. A lock, comprising:
a lock housing (7; 207),
a profiled cylinder (38: 209) having a cylinder axis is insertable into an insertion opening (87: 211) of the lock housing (7: 207) and shaped in conformity with the insertion opening (87; 211), said cylinder comprises in a cylinder part (97) an axially extending key passage (39) for the reception of a key and a radially protruding flange (99:213) on the cylinder part (97),
a reading device (40) provided on the profiled cylinder (38; 209), which detect control information of the key introduced into the key passage (39) and delivers electric signals corresponding to the control information,
a slide piece (103; 221) guided displaceably transversely toward and away from the cylinder axis of the profiled cylinder (38; 209) on the lock housing (7; 207) with a plurality of electrical contact elements (107; 219) with a plurality of electrical contact elements (107; 219) mounted on said slide piece, counter-contact elements (109; 215) mounted on the profiled cylinder (38; 209), arranged to receive said contact elements and at least one detent element (121; 227) on said slide element, with a complementary detent element (123; 229) on the profiled cylinder (38; 209), arranged to receive said detent for fixing said detent in relation to the profiled cylinder (38; 209), and a setting device (115, 117; 231) in engagement with said slide piece by means of which the slide piece (103; 221) is slide piece by means of which the slide piece (103; 221 is movable in relation to the profiled cylinder (38; 209) for the mutual engagement of the detent elements (121, 123; 227, 229) and the contact elements (107, 109; 215, 219), and the contact elements (107; 219) and the detent element (121, 227) are arranged on the slide piece (103; 221) so that the setting device (115, 117; 231), for the fastening of the profiled cylinder (38; 209) on the lock housing (7; 207), moves said slide towards said profiled cylinder whereby firstly the detent element (121; 227) moves into engagement with said complementary detent element (123; 229) for fixing the profiled cylinder (38; 298), and only after such engagement brings the contact elements (107; 219) into contact with the counter-contact elements (109; 215).



5,044,185
**BYPASS KEY SYSTEM AND METHODS**
James R. Green, 111 Bridgers Ave., Auburndale, Fla. 33823
Filed Nov. 7, 1990, Ser. No. 610,143
Int. Cl.[5] E05B 9/04
U.S. Cl. 70—368 16 Claims

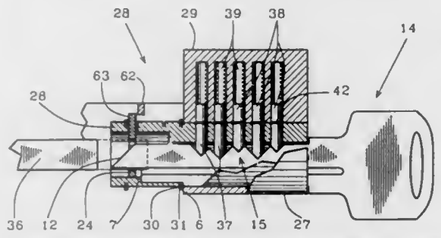
1. A lock-service bypass-key system comprising:
a control key blank having a key blade sized and shaped to fit inside of the keyway of the select lock cylinder and extended at least the length of the lock cylinder from an entry point of a keyway in the lock cylinder to a terminal end of a lock-cylinder attachment section of the lock cylinder and having a key-blade top profile made to oper-

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ate a select lock cylinder and a double ward-cut step profile in a key-blade bottom sized and shaped to allow passage of a control-key tip into the lock-cylinder attachment section and through a lock-attachment aperture in the lock-cylinder attachment section; and

a bypass key formable from the control key blank having a key blade sized and shaped to fit inside of a keyway of a select lock cylinder and extended at least the length of the




lock cylinder from an entry point of a keyway to a terminal end of a lock-cylinder attachment section in the lock cylinder with a key-blade top low enough to pass under spring-loaded tumblers of the lock cylinder and having a double ward-cut step profile in a key-blade bottom sized and shaped to allow passage of a bypass-key tip into the lock-cylinder attachment section and through a lock-attachment aperture in the lock-cylinder attachment section.

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**5,044,186**

## SYSTEM AND METHOD OF DETECTING ROLL POSITION IN A ROTARY STRAIGHTENER

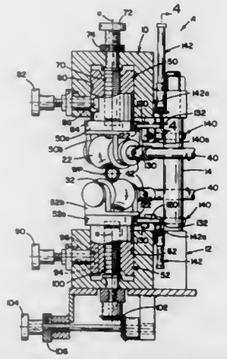
**Phillip G. Taylor, Hartville, and Robert L. Bair, Canton, both of Ohio, assignors to Turner Machine Company, Salem, Ohio**

**Division of Ser. No. 465,463, Jan. 16, 1990, Pat. No. 4,989,432. This application Oct. 15, 1990, Ser. No. 597,564**

**The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.**

**Int. Cl.[5] B21D *3/04***

**U.S. Cl. 72—35** **26 Claims**



1. A method of resetting the angularly adjustable cross rolls, and selected axially adjustable ones of the said cross rolls of a rotary tube straightener, for straightening new tube products as they are passed through the straightener along a given feed path between opposed pairs of the said cross rolls supported in respective support frames rotatively and axially mounted in a fixed housing for angular and axial movement relative thereto about respective parallel central axes, the said frames each being provided with an axially facing abutment surface and an angularly facing abutment surface relative to the respective said central axis and the housing being provided with means for directly measuring the axial and the angular positions of the said abutment surfaces relative to the said fixed housing, which method comprises the step of reset adjusting the angular and axial operating positions of the said adjustable cross rolls until the said direct measurements of the positions of the said abutment surfaces relative to the fixed housing equal respective predetermined known values.

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**5,044,187**

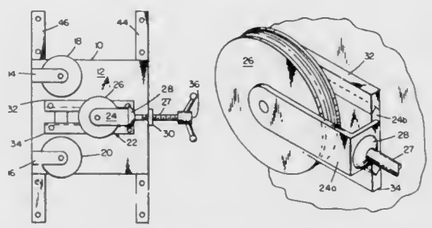
## METAL TUBING ROLLER OR CROWNER

**Willaim E. King, 6758 S. Heggenes Rd., Clinton, Wash. 98236**

**Continuation of Ser. No. 256,176, Oct. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 114,706, Oct. 30, 1987, abandoned. This application Jun. 29, 1990, Ser. No. 546,705**

**Int. Cl.[5] B21D *3/04***

**U.S. Cl. 72—175** **4 Claims**



1. A metal tube rolling apparatus comprising a mounting plate having a means for securing said mounting plate to a wall so that said planar face extends vertically;

a pair of rollers journal mounted in fixed positions to said planar face of said mounting plate and extending outward therefrom with horizontal axes of rotation perpendicular to said face when said mounting plate is arranged in a vertical operation position; a middle roller adjustably mounted to said mounting plate for movement transversely to a line between the two fixed rollers; and the rollers are arranged on the planar face to engage the metal tube during rolling so that the two fixed rollers are on side of the tube and the adjustable roller is on the opposite side of the tube with the fixed rollers being offset from the adjustable roller;

and middle roller mounting means journal mounting said adjustable roller for rotation about a horizontal axis perpendicular to said face when said mounting plate is arranged in a vertical operating position; said middle roller mounting means including an inverted downwardly-opening U-shaped roller-mounting bracket having inner and outer legs connected at the top with the middle roller rotatably-mounted between the two legs, the inner leg of which is slidably constrained in a pair of guide bars mounted to the face of said mounting plate to maintain said adjustable roller in a coplanar relationship with the two fixed rollers during operation, middle roller adjustment means positioned above said roller mounting bracket and contacting said mounting bracket centrally above said middle roller whereby downward force exerted by said



adjustment means will be directed centrally of said mounting bracket;

and said pair of guide bars fastened to the face of said mounting plate with one guide bar having a vertical edge parallel to and opposed by a corresponding vertical edge of the other guide bar edge, the opposing guide bar edges each having a V-shaped groove provided therein extending the length of the guide bar, each V-shaped groove extending along its respective guide bar edge being defined by a pair of flat intersecting surfaces, each flat intersecting surface of each V-shaped groove oriented at an angle to the planar face of the mounting plate; and the constrained leg of said middle roller mounting bracket having V-shaped vertical edges provided therein and interfitted with said pair of flat intersecting surfaces of each guide bar V-shaped groove whereby said mounting bracket is solely confined between and by said guide bars and tracks within said guide bar grooves whereby said middle roller mounting bracket may be moved parallel to said mounting plate face without interference from contact with said face and with less friction and better lateral positioning.

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**5,044,188**

## BENDING DEVICE FOR SMALL-DIAMETER PIPES

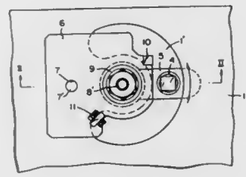
**Satoru Nonaka, Shizuoka, Japan, assignor to Usui Kokusai Sangyo Kaisha Ltd., Japan**

**Filed Apr. 20, 1990, Ser. No. 512,664**

**Claims priority, application Japan, Apr. 25, 1989, 1-105085**

**Int. Cl.[5] B21D *7/024***

**U.S. Cl. 72—217** **6 Claims**



1. A bending device for small-diameter pipes, comprising: a frame having a semicircular slot; a rotary actuator arranged below the frame; the rotary actuator including a rotary shaft and a rotary arm projecting generally radially from the rotary shaft of the rotary actuator; a support member erected on a location on the rotary arm spaced from the rotary shaft and passing through the semicircular slot of the frame; a pressure roll attached to the top end of the support member; a bolt extending upward from the frame; a positioning pin extending upwardly from the frame at a location spaced from the bolt and the semicircular slot; at least one plate-like jig having a central hole and a positioning hole disposed relative to one another for receiving the bolt and the positioning pin extending upwardly from the frame, said jig further comprising a positioning wall and a stopper wall disposed to be in proximity to the semicircular slot when the jig is mounted to the bolt and positioning pin of the frame; and a shaping roll attachable to the upper portion of the bolt for retaining the plate-like jig to the frame, whereby the pipe is bent around the shaping roll by movement of the pressure roll by the rotary actuator, and whereby the positioning wall and the stopper wall define the limits of the bend.

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**5,044,189**

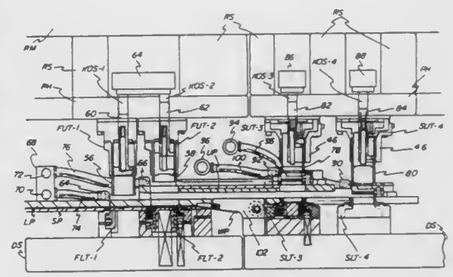
## SCRAP GUIDING AND CHOPPING IN A SHELL PRESS

**Kenneth P. Gnau, Beavercreek, and Stephen P. Common, Dayton, both of Ohio, assignors to Dayton Reliable Tool & Mfg. Co., Dayton, Ohio**

**Filed Jan. 19, 1990, Ser. No. 467,472**

**Int. Cl.[5] B21D *28/02***

**U.S. Cl. 72—336** **14 Claims**



1. Tooling for a press having a bed and a ram driven toward and away from the bed through operating strokes for the production of shells, as for can ends, comprising:

a punch plate including upper tooling and a die shoe including lower tooling, said punch plate and die shoe having a front and a back and opposite sides and being adapted for mounting on the ram and bed, respectively, of the press for opening and closing action of said tooling;

said upper and lower tooling including first and second stations located at said front and back of said punch plate and said die shoe with said second stations aligned front-to-back with corresponding said first stations;

means for guiding sheet metal material into the press between said upper and lower tooling along a front to back path;

said first tooling stations including a first set of tooling for severing blanks from the sheet material on the path leaving a skeleton of scrap material as the sheet metal material is advanced along the path and shaping the blanks into shell preforms;

means for moving the preforms from the scrap material by lifting the preforms above the path and for moving the preforms to corresponding second stations for completion of the shells;

means defining a scrap passage through said lower tooling and said die shoe including an entrance to said scrap passage at a position between said first station and said second station;

means for guiding the skeleton of scrap material from said first station into said entrance to said scrap passage; and

chopper means including

(i) a chopper block supported at said entrance under the path of the scrap skeleton and

(ii) a chopper plate located over said entrance and above the scrap skeleton on the opposite side of said chopper block from said first station and

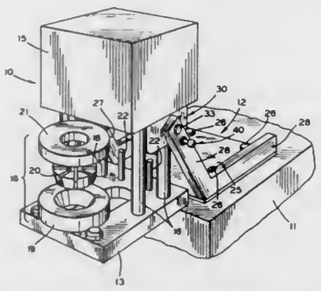
(iii) a chopper blade means on an edge of said chopper plate adjacent said chopper block and cooperative with said chopper block to reduce the skeleton to small pieces;

said chopper plate having a guiding undersurface for guiding the scrap skeleton downward out of the front to back path to confine those pieces into said scrap passage, said guiding undersurface being located downstream of said chopper blade means.

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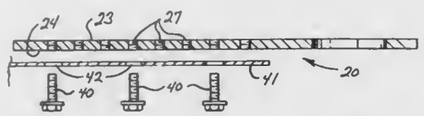


**5,044,190**
**BASE FOR ROTATABLY SUPPORTING A COLLET CRIMPING MACHINE**
Steven R. Hoff, Ft. Wayne, Ind., and Richard I. Wermer, Hicksville, Ohio, assignors to Dana Corporation, Toledo, Ohio
Filed Sep. 4, 1990, Ser. No. 578,077
Int. Cl.[5] B21D *41/04*
U.S. Cl. 72—402 9 Claims



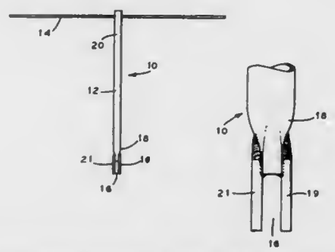
1. An apparatus for crimping a tubular metallic fitting onto the end of a hose comprising:
a collet crimping machine including a lower frame plate, a die assembly carried on said lower frame plate, and means supported on said lower frame plate for selectively engaging said die assembly so as to crimp a tubular metallic fitting onto the end of a hose, said collet crimping machine defining a center of gravity located on an axis;
a base for rotatably supporting said lower frame plate, die assembly, and engaging means of said collet crimping machine for movement about said axis between first and second positions, said base including a rotatable bracket connected to said collet crimping machine, said bracket having an aperture formed therethrough; and
means for selectively retaining said collet crimping machine in a desired rotational position relative to said base, said means for selectively retaining including a detent pin slidably mounted on said base and being movable into cooperation with said bracket aperture to retain said collet crimping machine in a desired rotational position.

**5,044,191**
**FRAME PULLING BAR AND TOOL SYSTEM**
Paul D. Combs, 1268 Oakfield Dr., North, Columbus, Ohio 43229
Filed Mar. 21, 1990, Ser. No. 497,922
Int. Cl.[5] B21D *1/12*
U.S. Cl. 72—422 6 Claims



1. A clamping bar for use in the repair of automobile and vehicle bodies and frames which require pulling and stretching back to their original shape, and with which it is necessary to attach powerful pulling devices that are securely clamped to the bodies and frames, comprising:
(a) an elongated bar including a clamping portion and an anchor portion, with the clamping portion comprising a generally rectangular cross-section with opposing flat sides connected by opposing edges, the flat sides having a plurality of threaded holes constructed to receive a plurality of matching threaded bolts, the threaded holes being in space relation one to the next and aligned with the longitudinal axis of elongation of the bar, and
(b) the anchor portion including means to anchor the pulling devices.

**5,044,192**
**LUG STRAIGHTENER**
Tei S. Sanmiya, Walden, Canada, assignor to Inco Limited, Toronto, Canada
Filed Jun. 12, 1990, Ser. No. 537,068
Claims priority, application Canada, Jun. 19, 1989, 603214
Int. Cl.[5] B21D *1/10*
U.S. Cl. 72—458 3 Claims

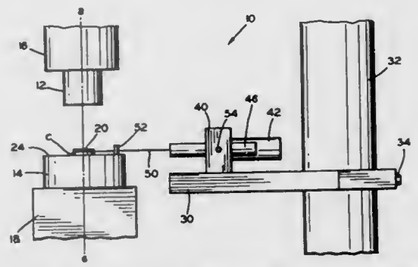


1. A tool for straightening a lug of an anode for correcting suspension of the anode while the anode remains in an electrolytic cell comprising:
an elongated shaft having a lower portion and an upper portion, the shaft having a length of at least about 1 m for waist level operating of the tool, the shaft being hollow for simplified hand-held transportation, the lower portion of the shaft having two opposing rectangular bars depending downwardly from the lower portion, and a transverse slot extending longitudinally upward between the rectangular bars, the rectangular bars having a transverse rectangular cross section, the slot having two parallel flat working surfaces, a width and a depth, the slot being adapted for receiving the lug by placing the working surfaces of the slot adjacent opposing sides of the lug, the width being adapted for twisting the lug and the depth being adapted for pivoting the lug, and
a handle attached to the upper portion of the shaft, the handle being hollow for simplified hand-held transportation, the handle extending laterally outward in substantially opposing directions orthoganal to a transverse direction of the slot from the shaft for turning the shaft to cause the slot to straighten twisted lugs within the slot and for visually determining alignment of a lug without moving and for tilting the shaft for pivoting the lug to correct tilted suspension of the anode.

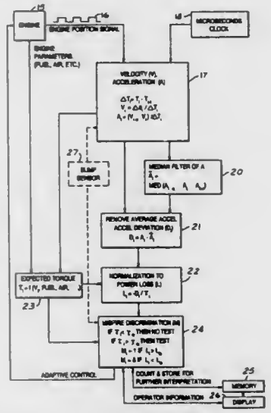
**5,044,193**
**LATERAL DISPLACEMENT MEASURING APPARATUS & METHOD**
Paul M. Fudacz, Chicago, Ill., assignor to Dana Corporation, Toledo, Ohio
Filed Jun. 29, 1990, Ser. No. 546,493
Int. Cl.[5] G01N *3/08*
U.S. Cl. 73—818 11 Claims

1. An apparatus for measuring lateral expansion of an extrudable solid specimen subjected to compressive forces along an axis; said apparatus comprising:
(a) a pair of platens relatively movable with respect to one another along said axis, each platen comprising a load bearing surface generally orthogonal to said axis, one of said surfaces defining a specimen support for supporting said specimen;
(b) an elongate flexible high strength tensile member having two ends, wherein an intermediate portion thereof is adapted for being looped about said specimen for making lateral contacting engagement therewith, said tensile member comprising an axial thickness less than the thickness of said specimen; and
(c) a reference platform positioned adjacent said support surface, a displacement transducer fixed to said platform, one end of said tensile member being coupled to said transducer, an adjustment means also fixed to said platform, the other end of said tensile member being coupled to said adjustment means; whereby said tensile member may be positioned tautly about said specimen via said adjustment means prior to test of said specimen, so that upon test of said specimen, said specimen is compressed and said tensile member is further tensioned by lateral expansion of said specimen, whereby said displacement transducer produces a signal corresponding to magnitude of said expansion.



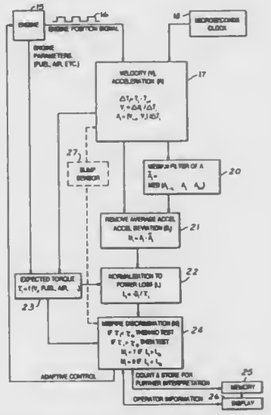


**5,044,194**
**MISFIRE DETECTION IN AN INTERNAL COMBUSTION ENGINE**
John V. James, Walled Lake; James M. Dosdall, Grosse Ile, and Kenneth A. Marko, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Division of Ser. No. 572,650, Aug. 24, 1990. This application Feb. 4, 1991, Ser. No. 650,102
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—112 1 Claim



1. A method for determining, in a multi-cylinder engine, the power produced by a particular firing of a particular cylinder relative to other firings of said cylinders surrounding said particular firing, said method comprising the steps of:
measuring an acceleration value corresponding to said particular firing and each of said other firings;
determining a deviation of said acceleration value of said particular firing from said acceleration values of said other firings;
sensing predetermined engine parameters during operation of said multi-cylinder engine;
determining an expected torque proportional to the torque that would be produced by said particular firing in the absence of any operational faults in said engine from said sensed predetermined parameters; and
determining a ratio between said deviation and said expected torque.

**5,044,195**
**MISFIRE DETECTION IN AN INTERNAL COMBUSTION ENGINE**
John V. James, Walled Lake; James M. Dosdall, Grosse Ile, and Kenneth A. Marko, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Aug. 24, 1990, Ser. No. 572,650
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—117.3 26 Claims



23. Apparatus for detecting misfires occurring during individual cylinder firings of a multi-cylinder combustion engine comprising:
measuring means for measuring engine acceleration corresponding to each of a plurality of cylinder firings of each of said multiple cylinders during operation of said engine;
averaging means coupled to said measuring means for determining an average acceleration over a series of said cylinder firings substantially centered on a selected one of said cylinder firings;
deviation means coupled to said measuring means and said averaging means for determining deviation of acceleration of said selected cylinder firing from said average acceleration;
torque means for determining an expected torque during each of said cylinder firings; and
first comparing means coupled to said deviation means and said torque means for detecting a misfire of said selected cylinder firing by performing a first comparison in response to said deviation of acceleration and the expected torque corresponding to said selected cylinder firing.

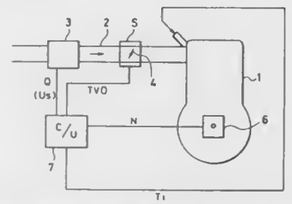
VOL
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5,044,196
**METHOD AND APPARATUS FOR DETECTING DETERIORATION OF A HOT-WIRE TYPE SUCKED AIR FLOW QUANTITY-DETECTING DEVICE FOR AN ENGINE**

Naoki Tomisawa, and Hiroshi Okada, both of Isesaki, Japan, assignors to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

Filed Jun. 20, 1990, Ser. No. 540,615
Claims priority, application Japan, Jun. 20, 1989, 1-155694
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.2 5 Claims

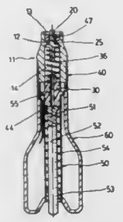



1. A method for detecting deterioration of a hot-wire type sucked air flow quantity-detecting device for detecting the flow quantity of air sucked in an engine, which comprises the step of emitting a diagnosis instruction when the output voltage of the hot-wire type sucked air flow quantity-detecting device is to be changed while the engine is in the substantially non-revolving state, the step of measuring the ratio of the change of the output voltage of the sucked air flow quantity-detecting device on receipt of the instruction from a diagnosis-instructing unit, and the step of judging deterioration when the change ratio measured by an output voltage change ratio-measuring unit is smaller than a predetermined value.

5,044,197
**AIR PRESSURE MEASURING HEAD**

Hsi K. Weng, No. 306, Her Shuenn Rd., Her Mei, Chang Huah, Taiwan

Filed May 30, 1990, Ser. No. 530,709
Int. Cl.[5] B60C *23/02*; G01L *7/16*
U.S. Cl. 73—146.8 3 Claims

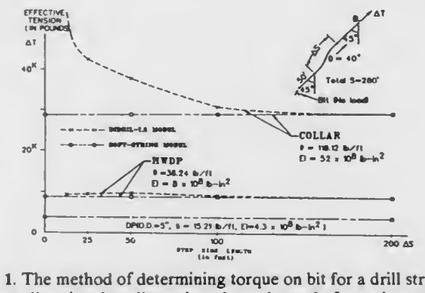


1. A measuring head for a gauge for measuring an air pressure of a tire, adapted to conduct therethrough said air pressure to act upon a piston and an indicating rod of said gauge having a first spring urging said piston to act against said air pressure, and comprising:
an insulating head tube having a through hole;
a conductible actuting rod received in said through hole and having an upper portion protruding beyond said through hole, an intermediate annular flange, and a lower portion;
a conductible plug connected to said head tube, having an axial through hole, and adapted to mount thereunder said piston;
a second spring mounted between said plug and said intermediate annular flange for tighlty urging said annular flange against said head tube; and
a conductible sleeve sleeved on said head tube and connecting thereto a conducting wire.

5,044,198
**METHOD OF PREDICTING THE TORQUE AND DRAG IN DIRECTIONAL WELLS**

Hwa-Shan Ho, Spring, Tex., assignor to Baroid Technology, Inc., Houston, Tex.

Division of Ser. No. 365,192, Jun. 12, 1989, Pat. No. 4,972,703, which is a continuation of Ser. No. 253,075, Oct. 3, 1988, Pat. No. 4,848,144. This application Jun. 28, 1990, Ser. No. 546,046
Int. Cl.[5] E21B *47/00, 12/02*
U.S. Cl. 73—151 11 Claims




1. The method of determining torque on bit for a drill string in a directional well passing through earth formations, the method comprising the steps of:
(1) taking a surface measurement indicative of the torque on bit;
(2) calculating drill string stiffness of at least a portion of the drill string;
(3) determining contact locations between the portion of the drill string and side walls of the well as a function of the calculated drill string stiffness and a presumed borehole trajectory;
(4) determining the magnitude of the contact force between the sidewalls of the well and the drill string at each of the determined contact locations;
(5) determining the magnitude of torque drag on the portion of the drill string from the determined contact forces; and
(6) determining torque on bit as a function of the determined torque drag and the surface measurement.

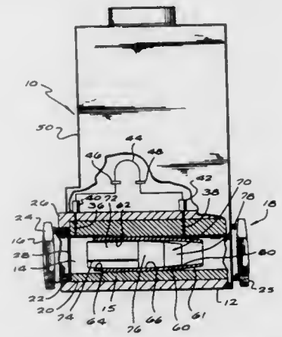
5,044,199
**FLOWMETER**

Charles F. Drexel, Rolling Hills, Calif., and Daniel T. Mudd, St. Charles, Mo., assignors to DXL International, Inc., Torrance, Calif.

Filed Nov. 13, 1989, Ser. No. 437,053
Int. Cl.[5] G01F *5/00*
U.S. Cl. 73—202 63 Claims

1. A flow splitter section in a flowmeter having an axial passage therethrough comprising
1) a surface defining a longitudinal fluid path having a central longitudinal axis, said fluid path defining a cylindrical bore adjacent to at least one tapered calibration bore,
2) a flow splitter adjustably secured in said fluid path, so as to form an annular gap between said fluid path surface and said flow splitter, said annular gap capable of maintaining a laminar fluid flow, said flow splitter defining a cylindrical section adjacent to at least one tapered calibration section, and the surface said cylindrical section being substantially parallel to the surface of said cylindrical bore and both being substantially parallel to the axis of said fluid path, and the taper of said calibration section at most diverging slightly away from the taper of said calibration bore and
3) means for securing said flow splitter in said fluid path, said securing means being located in the region of said annular gap formed between the cylindrical bore surface and said





cylindrical section and where said securing means enables axial adjustment of the position of said flow splitter in said fluid path.

5,044,200
**ALL PURPOSE LAWN AND GARDEN MARKER**

C. Millard Dailey, Peoria, and John F. Chmela, Mt. Prospect, both of Ill., assignors to Green Genie Products, Inc., Peoria, Ill.

Filed Jul. 20, 1990, Ser. No. 555,199
Int. Cl.[5] G01F *19/00*; G09F *19/00*
U.S. Cl. 73—427 2 Claims

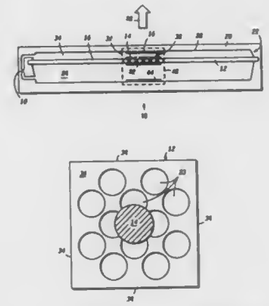


1. A lawn and garden marker comprising a stake portion; a water gauge at the top end of said stake portion; a sign holder, said sign holder portion comprising a pair of spaced apart legs formed at the top end of said stake portion, said spaced-apart legs and said water gauge being disposed with respect to one another to vertically support between them a sign; a platform integrally molded with said stake portion, said platform being substantially horizontally disposed and providing a step to step on to assist in pushing the stake portion into the ground; said water gauge having indicia on at least one wall thereof graduated so as to provide an indiciation of the amount of rain fall or water sprinkled on the lawn; and indicia on said stake portion for providing an indication of the height of the grass.

5,044,201
**DOUBLE-INTEGRATING SILICON ACCELERATION SENSING DEVICE**

Louis P. Farace, Mesa, and John D. Titus, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 361,524, Jun. 5, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 566,789
Int. Cl.[5] G01C *21/16*; G01P *15/125*
U.S. Cl. 73—503 13 Claims

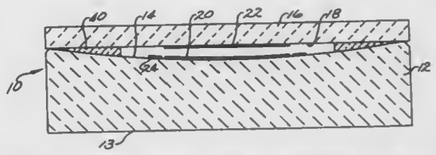


1. An acceleration sensing device comprising:
device housing including a sealed cavity;
flexible diaphragm dividing said sealed cavity into a plurality of small cavities;
said plurality of small cavities filled with a generally incompressible fluid;
conduit means connecting said plurality of small cavities;
said conduit means allowing flow of said fluid between said plurality of small cavities:
a plurality of capacitor plates :
a first of said plurality of capacitor plates coupled to said flexible diaphragm and a second of said plurality of capacitor plates coupled to said housing and adjacent to said first of said plurality of capacitor plates; and
orifice means for controlling the rate of flow of said generally incompressible fluid between said plurality of small cavities.

5,044,202
**PRESSURE TRANSDUCER APPARATUS**

Robert Southworth, Pawtucket; James L. Tomlinson, North Smithfield, both of R.I., and James P. McAndrews, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 408,657, Sep. 18, 1989. This application Sep. 17, 1990, Ser. No. 583,744
Int. Cl.[5] G01L *7/08, 9/12*
U.S. Cl. 73—724 7 Claims




1. A capacitive pressure transducer comprising a relatively rigid substrate having an outer periphery and a top, the top having a recess formed therein defined by a curved bottom wall surface, a relatively flexible diaphragm formed of material having essentially zero elastic hysteresis,
a layer of electrically conductive material attached to a central portion of the bottom wall surface and the dia-

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phragm respectively, electrically conductive lead means connected to the respective layers and adapted to be coupled to signal conditioning circuit means,

the diaphragm disposed on, in contact with and supported by the substrate in alignment with the curved bottom wall surface and annular securing means received on and in engagement with the curved bottom wall surface of the substrate adjacent the outer periphery for securing the diaphragm to the substrate.

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5,044,203

## PRESSURE MEASUREMENT DEVICE FOR FLUIDS FLOWING IN LINES

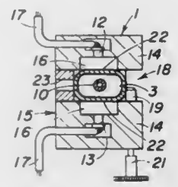
Peter P. Wiest, Hessenallee 8, D-1000 Berlin 19, and Hubert G. Fuchs, Berlin, both of Fed. Rep. of Germany, assignors to Peter P. Wiest, Berlin, Fed. Rep. of Germany

Filed May 30, 1990, Ser. No. 530,601

Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3918142

Int. Cl.[5] G01L *7/08, 9/00*

U.S. Cl. 73—730 11 Claims




1. A pressure measurement system for fluids flowing in tubing lines of a pressure-controlled roller pump for use in arthroscopy and urethroscopy, comprising: a tubing line formed with a cushion element supporting first and second thin-walled membrane elements said membrane elements being substantially planar and substantially parallel, spaced a predetermined distance defining first and second tubing surfaces, said thin-walled membrane elements being under pressure exerted by fluid at a pressure level prevalent inside the tubing; first pressure sensor means, including a first pressure sensor element in contact with one of said surfaces, for monitoring the outside of said membrane fluid pressure of said fluid within said membrane; second pressure sensor means, including a second pressure sensor element in contact with one of said surfaces, for monitoring the outside of said membrane to measure pressure of said fluid within said membrane; a support arrangement including a first support wall and a second support wall defining a space for receiving said thin-walled membrane elements, said first support wall supporting said first pressure sensor means with said first pressure sensor element being positioned for contact with one of said surfaces, said second support wall supporting said second pressure sensor means positioning said second pressure sensor element in contact with one of said surfaces and, evaluating electronic means connected to each of said first sensor means and said second sensor means for monitoring measured values of said first sensor means and said second sensor means.

5,044,204

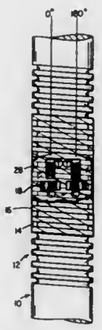
## DEVICE WITH STRAIN GAGED THREADED PORTION

George A. Leighton, Carver, Mass., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 9, 1990, Ser. No. 550,113

Int. Cl.[5] F16B *31/02*

U.S. Cl. 73—761 8 Claims




1. A device comprising

threads,

a filled area in which said threads are filled by a filling material, and

strain gages adhered to said filling material.

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5,044,205

## METHOD FOR MONITORING DEFORMATIONS WITH LIGHT WAVEGUIDES

Reinhard Wolff; Hans-Joachim Miesseler, and Martin Weiser, all of Cologne, Fed. Rep. of Germany, assignors to Strabag Bau-AG, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 101,844, Sep. 28, 1987, abandoned. This application Aug. 24, 1990, Ser. No. 571,838

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635053

Int. Cl.[5] G01L *1/24*

U.S. Cl. 73—800 9 Claims




1. In a method for monitoring deformations of components by means of light waveguides which are connected securely to the component at least over part of the length of the latter and are connected to a measuring apparatus with which the transmitting capacity of the light waveguides and the transit time and/or the damping of the light pulses sent through the light waveguides are continuously or intermittently monitored, the improvements comprising: a light waveguide being mechanically prestressed at least to such an extent before being securely connected to the component that at all levels of deformation to be expected in the component the stressing of said waveguides remains in the tension range; said light waveguide being laid in a casing tube arranged within or outside of the component and connected securely thereto; and, said light waveguide being mechanically prestressed in said casing tube and connected securely to said casing tube by grouting said casing tube with a composition which adheres to said tube and to said light waveguide.



5,044,206

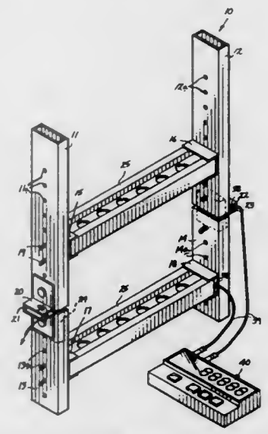
## STRUCTURAL LOAD ANALYSIS APPARATUS

Graham R. Williams, 8 Larch Croft, Redwood Drive, Tividale, Warley, West Midlands, England

Filed Apr. 23, 1990, Ser. No. 512,333

Int. Cl.[5] G01N *19/00*

U.S. Cl. 73—804 9 Claims




1. A structural load analysis apparatus comprising, in combination,

a first and second box beam secured in aligned end to end relationship spaced from a third and fourth box beam aligned in an end to end relationship, and

a first and second deflection indicator plate secured respectively to each lower end of first and third box beam, and

a third and fourth deflection indicator plate secured to each upper end of the second and fourth box beams, and

load deflection beam members mounted between confronting sides of the first and third box beams and the second and fourth box beams for accommodating a predetermined load thereon to effect deflection between the first and third deflection indicator plates and the second and fourth deflection indicator plates to enable measurement of such deflection based on the predetermined load, and

measurement means positioned between the first and third and second and fourth deflection indicator plates to measure the deflection therebetween.

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5,044,207

## MASS FLOW MEASUREMENT

David I. H. Atkinson, Farnham, and Steven C. Doe, Camberley, both of England, assignors to Schlumberger Industries Limited, Farnborough, England

Filed Mar. 11, 1988, Ser. No. 167,087

Claims priority, application United Kingdom, Mar. 11, 1987, 8705758

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.37 5 Claims

1. A mass flow transducer comprising:

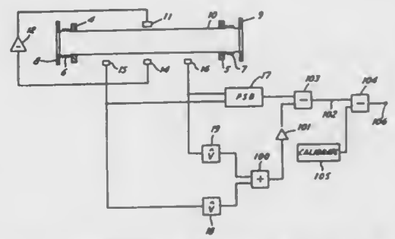
a vibratable element mass flow sensor;

means for exciting said element into vibration;

means for determining the value of the phase difference in the vibration between first and second positions along the sensor;

means for determining an amplitude of the vibration;

means for correcting the phase difference value in dependence upon the amplitude, such that the corrected value is representative of mass flow; and




means for determining the amplitude ratio of the vibration occurring at the first and second positions, and wherein the correction is dependent upon the amplitude ratio.

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5,044,208

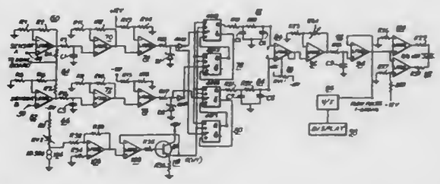
## DOUBLE-PIGTAIL-SHAPED, CORIOLIS-TYPE MASS FLOW RATE METER

Michael E. Corown, and Randy L. Oliver, both of Greenwood, S.C., assignors to Neptune Measurement Company, Greenwood, S.C.

Filed Mar. 18, 1987, Ser. No. 27,522

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.38 42 Claims



8. A meter comprising:

a pair of continuous conduits each having an inlet and an outlet separated from each other by at least four flow reversing bends which are in the same angular direction;

a driver which oscillates the conduits relative to each other about respective oscillation axes; and

a circuit responsive to the relative response of the conduits about respective response axes in the presence of flow through the conduits and of oscillation thereof about the respective oscillation axes to provide an indication of the mass flow rate of said flow.

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5,044,209

## REACTION FORCE FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 477,488, Feb. 9, 1990, and a continuation-in-part of Ser. No. 492,919, Mar. 13, 1990. This application May 3, 1990, Ser. No. 518,173

Int. Cl.[5] G01F *1/20*

U.S. Cl. 73—861.72 23 Claims

7. An apparatus for measuring reaction force flow as a measure of flow rate of media comprising in combination:

a) a first conduit extending from one extremity thereof connected to an inlet leg and secured to a support, and including a bend at the other extremity opposite to said one extremity; and a second conduit extending from one extremity thereof connected to an outlet leg and secured to a support, and including a bend at other extremity opposite to said one extremity, wherein said first and second conduits are disposed in a symmetric arrangement with respect to one another and the other extremities of said

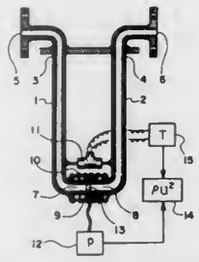
VOL 1130 ISS 1 SE 3 1991 UMI



first and second conduits are connected to one another by a coupling allowing a relative displacement therebetween;

b) means for measuring pressure of media contained in the combination of the first and second conduits existing at a midsection of said combination of the first and second conduits;

c) means for measuring a force tending to create relative




displacement between the other extremities of the first and second conduits; and

d) means for determining momentum flow rate of the media from said force tending to create said relative displacement minus a portion of said force created by the pressure of media determined from said measured pressure of the media existing at said midsection of the combination of the first and second conduits.

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**5,044,210**

**METHOD AND MEANS FOR TESTING THE STRENGTH OF PLANT STALKS**

**Kevin W. Kuhn, Tipton; Stephen L. Letsinger, Kempton; Joseph W. Keaschall, Sharpsville; Charles T. Cunnyngham, Tipton; Alan P. Floyd, Elwood; Keith G. Freeman, Kirklin, and James B. Ray, Tipton, all of Ind., assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa**

**Filed Nov. 1, 1990, Ser. No. 609,164**

**Int. Cl.[5] G01N** *3/20*

**U.S. Cl. 73—865.3** **3 Claims**



1. A method of testing the relative strength of a plant stalk, comprising:

engaging the stalk with an arm extending horizontally in a first position and having opposite first and second ends, the first end being operatively connected to a prime mover so as to be pivotal about a vertical axis;

moving the prime mover and arm forwardly whereby the arm pivots rearwardly to a second position when the stalk is sufficiently strong to resist the force of the forwardly moving arm, and whereby the arm pushes the stalk over when the stalk is not sufficiently strong to resist the force of the forwardly moving arm.

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**5,044,211**

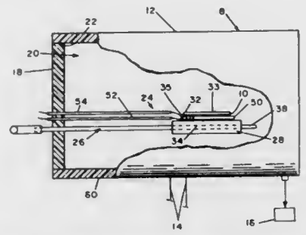
**METHOD FOR DETERMINING THE EFFECTS OF OXYGEN PLASMA ON A SPECIMEN**

**Ann F. Whitaker, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Jul. 28, 1989, Ser. No. 386,174**

**Int. Cl.[5] G01N** *33/00;* **B05C** *11/00*

**U.S. Cl. 73—866** **1 Claim**



1. A method for testing a temperature controlled specimen in a plasma environment, whereby the effects of said plasma environment on said specimen may be ascertained comprising:

placing the specimen on a holder and positioning said specimen holder in a chamber of a test apparatus disposed for generating said plasma environment therein;

reducing the chamber pressure and back-filling said chamber with a gas to a stable pressure;

temperature controlling said specimen and allowing said specimen to stabilize at a set temperature at said stable pressure for a predetermined time;

generating said plasma environment by applying a source of electric power for ionization of said gas to produce the desired plasma environment after said specimen has stabilized at said set temperature;

continuously sensing the temperature of said specimen during exposure thereof to said plasma environment to sense any temperature variations of said specimen during said exposure as said temperature variations occur in said specimen;

adjusting the temperature of said specimen to said set temperature responsive to said temperature variations;

ascertaining the nature of said specimen after exposure thereof to said plasma environment to determine if any fractures have occurred as a result of said exposure.

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**5,044,212**

**COAXIAL ENGINE STARTER**

**Shuzoo Isozumi, and Keiichi Konishi, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan**

**Filed Feb. 16, 1990, Ser. No. 481,077**

**Claims priority, application Japan, Feb. 17, 1989, 1-38681; Apr. 20, 1989, 1-102210**

**Int. Cl.[5] F02N** *15/06*

**U.S. Cl. 74—7 A** **2 Claims**

1. An engine starter comprising:

an electric motor having a hollow armature rotary shaft;

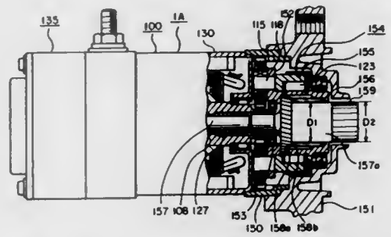
a solenoid switch for energizing said electric motor and having a push rod extending into said hollow armature rotary shaft;

an output rotary shaft having a pinion disposed on one end thereof, said output rotary shaft being axially slidable to move said pinion into and out of engagement with an engine ring gear; and

an over-running clutch unit mounted on said output rotary shaft and having a clutch outer member connected to said electric motor for rotation thereby, and a clutch inner member driven by said clutch outer member through a plurality of rollers and including helical splines on its inner circumferential surface;

said output rotary shaft having a large-diameter portion





having formed on its outer circumference outer helical splines which are in mesh with inner helical splines in the clutch inner member of said over-running clutch, and having a small-diameter end portion of a diameter smaller than said larger-diameter portion, and said pinion having an outer diameter no greater than that of said small-diameter end portion of said output rotary shaft.

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**5,044,213**

**SPEED CONTROL APPARATUS FOR A BICYCLE**

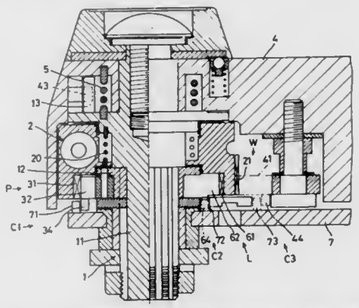
**Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 27, 1989, Ser. No. 441,252**

**Claims priority, application Japan, Nov. 29, 1988, 63-303424; Nov. 29, 1988, 63-303425; Nov. 29, 1988, 63-303426; Apr. 11, 1989, 1-91226**

**Int. Cl.[5] F16H** *27/02;* **B60K** *20/00*

**U.S. Cl. 74—142** **16 Claims**



1. A bicycle speed control apparatus having a take-up element, that is urged in a cable winding direction, for winding up a speed control cable, comprising;

a fixed member,

the take-up element being rotatably supported by said fixed member,

a wind-up control member operable to effect a change speed by rotating said take-up element against the urging force in the unwinding direction for winding up the cable,

a position maintaining mechanism including a first engaging member and a first engaging portion engageable stepwise for maintaining said take-up element in a selected position,

a rotation limiting mechanism including a second engaging member and a second engaging portion engageable stepwise for limiting rotation in the unwinding direction of said take-up element to a predetermined amount, and

an unwind control member operable to effect a change speed by actuating said rotation limiting mechanism and releasing said take-up element from said position maintaining mechanism for unwinding the cable,

characterized in that said first engaging member (32, 32*a*, 32*b*) of the position maintaining mechanism (P) and said second engaging member (62, 62*a*, 61*b*) of the rotation limiting mechanism (L) are movable independently of each other.

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**5,044,214**

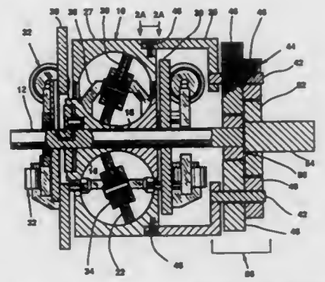
**TOROIDAL TRANSMISSION WITH SPLIT TORQUE AND EQUALIZATION PLANETARY DRIVE**

**John S. Barber, Jr., 45 Cedar Bluff Dr., Apt. 5, Lake St. Louis, Mo. 63367**

**Filed Dec. 11, 1989, Ser. No. 448,729**

**Int. Cl.[5] F16H** *15/16*

**U.S. Cl. 74—193** **8 Claims**



1. A traction transmission mechanism comprising a toric inner race element, a toric outer race element, encircling and complementary with the inner race element, and arranged concentrically therewith, a driving means operatively associated with the inner race element to drive the same, inner and outer race element support means, said inner race element being the driving race, and the outer race element being the driven race, transmission roller means operatively associated with said driving and driven race elements and arranged intermediate thereof for limited pivot between the race elements and to drive by traction force from said driving inner toric race element said driven outer toric race element and being mounted for angular pivotal adjustment to vary the speed of the driven race element, said driving race element being formed of axially separate halves, with means providing for adjustment in the setting of the space between said speparate halves of the driving race element to provide variation of speeds of operation of the transmission mechanism during its functioning, a driven support means operatively associated with said driven outer race element, a planetary gear means supported by the driven support means, at least one transmission gear supported by the planetary gear means and operatively associated with the driven outer race element, a driving element connected with the driving means and its supported driving inner race element, said driving gear element being operatively associated with the planetary gear means, a driven transmission gear mounted for rotation and operatively associated with the planetary gear means to provide an output force for an output driven means of the transmission mechanism.

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**5,044,215**

**TRANSMISSION WITH AN ULTRA LOW SPEED RANGE**

**Tsukasa Watanabe, Hamamatsu, Japan, assignor to Suzuki Motor Corporation, Shizuoka, Japan**

**Filed Jan. 31, 1991, Ser. No. 648,223**

**Claims priority, application Japan, Feb. 28, 1990, 2-48197**

**Int. Cl.[5] F16H** *3/08*

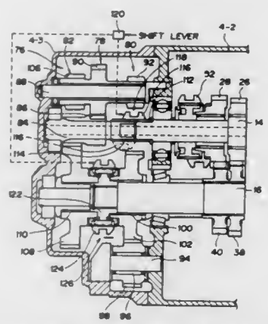
**U.S. Cl. 74—329** **1 Claim**

1. In a transmission in which the transmission gear ratio can

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be changed in accordance with the meshing state between a main shaft gear train mounted on a main shaft and a counter shaft gear train mounted on a counter shaft, the improvement comprising an extremely low speed gear mechanism adapted to reduce the speed to an ultra low range even lower than the lowest gear train among said gear trains, said extremely low speed gear mechanism comprising an extremely low speed shaft provided with an extremely low speed main gear train



and disposed coaxially with said main shaft, a first shift mechanism having a first changeover sleeve which is movable in order to bring said extremely low speed shaft into and out of engagement with said main shaft, and a second shift mechanism having a second changeover sleeve which is movable for selectively shifting a forward low speed gear train and a reverse low speed gear train into driving engagement between said extremely low speed shaft and said counter shaft.

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**5,044,216**

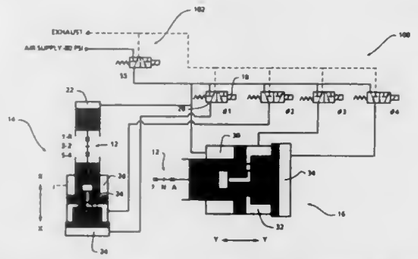
**TRANSMISSION SHIFT CONTROL**

**Jon A. Steeby, Schoolcraft, and Alan R. Davis, Plainwell, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Aug. 30, 1990, Ser. No. 574,868**

**Int. Cl.[5] B60K *20/14***

**U.S. Cl. 74—335** **8 Claims**



1. A control medium controlled, fluid pressure actuated control system (**100**) for controlling the position of a multiple position (F, N, A) piston/cylinder actuator (**16**), said actuator having at least one selectively pressurized and exhausted chamber (**32, 34**) controlled by a two-position positioning valve (**1, 2, 3, 4**) having a normally assumed position wherein said chamber is fluidly connected to one of a source of pressurized fluid or exhaust and a displaced position wherein said chamber is fluidly connected to the other of said exhaust or source of pressurized fluid, said actuator assuming a first default position (N) when all of said position valves are in the normally assumed positions thereof and displaceable from said default position to at least one second position (F, A) upon selective displacement of at least one of said position valves from the normally assumed position thereof, said system characterized by:

a control medium actuated normally closed two position anti-default valve (**102**) fluidly interposed said source of pressurized fluid and said actuator.

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**5,044,217**

**BEVEL GEAR DRIVE**

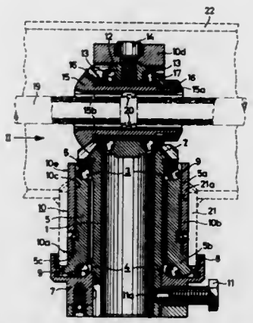
**Helmut Eberhardt, Gründau, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau am Main, Fed. Rep. of Germany**

**Filed Mar. 21, 1988, Ser. No. 170,713**

**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801434**

**Int. Cl.[5] F16H *1/14, 37/06***

**U.S. Cl. 74—417** **6 Claims**



1. Multiple angle drive comprising: an input shaft with a plurality of first gears disposed at intervals thereon, and a plurality of output shafts driven through second gears by the first gears and disposed radially to the input shaft, each of said first gears having a hollow shaft, a drive casing and a driven, the output shafts with the second gears in the form of bevel gears being mounted each in the drive casing in which the particular first gear is journaled, and the input shaft being brought in a longitudinally displaceable manner through each hollow shaft of all first gears and being joined for co-rotation to the latter by means of the driver.

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**5,044,218**

**APPARATUS FOR TRANSMITTING THE TURNING FORCE OF A CAPSTAN FLYWHEEL FOR VIDEO CASSETTE RECORDERS**

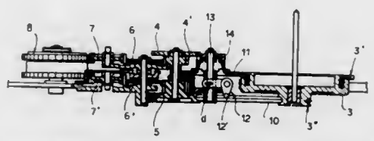
**Jae G. Lee, Incheon, and Tae W. Park, Suwon, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Sep. 1, 1989, Ser. No. 401,855**

**Claims priority, application Rep. of Korea, Sep. 1, 1988, 1988-14657**

**Int. Cl.[5] F16H *57/00***

**U.S. Cl. 74—421 K** **8 Claims**



1. An apparatus for transmitting the turning force of a capstan flywheel for a video cassette recorder, comprising:

a slider gear provided at its upper axial side with a clutch gear and slidably mounted on a vertically moving shaft member, said slider gear being located between a gear portion of said capstan flywheel and connector gears of the video cassette recorder, said shaft member being movable up and down by means of a slider lever interlocked with a clutch lever pivotally mounted by means of a pinch lever.

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**5,044,219**

**VARIABLE RADIUS SEGMENT GEAR IN THE FORM OF A CIRCULAR ARC AND A GEAR MECHANISM FOR SUCH GEAR**

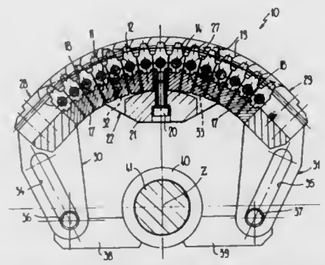
**Hans G. Braunschweiler, Nidelhadstrasse 80, CH-8803 Ruschlikon, Switzerland**

**Filed May 9, 1990, Ser. No. 520,806**

**Claims priority, application Switzerland, May 10, 1989, 1754/89**

**Int. Cl.[5] F16H *55/30***

**U.S. Cl. 74—448** **14 Claims**



1. A variable radius segment gear in the form of a circular arc comprising a plurality of individual tooth elements arranged in succession each carrying at least one gear tooth and at least one tensioned, flexible coupling element holding together said elements in a circular arc and being anchored at each of its ends in an endpiece, and adjusting means for altering the distance of the endpieces from the center of the circular arc and hence the radius of the segment gear.

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**5,044,220**

**SHIFTING ARRANGEMENT FOR AN AUTOMATIC TRANSMISSION OF A MOTOR VEHICLE**

**Friedrich Raff, Eberdingen, and Ulrich Maier, Freiberg/N., both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 302,387, Jan. 27, 1989, Pat. No. 4,987,792. This application Aug. 6, 1990, Ser. No. 562,930**

**Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807881; Aug. 18, 1989, 3927250**

**Int. Cl.[5] B60K *20/04***

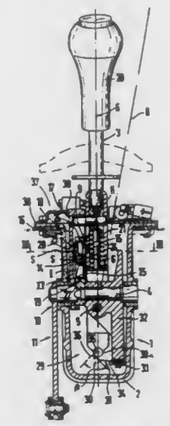
**U.S. Cl. 74—473 R** **11 Claims**

1. A shifting arrangement for an automatic transmission of a motor vehicle which is influenced by an electronic control unit, comprising:

a selector lever pivotable in a first shifting path to select several operating positions and automatically shifting transmission gears, movable via a transverse path into a second shifting path parallel with respect to the first shifting path, a pivoting of the selector lever in a first direction from a neutral center position in the second shifting path causing an upshifting by one gear and a pivoting in a second direction from the neutral center position causing a downshifting by one gear;

a transmitting device coupled to the selector lever in the first shifting path to transmit movements of the selector lever to shift the operating positions and automatically shift gears, said transmitting device including a driving dog that interacts with the selector lever;

a shaft extending transversely with respect to a longitudinal direction of the motor vehicle, said selector lever and said driving dog being rotatably disposed on said shaft;



a locking device that interacts with the transmitting device to lock the transmitting device when the selector lever is in the second shifting path.

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**5,044,221**

**SHIFT LEVER CONTROL DEVICE**

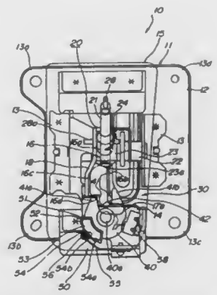
**Toshio Suzuki; Hiroshi Yamazaki, both of Yokohama, and Katsunori Shirahama, Atsugi, all of Japan, assignors to Ohi Seisakusho Co., Ltd. and Nissan Motor Co., Ltd., both of Yokohama, Japan**

**Filed Nov. 29, 1989, Ser. No. 442,559**

**Claims priority, application Japan, Nov. 29, 1988, 63-155530[U]**

**Int. Cl.[5] F16H *59/02*; G05G *5/03, 1/28***

**U.S. Cl. 74—475** **9 Claims**



1. A shift lever control device comprising:

first means which defines a cranked guide slot along which a shift lever is slidably moved, said cranked guide slot including at least one elongate part and a shorter terminal part which extends in a given direction perpendicular to said elongate part;

second means for permitting said shift lever to pivot in a universal direction;

third means for biasing said shift lever in a direction opposite to said given direction;

a pivot latch member located near a joint portion between said elongate part and said shorter terminal part of said guide slot, said pivot latch member having two arm portions by and between which a guide recess is defined, said

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pivot latch member being pivotal between a first given position wherein an enclosed space is defined by said shorter terminal part of said cranked guide slot and said guide recess of the pivot latch member and a second given position wherein said guide recess of the latch member is open to said elongate part of said cranked guide slot; and

check means for making the pivotal movement of said latch member to said first and second given positions in a snap action manner, said check means including a cam member secured to said latch member to move therewith and having a cam surface which includes rounded depressions; elastomeric members respectively disposed in said rounded depressions; and a detent member which is held by a stationary member and resiliently pressed against said cam surface of said ca member.

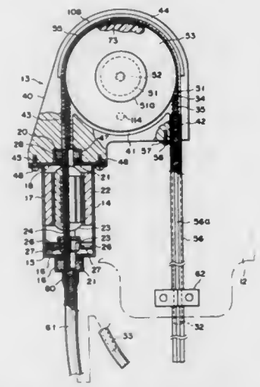
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**5,044,222**

## DRIVE APPARATUS FOR OPENING/CLOSING AN OPERATION MEMBER

**Motoyuki Tanaka, Tokyo, and Fumikiyo Nakazawa, Hadano, both of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan**

**Filed May 3, 1990, Ser. No. 518,654**
**Claims priority, application Japan, May 10, 1989, 1-116990**
**Int. Cl.[5] F16C *1/12*; E05F *11/48***
**U.S. Cl. 74—500.5** **34 Claims**



1. A drive apparatus for opening and closing an operation member in a reciprocable motion, comprising:

a power transmission cable comprised of a wire rope and a spiral tooth-like rib formed on an outer periphery of the rope, the cable including one end and another end being and a flexible intermediate portion between both ends, the one end connected to the operation member;

a guide roller around which the intermediate portion of the cable is wrapped in a curved fashion;

a guide base having a roller support shaft to rotatably support the guide roller and a curved guide section covering the intermediate portion of the cable to provide a curved channel relative to the guide roller to allow the cable to pass through the curved channel; and

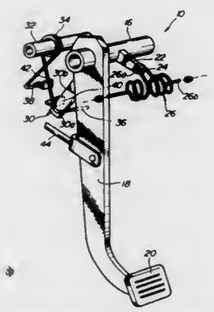
a cable drive means having an engaging member engaging with the spiral tooth-like rib and a rotation member rotating the engaging member, to move the cable in an axial direction to move the operation member in a reciprocating motion so that the operation member is opened and closed.

**5,044,223**

## PEDAL DEPRESSION ASSISTING MECHANISM

**Hiroyuki Mizuma, Hatano; Yasushi Asano, and Yoshimasa Katauml, both of Shizuoka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Fuji Kiko Co., Ltd., Tokyo, both of, Japan**

**Filed May 19, 1989, Ser. No. 354,163**
**Claims priority, application Japan, May 21, 1988, 63-67060[U]**
**Int. Cl.[5] G05G *1/14***
**U.S. Cl. 74—512** **3 Claims**



1. A pedal depression assisting mechanism comprising:

a stationary bracket;

a pedal arm rotatably installed on said bracket;

first assist spring means for urging said pedal arm in one direction upon rotation of said pedal arm between first and second positions and in the opposite direction when rotation of said pedal arm goes beyond said second position; and

second assist spring means for urging said pedal arm in said opposite direction upon rotation of said arm between said first and second positions, said second assist spring means becoming ineffective on said pedal arm when said pedal arm is in said second position or rotated beyond said second position;

in which said second assist spring means includes a second assist spring and a second assist lever rotatable together with said pedal arm in such a manner as to be held engaged with said second assist spring upon rotation of said pedal arm between said first and second positions and held disengaged from said second assist spring upon rotation of said pedal arm exceeding said second position;

in which said second assist spring is a coil spring having opposite first and second end portions, and said second assist spring means further includes two stoppers upon which said first and second end portions of said second assist spring abut so as to be held stationary thereon when rotation of said pedal arm goes beyond said second position.

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**5,044,224**

## CAMSHAFT

**Takeshi Hiraoka, Saitama; Shunsuke Takeguchi, Tochigi, and Satoshi Kawai, Kuki, all of Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 347,224, May 4, 1989. This application Oct. 25, 1990, Ser. No. 603,307**
**Claims priority, application Japan, May 23, 1988, 63-66898**
**Int. Cl.[5] F16H *53/00***
**U.S. Cl. 74—567** **1 Claim**

1. A camshaft comprising

a steel shaft,

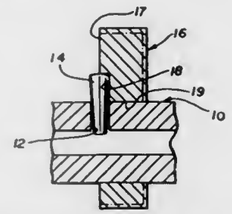
at least one pin-receiving hole formed in the outer surface of said shaft and perpendicular to the axis of said shaft,



cam pieces made from a sintering alloy material and secured to said shaft by sintering,

a pin-receiving groove formed in the side surface of each of said cam pieces,

a positioning pin having a lower portion inserted into and



tightly held by each of said holes and an upper portion fitted in said pin-receiving groove to define the axial and peripheral portions of said cam pieces on said shaft when said cam piece is sintered,

said positioning pin having a straight configuration and said pin-receiving hole having a tapered configuration.

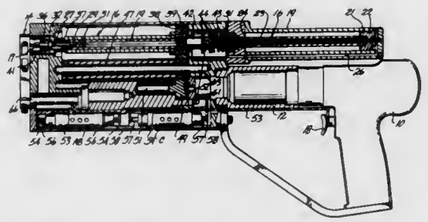
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**5,044,225**

## PNEUMATIC NUT INSTALLATION TOOL

**John A. Louw, Temecula, Calif., assignor to VSI Corporation, Carson, Calif.**

**Filed Jun. 21, 1990, Ser. No. 542,256**
**Int. Cl.[5] B25B *23/04***
**U.S. Cl. 81—430** **31 Claims**



1. A nut installation tool comprising:

a housing;

a plunger assembly mounted in the housing for advancing from a retracted position adjacent to the rear of the housing through a nut pickup station to an extended position extending from the front of the housing for delivering a nut to a workpiece;

means on the plunger assembly for retaining a nut on the end of the plunger assembly and permitting rotation of the nut;

means for rotating a portion of the plunger assembly for tightening a nut on the plunger assembly onto a bolt on a workpiece; and

shuttle means for delivering a nut in front of the plunger assembly before it reaches the nut pickup station and retracting away from the nut pickup station before the plunger assembly moves through the nut pickup station; and wherein-

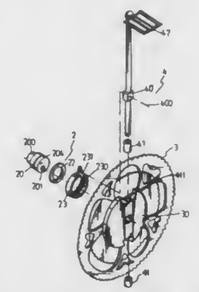
the plunger assembly comprises spring biased means for advancing the plunger assembly from its retracted position to the nut pickup station, and pneumatic means for advancing the plunger assembly from the nut pickup station to its extended position.

**5,044,226**

## STRUCTURE OF BICYCLE CHAIN TRANSMISSION

**Ching-Rong Wu, No. 13, Hsin Hsing Rd., Tainan, China**

**Filed Jul. 30, 1990, Ser. No. 559,918**
**Int. Cl.[5] G05G *1/14***
**U.S. Cl. 74—594.3** **1 Claim**



1. A bicycle chain transmission, comprising:

a bottom bracket bearing device comprised of a connector, a hub, a bush and a ball bearing, said connector comprising a projection extending forward at one end for fastening in a bottom bracket of a bicycle, an eccentric hole piercing therethrough for the insertion therethrough of a bottom bracket axle of said bicycle, and a circular groove on its outer wall surface for mounting said bush and said said ball bearing, said ball bearing comprising a side projection, and a plurality of steel balls fastened in its inner wall surface between said bush permitting said ball bearing to to follow said connector to rotate clockwise or to make idle running in counter-clockwise direction;

a chain wheel mounted on said bottom bracket axle, comprising a bearing block at an outer side, said bearing block having a hole vertically made thereon with two bearings fastened therein at two opposite ends; and

a crank movably fastened in the two bearings of said bearing block of said chain wheel, having a pedal rotatably secured thereto at one end for pedaling to drive said crank to carry said chain wheel to rotate via said bottom bracket bearing device, and a fastening member at an opposite end for the connection thereto of said unitary side projection of said ball bearing by a lock pin;

whereby the rotation of said connector drives said ball bearing to rotate eccentrically and to drive said crank to automatically change its arm of force so as to minimize energy consumption in pedaling.

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**5,044,227**

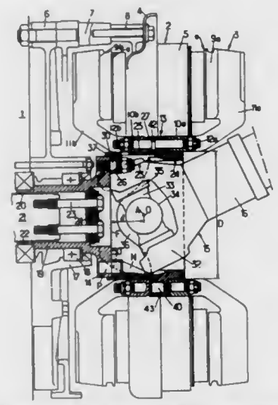
## VEHICLE TRANSMISSIONS EQUIPPED WITH ELECTRIC RETARDERS

**Guy Rugraff, Pantin, France, assignor to Labavia-S.G.E., Montigny Le Bretonneux, France**

**Filed Jun. 26, 1990, Ser. No. 543,471**
**Claims priority, application France, Jun. 30, 1989, 89 08794**
**Int. Cl.[5] F16H *57/02*; H02K *49/00*; F16D *3/16***
**U.S. Cl. 74—606 R** **6 Claims**

1. A vehicle transmission comprising a gearbox including a casing, a cardan joint including a shaft and a journal cross and an electric eddy current retarder comprising an annular inductor stator cantilevered on the casing of the gearbox by means of a frame, and a rotor comprising two induced ferromagnetic material discs which surround the stator and are both supported by a gearbox flange cantilevered on a stub shaft inside the casing, each said disc being connected by means of a respective crown of arms forming ventilation fins, to a respective ring affixed to said flange, said transmission further comprising, disposed between the gearbox flange and the journal cross of the cardan joint, a tubular insert affixed to the periphery of said gearbox flange on the side of the flange away from the

gearbox and a cardan flange affixed to said insert and to said cardan joint and disposed on the same side thereof as the shaft of the cardan joint with respect to the center of the journal cross, said cardan flange comprising an annulus surrounding



said shaft and including an external collar, and said insert including an external collar affixed to and in axial abutment with the external collar of the cardan flange such that said collars together form an annulus to which the rotor rings of the retarder are affixed axially on each side thereof.

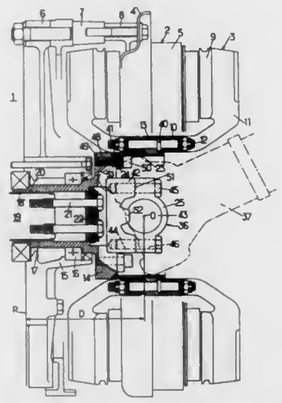
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**5,044,228**

## VEHICLE TRANSMISSIONS EQUIPPED WITH ELECTRIC RETARDERS

**Guy Rugraff, Pantin, France, assignor to Labavia - S.G.E., France**

**Filed Jun. 18, 1990, Ser. No. 539,485**
**Claims priority, application France, Jun. 16, 1989, 89 08045**
**Int. Cl.[5] H02K** *49/00;* **F16H** *57/02;* **F16D** *3/16*
**U.S. Cl. 74—606 R** **9 Claims**



1. Vehicle transmission comprising a gear-box including a casing, a cardan joint including a shaft and journal cross, and an electric eddy current retarder mounted directly on the casing of the gear-box and comprising an annular inductive stator cantilevered on said casing by means of a frame and a rotor comprising two induced ferromagnetic material discs which surround the stator and which are both supported by a gear-box flange itself cantilevered on a stub shaft inside the casing, each disc being affixed, by means of a ring of arms forming ventilation fins, to a rotor ring secured to said gear-box flange, said gear-box flange including first and second rings of fixing elements, the first ring of fixing elements serving to connect the flange to the cardan joint, said transmission further comprising a tubular insert extending axially away from the periphery of the gear-box flange on the side thereof opposite the gear-box, said insert including an internal collar joined in axial engagement against the periphery of the face of the gear-box flange furthest away from the gear-box, said collar including at one axial end thereof a ring of fixing holes which receive the fixing elements of the second ring of the gear-box flange and including at the other axial end thereof an external collar having formed therein a ring of holes for fixing the rotor rings to said gear-box flange.

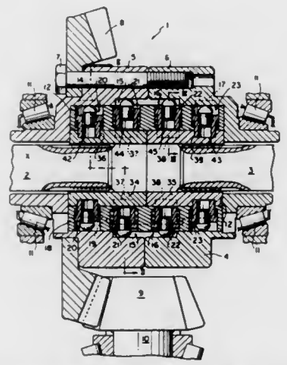
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**5,044,229**

## DIFFERENTIAL GEAR MECHANISM FOR MOTOR VEHICLES

**Ivano Visentini, S. Maria di Sala, Italy, assignor to Carraro S.p.A., Italy**

**Filed Nov. 22, 1989, Ser. No. 440,534**
**Claims priority, application Italy, Nov. 22, 1988, 22685 A/88**
**Int. Cl.[5] F16H** *35/04*
**U.S. Cl. 74—650** **11 Claims**



1. A differential gear mechanism for motor vehicles, in particular agricultural tractors, intended to drive rotatively two axle shafts of a motor vehicle live axle comprising:

a differential gear case,

a tubular body mounted within the case for rotation with the case,

connecting means connecting said tubular body to said case with a predetermined amount of backlash to permit a relative angular displacement between the tubular body and the case on reversal of the direction of rotation of the case,

first and second sleeves structurally independent of and set coaxially with each other, being secured to respective axle shafts and journalled in the tubular body,

first and second freewheel devices comprising respective first and second notched gears intervening between each sleeve and the tubular body, respectively to rotatively drive its respective sleeve at an angular rate at least equal to the rotational speed of the tubular body and

change-over means for alternately operating, for each sleeve, either of the freewheel devices according to the direction of rotation of said case in forward or reverse gear respectively,

wherein said change-over means comprises camming means formed in the case to act on said first and second ratchet gears, said camming means being operated by said relative angular displacement to disengage the first ratchet gears while concurrently operating the second ratchet gears, or vice versa, according to the direction of rotation of the differential gear case.



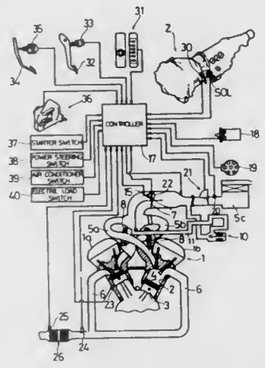
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**5,044,230**

## GEAR SHIFT CONTROLLING DEVICE OF AUTOMATIC TRANSMISSION

**Yoshiyuki Shinya, and Hiroshi Mooden, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jun. 25, 1990, Ser. No. 542,829**
**Claims priority, application Japan, Jun. 26, 1989, 1-162899**
**Int. Cl.[5] B60K** *41/06*
**U.S. Cl. 74—866** **4 Claims**



1. A gear shift controlling device of an automatic transmission which controls gear shift of the automatic transmission on the basis of engine load and r.p.m. of engine driving system, comprising:

a load detecting means to detect engine load;

a signal change adjusting means to temper the change of engine load signals detected by said load detecting means; and

a control means which receives outputs of said load detecting means and signal change adjusting means and controls gear shift of the automatic transmission according to the engine load signal and the r.p.m. of engine driving system, on the basis of the engine load signal of the load detecting means when the engine load detected by the load detecting means increases and on the basis of the engine load signal for which change was tempered by the signal change adjusting means when the engine load detected by the load detecting means decreases.

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**5,044,231**

## AUTOMATIC TRANSMISSION

**Takuji Fujiwara, and Kouzou Ishii, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Nov. 15, 1990, Ser. No. 613,055**
**Claims priority, application Japan, Nov. 15, 1989, 1-296603; Dec. 19, 1989, 1-330314**
**Int. Cl.[5] B60K** *41/10*
**U.S. Cl. 74—869** **5 Claims**

1. An automatic transmission comprising:

a transmission mechanism; and

a hydraulic control circuit;

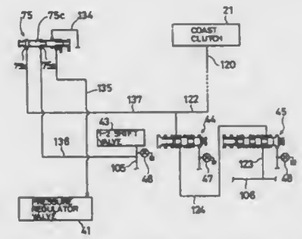
the transmission mechanism including a friction coupling member for enabling engine brake and being operable to provide a usual running range having a gear ratio and an engine brake enable range having at least the same gear ratio as the usual running range, the usual running range being unable to execute the engine brake in the gear ratio, the engine brake enable range being able to execute the engine brake in the gear ratio;

the hydraulic control circuit including:

hydraulic pressure means for feeding a coupling pressure to the friction coupling member;

shift valve means for shifting from a lower speed gear ratio to a higher speed gear ratio;

shift valve control means for feeding a shift control pressure to the shift valve means to control the shifting;



cutback means changeable into one of a cutback execution state of allowing the coupling pressure to reduce and a cutback suspension state of allowing the coupling pressure not to reduce;

cutback control means for feeding the shift control pressure and the coupling pressure to the cutback means so as to change to the cutback suspension state when the transmission is set in the gear ratio in the engine brake enable range.

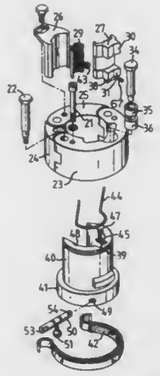
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**5,044,232**

## ACTIVE JAW FOR A POWER TONG

**Joerg E. Schulze-Beckinghausen, Garbsen, Fed. Rep. of Germany, assignor to Weatherford U.S., Inc., Houston, Tex.**

**Filed Nov. 28, 1989, Ser. No. 442,542**
**Claims priority, application United Kingdom, Dec. 1, 1988, 8828087**
**Int. Cl.[5] B25B** *13/50*
**U.S. Cl. 81—57.18** **7 Claims**



1. An active jaw for a power tong, the power tong having a rotary movably mounted in a body and rotation means interconnected with the rotary for rotating the rotary, the power tong having a drum attached to the rotary, the drum having a drum recess for receiving and holding a jaw tongue, the drum recess conforming in shape to the jaw tongue, and a brake applicable to the drum to inhibit synchronous movement of the rotary and the active jaw to facilitate the application of the active jaw to a pipe to be gripped and rotated by the power

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tong, the active jaw movable radially of the pipe and movably connected to the rotary, the active jaw comprising

a jaw body disposed above the drum,

a first cam surface on the jaw body for reacting with a cam member attached to the rotary to urge the active jaw against the pipe upon rotation of the rotary in a first direction,

a second cam surface on the jaw body for reacting with the cam member to urge the active jaw against the pipe upon rotation of the rotary in a second direction opposite the first direction,

the active jaw having a tongue in the drum recess, the drum recess holding the tongue so that the jaw moves with the drum, the tongue extending generally parallel to the pipe.

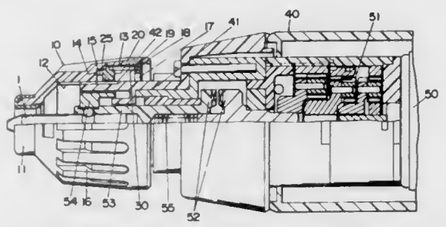
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**5,044,233**

## DEPTH ADJUSTER FOR ROTARY TOOLS SUCH AS SCREWDRIVERS

**Kunihiko Tatsu; Masao Torigoe; Syoichi Hongo, all of Hikone, and Masao Yamamoto, Yasu, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Apr. 11, 1990, Ser. No. 507,409**
**Claims priority, application Japan, Apr. 20, 1989, 1-102598**
**Int. Cl.[5] B25B** *23/00*
**U.S. Cl. 81—429** **2 Claims**



1. A depth adjuster adapted to be mounted on a rotary tool such as screwdriver, said screwdriver having a nose through which a rotating tool bit projects, said adjuster comprising:

a locator sleeve rotatably mounted on said nose to surround said tool bit, said locator sleeve having an internal thread engaged with an external thread on said nose so as to be movable along an axis of said tool bit as said locator sleeve rotates relative to said nose, said locator sleeve formed in its interior at a portion axially rearwardly of said internal thread with a first engaging surface;

a lock ring attached to said nose within said locator sleeve to be rotatively fixed but axially movable relative to said nose, said lock ring having a second engaging surface for locking engagement with said first engaging surface so as to rotatively fix said locator sleeve on said nose;

a spring biasing said lock ring in the forward direction for maintaining said locking engagement between said first and second engaging surfaces for retaining said locator sleeve at a desired axial position relative to said nose;

said first and second engaging surfaces cooperating with each other to define a torque limiting clutch which allows said lock ring to move axially rearwardly against the bias of said spring when said locator sleeve is forced to rotate, thereby disengaging the first engaging surface from said second engaging surface and permitting said locator sleeve to move axially for adjustment of an axial position thereof relative to said nose;

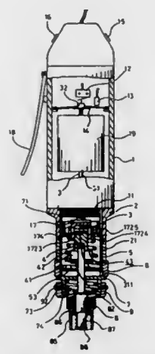
said spring being held between said lock ring and a rear end of said locator sleeve so as to be received and concealed within said locator sleeve together with said lock ring.

**5,044,234**

## ELECTRICAL SCREWDRIVER

**Chuan-Yi Cheng, No. 91, Ln. 35, Dong Hsin Rd., Keelung, Taiwan**

**Filed Mar. 13, 1990, Ser. No. 492,193**
**Int. Cl.[5] B25B** *23/151*
**U.S. Cl. 81—469** **3 Claims**



1. An electrical screwdriver which turns off automatically when a screw is tightened comprising a handle,

a rotation head disposed on the front end of said handle and having two inwardly arcuate dents disposed in opposite directions, said head, and having a central through passage to an inner space of said handle;

a first contact switch means located along a central line of said handle to control the rotary movement of said rotation head;

two downward and radially extending spring plates attached to said handle and located forward of said first contact switch means;

a second contact switch means located adjacent to one of said two spring plates to control the supply of power;

an outer sleeve having a clear glass tube fixedly connected to said front end;

a slender pipe within said handle

the fine steel wire having one end thereof wound into a compression spring while the other end thereof extends into said pipe within said handle;

a clutch having a central shaft with a larger diameter at its middle section than at its ends;

two smaller collars, two larger collars, and two rollers bilaterally and symmetrically attached sequentially to said central shaft, said two larger collars being detachably engaged with said two inwardly arcuate dents on said rotation head;

a clutch seat used to contain said clutch therein;

a transmission shaft having a rear end with a dent and a front end with an elongated central blind hole, wherein said smaller collars of said clutch are received in said rear end within said dent and are clamped thereto, said elongated central blind hole having a tiny through hole formed at its bottoms center permitting said fine steel wire to pass through, said front end of said transmission shaft also having two side flutes;

a shiftable member having two integrally formed long legs;

scales for indicating torsion value disposed on the outer surface of said two legs while male threads are formed at the roots of said two legs;

a first compression spring being located between said shiftable member and said clutch seat;

an inner sleeve having two elongated side openings extending halfway from its front portion toward its rear end to serve as a pair of rails permitting said two legs of said shiftable member to separately slide relative thereto while



said male threads formed on the roots of said two legs are exposed, female threads being provided on its inner wall and two L-shaped slots in reversed direction being formed at two sides near its front portion;

a rotation collar on said inner sleeve and having female threads formed on its inner wall to engage with said male threads on said shiftable member;

a second compression spring being positioned into a cylindrical space formed at a front end of said inner sleeve;

a main shaft having a rear shaft portion being provided with a through hole with a pin extending therethrough;

said main shaft extending within said inner sleeve;

an adjusting sleeve having a larger diameter section formed at its rear portion then at its front portion, at two sides of said larger diameter section, two screws being provided to firmly screw into said adjusting sleeve; and

a fixing cap covering a terminal end of said fine wire and in engagement with said two spring plates.

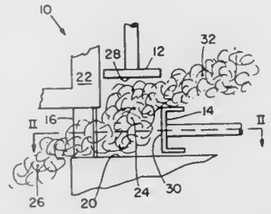
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**5,044,235**

## FILAMENT CUTTING MACHINE SYSTEM

**Peter Lehner, Hingham, Mass., assignor to Leigh Fibers, Inc., Norwell, Mass.**

**Filed Mar. 2, 1990, Ser. No. 488,273**
**Int. Cl.[5] B26D** *1/00*
**U.S. Cl. 83—13** **8 Claims**



1. Apparatus for forming a stream of cut filaments from a source of non-oriented filaments comprising:

a) a feeder ram movable between a feed position and a load position;

b) a cutter ram movable between a load position and a cut position, whereby the feeder ram directs substantially non-oriented filaments from a source of non-oriented filaments into interfering relation with advancement of the cutter ram by advancement of the feeder ram from the feed position to the load position; and

c) at least two blades disposed opposite advancement of the cutter ram from the load position to the cut position, whereby advancement of the cutter ram directs at least a portion of the filaments, which are in interfering relation with advancement of the cutter ram, against the blades, and whereby the filaments directed against the blade are cut, the cut filaments and the remaining filaments which are not cut thereby forming a stream of cut filaments.

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**5,044,236**

## NESTING VISE

**Dennis L. Mills, Chaska, Minn., assignor to Continental Machines, Inc., Savage, Minn.**

**Filed Jan. 5, 1990, Ser. No. 461,279**
**Int. Cl.[5] B23D** *55/04;* **B25B** *1/24*
**U.S. Cl. 83—29** **12 Claims**

1. A vise apparatus for nesting bundles of individual pieces of stock to be cut by a sawing means, said vise comprising:

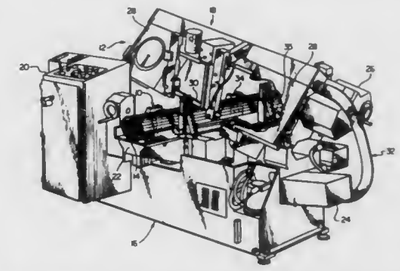
a base;

a fixed jaw fixedly mounted on said base, said fixed jaw having a first face with a first aperture therein;

a movable jaw movably mounted on said base and capable of repeated movement toward and away from said jaw during the nesting procedure, said movable jaw having a second face with a second aperture therein, and positioned on said base so that the first face of said fixed jaw is generally opposed to the second face of said movable jaw;

a strap means extending between said fixed jaw and said movable jaw through said first and second apertures, said strap means being used for securely nesting said bundles of stock, and having a first end, a second end and a length;

locking means capable of securably engaging or disengaging



said length of said strap means repeatedly during the nesting procedure prior to the cutting operation; and

strap tightening means capable of repeatedly engaging or disengaging said first end of said strap during the nesting procedure prior to the cutting operation and effecting tightening or loosening of said strap means around said bundle of stock, so as to nest individual pieces of said bundle of stock between said strap means and said base and between said fixed and movable jaws.

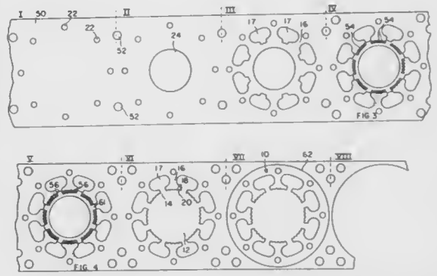
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**5,044,237**

## METHOD FOR STAMPING STEPPER MOTOR LAMINATIONS

**Charles Frame, Clementon, N.J., assignor to Magnetic Metals Corporation, Camden, N.J.**

**Filed Feb. 5, 1990, Ser. No. 474,915**
**Int. Cl.[5] H02K** *15/02*
**U.S. Cl. 83—41** **4 Claims**



1. A method of stamping stator laminae for rotary electric machines from a thin sheet of material, the laminae having a plurality of substantially rectangular teeth with interstices therebetween, said teeth being on an inner edge of the stator, comprising the steps of:

pre-punching in the thin sheet a plurality of openings, each of said openings having an edge which lies on the circumference of a circle centered about the center of the lamina, said edges defining the inner diameter of the stator; and

punching from the thin sheet a portion of material therefrom using a spline punch whereby the punched portion defines

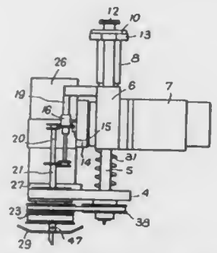
VOL 1130 ISS 1 SE 3 1991 UMI



side edges of each of the teeth on the stator and the interstices between the teeth, the side edges of each of the teeth being parallel to each other whereby intersections are, intersections formed by the punched portion defining the side edges of the teeth and the edges of each of the openings defining the inner diameter, the intersections forming sharp corners.

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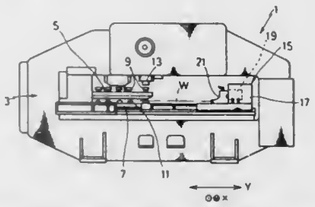
**5,044,238**
**CUTTING AND PUNCHING APPARATUS FOR SHEET MATERIAL**
**Jean Etcheparre, and Bernard Etcheparre, both of Bordeaux, France, assignors to Lectra Systems, Cestas, France**
**Filed Sep. 6, 1989, Ser. No. 403,673**
**Claims priority, application France, Sep. 23, 1988, 88 12488**
**Int. Cl.[5] B26D *3/14***
**U.S. Cl. 83—76.1** **15 Claims**



1. Cutting and punching apparatus for sheet material, designed to be movably mounted on an automatic cutting machine, having a cutting tool and a punching tool, wherein said apparatus comprises means for vibrating said cutting tool, means for vertically displacing said cutting tool, means for rotating said cutting tool, means for sharpening said cutting tool, means for vertically displacing said punching tool, means for rotating said machine tool, and a supporting base on which are grouped in a compact manner all said means, which all said respective means being operable both simultaneously and independently of each other.

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**5,044,239**
**PUNCH FOR PUNCH PRESS**
**Shigeru Endo, La Mirada, and Yoshinori Kiuchi, Hacienda Heights, both of Calif., assignors to Amada Engineering & Service Co., Inc., La Mirada, Calif.**
**Continuation of Ser. No. 160,395, Feb. 25, 1988, abandoned.**
**This application Oct. 6, 1989, Ser. No. 418,934**
**Int. Cl.[5] B21D *28/36*; B26F *1/04***
**U.S. Cl. 83—133** **8 Claims**



1. A punch tool for a punch press provided with a plurality of striking positions at which a striker is selectively placed for punching a workpiece, said punch press also being provided with a tool support means for supporting said punch tool, said punch tool comprising:

a punch holder having a key way, said punch holder being detachably inserted into a punch installation portion formed in the tool support means and held in place by a key attached to said support means;

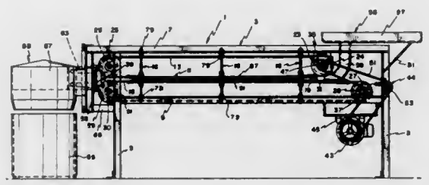
a pair of punch bodies so supported on said punch holder as to be independently movable in the vertical direction, said pair of punch bodies so located as to be concurrently aligned with a pair of respective striking positions, said punch bodies each having a keyway, said keyways aligned to engage a single key fixedly attached to said punch holder;

a pair of shearing blade portions formed on the lower ends of the pair of punch bodies, respectively, said pair of shearing blade portions having elongated configurations so guided by guide means as to have their elongated directions extending perpendicular to one another; and

a die detachably inserted into a die installation portion formed in the tool support means, the die having a pair of die holes corresponding to the pair of shearing blade portions.

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**5,044,240**
**APPARATUS FOR CONVEYING AND CUTTING A PRODUCT INTO DISCRETE PIECES**
**Robert R. Fischer, Michigan City, and Charles E. Rowell, Valparaiso, both of Ind., assignors to Urschell Laboratories Incorporated, Valparaiso, Ind.**
**Filed Aug. 11, 1989, Ser. No. 392,573**
**Int. Cl.[5] B26D *7/06***
**U.S. Cl. 83—161** **14 Claims**



1. An apparatus for conveying and cutting a product into a plurality of discrete pieces comprising:

a) first and second flexible endless conveyors wherein each conveyor comprises;

i) a feed roller;

ii) a discharge roller defining a circumferential groove; and,

iii) a single flexible endless belt operatively passing over the feed roller and the discharge roller, the belt having opposite lateral edge portions,

b) means supporting the conveyors in a spaced disposition to define a longitudinal feed path between the conveyor belts the feed path including a feed throat and discharge port;

c) means for varying the spacing between the conveyors along the length of the feed path such that the distance between corresponding lateral edge portions of the first and second conveyor belts is less than a corresponding dimension of the product such that a portion of the conveyor belts is displaced outwardly by the product placed between the conveyor belts thereby causing the product to be frictionally gripped by the conveyor belts;

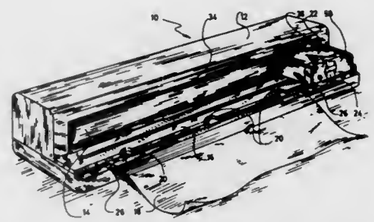
d) means for simultaneously driving the conveyors at substantially the same speed whereby a product fed into the feed throat is frictionally gripped and maintained between the conveyors in a fixed orientation and conveyed along the feed path towards the discharge port; and

e) cutting means for receiving the product from the discharge port in the fixed orientation and dividing the product into a plurality of discrete pieces.



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**5,044,241**
**CUTTING APPARATUS FOR WRAP FILM**
**Normand F. Labrecque, 392, rue du Cap, St-Bernard, Quebec, Canada G0S 2G0**
**Filed Mar. 20, 1990, Ser. No. 496,346**
**Int. Cl.[5] B26D *1/18***
**U.S. Cl. 83—489** **1 Claim**

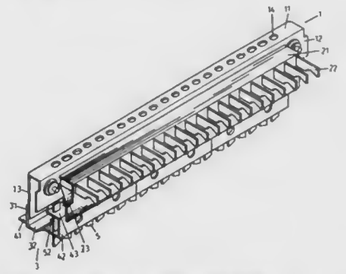


1. A cutting apparatus for wrap film of paper and plastic comprising:

an elongated dispenser housing having a concave tray for freely supporting a roll of wrap film and a cover hingedly fixed to said tray along an axis parallel to said roll and rearwardly thereof, said cover adapted to hide said roll in a closed position and completely expose it in its opened position, said tray extending forwardly to form an apron for supporting a leading edge portion of said wrap film, said housing displaying a slot extending lengthwise between said apron and said cover to allow said film to exit from said housing, said cover having a forward open panel displaying a rectangular opening, said opening having a bordering ledge forming a track in front of said roll and extending sideways beyond said roll, a carriage slidably mounted on said track for travelling over said apron lengthwise relative to said track across and beyond said roll, a cutting wheel rotatably mounted inside said carriage over said apron to rotatably ride on the latter upon movement of said carriage, means in said carriage for rotating said wheel on said apron at a peripheral speed faster than the linear displacement of said carriage, said leading edge portion adapted to be cut by said cutting wheel along said apron upon displacement of said carriage along said track, said housing being provided with an enclosure extending in front of said opening for covering said carriage and the cutting wheel along a distance corresponding to the travelling path of the carriage, said enclosure having a pending door pivotally suspended in front of said enclosure and dimensioned in length to correspond to the length of the roll, said door adapted to exclusively swing inside the enclosure, said door extending in front and parallel to said travelling path and adjacent said cutting wheel, whereby the pivoting action of said door is hindered when the carriage is located in front of the door and is free to pivot inside said enclosure when the carriage is located beyond the length of said roll.

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**5,044,242**
**CUTTER SHAFT OF PERFORATOR**
**Tom Chiang, No. 87, Kung Yeh Rd., Ind'l District, Tou Liu City, Yun Lin Hsien, Taiwan**
**Filed May 11, 1990, Ser. No. 522,102**
**Int. Cl.[5] B26D *5/10*; B26F *1/04***
**U.S. Cl. 83—549** **2 Claims**



1. An improved cutter system comprising:

(a) a pressure shaft having a horizontal surface, a first vertical surface intergrally attached to one edge of said horizontal surface, a second vertical surface integrally attached to said horizontal surface displaced from said first vertical surface, wherein said horizontal surface has a plurality of openings formed therethrough, said second vertical surface having a plurality of lug members extending rearwardly from a bottom edge, said pressure shaft further including a plurality of pressure levers fixedly connected to said first vertical surface;

(b) a press bar having said pressure levers extending through an upper end of a vertical surface of said press bar and a plurality of spring plates, wherein each of said spring plates has a first end fixedly attached to a mounting of said press bar and a second end engaged within a trough of a respective said pressure lever;

(c) a L-shaped lever having a horizontal surface and a vertical surface, wherein said vertical surface of said L-shaped lever has a plurality of openings passing therethrough for reception of said lug members of said pressure shaft;

(d) a cutter mounting including a twist plate having a plurality of opening passing therethrough, a vertical surface, and a horizontal surface having a plurality of through openings, wherein respective openings through said horizontal surface of said cutter mounting are aligned with said openings formed through said twist plate; and,

(e) a plurality of cutters inserted through said openings of said twist plate and said horizontal surface of said cutter mounting, wherein each cutter has a protuberance located between said twist plate and said horizontal surface of said cutter mounting, said plurality of cutters each having an inclined cutting edge wherein inclined cutting edges of adjacent cutters are inclined in an opposing manner.

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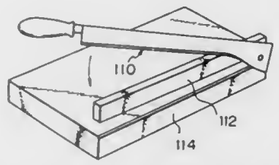
**5,044,243**
**CUTTING APPARATUS**
**Tokushi Aizawa, Kanagawa, Japan, assignor to Cybernet Co., Ltd., Kanagawa, Japan**
**Filed Dec. 4, 1989, Ser. No. 445,545**
**Claims priority, application Japan, Aug. 10, 1989, 1-94004[U]**
**Int. Cl.[5] B26D *5/08***
**U.S. Cl. 83—558** **1 Claim**

1. A cutting apparatus including a pair of co-acting blades respectively having linearly extending cutting edges so that said cutting edges are brought into sliding contact with each other and create a sliding contact surface on each of said cutting edges, wherein said pair of blades comprise a first stationary blade and a second moving blade which are of continuous thin plate form, at least said second moving blade being formed from a magnetic material, and said second moving blade being

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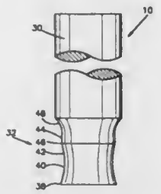
adapted for movement in a first direction for sliding contact of the sliding contact surface of said second moving blade with the sliding contact surface of said first stationary blade, said cutting apparatus further comprising means arranged along at least a substantial segment of said first stationary blade for drawing the cutting edge of said second moving blade in a second direction, generally transverse to said first direction,




toward the cutting edge of said stationary blade by means of magnetic force when said sliding contact surface of the cutting edge of said second moving blade comes into sliding contact with said sliding contact surface of the cutting edge of said first stationary blade, thereby drawing said sliding contact surface of the cutting edge of said second moving blade together with said sliding contact surface of the cutting edge of said first stationary blade.

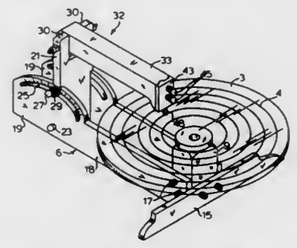
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**5,044,244**
**HEAVY DUTY PUNCH**
**Charles W. Olson, 2 Hanover La., Beachwood, Ohio 44122**
**Filed Jun. 29, 1990, Ser. No. 546,239**
**Int. Cl.[5] B26F** *1/14*
**U.S. Cl. 83—686** **8 Claims**




1. A heavy duty punch for piercing holes having a diameter (D) in workpieces having a thickness (T), comprising:
a shank by which the punch may be held when in use; and
a piercing end projecting axially from the shank, the piercing end terminating in a tip having a diameter (D), the piercing end having a reduced-diameter portion connecting the tip and the shank, the reduced-diameter portion including a curved sidewall extending axially from the tip toward the shank, and a straight-sided sidewall extending axially from the curved sidewall toward the shank, the diameter of the straight-sided sidewall being equal to (D) minus about 0.015 inch, the intersection of the curved sidewall and the straight-sidewall being located a distance from the tip equal to (T) plus about 0.032 inch, the axial extent of the straight-sided sidewall being equal to about 0.032 inch, and the curved sidewall, in cross-section, being defined by a curved segment of the circumference of a circle passing through (a) the edge of the tip, (b) a point equal to (D) minus about 0.040 inch, and (c) the intersection of the curved sidewall and the straight-sided sidewall.

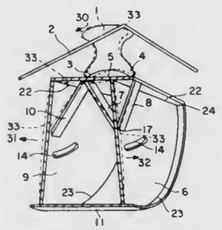
**5,044,245**
**ROTARY PRECISION CIRCLE CUTTER**
**Daniel Molleker, Bothell, Wash., and David H. Klempel, Plains, Mont., assignors to Artistic Photo Plate Creations, Inc., S.E. Bothell, Wash.**
**Filed Jun. 22, 1990, Ser. No. 542,323**
**Int. Cl.[5] B26D** *3/08, 1/02*
**U.S. Cl. 83—886** **20 Claims**



1. A rotary cutter apparatus, comprising:
a base including a rotatable table mount;
a rotatable table positionable on said mount and rotatable thereon about an axis of rotation;
an articulated cutter arm assembly, comprising
a main cutter arm; and
a support arm having first and second ends, with the first end being pivotally mounted on the base for pivotal movement about a first pivotal axis, and the second end being pivotally connected to the main cutter arm for pivotal movement about a second pivotal axis, such that the main cutter arm is translatable along a direction generally perpendicular to the axis of rotation of the rotatable table, with the first pivotal axis and the second pivotal axis of the support arm being parallel to one another; and
means for detachably securing a cutting implement to a portion of the main cutter arm overlying the rotatable table.

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**5,044,246**
**DEVICE FOR TRANSFERRING THE VIBRATIONS OF STRINGS TO THE WALLS OF A HOLLOW BODY**
**Karlwalter Schmidt, Kapellenweg 17, D-8990 Lindau, Fed. Rep. of Germany**
**PCT No. PCT/DE88/00785, § 371 Date Aug. 17, 1989, § 102(e) Date Aug. 17, 1989, PCT Pub. No. WO89/07308, PCT Pub. Date Aug. 10, 1989**
**PCT Filed Dec. 29, 1988, Ser. No. 415,280**
**Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802245**
**Int. Cl.[5] G03B** *3/00*
**U.S. Cl. 84—291** **12 Claims**

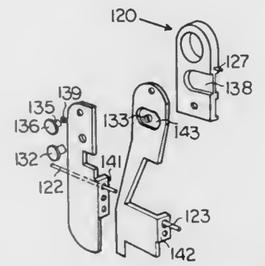


1. A device for the propagation of vibrating movements of strings (2) of a musical instrument having two oppositely arranged sound emitting main walls (6,9) in a hollow instrument body and having a bridge supporting wall (5), the strings being stretched over a bridge (1) mounted at two bridge feet (3,4) to said bridge supporting wall, said device comprising supports (7,8,10) emanating from a lower side of said bridge supporting wall (5) at locations directly opposite said bridge feet (3,4) and leading downwards to both sound emitting main walls (6,9), which main walls (6,9) are arranged as sidewalls of the musical instrument body and also emanate from the bridge supporting wall (5), one of said main walls (6 of FIG. 1) emanating from a location between the bridge feet (3,4) and the other of said main walls (9 of FIG. 1) emanating from a location exterior of the region between the bridge feet (3,4).



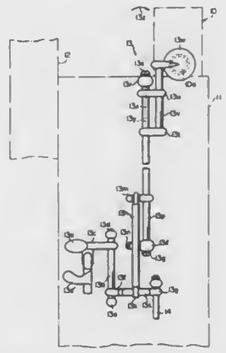
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**5,044,247**
**STRING TENSION ADJUSTING MECHANISM FOR A STEEL GUITAR**
**Charles F. Stepp, 2125 Dixie Hwy., Louisville, Ky. 40210**
**Filed Apr. 27, 1990, Ser. No. 516,042**
**Int. Cl.[5] G10D** *3/14*
**U.S. Cl. 84—312 P** **7 Claims**




1. A string tension adjusting mechanism for a steel guitar, which comprises:
A. a bridge member, pivotably mounted on an axle adjacent to one end and resiliently biased into a normal operative position to tension to a desired pitch a string anchored to the said one end in use of the mechanism;
B. a raising lever member and a lowering lever member pivotably mounted to each other:
C. said lowering lever member having an enlarged hole below the point where the first and second lever members are pivotably mounted to each other;
D. a rivet member extending from said raising member through the enlarged hole of said lowering member and into operative relation with the body of said bridge member:
E. a spacer means mounted on said rivet member and occupying space within the circumscribed area of said hole, said spacer means maintaining a free space between said bridge member and said lowering member and a space between said lowering lever member and said raising lever member;
F. respective pull rods attached to said raising lever and said lowering lever, so that on pulling of each respective pull rod, said corresponding raising and lowering members create clockwise or counterclockwise rotation of said bridge member about the axle, thus raising or lowering the tension of the string trained across said bridge member to raise or lower the pitch;
G. a biasing spring attached to the lowering lever member.

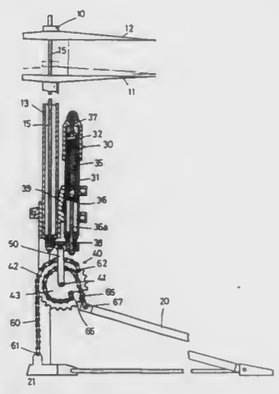
**5,044,248**
**GERMAN BASSOON EQUIPPED WITH IMPROVED PIANISSIMO KEY MECHANISM**
**Hiroshi Kenmochi, Shizuoka, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan**
**Filed Oct. 24, 1990, Ser. No. 602,613**
**Claims priority, application Japan, Oct. 27, 1989, 1-281290**
**Int. Cl.[5] G10D** *7/06*
**U.S. Cl. 84—380 A** **7 Claims**



1. A German bassoon comprising
a) a tube member having a crook and a series combination of component joints connected to the crook, a pianissimo hole being formed in said crook, and
b) a pianissimo key mechanism closing said pianissimo hole without any manipulation and allowing said pianissimo hole to be open when a player manipulates said pianissimo key mechanism.

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**5,044,249**
**HIGH HAT STAND WITH MECHANICAL ADVANTAGE WITH TWO SPROCKETS**
**Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan**
**Filed Aug. 28, 1990, Ser. No. 573,985**
**Claims priority, application Japan, Mar. 1, 1990, 2-50170**
**Int. Cl.[5] G10D** *13/00*
**U.S. Cl. 84—422.3** **16 Claims**



1. A high hat stand comprising:
a support; a stationary cymbal supported on the support;
a movable cymbal selectively movable toward engagement

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with and away from engagement with the stationary cymbal;

a rotatable assembly supported to move with the movable cymbal as the movable cymbal moves with respect to the stationary cymbal, the rotatable assembly including a common rotation axis supported on the movable cymbal and movable with the movable cymbal;

the rotatable assembly comprising a first rotary member and a second rotary member, both supported on the rotation axis and the rotary members being connected for rotation together; one of the first and second rotary members being of a larger diameter and the other being of a smaller diameter;

a movable cymbal operating pedal for being moved by a performer;

first connecting means connecting the pedal with the first rotary member for moving the first rotary member to rotate as the pedal is moved, the pedal being so connected with the first rotary member that as the pedal is moved, it both rotates the first rotary member around the axis and moves the first rotary member and the movable cymbal along with it to move the movable cymbal with respect to the stationary cymbal;

second connecting means connecting the second rotary member with the support at a location on the support such that movement of the pedal moves the first rotary member to move the second rotary member to both rotate and to move the axis to move the movable cymbal with respect to the stationary cymbal.

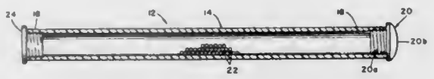
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**5,044,250**

**DRUMSTICK WITH SOUNDING PELLETS**

**David M. Beyer, 3530 Dover St., Los Angeles, Calif. 90039**

**Filed May 29, 1990, Ser. No. 529,500**
**Int. Cl.[5] G10D** *13/02*
**U.S. Cl. 84—422.4** **10 Claims**



1. A drumstick for use in striking a drum or cymbal comprising:

(a) an elongated hollow body having first and second ends and a gripping portion located proximate said second end for gripping said hollow body while striking the drum or cymbal;

(b) a tip for striking the drum or cymbal removably connected to said first end of said hollow body; and

(c) a multiplicity of pellets disposed within said hollow body for movement both axially and radially within said hollow body as said body is moved during the striking of the drum or cymbal, whereby said pellets will rattle within said hollow body to produce rhythmic sounds.

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**5,044,251**

**TIMBRE SETTING DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT**

**Takashi Matsuda, Oome, and Tatsuya Iijima, Fussa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Apr. 3, 1989, Ser. No. 332,802**
**Claims priority, application Japan, Apr. 11, 1988, 63-87361; Dec. 5, 1988, 63-307566**
**Int. Cl.[5] G10H** *1/057, 1/06, 1/46*
**U.S. Cl. 84—615** **15 Claims**

1. An electronic musical instrument for generating a tone signal with a first timbre in a normal mode, and a tone signal with a first timbre and a second timbre in a tone mix mode, said instrument comprising:

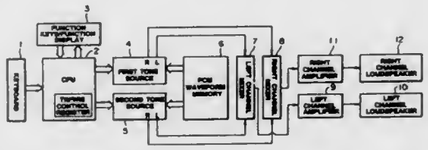
timbre designating means for designating a timbre;

mode select means for selectively setting one of said normal mode and said tone mix mode;

first memory means for storing timbre data of said first timbre;

second memory means for storing timbre data of said second timbre;

timbre setting control means responsive to designation of a timbre by said timbre designating means for storing in said first memory means said timbre data of said first timbre when either said normal mode or said tone mix mode is set



by said mode select means, and for storing in said second memory means said timbre data of said second timbre when said tone mix mode is set by said mode select means; and

tone signal generating means for generating a tone signal according to the first timbre data in said first memory means when said normal mode is set and for generating a tone signal according to both said first timbre data in said first memory means and said second timbre data in said second memory means when said tone mix mode is set.

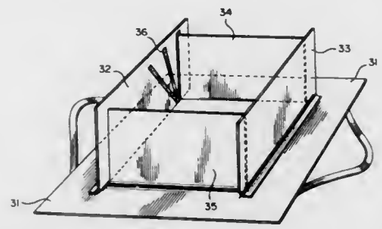
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**5,044,252**

**SHRAPNEL ABSORBER**

**Zwi Gamadi, 17 Brenner Street, and Yuval Fuchs, 9 Har Zion Street, both of Netanya, Israel**

**Filed Jun. 8, 1989, Ser. No. 363,139**
**Claims priority, application Israel, Jun. 16, 1988, 86763**
**Int. Cl.[5] F41H** *5/06*
**U.S. Cl. 86—50** **13 Claims**



1. A device adapted to afford protection against explosive charges, bombs and the like, comprising:

a foldable structure, said foldable structure being foldable into a folded form, said foldable structure, when in its folded form, being easily carried;

said foldable structure being partially openable to provide an essentially planar protective shield for placement on top of small explosive devices to absorb both fragments and shock-waves,

said foldable structure being fully openable to form a four-sided rim structure having four rim sections defining a rectangular inner area with a foldable flap attached to the inner edge of each rim section,

each foldable flap extending in an upward direction the foldable flaps together defining a confinement space, with an open top, adapted to absorb a part of fragments and shock-waves from a large exploding device when said foldable structure is fully opened.

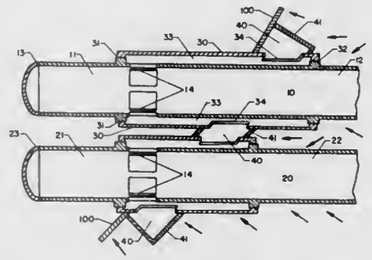


**5,044,253**

**SUBMARINE WEAPON LAUNCH SYSTEM USING AN EXTERNAL IMPULSE TANK**

**Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 15, 1990, Ser. No. 568,303**
**Int. Cl.[5] F41F** *3/10;* **B63B** *3/13*
**U.S. Cl. 89—1.810** **3 Claims**



1. In a submarine having a torpedo weapon system, a torpedo launch tube arrangement comprising:

at least one torpedo tube having a breechward section residing within said submarine and a muzzleward section residing outside said submarine wherein a portion of said torpedo tube between said breechward and muzzleward sections passes through a section of the hull of said submarine;

an impulse tank mounted on the outside of said hull for providing impulse water to said torpedo tube; and

a means for transporting said impulse water to said breechward section of said torpedo tube.

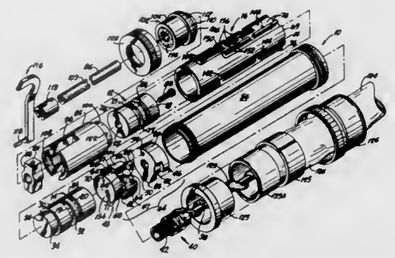
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**5,044,254**

**RECIPROCATING AIR MOTOR**

**Alan N. Miller, New City; Stanley E. Mayer, Bronx, and John Sullivan, Wappinger Falls, all of N.Y., assignors to Coltene/-Whaldent, Inc., New York, N.Y.**

**Filed Feb. 1, 1991, Ser. No. 649,849**
**Int. Cl.[5] F01L** *31/00, 21/00*
**U.S. Cl. 91—277** **23 Claims**



1. A reciprocating motor in which a fluid causes a drive piston to reciprocate, comprising:

a cylinder;

a drive piston positioned in said cylinder for reciprocation therein;

an anti-phase piston positioned in said cylinder for reciprocation in the opposite direction of said drive piston;

means for delivering the fluid to said drive piston and said anti-phase piston; and

means for feeding the fluid to the ends of the pistons to cause said drive piston and anti-phase piston to move in opposite directions whereby the motion of the anti-phase piston cancels vibrations caused by the drive piston.

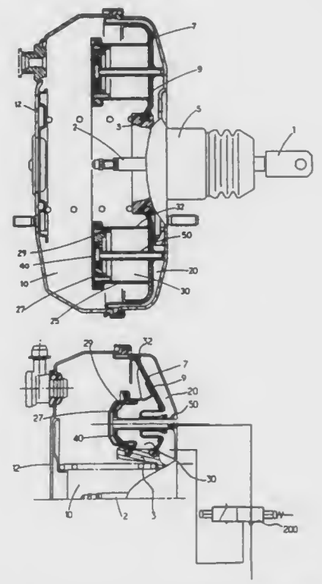
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**5,044,255**

**BRAKE REGULATOR WITH SECOND BOOST CHAMBER**

**Jean-Jacques Carre, Le Raincy; Philippe Castel, Paris, and Pascal Le Normand, Aulnay Sous Bois, all of France, assignors to Bendix Europe Services Techniques, Drancy, France**

**Filed Apr. 23, 1990, Ser. No. 512,714**
**Claims priority, application France, Apr. 28, 1989, 89 05661**
**Int. Cl.[5] F15B** *11/06*
**U.S. Cl. 91—519** **14 Claims**



1. A vacuum servomotor comprising a main casing divided sealingly on the inside into first and second chambers by a flexible membrane bearing on a rigid disk integral with an activating piston, said first chamber being subjected to a low pressure, while said second chamber is subjected to one of said low pressure and a higher pressure, said servomotor further comprising at least one auxiliary casing integral with said rigid disk and projecting into said first chamber, an auxiliary piston sealingly dividing said auxiliary casing on the inside into third and fourth chambers, said third chamber being closed by said rigid disk, said auxiliary piston being mounted stationary relative to said main casing.

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**5,044,256**

**EXHAUST PRESSURIZING CONTROL FOR A FLUID SYSTEM**

**Tadeusz Budzich, Moreland Hills, Ohio, assignor to Caterpillar Inc., Peoria, Ill.**

**Filed Nov. 5, 1990, Ser. No. 609,348**
**Int. Cl.[5] F15B** *13/08*
**U.S. Cl. 91—529** **27 Claims**

1. An exhaust pressurizing control adapted for use in a fluid system having a fluid motor subjected alternately to a unidirectional positive type load and a unidirectional negative type load, the fluid system having a pump, a reservoir, and a directional control valve operable to selectively interconnect the

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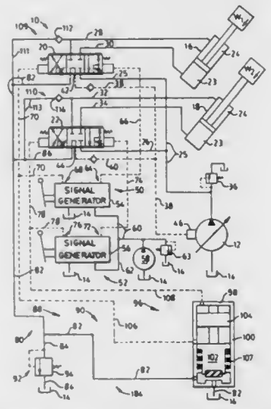


fluid motor with the pump and the reservoir, the exhaust pressurizing control, comprising:

exhaust manifold means interposed between the directional control valve and the reservoir;

anti-cavitational valve means interposed between the exhaust manifold means and the fluid motor;

means for generating a first control signal to control through the directional control valve the movement of the unidirectional positive type load and for generating a second




control signal to control through the directional control valve the movement of the unidirectional negative type load; and

said exhaust manifold means having a selector means for pressurizing the exhaust manifold means during control of the unidirectional negative type load and to depressurize the exhaust manifold means during control of the unidirectional positive type load, the selector means being responsive to one of the first and second control signals.

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**5,044,257**

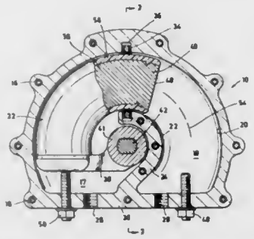
**ROTARY ACTUATOR AND METHOD FOR FORMING A ROTARY PISTON**

**William B. Scobie, Houston, Tex., assignor to Keystone International Holdings Corp., Houston, Tex.**

**Filed Mar. 20, 1990, Ser. No. 496,352**

**Int. Cl.[5] F01C *9/00*; F01B *11/02*; B28B *1/02***

**U.S. Cl. 92—120** **20 Claims**



1. A method of forming a toroidal arc segment piston for use in a rotary actuator including a housing defining an arcuate chamber therein, an actuator shaft journaled within the housing and rotatable in response to movement of the piston, a fluid inlet to introduce pressurized fluid into the housing to effect movement of the piston, and a seal for dynamic sealing engagement between the housing and the piston, the method comprising:

(a) forming a fixture defining an arcuate master chamber therein having a toroidal arc segment configuration;

(b) inserting a moldable polymeric material within the arcuate master chamber;

(c) rotatably mounting a metal piston core with respect to the fixture;

(d) rotating the metal piston core into the arcuate master chamber to form a sheath about the metal piston core filled with the polymeric material;

(e) curing the moldable polymeric material sheath about the metal piston core; and

(f) thereafter rotating the metal piston core and the cured polymeric sheath out of the master piston chamber within the fixture.

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**5,044,258**

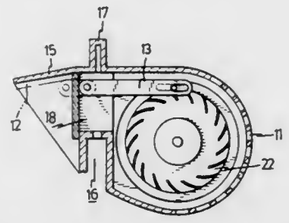
**MOTOR-DRIVEN CAR WINDOW FAN ASSEMBLY**

**Shih-Jang Wu; Hsu H. Chih; Paul Liao, and Shun C. Huang, all of 9 Fl., No. 45, An Tung St., Taipei, Taiwan**

**Filed Jun. 12, 1990, Ser. No. 536,512**

**Int. Cl.[5] B60H *1/26***

**U.S. Cl. 98—2.02** **1 Claim**




1. A car window fan assembly comprising the combination of:

(a) a substantially rectangular rigid window prop (**10**) having a door insert (**17**) at an upper end thereof which frictionally engages with a car window frame, an impeller housing (**11**) centrally fixed on said window prop (**10**) and two slideways (**16**) which are positioned on respective distal sides of said impeller housing (**11**), each of said slideways (**16**) slideably receiving a respective extension piece (**14**) therein for extending a length of said window prop (**10**);

(b) an impeller motor (**20**) and a motor housing (**21**) which are fixed onto one end of said impeller housing (**11**), said impeller motor (**20**) having an axle mount (**201**) thereon;

(c) a vent lid motor (**24**) and vent lid motor housing (**25**) which are fixed onto a second end of said impeller housing (**11**), said vent lid motor (**24**) driving a pin (**242**) to traverse a small arc, said vent lid motor (**24**) having an axle mount (**241**) thereon;

(d) an impeller (**22**) having an axle (**221**) which is rotatably supported by said axle mounts (**201** and **241**); said impeller motor (**20**) driving said impeller (**22**) to rotate when activated;

(e) a cigarette lighter plug (**3**) which is electrically connected to said impeller motor (**20**) and said vent lid motor (**24**) so as to activate said motors (**20** and **24**) when plugged into a car cigarette lighter socket; and

(f) a rain cover (**15**) being positioned on said window prop (**10**) opposite said impeller housing (**11**), a ventilation duct (**18**) being formed between said rain cover (**15**) and said impeller (**22**), a vent lid (**12**) being pivotally fixed proximate to an upper end of said ventilation duct (**18**), an activation arm (**13**) hinged to said vent lid (**12**) and said pin (**242**), said vent lid (**12**) being driven to open or close said ventilation duct (**18**) by said activation arm (**13**) when said vent lid motor (**24**) is activated.



**5,044,259**

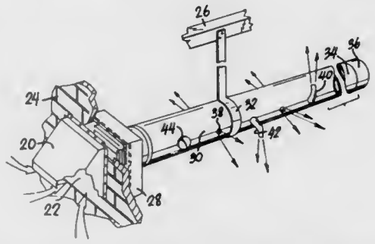
**AIR DIFFUSION SYSTEM CAPABLE OF LIMITED AREA CONTROL AND ADAPTED FOR SUPPLYING MAKE-UP AIR TO AN ENCLOSURE**

**Robert S. Catan, Greenlawn, and Mark Catan, Mt. Sinai, both of N.Y., assignors to Dynaforce Corporation, Old Bethpage, N.Y.**

**Filed Oct. 23, 1989, Ser. No. 425,426**

**Int. Cl.[5] F24F *7/06***

**U.S. Cl. 98—40.19** **2 Claims**




1. Apparatus for use in a structure defining an enclosure, said apparatus comprising a source of air, an elongated conduit in said enclosure and coupled to said source to receive said air therefrom, said conduit being of a generally rigid material and extending through at least a part of said enclosure at an upper location in the enclosure, said conduit further being provided with a plurality of openings allowing air to be discharged from the conduit via said openings into the enclosure, and control means in at least one of said openings to control the flow of air from the conduit into said enclosure; said control means including a rotatable nozzle on said conduit to direct air flow from the conduit and electro-mechanical means to control the rotation of said nozzle.

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**5,044,260**

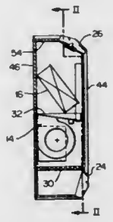
**AIR DISTRIBUTION UNIT**

**S. Richard Avari, Garden City, N.Y., assignor to CTS Consolidated Technical Services, Inc., Garden City, N.Y.**

**Filed Jun. 21, 1990, Ser. No. 541,636**

**Int. Cl.[5] F24F *13/075***

**U.S. Cl. 98—40.28** **8 Claims**




1. An air distribution unit comprising:

a housing defining an interior, an inlet for conducting air into the interior, and an outlet for discharging air from the interior; and

inlet and outlet grilles located in the inlet and outlet, respectively, the inlet and outlet grilles having identical shapes and identical sizes, and each of said grilles having first and second longitudinally extending sides and including

i) at least one transverse frame member having first and second legs, the first leg extending from the first longitudinally extending side of the grille to a position generally mid-way along the length of the frame member, and the second leg extending generally from said mid-way position to the second longitudinally extending side of the grille, and

ii) a multitude of parallel louvers, each of the louvers having a flat, elongated shape, said multitude of louvers including a first set of louvers rigidly connected to the first leg of the frame member and held in fixed positions relative thereto, and a second set of louvers rigidly connected to the second leg of the frame member and held in fixed positions relative to said second leg;

wherein the inlet grille extends downwardly and rearwardly across the inlet of the housing, and the inlet grille has first and second positions to help direct air into the interior of the housing at first and second inlet angles respectively; and

wherein the outlet grille extends forwardly and downwardly across the outlet of the housing, and the outlet grille has first and second positions for directing air from the interior of the housing at first and second outlet angles respectively.

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**5,044,261**

**COFFEE BREWING APPARATUS**

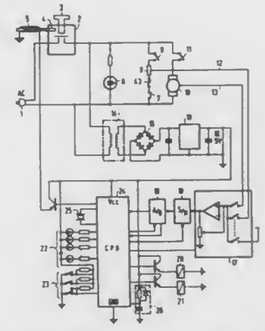
**Takemitsu Kawamoe, Tokyo, Japan, assignor to U.S. Philips Corporation, Tarrytown, N.Y.**

**Filed Sep. 27, 1989, Ser. No. 413,350**

**Claims priority, application Japan, Oct. 6, 1988, 63-252298**

**Int. Cl.[5] A47J *31/42***

**U.S. Cl. 99—280** **11 Claims**



1. A coffee brewing apparatus comprising a filter chamber for brewing coffee, a water tank, a heater for heating water delivered from the water tank and providing hot water to the filter chamber, detecting means for detecting an abnormal situation, and a power switch wherein the power switch has a switch function by which an "on"-state and an "off"-state are alternately selected in response to a manual operation of said power switch and comprising further means to release said "on"-state in response to a releasing signal, said releasing signal being a signal generated by said detecting means in response to a detected abnormal situation.

VOL 1130 ISS 1 SE 3 1991 UMI

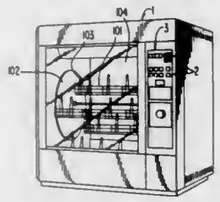


5,044,262

## ROTISSERIE CONTROL DEVICE

Douglas A. Burkett, Middletown; Gary L. Mercer, West Alexandria; Robert W. Stirling, Englewood, and David B. Winter, Eaton, all of Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Continuation of Ser. No. 239,398, Sep. 1, 1988, Pat. No. 4,968,515. This application May 15, 1990, Ser. No. 523,543
The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.
Int. Cl.[5] A23L *1/00*; A47J *27/00*
U.S. Cl. 99—327 13 Claims



1. A cooking device for automatically cooking and rotating food products comprising:
- a cooking chamber defined by a plurality of inner walls of the cooking device for receiving food products to be cooked;
- heating means operatively associated with said cooking chamber for heating food products located in said cooking chamber;
- rotor means operatively connected to said cooking chamber for supporting and rotatably moving food products located within said cooking chamber;
- selection means operable by a user of the cooking device for selecting desired cooking parameters;
- storage means connected to said selection means for storing the user selected cooking parameters; and
- control means responsive to the user selected cooking parameters stored in said storage means for controlling the operation of said heating and rotor means to automatically cook the food products supported by said rotor means in said cooking chamber in accordance with the user selected cooking parameters,
- wherein the user selected cooking parameters comprise cooking time, cooking temperature, and alarm information for a selected food product.

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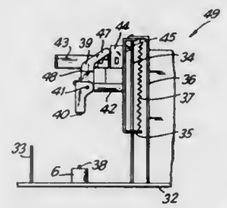
5,044,263

## ELECTRICALLY HEATED TOASTER

Karl Birkert, Steinbach; Heinz Marburger, Frankfurt am Main, and Günter R. Kullik, Meinerzhagen, all of Fed. Rep. of Germany, assignors to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany

PCT No. PCT/DE89/00066, § 371 Date Nov. 3, 1989, § 102(e) Date Nov. 3, 1989, PCT Pub. No. WO89/06927, PCT Pub. Date Aug. 10, 1989
PCT Filed Feb. 3, 1989, Ser. No. 427,848
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803571
Int. Cl.[5] A47J *27/00, 37/08*; H05B *1/00, 1/02*
U.S. Cl. 99—327 8 Claims

1. Electrically heatable toaster comprising at least one bread holder movable into a toasting position, the bread holder being held in toasting position by an electromagnet, a tripping device for the electromagnet, the tripping device being actuated manually as well as electrically by a timing control, the timing control including a clock pulse actuated counting circuit the counting circuit being in connection with a frequency-determining charging capacitor chargeable for presetting the degree of toasting as well as a voltage divider, the voltage divider including a temperature-dependent resistor for compensating the influence of the toasting degree temperature and for triggering the electromagnet tripping device after a preset degree of toasting is reached, an oscillator with two complementary transistors (**22, 23**) combined in a programmable unijunction transistor circuit for operating the counting circuit (**10**), the transistors being connected on the input side to a charging current circuit of the frequency determining capacitor (**24**) and



on the output side through a dividing point (**20**) of the voltage divider (**16, 17, 19**) with the temperature-dependent resistance (**19**) to a clock input (**15**) of the counting circuit (**10**) which switches a switch (**8**) in the current circuit of the electromagnet (**6**), the electromagnet being in effective connection with an actuating lever (**43**) for actuating the bread holder.

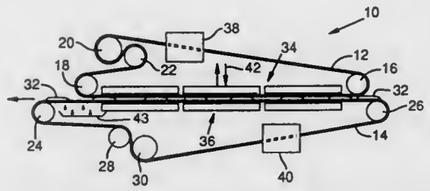
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5,044,264

## COOKING APPARATUS FOR PRODUCING GRILL STRIPES ON COOKED PRODUCTS

Robert B. Forney, P.O. Box AI, Tiburon, Calif. 94920

Filed Jan. 28, 1991, Ser. No. 646,871
Int. Cl.[5] A47J *37/00, 37/04*
U.S. Cl. 99—349 11 Claims



1. In a belt cooking apparatus or belt grill having a pair of spaced apart opposed heated platens and a pair of endless belts on rollers, positioned such that one of the belts travels adjacent to and against each of the heat platens so as to conduct heat from the heat platens to food products engaged between the belts, and with the two belts advancing at substantially the same speed, the improvement comprising means associated with the belts and platens for effecting increased heat transfer along selected lines on at least one of the belts as compared to remaining areas of the belts, while still providing sufficient heat to cook the food products at such remaining areas of the belts, so as to form grill lines on the food products at the positions of greater heat transfer.

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5,044,265

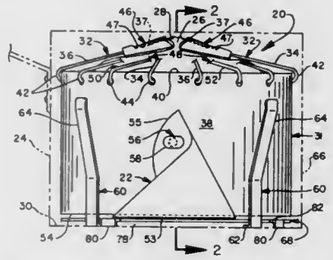
## COOKING UTENSIL ACCESSORIES

Alexander P. Janssen, 28 Old Farm Rd., Bellair, Charlottesville, Va. 22903

Filed Dec. 8, 1988, Ser. No. 282,463
Int. Cl.[5] A47J *36/20*
U.S. Cl. 99—418 15 Claims

1. A cooking utensil accessory which comprises: a hollow, vertically orientable base with cylindrical side wall means; means for supporting a cooking bag in said base with an openable and closable end of said bag uppermost; trivet means for keeping the lower end of said bag out of contact with the bottom of a cooking vessel in which said accessory is deployed, said trivet means being located at, and spanning, the lower end of said base; and retainer means at intervals around said base for detachably affixing said trivet means to said base at the lower edge of said side wall means, said retainer means





being spaced below and extending inwardly from the side wall means of said base and said trivet means being rotatable relative to said base between a first position in which it is trapped by said retainer means and a second position in which it can clear said retainer means and be detached from said base.

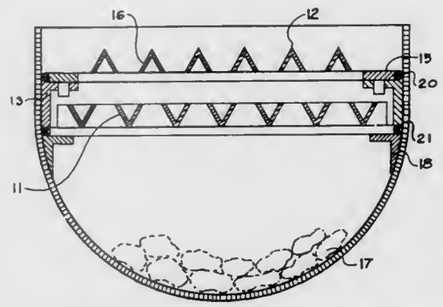
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5,044,266

## BARBACUE GRILL WITH WATER-FILLED FAT-COLLECTING TROUGH

Robert S. Geogaris, 1805 Imperial Golf Course Blvd., Naples, Fla. 33942

Filed Jul. 10, 1989, Ser. No. 377,608
Int. Cl.[5] A47J *37/07*
U.S. Cl. 99—446 2 Claims



1. A grill for supporting food in a barbeque kettle comprising:
- first grill means comprising
  - a first grill ring,
  - a plurality of spaced, inverted channels mounted on the first grill ring, the channels having longitudinal axes arranged parallel to each other and substantially horizontal for supporting food during cooking, and
  - at least one alignment lug on the first grill means;
- second grill means comprising:
  - a second grill ring,
  - a plurality of spaced, upright channels mounted on the second grill ring, the channels having longitudinal axes arranged parallel to each other and substantially horizontal,
  - at least one spacer bracket integral with the second grill ring and extending upwardly from the second grill ring for supporting the first grill means on the at least one spacer bracket above the second grill means,
  - a water reservoir mounted on the second grill and integral with the upright channels, the upright channels opening into the water reservoir and the water reservoir being adapted to hold water and to permit the water placed in the reservoir to flow between the reservoir and the channels, and
  - adjustable support means mounted on the second grill ring for permitting the second grill means to be leveled;
- the at least one alignment lug cooperating with the at least one spacer bracket when the first grill means is mounted on the second grill means to align the inverted and upright channels such that the upright channels of the second grill means are substantially directly below the spaces between the inverted channels of the first grill means, the grill being adapted to collect grease released from the food during cooking on the first grill into the inverted channels and water reservoir and prevent the grease from burning.

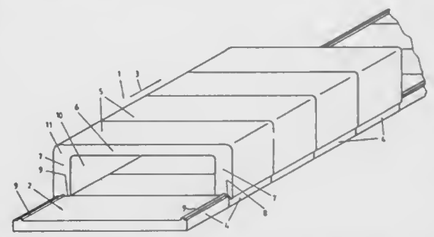
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5,044,267

## TUNNEL FOR COOLING, HEATING, OR DRYING PRODUCTS OF THE FOODSTUFFS AND ESPECIALLY CONFECTIONERY INDUSTRIES

Helmut Sollich, Rabenkirchen, Fed. Rep. of Germany, assignor to Sollich GmbH & Co. KG, Bad-Salzuflen, Fed. Rep. of Germany

Filed Apr. 25, 1990, Ser. No. 514,260
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914098
Int. Cl.[5] A23L *3/00*
U.S. Cl. 99—483 10 Claims



1. A tunnel for cooling, heating, or drying food products, particularly for confectionery industries, comprising: a base having a plurality of adjacent segments; a series of self-supporting hoods of rigid expanded plastic and having a cross-section in form of an inverted U; tracks between edges of said base and walls of said hoods to form a seal; a belt for conveying products longitudinally through the interior of said tunnel; and take-apart hinges positioned between said edges of said base and the walls of said hoods on each side of the tunnel.

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5,044,268

## CUTTING DEVICE

Thomas Lin, 606-608 Imperial St., Los Angeles, Calif. 90021

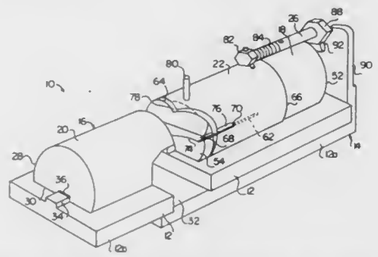
Filed Sep. 16, 1988, Ser. No. 245,749
Int. Cl.[5] A23N *4/00, 7/00*
U.S. Cl. 99—541 27 Claims

1. A device for cutting an article, the device comprising:
- a mounting member having a recess therein adapted to accommodate at least a segment of the article, the mounting member comprising two substantially cylindrical shaped spaced-apart portions mounted on a base, the recess being defined by the space between the two cylindrical portions;
- cutting means, the cutting means being movable relative to the mounting member between an extended position wherein the cutting means is over the recess and a with-

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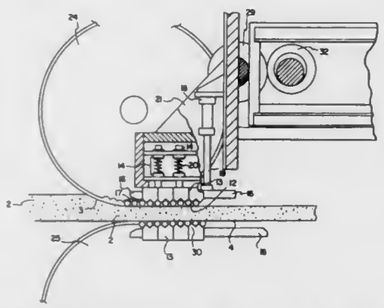
drawn position wherein the cutting means is away from the recess; and



means for moving the mounting members and cutting member relative to each other.

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**5,044,269**
**CONTINUOUSLY WORKING PRESS**
**Friedrich B. Bielfeldt, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany**
**Filed Jun. 8, 1990, Ser. No. 535,198**
**Claims priority, application Fed. Rep. of Germany, Jun. 8, 1989, 3918754**
**Int. Cl.[5] B30B** *5/06, 15/34*
**U.S. Cl. 100—38** **20 Claims**



16. A method of aligning rolling rods of a continuously working press as they are conveyed through said press, said press comprising a press platen and a pressing ram defining a pressing region therebetween, and a pair of endless bands which are supported by said rolling rods and which draw an article through said press and transmit a pressing force to said article, said method comprising the steps of:

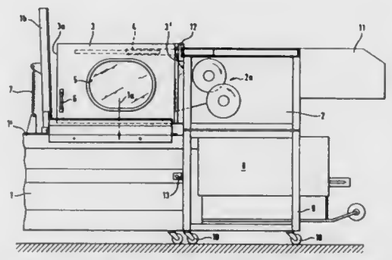
(A) introducing said rolling rods into an entry region of said press orthogonally relative to a longitudinal center of said press; then

(B) applying non-positive clamping forces along the lengths of said rolling rods that progressively increases as said rolling rods travel through said entry region;

(C) raising and lowering toothed members of pilgrim-step mechanisms into periodic engagement with gaps formed between said rolling rods as they travel through said entry region, whereby said rolling rods are periodically aligned by the positive clamping force imposed thereon by said pilgrim-step mechanisms; and then

(D) conveying said rolling rods through said pressing region.

**5,044,270**
**SHREDDER AND COMPACTOR WITH PROTECTIVE GUARD**
**Hermann Schwelling, Salem, Fed. Rep. of Germany, assignor to H S M - Pressen GmbH, Salem, Fed. Rep. of Germany**
**Filed Oct. 17, 1989, Ser. No. 422,559**
**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835450**
**Int. Cl.[5] B30B** *15/08*
**U.S. Cl. 100—53** **6 Claims**



1. Apparatus for shredding and compacting material comprising:

a shredder having a material inlet port and a material outlet port;

a compactor having a material entry port and a door movable between an opened position for facilitating access to said material entry port of said compactor and a closed position for operating said compactor and for limiting access to said material entry port of said compactor, said material entry port of said compactor being adjacent said material outlet port of said shredder to receive shredded material therefrom;

a cover defining a side opening;

said cover being slidable on said shredder to a compactor operating position thereby facilitating moving said door to said closed position for operating said compactor;

said cover being slidable on said shredder to a shredder operating position to cover said material entry port of said compactor when said door is in said opened position for operating said shredder wherein access to said material outlet port of said shredder and said material entry port of said compactor is restricted by said cover.

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**5,044,271**
**COMPACTOR DOOR AND INTERLOCK**
**James K. Robbins, Fayette; Brown, Ronald L., Vernon, both of Ala., and Kent Spiers, Caledonia, Miss., assignors tu Marathon Equipment Company, Vernon, Ala.**
**Filed Mar. 29, 1990, Ser. No. 480,572**
**Int. Cl.[5] B03B** *15/16*
**U.S. Cl. 100—53** **14 Claims**

1. In a compacting baler having a baling chamber defined by a continuous plate bottom member, opposed side walls affixed to said bottom member and a slotted rear wall, and an overhead ram selectively driving a reciprocating platen within said chamber, an improved door apparatus comprising:

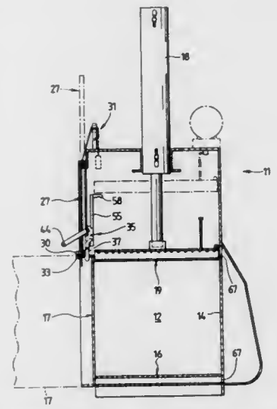
a.) a compaction chamber door mounted to one sidewall by a vertical hinge and selectively movable about said hinge to an open and closed position;

b.) a guard door slidably mounted above said chamber door and aligned with said chamber door when in the closed position thereof and selectively movable between a raised open position and a lowered closed position abutting said chamber door;

c.) a switch electrically connected to said ram to disable said ram when said switch is in a normally open position, said switch being mounted to the upper portion of said chamber door;



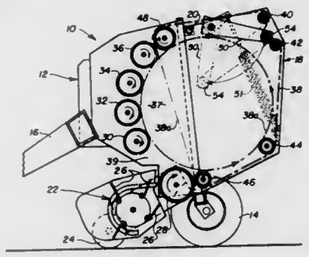
d.) a switch actuator cooperatively positioned on the lower portion of said guard door to cause closure of said switch when said guard door abuts said chamber door; and



e.) latch means for preventing the opening of said guard door during the downstroke of said ram.

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**5,044,272**
**ROUND BALER WITH ROLLERS AND BELTS**
**Richard E. Jennings, Manheim, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.**
**Division of Ser. No. 244,221, Sep. 14, 1988, Pat. No. 4,979,442, which is a continuation of Ser. No. 63,390, Jun. 18, 1987, Pat. No. 4,771,595. This application Oct. 17, 1990, Ser. No. 599,182**
**The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.**
**Int. Cl.[5] B30B** *3/04, 5/04;* **A01D** *39/00*
**U.S. Cl. 100—89** **6 Claims**



1. A machine for making cylindrical bales of crop material, comprising:

a bale starting chamber having a center, a front wall defined by a plurality of chamber rollers, and a rear wall defined by a run of an endless flexible element supported by rotatable support elements;

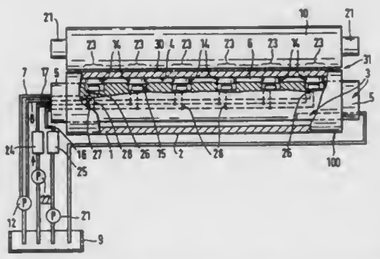
a take-up and tensioning device for said endless flexible element including a pair of arms which are pivotally mounted and which carry take-up means engaged with said endless flexible element;

said plurality of chamber rollers being arranged in an array disposed substantially arcuately about the center of said bale starting chamber for contacting a bale being started in said bale starting chamber with a lowermost chamber roller being located substantially vertically below an uppermost chamber roller; and

said endless flexible element including a plurality of belts arranged side-by-side, said rotatable support elements including an upper support roll and a lower support roll, said run being formed by portions of the belts extending between said upper and lower support rolls with said upper support roll being located forwardly of a vertical transverse plane extending tangent to said lower support roll whereby said run is inclined upwardly and forwardly from said lower support roll, and said lower support roll being spaced rearwardly of said lowermost chamber roller thereby defining a crop-receiving throat therebetween.

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**5,044,273**
**ROLL APPARATUS WITH A HYDRAULICALLY SUPPORTED BOTTOM ROLL HAVING ADDITIONAL SUPPORTING ELEMENTS**
**Bernard Brendel, Grefrath, Fed. Rep. of Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany**
**Filed Dec. 14, 1989, Ser. No. 450,827**
**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843294**
**Int. Cl.[5] B30B** *3/04*
**U.S. Cl. 100—162 B** **18 Claims**



1. A roll apparatus having a top roll and a hydraulically supported bottom roll defining a roll nip therebetween, said bottom roll comprising:

a rotating hollow cylinder having an inner circumference and an outer working roll circumference;

a stationary crosshead extending lengthwise through said hollow cylinder to form a surrounding clearance space with the inner circumference of the hollow cylinder;

said hollow cylinder being supported for radial displacement, as a whole, in the active plane away from the crosshead to a working position in the roll nip; and

at least one supporting element provided near each end of the hollow cylinder extending from the crosshead to abut the inner circumference of the hollow cylinder, each supporting element comprising a piston/cylinder unit including:

a piston and a cylinder, said piston being sealingly and slidably received in said cylinder to close said cylinder up to a predetermined relative position of said piston and cylinder corresponding to a predetermined position of the hollow cylinder in the roll nip short of the working position, said cylinder opening after said predetermined relative position is reached; and

a first hydraulic fluid supply line communicating with the cylinder whereby the piston/cylinder units move the hollow cylinder to the predetermined position short of the working position when hydraulic fluid is conducted to the cylinders.

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5,044,274

## INK CONDITIONING DEVICE FOR REMOVING EXCESS WATER FROM EMULSIONS OF INK AND WATER DURING LITHOGRAPHIC PRINTING

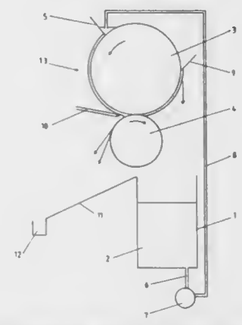
David K. Gaunt, Horsforth, United Kingdom, assignor to Vickers plc, London, United Kingdom

Filed Oct. 23, 1989, Ser. No. 425,632

Claims priority, application United Kingdom, Oct. 31, 1988, 8825411

Int. Cl.[5] B41F 7/20

U.S. Cl. 101—142 6 Claims



1. An ink conditioning device for removing excess water from an aqueous emulsion of ink during lithographic printing, which device comprises:

(i) a pair of rotatable rollers co-operating together to form a nip,

(ii) a means of forming a film of the emulsion on the surface of one of the rollers, which film is subjected to pressure at the nip to break down the emulsion into an ink phase and an aqueous phase,

(iii) jetting means to blow gas at the nip so as to displace the aqueous phase away from the nip, and onto a collector for the aqueous phase, and

(iv) means to remove the ink phase from said one of the rollers after it has passed through the nip.

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5,044,275

## ELECTROSTATIC PRINTING ASSIST SYSTEM

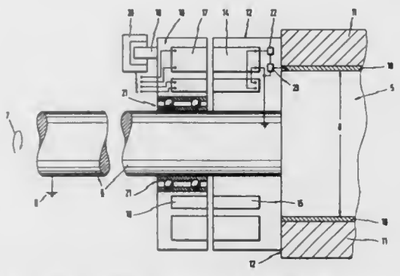
Franz Knopf, Bühl/Stadt; Ernst A. Hahne, Allschwil, and Herman Kunzig, Weil am Rhein, all of Fed. Rep. of Germany, assignors to Eltex Elektrostatik Gesellschaft mbH, Weil am Rhein, Fed. Rep. of Germany

Filed Jul. 19, 1989, Ser. No. 381,975

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824714

Int. Cl.[5] B41F 9/00

U.S. Cl. 101—153 20 Claims



1. A counter pressure cylinder of a printing unit including an electrostatic printing assist system, the counter pressure cylinder comprising a first homogeneous conductive coating means provided on an insulated jacket of the counter pressure cylinder, a second coating means of limited conductivity arranged over said first coating means, a first primary winding means disposed concentrically to an electrically grounded shaft means of the counter pressure cylinder means and fixedly arranged adjacent the counter pressure cylinder with respect to the printing unit, a first secondary winding disposed concentrically to the electrically grounded shaft means of the counter pressure cylinder means and fixedly arranged on one end face thereof and a rectifier circuit means, wherein a first electrical terminal of said secondary winding means is electrically connected to the shaft means of the counter pressure cylinder, and a second electrical terminal of the secondary winding means is connected to the first coating means through said rectifier circuit means.

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5,044,276

## TABLE-TOP APPARATUS FOR PRINTING ON WEB OF RECORD MEMBERS

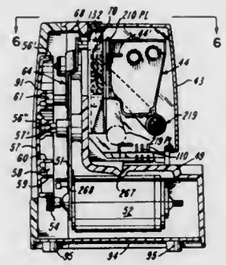
Orville C. Huggins, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 880,530, Jun. 30, 1986, Pat. No. 4,977,829, which is a division of Ser. No. 576,091, Feb. 1, 1984, Pat. No. 4,635,547, which is a division of Ser. No. 349,498, Feb. 17, 1982, Pat. No. 4,441,425. This application May 14, 1990, Ser. No. 522,948

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[5] B41F 1/08

U.S. Cl. 101—292 7 Claims



1. Table-top printing apparatus, comprising: a housing including a frame member molded from plastics material, the frame member including a generally vertical portion having a front panel and a generally horizontal portion, the housing further including a rear panel spaced from the front panel, the housing defining interior space, the horizontal portion having an upper surface, a platen at the upper surface, the front panel having an outer surface, a print head disposed above the horizontal portion, means for mounting the print head on the outer surface for straight line movement into and out of printing cooperation with the platen, means for feeding a web of record members to between the print head and the platen, and means housed in the interior space and coupled to the print head and to the feeding means for moving the print head and the feeding means in sequence.



5,044,277

## FLUID APPLICATION SYSTEM FOR A PRINTING MACHINE CYLINDER, ESPECIALLY CHAMBERED DOCTOR BLADE INKER

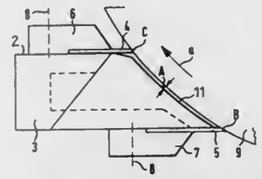
Thomas John, Augsburg, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 12, 1990, Ser. No. 492,539

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1989, 3909878

Int. Cl.[5] B41F 31/02

U.S. Cl. 101—367 3 Claims



1. Fluid application system in combination with a roller or cylinder (9) which rotates at a predetermined speed, to apply a film of fluid, especially for applying printing ink on a surface of the rotating roller or cylinder (9). having

an open box-like structure (2) defining a bottom wall, a top wall, a back wall, and two side walls (3), said side walls extending towards the roller or cylinder and having end surfaces (11) essentially matching the radius of the cylinder or roller,

wherein said side walls define, with respect to the direction of rotation of the roller or cylinder (9), a run-on position (B) and a run-off position (C),

wherein, in accordance with the invention,

at least a portion (10) of at least one of the side walls which is adjacent to and facing the roller or cylinder (9) is outwardly tipped, or inclined, starting from a run-on position (B) and extending to a run-off position (C) of the roller or cylinder (9), at an angle of inclination ($\alpha$) with respect to a plane perpendicular to the roller or cylinder (9), and

wherein the angle of inclination ($\alpha$) of said side wall portion (10, 11) is at least as great as the angle ($\beta$) of a resulting vector ($V_{res}$) based on a first vector ($V_a$) representative of the speed of ink flow due to pressure differences between ambient pressure ($P_0$) and fluid pressure ($P_1$) within said box-like structure, and a second vector ($V_t$) representative of the speed of movement of the fluid being carried along within said box-like structure upon rotation of said roller or cylinder (9) at said predetermined speed, wherein said angle ($\beta$) of said resultant vector ($V_{res}$) is the angle between said resultant vector and a plane perpendicular to the axis of rotation of said roller or cylinder 9.

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5,044,278

## ELECTRICALLY IGNITIBLE CARTRIDGE SYSTEM

W. D. Campbell, Los Angeles, Calif., assignor to James E. Meagher, La Canada, Calif.

Filed Jul. 3, 1989, Ser. No. 376,236

Int. Cl.[5] F42B 5/08

U.S. Cl. 102—202.8 29 Claims

1. In an electrically ignitable cartridge system having a case with a wall defining an internal chamber within said case for a propellant behind a projectile secured to an open end of said case opposite to said projectile, the improvement comprising:

first and second electrical conductor means within said head of said case, each of said conductor means extending between inner and outer faces of said head of said case;

first insulator means for electrically insulating said first and second conductor means from one another;

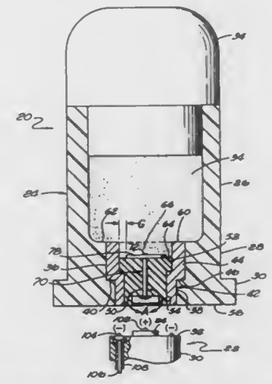
said first conductor means having an outer end portion terminating within an external pocket formed in an outer face of said first insulator means whereby said outer end portion is recessed relative to said outer face of said head;

a second insulator means in said external pocket that covers said outer end portion of said first conductor means to electrically insulate said outer end of said first conductor means from the ambient surroundings;

said second conductor means having an outer end portion terminating at substantially a plane of said outer face of said head to be axially spaced form said outer end portion of said first conductor means; and

hammer means in operative association with said outer end portions of said first and second conductor means for electrically interconnecting said first and second conductor means to an external electrical power source when said hammer means is actuated,

said hammer means having a face in opposing relationship to said outer end portions of said first and second conductor means,



said hammer face being fitted with first and second electrical contact means in operative alignment with said outer end portions of said first and second conductor means, respectively,

said first and second contact means being axially spaced apart a distance substantially corresponding to the axial spacing between said outer end portions of said first and second conductor means;

said second insulator means being made of a material that is penetrable by said first contact means of said hammer means,

said outer end portions of said first and second conductor means being made of a material that is penetrable by said first and second contact means of said hammer means, respectively, to electrically energize said first and second conductor means when said hammer means is actuated.

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5,044,279

## CONNECTOR FOR A BOMB AND A METHOD FOR SUCKING LIQUID IN A BOMB

Mikitake Fukushima, Osaka, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

Filed Jul. 13, 1990, Ser. No. 552,093

Claims priority, application Japan, Jul. 21, 1989, 1-189340

Int. Cl.[5] F42B 33/06; F25B 45/00

U.S. Cl. 102—293 22 Claims

1. A connector for a bomb comprising:

a case which has a top wall and a side peripheral wall with an opening for liquid discharging being formed on at least one of the top and side peripheral walls, and is capable of covering a projected opening of the bomb;

a case fastening device for fastening the case onto the bomb

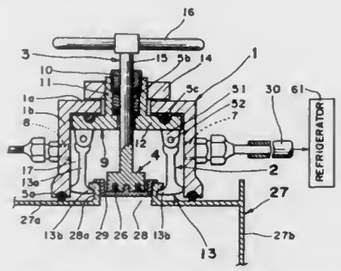
VOL 1130 ISS 1 SE 3 1991 UMI



by utilizing an outer circumferential recess of the projected opening of the bomb;

a handle comprised of a shaft portion and a handle portion fastened to one end of the shaft portion with the shaft portion being arranged to rotatably and movably pass through the top wall of the case and the handle portion being positioned outside the case;

a threaded plug retainer which is fixed to the other end of the shaft portion of the handle and is detach ably engaged with a threaded plug screwed onto the projected opening of the bomb;




a first sealing member for sealing between an end portion of the side peripheral wall of the case and the bomb; and

a second sealing member for sealing around the shaft portion of the handle,

whereby the case is fastened to the bomb by the case fastening device so as to cover the projected opening of the bomb and to form a hermetic chamber, and by operating the handle, the threaded plug retainer engaged with the threaded plug is turned so as to detach the threaded plug from the projected opening of the bomb, and liquid in the bomb is sucked out through the hermetic chamber and the opening on the case.

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**5,044,280**

## LINEAR HOLLOW CHARGE DEVICES

**Daniel A. Philippart, Redhill, and Peter J. Haskins, Kemsing, both of England, assignors to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom**

**PCT No. PCT/GB88/01005, § 371 Date Jun. 5, 1990, § 102(e) Date Jun. 5, 1990, PCT Pub. No. WO89/04943, PCT Pub. Date Jun. 1, 1989**

**PCT Filed Nov. 16, 1988, Ser. No. 476,395**

**Claims priority, application United Kingdom, Nov. 17, 1987, 8726912**

**Int. Cl.[5] F42B *1/00, 1/02***

**U.S. Cl. 102—307** **12 Claims**

1. Linear hollow charge device comprising:

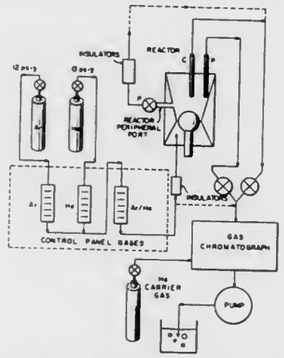
a longitudinal cutting charge, having a facing surface, of high explosive provided in one or more separate parts,

means defining a planisymmetrical groove along one side of the charge which is lined with a non-explosive hollow charge liner, and

a means for initiating the cutting charge along its opposite side wherein said means comprises:

a linear initiating charge, having a facing surface, of high explosive disposed along the plane of symmetry adjacent the opposite side of the cutting charge, facing surfaces of the linear initiating charge and said cutting charge defining a gap therebetween which is tapered longitudinally of the cutting charge from one end of the linear initiating charge to its other end,

means for locating a detonating means for detonating the linear initiating charge at one end, and a non-explosive primary initiating liner on said facing surface of the linear initiating charge which, when the linear initiating charge is detonated, is projected across the gap to initiate said cutting charge along the plane of symmetry, the degree of taper of the gap being selected such that the phase velocity of cutting charge initiation by the projected initiating liner exceeds the velocity of detonation of the high explosive of the cutting charge.




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**5,044,281**

## SUBMARINE FLARE WITH VERTICAL ATTITUDE DETERMINATION

**Peter Ramsay, Oak Park; Brian W. Whiffen, Pascoe Vale; Gerald M. Bushnell, Gordon; Victor Nanut, Forest Hill; Robert C. Czigledy, North Balwyn; Robert J. Swinton, Ascot Vale; Maxwell J. Coxhead, Pascoe Vale, and Timothy R. Clarke, Ringwood, all of Australia, assignors to The Commonwealth of Australia, Canberra, Australia**

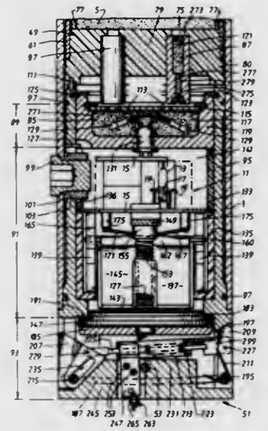
**PCT No. PCT/AU87/00285, § 371 Date Apr. 7, 1989, § 102(e) Date Apr. 7, 1989, PCT Pub. No. WO88/01364, PCT Pub. Date Feb. 25, 1988**

**PCT Filed Aug. 21, 1987, Ser. No. 334,278**

**Claims priority, application Australia, Aug. 21, 1986, PH7612**

**Int. Cl.[5] F42B *4/28***

**U.S. Cl. 102—340** **36 Claims**



1. A flare for underwater vessel use that can be launched from below the surface of a body of sea water comprising an elongated buoyant casing, a projectable tubular body located in the casing containing a flare composition which body can be projected from the casing into the air when the casing is at or near the surface of the water, propulsion means for projecting said tubular body from the casing, means for igniting the flare composition after the body is projected into the air to provide a visible display in the air, and control means for activating the propulsion means when the casing is at or near the surface of the water and for igniting the flare composition when the body is in the air, said control means including inclination means for sensing the vertical orientation of the casing that permit the propulsion means to be activated only when the vertical orientation of the casing is within a prescribed range of vertical attitude, said casing being deployable from a firing tube on the vessel from a location beneath the surface of the water, its buoyancy carrying it to the surface where the tubular body containing the flare composition can be projected therefrom.

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**5,044,282**

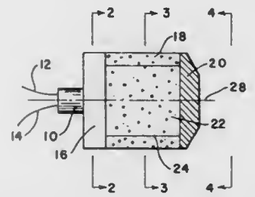
## TAPERED DISC AND JACKETED EXPLOSIVE DEVICE FOR PROJECTING HIGH VELOCITY METAL JETS

**Brian Fuchs, Hackettstown; Barry Fishburn, Dover; Ernest L. Baker, Vernon, N.J., and Pai-Lieu Lu, Rockaway, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 15, 1990, Ser. No. 599,556**

**Int. Cl.[5] F42B *1/00***

**U.S. Cl. 102—475** **2 Claims**



1. An apparatus for producing a shaped charge which comprises:

detonator means for initiating an explosive charge:

booster charge means operatively disposed in juxtaposition with said detonator means and capable of being explosively activated by said detonator means;

jacket explosive means disposed adjacent to and in axial alignment with said booster charge means for being explosively activated by said booster charge means and for generating high detonation velocities;

core explosive means axially disposed within said jacket explosive means for generating a Chapman-Jougnet detonation velocity lower than the detonation velocity of said jacket explosive means and for achieving a highly over driven Mach stem detonation; and

disc means operatively disposed against said jacket and core explosive means for interacting with the Mach stem detonation of said core explosive means to produce a penetrating jet of disc material, including a tapered circular flyer plate disc having a taper extending from the outer edge of said jacket explosive annular configuration to the diameter of a central Mach stem region of an impacting detonation wave, which will be smaller than the diameter of said core explosive.

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**5,044,283**

## FREE TRANSFER MACHINE, WITH INDEPENDENT, MOTORIZED CARRIAGES AND WITH MODULE FOR ORIENTATION OF SUCH CARRIAGES

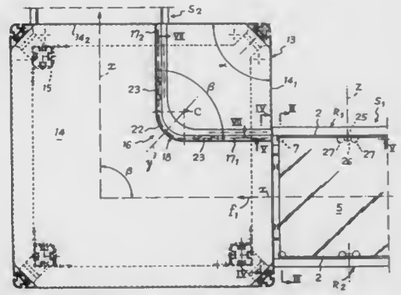
**Bruno A. E. Marie, Roche la Moliere, and Etienne M. Teissier, Chabeuil, both of France, assignors to Adl Automation, Malissard, France**

**Filed Oct. 16, 1989, Ser. No. 421,955**

**Claims priority, application France, Oct. 17, 1988, 88 14302; Jun. 30, 1989, 88 09077**

**Int. Cl.[5] B61J *1/12***

**U.S. Cl. 104—88** **19 Claims**



1. A free transfer machine having an orientation module to change a direction of travel of independent motorized carriages traveling between trackway segments defining an angle $\beta$ therebetween, each trackway segment having two parallel rails, each rail defining a rolling surface and a lateral guiding surface, each motorized carriage having lateral guiding rollers, rolling members to support the carriage on the rolling surfaces of the rails, lateral tracker rollers and relief rollers, wherein the orientation module comprises:

a) a rolling plate substantially co-planar with the rolling surfaces of the rails of the track segments;

b) a pair of rectilinear lateral guiding sections located on the rolling plate each being aligned with one of the rails of each trackway segment and defining the angle $\beta$ therebetween each lateral guiding section having a length at least as great as one-half the length of the motorized carriage; and,

c) a curved section located on the rolling plate and operatively associated with the lateral guiding sections, the curved section defining lateral guide means adapted to interact with the lateral tracker rollers and relief rollers to change the direction of travel of the motorized carriages to enable the carriages to pass from one trackway segment to another.

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**5,044,284**

## COMPUTER WORKSTATION

**Milton Gross, 34 Elmore Rd., Rochester, N.Y. 14618**

**Filed Mar. 1, 1990, Ser. No. 486,692**

**Int. Cl.[5] E06B *11/00***

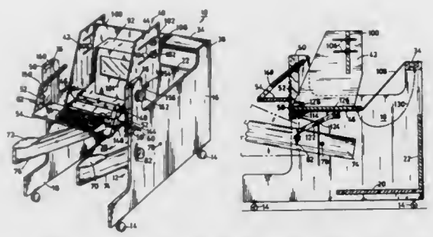
**U.S. Cl. 108—10** **11 Claims**

1. A workstation for supporting a computer and/or a video display terminal which comprises a frame having sidewalls and a back member extending between said sidewalls, racks having edges with a plurality of slots along one edge of each of said racks said racks being disposed on said sidewalls with said slots of one of said racks laterally aligned with the slots of the other of said racks a table having an upper surface for supporting said terminal, said table having forward and rear edges and having side edges and also having a bottom surface, members connected to said table and extending beyond said side edges, said table being disposed between said sidewalls with each of said members disposed in one of said slots in said rack said

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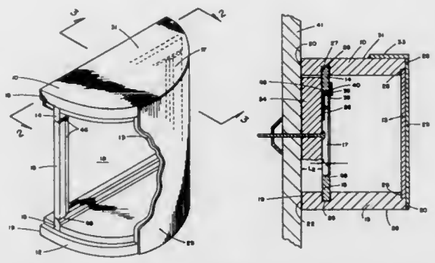
members may be disposed in different ones of said slots; to adjust the elevation of said table, said table being pivotally mounted on said members in said slots, and means including a belt connected to said back member of said frame and extending along and in supporting relationship with the bottom surface of said table, for adjusting the inclination of said table.



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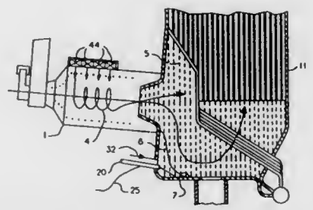
**5,044,285**
**SHELF AND BRACKET COMBINATION**
**Russell Wolfe, III, 32 Moore Ave., Nashville, Tenn. 37210**
**Filed Aug. 16, 1990, Ser. No. 568,423**
**Int. Cl.[5] A47B** *3/06*
**U.S. Cl. 108—152** **11 Claims**

1. A new and improved shelf and shelf mounting combination including:
a shelf having an upper support block and a lower support block;
the upper support block having a top surface and the lower support block having a bottom surface generally parallel to the top surface;
means creating a facing surface;
means creating a mounting cavity;
the upper support block and the lower support block being connected and spaced apart by the means creating a facing surface and the means creating a mounting cavity;
the support blocks having faces forming a mounting surface;
an elongated tooth protruding from the upper support block into the mounting cavity and an elongated tooth protruding from, the lower support block into the mounting cavity, said elongated teeth being connected to each other at their longitudinal ends by mounting teeth;
the teeth being spaced inwardly of the mounting cavity from the mounting surface;
the teeth being generally uniform in cross-section;
a mounting bracket to be mounted on a wall including a mounting base and a support arm connected thereto by an offset creating a longitudinal channel having a cross-section substantially similar to the cross-section of the teeth, said channel having an opening at one end and a closed base at the other end and said channel being narrower at said opening than at said base to cause the support arm to bias the shelf in the direction of the mounting base;
the upper surface and the lower surface having their edges in flush continuous contact with the wall when the mounting bracket, is mounted on a wall and the shelf is attached thereto with one of the elongated fitted within the channel.



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**5,044,286**
**PROCESS TO ELIMINATE PRODUCTION OF FLY ASH BY WET BOTTOM BOILERS**
**Bernard P. Breen, Pittsburgh; Robert A. Schrecengost, North Huntingdon, both of Pa., and James E. Gabrielson, Plymouth, MN. assignors to Consolidated Natural Gas Service Company, Inc., Pittsburgh, Pa.**
**Filed Dec. 8, 1989, Ser. No. 447,789**
**Int. Cl.[5] F23J** *1/00*
**U.S. Cl. 110—165 A** **17 Claims**

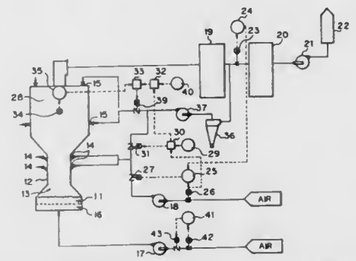


1. A process for the reduction of fly ash in a wet bottom boiler of the type having a primary and secondary furnace, the process comprising the steps of:
(a) collecting the fly ash from one of an electrostatic precipitator, a bag house, a cyclone collector, a multi-cyclone collector, a gravity separator and a sharply curved duct;
(b) removing the fly ash in a stream of carrier gas into the furnace;
(c) adding a fuel to the stream of carrier gas and fly ash;
(d) introducing the carrier gas and fly ash and fuel into one of the primary and secondary furnaces, wherein the fuel and the heat from at least one of the surrounding gas and molten slag provide energy to melt the fly ash; and
(e) discharging the melted fly ash with slag from the furnace bottom.



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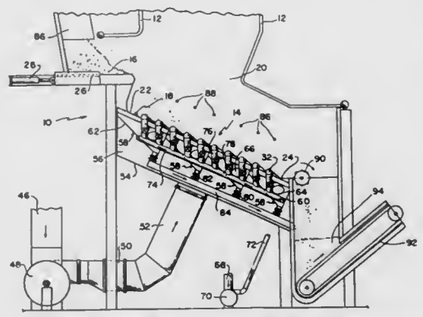
**5,044,287**
**METHOD OF CONTROLLING COMBUSTION IN A FLUIDIZED BED FURNACE**
**Masaaki Furukawa; Hiroshi Yoshida; Takeyuki Naito, and Keiichi Sato, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan**
**Filed Jun. 13, 1990, Ser. No. 537,627**
**Claims priority, application Japan, Jun. 16, 1989, 1-154030**
**Int. Cl.[5] F23G** *5/00*
**U.S. Cl. 110—346** **6 Claims**



1. In a method of controlling combustion in a fluidized bed type furnace having a combustion chamber, the lower portion of the combustion chamber being a mixing/stirring region in which unburnt gas and secondary combustion air are mixed and stirred together, said furnace being supplied with a quantity of combustible material varying per unit time and a quantity of combustion air which is controlled in response to the quantity of the combustible material, the improvement wherein a flow rate of mixture gas comprising secondary combustion air and exhaust gas to be fed into the mixing/stirring region is maintained within a predetermined range by blowing a part of exhaust gas into the mixing/stirring region depending on variation in said quantity of combustion air.

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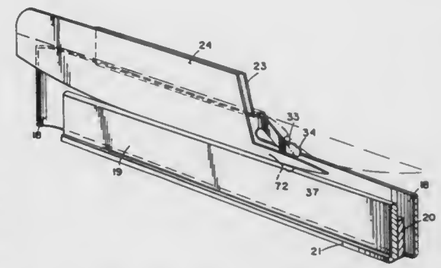
**5,044,288**
**METHOD AND APPARATUS FOR THE EFFICIENT COMBUSTION OF A MASS FUEL**
**James L. Barlow, 1524 Ticonderoga Dr., Fort Collins, Colo. 80525**
**Filed Apr. 13, 1990, Ser. No. 508,929**
**Continuation-in-part of Ser. 278,183 Dec. 1, 1988**
**Int. Cl.[5] F23G** *5/00*
**U.S. Cl. 110—346** **20 Claims**



1. A method for the efficient incineration of combustible mass fuel comprising the steps of:
a. receiving said combustible mass fuel; then
b. directing said mass fuel to a surface for combustion; then
c. admitting a combustion support gas to said combustible mass fuel while it is situated on said surface; while
d. combusting said mass fuel as it is situated on said surface to produce combusted material; while
e. mixing said mass fuel by introducing a separate mix gas into said mass fuel wherein said separate mix gas does not significantly support combustion; while
f. transporting said combustible mass fuel along said surface in a predominant direction; and then
g. advancing the combusted material towards a containment area.

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**5,044,289**
**ONE PIECE FOLDER FOR HEMMING GARMENTS**
**J. Herbert Keeton, 747 Meader St., Campbellsville, Ky. 42718**
**Filed May 18, 1990, Ser. No. 524,978**
**Int. Cl.[5] D05B** *35/00, 35/02*
**U.S. Cl. 112—178** **20 Claims**



1. A down type static folder for folding the edge of a garment during hemming, in combination with an automatic sewing machine head having a needle, comprising:
static plate means for effecting fold over of the edge of a garment brought into operative association therewith;
tongue means operatively connected to said plate means for holding the folded over edge of a garment in a predetermined spatial relationship with the needle of the automatic sewing machine during hemming of the garment edge by the sewing machine; and
means for mounting said static plate means and said tongue means in a specific predetermined relationship directly to said sewing machine head so that said tongue is in close proximity to said needle.

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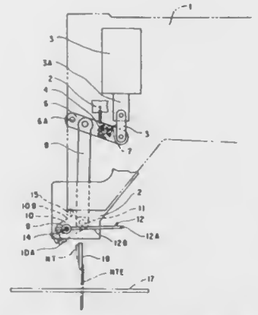
**5,044,290**
**WIPER UNIT OF A SEWING MACHINE**
**Shuichi Sato, and Shirou Ayusawa, both of Utsunomiya, Japan, assignors to SSMC Inc., Edison, N.J.**
**Filed Nov. 24, 1989, Ser. No. 440,839**
**Claims priority, application Japan, Dec. 24, 1988, 63-166307[U]**
**Int. Cl.[5] D05B** *65/00*
**U.S. Cl. 112—286** **1 Claim**

1. A wiper unit for sewing machine having an arm and comprising:
a supporter secured to the arm of the sewing machine;
a stopper secured to the supporter;
a wiper shaft rotatably supported by the supporter, the stopper restricting the rotation of the shaft;
a wiper mounted on the wiper shaft, the wiper having a wiper arm and a tip end thereof, the tip end having a hook for wiping a thread end of an upper thread;
a wiper operation crank fixed to the wiper shaft for adjusting a turning position thereof relative to the wiper;
an operation link;

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a pin connecting the operation link to the operation crank; and



a driving unit for driving the operation link reciprocally and for driving the wiper operation crank and the wiper shaft to turn about an axis of the wiper shaft.

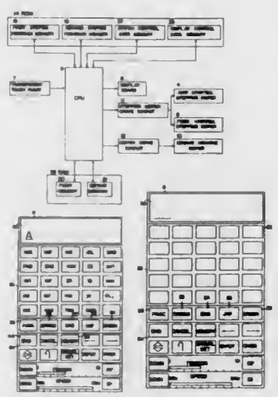
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**5,044,291**

**STITCH PATTERN SELECT/INPUT SYSTEM IN SEWING MACHINE**

**Fumihiko Kobayashi; Yoshiaki Sakata; Takumi Ando, all of Tokyo, and Toru Hyodo, Kanagawa, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan**

**Filed Jul. 12, 1990, Ser. No. 552,252**
**Int. Cl.[5] D05B** *3/02*
**U.S. Cl. 112—445** **2 Claims**



2. A stitch pattern selection system for use in an electronically controlled sewing machine having first memory means (**37**) for storing stitch control data for a plurality of stitch patterns; second memory means (**38**) for storing display control data for the stitch patterns; and stitch forming means (**13,15,17,19**) for producing every stitch of the stitch pattern in response to the stitch control data thereof; said system comprising display means (**8**) partitionable into a pattern list section (**8***b*) for representing in a lump the stitch patterns belonging to one of pre-classified groups and a pattern display section (**8***a*) for representing at least one selected stitch pattern; a transparent panel (**7**) overlying said pattern list section and including a plurality of operating keys (**22,40,41,43** . . . ) each corresponding to the stitch pattern appearing in said pattern list section; control means (**9**) for controlling representation of at least one of the stitch patterns in said pattern display means by operation of at least one of the corresponding operating keys, said control means utilizing display control data stored in said second memory means while controlling said representation said stitch patterns being stitchable by operation of said stitch forming means in response to the stitch control data thereof stored in said first memory means; and pattern group select means (**25–29**) included in said display means for selecting a different stitch pattern group from that appering in said pattern list section so that at least one of the stitch patterns belonging to the different stitch pattern group may be selected by operation of at least one of the corresponding operating keys.

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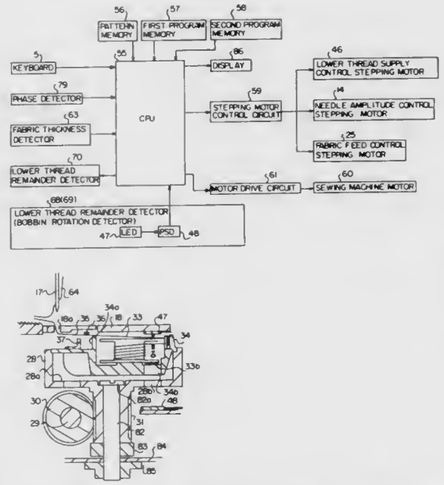
**5,044,292**

**SEWING MACHINE WITH LOWER THREAD SUPPLY CONTROL MEANS**

**Takashi Nakamura; Haruhiko Tanaka; Akira Orii, all of Hachioji, and Toru Hyodo, Sagamihara, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan**

**Filed Jun. 8, 1990, Ser. No. 535,118**
**Claims priority, application Japan, Jun. 9, 1989, 1-145081**
**Int. Cl.[5] D05B** *3/02, 45/00*
**U.S. Cl. 112—453** **2 Claims**

1. A sewing machine having a vertically reciprocating needle carrying an upper thread; a rotatable bobbin carrying a lower thread; and a loop-taker means operated in synchronism with reciprocation of the needle to interlock the upper thread with the lower thread to form a stitch; which further comprises a memory means for storing stitch control data of a plurality of patterns which may be produced with the sewing machine; a calculation means for theoretically determining an amount of the lower thread to be supplied from the bobbin in formation of each stitch, based on the stitch control data of a specific pattern to be produced; a detection means for detecting a practical amount of the lower thread which has actually been supplied from the bobbin in formation of each stitch; and a control means for comparing said theoretical lower thread amount determined by said calculation means and said practical lower thread amount determined by said detection means to thereby calculate a correction coefficient to be used for correcting said theoretical lower thread amount of the lower thread in a controlled manner to an optimum amount by which the lower thread is supplied from the bobbin to produce the next stitch.



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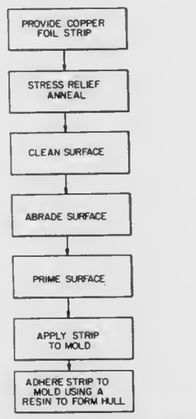


**5,044,293**

**METHODS OF UTILIZING ANTI-FOULING MATERIAL IN MARINE VESSEL HULL CONSTRUCTION**

**Graham C. Andoe, Fort Lauderdale, Fla., assignor to Andoe, Inc., Atlanta, Ga.**

**Filed Sep. 19, 1989, Ser. No. 409,072**
**Int. Cl.[5] B63B** *3/00, 5/24*
**U.S. Cl. 114—88** **21 Claims**




1. In the method of manufacturing a marine vessel hull including the steps of providing a mold having a surface configuration corresponding to a vessel hull surface configuration and laminating a plurality of layers of a fiberglass material together using a resin and said mold to form said vessel hull, the improvement comprising the steps of:

(a) prior to said laminating steps, providing at least one predominantly copper foil strip having a continuous first and a continuous second surface;

(b) a stress relief annealing said predominantly copper foil strip to improve flatness and promote bonding;

(c) applying at least one said predominantly copper foil strip on said mold such that said predominantly copper foil strip corresponds to said surface configuration of said mold;

(d) manufacturing said hull by laminating a plurality of layers of fiberglass material to said predominantly copper foil strip using a resin;

(e) wherein said predominantly copper foil strip becomes an integral part of said hull.

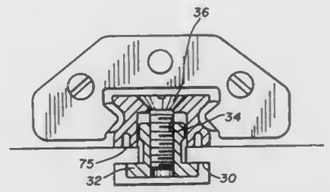
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**5,044,294**

**MAST TRACK SYSTEM FOR SAILING VESSEL**

**Christine G. Kronich, Pewaukee; Gregory W. Hartlmeier, Milwaukee, and Peter O. Harken, Pewaukee, all of Wis., assignors to Harken, Inc., Pewaukee, Wis.**

**Filed Sep. 5, 1990, Ser. No. 579,066**
**Int. Cl.[5] B63H** *9/04*
**U.S. Cl. 114—112** **8 Claims**



1. A mast track system for a sailing vessel wherein the vessel comprises an upright mast having a rearwardly facing groove with a restricted opening for normally supporting the luff of a sail, said system comprising a track extending along said mast over said groove, a plurality of lugs in said groove, means for securing said track to said lugs through said restricted opening to secure said track to said mast, and a plurality of traveler cars slidably mounted on said track.

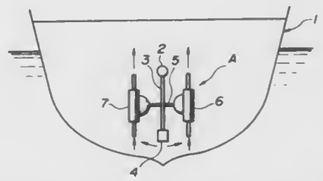
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**5,044,295**

**APPARATUS FOR REMOVING BILGE WATER OUT OF A BOAT**

**Toshiharu Shimokawa, 579-294 Yoshimutago, Nagayo-cho, Nisbionogi-gun, Nagasaki-ken, Japan**

**Filed Feb. 4, 1988, Ser. No. 152,414**
**Claims priority, application Japan, Mar. 28, 1987, 62-74995**
**Int. Cl.[5] B63B** *13/00*
**U.S. Cl. 114—183 A** **6 Claims**



1. Apparatus for removing water out of a boat, comprising:

a) a swingable rod mounted within the boat for swinging movement in response to at least one of rolling and pitching motion of the boat, said rod extending substantially vertically in its stationary position and being supported at

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one end portion thereof by the boat and having a weight at the other end portion thereof;

b) an actuating push member connected to extend generally perpendicular to the swingable rod member; and

c) water discharging diaphragm pump means including a first diaphragm pump having a diaphragm defining a diaphragm pump chamber, an inlet valve connected to a suction pipe and an outlet valve connected to a discharge pipe through which inlet valve and suction pipe bilge water enters the pump chamber and through which outlet valve and discharge pipe bilge water is discharged from the pump chamber;

said actuating member contacting to act directly on and push the diaphragm to cause water to be discharged form the pump chamber in response to swinging movement of the rod in a predetermined direction.

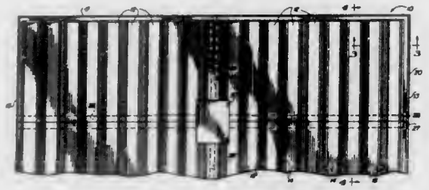
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**5,044,296**

## MODULAR FLOATING STRUCTURES AND METHODS FOR MAKING

**Arnold A. Finn, 3605 Conway Gardens Rd., Orlando, Fla. 32812**

**Division of Ser. No. 187,267, Apr. 28, 1988, Pat. No. 4,947,780.**
**This application Jun. 18, 1990, Ser. No. 539,747**
**The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.**
**Int. Cl.[5] B63B** *35/38*
**U.S. Cl. 114—263** **6 Claims**



1. A method for fabricating a buoyant member comprising the steps of:

providing a buoyant volume of an inert, nonmetallic material having a top surface, a bottom surface and peripheral side surfaces;

depositing a protective sheet over the bottom and peripheral side surfaces;

placing forms about the edges of the top surface;

pumping a settlable liquid into the forms and across the top surface to a predetermined thickness above the top surface and permitting the liquid to set into a monolithic layer over the top surface; and

lapping the protective sheet and the monolithic layer one with respect to the other.

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**5,044,297**

## DISCONNECTABLE MOORING SYSTEM FOR DEEP WATER

**Jacob de Baan, BH Maassluis, Netherlands, and Willem Jan van Heijst, Villars-sur-Glane, Switzerland, assignors to Bluewater Terminal Systems N.V., Netherlands**

**Filed Sep. 14, 1990, Ser. No. 583,033**
**Int. Cl.[5] B63B** *21/50*
**U.S. Cl. 114—293** **7 Claims**

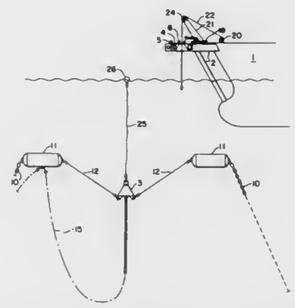
3. A deep water mooring system comprising

a plurality of flotation tanks,

mooring legs connecting from the ocean bottom to the flotation tanks for fixing the location of said flotation tanks,

a nonbuoyant connector body having connections to a submerged pipeline,

means supporting said connector body from said flotation tanks, and



means for retrieving said connector body from the ocean to allow flow between the surface and said submerged pipeline.

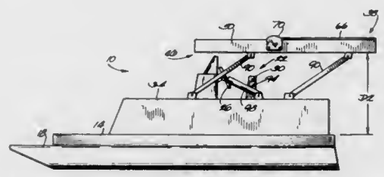
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**5,044,298**

## MOVABLE BOAT CANOPY

**Geoffrey T. Pepper; James R. Buttrey, both of Lebanon, Mo.; Donald P. Dimmitt, Chicago, and William S. Becker, Park Forest, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Sep. 27, 1989, Ser. No. 413,328**
**Int. Cl.[5] B63B** *17/02*
**U.S. Cl. 114—361** **18 Claims**



1. A boat comprising a deck having thereon a forwardly located helm, a canopy including a rearwardly located permanent cover, spaced-apart portions extending forwardly from said permanent cover and defining therebetween a forwardly open opening, and a second cover extending forwardly from said permanent cover and movable between a retracted position wherein said second cover does not extend over said opening and an extended position wherein said second cover extends over said opening, and means for moving said canopy relative to said deck between a raised horizontally extending position wherein said canopy is located above said helm and spaced a first distance above said deck so as to permit an operator to stand or sit adjacent said helm and under said second cover when said second cover is in said extended position and a lowered horizontally extending position wherein said canopy is spaced a second distance less than said first distance above said deck and wherein said opening is located above said helm so as to permit an operator to stand or sit adjacent said helm and between said spaced apart portions when said second cover is in said retracted position.

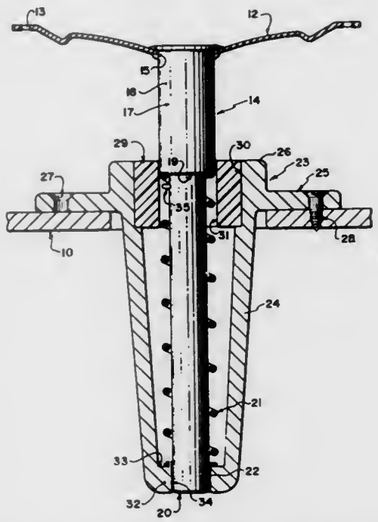


**5,044,299**

## SEAT CONSTRUCTION FOR A BOAT

**Ronald M. Frank, Box 6, Group 13, S.S. No. 1, Winnipeg, Manitoba, Canada R3C 2E3**

**Filed May 7, 1990, Ser. No. 518,702**
**Int. Cl.[5] B63B** *29/00*
**U.S. Cl. 114—363** **9 Claims**



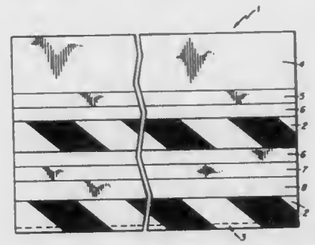
1. A seat construction for a boat comprising a support sleeve member, means on the sleeve member for mounting the sleeve member on the boat with a longitudinal axis thereof standing vertically of the boat, a seat support element for supporting an underside of a seat bottom, a shaft directly and fixedly mounted on the seat support element so as to extend vertically downwardly therefrom to a free end thereof received within said sleeve member, a cylindrical abutment and bearing member fixedly mounted on the shaft and having an end abutment surface lying in a radial plane of the shaft and facing downwardly of the shaft and a first cylindrical bearing surface facing outwardly of the shaft and coaxial with the shaft having a radius larger than that of the shaft the radial extent of the abutment surface being no greater than the radius of the cylindrical bearing surface, a helical coil spring coaxially surrounding the shaft and having one end thereof in engagement with the abutment surface and an end opposed to said one end spaced from the free end of the shaft leaving a free portion of the peripheral surface of the shaft at the free end of the shaft, means attaching the spring to the shaft such that the spring is carried by the shaft when removed from the sleeve, the radial extent of the spring being less than the radius of the cylindrical bearing surface, said support sleeve member including a second cylindrical bearing surface facing inwardly of the sleeve member cooperating with said first cylindrical bearing surface to accommodate the rotational and axial movement of said seat support element relative to said sleeve member, a third cylindrical bearing surface cooperating with said free portion of the shaft to accommodate said rotational and axial movement, an upper end of said third bearing surface defining an abutment surface lying in a radial plane for engaging said opposed end of the spring, and a connecting portion between said second and third bearing surfaces spaced outwardly from and surrounding the spring to allow compression and expansion of the spring in response to shock loads applied to the seat by an occupant.

**5,044,300**

## BARRIER WRAPPER

**Douglas M. Herd, #1021 Toronto Dominion Tower, Edmonton Center, Edmonton, Alberta T5J 2Z1, Canada**

**Filed Apr. 18, 1990, Ser. No. 523,708**
**Claims priority, application Canada, Dec. 15, 1989, 2005674**
**Int. Cl.[5] E01F** *13/00;* **G09F** *7/12*
**U.S. Cl. 116—63 R** **2 Claims**



2. A replaceable wrapper for an elongate wooden gate arm for use with the entrance and exit ways of parking facilities, comprising an elongate sheet of flexible material dimensioned to form a single elongate sleeve adapted to encase said elongate wooden gate arm;

said wrapper carrying two sets of a plurality of oblique lined indicia positioned on said flexible material such that when said wrapper is applied to said arm, said indicia visually exaggerate the front and rear faces of said arm;

said wrapper further comprising at least one adhesive surface on one side of said flexible material;

said sheet of flexible material being adapted to wrap around said elongate wooden gate arm and be secured upon itself.

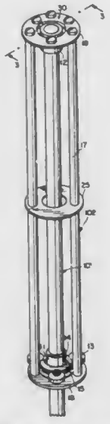
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**5,044,301**

## AUTOMATIC FLAG UNFURLER

**Jack Peters, 806 Eastwood Dr., Prescott, Ariz. 86303, and Jack T. Melton, Prescott, Ariz., assignors to Jack Peters, Prescott, Ariz.**

**Filed Feb. 20, 1990, Ser. No. 481,236**
**Int. Cl.[5] G09F** *17/00*
**U.S. Cl. 116—174** **16 Claims**



1. An apparatus for use on a flagpole with a central elongate pole, said apparatus adapted for automatically unfurling and maintaining in an unfurled state a flag attached thereto and comprising;

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a squirrel-cage like assembly adapted for rotational mounting about the axis of said pole and including first and second spaced circular, substantially planar end plates transverse to said axis and elongate members parallel to said axis and extending between said end plates, said elongate members being uniformly spaced about said end plates to ensure that said squirrel-cage assembly is dynamically balanced for rotation about said central pole;

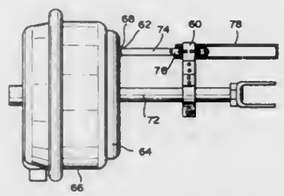
bearing means including bearing members equidistantly spaced and rigidly mounted between said squirrel-cage assembly and said elongate pole for providing low rotational friction between said assembly and said pole and to further ensure dynamical balance of said assembly, said bearing members having their axis of rotation fixed with respect to said end plates and separate and parallel with respect to said central elongate pole;

means secured to one of said elongate members for attaching to said one elongate member an edge of the flag; and

whereby forces acting on said flag resulting either from its weight or as a result of wind blowing on said flag readily cause said assembly to rotate about said elongate pole and thereby cause the unfurling of flag.

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**5,044,302**
**BRAKE WEAR INDICATOR**
**Nathan L. Goldfein, and Frank J. Sonzala, both of Houston, Tex., assignors to LGS Research, Inc., Houston, Tex.**
**Filed Jun. 29, 1990, Ser. No. 545,408**
**Int. Cl.[5] G01D *21/00*; F16D *66/02***
**U.S. Cl. 116—208** **1 Claim**




1. A brake wear indicator for a brake having a push rod which is moved to move braking means into braking engagement, the brake mounted to a vehicle and having a brake housing, the indicator comprising

a hollow cartridge, the hollow cartridge secured to the push rod by an adjustable clamp which clamps onto the push rod and onto the cartridge,

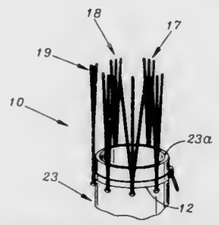
an indicator member partially disposed in and movable with respect to the hollow cartridge, the indicator member having a first end with a warning portion, the warning portion normally disposed within the cartridge, the indicator member urged against a part of the vehicle by a spring within the hollow cartridge which yieldably urges the indicator against the part of the vehicle,

the hollow cartridge securable to the push rod and having a second end through which the first end of the indicator member is freely movable,

the first end of the indicator member urged against the part of the vehicle by the spring so that upon activation of the brake the push rod and the hollow cartridge move exposing a portion of the indicator member, to indicate amount of brake wear, the warning portion exposed in the event of abnormal brake wear, and

the hollow cartridge second end having an opening sized so that a portion of the wear indicator exposed from within the hollow cartridge upon brake activation is cleaned of foreign material adhering to said exposed portion during its exposure when it returns within the cartridge.

**5,044,303**
**SUB-SURFACE CONDUIT MARKING APPARATUS**
**Frank A. Culver, Jr., 6252 Mandarin Dr., Las Vegas, Nev. 89108**
**Filed Oct. 23, 1989, Ser. No. 425,304**
**Int. Cl.[5] F16L *55/00***
**U.S. Cl. 116—209** **8 Claims**




6. A device for marking the location of conduit at or below the surface of a poured concrete floor, said device comprising:

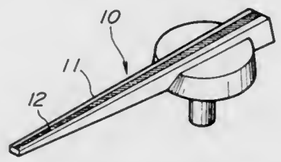
strip means for fastening the device to a portion of a conduit;

a plurality of sets of generally flexible generally identical feather strip members all of which are secured at one end thereof to said strip means, said strip members having a rigidity sufficient to withstand concrete finishing methods and having a length sufficient for a second end thereof to protrude, at least in part, above the surface of the concrete floor after finishing thereof; and

means for banding said set of strip members together at a point intermediate said strip means and said second end of said strip members for enhancing the rigidity of said set of strip members.

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**5,044,304**
**ILLUMINATED INDICATOR GAUGE**
**Kiyoshi Tomita, Saitama Prefecture, Japan, assignor to Kanto Seiki Co., Ltd., Omiya, Japan**
**Continuation of Ser. No. 357,013, May 25, 1989, abandoned. This application Aug. 21, 1990, Ser. No. 569,740**
**Claims priority, application Japan, Jun. 8, 1988, 63-76248[U]**
**Int. Cl.[5] G01D *13/20***
**U.S. Cl. 116—286** **7 Claims**




1. An indicator gauge for use in a motor vehicle comprising:

a housing having a closed portion, an open portion and an interior;

a transparent cover covering said open portion of said housing;

a movement secured to said closed portion of said housing;

a spindle extending from said movement towards said interior of said housing;

a dial board installed in said housing having a front face which faces towards said transparent cover, said dial board having an opening through which said spindle passes and having a front face with indicia coated with a fluorescent substance;

a pointer connected to said spindle so that an elongate indicating portion thereof swingably moves over said front face of said dial board in response to operation of said movement with said indicating portion extending over a center of rotation of said pointer; and

an ultraviolet lamp arranged at said open portion of said housing in a manner to be exposed to said interior of said housing, said ultraviolet lamp generating ultraviolet rays when electrically energized;

said elongate indicating portion having a single elongate surface oriented toward a driver's ordinary viewing position in said vehicle;

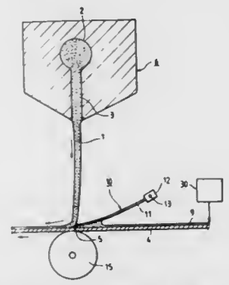
a narrow band of fluorescent substance centrally located longitudinally along the full length of said single elongate surface;

said narrow band being bordered on each side along said full length by remaining areas of said single elongate surface free of any fluorescent substance to create a contrasting appearance for maintaining a distinction between said band and said indicia on said dial board when subject to said ultraviolet rays.



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**5,044,305**
**CURTAIN-TYPE COATING DEVICE**
**Norio Shibata, and Tsunehiko Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Continuation of Ser. No. 363,571, Jun. 7, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 597,273**
**Claims priority, application Japan, Jun. 7, 1988, 63-138478**
**Int. Cl.[5] B05C *5/00, 9/06***
**U.S. Cl. 118—73** **5 Claims**



1. A coating device for forming a film layer on a moving support, comprising: means for pre-coating said moving substrate with a liquid solvent; a supply of a coating solution which is soluble with said solvent of said pre-coated layer and which has a greater viscosity than said solvent; said coating solution dropping in the form of a curtain from said coating head under force of gravity and which collides against said one surface of said moving support to form said film layer on the support; and a blade for guiding said curtain, said blade being disposed entirely upstream of said curtain with respect to a direction of conveyance of said support, a front edge of said blade being laid over and simultaneously contacting both said curtain and said pre-coated layer only at a meeting line where said curtain meets said pre-coated layer on said one surface of said support without said front edge contacting said support, and in such a manner as to catch a part of said pre-coated layer but allow the passage of remaining portions of said pre-coated layer, whereby entrance of air into said film layer is prevented.

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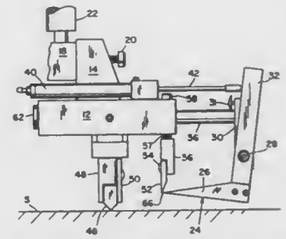
**5,044,306**
**SOLDER APPLYING MECHANISM**
**Gunter Erdmann, 18 Ponderosa La., Walpole, Mass. 02032**
**Filed Jun. 11, 1990, Ser. No. 535,847**
**Int. Cl.[5] B05C *1/02***
**U.S. Cl. 118—120** **12 Claims**

1. Mechanism for wiping solder paste onto a printed circuit board through a stencil superposed on the board, comprising:

a) a first squeegee for wiping solder paste onto a stencil

b) a second squeegee for depositing solder paste at a location for engagement by the first squeegee; and

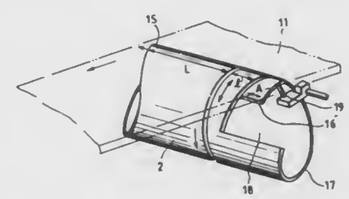
c) a movable tray alternatively engagable with both squeegees to cooperate with the second squeegee to deposit solder paste at the beginning of a wiping stroke and to



cooperate with the first squeegee to pick up excess solder paste at the end of a wiping stroke.

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**5,044,307**
**COATING WIDTH CHANGING DEVICE FOR USE IN CURTAIN COATING**
**Kunio Takahashi; Osamu Yamane; Yasunori Hori, and Takanori Endo, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Jun. 15, 1990, Ser. No. 538,445**
**Claims priority, application Japan, Jun. 19, 1989, 1-154534**
**Int. Cl.[5] B05C *3/18, 5/00***
**U.S. Cl. 118—325** **8 Claims**



1. In a coating apparatus for performing coating by forming a free falling curtain film striking a continuously running elongated belt-like web, a curtain coating width changing device comprising:

a backup roller for supporting said web;

at least one collar member provided at an edge portion of said backup roller and movable in the axial direction of said backup roller, said collar member lying on an extension of a top portion of said backup roller; and

at least one spacer provided in a space between said roller and said collar member so as to form an extended surface of said top portion of said backup roller and to fill said space, said spacer having a spiral end surface whereby the effective axial length of said extended portion of said top portion of said roller can be adjusted by forward/reverse rotation of said spacer.

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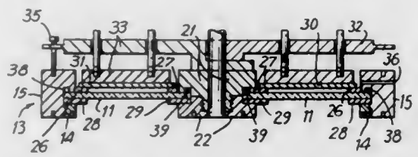
**5,044,308**
**DEVICE AND METHOD FOR FLUORESCENCE MICROSCOPIC CONTROLLED FORMATION OF MONOMOLECULAR LAYERS OF ORGANIC FILMS**
**Fatemeh Mojtabaj, 3570 Greenbrier Blvd. #408C, Ann Arbor, Mich. 48105**
**Continuation of Ser. No. 157,846, Feb. 18, 1988, abandoned. This application Jul. 10, 1989, Ser. No. 378,460**
**Int. Cl.[5] B05C *3/02***
**U.S. Cl. 118—402** **45 Claims**

1. A trough for the formation of a monomolecular layer of an organic film on a subphase comprising:

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(a) a frame having an inner rim portion and an outer rim portion surrounding said inner rim portion;
(b) a plate, disposed within said frame, of a rigid, chemically-inert, transparent, non-fluorescent, hydrophilic substance, and having a central aperture;
(c) means, extending through said aperture, for securing said plate and locating it with respect to a barrier;
(d) hydrophobic sealing means positioned between the top of said plate and said securing and locating means and said frame and formed to prevent subphase leakage from said trough;
(e) hydrophobic spacer means positioned between the bottom of said plate and said frame and said securing and



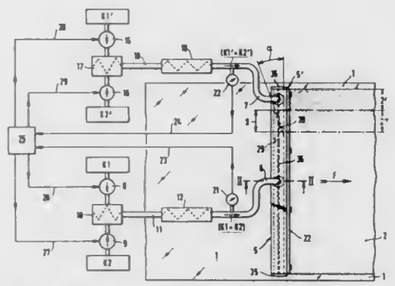
locating means and formed to prevent direct contact between said plate and said frame and said securing and locating means;
(f) said barrier being of a flexible, resilient, chemically-inert, hydrophobic material, axially dimensioned to rest in superposed relation on said plate;
(g) means for rotating said barrier about the vertical axis of said securing and locating means to laterally compress a layer of amphipilic solution deposited on said subphase to form said monomolecular layer; and
(h) a pair of hydrophobic sealing rings, one ring disposed within the inner circumference of said frame, the other ring disposed within the outer circumference of said securing and locating means.

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**5,044,309**
**COATING APPARATUS FOR COATING TRANSPARENT PLASTIC COATINGS WITH A PIGMENTED FILTER STRIP**

**Richard Crumbach, Aachen, and Otto Jandeleit, Alsdorf, both of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France**

**Filed Jun. 7, 1990, Ser. No. 534,283**
**Claims priority, application Fed. Rep. of Germany, Jun. 24, 1989, 3920774**
**Int. Cl.[5] B05C** *3/12, 9/06*
**U.S. Cl. 118—419** **13 Claims**



1. A coating apparatus for applying plastic coatings onto planar substrates, comprising:
an elongate coating head defining therein on elongate distribution channel having a length corresponding to a width of a substrate to be coated, and further defining a coating gap for discharging a coating material from said distribution channel;
a first supply channel connected between a pump for a first coating material and a portion of said distribution channel;
a second supply channel connected between a pump for a second coating material and another portion of said distribution channel; and
mixing means in said distribution channel between said portion of said distribution channel and said another portion of said distribution channel for mixing said first and second coating materials.

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**5,044,310**
**DEVELOPING APPARATUS FOR NON-MAGNETIC DEVELOPER**

**Junichiro Kanbe; Tsutomu Toyono; Nagao Hosono, and Tohru Takahashi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 22,598, Mar. 4, 1987, Pat. No. 4,913,088, which is a division of Ser. No. 745,994, Jun. 17, 1985, abandoned, which is a continuation of Ser. No. 492,440, May 6, 1983, abandoned, which is a division of Ser. No. 264,516, May 18, 1981, Pat. No. 4,395,476, which is a continuation of Ser. No. 58,434, Jul. 18, 1979, abandoned. This application Dec. 22, 1989, Ser. No. 455,243**
**Claims priority, application Japan, Jul. 28, 1978, 53-92105; Jul. 28, 1978, 53-92106; Jul. 28, 1978, 53-92107; Apr. 28, 1979, 54-52641; Jun. 1, 1979, 54-68562**
**Int. Cl.[5] G03G** *15/09*
**U.S. Cl. 118—653** **4 Claims**

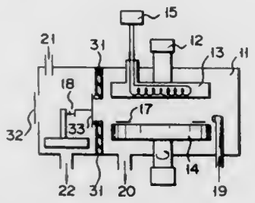
1. A developing apparatus for developing a latent image formed on an image bearing member with a one-component non-magnetic developer, comprising:
a container for containing the one-component non-magnetic developer to which silica particles are added;
a rotatable developer carrying member for carrying the developer from said container toward the image bearing member;
a regulating member for regulating the thickness of a layer of the developer applied on said developer carrying member, wherein said regulating member is in contact with said developer carrying member; and
a member, in contact with said developer carrying member, for stirring and supplying the developer to said developer carrying member, said stirring and supplying member being disposed within said container upstream of said regulating member with respect to the movement direction of said developer carrying member.

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**5,044,311**
**PLASMA CHEMICAL VAPOR DEPOSITION APPARATUS**

**Yasukazu Mase, Fujisawa, and Masahiro Abe, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan**

**Filed Nov. 3, 1989, Ser. No. 431,243**
**Claims priority, application Japan, Nov. 4, 1988, 63-278793**
**Int. Cl.[5] C23C** *16/50*
**U.S. Cl. 118—723** **14 Claims**



1. A plasma chemical vapor deposition apparatus comprising:
a reaction chamber having a wall for completely enclosing a chemical reaction gas in said reaction chamber.



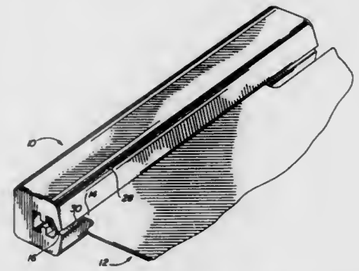
electrodes provided in the reaction chamber; and
a side wall which is a part of said wall and having a wafer access opening, at least said side wall being covered with an insulating member.

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**5,044,312**
**CONFORMAL COAT CONTACT INSERTION STRIP MASK**

**Bryan W. Guenther, and Eric M. Frey, both of Tucson, Ariz., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Nov. 7, 1989, Ser. No. 432,655**
**Int. Cl.[5] B05C** *13/00;* **B05D** *1/32*
**U.S. Cl. 118—505** **13 Claims**



1. A masking device comprising:
a block including an interior cavity sufficient in size to receive an edge portion of a contact insertion strip, said block including a pair of opposed, sharp sealing edges confronting opposite sides of said edge portion when inserted into said cavity;
said block further including a pair of intersecting planar faces forming each sharp sealing edge, each pair of intersecting planar faces including an inner planar face defining a portion of said cavity and forming an angle $\beta$ of at least substantially 45° with respect to a center plane extending through said cavity; and
means for maintaining said opposed sealing edges in tight edge contact with the opposite sides of said edge portion when inserted into said cavity, thereby protecting said edge portion from unwanted effects of spraying a conformal coat on said contact insertion strip.

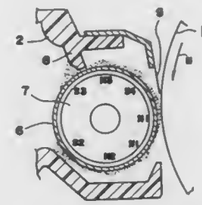
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**5,044,313**
**ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS**

**Shizuo Yuge; Kouji Matsushita, both of Toyokawa, and Hidetoshi Kawabata, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 234,071, Aug. 12, 1988, Pat. No. 4,887,130, which is a continuation of Ser. No. 915,571, Oct. 6, 1986, abandoned. This application Nov. 1, 1989, Ser. No. 430,243**
**Claims priority, application Japan, Oct. 7, 1985, 60-224255**
**Int. Cl.[5] G03G** *15/09*
**U.S. Cl. 118—658** **11 Claims**

1. An electrostatic latent image developing apparatus comprising:
a developing sleeve drivingly rotatable for supplying a magnetic developer to an image bearing surface of an electrostatic latent image bearing member;
a casing covering at least a portion of the developing sleeve and extending from a portion where the sleeve is opposed to the electrostatic latent image bearing member to a position where the developer is supplied to the sleeve with respect to the direction of rotation of the developing sleeve, said casing defining a gap with said sleeve; and
magnetic means fixedly positioned in said sleeve and having a plurality of poles opposed to said casing, said plurality of poles including first and second poles of same polarity and a third pole of different polarity, said first and second poles being positioned adjacently with no pole therebetween, whereby a first bristle of developer for sealing said



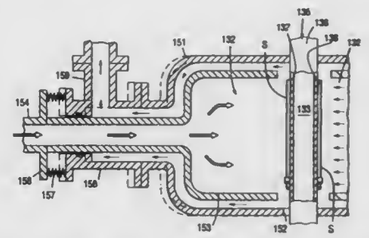
gap is formed by the first and second poles and a second bristle of developer for sealing said gap is formed by the third pole.

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**5,044,314**
**SEMICONDUCTOR WAFER PROCESSING APPARATUS**

**Michael A. McNeilly, Palo Alto, Calif., assignor to Advantage Production Technology, Inc., Sunnyvale, Calif.**

**Continuation-in-part of Ser. No. 919,313, Oct. 15, 1986, Pat. No. 4,778,559. This application Oct. 14, 1988, Ser. No. 257,855**
**The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.**
**Int. Cl.[5] C23C** *16/00*
**U.S. Cl. 118—715** **12 Claims**



1. Semiconductor wafer processing apparatus comprising, in combination,
a processing housing having an axis,
means for supporting at least one wafer at a wafer treating position along said housing axis and substantially normal thereto,
a first housing member centered on said axis along one side of said wafer treating position,
means for introducing and directing a treatment medium into said first housing member in a direction substantially parallel to said axis and toward said wafer treating position,
a second housing member centered on said axis on the other side of said wafer treating position, and
means for introducing and directing a treatment medium into said second housing member in a direction substantially parallel to said axis and toward said wafer treating position,
each of said first and second housing members comprising a first inner cylindrical wall portion and a second outer cylindrical wall portion, said wall portions being coaxial and defining an inner cylindrical chamber for direction the treatment medium towards said wafer treating position and an outer annular chamber for directing the treatment medium away form said wafer treating position, the opening into said annular chamber being substantially radially outward from said wafer treating position.

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**5,044,315**

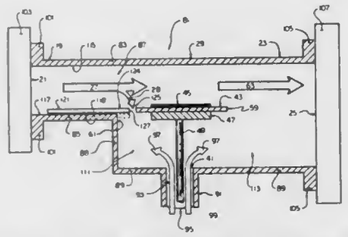
## APPARATUS FOR IMPROVING THE REACTANT GAS FLOW IN A REACTION CHAMBER

**Albert E. Ozias, Aumsville, Oreg., assignor to Epsilon Technology, Inc., Tempe, Ariz.**

**Division of Ser. No. 329,778, Mar. 28, 1989, which is a division of Ser. No. 65,945, Jun. 24, 1987, Pat. No. 4,846,102. This application Jan. 23, 1990, Ser. No. 468,630**

**Int. Cl.[5] C23C** *16/00*

**U.S. Cl. 427—719** **10 Claims**



1. A method for controlling the flow of a reactant gas passing over a single substrate mounted upon a circular susceptor within a reaction chamber, the reaction chamber including a top panel, a pair of side panels and a first bottom panel disposed between the pair of side panels and extending from a location proximate the gas inlet of the reaction chamber and having a downstream terminal edge defining the upstream side of a well extending downwardly from the first bottom panel and terminating at a second bottom panel, the second bottom panel extending downstream to a location proximate the gas outlet of the reaction chamber, the susceptor being mounted upon a pedestal extending upwardly from within the well to locate the susceptor essentially coplanar with the first bottom panel but displaced downstream of the terminal edge of the first bottom panel, said method comprising the steps of:

a) urging the flow of gas along the first bottom panel and urging the portion of the flow of gas located generally midway between the side panels and flowing downstream from the terminal edge of the first bottom panel to split into a first component of flow across the substrate and a second component of flow into the well through the gap between the central upstream terminal edge of the first bottom panel and the edge of the susceptor;

b) directing the flow of gas in proximity to each of the side panels and flowing downstream from the opposed lateral terminal edge of the first bottom panel to split into a third component of flow across the substrate and a fourth component of flow into the well through the gap between the opposed lateral terminal edges of the first bottom panel and the edge of the susceptor wherein the proportion of flow of the fourth component to the third component is greater than the proportion of flow of the second component is to the first component; and

c) increasing the proportion of flow of reactant gas into the well from a minimum value represented by the second component of flow to a maximum value represented by the fourth components of flow adjacent the respective side panels.

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**5,044,316**

## VENTILATED ANIMAL CAGING SYSTEM WITH CAGE RACKS AND FILTER COVERS INCLUDING VALVES OPERABLE BY RACK

**William R. Thomas, Conyngham, Pa., assignor to Thoren Caging Systems, Inc., Hazleton, Pa.**

**Filed Mar. 28, 1990, Ser. No. 500,068**

**Int. Cl.[5] A01K** *1/03*

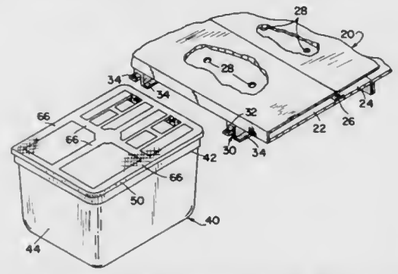
**U.S. Cl. 119—15** **20 Claims**

1. A cover for an animal cage of the type having an enclosure body opening at a perimeter residing in a plane, the cage being removably fittable in a ventilating rack with the perimeter disposed against mean associated with the rack providing powered airflow through the animal cage, the cover comprising:

a frame dimensioned to sealingly engage the perimeter of an area of the cage, the frame having a minimal thickness in the perimeter of the cage, whereby the cage can be fitted into the ventilating rack with the frame in place on the perimeter;

a support web attached to the frame, the support web extending inwardly of the perimeter within the frame;

a filter membrane sealed to the frame, the filter membrane



blocking passage of airborne particles, the filter membrane having an opening adjacent the support web; and,

a movable valve body mounted on the support web, the valve body including a blocking portion resiliently urged to block said opening in the filter membrane, and a contact portion protruding through the opening by an opening displacement of the valve body, the blocking portion being displaced by the contact portion when the cage is fitted in the ventilating rack, whereupon the valve is opened, and the blocking portion being resiliently released to cover the opening when the cage is removed from contact with the ventilating rack, whereupon the valve is closed.

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**5,044,317**

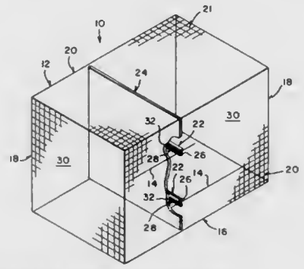
## ADJUSTABLE ANIMAL BOXING (CAGE)

**James J. Shean, 1041 Castle Hill Ave., Bronx, N.Y. 10472, and George Spector, 233 Broadway, Rm. 3815, New York, N.Y. 10007**

**Filed Sep. 4, 1990, Ser. No. 577,201**

**Int. Cl.[5] A01K** *31/00*

**U.S. Cl. 119—17** **5 Claims**



1. An adjustable animal cage comprising:

(a) an enclosure being of a plurality of rods forming a grid configuration having a floor, opposed ends, opposed sides and a top;

(b) a pair of support bars, each having opposed recessed ends so that said support bars can be removably installed horizontally in a spaced apart relationship along one of a plurality of positions between the opposed sides of said enclosure with each recessed end to receive one of the rods;

(c) a pair of separator partitions, each sized to fit vertically into said enclosure to extend between the opposed sides thereof; and

(d) means for removably attaching each said separator partitions against one surface of said support bars so that said support bars will be between said separator partitions, while said enclosure will be split into two variable sized spaces to house animals therein.



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**5,044,318**

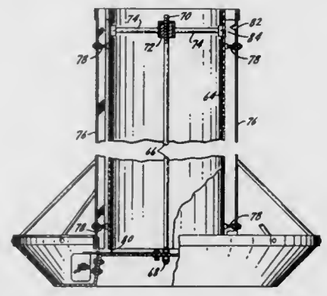
## HOG FEEDER

**Steven E. Sutton; Bernard F. Kitten, both of Plains; Douglas B. Jewell, Liberal; Ben J. Standard, Jr., and Dwight G. Naber, both of Kismet, all of Kans., assignors to Dekalb Swine Breeders, Inc., DeKalb, Ill.**

**Continuation of Ser. No. 284,305, Dec. 14, 1988, abandoned. This application May 3, 1990, Ser. No. 518,750**

**Int. Cl.[5] A01K** *5/00*

**U.S. Cl. 119—53.5** **22 Claims**



1. In a hog feeder, a circumferential base with a central plateau with an outside periphery, a feeding trough around the outside of and below the level of the plateau divided into a plurality of feeding stations, a hollow upright in the center of the base defining a feed supply chamber, a vertical peripheral gap between the bottom of the feed chamber and the plateau opening outwardly toward the feeding trough, the hollow upright being sufficiently smaller in diameter than the outside periphery of the plateau relative to the vertical dimension of the peripheral gap such that feed will not flow from the feed supply chamber to the feeding trough by gravity, a plurality of independent vanes, one for each feeding station, extending outwardly from an inner pivot on the plateau through the peripheral gap, each vane being pivoted independently of the other vanes, and a driver plate on and projecting downwardly from the outer end of each vane and disposed in the feeding trough for manipulation by a hog to cause feed to be moved outwardly by the vane through the peripheral gap from the feed supply chamber to the feed supply chamber to the feeding trough.

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**5,044,319**

## BIRD FEEDER

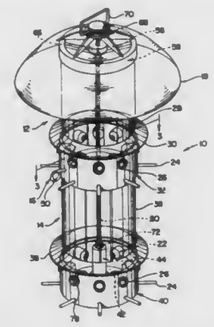
**Morton L. Blasbalg, 22 River Road, East Greenwich, R.I. 02818**

**Filed Aug. 27, 1990, Ser. No. 572,424**

**Int. Cl.[5] A01K** *39/01*

**U.S. Cl. 119—57.9** **9 Claims**

1. A bird feeder comprising vertically disposed tubular upper and lower housing means sections for receiving and storing birdseed therein, each of said upper and lower housing means sections having upper and lower ends and each including a side wall having at least one side feeding aperture therein, said lower housing means section including bottom wall means on the lower end thereof, the lower end of said upper housing means section being received on the upper end of said lower housing means section, valve means for selectively controlling the downward flow of birdseed from said upper housing means



section into said lower housing means section and means for restricting the flow of bird seed outwardly through said side feeding apertures.

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**5,044,320**

## WATER DISPENSER, PARTICULARLY FOR POULTRY

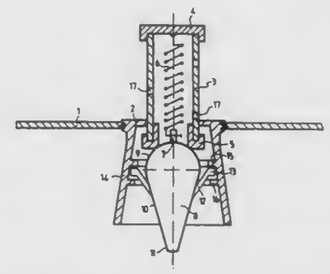
**Ernest Le Roy, 48, rue Monsieur-Vincent, BP 56132, 35056 Rennes Cedex, France**

**Filed Aug. 9, 1989, Ser. No. 391,446**

**Claims priority, application France, Aug. 17, 1988, 88 11076**

**Int. Cl.[5] A01K** *7/00*

**U.S. Cl. 119—72.5** **7 Claims**

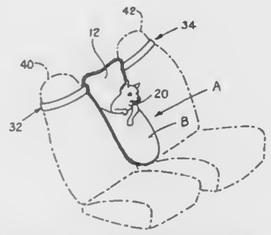


1. A water distributor, particularly for poultry, said distributor comprising a valve having a valve body in the form of a pipe having a valve seat thereon, a return spring and a valve stem hung on a first end of said return spring and closing said valve seat of the pipe, means for limiting the tilt of the valve stem, said means for limiting the tilt engaging an intermediate portion of the valve stem, the valve stem closing said valve seat as long as the animals do not cause it to tilt, characterized by the valve stem being substantially an egg shaped, a lower portion of said egg shaped stem facing downwardly inward and an upper spherical cap of said egg shaped stem being held against the seat, a center of said spherical cap being hooked to the first end of said return spring biasing said valve stem to a closed position.

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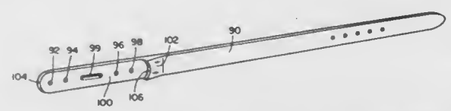
5,044,321
**PET CARRIER AND RESTRAINT FOR VEHICLE USE**
Lottie J. Selph, P.O. Box 197, Greer, S.C. 29652
Filed Jul. 19, 1989, Ser. No. 381,982
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—96 19 Claims




1. A protective pet animal carrier for use in a vehicle and the like comprising:
a web of flexible material having a first side and a second side;
a front panel of flexible material having a top free edge unattached to said web and having remaining perimeter edges secured to said web so as to form a non-supported pouch continuously closed about said perimeter edges of said front panel;
said pouch having a pouch opening at said top edge of said front panel and said pouch is closed off except for said pouch opening defining a pouch closure having a non-rigid bottom so that said pouch is freely hanging to limit the exit of said animal;
means for attaching said web to an associated structure of said vehicle so that said pouch opening is disposed generally horizontal, and said pet is carried within said pouch in a generally vertical orientation; and
said pouch having a height which extends from said pouch closure to said pouch opening which captivates said pet and renders said pet generally immobile during transit in said vehicle.

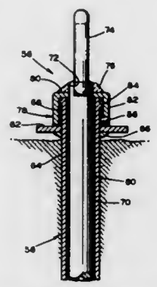
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5,044,322
**STRAP DEVICE**
David S. Cohen, Beverly, and Melvin I. Loman, Peabody, both of Mass., assignors to Halemar Specialties, Inc., Peabody, Mass.
Continuation-in-part of Ser. No. 416,589 Oct. 3, 1989
This application filed Jul. 5, 1990, Ser. No. 548,565
Int. Cl.[5] A01K *27/00, 25/00*
U.S. Cl. 119—106 6 Claims




1. A strap device adapted to be secured to an animal which comprises a strap having at least one strap end portion adapted to be formed into a loop by positioning two holes in said at least one end portion having an end surface and a top surface over a fastener, said fastener having exposed continuous surfaces, a strap section adjacent said end surface of said at least one end portion, said strap section having a second top inclined surface and having a thickness greater than the thickness of said at least one end portion, said top surface and said second top inclined surface forming an essentially continuous third smooth top surface.

5,044,323
**TETHERING DEVICE WITH LOCKING MEANS**
Don J. Papak, 3478 Woodland, Windsor, Ontario, Canada N9E 1Z7
Continuation-in-part of Ser. No. 424,866, Oct. 20, 1989, Pat. No. 4,982,701. This application Sep. 27, 1990, Ser. No. 588,743
Int. Cl.[5] A01K *3/00*
U.S. Cl. 119—121 6 Claims




4. An animal tethering device for tethering an animal in a given area about a central point in the ground, said device comprising a tubular member, said tubular member having an annular collar affixed at an upper end portion thereof and extending outwardly therefrom, said collar being spaced slightly above the ground, an upper extremity of said tubular member extending above said collar; an elongate, rod-like member having a diameter smaller than the inner diameter of said tubular member and having a length less than the length of said tubular member, means affixed to the upper end of said rod-like member for receiving an end of a flexible line, a cap affixed to an upper end portion of said rod-like member below said means, said cap having an annular portion extending outwardly from said rod-like member and having a downwardly-extending flange at its outer edge, said flange having a diameter exceeding the outer diameter of said tubular member, but not exceeding the diameter of said collar, said tubular member and rod-like member having cooperating engagable means whereby said rod-like member must be turned relative to said tubular member to be fully inserted therein and to be removed therefrom.

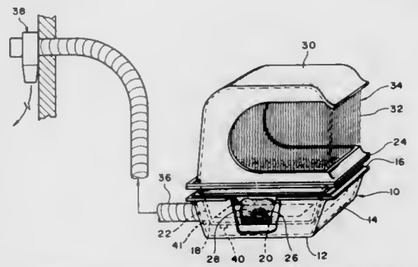
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5,044,324
**WOOD FIBER CRUMBLES**
William M. Morgan, Hoquiam, and Bill E. Williams, Olympia, both of Wash., assignors to Mountain Cat, Inc., Lacey, Wash.
Filed Apr. 24, 1989, Ser. No. 321,390
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—171 14 Claims

1. A method of making wood fiber crumbles, comprising the steps of:
(a) grinding bark, sawdust, lumber and/or chips to form grists of two or more types of wood consisting of western red cedar, red alder, larch, Ponderosa pine, lodgepole pine, sugar pine, Engelmann spruce, Sitka spruce, Douglas fir, western hemlock and mountain hemlock;
(b) drying the grists to a maximum moisture content of 3% by weight;
(c) combining and admixing the grists;
(d) moistening the admixed grists to 12 to 16% moisture content by weight;
(e) pelletizing the moistened admixed grists to form pellets; and
(f) grinding the pellets in a corn grinder to form crumbles.



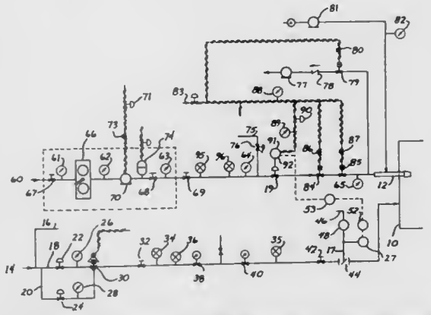
5,044,325
**VENTILATED LITTER BOX**
Frank J. Miksitz, Phillipsburg, N.J., assignor to UFI, Inc., Phillipsburg, N.J.
Filed Dec. 13, 1990, Ser. No. 626,693
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—165 17 Claims




1. An animal litter box comprising a housing having a bottom portion and upwardly extending walls terminating at a top edge, a litter support surface to receive a bed of animal litter positioned in said housing and extending substantially the dimension of the housing and being spaced above and substantially parallel to the bottom portion of the housing, said litter support further being porous to the flow of air substantially throughout its width and length, fan means attached to said housing and in communication with a space between said bottom portion of the housing and litter support surface whereby said fan draws air downwardly through said bed of litter to dry said litter and exhaust air from the litter box.

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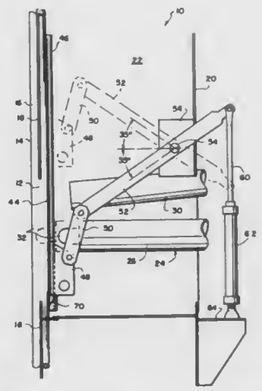
5,044,326
**FLAMMABLE WASTE LIQUID COMBUSTION SYSTEM AND METHOD**
Philip R. Coerper, Waukesha, and Boris M. Tynkov, Bayside, both of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.
Filed Mar. 14, 1990, Ser. No. 494,033
Int. Cl.[5] F22B *35/00*; F23C *1/00*; F23G *7/00*
U.S. Cl. 122—4 R 3 Claims




1. A method of burning a volatile organic waste liquid in a boiler comprising (a) providing a supply of a conventional fuel controlled by a first valve to the burner of said boiler, (b) providing a supply of air to said burner, (c) providing a flow of volatile organic waste liquid to said burner controlled by a second valve, (d) modulating the rate of firing of said burner in response to the demand for steam on said boiler by opening and closing said first and second valves proportionately to provide an approximately fixed ratio of the caloric heating value of said fuels of approximately 50 to 80 percent conventional fuel to approximately 20 to 40 percent volatile liquid, and maintaining an approximately constant excess of air to sand burner, (e) monitoring the position of said first control valve, (f) monitoring the position of said second flow regulating valve, (g) comparing the relative valve positions indicated by said two monitoring means and (h) stopping the flow of said volatile liquid to said burner in the event that more than a predetermined discrepancy between the indicated positions of said valves occurs.

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5,044,327
**AIR/BURNER PORT**
Jeffrey D. Hunt, Copley, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 14, 1990, Ser. No. 583,050
Int. Cl.[5] F22B *37/00*
U.S. Cl. 122—6.6 14 Claims




1. An air/burner port assembly for a boiler having a water-wall and a windbox wall spaced rearwardly of the water-wall to form a windbox, the assembly comprising:
means for defining a port in the water-wall communicating with the windbox;
a burner mounted in the windbox for discharging fuel through the port;
a damper door mounted for movement between a closed position at least partly covering the port and an open position spaced away from the port;
a guide fixed to the water-wall for guiding movement of the damper door between its open and closed position; and
drive means mounted in the windbox and connected to the damper door for moving the damper door between the open and closed positions, the drive means including a pair of interconnect linkages connected to the door on opposite sides of the burner, the linkages being connected to each other for synchronous movement therewith, and an actuator connected to at least one of the linkages for moving the linkages to move the door between its open and closed positions.

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5,044,328
**IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINE**
Tomokazu Umezaki, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan
Continuation of Ser. No. 371,855, Jun. 27, 1989, abandoned.
This application Oct. 17, 1990, Ser. No. 598,586
Claims priority, application Japan, Aug. 5, 1988, 63-194468
Int. Cl.[5] F02P *3/12*
U.S. Cl. 123—647 4 Claims

1. An ignition device for an internal combustion engine comprising:

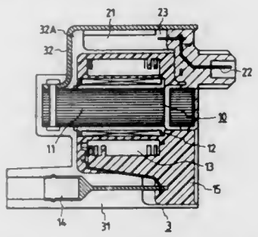
VOL 1130 ISS 1 SE 3 1991 UMI



an ignition coil unit including an iron core, a primary coil wound around said core, a secondary coil electro-magnetically coupled to said primary coil;

a case for housing said iron case, said primary coil and said secondary coil therein; and

a control circuit for controlling a current flowing in said primary coil, wherein said control circuit is housed in said case so that heat generated by said control circuit is transferred to said case to radiate out therefrom;



wherein said case is composed of first portion made solely of an electrically insulating material and surrounding the lower half of said ignition coil unit for purposes of electrically protecting said coil and control circuit, and a second portion made of high-thermal-conductivity material and surrounding the upper half of said ignition coil unit and said control circuit.

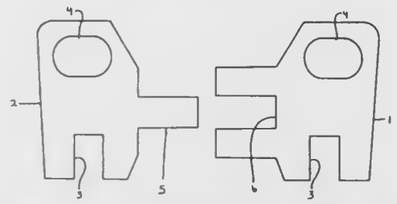
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**5,044,329**

**ADJUSTABLE PUSHROD GUIDE PLATE ASSEMBLY**

**Vince Jamora, 4418 Emerald St., Torrance, Calif. 90503**

**Filed Jun. 19, 1990, Ser. No. 524,035**
**Int. Cl.[5] F01L** *1/46*
**U.S. Cl. 123—90.61** **4 Claims**



1. A fully adjustable two piece pushrod guide plate assembly to guide pushrods in an internal combustion engine comprising a first plate and a second plate, each of said plates including a pushrod guide slot and an elongated mounting slot, one of said plates including a projecting tab to match a complementary slot in the other of said plates.

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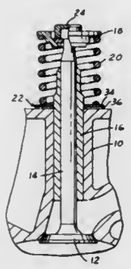
**5,044,330**

**VALVE SPRING SPACER**

**Elwood L. Havens, and Mazy C. Havens, both of 20700 Country Oaks Dr. #43, Riverview, Mich. 48192**

**Filed Jul. 6, 1990, Ser. No. 548,853**
**Int. Cl.[5] F01L** *3/10*
**U.S. Cl. 123—90.67** **1 Claim**

1. A spacer shim ring for altering valve spring tension in an internal combustion engine which comprises a metal ring having an open center to accommodate a valve stem and serving as a support for one end of a valve spring biased to close the valve, said ring lying in a plane and having a ribbed and grooved surface on each side, said ribs and said grooves being trapezoidal with curved ends and converging sides from a large outer end to a smaller inner end, the converging sides of said grooves and ribs lying in planes normal to the plane of the ring, and said grooves and ribs being equally spaced such that each has essentially equal circumferential dimensions, said ribs and grooves presenting a zigzag configuration viewed from



the edge of the ring, the axial depth of the grooves being less than the total thickness of the ring.

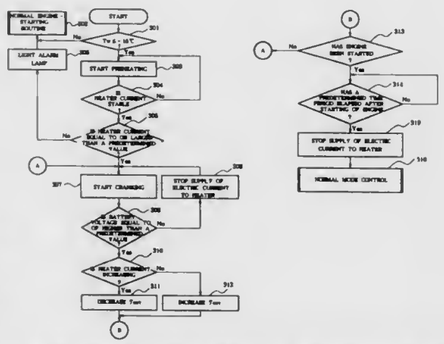
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**5,044,331**

**AIR-FUEL RATIO CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE HAVING SPARK PLUGS WITH HEATERS**

**Toshiyuki Suga; Shinichi Kitajima, and Horiki Kodama, all of Wako, Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan**

**Filed Dec. 19, 1990, Ser. No. 630,071**
**Claims priority, application Japan, Dec. 28, 1989, 1-343220**
**Int. Cl.[5] F02D** *41/06, 43/00*
**U.S. Cl. 123—179 G** **10 Claims**



1. An air-fuel ratio control method of controlling the air-fuel ratio of an air-fuel mixture supplied to an internal combustion engine having spark plugs, and heaters for heating said air-fuel mixture in the vicinity of respective ones of said heaters, said



air-fuel mixture containing a fuel which is poor in atomizing characteristic at a low temperature, the method comprising the steps of:

(1) determining whether or not a temperature of said engine is lower than a predetermined value;

(2) determining whether or not said engine is being cranked;

(3) detecting an amount of electric current flowing through each of said heaters; and

(4) controlling an amount of fuel supplied to said engine based on the detected amount of electric current when it is determined that said temperature of said engine is lower than said predetermined value and at the same time said engine is being cranked.

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**5,044,332**

**ELLIPTICAL VALVE STEM FOR REDUCING TURBULENCE IN COMBUSTION ENGINES**

**John Ondracek, 1080 Broadway, Apt. #25, Denver, Colo. 80203**

**Filed Dec. 24, 1990, Ser. No. 632,853**
**Int. Cl.[5] F01L** *3/06*
**U.S. Cl. 123—188 AA** **1 Claim**



1. A valve stem construction for use in the flow of fluid between the fuel intake inlet and piston chamber of an internal combustion engine wherein the valve stem construction comprises:

an elongated valve stem member having one end physically connected to a valve head disposed between the fuel intake inlet and the piston chamber wherein at least the said one end of the valve stem member is provided with a generally elliptical cross sectional profile and wherein the longitudinal axis of said cross sectional profile is oriented parallel to the fluid flow passing through said fuel intake inlet for reducing the fluid turbulence entering into said piston chamber.

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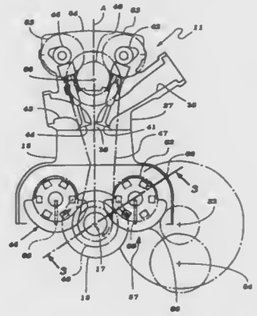
**5,044,333**

**BALANCING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE**

**Wataru Fuchigami, and Yoji Utsumi, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Filed Jun. 1, 1990, Ser. No. 532,203**
**Claims priority, application Japan, Jun. 5, 1989, 1-141095**
**Int. Cl.[5] F02B** *75/06*
**U.S. Cl. 123—192 B** **17 Claims**

1. A balancing shaft arrangement for an internal combustion engine having a pair of aligned, adjacent cylinder bores, a crankshaft journalled for rotation about an axis at one end of said cylinder bores and having a pair of adjacent throws, a drive gear formed on said crankshaft between said throws, a pair of balancer shafts rotatably journalled about axes parallel to said crankshaft axis and driven by said drive gear, and a pair of eccentrial inertial masses each affixed for rotation with a



respective one of said balance shaft and located in the area between said adjacent cylinder bores.

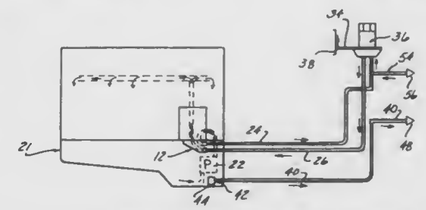
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**5,044,334**

**PROCESS FOR CLEAN SIMPLE AND HIGH SPEED OIL CHANGE AND/OR FLUSHING OF THE MOVING COMPONENTS OF THE CRANKCASE IN AN INTERNAL COMBUSTION ENGINE**

**Ram D. Bedi, Birmingham, Mich., assignor to K. J. Manufacturing Co., Wixom, Mich.**

**Continuation-in-part of Ser. No. 413,008, Sep. 26, 1989, Pat. No. 4,964,373, which is a continuation-in-part of Ser. No. 350,303, May 11, 1989, Pat. No. 4,884,660. This application Feb. 22, 1990, Ser. No. 484,344**
**Int. Cl.[5] F01M** *1/00*
**U.S. Cl. 123—196 R** **14 Claims**



1. A device for implementing a high speed oil change in an internal combustion engine, said internal combustion engine having an oil pan with an associated drain opening and removable drain plug, the device comprising:

a drain adapted having a body, a central throughbore with first and second outlets said throughbore extending through said body, a connecting bore in fluid communication with said central throughbore having a branch outlet, and means for sealingly retaining the drain plug in said first outlet of said connecting bore;

means for maintaining said second outlet in fluid communication with the drain opening;

an oil conveying conduit line connected to said branch outlet, said conduit having a first quick connect member at a remote end, said quick connect member adapted to removably contact an external pump device, fresh oil reservoir and spent oil reservoir.

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**5,044,335**

## MONITORING ARRANGEMENT FOR A FUEL FILTER

**Ulrich Flaig, Markgröningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

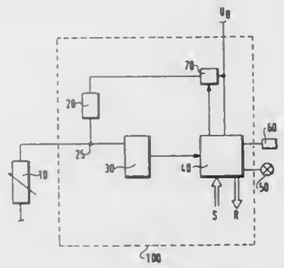
**PCT No. PCT/DE89/00557, § 371 Date Jun. 26, 1990, § 102(e) Date Jun. 26, 1990, PCT Pub. No. WO90/06437, PCT Pub. Date Jun. 14, 1990**

**PCT Filed Aug. 25, 1989, Ser. No. 548,902**

**Claims priority, application Fed. Rep. of Germany, Nov. 26, 1988, 3839960**

**Int. Cl.[5] F02B *77/00***

**U.S. Cl. 123—198 D** **13 Claims**



1. A monitoring arrangement for a fuel filter of a diesel engine having operating characteristic variables and to which fuel is metered, the monitoring arrangement comprising:

a residue sensor for monitoring the functional capability of the filter and generating a sensor signal in dependence upon said functional capability;

an electronic control unit for controlling the fuel metered to the engine in dependence upon the operating characteristic variables of the engine and in dependence upon said sensor signal;

first circuit means interconnecting said residue sensor and said control unit for transmitting said sensor signal so as to permit said control unit to generate a warning signal dependent upon said functional capability; and,

said second circuit means for enabling said control unit to activate said residue sensor at specific operating conditions of the engine which conditions include idle.

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**5,044,336**

## CYLINDER RECOGNITION APPARATUS AND METHOD FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

**Wataru Fukui, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 1, 1990, Ser. No. 591,179**

**Claims priority, application Japan, Oct. 2, 1989, 1-255172; Oct. 2, 1989, 1-255173**

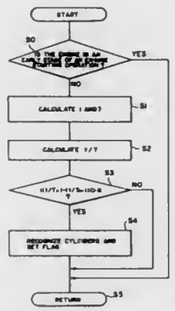
**Int. Cl.[5] F02P *7/073***

**U.S. Cl. 123—414** **12 Claims**

1. A cylinder recognition apparatus for a multi-cylinder internal combustion engine comprising:

a signal generator for generating a single output signal in synchrony with the rotation of the engine, the output signal including a plurality of positional pulses each representative of prescribed rotational positions of a corresponding cylinder, and a cylinder recognition pulse at a location near a specific one of the positional pulses corresponding to a specific cylinder; and

a controller for discriminating the cylinder recognition pulse from among the pulses contained in the output signal of the signal generator so as to recognize a specific positional pulse corresponding to a specific cylinder, the controller




being operable to stop cylinder recognition in an early stage of an engine starting operation.

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**5,044,337**

## CONTROL SYSTEM FOR AND METHOD OF CONTROLLING AN INTERNAL COMBUSTION ENGINE

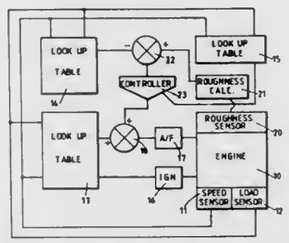
**David Williams, Kingsbury, Great Britain, assignor to Lucas Industries public limited company, Birmingham, England**

**Filed Oct. 23, 1989, Ser. No. 425,039**

**Claims priority, application United Kingdom, Oct. 27, 1988, 8825213**

**Int. Cl.[5] F02M *7/00***

**U.S. Cl. 123—436** **22 Claims**




1. A method of controlling an internal combustion engine of a predetermined type, said method comprising the steps of:

determining a first distribution of actual engine control parameters corresponding to at least a first demanded engine control parameter supplied to a first plurality of internal combustion engines of said predetermined type;

determining a second distribution of second demanded engine control parameters supplied to a second plurality of internal combustion engines of said predetermined type, where, above said second demanded engine control parameter, processes in the internal combustion engines of the second plurality of engines become unacceptable;

determining a limit value as a magnitude of engine control parameters at an intersection of said first and second distributions;

establishing a base value of said engine control parameter used in a combustion process occurring in the internal combustion engine of said predetermined type;

detecting when the combustion process becomes unacceptable;

applying a correction to said base value upon detecting that the combustion process has become unacceptable, said correction being applied in a direction which makes the combustion process more acceptable; and

limiting in magnitude said correction to the limit value.



**5,044,338**

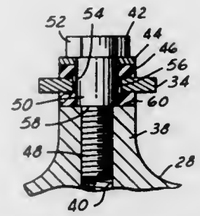
## FUEL RAIL VIBRATION DAMPER

**Randolph A. Shelton, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.**

**Filed Jan. 23, 1990, Ser. No. 468,519**

**Int. Cl.[5] F02M *55/02***

**U.S. Cl. 123—469** **7 Claims**




1. In a fuel-injected internal combustion engine having an engine-mounted rail via which one or more fuel injectors are supplied with fuel, said rail being mounted on the engine by a mounting means that comprises one or more brackets each of which is fastened to the engine by a corresponding threaded fastening means passing through aperture means in the bracket, the improvement in said mounting means which comprises for at least one of said brackets: **(1)** an annular elastomeric damper means coaxially disposed with respect to the aperture means of the bracket and isolating the bracket from the engine, **(2)** said threaded fastening means comprising (a) a threaded shank that is threadedly engaged with a complementary threaded hole in the engine, (b) a body that is proximal to the threaded shank, that is disposed coaxially within the annular elastomeric damper means in isolation from the bracket, and that comprises a shoulder that is caused to forcefully abut the engine around the complementary threaded hole upon tightening of the threaded shank in the complementary threaded hole, and (c) compression-causing means that is proximal to the body in isolation from the bracket and that is disposed in predetermined relationship to the threaded shank to cause a predetermined axial compression of the annular elastomeric damper means when the shoulder is forced into abutment with the engine around the threaded hole.

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**5,044,339**

## FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

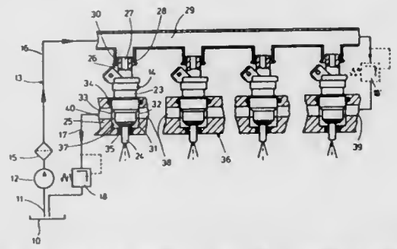
**Udo Hafner, Ludwigsburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jan. 11, 1990, Ser. No. 463,576**

**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1989, 3907972**

**Int. Cl.[5] F02M *41/00***

**U.S. Cl. 123—456** **8 Claims**



1. A fuel injection system for internal combustion engines, having a fuel supply line **(13)** and a plurality of electromagnetically actuated fuel injection valves **(14)**, each of which meter a fuel injection quantity into an intake tube of an engine, each of said plurality of valves includes a mouthpiece fitting embodied on a face end of a valve body which mouthpiece fitting protrudes into an opening in the intake tube of the engine, and communicates with the fuel supply line via a fuel inflow disposed on an upper end of said fuel injection valve remote from the mouthpiece fitting, a sheath **(25)** surrounding said fuel injection valve body **(23)**, an annular chamber **(31)** formed between said sheath and said valve body and extending approximately from said mouthpiece fitting **(24)** over a substantial portion of an axial length of said valve body **(23)**, and that via an inflow opening **(32)** and an outflow opening **(33)** which communicate with the annular chamber **(31)**, the sheath **(25)** is incorporated into the fuel supply line **(13)**, and said fuel supply line **(13)** is embodied such that it communicates downstream of an inflow neck **(26)** of one of said injection valves with the annular chambers **(31)** of each of said fuel injection valves.

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**5,044,340**

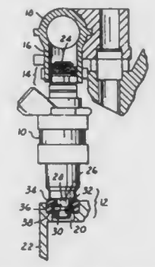
## FUEL INJECTORS HAVING ADAPTER GROMMET

**James T. Robnett, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.**

**Filed Jan. 30, 1990, Ser. No. 472,526**

**Int. Cl.[5] F02M *61/14***

**U.S. Cl. 123—470** **24 Claims**



1. In a fuel-injected internal combustion engine comprising a fuel rail structure that supplies pressurized liquid fuel to one or more electrically operated fuel injectors which function to control the injection of fuel into an air induction system of the engine for entrainment with induction air to form a combustible mixture for use in a combustion chamber space of the engine, at least one of said injectors having a fuel feed end that is telescopically fitted in a sealed manner to said fuel rail structure to provide for passage of liquid fuel from said fuel rail structure into the injector, said at least one injector having a tip end at which fuel is emitted from the injector, said tip end comprising a circular annular groove that is open radially outwardly, and a circular annular seal that is seated in said groove and serves to seal between said tip end and an adjacent circular hole via which said injector tip end is in communication with said air induction system, the improvement comprising said hole being spaced axially and radially of said groove, and said circular annular seal comprising a radially inner portion that is disposed in said groove and a radially outer portion that is disposed radially outwardly of said groove and has an axial extent that overlaps both said groove and a portion of said tip end that lies axially beyond said groove in the direction away from said fuel feed end, said radially outer portion of said seal having sealing contact with said hole, said hole comprising a counterbore including an axially facing shoulder, and said radially outer portion of said seal comprising a radial face that is disposed against said shoulder and is in continuous sealing contact with said shoulder, such continuous sealing contact beginning radially outwardly of said groove and ending even further radially outwardly of said groove.

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**5,044,341**

## PROCESS AND DEVICE FOR TANK-VENTILATION ADAPTATION IN LAMBDA CONTROL

Cordes Henning, Eberdingen; Kurle Jürgen, Reutlingen, and Pfau M. Eberhard, Weissach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

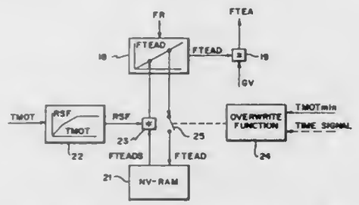
PCT No. PCT/DE89/00379, § 371 Date Mar. 1, 1990, § 102(e) Date Mar. 1, 1990, PCT Pub. No. WO90/00225, PCT Pub. Date Jan. 11, 1990

PCT Filed Jun. 8, 1989, Ser. No. 473,941

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822300

Int. Cl.[5] F02M *25/08*; F02D *41/26*

U.S. Cl. 123—489 8 Claims




1. A method for tank-ventilation adaptation is the lambda control of the air/fuel mixture to be supplied to an internal combustion engine, the method comprising the steps of:

determining the charging factor for the tank-venting gas;

storing the last value as the charging factor at the end of the method;

multiplying the stored charge factor by a reset factor when the method is restarted, said reset factor having a maximum value of unity and being dependent on the value of a variable dependent on fuel temperature; and

using the value obtained from the multiplication of said stored charge factor and said reset factor as an initial value of the charge factor for the tank-ventilation adaptation with the reset factor being the greater, the higher the value of the variable dependent on the fuel temperature is.

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**5,044,342**

## AUTOMOTIVE FUEL INJECTION SYSTEM

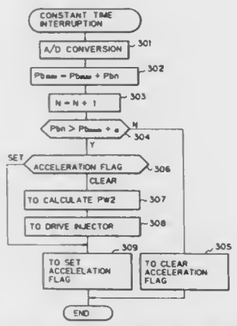
Kouichi Yamane; Koji Nishimoto, and Masanobu Uchinami, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1990, Ser. No. 625,386

Claims priority, application Japan, Jan. 23, 1990, 2-14405

Int. Cl.[5] F02D *41/10*

U.S. Cl. 123—492 2 Claims




1. A fuel injection system for use in association with an automotive combustion engine designed to effect an injection of fuel into a combustion engine in synchronism with a signal generated each time a predetermined cranking angle is attained or at each ignition timing by calculating the amount of fuel to be injected through detection of a pressure inside a fuel intake system of the combustion engine, said system comprising:

a pressure detecting means for detecting the pressure inside the fuel intake system of the combustion engine; and

a control means operable to calculate an average pressure value by averaging output signals generated by the pressure detecting means and also to determine that the combustion engine is being accelerated in the event that the output signal generated by the pressure detecting means deviates from the average pressure value by a quantity equal to or greater than a predetermined value, thereby to effect an asynchronous fuel injection in the event that the combustion engine is deemed to have accelerated.

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**5,044,343**

## SYSTEM AND METHOD FOR CONTROLLING FUEL SUPPLY TO AN INTERNAL COMBUSTION ENGINE

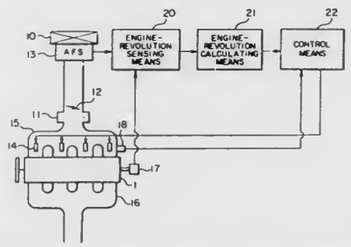
Yoshiaki Kanno, and Jiro Sumitani, both of Himeji, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 7, 1989, Ser. No. 390,009

Claims priority, application Japan, Aug. 9, 1988, 63-199137

Int. Cl.[5] F02D *41/12*

U.S. Cl. 123—493 5 Claims




1. A system for controlling fuel supply to an internal combustion engine comprising:

first means for sensing a reduction in the amount of intake air sucked into an engine per intake stroke;

second means for reducing the amount of fuel supplied to the engine when said first means senses a reduction in the intake air amount, said second means controlling the time of fuel supply $T_{I(n)}$ based on the following formula,

$$T_{I(n)}=T_{I(n-1)}+\Delta AN\times K_{IA},$$

where $T_{I(n)}$ is the time of the present fuel supply, $T_{I(n-t)}$ is the time of the last fuel supply, $\Delta AN$ is the difference between the present engine load and the last engine load, and $K_{IA}$ is a modification coefficient; and

third means for changing the modification coefficient $K_{IA}$ in the above formula in accordance with at least one of the number of revolutions per minute of the engine and the amount of intake air sucked into the engine per intake stroke.

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**5,044,344**

## PRESSURE-RESPONSIVE FUEL DELIVERY SYSTEM

Charles H. Tuckey; James L. Thompson, both of Cass City, and Thomas M. Hoover, Reese, all of Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Oct. 16, 1989, Ser. No. 421,810

Int. Cl.[5] F02M *37/04*

U.S. Cl. 123—497 20 Claims

1. A fuel delivery system for an internal combustion engine that includes:

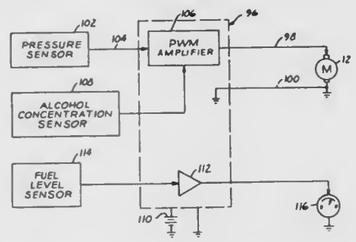
a fuel supply with a self-contained electric-motor fuel pump responsive to application of electrical power for supplying fuel under pressure, said pump having a pair of coaxially spaced end caps and a case joining said end caps to form a pump housing, fuel inlet means in one of said end caps and fuel outlet means in the other of said end caps, a d.c. motor having an armature journaled for rotation within said housing, and means coupled to said armature for pumping field through said housing from said inlet means to said outlet means,

fuel delivery means on said engine coupled to said supply for controlled delivery of fuel from said supply to said engine, and

means for applying electrical power to said pump comprising first sensor means mounted on said other end cap so as to be responsive to fuel pressure at said outlet means for supplying a first electrical signal as a function of fuel pressure in said system, second sensor means for supplying a second electrical signal as a function of a second predetermined condition of fuel at said supply, and means for applying electrical power to said pump as a combined function of said first and second signals,

said power-applying means comprising an electrical circuit-board assembly mounted on said other end cap and including connection means for receiving said first and second sensor signals and for applying electrical power to said motor.






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**5,044,345**

## FUEL PUMPING APPARATUS

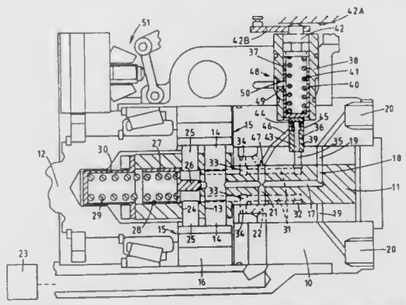
Peter A. G. Collingborn, Gilligham, England, assignor to Lucas Industries public limited company, West Midlands, England

Filed Oct. 15, 1990, Ser. No. 597,040

Claims priority, application United Kingdom, Oct. 18, 1989, 8923485

Int. Cl.[5] F02M *41/06*

U.S. Cl. 123—506 9 Claims



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a rotary distributor member, a pumping plunger mounted in a bore in the distributor member, a cam for imparting inward movement to the plunger as the distributor member rotates, passage means through which fuel displaced from the bore during successive inward movements of the pumping plunger can flow to a plurality of outlet ports in turn, fluid pressure operable valve means for spilling fuel from said bore to terminate the flow of fuel through an outlet port, auxiliary plunger means operable in synchronism with said pumping plungers, a shuttle slidable in a cylinder, means urging the shuttle towards one end of said cylinder, the shuttle being moved away from said one end of the cylinder by fluid displaced by said auxiliary plunger means, to a position at which the pressure of fluid applied to said valve means is sufficient to open said valve means to spill fuel, said position of the shuttle being determined by an hydraulic lock created in the other end of the cylinder containing the shuttle, and means for adjusting the angular position of the shuttle in the cylinder to determine the position at which said hydraulic lock is created.

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**5,044,346**

## FUEL ACTIVATION METHOD AND FUEL ACTIVATION DEVICE

Hideyo Tada, 1-43-2, Chuo, Kasukabe-shi, Saitama-ken, and Hideaki Akuzawa, Urawa, both of Japan, assignors to Hideyo Tada, Japan

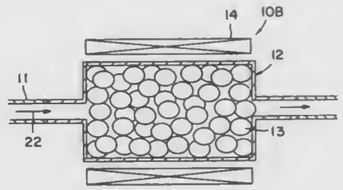
Continuation of Ser. No. 344,003, Apr. 26, 1989, abandoned.

This application Aug. 13, 1990, Ser. No. 567,695

Claims priority, application Japan, Feb. 6, 1989, 1-25881

Int. Cl.[5] F02M *33/00*

U.S. Cl. 123—536 2 Claims




2. A fuel activation device comprising a container unit in a fuel pipe introducing fuel into a combustion engine, said container unit being positioned between a fuel tank and a fuel injector or carburetor, a functional ceramic emitting no infrared rays other than in the far infrared region being contained in said unit and adapted to contact said fuel passing through said unit, whereby said fuel is activated,

said device further comprising a heater for said ceramic which increases the temperature of said ceramic to a temperature at least 1° C. over the temperature of said fuel prior to contacting said ceramic and less than the temperature at which substantial vaporization takes place.

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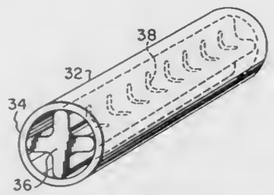


5,044,347

## DEVICE PROMOTING THE DISPERSION OF FUEL WHEN ATOMIZED

Rolf Ullrich, Barrie, and Eddy E. Glick, North York, both of Canada, assignors to 911105 Ontario Limited, Willowdale, Canada

Filed Jun. 12, 1990, Ser. No. 536,475
Int. Cl.[5] F02M *33/00*
U.S. Cl. 123—538 16 Claims



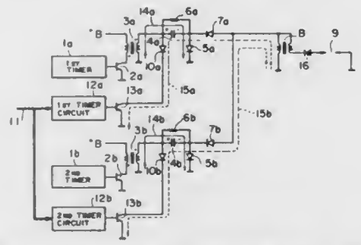

1. A core for a device promoting the dispersion of fuel when atomized comprising an alloy comprising copper, zinc, manganese, nickel, aluminum, iron, tin, lead, chromium, cobalt, titanium, magnesium, and molybdenum.

5,044,348

## IGNITER FOR AN INTERNAL COMBUSTION ENGINE

Kiyoshi Ookawa, Himeji, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Sep. 27, 1989, Ser. No. 413,509
Claims priority, application Japan, Sep. 27, 1988, 63-239746
Int. Cl.[5] F02P *3/08, 15/00*
U.S. Cl. 123—637 5 Claims



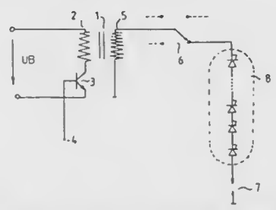

1. An igniter for an internal combustion engine comprising:
an ignition coil having a primary winding and a secondary winding;
a plurality of drive circuits connected to the primary winding, each of said drive circuits applying a voltage to said primary winding so as to produce successive voltages applied to said primary winding, said successive voltages being separated from one another by an interval, said interval being varied in response to an ignition timing signal provided to said drive circuits;
a spark plug; and
diode means for preventing a voltage of one polarity from being generated in the secondary winding of said ignition coil, said diode means connected in series between the secondary winding of the ignition coil and the spark plug.

5,044,349

## HIGH-VOLTAGE SWITCH

Walter Benedikt, Kornwestheim, and Werner Herden, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE88/00566, § 371 Date Mar. 16, 1990, § 102(e) Date Mar. 16, 1990, PCT Pub. No. WO89/02528, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 13, 1988, Ser. No. 490,695
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1987, 3731393
Int. Cl.[5] F02P *3/12*
U.S. Cl. 123—655 8 Claims



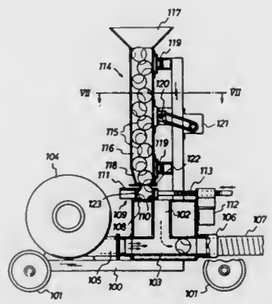

1. A high-voltage switch for use in an ignition system for internal combustion engines to ignite a spark plug, the high-voltage switch comprising a cascade of series-connected thyristors to be located upstream of the spark plug, each thyristor having a gate thereof connected with a cathode thereof to form a breakdown diode whereby a breakdown voltage of the cascade corresponds to a sum of breakdown voltages of individual breakdown diodes.

5,044,350

## PITCHING MACHINE

Shigeru Iwabuchi, Aikawa; Aritsune Sato, Atsugi, and Haruo Ueno, Zama, all of Japan, assignors to Nagao Compnay, Inc., Tokyo, Japan

Division of Ser. No. 224,848, Jul. 27, 1988, Pat. No. 4,922,885.
This application Mar. 6, 1990, Ser. No. 489,353
Claims priority, application Japan, Sep. 22, 1987, 62-144844
Int. Cl.[5] A63B *69/40;* F41B *11/00*
U.S. Cl. 124—51.1 12 Claims




3. A ball feed mechanism for feeding balls to a pitching machine, comprising:
a chassis;
a blower mounted on said chassis, said blower having a blow port;
a feed tube having first and second ends, said first end of said feed tube being connected to said blow port;
a flexible hose connected to said second end of said feed tube, said flexible hose additionally being connectable to said pitching machine;
a vertically disposed supply tube having an open top end and having a lower end which is connected to said feed tube, said supply tube being substantially perpendicular to said feed tube;
a slider having an opening, said slider being mounted for horizontal reciprocation; and
a ball storage chamber mounted on the chassis above said slider to store a plurality of balls and supply balls one by one to said slider, said ball storage chamber being divided into a plurality of vertically disposed compartments which store balls in respective columns,
wherein said supply tube is cylindrical, and
wherein said opening in said slider is circular, said circular opening in said slider having substantially the same diameter as the inner diameter of said cylindrical supply tube.

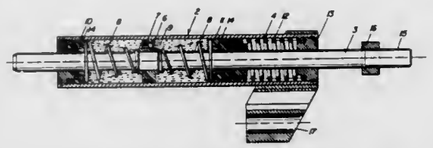


5,044,351

## SHOCK ABSORBER FOR SPORTING AND HUNTING BOWS

Anton Pfeifer, Furth i. Wald, Fed. Rep. of Germany, assignor to Amerika-Bogen-Handelsgesellschaft mbH, Duisburg, Fed. Rep. of Germany

PCT No. PCT/EP89/00854, § 371 Date Mar. 27, 1990, § 102(e) Date Mar. 27, 1990, PCT Pub. No. WO90/02307, PCT Pub. Date Mar. 8, 1990
PCT Filed Jul. 20, 1989, Ser. No. 469,596
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827934; Jul. 11, 1989, 3922805
Int. Cl.[5] F41B *5/00*
U.S. Cl. 124—89 11 Claims



1. A shock-absorber for sporting and hunting bows, comprising a fluid shock-absorber having a housing, a piston moveable within the housing and a piston rod carrying the piston and adapted to be attached to the bow to extend in the direction of the shot so that shock and vibrations generated by the bow upon its release during use are counteracted and dampened, and a counterweight for the bow in the form of a V-bar fitted to the housing.

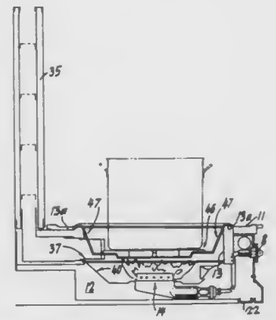
5,044,352

## LARGE-BURNER STOVE WITH RECESSED BURNER WELL

Yuk L. Lok, 33-39 73rd St., Queens, N.Y. 11372

Continuation-in-part of Ser. No. 480,913, Feb. 16, 1990, Pat. No. 4,984,558. This application Dec. 12, 1990, Ser. No. 626,959
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—39 R 17 Claims

1. A stove suitable for large-burner cooking generating a high heat exhaust comprising:
an enclosed stove casing having walls defining a horizontal upper surface used as a cooking surface and a hollow interior;
a burner well extending into the interior of said stove casing and having an upper annular rim at said horizontal upper surface, said annular rim defining a support for a cooking vessel;
a burner recessed at an interior position in said well in the interior of said casing which provides a flame to a bottom portion of a cooking vessel used thereon;
ducting means including a first duct member positioned at a rear portion of said stove casing remote from said burner well and a second duct member having an opening located adjacent said interior position of said well and another opening communicating into said first duct member for conveying high heat exhaust from said burner into said first duct member at said rear portion of said stove casing; and



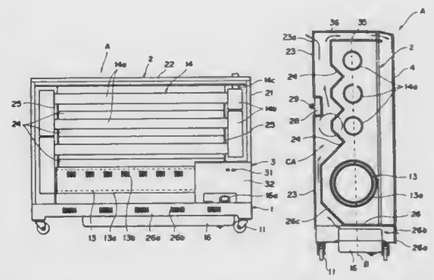

a catch basin member positionable in the interior of said burner well having annular walls defining a central opening for fitting around said burner and a surrounding retention area for catching any spillage or debris falling from a cooking vessel used thereon.

5,044,353

## LIQUID FUEL COMBUSTION TYPE INFRARED RAY IRRADIATING APPARATUS

Akira Mizuno; Hiroshi Komai; Toshio Ina, and Tadao Suzuki, all of Shizuoka, Japan, assignors to Shizuoka Seiki Co., Ltd., Shizuoka, Japan

Filed Jun. 25, 1990, Ser. No. 543,155
Claims priority, application Japan, Jun. 28, 1989, 1-166162
Int. Cl.[5] F24C *3/00*
U.S. Cl. 126—91 A 12 Claims



1. A liquid fuel combustion type infrared ray irradiating apparatus, comprising:
a base formed in a generally tetragon-shaped framework

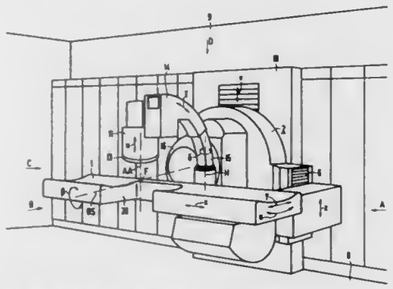
VOL 1130 ISS 1 SE 3 1991 UMI



having opposed pairs of approximately parallel members which extend generally horizontally, each corner of said framework being provided with a wheel;
a fuel tank fixedly suspended astride one said opposed pair of parallel members which form long horizontally extending opposed sides of said base;
a pump disposed on said base and adapted to pump fuel from said fuel tank;
a burner for receiving fuel from said pump and combusting same;
a combustion chamber connected to said burner;
an irradiation pipe connected to said combustion chamber for guiding combustion gas from said combustion chamber into an upper chimney, receiving heat from said combustion gas, and irradiating infrared rays; and
a heat irradiating portion for supporting said irradiation pipe, and having a main reflecting plate upstanding from said base for forwardly reflecting rearwardly directed radiant heat radiated from said irradiation pipe.

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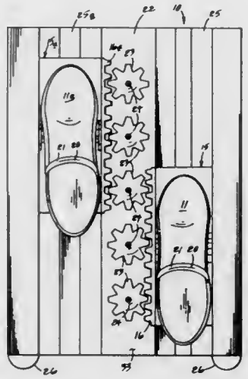
**5,044,354**
**APPARATUS FOR TREATING A LIFE FORM WITH FOCUSSED SHOCKWAVES**
**Klaus Goldhorn, Erlangen, and Hans P. Seubert, Heroldsbach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**
**Filed Jun. 29, 1990, Ser. No. 546,526**
**Claims priority, application European Pat. Off., Jun. 30, 1989, 89111988.5; Fed. Rep. of Germany, Jun. 30, 1989, 8908037[U]**
**Int. Cl.[5] A61B** *17/22*
**U.S. Cl. 128—24 EL** **26 Claims**



1. An apparatus for the treatment of a life form with focused shockwaves, said apparatus comprising:
a patient bed;
a shockwave source having an acoustic axis, said patient bed and said shockwave source constituting pivotable components;
means for adjusting said shockwave source relative to said patient bed;
means adapted for acoustically coupling shockwaves from said shockwave source into the body of a life form;
means for converging said shockwaves in a focal region on said acoustic axis of the shockwave source; and
means for supporting said pivotable components having a common swiveling axis around which said pivotable components are selectively pivotable independently of one another or synchronously.

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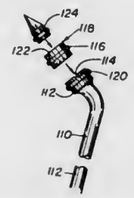
**5,044,355**
**RECIPROCATING LEG EXERCISE APPARATUS WITH GEAR ASSEMBLY**
**Lawrence E. Reopelle, Rhinehart Dr., E. Grand Forks, Minn. 56721**
**Filed Apr. 23, 1990, Ser. No. 512,372**
**Int. Cl.[5] A61H** *1/02;* **A63B** *23/04*
**U.S. Cl. 128—25 B** **7 Claims**



1. An exercise apparatus for therapeutic stretching of an individual's knee joint, wherein the apparatus comprises,
an elongate planar support base, the planar support base including a planar top surface,
a gear channel defined medially and longitudinally of the planar top surface, the gear channel defined by a predetermined width,
a plurality of rotary gears spaced at a predetermined equal spacing relative to one another within the gear channel,
a right and left block support formed longitudinally of and equally spaced from the rotary gears, and
a respective right and left foot support means captured between a respective right and left block support and the rotary gears for permitting reciprocation of the right and left foot support means overlying the planar top surface of the planar support base.

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**5,044,356**
**APPLICATOR AND GUM MASSAGING DEVICE**
**John Fishman, 7972 Biscayne Point Cir., Miami Beach, Fla. 33141, and Iris Lopez, 750 SW. 10 St., Miami, Fla. 33130**
**Filed Aug. 6, 1990, Ser. No. 563,691**
**Int. Cl.[5] A61H** *9/00;* **A61G** *17/02*
**U.S. Cl. 128—62 A** **2 Claims**

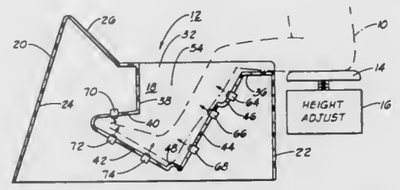


1. A hand-held dental tool for massaging the gums of a user of the type which includes a wand with a distal tip zone and a handle connected to the wand including means to move the distal tip zone in a massaging motion, the improvement which comprises:
a tip member formed of a substantially absorbent material adapted to carry a medicament for application to the gums during use of the tool, said tip member including a base portion and a conical end portion,
a female socket disposed on the distal tip zone of the wand formed of a substantially yieldable, flexible material and including a slot opening therein,
means to secure said tip member in a snug fitting relation within said female socket and including a holder element sized and configured to be received through said slot opening and into secured, fixed position within said female socket with a bead on an outer portion of said holder element being nested within a groove on an inner portion of said female socket, and
said holder element including a recess formed therein being structured and configured to hold and maintain said base portion of said tip member in snug fitting relation therein.

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**5,044,357**
**APPARATUS FOR INCREASED VOLUME HYDROTHERAPY**
**C. Richard Johns, 2800 Shady Tree La., Edmond, Okla. 73013**
**Filed Sep. 19, 1989, Ser. No. 409,089**
**Int. Cl.[5] A61H** *9/00*
**U.S. Cl. 128—66** **5 Claims**

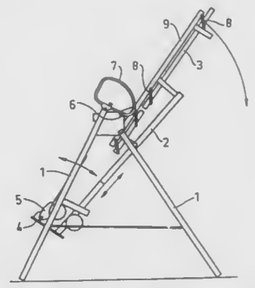



1. Apparatus for foot and leg hydrotherapy, comprising:
a housing for receiving a person's feet and legs that defines a well having at least front and back walls, left and right side walls and a bottom, wherein said front wall is further formed to define a lower foot space by the front wall bending forward at approximately 90° to form a foot top wall and reversing at an acute angle to form said bottom;
a transverse sump with plural drain holes formed integrally with said housing bottom at the lowermost position;
a plurality of jets disposed at selected similar positions on each of the left and right side walls, the front wall, the bottom and the back wall;
a motor driven pump having inlet and outlet with the inlet connected to the transverse sump and the outlet connected to each of said jets;
a suction tube providing a source of air connected to each of said jets; and
means for adjusting the amount of air drawn into the suction tube thereby to adjust the pressure of air/water from the jets;
whereby a volume of water is maintained in circulation from the pump outlet to the jets, and through the sump for return to the pump inlet.

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**5,044,358**
**TREATMENT BENCH**
**Hans Morin, Akers Styckebruk, Sweden, assignor to Oy Suomen Selkapalvelu, Kristinestad, Finland**
**Filed Jan. 8, 1990, Ser. No. 461,757**
**Claims priority, application Sweden, Jan. 13, 1989, 8900118**
**Int. Cl.[5] A61F** *5/00, 5/04;* **A63B** *23/02*
**U.S. Cl. 128—71** **2 Claims**

1. A treatment bench for suspending a head down, feet up inclininglyreclining patient from his or her feet with his or her back thereby subjected to traction, comprising:
a stand;
a bench-section having two longitudinally opposite ends and two laterally opposite sides;
means pivotally securing said bench-section to said stand for pivotal motion about a first transverse horizontal axis between a first position in which one said end of said bench-section is higher than the other said end of said bench-section, and a second position in which said one end of said bench-section is lower than said other end of said bench-section;
means providing a foot-rest on said bench-section at said other end thereof;
means defining a longitudinally extending frame-part secured to said bench-section at said one end thereof;
at least one patient support member having a patient-reclining surface means provided thereon at a location that is spaced longitudinally along said bench-section from said foot rest;
a plurality of generally vertically extending suspension links each having one end pivotally secured to said frame-part



for pivoting about a respective transverse, horizontal axis pivot axis, and another end pivotally secured to a respective said patient support member for pivoting about a respective transverse, horizontal axis pivot axis, so that a patient may board said bench while said bench-section is located in said first position, secure his or her feet to said foot rest and support his or her torso on said patient-reclining surface means, and said bench-section may then be pivoted relative to said stand about said first horizontal axis, to said second position, whereby said suspension links pivot to tend to remain generally vertical, causing the relative distance between the foot-rest and the patient support member to increase and, consequently, the patient's torso to become stretched axially away from the patient's feet;
said frame-part comprising left and right elements disposed above each said patient support member, with said suspension links hangingly supporting each said patient support member from said left and right elements of said frame-part.

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**5,044,359**
**PASSIVE SPINAL EXTENSION DEVICE**
**Otto C. Reinert, 2024 Long Gate Ct., Chesterfield, Mo. 63017**
**Filed Jun. 12, 1990, Ser. No. 536,724**
**Int. Cl.[5] A61F** *5/00*
**U.S. Cl. 128—74** **14 Claims**

5. A device for passive extension of the spine, the device comprising:
first and second support panels abutting in end to end alignment for supporting a person's body in a prone position thereon, the first panel being adapted to pivot with respect to said second panel about a transverse axis, the upper portion of the person's body being supported on the first panel, the lower portion of the person's body being supported on the second panel and a selected area of the lumbar or sacrum region of the spine being disposed over the transverse axis;

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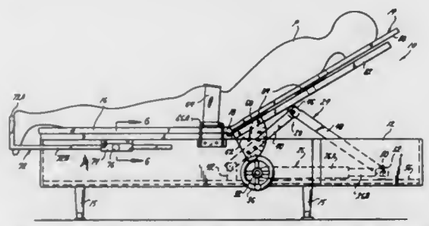


the first panel being adapted to support the head of the person lying face down thereon while providing clearance for the person's nose and mouth;

means for holding the first panel and the portion of the person's body supported thereon at a selected angular position with respect to the second panel thereby holding the person's spine at a selected angle of extension;

means indicating the approximate degree of extension of the spine;

the first panel comprising an upper section pivotally connected to a lower section at the transverse axis and wherein said holding means comprises a brace member having an upper end and a lower end, the brace member being pivotally mounted at its upper end on the underside of the upper section of the first panel, and elongate rack means extending lengthwise of the first panel and having a plurality of longitudinally spaced slots therein, the lower end of the brace member being receivable in any one of the slots in said rack means, each slot corresponding to a predetermined angular orientation of the first and second panels.



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**5,044,360**

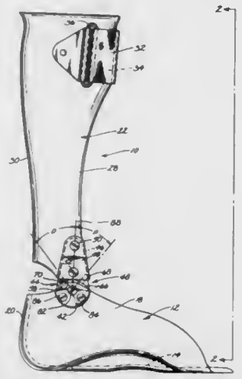
## ORTHOSIS WITH VARIABLE MOTION CONTROLS

**Wayne R. Janke, Pasadena, Calif., assignor to United States Manufacturing Company, Pasadena, Calif.**

**Continuation-in-part of Ser. No. 457,018, Dec. 26, 1989, abandoned. This application Feb. 27, 1990, Ser. No. 485,962**

**Int. Cl.[5] A61F** *5/00*

**U.S. Cl. 128—80 H** **17 Claims**



7. A controlled motion orthosis assembly for controlling angular motion between first and second orthotic support members adapted for attachment to bodily members on opposite sides of a bodily joint, comprising:

an elongated rigid support adapted to extend from the first orthotic support member across a single axis of rotation of the bodily joint and to the second orthotic support member;

fastening means on the support plate for rigidly securing the support plate to the first orthotic support member spaced from the single axis of rotation through the bodily joint;

an elongated shoulder projecting from a face of the support plate for extending anteriorly of and posteriorly of the bodily joint, the shoulder providing a rigid stop in both angular directions of rotation about said single axis of rotation;

a set of individual cam members each adapted for selective positioning between the support plate and the second orthotic support member, each cam member having means for releasably but rigidly securing the cam member to the second orthotic support member, the cam member being adapted for releasably but rigidly securing the cam member to the second orthotic support member, the cam member being adapted for positioning adjacent the rigid support plate and the shoulder thereon; and

means pivotally securing the cam member and the second orthotic support member to the support plate so the cam member and the attached second orthotic support member rotate in unison relative to the first orthotic support member about said single axis of rotation;

the cam members having separate combinations of anterior and posterior can surfaces extending anteriorly of and posteriorly of the single joint axis of rotation and adapted for positioning adjacent the shoulder of the support plate so that rotation of the cam member in a first direction about the joint axis causes the first cam surface to engage or rotate into engagement with the first shoulder to act as a rigid stop to limit the angle of rotation in a first direction, and so that rotation of the cam member in a second direction about the joint single axis of rotation causes the second cam member to engage or rotate into engagement with the shoulder to act as a rigid stop to limit the angle of rotation in a second direction, the set of cam members providing different combinations of anterior and posterior cam surfaces so that each individual cam member can be releasably fastened to the second orthotic support member and engaged with the support plate to control a unique combination of rotation about the axis in the first and second directions.

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**5,044,361**

## METHOD AND APPARATUS FOR REUSE OF ANESTHETICS

**Olof Werner; Hans-Henrik Luttropp; Ronnie Thomasson, all of Lund, and Georgios Psaros, Tullinge, all of Sweden, assignors to Zenova Aktiebolag and Siemens-Elema Aktiebolag, Sweden**

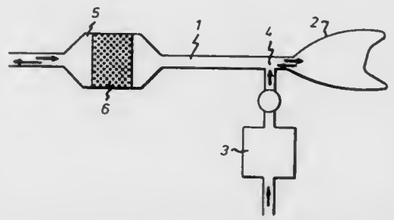
**PCT No. PCT/SE88/00184, § 371 Date Oct. 13, 1989, § 102(e) Date Oct. 13, 1989, PCT Pub. No. WO88/07876, PCT Pub. Date Oct. 20, 1988**

**PCT Filed Apr. 12, 1988, Ser. No. 424,249**

**Claims priority, application Sweden, Apr. 14, 1987, 8701547-5**

**Int. Cl.[5] A61M** *16/00*

**U.S. Cl. 128—204.16** **2 Claims**



1. Method for reuse of anesthetics in inhalation anesthesia, wherein fresh gas is mixed with highly concentrated anesthetic from an anesthetics evaporator (3) in a collector conduit (1) leading into and out of a patient (2), characterised in that, when the patient (2) exhales, the exhalation gas is passed in a first direction through an adsorption filter (5) disposed in the ingoing and outgoing collector conduit (1) and arranged distally relative to the outlet (4) from the anesthetics evaporator (3), as seen from the patient (2), the anesthetic gas not absorbed by the patient being adsorbed in gaseous form by an adsorption material (6) in the adsorption filter (5), while the rest of the exhalation gas leaves the apparatus, and when the patient inhales, the inhalation gas is passed in a second direction opposite the first direction through said adsorption filter (5), whereby the adsorbed anesthetic is desorbed from the adsorption material (6) and retransferred to the patient.



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**5,044,362**

## LUNG VENTILATOR DEVICE

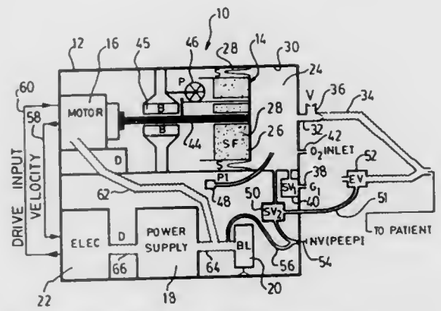
**Magdy Younes, Winnipeg, Canada, assignor to University of Manitoba, Winnipag, Canada**

**Continuation of Ser. No. 158,752, Feb. 22, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 496,172**

**Claims priority, application United Kingdom, Feb. 21, 1987, 8704104**

**Int. Cl.[5] A61M** *16/00*

**U.S. Cl. 128—204.21** **15 Claims**




8. A lung ventilator apparatus, comprising:

chamber means having a piston movable therein permitting the free flow of gas from said chamber means to a patient in response to a pressure gradient generated by the patient,

pressure transducer means operatively connected to said chamber means for detecting the pressure therein and for generating an electrical signal proportional to the magnitude of the detected pressure,

electrical motor means operatively connected to said piston to apply to said piston a force which is proportional to the magnitude of the power applied thereto, and

electronic circuit means for providing electrical power to said electrical motor means,

said electronic circuit means including:

means for generating electrical signals corresponding to the inspired flow rate and the inspired flow volume, respectively, of said gas from said chamber means to said patient,

means for varying the proportionality for each of said signals,

means for generating an electrical signal to apply electrical power to said electrical motor means in proportion to the sum of said inspired flow rate and inspired flow of flow signals,

comparator means for continuously comparing the magnitude of said detected pressure signal during inhalation by said patient with the expected pressure signal corresponding to the applied electrical power to said electrical motor means and for generating a comparator electrical signal corresponding in magnitude to any detected difference between said detected pressure signal and said expected pressure signal, and

control signal generating means for generating an electrical signal to said electrical motor means in response to said comparator electrical signal to move said piston with a force corresponding to the magnitude of said electrical signal.

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**5,044,363**

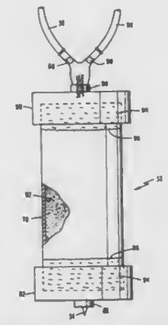
## ADSORPTION SYSTEM FOR SCAVENGING ANESTHETIC AGENTS FROM WASTE GAS RELEASED DURING SURGICAL ACTIVITY

**Joseph E. Burkhart, Morgantown, W. Va., assignor to The United States of America as represented by the Department of Health and Human services, Washington, D.C.**

**Filed May 24, 1990, Ser. No. 528,080**

**Int. Cl.[5] A61M** *16/10*

**U.S. Cl. 128—205.27** **13 Claims**



1. Apparatus for scavenging an anesthetic substance from a waste gas flow leaving an anesthetic-administration system, the waste gas flow comprising at least one of a flow of unused anesthetic in gas or vapor form and anesthetic in the exhalation from a patient, comprising:

containing means for containing a quantity of a replaceable adsorbing medium, disposed to receive a flow of waste gas from the anesthetic-administration system to percolate the waste gas through the adsorbing medium for adsorption of said anesthetic substance by said adsorbing medium, said adsorbing medium being loosely contained so as to allow shaking thereof to rearrange the same to extend its adsorbing ability; and

means for quickly connecting and disconnecting said containing means to said anesthetic-administration system in such a manner that said waste gas flow is caused solely by an internal pressure within the anesthetic administration system.

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**5,044,364**

## METHOD AND APPARATUS FOR FLOWING CONDITIONED AIR ONTO PERSON

**Jonathan M. Crowther, Wilmington, Del., assignor to Primed Products, Inc., Wilmington, Del.**

**Filed Jun. 19, 1989, Ser. No. 368,182**

**Int. Cl.[5] A61F** *7/00*

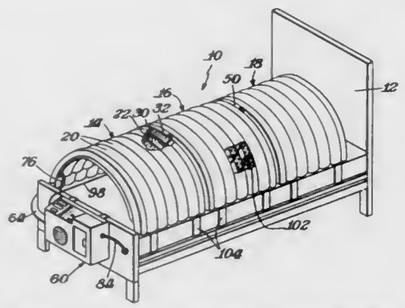
**U.S. Cl. 128—400** **18 Claims**

1. A flexible treatment cover for flowing conditioned air onto a person located under the cover having an inflated in use position above and out of contact with such person and a deflated flat stored condition comprising inflatable support means fabricated of flexible material having an upper surface portion and a lower surface portion, the inflatable support means having a generally arch shaped configuration when inflated, separate air chamber means secured to the lower surface portion of the inflatable support means fabricated of flexible material, the separate air chamber means having an underside surface with perforations therein which allow condi-

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tioned air to flow out of the chamber onto a person located under the cover, and air supply means for inflating the support



means and for continuously supplying conditioned air to the separate air chamber.

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**5,044,365**

**RATE-RESPONSIVE PACEMAKER**

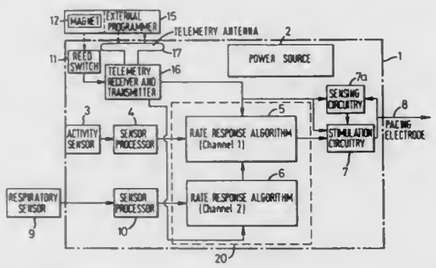
**Stuart C. Webb, 5 Lingholm Way, Barnet, Hertfordshire; Leland M. Lewis, 43 Prince George Avenue, Oakwood London N14 4TL, and Jayne A. Morris-Thurgood, 20 Pym Walk, Thame Oxfordshire, all of United Kingdom**

**Continuation of Ser. No. 311,638, Jul. 16, 1989. This application Apr. 26, 1990, Ser. No. 515,085**

**Claims priority, application United Kingdom, Feb. 17, 1988, 8803613; Aug. 12, 1988, 8819268**

**Int. Cl.[5] A61N** *1/00*

**U.S. Cl. 128—419 PG** **7 Claims**



1. A pacemaker comprising

means to control pacing rate by (a) rapidly responding to a change in a patient's exercise level as indicated by the value of a first signal representative of a first biological variable, and (b) following such rapid response, accurately setting the pacing rate relative to the patient's exercise level as indicated by the value of a second signal representative of a second biological variable;

a single sensor including means for measuring activity by the patient to produce an activity signal; and

signal processing means for generating said first and second signals from said activity signal.

**5,044,366**

**RATE RESPONSIVE CARDIAC PACEMAKER**

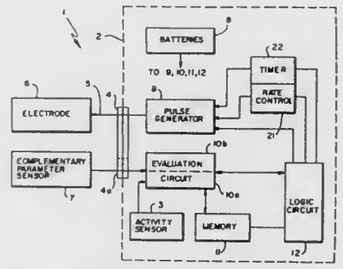
**Eckhard Alt, Ottobrunn, Fed. Rep. of Germany, assignor to Intermedics, Inc., Angleton, Tex.**

**Division of Ser. No. 94,875, Sep. 10, 1987, Pat. No. 4,926,863. This application Jun. 22, 1989, Ser. No. 369,813**

**Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631155**

**Int. Cl.[5] A61N** *1/36*

**U.S. Cl. 128—419 PG** **47 Claims**



1. A rate responsive cardiac pacemaker for implantation in a patient, comprising

activity sensor means for detecting movements of the patient, said activity sensor means including

exercise responsive means arranged and adapted to distinguish between movements of the type attributable to physical exercise of the patient and movements of the type produced by spasmodic reaction to internal and external influences on the patient, for generating a first electrical signal level representative of patient movement attributable to physical exercise,

physiological sensor means arranged and adapted to detect a variable physiological parameter indicative of the present metabolic state of the patient, for generating a second electrical signal level representative thereof,

adjustable rate pulse generating means for stimulating the patient's heart, and

rate selecting means responsive to both of said first and second electrical signal levels for adjusting the pulse rate of said pulse generating means to stimulate the patient's heart at a rate according to the relative values of said signal levels, whereby to pace the patient's heart at a rate which is physiologically appropriate to the physical exercise of the patient.

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**5,044,367**

**METHOD AND APPARATUS FOR SWITCHING CARDIAC STIMULATION SIGNALS**

**William P. Endres, and Betty Stephens, both of Portland, Oreg., assignors to The State of Oregon Acting by and Through the State Board of Higher Education on Behalf of Oregon Health Sciences University, Portland, Oreg.**

**Filed Jun. 26, 1989, Ser. No. 371,495**

**Int. Cl.[5] A61N** *1/08*

**U.S. Cl. 128—419 R** **15 Claims**

6. In combination,

means for receiving a pacing signal,

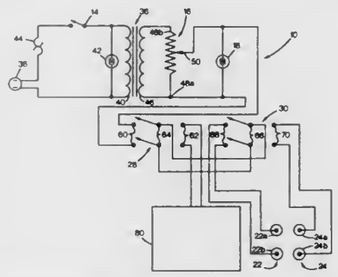
a fibrillation signal generator providing a fibrillation signal as output,

a switching network coupled to said means for receiving the pacing signal and to said fibrillation signal generator for selecting one of said pacing signal and said fibrillation signal as a selected output signal;

connector means coupled to said switching network to receive the selected output signal, said connector means being adapted for coupling to a patient electrode pair, and including a plurality of separate connector jack pairs, each



connector jack pair being adapted for connection to separate patient electrode pairs, and wherein said switching



network comprises means for routing the selected output signal to one of said connector jack pairs.

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**5,044,368**

**DIAGNOSTIC ELECTRODE FOR USE WITH MAGNETIC RESONANCE IMAGING**

**David A. Putz, Racine, Wis., assignor to Ad-Tech Medical Instrument Corporation, Racine, Wis.**

**Filed Apr. 23, 1990, Ser. No. 512,862**

**Int. Cl.[5] A61B** *5/04*

**U.S. Cl. 128—642** **6 Claims**



1. An improved diagnostic electrode for intracranial implantation to determine the foci of diseased brain tissue and including:

an electrode body;

at least one metallic contact supported by the body;

an electrical lead wire attached to the contact for connection to a diagnostic instrument;

such metallic contact being made of an alloy which includes nickel and chromium and which is substantially devoid of iron;

the electrode thereby providing an essentially artifactfree image of the location of such metallic contact when contact location is determined using magnetic resonance imaging techniques.

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**5,044,369**

**BENT TOPLESS CATHETERS**

**Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740**

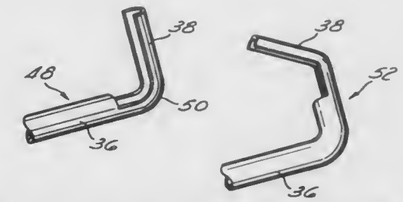
**Continuation of Ser. No. 301,179, Jan. 23, 1989, Pat. No. 4,976,691. This application Apr. 18, 1990, Ser. No. 510,472**

**Int. Cl.[5] A61M** *25/00*

**U.S. Cl. 128—658** **5 Claims**

1. A guiding catheter for use in the diagnosis and treatment of arterial stenosis, constructed and arranged to i) conduct ratio opaque dyes into a predetermined blood vessel and ii) guide a balloon dilatation catheter into the blood vessel to relieve the stenosis, said guiding catheter comprising:

an axially elongate cylindrical shaft, having a proximal end and a distal end; and



an arcuate topless section, integrally connected to said distal end of said shaft, said distal topless section being preformed into a single, substantially right-angle bend.

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**5,044,370**

**PROBE WITH BAR OF PIEZOELECTRIC ELEMENTS FOR ULTRASOUND APPARATUS**

**Patrick Dubut, Tourrettes S/Loup, and Jean-Francois Gelly, Valbonne, both of France, assignors to General Electric CGR, Issy les Moulineaux, France**

**PCT No. PCT/FR87/00465, § 371 Date May 24, 1989, § 102(e) Date May 24, 1989, PCT Pub. No. WO88/04092, PCT Pub. Date Jun. 2, 1988**

**PCT Filed Nov. 24, 1987, Ser. No. 368,364**

**Claims priority, application France, Nov. 28, 1986, 88 16663**

**Int. Cl.[5] A61B** *8/00*; **H01L** *41/22*

**U.S. Cl. 128—662.03** **9 Claims**



1. An ultrasonic probe comprising: a bar of piezoelectric transducer elements, each element emitting an acoustic wave along a propagating path, being inserted between a support and an acoustic transition blade and having a metallization on respective faces thereof which are juxtaposed to the support and the blade, wherein at least one of the blade and the support includes a facing metallization for electrical connection to the corresponding metallization of the element to form an electrical contact positioned to prevent interference with the propagating path of the acoustic wave.

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**5,044,371**

**MEMORY UNIT FOR CONTROLLING AN ERGOMETER**

**Peter Lautenschläger, Gonbach, Fed. Rep. of Germany, assignor to Keiper Dynavit GmbH & Co., Fed. Rep. of Germany**

**Filed Mar. 15, 1990, Ser. No. 493,749**

**Claims priority, application Fed. Rep. of Germany, Mar. 17, 1989, 3908756**

**Int. Cl.[5] A61B** *5/04*

**U.S. Cl. 128—707** **28 Claims**

1. Memory unit for use with an ergometer, comprising:

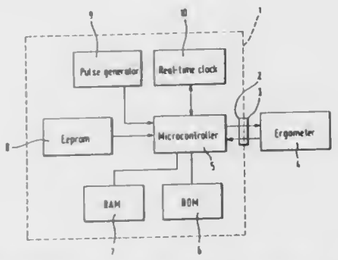
a) means for controlling said ergometer with respect to a performance applied by a user in dependence on time and/or distance;

b) means for removably connecting said memory unit to said ergometer; and

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c) means for data storage for a period of time until subsequent recall. including a ROM, a RAM, a pulse generator, and a real time clock, each of which are connected to a micro-controller;




wherein the memory unit is selectively connectable with said ergometer and with a bicycle computer.

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**5,044,372**

## EPICUTANEOUS TEST PLASTER

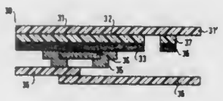
**Dieter Anhäuser, Melsbach, and Kurt Seeger, Neuwied, both of Fed. Rep. of Germany, assignors to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany**

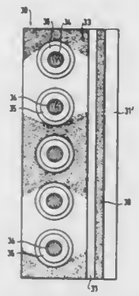
**Filed Mar. 23, 1989, Ser. No. 328,089**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810658**

**Int. Cl.[5] A61B *5/00***

**U.S. Cl. 128—743** **8 Claims**





1. An epicutaneous test plaster comprising one active substance absorbing device arranged on a carrier film, characterized in that the carrier film (12,32) is made from a highly elastic polymer material which is impermeable for liquid water but permeable for water vapor, the carrier film having a skin side carrying said active substance absorbing device and a skin-remote surface which is detachably connected over at least a partial area thereof a support film (11,31) for at least covering the surface of the carrier film.

**5,044,373**

## METHOD AND APPARATUS FOR FITTING OF A HEARING AID AND ASSOCIATED PROBE WITH DISTANCE MEASURING MEANS

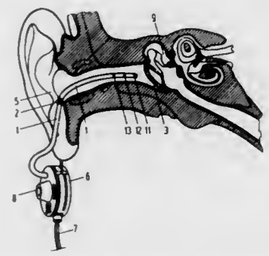
**Allan Northeved, Farum, and Torsten Johnsen, Copenhagen, both of Denmark, assignors to GN Danavox A/S, Copenhagen, Denmark**

**Filed Jan. 24, 1990, Ser. No. 469,221**

**Claims priority, application Denmark, Feb. 1, 1989, 458/89**

**Int. Cl.[5] A61B *5/12***

**U.S. Cl. 128—746** **15 Claims**



5. Apparatus for use in the fitting of a hearing aid and comprising:

a) a signal source (10) arranged to emit an acoustic signal in the audible frequency range,

b) a reference microphone (8) for the measuring of the sound pressure created by the signal source at the inlet to the user's ear, and with means (14) for the regulation of the strength of the signal source,

c) a measuring probe (1) comprising a tube having an end inserted in the auditory canal, with microphone for the measurement of the sound pressure in the vicinity of the ear drum (3),

d) a data processing unit (14) for the calculation of the measured sound pressure levels, characterized in that the measuring probe (1) tube end comprises means (21, 29) for the measurement of the distance between the probe tube end and the ear drum comprising a light source with means for conducting light to the measuring probe tube end, means for receiving light reflected off of the ear drum and conducting the reflected light to a measuring circuit for calculating the distance between the tube end and the ear drum by measuring the time difference between emission and reception of light from the light source.

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**5,044,374**

## MEDICAL ELECTRICAL LEAD

**Fred Lindemans, Limbricht, Netherlands; Clare Padgett, Minneapolis, Minn.; Thomas Kiekhafer, Coon Rapids, Minn.; Timothy Holleman, Ham Lake, Minn.; John Keimel, New Brighton, Minn., and David Peterson, Mounds View, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 264,916, Oct. 31, 1988, which is a continuation-in-part of Ser. No. 63,371, Jun. 18, 1987, Pat. No. 4,817,634. This application Jul. 7, 1989, Ser. No. 376,730**

**Int. Cl.[5] A61N *1/05***

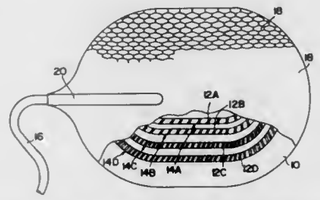
**U.S. Cl. 128—784** **6 Claims**

1. An implantable defibrillation electrode apparatus comprising:

an insulative electrode pad having upper and lower surfaces and having an outer periphery;



a conductive electrode mounted to and exposed to the exterior of said electrode pad only along the lower surface of



said electrode pad, said electrode extending no closer than 0.5" to the external periphery of said electrode pad.

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**5,044,375**

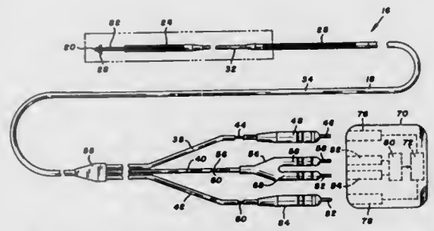
## UNITARY INTRAVASCULAR DEFIBRILLATING CATHETER WITH SEPARATE BIPOLAR SENSING

**Stanley M. Bach, Jr.; J. Edward Shapland, both of Shoreview; Douglas J. Lang, Arden Hills, and Roger W. Dahl, Andover, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.**

**Filed Dec. 8, 1989, Ser. No. 447,908**

**Int. Cl.[5] A61N *1/05***

**U.S. Cl. 128—786** **61 Claims**



1. A unitary intravascular cardioversion device including:

an elongate, flexible and dielectric catheter body having a proximal end region and a distal end region;

a cardioversion circuit including a first cardioversion electrode mounted on said catheter body along said distal end region; a first flexible conductor means connected to said first cardioversion electrode for conducting electrical pulses between said first cardioversion electrode and said proximal end region; a second cardioversion electrode mounted on said catheter body proximally of said first cardioversion electrode, spaced apart from said first cardioversion electrode; a second flexible conductor means connected to said second cardioversion electrode for transmitting electrical pulse between said second cardioversion electrode and said proximal end region; and a cardioversion connector means near said proximal end region for electrically coupling said first and second conductor means with a cardioversion pulse generating means, thereby to utilize said first and second cardioversion electrodes as a cardioversion electrode pair; and

a cardiac sensing circuit electrically isolated from the cardioversion circuit and including a first sensing electrode mounted on said catheter body along said distal end region; a third flexible conductor means connected to said first sensing electrode for transmitting electrical pulses between said first sensing electrode and said proximal end region; a second sensing electrode, mounted on said catheter body along said distal end region proximally of said first sensing electrode and spaced apart from said first sensing electrode by a predetermined first distance; a fourth flexible conductor means connected to said second sensing electrode for transmitting electrical pulses between said second sensing electrode and said proximal end region; and a sensing connector means near said proximal end region for electrically coupling said third and fourth conductor means with a pulse sensing means; wherein each of said first and second cardioversion electrodes has a surface area at least three times the surface area of each of the first and second sensing electrodes, and the sensing electrodes are separated from each of the cardioversion electrodes by a distance sufficient to isolate tissue proximate and between the cardioversion electrodes from tissue adjacent to said sensing electrodes.

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**5,044,376**

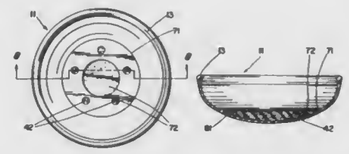
## VAGINAL DIAPHRAGMS WITH MEDICAMENT DISPENSING FOAM PADS

**Jack W. Shields, 1950 Las Tunas Rd., Santa Barbart, Calif. 93103**

**Continuation of Ser. No. 234,812, Aug. 22, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 415,472**

**Int. Cl.[5] A61F *6/10***

**U.S. Cl. 128—837** **4 Claims**



1. A reusable intravaginal contraceptive device comprising:

(a) a dome shaped barrier-forming member made from an elastomer which will substantially prevent sperm present on one side of said barrier-forming member from crossing said barrier forming member; and

(b) a foam pad-retaining member permanently affixed to said barrier-forming member, said foam pad-retaining member external from the interior or cervical surface of said barrier-forming member so as to allow the release of medicament contained within a foam pad preferentially in the vicinity of the external os of the cervix uteri when said intravaginal contraceptive device is correctly positioned within the vagina; and

(c) a medicament-dispensing open-cell foam pad, said foram being removably attached to said barrier forming member by said foam pad retaining-member thereby rendering said foam pad disposable.

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**5,044,377**

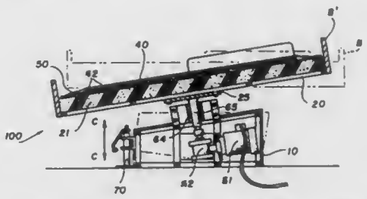
## APPARATUS FOR PERIODICALLY VARYING THE ELEVATION OF A HUMAN SUBJECT

**Arnold Stillman, 5756 Montessa Dr., Camarillo, Calif. 93010**

**Continuation-in-part of Ser. No. 158,788, Feb. 22, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 465,382**

**Int. Cl.[5] A61G *15/00***

**U.S. Cl. 128—845** **4 Claims**



1. Apparatus for periodically and gradually changing the

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elevation of the body extremities of a human subject, said apparatus comprising:

platform means for supporting said subject in a reclined orientation, said platform means having first and second ends and being mounted for rotation about an axis of rotation defined by a shaft extending perpendicular to said platform means;

said shaft extending at an incline to the vertical to thereby tilt said platform means from the horizontal; and

electric drive means for rotating said platform means about said axis whereby the first and second ends of said platform means will traverse a tilted circular path whereby the elevation along said path varies periodically and gradually with respect to a horizontal reference plane.

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**5,044,378**

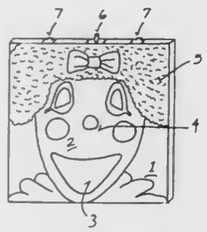
**DEVICE FOR DISTRACTING PATIENTS DURING INTRAVENOUS INJECTIONS**

**Beatrice Toma, London, Canada; John Toma, Brooklyn, N.Y.; Rita Toma, Guelph, Canada; Lorraine Toma-Jones, Mississauga, Canada; Thomas Toma, Blenheim, Canada; Kathy Ducharme, Windsor, Canada, and Yvonne Toma, Culver City, Calif., assignors to Jeibralt Incorporated, London, Canada**

**Filed Aug. 27, 1990, Ser. No. 572,779**

**Int. Cl.[5] A61F *5/37***

**U.S. Cl. 128—877** **3 Claims**



1. A portable medical unit that aids during the procedures of the extraction of blood from, and/or the giving of needles to a patient comprising;

a first form and a second form that are joined together at adjacent corners by at least one hinge, said forms having the ability to be collapsed together in which case inside surfaces of the forms will face each other in parallel planes, or retained open in which case the first form shall be situated at an angle to the second form,

a hollowed opening through the first form through which a patient may insert his or her arm,

the second form having a padded work area attached to its inside surface with strap means for retaining a patient's arm to the work area when arm is placed through the opening in the first form,

patient distraction means attached to the exterior side of the first form for distracting a patient during said procedures.

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**5,044,379**

**CIGARETTE MANUFACTURE**

**Michael J. Cahill, Coventry, and Paul R. Wiese, Milton Keynes, both of England, assignors to Molins PLC, London, England**

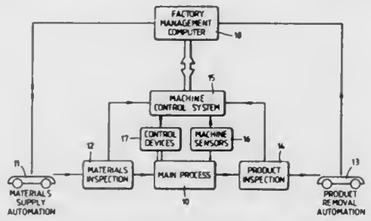
**Filed Jun. 23, 1989, Ser. No. 370,859**

**Claims priority, application United Kingdom, Jun. 25, 1988, 8815175**

**Int. Cl.[5] A24C *5/00, 5/60***

**U.S. Cl. 131—280** **11 Claims**

1. A method of manufacturing cigarettes in which each of a number of quality parameters of the product is monitored and a quality value for each parameter is continuously calculated in accordance with predetermined criteria; control devices are automatically operated under the control of a programmable control unit so as to optimise the total of the quality parameters; and in which the machine operating characteristics which are monitored include stoppage causes.




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**5,044,380**

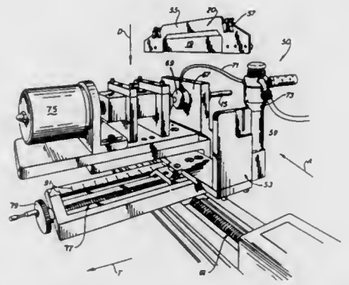
**APPARATUS AND METHOD FOR STUDYING SMOKE COMPONENTS**

**Evon L. Crooks, Winston-Salem, and Jerry S. Simmons, Garner, both of N.C., assignors to R. J. Reynolds Tobacco COmpany, Winston-Salem, N.C.**

**Filed Feb. 8, 1990, Ser. No. 478,710**

**Int. Cl.[5] A24C *5/60***

**U.S. Cl. 131—329** **11 Claims**



1. An apparatus for collecting components of mainstream smoke of a smoking article, said apparatus comprising

a) means for drawing successive individual puffs of smoke from the smoking article,

b) means for providing a predetermined path of travel for smoke drawn from the smoking article, and

c) means for collecting a discrete sample amount of smoke components from the drawn smoke during a predetermined time interval within each individual puff, said collection means including:

(i) filter means positioned within the predetermined path of the drawn smoke for collecting smoke components therefrom, and

(ii) means for providing relative movement between said filter means and said path of travel of the drawn smoke to collect discrete sample amounts of substantially uniform distribution on different portions of the filter means from predetermined spaced apart segments of the drawn smoke during the predetermined time interval.

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**5,044,381**

**CLOSED CIGARETTE FILTER**

**Annie R. Thomas, 700 E. Emily, Longview, Tex. 75601**

**Filed Apr. 2, 1990, Ser. No. 502,789**

**Int. Cl.[5] A24D *1/02, 1/04***

**U.S. Cl. 131—361** **16 Claims**

1. A closed cigarette filter comprising a thin strip of material of selected length and width and a plurality of panels provided in adjacent relationship along one edge of said strip material, said strip of material adapted to encircle one end of a cigarette and said panels folded inwardly in partially lapped relationship to close said filter and further comprising a vent provided in said strip of material between the end of the cigarette and said panels, whereby smoke from the smoked end of the cigarette is permitted to escape to the atmosphere from said filter without filtering through said panels when the cigarette is lighted, but is not being smoked.



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**5,044,382**

**WIG**

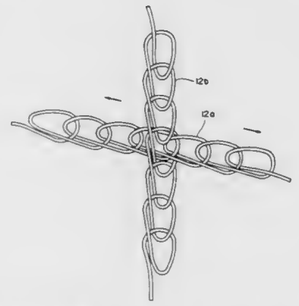
**Masaaki Ando, Kanagawa, and Ryuji Teratoko, Tokyo, both of Japan, assignors to Aderans Co., Ltd., Tokyo, Japan**

**Filed Oct. 9, 1990, Ser. No. 594,700**

**Claims priority, application Japan, Dec. 31, 1989, 1-341344**

**Int. Cl.[5] A41G *5/00***

**U.S. Cl. 132—54** **20 Claims**



1. A wig comprising:

a hair-planting framework bulging outwardly as a whole to have a cap-like outer configuration, said hair-planting framework having a peripheral-edge frame formed generally into an elongated elliptic configuration, and a plurality of interlocking chain-like thread elements each of which is formed by a filament so knitted as to have stretchability, said chain-like thread elements being arranged within said peripheral-edge frame in interlocking intersected relation to each other, said chain-like thread elements being fastened to said peripheral-edge frame to define a plurality of openings in said hair-planting framework; and

a plurality of strands of hair planted to said hair-planting framework so as to extend outwardly thereof,

wherein, when said wig is worn onto a head of a wearer, a plurality of strands of existing hair of the wearer are drawn outwardly through said openings in said hair-planting framework and are blended with said strands of hair planted to said hair-planting framework.

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**5,044,383**

**DISPOSABLE MANICURE DEVICE**

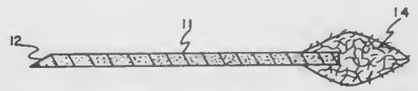
**Gerald Alessio, 127 Nottingham Ct., Montvale, N.J. 07645; William G. Blasius, Jr., West Shore Dr., Higganum, Conn. 06441, and Joseph Silberberg, 1084 E. 28th St., Brooklyn, N.Y. 11210**

**Continuation of Ser. No. 863,657, May 15, 1986, abandoned. This application Jan. 2, 1990, Ser. No. 462,845**

**Int. Cl.[5] A45D *29/00***

**U.S. Cl. 132—73** **5 Claims**

1. A manicure device which comprises: an applicator stick, formed from a wood filled polyolefin, having at one end, a substantially cylindrical portion, an adherent swab member, formed of an absorbent fibrous material, the swab member overlying the substantially cylindrical portion of the applicator stick, the entire portion of the applicator stick underlying the swab member being free of transverse grooves and which



applicator stick at its opposed end, merges into with an integral manicure tip.

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**5,044,384**

**METHOD OF ACCOMPLISHING RAPID AND DURABLE MANICURE**

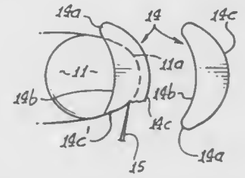
**Yosh Hokama, Torrance, and Luis Romero, Lawndale, both of Calif., assignors to International Beauty Distributors, Inc., Gardena, Calif.**

**Continuation-in-part of Ser. No. 66,267, Jun. 25, 1987, Pat. No. 4,767,648, and a continuation of Ser. No. 197,630, May 23, 1988, abandoned. This application Aug. 27, 1990, Ser. No. 573,327**

**The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.**

**Int. Cl.[5] A45D *24/00***

**U.S. Cl. 132—200** **10 Claims**



1. A method of rapidly accomplishing a durable manicure, that includes the steps:

a) forming and providing a generally crescent shaped, flexible tab having a protective and separable upper layer, and adjacent thereto a durable lower layer providing a smooth upper surface, the tab having the shape of a fingernail forward tip portion, the tab being oversize in relation to the fingernail forward tip portion, the tab lower layer selected from the group consisting of porous fabric and paper, and the tab upper layer consisting of a sheet of synthetic resin having thickness between 0.003 and 0.015 inches,

b) applying a liquid primer coating to the fingernail upper surface, and allowing that coating to dry, and applying and adhering the tab lower layer only to the said coating at the fingernail forward tip portion so that the crescent-shaped tab has extent beyond the forward edge of the fingernail forward tip portion, and so that said coating is openly exposed rearwardly of said tab,

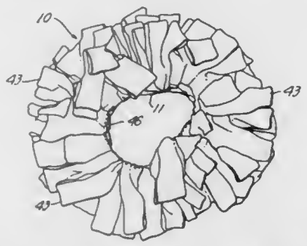
c) then peeling off said tab upper layer from said lower layer, thereby to expose the tab lower layer smooth upper surface and to expose a rearward edge defined by said tab lower layer,

d) then trimming off the tab lower layer extent at the forward edge of the fingernail forward tip portion,

e) whereby the fingernail forward tip portion has an upwardly exposed upper smooth surface of selected finish on said tab lower layer, and only at its forward tip portion,

f) and applying nail adherent protective liquid to and over said upper smooth surface and to and over said exposed primer coating, to protect the tab and its said rearward edge.

**5,044,385**
**PONYTAIL HOLDER AND METHOD OF MAKING SAME**
Deborah Rhodes, New York, N.Y., assignor to Nimbus Corp., New York, N.Y.
Filed Dec. 12, 1990, Ser. No. 626,451
Int. Cl.[5] A45D *8/34*
U.S. Cl. 132—273 5 Claims




3. An improved ponytail holding device comprising an endless planar elastic band; at least one flattened hollow tube of flexible material having mutually interconnecting end edges and interconnected to said elastic band along the axial length of said tube and band, while said band is in relatively expanded condition; said hollow tube having radially inwardly directed cut edges extending through less than the entire width of said tube to form two ply radially outwardly extending petal simulating members.

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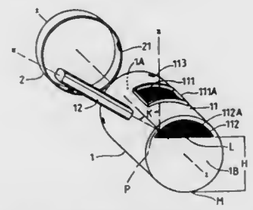
**5,044,386**
**PORTABLE DENTAL CARE UNIT**
Gary M. Nelson, 1324 SE 23rd St., Cape Coral, Fla. 33990
Filed May 4, 1990, Ser. No. 519,162
Int. Cl.[5] A45D *44/18*
U.S. Cl. 132—309 20 Claims



1. A portable dental care unit comprising:
a toothbrush apparatus, which includes an upper piece and a lower piece, said upper piece having a head portion and bristle means, which are attached to and extend generally laterally from said head portion, a base portion, which includes means for selectively attaching to complementary means on said lower piece such that said lower piece forms a handle for said toothbrush apparatus, and an intermediate portion integrally interconnecting said head portion and said base portion and including a recessed region formed below said bristle means, said lower piece further having a receptacle for accommodating a first dentifrice therein:
a container received by said recessed region for holding a second dentifrice therein; and
closure means which are selectively engaged with said toothbrush apparatus for provisionally enclosing at least said head portion and said bristle means of said upper piece between uses; said intermediate portion including a spool region formed peripherally about said upper piece below said head portion for winding a supply of dental floss thereon and further including a pair of enlarged segments formed peripherally about said upper piece above and below said spool region for engaging the inside wall of said closure means when said closure means are engaged with said toothbrush apparatus.

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**5,044,387**
**EDIBLE GRAIN WASHER**
Yung C. Hsu, 4th Fl., No. 12, Lane 251, Tsun Hsien Street, Taipel, Taiwan
Filed Jun. 29, 1990, Ser. No. 545,785
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—198 2 Claims

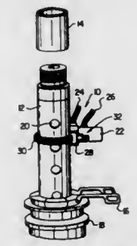



1. An edible grain washer comprising:
a hollow body including a horizontal axis horizontally defined in a central portion in said hollow body, an open side formed on a first side of said hollow body, a closed side formed on a second side of said hollow body opposite to said open side, said horizontal axis of said hollow body passing through a central portion of said open side and through another central portion of said closed side, a water inlet port formed in an upper side of said hollow body and secured with a first screen means on said water inlet port for passing water through said first screen means for precluding an outward releasing of grains filled in said body, and a water outlet port formed in said closed side and secured with a second screen means on said outlet port for filtering off washed water and preventing releasing of the grains filled in the body;
a cover detachably secured on said open side of said hollow body; and
a handle extending rearwardly from said hollow body along a longitudinal axis of said handle, said longitudinal axis of said handle defining an acute angle with a vertical axis which is vertically formed in a central portion of said hollow body perpendicularly intersecting said horizontal axis of said hollow body, said handle being operatively rotated about said longitudinal axis of said handle for turning said open side upwardly for filling grains to be washed into said body through said open side upon a removal of said cover, and said hollow body covered with said cover being operatively reciprocated by gripping said handle for washing the grains filled in said body when pouring water into said body through said water inlet port and said first screen means.

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**5,044,388**
**PERFORATING GUN PRESSURE BLEED DEVICE**
John A. Barton, Houston, and Thomas D. Ricles, Kingwood, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Feb. 13, 1989, Ser. No. 310,243
Int. Cl.[5] E21B *43/112*
U.S. Cl. 137—15 42 Claims

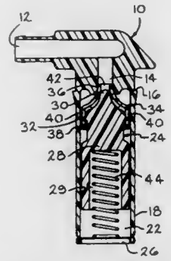
39. A method for releasing internal pressure from a perforating gun utilizing a piercing element, said perforating gun including downhole equipment for perforating well casings, in the event that said perforating gun when disposed downhole fails to perforate the well casing, said perforating gun is brought back to the surface to release the trapped pressure therein by said apparatus to prevent serious injury, said method comprising the steps of:
clamping a pressure-operated cylinder to a perforating gun by wrapping a linked chain around the gun and fastening the linked chain to the cylinder;
tightening said linked chain so that an elastomer-faced portion of said cylinder is sealed to the perforating gun;



pressurizing the cylinder with a fluid so that a ram of said cylinder forces the piercing element through a sidewall portion of the perforating gun;
releasing fluid from said cylinder so that said piercing element is withdrawn from an aperture formed in said perforating gun sidewall; and
venting pressurized fluid from said perforating gun through said sealed cylinder.

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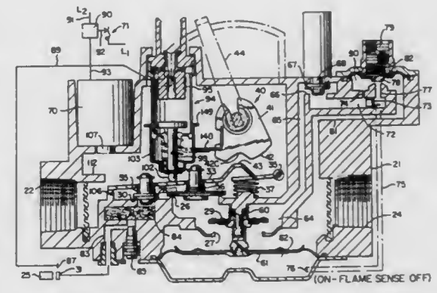
**5,044,389**
**HIGH VOLUME FUEL VAPOR RELEASE VALVE**
David R. Gimby, Livonia, Mich., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Filed Aug. 28, 1990, Ser. No. 574,424
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—39 4 Claims




1. A fuel vapor release valve for use in a vehicle fuel system comprising, in combination:
a valve housing **10** placed in a specific longitudinal orientation, said valve housing **10** defining an interior cavity **22** having an inlet **20** for admitting fuel vapor and an outlet **14** for discharging such fuel vapor;
a valve member **24** positioned in said cavity **22** for movement between an outlet **14** opening position and an outlet **14** closing position, said valve member **24** including a cap member **34** having a seat surface **36** for mating with said outlet **14** and an orifice **42** extending through said cap member **34** providing a passageway from said outlet **14** to said cavity 22, said orifice **42** having a lesser radius than said outlet **14**;
said valve member **24** further including a plug member **30** engaged with said cap member **34** for movement between an orifice **42** opening position and an orifice **42** closing position; and,
a valve housing tilt responsive means for moving said valve member **24** to an outlet **14** and orifice **42** closing position in response to tilting of said valve **10** about its longitudinal axis whereby, upon the return of said valve **10** to its specified longitudinal orientation, said plug member **30** first moves to an orifice **42** opening position and said cap member **34** subsequently moves to an outlet **14** opening position.

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**5,044,390**
**CAM OPERATED FUEL VALVE**
Samuel T. Kelly, Torrance, and Jay R. Katchka, Cypress, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Division of Ser. No. 483,090, Feb. 20, 1990, Pat. No. 4,971,095, which is a division of Ser. No. 341,437, Apr. 21, 1989, Pat. No. 4,928,721, which is a division of Ser. No. 241,966, Sep. 8, 1988, Pat. No. 4,992,011, which is a division of Ser. No. 87,419, Aug. 20, 1987, Pat. No. 4,787,414, which is a division of Ser. No. 938,621, Dec. 5, 1986, Pat. No. 4,729,396. This application Sep. 7, 1990, Ser. No. 579,977
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[5] F23D *14/72*
U.S. Cl. 137—66 20 Claims




1. In a fuel control valve construction comprising a housing means having an inlet means adapted to be interconnected to a fuel source and a main outlet means adapted to be interconnected to a main burner means, said housing means having a main valve seat for interconnecting said inlet means with said main outlet means, said housing means having a movable main valve member for opening and closing said main valve seat, said housing means having a movable lever operatively associated with said main valve member and having a manually operable actuator means for controlling the operating positions of said lever, said lever having an intermediate cam follower portion and opposed ends disposed on each side of said cam follower portion with one end of said opposed ends being pivotally mounted to said housing means and with the other end of said opposed ends for operating said main valve member, said housing means having biasing means operatively interconnected to said lever to tend to pivot said lever in one direction that opens said main valve member away from its said main valve seat, said actuator means having a cam means operatively associated with said cam follower portion of said lever to tend to control the pivoted position of said lever under the force of said biasing means, said actuator means having an "off" position thereof that causes said cam means to hold said lever in an "off" pivoted position thereof that maintains said main valve member in its closed condition against its said valve seat, said actuator means having an "on" position thereof that causes said cam means to tend to hold said lever in an "on" pivoted position thereof that maintains said main valve member in its open condition away from its said valve seat, the improvement wherein said housing means has a thermostatically controlled means that is operatively associated with said lever and is adapted to engage and hold said lever in a position wherein said main valve member is in a closed condition

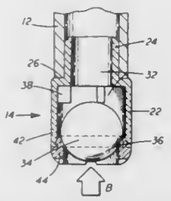
VOL 1130 ISS 1 SE 3 1991 UMI



against its said main valve seat when said thermostatically controlled means is in one operating condition thereof and said actuator means is in said "on" condition thereof.

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**5,044,391**
**SIPHON ASSEMBLY WITH PRIMING VALVE**
**William B. Brumfield, Richmond, Ky., assignor to Si-Flo, Inc., Richmond, Ky.**
**Filed Apr. 30, 1990, Ser. No. 516,320**
**Int. Cl.[5] F04F *10/00***
**U.S. Cl. 137—151** **5 Claims**

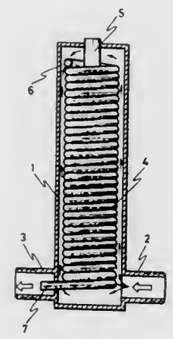


1. An assembly for siphoning fluid from a fluid source into a fluid receiver, comprising:
tube means providing fluid communication between said fluid source and said fluid receiver;
priming means connected to said tube means, said priming means including body means having an inlet port leading to a flow cavity and neck means for receiving said tube means, said flow cavity connecting said inlet port with said tube means;
said body means having a housing and an end ring attached to said housing;
said body means and said neck means meeting at a transition surface oriented in substantially perpendicular relation to said body and said neck means;
valve means within said body means, said valve means including a ball receivable in a cooperating seat;
positioning means integral with said body means, said positioning means extending from the transition surface to a point less than midway toward said inlet port and serving to both radially and longitudinally centrally position said valve means in said flow cavity during siphoning so as to provide smooth rapid fluid flow through said body means;
said positioning means including a plurality of ribs attached at an end of said body means;
passage means for providing continuous fluid flow even while said inlet port of said priming means rest flush against a surface of said fluid source; and
an annular flange on an inner surface of said housing and a cooperating locking tab on said end ring, said annular flange and locking tab mating to form a positive and secure attachment,
whereby siphon flow is actuated by shaking said assembly.

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**5,044,392**
**CONDENSATE DRAINAGE DEVICE FOR CLOSED CIRCUIT STEAM INSTALLATIONS**
**Roberto Baviera Sabater, Gómez Ferrer, 33, Torrente (Valencia), Spain**
**Filed Nov. 20, 1989, Ser. No. 439,604**
**Int. Cl.[5] F16T *1/34***
**U.S. Cl. 137—171** **9 Claims**

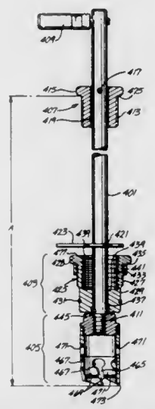
1. A condensate drainage arrangement, comprising:
an elongated tube having inlet and outlet openings and an inner facing side which defines a hollow interior;
a spiral conduit spiraling axially about a space within said hollow interior and having first and second ends which are open, said first end being in communication with said hollow interior, said spiral conduit extending through said outlet opening of said tube so that said second end opens outside said hollow interior and not in communication with said hollow interior, said spiral conduit having an outer facing side which is spaced from said inner facing side of said tube to define a chamber therebetween for enabling the flow of condensates from said inlet opening



through said chamber and into said first end of said spiral conduit, said spiral conduit being hollow for enabling the condensates to flow from said first end through said conduit to discharge out said second end and thereby emerge outside of said elongated tube.

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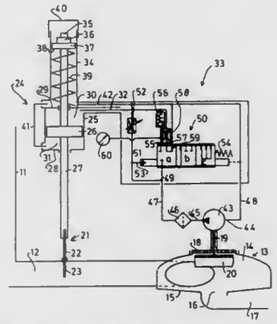
**5,044,393**
**SHELL CUTTER**
**Stephen L. Jiles, 1513 Dogwood Ave., Anaheim, Calif. 92801**
**Division of Ser. No. 513,599, Apr. 24, 1990. This application Oct. 26, 1990, Ser. No. 604,745**
**Int. Cl.[5] F16L *41/04*; F16K *43/00*; B23B *41/08***
**U.S. Cl. 137—318** **2 Claims**



1. A cutter for cutting and removing a coupon out of the wall of a pipe, comprising:
a) a cylindrical wall terminating at one of its ends in a cutting end and closed at its opposite end;
b) a plurality of circumferentially-distributed slots in said wall, each slot extending from said cutting end at an angle to the axis of said cylindrical wall and terminating in an enlarging arcuate cutout,
the sections of said cylindrical wall defined by adjacent pairs of said slots comprising a plurality of teeth of said shell cutter, each of said teeth having an end face which is inclined relative to a plane which is orthogonal to the axis of said cylindrical wall; and
c) at least one cutting ridge extending across the inside surfaces of the teeth so that as the teeth bite progressively deeper into a pipe, the cutting ridge bits into the side of the coupon being cut from the pipe, so engaging the coupon that when the cutter is withdrawn from the pipe, it continues to grab the coupon and retains it within itself.

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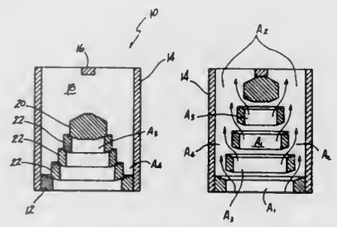
**5,044,394**
**APPARATUS FOR REGULATING AM OUTFLOW**
**Hansjörg Brombach, Von-Berlichingen-Str. 21, D-6990 Bad Mergentheim-Neunkirchen, Fed. Rep. of Germany**
**Filed Apr. 9, 1990, Ser. No. 507,021**
**Claims priority, application Fed. Rep. of Germany, Apr. 15, 1989, 3912436**
**Int. Cl.[5] G05D *7/01***
**U.S. Cl. 137—486** **24 Claims**



1. An apparatus for regulating and/or controlling the outflow from rain water tanks, overflows or the like, comprising a slide valve, which is inserted in an outlet line of the water tank or the like and has a drive mechanism for varying its cross section;
a waste water restrictor containing a turbulence chamber in which a vortex is created by the flowing water;
a turbine wheel arranged in rotary manner in the turbulence chamber and which may be driven by the flowing water;
an energy converter driven by the turbine wheel;
the output of the energy converter being used for operating a control mechanism, which controls via the drive mechanism the position of the slide valve.

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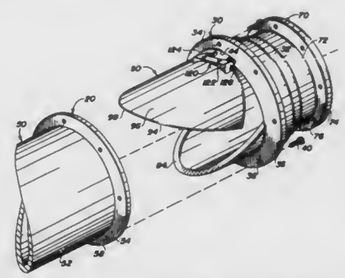
**5,044,395**
**MINIMUM PRESSURE DROP COMPOSITE PLUG RETENTION VALVE**
**Ammon M. Vadasz F., San Antonio de los Altos, Venezuela, assignor to Intevep, S.A., Caracas, Venezuela**
**Filed Oct. 26, 1990, Ser. No. 603,444**
**Int. Cl.[5] F16K *15/00***
**U.S. Cl. 137—512.1** **4 Claims**



1. A check valve comprising a housing; a valve seat secured within said housing, said valve seat defining a first flow area $A_1$; a valve stop disposed in said housing and defining therewith and said valve seat a chamber; a solid valve plug positioned within said chamber, said valve plug having a outer periphery which defines with said housing a second annular flow area $A_2$; and at least one hollow valve ring disposed between said valve plug and said valve seat, said hollow valve ring having an internal flow area $A_3$ and an outer periphery which defines with said housing and external annular flow area $A_4$ wherein $A_1$ is (1) substantially equal to $A_2$ and (2) substantially equal to $A_3+A_4$.

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**5,044,396**
**CHECK VALVE FOR FLUIDS**
**Howard C. Daudet, 4635 E. Lafayette Blvd., and Richard O. Washburn, 2535 N. 49th St., #3, both of Phoenix, Ariz. 85008**
**Filed Jun. 18, 1990, Ser. No. 539,923**
**Int. Cl.[5] F16K *15/03***
**U.S. Cl. 137—515.5** **11 Claims**



1. Check valve apparatus for fluids, comprising, in combination:
a valve duct through which fluid may flow;
a first valve seat on the valve duct and defining a first plane;
a second valve seat on the valve duct and defining a second plane which is substantially perpendicular to the first plane of the first valve seat;
a flapper pivotally connected to the valve duct and having
a first valve face defining a third plane and adapted to be disposed against the first valve seat, and the third plane intersects the first plane as the flapper moves between an open position and a closed position in which the first valve face is disposed against the first valve seat,
a second valve face defining a fourth plane which is substantially perpendicular to the third plane and which second valve face is adapted to be disposed against the second valve seat in the closed position, and
an outer surface;
pin means secured to the outer surface of the flapper, including a first pin and a second pin spaced apart from the first pin and aligned with the first pin to provide a common centerline and with the first valve face and first valve seat such that the alignment of the centerline of the first and second pins is tangent to the outer surface at a point on the intersection of the first plane and the third plane as the flapper pivotally moves between a closed position in which the first and second valve faces are respectively disposed on the first and second valve seats for preventing the flow of fluid through the valve duct and an open position for allowing the flow of fluid through the valve duct; and
valve hanger means adjacent to the first valve seat for receiving the first and second pins of the pin means.

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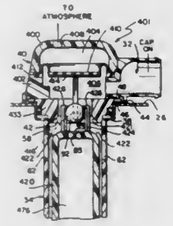


5,044,397

## TANK PRESSURE CONTROL APPARATUS

Emil Szlaga, 3600 Western; Robert S. Harris, R.R. 3, Box 177, and Jeffery Griffin, Rt. 6, Box 414A, all of Connersville, Ind. 47331

Division of Ser. No. 488,289, Mar. 2, 1990, Pat. No. 4,991,615.
This application Dec. 24, 1990, Ser. No. 634,555
Int. Cl.[5] F16K *24/04, 31/18*
U.S. Cl. 137—587 38 Claims



37. An apparatus for controlling flow of fuel vapor from a fuel tank through a venting outlet, the fuel tank having a filler neck, the apparatus comprising

a hollow housing mounted to the fuel tank and formed to provide the venting outlet,

a float valve movable in the hollow housing to close the venting outlet, the float valve being formed to include a chamber and a chamber-venting outlet,

a valve member seated on the float valve to close the chamber-venting outlet,

a diaphragm mounted above the float valve for movement relative to the float valve,

means for lifting the valve member off its seat to open the chamber-venting outlet in response to movement of tne diaphragm, and

means for using fuel vapor pressure to move the diaphragm so that the valve member is lifted off its seat to open the chamber-venting outlet and reduce the buoyancy of the float valve.

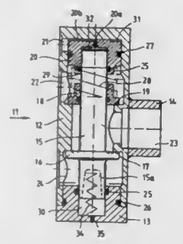
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5,044,398

## CONTROL VALVE FOR COUNTERBLOW-TAP HOLE-BORING MACHINE

Franz Mock, Bruck an der Mur; Peter Pacnik, Leoben; Werner Schantl, Mitterdorf; Josef Mocivnik, Judenburg, all of Austria, and Hans-Jörg Müller-Späth, Kreuztal, Fed. Rep. of Germany, assignors to Böbler Pneumatik International Gesellschaft m.b.H., Kapfenberg, Austria

Filed Dec. 20, 1989, Ser. No. 453,503
Claims priority, application Austria, Dec. 29, 1988, 3186/88
Int. Cl.[5] F15B *13/042*
U.S. Cl. 137—596.18 2 Claims



1. A control for a counterblow—taphole—boring machine of the type having a pneumatic rammer advance, a counterblow device, and a rotator for actuating a striking bar which taps said tap hole, said valve comprising:

a slidable control valve dispersed in a housing provided with a cap to receive one end of the control valve, said valve including a valve disk intermediate its ends for controlling the flow of pressurized air introduced to said housing;

a first piston adapted to receive the end of the control valve opposite that received within said cap;

a second piston annularly disposed about said control valve and positioned between said first piston and the valve disk, said second piston being movable between a first shouldered surface within said housing and said first piston whereby when said second piston is disposed against the first shouldered surface, pressurized air is prevented from flowing as exhaust air from the housing and when the second piston is placed from said first shouldered surface towards the first piston, air is permitted to be exhausted from the housing; and

air passage means provided in said housing and within said first piston for introducing control air to said first piston and the control valve to displace said valve and piston towards said cap whereby the disk valve is displaced from a second shouldered surface within said housing to permit pressurized air to flow to one of the pneumatic rammer advance, counterblow device and rotator.

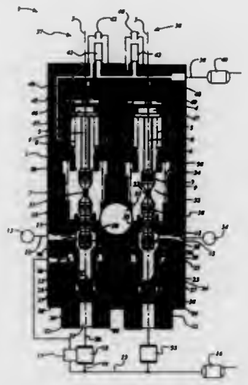
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5,044,399

## SWITCH VALVE

Roland Blanz, Heiligkreuzsteinach, Fed. Rep. of Germany, assignor to Grau GmbH, Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,753
Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915827
Int. Cl.[5] F15B *13/043, 13/06*
U.S. Cl. 137—596.15 8 Claims



1. A switch valve having an inlet side, an outlet side, and an end face, and being connectable on said inlet side to a levelling valve by means of a control line, said switch valve being actuatable to a raise position, a lower position, a drive position, and a stop position;

said switch valve further comprising a housing, a supply connection in said housing for connecting the housing to a compressed air source, an outlet in said housing, and a first connection piece in said housing for connecting the housing to a pneumatic spring bellows, a hollow double valve body having an end face, a slide member having first and second ends, said first end being adapted for movement within said hollow double valve body, means for moving said slide member relative to said hollow double valve member to positions corresponding to the raise, lower, drive and stop positions, said means for moving



comprising first and second movable switch pistons, said first switch piston being attached to said second end of said slide member and adapted to move within said second switch piston, means for controlling the movement of said first and second switch pistons comprising first and second valve means,

said hollow double valve member having a second connection piece in the end face thereof for connection to said control line,

said supply connection and said first connection piece being located on said housing between said second connection piece and said outlet.

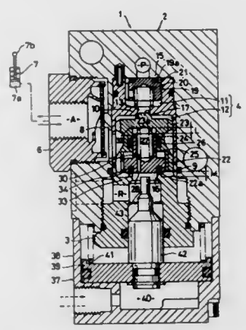
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5,044,400

## CONTROL VALVE ASSEMBLY FOR PRESSURIZED OIL

Keitaro Yonezawa, Nishi, Japan, assignor to Kabushiki Kaisha Kosmek, Japan

Filed Jul. 20, 1990, Ser. No. 554,900
Claims priority, application Japan, Aug. 9, 1989, 1-207673
Int. Cl.[5] F15B *13/042*
U.S. Cl. 137—596.18 15 Claims



1. A control valve assembly for a pressurized oil, including a valve chamber (4) having a first end side and a second end side opposed to each other; a pressure supply port (P) opened to the first end side space of the valve chamber (4); a return port (R) opened to the second end side space of the valve chamber (4); a working port (A) opened to the valve chamber (4) at a location out of both the ports (P), (R); a pressure supply valve seat (15) formed in the opening edge portion of the pressure supply port (P); a return valve seat (16) formed in the opening edge portion of the return port (R); a check valve member (19) inserted into the first end side of the valve chamber (4) and resiliently urged to the pressure supply valve seat (15) for valve closing by means of a check valve member closing spring (20); a return valve member (22) inserted into the second end side of the valve chamber (4) and resiliently urged to the return valve seat (16) by means of a return valve member closing spring (30); and a return operation means (37) provided with a valve opening member (43) adapted to push the return valve member (22) toward the first end side, characterized in that said valve chamber (4) is divided into a first chamber (11) on the first end side and a second chamber (12) on the second end side by means of an intermediate partition wall (10), said intermediate partition wall (10) has a communication hole (13) for intercommunicating the first chamber (11) and the second chamber (12) with each other,

that said pressure supply port (P) is opened to the first chamber (11), and said return port (R) and said working port (A) are opened to the second chamber (12),

that said check valve member (19) is inserted into the first chamber (11) and adapted to be brought into contact with the pressure supply valve seat (15) for valve closing through a resilient sealing member (21),

that a short-circuit prevention valve seat (17) is formed in the opening edge portion of said communication hole (13) on the side of the second chamber (12),

that a short-circuit prevention valve (23) is inserted into said second chamber (12) in series to said return valve member (22) and adapted to be brought into contact with the short-circuit prevention valve seat (17) for valve closing through hard sealing members, and

that under a pressure releasing condition (Z) in which said return operation means (37) is operated, said short-circuit prevention valve member (23) is adapted to be brought into contact with the short-circuit prevention valve seat (17) for valve closing through the return valve member (22) by means of the valve opening member (43) advanced toward the first end side, and thereby the pressurized oil within the pressure supply port (P) is prevented from leaking from the first chamber (11) to the second chamber (12).

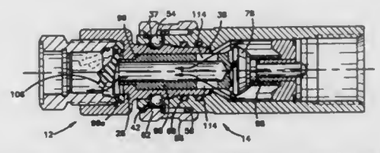
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5,044,401

## INTEGRAL VALVE AND SEAL FOR A QUICK CONNECT COUPLING

Dennis C. Giesler, Maple Grove, and Lowell R. Hanson, Cedar, both of Minn., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Nov. 20, 1990, Ser. No. 615,946
Int. Cl.[5] F16L *29/00*
U.S. Cl. 137—614.03 33 Claims



1. In a quick connect coupling of the type having a nipple assembly connectable with a coupler assembly and at least one of the coupling assemblies having axially mateable male and female parts, the female part having an inward flange providing a shoulder axially spaced from an inner end of the male part when the male and female parts are made up, and the other coupling assembly having an axial probe that inserts into the one coupling assembly towards said female shoulder as the nipple and coupler assemblies are connected, the improvement comprising: an integral valve and body seal made of an elastomeric material and having a peripheral body seal portion captured between the female shoulder and male inner end when the male and female parts are mated, and a hinged valve portion that seats against the female shoulder when the nipple and coupler assemblies are unconnected and that is axially displaced from the shoulder by the probe when the nipple and coupler assemblies are connected.

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5,044,402

## VARIABLE AIR VOLUME TERMINAL UNIT

Otto F. Haas, Woodbridge, Canada, assignor to Nailor Industries Inc., Toronto, Canada

Filed Aug. 30, 1990, Ser. No. 574,722
Int. Cl.[5] F16K *1/16*
U.S. Cl. 137—875 7 Claims

1. A variable volume terminal unit for an air handling system, comprising:

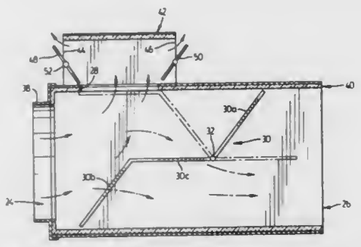
a duct having an inlet for conditioned air, a main outlet, and a by-pass outlet, the duct defining an air flow path between said inlet and main outlet and the by-pass outlet being located in a wall of the duct laterally of said air flow path;

an air deflector blade mounted within said duct for angular movement about a pivot axis between a diverting position in which incoming air is deflected to said by-pass outlet, and a straight-through position in which the blade closes the by-pass outlet, said pivot axis extending transversely

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of the duct at a position spaced inwardly of the duct from said by-pass outlet, and the blade having an angled shape selected so that, in said diverting position of the blade, the blade presents to the incoming air, surface portions of substantially similar area disposed on respectively oppo-



site sides of the shaft and, in the straight-through position of the blade, the by-pass outlet is closed by a portion of the blade; and,

an actuator coupled to said blade for moving the blade between said positions.

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**5,044,403**

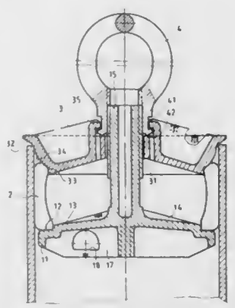
**DIRT AND MOISTURE SEALING PIPE PLUG FOR SEALING DIFFERENT SIZE PIPE**

**Chung F. Chen, 26272 Tarssa La., Mission Viejo, Calif. 92691**

**Filed Oct. 3, 1990, Ser. No. 592,386**

**Int. Cl.[5] F16L *11/12***

**U.S. Cl. 138—89** **1 Claim**



1. A pipe plug for sealing a tubing against dirt and moisture comprising:

a tie plate having a threaded bolt vertically extending upward from a circular, stepped base at the center, said stepped base having a lower top surface portion and a higher top surface portion;

an elastic seal ring having a tapered boring bore and being mounted on said lower top surface portion of said tie plate with its wider boring bore portion disposed at the top and its narrower boring bore portion disposed at the bottom permitting said higher top surface portion to insert in its narrower boring bore portion;

a wedge ring having a center hole piercing therethrough at the center, a plurality of hook portions at the top around said center hole, a wider circular top edge, a narrower circular bottom edge inserted in said wider boring bore portion of said seal ring, and a tapered side wall, said tapered side wall having a circular arc surface at the outer side;

a cone having a threaded hole at the center for mounting said threaded bolt of said tie plate, a loop at the top for holding of the hand, and a circular groove on its outer wall at a lower end within which said hook portions of said wedge ring are engaged; and

wherein said cone can be rotated on said threaded bolt in forward direction to force said wedge ring against said stepped base of said tie plate so as to squeeze said seal ring to extend outward for sealing a tubing, or rotated on said threaded bolt in reverse direction to release squeezing force from said seal ring permitting said seal ring to return to its original condition.

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**5,044,404**

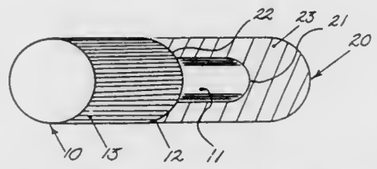
**VACUUM AND CONTROL SYSTEM SEALING CAPS AND PLUGS**

**Roy L. Watson, 2131 Stallings St., NW., Covington, Ga. 30209**

**Filed Aug. 27, 1987, Ser. No. 90,096**

**Int. Cl.[5] F16L *57/00***

**U.S. Cl. 138—89** **6 Claims**



1. A color-coded closure system for sealing and identifying fluid lines wherein the closure system comprises;

a fluid line enclosure plug have a cylindrical configuration with a proximal end and a distal end,

the proximal end of the plug having a substantially greater diameter than the distal end of the plug,

the proximal end of the plug and the distal end of the plug having a juncture point defining a shoulder portion,

a fluid line closure cap having a uniform cylindrical configuration with a proximal end and a distal end,

the proximal end of the cap being closed,

the distal end of the cap having an aperture therein,

said aperture extending along the longitudinal center line of the closure cap to a predetermined distance short of the proximal end of the cap,

the distal end of the plug adapted to be matingly engaged with the aperture of the cap for storage purposes,

the plug and the cap being color coordinated in predetermined colors.

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**5,044,405**

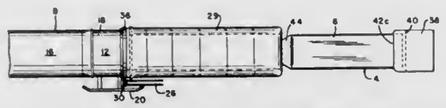
**METHOD AND APPARATUS FOR REPAIR-LINING OF SHORT SECTIONS OF PIPE**

**F. Thomas Driver, and Jeff P. Wells, both of Memphis, Tenn., assignors to Insituform Licensees B.V., Netherlands**

**Filed Aug. 21, 1989, Ser. No. 396,238**

**Int. Cl.[5] F16L *55/18*; B29C *23/22***

**U.S. Cl. 138—98** **11 Claims**



1. The method of effecting repair of a length of pipe remote at both ends from an access opening to said pipe by applying a lining to said length which comprises putting said lining inside a carrier, locating said carrier within said pipe with one end of said carrier adjacent one end of said length, extending said lining from said carrier and causing it to be located along the inside of said pipe length, fixing said lining in position within said pipe length and removing said carrier from said pipe, including the steps of initially locating a flexible tube within said carrier, securing the leading end of said tube to said carrier adjacent said one end thereof, positioning said lining remote from said carrier, extending said tube from said carrier and engaging said lining with said extended tube, then moving said tube back into said carrier, thereby pulling said lining into said carrier, and thereafter extending said tube from said carrier to thereby cause said lining to extend from the carrier with said tube inside said lining.



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**5,044,406**

**PIPE MADE FROM A SUPERCONDUCTING CERAMIC MATERIAL**

**Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan**

**Filed Mar. 14, 1988, Ser. No. 167,912**

**Claims priority, application Japan, Mar. 18, 1987, 62-63391; Mar. 18, 1987, 62-63392**

**Int. Cl.[5] F16L *11/12*; H01B *12/00***

**U.S. Cl. 138—143** **5 Claims**



1. A pipe utilizing a superconducting ceramic material comprising:

a hollow support body made from a member selected from a metal and a metallic compound and a hollow copper oxide superconducting ceramic material which covers the inner surface of the hollow support body, said superconducting ceramic material having an inner surface defining a space within the hollow support body.

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**5,044,407**

**MAIN LEVER FOR A ROTARY DOBBY OPERATING AT HIGH SPEED**

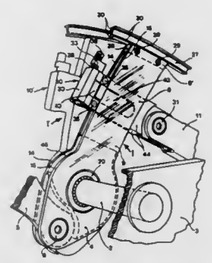
**Costantino Vinciguerra, Florence, Italy, assignor to Nuovopignone Industrie Meccaniche e Fonderie S.p.A., Florence, Italy**

**Filed Apr. 12, 1990, Ser. No. 508,808**

**Claims priority, application Italy, Apr. 18, 1989, 20187 A/89**

**Int. Cl.[5] D03D *1/00***

**U.S. Cl. 139—66 A** **7 Claims**



1. A main lever for a fast rotary dobby of a high-speed loom, having a standardized 12 mm thickness and comprising a pivoted central portion to which a big end of a crank arm is pivoted by a main coupling pin and a rotation bearing, and a curved guide for a slider which is hinged via a drive arm to lever systems for operating heddle frames of the loom, means being also provided for locking said slider in position along said curved guide, said main lever being of composite construction with two opposing sidepieces of gauged metal plate, said sidepieces being produced by fine blanking, said fine blanking also forming in said sidepieces two opposing holes with edges and with frusto-conically flared lips for said main coupling pin, said main coupling pin being of removable type, and said fine blanking also forming two inner annular recesses concentric with said holes for housing a bearing of increased axial length, said sidepieces being joined together by an annular spacer hub acting as a fulcrum for the lever and said spacer hub comprising at its two outer edges two opposing annular recesses for receiving and acting as a shoulder for the edges of the two corresponding holes in said two sidepieces, and two opposing annular grooves which with said receses form two annular projections which are crushed in a press in order to fix the two sidepieces in position, the sidepieces also being kept joined together, in a position corresponding with a free upper end of the curved guide, by a spacing and vibration-damping block which has a thickness of about 12 mm and a curved profile with its center at the fulcrum about which the lever rotates, and is bolted between the sidepieces, said slider passing internally between the two constituent sidepieces of the curved guide of the lever.

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**5,044,408**

**DEVICE FOR MOVING THE BACK REST IN WEAVING MACHINES**

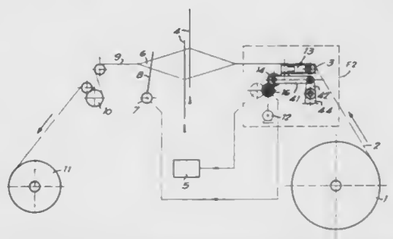
**Michel Vandeweghe, Wijtschate-Heuvelland; Bart Levever, Ieper, and Stefaan Vandersyppe, Wervik, all of Belgium, assignors to Picanol N.V., naamloze vennootschap, Belgium**

**Filed Jul. 16, 1990, Ser. No. 552,560**

**Claims priority, application Belgium, Jul. 17, 1989, 8900779**

**Int. Cl.[5] D03D *49/14, 49/22***

**U.S. Cl. 139—115** **13 Claims**



1. A device for periodically moving a back rest in a weaving machine, comprising:

means for supporting the back rest including two moveable supporting mechanisms between which the back rest is mounted; means including at least one eccentric member for moving the supporting mechanisms; drive means including a driving wheel for driving the eccentric member; driving means for driving the driving wheel; and continuous phase setting means between the driving wheel and the eccentric member for continuously setting the phase of the eccentric member in relation to the driving wheel, said continuous phase setting means comprising a seating connected to the driving wheel in a centric position relative to the driving wheel; a turnable element rotatably fitted in the seating and coupled to the eccentric member; and clamping means for clamping the turnable element in any required angular position in relation to said seating.

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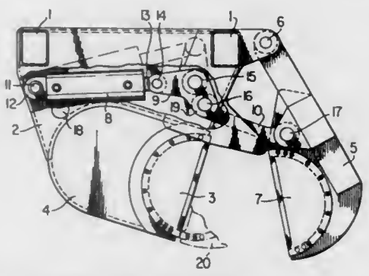


5,044,409

## FORCE MATCHING TREE SHEAR

Douglas D. Hamilton, 139 Lazard Avenue, Town of Mount Royal, Quebec, Canada

Continuation of Ser. No. 447,587, Dec. 8, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 605,213
Int. Cl.[5] A01G *23/08*
U.S. Cl. 144—34 E 8 Claims



1. A tree severing shear comprising:
(a) an elongate frame having a rear portion, a front portion and opposite ends;
(b) a shear blade arm having a shear blade mounted thereon;
(c) first pivot means connecting said shear blade arm to said frame at a first position adjacent the rear portion of such frame;
(d) a lever;
(e) means pivotly mounting said lever on said frame at a second position;
(f) A link pivotly connected at one end thereof to said shear blade arm at a location intermediate the shear blade and said first position and pivotly connected at the opposite end to said lever arm at a third position; and
(g) power means to pivot said shear blade arm so that the shear blade thereon moves toward and away from a tree abutment located on the front portion of said frame and facing said shear blade to sever a tree placed between said abutment and shear blade, said power means comprising a hydraulic piston-cylinder unit pivotally connected at opposite ends respectively to said frame at a fourth position and said lever at a fifth position, said first and fourth positions being in fixed locations relative to the frame and spaced apart from one another longitudinally along said frame, said third and fifth positions being movable relative to said frame in arcuate paths about said second position in directions generally toward and away from a plane intersecting pivot axes at said second and fourth positions, said third and fifth positions on said lever arm and said second position on said frame being so located and the stroke of the piston of said piston-cylinder unit such that in a shear open position said fifth position is adjacent said plane and in a shear jaw closed position, is located spaced from said plane and the opposite of this applying to said third position whereby said third position is remote from said plane when the shear jaw is open and closely adjacent said plane when the shear jaw is closed.

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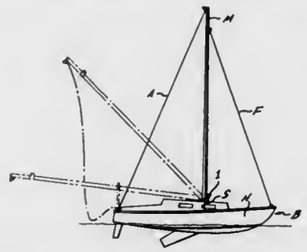
5,044,410

## AUTOMATIC LATCHING SWINGING MAST MOUNT

P. Todd Mix, 12403 Maplewood Ave., Edmonds, Wash. 98020

Filed Dec. 12, 1989, Ser. No. 449,038
Int. Cl.[5] B63B *15/00*
U.S. Cl. 114—90 10 Claims

1. In a sailboat having a hull, a mast-mounting base component secured to the hull, a mast, a mast mounting heel component secured to the mast, pivot means mounting the heel component for swinging relative to the base component so as to permit up and down swinging of the mast between a generally horizontal position and an erect position and support lines normally connected between the hull and the mast for normally maintaining the mast in its erect position but disconnectible to permit movement of the mast between its erect position and its generally horizontal position the improvement comprising mechanical latching means for automatically latching the mast in its erect position by swinging of the mast to such position for maintaining the mast in erect position while the supporting lines are connected or disconnected.



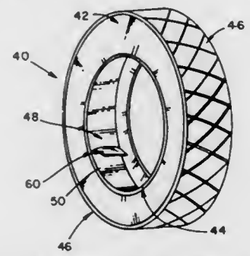
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5,044,411

## LAWNMAKER TIRE COVER

Richard Doll, 626 Niver Ave., Northglenn, Colo. 80221

Filed Jun. 15, 1990, Ser. No. 538,748
Int. Cl.[5] B60C *11/02*
U.S. Cl. 152—208 7 Claims



1. A cover for a lawnmower tire having a worn thread comprising:
A) said cover being one-piece and stretchable and including
(1) an annular sidewall portion comprised of nylon stretch material and having an outer edge and an inner edge, said inner edge being formed of stretch cord and defining an opening, said annular side wall covering an entire sidewall portion of a lawnmower tire, and
(2) a tread portion having an inner surface and an outer surface and being attached to said cover annular sidewall portion inner edge;
B) tread on said cover tread portion outer surface;
C) adhesive material on said tread portion inner surface, said adhesive material entirely covering said tread portion inner surface; and
D) backing material releasably mounted on said adhesive material and including at least two portions with a first portion of said backing material extending ninety degrees about said tread portion inner surface and a second portion extending more than two hundred and seventy degrees about said tread portion inner surface, said first portion having an end edge positioned adjacent to an end edge of said second portion, with said second portion end edge overlapping said first portion end edge and forming a pull tab.

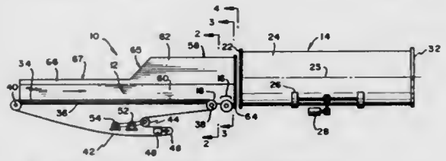


5,044,412

## METHOD AND APPARATUS FOR DEBARKING LOGS

John P. Price, and Donald V. Woodham, both of Monticello, Ark., assignors to Price Industries, Monticello, Ark.

Filed Dec. 2, 1988, Ser. No. 278,778
Int. Cl.[5] B27L *1/02*
U.S. Cl. 144—208 B 22 Claims



1. Apparatus for debarking logs comprising,
a generally horizontal rotary drum debarker having an inlet end,
power means for continuously rotating the drum of the debarker generally about a horizontal axis,
generally horizontal main conveyor means for conveying groups of tree length logs toward said drum, said main conveyor means having a discharge end below the axis of rotation of said drum,
drive means for continuously driving the main conveyor means, and
auxiliary feed means below the axis of rotation of the drum and between the discharge end of said main conveyor means and the inlet end of said drum for assisting the movement of groups of logs fed by said main conveyor means into said inlet end of the drum.

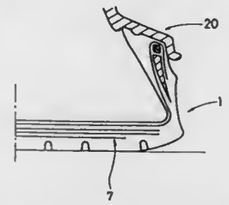
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5,044,413

## WIDE TREAD RADIAL TIRE-RIM ASSEMBLY WITH BEAD-RIM INTERLOCK

Hiroyuki Noma, and Saneto Saitou, both of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation of Ser. No. 144,924, filed as PCT JP 87/00298 on May 11, 1987, published as WO87/06891 on Nov. 19, 1987, abandoned.
This application Nov. 2, 1989, Ser. No. 430,935
Claims priority, application Japan, May 16, 1986, 61-113200
Int. Cl.[5] B60B *21/00*; B60C *15/024, 17/00, 3/00*
U.S. Cl. 152—209 WT 8 Claims



1. An assembly comprising a wheel rim and a radial tire for four-wheeled vehicles mounted thereon, said radial tire having an aspect ratio of smaller than 60% comprising:
a pair of beads;
a pair of bead cores disposed one in each bead;
a carcass extending between said beads and turned up in both edge portions around said bead cores;
a tread disposed radially outside the carcass;
a belt disposed between the carcass and the tread; and
a bead apex disposed between each of the carcass turned up part and the carcass main part and extending radially outward from the bead core,
and said wheel rim comprising:
a pair of axially spaced bead seats on which beads of the tire are seated;
a well located between said bead seats to facilitate the mounting of the tire; and
flanges extending radially outwardly from the axially outer edges of the bead seats,
at least one of the beads provided with a radially inwardly extending toe in a portion axially inward of the bead core, and a circumferentially extending hump groove on the axially outside of said toe,
said wheel rim provided, between the well and each of or one of the bead seats, with a circumferentially extending annular groove into which said toe is extended, and a hump extended into said bump groove and located at the axially inner edge of the bead seat,
the surface of said tread being curved so that the axial width of the tread is wider than the maximum axial section width of the carcass, and that the axially outer edges of the surface are positioned at a height within a range of 50 to 100% of the maximum cross-section height of the carcass,
the thickness of said tread at both edges being within the range of 70 to 200% of the average value of the thickness at the tread center and the thickness at the position three quarters of the maximum width of the carcass measured from the tread center,
said belt having at least one ply of organic fiber cords of which elastic modulus is lower than 1000 kg/sq.mm having a width being within the range of 70 to 100% of the entire distance along said curved surface of the tread,
each bead apex being made of rubber of which JIS(A) hardness is 74 to 95, and extends up to 70 to 90% of the height of said axially outer edge of the tread,
each of said bead seats having a width of a conventionally standardized dimension so that the wheel rim can be accommodated to a conventional tire having a bead devoid of a radially inwardly extending toe and a circumferentially extending groove.

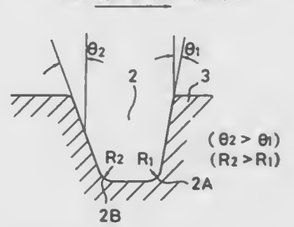
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5,044,414

## PNEUMATIC TIRE WITH DIRECTIONAL TREAD

Hisao Ushikubo, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,425
Claims priority, application Japan, May 15, 1989, 1-118791
Int. Cl.[5] B60C *11/04*
U.S. Cl. 152—209 R 6 Claims




1. A pneumatic tire for high speed passenger cars comprising; a directional tread located at a crown portion of a toroidal casing and formed with a plurality of blocks partitioned by a plurality of circumferential grooves, a plurality of U-shaped cross-section transversal grooves arranged into a herringbone pattern at substantially regular intervals along a tire circumferential direction in such a way as to extend from near a tread central area to both tread side areas at an inclination angle with respect to the tread circumferential direction, the tire rotational direction being determined in such a way that a tread central portion of each of the transversal grooves is first brought into contact with the ground, wherein the U-shaped cross-section of each of said transversal grooves is formed in such a way that a radius ($R_1$) of curvature of a step-out side

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corner between a side wall and a bottom of each transversal groove which is first brought into contact with the ground along a tire rotating direction is determined smaller than that ($R_2$) of a kick-out side corner therebetween which is afterward brought into contact with the ground, a ratio $R_2/R_1$ of radius of curvature is in the range of 2:1 to 5:1, and the U-shaped cross-section of some of said transversal grooves is formed in such a way that an inclination angle ($\theta_1$) with respect to a tire radial direction of the step-out side wall which is first brought into contact with the ground is determined preferably smaller than that ($\theta_2$) of the kick-out side wall which is afterward brought into contact with the ground.

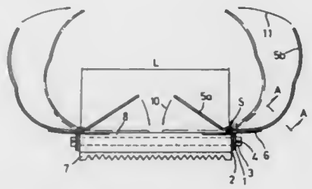
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**5,044,415**

## AUTOMOBILE TIRE CHAIN HAVING WING-SHAPED MOUNTING MEMBERS HINGEABLY ATTACHED TO ANTI-SLIDING MEMBERS

**Shigeru Ishihara, 13-5, Kamodahonmachi, Okazaki-shi, Ichigen, Japan**

**Filed Jun. 20, 1989, Ser. No. 368,793**
**Claims priority, application Japan, Jun. 22, 1988, 63-152137**
**Int. Cl.[5] B60C** *27/20, 27/10*
**U.S. Cl. 152—228** **10 Claims**



1. A tire chain comprising:
a plurality of anti-sliding members, each of which is attached to corresponding base plates and pivot pins;
a plurality of wing-shaped members, each of which is hingeably attached to said base plates; and
a plurality of substantially parallel chain links connecting parallel ends of said pivot pins.

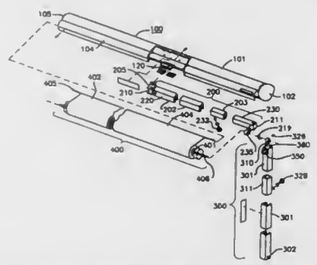
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**5,044,416**

## CASE AWNING ESPECIALLY FOR RECREATIONAL VEHICLE

**Brent Murray, Trabuco Canyon, Calif., assignor to The Dometic Corporation, Elkhart, Ind.**

**Filed Mar. 13, 1990, Ser. No. 492,646**
**Int. Cl.[5] E04F** *10/00*
**U.S. Cl. 160—22** **14 Claims**



1. In a case awning assembly having a having an awning, a housing, means for selectively storing said awning in said housing and extending said awning from said housing, a rafter arrangement for holding said awning at a position extended from said housing, and an arm arrangement for vertically positioning said awning when it is extended from said housing, the improvement wherein
said rafter arrangement comprises a longitudinally extendible rafter pivoted to said housing, said arm arrangement comprises a longitudinally extendible arm pivoted to said rafter, whereby said rafter and arm may be pivoted to fit within said housing, while remaining pivotally connected together and means for releasably locking said rafter and arm in said housing,
said locking means comprising means responsive to pivoting of said arm into said housing for inhibiting movement of said arm and rafter from said housing.

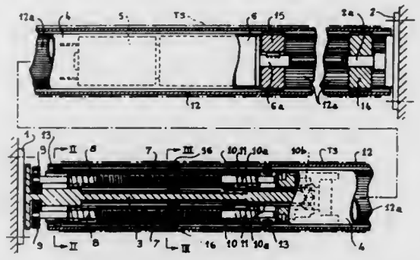
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**5,044,417**

## ROLLER ASSEMBLIES FOR AUTOMATICALLY WINDING AND UNWINDING CLOSURES

**René Bresson, Mantoche, France, assignor to SIMU, Gray, France**

**Filed Aug. 3, 1990, Ser. No. 562,572**
**Claims priority, application France, Oct. 18, 1989, 89 13886**
**Int. Cl.[5] E06B** *9/56*
**U.S. Cl. 160—310** **3 Claims**



1. A roller assembly for automatically winding and unwinding closures comprising, a hollow rotatable drum for supporting a closure, said drum having inner and outer surfaces, a drive mechanism disposed within said drum, said drive mechanism including an electric motor and a speed reducer driven by said motor, said speed reducer having a driven shaft, said drum having a plurality of regularly spaced internal ribs extending along substantially the entire length of said inner surface thereof, a cylindrical drive piece mounted to said driven shaft, said drive piece having outer peripheral teeth engaging said internal ribs of said drum so that said drum is rotated by said drive piece, electrical contact means mounted within said drum for controlling said motor to limit the winding and unwinding of the roller assembly, ring means for supporting said drum about said drive mechanism, said ring means having outer peripheral teeth engaging said internal ribs of said drum, and travelling nut means mounted within said drum and having outer peripheral teeth engaging said internal ribs of said drum, said travelling nut means being movable upon the rotation of said drum to activate said electrical contact means to limit the winding or unwinding of the roller assembly.

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**5,044,418**

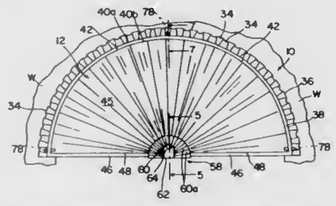
## WINDOW TREATMENT

**Nadine G. Donahue, St. Louis, Mo., assignor to Midwest Curtain Co. Inc., St. Louis, Mo.**

**Filed Aug. 29, 1990, Ser. No. 574,062**
**Int. Cl.[5] A47H** *1/00*
**U.S. Cl. 160—330** **16 Claims**

1. A method for producing an arch-shaped window treatment, said method comprising:
cutting a one-piece longitudinal blank of flexible material to a predetermined size such that said blank has front and back sides and is provided with a curved, upper longitudinal edge and a lower longitudinal edge and two opposing end edges of equal length formed perpendicular to said lower longitudinal edge at opposing ends thereof and extending to opposing ends of the curved upper edge;
forming a hem in the lower longitudinal edge of the blank, the hem being of such width as to permit passage therethrough of a cord;
forming a hem in the curved, upper longitudinal edge of the flexible material blank; the curved, upper longitudinal edge hem being of such width as to accommodate passage there through of a frame curved portion; forming a hem at each end edge of the blank of such width as to accommodate the passage therethrough of a frame elongated portion;
forming entrance sites in the upper longitudinal edge hem and the lower longitudinal hem, for passage therethrough of window treatment frame pieces and a gathering cord, respectively;
mounting the flexible material blank upon a window treatment frame having a curved, semi-rigid upper, portion and a lower elongated piece;
connecting the respective first and second ends of the curved frame portion and the elongated frame piece;
closing the entrance sites;
gathering excess flexible material substantially centrally along the straight frame elongated portion by inserting a cord shorter than the length of the hem formed in the lower longitudinal edge of the blank into the entrance site therein and thorough the hem and pulling on opposing ends of the cord;
tying the cord so as to maintain the gathered portion of the flexible material substantially at the center of the lower elongated frame piece;
applying a decorative piece so as to shield from view the elongated frame piece, the tied cord and the lower hem gathered thereon;
mounting the window treatment on a wall in such manner that it is easily removed.





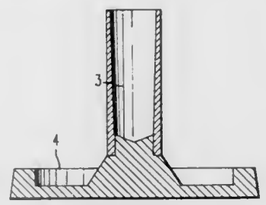
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**5,044,419**

## HOLLOW POST CYLINDRICAL SPRUE CASTING METHOD

**Maximillian Ware, Minneapolis, Minn., assignor to Kirchner Corporation, Minneapolis, Minn.**

**Filed Mar. 7, 1990, Ser. No. 489,542**
**Int. Cl.[5] B22C** *7/02, 9/04*
**U.S. Cl. 164—34** **6 Claims**



1. A method of preparing a wax or plastic tree as a step in the manufacture of jewelry by the lost wax casting method, comprising:
forming a hollow tube by injection molding in a mold, said tube having a tapered wall thickness along substantially its entire length achieved by use of a tapered insert for said mold;
positioning said tube on a base, and
attaching jewelry patterns to the tube.

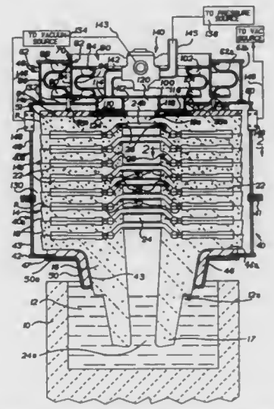
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**5,044,420**

## VACUUM-ASSISTED, COUNTERGRAVITY CASTING APPARATUS AND METHOD

**A. Dean VanderJagt, Essexville, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 13, 1990, Ser. No. 566,523**
**Int. Cl.[5] B22D** *18/06*
**U.S. Cl. 164—63** **37 Claims**



1. Apparatus for the vacuum-assisted, countergravity casting of a melt, comprising:
a) a gas permeable casting mold including an upstanding sprue having a lower open end for communicating with an underlying source of the melt, at least one mold cavity and a lateral ingate connecting the sprue and the mold cavity for supplying the melt from the sprue to the mold cavity,
b) means for applying subambient pressure to the sprue when said lower open end and said source are communicated sufficient to urge the melt upwardly into the sprue,
c) means for applying subambient pressure to the mold cavity when said lower open end and said source are communicated sufficient to urge the melt in the sprue to fill the mold cavity via the ingate, and
d) means for selectively raising the pressure applied to the sprue after said mold cavity is filled with the melt, the pressure applied to the sprue being so raised relative to the subambient pressure applied to the mold cavity as to cause the melt in the sprue to drain through said lower open end for return to said source without siphoning of the melt from the melt-filled mold cavity.

22. A method of vacuum-assisted, countergravity casting of a melt, comprising the steps of:
a) providing a gas permeable casting mold having an upstanding sprue with a lower open end for communicating with an underlying source of the melt, at least one mold cavity and a lateral ingate connecting the sprue and the mold cavity for supplying the melt from the sprue to the mold cavity,
b) applying subambient pressure to the sprue and the mold cavity when said lower open end and said source are communicated sufficient to urge the melt upwardly through the sprue and into the mold cavity via the ingate to fill said mold cavity with said melt, and
c) selectively raising the pressure applied to the sprue after

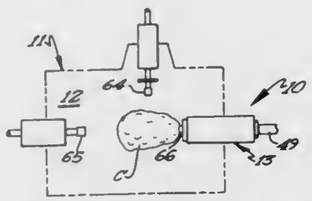
VOL 1130 ISS 1 SE 3 1991 UMI



the mold cavity is filled with the melt, the pressure applied to the sprue being so raised relative to the subambient pressure applied to the mold cavity as to cause the melt in the sprue to drain through the open lower end for return to said source without siphoning of the melt from the melt-filled mold cavity.

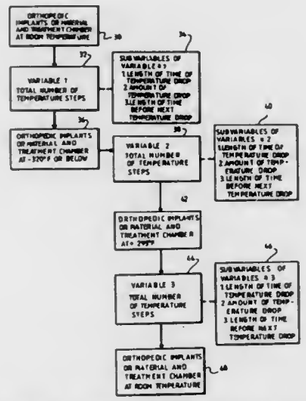
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**5,044,421**
**ROTARY PNEUMO-HYDRAULIC CLAMP**
**Joseph J. Tebbe, St. Paul, Minn.**
**Filed Jul. 30, 1990, Ser. No. 559,711**
**Int. Cl.[5] B22D** *29/00*
**U.S. Cl. 164—401** **5 Claims**




1. A rotary clamping device for use in clamping an investment casting in a closed cleaning center for removal of the investment from the casting by high pressure water jets, the investment casting having pouring cup at one end thereof, comprising,
a cylinder having a piston chamber,
a piston positioned within and axially movable in said chamber,
a piston rod secured to said piston and projecting from said chamber and being extensible and retractable relative to said chamber,
a clamping assembly secured to said piston rod and shiftable therewith and including a claw retainer plate, a rigid, adjustable stop member secured to the end of said piston rod,
a plurality of elongate, longitudinally curved clamping claws, each claw having longitudinally curved inner and outer surfaces, means pivotally mounting each claw on said claw retainer plate for pivotal movement relative thereto between an outward release position and an inward clamping position, each of said claws having a cam follower surface, a plurality of resilient elements each engaging one of said claws to normally urge each claw in an outward release direction,
a claw actuator cam ring, means connecting said cam ring with said cylinder, said cam ring engaging the cam follower surfaces of said claws whereby when the pouring cup of an investment casting is positioned in engaging relation with said rigid stop member and said piston rod is extended, said claws will be cammed into clamping relation with the pouring cup of an investment casting to rigidly immovably capture and clamp the pouring cup against the rigid stop member, and when said piston rod is retracted, each of said claws will be urged to the release position by one of said resilient elements,
passage means connected in communicating relation with said chamber on one side of said piston and connected to a source of hydraulic fluid under high pressure for extending said piston rod,
passage means connected in communicating relation to said chamber on the other side of said piston and connected to a source of air under pressure for retracting said piston rod,
and rotary drive means connected with said clamping device and a reversible rotary power means for selectively rotating said clamping device in either direction.

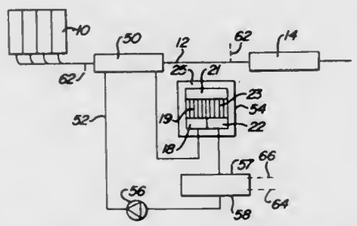
**5,044,422**
**CRYOGENIC PROCESSING OF ORTHOPEDIC IMPLANTS**
**Charles A. Lenker, 14264 12th Rd., Plymouth, Ind. 46563**
**Filed Oct. 1, 1990, Ser. No. 590,698**
**Int. Cl.[5] F25B** *13/00*
**U.S. Cl. 165—2** **1 Claim**




1. A cryogenic method for strengthening and improving wearibility and longevity of orthopedic implant and implant material prior to its use, comprising the steps of:
a) placing the orthopedic implant and implant material in a treatment chamber which is kept at room temperature;
b) cooling the implant and implant material to a temperature of at least −320° F.;
c) heating the cooled implant and implant material to a temperature of at least +295° F.;
d) bringing the implant and implant material back to room temperature.

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**5,044,423**
**METHOD AND AN ARRANGEMENT FOR DISCONNECTING A HEAT EXCHANGER CHARGED WITH A HEAT VEHICLE FLUID AND PLACED IN THE PATH OF EXHAUST GAS FROM AN IC ENGINE**
**Oskar Schatz, Waldpromenade 16, D 8035, Gauting, Fed. Rep. of Germany**
**Filed Jun. 8, 1990, Ser. No. 535,427**
**Int. Cl.[5] F28F** *27/02;* **F28D** *20/00*
**U.S. Cl. 165—10** **8 Claims**

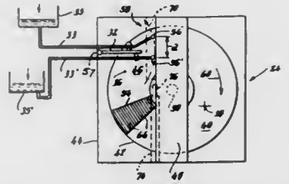



1. A method for charging a heat absorbing means comprising:
providing an internal combustion engine having an exhaust means;
providing a heat exchanger operatively coupled with the exhaust means;
providing a heat transfer circuit including a heat absorbing means with a flowable heat vehicle fluid for circulating in said heat transfer circuit, said heat transfer circuit operatively coupled with said heat exchanger;
selectively passing said flowable heat vehicle fluid through said heat exchanger for connecting said heat exchanger with said heat transfer circuit for exchanging heat between said flowable heat vehicle fluid and said heat exchanger;
passing said flowable heat vehicle fluid into said heat absorbing means for charging said heat absorbing means;
selectively terminating flow of said flowable heat vehicle fluid through said heat exchanger for disconnecting said heat exchanger with said heat transfer circuit;
withdrawing said flowable heat vehicle fluid from said heat exchanger; and
transferring said flowable heat vehicle fluid to said heat absorbing means.



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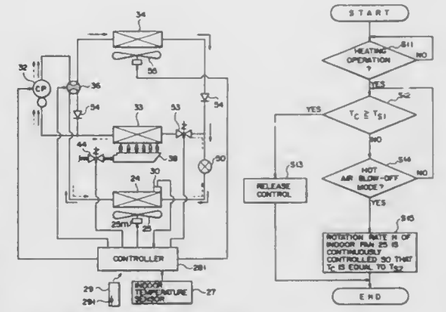
**5,044,424**
**HEAT GENERATOR**
**Richard J. Monro, 102 Ramapoo Rd., Ridgefield, Conn. 06877**
**Division of Ser. No. 906,524, Sep. 12, 1986, Pat. No. 4,903,756, which is a continuation-in-part of Ser. No. 749,000, Jun. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 578,378, Feb. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 385,051, Jun. 4, 1982, Pat. No. 4,444,128, which is a continuation of Ser. No. 218,355, Dec. 19, 1980, abandoned, which is a continuation of Ser. No. 26,028, Apr. 2, 1979, abandoned. This application Nov. 22, 1989, Ser. No. 440,852**
**The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.**
**Int. Cl.[5] F28D** *19/04;* **F28G** *9/00*
**U.S. Cl. 165—5** **66 Claims**




1. A method for improving the efficiency of a heat generator wherein an inflow of air is used and a hot gas is generated which exhausts as a flue gas at an elevated temperature and contains particulates and gaseous pollutants, comprising the steps of:
passing the flue gas and the inflow of air into axial ends of a rotary heat exchanger having a rotor for the transfer of heat from the flue gas passing on one side to said inflow of air passing on another side for a preheating of the air by virtue of rotation of the heat exchanger, wherein the heat exchange relationship between the inflow of air and the flue gas is sufficient to reduce the temperature of the flue gas from a transfer of heat therefrom to the inflow of air for an enhanced thermal efficiency of the heat generator, and with the temperature of the flue gas being reduced by said transfer of heat by said heat exchanger to a level where at least one of said pollutants condenses out from the flue gas within the heat exchanger;
during said heat transfer directing a localized stream of wash liquid and neutralizer material at the axial end of the rotary heat exchanger where the flue gas enters and the air exits to remove particles and pollutants from heat exchange elements of the heat exchanger, with said neutralizing material being in an amount sufficient to establish a dry neutralizing layer on surfaces of the rotary heat exchanger so as to protect the surfaces against acid condensed from the flue gas within the rotary heat exchanger for an extended interval of time; and
during said heat transfer moving the stream of wash liquid along a zone located at said latter axial end and in the vicinity of the region where a rotor in the heat exchanger leaves the air side or enters the flue gas side, said zone being further oriented to rinse the entire rotary heat exchanger as this is rotated past the stream of wash liquid.

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**5,044,425**
**AIR CONDITIONER HAVING A REFRIGERANT HEATER**
**Mitsuyoshi Tatsumi, Fujinomiya; Haruo Noguchi, and Takashi Kobayashi, both of Fuji, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Jul. 31, 1990, Ser. No. 560,733**
**Claims priority, application Japan, Sep. 14, 1989, 1-239195**
**Int. Cl.[5] F25B** *29/00, 27/00, 13/00*
**U.S. Cl. 165—29** **3 Claims**




1. An air conditioner comprising:
a heat-pump refrigeration circuit including a compressor, a four-way valve, an outdoor heat exchanger, a pressure reducer, an in door heat exchanger, connected in this order;
a refrigerant heater arranged in the refrigeration circuit, the heating capacity thereof being variable;
an indoor fan for circulating indoor air through the indoor heat exchanger;
temperature detecting means for detecting a temperature Tc in the indoor heat exchanger;
heating operation means for causing said heat-pump refrigeration circuit to perform a heating operation, in cooperation with the compressor, the four-way valve, and the refrigerant heater;
release control means for reducing the heating capacity of the refrigerant heater, when the detected temperature Tc exceeds a first set temperature Ts1;
setting means for causing the air conditioner to operate in a

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hot air blow-off mode in which the indoor fan rotates at a low rate; and

rotation rate control means for continuously controlling the rotation rate of the indoor fan so that the detected temperature Tc is kept at a second set temperature Ts2 which is lower than the first set temperature Ts1, while the air conditioner is set in the hot air blow-off mode.

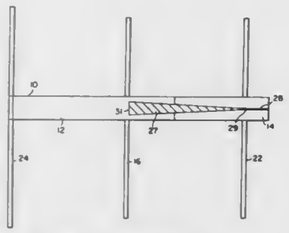
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**5,044,426**

## VARIABLE CONDUCTANCE HEAT PIPE ENHANCEMENT

**Kurt E. Kneidel, Alliance, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Mar. 12, 1990, Ser. No. 492,521**
**Int. Cl.[5] F28D** *15/02*
**U.S. Cl. 165—32** **9 Claims**



1. A heat pipe assembly comprising:

a tubular hollow heat pipe having an evaporator end and an opposite condenser end, said heat pipe having a cross-sectional area and having a condenser length extending from said condenser end, said condenser length including an active length where evaporated fluid condenses;

an evaporatable and condensable fluid in said heat pipe for evaporating when receiving heat near said evaporation end and for condensing when giving up heat in said active length;

a noncondensable gas near said condenser end and in said condenser length of said heat pipe;

a restriction member fixed in said heat pipe near said condenser end, said restriction member extending only along a portion of the condenser length and being spaced away from the evaporation end of said heat pipe, said restriction member having a varied cross-sectional area along the length of said restriction member which is less than the cross-sectional area of said heat pipe for confining said gas and a portion of said fluid in the active condenser length, to an area around said restriction member and in said heat pipe; and

a fixed ligament connected between said restriction member and said heat pipe for fixing said restriction member in said heat pipe, said ligament being fixed between said condenser end of said heat pipe end and an end of said restriction member which is closest to said condenser end.

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**5,044,427**

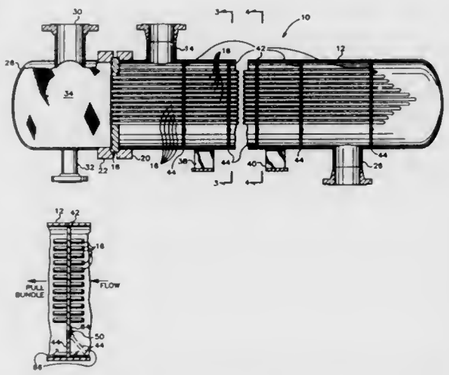
## HEAT EXCHANGER

**Scott D. Love, and Stone P. Washer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Aug. 31, 1990, Ser. No. 575,724**
**Int. Cl.[5] F28F** *7/00*
**U.S. Cl. 165—76** **10 Claims**

1. In a shell and tube type heat exchanger having a shell having an inside surface and containing a removable bundle of tubes, at least one tube sheet wherein the ends of the tubes of said removable bundle of tubes are operatively connected, means for introducing a first fluid to the tubes of said removable bundle and means for withdrawing the first fluid from the tubes of said removable bundle, means for introducing a second fluid to the interior of said shell and means for withdrawing the second fluid from said shell, at least one baffle extending transversely across said removable bundle so as to direct the second fluid in a desired flow pattern across the tubes of said removable tube bundle, wherein said baffle comprises:

a top section defining a plurality of apertures through which the tubes of said removable bundle extend and having a first edge, a second edge, and a third edge with the shape



of said third edge corresponding to the shape of the inside surface of said shell;

a bottom section having a first edge and a second edge with the shape of said second edge corresponding to the shape of the inside surface of said shell; and

hinging means connecting said first edge of said bottom section to said first edge of said top section for allowing said bottom section to rotate relative to said top section.

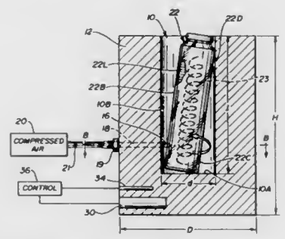
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**5,044,428**

## AIR POWERED HEATER/MIXER

**Andre Nohl, San Jose, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.**

**Filed May 30, 1989, Ser. No. 358,772**
**Int. Cl.[5] B01F** *13/02, 15/06*
**U.S. Cl. 165—85** **16 Claims**



1. A mixer for mixing contents of a container comprising:

a chamber for freely holding the container;

a heat conductive path to the chamber;

means for providing heat to the heat conductive path;

an inlet in the chamber for admitting a flow of fluid to the chamber; and

means for providing a flow of fluid to the inlet so as to revolve the container in a vortex of the flow of fluid and carry heat from the heat conductive path to the container.

12. A method for mixing a liquid in a container comprising the steps of:



providing a chamber;

placing the container holding the liquid in the chamber; and

providing a stream of heated gas to the chamber so as to revolve the container in the stream of gas inside the chamber to mix the liquid and heat the container.

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**5,044,429**

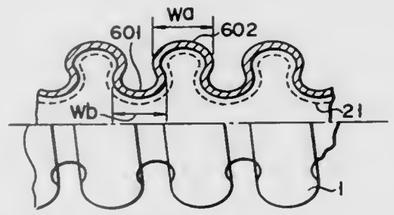
## HEAT PIPE AND METHOD OF MANUFACTURING THE SAME

**Masuji Sakaya, Narashino; Ryuichi Okiai, Yotsukaido; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan**

**Division of Ser. No. 523,046, May 14, 1990, which is a division of Ser. No. 365,531, Jun. 13, 1989, Pat. No. 4,953,632, which is a division of Ser. No. 282,025, Dec. 7, 1988, abandoned. This application Dec. 5, 1990, Ser. No. 622,764**

**Claims priority, application Japan, Dec. 9, 1987, 62-309669; Apr. 27, 1988, 63-102422; Apr. 27, 1988, 63-102423; Apr. 27, 1988, 63-102424**

**Int. Cl.[5] F28D** *15/02*
**U.S. Cl. 165—104.26** **1 Claim**



1. A heat pipe comprising:

a pipe with a mating edge of a metal pipe;

a wick layer on an inner surface of said pipe; and

Ω-like grooves in which a length of a wave of an outer projecting portion is larger than that of an inner recessed portion, formed on an outer surface of said pipe in an oblique direction thereof.

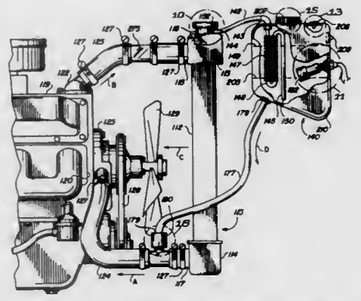
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**5,044,430**

## METHOD AND APPARATUS FOR CONTINUOUSLY MAINTAINING A VOLUME OF COOLANT WITHIN A PRESSURIZED COOLING SYSTEM

**Walter C. Avrea, 1071 E. Sandpiper Dr., Tempe, Ariz. 85283**

**Division of Ser. No. 147,537, Jan. 25, 1988, abandoned, and a continuation-in-part of Ser. No. 632,526, Jul. 19, 1984, abandoned, which is a continuation of Ser. No. 372,915, Apr. 29, 1982, Pat. No. 4,461,342. This application Jul. 21, 1989, Ser. No. 383,738**
**Int. Cl.[5] F01P** *11/02*
**U.S. Cl. 165—104.32** **24 Claims**



1. A kit for use in combination with the pressurized liquid cooling system of an internal combustion engine, which system includes

a finite fluid capacity,

a water jacket having an inlet and an outlet,

a radiator having an inlet tank and an outlet tank,

a supply conduit having a first end communicating with the outlet tank, and second end communicating with the inlet of the water jacket,

a return conduit communicating between the outlet of the water jacket and the inlet tank, and

a pump for circulating coolant through the supply conduit from the radiator to the water jacket.

and for purging gaseous matter from the system and for continuous maintenance of the volumetric capacity of coolant with the system, said kit comprising:

a. a valving apparatus positionable in series with said return conduit and including

i. pressure valve means being normally closed and being openable in response to pressure within said system exceeding a predetermined value for flow of fluid from said system; and

ii. a discharge port for flow of fluid from said valving apparatus when said pressure valve is open;

b. an accumulator having

i. an inlet port,

ii. an outlet port and valve means communicating with the atmosphere to allow the exchange of air between the atmosphere and the accumulator;

c. an overflow conduit having

i. an inlet end securable to the discharge port of said valving apparatus, and

ii. an outlet end securable to the inlet port of said accumulator;

d. a make-up conduit having

i. an inlet end securable to the outlet port of said accumulator, and

ii. an outlet end securable to a low point in said system;

e. a normally closed, one-way check valve for placement in series with said make-up conduit for permitting flow of fluid from said accumulator into said system; and

f. coupling means for coupling said outlet end of said make-up conduit to said supply conduit at a location intermediate said first end and said second end.

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**5,044,431**

## TUBE LAYOUT FOR HEAT EXCHANGER

**Gordon M. Cameron, 4 Wellesbourne Cres., Willowdale, Ontario, Canada M2H 1Y7**

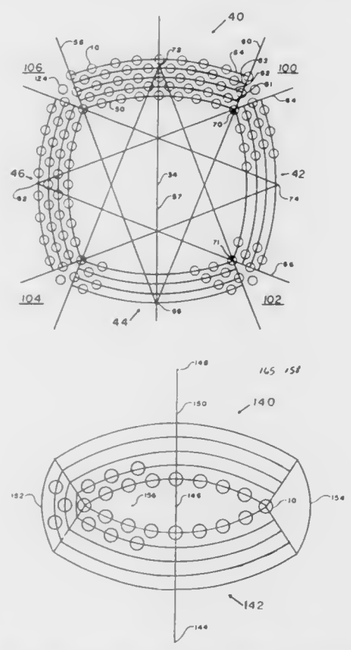
**Filed Aug. 21, 1990, Ser. No. 570,564**
**Claims priority, application Canada, Aug. 24, 1989, 609339**
**Int. Cl.[5] F28D** *7/10*
**U.S. Cl. 165—158** **8 Claims**

1. A heat exchanger for exchanging heat between fluids and having a shell and at least first and second tube bundles extending longitudinally in said shell, each tube bundle consisting of a plurality of longitudinally extending parallel tubes laid out in a set of concentric circular arcs which extend less than 180 degrees, said tube bundles defining a central space between them, said central space also extending longitudinally in said shell and being parallel to tubes, said tube bundles having together a longitudinal axis of symmetry between them extending through said central space, the arcs of said first tube bundle

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having a first common center of curvature and the arcs of said second tube bundle having a second common center of curvature, said first and second centers f curvature being displaced from said axis of symmetry and from each other.



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**5,044,432**
**WELL PIPE HANGER WITH METAL SEALING ANNULUS VALVE**

**Christopher E. Cunningham, Edinburgh, and Rolf A. Ruesse, Fife, both of Scotland, assignors to FMC Corporation, Chicago, Ill.**

**Filed Aug. 10, 1990, Ser. No. 566,009**
**Int. Cl.[5] E21B** *33/04*
**U.S. Cl. 166—87** **27 Claims**

**1.** A well pipe hanger with a metal sealing annulus closure system, said hanger comprising:

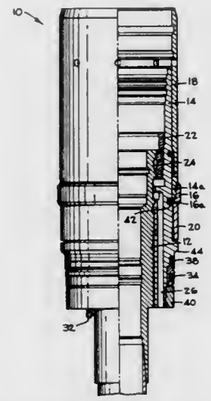
a) an annular hanger body;

b) means to support the hanger body within a surrounding hanger receptacle;

c) an annular valve chamber defined by radially spaced and opposed axial surfaces within the hanger body, said chamber having two radially spaced and opposed annular metal sealing surfaces;

d) passageway means for providing communication between the chamber and a well annulus below the hanger when the hanger body is in functional position within said hanger receptacle;

e) an annular metal annulus valve closure element within the hanger body chamber for movement with respect thereto, said valve element having two annular metal sealing surfaces for cooperation with said chamber sealing surfaces to establish a metal-to-metal seal therebetween when said valve closure element is in its closed position; and



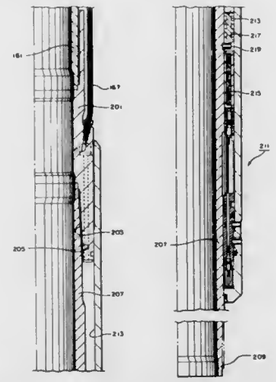
f) means on the valve closure element to accept a force for mechanically moving said closure element between its open and closed positions.

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**5,044,433**
**PACK-OFF WELL APPARATUS WITH STRAIGHT SHEAR RELEASE**

**Richard P. Rubbo, The Woodlands; Mike A. Luke, Pasadena; Brett Bouldin, and Frank X. Mooney, both of Friendswood, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.**

**Filed Aug. 28, 1990, Ser. No. 574,279**
**Int. Cl.[5] E21B** *33/128, 23/06*
**U.S. Cl. 166—120** **11 Claims**



**1.** A pack-off apparatus for sealing between concentric tubular bodies in a subsurface well location, comprising:

a generally cylindrical hanger body having an upper end and a lower end, the hanger body being adapted to be supported in a surrounding well casing, the hanger body having a longitudinal axis and an internal bore;

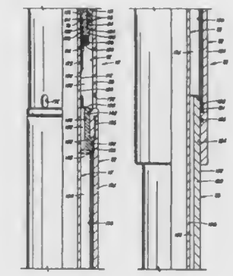
an annular packing element carried about the hanger body which is radially expandable under axial compression;

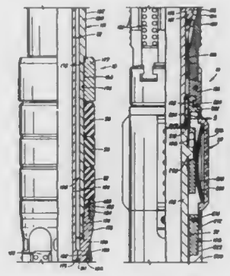
a setting sleeve carried about the hanger body, the setting sleeve being axially movable with respect to the packing element for compressing the packing element, the setting sleeve having an upper end adapted to contact the packing element and a lower end, the lower end of the setting sleeve being slidably received within the interior of a circumscribing member which defines a setting chamber on the exterior of the hanger body;

a plurality of circumferentially spaced slips carried on the exterior of the hanger body, the slips having outer gripping surfaces adapted to grip the surrounding well casing, the slips being actuable by axial movement of the setting sleeve to grip the well casing and support the hanger body within the well casing; and

wherein a hydraulic line is provided for communicating hydraulic pressure to the setting chamber, the hydraulic line being located within the internal bore of the hanger body and being arranged to extend from a point below the circumferentially spaced slips along the longitudinal axis of the hanger body to the setting chamber, whereby the packing element and gripping slips can be set by the application of hydraulic pressure from the lower end of the hanger body.







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**5,044,434**
**LONG STROKE PACKER**

**Timothy D. Burns, Sr.; Kenneth D. Caskey, and Donald W. Winslow, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.**

**Filed Mar. 16, 1990, Ser. No. 494,718**
**Int. Cl.[5] E21B** *33/128, 33/129*
**U.S. Cl. 166—129** **18 Claims**

**1.** A packer for use in a well bore, said packer comprising:

a housing;

a packer mandrel slidably disposed with respect to said housing;

an operating mandrel slidably disposed in said housing and packer mandrel and adapted for connection to a tool string;

packer means disposed on said packer mandrel for sealingly engaging said well bore when in a set position; and

a packer shoe slidably disposed on said packer mandrel between said housing and packer means, said shoe being initially spaced from said housing, wherein during a setting operation, said packer shoe is contacted by said housing such that said shoe is moved against said packer means for setting thereof.

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**5,044,435**
**ENHANCED OIL RECOVERY USING DENITRIFYING MICROORGANISMS**

**George T. Sperl, and Penny L. Sperl, both of Bartlesville, Okla., assignors to Injectech, Inc., Ochelata, Okla.**

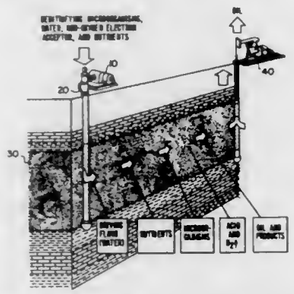
**Filed Jul. 16, 1990, Ser. No. 552,709**
**Int. Cl.[5] E21B** *43/22, 43/27*
**U.S. Cl. 166—246** **36 Claims**

**1.** A method of microbial enhanced oil recovery, comprising the step of introducing, into a carbonate-containing rock formation that defines an anaerobic environment, (a) denitrifying microorganisms, (b) an aqueous liquid carrier and (c) a non-

VOL 1130 ISS 1 SE 3 1991 UMI



oxygen electron accepter, such that said microorganisms reduce said non-oxygen electron accepter in the presence of a



sulfur-containing compound and produce sulfuric acid, which dissolves carbonate in said rock formation to release oil.

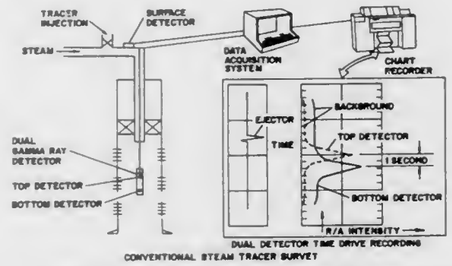
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**5,044,436**

**STEAM INJECTION PROFILING WITH UNSTABLE RADIOACTIVE ISOTOPES**

**Charles F. Magnani, Placentia, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.**

**Filed Aug. 24, 1990, Ser. No. 572,832**
**Int. Cl.[5] E21B *43/00***
**U.S. Cl. 166—247** **6 Claims**




1. A method of determining liquid and vapor phase profiles in a steam injection well comprising the steps of:

(a) inserting a well logging tool into a steam injection well at a first location, said logging tool further comprising dual gamma ray detectors separated by a specified distance;

(b) measuring a mass flow rate of steam entering the steam injection well, before, during, and after logging said steam injection well;

(c) injecting an unstable radioactive isotope into the steam injection well, said isotope being of a type which naturally hydrolyzes from a vapor phase into a liquid phase at a known rate, so that a given time after said isotope injection, the relative proportions of said vapor phase and said liquid phase can be determined;

(d) measuring the transit time of said vapor phase isotope and said liquid phase isotope to pass between said gamma ray detectors;

(e) moving said logging tool to a second location in said well;

(f) repeating steps (c), (d), and (e);

(g) calculating vapor phase and liquid phase velocities based on the elapsed time required for said vapor and liquid phase isotopes to pass between said two gamma detectors; and

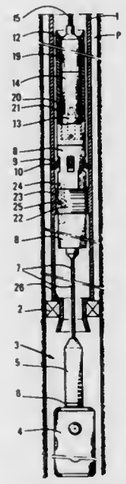
(h) calculating the amount of vapor and liquid entering a formation between said first location and said second location based on said mass flow rate of steam entering the well, said liquid transit times, and said vapor transit times.

**5,044,437**

**METHOD AND DEVICE FOR PERFORMING PERFORATING OPERATIONS IN A WELL**

**Christian Wittrisch, Rueil-Malmaison, France, assignor to Institut Francais du Petrole, Rueil Malmaison, France**

**Filed Jun. 20, 1990, Ser. No. 541,016**
**Claims priority, application France, Jun. 20, 1989, 89 08309**
**Int. Cl.[5] E21B *43/119***
**U.S. Cl. 166—250** **11 Claims**



1. A method for performing perforating operations in a well extending downwardly through earth formations comprising: lowering down into a well to the area to be perforated

(a) a tubing of a section smaller than that of the well, said tubing being externally fitted towards a lower portion thereof with an expansible packer, the expansion of which acts to close an annular space between the well and the tubing and to couple the tubing to surrounding earth formations;

(b) a support frame displaceable within said tubing, said frame being provided with a first locking means that is operated by remote control for releasably securing the support frame within the tubing; and

(c) a mobile intervention system comprising a measuring set permanently connected with the support frame via a linking element, a perforating tool and detachable fastening means for attaching the perforating tool to the measuring set, said fastening means being detachable by remote control;

positioning inside a portion of said tubing from a surface installation a control cable connected with a connection means provided with a second locking means for releasably securing said connection means to the support frame;

releasing the intervention system by remote control of the first locking means and displacing the system within the well below said tubing;

effecting a series of measuring cycles by said measuring set to determine at least one location where the perforating tool must be operated;

actuating the perforating tool a determined location, thereby perforating the surrounding earth formation;

dropping the perforating tool into a lower portion of the well by actuating said fastening means to detach the perforating tool from the measuring set; and

clearing the tubing by removing the support frame with the linking element and the measuring set connected thereto.

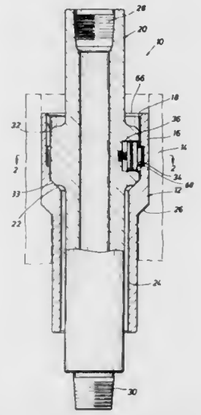


**5,044,438**

**WELLHEAD BOWL PROTECTOR AND RETRIEVING TOOL**

**Joe A. Young, 110 Heath Rd., Scott, La. 70583**

**Filed Mar. 16, 1990, Ser. No. 494,773**
**Int. Cl.[5] E21B *17/12, 23/00, 31/20***
**U.S. Cl. 166—250** **20 Claims**



1. A wellhead protection system including a wear bushing and a retrieving tool, the improvement comprising:

a) a wear bushing supported within the wellhead, wherein said wear bushing includes an enlarged upper end having an external support shoulder for engagement with an internal support shoulder formed in the wellhead;

b) wherein said wear bushing further includes an internal circumferential slot intersected by at least one vertically extending slot, said vertical slot extending from said circumferential slot to the upper end of said wear bushing;

c) a retrieving tool having at least one outwardly biased, retractable lug member mounted thereon; and

d) wherein said retrieving tool includes an enlarged portion adapted to be received within said enlarged upper end of said wear bushing.

13. A method of retrieving a wear bushing from a wellhead comprising the steps of:

a) lowering a retrieving tool into the wellhead for locking engagement with the wear bushing;

b) aligning said retrieving tool with said wear bushing for automatically forcing lug members carried by said retrieving tool outwardly into locking engagement with said wear bushing;

c) monitoring drill string weight for determining engagement of said retrieving tool with said wear bushing, wherein a substantial decrease in drill string weight is an indication that said retrieving tool is engaged with said wear bushing; and

d) removing the wear bushing from the wellhead.

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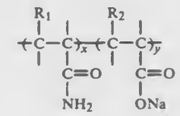
**5,044,439**

**METHOD OF TREATING GEOTHERMAL WELLS WITH ACRYLATE/ACRYLAMIDE SCALE INHIBITOR**

**Lawrence M. Cenegy, Spring; Darrel F. Griffith, Houston, both of Tex., and George W. M. Hobbs, Adelaide, Australia, assignors to Exxon Chemical Patents, Inc., Linden, N.J.**

**Filed May 10, 1990, Ser. No. 521,584**
**Int. Cl.[5] E21B *43/12*; C02F *5/12***
**U.S. Cl. 166—310** **9 Claims**

1. A method of treating a geothermal water well producing from a subterranean formation through pipe in the well, said method comprising introducing into said well pipe at a subsurface location an effective amount of a scale inhibitor formulation to inhibit the build up of $CaCO_3$ scale therein; said formulation comprising an aqueous solution of a Na acrylate/acrylamide copolymer having the following formula



where

$x+y=1$;

x ranges from about 0.3 to about 0.15;

y ranges from about 0.7 to about 0.85;

$R_1$ is H, $C_1$ or $C_2$; and

$R_2$ is H, $C_1$ or $C_2$.

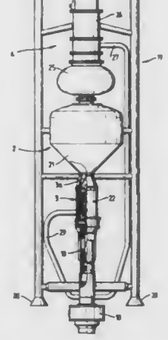
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**5,044,440**

**UNDERWATER STATION FOR PUMPING A WELL FLOW**

**Kjell O. Stinessen; John L. Cotton, and Jan S. Christensen, all of Oslo, Norway, assignors to Kvaerner Subsea Contracting, Saker, Norway**

**Filed Jan. 3, 1990, Ser. No. 460,398**
**Claims priority, application Norway, Jan. 6, 1989, 890057**
**Int. Cl.[5] E21B *43/01***
**U.S. Cl. 166—344** **6 Claims**



1. In an underwater station for pumping a well flow,

a separator to separate the well flow into liquid and gas, said separator including a pressure vessel comprising an upper gas chamber and a lower liquid chamber,

a pump and a pump motor arranged in a first common pressure shell,

a compressor and a compressor motor arranged in a second common pressure shell,

said pressure vessel, first and second common pressure shells being joined into a compact column structure unit having a lower end, with the first common pressure shell lowermost, then the pressure vessel, and the second common pressure shell uppermost,

said pressure vessel and first and second common pressure shells being directly exposed to ambient water when arranged in an underwater station,

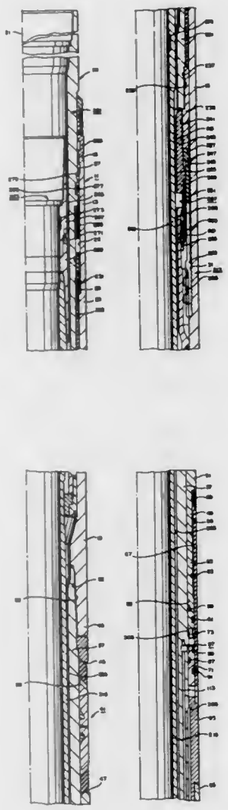
fluid carrying conduits between said separator and pump, and compressor, respectively, said fluid carrying conduits being joined in a common connector at the lower end of said column structure unit.

5,044,441

## PACK-OFF WELL APPARATUS AND METHOD

Dick Rubbo, The Woodlands; Mike Luke, Pasadena; Brett Bouldin, and Frank Mooney, both of Friendswood, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Aug. 28, 1990, Ser. No. 574,435
Int. Cl.[5] E21B *33/129, 34/10, 23/00*
U.S. Cl. 166—382 37 Claims



1. A pack-off apparatus for sealing between concentric tubular bodies in a subsurface well location, comprising:

a generally cylindrical hanger body having an upper end and a lower end, the hanger body being adapted to be supported in a surrounding well casing, the hanger body having a longitudinal axis, cylindrical sidewall portions and an internal bore;

an annular packing element carried about the hanger body which is radially expandable under axial compression;

a setting sleeve carried about the hanger body, the setting sleeve being axially movable with respect to the packing element for compressing the packing element, the setting sleeve having an upper end adapted to contact the packing element and a lower end, the lower end of the setting sleeve being slidably received within the interior of a circumscribing member which defines a setting chamber on the exterior of the hanger body;

an anti-preset piston carried about the hanger body below the setting sleeve, the anti-preset piston having an engagement end which initially locks the setting sleeve in a running-in position, the anti-preset piston being axially movable in an opposite direction from the setting sleeve to release the setting sleeve and set the packing element upon the application of hydraulic pressure to the setting chamber;

a plurality of circumferentially spaced slips carried on the exterior of the hanger body, the slips having outer gripping surfaces adapted to grip the surrounding well casing, the slips being actuable by axial movement of the anti-preset piston to grip the well casing and support the hanger body within the well casing; and

wherein the hanger body has a longitudinal passageway for communicating hydraulic pressure to the setting chamber, the longitudinal passageway extending from a point below the circumferentially spaced slips along the longitudinal axis of the hanger body to the setting chamber.

19. An improved latch assembly of the type having an outer tubular body and a concentrically spaced inner tubular body at an upper extent thereof, the upper extent also having an external latch profile adapted to be engaged with an internal profile provided within an internal bore of a surrounding hanger body, the latch assembly also having a lower, tubular extent which extends downwardly within the interior of the hanger body, the improvement comprising:

a downwardly extending latch collet supported on the outer tubular body, the latch collet having a plurality of externally threaded collet fingers which are adapted to matingly engage an internal thread profile provided in the internal bore of the surrounding hanger body to thereby latch the latch assembly in a latched position within the hanger body; and

stop means provided on the exterior of the outer tubular body for initially preventing downward movement of the outer tubular body relative to the hanger body and for preventing the externally threaded collet fingers from engaging the internally threaded profile provided in the internal bore of the hanger body.

27. A method of re-installing a concentric tubing string within tubing hanger which was previously set in a surrounding well casing in a borehole, the hanger body having an internal bore and an annular packing element carried about the hanger body which is radially expandable under axial compression and having a plurality of circumferentially spaced slips with outer gripping surfaces adapted to grip the surrounding well casing, the method comprising the steps of:

providing a concentric tubing anchor on the concentric tubing string for latching the concentric tubing string within the internal bore of the hanger body;

providing the concentric tubing anchor with latch means adapted to engage a mating profile provided within the internal bore of the hanger body;

providing the concentric tubing anchor with stop means on the exterior thereof for initially preventing downward movement of the tubing anchor relative to the hanger body to prevent the latch means from engaging the mating profile provided in the hanger body, the stop means being movable between an extended radial position and a retracted radial position on the exterior of the concentric tubing anchor;

running the concentric tubing anchor on the concentric tubing string down to the previously set tubing anchor until the concentric tubing anchor shoulders and locates on the tubing anchor;

lifting the concentric tubing string from the well surface so that the concentric tubing anchor is moved axially upward relative to the hanger body, thereby moving the stop means from the extended radial position to the retracted radial position;

adjusting the length of the tubing string extending to the well surface;

reinserting the concentric tubing anchor within the hanger body and moving the concentric tubing anchor axially downward until the latch means engage the mating profile provided in the hanger body to latch the tubing anchor within the hanger body.

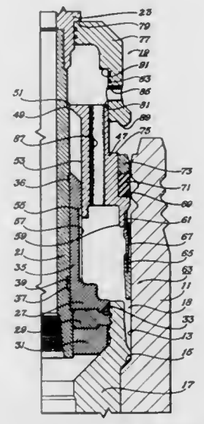


5,044,442

## CASING HANGER RUNNING TOOL USING ANNULUS PRESSURE

Philippe C. Nobileau, Paris, France, assignor to Abb Vetcogray Inc., Houston, Tex.

Filed Jan. 31, 1990, Ser. No. 472,788
The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.
Int. Cl.[5] E21B *33/43, 23/04*
U.S. Cl. 166—382 6 Claims



1. A running tool for setting a packoff between a casing hanger and a wellhead housing, comprising in combination:

a mandrel having means for connection to a string of conduit;

a body carried by said mandrel;

means for releasably connecting the packoff to the body;

an elastomeric seal mounted on the body above the packoff for sealing engagement with the wellhead housing;

means for transmitting weight of the string of conduit to the body to apply a downward force on the packoff once the packoff is located between the casing hanger and wellhead housing to initially set the packoff; and

means for applying hydraulic pressure to the interior of the wellhead housing above the elastomeric seal to cause the body to exert a downward force on the packoff to finally set the packoff; and

means for retrieving the running tool along with the elastomeric seal once the packoff has set.

5,044,443

## METHOD AND APPARATUS FOR PRODUCING WELLS

Ronald K. Churchman, Carrollton, and Roddie R. Smith, Plano, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Aug. 17, 1990, Ser. No. 569,073
Int. Cl.[5] E21B *34/10*
U.S. Cl. 166—386 8 Claims

1. A valve comprising:

a body having a flowway therethrough,

ports through the side wall of the body,

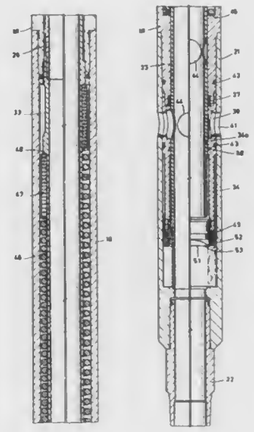
a slide valve member and seat controlling flow through the ports,

a reciprocal actuator for shifting said slide valve member between open and closed position,

a piston on said actuator exposed to a chamber for receiving pressure fluid from exterior of the body and urging the actuator toward slide valve member open position,

resilient means for urging the actuator toward slide valve member closed position,

a second valve seat in the body and around said flowway, and



a second valve member cooperable with said second valve seat and in the path of said slide valve member and moved to the open position by the slide valve member when said actuator is in the slide valve open position.

5,044,444

## METHOD AND APPARATUS FOR CHEMICAL TREATMENT OF SUBTERRANEAN WELL BORES

Martin P. Coronado, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Continuation of Ser. No. 345,343, Apr. 28, 1989, abandoned.
This application Jul. 5, 1990, Ser. No. 548,622
Int. Cl.[5] E21B *33/127, 34/10*
U.S. Cl. 166—387 67 Claims

1. An inflatable well treatment tool suitable for insertion into a well through a well conduit disposed in a well bore, comprising:

a central tubular body assemblage connectable to a fluid supply conduit extending to the surface;

said central tubular body assemblage defining a central fluid passage communicating with the fluid supply conduit;

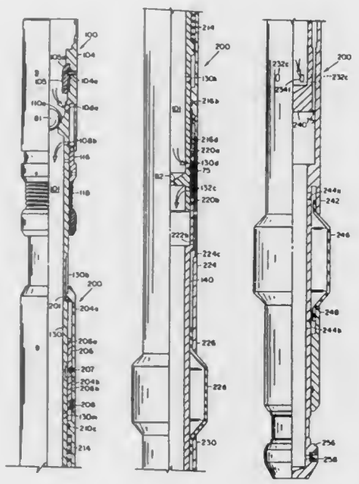
VOL 1130 ISS 1 SE 3 1991 UMI



an outer tubular assemblage surrounding a medial portion of said central tubular body and cooperating therewith to define a generally annular fluid passage surrounding said central tubular body assemblage;

resilient means urging said central tubular body assemblage downwardly relative to said outer tubular assemblage to a run-in position;

said outer tubular assemblage including at least one annular elastomeric means expandable by pressured inflation fluid supplied through said annular fluid passage into sealing engagement with the well bore;



inflate port means in the lower portion of said central tubular body assemblage connecting said central fluid passage to said annular fluid passage;

said central tubular body assemblage having a first radial port in its upper end communicating with the well bore, whereby circulation may be maintained during run-in;

a valve seat surrounding said central fluid passage adjacent said first radial port;

a second radial port in said central tubular body assemblage below said valve seat;

an annular piston sealably surrounding the upper end of said central tubular body assemblage and responsive to fluid pressure in said central fluid passage for axially shiftable movement relative to said first and second radial ports between a first position permitting circulation and a second position bypassing said valve seat; and

a valve head seatable on said valve seat to permit build-up of fluid pressure in said central fluid passage to shift said annular piston to said second position and supply pressurized fluid to expand said annular elastomeric means into sealing engagement with the well bore.

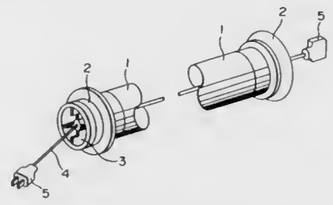
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**5,044,445**

## FIRE HOSE CAPABLE OF TRANSMITTING SIGNALS

**Isao Kayahara, Tokyo, Japan, assignor to Funayama Co., Ltd., Japan**

**Filed Jun. 7, 1990, Ser. No. 534,269**
**Claims priority, application Japan, Dec. 14, 1987, 62-189693**
**Int. Cl.[5] A62C *33/00***
**U.S. Cl. 169—52** **2 Claims**



1. A hose comprising:

an elongate, hollow hose section;

a metal connecting fitting at each end of the hose section for connecting the hose to another hose or fitting;

a wire supporting member mounted inside each connecting fitting;

an electrical wire disposed within the hose section, each end of the electrical wire penetrating an associated one of the wire supporting members, the portion of the electrical wire extending between the supporting members being freely displaceable relative to the hose section; and

connector means on the ends of the electrical wire penetrating the wire supporting members, for connecting cableways at each end of the hose

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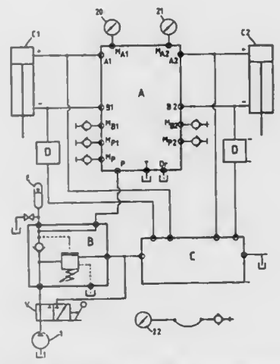
**5,044,446**

## CONSTANT PRESSURE REGULATION OF GRADER BLADES

**Karl-Jonas Jonasson; Bo Tibäck, both of Borlänge; Lars-Ake Hedberg, Falun, and Alf Wallin, Borlänge, all of Sweden, assignors to Maskin AB Tube, Huddinge, Sweden**

**PCT No. PCT/SE88/00328, § 371 Date Feb. 26, 1990, § 102(e) Date Feb. 26, 1990, PCT Pub. No. WO88/10342, PCT Pub. Date Dec. 29, 1988**
**PCT Filed Jun. 16, 1988, Ser. No. 457,727**
**Claims priority, application Sweden, Jun. 26, 1987, 8702668**
**Int. Cl.[5] E02F *3/85*; E01H *6/00***
**U.S. Cl. 172—4.5** **4 Claims**

2. Device for constant pressure regulation of a work blade on a road machine where a hydraulic system comprising a first hydraulic cylinder (C1) operating on one side of the work blade and a second hydraulic cylinder (C2) operating on the other side of the work blade is arranged to regulate the vertical force of the work blade towards the underlying surface, characterized by that each hydraulic cylinder (C1,C2) is fed with a constant pressure at a plus-side of each cylinder and a constant pressure at a minus-side of each cylinder and that these pressures, are maintained by the arrangement of two pressure reducing valves (10,11) operated by two proportionally pressure limiting valves (14,15) on the plus-sides of the hydraulic cylinders and by the arrangement of two more pressure reducing valves (12,13) operated by two more pressure limiting



valves (16,17) in order to balance the pressure on the minus-sides of the hydraulic cylinders.



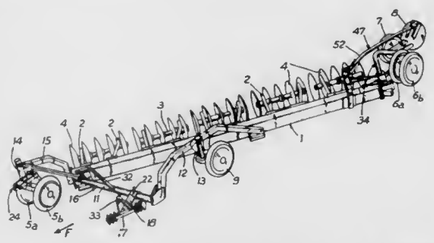
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**5,044,447**

## GUIDE AND CONTROL DEVICE FOR AN AGRICULTURAL MACHINE

**Jacques F. Langeoire, 103, Impasse Clémence de Genéve, Firembieres - 74100 Annemasse, France**

**Filed Mar. 1, 1990, Ser. No. 486,862**
**Claims priority, application France, Mar. 6, 1989, 89 02912**
**Int. Cl.[5] A01B *73/00***
**U.S. Cl. 172—26** **32 Claims**



1. In a guide and control device for use on an agricultural machine that is subjected during operation to lateral thrust relative to a direction of traction and that includes a frame equipped with soil-working members, front carrying wheels, rear carrying wheels and at least one furrow wheel, said guide and control device including systems for changing the wheels of the machine between respective road-travel positions thereof and respective working positions thereof, the improvement wherein said system for the rear carrying wheels and for the at least one furrow wheel comprises:

means, to be operatively connected to the rear carrying wheels and to the at least one furrow wheel, for pivotally moving the rear carrying wheels about an approximately vertical axis between the road-travel and working positions thereof and for simultaneously controlling the movement of the furrow wheel to tilt between a raised road-travel position thereof and a lowered working position thereof.

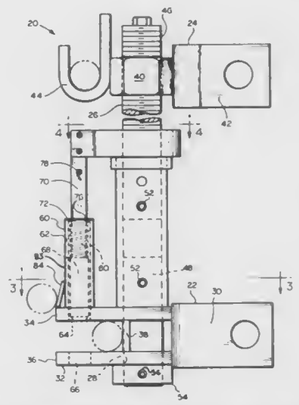
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**5,044,448**

## FARM IMPLEMENT ATTACHING FITMENT

**Bobby R. Lynch, and Robert L. Lynch, both of Ozark, Mo., assignors to TRI-L Manufacturing, Inc., Ozark, Mo.**

**Filed Feb. 3, 1989, Ser. No. 305,710**
**Int. Cl.[5] A01B *51/00***
**U.S. Cl. 172—272** **10 Claims**



8. A tractor implement attaching fitment comprising: a base member, a traveling member, a threaded rod assembly movably joining said members together such that said traveling member can be manually positioned a selected distance from said base member, said threaded rod assembly having a lower end section journalled in said base member and a coaxially disposed upper threaded section engaged in and extending through a nut section of said traveling member, each of said members having a front, a back, a top, a bottom and an open socket for receiving and holding an implement pin, said sockets being located on the fronts of said members, said socket on said traveling member being in the form of a hook with an entrance opening facing upwardly, said socket on said base member having an entrance opening facing forwardly, a clevis member affixed to the back side of each of said base and traveling members, and a latch mechanism for locking an implement pin in said base member socket.

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**5,044,449**

## FLEX TINE SOIL MULCHER

**Louis Stirek; Bruce J. Steffens, and Douglas B. Steffen, all of Griswold, Iowa, assignors to Triple S Engineering, Inc., Griswold, Iowa**

**Filed May 4, 1990, Ser. No. 519,294**
**Int. Cl.[5] A01B *23/04, 19/08, 35/20***
**U.S. Cl. 172—634** **8 Claims**

1. A flex tine soil mulcher adapted for travel in a longitudinal direction, comprising,

a plurality of spaced parallel elongated support arms extending laterally with respect to said longitudinal direction,

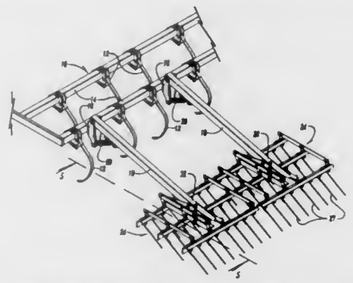
a plurality of elongated spaced soil engaging tines secured to each of said support arms and extending downwardly therefrom,

an upstanding bracket arm secured to each of said support arms;

said bracket arms being in longitudinal alignment with respect to each other, first and second parallel connecting arms pivotally secured to said bracket arms, whereby the angle of said tines with respect to a vertical plane can be adjusted by longitudinally moving one of said connecting arms with respect to the other of said connecting arms,

and stop means interconnecting said connecting arms to prevent longitudinal movement of one connecting arm

with respect to the other in a first longitudinal direction, but to permit free longitudinal movement therebetween in an opposite longitudinal direction, said stop means is a bar rigidly secured to one of said connecting arms, and ex-



tending adjacent said other connecting arm, with abutment means secured to the other connecting arm to engage said bar to prevent longitudinal movement between said connecting arms in said first longitudinal direction.

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**5,044,450**

## SPAR-BUOY BORING DERRICK AND MOORING FACILITY

**Hiroshi Aso, and Jyunichi Harada, both of Ikeda, Japan, assignors to Zeni Lite Buoy Co., Limited, Osaka, Japan**

**Filed Feb. 26, 1990, Ser. No. 485,270**
**Claims priority, application Japan, Feb. 28, 1989, 1-49157**
**Int. Cl.[5] E21B** *7/128, 7/132*
**U.S. Cl. 175—7** **6 Claims**



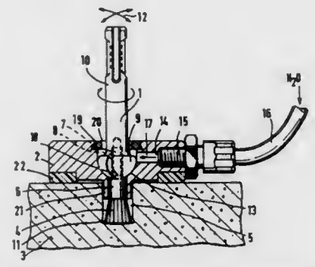
1. A pull-in mooring type spar-buoy boring derrick which is a spar-buoy scaffold, comprising a column which has a platform at the top, a buoy in the middle and a bottom plate at a lower end and is moored to a sinker at the bottom by a mooring facility to pull the buoy into the water so that the water line comes somewhere on the column above the buoy, and so that the scaffold stands upright in the water by buoyancy, and comprising a center pipe that houses a casing pipe and boring rod, running through the buoy and column, the lower end of said center pipe reaches the bottom plate of the column and the lower end of said center pipe is open in the water and the upper end of said center pipe reaches higher than the water level.

**5,044,451**

## DEVICE FOR FORMING AN UNDERCUT IN A DRILLED HOLE

**Artur Fischer, Waldachtal/Tumlingen, Fed. Rep. of Germany, assignor to Fischerwerke Artur Fischer GmbH & Co. KG, Tumlingen/Waldachtal, Fed. Rep. of Germany**

**Filed Jun. 29, 1990, Ser. No. 547,671**
**Claims priority, application Fed. Rep. of Germany, Jul. 21, 1989, 3924044**
**Int. Cl.[5] E21B** *1/00*
**U.S. Cl. 175—220** **6 Claims**



1. A device for forming an undercut in a drill hole, comprising a drilling tool having a shank adapted to be clamped in a chuck of a drilling machine and having a convex collar; a bearing element having a cavity with a concave bearing surface corresponding to a convex surface of said convex collar for supporting said convex collar, an opening for communicating with a source of lubricant fluid, and a bore communicating said opening with said cavity, said collar having at least one groove inclined to a longitudinal axis of said drilling tool; and a ring-shaped spring member for securing said drilling tool in said bearing element.

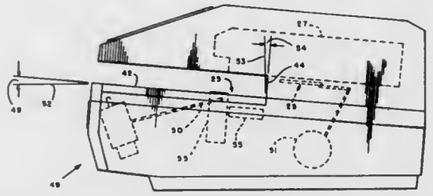
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**5,044,452**

## TILTED DECK MAIL HANDLING MACHINE

**Ralph K. Rand, Sandy Hook, Conn., and John J. O'Brien, San Francisco, Calif., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Continuation of Ser. No. 291,093, Dec. 28, 1988, abandoned. This application Feb. 20, 1990, Ser. No. 481,679**
**Int. Cl.[5] G01G** *23/38;* **B41J** *3/00*
**U.S. Cl. 177—2** **2 Claims**



1. In an article processing apparatus, the combination comprising:

feeder means for receiving a stack of varying size and thickness articles, said feeder means having a continuous feed deck, a reference wall extending longitudinally along one side of said deck, and having singulating means for withdrawing an article from the stack in a seriatim manner, sealing means for sealing said articles which are unsealed and feeder transport means for transporting said articles along said feed deck from said singulating means to and from said sealing means;

imprinting means for receiving said articles from said feeder transport means and printing on said articles, said imprinting means having a continuous imprinting deck, and having printing means including print members for imprinting on said article, said imprint means including an inker module having an ink pad for contact transfer of ink to said print members of said printing means, a supply ink reservoir and a pump means for causing ink to be delivered from said ink reservoir to said pad, and imprinting transport means for receiving articles from said feeder transport and positioning said article for imprinting by said imprinting means and causing said articles to be discharged from said imprinting means following imprinting; and

said feeder deck and said imprinting decks being tiltable reclined with respect to the horizontal at a matching angle of approximately 4 to 6 degrees.



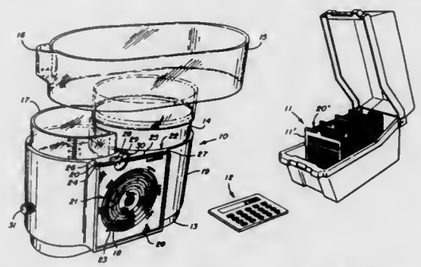
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**5,044,453**

## WEIGHING INSTRUMENT HAVING INTERCHANGEABLE SLIDES CARRYING GRADUATED SCALES

**Jack D. Bankier, Northbrook, Ill., and Kenneth J. Muderlak, Shorewood, Wis., assignors to Pelouze Scale Co., Evanston, Ill.**

**Filed Aug. 6, 1986, Ser. No. 893,652**
**Int. Cl.[5] G01G** *19/40*
**U.S. Cl. 177—25.16** **20 Claims**



1. A weighing instrument comprising a base, a platform for receiving material to be weighed and being vertically movable with respect to said base, a mechanical mechanism for rotating a shaft about an axis in response to the vertical movement of said platform with respect to said base, the angle of rotation of said shaft with respect to said base being an indication of the weight of said material, a pointer fixed to said shaft and disposed in a first plane perpendicular to said axis, and means for receiving and holding a slide in a second plane perpendicular to said axis and axially spaced from said first plane and in a predefined position with respect to said base for which said slide and said pointer are both visible and for engaging said slide only when said slide is placed in a predefined angular orientation about said axis, thereby permitting said slide to carry a scale graduated in selected units proportional to the weight of said material, and permitting said slide to be readily interchangeable with similar slides carrying scales having different graduations.

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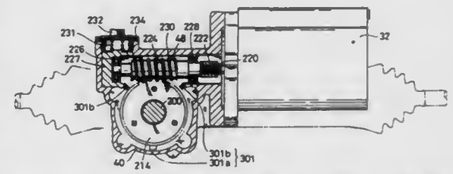
**5,044,454**

## REAR WHEEL STEERING DEVICE FOR A VEHICLE

**Hirokata Kanazawa, and Hiroshi Ohmura, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Sep. 26, 1990, Ser. No. 589,784**
**Claims priority, application Japan, Sep. 27, 1989, 1-253087**
**Int. Cl.[5] B62D** *5/06, 7/06*
**U.S. Cl. 180—79.1** **8 Claims**

1. A rear wheel steering device for a vehicle including: a rear wheel steering shaft for interconnecting left and right rear wheels; an electric motor; a transmission mechanism for transmitting an output from said electric motor to said rear wheel steering shaft; and said transmission mechanism having a rotatable element engaged with an output shaft of said electric motor, and a clutch to interrupt an output transmission from said electric motor to said rear wheel steering shaft wherein,



a stopper member is disposed to restrict a relative rotation of said rotatable element, thereby preventing an excessive rotation of said electric motor exceeding a fixed level.

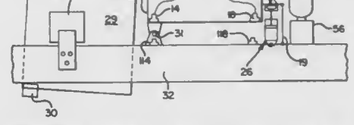
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**5,044,455**

## ACTIVELY CONTROLLED TRUCK CAB SUSPENSION

**Thomas C. Tecco, Ann Arbor, Mich., and Shao-Sheng R. Chu, LaFayette, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.**

**Filed Feb. 16, 1990, Ser. No. 480,989**
**Int. Cl.[5] B60G** *17/00*
**U.S. Cl. 180—89.13** **22 Claims**



1. A suspension system for actively controlling the pitch of a truck cab of a truck having a frame comprising:

means for connecting the cab to the frame while permitting controlled relative movement therebetween;

cab pitch sensing means operatively disposed to provide output signals indicative of the pitch of said cab, said cab pitch sensing means comprising vertical acceleration sensing means operatively disposed to provide output signals indicative of accelerations experienced respectively at a front portion and at a rear portion of said cab;

actuator means disposed between said frame and said truck cab adjacent a rear end thereof, said actuator means being capable of selectively raising or lowering said rear end edge of said cab relative to said frame upon activation thereof; and

automatic control means in communication with said sensing means and with said actuator means, said control means to produce a control signal output means responsive to said cab pitch signal to effect activation of said actuator means to move said rear end of said cab to reduce the pitching movement thereof, said control means including differencing means responsive to said output signals from said acceleration sensing means to produce said cab pitch signal.

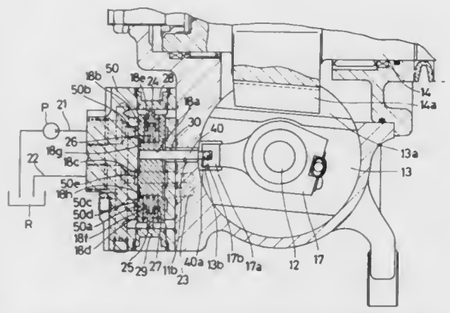
VOL 1130 ISS 1 SE 3 1991 UMI



**5,044,456**
## HYDRAULICALLY OPERATED POWER STEERING SYSTEM

**Yasuhito Hayashi, Toyota, and Hiroshi Hachisuka, Nishio, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Jan. 31, 1990, Ser. No. 472,872**
**Claims priority, application Japan, Jan. 31, 1989, 1-11229**
**Int. Cl.[5] B62D *5/087***
**U.S. Cl. 180—132** **4 Claims**



1. A hydraulically operated power steering system comprising:

a housing;

an input shaft rotatably mounted in the housing;

a reciprocal hydraulic operating cylinder means for moving a steering link mechanism and having first and second fluid chambers defined in an inner bore of the housing;

a power piston slidably disposed in the inner bore;

a reservoir containing hydraulic fluid;

a fluid pump feeding hydraulic fluid in the reservoir to the cylinder means;

a control valve device including a valve lever disposed in the power piston so as to be relatively rotatable with respect to the power piston and to move in an axial direction of the housing with the power piston in response to rotation of said input shaft, the valve lever having an engaging portion provided with an engaging surface extending in a direction of sliding movement of the power piston;

a valve spool slidably disposed in a bore separate from and perpendicular with respect to the inner bore and slidably engaged with the engaging portion of the valve lever so as to reciprocatingly slide in response to rotation of the input shaft, wherein the hydraulic fluid from the fluid pump is introduced into the first fluid chamber upon the rotation of the input shaft in a first direction and the hydraulic fluid in the second fluid chamber is discharged to the reservoir, the hydraulic fluid from the fluid pump is introduced into the second fluid chamber upon rotation of the input shaft in a second direction when the hydraulic fluid in the first fluid chamber is discharged to the reservoir;

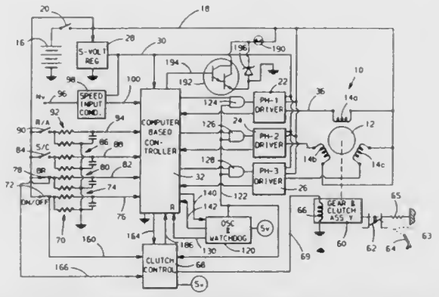
the engaging portion of the valve lever having a slot portion provided with the engaging surface at an inner circumferential portion and connected at an opposite end to the power piston; and

a pin member having a first end portion slidably engaged with the slot portion and a second end portion secured to the valve spool so as to connect the valve lever with the valve spool for movement therewith.

**5,044,457**
## MOTOR VEHICLE CRUISE CONTROL SYSTEM HAVING MODE DEPENDENT GAIN

**Steven W. Aikman, 7086 Timberwood Dr., Davison, Mich. 48423**

**Filed Dec. 15, 1989, Ser. No. 452,155**
**Int. Cl.[5] B60K *31/02***
**U.S. Cl. 180—178** **4 Claims**



1. In a motor vehicle speed control system for positioning an engine throttle in relation to a position command generated to maintain an actual speed at a desired speed, control apparatus comprising:

means for generating an error signal according to a difference between the actual and desired speeds;

means effective during a first control mode for generating said position command as a first function of said error signal;

means effective during a second control mode for generating said position command as a second function of said error signal, a change in said position command during said second control mode for a given change in said error signal being low relative to a corresponding change in said position command during said first control mode; and

transition control means effective in response to a change between said first and second control modes for offsetting the error signal such that said position command is substantially equal immediately before and after said change in control modes, thereby to effect a smooth transition between said first and second control modes.

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**5,044,458**
## DRIVE ENGAGEMENT FOR A SELECTIVELY ENGAGEABLE WHEELSET

**Reinhard Schwarz, Gondelsheim, and Dieter Nobis, Lonsee-Halzhausen, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.**

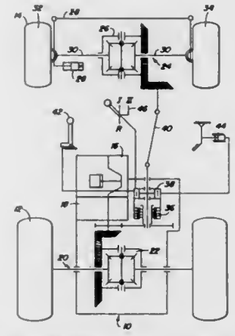
**Continuation of Ser. No. 296,912, Jan. 12, 1989, abandoned, which is a continuation of Ser. No. 103,482, Sep. 30, 1987, abandoned. This application Apr. 4, 1990, Ser. No. 505,093**
**Claims priority, application Fed. Rep. of Germany, Oct. 1, 1986, 3633424**
**Int. Cl.[5] B60K *17/344, 23/08***
**U.S. Cl. 180—248** **6 Claims**

1. A drive arrangement including a selectively engageable wheelset in a vehicle also having a substantially constantly engaged wheelset, a prime mover, and a differential drivingly connected to said selectively engageable wheelset, the arrangement comprising:

a freewheel having a first side drivingly connected to the selectively engageable wheelset via said differential and a second side;



an overload release clutch having a first side drivingly connected to said prime mover, said overload release clutch



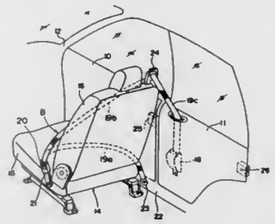
automatically disengaging when the torque transmitted therethrough exceeds a predetermined maximum.

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**5,044,459**
## AUTOMOBILE SEAT BELT APPARATUS

**Satoshi Nishikaji, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Oct. 25, 1989, Ser. No. 426,225**
**Claims priority, application Japan, Oct. 26, 1988, 63-270259**
**Int. Cl.[5] B60R *22/08***
**U.S. Cl. 180—268** **12 Claims**



1. In an automotive vehicle having a vehicle body structure defining a plurality of utility openings therein respectively leading into a passenger compartment, an engine compartment, and a trunk compartment, a seat assembly disposed within the vehicle body structure, and a plurality of closure members hingedly connected to the body structure over the utility openings, respectively, so as to be movable between open and closed positions at which the utility openings are respectively opened and closed by the closure members, the closure members including front, side doors hingedly connected over respective ones of the utility openings leading into the passenger compartment, rear, side doors hingedly connected over respective ones of the utility openings leading into the passenger compartment, a hood hingedly connected over one of the utility openings leading into the engine compartment, and a trunk lid hingedly connected over the utility opening leading into the trunk compartment, a seat belt apparatus for restraining an occupant of the seat assembly, said seat belt apparatus comprising:

a length of flexible belt having first and second opposite ends;

a belt anchor fixing the first end of said flexible belt relative to the vehicle body structure;

a seat belt retractor disposed within one of the rear, side doors,

said seat belt retractor including automatic winding means connected to the second end of said flexible belt for exerting a tension force on said belt that tends to automatically forcibly wind the belt into the seat belt retractor, locking mechanism means for preventing said belt from being able to be pulled out from the seat belt retractor when a predetermined acceleration acts on the seat belt retractor, and a cancelling mechanism operative to disable said locking mechanism means from preventing said belt from being pulled out from the seat belt retractor when said predetermined acceleration acts thereon; and

control means including belt detecting means for detecting whether at least one of the closure members other than said one of the rear, side doors is in the open position thereof,

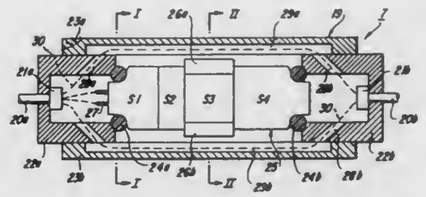
said control means operatively connected to said cancelling mechanism for operating said cancelling mechanism to disable said locking mechanism means when said detecting means has detected that said at least one of the closure members is in the open position thereof.

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**5,044,460**
## DOWNHOLE SEISMIC EXPLORATION DEVICE AND APPARATUS

**Masahiro Kamata, Tokyo; Shitomi Katayama, Kanagawaken, both of Japan; Francis Mons, Bonnelles, France, and Robert Porter, Bellevue, Wash., assignors to Schlumberger Technology Corporation, Houston, Tex.**

**Continuation of Ser. No. 887,307, Jul. 18, 1986, Pat. No. 4,953,136. This application Mar. 8, 1990, Ser. No. 490,187**
**Claims priority, application Japan, Jul. 24, 1985, 60-161793**
**Int. Cl.[5] G01V *1/00***
**U.S. Cl. 181—102** **7 Claims**



1. A device for use in geophysical exploration of earth formations traversed by a borehole, comprising:

sensor means having detecting means for detecting seismic acoustic data and having a clamping means for clamping the sensor means to a wall of a borehole;

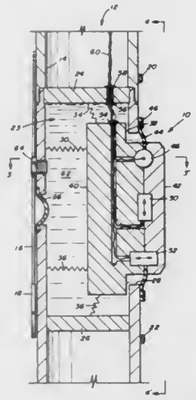
carrier means for carrying the sensor means, the carrier means defined by a front end block, a rear end block spaced from the front end block, and a pair of side blocks extending in parallel between the front and rear end blocks, the front end block being adapted for connection to a first point of a cable and the rear block being adapted for connection to a second point of the cable, and at least one of the pairs of side blocks being formed with a conduit passage for receiving conductors of the cable; and

damping means, comprising two O-rings interposed between the sensor means and the carrier means, for acoustically isolating the carrier means from the sensor means when the sensor means is clamped to the wall of the borehole.

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**5,044,461**
**DECOUPLED BOREHOLE SENSOR**
Peter S. Aronstam, Katy, Tex., assignor to Western Atlas International, Inc., Houston, Tex.
Filed Jan. 10, 1991, Ser. No. 639,549
Int. Cl.[5] G01V *1/40;* E21B *4/18*
U.S. Cl. 181—102 6 Claims

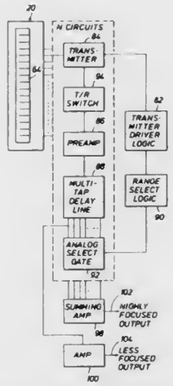


1. A downhole acoustic logging tool, comprising:
a sonde;
a closed and sealed compartment formed in said sonde;
a window in a side of said closed compartment;
a sensor module, characterized by tri-axial spatial sensitivity and including an exterior contact shoe;
passive support means for resiliently mounting said sensor module in said closed compartment with three degrees of freedom with respect to said sonde, said resilient mounting means including means for forcibly urging said exterior contact shoe to project outwardly through said window;
means, sealed within said closed compartment, for damping parasitic vibrations communicated to said sensor module;
means for displacing said sonde so that said exterior contact shoe is forcibly pressed against a wall of a borehole thereby to cause said shoe to retract inwardly into said compartment through said window against the force of said means for urging;
means, mounted in a wall of said closed compartment, for equalizing the pressure between the interior of said closed compartment and the ambient fluid pressure in said borehole.

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**5,044,462**
**FOCUSED PLANAR TRANSDUCER**
Voldi E. Maki, Jr., Austin, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.
Filed Jul. 31, 1990, Ser. No. 560,676
Int. Cl.[5] G01V *1/40;* H04N *5/30*
U.S. Cl. 181—103 17 Claims

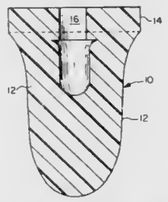
1. An acoustic borehole imaging system comprising:
(a) an acoustic piezoelectric transmitter and receiver transducer, said transducer being generally circularly disk shaped and having a thickness T, and being arranged to oscillate in a thickness mode when electrically excited by a potential difference applied across said thickness, and having N independent concentric circumferential regions therein wheren N is an integer;
(b) N acoustic transmitter circuits each of which is connected to one of said N concentric circumferential regions wherein said N acoustic transmitter circuits are operated in a timed sequence to produce potential differences across said thickness T so that said circumferential regions have timing dynamically variable according to a control function;
(c) N acoustic receiver circuits connected to said N circumferential regions where N is an integer, said N circumferential regions are each connected to one of N variable




duration delay lines with selectable outputs and whose selection is determined by a control means utilizing digital logic; and
(d) summing means to sum outputs of said N multiple tap delay lines and produce an acoustic pulse output.

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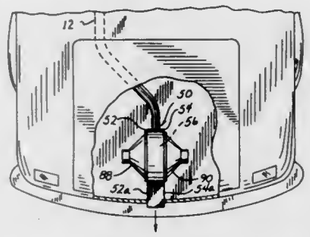
**5,044,463**
**MOLDED FOAM EARPLUG AND METHOD FOR MAKING SAME**
John W. Carr, Zionsville, Ind., assignor to Cabot Corporation, Waltham, Mass.
Filed Nov. 30, 1989, Ser. No. 443,142
Int. Cl.[5] H61B *7/02*
U.S. Cl. 181—135 15 Claims



1. A molded polymeric foam earplug of generally bullet shape comprising a base at one end and a nose at an opposite end and a length therebetween, wherein said earplug has an axial cavity which extends from said base to a point located a distance from said base of between 50% to 95% of the length of said earplug,
wherein said cavity has a diameter of sufficient size such that the earplug can be radially rolled down without the cavity flattening to a closed position in such a manner as to cause the earplug to form a large wrinkle or fold,
wherein said rolled down earplug can be inserted into a human ear canal and there allowed to expand and obturate the ear canal.



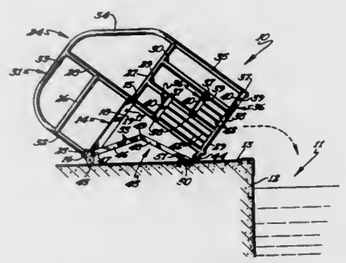
**5,044,464**
**ACTIVE ACOUSTIC ATTENUATION MIXING CHAMBER**
Cary D. Bremigan, Madison, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.
Filed Jan. 23, 1990, Ser. No. 468,590
Int. Cl.[5] F01N *1/06*
U.S. Cl. 181—206 34 Claims



1. Active acoustic attenuation apparatus for cancellation of noise from an exhaust pipe, comprising a chamber defined by an enclosing wall structure, said chamber having an input receiving exhaust from said pipe and directing said exhaust along a flowpath to a chamber output, said chamber having a section mounting an acoustic source directed along an axial centerline perpendicular to and offset from said flowpath, said acoustic source introducing sound into said chamber at a space having a transverse area at least as large as said acoustic source, to minimize acoustic loading of said acoustic source, the sound from said acoustic source cancelling undesirable noise in said exhaust.

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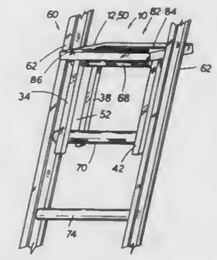
**5,044,465**
**RETRACTABLE WALK-IN SWIMMING POOL LADDER**
Robert M. Rinke, 2201-33 Ave. S., Fargo, N. Dak. 58104
Filed Oct. 29, 1990, Ser. No. 603,513
Int. Cl.[5] E06C *9/08*
U.S. Cl. 182—97 4 Claims



1. A retractable swimming pool ladder for use with swimming pools having vertical walls and an exterior deck, comprising;
a generally rectangular, substantially flat platform having front, rear and side edges,
a first pair of rollers journaled on said platform adjacent the rear edge thereof,
a pair of parallel substantially identical side frames secured to said platform adjacent the side edges thereof, said side frames each including a plurality of vertical and horizontal frame members,
a pair of side rails each being secured to vertical and horizontal frame members of one of said side frames,
a plurality of vertically spaced apart rectangular shaped steps extending between and secured to said side frames,
a second pair of rollers each being journaled on one of said side frames,
a foldable and extensible linkage means pivotally connected to said platform and pivotally connected to the deck, said linkage means being disposed in a folded condition when the swimming pool ladder is in a normal operative position, and being extended when the swimming pool ladder is in a retracted position, said first and second pairs of rollers respectively engaging the deck and a vertical wall of the swimming pool in rolling engagement therewith during shifting movement of the swimming pool ladder to a retracted position, and cooperating with said linkage means to position the swimming pool ladder completely on the deck exteriorly of the pool when the swimming pool ladder is in the retracted position.

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**5,044,466**
**LADDER PLATFORM**
Donald W. Jacobsmeyer, Jr., 1525 S. 8th St., St. Louis, Mo. 63104
Filed Apr. 23, 1990, Ser. No. 512,949
Int. Cl.[5] E06C *7/14*
U.S. Cl. 182—121 20 Claims



1. A platform for supporting an individual, tools, or other items while working on an extension a ladder with rungs, the platform comprising:
support means supported by a plurality of ladder rungs;
framework means for maintaining the support means in operative engagement with the ladder rungs, the framework means operatively associated with the support means, the framework means defining at least two laterally spaced apart rung engaging members, each rung engaging member receiving a plurality of ladder rungs; and
each of the rung engaging members defining a rung receiving gap.

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**5,044,467**
**SCAFFOLD**
Gary J. Heiden, Rte. 1, Box 324-B8, Meeker, Okla. 74855
Filed Jul. 17, 1989, Ser. No. 380,636
Int. Cl.[5] E04G *1/20*
U.S. Cl. 182—130 4 Claims

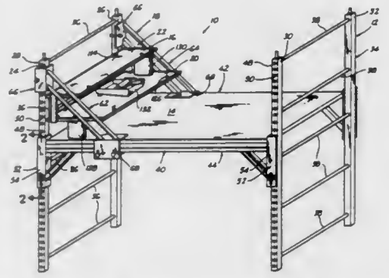
1. An auxiliary frame for mounting a plurality of auxiliary platforms above a main platform of a scaffold of the type wherein the main platform is supported by two parallel side trusses connected perpendicularly to a plurality of vertical end posts arranged in a substantially rectangular array, each of the vertical end posts extending upwardly from the side trusses and the main platform, the auxiliary frame comprising:
two substantially parallel side members spaced a distance apart substantially equal to the spacing between two of the vertical end posts, each of the side members characterized as having an upper end and a lower end;
first connecting means for connecting the upper end of each of the side members to one of the vertical end posts, the first connecting means comprising:

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a post engagement member constructed of angle stock having perpendicular webs engaging two sides of the vertical post; and

a bent rod having threaded end portions bolted to the webs of the post engagement member and a central portion extending about remaining sides of the vertical post;



second connecting means for connecting the lower end of each of the side members to one of the side trusses; and

means connected to the side members and extending therebetween for supporting the auxiliary platforms on the auxiliary frame.

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**5,044,468**

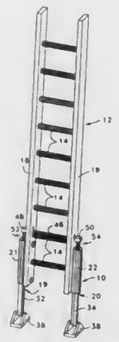
**LADDER LEVELING DEVICE**

**Charles L. Worthington, Jr., Winchester, Va., assignor to Worthington-Kemp, Winchester, Va.**

**Filed Nov. 9, 1990, Ser. No. 611,113**

**Int. Cl.[5] E06C *7/44***

**U.S. Cl. 182—202** **16 Claims**



1. A leveling device for a ladder having a plurality of spaced rungs extending between a pair of generally parallel side rails, said device comprising:

a pair of hydraulic cylinder/piston units adapted to be secured one to each of the lower ends of the ladder side rails, each of said units including an elongated cylinder having top and bottom ends, a piston to establish a working chamber with the upper interior of said cylinder, and a piston rod connected at one end to said piston and extending through the bottom of said cylinder to a ladder support end;

means for establishing a closed fluid passageway between said working chambers;

valve means for, in a closed position, closing said passageway to isolate said working chambers from each other and for, in an open position, opening said passageway to place said working chambers in fluid communication with each other; and

actuating means for selectively moving said valve means to said open or closed position, whereby the ladder support ends self adjust relative to the side rails when the valve means is in said open position and are fixed relative to said rails with stability in the properly oriented position, when the valve means is in the closed position, said actuating means being located in the region of a lower rung of the ladder and movable between an elevated valve-open position and a depressed valve-close position, whereby said valve means is closed by stepping on said actuating means in ascending the ladder.

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**5,044,469**

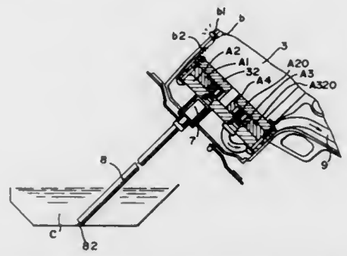
**PORTABLE AUTOMOBILE ENGINE OIL SUCTION PUMP**

**Chen C. Liu, No. 9, Lane 119, Sec. 3, Ho Ping East Road, Taipei, Taiwan**

**Filed Jul. 12, 1990, Ser. No. 551,805**

**Int. Cl.[5] F16N *33/00***

**U.S. Cl. 184—1.5** **3 Claims**



1. An improved portable type automobile engine oil suction pump having a housing, and an electric motor having an output drive shaft, the motor adapted to be connected to a source of electrical power comprising:

a) an internal gear pump comprising:

i) a first circular disk defining an opening;

ii) a second circular disk defining a suction inlet and an outlet;

iii) a cresent-shaped block protruding from an interior side of the second circular disk and extending generally between the suction inlet and outlet;

iv) a ring gear rotatably located within the opening defined by the first disk such that it is in contact with a convex surface of the cresent-shaped block;

v) a pinion gear in driving engagement with the ring gear and located such that it is in contact with a concave surface of the cresent-shaped block; and,

vi) means to attach the first and second disks to the electric motor such that the output drive shaft drivingly engages the pinion gear;

b) a suction pipe joint formed of electrically conductive material attached to the second disk such that the joint communicates with the suction inlet;

c) a suction tube having an electrically conductive wire extending therethrough attached to the suction pipe joint such that the wire is in electrically conductive contact with the suction pipe joint;

d) a visual light source; and,

e) electrical circuit means interconnecting the electric motor, the visual light source and the electrically conductive wire such that contact between the electrically conductive wire and a wall of an oil reservoir will cause the visual light source to be illuminated.



**5,044,470**

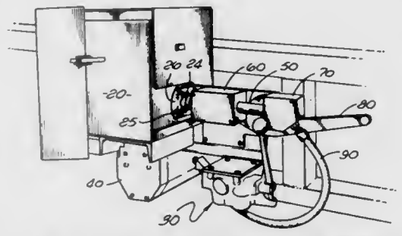
**LUBRICANT PUNCTURE DEVICE AND METHOD**

**Paul Nicholas, Burbank, Calif., assignor to Lubricating Specialties Company, Pico Rivera, Calif.**

**Filed Aug. 23, 1990, Ser. No. 572,180**

**Int. Cl.[5] F16N *21/00***

**U.S. Cl. 184—105.1** **4 Claims**



1. An apparatus that punctures a lubricant reservoir, the lubricant reservoir having a flexible wall that defines an inner cavity which contains lubricant, comprising:

a rod adapted to penetrate the flexible wall of the lubricant reservoir, said rod having a first bore adapted to allow the lubricant to flow through said first bore;

actuation means operatively connected to said rod to move said rod between a first position and a second position, wherein said rod is external to the lubricant reservoir in said first position and extending into the inner cavity of the lubricant reservoir in said second position such that the lubricant can flow through said first bore; and,

a support plate adjacent the flexible wall of the lubricant reservoir, said support plate having a hole;

a sealing housing that has a second bore adapted to allow said rod to move from said first position to said second position, said sealing housing having a lip extending through said support plate hole and adapted to engage the flexible wall when said rod is in said second position, said sealing housing further having a flange adapted to engage said support plate to limit movement of said sealing housing when said rod moves from said first position to said second position.

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**5,044,471**

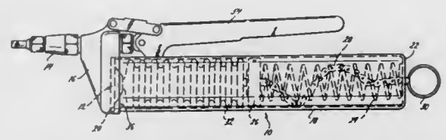
**GREASE GUN CARTRIDGE ADAPTER**

**John A. Machek, St. Louis, Mo., assignor to Lincoln, St. Louis, Mo.**

**Filed Apr. 23, 1990, Ser. No. 512,319**

**Int. Cl.[5] F16N *21/00***

**U.S. Cl. 184—105.2** **20 Claims**



1. An insert means for use with a fluid dispensing device of a type having a pump housing and a fluid supply casing connected to and separable from the pump housing, the pump housing having an interior and an exterior with a fluid supply opening provided on the pump housing exterior, the fluid supply casing having an interior and an exterior with an opening at one end of the fluid supply casing communicating with the fluid supply casing interior and the one end of the fluid supply casing being releasably connected to the pump housing fluid supply opening, the insert means adapting the fluid dispensing device for use with a separate fluid container of a type having an interior containing fluid and an outlet at one end of the fluid container communicating with the fluid container interior, the insert means comprising;

a support means adapted to be inserted into the pump housing fluid supply opening; and

a connector means on the support means, the connector means being adapted to be connected to the fluid container outlet and communicate the fluid container interior with the pump contained in the pump housing interior.

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**5,044,472**

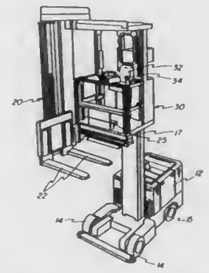
**DUAL OPERATOR POSITION FOR MATERIAL HANDLING VEHICLE**

**Ned E. Dammeyer, and Harold A. Stammen, both of New Bremen, Ohio, assignors to Crown Equipment Corporation, New Bremen, Ohio**

**Filed Dec. 5, 1989, Ser. No. 446,268**

**Int. Cl.[5] B66B *9/20***

**U.S. Cl. 187—9 R** **4 Claims**



1. A materials handling vehicle wherein the operator may operate the vehicle in either a standing or a sitting position, said vehicle including

an operator's seat,

switch means associated with said seat for indicating when the operator is in the seated position,

pedestal pedals mounted for operation by the operator when in the seated position,

dead man switch means associated with a pair of said pedestal pedals for indicating when said pedals are depressed, a brake switch associated with the third pedestal pedal,

a pair of floor mounted pedals positioned to be operated when the operator is in the standing position, and switches associated with said floor mounted pedals for indicating when said floor pedals are depressed, and

circuit means responsive to said seat actuated switch means wherein,

a) if the operator is standing, the seat actuated switch means is released, the floor operated switches control the braking of the vehicle, with braking being applied upon release of either of said switches, and

b) if the operator is sitting, the pedestal switches must both be activated to permit selected operations of the vehicle and lift truck functions, and wherein braking is controlled by the operation of said pedestal brake switch.

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**5,044,473**

**ELEVATOR WORK STATION APPARATUS**

**Thomas L. Gripe, 2719 El Rancho, Wichita, Kans. 67216**

**Filed Sep. 18, 1989, Ser. No. 408,281**

**Int. Cl.[5] B66B *1/26***

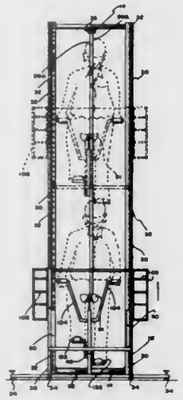
**U.S. Cl. 187—29.1** **25 Claims**

1. An elevator work station comprising a generally upright back having a top and a bottom, a base means generally secured normally to said upright back for supporting said upright back in a generally upright position; a work station means for supporting an operator and slidably secured to and along said

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upright back such that said work station means can travel generally from the bottom of said upright back to the top thereof; a work station movement control means for controlling the movement of said work station means and mounted to said work station means; and means for raising and lowering said work station means, said means for raising the lowering being engaged to said top of said upright back and controlled engageably by said work station movement control means; said upright back comprises a pair of hollow stanchion members with each stanchion member having a hollow structure defining an open slot wherethrough a structural portion of the work station means slidably passes such that the work station means



can readily slide up and down the pair of stanchions; said means for raising and lowering said work station means comprises a gear sprocket, a hub bound to said gear sprocket, a pair of cables connected to said hub and to said top of said upright back; and a means for rotating said gear sprocket; said work station means includes a pair of rotating guide rollers whereround said pair of cables pass; said means for rotating said gear sprocket comprises a pair of pedals geared t said gear sprocket; and said means for rotating said gear sprocket comprises a worm gear engaged by the pair of pedals, a horizontal gear geared to the worm gear and a vertical gear geared to the horizontal gear and to the gear sprocket.

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**5,044,474**

**ELECTRICALLY ADJUSTABLE SHOCK ABSORBER**

**Cornelis de Kock, Oud-Beijerland, Netherlands, assignor to Koni B.V., Oud-Beijerland, Netherlands**

**Continuation of Ser. No. 927,321, Nov. 4, 1986, abandoned. This application May 5, 1988, Ser. No. 188,641**

**Claims priority, application Netherlands, Nov. 5, 1985, 8503031**

**Int. Cl.[5] F16F** *9/34*

**U.S. Cl. 188—319** **3 Claims**

1. In a hydraulic shock absorber including a hollow fluid filled cylinder, piston means slidably and sealingly received in said cylinder for sliding movement axially of said cylinder and dividing the interior of said cylinder into a first and a second fluid chamber, and valve controlled passage means in said piston means for adjustably controlling the flow of fluid between said chambers induced by movement of said piston means axially of said cylinder;

the improvement wherein said piston means and valve controlled passage means comprise a piston having an axially extending flow chamber therein;

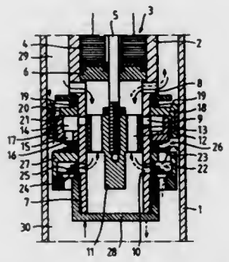
first passage means opening directly from said flow chamber into said first chamber of said cylinder;

second passage means spaced axially of said piston from said first passage means and extending from said flow chamber to said second chamber;

third passage means located axially of said piston between said first and said second passage means and extending from said flow chamber to said second chamber via third passage check valve means oriented to permit flow from said flow chamber into said second chamber and to block flow from said second chamber into said flow chamber;

a remotely controlled valve member mounted in said flow chamber for axial movement relative to said piston means between at least three selected rest positions, said valve member

(a) when in a first of said rest positions establishing fluid communication between said flow chamber and said first, second and third passage means;



(b) when in a second rest position blocking fluid communication between said flow chamber and said second passage means while maintaining fluid communication between said flow chamber and said first and third passage means and

(c) when in a third rest position blocking fluid communication between said flow chamber and said third passage means while maintaining fluid communication between said flow chamber and said first and second passage means, and bypass passage means through said piston for accommodating flow of fluid from said second chamber to said first chamber while blocking flow from said first chamber to said second chamber.

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**5,044,475**

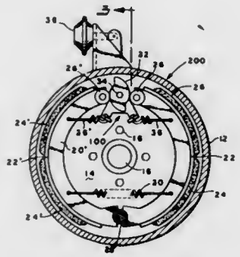
**ROTARY DRUM BRAKE ASSEMBLY BRACKET**

**James R. Clark, Plainwell, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Apr. 27, 1990, Ser. No. 515,899**

**Int. Cl.[5] F16D** *51/00*

**U.S. Cl. 188—329** **16 Claims**



1. A rotary drum brake assembly comprising;

a stationary backing plate,

a pair of opposed brake shoe assemblies respectively having one end pivotally secured to the stationary plate and carrying a frictional braking material facing towards the drum,



a cam disposed between the opposite ends of the brake shoe assemblies, said cam mounted on a rotary shaft and operative to rotate and urge said brake shoe assemblies away from each other and cause the frictional braking material to engage the drum upon actuation of the brake,

an anchor bracket having an aperture for receiving the rotary shaft therethrough, said bracket mounted on the shaft and movable relative thereto, and

biasing means, respectively securing each brake shoe assembly to the bracket and operative to urge the brake shoe assemblies towards each other and away from the drum upon release of the brake.

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**5,044,476**

**RIGID OR SEMI-RIGID SUITCASE MADE OF PLASTIC MATERIAL**

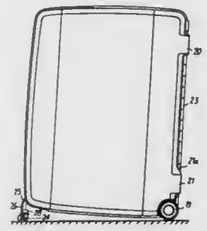
**Andre Seynhaeve, Senlis, France, assignor to Delsey S.A., Bobigny, France**

**Filed Jan. 18, 1990, Ser. No. 466,941**

**Claims priority, application France, Jan. 20, 1989, 89 00643**

**Int. Cl.[5] A45C** *5/14, 13/04*

**U.S. Cl. 190—18 A** **25 Claims**



1. An article of luggage comprising:

a one-piece, generally rigid central frame including a continuous peripheral wall defining an internal opening, the wall transversely extending between opposed peripheral edges and having an externally open recess between the peripheral edges of the wall at a peripherally elongated latch portion thereof;

an elongated, one-piece reinforcing member fixed to the latch portion of the wall to define with the recess an enclosed hollow beam, the reinforcing member including a latch mechanism cavity projecting into the hollow beam proximate each end of the elongated latch portion of the wall and an opening between the latch mechanism cavities for attachment of a top handle;

a first generally rigid shell fixed throughout its periphery to one peripheral edge of the wall; and

a second generally rigid shell including hinge means for pivotally connecting a hinge part of the shell periphery to a hinge portion of the wall for selective movement between an open position and a closed position wherein the entire periphery of the second shell engages the other peripheral edge of the wall, the hinge portion being in generally opposed relation to the latch portion of the wall.

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**5,044,477**

**TORQUE CONVERTER VISCOUS COUPLING BYPASS ELEMENT WITH IMPROVED SEAL ARRANGEMENT**

**Edward J. Bojas, Marshall; Lester R. Campbell, Jr.; Lawrence H. Williams, Jr., both of Battle Creek, and Charles A. Mains, Marshall, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Sep. 19, 1990, Ser. No. 584,962**

**Int. Cl.[5] F16D** *33/00*

**U.S. Cl. 192—3.29** **8 Claims**

1. A viscous coupling for use as a bypass element in a torque converter assembly including a torque converter housing and an output shaft; said viscous coupling being of the type including an annular housing assembly adapted to be positioned within the torque converter housing and having axially spaced, radially-extending annular side wall members defining an annular viscous chamber therebetween adapted to contain viscous fluid; said annular housing assembly defining a radially-extending annular clutching surface adapted for clutching coaction with a confronting surface of the torque converter housing; an annular clutch assembly disposed within said viscous chamber and including an annular, radially-extending clutch portion adapted for viscous clutching coaction with one of said side wall members, and an axially-extending clutch hub portion adapted to be drivingly associated with the output shaft of the torque converter assembly; said side wall members defining annular, axially-extending hub portions defined at a



radially inner extent of said side wall members, said side wall hub portions having inner peripheral surfaces journaled on outer peripheral surfaces of said clutch hub portion; said viscous coupling cooperating with said torque converter housing to define an upstream, high pressure chamber, and a downstream, low pressure chamber with regard to the flow of fluid within the torque converter assembly; characterized by:

(a) said inner peripheral surfaces of said side wall hub portions and said outer peripheral surfaces of said clutch hub portion cooperating to define a pair of seal chambers; and

(b) sealing members disposed in said seal chambers, said sealing members comprising substantially the only fluid seal between the upstream chamber of the torque converter assembly and said annular viscous chamber of said viscous coupling, along said clutch hub portion.

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**5,044,478**

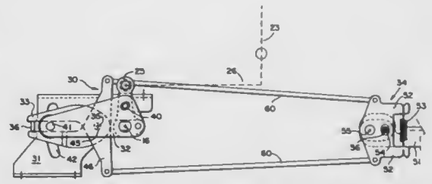
**FOOT PEDAL OPERATED POSITIONING CONTROL**

**Jurgen Kaesgen, Brunswick, and Rudolf Siegrist, Valley City, both of Ohio, assignors to MTD Products Inc, Cleveland, Ohio**

**Filed Feb. 26, 1990, Ser. No. 484,802**

**Int. Cl.[5] B60K** *20/00*

**U.S. Cl. 192—4 R** **18 Claims**



1. In a variable speed transmission having a rotary speed

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control including a neutral position, a positioning control comprising an actuation lever, said actuation lever having two ends, one end of said actuation lever being fixedly connected to the rotary speed control for rotation therewith, a bushing, said bushing being fixedly connected to the other end of said actuation lever, a stop, said stop being fixedly connected to the transmission with the alignment of said bushing to said stop placing the rotary speed control into its neutral position, jaws, said jaws being selectively moveable between two positions, one position of said jaws aligning said bushing with said stop, the other position of said jaws allowing the movement of said bushing in respect to said stop, and a selectively movable control, said selectively movable control actively moving said jaws to said one position thereof upon the selective movement of said movable control so as to place the rotary speed control into its neutral position.

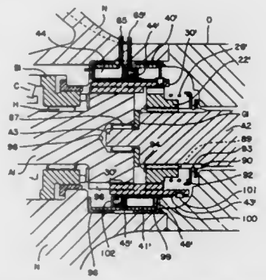
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**5,044,479**

## REMOTE-ACTIVATED, POWER SHIFT CLUTCH ASSEMBLY

**Harry A. Petrak, Boulder, Colo., assignor to Boulder 12 Investments, Boulder, Colo.**

**Filed Mar. 12, 1990, Ser. No. 491,736**
**Int. Cl.[5] F16D *39/00***
**U.S. Cl. 192—49** **18 Claims**



1. A clutch assembly to effect positive engagement and disengagement between a first rotatable drive member and second member to be driven and wherein an axially displaceable clutch member is keyed for rotation to said first drive member and a second clutch member is drivingly connected to said second member to be driven, said first clutch member movable into and out of intermeshing engagement with said second clutch member, pressure-responsive shift means associated with said first clutch member including annular non-rotatable pressure chamber means expandable and contractable in axial directions toward and away from said second clutch member, and fluid pressure operator means for applying positive pressure to said shift means for positively advancing said first clutch member into and out of engagement with said second clutch member.

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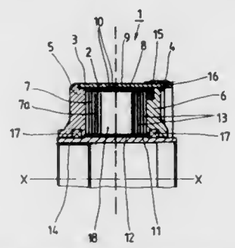
**5,044,480**

## FLUID FRICTION COUPLING

**Herbert Taureg, Hennef, Fed. Rep. of Germany, assignor to Viscodrive GmbH, Lohmar, Fed. Rep. of Germany**

**Filed Jun. 13, 1990, Ser. No. 537,368**
**Claims priority, application Fed. Rep. of Germany, Jun. 26, 1989, 3920790**
**Int. Cl.[5] F16D *31/00***
**U.S. Cl. 192—58 B** **12 Claims**

1. A fluid friction coupling for transmitting different torques in two rotation directions, comprising:
a housing as a first coupling part;
at least one hub rotatably supported therein as a further coupling part;
outer plates non-rotatingly associated with the housing; and
inner plates non-rotatably associated with the at least one hub, the outer and the inner plates being alternately arranged in a certain sequence and the plates of at least one of the plate sets being arranged so as to be axially movable, and a part of the housing interior not occupied by plates being at least partially filled with a viscous medium,



at least one of the plates (**7**, **7***a*) associated with one of the coupling parts (**2** or **11**) being held non-rotatably in one direction of rotation by shearing resistance and relatively rotatably in an opposite direction of rotation relative to the coupling part (**2** or **11**) with which it is associated, so that a different number of plates transmit torque in the one direction than the number of plates that transmit torque in the opposite direction.

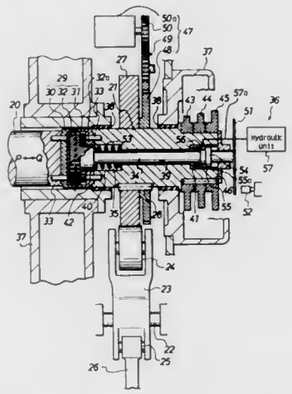
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**5,044,481**

## APPARATUS FOR ADJUSTMENT OF KNOCK-OUT TIMING FOR PRESS

**Takeshi Yoshida, and Yoshinori Goto, both of Sagamihara, Japan, assignors to AIDA Engineering Ltd., Sagamihara, Japan**

**Filed Jul. 17, 1990, Ser. No. 553,379**
**Claims priority, application Japan, Jul. 28, 1989, 1-88742[U]**
**Int. Cl.[5] F16D *11/00, 25/061***
**U.S. Cl. 192—67 R** **9 Claims**



1. An apparatus for adjustment of knock-out timing for a press having a drive shaft, comprising:
a first rotary shaft for synchronously rotating with the drive shaft;
a second rotary shaft coaxial with said first rotary shaft;
a drive cam mounted to said second rotary shaft for driving a knock-out mechanism;
a clutch, disposed at connecting surfaces between said first and second rotary shafts, and shiftable between an engaged condition in which said clutch connects said first and second rotary shafts together and a disengaged condition in which said first and second shafts are disconnected, said clutch comprising a driving gear, a driven gear and a connector gear, said driving and driven gears being internal gears which are mounted at said connecting surfaces and said connector gear being an external gear which is mounted axially movable with respect to said first and second rotary shafts between a first position in engagement with both said driving gear and said driven gear and a second position disengaged from one of said driving gear and said driven gear;
a connector means for shifting said clutch into said engaged condition;
a separator means for shifting said clutch from said engaged condition into said disengaged condition; and
a rotating means for rotating only one of said first rotary shaft and said second rotary shaft, while said clutch is in said disengaged condition.



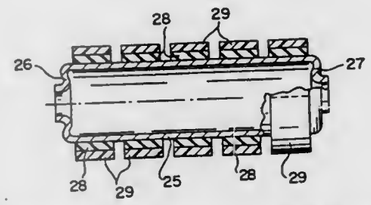
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**5,044,482**

## RUBBER-PLASTIC COMPOSITE

**James H. Kramer, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Division of Ser. No. 794,896, Nov. 4, 1985, Pat. No. 4,768,761, which is a division of Ser. No. 592,031, Mar. 21, 1984, Pat. No. 4,585,215, which is a continuation-in-part of Ser. No. 530,934, Sep. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 360,092, Mar. 19, 1982, abandoned. This application Apr. 25, 1988, Ser. No. 185,563**
**Int. Cl.[5] B65G *13/00***
**U.S. Cl. 193—37** **5 Claims**



1. An elastomeric plastic support roller having a cylindrical hollow shaft, a plurality of laterally spaced elastomeric annular members bonded to said hollow shaft, each of said elastomeric members are in compression, and each of said elastomeric members having bonded to their exterior surface a relatively thick ultra high molecular weight polyethylene cylindrical sleeve that is coextensive with the lateral dimensions of said elastomeric annular members to provide said shaft with a plurality of axially spaced rollers.

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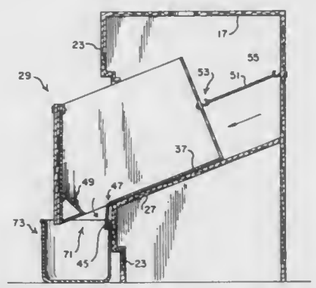
**5,044,483**

## COIN BOX FOR A SLOT MACHINE

**Alexander Stefan, 216 E. Arby Ave., Las Vegas, Nev. 89119**

**Filed Jun. 11, 1990, Ser. No. 536,322**
**Int. Cl.[5] G07F *9/06***
**U.S. Cl. 194—350** **6 Claims**

1. Coin receptacle and dispensing assembly for use with a slot machine, and being mountable within an enclosure below said slot machine, said enclosure adapted to allow passage of downwardly discharged coins from said slot machine, said assembly including:
a) downwardly and forwardly sloped support and guide means mounted within said enclosure, and extending towards an opening in the front wall of said enclosure;
b) coin box, open-topped and having a bottom and sidewalls including a front wall which define a coin-receiving compartment, said box adapted to engage said downwardly sloped support means for gravitationally urged movement along said guide means and outwardly of said enclosure through said opening, said box having a fully enclosed position wherein the front wall of said box covers said enclosure opening and wherein said box is aligned to receive coins discharged from said slot machine, the forward part of the bottom of said box having a pivotally mounted, transversely extending flap and mean supporting said flap in a closed configuration when it lies inwardly of said enclosure, and said flap being pivotable to create a coin-passing opening in said bottom when said box is moved outwardly sufficiently to carry said flap beyond said means supporting said flap;
c) lock means for releasably locking said cash box in its fully enclosed position;



d) releasable latch means for holding said box against further outward movement beyond a partial withdrawn position for partially exposing the open top of said box to allow viewing of said compartment and in which position said flap is held closed, said box being outwardly movable to a discharge position when said latch is released, in which discharge position said flap is moved beyond said flap support means to allow it to open; and
e) stop means operative between said box and said enclosure for limiting further movement of said box outwardly beyond its discharge position.

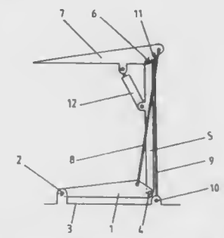
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**5,044,484**

## ENDLESS CONVEYOR ELEVATOR WITH FOLDABLE SUPPORT FRAME

**Patrick J. Douglas, Santon, Isle of Man, assignor to Extec Screens & Crushers Limited, Sheffield, England**

**PCT No. PCT/GB89/00397, § 371 Date Jan. 23, 1990, § 102(e) Date Jan. 23, 1990, PCT Pub. No. WO89/09740, PCT Pub. Date Oct. 19, 1989**
**PCT Filed Apr. 17, 1989, Ser. No. 438,483**
**Claims priority, application United Kingdom, Apr. 15, 1988, 8808999**
**Int. Cl.[5] B65G *15/26***
**U.S. Cl. 198—313** **6 Claims**



1. An endless conveyor elevator having a foldable support frame and which comprises:
a chassis;
a tail conveyor portion pivotally mounted at one end on the

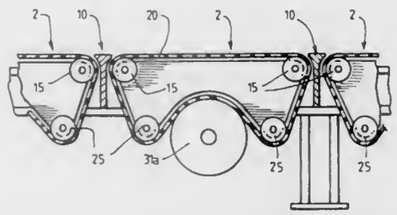
VOL 1130 ISS 1 SE 3 1991 UMI



chassis and intended to form a lower input end of the elevator;
a head conveyor portion intended to form an upper discharge end of the elevator;
an intermediate conveyor portion pivotally connected to the tail portion and to the head portion;
at least one link member pivotally connected at one end to the chassis and at its other end to the conveyor in the region of the pivotal connection between the head conveyor portion and the intermediate conveyor portion; and
an actuator coupled with the conveyor elevator and operable to move the conveyor portions between an inoperative folded position and an unfolded working position;
in which the geometry of the conveyor portions and the link member, and the mounting of the tail conveyor portion and the link member on the chassis are such that;
when the conveyor elevator is in its folded inoperative position the tail conveyor portion is constrained to extend substantially horizontally over the chassis; the intermediate conveyor portion is constrained to extend upwardly of the tail portion; and the head conveyor portion is constrained to extend substantially horizontally of the upper end of the intermediate conveyor portion; and
when the conveyor elevator is in its unfolded working position the conveyor portions extend substantially rectilinearly as a rigid assembly and in an upwardly sloping direction from the mounting of the tail portion on the chassis.

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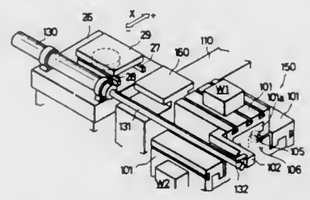
**5,044,485**
**MOVING WALKWAY**
**John L. Loder, Hawthorn, Australia, assignor to Loderway Pty. Limited, Australia**
**Continuation of Ser. No. 384,707, Jul. 25, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 609,014**
**Claims priority, application Australia, Jul. 25, 1988, PI9432; Jan. 9, 1989, PI2195**
**Int. Cl.[5] B66B *29/08***
**U.S. Cl. 198—325** **10 Claims**




1. A beltway system for the transport of standing passengers, said system comprising, for the full length of the system, a plurality of co-linear sequentially disposed slider belt sections moving in the same direction; each said slider belt section comprising first and second spaced small diameter rollers which define receiving and delivery ends of the corresponding section, and a thin flat flexible continuous slider belt passing over and around said rollers to provide upper and lower runs; the diameters of said small diameter rollers being less than 70 mm and said sections being disposed closely adjacent to one another so that the spacing between the upper runs of adjacent belts is such that the footwear of even the smallest standing child passenger travelling from the delivery end of the belt of one section to the receiving end of the belt of the adjacent section is in contact with the belt of the adjacent section before losing contact with the belt of the one section; a transfer plate disposed between at least first and second adjacent beltway sections and extending across the width thereof, the transfer plate having a smooth upper surface and being formed so as to terminate at each edge thereof so closely to the belt of the second section as to restrict the entrance of a body between the transfer plate and the belt of the second section and at a level so as to provide a smooth transition from the belt of the first section to the belt of the second section, the transfer plate being located, at least on the side adjacent the delivery end of the first section, below the general level of the surface of the belt of said first section, the speed of the belt of the first section in relation to the radius defined by the belt of the first section as the belt passes over the roller at the delivery end of the belt of the first section and the spacing of the transfer plate below the general level of the surface of the belt of the first section being such that a body moving from the delivery end of the belt of the first section and falling under gravity cannot strike the transfer plate until the body has passed the junction between the belt of the first section and the transfer plate.

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**5,044,486**
**PALLET MAGAZINE**
**Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Toyama, Japan**
**Filed Jun. 2, 1989, Ser. No. 360,481**
**Claims priority, application Japan, Jun. 7, 1988, 63-138320**
**Int. Cl.[5] B65G *37/00***
**U.S. Cl. 198—346.1** **10 Claims**



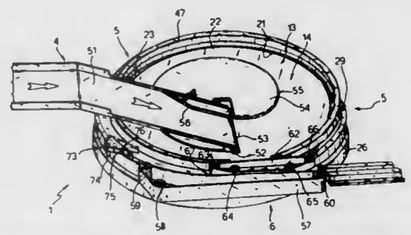

1. In a machine tool which includes a table (26) movable along a first direction (X) and a pallet magazine for setting a plurality of pallets (101) each having a first engaging means (102), the pallet magazine including a column (110), a swing unit (150) mounted on the column (110), and a pallet-carrying means (130) having a second engaging means (132) and mounted on the table (26) for carrying a pallet (101) between the table (26) and the swing unit (150), the swing unit (150) comprising:
a turntable (103) having a horizontal axis of rotation and a plurality of rails (104) for slidably receiving a pallet (101);
a driven means (140) mounted on the column (110) for rotating the turntable (103) about the horizontal axis; and
an indexing means for securing the turntable at a desired position after rotation by the drive means (140),
wherein the first and second engaging means (102 and 130) can be engaged by moving the table (26) in the first direction (X) and then the pallet (101) can be carried from the swing unit (150) to the table (26) by actuating the pallet-carrying means (130).

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**5,044,487**
**PRODUCT ALIGNING DEVICE, PARTICULARLY FOR SUPPLYING WRAPPING MACHINES**
**Mario Spatafora, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D Societa per Azioni, Bologna, Italy**
**Filed May 1, 1990, Ser. No. 518,505**
**Claims priority, application Italy, May 18, 1989, 3469 A/89**
**Int. Cl.[5] B65G *47/24***
**U.S. Cl. 198—392** **9 Claims**

1. A product aligning device (1) designed to receive said product (2) in bulk and to feed the same, correctly oriented and aligned, on to a manufacturing machine (3), in particular, a wrapping machine; said device (1) comprising a flat disc (13) turning about a first axis (15); first actuating means (35) for turning said disc (13) about said first axis (15) at a first given speed; means (51) for feeding said product (2) in bulk on to the upper surface (14) of said disc (13); and conveyor means (6) defining, for a neatly arranged row of said product items (2), an output route substantially tangent to the outer edge (22) of said disc (13); characterised by the fact that said device further comprises an inner annular body (20) turning about a second axis (17); and second actuating means (38) for turning said inner annular body (20) about said second axis (17) at a second given speed; said inner annular body (20) presenting an upper annular surface (23) located between said outer edge (22) of said disc (13) and said conveyor means (6) and defining a first annular route for a neatly arranged row of said product items (2), and a substantially cylindrical inner lateral surface (21)

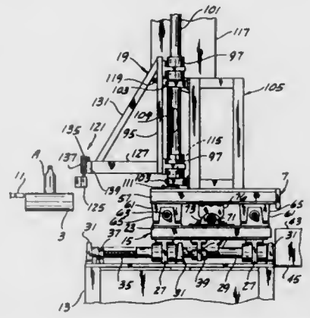





surrounding said outer edge (22) of said disc (13) and defining, with the upper surface (14) of the same, a second annular route for said product items (2); said first route being inclined in relation to both said second route and said output route, so as to define a first junction between said first and second routes, and a second junction between said first and said output routes, said first speed being such as to enable said product items (2) to be fed, by centrifugal force, from respective positions on said upper surface (14) of said disc (13) on to said second route and, one by one, through said first junction on to said first route.

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**5,044,488**
**ARTICLE TRANSFER APPARATUS**
**James A. Bolin, Tulsa, Okla., assignor to Liberty Glass Company, Sapulpa, Okla.**
**Filed Dec. 8, 1989, Ser. No. 447,662**
**Int. Cl.[5] B65G *25/00***
**U.S. Cl. 198—430** **4 Claims**




1. Apparatus for transferring articles such as glass containers from a first conveyor, on which the containers are travelling generally horizontally in line one after another in a first direction on a first horizontal axis, on to a second conveyor extending in a second direction on a second horizontal axis generally at right angles to the first axis from one side of the first conveyor, said apparatus being operable in cycles to transducer on each cycle a group of articles from the first to the second conveyor with the articles in the group extending in a row transversely of the second conveyor, said apparatus comprising:
a base positionable at the other side of the first conveyor from the second conveyor,
a first carriage mounted on the base for linear horizontal sliding movement at right angles to said first axis between a retracted position spaced away from the first conveyor and an advanced position past the first conveyor,
means for effecting linear horizontal reciprocation of said first carriage back and forth between its retracted and advanced positions comprising a screw shaft mounted on the base extending horizontally at right angles to said first axis, a nut fixed to the bottom of said first carriage, the screw shaft extending through the nut in threaded interengagement therewith, and an electric motor mounted on the base for driving the screw shaft,
a second carriage mounted on the first carriage for reciprocation with the first carriage and for linear horizontal sliding movement on the first carriage parallel to said first axis between a rearward retracted position and a forward advanced position relative to said first conveyor and said first carriage,
means for effecting linear horizontal reciprocation of said second carriage relative to said first carriage back and fourth between its said rearward and forward positions comprising a second screw shaft mounted on the first carriage extending horizontally parallel to said first axis, a second nut fixed to the bottom of said second carriage, said second screw shaft extending through said second nut in threaded interengagement therewith, and a second electric motor mounted on said first carriage for driving said second screw shaft,
said second carriage carrying a pair of slide guides extending vertically parallel to one another in a vertical plane parallel to said second screw shaft at one side of the second carriage toward the first conveyor,
a third carriage mounted on said slide guides for movement with the second carriage and for linear vertical sliding movement relative to said second carriage between a lowered position and a raised position relative to the second carriage,
means for effecting linear vertical reciprocation of said third carriage up and down relative to said second carriage between said lowered and said raised positions comprising a third screw shaft mounted on said second carriage extending vertically between said slide guides at said one side of the second carriage in a vertical plane at right angles to said second screw shaft, a third nut fixed to said third carriage, said third screw shaft extending vertically through the nut in threaded interengagement therewith, and a third electric motor carried by said second carriage for driving said third screw shaft,
pusher means carried by said third carriage for pushing a group of articles off the first conveyor on to the second conveyor,
said pusher means being located at such an elevation relative to the first conveyor when the third carriage is in its said lowered position for engagement with said group of articles on the first conveyor on movement of the third carriage with the second and third carriages from the retracted position of the first carriage to its advanced position, and at such an elevation when the third carriage is in its said raised position as to clear the tops of articles on the first conveyor, and
a programmable controller for controlling said first, second and third electric motors for operation in cycles each starting with the first carriage in its retracted position, the second carriage in its rearward position and the third carriage down in lowered position and comprising sliding the first carriage inwardly from its retracted to its advanced position and sliding the second carriage forward to its forward position and concomitantly moving the pusher means forward for pushing a group of articles off the first conveyor and onto the second conveyor, then raising the third carriage to its raised position for clearing articles advancing on the first conveyor, moving the sec-

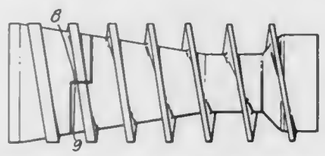
VOL 1130 ISS 1 SE 3 1991 UMI



ond carriage back to its rearward position, moving the first carriage back to its retracted position to retract the pusher means, and then moving the third carriage back down to its lowered position.

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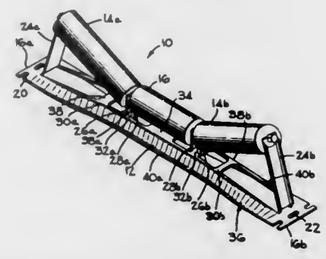
**5,044,489**
**FEED SCREW**
**Jaakko Barsk, Tampere; Pekka Havola, Parainen; Olli Kekäläinen, and Rantanen, both of Toijala, all of Finland, assignors to Oy Partek Ab, Toijala, Finland**
**Continuation of Ser. No. 342,791, Apr. 25, 1989, abandoned. This application Sep. 6, 1990, Ser. No. 579,282**
**Claims priority, application Finland, Apr. 27, 1988, 881980**
**Int. Cl.[5] B65G *33/32***
**U.S. Cl. 198—666** **9 Claims**



1. A feed screw for feeding a mix for slide casting products out of concrete that include one or more cavities, said screw comprising:
a core part which becomes thicker towards its trailing end,
a screw spiral that revolves continuously around said core part,
a detachable tip portion provided at the thicker end of the core part,
said detachable tip portion being sleeve-shaped,
an inner part that constitutes a projection on the core part of the feed screw,
said tip portion being detachably supported by the inner part of the core part,
said tip portion including a counter-face,
the core part including at least one front face which, when the screw revolves, pushes ahead of itself the counter-face provided in the tip portion and transmits a torque to the tip portion, and
said front face in the core part extending to the outer face of the screw.

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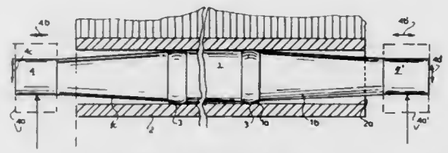
**5,044,490**
**BELT CONVEYOR IDLER SUPPORT FRAME**
**Charles F. East, Van Vleet, Miss., assignor to FMC Corporation, Chicago, Ill.**
**Filed Dec. 1, 1989, Ser. No. 444,461**
**Int. Cl.[5] B65G *15/08***
**U.S. Cl. 198—830** **6 Claims**



1. An elongate support beam having mounting pad sections at the ends thereof and a midpoint section between the mounting pad sections and having a major longitudinal axis for use in support one or more than one idler rolls thereon, each idler roll having a major longitudinal axis generally aligned in a vertical plane projecting from the longitudinal axis of said elongate support beam, said support beam having first and second compression flanges gradually increasing in height and angle from the mounting pad sections to the midpoint section of the support beam; and
at least one pair of roll support brackets extending upwardly from said elongate support beam to support one or more than one idler roll thereon.

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**5,044,491**
**SUPPORT ROLL FOR BELT CONVEYORS, PROCESSING CONVEYORS AND PRESSES, ESPECIALLY DOUBLE-BELT PRESSES**
**Rupert Harreither, Baden, Austria, assignor to Austria Metall Aktiengesellschaft, Braunau, Austria**
**Filed Sep. 27, 1989, Ser. No. 413,527**
**Claims priority, application Austria, Sep. 27, 1988, 2376/88**
**Int. Cl.[5] B65G *39/10***
**U.S. Cl. 198—842** **5 Claims**



1. A support roll for a transport belt, press belt or process belt, especially for a press belt of a double-belt press, comprising:
a support tube having an outer surface engageable with a belt and supported other than at opposite ends of said tube;
a support shaft concentric with said tube and extending continuously therethrough, said shaft having opposite axial ends projecting from and beyond said opposite ends of said tube;
bearings at said opposite axial ends of said support shaft journaling said shaft and supporting the support shaft; and
two circumferential protuberances formed on said support shaft and bearing radially upon said support tube spaced inwardly from ends of said tube and spaced apart from one another for supporting said tube against bending, one of said protuberances being coupled axially with said tube member, each of said protuberances being formed by a plurality of ring segments on said shaft.

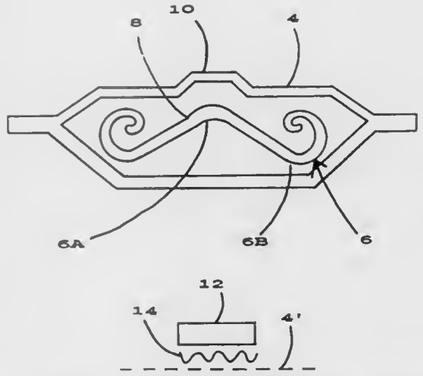
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**5,044,492**
**ORIENTATION-INDICATING CONDOM PACKAGE**
**Abraham E. Auerbach, P.O. Box 256, Oracle, Ariz. 85623**
**Filed Aug. 20, 1990, Ser. No. 569,634**
**Int. Cl.[5] B65D *85/00***
**U.S. Cl. 206—69** **6 Claims**

1. A condom package, comprising:
a container having a configuration with two major sides, said sides each having an external surface and an internal surface, said external surfaces of said major sides facing in opposing directions, said internal surfaces facing each other, said internal surfaces having corresponding portions which are spaced apart in a first direction normal to said major sides so as to define a volume therebetween,
said volume having a first dimension, designated a thickness, which is measured in said first direction and between said corresponding portions,
said volume having a second dimension, designated a width, which is measured in a second direction generally parallel to said sides and perpendicular to said first direction, said width being the minimum size of said volume in said second direction,

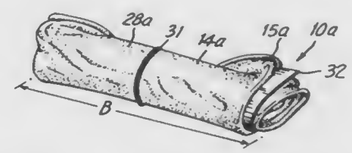


said thickness of said volume being being smaller than said width thereof such that said volume is generally flat,
a rolled condom being enclosed within said volume of said container,
said external surface of one of said major sides of said container containing tactile means for indicating the orientation of said rolled condom within said container, said tactile means comprising an integral protrusion on said corresponding portion of said one major side, said protrusion having an area, as measured parallel to said major sides, which is smaller than the area of said corresponding portion of said one major side.
4. A condom package, comprising:
a container having a configuration with two major sides, said sides each having an external surface and an internal surface, said external surfaces of said major sides facing in opposing directions, said internal surfaces facing each other, said internal surfaces having corresponding portions which are spaced apart in a first direction normal to said major sides so as to define a volume therebetween,



said volume having a first dimension, designated a thickness, which is measured in said first direction and between said corresponding portions,
said volume having a second dimension, designated a width, which is measured in a second direction generally parallel to said sides and perpendicular to said first direction, said width being the minimum size of said volume in said second direction,
said thickness of said volume being being smaller than said width thereof such that said volume is generally flat,
a rolled condom being enclosed within said volume of said container,
said external surface of one of said major sides of said container containing tactile means for indicating the orientation of said rolled condom within said container, said tactile means comprising a tactile discernable element which is adhesively secured to said corresponding portion of said one major side, said tactile discernable element having an area, as measured parallel to said one major side, which is smaller than the area of said corresponding portion of said one major side.

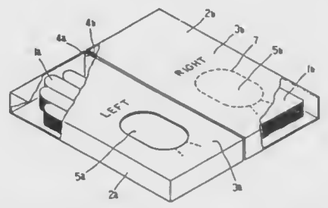
**5,044,493**
**ROLLED GLOVE PAIR HAVING CIRCUMSCRIBING BINDING**
**Mark A. Crawford, Sandy; T. Andrew Guhl, Salt Lake City, and J. Robert Stanley, West Jordan, all of Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.**
**Filed Sep. 27, 1988, Ser. No. 249,792**
**Int. Cl.[5] B65D *85/18***
**U.S. Cl. 206—293** **5 Claims**



1. A compact package for a glove pair comprising:
a glove pair formed of a think flexible resilient material and each glove in the pair placed juxtaposed to one another with the glove pair having a plurality of finger ends against one another, a pair of hand parts against one another and a pair of cuff portions against one another and the glove pair rolled up together along a longitudinal elongate dimension from the finger ends to the cuff portions, to drive air entrapped within the gloves by the process of rolling from the finger ends to the cuff portions, and to present the cuffs of each glove at the outer periphery of the rolled generally cylindrical glove pair for ease in access to the inside of each glove during donning; and
a binding located about the middle of the rolled glove pair circumscribes the cylindrical glove pair formed thereby for holding the rolled glove pair together.

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**5,044,494**
**PACKAGING MEANS FOR A PLURALITY OF PAIRS OF THROWAWAY THREE-DIMENSIONAL HAND COVERINGS**
**Shinpei Tamura, Hiroshima, Japan, assignor to Nippon Technics Kabushiki Kaisha, Hiroshima, Japan**
**Filed May 19, 1989, Ser. No. 355,178**
**Claims priority, application Japan, May 28, 1988, 63-131074**
**Int. Cl.[5] B65D *85/18***
**U.S. Cl. 206—299** **1 Claim**



1. A packaging case for a plurality of pairs of throwaway three-dimensional hand coverings, comprising:
an opaque left box having a rectangular shape, said left box being filled with a plurality of three-dimensional left hand coverings which are stacked upon each other, said left box having a hole in an upper surface thereof for permitting removal of said left hand coverings therefrom, and said left box having a ridge which extends longitudinally along one edge thereof;
an opaque right box having a rectangular shape, said right box being filled with a plurality of three-dimensional right hand coverings which are stacked on each other, said right box having a hole in an upper surface thereof for

permitting removal of said right hand coverings therefrom, and said right box having a ridge which extends longitudinally along one edge thereof;

said left and right boxes being foldably connected with each other along said ridges thereof;

said left and right hand coverings defining respective shapes which are different but are substantially mirror images of each other, said left and right boxes having visible indicia marked on said upper surfaces thereof for uniquely identifying each said box and facilitating selecting said left and right hand coverings; and

each said hand covering including a base portion and a plurality of finger portions extending from said base portion, said hand coverings being stacked in said boxes such that said finger portions overlie each other and said base portions overlie each other, said holes in said upper surfaces of said boxes being dimensioned so as to overlie only said base portions of said hand coverings and being spaced from both longitudinal ends of the associated box, said finger portions being covered by said upper surfaces, said visible indicia overlying a part of said hand coverings between said hole and said finger portions, each said base portion having a palm side and a back side which faces oppositely away from said palm side, and said back sides of said base portions facing toward the associated holes and upper surfaces of said boxes.

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**5,044,495**

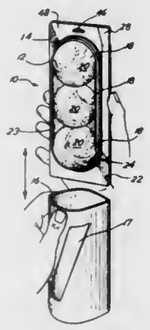
## MULTIPLE COMPONENT PRESSURIZED PACKAGE FOR ARTICLES AND METHODS OF PRESSURIZATION THEREOF

**Ihor Wyslotsky, Rolling Meadows, Ill., assignor to Redex Packaging Corp., Rolling Meadows, Ill.**

**Filed Jun. 25, 1990, Ser. No. 543,033**

**Int. Cl.[5] B65D** *85/00*

**U.S. Cl. 206—315.9** **23 Claims**



1. A multiple component pressurized package for articles comprising:

a polymeric inner package component including at least one sealed compartment for containing therein the articles, said compartment maintained under pressure above atmospheric pressure; and

separate sleeve means disposed longitudinally slideably, non-sealingly, and circumferentially about at least a substantial portion of said inner package component for compressively containing said inner package components while said inner package component is maintained under pressure.

**5,044,496**

## CASE

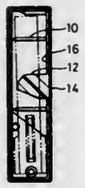
**Kimio Tanaka, Saku, and Haruo Shiba, Komoro, both of Japan, assignors to TDK Corporation, Japan**

**Filed Apr. 11, 1989, Ser. No. 336,105**

**Claims priority, application Japan, Apr. 26, 1988, 63-55258[U]**

**Int. Cl.[5] B65D** *85/672*

**U.S. Cl. 206—387** **6 Claims**




1. A combination tape cassette and case, said case comprising:

a cover and a case body,

said case body being made of a material consisting of a stiff thermoplastic first layer and an elastomeric second layer subsequently molded by an injection molding operation integrally over a surface of said first layer.

5. A tape case comprising:

a cover and a case body,

said case body having lugs adopted to position a tape cassette,

said case body being made of a material consisting of a stiff thermoplastic first layer and an elastomeric second layer subsequently molded by an injection molding operation integrally over a surface of said first layer.

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**5,044,497**

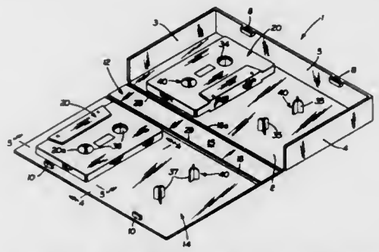
## AUDIOCASSETTE STORAGE CONTAINER HAVING OFFSET POST MEMBERS

**James T. Weisburn, Massillon, and Ronald K. Burdett, Strasburg, both of Ohio, assignors to Alpha Enterprises, Inc., East Canton, Ohio**

**Filed Jun. 28, 1990, Ser. No. 544,966**

**Int. Cl.[5] B65D** *85/672*

**U.S. Cl. 206—387** **16 Claims**



1. A universal storage container for securely retaining a plurality of cassettes therein, said container comprising:

a) a generally rectangular enclosure having opposed top and bottom walls, opposed front and rear walls, and opposed side walls, said top and bottom walls being hingedly connected to the longitudinal edges of one side wall;

b) first and second pairs of spaced-apart mounting post members disposed on and projecting interiorly from said top wall in longitudinally-spaced arrangement with each pair of said post members adapted to engagement with reel hub openings of an individual cassette;

c) third and fourth pairs of spaced-apart mounting post members disposed on and projecting interiorly from said bottom wall in longitudinally-spaced arrangement with each pair of said post members adapted for engagement with the reel hub openings of an individual cassette;

d) all post members being similarly shaped and each pair of said post members being offset longitudinally from its respective juxtaposed pair of said post members when said container is closed and said pairs of mounting post members are disposed in adjacent near-opposing relation with an individual cassette adapted to be retained on each pair of said mounting post members; and

e) latching means and latch receiving means formed on the juxtaposed edges of one sidewall and said top wall to engageably interconnect said walls when in adjacent relation to close said container in temporarily locked arrangement.



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**5,044,498**

## PACKAGING DEVICE OF THE TRAY TYPE FOR A PLURALITY OF ARTICLES, MORE PARTICULARLY FOR POTS CONTAINING FRESH MILK PRODUCTS SUCH AS YOGHURTS OR SIMILAR

**Daniel Galiegue, Les Clayes-Sous-Bois, and Eric Thiry, Paris, both of France, assignors to Compagnie Gervais Danone, Levallois-Perret, France**

**Division of Ser. No. 264,594, Oct. 31, 1988, Pat. No. 4,938,356.**

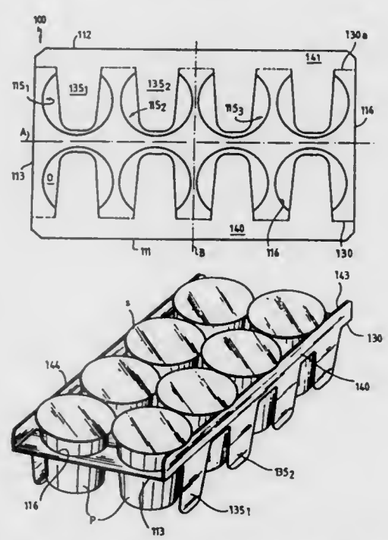
**This application Feb. 5, 1990, Ser. No. 475,588**

**Claims priority, application France, Oct. 29, 1987, 87 14984; Jul. 6, 1988, 88 09146**

**The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.**

**Int. Cl.[5] B65D** *75/00*

**U.S. Cl. 206—429** **11 Claims**




5. A packaging device for displaying and carrying individual containers of the type of pots containing fresh milk products including yoghurts, having a given height and an external projection at one end, said packaging device comprising

at least one material blank of the type chosen from among cardboard, plastic and other material blank, having a substantially rectangular shape with parallel longitudinal edges and parallel transversal edges and orifices cut out of said blank shaped to lodge said containers;

two in-line sets of grooved folding lines on said blank parallel to said longitudinal edges;

a surface of said blank between said sets of said grooved folding lines;

two short parallel flaps of said blank between said folding lines and said longitudinal edges;

tongues in number as the number of said orifices each formed by part of said surface of said blank between said grooved folding lines and within said orifices;

said blank foldable along said sets of grooved lines so that each said flap and said tongues connected to said flap lie in a plane substantially perpendicular to said surface of said blank;

walls formed by one of said flaps and said tongues extending from said one of said flaps, with each said wall having a total height substantially equal to a height of said containers;

said orifices located in adjacent positions to each other in proximity to allow the external projections on the container ends to have a portion in overlapping relationship to the containers in adjacent said orifices.

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**5,044,499**

## MACHINE AND METHOD FOR PACKAGING FOLDED SWABS

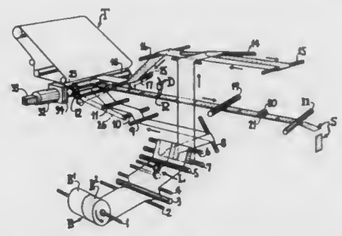
**Louis Marion, 42230 Saint Victor Sur Loire, Vieux Bourg de Condamine, France**

**Filed Nov. 29, 1989, Ser. No. 443,702**

**Claims priority, application France, Dec. 1, 1988, 88 16490**

**Int. Cl.[5] B65B** *9/02, 35/30, 41/16*

**U.S. Cl. 206—438** **10 Claims**



9. A method of continuously packaging folded swabs in packets, comprising successively performing the steps of:

advancing a substantially continuous sheet of paper which is twice as wide as the packets to be obtained;

cutting the sheet of paper into two half-widths;

separating the two half-widths to form a top half-width and a bottom half-width, said two half-widths having reference marks thereon;

stacking a plurality of folded swabs on the bottom half-width such that each successive folded swab is longitudinally offset from a preceding folded swab by a portion of a folded swab length;

detecting said reference marks;

superposing the top half-width onto the bottom half-width in exact superposition as a function of detecting said reference marks;

cold sealing the two superposed half-widths at a periphery around the plurality of folded swabs;

cutting the two superposed half-widths transversely along a cold sealing surface to form one of the packets.

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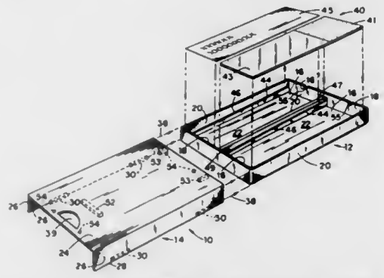


**5,044,500**

## PACKAGE FOR HANDLING AND TRANSPORTING GLASS SLIDES

**Peter J. Webber, and Philip L. J. Webber, both of Hertfordshire, England, assignors to Erie Scientific Company, Portmouth, N.H. and Histolab, Ltd., Herts, United Kingdom**

**Filed Sep. 1, 1989, Ser. No. 402,000**
**Int. Cl.[5] B65D** *1/36*
**U.S. Cl. 206—456** **31 Claims**



1. A container for handling and transporting glass slides comprising:
- a base support having at least one slide retention well having a pair of oppositely disposed sidewalls and a pair of oppositely disposed endwalls for receiving a single glass slide therein leaving only a small clearance between the slide and said sidewalls and said endwalls, the glass slide having a top surface having a specimen retention area;
- a top cover for engagement with said base support and for substantially enclosing said glass slide within said base support, said top cover being slideably mounted to said base support and remaining secured thereto for movement in either direction along a single axis so as to allow access to a desired portion of the top surface of the glass slide placed within said one slide retention well;
- means for positioning said glass slide placed in said at least one slide retention well at a small acute angle greater than 0° with respect to said cover so that the specimen retention area of the glass slide is spaced from said cover; and
- means for firmly holding in position the glass slide in said retention well when said top cover is in the closed position.

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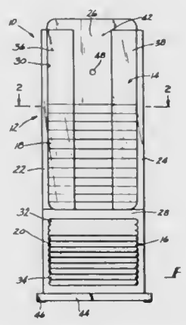
**5,044,501**

## DEVICE FOR STORING AND DISPENSING WASTE CONTAINERS

**Holly J. Shaker, 246 Bullock St., Fall River, Mass. 02723, and Norma J. Roberts, 234 Paisley Rd., Ballston Spa, N.Y. 12020**

**Filed Sep. 8, 1989, Ser. No. 404,606**
**Int. Cl.[5] B65D** *21/00*
**U.S. Cl. 206—499** **17 Claims**

1. A portable device for storing and dispensing containers and covers for said containers, said device comprising:
- a columnar member having two spaced part side walls and a rear wall extending between said side walls;
- said member having a first compartment for storing said containers and a second compartment for storing said covers;
- said compartments being axially aligned and separated by a partition wall member extending between said side walls;
- each said compartment having a width and a height determined by said side walls and the location of a surface of said partition wall member;
- said second compartment having a plurality of shaped portions formed into a portion of said side walls defining said second compartment along two opposed inner surfaces; and



- said shaped portions holding said covers in a desired position.

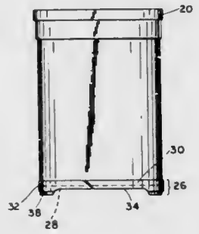
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**5,044,502**

## NESTABLE FIBER DRUM WITH INTEGRAL SKID AND A METHOD OF MAKING THE SAME

**James A. Hale, Red Bank, N.J., assignor to 501 Greif Bros., Del.**

**Filed Mar. 1, 1990, Ser. No. 487,189**
**Int. Cl.[5] B65D** *19/00*
**U.S. Cl. 206—595** **18 Claims**



1. A fiber drum with an integral skid comprising:
- a. a drum body having a sidewall with a lower sidewall portion and a bottom secured to said sidewall; and
- b. a lower skirt with downwardly extending cutouts arranged and constructed for engagement by mechanized handling means, said lower skirt including a lower skirt member having an outer skirt member dimension, and a lower band partially overlapping said lower sidewall portion and said lower skirt member for securing said skirt to said drum body, said lower skirt member having a tubular section extending below said lower band.

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**5,044,503**

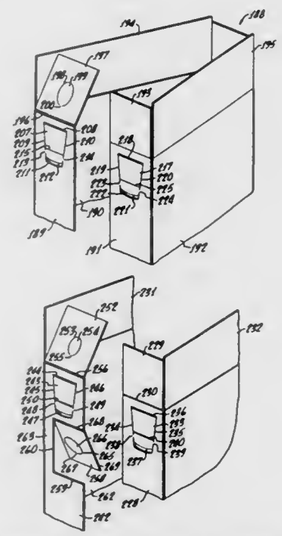
## BOX GLUING ARRANGEMENT

**Sam Wein, 5061 Aegina Way, Oceanside, Calif. 92056**

**Continuation-in-part of Ser. No. 163,692, Mar. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 103,849, Oct. 1, 1987, abandoned. This application May 24, 1989, Ser. No. 356,932**
**Int. Cl.[5] B65D** *5/70*
**U.S. Cl. 206—621.3** **23 Claims**

1. A box having a spout comprising:
- a sheet of fibrous material defining an enclosure which includes two side panels and two end panels, one of said end panels having overlapping layers including a first outside layer and a second layer inside of said first layer,
- said first layer having a transverse upper edge and a transverse lower edge, and including a first closure flap intermediate said upper and lower edges,
- said first closure flap being integral with and connected to said first layer at a transverse upper edge thereof parallel to and inwardly of said upper edge of said first layer,
- said material having a first score along said upper edge of said first closure flap whereby said first closure flap is pivotal about said first score, said first score having opposite ends and defining a portion of the periphery of said first closure flap,
- said first layer having a cut therethrough extending from the opposite ends of said first score for defining the remainder of the periphery of said first closure flap,
- said second layer having a transverse upper edge and a transverse lower edge and including a second closure flap intermediate said upper and lower edges of said second layer,
- said second closure flap being integral with and connected to said second layer at a transverse upper edge thereof parallel to and inwardly of said upper edge of said second layer,





- said material having a second score along said upper edge of said second closure flap whereby said second closure flap is pivotal about said second score, said second score having opposite ends and defining a portion of the periphery of said second closure flap,
- said second layer having a cut therethrough extending from the opposite ends of said second score for defining the remainder of the periphery of said second closure flap,
- a third flap integral with said second layer and projecting from said upper edge of said second layer,
- said material having a third score along said upper edge of said second layer and being bent so that said third flap is doubled over the inner surface of said second layer and forms a third layer,
- said third layer having a cut therethrough forming the periphery of an opening except for at least one frangible uncut segment interconnecting the parts of said third layer within said periphery with the portion of said third layer outside of said periphery,
- said second closure flap overlying said part of said third layer,
- a quantity of glue between said first closure flap and said second closure flap for connecting the same together, and
- a quantity of glue between said second closure flap and said part of said third layer within said periphery of said opening therein,
- whereby said first closure flap and said second closure flap can be pivoted upwardly together about said first and second scores, thereby severing said frangible segment and pulling out said part of said third layer within said periphery of said cut in said third layer.

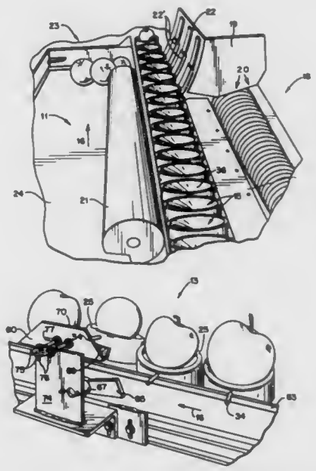
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**5,044,504**

## SELF-SINGULATING WEIGHT SIZER

**Harry C. Powell, Jr., Faber, Va., assignor to Powell Machinery Inc., Faber, Va.**

**Division of Ser. No. 248,199, Sep. 23, 1988, Pat. No. 4,957,619. This application Jun. 22, 1990, Ser. No. 541,949**
**The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.**
**Int. Cl.[5] B07C** *5/02, 5/16*
**U.S. Cl. 209—539** **18 Claims**

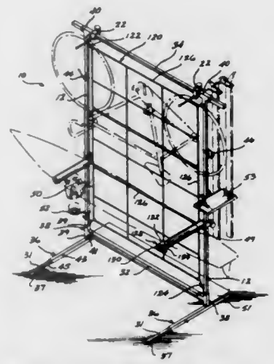


1. An article sorter for sorting discrete bruisable articles, comprising:
- a continuous conveying chain elongated in a dimension of elongation;
- a plurality of discrete article supporting elements connected to said chain for linear movement therewith and pivotal movement with respect thereto; and
- a plurality of stations for said continuous conveying chain and article supporting elements including: (a) a self-singulating section in which the articles are received asynchronously from a bulk supply and singulated onto the supporting elements with excess articles returned to the bulk supply, (b) an article property determining section through which the articles are carried by said supporting elements, without transfer, and properties thereof sensed, and (c) a discharge section in which the articles are selectively discharged at a plurality of spaced distinct locations depending upon the properties thereof sensed in said article property determining section.

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5,044,505
**EQUIPMENT STORAGE FRAME**
James V. Spratt, 24511 - 140th Ave. S.E., Kent, Wash. 98042
Filed Jun. 9, 1988, Ser. No. 204,384
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—22 3 Claims

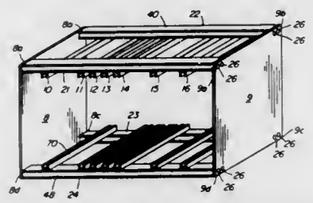


1. An equipment storage frame comprising:
(a) at least two independent, upright, elongated supports for mounting in compression between two fixed surfaces;
(b) a bottom foot attached at one end of said elongated support for bearing against one of said fixed surfaces;
(c) a longitudinally adjustable top foot attached at the other end of said elongated support to bear against the other of said fixed surfaces and provide adjustment in the compressive pressure exerted by the elongated support on the fixed surfaces;
(d) at least one horizontally projecting arm mounted on said elongated support for supporting equipment;
(e) a horizontally and vertically adjustable beam clamp for mounting each arm on each of said elongated supports, whereby said elongated supports and said arms cooperate to support large pieces of equipment without the use of cross supports connecting said elongated supports; and
(f) a wire support clamp comprising:
(i) a length of rigid wire, said length of rigid wire including:
(1) a U-shaped midregion;
(2) first and second helically-shaped intermediate regions, one located on either side of said U-shaped midregion; and
(3) first and second end regions, one located on the end of each helically-shaped intermediate region remote from said U-shaped midregion; and
(ii) tightening means mounted in the holes formed by said spirally-shaped intermediate regions for pulling said spirally-shaped intermediate regions toward one another.

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5,044,506
**EQUIPMENT SHELF**
David C. Brown, Belleville, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Mar. 15, 1990, Ser. No. 494,072
Int. Cl.[5] A47G 19/08
U.S. Cl. 211—41 10 Claims

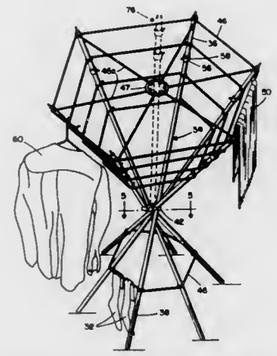
1. An equipment shelf, for mounting a plurality of board sliders for removably retaining circuit boards, whereby a plurality of circuit boards may be slidably inserted into a system, comprising:
fastening means for fixedly engaging the plurality of board sliders, each fastening means being an elongated flat strip and each strip defining a plurality of fastening locations;
a plurality of elongated cross connecting members each member including a body portion terminating at first an second ends and retaining means, in the body portion, for retaining one of the fastening means, wherein the retaining means in each of the elongated cross connecting members includes a first longitudinal channel extending along a side of the body portion between the first and second ends, and being defined by a pair of side surfaces being connected by a bottom surface, each of the pair of side surfaces having a groove therein being spaced a predetermined distance from the bottom surface, for slidably receiving a longitudinal edge of one of said plurality of elongated flat strips;



first and second side panels, being spaced apart by the plurality of elongated cross connecting members, one pair of which are fixed at said first ends to the first side panel along a first line and at said second ends to the second side panel along a line similar to the first line, and another pair of which are fixed at said first ends to the first side panel along a second line spaced apart from the first line and are fixed at said second ends to the second side panel along a line similar to the second line;
whereby lateral spacing of circuit board positions in the equipment self are defined by the relative location of each fastening location in said plurality of elongated flat strips.

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5,044,507
**COLLAPSIBLE DRYING RACK**
Lev A. Shulyak, 22 Buckley Rd., Worcester, Mass. 01602
Filed Jul. 9, 1990, Ser. No. 550,312
Int. Cl.[5] D06F 57/08
U.S. Cl. 211—203 25 Claims

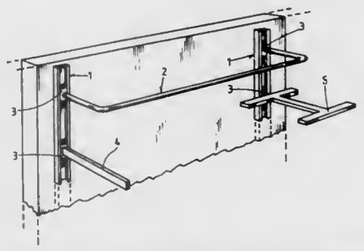


1. A collapsible rack for drying clothing and other articles comprising:
a core member having a central axis and including a plurality of stop members extending radially outwardly from said central axis at equally spaced peripheral locations;
a plurality of mounting pins fixed to said core member at equally spaced peripheral locations adjacent said stop members and extending radially outwardly therefrom and terminating at tip ends and lying substantially in a plane perpendicular to said central axis;
a plurality of elongated leg members of substantially equal length extending between opposed ends, said leg members being pivotally mounted on said mounting pins at substantially similar locations intermediate said ends for movement between collapsed and extended positions, each of said leg member being engaged with an associated one of said stop members when it assumes the collapsed position and angularly disposed relative to said central axis when it assumes the extended position;
flexible elongate material of substantially equal length extending between each successive one of said leg members and joined to each of said leg members at substantially similar distances from said mounting pins, said elongate material being substantially taut when said leg members assume their extended positions, said elongate material being limp when said leg members assume their collapsed positions; and
retention means for retaining said leg members on said mounting pins while permitting movement of said leg members between their extended and collapsed positions, said retention means including an elongated band member having first and second opposed ends and a plurality of spaced apertures therein, said band member encircling said leg members adjacent said core member, each of the apertures in said band member positioned to receive an associated one of said tip ends of said mounting pins, said first and second opposed ends being caused to overlap such that the apertures adjacent said ends are fittingly received on a same one of said mounting pins, said band member being sized to bias said leg members into engagement with said core member.



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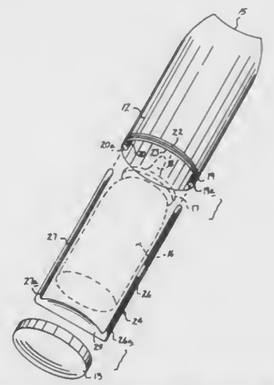
5,044,508
**GOODS PRESENTATION SYSTEM HAVING HEIGHT-ADJUSTABLE BRACKET ELEMENTS IN A WALL ARRANGEMENT OR PILLAR ARRANGEMENT**
Herbert Walter, Müllheim, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands
Filed Jun. 12, 1990, Ser. No. 537,561
Claims priority, application Switzerland, Jun. 23, 1989, 2356/89
Int. Cl.[5] A47B 47/00
U.S. Cl. 211—207 6 Claims



1. An adjustable rack presentation system for wall and pillar arrangements, comprising at least one rail member having a C-shaped longitudinal opening and at least one slide device movably received within said opening of said rail member, said slide device including a housing which has attaching means for releasably attaching a support member to said housing, an upper end, a lower end, a central longitudinal axis extending between said upper and lower ends, a first guide groove aligned with said central longitudinal axis, a pair of second guide grooves, one of said second guide grooves being positioned on one side of said central longitudinal axis and extending from said upper end of said housing towards said lower end and said central longitudinal axis thereof and the other of said second guide grooves being positioned on an opposite side of said central longitudinal axis and extending from said upper end of said housing towards said lower end and said central longitudinal axis thereof whereby said second guide grooves converge downwardly with respect to each other, locking means extending from opposite sides of said housing for releasably locking said side device in a fixed position relative to said rail member, said locking means including a first locking jaw slidably mounted in one of said second guide grooves for movement relative to said housing between an extended position, in which said first locking jaw engages said rail member, and a retracted position, in which said first locking jaw disengages said rail member, and a second locking jaw slidably mounted in the other of said second guide grooves for movement relative to said housing between an extended position, in which said second locking jaw engages said rail member, and a retracted position, in which said second locking jaw disengages said rial member, each of said first and second locking jaws having a transverse groove therethrough, and controlling means movably mounted in said first guide groove for controlling the operation of said locking means, said controlling means having a first crosspiece received in said transverse groove of said first locking jaw and a second crosspiece received in said transverse groove of said second locking jaw, and said controlling means being movable along said first guide groove between a first position, in which said first and second crosspieces maintain said first and second locking jaws, respectively, in their extended positions, and a second position, in which said first and second crosspieces maintain said first and second locking jaws, respectively, in their retracted positions.

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5,044,509
**INFANT NURSING BOTTLE AND LUMINESCENT INDICATOR**
Thomas Petrosky, and Paula A. Petrosky, both of 7433 Oregon Trail, Youngstown, Ohio 44512
Filed Nov. 29, 1989, Ser. No. 443,005
Int. Cl.[5] A61J 9/00, 9/08
U.S. Cl. 215—366 5 Claims



1. An infant nursing bottle and luminescent fluid indicator apparatus comprising,
a transparent outer shell defined by an internal configuration, and
a nursing bottle defined by an external configuration substantially complementary to that defined by the internal configuration, and
a displacement vessel with at least one conduit member positioned between the nursing bottle and the outer shell, and
a chemi-luminescent fluid captured within the displacement vessel, and
a cap member including means for securement to a lower-

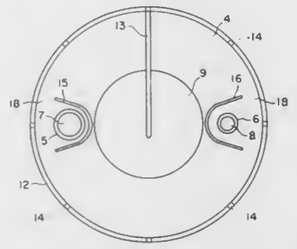
VOL 1130 ISS 1 SE 3 1991 UMI



most end of the outer shell to capture the nursing bottle within the outer shell and to capture the displacement vessel between the cap member and the nursing bottle.

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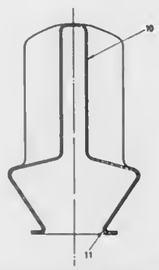
**5,044,510**
**BUNGHOLE-EQUIPPED BARREL**
**Udo Schütz, Rückersteg 4, D-5418 Selters, Fed. Rep. of Germany**
**Filed Jul. 6, 1990, Ser. No. 548,846**
**Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 8908528[U]**
**Int. Cl.[5] A65D** *25/28*
**U.S. Cl. 220—4.05** **7 Claims**



1. Bunghole-equipped barrel of a synthetic resin with a blow-molded sidewall with a bottom, and with a lid made of a plastic injection-molded component with integrally molded-on bungholes, the lid (4) having a central, trough-like indentation (9) which in a substantially upended position (1') of the barrel (1), forms a shallow drainage dome (10) sloping downward toward the bunghole orifices (7, 8), the lid (4) having an outer ring (12) having an L-profile serving as a supporting ring, carrying ring, and roller chime, projecting past the bungholes (5, 6) in a direction parallel to the longitudinal axis (11—11) of the barrel, and ridges (15, 16) extending from the lid (4) at a spacing around the bungholes (5, 6) and at least partially surrounding the bungholes and having the same height (17) as the outer ring (12) for protecting the bungholes (5, 6) and for supporting a stacked barrel.

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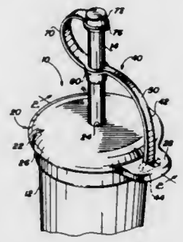
**5,044,511**
**MANUFACTURE AND METHOD OF PRODUCING A RESILIENT DIAPHRAGM SUITABLE FOR LIQUID PRESSURE TANKS**
**Hugh McDonald, Boronia, Australia, assignor to Davey Products Pty. Ltd., Huntingdale, Australia**
**Filed Apr. 26, 1990, Ser. No. 514,823**
**Claims priority, application Australia, Apr. 27, 1989, PJ3918**
**Int. Cl.[5] F16L** *55/00*
**U.S. Cl. 220—85 B** **5 Claims**



1. A method of production of a diaphragm for a water pressure tank accumulator comprising a thin walled flexible membrane envelope having two regions of differing geometry, one region including an apertured neck region incorporating a single opening into the membrane envelope and adapted to be secured in an opening in the pressure tank accumulator, and a second region forming the body of the diaphragm and adapted to expand and contract within the pressure accumulator during use, said second region having a relaxed, molded contracted shape in the form of a cruciform pleated configuration, said diaphragm having an expanded lateral dimension and a contracted lateral dimension; comprising the step of moulding said diaphragm in a contracted cruciform pleated configuration using inner and outer mould members such that the overall contracted lateral dimension of said second region relative to the size of the apertured neck region of the moulded diaphragm is small thereby allowing easy removal of said inner mould through the apertured neck region of said diaphragm.

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**5,044,512**
**BOTTLE APPARATUS**
**Joseph C. Giancaspro, 925 S. Maple, Maricopa County, Ariz. 85206, and Robert F. Sassman, 615 W. Chilton, Chandler, Maricopa County, Ariz. 85224**
**Filed Dec. 12, 1990, Ser. No. 626,251**
**Int. Cl.[5] B65D** *55/16, 23/10*
**U.S. Cl. 220—90.2** **7 Claims**

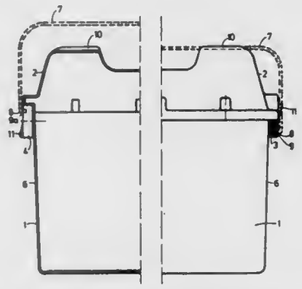


1. Sports bottle apparatus, comprising in combination:
a cup for holding a liquid;
lid means secured to the cup, including
a top portion, and
an aperture extending through the top portion;
a straw extending into the cup through the aperture in the lid means and terminating in an end remote from the cup; and
handle and cap means for providing a handle for holding the cup and for covering the end of the straw, including
a first portion secured to the lid means;
a straw retainer portion secured to the straw between the end of the straw and the lid,
a handle portion extending between the first portion and the straw retainer portion,
a cap portion covering the end of the straw; and
a retainer strap portion extending between the straw retainer portion and the cap portion.

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**5,044,513**
**HOLDER PROVIDED WITH A LOCKABLE LID**
**Joost Van Berne, Breda, Netherlands, assignor to Curver Rubbermaid b.v., Breda, Netherlands**
**Filed May 17, 1990, Ser. No. 524,472**
**Claims priority, application Netherlands, May 18, 1989, 8901236**
**Int. Cl.[5] B65D** *45/00*
**U.S. Cl. 220—318** **4 Claims**

1. A holder provided with a lockable lid and a carrying handle connected with the holder, the carrying handle having ends attached to a holder wall, wherein the ends of the carrying handle stick eccentrically in openings of rotating disks attached to the holder wall and wherein in a first position of the disks a hand grip part of the carrying handle is positioned



in a groove in the lid, while in a second position of the disks, the carrying handle is clear of the lid.

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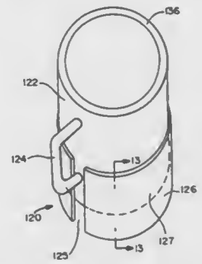
**5,044,514**
**CASK FOR THE TRANSPORT AND STORAGE OF CHEMICAL PRODUCTS**
**Philippe Portat, Chalon sur Saone, and Michel Gourat, Chatenoy le Royal, both of France, assignors to Campagnie Plastic Omnium, Lyons, France**
**Continuation of Ser. No. 316,876 Feb. 20, 1989 abandoned**
**This application Aug. 8, 1990, Ser. No. 565,201**
**Claims priority, application France, Mar. 1, 1988, 88 02541**
**Int. Cl.[5] B65D** *90/04*
**U.S. Cl. 220—411** **4 Claims**



1. A liquid-tight cask for the transport and storage of chemical products, including
(a) an interior liquid-retaining shell or predetermined shape made of perfluoroalkyoxy copolymer material;
(b) an exterior double-walled shell having a generally cylindrical external configuration and an internal shape similar to that of the interior shell;
(c) said exterior shell comprising superposed upper and lower elements nested and joined in a separable, liquid-tight manner;
(d) said lower exterior shell element being substantially circular in cross-section and having an annular first flat surface at its uppermost end and having internal thread means formed on cylindrical internal surfaces;
(e) said lower exterior shell having an annular second flat surface disposed below said thread means along an inner surface of said exterior shell;
(f) said lower exterior shell having an annular third flat surface disposed below said first annular surface along an outer surface of said lower exterior shell;
(g) said upper element being substantially circular in cross-section and having a depending cylindrical flange having external threads adapted to threadingly engage said internal threads;
(h) said upper element further including staggered fourth, fifth and sixth annular flat surfaces at its lower end adapted to contact said first, second and third annular flat surfaces of said lower element when said internal and external threads are engaged, thereby forming an impermeable labyrinthine relation when said upper and lower elements are fully threaded together.

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**5,044,515**
**COASTER CARRIER AND COASTER**
**Albert H. Straub, 13060 Skyline Blvd., Woodside, Calif. 94062**
**Division of Ser. No. 178,765, Mar. 25, 1988, Pat. No. 4,940,137, which is a continuation-in-part of Ser. No. 932,451, Nov. 18, 1986, abandoned. This application Jun. 7, 1990, Ser. No. 534,746**
**Int. Cl.[5] B65D** *23/12, 23/10*
**U.S. Cl. 220—630** **3 Claims**



1. A coaster for a beverage container, which comprises an open ended ring having a lateral split, said ring having a width which is narrow when compared with a height of the beverage container, being dimensioned to fit around the beverage container in a friction fit, said ring being of a material having a sufficient spring property so that the friction of the friction fit is sufficient to hold said ring at the bottom end of the beverage container and extending partially beyond the bottom end of the beverage container, said ring having a sufficient rigidity to support the beverage container above a horizontal supporting surface when said ring extends partially beyond the bottom end of the beverage container, an inner wall of said ring being tapered inward from an outer edge toward a point of said inner wall intermediate between a top and a bottom of said inner wall, said inner wall having a projecting stop for the beverage container at the point.

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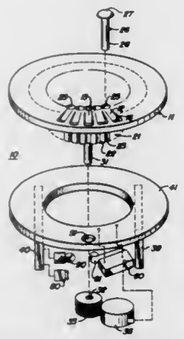
**5,044,516**
**AUTOMATED PILL DISPENSING DEVICE**
**Russel A. Hoar, 6151 Vernon St., Long Beach, Calif. 90815**
**Filed Sep. 26, 1990, Ser. No. 588,149**
**Int. Cl.[5] B65B** *59/00*
**U.S. Cl. 221—2** **5 Claims**

1. A medication dispensing assembly, comprising:
a first, substantially circular, plate characterized by an upper surface and a lower surface;
a plurality of radial depressions formed in said upper surface of said first plate, each said depression being formed as an arc segment of said first plate and each said depression including a bottom surface sloped towards an opening extending to said lower surface proximate the periphery of said first plate;
a substantially cylindrical boss extending axially from said lower surface and including a plurality of spaced deforma-

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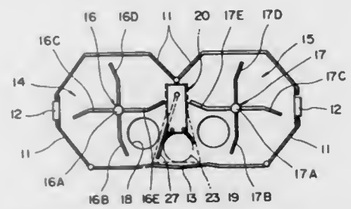
tions in the periphery thereof, each said deformation corresponding to a predetermined depression;
a plurality of drillings extending through said first plate in corresponding alignment with said deformation;
a plurality of pins selectively insertable into said drillings and extending into the corresponding ones of said deformations;



a second, substantially annular, plate conformed to receive said boss in the annulus thereof and including a dispensing perforation at one selected azimuth;
a source of motive power conformed to advance in rotation said first plate relative said second plate;
switching means mounted on said second plate and operative by said deformations in said boss; and
signaling means connected to said switching means.

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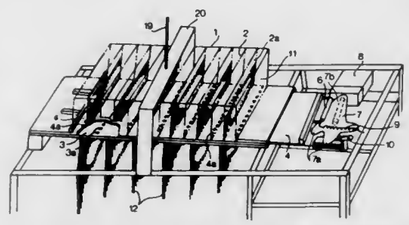
**5,044,517**
**AUTOMATIC VENDING MACHINE HAVING CUP DISPENSER WITH AUXILIARY CUP LOADING RACK AND CONTROL CIRCUIT THEREFOR**
**Kwon U Park, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Rep. of Korea**
**Filed Nov. 14, 1989, Ser. No. 436,329**
**Claims priority, application Rep. of Korea, Nov. 14, 1988, 88-14946**
**Int. Cl.[5] G07F *11/12***
**U.S. Cl. 221—11** **2 Claims**



1. A cup dispenser control circuit comprising:
(a) first and second dropping outlet detecting means located adjacent first and second dropping outlets, respectively, for detecting and outputting positioning control signals in response to a loading of at least one of a first and second drink cup type on said first and second dropping outlets;
(b) first control means for rotating first and second turrets in accordance with said positioning control signals of said first and second dropping outlet detecting means when one of said first or second drink cup types is not loaded on its respective dropping outlet;
(c) auxiliary cup moving means for moving at least one auxiliary cup, having an initial position between said first and second dropping outlets, to at least one of said first and second dropping outlets in response to further positioning control signals;
(d) means for detecting whether auxiliary cups are loaded; and
(e) second control means for disengaging said first and second turrets, respectively, by supplying disengage control signals to said first control means when no auxiliary cups are loaded, wherein said second control means generates said further positioning control signals in response to a selection switch indicating the selection between different drink cup types according to consumer drink demands.

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**5,044,518**
**SEEDING DEVICE**
**Osamu Sakaue, Morioka; Tsuyoshi Sekimura, Iwate, and Seiichi Shimoda, Takizawa, all of Japan, assignors to Director General of the Touhoku National Agriculture Experiment Station, Morioka, Japan**
**Filed Mar. 22, 1990, Ser. No. 497,276**
**Claims priority, application Japan, Mar. 31, 1989, 1-082522**
**Int. Cl.[5] B65H *3/44***
**U.S. Cl. 221—95** **2 Claims**



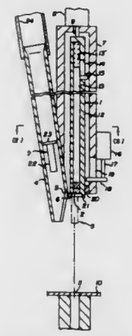
1. A seeding device having a seeding unit and a carrier, the seeding unit, comprising:
a seed container having a plurality of partition plates for dividing the container into a plurality of spaces and a brush provided in each space in parallel with the partition plates;
a cell plate provided in a bottom of the seed container so as to be reciprocated and having a plurality of cells arranged in a row at one side of the brush in each of the spaces;
a receiving plate securely provided under the cell plate and having a plurality of apertures corresponding to the cells;
reciprocating means for reciprocating the cell plate so as to reciprocate each row of the cells over the corresponding brush to coincide each cell with a corresponding aperture;
a plurality of pipes connected to the receiving plate at the underside thereof, each of the pipes being communicated with a corresponding aperture; and
a shutter plate for receiving seeds dropped from the cell plate through the pipes and for dropping the received seeds for the seeding thereof.

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**5,044,519**
**APPARATUS FOR FEEDING SLENDER PARTS**
**Yoshitaka Aoyama, 20-11, Makitsukadai 2-chome, Sakai-shi, Osaka 590-01, Japan**
**Filed Oct. 18, 1989, Ser. No. 423,302**
**Claims priority, application Japan, Oct. 22, 1988, 63-266885; Jun. 17, 1989, 1-155038**
**Int. Cl.[5] B23Q *7/04***
**U.S. Cl. 221—212** **11 Claims**

1. Apparatus for feeding slender parts to a predetermined location comprising:
a feed rod having means for magnetically holding a slender part at one end thereof,
means mounting said feed rod for reciprocating movement between a retracted position spaced away from said location and a second position adjacent said location,
a feed tube having a lower end open adjacent said one end of said feed rod in said retracted position, said lower end of said feed tube having an axis disposed at an acute angle relative to the axis of the path of said reciprocating movement of said feed rod, and

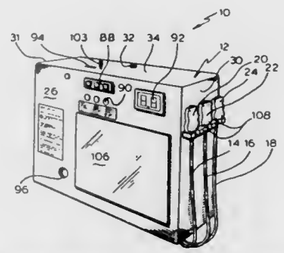




means for supplying slender parts to an upper part of said feed tube whereby said slender parts fall freely through said feed tube and are delivered by said lower open end of said feed tube to said means for magnetically holding a slender part at one end of said feed rod with the axes of said slender parts oriented at an acute angle relative to said axis of the path of movement of said feed rod.

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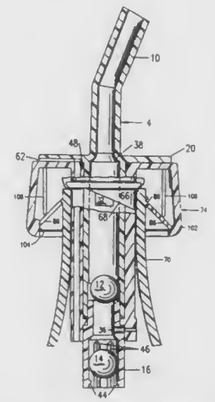
**5,044,520**
**COIN OPERATED COSMETIC DISPENSING MACHINE**
**Hubert Moisan, 4020, boul. Talbot, Stoneham (Québec), Canada G0A 4P0**
**Filed Oct. 10, 1989, Ser. No. 418,877**
**Int. Cl.[5] G07F *13/08***
**U.S. Cl. 222—2** **7 Claims**



1. A coin-operated dispensing machine, comprising:
(a) at least one container for a cosmetic liquid;
(b) a compressed air tank;
(c) a first air line, interconnecting said cosmetic container and air tank;
(d) a second air line, interconnecting said air tank to a spray gun having a trigger for controlled dispensing of said cosmetic liquid;
(e) said trigger controlling a first electro-valve means to control airflow in said second line;
(f) a large closed box-like casing, enclosing said container, said tank, said first line and said first valve means;
(g) a third cosmetic liquid line, interconnected said container and said spray gun, whereby both pressurized air from said second line and cosmetic from said third line are destined to be ejected from said spray gun only when said trigger is depressed;
(h) a tamper-proof coin-receiving and processing means, embodied into said large casing and capable of recording the number of coins inserted therethrough into said casing and of correlating said number of coins to a preset coin amount; and
(i) second electro-valve means, to control cosmetic flow through said third line; and
(j) switch means, to control the opening of both said valve means once the threshold of said preset coin amount has been registered by said processing means, a central processing unit; a timer means operatively connected to said first and second valve means, to said central processing unit and to said coin-receiving and processing means; said timer means being connected to disengage said first and second valve means once a preset time period has elapsed following the opening of said first and second valve means, a visual time display device mounted on said casing and visible to a user to indicate the opening time available for opening said first and second valve means to dispense said cosmetic liquid, said first and second valve means being opened and closed by the actuation of said trigger so that the user is aware by said time display device how much dispening time remains during a dispensing time period so that said cosmetic liquid can be dispensed in a controlled manner and shared with other users during said dispensing time period, then being at least two of said containers, each having an associated spray gun, each one of said two containers having a different dispensing time period.

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**5,044,521**
**VOLUMETRICALLY CONTROLLED DRINK DISPENSER**
**Arganius Peckels, Rte. 2 Box 489, Ogilvie, Minn. 56358**
**Filed Feb. 9, 1990, Ser. No. 477,553**
**Int. Cl.[5] B67D *5/06, 5/35***
**U.S. Cl. 222—23** **14 Claims**



14. Liquid metering apparatus for a liquid containing bottle comprising:
a. nozzle means including a tubular member having a bore in communication with the bottle interior for dispensing liquid through said bore, wherein said tubular member includes a first vent aperture opening through a sidewall to said bore from the bottle interior, a second vent aperture in communication with the atmosphere and bottle interior and further including at least one fill aperture opening through a sidewall of said tubular member in communication with said bore and the bottle interior and

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positioned forward of said first vent aperture and wherethrough the liquid enters the bore;

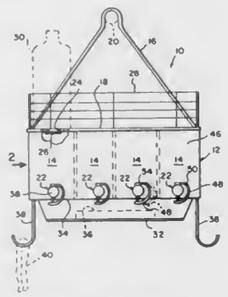
b. first means including a first collar concentrically mounted in relation to the tubular member and rotationally operative along a radial axis for selectively varying the exposure of said fill aperture;

c. second means including a second collar concentrically mounted in relation to the tubular member and rotationally operable along a radial axis for selectively varying the exposure of said first vent aperture and whereby the first and second means define a repetitively deliverable liquid volume; and

d. means for forming a liquid tight seal between said nozzle means and said bottle.

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**5,044,522**
**SHAMPOO DISPENSER**
**Miguel Roig, 410-25 St., Union City, N.J. 07087, and George Spector, 233 Broadway, New York, N.Y. 10007**
**Filed Mar. 1, 1990, Ser. No. 486,888**
**Int. Cl.[5] B67D** *1/16, 5/06*
**U.S. Cl. 222—108** **1 Claim**



I. A shower dispenser comprising:

a) a container having a plurality of compartments for holding a different liquid in each of said compartments;

b) a holder extending from top of said container to suspend said container from a shower head arm;

c) a plurality if nozzles, each fluidly connected to each of said compartments in said container for dispensing the liquid therefrom when manually operated;

d) a plurality of filler ports on the top of said container, each being above each of said compartments; and

e) a plurality of flap closures, each located in each of said filler ports for sealing after the liquids are poured into said compartments; further including a retaining enclosure carried on the top of said container for holding various items therein to prevent the items from falling therefrom; further including a soap tray carried on bottom of said container for supporting a bar of soap therein; further including a pair of hook members each suspended from the bottom of said container on either side of said soap tray so that wash cloth and the like can be hung thereon; further including a drip catcher release mechanism for each nozzle comprising;

f) a post extending from front of said container;

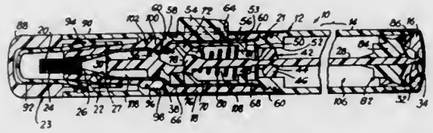
g) a curved drip catcher pivotly connected to said post for catching the liquid drops from said nozzle when not in use;

h) a wedge connected to top edge of said drip catcher on opposite side thereof; and

i) a finger connected to the dispensing button of said nozzle, said finger having a slanted tip, which when the dispensing button is pressed inwardly, the slanted tip of said finger will engage with said wedge causing said drip catcher to pivot thereabout and move away from said nozzle thus allowing the fluid to exit freely therefrom.

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**5,044,523**
**METHOD AND APPARATUS FOR DISPENSING OF VOLATILE FLUIDS**
**Donald W. McNab, Long Beach, Calif., assignor to Photofinish Cosmetics Inc., Encino, Calif.**
**Filed Feb. 28, 1990, Ser. No. 486,529**
**Int. Cl.[5] B65D** *37/00*
**U.S. Cl. 222—207** **38 Claims**



29. In a fluid dispenser for operator-controlled discharge of a stored fluid:

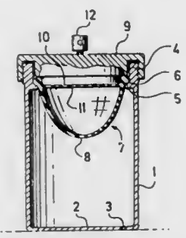
an elongated dispenser housing for containing a supply of stored fluid and including a discharge opening proximate a discharge end of said housing and through which discharge opening stored fluid is operatively dispensable;

actuating means on said housing and inwardly movable from a first to a second position for initiating a discharge of stored fluid through said opening; and

a wall having a predetermined thickness and disposed inwardly proximate said actuating means, said wall being formed of PTFE and said predetermined thickness being selected so as to impart to said wall sufficient flexibility for accomodating said inward movement of the actuating means while maintaining a fluid-tight containment barrier to the stored fluid in said housing.

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**5,044,524**
**PRESSURIZED DISPENSING CONTAINER**
**Václav Pisíek, 497 HlavníHluk, Czechoslovakia**
**Filed Jan. 25, 1990, Ser. No. 469,939**
**Claims priority, application Czechoslovakia, Jan. 27, 1989, 538-89**
**Int. Cl.[5] B67D** *5/06*
**U.S. Cl. 222—212** **9 Claims**



1. A pressurized dispenser comprising:

a protective flask having a neck defining an opening;

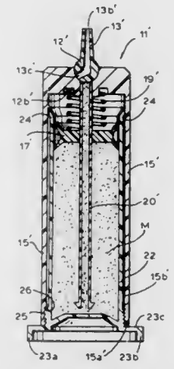
a resilient hollow body defining a closed gas filled space and having a periphery with at least one bead therearound, said bead being engaged against at least a portion of said neck, said hollow body being disposed in said flask with said space being out of communication with said neck opening; and

a lid containing a discharging pressure valve therein, said lid being fixed to said flask for closing the opening of said flask, at least a portion of said lid being engaged against said bead for firmly fixing said bead between said neck and said lid and for forming a seal for said flask between said lid and said neck, said lid and valve being out of communication with said space.

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**5,044,525**
**DISPENSING DEVICE**
**James C. McKinney, Somerset, N.J., assignor to Colgate-Palmolive Company, Piscataway, N.J.**
**Continuation of Ser. No. 161,550, Feb. 29, 1988, abandoned. This application Jul. 12, 1989, Ser. No. 378,728**
**Int. Cl.[5] B65D** *88/54*
**U.S. Cl. 222—326** **8 Claims**



1. A dispensing device particularly adapted to dispense pasty materials, said dispensing device comprising a pumping section including a top portion; a nozzle movable between first and second positions, said nozzle having a channel with an inlet and an outlet and having a blocking surface, a tube extending from the nozzle through said top portion, said tube being secured to said top portion and having a channel with an inlet and an outlet, said tube outlet communicating directly with said nozzle inlet when said nozzle is in said first position and being blocked by said blocking surface of said nozzle when said nozzle is in said second position; a piston slidably disposed around said tube; and spring means disposed between said top portion and said piston, said device further comprising container means for housing the pasty material, and attaching means for removably attaching said container means to said pump section, said container means comprising a bottom portion and side portion which define an open interior portion for containing the pasty materials, said tube inlet communicating directly with with said open interior portion, whereby the pasty material in said open interior portion is discharged out said nozzle outlet by way of said tube when said nozzle is in said first position in response to the urging of said spring means.

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**5,044,526**
**FUEL PUMP AND RESERVOIR ARRANGEMENT FOR USE IN AN AUTOMOTIVE FUEL TANK**
**Michiaki Sasaki, Hadano; Katsunori Ozaki, Zama; Tsutomu Oshida, Yokohama; Shigeru Kimura, Yokohama; Takashi Umezawa, Yokohama, and Kazuyuki Tomioka, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd. and NIFCO Inc., both of Yokohama, Japan**
**Filed Dec. 7, 1989, Ser. No. 446,524**
**Claims priority, application Japan, Dec. 7, 1988, 63-307780**
**Int. Cl.[5] F04B** *17/00*
**U.S. Cl. 222—377** **11 Claims**

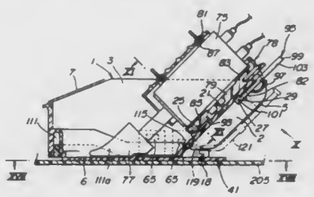
1. In a fuel tank

a bracket, said bracket being permanently secured to an inner surface of said fuel tank;

a fuel pump;

a fuel pump housing which encloses said fuel pump;

a reservoir in which a portion of the fuel in said fuel tank can be collected, said reservoir having a structure which receives said fuel pump housing and supports said fuel pump housing in a predetermined position within said



reservoir, said fuel pump housing having a latch arrangement which permits said fuel pump housing to be selectively removed from said reservoir;

connection means for connecting said reservoir to said bracket, said connecting means being arranged to release said reservoir when a predetermined force is applied to said reservoir.

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**5,044,527**
**LIQUID DISPENSING SYSTEM**
**Frederick R. Hickerson, R.D. 6, Box 530, Newton, N.J. 07860**
**Filed Aug. 30, 1989, Ser. No. 400,492**
**Int. Cl.[5] G01F** *11/00*
**U.S. Cl. 222—451** **9 Claims**



1. A device for dispensing a predetermined quantity of the contents of a container, comprising:

a container for said contents having a discharge opening;

a chamber on said container having a central axis and side walls extending from a first end in communication with said discharge opening to a second end open to dispense contents from said chamber when said container is positioned to cause said contents to enter said chamber; and

first valve means mounted inside said chamber for regulating the quantity of contents flowing through said opening into said chamber, said first valve means including piston means moveable axially from a first inner position at said first end of said chamber to a second outer discharge position adjacent said second end, vent means defining a path for air flow to said container when said piston means moves from said first position to said second position, said piston means including guide means, axially spaced closely to said piston means, confronting and spaced closely to the side wall of said chamber during movement of said piston means from said first position to said second position to align said piston means generally perpendicularly to said axis, second valve means for closing said opening at said first end when said piston is at its second outer discharge position means and said chamber is filled with a predetermined quantity of contents.

VOL 1130 ISS 1 SE 3 1991 UMI

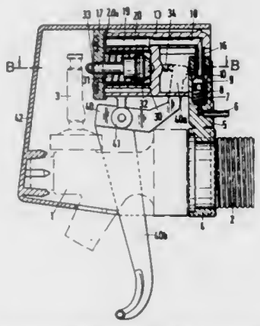


5,044,528

## ACTUATING DEVICE FOR A TAP ON A BEVERAGE DECANTING INSTALLATION

Carl M. Becker, Kalkstrasse 67, D-4030 Ratingen 4, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 482,559
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1989, 3906836
Int. Cl.[5] B67D *3/04*
U.S. Cl. 222—504 7 Claims



1. A device for decanting a beverage stored under pressure in a storage tank, comprising

a frame connected to said storage tank,

a tap connected to said storage tank and mounted adjacent said frame, said tap having a closed position and an open position through which said beverage is decanted,

an actuating member disposed adjacent said tap for moving said tap from said closed position into said open position,

a holder mounted in said frame, said holder comprising a plug-in receptacle including a connection for introducing pressurized gas into a pressure chamber of said receptacle and a first non-return valve located in said pressure chamber, said first non-return valve comprising a first valve member, a first valve seat, and a first spring urging said first valve member against said first valve seat, said first valve member being moved away from said first valve seat when pressurized gas is introduced into said pressure chamber through said connection,

a casing mounted in said frame, said casing including a piston cylinder having an inlet, and an actuating piston and a piston spring disposed in said piston cylinder, said actuating piston being disposed opposite to said actuating member, said actuating piston being movable from a first position to a second position which causes said actuating member to open said tap when pressurized gas is introduced into said piston cylinder, said piston spring urging said actuating piston into said first position whereby said tap is normally closed,

said casing further including a plurality of casing chambers leading to said inlet of said piston cylinder and a second non-return valve disposed in one of said chambers, said second non-return valve comprising a second valve member, a second valve seat, and a second spring urging said second valve member against said second valve seat whereby said second non-return valve is normally closed,

said casing being mounted in said frame adjacent said holder so that when pressurized gas is introduced into said pressure chamber, said first non-return valve is opened and pressurized gas is introduced into said casing chambers through an inlet in said casing chambers, and

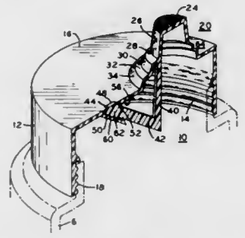
means associated with said second non-return valve for opening said second non-return valve so that pressurized gas is introduced into said piston cylinder.

5,044,529

## LIQUID DISPENSING BOTTLE CAP WITH INTEGRAL VALUE AND ACTUATOR

Phillip J. Campbell, P.O. Box 51480, Raleigh, N.C. 27609

Filed Jul. 29, 1989, Ser. No. 386,575
Int. Cl.[5] B67D *3/00*
U.S. Cl. 222—508 28 Claims



1. A unitary liquid dispensing cap for a liquid container comprising:

a body portion configured to encircle an opening in the liquid container;

a top portion closing said opening;

means to secure the dispensing cap to the bottle to position said body portion and said top portion about said opening;

an integral actuator assembly secured to and passing through said top portion and including an at rest position and an actuated position;

said actuator assembly comprising an actuator and an accordion pleated member positioned below said top portion and connecting said top portion to a valve assembly integral with said dispensing cap;

said valve assembly comprising an arm connected to a valve;

said valve being position within and closing a dispensing passage when said actuator is in the at rest position;

said actuator assembly and valve assembly being moved downward upon pressure being applied to said actuator;

said movement opening said dispensing passage and developing a restoring force in said accordion pleated member which opposes said pressure; and

said restoring force moving said actuator assembly and said valve assembly upward upon release of pressure applied to said actuator;

whereby said valve recloses said dispensing passage.

5,044,530

## RIBBON-TYPE DISPENSING CAP HAVING AN AXIAL CLOSURE BLADE THAT ROTATES ALONG WITH AN OUTER APERATURED CAP BUT REMAINS LONGITUDINALLY STATIONARY

Gene Stull, 1086 Hacklebarney Rd., Chester Township, Morris County, N.J. 07930

Filed Feb. 9, 1990, Ser. No. 477,555
Int. Cl.[5] B67D *47/00*
U.S. Cl. 222—521 17 Claims

1. A dispensing cap construction for containers, comprising in combination;

a) a cap body and means for attaching the cap body to a container neck, said cap body having a discharge spout portion,

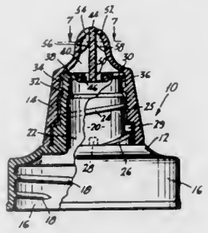
b) a closure cap turnably carried by the cap body and overlying said spout portion,

c) said closure cap having a non-round orifice,

d) a stopper blade located in said closure cap and receivable in said orifice to close off said orifice, and

e) means for rotatably mounting said stopper blade on the spout portion of the cap body and for simultaneously retaining the stopper blade against axial movement with respect to the spout portion of the cap body, to enable the stopper blade to rotate with the closure cap while the stopper blade is held against axial movement with respect to the closure cap, as the closure cap is turned.



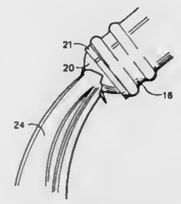


5,044,531

## BOTTLE HAVING SPILLAGE PREVENTION

Harold B. Rhodes, Jr., 1805 Wilton Rd., Leucadia, Calif. 92024

Division of Ser. No. 895,123, Aug. 11, 1986, Pat. No. 4,696,328.
This application Sep. 14, 1987, Ser. No. 97,613
The portion of the term of this patent subsequent to Sep. 29, 2004, has been disclaimed.
Int. Cl.[5] B65D *47/10*
U.S. Cl. 222—541 5 Claims



1. A liquid containing bottle made of a flexible material that may be squeezed to decrease the interior volume of the bottle, and having an elongated neck terminating in an opening that is wide enough to enable viscous liquid to pour freely therethrough from the bottle when the bottle is tilted, comprising

an airtight seal permanently secured to the perimeter of the neck and closing the opening for preventing liquid from being poured from the opening when the bottle is tilted;

wherein the seal is rupturable upon pressure being exerted thereon by the contents of the bottle when the bottle is squeezed; and

a cap fitted over the opening of the bottle for contacting the seal when the bottle is squeezed to counteract any pressure applied against the seal as a result of the squeezing of the bottle and to thereby prevent the seal from being ruptured.

5,044,532

## SLIDE UNIT AND PARTIAL PLATE MEMBER THEREOF FOR USE IN A SLIDING CLOSURE UNIT

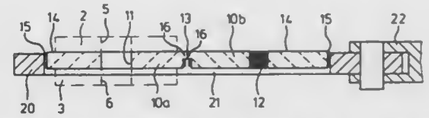
Robert Fricker, Unterägeri, Switzerland, assignor to Stopinc Aktiengesellschaft, Baar, Switzerland

Continuation of Ser. No. 842,807, Mar. 21, 1986, Pat. No. 4,729,497. This application Oct. 13, 1987, Ser. No. 107,632
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1985, 3512796
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[5] B22D *41/24*
U.S. Cl. 222—600 10 Claims

1. A slide unit for use in a sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said slide unit comprising:

two partial movable refractory plates having respective planar surfaces, each said partial plate being surrounded circumferentially by a respective band, at least a first said partial plate having therethrough a discharge opening;

said two partial plates being assembled together to abut circumferentially along a butt joint, so that said two partial plates can be moved together with said planar surfaces thereof adapted to seal against a stationary refractory plate of the sliding closure unit to bring said discharge opening into and out of alignment with a discharge opening of the stationary refractory plate; and



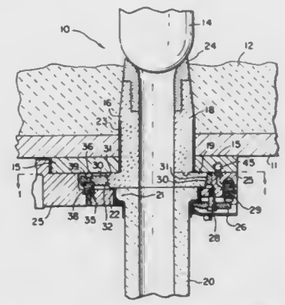
means for extending said planar surfaces across both said bands at said butt joint so that said planar surfaces of said two partial plates form a continuous sealing surface preventing contact of molten metal with said bands during movement of said two partial plates, said means comprising a refractory shoulder formed integrally with at least one said partial plate and extending therefrom into abutment with a refractory portion of the other said plate, thereby forming said butt joint, circumferential portions of said one partial plate adjoining said planar sealing surface thereof, other than said integral shoulder thereof, not extending across the thickness of the respective said band.

5,044,533

## CLAMP FOR BANDLESS REFRACTORY AND METHOD

Patrick D. King, Bantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Filed Oct. 1, 1990, Ser. No. 591,067
Int. Cl.[5] B22D *41/50*
U.S. Cl. 222—606 8 Claims



1. A valve assembly comprising, in combination,

an unencased plate assembly and a depending tube assembly for insertion into a vessel in which the side walls of the nozzle plate are continuous and continuously taper outwardly from the downstream face of the plate toward the vessel,

a mounting plate for securing the valve assembly to a vessel,

a main frame for yieldably urging a depending tube assembly having an upstream flat face in fact to face relationship with the outer face of the unencased plate,

a clamp ring for insertion interiorly of the main frame having tapered sidewalls for a meeting engagement with the unencased plate sidewalls,

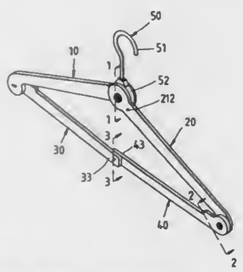
VOL 1130 ISS 1 SE 3 1991 UMI



spring assemblies for seating in the main frame and bearing against the clamp ring,
means for clampingly securing the main frame to the mounting plate,
means on the clamp ring for securing the same to the main frame,
all of said elements namely unencased plate assembly, mounting plate, depending tube assembly, main frame, clamp ring, spring assembly, clamping means and securing means, being proportioned and oriented to permit the means for securing the clamp ring to the main frame to preload the spring assembly against the clamp ring, and when subsequently securing the main frame to the mounting plate, further applying pressure to the spring assembly,
whereby upon the closing of the main frame to the mounting plate the clamp ring has a preselected substantial central and clamping force engaging the periphery of the continuous sidewall of the plate.

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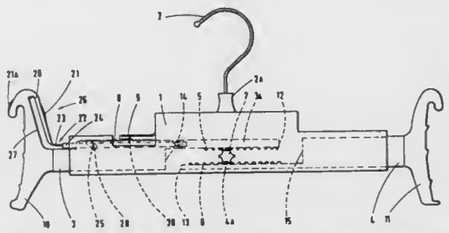
**5,044,534**
**COLLAPSIBLE MULTI-PIECE GARMENT HANGER**
**Ching-Ian Hwang, No. 181, Jang-Shoei Rd., Jang-Hua, Taiwan**
**Filed Apr. 5, 1990, Ser. No. 507,315**
**Int. Cl.[5] A47G** *25/40, 25/14*
**U.S. Cl. 223—94** **9 Claims**



1. A collapsible hanger comprising:
a first upper piece;
said first upper piece including a first upper engaging end and an opposite first lower engaging end;
said first upper engaging end having a centrally-located projection;
a C-shaped groove in said first upper engaging end;
said C-shaped groove including an angle of more than 180, and less than 360 degrees; a lug on said first lower engaging end;
a second upper piece;
said second upper piece including a second upper engaging end pivotally mounted on said first upper engaging end;
an opposite lower engaging end on said second upper piece;
a lug on said opposite lower engaging end;
a first lower piece;
a first connecting end on said first lower piece;
an opposite second connecting end on said first lower piece;
said first connecting end having a first side surface;
a recess in said first side surface;
an opposite side surface on said first connecting end;
a lug on said opposite side surface;
said opposite second connecting end having a centrally-located through hole;
a C-shaped groove in said opposite second connecting end;
means for rotatably mounting said first connecting end on said first lower piece to said opposite first lower engaging end with said lug on said first lower engaging end engaging said C-shaped groove in said opposite second connecting end;
a second lower piece;
said second lower piece having a first joining end and an opposite second joining end;
said first joining end having a first surface;
a protrusion on said first side surface;
an opposite side surface on said opposite second joining end;
said opposite second joining end having a centrally-located through hole;
a C-shaped groove about said centrally-located through hole;
means for rotatably affixing said first joining end of said second lower piece to said opposite lower end on said second upper piece with said lug on said opposite lower end engaging said C-shaped groove about said centrally located through hole;
a hook member;
said hook member including a wire hook affixed to a ring; and
said ring being affixed to said first upper piece and said second upper piece.

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**5,044,535**
**EXPANDABLE GARMENT HANGER FOR PANTS OR SKIRT WITH RELEASING LEVER**
**William J. Hunt, Finchley, United Kingdom, assignor to Braitrim (U.K.) Limited, London, England**
**PCT No. PCT/GB88/00919, § 371 Date Apr. 17, 1990, § 102(e) Date Apr. 17, 1990, PCT Pub. No. WO89/03652, PCT Pub. Date May 5, 1989**
**PCT Filed Oct. 21, 1988, Ser. No. 473,977**
**Claims priority, application United Kingdom, Oct. 23, 1987, 8724851**
**Int. Cl.[5] A47G** *25/62, 25/68, 25/44, 25/14*
**U.S. Cl. 223—95** **15 Claims**

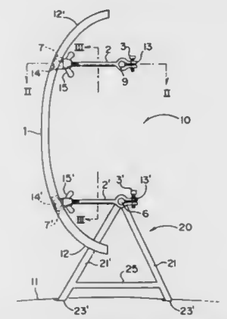


15. A garment hanger having a body and a hook mounted on the body for suspending the hanger on a rail, a pair of pivotal arms slidably mounted in the body for free movement in at least one direction, locking means located on the body and being engagable with at least one of the said movable arms for locking the movable arms relative to the body against movement in a direction opposite to the said at least one direction, and releasable means for releasing the locking means to allow free movement of the arm in the said opposite direction, wherein the releasable means are mounted independently of the locking means and comprise a lever mechanism for remotely operating the locking means to release the movable arms for free movement thereof in the said opposite direction, and wherein each arm includes a toothed portion engagable with a common centrally located gear wheel rotatably mounted in the body so that movement of one arm in one direction moves the other arm in the opposite direction so that both arms move in opposite directions together.

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**5,044,536**
**SHIELD**
**Dean Gleason, P.O. Box 11614, Zephyr Cove, Nev. 89448**
**Filed Jul. 20, 1989, Ser. No. 382,229**
**Int. Cl.[5] B60R** *9/05;* **B62J** *11/00*
**U.S. Cl. 224—30 R** **18 Claims**

1. In the combination of a bicycle rack mountable on a surface of a vehicle and a bicycle mounted on said bicycle rack with the front wheel removed, the improvement comprising a shield device for protecting said bicycle during transport thereof further comprising:
a) shield means having a generally curved shape;
b) a first attachment means on said shield means for attaching said shield means to said bicycle rack;
c) a second attachment means on said shield means for attaching said shield means to said bicycle; and

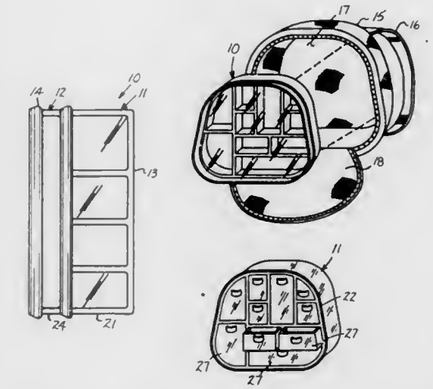


d) said first and second attachment means being sized and shaped such that said shield means is positioned in front of said bicycle when mounted on said rack and further occupies the space normally occupied by said front wheel;
e) said shield means further including horizontal track means mounted thereon for engaging each said first and said second attachment means to said shield means.



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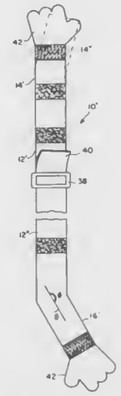
**5,044,537**
**BACKPACK ORGANIZER APPARATUS**
**Jeffery P. Bufalo, R.D. #2 Box 443B, Pine Bush, N.Y. 12566**
**Filed May 7, 1990, Ser. No. 519,826**
**Int. Cl.[5] A45F** *3/04*
**U.S. Cl. 224—245** **1 Claim**



1. A backpack organizer apparatus in combination with a backpack, wherein the backpack includes a backpack cavity defined within the backpack, the backpack further includes a cover flap selectively overlying the cavity to enclose the cavity, the organizer includes:
a first housing container securable to a second housing container, the second container includes a lid, wherein the first container, the second container and the lid define a geometric configuration that is complementary to a configuration defined by the backpack cavity, and
the first container, the second container and the lid are transparent, and
the first container includes a floor and a continuous, deformable side wall, the side wall being integrally and orthogonally mounted to the first container floor, the first container further includes a first lip integrally mounted and extending exteriorly of a free end of the first container side wall, wherein the first lip is receivable within a first channel integrally mounted to the second container, and
the second container includes a floor and a continuous, deformable side wall, the second container floor is integrally mounted adjacent an end of the second container side wall, the first channel also being located at the end of the second container side wall, and
the second container side wall includes a second lip formed at a free end of the side wall, and the lid includes a lid channel, the lid channel complementarily receives the second lip therein, the lid channel being integrally formed about a peripheral surface of the lid, and
the first container includes a plurality of first walls and a plurality of second walls, the first and second walls, are integrally mounted to the floor interiorly of the side wall to define a matrix of compartments therewithin, and
each of the compartments includes a slidably mounted removable tray, each tray includes a handle mounted to a wall of the tray to permit selective removal and insertion of each tray within a compartment of the first container.

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**5,044,538**
**CARRYING STRAP**
**Daniel M. Bader, 2133 Hemlock Rd., Norristown, Pa. 19403**
**Filed Jul. 27, 1990, Ser. No. 559,006**
**Int. Cl.[5] A45F** *3/14*
**U.S. Cl. 224—258** **9 Claims**



1. A one-piece carrying strap for an article, comprising an elongated web of material having a first end and a second end, the first end having releasable fastening means for forming an openable and closable loop integral and continuous with the web at said first end, the second end being disposed at an oblique angle to a longitudinal center line of the web and having releasable fastening means for forming an openable and closable loop integral and continuous with the web at said second end, each said loop being adapted to receive a portion of an article to be carried, the strap having a length defined by the approximate distance along the web between said loops,

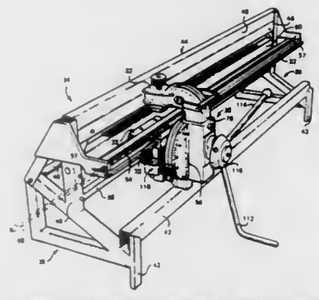
the releasable fastening means at the first end comprising a plurality of fastening elements for forming an openable and closable loop of a plurality of selectable sizes and simultaneously adjusting the length of the strap.

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**5,044,539**
**APPARATUS FOR AFFIXING FASTENERS TO A CONVEYOR BELT**

**Arthur Hargreaves, Blackburn, England, assignor to J. H. Fenner & Company Limited, North Humberside, England**

**Filed Mar. 7, 1990, Ser. No. 489,913**
**Claims priority, application United Kingdom, Mar. 8, 1989, 8905315**
**Int. Cl.[5] B25C *7/00***
**U.S. Cl. 227—111** **14 Claims**



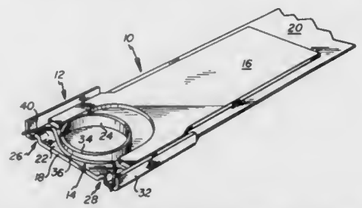
1. An apparatus for affixing fasteners, each comprising two arms Joined by an arcuate portion, to an end of a conveyor belt, comprising:
   locating means for locating a plurality of said fasteners at substantially equally-spaced intervals, with the legs of each of said fasteners embracing an edge of said conveyor belt;
   fastener affixing means for deforming the arms of a fastener onto said belt, for inserting a staple through the arms of said fastener and through said belt located between said arms and for deforming the ends of said staple projecting through said belt and through the arms of said fastener;
   advancing means for advancing said fastener affixing means stepwise; and
   an actuating mechanism for actuating said fastener affixing means and said advancing means and having an input shaft which rotates continuously in one direction to induce a cycle of operation of the apparatus.

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**5,044,540**
**SURGICAL STAPLING INSTRUMENT**

**David H. Dulebohn, Tonka Bay, Minn., assignor to Micro Precision, Inc., Plymouth, Minn.**

**Filed Mar. 5, 1990, Ser. No. 488,319**
**Int. Cl.[5] B31B *1/00***
**U.S. Cl. 227—175** **18 Claims**



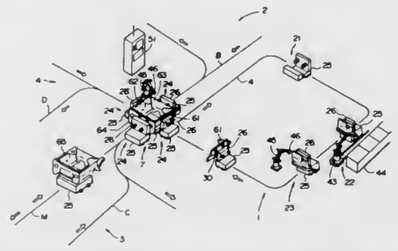
1. An instrument for stapling body tissue, comprising:
   staple means preformed in a closed state and made of a body-compatible material having a stress plateau such that the staple means may be flexed to an open state without permanent deformation;
   means for storing the staple means in the open state, the storing means having a discharge end and further comprising means for retaining the staple means within the storing means in the open state; and
   means for ejecting the staple from the retaining means at the storing means discharge end such that the staple returns itself to the performed closed state.

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**5,044,541**
**METHOD AND APPARATUS FOR ASSEMBLING VEHICLE BODY**

**Yoshitada Sekine, Yokohama; Tatsuo Miyauchi, Utsunomiya; Kazuyoshi Abe, Tokyo; Tohru Nishiyama, Ayase, and Hiroyuki Ono, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Apr. 18, 1990, Ser. No. 510,422**
**Claims priority, application Japan, Apr. 21, 1989, 1-100209; Apr. 27, 1989, 1-105807; Apr. 27, 1989, 1-105810; Jun. 6, 1989, 1-142172**
**Int. Cl.[5] B23K *9/32, 37/00***
**U.S. Cl. 228—6.1** **14 Claims**



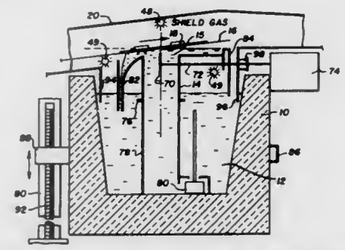
1. In a flexible manufacturing system for assembling various types of vehicle bodies, said system including a plurality of work piece carriers which run along a guide way, each carrier having thereon a work piece positioning device which includes a plurality of position changeable work piece holders by which at least one work piece is held and positioned with respect to the carrier,
   a method for carrying the work piece to a certain assembling stage, comprising the steps of:
   (a) moving said carrier together with said work piece positioning device to a type switching stage, said type switching stage being cable of actuating the work piece positioning device by using a power source mounted on said type switching stage;
   (b) connecting the power source on said type switching stage to said work piece positioning device to change the positions of said work piece holders in accordance with a type of work piece which will be subsequently handled by the positioning device;
   (c) disconnecting the power source from the positioning device upon completion of the position change of the work piece holders;
   (d) moving the carrier together with the work piece positioning device to a work piece pick up stage;
   (e) picking up at least one selected work piece from a work piece storing rack and putting the selected work piece onto the work piece holders of the positioning device; and
   (f) moving said carrier together with said positioning device to said certain assembling stage with the selected work piece held by said work piece holders and positioned with respect to said carrier.



**5,044,542**
**SHIELD GAS WAVE SOLDERING**

**Carlos A. Deambrosio, Laprairie, Canada, assignor to Electrovert Ltd., La Prairie, Canada**

**Filed Nov. 22, 1989, Ser. No. 441,009**
**Int. Cl.[5] B23K *3/00***
**U.S. Cl. 228—37** **29 Claims**



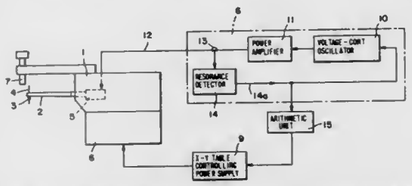
1. An apparatus for wave soldering an element comprising,
   an enclosure for a shield gas atmosphere substantially excluding oxygen with an entry for an element and an exit for the element;
   means to maintain the shield gas atmosphere within the enclosure;
   a preheating portion in the enclosure adjacent the entry with means to preheat the element therein;
   means for forming at least one solder wave in the enclosure after the preheating portion;
   means for moving the element in a predetermined path through the enclosure from the entry to the exit, the path ensuring at least a portion of the element passes through the solder wave;
   oscillating means to produce oscillations in the solder wave during the passage to the element therethrough, the frequency of oscillations being in the range of about 20 to 400 Hertz, and
   a cooling portion in the enclosure after the solder wave, adapted to allow solder on the element to solidify in the shield gas atmosphere.

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**5,044,543**
**WIRE BONDING METHOD AND APPARATUS**

**Mikiya Yamazaki, and Hiroshi Ushiki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan**

**Filed Feb. 26, 1990, Ser. No. 485,266**
**Claims priority, application Japan, Feb. 27, 1989, 1-47597**
**Int. Cl.[5] H01L *21/607***
**U.S. Cl. 228—110** **2 Claims**



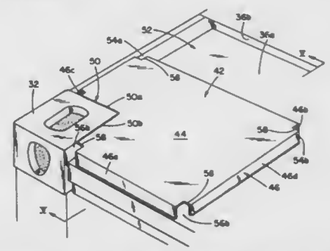
1. A wire bonding method used in a wire bonding apparatus which comprises a bonding tool through which a wire is passed, a horn which holds said bonding tool at one end, a vibrator fastened to said horn, a bonding head which supports said horn so that said horn is free to move upward and downward and to rotate, and an X-Y table which drives said bonding head in the X and Y directions, wherein said method comprises the steps of:
   converting the changes in the resonance frequency of said vibrator into an expansion or contraction of said horn;
   correcting the bonding coordinate by calculating the amount of said expansion or contraction; and
   driving said X-Y table in accordance with said corrected bonding coordinates so that said bonding tool is brought to a correct bonding point.

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**5,044,544**
**MODULAR CARGO CONTAINER**

**Charles W. Grogan, Yardley, Pa., assignor to Sea-Land Corporation, Inc., Iselin, N.J.**

**Filed Feb. 22, 1990, Ser. No. 483,252**
**Int. Cl.[5] B65D *19/08, 88/12***
**U.S. Cl. 228—119** **5 Claims**



1. A method of protecting a cargo container of the type having a body defining the shape of the container, and forming an interior cargo space, and including a roof, a floor, front and back walls, left and right side walls, a pair of support posts, a header extending between the support posts, and a plurality of post end members connected to the support posts to facilitate handling the cargo container, the method comprising the steps o:
   welding an energy absorption pad to an area of the header immediately adjacent one of the post end members, to protect said area from container handling equipment, wherein in use, the handling equipment strikes and dents the energy absorption pad;
   cutting the energy absorption pad from the header; and
   welding a replacement energy absorption pad to said area of the header to further protect said area from the container handling equipment.

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**5,044,545**
**OIL COOLER AND PROCESS FOR MANUFACTURING THE SAME**

**Masayuki Matsuda; Toyoharu Nishimura, both of Himeji; Yasuji Takagi, Ebina; Mamoru Tanaka, Isehara, and Naoki Norimatsu, Zama, all of Japan, assignors to Nichirin Rubber Industrial Co., Ltd., Kobe; NHK Spring Co., Ltd. and Nissan Motor Co., Ltd., both of Yokohama, all of, Japan**

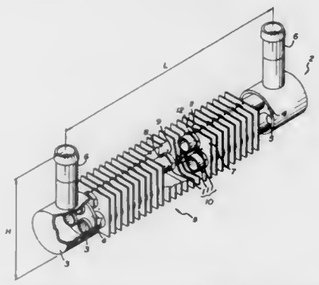
**PCT No. PCT/JP89/00055, § 371 Date Sep. 15, 1989, § 102(e) Date Sep. 15, 1989, PCT Pub. No. WO89/06744, PCT Pub. Date Jul. 27, 1989**
**Division of Ser. No. 415,342, filed as PCT JP89/00055 on Jan. 10, 1989, published as WO89/06744 on Jul. 27, 1989, abandoned. This PCT application Jan. 20, 1989, Ser. No. 544,093**
**Claims priority, application Japan, Jan. 23, 1988, 63-13383**
**Int. Cl.[5] B23K *1/18***
**U.S. Cl. 228—183** **2 Claims**

1. A process for manufacturing the oil cooler having chambers connected to both ends of a tube bundle, hose fittings fixed to each chamber and a plurality of cooling fins fixed to the tube bundle, which comprises the steps of:
   (A) making cooling fins by forming a plurality of insertion holes of which inner brim is projected along an axial direction for inserting a plurality of tubes in each sheet to be transformed into a cooling fin, and by drilling a plurality of pores for inserting linear brazing materials, at positions closed to and spaced apart from said insertion holes respectively,

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(B) inserting a plurality of seamless tubes arranged in parallel into each of insertion holes of a number of the cooling fins respectively, and inserting linear brazing materials into the pores of each of the cooling fins, and



(C) joining said brims of the cooling fins to the tubes by melting said brazing materials.

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**5,044,546**

**PROCESS FOR BONDING ALUMINUM SHEETS WITH CADMIUM AND PRODUCT THEREOF**

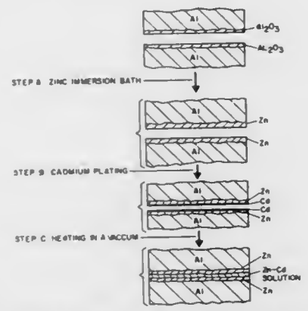
**Charles E. De Clerck, Great River, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.**

**Continuation of Ser. No. 147,021, Jan. 19, 1988, Pat. No. 4,948,031, which is a continuation of Ser. No. 928,425, Nov. 10, 1986, abandoned. This application Dec. 18, 1989, Ser. No. 423,513**

**The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.**

**Int. Cl.[5] B23K** *1/20;* **H01P** *11/00*

**U.S. Cl. 228—194** **12 Claims**




1. A process for joining surfaces of first and second aluminum members, said surfaces having an aluminum oxide layer thereon, said process comprising the steps of:

(a) dissolving and removing completely the aluminum oxide layer from the surface of each of said first and second members to be joined and replacing each of the aluminum oxide layers with a layer consisting essentially of zinc;

(b) plating at least one of the zinc layers with a non-alloy cadmium;

(c) assembling and retaining together said first and second aluminum members so that the surfaces to be joined are held in contact with one another and placing said aluminum members in a vacuum; and

(d) heating the members while in the vacuum thereby forming a bond between said first and second aluminum members.

**5,044,547**

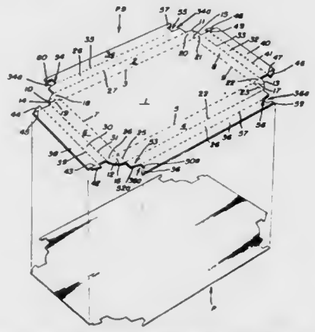
**DECORATIVE TRAY OR TRAY COVER**

**Andrew F. Hartman, Eindhoven, Netherlands, assignor to Timothy A. Canning, Raleigh, N.C.**

**Filed Mar. 27, 1990, Ser. No. 499,766**

**Int. Cl.[5] B65D** *5/62*

**U.S. Cl. 229—40** **13 Claims**



1. A tray or tray lid comprising a scored paperboard blank and a separate paper blank of wrapping material of similar configuration to said paperboard blank and arranged with its inner surface in flat face contacting relation with the outer surface of said paperboard blank and with its edges in substantial coincidence with the edges of said paperboard blank, said paperboard blank and corresponding parts of said unscored paper blank including main panels of quadrilateral configuration with right angle corners, outer side panels foldably joined to opposite side edges of said main panels and disposed in substantially perpendicular relation to said main panels respectively, outer end panels foldably joined to opposite end edges of said main panels and disposed in substantially perpendicular relation to said main panels respectively, locking means including web structure securing the adjacent ends of said outer side and end panels of said scored paperboard blank and of said paper blank together at each corner of the tray or tray lid and constituting means for holding the paper blank in contact with the paperboard blank whereby mechanical strength and durability are imparted to the tray or tray lid by the scored paperboard and an attractive appearance is derived from the outer surface of the paper blank.

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**5,044,548**

**STACKING BALL CARTON, BLANK AND METHOD**

**Leo T. Olsen, 93 W. Fullerton, Glendale Heights, Ill. 60139, and Thomas W. Fester, Woodridge, Ill., assignors to Leo T. Olsen, White Heath, Ill.**

**Filed Sep. 28, 1989, Ser. No. 414,093**

**Int. Cl.[5] B65D** *5/48*

**U.S. Cl. 229—120.03** **4 Claims**

1. A stacking carton for holding a plurality of members in four stacks, said carton having four internal tubular sections of a tube, said tube having opposed closed ends and four sidewalls, comprising, in combination,

two anchored full panel struts adjacent each other and extending at an angle with respect to each other,

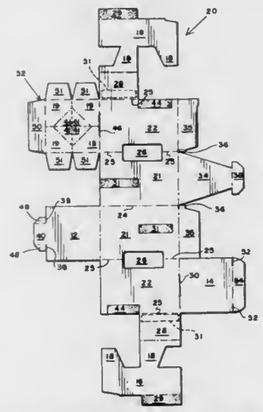
anchor tabs each attached to one of said two full panel struts which run substantially the full length of each strut and are secured to a mid-portion of an adjacent sidewall,

two partial panel struts attached to said full panel struts, each partial panel strut having a portion secured to one of said sidewalls and an unsecured portion, each portion being spaced from the other a distance to inhibit the lateral shifting of contents of the carton,

and an anchor tab attached to each partial panel strut for securing the secured portion of each partial panel strut,



said anchor tabs each being secured at a mid-position to an adjacent one of said sidewalls, whereby a single carton



having four internal stacking sections can be formed in knock down configuration.

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**5,044,549**

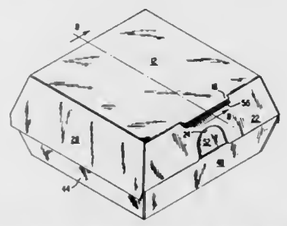
**CLAMSHELL TYPE CARTON**

**Jonathan Beales, Philadelphia, Pa., assignor to International Paper Company, Purchase, N.Y.**

**Filed Jun. 15, 1990, Ser. No. 538,450**

**Int. Cl.[5] B65D** *5/20*

**U.S. Cl. 229—125.27** **4 Claims**



1. A clamshell type carton having an upper half and a lower half and having an easily releasable latch to hold the top clamshell half in a closed position relative to the bottom clamshell half, the top and bottom clamshell halves being hingedly secured together along a rear wall of the carton, the lower clamshell half having an upstanding front latch release panel having an upper portion and bendably secured to the lower clamshell half along a fold line, the upper portion of said latch release panel resiliently and bendably secured to a horizontally disposed latch tongue panel provided with a horizontally extending latch tongue, the upper clamshell half including a front wall having a latch aperture which releaseably receives said latch tongue in the closed position of the carton wherein the two said carton halves are closed together, said front wall of the upper clamshell half having a finger receiving recess, said recess located below said latch tongue, said upper clamshell half normally overlying said lower clamshell front latch release panel, whereby the finger receiving recess uncovers a portion of the lower clamshell front latch release panel to permit direct pressing, by a finger, of the front latch release panel to move the latch tongue out of the latch aperture upon bending of the latch release panel about said fold line.

**5,044,550**

**FLIP-TOP CARTONS**

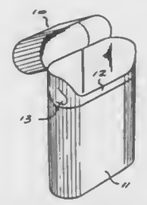
**Klaus P. Lamm, Cape Province, South Africa, assignor to Tobacco Research and Development Institute Limited, Switzerland**

**Filed Aug. 22, 1990, Ser. No. 570,634**

**Claims priority, application South Africa, Aug. 22, 1989, 89/6398**

**Int. Cl.[5] B65D** *11/48*

**U.S. Cl. 229—160.1** **6 Claims**



1. A carton with parallel flat front and rear surfaces joined by curved sides and a flip-top lid hinged to the carton, composed of two superimposed layers adhesively secured at a joint line at lapped edges, in which the outer layer is slit along its fornt surface parallel to the carton ends and along upwardly extending curves around the sides to a fold line parallel to and raised above the front sliT, the inner layer having a cutout in its front surface above the front slit of the outer layer, which cutout curves upwardly short of the sides where taps are cut out of the sides of the inner layer, the outer layer overlapping the inner layer at the carton ends and top and bottom closures being adhesively secured to the outer layer at the ends of the carton.

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**5,044,551**

**THERMO BULB FOR USE WITH THE THERMOSTATIC EXPANSION VALVE**

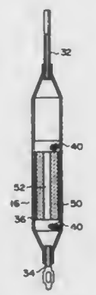
**Hazime Tanaka, Yokohama, and Kazuhiko Watanabe, Kanagawa, both of Japan, assignors to Fuji Koki Mfg. Co. Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 292,356, Dec. 30, 1988, abandoned. This application Dec. 29, 1989, Ser. No. 462,299**

**Claims priority, application Japan, Jan. 8, 1988, 63-2130**

**Int. Cl.[5] G05D** *23/12*

**U.S. Cl. 236—92 B** **10 Claims**



1. A thermo bulb for use with a thermostatic expansion valve, comprising:

a temperature sensing cylinder having an inner surface and being connected to a power element of a valve unit of the thermostatic expansion valve;

a thermal ballast arranged in the temperature sensing cylinder and made by a ceramic sinter, which includes silica and alumina as its main components so as to have at least one bore hole extending straight through in an axial direc-

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tion of the temperature sensing cylinder and opening at both axial ends of the thermal ballast;
an operating fluid, sealed in the temperature sensing cylinder so as to change from a gas phase to a liquid phase and vice versa, in response to temperature sensed by the temperature sensing cylinder at an outlet of an evaporator of a refrigeration system; and
means for fixing the thermal ballast into a certain position with substantially unequal axial clearances in the temperature sensing cylinder so as not to prevent the operating fluid in the gas phase from making surface contact with the inner surface of the temperature sensing cylinder;
whereby the thermal ballast is able to trap and hold the operating fluid in the liquid phase at surfaces and pores of the thermal ballast.

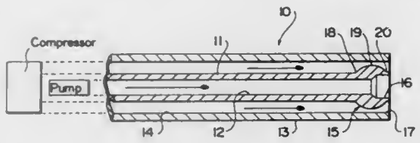
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**5,044,552**

## SUPERSONIC COAL WATER SLURRY FUEL ATOMIZER

**Frederick E. Becker, Reading; Leo A. Smolensky, Concord, and John Balsavich, Foxborough, all of Mass., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Nov. 1, 1989, Ser. No. 430,032**
**Int. Cl.[5] B05B** *7/06, 17/04*
**U.S. Cl. 239—8** **17 Claims**




11. A method of atomizing a liquid fluid, comprising:
flowing a substantially liquid fluid at a first velocity through a first passageway having a first outlet;
flowing a secondary fluid at a second velocity below a supersonic velocity through an annular second passageway surrounding said first passageway, said second passageway having a common axis with said first passageway and a second outlet concentric with said first outlet and in the same plane normal to the axis of said passageways, said second velocity increasing to a supersonic velocity at said second outlet; and
maintaining said secondary fluid at essentially atmospheric pressure as it emerges from said second outlet, whereby said substantially liquid fluid is atomized through shearing action between said substantially liquid fluid and said secondary fluid external to the nozzle.

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**5,044,553**

## SIDEWALL DEFLECTION CONTROL FOR A TWO-DIMENSIONAL NOZZLE

**Peter B. Degress, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Feb. 20, 1990, Ser. No. 481,935**
**Int. Cl.[5] F02K** *1/12;* **B64C** *15/02*
**U.S. Cl. 239—11** **16 Claims**



1. A sidewall deflection controlled two-dimensional nozzle in which exhaust gas from a gas turbine engine enters the nozzle through a forward end of the nozzle and exits through an aft end of the nozzle, said nozzle comprising:
a static structure having a centerline defined therethrough and first and second sidewalls laterally spaced from said centerline; and
upper and lower movable flap assemblies, each flap assembly extending between the first and second sidewalls and including
a divergent flap extending between the first and second sidewalls and having a leading edge and a trailing edge, and,
positioning means for selectively positioning the trailing edge of the divergent flap, said positioning means including
actuator means mounted to the respective sidewall at a mounting position which is aft of the leading edge, thereby counteracting sidewall deflection caused by said exhaust gas
a positioning member slideably contacting the divergent flap for positioning thereof, said positioning member fixedly secured to a pivot shaft mounted in the static structure of the nozzle;
rotating means for rotating said positioning member, said rotating means attached to said pivot shaft; and,
each actuator means including a load arm connected to the corresponding rotating means.

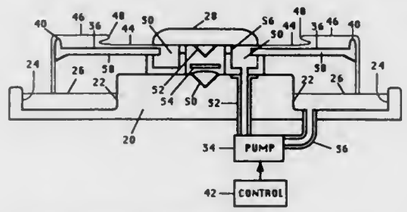
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**5,044,554**

## HYDRAULIC JUMP WATER DISPLAY

**Mark W. Fuller, 10711 Bluffside Dr., #101, Studio City, Calif. 91604, and Alan S. Robinson, 5344 C N. Peak Rd., El Monte, Calif. 91732**

**Filed Apr. 25, 1990, Ser. No. 514,422**
**Int. Cl.[5] B05B** *17/08*
**U.S. Cl. 239—17** **19 Claims**




1. A water display comprising:
a source of water under pressure;
means defining a surface over which water is to flow;
means adjacent to said surface and coupled to said water under pressure for directing water from said source of water under pressure over said surface in a high velocity thin sheet of water, and;
means on said surface, to be intercepted by said thin sheet of water, for tending to establish a quantity of low velocity water of a thickness substantially greater than the thin sheet of water;
whereby a hydraulic jump is created in the boundary region between the high velocity thin sheet of water and the quantity of low velocity water of a thickness substantially greater than the thin sheet of water.

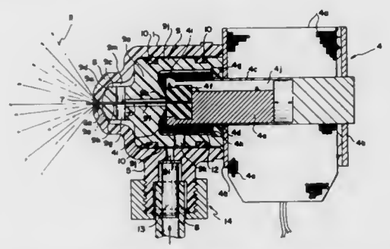


**5,044,555**

## SELF-CLEANING SOLENOID CONTROLLED WATER SPRAY NOZZLE AND VALVE ASSEMBLY

**Judy L. Youngeberg, Manheim, and Richard A. Colberg, Lancaster, both of Pa., assignors to Herrmidifier Company, Inc., Lancaster, Pa.**

**Filed Jul. 23, 1990, Ser. No. 555,615**
**Int. Cl.[5] B05B** *15/02* .
**U.S. Cl. 239—117** **14 Claims**



1. A self cleaning solenoid controlled water spray nozzle and valve assembly comprising, an adaptor, means for connecting one end of said adaptor to a solenoid, a nozzle having an outlet orifice connected to the opposite end of said adaptor, a nozzle flow direction member mounted within said nozzle, a valve seat mounted within said adaptor, a water inlet fitting connected to said adaptor, water flow passages extending from said water inlet fitting through said adaptor, the valve seat and nozzle flow direction member to the nozzle orifice, said solenoid including a reciprocatory armature, a valve head mounted on one end of said armature and engageable with the valve seat for controlling the flow of water therethrough, and a thin needle connected at one end to said valve head, said needle extending axially from the valve head through the valve seat, the nozzle flow direction member and nozzle orifice to thereby prevent the orifice from becoming clogged by an accumulation of minerals from the spray water, whereby upon actuation of said solenoid the valve head is moved away from the valve seat while simultaneously retracting the free end of the needle from the nozzle orifice, and water is sprayed through the nozzle.

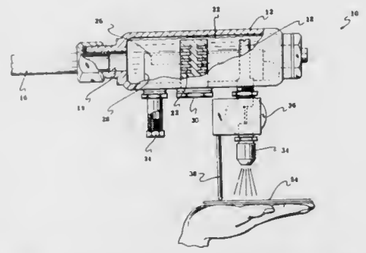
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**5,044,556**

## WATER SPRAYER FOR WETTING TOILET PAPER

**Masahiko Suzuki, 896, Nagafusa-cho, Hachioji-shi, Tokyo, Japan**

**Filed Jan. 3, 1990, Ser. No. 460,367**
**Int. Cl.[5] A47K** *7/00;* **B05B** *1/24*
**U.S. Cl. 239—135** **12 Claims**



1. A water sprayer for wetting toilet paper comprising:
a tank having a water feeding port and a water exhalant port;
a heater for heating the water in said tank;
means for controlling the temperature of the water heated by said heater;
a nozzle, which is connected to the water exhalant port of said tank, for spraying water toward toilet paper;
a valve for opening and closing the water path in said nozzle;
an exhalant pipe whose lower end section is connected to said tank, and whose upper end is said exhalent port which is located higher than the upper most section of said heater.

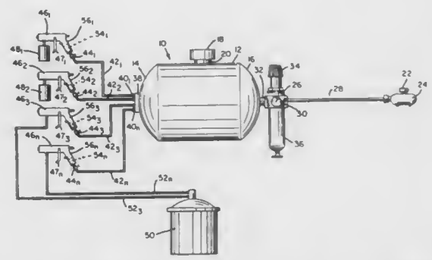
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**5,044,557**

## HIGH VOLUME, LOW PRESSURE SPRAYING SYSTEM

**William C. Smith, 7701 Whiterim Ter., Potomac, Md. 20854**

**Division of Ser. No. 450,474, Dec. 14, 1989, Pat. No. 4,991,776.**
**This application Oct. 30, 1990, Ser. No. 605,365**
**The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.**
**Int. Cl.[5] B05B** *7/24, 7/06;* **F04B** *23/00*
**U.S. Cl. 239—302** **28 Claims**



1. A high volume, low pressure atomization system, coupled to a compressed air source, for atomizing a fluid, comprising:
at least one atomizer including means for being coupled to a source of fluid to be atomized;
a jet venturi induction pump including a nozzle and a venturi section, said venturi section having an input end, an output end, and induction port means located at said input end adjacent said nozzle;
means for coupling the nozzle to said compressed air source;
ambient air intake means for receiving ambient air and supporting said induction pump and including valve means biased in a normally closed position but which is moved to an open position to deliver ambient air to said induction port means when said at least one atomizer is activated, said output end feeding low pressure air generated by said venturi section to said at least one atomizer,
said ambient air intake means being located apart from and at a predetermined distance away from said at least one atomizer so that overspray produced thereby and present in the ambient air in the vicinity thereof is prevented from being fed into said air intake means and said venturi induction pump along with compressed air from said compressed air source.

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**5,044,558**

## BURNER NOZZLE WITH REPLACEABLE AIR JETTING ASSEMBLY

**Timothy M. Young, Coppell; Charles D. Coppedge, Euless, and Charles S. McCasland, Westminister, all of Tex., assignors to Halliburton Company, Duncan, Okla.**

**Filed May 9, 1989, Ser. No. 350,105**
**Int. Cl.[5] A62C** *31/02;* **F23D** *14/62*
**U.S. Cl. 239—391** **14 Claims**

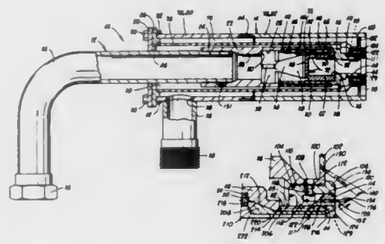
1. A petroleum burner nozzle for use with a petroleum supply, said nozzle comprising:
petroleum orifice means for forming and directing a petroleum stream from said petroleum source, said petroleum

VOL 1130 ISS 1 SE 3 1991 UMI



orifice means defining a central bore through which said petroleum stream is discharged;

an air jacket disposed around said petroleum orifice means; and



an air jet removably attached to said air jacket and defining a substantially annular jetting orifice for forming an air stream and directing said air stream into impingement with said petroleum stream for facilitating atomization of said petroleum stream.

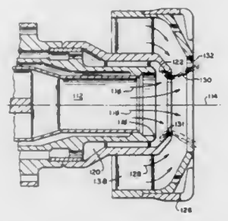
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**5,044,559**

## GAS ASSISTED LIQUID ATOMIZER

**Sid Russell, Suffield, and Richard S. Tuthill, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Nov. 2, 1988, Ser. No. 266,033**
**Int. Cl.[5] B05B *7/10***
**U.S. Cl. 239—406** **4 Claims**



1. In a single stage liquid atomizer having a central gas discharge opening surrounded by a coaxial liquid discharge opening, wherein the gas discharge opening is disposed upstream of the liquid discharge opening and wherein the liquid and gas are both discharged from an atomizer outlet opening disposed downstream of the liquid outlet opening,

the improvement comprising:

sizing the atomizer outlet opening no greater than the gas discharge opening, whereby the liquid and gas are commingled prior to exiting the atomizer.

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**5,044,560**

## NOZZLE HEAD FOR LIQUID SPRAY

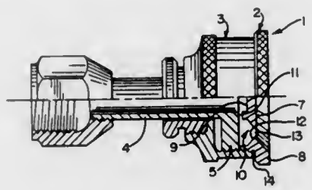
**Yap Y. Cheng, Syarikat Jun Chong Sdn Bhd, 18 Jalan Lambak, 86000 Kluang, Jobor, Malaysia**

**Filed Aug. 1, 1989, Ser. No. 388,584**
**Int. Cl.[5] B05B *1/34, 1/18***
**U.S. Cl. 239—476** **1 Claim**

1. A nozzle cover for providing a large angle of liquid spray comprising:

a drum body having a hollow cylindrical shaft coaxially movable along a longitudinal axis of said drum body, a flange fastened to the terminal end of said shaft inside said drum body, said flange having a coaxial aperture and being sealingly engageable and coaxially movable along said longitudinal axis of said drum body;

a first portion mountable onto an open end of said drum body, said first portion having a primary cavity in registration with said shaft and connected via a communication duct to at least one secondary cavity, said communication duct being positioned tangentially in relation to said primary and secondary cavities, each of said at least one secondary cavity having an orifice leading to the outside atmosphere at one end and further having an opposite end, said first portion having a thickness such that the distance from said opposite end of said orifice to said one end of said orifice comprises said thickness of said first portion, and said communication duct having a width measured



perpendicular to the direction of liquid flow through said communication duct, said width of said communication duct being substantially larger than the diameter of said orifice; and

a second portion attached to said first portion, said second portion having an outer edge and a planar surface through which said orifice passes, said planar surface being depressed from said outer edge such that said thickness of said first portion is less than the distance from said opposite end to said outer edge;

whereby, liquid that is pumped under pressure through said drum body into said primary cavity passes through said communication duct to said secondary cavity, and is ejected through said orifice into the outside atmosphere in a large angle of spray.

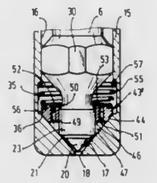
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**5,044,561**

## INJECTION VALVE FOR FUEL INJECTION SYSTEMS

**Volker Holzgrefe, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Nov. 24, 1987, Ser. No. 126,073**
**Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643523**
**Int. Cl.[5] F02M *61/20***
**U.S. Cl. 239—491** **17 Claims**



8. An insert body for use in an injection valve for an internal combustion engine which comprises

a central axial bore through which an end portion of a valve needle passes,

a plurality of equally spaced openings which extend from upstream to downstream through said insert body through which fuel flows, and

said insert body further includes a bottom portion and an upwardly extending rim.

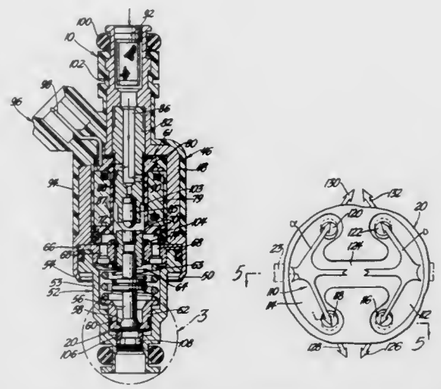


**5,044,562**

## DUAL SPRAY DIRECTOR USING AN "H" ANNULUS

**David W. Rogers; Kurt T. Hertzog, both of Henrietta; Jay K. Sofianek, Livonia, all of N.Y., and Lawrence W. Robinson, Rochester Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jul. 2, 1990, Ser. No. 546,993**
**Int. Cl.[5] F02M *51/06***
**U.S. Cl. 239—543** **10 Claims**



1. A director plate for an electromagnetic fuel injector for discharging fuel into the combustion chambers of an internal combustion engine, said director plate having a centralized axis and an upper surface with opposing discrete fuel distributing channel means therein for distribution of fuel supplied thereto, a plurality of associated pairs of spaced apart injector orifice means at predetermined locations in said discrete channel means and extending through said director plate, each of said injector orifice means being inclined at a predetermined angle to said central axis so that associated pairs of said injector orifice means will direct streams of fuel toward said central axis which partially intersect one another whereby said streams from each associated pair of injector orifice means will at least partly impinge upon each other to produce a fuel spray pattern which impinges on a preselected target.

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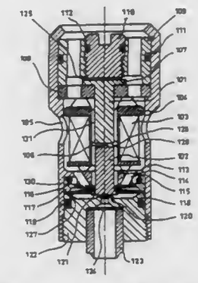
**5,044,563**

## ELECTROMAGNETIC FUEL INJECTOR WITH DIAPHRAGM SPRING

**Gerhard Mesenich, Bochum, Fed. Rep. of Germany, assignor to Siemens Automotive L. P., Auburn Hills, Mich.**

**Filed Oct. 10, 1989, Ser. No. 419,489**
**Claims priority, application Fed. Rep. of Germany, Oct. 10, 1988, 3834444**
**Int. Cl.[5] B05B *1/30***
**U.S. Cl. 239—585** **11 Claims**

1. An electromagnetic fuel injector comprising body structure having a main longitudinal axis, a fuel inlet port, a fuel outlet port, a fuel path extending through said body structure between said fuel inlet and said fuel outlet ports, a valve seat circumscribing said fuel path, a closure surface that coacts with said valve seat to open and close said fuel path, an armature that is biased on said body structure by a spring to cause said closure surface to seat against said valve seat and block flow through said fuel path, and a solenoid mounted on said body structure and comprising a coil that is coaxial with said axis, that contains a stator which passes axially partially through said coil to terminate in a pole disposed within said coil and facing said armature, and that when energized causes said armature to be attracted toward said pole and to unseat from said valve seat so that fuel can flow through said fuel path, characterized in that said armature comprises a main body having a first portion disposed within said coil and a second portion disposed without said coil, said spring is a spring disc having an outer peripheral margin held on said



body structure, said spring disc has through-aperture means located centrally therein, said second portion of said armature passes through said through-aperture means to form a joint for joining said armature with a central region of said spring disc, and said spring disc is disposed in said fuel path and comprises further through-aperture means that allows for fuel to flow through said spring disc, said body structure comprises a first part containing said valve seat and a second part, said two parts are coaxially threaded together about said axis so that the axial position of said first part on said second part can be adjusted, the peripheral margin of said spring disc bears directly against a peripheral surface portion of said first part, and resilient means are provided between said spring disc and said second part to allow for the adjustment of said first part on said second part.

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**5,044,564**

## ELECTROSTATIC SPRAY GUN

**James E. Sickles, 21889 Potomac Dr., Southfield, Mich. 48076**

**Filed Nov. 21, 1989, Ser. No. 439,842**
**Int. Cl.[5] B05B *5/034***
**U.S. Cl. 239—690.1** **41 Claims**

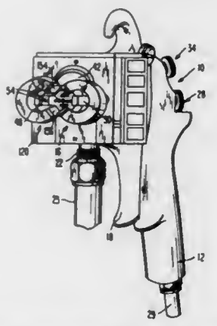
1. An adapter for electrostatic charging of particles produced by a spray gun having a spray nozzle for spraying an atomized liquid forwardly along a spray axis and having an air cap on the nozzle, the air cap having a forward surface and having at least one port for directing air under pressure toward the atomized liquid for further atomization and for directing the spray pattern, comprising:

an electrode assembly having an axis, said assembly including electrode means around said axis;

means for connecting a high voltage of known polarity to said electrode means to produce a charging zone in the region of said axis; and

means for mounting said electrode assembly on a spray gun to locate said electrode means forwardly of the forward surface of the air cap and coaxial with a spray axis of the spray gun to space said electrode means close to the spray axis to produce an electrostatic field gradient in said

charging zone coaxial with the spray axis and in the path of liquid sprayed from a spray gun on which said elec-



trode assembly is mounted to charge the liquid particles to the opposite polarity as said high voltage.

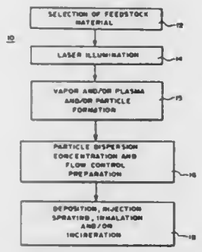
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**5,044,565**

**FORMING FINE PARTICLES**

**Dennis R. Alexander, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebrasaka, Lincoln, Nebr.**

**Filed Mar. 13, 1990, Ser. No. 492,928**
**Int. Cl.[5] B23K *15/00*; B02C *23/00***
**U.S. Cl. 241—1** **13 Claims**




1. A process for forming and using small particles comprising the steps of:

selecting a feedstock material to be broken into particles;

irradiating the feedstock material with radiant energy having a predetermined angle of incidence to the feedstock material at a predetermined point, having a predetermined wavelength and having sufficient intensity to cause the feedstock material to be formed into particles that are at low velocity at least after moving a distance less than one inch from the predetermined point;

gathering the particles in a space at least partly confining the particles;

controlling the direction of movement of the particles to move then to a predetermined location;

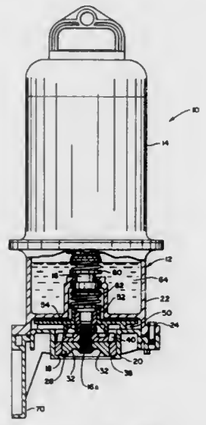
the step of controlling the direction of movement including the substep of controlling the flow of particles at a low velocity to the predetermined location after the step of gathering the particles.

**5,044,566**

**SEWAGE PUMP WITH SELF-ADJUSTING CUTTERS**

**Brian M. Mitsch, Perrysville, Ohio, assignor to General Signal Corporation, Stamford, Conn.**

**Filed Dec. 27, 1989, Ser. No. 457,456**
**Int. Cl.[5] B02C *23/00, 18/40***
**U.S. Cl. 241—46.04** **15 Claims**



1. A grinder pump which comprises:

a housing;

a shaft disposed within said housing having an axis;

means for mounting said shaft within said housing for rotational movement thereof;

a moveable cutter carried on said shaft;

means for coupling said moveable cutter to said shaft to cause rotation of said moveable cutter upon rotation of said shaft;

a stationary cutter carried by said housing, said moveable cutter cooperating with said stationary cutter to perform cutting along respective surfaces of said moveable cutter and said stationary cutter, said respective surfaces of said stationary and moveable cutters being substantially within a plane that is substantially perpendicular to said axis; and

means for self sharpening of said moveable cutter and means for avoiding jamming of materials intermediate said moveable cutter and said stationary cutter comprising means resiliently biasing said moveable cutter against said stationary cutter.

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**5,044,567**

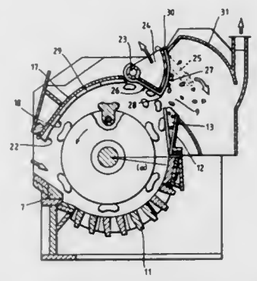
**SCRAP CRUSHING MACHINE**

**Dietrich Hte, Vellmar, and Josef Weber, Melsungen, both of Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Essen, Fed. Rep. of Germany**

**Filed Dec. 27, 1989, Ser. No. 457,332**
**Claims priority, application Fed. Rep. of Germany, Dec. 27, 1988, 3844005**
**Int. Cl.[5] B02C *17/00***
**U.S. Cl. 241—73** **14 Claims**

1. A scrap crushing machine, comprising crushing means including a crusher rotor and at least one associated anvil; a housing accommodating said crushing means, said housing having an inlet opening and an outlet opening, a base arranged substantially under said rotor and extending from said inlet opening to said outlet opening, and an upper cover arranged substantially above said rotor and extending from said outlet opening to said inlet opening so as to define with said rotor a return chamber; separating means arranged in said outlet opening; an outlet connected with said outlet opening; and a flap arranged behind said separating means as considered in direction of rotation of said rotor and having a separating edge, said flap being swivelable, during rotation of said rotor, to at least one operating position in which said edge feeds sufficiently crushed scrap pieces passing through said separating means





mainly to said outlet and feeds insufficiently crushed scrap pieces mainly to said return chamber, said flap being also swivelable to an open position in which insufficiently crushed scrap pieces are also fed to said outlet.

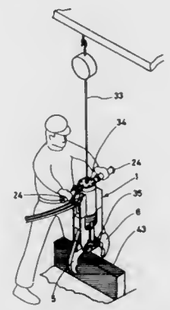
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**5,044,568**

**HAND CRUSHER WITH ROTATABLY MOUNTED HANDLE**

**Akihiko Shigemizu, Tokyo, Japan, assignor to Takachiho Kogyo Yuugen Kaisha, Tokyo, Japan**

**Filed Aug. 20, 1990, Ser. No. 570,088**
**Int. Cl.[5] B02C *1/08***
**U.S. Cl. 241—169** **5 Claims**



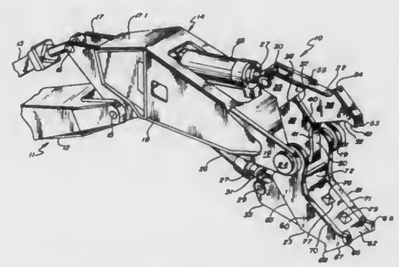
1. A hand crusher with rotatably mounted handle, comprising a main body, which consists of a cylinder unit having a built-in hydraulic cylinder in longitudinal direction along an engagement center line of a pair of crushing arms, being opened or closed at symmetrical positions and of a parallel plate unit bonded on said cylinder unit, wherein said crushing arms are pivotally supported at a lower portion of the parallel plate unit, said crushing arms are opened or closed in linkage with a piston rod which is extended from said hydraulic cylinder and makes reciprocal movement along said center line, slide keys furnished at a tip of said piston rod are engaged in guide grooves on the parallel plate unit, a handle member having a left grip and a right grip is rotatably mounted on a rotating unit at an upper end of the cylinder unit, the left grip and the right grip are connected straightly on both ends of the handle member and protrude at symmetrical positions to said center line, and the main body is designed in oblong and compact form and is well balanced on both sides at symmetrical positions.

**5,044,569**

**ROCK AND CORAL DEMOLITION TOOL**

**Roy E. LaBounty, HC2, Box 105E, and Kenneth R. LaBounty, Rte. 1, Box 164B, both of Two Harbors, Minn. 55616**

**Filed Dec. 15, 1989, Ser. No. 451,506**
**Int. Cl.[5] B02C *1/06***
**U.S. Cl. 241—266** **15 Claims**



1. A heavy-duty mobile demolition tool for attachment to the boom and hydraulic system of a hydraulic excavator, comprising

a frame means mountable on the boom,

a pair of upper and lower demolition jaws pivotally connected to each other as to be opened and closed relative to each other, at least one of the jaws being pivotally mounted on the frame means as to be movable for opening and closing the jaws relative to each other,

a hydraulic cylinder mounted on the frame means and connected with the at least one moveable jaw for producing swinging thereof,

the upper jaw having a main plate with a lower edge having a tooth-like tip,

the lower jaw having spaced apart plates with upper lips, a cross plate joining the spaced apart plates, and an array of tooth-like tips on the lips and cross plate which are indirectly confronting, staggered and linear in relation to the tip of the upper jaw when the jaws are pivoted to the closed position whereby a demolition force may be exerted against a material so as to cause breaking of it into smaller pieces.

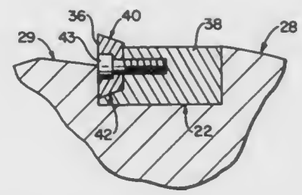
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**5,044,570**

**SHAVER ROTOR ASSEMBLY**

**Robert C. Montgomery, Sr., Jacksonville, Fla., assignor to Montgomery Industries International Inc., Jacksonville, Fla.**

**Filed May 9, 1990, Ser. No. 520,739**
**Int. Cl.[5] B02C *18/18***
**U.S. Cl. 241—294** **9 Claims**




1. A rotor assembly for a shavings making machine comprising:

a rotor having an external periphery;

a plurality of circumferentially spaced longitudinally extending parallel channels in said rotor periphery;

a wedge insert mounted in each channel, at least one of said wedge inserts having a lower portion which is approxi-

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mately equal to the width of the respective channel and with said at least one wedge insert extending approximately the length of the respective channel;

a knife insert for mounting on said at least one wedge insert, said knife insert having a pair of cutting edges which are symmetrical in two planes, thus providing a reversible insert with two cutting edges; and

means for removably mounting said knife insert on said at least one wedge insert;

said knife insert having a vertical exterior surface which abuts a side wall of the respective channel, said mounting means extending only from said vertical exterior surface inwardly through said knife insert and said at least one wedge insert, and wherein said mounting means abuts said side wall and thus cannot back out of the knife insert due to vibrational forces.

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**5,044,571**

## APPARATUS FOR WINDING YARN

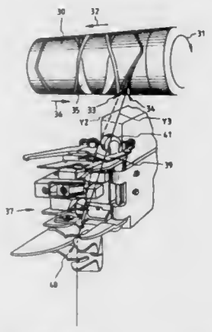
**Kenji Ohashi, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Jul. 20, 1989, Ser. No. 383,365**

**Claims priority, application Japan, Jul. 27, 1988, 63-187720**

**Int. Cl.[5] B65H** *54/38, 54/48*

**U.S. Cl. 242—18.1** **5 Claims**



1. An apparatus comprising:

a rotatable traverse drum including a first traverse groove having a first wind number and a second traverse groove having a second wind number, the first wind number being different than the second wind number,

the traverse drum further including a branch portion at which a yarn to be wound on a package is selectively distributed to at least one of the first and second traverse grooves as the drum rotates; and

switching means for distributing yarn at the branch portion to at least one of the first and second traverse grooves.

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**5,044,572**

## YARN UNWINDING GUIDE APPARATUS FOR A TEXTILE WINDING MACHINE

**Hans Grecksch, and Dietmar Engelhardt, both of Monchen-Gladbach, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany**

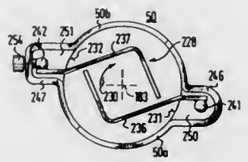
**Filed Dec. 26, 1989, Ser. No. 456,382**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843553**

**Int. Cl.[5] B65H** *54/20, 67/02, 49/00*

**U.S. Cl. 242—35.5 R** **27 Claims**

1. In a textile machine of the type having a plurality of independently movable tube support members for individually supporting tubes in generally upright dispositions, an unwinding device for unwinding, at an unwinding location, packages of textile material such as yarn or the like wound on tubes supported on the tube support members, a delivery assembly for delivering the tube support members to a preliminary location for feeding to the unwinding device, a discharge assembly for transporting tube support members from a discharge location to a further handling location and a yarn end loosening assembly having means for emitting streams of gas, a pair of chamber portions and means for moving the chamber portions between a clearance position for travel therepast of a tube support member along a cross path extending through the unwinding device and a chamber forming position in which the chamber portions are cooperatively disposed relative to one another to form a gas guide chamber at the unwinding location, the gas guide chamber encircling a yarn package supported by a tube support member to guide against the yarn



package streams of gas emitted by the gas stream emitting means for loosening a yarn end of the yarn package, an apparatus for handling yarn during axial unwinding of the yarn from a yarn package in the gas guide chamber to control ballooning of the yarn, comprising: means mounted to at least one of the chamber portions for restricting laterally outward displacement of the yarn relative to the axis of unwinding at a location between the end of the tube and generally the top of the gas guide chamber, said restricting means including vertically extending plate means shaped to define a yarn receiving area within the lateral extent of the gas guide chamber for confining the path of the yarn being unwound, said plate means including means for guiding the yarn from the inner wall of the gas guide chamber into said yarn receiving area.

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**5,044,573**

## ROTATING DRUM FILAMENT DISPENSER

**George W. LeCompte, Tucson, Ariz., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Jun. 23, 1989, Ser. No. 370,665**

**Int. Cl.[5] F41G** *7/00, 7/20;* **F42B** *15/04, 15/00*

**U.S. Cl. 242—54 R** **12 Claims**

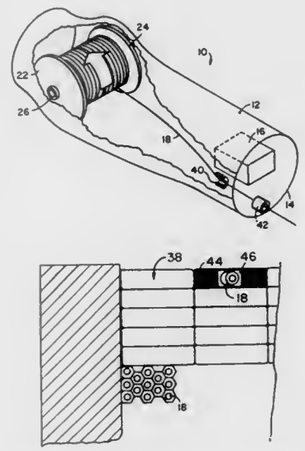
1. Fiber optic filament dispensing apparatus for an airborne vehicle which produces start-up tensile forces and exhaust gases during launch, comprising:

a hollow cylindrical bobbin having flanges at each end thereof for receiving a length of filament wound onto the bobbin between said flanges;

means for mounting the bobbin within the vehicle for rotation about an axis extending transversely to the direction the filament is dispensed from the bobbin;

brake means within the bobbin for slowing bobbin rotation during filament dispensing to place the dispensed filament under a predetermined amount of tension; and

protective means engaging the filament for joint movement therewith, said protective means preventing said vehicle start-up tensile forces and exhaust gases from destroying



or degrading the fiber optic filament as the filament is dispensed from the bobbin.

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**5,044,574**

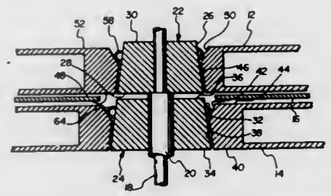
## REEL HUB LATCH ASSEMBLY

**Frederic F. Grant, Bellflower, Calif., assignor to Datatape Incorporated, Pasedena, Calif.**

**Filed Mar. 20, 1989, Ser. No. 326,141**

**Int. Cl.[5] B65H** *17/02;* **F16F** *1/30*

**U.S. Cl. 242—68.3** **4 Claims**



1. A magnetic tape reel latch assembly, comprising:

a rotatably mounted hub having a concical wall which tapers axially outwardly from a smaller to a larger periphery, and having an annular groove at the smaller periphery thereof;

an annular U-shaped radial spring located at the bottom of said groove, said radial spring having a plurality of circumferentially spaced fingers;

an annular garter spring located in said groove overlying the circumferentially spaced fingers of said radial spring;

a magnetic tape reel mounted on said hub, said reel having opposing faces and first and second divergent conical inner walls opening out on said faces, said second inner wall being dimensioned to engage said hub conical wall and said first conical inner wall adjacent to said groove, wherein said radial spring fingers urge said garter spring to engage said first conical inner wall of said reel to axially engage said second concical wall of said reel with said conical wall of said hub, and to prevent slippage between said reel and said hub.



**5,044,575**

## BELT RETRACTOR APPARATUS FOR A SEAT BELT SYSTEM COMPRISING A BELT RETRACTOR

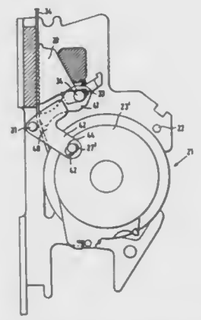
**Walter Knabel, Murnau/Staffelsee; Josef Mayer; Walter Notar, both of Unterschleissheim, and Edmund Lochbihler, Munich, all of Fed. Rep. of Germany, assignors to Autoliv-Kolb GmbH & Co., Dachau, Fed. Rep. of Germany**

**Filed Sep. 12, 1988, Ser. No. 242,910**

**Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731143; Nov. 17, 1987, 3739063; Mar. 25, 1988, 3810246**

**Int. Cl.[5] B65H** *75/48*

**U.S. Cl. 242—107.2** **16 Claims**



1. A belt clamping apparatus for a seat belt system comprising a housing provided with a sliding surface and having located therein a belt retractor including a movable reel shaft having a belt wound thereon, a back-pressure plate attached to said housing and a clamping wedge provided with two arms, said clamping wedge sliding on said sliding surface and guided to move parallel to said back-pressure plate and which back-pressure plate together with said clamping wedge defines a gap for the passage of said belt, an actuating member displacing said clamping wedge to its clamping position, said actuating member being rotatably connected at one end to said housing and pivoted at its other end to said clamping wedge when said belt is being extracted, said actuating member in response to movement of said reel shaft imparting a translational movement to said clamping wedge, a spring element located between said clamping wedge and a stop fixed to the housing, the arms of said clamping wedge forming a two-armed lever, one arm constituting a spring abutment having said spring element associated therewith which holds said clamping wedge out of engagement with said sliding surface fixed to said housing.

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**5,044,576**

## PARAWING WITH AN AUTOMATIC CANOPY WITHDRAWING MECHANISM

**Taichi Inada, 10F-5, No. 417, Kwang Fu S. Rd., Taipei, Taiwan, Taiwan**

**Filed Aug. 24, 1990, Ser. No. 571,873**

**Int. Cl.[5] B64D** *17/02*

**U.S. Cl. 244—13** **5 Claims**

1. A parawing with an automatic canopy withdrawing mechanism, comprising:

a canopy adapted to produce a lift required for upwardly supporting said parawing, said canopy having a leading edge and a trailing edge;

a frame having a front end and a rear end to which said canopy is fastened and on which a pilot can be carried, said frame including horizontal stabilizing means;

a propeller mounted on said frame adapted to produce a thrust required for the propulsion of said parawing;

a rudder pivoted to said rear end of said frame around a vertical axis;

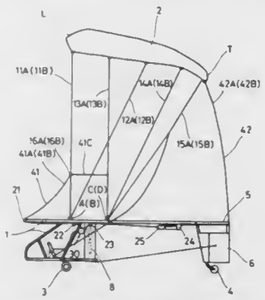
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a first row of suspension lines each line having an upper and a lower end including a first group and a second group of suspension lines, said first group of suspension lines being separately fixed at their upper ends to the left side of the canopy near said leading edge, and being fixed at their lower ends to a first fastening point on said frame; said second group of suspension lines being separately fixed at their upper ends to the right side of the canopy near said leading edge, and being fixed at their lower ends to a second fastening point on said frame;

a second row of suspension lines each line having an upper and a lower end including a third group and a fourth group of suspension lines, said third group of suspension lines being separately fixed at their upper ends to the left side of the canopy intermediate of said leading edge and said trailing edge, and being fixed at their lower ends to the first fastening point on said frame; said fourth group of suspension lines being separately fixed at their upper ends to the right side of the canopy intermediate of said leading edge and trailing edge, and being fixed at their lower ends to the second fastening point on said frame;

a third row of suspension lines each line having an upper and a lower end including a fifth group and a sixth group of suspension lines, said fifth group of suspension lines being separately fixed at their upper ends to the left side of the canopy intermediate of said first group and said third group of suspension lines, and being fixed at their lower ends to a third fastening point on said frame; said sixth




group of suspension lines being separately fixed at their upper ends to the right side of the canopy intermediate of said second group and said fourth group of suspension lines, and being fixed at their lower ends to a fourth fastening point on said frame;

a fourth row of suspension lines each line having an upper and a lower end including a seventh group and a eighth group of suspension lines, said seventh group of suspension lines being separately fixed at their upper ends to the left side of the canopy intermediate of said third group of suspension lines and said trailing edge, and being fixed at their lower ends to said third fastening point on said frame; said eighth group of suspension lines being separately fixed at their upper ends to the right side of the canopy intermediate of said fourth group of suspension lines and said trailing edge, and being fixed at their lower ends to said fourth fastening point on said frame;

a row of steering lines each line having an upper and a lower end including a left group and a right group of steering lines, said left group of steering lines being separately fixed at their upper ends to the left side of said trailing edge of said canopy and being fixed at their lower ends to said third fastening point on said frame; said right group of steering lines being separately fixed at their upper ends to the right side of said trailing edge of said canopy, and being fixed at their lower ends to said fourth fastening point on said frame;

a front group of guide rollers provided at proper locations in said frame;

a rear group of guide rollers provided at proper locations in said frame;

an automatic canopy withdrawing mechanism mounted on said frame, including a reel which may be rotated to pull back said suspension lines for withdrawing said canopy;

a front pulling rope which is fixed at one end to said reel, which extends forward through said front group of guide rollers, and is then properly connected to all suspension lines included in said first, second, fifth and sixth group of suspension lines in a manner capable of gathering and pulling said first, second, fifth and sixth group of suspension lines into a withdrawn state from the front end of said frame under a pulling action of said reel and through the guidance of said front group of guide rollers;

a rear pulling rope which is fixed at one end to said reel, which extends rearward through said rear group of guide rollers, and is then connected to said trailing edge of said canopy in a manner capable of gathering and pulling said canopy into a withdrawn state from the rear end of said frame under a pulling action of said reel and through the guidance of said rear group of guide rollers.

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**5,044,577**

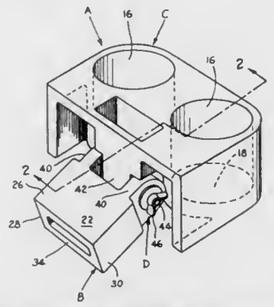
**AUTOMOBILE ACCESSORY HOLDING DEVICE**

**John W. Spearman, P.O. Box 1051, Easley, S.C. 29641**

**Filed Apr. 3, 1990, Ser. No. 503,667**

**Int. Cl.[5] B60R** *7/00, 9/00*

**U.S. Cl. 224—42.45 R** **15 Claims**




1. A holder for holding a substantially cylindrical beverage container and accessories in a generally upright position in an automobile having a passenger compartment, an ashtray socket having a front opening, and said ashtray socket defined by interior surfaces formed in an associated surface in said passenger compartment and an ashtray disposed within said ashtray socket, said holder comprising:

(a) an anchor means having first and second end portions, said first end portion adapted to fit within said ashtray socket with said ashtray removed so that said anchor means occupies for a substantial portion of said ashtray socket for engaging said interior surfaces for holding said anchor means in place within said socket;

(b) a holder body having first and second portions, said first portion of said holder body carried by said second end portion of said anchor means with said holder body extending transversely across said front opening of said ashtray socket, with said holder body contacting said associated surfaces;

(c) a receptacle formed in said first portion of said holder body and having a generally horizontal container support surface for supporting said beverage container in a generally upright position when said anchor means is inserted in said ashtray socket preventing said beverage from being spilled from said beverage container;



(d) said holder body including an upper surface in which said receptacle is formed, said container support surface being disposed below said upper surface a sufficient distance to provide a depth for receiving said beverage container in stable retention; and

(e) said second portion of said holder body being pivotally connected to said second end portion of said anchor means to adjust the angle of the anchor means with respect to the holder body.

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**5,044,578**

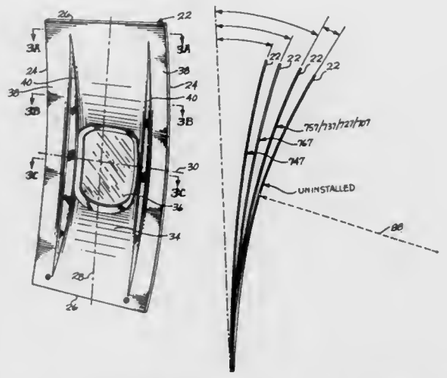
**UNIVERSAL CABIN SIDEWALL PANEL FOR AIRCRAFT**

**Thomas H. White, 26325 SE. 39th St., Issaquah, Wash. 98027, and Miguel A. Remedios, 4900 222nd St. SE., Mountlake Terrace, Wash. 98043**

**Filed Dec. 27, 1989, Ser. No. 457,639**

**Int. Cl.[5] B64D** *11/00;* **B64C** *1/14*

**U.S. Cl. 244—119** **4 Claims**




1. A sidewall panel assembly for aircraft, the assembly comprising:

a. first and second flexible sidewall panels each having a first radius of curvature when not subjected to a bending force; and

b. means for attaching the first and second flexible sidewall panels to the aircraft in a manner that (i) a portion of the first flexible sidewall panel overlaps a portion of the second flexible sidewall panel, and (ii) each of the attached first and second flexible panels has a second radius of curvature which is greater than the first radius of curvature so that the overlapping portion of the first flexible panel is supported against the overlapped portion of the second flexible panel in a manner to maintain a close fit therebetween.

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**5,044,579**

**INFLATABLE FOLDABLE STRUCTURE AND METHOD OF MANUFACTURING FOLDABLE STRUCTURES**

**Marco C. Bernasconi, and Karl Kotacka, both of Zürich, Switzerland, assignors to Oerlikon-Contraves, AG, Zurich, Switzerland**

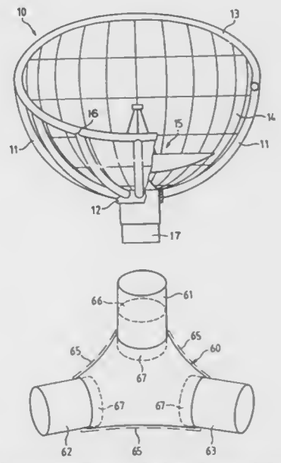
**PCT No. PCT/CH88/00112, § 371 Date Feb. 23, 1989, § 102(e) Date Feb. 23, 1989, PCT Pub. No. WO88/10211, PCT Pub. Date Dec. 29, 1988**

**PCT Filed Jun. 21, 1988, Ser. No. 343,299**

**Claims priority, application Switzerland, Jun. 24, 1987, 02375/87**

**Int. Cl.[5] B64G** *1/22*

**U.S. Cl. 244—158 R** **32 Claims**




1. An inflatable foldable structure, comprising:

a plurality of inflatable flexible tubes;

a plurality of nodal points defining gas-tight interconnections between predetermined ones of said inflatable flexible tubes of said plurality of inflatable flexible tubes and permitting inflation of said plurality of inflatable flexible tubes and unfolding of the foldable structure to form a skeleton, said plurality of inflatable flexible tubes forming, upon inflation and unfolding of the foldable structure, as said skeleton, a self-supporting structural skeleton;

a plurality of membranes affixed to respective ones of said plurality of inflatable tubes and extending between respective ones of said plurality of inflatable flexible tubes; and

a predetermined number of coupling members for providing interconnection between at least some of said plurality of inflatable flexible tubes, said predeterminate number of coupling members permitting gas exchange between said at least some of said plurality of inflatable flexible tubes through said coupling members, wherein:

each one of said coupling members is located at a respective one of said plurality of nodal points;

each one of said coupling members constitutes a three-dimensional coupling member constituting a connecting member for providing said interconnection between a predeterminate number of said plurality of inflatable flexible tubes; and

each one of said coupling members is formed in accordance with a predetermined topology of said skeleton from a single coherent piece of flexible, gas-impervious material in the form of a cut-away pattern representing a two-di-

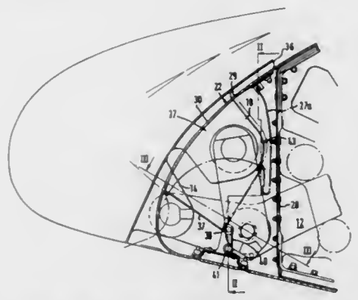
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mensional development of said three-dimensional coupling member.

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**5,044,580**
**FLEXIBLE CLOSING DEVICE FOR A WING LEADING EDGE**
**Anthony J. Williams, Filton, United Kingdom, assignor to British Aerospace PLC, London, England**
**Filed May 9, 1990, Ser. No. 520,821**
**Claims priority, application United Kingdom, May 9, 1989, 8910654**
**Int. Cl.[5] B64C** *3/50*
**U.S. Cl. 244—214** **4 Claims**



1. A wing leading edge arrangement for aircraft in which a slat is provided forwardly of a fixed leading edge and movable between a retracted configuration in which it lies closely adjacent the fixed leading edge and a deployed configuration in which it is spaced from the fixed leading edge to define a slot, said slot including:

attachment means to two or more substantially chordwise support tracks slidably mounted upon said leading edge to define said slat movement; an aperture in the leading edge skin of said fixed leading edge to accommodate said slat attachment means when said slat is in its retracted configuration; aperture closing means mounted within said fixed leading edge and movable between an aperture closing position when the slat is in its deployed configuration and a retracted position when the slat is in its stowed configuration;

characterised in that said aperture closing means comprises:

a) a closing panel of a flexibly foldable material having a surface area of a size to close off said apertures;

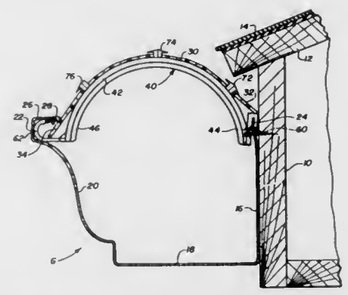
b) mounting means for locating said closing panel within said fixed leading edge adjacent said apertures; and

c) actuating means effective to displace said closing panel between a retracted configuration within said fixed leading edge in which said panel is slackly folded on itself and a fully deployed position in which said closing panel is maintained in an unfolded condition in which it substantially and sealingly conforms to the profile of the leading edge profile over at least the area of said aperture.

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**5,044,581**
**GUTTER GUARD SCREEN SUPPORT CLIP**
**Robert D. Dressler, Mechanicsburg, Pa., assignor to Alumax Aluminum Corporation, Lancaster, Pa.**
**Filed Jan. 7, 1991, Ser. No. 637,659**
**Int. Cl.[5] E04D** *13/06*
**U.S. Cl. 248—48.1** **10 Claims**

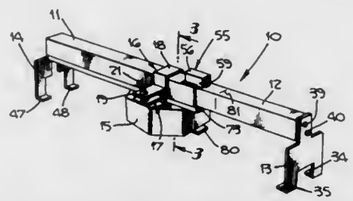
1. A support clip for a screen on a gutter to keep debris from entering the gutter, wherein, the gutter has a vertically extending inner wall, a horizontally extending bottom wall and an upwardly and outwardly extending outer wall, said inner wall being attachable to a building below an adjacent terminal edge of a roof and having an upper free edge, said outer wall terminating in an upper free edge across from the upper edge of the inner wall, and wherein a flexible screen is provided to extend from the upper ends of said inner and outer gutter walls, said support clip comprising a body extendable from the upper ends of said gutter inner and outer walls, means providing a rotatable hinged connection of said clip to the upper end of said



outer wall, means for detachably connecting the opposite end of said clip to the upper end of said inner wall, said screen when extended across said gutter being supported by said clip, and means on said clip and projectable through openings in said screen to secure the screen to the clip and prevent movement of the screen upwardly and longitudinally relative to the gutter.

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**5,044,582**
**CEILING FAN SUPPORT**
**Randall Walters, Douglas City, Calif., assignor to Trade Source International, El Dorado Hills, Calif.**
**Filed Mar. 7, 1990, Ser. No. 489,695**
**Int. Cl.[5] H02G** *3/08*
**U.S. Cl. 248—57** **14 Claims**



1. A brace assembly for a ceiling fixture or the like adapted to be mounted through a hole in a ceiling and above said ceiling having a pair of spaced joists on each side of said hole comprising:

a first hollow elongated member telescopingly received in a second hollow telescoping member, each of said members having a top wall, a bottom wall and interconnecting side walls with a plurality of spaced apertures extending through each of said bottom walls;

a first clip receivably mounted in the end of said second member opposite the end therethrough receiving said first member therein, said first clip having teeth means extending in a direction away from said second member adapted to dig into one of said joists when moved into engagement therewith;

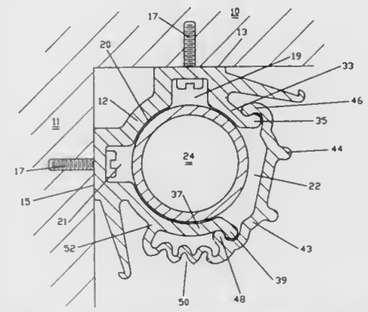
a second clip receivably mounted in the end of said first member opposite the end thereof received in said second member, said second clip having teeth means extending in a direction away from said first member adapted to dig into the other of said joists when moved into engagement therewith; and



biasing means mounted on said second member engaging said first member under bias of a spring bearing only downwardly constantly and continuously against said first member at all times when said first member is moved in a telescoping relationship with respect to said second member thereby retaining said first member in fixed telescoping relationship to said second member at all times during telescoping movement of said first and second members.

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**5,044,583**
**CONDUIT BRACKET LOCK SYSTEM WITH FLEXIBLE HINGE**
**Robert V. Daigle, Deerfield Beach, Fla., and Gordon J. Grice, Janesville, Wis., assignors to Creative Systems Enginnering, Inc., Janevill, Wis.**
**Continuation-in-part of Ser. No. 354,806, May 22, 1989, Pat. No. 4,911,387, which is a continuation-in-part of Ser. No. 211,967, Jun. 27, 1988, Pat. No. 4,901,957. This application Feb. 16, 1990, Ser. No. 480,912**
**The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.**
**Int. Cl.[5] F16L** *3/00*
**U.S. Cl. 248—62** **9 Claims**



1. A modular system for the securement of a conduit to at least one constructional surface, the system comprising:

(a) a back bracket having, in transverse cross-section, a partial polygonal back surface having a plurality of faces, each face thereof proportioned for securement to at least one constructional surface, said bracket having front surface defining resilient nesting means having a partially opened-face geometry said nesting means proportioned to the geometry of said conduit, said back plate further comprising, along each opposite inner transverse edge thereof, complemental coupling means;

(b) a front plate proportioned, in transverse cross-section, for complemental engagement with said complemental coupling means; and

(c) flexible hinge means in integral communication with that surface of said front plate positioned opposite to said back bracket said hinge further integral with a surface of said back bracket not coupled to said conduit,

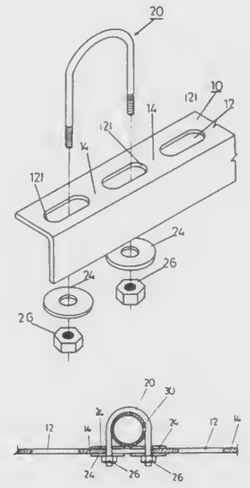
whereby a modular conduit system may be formed by inserting said conduit into said nesting means and by coupling said front plate to said complemental coupling means of said back bracket.

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**5,044,584**
**ANGLE IRON AND ITS FAST PIPE HANGER**
**Tan H. Lin, No. 6, Alley 166, Yuh Cheng Street, Taipei, Taiwan**
**Filed Nov. 20, 1989, Ser. No. 438,173**
**Int. Cl.[5] F16L** *3/22*
**U.S. Cl. 248—68.1** **1 Claim**

1. A pipe hanger comprising in combination: at least one L-shape angle iron member having a plurality of mutually spaced slots along substantially the length of one leg of said member each slot having a first predetermined length and defining an arc of predetermined radius at either end thereof and the space between each slot being a second predetermined length;

a plurality of circular in cross section U-bolts each having threaded ends and a cross sectional radius substantially the same as the arc at either end of the slots, the width across

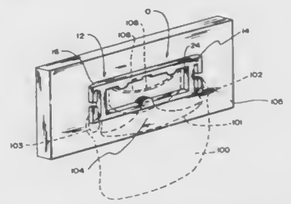


the legs of each bolt being substantially equal to the first predetermined length and the width between the legs of each bolt no less than the second predetermined length;

fastener means for threadedly engaging the ends of each bolt whereby said bolts may either be inserted through each slot or the legs thereof inserted through adjacent slots to encircle a pipe and clamp it against said member when said fastener means engages the threaded ends thereof.

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**5,044,585**
**BAG HOLDER**
**George T. Breitenstein, 4965 South Shore Drive, New Port Richey, Fla. 34652**
**Filed Oct. 5, 1989, Ser. No. 417,648**
**Int. Cl.[5] B65B** *67/00*
**U.S. Cl. 248—100** **8 Claims**



1. A bag holder for use with a bag having at least one hand grip for cooperation with a cabinet door handle secured to a cabinet door, said bag holder comprising:

a resilient body having a first and a second end;

an aperture formed between said first end of said resilient body and said second end of said resilient body such that in use a portion of the cabinet door handle passes through said aperture which enables said resilient body when

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stretched into position about the cabinet door handle to grip a portion of the cabinet door handle;

a first and a second bag grip receiving means positioned at said first and said second end, respectively, of said resilient body for securely and supportingly receiving the hand grip of the bag; and

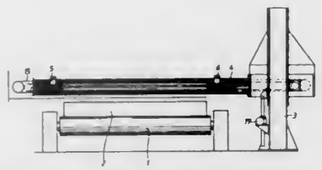
means for frictionally engaging the cabinet door handle to aid in retaining the bag holder in use on the cabinet door handle when the bag holder is positioned on the cabinet door handle.

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**5,044,586**
**MANIPULATOR FOR CRACK DETECTOR TRANSDUCERS**

**Bo Gustafsson, Västerås, Sweden, assignor to ASEA Brown Boveri AB, Västerås, Sweden**

**Filed Mar. 28, 1990, Ser. No. 500,512**
**Claims priority, application Sweden, Mar. 29, 1989, 8901086; Dec. 14, 1989, 8904217**
**Int. Cl.[5] G01N *29/04***
**U.S. Cl. 248—124** **16 Claims**



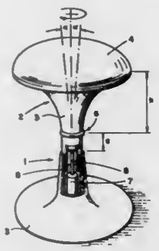
1. A transducer manipulator for supporting a transducer detector for movement over the surface of a hot test object for the indication of surface defects on the hot test object, comprising a transducer carrier for supporting said transducer detector, a tube for supporting said transducer carrier and extending across the surface of the test object, means for moving said tube towards and away from said test object, said transducer detector being mounted outside said tube and being connected to said transducer carrier by a supporting arm passing through a longitudinally extending slit in said tube, a thin strip covering said slit to prevent the penetration of foreign bodies into the interior of said tube.

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**5,044,587**
**ERGONOMIC SEAT**

**Hugo Degen, Seltisberg, Switzerland, assignor to Marpal AG, Chur, Switzerland**

**Filed Apr. 24, 1990, Ser. No. 513,559**
**Claims priority, application Switzerland, Apr. 25, 1989, 1559/89**
**Int. Cl.[5] F16M *13/00***
**U.S. Cl. 248—158** **6 Claims**



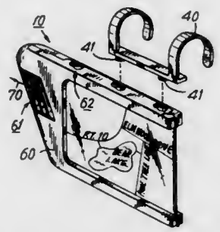
1. An ergonomic seat, comprising a stand portion supported on an underalying surface; a seat portion mounted on said stand portion and formed with a seat surface and a columnar foot projecting from said seat surface to be received by said stand portion, said columnar foot having an upper section, a lower section and a central region arranged between said upper and lower sections approximately 20–30 cm below said seat surface; and an elastic joint device positioned in said central region of said columnar foot, said elastic joint device including first mounting means for resiliently mounting said upper section of said columnar foot on said lower section of said columnar foot such that said upper section is laterally deflectable in a tumbling manner from a rest positions and such that said supper section automatically returns to said rest position after its lateral deflection therefrom, said first mounting means including at least one elastic cushion positioned in said central region, and second mounting means for rotatably mounting said upper section of said columnar foot on said lower section of said columnar foot, said second mounting means including sliding elements having anti-friction characteristics to thereby promote the rotation of said upper section relative to said lower section.

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**5,044,588**
**MAP HOLDER**

**Tod D. Gunter, R.D. #1, Box 3080, Bristol, Vt. 05443**

**Filed Aug. 13, 1990, Ser. No. 566,241**
**Int. Cl.[5] G09F *3/00***
**U.S. Cl. 248—214** **20 Claims**



1. A map holder, comprising:

(a) a generally flat pouch for holding a map, said pouch including transparent material through which at least part of the map is viewable; said pouch further including a mounting strip along a perimeter of said pouch; said mounting strip being provided with spaced apertures;

(b) a carrier arrangement for holding said map pouch, said carrier arrangement comprising a pair of separable pouch-mounting members, said pouch-mounting members being adapted, in a first position, to be secured together while securing between them said mounting strip of said pouch and, in a second position, to be separated from each other while allowing the pouch to be withdrawn from said carrier;

(c) a first of said separable pair of pouch-mounting members including pegs for respectively passing through said spaced apertures in said mounting strip of said pouch to thereby secure the pouch when said pouch-mounting members are in said first position; and

(d) means for mounting said carrier onto a vehicle member.

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**5,044,589**
**VERTICAL WALL COVERING BRACKET ASSEMBLY**

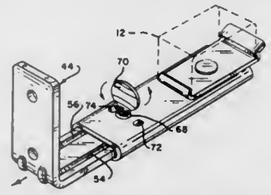
**Fred W. Milne, 25422 Trabuco Rd., No. 105-154, El Toro, Calif. 92630, and Rolf Hess, 501 Park Industrial Dr., La Habra, Calif. 90631**

**Filed Jun. 25, 1990, Ser. No. 542,767**
**Int. Cl.[5] A47H *1/10***
**U.S. Cl. 248—265** **4 Claims**

1. A bracket assemblay for adjustably locating a window covering headrail at a desired spacing from a wall surface, comprising:

a first bracket part formed into a generally L-shaped body including first and second arms, said first arm having at least one opening for receiving means to secure said first arm to wall surface, and said second arm including a pair of spaced apart grooves extending along the second arm away from the first arm to a point short of the second arm edge and both grooves having their respective concave parts facing inwardly of the L-shaped body in the same direction as the first arm;

a second bracket part of generally rectangular shape with guide channels extending along two opposite sides for slidingly receiving edges of the first bracket part second arm therein, and first and second openings in said second



bracket located respectively adjacent opposite ends of said second bracket between the guide channels;

a pair of projections on the second bracket part surface facing the second arm of the first bracket part, said projections located to be received within respective grooves of the first bracket part second arm and extending to such an extent that they will frictionally engage a surface on the first bracket part second arm during assembly of the first and second bracket parts together until the projections are positioned opposite respective grooves in the second arm at which time the projections are free from contact with a second arm surface; and

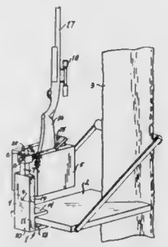
a selectively releasable means threaded within the opening of the second bracket part closer to the first bracket part first arm.

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**5,044,590**
**PORTABLE WEAPON RACK**

**Vincent D. Carafice, 123 Hillview Ter., West Seneca, N.Y. 14224**

**Continuation-in-part of Ser. No. 217,690, Jul. 11, 1988. This application Oct. 23, 1989, Ser. No. 412,121**
**Int. Cl.[5] F16M *13/00***
**U.S. Cl. 248—309.1** **6 Claims**



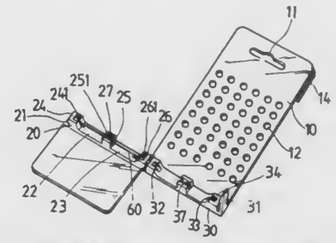
1. A two-piece portable weapon stand comprising as a first piece a universal support means, and as a second piece a weapon housing, said weapon housing adapted to be movably connected to said universal support means, said weapon housing having a female connecting means adapted to receive and lock with a male connecting means of said universal support means, said female connecting means positioned on an outer wall portion of said weapon housing and having therein a tightening means adapted to fix and lock said male connecting means in place, said universal support means comprising a narrow top stem portion which defines said male connecting means, said stem portion tapering outwardly at its bottom portion to define a wider section, an adjusting hinge means located at a point below said narrow stem portion and a bottom base section and wherein said universal support means contains below said adjusting hinge means an inverted F-shaped clamp adapted to connect and fix said universal support to a horizontal surface, said bottom base section having an upward projection which is complemental to a downward projection of said top stem section to form said hinge portion with a bolt which extends therethrough.

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**5,044,591**
**DEVICE FOR MOUNTING TOOL HAVING TWO PIVOTED HANDLES**

**Te-Chen Huang, No. 12, South 3rd Alley, Yung Hsin Lane, Wen Hua Rd., HsiTun Area, Taichung, Taiwan**

**Filed Jan. 23, 1991, Ser. No. 644,816**
**Int. Cl.[5] A47F *5/00***
**U.S. Cl. 248—317** **3 Claims**



1. For mounting a hand tool having two pivoted handles, a device comprising:

a flat board made from flexible rubber or plastic material, having a hanging hole at one end, a plurality of small through-holes longitudinally latitudinally aligned, and a pair of L-shaped strips bilaterally disposed on an opposite side by said hanging hole;

a support transversely made on said flat board at on end opposite to said hanging hole, having three blocks spaced from one another at equal interval with two openings defined therebetween and a hook member made from resilient material at one end thereof;

a cover plate pivoted to said support by a hinge means at one end of said cover plate, having three blocks spaced from another at equal interval with two openings defined therebetween, and a hook member at another end;

wherein said cover plate is closed to said support with the hook member thereof hooked with the hook member of said support, with the two openings thereof incorporated with the two openings of said support into two holes for mounting the two pivoted handles of said hand tool.

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**5,044,592**
**ADJUSTABLE SEAT FOR BICYCLES AND THE LIKE**

**Henry Cienfuegos, P.O. Box 2365, La Puenze, Calif. 91746**

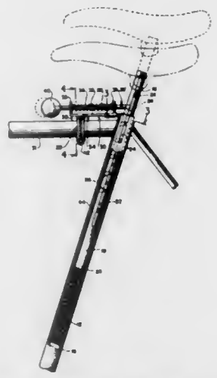
**Filed Feb. 16, 1990, Ser. No. 480,796**
**Int. Cl.[5] B62J *1/00***
**U.S. Cl. 248—408** **3 Claims**

1. A mechanism for adjusting the height of a seat on a bicycle, said bicycle having a frame comprising at least a vertical tubular portion and a horizontal portion, a tube, said tube sized to fit inside said vertical tubular portion of the frame, a shaft mounted inside said tube, biasing means for exerting force on said shaft to urge it in a direction toward the top of said vertical tubular portion, said shaft having spaced pin receiving open-

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ings, a circular collar surrounding and tightly attached to said horizontal portion of the frame, a bracket, said bracket having a base portion and upstanding flanges at each end of said base portion, a keel like member formed at the base of said bracket extending downward to the surface of said horizontal portion, a slot formed in said keel like member, said circular clamp extending through said slot and around said horizontal portion of said frame to tightly secure said bracket to said horizontal portion of said frame, a coil spring positioned between said upwardly extending flanges of said bracket, a locking pin extending through openings in said flanges in said bracket and



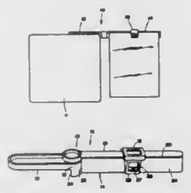
through the center of said coil spring, one end of said coil spring engaging one of said flanges of said bracket, means securing the opposite end of said coil spring to said locking pin, a knob, said knob attached to the end of the locking pin, whereby when the knob is pulled back, the locking pin is disengaged from the pin receiving openings in said shaft and the coil spring is compressed so that the rider of the bicycle can by standing on the pedals vary the weight on the seat, so that the seat will move up or down, until the rider is satisfied with the height of the seat and releases the knob permitting the locking pin to enter one of the pin receiving openings.

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**5,044,593**
**COPY HOLDER**

**Hwfa J. Jones, 47 Penkett Road, Wallasey, Wirral, Merseyside, England L45 7QC**

**Filed Feb. 15, 1990, Ser. No. 479,674**
**Claims priority, application United Kingdom, Feb. 18, 1989, 8903718**
**Int. Cl.[5] B41J** *11/02*
**U.S. Cl. 248—442.2** **6 Claims**



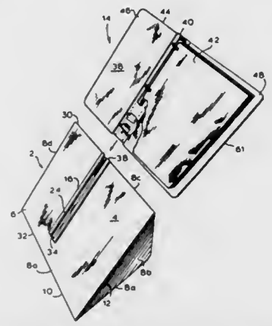
1. A copy holder for supporting at least one paper sheet adjacent an office machine comprising:
an attachment arm for attachment to the office machine having a cylindrical section a bottom of which has a substantially vertical face which, when in place, abuts a corresponding vertical surface of said office machine;
an extension arm for supporting the sheet or sheets, said extension harm having a cylindrical section and a vertical face below said cylindrical section;
wherein said extension arm cylindrical section and said attachment arm cylindrical section are removably engageable and when engaged couple said extension arm to said attachment arm so that said extension arm can be rotated relative to said attachment arm and the abutment of the vertical surface on said attachment arm cylindrical section with the vertical surface of said office machine and the abutment of the vertical face of said extension arm with the cylindrical surface of said attachment arm cylindrical section inhibits sagging in a vertical plane.

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**5,044,594**
**MULTI-POSITIONABLE DOCUMENT SUPPORT STAND AND INTERLOCKING MODULAR DOCUMENT HOLDER**

**David Hegarty, 36 Wyatt Rd., Nassau County, 11530**

**Continuation of Ser. No. 273,404, Nov. 18, 1988, Pat. No. 4,925,146, which is a continuation-in-part of Ser. No. 45,630, May 1, 1987, Pat. No. 4,787,595, which is a continuation-in-part of Ser. No. 791,743, Oct. 28, 1985, abandoned. This application Jan. 12, 1990, Ser. No. 465,916**
**Int. Cl.[5] A47G** *1/24*
**U.S. Cl. 248—454** **35 Claims**



1. A document support stand for removably mounting at least one document holder thereon, which comprises:
a main body, the main body including a viewing side; and
first means for mounting a document holder in a first location on the viewing side of the body, and second means for mounting a document holder in a second location on the viewing side of the body, the first location effected by the first mounting means being different from the second location effected by the second mounting means, the first and second mounting means being situated on the viewing side of the body, wherein a document holder is selectively engageable with the first and second mounting means and mountable on the viewing aide of the document support stand in the first and second different locations;
wherein the first mounting means includes first means defining a first elongated slot, and the second mounting means includes second means defining a second elongated slot, the first and second slot defining means being situated on the viewing side of the body;
wherein the viewing side has formed therein an enlargement, the enlargement being in communication with the first and second slots, the enlargement defining an access opening for providing access to the first and second elongated slots for mounting a document holder to the stand; and
which further comprises securing means for preventing the removal of a document holder mounted on the viewing side of the stand;
wherein the securing means includes a block member dimensioned to conform to the shape of the enlargement so as to be adapted to be received by the enlargement, the block member substantially preventing communication between the access opening defined by the enlargement and the first and second elongated slots when the block member is received by the enlargement;
and wherein the document support stand further comprises a spacer member, the spacer member being adapted to be received by at least one of the first and second elongated slots to cooperate with the block member to prevent the document holder from moving on the viewing side of the stand when the document holder is mounted thereon.

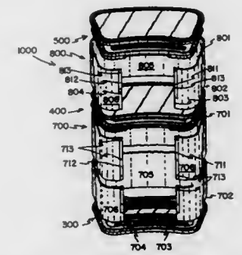
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**5,044,595**
**COLLAPSIBLE PODIUM**

**Arthur G. Carr, Washington, D.C., and William D. Griffiths, Annandale, Va., assignors to Nomadic Structures, Inc., Springfield, Va.**

**Filed Dec. 1, 1989, Ser. No. 444,592**
**Int. Cl.[5] A47B** *47/00*
**U.S. Cl. 248—460** **23 Claims**



1. A kit for constructing a collapsible podium, comprising:
(a) a first laterally pliable, longitudinally rigid panel having a top edge, a bottom edge, a right edge and a left edge;
(b) a first plate having a top surface, a bottom surface, a substantially circumferential channel in the top surface into which the bottom edge of the first panel is operably receivable and an interior wall operable for conforming the first panel to the shape of the circumferential channel in the first plate prior to insertion of the bottom edge of the first panel into the circumferential channel in the first plate; and
(c) a second plate having a top surface, a bottom surface, and a substantially circumferential channel in the bottom surface into which the top edge of the first panel is operably receivable.

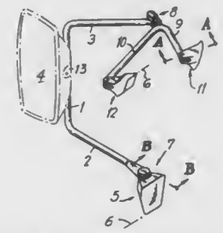
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**5,044,596**
**SUPPORT FOR AN EXTERNAL REARVIEW MIRROR FOR MOTOR VEHICLES**

**Antonio F. do Espirito Santo, Sao Paulo, Brazil, assignor to Metagal Industria e Comercio Ltda., Sao Paulo, Brazil**

**Filed Jul. 6, 1990, Ser. No. 550,145**
**Claims priority, application Brazil, Dec. 11, 1989, 6902580[U]**
**Int. Cl.[5] B60R** *1/00*
**U.S. Cl. 248—479** **3 Claims**

1. A support for an external rear view mirror for motor vehicles, comprising a support rod having an intermediate vertical portion for supporting the mirror and lower and upper transverse portions extending substantially horizontally from opposite ends of said intermediate vertical portion and having free ends; first and second base means connected with said free ends of said upper and lower transverse portions, respectively, for supporting said support rod on a vehicle body; means for pivotally connecting the free end of the upper transverse portions of said support rod with the first base means; means for rigidly connecting the free end of the lower transverse portion of said support rod with the second base means; first attachment means for pivotally attaching said first base means to the vehicle body; and second attachment means for fixedly attaching said second base means to the vehicle body; the free end of said upper transverse portion of said support rod having a flat end portion with an orifice therein, said first base means comprising a substantially L-shaped rod and a bracket fixedly secured to said substantially L-shaped rod and having spaced parallel sides for receiving said flat end portion therebetween,



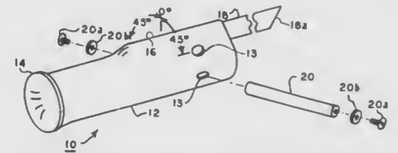
said parallel sides having openings therein corresponding to said orifice in said flat end portion, and said pivotally connecting means including a pin member extending through said openings in said parallel sides of said bracket and said orifice of said flat end portion; said L-shaped rod having long and short legs having free end portions, said first attachment means comprising two spaced cantilevers for pivotally receiving respective free end portions of said long and short legs of said L-shaped rod.

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**5,044,597**
**REMOVABLE ANCHOR FOR REMOVABLY RECEIVING AND SUPPORTING AN EXTERNAL MEMBER**

**Lester S. Walczak, 832 Oakwood Dr., Westmont, Ill. 60559**

**Filed Jan. 22, 1990, Ser. No. 467,926**
**Int. Cl.[5] F16M** *13/00*
**U.S. Cl. 248—530** **18 Claims**

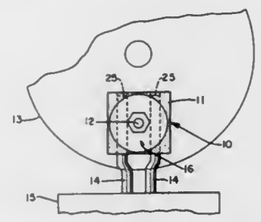


1. A receptacle device for removably receiving and supporting an external generally longitudinally extending utilization member, said device comprising, in combination:
a generally tubular receptacle body of insulating material extending in a longitudinal direction and having a receiving opening at one end thereof, said body having an enclosed and electrically insulated support opening at and extending along its other end thereof, wherein the axis of said enclosed support opening is spaced apart from and extends generally parallel to the axis of said receiving opening; and,
a rigid longitudinally extending support shaft insertable into said enclosed support opening to rigidly extend away from said receptacle device at said support opening in the direction of said axis of said support opening, for anchoring said receptacle device through an opening of an external surface, and, wherein said body comprises a dual sleeve of an extruded plastic configuration having an outer sleeve and an inner sleeve coaxially provided therein.

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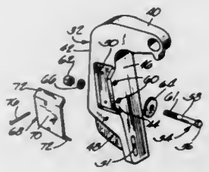
5,044,598
**RESILIENT MOTOR MOUNTING STRUCTURE**
David W. Mann, Akron, and Bruce J. Senecal, Munroe Falls, both of Ohio, assignors to Karman Rubber, Akron, Ohio
Filed Aug. 28, 1989, Ser. No. 399,708
Int. Cl.[5] F16M *11/00*
U.S. Cl. 248—638 8 Claims



1. A mount for a motor, said mount including:
a mounting stud protruding from said motor;
a fixture protruding from a motor support structure adapted to engage said stud, said fixture comprising a plurality of rods;
a resilient elastomeric member adapted to be interposed between said fixture and said stud and vibrationally insulate said fixture from said stud, having a first portion encircling said stud and a second portion encircling said fixture; and
a clamping means adapted to engage said stud and thereby securing the elastomeric member in place.

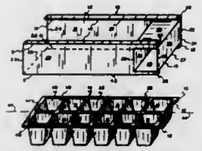
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5,044,599
**COVER FOR TRANSOM BRACKET MOUNTING SCREWS**
Gregory J. Binversie, Grayslake, Ill.; Joseph E. Capodarco, Kenosha, Wis., and James E. Macier, Beach Park, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Apr. 27, 1990, Ser. No. 515,824
Int. Cl.[5] B63H *21/26*
U.S. Cl. 248—640 15 Claims



1. An apparatus for mounting an outboard motor on a transom of a boat, said apparatus comprising a transom bracket including an upper portion and a portion extending downwardly from said upper portion and including a flange, and a surface adapted to engage the boat transom, means which is adapted to extend through the boat transom, which extends through said flange for releaseably clamping said transom bracket to the boat transom, and which includes a portion projecting outwardly from said downwardly extending portion, and a removeable cover which is located on said downwardly extending portion, which conceals said outwardly projecting portion, and which conceals the entirety of said flange.

5,044,600
**ICE CUBE DISPENSER**
Steven L. Shannon, Rte. 2, Box 103, Hiawatha, 66434
Filed Jan. 24, 1991, Ser. No. 645,147
Int. Cl.[5] B28B *7/24*
U.S. Cl. 249—121 4 Claims

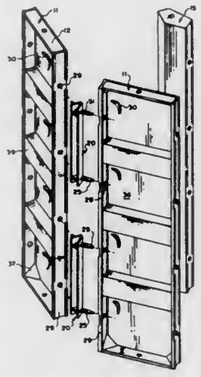


1. A dispenser specially adapted for use with a flexible plastic ice tray of substantially conventional construction having an array of upwardly opening compartments of substantially uniform size and shape arranged in a number of rows transversely disposed to a center axis of elongation, each of said compartments being adapted to receive liquid to be frozen to form separate pieces of ice, said tray having an upper extremity defined by a rectangular perimeter comprised of paired long edge lips and paired short edge lips, said dispenser being of substantially box-like rectangular configuration bounded in part by two pairs of straight parallel corner edges, each pair in vertically spaced apart relationship defining upper and lower edges which in turn define the top and bottom extremities, respectively, of the dispenser, said dispenser further comprising:
(a) first and second parallel side walls extending vertically between said upper and lower corner edges, and horizontally terminating in straight vertical borders that substantially define front and rear extremities of the dispenser,
(b) a front end panel extending othogonally between said side walls,
(c) a small chamber having a first opening for receiving ice and a second opening for discharging ice, and bounded in part by said front end panel, a top panel disposed within the plane of the top extremity, a portion of said second side wall, and a divider panel spaced rearwardly from said front end panel and parallel thereto, said first opening being downwardly directed, and said second opening emergent through said first side wall,
(d) a large chamber contiguous to said small chamber, having a first opening for receiving ice and a second opening for discharging ice, and bounded in part by said divider panel, portions of said side walls, and a bottom panel disposed within the plane of said bottom extremity, said first opening being upwardly directed, and said second opening emergent at said rear extremity, and
(e) engagement means associated with each corner edge in facing juxtaposition and adapted to slidably engage the long edge lips of said tray.

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5,044,601
**OUTSIDE BAY ADAPTER FOR A CONCRETE FORMING SYSTEM**
Michael J. Miller, Medinah, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Filed May 30, 1989, Ser. No. 357,804
Int. Cl.[5] E04G *17/04*
U.S. Cl. 249—194 26 Claims

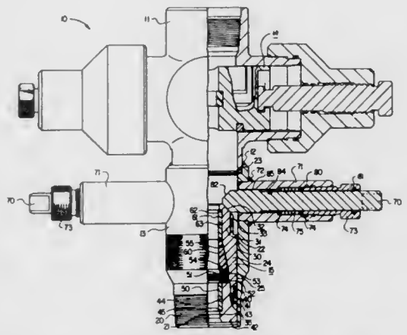
1. An outside bay adapter for a residential concrete forming structure comprising a pair of elongated flat plates each of substantial length as compared to its width thereof, the plates being disposed in angular V-shaped relation to one another, said plates having a pair of slots, the slots on the plates being transversely aligned with one another, slotted wedge bolts being arranged in diverging relation to one another and extended through the aligned slots and extending outwardly, a weldment welding the slotted wedge bolts extended through the slots to the plates in unitary assembly together, and a triangular plate having a pointed end extending between the flat



plates holding the flat plates apart and in spaced relationship to one another.

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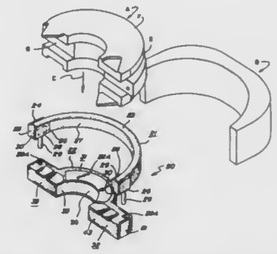
5,044,602
**BLOWOUT PREVENTER**
Robert L. Heinonen, Dallas, Tex., assignor to Double-E, Inc., Dallas, Tex.
Filed Jul. 27, 1990, Ser. No. 558,793
Int. Cl.[5] E21B *33/02*
U.S. Cl. 251—1.1 21 Claims



1. A blowout preventer for use on a well to seal around a well member extending through said blowout prevent into said well comprising:
an upper housing having a bore for said well member;
oppositely disposed ram assemblies secured in said upper housing for extension into intersecting relationship with said bore to seal around said well member and retractable from said bore into nonsealing relationship with said well member;
a lower housing secured with said upper housing and having a bore for said well member aligned along a common axis with and opening into said bore of said upper housing; and
a heat responsive seal assembly in said lower housing for sealing with said well member responsive to a well temperature at said seal assembly above a predetermined value.



5,044,603
**VARIABLE BORE RAM RUBBER WITH NON-OVERLAPPING INSERTS**
Stanley W. Granger, 23800 Gold Nugget, Diamond Bar, Calif. 91765; Joseph O. Beard, 1625 N. Lincoln Ave., Fullerton, Calif. 92631, and Frode Sveen, 12697 Orgren Ave., Chino, Calif. 91710
Filed Aug. 31, 1990, Ser. No. 576,277
Int. Cl.[5] E21B *33/06*
U.S. Cl. 251—1.3 3 Claims



1. An improved sealing element for use in a sealing apparatus of the type used for forming a fluid pressure-tight seal with at least part of the outer convex surface of a tubular member, said sealing apparatus comprising two identical, laterally opposed sealing elements having in plan view a generally semi-circular shape adapted to fit around a semi-cylindrical ram block and adapted to abut one another along a front diametrical plane, said improved sealing element comprising;
a. an arch-shaped resilient top seal section adapted to encircle the rear semi-cylindrical surface of a ram block, said top seal having the overall shape of a generally rectangular cross-section bar bent into an arch having at opposite lateral ends thereof of downward depending fastening means,
b. a face seal fastenable to said top seal, said face seal being adapted to fit into the front diametrical face of a ram block, said face seal being a composite structure made of a plurality of metal inserts of different shapes imbedded in a resilient matrix and having the overall external appearance of a straight, generally rectangular cross-section bar bent to form a symmetrical arch-shaped center section having coplanar, laterally disposed legs which protrude perpendicularly outwards from opposite bases of said arch, each of said inserts being positioned symmetrically about the longitudinal mid-plane of said face seal and being symmetrically shaped about said mid-plane, each of said inserts comprising an upper plate section joined to a parallel, longitudinally aligned, lower plate section by a pedestal member disposed perpendicularly between the adjacent faces of said upper and lower plate sections, the longitudinal axis of said pedestal being symmetrically positioned with respect to the perimeter of said plates, said plurality of inserts comprising,
i. an end insert at the outer lateral end of each of the two said legs, the plate sections of said end insert having a generally square shape, the front edges of which are parallel to and slightly rearward of the front longitudinal faces of said legs, a rear edge parallel to said front edge, and outer and inner lateral edges perpendicular thereto,
ii. a corner insert located laterally inwards of each of two said end inserts, the plate sections of each of said corner inserts having an elongated straight front edge longitudinally aligned with said front edges of said end inserts, an outer lateral edge which is perpendicular to said front edge of said corner insert, and parallel to and spaced laterally inwards from said inner lateral end of an adjacent one of said end inserts, a relatively short,

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straight rear edge coplanar with said rear edge of said end inserts, a straight oblique edge intersecting said rear edge at an obtuse angle and disposed laterally inwards and forward from said rear edge, and a relatively short arcuate, concavely curved inner lateral edge joining said oblique edge to said front edge, said inner lateral edge being concentric with and lying radially outwards or rearwards of the concave wall surface of said central arch section, and

iii. a single center insert, the plate sections of said center insert having the shape of a sector of a circle having a front concave edge concentric with and lying radially outwards or rearwards of said concave wall surface of said central arch section, and a rear convex edge concentric with said front concave edge and lying radially inwards or forward of the rear convex wall surface of said central arch section, and two straight radial edges, one each lying parallel to and spaced laterally inwards of an oblique edge of an adjacent one of said corner inserts.

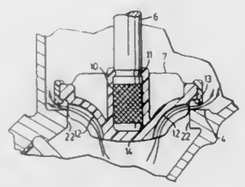
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**5,044,604**

## VALVE PLUG HAVING FLUID DIRECTING GROOVES

**Fred A. Topham, 17 Van Order Dr., Apt. 12-303, Kingston, Ontario, Canada K7M 1B5 ; Joseph A. Toth, 9 Atlantic Ave., Unionville, Ontario, Canada L3P 7B6 , and Michael F. Wilson, 40 Servington Crescent, Toronto, Ontario, Canada M4S 2J4**

**Filed Aug. 31, 1990, Ser. No. 575,607**
**Int. Cl.[5] F16K *1/36, 1/04***
**U.S. Cl. 251—120** **14 Claims**



1. A valve comprising:

a hollow valve body having an inlet, an outlet and an internal annular valve seat,

a valve stem having a forward end and a rearward portion, said rearward portion being mounted in said valve body for reciprocal movement along a longitudinal axis perpendicular to and coaxial with said valve seat, and

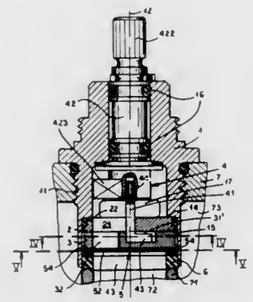
a valve plug connected to the forward end of said valve stem, said valve plug having a forward sealing surface positioned to coact with said valve seat to restrict fluid flow through said valve as said stem is moved forwardly, said valve plug having a plurality of arcuate grooves circumferentially spaced equidistantly from each other in the forward surface of said plug radially inward and forward of said sealing surface, said arcuate grooves at their outward ends being tangentially parallel to said sealing surface and said valve seat, whereby fluid flow is distributed substantially equally about the periphery of said valve plug and whereby fluid is directed by said grooves to flow between said sealing surface and valve seat in an outward radial direction substantially parallel to said valve seat and sealing surface.

**5,044,605**

## FLOW-CONTROL AND SHUTOFF VALVE

**Harald Körfgen, Fröndenberg; Heinz Hirsch, Soest, and Vinzenz Grendel, Hemer, all of Fed. Rep. of Germany, assignors to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany**

**Filed Oct. 18, 1990, Ser. No. 599,706**
**Claims priority, application Fed. Rep. of Germany, Oct. 20, 1989, 3934977**
**Int. Cl.[5] F16K *5/04, 5/18***
**U.S. Cl. 251—180** **13 Claims**



1. A valve comprising:

a housing forming a compartment traversed by an axis and having a radially opening outlet port and an axially open inlet port, whereby fluid can flow through the compartment in a flow direction from the inlet port to the outlet port;

a valve plate fixed in the housing and formed relative to the flow direction with a flat upstream face and with an axially throughgoing valve orifice opening at the face;

a control plate in the housing formed relative to the flow direction with a flat downstream face riding on the valve-plate face, with an axially throughgoing control orifice opening at the face, and with an axially open and radially elongated socket, the control plate being pivotal on the valve plate about the axis for alignment of the orifices and flow through the valve from the inlet port to the outlet port and for misalignment of the orifices for restricted flow from the inlet port to the outlet port;

a large-diameter valve stem rotatable in the housing about the axis and formed with a socket open axially toward the plates; and

a small-diameter L-shaped connecting rod formed as a separate element from the valve stem, extending through the valve plate, and having an inner end complementary to, axially slidable, and rotationally fixed in the valve-stem socket and an outer end unitarily formed with a laterally and radially projecting foot received and rotationally fixed in the control-plate socket, whereby rotation of the stem is transmitted by the rod to the control plate.

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**5,044,606**

## VALVE STEM AND PACKING ASSEMBLY

**John J. Wordin, Bingham County, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed May 31, 1990, Ser. No. 531,487**
**Int. Cl.[5] F16K *41/04, 25/00, 5/14***
**U.S. Cl. 251—214** **13 Claims**

1. A valve stem and packing assembly including means for providing uniform wear at all points of contact between contacting parts, said assembly comprising:

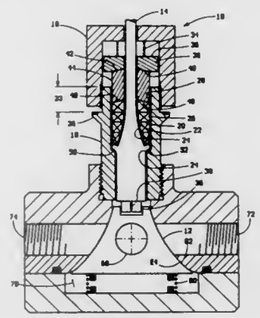
a rotatable valve stem including a first sliding tractrix surface for sliding contact with a stem packing,

a stem packing including a first complementary tractrix surface for contacting said first sliding tractrix surface, and including a surface for contacting bonnet wall,

a bonnet including a wall portion for contacting said stem packing surface, and

means for urging said stem packing against said valve stem and said bonnet, whereby a seal is created and maintained between said stem packing and said valve stem and a seal is created and maintained between said stem packing and





said bonnet, wherein said first sliding tractrix surface contacting said first complementary tractrix surface of said stem seal are such that vertical wear between said first sliding tractrix surface and first complementary tractrix surface is uniform at all points of contact between said first sliding tractrix surface and said first complementary tractrix surface, and such that said urging means is effective in creating and maintaining said seal between said valve stem and said stem packing.

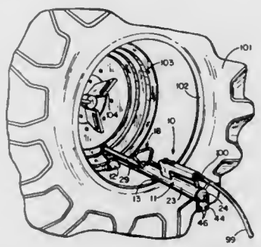
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**5,044,607**

## TIRE SPREADER

**Ronald F. Haugen, and David T. Murphy, both of Forest City, Iowa, assignors to Vix Design Products, Inc., Forest City, Iowa**

**Continuation-in-part of Ser. No. 342,446, Apr. 24, 1989. This application Dec. 20, 1989, Ser. No. 454,034**
**Int. Cl.[5] B66F *3/24***
**U.S. Cl. 259—50.3** **21 Claims**



1. An apparatus for spreading a bead of a pneumatic tire away from a rim accommodating the tire and holding the tire in a spread position comprising: extendible and contractible means having a first piston member and a second cylinder member having an outer side wall and a chamber accommodating the piston member, said first and second members being movable relative to each other to an extended position and a contracted position, a first jaw connected to the first member adapted to engage the rim, a second jaw connected to the second member adapted to engage the bead and move the bead away from the rim thereby spread the tire when the first and second members are in the extended position, guide means connected to the first jaw and second member for keeping the first jaw longitudinally aligned with the second jaw during relative movement of said jaws between the extended and contracted positions thereof, said guide means comprising an elongated tubular member having a guide passage secured to the outer side wall of the second cylinder member, said guide passage extending generally parallel to the direction of relative movement of the first and second members, and rod means secured to the first jaw slideably extended into the passage of the tubular member whereby the tubular member and rod means prevent rotational movement of the first jaw relative to the second jaw to keep the jaws longitudinally aligned during relative movement thereof; and means connected to the cylinder member for controlling the flow of fluid under pressure to and from the chamber on opposite sides of the piston member operable to cause selected movement of the first and second members relative to each other thereby move the first and second jaws relative to each other to spread the bead to the tire, hold the first and second jaws in the extended position, and release the spread tire so that the apparatus can be removed from the tire.

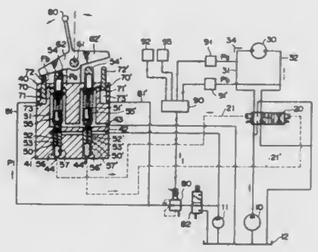
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**5,044,608**

## OPERATING FORCE CONTROLLING DEVICE FOR OPERATING LEVER

**Sachio Hidaka, Kakogawa, and Yoshiaki Fujimoto, Himeji, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Filed Oct. 26, 1989, Ser. No. 426,671**
**Claims priority, application Japan, Oct. 26, 1988, 63-271822; Oct. 26, 1988, 63-271823**
**Int. Cl.[5] B66D *1/44***
**U.S. Cl. 254—266** **19 Claims**



1. An operating force controlling device for an operating lever in a hydraulic circuit including a fluid supply source and an actuator comprising:

a valve mechanism having at least two positions for controlling supply of fluid from the fluid supply source to the actuator for placing the actuator in an operating condition;

an operating lever for changing a position of said valve mechanism, said operating lever including a pivotal member;

at least one reactive force mechanism disposed in an opposing relationship to said pivotal member for applying to said operating lever an operation reactive force in a direction opposite to the direction of operation of said lever;

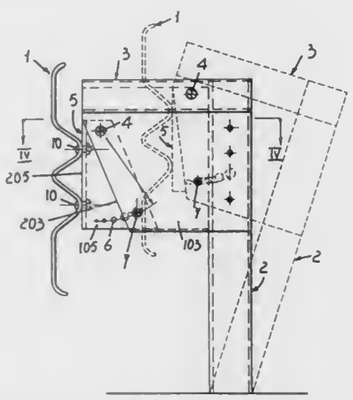
means for detecting an operating condition of said actuator; and

a control mechanism connected to said reactive force mechanism, said control mechanism including means for receiving a signal from said detecting means and means for controlling said reactive force mechanism as a function of the received signal such that the reactive force corresponds to the detected operating condition.

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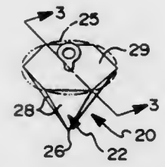


5,044,609
**GUARDRAIL BARRIER**
Luigi Cicinnati, Padua, and Adriano Fracasso, Fiesso D'Artico, both of Italy, assignors to Metalmeccanica Fracasso S.p.A., Fiesso D'Artico, Italy
Filed Jan. 23, 1990, Ser. No. 469,070
Claims priority, application Italy, Feb. 24, 1989, 12432 A/89
Int. Cl.[5] E01F *15/00*
U.S. Cl. 256—13.1 9 Claims



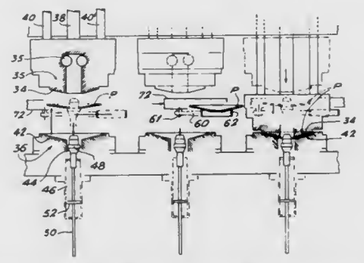
1. A metallic guardrail barrier comprising:
a sustaining post projecting out from a ground;
a spacing member extending parallel to the ground which is secured at one side thereof to said sustaining post;
a supporting member secured at another side of said spacing member;
an elongate rail mounted to said supporting member with a predetermined vertical orientation thereof;
a member mounting means for mounting said supporting member to said spacing member and defining a fulcrum permitting said supporting member to swing about said fulcrum, said fulcrum being parallel to a longitudinal direction of said rail and located at a height above the ground to one side of the horizontal centerline of said rail; and
a shock absorber means for damping a swinging movement of said supporting member about said fulcrum when a vehicle impacts said rail, said shock absorber means including (a) a weakened area of one of said supporting member and said spacing member at a location thereof spaced from said fulcrum, said weakened area being weakened by a plurality of holes provided therein, and (b) a pin connecting said supporting member and said spacing member and passing through one of said plurality of holes such that said pin causes a tearing of said weakened area when said rail is impacted by a vehicle and said supporting member swings about said fulcrum, wherein said supporting member includes a front to which said rail is secured and a side member having a downwardly diverging shape, said side member having an upper portion in which said fulcrum is located and a lower portion; wherein said spacing member includes a flat wing which is cantilever mounted to said sustaining post at one side and at another side is connected to said upper portion by said fulcrum and to said lower portion by said pin; and wherein said weakened portion has a curved outline having a centerpoint at said fulcrum and said holes are spaced from one another and arranged in a curved row along said weakened portion with said pin passing through one of said holes at an end of said row.

5,044,610
**VORTEX INHIBITOR FOR MOLTEN METAL DISCHARGE**
Robert J. Koffron, Farmington Hills, Mich., assignor to Tetron, Inc., Farmington Hills, Mich.
Filed Oct. 6, 1989, Ser. No. 418,324
Int. Cl.[5] B22D *41/14*
U.S. Cl. 266—45 6 Claims



5. A method of discharging a molten metal from a receptacle having a discharge nozzle comprising:
opening said discharge nozzle,
inserting a tapered refractory body with a specific gravity less than the specific gravity of the molten metal at the level of molten metal before said level of molten metal reaches a critical height in the receptacle, and
maintaining the body in an upright orientation in which said body generally conforms with vortex shape along a submerged portion of the body by geometrically proportioning the body so that the center of gravity is below the center of buoyancy,
wherein said inserting step comprises positioning said body at the interface of a slag layer and the molten metal layer,
wherein said positioning step comprises rolling said body toward the level of molten metal.

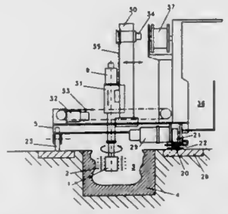
5,044,611
**AUTOMATIC INSTALLATION FOR THE FORMING AND THERMAL TREATMENT OF CIRCULAR PIECES**
Maurice Beney, Montreuil, and Jean Fromentin, Courcouronnes, both of France, assignors to Stein Heurtey, Ris Orangis, France
Filed May 19, 1989, Ser. No. 354,239
Int. Cl.[5] C21D *9/54*
U.S. Cl. 266—105 12 Claims



1. An automatic installation for obtaining in series, circular pieces of small thickness, which includes various working treatment stations placed one after the other so that the pieces to be worked are successively transferred from one station to another, which comprises:
a) an automatic machine for hot swaging and quenching of circular pieces;
b) transfer means wherein the pieces are extracted by an extractor from the swaging and quenching automatic machine and transferred one by one to the various working stations, with the assistance of gripping arms including piece receiving plates, said arms being imparted with a rotary motion and with a translation motion with the assistance of a mobile beam and jacks system, said extractor transferring pieces to said transferring means when said extractor is in a high position;
c) said automatic installation containing working stations having a press provided with individual heating means, said working stations receiving the pieces one by one with the assistance of the transfer means and withdrawing the pieces to be treated from the quenching stations of the automatic machine for transferring them successively thereafter to each of the working stations;
d) each working station is provided in the form of a press including a die and a punch, each press being provided with an individual heating means and the piece being able to be clamped in the press, the die being formed with a bore in its central portion, said bore being in correspondence with a duct for passing cold air on to the central portion of the pieces placed in the die, said extractor being movable within said bore to said high position;
e) means for tempering each piece by blowing into each working station cold air in the central portion of the piece placed on a corresponding press, so as to maintain the temperature of this central portion at less than the temperature of the periphery of the pieces, means associated with said extractor to interrupt feeding of the cold air when said extractor is in said high position;
f) a final cooling station on which the incoming piece from the preceding work station is subjected to a cooling by being blown with cold air; and
g) means for storing the treated pieces by stacking them so as to ensure thereafter the discharge of the treated pieces conditioned in stacks.

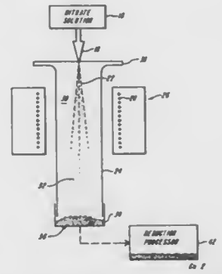


5,044,612
**APPARATUS TO CLEAN REFRACTORY-LINED CONVEYOR TROUGHS**
Heinrich Kaiser, Salzgitter, Fed. Rep. of Germany, assignor to Stahlwerke Peine-Salzgitter AG, Peine, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 505,050, Apr. 4, 1990. This application Jun. 29, 1990, Ser. No. 546,546
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827401
Int. Cl.[5] C21B *9/10*
U.S. Cl. 266—135 20 Claims



1. An apparatus for cleaning a refractory-lined conveyor trough for conveying molten metals and slags, said apparatus comprising:
a rail-guided carriage which is movable over and along the conveyor trough, and which carriage extends across the trough;
a cleaning apparatus being mounted to said rail-guided carriage;
at least one guide rail for being disposed along a first surface adjacent a first side of the trough;
said rail-guided carriage having two wheels for being disposed on said at least one guide rail, said two wheels being spaced apart from one another, at least one of said two wheels being motor driven;
said two wheels being engageable with said guide rail for carrying said carriage along said guide rail;
means for permitting movement of said carriage along a second surface adjacent a second side of the trough opposite the first side thereof; and
said means for permitting movement and said two wheels providing said carriage with only three contact points for contacting said at least one guide rail and the second surface on the opposite side of the trough.

5,044,613
**UNIFORM AND HOMOGENEOUS PERMANENT MAGNET POWDERS AND PERMANENT MAGNETS**
Kaplesh Kumar, Wellesley, and Anthony Petrovich, Tewksbury, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Feb. 12, 1990, Ser. No. 478,682
Int. Cl.[5] B22F *9/24*
U.S. Cl. 266—170 16 Claims



1. Apparatus for producing rare-earth permanent magnet precursors of high homogeneity metal alloy powders comprising:
a reservoir of a nitric acid solution of salts of plural metals;
a nozzle means for generating a mist of droplets by atomization of said solution;
means for heating the mist to dry the liquid components of the droplets and oxidize the metal salts producing controlled, fine sized powders of the resulting metal oxides wherein each powder grain contains each of said plural metals in homogeneous proportions;
means for collecting the metal oxide powder particles;
means for reducing the metal oxides to metal alloy particles each containing said plural metals in homogeneous proportions.

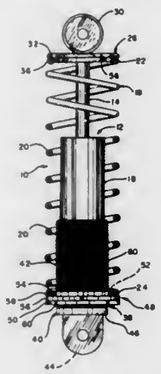
5,044,614
**SHOCK ABSORBER SPRING ADJUSTER**
John A. Rau, 10005 Obsidian Dr., Reno, Nev. 89506
Filed Feb. 22, 1990, Ser. No. 482,902
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—221 6 Claims

1. A shock absorber assembly comprising;
a shock sub-assembly including a piston rod and telescopically cooperating tube, said tube having an end projecting therefrom for affixing to a vehicle,
one piece radially slotted retainer means adjacent one end of said piston rod,
a separately and freely removable one piece elongated tubular body sleeve surrounding and adjacent an end of said tube, said sleeve having a smooth inner bore and opposite open ends including a top and a bottom,
said body sleeve containing sealing and damping means located adjacent said top open end and between said inner bore and said shock tube,
body sleeve mounting means comprising spaced apart parallel flanges projecting from said bottom of said body sleeve, said flanges having apertures bored therethrough to permit common mounting of said body sleeve bottom with said tube projecting end,

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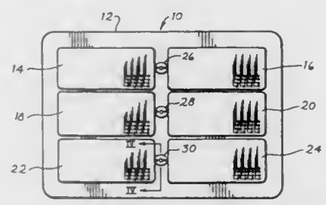
an adjusting member surrounding said body sleeve,
thread means joining said adjusting member to said body sleeve, said thread means allowing selective axial displacement of said adjusting means along said body sleeve,
a coil spring having opposite ends respectively abutting said



retainer means and adjusting member, and surrounding said piston rod, tube and body sleeve, whereby
angular movement of said adjusting member alternately upwardly and downwardly displaces said adjusting member relative to said body sleeve to respectively increase or decrease the effective length of said coil spring.

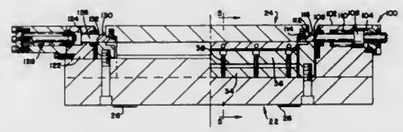
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**5,044,615**
**DUAL PURPOSE WORK BOARD HOLDER**
Robert L. Newman, SE. Concord; Michael C. Weller, and Frank P. Zickefoose, both of Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 8, 1991, Ser. No. 653,200
Int. Cl.[5] B25B *1/08*
U.S. Cl. 269—231 11 Claims



1. A work board holder for use in registering printed circuit boards during manufacturing operations involving said boards, said board holder comprising:
a fixture containing at least two recessed openings each dimensioned to accept a printed circuit board having outside edges; and
force exerting means located between said two recessed openings for exerting forces in opposite directions against the outside edges of each printed circuit board disposed in said openings to secure the boards in said openings;
said force exerting means being located substantially flush with the surface of the board to provide a relatively smooth surface across the circuit board, the fixture, and the force exerting means.

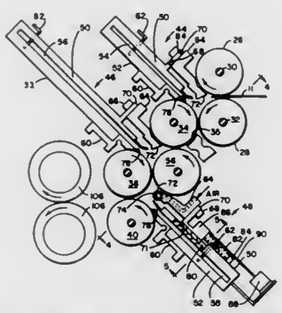
**5,044,616**
**LOCATING DEVICE FOR WORKPIECE-PROCESSING APPARATUS**
Daniel Jakob, Elgin, Ill., assignor to Jakob Tooling, Inc., East Dundee, Ill.
Continuation-in-part of Ser. No. 440,020, Nov. 21, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 597,423
Int. Cl.[5] B23Q *3/02*
U.S. Cl. 269—309 28 Claims



1. A locating device for positioning a workpiece with respect to a workpiece-processing apparatus having a support comprising:
a base unit adapted to be fixed to the support;
a fixture plate supported by said base unit for supporting the workpiece;
first positioning means secured to said base unit;
cooperating second positioning means having a first and second member secured to said fixture plate for aligning said fixture plate along a generally horizontal axis above said base unit,
said second positioning means gripping said first positioning means therebetween; and,
clamping means disposed within said base unit for securing said fixture plate to said base unit in an aligned position.

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**5,044,617**
**SHEET FOLDING APPARATUS HAVING AIR DEFLECTOR MEANS**
Randall J. Roberts, Kingsport, Tenn., assignor to M.B.O. Binder and Company of America, Cinnaminson, N.J.
Filed Feb. 28, 1989, Ser. No. 316,657
Int. Cl.[5] B42C *1/00*
U.S. Cl. 270—45 8 Claims



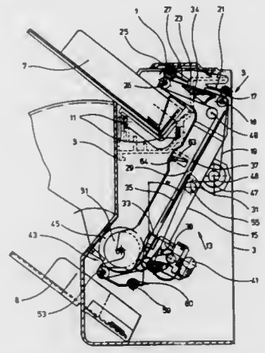
1. A sheet folding apparatus having feed roller means for grasping and propelling a sheet forward, first gate means for receiving a leading portion of said propelled sheet and stopping the same at a predetermined distance therein to cause a first buckle to form in the trailing portion of said sheet, first fold roller means for grasping said sheet at said first buckle to effect a first fold and a first inner panel and propelling said sheet with said first fold leading into second gate means adapted to stop the same at a predetermined distance therein to cause a second buckle to form in the trailing portion of said sheet, second fold roller means for grasping said sheet at said second buckle to effect a second fold and a second inner panel



with the inner edges of said panels being juxtaposed and propelling said sheet with said second buckle leading into third gate means adapted to stop the same at a predetermined distance therein to cause a third buckle to form in the trailing portion of said sheet intermediate said panel inner edges, third fold roller means for grasping said sheet at said third buckle to effect a third fold and propelling said sheet with said third fold leading through the exit of the folding operation, air jet means, mounting means on said apparatus for movably supporting said jet means and for selectively positioning the same in close proximity to said inner edges of said panels and adjacent the nip of said third fold roller means, and valving means on said apparatus for said air jet means for applying air pressure to said inner edges of said panels in a direction tending to force them flat against the underlying sheet portion only during the period that said third buckle and third fold are being formed.

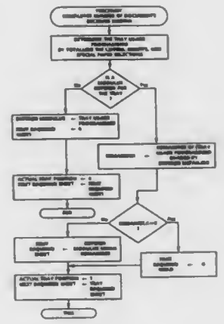
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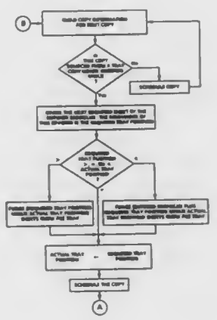
**5,044,618**
**SHEET-HANDLING DEVICE**
Helmut Ettischer, Ostfildern, and Arno Ebner, Ammerbuch, both of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 16, 1990, Ser. No. 509,274
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 3918579
Int. Cl.[5] B42B *1/02*
U.S. Cl. 270—53 8 Claims



1. Sheet-handling device comprising:
a first tray (7) arranged in a housing (1) and adapted to receive sheets which are not to be stapled;
a second tray (29) provided in said housing (1) for collecting sheets which are to be stapled;
a stapling device (39) associated with said second tray (29); and
driving and guiding means for selectively feeding sheets to either the first tray (7) or said second tray (29), said second tray (29) being combined with said stapling device (39) and with said driving and guiding means to form an assembly unit (13), and means for releasably locking said assembly unit (13) to said housing (1) such that said assembly unit (13) is connected with said housing (1) in an easily releasable manner.

**5,044,619**
**CONTROL OF PRE-ORDERED STOCK**
Douglas F. Sundquist; Joseph L. Filion, both of Rochester; Paul F. Schmitt, Palmyra; Eugene S. Evanitsky, and Charles E. Smith, both of Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 14, 1990, Ser. No. 523,497
Int. Cl.[5] B65H *39/02*
U.S. Cl. 270—58 5 Claims





1. In a printing system having a machine with a plurality of operating components, a control with operator interface, the control cooperating with the operating components to produce images on copy sheets, an output station for receiving sets of said copy sheets, and a source of insert sheets having a predetermined repetitive frequency, the insert sheets being provided at given locations within the sets of the copy sheets, the method of automatically ordering the insertion of the inserts within said sets comprising the steps of:
selecting an automatic insert ordering option at the operator interface,
programming the required order of the inserts in a set of copy sheets received at the output station,
determining the repetitive frequency of the insert sheets, and
automatically selectively performing one of inserting and discarding insert sheets in order to provide sets of copy

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sheets with uniform inserts upon determining that the required number of inserts is more or less than said repetitive frequency.

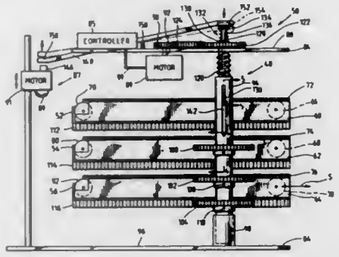
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**5,044,620**

## APPARATUS FOR CONTROLLING THE MOVEMENT OF TRAYS OF PAPER WITHIN AN ELECTROPHOTOGRAPHIC PRINTER

**Mark H. Ruch; Roger Q. Paulsel, and James M. Bradshaw, all of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.**

**Filed Jun. 2, 1989, Ser. No. 360,437**
**Int. Cl.[5] B65H *3/44***
**U.S. Cl. 271—9** **21 Claims**



1. A paper handling apparatus for an electrophotographic printer, comprising:

paper feeding means for contacting a selected one of a plurality of stacks of sheets of paper and removing a selected one of said sheets of paper from said selected stack of sheets of paper, said paper feeding means being controllably moveable along a preselected substantially vertical path;

a plurality of paper receiving trays, each of said trays being adapted for receiving a stack of sheets of paper, said plurality of trays being generally vertically arranged relative to one another and adapted for general horizontal movement between a first selected position and a second unselected position, wherein said first selected position intersects the substantially vertical path of said paper feeding means;

a motor; and

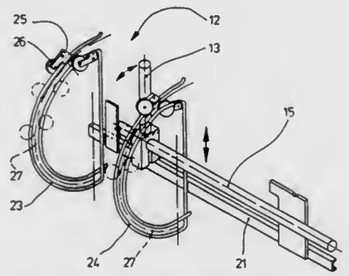
transmission means for selectively engaging said motor with one of said plurality of trays and moving said selected tray between said first selected position and said second unselected position, wherein said transmission means includes a shaft having an upper end portion and a lower end portion and being vertically positioned adjacent said trays and rotatably connected to said motor, a plurality of gears connected to said shaft and disposed at preselected vertical heights relative to each of said vertically disposed trays, a plurality of racks respectively connected to each of said trays and associated with said corresponding gears, whereby said gears selectively engage said corresponding rack and rotation of said motor in a first and second direction produces linear movement of said trays between said first and second positions.

**5,044,621**

## AUTOMATIC FILM-LOADING DEVICE FOR SHEET-FILM CASSETTES

**Guenter Sachs, and Hans-Peter Wuerschum, both of Ostfildern, Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.**

**PCT No. PCT/EP88/00421, § 371 Date Nov. 16, 1989, § 102(e) Date Nov. 16, 1989, PCT Pub. No. WO88/09524, PCT Pub. Date Dec. 1, 1988**
**PCT Filed May 16, 1988, Ser. No. 458,699**
**Claims priority, application Fed. Rep. of Germany, May 20, 1987, 3716903**
**Int. Cl.[5] B65H *5/08***
**U.S. Cl. 271—11** **1 Claim**



1. In apparatus for loading sheet film, such as xray film, into a cassette from a film supply magazine, wherein a sheet is removed from the magazine by a device which moves it into a holder in which it is carried to a cassette loading station, the improvement wherein:

said holder comprises a pair of spaced, identical edge guides for the lateral edges of the film sheet, each edge guide comprising two concentric, arcuate wire portions spaced apart to provide a guide channel which receives an edge portion of a sheet, and roller means carried by said wire portions to engage said edge portions.

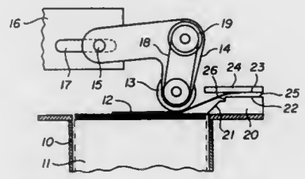
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**5,044,622**

## APPARATUS FOR AUTOMATICALLY DISPENSING OBJECTS

**Roger Cattin, Saignelegier, Switzerland, assignor to SADAMEL Societe Anonyme des Apparails de Mesure et de Laboratoire, Switzerland**

**PCT No. PCT/CH88/00194, § 371 Date Jun. 27, 1989, § 102(e) Date Jun. 27, 1989, PCT Pub. No. WO89/03798, PCT Pub. Date May 5, 1989**
**PCT Filed Oct. 17, 1988, Ser. No. 381,735**
**Claims priority, applicatioo France, Oct. 27, 1987, 87 15033**
**Int. Cl.[5] B65H *3/52***
**U.S. Cl. 271—121** **10 Claims**



1. An apparatus for individually dispensing flexible laminar objects in succession from a stack, said apparatus comprising:

support means for supporting a said stack;

a guide unit defining a path to be followed by each object to be dispensed, the path comprising a guideway and a ramp located between the support means and an entrance of the guideway dimensioned to accommodate a single said object at a time, the ramp being inclined with respect to the guideway, the ramp having an upper portion situated adjacent the entrance of the guideway and a lower portion situated to receive the topmost object of a said stack, when present, and the guideway having a first surface defined by an upper guide plate which extends over an upper portion of the ramp;

at least one friction drive unit disposed above the support means and having friction drive means which engages the top surface of a said stack, when present, for conveying the topmost object thereof along the path;

a step-like recess disposed in the upper portion of the ramp and forming a stop adjacent the entrance of the guideway;

wherein during operation of said friction drive unit, a front edge of a said topmost object, when present, is carried along the path by sliding along the ramp and is brought into contact with the upper guide plate at the entrance of the guideway, and a said topmost object is deflected into the guideway by sliding along the upper guide plate.



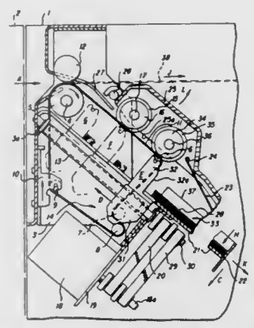
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**5,044,623**

## APPARATUS FOR STACKING SHEETS

**Rolf Munz, Kernen, and Claus Weber, Ostfildern, both of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 15, 1989, Ser. No. 437,007**
**Claims priority, application Fed. Rep. of Germany, Nov. 21, 1988, 3839304**
**Int. Cl.[5] B65H *31/20***
**U.S. Cl. 271—223** **12 Claims**



1. Apparatus for stacking individual sheets in a collecting bin, said apparatus being adjustable in the entrance direction to different sheet sizes such that a stationary abutment associated with all sheet sizes is provided for the lead sheet edge, as seen in the entrance direction, and an adjustable rear limiting element is associated with a trailing sheet edge, the sheets being stacked in the collecting bin from the edge of said stack which is adjacent to said stationary abutment, said adjustable rear limiting element comprising:

an endless transport belt for transporting sheets into the collecting bin arranged in the entrance area of the collecting bin, said belt extending approximately parallel with the upper side of the stack and being arranged above the maximum stack height in the area where the sheets are fed into the collecting bin;

said transport belt being deflected about a first deflecting roller mounted so as to be adjustable in the entrance direction such that the deflected section of the transport belt forms the adjustable rear limiting element of the collecting bin; and

a second deflecting roller adjustable together with the first deflecting roller arranged below the collecting bin so as to face the rear edge of the sheet stack opposite the sheet stack edge adjacent to said stationary abutment.

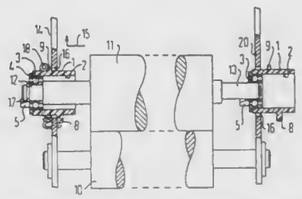
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**5,044,624**

## BEARING ARRANGEMENT FOR A PRESSURE ROLLER OF A PRINTER MEANS

**Rainer Haus, Biebertal, and Karl-Heinz Polzer, Mücke, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**PCT No. PCT/DE88/00318, § 371 Date Aug. 24, 1990, § 102(e) Date Aug. 24, 1990, PCT Pub. No. WO89/08559, PCT Pub. Date Sep. 21, 1989**
**PCT Filed Jul. 1, 1988, Ser. No. 566,382**
**Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808622**
**Int. Cl.[5] B65H *5/06***
**U.S. Cl. 271—274** **8 Claims**



1. A bearing arrangement for a pressure roller having an elastically deformable surface which presses on a conveyor drum for conveying recording media in a printer equipment, comprising:

wall parts in which a position of the pressure roller equipped with the elastically deformable surface is axially defined,

rolling bearings in two bearing locations on the pressure roller by which the pressure roller is mounted in the wall parts in a position so that the pressure roller presses in a radial direction against the conveyor drum with a given pressing power,

substantially identical bearing housings in which said rolling bearings at said two bearing locations are fixed, each of said substantially identical bearing housings comprising:

self-holding securing elements for axially fixing the bearing housing in a recess of the allocated wall part;

a locking ring mounted at one of the two bearing locations which serves as a fixed bearing, the locking ring being mounted to axially fix a bearing neck of the pressure roller in a corresponding one of the bearing housings; and

the other of the two bearing locations serving as a movable bearing and extending around a corresponding bearing journal of the pressure roller with radial play.

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**5,044,625**

## ACTIVE TAMPER FOR BIDIRECTIONAL SORTER

**Paula E. Reid, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

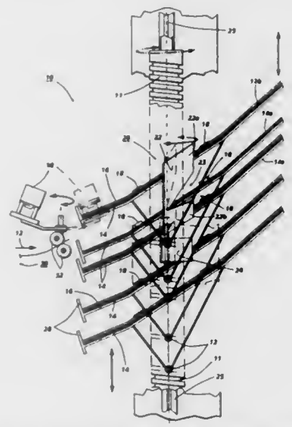
**Filed May 11, 1990, Ser. No. 521,873**
**Int. Cl.[5] B65H *39/10***
**U.S. Cl. 271—293** **7 Claims**

1. In a multi-bin sorter with means for sequentially feeding a sheet of paper or the like in a sheet feeding path from a fixed sheet output such as a copier or printer sequentially into one said bins adjacent thereto, and wherein said bins are reciprocally indexable in two directions relative to said fixed sheet output, to accumulate stacked sheet sets in respective said sorter bins, and further including a sheet edge alignment registration jogging system, the improvement wherein said sheet edge alignment registration jogging system comprises tamping means for tamping those sheets which are in said sorter bins which are above and below said one said bin adjacent to said

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fixed sheet output into which a sheet is being so fed without interfering with said feeding of a sheet into said one said bin, wherein said tamping means is stationarily mounted and comprises a tamping member extending alongside said sorter bins which are above and below said one said bin



adjacent to said fixed sheet output, which tamping member is intermittently movable into those bins for tamping sheets therein towards a registration position but is configured such that it does not extend into said sheet feeding path and does not tamp sheets in said one said bin adjacent to said fixed sheet output.

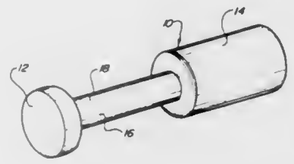
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**5,044,626**

**EXERCISE APPARATUS HAVING ASYMMETRICAL IMPACT CUSHIONS AND METHODS OF EXERCISING SELECTED MUSCLE GROUPS BY DIRECT FORCE APPLICATION**

**Clarence Parker, Jr., 15433 Sorrento, Detroit, Mich. 48227**

**Filed Jul. 23, 1990, Ser. No. 558,702**
**Int. Cl.[5] A63B *21/00***
**U.S. Cl. 272—68** **13 Claims**



1. An exercise apparatus adapted to provide glancing blows, direct impact rolling pressure and twisting pressure to selected muscle groups for the purpose of increasing circulation, muscle tone and skin and muscle toughness within selected muscle groups comprising:
- an elongated rod;
- an annular heel cushion affixed to one end of said rod, said annular heel cushion having a length of one to two inches and a diameter of one to three inches;
- a cylindrical head cushion affixed at the opposite end of said rod from the annular heel cushion, said cylindrical head cushion having a longitudinal dimension that is longer than that of the heel cushion;
- a handle portion being defined on said rod between said head and heel cushions; and
- said heel cushion and said head cushion having sufficient padding to prevent bruising of the selected muscle group.

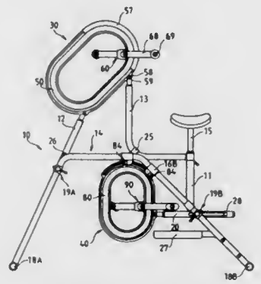
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**5,044,627**

**MULTI-FUNCTIONAL STATIONARY BIKE FOR GYMNASTIC PURPOSE**

**Gwo-Ming Huang, No. 181, Lane 412, Chenhsing Rd., Taichung, Taiwan**

**Filed Jan. 25, 1990, Ser. No. 470,072**
**The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.**
**Int. Cl.[5] A63B *21/00***
**U.S. Cl. 272—73** **6 Claims**



6. A multi-functional stationary bike, comprising:
- a bike frame;
- a bike seat carried by the frame for accommodating the user of the bike;
- a hand-exercise mechanism mounted on the bike frame, the hand-exercise mechanism including an elliptic-shaped gear track and a hand-driven gear disposed in the gear track, such that when hand-driven, the hand-driven gear moves along the elliptic track in a reciprocating manner for providing the user of the bike with an upper body exercise; and
- a foot-exercise mechanism mounted on the bike frame, the foot-exercise mechanism including an elliptic-shaped gear track and a foot-driven gear disposed in the gear track, such that when foot-driven, the foot-driven, gear moves along the elliptic track in a reciprocating manner for providing the user of the bike with a lower body exercise.

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**5,044,628**

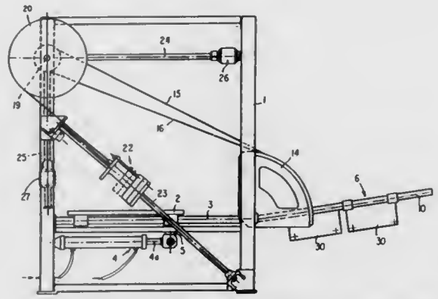
**MACHINE FOR THE THERAPEUTIC TREATMENT OF LUMBAGO AND LUMBAGO/SCIATICA**

**Riccardo Bracci; Guglielmina Catelani, both of Pisa; Massimo Fantozzi, Leghorn; Luigi Grimaldi, Pisa; Pietro Marri, Lido Di Camaiore, and Paolo Lippi, Lucca, all of Italy, assignors to T.E.K. S.r.l., Lucca, Italy**

**PCT No. PCT/IT89/00003, § 371 Date Nov. 21, 1989, § 102(e) Date Nov. 21, 1989, PCT Pub. No. WO89/06527, PCT Pub. Date Jul. 27, 1989**
**PCT Filed Jan. 20, 1989, Ser. No. 457,770**
**Claims priority, application Italy, Jan. 22, 1988, 9313 A/88**
**Int. Cl.[5] A63B *23/08***
**U.S. Cl. 272—96** **7 Claims**

1. A machine for the therapeutic treatment of lumbago and lumbago-sciatica diseases comprising
- a fixed footplate;
- a movable footplate movable by the weight of a patient supported angularly in an upright position with one foot of the patient on one of said footplates and another foot of the patient on the other of said footplates;
- said footplates being arranged one in front of the other so that the patient is supported by them in a substantially ambulatory position;
- said movable footplate including two adjacent portions, a front portion and a rear portion, for supporting the front part of the foot of the patient and the heel of the patient respectively;
- a balanced counterweight means connecting to said front portion and said rear portion and locatable to a plurality of equilibrium positions for said portions by varying resistance to a load applied by the patient when displacing the patient's own body weight from said fixed footplate to said movable footplate;
- said balanced counterweight means including
  - a variable counterweight sliding in response to movements of said movable footplate,
  - a balancing couple means for braking the sliding movement of said variable counterweight,





and a common axis of rotation connected to said movable footplate and said counterweight means;
- separate drive means for each of said portions of said movable footplate connecting them to said counterweight means through said common axis of rotation in order to impart to said counterweight means a rotational movement corresponding to the relative angular displacement of said portions;
- each of said portions of said movable footplate connected to transmit torques acting in opposite directions to said counterweight means;
- a frame supporting said fixed footplate and with said front and rear portions of said movable footplate rotatably connected in a cantilevered manner to said frame.

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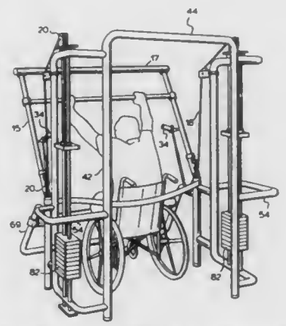
**5,044,629**

**WHEELCHAIR ACCESSIBLE WEIGHT TRAINING APPARATUS**

**Stephen Ryan, 3135 Cambourne, Crescent, Mississauga, Ontario, Canada L5N 5E8 , and Stephen Naumann, 5937 Bathurst Street, No. 4, Willowdale, Ontario, Canada M2R 1Y8**

**Filed Apr. 6, 1989, Ser. No. 334,662**
**Int. Cl.[5] A63B *21/06***
**U.S. Cl. 272—118** **11 Claims**

1. An apparatus for use by occupants of wheelchairs, to enable selective exercising of the upper body of the user, comprising stationary frame means for securement of a wheelchair seated user at an exercise location within said frame;
- an angularly adjustable guide means pivotally secured substantially at mid-body level to said stationary frame means for relative outward adjustment by said seated user, in secured angularly inclined relation from said frame means;
- a laterally extending, substantially horizontal force bar slidably supported by said guide means and movable along the guide means;
- selectively adjustable load means located adjacent said exercise location and accessible, in use by said user when seated in said wheelchair in said exercise location; and
- force transfer means interconnecting the load means and the force bar in load transfer relation therebetween in use to permit upper body exercising by said user in displacing a



load selectable by the user, at a selected angle of load displacement along said guide means.

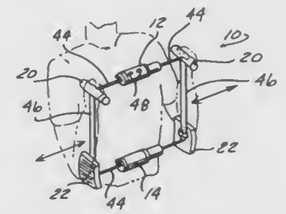
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**5,044,630**

**PORTABLE EXERCISE DEVICE**

**Stephen Ventimiglia, 28830 E. King William, Farmington Hills, Mich. 48331**

**Filed Dec. 26, 1990, Ser. No. 633,759**
**Int. Cl.[5] A63B *21/008, 21/00, 21/05, 21/02***
**U.S. Cl. 272—130** **11 Claims**

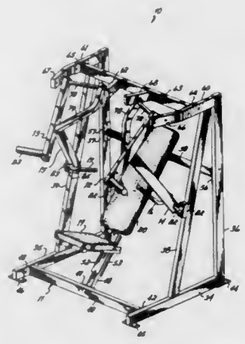


11. A portable exercise device, comprising:
- two handles;
- two elbow pads;
- a first cylinder positioned between the handles for yieldingly resisting longitudinal displacement of a user's hands;
- a second cylinder for yieldingly resisting longitudinal displacement of a user's elbows, each of the first and second cylinders comprising:
- an inner tube having an inner end and an outer end;
- an outer tube having an outer end and a inner surface, the outer tube being in telescoping relationship with the inner tube, wherein either of the handles and the elbow pads are connected to the outer ends of the two tubes;
- means on the inner end of the inner tube for slidably and sealingly engaging the inner surface of the outer tube; and
- means for closing the outer end of the outer tube to form an elongated cavity in which a column of air is compressed and expanded as either of the handles and the elbow pads are moved toward and away from one another in, respectively, a compression and a tension mode;
- means for joining each of the handles to the first cylinder;
- means for joining each of the elbow pads to the second cylinder;
- two bars for laterally positioning a user's forearms, each of the bars having a proximate and a distal end, each of the proximate ends attached to one of the handles, each of the distal ends attached to one of the elbow pads; and
- means for adjusting tension in each of the first and second cylinders.

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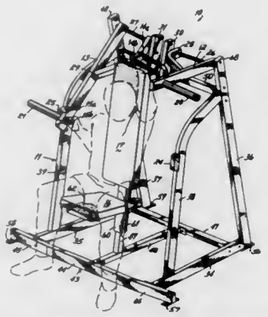
**5,044,631**
**DECLINE PRESS EXERCISE MACHINE**
Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation
Filed Jun. 20, 1990, Ser. No. 540,843
Int. Cl.[5] A63B *21/00, 21/22*
U.S. Cl. 272—134 23 Claims



1. A decline press exercise machine comprising:
a frame;
a declined seat connected to the frame and adapted to support a person in a declined seated position straddling a centered vertical plane;
a lever having two ends, an upper rearward end of the lever connected to the frame for pivotal movement about an axis located above the seat and along an outer vertical plane that converges toward said centered vertical plane, the lever also having a lower, forward end adapted to hold a removable weight;
an arm extending downwardly and rearwardly from the lever; and
a handle connected to a bottom end of the arm and adapted to be grasped and pressed forwardly and upwardly in an arcuate direction by a person supported on said seat, thereby to pivot the lever through the outer vertical plane.

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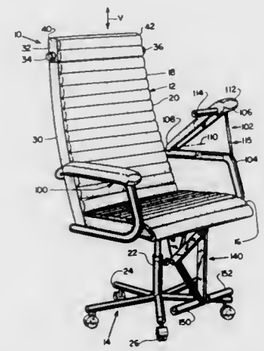
**5,044,632**
**DUMBBELL PRESS EXERCISE MACHINE**
Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation
Filed Apr. 26, 1990, Ser. No. 514,839
Int. Cl.[5] A63B *21/00, 21/22*
U.S. Cl. 272—134 17 Claims



1. A dumbbell press exercise machine comprising:
a frame:
a seat connected to the frame and adapted to support a person in a seated position straddling a first vertical plane;
a lever pivotally connected at one of its two ends to the frame and adapted to be pivoted about an axis located behind and above said seat, the lever adapted to hold a removable weight at the other of its two ends;
at least one handle connected to said other end of the lever and adapted to be grasped and pressed in an upward arcuate direction by a person supported on said seat, the upward arcuate movement causing said lever to be pivoted in an outer vertical plane that diverges from said first vertical plane.

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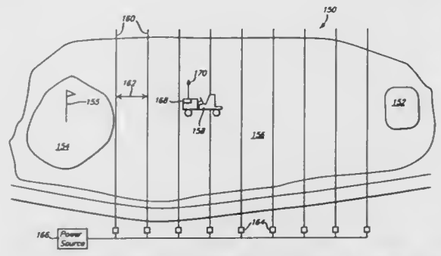
**5,044,633**
**OFFICE CHAIR WITH OCCASIONAL EXERCISE CAPABILITY**
Bryan A. Rice, 1425 11th St., Santa Monica, Calif. 90401
Filed Jan. 9, 1991, Ser. No. 639,138
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—144 9 Claims



1. An office chair with occasional exercise capability comprising:
a seat having a seat bottom for supporting a seated person and a seat back for supporting the back of the person, said bottom and back being padded to comfortably support the person;
a pedestal having an upper part that supports said seat bottom and a lower part, said lower part having a pluraiity of casters for rolling on the ground;
said seat back having a lower part extending along most of the height of the seat back, an upper part, and a guide and resistance mechanism which guides said upper part in primarily vertical movement relative to said seat back lower part and which resists vertical movement of said upper part while allowing such movement by a force applied by a person seated in the chair,
said seat back upper part being homogeneous in structure with said seat back lower part, said seat back upper part having opposite end portions and having a pair of handles located at each of said end portions, said handles being positioned to be grasped by the raised arms of a person seated in said chair.



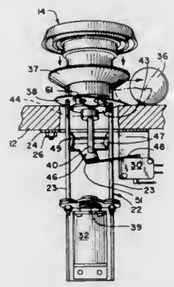
**5,044,634**
**GOLF INFORMATION SYSTEM**
Douglas P. Dudley, Orlando, Fla., assignor to Yardmark, Inc., Orlando, Fla.
Continuation-in-part of Ser. No. 172,458, Mar. 21, 1988, abandoned. This application Dec. 13, 1989, Ser. No. 449,995
Int. Cl.[5] A63B *57/00*; G08G *9/00*
U.S. Cl. 273—32 R 24 Claims



1. A golf information system for providing a golfer with information regarding the position and distance of designated points on a golf course comprising:
(a) a plurality of antenna means, each of said antenna means being buried within and extending across portions of said golf course for transmitting a digitally encoded signal therefrom, said digitally encoded signal corresponding to said information;
(b) a plurality of transmitter means, coupled to a corresponding antenna means, for generating said digitally encoded signal transmitted from said antenna means; and
(c) receiver means, mounted upon a golf cart, for receiving said digitally encoded signal when passing over one of said antenna means, said receiver means having a limited range for receiving comprising the area beneath and in the immediate vicinity of said golf cart, intended to cause only one digitally encoded signal to be received at any given time, said receiver means interpreting said digitally encoded signal via a system memory, said system memory correlating each of said digitally encoded signals to corresponding data defining said information, said receiver means relaying said information derived therefrom to display means for displaying said information to the golfer.

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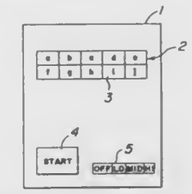
**5,044,635**
**POP BUMPER FOR PINBALL GAME**
David P. Oermann, Chicago, Ill., assignor to Data East Pinball, Inc., Melrose Park, Ill.
Filed Jun. 22, 1990, Ser. No. 542,116
Int. Cl.[5] A63F *7/00*
U.S. Cl. 273—127 R 17 Claims



1. In a bumper for a pinball game which comprises: a depressible flange for contact with a rolling ball; a vertically movable pin engaging said flange and positioned to move between a first vertical position when the flange is depressed and a second vertical position when the flange is not depressed; spring means to urge said vertically movable pin toward one of said vertical positions; switch means which is actuated between open and closed positions as the pin moves between the first and second vertical positions; pivotable arm means having a pivot point and a free end, said arm means engaging the end of said vertically movable pin at a first position between said pivot point and free end, said arm means also engaging said switch means at a second position closer to said free end than said first position, whereby movements of said pin can cause said engaging of said switch means in magnified manner; and function means actuated by said switch means.

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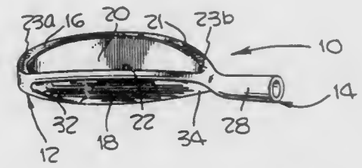
**5,044,636**
**GAME APPARATUS FOR RANDOMLY DISPLAYING GRADEABLE CHARACTERISTICS**
Lorie Rosenberg, 2171 SW. 117th Ter., Davie, Fla. 33325
Filed Apr. 3, 1990, Ser. No. 503,787
Int. Cl.[5] A63F *9/00*
U.S. Cl. 273—138 A 15 Claims




1. A game apparatus comprising a plurality of display sectors each having a label expressing a characteristic, indicator means for indicating one of said display sectors, and user-actuatable display sector selecting means connected to said indicator means for either randomly selecting one of said display sectors to be indicated or directly selecting one of said display sectors to be indicated.

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**5,044,637**
**GOLF CLUB HEAD**
Richard C. Wilson, 2066 Vista, Arcadia, Calif. 91006
Filed Oct. 29, 1990, Ser. No. 605,562
Int. Cl.[5] A63B *53/04, 69/36*
U.S. Cl. 273—164 12 Claims



1. A cavity back wood type driver comprising:
a club head body including a body shell and a substantially flat front ball striking face, said body shell having a generally arcuate lower flange and a generally curvilinear upper flange, said lower flange having a sole portion generally midway therein, said face being canted at an angle of less than 14° from a vertical plane normal to a horizontal plane tangent to said sole portion each of said lower flange and said upper flange extending rearwardly from said front face to form a cavity back, said lower flange extending substantially further rearwardly than

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said upper flange and tapering inwardly towards a juncture at each of its ends with said upper flange wherein the extension and tapering of said lower flange is selected so that a center of mass of said club head body is foreweighted and is further located a selected distance not more than ½ inch behind a center of said face; and

a hosel having a shaft portion which receives a shaft of a golf club and a club body portion integrally interconnected to said body shell proximate one juncture of said lower flange and said upper flange.

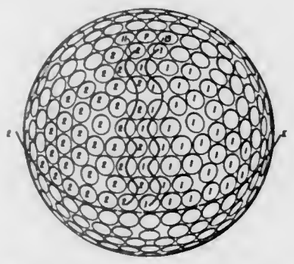
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**5,044,638**

**GOLF BALL**

**R. Dennis Nesbitt, Westfield, and Joseph F. Stiefel, Shrewsbury, both of Mass., assignors to Spalding & Evenflo Companies, Inc., Tampa, Fla.**

**Filed Jun. 12, 1990, Ser. No. 544,554**
**Int. Cl.[5] A63B *37/14***
U.S. Cl. 273—232 **7 Claims**



1. A golf ball having a dimpled surface, the configuration of said dimples comprising

a dimple-free equatorial line on said ball dividing said ball into two hemispheres;

a dimple at each pole of said ball;

six identical dimple sections on each side of said equatorial line; each of said sections comprising

six dimples lying substantially along a line parallel with but spaced from said equatorial line; and

twenty-nine dimples between said six dimples and said dimple on the pole of the associated hemisphere.

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**5,044,639**

**BALL GAME WITH PLAYER CONTROLLED REBOUND SURFACE**

**Keith J. Egging, Itasca, and Chester F. Robards, Jr., Roselle, both of Ill., assignors to Taito America Corporation, Wheeling, Ill.**

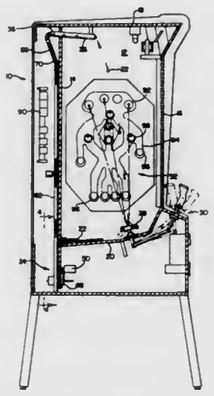
**Filed May 29, 1990, Ser. No. 530,890**
**Int. Cl.[5] A63B *67/00***
U.S. Cl. 273—342 **22 Claims**

1. In a game of the type comprising a plurality of balls, a plurality of targets responsive to interaction with the balls, and a scoring mechanism for keeping a score associated with interaction between the balls and the targets, the improvement comprising:

a movable rebound surface;

a powered raising mechanism having an input at a lower elevation and an output at a higher elevation, said raising mechanism automatically operative to raise the balls from the input to the output and to discharge the balls from the output onto the rebound surface in a regularly spaced sequence at a rate selected such that multiple balls simultaneously stream toward the rebound surface; and

a user controlled steering mechanism coupled to the rebound surface to allow a user to position the rebound surface during play in order to direct the balls that bounce



off of the rebound surface against selected ones of the targets.

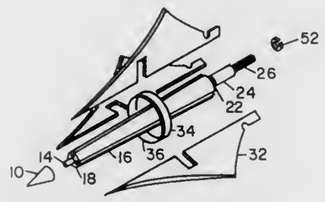
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**5,044,640**

**ARROW RINGED BROADHEAD**

**Nicholas J. DelMonte, 270 N. Ogden St., Buffalo, N.Y. 14206, and Louis M. Fioretti, 143 Meadowlawn Rd., Cheektowaga, N.Y. 14225**

**Filed Apr. 10, 1991, Ser. No. 683,321**
**Int. Cl.[5] F42B *6/08***
U.S. Cl. 273—422 **1 Claim**




1. An arrow bradhead tip comprising:

a) A central tapered tip shaft made of aluminum comprising at its formost end a protruding cylindrical feature of diameter smaller than the smallest diameter of any cross section of said taper, and also comprising adjacent to and in line with said protuberance a tapered feature whose foremost diameter is larger than the diameter of said protuberance and which tapers gradually to a larger diameter at the opposite end of said tapered feature, and also comprising adjacent to and in line with said tapered feature a snap ring groove of cylidrical shape and of diameter equal to the diameter of said protuberance at the opposite end of said tapered feature, and also comprising adjacent to and in line with said snap ring groove an extended shaft feature of cylindrical shape and of diameter equal to the said formost end of said tapered feature, and also comprising a threaded shaft feature adjacent to and in line with said extended shaft feature having an external threaded fastening means for connecting the entire said tapered tip shaft to an existing arrow shaft,

b) a plurality of blade grooves equally spaced radially around the exterior of said tapered feature of central tapered tip shaft, each being a void with a rectangular box shape penetrating to a depth which is a few thousandths of an inch below the surface of said protuberance and said snap ring groove, and extending from said protuberance to said threaded shaft feature,

c) a plurality of blades equal in quantity to said blade grooves and each made of a corrosion resistant hardened steel and having a right-triangular shape with the second longest side of said right-triangular shape having a sharpened razor edge its full length and comprising a rectangular shaped void beginning on the hypotenuse of said right-triangular shape and extending normal to it to a place midway to said razor edge, and comprising a rectangular shaped feature which is located at and includes the corner of said right-triangular shape where said hypotenuse meets the shortest side of said right-triangular shape, and comprising a semi-circular shaped void beginning on the side of said rectangular shape nearest said shortest side of said right-triangular shape and extending midway toward the opposite side of said rectangular shape which is co-linear, or in line, with said hypotenuse, and each of said blades having thickness equal to said blade grooves in said tapered tip shaft so as to have a slight frictional slip fit when said blades fit into said blade grooves, and length of said hypotenuse including said rectangular shape equal to the length of said tapered tip shaft from the point of the smallest diameter of said tapered feature to the beginning of said threaded feature,

d) a ring blade having a hollow cylindrical shape of length equal to the widths of said rectangular voids in said blades, and having one circumferencial edge sharpened to a razor edge, and being made of a corrosion resistant hardened steel,

e) a tip having a sharp pointed conical shape and having a cylindrical shaped void extending into its interior from the base of said conical shape and said void having diameter equal to the diameter of said protuberance of said tapered tip shaft so as to fit together with a slight frictional force fit, and said tip being made of corrosion resistant hardened steel.

f) a snap ring means for holding the entire Arrow Ringed Broadhead assembly together after said blades with said ring blade are assembled into said grooves of said tapered tip shaft, said means accomplishing said assembly by sliding over said threaded portion and said extended shaft feature and into said semi-circular void of said blades which are in line with said snap ring groove.

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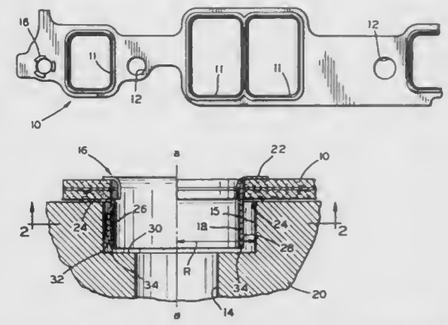
**5,044,641**

**FRICTIONLESS POSITIONING GROMMET FOR ENGINE GASKET**

**Jerome G. Belter, Mt. Prospect, Ill., assignor to Dana Corporation, Toledo, Ohio**

**Filed Oct. 31, 1989, Ser. No. 429,519**
**Int. Cl.[5] F16J *15/12***
U.S. Cl. 277—11 **7 Claims**

1. In a gasket having a plurality of apertures, at least two of which are adapted to accommodate passage of mechanical fasteners, said gasket being disposed for securement between two separate but communicating parts of an engine, said parts containing mating bores for accommodating passage of said mechanical fasteners; an improvement comprising one of said engine parts having a counterbore disposed concentrically in each of two of said engine fastener bores, each counterbore defining an axis, and a plurality of grommets fixed to said gasket for locating said gasket relative to said one engine part, one grommet disposed within each one of said counterbores, each counterbore and associated grommet sized for frictionless, interference-free radial clearance, wherein each grommet defines a generally cylindrical body having an axis coincident with said axis of its associated counterbore, a first end of said cylindrical body comprising a first plurality of radially extending, symmetrically spaced flanges circumferentially distributed about said axis, an intermediate portion of said cylindrical body comprising a second plurality of radially extending, symmetrically spaced flanges, also circumferentially distributed about said axis, said first and second pluralities of flanges being axially spaced apart and with individual flanges of said first and second respective pluralities being circumferentially offset from one another, wherein said axially spaced first and second




pluralities are compressed axially toward each other to secure each said grommet to said gasket, and wherein said cylindrical body of each grommet comprises a plurality of integral detents, each detect symmetrically and radially aligned with one flange of said second plurality.

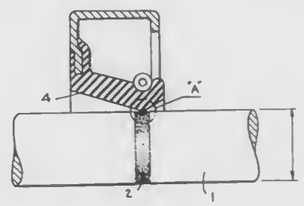
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**5,044,642**

**ANNULAR SEAL**

**Rolf Vogt, Oftersheim; Karl H. Spies, Birkenau, and Gerhard Kilthau, Mannheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany**

**Continuation of Ser. No. 308,436, Feb. 9, 1989, abandoned. This application Aug. 29, 1990, Ser. No. 576,142**
**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810741**
**Int. Cl.[5] F16J *15/54***
U.S. Cl. 277—134 **3 Claims**




1. An annular seal, comprising:

a cylindrical surface having an outside diameter DA with indentations made therein and defined between opposed axially spaced boundaries on said surface;

a sealing lip of polymeric material and of annular configuration pressed with resilient bias against the cylindrical surface;

said indentations having saucer-like bottoms having centers and having a maximum depth of 4 to 12 micrometers, with respect to said diameter DA;

each bottom being surrounded at its entire outer periphery by adjacent indentations except at said boundaries;

the distances between said centers of said bottoms of said adjacent indentations being so small that said bottoms of said adjacent indentations adjoin one another at arrises;

the maximum relative frictional speed of the annular seal

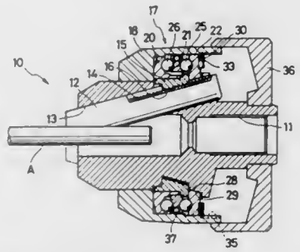
VOL 1130 ISS 1 SE 3 1991 UMI



against the cylindrical surface being more than 20 meters per second.

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5,044,643
## TOOL CHUCK
Daijiro Nakamura, 662-2, Shimokishi-cho, Ono, Japan
Filed Jun. 12, 1990, Ser. No. 537,471
Claims priority, application Japan, Jun. 16, 1989, 1-754900
Int. Cl.[5] B23B *31/12*
U.S. Cl. 279—60 12 Claims

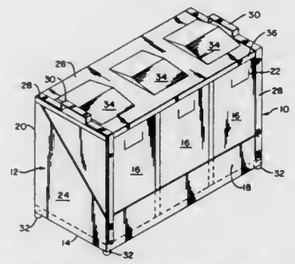


1. A tool chuck comprising
a chuck body,
a plurality of chuck jaws mounted centrally of of a forward end of said chuck body to be slidable toward and away from one another,
a screw ring,
a control ring mounted peripherally of the chuck body to be rotatable in opposite directions to rotate said screw ring for screw-feeding the chuck jaws toward and away from one another,
lock means disposed between said chuck body and said chuck jaws for pressing and locking to said chuck body by a reaction force occuring when said chuck jaws clamp a tool, and releasable upon removal of the reaction force and
torque amplifying means disposed between said lock means and said control ring for reducing rotation of said control ring to output an amplified torque to said screw ring when said lock means is locked to said chuck body, and transmitting rotation of said control ring to said screw ring when said lock means is released from said chuck body.

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5,044,644
## MOBILE CONTAINER SYSTEM WITH COMMON COVER FOR MULTIPLE CONTAINERS
Randy Duran, and Michael Duran, both of 15 Garvey Dr., Jamesburg, N.J. 08831
Filed Jul. 9, 1990, Ser. No. 549,913
Int. Cl.[5] B62B *3/10*
U.S. Cl. 280—47.35 5 Claims

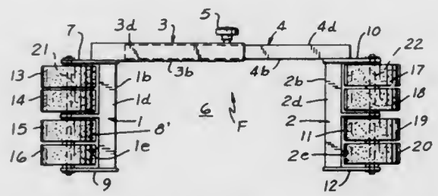
1. A refuse containment apparatus having the capacity to contain a plurality of individual refuse bins comprising:
(a) a hollow base having a substantially vertical back wall, a front wall substantially parallel to said back wall and having a height less than that of said back wall, side walls connecting said back wall to said front wall, and bottom support means extending inwardly from a lower edge of said front and back walls for supporting said individual refuse bins within said base;
(b) a bin cover hingedly connected to an upper edge of said back wall for simultaneously covering the tops of said plurality of refuse bins when in a first position and uncovering the tops of said refuse bins when in a second position, said bin cover penetrated by a plurality of access ports matching in position and number said plurality of refuse bins to allow refuse to be deposited in said bins when said cover is in said first position;
(c) at least one U-shaped strap lock straddling said base and pivotably attached thereto at the open end of said U-shaped lock to a pair of juxtaposed attachment points, one on said front wall and another on said back wall, each said



attachment point being exterior to said hollow of said base, such that said lock, when pivoted upwards captures said cover in a closed position, and when pivoted downward, permits said cover to be opened.

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5,044,645
## DOLLY FOR HEAVY OBJECTS
Bjorn Eltvik, Arboga, Sweden, assignor to Car-O-Liner Company, Wixom, Mich.
Filed Mar. 2, 1990, Ser. No. 488,603
Claims priority, application Sweden, Mar. 2, 1989, 8900723
Int. Cl.[5] B62B *3/10*
U.S. Cl. 280—79.4 14 Claims



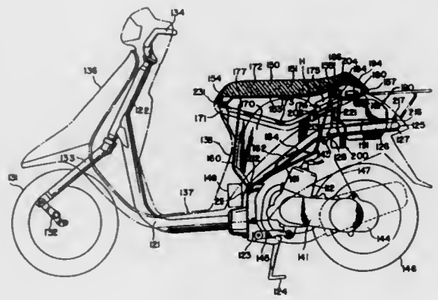
1. A dolly for moving a heavy object along a support surface and holding a heavy object in a static position comprising:
(a) a main frame including a telescoping member, means for releasably locking said telescoping member to a predetermined length, and at least two cross members transverse to said telescoping member and fixedly attached on one side of said telescoping member, wherein said frame has a top side, a bottom side and a generally U-shaped opening, said telescoping member varies the distance between said cross members and the length of said opening;
(b) wheels carried by said frame for rolling said frame on the support surface, said wheels being carried by said frame such that their peripheries are positioned in part below the plane of said bottom side of said frame for engagement of said wheels with the support surface when said frame is in an upright position and completely below the plane of said top side of said frame for disengagement from the support surface when said frame is in an upside-down position,
(c) a first pair of abutment means carried by said cross members in generally opposed relation, disposed wholly above the support surface when said frame is in its upright position, and constructed and arranged to engage and support a heavy round object wholly above the support surface when said frame is in its upright position,
(d) a second pair of abutment means carried by said cross members in opposed relation, disposed below the plane of the top side of the frame and above the support surface when said frame is in its upright position, and constructed



and arranged to engage a heavy round object when said frame is in its upside-down position, and
(e) abutment surfaces carried by said cross members, lying in generally the same plane and engagable with the support surface when said frame is in its upside-down position to thereby restrain the heavy round object in a substantially static position and none of the components of said dolly projecting beyond said plane of said abutment surfaces carried by said cross members.

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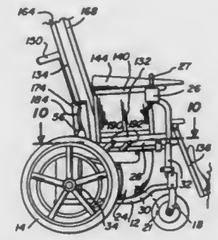
5,044,646
## SCOOTER TYPE VEHICLE
Tsuyoshi Ilga; Yasuji Kitasei; Junji Kikuno; Nobuo Yamaguchi, all of Saitama; Yoshio Nakagomi, Tokyo, and Takeo Miura, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 946,739, Dec. 24, 1986, abandoned.
This application Jan. 12, 1989, Ser. No. 296,881
Claims priority, application Japan, Dec. 27, 1985, 60-294508[U]; Jun. 6, 1986, 61-85466[U]; Sep. 30, 1986, 61-149862[U]
Int. Cl.[5] B62J *7/02*
U.S. Cl. 180—219 30 Claims



1. A scooter-type vehicle comprising a body frame structure including a low bed step floor positioned forwardly of a rear body portion, a seat, a power unit defined by an integrated engine and transmission mechanism for transmitting engine output to a rear wheel, a storage box in said rear body portion located below said seat and above said power unit, said storage box comprising plate means including structurally rigid wall plates secured to and upstanding from said body frame structure, the upper ends of said wall plates defining a storage box opening vertically supporting said seat and having means at the front side thereof for pivotally attaching said seat, means for pivotally mounting said power unit to said body frame structure for vertical movement beneath said storage box, a rear body cover spacedly enclosing said storage box, and a fuel tank disposed rearwardly of said storage box between said storage box and said rear body cover.

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5,044,647
## STABILIZED RECLINING WHEELCHAIR SEAT
Donald Patterson, Longmont, Colo., assignor to Folio Products, Inc., Longmont, Colo.
Filed Nov. 17, 1989, Ser. No. 438,874
Int. Cl.[5] B62M *1/14*
U.S. Cl. 280—250.1 20 Claims



1. A wheelchair for transporting a handicapped user, the wheelchair having a base framework structure having upper side support rails on each side and a forward and rearward end portion, a pair of drive wheels rotatably mounted on each side of said base structure and near one end, and a second pair of wheels rotatably mounted one each side of said structure near the opposite end portion of said base structure from said drive wheels, said second pair of wheels being capable of castering, the improvement to said wheelchair comprising:
a) a seat unit having a seat portion and a back portion, said seat and back portion being joined together along a common edge to form a seat unit with the angular position of the seat and back portion being adjustably fixed;
b) a slidable support means for supporting said seat unit, said support means including guide rails fixedly attached to an upper portion of the wheelchair base structure, said support means having mounting means for pivotally mounting and supporting said seat unit;
c) means for moving the slidable seat support means in a longitudinal direction along said base framework structure whereby the slidable support means and seat unit can be moved between a rearward position and a forward position; and
d) cam means arranged and fixedly attached between said base framework structure and said seat unit whereby as the moving means moved the seat unit towards a forward position the seat unit will be tilted backward toward a reclining position while at the same time the seat unit and user is moved forward so that the center of gravity of the wheelchair and user will remain substantially centered between said first and second pairs of wheels of the chair to maintain the stability of the wheelchair and the safety of the user.

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5,044,648
## BICYCLE SUSPENSION SYSTEM
Thomas D. Knapp, 1081 Graham Rd., Kent, Ohio 44240
Filed Apr. 18, 1989, Ser. No. 340,088
Int. Cl.[5] B62K *19/36, 21/20;* F16F *9/36, 11/00*
U.S. Cl. 280—283 28 Claims

1. A shock isolation system for a bicycle or other vehicle having a main frame, the shock isolation system comprising,
an outer housing member sealed at both ends thereof and secured to the frame of the vehicle,

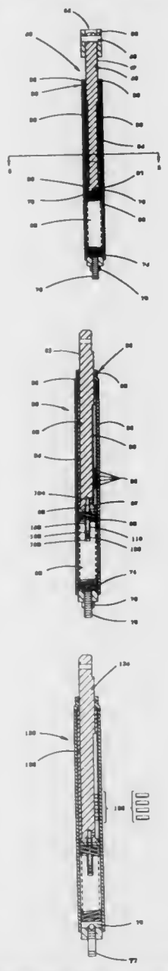
VOL 1130 ISS 1 SE 3 1991 UMI



a piston having a piston head and body portion slidably disposed within said outer housing member with said body portion extending outwardly from said outer housing, said piston having first guide means formed on said body portion within said outer housing member,

wherein said outer housing member includes second guide means associated therewith which coact with said first guide means,

bearing means disposed within said coacting first and second guide means to allow at least relative linear movement



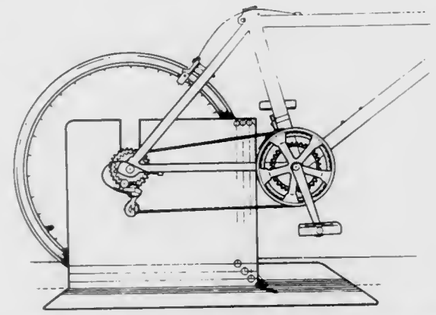
between said piston and said outer housing member and to limit rotational movement of said piston relative to said outer housing member,

a bias spring positioned within said outer housing member opposite said piston body portion and acting on said piston head,

a hydraulic fluid disposed in said outer housing member,

means to allow said hydraulic fluid to flow past said piston to provide variable dampening of the sliding movement of said piston, and to provide lubrication to the interior surfaces of said sealed outer housing member.

**5,044,649**
**BICYCLE DRIVE TRAIN CLEANING SHIELD**
**James Sampson, IV, 39 Powell Rd., Tabernacle, N.J. 08088**
**Filed Aug. 27, 1990, Ser. No. 572,778**
**Int. Cl.[5] B62J** *13/00*
**U.S. Cl. 280—288.4** **14 Claims**

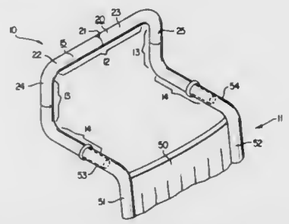


1. In a bicycle, the improvement comprising in combination:

a drive system comprising a chain, derailleur mechanisms, chain wheels and sprockets;

a cleaning shield fabricated from substantially rigid non-absorbent sheet material, with means for releasably retaining same between the rear wheel and its sprockets in a plane parallel to said wheel, protecting the wheel and tire while allowing access to the chain, chain wheels, sprockets, and derailleur mechanisms for cleaning and lubrication.

**5,044,650**
**WHEELCHAIR HANDLE**
**Robert Eberle, Jr., P.O. Box 10, Dripping Springs, Tex. 78620-0010**
**Filed Dec. 20, 1989, Ser. No. 453,768**
**Int. Cl.[5] B62J** *29/00*
**U.S. Cl. 280—304.1** **4 Claims**



1. A removable wheelchair handle for mounting on a wheelchair for operation of the wheelchair by an attendant from a location behind and above the back of the wheelchair comprising:

a hand grip crossbar;

laterally spaced parallel support posts connected at first ends with opposite ends of said crossbar at an angle of at least 90 degrees with said crossbar and extending in the same direction from said crossbar for supporting said crossbar in predetermined spaced relation relative to said wheelchair;

spaced parallel mounting members connected at first ends with and at a minimum of 90 degree angles relative second ends of to said support posts and extending in the same direction from said posts;

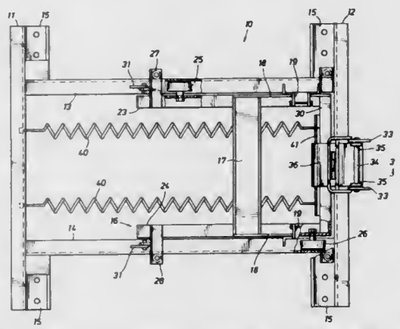
a mounting pin on each second end of each of said mounting members extending along the axis of each said mounting member, each mounting pin being sized to fit into an open end of a handle on the wheelchair, said mounting pins being positioned relative to said crossbar to support said crossbar behind and above said wheelchair when said removable handle is mounted on said wheelchair;

stop means on each of said mounting members spaced from the end of the mounting pin on said mounting member to engage the end edge of the wheelchair handle in which said mounting pin is inserted when said removable handle is mounted on said wheelchair; and

each half of said crossbar and a portion of each of said support posts comprising an elbow and each said mounting member and another portion of each of said support posts comprising an elbow, said elbows forming said crossbar telescoping together at substantially the center of and to form said crossbar, and each of said mounting members and the portion of each of said support posts formed with each said mounting member telescoping together with the portion of said support posts formed integral with half of said crossbar, each of said elbows being a 90 degree elbow.



**5,044,651**
**FIFTH WHEEL HITCH MOUNTING MECHANISM ENABLING TOWING AND TURNING IN A TIGHT RADIUS**
**John D. Weikel, Rte. 6, Box 899, Beaumont, Tex. 77705**
**Filed Aug. 10, 1990, Ser. No. 565,465**
**Int. Cl.[5] B62D** *53/08*
**U.S. Cl. 280—407** **10 Claims**



1. A fifth wheel mounting mechanism enabling a towing pickup truck to pull a gooseneck trailer supported by the fifth wheel mechanism, comprising:

(a) a fixed framework mountable in the bed of a pickup truck;

(b) frame guide means extending rearwardly of the pickup truck to define forward and rearward positions relative to the truck;

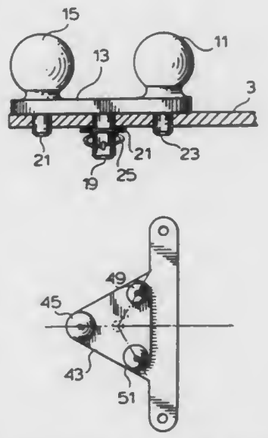
(c) mounting means for supporting a fifth wheel slidably mounted for movement between the rearward and forward positions;

(d) means for releasably locking said slidable mounting means to prevent sliding movement thereof; and

(e) wherein said releasable locking means comprises a hook pivotally mounted and urged by resilient spring means for reaching over and engaging said mounting means to lock said mounting means in a specific location along said frame guide means; and

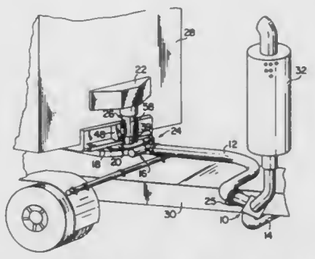
(f) further including means for releasing said hook.

**5,044,652**
**MULTI-BALLED ROTATABLE TRAILER HITCH**
**Roger Brisson, P.O. Box 523, Elliot Lake, Ontario, Canada P5A 2J9**
**Filed May 31, 1990, Ser. No. 531,083**
**Int. Cl.[5] B60D** *1/06*
**U.S. Cl. 280—416.1** **4 Claims**



1. A trailer hitch comprising in combination a bumper mount and hitch plate supporting a plurality of different sized hitch balls, said hitch plate being settable on said bumper mount in a plurality of different positions to locate a particular one of said hitch balls in a towing position, said trailer hitch having a pulling axis and said hitch plate being secured to said bumper mount by at least two securing posts in line with said pulling axis, one of said posts being located immediately beneath the hitch ball set in the towing position.

**5,044,653**
**AUTOMATIC TRACTOR-TRAILER EXHAUST COUPLING APPARATUS**
**James A. Savanella, 32 Clearview Ave., Harwinton, Conn. 06791**
**Filed Apr. 25, 1990, Ser. No. 514,162**
**Int. Cl.[5] B60D** *1/62, 53/08*
**U.S. Cl. 280—421** **7 Claims**



1. Automatic tractor-trailer exhaust coupling apparatus for diverting exhaust gasses from a tractor having an engine and exhaust system to a trailer having heat transfer means for delivering heat to portions of the trailer, the tractor having a fifth wheel engageable on relative horizontal movement between the trailer and tractor into operational relationship with the trailer, and said exhaust coupling apparatus automatically establishing a conduit connection for the diversion of exhaust

gases from the tractor exhaust system to the trailer heat transfer means when the fifth wheel is engaged and the tractor is in operational relationship with the trailer; said apparatus comprising:

an exhaust gas conduit having inlet and discharge end portions;

first connection means providing communication between the tractor exhaust system and the inlet end portion of the conduit;

a tractor mounted coupling device having a gas discharge opening and which is supported adjacent and projects forwardly from the fifth wheel of the tractor;

second connection means providing communication between the discharge end portion of the exhaust gas conduit and the tractor coupling device for the delivery of exhaust gases to said discharge opening;

a trailer coupling device on a front end portion of the trailer above and forwardly of the fifth wheel and having an exhaust gas inlet opening in communication with the trailer heat transfer means,

said tractor and trailer coupling devices being fixed respectively relative to the tractor and trailer so as to be automatically interengaged on relative horizontal movement between the tractor and trailer when the tractor fifth wheel is engaged with the trailer and the tractor and trailer are in operational relationship with each other, the exhaust gas conduit and two coupling devices thus serving cooperatively to provide communication between the tractor exhaust system and the trailer heat transfer means, and said two coupling devices being adapted to maintain communication between said gas discharge and inlet openings throughout the full operational range of relative angular movement between the longitudinal centerlines of the tractor and trailer, and said trailer coupling device being adapted for independent limited vertical movement during interengagement of the two coupling devices, said trailer coupling device also including means biasing the device vertically downwardly toward the tractor coupling device.

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**5,044,654**

## FLATE RELEASE BINDING WINTER SPORTS DEVICE

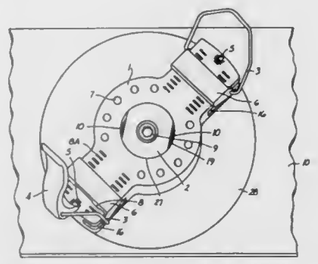
**Urs P. Meyer, In der Rehweid 2, CH-8122 Pfaffhausen, Switzerland**

**Filed May 4, 1990, Ser. No. 519,152**

**Claims priority, application Switzerland, May 4, 1989, 1675/89**

**Int. Cl.[5] A63C** *9/08*

**U.S. Cl. 280—613** **9 Claims**



1. A plate release system for a pair of bindings that releasably secures the boots of a snowboard rider to a snowboard and for automatically releasing the boots from the snowboard upon a predetermined force being exceeded on said boots, each one of said pair of bindings comprising:

a base plate adapted to be fixedly mounted to the upper surface of the snowboard,

a hub adapted to overlie said base plate,

an anchor bolt extending through the center of said base plate and said hub, each of said base plate and said hub having radially extending teeth which are adapted to overly in mating relationship to define a plurality of angular positions of rotation of said hub about a vertical axis of said base plate, said anchor bolt being adapted to lock said hub to said base plate in a selected one of said angular positions,

a rotatable plate adapted to be attached to the sole of the boot, said plate having a central vertical bore for rotatably receiving said hub, and

connection means for releasably coupling said plate to said hub, said connection means including at least one spring-biased pressure piston located in said plate, said piston having a tip portion extending into said central bore and recesses located along a radial periphery of said hub for selectively receiving said piston, whereby said connection means releases said plate from said hub in response to said predetermined force.

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**5,044,655**

## SKI BINDING FOR A CROSS-COUNTRY OR TOURING SKI

**Jean P. Garau, Villeneuve Loubet, France, assignor to TMC Corporation, Baar, Switzerland**

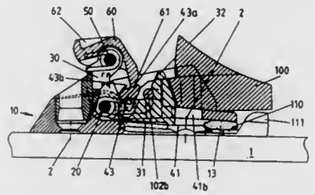
**PCT No. PCT/EP89/00815, § 371 Date Mar. 28, 1990, § 102(e) Date Mar. 28, 1990, PCT Pub. No. WO90/00918, PCT Pub. Date Feb. 8, 1990**

**PCT Filed Jul. 13, 1989, Ser. No. 469,593**

**Claims priority, application Austria, Jul. 28, 1988, A1917/88**

**Int. Cl.[5] A63C** *9/00*

**U.S. Cl. 280—615** **1 Claim**



1. In a ski binding for a cross-country or touring ski, comprising a bearing block on a base plate which is adapted to be fastened onto the ski and comprising a holding cup adapted to receive a front end region of a ski boot, which ski boot has at its front end area a generally U-shaped bar, a crossbar portion of the U-shaped bar being spaced from a tip of the toe portion the ski boot and forms an opening with said tip such that, when the ski boot is inserted into the binding, top and bottom sole edges of the ski boot engage top facing and bottom facing surfaces provided on the holding cup, a spring means for biassing the holding cup toward an open position of the binding in an upward direction about a horizontal transversely extending axle located in front of the ski boot, the holding cup being pivotally supported between upstanding walls of the bearing block and is adapted to be manually pivotally moved downwardly into a closed position by means of the ski boot, in which closed position at least one locking pin of the binding penetrates from below through the opening defined by the bar on the toe of the ski boot, and a pawl pivotally supported for movement about a further horizontal transversely extending axle and has a projection thereon cooperatively received in a groove provided on the holding cup to thereby lock the holding cup and the locking pin relative to one another and in the closed position of the binding, the improvement wherein at least one of a further groove is provided on the holding cup and a further projection is provided on the pawl for defining at least one further closed position of the ski binding, said further closed position occurring when a bottom of the holding cup is



spaced a larger distance from the base plate than in the first-mentioned closed position of the ski binding.

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**5,044,656**

## SLIDEBOARD

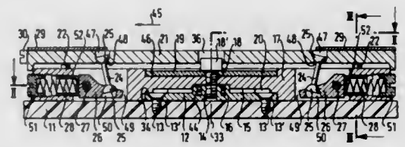
**Henri Peyre, Saint Benin D'Azy, France, assignor to Look S.A., Nevers, France**

**Filed Mar. 29, 1990, Ser. No. 501,691**

**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1989, 3918939**

**Int. Cl.[5] A63C** *9/08*

**U.S. Cl. 280—618** **27 Claims**



1. A slideboard comprising a board and first and second bindings for boots with the bindings arranged one behind the other at a substantial angle to the longitudinal axis of the board, each binding including a board plate secured to the board and a boot plate which is movable relative to the board plate and firmly connectable with the boot, resilient tensioning means for resiliently drawing said board plate and said boot plate into firm contact with one another in a front region and a rear region of the binding, said tensioning means generating a resilient force so that an excessive loading of the boot can cause tilting movements of the boot plate relative to the board plate in lateral and longitudinal directions about a lateral axis of the board plate and a longitudinal axis substantially perpendicular thereto, respectively, a circular holding disc secured to the board, a central bolt releasably securing said board plate to said holding disc, the board plate centrally pivotable about a vertical axis and having a ring recess of complementary shape to and accommodating said holding disc, opposing surfaces of the board plate and the holding disc defining cooperating radially oriented projections and recesses at predetermined angular spacings about the vertical axis for locking the board plate with the bolt to the holding disc in a chosen one of predetermined angular positions determined by the cooperating projections and recesses.

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**5,044,657**

## SAFETY SKI BINDING

**Henry Freisinger, and Egon Brunnhuber, both of Vienna, Austria, assignors to TMC Corporation, Barr, Switzerland**

**PCT No. PCT/EP89/00670, § 371 Date Mar. 2, 1990, § 102(e) Date Mar. 2, 1990, PCT Pub. No. WO90/00078, PCT Pub. Date Jan. 11, 1990**

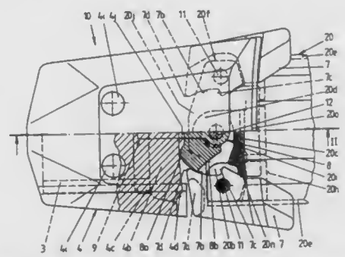
**PCT Filed Jun. 15, 1989, Ser. No. 466,350**

**Claims priority, application Austria, Jul. 4, 1988, 1720/88**

**Int. Cl.[5] A63C** *9/081*

**U.S. Cl. 280—625** **8 Claims**

1. In a safety ski binding comprising a sole plate pivotal about a ski-fixed pivot pin in a horizontal plane, on which sole plate is adapted to be supported a ski boot, a heel holder mounted on said sole plate and adapted to hold a heel end region of the ski boot, and two two-arm sole holders pivotally mounted on vertically extending axles on said sole plate for holding a toe region of the ski boot, a first lever arm of each sole holder engaging a sole edge on opposite lateral sides of the toe of the ski boot, a second lever arm of each sole holder engaging a locking element, a pair of transversely spaced stop surfaces arranged fixed to the ski, so that at least one of said stop surfaces, after a pivoting of the sole plate through a specific range, will effect a release of the edge of the sole of the ski boot, the improvement wherein means are provided on each sole holder defining a curved surface, wherein said locking element is pivotally supported on a further axle arranged between said axles for pivotally supporting the sole holders on said sole plate and extending parallel to said axles, said locking element having a pair of laterally spaced, forwardly facing, arched surfaces with following and a pair of laterally facing curved surfaces, each contiguous with a respective one of said arched surfaces to thereby define support surfaces adapted to engage said two sole holders in both a travelling position thereof and an outward pivoted ski boot release position thereof, said curved surface on each sole holder directly abutting a respective one of said arched surfaces in said travelling position, wherein a housing is provided and covers both a portion of said sole holders in the travelling position, a ski-fixed



base plate having support means thereon for supporting said housing for movement parallel to a longitudinal axis of the ski, and wherein an elongated rod-shaped control element is provided on said locking element, a longitudinal axis of which control element intersects said further axle pivotally supporting said locking element and extends, in said travelling position, generally parallel to a longitudinal axis of said sole plate, said housing also having said pair of stop surfaces provided thereon, said control element engaging in the pivoted position of said sole plate a respective one of said pair of stop surfaces to facilitate said locking element pivoting about said further axle support therefor to further facilitate one of said sole holders pivoting to the ski boot release position to allow the ski boot to be released from said ski binding.

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**5,044,658**

## SAFETY SKI BINDING ADAPTED TO COMPENSATE FOR DIFFERENT THICKNESSES OF SOLES OF SKI BOOTS

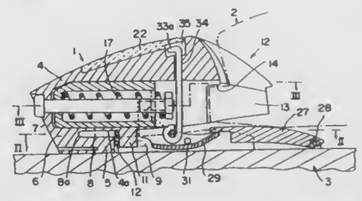
**Christian Challande, Cruseilles, and Jean-Pierre Boussemart, Choisy, both of France, assignors to Salomon S.A., Annecy Cedex, France**

**Filed Dec. 12, 1989, Ser. No. 448,836**

**Claims priority, application France, Dec. 16, 1988, 8816661**

**Int. Cl.[5] A63C** *9/08*

**U.S. Cl. 280—631** **27 Claims**



1. A safety ski binding adapted to be mounted on a ski to releasably hold the front of a sole of a ski boot on the ski, said safety ski binding having a front and rear and further comprising:

a) a unitary assembly comprising a lower base and a body, said assembly being formed in a single piece;

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b) a jaw mounted on said assembly for retention of the sole of the ski boot including a sole-gripping element and two opposed lateral retention wings; and

c) an energization mechanism movable in said body to elastically bias said jaw toward a locking position;

wherein said lower base is adapted to be mounted on the ski, said lower base and said body are connected together only at the front of the binding at an elastic deformation zone which allows upward movement of said body with respect to said lower base, to permit said jaw to automatically adapt in height to soles with different thicknesses.

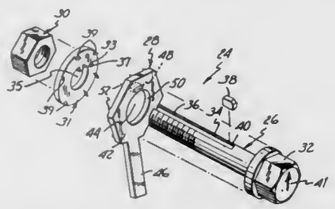
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**5,044,659**

**DEVICE FOR ADJUSTMENT OF AUTOMOBILE WHEEL ALIGNMENT**

**Gerald A. Specktor, St. Paul, and John Specktor, Golden Valley, both of Minn., assignors to Shim-A-Line, Inc., Minneapolis, Minn.**

**Filed Apr. 21, 1989, Ser. No. 342,459**
**Int. Cl.[5] B60G *9/02, 11/28***
**U.S. Cl. 280—661** **17 Claims**



1. A device for adjusting at least one alignment characteristic in a suspension system of an automotive vehicle, the suspension system having a wheel support member and a wheel assembly attached to the wheel support member by at least one movable bolt that extends through a bore having an axis, the device comprising:

an adjusting bolt means having a shaft that is movable within the bore;

means for engaging the wheel support member including tab means projecting into the wheel support member and for engaging the adjusting bolt to position the adjusting bolt for movement of the adjusting bolt to a position offset from an original position;

means for moving the wheel assembly by acting against the wheel assembly in cooperation with the means for engaging the wheel support member and for engaging the adjusting bolt to move the wheel assembly relative to the wheel support; and

means for securing the bolt in a non-rotatable position by engaging the bolt once the adjustment of the alignment characteristic has been completed.

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**5,044,660**

**SUSPENSION CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE WITH ADJUSTMENT OF WHEEL SLIPPAGE DEPENDENT WHEEL LOAD DISTRIBUTION**

**Tomohiro Yamamura; Fukashi Sugasawa; Masatsugu Yokote, and Takashi Imaseki, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan**

**Filed Jan. 9, 1990, Ser. No. 462,408**
**Claims priority, application Japan, Jan. 10, 1989, 1-1363**
**Int. Cl.[5] B60G *11/26***
**U.S. Cl. 280—707** **18 Claims**

1. A suspension control system comprising:

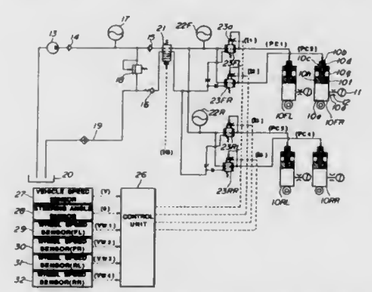
a suspension system disposed betweena vehicle body and a suspension member pivotably mounted on a vehicle body and rotatably supporting a road wheel;

first means, associated with said suspension system, for adjusting suspension characteristics for adjusting load exerted on said road wheel;

second means, for monitoring preselected suspension control parameter for providing a first parameter data;

third means for monitoring state of traction at said road wheel for producing a second parameter data; and

fourth means, receiving said first and second parameter data, for controlling operation of said first means, said fourth means being active in a first mode while said second parameter data is greater than or equal to a predetermined threshold level, for controlling operation of said first means on the basis of said first parameter data, and a second mode while said second parameter data is smaller than said predetermined threshold level, for controlling operation of said first means so as to increase traction so that said second parameter data becomes greater than or equal to said predetermined threshold level.



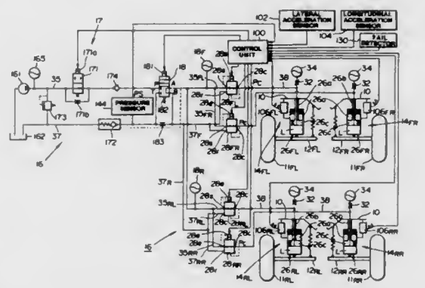
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**5,044,661**

**ACTIVE SUSPENSION SYSTEM WITH ENHANCED SUSPENSION CONTROL CHARACTERISTICS AT ON/OFF TRANSISTION OF SUSPENSION CONTROL**

**Kazunobu Kawabata, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan**

**Filed Aug. 30, 1990, Ser. No. 574,720**
**Claims priority, application Japan, Aug. 31, 1989, 1-225581**
**Int. Cl.[5] B60G *17/08***
**U.S. Cl. 280—707** **15 Claims**



1. An active suspension system comprising:

a suspension system disposed between a vehicular body and a road wheel for damping energy for causing relative displacement between the vehicular body and the road wheel, said suspension system including means for defining a variable pressure chamber;

a fluid circuit for circulating pressurized fluid across said variable pressure chamber, said fluid circuit including a pressurized fluid source and a pressure control valve means for adjusting fluid pressure within said variable pressure chamber across a predetermined neutral pressure;

a flow control valve network disposed between said pressurized fluid source and said pressure control valve means in said fluid circuit for establishing and blocking fluid communication between said pressurized fluid source and said pressure control valve means, said flow control valve network further operating to blocking of fluid flow back to said pressurized fluid source from said pressure control valve when the line pressure supplied to said pressure control valve is lower than said neutral pressure;

a sensor means for monitoring vehicular driving parameter affecting vehicular attitude for producing a sensor signal indicative thereof;

a power supply circuit for supplying an electric power to said fluid pressure source for driving the latter;

a detector means for monitoring state of fluid flow for detecting line pressure to be supplied to said pressure control valve higher than said neutral pressure to produce a detector signal indicative thereof;

a control means responsive to said sensor signal for deriving a suspension control command for controlling said pressure control valve for adjusting pressure in said variable pressure chamber for regulating vehicular height and vehicular attitude, said control unit being powered by the electric power supplied by said power supply circuit, said control means being responsive to initiation of power supply for maintaining said flow control valve network at flow blocking position until the line pressure at said pressure control valve is increased across said neutral pressure and maintaining said suspension control command value at a predetermined value for a predetermined period after placing said flow control valve network at a state permitting fluid flow thereacross.

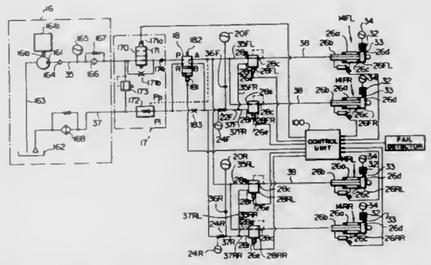
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**5,044,662**

**ACTIVE SUSPENSION SYSTEM WITH ENHANCED SUSPENSION CONTROL CHARACTERISTICS AT ON/OFF TRANSITION OF SUSPENSION CONTROL**

**Kazunobu Kawabata, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan**

**Filed Mar. 30, 1990, Ser. No. 574,686**
**Claims priority, application Japan, Aug. 31, 1989, 1-225576**
**Int. Cl.[5] B60G *17/00***
**U.S. Cl. 280—707** **14 Claims**



1. An active suspension system comprising:

a suspension system disposed between a vehicular body and a road wheel for damping energy for causing relative displacement between the vehicular body and the road wheel, said suspension system including means for defining a variable pressure chamber;

a fluid circuit for circulating pressurized fluid across said variable pressure chamber, said fluid circuit including a pressurized fluid source and a pressure control valve means for adjusting fluid pressure within said variable pressure chamber across a predetermined neutral pressure;

a flow control valve network disposed between said pressurized fluid source and said pressure control valve means in said fluid circuit for establishing and blocking fluid communication between said pressurized fluid source and said pressure control valve means;

a sensor means for monitoring vehicular driving parameter affecting vehicular attitude for producing a sensor signal indicative thereof;

a power supply circuit for supplying an electric power to said fluid pressure source for driving the latter;

a control means responsive to said sensor signal for controlling said pressure control valve for adjusting pressure in said variable pressure chamber for regulating vehicular height and vehicular attitude, said control means powered by the electric power supplied by said power supply circuit, said control means designed to maintain operation for a predetermined first period after shutting down of power supply from said power supply circuit for adjusting the fluid pressure in the vicinity of said neutral pressure and operating said flow control valve network at said blocking position for maintaining the pressure in said variable pressure chamber at the pressure in the vicinity of the neutral pressure, said control means being responsive to initiation of power supply for maintaining said flow control valve network at flow blocking position for a predetermined second period of time so as to increase line pressure to be supplied to said pressure control valve at a limited rate, and said control means being responsive to resumption of power supply within said first period for maintaining said flow control valve network at fluid communication establishing state and setting instantaneous fluid pressure as an initial pressure for starting suspension control.

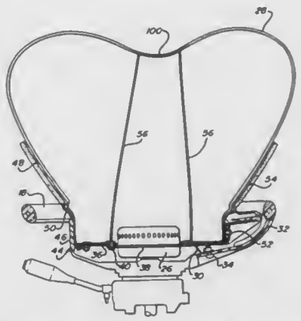
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**5,044,663**

**BLOW MOLDED AIRBAG WITH FABRIC REINFORCEMENTS**

**Robert D. Seizert, Canton, Mich., assignor to Solvay Automotive, Inc., Houston, Tex.**

**Filed Feb. 12, 1990, Ser. No. 479,082**
**Int. Cl.[5] B60R *21/22***
**U.S. Cl. 280—730** **30 Claims**

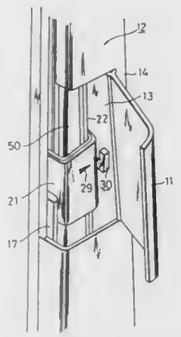


1. A one-piece plastic airbag for use in a motor vehicle occupant restraint system comprising a continuous wall made from a blow molded plastic material and at least one reinforcement insert encapsulated on a preselected area of an exterior surface of said wall, said insert providing supplemental support at said preselected area during inflation of said airbag.

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5,044,664
**PASSIVE SEAT BELT SYSTEM WITH ADJUSTABLE ANCHOR FOR SHOULDER WEBBING**
Shinobu Mogi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 452,264, Dec. 18, 1989, abandoned. This application Sep. 27, 1990, Ser. No. 588,746
Claims priority, application Japan, Dec. 28, 1988, 63-171550
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—804 16 Claims

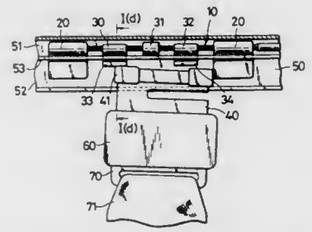


1. A passive seat belt system for a vehicle, comprising:
a guide rail;
a slider carrying an occupant-restraining webbing fastened thereto and arranged movably along the guide rail between a restraining position, at which said webbing restrains an occupant, and a releasing position at which said occupant is free from restraint by said webbing, said restraining and releasing positions being on the side of a rear end portion of said guide rail and on the side of a front end portion of said guide rail, respectively, and said rear end portion of said guide rail extending vertically along a center pillar of said vehicle;
an adjusting device provided on the side of said rear end portion of said guide rail for adjusting said restraining position of said slider;
a trim covering said rear end portion of said guide rail and said adjusting device; and
an openable/closable door formed in said trim at a position corresponding to the position at which said adjusting device is arranged.

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5,044,665
**PASSIVE SEAT BELT SYSTEM**
Yoshito Hashimoto, Yamato 242 , and Kazuo Yamamoto, Sagamihara, both of Japan 228 , assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed May 30, 1990, Ser. No. 530,281
Claims priority, application Japan, May 31, 1989, 1-63576[U]
Int. Cl.[5] B60R *21/00*
U.S. Cl. 280—804 10 Claims

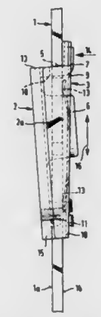
1. A passive seat belt system comprising:
a guide rail longitudinally defining a first channel and a second channel, said first and second channels communicating with each other;
a slider movable along the second channel of the guide rail;
a webbing fastened to the slider and movable between an occupant-restraining position and an occupant-releasing position;
a drive member for driving the slider, said drive member being received in the first channel of the guide rail; and
means provided between the slider and the drive member for preventing the slider from directly contacting an inner wall portion of the second channel, said inner wall portion being on a side closer to the first channel;
wherein the preventing means has at least one collar provided integrally with the drive member;
wherein the collar extends at a free end portion into the second channel; and



wherein the free end portion of the collar is broader than a strait portion, through which the first and second channels communicated with each other, as viewed in a transverse cross-section of the second channel.

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5,044,666
**DEVICE FOR THE INCREMENTAL HEIGHT ADJUSTMENT OF AN ATTACHMENT OR DEFLECTION POINT FOR A SAFETY BELT**
Albert Griesemer, Dorfwiese 3, D-5438 Westerburg-Gershasen, Fed. Rep. of Germany
Filed Oct. 25, 1989, Ser. No. 426,214
Int. Cl.[5] B60R *22/20*
U.S. Cl. 280—808 5 Claims

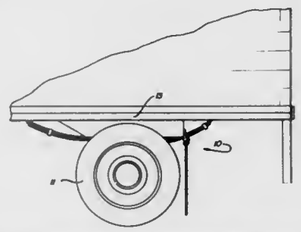


1. A device for the incremental adjustment of a safety belt, comprising;
a guide track with a slot extending along a portion of the guide track length and recesses formed at increments along said track;
an adjustment element slidably disposed on one side of said guide track;
retaining means provided on a side of said adjustment element facing said guide track positioned so as to engage with said recesses when said adjustment element is brought into contact with said guide track, thus locking said adjustment element from sliding along said guide track; and
a separate leaf spring element extending essentially over the length and width of said adjustment element and connected with said adjustment element to form a clamping module on said guide track, positioned so as to hold said adjustment element in contact with said guide track;
wherein said adjustment element comprises at least one protruding portion extending through said slot to secure said adjustment element to said leaf spring element;
and at least one slit is provided on said leaf spring element for engaging said protruding portion.



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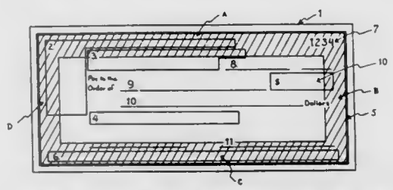
5,044,667
**PULL-AWAY MUD FLAP**
Kenneth G. Manning, 3140 E. M-72, Harrisville, Mich. 48740
Filed Mar. 26, 1990, Ser. No. 498,433
Int. Cl.[5] B62D *25/18*
U.S. Cl. 280—851 8 Claims



1. A mud flap assembly mountable to a vehicle behind a tire thereof comprising:
an "h " shaped mounting bracket having a body portion, a first planar flange having an upper end integral with said body portion, a second planar flange offset from said body portion and said first planar flange, a transverse branch member generally normal to said body portion which integrally connects an upper end of said second planar flange to said body portion and means for connecting said mounting bracket to said vehicle, said first and second planar flanges converging towards each other at the ends opposite said upper ends thereof to form a tapered slot having a bottom opening, said first and second flanges being resiliently displaceable relative to each other; and
a mud flap having a flexible rectangular body and an upper end received in said tapered slot, said flexible rectangular body descending from said mounting bracket through said bottom opening of said tapered slot, said flexible rectangular body having a cross-sectional thickness approximately equal to the width of said bottom opening, said upper end having a cross-sectional thickness substantially greater than the cross-sectional thickness of said flexible rectangular body, said cross-sectional thickness of said upper end selected to be slidably receivable in said tapered slot.

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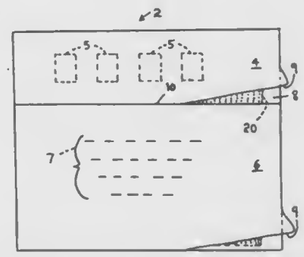
5,044,668
**CHECK CHECKER SYSTEM**
Lyle E. Wright, P.O. Box 127, Lanham, Md. 20703
Filed Aug. 31, 1990, Ser. No. 575,685
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—058 1 Claim



1. A bank check comprising a magnetic strip, said magnetic strip being of methyl methacrylate and azores catalysts, said magnetic strip carrying electronic data to be read by reader means, whereby said data will be transferred to various computer networks to determine approval or rejection of said bank check at time of submission.

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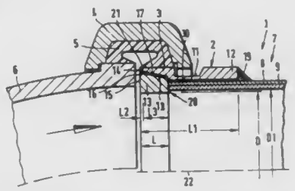
5,044,669
**STAMPABLE ADDRESSABLE SELF ADHESIVE LABEL**
Richard M. Berry, 218 Grange Road, London SE1 3AA, England
Filed Jun. 15, 1989, Ser. No. 366,521
Claims priority, application United Kingdom, Jun. 22, 1988, 8814838
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 9 Claims



1. A stampable addressable self adhesive label comprising a first portion bearing postage payment means, a second portion bearing an address, a third portion bearing postal code indicator means for indicating a postal code, and a backing sheet to which the first, second and third portions are stuck, the first, second and third portions having a pressure sensitive adhesive for enabling the first, second and third portions to be peeled off the backing sheet and stuck on an item of mail, the first, second and third portions being of the same length, the second portion being wider than the third portion, the first, second and third portions being such that they are able to be peeled off the backing sheet separately from one another whereby the first portion can be stuck on the item of mail in a postage payment position, the second portion can be stuck on the item of mail in an address position, and the third portion can be stuck on the item of mail in a postcode position, and the stampable addressable self adhesive label being such that it has top and bottom edges which are 100 mm (4 inches) long and side edges which are 105 mm (4¼ inches) long.

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5,044,670
**PIPE FOR CONVEYING SOLID MATTER**
Alexander Esser, Warstein, Fed. Rep. of Germany, assignor to Esser-Brieden GmbH & Co. KG
Filed Nov. 22, 1989, Ser. No. 440,996
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839582
Int. Cl.[5] F16L *55/18*
U.S. Cl. 285—16 9 Claims



1. In a pipe for conveying solid matter, the pipe having a cylindrical middle portion with two ends, a double-layer welding neck welded to the middle portion at each end of the middle portion, the welding neck being composed of an inner

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layer and an outer layer and an annular coupling flange overlying the end of the cylindrical middle portion, the inner layer of each welding neck being of a material which is more resistant to wear than the material of the outer layer, the inner layer and the outer layer having end faces spaced axially outwardly from the end of the middle portion, the end faces of the inner layer and of the outer layer extending in a common transverse plane, the improvement comprising the outer layer having a substantially greater length than the inner layer, and means for replaceably locking and frictionally clamping the inner layer in the outer layer.

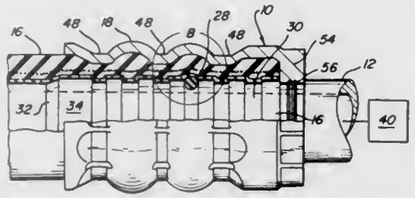
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**5,044,671**

## SWAGED-TYPE FLEXIBLE HOSE COUPLING

**Jerry H. Chisnell, Northville; Myles E. Davis, Milford, and Steven J. Dashevich, Novi, all of Mich., assignors to S & H Fabricating and Engineering Incorporated, Lake Mary, Fla.**

**Filed Jun. 21, 1990, Ser. No. 541,585**
**Int. Cl.[5] F16L *55/00***
**U.S. Cl. 285—55** **14 Claims**



1. An improved hose coupling assembly, particularly adapted for a motor vehicle air conditioning system, comprising:

a flexible hose including an outer layer of rubber-like material, an intermediate layer of reinforcing material and an inner liner of deformable gas impermeable material;

a rigid tubular fitting having an end portion received within one end of said liner;

said end portion including a plurality of axially spaced annular ribs having an outer diameter substantially equal to the inner diameter of said liner, said ribs including a pair of sealing ribs;

an annular sealing groove disposed between said sealing ribs and having a base wall;

said sealing ribs including opposing sidewalls defining the width of said sealing groove;

an annular resilient sealing member fitted within said sealing groove and engaging the inner surface of said liner in compression;

a sleeve member surrounding the outer surface of said hose, said sleeve member being radially inwardly deformed at a plurality of axially spaced substantially annular locations to provide radially inwardly directed annular locking ribs which exert a clamping force on said hose to thereby secure said hose on said fitting;

said sleeve locking ribs being disposed axially outwardly of said pair of sealing ribs;

said resilient sealing member being centrally axially located between an adjacent pair of said sleeve locking ribs;

said pair of sealing ribs providing means for dissipating said clamping force whereby the compression of said resilient seal member will be substantially unaffected;

said plurality of ribs further including at least a first pair of tubular fitting locking ribs, each being disposed on opposite sides of said sealing groove and axially spaced from a respective sealing rib to provide a locking groove for locking said liner in place axially relative to said tubular fitting over an operating temperature range of up to at least about 300° F. and for sealing said liner relative to said tubular fitting over said operating temperature range to thereby preclude the passage of fluids and gases from said coupling;

each said sleeve locking rib being generally located radially opposite a respective locking groove whereby the maximum clamping force is applied directly upon said liner at the locking grooves and a minimum clamping force is directed upon said resilient sealing member; and

the ratio of the thickness of said liner to the depth of each said tubular fitting locking groove ranging from about 2:1 to about 6:1.

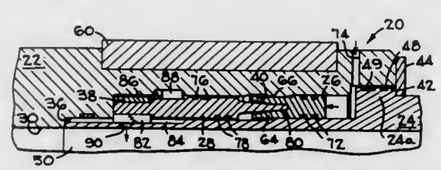
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**5,044,672**

## METAL-TO-METAL SEALING PIPE SWIVEL JOINT

**Harold B. Skeels, Kingwood, Tex.; Christopher E. Cunningham, Edinburgh, Scotland; Edmund M. Mouret, Houston, Tex.; Donald M. Underwood, Singapore, Singapore, and Michael J. Krenek, Spring, Tex., assignors to FMC Corporation, Chicago, Ill.**

**Filed Mar. 22, 1990, Ser. No. 497,474**
**Int. Cl.[5] F16L *17/035***
**U.S. Cl. 285—98** **29 Claims**



1. A metal-to-metal sealing pipe swivel joint comprising:

a) an outer joint element with an inner annular metallic sealing surface;

b) an inner tubular joint element with an outer annular metallic sealing surface, said inner element extending at least partially within said outer element;

c) means securing together said inner and outer elements in a relatively rotatable but non-axially separable manner;

d) an annular seal element disposed between said inner and outer joint elements, said seal element having inner and outer annular metallic sealing surfaces moveable axially between a first position wherein said seal element sealing surfaces are not in contact with said inner and outer joint elements, and a second position wherein said seal element sealing surfaces bear against said inner and outer joint element sealing surfaces to establish a metal-to-metal fluid pressure seal therebetween; and

e) means to axially move said inner and outer seal element sealing surfaces between said first and second positions.

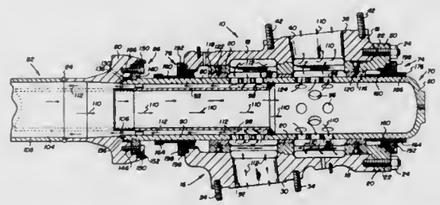
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**5,044,673**

## ROTARY CONNECTOR

**William B. Jones, Jr., Whittier, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jan. 16, 1990, Ser. No. 465,443**
**Int. Cl.[5] F16L *39/04***
**U.S. Cl. 285—134** **23 Claims**



1. A rotary connector for selectively coupling a rotating pipe to first and second stationary pipes comprising:



a housing including an outer case having an inlet port for interconnection to the first stationary pipe and an outlet port for interconnection to the second stationary pipe, said housing further including an inner case interconnected to said outer case and selectively removable from said outer case;

a rotary stem disposed within said housing inner case and coaxially aligned with the rotating pipe for providing a first fluid communication path between the rotating pipe and the first stationary pipe, and a separate second fluid communication path between the rotating pipe and the second stationary pipe, and said rotary stem being selectively removable from said outer case by removing the inner case from said outer case without removal of said housing from the stationary pipes; and

housing seal means interconnected to said rotary stem and disposed between said rotary stem and said housing inner case for sealing said rotary stem within said housing, and said housing seal means being selectively removable from said outer case with said rotary stem.

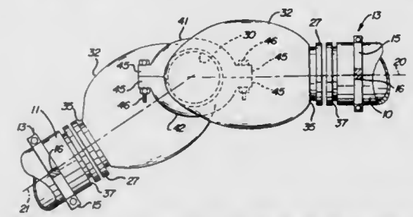
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**5,044,674**

## ANGULARLY ADJUSTABLE PIPE CONNECTOR

**Thomas R. Hendrickson, Montezuma, Mich., assignor to Quikcoup, Inc., Pontiac, Mich.**

**Filed Aug. 3, 1990, Ser. No. 563,315**
**Int. Cl.[5] F16L *27/00***
**U.S. Cl. 285—168** **1 Claim**



1. A connector for connecting together adjacent ends of a pair of conventional, circular in cross-section, pipes which have axes that are arranged substantially in the same plane but are angled relative to each other within that plane, comprising:

a pair of substantially identical tubular shaped, connector sections, each having an inner end with a circular opening for arrangement in said plane and an outer end with a circular opening for arrangement perpendicularly to said plane, and each of said connector sections, between their opposite circular ends, being curved and being flattened towards plane containing the pipe radii into a generally elliptically, bulged cross-sectional shape whose major axes are arranged roughly parallel to, but offset from the plane containing the pipe axes, whereby the overall radial distance from the pipe axes to the exterior of the respective connector elliptical sections is only slightly more than the radii of each pipe and the cross-sectional area of each connector section is about the same, along the length of that section, as the cross-sectional areas of each of its openings:

each of said outer end openings being adapted for axial alignment with and overlapping relationship with the opening of the adjacent end of one of the pipes;

the two inner ends openings normally overlapping each other and being coaxially aligned relative to each other, for being located approximately in the plane containing the pipe axes;

a mechanical, releasable, coupling means including a seal means shaped for encircling and securing each of the outer ends of the connector sections and their respective adjacent pipe ends for coupling and sealing the adjacent ends together;

a mechanical, releasable coupling means including a seal means encircling and securing and sealing the two connector section inner ends together;

said coupling means being manually releasable for removing and applying the connector to adjacent pipe ends and for adjusting the angularity of the two connector sections relative to each other for corresponding to the relative angles of their respective pipe ends, said coupling means comprising a conventional, circular pipe coupling formed of arcuate coupling sections that are fastened together and with the coupling formed for surrounding and clamping together the adjacent end portions of the pipe ends and their respective connector section outer ends and the adjacent connector section inner ends, and annular grooves formed in each of the outer surface portions of each of the pipe ends and coupling section ends, and said pipe couplings each being U-shaped in cross-section so that the free ends of the legs defining the U-shaped cross-sections, extends radially inwardly into said grooves for positively fastening the connector sections to their respective pipe end portions and the connector sections to each other.

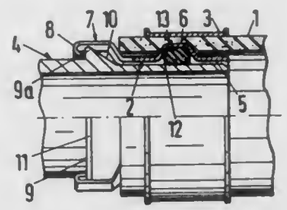
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**5,044,675**

## HOSE COUPLING

**Heinz Sauer, Ronneburg, Fed. Rep. of Germany, assignor to Rasmussen GmbH, Maintal, Fed. Rep. of Germany**

**Filed May 1, 1989, Ser. No. 345,636**
**Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815169**
**The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.**
**Int. Cl.[5] F16L *33/20***
**U.S. Cl. 285—256** **12 Claims**



1. A coupling for establishing a separable fluidtight connection between an end portion of a first tubular component wherein the end portion has an external retainer and an end portion of a second tubular component, particularly between a nipple of a first component in the form of a pipe and an end portion of a flexible elastic hose, comprising a sleeve-like tubular first section insertable into the end portion of the second component and a second section including at least one substantially prong-like flexible coupling element engageable with the external retainer of the end portion of the first component, said first section having an internal surface and an annular corrugation defining a groove extending from said internal surface radially outwardly of said first section; an annular sealing element received in said groove and engaging the exterior of the end portion of the first component upon insertion of the end portion of the first component into said first section; and a clamping member having means for biasing the end portion of the second component against the exterior of said first section.

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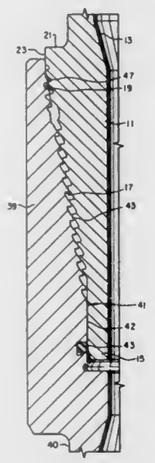


5,044,676

## TUBULAR THREADED CONNECTOR JOINT WITH SEPARATE INTERFERING LOCKING PROFILE

Kevin Burton, and David S. Christie, both of Aberdeen, Scotland, assignors to Abbvetco Gray Inc., Houston, Tex.

Filed Jan. 5, 1990, Ser. No. 461,384
Int. Cl.[5] F16L *25/00*
U.S. Cl. 285—334 4 Claims



1. A connection joint for connecting two tubular members together, comprising in combination:

a pin having a longitudinal axis, the pin being joined to one of the tubular members, the pin having a frusto-conical section containing a set of pin threads, and a locking section spaced axially from the pin threads;

a box having a longitudinal axis, the box being joined to the other of the tubular members, the box having a bore with a frusto-conical section containing a set of box threads for mating with the pin threads, and having a locking section spaced axially from the box threads;

the locking section of the box having at least one circumferential profile which is parallel to a plane perpendicular to the longitudinal axis of the box, the box having a box crest which has a lower termination and which joints on the lower termination of a frusto-conical box shoulder which diverges in a downward direction;

the locking section of the pin having at least one mating circumferential profile which is parallel to a plane perpendicular to the longitudinal axis of the pin and which has a pin crest that has an upper termination and which joins on the upper termination a frusto-conical pin shoulder which diverges in an upward direction at the same taper as the box shoulder;

the box crest having a smaller diametrical dimension than the pin crest so as to cause an interference between the box crest and pin rest as the pin stabs into and is rotated in the box, said diametrical dimensions being selected to cause the box to elastically expand and to cause an increase in make-up torque required to make-up the pin and box threads; and

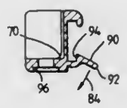
the circumferential profiles of the pin and box being positioned so that the pin and box crests will slide past each other and the pin shoulder will locate below the box crest in contact with the box shoulder as the pin and box threads reach full make-up, the taper of the pin and box shoulders requiring more break-out torque than the make-up torque.

5,044,677

## BAR GUIDEWAY FOR THE FLAT STRIP BARS OF A BAR CLOSURE

Dieter Ramsauer, Am Neuhauskoten 20, D-5620 Velbert 11, Fed. Rep. of Germany

PCT No. PCT/DE87/00412, § 371 Date May 25, 1988, § 102(e) Date May 25, 1988
PCT Filed Sep. 12, 1987, Ser. No. 214,732
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 86113170
Int. Cl.[5] E05L *1/06*
U.S. Cl. 292—39 19 Claims



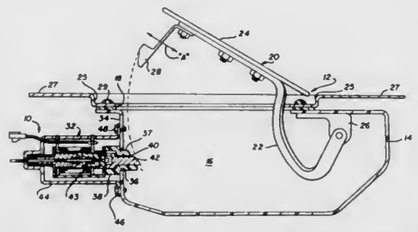
1. A bar guideway for a flat strip bar of a bar closure, which is provided for installation in a fillet gap of a cabinet door, comprising of a pair of legs extending away from a corner area so that said legs and said corner area together have an L-shaped cross-section, one of said legs having a fastening hole, the other of said legs having a free end from which extends one projecting hook rail with a hook-shaped profile, another projecting hook rail with a hook-shaped profile extending from said corner area, both of said hook rails cooperating with each other to form a guide track for guiding the flat strip bar therebetween, both of said hook rails extending outward from said other leg and corner area, respectively, in a direction which is opposite to a direction in which extends said leg with said fastening hole away from said corner area.

5,044,678

## SOLENOID OPERATED LATCH DEVICE WITH MOVABLE POLE PIECE

Charles A. Detweiler, Durand, Mich., assignor to Lectron Products, Inc., Rochester Hills, Mich.

Filed Jul. 25, 1990, Ser. No. 558,072
Int. Cl.[5] E05C *1/12*
U.S. Cl. 292—144 32 Claims



1. A remotely actuated solenoid latch apparatus adapted to be mounted to a motor vehicle structure and engagable with a striker bar, comprising:

a pole piece;

an armature movable between a first position displaced from said pole piece so as to define a working air gap therebetween to a second position attracted toward said pole piece;

a solenoid winding encircling said pole piece and said armature for attracting said armature to said second position through energization of said winding;

latch means associated with said movable armature for lockingly engaging the striker bar when said armature is in one of said first and second positions and releasably disengaging the striker bar when said armature is in the other position;

alignment compensating means associated with said latch means and adapted to mole upon engagement with the striker bar for aligning said latch means relative to the striker bar to enable said latch means to thereafter lockingly engage the striker bar in a latched position; and

biasing means for urging said armature to said first position such that said latch means is urged into a predetermined orientation relative to said alignment compensating means.

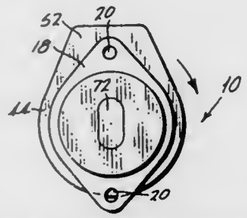


5,044,679

## LATCH CONSTRUCTION

Michael Barnes, Newtown, and Joseph Koskelowsky, Danbury, both of Conn., assignors to Norco, Inc., Ridgefield, Conn.

Filed Feb. 26, 1990, Ser. No. 484,799
Int. Cl.[5] E05C *3/10*
U.S. Cl. 292—207 13 Claims



1. A releasable latch construction for holding in place panels and the like, comprising in combination:

a) a body member having means for attaching it to a panel,

b) a latching member and means turnably mounting the same on the body member for arcuate movement between a latching position and a releasing position,

c) locking means movably carried by the body member, operable to lock the latching member in either its latching position or else in its releasing position,

d) actuator means movably carried in the body member and engageable with said locking means to actuate the latter for effecting the locking or release of said latching member, and

e) keying means connected with said latching member, said keying means being directly engageable by a latch key to enable the latter to apply turning forces to the latching member and said actuator means being directly engageable by said latch key and being shiftable thereby to effect unlocking of the latching member,

f) said latching member comprising a ring which encircles the body member,

g) said body member having a slot, and

h) said latching member having a cross pin passing through the slot of the body member.

5,044,680

## DOOR HOLDER POWER SUPPLY ACCESS MEMBER

William Baker; Raymond G. Benson, Jr., and Robert C. Gudgel, all of Indianapolis, Ind., assignors to Motus Incorporated, Indianapolis, Ind.

Continuation-in-part of Ser. No. 416,929, Oct. 4, 1989. This application Sep. 5, 1990, Ser. No. 577,525
Int. Cl.[5] E05C *17/08*
U.S. Cl. 292—278 5 Claims

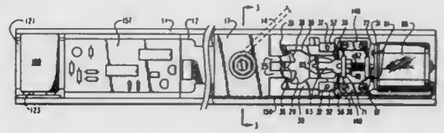
1. A releasable door hold open device, comprising:

a latching means for latching a door in an open position,

a power supply receiving means capable of receiving power,

an access member to the power supply receiving means, and

unlatch means operatively connected to said access member to unlatch said latching means, before the power is disconnected from the power supply receiving means, when the access member is moved in such a manner so as to permit



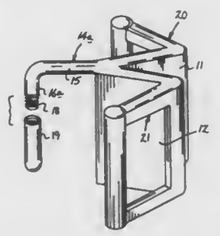
disconnection of power to the power supply receiving means.

5,044,681

## DOOR STOP

Carey W. Neighbors, 1402 15th Pl., Alexander City, Ala. 35010

Filed Feb. 19, 1991, Ser. No. 657,403
Int. Cl.[5] E05C *19/18*
U.S. Cl. 292—288 5 Claims



1. A door stop comprising, in combination,

a first plate mounted to a second plate arranged coextensively therewith defining an acute angle therebetween, wherein the first and second plates are joined together along a common joinder line, and the first plate includes a first plate top surface and a second plate defines a second plate top surface, wherein the first plate top surface and the second plate top surface are coplanar relative to one another, and

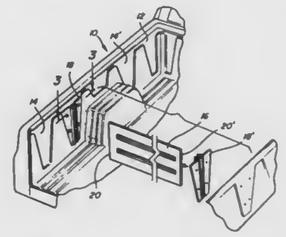
an "L" shaped support leg is fixedly mounted relative to the first plate and second plate at a junction defined by the joinder line and the first plate top surface and the second plate top surface.

5,044,682

## PICKUP TRUCK BED LINER DIVIDER INSERT

Mark Wayne, 29436 Briarbank Ct., Southfield, Mich. 48034

Filed Nov. 23, 1990, Ser. No. 617,496
Int. Cl.[5] B62D *33/00*
U.S. Cl. 296—39.2 20 Claims



1. A bed liner divider system for interfitting with tapered slots defined in the bed liner of a pick-up truck and the like, said system comprising:

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a removable divider portion;
at least one insert slottingly fittable within at least one of said slots;
said at least one insert having a base portion and a divider receiving portion;
said base portion having at least two opposing sides:
said two opposing sides defining a taper;
said divider receiving portion comprising a channel.

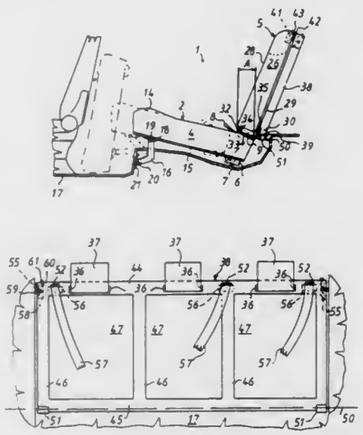
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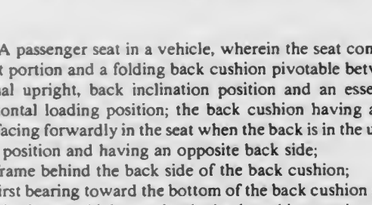
**5,044,683**

## PASSENGER SEAT ARRANGEMENT IN VEHICLES HAVING A RELEASABLE BACK-CUSHION SUPPORT FRAME

**Owe Pärsson, Liljevägen 2, S-461 44 Trollhättan, Sweden**

**Filed Dec. 12, 1990, Ser. No. 626,473**
**Claims priority, application Sweden, Dec. 12, 1989, 8904183**
**Int. Cl.[5] B60N** *2/36*
**U.S. Cl. 296—65.1** **21 Claims**





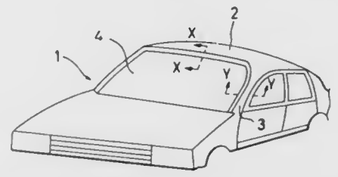
1. A passenger seat in a vehicle, wherein the seat comprises a seat portion and a folding back cushion pivotable between a normal upright, back inclination position and an essentially horizontal loading position; the back cushion having a front side facing forwardly in the seat when the back is in the upright back position and having an opposite back side;
a frame behind the back side of the back cushion;
a first bearing toward the bottom of the back cushion and on the frame which permits the back cushion to pivot selectively with and with respect to the frame between the upright back inclination position and the essentially horizontal loading position;
a second bearing on the frame and connected to the body of the vehicle, and the frame being pivotable at the second bearing between a generally upright inclination position corresponding to the normal back inclination position of the back cushion and an essentially horizontal loading position, means for locking the back cushion to the frame; the first bearing for the back cushion on the frame enabling the back cushion to be pivoted independently of the frame, and also to be pivoted along with the frame when the back cushion is locked to the frame, between the back inclination position and the horizontal loading position, the second bearing for the frame on the vehicle body enabling the frame to be pivoted from the upright inclination position into the loading position.

**5,044,684**

## MOLDING FOR WINDSHIELD OF AUTOMOBILE

**Yukihiko Yada, Nagoya, Japan, assignor to Tokai Kogyo Kabushiki Kaisah, Oobu, Japan**

**Filed Nov. 20, 1990, Ser. No. 615,853**
**Claims priority, application Japan, Nov. 22, 1989, 1-134912[U]**
**Int. Cl.[5] B60R** *13/06*
**U.S. Cl. 296—93** **3 Claims**



1. A belt-like molding for a windshield to be fitted into the gaps defined between the peripheral portions of the windshield of an automobile and a window frame of a car body panel, characterized in that:
said molding comprises a molding main body and an auxiliary plate, said molding main body consists of a leg portion to be fitted into said gap and a decorative portion for covering and decorating said gap, and said auxiliary plate consists of an upper portion auxiliary plate, side portion auxiliary plates and corner portion auxiliary plates, and is fitted integrally to the inner peripheral side of said decorative portion of said molding main body; and
the thickness of each of said side portion auxiliary plates fitted to both sides of the windshield is greater than the thickness of said upper portion auxiliary plate to be fitted to the upper portion of the windshield, the inner peripheral surface of said side portion auxiliary plate is recessed and said side portion auxiliary plate functions as a rain water groove.

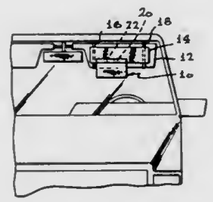
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**5,044,685**

## SUN VISOR SYSTEM

**Pai-Sung Yang, 2716 7th Street, Santa Monica, Calif. 90405**

**Continuation-in-part of Ser. No. 466,862, Jan. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 423,059, Oct. 18, 1989, abandoned. This application Sep. 18, 1990, Ser. No. 584,252**
**Int. Cl.[5] B60J** *3/02, 3/00*
**U.S. Cl. 296—97.6** **12 Claims**



1. For use in a motor vehicle, a sun visor system comprising:
(a) a flat plate attached to a main sun visor of the vehicle;
(b) at least one bendable one-piece plate attached to a dashboard of the vehicle;
(c) at least a first one hook-and-loop fastener secured to an upper surface of the vehicle;
(d) an attachable shield having a geometrical shape, wherein said shield is attachable to any one of said main sun visor of the vehicle, said dashboard of the vehicle, and said upper surface of the vehicle; and



(e) shield attaching means for attaching said shield to any one of said main sun visor of the vehicle, said bendable plate on said dashboard of the vehicle, and said fastener on said upper surface of the vehicle.

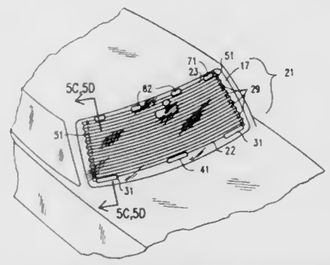
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**5,044,686**

## RETRACTABLE HORIZONTAL CONVEYANCE SHADE APPARATUS

**Donald F. Acenbrack, 1926 Sever Dr., Clearwater, Fla. 34624**

**Filed Jun. 19, 1989, Ser. No. 367,746**
**Int. Cl.[5] B60J** *3/00*
**U.S. Cl. 296—97.7** **8 Claims**



1. A sun shade apparatus for shading a forward enclosed area of a conveyance, such as an automobile, boat, pickup truck, airplane, or travel van, from light entering through a front windshield of such conveyance, the apparatus comprising:
a sun shade, comprising a substantially opaque pleated sheet, said pleated sheet further comprising pleats of uniform width and oriented transversely with respect to a longitudinal axis of said conveyance, and further permitting said sheet to be selectively folded into a compact bundle of pleats of said sheet and to be unfolded to substantially block light coming through said windshield;
said sheet further comprising a bottom pleat and a top pleat, each of which are of adequate extra rigidity to provide stability to a shape of the overall sheet when either folded into said compact bundle or unfolded to block the light coming through said windshield;
a storage and mounting means, said storage and mounting means comprising two side mounting brackets and one center mounting bracket, said side mounting brackets being located and fixed upon a point near an interior bottom of said windshield near either side of said windshield and said center bracket being located and fixed upon a point near the interior bottom of said windshield at a center of said windshield;
each said side bracket comprising a front side, a plane of which is substantially parallel with a plane of said windshield and which is fastened to and separated from said windshield by an adhesive mounting member, and a bottom side, each said bottom side further comprising a front edge which is attached to a bottom edge of said front side, and a resting surface, said resting surface extending out from said front side in a plane substantially perpendicular to the force of gravity a distance sufficient to permit said compact bundle of pleats to rest thereon;
said center bracket further comprising a front side, a plane of which is substantially parallel to the plane of said windshield and which is fastened to and separated from said windshield by an adhesive mounting member, and a bottom side, said bottom side further comprising a front edge which is attached to a bottom edge of said center bracket front side, and a resting surface, said resting surface extending out from said center bracket front side in a plane substantially perpendicular to the force of gravity a distance sufficient to permit said compact bundle of pleats to rest thereon, and a rear side, said rear side having a bottom edge attached to a rear edge of said center bracket resting surface and extending a short distance up from said center bracket resting surface;
each said side bracket including a slotted path, said slotted path running diagonally from an upper point on each said side bracket front side away from the center of said windshield through each said side bracket front side bottom edge to a lower point on each said side bracket bottom side;
two bottom pleat anchoring means each comprising a joining member attached to said bottom pleat and adapted to freely pass through each respective side bracket slotted path, each said joining member further including an anchoring member which is adapted to slide along an exterior surface of each said slotted path but not pass through said slotted path; and
fastening means comprising at least one means for releasably securing said top pleat along a top of said windshield.

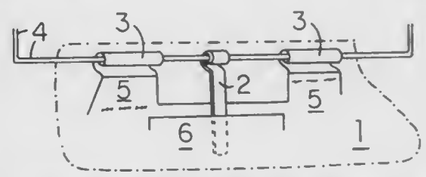
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**5,044,687**

## SLIDABLE SUN VISORS FOR AUTOMOBILES

**Ibrahim K. Abu-Shumays, and Mary D. Abu-Shumays, both of 1248 Varner Rd., Pittsburgh, Pa. 15227**

**Continuation-in-part of Ser. No. 387,784, Aug. 1, 1989, Pat. No. 4,919,468, which is a continuation-in-part of Ser. No. 158,846, Apr. 2, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 451,938**
**Int. Cl.[5] B60J** *3/02*
**U.S. Cl. 296—97.11** **4 Claims**



1. A sun visor for use to cover a corner and top part of a window of an automobile;
said sun visor has a cylindrical part which surrounds and can rotate freely around, and can slide back and forth freely along a rod axle fixed in a horizontal position near an interior top part of a side window;
a plate sits loose inside and is sandwiched between two boards in the interior of said sun visor; said plate can rotate together with said sun visor around, but does not slide along said rod axle; the plate has at its end a cylindrical clamp which sits in a fixed horizontal position along said rod axle; said cylindrical clamp surrounds said rod axle, and is tight enough but still not too tight in order to enable rotation of the plate around said rod axle by exerting a slight tension on said sun visor; the sun visor and the plate rotate jointly through a range of angles around said rod axle; the clamp of said plate makes it possible to hold the visor in place following partial rotations.

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**5,044,688**

## METHOD AND APPARATUS FOR VEHICLE BODY RESURFACING

**Roger J. Jacobson, Fleming Rte., Box 53, Aitkin County, Minn. 56431**

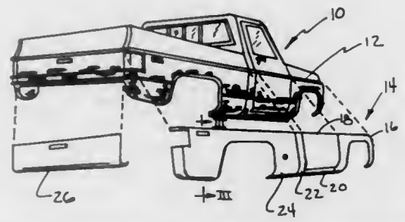
**Filed Aug. 21, 1989, Ser. No. 396,221**
**Int. Cl.[5] B60J** *11/00*
**U.S. Cl. 296—136** **20 Claims**

1. A motor vehicle body resurfacing panel, comprising
(a) a preformed structurally reinforced and substantially rigid plastic resin panel having
(1) a backside surface compliantly fittable directly upon

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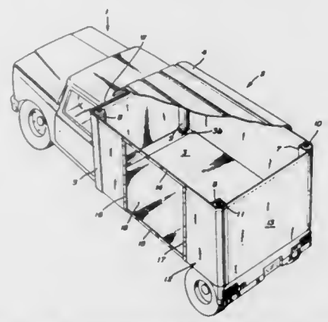
and in contact with a rigid original body panel of a motor vehicle;
(2) an upper edge conformal to an original longitudinal line in the original panel;
(3) a lower edge generally conformal to and below an original bottom edge of the original panel;
(4) upright edges generally conformal to original upright edges of the original panel, and
(5) an outer cosmetic quality surface presenting a new exterior vehicle body surface to go over and outside of the original panel;




(b) edge bonding means on said backside surface and immediately adjacent said upper and upright edges for adhesive securement of said upper and upright edges to the original panel;
(c) central bonding means on said backside surface and spaced downward from said upper edge and upward of said lower edge for adhesive securement of said backside surface to the original panel; and
(d) structural means for holding said lower edge in position adjacent to and enclosing the bottom edge, without bonding thereof.

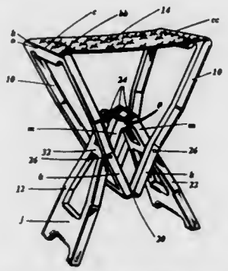
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**5,044,689**
**TRUCK VAN CLOSURE HAVING IMPROVED ACCESS MEANS**
**Ande Evers, 1600 Huntingdon Trail Dr., Atlanta, Ga. 30350**
**Filed Feb. 12, 1991, Ser. No. 654,241**
**Int. Cl.[5] B60J** *5/06*
**U.S. Cl. 296—183** **16 Claims**



1. A truck van comprising a quadrilateral floor bed, a plurality of rollers mounted respectively at the corners of said floor bed and having vertically disposed axes, an endless web disposed about said rollers and in snug close contact therewith, an access aperture formed in said web, and means for imparting bodily movement to said web about said rollers so as selectively to locate said access aperture at the front, rear or at either side of said truck van.

**5,044,690**
**FOLDING STOOL**
**Ralph H. Torrey, 3500 Dry Creek Rd., Marietta, Ga. 30062**
**Filed Mar. 14, 1990, Ser. No. 493,404**
**Int. Cl.[5] A47C** *4/00;* **A47D** *1/02*
**U.S. Cl. 297—16** **9 Claims**

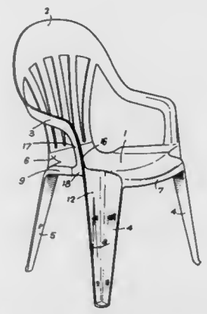


1. A folding stool comprising in combination a pair of hinged leg supports connected to a pair of hinged seat supports by means of a pair of pivots in such a manner that when folded said leg supports fold up into and fit within said seat supports thus making a compact unit easily carried and stored;
said seat supports are connected by a first hinging means permitting opening of said seat supports to 180°;
said pivots connect said seat supports to said leg supports at points which are intermediate of the respective extremities of said seat and leg supports seat and leg whereby said supports are held in controlled and firm adjustment relative to each other at all stages of folding and unfolding, and whereby said seat supports and said leg supports cross each other at said points of said pivots in substantially X form when said stool is in an open in-use state thus providing firm and sturdy support for an adult user;
said leg supports are connected by a second hinging means comprised of a plurality of flexible strips forming a flexible double acting hinge which permits rotating of said leg supports out of folded state about said pivots over the 180° horizontal allowing said leg supports to extend downward into a position suitable for supporting an adult user;
said pair of leg supports consists of a connected portion;
said pair of leg supports consisting of a protrusion or nose common to both leg supports;
said protrusion or nose constructed to force the connected portion of the leg supports apart when the stool is opened and in position for use;
at least two of the plurality of flexible strips having one end each, attached to a first of the pair of leg supports, and the reverse side of each opposite end attached to the second of the pair of leg supports; at least one of the plurality of flexible strips having one side of one end attached to the second of the pair of leg supports and the opposite end attached to the first of the leg supports;
said pivots connecting said seat supports to said leg supports are disposed at a predetermined distance from said second hinging means said distance calculated to provide a predetermined elevation of said seat at a height comfortable for an adult user, while at the same time providing structural sturdiness of the assembly and compactness of the folded package;
said folding stool has a foldable or flexible seat stretchable across and attachable to top or upper extremity of said seat supports in a manner such that said seat prevents further opening of said folding stool and in combination with said support members will support an adult user;
said foldable or flexible seat and said supporting members are so disposed and so connected and function together in combination in such a manner that said stool in its folded state presents a very compact package of predetermined dimensions and whereby said stool in its open in-use state permits user to sit at a predetermined comfortable height, the dimension describing said height being substantially greater than the dimension describing the extremities of said folded package;
said foldable seat is attached to said seat supports by means permitting convenient and ready conversion of said stool from a folded state to a use state suitable for supporting an adult user;
said folding seat is readily removable and inexpensively replaceable;
said double acting hinge connecting said leg supports is in close proximity to and uppermost relative to said hinging means connecting said seat supports when stool is in its folded state and wherein said double acting hinge moves upward and away from said hinging means connecting said seat supports during unfolding action in which said double acting hinge passes through a line joining and thus describing the location of said pivots, permitting said leg supports to extend downward into a position suitable for supporting an adult user;
said leg supports have incorporated at the point of their hinging means to force leg supports into a more vertical stance when stool is in use, thus adding substantially to the weight supporting capacity of said stool;
the configuration of said support members is such as to provide cutout convenient for grasping of folded stool by the hand for carrying purposes.



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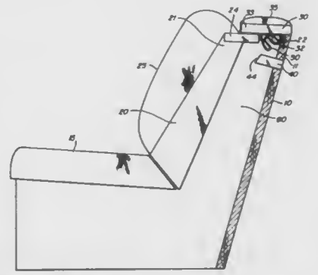
**5,044,691**
**MONOLITHIC ARMCHAIR MADE OF INJECTED PLASTIC MATERIAL, STACKABLE WITH SMALL PITCH**
**Jean-Paul Guichon, Saint Lupicin, France, assignor to Grosfillex S.A.R.L., Arbent, France**
**Filed Feb. 26, 1990, Ser. No. 485,141**
**Claims priority, application European Pat. Off., Mar. 1, 1989, 8900563.6**
**Int. Cl.[5] A97L** *3/00*
**U.S. Cl. 297—239** **15 Claims**



1. A plastic injection molded monolithic chair having a front, sides and a rear, said chair comprising:
a seat joined to a backrest by a rounded joining part, said seat having a plurality of ribs comprising at least one front rib substantially parallel to a front edge, at least two lateral ribs substantially parallel to two lateral edges, at least one rear rib substantially parallel to the rounded joining part, and at least two diagonal ribs;
two front legs having substantially vertical faces, said two front legs being shaped as angles open on the sides and forwardly and comprising transverse flanges and antero-posterior flanges, said transverse flanges extending substantially in line with one another to the sides of said chair and said antero-posterior flanges being connected together by said front edge and said front rib; and
two rear legs having substantially vertical faces, said two rear legs being shaped as angles open on the sides and rearwardly and comprising transverse flanges and antero-posterior flanges, said transverse flanges extending substantially in line with one another to the sides of said chair and said antero-posterior flanges being connected together by said rounded joining part and said rear rib, said antero-posterior flanges of said rear legs extending approximately in parallel relation with the antero-posterior flanges of said front legs and said transverse flanges of the front and rear legs being connected together by said lateral edges and said lateral ribs;
the substantially vertical faces of the legs being inclined for the stackage of a plurality of chairs along a vertical axis, and said faces having a line of greatest slope which forms with a vertical line a stacking angle of between 8 degrees and 15 degrees.

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**5,044,692**
**PIVOTING TOP RAIL HEADREST**
**Charles J. Tidwell, Jr., and Donald R. Shutiok, both of Tupelo, Miss., assignors to Super Sagless Corporation, Tupelo, Miss.**
**Filed May 15, 1990, Ser. No. 523,399**
**Int. Cl.[5] A47C** *1/02*
**U.S. Cl. 297—391** **10 Claims**



1. An incliner comprising:
a stationary frame including a fixed back,
a body support including a seat and a backrest movable between upright and reclining positions and disposed within the stationary frame, said backrest being positioned in front of and spaced from the fixed back with the top of the backrest being adjacent the top of the fixed back when the body support is in the upright position and below the top of the fixed back when the body support is in the reclining position,
a top rail, having a front end and a rear end, wherein the rear end is hinged to the top of the fixed back so that the top rail is oriented in a first position extending over and resting on the top of the backrest and spanning the space between them when the body support is in the upright position and oriented in a second position hanging downwardly from the fixed back and disposed above the top of the backrest when the body support is in the reclining position so as to serve as a headrest, with the front end of said top rail disposed above and closest to the top of the backrest.

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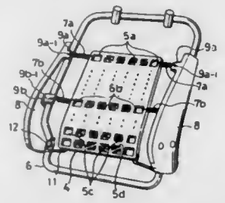
**5,044,693**
**SEAT BACK STRUCTURE OF AN AUTOMOTIVE SEAT**
**Masaaki Yokota, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan**
**Filed Oct. 31, 1989, Ser. No. 429,422**
**Int. Cl.[5] A47C** *7/02*
**U.S. Cl. 297—452** **1 Claim**

1. A seat back structure of an automotive seat, comprising:
a seat back frame having a space therein defined by its frame sections;

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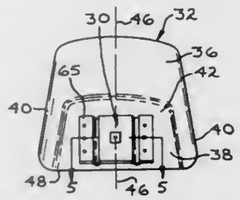
a back support plate disposed within said space of said seat back frame;
a torsion bar for elastically supporting a lower end area of said back support plate;
plural pairs of tension springs which are so arranged between said seat back frame and back support plate that each pair of springs are extended in respective pair of spaces laterally between one lateral frame section of said seat back frame and one lateral edge of said seat support plate and between the other lateral frame section of said seat back frame and the other lateral edge of said seat support plate, wherein all those pairs of tension springs are



disposed above said torsion bar, and adapted for elastically supporting an upper area of said back support frame;
said torsion bar being at its both ends secured rotatably on the respective said lateral plate sections of said seat back plate, and so elastically bent as to give such cambered configure that its central part is projected forwardly relative to secured points where said torsion bar is secured on said lateral plate sections of said seat back plate, whereby back support force of said torsion bar is greater than that of said tension springs; and
wherein to said forwardly curved central part of said torsion bar, is fixed to said back support plate.

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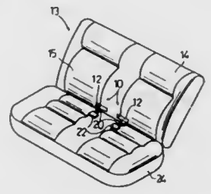
**5,044,694**
**SEAT PAN AND SPRING PLATE ASSEMBLY**
**Chi H. Koa, Jackson, Mich., assignor to Michigan Seat Company, Jackson, Mich.**
**Filed Jan. 9, 1991, Ser. No. 639,018**
**Int. Cl.[5] A47C 7/00**
**U.S. Cl. 297—452** **9 Claims**



1. A seat pan for supporting a cushion comprising, in combination, a pan having a bottom and a back, said pan bottom having a general plane, a front edge, an inside surface and an exterior surface, a pair of spaced, elongated arcuate embossments defined in said pan bottom transversly disposed to said front edge, said embossments extending from said general plane from said exterior surface, a mounting spring plate engaging said pan bottom inside surface, said mounting spring plate including a pair of spaced arcuate ridges of a configuration complementary to the configuration of said arcuate embossments, said plate arcuate ridges being closely received within said pan arcuate embossments, spring mounting plate fastening means connecting said plate to said pan bottom, and aligned mounting spring fastening means defined in said pan bottom and mounting plate intermediate said pairs of arcuate embossments and arcuate ridges, said pan bottom exterior surface intermediate said arcuate embossments defining a mounting spring engaging surface.

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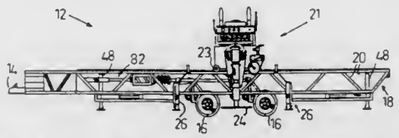
**5,044,695**
**SEAT BELT STORAGE STRUCTURE IN A HINGED SEAT**
**Fumiaki Tsuchiya, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan**
**Filed Jul. 12, 1989, Ser. No. 378,935**
**Int. Cl.[5] B60R 22/00**
**U.S. Cl. 297—481** **2 Claims**



1. A seat belt storage structure in a hinged seat, in which said hinged seat includes a seat cushion hinged at a first hinge point and a seat back hinged at a second hinged point, such that said seat cushion and seat back are respectively rotatable about said first and second hinge points in a forward direction, and in which a recessed hole is formed in said seat back, said recessed hole being so adapted that an end of a seat belt is removably stored therein, said seat belt storage structure comprising:
an inner cloth cell made of a cloth which is inserted and attached in said recessed hole of said seat back,
wherein said seat back comprises a covering member and an elastic foam padding such that said foam padding is covered with said covering member,
wherein said inner cloth cell is jointed by sewing to said covering member,
whereby a seat belt storage is defined in the said seat back to permit storage of said seat belt in said recessed hole,
wherein said recessed hole has a mouth portion having an opening which is narrow relative to an inner hollow of said hole, so as to prevent said end of said seat belt form falling out of said hole,
wherein said recessed hole is located at a lower point on said seat back and adjacent to the junction of said seat back and said seat cushion when said seat is in the seat position, and
wherein said recess hole extends slightly upward with respect to a line perpendicular to said seat back.

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**5,044,696**
**CURB CUTTING SYSTEM AND METHOD**
**Michael Blackhurst, 27 Squires Avenue, East York, Ontario, Canada M4B 2R2**
**Filed Jun. 21, 1990, Ser. No. 541,657**
**Int. Cl.[5] E01C 23/09**
**U.S. Cl. 299—41** **23 Claims**

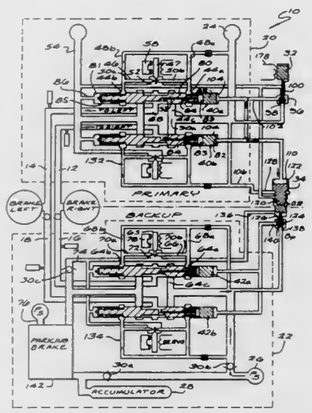


20. In a curb cutting system having a wheeled vehicle with a carriage mounted thereon for planar movement longitudinally of the vehicle, and having a motor driven saw extending laterally from the carriage adjacent the vehicle, the method of operating the vehicle comprising the steps:
(1) deploying a driven fifth wheel in steered driving relation with the vehicle, to position the vehicle laterally and longitudinally in desired relation with said curb;
(2) deploying a first set of jacks on the near-side of the vehicle, at a selected setting;
(3) partially retracting the vehicle wheels to settle the first jack set, in ground engaging relation;
(4) adjusting the height setting of said vehicle wheels to orient the plane of said carriage to a desired lateral orientation;
(5) deploying a second set of jacks on the off-side of the vehicle into ground engaging, stable supporting relation with the off-side side of the vehicle, to maintain said carriage orientation; and,
(6) retracting the vehicle wheels out of ground contact, whereby the vehicle is fully and stably supported on said first and second jack sets.



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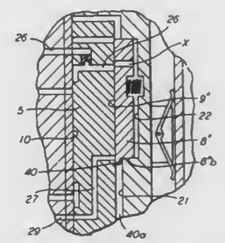
**5,044,697**
**BRAKE VALVE CONTROL SYSTEM**
**Douglas M. Longyear, Pasadena, and Stanley R. Bluhm, Manhattan Beach, both of Calif., assignors to Crane Company, Burbank, Calif.**
**Filed May 26, 1989, Ser. No. 357,363**
**Int. Cl.[5] B60T 11/18, 15/16**
**U.S. Cl. 303—14** **13 Claims**



1. A brake valve control system for use in a wheel braking system including brake actuator means said brake valve control system comprising:
a) a primary brake valve control subsystem for controlling said brake actuator means having a primary source of brake pressure in fluid communication with said brake actuator means, said primary brake valve control subsystem including at least one primary control valve having an inlet in fluid communication with said primary source of brake pressure and an outlet in fluid communication with said brake actuator means;
b) a secondary brake valve control subsystem for controlling said brake actuator means in the event of failure of said primary brake valve control subsystem, said secondary brake valve control subsystem having a secondary source of brake pressure in fluid communication with said brake actuator means, said secondary brake valve control subsystem including at least one secondary control valve having an inlet in fluid communication with said secondary source of brake pressure and an outlet in fluid communication with said brake actuator means;
c) subsystem selector means in fluid communication with said primary and secondary brake valve control subsystems operative to select either said primary or secondary brake valve control subsystems to actively control said brake actuator means and to simultaneously render the non-selected brake valve control subsystem inactive, whereby said subsystem selector means is operative to override any failure in either the primary or secondary brake valve control subsystem, each said control valve including a housing, a metering spool in said housing controlling fluid communication between said sources of brake pressure with said brake actuator means, and means for deactivating said control valves, comprising a slidable stop member movable between an open position and a closed position for closing communication between said sources of brake pressure and said brake actuator means in response to fluid pressure from said subsystem selector means.

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**5,044,698**
**FREIGHT BRAKE CONTROL VALVE HAVING LAP LEAKAGE PROTECTION**
**James E. Hart, Trafford, and Charles L. Weber, Jr., N. Huntingdon, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.**
**Filed Aug. 29, 1990, Ser. No. 574,718**
**Int. Cl.[5] B60T 15/42, 17/04**
**U.S. Cl. 303—33** **17 Claims**



1. For use on a railway car having a brake pipe charged with fluid at a certain chosen pressure, an auxiliary reservoir charged with fluid at said certain chosen pressure, a brake cylinder device, and a control valve device for controlling pressurization of said brake cylinder device, said control valve device comprising:
(a) a piston member subject on one side thereof to the fluid pressure effective in said brake pipe and on the opposite side thereof to the fluid pressure effective in said auxiliary reservoir;
(b) a tailpiece projecting from said opposite side of said piston member;
(c) a face of said tailpiece having a first recess formed therein;
(d) a graduating valve carried fast in said recess so as to be movable axially with said piston member, said graduating valve having a front side, a back side, and a first planar surface extending therebetween and projecting beyond said face of said tailpiece;
(e) a slide valve carried by said piston member with relative movement therebetween, said slide valve having a second planar surface slidably engaged with said first planar surface;
(f) a first passage in said slide valve having an opening in said second planar surface, the opening of said first passage being uncovered by said back side of said graduating valve in said application position, whereby said auxiliary reservoir fluid under pressure is supplied from said opposite side of said piston member to said brake cylinder device when said piston member is actuated from a release position to said application position;
(g) a second passage in said slide valve via which fluid pressure communication is established between said opposite side of said piston member, said second passage having an

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opening in said second planar surface axially displaced from said opening of said first passage, said opening of said second passage being uncovered by said front side of said graduating valve in a lap position of said piston member intermediate said release and application positions, the axial dimension of said graduating valve between said front and back sides thereof being less than the distance said opening of said first passage is displaced from said opening of said second passage; and

(h) said graduating valve having a lip portion projecting in an axial direction from at least one of said front and back sides of said graduating valve, said lip portion being flush with said first planar surface to thereby extend the axial length of said first planar surface, whereby said opening of said second passage is uncovered by said front side of said graduating valve only after said opening of said first passage is covered by said back side of said graduating valve during said movement of said piston member from said application position to said lap position.

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**5,044,699**

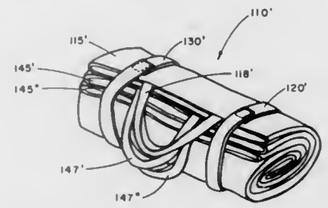
## TOTE BAG WITH STRAPS

**Carolyn Duty, 3028 Bridlewood, Franklin, Tenn. 37064**

**Filed Jun. 8, 1990, Ser. No. 535,378**

**Int. Cl.[5] B65D** *33/06*

**U.S. Cl. 383—37** **10 Claims**




1. A tote bag assembly comprising:

a primary tote bag having handles affixed thereto;

a secondary tote bag having handles affixed thereto;

the secondary bag being in a rolled up condition, the primary bag being rolled up to encompass the rolled up secondary bag; and

keeper means, affixed to the primary tote bag, for keeping the primary and secondary tote bags in the rolled up condition.

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**5,044,700**

## SYSTEM AND METHOD FOR REGULATING A BRAKE PRESSURE IN A BRAKE CHAMBER

**Karl-Heinz Willmann, Freiberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

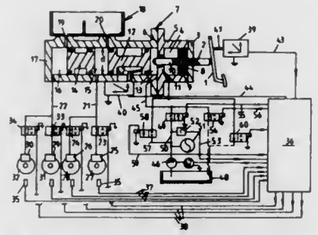
**Filed Jun. 22, 1990, Ser. No. 542,122**

**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925649**

**Int. Cl.[5] B60T** *8/32, 8/36, 13/68*

**U.S. Cl. 303—100** **18 Claims**

1. A hydraulic brake system having wheel brake cylinders (25, 26, 29, 30) for braking driven and non-driven wheels (27, 28, 31, 32), a master brake cylinder (7) which supplies the wheel brake cylinders with brake pressures, said master brake cylinder having a housing part (6) and at least one first master brake cylinder piston (12) displaceable in said master cylinder, a brake pedal (1) and a pedal rod (2) which activates a piston rod (10) movable toward said first master brake cylinder piston (12) for activating said first master brake cylinder piston (12), a hydraulic brake booster having a pressure chamber (13) in said master cylinder, said pressure chamber is supplied from a servo pressure source (46, 51) by which the master cylinder piston (12) is displaceable, said piston rod (10) passes into said pressure chamber (13) in a sealed and displaceable manner for mechanically displacing said first master brake cylinder piston (12), a control unit (36), said first travel sensor (39) operative by said brake pedal to send a control signal to said control unit (36) for operation of a booster valve assembly (49, 54) controllable by moving the brake pedal (1), said booster valve assembly is disposed between the servo pressure source (46, 51) and the pressure chamber (13) and between said pressure chamber (13) and a supply container (48), said booster valve assembly (49, 54) is embodied as an electrically controllable magnet valve assembly and is controllable by said control unit (36), a second travel sensor (40) is operative by said first master brake cylinder piston (12) and is electrically connected to the control unit (36), first travel sensor (39) is arranged for outputting electrical signal values that are in a first preselected ratio to displacement travel distances of the pedal rod (2); said second travel sensor (40) is arranged for outputting electrical signal



values that are in a second preselected ratio to displacement travel distances of said first master brake cylinder piston (12), said first and second preselected ratios are adapted to one another in such a way that if the values from both travel sensors (39, 40) are equally large, the displacement travel of the master brake cylinder piston (12), is intentionally longer than an associated displacement travel of the pedal rod (2), and the booster valve assembly (49, 54) is controllable via the control unit (36) as a function of a comparison of the first and second values in such a manner that a value from the first travel sensor that varies upon displacement of the pedal rod (2) leads to an approximation of the part of the value from the second travel sensor (40), to the first value from the first travel sensor (39), via displacement of the master brake cylinder piston (12) by imposition of pressure from the servo pressure source (46, 51) via said booster valve assembly (49, 54).

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**5,044,701**

## ELASTIC BODY APPARATUS ESPECIALLY INTENDED FOR AN ANTI-LOCK BRAKE SYSTEM

**Mamoru Watanabe, Kawaguchi, and Yasuhiro Miyama, Hunabashi, both of Japan, assignors to Miyako Jidosha Kogyo Kabushikigaisha, Tokyo, Japan**

**Filed Apr. 10, 1990, Ser. No. 507,153**

**Claims priority, application Japan, Apr. 14, 1989, 1-94650**

**Int. Cl.[5] B60T** *8/32*

**U.S. Cl. 303—115** **5 Claims**

1. An elastic body apparatus comprising:

a hollow, flexible, pneumatic pressure sealing member having a pressure-sealed gas chamber for containing a pressurized gas which, in turn, causes said pneumatic pressure sealing member to generate a pressure in a pressing direction, said sealing member defining a fixed portion and a displacing portion;

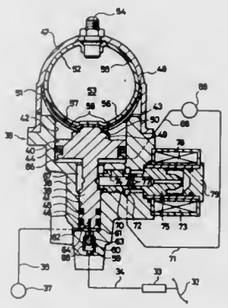
a movable member to which an external force may be applied to cause it to act against the pressure of said pneumatic pressure sealing member;

a fixed shell enveloping said fixed portion of said pneumatic pressure sealing member; and

an elastic shell having plate spring portions for applying a spring force in the same direction as the pressing direction



of said pneumatic pressure sealing member to said movable member, and disposed at a position enveloping said



displacing portion of said pneumatic pressure sealing member.

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**5,044,702**

## HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES COMPRISING A TRACTION SLIP CONTROL MEANS

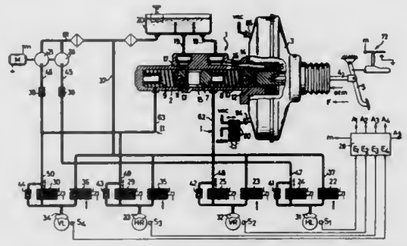
**Erhard Beck, Wellburg, and Dieter Dinkel, Eppstein/Ts., both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Mar. 30, 1990, Ser. No. 502,396**

**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910285**

**Int. Cl.[5] B60T** *8/58, 8/44*

**U.S. Cl. 303—100** **5 Claims**



1. A hydraulic brake system for an automotive vehicle including a means for controlling traction slip comprising wheel sensors, a master brake cylinder (1), a pedal operated servo system (3) for actuating the master brake cylinder (1), wheel brake cylinders on driven wheels of the vehicle which are in communication with the master brake cylinder (1), through brake conduits (62, 63), sensors (S1, S2, S3, S4) for determining angular speed of the wheels, and an electronic analyzer (28) evaluating the sensor signals and generating switch signals for inlet and outlet valves, with the inlet valves (24, 25, 29, 30) being provided in the brake conduits and the outlet valves (22, 23, 35, 36) being provided in a relief conduit (37) between the wheel brake cylinders and a pressure fluid reservoir, and pumps (21, 26) having intake sides which are respectively in communication with the brake conduits (62, 63), wherein a booster chamber (84) of the servor system is placed in communication with a pressure source through an ASR control valve (80), irrespective of positions of the pedal (5), and wherein the electronic analyzer (28) generates switching signals for operating said control valve (80) and said pumps (21, 26) upon detection, through the sensor signals, that one of the driven wheels tends to spin, and wherein upon detection of the driven wheel tending to spin, said pumps (21, 26) are activated and said control valve (80) is switched causing air pressure to be applied to said booster chamber (84) of said servo system (3) wherein said master cylinder (1) is actuated independently of actuation of the pedal (5) and wherein during an initial start-up phase of said pumps (21, 26) pressure fluid is transmitted from the master brake cylinder to the driven wheels to prevent the wheels from spinning during the start-up phase of said pumps 21, 26).

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**5,044,703**

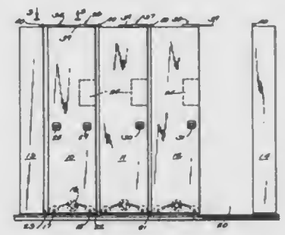
## LIMIT SWITCH ASSEMBLY FOR MOBILE STORAGE APPARATUS

**Dean L. Dahnert, Fort Atkinson, Wis., assignor to Spacesaver Corporation, Fort Atkinson, Wis.**

**Division of Ser. No. 471,256, Mar. 9, 1990, Pat. No. 5,005,923. This application Jan. 7, 1991, Ser. No. 638,070**

**Int. Cl.[5] A47B** *53/00*

**U.S. Cl. 312—201** **1 Claim**



1. A method of opening and closing aisles among a row of mobile storage units which are mounted on wheels for running on tracks and each mobile storage unit has a reversible electric motor for driving said units in opposite directions longitudinally of the tracks, said method comprising:

energizing the motor on the leading mobile storage unit adjacent an aisle which is presently open to initiate acceleration of said mobile storage unit on the way to full speed in a direction for closing the aisle,

energizing the motor on the next trailing mobile storage unit in the row which trails said leading mobile storage unit to begin accelerating said trailing mobile unit on the way to full speed in the same direction as said leading mobile storage unit traveling immediately after said leading mobile storage unit starts to accelerate and is still accelerating,

initiating deceleration of said motor on said leading mobile storage unit when said unit is near the end of the travel required to close said aisle,

deenergizing said motor on said leading mobile storage unit at the end of the deceleration interval and letting the leading mobile storage unit coast to a stop,

next initiating deceleration of the motor on said trailing mobile unit when it has moved to within a predetermined distance from said leading mobile storage unit and,

finally deenergizing said motor on said trailing mobile storage unit at the end of its deceleration interval for enabling said trailing unit to come to a stop.

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**5,044,704**

## ADJUSTABLE REFRIGERATOR CRISPER DRAWER STRUCTURE

**Marc R. Bussan; Ronald K. Hupfer, and Marion J. Weis, all of Evansville, Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed May 17, 1990, Ser. No. 525,881**

**Int. Cl.[5] A47B** *81/00*

**U.S. Cl. 312—214** **19 Claims**

1. In a refrigerator having a cabinet defining a fresh food compartment with a front access opening, a door for selec-

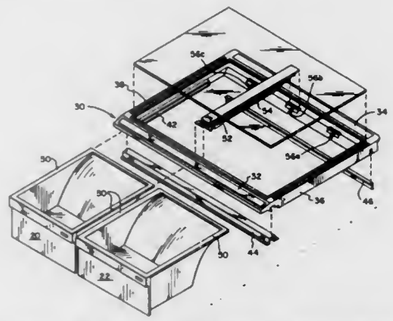
VOL 1130 ISS 1 SE 3 1991 UMI



tively closing said opening, a food storage drawer assembly comprising:

a frame horizontally disposed within said compartment, said frame including front and rear frame members and two side frame members;

a plurality of drawer support members having horizontal channels therein;



a plurality of drawer support member receiving means in each said respective front and rear members for receiving respective ends of each said drawer support members;

front and rear support rails respectively secured to said front and rear frame members and detachably connected to said cabinet; and

a plurality of drawers slideably received in respective said horizontal channels.

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**5,044,705**

**INSULATION STRUCTURE FOR APPLIANCES**

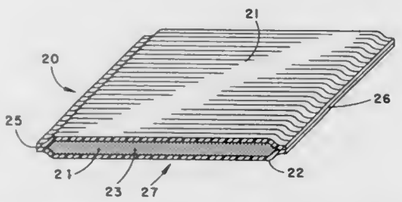
**Thomas E. Nelson, Crestwood, Ky., assignor to Soltech, Inc., Shelbyville, Ky.**

**Continuation of Ser. No. 220,027, Jul. 15, 1988, Pat. No. 4,985,106, which is a continuation-in-part of Ser. No. 177,439, Apr. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 931,150, Nov. 17, 1986. This application Apr. 16, 1990, Ser. No. 509,899**

**The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.**

**Int. Cl.[5] A47B** *77/06*

**U.S. Cl. 312—228** **4 Claims**



1. In combination:

an insulation panel arranged into four sections comprising:

a first layer of enclosing material having a configuration which approximates the four sections of said panel;

a second layer of enclosing material having a configuration which approximates the four sections of said panel; and

an intermediate layer of insulation material disposed between said first and second layers of enclosing material; and

an automatic dishwasher wherein said insulation panel is formed over and around the exterior of said dishwasher such that each section of said insulation panel is applied against a different surface of said dishwasher.

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**5,044,706**

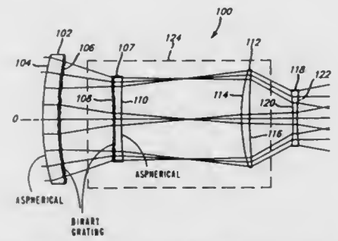
**OPTICAL ELEMENT EMPLOYING ASPHERICAL AND BINARY GRATING OPTICAL SURFACES**

**Chungte W. Chen, Irvine, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Feb. 6, 1990, Ser. No. 475,526**

**Int. Cl.[5] G02B** *3/02, 3/08, 5/18, 9/34*

**U.S. Cl. 359—357** **17 Claims**




1. An optical element for reducing aberration in an optical system, said optical element having first and second surfaces, said first surface being an aspherical surface and said second surface being a diffractive surface and, wherein said second surface is a binary grating surface including a plurality of concentric rings, each ring having a series of phase level steps for approximating a Kinoform profile.

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**5,044,707**

**HOLOGRAMS WITH DISCONTINUOUS METALLIZATION INCLUDING ALPHA-NUMERIC SHAPES**

**Donald W. Mallik, North Tarrytown, N.Y., assignor to American Bank Note Holographics, Inc., Elmsford, N.Y.**

**Filed Jan. 25, 1990, Ser. No. 470,121**

**Int. Cl.[5] G02B** *5/18;* **B44F** *1/12*

**U.S. Cl. 359—2** **15 Claims**



1. A document having visual information thereon protected from alteration, comprising a hologram or diffraction grating device firmly attached to said document over at least a portion of said visual information, said device comprising:

a substantially transparent layer having a surface relief pattern formed in a surface thereof facing the document and its said visual information with substantially completely reflective material attached thereto in a discontinuous pattern thereacross in a manner that the device, when illuminated with light, allows viewing of both the visual information on the document through said layer and a light image or pattern reconstructed from said surface relief pattern in reflection from portions thereof to which said reflective material is attached, and

said reflective material additionally being arranged in a shape or pattern of visual information separate from that of the reconstructed image or pattern and also separate from the document visual information.



**5,044,708**

**WIDE VISUAL FIELD HOLOGRAM**

**Thierry Garcon, 1, Boulevard de la République, Eaubonne, 95600, Val D3 Oise, France**

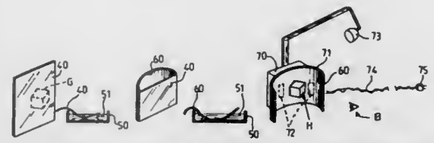
**PCT No. PCT/FR89/00315, § 371 Date Apr. 6, 1990, § 102(e) Date Apr. 6, 1990, PCT Pub. No. WO89/12851, PCT Pub. Date Dec. 28, 1989**

**PCT Filed Jun. 20, 1989, Ser. No. 477,808**

**Claims priority, application France, Jun. 20, 1988, 88 08211**

**Int. Cl.[5] G03H** *1/20, 1/22*

**U.S. Cl. 359—8** **10 Claims**



1. A process for making a hologram restoring an image of at least one object, characterized in that a first recording of the image of said object is made on at least one first holographic recording material with a view to obtaining a holographic image of said object; then a development of this first holographic recording material is made; then a second recording is made from said holographic image on a second holographic recording material arranged to have at least one concave portion oriented toward the first holographic recording material, at least a portion of this image having to be located between the space defined by the two holographic recording materials; that the first and the second holographic recording material are associated in such a manner that the distance separating them at the time of the second recording is variable; then a development of this second holographic recording material is performed; then the second holographic recording material is used in accordance with the same configuration to reconstruct the image of the object.

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**5,044,709**

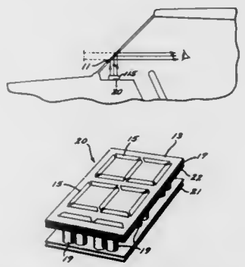
**LED ARRAY POLARIZED IMAGE SOURCE/0 DEGREE HOLOGRAM VIRTUAL IMAGE HEAD UP DISPLAY**

**Ronald T. Smith, Redondo Beach, and Mark McDonald, Culver City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Nov. 30, 1988, Ser. No. 278,083**

**Int. Cl.[5] G02B** *5/32*

**U.S. Cl. 359—13** **9 Claims**



1. A virtual image display system comprising:

means for providing a dynamically changing image comprising means for providing beams of light having a narrow spectral bandwidth of less than about 50 nanometers, wherein said means for providing light beams includes light emitting diodes and a mask having openings for selectively masking the illumination provided by said light emitting diodes; and

a reflection hologram having fringe planes equidistant to the hologram surface for reflecting the image to produce an observable virtual image.

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**5,044,710**

**LASER BEAM DEFLECTION APPARATUS**

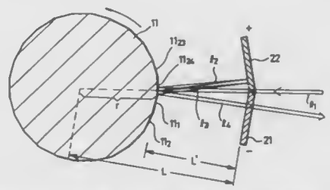
**Junichi Iwai, Tokyo; Yasuaki Nakane, Miyagi; Hiroshi Nakayama, and Shuichi Igarashi, both of Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Mar. 26, 1990, Ser. No. 498,948**

**Claims priority, application Japan, Mar. 30, 1989, 1-079944**

**Int. Cl.[5] G02B** *26/08*

**U.S. Cl. 350—6.8** **10 Claims**



1. A laser beam deflection apparatus comprising:

a rotatable polygon mirror having a plurality of reflection surfaces;

means for directing a laser beam to be incident on each of the reflection surfaces of the polygon mirror in turn as the polygon mirror rotates so that the laser beam is deflected through a predetermined angle during a predetermined increment of rotation ("deflection cycle") of the polygon mirror;

a plurality n of flat mirrors which are positioned in facing relation to the polygon mirror and aligned with respect to the polygon mirror such that hypothetical normal lines passing through the center of each of the flat mirrors converge at the same point on one of the reflection surfaces of the polygon mirror and such that the deflected laser beam is consecutively reflected by each of the n flat mirrors during each deflection cycle of the polygon mirror, for reflecting the laser beam reflected from one of the reflection surfaces back towards said one of the reflection surfaces of the polygon mirror, whereby the laser beam is twice reflected by said one of the reflection surfaces and is deflected through the predetermined angle n times for each deflection cycle of the polygon mirror.

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**5,044,711**

**OPTICAL-FIBER ALIGNING MEMBER AND METHOD OF FORMING THE MEMBER**

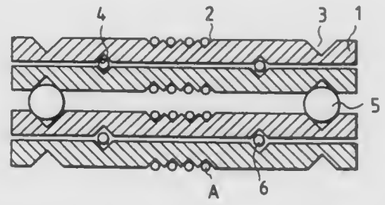
**Kazuhito Saito, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Sep. 20, 1990, Ser. No. 585,667**

**Claims priority, application Japan, Oct. 17, 1989, 1-271185**

**Int. Cl.[5] G02B** *6/36*

**U.S. Cl. 350—96.2** **17 Claims**



1. An optical fiber aligning member comprising:

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a plurality of grooved substrates, each of said grooved substrates having a first main surface in which a plurality of optical fiber aligning grooves and at least two first positioning grooves are formed and a second main surface opposite said first main surface in which at least two second positioning grooves are formed, the grooved substrates being laminated one on one in a manner so that every grooved substrate is turned over alternately such that at least one pair of adjacent grooved substrates have first positioning grooves opposing each other and at least one pair of adjacent grooved substrates have second positioning grooves opposing each other;

a plurality of first positioning pins positioned in the opposing first positioning grooves; and

a plurality of second positioning pins positioned in the opposing second positioning grooves.

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**5,044,712**

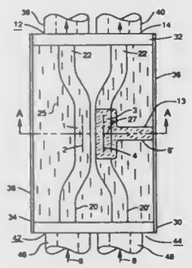
**WAVEGUIDED ELECTROOPTIC SWITCHES USING FERROELECTRIC LIQUID CRYSTALS**

**Richard A. Soref, Newton Centre, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Jun. 29, 1990, Ser. No. 551,099**

**Int. Cl.[5] G02F *1/135***

**U.S. Cl. 350—96.14** **15 Claims**



1. An electro-optic switch comprising:

(a) coplanar light transmissive optical channel waveguide core portions for supporting guided modes of light polarized substantially parallel to the plane of the waveguide core portions, said waveguide core portions having a longitudinal light propagation axis and a core refractive index within a first range;

(b) a cladding layer having an initial ordinary index of refraction overlying a waveguide core portion and evanescently optically coupled thereto and comprising a substantially uniformly ordered layer of ferroelectric liquid crystal (FLC) having a cladding index of refraction which increases from said initial index of refraction in response to a change in voltage applied thereto, causing said cladding index to assume an index within a second range, lower than the first range of the refractive core index of said waveguides and not overlapping said first range; and

(c) voltage supply means for impressing a voltage across said cladding layer of a magnitude to cause the cladding index of said cladding layer to be increased to a sufficient extent to change the effective index of refraction of the guided modes within said core portion.

**5,044,713**

**OPTICAL ISOLATOR**

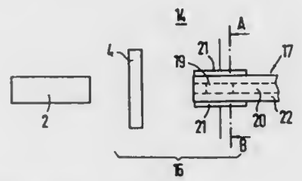
**Albrecht Mozer, Bietigheim-Bissingen, and Peter Kersten, Leonberg, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands**

**Filed Dec. 7, 1988, Ser. No. 281,083**

**Claims priority, application Fed. Rep. of Germany, Dec. 8, 1987, 3741455**

**Int. Cl.[5] G02F *1/295, 1/035***

**U.S. Cl. 385—11** **4 Claims**



1. An optical isolator comprising:

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**5,044,714**

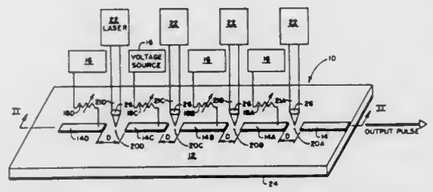
**VARIABLE INTERVAL ELECTROMAGNETIC PULSE TRAIN GENERATOR**

**James D. Taylor, Cambridge, Mass.; Michael M. Salour, Carlsbad, and James H. Bechtel, San Diego, both of Calif., assignors to The United States of America as Represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Nov. 9, 1990, Ser. No. 611,194**

**Int. Cl.[5] G02B *6/10*; H01L *27/14***

**U.S. Cl. 385—5** **14 Claims**




1. A variable interval electromagnetic pulse train generator, comprising:

a substrate, said substrate being made of a semiconductor material;

a plurality of electrodes mounted in series on a surface of said substrate, said electrodes being spaced apart from each other a predetermined distance, forming therebetween a plurality of switching areas;

a base plate, said base plate being in the form of an electrode mounted on a surface of said substrate opposite said surface having said spaced apart electrodes thereon;

means for applying a predetermined voltage to said spaced apart electrodes; and

means for applying a controllable optical pulse to each of said plurality of switching areas;

whereby said pulse train generator is capable of emitting a series of variable, spaced apart electromagnetic pulses.



**5,044,715**

**GUIDED-WAVE OPTICAL BRANCHING COMPONENTS AND OPTICAL SWITCHES**

**Masao Kawachi; Kaname Jinguji, both of Mito; Norio Takato, Katsuta, and Akihiro Takagi, Mito, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan**

**Filed Feb. 5, 1990, Ser. No. 475,435**

**Claims priority, application Japan, Feb. 7, 1989, 1-26542; Mar. 7, 1989, 1-52866; Jul. 7, 1989, 1-174072; Sep. 4, 1989, 1-227449**

**Int. Cl.[5] G02B *6/26, 6/12***

**U.S. Cl. 385—42** **18 Claims**

1. A guided-wave optical branching component having two or more optical waveguides, said optical waveguides being in proximity with one another at a plurality of positions so as to constitute a plurality of directional couplers, one end of each said optical waveguides being an input port and the other end of each said optical waveguides being an output port, wherein the effective optical-path length of at least one of said optical waveguides differs from that of the other optical waveguides between two arbitrarily selected adjacent directional couplers, the difference of said effective optical-path length being less than the shortest wavelength in the operational wavelength region of said guided-wave optical branching component, the coupling ratio of each of said two adjacent directional couplers monotonically increases according to the wavelength in said operational wavelength region.

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**5,044,716**

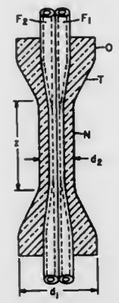
**CHLORINE-DOPED OPTICAL COMPONENT**

**George E. Berkey, Pine City, N.Y., assignor to Corning Incorporated, Corning, N.Y.**

**Filed Dec. 8, 1989, Ser. No. 447,796**

**Int. Cl.[5] G02B *6/26***

**U.S. Cl. 385—51** **30 Claims**



1. A fiber optic coupler comprising at least first and second optical fibers, each having a core and a cladding, said fibers being fused together along a portion of the lengths thereof to form a coupling region, most of the cross-sectional areas of the claddings of said first and second fibers containing chlorine, the cladding of said second fiber having a chlorine concentration greater than that of said first fiber cladding, the difference in chlorine concentration int he claddings of said first and second fibers being sufficient to increase the refractive index $n'_2$ of said second fiber cladding to a value greater than the refractive index $n_2$ of the cladding of said first fiber.

**5,044,717**

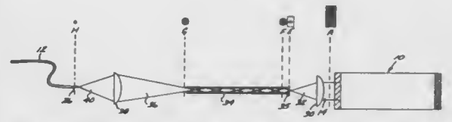
**METHOD AND APPARATUS FOR COUPLING HIGH ENERGY LASER TO FIBEROPTIC WAVEGUIDE**

**Jeffrey I. Levatter, Rancho Santa Fe, Calif., assignor to Accu-Lase, Inc., San Diego, Calif.**

**Filed Jan. 18, 1990, Ser. No. 467,128**

**Int. Cl.[5] G02B *6/32***

**U.S. Cl. 385—33** **13 Claims**



4. Apparatus for producing a small diameter, high energy density light beam having a substantially uniform cross-sectional energy density from a high-energy laser that produces a beam having a substantially non-uniform cross-sectional energy density, the apparatus comprising:

first focusing means for optically reducing the cross-sectional size of the laser beam;

an optical fiber segment having an input end and an output end, the input end of the optical fiber segment receiving the reduced cross-section laser beam from the first focusing means for optically reducing and also transmitting the beam to its output end;

second focusing means, located adjacent to the output end of the optical fiber segment, for further optically reducing the cross-sectional size of the beam received from the optical fiber segment; and

a conducting optical fiber having a diameter less than the diameter of the optical fiber segment and having an input end positioned to receive the reduced cross-section beam from the second focusing means.

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**5,044,718**

**OPTICAL HEAD USED IN OPTICAL INFORMATION PROCESSOR**

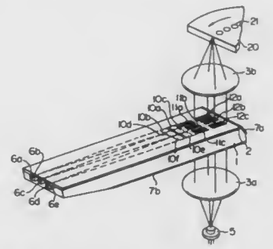
**Hidehiko Kando, Matsudo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 16, 1990, Ser. No. 480,949**

**Claims priority, application Japan, Mar. 20, 1989, 1-66196**

**Int. Cl.[5] G02B *6/34***

**U.S. Cl. 385—4** **20 Claims**



13. An optical head, comprising:

a plane waveguide for propagating light therethrough;

at least one grating coupler provided at a part of said waveguide for converting incident light into light which is propagated in said waveguide;

at least one first diffraction grating for diffracting light which was emitted from a light source and incident to said at least one first diffraction grating;

a second diffraction grating for diffraction light which was diffracted by said at least one first diffraction grating and

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leading the diffracted light to said at least one grating coupler; and

a plurality of waveguide lenses which permit light from said at least one grating coupler to pass therethrough.

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**5,044,719**

**CABLE CONNECTOR**

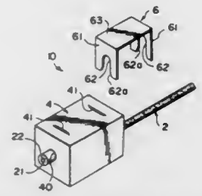
**Kunio Nakamura, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Aug. 9, 1990, Ser. No. 565,296**

**Claims priority, application Japan, Aug. 11, 1989, 1-94619**

**Int. Cl.[5] G02B** *6/36*

**U.S. Cl. 385—76** **8 Claims**



1. A cable connector for holding a cable against axial movement, said connector comprising:

a housing having a cable-receiving opening extending therethrough and a first slot located intermediate ends of said housing and normally intersecting said opening, said first slot including a first portion having a narrower width than the rest of said first slot; and

a flat U-shaped clamping member having a single first pair of legs joined by a bight at one end for being inserted into said opening through said first slot and for receiving the cable when disposed in the opening between said first pair of legs, said clamping member having a thickness greater than the width of said first portion of said first slot so that said clamping member is fictionally retained in said housing.

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**5,044,720**

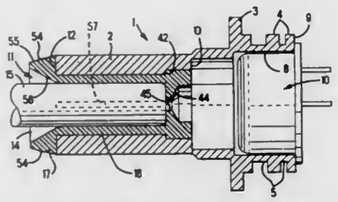
**ACTIVE DEVICE MOUNT WITH MARK PREVENTION AND METHOD OF MAKING SAME**

**Edmund J. Haley, Dillsburg; Robert L. Mansberger, II, Middletown, and Robert N. Weber, Hummelstown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Dec. 10, 1990, Ser. No. 624,854**

**Int. Cl.[5] G02B** *6/26;* **H01J** *5/16;* **B29D** *11/00*

**U.S. Cl. 385—88** **10 Claims**



1. An active device mount, comprising: a body for receiving an optoelectronic device and having a socket for receiving a holder for an optical fiber, an interior and an entrance end of the socket being covered with a material resisting deformation by receipt of the holder in the socket, the material being molded with a lip projecting from the entrance end, the lip having exterior mold vestige, the material covering the interior being devoid of mold vestige, and the material preventing a stain from being applied on the holder by the socket.

8. A method for molding an active device mount, comprising the steps of: holding an alignment body of an active device mount within molding dies of a molding apparatus, the body having a socket for receiving a holder of an optical fiber in alignment with an optoelectronic device, inserting a first core pin in the body, inserting a second core pin in the body, forming molten material into a space between the second core pin and the body, and forming molten material between the second core pin and an open end of the socket to form a lip covering the open end of the socket.

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**5,044,721**

**HOLDER FOR OPTICAL FIBER END-PROCESSING DEVICE**

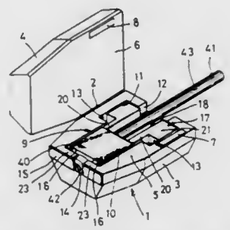
**Kunio Nakamura, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Apr. 18, 1990, Ser. No. 510,757**

**Claims priority, application Japan, Apr. 18, 1989, 1-97798**

**Int. Cl.[5] G02B** *6/36, 7/26*

**U.S. Cl. 385—53** **8 Claims**



1. An end-processing device for an optical fiber characterized in that;

a housing having a receiving recess extending from a front wall to the other end for removably inserting at least one optical fiber, said front wall having an aperture;

a heat conductive plate member having a flat inner surface mounted at a predetermined angle on a front surface of said front wall of said housing in alignment with the aperture;

pushing means in the receiving recess of said housing for pushing the end of the optical fiber toward said inner surface of said plate member; and

a surface at said front wall in said receiving recess of said housing against which said pushing means engages thereby stopping movement of the optical fiber;

wherein said plate member is selectively coupled to a heating means for processing the end of the optical fiber.

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**5,044,722**

**SELF-SUPPORTING OPTICAL CABLE**

**Othmar Voser, Möriken, Switzerland, assignor to Kupferdraht-Isolierwerk AG, Wildegg, Switzerland**

**PCT No. PCT/CH89/00204, § 371 Date Jul. 30, 1990, § 102(e) Date Jul. 30, 1990, PCT Pub. No. WO90/06530, PCT Pub. Date Jun. 14, 1990**

**PCT Filed Nov. 21, 1989, Ser. No. 548,966**

**Claims priority, application Switzerland, Dec. 5, 1988, 4501/88**

**Int. Cl.[5] G02B** *6/44*

**U.S. Cl. 385—113** **16 Claims**

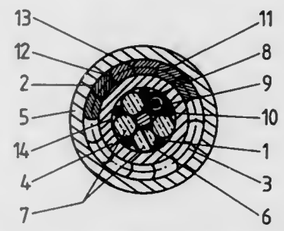
1. A self-supporting optical cable, comprising:

a central member;

at least one optical conductor stranded around said central member in a plurality of turns which change direction substantially after each turn and which have a diameter around said central member, each turn having a length which is at least five times the diameter of the turn, said central member and said at least one optical conductor forming a core;



a plurality of strength members positioned around and at a distance from said core, each strength member comprising an elongated profiled body having a substantially flat cross section and formed at least partly of reinforcing fibers, each strength member having a pair of opposite



side faces which engage side faces of adjacent strength members around said core to form a compression-proof closed jacket around said core which is stable against changes of diameter of said jacket; and

an outer protective jacket around said closed jacket.

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**5,044,723**

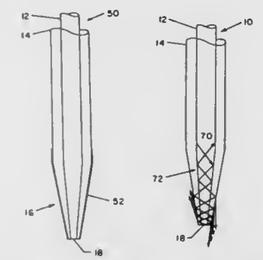
**TAPERED FIBRE SENSOR**

**Robert I. MacDonald, Edmonton, Canada, assignor to Alberta Telecommunications Research Centre, Edmonton, Canada**

**Filed Apr. 5, 1990, Ser. No. 504,868**

**Int. Cl.[5] G02B** *6/16*

**U.S. Cl. 385—12** **8 Claims**



1. In an optical fibre sensor for measuring the index of refraction of an external medium, the optical fibre sensor having a core and a cladding, and the cladding having a refractive index greater than the index of the external medium, in combination with an optical reflectometer, the optical reflectometer being optically connected to the optical fibre sensor to receive light propagating through the optical fibre sensor: the improvement comprising the optical fibre sensor terminating in an end region, and the diameter of the core diminishing monotonically over the end region such that propagation modes of the fibre become unbound in the end region.

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**5,044,724**

**METHOD OF PRODUCING OPTICAL FIBER, AND FIBER PRODUCED BY THE METHOD**

**Paul F. Glodis, Atlanta, Ga., and Kenneth L. Walker, New Providence, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

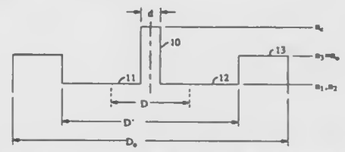
**Filed Dec. 22, 1989, Ser. No. 456,880**

**Int. Cl.[5] G02B** *6/22*

**U.S. Cl. 385—127** **11 Claims**

5. Silica-based optical fiber comprising a central region (the "core") having an effective diameter d and an effective refractive index $n_c$; a first cladding region contactingly surrounding the core and having an effective outer diameter D and an effective refractive index $n_1$; a second cladding contactingly surrounding the first cladding and having an outer diameter D' and a refractive index $n_2$; wherein $n_c > n_1$, $n_2$; $n_c \gtrsim n_o$, wherein $n_o$ is the refractive index of vitreous silica; $n_o > n_1$, $n_2$; and $n_1$ is substantially equal to $n_2$;

wherein the core and the first cladding region consist essentially of glass formed in situ by means of a glass-forming



reaction, and wherein the second cladding region consist essentially of pre-existing glass;

CHARACTERIZED IN THAT the fiber further comprises an overcladding region contactingly surrounding the second cladding region, having an outer diameter $D_o$, consisting substantially of pre-existing glass and comprising a third cladding region having a refractive index $n_3$, where $n_2 \lesssim n_3 \lesssim n_o$, and wherein D/d is less than 5.0.

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**5,044,725**

**POLYMERIC THIN FILM WAVEGUIDE MEDIA**

**Ronald N. DeMartino, Wayne; Hyun-Nam Yoon, New Providence, and James B. Stamatoff, Westfield, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.**

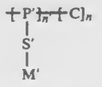
**Continuation of Ser. No. 468,676, Jan. 23, 1990, Pat. No. 5,002,361, which is a continuation-in-part of Ser. No. 915,179, Oct. 3, 1986, Pat. No. 4,915,491, which is a continuation-in-part of Ser. No. 822,090, Jan. 24, 1986, abandoned. This application Nov. 16, 1990, Ser. No. 614,904**

**The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.**

**Int. Cl.[5] G02B** *1/00*

**U.S. Cl. 385—130** **1 Claim**

1. A thin film optical waveguiding medium comprising a sidechain polymer having recurring units of the formula:



where P' is a polymer main chain unit, S' is a pendant spacer group having a linear chain length of between about 2-12 atoms; n' is an integer greater than 0, n is zero or an integer greater than 0, C is accordingly an optical comonomer unit and M' is an organic structure containing an electron donating group and an electron withdrawing group at opposing terminii of a conjugated II electron system.

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**5,044,726**

**DEVICE FOR THE CORRELATION BETWEEN OPTICAL BEAMS**

**Giorgio Grego, Venaria, Italy, assignor to Cselt Centro Studi E Laboratori Telecomunicazioni S.P.A., Turin, Italy**

**Filed Mar. 26, 1990, Ser. No. 499,762**

**Claims priority, application Italy, Mar. 24, 1989, 67208 A/89**

**Int. Cl.[5] G02F** *3/00;* **H01S** *3/30*

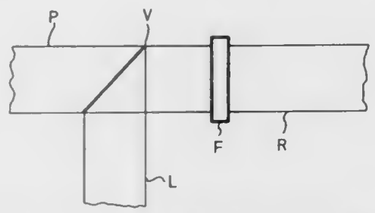
**U.S. Cl. 359—561** **4 Claims**

1. A device for obtaining the correlation between optical beams having spatially modulated intensities, comprising an active-glass window composed of a material capable of light-stimulated photon emission, means for directing against said window from one side a reading beam and a pump beam and including at least one semitransparent mirror, the reading beam

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consisting of a radiation with a wavelength equal to a wavelength of transition between an intermediate and a fundamental energy level of the active glass window and the pump beam




consisting of a radiation with a wavelength corresponding to a highest energy level of the active glass window; and means on the other side of the window for obtaining a light beam carrying a correlation between the reading and pump beams.

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**5,044,727**

**BEAM SPLITTER/COMBINER APPARATUS**

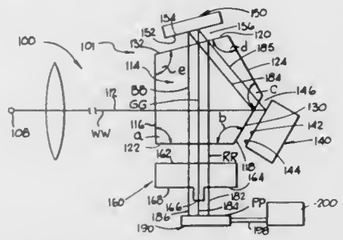
**Michael J. Steinle, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed May 3, 1990, Ser. No. 519,069**

**The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.**

**Int. Cl.[5] G02B *27/14, 5/28;* G01J *3/50***

**U.S. Cl. 350—171** **20 Claims**




1. An optical separator device for splitting a beam of incident polychromatic light into a plurality of spacially and spectrally separated component beams having parallel optical axes comprising:

first parallel layer means for spectrally and spacially separating said incident beam into a first plurality of component beams comprising a first plurality of parallel, spectrally selective, reflective layers including a layer adapted to reflect light in a first spectral range and a second spectral range;

second parallel layer means for further spectrally and spacially separating said first plurality of component beams into a second plurality of component beams comprising a second plurality of parallel, spectrally selective, reflective layers including a layer adapted to reflect light in said first spectral range and to transmit light in said second spectral range.

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**5,044,728**

**DEVICE FOR CORRECTING PERSPECTIVE DISTORTIONS**

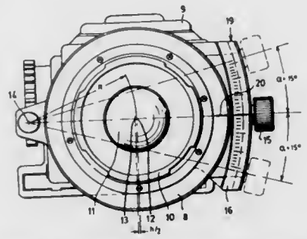
**Werner Flöther, Aalen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Hiedenheim, Fed. Rep. of Germany**

**Filed Apr. 5, 1990, Ser. No. 505,173**

**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 3912235**

**Int. Cl.[5] G02B *7/02, 27/64, 27/32***

**U.S. Cl. 359—813** **9 Claims**




4. A device for correcting perspective distortions in an arrangement which includes an apparatus having a beam pass-through opening and which includes an imaging optical system defining a system optical axis and an image plane, the apparatus defining an apparatus optical axis and having an image carrier in the image plane of the optical system, the device comprising:

pivot means disposed outside of said beam pass-through opening and defining a pivot axis parallel to said apparatus optical axis;

displacement means pivotally connected to said pivot means for effecting a pivotal displacement of said optical system about said pivot axis for correcting said distortions and for displacing said system optical axis relative to said apparatus optical axis through a center offset (h) measured along a connecting line passing through said pivot axis and said apparatus optical axis;

said displacement means being mounted on said apparatus to permit said displacement to occur in a plane transverse to said axes; and,

said optical system axis being spaced from said apparatus optical axis in a direction away from said pivot means by an amount corresponding to one-half the center offset (h) when said optical system is positioned by said displacement means so as to cause said optical system axis to lie on said connecting line.

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**5,044,729**

**OBJECTIVE LENS ACTUATOR**

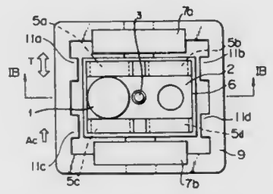
**Hironori Tomita; Tohru Nakamura, both of Katano; Noboru Kikuchi, Hirakata, and Masanari Mohri, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 12, 1989, Ser. No. 406,303**

**Claims priority, application Japan, Sep. 30, 1988, 63-248115**

**Int. Cl.[5] G02B *7/02***

**U.S. Cl. 359—824** **7 Claims**




1. An objective lens actuator for actuating a movable section



of an apparatus for writing or reading information into or from a recording medium, said movable section comprising an objective lens and a lens holder for holding said objective lens, said movable section making turning motion about an axis adapted to be oriented substantially normal to a reading/writing surface of said recording medium, said actuator comprising:

an actuating mechanism for actuating said objective lens to make said turning motion about said axis, said actuating mechanism comprising:

a parallel driving coil to be mounted on said movable section and having a plurality of coil faces;

a parallel driving magnetic circuit means for imparting a magnetic flux to said parallel driving coil;

said parallel driving coil and said parallel driving magnetic circuit means being disposed relative to one another to produce at least first and second drive forces responsive to respective actions of electric current passing through at least two faces of said coil faces of said parallel driving coil and at least a first and a second portion of the magnetic flux generated from said parallel driving magnetic circuit means and passing through said two faces of said parallel driving coil such that said first and second drive forces both provide turning forces acting in the same rotational direction for causing said turning motion about said axis;

wherein said two faces of said parallel driving coil are oriented substantially parallel to said axis; and

wherein said parallel driving coil is wound around an axis into a substantially square hollow block shape which bears a relationship of $W > t$, where t represents the width of one side of said square hollow block shape with respect to a section thereof along a direction normal to said axis of said parallel driving coil and W represents the width of said one side thereof along a direction of said axis of said parallel driving coil.

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**5,044,730**

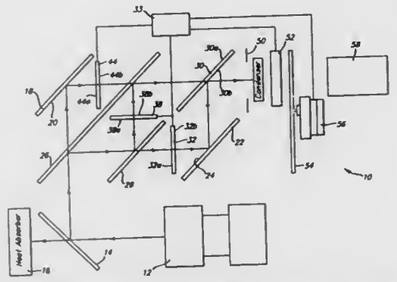
**COLOR CHANGING DEVICE**

**Thomas F. LaDuke, Buena Park; Joel D. Gruber, Laguna Niguel, and Richard Romano, Morgan Hill, all of Calif., assignors to Artifex Corporation, Santa Ana, Calif.**

**Filed Feb. 8, 1989, Ser. No. 307,889**

**Int. Cl.[5] G02B *27/14, 5/22***

**U.S. Cl. 359—890** **14 Claims**




1. A device for generating a plurality of hues of color from a light beam emitted from a light source, comprising:

first mirror means for reflecting light having a wavelength below eight hundred nanometers and for transmitting light equal to or greater than eight hundred nanometers;

second mirror means spaced laterally from said first mirror means for reflecting light having a wavelength from six hundred to seven hundred nanometers;

third mirror means disposed between and spaced longitudinally from said first and second mirror means for reflecting having a wavelength from five hundred to six hundred nanometers;

means for receiving the light from either one of said first, second and third mirror means and transmitting the light having a wavelength between four hundred and five hundred nanometers and six hundred and seven hundred nanometers and reflecting the light having a wavelength between five hundred and six hundred nanometers to generate a hue of color of light;

first filter means disposed between said first and second mirror means and said receiving means for transmitting light having a wavelength between six hundred and eight hundred nanometers and reflecting light having a wavelength between four hundred and six hundred nanometers;

second filter means disposed between said first filter means and said third mirror means for transmitting light from said first filter means to said third mirror means having a wavelength greater than five hundred nanometers and reflecting light from one portion of said first filter means to another portion of said first filter means having a wavelength less than five hundred nanometers;

said receiving means transmitting light from said second mirror means and said first filter means, and reflecting light from said third mirror means;

said receiving means comprising third filter means spaced longitudinally from said second mirror means and said first mirror means and laterally from said third mirror means and placed in an optical path of light from said third mirror means at a substantially forty-five degree angle of incidence; and

a heat sink placed behind said first mirror means to absorb light having a wavelength equal to or greater than said eight hundred nanometers passing through said first mirror means.

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**5,044,731**

**LASER TUBE**

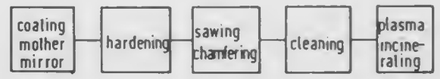
**Hans Krueger, Munich, and Wolfgang Welsch, Baldham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Division of Ser. No. 265,932, Nov. 2, 1988, Pat. No. 4,943,972. This application Feb. 6, 1990, Ser. No. 475,998**

**Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737626**

**Int. Cl.[5] G02B *27/00***

**U.S. Cl. 359—838** **2 Claims**




1. A method for manufacturing mirrors, comprising the steps of:

coating a mother mirror having an area equal to that of a plurality of individual mirrors with a photoresist;

hardening said photoresist;

sawing said mother mirror into said plurality of individual mirrors, including providing cut edges of said individual mirrors with a chamfer;

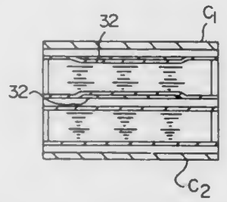
cleaning said individual mirrors; and

removing said photoresist free of residue in a plasma incinerating system.

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5,044,732
## LIQUID-CRYSTAL DISPLAY DEVICE
Naofumi Kimura; Yutaka Ishii, and Shuichi Kozaki, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 23, 1988, Ser. No. 172,044
Claims priority, application Japan, Mar. 23, 1987, 62-69926
Int. Cl.[5] G02F 1/133
U.S. Cl. 359—53 3 Claims




2. A liquid-crystal display device comprising:
a double-layered-type liquid-crystal cell that is composed of a first cell layer and a second cell layer, said cell containing liquid-crystal molecules with a twisted nematic orientation therein and
a voltage-applying means in one of the first and second cell layers,
wherein the angle of twist of the liquid-crystal molecules in the first cell layer is opposite to that of twist of the liquid-crystal molecules in the second cell layer, said angle of twist of the liquid-crystal molecules in each of the first and second cell layers being in the range of 180° to 360°, and the orientation of the liquid-crystal molecules in the first cell layer in the vicinity of the second cell layer is at right angles to that of the liquid-crystal molecules in the second cell layer in the vicinity of the first cell layer, wherein

$$\Delta n_2 d_2 < 0.85 \Delta n_1 d_1,$$

and
wherein the relationship between the pitch p of twist of the liquid-crystal molecules in the cell layer that has the voltage-applying means therein and the thickness d of the liquid-crystal layer in the said cell layer is as follows:

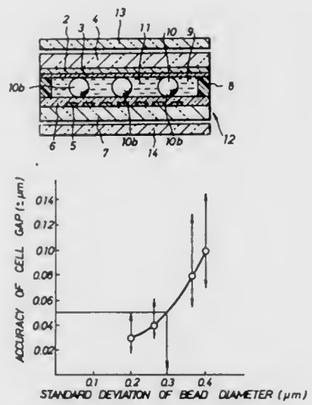
$$\theta/2\pi - \frac{1}{4} < d/p < \theta/2\pi$$

wherein $\theta$ is the angle of twist of the liquid-crystal molecules, and
wherein a color filter layer is disposed in at least one of the first and second cell layers.

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5,044,733
## SUPER TWISTED NEMATIC LIQUID CRYSTAL DISPLAY DEVICE HAVING THE STANDARD DEVIATION OF THE SPHERICAL GRAINS BEING NOT MORE THAN 3% AND THE DISPERSION QUANTITY OF THE SPHERICAL GRAINS BEING 100-200 GRAINS/MM$^2$
Sumio Kamoi, and Yumi Matsuki, both of Kawasaki, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 233,747, Aug. 19, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 489,024
Claims priority, application Japan, Aug. 19, 1987, 62-206987; Sep. 18, 1987, 62-234404; Mar. 23, 1988, 63-68731
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—81 3 Claims

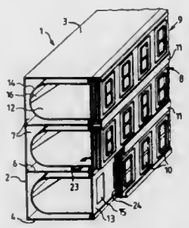
1. A super twisted nematic type liquid crystal display device, comprising:
two of substrates, at least one of which is made of a plastic film;
transparent electrode films disposed on each inner face of the two of said substrates;
a plurality of spacers dispersed between said substrates for maintaining the two of said substrates at a predetermined space, said spacers being of spherical grains, a standard deviation of a distribution with respect to diameters of




said spherical grains being not more than 3.5% of an average diameter of said spherical grains, a dispersion quantity of said spherical grains between said substrates being 100 to 200 grains/mm$^2$; and
a liquid crystal enclosed between said substrates and having a twisted angle of 180° to 270° with respect to liquid crystal molecules thereof.

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5,044,734
## ELECTRO-OPTICAL FLAT-DESIGN DISPLAY DEVICE, IN PARTICULAR LCD AREA
Herbert Sperl; Frank Mössner, and Hartmuth Siefker, all of Berlin, Fed. Rep. of Germany, assignors to Krone Aktiengesellschaft, Berlin, Fed. Rep. of Germany
Filed Dec. 7, 1989, Ser. No. 447,550
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842900
Int. Cl.[5] G02F 1/13; F21V 7/04
U.S. Cl. 359—49 12 Claims



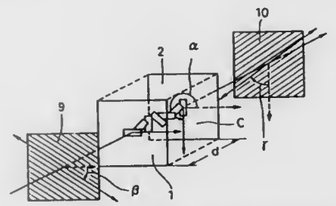
1. An electro-optical flat-design display device, particularly with an LCD display area, comprising: a substantially flat housing having a plurality of rows of display elements forming the front of the housing; a back-lighting device disposed inside said housing and assigned to the rows of display elements, the backlighting device including a light-guide tube for each of said rows of display elements, each said light guide tube being disposed inside the housing, each said light-guide tube being connected to a light-guide transmission tube including a light



entrance opening, each said light-guide tube being formed of transparent material and being surrounded by a reflective material, said reflective material including cutouts defining a light exit opening, each cutout substantially coinciding with individual display elements and a light source positioned adjacent said light entrance opening.

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5,044,735
## LIQUID CRYSTAL DISPLAY DEVICE FOR PROVIDING SUFFICIENTLY HIGH CONTRAST RATIO AND EXCELLENT RESPONSE TIME
Kazuo Asano; Kazuo Arai, and Shinichi Nishi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 935,225, Jan. 26, 1986, abandoned. This application May 25, 1990, Ser. No. 529,745
Claims priority, application Japan, Nov. 29, 1985, 60-267081; Jul. 1, 1986, 61-152663
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—75 11 Claims




1. A liquid crystal display device comprising a liquid crystal layer aligning a liquid crystal material between a pair of substrates, each one of said substrates having an oriented layer, characterized in that the following conditions (a) to (d) are satisfied:
(a) a twisted angle α of liquid crystal molecules in the liquid crystal layer between said pair of substrates is 200° to 300°;
(b) an angle created between a director direction of liquid crystal molecules contacting a surface of at least one of said oriented layers and a substrate surface having said oriented layer is not less than 5°;
(c) the following relationship (1) is valid between a spontaneous twisting pitch Ps of said liquid crystal material and a compulsively twisted pitch Pc of said liquid crystal material when an arrangement of liquid crystal molecules is compulsorily regulated by said oriented layers:

$$0 < (Pc - Ps)/Pc \leqq 0.3 \ldots \quad (1);$$ and

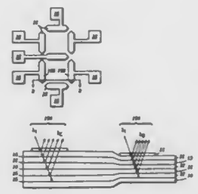
(d) the following relationship (2) is valid between a twisting elastic constant $k_{22}$ and a bending elastic constant $k_{33}$ of the liquid crystal material:

$$1.8 < k_{33}/k_{22} < 2.5 \ldots \quad (2).$$

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5,044,736
## CONFIGURABLE OPTICAL FILTER OR DISPLAY
James E. Jaskie, Scottsdale, and Curtis D. Moyer, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 6, 1990, Ser. No. 609,539
Int. Cl.[5] G02B 26/00, 27/28, 5/30, 27/00
U.S. Cl. 359—291 12 Claims

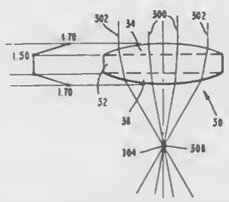
1. An optical display having a plurality of pixels, each pixel comprising: a first transparent electrode; a first layer of resilient transparent material mechanically coupled to the first transparent electrode, wherein the first layer has an index of refraction $n_1$; a second layer of resilient transparent material having an index of refraction $n_2$, wherein the second layer



contacts the first layer to form a reflective interface; and a second electrode mechanically coupled to the second layer.

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5,044,737
## DOUBLE AXIAL GRADIENT LENS AND PROCESS FOR FABRICATION THEREOF
Richard Blankenbecler, Stanford, Calif., assignor to Isotec Partners, Limited, San Jose, Calif.
Filed Jul. 13, 1989, Ser. No. 379,086
Int. Cl.[5] G02B 3/00, 9/02
U.S. Cl. 359—653 19 Claims




1. A double-axial gradient lens comprising a monolithic unit having an optic axis, said unit having three sections perpendicular to said optic axis, a first section having a first graded index of refraction profile and having an outer surface, a middle section having a second index of refraction profile, and a third section having a third graded index of refraction profile and having an outer surface, with said middle section between said first and third sections.

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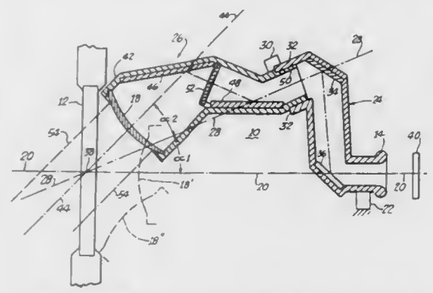
5,044,738
## WIDE ANGLE VIEWING SYSTEM
James E. Shaffer, Maitland, Fla., assignor to Consulier Engineering, Inc., Riviera Beach, Fla.
Filed Dec. 11, 1989, Ser. No. 448,645
Int. Cl.[5] G02B 23/16, 7/00; H01J 3/14
U.S. Cl. 359—504 22 Claims

7. A wide angle viewing system for viewing through a small aperture comprising:
a sensor positioned along a first axis remote from said aperture;
a first offset device having an input port and an output port, said output port having a viewing path along said first axis, said input port having a viewing path along a second axis, said second axis intersecting said first axis at said aperture;
means for rotating said first device about said first axis;
a second offset device having an input port and an output port, said second device output port having a viewing

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path along said second axis, said second device input port having a viewing path along a third axis, said third axis



intersecting said first axis at the same point said second axis intersects said first axis; and

means for rotating said second device about said second axis.

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**5,044,739**

**AUXILIARY EXTERNAL REAR VIEW MIRROR SET FOR A MOTOR VEHICLE**

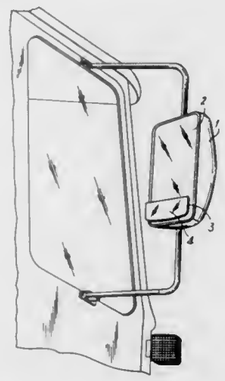
**Antonio F. do Espirito Santo, Sao Paulo, Brazil, assignor to Metagal Industria E Comercio Ltda., Sao Paulo, Brazil**

**Filed Jan. 29, 1991, Ser. No. 647,451**

**Claims priority, application Brazil, May 30, 1990, 9002624**

**Int. Cl.[5] G02B *5/10;* B60R *1/08***

**U.S. Cl. 359—864** **6 Claims**



1. In an auxiliary external rear view mirror set of a motor vehicle, comprising a substantially smooth base mirror, a comparatively smaller auxiliary convex mirror having a convex front face and mounted on a reflective portion of said base mirror which is comparatively smaller than the remaining reflective portion of said base mirror, and means for mounting said auxiliary convex mirror on said base mirror, the improvement wherein said means for mounting said auxiliary convex mirror on said base mirror comprises a support plate fixedly mounted on said base mirror, said support plate having a front face and a central bar projecting from said front face, said central bar having a spherical head, said support plate also having at least one stop piece attached to said front face spaced from said central bar; an adhesive means for mounting said support plate on said base mirror; and a tilting plate having a front side and a rear side, said smaller auxiliary convex mirror being attached to said front side of said tilting plate by another adhesive means and said tilting plate having a central cylindrical projecting member with a cavity on a rear side thereof, said cavity being dimensioned so that said spherical head fits in said cavity, and said tilting plate also having at least one offset member spaced from said central cylindrical projecting member and positioned to be engagable by said stop piece of said support plate; said stop piece, said spherical head and said projecting member being structured so that said smaller convex auxiliary mirror and said tilting plate is tiltable to an extend limited by engagement of said stop piece on said offset member.

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**5,044,740**

**MIRROR ASSEMBLY**

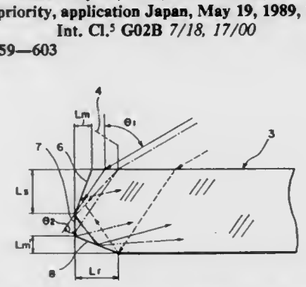
**Morihiko Ogasawara, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusbo, Aichi, Japan**

**Filed May 16, 1990, Ser. No. 524,235**

**Claims priority, application Japan, May 19, 1989, 1-58188[U]**

**Int. Cl.[5] G02B *7/18, 17/00***

**U.S. Cl. 359—603** **3 Claims**



1. A mirror assembly comprising a mirror having a foreside and a backside, a transparent plate and a reflective film formed on the backside thereof, said transparent plate provided with an outer peripheral side face, and a mirror holder having a base plate covering the backside of said mirror and an engaging edge portion formed to extend from a periphery of said base plate and to reach inward of a periphery of the foreside of said mirror, wherein

a ground glass-like chamfer is formed by grinding at each of the fore and back peripheral corners of said mirror within the range of engagement with the engaging edge portion of said mirror holder to form a foreside chamfer and a backside chamfer, respectively,

said foreside chamfer formed in said mirror is so dimensioned that a light ray incident upon said mirror and reflected by said reflective film at its outer periphery toward an outer periphery of said mirror is incident upon said foreside chamfer for preventing glare, and

said backside chamfer formed in said mirror is so dimensioned that a light ray incident upon said mirror and reflected by said outer peripheral side face toward said reflective film side is incident upon said backside chamfer for preventing glare.



**5,044,741**

**EYEGLASSES WITH INTEGRAL REAR VIEW MIRROR**

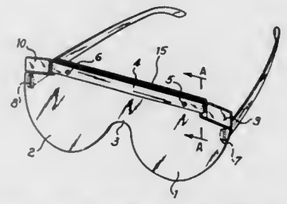
**Giancarlo De Giacomi, Via A. Sforza, 47 - Milano, Italy**

**Filed Feb. 20, 1990, Ser. No. 482,113**

**Claims priority, application Italy, Feb. 21, 1989, 20615/89[U]**

**Int. Cl.[5] G02C *7/14, 9/04***

**U.S. Cl. 351—50** **14 Claims**



1. Eyeglasses with integral rear view mirror wherein an external portion of at least one lens is replaced by a rear view mirror part which is pivotally coupled to the lens and has the same shape and dimension of the replaced portion of the lens.

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**5,044,742**

**CONTACT LENS**

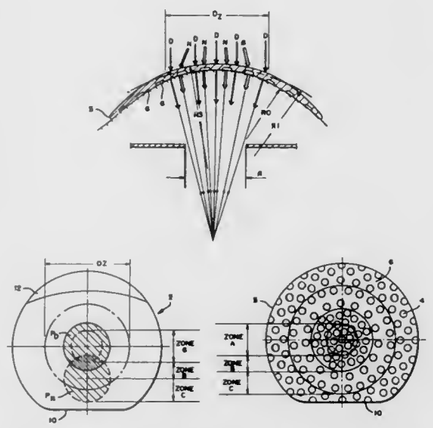
**Amir Cohen, 53 Hatishbi Street, Haifa, Israel**

**Filed Mar. 21, 1989, Ser. No. 326,721**

**Claims priority, application Israel, Mar. 24, 1988, 85860**

**Int. Cl.[5] G02C *7/04***

**U.S. Cl. 351—161** **13 Claims**



1. A contact lens comprising a central, optically active zone and a peripheral, optically nonactive zone, said lens having an anterior surface and a posterior surface, said posterior surface being constituted by the collective surfaces of a plurality of pad-like projections forming together a first, at least partially optically active surface, being the surface making contact with the cornea, said pad-like projections being separated from each other by a system of substantially interconnected recesses leading to the edge of said lens, the collective bottom surfaces of which recesses constitute a second, at least partially optically active surface, said system of recesses serving as reservoir for an increased tear volume and as passageway for increased tear flow, wherein said lens is constituted by a system of first lens elements each defined by said anterior surface on the one hand and the surface of said pad-like projection on the other, and by a system of second lens elements each defined by said anterior surface on the one hand and the bottom surface of said recesses on the other, and wherein, when said recesses are filled with tears, said first and said second lens elements are at least approximately of equal refractive power.

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**5,044,743**

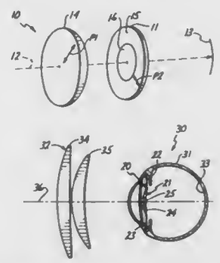
**CORRECTIVE LENS SYSTEM**

**Albert C. Ting, Rancho Santa Margarita, Calif., assignor to Allergan, Inc., Irvine, Calif.**

**Filed Dec. 20, 1988, Ser. No. 287,468**

**Int. Cl.[5] G02C *7/12, 7/04;* G02B *5/30;* A61F *2/16***

**U.S. Cl. 351—163** **26 Claims**



1. A lens system, comprising:

a lens element dimensioned and arranged to be carried on or in an eye;

a polarizer element for placement in the optical path of the eye ahead of the lens element;

the polarizer element being configured to pass polarized light having a first direction of polarization toward the lens element;

the lens element having first and second regions;

the first region having different optical characteristics than the second region;

the first region being polarized and arranged to restrict the passage of polarized light received from said polarizer element; and

the second region passing polarized light received from said polarizer element.

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**5,044,744**

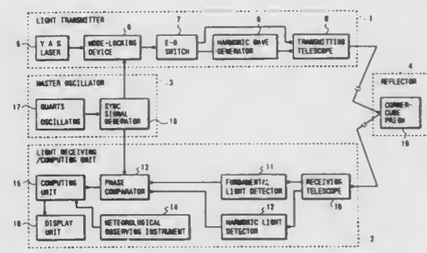
**METHOD AND APPARATUS FOR DISTANCE MEASUREMENT USING ELECTROMAGNETIC WAVES**

**Ichizo Ogawa; Yoshihisa Warashina; Yoshihiko Mizushima; Koji Ichie; Morio Takeichi, and Akira Takeshima, all of Shizuoka, Japan, assignors to Hamamatsu Photonics K. K., Shizuoka, Japan**

**Filed May 29, 1990, Ser. No. 529,617**

**Int. Cl.[5] G01C *3/08***

**U.S. Cl. 356—5** **3 Claims**




1. A method for measuring a length of a path between a

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reference point and a target point using two electromagnetic waves having different wavelengths, comprising the steps of:

measuring respective times $t_1$ and $t_2$ required for a first electromagnetic wave and a second electromagnetic wave to propagate from the reference point to the target point;

measuring meteorological conditions along the path including a temperature, an atmospheric pressure and a relative humidity;

determining respective refractivities $N_1$ and $N_2$ of the path for the first and second electromagnetic waves as:

$$N_1=\alpha_1\cdot\rho_s+\beta_1\cdot\rho_w$$

$$N_2=\alpha_2\cdot\rho_s+\beta_1\cdot\rho_w$$

where $\rho_s$ and $\rho_w$ are densities of dry air and water vapor in the path, respectively, based on the measured meteorological conditions and where $\alpha_1$, $\alpha_2$, $\beta_1$ and $\beta_2$ are wavelength-dependent coefficients; and

calculating the length of the path using a formula of:

$$D=[t_1+\{(\alpha_1+\beta_1\cdot\rho_w/\rho_s)\cdot(t_2-t_1)\}/\{(\alpha_1+\beta_1\cdot\rho_w/\rho_s)-(\alpha_2+\beta_2\cdot\rho_w/\rho_s)\}]\cdot C$$

where C is a speed of an electromagnetic wave in vacuum, or using an approximated expansion of the formula.

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**5,044,745**

**SEMICONDUCTOR OPTICAL SWITCH AND ARRAY OF THE SAME**

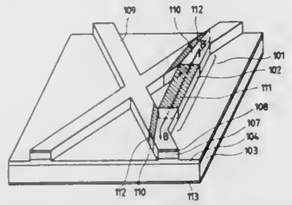
**Hiroaki Inoue, Saitama; Kazuhisa Uomi, Hachioji, and Koji Isbida, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 12, 1990, Ser. No. 464,192**

**Claims priority, application Japan, Jan. 30, 1989, 1-17604**

**Int. Cl.[5] G02F** *1/15*

**U.S. Cl. 385—16** **24 Claims**




1. A semiconductor optical device comprising: a first waveguide for guiding a light wave; a second waveguide for guiding said light wave; light propagation direction changing means disposed between said first and second waveguides to change the direction of propagation of said light wave propagated through said first waveguide; a third waveguide connecting together said first and second waveguides to bypass said light wave from said first waveguide to said second waveguide; and light wave amplifying means provided on said third waveguide to amplify said bypassed light wave propagated through said waveguide.

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**5,044,746**

**APPARATUS FOR MEASUREMENT OF WHEEL ALIGNMENT DATA**

**Karl-Heinz Henseli, Neufahrn, Fed. Rep. of Germany, assignor to A. Rohe GmbH, Schoellkrippen, Fed. Rep. of Germany**

**Filed Feb. 13, 1990, Ser. No. 479,609**

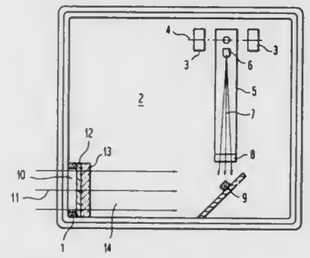
**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1989, 3904557**

**Int. Cl.[5] G01B** *11/275*

**U.S. Cl. 356—155** **18 Claims**

1. A wheel alignment measurement apparatus for measuring wheel alignment data, said apparatus comprising measuring heads mounted on vehicle wheels, each of said measuring heads comprising a means for detecting vertical angles for evaluating camber, castor and king pin inclination and a means for detecting horizontal angles for evaluating track angles, and comprising evaluation means for evaluating said wheel alignment data from said detected vertical and horizontal angles, wherein

said means for detecting said vertical angles comprises a pendulum structure suspended in a manner allowing free movement about a horizontal axle in a vertical plane and




including a radiation source with a vertical beam and a sensor line for said vertical beam,

said means for detecting said horizontal angles comprises an outside radiation source disposed outside of said measuring head and emitting a horizontal beam in a horizontal plane, and a sensor line for said horizontal beam, and

both sensor lines are combined into one sensor line located in an area of intersection of said horizontal plane and said vertical plane for contact-free detection of horizontal and vertical angles.

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**5,044,747**

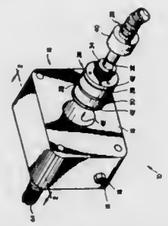
**MODULAR FLOW-THROUGH CELL**

**Michael M. Anthony, Gaithersburg, Md., assignor to LT Industries, Rockville, Md.**

**Filed Mar. 3, 1989, Ser. No. 318,247**

**Int. Cl.[5] G01N** *21/05*

**U.S. Cl. 356—246** **8 Claims**



1. A modular flow-through cell, comprising

(a) a main block member, said main block member having a first fluid passageway extending from an inlet port, a second fluid passageway extending from an outlet and a bore, said first and second fluid passageways being in fluid communication with said bore;

(b) a cartridge assembly removably disposed within said bore, said cartridge assembly having an optical window for receiving light therethrough and having means for altering fluid flow within said cartridge assembly, and wherein fluid entering said inlet port will exit said exit port and will pass in a location to receive light passing through said optical window, whereas said cartridge assembly is removable from said cell without disassembly thereof.



**5,044,748**

**COLLIMATOR GUN SIGHT**

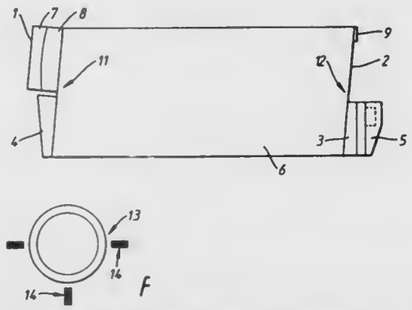
**Fraser Scott, Guildford, and Raymond G. Budden, Havant, both of England, assignors to Ring Sights International Limited, Monrovia, Liberia**

**Filed Apr. 30, 1990, Ser. No. 562,871**

**Claims priority, application United Kingdom, May 4, 1989, 8910204**

**Int. Cl.[5] G02B** *23/10*

**U.S. Cl. 356—251** **7 Claims**




1. A collimator gun sight of the type in which a virtual image of a graticule pattern is made to overlie the view of a target through the sight along a viewing axis of the sight, the sight comprising a single composite graticule pattern having a light trasmissive component and a light reflective component, a source of artificial light located adjacent to the graticule pattern, means to project said artificial light through the light transmissive component of said graticule pattern, and first prism means to direct ambient light from the target zone to the composite graticule pattern to be reflected by the light reflective component thereof, whereby a virtual image of at least a part of the single composite graticule pattern may be viewed under any conditions.

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**5,044,749**

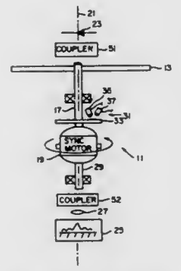
**FIBER-OPTIC BENDER BEAM INTERFEROMETER RATE SENSOR**

**Herbert T. Califano, Bloomingdale, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Filed Jul. 31, 1989, Ser. No. 387,032**

**Int. Cl.[5] G01B** *9/02*

**U.S. Cl. 356—345** **10 Claims**




1. A fiber-optic interferometer rate sensor comprising:

a rate sensor rotatable around a spin axis comprising means for receiving optical energy and for providing a rate sensor optical output representative of rotational rate, wherein said rate sensor comprises one or more bender beam fiber optic transducers.

**5,044,750**

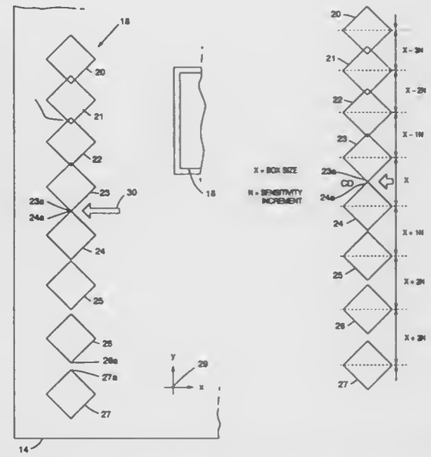
**METHOD FOR CHECKING LITHOGRAPHY CRITICAL DIMENSIONS**

**Edward M. Shamble, Milpitas, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Aug. 13, 1990, Ser. No. 566,561**

**Int. Cl.[5] G01B** *11/00;* **G03C** *5/00;* **G03B** *27/32*

**U.S. Cl. 356—372** **10 Claims**




1. A method for measuring the proper exposure of a desired circuit feature on an integrated circuit wafer, wherein the method of making the integrated circuit feature comprises forming a layer of photoresist on a surface, creating a mask pattern of the desired circuit feature, transferring the mask pattern to the photoresist layer, exposing the photoresist layer using photochemical means and transferring the pattern to the underlying surface, the method comprising:

including a structure in the mask pattern, apart from the desired circuit feature, wherein the structure comprises a plurality of identical geometric patterns arranged in a progressively overlapping edge-to-edge orientation on the mask pattern, the progressive overlap being such that at one end of the structure, there is a substantial separation between the opposing edges of the geometric patterns, in the middle of the structure the opposing edges of the geometric patterns meet, and at the other end of the structure there is a substantial overlap of the opposing edges of the geometric patterns; and

analyzing the degree of exposure of the structure on the photoresist layer, wherein the proper degree of exposure is obtained when the opposing edges of the geometric pattern meet in the middle of the structure, and wherein

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an underexposed or overexposed condition exists when the point at which the opposing edges meet has shifted from the middle of the structure.

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5,044,751

## LIGHT SOURCE FOR AN OPTICAL SENSOR AND OPTICAL MEASURING DEVICE USING SAME

**Christian Singer, Le Cannet, and Guy Cerutti-Maori, Cannes La Bocca, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France**

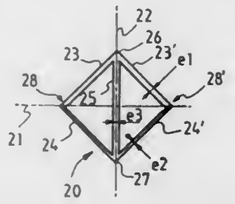
**PCT No. PCT/FR88/00585, § 371 Date Jul. 20, 1989, § 102(e) Date Jul. 20, 1989, PCT Pub. No. WO89/05437, PCT Pub. Date Jun. 15, 1989**

**PCT Filed Nov. 29, 1988, Ser. No. 393,912**

**Claims priority, application France, Nov. 30, 1987, 87 16569**

**Int. Cl.[5] G01B *11/00***

**U.S. Cl. 356—375** **13 Claims**




1. Light source for use in a device for optically sensing the position of a body measured by the relative position or positions of light spots from the source on a linear sensing member, the source being in the form of a plane luminous geometrical figure comprising a curve symmetrical relative to an axis, characterized in that the curve is symmetrical relative to another axis and has at least a first thickness on one side of a first of the two axes and at least a second thickness on the other side of that axis.

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5,044,752

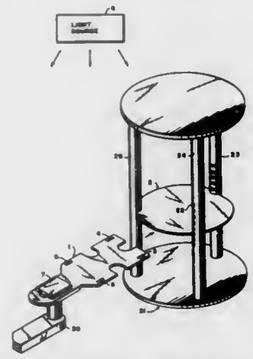
## APPARATUS AND PROCESS FOR POSITIONING WAFERS IN RECEIVING DEVICES

**Henrik Thurfjell, Sunnyvale, and Robert G. Ozarski, Livermore, both of Calif., assignors to General Signal Corporation, Stamford, Conn.**

**Filed Jun. 30, 1989, Ser. No. 374,410**

**Int. Cl.[5] G01B *11/00*; B65B *21/02***

**U.S. Cl. 356—400** **11 Claims**



1. An apparatus for transporting and precisely positioning a semiconductor wafer relative to a receiving device, comprising:

means for holding said wafer and placing it into said receiving device;

a sensor means, comprising at least two spaced sensors disposed on said means for holding, for producing electrical analog signals whose value is dependent on the position of said wafer with respect to the center of said holding means;

means for converting said analog signals to digital signals

a digital processor for processing said digital signals to determine a given position of a wafer; and

means couple to said digital processor for compensating for any misalignment in the position of said wafer with respect to the center of said holding means by correspondingly adjusting the movement of said holding means with respect to said receiving device, thereby to insure the precise positioning of said wafer in an appropriate receiving slot of said receiving device.

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5,044,753

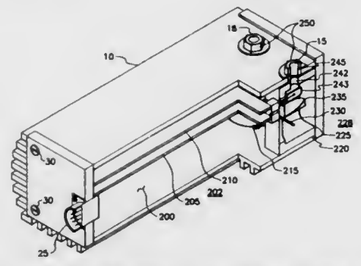
## ENVIRONMENTALLY SEALED COLORIMETER FOR INDUSTRIAL ENVIRONMENTS

**Thomas A. Fletcher, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jun. 21, 1990, Ser. No. 541,552**

**Int. Cl.[5] G01J *3/50***

**U.S. Cl. 356—402** **9 Claims**




1. An environmentally sealed colorimeter for characterizing the color of an object, comprising:

lighting means for illuminating the object;

detector optics means for receiving light from the illuminated object and to produce an object color signature;

data processing means for receiving said object color signature and to compare it with stored color signatures;

an enclosure having an opening therein and light entry and exit ports, said enclosure housing said data processing means and said lighting means;

a heat shield which substantially surrounds said lighting means having a first light port formed therein, said heat shield being comprised of a thermally conductive material and being thermally coupled to said enclosure; and

a cover having sealing means, said cover mountable on said enclosure to seal said opening.

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5,044,754

## APPARATUS AND METHOD FOR USE IN DETERMINING THE OPTICAL TRANSMISSION FACTOR OR DENSITY OF A TRANSLUCENT ELEMENT

**James M. Cicchiello, and Tomi Lahcanski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 20, 1989, Ser. No. 453,530**

**Int. Cl.[5] G01N *21/59*; G01J *1/04***

**U.S. Cl. 356—432** **28 Claims**

1. Apparatus for use in determining the optical transmission factor or density of a translucent element using the cosine-to-the-fourth law, including:

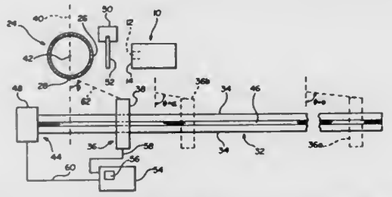


a source of lambertian light of constant color temperature and constant radiance;

means for mounting the element to be tested in position to affect the light from said source;

detector means having an operative face and adapted to provide a signal indicative of the intensity of light incident on the operative face;

track means for mounting the detector means for movement along a rectilinear path, the plane of the operative face of



the detector means being parallel to the rectilinear path, the track means being so disposed relative to the source of light that in one position of the detector means on the track means, light from the source is incident normally on the operative face of the detector means and, at other positions on the track means said light is incident at an angle to the detector operative face; and

means for determining the position of the detector means along the track means.

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5,044,755

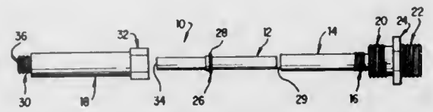
## PROBE FOR TRANSMITTING AND RECEIVING LIGHT FROM A SAMPLE

**Isaac Landa, Potomac; Michael M. Anthony, Gaithersburg, and George E. Toth, Colombia, all of Md., assignors to LT Industries, Rockville, Md.**

**Filed Mar. 3, 1989, Ser. No. 318,245**

**Int. Cl.[5] G01N *21/00***

**U.S. Cl. 356—440** **38 Claims**




1. A probe for use with an optical detection apparatus, comprising:

(a) a sleeve defining a passageway;

(b) an optical barrel having a bore extending along the longitudinal axis thereof, said barrel being at least in part removably inserted within the passageway defined by said sleeve;

(c) a means for transmitting light, said means for transmitting light being at least in part removably inserted within the bore of said optical barrel;

(d) means for introducing light to a sample through said means for transmitting light; and

(e) a seal, said seal being disposed to inhibit the flow of liquid between said means for transmitting light and said optical barrel.

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5,044,756

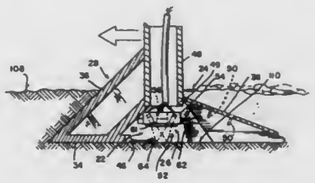
## REAL-TIME SOIL ORGANIC MATTER SENSOR

**Lawrence D. Gaultney; George E. Van Scoyoc; Darrell G. Schulze, all of West Lafayette, Ind., and Jason L. Shonk, Woodridge, Ill., assignors to Purdue Research Foundation, West Lafayette, Ind.**

**Filed Mar. 13, 1989, Ser. No. 325,698**

**Int. Cl.[5] G01N *21/49, 21/84, 33/24***

**U.S. Cl. 356—446** **18 Claims**



1. An apparatus for attachment to a vehicle for sensing the organic matter content of soil at a soil scene, comprising:

a probe having a housing, a light source and a light sensor;

the housing including means for preparing the soil scene to obtain a generally uniform surface before it is observed by the light sensor;

means for mounting the light source and the light sensor in the housing so that light from the light source is directed onto the soil scene and such that the light sensor senses light from the light source that is reflected from the soil scene; and

means for attaching the housing to the vehicle wherein the vehicle moves the probe through the soil and the soil scene against which the light from the light source is directed is beneath the surface of the soil;

the light sensed by the light sensor being indicative of the organic matter content of the soil scene.

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5,044,757

## EXTRUSION DEVICE FOR INCORPORATING ADDITIVES

**Manfred Dienst, Burgdorf, Fed. Rep. of Germany, assignor to Hermann, Berstorff Maschinenbaum GmbH, Hanover, Fed. Rep. of Germany**

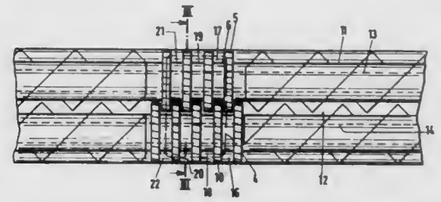
**Filed Dec. 8, 1989, Ser. No. 447,853**

**Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841728**

**The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.**

**Int. Cl.[5] B28C *7/04***

**U.S. Cl. 366—76** **8 Claims**



1. A twin-screw extrusion device for incorporating pulverulent or fibrous additives in a melt of a thermoplastic plastics material comprising:

(a) twin barrels, and a screw shaft mounted for rotation in each barrel, each barrel having an internal wall surface defining a first throughbore into which plastics material is introduced and a second throughbore downstream of said first throughbore,

(b) a screw mounted on each shaft in said first and second

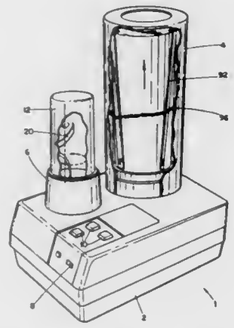
VOL 1130 ISS 1 SE 3 1991 UMI



throughbores, said screw comprising a core and flight means helically disposed about the periphery of said core,
(c) a fist feed aperture for introducing plastics material into said first throughbore,
(d) a second feed aperture downstream of said first feed aperture for introducing a pulverulent additive into the barrels, the core and flight means of each screw being discontinuous in the region of the barrels immediately below said second feed aperture,
(e) an intake and metering zone defined by said first throughbores of said barrels between said first and second feed apertures, said thermoplastic material being fused in said intake and metering zone,
(f) a plurality of alternately mounted disc members and spacer discs on each shaft in the region below said second feed aperture,
(g) each said disc member and spacer disc having first and second opposed major surfaces, said first major surface being downstream of said second major surface,
(h) the first major surfaces of each disc member being formed with conveying profiles by means of which conveyance of the plastics material in a downstream direction is enhanced,
(i) each of said disc members having a major dimension substantially equal to the overall diameter of said screw flight,
(j) each of said spacer members having a major dimension substantially equal to the diameter of said screw core, and wherein,
(k) the thickness of each of said disc members and spacer discs measured from said first major surface to said second major surface lies in the range of 0.1 to 1.5 times the screw diameter.

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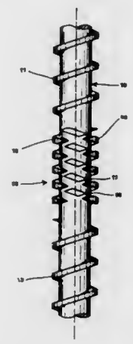
**5,044,758**
**CAULK AND TRANSFER APPARATUS**
**William Kurtz, 30 Elaine Ave., Mill Valley, Calif. 94941**
**Continuation-in-part of Ser. No. 305,074, Feb. 2, 1989, abandoned. This application Mar. 23, 1989, Ser. No. 327,780**
**Int. Cl.[5] B01F** *7/16, 15/02*
**U.S. Cl. 366—77** **11 Claims**



1. A machine for mixing pigment and caulk in a caulk jar having at least one lid and for transferring the mixture to caulk tubes including:
means for engaging the jar and mixing the pigment and caulk therein; and
means for engaging the jar and transferring the mixture to the caulk tubes;
and wherein
the engaging and mixing means includes
a socket for engaging the jar and
means for rotating at least one part of the jar lid; and
the engaging and transferring means includes
a compression tube for engaging the jar and
means for pushing the mixture into caulk tubes.

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**5,044,759**
**MIXING PROCESS AND SCREW EXTRUDERS FOR CARRYING OUT THE SAME**
**Giuseppe Gagliani, Via Ugo La Malfa n, 10126, Palermo, Italy**
**Continuation-in-part of Ser. No. 52,731, May 20, 1987. This application Feb. 21, 1989, Ser. No. 315,241**
**Int. Cl.[5] B01F** *7/08*
**U.S. Cl. 366—88** **4 Claims**

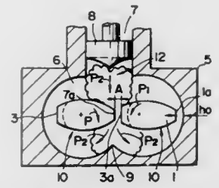


1. An extruder for homogenizing, kneading, dispersing, coloring and mixing a material, comprising a cylinder; and an extruding screw arranged for rotation within said cylinder, said extruding screw having one end threading extending in one direction, another end threading extending also in said one direction, and two mixing threadings located between said one and other end threadings and including a forward threading extending in said one direction, and a counterthreading extending in the opposite direction and intersecting said forward threading, said forward threading and said counterthreading having the same pitch to delimit two helical channels that cross each other at a plurality of free intersections, one of said channels imparting a forward movement to the material while the other channel imparting a return movement to a part of said material to create a backward flow of material which, on meeting the forward flow causes the material from the two crossing helical channels to mix whereby the mixing becomes increasingly thorough as the forward flow of material proceeds, said one threading, said two mixing threadings, and said other end threading having the same diameter.

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**5,044,760**
**CLOSED TYPE KNEADER**
**Toshihiro Asai, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**
**Filed Sep. 8, 1989, Ser. No. 404,752**
**Int. Cl.[5] B01F** *7/04;* **B29B** *7/20*
**U.S. Cl. 366—97** **4 Claims**

1. A closed type kneader comprising:
a casing:
two rotors rotatably mounted in said casing for rotation about parallel axes;
two blades extending from each of said rotors such that the locus of the tip of at least one of said blades of one of said rotors overlaps the locus of the tip of at least one of the blades of the other rotor, said blades of each of said rotors comprising a main blade extending at an angle of torsion along the rotor and an auxiliary blade, a tip of said auxiliary blade having a radius less than that of said main blade and a length not less than one half of the rotor axial length and having an angle of torsion not smaller than 0° in the same direction as the angle of torsion of the main blades; and

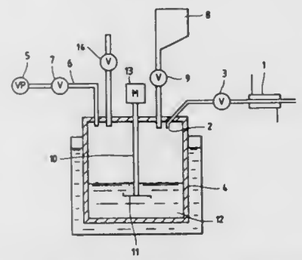


means for rotating said rotors in synchronism such that the main blade tip of each rotor is in phase with the auxiliary blade tip of the other rotor at the axial centers of the rotors.

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**5,044,761**
**DISSOLVING AND DEAERATING METHOD**
**Hirokazu Yuhki; Sadao Kumazawa; Shigeru Yamaguchi, and Hiroshi Ohnishi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Jun. 18, 1990, Ser. No. 539,120**
**Claims priority, application Japan, Jun. 19, 1989, 1-154531**
**Int. Cl.[5] B01D** *19/00*
**U.S. Cl. 366—139** **8 Claims**

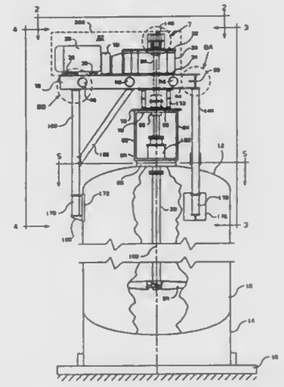


3. A method of deaerating a liquid, comprising the steps of:
supplying the liquid into an air-tight jacketed tank;
reducing a pressure in the tank by commencing a decompression operation and then ending said operation at a later time;
agitating the liquid at a high speed; and
cycling through further decompression operations of the tank in discrete steps for progressively lowering the pressure in the tank, while continuously agitating the liquid at the high speed.

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**5,044,762**
**MIXER APPARATUS FOR HIGH HORSE POWER MIXER APPLICATION WHERE MIXER COMPONENTS OF LARGE WEIGHT AND SIZE ARE SUPPORTED**
**Robert A. Blakley, and Donald G. Schirtz, both of Rochester, N.Y., assignors to General Signal Corporation, Stamford, Conn.**
**Filed Dec. 26, 1990, Ser. No. 633,915**
**Int. Cl.[5] B01F** *7/22*
**U.S. Cl. 366—286** **15 Claims**

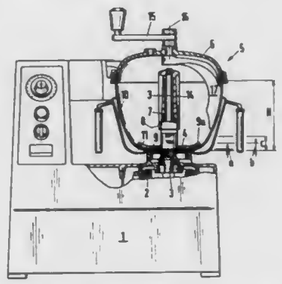
1. Mixer apparatus which is supported by a support structure on a vessel which apparatus comprises an impeller attached to an impeller shaft driven by a motor through a transmission which presents a load on the vessel, the vessel having a side wall, a base resting on a foundation and a top head in which vessel material is mixed by said impeller, which load is greater than the load which top head of said vessel can support without vibration which can cause wobbling of the mixer apparatus and can cause catastrophic damage to the vessel during mixing of said material when the mixer apparatus is totally supported on said top head, said support structure comprising a base on which said motor and transmission are disposed and from which said mixer shaft depends into said vessel and disposes



said impeller therein, a plurality of columns extending vertically in the same direction as said impeller from said base to a plurality of locations spaced from each other around the periphery of said side wall of said vessel, and said legs having ends presenting connections to said side wall of said vessel for distributing said load through said side wall to said foundation.

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**5,044,763**
**MACHINE FOR THE PROCESSING OF FOODSTUFFS OR FOR THE PREPARATION OF PHARMACEUTICAL AND CHEMICAL PRODUCTS**
**Friedrich Otto, Hameln, Fed. Rep. of Germany, assignor to A. Stephan u. Soehne GmbH & Co., Hameln, Fed. Rep. of Germany**
**Filed Nov. 7, 1989, Ser. No. 433,006**
**Claims priority, application Fed. Rep. of Germany, Nov. 7, 1988, 8813901[U]**
**Int. Cl.[5] B01F** *7/22*
**U.S. Cl. 366—309** **13 Claims**



1. A mixing machine, comprising;
a container having a bottom portion and a wall portion which are connected through a radius portion;
means, disposed in said container, for supporting a tool;
means for rotating said support means; and
a plurality of tools supported by said support means and extending radially from a lower end thereof;

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said plurality of tools comprising at least two diametrically opposed mixing fingers of rounded cross-section arranged to resolve in a horizontal plane in the vicinity of the container bottom portion;

said mixing fingers each having a free outer end which is bent upwardly to contour approximately said radius portion;

wherein said plurality of tools further comprise at least two mixing blades, which are arranged above the mixing fingers and offset by 90°; and

said mixing blades being twisted about their longitudinal axes by an acute setting angle so that, in the direction of rotation, the leading edge of the mixing blade is higher than the tailing edge thereof.

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**5,044,764**

## METHOD AND APPARATUS FOR FLUID STATE DETERMINATION

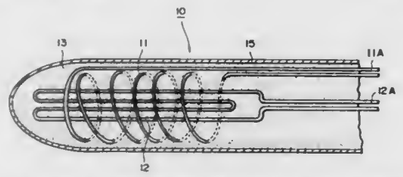
**Kazuichi Aoki, and Yukihiro Saiki, both of Saitama, Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan**

**Filed Mar. 1, 1990, Ser. No. 486,943**

**Claims priority, application Japan, Mar. 8, 1989, 1-55648**

**Int. Cl.[5] G01N *25/02, 25/20;* G01F *23/22***

**U.S. Cl. 374—16** **7 Claims**




1. A sensor for measuring the state of a fluid, comprising:

(a) an elongated outer sheath;

(b) an elongated electrical heating element disposed substantially along the length of and within said sheath for substantially uniformly heating the sheath along the length thereof and for causing heat to be transferred from said sheath along the length thereof to said fluid at a rate responsive to the state of the fluid along the length of the sheath; and

(c) an elongated temperature detecting element spaced from said heating element and disposed within said sheath and either (1) generally around the length of said heating element or (2) generally centrally inside the length of said heating element, for measuring the temperature of the heating element by the resistance induced in the temperature detecting element by heat from said heating element.

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**5,044,765**

## OPTICAL HEAT FLUX GAUGE

**Bruce W. Noel, Espanola, N. Mex.; Henry M. Borella, Santa Barbara, Calif.; Michael R. Cates, Oak Ridge, Tenn.; W. Dale Turley, Santa Barbara, Calif.; Charles D. MacCarthur, Clayton, and Gregory C. Cala, Dayton, both of Ohio, assignors to United States Department of Energy and United States Department of Air Force, Washington, D.C.**

**Division of Ser. No. 362,541, Jun. 7, 1989.**

**This application Aug. 24, 1990, Ser. No. 572,065**

**The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.**

**Int. Cl.[5] G01K *17/00***

**U.S. Cl. 374—29** **6 Claims**

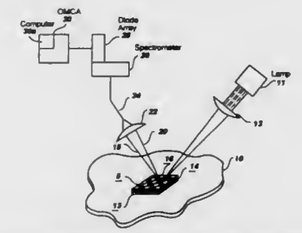
1. An optically interrogated gauge for measuring heat flux incident on a surface comprising:

a first thermographic phosphor in direct contact with said surface;

a second thermographic phosphor overlying and spaced apart from said first thermographic phosphor;

thermal insulating means having a predetermined thickness and thermal conductivity between said first thermographic phosphor and said second thermographic phosphor for thermally isolating said first thermographic phosphor from said second thermographic phosphor;

light means incident on said first and second thermographic phosphors, for producing first luminescence from said first thermographic phosphor and second luminescence from said second thermographic phosphor, wherein said first luminescence and said second luminescence are indicative of the temperatures of said first and second thermographic phosphors;




collecting means for collecting said first and second luminescences; and

computing means connected to said collecting means for determining heat flux on said plurality of points on said surface using numerical differences between said temperatures of said pluralities of first and second thermographic phosphors, and said thickness and thermal conductivity of said thermal insulating means.

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**5,044,766**

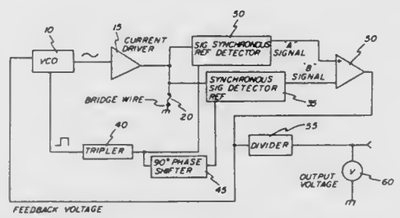
## METHOD AND APPARATUS FOR DETERMINING THE THERMAL TIME CONSTANT OF FINE METAL WIRE SEGMENTS

**James G. Stuart, Mont Clare, Pa., assignor to Calspan Corporation, Buffalo, N.Y.**

**Filed Aug. 3, 1990, Ser. No. 562,174**

**Int. Cl.[5] G01N *25/20***

**U.S. Cl. 374—43** **3 Claims**




2. Apparatus for measuring the thermal time-constant of fine metal wire segments comprising

means for supplying a voltage variable frequency source of current to the wire,

frequency tripler means responsive to the actual frequency output of said frequency source

means for phase shifting the output of said tripler means by 90 degrees,

first and second synchronous detector means sensing the voltage developed across the wire, said first detector means receiving a reference input from said tripler means and said second detector means receiving a reference input from said phase shifting means,

feedback circuit means responsive the outputs of said synchronous detector means for applying a control voltage to said voltage variable frequency source in a direction which tends to make the magnitude of the outputs of said synchronous detector means equal, and

means for displaying value of said control voltage as a function of the thermal time constant of the metal wire.



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**5,044,767**

## DEVICE FOR MEASURING THERMAL PROPERTIES OF A TEST SUBSTANCE-THE TRANSIENT PLANE SOURCE (TPS) METHOD

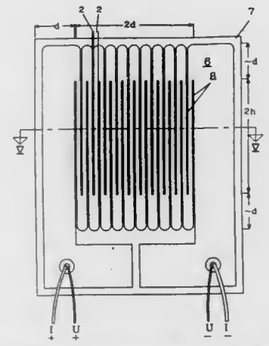
**Silas Gustafsson, Gothenburg, Sweden, assignor to Thermetrol AB, Sweden**

**Continuation-in-part of Ser. No. 411,463, Sep. 19, 1989, abandoned. This application Dec. 6, 1989, Ser. No. 446,935**

**Claims priority, application Sweden, Mar. 16, 1988, 88009436**

**Int. Cl.[5] G01N *25/18***

**U.S. Cl. 374—44** **7 Claims**




1. A device for measuring thermal properties of a test substance, which device incorporates a thin element or a layer of an electrically conductive material, e.g. metal, intended to be brought in heat conductive contact with said test substance, means for passing an electric current through said element or layer for supplying heat to the test substance and causing a temperature increase therein and means for recording the voltage variation over the element or the layer as a function of time and to evaluate therefrom thermal properties, such as thermal conductivity thermal diffusivity and specific heat per unit volume of the test substance, wherein the active part of said element or layer has substantially equal size along at least two lateral dimensions.

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**5,044,768**

## THERMAL ENVIRONMENT SENSOR WITH MEANS TO ESTIMATE THE WIND VELOCITY

**Masahiro Kobayashi; Noboru Kobayashi, and Kazuhisa Shigemori, all of Sakai, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan**

**Continuation of Ser. No. 219,541, filed as PCT JP 87/00661 on Sep. 4, 1987, published as WO 88/01728 on Mar. 10, 1988, abandoned. This application Nov. 9, 1989, Ser. No. 433, 443**

**Int. Cl.[5] G01K *7/00, 1/20***

**U.S. Cl. 374—109** **3 Claims**

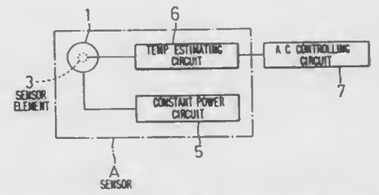
1. A thermal environment sensor, comprising:

a single temperature detector for detecting temperature and producing an output representative of the detected temperature, said temperature detector having, when heated by a predetermined constant power, a convective heat transfer coefficient giving said temperature detector a wind velocity dependent temperature drop characteristic in close conformity with the effective temperature drop felt by a human body due to the wind velocity;

a heating means for heating said temperature detector;

an electric power supplying means connected to said heating means for supplying said heating means with a constant electric power corresponding to said predetermined constant power; and

a temperature estimating circuit connected to said temperature detector for correcting the output of said temperature detector by a predetermined constant temperature difference for thereby obtaining the effective temperature felt by a human body.




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**5,044,769**

## TEMPERATURE SENSORS

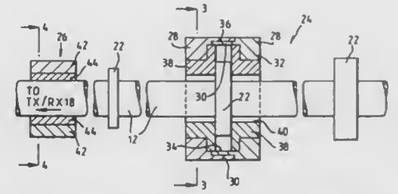
**Konrad Kulczyk, Hertfordshire, and George W. Smith, London, both of England, assignors to Schlumberger Industries Limited, Farnborough, England**

**Filed Jan. 9, 1990, Ser. No. 462,372**

**Claims priority, application United Kingdom, Jan. 14, 1989, 8900815; Jun. 29, 1989, 8914929**

**Int. Cl.[5] G01K *11/22, 11/24, 1/14***

**U.S. Cl. 374—119** **16 Claims**




1. A temperature sensor comprising an elongate ultrasonic waveguide having distributed along its length a plurality of means for partially reflecting ultrasonic pulses launched into one end of the waveguide by an ultrasonic pulse transmitting and receiving means coupled to said one end of said waveguide, and means for mounting the waveguide such that it extends through an area whose temperature is to be monitored, wherein at least some of the reflecting means comprise outwardly projecting portions of the waveguide each having a pair of opposed surfaces extending substantially perpendicular to the longitudinal axis of the waveguide, and the mounting means includes at least one locating means for engaging the opposed surfaces of at least one of these portions so as to substantially prevent longitudinal movement of the parts of the waveguide adjacent said at least one portion.

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**5,044,770**

## THERMOMETER FOR HOT ASPHALTIC CONCRETE APPLICATION

**Cyrus Haghkar, 610 Middleton Pla., Norristown, Pa. 19403**

**Filed Mar. 28, 1990, Ser. No. 500,583**

**Int. Cl.[5] G01K *01/14***

**U.S. Cl. 374—208** **6 Claims**

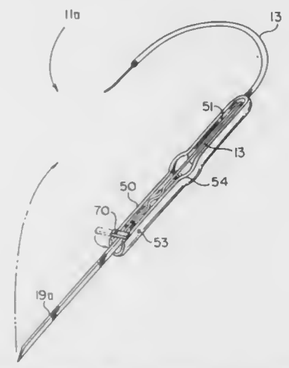
1. An improved thermometer for hot asphaltic concrete application comprising:

(a) a housing, said housing having a first portion containing a thermometer body and a spool assembly for storing a cable and a second portion having a slot therein for removably storing a temperature sensing probe;

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(b) a temperature sensing probe, said temperature sensing probe further comprising a housing having a slot therein and an extendable sensing portion pivotally connected to an end portion of said housing, and whereby said extendable sensing portion may pivot between a retracted position within said housing when said thermometer is not in use and an extended position when said thermometer is being used to facilitate measuring temperatures of hot asphaltic concrete at increased depths; and




(c) a cable connecting said thermometer body and said temperature sensing probe, said cable being adapted to transmit a sensed temperature from said temperature sensing probe to said thermometer body for indication of said sensed temperature;

(d) whereby said spool assembly facilitates extension and retraction of said cable.

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**5,044,771**

**LOCKING MECHANISM FOR PYROMETERS**

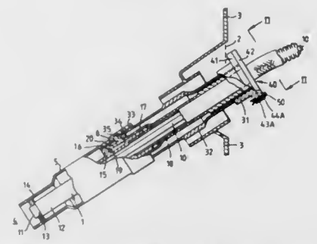
**Ronald A. Masom, Southampton, England, assignor to Smiths Industries Public Limited Company, London, England**

**Filed Sep. 26, 1990, Ser. No. 588,551**

**Claims priority, application United Kingdom, Oct. 17, 1989, 8923326**

**Int. Cl.[5] G01K *1/14***

**U.S. Cl. 374—208** **2 Claims**



1. A pyrometer for mounting with a screw-threaded sleeve, the pyrometer comprising a body portion, the body portion including temperature-responsive means; and a lock nut, the lock nut being rotatable relative to the body portion, the lock nut being screw-threaded for engagement with the sleeve, the body portion being shaped to engage with the sleeve to prevent rotation of the body portion relative to the sleeve, wherein the lock nut and body portion both have a plurality of surface formations, wherein the surface formations of both the lock nut and body portion are spaced apart from one another in respective circles around an axis of rotation of the lock nut relative to the body portion, wherein the spacing of the surface formations of the body portion differs from that of the surface formations on the lock nut such that different ones of the surface formations of the lock nut will align with different ones of the surface formations of the body portion at different rotational positions, and wherein the pyrometer includes means for locking aligned surface formations with one another, such that the lock nut and body portion can be locked in a number of different rotational positions that exceeds the number of surface formations of the lock nut or body portion and such that when the lock nut is locked with the body portion the pyrometer is locked with the sleeve.

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**5,044,772**

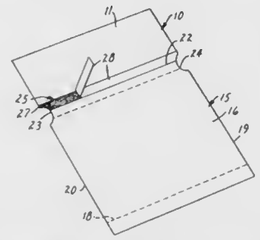
**FLEXIBLE BAG WITH SUPPORTING AND SEALING TAPE**

**Curtis L. Larson, Hudson, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Apr. 28, 1987, Ser. No. 43,488**

**Int. Cl.[5] B65D *27/14, 33/18***

**U.S. Cl. 383—11** **3 Claims**



1. A bag comprisign a back panel having a front surface and a rear surface, a front panel having a front surface and a rear surface, the back panel and the front panel beign joined to form the bottom and sides of the bag, a strip of pressure-sensitive adhesive tape having a backing and an adhesive coated surface, said strip of pressure-sensitive adhesive tape being adhered to the rear surface of the front panel, and a line of weakening extending between side edges of said front panel for dividing said front panel into an upper portion that covers an upper portion of the adhesive coated surface of said strip of pressure-sensitive adhesive tape and a lower portion adhered to the remaining portion of the adhesive coated surface of said strip of pressuer-sensitive adhesive tape, and for permitting separation and removal of said upper portion of said front panel from said bag.

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**5,044,773**

**CONTAINER FOR RECEIVING AND HOLDING AN OBJECT INCLUDING SUPPORT MEMBER THEREFOR**

**William Harms, Park Ridge; James Howell, Sr., Woodcliff Lake, and Richard Cypranowski, Fair Lawn, all of N.J., assignors to Berwick Industries Inc., Paramus, N.J.**

**Filed Apr. 18, 1990, Ser. No. 510,780**

**Int. Cl.[5] B65D *3/28***

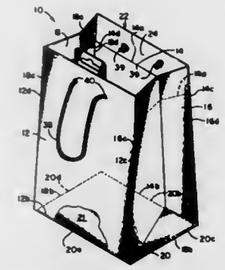
**U.S. Cl. 383—22** **5 Claims**

1. A container for receiving and holding an object comprising:

generally parallel front and rear panels each having generally parallel top and bottom edges and generally parallel lateral edges;

a pair of generally parallel side panels each having generally parallel top and bottom edges and generally parallel lateral edges;

a bottom panel having two pairs of generally parallel edges, the lateral edges of the front and rear panels being joined to the lateral edges of the side panels and the bottom edges of the front, rear and side panels being joined to the edges of the bottom panel to form a container having an open top, the top edges of the front, rear and side panels being folded toward the bottom panel to form a reinforcing cuff of a predetermined width proximate the open top of the container;



a support member comprised of a first portion installed within the cuff and a second portion extending from the first portion out of the cuff and beyond the top of the container, the second portion including means for receiving a supporting member for supporting the container in a hanging condition.



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**5,044,774**

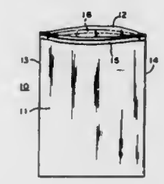
**HOLD-OPEN BAG TOP**

**Edward M. Bullard, East Rochester, N.Y.; Stephen K. Guerrera, Milford, Mass.; Fox J. Herrington, Holcomb, and Ivy Wolpin, Rochester, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Continuation of Ser. No. 375,173, Jul. 3, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 599,268**

**Int. Cl.[5] B65D *33/02***

**U.S. Cl. 383—34.1** **5 Claims**



1. A thermoplastic bag having a hold-open top comprising two panels forming an open top, closed bottom bag, said panels being joined along the sides of said bag, and a pair of narrow strips of stiff material extending along the open top of said bag, one of said strips being attached to a surface of one of said panels, the other of said strips being attached to a surface of the other of said panels and both of said strips being attached to each other in face-to-face relation at the respective ends thereof, said pair of strips having the characteristic of being flexible throughout their length and a width to thickness ratio whereby when the top of the bag is rolled outward, the pair of attached strips bend and turn inside out so as to hold open the mouth of the bag; each of said strips having hinge structure intermediate the ends thereof at one-third points across its length to divide said strips into a center section and two end sections to permit folding of the bag for packing by folding the end sections over against the center section.

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**5,044,775**

**PLASTIC FILM BAG WITH INTEGRAL PLASTIC FILM TIE ELEMENT, AND ASSOCIATED FABRICATION METHODS**

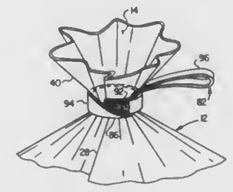
**Gary L. Rutledge, Dallas, Tex., assignor to John C. Marrelli, Tustin, Calif.**

**Continuation of Ser. No. 321,719, Mar. 16, 1989, Pat. No. 4,948,268, which is a division of Ser. No. 117,209, Nov. 4, 1987, Pat. No. 4,854,735. This application May 15, 1990, Ser. No. 524,368**

**The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.**

**Int. Cl.[5] B65D *33/28***

**U.S. Cl. 383—72** **4 Claims**



1. A plastic film bag comprising:

an open upper end;

a closed lower end;

a side edge portion extending between said upper and lower ends;

an elongated flexible bag tie element having first and second opposite end portions,

said bag tie element being a looped strip of plastic film material having opposite first and second outer end portions which collectively define said first end portion of said bag tie element, and a longitudinally central portion which defines said second end portion of said bag tie element; and

means for securing said first end portion of said bag tie element to said side edge portion of the bag, downwardly apart from said upper end of the bag, with sufficient strength to permit said second end portion of said bag tie element to be passed around an upper end portion of the bag to form a loop therearound, passed through the loop, and then firmly pulled to tighten the loop and close the bag without separating said first end portion of said bag tie element from said side edge portion of the bag,

said bag tie element having a sufficient limpness and deformability to cause the tightened loop to frictionally engage the bag and hold it closed when said second end portion of said bag tie element is released.

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**5,044,776**

**RESEALABLE CLOSURE SYSTEM**

**Kurt M. Schramer, Stow, and K. Randy Snavely, Greensburg, both of Ohio, assignors to Morgan Adhesives Company, Stow, Ohio**

**Filed Apr. 27, 1990, Ser. No. 515,599**

**Int. Cl.[5] B65D *33/20***

**U.S. Cl. 383—89** **22 Claims**

21. A method of repeatedly closing a flexible product bag having at least one open end and comprising the steps of:

affixing at least one resealable closure system to said non rigid product bag, said resealable closure system comprising an elongated carrier strip having a first and a second surface, said first surface having an adhesive layer having a first adhesion strength disposed on at least a portion thereon such that said first surface is permanently affixed to said non rigid product bag, said second surface having an adhesive layer having a second adhesion strength disposed on at least a portion thereof for application to a mounting surface, said second adhesion strength being less

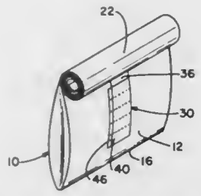
VOL 1130 ISS 1 SE 3 1991 UMI



than said first adhesion strength, a release liner dimensioned at least equal to the carrier strip and contacting said second surface of said strip with a controlled adhesive bond, said release liner comprising a means for defining a plurality of release liner segments;

expelling at least a substantial portion of air from said bag through said open end;

substantially closing said open end of said non rigid product bag;




folding said open end of said product bag upon itself repeatedly to reduce a void space on the inside of said bag;

removing at least one release liner segment from said second surface of said resealable closure strip, thereby activating the non-permanent adhesive;

attaching said open end to said activated non-permanent adhesive on said second surface of each resealable closure system to thereby maintain the substantially closed position of said open end of said product bag.

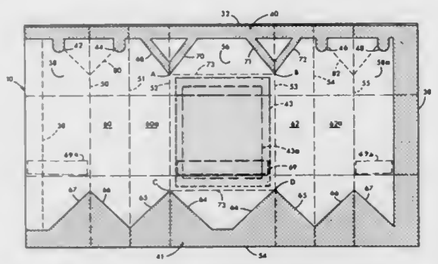
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**5,044,777**

## FLAT-FACED PACKAGE FOR IMPROVING THE MICROWAVE POPPING OF CORN

**Jeffrey T. Watkins, Bloomington, and Lawrence C. Brandberg, Edina, both of Minn., assignors to Golden Valley Microwave Foods Inc., Edina, Minn.**

**Filed Oct. 26, 1990, Ser. No. 604,759**
**Int. Cl.[5] B65D *81/34***
**U.S. Cl. 383—100** **5 Claims**



1. A bag for popping popcorn in a microwave oven comprising, a pair of upper and lower rectangular face panels having parallel top and bottom edges defining the top and bottom of the bag and each face panel having parallel side edges at right angles thereto, left and right longitudinally extending centrally projecting gusset folds extending between the upper and lower panels of the bag, the gussets separating the bag into a pair of communicating chambers, seals having diagonal edges at both the top and bottom of the bag between the gussets and at least the lower face panel, the diagonal seals having edges extending diagonally from the side edge of the lower face panel proceeding centrally and toward the adjacent end of the bag, the bottom end of the bag being pinched shut transversely all the way across to provide a permanent fin seal at the bottom end of the bag, the diagonal seals at the top of the bag between the gusset folds and the lower face of the bag being constructed and arranged to provide free-standing outwardly projecting triangular flaps with diagonally extending sealed edges that terminate near the center of the bag at two spaced apart points, the space between said two points at the ends of the flaps defining a steam vent area of the bag that opens under the influence of internal pressure during cooking, the outer ends of the diagonal seals intersecting the lower face panel at four points A, B, C and D such that the triangular flaps define the top edge of a rectangular lower face area determined by points A, B, C, D containing a microwave interactive susceptor that remains relatively flat during popping of the popcorn in a microwave oven to provide a relatively large and flat supporting panel to enhance popping of the corn.

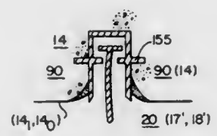
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**5,044,778**

## LINEAR BARRIER FOR SEPTIC TANKS

**Alan G. Hines, Exeter, Canada, assignor to Red Line Products, Seaforth, Canada**

**Filed Dec. 7, 1987, Ser. No. 129,789**
**Claims priority, application Canada, Nov. 30, 1987, 553402**
**Int. Cl.[5] F16C *29/00***
**U.S. Cl. 384—7** **11 Claims**




1. A longitudinal track defining a race, for use in a sewerage disposal system comprising:

(a) a longitudinally partitioned channel defined by a longitudinal base member being integral to opposite longitudinal margins disposing opposite sides so that the base and the opposite sides define a longitudinal race therebetween;

(b) each side projecting forward to a frontal margin defining a longitudinal crease and terminating in a flat traversely oriented frontal flange with flange each having a respective longitudinal distal margin in relatively closer proximity defining a frontal narrow longitudinal gap therebetween;

(c) the inner surface of each side extends as an interiorly mounted flange toward the other side to define an inner marginal edge of each inner flange in proximaty closer to each other than to the interior distance between each side and hence to define an interior longitudinal gap that partition in the longitudinal direction the interior of the track into a forward plenum and a rearward plenum that communicate with each other through the interior longitudinal gap and with outside by the frontal longitudinal gap.

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**5,044,779**

## LINEAR BALL BUSH

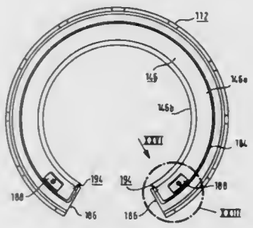
**Ernst Albert, Sand/Main; German Dütsch, Schweinfurt, and Rainer Höfling, Arnstein, all of Fed. Rep. of Germany, assignors to Deutsche Star GmbH, Schweinfurt, Fed. Rep. of Germany**

**Filed Mar. 27, 1990, Ser. No. 499,898**
**Claims priority, application Fed. Rep. of Germany, Mar. 31, 1989, 3910457**
**Int. Cl.[5] F16C *29/08, 29/06***
**U.S. Cl. 384—15** **22 Claims**

1. Linear ball bush of part-annular form, comprising a cage with a cage axis having a plurality of ball circuits and a longitudinal gap defined by longitudinal faces (**186**), where each ball circuit comprises two substantially straight ball rows substantially parallel to the cage axis, namely a carrier ball row and a return ball row, and two curved ball rows connecting the two straight ball rows, where the respective carrier ball row is



radially outwardly supported by a carrying straight track section and radially inwardly partially penetrates a slot of the cage, in order to be able to abut on a shaft partially enclosed by the cage, and part-annular seals (**146**) are provided for abutment on the shaft, close to the axially directed ends of the cage,




said part-annular seals (**146**) being secured against rotation about the cage axis by circumferentially opposite abutment faces (**184c, 189; 188, 190**) integral with the cage (**112**) and the respective part-annular seal (**146**), said part-annular seals (**146**) being radially movable over their entire circumferential extent in relation to the cage axis.

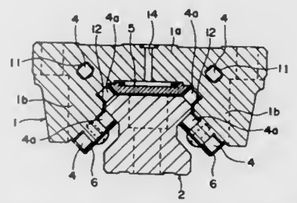
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**5,044,780**

## LINEAR SLIDING BEARING AND LINEAR SLIDING TABLE

**Hiroshi Teramachi, Tokyo, Japan, assignor to THK Co, Ltd., Tokyo, Japan**

**PCT No. PCT/JP89/00828, § 371 Date Apr. 3, 1990, § 102(e) Date Apr. 3, 1990, PCT Pub. No. WO90/02270, PCT Pub. Date Mar. 8, 1990**
**PCT Filed Aug. 15, 1989, Ser. No. 469,464**
**Claims priority, application Japan, Aug. 16, 1988, 63-202666**
**Int. Cl.[5] F16C *29/06***
**U.S. Cl. 384—44** **6 Claims**




1. A linear sliding bearing comprising: a track base having axial roller races and fixed to a machine apparatus; a sliding bed formed with endless tracks, which have load regions having load races facing said roller races and no-load regions for effecting the communicating connections between the two ends of said load regions, and made movable along said track base; and a multiplicity of rollers circulating in said endless tracks for bearing the load between the load races of said sliding bed and the races of said track base, wherein the improvement resides in that said sliding bed includes: side walls extending along one-end sides of said load races for regulating the axial movements of load rollers rolling on said load races; and pressure means for pressing the one-end sides of said load rollers in the axial direction and the other sides onto said side walls.

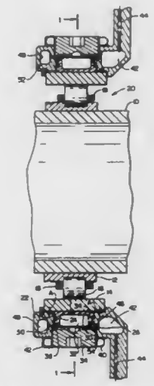
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**5,044,781**

## SPRING SUPPORTED DAMPING SYSTEM

**Malcolm J. Werner, Minden, Nebr., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Jul. 26, 1990, Ser. No. 560,984**
**Int. Cl.[5] F16C *39/04***
**U.S. Cl. 384—99** **13 Claims**



1. Damper means for a bearing supporting a rotating shaft comprising wall means defining a plurality of radially extending cylindrically shaped chambers circumferentially disposed around said bearing, each chamber having a reciprocal piston having one end bearing against the outer race of said bearing, spring means disposed in said chamber bearing against one end of said reciprocal piston for urging said piston toward said outer race, a portion in each of said chambers defining a sub-chamber for receiving fluid, means including a restriction for flowing fluid out of said sub-chamber when said reciprocal piston is urged by said outer race in a direction away from said outer race and a fluid inlet into said sub-chamber having an opening larger than said restriction to maintain the pressure of the fluid in said sub-chamber at a predetermined value.

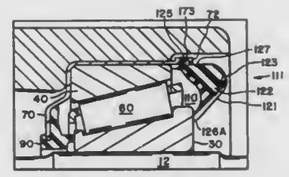
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**5,044,782**

## SEALED TAPERED ROLLER BEARING ASSEMBLY FOR AIRCRAFT WHEEL BEARING SYSTEM

**Richard B. Jankowski, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.**

**Filed Sep. 14, 1990, Ser. No. 582,722**
**Int. Cl.[5] F16C *33/78***
**U.S. Cl. 384—482** **15 Claims**




1. A bearing assembly, comprising an annular inner race, an annular outer race having an inside diameter greater than an outside diameter of the annular inner race to provide an inner race-outer race annular space, bearing rollers disposed within said space, retaining means spacing said rollers apart from one another, the space having a first diameter at a first axial end which is smaller than a second diameter at a second axial end, and lubricant sealing means disposed about said first and sec-

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ond axial ends, the lubricant sealing means comprising a positioning ring having a first end member disposed over said first axial end and extending to a radial surface of said outer race, the first end member comprising a dam seal extending between the inner race and said ring in order to define a lubricant dam area at said first axial end, the ring formed over said outer race to form a radial portion extending into an axial portion each of which conforms with the shape of and engages said outer race, the axial portion having an axial extension extending axially at said second axial end, and a second end member of the ring comprising a composite seal member extending between said axial extension and said inner race to define a lubricant seal area about said second axial end.

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**5,044,783**

## POCKET SURFACE FOR SEPARATOR FOR BALL BEARINGS

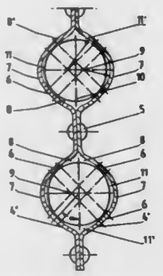
**Wilfried Willner, Grafenrheinfeld, Fed. Rep. of Germany, assignor to FAG Kugelfischer George Schafer (KGaA), Fed. Rep. of Germany**

**Filed Feb. 23, 1990, Ser. No. 484,393**

**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1989, 3939438**

**Int. Cl.[5] F16C** *33/38*

**U.S. Cl. 384—523** **17 Claims**



1. A separator for ball bearings, wherein the bearing includes balls, each ball having poles which define the axis about which the ball rotates and each ball having an equator perpendicular to the ball rotation axis and in a plane through the center of the ball;

the separator comprising:

a plurality of bearing ball pockets arrayed around the separator; each pocket being defined by a pocket surface which faces the ball within the pocket in a pitch circle around the ball, the pocket surface guiding the ball for enabling the ball to rotate in the pocket;

the separator having a thickness dimension in the radial direction of the bearing;

each pocket surface including: first pocket surface sections which are at least approximately uncurved along the thickness dimension of the separator and around an axis across the respective pitch circle, and the first pocket surface sections being spaced a relatively smaller distance from the surface of the ball in the pocket; and

second pocket surface sections adjoining the first pocket surface sections, around the pitch circle of the pocket surface, at both sides of the first pocket surface sections, the second pocket surface sections being spaced a relatively larger distance from the surface of the ball in the pocket;

the distance of each second pocket surface section from the ball in the respective pocket becomes progressively larger gradually moving away from the adjoining first pocket surface section around the pocket surface.

**5,044,784**

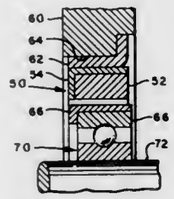
## BEARING ISOLATOR

**Bohdan Lisowsky, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jul. 31, 1990, Ser. No. 560,917**

**Int. Cl.[5] F16C** *27/00*

**U.S. Cl. 384—536** **10 Claims**




1. An isolator for use with a bearing for journalling a shaft on a mounting structure comprising: (a) an inner ring and an outer ring disposed concentrically and formed of rigid material, said inner ring adapted to have the outer race of said bearing secured thereto said outer ring adapted for attachment to said mounting structure; (b) an energy-absorbing ring formed of material concentrically disposed radially intermediate said inner and outer rings, said energy-absorbing ring formed of non-metallic material; and, (c) a ring member axially adjacent said energy-absorbing ring and having integrally therewith means defining a first plurality of circumferentially spaced spokes extending between said outer ring and said energy-absorbing ring and means defining a second plurality of circumferentially spaced spokes extending between said energy-absorbing ring and said inner ring, said first and second plurality of spokes circumferentially staggered with respect to each other.

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**5,044,785**

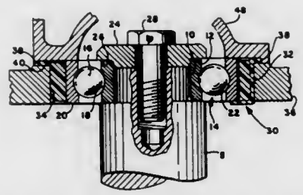
## BEARING ISOLATOR

**John J. Bair, Union Lake, Mich.; Edward J. Bantz, Grafton, Wis., and Gerald D. Damon, Farmington, Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Jun. 18, 1990, Ser. No. 539,118**

**Int. Cl.[5] F16C** *27/06*

**U.S. Cl. 384—536** **20 Claims**



1. A bearing isolator assembly for mounting a bearing of the type comprising an radially inner race, a radially outer race and a plurality of roller member to a housing having an aperture defining an inner diameter surface for receipt of said bearings, said outer bearing race defining an axially outwardly facing surface and an outer diameter surface, said bearing isolator assembly comprising:

(a) integrally formed annular member formed of non-metallic material disposed about said housing aperture inner diameter in closely fitting arrangement, said annular member having integrally formed thereon,

(i) inner flange means extending radially inwardly and operable to limit axial movement of said outer race in at least one axial direction,

(ii) a plurality of dampening pads disposed about the inner periphery of said member in circumferentially spaced arrangement, with the radially inner surface of said pads contacting the said outer race in at least line-to-line interference relationship; and,

(iii) a plurality of stop means disposed about the inner periphery of said member in circumferentially spaced arrangement with the radially inner surface of each of said stop means spaced from the outer periphery of said outer race by a predetermined distance, wherein radial movement of said outer race with respect to said housing is absorbed by radial compression of said dampening pads and limited to said predetermined distance by contact with said stop means.



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**5,044,786**

## BEARING ARRANGEMENT FOR A ROTARY DRUM

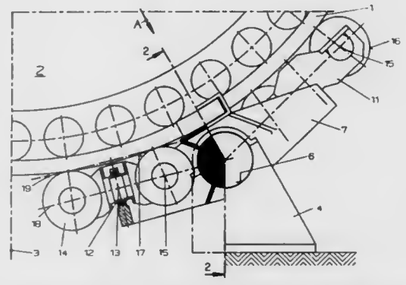
**Werner Jacob, Frankfurt, and Martin Schepp, Schweinfurt, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany**

**Filed Nov. 30, 1990, Ser. No. 620,155**

**Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940446**

**Int. Cl.[5] F16C** *13/06;* **F26B** *11/02;* **D06F** *58/06*

**U.S. Cl. 384—549** **10 Claims**



1. In a bearing arrangement for supporting an axially extending rotary drum, wherein both ends of a first load carrying roller rolling on a bearing surface of a race of the rotary drum are supported in a cradle, and wherein the cradle is supported in a pivot bearing by an intermediate cradle that is in turn supported by at least one load bearing structure to rotate around the axis of a journal bearing, the improvement comprising:

a second load carrying roller rolling on said surface of said race and circumferentially spaced from said first roller, both ends of said second roller being supported in said cradle

means for supporting said load-carrying rollers on their rotational axes to be free of slanting and without axial clearance around the respective end of the cradle,

said pivot bearing comprising means for supporting said cradle without bearing clearance in a self-aligning bearing with a pivot point located between the two load carrying rollers at the end of the intermediate cradle, and

means for supporting the intermediate cradle in the journal bearing with an axial clearance of the same size or larger than the clearance of the axial bearing arrangement of the load-carrying rollers in the load bearing structure which occurs during the operation of the rotary drum.

**5,044,787**

## SLIT CAGE, PARTICULARLY FOR NEEDLE BEARINGS

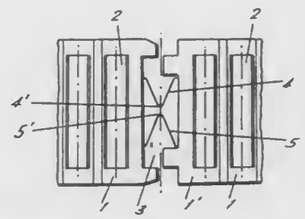
**Georg Hupfer, Erlangen; Johann Vitzthum, Altforf, and Roland Tischer, Dittelbrunn, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany**

**Continuation of Ser. No. 255,623, Oct. 11, 1988, abandoned. This application Jan. 8, 1990, Ser. No. 463,928**

**Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 8715732**

**Int. Cl.[5] F16C** *33/46*

**U.S. Cl. 384—572** **6 Claims**



1. A bearing cage, comprising:

an annular ring having a circumference, an axis, pockets defined around said circumference for receiving bearings, and spaced-apart opposed ends, said ring being resilient so that said opposed ends may be resiliently moved further apart from each other and toward each other in a circumferential direction to prevent ripples; and

uninterrupted connecting elements each of which is connected to each of said ends of said ring so as to prevent relative axial movement of said ends of said ring, each of said connecting elements being in the form of an elastic arm so as to permit the resilient movement of said opposed ends in the circumferential direction.

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**5,044,788**

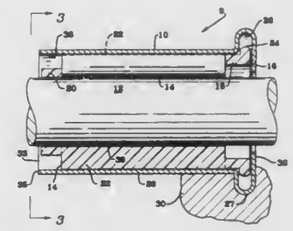
## GROOVED MOUNTING FOR BEARING SEPARATOR

**Richard F. Murphy, and Steven C. Santelman, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.**

**Filed Jun. 25, 1990, Ser. No. 542,888**

**Int. Cl.[5] F16C** *33/16*

**U.S. Cl. 384—577** **11 Claims**



1. A bearing apparatus to be inserted into a first tubular race having a retainer formed therein, the bearing apparatus comprising:

a separator comprising a first and a second annular rim spaced from each other to define two axial ends of the separator, the two annular rims are connected to each other by a plurality of separator bars which are spaced about a periphery of said first and second annular rims, a plurality of rolling elements of a uniform diameter being interspaced between the plurality of separator bars, the

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first annular rim being displaceable between a first diameter and a second diameter; and

a radially outword extending annular projection affixed to the first annular rim, a slot extends through the first annular rim and the annular projection permitting circumferential contraction of the first annular rim to the first diameter from the second diameter during relative axial displacement between the separator and the first tubular race, and when the first annular rim is of the second diameter, the annular projection engages the retainer limiting relative axial displacement between the separator and the first tubular race, the radial cross-section of the first annular rim remaining substantially circular during circumferential contraction.

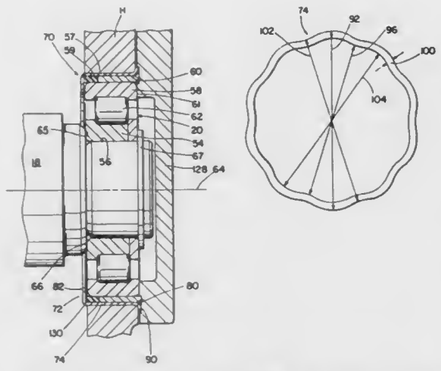
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**5,044,789**

## ROLLER AND BALL BEARING BEARING ISOLATOR

**Gerald D. Damon, Farmington; John J. Bair, Union Lake, and Eugene R. Braun, Royal Oak, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Apr. 16, 1990, Ser. No. 509,395**
**Int. Cl.[5] F16C *27/04***
**U.S. Cl. 384—581** **14 Claims**



1. A bearing isolator assembly (**70**) for mounting a bearing (**20**) of the type comprising a radially inner race (**54**), a radially outer race (**58**) and a plurality of rotating members (**62**) to a housing (**H**) having an aperture (**60**) defining an inner diameter surface (**57**) for receipt of a bearing, said outer bearing race defining an outer diameter surface (**59**), said bearing isolator assembly comprising:

a generally tubularly shaped radial wave spring (**74**) telescopically received on at least a portion of said outer bearing race outer diameter surface and radially interposed said outer diameter surface and the inner diameter surface of said aperture; and

a retaining member (**72**), said retaining member comprising a generally tubular shaped intermediate portion (**84**) having an inner diameter (**94**) generally equal to the largest outer diameter (**92**) of said radial wave spring, and an outer diameter (**86**) generally equal to the inner diameter of said aperture (**60**) in said housing, a radially outwardly extending flanged portion (**80**) at the axially outer end thereof and a radially inwardly extending flanged portion (**82**) at the axially inward end thereof, said radially inwardly extending flanged portion (**82**) having an inner diameter (**98**) smaller than the outer diameter (**59**) of said bearing (**20**).

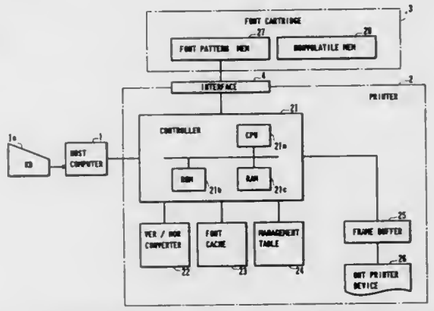
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**5,044,790**

## PRINTING APPARATUS

**Yoshiaki Kawamura, Narashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 346,643, May 3, 1989, abandoned. This application Oct. 31, 1989, Ser. No. 430,057**
**Claims priority, application Japan, May 10, 1988, 63-111496; May 28, 1988, 63-129480**
**Int. Cl.[5] B41J *11/44***
**U.S. Cl. 400—76** **8 Claims**




1. A printing apparatus having a font pattern memory to store portrait font patterns and pattern converting means for converting the portrait font pattern which is read out of said font pattern memory into a landscape font pattern, in which both a portrait printing process and a landscape printing process are executed, said printing apparatus comprising:

a frequency information memory to store print frequency information of each of the portrait font patterns;

managing means for updating and managing the print frequency information to be stored into said frequency information memory in parallel with a printing process;

a landscape memory for storing a predetermined number of landscape font patterns which are converted by said pattern converting means on the basis of the print frequency information which is updated and managed by said managing means in a manner such that said landscape font patterns can be updated; and

landscape font pattern generation control means for determining whether a landscape font pattern corresponding to input print information is stored in said landscape memory,

said landscape font pattern generation control means directing the output of the corresponding landscape font pattern when a corresponding landscape font pattern is stored in said landscape memory, and

said landscape font pattern generation control means reading one of the portrait font patterns stored in said font pattern memory corresponding to the input print information, directing said pattern converting means to convert the read one portrait font pattern to a landscape font pattern, directing the output of the converted landscape font pattern, and directing said landscape memory to store the converted landscape font pattern when a corresponding landscape font pattern is not stored in said landscape memory.

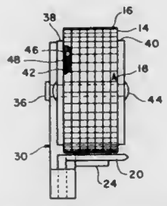


**5,044,791**

## IMPRESSION TOOL

**J. Alan Lawson, 205 Old Plank Rd., Courtland, Va. 23837**

**Filed Jul. 17, 1989, Ser. No. 380,317**
**Int. Cl.[5] B41J *1/54***
**U.S. Cl. 400—134.4** **2 Claims**



1. A method of marking a wire comprising:

forming label out of a sheet of pressure sensitive material by rolling the sheet into a sleeve having inner and outer surfaces,

rotating a marker head having a plurality of print characters until a predetermined combination of print characters are aligned,

sliding an anvil into the sleeve so as to support the sleeve thereon,

moving the marker head and anvil together with the label to be marked therebetween to thereby press the combination of print characters against the outer surface of the sleeve; and

attaching the label to the wire.

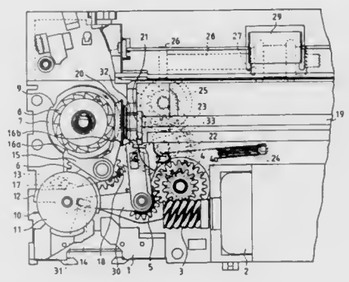
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**5,044,792**

## COMPACT TYPE BELT MICROPRINTER

**Atsushi Goto, Iwate, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Jul. 21, 1989, Ser. No. 383,956**
**Claims priority, application Japan, Aug. 26, 1988, 63-212258**
**Int. Cl.[5] B41J *1/20***
**U.S. Cl. 400—146** **1 Claim**



1. A structure comprising:

a type belt carrying a plurality of type;

a driving belt pulley operatively coupled to said type belt for driving said type belt;

a motor operatively coupled to said driving belt pulley for driving said driving belt pulley;

a type selecting ratchet wheel coupled with said driving belt pulley such that said ratchet wheel rotates with said driving belt pulley;

a hammer disposed for pressing a selected type of said type belt to print said selected type on a recording sheet disposed adjacent to said type belt;

a main printing gear operatively coupled to said motor and said hammer to drive said hammer for printing;

a selector lever disposed adjacent to said type selecting rachet wheel and said main printing gear for selectively engaging said type selecting ratchet wheel or alternately said main printing gear;

a single armature plate operatively coupled with said selector lever;

an electromagnetic clutch operatively coupled with said armature plate for driving said armature plate; and

a sheet feed lever operatively coupled with said armature plate, wherein said sheet feed lever controls the movement of a recording sheet with respect to said type belt.

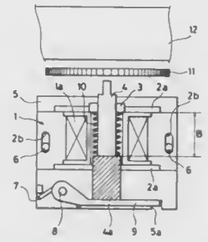
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**5,044,793**

## HAMMER DEVICE HAVING ADJUSTABLE STRIKING FORCE

**Toshihide Wada, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 370,122, Jun. 20, 1989, abandoned, which is a continuation of Ser. No. 124,446, Nov. 23, 1987, abandoned, which is a continuation of Ser. No. 935,128, Nov. 26, 1986, abandoned, which is a continuation of Ser. No. 827,673, Feb. 10, 1986, abandoned, which is a continuation of Ser. No. 625,640, Jun. 28, 1984, abandoned. This application Feb. 20, 1990, Ser. No. 481,692**
**Claims priority, application Japan, Jul. 8, 1983, 58-123465**
**Int. Cl.[5] B41J *9/44***
**U.S. Cl. 400—157.3** **15 Claims**



1. An impact printer comprising:

printing means having a printing type for printing;

hammer means including a hammer member for striking said printing type to make a record on a recording sheet, wherein said hammer member is formed in a bar shape along a striking direction;

actuating means for actuating said hammer means to move toward and away from said printing means, including a coil for generating a magnetic moving force to generate a striking force by energizing said coil and a spring member having a resilient force opposing the striking force;

a magnetic member, integrally connected with said hammer member in series in the striking direction of said hammer member, for moving said hammer member in the striking direction by means of the moving force generated by said coil, wherein said coil and said spring member have an opening through which said hammer means is slidably inserted, with said spring member applying a resilient force of variable magnitude to said magnetic member, and said magnetic member is attracted by said coil in order to move said hammer means toward said printing means, and wherein said magnetic member is formed in a bar shape;

a first support member having a plurality of first regulating means for regulating the relative position of said first support member, and a second support member supporting at least said coil and said hammer means, wherein said second support member comprises a plurality of second regulating means at the positions corresponding to said first regulating means of said first support member, with said first regulating means being movable in relation to said second regulating means for manually regulating said variable magnitude resilient force applied against said magnetic member, and surfaces of said first and second support members are planar and said first support member

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is kept in contact with said second support member through plane surfaces of said first support member and said second support member, and wherein said hammer member is free to move relative to said second support member and said second regulating means is provided on opposite sides of the path of said hammer member; and

stopper means, arranged on said first support member resiliently in contact with said magnetic member, for supporting an end portion of said magnetic member, wherein said moving force is adjusted by shifting said second support member in the striking direction by regulating said resilient force by means of said first and second regulating means.

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**5,044,794**

## INK RIBBON CASSETTE

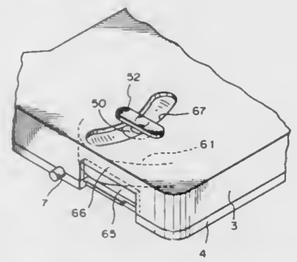
**Noboru Shimoyama, and Yasuo Ohba, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 62,672, Jun. 16, 1987, abandoned. This application May 10, 1989, Ser. No. 352,698**

**Claims priority, application Japan, Apr. 25, 1987, 62-102456; Apr. 25, 1987, 62-102457; Apr. 25, 1987, 62-102458; Apr. 25, 1987, 62-102462**

**Int. Cl.[5] B41J** *35/28*

**U.S. Cl. 400—208** **16 Claims**




1. An ink ribbon cassette removably mountable on a recording apparatus, comprising:

(a) a frame;

(b) an ink ribbon;

(c) a first spool for holding said ink-ribbon;

(d) a second spool for taking up said ink-ribbon, said second spool being movably supported and the ink ribbon on said second spool having a first area and a second area, wherein said first area is the upper half of said ink ribbon;

(e) biasing means for biasing said second spool in a predetermined direction; and

(f) restriction means for, when said ink ribbon cassette is mounted on said recording apparatus, engaging said first area of said ink ribbon, said first area being mutually exclusive from said second area, said second area being a location to which an ink ribbon feeding force is applied by said recording apparatus, said restricting means thereby restricting shifting of said second spool, said restriction means being comprised of a support wall that engages only the first area.

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**5,044,795**

## WRAP BRAKE SPRING FOR THE TAKE-OFF CORE OF AN INKED RIBBON CARTRIDGE

**Markus Burgin, Uster, Switzerland, assignor to Pelikan, Inc., Franklin, Tenn.**

**Filed Aug. 30, 1989, Ser. No. 400,358**

**Int. Cl.[5] B41J** *33/14*

**U.S. Cl. 400—234** **10 Claims**

1. A wrap brake spring for braking an unwinding core of a ribbon cartridge, comprising

a circular-shaped web segment which rests against the unwinding core and has an angle of wrap between 180° and 360°,

a first leg attached to a first end of the circular-shaped web segment and extending radially outwardly therefrom,

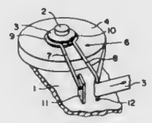
a second leg attached to a second end of the circular-shaped web segment and extending radially outwardly therefrom,

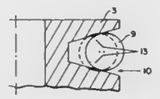
the first leg having a free end,

the free end of the first leg being retained in a predetermined position,

the second leg having a free end,

the free end of the second leg having a deflecting organ around which a ribbon is adapted to pass so that when tension is exerted on the ribbon, the ribbon exerts a force




on the deflecting organ, which spreads the first leg and second leg and releases the wrap brake spring, allowing the unwinding core to rotate, and

means for removing sufficient material from the core so that, as the unwinding core continues to rotate, the contact radius of the circular-shaped web segment is reduced and the braking force of the wrap brake spring is reduced to prevent an increase in ribbon tension towards the end of the ribbon, said means including

abrasion means formed on the surface of the wrap brake spring at least in a contact area where the circular-shaped web segment contacts the unwinding core for abrading the unwinding core as the unwinding core is rotated.

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**5,044,796**

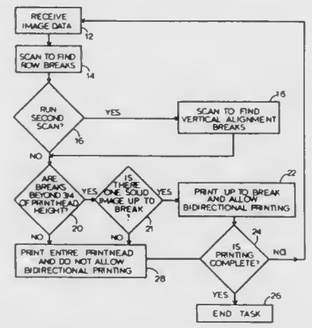
## BIDIRECTIONAL PRINTING METHOD IN ACCORDANCE WITH VERTICAL BREAKS

**Mark D. Lund, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jan. 19, 1989, Ser. No. 299,105**

**Int. Cl.[5] B41J** *19/14, 2/52*

**U.S. Cl. 400—323** **11 Claims**




1. A method for increasing the throughput of a scanning-head printer comprising:



receiving data defining an image to be printed;

analyzing such received data to determine when bidirectional printing could cause print misregistration between vertically adjacent parts of the image, said analyzing including detecting dot-row or vertical alignment breaks; and

printing passes of the image bidirectionally when there are such breaks and unidirectionally when no such breaks are detected.

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**5,044,797**

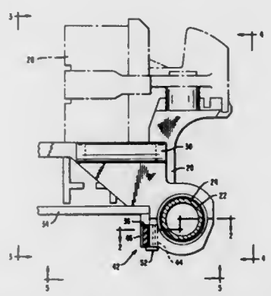
## DEVICE FOR CONNECTING A TIMING BELT TO A PRINTHEAD CARRIAGE

**Alan H. Walker, Barton, and RObert A. Brull, Dryden, both of N.Y., assignors to NCR Corporation, Dayton, Ohio**

**Filed Apr. 1, 1988, Ser. No. 176,576**

**Int. Cl.[5] B41J** *19/20*

**U.S. Cl. 400—335** **8 Claims**


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partial cylindrical surfaces being spaced from one another to define a guide passageway therebetween such that paper passes through said paper guide passageway to said opening where said paper is printed by said printing head.

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**5,044,800**

## DEVICE FOR DETACHABLY SUPPORTING A DRUM IN LATERAL WALLS OF A HOUSING

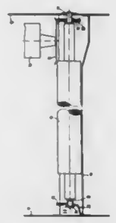
**Manfred Rosenthal, Kirchen-Freusburgh, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 13, 1990, Ser. No. 537,559**

**Claims priority, application Fed. Rep. of Germany, Jun. 16, 1989, 3919754**

**Int. Cl.[5] B41J *11/02***

**U.S. Cl. 400—660** **16 Claims**



1. A mechanism for releaseably securing a platen drum to a printing apparatus, said apparatus including first and second spaced walls, the first wall including an annularly enclosed bearing, said mechanism comprising:

a platen drum having a journal at one end for longitudinal reception by said bearing;

a support wall secured to one of and between the first and second walls, said support wall comprising a segment of a bearing having a transverse opening of a given width; and

drum locking means secured to a drum end opposite the one end and cooperating with said support wall bearing for sequentially initially longitudinally and then transversely releaseably securing the drum opposite end to said support wall bearing.

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**5,044,801**

## PRINTING APPARATUS

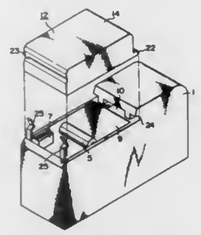
**Mitsuo Uchimura, Numazu; Seiji Koike, Shizuoka; Takeshi Tashiro, Mishima; Toshiharu Shimosato, Shizuoka; Kazuhiro Fushimi, Mishima, and Osamu Koizumi, Shizuoka, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 11, 1989, Ser. No. 448,749**

**Claims priority, application Japan, Dec. 15, 1988, 63-162674[U]; Dec. 15, 1988, 63-162675[U]**

**Int. Cl.[5] B41J *29/02***

**U.S. Cl. 400—692** **18 Claims**



1. A printing apparatus comprising:

a printer body having an opening on one end side thereof;

sheet feeding means for feeding a paper sheet, said sheet feeding means being disposed in the printer body and including a platen facing the opening of the printer body, and a drive mechanism for the platen; and

a head unit removably mounted on the printer body, the head unit including a housing having an opening on one end side thereof and a print head disposed in the housing to face the opening of the housing, said head unit being movable between (i) an operative position in which the head unit is mounted on the printer body so that the opening of the housing and the print head face the opening of the printer body and the platen, respectively, whereby a paper sheet is passible between the platen and the print head so as to be ready for printing, and (ii) an open position in which the head unit is completely removed from the printer body so that the whole opening of the printer body is exposed; and

fixing means for removably fixing the head unit to the printer body such that the head unit is attachable to and completely removable from the printer body without removing a fixing part of the fixing means from the printer body;

said fixing means comprising:

slot means in said printer body;

projection means on said head unit for removably engaging in said slot means; and

interengaging locking means on said head unit and on said printer body for locking said head unit on said printer body with said projecting means engaged in said slot means.

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**5,044,802**

## PRINTING APPARATUS HAVING AN ERASER FOR ERASING A PRINTED CHARACTER

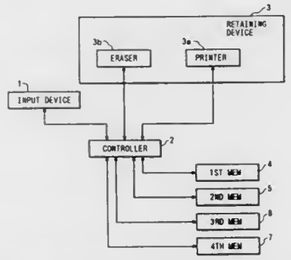
**Noriyuki Sugiyama, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 7/401,637, Aug. 31, 1989, abandoned. This application Dec. 26, 1990, Ser. No. 632,642**

**Claims priority, application Japan, Aug. 31, 1988, 63-217867**

**Int. Cl.[5] B41J *29/00***

**U.S. Cl. 400—695** **31 Claims**




1. A printing apparatus comprising:

a print mechanism for printing key-input print information on a recording medium;

erasing means for erasing a character or a symbol printed on the recording medium with said print mechanism;

first storage means for storing the key-input print information;

second storage means for storing information on a print object erased with said erasing means; and

erasure control means for controlling said erasing means in accordance with a comparison between the erased object information stored in said second storage means and the key-input print information stored in said first storage means.



**5,044,803**

## APPLICATOR TOOL FOR LIQUIDS

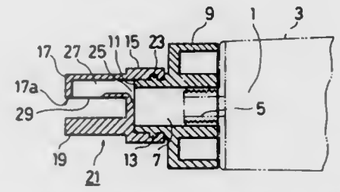
**Yoshitaka Kurosawa, Hachioji; Minoru Imamura, and Makoto Iwamura, both of Yokohama, all of Japan, assignors to Three Bond Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 264,452, Oct. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 904,169, Sep. 5, 1986, abandoned. This application Jul. 9, 1990, Ser. No. 551,049**

**Claims priority, application Japan, Sep. 11, 1985, 63-199322**

**Int. Cl.[5] B05C *17/00***

**U.S. Cl. 401—9** **10 Claims**




1. A liquid applicator for applying liquid to an application surface, said applicator comprising:

(a) a liquid container having a nozzle orifice from which a liquid is emitted;

(b) a nozzle member removably affixed to said nozzle orifice, said nozzle member having a nozzle into which the liquid emitted from said nozzle orifice is discharged;

(c) an applicator tool body; and

(d) means for circumferentially mounting said applicator tool body on said nozzle member by at least one pair of non-helical intermeshing projecting members and channels so that said applicator tool body is freely rotatable through an unlimited number of rotations with respect to said nozzle member;

wherein said applicator tool body comprises a spatulate section projecting from one side surface of the body of the applicator tool body, said spatulate section having a discharge orifice formed in an inner circumferential side thereof through which liquid is dispensed from the applicator tool body radially inwardly, and a communication channel to provide liquid communication between said nozzle of the nozzle member and said discharge orifice, the rotation of said applicator tool body having substantially no effect on the flow rate of said liquid through said discharge orifice, wherein said applicator tool body further comprises a cylindrical guide pin projecting from a side surface of the body of the applicator tool body and spaced from the spatulate section for holding between the guide pin and the spatulate section said application surface, whereby the coaction of said guide pin and said spatulate section maintains the application of liquid dispensed through said discharge orifice upon said application surface.

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**5,044,804**

## WRITING INSTRUMENT

**Cheng-Hwa Chuang, Taipei, Taiwan, assignor to Pioneer Industrial Corp., Taipei, Taiwan**

**Filed Dec. 14, 1989, Ser. No. 451,122**

**Claims priority, application Japan, Jun. 7, 1989, 1-144516**

**Int. Cl.[5] B43K *27/08, 23/00;* A45D *40/20***

**U.S. Cl. 401—34** **3 Claims**

1. A marking instrument comprising:

(A) a core unit comprising a coloring substance; and

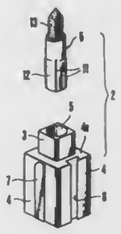
(B) a plurality of cartridges, each comprising:

(i) a tubular body having a longitudinal axis and a first end and a second end;

(ii) a tubular projection formed integrally and coaxially with said first end of said tubular body, said tubular projection having a first insertion hole defined therethrough coaxially with said tubular projection and tubular body, said tubular body having a second insertion hole defined therethrough at said second end of said tubular body, said core unit being insertable into said first insertion hole and tightly retained therein;

(iii) at least one engagement projection formed parallel to said longitudinal axis of said tubular body and extending axially along nearly the total length of said tubular body, said engagement projection widening outward from said tubular body; and

(iv) at least one engagement recess, formed parallel to said



longitudinal axis of said tubular body and extending nearly the total length of said tubular body, said engagement recess widening from the outer surface of said tubular body inward, wherein a plurality of said cartridges can be fitted and coupled together in a longitudinal direction by fitting said tubular projection of one cartridge to the second insertion hole of another cartridge, and laterally by slidably engaging the engagement projection of a cartridge with the engagement recess of a parallel cartridge.

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**5,044,805**

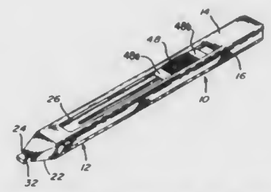
## MECHANICAL PENCIL

**Steve Kosteniuk, 1301 Cumberland Avenue, Saskatoon, Saskatchewan, Canada S7H 2L9 , and Jean-Guy Dufour, Ville de Ste-Catherine, Canada, assignors to Steve Kosteniuk, Saskatoon, Canada**

**Filed Apr. 11, 1990, Ser. No. 507,402**

**Int. Cl.[5] B43K *21/06, 21/22, 24/04***

**U.S. Cl. 401—82** **10 Claims**



1. A mechanical pencil comprising an elongated housing having a pair of opposed flat rectangular front and rear walls tapering at one end and defining an opening, the walls further defining an elongated chamber having flat parallel spaced-apart surfaces therein, the chamber including an elongated lead path spaced from the surfaces for accommodating a flat graphite lead member and extending axially of the elongated housing which communicates at one end of the housing with said opening in line with the lead path; at least a linear rack means within the elongated chamber extending parallel to and along one edge of the lead path and an elongated slot defined in the flat front wall parallel with the lead path; a manually engageable slider movable longitudinally on the front wall exteriorly of the housing, the slider including a stem extending through the elongated slot and connected to a lead gripper means slidable in the elongated chamber along the lead path, the lead gripper means including anchor means for engaging the linear rack

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means; the slider having a bowed shape with the ends of the bow engaged against the front wall to provide spring action to retain the anchor means engaged in the rack means to prevent axial movement of the gripper means and thus the lead, whereby pressure exerted against the slider sufficient to overcome the spring action of the slider will disengage the anchor means from the rack means, allowing the slider and lead gripper means to slide in unison longitudinally of the housing for advancing or retracting the lead in the housing through the opening in the end of the housing.

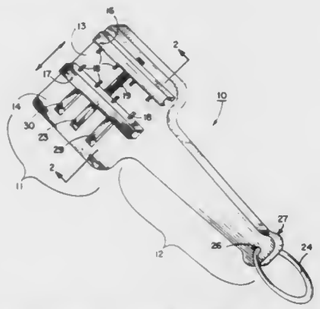
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**5,044,806**

## BACK SCRUBBER

**Bob J. Nickelston, Rt. 6, P.O. Box 232, Martinsville, Va. 24112**

**Filed Sep. 20, 1990, Ser. No. 585,822**
**Int. Cl.[5] A45D** *40/00*
**U.S. Cl. 401—88** **4 Claims**



1. A back scrubber for holding a bar of soap comprising: a soap bar container, said container comprising a planar base having top and bottom surfaces, a pair of opposingly positioned soap bar engaging jaws, said jaws mounted on said top surface of said planar base, one of said pair of jaws being slidably affixed to said base for releasable engagement with said soap bar, a means to manually open said slidable jaw, said opening means positioned on said bottom surface of said base, said base defining a lateral slot, means to attach said slidable jaw to said opening means, said attaching means extending through said slot for movement therealong, said attaching means fixed to said slidable jaw and to said opening means, a resilient member, said resilient member positioned laterally along the center of said base and affixed to said slidable jaw, each of said pair of jaws comprising a plurality of soap bar engaging pins, a handle, said handle joined to said base and extending therefrom.

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**5,044,807**

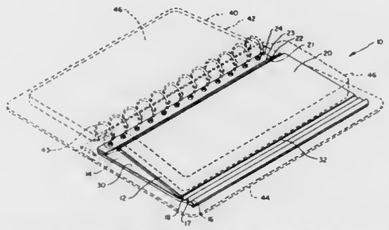
## ADJUSTABLE WRITING PLATFORM FOR A NOTEBOOK

**Jay A. Meservy, 564 Pheasant Cir., Bountiful, Utah 84010, and Jerry D. Meservy, 692 South 850 East, Centerville, Utah 84014**

**Filed Jun. 1, 1990, Ser. No. 532,050**
**Int. Cl.[5] B42F** *13/00, 13/40*
**U.S. Cl. 402—80 L** **15 Claims**

1. A writing platform for a notebook comprising:
a writing table mountable in said notebook; and
elevation means for elevating at least a portion of said writing table while in said notebook to provide said writing platform, said elevation means comprising a riser and a retainer strip hingedly joined together along a common edge, said riser being hingedly joined along an opposite edge to said writing table, said retainer strip including elongated apertures for removably mounting said retainer strip to rings of a looseleaf notebook, said riser including a plurality of slotted brackets, each of said slotted brackets being configured to individually engage said rings and each of said slotted brackets having a longitudinal slot extending transverse to said riser to allow said riser to be raised vertically relative to said rings, said longitudinal slot including at least one transverse slot into which said ring can be releasably engaged to hold the relative position between said riser and said ring thereby elevating said writing table.

2. A method for providing a writing platform in a notebook having a ring binder comprising:
preparing a basal element by forming a plurality of spaced, ring-receiving holes for rings of said ring binder;
mounting said basal element in said notebook by engaging said rings in said holes;



forming a writing table as a planar surface superimposed over said basal element;
selecting a riser for said writing table comprising a strip of rigid material hingedly joined along a edge to said writing table, the width of said strip determining the maximum distance said writing table can be elevated above said basal element;
engaging said riser to said notebook adjacent said rings; and
elevating said writing platform in said notebook by raising said riser with said riser supporting said edge of said writing table above said basal element.

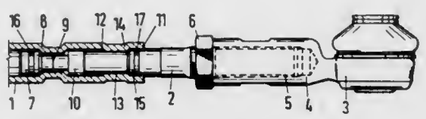
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**5,044,808**

## STEERING ROD FOR MOTOR VEHICLES

**Fritz Busse, Hilden, Fed. Rep. of Germany, assignor to TRW Ehrenreich GmbH & Co. KG, Dusseldorf, Fed. Rep. of Germany**

**Filed Aug. 17, 1989, Ser. No. 395,252**
**Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827854**
**Int. Cl.[5] F16D** *9/00*
**U.S. Cl. 403—2** **27 Claims**



1. A steering rod for motor vehicles comprising a guide rod or cross guide in pipe form, and a transmission rod inserted into the pipe for the transmission of tension forces, one end of the transmission rod being held in the pipe by a force-locking holding device and the other end projecting out of the pipe, with the distinction that the transmission rod (**2**) has a breaking point (**9**) between the holding device and the pipe end (**11**), and an offset (**10, 22**) between the breaking point (**9**) and the pipe end (**11**), the pipe (**1**), between the offset (**10, 22**) and the pipe end (**11**), being provided with a pipe narrowing which forms a stop (**12**) for the offset (**10, 22**) in case of rupture of the breaking point (**9**).

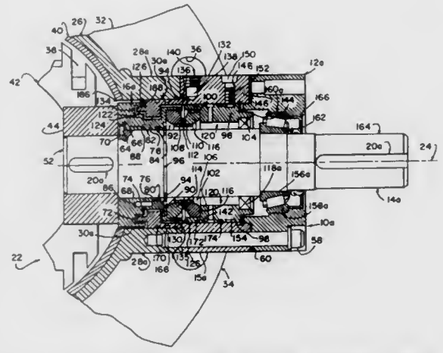


**5,044,809**

## TWO PART AXIAL DRIVE DEVICE EACH HAVING SELF CONTAINED BEARING SEALING MEANS

**William B. Galanty, Short Hills, and Joseph Kennedy, Emerson, both of N.J., assignors to Franklin Miller, Inc., Livingston, N.J.**

**Filed Mar. 29, 1990, Ser. No. 500,920**
**Int. Cl.[5] F16D** *1/00*
**U.S. Cl. 403—24** **10 Claims**



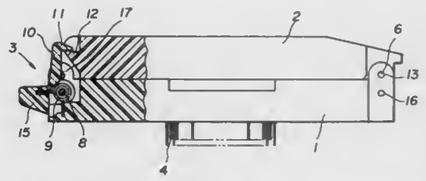
1. An improved detachable cartridge assembly having a body for a shaft supported at one end by an anti-friction bearing for rotation about its axis within a housing bore of said cartridge to provide means for producing rotational drive power along said shaft, the improvement comprising:
a. a shaft having a first and second end disposed axially within said cartridge having a rotor key affixed at said first end and a drive key affixed at said second end, said shaft being axially supported near said first end by an annular spacer which is linked thereto and by said anti-friction bearing near said second end of said shaft;
b a first section of an annular stationary outer housing gland and an inner rotary gland disposed in coaxial fixed spaced apart relationship with said outer gland and axially disposed adjacent and linked to said spacer and coaxial with said shaft, said spaced apart relationship between said outer and inner glands forming a labyrinth path along said shaft axis within said cartridge assembly for creating a tortuous flow passageway to liquid flow therethrough;
c. said inner rotary gland and an inner annular static gland being disposed in fixed axial spaced apart relationship about said shaft, a second section of said stationary gland being coaxially and fixedly disposed with said inner static gland, said coaxially disposed inner static gland and said second section of said outer stationary gland extending axially and terminating near said anti-friction bearing;
d. a pressure sealing arrangement disposed between said spaced apart adjacent ends of said axially disposed inner rotary and static glands and coaxial with said shaft;
e. a static oil gland seal ring disposed coaxially between said shaft and inner static gland nearest to said second end of said shaft to prevent fluid leakage therebetween within said cartridge; and
f. a plurality of axial spaced apart openings in said body of said cartridge for receiving a plurality of bolts for connecting or disconnecting said cartridge and an associated apparatus.

**5,044,810**

## IC SOCKET HAVING COVER WITH LOCKING MEMBER

**Noriyuki Matsuoka; Yoshiyuki Kato, and Kazumi Uratsuji, all of Tokyo, Japan, assignors to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan**

**Filed Aug. 7, 1989, Ser. No. 390,815**
**Claims priority, application Japan, Aug. 5, 1988, 63-103864**
**Int. Cl.[5] F16C** *11/04*
**U.S. Cl. 403—93** **7 Claims**



1. An IC socket comprising:
a socket substrate having first and second opposing ends, a horizontal upper face, first and second vertical side faces, first and second press cover pivot holes (**13, 17**) formed horizontally through said first and second ends, respectively, and first and second lock member pivot holes (**16, 14**) formed horizontally through said first and second ends, respectively, said first and second press cover pivot holes (**13, 17**) being aligned vertically with said first and second lock member pivot holes (**16, 14**), respectively;
a press cover pivot shaft selectively removably inserted through one of said first and second press cover pivot holes (**13, 17**);
a lock member pivot shaft selectively removably inserted through the one of said first and second lock member pivot holes (**16, 14**) formed through the one of said first and second ends opposite to the one of said first and second ends through which said press cover pivot shaft is inserted;
a press cover pivotably mounted about said press cover pivot shaft for movement between a closed position in which said press cover is in overlying relation to said socket substrate and an open position; and
a lock member pivotably mounted about said lock member pivot shaft for movement between a locking position in which said lock member can lock said press cover in said closed position, and an unlocking position.

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**5,044,811**

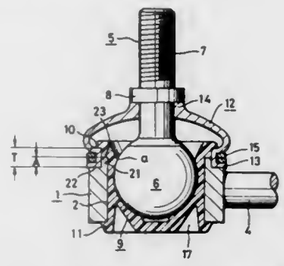
## BALL JOINT

**Keiichiro Suzuki, Shizuoka; Kazumasa Suzuki, Iwata, and Masahiro Yamada, Shizuoka, all of Japan, assignors to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 6, 1990, Ser. No. 534,487**
**Claims priority, application Japan, Jun. 15, 1989, 1-69885**
**Int. Cl.[5] F16C** *11/06*
**U.S. Cl. 403—134** **5 Claims**

1. A ball joint comprising:
a socket;
a cylindrical through hole in said socket;
a ball seat in said through hole;
a ball stud with a ball portion slidably supported in said socket;
at least one shank portion of said ball stud protruding from said through hole in at least one direction;
at least one dust cover;
a locking part for attaching said dust cover to said socket;
a recessed part around an outer surface at an end of said socket;
a receiving part on an outer surface near an end of said ball seat;
said receiving part having an inner surface being disposed at

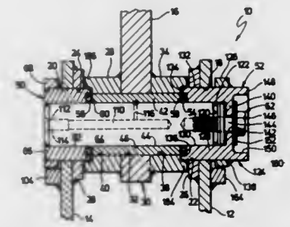
a common diameter with that of an inner surface of said recessed part;
an attaching part of said dust cover; and



said attaching part being clamped around and abutting said inner surfaces of said recessed part and said receiving part.

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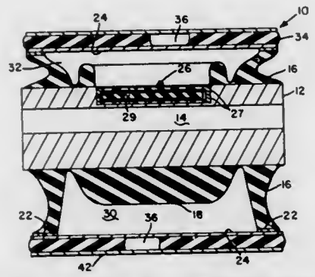
**5,044,812**
**SEALED AND LUBRICATED PIVOT PIN ASSEMBLY AND METHOD**
**Clarence A. Ardelt, Wheaton, and Jack M. Deli, Winfield, both of Ill., assignors to Dresser Industries, Inc., Dallas, Tex.**
**Filed Jan. 23, 1990, Ser. No. 468,711**
**Int. Cl.[5] F16C** *11/00*
**U.S. Cl. 403—154** **24 Claims**



1. A sealed and lubricated pivot pin assembly for use in connecting linkage components such as a pair of bracket members of a bucket and an eye of a loader arm of an earth-working vehicle, the inner surface of the eye in the loader arm being defined by a cylindrical bushing having first and second end faces, said pivot pin assembly comprising:
a substantially cylindrical pivot pin having first and second ends,
a first annular end sleeve fixedly attached to said first end of said pivot pin and having an inner dimension which conforms to the periphery of said pivot pin in the area of said first end and an outer dimension which substantially conforms to a circular opening in one of said bracket members,
a pair of spacer rings each having an inner diameter which conforms to the periphery of said pivot pin in the areas adjacent the end faces of said cylindrical bushing and an outer diameter which is less than that of said cylindrical bushing,
first and second annular seals each having an inner surface which corresponds to the outer diameter of a respective one of said spacer rings and a laterally protruding surface adapted to contact a respective end face on said cylindrical bushing in a manner providing a lubricant tight seal therewith,
an end cap having a cylindrical section defining a second annular end sleeve having an inner dimension which conforms to the periphery of said pivot pin in the area of said second end and an outer dimension which substantially conforms to a circular opening in the other of said bracket members,
said end cap having a planar section defining a lateral end face overlying said second end of said pivot pin and having a central opening for accommodating a threaded fastener for releasably fastening said end cap to said pivot pin,
said pivot pin including a threaded central opening for receiving said threaded fastener to a point whereat said pivot pin assembly joins said linkage components and each of said spacer rings defines the gap between the inner end of each of said first and second end sleeves and said first and second end faces of said cylindrical bushing and thereby determines the compression applied to each of said first and second annular seals,
a lubricant tight seal provided between said pin and said end cap in the are of said second end of said pivot pin,
wherein each of said first and second end sleeves extends beyond the respective bracket members to provide for axial movement of the pivot pin assembly relative to said bracket members,
first and second substantially rectangular end plates each being fixedly attached to one of said first and second end sleeves, respectively, exterior to said bracket members and spa ed from said bracket members to allow for axial movement of the pivot pin assembly relative to said bracket members and accommodate axial deflection of said bracket members, and
wherein said pivot pin assembly is symmetrical in that the outer and inner dimensions of said first and second end sleeves are substantially the same so as to accommodate installation of said pivot pin assembly from either side of said bracket members.

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**5,044,813**
**BUSH TYPE HYDRAULICALLY DAMPED ENGINE OR TRANSMISSION MOUNT**
**Michael J. W. Gregg, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**
**Filed Jan. 26, 1988, Ser. No. 148,467**
**Int. Cl.[5] F16F** *5/00*
**U.S. Cl. 403—225** **8 Claims**

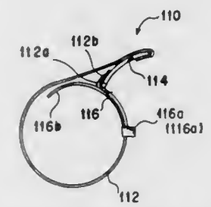


1. A bush type mounting device (**10**) having inertial hydraulic damping and internal hydraulic decoupling comprising:
(a) an outer sleeve (**42**);
(b) an intermediate sleeve (**21**), radially inward from said outer sleeve (**42**) defining an annular space (**35**) therebetween;
(c) an inner metal (**12**) portion formed within said intermediate sleeve (**21**);
(d) a rubber spring bonded to an outer surface of said inner metal (**12**) on one side of said rubber spring (**16**) and to an inner surface of said intermediate sleeve (**21**) on another side of said rubber spring (**16**) diametrically located to divide said intermediate sleeve (**16**) into a lower fluid chamber (**30**) and an upper fluid chamber (**32**), each containing a fluid;
(e) an inertial damping channel (**36**) located within said annular space (**35**); and
(f) means for hydraulically decoupling (**26**) said fluid between said lower chamber (**30**) and said upper chamber (**32**), wherein said inner metal portion (**12**) is tubular in shape, oriented axially within said intermediate sleeve (**21**), has an aperture (**14**) therethrough in its axial direction and has a decoupling channel (**28**) connecting said lower chamber and said upper chamber.



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**5,044,814**
**CLAMPING BAND**
**Taira Hama, Chino, Japan, assignor to Kabushiki Kaisha Mihama Seisakusho, Chino, Japan**
**Filed Dec. 29, 1989, Ser. No. 459,025**
**Claims priority, application Japan, Jan. 18, 1989, 1-9056**
**Int. Cl.[5] F16B** *2/18;* **B65D** *63/02*
**U.S. Cl. 403—290** **7 Claims**

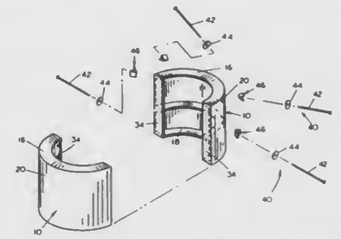


1. A clamping band comprising an elongated member adapted to be clamped around an object, said band having first and second ends and first and second faces, the first and second faces forming a convex outer face, and a concave inner face when the band is clamped around the object, fulcrum means formed on the first face of the elongatged member substantially closer to said first end of the elongated member than to said second end, a lever fixed to the second end of the elongated member and having one end shaped to releasably engage and disengage the fulcrum means at said first face in a direction transverse of said first and second faces, the lever being pivotable about the fulcrum means when said shaped end is engaged with the fulcrum means from a non-clamping orientation extending outwardly away from the elongated member to a clamping orientation overlying the elongated member, whereby the elongated member can be wound around the object to be clamped with the shaped end of the lever disengaged from the fulcrum means, the shaped end of the lever being then engagable with the fulcrum means to enable the lever be pivoted from the non-clamping orientation to the clamping orientation.

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**5,044,815**
**METHOD AND APPARATUS FOR CONNECTING CASTINGS**
**Joey D. Wright, 200 Arthur, Blair, Nebr. 68008**
**Filed May 18, 1990, Ser. No. 527,744**
**Int. Cl.[5] F16D** *1/00*
**U.S. Cl. 403—338** **11 Claims**

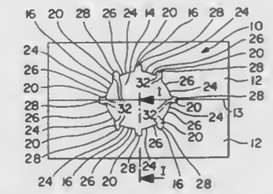
1. An apparatus for connecting castings, comprising:
an elongated screw having a threaded shank and a head;
a washer mounted on said screw and adapted to abut against the screw head;
a rigid, non-bendable bracket removably and operably mounted on said threaded screw shank;
said bracket including a threaded aperture therethrough for threaded engagement with said threaded screw shank, such that rotation of the screw with respect to the bracket will move the bracket towards, or away from, the screw head;
said bracket including first and second legs connected at one end to form a junction, said threaded aperture formed in said junction, and said legs diverging from said junction at substantially equal angles from the axis of said threaded aperture; and
said bracket further comprising first and second lip portions



projecting from the free ends of said first and second legs, respectively, said lip extending outwardly from said legs at an angle generally perpendicular to the axis of said threaded aperture.

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**5,044,816**
**CLAMPING COLLAR WITH LONGITUDINAL RIBS**
**Peter E. Junkes, Hamburg, Fed. Rep. of Germany, assignor to Hydac Technology GmbH, Sulzbach, Fed. Rep. of Germany**
**Filed Jul. 2, 1990, Ser. No. 546,833**
**Claims priority, application Fed. Rep. of Germany, Jul. 18, 1989, 8908688[U]**
**Int. Cl.[5] F16B** *2/02*
**U.S. Cl. 403—344** **8 Claims**



1. A clamping collar, comprising:
a clamping collar body extending along a longitudinal axis and having at least two clamping collar shells with side walls;
at least one clamping receiving space defined by said side walls of said collar shells for receiving and retaining a pipe therein along said longitudinal axis; and
at least one recess in said side walls opening radially inwardly into said receiving space and extending axially parallel to said longitudinal axis, said recess being open to an atmosphere exteriorly of said collar body at at least one axial end of said recess and having a base including an axially extending bulge projecting radially inwardly toward said receiving space, said bulge projecting inwardly to define a highest point of said recess such that said recess increases constantly in depth along an axial direction from said highest point to said one axial end;
whereby said recess aerates and drains fluids to inhibit pipe corrosion.

VOL 1130 ISS 1 SE 3 1991 UMI

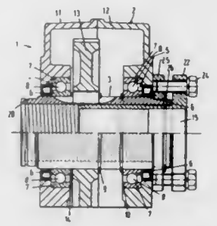


5,044,817

## THREADED BUSH ASSEMBLY FOR SHAFT MOUNT

David A. Rayner, and Rodney Chester, both of North Humberside, England, assignors to J. H. Fenner & Co. Limited, Hull, England

Filed Jan. 5, 1990, Ser. No. 461,393
Claims priority, application United Kingdom, Jan. 5, 1989, 8900171
Int. Cl.[5] F16B *2/06*
U.S. Cl. 403—370 7 Claims



1. A threaded bush assembly for receiving and coupling a shaft to a rotatable hub, comprising:

a tubular sleeve member adapted to be located within the rotatable hub;

a tubular bush member adapted to be received in the sleeve member, said bush member having a central bore in which the shaft is received; and,

means for effecting axial movement of the bush member relative to the sleeve member, the inner circumferential surface of the sleeve member and the outer circumferential surface of the bush member each having a helical thread formed thereon, each thread being defined by a pair of mutually opposed tapered surfaces when viewed in cross-section, the pair of mutually opposed tapered surfaces of the thread formed on the outer circumferential surface of the bush member forming substantially the same angle with the longitudinal axis of the bush member and the pair of mutually opposed tapered surfaces of the thread formed on the inner circumferential surface of the sleeve member forming substantially the same angle with the longitudinal axis of the sleeve member so that the bush member can be screwed into the sleeve member from either end thereof with the two threads being threadedly engageable with one another, the inner diameter of the sleeve member being slightly greater than the outer diameter of the bush member to define a gap between facing tapered surfaces of the two threads to permit relative axial movement of the two threads with respect to one another such that upon axial movement of the bush member into or out of the sleeve member the tapered surfaces which face one another in the direction of axial movement effect a wedging action.

5,044,818

## ADJUSTABLE MANHOLE COVER ASSEMBLY

Phillip C. Pritchard, 131B Davis St., Asheboro, N.C. 27203

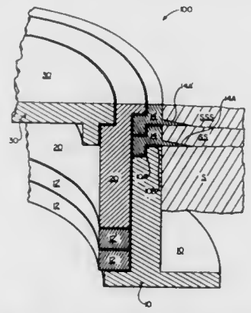
Filed Jul. 24, 1990, Ser. No. 557,580
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—26 10 Claims

1. A vertically adjustable manhole cover assembly comprising:

a fixed annular frame member having an upper rim surface adapted to be placed so as to be substantially flush with the surface of a roadway, and defining an upper annular shoulder support surface located inwardly and below said upper rim surface and a lower annular shoulder support surface vertically spaced apart from said upper annular shoulder and located inwardly thereof;

a vertically adjustable annular sleeve member defining a height less than the height of said fixed annular frame member adapted to be slidably received within said fixed annular frame member and for the bottom surface thereof to rest on said lower annular shoulder of said fixed annular frame member, said annular sleeve member further defining an outwardly extending annular flange around the top surface thereof adapted to rest on said upper annular shoulder support surface of said fixed annular frame member when slidably received therein wherein the bottom surface and annular flange of said annular sleeve member simultaneously rest on and are supported by the lower annular shoulder and upper annular shoulder, respectively, of said fixed annular frame member; and

a manhole cover member supported on said vertically adjustable annular sleeve member.

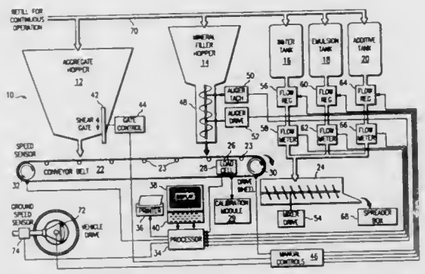


5,044,819

## MONITORED PAVING SYSTEM

Kenneth E. Kilheffer, Waco; Keith B. Mosley, Hewitt, and Robert J. Province, China Spring, all of Tex., assignors to Scanroad, Inc., Waco, Tex.

Filed Feb. 12, 1990, Ser. No. 479,066
Int. Cl.[5] E01C *19/00*; B28C *7/06*
U.S. Cl. 404—72 64 Claims



1. A mobile system disposed on and transportable by a vehicle comprising a frame, the system operable to produce and apply paving surface material to a surface while the system and the vehicle proceed over the surface, the paving surface material comprising a plurality of ingredients comprising aggregate, the system comprising:

a conveyor for conveying the aggregate;

a scale associated with said conveyor and operable to generate an aggregate signal indicative of the weight of aggregate material being conveyed; and

means for preventing distortions of the frame of the vehicle from substantially affecting the generation of said aggregate signal by said scale.

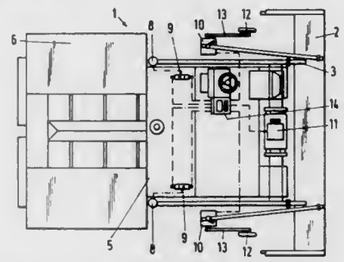


5,044,820

## ROAD-FINISHING APPARATUS WITH IMPROVED CONTROL OVER LAYING BEAM

Robert Prang, Hameln, Fed. Rep. of Germany, assignor to ABG-Werke GmbH, Hameln, Fed. Rep. of Germany

Filed Mar. 13, 1990, Ser. No. 492,699
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909583
Int. Cl.[5] E01C *19/00*
U.S. Cl. 404—84 12 Claims



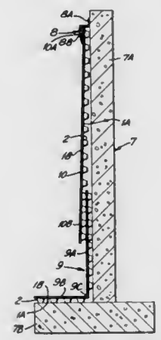
1. An improved road-finishing machine for forming a layer of material over a road surface, said machine being of the type including a laying beam (2), control members (8) for adjusting height and inclination of the laying beam (2) relative to the road surface, measuring sensors for producing output signals, and height and inclination adjusters (10, 11) for controlling the control members (8) according to the predetermined desired values, wherein the improvement comprises a path measurement device (1) which provides output signals corresponding to path elevation, an onboard computer (14) having a data store (17) for storing a length of a transitional section and a differential value of the transverse inclination, which differential value is to be maintained between starting and finishing points of the transitional section, wherein the desired values can be predetermined and are calculated by the onboard computer (14) for the inclination adjuster (11), and are altered continually by the onboard computer (14) depending on the road surface from the starting to the finishing point.

5,044,821

## IMPROVEMENT IN A SYSTEM FOR PROTECTING FOUNDATION WALLS AND THE LIKE

Finn Johnsen, Notodden, Norway, assignor to Platon, Notodden, Norway

Filed May 8, 1990, Ser. No. 520,234
Claims priority, application Norway, Jan. 16, 1990, 900235
Int. Cl.[5] E02B *11/00*; E02D *31/02*
U.S. Cl. 405—50 13 Claims



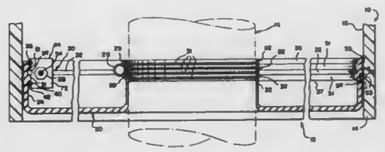
1. A system for protecting foundation walls and the like, said system comprising at least one main protecting sheet made of imperforate, relatively thin, stiff material and including protrusions formed therein, as well as means extending between said protrusions for forming air channels and channels for receiving water from back fill, and imperforate pre-cut top sheet elements and bottom sheet elements adapted to be mounted along a foundation wall prior to the mounting of said main protecting sheet thereupon for full outer coverage of said foundation wall against surrounding fill mass.

5,044,822

## OPEN BOTTOM PIT SEAL

Kathyleen D. Moss, Garden Grove, Calif., assignor to Kathyleen A. Dabic, as Trustee & Her Successor Under Trust Agreement for Moss, Fountain Valley, Calif.

Filed Feb. 20, 1990, Ser. No. 482,153
Int. Cl.[5] B65B *3/06*; E02D *29/14*
U.S. Cl. 405—52 7 Claims



1. A sealing device for a subsurface chamber having a wall defining an inner cylindrical surface and an open bottom comprising: an expanse of flexible, liquid impervious material disposed across said open bottom and defining an outer annular peripheral margin which establishes a continuous, unbroken annular band of contact with said inner cylindrical wall surface, and clamping means including an expandable hoop comprised of an elongated length of metal wire having opposite ends juxtaposed in proximity to each other and formed into a loop having an opening between said opposite ends, a pair of bearing lugs each of which is secured to a different one of said opposite ends of said elongated length of wire and each of which includes longitudinal openings in coaxial alignment with each other, interiorally threaded engagement means located at each of said longitudinal openings, a pair of metal wire segments each of which is secured to one and no more than one of said lugs wherein said wire segments reside in contact with said unbroken annular band on opposite sides of said opposite ends of said elongated length of wire and in longitudinally overlapping fashion therewith to thereby span said opening between said opposite ends to form a completely enclosed hoop, and an externally threaded stud having ends which project into said longitudinal openings in said bearing lugs and wherein said externally threaded stud is threadably engaged in both of said interiorally threaded engagement means at said longitudinal openings such that relative rotation between said externally threaded stud and said interiorally threaded engagement means in one direction presses said lugs apart to expand said hoop and relative rotation between said externally threaded stud and said interiorally threaded engagement means in an opposite direction allows said hoop to contract.

5,044,823

## RELATING TO SEALS

George H. Burgess, Maidstone, England, assignor to C.E. Heinke & Company Limited, England

Filed Dec. 20, 1989, Ser. No. 452,466
Claims priority, application United Kingdom, Dec. 22, 1988, 8830022
Int. Cl.[5] E21D *11/00*; F16J *9/00*
U.S. Cl. 405—152 11 Claims

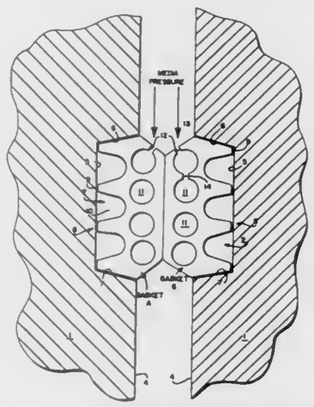
1. A sealing member for sealing a gap between two members to separate fluid media at different pressures, comprising:

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an elongate member of elastic material having at least one cavity within it extending along its length,

wherein at least one said cavity is in communication with the exterior at intervals along its length through a portion of



the surface of the sealing member that is arranged, in use, to be exposed to the medium at the higher pressure, and is in communication with the exterior through only the said portion of the surface of the sealing member.

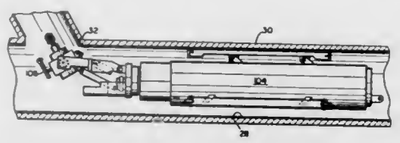
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**5,044,824**

## METHOD AND APPARATUS FOR LOCATING A SERVICE PIPE OUTLET TRANSVERSELY CONNECTED TO A LINED MAIN PIPE

**Charles A. Long, Jr., and Todd W. Goodwin, both of Birmingham, Ala., assignors to Long Technologies, Inc., Birmingham, Ala.**

**Filed May 1, 1990, Ser. No. 517,121**
**Int. Cl.[5] E03F *3/06***
**U.S. Cl. 405—156** **9 Claims**



1. A method of locating a service pipe outlet transversely connected to a main pipe having an axis after a flexible liner has been installed in the main pipe, said method comprising the steps of:

locating a position of a service pipe outlet within said main pipe;

depositing a locator material on an interior surface of said main pipe adjacent the position of said service pipe outlet;

installing a flexible tubular liner within said main pipe such that said service pipe outlet and said locator material is covered thereby; and

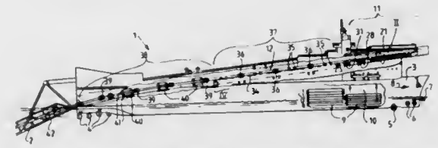
moving sensor means within said main pipe along said axis for sensing said locator material through said liner and for generating an indicator signal when said sensor means senses said locator material, whereby the position of the service pipe outlet is determined for allowing the liner to be cut away so that fluid may flow between said service pipe and said lined main pipe.

**5,044,825**

## METHOD AND INSTALLATION FOR LAYING A PIPELINE

**Willem P. Kaldenbach, The Hague, Netherlands, assignor to Allseas Engineering B.V., Netherlands**

**Filed Nov. 8, 1989, Ser. No. 433,582**
**Claims priority, application Netherlands, Nov. 7, 1988, 8802725; Oct. 23, 1989, 8902622**
**Int. Cl.[5] F16L *1/12***
**U.S. Cl. 405—166** **7 Claims**



1. Installation (1) for laying a pipeline on a surface located under water, comprising a vessel (3) provided with positioning means (21, 23, 24, 60) for holding a pipe (9) in line behind a pipe string (12) of the pipeline (2) and welding means (25) for fixedly welding this pipe (9) onto said pipe string (12) comprising positioning means (21, 23, 24, 60) which during welding of said pipe (9) to said pipe string (12) said positioning means are moved relative to said vessel (3) at a speed which corresponds with the relative speed of said pipe string (12) relative to said vessel (3), whereby said positioning means (21, 23, 24, 60) are provided with at least one carriage (21, 60) for bearing the pipe (9) for fitting, which carriage (21, 60) is movable at substantially the same speed as said pipe string (12) relative to said vessel (3), characterized by at least two pipe carriers (21, 60) to be used alternately for placing pipes (9) in line with said pipe string (21).

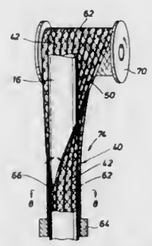
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**5,044,826**

## METHOD AND APPARATUS FOR UMBILICAL HYDRAULIC CONTROL LINES IN FLOATING PRODUCTION SYSTEMS

**Larry D. Forster, Houston, Tex., assignor to Shell Offshore Inc., Houston, Tex.**

**Filed Nov. 26, 1986, Ser. No. 935,432**
**Int. Cl.[5] F21B *17/00***
**U.S. Cl. 405—169** **37 Claims**



1. A hydraulic control umbilical for supporting a plurality of hydraulic control lines along a riser between a surface facility and a subsea completion, the umbilical comprising:

a flexible skin exteriorly encircling the riser and extending substantially the length of the riser;

means for providing lateral support to the skin substantially the length of the riser; and

means for supporting the hydraulic control lines within the skin.

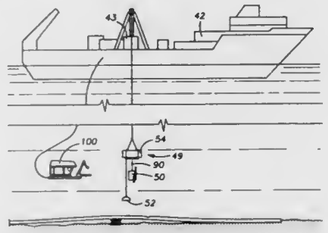


**5,044,827**

## METHOD FOR RECOVERING WET BUCKLED PIPE

**David A. Gray, Cypress, Tex.; Walter E. Gray, Jr., Santa Barbara, Calif., and Charles R. Yemington, Houston, Tex., assignors to Diverless Systems, Inc., Carpinteria, Calif.**

**Filed Oct. 30, 1990, Ser. No. 605,642**
**Int. Cl.[5] F16L *1/16***
**U.S. Cl. 405—173** **19 Claims**



1. A method for severing a submerged pipeline setting on the sea floor, comprising the steps of:

lowering a deflated lift bag from the water surface to a substantially straight segment of said pipeline;

positioning said deflated lift bag under the substantially straight segment of said pipeline;

inflating said deflated lift bag with liquid and raising a section of said pipeline off said sea floor;

lowering a cutoff saw from the water surface to said raised section of said pipeline;

clamping said cutoff saw to said raised section of said pipeline; and

severing said pipeline by means of said cutoff saw.

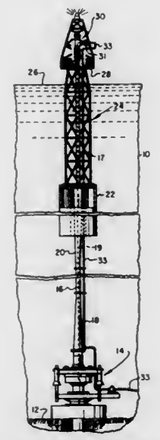
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**5,044,828**

## SUPPORT TOWER FOR OFFSHORE WELL

**Paul C. Berner, Jr., Southside Place, and William C. Kazokas, Jr., Mesquite, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Feb. 9, 1990, Ser. No. 478,113**
**Int. Cl.[5] E02D *5/54***
**U.S. Cl. 405—202** **9 Claims**



1. A freestanding tower for an offshore well wherein said tower extends from a point below the sea surface to a point above the sea surface, said tower comprising:

a plurality of generally vertically spaced apart triangular base members, adjacent ones of said base members being oriented such that the apices of said base members are not aligned with each other, each of said base members being made up of a triangular having two opposed legs and a base leg wherein at least said two opposed legs are of equal length and the centroids of said base members are aligned with each other along a common axis of said tower; and

a plurality of lateral brace members interconnecting said base members by extending between adjacent apices of said adjacent ones of said base members, respectively, said legs and said brace members comprising at least one of generally cylindrical, rigid tubes or rods wherein said tower presents minimum hydrodynamic resistance to wave and current action of the sea.

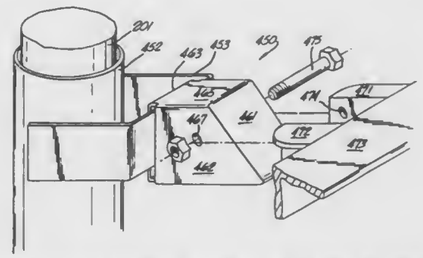
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**5,044,829**

## MOORING SYSTEM

**Paul W. Hemminger, Rte. 4, Box 1466, Eufaula, Okla. 74432**

**Continuation of Ser. No. 229,145, Aug. 5, 1988, Pat. No. 4,990,029. This application Nov. 2, 1990, Ser. No. 608,211**
**The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.**
**Int. Cl.[5] E01D *1/00*; E02B *3/20***
**U.S. Cl. 405—203** **5 Claims**



1. In a mooring system for use on a body of water and having an anchoring structure and a floatation platform including a waterward end, a coupler comprising means for attaching said coupler with said anchoring structure to permit substantially unrestricted independent movement of said coupler in a direction substantially perpendicular to the surface of the water with substantially restricted movement of said coupler in a direction substantially parallel to the surface of the water; a link member coupled to said attachment means; means for allowing limited rotation of said link member with respect to said attachment means about a horizontally disposed axis perpendicular to said direction of movement of said coupler and means for allowing the waterward end of said floatation platform to pivot upward around said link member while preventing said floatation platform from pivoting downward substantially below the horizontal plane defined by said attachment means and said pivot means.

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**5,044,830**

## GRAVITY BASE STRUCTURE FOR AN OFFSHORE PLATFORM IN ARTIC REGIONS

**Gérard A. A. Barbaras, La Queue en Brie; Jean Pagés, Paris, and Phillippe A. R. Dumas, Saint-Fargeau, all of France, assignors to Doris Engineering, Paris, France**

**Continuation of Ser. No. 190,157, May 4, 1988, Pat. No. 4,906,138. This application Jan. 24, 1990, Ser. No. 467,271**
**Claims priority, application France, May 13, 1987, 87 06711**
**The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.**
**Int. Cl.[5] E02D *27/38***
**U.S. Cl. 405—210** **5 Claims**

1. A gravity base structure which can extend from a seabed to above seawater level and protect from iceberg impact the

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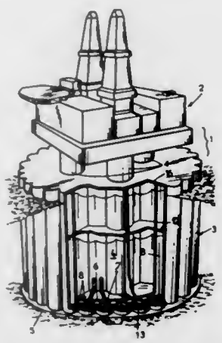


deck of an offshore platform having supporting columns extending from seabed to above seawater level, comprising

a monolithic concrete caisson which includes a bottom slab adapted to rest on the seabed, a top slab spaced upwardly therefrom,

an inner protective wall which extends between said bottom slab and said top slab and is integral with both said slabs,

an outer protective wall which extends between said bottom slab and said top slab and is integral with both said slabs, said outer wall being substantially concentric with said inner wall, and



a plurality of partition walls which extend between said bottom slab and said top slab and from said inner wall to said outer wall to form therebetween a lattice structure for transmitting impact energy from said outer wall to said inner wall,

said deck supporting columns being substantially free of means for transmitting impact energy to said columns from said inner and outer protective walls other than that transmitted by said top and bottom slabs.

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**5,044,831**

**SOIL NAILING**

**Bernard Myles; Ronald J. Bridle, both of Gwent; Benjamin I. G. Barr, Cardiff, and Colin I. Campbell, Guildford, all of United Kingdom, assignors to University College Cardiff Consultants Limited, Cardiff, England**

**Continuation-in-part of Ser. No. 346,539, May 2, 1989. This application Apr. 30, 1990, Ser. No. 515,743**

**Claims priority, application United Kingdom, Apr. 28, 1989, 8909837**

**The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.**

**Int. Cl.[5] E21D** *20/00, 21/00;* **F21B** *11/00*

**U.S. Cl. 405—259** **17 Claims**

1. A method of soil nailing in which a soil nail is placed in the ground by being fired from a barrel of a launcher, the method including the steps of loading the nail into the barrel with the nail being a loose fit in the barrel, providing the nail with a sabot which is a sliding fit in the barrel, supporting the barrel such that a forward end of the barrel is spaced from the surface of the ground into which the nail is to be fired, admitting pressurised gas to the barrel to apply an accelerating force to the sabot so as to drive the sabot and with it the nail towards the forward end of the barrel, allowing the nail to travel towards the ground surface such that the sabot exits from the barrel thereby discontinuing the accelerating force and allowing the nail to thereafter continue travelling to penetrate and become embedded in the ground under its own momentum.

8. Apparatus for use in soil nailing comprising a barrel receiving in use a soil nail, support means supporting the barrel such that a forward end of the barrel is spaced from the surface of the ground, the soil nail being a loose fit in the barrel and being provided with a sabot which is slidable in the barrel, the barrel having a rearward end provided with a breech defining a firing chamber closed by the sabot, and firing means operable to admit pressurised gas to the chamber so as to apply an accelerating force to the sabot whereby in use the soil nail is



accelerated towards the ground surface by the accelerating force until the sabot exits the barrel, the soil nail thereafter travelling under its own momentum to penetrate and become embedded in the ground.

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**5,044,832**

**METHOD OF AND ARRANGEMENT FOR SETTING ANCHORS IN LOOSE ROCK RANGING FROM COHESION-POOR TO NON-COHESION ROCKS**

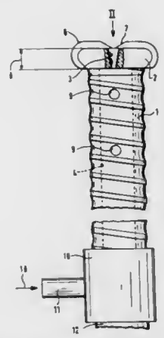
**Heinz Gruber, Seesen/Rhüden, Fed. Rep. of Germany, assignor to GD-Anker GmbH, Seesen/Rüden, Fed. Rep. of Germany**

**Filed Nov. 29, 1989, Ser. No. 443,121**

**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1988, 3840158**

**Int. Cl.[5] E21D** *20/02, 21/00*

**U.S. Cl. 405—260** **10 Claims**



1. An arrangement for anchoring in loose rocks ranging from cohesion-poor to non-cohesion rocks, comprising an anchor including a drilling crown and a drilling rod having a central axial opening and a plurality of radial openings in the region close to said drilling rod so that during drilling a liquid medium is simultaneously supplied through said central opening, said drilling rod having over its whole length a profiled outer surface formed as a round thread, said drilling crown including a tubular projection provided with means for tearing of rocks and mixing released material particles with mortar, said means in an axial view overlapping at least 50% of an area covered by the rock anchor during drilling, said projection being provided with an outer thread formed as a round thread for screwing said drilling rod, said projection being provided with a plurality of lateral openings and also with an axial opening at its front end formed so that said lateral openings and said axial opening communicate with said central axial opening of said drilling rod, said means extending laterally so that they cover a radius corresponding to a radius of a cross-section allowing a flow of the liquid medium during setting the rock anchor.



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**5,044,833**

**REINFORCED SOIL RETAINING WALL AND CONNECTOR THEREFOR**

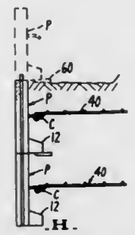
**William K. Wilfiker, P.O. Drawer L, Eureka, Calif. 95501**

**Filed Apr. 11, 1990, Ser. No. 508,255**

**The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.**

**Int. Cl.[5] B23D** *21/04*

**U.S. Cl. 405—267** **1 Claim**



1. An improved precast concrete face panel or reinforced soil embankments, said panel comprising:

(a) a horizontally elongate vertically extensive planar body section with steel reinforcing rods embedded therein, said section having top and bottom edges and including means for mutually engaging the top edge of said section with the bottom edge of a like panel stacked thereabove; and,

(b) a cantilever section integral with and extending longitudinally of and laterally from one side of the body section adjacent the bottom edge thereof for extension into a soil embankment being reinforced, said section extending horizontally over substantially the entire length of the body section.

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**5,044,834**

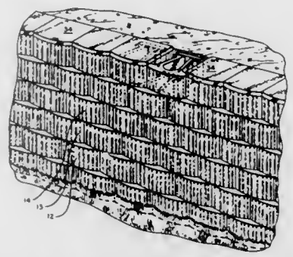
**RETAINING WALL CONSTRUCTION AND BLOCKS THEREFOR**

**Peter Janopaul, Jr., Modesto, Calif., assignor to Graystone Block Co., Inc., Modesto, Calif.**

**Filed Jul. 26, 1990, Ser. No. 557,956**

**Int. Cl.[5] E02D** *29/02*

**U.S. Cl. 405—284** **9 Claims**



1. In a retaining wall construction formed by a number of interlocking concrete blocks, the wall having a predetermined upward slope established by the interlocking means, said construction comprising a first plurality of blocks disposed in line and forming a first row thereof, a second plurality of blocks disposed in line and forming a second row of blocks carried by the first row, said blocks having a top and bottom surface, said blocks of one row overlapping a pair of blocks of another row, and having a pair of openings formed in the top and bottom surfaces of said block, said openings being aligned between those on top and those underneath, a plurality of interlocking elements interposed between blocks of said first and second rows, said elements including first and second elongate body portions, said first body portion having, along the length thereof, a rectangular cross-section as viewed in plan, said second body portion having along a limited extent of the length thereof, a rectangular cross-section as viewed in plan, said rectangular cross-section of said first and second body portions being shaped and dimensioned to fit within said openings to provide a loose fit therein, said second body portion carrying thereon a progressively reduced upper end portion serving to guide said second body portion into an opening exposed underneath one of said blocks being placed thereon, said first portion being offset a predetermined degree from said second body portion to form a step between said first and second body portions, the extent of said step serving to define the degree of the predetermined upward slope of the wall.

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**5,044,835**

**EXPANSION JOINT FOR USE IN CONSTRUCTING CONCRETE STRUCTURES**

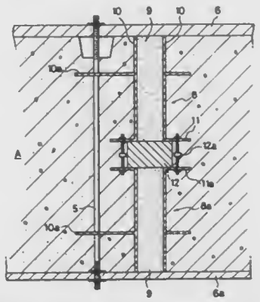
**Takuo Fukushima; Hiroshi Inoue; Yasumasa Hayashida, and Makio Takahashi, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 21, 1989, Ser. No. 454,155**

**Claims priority, application Japan, Dec. 29, 1988, 63-170902[U]**

**Int. Cl.[5] E04C** *11/12*

**U.S. Cl. 405—287** **16 Claims**



1. An expansion joint for use in constructing concrete structures, the expansion joint comprising a plurality of sandwich type composite plates, each composite plate comprising a sheet-like elastic body sandwiched between a pair of hard plates with a rib at an end of each of said hard plates, said ribs being connected to each other by a connection means and a water-swelling rubber disposed between said composite plates.

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**5,044,836**

**ELECTRIC AIR ADMISSION CONTROLLER**

**John M. Grooms, Rochester, Ind., assignor to Burton Mechanical Contractors, Inc., Rochester, Ind.**

**Filed Mar. 9, 1990, Ser. No. 491,255**

**Int. Cl.[5] B01D** *1/00*

**U.S. Cl. 406—22** **21 Claims**

1. An air admission controller for automatically regulating the opening and closing of a control valve connected to a vacuum sewage transport conduit to admit atmospheric pressure into the conduit, comprising:

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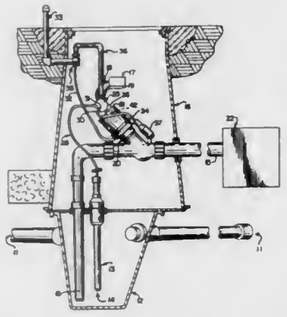


a timer unit having a first activated condition and a second inactivated condition;

a source of vacuum or subatmospheric pressure;

a source of atmospheric pressure;

means, operatively in communication with said timer unit, for establishing communication of one of these pressure conditions with the control valve, which, in response



thereto, either opens or closes the valve to commence or terminate an air transport cycle within the transport conduit, wherein vacuum or subatmospheric pressure is delivered while said timer is in one condition, and wherein atmospheric pressure is delivered while said timer is in another condition; and

a housing for containing the components of the air admission controller.

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**5,044,837**

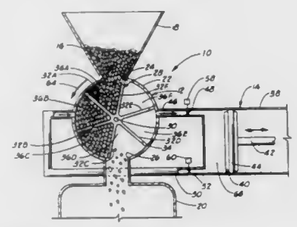
## METHOD AND APPARATUS FOR CONTINUOUSLY FEEDING PARTICULATE SOLID MATERIAL INTO A PRESSURIZED SYSTEM WITHOUT PRESSURE LOSS

**Thomas W. Schmidt, Ochelata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Sep. 14, 1989, Ser. No. 407,316**

**Int. Cl.[5] B65G *51/02***

**U.S. Cl. 406—85** **20 Claims**



1. An apparatus for transferring solids comprising:

a case having inlet means for connecting to a supply of the solids and an outlet means for connecting to a discharge location;

a rotor rotatably disposed in said case, said rotor defining a plurality of solids transfer chambers; and

means for compressing gas from one of said chambers and transferring said gas to another of said chambers, said means comprising a gas compressor having a reciprocating piston therein, wherein a stroke of said piston is controlled by rotation of said rotor.

**5,044,838**

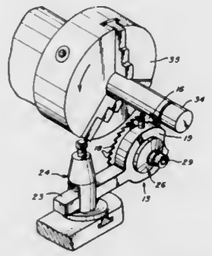
## TOOL HOLDING CIRCULAR TOOTHED BLADES STATIONARY WHILE CUTTING OR GROOVING ROTATING WORK

**Richard A. Brookfield, 9625 Merrimoor Blvd., Largo, Fla. 34647**

**Filed Apr. 26, 1990, Ser. No. 514,754**

**Int. Cl.[5] B23P *15/28***

**U.S. Cl. 407—103** **11 Claims**



1. A tool for use with a holder in holding at least one blade such as a circular saw blade or a milling cutter against turning when a selected tooth of the blade is in cutting or grooving contact with a rotating work piece having a longitudinal center line, the blade having an axial aperture, said tool including a body provided with a shank connectable to the holder, said body having first and second parallel backing surfaces and a socket in the form of a straight slot having parallel sides and opening through both surfaces and normal to the center line of the work when the body is connected to the holder, first and second clamping members, the first clamping member provided with a hub shaped and dimensioned to extend through the blade aperture and rotatably and slidably support the blade and also to extend into the slot with the slot then intersecting the blade axis, the hub having flat sides spaced apart for sliding engagement with the sides of the slot thereby to prevent the hub from turning, the first clamping member and the portion of the body having the first backing surface so dimensioned that the portion of the periphery of the blade including the selected tooth protrudes therefrom, means detachably interconnecting the body and clamping members through the slot in a manner enabling the first clamping member with the blade supported by the hub to releaseably clamp the blade against the first backing surface, the second clamping member then engageable with the second backing surface, and the body provided with hub positioning means extending into the slot and detachably connected to the hub when in the slot and operable to shift the hub lengthwise of the slot to enable the selected tooth to be precisely positioned relative to the center line of the work after the blade has been manually turned to place the selected tooth in approximately its position for use and before the blade is clamped in place.

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**5,044,839**

## THROW AWAY INSERT

**Nobuhiro Takahashi, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Aug. 28, 1990, Ser. No. 574,286**

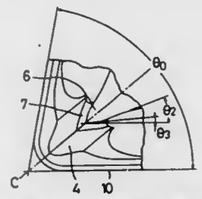
**Claims priority, application Japan, Aug. 31, 1989, 1-102495[U]**

**Int. Cl.[5] B23B *27/22***

**U.S. Cl. 407—114** **6 Claims**

1. A throw-away insert having a corner portion, a cutting edge extending at the periphery of the insert, a center land, a breaker groove extending therein between said cutting edge and said center land, a pair of slopes protruding upwardly in said breaker groove near said corner portion of the insert, said slopes extending obliquely at an angle of 5–20 degrees in a symmetrical relation with each other with respect to the bisector of the angle subtended by said corner portion so as to define a ridge therebetween, a breaker protrusion extending from said center land toward said corner portion and having a tapered end, breaker walls extending obliquely upwardly from rear end portions of said pair of slopes remote from said corner portion to a front end of said breaker protrusion facing said corner





portion, and ellipsoidal grooves formed in said breaker groove and contiguous with said breaker walls, said protrusion have a tip at the front end portion thereof having a small radius of curvature and defined by ridges each extending at an angle of $\theta_2$ with respect to respective straight portions of said cutting edge, said angle $\theta_2$ being approximately 1° to one-half of said angle subtended by said corner portion.

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**5,044,840**

## INDEXABLE CUTTING INSERT

**Richard Fouquer, and Jocelyn Gibert, both of Tours, France, assignors to Safety S. A., Boulogne-Billancourt, France**

**Filed Aug. 31, 1989, Ser. No. 401,173**

**Claims priority, application France, Sep. 29, 1988, 88 12737**

**Int. Cl.[5] B23D *15/28***

**U.S. Cl. 407—114** **10 Claims**



1. Cutting insert for chipforming machining of metal workpieces, comprising a polygonal body of wear resistant material including opposed top and bottom surfaces and a plurality of side walls extending therebetween, a plurality of cutting edges formed by the intersection of said side walls and at least one of said top and bottom surfaces, pairs of said cutting edges converging toward respective corners of said insert, said corners including curved corner cutting edge portions, a continuous land area extending inwardly from said cutting edge toward a center of the insert, a chip breaker groove located along each cutting edge inwardly of the associated land area, said chip breaker groove comprising a row of concave depressions extending along each cutting edge, said row of concave depressions including a pair of end depressions arranged at opposite ends of the associated cutting edge and situated adjacent respective corners of said insert, and a series of intermediate depressions extending between said pair of end depressions, said end depressions extending along respective end portions of a respective cutting edge, and said intermediate depressions extending along respective intermediate portions of a respective cutting edge, said end portions of adjacent cutting edges being separated by respective ones of said curved corner cutting edge portions, each of said cutting edge end portions being longer in length than each of said cutting edge intermediate portions as said top surface is viewed in plan, said cutting edge end portions being straight as said insert is viewed in side elevation and in top plan, and said cutting edge intermediate portions forming a wave shape as said insert is viewed in side elevation.

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**5,044,841**

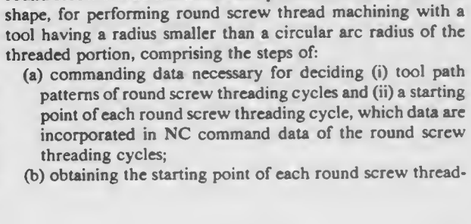
## VALVE SEAT BUSHING MACHINING APPARATUS

**Leonard W. Biera, Ortonville; William F. Crawford; John Kobane, Jr., both of Sterling Heights, and Jack R. Settimo, Shelby Township, Macomb County, all of Mich., assignors to Litton Industrial Automation Systems, Inc., Florence, Ky.**

**Filed Jul. 20, 1990, Ser. No. 556,648**

**Int. Cl.[5] B23B *41/06***

**U.S. Cl. 408—36** **4 Claims**



1. Apparatus for machining an annular valve seat and associated concentric valve stem guide of a workpiece, comprising a support for the workpiece, a tool head, means supporting said tool head adjacent said workpiece support for rotation on an axis aligned with the valve stem guide of the supported workpiece and for axial movement toward and away from the supported workpiece, first power means for rotating said tool head about its axis of rotation, a reamer mounted on said tool head coaxially with the axis of rotation of said tool head for reaming said valve stem guide, a tool slide, a cutting tool mounted on said tool slide, guide means mounting said tool slide on said tool head for movement of said cutting tool along a line which intersects said axis of rotation, second power means operative to axially move said tool head, third power means operative to move said tool slide along said guide means, and control means for coordinating the operation of said second and third power means to cause said cutting tool to follow a predetermined path suitable for the machining of said valve seat.

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**5,044,842**

## ROUND SCREW THREAD MACHINING METHOD

**Mitsuto Miyata; Teruyuki Matsumura, both of Tokyo, and Masashi Kawasumi, Yamanashi, all of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan**

**PCT No. PCT/JP89/00227, § 371 Date Nov. 6, 1989, § 102(e) Date Nov. 6, 1989, PCT Pub. No. WO89/08521, PCT Pub. Date Sep. 21, 1989**

**PCT Filed Mar. 3, 1989, Ser. No. 432,771**

**Claims priority, application Japan, Mar. 10, 1988, 63-56927**

**Int. Cl.[5] B23C *3/32*; B23B *1/00***

**U.S. Cl. 409—66** **2 Claims**

1. A round screw thread machining method in which a round screw thread has a threaded portion which is arcuate in shape, for performing round screw thread machining with a tool having a radius smaller than a circular arc radius of the threaded portion, comprising the steps of:

(a) commanding data necessary for deciding (i) tool path patterns of round screw threading cycles and (ii) a starting point of each round screw threading cycle, which data are incorporated in NC command data of the round screw threading cycles;

(b) obtaining the starting point of each round screw thread-

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ing cycle along the circular arc profile of the round screw thread using the data; and

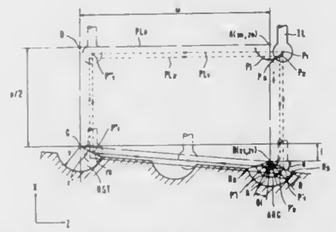
(c) performing round screw thread machining by repeatedly executing the threading cycles while successively shifting the cycle starting point along the actuate profile,

wherein the data necessary for deciding the starting point of the round screw threading cycle are an arc radius r of the round screw thread, angles a, b which center lines passing through respective arc starting and end points of the round screw thread make with horizontal axes, and a number d of partitions of the arc, and wherein steps (a) and (b) include

obtaining a partitioning angle $\theta$ in accordance with the equation

$$\theta=(b-a)/d$$

using the number of partitions d and the angles a, b;



obtaining an angle Ai of an i-th partitioning position in accordance with the equation

$$\Theta i=a+(i-1)\cdot\theta$$

and

computing coordinates (X,Y) of a cycle starting point of an i-th round screw threading cycle, using coordinates $(x_o,y_o)$ of a tool path pattern starting point of the round screw threading cycle, the i-th angle Ai and a difference r' between the radius r of the threaded portion and tool diameter $r_o$, in accordance with the equations

$$X=x_o-r' \sin(\Theta i)$$

$$Z=Z_{o=}r'\cos(\theta i)$$

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**5,044,843**

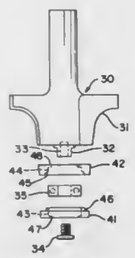
**CUTTING TOOL**

**Fredric A. Velepec, Glendale, N.Y., assignor to Fred M. Velepec Co., Inc., Glendale, N.Y.**

**Filed May 2, 1990, Ser. No. 518,023**

**Int. Cl.[5] B26D *1/12***

**U.S. Cl. 409—126** **5 Claims**



1. A cutting tool suitable for shaping the top of a counter section having a fixture disposed therebeneath, the cutting tool comprising a shaft member having a shaped cutting means disposed at the lower end thereof for shaping the counter section, said shaft member including a smaller diameter shaft extending from the lower end of said shaped cutting means with a receptacle means included therein suitable for receiving a fastening means, a ball bearing means adapted to be rotatably mounted on said smaller diameter shaft, a split follower means adapted to captively hold said ball bearing means, including a first and second section, the outer diameter thereof shaped to bear against the side wall of the fixture, said first section including a recess for mounting said ball bearing means, an outer diameter for bearing against the fixture being shaped and a cylindrical boss section having a diameter smaller than said outer diameter suitable for engaging a recess in said second section, said second section including a first recess therein for holding said ball bearing means and a second recess adapted to mate with said boss means of said first section to form a closed follower means captively holding said ball bearing means therein, and a fastening means engageable with said receptacle means to facilitate screw fastening of said follower means including said ball bearing means therein to said shaft member.

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**5,044,844**

**MACHINING APPARATUS**

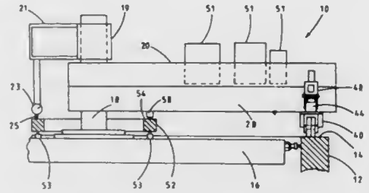
**Anthony E. Backhouse, Kew, Australia, assignor to Furmanite Australia Pty. Ltd., Victoria, Australia**

**Filed Nov. 30, 1990, Ser. No. 620,167**

**Claims priority, application Australia, Nov. 30, 1989, PJ7641; Oct. 4, 1990, PK2633**

**Int. Cl.[5] B23C *1/20***

**U.S. Cl. 409—178** **25 Claims**



1. Apparatus for machining a workpiece, comprising a boom supported on a support structure, a machining station mounted on the boom, a plurality of spaced displacement means on the boom for enabling displacement of the boom relative to the support structure through engagement with one or more support surfaces, drive means to displace the boom along the support surface or surfaces, the displacement means being associated with respective portions of the boom and each being independently adjustable to allow the associated portion of the boom to move towards or away from the support surface, and wherein the independent adjustment of each displacement means is controlled by a respective sensor monitoring movement of the associated portion of the boom relative to a reference to counter inconsistencies in the support surface and thereby to maintain the machining station at a desired level.

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**5,044,845**

**SNOWMOBILE TRANSPORT APPARATUS**

**Vernon J. Baker, Jr., Box 424 High St., Athol, N.Y. 12810**

**Filed Aug. 8, 1990, Ser. No. 564,123**

**Int. Cl.[5] B60P *7/00***

**U.S. Cl. 410—3** **7 Claims**

1. A snowmobile transport apparatus comprising, in combination,

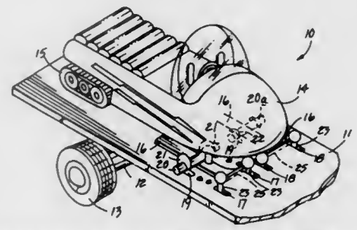
a planar platform having two wheels depending downwardly therefrom and suitable for towing behind a vehicle, the planar platform including a first pair of spaced parallel forward slots directed through the platform, and

a second pair of spaced parallel forward slots directed through the platform, wherein the first and second pair of forward slots are in a parallel coextensive aligned relationship relative to one another transversely directed across the platform, and

each forward slot includes a rear slot spaced from and aligned with each forward slot, and

a movable hook member directed and projecting upwardly through each rear slot, and an actuator rod directed





through each forward slot for moving an associated hook member, and

the first pair of forward slots cooperative with a plurality of rear slots defining a first pair of rear slots, and the second pair of forward slots cooperative with a plurality of rear slots to define a second pair of rear slots, and

a first transversely directed latch rod cooperative with the hook members directed through the first pair of rear slots, and second transversely directed latch rod cooperative with the second pair of rear slots, wherein a respective snowmobile ski member is securable between each of the first and second pairs of rear slots respectively.

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**5,044,846**

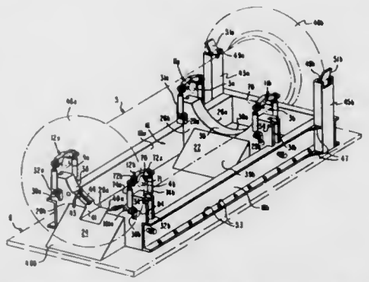
**COMPLIANT TIEDOWN SYSTEM FOR SECURING A CASK FOR TRANSPORTING RADIOACTIVE MATERIALS TO A VEHICLE**

**Raymond V. Richardson, Greensburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Continuation of Ser. No. 181,896, Apr. 15, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 485,839**

**Int. Cl.[5] B60P *7/12***

**U.S. Cl. 410—47** **28 Claims**



1. A tiedown system for releasably securing a cask having opposing trunnions to a cradle assembly that in turn is mounted onto the deck and frame of a vehicle, wherein said cradle assembly includes at least one cradle member for supporting the weight of the cask, and wherein said cask trunnions are displaceable in opposite vertical directions relative to the cradle member of the cradle assembly when said assembly is torsionally flexed, and said cask rotates relative to said cradle member, about a horizontally oriented axis comprising a compliant linkage means including a tie-bar means operably connected between said trunnions and movably mounted within the cradle assembly for applying a biasing force on each of said trunnions that remains substantially constant despite the opposite vertical displacement of said trunnions relative to the cradle member that results from the torsional flexing of said vehicle deck.

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**5,044,847**

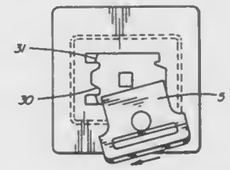
**POSITIVE LOCKING TIE-DOWN SYSTEM**

**Gerald A. B. Saunders, Sydenham; Henk W. Wevers, Glenburnie, and David Sin, Kingston, all of Canada, assignors to Queen's Univeristy at Kingston, Kingston, Canada**

**Filed Feb. 15, 1990, Ser. No. 480,391**

**Int. Cl.[5] B60P *7/08***

**U.S. Cl. 410—101** **9 Claims**



1. An anchoring device, floor-mountable in a load carrying vehicle, said device comprising:

(a) receptacle means having an open top;

(b) planar cover means rigidly secured on said receptacle means in overlying relationship over said open top;

(c) means to mount and secure said receptacle means and cover means in said vehicle floor such that, in operative position, said cover means is substantially flush with said vehicle floor;

(d) flat resilient spring means contained in said receptacle means adjacent one marginal side wall thereof; said cover means having an irregularly shaped opening defined therethrough including a pair of opposed parallel sides and a pair of shaped sides substantially perpendicular thereto such that a load tie-down hook may be inserted in a central portion of said opening intermediate said pair of parallel sides and moves to a locked position against one of said shaped sides in which said resilient spring means urges said hook laterally against said one shaped side and thus releasably retains said hook between said shaped sides and adjacent one of said parallel sides in said locked position.

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**5,044,848**

**PARTITION SECUREMENT STRUCTURE FOR A PICK-UP TRUCK**

**Robert E. Burnham, Novi, Mich., assignor to Chrysler Corporation, Highland Park, Mich.**

**Filed Mar. 21, 1990, Ser. No. 496,708**

**Int. Cl.[5] B60P *1/64***

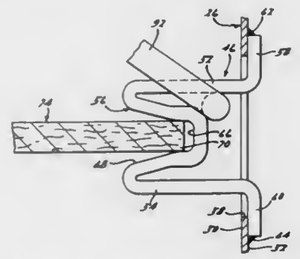
**U.S. Cl. 410—102** **5 Claims**

1. The combination comprising a pick-up truck having partition securement structure thereon, the pick-up truck including a cargo compartment defined in part by a cargo bed and a pair of spaced apart longitudinal side walls extending upwardly therefrom, each side wall having an inner panel with an inner face and an outer face, each inner panel having opening means therein, said opening means being adjacent to, but spaced vertically from, the cargo bed, the opening means of one inner panel being in transverse alignment with the opening means of the other inner panel, a pair of wire retainers, each retainer including a pair of spaced apart legs, a web joining the legs together at one end, the other end of each leg having an outturned foot, the feet of each retainer being received through

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one of said opening means from a point within the cargo compartment and abutting against the outer face of the respective inner panel, the web of each retainer being positioned within the cargo compartment, each web having a generally U-



shaped recess with the mouth thereof facing into the cargo compartment, each retainer providing securement structure for one side of a partition extending transversely between the cargo compartment side walls with the edges thereof being removably receivable in the retainer U-shaped recesses.

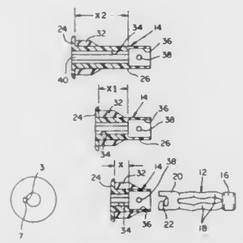
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**5,044,849**

## SCREW ANCHOR

**David E. Starke, Whitfield, Pa., assignor to Emhart Inc., Newark, Del.**

**Filed Jun. 1, 1990, Ser. No. 521,227**
**Int. Cl.[5] F16B *13/04***
**U.S. Cl. 411—38** **3 Claims**



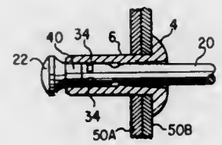
1. A screw anchor comprising a metallic collapsible part and a plastic cap part, said metallic collapsible part including
a nut end,
a plurality of collapsible legs extending from said nut end,
a latching cylinder at the other end of said collapsible legs, and
an arcuate capturing slot defined in said latching cylinder, and said plastic cap part including
a through bore for receiving a screw,
a flanged end at one end,
a latching cylinder receiving bore at the other end,
a pin projecting radially from said receiving bore to be captured by said arcuate capturing slot when said latching cylinder is inserted into said receiving bore, and a longitudinally extending slot, communicating with said through bore and extending axially inwardly from said flanged end.

**5,044,850**

## SELF PLUGGING BLIND RIVET

**Steven Getten, Albrightsville, Pa., and Carlos Castaneda, Dover, N.J., assignors to Avdel Corporation, Parsippany, N.J.**

**Filed May 11, 1990, Ser. No. 522,053**
**Int. Cl.[5] F16B *13/04***
**U.S. Cl. 411—43** **6 Claims**



1. A self plugging blind rivet having a large grip range, comprising:
a tubular shell having a head at one end, an elongate shank portion having means for permitting said shank portion to expand radially to form a blind head, and a bore extending through said head and said shank portion from said one end to another end opposite thereto, wherein said bore has a shoulder at a midportion thereof to form a locking portion of said bore on a side of said shoulder towards said one end, said locking portion having a diameter smaller than a diameter of said bore on a side of said shoulder towards said another end;
a stem fitted in said bore of said tubular shell, said stem comprising a head positioned adjacent said another end, and a shank extending from said stem head toward said one end of said shell and beyond said one end of said shell, whereby a setting tool may grip said shank to set the rivet;
a breakneck formed on said shank, whereby said stem can rupture at said break neck during the setting of said rivet;
a shoulder formed on said shank at a position between said breakneck and said stem head such that said shoulder may reach said locking portion during the setting of said rivet, said shoulder of said shank defining a swaging portion of said shank on a side thereof towards said stem head, said swaging portion having a diameter greater than that of said locking portion of said bore; and
locking means formed on said shank at a position between said shoulder of said shank and said breakneck, said locking means comprising at least one projection extending radially from said shank and having a diameter which is not greater than that of said locking portion of said bore,
whereby upon engagement of said shoulder of said shank with said shoulder of said bore during the setting of the rivet, material of said shell at said locking portion is caused to flow towards said locking means to lock said stem in said bore,
wherein said locking means comprise a split ring having at least two circumferentially extending ring portions projecting from said shank, each of said ring portions being circumferentially separated from adjacent ring portions by a reduced diameter gap, whereby said material of said shell which has been caused to flow towards said locking means may flow axially through said gaps.

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**5,044,851**

## FASTENING ELEMENT ASSEMBLY AND METHOD OF SETTING FASTENING ELEMENTS

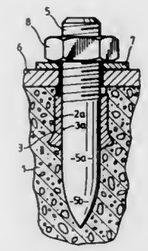
**Peter Gschwend, Gamprin, Switzerland, assignor to Hilti Aktiengesellschaft**

**Filed Dec. 26, 1989, Ser. No. 456,331**
**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843392**
**Int. Cl.[5] F16B *13/06***
**U.S. Cl. 411—44** **14 Claims**

11. Fastening element assembly arranged to be set into a



blind borehole in a hard receiving material such as concrete, stone and the like, comprising an axially extending fastening element arranged to be driven into the receiving material by high pressure gases, said fastening element having an axially extending shank, said shank having a first end and a second end, said shank having a diameter extending from the second end toward the first end, said shank adjacent the first end tapering inwardly from said diameter to the first end, an axially extending sleeve to be inserted into the borehole in the receiving material having an axially extending bore therein, said



sleeve having a first end and a second end with the bore extending from the second end toward the first end thereof and with said second end arranged to receive the first end of said shank so that by applying high pressure gases to the second end of said fastening element, said fastening element can be driven through said sleeve out of the first end thereof into the receiving material, and said sleeve having a bore diameter at the second end thereof smaller than the diameter of said shank whereby said fastening element expands said sleeve against the receiving material.

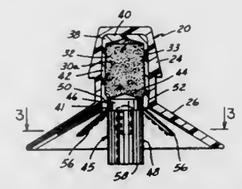
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**5,044,852**

## VACUUM FIXED ADHESIVELY SECURED FASTENER

**Theodore J. Sweeney, Grosse Pointe City, Mich., and Englebert A. Meyer, Sun City, Calif., assignors to Theodore Sweeney & Company, Inc., Detroit, Mich.**

**PCT No. PCT/US88/00499, § 371 Date Sep. 4, 1990, § 102(e) Date Sep. 4, 1990, PCT Pub. No. WO89/07718, PCT Pub. Date Aug. 24, 1989**
**Continuation-in-part of Ser. No. 86,363, Aug. 17, 1987, Pat. No. 4,830,558, which is a division of Ser. No. 800,555, Nov. 21, 1985, Pat. No. 4,693,652, which is a continuation of Ser. No. 472,084, Mar. 4, 1983, Pat. No. 4,555,206, which is a division of Ser. No. 234,777, Feb. 11, 1981, Pat. No. 4,425,065, which is a division of Ser. No. 936,331, Aug. 24, 1978, abandoned. This PCT application Feb. 18, 1988, Ser. No. 571,573**
**Int. Cl.[5] F16B *39/00, 37/06***
**U.S. Cl. 411—258** **17 Claims**



1. A vacuum fixed adhesively secured fastener for attachment to a substrate comprising, in combination:
a body member having a vacuum cup thereon for flattening against a substrate to temporarily hold the body member thereto and defining an interface therebetween;
a reservoir on the body member for containing a quick setting adhesive;
plunger means on the body member cooperating with the reservoir for displacement thereinto as the vacuum cup is flattened;
distributing means for receiving adhesive expelled from the reservoir and distributing it throughout said interface;
valve means between the reservoir and distributing means and responsive to displacement of the plunger means to allow escape of adhesive from the reservoir to said distributing means; and
the volume of the reservoir being reduced as the plunger means is displaced thereinto to expel adhesive in the reservoir into the interface between the body member and a substrate against which the vacuum cup is flattened.

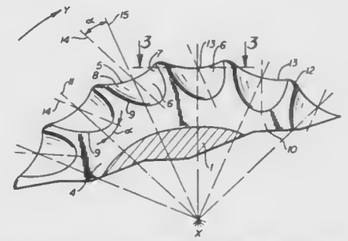
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**5,044,853**

## THREAD-CUTTING SCREW

**Robert Dicke, Ennepetal, Fed. Rep. of Germany, assignor to Erwin Rommel, Fed. Rep. of Germany**

**Filed Apr. 19, 1990, Ser. No. 510,961**
**Claims priority, application Fed. Rep. of Germany, Apr. 25, 1989, 8905189[U]**
**Int. Cl.[5] F16B *39/30***
**U.S. Cl. 411—311** **4 Claims**



1. Thread-cutting screw with a thread (4) extending over at least part of the shaft of the screw, with a screw tip and a screw head, where the edge (5) of the thread is at least partially undulating and the thread runs to the end of the tip of the screw, and the undulating edge of the thread has recesses (6) interrupting the flank face (10) of the thread on at least the flank face that faces the tip of the screw, in the section of the valleys of the undulating edge and at least on the screw shaft next to the tip of the screw, where the upper border of these recesses is the edge (5) of the thread, characterized in that:
the recesses (6) are in the shape of a parabola (9) and are asymmetrical, and the front flank face (7) of the recesses in the screw-in direction is steeper than the rear flank face (8) in the screw-in direction.

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**5,044,854**

## FASTENING DEVICE IN THE FORM OF DIVIDED WASHER SECTIONS WITH GUIDE WIRE

**Jung Ho Oh, 91-265, Shinsu-dong, Mapo-ku, Seoul, Rep. of Korea**

**Filed Feb. 25, 1988, Ser. No. 160,304**
**Claims priority, application Rep. of Korea, Jan. 31, 1987, 87-755**
**Int. Cl.[5] F16B *37/08, 43/00***
**U.S. Cl. 411—344** **1 Claim**

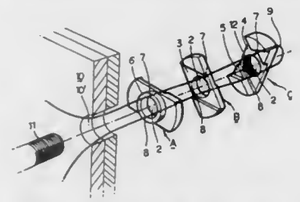
1. A fastening device comprising:
a plurality of divided washer sections for engagement with the back side of a wall after insertion of the sections through a joining hole formed in said wall;
each washer section having a first planar surface for engagement with the back side of the wall and a second planar surface opposite said first planar surface,
each washer section having a recess formed in the surface of the washer section which faces an adjacent washer section,
each recess having a configuration which both permits adja-

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cent sections to be assembled in stacked together relation such that the first planar surfaces are aligned in the same plane for engagement with the back side of the wall and also permits the adjacent washer sections to be interlocked against relative rotation and lateral movement when the sections are assembled in stacked together relation,

each washer section having a first guide wire fastening hole and a second guide wire fastening hole located to be respectively aligned with a first and a second guide wire hole of an adjacent washer section when the washer sections are assembled in stacked together relation, and



a guide wire for connecting the said washer sections by passing through the guide wire fastening holes formed in the said washer sections,

and wherein the separated washer sections after passing through the joining hole are, by pulling the guide wire forward, combined overlappingly into a short cylindrical form which has a planar, circular contact surface engaged with the back side of the wall and which functions as an integral cylindrical washer.

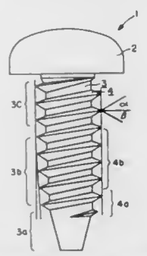
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**5,044,855**

## THREAD-FORMING FASTENERS

**Kenji Fukubayashi, Kyoto, Japan, assignor to Nitto Seiko Co., Ltd., Kyoto, Japan**

**Filed Aug. 31, 1990, Ser. No. 576,369**
**Int. Cl.[5] F16B *25/00, 35/04***
**U.S. Cl. 411—386** **1 Claim**



1. In a thread forming fastener comprising a driving head with a recess to be engaged with a driving tool and a shank portion, wherein the shank portion consists of a first portion of a tapered end portion which is of equilaterally polygonal shape in cross section having lobes wherein a distance from a screw axis to a crest of each lobe continuously increases toward the driving head, a second portion merged with the said first portion wherein a distance from the screw axis to a crest of each lobe of said second portion is constant and a cross sectional shape of said second portion continuously changes towards the driving head until said second portion is substantially circular in cross section, a third portion which is of a substantially circular shape in cross section merged with the second portion, and a continuous screw thread over the second portion and the third portion,

the screw thread over the second portion and the third portion starts at a joint portion between the first portion and the second portion and spirals toward the head and is formed having a leading flank with a larger flank angle and a following flank with a smaller flank angle.

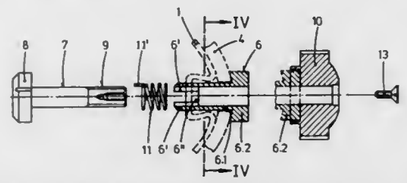
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**5,044,856**

## FASTENING ELEMENT SECURED AGAINST ROTATION FOR A STRUCTURAL PART TO BE REMOVABLY ATTACHED TO A SUPPORTING ARRANGEMENT

**Harald Jerabek, Müllheim, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands**

**Filed May 24, 1990, Ser. No. 528,749**
**Claims priority, application Switzerland, Jun. 21, 1989, 2308/89**
**Int. Cl.[5] A44B *17/00***
**U.S. Cl. 411—551** **6 Claims**



1. A fastening device for fastening a structural member to a supporting arrangement, the structural member having a first opening with a non-circular cross-sectional shape, and the supporting member having a second opening with a non-circular cross-sectional shape, said device comprising an adapter sleeve having a front end with a non-circular cross-sectional shape, a rear end, and a bore extending from said front end to said rear end, said front end being adapted to engage the first and second openings; a bolt having a first end adapted to extend through the first and second openings, a second end adapted to be received in said bore of said adaptor sleeve, a hammer head attached to said first end of said bolt and having a cross-sectional shape that matches said cross-sectional shape of said front end of said adapter sleeve, whereby said hammer head abuts against the supporting member when said hammer head is rotated by said bolt relative to said adapter sleeve; and limiting means attached to said front end of said adapter sleeve for limiting the rotation of said hammer head by approximately 90 degrees in relation to said adapter sleeve.

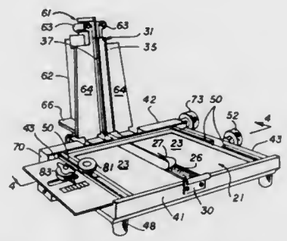
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**5,044,857**

## CASING-IN MACHINE

**Phillip M. Crudo, Sparks, Nev., assignor to VeloBind, Inc., Fremont, Calif.**

**Continuation of Ser. No. 237,318, Aug. 29, 1988, abandoned. This application May 23, 1990, Ser. No. 528,333**
**Int. Cl.[5] B42C *11/02***
**U.S. Cl. 412—19** **6 Claims**



1. Apparatus for casing-in a core of the type having a plurality of sheets bound together along the spine edge of the core by means of narrow thin binding strips located on opposite sides of said core along the spine edge thereof into a case having front and back covers and an interconnecting flexible spine



area substantially wider than the thickness of said core, a spine strip affixed to the middle of said spine area having pressure-sensitive adhesive on its outer surface covering substantially all of said spine area,

said apparatus comprising

a horizontally disposed frame, said frame having coplanar horizontal platen supports having upper and lower surfaces separated by a longitudinal central gap, a pair of platens transversely slidable on said upper surfaces of said supports, platen adjustment means for moving said platens on said upper surfaces transversely toward and away from the center line of said gap to center a case supported by said platens relative to said center line, said platen adjustment means being in the area below said gap and being located substantially below said lower surfaces at a distance at least as great as the widths of said binding strips,

a clamp mounted on said frame rearward of said gap about a transverse horizontal axis located rearward of said platen supports comprising a pair of sides, clamp adjusting means for moving said sides toward each other to clamp a core therebetween and away from each other, and means mounting a core within said clamp with one edge projecting from said clamp, said clamp being pivotable forwardly about said axis to depress said one edge below the level of said platen a distance at least as great as the widths of said binding strips.

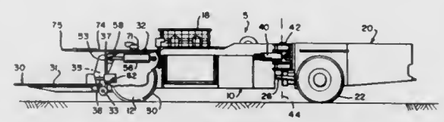
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**5,044,858**

## VEHICLE WITH LATERAL MOVING LIFT

**Melvin E. Scott, Bristol, and Alfred D. McCue, Abingdon, both of Va., assignors to Simmons-Rand Company, Bristol, Va.**

**Continuation of Ser. No. 393,860, Aug. 11, 1989, abandoned, which is a continuation of Ser. No. 183,549, Apr. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 908,179, Sep. 17, 1983, abandoned. This application Jul. 11, 1990, Ser. No. 550,243**
**Int. Cl.[5] E04G *21/14***
**U.S. Cl. 414—10** **3 Claims**



1. A vehicle having a laterally moving lift for moving roof supports in mining and similar operations comprising:

an articulated vehicle including a main drive section and a second section connected to one end of the main drive section by a joint that allows the two vehicle sections to articulate relative to each other, each of said vehicle sections including mobile means for allowing it to travel over the ground and the main drive section including a body;

a lift plate assembly connected to the other end of the main drive section and including a lift plate extending forward from the main drive section for supporting and lifting a roof support of the type that covers a relatively large area and requires a supporting surface having a relatively large area for stable support, said lift plate having a generally flat horizontal upwardly facing lift surface similar to a table, and being relatively thin in order for it to be easily moved under objects resting on the ground that are to be lifted while supported on said upper surface, and extending horizontally across the width of the main drive section and forwardly of the main drive section for a distance similar to its width to provide a relatively large upper surface sufficient for supporting and lifting said roof supports in a stable orientation, said lift plate assembly including a structure connected to the rear edge of the lift plate and projecting vertically upward therefrom, a back plate assembly, swinging pivot means connecting the vertically upward projecting structure of the lift plate assembly to the back plate assembly for supporting the lift plate and allowing it to pivot on the back plate assembly about a vertical axis located generally near the rear edge of the lift plate at the vertically upward projecting structure so that the majority of the lift plate is located forward of the vertical axis, and swinging pivot means including a pair of vertically spaced pivoted joints interconnecting the lift plate assembly and the back plate assembly and aligned on said vertical axis, each of said pair of pivoted joints in the swinging pivot means including a ball and socket bearing and a pivot pin separate from the pivot pin of the other pivoted joint allowing the axes of the two pivoted joints to shift from aligned positions to accommodate any misalignment problems of the axes of the two pivoted joints during manufacture and to accommodate any bending of the back plate assembly such as during times of high stress of the lift plate assembly and back plate assembly;

a majority of said back plate assembly being located above said lift surface, swinging power means interconnected between said vertically upward projecting structure of the lift plate assembly and said back plate assembly for powering said lift plate about said vertical axis, tilting pivot means connecting the back plate assembly to the body of the main drive section for supporting the back plate assembly and allowing it to tilt on said body about a horizontal axis, and tilting power means interconnected between said back plate assembly and said body for powering said back plate assembly about said horizontal axis, said horizontal axis being located adjacent to the horizontal plane of the upwardly facing lift surface of said lift plate.

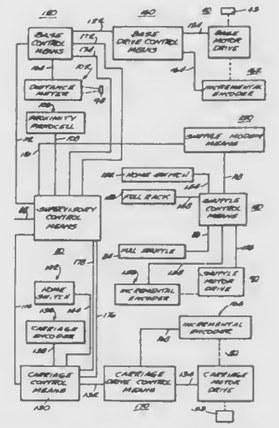
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**5,044,859**

## CONTROL SYSTEM FOR A STORAGE AND RETRIEVAL MACHINE

**B. Chuck Sorensen, Salt Lake City, Utah, and Craig A. Devroy, Wauwatosa, Wis., assignors to Harnischfeger Engineers, Inc., Brookfield, Wis.**

**Filed Oct. 19, 1989, Ser. No. 423,910**
**Int. Cl.[5] H02P *5/06*; G06F *15/40*; B65G *1/06***
**U.S. Cl. 414—273** **2 Claims**



1. In a storage and retrieval machine controllable in response to commands from a remote source and having a base travelable along a generally horizontal path having an end, a control system comprising:

base drive means for providing horizontal movement to said base;

sensing means for sensing the end of the path along which the base moves and providing an end-of-path indication;

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supervisory control means mounted on the storage and retrieval machine and connected to the sensing means and to the remote source, the supervisory control means being responsive to operating commands from the remote source and to the end-of-path indication from the sensing means to provide operating instructions for the base including a stop instruction upon receipt of the end-of-path indication;

indicating means separate from the sensing means for sensing the position of the base means as it moves along the path and providing a position indicating including an end-of-path position indication; and

base control means for controlling said base motor drive and for receiving the operating instructions from the supervisory control means including said stop instruction and the position indication from the indicating means including the end-of-path position indication, the base control means being responsive to both the stop instruction and the end-of-path position indication to stop the travel of the base upon receipt of either the stop instruction or the end-of-path indication whereby the safety of the redundant end-of-path base stopping control is provided.

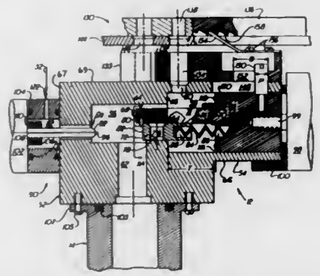
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**5,044,860**

## ANALYSIS OF ORGANIC MATERIAL

**Stanley D. Norem, Bayside, N.Y.; Richard T. Ferranti, Huntington, Conn., and Robert F. Culmo, Woodbridge, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Division of Ser. No. 19,905, Feb. 27, 1987, Pat. No. 4,795,614.**
**This application Apr. 7, 1988, Ser. No. 178,713**
**Int. Cl.[5] B65G *65/32***
**U.S. Cl. 414—287** **10 Claims**



1. A device for transferring samples of a material, comprising:

an elongated body comprising a cylinder wall defining a cylindrical cavity extending horizontally from a piston end of the body, an end wall opposite the piston end, and a perimeter wall extending horizontally from the cylinder wall to the end wall so as to define a central chamber adjacent to the cylindrical cavity, the cylinder wall having a body aperture therethrough receptive of a sample and extending from the cylindrical cavity proximate the central chamber upwardly through the cylinder wall, and the perimeter wall having a drop port extending from the central chamber downwardly through the perimeter wall;

a piston member slidingly situated in the cylindrical cavity so as to have an inner position proximate to the central chamber and an outer position distal from the chamber;

piston-moving means for moving the piston member between the outer position and the inner position;

a guide member attached to the piston member so as to protrude into the central chamber, the guide member having a vertical guide aperture therethrough, the guide aperture being vertically aligned with the body aperture so as to be receptive of the sample from the body aperture when the piston member is at the outer position and vertically aligned with the drop port when the piston member is at the inner position;

a horizontally sliding retaining door situated adjacently below the guide member, having a wall portion and a door aperture, the door aperture extending vertically through the retaining door adjacent to the wall portion, and further having a sample retaining position and a sample drop position, each such position being with respect to the guide member such that the wall portion is aligned vertically with the guide aperture for the retaining position and the door aperture is aligned vertically between the guide aperture and the drop port for the drop position;

door-positioning means for maintaining the retaining position of the retaining door with respect to the guide member until the piston member is moved to the inner position; and

door-actuating means for sliding the retaining door to the drop position while the piston member is at the inner position, thereby releasing the sample from the guide aperture through the drop port.

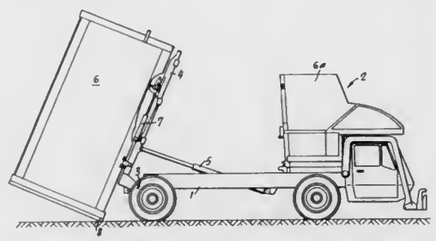
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**5,044,861**

## GARBAGE-COLLECTING TRUCK HAVING A REPLACEABLE CONTAINER WHICH IS RECIRPROCABLY MOUNTED ON A TILTABLE FRAME

**Johannes Kirchhoff, Iserlohn, and Georg Sandkuhler, Hemer, both of Fed. Rep. of Germany, assignors to Edelhoff Polytechnik GmbH & Co., Iserlohn, Fed. Rep. of Germany**

**Continuation of Ser. No. 370,332, Jun. 22, 1988, abandoned.**
**This application Oct. 31, 1990, Ser. No. 607,202**
**Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3821094; Nov. 29, 1988, 3840246**
**Int. Cl.[5] B60P *1/64***
**U.S. Cl. 414—332** **3 Claims**



1. A garbage-collecting truck comprising a replaceable container, which is connected by releasable coupling means to a tiltable frame having longitudinal tracks on sliding means, which frame is pivotally movable by at least one first hydraulic fluid-operable piston-cylinder unit relative to the main frame of the chassis of said truck about a transverse axle connecting the two frames, said axle being located at the rear end portion of the truck thereof, said container being movable on said tiltable frame along the longitudinal tracks on said sliding means for an extending movement toward the rear end of said truck and for a retracting movement toward the driver's cab of said truck by a second piston-cylinder unit and means for switching the second hydraulic fluid-operable piston-cylinder unit to a floating condition,

characterized in that the second fluid-operable piston-cylinder unit is connected through a plurality of lines to a directional valve having retracting, extending and floating positions, and when in the floating position the lines leading to and from the cylinder chambers are connected to each other and then to a return line leading to a tank containing pressurized hydraulic fluid, the line leading to the extending cylinder chamber of said fluid-operable piston-cylinder unit containing a controllable non-return valve only allowing fluid flow in a single direction and thereby preventing a return flow of fluid from said chamber, said non-return valve being adapted to be bypassed whenever pressure is raised in a plurality of pilot lines, said non-return valve being released when said fluid-operable piston cylinder unit is supplied with pressurized fluid in an extending sense or when the fluid-operable piston-cylinder unit for pivotally moving said tiltable frame is supplied with pressurized fluid in a retracting sense whereby the container may be positioned in an erect position on the ground.



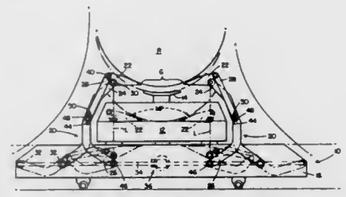
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**5,044,862**

## TRANSFER TABLE CLAM SHELL LINKAGE AND METHOD OF TRANSFERRING A ROLL TO A REEL STAND

**David P. Herigstad, Aberdeen, and James D. Terry, Edmonds, both of Wash., assignors to Haines & Emerson, Inc., Hoquiam, Wash.**

**Filed Nov. 29, 1989, Ser. No. 444,645**
**Int. Cl.[5] B65G *67/24***
**U.S. Cl. 414—392** **6 Claims**



1. A transfer table for positioning rolls of various sizes on a spindle of a reel stand, comprising:

a moveable base frame having a top surface;

a pair of articulated arm means coupled to the base frame opposite each other and moveable upwardly from said top surface for lifting a roll off of a cart and supporting the weight of the roll, the configuration of the arm means allowing the arm means to be lowered to a flat position corresponding to the top surface of the moveable base frame so the cart can pass over the moveable base frame top surface or raised to an extended position so the cart can pass between the arm means and the arms can lift the roll off of the cart; and

means for moving the arm means vertically to maintain contact between each arm means and the roll at a fixed location on the roll throughout a full vertical adjustment range of the articulated arm means so that a point on each arm means always travels in a vertical path.

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**5,044,863**

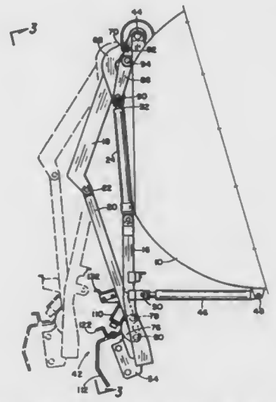
## SIDE REFUSE LOADER FOR VEHICLES

**Donald D. LaBass, Catoosa, and Willie A. Hutson, Tulsa, both of Okla., assignors to Crane Carrier Company, Tulsa, Okla.**

**Filed Jun. 6, 1990, Ser. No. 534,681**
**Int. Cl.[5] B65F *3/00***
**U.S. Cl. 414—409** **5 Claims**

1. In an apparatus for use in conjunction with a trash can of the type having an upper handle and a lower handle extending from the same side of the trash can to lift the can from the ground to above the bin of a refuse collection vehicle so that the trash can is emptied through a hole in a top of the bin, the apparatus having two guide rails each with a guide channel having a long straight section and a curved section at the top end, an upper torsion bar rotatably supported from the bin at a fixed location with respect thereto near the top of the guide rails, means rotatably attaching the top ends of the guide rails to the upper torsion bar in a non-sliding relationship, push means pivotally connected to a lower end of the guide rails and the bin to rotate the guide rails about the upper torsion bar, grabber means for grabbing the trash can, a pair of lift arms, each arm having an upper arm segment and a lower arm segment movably connected thereto, means rigidly attaching the upper end of the upper arm segments to the upper torsion bar, means pivotally connecting the lower end of the lower arm segments to the grabber means including roller means to guide the grabber means along each of the guide channels and means to rotate the upper torsion bar, the improvement comprising:

a lower grip means rigidly mounted between said lower arm segments for engaging with the lower handle of the trash can,



said grabber means for engaging with the upper handle of the trash can to support the can in an upright condition as the roller means moves along the straight section of the guide rails and said grabber means and said lower grip means cooperating with the upper and lower handles of the can to support the can in inverting and returning condition as the roller means moves along the curved section of the guide rails.

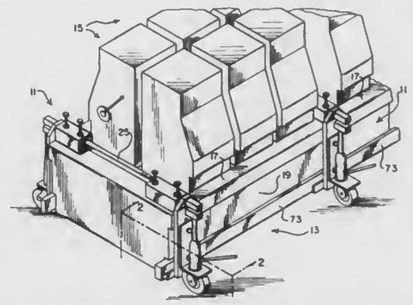
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**5,044,864**

## LIFT FOR A SLOT MACHINE STAND

**Alexander Stefan, 216 E. Arby Ave., Las Vegas, Nev. 89119**

**Filed Aug. 30, 1990, Ser. No. 575,355**
**Int. Cl.[5] B60P *3/00***
**U.S. Cl. 414—459** **11 Claims**



1. Apparatus for lifting and rendering mobile on a floor a stand upon which a plurality of slot machines are mounted, said stand including a top wall and spaced-apart front and rear side walls, said front wall and rear wall each having a lower edge portion with an inwardly recessed ledge, said apparatus comprising:

a) a plurality of lifting assemblies adapted to be mounted to

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said stand at spaced-apart locations therealong, and each said assembly including:

1) rigid, horizontally extending cross-bar spanning and lying adjacent to said stand top wall;
2) a pair of upright members adapted to be attached to opposite end portions of said cross-bar so as to lie adjacent said respective stand side walls, the upper portion of each upright member adapted to slidably embrace said cross bar for inward and outward adjustment with respect to said cross bar and to hold said upright member at about 90° to said cross bar, a lower end of said upright member adapted to make uplifting engagement with said stand lower edge;
3) means for releasably securing each said upright members to said cross bar;
4) a wheel-equipped extension member mounted to said upright member for guided vertical motion and including a wheel mounted at a lower end of said extension member; and
5) lifting-jack mechanism for engaging said upright member and urging it upwardly into lifting engagement with said stand and for urging said extension member downwardly whereby said plurality of lifting assemblies are operative to elevate said stand off said floor so as to be rollingly supported on said wheels.

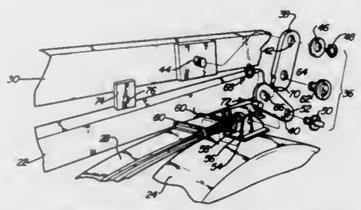
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**5,044,865**

## SQUAT MECHANISM FOR VEHICLE TRAILER ASSEMBLY

**Michael R. Baer, Maugansville, Md., and Francis S. Grata, Chambersburg, Pa., assignors to Jerr-Dan Corporation, Greencastle, Pa.**

**Filed Mar. 26, 1990, Ser. No. 500,624**
**Int. Cl.[5] B60P *1/32***
**U.S. Cl. 414—477** **10 Claims**



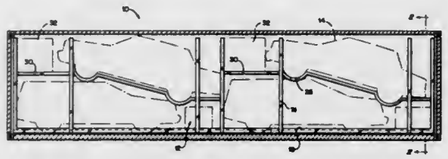
1. A trailer assembly for transporting vehicles comprising:
a main frame supported a vertical distance off the ground;
a roll back frame supported on said main frame and moveable relative thereto from a transport position at which it is removed from the ground, to a loading position at which it has moved downwardly through said vertical distance and engages the ground;
means for lowering said main frame to reduce said vertical distance, thus lessening an approach angle defined by said roll back frame and the ground when said roll back frame is in said loading position, said means for lowering being self-actuated by the movement by said roll back frame from said transport position towards said loading position;
said means for lowering being self-releasing when said roll back frame moves from said loading position to said transport position, the release of said means for lowering allowing said main frame to return vertically upwardly; and
wherein said main frame is supported off the ground by a spring, which provides a resilient connection between said main frame and a wheel axle, said means for lowering is a two-bar linkage with an upper link pivotally connected to said roll back frame and a lower link pivotally connected to said spring, said upper and lower links being connected to each other at a central connection.

**5,044,866**

## CONTAINERIZING AND DECONTAINERIZING A LOAD

**James J. Harp, Annandale, Va., assignor to Commodity Handling Systems, Inc., Woodbridge, Va.**

**Continuation of Ser. No. 83,201, Aug. 10, 1987, Pat. No. 4,833,560, Division of Ser. No. 83,201, Aug. 10, 1987, Pat. No. 4,833,560, and a continuation-in-part of Ser. No. 42,815, Apr. 27, 1987. This application Nov. 15, 1988, Ser. No. 271,422**
**The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.**
**Int. Cl.[5] B60P *1/64*; B65D *88/12*; B65G *67/02***
**U.S. Cl. 414—495** **14 Claims**



1. An assembly for lifting a load comprising:
first and second elongated support elements in side-by-side relation one to the other;
air-bearing means disposed along the underside of each of said elements, including connections for receiving air under pressure whereby said elements are displaceable for movement under a load;
an inflatable member carried by each of said elements, including connections for receiving air under pressure whereby, upon inflation, the load may be lifted;
means interconnecting said elements one to the other for movement toward and away from one another; and
means for moving said elements toward and away from one another;
said assembly in combination with a rack for supporting the load, said rack including a plurality of interconnected longitudinally and laterally and upright extending structural elements for supporting the load thereon, means carried by said rack for supporting portions of said rack at elevated positions for supporting a load thereon above the rest of the rack, and most other portions of the rack above ground level sufficiently to enable movement of said air bearing means underneath said rack portions, with said inflatable members in an un-inflated condition so that upon inflation thereof, said support elements with air bearing means lift said rack with the load thereon.

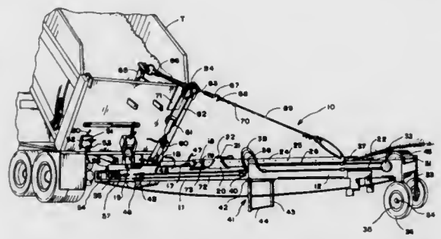
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**5,044,867**

## MOBILE HYDRAULIC CONVEYOR

**Michael J. Pettijohn, 15111 Oak Rd., Carmel, Ind. 46032**

**Filed Jul. 6, 1990, Ser. No. 549,071**
**Int. Cl.[5] B60P *1/36***
**U.S. Cl. 414—523** **5 Claims**



1. An apparatus having a truck end and a free end that can be attached to the rear of a truck to convey particulate material from said truck to a specific location comprising:
at least two structural trays,



each of said structural trays comprising at least two structural side bars,
said structural side bars having roller means disposed therebetween,
said structural side bars having a conveyor belt therebetween,
said structural sides bars having a cover thereover,
said structural trays being connected to one another by a folding joint,
said folding joint being a pivotal joint,
said truck end of said apparatus attaching to said truck by a pivotal attachment means,
said free end having a motorized roller rotatably disposed between said structural bars of said structural tray around which said conveyor belt revolves,
said motorized roller being powered by a hydraulic motor means,
said truck end having a roller disposed between said structural side bars of said structural tray around which said conveyor belt revolves,
at least one of said rollers being adjustable with respect to its longitudinal position on said apparatus allowing for minute adjustment of the tension on said conveyor belt during the life of said conveyor belt,
one of said structural trays having two side hydraulic cylinders pivotally attached thereto,
each of said side hydraulic cylinders attaching to said truck by at least one chain which is disposed around a post attached to said truck,
said side hydraulic cylinders allowing for the lateral motion of said apparatus,
a height hydraulic cylinder attached vertically to the rear of said truck,
said height hydraulic cylinder attaching via a cable through a pulley assembly to a hook means,
a fixed cable length having two ends,
each of said ends of said fixed cable length having a loop,
said hook means removably attaching to one of said loops of said fixed cable length.
said loop opposite said loop attaching to said hook means removably attaching to a fixed hook means disposed on said structural tray furthest from said truck,
wherein said height hydraulic cylinder adjusts the height of said apparatus from the ground,
said structural tray closest to said truck having a crossbar disposed thereacross allowing for removable attachment to said hook means to fold said apparatus when necessary,
said free end of said apparatus having a wheel support structure attached thereto,
said wheel support structure having at least one wheel hub pivotally disposed thereon,
said wheel hub having at least one tire means disposed thereon,
said apparatus having a conveyor belt carrying means disposed thereunder at each location having one of said folding joints,
said conveyor belt carrying means holding said conveyor belt from draggin on the ground when said apparatus is operating and folded,
hydraulic fluid tubing,
said hydraulic fluid tubing extending to and from said hydraulic side cylinders,
said hydraulic fluid tubing extending to said hydraulic side cylinders being the side cylinder supply line,
said hydraulic fluid tubing extending from said hydraulic side cylinders being the side cylinder return line,
said hydraulic fluid tubing extending to and from said hydraulic motor means,
said hydraulic fluid tubing extending to said hydraulic motor means being the hydraulic motor supply line,
said hydraulic fluid tubing extending from said hydraulic motor means being hydraulic motor return line,
said hydraulic fluid tubing extending to and from said height cylinder,
said hydraulic fluid tubing extending to said height cylinder being the height cylinder supply line, and
said hydraulic fluid tubing extending from said height cylinder being said height cylinder return line.

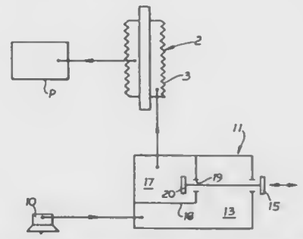
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**5,044,868**

## VALVE SYSTEM FOR CONTROLLING A VACUUM LIFTING APPARATUS

**Stewart Bennison, Sheepbridge, England, assignor to Palamatic Handling Systems Ltd, Chesterfield, England**

**Filed Dec. 8, 1989, Ser. No. 447,890**
**Claims priority, application United Kingdom, Dec. 10, 1988, 8828914**
**Int. Cl.[5] B66C *1/02*; G25J *11/00***
**U.S. Cl. 414—627** **7 Claims**



1. A system for controlling vacuum lifting apparatus comprising a lift tube which is extendable and retractable in length, and is adapted to be located in an upright position with an upper end of said lift tube being connectable to an anchorage, an interior of said lift tube being connectable to a vacuum generating means air sealing means provided at each end of said tube, a suction foot associated with the lower end of said lift tube, and valve means, to connect said interior of said lift tube at a controllable level to atmosphere to regulate the vacuum therein and hence the axial extension of said lift tube, comprising a housing, a first connection carried by said housing, a chamber provided by said housing, said first connection being connectable to said suction foot and in air-flow communication with said chamber an outlet of said chamber connectable to atmosphere, a first valve member to control connection to atmosphere of said outlet, a second connector in air flow communication to said vacuum generating means via the lift tube, a second valve member to control air flow along said second connector whereby, in a load gripping and lifting mode, the first valve member is partially open to regulate the vacuum level within the interior of associated lift tube and hence the height to which the load is lifted, and the second valve member is fully open, while in a load-releasing mode the first valve member is further or fully opened to admit air to the suction foot thereby releasing the grip of the suction foot on the load and simultaneously, or shortly thereafter, the second valve member is closed, or partially closed, producing a higher vacuum within the interior of the lift tube, to retract the axial length thereof to lift the suction foot away from the previously released load.

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**5,044,869**

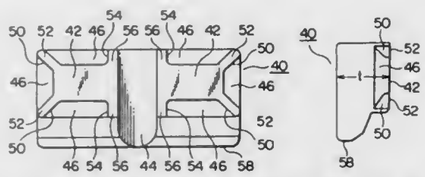
## FORKLIFT FORKHOOK HAVING DAMS ADJACENT ITS VERTICAL CONTACT SURFACE TO CONFINE MOLTEN WELD MATERIAL

**Yoshihiro Shindo; Masanao Kobayakawa, and Kochi Maruyama, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan**

**Filed May 14, 1990, Ser. No. 523,010**
**Claims priority, application Japan, May 17, 1989, 1-56896[U]**
**Int. Cl.[5] B66F *9/12***
**U.S. Cl. 414—785** **7 Claims**

1. A forkhook for welding to a vertical surface of a fork of

a forklift, said forkhook having a normally vertical contact surface for contacting said vertical surface of said fork and an elongated beveled surface extending along at least one side of said contact surface whereby, when said contact surface is in contact with said vertical surface of said fork a gap is provided between said beveled surface and said vertical surface of said fork for receiving molten weld material for welding said fork-




hook to said fork, and a dam at each of the opposite ends of said elongated beveled surface for retaining said weld material during said welding of said forkhook to said vertical surface of the fork, each of said dams extending outwardly from and across said elongated beveled surface and having an upper surface flush with said contact surface and a side surface facing said beveled surface.

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**5,044,870**

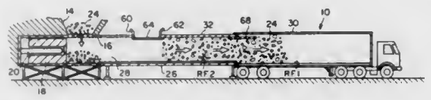
## METHOD FOR COLLECTING AND COMPACTING GARBAGE AND THEN LOADING IT INTO A ROAD VEHICLE

**Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741**

**Division of Ser. No. 357,094, May 26, 1989, Pat. No. 4,990,048, which is a division of Ser. No. 189,522, May 3, 1988, Pat. No. 4,923,356. This application Jun. 4, 1990, Ser. No. 533,001**

**Int. Cl.[5] B30B *15/32***

**U.S. Cl. 414—786** **5 Claims**




1. A method of handling bulk material, comprising:

providing an elongated containment vault of a type having an inlet end, an outlet end, spaced apart sidewalls, a top wall and a bottom in the form of a reciprocating floor conveyor, said ends, sidewalls, top wall and bottom defining an inner space;

delivering bulk material into the vault through the inlet and at the same time compacting the bulk material within the vault;

moving the compacted material lengthwise through the vault, towards the outlet, while bulk material is being delivered into the vault and is being compacted within the vault;

providing a road vehicle of a type having a cargo receiving compartment which includes a reciprocating floor conveyor and an end with an opening through which material is moved for both placing it into and removing it out from the cargo receiving compartment;

placing such end opening of the cargo receiving compartment of the road vehicle into registry with the outlet of the vault; and

operating the reciprocating floor conveyor in the vault and the reciprocating floor conveyor in the cargo receiving compartment of the road vehicle to move the compacted material out from the vault into the cargo receiving compartment of the road vehicle.

**5,044,871**

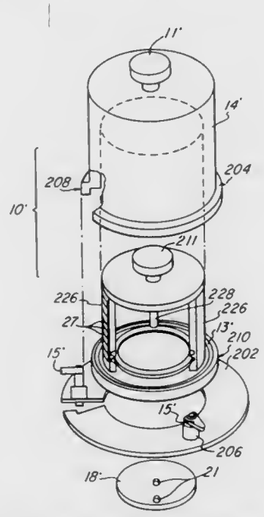
## INTEGRATED CIRCUIT PROCESSING SYSTEM

**Cecil J. Davis, Greenville; Robert Matthews, Plano, and Robert A. Bowling, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 114,812, Oct. 29, 1987, Pat. No. 4,966,519, which is a division of Ser. No. 61,017, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 824,342, Jan. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 790,708, Oct. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 790,918, Oct. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 790,924, Oct. 24, 1985, Pat. No. 4,687,542. This application Jan. 13, 1988, Ser. No. 143,918**

**Int. Cl.[5] B65G *49/05***

**U.S. Cl. 414—786** **9 Claims**




1. A method for fabricating integrated circuits, comprising the steps of:

providing a plurality of wafers in a vacuum sealable wafer carrier, said wafer carrier comprising a bell jar shape cover which is vacuum sealable to a body thereof, said bell jar shape cover being removable from said body in a direction which is substantially normal to the plane of wafers supported in said body;

placing said wafer carrier into a vacuum sealable load lock upper chamber having a partial floor with an aperture therein and a stage positioned below said aperture in close proximity to said floor;

pumping down said load lock upper chamber to a pressure less than 10 to the −4 Torr;

lowering said stage in a linear, vertical direction, so that said bell jar shape cover remains supported on said partial floor in said upper process chamber while said body including wafers is lowered into the lower chamber;

transferring wafers in a desired sequence from said wafer carrier under vacuum to one or more selected process stations which are enclosed inside a connecting contiguous vacuum-tight space with said lower chamber until a desired sequence of processing operations has been completed;

and then raising said stage to rejoin said wafer carrier body with said wafer carrier bell jar shape cover and again effect a vacuum seal therebetween;

venting said upper chamber to ambient; and

removing said wafer carrier from said upper chamber.



**5,044,872**

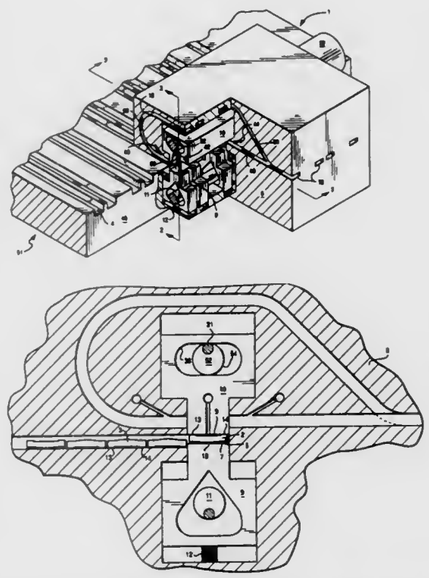
## SYSTEM AND METHOD FOR CHIP ORIENTATION

**Ronald E. Hunt, Georgetown, and Verlon E. Whitehead, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 8, 1990, Ser. No. 520,440**

**Int. Cl.[5] B65H *29/24, 29/32***

**U.S. Cl. 414—786** **7 Claims**





1. Method for orienting components in a chip orienting apparatus, comprising

supporting a first of said components in a passageway in an initial first orientation from below said first component;

injecting a first pressurized fluid jet into said passageway to re-orient said component 180 degrees from said first orientation relative to a horizontal line transverse to the direction of travel of said first component within said passageway;

supporting a second of said components in said passageway in a second orientation from above said second component; and

injecting a second pressurized fluid jet into said passageway to expel said component from said passageway in said second orientation.

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**5,044,873**

## APPARATUS FOR STACKING FOLDED SHEETS ON EDGE

**Michael Vijuk, 7 Tower Rd., Oakbrook, Ill. 60512**

**Division of Ser. No. 940,890, Dec. 12, 1987, Pat. No. 4,812,195. This application Mar. 7, 1989, Ser. No. 319,953**

**Int. Cl.[5] B65G *57/22***

**U.S. Cl. 414—792.5** **3 Claims**

1. An apparatus for stacking folded sheets comprising:

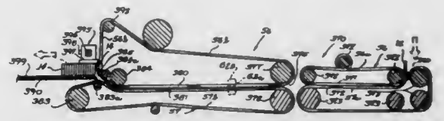
upper and lower conveyor belt for conveying the folded sheets in a flat position along a first portion of a conveying run,

said upper and lower conveyor belt traveling upwardly at a discharge end of the conveyor run to turn the folded sheet into an on-edge vertical position,

said upper belt continuing upwardly at said discharge end to urge the on-edge folded sheet upwardly,

stop means adjacent the upwardly traveling upper belt to abut the top edge of the folded sheet and to arrest its upward travel, and

support means extending outwardly from the upwardly traveling upper belt to engage the lower edge of the folded sheet to support the folded sheet in an on-edge



position in a column, each subsequent discharging on-edge folded sheet abutting the previously discharged and adjacent folded sheet a jogger means located adjacent said conveyor belts for engaging and jogging laterally outserts at a predetermined count of outserts, said laterally jogged outserts having a portion positioned laterally outwardly of the other outserts in a column to indicate a predetermined number of outserts in the the column.

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**5,044,874**

## STACK DIVIDING MECHANISM FOR A CORRUGATED SHEET UNSTACKING AND FEEDING APPARATUS

**David Shill, Spokane, Wash., assignor to Thermoguard Equipment, Inc., Spokane, Wash.**

**Filed May 16, 1990, Ser. No. 524,155**

**Int. Cl.[5] B65G *59/02***

**U.S. Cl. 414—796** **3 Claims**




1. A stack dividing mechanism for a corrugated sheet unstacking and feeding apparatus that removes successive blocks of sheets from the top of a vertical stack and moves each block along a longitudinal path, comprising:

a framework;

a powered conveyor arranged along the longitudinal path on the framework, the conveyor having a moving surface extending from a receiving end;

elevator means on the framework for supporting a vertical stack of sheets and for intermittently moving the stack upwardly until the upper end of the stack reaches a predetermined elevation relative to the framework;

a transverse backstop interposed on the framework between the elevator means and the receiving end of the conveyor for abutment by one edge of a stack of corrugated sheets on the elevator means;

ramp means located across the top of the backstop at a position spaced from the receiving end of the conveyor for vertically separating each block of sheets from a stack on the elevator means as the block is shifted toward the receiving end of the conveyor; and

block pusher means located on the framework on the side of the elevator means opposite the ramp means for periodically shifting a block of sheets from the top of a stack over the ramp means and onto the moving surface at the receiving end of the conveyor, the block pusher means including a transverse plate having a horizontal lower edge posi-

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tioned at an elevation intermediate the top and bottom elevations of the ramp means;

the ramp means comprising:

a rectangular plate pivotally mounted on the backstop about a transverse horizontal axis, the plate including a horizontal transverse top edge;

a cylindrical roller rotatably mounted between the plate and the receiving end of the conveyor about a central transverse horizontal axis; and

biasing means operably connected to the plate for yieldably urging it to an upright position, the biasing means further permitting pivotal movement of the plate about its transverse horizontal axis to move its top edge toward the roller in response to shifting of a block of sheets by the block pusher means.

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**5,044,875**

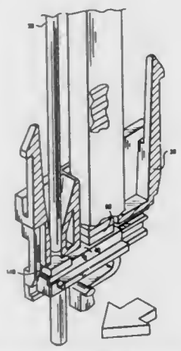
## METHOD AND APPARATUS FOR POSITIONING COMPONENTS

**Ronald E. Hunt, Georgetown, and Verlon E. Whitehead, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 155,945, Feb. 16, 1988, abandoned. This application May 17, 1989, Ser. No. 353,299**

**Int. Cl.[5] B65G** *59/06;* **B23P** *19/00*

**U.S. Cl. 414—797.9** **24 Claims**



18. A method of positioning leadless chips, for use in simultaneous mounting of a plurality of said ships at circuit board sites, comprising:

providing a plurality of chip placement devices, each corresponding to the mounting location of said chips at said circuit board sites;

simultaneously disposing said leadless chips adjacent said board in a plurality of stacks each defining a longitudinal axis therethrough;

simultaneously urging a first leadless chip of each said stack along a line transverse to said stack from

a first position within said stack and into a cavity aligning said chip in

a second position opposing one of said sites; and

simultaneously supporting said chip of each said stack with a fluid pressure differential while maintaining said alignment by said cavity.

**5,044,876**

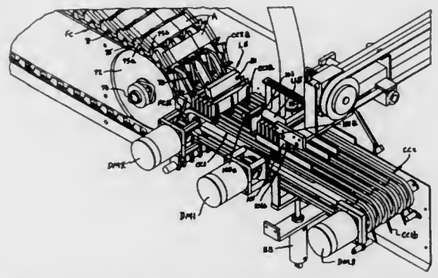
## APPARATUS FOR FORMING AND TRANSFERRING GROUPS OF ARTICLES

**Roger H. Stohlquist, Rockford, Ill., assignor to APV Crepaco, Inc., Rockford, Ill.**

**Filed May 2, 1990, Ser. No. 517,929**

**Int. Cl.[5] B65G** *57/11*

**U.S. Cl. 414—798.2** **22 Claims**



1. Apparatus for assembling articles in succession in generally horizontal groups of sidewise adjacent articles and for transferring the groups to an unloading station, the apparatus comprising, feed conveyor means for feeding articles in succession to an article loading station, an endless type pusher conveyor means having an upper run extending forwardly along a generally horizontal path from the article loading station to a group unloading station, the pusher conveyor means having a plurality of article pusher means at spaced locations therealong, endless type first and second group control conveyor means each having an upper run extending forwardly along said generally horizontal path from the loading station past the unloading station, the first and second group control conveyor means each having at least one lead article control finger thereon, means for intermittently driving the first group control conveyor means to advance a lead article control finger thereon along the path away from the loading station as the feed conveyor means feeds successive articles of a first group to the loading station, means operative when a number of articles comprising the first group of articles has been fed to the loading station for driving the pusher conveyor means and the first group control conveyor means to advance the first group of articles along the path to the unloading station, means for intermittently driving the second group control conveyor means to advance a lead article control finger thereon along the path away from the loading station as the feed conveyor means feeds successive articles of a next succeeding group to the loading station, and means operative when a number of articles comprising the next succeeding group of articles has been fed to the loading station for driving the pusher conveyor means and the second group control conveyor means to advance the next succeeding group of articles along the path to the unloading station.

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**5,044,877**

## MAGAZINE FOR STORING AND FEEDING FLAT ARTICLES TO BE UNSTACKED

**Bernard Constant, Beaumont les Valence, and Gilbert Del Fabro, La Roche de Glun, both of France, assignors to Compagnie Generale d'Automatisme CGA-HBS, Paris, France**

**Filed Oct. 17, 1990, Ser. No. 599,191**

**Claims priority, application France, Oct. 18, 1989, 89 13605**

**Int. Cl.[5] B65G** *59/00*

**U.S. Cl. 414—798.9** **20 Claims**

1. A magazine for storing and feeding flat articles to be unstacked, the magazine comprising:

a first base plate on which the articles are stood edgeon, and a rear side wall, thereby defining a first zone in which articles are loaded and caused to advance up to an unstacking head;

slats each having a substantially vertical thrust plate for holding articles on said first base plate;

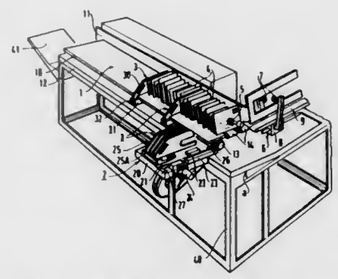
drive means mounted along said first base plate for moving said slats along said first base plate;

means for coupling the slats to said drive means;

means for holding and guiding the slats along said first base plate; and

means for retracting successive ones of said slats when detected at the unstacking head;





wherein each of said slats is removable from said first base plate, and further includes a substantially horizontal flat finger connected to its said thrust plate and extending at a distance therefrom adjacent to the bottom edge of said thrust plate, the finger being suitable for insertion beneath said first base plate when the slat is mounted on said first base plate, thereby defining said means for holding and guiding the slat along said first base plate, a terminal portion of the finger being fitted with said coupling means for engaging said drive means when the slat is put into place on said first base plate.

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**5,044,878**

## WIND POWER ENGINE

**Alfred Wilhelm, Artilleriestrasse 36C, D-5000 Koeln 90, Fed. Rep. of Germany**

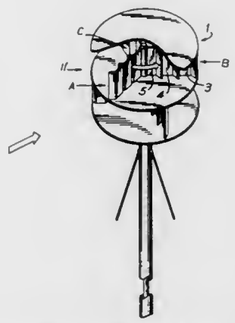
**PCT No. PCT/EP88/00507, eriestrasse 36C, D-5000 Koeln 90, Fed. Rep. of Germany**

**ub. Date DJun. 9, 1988, Ser. No. 328,585**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 8708163[U]**

**Int. Cl.[5] F03D** *3/02*

**U.S. Cl. 415—4.2** **6 Claims**



1. A wind power engine comprising a rotor rotatable about a vertical axis and including at least three substantially radially extending blades which divide said rotor into equisized sectors, each of said plurality of rotor blades comprises a plurality of sub-blades separated by gaps for passage of air therethrough, and each of said plurality of sub-blades having radially outer and inner edge portions bent relative to a remaining portion of a respective sub-blade against a direction of rotation at an angle of about 20°–60°.

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**5,044,879**

## VARIABLE STATOR VANE ARRANGEMENT FOR AN AXIAL FLOW COMPRESSOR

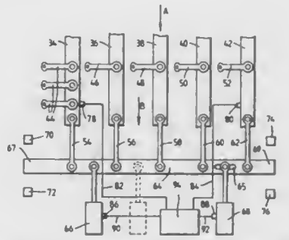
**Peter G. G. Farrar, Derby, England, assignor to Rolls-Royce plc, Derby, England**

**Filed Nov. 22, 1989, Ser. No. 440,362**

**Claims priority, application United Kingdom, Jan. 25, 1989, 8901569**

**Int. Cl.[5] F01D** *17/00*

**U.S. Cl. 415—150** **19 Claims**



1. A variable pitch stator vane arrangement for an axial flow compressor comprising:

a stator structure;

a plurality of stages of stator vanes, each stage of stator vanes having a plurality of circumferentially arranged radially extending stator vanes, each stator vane having a longitudinal axis, each stator vane being mounted to the stator structure for rotation about its longitudinal axis so that each stator vane has a variable pitch;

a plurality of control rings being arranged substantially coaxial with the compressor and surrounding the stator structure;

a plurality of operating levers, the stator vanes in each stage being connected to a respective one of the plurality of control rings by the operating levers;

an axially extending member positioned in a plane substantially tangential to each of the control rings, the axially extending member having a first end and a second end, the first and second ends being movable with respect to the stator structure but independently of said stator structure;

a plurality of operating links, each control ring being connected to the axially extending member by a respective one of the operating links; and

an actuator means for moving the axially extending member in the plane substantially tangential to the control rings, the actuator means comprising a first actuator connected to the axially extending member at a first location and a second actuator connected to the axially extending member at a second axially spaced location, the axially extending member being movable by the actuators in the plane substantially tangential to each of the control rings such that at least one of the control rings is rotated coaxially of the compressor to change the pitch of the stator vanes in the associated stage of stator vanes by rotating the stator vanes about their longitudinal axes.

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5,044,880

## VARIABLE GEOMETRY TURBINE ACTUATOR ASSEMBLY

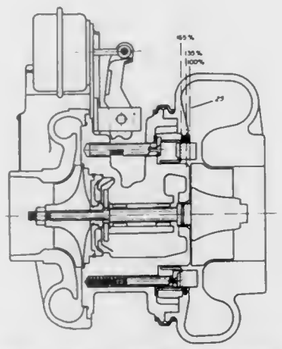
Peter McKean, Marsh, United Kingdom, assignor to Holset Engineering Company Limited, United Kingdom

Filed May 16, 1989, Ser. No. 353,763

Claims priority, application United Kingdom, May 17, 1988, 8811624

Int. Cl.[5] F04D 29/56, 27/00

U.S. Cl. 415—158 5 Claims



1. An actuator assembly for a variable geometry turbine comprising an annular inlet passageway, one wall of which is defined by a movable annular wall member the position of which relative to a facing wall of the inlet passageway is adjustable to control the width of the inlet passageway, the annular wall member having mounted thereon a single pair of pins which extend parallel to and are slidable parallel to the axis of rotation of the turbine wheel, wherein each pin is engaged by a respective arm of a single pivotally mounted stirrup the angular position of which is controlled by a single actuator, and wherein the engagement between the pins and the stirrup permits pivotal movement of the stirrup to cause axial movement of the pins.

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5,044,881

## TURBOMACHINE CLEARANCE CONTROL

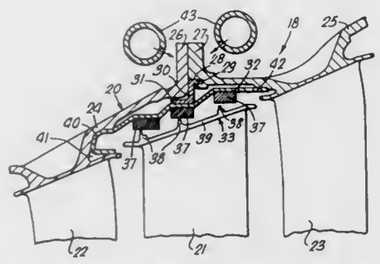
Alec G. Dodd, Derby, and Terence R. Pellow, Watford, both of England, assignors to Rolls-Royce plc, London, England

Filed Nov. 22, 1989, Ser. No. 440,365

Claims priority, application United Kingdom, Dec. 22, 1988, 8829955

Int. Cl.[5] F01D 11/08

U.S. Cl. 415—173.3 9 Claims



1. A turbomachine clearance control system comprising a casing, an annular array of radially extending rotor aerofoil blades in coaxial radially spaced apart relationship, said casing operationally surrounding the radially outer tips of said rotor aerofoil blades, a plurality of shroud segments which cooperate to define an annular shroud interposed between the tips of said rotor aerofoil blades and said casing, each of said shroud segments having upstream, mid and downstream portion with respect to the operational fluid flow through said casing, the mid portion of each of said shroud segments being interconnected with said casing in such a manner that a limited degree of pivotal movement of each of said shroud segments relative to said casing is permitted to vary the clearances between the axial extents of each of said shroud segments and said rotor aerofoil blade tips, means being provided to provide said pivotal movement, wherein each of said shroud segments has an upstream end restrained against radial displacement, means being provided to operationally cool said casing in the region of the pivotal connection thereto of said shroud segments so as to cause said casing to locally thermally contact relative to said upstream shroud segment end and thereby provide said shroud segment pivotal movement.

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5,044,882

## PRECESSIONAL CENTRIFUGAL PUMP

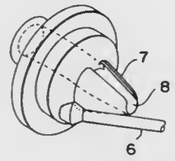
Teruaki Akamatsu, Nakadachiurimuromachi, Japan, assignor to Ube Industries, Ltd., Ube, Japan

Filed Sep. 12, 1989, Ser. No. 406,037

Claims priority, application Japan, Nov. 30, 1988, 63-303576

Int. Cl.[5] F04D 29/40

U.S. Cl. 415—182.1 3 Claims



1. A precessional centrifugal pump comprising:

a conical casing having a side wall, a circular end face and an opening at an apex of said casing;

an annular space which is externally defined by the side wall of said casing;

an impeller which is arranged in said annular space so as to revolve therein and which consists of a head and a rod that extends through the opening at the apex of said casing;

a flow guide wall protruding from the center of the circular end face of said casing into said annular space and having a head section which partially internally defines said annular space;

an inlet way formed within said flow guide wall and being open axially in a spiral manner along an entire length of said head section of said flow guide wall;

an inlet provided at the center of the circular end face of said casing and connected to said annular space through said inlet way;

an outlet tangentially extending from said annular space; and

a sealing membrane covering said opening at the apex of said casing, said membrane adhering to the side wall of said casing and to said impeller in a water-tight manner.



5,044,883

## WATER PUMP OR THE LIKE

Ludwig Neueder, Amselstr. 9, D-8443 Furth/Bogen, Fed. Rep. of Germany

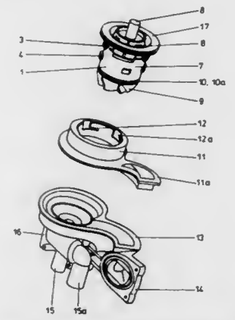
Continuation of Ser. No. 873,203, Jun. 11, 1986, abandoned.

This application Sep. 21, 1989, Ser. No. 410,033

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1985, 3524515

Int. Cl.[5] F04D 29/60

U.S. Cl. 415—214.1 3 Claims



1. A water pump for an internal combustion engine comprising: a pump holder and a pump block; said pump block being adapted to fit within said pump holder and including a pump mount; said pump block further including a pump impeller and a pump shaft extending through said pump mount and connected to said impeller in a driving relationship, means on said pump mount including a quick release coupling for mounting said block to said holder, means for sealing said pump mount to said holder, and a snap fit locking ring for locking said block to said holder and to prevent rotation of said block relative to said holder.

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5,044,884

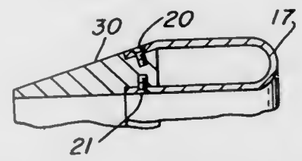
## SAFETY PROPELLER

Laurence E. Thibault, Paoli, and Richard J. Pollini, Hatboro, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelpbia, Pa.

Filed Sep. 5, 1989, Ser. No. 403,095

Int. Cl.[5] B63H 1/16

U.S. Cl. 416—189 25 Claims



1. In a boat propeller having a hub and a plurality of blades, each of the blades having a proximal end affixed to the hub and a distal end, each of the blades having a leading edge and a trailing edge, an apparatus for increasing the safety of the propeller, comprising:

(a) a first approximately annular member having an inner surface and an outer surface, the distal end of each of the blades affixed to the inner surface;

(b) a second approximately annular deformable member disposed upstream of the leading edges of each of the blades, the second member being substantially hollow; and

(c) means for coupling and uncoupling the second member from the first member.

5,044,885

## MOBILE BLADE FOR GAS TURBINE ENGINES PROVIDING COMPENSATION FOR BENDING MOMENTS

Christian Odoul, Lieusaint; Marc G. F. Paty, Paris, and Jean-Pierre R. Serey, Ste Genevieve des Bois, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." , Paris, France

Filed Mar. 1, 1990, Ser. No. 486,825

Claims priority, application France, Mar. 1, 1989, 89 02639

Int. Cl.[5] F01D 5/14

U.S. Cl. 416—196 R 2 Claims



1. A mobile blade for a gas turbine engine having an axis of rotation, which comprises:

a root,

a platform, and

a vane forming the aerodynamic portion of said blade, said vane having a junction portion which merges smoothly with said platform and said root, wherein said vane is arranged such that the geometric locus of the centers of gravity of successive cross-sections of said vane between said platform and the tip of said vane is a curve which has its origin in an axial plane of symmetry of said root at the point where a radial straight line passing through said axis of rotation of said engine meets said junction portion of said root and platform with said vane, and which merges progressively from said origin into a first straight line portion of said curve parallel to said radial straight line and tangentially displaced therefrom in such a manner that the corresponding vane sections are offset overall so as to nullify bending moments at said root by a compensating effect and wherein the radial straight line meets the junction portion at the center of one of the platform and root.

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5,044,886

## ROTOR BLADE FIXING PROVIDING IMPROVED ANGULAR ALIGNMENT OF SAID BLADES

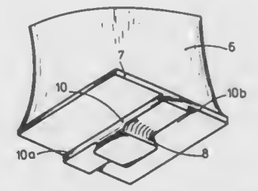
Jacques M. P. Stenneler, Le Chatelet En Brie, France, assignor to Societe Nationale d'Etude et de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Mar. 9, 1990, Ser. No. 491,209

Claims priority, application France, Mar. 15, 1989, 89 03374

Int. Cl.[5] F01D 5/30

U.S. Cl. 416—215 3 Claims



1. In a rotor for a compressor or turbine of a gas turbine engine,

a rotor disc having a rim and means defining a circumferentially extending groove in said rim, said groove having

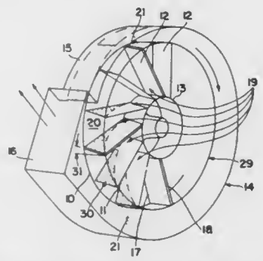
VOL 1130 ISS 1 SE 3 1991 UMI



side walls defining a reduced width mouth opening at said rim,
and an array of blades secured to said rotor disc around said rim thereof, each of said blades comprising:
a platform having radially inner and outer faces,
an aerofoil portion fixed to and projecting radially outwardly from said outer face of said platform,
a raised portion on said inner face of said platform extending in a circumferential direction over substantially the whole of the circumferential length of said platform, said raised portion having a width substantially equal to the width of said mouth of said groove in said disc rim, and
a bulbous root of the hammer-head type fixed to and projecting radially inwardly from said raised portion at a position spaced from the ends thereof,
said root being received in said groove in said disc rim to secure said blade on said disc, and
said raised portion being received as a close fit in said mouth of said groove to ensure the correct alignment of said blade on said disc.

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**5,044,887**
**BLOWER FAN IMPELLERS**
**Anthony J. Duthie, and Mark Cullen, both of Horsham, England, assignors to Johnston Engineering Limited, Dorking, England**
**Filed Oct. 27, 1989, Ser. No. 427,602**
**Claims priority, application United Kingdom, Dec. 6, 1988, 8828411**
**Int. Cl.[5] F01D** *5/14*
**U.S. Cl. 416—223 B** **13 Claims**

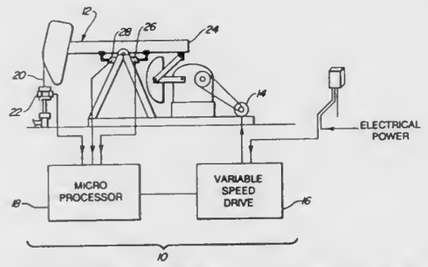


1. A fan impeller comprising a back plate, a front plate and a plurality of blades lying between the front plate and the back plate, wherein the blades are tilted relative to the axis of rotating of the impeller at an angle of between 5° and 12° to provide a leading edge adjacent said back plate so as to impart, in use, a lateral sideways vector to a stream of air passing along the blades.

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**5,044,888**
**VARIABLE SPEED PUMP CONTROL FOR MAINTAINING FLUID LEVEL BELOW FULL BARREL LEVEL**
**Lawrence R. Hester, II, Sachse, Tex., assignor to Teledyne Industries, Inc., Garland, Tex.**
**Filed Feb. 10, 1989, Ser. No. 309,702**
**Int. Cl.[5] F04B** *49/00*
**U.S. Cl. 417—22** **15 Claims**

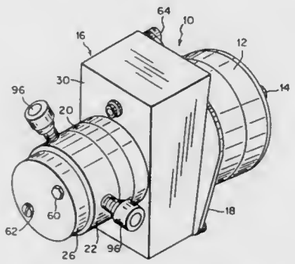
1. A beam pumping unit for a well for continuously controlling the rate of fluid removal from the well, said unit comprising:
(a) a beam supported so that it can pivot;
(b) a rod string connected to said beam;
(c) a down hole pump with a full barrel level and a pump off level, said down hole pump connected to said rod string and reciprocated by said rod string and said beam;
(d) a pump motor connected to pivot said beam;
(e) a load transducer connected to said rod string to measure the load on said rod string;
(f) a position transducer connected to said beam to measure the position of said beam;
(g) a pump speed sensor to measure the pumping speed of the beam pumping unit;
(h) a microprocessor based controller that receives data from said load transducer, said position transducer, and said pump speed sensor; and
(i) a variable speed motor controller connected to said pump motor to vary the speed of said pump motor in response to signals from said microprocessor based controller;
wherein said microprocessor based controller;
signals said variable speed motor controller to vary the




motor speed that varies the pump speed of the beam pumping unit;
determines and stores a relationship between the power transferred to the rod string as a function of pump speed at a full barrel level for the first half of the down stroke of the rod string;
computes the power transferred to the rod string for the first half of each down stroke of the beam during operation of the beam pumping unit;
compares said power to said relationship; and
signals said variable speed motor controller to vary the motor speed that varies the pump speed of the beam pumping unit according to said relationship whereby the rate of removal of fluid from the well is varied to maintain the fluid level in the well between the full barrel level and the pump off level.

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**5,044,889**
**PHASE ADJUSTABLE METERING PUMP, AND METHOD OF ADJUSTING THE FLOW RATE THEREOF**
**Dennis Pinkerton, P.O. Box 179, Oyster Bay, N.Y. 11771**
**Filed May 16, 1990, Ser. No. 523,981**
**Int. Cl.[5] F04B** *7/06*
**U.S. Cl. 417—53** **18 Claims**

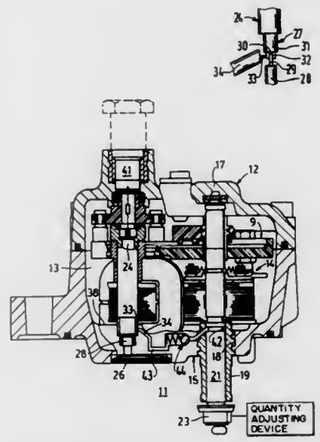


12. A method of adjusting the flow rate into or out of a valveless, positive displacement metering pump of the type including a housing, a cylindrical working chamber within said housing, a piston rotatably and slidably positioned within said working chamber, said piston including a duct defined by an outer surface portion of said piston, a first port extending into said housing and communicating with said working chamber at a first radial position, a second port extending into said housing and communicating with said working chamber at a second radial position, means for causing said piston to move in back and forth strokes along an axis within said working chamber, and means for rotating said piston within said working chamber as said piston moves back and forth within said working chamber such that said duct is in sequential communication with said first and second ports, respectively, comprising:
changing the relative positions of said working chamber and said piston such that said duct communicates with each of said ports during different phases of the rotational and back and forth movements of said piston within said working chamber, the step of changing the relative positions of said working chamber and said piston including the step of rotating said housing from a first position to a second position with respect to said piston such that said duct communicates with each of said ports during different phases of said rotational and back and forth movements of said piston in said second position than in said first position.



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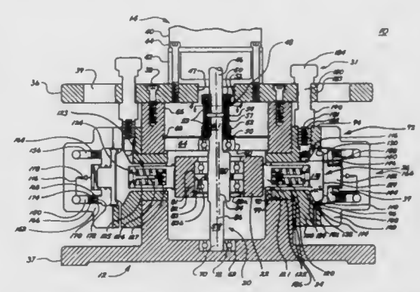
**5,044,890**
**FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES**
**Alf Loeffler, Markgroeningen Talhausen; Wolfgang Fehlmann; Eberhard Fiedler, both of Stuttgart; Wolfgang Geiger, Remshalden Grunbach, and Helmut Laufer, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**
**Filed Jun. 27, 1990, Ser. No. 544,561**
**Claims priority, applicatioo Fed. Rep. of Germany, Aug. 30, 1989, 3928718**
**Int. Cl.[5] F04F** *5/00;* **F02M** *37/04*
**U.S. Cl. 417—87** **8 Claims**




1. A fuel injection pump for internal combustion engines having a pump housing (**10**), a pump interior (**11**) enclosed in said pump housing (**10**), the pump interior being filled with fuel under pressure that is supplied to a pump work chamber upon an intake stroke of a pump piston defining the pump work chamber, a quantity adjusting device disposed in the pump interior (**11**) for controlling the fuel injection quantity pumped by the pump piston at high pressure, a final control element housing (**12**), a final control element chamber (**13**) in said final control element housing separated from the pump interior (**11**), said final control element chamber communicating with said pump interior only via a throttle restriction (**22**), said final control element housing (**12**) contains an overflow opening (**41**), an electrical final control element (**14**) disposed in the final control element chamber (**13**), the final control element having a potentiometer (**9**) associated with it, a control shaft (**21**) guided through a partition (**15**) that divides the final control element chamber (**13**) from the pump interior (**11**), said control shaft is coupled to the quantity adjusting device, a flow conduit (**24**) that passes through the final control element housing (**12**) which discharges at one end into the pump interior (**11**) and at the other end discharges into the overflow opening (**41**) which leads to a fuel tank, a portion of said flow conduit (**24**) is embodied as a jet pump (**27**) with an intake bore (**33**) that communicates via the final control element chamber (**13**) with a part of the throttle restriction (**22**).

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**5,044,891**
**VARIABLE DISPLACEMENT DIAPHRAGM PUMP**
**Ken Ozawa, Quincy, Wash., assignor to Ozawa R&D, Inc., Portland, Oreg.**
**Continuation of Ser. No. 142,537, Jan. 11, 1988, Pat. No. 4,856,966. This application Aug. 14, 1989, Ser. No. 393,636**
**Int. Cl.[5] F04B** *49/00*
**U.S. Cl. 417—214** **53 Claims**



1. A high cycle, variable capacity fluid feed pump operable without the need for a source of lubricating fluid, comprising:
(a) a housing, defining an internal chamber;
(b) flexible diaphragm means extending across the internal chamber of the housing to divide the internal chamber into a pumping chamber and a piston chamber, the piston chamber being substantially devoid of lubricating fluid;
(c) a fluid inlet and a fluid outlet in communication with the pumping chamber;
(d) diaphragm support means movably disposed within the pumping chamber to bear against a substantial portion of the adjacent, first face of the diaphragm means;
(e) piston assembly means disposed within the piston chamber to bear against the adjacent, second face of the diaphragm means in opposition to the diaphragm support means;
(f) means for reciprocating the piston assembly means within the piston chamber toward and away from the diaphragm means for pumping fluid through the pumping chamber, the reciprocating means having contact surface means;
(i) said contact surface means cyclically making rolling contact and minimal sliding contact against the piston assembly means when driving the piston assembly means toward the diaphragm; and,
(ii) the contact surface means being free of lubricating fluid; and,
g) adjustable means for infinitely and precisely adjusting the stroke of the piston assembly means within a given stroke range, said adjustable means cooperating with the piston assembly means to adjust the stroke of the piston assembly means so that during at least part of the time period between the cyclical rolling contacts of the contact surface

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means against the piston assembly means, the reciprocating means is sufficiently retracted in the direction away from the diaphragm means to space the contact surface means away from the piston assembly means, whereby a different section of the contact surface means is placed in contact with the piston assembly means the next time the reciprocating means drives the piston assembly means toward the diaphragm means.

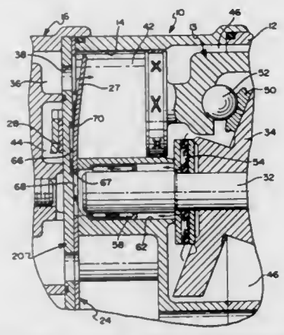
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**5,044,892**

## SWASH PLATE COMPRESSOR LUBRICATION SYSTEM

**Edward D. Pettitt, Burt, N.Y., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Mar. 5, 1990, Ser. No. 488,195**
**Int. Cl.[5] F04B *1/14***
**U.S. Cl. 417—269** **3 Claims**



1. A swash plate compressor that circulates refrigerant with entrained lubricant for compressor lubrication, said compressor comprising a pair of combined cylinder blocks having centrally located axially aligned shaft bores and radially and angularly located piston bores, said cylinder blocks defining a crankcase chamber therebetween, double-ended pistons mounted in the respective piston bores, a drive shaft, radial bearings mounting said drive shaft in the respective shaft bores, a swash plate fixed to said drive shaft and located in said chamber and operatively drivingly connected to said pistons, a pair of thrust bearings axially supporting said swash plate between said cylinder blocks, a pair of valve plates arranged on opposite ends of said combined cylinder blocks to close said cylinder bores and cooperate with the respective pistons to define pumping chambers, cylinder heads arranged with the respective valve plates to define suction cavities and discharge cavities at opposite ends of the combined cylinder blocks, each of said valve plates having a suction port and a discharge port for connecting each associated pumping chamber with the associated suction and discharge cavities, suction reed valves for opening the respective suction ports in response to differential pressure effected thereon by piston movement, discharge valves for opening the respective discharge ports in response to pressure rise in the associated pumping chamber, the improvement comprising:

a lubrication channel in the piston side of each of the valve plates extending from the shaft bearing bore in the associated cylinder block behind one of the associated suction reed valves to an intermediate point between said shaft bearing bore and said one suction reed valve, said lubrication channel being sized and arranged so as to be closed along its length by said one suction reed valve when said one suction reed valve closes the associated suction port but then be opened by said one suction reed valve to the associated pumping chamber in parallel relationship with the associated suction port when said one suction reed valve opens whereby refrigerant with entrained lubricant is forced to flow from the crankcase chamber through at least the associated radial bearing and thence via the lubrication channel to the associated pumping chamber.

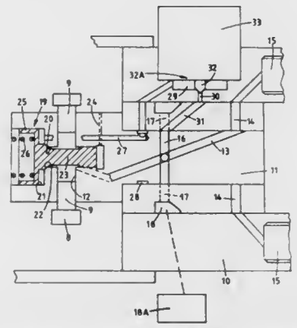
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**5,044,893**

## FUEL INJECTION APPARATUS

**Peter A. G. Collingborn, Kent, England, assignor to Lucas Industries Public Limited Company, Birminghan, England**

**Filed Aug. 1, 1990, Ser. No. 561,152**
**Claims priority, application United Kingdom, Sep. 8, 1989, 8920330**
**Int. Cl.[5] F04B *49/02***
**U.S. Cl. 417—279** **4 Claims**



1. A fuel injection pumping apparatus for supplying fuel to an internal combustion engine, comprising a rotary distributor member housed in a pump body, a transverse bore in the distributor member and a pair of pumping plungers slidable therein, a cam for imparting inward movement of the plungers as the distributor member is driven in timed relationship with the associated engine, a delivery passage communicating with the bore for registration in turn with a plurality of outlet ports during successive inward movement of the plungers, means for supplying fuel to the bore to effect maximum outward movement of the plungers during at least part of the time the delivery passage is out of register with an outlet port, valve means operable to spill fuel from said bore during the inward movement of the plungers thereby to terminate delivery of fuel through an outlet port, characterised by a spill passage extending from the bore, a seating formed in said spill passage, a valve member engageable with said seating and a piston member connected to the valve member, the piston member being slidable within a cylinder and defining a surface against which fuel under pressure can act to lift the valve member from the seating, passage means through which fuel under pressure from said bore can be applied to said surface of the piston member and an electro-magnetically operable control valve in said passage means, said control valve when opened allowing fuel under pressure to act on said surface of the piston member to lift the valve member from the seating to terminate delivery of fuel through an outlet port.

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**5,044,894**

## CAPACITY VOLUME RATIO CONTROL FOR TWIN SCREW COMPRESSORS

**Michael G. Field, Fabius, and David N. Shaw, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed Nov. 30, 1990, Ser. No. 620,116**
**Int. Cl.[5] F04B *49/00*; F01C *1/16***
**U.S. Cl. 417—310** **5 Claims**

1. In a screw compressor having rotors, a slide valve exposed to discharge pressure and movable slide stop exposed to suction pressure, slide valve and slide stop positioning means comprising:

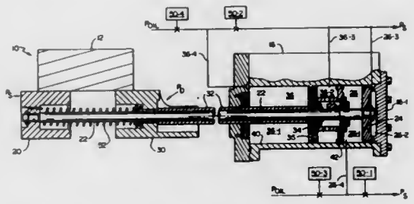
a control housing means having a bore therein;



dividing means for dividing said bore into first and second piston chambers;

a first piston means reciprocatably located in and dividing said first chamber into two cavities and having an annular rod connecting said first piston means and said slide valve and extending through said control housing means in a sealingly guided relationship;

a second piston means reciprocatably located in and dividing said second chamber into two cavities and having an inner rod connecting said second piston means on said slide stop



and serially extending through said dividing means in a sealingly guided relationship, through said annular rod and said slide valve;

spring means surrounding said inner rod and acting against said slide valve and said slide stop so as to tend to separate said slide valve and said slide stop; and

fluid pressure means connected to said two cavities in both said first and second chambers for selectively moving said first and second piston means and thereby said slide valve and slide stop.

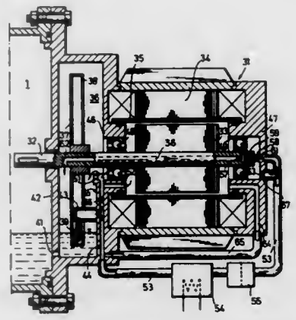
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**5,044,895**

## OIL SUPPLY DEVICE FOR A ROTARY MACHINE

**Peter Frieden; Heinz Frings, both of Cologne, and Karl-Heinz Ronthaler, Zülpich, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Filed Dec. 18, 1985, Ser. No. 810,379**
**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 3447193**
**Int. Cl.[5] F04B *17/00***
**U.S. Cl. 417—354** **19 Claims**



1. In a Roots vacuum pump having a gear chamber constituting a reservoir adapted to contain oil having a predetermined oil level; a rotary shaft extending into the reservoir; meshing toothed gears situated in said gear chamber and operatively connected with the rotary shaft; and an oil supply device drawing oil from the reservoir for delivering oil to pump components; the improvement in said oil supply device comprising:

(a) a disc affixed to said rotary shaft and having a diameter selected such that a portion of the disc dips at all times into the oil contained in said reservoir;

(b) a trough affixed to said disc for rotation therewith as a unit; said trough extending arcuately and having a radially inwardly open side as viewed relative to said disc; said trough being arranged to be submerged, together with said portion of said disc, at all times partially in the oil contained in said reservoir for filling the trough with oil directly from said reservoir through said radially inwardly open side solely by virtue of submerging the trough in the oil contained in the reservoir; and

(c) an oil conduit having a stationarily supported terminal portion accommodated in said reservoir and projecting into said trough and being provided with an open end situated in said trough and oriented opposite an operational rotary direction of said disc, whereby oil is driven into said terminal portion through said open end from said trough upon rotation of said rotary shaft, whereby said oil conduit supplies oil under pressure.

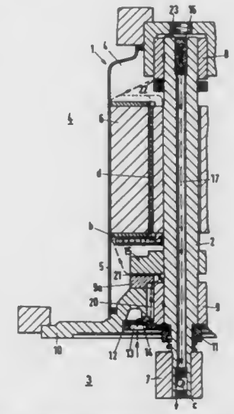
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**5,044,896**

## SPLIT TUBE CENTRIFUGAL PUMP

**Albert Genster, Marl, Fed. Rep. of Germany, assignor to Wilo-Werk GmbH & Co. Pumpen - und Apparatebau, Dortmund, Fed. Rep. of Germany**

**Continuation of Ser. No. 265,040, Oct. 31, 1988, abandoned.**
**This application Jun. 11, 1990, Ser. No. 537,164**
**Int. Cl.[5] F04B *39/00***
**U.S. Cl. 417—365** **11 Claims**



1. A split tube centrifugal pump, comprising

a pump casing divided into a pump space and a motor space,

a conveying fluid in said pump casing,

a vertically disposed shaft in said casing, said shaft being hollow and including an axially extending channel therein,

an impeller mounted on said shaft and driving said conveying fluid in said pump casing,

a rotor including a first channel associated with said rotor and disposed between said rotor and said pump casing,

a partition separating said pump space from said motor space, said partition including a first aperture and a second aperture, said shaft passing through said second aperture,

said conveying fluid circulating between said pump space and said motor space in a first circuit comprising said first aperture, said first channel associated with said rotor, and said channel in said shaft,

a filter in juxtaposition with said first aperture in said partition,

a slide ring sealing retaining said shaft in said second aperture of said partition, and

a second channel associated with said rotor and in fluid

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communication with said first circuit so that said conveying fluid can circulate in a second circuit which bypasses a portion of said first circuit.

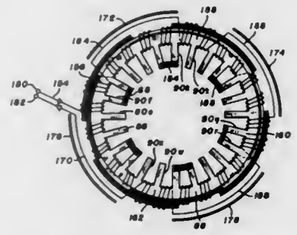
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**5,044,897**

## RADIAL DRIVE FOR IMPLANTABLE CENTRIFUGAL CARDIAC ASSIST PUMP

**Frank Dorman, Minneapolis, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.**

**Filed Jul. 10, 1989, Ser. No. 377,273**
**Int. Cl.[5] F04B *17/02***
**U.S. Cl. 417—423.7** **13 Claims**



1. An apparatus for driving a body implantable centrifugal pump, including:

a dielectric casing defining a rotor chamber, an impeller chamber, bodily fluid inlet and outlet passages in fluid communication with said impeller chamber and the exterior of said casing, and a lubricant fluid inlet passage in fluid communication with said rotor chamber and said exterior;

a rotor assembly contained in said rotor chamber and supported to rotate relative to the casing by hydrodynamic bearing action of a fluid lubricant provided through said lubricant inlet passage, said rotor assembly including a permanent magnet having an equal number of N-magnetic and S-magnetic poles in an alternating configuration with opposite poles adjacent one another;

a stator mounted to the exterior of said casing in surrounding, radially spaced apart relation to said rotor assembly, said stator including an annular stator frame fixed to the casing and coaxial with the rotor to provide a predetermined radial gap between the stator frame and rotor assembly, said stator frame constructed of a magnetic flux carrying material and including an annular outer rim having a diameter greater than its axial length;

said stator further including at least two electrical conductors disposed along said outer rim and electrically isolated from one another, each of said conductors including a plurality of active segments disposed symmetrically about the outer rim, each active segment including a plurality of traverses of the associated conductor toroidally around said rim;

a drive means including an electrical power supply, for providing an electrical current to said conductors in a predetermined sequence to rotate the rotor assembly relative to said casing and said stator; and

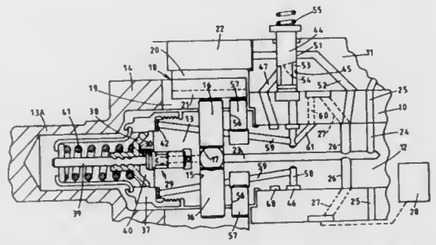
an impeller contained in said impeller chamber, and a connecting means for coupling said impeller to rotate responsive to rotation of the rotor.

**5,044,898**

## FUEL INJECTION PUMP

**Kenneth M. Harris, Maidstone, England, assignor to Lucas Industries, England**

**Filed Jan. 31, 1990, Ser. No. 472,884**
**Claims priority, application United Kingdom, Feb. 9, 1989, 8902860**
**Int. Cl.[5] F04B *19/02***
**U.S. Cl. 417—462** **2 Claims**



1. A fuel injection pump for supplying fuel to an internal combustion engine and of the kind comprising a rotary distributor member rotatably mounted in a body, a portion of the distributor member extending from the body, a transverse bore formed in said projecting portion and a pair of pumping plungers in the bore, cam followers at the outer ends of the plungers the cam followers being engageable with cam lobes formed on the internal peripheral surface of a cam ring surrounding the portion of the distributor member, passage means through which fuel displaced from said bore can flow to outlet ports in turn and through which fuel can be supplied to the bore from a source or fuel under pressure, a further plunger slidable in said portion of the distributor member said further plunger being located in spaced side by side relationship relative to one of said pumping plungers and being actuated by the respective one of said cam followers, said further plunger delivering liquid to a spill control shuttle housed in said body characterized in that the further plunger is positioned in a blind bore disposed between the pumping plungers and the body, the blind bore being connected to a drilling which is located in a plane containing the axis of the transverse bore and the blind bore, the drilling intersecting the transverse bore at a position where its point of entry onto the transverse bore is covered by one of the pumping plungers.

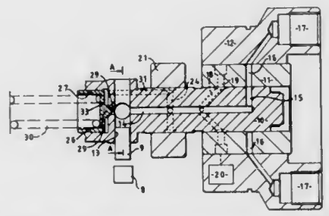
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**5,044,899**

## FUEL PUMPING APPARATUS

**Stuart W. Nicol, London, England, assignor to Lucas Industries, Birmingham, England**

**Filed Jun. 1, 1990, Ser. No. 532,313**
**Claims priority, application United Kingdom, Jun. 3, 1989, 8912824**
**Int. Cl.[5] F04B *29/00, 23/00;* F02M *37/04***
**U.S. Cl. 417—462** **6 Claims**



1. A liquid fuel injection pumping apparatus of the kind



comprising a rotary cylindrical distributor member mounted in a body, a bore formed in the distributor member and a pumping plunger mounted therein, a cam for imparting inward movement to the pumping plunger as the distributor member rotates, means for supplying fuel to the bore from a source of fuel under pressure to effect outward movement of the pumping plunger, further means for conveying fuel displaced by the pumping plunger to a plurality of outlet ports in turn and a control sleeve slidable on the distributor member for controlling the flow of fuel through a passage connected to said bore whereby the quantity of fuel which is delivered by the apparatus during inward movement of the pumping plunger can be controlled characterised by a spill passage communicating with said bore, said spill passage opening into a chamber, a spring loaded piston movable in said chamber and a valve element mounted on said piston, said valve element in use engaging a seating defined about said spill passage to prevent flow of fuel through the spill passage, said first mentioned passage communicating with said chamber whereby during inward movement of the plunger when fuel flows through said first mentioned passage into the chamber, the piston will be moved to lift the valve element from the seating thereby to open the spill passage, the spilled fuel collecting in said chamber and being returned to the bore prior to the next inward movement of the pumping plunger.

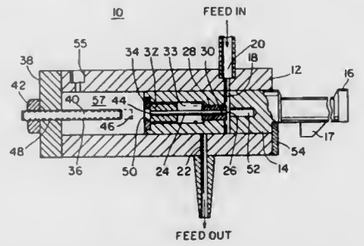
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**5,044,900**

## POSITIVE DISPLACEMENT SHUTTLE PUMP

**William A. Cavallaro, Bradford, Mass., assignor to Knight Tool Company, Inc., Haverbill, Mass.**

**Filed Mar. 1, 1990, Ser. No. 486,901**
**Int. Cl.[5] F04B *19/02***
**U.S. Cl. 417—466** **11 Claims**




1. A positive displacement shuttle pump comprising:

a cylinder with axially displaced and mutually isolated inlet and outlet ports;

a shuttle piston having a reservoir for accepting pressurized feed from the inlet port in the feed cycle and for dispensing feed to the outlet port in the dispensing cycle;

a displacement piston extending longitudinally in said shuttle piston and communicating with said reservoir;

an actuator for extending said displacement piston into said reservoir to pressurize the feed and urge the feed through said outlet port during the dispensing cycle, said displacement piston being responsive to said pressurized feed in said reservoir for retracting during the feed cycle; and

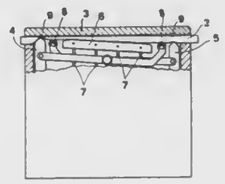
means for driving said shuttle piston through said feed and dispensing cycles.

**5,044,901**

## PULSATILE PUMP FOR EXTRA-CORPOREAL CIRCULATION

**Roberto Fumero, Basiglio, and Lucio Perenzan, Bergamo, both of Italy, assignors to Bellco S.p.A., Modena, Italy**

**Continuation of Ser. No. 462,292, Dec. 29, 1989, abandoned, which is a continuation of Ser. No. 228,671, Aug. 5, 1988, abandoned. This application Aug. 27, 1990, Ser. No. 573,272**
**Claims priority, application Italy, Nov. 13, 1987, 22629 A/87**
**Int. Cl.[5] F04B *43/12***
**U.S. Cl. 417—474** **8 Claims**



1. A pulsatile pump for extra-corporeal circulation in cardiosurgery, which comprises:

a housing chamber in which a length of an elastic hose is inserted;

two squeeze valves positioned in said chamber, one of which is for suction and the other of which is for delivery;

an electro-pneumatically actuated plate which includes means in the systolic stroke for partially compressing the hose for carrying out rototranslational movement of said plate and, in the diastolic stroke for moving said plate away from the hose by an analogous opposite movement, so as to allow the hose to relax; and

a set of pneumatic cylinders for controlling rototranslational movement of the plate.

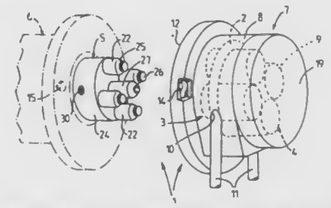
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**5,044,902**

## CARTRIDGE FOR PERISTALTIC PUMP WITH A FLEXIBLE TUBE, AND PERISTALTIC PUMP FITTED WITH SUCH A CARTRIDGE

**Edouard Malbec, Logis de Chalonne, 16160 Le Gond Pontouvre, France**

**Filed Mar. 12, 1990, Ser. No. 491,705**
**Claims priority, application France, Mar. 13, 1989, 89 03234**
**Int. Cl.[5] F04B *43/08***
**U.S. Cl. 417—477** **9 Claims**



1. A cartridge for a peristaltic pump, of the type using a flexible tube to pump fluid, comprising a housing having at one end thereof a generally cylindrical raceway, a chamber, said raceway extending around at least a portion of said chamber, a plurality of cylindrical rollers disposed in said chamber and positioned to engage a flexible tube disposed in said raceway, said rollers each having a longitudinal axis with the axes of said rollers extending parallel to one another, said chamber having a central opening for receiving drive means for engaging and moving each said roller about an axis extending through said central opening whereby a said roller will deform a portion of the flexible tube in said raceway as a said roller is moved relative to a portion of said raceway, said chamber having a

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relative dimension such that with the drive means removed from said central opening, said rollers will be moved radially inwardly toward said axis of said opening of said chamber by the flexible tube to enable rapid and complete sterilization of the flexible tube.

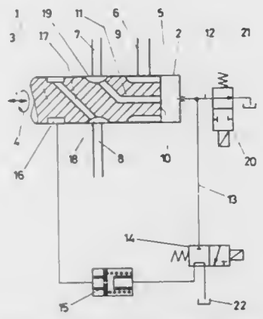
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**5,044,903**

## FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

**Helmut Rembold, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Oct. 20, 1989, Ser. No. 424,642**
**Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844367**
**Int. Cl.[5] E04B** *7/06*
**U.S. Cl. 417—500** **23 Claims**



1. A fuel injection pump for internal combustion engines, comprising a piston having a jacket face and which is driven for simultaneous reciprocation and rotation in a guide bore and there encloses a pump work chamber, said piston being embodied both as a pump piston that periodically pumps fuel, and as a distributor piston rotatable in the guide bore, the piston has a first and a second distributor opening, each of said first and second distributor openings discharge at its jacket face and communicates with various injection nozzles as a function of the rotational position of the distributor piston during a supply stroke of the pump piston, said first distributor opening (19) being permanently connected to said work chamber (5) via a conduit (11) in said distributor piston, further a branch line (13) is connected to the work chamber (5) of the pump piston (1), said branch line is connectable to said second distributor opening (18) of the distributor piston (1) upon rotation of said distributor piston and connectable with at least one injection nozzle different from the injection nozzle connected directly to the work chamber (5) via said first distributor opening (19), said pump work chamber being permanently connected with a relief line (12) which is controlled by a relief valve (20) which upon closure controls an effective stroke of the piston along which fuel under high pressure is delivered to said injection nozzles.

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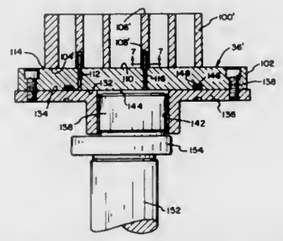
**5,044,904**

## MULTI-PIECE SCROLL MEMBERS UTILIZING INTERCONNECTING PINS AND METHOD OF MAKING SAME

**Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Jan. 17, 1990, Ser. No. 466,500**
**Int. Cl.[5] F04C** *18/04, 27/00;* **F16B** *9/02, 17/00*
**U.S. Cl. 418—55.2** **20 Claims**

1. A scroll member assembly for use as a fixed or orbiting scroll member in a scroll-type compressor, comprising:
an end plate member having a planar face surface;
an involute wrap member extending involutely about a central axis and having a planar involute axial end surface, said wrap member being contactingly adjacent said plate member such that said involute axial end surface and said face surface define a planar involute interface therebetween; and
interconnecting means spaced along said planar involute interface for interconnecting said wrap member and said plate member, said interconnecting means including a plurality of axial bores in said wrap member opening onto said involute axial end surface, a plurality of axial bores in said plate member opening onto said face surface, wherein each one of said plurality of axial bores in said wrap mem-



ber is axially aligned with a respective one of said plurality of axial bores in said plate member, and a plurality of pin members each being received within a respective bore in said plate member and extending across said planar involute interface and being received within a corresponding bore in said wrap member, one of said plurality of bores in said wrap member and said plurality of bores in said plate member are oversized with respect to said corresponding plurality of pin members received therein, such that said wrap member is movable with respect to said plate member in a plane parallel to said planar involute interface between said involute axial end surface of said wrap member and said face surface of said plate member.

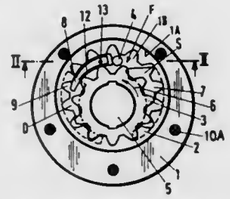
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**5,044,905**

## DEVICE FOR MINIMIZING FLUTTER OF A FILLER PIECE IN AN INTERNAL GEAR PUMP

**Max Bartl, Munich, and Richard Strehler, Chieming, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany**

**Filed May 10, 1990, Ser. No. 521,896**
**Claims priority, application Fed. Rep. of Germany, May 18, 1989, 3916155; Feb. 23, 1990, 9002160[U]**
**Int. Cl.[5] F04C** *2/10*
**U.S. Cl. 418—126** **8 Claims**



1. In a gear pump comprising a housing having a chamber with a bottom wall closed off with a lid, an internally toothed gear rotatably supported in said chamber, an externally toothed pinion in said chamber, the teeth of which is in meshing engagement with teeth on said internally toothed gear, means defining a sickle-shaped free space between said internally toothed gear and said pinion, one end of said free space communicating with a first opening and a suction side of said gear pump, an end of said free space communicating with a second opening and a pressure side of said gear pump, and a sickle-shaped filler piece located between said suction side and said pressure side of said gear pump in said free space, which filler piece is at a wide end thereof adjacent said suction side opposing a support element extending through said free space, said filler piece being normally spaced from said bottom wall, said lid and the teeth on said gear and said pinion so that said filler piece will normally flutter in said free space as fluid is moved through said gear pump, the improvement wherein said filler piece has a flat side facing said lid, a groove in said flat side extending from a narrow end of said filler piece to a location adjacent its opposite wide end, which groove is connected in fluid circuit to the pressure side of said gear pump to allow the pressurized fluid to enter the groove and urge said filler piece toward and into engagement with said bottom wall of said chamber to retard the flutter of said filler piece in said free space.



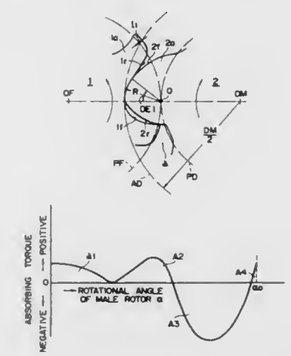
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**5,044,906**

## SCREW ROTOR FOR SCREW PUMP DEVICE HAVING NEGATIVE TORQUE ON THE FEMALE ROTOR

**Noboru Tsuboi, Kakogawa, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Filed Jan. 8, 1990, Ser. No. 461,912**
**Claims priority, application Japan, Mar. 24, 1989, 1-73133**
**Int. Cl.[5] F04C** *18/16*
**U.S. Cl. 418—150** **1 Claim**



1. A screw rotor for a screw pump device comprising a male rotor and a female rotor meshing with said male rotor and adapted to be driven by said male rotor, wherein tooth profiles of said female and male rotors are unsymmetrical such that the sum of absorbing torques of said female rotor is negative, wherein

$$DE1 \cong 7.7\,Ap + 33$$

wherein,
DE1 is an opening angle of a sectionally arcuate portion of said male rotor, and
Ap is an addendum % defined as (l1/DM)×100, wherein l1 is an addendum of the female rotor and DM is the diameter of the addendum circle of the male rotor.

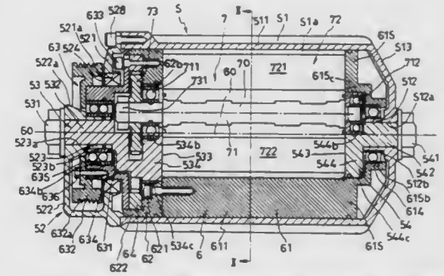
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**5,044,907**

## ROTOR DEVICE HAVING INNER ROTOR AND DRIVEN OUTER ROTOR

**Koichiro Hirosawa, Kariya; Takashi Ohmitsu, Toyota, and Masahiro Fukuta, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Continuation of Ser. No. 251,808, Sep. 30, 1988, abandoned. This application Aug. 16, 1990, Ser. No. 568,629**
**Claims priority, application Japan, Sep. 30, 1987, 62-246736**
**Int. Cl.[5] F04C** *18/10*
**U.S. Cl. 418—168** **10 Claims**



1. A rotor device for use as a compressor in a supercharger comprising:
a casing;
an outer rotor positioned in said casing and partially defining an operating chamber, a first boss portion integral with a cover of the casing and a second boss portion integral with a bottom portion of the casing rotatably supporting said outer rotor through a bearing arrangement for rotation about a first rotational axis, said outer rotor including an outer rotor body connected to a positioning member, said positioning member having a bearing surface;
an inner rotor having an outer circumferential surface positioned in said casing and rotatably supported about a second rotational axis by an inner shaft through a bearing arrangement positioned at opposite ends of said inner shaft;
an outer sealing portion of said inner rotor defining a locus along an inner wall surface of an operating chamber of said outer rotor as a result of the rotation of said inner rotor;
an inner sealing portion of said outer rotor defining a locus along an outer circumferential surface of said inner rotor as a result of the rotation of said outer rotor;
said inner wall surface of said operating chamber being engaged with said outer circumferential surface of said inner rotor through a gear engagement comprising a first gear and a second gear;
an input driving shaft portion connected to said outer rotor;
a front shaft portion including an end portion, said end portion of said front shaft portion having a bearing surface on its inner circumferential surface, and an inner bearing positioned between the bearing surface on said positioning member and the bearing surface on the end portion of the front shaft portion so as to rotatably support one end of said inner rotor;
said first gear having teeth on its inner circumferential surface and connected to said outer rotor;
said second gear having teeth on its outer circumferential surface, said second gear being connected to said inner rotor and being engaged with said first gear; and
said inner rotor being driven by said outer rotor via said first and second gears.

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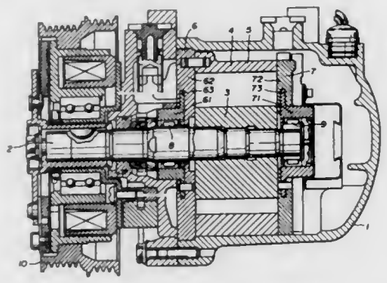


5,044,908

## VANE-TYPE ROTARY COMPRESSOR WITH SIDE PLATES HAVING SEPARATE BOSS AND FLANGE SECTIONS

Tsuneshige Kawade, Kanagawa, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Filed Mar. 22, 1989, Ser. No. 327,335
Claims priority, application Japan, Mar. 22, 1988, 63-65746
Int. Cl.[5] F04C *18/344, 29/04;* F16C *35/04*
U.S. Cl. 418—179 3 Claims



1. A vane-type rotary compressor comprising:
a compressor housing;
a cam ring disposed within said compressor housing and defining an essentially elliptic opening;
a rotor carrying a plurality of rotor vanes for defining working chambers between adjacent vanes, said rotor being coupled with a rotor shaft for rotation therewith;
side plates fitted on both axial ends of the cam ring for closing the both axial ends of the cam ring, each of said side plates comprising a boss section and a flange section radially extending from the boss section, said boss section receiving a bearing member for rotatably supporting said rotor shaft, said flange section being formed of an aluminium containing material, and said boss section being formed of a material having a linear expansion coefficient approximately equal to the linear expansion coefficient of said bearing member; said boss section and said flange section are formed substantially in integral form by insert casting; said boss section is formed with a radially extending portion which is mechanically secured to an associated portion of said flange section; said radially extending portion of said boss section comprises at least one radially extending projection, a through opening is formed through said projection and associated portion of said flange section for receiving a securing means for establishing tight interfitting between said boss section and said flange section.

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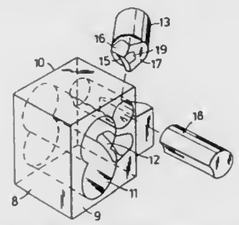
5,044,909

## VALVE DEVICE FOR CONTROL OF THE INNER VOLUME RELATION IN A SCREW TYPE ROTARY COMPRESSOR

Paul Lindström, Norrköping, Sweden, assignor to STAL Refrigeration AB, Norrköping, Sweden

Filed Mar. 7, 1990, Ser. No. 489,551
Claims priority, application Sweden, Mar. 8, 1989, 8900816
Int. Cl.[5] F04C *29/08*
U.S. Cl. 418—201.2 4 Claims

1. A valve device for control of the inner volume relation in a screw type rotary compressor, having an outlet port located in the rotor housing of the compressor and oriented towards the running rotors, characterized in that the outlet port (12) is axially delimited by the outlet plane and by oblique cam lines in the mantle wall of the working space, which cam lines correspond to the delimiting lines of the screw ends, and in that for the outlet port a corresponding mobile valve body (13) is arranged, which in the fully inserted position is adjacent to the outer diameter of the rotors, and that the valve body is arranged to move at an angle relatively to the outlet plane and is provided with two concave surfaces (15, 16) towards the rotor plane which are separated by a pointed line (14), and a plane



surface (17) towards the outlet plane, the concave surfaces, in the fully inserted position of the valve body, being adjacent to the outer diameters of the rotors at a minimum amount of play, and the plane surface being adjacent to the surface of the outlet plane.

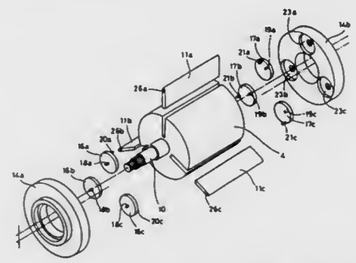
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5,044,910

## VANE PUMP WITH ROTATABLE DRIVE MEANS FOR VANES

Hiroshi Sakamaki; Yukio Horikosbi; Takeshi Jinnouchi, and Kenji Tanzawa, all of Sakado, Japan, assignors to Eagle Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 394,620, Aug. 16, 1989, abandoned, which is a division of Ser. No. 197,548, May 23, 1988, Pat. No. 4,958,995, which is a continuation-in-part of Ser. No. 75,006, Jul. 17, 1987, abandoned, and a continuation-in-part of Ser. No. 110,919, Oct. 21, 1987, abandoned, and a continuation-in-part of Ser. No. 113,568, Oct. 26, 1987, abandoned, and a continuation-in-part of Ser. No. 115,677, Oct. 30, 1987, abandoned. This application Sep. 28, 1990, Ser. No. 590,568
Claims priority, application Japan, Jul. 22, 1986, 61-111490[U]; Jul. 22, 1986, 61-170903; Oct. 23, 1986, 61-161609[U]; Oct. 23, 1986, 61-161610[U]; Nov. 4, 1986, 61-168145[U]; Nov. 4, 1986, 61-168147[U]; Nov. 14, 1986, 61-269960[U]; Nov. 14, 1986, 61-269961; Nov. 17, 1986, 61-271934; Nov. 21, 1986, 61-178287[U]; Nov. 21, 1986, 61-178288[U]; Nov. 21, 1986, 61-276689; Nov. 21, 1986, 61-276690; Dec. 3, 1986, 61-185571[U]
Int. Cl.[5] F01C *1/344*
U.S. Cl. 418—253 10 Claims



1. A rotary machine comprising a housing means having a rotor chamber, said rotor chamber having an inner peripheral surface, a rotor means rotatably mounted in said rotor chamber, said inner peripheral surface having a central axis which is eccentrically disposed relative to the axis of rotation of said rotor means, said rotor means having a plurality of generally radially disposed vane slots, a plurality of vane means slidably mounted in said vane slots and operable to define variable volume chambers as said rotor means rotates and said vane means move generally radially in and out of said vane slots, said housing means having annular ring means rotatable coaxial with said peripheral surface of said rotor chamber, and rotatable cam means operatively connected between said ring means and said vane means such that upon rotation of said rotor means, said cam means is operable to rotatably drive said ring means and to control the in and out radial movement of said vane means in said vane slots to preclude sliding contact between said vane means and said inner peripheral surface of said housing means, said cam means comprising a disk means having one part rotatably connected to said ring means and another part rotatably connected to said vane means, said other part being eccentrically disposed relative to said first part.



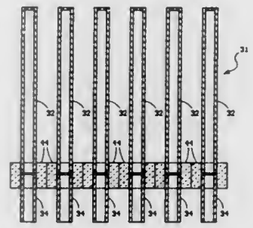
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5,044,911

## APPARATUS FOR INJECTION CASTING METALLIC NUCLEAR ENERGY FUEL RODS

Bobby R. Seidel, Idaho Falls; Donald B. Tracy, Firth, both of Id., and Vernon Griffiths, Butte, Mont., assignors to United States Department of Energy, Washington, D.C.

Filed Apr. 6, 1989, Ser. No. 333,935
Int. Cl.[5] B22D *18/06;* G21C *21/00*
U.S. Cl. 425—110 13 Claims



7. An apparatus for producing a metallic nuclear energy fuel rod from a melt of a selected nuclear fuel and an alloying element comprising:
a tube, including an alloying element selected to react and fuse with said nuclear to form an alloy, having cylindrical inner walls which form a cavity, and two opposed ends;
means for sealing a selected end of said tube and closing said selected end while leaving said other opposed end open;
a reuseable pipe;
means for securing said reusable pipe to said tube and having the ability to be removed prior to said fuel rod being molded and said reusable pipe having an inner wall with two open ends forming a second cavity therewithin, said reusable pipe being composed of an element non-reactive to said melt; and
wherein said means for securing allows for the removal of said pipe after fuel rod has been molded, thereby essentially minimizing the creation of hazardous radioactive waste incident to the formation of the fuel rod.

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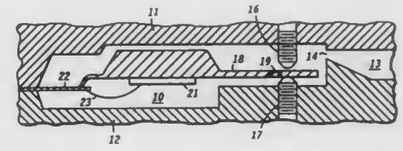
5,044,912

## MOLD ASSEMBLY HAVING POSITIONING MEANS

David Billings, Mesa, Ariz., and Soon C. Hong, Seoul, Rep. of Korea, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 11, 1989, Ser. No. 448,490
Int. Cl.[5] B29C *45/14, 45/16, 39/10, 39/12*
U.S. Cl. 425—116 5 Claims

1. A mold assembly having a first mold half and a second mold half and forming a cavity when the first and second mold halves are mated together, comprising: at least a first pin extending into the cavity from the first mold half; and at least a second pin extending into the cavity from the second mold half wherein the at least a first pin and the at least a second pin position a portion of a leadframe within the cavity, and wherein the at least a first pin is too short to make physical contact with the leadframe when the mold halves are mated and during encapsulation, so that when encapsulating material



is forced into the cavity it will encapsulate the portion of the leadframe nearest the first pin.

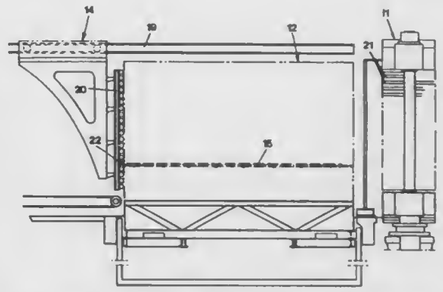
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5,044,913

## DEVICE AT MULTI PLATEN PRESSES

Carl-Olof Östman, Kajutgatan, Sweden, assignor to Swanboard Masonite AB, Sweden

PCT No. PCT/SE86/00449, § 371 Date Apr. 6, 1989, § 102(e) Date Apr. 6, 1989, PCT Pub. No. WO88/02301, PCT Pub. Date Apr. 7, 1988
ub. Date DOct. 6, 1986, Ser. No. 346,176
Int. Cl.[5] B29C *43/58, 15/28*
U.S. Cl. 425—135 14 Claims



1. A device at a multi platen press for transferring transport plates, wherein the transport plates are for carrying stampings thereon through the press, and the press includes a loading elevator for the plates, a press on which each plate is stamped, and an unloading elevator from the press; and wherein the device is for transferring plates from the loading elevator to the press and from the press to the unloading elevator and wherein the press is disposed in the path of transfer between the loading and unloading elevators;
the device comprising:
a pusher at the loading elevator for simultaneously pushing a plurality of the plates onto the press;
an extractor at the unloading elevator for simultaneously removing a plurality of the plates from the press;
at least one of the pusher and the extractor inlcuding sensors adapted for individually sensing the resistance to movement of each plate by the respective one of the pusher and the extractor at which the sensor is included, and
each sensor being connected to other means responsive to the sensing of the resistance to movement of the respective plate and the responsive means acting when the sensed resistance is beyond a predetermined level.

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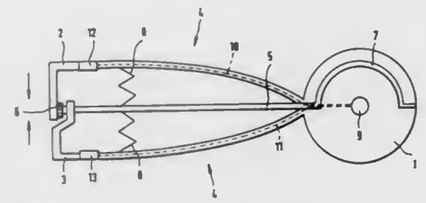


5,044,914

## SCOOP FOR COUNTING SERVING PORTIONS OF FOOD

Christof Schülling, Am Sportfeld 7, 8729 Sand am Main, Fed. Rep. of Germany

PCT No. PCT/DE88/00387, § 371 Date Jan. 9, 1990, § 102(e) Date Jan. 9, 1990, PCT Pub. No. WO89/00383, PCT Pub. Date Jan. 26, 1989
ub. Date DJun. 28, 1988, Ser. No. 477,852
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1987, 3722822
Int. Cl.[5] B28B *1/00*
U.S. Cl. 425—169 20 Claims



1. A portioning scoop for food, comprising:
a handle;
a spoon affixed to said handle; and,
a temperature sensor constituting a part of said spoon, said temperature sensor including means for recording and counting the number of temperature changes of said spoon.

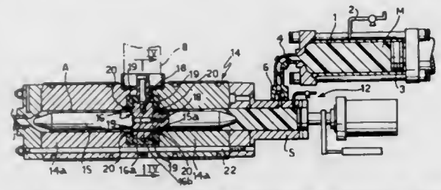
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5,044,915

## APPARATUS FOR THE INJECTION MOULDING OF UNSATURATED POLYESTER RESIN MASSES

Mario Da Re', Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 251,424, Sep. 30, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 483,980
Claims priority, application Italy, Sep. 30, 1987, 67827 A/87
Int. Cl.[5] B29C *35/12, 45/72*
U.S. Cl. 425—174.8 R 1 Claim



1. An injection molding apparatus for the injection molding of unsaturated polyester resin masses comprising:
a metering cylinder provided with a piston for supplying a mass of resin material to an accumulation cylinder provided with a piston for injecting the resin mass into a die,
a preheating unit connected between said accumulation cylinder and said die and comprising two half cylinders disposed on a common axis,
an electrode support member connected between said two half cylinders and including a central cylindrical portion coaxial with said half cylinders and an outer peripheral ring portion connected in spaced relation to said cylindrical portion by means of spaced apart radial arms,
two cylindrical electrodes connected to opposite sides of said central cylindrical portion, respectively, to define together with said central cylindrical portion a torpedo shaped cylindrical electrode extending through said half cylinders in coaxial spaced relation thereto and
means for connecting said torpedo shaped cylindrical electrode to a high frequency generator for creating a high frequency field in resin material passing between said cylindrical electrode and said half cylinders to heat the resin material to a temperature close to its polymerization temperature.

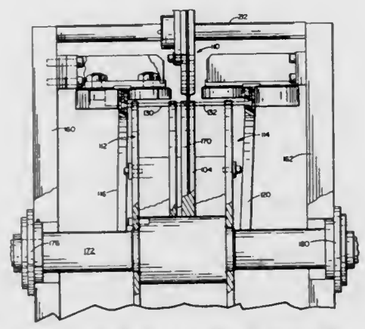
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5,044,916

## SUPPORT ASSEMBLY IN A ROTARY PRESS

William G. Wunder, Sr., Hamilton, Mich., assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Mar. 1, 1990, Ser. No. 487,499
Int. Cl.[5] B30B *11/08*
U.S. Cl. 425—345 14 Claims



1. In a rotary press having a die plate forming a multitude of die cavities and supported for rotation about a given axis, a multitude of punches supported for axial reciprocating movement in the die cavities, and a rotatable punch drive plate engaging the punches, wherein rotation of the die plate and the drive plate reciprocates the punches to force a food material into the die cavities, to mold the food material therein into tablets and then to eject the tablets from the die cavities, wherein the rotary press further comprises a support assembly for the punch drive plate, comprising:
a multitude of support subassemblies spaced around and engaging the drive plate, said support subassemblies supporting the drive plate for rotation about the given axis and axially flexing the drive plate toward and away from the die plate as the drive plate rotates about the given axis.

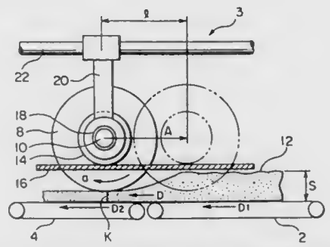
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5,044,917

## APPARATUS FOR STRETCHING DOUGH

Torahiko Hayashi, Utsunomiya, Japan, assignor to Rheon Automatic Machinery Co., Ltd., Utsunomiya, Japan

Division of Ser. No. 487,700, Mar. 1, 1990. This application Jul. 5, 1990, Ser. No. 548,038
Claims priority, application Japan, Mar. 6, 1989, 1-53319
Int. Cl.[5] A21C *3/02*
U.S. Cl. 425—373 3 Claims



1. In an apparatus for stretching dough comprising a roller



rotatable around its own axis, and a conveyor system arranged below said roller and including at least two serially arranged conveyors, the conveying speed of each conveyor of said serially arranged conveyors being lower than that of the next downstream conveyor, the dough being conveyed on an upper surface of said serially arranged conveyors, the improvement comprising:
drive means for reciprocating said roller over the surface of the dough,
means for rotating said roller at a first peripheral speed which is higher than the total of the speed of movement of the dough plus the speed of the linear movement of the roller when said roller moves upstream, and at a second peripheral speed which is equal to or lower than the difference between the speed of the linear movement of said roller and the speed of movement of the dough when said roller moves downstream, and
means for switching the rotational direction of said roller at the upstream and downstream ends of the reciprocating strokes of said roller.

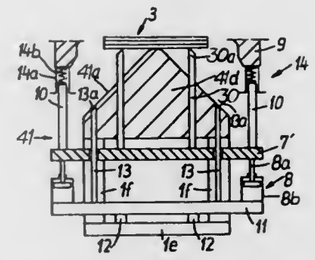
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5,044,918

## APPARATUS FOR SECURELY POSITIONING A FIBER-REINFORCED PLASTIC MASS IN A PRESS

Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Krupp Maschinentechnik Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Dec. 13, 1989, Ser. No. 450,260
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, 3842660
Int. Cl.[5] B29C *43/00*
U.S. Cl. 425—397 5 Claims



1. An apparatus, for use in a compression molding machine having an upper mold half and a lower mold half with a mold surface that faces the upper mold half and having means for moving the mold halves relative to one another so as to form a compression molded object from a mass of hardenable plastic compound that has been placed between the mold halves, to secure the position of the mass of hardenable plastic compound in the compression molding machine, said apparatus comprising:
a plurality of holding pins; and
means for mounting the pins so that the pins project beyond the mold surface of the lower mold half at least when the mass is being placed between the mold halves and during part of the time that the mold halves are being moved relative to one another, the height of the holding pins relative to the mold surface of the lower mold half, when the mold halves are closest together, being less than the thickness of the mass adjacent the pins,
wherein the pins are movable relative to the lower mold half and the means for mounting includes means for adjusting the height of the pins relative to the mold surface of the lower mold half,
wherein the means for adjusting includes a pin carrier to which the pins are attached, the pin carrier having a side which faces the upper mold half, and means for varying the position of the pin carrier relative to the lower mold half, and
wherein the means for varying the position includes
press rams having ends facing the upper mold half, the press rams being adjustable in length and being disposed on the side of the pin carrier facing the upper mold half, the press rams being carried along by the upper mold half once they have been brought into contact with the upper mold half,
lifting mechanism means for exerting a holding force on the pin carrier and in the direction of the upper mold half, and spring units disposed at the ends of the press rams facing the upper mold half, the spring units having a spring force which is greater than the holding force exerted by the lifting mechanism means in the direction toward the upper mold half.

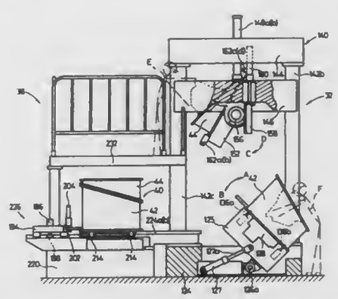
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5,044,919

## SYNTHETIC RESIN MOLDING APPARATUS

Nozomu Hama; Takaaki Sato; Akihiko Koshiro; Masao Tegawa; Tomio Iino; Seiji Yanagisawa; Nobuo Kikuchi; Kazuo Migishima, and Kazumi Ishida, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1989, Ser. No. 446,450
Claims priority, application Japan, Dec. 9, 1988, 63-160239[U]; Jan. 25, 1989, 1-015881; Feb. 1, 1989, 1-011681[U]
Int. Cl.[5] B29C *33/36, 39/06*
U.S. Cl. 425—443 6 Claims

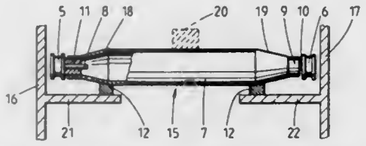


1. An apparatus for molding a product of synthetic resin, comprising:
a first station including a mechanism for opening and closing a mold assembly, said mechanism of said first station comprising a base, a tilt table angularly movably supported on said base about a first horizontal axis by a first support shaft, a vertically movable ram, and a holder frame angularly movably supported on said vertically movable ram about a second horizontal axis by a second support shaft, wherein said holder frame is angularly movable through an angle greater than 90° with respect to a horizontal plane, each of said mold assemblies comprising a first mold die supportable on said tilt table and a second mold die holdable by said holder frame;
a second station including a mechanism for pouring a resin solution into the mold assembly which is closed;
a third station for hardening the poured resin solution in the mold assembly; and
a feed mechanism interconnecting said first, second, and third stations in a looped configuration, for circulating at least three mold assemblies through said first, second, and third stations.

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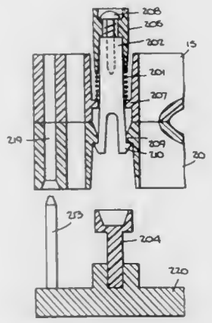
**5,044,920**
**HEAT TREATMENT APPARATUS FOR CONTINUOUSLY ADVANCED MATERIAL**
**Jürgen Gerlach, In den Gärten 30, D-5140 Erkelenz, Fed. Rep. of Germany**
**Filed Jul. 28, 1989, Ser. No. 386,987**
**Claims priority, application Fed. Rep. of Germany, Aug. 4, 1988, 3826523**
**Int. Cl.[5] B29C** *35/02;* **B65G** *17/24;* **F27D** *3/12*
**U.S. Cl. 425—445** **15 Claims**



1. Heat treatment apparatus for continuously advanced material, said apparatus comprising a heating channel having an entrance and an exit; and transporting means arranged within said channel for transporting said material, said transporting means including a driven endless transporting element comprising two mutually parallel chains and a plurality of cylindrical rollers, located one behind another between said chains, with ends of said rollers being rotatably mounted to said chains, each said roller having at least one conically shaped end, through which each said roller is selectively in rolling contact with at least one stationary strip positioned in said channel to form a friction support, wherein said strip is positioned in an oblique orientation relative to said parallel chains, such that said strip contacts a relatively large circumferential portion of said conically shaped end of each said roller near the entrance of said channel, and said strip contacts a relatively small circumferential portion of said conically shaped end of each said roller near the exit of said channel, whereby each said roller rotates at increaseingly high speeds as each said roller proceeds from the entrance of said channel to the exit of said channel by movement of said parallel chains.

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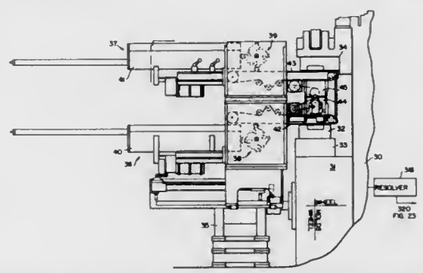
**5,044,921**
**RELEASABLE MOLD LOCKING APPARATUS**
**Joseph Micelli, 80-16 19th Ave., Jackson Heights, N.Y. 11370; John Micelli, and Ned Micelli, both of 1118 Sunapee Rd., West Hempstead, N.Y. 11552**
**Filed Feb. 5, 1990, Ser. No. 475,362**
**Int. Cl.[5] B29C** *33/20*
**U.S. Cl. 425—451.9** **15 Claims**



1. A mold comprising:
a first section and a second section adapted to be joined together along a common plane;
said first section having an aperture therein;
said second section having an aperture therein;
said first and second sections being alignable with one another so that the apertures therein can be aligned with each other;
a pin being provided in the aperture in the first section, said pin being radially compressible and being axially movable in the aperture in said first section and being receivable in the aperture in the second section such that when said pin is moved into the aperture in said second section, said pin first compresses radially and then expands so as to be securely locked to said second section, thereby locking the first and second sections together, said pin comprising a shaft having a forked end, said forked end having a head adapted to be received in a surface of the aperture in said second section, at least one of said head of said forked end and said surface of the aperture comprising a tapered surface whereby said forked end is compressed by said tapered surface as the pin is moved axially in said aperture in the second section, said aperture of said second section having a radially enlarged space therein so that once the pin reaches a point of maximum compression, said pin expands to be securely received in said aperture in said second section.

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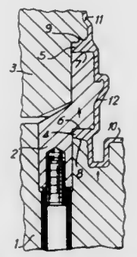
**5,044,922**
**APPARATUS FOR APPLYING LABELS IN THE MOLDS OF A PLASTIC BLOW MOLDING MACHINE**
**John A. Plenzler, Toledo, Ohio, and Lawrence H. Weber, Ypsilanti, Mich., assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio**
**Filed Oct. 2, 1989, Ser. No. 416,204**
**Int. Cl.[5] B29C** *51/16*
**U.S. Cl. 425—503** **13 Claims**



1. In a blow molding machine, the combination comprising at least one set of mold sections movable between a spaced-apart open position for receiving a parison and a closed position to form a cavity for enclosing the parison to be blown outwardly against the confines of said cavity, and in-mold labeling apparatus comprising:
a first source of labels,
first conveyor means having a first end adjacent to said first source and a second end adjacent to said mold sections in said open position,
first label pickup means positioned adjacent said first end of said conveyor means and including means for engaging a label at said source and depositing the label on said conveyor means at said first end, and
first label placement means positioned adjacent to said second end of said conveyor means for removing labels from said conveyor means and placing the labels in an open mold section,
said first conveyor means comprises means for driving said conveyor means intermittently from said first end toward said second end of said conveyor means,
said first pickup means comprising at least one pickup head,
vacuum means on said head for selectively grasping and releasing a label,
means for intermittently moving said head between a position adjacent to said first source and a position adjacent said first end of said conveyor means, and
synchronizing means synchronizing motion of said pickup head to the motion of said conveyor means and to the motion of said selectively grasping and releasing mean such that both said pickup means and said first conveyor means are stationary when a label is released from said head onto said conveyor means, and said conveyor and said pickup head are stationary when the label is grasped since grasping and releasing are done at the same time,
said first pickup means comprising means for mounting said head for rotation in the same direction as movement of said conveyor means and for radial movement,
means for intermittently rotating said head between a position adjacent to said first source and a position adjacent to said first conveyor means, and means for intermittently moving said head in a radial direction between an inner position and an outer position,
means for constraining said head motion to said radial direction only,
said first pickup means further comprises means coupled to said radially moving means and to said synchronizing means for rotating said head and advancing said conveyor means simultaneously and for moving said head radially only when said conveyor means is stationary and said pickup means is stationary.

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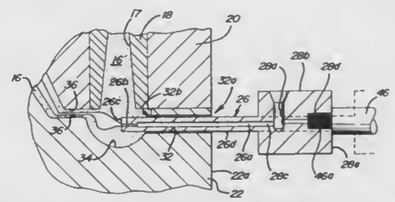
**5,044,923**
**DEVICE FOR BLOW MOLDING A HOLLOW BODY**
**Dietmar Przytulla, Kerpen, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Bruehl, Fed. Rep. of Germany**
**Filed Apr. 4, 1990, Ser. No. 504,490**
**Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 3913087**
**Int. Cl.[5] B29C** *49/20*
**U.S. Cl. 425—525** **4 Claims**



1. A blow molding device for blow molding a hollow body of thermoplastic synthetic material having two flange rings projecting radially outwardly from the circumferential wall of the hollow body, the device comprising:
a) a stationary blow mold part (3);
b) a first mold slide (2) displaceable axially with respect to said stationary mold part (3) between a first position and second position, said first mold slide having a first mold portion spaced axially from said mold part to define a first annular recess (5) therebetween when said first mold slide is in said first position and for producing a first flange ring (14) on the circumferential wall of said hollow body upon axial movement of said first mold slide (2) to said second position; and
c) a second mold slide (1) displaceable axially with respect to said first mold slide (2) between a first position and a second position, said second mold slide having a second mold portion spaced axially from the first mold slide, on the axial side thereof opposite said stationary mold part (3), to define a second annular recess (4) therebetween when said second mold slide is in said first position and for producing a second flange ring (15) in the circumferential wall of said hollow body upon axial movement of said second mold slide to said second position.

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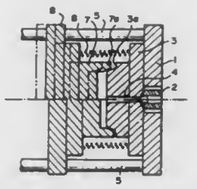
**5,044,924**
**GAS ASSISTED INJECTION MOLDING APPARATUS**
**Norman S. Loren, 24874 Chalk Farm Rd., Warren, Mich. 48091**
**Filed Jun. 8, 1990, Ser. No. 535,313**
**Int. Cl.[5] B29C** *45/17*
**U.S. Cl. 425—542** **11 Claims**



1. A gas assisted injection molding apparatus in which a supply of resin is introduced into a cavity in a mold at a resin injection location and gas injection means are provided to introduce gas into the mold at a gas injection location removed from the resin injection location to assist the resin in filling out the mold cavity, wherein the gas injection means includes an axially extending bore in the mold communicating with the mold cavity and having uniform size and cross-sectional configuration, a pin including a passage for delivery of gas through the pin and having an axially extending portion having a size and cross-sectional configuration matching the size and cross-sectional configuration of the bore and fitting slidably in the bore and coacting with the bore to form a resin seal during resin injection and gas injection, means mounting the pin for movement between an advanced gas injection position in which the pin is positioned in the bore with its forward tip positioned at least as far forwardly as the forward edge of said bore and in communication with the mold cavity and a retracted position in which the mold is vented through said bore, and means defining an annular edge on said pin portion operative to remove obstructions in said bore with each forward movement of the pin from its retracted position to its advanced position.

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**5,044,925**
**INJECTION-COMPRESSION MOLD**
**Seiichi Watanabe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Sep. 1, 1989, Ser. No. 403,240**
**Claims priority, application Japan, Sep. 5, 1988, 63-221570**
**Int. Cl.[5] B29C** *45/03*
**U.S. Cl. 425—542** **6 Claims**



3. An injection-compression mold controlling a clamping force in conformity with a condition in which a mold cavity is filled with a resin, said injection-compression mold comprising:
stationary mold means and movable mold means being clampable together and forming a mold cavity therebe-

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tween for use in injection-molding a molded piece from molten thermoplastic resin;

at least one spring means having one end fixed with respect to one of said stationary and movable mold means and another end arranged to apply force against the other of said stationary and movable mold means when said mold is clamped, said at least one spring means for:

decreasing, utilizing a bias force of said spring means, a clamping force exerted between said stationary mold means and movable mold means in a predetermined clamping range proximate to positions where said stationary and movable mold means contact each other, to assist said resin in effecting a subsequent forced separation of said stationary and movable mold means due to pressure from injection-molded thermoplastic resin.

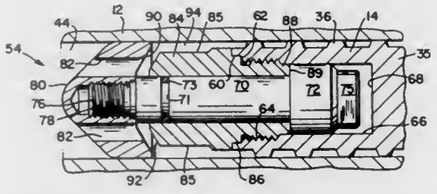
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**5,044,926**

## ANTI-BACKFLOW VALVE FOR INJECTION MOLDING MACHINES

**Alex Dinerman, and James E. O'Bryan, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Jun. 25, 1990, Ser. No. 542,988**
**Int. Cl.[5] B29C *45/52***
**U.S. Cl. 425—562** **17 Claims**




1. Injection molding apparatus comprising:

a) a tubular barrel having an inner surface, the barrel including a material inlet and a material outlet spaced axially from the material inlet;

b) a plasticating screw rotatably and slidably supported in the barrel for plasticating polymeric material and for conveying polymeric material within the barrel from the material inlet to the material outlet, the screw including a forward end facing toward the material outlet;

c) flow control means carried by the plasticating screw at a forward end of the screw for controlling flow of plasticated polymeric material from the screw toward the material outlet, the flow control means including body means extending outwardly from the forward end of the screw said body means being rotationally and translationally movable relative to the screw while the screw is rotating to plasticate polymeric material, the body means having a forward end and a back end, retainer means carried by the forward end of the screw and surrounding the body means for retaining the body means, the retainer means including stop means for limiting forward axial translational movement of the body means relative to the screw and including valve seat means facing in a forward direction relative to the screw for defining a first valve surface, sealing means positioned between the body means and the retainer means to prevent flow of plasticated material therebetween, the sealing means including an annular metallic sealing ring, and a screw tip carried by the forward end of the body means, the screw tip having a longitudinal axis and including a second valve surface facing and engagable with the first valve surface for selectively opening and closing a plasticated material flow path between the screw and the screw tip, the screw tip having an outer diameter sufficient to prevent flow of plasticated material between the screw tip and the tubular barrel, and the screw tip including passageway means for permitting flow of plasticated material from the screw through the flow control means to an area forward of the screw when the second valve surface is spaced from the first valve surface.

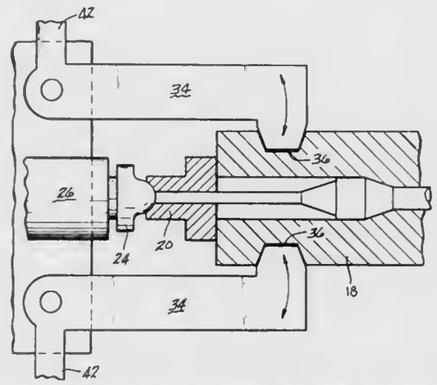
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**5,044,927**

## MOLD CLAMPING EQUILIZATION SYSTEM

**John DiSimone, Woodbridge, Canada; Paul Brown, St. Croix, V.I., and Robert D. Schad, Toronto, Canada, assignors to Husky Injection Molding Systems, Ltd., Bolton, Canada**

**Filed May 17, 1990, Ser. No. 524,482**
**Int. Cl.[5] B29C *45/66***
**U.S. Cl. 425—567** **18 Claims**




1. An improved injection molding apparatus which comprises:

a stack mold arrangement including a stationary mold member fixed to a stationary platen, a movable central mold member, and a movable outer mold member, said stationary and movable mold members forming at least two molds;

means for injecting plastic material into said at least two molds;

said injecting means including an injection nozzle communicating with a source of plastic material and sprue bar means engaging said nozzle for distributing plastic into said at least two molds;

means for creating a clamping force on both sides of said mold arrangement so as to keep said molds closed during molding; and

means for maintaining said sprue bar means in contact with said injection nozzle and for containing separation forces which occur at the connection between said sprue bar means and said injection nozzle so as to maintain balanced clamping forces on both sides of said stack mold arrangement.

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**5,044,928**

## PULSE COMBUSTION DEVICE

**Nobuyoshi Yokoyama, and Susumu Ejiri, both of Toyoake, Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan**

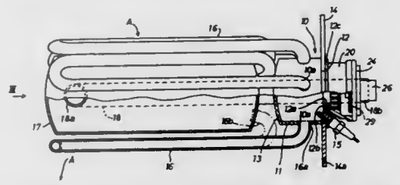
**Filed Oct. 31, 1989, Ser. No. 429,643**
**Claims priority, application Japan, Nov. 1, 1988, 63-276497**
**Int. Cl.[5] F22B *31/00*; F23C *11/04***
**U.S. Cl. 431—1** **2 Claims**

1. A pulse combustion device comprising a combustion chamber having a cylindrical side wall, a forward end wall secured to a first end of the cylindrical wall for attachment with a liquid vessel, said forward end wall comprising an inlet port to be supplied with a mixture of gaseous fuel and air, a rearward end wall secured to a second end of the cylindrical wall to close said combustion chamber and a spark plug



mounted on the forward end wall, said spark plug having an electrode located in said combustion chamber,

wherein the cylindrical wall of said combustion chamber is formed with a plurality of circumferentially equally spaced radial exhaust ports, which are located respectively in a position adjacent the inlet port of said forward end wall and wherein a plurality of tailpipes are secured at first ends thereof to the exhaust ports of said combustion chamber and extended substantially radially outwardly



therefrom, wherein a cylindrical decoupler is arranged coaxially with said combustion chamber, and wherein said tailpipes are extended rearwardly from the exhaust ports of said combustion chamber in parallel axially along said cylindrical decoupler and turned forwardly at their intermediate portions, said tailpipes being radially inwardly bent at second ends thereof and secured to a forward end of said decoupler for communication with the interior of said decoupler.

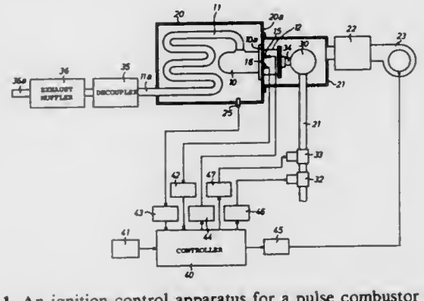
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**5,044,929**

## IGNITION CONTROL APPARATUS FOR PULSE COMBUSTOR

**Yasuhiko Tabuchi, Sapporo; Susumi Ejiri, Toyoake, and Makoto Kimura, Inazawa, all of Japan, assignors to Paloma Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Sep. 12, 1989, Ser. No. 406,273**
**Claims priority, application Japan, Sep. 12, 1988, 63-228115**
**Int. Cl.[5] F23C *11/04***
**U.S. Cl. 431—1** **4 Claims**




1. An ignition control apparatus for a pulse combustor including a combustion chamber, an air-fuel mixer head mounted to an inlet of said combustion chamber, a purge blower arranged to supply forced fresh air into said mixer head for effecting pre-purge of said mixer head and combustion chamber, a fuel supply pipe connected to said mixer head to supply gaseous fuel into said mixer head, a fuel control valve provided on said fuel supply pipe to permit the supply of gaseous fuel into said mixer head when activated and to interrupt the supply of gaseous fuel when deactivated, ignition means for igniting a mixture of gaseous fuel and air supplied into said combustion chamber from said mixer head, a tailpipe connected to an exhaust port of said combustion chamber, and an exhaust decoupler connected to an exhaust end of said tailpipe,

the ignition control apparatus comprising:

means for activating said fuel control valve and for energizing said ignition means;

means for calculating the number of trials for energization of said ignition means and for memorizing the calculated number of trials;

means for resetting the memorized number of trials to an initial value after ignition of the mixture has been successfully obtained in said combustion chamber;

means for changing a period of time for pre-purge of said mixer head and combustion chamber according to a predetermined memorized number of trials for energization of said ignition means; and

means for activating said purge blower for the determined period of time prior to energization of said ignition means.

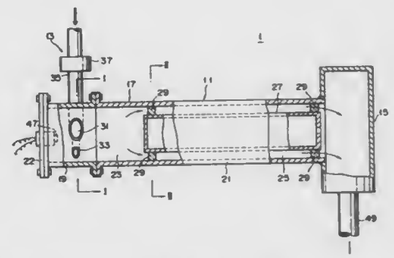
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**5,044,930**

## PULSE COMBUSTION APPARATUS

**Ichiro Hongo, Yokohama; Kazuo Saito, Fujisawa, and Akio Mitani, Fuji, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 28, 1990, Ser. No. 503,475**
**Claims priority, application Japan, Mar. 31, 1989, 1-83701**
**Int. Cl.[5] F23C *11/04***
**U.S. Cl. 431—1** **10 Claims**



1. A pulse combustion apparatus comprising:

a metal pipe member having a first open end and a second open end and an inner diameter uniform over its entire length;

a closing member closing the first open end of said metal pipe member;

an exhaust chamber connected to the second open end of said metal pipe member;

an insert member located in said pipe member and defining a combustion chamber in that portion of said pipe member which is close to the first open end, and also an exhaust passage which extends along the inner periphery of the pipe member, connect said combustion chamber to said exhaust chamber, and has a cross section area smaller than that of the combustion chamber;

holder means holding said insert member in said metal pipe member;

fuel-supplying means for supplying fuel to said combustion chamber; and

air-supplying means for supplying air to said combustion chamber.

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**5,044,931**

## LOW NOX BURNER

**John J. Van Eerden; Chad F. Gottschlich, both of Philadelphia, and Wayne C. Gensler, Point Pleasant, all of Pa., assignors to Selas Corporation of America, Dresher, Pa.**

**Filed Oct. 4, 1990, Ser. No. 592,622**
**Int. Cl.[5] F23C *5/00***
**U.S. Cl. 431—8** **19 Claims**

17. In a method of heating a furnace with a gas burner located adjacent to a furnace wall, to provide a reduced percent-

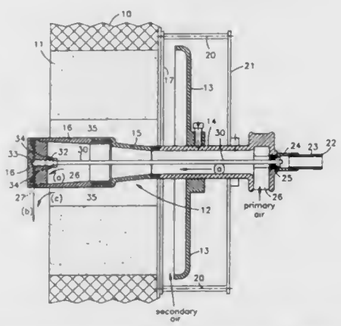
VOL 1130 ISS 1 SE 3 1991 UMI



age of nitrogen oxide components in the furnace flue gas, the steps which comprise:

(a) burning a mixture of primary gaseous fuel and primary air in said furnace;

(b) guiding the products of combustion of step (a) to form a combustion gas screen directed generally along a portion of said furnace wall adjacent to said burner;



(c) introducing a separate flow of secondary gaseous fuel in a path also directed toward the area along said portion of said furnace wall; and

(d) introducing secondary air along said burner, whereby said secondary air is contacted by and at least partially mixed with said combustion gas stream as said secondary air moves into position to react with said secondary gaseous fuel.

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**5,044,932**

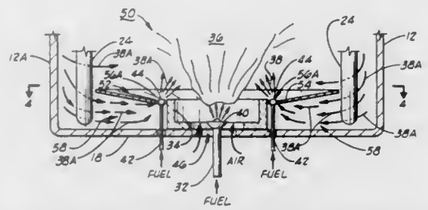
**NITROGEN OXIDE CONTROL USING INTERNALLY RECIRCULATED FLUE GAS**

**Michael J. Martin, Broken Arrow; William C. Gibson, and Lee R. Massey, both of Tulsa, all of Okla., assignors to 1T-McGill Pollution Control Systems, Inc. and Tulsa Heaters, Inc., both of Tulsa, Okla.**

**Filed Oct. 19, 1989, Ser. No. 423,145**

**Int. Cl.[5] F23L** *9/00*

**U.S. Cl. 431—116** **1 Claim**



1. In combination with a burner assembly disposed to provide a combination flame in the combustion zone of a furnace in which internally recirculating flue gas is created, the furnace having a wall portion and a furnace floor portion which supports the burner assembly, the burner assembly having a burner tile surrounding a primary fuel nozzle disposed centrally to an inlet port for intake of a combustion supporting fluid, and the burner assembly having a plurality of secondary fuel nozzles peripherally disposed about the burner tile, the improvement comprising:

flue gas recirculating means disposed in the furnace for collecting and directing internally recirculating flue gas into the vicinity of the secondary fuel nozzles so that the collected internal flue gas is aspirated into reaction contact with the combustion flame so that the collected internally recirculating flue gas is reacted with the combustion flame to substantially diminish the $NO_x$ content of the flue gas exhausted from the furnace, the flue gas recirculating means comprising:

a barrier member disposed in proximity to the furnace floor portion and cooperating therewith to form a flue gas tunnel, the flue gas tunnel having an opening to collect internally recirculating flue gas from near the wall portion of the furnace, the barrier member having a central opening disposed about the wall portion of the burner tile to form a flue gas discharge gap therebetween; and

the secondary fuel nozzles supported in near proximity to the flue gas discharge gap so that a portion of the internally recirculating flue gas collected in the flue gas tunnel is aspirated into reaction contact with the combustion flame when fuel is dispensed by the secondary fuel nozzles.

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**5,044,933**

**WINDPROOF LIGHTER**

**James C. H. Yang, 2416 W. 231 St., Torrance, Calif. 90501**

**Filed Nov. 27, 1989, Ser. No. 441,471**

**Int. Cl.[5] F23Q** *25/00*

**U.S. Cl. 431—144** **11 Claims**



1. A windproof lighter comprising:

a butane housing member having a top edge, a flame area and a striker means; and

a windshield on said top of said housing member having a substantially U-shaped cross-section and partially surrounding said flame area, said windshield comprising a curved portion, substantially planar spaced side portions extending from said curved portion, said curved and side portions extending outwardly from said top edge of said housing member, a side opening facing said striker means, an outer opening over said flame area, edges on said curved and side portions at said openings, and smooth, rounded flange means on said edges extending into said openings; and

a flame gate within said windshield.

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**5,044,934**

**WARM UP BURNER FOR THE HEARTH OF A CIRCULATING FLUIDIZED BED BOILER**

**Jacques Gutel, Montrouge, and Christian Duez, Voisins Les Bretonneux, both of France, assignors to Stein Industrie, France**

**Filed Jul. 9, 1990, Ser. No. 549,989**

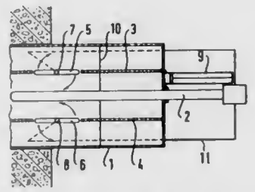
**Claims priority, application France, Jul. 7, 1989, 89 09187**

**Int. Cl.[5] F23D** *11/36*

**U.S. Cl. 431—153** **2 Claims**

1. An oil-burning or gas-burning warm up burner for a hearth of a circulating fluidized bed boiler, said burner having an axis and comprising: a fuel lance on said axis, a rectangular peripheral admission channel for admitting combustion air around the lance, a pair of parallel, combustion air flow channeling sheets within said channel, on respective sides of the lance, means for retracting the fuel lance axially outwardly of said channel during periods of normal operation of the circulating fluidizing bed boiler when the warm up burner is not in operation, and means for isolating the lance in its retracted position from the atmosphere of the hearth, said means for isolating the lance being constituted by flaps forming longitudi-





nal segments of said combustion air flow channeling sheets, and in line therewith, an axle connected to the center of each flap perpendicular to the axis of the burner and mounting said flaps to said channel for pivoting from said in line position to a position perpendicular to the burner axis, such that said flaps close the corresponding passage of the combustion air admission channel beyond the end of the lance, when the lance is in its retracted position.

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**5,044,935**

**METHOD AND APPARATUS FOR OPERATING A FIRING PLANT USING FOSSIL FUELS**

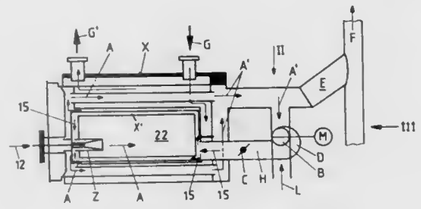
**Hans Peter, Urdorf, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland**

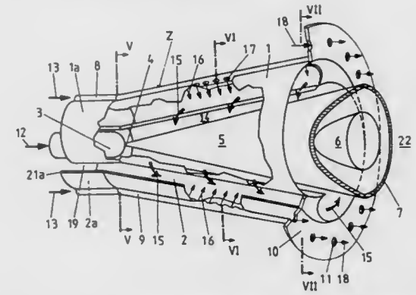
**Filed Mar. 12, 1990, Ser. No. 491,734**

**Claims priority, application Switzerland, Mar. 15, 1989, 947/89**

**Int. Cl.[5] F23M** *9/00, 3/00*

**U.S. Cl. 431—182** **8 Claims**





4. A burner system for a firing plant using fossil fuels comprising:

a frame having a combustion space;

a burner mounted on said frame, said burner having an exhaust nozzle substantially disposed in said combustion space;

a first heat exchanger disposed on said frame and substantially surrounding said combustion space such that exhaust gases from said burner are cooled by said first heat exchanger to form cooled exhaust gases;

duct means mounted on said frame for mixing a portion of said cooled exhaust gases with substantially fresh air to form combustion air;

a second heat exchanger disposed on said frame and substantially surrounded by said first heat exchanger, said second heat exchanger providing fluid communication between said duct means and a fluid inlet of said burner such that said combustion air is preheated prior to introduction to said fluid inlet of said burner; and

said burner comprising at least two hollow part-conical bodies mated together in an offset relationship and having tangential air inlet slots for receiving said combustion air and having a conical inclination increasing in a flow direction, said air inlet slots extending substantially the length of said burner, said burner including a nozzle means for supplying a conical column of liquid fuel substantially along the length of said burner, said nozzle means being disposed between said conical bodies at a burner head of said burner.

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**5,044,936**

**GASEOUS FUEL SUPPLYING MEANS OF AN APPARATUS USING THE COMBUSTION OF THIS GAS STORED IN THE LIQUID PHASE**

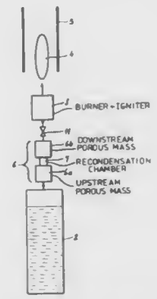
**Rene Frigiere, Charbonnieres Les Bains, France, assignor to Feudor S. A., Rillieux La Pape, France**

**Filed Sep. 6, 1990, Ser. No. 578,732**

**Claims priority, application France, Sep. 21, 1989, 89 13224**

**Int. Cl.[5] F23D** *14/28*

**U.S. Cl. 431—344** **2 Claims**




1. A gaseous fuel supply device for an apparatus using combustion of a gas fuel stored in a liquid phase, comprising:

a flow regulator/evaporator;

a reservoir upstream of said flow regulator/evaporator in which the fuel is stored in the liquid phase;

a burner associated with an igniting device downstream of said flow regulator/evaporator for producing a gaseous-phase fuel/combustion air mixture supplying combustion for heating said apparatus;

a heat-distributing member maintained by this combustion at a temperature situated between two limiting values, one an operating threshold limit and the other a safety limit; and

a closing/opening flap valve between said flow regulator-/evaporator and said burner, the flow regulator/evaporator consisting of two multicapillary porous masses comprising mesoporous membranes whose permeabilities are such that the sum of the pressure losses which they generate is equal to a pressure loss corresponding to a desired

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flow for normal operation of the apparatus and which are separated from one another by a recondensation chamber whose volume corresponds to the quantity of fuel required for a rapid temperature rise of the heat-distributing member to its normal operating temperature, the porosity of the second of said mass downstream of said chamber being fixed as a function of the fuel flow corresponding to a desired duration for said temperature rise.

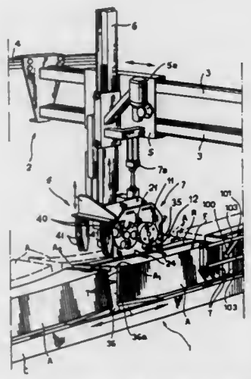
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**5,044,937**

## METHOD AND APPARATUS FOR CUTTING AND REMOVING STRAPS FROM STRAPPED ARTICLES

**Mario Lisa, Poirino, Italy, assignor to L.I.T.A. S.r.l., Turin, Italy**

**Continuation of Ser. No. 471,569, Jan. 29, 1990, abandoned. This application Nov. 26, 1990, Ser. No. 618,022**
**Claims priority, application Italy, Jan. 31, 1989, 67055 A/89**
**Int. Cl.[5] F27D *5/00***
**U.S. Cl. 432—5** **33 Claims**



32. Apparatus for removing straps from strapped articles including:

separating means for engaging a strap and separating a portion of said strap from said strapped articles;

cutting means for cutting the strap engaged by said separating means;

collecting means including at least one recess having a cylindrical configuration and provided with a peripheral opening through which a strap cut by said cutting means is to be inserted with said opening positoned to face said strap adjacent said separating means and

drive means for advancing a cut strap cut by said cutting means into said recess.

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**5,044,938**

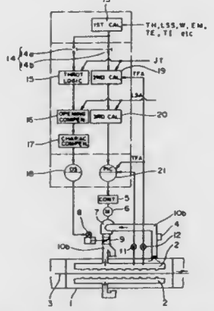
## METHOD OF CONTROLLING TEMPERATURE OF A JOINING AREA BETWEEN TWO DIFFERENT STRIP MATERIALS IN A CONTINUOUS STRIP PROCESSING LINE

**Masao Tanabe, Osaka, and Hiroshi Shirono, Habikino, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan**

**Filed Oct. 2, 1990, Ser. No. 592,544**
**Claims priority, application Japan, Oct. 3, 1989, 1-258039**
**Int. Cl.[5] F26B *13/00***
**U.S. Cl. 432—8** **3 Claims**

1. A method of controlling a temperature of a joining area between two different strip materials in a continuous strip processing line, said method comprising, in the case where a strip material after the joining area requires a nozzle pressure greater than that of a preceding strip material, the steps of:

gradually throttling an opening of a damper, at a timing before the joining area passes through a predetermined location in a treating furnace, by an amount required for changing a nozzle pressure so that an optimum pressure of the preceding strip material is changed to that of the following strip material;



raising a rotational speed of a recirculation fan to keep the nozzle pressure substantially constant; and

rapidly opening said damper to the opening before the throttling at a timing the joining area passes through said predetermined location.

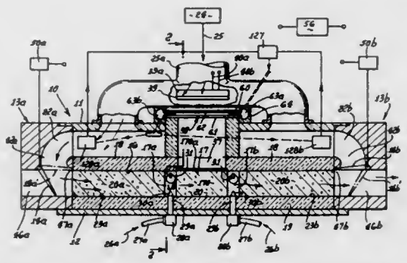
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**5,044,939**

## REVERSING LINEAR FLOW TPV PROCESS AND APPARATUS

**James G. P. Dehlsen, 21221 Carriage Dr., Tehachapi, Calif. 93561**

**Filed Oct. 18, 1990, Ser. No. 599,398**
**Int. Cl.[5] F27D *7/00, 17/00***
**U.S. Cl. 432—25** **14 Claims**



1. A linear combustion emitter regenerator process capable of operating at high temperatures for sustained periods of time, that includes

a) flowing reactants including fuel and air to a combustion zone,

b) adding regenerated heat to at least one of the reactants flowing to said zone,

c) combusting the reactants at said zone to produce combustion products at high temperature, to heat a selective or blackbody radiant emitter,

d) operating the emitter to radiate energy from said zone and converting said radiation from the emitter into photovoltaic produced electricity,

e) extracting heat from said combustion products for return to said at least one of the reactants as said regenerated heat,

f) removing the products of combustion at reduced temperature, and

g) providing a porous bed at and to which said extracted heat is transferred,



h) incorporating a catalyst in the porous bed to reduce nitrous oxide and other emissions,

i) and periodically reversing the direction of flow of said at least one of the reactants, and in heat transfer contact with said bed.

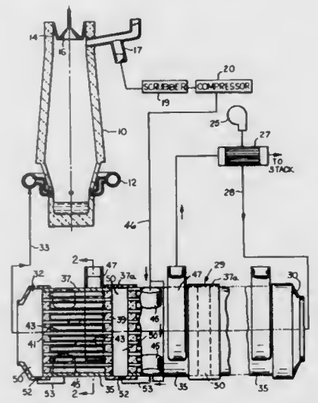
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**5,044,940**

## BLAST FURNACE AIR HEATER

**Robert N. Knight, Jr., Southgate, Mich., assignor to James R. Martin, Canton, Mich.**

**Filed Oct. 15, 1990, Ser. No. 597,413**
**Int. Cl.[5] F24H *7/00***
**U.S. Cl. 432—30** **11 Claims**



1. Apparatus for heating air to be used in a blast furnace; said apparatus comprising a plurality of similarly constructed air heater devices arranged in series flow relation; each device being operable to raise the air supplied thereto from a given inlet temperature to a given outlet temperature, whereby the apparatus is enabled to raise the air temperature from the air inlet temperature at the first air heater device to the air outlet temperature at the last air heater device;

each air heater device comprising a tube-shell heat exchanger that includes a shell structure, two spaced tube sheets, and a series of heat exchange tubes extending between said tube sheets; said shell structure having a greater axial length than the tubes so that an air expansion space is formed within the shell structure in communication with opposite ends of the tubes; one of said expansion spaces constituting an air inlet chamber for the air heater device, and the other expansion space constituting an air outlet chamber for the air heater device; and a plural number of forced draft burner units spaced around said shell structure for directing flames into the shell structure generally normal to the tubes, whereby said tubes, are heated to thus heat the air flowing through the tubes and ultimately to said blast furnace.

said air heater devices being interconnected so that the air outlet chamber for a given air heater device serves as the air inlet chamber for the next air heater device.

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**5,044,941**

## FLUIDIZED BED SYSTEM

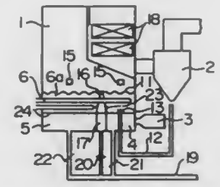
**Takeo Noya, Kanagawa, Japan, assignor to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 20, 1988, Ser. No. 208,459**
**Claims priority, application Japan, Oct. 23, 1985, 237065/85**
**Int. Cl.[5] F23G *7/00***
**U.S. Cl. 432—58** **10 Claims**

1. A method for operating a fluidized bed combustion comprising a furnace, a distributor plate supported in said furnace, bed material supported on said distributor plate, and a plurality of wind boxes arranged side by side below said distributor plate for feeding fluidizing gas through portions of said distributor plate into corresponding portions of said bed material, each of said wind boxes having a gas damper; said method comprising:

closing at least one of the wind boxes by closing its associated damper so that a bed material portion extending above said closed wind box remains in a deposited condition on said distributor plate and simultaneously opening the other wind boxes by opening their associated dampers so that bed material portions extending above said opened wind boxes are fluidized, said closed wind box being arranged so that said deposited bed material acts to separate said furnace into a plurality of fluidized bed zones; and

operating said plurality of fluidized bed zones at different operating conditions, respectively.



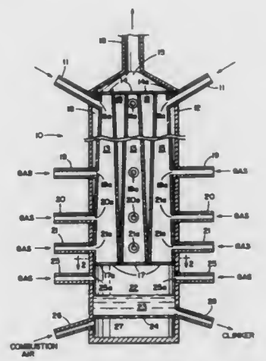
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**5,044,942**

## CEMENT SHAFT SUSPENSION FURNACE AND PROCESS

**Ashok U. Chatwani, Burlington, Mass.; Rajiv Tiwary, Glenshaw, Pa.; Jaime A. Woodroffe, Andover, and Oswald L. Zappa, Stoneham, both of Mass., assignors to Gas Research Institute, Chicago, Ill.**

**Division of Ser. No. 467,132, Jan. 18, 1990, Pat. No. 4,975,046. This application Aug. 23, 1990, Ser. No. 571,742**
**Int. Cl.[5] F27D *1/08***
**U.S. Cl. 432—99** **6 Claims**



1. A suspension furnace for producing discrete, clinkered cement pellets from discrete pellets of cement-forming batch materials in a minimum amount of time, comprising a vertical furnace housing enclosing a top heating portion, an intermediate calcining portion and a bottom clinkering portion, a vertical suspension shaft within said housing extending from said top heating portion and terminating above said bottom clinkering portion; heat-exhaust means in said top portion for exhausting heat from said vertical furnace housing; particle supply

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means in said top portion for introducing discrete cement-forming pellets to the top portion of said vertical suspension shaft for gravity-migration down to said bottom portion; upper heating means in the top portion of said shaft, downstream of said particle supply means, for heating cement-forming pellets supplied to said top portion to a pre-calcining temperature; intermediate calcination heating means in the intermediate calcining portion of said shaft for heating said cement-forming pellets migrating therethrough to their calcining temperature; lower clinker-initiating heating means in said bottom portion of said housing for heating said calcined cement-forming pellets exiting said shaft and migrating downstream therethrough to a temperature sufficient to initiate clinkering thereof, with resultant generation of exothermic heat; a porous base in the bottom portion of said housing, immediately downstream of said clinker-initiation heating means, for receiving a porous bed of said clinker-initiated cement pellets for the completion of the clinkering reaction thereon; cooling means in said bottom portion, downstream of said porous base means, for forcing a supply of a cooling combustion-supporting gas upstream through said porous base and through the porous bed of cement pellets clinkering thereon, to prevent the pellets from being melted and/or fused by the exothermic heat of the clinkering reaction, and upstream through said suspension shaft to regulate the dwell time of said pellets at said pre-calcining, calcining and pre-clinkering temperatures and for eventual release through said heat-exhaust means in said top portion; and discharge means, adjacent the upstream surface of said porous base means, for discharging discrete, cooled, clinkered cement pellets from the bottom of the porous bed of pellets, which have completely clinkered and cooled in said bed.

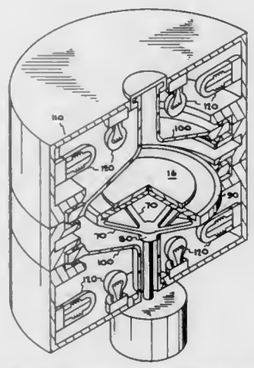
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**5,044,943**

## SPOKED SUSCEPTOR SUPPORT FOR ENHANCED THERMAL UNIFORMITY OF SUSCEPTOR IN SEMICONDUCTOR WAFER PROCESSING APPARATUS

**Russell Bowman, and Roger N. Anderson, both of San Jose, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Filed Aug. 16, 1990, Ser. No. 568,008**
**Int. Cl.[5] F27D** *5/00*; **B05C** *13/00*; **B60L** *1/02*; **F24J** *3/00*
**U.S. Cl. 432—121** **14 Claims**



1. In an apparatus for processing semiconductor wafers for the construction of integrated circuit structures thereon, wherein a semiconductor wafer is supported on the upper surface of a susceptor, heated by heating means in said apparatus the improvement comprising: support means for peripherally supporting said susceptor in said apparatus to provide thermal uniformity across said susceptor resulting in more even heating of a semiconductor wafer placed thereon, said support means comprising:

(a) a central hub spaced from the center of said susceptor and positioned in said apparatus coaxial to said susceptor; and

(b) a series of spokes radiating from said central hub and positioned between said susceptor and said heating means to engage an undersurface of said susceptor at positions adjacent the perimeter of said susceptor.

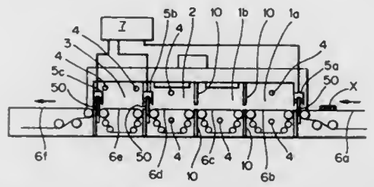
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**5,044,944**

## FURNACE OF DECREASING OXYGEN CONCENTRATION TO ULTRA LOW AMOUNT

**Toshio Furuya, Kanagawa, and Masayoshi Hamano, Tokyo, both of Japan, assignors to Yugen Kaisha R.I. Electronic Industry and Yamato Works Co., Ltd., both of Tokyo, Japan**

**Filed Mar. 8, 1990, Ser. No. 490,768**
**Claims priority, application Japan, Oct. 12, 1989, 63-2656**
**Int. Cl.[5] F27B** *9/02*
**U.S. Cl. 432—128** **1 Claim**



1. A furnace with an ultra low amount of oxygen concentration, comprising an inlet; an outlet; a plurality of zones between said inlet and said outlet; means for supplying a non-oxidizing gas into each of said plurality of zones to increase an internal pressure therein; shutter means at least at an inlet and an outlet of said furance for checking flow of air into said furnace; control means for controlling operation of said shutter means; means for transferring a workpiece through said furnace and including a transferring arrangement for transferring the workpiece between said plurality of zones, said transferring arrangement having a speed which is lower than speeds of workpiece transferring elements located at said inlet and said outlet whereby opening time of said shutter means is reduced; and a plurality of partitions for separating said plurality of zones, each of said plurality of partitions having opening means having a predetermined size corresponding to the size of the workpiece for passing the workpiece through said partitions, said transferring arrangement comprising a plurality of independently operating endless conveyors corresponding in number to a number of zones in said plurality of zones, each of said plurality of endless conveyors having means projecting transverse to a path of movement of the workpiece for supporting the workpiece at both sides of the workpiece during transfer of the workpiece through said plurality of zones with the upper surface of the workpiece being exposed to an atmosphere in said plurality of zones.

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**5,044,945**

## SLOT FOR ORTHODONTIC BRACKETS AND METHOD

**Jeffrey A. Peterson, Aurora, Colo., assignor to RMO, Inc., Denver, Colo.**

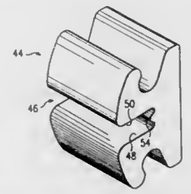
**Filed May 22, 1990, Ser. No. 527,094**
**Int. Cl.[5] A61C** *3/00*
**U.S. Cl. 433—8** **19 Claims**

2. An orthodontic appliance, comprising:

an orthodontic wire;

a bracket having a slot defined by sidewalls and a base formed in said bracket for receiving said wire; and

a protrusion in said base for reducing frictional and binding contact between said slot and said wire, said protrusion being spaced from said sidewalls and ending before said base merges with said sidewalls and wherein said protrusion substantially continuously contacts said orthodontic wire along substantially the entire length of that portion of said orthodontic wire that is positioned in said slot.



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**5,044,946**

## UNIVERSAL ORTHODONTIC ROTATION WEDGE

**James D. Cleary, Glendora, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 282,434, Dec. 8, 1988, abandoned. This application Oct. 12, 1990, Ser. No. 597,099**
**Int. Cl.[5] A61C** *3/00*
**U.S. Cl. 433—18** **9 Claims**



1. An orthodontic rotation wedge for use with an orthodontic bracket having a ligature groove comprising:

an elastomeric base having a side and a thickness adapted to fit in compression between an archwire and adjacent surfaces of a tooth; and

a pair of elastic ligature loops each having a thickness substantially less than the thickness of said base, said loops being movable relative to each other and connected to said base for interconnecting said wedge as well as an archwire to the orthodontic bracket, said loops having cross-sectional areas for together fitting in the same ligature groove of the bracket, said loops being normally spaced apart from each other and extending from said side of said base, both of said loops together with said base presenting a recess for receiving said bracket.

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**5,044,947**

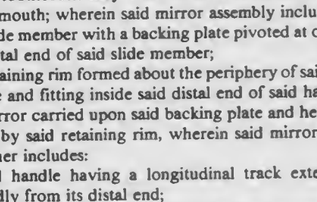
## ORTHODONTIC ARCHWIRE AND METHOD OF MOVING TEETH

**Rohit C. L. Sachdeva, Plano, Tex.; Shuichi Miyazaki, Ibaraki, Japan, and Farrokh Farzin-Nia, Inglewood, Calif., assignors to Ormco Corporation, Glendora, Calif.**

**Filed Jun. 29, 1990, Ser. No. 546,559**
**Int. Cl.[5] A61C** *3/00*
**U.S. Cl. 433—20** **50 Claims**

1. An orthodontic archwire having superelastic properties made of an alloy consisting essentially of nickel, titanium and copper in accordance with the following relationship:

$$Ti_{50}Ni_{50-X}Cu_X$$



wherein X is in the range from about 3–13% (by atomic percent).

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**5,044,948**

## SEARCHER

**Wilbur Vance, Sr., 5634 Arch St., Philadelphia, Pa. 19139, and George Spector, 233 Broadway, New York, N.Y. 10007**

**Filed May 7, 1990, Ser. No. 519,766**
**Int. Cl.[5] A61C** *1/00*
**U.S. Cl. 433—31** **2 Claims**



1. An improved toothbrush comprising:

a) an elongated handle having a head at one end thereof;

b) a plurality of bristles extending from said head for brushing the teeth; and

c) a mirror assembly adjustably disposed to the distal end of said handle remote from said head so that a person using said toothbrush may observe the condition of the teeth and mouth; wherein said mirror assembly includes:

d) a slide member with a backing plate pivoted at one side to a distal end of said slide member;

e) a retaining rim formed about the periphery of said backing plate and fitting inside said distal end of said handle; and

f) a mirror carried upon said backing plate and held in position by said retaining rim, wherein said mirror assembly further includes:

g) said handle having a longitudinal track extending inwardly from its distal end;

h) said slide member rides within said longitudinal track;

i) a ball and socket carried on a free end of said slide member;

j) said backing plate is connected to said ball and socket at one side so said backing plate can be angularly adjusted about an axis longitudinal of said handle;

k) a finger grip extending outwardly from said backing plate opposite said ball and socket so that said mirror assembly can slide within said handle for storage and can be withdrawn for use in viewing the teeth and mouth.

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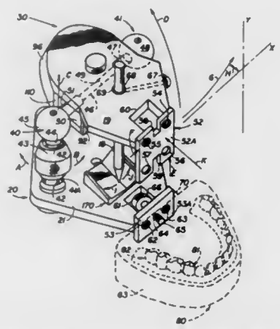


**5,044,949**

## DENTAL ARTICULATOR

George Xanthopoulos, 8260 E. Arabian Trail,, Scottsdale, Ariz. 85258

Filed Mar. 1, 1990, Ser. No. 487,203
Int. Cl.[5] A61C *11/00*
U.S. Cl. 433—58 7 Claims



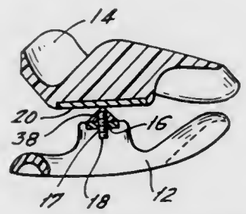
1. A dental articulator for a dental model, the dental model including:
a lower part including replications of the lower teeth of a patient's mouth, and
an upper part including replications of the upper teeth of a patient's mouth,
said articulator including:
(a) base means including a forward portion shaped and dimensioned to receive the lower part of the dental model;
(b) an upper member including a forward portion shaped and dimensioned to receive the upper part of the dental model, said upper member having first and second operative positions;
(c) connecting means for interconnecting said base means and said upper member in spaced apart relationship, said connecting means including:
(i) at least one support arm attached to and outwardly extending from said base means,
(ii) shaft means extending from said support arm, spaced apart from said base means, and having a longitudinal axis spaced apart from said forward portion of said upper member,
(iii) a slot formed in said upper member, slidably engaging said shaft means, and having a back inner stop portion, and
(iv) spring means interconnecting said upper member and said shaft means, said spring means extending outwardly from said shaft means and having a selected load to hold said upper member in said first operative position with said back inner stop portion of said slot against at least one of the pair consisting of said spring means and said shaft means;
said slot and said shaft means being shaped and dimensioned such that when a lateral force generally parallel to and spaced apart from said longitudinal axis of said shaft means and having a selected magnitude is applied to said forward portion of said upper member, a torque is produced on said upper member which causes:
(d) said upper member to move from said first operative position to said second operative position;
(e) said slot to pivot with respect to and slide over said shaft means and at least a portion of said stop portion to move away from said shaft means; and,
(f) the loading of said spring means to be altered.

**5,044,950**

## THERAPEUTIC TRAINING DEVICE AND METHOD FOR FITTING DENTURES

Stanley Hobish, 4 Oxford Pl., Massapequa, and Sheldon M. Weiss, 48 Captains Dr., Islip, both of N.Y. 11758

Filed Nov. 29, 1989, Ser. No. 444,001
Int. Cl.[5] A61C *19/04*
U.S. Cl. 433—69 6 Claims




1. A method for posteriorly repositioning a protruding mandible of an edentulous individual to an optimal position for the mandible, comprising using a therapeutic, intraoral training device comprising:
a lower denture plate adapted to fit over the lower gum of the individual, the lower denture plate having:
a base member fixedly mounted onto an upper portion of the lower denture plate; and
a striking pin received within the base member, the striking pin being positioned at substantially a right angle to the base member; and
an upper denture plate adapted to fit over the upper gum of the individual, the upper denture plate having:
a contact plate fixedly mounted onto a lower portion of the upper denture plate for contact by the striking pin; and
a grid means for indicating the repositioning movement of the mandible, the grid indicating means being located on the contact plate such that the striking pin contacts the grid indicating means and traces the repositioning movement of the mandible thereon;
wherein the base member and contact plate are oriented with respect to a horizontal plane such that when the striking pin contacts the contact plate, the device urges the mandible to be posteriorly repositioned to the optimal position, and the posterior movement of the mandible is indicated by the grid indicating means so that optimal repositioning of the mandible can be determined by visual inspection of the grid indicating means, the device being used until the protruding mandible is repositioned to the optimal position.

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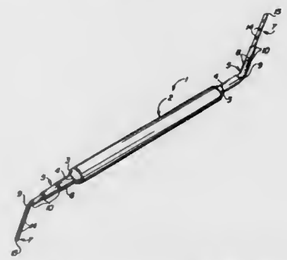
**5,044,951**

## DENTAL SPACE AND PERIODONTAL CAVITY MEASURING INSTRUMENT

Sheridan John J., 1401 Lake St. Unit E-9, Metairie, La. 70005

Continuation-in-part of Ser. No. 358,597, May 30, 1989, Pat. No. 4,959,014. This application Apr. 25, 1990, Ser. No. 514,149
Int. Cl.[5] A61C *19/04*
U.S. Cl. 433—72 16 Claims

1. A dental space and periodontal cavity measuring instrument comprising handle means, a first calibrated, graduated portion projecting from one end of said handle means and an end portion extending from said first calibrated, graduated portion in angular relationship for insertion in the dental space and the periodontal cavity and ;measuring the width of the dental space and the depth of the periodontal cavity and at least one measuring mark provided on said end portion for indicating the depth of the periodontal cavity.



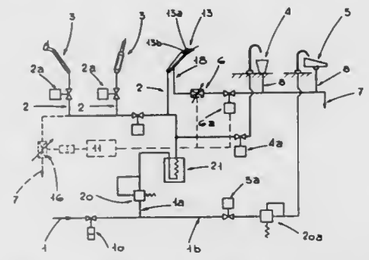
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**5,044,952**

## DEVICE TO PREVENT WATER STAGNATION IN DENTAL SUPPLY CIRCUITS

Franco Castellini, Bologna, Italy, assignor to Castellini, S.p.A., Bologna, Italy

Filed Oct. 31, 1989, Ser. No. 429,359
Claims priority, application Italy, Nov. 11, 1988, 3659 A/88; Mar. 24, 1989, 3398 A/89
Int. Cl.[5] A61C *1/10*
U.S. Cl. 433—84 5 Claims



1. A device serving to prevent stagnation of water in supply circuits of dental surgery apparatus having a potable water inlet line and a main waste outlet, comprising at least a variable flow bleed-off means connected between said potable water inlet line and said main waste outlet, said bleed-off means being opened continuously when the apparatus is in the operative phase to provide a constant and moderate trickle of water through to the main waste outlet, said potable water inlet line serving:
a first circuit having heating means to supply heated water to a branch handpiece line, to a chip blower of the type in continuous receipt of water from said inlet line, affording a handpiece built-in on-off valve and connected by way of a return line to said main waste outlet, and to an oral rinse glass replenishing outlet;
a second circuit supplying water at least to a spittoon cup;
wherein said bleed-off means is a variable flow restriction installed on the said chip blower return line in such a way as to bring a continuous connection between the relative supply inlet line and said main waste outlet and thus obtaining a heated running water flow through said blower handpiece;
a valve installed downstream of said variable flow restriction and serving to shut off the flow of water through the return line without altering the current setting of said restriction; and
wherein said bleed-off means comprise further a bleed-off valve installed on said branch handpiece line and consisting in a variable flow restriction the purpose of which is to bring a continuous connection between the branch handpieces line and the main waste outlet, in such a way as to ensure the constant and moderate trickle of water through to the main waste outlet.

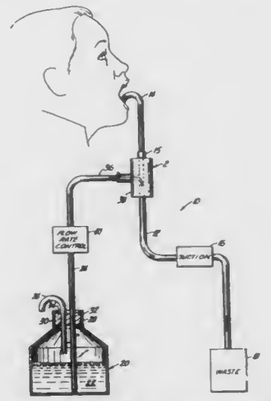
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**5,044,953**

## DENTAL EVACUATOR DISINFECTANT AND FLUSH SYSTEM

Jerry Sullivan, Ridgewood, N.J., assignor to Coltene/Whaledent, Inc., New York, N.Y.

Filed Aug. 30, 1989, Ser. No. 400,476
Int. Cl.[5] A61C *17/06*
U.S. Cl. 433—92 25 Claims



1. An evacuator disinfectant and flush system for a dental waste evacuator having a mouth piece insertable into a patient's mouth, a main flow tube, a waste disposal connected to said main flow tube, and a suction source which sucks saliva and dental waste from a mouth area into said flow tube, the system comprising:
disinfectant supply means;
tube connecting means; and
control means connectable to said mouth piece and connected to said connecting means and said main flow tube, respectively, said control means being constructed to convey saliva and dental waste from said mouth piece to said main flow tube and to control a flow of disinfectant to said main flow tube so as to permit said flow into said main flow tube during operation of the dental waste evacuator.

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**5,044,954**

## FORCEPS WITH INSERTS FOR REMOVING A DENTAL CROWN AND BRIDGE

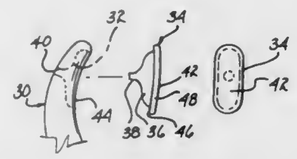
Stephen P. Lukase, Glendale, Ariz., and Thomas A. Lukase, 2670 Greentree La., La Jolla, Calif. 92037, assignors to Thomas A. Lukase, Glendale, Ariz.

Filed Oct. 23, 1990, Ser. No. 601,663
Int. Cl.[5] A61C *3/16*
U.S. Cl. 433—159 16 Claims

1. A pair of forceps for gripping in a non damaging manner a dental prosthetic device to effect removal of the dental prosthetic device, said pair of forceps comprising in combination:
(a) a pair of handles for manipulating said pair of forceps;
(b) a pair of jaws for gripping opposed side of the dental prosthetic device, one end of each handle of said pair of handles including one jaw of said pair of jaws;
(c) means for pivotally interconnecting said pair of handles to relocate said pair of jaws toward and away from one another in response to pivotal movement of said pair of

handles relative to one another, said pair of jaws being located and movable outside of a plane defined by the pivotal movement of said pair of handles;

(d) at least one jaw of said pair of jaws including a cavity and a perimeter defining said cavity, said perimeter including an indented edge segment for engaging the cervical ridge of the dental prosthetic, each said cavity being in opposed facing relationship to the other jaw of said pair of jaws,




each said cavity including a surface defined by said perimeter which is three dimensionally compatible with the corresponding surface of the dental prosthetic device to be gripped; and

(e) an insert demountably mountable within each of said cavities for contacting the dental prosthetic device and for restraining contact between the dental prosthetic device and the respective one of said perimeters.

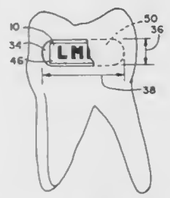
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**5,044,955**

## RADIOGRAPHICALLY READABLE INFORMATION CARRIER AND METHOD OF USING SAME

**Gary E. Jagmin, 875 St. Andrews Way, Frankfort, Ill. 60423**

**Filed May 9, 1989, Ser. No. 349,530**
**Int. Cl.[5] A61C *3/00***
**U.S. Cl. 433—229** **56 Claims**




1. An identification apparatus comprising:

a permanent, personal information carrier of a size insertable into a radiolucent, man-made cavity within a tooth of an individual and having information carrying radiopaque shapes which are radiographically discernable; and

means for sealing an concealing the carrier within said cavity and permitting utilizing a radiopaque sensing, noninvasive, visualizing technique to convey information concerning the individual, said means including a visually opaque radiolucent dental filler.

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**5,044,956**

## CONTROL DEVICE SUCH AS A STEERING WHEEL FOR VIDEO VEHICLE SIMULATOR WITH REALISTIC FEEDBACK FORCES

**Max L. Behensky, Hayward; Rick L. Moncrief, Santa Clara; Erik J. Durfey, Los Gatos, and Milton H. Loper, III, Mountain View, all of Calif., assignors to Atari Games Corporation, Milpitas, Calif.**

**Filed Jan. 12, 1989, Ser. No. 296,472**
**Int. Cl.[5] G09B *9/08***
**U.S. Cl. 434—45** **14 Claims**

1. An apparatus in a simulated vehicle for simulating in the steering wheel of said simulated vehicle the forces felt in a steering device of a real vehicle comprising:

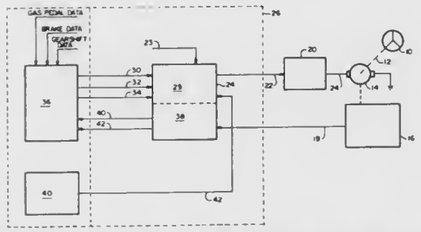
a rotatable steering wheel for a simulated vehicle for being manipulated by an operator of said simulated vehicle;

an electric motor means coupled to said steering wheel for driving said steering wheel with an amount of torque controlled by an input signal;

travel limitation safety means coupled to said motor means for limiting the number of revolutions of said steering wheel to a predetermined maximum number such that if said steering wheel is allowed to rotate freely under the influence of said motor means, insufficient turns available for said steering wheel to attain an unsafe RPM that could injure a user;

an amplifier means for driving said electric motor in accordance with a driving signal indicative of the amount of torque to apply to said steering wheel;

sensor means coupled to said steering wheel for sensing the instantaneous position of said steering wheel; and




computer means coupled to said amplifier means and said sensor means for calculating the position and velocity of movement of said steering wheel and for outputting said data, and for receiving model data regarding the forces which would be acting upon said steering wheel if said steering wheel was being used for steering a real vehicle and for calculating from said model data drive signal data necessary to define said driving signal and for generating said driving signal from said driving signal data and outputting said driving signal to cause said amplifier means to drive said motor means such that forces are felt by an operator manipulating said steering wheel which simulate the actual forces which would be felt in an actual steering wheel under similar conditions acting upon said real vehicle.

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**5,044,957**

## SET OF DEVICES FOR FABRICATING COLORED PLASTIC PICTURES OR PRODUCTS AND METHOD OF FABRICATING COLORED PLASTIC PICTURES OR PRODUCTS WITH USE THEREOF

**Ikuo Kuranaga, Saitama, Japan, assignor to AIKO Co., Ltd., Saitama, Japan**

**Continuation of Ser. No. 381,660, Jun. 22, 1989, abandoned. This application Oct. 17, 1990, Ser. No. 598,818**
**Claims priority, application Japan, Oct. 28, 1987, 62-270068**
**Int. Cl.[5] G09B *11/00***
**U.S. Cl. 434—82** **2 Claims**

1. A method of making a colored, soft, thin sheet like plastic article comprising

drawing a rough sketch of the desired design on a metal plate in quick drying ink;

carrying out a first heating of the metal plate;

while heating, applying a sol colored vinyl chloride resin material along the pattern of the rough sketch using a squeeze tube to border the design thereon;

removing the resin material-treated metal plate from the heat source and cooling;

painting the resin material-bordered sketch with sol colored vinyl chloride resins of the desired colors in the sections of the sketch bordered to fill in the sketch;



carrying out a second heating of the metal plate to gel all the sol colored vinyl chloride resin materials applied;

cooling the treated metal plate to set the gelled resin materials; and




removing the gelled soft sheet-like colored vinyl chloride resin material article from the metal plate.

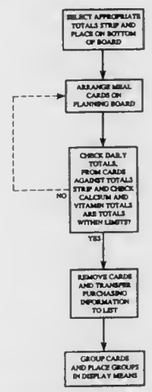
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**5,044,958**

## METHOD FOR PLANNING AND CONTROLLING DIET

**Herbert R. Robertson, and Joan E. Robertson, both of 6101 Pembridge Dr., Toledo, Ohio 43615**

**Division of Ser. No. 456,329, Dec. 26, 1989, Pat. No. 4,979,901. This application Dec. 24, 1990, Ser. No. 633,601**
**Int. Cl.[5] G09B *1/00***
**U.S. Cl. 434—127** **2 Claims**




1. A method for planning human dietary intake, said method comprising the steps of

selecting a totals strip reflecting daily dietary goal totals for at least two nutritional factors for an individual or a group of individuals and placing the totals strip on a board at the end of a plurality of columns representing days, each column containing a plurality of spaces representing meals for that day,

selecting desired meal cards from a plurality of cards containing meal menus and information about said two nutritional factors for the items listed in those meals menus, and arranging them, as desired, in the spaces in the columns,

adding information about said two nutritional factors from the cards in each column and checking those totals against the daily dietary goal totals for the nutritional factors set forth on the totals strip,

if totals from cards are not within the daily dietary goals totals provided on totals strip, repeating the preceding two steps, until there is planned a menu which is nutritionally appropriate for the individual or group of individuals.

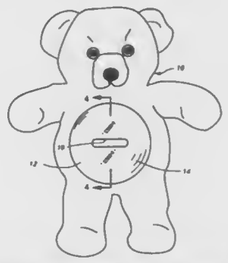
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**5,044,959**

## METHOD FOR DIAGNOSING AND TREATING PSYCHOLOGICAL TRAUMA

**Carol J. Shaver, and Donna M. Purdy, both of 5102 Shell St., North Highlands, Calif. 95660**

**Continuation-in-part of Ser. No. 319,969, Apr. 20, 1989, abandoned. This application Apr. 20, 1990, Ser. No. 511,794**
**Int. Cl.[5] G09B *19/00***
**U.S. Cl. 434—236** **6 Claims**




1. A method for diagnosing and treating psychological trauma in a child, said method comprising the steps of:

giving said child a representational figure having a first side and a second side, said second side generally opposed to said first side, said representational figure having a transparent receptacle extending between said first and second sides and defining an interior observable from either one of said first side and said second side;

presenting said child with a plurality of objects, each of said objects being distinctive in appearance from all of the other of said objects, and the appearance of each object representative of the nature or intensity of emotional feelings;

instructing said child to select from said plurality of objects at least one object which most corresponds to the emotion being felt by the child and to place said at least one object in the receptacle; and

observing the at least one object in the receptacle through either of said first and second sides after placement thereof in the receptacle by the child.

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**5,044,960**

## MODEL CONSTRUCTION

**Karl M. De Porteous, 556a Greenhill Rd., Burnside, Australia 5066**

**PCT No. PCT/AU89/00015, § 371 Date Sep. 13, 1989, § 102(e) Date Sep. 13, 1989, PCT Pub. No. WO89/06564, PCT Pub. Date Jul. 27, 1989**
**ub. Date DJan. 13, 1989, Ser. No. 423,447**
**Claims priority, application Australia, Jan. 13, 1988, PI6282**
**Int. Cl.[5] G09B *23/28***
**U.S. Cl. 434—274** **12 Claims**

1. Model construction comprising a model skeleton having a torso comprising shoulder and hip portions,

arm assemblies, shoulder hinge joints comprising hinge joint members which hingedly join the arm assemblies to the torso shoulder portions,

leg assemblies, and hip hinge joints comprising hinge joint members which hingedly join the leg assemblies to the torso hip portions, wherein

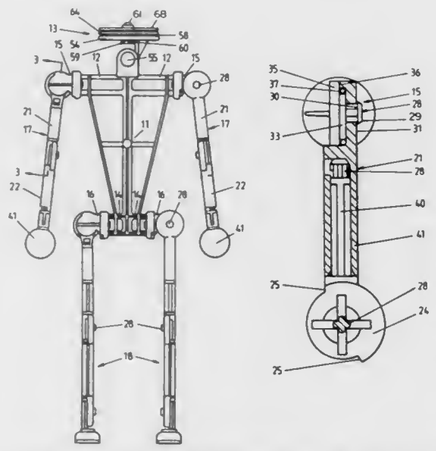
each said hinge joint member comprises two projections at right angles to each other, one said projection being between a said torso portion and a said hinge joint member, and the other said projection being between said hinge joint member and the relevant said assembly, respective barb heads on the ends of said projections,

and annular seal rings surrounding respective said projections, said seal rings engaging with annular abutment surfaces on the hinge joint member and relevant said torso

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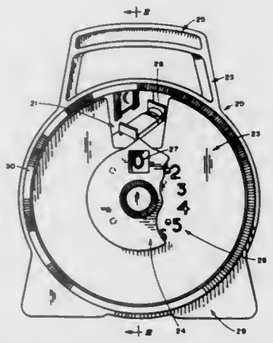
portion, or leg or arm assembly to thereby seal the hinge joint between said projection and said torso portion, hinge joint member or leg or arm assembly, and the seal rings



imparting a frictional engagement against said projections of sufficient magnitude to effect a snubbing of hinging movement of the joints.

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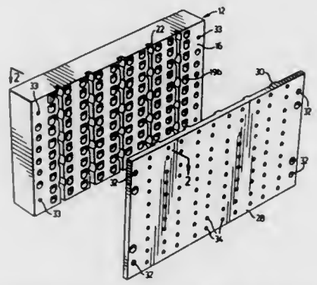
**5,044,961**
**CHILD ACTIVITY TIMER**
**Eileen Bruskewitz, 505 Merrill Crest Dr., Madison, Wis. 53705**
**Filed Oct. 16, 1990, Ser. No. 598,912**
**Int. Cl.[5] G09B** *19/12*
**U.S. Cl. 434—304** **19 Claims**



1. An apparatus, comprising:
(a) a means for timing a duration of pre-selected length;
(b) a means for displaying, in a stationary position, during said duration at least one of a plurality of symbols wherein each said symbol represents an activity;
(c) a means for indicating when said duration is ended.

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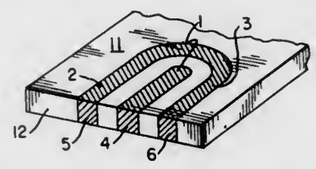
**5,044,962**
**TERMINAL BLOCK**
**Alexander Tomes, and Jacobus T. Barbier, Jr., both of Calgary, Canada, assignors to Circa Telecommunications, Inc., Calgary, Canada**
**Filed Dec. 5, 1989, Ser. No. 446,298**
**Int. Cl.[5] H01R** *9/28*
**U.S. Cl. 439—54** **13 Claims**



1. A terminal block having a front face and a rear face with an array of bores provided therein extending between said faces and defining at least one abutment surface in each of said bores, said array of bores being arranged in rows of predetermined sets of bores, each of said bores including a first portion which is generally circular in section and a second portion which is generally arched-shaped in section, said second portions having radial dimensions extending beyond the diameter of said first portions to define said abutment surfaces at the interface between said first and second portions, each predetermined set of bores being arranged in a generally U-shaped configuration which defines a pair of limbs and a bight portion;
at least one groove formed in said rear face in association with each of said rows, each of said grooves connecting a central bore located in the bight portion of each predetermined set of bores in the associated row, said bores providing an interference fit for terminal contacts inserted therein via said rear face; and
a face plate removeably secured to said rear face, said face plate including an array of apertures formed therein, each of said apertures being associated with one of said bores to allow one end of terminal contacts seated in said bores to pass therethrough.

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**5,044,963**
**SURFACE CONNECTOR FOR RADIO FREQUENCY SIGNALS**
**Osmo Kukkonen, and Antero Väyrynen, both of Salo, Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland**
**Filed Mar. 14, 1990, Ser. No. 493,612**
**Claims priority, application Finland, Apr. 12, 1989, 891744**
**Int. Cl.[5] H01R** *4/66, 9/09*
**U.S. Cl. 439—55** **9 Claims**

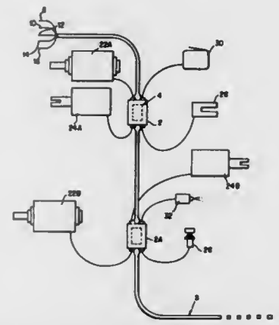


1. Surface connector arrangement, comprising: a printed circuit board having a planar surface; a ground contact having two legs extending on said surface and into contact with each other for providing a ground; and an elongated signal contact extending on said surface and between said legs for enabling transmission of radio frequency signals, said elongated signal contact being spaced from said ground contact, each of said contacts being arranged for connecting to other contacts on another printed circuit board, said printed circuit board having another surface extending adjacent and substantially perpendicular to said planar surface, said ground and signal contacts extending onto said another surface as respective contact faces.



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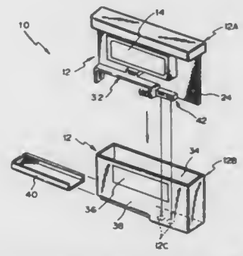
**5,044,964**
**PROGRAMMABLE CONNECTOR MODULE**
**Timothy M. Minerd, Pittsford; Larry R. Barnard, Rochester; Lawrence P. Lavery, Fairport, and Ross E. Schroll, East Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Jul. 30, 1990, Ser. No. 559,241**
**Int. Cl.[5] H01R** *9/07*
**U.S. Cl. 439—67** **14 Claims**



1. A programmable connector module for transmitting data between a multi-wire bus and a plurality of loads comprising:
a molded plastic base having first and second oppositely facing surfaces, said second surface having contacts attachable to an IC chip thereon, said plastic base including a thinned-out section wherein a distance between said first and second surfaces is reduced so as to be frangible, said thinned-out section forming an indentation on said first surface;
first connecting means, located on one of said first and second surfaces, for electrically connecting to a plurality of wires in a multi-wire bus;
second connecting means, located on the opposite one of said first and second surfaces from said first connecting means, for electrically connecting to at least one electrical load;
the one of said first and second connecting means which is located on said first surface including electrical connections which extend through said plastic base from said first surface to said second surface;
input/output circuitry located on said second surface and attaching said first and second connecting means to said contacts, said input/output circuitry including a plurality of conductive portions which extend over said thinned-out sections and which also connect to some of said contacts, wherein said conductive portions can be selectively broken so as to program an IC chip mounted on said contacts.

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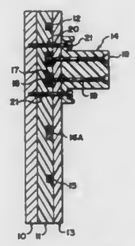
**5,044,965**
**OUTPUT TERMINAL STRUCTURE FOR A PAGING RECEIVER**
**Shigeki Hayasaka, Tokyo, Japan, assignor to NEC Corporation, Japan**
**Filed May 29, 1990, Ser. No. 530,659**
**Claims priority, application Japan, May 31, 1989, 1-63274[U]**
**Int. Cl.[5] H01R** *9/09*
**U.S. Cl. 439—76** **7 Claims**



1. An output terminal structure for electrically connecting a paging receiver to a printer capable of printing out information received by said paging receiver, comprising:
a receiver casing loaded with a printed circuit board therein-side and having a case of a battery containing portion;
a plurality of terminal members each having a contact surface and a single leg which is affixed to the printed circuit board and electrically connected to circuitry provided on said printed circuit board; and
a retaining member formed integrally with said case of said battery contining portion and comprising slots each receiving respective one of said terminal members and windows each causing respective one of said terminal members received in said slots to show;
said contact surface of each of said terminal members contacting a contact terminal member of the printer through associated one of said windows.

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**5,044,966**
**ELECTRICAL PANEL FOR PHYSICALLY SUPPORTING AND ELECTRICALLY CONNECTING ELECTRICAL COMPONENTS**
**Peter Friesen, R. R. #1, Box 314, Group 24, Winkler, Manitoba, Canada R0G 2X0**
**Filed May 23, 1989, Ser. No. 355,749**
**Int. Cl.[5] H01R** *9/09*
**U.S. Cl. 439—78** **20 Claims**



1. An electrical panel for physically supporting and supplying electrical connections for a plurality of electrical components comprising a layer of a conductive material formed into a plurality of conductive paths having a thickness of conductive materials to accommodate voltage greater than 100 volts, a first layer of a non-conductive material covering a forward side of said conductive layer, a second layer of a non-conduc-

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tive material covering a rearward side of said conductive layer, at least one of said first and second layers having recess means formed therein shaped to follow the shape of the conductive paths of the conductive layer so that the conductive layer is received in said recess means and is fully enclosed and sandwiched between said first and second layers, means providing structural strength for said panel sufficient to support said panel and said components attached thereto, a first plurality of holes formed in said first layer of non-conductive material communicating with electrical connecting points on said conductive paths of said conductive layer for allowing electrical connection thereto and a second plurality of holes formed in said first layer of non-conductive material separate from said first holes communicating with positions on said panel spaced from said conductive paths to provide mechanical connection of said components to said panel.

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**5,044,967**

## ELECTRICAL CONNECTORS

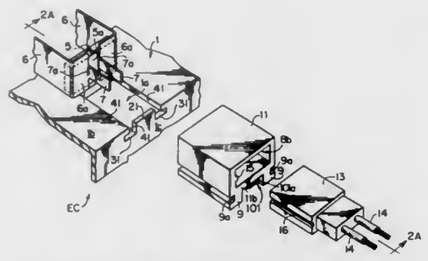
**Tsunesuke Takano, Tokyo, Japan, assignor to Kabushiki Kaisha T AN T, Tokyo, Japan**

**Filed Jun. 7, 1990, Ser. No. 534,640**

**Claims priority, application Japan, Jun. 7, 1989, 1-66391[U]; Jun. 7, 1989, 1-66393[U]; Jul. 12, 1989, 1-82055[U]; Jul. 26, 1989, 1-87885[U]; Jul. 26, 1989, 1-87886[U]; Jul. 26, 1989, 1-87887[U]**

**Int. Cl.[5] H01R** *9/09*

**U.S. Cl. 439—79** **26 Claims**



1. An electrical connector comprising:

an electrically insulating base member having an upright retaining wall establishing a forward surface;

at least one electrically conductive bus having a base section disposed adjacent said forward surface of said retaining wall, and a male terminal extending from said base section in a forwardly direction;

a tubular housing positioned forwardly of said retaining wall, and having a rear wall which defines an opening through which said male terminal extends so that said male terminal is present within said tubular housing; and

coupling means for coupling said tubular housing and said base member so that said rear wall of said tubular housing exerts a force against said base section of said conductive bus so as to positionally capture said base portion against said retaining wall, whereby said male terminals are rigidly fixed within said tubular housing.

**5,044,968**

## CLOCK SPRING

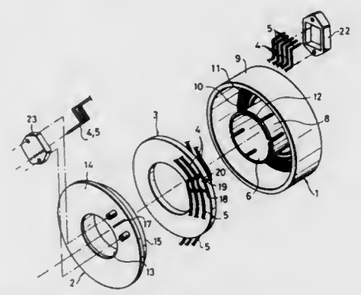
**Hiroyuki Bannai, Furukawa, and Hironori Kato, Sendai, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Dec. 26, 1990, Ser. No. 633,916**

**Claims priority, application Japan, Dec. 26, 1989, 1-148719[U]**

**Int. Cl.[5] H01R** *35/00*

**U.S. Cl. 439—164** **2 Claims**



1. A clock spring comprising:

a stationary member defining a first cable receiving portion;

a moveable member rotatably coupled to said stationary member, said moveable member defining a second cable receiving portion;

a first plurality of cables having one end coupled to said stationary member and another end coupled to said moveable member, portions of said first plurality of cables wound in a first direction in said first cable receiving portion, and other portions of said first plurality of cables wound in a second direction in said second cable receiving portion;

a second plurality of cables having one end coupled to said stationary member and another end coupled to said moveable member, portions of said second plurality of cables wound in said second direction in said first cable receiving portion, and other portions of said second plurality of cables wound in said first direction in said second cable receiving portions;

a spacer rotatably disposed between said moveable member and said stationary member, said spacer including a plurality of radially disposed openings, said spacer having a predetermined thickness; and

a plurality of rollers, each said roller disposed in an associated one of said plurality of openings, said rollers eccentrically mounted on a common axis, said rollers having a diameter greater than said predetermined thickness, said first plurality of cables being trained over a first group of said rollers and through said associated openings, said second plurality of cables being trained over a second group of said rollers and through said associated openings.

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**5,044,969**

## FEMALE TERMINAL FOR DISTRIBUTION OF ELECTRICAL CURRENT AND PROVIDED WITH ELECTROCUTION-PREVENTING MEANS

**Paul Richier, les Amandiers No.10, Néoules 83136, France**

**Filed Mar. 12, 1990, Ser. No. 491,740**

**Claims priority, application France, Aug. 25, 1989, 89 07132**

**Int. Cl.[5] H01R** *29/00*

**U.S. Cl. 439—188** **8 Claims**

1. Female terminal for electrical current distribution, comprising at least one assembly of at least two female sockets destined to receive as many male parallel pins belonging to a male electrical plug having a predetermined spacing, said female sockets extending parallel to a main axis, the terminal further comprising:

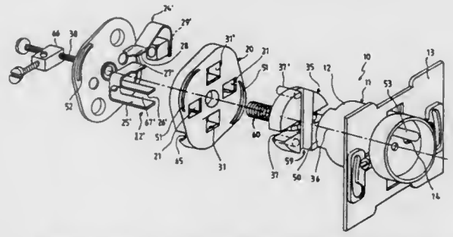
(a) a casing made from an insulating material comprising an anterior mounting plate having at least two through-bores for the male pins;

(b) a contact support facing the anterior wall, adapted to carry:

(i) at least two primary contacts destined to receive said male pins, each of these primary contacts comprising in view thereof two primary contact surfaces mounted in respective register, extending along the pathway of the male pin so as to tightingly enclose the latter, these surfaces being connected to a first secondary contact surface;

(ii) at least two secondary contacts, each having, on the one hand, at east a second secondary contact surface and, on the other hand, electrical connecting means at a current outlet, each second secondary contact surface being assembled to be in register with one of said first secondary surfaces of primary contacts and to thus define an assembly of secondary contact surfaces;





(c) an insulating connecting blade, positioned between the cavity anterior wall and the contact support, destined to move along said axis while remaining parallel to itself, this blade comprising at least two connecting members each destined to come in simultaneous contact with the two contact surfaces of an assembly of secondary contact surfaces when the blade is in a "working" position, the blade further comprising, in register with the primary contact surfaces of each of the primary contacts, a cavity destined to enable the passage of said primary contact surfaces of the assembly of primary contacts which are in register with the cavity and at least two abutment areas mounted partially in register with said through-bores;

(d) elastic means adapted to maintain said blade spaced from its working position until an assembly of male pins is engaged into said sockets;

wherein said blade cavities are radially exteriorly oriented, as well as the primary contact surfaces, whereas each abutment area comprises, in register with the associated through-bore, a radially-exteriorly inclined surface.

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**5,044,970**

## ROTATABLE HIGH-CURRENT CONNECTOR

**Wolfgang Reuter, Niddatal, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany**

**Filed Dec. 14, 1989, Ser. No. 451,453**

**Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935440**

**Int. Cl.[5] H01R** *13/533;* **H05K** *7/20*

**U.S. Cl. 439—196** **7 Claims**

1. Rotatable high-current connection for establishing an electric power supply to movable elements in closed chambers, comprising:

an electrically conductive internal pipe and coaxially therewith external pipes the pipes having hollow spaces or channels therein which serve to channel a cooling agent and having metallic flanges at their ends;

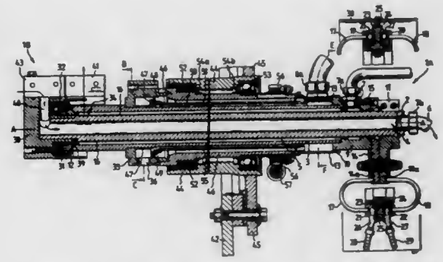
stationary power supply lines and a bundle of metallic strands leading therefrom;

corresponding, metallic counter flanges connected to the metallic strands at the stationary power supply lines;

the counter flanges at the stationary power supply lines having cooling devices;

at least four of said pipes being disposed so as to be coaxial to one another and together forming four of said channels for a pressure medium;

two flanges of which a first one is disposed at one end of two of said pipes and a second one is disposed at another end



of the two pipes, for connecting two said channels which are radially at the exterior;

these two flanges having two radially extending connecting boreholes and connecting pieces, pieces and surrounding another pipe of a greater total length; and

two further flanges for supporting ends of said pipe of a greater total length.

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**5,044,971**

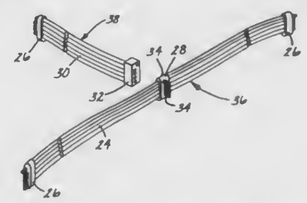
## TWO CORD CONNECTOK SYSTEM FOR PREFABRICATED PANELS

**Elmont F. Hollingsworth, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Jun. 14, 1990, Ser. No. 538,138**

**Int. Cl.[5] H01R** *4/60*

**U.S. Cl. 439—21.5** **11 Claims**



1. A wiring system for distributing electrical power, comprising:

a first electrical cord having a plurality of insulated conductors, and having first and second ends, each of said ends terminating in substantially identical male connectors;

a tap connector attached to said first electrical cord intermediate said first and second ends thereof, said tap connector having a male connector which is substantially identical to said male connectors on said ends of said first electrical cord;

a first junction block having a female connector which matingly engages one of said male connectors of said first electrical cord, said junction block further having at least one electrical outlet;

a second electrical cord having a plurality of insulated conductors, and having first and second ends, said first end terminating in a female connector which is substantially identical to said female connector of said junction block, said female connector of said second electrical cord matingly engaging said male connector of said tap connector, and said second end of said second electrical cord terminating in a male connector which is substantially identical

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to said male connector on said ends of said first electrical cord; and

a second junction block substantially identical to said first junction block, attached to said male connector of said second electrical cord.

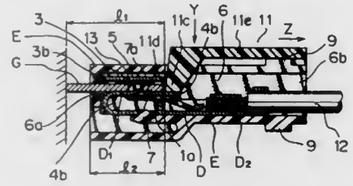
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5,044,972

## ELECTRIC CONNECTOR

**Tomohiro Ikeda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan**

**Filed Mar. 2, 1990, Ser. No. 487,091**
**Claims priority, application Japan, Mar. 17, 1989, 1-63792**
**Int. Cl.[5] H01R *11/22***
**U.S. Cl. 439—268** **7 Claims**




1. An electric connector comprising:

a connector housing having a terminal accommodating chamber therein and an opening formed in a surrounding wall, the opening communicating with the terminal accommodating chamber inside the connector housing;

a female terminal installed in the terminal accommodating chamber in the connector housing, the female terminal having a lock mechanism to lock an incoming male terminal, the female terminal further comprising:

a base plate;

a male terminal receptor portion formed integral with a front part of the base plate, the male terminal receptor portion being formed into the shape of a channel or frame;

a wire connecting portion formed integral with the rear part of the base plate; and

a resilient tongue formed by reversely folding the base plate at the front end of the male terminal receptor portion so that the folded part of the base plate extends rearwardly until its free end projects from the rear end of the male terminal receptor portion and is also exposed from the opening of the connector housing; and

a lock release bar having a front end portion disposed in the opening of the connector housing, the front end of the lock release bar being in contact with the resilient tongue and also movable in a direction almost perpendicular to the resilient tongue to release the lock between the mating terminals said lock release bar being adapted to block an advancing male terminal within said male terminal receptor portion when said front end of the lock release bar extends through the opening of the connector housing into said male terminal receptor portion.

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5,044,973

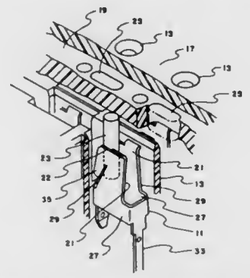
## ELECTRICAL CONNECTOR

**Atsuhito Noda; Osamu Hashiguchi; Mitsuo Komoto, and Shoji Umesato, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited, and NEC Corporation, both of Japan**

**Filed Jan. 19, 1990, Ser. No. 467,872**
**Claims priority, application Japan, Jan. 20, 1989, 1-9832**
**Int. Cl.[5] H01R *13/62***
**U.S. Cl. 439—296** **5 Claims**

1. In an electrical connector for use in electrically connecting a conductive connection pin, comprising a base insulator, a conductive contact held to said base insulator and having a resilient contact portion, and a cover insulator having a penetrating guide hole which extends in a first direction for passing said connection pin therethrough so that said connection pin is bought into contact with said contact portion in a second direction which is perpendicular to said first predetermined direction, said base insulator being opposite to said cover insulator in said first direction, the improvement which comprises:

a slider placed between said base and said cover insulators



and movable in a third direction which is perpendicular to said first and said second directions, said slider having an elongated hole which extends in said first direction for passing said connection pin therethrough, said elongated hole having a size which is greater than that of said connection pin in said third direction; and a preload pin held to said slider for displacing beforehand said contact portion in said second direction to a predetermined position where said connection pin is to be brought into contact with said contact portion.

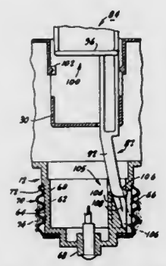
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5,044,974

## MECHANISM FOR LOCKING A FLUORESCENT LAMP ADAPTOR

**Bruce A. Pelton, Manteca, and James G. O'Carroll, Emeryville, both of Calif., assignors to Lumatech, Inc., Emeryville, Calif.**

**Filed Jul. 30, 1990, Ser. No. 559,828**
**Int. Cl.[5] H01R *39/00***
**U.S. Cl. 439—307** **12 Claims**



1. A mechanism for locking fluorescent lamp adaptor to a threaded screw-in lamp socket,

a. a base member including a bottom and a wall portion extending therefrom, said wall portion having an inner surface and an outer surface, said wall portion further including an aperture extending between said inner surface and said outer surface of said wall portion;

b. a male screw-in element having a threaded portion, said male screw-in element being freely rotatable relative to said outer surface of said wall portion of said base member, and being held in surrounding relationship relative to said base member, said male screw-in element being electrically conductive; and



c. means for engaging said threaded portion of said male screw-in element to confine said threaded male screw-in element to said base member for movement therewith.

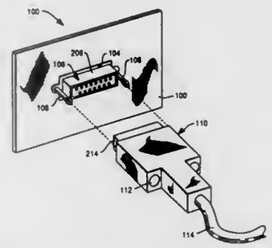
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5,044,975

## CABLE CONNECTOR LOCKING ARRANGEMENT

**Joseph T. DiBene, II, San Marcos; William F. Roosa, El Cajon, and Warren W. Porter, Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio**

**Filed Nov. 5, 1990, Ser. No. 608,783**
**Int. Cl.[5] H01R *13/627***
**U.S. Cl. 439—352** **13 Claims**




1. A cable connector locking arrangement comprising:

a first connector:

at least a resilient, cantilever flange, said flange having a tab with an inclined face and a substantially orthogonal catching face; and

a second connector coupled to a cable and mateable with said first connector, said second connector comprising a tab receptor cavity with a ledge for each tab on said resilient flange;

during the mating of said first connector with said second connector, said tab is inserted into said tab receptor cavity, and the inclined face of said tab is impinged upon by said ledge to laterally displace said flange until the catching face reaches said ledge, whereupon said flange springs back to mate said catching face with said ledge, thus locking said first and second connectors in place,

wherein said second connector further comprises a release bar slidably mounted in said tab receptor cavity, so that during unlocking of said locking arrangement, a first end of said release bar is pressed against the inclined face of said tab to disengage the catching surface from said ledge, and to displace said tab to enable disconnection of said first and second connectors.

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5,044,976

## ELECTRICAL CORD HOLDING DEVICE AND METHOD FOR USING SAME

**Dennis L. Thompson, 6411 Franklin Ave., Des Moines, Iowa 50322**

**Filed Oct. 22, 1990, Ser. No. 600,729**
**Int. Cl.[5] H01R *13/62***
**U.S. Cl. 439—368** **4 Claims**

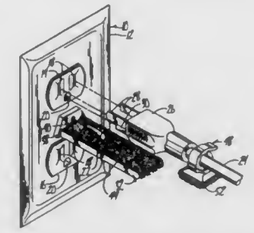
1. An electrical cord holding device for use with a plug receptacle and an electric cord having a plug at one end thereof, said plug having an elongated plug body having a first end connected to said cord and having a second end, a pair of prongs protruding from said second end of said plug body and being matingly fitted within said plug receptacle a receptacle plate surrounding said plug receptacle and extending in a first plane approximately perpendicular to the longitudinal axis of said plug body, said holding device comprising:

an elongated member having a longitudinal axis and first and second opposite ends;

first securing means securing said second end of said elongated member to said receptacle adjacent said plug body and supporting said elongated member with said longitudinal axis thereof extending in a direction approximately parallel to said longitudinal axis of said plug body, said first end of said elongated member being adjacent said cord and said first end of said plug body;

clamp means detachably retentively engaging a portion of said cord adjacent said first end of said elongated member;

said clamp means comprising a pair of clamp members, at least one of said clamp members being movable from a closed position wherein said clamp members surround and retentively engage said cord to an open position wherein said clamp members are separated from one another too permit said cord to be removed therefrom;



second securing means detachably securing said clamp means to said elongated member for preventing said prongs from being pulled out of said receptacle when said cord is pulled in a direction away from said receptacle;

said second securing means comprising a group of hook members on one of said clamp means and said elongated member and a group of eye members on the other of said clamp means and said elongated member, said hook members and said eye members retentively engaging one another.

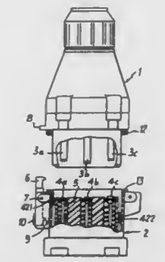
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5,044,977

## ELECTRICAL CONNECTOR HAVING PRESSURE CONTACTS

**Henry Vindigni, Alfortville, France, assignor to Societe d'Exploitation des Procedes Marechal (SEPM) S.A., Paris, France**

**PCT No. PCT/FR88/00580, § 371 Date Jul. 28, 1989, § 102(e) Date Jul. 28, 1989, PCT Pub. No. WO89/05532, PCT Pub. Date Jun. 15, 1989**
**ub. Date DNov. 25, 1988, Ser. No. 392,934**
**Claims priority, application France, Nov. 30, 1987, 87 16574**
**Int. Cl.[5] H01R *13/64, 4/50, 17/00***
**U.S. Cl. 439—374** **16 Claims**



9. An electrical connector comprising:

a socket provided with a plurality of pressure contacts and means for biasing said pressure contacts in an axial direction of said contacts;

a plug provided with a plurality of pins, said plug adapted to be inserted in said socket, said socket and said plug having a longitudinal axis when connected;

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means for latching said plug and said socket together, located on an outside surface of said connector;

at least one hump formed on at least one of either an exterior smooth mating surface of said plug or an interior smooth mating surface of said socket, said hump being adapted to oppose said smooth mating surface thereby substantially preventing misalignment of said plug and said socket with respect to said longitudinal axis.

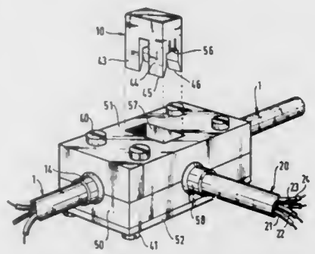
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**5,044,978**

## CABLE CONNECTOR BLOCK, IN PARTICULAR FOR A SCREENED PAIR

**Claude Gelin, Creteil, France, assignor to Cegelec, Levallois Perret, France**

**Filed May 29, 1990, Ser. No. 530,055**
**Claims priority, application France, May 31, 1989, 89 07182**
**Int. Cl.[5] H01R *4/24***
**U.S. Cl. 439—394** **8 Claims**



1. A connector block for a screened pair cable including a drain wire and first and second insulated wires inside a metal sheath and an outer insulating cover, said block comprising:

a support and a slidable cutting device;

said support including a housing slidably mounting the cutting device for movement between a first extracted end position and a second projected end position, and first and second sets of insulation-piercing contact pieces, with the contact pieces in each set being disposed on opposite sides of the housing with the first and second insulated wires crossing the housing between the two end positions of the slidable cutting device;

a length of said insulating covering and metal sheath being removed at the location of the connector block, said first wire of the cable being inserted in the contact pieces of the first set and the second wire of the cable being inserted in the contact pieces of the second set;

a similarly screened take-off cable being connected to an electrical device and including four wires, each of said four wires being connected to a respective one of the contact pieces in the first and second sets of contact pieces; and

said slidable cutting device being pushed into the housing to said second projected end position and said knives cutting the first and second wires of the cable thereby putting said electrical device into series with said cable.

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**5,044,979**

## CONNECTOR BLOCK AND TERMINAL

**John A. Siemon, Woodbury, and Howard Reynolds, Waterbury, both of Conn., assignors to The Siemon Company, Watertown, Conn.**

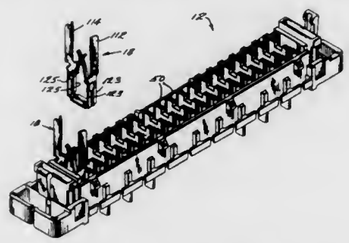
**Filed Oct. 12, 1989, Ser. No. 420,246**
**Int. Cl.[5] H01R *4/24***
**U.S. Cl. 439—404** **20 Claims**

1. A terminal block comprising:

a retainer, said retainer including retaining means for retaining a plurality of spaced terminal clips;

a cover removably attached to said retainer, said cover including support means for supporting a plurality of spaced terminal clips in said retainer;

at least one terminal clip in said retainer and extending into said cover, said terminal clip including an insulation displacement portion comprised of a first arm and a second arm arranged in a V shape with the base of the V defining an insulation stripping slot wherein said support means in said cover is contoured to provide lateral and torsional support to said first and second arms of said terminal clip



and permit said first and second arms to flex when a wire conductor is inserted in said stripping slot, said first and second arms terminating at an arm base, said arm base being curved with the direction of the curve being commensurate with the direction of the V, said arm base being connected to a narrower neck and said neck being connected to a flattened base portion wherein said neck defines a transition between said curved arm base and said flattened base portion.

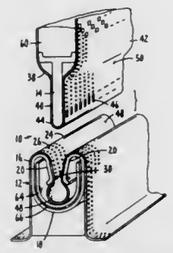
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**5,044,980**

## HIGH DENSITY AND MULTIPLE INSERTION CONNECTOR

**John F. Krumme, Del Mar, and Gary Yasumura, Santa Clara, both of Calif., assignors to Beta Phase, Inc., Menlo Park, Calif.**

**Filed Jan. 16, 1990, Ser. No. 465,982**
**Int. Cl.[5] H01R *9/07***
**U.S. Cl. 439—496** **10 Claims**



1. A high density multiple insertion connector comprising:

a biasing member, said biasing member being elongated and having a longitudinal opening along the length thereof, said biasing member being generally C-shaped and having a center portion and arm portions having ends;

flexible circuitry having first and second sets of parallel-spaced electrical conductors, at least a portion of said flexible circuitry mounted about said biasing member, said electrical conductors terminating in first and second sets of electrical contacts, said first set of contacts positioned on one side of said opening and said second set of contacts positioned on the other side of said opening, said first and second sets of electrical contacts positioned within the opening near but slightly spaced from the ends of said arm portions, the flexible circuitry near said first and second sets of electrical contacts having a first sliding surface, said biasing member and said flexible circuitry defining a female portion of the connector; and

an insertion member, said insertion member being elongated and having a longitudinal edge for insertion into said opening, said insertion member having additional flexible circuitry on the surface thereof including third and fourth sets of parallel-spaced conductors, said third and fourth sets of conductors positioned on each side of said insertion member, said third and fourth sets of electrical conductors terminating in third and fourth sets of electrical contacts positioned adjacent to but spaced from the edge of said insertion member, the flexible circuitry near said third and fourth sets of electrical contacts having a second sliding surface, said first and second sliding surfaces being made of low friction material such that insertion or removal of the insertion member causes contact between said first and second surfaces, overcoming the bias of said biasing member to widen the opening further for insertion or withdrawal of the insertion member, said first and second surfaces undergoing a minimum of friction created by insertion and removal of the insertion member, further insertion movement of the insertion member positioning and wiping the contacts of said first, second, third, and fourth sets of electrical contacts with respect to each other into mating position, the insertion member defining a male portion of the connector.



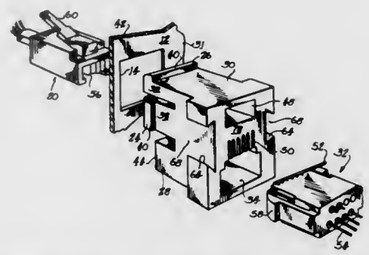
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**5,044,981**

## SNAP-ON STACKING TELEPHONE JACK

**Louis Suffi, Westchester, and Ronald G. Sommers, Algonquin, both of Ill., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.**

**Filed Apr. 18, 1990, Ser. No. 510,524**
**Int. Cl.[5] H01R *13/627***
**U.S. Cl. 439—533** **8 Claims**



1. A communication line plug coupler for use in a multiline equipment panel for receiving at least two communication line plugs, said coupler providing a primary demarcation point in determining system problems, said coupler comprising: a coupler body integrally formed as a single piece body having a front portion and a rear portion and side portions extending between said front and rear portions, said coupler body having at least one front receptacle formed in a surface of said front portion and at least one rear receptacle formed in a surface of said rear portion; flexible retention means formed on side portions of said coupler body for retaining said coupler in an aperture formed through said multiline equipment panel; said front receptacle and said rear receptacle being located in said coupler for maintaining electrical engagement between plugs inserted respectively therein; said coupler body being formed with keyway grooves along sides of said coupler body for receiving mating key means for joining a plurality of like coupler bodies together in a side-by-side fashion.

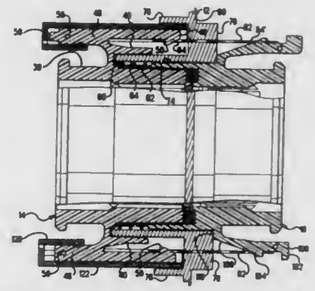
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**5,044,982**

## SEALED BULKHEAD CONNECTOR FOR VEHICLES

**Carlo Bertini, Turin, Italy, assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Nov. 7, 1990, Ser. No. 610,174**
**Claims priority, application Italy, Nov. 10, 1989, 22344 A/89**
**Int. Cl.[5] H01R *13/60, 13/73***
**U.S. Cl. 439—533** **6 Claims**



1. An electrical connector assembly, having a plurality of pairs of matable housing members, of the type for mounting on a support plate, where each said housing member is provided with plural through cavities, each containing a contact member matable with a complementary contact member secured within a corresponding cavity in the other said housing member wherein said support plate is provided with a plurality of first inserts extending therethrough, and each said housing member is provided with a flexible arm adapted to engage a corresponding said first insert in the mated position for said housing members and complementary contact member, said support plate further provided with a plurality of openings where each opening is to receive a pair of complementary housing members, and that each said opening is provided with a pair of said first inserts, and that each said opening is provided with an annular hood and a support projection spaced therefrom, and that said first insert is intermediate said hood and said projection.

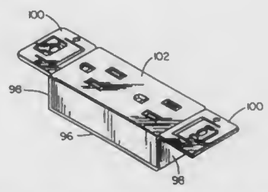
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**5,044,983**

## DEFORMABLE MOUNTING STRAP FOR WIRING DEVICE

**John T. Mahaney, Baldwinsville, and Edward B. Hubben, Skaneateles, both of N.Y., assignors to Pass & Seymour, Inc., Syracuse, N.Y.**

**Filed Jun. 7, 1990, Ser. No. 534,494**
**Int. Cl.[5] H01R *13/60***
**U.S. Cl. 439—539** **7 Claims**



1. A mounting strap for incorporation in an electrical wiring device having a body portion with a front surface, said strap comprising:

(a) a medial portion fixed with respect to said wiring device; and

(b) a pair of end portions extending outwardly in opposite

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directions from the body of said wiring device, each of said end portions including:

(i) a first opening for loose passage of a screw by which said strap may be attached to a utility box positioned behind the plane of a wall surface having a second opening through which said utility box is accessible;

(ii) a pair of lateral edge portions extending along the sides of said end portion;

(iii) a terminal edge portion lying farthest from said wiring device, the linear distance between said terminal edge portions of said pair of end portions being greater than the distance across said second opening, whereby said terminal edge portions may contact said wall surface when said end portions are attached to said utility box;

(iv) a deformable portion lying between said lateral edge portions and between said wiring device and said terminal edge portion, said deformable portion being co-planar with the adjacent parts of said end portion, said first opening lying within said deformable portion;

(v) a bendable portion by which said deformable portion is connected to an adjoining part of said strap, whereby said deformable portion may be moved relative to and out of the plane of said adjacent parts by bending said bendable portion; and

(vi) two mutually distinct cut-out portions, by which said deformable portion is separated from said adjacent parts of said end portion, each of said two cut-out portions being essentially U-shaped, the open end of the U of one of said cut-out portions facing toward and the other away from said wiring device.

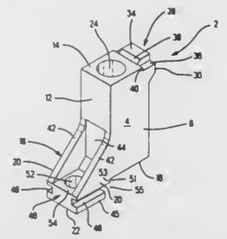
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**5,044,984**

## STACKABLE CONNECTOR ASSEMBLY AND BRACKET THEREFOR

**Bruce T. Mosser, Spring Grove; Dale F. Pells, Middletown, and James R. Weaver, Lancaster, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

Filed Jun. 22, 1990, Ser. No. 542,295
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—540 26 Claims



1. A bracket for use in stacking, in superposed relationship, first and second electrical connectors having apertured mounting flanges projecting from opposite ends thereof, said bracket comprising:

an elongate tubular body having at one end thereof a top mounting face for receiving a bottom face of amounting flange of the first connector and at an end of the body opposite to said one end, a bottom mounting face, the body defining a first bore extending continuously through the body and opening into each of said faces for receiving fastener means for securing said mounting flanges thereto; and

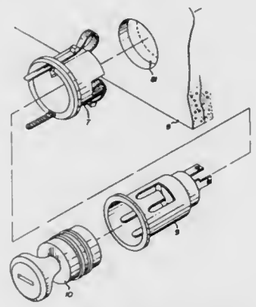
a fastening block projecting from said body and below said bottom face thereof to provide a shoulder bounding said bottom face and co-operating with said bottom face to define a recess for receiving a mounting flange of said second connector, said fastening block defining a second bore spaced laterally from said body for receiving means for fastening said bracket to a circuit board.

**5,044,985**

## TYPE OF FIXED SLEEVE FOR A CIGARETTE LIGHTER SEAT

**Light Sheen, No. 37, Lane 25, Ching Li Street, Tu Chen Hsiang, Taipei, Taiwan**

Filed Jan. 24, 1990, Ser. No. 469,666
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—544 4 Claims



1. A fixed sleeve for an automobile cigarette lighter, comprising:

a sleeve having a front edge, with two holes located therein;

at least one hooking tooth row set in the interior of each of said holes;

at least two pulling strips having at least two sides disposed along said sleeve;

tooth grooves formed in one side of each pulling strip, said tooth groove being disposed to engage said hooking tooth rows when the pulling strips are pulled through said holes.

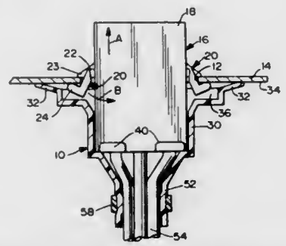
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**5,044,986**

## SEALING DEVICE FOR PANEL MOUNTED ELECTRICAL CONNECTOR

**Bruno Baumanis, River Forest, Ill., assignor to Molex Incorporated, Lisle, Ill.**

Filed Jun. 29, 1990, Ser. No. 545,562
Int. Cl.[5] H01R *13/73*
U.S. Cl. 439—548 6 Claims



1. A sealing device for closing an opening in a panel which accommodates an electrical connector, comprising a body positionable about the connector, a sealing flange on the body for sealing engagement with the panel about the opening, and complementary interengaging means between the body and the connector for holding the sealing device in position with the sealing flange in sealing engagement with the panel wherein said complimentary interengaging means includes,

a flange means formed on the inside of the body for snapping behind surface means located on the outside of the connector providing a snap-fit of the body on the connector,

a connector latch means for engaging the panel at the opening therein said body being of a size sufficient to accommodate the latch means therein, the latch means including at least two latching arms each rotatably mounted on a respective hinge and each including a camming surface for engaging the panel and rotating the arms towards the connector, and wherein said panel is captured between the arms and the camming surfaces, and

wherein said body, sealing flange and flange means comprise and integrally molded flexible member and wherein said body has generally straight side wall on two sides thereof and stepped side walls on the other two sides to accommodate said latching means.



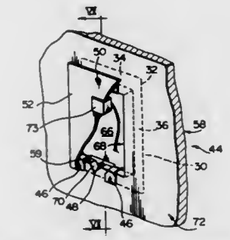
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**5,044,987**

## MOUNTING PLATE FOR TELECOMMUNICATIONS WALL OUTLET

**George Tihanyi, Montreal, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

Filed Jan. 10, 1990, Ser. No. 463,052
Int. Cl.[5] H01R *13/74*
U.S. Cl. 439—560 7 Claims



1. A mounting plate for a telecommunications wall outlet comprising:

a planar element having two opposite ends and sides extending between the ends, the sides and ends having edges defining and surrounding an aperture for access through the planar element; and

at least one bendable tab which extends from each end of the planar element at the aperture defining edge of each end for securing the planar element against a surface of a wall panel;

each end of the planar element providing a means for attachment of a faceplate of a wall outlet for carrying a telecommunications connector of the wall outlet, and each tab being spaced laterally in the plane of the ends of the means for attachment of the faceplate.

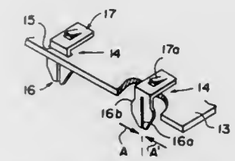
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**5,044,988**

## MOUNTING DEVICE FOR ELECTRICAL CONNECTORS

**Naohiro Hirayama, Yokohama, Japan, assignor to AMP Incorporated, Harrisburg, Pa.**

Filed Aug. 24, 1990, Ser. No. 573,426
Claims priority, application Japan, Aug. 24, 1989, 1-98759
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—571 7 Claims



1. An electrical connector for mounting onto a circuit board, comprising:

a dielectric housing having electrical contacts secured therein and including engaging-section means along a bottom wall of said housing;

mounting device means including mounting means for mounting the mounting device means onto the circuit board and retention means for latchable engagement with said engaging section means of said housing thereby mounting the connector onto the circuit board.

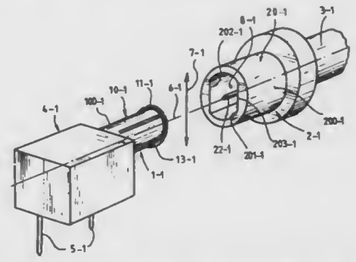
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**5,044,989**

## CONNECTION DEVICE, IN PARTICULAR FOR ULTRAHIGH-FREQUENCY ELECTROMAGNETIC SIGNALS

**Jean-Claude Aliquot, Gometz La Ville, and Henri Caramelle, Breuillet, both of France, assignors to Alliance Technique Industrielle, Evry, France**

Filed Jun. 29, 1990, Ser. No. 545,608
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—578 23 Claims



1. A connection device, including a first hollow part, open at one end, having a first side wall and arranged to be inserted along an internesting axis into a second hollow part, which is open at one end, and having a second side wall,

an outer face of the first side wall being arranged for connection with contact at an inner face of the second side wall, and said outer face including a first connection zone that can be inscribed in a first cylinder the generatrix of which is substantially parallel to the internesting axis, while said inner face includes a second connection zone that can be inscribed in a second cylinder having a generatrix substantially parallel to the internesting axis, characterized in that the second connection zone includes two principal flat sides, which are symmetrical with respect to an internesting plane containing the internesting axis,

and that said inner and outer faces conform to allow a principal play contained in the internesting plane and substantially perpendicular to said generatrix,

which allows a relative displacement of the two parts along an axis perpendicular to said generatrix and contained in the internesting plane, while maintaining the contact between the two faces.

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**5,044,990**

## RF COAXIAL CONNECTOR

**William D. Knotts, New Albany, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.**

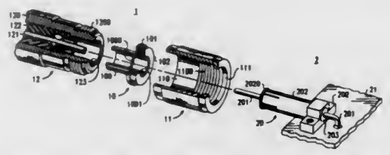
Filed Jun. 29, 1990, Ser. No. 546,285
Int. Cl.[5] H01R *9/05*
U.S. Cl. 439—578 11 Claims

1. An assembly for engaging a connector having a cylindrical ground conductor formed of electrical conducting material with an elongated signal conductor member extending outward from the cylindrical ground conductor and insulated therefrom, said assembly comprising

means having apparatus formed of said electrical conducting material with a cavity formed therein along a longitudinal axis of said apparatus and with another signal conductor

member positioned along said axis within said apparatus and electrically insulated therefrom for engaging the elongated signal conductor member, and

adaptor means having a tubular member with an inner duct for receiving and compressing the cylindrical ground conductor and having an annular recess formed in said inner duct for engaging said compressed ground conductor and enabling said compressed ground conductor to



expand to engage said duct and with the elongated signal conductor member in electrical engagement with said other signal conductor member and wherein said tubular member is sized for insertion into said cavity with sides of said cavity in electrical engagement with said tubular member and wherein said tubular member is formed with a member abutted an end of said tubular member for supporting said tubular member within said cavity in electrical engagement with said apparatus.

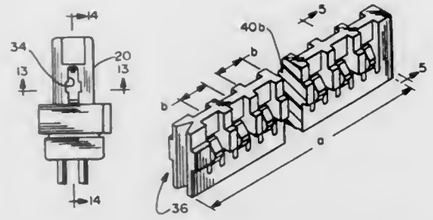
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**5,044,991**

**ELECTRICAL CONNECTOR WITH TERMINAL POSITION ASSURANCE COMPONENT**

**Stephen Colleran, Lisle; Fred L. Krehbiel, Chicago, and Bill Wilson, Montgomery, all of Ill., assignors to Molex Incorporated, Lisle, Ill.**

**Filed Nov. 5, 1990, Ser. No. 608,782**
**Int. Cl.[5] H01R *13/40***
**U.S. Cl. 439—595** **14 Claims**



1. An electrical connector comprising a housing having a plurality of terminal receiving cavities and at least one keyway extending transverse to and intersecting said terminal receiving cavities; and at least one TPA component dimensioned for transverse slidable insertion into the transverse keyway of the housing and being selectively engagable in alternate pre-load and final locked positions relative to the housing, said TPA component comprising a plurality of resiliently deflectable primary latches disposed to extend into the respective terminal receiving cavities of the housing when the TPA component is in the pre-load position in the housing, said primary latches being configured to deflect during insertion of terminals into the respective terminal receiving cavities and to resiliently return toward an undeflected condition for engaging the respective terminal after complete insertion into the housing, said TPA component further comprising a plurality of static secondary locks aligned transversely with the flexing primary latches for rigidly engaging the respective terminal inserted into the housing when the TPA component is in the final locked position on the housing.

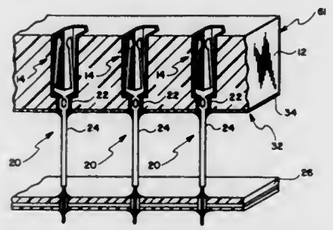
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**5,044,992**

**PRINTED CIRCUIT INJECTION MOLDED CONNECTOR WITH REMOVABLE BIFURCATED CONTACTS CAPABLE OF HIGH TEMPERATURE EXPOSURE**

**Luke Dzwonczyk, Marlborough; Richard Sullivan, Marshfield; William E. Wesolowski, Holden, all of Mass., and James W. Malloy, Valbonne, France, assignors to The Charles Stark Draper Laboratory, Cambridge and Raytheon Company, Lexington, both of, Mass.**

**Filed Oct. 20, 1989, Ser. No. 424,522**
**Int. Cl.[5] H01R *13/658***
**U.S. Cl. 439—608** **19 Claims**



1. A shielded connector assembly comprising:

at least one contacting pin;

a block of insulating connector material including at least one aperture to receive said at least one contacting pin;

a continuous conductive lining substantially disposed in said at least one aperture, said lining forming a conductive cup surrounding a respective at least one contacting pin and shielding said at least one contacting pin substantially within said at least one aperture;

said at least one aperture being dimensioned with respect to said at least one contacting pin so as to make electrical contact between said conductive cup and a respective one of said at least one contacting pin, said contacting pin having a shank portion extending outwardly of a surface of the block and having a contact portion for engaging a mating contact to be inserted into said aperture, said contact portion being substantially fully surrounded by said conductive cup, which forms a radiation shield about said contact portion.

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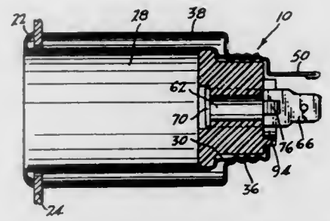
**5,044,993**

**POWER OUTLET FOR ELECTRICAL ACCESSORIES**

**Ali El-Haj, Bridgeport; Donald J. Mattis, Norwalk, and Mark Michael, Orange, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.**

**Filed Sep. 10, 1990, Ser. No. 580,334**
**Int. Cl.[5] H01R *17/18***
**U.S. Cl. 439—668** **36 Claims**

1. A socket for an electric accessory comprising, in combination a one-piece, deep-drawn metal cup having at its mouth an integral out-turned flange constituting a bezel and having at its bottom a transverse end wall that is lanced to form a diametric, spade-like terminal piece which at one of its ends is attached to said metal cup, the other end of the terminal piece being free and clear, said terminal piece being bent outward to form an outstanding spade connector, and said metal cup having adjacent said transverse end wall an annular barrel portion the walls of which are configured to constitute a screw thread.



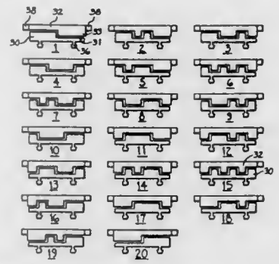
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**5,044,994**

**CONNECTOR ASSEMBLY WITH CODING MEANS**

**Johannes Maria B. Van Woensel, Rosmalen, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Apr. 9, 1990, Ser. No. 509,413**
**Claims priority, application Netherlands, Apr. 14, 1989, 8900947**
**Int. Cl.[5] H01R *13/64***
**U.S. Cl. 439—681** **7 Claims**



1. A connector assembly comprising:

a male connector having a housing of electrically insulating material and having disposed therein a plurality of electrical contacts, each said contact having one contact end extending toward a front face of the male connector and second contact end extending in another direction,

a female connector also having a housing of electrically insulating material and also having disposed therein a plurality of electrical contacts, each said contact having one contact end extending to meet and mate with said one contact end of a corresponding contact of the male connector when said male connector is inserted into the female connector, the other end of each female connector contact extending from said female connector in another direction, said female connector housing having side walls defining a socket space within which the housing of the male connector fits during insertion, and

at least one coding element detachably secured to an outer surface of a side wall of the housing of the male connector, said coding element provided with a code face having a unique coding sequence comprising one or more recesses, at least a second coding element detachably secured along an inner surface of one of said side walls of the female connector defining the socket space so as to be within said socket space, said second coding element provided with a code face also having a unique coding sequence comprising one or more recesses which is complementary to the coding sequence of the code face of the first coding element and which will permit the female connector to mate completely with said male connector, each said code face having the same predetermined number of removable code bits, said recesses being formed by the removal of the same number of said code bits, more than one code bit being removable in each code face to form recesses of different widths and at different locations, a predetermined number of coding sequences being used for each code face which is less than all coding sequences possible for a particular code face to avoid ambiguous selections.

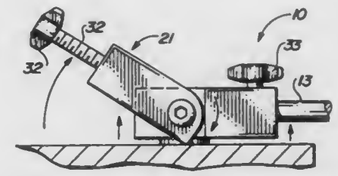
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**5,044,995**

**BATTERY TERMINAL CABLE CONNECTOR**

**Richard W. Cason, Coolidge, Ariz., assignor to R. D. Walker, Casa Grande, Ariz.**

**Filed Aug. 27, 1990, Ser. No. 572,702**
**Int. Cl.[5] H01R *13/00***
**U.S. Cl. 439—757** **5 Claims**



1. A connector for clasping to a terminal post of a storage battery comprising:

an elongated clamp having a first aperture extending laterally therethrough for receiving a battery post,

a U-shaped member comprising a pair of spaced legs interconnected at one end by a bight and pivotally mounted to the sides of said clamp in one position and movable to a second position extending laterally of said clamp and over said first aperture,

a second threaded aperture extending laterally through said bight,

a third threaded aperture extending into said one end of said clamp and into said first aperture,

a first bolt threadedly mounted in said second aperture in said bight and selectively threadable to penetrate into said third aperture and into contact with a battery post when inserted into said first aperture,

said first bolt when threadedly withdrawn from said second aperture permitting said U-shaped member to be pivotally moved to said position laterally of said clamp with said second aperture being axially aligned with said first aperture,

said first bolt when threadedly moved through said second aperture and into said first aperture engaging the battery post therein and forcing said clamp off of the battery post upon further rotation of said first bolt,

a fourth threaded aperture in said other end of said clamp for receiving a conductor, and

a second winged bolt for threadedly extending in said fourth aperture for holding said conductor in said fourth aperture.

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**5,044,996**

**WEDGE CONNECTOR**

**Kazuhiro Goto, Markham, Canada, assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Mar. 6, 1991, Ser. No. 665,387**
**Int. Cl.[5] H01R *4/50***
**U.S. Cl. 439—783** **10 Claims**

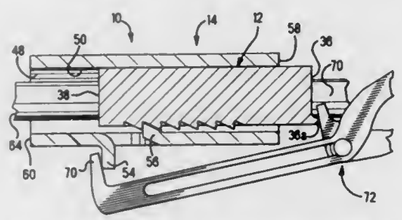
1. A wedge connector for commoning a pair of wires, said connector comprising:

a C-member with rolled over edges providing a pair of wire-receiving channels opening into a space therebetween and a web attached to and extending between said rolled over edges;

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a wedge for being inserted in between said channels to common wires which may be positioned therein, said wedge including one end adapted to provide support for one jaw of a compressing type tool; and



deformable means on said C-member for providing support for another jaw of a compressing-type tool whereby said wedge may be forced into said C-member, said means adapted to deform when a predetermined force exerted thereagainst is reached.

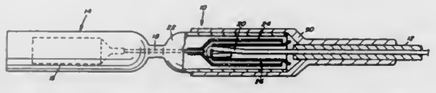
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**5,044,997**

## HIGH VOLTAGE ELECTRICAL CONNECTOR

**Carl O. Gellenthin, Jr., Houston, Tex., assignor to Signeon Corporation, Houston, Tex.**

**Filed Mar. 26, 1990, Ser. No. 498,790**
**Int. Cl.[5] H01R** *4/48*
**U.S. Cl. 439—835** **9 Claims**



1. A high voltage electrical connector for connecting two electrical conductors together comprising,

a tubular glass insulator for providing high voltage protection,

a tubular electrically conductive metal liner positioned in the glass insulator,

a metal connector adapted to receive a bare end of an electrical conductor, said metal connector adapted to be releasably engaged in the inside of the metal liner of said electrical connector, including,

a resilient metallic face having first and second sides, each side having first and second ends, said ends, when the metal connector is positioned in the inside of the metal liner, resiliently engage and grip the inside of the metal liner,

first and second levers having first and second ends being connected to said first and second sides of the face, respectively, whereby when the second ends of the levers are pushed together the sides of the face move together and release from the inside of the metal liner.

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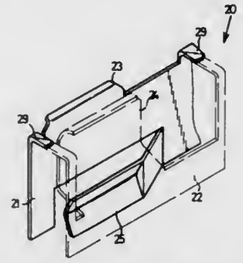
**5,044,998**

## SOCKET

**Chao C. Lin, No. 2, Ching Cherng 4 St., Hsi Chu, Taichung, Taiwan**

**Filed Oct. 19, 1990, Ser. No. 599,862**
**Int. Cl.[5] H01R** *13/00*
**U.S. Cl. 439—856** **2 Claims**

1. A socket comprising generally a casing, two slots being formed in an upper side of said casing and being respectively communicated with two chambers which are formed in said casing, and a conductor being located in each of said chambers; each of said conductors including a first member vertically disposed below said slot, a second member which is resilient being parallel to said first member so that said first member and said second member form a receptacle for receiving a prong of a plug, an upper end of said first member and an upper end of said second member being curved outward so as to facilitate an insertion of said prongs into said socket, and a third member being disposed below said second member and being resilient; each of said conductors including substantially a first plate and a second plate which are substantially parallel with each other and which are vertically disposed in each of the chambers, said first member being formed by said first plate, said second



member being bent from said second plate, said third member being punched from said first plate and having one end integrally coupled to said first plate so that said third member is resilient; and when said prongs are inserted through said slots into said socket, a middle portion of each of said prongs being stably held between said first member and said second member by a resilient force of said second member, and a lower end of said prong being pressed by said third member and being stably held in place by a resilient force of said third member.

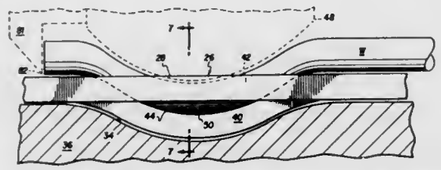
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**5,044,999**

## FLAT CABLE-CONNECTOR HAVING IMPROVED CONTACT SYSTEM

**Edward P. Brandeau, Fall Mountain Ct., Martinsville, N.J. 08836, assignor to Edward P. Brandeau, Flemington, N.J.**

**Division of Ser. No. 346,555, May 2, 1989, Pat. No. 4,945,627, which is a division of Ser. No. 65,684, Jun. 16, 1987, Pat. No. 4,829,668, which is a continuation of Ser. No. 633,897, Jul. 24, 1984, abandoned. This application Aug. 1, 1990, Ser. No. 561,111**
**Int. Cl.[5] H01R** *4/10*
**U.S. Cl. 439—879** **14 Claims**



1. An array of high performance contacts for electrically terminating a plurality of fine gage wires on close spacing, said array comprising:

a thin spring hard piece of metal with a substantially planar top surface and a substantially planar bottom surface, each contact comprising a slot for receiving and terminating a fine gage wire therein, said slot being formed in said hard piece of metal with a downwardly extending rib defining the bottom of the slot, the top of said rib lying below the bottom surface of said piece of hard metal along a portion of its length, each contact being located in said array to correspond to the close spacings of the fine gage wires, and portions of said array are separated from the remainder of said thin spring hard piece of metal to electrically isolate contacts formed on those portions of the array from the remainder of said contacts.

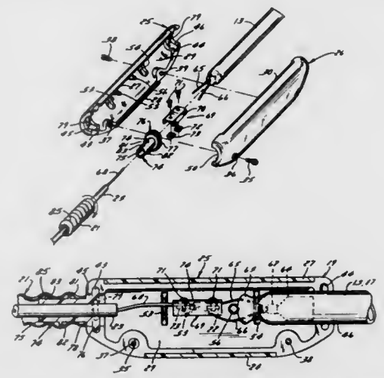


**5,045,000**

## NEON SIGN CONNECTOR

**Charles E. Trame, Mequon, and Gary L. Reidenbach, Franklin, both of Wis., assignors to Everbrite, Inc., Greenfield, Wis.**

**Filed Jul. 9, 1990, Ser. No. 550,123**
**Int. Cl.[5] H01R** *4/70, 13/44;* **G09F** *13/26*
**U.S. Cl. 439—892** **5 Claims**



1. A connector for connecting the bare end of an insulation coated lead wire leading from a neon tube power supply to a lead wire extending from the end of a neon tube, said connector comprising:

two half-shell members composed of insulating material each of which has laterally spaced apart opposite longitudinally extending edges which define the boundaries of a cavity lying between said edges,

said half-shell members having opposite longitudinally spaced apart end portions, a generally semi-circular opening in each end portion and a generally semi-circular groove adjacent each opening such that when said two half-shell members are joined together at their edges, the members form a housing containing a chamber made up of the cavities and the semi-circular openings and grooves become contiguous and form substantially circular openings and grooves, respectively, at opposite end portions of said housing,

a feedthrough adapter composed of insulating material having a tubular part and a radially extending collar integral with the tubular part, said collar fitting into the substantially semi-circular groove in one end portion of a half-shell member and being secured in the housing by entering the substantially semi-circular groove at the corresponding one end portion of the other half-shell member when the two half-shell members are joined,

a flexible sleeve composed of insulating material, said flexible sleeve being adapted to connect to said tubular part of said feedthrough adapter to provide for an insulated wire to pass through the flexible sleeve and through such feedthrough adapter to said chamber in the housing in double insulated fashion so as to present a bare wire end to the interior of the housing,

said opening in said other end portion of the housing being for entry of said end of a neon tube into said chamber for the lead wire from a neon tube and a lead wire from the power supply to be connected before said half-shells are joined together,

joining said half-shells causing said neon tube to be clamped in the housing, and

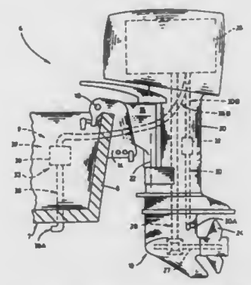
rigid elements projecting integrally in opposed relationship from each half-shell member inside of said housing for engaging a neon tube between them when the half-shell members are joined together.

**5,045,001**

## AUXILIARY AUTOMATIC COOLING WATER SUPPLY FOR MARINE ENGINES

**Gaylord M. Borst, Gurnee, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Mar. 12, 1990, Ser. No. 492,094**
**Int. Cl.[5] B63H** *21/38*
**U.S. Cl. 440—1** **24 Claims**



1. A marine propulsion device comprising an internal combustion engine, primary means for supplying cooling water to said engine, and ancillary means for supplying cooling water to said engine in response to the temperature of said engine exceeding a predetermined temperature and for continuing to supply cooling water to said engine regardless of engine temperature until said ancillary means is manually deactivated.

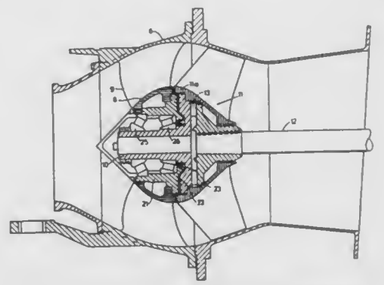
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**5,045,002**

## JET PROPULSION ASSEMBLY FOR SHIPS

**Gerard Törneman, Gimo, and Nils E. Lundberg, Österbybruk, both of Sweden, assignors to MJP Marine Jet Power AB, Osthammar, Sweden**

**PCT No. PCT/SE88/00269, § 371 Date Nov. 16, 1989, § 102(e) Date Nov. 16, 1989, PCT Pub. No. WO88/09287, PCT Pub. Date Dec. 1, 1988**
**ub. Date DMay 20, 1988, Ser. No. 435,416**
**Claims priority, application Sweden, May 21, 1987, 8702121**
**Int. Cl.[5] B63H** *11/00*
**U.S. Cl. 440—38** **2 Claims**



1. A jet propulsion assembly for ships, comprising:

a drive unit;

a drive shaft attached to said drive unit for rotation by said drive unit;

a pump housing having an inlet side connected to a water inlet canal, an opposite outlet side, and a water passageway extending therebetween; and

a propeller pump housed within said pump housing, said propeller pump including:

a hub casing fixedly attached within said pump housing and positioned within said water passageway;

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a pump wheel having a bowl-shaped portion and being rotatably journalled within said hub casing; and

means coupling said pump wheel to said drive shaft for causing rotation of said pump wheel by said drive shaft, providing torsional resistance and permitting angular deflection of said drive shaft, said means including a flexible coupling disposed within said bowl-shaped portion.

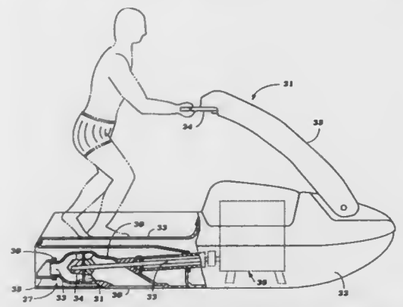
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**5,045,003**

## WATER JET PROPELLING SYSTEM

**Kenji Ikeda, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Aug. 1, 1989, Ser. No. 387,900**
**Claims priority, application Japan, Aug. 3, 1988, 63-192803**
**Int. Cl.[5] B63H *11/00***
**U.S. Cl. 440—042** **6 Claims**



1. A jet propulsion unit for propelling and steering a watercraft having a pumping unit for collecting water from an inlet and expelling it through a discharge, a steering nozzle pivotally supported adjacent said discharge and adapted to collect water discharged from said discharge and return it to the body of water in which said watercraft is operating, said steering nozzle being pivoted about a generally vertically extending steering axis, and means fixed against movement relative to said steering nozzle for generating a side force acting generally non perpendicularly to said steering axis upon said steering nozzle from the water flowing from said discharge only upon said steering nozzle being pivoted from the straight ahead position.

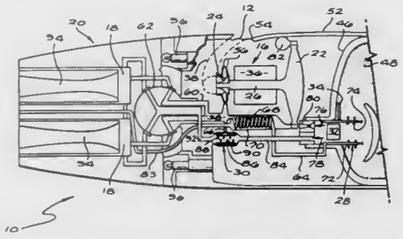
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**5,045,004**

## TURBO-HYDRODUCT PROPULSION SYSTEM

**Yong Kim, Fountain Valley, Calif., assignor to Allied-Signal Inc., Morris Township, N.J.**

**Filed Sep. 28, 1989, Ser. No. 413,925**
**Int. Cl.[5] B63H *11/14***
**U.S. Cl. 440—45** **27 Claims**



19. A propulsion system for an underwater vehicle comprising:

a propellant storage tank;

gas generator means, mounted within said vehicle, for receiving and combustion propellant from said propellant storage tank producing a flow of high temperature pressurized combustion gases;

means for extracting energy from said flow of combustion gases;

high pressure water pump for pressurizing a flow of ingested ambient water to a pressure at least 200 psi greater than ambient water pressure, said pump means powered by said means for extracting energy;

primary mixing chamber means for receiving at least a portion of said flow of combustion gases and at least a portion of said flow of pressurized water and for mixing said gases and said pressurized water forming a mixed flow;

second mixing chamber means for receiving a diverted portion of said pressurized water and at least a portion of said combustion gases from said gas generator means, and for spraying said diverted water into said combustion gases to cause evaporation of said water thereby producing a mixed gas-steam flow;

conduit means for conducting said mixed gas-steam flow from said second mixing chamber means to said means for extracting energy; and

nozzle means for receiving said mixed flow from said primary mixing chamber means and for ejecting said mixed flow to ambient to generate thrust.

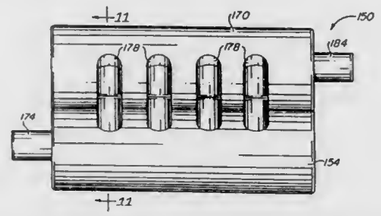
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**5,045,005**

## MARINE ENGINE EXHAUST SYSTEM AND METHOD

**Charles C. Miles, Jr., Longwood, Fla., assignor to Marine Muffler Corporation, Apopka, Fla.**

**Division of Ser. No. 322,408, Mar. 13, 1989, Pat. No. 4,917,640.**
**This application Apr. 10, 1990, Ser. No. 507,124**
**Int. Cl.[5] B63H *21/32***
**U.S. Cl. 440—89** **11 Claims**



1. An exhaust muffler for marine engines, comprising:

a first enclosed chamber defined by a generally cylindrical first chamber wall and a bottom portion within the first chamber;

an inlet passageway extending into the first chamber for passing exhaust gases from a marine engine into the first chamber, and so that cooling liquids entrained with the exhaust gases collect in the bottom portion of the first chamber;

a second enclosed chamber defined by a generally cylindrical second chamber wall, the second enclosed chamber positioned laterally alongside and adjacent to the first enclosed chamber and wherein the axis of the second generally cylindrical chamber wall is not coaxial with the axis of the first generally cylindrical chamber wall;

a plurality of intermediate exhaust passageways extending from the bottom portion of the first chamber, through the first cylindrical chamber wall in a direction lateral to the axis of the first chamber wall and through the second cylindrical chamber wall into the second chamber; and

an outlet exhaust passageway extending out of the second chamber for venting the muffled exhaust gases.

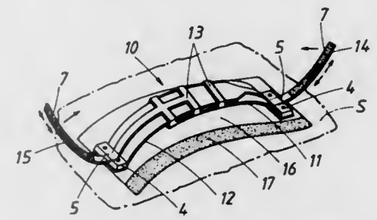


**5,045,006**

## FOOT LOOP FOR A WINDSURFING BOARD

**Robert Sperzel, Surheim, Fed. Rep. of Germany, and Wolfgang Berndorfer, Neukirchen/Walde, Austria, assignors to Alpha International Gesellschaft m.b.H., Salzburg, Austria**

**Filed Oct. 25, 1989, Ser. No. 427,257**
**Claims priority, application Austria, Nov. 2, 1988, 2689/88**
**Int. Cl.[5] B63B *35/79***
**U.S. Cl. 441—75** **2 Claims**



1. In a foot loop for a windsurfing board including:

a loop strip having a first strip section, with an end portion and a second strip section with an end portion and an arched intermediate portion of adjustable length between said first and second end portions, said strip sections overlapping throughout said intermediate portion, said intermediate portion having a top surface,

two holders, each of which is in the shape of an eyelet, for fixing said first and second end portions of said strip to the top surface of a windsurfing board at two spaced-apart locations,

said first strip section being secured at one end to one of said holders and is provided at its other end with a strap, which is threaded through the eyelet of the other of said holders,

said second strip section being secured at one end to said other holder and is provided at its other end with a strap, which is threaded through the eyelet of said one holder,

each of said straps is backfolded around the associated eyelet to overlie said top surface of said intermediate portion, and

fastening means are provided for detachably fastening each of said straps to said top surface of said intermediate portion in any of a plurality of positions corresponding to different lengths of said intermediate position.

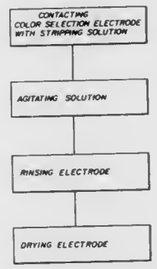
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**5,045,007**

## METHOD OF SALVAGING A COLOR SELECTION ELECTRODE FOR A CRT

**James F. Edwards, Lancaster, and Donald W. Bartch, Wrightsville, both of Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Nov. 19, 1990, Ser. No. 615,546**
**Int. Cl.[5] H01J *9/50***
**U.S. Cl. 445—2** **18 Claims**




1. A method of salvaging a color selection electrode for a CRT, said electrode having a coating on a surface thereof, said coating comprising a compound of a heavy metal and an alkali silicate, the method comprising the steps of

contacting said electrode with a stripping solution consisting essentially of ammonium bifluoride, a suitable detergent, and water;

agitating said solution, to remove said coating from said surface;

rinsing said electrode; and

drying said electrode.

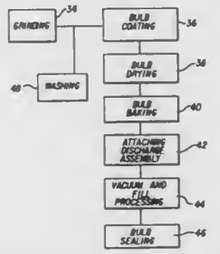
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**5,045,008**

## METHOD OF PROVIDING AN IMPROVED PHOSPHOR COATING

**Costas C. Lagos, Danvers, Mass., assignor to GTE Products Corporation, Danvers, Mass.**

**Filed Dec. 22, 1989, Ser. No. 457,004**
**Int. Cl.[5] H01J *9/22, 61/35***
**U.S. Cl. 445—26** **11 Claims**




1. A method of producing a fluorescent lamp comprising the steps of:

providing conventional phosphor powder;

attritor grinding said conventional phosphor powder to form attritor phosphor power having a reduced average particle size relative to the average particle size of said conventional phosphor powder;

suspending said attritor phosphor powder in a liquid;

coating the inside of a lamp bulb with said suspended attritor phosphor powder;

drying said coating of attritor phosphor powder;

baking said dried attritor phosphor powder;

attaching a discharge assembly including electrodes to said lamp bulb;

subjecting said lamp bulb to vacuum and introducing a fill material therein; and

sealing said lamp bulb.

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**5,045,009**

## MECHANICAL MEANS AND PROCESS FOR SEVERING A TENSED FOIL SHADOW MASK

**Lowell A. Cordingley, Des Plaines; Lawrence W. Dougherty, Sleepy Hollow; Allan D. Kautz, Naperville, and Armando V. Marino, Elmhurst, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**

**Filed May 4, 1990, Ser. No. 519,090**
**Int. Cl.[5] H01J *29/07***
**U.S. Cl. 445—30** **13 Claims**

1. In the manufacture of a tension mask color cathode ray tube, a process comprising:

providing a color cathode ray tube faceplate from which extends mask support means separated by a predetermined spacing;

expanding a foil shadow mask and retaining it in tension on a frame;

while in said tensed state in said frame, securing said mask to said mask support means;

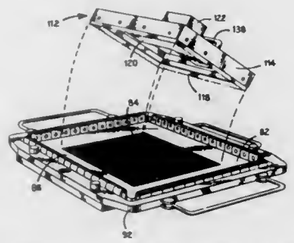
supporting piercing blade means in a mount having a span

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greater than said predetermined spacing of said mask support means;

causing said piercing blade means to make physical contact with said tensed mask between where said mask is joined



to said mask support means and where it is supported on said frame; and

causing said piercing blade means to pierce said mask to sever a peripheral waste portion thereof from a useful central portion between said mask support means.

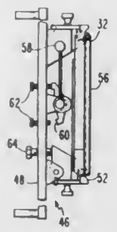
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**5,045,010**

**METHOD OF ASSEMBLYING A TENSIONED SHADOW MASK AND SUPPORT FRAME**

**David W. Fairbanks, South Brunswick Township, Middlesex County, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.**

**Filed Jul. 23, 1990, Ser. No. 556,143**
**Int. Cl.[5] H01J** *9/00*
**U.S. Cl. 445—30** **2 Claims**



1. In a method of assembling a tensioned shadow mask and support frame, said mask being rectangular having two long sides paralleling a central major axis thereof and two short sides paralleling a central minor axis thereof, said frame having two curved members paralleling said major axis and two straight members paralleling said minor axis, the two long sides of said mask being welded to said curved members, the improvement comprising

forming two subassemblies of said frame, each subassembly including one of said curved members and two partial straight members, each partial straight member being attached to an end of the curved member,

clamping said two subassemblies in approximately their final positions with respect to each other with the partial straight members on each side of the frame overlapping each other,

rotating said subassemblies to form an angle between the overlapped partial straight members, the angle being less than 180 degrees on the side of the frame of the intended mask attachment,

positioning said mask on said frame with the long sides of said mask being on said curved members,

welding the long sides of said mask to said curved members,

rotating said subassemblies in a direction opposite to the first rotation to apply tension to said two curved members to place at least a central portion of said shadow mask under a predetermined tension,

applying pressure to the ends of one of said curved members in a direction away from the other curved member to place at least the side portions of said shadow mask under said predetermined tension, and

welding the partial straight members together where they overlap to form complete straight members extending between said curved members.

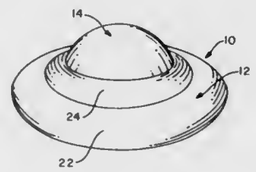
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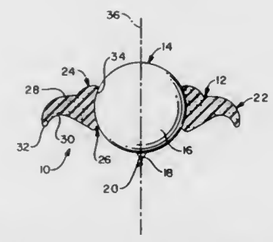
**5,045,011**

**FLYING BALLOON TOY**

**Craig J. Lovik, 8036 Makah, Blaine, Wash. 98230**

**Filed Jun. 1, 1990, Ser. No. 531,929**
**Int. Cl.[5] A63H** *27/00, 3/06;* **A63B** *65/08, 65/00*
**U.S. Cl. 446—46** **16 Claims**





1. A flying balloon toy for use with an inflatable balloon of the type having a constricted neck portion that terminates at one end in an inflation aperture and at the other end in an imperforate sidewall, the toy comprising:

a rigid aerodynamic body, formed of a stiff, lightweight material, that is intended to rotate about a rotational axis when thrown by a user, and

means for holding the balloon in readily removable engagement in a central portion of said aerodynamic body when the balloon is inflated, said holding means comprising an opening formed in said body and having sides for engaging the balloon, extends above and below said central portion to provide aerodynamic stability to the toy when thrown by a user.

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**5,045,012**

**RECONFIGURABLE TOY GLIDER**

**Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024**

**Filed May 17, 1990, Ser. No. 512,769**
**Int. Cl.[5] A63H** *27/00, 3/46, 33/00*
**U.S. Cl. 446—62** **9 Claims**

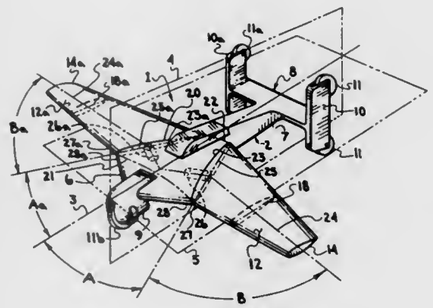
1. A transformable toy glider comprising:

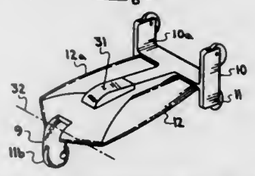
an elongated fuselage having a generally horizontal longitudinal axis when said toy glider is in an attitude of normal flight, a nose section and a tail section having airfoil portions parallel to the longitudinal axis, generally in the horizontal and vertical planes including aft and tip edges, said fuselage including a portion of generally trapezoidal form in a horizontal plane, said trapezoidal portion having its parallel sides comprising parallel planes orthogonal to the longitudinal axis and having non-parallel sides forming wing root fairings comprising non-parallel planes at an angle to the longitudinal axis and adapted for the mounting of respective wings thereon;

a pair of generally planar airfoil wings in the horizontal plane, each having a leading edge and a trailing edge, a span axis and having generally planar wing roots in a vertical plane at an angle to said span axis, said wing roots being pivotally attached the the fuselage in abutment with said wing root fairings.

a first rotational position stop for each of said wings in which the angle of the wing root and the angle of the fuselage wing root fairing are added to orient the span axis of the wings into a generally extended flight position normal to







the longitudinal axis of the fuselage and the wing airfoils are in the horizontal plane and parallel to the longitudinal axis; and

a second rotational position stop for each of said wings, approximately 180° from said first limit stop position, in which the angle of the wing root and the angle of the fuselage wing root fairing are subtracted to orient the span axis of the wings in a retracted position generally parallel to the longitudinal axis of the fuselage and the wing airfoils are in the horizontal plane and transverse to the longitudinal axis and the leading edges of the wings are adjacent to the fuselage.

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**5,045,013**

**AIR-CUSHION VEHICLE TOY**

**Takashi Fujitani, Tokyo, Japan, assignor to Kabushiki Kaisha Gakushu Kenkyusha, Japan**

**Filed Jul. 17, 1990, Ser. No. 553,458**
**Claims priority, application Japan, Apr. 23, 1990, 2-43365**
**Int. Cl.[5] A63H** *33/40, 29/02, 29/22*
**U.S. Cl. 446—179** **7 Claims**

1. An air-cushion vehicle toy comprising:

a chassis;

a propeller fan mounted on said chassis;

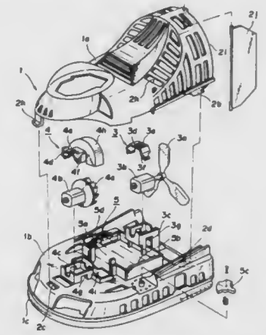
a first motor mounted on said chassis, for driving said propeller fan;

a hovering fan mounted on said chassis;

a second motor mounted on said chassis, for driving said hovering fan;

a power supply mounted on said chassis and selectively connectable to said first motor and said second motor, for energizing the first motor and the second motor, said power supply and said first and second motors constituting a power supply circuit;

a body detachably mounted on said chassis in covering relation to said propeller fan, said first motor, said hovering fan, said second motor, and said power supply; and



a power cutoff mechanism disposed in said power supply circuit, for breaking said power supply circuit to de-energize said first and second motors, when said body is removed from said chassis, and for making said power supply circuit when said body is attached to said chassis.

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**5,045,014**

**BATTERY OPERATED TOY**

**William F. Harkins, 4834 N. Territory Loop, Tucson, Ariz. 85715**

**Filed Nov. 13, 1990, Ser. No. 612,196**
**Int. Cl.[5] A63H** *11/00*
**U.S. Cl. 446—236** **9 Claims**



1. A toy comprising in combination:

(a) a casing;

(b) an electrically energized motor enclosed within the casing, said motor including a drive shaft;

(c) a battery enclosed within the casing for supplying electrical energy to the motor;

(d) an intermittently moving flickering element comprising a wand having a proximal end and an opposing distal end;

(e) a tube having a distal end located outside the casing, the tube distal end adapted to receive the proximal end of the wand therein, and an opposing proximal end located inside the casing, the tube proximal end adapted to receive the drive shaft therein so that the flickering element protrudes from the casing and rotates when the motor is operated, causing the casing to rotate responsively.

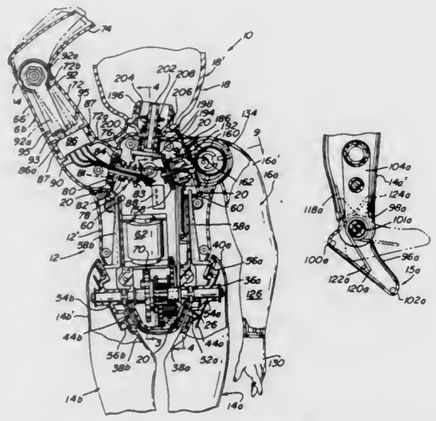
VOL 1130 ISS 1 SE 3 1991 UMI



**5,045,015**
**DOLL HAVING A PAIR OF MECHANICALLY DRIVEN LEGS**

Avi Arad, Westpoint, Conn.; Janos Beny, Vista, and Berne E. Danielson, Pacific Palisades, both of Calif., assignors to Tyco Industries, Inc., Mount Laurel, N.J.

Filed Apr. 24, 1990, Ser. No. 513,712
Int. Cl.[5] A63H *11/18, 3/46*
U.S. Cl. 446—355 8 Claims



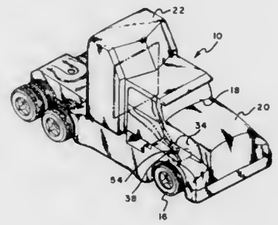
1. A doll having a pair of mechanically driven legs for enabling the doll to move over a surface when held in an upright position, said doll comprising:
a body portion for housing and supporting various elements of said doll;
a first leg member mounted on said body portion and extending therefrom for movement with respect thereto;
a first foot member pivotally mounted on a distal end of said first leg member, said first foot member having a heel portion and a toe portion;
biasing means for biasing said toe portion away from said distal end of said first leg member;
a second leg member mounted on said body portion and extending therefrom for movement with respect thereto;
a second foot member pivotally mounted on a distal end of said second leg member, said second foot member having a heel portion and a toe portion;
second biasing means for biasing said second foot member toe portion away from said distal end of said second leg member, whereby when said doll is in said upright position and moving along a surface only said toe portions of said first and second foot members contact said surface;
drive means mounted on said body portion and drivingly connected to said first and second leg members for moving said first and second leg members with respect to each other such that said body portion and with respect to each other such that said doll moves over a surface when held in an upright position.

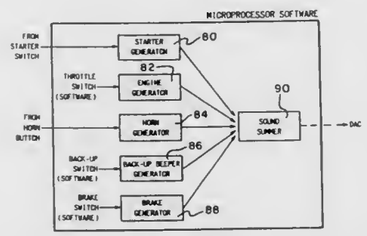
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**5,045,016**
**TOY VEHICLE WITH ELECTRONIC SOUNDER AND DIRECTION SENSOR**

Carl M. Stern, Pennington; Richard N. Meckstroth, Princeton, and Stephen L. Hayes, East Windsor, all of N.J., assignors to Innova Development Corporation, Pennington, N.J.

Division of Ser. No. 431,020, Nov. 1, 1989, Pat. No. 4,946,416.
This application Jul. 25, 1990, Ser. No. 557,638
The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.
Int. Cl.[5] A63H *5/00, 17/00, 17/26, 33/26*
U.S. Cl. 446—409 24 Claims






1. In a toy wheeled vehicle including electronic sound generating means for generating a sound when said vehicle is at rest and when said vehicle is moving but which changes when said vehicle is moved, the improvement comprising:
means for determining whether said vehicle is moving in a forward or reverse direction, and
means for generating a second sound different from said first-mentioned sound when said determining means determines that said vehicle is moving in a reverse direction, said second sound being generated concurrently with said first-mentioned sound.

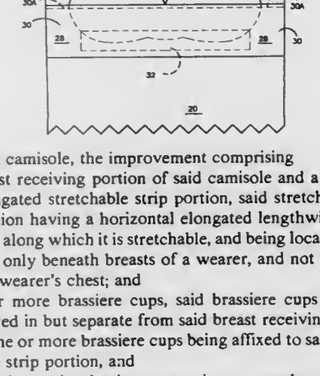
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**5,045,017**
**PEOPLE ENTERTAINMENT WITH HAND-HELD SOUND-EMITTING DEVICES**

Rudy Masson, 4015 W. Verdugo, Burbank, Calif. 91505

Filed Apr. 4, 1990, Ser. No. 504,653
Int. Cl.[5] A63H *5/00*
U.S. Cl. 446—415 22 Claims

1. In a people entertainment noisemaker method, the improvement comprising in combination the steps of:
providing a single sound-emissive, tear-resistant sheet of material;



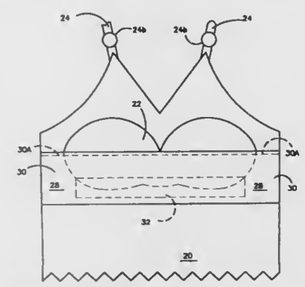

bending said sound-emissive sheet of material into a single loop around a space running transversely to said loop and being open to atmosphere laterally of said loop; and
attaching said loop to a handle.

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**5,045,018**
**CAMISOLE COMBINED WITH BRASSIERE CUPS**

Anna M. Costanzo, 6587 Big Creek Pkwy., Parma Heights, Ohio 44130

Filed Mar. 5, 1990, Ser. No. 487,931
Int. Cl.[5] A41C *3/08, 3/10, 3/12*
U.S. Cl. 450—31 5 Claims



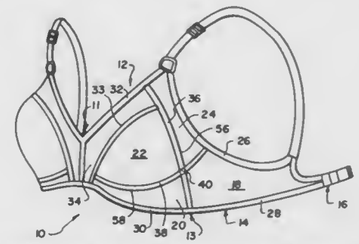
1. In a camisole, the improvement comprising
a breast receiving portion of said camisole and a generally elongated stretchable strip portion, said stretchable strip portion having a horizontal elongated lengthwise dimension along which it is stretchable, and being located generally only beneath breasts of a wearer, and not encircling the wearer's chest; and
one or more brassiere cups, said brassiere cups being received in but separate from said breast receiving portion,
said one or more brassiere cups being affixed to said stretchable strip portion, and
said strip portion having no portion or member encircling the wearer's chest and functioning to bind or support the breasts.



**5,045,019**
**BRA WITH UNDERARM X-FEATURE**

Ursula Capasso, Hollis, and Claudette Goff, New York, both of N.Y., assignors to Exquisite Form Industries, Inc., Purchase, N.Y.

Filed Oct. 4, 1990, Ser. No. 592,816
Int. Cl.[5] A41C *3/12, 3/00*
U.S. Cl. 450—74 2 Claims



1. A brassiere (10) with underarm comfort feature, comprising:
a pair of cup regions (12) each having an inner margin and an outer margin, the inner margins of said cup regions being connected to each other;
an underarm region (14) connected to the outer margin of each cup region (12);
a back region (16) connected to each underarm region;
said underarm region (14) comprising an elastic underarm panel (18) extending from said cup region (12) to said back region (16);
said cup region comprising a relatively inelastic main cup panel (22) having inner (33), outer (56) and lower (58) edges, an elastic lower cup panel (20) connected to the lower edge of said main cup panel, an elastic upper cup panel (24) connected to the outer edge of said main cup panel and a relatively inelastic central cup panel (34) connected to the inner edge of said main cup panel;
an elastic upper side band (26) extending along an upper edge of said underarm panel (18) and an outer edge of said upper cup panel (24) at a location spaced from the outer edge (56) of said main cup panel (22);
an elastic lower band (28,30) extending along a lower edge of said underarm panel (18) and a lower edge of said lower cup panel (20);
a relatively inelastic upper cup band (32) extending along an inner edge of said central cup panel (34) and along an upper edge of said upper cup panel (24);
a relatively inelastic lateral band (36) extending between said upper cup band (32) at a location between said central cup panel (34) and said upper cup panel (24), to said lower band (28,30) at a location between said underarm panel (18) and said lower cup panel (20), said lateral band (36) separating said main cup panel (22) from said upper cup panel (24) and being spaced from and parallel to said upper side band (26) in said cup region (12); and
a relatively inelastic under-cup band (38) extending along the lower edge of said main cup panel (22) and between said upper cup panel (24) and said underarm panel (18), to said upper side band (26), said lateral band (36) crossing said under-cup band (38) at an X-junction (40) located on the outer margin of said cup region (12) and at an inner edge of said underarm panel (18), intermediate said upper side band (26) and said lower band (28,30);
said lower band (28,30) comprising a first lower band portion (28) at a lower edge of said underarm panel (18), and a second lower band portion (30) at a lower edge of said lower cup panel (20), said first lower band portion (28) being more elastic than said second lower band portion (30).

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5,045,020

## SHIRRED PACKAGING TUBE

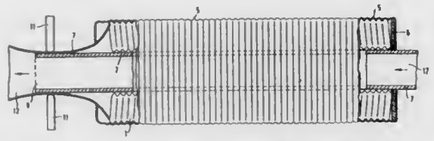
Rainer Neeff; Richard Lenhart, and Helmut Sattler, all of Weisbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,158

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1988, 8813273[U]

Int. Cl.[5] F16L *11/08*

U.S. Cl. 452—21 12 Claims



1. An article comprising a cylindrical hollow rod which comprises a shirred packaging tube with an internal bore having a circular cross-section and ending in a cavity opening at each of the two end faces of said hollow rod, a shrink-fitted plastic film surrounding said hollow rod and leaving said cavity openings free, and an annular disk disposed at one of said cavity openings, wherein the inner side face of said disk bears directly against the adjoining end face of said hollow rod, the outer side face of said disk is at least partially surrounded by said shrink-fitted plastic film and the internal bore of said disk remains free of said shrink-fitted plastic film and comprises a flexible element for fixing said disk to a cylindrical filler pipe, and wherein said disk precedes said shirred packaging tube when said article is mounted on said filler pipe.

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5,045,021

## METHOD OF THERMAL TREATMENT AND AN APPARATUS FOR CARRYING OUT THE METHOD

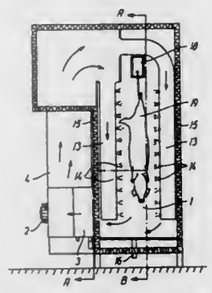
Uffe Borup, Himmelev, Denmark, assignor to Slagteriernes Forskningsinstitut, Roskilde, Denmark

Filed Jan. 30, 1990, Ser. No. 472,288

Claims priority, application Denmark, Jan. 31, 1989, 421/89

Int. Cl.[5] A22B *5/08*

U.S. Cl. 452—74 15 Claims



1. A method of scalding of carcasses advanced through a chamber comprising circulating hot humid air through the chamber by the continuously repeated steps of:

a) evacuating hot humid air from said chamber;

b) supplying said evacuated hot humid air from step a) with humidity and heat; and

c) blowing said hot humid air supplied with humidity and heat in step b) back to the chamber; wherein in step b) heat and humidity are supplied to the air by atomizing excess water into the circulating air in relation to saturation thereof with steam, of a temperature higher than that desired in the chamber.

5,045,022

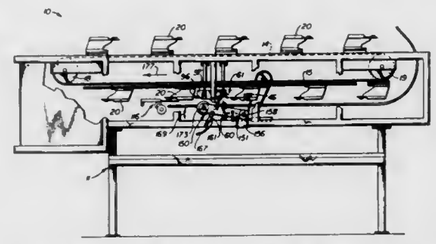
## ADJUSTABLE POULTRY BREAST FILLETING SYSTEM

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands

Filed Jan. 31, 1990, Ser. No. 472,790

Int. Cl.[5] A22C *21/00*

U.S. Cl. 452—165 18 Claims



1. In a filleting apparatus for removing meat fillets from previously eviscerated poultry carcasses from which the legs, wings and skin have been previously removed, the apparatus having a frame and having a plurality of carcass carriers mounted at spaced intervals on a movable conveyor for moving the carriers along a path and meat removing means mounted along the path formed with a shape that corresponds to the profile of the skeletal structure of the poultry for partially separating at least a portion of the meat of the carcass from the skeletal structure thereof, the improvement comprising,

cutting means having a first position interposed in the path of the carcass carriers for engaging and cutting the partially separated meat into at least two substantially boneless portions along a portion of the skeleton of the carcass, a second position removed from the path of the carcass carriers, and

means for moving said cutting means between said first and second positions for selectively cutting the meat.

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5,045,023

## METHOD AND APPARATUS FOR BEHEADING FISH, AND METHOD AND APPARATUS FOR EXTRACTING ROE OR MILT FROM A FISH

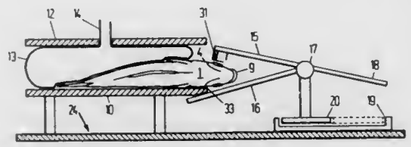
Henrik M. Nielsen, Haarby, Denmark, assignor to Cabinplant International A/S, Harby, Denmark

Filed May 25, 1990, Ser. No. 529,348

Claims priority, application Denmark, May 30, 1989, 2635/89

Int. Cl.[5] B65B *23/22*

U.S. Cl. 452—185 8 Claims



1. A method for releasable, mechanical seizure of an object relative to a supporting surface comprising the steps of: placing said object adjacent one side wall of a flexible, fluid-tight bag, placing the object with one side thereof against a firm abutment surface which can withstand the force of fluid pressure, and introducing fluid under pressure at the opposite side of the bag wall so as to urge said bag against said object, whereby the object is engaged by friction between at least a portion of the object surface, and a surface, which is arrested relative to said supporting structure.



5,045,024

## HOLDING DEVICE FOR HOLDING POULTRY CARCASSES DURING PROCESSING

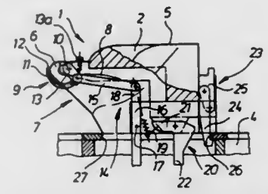
Karl-Heinz Diesing, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH+ CO KG, Lübeck, Fed. Rep. of Germany

Filed Jun. 5, 1990, Ser. No. 533,340

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918345

Int. Cl.[5] A22C *21/00*

U.S. Cl. 452—185 20 Claims



1. In a machine for processing gutted poultry carcasses, a device for holding at least parts of such carcasses to be processed containing meat and bones including the breastbone (sternum), said device comprising

a) a support body adapted to receive one of said parts to be processed by said part being pushed onto said support body in a pushing direction;

b) a support face arranged on said support body for supporting said part at least on the inner contour of said breastbone; and

c) controllable fixing means for fixing said part to be processed, which fixing means comprise a clamping device formed by a clamping lever adapted to move against said support body and which lever in its active position forms an abutment gripping behind said part to be processed counter to said pushing direction.

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5,045,025

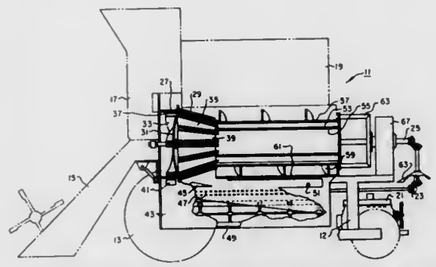
## CO-ROTATIONAL AXIAL FLOW COMBINE

Mark R. Underwood, Burr Oak, Kans., assignor to Probe Adventures, Inc., Haslet, Tex.

Filed Aug. 21, 1990, Ser. No. 570,213

Int. Cl.[5] A01F *7/06, 12/18, 12/20*

U.S. Cl. 460—66 37 Claims



1. In a combine having a frame mounted on wheels and having a longitudinal axis, a header for cutting crop, a rotatably driven threshing drum mounted along the longitudinal axis inside a hollow grate containing apertures for threshed grain to fall into a sieve for separating chaff from the grain, a feeder head on the forward end of the threshing drum and having a set of curved impellers carried on the forward face of the feeder head inside a feeder housing, the feeder housing being mounted to the forward end of the grate for receiving the crop from the header, the improvement comprising in combination:

a plurality of apertures in the feeder housing for allowing any grain threshed by the impellers to pass downward out of the feeder housing without moving into the grate; and

the sieve being mounted to the frame for receiving the grain that passes through the apertures in the feeder housing.

23. In a combine having a frame mounted on wheels and having a longitudinal axis, a header for cutting crop, a rotatably driven threshing drum mounted along the longitudinal axis inside a hollow grate, the grate containing apertures for threshed grain to fall, the improvement comprising in combination:

a beater housing extending rearward from the grate;

a beater mounted to the threshing drum for rotation therewith and extending rearward within the beater housing;

a plurality of vanes mounted on the beater and closely spaced to the beater housing for performing final threshing on the crop discharged rearwardly from the grate;

at least one perforated plate; and

mounting means for releasably mounting the perforated plate to the beater housing, forming a part of the beater housing and allowing grain separated from the crop in the beater housing to fall through perforations in the perforated plate, the mounting means allowing the perforated plate to be readily removed from the beater housing and replaced with another perforated plate for different crop threshing conditions.

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5,045,026

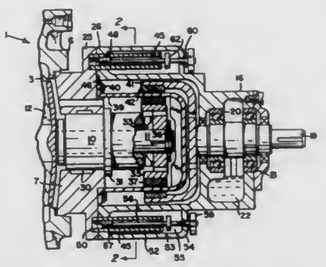
## SEALLESS PUMP ASSEMBLY APPARATUS

Frederic W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 15, 1990, Ser. No. 538,660

Int. Cl.[5] H02N *13/00;* F16D *27/01*

U.S. Cl. 464—29 6 Claims



1. In a magnetically driven machine including a casing supporting an inner rotor carrying magnets, a separating shell mounted on the casing surrounding the inner rotor and a outer frame containing an outer rotor carrying magnets adapted to couple magnetically with the inner rotor for transmitting rotary torque through the shell, wherein the invention comprises: a pair of guide members mounted on the casing and adapted to slide in cooperating openings in the outer frame for guiding the outer frame into and from an assembled position seated over the shell wherein the rotors are magnetically coupled for the transmission of rotary power, means for moving the outer frame into the assembled position seated over the shell, and means for moving the outer frame toward a disassembled position, both movements being carried out while the outer frame is guided by the guide members in a controlled manner along a defined path extending between the assembled and disassembled positions.

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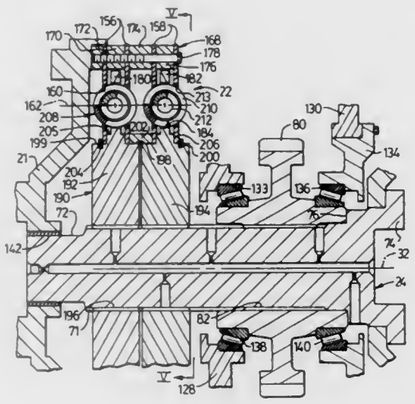


**5,045,027**

## TORSIONALLY TUNED SPRING COUPLING AND DRIVE MECHANISM INCLUDING SAME

**Ardean R. Larsen, Chillicothe; James E. Winzeler, East, Ill., assignors to Caterpillar Inc., Peoria, Ill.**

Filed Aug. 7, 1989, Ser. No. 390,941
Int. Cl.[5] F16D *3/52, 3/66*
U.S. Cl. 464—63 3 Claims



1. A torsionally tuned spring coupling adapted to be releasably connected between a driving member and a driven member having an external spline, comprising:

first and second pairs of outer plates individually defining a plurality of first windows;

ring means for releasably securing the pairs of outer plates to the driving member in a fixed axially spaced apart relationship and axially aligning the first windows in facing pairs about a common hypothetical cylindrical surface;

two inner plates individually having an integral hub which defines an internal spline connected to the external spline of the driven member, each of the hubs having first axially inner and outer cylindrical surfaces and second axially inner and outer cylindrical surfaces radially outwardly thereof defining flat annular side faces therebetween with the faces on the hub of the first inner plate being disposed between the outer plates of the first pair of outer plates and the faces on the hub of the second inner plate being disposed between the outer plates of the second pair of outer plates, each of the inner plates being located between the respective pair of outer plates and defining a plurality of second windows individually axially aligned with the facing pairs of first windows;

a cylindrical centering sleeve engaged with the juxtaposed first axially inner cylindrical surfaces of the hubs and serving to center the hubs concentrically; and

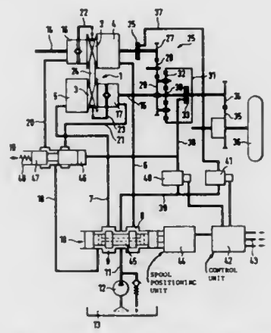
a plurality of compression spring sets seated in the first and second windows and arranged in at least two circular arrays generally about the common hypothetical cylindrical surface, each of the spring sets having an outer spring and an inner spring disposed within the outer spring, a first plurality of the outer and inner springs being initially compressible to collectively provide a preselected tuning stiffness rate, and a second plurality of the outer and inner springs being subsequently compressible to collectively provide with the first plurality a cushioning stiffness rate greater than the tuning stiffness rate as torsional loads are transmitted in a parallel manner between the outer plates and the inner plates.

**5,045,028**

## CONE DISK TRANSMISSION, ESPECIALLY FOR MOTOR VEHICLES

**Manfred Rattunde, and Hans Buttner, both of Bad Homburg von der Hohe, Fed. Rep. of Germany, assignors to Reimers Getriebe AG, Zug, Switzerland**

Filed May 16, 1990, Ser. No. 524,646
Claims priority, application Fed. Rep. of Germany, May 30, 1989, 3917466
Int. Cl.[5] F16H *9/18, 9/26, 59/14*
U.S. Cl. 474—17 10 Claims



1. A cone disk transmission, especially for motor vehicles, having an infinitely settable and variable transmission ratio, having

two pairs of cone disks (**2, 3**), one disk of each pair being axially displaceable;

two shafts (**14, 15**), one of said shafts forming a driving shaft and the other a driven shaft, wherein the driving or driven operation of said shafts is selectively interchangeable, said pairs of cone disks being, respectively, mounted on a respective shaft;

a hydraulic gripping or clamping mechanism(**4, 5**) coupled to the axially displaceable disk of each of the cone disk pairs and when acted upon by pressure fluid, generating clamping or gripping forces against a traction element (**24**) running between the cone disks of the pairs;

a control spool valve (**10** );

control means (**42, 43, 44** ) coupled to said spool valve for controlling the position of a spool or slider thereof;

a pressure fluid inlet (**11**) to the valve;

pressure fluid lines (**6, 7**) coupled to said control spool valve and to said gripping and clamping mechanism (**4, 5**);

two torque sensors (**16, 17; 102**) one each located on a respective shaft in the flow of torque between the shafts and said disks;

valve return flow line connection means (**18, 20, 21; 101***a*) connected between a return line connection of said spool valve and said torque sensors,

said torque sensors, upon torque-dependent relative motion of the disks controlling the pressure of the pressure fluid acting on said hydraulic gripping or clamping mechanisms as a function of load,

said torque sensors being controllable in their operation as a function of the operating state of the transmission,

wherein both torque sensors are coupled to the fluid pressure return line connection means connected to said control spool valve;

said transmission further including

a gearing (**26**) coupled to said shafts;

hydraulically controlled clutch means (**25, 33**) selectively controlling engagement of said shafts with said gearing;

means (**39, 38, 40, 41**) for selectively applying hydraulic operating pressure to said clutch means (**25, 33**);

a switch-over or transfer valve (**19**) connected in said return line connection means (**18, 20, 21**);



said switch-over or transfer valve (**19**) being connected in the valve return flow line connection means from the spool valve (**10, 55, 88**) and switching the flow in said return line connection means to a respective one of said torque sensors (**16, 17**), and being controlled in dependence on commanded direction of torque or power transfer between said shafts; and

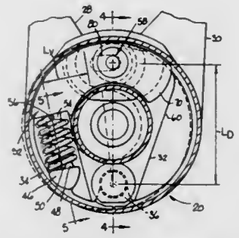
means (**38, 46,48**) controlling the switching position of said switch-over or transfer valve (**19**) as a function of the clutch operating pressure in said hydraulic clutch pressure applying means (**39, 38**).

**5,045,029**

## PULLEY ENCASED TENSIONER WITH DAMPING

**Andrzej Dec, and Henry W. Thomey, both of Windsor, Canada, assignors to Gates Power Drive Products, Inc., Bloomfield Hills, Mich.**

Filed Dec. 20, 1990, Ser. No. 630,593
Int. Cl.[5] F16H *7/12*
U.S. Cl. 474—112 8 Claims



1. In a tensioner for tensioning a flexible power transmission member and of the type with a base structure; a pivot arm pivotably mounted with a pivot to the base structure; pulley means rotatably mounted to the base structure for engaging the power transmission member and having a generally tube-pan configuration that opens on an axial side to an annular space, a portion of the pivot protruding into the annular space; a spring means between the base structure and pivot arm for biasing the position of the pivot arm; and means for damping movement of the pivot arm, the improvement comprising:

the pivot arm having a first lever arm with a portion that protrudes into the annular space and defines a first means for connecting a spring;

the base structure with a portion that protrudes into the annular space and defines a second means for connecting a spring, and

a compression spring oriented substantially chordally relative to the pulley and at least partially disposed in the annular space and interconnected between the first and second connecting means.

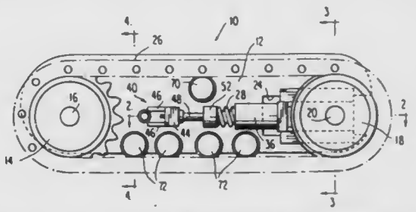
**5,045,030**

## GUIDE AND TENSIONING DEVICE FOR ENDLESS TRACK VEHICLES

**Kelly G. Cunningham, P.O. Box 7146, Charleston, W. Va. 25356**

Filed Jun. 13, 1990, Ser. No. 537,959
Int. Cl.[5] F16H *7/12*
U.S. Cl. 474—138 2 Claims

1. A tensioning device for endless track vehicles comprising a flat, elongated, vertically disposed plate adapted to be mounted on each side of a vehicle, a drive sprocket rotatably supported at one end of said plate, an idler sprocket disposed adjacent an opposite end of said plate, adjustable mounting means for said idler sprocket and an endless track entrained about said drive sprocket and said idler sprocket, said adjustable mounting means comprising a horizontally disposed slot extending inwardly from said opposite end of said plate, a support plate upon which said idler sprocket is mounted, guide means slidably mounting said support plate in said slot for movement along said slot, means for rotatably supporting said idler sprocket on said support plate, adjustable spring support means secured to one side of said plate between said drive sprocket and said idler sprocket and spring means disposed between said spring support means and said support plate for biasing said support plate towards said opposite end to move said idler sprocket away from said drive sprocket to tension



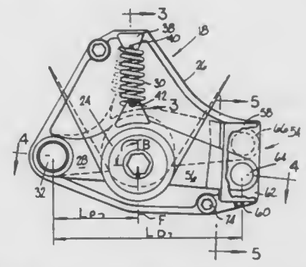
said endless track, wherein said guide means is comprised of a first pair of guide plates secured to opposite sides of said support plate along a top edge thereof to define a U-shaped channel for slidably engaging said elongated plate above said slot and a second pair of guide plates secured to opposite sides of said support plate along a bottom edge thereof to define a second U-shaped channel for slidably engaging said elongated plate below said slot.

**5,045,031**

## TENSIONER FOR AN ENDLESS POWER TRANSMISSION MEMBER AND SYSTEM

**Henry W. Thomey, Windsor, Canada, assignor to Gates Power Drive Products, Inc., Bloomfield Hills, Mich.**

Filed Sep. 26, 1990, Ser. No. 588,245
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—138 26 Claims



1. In a tensioner for tensioning a flexible power transmission member and of the type with a support structure, a pivot arm pivotably mounted with a pivot to the support structure, pulley means rotatably mounted to the pivot arm for engaging the power transmission member and a spring means between the support structure and pivot arm for biasing the position of the pivot arm, and means for damping movement of the pivot arm, the improvement comprising:

the spring means being a compression spring having opposite ends, and a compressed length that varies with pivotal movements of the pivot arm;

means for articulately mounting the spring to the support structure and the pivot arm at a moment arm that varies in length with articulated movements of the spring where the moment arm 1) shortens with a shortening of length of the compression spring, and 2) lengthens with a lengthening of the compression spring as the pivot arm is pivoted.

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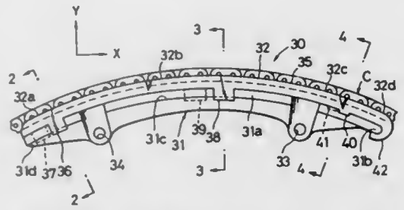


5,045,032

## CHAIN GUIDE HAVING SHOE MADE OF PLASTICS

Tadasu Suzuki, Kawagoe, and Atsushi Kumakura, Tokorozawa, both of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed May 29, 1990, Ser. No. 530,549
Claims priority, application Japan, May 31, 1989, 1-62461[U]
Int. Cl.[5] F16H *7/08*
U.S. Cl. 474—140 4 Claims



1. A chain guide comprising a shoe made of plastics having a pair of L-shaped side engaging members adapted to engage with the respective sides of a T-shaped arm and a U-shaped hook member adapted to engage with the chain-introducing end of said arm, wherein each of said L-shaped side engaging members comprises a flexible, resilient leg portion and a hook-shaped snap fit member having cam surface-providing means engageable with said T-shaped arm for urging its L-shaped side engaging member to flex outwardly when the shoe is forcibly engaged with said T-shaped arm in a direction perpendicular to the length of the arm, whereby said hook-shaped members snap fit onto said T-shaped arm.

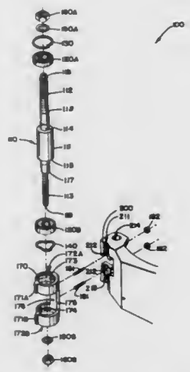
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5,045,033

## DUAL ARBOR SPINDLE

Kenneth Kapton, Verona, and Barry D. Wixey, Pittsburgh, both of Pa., assignors to Delta International Machinery Corporation, Pittsburgh, Pa.

Filed May 22, 1990, Ser. No. 525,238
Int. Cl.[5] F16H *55/00*
U.S. Cl. 474—197 8 Claims



1. A dual-arbor spindle, comprising:
a central section providing a pulley surface,
a first arbor extending from the central section in a first longitudinal direction, and
a second arbor extending from the central section in a second longitudinal direction which is diametrically opposed to the first longitudinal direction,
wherein the central section, first arbor and second arbor form a spindle which is of single piece construction.

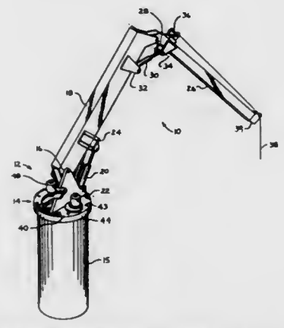
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5,045,034

## ADJUSTABLE ANTIBACKLASH GEAR SYSTEM

Benjamin M. Almeda, Jr., Seattle, Wash., assignor to Aurora Crane Corporation, Seattle, Wash.

Filed May 31, 1990, Ser. No. 530,856
Int. Cl.[5] F16H *55/18*
U.S. Cl. 475—5 9 Claims



1. An antibacklash gear drive system for an elongate boom having a support frame that is rotatably supported by a base, the antibacklash gear drive system transmitting motion from a drive input member that is rotatable about a drive axis to an output member, comprising:
(a) a first gear nonrotatably secured to the drive input member to rotate with the drive input member about the drive axis;
(b) a second gear meshed with the first gear and mounted about a second axis to the output member to rotate the boom relative to the base; and,
(c) adjustment means for selectively positioning one of the first and second gears relative to the other of the first and second gears, and then securing the positionable gear, to adjust and maintain the distance separating the drive axis and second axis to adjust the backlash between the first and second gears.

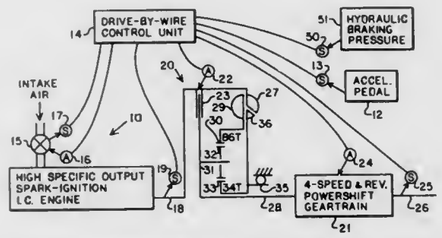
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5,045,035

## HIGH-EFFICIENCY POWERTRAIN

David P. Ganoung, 2800½ Candelaria NW., Albuquerque, N. Mex. 87107

Continuation-in-part of Ser. No. 145,568, Jan. 19, 1988, Pat. No. 4,964,318. This application Apr. 30, 1990, Ser. No. 516,433
Int. Cl.[5] F16H *47/08*
U.S. Cl. 475—42 20 Claims




1. Power transmission apparatus for expanding the speed and torque ranges of the mechanical power produced by an internal combustion engine, the apparatus comprising:
a powershift geartrain having an upshift sequence which includes all forward speed ratios available in upshifting sequence for powershift operation of said powershift geartrain, at least three forward speed ratios being in said upshift sequence and said upshift sequence having an upshift which is executed first and with which a first numerical gear ratio gap is associated,
two-speed means which is coupled to deliver power from the engine to said powershift geartrain and which comprises (1) a hydrodynamic powerpath which delivers power from the engine to said powershift geartrain through a hydrodynamic device within said hydrodynamic powerpath and selected from fluid couplings and torque converters and (2) a lockup powerpath which delivers power from the engine to said powershift geartrain and in so doing bypasses said hydrodynamic device; said hydrodynamic powerpath having associated therewith a low speed ratio measured between the engine and said powershift geartrain and calculated using an assumption of a one-to-one speed ratio across said hydrodynamic device, said lockup powerpath having a high speed ratio also measured between the engine and said powershift geartrain, said high speed ratio being in the upshift direction from said low speed ratio and a lockup ratio gap being that numerical ratio gap which separates said high and said low speed ratios,
and shift control means normally operative to initiate and proceed to completion of said upshift sequence in said powershift geartrain only when said lockup powerpath is being used to the exclusion of said hydrodynamic powerpath for delivering power from the engine to said powershift geartrain,
whereby hydrodynamic losses are eliminated early during acceleration of a load driven by the engine through the power transmission device.



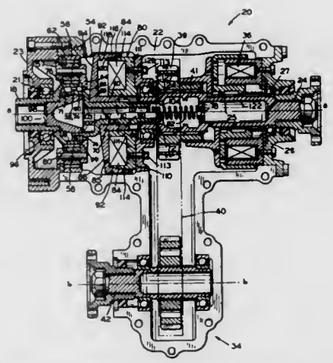
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5,045,036

## ELECTROMAGNETIC SPEED CHANGE APPARATUS

David C. Reuter, Fort Wayne, Ind., and Paul A. Larson, Belvidere, Ill., assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 11, 1990, Ser. No. 626,126
Int. Cl.[5] F16H *37/06*
U.S. Cl. 475—149 10 Claims



1. In a speed change mechanism including a housing, said housing comprising interior walls including an interior ring gear fixed thereto, said ring gear defining an axis, a rotary power input shaft having an end thereof journaled within said housing for rotation within said ring gear, said shaft end defining an exterior sun gear and an internally splined shaft aperture concentrically disposed about said axis, a set of planetary gears in mesh with said sun gear and said ring gear, a planetary carrier supporting said set of planetary gears for movement of said carrier about said axis, said carrier defining an internally splined aperture axially spaced from said splined shaft aperture, a rotary output shaft having an end thereof journaled within a second end wall of said housing, said end of said output shaft sharing said axis but axially spaced from said end of said input shaft in end-to-end relation therewith, and a shifting sleeve for changing speed of said output shaft, said sleeve having a first end splined to said output shaft, said sleeve having exterior splines at its opposite end adapted for axial translation of said sleeve for selective engagement of said exterior splines with said shaft aperture or with said carrier aperture; an improvement comprising an electromagnetic apparatus for shifting said sleeve from a first speed change position to a second.

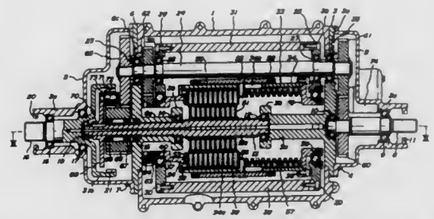
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5,045,037

## FRICTION STEPLESS SPEED CHANGE DEVICE

Kikuzo Takamiya, Kitamoto; Yoshitaka Tamura, Saitama, and Kiyofumi Hirai, Ageo, all of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,618
Claims priority, application Japan, Jun. 27, 1989, 1-162704
Int. Cl.[5] F16H *37/00*
U.S. Cl. 475—215 1 Claim



1. A friction stepless speed change device comprising an input shaft, a driven shaft and an output shaft rotatably arranged on a common axis, a countershaft rotatably provided in parallel with the common axis, two rockable arms rockable about the countershaft, a cylindrical driving rotary assembly rotatably provided on free ends of the rockable arms to enclose the driven shaft, a set of driving friction discs rotating together with the driving rotary assembly, a set of driven friction discs rotating together with the driven shaft, said driving and driven friction discs being wedge-engaged with each other, a first gear fixed to the countershaft and being in mesh with a gear fixed to the input shaft a second gear fixed to the countershaft and being in mesh with a gear fixed to the driving rotary assembly, a third gear fixed to the countershaft and being in mesh with a sun gear rotatably provided on said common axis, planet gears journaled on a planetary carrier fixed to the driven shaft and being in mesh with the sun gear, and an internal gear integrally provided on the output shaft and being in mesh with the planet gears.

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5,045,038

## LIMITED SLIP DIFFERENTIALS

John E. Sherlock, Wolverhampton, England, assignor to GKN Axles Limited, Birmingham, England

Filed Apr. 2, 1990, Ser. No. 503,390
Claims priority, application United Kingdom, Apr. 5, 1989, 8907665
Int. Cl.[5] F16H *1/44*
U.S. Cl. 475—235 7 Claims

1. A limited slip differential, comprising:
a housing rotatable about an axis;
two bevel side gears in said housing at opposite ends thereof, said side gears being arranged for torque transmitting

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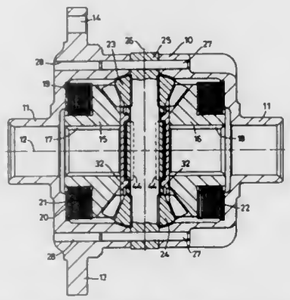
engagement with respective output shafts and being rotatable within the housing about said axis;

respective clutch assemblies disposed between the outermost ends of said side gears and said housing, each clutch assembly comprising at least one member rotationally fast with the associated side gear and at least one member rotationally fast with the housing, said members being frictionally engageable with one another;

two bevel planet gears each meshing with both side gears and supported in said housing for rotation about a planet gear axis perpendicular to said axis;

thrust members engaging said side gears;

respective spring means operable on said thrust members;



a support member for said thrust members and spring means, said support member holding said thrust members to prevent rotation thereof relative to said housing about said axis; and

a shaft member on which said planet gears are supported, said shaft member extending transversely of the housing and through said support member to hold the support member in position reacting against said shaft member whereby said spring means exerts force on said thrust members to urge them and the side gears away from one another to cause said frictional engagement in said clutch assemblies.

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**5,045,039**

## PROGRAM CONTROLLED SHEET FOLDING APPARATUS FOR FOLDING LARGE SHEETS INTO PREDETERMINED FORMATS

**Otto Bay, Luzernstrasse 45, CH-4553 Subingen, Switzerland**

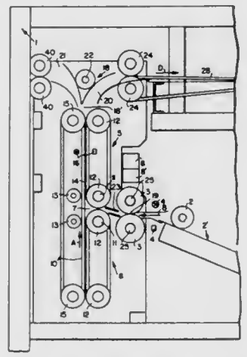
**Filed Aug. 28, 1989, Ser. No. 399,584**

**Claims priority, application Switzerland, Jun. 16, 1989, 02265/89**

**Int. Cl.**[5] **B65H** *45/14, 45/18, 45/20*

**U.S. Cl. 493—1** **5 Claims**

1. An apparatus for folding large, essentially rectangular sheets (9) by forming one or more fold lines across the sheet, comprising a folding system (5, 6, 10) for folding said sheets, a pair of driven sheet supply rollers (3) for feeding sheets in a feeding direction (B) into said folding system, said folding system including a first belt means (5) operating in a first plane, a second belt means (6) longitudinally spaced from said first belt means and operating essentially in said first plane, a third belt means (10) operating in a second plane, parallel to said first plane, spaced therefrom for defining a folding gap (14) between said planes, reversible drive means (8, 8') coupled to said belt means for driving said belt means, and control means (35) for controlling an operation of said drive means for selectively reversing a travel direction of said belt means, a first sensor (4) located upstream of said folding gap (14), as viewed in said sheet feeding direction (B) of a sheet moving from said sheet supply rollers (3) into said folding gap (14), said first sensor (4) providing a first "edge present " signal, a second sensor (16) located at a predetermined distance downstream of said first sensor (4) also as viewed in said sheet feeding direction (B), said second sensor (16) providing a second "edge present" signal, conductor means connecting said first and second sensors (4, 16) to said control means (35) for supplying said first "edge present" signal to said control means (35) to initiate an introduction of a sheet into said folding system and for supplying said second "edge present" signal to said control means (35) for initiating a drive control, said control means comprising a memory (50) having stored therein a plurality of folding programs for defining the number and position of fold lines on a sheet depending on a longitudinal dimension of a sheet, said control means further including signal generating means (75, 78) for providing a sheet length signal representative of the length of a sheet for selecting one program out of a number of programs stored in said memory (50) in accordance with said sheet length signal and in response to at least one of said "edge



present" signals, said signal generating means (75, 78), said first and second sensors (4, 16) and said memory cooperating in said control means (35) for operating said reversible drive means to selectively drive said first, second, and third belt means (5, 6, 10) so that the direction of rotation of said drive means is in accordance with said selected folding program based on said sheet length signal as communicated to said memory by said signal generating means (75, 78), and wherein said drive means (8, 8') comprise a controlled motor (8') for driving said sheet supply rollers (3) at a controlled speed in said sheet feeding direction, and a reversible stepping motor (8) for operating said first belt means (5), said second belt means (6), and said third belt means (10) in a direction of rotation and in rotary steps in response to said control means (35) for folding a sheet in accordance with said selected one program.

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**5,045,040**

## ENVELOPE CLOSURE SEAL AND METHOD

**Kurt W. Vetter, Long Island, N.Y., assignor to Uniflex, Inc., Westbury, N.Y.**

**Division of Ser. No. 350,460, May 11, 1989, Pat. No. 4,932,791, which is a continuation-in-part of Ser. No. 187,650, Apr. 28, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 487,393**

**Int. Cl.**[5] **B31B** *23/72, 23/10*

**U.S. Cl. 493—194** **5 Claims**

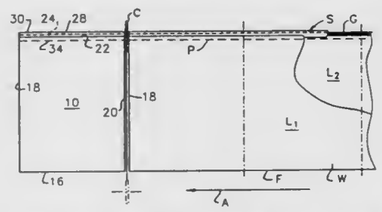
1. The method of forming closure seals for envelopes including overlying panels each having bottom, side and top edges, said method comprising the steps of:

longitudinally folding a continuous web of thermoplastic material to establish superimposed layers extending from a fold line to free edges of the web material;

providing a band of pressure sensitive adhesive along one of said layers in generally parallel relationship to said free edges;

covering said band of pressure sensitive adhesive with a continuous release liner strip of a width to extend between and project from the free edges of said layers; and

severing the folded web and said release liner strip and simultaneously heat fusing said layers at spaced intervals to form the side edges of the envelopes;



said release liner strip preventing heat fusion of said layers across the width of said liner strip to delimit upper ends of side edge fusion and to ensure separability and removal of said liner strip from between said layers.

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**5,045,041**

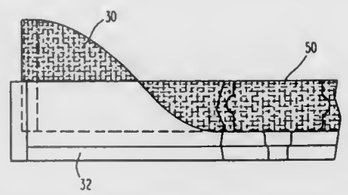
## METHOD OF MANUFACTURING A REUSABLE FABRIC-COVERED HEAT-EXCHANGE BAG

**Edward Murphy, Hatboro, Pa., assignor to SePro Healthcare Inc., Montgomeryville, Pa.**

**Filed Dec. 1, 1989, Ser. No. 444,680**

**Int. Cl.**[5] **B31B** *27/25, 25/64, 39/26*

**U.S. Cl. 493—194** **16 Claims**



1. A method of manufacturing a reusable heat exchange bag, comprising:

providing waterproof film means for containing a heat exchange medium and fabric material means for providing a comfortable contact surface against a patient's skin, said waterproof film means and said fabric material means comprising respectively nonfibrous and fibrous heat sealable thermoplastic stock;

folding said fabric material means along a fold line to enclose a substantial portion of said waterproof film means within said fabric material means; said fold line comprising a first edge of the reusable heat exchange bag when said bag is in a flattened condition;

heat sealing said water proof film means and said fabric material means together to define with said first edge a peripheral region of said bag including a tear initiation heat seal comprising a line of weakening for facilitating the subsequent severing of said reusable heat exchange bag from said thermoplastic stock.



**5,045,042**

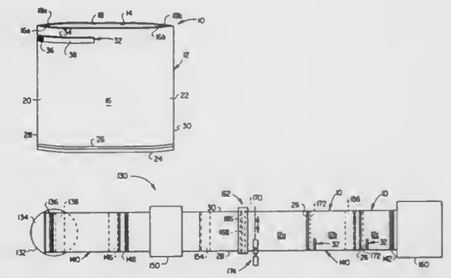
## PLASTIC FILM BAG WITH INTEGRAL PLASTIC FILM TIE ELEMENT, AND ASSOCIATED FABRICATION METHODS

**Gary L. Rutledge, Dallas, Tex., assignor to John C. Marrelli, Tustin, Calif.**

**Division of Ser. No. 117,209, Nov. 4, 1987, Pat. No. 4,854,735. This application Jul. 17, 1989, Ser. No. 381,105**

**Int. Cl.**[5] **B31B** *23/74, 23/90*

**U.S. Cl. 493—225** **21 Claims**



1. A method of continuously forming plastic film bags having integral, ready-to-use top tie elements, said method comprising the steps of:

longitudinally conveying an elongated plastic film element at least partially defined by a duality of opposed plastic film sheets extending across the width of said plastic film element;

delimiting on the plastic film element a series of individual bags by forming cut lines and weld lines thereon, each of said bags having an upper end, a pair of side edge portions defined by a plurality of plastic film layers, and a pair of opposite side walls extending between said side edge portions; forming from a relatively limp plastic material a series of elongated closure tie elements having a relatively large inner end portion including an inner end edge of said tie element, a free outer end portion, and a longitudinally intermediate portion extending between said inner and outer end portions;

delivering and positioning one of said series of elongated plastic tie elements with said large inner end portion, including a section thereof closely adjacent said inner end edge placed in an abutting and laterally overlapping relationship with a side surface of one of said side edge portions of said bag adjacent the upper end portion of each bag with the relatively large end portion positioned against at least two film layers of a side edge portion of each bag; and

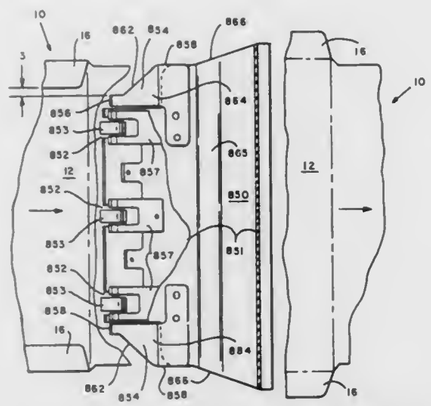
weldingly intersecuring the relatively large inner end portion area of each of the series of elongated plastic film tie elements and at least two film layers of side edge portions of each of the bags adjacent their upper ends to leave on each plastic film tie element a free outer end portion, whereby the free outer end portion of the tie element on each bag may be looped around an upper end portion of the bag, passed through the loop and then firmly pulled to constrict around, frictionally engage and tightly close such upper end portion, without separating the welded inner end portion of the tie element from its bag.

5,045,043

## FLAP OPENING MECHANISM AND METHOD

Michael A. Brown, 84 Field St., Norwalk, Conn. 06851; Carl A. Miller, 641 Jennings Rd., Fairfield, Conn. 06430; Morton Silverberg, 24 Edgewater Common, Westport, Conn. 06880, and Steven A. Supron, 11 Comstock Hill Ave., Norwalk, Conn. 06850

Filed Mar. 12, 1990, Ser. No. 491,875
Int. Cl.[5] B31B *1/36*
U.S. Cl. 493—245 11 Claims



1. A mechanism for opening side flaps of an envelope form, said side flaps being jointed to said form along fold lines and having a width perpendicular to said fold lines, said form lying substantially in a plane and said side flaps being rotated inwards to a closed position to lie substantially co-planar with said form said mechanism comprising:

a) means for transporting said form substantially in said plane in a direction parallel to said fold lines;

b) a plate, said plate including a forward portion lying inboard of said closed position of said flaps, a rear portion extending outboard of said fold lines in an open position of said flaps, and angled edges extending from said forward position to said rear portion, at least said forward portion being substantially parallel to said plane and spaced from said plane by a distance less than said width of said flaps

c) separator elements positioned substantially co-planar with said form, said separator elements having tips positioned inboard of said closed position of said flaps, outer edges substantially parallel to and inboard of said fold lines and outboard of and behind said tips, said knife edges angled outwards from said tips to said outer edges; and

d) steps connecting said separator elements to said plate; whereby

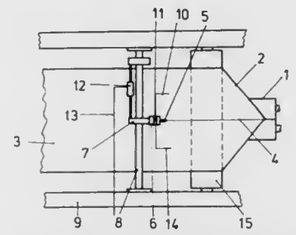
e) as said form is transported said flaps are separated from said form by said knife edges, and as said form is transported further said side flaps are fully engaged by said separator elements until said side flaps reach said steps which displace said flaps to contact said angled edges of said plate, where upon, as said form is transported further said angled edges bear upon said side flaps away from said fold lines causing said side flaps to rotate outwards to said open position.

5,045,044

## METHOD AND DEVICE FOR FOLDING A PAPER WEB

Malcolm McPherson, Poole-Dorset, United Kingdom, and Reinhold Ernest, Stadtbergen, Fed. Rep. of Germany, assignors to Grafotec Kotterer GmbH, Diedorf, Fed. Rep. of Germany

Continuation of Ser. No. 259,736, Oct. 19, 1988, abandoned.
This application Aug. 13, 1990, Ser. No. 566,306
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735856; Nov. 26, 1987, 3740046
Int. Cl.[5] B31B *1/36, 1/62*
U.S. Cl. 493—328 1 Claim



1. In a method of producing at least one fold in a plurality of superposed layers of paper webs, comprising the steps of:

continually heating a liquid folding adjuvant, comprising essentially tap water, to a temperature in a range extending from essentially 30° C. to 60° C.;

applying the heated tap water in the form of a thin jet to the top layer of said superposed layers of paper webs along a fold line;

folding the web on which the heated tap water is applied along the fold line;

applying glue from a glue applying system in the form of a stream to the layers of said superposed layers of paper webs below said top layer; and

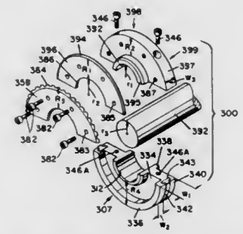
flushing the glue applying system with heated water.

5,045,045

## SKIP-SCORER, SKIP-PERFORATOR FOR USE WITH PRINTING PRESS SYSTEMS

Harold D. Davenport, La Mirada, and Anthony J. Devito, Huntington Beach, both of Calif., assignors to D & D Enterprises, Orange, Calif.

Filed Mar. 15, 1990, Ser. No. 493,721
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[5] B26D *3/08*
U.S. Cl. 493—363 14 Claims



1. An improved web scoring apparatus comprising,

a first arcuate blade support element having a flat surface and an arcuate peripheral surface,

a first arcuate pad support element having a flat surface and an arcuate peripheral surface,

said first blade support element and said first pad support element arranged to be joined together at the respective flat surfaces so that the respective arcuate peripheral surfaces form a continuous arcuate surface,

first arcuate blade means detachably mounted to said first blade support element,

first resilient pad means detachably mounted at the peripheral surface of said first pad support element,

said first pad support element includes a groove in the peripheral surface thereof to receive said first resilient pad means,

said groove includes an enlarged inner end to secure said first resilient pad means,

said first resilient pad means includes an enlarged inner end which is detachably secured in said groove,

a second arcuate blade support element having a flat surface and an arcuate peripheral surface,

a second arcuate pad support element having a flat surface and an arcuate peripheral surface,

said second blade support element and said second pad support element arranged to be joined together at the respective flat surfaces so that the respective arcuate peripheral surfaces form a continuous arcuate surface which is mounted adjacent to the continuous arcuate surface of said first arcuate blade support element and said first arcuate pad support element,

second arcuate blade means detachably mounted to said second blade support element, and

second resilient pad means detachably mounted at the peripheral surface of said second pad support element,

said second pad support element includes a groove in the peripheral surface thereof to receive said second resilient pad means,

said groove includes an enlarged inner end to secure said resilient pad means,

said second resilient pad means includes an enlarged inner end which is detachably secured in said groove,

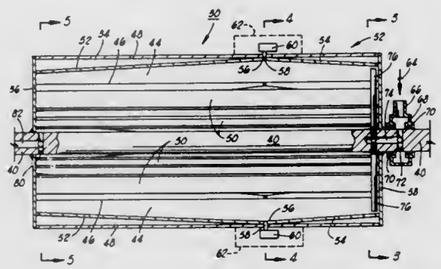


5,045,046

## APPARATUS FOR OIL SEPARATION AND RECOVERY

Lesley O. Bond, 707 Peterson Rd., Neosho, Mo. 64850

Filed Nov. 13, 1990, Ser. No. 612,404
Int. Cl.[5] B04B *15/00*
U.S. Cl. 494—10 14 Claims



1. Apparatus for extraction of oil from a water/dirt/oil mix, comprising:

a container having an axis of revolution, first and second ends, and a side wall consisting of plural, V-shaped flutes forming a continuous side wall as flute open tops are joined contiguously and apex folds are directed radially outward from the axis;

a plurality of triangular baffles having base and apex, each secured within a respective flute with base adjacent the first end wall and the triangle apex secured at a first point within the apex fold of the flute;

shaft means secured along the axis of revolution of the container;

means for controllably rotating the shaft means;

input means for releasing the water/dirt/oil mix adjacent the triangular baffles at the first end wall;

first output means connected through the triangle apex to conduct water/dirt heavies to the exterior; and

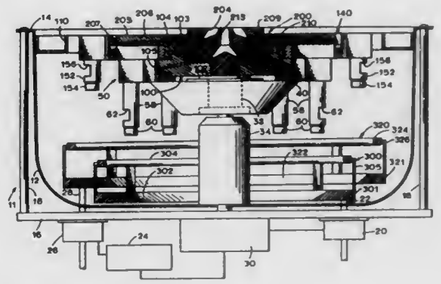
second output means proximate the container axis of revolution at the second end wall to conduct oil product lighter components for recovery.

5,045,047

## AUTOMATED CENTRIFUGE

Burleigh M. Hutchins, Hopedale; Raymond R. Dunlap, Uxbridge; Louis Abrahams, Worcester, and Susan M. Amato, Milford, all of Mass., assignors to Zymark Corporation, Hopkinton, Mass.

Filed Jul. 17, 1989, Ser. No. 380,965
Int. Cl.[5] B04B *5/02*
U.S. Cl. 494—17 26 Claims



1. A centrifuge apparatus comprising:

rotor means;

drive means coupled to said rotor means;

inner ring means adapted to pivotally support an annular array of inner containers having open upper ends;

inner coupling means coupling said rotor means to said inner ring means so as to cause rotation thereof and resultant centrifugal force induced pivotal movement of said inner containers into centrifuge positions wherein said open upper ends are directed radially inwardly;

outer ring means adapted to pivotally support an annular array of outer containers having open upper end and displaced outwardly from the inner array in a direction transverse to the rotational axis of said rotor means;

outer coupling means coupling said rotor means to said outer ring means so as to cause rotation thereof and resultant centrifugal force induced pivotal movement of said outer containers into centrifuge positions wherein said open upper ends are directed radially inwardly; and

inner orientation means for preventing said movement of said upper ends of said inner containers into said centrifuge positions so as to permit decanting of said inner containers such that fluid is transferred from said inner to said outer containers.

5,045,048

## ROTARY CENTRIFUGE BOWL AND SEAL FOR BLOOD PROCESSING

Edward W. Kaleskas, Jefferson; Thaddeus G. Minior, Jr., Bedford, and Sepideh H. Nott, Fall River, all of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Filed Mar. 29, 1990, Ser. No. 502,102
Int. Cl.[5] B04B *7/08*; F16J *15/54*
U.S. Cl. 494—41 12 Claims

1. In a rotary centrifuge bowl having a non-rotatable header coupled by a rotary seal to a bowl body, the improvement comprising:

a) a dynamic rotary seal having:

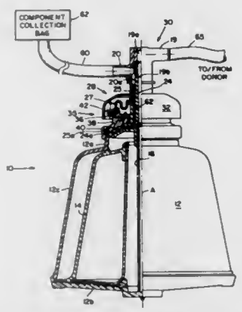
(i) an upper non-rotatable bearing surface ring member; and

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(ii) a lower rotatable bearing surface ring member formed of a ceramic, one planar side of which faces said upper ring member; and

(iii) an adapter ring member formed of blood compatible plastic and adhesively bonded to a side of said lower ring member opposite said planar side, said adapter ring being directly connected to a neck of said bowl body about the periphery thereof and including projections integrally formed on a surface of said adapter ring member to which said lower ring member is bonded and




wherein the adapter ring is a molded piece and the projections are integrally formed thereon and wherein a side of the lower ring member opposite said planar side is formed of at least three portions:

(i) a first portion which extends radially from the inner periphery of the lower ring member;

(ii) a second portion which extends vertically downward toward the interior of the bowl body; and

(iii) a third portion which extends radially outwardly from the second portion to the outer periphery of the lower ring member.

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**5,045,049**

**CENTRIFUGAL SEPARATOR**

**Christer Lantz, Stocksund, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden**

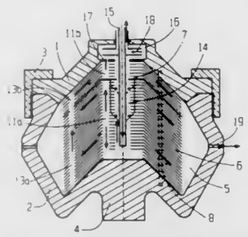
**PCT No. PCT/SE88/00541, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO90/04461, PCT Pub. Date May 3, 1990**

**ub. Date DOct. 3, 1989, Ser. No. 487,962**

**Claims priority, application Sweden, Oct. 17, 1988, 8803687**

**Int. Cl.[5] B04B** *1/08*

U.S. Cl. 494—70 **5 Claims**



1. Centrifugal separator comprising a rotor having a central inlet chamber (**14**) for a liquid mixture of components to be separated and a separation chamber (**5**) which surrounds the inlet chamber (**14**) and contains a stack of at least partly conical separation discs (**6**) arranged axially spaced from each other and coaxially with the rotor and having radially inner and radially outer edges, the spaces between the separation discs having inlets for mixture at the radially inner edges of the separation discs, which inlets communicate with said inlet chamber (**14**), and outlets for separated components radially outside the inlets, so that mixture as well as components separated therefrom are allowed to flow radially outwards between the separation discs during the operation of the rotor, characterized in that the spaces between the separation discs are open towards and communicate directly with the inlet chamber around the whole of the rotor axis, and that at least some of the separaton discs (**6**) have axially extending through holes (**11**) situated radially inside said outlets of the spaces between the separation discs and at a distance from the radially inner edges of the separation discs, that is smaller than the distance between the holes (**11**) and the radially outer edges of the separation discs.

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**5,045,050**

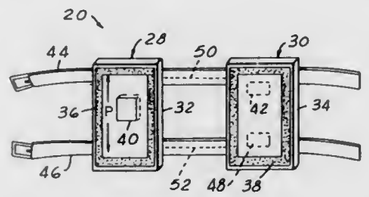
**METHOD AND APPARATUS FOR THE TREATMENT OF CANCER**

**Abraham R. Liboff, Birmingham, Mich.; Bruce R. McLeod, Bozeman, Mont., and Stephen D. Smith, Lexington, Ky., assignors to Life Resonances, Bozeman, Mont.**

**Filed Nov. 15, 1989, Ser. No. 437,485**

**Int. Cl.[5] A61N** *1/00*

U.S. Cl. 600—9 **17 Claims**




1. A method for treating cancer comprising the steps of:

positioning a magnetic field generating means adjacent a biological subject afflicted with cancer;

generating a magnetic flux with said magnetic field generating means, said magnetic flux extending through said subject parallel to a predetermined axis projecting through said subject;

fluctuating said magnetic flux and controlling the density of said magnetic flux to create and maintain a predetermined relationship between the frequency of said fluctuations and the magnitude of said magnetic flux density which regulates the growth characteristics of cancer cells in said subject;

wherein said predetermined relationship of said frequency to said magnitude of said magnetic flux density is a function of

$$f_c/B = q/(2\pi m)$$

where $f_c$ is said frequency in Hertz, B is the average value of said magnetic flux density in Tesla parallel to said predetermined axis, q/m has a value of from about $5\times10^5$ to about $100\times10^6$ in Coulombs per kilogram and where B preferably has a value not in excess of about $1\times10^{-2}$ Tesla, and wherein q and m are, respectively, equal to the charge and mass of a preselected ionic species.



**5,045,051**

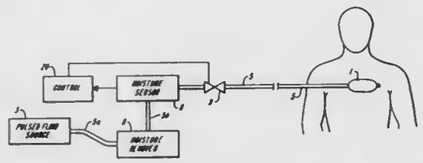
**LEAK DETECTOR**

**Fredric L. Milder, Brookline, Mass., and Saul Stricker, Richmond Hill, Canada, assignors to Abiomed, Inc., Danvers, Mass.**

**Filed Mar. 14, 1989, Ser. No. 323,322**

**Int. Cl.[5] A61B** *19/00*

U.S. Cl. 600—16 **9 Claims**



1. A system for leak detection in a blood pump having a pumping membrane located within a body and a fluid drive conduit extending from the pumping membrane to a drive source, such system comprising

moisture remover means for fluid communication with the conduit having a capacity for removing just sufficient moisture to maintain a stable water vapor pressure in the conduit due to intrinsic permeability of said pumping membrane located within the body and communication with the conduit, and

humidity detector means in fluid communication with said conduit for monitoring humidity, whereby an increase in water vapor pressure provides an indication of membrane leakage.

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**5,045,052**

**SEALING DEVICE FOR CONTROLLING ILEO-COLOSTOMIES**

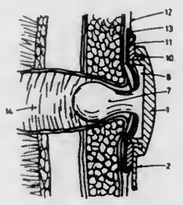
**José V. Sans, Burdeos, 8-10, 08029-Barcelona, Spain**

**Filed Nov. 15, 1989, Ser. No. 437,364**

**Claims priority, application Spain, Nov. 15, 1988, 8803463; Oct. 25, 1989, 903591**

**Int. Cl.[5] A61F** *2/02, 5/44*

U.S. Cl. 600—32 **18 Claims**



1. A sealing device for controlling ileo-colostomies, comprising an external cover; a hollow stopper insertable into a hole or preternatural anus practiced; a base plate to be applied on an external face of an abdominal area and surrounding the hole or preternatural anus; and means for detachably connecting said cover with said stopper and with said base plate and including connecting formations provided on said stopper and said cover and detachably engageable with one another, so that said stopper can be connected with said cover by pressing said stopper against said cover, and said stopper can be withdrawn from said cover being replaced by a colostomy bag or another stopper.

**5,045,053**

**DEVICE FOR RECOVERING A TISSUE SAMPLE OR TISSUE FLUID**

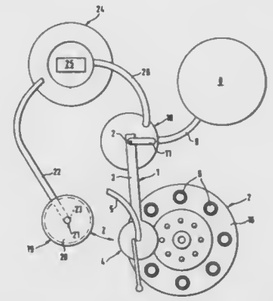
**Lutz Kothe, Bodmaner Str. 15, D07764 Radolfzell 14, Fed. Rep. of Germany**

**Filed Jun. 21, 1989, Ser. No. 369,304**

**Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3821336; Apr. 14, 1989, 3912257**

**Int. Cl.[5] A61N** *1/30*

U.S. Cl. 604—21 **23 Claims**



1. A device for recovering a tissue sample comprising a surgical instrument for taking a tissue sample:

tubing having one end connected to said surgical instrument and the other end connected to a transmission head provided with sealing means for sealing and seating said transmission head to a tissue collecting apparatus;

a rotary lever connecting said transmission head to a rotary valve unit, said rotary lever having a borehole; and

a hollow connecting piece having one end in communication with said borehole and the other end in communication with a vacuum-producing means such that when said transmissions head is seated on said collecting apparatus as vacuum-producing means draws air from said hollow connecting piece, said borehole, said transmission head and said tubing for drawing a tissue sample from said surgical instrument, through said tubing, to said transmission head from which said sample is deposited into said collecting apparatus.

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**5,045,054**

**APPARATUS FOR IMPLANTATION AND EXTRACTION OF OSTEAL PROSTHESES**

**Larry L. Hood, Laguna Hills; Robert C. Klapper, Los Angeles, and James T. Caillouette, Newport Beach, all of Calif., assignors to Advanced Osseous Technologies Inc., Aliso Viejo, Calif.**

**Filed Feb. 6, 1990, Ser. No. 475,492**

**Int. Cl.[5] A61B** *17/32;* **A61H** *1/00*

U.S. Cl. 604—22 **18 Claims**

1. Apparatus comprising:

an ultrasonic power generator including an output line for transmission of electrical energy therefrom;

regulator means for regulating said ultrasonic power generator;

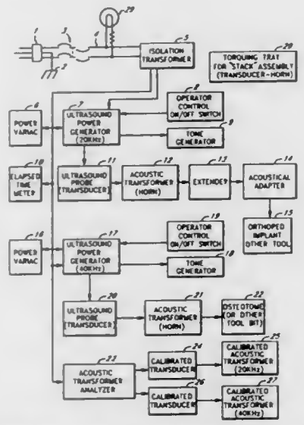
a transducer connected to said output line for converting said electrical energy to a linear mechanical motion at a first predetermined frequency;

an acoustic transformer connected to said transducer for modulating peak-to-peak motion of said transducer;

workpiece means for carrying out a desired manipulation, said workpiece means being selected from the group consisting of surgical tools and prosthetic devices; and

coupling means for detachably connecting said acoustic

transformer to said workpiece means, said coupling means including adapter means for isolating thermally the workpiece means connected thereto and for adjusting nominal resonant frequency in the range of 20 KHz ±50 Hz.



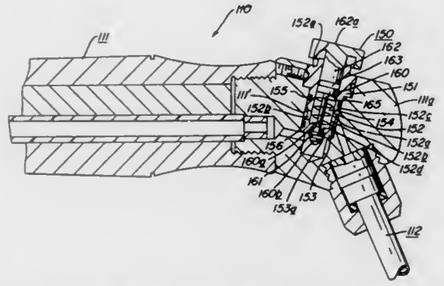
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**5,045,055**

**FLOW CONTROL VALVE ASSEMBLY FOR SYRINGES**

**Donald I. Gonser, and Douglas M. Reinhart, both of Lancaster, Pa., assignors to Den-Tal-Ez, Inc., Audubon, Pa.**

**Division of Ser. No. 260,932, Oct. 21, 1988, Pat. No. 4,957,483.**
**This application Jun. 7, 1990, Ser. No. 535,040**
**Int. Cl.[5] A61G *17/02***
**U.S. Cl. 604—33** **5 Claims**



1. In a syringe having a flow control nozzle mounted on a proximal end of a handle and communicating through a bore in the handle with a source of fluid connected to a distal end of the handle, and flow control valve means mounted in the bore for controlling flow of the fluid to the nozzle, the improvement wherein the flow control valve means includes a tubular valve body for insertion in the bore and having an end wall with an axial port and at least one lateral port adjacent said end wall, a cavity in said valve body providing fluid communication between said ports, a valve stem mounted in said valve body cavity for axial motion relative to said axial port, said valve stem having a head extending through said axial port with an annular groove adjacent said end wall, an 0-ring removably mounted in said groove and axially movable with said head for seated engagement with said end wall around said axial port, biasing means in said cavity operatively connected between said stem and said valve body for biasing said 0-ring into said seated engagement, and finger operable means on said stem for displacing said 0-ring out of said seated engagement to afford fluid flow through said ports, said 0-ring cooperating with said end wall to provide the sole means for maintaining said stem operatively assembled with said valve body.

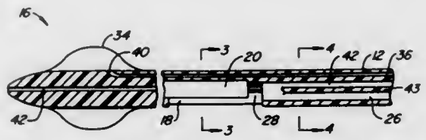
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**5,045,056**

**METHOD AND DEVICE FOR THERMAL ABLATION OF HOLLOW BODY ORGANS**

**Robert S. Behl, 361 Tioga Ct., Palo Alto, Calif. 94306**

**Filed Sep. 15, 1989, Ser. No. 407,839**
**Int. Cl.[5] A61M *31/00***
**U.S. Cl. 604—49** **54 Claims**



13. A method for ablating a hollow body organ, said method comprising:

percutaneously introducing a catheter into the interior of said hollow body organ, said catheter having proximal and distal ends and including a heating means at or near its distal end;

introducing a substantially unheated thermally conductive medium through the catheter to the interior of said hollow body organ, wherein said medium is generally unconstrained so that it is in direct contact with the interior of the hollow body organ;

heating the thermally conductive medium within the hollow body organ using the heating means on the catheter to a temperature sufficient to destroy the lining of said organ, whereby said organ will subsequently fibrose and be resorbed over time.

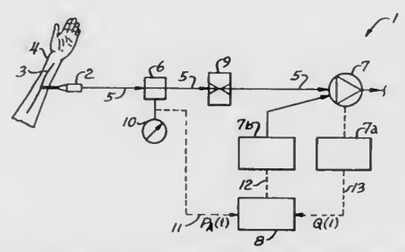
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**5,045,057**

**APPARATUS AND METHOD FOR WITHDRAWING AN OPTIMUM AMOUNT OF BLOOD PER UNIT OF TIME FROM A DONOR**

**Petrus J. D. M. Van Driessche, Jansteen, and Lambertus G. P. Dalmolen, Arnhem, both of Netherlands, assignors to Akzo nv, Arnhem, Netherlands**

**Filed May 30, 1989, Ser. No. 358,770**
**Claims priority, application Netherlands, Jun. 1, 1988, 8801400**
**Int. Cl.[5] A61M *1/10***
**U.S. Cl. 604—50** **13 Claims**



1. An apparatus for withdrawing an optimum amount of blood (Qo) per unit of time from a donor comprising:

a. a blood connection means for connecting the apparatus to the vascular system of the donor having an inlet open to said vascular system and an outlet;

b. blood flow conduit means for conducting blood withdrawn from the donor by way of said blood connection means, having an inlet connected to said outlet of said blood connection means and an outlet;



c. a blood pump connected to the outlet of said blood flow conduit means for withdrawing blood from the donor through said blood flow conduit means, said pump being connected to a power source so as to be energized by it;

d. blood flow rate (Q) measuring means cooperating with said blood pump to obtain an electric signal representing the flow rate of blood through said blood pump which is supplied to a flow rate output connection;

e. a pressure transducer for measuring the blood pressure ($P_A$), connected to said blood flow conduit means between said blood connection means and said blood pump, said pressure transducer converting $P_A$ into an electric signal supplied to a transducer output connection;

f. a control device connected to said transducer output connection, said blood flow rate measuring means output connection, and said power source of said blood pump for controlling Q through said blood pump in response to $P_A$ and Q, wherein said control device comprises means for adjusting Q through said blood pump to Qo at which the change in pressure ($\Delta P_A$) resulting from a particular change in the flow rate remains less than a maximum allowance value $(\Delta P_A)_m$.

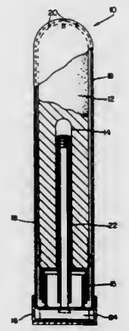
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**5,045,058**

**APPARATUS AND METHOD FOR THE CLEANSING AND ANTISEPSIS OF THE VAGINA**

**George Demetrakopoulos, 1942 Calvert St., NW., Washington, D.C. 20009**

**Filed Jul. 29, 1988, Ser. No. 225,805**
**Claims priority, application United Kingdom, Dec. 30, 1987, 872069**
**Int. Cl.[5] A61M *31/00***
**U.S. Cl. 604—55** **18 Claims**



1. An apparatus for use in cleansing and antisepticizing the vagina, comprising a substantially phallic-shaped solid soap material containing an antiseptic, a substantially cylindrical reinforcing non-soap core material embedded within said solid soap material, a substantially phallic-shaped removable outer casing disposed around and completely enclosing said solid soap material, a telescoping plunger disposed to fit inside said core material and a rubber head attached to said plunger at one end, wherein said rubber head is disposed to slidably engage inside said main casing, thereby enabling said telescoping plunger, said rubber head, and said main casing to function as a syringe.

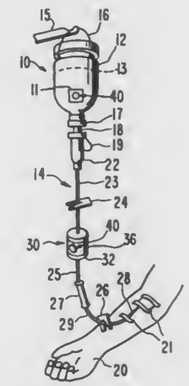
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**5,045,059**

**INTRAVENOUS SYSTEM FOR DELIVERING A BENEFICIAL AGENT**

**Felix Theeuwes, and Su I. Yum, both of Los Altos, Calif., assignors to Alza Corporation, Palo Alto, Calif.**

**Division of Ser. No. 311,906, Feb. 15, 1989, Pat. No. 4,969,871.**
**This application Aug. 15, 1990, Ser. No. 568,457**
**The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.**
**Int. Cl.[5] A61M *37/00***
**U.S. Cl. 604—82** **21 Claims**



1. A parenteral delivery system for administering an agent parenterally to an animal in which the agent is formulated in situ, comprising in combination:

(1) a container of a pharmaceutically acceptable parenteral fluid that is a carrier for the agent;

(2) a parenteral fluid administration set connected to the container for permitting the fluid to flow from the container through the administration set to the animal, the set comprising a drip chamber, tubing extending from the drip chamber to the animal, and an agent formulator connected into the tubing such that the intravenous fluid flows through the formulator;

the formulator comprising:

(a) a chamber having fluid inlet and outlet means to maintain a continuous flow of the parenteral fluid therethrough, the chamber having a wall portion that (1) is permeable to the beneficial agent to be delivered into the fluid and (2) prevents convective flow of parenteral fluid therethrough, the wall portion having an interior surface and an exterior surface which is accessible from the exterior of the formulator;

(b) a flow distributor within the chamber for distributing the flow of parenteral fluid along the interior surface of the wall portion; and

(c) a transdermal-type agent delivery device attached to the external surface of the wall portion, the delivery device comprising a reservoir containing the beneficial agent, the reservoir being releasably attached to the external surface of the portion;

wherein in operation, the fluid flowing through the chamber is directed by the flow distributor to flow along the internal surface of the wall portion, causing the agent to be delivered from the device through the wall portion and into the flowing fluid, the agent being delivered at a rate which is controlled substantially by the formulator and which is substantially independent of volumetric flow rate of the fluid flowing through the chamber.

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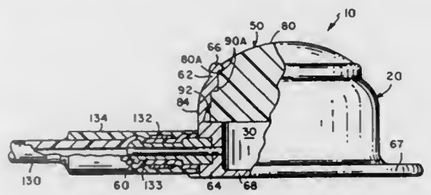


5,045,060

## IMPLANTABLE INFUSION DEVICE

Gerald S. Melsky, Lexington, and Frank R. Prosl, Duxbury, both of Mass., assignors to Therex Corp., Walpole, Mass.

Filed Apr. 26, 1989, Ser. No. 343,914
Int. Cl.[5] A61H *11/00*
U.S. Cl. 604—93 5 Claims



1. An implantable infusion device, comprising:
a rigid one-piece housing means forming an infusate chamber and including
a generally tubular wall section disposed about said chamber, said wall section having first and second axially spaced ends and an interior surface, said interior surface including a generally frustoconical portion narrower nearer said second end and a plurality of overhanging septum-retaining notches formed therealong;
a housing means wall closing said tubular wall section proximate said first end,
an entry port into said chamber proximate said second end, and
a ledge formed in said housing means intermediate said entry port and said chamber;
means for closing said entry port, said closing means including a self-sealing needle-penetrable septum of resilient material disposed on said ledge and engaging said notches by material flexure, said septum including a frustoconical wall having notches in interlocking engagement with the notches of said frustoconical wall portion so that the septum is secured at least partially within said entry port, and
means in said wall section defining a fluid outlet passage from said chamber for selectively delivering infusate therefrom.

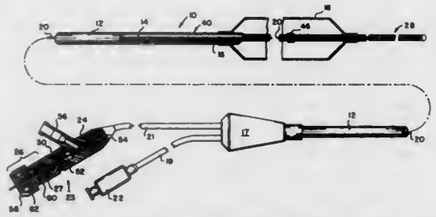
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5,045,061

## BALLOON CATHETER AND LOCKING GUIDEWIRE SYSTEM

C. Vaughan Seifert, Boxborough; Wolcott M. Downey, Melrose, and Peter J. Shank, Burlington, all of Mass., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 2, 1990, Ser. No. 474,371
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—96 25 Claims



1. A dilatation catheter and guidewire comprising:
an elongate flexible catheter shaft having a proximal end, a distal end, a guidewire lumen and an inflation lumen;
a dilatation balloon mounted on the distal end of the shaft with the inflation lumen being in communication with the interior of the balloon;
a guidewire extending through the guidewire lumen, the guidewire comprising a shaft adapted to extend fully through the guidewire lumen and a flexible distal segment affixed to the distal end of the guidewire shaft, the flexible distal segment extending distally beyond the distal end of the catheter shaft;
means for attaching an extension wire to the proximal end of the guidewire; and
means for releasably locking a proximal portion of the guidewire to the proximal portion of the catheter;
the guidewire lumen being larger in diameter than the outer diameter of any portion of the guidewire shaft proximal to the flexible distal segment; and
the locking means, when locked, allowing the guidewire to be rotated relative to the catheter while preventing relative axial movement between the guidewire and the catheter, and when unlocked, allowing the guidewire to be rotated and advanced independently of the catheter.

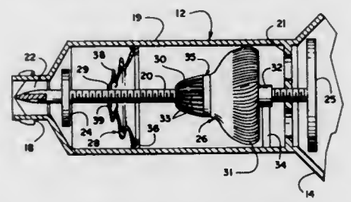
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5,045,062

## NON-REUSABLE HYPODERMIC SYRINGE WITH TURBINE ACCUATED FLOW CESSATION MEMBER

Jerry H. Henson, 4774 Annistown Rd., Stone Mountain, Ga. 30087

Filed Jul. 10, 1989, Ser. No. 377,055
Int. Cl.[5] A61M *5/50*
U.S. Cl. 604—110 17 Claims



1. In the combination of a hypodermic needle and syringe, the improvement comprising flow prevention means between said needle and said syringe for selectively preventing the flow of fluid from said syringe to said needle, said flow prevention means including an enclosure, a sealing means within said enclosure including an actuator, a first seal portion carried by said actuator, a second seal portion within said enclosure and fixed with respect thereto, said actuator being selectively movable within said enclosure so that said first seal portion approaches said second seal portion, the arrangement being such that the flow of fluid through said enclosure prevents sealing between said first seal portion and said second seal portion, the further improvement wherein said actuator comprises a fluid turbine rotatable by the flow of fluid through said enclosure, a central rod extending through said enclosure, external threads on said rod, said actuator defining a threaded hole therethrough, said rod being received within said threaded hole and threadedly engaging said actuator, the arrangement being such that the flow of fluid past said actuator causes rotation of said actuator and consequent movement along said rod towards said second seal portion.

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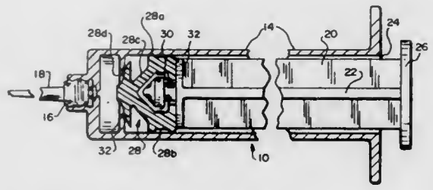
5,045,063

## HYPODERMIC SYRINGE

Alissa R. Spielberg, 10 Pinewood Cir., Wellesley, Mass. 02181

Filed May 30, 1989, Ser. No. 358,886
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—110 2 Claims

1. A non-reusable hypodermic syringe comprising:
A a body having a barrel for receiving a fluid to be injected;
B means forming an asymmetric aperture in said body and having a face tapering toward the forward end of said syringe;
C a plunger carrying a piston for ejecting fluid from said body;
D a collar on said piston, said collar:
(1) of larger size than said aperture,



(2) of smaller size than said barrel,
(3) deformable in a first direction for enabling passage through said aperture in said first direction, and
(4) resisting deformation in a second direction for blocking passage through said aperture in said second direction.

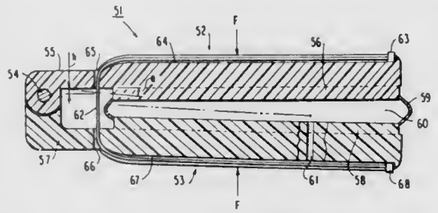
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5,045,064

## CONSTANT PRESSURE IMPLANTABLE PUMP RESERVOIR

Samir F. Idriss, Hyde Park, Mass., assignor to Infusaid, Inc., Norwood, Mass.

Filed Jun. 1, 1990, Ser. No. 531,592
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—132 20 Claims



1. An implantable pump reservoir comprising:
a housing having an internal chamber of variable volume, at least a deformable shape memory alloy component to apply a contracting force reducing the volume of said housing and;
means providing access to said chamber whereby when said chamber is filled with a material said shape memory alloy is stressed so that said material is released by the application of said contracting force.

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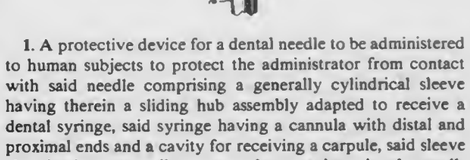
5,045,065

## CATHETER INTRODUCTION SYRINGE

J. Daniel Raulerson, 1203 Belleville Ave., Brewton, Ala. 36426

Continuation-in-part of Ser. No. 326,171, Mar. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 97,758, Sep. 17, 1987, Pat. No. 4,813,938. This application Mar. 15, 1990, Ser. No. 491,572
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—167 28 Claims

1. A catheter introduction syringe for the introduction of a catheter or catheter guide wire into a patient's body, said catheter introduction syringe comprises a hollow syringe barrel including a fluid chamber, a plunger movable between an advanced position defining a distal end and retracted position defining a proximal end and slidably disposed within said fluid chamber, a guide passage means formed longitudinally through and engaged with a distal end of said hollow syringe barrel and said plunger, said guide passage means including an aperture disposed within said fluid chamber and a valve assembly disposed in operative relationship relative to said guide passage means to prevent passage of fluid through said guide passage means during flushing or aspirating of said catheter introduction syringe or during the introduction or withdrawal



of a catheter or catheter guide wire through said guide passage means and to permit fluid to flow from the patient's body into said fluid chamber through said aperture, said guide passage means being configured to maintain the catheter or catheter guide wire in a substantially straight configuration while the catheter or catheter guide wire is disposed within said guide passage means.

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5,045,066

## DENTAL NEEDLE WITH STICK RESISTANT PROTECTIVE SLEEVE

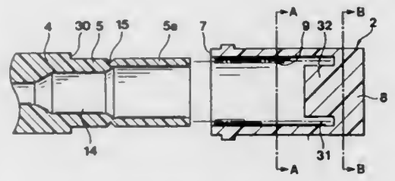
Gustav A. Scheuble, Des Plaines; Fritz Kohnke, Palatine, and Guenther Paczka, Hoffman Estates, all of Ill., assignors to Smith & Nephew, Inc., Largo, Fla.

Filed Jun. 7, 1990, Ser. No. 535,003
Int. Cl.[5] A61M *5/32*
U.S. Cl. 604—198 7 Claims



1. A protective device for a dental needle to be administered to human subjects to protect the administrator from contact with said needle comprising a generally cylindrical sleeve having therein a sliding hub assembly adapted to receive a dental syringe, said syringe having a cannula with distal and proximal ends and a cavity for receiving a carpule, said sleeve also having generally rectangular openings in the walls thereof, said hub assembly including releasable locking means extending through said generally rectangular openings to releasably retain said syringe in a retracted position, said sleeve extending over and covering both said distal and proximal ends of said cannula when said sleeve is in a retracted position.

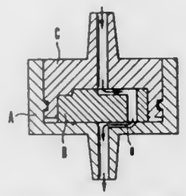
5,045,067
**BREAKAWAY TUBE ASSEMBLY**
Yukihiro Ohnaka, Tokyo, and Yoshikazu Kiso, Fujinomiya, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP88/00285, § 371 Date Sep. 11, 1989, § 102(e) Date Sep. 11, 1989, PCT Pub. No. WO88/06902, PCT Pub. Date Sep. 22, 1988
ub. Date DMar. 18, 1988, Ser. No. 415,341
Claims priority, application Japan, Mar. 19, 1987, 62-64864
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—244 6 Claims




1. A breakaway tube assembly comprising:
a tubular body formed of a rigid resin and having an open end;
said tubular body including a substantially annular frangible portion at a predetermined position in proximity to said open end;
said frangible portion fracturing upon application of a predetermined force thereto; and
hollow plug means formed of a resin more flexible than said rigid resin forming said tubular body, said hollow plug means having first and second end portions, said first end portion being closed and second end portion being open;
said hollow plug means being mounted over the outside of said tubular body to provide a seal for said open end of said tubular body, with said second end portion of said hollow plug means covering said substantially annular frangible portion of said tubular body; and
said frangible portion of said tubular body fracturing before said seal breaks upon application of said predetermined force.

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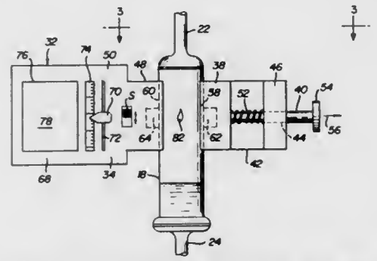
5,045,068
**FLOW RATE REGULATOR FOR LIQUID MEDICINE OR BLOOD TRANSFUSION UNIT**
Tatsuya Kawai, and Takashi Matsuda, both of Hiroshima, Japan, assignors to Japan Medical Supply Company Limited, Hiroshima, Japan
Filed Apr. 10, 1989, Ser. No. 335,408
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—246 5 Claims




1. A flow rate regulator usable for a liquid medicine or blood transfusion unit comprising:
a first cylindrical member including upper and lower ends, a bottom portion which substantially closes off the lower end, an outlet port which extends outwardly from said bottom portion, and a peripherally extending groove on said bottom portion, the cross-sectional area of said peripherally extending groove continually and gradually varying, said first cylindrical member further including a radial groove and a through hole in said bottom portion for connecting the peripherally extending groove with said outlet port via said through hole and said radial groove, and an annular protrusion formed on the inner cylindrical surface at the location between said upper and lower ends;
a second cylindrical member having upper and lower ends and including a bottom portion which substantially closes off the upper end, said second cylindrical member being rotatably fitted in the first cylindrical member and having a projection extending from said bottom portion, said second cylindrical member further including a through hole in said bottom portion, an inlet port which extends outwardly from said bottom portion and which communicates with said through hole in said bottom portion, and an annular groove formed on the outer cylindrical surface at a location between said upper and lower ends;
a disc-shaped member having a cut out portion which mates with said projection of said second cylindrical member so that said disc-shaped member will not be rotated relative to said second cylindrical member when fitted therein, said disc-shaped member being brought in close contact with said bottom portion of said first cylindrical member and having a through hole and a radial groove formed therein for connecting said peripherally extending groove on said bottom portion of said first cylindrical member with said through hole in said second cylindrical member when said first and second cylindrical members are rotatably fitted together with said disc-shaped member therebetween, by causing said annular protrusion of said first cylindrical member to enter said annular groove of said second cylindrical member.

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5,045,069
**PORTABLE INFUSION MONITOR**
Robert Imparato, 17 Rolling Wood Dr., Trumbull, Conn. 06611
Filed Jan. 17, 1989, Ser. No. 297,652
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—253 12 Claims

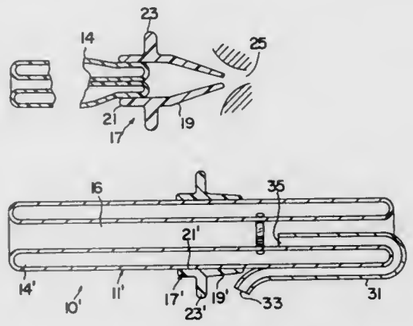



1. A device for monitoring the volumetric flow rate of an infusion liquid flowing through an IV set comprising, in combination:
a housing;
means for detachably mounting said housing onto a drip chamber forming part of said IV set;
means for detecting each drop of liquid falling through said drip chamber;
a clock in said housing;
a pulse counter in said housing coupled to said detecting means for counting the number of pulses produced by said clock between successive drops falling through said drip chamber;
means coupled to said pulse counter for calculating the rate at which each drop falls through said drip chamber and for producing a signal corresponding thereto;
a variable potentiometer in said housing;
means external to said housing for manually setting said potentiometer and for generating an input signal representing the drop volume;
means coupled to said variable potentiometer for combining said input signal and said drop rate signal and for producing an output signal representing the volumetric flow rate of liquid flowing through said IV set; and means for visually displaying said output signal.



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5,045,070
**BODY CAVITY PROBE WITH EVERTING TUBE**
Richard Grodecki, Milton, and Raymond Laborie, St. Bruno, both of Canada, assignors to Pentotech, Ltd., Ontario, Canada
Filed Dec. 22, 1988, Ser. No. 288,136
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—271 5 Claims

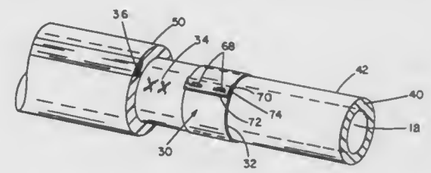



1. In an everting tube having an inner wall and an outer wall which together form a continuous elongated annular cross-section, said inner wall and outer wall defining therebetween a chamber, said inner wall surrounding an elongated open space, the improvement comprising a flexible introduction device having a rear portion and a forward portion, said rear portion having an inner surface affixed to said tube outer wall, said forward portion having a truncated conical section with an inner surface unconnected to said outer wall, said section being continuous and expansible, said device section being insertable into a body cavity orifice whereupon said tube may be everted into said body cavity through said device with said section expanding to allow said tube to evert therethrough.

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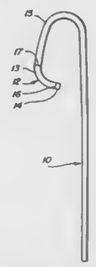
5,045,071
**DOUBLE WALL CATHETER WITH INTERNAL PRINTING AND EMBEDDED MARKER**
William McCormick, Carlisle, and Miles C. O'Donnell, Andover, both of Mass., assignors to MBO Laboratories, Inc., North Chelmsford, Mass.
Continuation of Ser. No. 196,047, May 19, 1988, abandoned, and Ser. No. 810,015, Dec. 17, 1985, abandoned. This application Jan. 19, 1989, Ser. No. 299,237
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—280 7 Claims

1. A catheter for insertion into biological tissue to provide an opening therein, and when so inserted, only the distal end of said catheter being detectable outside the biological tissue by means of a narrow electromagnetic field, said catheter comprising:
a double-walled tubular section having a proximal end and a distal end,
said double-walled tubular section, which does not interfere with an electromagnetic field, comprising a first tube, said first tube extending the entire length of said catheter from the proximal end to the distal end, said first tube defining an internal passageway which also extends the length of said catheter, and having an outer-surface which extends the length of said catheter, and a second tube, said second tube extending the length of said catheter and being connected to the outer surface of said first tube over its entire length forming a seam therebetween, said second tube having a smooth outer surface which defines the outer surface of said double-walled tubular section, and
a means for interfering with an electromagnetic field, said means for interfering being a small and narrow metal band attached to the outer surface of said first tube only at the distal end of said catheter, said metal band having a leading edge and a trailing edge which overlap when said band is wrapped around said first tube and which band is fused at least in part to said first tube, said means for interfering fitting into an indentation in an inner wall of said second tube at the distal end so as to maintain the smooth outer surface of said second tube without any protrusion at the means for interfering, said means for interfering disturbing a narrow electromagnetic field directed towards it even through biological tissue, but said means for interfering being so small and narrow a metal band so as to only disturb the field when the field is proximate to said means for interfering.




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5,045,072
**CATHETER HAVING HIGHLY RADIOPAQUE, FLEXIBLE TIP**
Miguel A. Castillo, Hialeah; Javier E. Castaneda, and Eric Glemser, both of Miami, all of Fla., assignors to Cordis Corporation, Miami Lakes, Fla.
Filed Jun. 13, 1989, Ser. No. 365,477
Int. Cl.[5] A61M 25/00
U.S. Cl. 604—280 30 Claims

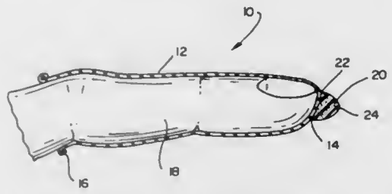



1. A flexible plastic arteriovenous catheter which defines a radiopaque catheter shaft and flexible, distal tip, said distal tip comprising a plastic formulation containing from 40 to 75 weight percent of radiopaque agent to be substantially more radiopaque than portions of said catheter proximal to said tip, said distal tip being softer than said portions of said catheter proximal to said tip.

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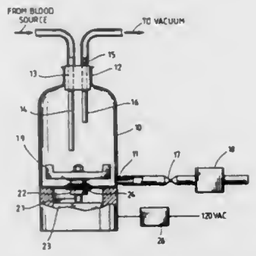
5,045,073
**DIGITAL APPLICATOR AND PROGRAM**
Eugene C. Wagner, 9 Tanglewild Pl., Chappaqua, N.Y. 10514
Filed Mar. 28, 1990, Ser. No. 500,588
Int. Cl.[5] A61M *35/00;* A46B *5/04*
U.S. Cl. 604—310 15 Claims



1. A digital applicator suitable for topically dispensing a desired amount of a preparation on a selected area, the applicator comprising a dactyl cot, means for dispensing the preparation, and means for fixing the dispensing means to the cot, the cot comprising a tubular casing having an open end and a closed distal end, the dispensing means comprising sponge means for absorbing a quantity of the preparation and for excreting the desired amount of the absorbed preparation on the selected area upon the application of compressive force exerted by a dactyl on which the applicator is mounted, substantially the entire casing except for the distal end being coiled about itself from the open end toward the distal end in a toroid, whereby the applicator may be easily mounted to a dactyl by uncoiling the toroid about the dactyl.

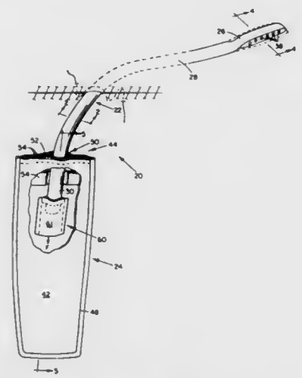
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5,045,074
**DIRECT DRIVE BLOOD DEFIBRINATION APPARATUS AND METHOD**
William C. Satterfield, Elgin; Joan E. Foytik; Joe W. Bailey, both of Bastrop, and William C. Schmidt, Fayetteville, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.
Filed May 17, 1989, Ser. No. 353,125
Int. Cl.[5] A61J *1/05*
U.S. Cl. 604—317 9 Claims




1. A direct drive blood defibrination unit comprising:
a vacuum bottle having an input port connectable to a source of blood to be defibrinated, a vacuum port connectable to a source of vacuum, and a drive port;
a stir bar located within said vacuum bottle;
a rotatable drive shaft connected to said stir bar and passing through said drive port, said stir bar being rotated when said drive shaft rotates;
a bacteria and vacuum seal surrounding said drive shaft adjacent to said drive port, for maintaining a pressure differential between an interior and an exterior of said vacuum bottle without bacterial contamination; and
a motor for rotating said drive shaft.

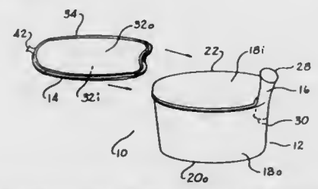
5,045,075
**SURGICAL DRAIN APPARATUS AND METHOD**
Robert A. Ersek, Austin, Tex., assignor to Renoble, N. V. - Division 1, Austin, Tex.
Filed Jun. 23, 1989, Ser. No. 370,632
Int. Cl.[5] A61M *27/00*
U.S. Cl. 604—317 29 Claims



1. A surgical drain comprising:
A. an elongated conduit portion having an outlet end and a marquise-shaped transverse cross-section, the conduit portion being adapted for transversing a wound with the major transverse axis of the marquise shape aligned with the wound so that the wound edges may conform to the marquise-shaped conduit portion and create a seal around the entire transverse perimeter of said conduit portion;
B. an elongated fluid intake portion connected to the end of said conduit portion opposite said outlet end and being adapted to be positioned within a patient's body through the wound;
C. a fluid flow passage extending longitudinally through said conduit portion and said fluid intake portion of the drain, the fluid flow passage being adapted for enabling fluid to flow through said fluid intake portion and said conduit portion and out said outlet end of said conduit portion; and
D. at least one fluid intake opening in said fluid intake portion of the drain for enabling fluid to flow into said fluid flow passage.

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5,045,076
**DISPOSABLE INSULATED SURGICAL BASINS**
Pam Pierce, 14163 Mandy La., Tyler, Tex. 75703
Filed Mar. 26, 1990, Ser. No. 498,847
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—317 16 Claims

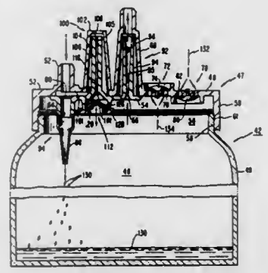


1. A surgical irrigation basin to contain a liquid irrigation solution and to be used in conjunction with an irrigation syringe, comprising
a bowl-like open topped body having a continuous side wall with an upper edge defining a closed curve in a single plane, said side wall having an inner wall and an outer wall symmetrically spaced a short distance from said inner wall with said inner wall and said outer wall interconnected at said upper edge of said side wall and with each of said inner and outer walls having a lower edge, a bottom closure having an inner bottom and an outer bottom symmetrically spaced a short distance from said inner bottom, each of said inner bottom and said outer bottom having an outer edge, with the outer edge of said inner bottom interconnected to the lower edge of said inner wall in liquid-tight relation and with the outer edge of said outer bottom interconnected to the lower edge of said outer wall in liquid-tight relation, so as to form a fully enclosed space between the interconnected inner side wall and inner bottom and the interconnected outer side wall and outer bottom, with said upper edge of said side wall adapted to releaseably mate with a cover in liquid-tight relation;
a substantially planar cover having a central portion with an upper surface and a lower surface and having an outer edge, said central portion being of double wall construction with an inner wall and an outer wall symmetrically spaced a short distance from said inner wall, with said inner wall and said outer wall interconnected at said outer edge of said cover so as to form a fully enclosed space between said inner wall said outer wall of said central portion of said cover, said outer edge defining a closed curve in a single plane with said closed curve defined by said outer edge matching said closed curve defined by said upper edge of said side wall of said body, said outer edge adapted to releaseably mate with said upper edge of said wall of said body in liquid-tight relation for the purpose of releaseably interconnecting said cover to said body; and
means forming a passageway from the exterior of the basin to the interior thereof for the purpose of inserting an irrigation syringe through the passageway to withdraw irrigation solution from the basin.



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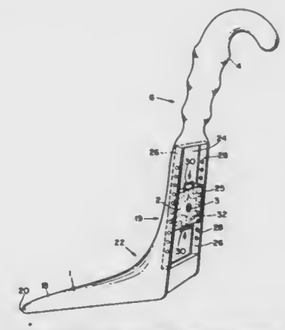
5,045,077
**BODY CAVITY DRAINAGE IMPLEMENT**
Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840
Continuation-in-part of Ser. No. 801,205, Nov. 25, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 116,390
Int. Cl.[5] A61M *1/00*
U.S. Cl. 604—321 26 Claims



1. An article useful in the suction-assisted removal of fluids, including gases, such as air, and liquids, such as blood, from a body cavity which will prevent backflow of gases into said cavity, without the intervention of any liquid seals, in the event the pressure within said cavity becomes negative relative to the pressure at the discharge end of conduit means for passing said fluids from the body cavity to an accumulation chamber surrounded by a container for the collection of said liquids, wherein said article consists of a removable cap assembly, for said container, consisting of
A. a hollow chamber within a housing comprising:
i) a first horizontal wall, consisting of a flat member containing a first port therethrough, at one end;
ii) a large opening at the end opposite said first horizontal wall; and
iii) an annular wall descending from the periphery of said first horizontal wall to said large opening;
B. conduit means, for passing said fluids through the cap into the hollow chamber, said conduit means consisting of
i) an inlet stem rising from the first port;
ii) a vertical elongated tubular element, containing a port in its side wall, attached at one end to said said inlet stem at said first port in the first horizontal wall and terminated at its other end by a discharge stem; and
iii) negative pressure transmission means to transmit changes in negative pressure to negative pressure indicating means;
C. one-way valve means, associated with the discharge stem of said conduit means, which will permit the flow of fluids therethrough when the pressure at the inlet stem is greater than that at the discharge stem of the valve and will close to prevent flow of fluids therethrough when the pressure at the inlet stem is less than that at said discharge end; and
D. negative pressure detecting and indicating means, in negative pressure-indicating connection with said conduit means, through said negative pressure transmission means, for indicating the negative pressure in the body cavity, when said one-way valve means is closed consisting of:
i) negative pressure indicating means rising from the outer surface of the first horizontal wall; and
ii) means for connecting said negative pressure indicating means to the negative pressure transmission means of the conduit means.

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5,045,078
**DEVICE FOR FEMALE INTERMITTENT SELF-CATHETERIZATION**
Linda R. Asta, 16 Alden Pl., West Newton, Mass. 02165
Continuation-in-part of Ser. No. 421,504, Feb. 6, 1990, abandoned. This application Dec. 10, 1990, Ser. No. 624,448
Int. Cl.[5] A61F *5/44;* A61B *5/00*
U.S. Cl. 604—329 21 Claims



1. A device for use during female, intermittent, self-catheterization to assist in guiding a catheter into the urinary meatus comprising:
a. a hand held guide having a vaginal insert portion joined to a guiding portion; and
b. a plurality of linearly arranged guide holes in the guiding portion at least one hole of the plurality being alignable with the meatus when the insert is in the vagina through which aligned guide hole a catheter may pass.

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5,045,079

## METHOD FOR ALLEVIATING FEMALE URINARY INCONTINENCE

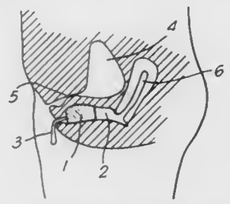
Hazel R. West, Elmley Castle, United Kingdom, assignor to Prosthex Limited, Camberley, United Kingdom

Division of Ser. No. 317,475, Feb. 13, 1989, abandoned. This application Jun. 15, 1990, Ser. No. 538,887

Claims priority, application United Kingdom, Jun. 15, 1987, 8713938

Int. Cl.[5] A61F 5/44

U.S. Cl. 604—329 14 Claims



1. A method for alleviating female urinary incontinence which comprises the steps of providing a tampon of a sponge material which, when compressed in the wet state is capable of supporting a weight of at least 0.23 kg (0.5 lb) and not greater than 4.54 kg (10 lb) per 60 mm length, soaking said tampon in water, and inserting said water-soaked tampon in the vagina, thereby supporting the urethra and preventing leakage from the urethra during active movement, the weight supporting capability of the sponge material being determined at 20° C. by compressing a cylinder of sponge material across its diameter of 34 mm between flat plates at a rate of approximately 22 mm per second, allowing a compressed dwell time of 1 minute, and subsequently allowing expansion over a period of 1 second, repeating the above cycle of operations a further four times with a dwell time in the uncompressed state of 1 second, and taking a measurement on the expansion stroke of the fifth cycle to determine the weight capable of being supported.

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5,045,080

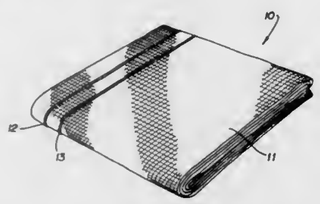
## SURGICAL FABRIC WITH PRINTED X-RAY MARKER

John Dyer, Randolph; Thomas A. Denny, East Brunswick, and Stephen Papp, Jr., Edison, all of N.J., assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Dec. 22, 1986, Ser. No. 944,135

Int. Cl.[5] A61F 13/00

U.S. Cl. 604—362 21 Claims



1. In a method of preparing a surgical sponge comprising an absorbent fabric having an X-ray detectable marker associated therewith, the improvement comprising applying a flowable, uniformly radiopaque polymeric composition to said fabric in a visually distinctive pattern and securely bonding said polymeric composition to said fabric to provide an X-ray discernable marker having an X-ray detectable pattern corresponding to the pattern of said polymeric composition as applied to said fabric.

5,045,081

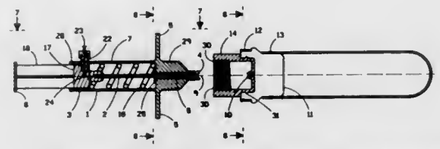
## TRAP IN BARREL ONE HANDED RETRACTABLE VIAL FILLING DEVICE

Edward D. Dysarz, 11423 Triola La., Houston, Tex. 77072

Continuation-in-part of Ser. No. 466,722, Jan. 16, 1990, Pat. No. 4,973,316. This application Aug. 17, 1990, Ser. No. 568,879

Int. Cl.[5] A61B 19/00

U.S. Cl. 604—411 9 Claims



1. A vial filling device for inserting a needle cannula through a plug in the vial wherein blood or other fluid flows into the vial comprising:

an elongated hollow barrel having a first end and a second end;

a barrel flange formed near the second end of said elongated hollow barrel;

a slidable piston inside of said elongated hollow, said slidable piston having a first end and a second end;

a needle cannula with a first end and a second end. Said first end of said needle cannula is fixed to said second end of said slidable piston;

a spring disposed between said second end of said slidable piston and said barrel flange;

a piston shaft with a thumb flat at the first end of said piston shaft and said piston shaft is further fixed to said slidable piston at the second end of said piston shaft;

a lap flange at the second end of said elongated hollow barrel, said lap flange having a first side and a second side, said first side is perpendicular to said needle cannula;

a concave annulus disposed on said second side of lap flange;

a plug having a first end and a second end, said plug is fixed to said vial at said second end of said plug;

a plug fitting with a first end and a second end, said plug fitting is fixed to said first end of said plug at said second end of said plug fitting;

a convex annulus fixed to said plug fitting and wherein said second end of elongated hollow barrel is attached to said second end of said plug fitting, pushing said concave annulus into said convex annulus thereby forcing said lap flange open to further allow said second end of said needle cannula to pass said lap flange and to further extend through said plug wherein said second end of said needle cannula is inserted into said vial wherein said blood or fluid flows through said needle cannula into said vial and wherein said spring will further thrust said slidable piston toward said second end of said elongated hollow barrel, pulling said needle cannula out of said vial and plug and further enclosing said needle cannula within said elongated hollow barrel and wherein said elongated hollow barrel is disengaged with said plug fitting and said vial and wherein said concave annulus is disengaged with said convex annulus thereby allowing said lap flange to close wherein said needle cannulus is trapped within said elongated hollow barrel and said lap flange cannot extend out of said elongated barrel.



5,045,082

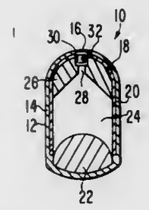
## LONG-TERM DELIVERY DEVICE INCLUDING LOADING DOSE

Atul D. Ayer, Palo Alto; James B. Eckenhoff, Los Altos; Jeremy C. Wright, Los Altos, and Anthony L. Kuczynski, Palo Alto, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jan. 10, 1990, Ser. No. 463,109

Int. Cl.[5] A23K 1/18

U.S. Cl. 604—892.1 13 Claims



1. A single dispensing device for delivering a beneficial agent to an environment of use at a substantially constant rate for an extended period of time, said single dispensing device comprising:

(a) a first agent delivery means for making a first beneficial agent formulation quickly and continuously available to the environment of use, said first agent delivery means comprising:

(1) a first beneficial agent formulation which comprises at least one beneficial agent, and which releases said beneficial agent within the environment of use substantially throughout the time prior to the release of a second beneficial agent; and

(2) retaining means for retaining the first beneficial agent formulation within or at the surface of a second agent delivery means while exposing the first beneficial agent formulation and the second agent delivery means to the environment of use; and

(b) a second agent delivery means for continuous and prolonged delivery of a second beneficial agent formulation to the environment of use, said second agent delivery means comprising:

(1) a wall that surrounds and defines an internal lumen, the wall comprising a composition that is permeable to the passage of fluid and substantially impermeable to the passage of beneficial agent;

(2) a second beneficial agent formulation in the lumen that provides a dispensable formulation including at least one beneficial agent to the environment of use;

(3) an expansion emans in the lumen for displacing said second beneficial agent formulation from the interior of the lumen to the environment of use after exposure to the environment of use; and

(4) an exit means in the dispensing device for delivery of said second beneficial agent formulation to the environment of use;

the release rates of agent from said first and second delivery means being selected to maintain the total agent delivery rate substantially constant over said extended period of time.

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**5,045,083**

## LIGHT-FAST DYEING OF SYNTHETIC POLYAMIDE FIBERS: ANIONIC DYE, OXAZOLO-ANILIDE AND A COPPER COMPLEX

**Brian Bennett, Bradford, Great Britain, assignor to Sandoz Ltd., Basle, Switzerland**

**Filed Feb. 22, 1990, Ser. No. 483,197**

**Claims priority, application United Kingdom, Feb. 22, 1989, 8904015; Mar. 1, 1989, 8904645**

**Int. Cl.**[5] **D06P** *1/39, 3/24, 5/06*

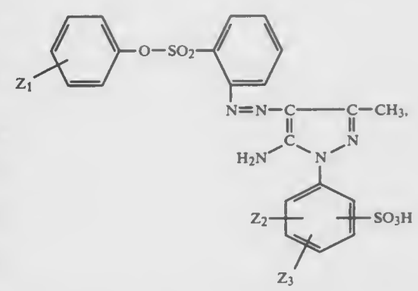
**U.S. Cl. 8—442** **39 Claims**

**1.** A process for dyeing polyamide which comprises applying thereto the following components a), b) and c):

a) one or more oxanilide **U.V.** absorbers;

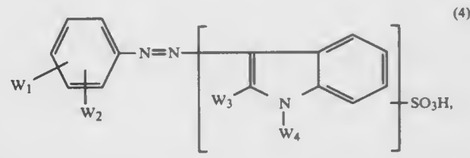
b) one or more copper complexes of α-hydroxy-$C_{2-6}$ alkylene carboxylic acids; and

c) one or more metal-free acid dyes and/or metal complex dyes.



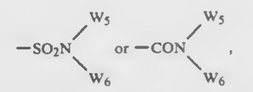
(3)

in which $Z_1$, $Z_2$ and $Z_3$, independently of one another, are hydrogen, halogen, $C_{1-4}$alkyl or $C_{1-4}$alkoxy, or mixtures of dyes of the formula (2) and (3), or a yellow dye of the formula

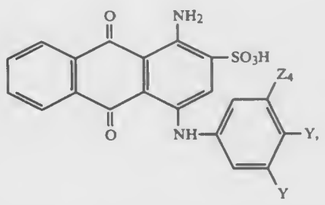


(4)

in which $W_1$ is hydrogen, $C_{1-4}$alkyl, $C_{1-4}$alkoxy, halogen, $C_{2-4}$alkanoylamino or a substituted or unsubstituted arylsulfonyl, aryloxy or arylcarbonyl radical, $W_2$ is hydrogen, halogen, a substituted or unsubstituted alkyl, aryloxy or aryloxysulfonyl radical or a radical of the formula



$W_3$ is a substituted or unsubstituted alkyl or aryl radical, $W_4$ is hydrogen or alkyl and $W_5$ and $W_6$, independently of one another, are hydrogen or a substituted or unsubstituted alkyl, cycloalkyl or aryl radical, or mixtures of dyes of the formulae (2), (3) and (4) and at least one blue dye of the formula



(5)

in which one Y is hydrogen or methyl and the other Y is $C_{2-4}$alkanoylamino or $C_2$–$C_4$hydroxyalkylsulfamoyl and $Z_4$ is hydrogen or methyl.

**5,045,084**

## PROCESS FOR TRICHROMATIC DYEING OR PRINTING

**Harald Walter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

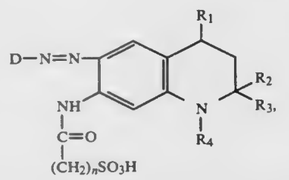
**Filed Oct. 18, 1990, Ser. No. 599,588**

**Claims priority, application Switzerland, Oct. 23, 1989, 3827/89**

**Int. Cl.**[5] **C09B** *67/22*

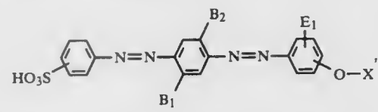
**U.S. Cl. 8—641** **13 Claims**

**1.** A process for the trichromatic dyeing or printing of natural and synthetic polyamide fibre materials which comprises using at least one red dye of the formula



(1)

in which D is a diazo component of the benzene or naphthalene series, $R_1$, $R_2$, $R_3$ and $R_4$, independently of one another, are hydrogen or substituted or unsubstituted $C_1$–$C_8$alkyl and n is the number 1,2,3,4 or 5, together with at least one yellow or orange dye of the formula



(2)

in which $B_1$, $B_2$ and $E_1$ are hydrogen, $C_{1-4}$alkyl or $C_{1-4}$alkoxy and X is straight-chain or branched $C_{1-4}$alkyl or straight-chain or branched $C_{2-4}$hydroxyalkyl, or

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5,045,085

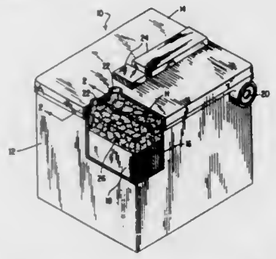
## BATTERY EXPLOSION ATTENUATION MATERIAL AND METHOD

Richard R. Binder, Menomonee Falls; Paul E. Bantz, Colgate; William H. Tiedemann, Cedarburg; Guy D. McDonald, and William J. Wruck, both of Shorewood, all of Wis., assignors to Globe-Union Inc., Milwaukee, Wis.

Division of Ser. No. 205,411, Jun. 10, 1988, Pat. No. 4,859,546, which is a continuation-in-part of Ser. No. 87,774, Aug. 21, 1987, Pat. No. 4,751,154. This application Jun. 21, 1989, Ser. No. 369,372

Int. Cl.[5] H01M 2/12

U.S. Cl. 29—623.1 2 Claims



1. A method of making an improved electric storage battery of the type having a substantially closed container, electrode elements and an electrolyte disposed within said container, and a head space within said container, said method comprising inserting within said head space a plurality of loosely and randomly distributed pillows of needle punched polypropylene each having at least one bonded segment.

5,045,086

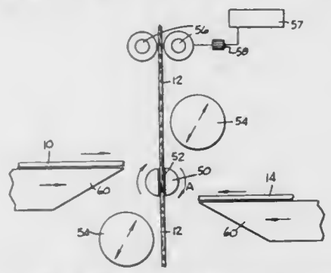
## METHOD FOR MANUFACTURE OF ELECTROCHEMICAL CELL

Tristan Juergens, Loveland, Colo., assignor to Bolder Battery, Inc., Black Hawk, Colo.

Continuation-in-part of Ser. No. 366,867, Jun. 14, 1989. This application Sep. 27, 1989, Ser. No. 413,272

Int. Cl.[5] H01M 2/22

U.S. Cl. 29—623.1 5 Claims



1. A process of making rechargeable electrochemical cells comprising:

inserting a sheet of separator at about its lengthwise center point, through the opening of a rotatable mandrel;

rotating the mandrel one quarter turn, so that two openings exist, defined by the outside of said mandrel and said sheet of separator;

inserting the front edge of a plate into each of said openings from opposite sides of said mandrel, so that said plates become engaged;

spirally winding said plates and said separator by the rotation of said mandrel;

removing said cell from said mandrel;

placing said removed cell in a stainless steel canister;

attaching positive and negative connectors to said cell with a rotatable motion in order to maximize contact between the edges of said plate and the connectors.

5,045,087

## STABILIZED SUSPENSIONS OF CARBON OR CARBONACEOUS FUEL PARTICLES IN WATER

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Bonham, Tex.

Filed Feb. 22, 1988, Ser. No. 158,391

Continuation of Ser. No. 014,980, Feb. 17, 1987 abandoned which is a continuation of Ser. No. 953,498, Oct. 23, 1978 abandoned which is a continuation of Ser. No. 119,756, Feb. 8, 1980 abandoned which is a continuation of Ser. No. 180,448, Sep. 22, 1980 abandoned which is a continuation of Ser. No. 892,919, Sep. 4, 1986 abandoned.

This application Feb. 22, 1988, Ser. No. 158,391

The portion of the term of this patent subsequent to Dec. 3, 2006, has been disclaimed.

Int. Cl.[5] C10L 1/32

U.S. Cl. 44—53 17 Claims

1. A method of preparing a fluid fuel comprising the steps of: firstly

a. comminuting coal to form particles of a predetermined size range, and

b. coating the exposed surfaces of the particles of said coal with an alcohol selected from the class consisting of methanol, ethanol, propanol, butanol and mixtures thereof to impart buoyancy to coal particles and form alcohol-coated coal particles such that said alcohol-coated coal particles can be admixed with water to form a stable, uniform admixture that in sufficiently high proportion coal particles forms a shear thinning suspensoid that can be pumped at a lower apparent viscosity than its at-rest viscosity and that can be transported by hydraulic transport over a long distance readily, maintaining the alcohol-coated coal particles in suspension so they do not fall out in hydraulic transport even over long distances; the amount of alcohol being employed being less than 8% by weight of the final admixture in water; and, thereafter,

c. admixing said alcohol-coated coal particles with water to form a substantially stable, uniform admixture thereof and to form a high carbon content fuel that can be readily transported by hydraulic transport and the like to a using destination and burned with acceptable high efficiency.

5,045,088

## CHEMICAL COMPOSITIONS AND USE AS FUEL ADDITIVES

Iain More, Abingdon; Ian W. Harper, Oxford, both of United Kingdom, and Wayne M. Camarco, Woodbridge, N.J., assignors to EXXON Chemical Patents Inc., Linden, N.J.

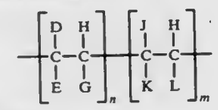
Filed Aug. 25, 1989, Ser. No. 399,698

Claims priority, application United Kingdom, Aug. 26, 1988, 8820295

Int. Cl.[5] C10L 1/18

U.S. Cl. 44—393 6 Claims

1. An additive composition for improving the low temperature properties of distillate fuels having a cloud point above 0° C. and containing more than 5 wt. % wax at 10° C. below the cloud point comprising a mixture of a comb polymer of the general formula:



wherein:

D is selected from R, —CO.OR, —OCO.R, —R'CO.OR and —OR;

E is selected from H, —$CH_3$, D and R';

G is selected from H and D;

J is selected from —H', R', —Aryl or a heterocyclic group, and —R'CO.OR;



K is selected from H, —CO.OR', —OCO.R', —OR' and —$CO_2H$;

L is selected from H, R', —CO.OR', —OCO.R', aryl and —$CO_2H$;

R is ≧$C_{10}$n-alkyl, and R' is ≧$C_1$ hydrocarbyl; and m and n are each molar ratios, m being 1.0 to 0.4 and n being 0.0 to 0.6, together with a co-additive selected from the group consisting of a poly alkyl ester, ether or ester/ether of a polyhydroxy compound.

5,045,089

## FUEL COMPOSITIONS CONTAINING PHENOLIC ANTIOXIDANTS

William Y. Lam, Ballwin, and Gregory P. Liesen, St. Louis, both of Mo., assignors to Ethyl Petroleum Additives, Inc., St. Louis, Mo.

Division of Ser. No. 442,657, Nov. 29, 1989, Pat. No. 5,009,802. This application Dec. 3, 1990, Ser. No. 622,493

Int. Cl.[5] C10L 1/24, 1/18

U.S. Cl. 44—435 9 Claims

1. A fuel composition comprising a liquid fuel and from about 0.05 to 5.0 weight percent of composition of a liquid, partially sulfurized hindered phenol product prepared by the process comprising reacting a liquid mixture of phenols, at least about 50 weight percent of said mixture consisting of one or more reactive, hindered phenols, with sulfur monochloride in proportions to provide from about 0.3 to 0.7 gram atoms of sulfur per mole of reactive, hindered phenol, so as to produce a liquid product.

5,045,090

## PROCESS AND DEVICE FOR RECLAIMING USED FOUNDRY SANDS

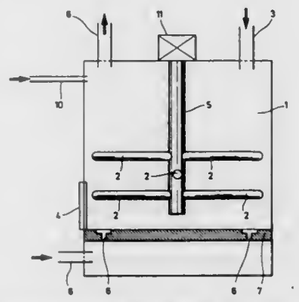
Peter Pohl, Rehburg-Loccum, Fed. Rep. of Germany, assignor to Pohl Giesserreitechnik, Fed. Rep. of Germany

Filed May 22, 1989, Ser. No. 354,841

Claims priority, application European Pat. Off., May 26, 1988, 88108436.2

Int. Cl.[5] B24B 15/00

U.S. Cl. 51—26 6 Claims



1. Apparatus for mechanical cleaning of used foundry sands, comprising

(a) a cylindrical receptable (1);

(b) divider means (7) arranged within said receptacle for dividing said receptacle into a cleaning chamber and an air supply chamber, said cleaning chamber including an inlet opening (3) for depositing used foundry sands into said receptacle cleaning chamber and an outlet opening (4) for discharging clean sand from said receptacle cleaning chamber;

(c) said divider means containing a plurality of nozzles (6) for supplying air from said air supply chamber to said cleaning chamber to create a fluidized bed within said cleaning chamber; and

(d) a plurality of friction members formed of a wear-resistant material arranged within said cleaning chamber, said friction members being driven for rotation through the dirty foundry sands, whereby the friction generated by said rotation friction members abrasively cleans the sands.

5,045,091

## METHOD OF MAKING ROTARY BRUSH WITH REMOVABLE BRUSH ELEMENTS

Gerald R. Abrahamson, and Ernest J. Duwell, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 532,356, May 31, 1990, abandoned, which is a continuation of Ser. No. 307,221, Feb. 6, 1989, abandoned, which is a continuation of Ser. No. 228,859, Aug. 4, 1988, abandoned, which is a continuation of Ser. No. 67,711, Jun. 26, 1987, abandoned. This application Feb. 5, 1991, Ser. No. 652,383

Int. Cl.[5] B24B 1/00

U.S. Cl. 51—293 4 Claims



1. Method of making a brush element, said method comprising the steps of:

(a) forming a dead soft, cold rolled steel plate to provide a U-shaped metal channel having sidewalls extending in the same direction from a channel bottom;

(b) folding a segment of polymer reinforced fabric having opposite terminal ends at its longitudinal center to form a temporary looped end with the folded portions of the fabric touching between the looped end and the terminal ends of the fabric;

(c) fastening together the touching folded portion of the fabric to provide a permanent looped end and unfastened terminal ends;

(d) adhesively bonding one terminal end of the fabric segment over each opposite sidewall of said U-shaped metal channel with the fabric adjacent the exterior of the metal channel so that the permanent loop projects from said channel bottom in an opposite direction as said sidewalls;

(e) inserting into said U-shaped channel a plurality of filaments folded at their midportion;

(f) locking the folded filaments into the channel by placing a core rod over the folded midportion of said folded filaments; and,

(g) crimping the metal channel locked core rod and filament midportions inside the metal channel to provide said brush element.

5,045,092

## DIAMOND-CONTAINING CEMENTED METAL CARBIDE

Madapusi K. Keshavan, Fullerton, Calif., assignor to Smith International, Inc., Houston, Tex.

Filed May 26, 1989, Ser. No. 357,427

Int. Cl.[5] B24D 3/00

U.S. Cl. 51—293 17 Claims

1. A method for forming a cemented tungsten carbide article with embedded diamond particles comprising the steps of:

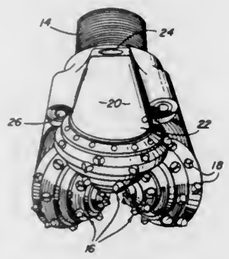
introducing excess non-diamond carbon beyond the stoi-

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chiometric proportion in tungsten carbide into a cemented tungsten carbide article;

pressing the article at a temperature and pressure where diamond is thermodynamically stable; and



cooling the article out of the thermodynamically stable region while maintaining the pressure sufficiently high to prevent decomposition of diamond.

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**5,045,093**

## GAS SEPARATING MEMBRANES FROM POLYIMIDE POLYMERS AND A PROCESS FOR USING THE SAME

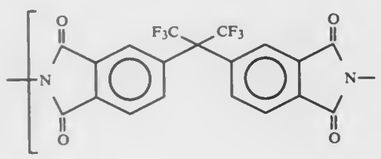
**Ingrid K. Meier, Easton, and Michael Langsam, Allentown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.**

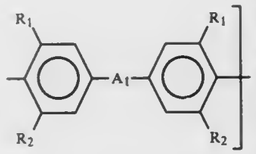
**Filed Oct. 16, 1990, Ser. No. 598,490**

**Int. Cl.[5] B01D** *53/22, 71/64*

**U.S. Cl. 55—16** **18 Claims**

1. A semi-permeable membrane formed of a polyimide homopolymer having surface modifiable functionalities, the polyimide homopolymer comprising repeating units of the general structural formula:





wherein

each $R_1$ is independently selected from a hydrogen atom, an alkyl having from 1 to about 8 carbon atoms, aryl or an arylalkylene;

each $R_2$ is independently selected from an alkyl having from 1 to about 8 carbon atoms, perhaloalkyl or an arylalkylene; and

$A_1$ is a single bond or



wherein $R_3$ and $R_4$ are independently selected from a hydrogen atom, $CF_3$, $CF_2Cl$, an alkyl having from 1 to about 8 carbon atoms, phenyl, 1-arylalkyl, arylalkylene, naphthyl or a halogen;

wherein the polyimide homopolymer having surface-modifiable functionalities is contacted in the presence of an oxygen source with a source of high energy electromagnetic irradiation or a free radical source to affect modification of the polymer surface.

11. A process for separating a gaseous mixture containing two or more components, the process comprising: bringing the gaseous mixture into contact with one side of the semi-permeable membrane according to claim 1 whereby one component selectively permeates through the membrane at a different productivity rate than at least one other component.

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**5,045,094**

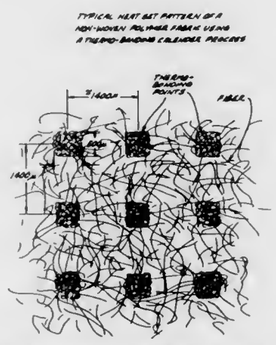
## NONWOVEN FIBER BED MIST ELIMINATOR

**Prabhakar D. Paranjpe, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of Ser. No. 284,932, Dec. 15, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 468,089**

**Int. Cl.[5] B01D** *46/00*

**U.S. Cl. 55—97** **37 Claims**



37. In a process for removing aerosols from a moving gas stream in a separator wherein an aerosol-containing gas is caused to flow through a substantially vertically mounted fiber bed element resulting in separation of a substantial portion of the aerosol from the gas as a liquid phase, the improvement comprising providing an element comprised of a synthetic polymer nonwoven fabric fiber bed containing point bonded coalescing sites distributed throughout said fiber bed, said sites having an equivalent surface area diameter of at least about 3 times the average mean diameter of the fibers in said fabric, said equivalent surface area diameter and said mean diameter being expressed in the same units, wherein the ratio of the wet bed pressure drop to the dry bed pressure drop is essentially constant, and wherein said equivalent surface area diameter is expressed by the equation

$$\sqrt{\frac{A_s}{3.14}}$$

where

$A_s$ is the average surface area of a bonding site, wherein

$$A_s = \left(\frac{d^2}{2} + dt\right)3.14, \text{ where}$$

d=the average diameter of the horizontal surface of the coalescing site, and



t=the average thickness of depth of the coalescing sites.

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**5,045,095**

## DUST COLLECTOR FOR AN AIR CLEANER

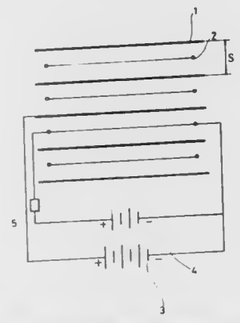
**Hee S. You, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Jun. 14, 1990, Ser. No. 537,998**

**Claims priority, application Rep. of Korea, Jun. 15, 1989, 89-8267[U]**

**Int. Cl.[5] B03C** *3/00*

**U.S. Cl. 55—139** **12 Claims**



12. An air cleaner having a dust collector provided with a plurality of electrifying panels arranged spaced-apart from each other, a plurality of ionizing wires interposed between said plurality of panels, and voltage generating means for supplying power to said electrifying panels and said ionizing wires, comprising:

high voltage generating means having a first terminal of a first electrical plurality connected to said plurality of electrifying panels and a second terminal of a second and electrically opposite polarity ends of said plurality of ionizing wires, said high voltage generating means exhibiting a first potential between said positive and negative terminal; and

low voltage generating means coupled between the other ends of said plurality of ionizing wires and one of said positive and negative terminals, for supplying power at a second and lower potential across said first ends and the other ends of said plurality of ionizing wires.

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**5,045,096**

## DEVICES FOR DE-AERATING LIQUIDS FLOWING IN MEDICAL LIQUID SYSTEMS

**Minh B. Quang, Rathausmarkt 2d, 2406 Stockelsdorf, and Eberbard Frank, W',uml/o/ rth Weg 18, 7910 Neu-Ulm 8, both of Fed. Rep. of Germany**

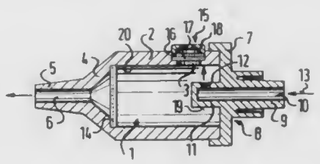
**Filed Sep. 18, 1989, Ser. No. 408,882**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1988, 3832028**

**Int. Cl.[5] B01D** *19/00*

**U.S. Cl. 55—159** **15 Claims**

1. A device for de-aerating liquids flowing in medical liquid systems, in particular infusible solutions to be administered from a gravity-operated infusion set, said device comprising a hollow chamber through which the infusible solution flows, said chamber having a wall containing at least one aperture in which a liquid-tight air-permeable de-aerating unit is fitted, wherein the hollow chamber is cup-shaped in configuration and at the ends is provided with connecting sections with a first connecting section having an outlet passage running from the interior of the hollow chamber and a second connecting section having an inlet passage which opens into the hollow chamber, and wherein an outlet orifice from the inlet passage into the hollow chamber is orientated transversely to the longitudinal axis of the hollow chamber and leads the flow directly to the de-aerating unit.



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**5,045,097**

## SOOT FILTER FOR DIESEL-POWERED VEHICLES

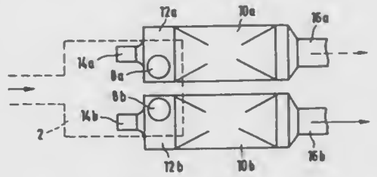
**Herbert Langen, Altbach, Fed. Rep. of Germany, assignor to J. Eberspächer, Esslingen, Fed. Rep. of Germany**

**Filed Oct. 30, 1989, Ser. No. 429,804**

**Claims priority, application Fed. Rep. of Germany, Oct. 31, 1988, 3837073**

**Int. Cl.[5] F01N** *3/02*

**U.S. Cl. 55—282** **7 Claims**



1. A soot filter regenerator arrangement for diesel-powered vehicles, comprising: a first diesel particle filter including a pre-chamber; a second diesel particle filter including a pre-chamber; a preliminary muffler connected to an exhaust stream of the diesel-powered vehicle; a first duct connected from said preliminary muffler to said pre-chamber of said first particle filter, said first duct connecting into said first diesel particle filter pre-chamber between one of a radial and tangential direction with respect to said first diesel particle filter pre-chamber; a second duct connected from said preliminary muffler to said pre-chamber of said second particle filter, said second duct connecting into said second diesel particle filter pre-chamber between one of a radial and tangential direction with respect to said second diesel particle filter pre-chamber; a first burner connected to said pre-chamber of said first diesel particle filter; a second burner connected to said pre-chamber of said second diesel particle filter; and, said first and second burners producing an approximately disc-shaped flame directly interacting with soot lighting surfaces of the soot filter.

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**5,045,098**

## BAG SEPARATOR

**James C. Poor, East Granby, Conn., assignor to The Spencer Turbine Company, Windsor, Conn.**

**Filed Aug. 13, 1990, Ser. No. 566,554**

**Int. Cl.[5] B01D** *46/04*

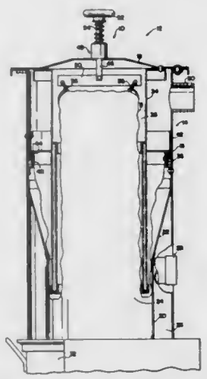
**U.S. Cl. 55—300** **11 Claims**

1. In a bag separator having a housing including a top wall and a cylindrical side wall defining a main chamber, a filter bag, and a bag shaker mechanism supporting the filter bag within the housing, the improvement wherein said housing includes a cylindrical perforated wall coaxially depending from said top wall and defining a downwardly open secondary

VOL 1130 ISS 1 SE 3 1991 UMI



chamber within said main chamber, said filter bag being supported within said secondary chamber and having a lower open end portion turned outwardly and upwardly over the lower end portion of said perforated wall, and means for attaching said open end to the inner peripheral surface of said side wall in upwardly spaced relation to said lower end of said perforated wall and in surrounding relation to said perforated wall, and said bag shaker mechanism includes an axially elongate vertically disposed generally cylindrical shaker rod extending through said top wall, mounting means supporting said shaker rod for vertically reciprocal and rotational movement relative to said housing and including a cylindrical bushing assembly mounted in fixed position on said top wall and slidably receiving said shaker rod therethrough, means for supporting said filter bag in depending position from said shaker rod and including a shaker bar mounted in fixed position on the lower end of said shaker rod and extending in radially opposite directions therefrom, said shaker bar having openings in the opposite ends thereof, means for attaching said filter bag to the shaker bar and including a pair of fasteners respectively received in said openings and connected to the filter bag, a knob attached in fixed position to the upper end of the shaker rod externally of the separator housing, and a compression spring received on said shaker rod and acting between said top wall and said knob to urge said shaker rod in an upwardly direction relative to said housing, whereby a single downward thrust and release of said knob produces a plurality of vertically reciprocal bag shaking cycles.



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**5,045,099**

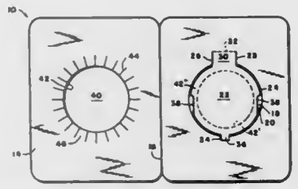
## VACUUM CLEANER BAG INCLUDING COLLAR SEALING CLOSURE DEVICE

**Harry Goldberg, Monsey, N.Y., assignor to Mastercraft Industries, Inc., Newburgh, N.Y.**

**Filed Sep. 25, 1989, Ser. No. 411,859**

**Int. Cl.[5] B01D *46/02***

**U.S. Cl. 55—367** **11 Claims**



1. A vacuum cleaner bag, comprising: a collar of rigid or semi-rigid material defining inner and outer surfaces and having an inlet opening of predetermined configuration; a bag attached to said inner surface; cover means having a shape substantially corresponding to said predetermined configuration, said cover means being hingedly mounted for movement between an exposing position in a direction spaced from said outer surface for uncovering said inlet opening and a covering position substantially covering and sealing said inlet opening; and locking means for positively locking said cover means in said covering position, said locking means comprising a projecting finger radially extending from said disk beyond a periphery of said inlet opening, said finger being sufficiently flexible to permit said finger to be resiliently force snapped beyond said inlet opening into locking abutment against said inner surface, whereby said cover means may be maintained in said covering position after the filled vacuum cleaner bag is removed from a vacuum cleaner thereby preventing debris from escaping from said inlet opening.

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**5,045,100**

## METHOD OF FORMING A FIBRE OPTIC TERMINAL ASSEMBLY

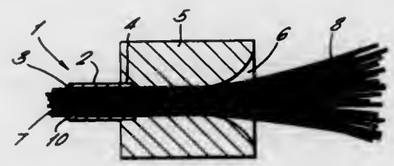
**Nigel C. Smith, and Christopher M. Bailey, both of Essex, United Kingdom, assignors to KEYMED (Medical & Industrial Equipment) Ltd., United Kingdom**

**Filed May 22, 1990, Ser. No. 526,146**

**Claims priority, application United Kingdom, May 30, 1989, 8912356**

**Int. Cl.[5] C03B *37/10***

**U.S. Cl. 65—4.21** **8 Claims**



1. A method of forming a fiber optic terminal assembly comprising the steps of: inserting fibers into a duct defined by a housing, said housing including a sleeve portion having an open end and defining a tubular portion of the duct, the fibers being inserted such that the fibers are supported in a closely packed bundle throughout the tubular portion and project through the end of the sleeve portion; trimming the bundle to form an end face thereof; applying heat locally to the end face to form a molten glass surface layer; allowing glass from the layer to flow between the fibers of the bundle; allowing the glass to cool such that the glass forms a matrix fusing the fibers to one another and to the housing; and controlling the temperature and duration of heating applied to the end face such that the matrix extends less than the full longitudinal extent of the tubular portion.

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**5,045,101**

## METHOD OF AND AN APPARATUS FOR BENDING GLASS PLATES FOR A LAMINATED GLASS WHEREIN SIDE PORTIONS OF TWO OVERLAPPING GLASS PLATES ARE SIMULTANEOUSLY SUBJECTED TO DEEP-BENDING

**Takashi Hirotsu; Yukiyasu Mori; Hiroshi Tsuji; Tatsuo Sugiyama; Yoshihiro Watanabe, and Kenji Maeda, all of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 314,922, Feb. 24, 1989, Pat. No. 4,909,820. This application Nov. 28, 1989, Ser. No. 442,523**

**Claims priority, application Japan, Feb. 25, 1988, 63-40721; Mar. 10, 1988, 63-55019; Aug. 17, 1988, 63-203086**

**Int. Cl.[5] C03B *23/023***

**U.S. Cl. 65—106** **13 Claims**

1. A method of bending glass plates for a laminated glass



wherein side portions of two overlapping glass plates are simultaneously subjected to deep-bending, said method comprising:

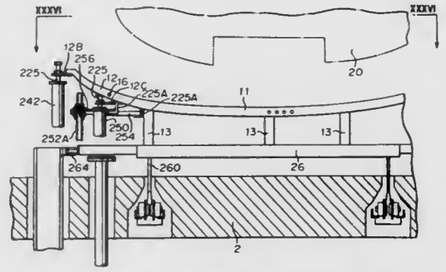
(a) a provisional shaping step of heating said two glass plates placed on a splittable type bending mold provided with:

(i) a fixed mold;

(ii) a movable mold which defines a deep-bending portion, said movable mold being capable of moving to a set position in alignment with said fixed mold by its own deadweight and stopping at said set position adjacent to said fixed mold; and

(iii) a pivot shaft which supports a portion of said movable mold,

by elevating temperature to a temperature capable of bending glass at a heating/bending stage in a heating-/bending furnace so that said two glass plates are provisionally shaped by their own deadweight into a shape corresponding to the shape of said bending mold and



(b) a pressing step of pressing a portion to be deeply bent of said glass plates in said deep-bending portion of said movable mold after said provisional shaping in said heating-/bending furnace,

wherein:

(c) prior to said pressing step, said movable mold is fixed at said set position so as to prevent jumping of said movable mold and

(d) said movable mold is fixed at said set position:

(i) by supporting a portion of said movable mold which is outside said pivot shaft with respect to said fixed mold and

(ii) by exerting a force on a portion of said movable mold which is inside said pivot shaft with respect to said fixed mold,

whereby the shaping surface of said movable mold is in alignment with the shaping surface of said fixed mold.

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**5,045,102**

## BLOW BOX FOR HEAT TEMPERING GLASS SHEETS IN HORIZONTAL POSITION

**Luc Vanaschen, Eupen, Belgium; Hans-Werner Kuster, Aachen, and Werner Diederen, Herzogenrath, both of Fed. Rep. of Germany, assignors to Saint Gobain Vitrage International, Courbevoie, France**

**Filed Jul. 24, 1990, Ser. No. 556,436**

**Claims priority, applicatioo Fed. Rep. of Germany, Jul. 24, 1989, 3924402**

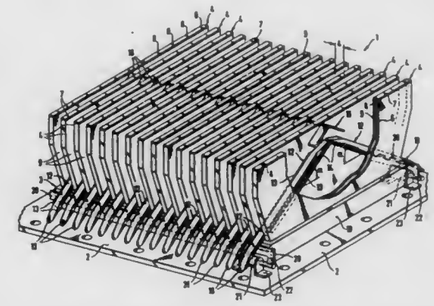
**Int. Cl.[5] C03B *27/00***

**U.S. Cl. 65—165** **10 Claims**

1. Device for heat tempering glass sheets in horizontal positions comprising:

two blow boxes positioned opposite one another in upper and lower positions, said lower blow box comprising a series of nozzle plates, each of said nozzle plates being positioned at a distance from one another to create a space between each of said nozzle plates;

slides obliquely positioned in said space between said nozzle plates, wherein broken glass which occurs due to breaking



of the glass sheets during tempering slide laterally out of said lower blow box on said slides; and

means for vibrating said slides between said nozzle plates.

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**5,045,103**

## APPARATUS FOR HEATING AND BENDING GLASS SHEETS

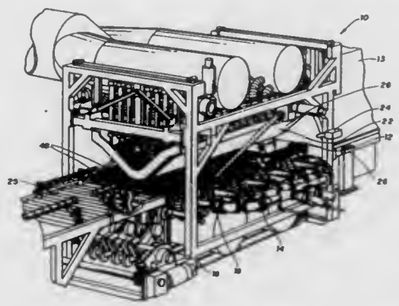
**Harold A. McMaster, Woodville, Ohio, and Ben M. Balestra, Temperance, Mich., assignors to Glasstech, Inc., Perrysburg, Ohio**

**Continuation of Ser. No. 367,849, Jun. 19, 1989, Pat. No. 4,957,531, which is a continuation-in-part of Ser. No. 249,718, Sep. 27, 1988, Pat. No. 4,883,527, which is a continuation of Ser. No. 83,675, Aug. 7, 1987, Pat. No. 4,822,398. This application Sep. 4, 1990, Ser. No. 557,978**

**The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.**

**Int. Cl.[5] C03B *23/023***

**U.S. Cl. 65—273** **19 Claims**



1. A glass heating and bending apparatus for receiving a heated glass sheet, the apparatus comprising: a first platen; said first platen being deformable and including an actuator for deforming said platen from a planar shape to a bent shape; said first platen including a first heating means throughout the extent thereof; said first heating means of the first platen being movable therewith during the deformation of the platen; said first heating means providing heat in close proximity to the heated glass sheet during the bending to maintain an optimal glass bending temperature; a second platen opposing the first platen in spaced relationship with the glass sheet therebetween; heat being supplied by the heating means to the glass sheet to maintain an optimal bending temperature.

### 5,045,104
### SYNERGISTIC COMPOSITIN OF 2-(2-BROMO-2-NITROETHENYL) FURAN AND 2-BROMO-2-NITROPROPANE-1,3-DIOL AND USES THEREOF

William F. McCoy, West Lafayette, Ind., assignor to Great Lakes Chemical Corporation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 205,078, Jun. 10, 1988, abandoned. This application Aug. 9, 1990, Ser. No. 565,803

Int. Cl.[5] A01N *33/18, 33/24, 43/08*

U.S. Cl. 71—67 17 Claims

1. A synergistic composition for use as an antimicrobial for inhibiting microbial growth selected from the group consisting of algae, fungi, bacteria and yeast in an aqueous media comprising 2-(2-bromo-2-nitroethenyl) furan ("BNEF") and 2-bromo-2-nitropropane -1,3-diol ("BNPD").

### 5,045,105
### USE OF DERIVATIVES OF N-PHENYL-3,4,5,6-TETRAHYDROPHTHALIMIDE FOR THE DESICCATION AND ABSCISSION OF PLANT ORGANS

Klaus Grossmann, Limburgerhof, Fed. Rep. of Germany; Christiaan E. G. Mulder, Nelspruit, South Africa, and Bruno Wuerzer, Otterstadt, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 20, 1990, Ser. No. 481,262

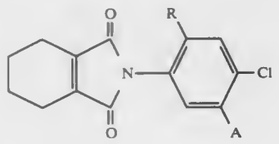
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905916

Int. Cl.[5] A01N *43/38*

U.S. Cl. 71—74 4 Claims

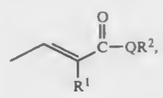
1. A method for the dessication and absicission of plant organs, wherein an effective plant organ dessicating and absicising amount of a derivative of N-phenyl-3,4,5,6-tetrahydrophthalimide of the formula I

(I)

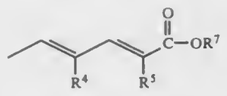


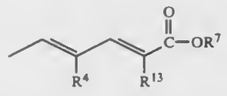
where
R is hydrogen, fluorine or chlorine,
A is group I-1, I-2 or I-3

(I-1)



(I-2)





wherein
$R^1$ is hydrogen, chlorine, bromine, cyano or $C_1$-$C_6$-alkyl,
$R^2$ is hydrogen, $C_1$-$C_8$-alkyl, $C_1$-$C_8$alkenyl, $C_2$-$C_4$-alkynyl, $C_1$-$C_4$alkoxy-$C_1$-$C_4$-alkyl, $C_1$-$C_4$-alkylthio-$C_1$-$C_4$-alkyl, phenyl-$C_1$-$C_3$-alkyl or phenyl which is unsubstituted or substituted by halogen,
$R^4$ and $R^5$ are each hydrogen or $C_1$-$C_3$-alkyl,
Q is oxygen or sulfur,
$R^7$ is hydrogen, $C_1$-$C_6$-alkyl, $C_1$-$C_6$-alkoxyalkyl, $C_1$-$C_6$-alkylthioalkyl or $C_5$p or $C_6$-cycloalkyl, and
$R^{13}$ is hydrogen or $C_1$-$C_4$alkoxycarbonyl,
is applied to plants or their habitat.

### 5,045,106
### HERBICIDAL SUBSTITUTED PYRAZOLES

Kurt Moedritzer, Webster Groves, and Michael D. Rogers, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 277,087, Nov. 23, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 418,790

Int. Cl.[5] C07D *231/20, 231/30;* A01N *43/56*

U.S. Cl. 71—92 15 Claims

13. A herbicidal composition comprising an adjuvant and an effective amount of a 3-phenoxypyrazole or agronimically acceptable salt thereof wherein:
the phenyl ring has a para nitro substituent and a meta substituent having a molecular weight of less than about 300 and selected from alkoxy, haloalkoxy, di(alkoxy), alkoxycarbonyl, alkoxycarbonylalkoxy, aminocarbonylalkoxy, alkylsulfonylaminocarbonylalkoxy, alkylamino, hydroxyalkylamino, alkoxyamino, alkoxyalkylamino, hydroxycarbonylalkylamino, and alkoxycarbonylalkyloxyimino; and
the pyrazole ring has a methyl substituent in the 1-position, a methyl substituent in the 4-position and a chloro, cyano, halomethyl, haloethyl, methylthio, ethylthio, methylsulfinyl, ethylsulfinyl, methylsulfonyl ethylsulfonyl or methoxymethyl substituent in the 5-position.

### 5,045,107
### USE OF QUINOLINE DERIVATIVES FOR THE PROTECTION OF CULTIVATED PLANTS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 895,627, Sep. 25, 1986, abandoned, which is a division of Ser. No. 465,740, Feb. 11, 1983, Pat. No. 4,623,727. This application Nov. 28, 1988, Ser. No. 277,530

Claims priority, application Switzerland, Feb. 17, 1982, 980/82

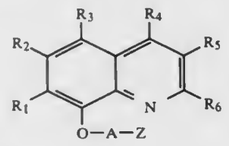
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[5] A01N *43/42*

U.S. Cl. 71—94 17 Claims

1. A process for the protection of cultivated plants against the harmful effects of a herbicide selected from the group consisting of triaziones, chloroacetanilides, pyridyloxyphenoxypropionic acid esters, triazinyl sulfonylureas, pyrimidinyl sulfonylureas and oxazolinyl diphenyl ethers, which process comprises treating the cultivated plants or parts of these plants, or the soil intended for the growing of the cultivated plants, with an antidotally effective amount of a compound of the formula

(I-3)



wherein
$R_1$, $R_2$ and $R_3$ independently of one another are each hydrogen, halogen, $C_1$-$C_3$-alkyl, $C_1$-$C_3$-alkoxy, nitro or cyano
R-hd **4**, $R_5$ and $R_6$ independently of one another are each hydrogen, halogen or $C_1$-$C_3$-alkyl,
A is any of the groups, $—CH_2—$, $—CH_2—CH_2—$, or $CH(CH_3)—$, and



Z is cyano,
including acid addition salts and metal complexes thereof.

### 5,045,108
### HERBICIDAL AND PLANT GROWTH-REGULATING N-ARYL-PYRROL-L-ONE AND ISOINDOL-2-ONE COMPOUNDS

Hans-Ludwig Elbe, Wuppertal; Albrecht Marhold, Leverkusen; Klaus Lürssen, Bergisch Gladbach; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, and Birgit Krauskopf, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 7, 1990, Ser. No. 534,383

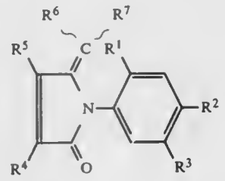
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1989, 3920271

Int. Cl.[5] A01N *43/36, 43/38;* C07D *207/38, 209/46*

U.S. Cl. 71—94 17 Claims

1. An N-aryl-nitrogen heterocyclic compound of the formula

(I)



in which
$R^1$ represents hydrogen or halogen,
$R^2$ represents cyano, nitro, fluorine, chlorine, bromine, iodine, alkyl, halogenoalkyl, alkoxy, halogenoalkoxy, alkylthio or halogenoalkylthio,
$R^3$ represents halogen, hydroxyl or mercapto, or represents an optionally substituted radical selected from the group consisting of alkoxy, alkenyloxy, alkinyloxy, cycloalkoxy, alkylthio, alkenylthio, alkinylthio and cycloalkylthio,
$R^4$ represents hydrogen, halogen or alkyl,
$R^5$ represents hydrogen, halogen or alkyl, or together with $R^4$ represents alkanediyl,
$R^6$ represents hydrogen or alkyl and
$R^7$ represents hydrogen or alkyl, or together with $R^6$ represents alkanediyl,
with the proviso that $R^2$ can represent chlorine only if either
(a) $R^1$ represents hydrogen or at least one of the radicals $R^4$, $R^5$, $R^6$ and $R^7$ represents alkyl and at the same time
$R^3$ represents halogen or mercapto or represents an optionally substituted radical selected from the group consisting of alkylthio, alkenylthio, alkinylthio and cycloalkylthio, or
(b) $R^3$ represents halogen or represents alkoxyalkoxyalkoxy.

13. A method of excluding unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound according to claim 1.

### 5,045,109
### HIGH CONCENTRATION HERBICIDE FORMULATION

Kanji Nakamura, Shimizu, and Susumu Katou, Shizuoka, both of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1990, Ser. No. 483,865

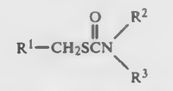
Claims priority, application Japan, Mar. 13, 1989, 64-60440

Int. Cl.[5] A01N *37/00, 43/40, 43/36, 43/38*

U.S. Cl. 71—100 4 Claims

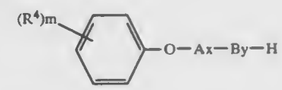
1. A high concentration herbicide formulation comprising (1) a herbicidally active thiolcarbamate of the following formula I which is liquid at room temperature, (2) at least one nonionic surfactant of the following formula II and (3) an anionic surfactant of the following formula III:

(I)

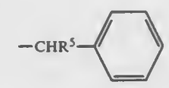


wherein $R^1$ is an alkyl group having from 1 to 8 carbon atoms, a phenyl group or a halogen-substituted phenyl group, $R^2$ is an alkyl group having from 1 to 5 carbon atoms, and $R^3$ is an alkyl group having from 1 to 5 carbon atoms, provided that $R^2$ and $R^3$ may form a ring;

(II)

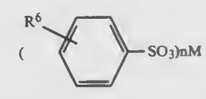


wherein $R^4$ is



wherein $R^5$ is a hydrogen atom or a methyl group, m is an integer of from 1 to 3, x is an integer of at least 10, y is an integer of from 0 to 10, provided that x+y is within a range of from 10 to 30, A is an oxyethylene group, and B is an oxypropylene group, provided that the addition form of A and B may be a block-form or a random-form; and

(III)



wherein $R^6$ is an alkyl group having from 9 to 15 carbon atoms, M is an alkali metal or an alkaline earth metal, and n is the number of metal ions.

### 5,045,110
### ALUMINIUM-STRONTIUM MASTER ALLOY

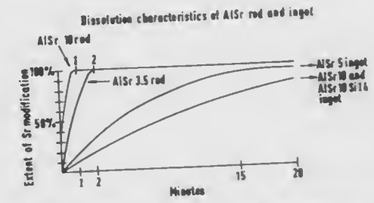
Mattheus Vader; Jan Noordegraaf; Edward H. Klein Nagelvoort, and Jan P. Mulder, all of Delfzijl, Netherlands, assignors to Shell Research Limited, England

Filed May 21, 1990, Ser. No. 525,704

Claims priority, application European Pat. Off., May 19, 1989, 89201287.3

Int. Cl.[5] B22F *9/08;* C22C *1/03*

U.S. Cl. 75—338 18 Claims




1. Process for the preparation of an aluminum-strontium master alloy suitable for use as structure refiner during the solidification of molten aluminum-silicon alloys, comprising atomizing a molten alloy containing 3 to 30% by weight of strontium to form atomized droplets of same, the balance of said molten alloy being aluminum, quick cooling the atomized droplets of said alloy at a cooling rate of between $10^{2°}$ and $10^{5°}$

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C./s to obtain solid particles, and consolidating the thus-obtained solid particles.

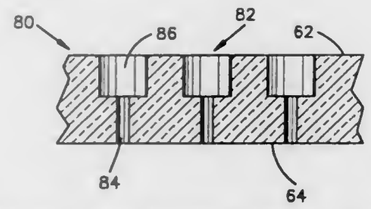
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5,045,111

## FILTRATION OF MOLTEN FERROUS METAL

Ajit Y. Sane, Medina; Alison W. Gee, and David J. Eichermiller, both of Chesterland, all of Ohio, assignors to The Carborundum Company, Cleveland, Ohio

Division of Ser. No. 323,509, Mar. 14, 1989, which is a continuation-in-part of Ser. No. 879,789, Jun. 27, 1986. This application Apr. 10, 1990, Ser. No. 506,712
Int. Cl.[5] C22B 9/02
U.S. Cl. 75—407 32 Claims




1. A method of filtering non-metallic inclusions and contaminants from molten ferrous metal, comprising the steps of:
providing a porous ceramic body having pores that define tortuous passageways therethrough, the body having first and second opposed surfaces;
forming openings distinct from the pores in the body, the openings opening through the first surface and extending into the body toward the second surface, the openings extending into the body a distance within the range of about 50–99% of the distance between the first and second surfaces; and
passing molten ferrous metal through the body and the openings from the first surface to the second surface, the non-metallic inclusions and contaminants being removed from the molten ferrous metal as it passes through the body.

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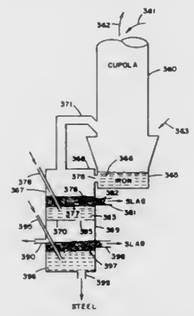
5,045,112

## COGENERATION PROCESS FOR PRODUCTION OF ENERGY AND IRON MATERIALS, INCLUDING STEEL

John M. Lehto, Cokato, Minn., assignor to Northern States Power Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 153,242, Feb. 8, 1988, which is a continuation-in-part of Ser. No. 91,427, Aug. 31, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 234,914
Int. Cl.[5] C21B 11/02
U.S. Cl. 7.5—499 20 Claims

1. A process for the production of electricity; said process including the steps of:
(a) providing a low grade coal fuel;
(b) performing a liquefaction procedure on the coal fuel to remove oil and volatiles therefrom, and to generate a resultant coal char product;
(c) pelletizing the coal char product to form coal char product pellets, said step of pelletizing comprising pelletizing at least a portion of the coal char product in combination with reducible solid iron material to form coal char product pellets containing reducible solid iron material;
(d) charging a copula with the coal char product and the reducible solid iron material, said step of charging a copula being characterized by charging substantially all the coal char product in the form of coal char product pellets and substantially all the reducible solid iron material in the form of pellets containing the coal char product in combination with the reducible solid iron material;
(e) reducing and melting substantially all the reducible solid iron material in the coal char product pellets by heating the pellets in the copula at a suitable temperature under a pressure of at least about 100 psia in the presence of a sufficient upward flow of process gases, with the resultant formation of reduced molten iron material and hot product gases having pressures greater than atmospheric pressure;
(f) lowering a head pressure of the reduced molten iron material from the pressure maintained in said reducing and melting step to near atmospheric pressure; said step of




lowering head pressure being conducted contemporaneously with continued melting and reducing of the reducible solid iron material in step (d);
(g) tapping the high pressure hot product gases from an upper portion of the copula;
(h) directing the high pressure hot product gases downstream to electrical production equipment; and,
(i) producing electricity from the hot product gases having pressures greater than atmospheric pressure.

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5,045,113

## WAX POLISH

Cleavance W. Grant, 37 Geary Rd., Dollis Hill, London, United Kingdom NW10 1HJ

Filed Jan. 12, 1990, Ser. No. 464,448
Int. Cl.[5] C09B 1/08; C08L 91/06
U.S. Cl. 106—10 8 Claims

1. A composition for use as a wax polish consisting essentially of the following: wax (20–30 parts by weight), turpentine, white spirit or mixture thereof (53 to 77 parts by weight), and alum (3 to 10 parts by weight).

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5,045,114

## REFLECTIVE COMPOSITION ALUMINUM PARTICLES MILLED TOGETHER WITH RESINOUS BINDER AND PROCESS FOR PREPARING SAME

Stephen V. Bigalk, White Bear Lake, Minn., and Stephen C. Hart, Hudson, Wis., assignors to H. B. Fuller Licensing & Financing Inc., Wilmington, Del.

Filed May 1, 1990, Ser. No. 516,350
Int. Cl.[5] C09C 1/64
U.S. Cl. 106—404 53 Claims

1. A process of preparing a powder coating material which can be applied to a substrate to form a glossy, highly reflective, finish, which process comprises:
(a) milling together a resinous binder and about 1 to 12 parts of aluminum particles per 100 parts of binder to produce a powder coating material;
(b) adding an effective amount of a fluidizing agent per 100 parts of binder to the powder coating material; and
(c) removing milling media and particles of powder material greater than about 250 microns from the powder material, wherein a powder coating material having a particle size of about 5 to 250 microns is obtained.

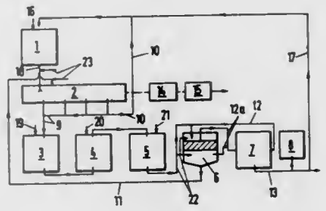


5,045,115

## METHOD FOR TREATING SOLID RESIDUES CONTAINING HEAVY METALS FROM COMBUSTION PLANTS

Arnold Gmunder, Seuzach; Jurgen Gnieser, Zurich, and Jorg Wiedersheim, Wangen, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 25, 1989, Ser. No. 412,182
Claims priority, application Switzerland, Sep. 28, 1988, 3605/88
Int. Cl.[5] B09B 3/00; C22B 7/02; C04B 18/04
U.S. Cl. 106—709 7 Claims



1. A method of treating solid residues containing heavy metals from combustion plants, said method comprising the steps of:
washing the residues with water in a washing stage to dissolve water-soluble compounds including heavy metals therein into solution;
thereafter separating insoluble solid residues from the solution of heavy metals in a dewatering stage;
removing the separated insoluble solid residues from the dewatering stage to a storage station;
correcting the pH of the solution containing heavy metals from the dewatering stage by adding at least one alkaline solution in a neutralizing stage to adapt the pH to the specific metal impurities;
precipitating hydroxides of the heavy metals from said pH-adapted solution in a precipitation stage;
thereafter adding a precipitating agent to the pH-adapted solution to form a mixture containing insoluble heavy metals;
separating a sludge containing heavy metal precipitate from the mixture by passing the mixture through a cross-current diaphragm filter in a filter stage to separate purified liquid from the mixture;
concentrating the dewatered mixture from the filter by a sedimentation stage while removing the purified liquid from the filter; and
re-cycling the sludge containing heavy metals from the sedimentation stage to the dewatering stage to separate the insoluble heavy metals therein for delivery to the storage station.

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5,045,116

## PRE-MOISTENED TOWELETTE FOR, AND METHOD OF, CLEANING COMPACT DISCS

Eric Cohen, Jockey Club, 11111 Biscayne Blvd., Apt. 615, Miami, Fla. 33161

Filed May 18, 1989, Ser. No. 353,535
Int. Cl.[5] B08B 7/00
U.S. Cl. 134—6 19 Claims

1. A moistened towelette for wiping a compact disc clean without leaving a visible residue on the compact disc, consisting essentially of:
(A) an ultra-pure, porous tissue composed essentially of hemp and cellulose fibers and being free of binders, fillers and dyes;
(B) a liquid cleaning preparation permeating the tissue, and including
(i) a highly concentrated solution of ultra-pure alcohol whose concentration is at least 99% by weight of the solution, said solution being in the range from about 40% to about 80% by weight of the preparation,
(ii) a non-ionic, ultra-pure surfactant in the range from about 0.005% to about 0.2% by weight of the preparation,
(iii) ultra-pure water making up the balance by weight of the preparation, and
(iv) said ultra-pure alcohol and ultra-pure water each having an evaporative residue level which is less than 2 parts per million;
(C) said preparation-permeated tissue having a wet tensile strength of at least 400 grams per 25 mm to withstand tearing when the preparation-permeated tissue is wiped across a compact disc surface to be cleaned; and
(D) said preparation being non-reactive with the tissue and the compact disc surface, and evaporating from the compact disc surface with a visually-undetectable residue thereon after wiping has occurred.

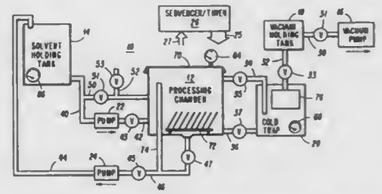
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5,045,117

## SYSTEM FOR REMOVING FLUX RESIDUES FROM PRINTED WIRING ASSEMBLIES

Donald R. Witherell, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 18, 1990, Ser. No. 586,099
Int. Cl.[5] B08B 5/04
U.S. Cl. 134—21 13 Claims




1. A process for cleaning rosin flux residues from printed wiring assemblies, comprising the steps of:
placing one or more printed wiring assemblies in a vacuum sealable processing chamber;
drawing down the ambient pressure within said chamber to achieve a partial vacuum in order to promote the migration of flux residues out of confined spaces on said assemblies;
washing said wiring assemblies with solvent to remove flux residues which have migrated out of confined spaces on said assemblies; and
drawing down the ambient pressure within said chamber to achieve a partial vacuum for a second time in order to evacuate any remaining solvent materials from on said assemblies.

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5,045,118

## METHOD OF REMOVING DEBRIS AND DUST FROM A CARPET

Richard A. Mason, Buffalo, and Archie A. Weidner, Minnetonka, both of Minn., assignors to Tennant Company, Minneapolis, Minn.

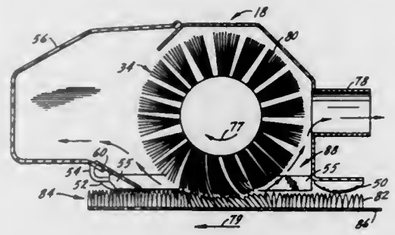
Filed May 4, 1990, Ser. No. 518,818
Int. Cl.[5] B08B 5/04; A47L 5/14, 9/04, 9/06
U.S. Cl. 134—21 4 Claims

1. A method of removing debris and dust from a carpet which has a base and a pile made of strands upstanding therefrom, including the steps of applying a rotary cylindrical brush to the carpet, moving the brush in a forward direction along the carpet while rotating it, causing sufficient contact between the bristles of the brush and the carpet to bend the carpet

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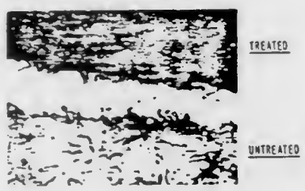
strands a predetermined amount, rotating the brush in a direction bottom side forward in the forward direction and at a speed sufficient to propel larger debris forwardly from the brush and, at the same time, to bend the carpet strands forwardly and the brush bristles rearwardly, providing a debris hopper in close proximity in front of the brush to catch and store the large debris propelled forwardly by the brush bristles, allowing the carpet strands to freely flex upwardly after the brush bristles move out of contact therewith to cause small



dust particles to be propelled into the air from the carpet strands, communicating a vacuum source to a point directly adjacent and above the carpet behind the brush so that the propelled dust particles will be removed before they fall by gravity back into the carpet, and further including the step of regulating the inward air flow behind the brush in response to the vacuum source so that the air moving between the rear of the brush and the point of the vacuum source communication will be at a relatively high velocity.

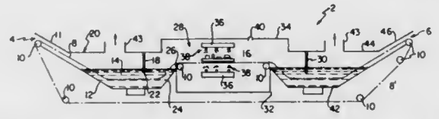
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**5,045,119**
**TELEPHONE CABLE CLEANING AND RESTORATION FLUID**
**Brent R. Dohner, Conroe, Tex., assignor to Pennzoil Products Company, Houston, Tex.**
**Filed Sep. 11, 1990, Ser. No. 581,215**
**Int. Cl.[5] B08B *9/03*; C09D *9/00***
**U.S. Cl. 134—22.11** **7 Claims**




1. A method of cleaning and restoring electrical properties to electrical cables which comprises passing a cleaning formulation through at least a section of a cable to be treated, said cleaning formulation comprising:
- a water-displacing additive selected from the group consisting of carboxylates, sulfonates, amides, imides, esters and combinations thereof;
- a water-proofing additive selected from the group consisting of silicone based compounds, fluorinated organic compounds and mixtures thereof; and
- a solvent component.

**5,045,120**
**METHOD FOR CLEANING ELECTRONIC AND OTHER DEVICES**
**Michael T. Mittag, New-Haven, Vt.; Donald A. Elliott, Brossard, and Alan S. Roberts, Pointe Claire, all of Canada, assignors to Electrovert Ltd., Ontario, Canada**
**Filed Mar. 6, 1989, Ser. No. 319,505**
**Int. Cl.[5] B08B *3/02, 3/04***
**U.S. Cl. 134—26** **12 Claims**



1. A method of cleaning workpieces using a potentially flammable or explosive liquid cleaning solvent, comprising passing the workpieces through an immersion wash stage comprising a tank of the solvent, then passing the workpieces through a spray wash stage in which inert gas is provided to reduce oxygen and reduce the danger of fire and explosion and in which the solvent is sprayed on the workpieces and then passing the workpieces through a further immersion wash stage comprising a tank of the solvent, in which the spray wash stage comprises a closed chamber sealed from both immersion wash stages.

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**5,045,121**
**METHOD FOR REMOVING CARBON FROM CEMENTED TUNGSTEN CARBIDE ARTICLES**
**Timothy J. Hoffman, Towanda; Robert G. Mendenhall, Athens, and Michael J. Cheresnowsky, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.**
**Continuation of Ser. No. 369,447, Jun. 21, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 649,328**
**Int. Cl.[5] B08B *3/04***
**U.S. Cl. 134—39** **3 Claims**

1. A method for removing carbon from the surfaces of a cemented tungsten carbide article, said method consisting essentially of contacting a cemented tungsten carbide article with an aqueous solution of hydrogen peroxide having a concentration of at least about 5% by volume hydrogen peroxide for a sufficient length of time to remove the major portion of said carbon from the surfaces of said article.

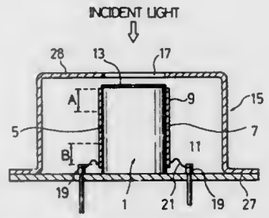
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**5,045,122**
**ESTER HYDROLYSIS AND DEPOLYMERIZATION OF POLYESTER AND POLYCARBONATE POLYMERS**
**George W. Tindall, Kingsport, and Randall L. Perry, Bluff City, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Dec. 14, 1989, Ser. No. 451,075**
**Int. Cl.[5] B08B *3/08***
**U.S. Cl. 134—29** **26 Claims**

1. A process for the hydrolysis of esters comprising contacting at least one ester with a mixture of (a) at least one alcohol or glycol; (b) at least one polar aprotic solvent; and (c) at least one alkoxide or hydroxide for a sufficient time to convert said ester to its corresponding alcohol or glycol and its corresponding acid or acid salt, wherein said alcohol or glycol is capable of bringing at least a portion of said alkoxide or hydroxide into solution with said polar aprotic solvent.



**5,045,123**
**THERMOPILE**
**Takao Hattori, Chiba; Suiya Hoshikawa, and Tatsuya Tsuda, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed May 15, 1989, Ser. No. 351,209**
**Claims priority, application Japan, May 17, 1988, 63-118049**
**Int. Cl.[5] H01L *35/00, 37/00***
**U.S. Cl. 136—213** **9 Claims**

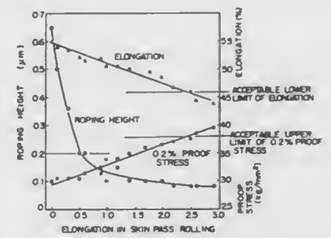



1. A thermopile for detecting incident light to be measured comprising;
- (a) a pillar-shaped substrate having a side extending in the parallel direction to said incident light to be measured such that the side is not irradiated with the incident light,
- (b) a plurality of first and second thermoelectric material layers arranged alternately on the side of said pillar-shaped substrate along the extending direction of the side of said pillar-shaped substrate,
- (c) said first thermoelectric material layers and second thermoelectric material layers being connected to each other in series such that one end of each first thermoelectric material is connected to one end of each second thermoelectric material at an incident-light side end portion of the side of said pillar-shaped substrate in the extending direction thereof to form hot junctions and another end of each first thermoelectric material is connected to another end of each second thermoelectric material at the other end portion of the side of said pillar-shaped substrate opposite to the incident-light-side end portion in the extending direction thereof to form cold junctions, and
- (d) a light shielding structure for blocking light from being incident on said substrate except through a window located just above said one ends.

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**5,045,124**
**PROCESS FOR PRODUCING COLD-ROLLED STRIP OR SHEET OF AUSTENITIC STAINLESS STEEL**
**Toshiyuki Suehiro, Hikari; Masanori Ueda, Kitakyushu; Shigeru Minamino, and Osamu Ikegami, both of Hikari, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**
**Filed Mar. 12, 1990, Ser. No. 492,557**
**Claims priority, application Japan, Mar. 14, 1989, 1-59781**
**Int. Cl.[5] C21D *8/02***
**U.S. Cl. 148—2** **3 Claims**

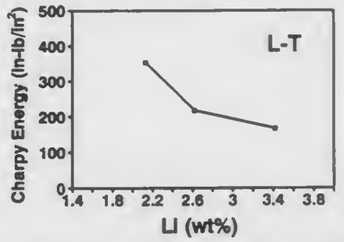
1. A process for producing a cold-rolled strip or sheet of an austenitic stainless steel, comprising the steps of:
- casting a melt of an austenitic stainless steel into a cast strip in the form of a thin strip having a thickness of 10 mm or less by using a continuous caster in which a casting-mold wall is moved synchronously with the cast strip;
- cold-rolling the cast strip to form a cold-rolled strip;




- final annealing the cold-rolled strip; and
- skin-pass-rolling the annealed strip at an elongation of from 0.5 to 2.5%.

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**5,045,125**
**CASE TOUGHENING OF ALUMINUM-LITHIUM FORGINGS**
**Jerry C. LaSalle, Montclair, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.**
**Filed Apr. 2, 1990, Ser. No. 502,950**
**Int. Cl.[5] C22F *1/04***
**U.S. Cl. 148—11.5 A** **7 Claims**



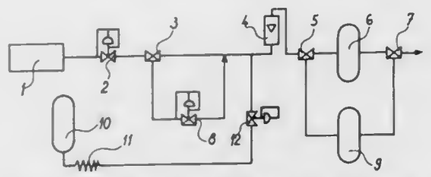

1. A process for enhancing toughness of rapidly solidified aluminum-lithium components, comprising the steps of:
- subjecting a component formed from a rapidly solidified aluminum-lithium alloy consisting essentially of the formula $Al_{bal}Li_aCu_bMg_cZr_d$ wherein "a" ranges from about 2.6 to 3.4 wt %, "b" ranges from about 0.5 to 2.0 wt %, "c" ranges from about 0.2 to 2.0 wt % and "d" ranges from about 0.6 to 1.8 wt %, the balance being aluminum to a thermal treatment at a temperature greater than 500° C. for a time period greater than 10 hrs. under protective atmosphere.

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**5,045,126**
**PROCESS AND EQUIPMENT FOR THE HEAT TREATMENT, BEFORE HARDENING, OF METALLIC PIECES BY CEMENTATION, CARBONITRIDATION OF HEATING**
**Alain Comier, Montreal, Canada; Patrice Ollivier, and Jean-Marc Viant, both of Paris, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France**
**Filed Dec. 19, 1989, Ser. No. 452,432**
**Claims priority, application France, Dec. 20, 1988, 88 16792**
**Int. Cl.[5] C21D *1/00***
**U.S. Cl. 148—13** **9 Claims**

1. A process for heat treating metallic pieces by cementation, carbonitridation, or heating, before hardening, under a treating atmosphere comprising nitrogen and methanol, in a treatment furnace having unlined walls of refractory bricks, comprising:

producing raw nitrogen by separation of nitrogen from air by adsorption through a permeation generator whereby is provided, in normal full flow operating conditions, a nitrogen gas having a residual content of oxygen of about 2%.




prior to restarting the treatment after an interruption of significant duration, introducing flushing nitrogen gas into the furnace at a flow which is substantially lower than the normal operating flow of said generator; and

accordingly adjusting said generator at a lower extraction rate such that the residual content of oxygen in said flushing nitrogen does not exceed 0.3%.

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**5,045,127**

**NON-IONIC, WATER WASHABLE SOLDERING PASTE**

**Stephen M. Dershem, Santee, and Richard R. Weaver, Poway, both of Calif., assignors to Quantum Materials, Inc., San Diego, Calif.**

**Filed Jun. 4, 1990, Ser. No. 532,912**
**Int. Cl.[5] B23K *35/34***
**U.S. Cl. 148—23** **13 Claims**

1. A non-ionic, water washable soldering paste composition comprising:

solder powder;

a thermally decomposable fluxing agent selected from quaternary ammonium hydroxides and mixtures thereof, said agent decomposing into volatile products; and

organic solvent.

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**5,045,128**

**SOLDER FLUXES BEARING OXIDE REMOVERS GENERATED BY LIGHT**

**Bobby D. Landreth, Ft. Lauderdale; Robert W. Pennisi, Boca Raton; James L. Davis, Tamarac, and Fadia Nounou, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 13, 1990, Ser. No. 566,029**
**Int. Cl.[5] B23K *35/34***
**U.S. Cl. 148—23** **46 Claims**

1. A fluxing composition for a solder formulation comprising a compound that will release a reducing agent upon exposure to light.

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**5,045,129**

**PROCESS FOR THE PRODUCTION OF SEMIPROCESSED NON ORIENTED GRAIN ELECTRICAL STEEL**

**Mario Barisoni, Ariccia, Italy, assignor to Centro Sviluppo Materiali S.p.A., Rome, Italy**

**Filed Dec. 18, 1990, Ser. No. 629,246**
**Claims priority, application Italy, Dec. 21, 1989, 47578 A/89**
**Int. Cl.[5] H01F *1/04***
**U.S. Cl. 148—111** **3 Claims**

1. Process for the production of semiprocessed non oriented grain sheet with high magnetic permeability and low magnetic losses, characterized by the combination of a previously vacuum carbodeoxidized steel containing:

| | | |
|---|---|---|
| C = 0.0020–0.0100% | Si = 0.2–2.0% | S = 0.001–0.10% |

-continued

| | | |
|---|---|---|
| N = 0.0010–0.0060% | Al = 0.2–0.5% | Mn = 0.200–0.800% |

which is subjected to the following manufacturing cycle:

treatment of the heat including heating of the slabs to a temperature between 1100 ° C. and 1200 ° C., finish of hot rolling at a temperature between 830 ° C. and 950 ° C. and coiling at a temperature between 650 ° C. and 800 ° C.;

annealing of the hot-rolled strip at temperatures in the 880 ° C. to 1030 ° C. range for between 30 and 120 seconds;

cold rolling with a reduction of area between 70% and 85%, without intermediate annealing;

recrystallization annealing at temperatures between 620 ° C. and 700 ° C. for between 30 and 120 seconds.

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**5,045,130**

**SOLUTION AND PROCESS FOR COMBINED PHOSPHATIZATION**

**M. Serge Gosset, Lestrem, and M. Jean-Claude Malras, Erquinghem-sur-la-Lys, both of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France**

**Filed Jun. 23, 1988, Ser. No. 211,448**
**Claims priority, application France, Jun. 25, 1987, 87 08989**
**Int. Cl.[5] C23C *22/23***
**U.S. Cl. 148—257** **14 Claims**

1. A method of combined acid phosphatization of a metallic substrate with zinc and with at least another metal selected from the group consisting of manganese and nickel comprising subjecting the said metallic substrate to a phosphatization step by way of an acid phosphatization solution comprising

at least about 2 g/l of a polyphosphate having the formula $(XPO_3)_n$ wherein $n \geqq 3$ and X represents an alkaline, alkaline earth-metal or ammonium;

at least about 0.5 g/l of a chelating agent; and

one of the following combinations of metal ions of the group consisting of zinc, manganese and nickel:

| | | |
|---|---|---|
| (a) | 0.5 g/l ≦ zinc ion | ≦ 10 g/l together with |
| | 2 g/l ≦ manganese ion | ≦ 6 g/l |
| (b) | 0.5 g/l ≦ zinc ion | ≦ 10 g/l together with |
| | 0.5 g/l ≦ nickel ion | ≦ 6 g/l. |

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**5,045,131**

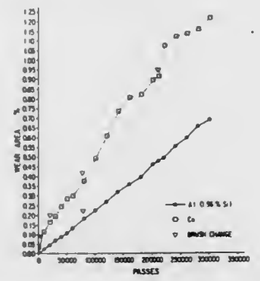
**CONTACT CONDUCTOR FOR ELECTRIC VEHICLES**

**Paul-Emile Fortin, and Willard M. Gallerneault, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada**

**Continuation-in-part of Ser. No. 86,521, Aug. 18, 1987, Pat. No. 4,861,388. This application Jun. 20, 1989, Ser. No. 369,010**
**Claims priority, application Canada, Aug. 20, 1986, 516434; May 20, 1987, 537462**
**Int. Cl.[5] C22C *21/00***
**U.S. Cl. 148—415** **3 Claims**

1. A contact conductor of improved wear resistance formed of an aluminum alloy having a tensile strength of at least 38,000 psi and a minimum electrical conductivity of 50% IACS, said alloy consisting essentially of 0.2–1% by weight magnesium, 1–7% by weight silicon, 0.001–0.03% by weight boron and the balance being aluminum and incidental impurities including iron, with said silicon being present in the alloy in an excess amount of at least 0.6% by weight as determined by the formula:

Excess % Si = Total % Si − {(%Mg/1.73) + (%Fe/3)},



said excess silicon being essentially in the form of finely distributed particles which are harder than aluminum.

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**5,045,132**

**HIGH-ENERGY EXPLOSIVE OR PROPELLANT**

**Milton B. Frankel, Tarzana, and Michael A. Cunningham, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Sep. 6, 1990, Ser. No. 578,157**
**Int. Cl.[5] C06B *45/10***
**U.S. Cl. 149—19.6** **8 Claims**

1. A composite for use as a high-energy explosive or propellant comprising:

(a) 1,9-dinitrato-2,4,6,8-tetranitrazanonane; and

(b) a polymeric binder.

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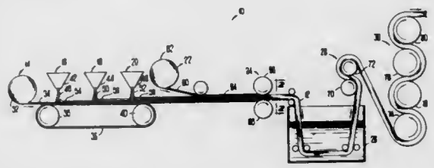
**5,045,133**

**HEALTH CARE LAMINATE**

**Diego H. DaPonte, Woodstock; Norman K. Fox, LaGrange, and Robert A. Funk, Roswell, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.**

**This application Dec. 14, 1988, Ser. No. 284,264**

**Related U.S. Application Data**
**Division of Ser. No. 148,817, Jan. 27, 1988 Pat. No. 4,818,598**
**Int. Cl.[5] B27N *3/00***
**U.S. Cl. 156—62.8** **4 Claims**



1. A process for producing a non-woven health care laminate comprising the steps of:

(a) forming a first outer layer of spun-bonded filaments of a non-polar polymer;

(b) depositing thereon a first insulative layer of melt-blown fibers of a non-polar polymer;

(c) depositing thereon a central layer of melt-blown fibers of a polar polymer;

(d) depositing thereon a second insulative layer of melt-blown fibers of a non-polar polymer;

(e) depositing thereon a second outer layer of spun-bonded filaments of a non-polar polymer;

(f) laminating the layers together to form the laminate; and

(g) treating the laminate with a fluorocarbon suspended in an alcohol and driving off the alcohol with heat.

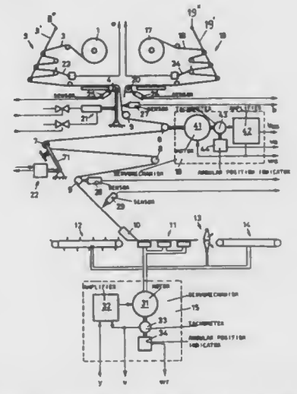


**5,045,134**

**METHOD FOR SPLICING TRAILING AND LEADING ENDS OF SHEETS**

**Thomas Schenker, Neuhausen am Rheinfall, Switzerland, and Horst Loewenthal, Tiengen, Fed. Rep. of Germany, assignors to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland**

**Filed Oct. 17, 1989, Ser. No. 422,804**
**Claims priority, application Switzerland, Oct. 17, 1988, 3867/88**
**Int. Cl.[5] B65H *19/00*; B32B *31/00***
**U.S. Cl. 156—64** **5 Claims**



1. A method of splicing a trailing end of a first sheet to a leading end of a second sheet, comprising the following steps:

(a) causing engagement of the first sheet by a first rotary drive of a first servomechanism and by a second rotary drive of a second servomechanism;

(b) advancing the first sheet in a direction of advance by said first rotary drive and said second rotary drive; said second rotary drive being situated upstream of said first rotary drive as viewed in the direction of advance;

(c) generating a signal a when the trailing end of the first sheet passes a predetermined location and applying the signal a to a computer;

(d) based on signal a, generating a particular signal Vas by the computer and applying the particular signal Vas to said second servomechanism for reducing the advancing speed of the first sheet to zero at a given moment thereby facilitating said splicing; said step of generating said particular signal Vas comprises the steps of

(1) generating, by a first correcting circuit of an equivalence circuit of the computer, an output signal z;

(2) generating, by a second correcting circuit of said equivalence circuit of the computer, an output signal Was separately from step (d)(1);

(3) applying the output signal z to a first input of a multiplier of the equivalence circuit;

(4) applying the output signal Was to a first input of a subtractor of the equivalence circuit;

(5) applying an output signal v of the first servomechanism to a second input of said multiplier; said output signal v representing an actual speed of the first sheet at said first rotary drive;

(6) forming, by said multiplier, an output signal V'as from the output signals v and z;

(7) applying the output signal V'as to a first input of an adder of the equivalence circuit;

(8) forming, by said adder, said particular signal Vas by summing the output signal V'as and an output signal da of the subtracter applied to a second input of said adder;

(9) applying an output signal wr of the first servomechanism to an input of said first correcting circuit and to an

input of said second correcting circuit; said output signal wr representing an actual angular position of said first rotary drive; and

(10) applying an output signal wa of the second servomechanism to a second input of said subtracter; said output signal wa representing an actual angular position of said second rotary drive;

(e) splicing said trailing end to said leading end at a location upstream of said second rotary drive while said trailing end is stationary as a result of step (d), and

(f) after step (e), generating a normal signal Vas by the computer and applying the normal signal Vas to said second servomechanism for normally advancing said first sheet.

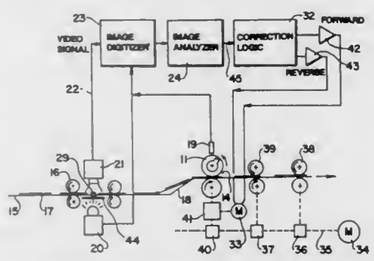
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**5,045,135**

## APPARATUS AND METHOD FOR CUTOFF REGISTER CONTROL FOR DIAPER MACHINES

**George H. Meissner; Bart C. Hardy, and Timothy M. LeRoy, all of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.**

**Filed Nov. 15, 1990, Ser. No. 614,393**
**Int. Cl.[5] B32B *31/00***
**U.S. Cl. 156—64** **7 Claims**




1. Apparatus for cutoff register control for diaper machines comprising a frame,

means for advancing a continuous diaper web along a longitudinally extending path, said web being equipped with longitudinally spaced apart absorbent pads,

strobe light means on said frame in said path, cutoff means on said frame downstream of said strobe light means for transversely severing said web between adjacent pads,

strobe light signal means coupling said cutoff means to said strobe light means for actuating said strobe light means as a function of the operation of said cutoff means,

camera means operably associated with said strobe light means to record an image of a diaper pad and a fixed point on said frame,

means for comparing the distance between the edge of an imaged pad and said fixed point with a predetermined acceptance distance range, and

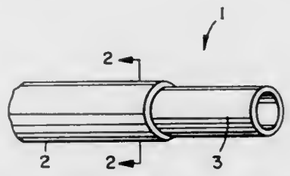
means for changing the operation of said cutoff means whenever the recorded distance is outside said range to bring the distance in a following pad within said range.

**5,045,136**

## METHOD OF MANUFACTURING A HEAT SHRINKABLE ARTICLE

**Benoit L. Poulin, Hudson, N.H., assignor to Essex Group, Inc., Fort Wayne, Ind.**

**Continuation of Ser. No. 259,066, Oct. 18, 1988, abandoned, which is a division of Ser. No. 115,306, Nov. 2, 1987, abandoned. This application Jan. 17, 1990, Ser. No. 466,681**
**The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.**
**Int. Cl.[5] B32B *31/20***
**U.S. Cl. 156—85** **4 Claims**



1. A method of manufacturing a unitary heat deformable structure comprising the steps of:

(a) providing an expanded heat deformable article having an inner surface and being capable of being heated so as to return to its original dimension;

(b) providing a noncrosslinked thermoplastic article comprising ethylene-vinyl acetate/polyethylene copolymer, having an outer surface, an inner surface and an outside dimension smaller than the inner dimension of the expanded heat deformable article;

(c) positioning the thermoplastic article inside the expanded heat deformable article such that the resultant composite has a first end and a second end;

(d) hermetically sealing the first end of the composite formed in step (c);

(e) pressuring the inner surface of the thermoplastic article so that the thermoplastic article expands into contact with the expanded heat deformable article;

(f) sealing the second end of the composite formed in step (c);

(g) heating the thermoplastic article and the expanded heat deformable article to a temperature sufficient to cause the thermoplastic article to flow in contact with the inner surface of the expanded heat deformable article effecting bonding between the thermoplastic article and the expanded heat deformable article, but insufficient to cause the thermoplastic article to fully melt and the heat deformable article to fully recover to its original dimension; and

(h) cooling the heated composite of step (g) to below a temperature sufficient to solidify the thermoplastic article, thereby bonding the thermoplastic article to the heat deformable article and forming said unitary heat deformable structure.

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**5,045,137**

## PROCESS OF JOINING SILICON NITRIDE BODIES AND INSERT FOR FACILITATING SUCH JOINING

**Ernö Gyarmati, Linnich-Tetz, Fed. Rep. of Germany, assignor to Forschungzentrum Julich GmbH, Julich, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 115,775, Oct. 30, 1987, Pat. No. 4,917,843. This application Dec. 8, 1989, Ser. No. 448,163**
**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842984**
**The portion of the term of this patent subsequent to Apr. 17, 2008, has been disclaimed.**
**Int. Cl.[5] B32B *18/00***
**U.S. Cl. 156—89** **10 Claims**

1. A process for joining molded parts respectively having

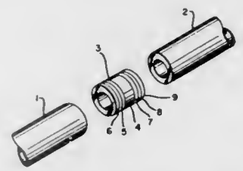


surfaces of silicon nitride at least for the surfaces to be joined, comprising the steps of:

providing on at least one of said surfaces to be joined, in sequence, a first nitrogen-deficient covering layer having the composition $SiN_x$ in which $x<1.3$, a nitrogen-surplus covering layer having the composition $SiN_y$ in which $y>1.33$, and a second nitrogen-deficient layer having the composition $SiN_x$ in which $x<1.3$, the respective compositions and the relative thicknesses of the layers being such as to complement an average composition of substantially $Si_3N_4$ for the combination of the three layers, the total thickness of said three layers not exceeding about 3 μm;

fitting together said surfaces to be joined; and

joining said parts and said surfaces together by hot-pressing with at least 10 MPa pressure and at a temperature above 1500° C.



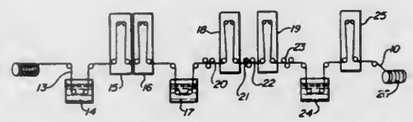
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**5,045,138**

## METHOD OF FORMING POWER TRANSMISSION BELT TENSILE CORD

**Satoshi Mashimo, Akashi; Yoshio Yamaguchi, Hyogo; Kazuhiro Takeda, Hyogo, and Koji Kitahama, Hyogo, all of Japan, assignors to Mitsuboshi Belting Ltd., Japan**

**Filed Apr. 20, 1987, Ser. No. 40,563**
**Claims priority, application Japan, Apr. 23, 1986, 61-95676**
**Int. Cl.[5] B29C *65/48***
**U.S. Cl. 156—137** **7 Claims**



1. The method of forming a tensile cord for use in a power transmission belt, comprising the steps of:

providing a cord of twisted polyester multifilaments having an ultimate viscosity in the range of approximately 0.75 to 0.95, an original double refraction ratio in the range of approximately 0.16 to 0.195, an original Young's modulus in the range of approximately 50 grams/denier to 106 grams/denier, an original thermal stress in the range of approximately 0.10 to 0.60 grams/denier when heated to a temperature of 150° C. for 8 minutes, an original stress ratio of approximately 0.85 to 0.91 with a load of 3 grams/denier applied for 2 minutes, and an original shrinkage under dry heat of approximately 4.0% to 9.0% when heated to a temperature of 150° C. for 30 minutes;

applying adhesive to the cord;

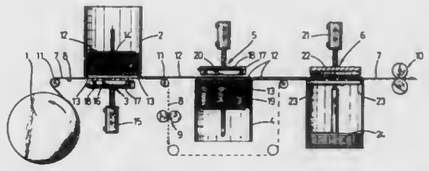
drawing the cord in at least two steps at a temperature in the range of approximately 220° C. to 240° C. with a first draw ratio in the range of approximately 1.0% to 1.7% and a second draw ratio in the range of approximately 1.0% to 1.7% and setting the drawn adhesive-coated cord, wherein the drawn cord has a Young's modulus of at least 110 grams/denier, a thermal stress of more than 0.48 grams/denier when heated to 150° C. for 8 minutes and a stress ratio of more than 0.925 with a load of 3 grams/denier.

**5,045,139**

## PROCESS FOR THE PRODUCTION OF A PICTUREPOSTCARD

**Wybe J. K. Vonk, London, England, assignor to Chubasco N. V., Curacao, Netherlands**

**Filed Jun. 5, 1989, Ser. No. 362,369**
**Int. Cl.[5] B32B *31/00***
**U.S. Cl. 156—152** **4 Claims**



1. A process for production of a picture postcard, comprising the steps of:

a) providing a continuous web having a layer of adhesive on each surface thereof, and advancing said web intermittently;

b) adhering one of a picture layer and support layer to a first surface thereof;

c) adhering to other of said picture layer and said support layer to the opposite surface thereof, said picture layer and said support layer being in registry and forming a picture postcard unit; and

d) cutting the picture postcard unit out of the web, wherein each said adhering step takes place at a different location spaced along said web, while said web is stopped.

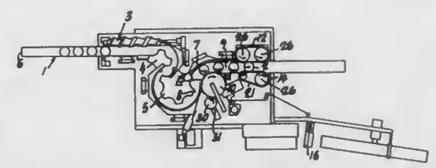
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**5,045,140**

## ULTRA HIGH SPEED LABELING APPARATUS AND METHOD

**Daniel M. Dickey, Denair, Calif., assignor to CMS Gilbreth Packaging Systems, Inc., Trevose, Pa.**

**Filed Apr. 28, 1989, Ser. No. 345,447**
**Int. Cl.[5] B65C *3/16, 9/04, 9/22***
**U.S. Cl. 156—215** **14 Claims**



1. Labeling apparatus for high speed application of labels to cylindrical containers comprising:

(a) a cylindrical rotary drum having a plurality of protrusions thereon and means for retaining a label on a face thereof such that an end of said label contacts the top of a protrusion;

(b) glue application roll means having a patterned surface for applying glue onto the ends of said label retained on said protrusions;

(c) a glue bar connected to a glue tank for applying glue to the surface of said glue application roll means through a tapered opening formed in a face of said glue bar which face addresses said glue application roll means

(d) conveyor means for continuous container feed of cylindrical containers in rapid succession to said cylindrical rotary drum;

(e) means for imparting spin opposite to the direction of rotation of said cylindrical rotary drum to said containers at a label application station such that the ends of said

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labels contact a surface of said container and are applied thereto;
(f) a discharge conveyor for carrying said labeled containers in rapid succession from said label application station;
(g) independently mounted stabilizer belt means for dampening axial rotation of said labeled containers while supporting them in an upright position as they are discharged in a stabilized manner on said discharge conveyor.

6. A method of applying labels in rapid sequence to cylindrical containers comprising the steps of:
(a) continuously transporting a rapid sequence of cylindrical containers toward a label application station;
(b) positioning a leading edge of a label segment on protrusions formed on the periphery of a vacuum drum;
(c) channeling glue through a vertically positioned glue bar including a face which abuts a glue application roll;
(d) depositing glue onto the glue application roll through a tapered portal on said face of said glue bar;
(e) spreading the glue evenly over the surface of the glue application roll; and,
(f) collecting excess glue from the surface of the glue application roll in a recess in said glue bar face positioned orthogonal to the surface of the glue application roll;
(g) applying glue to said leading edge of the label segment by contacting said leading edge with the glue spread on the glue application roll;
(h) advancing the label segment to the label application station;
(i) imparting a spin to each container and thereby affixing the label segment to said container by allowing the container to contact said leading edge of said label segment at said label application station;
(j) rapidly discharging said containers in a stable, non-rotating upright condition by simultaneously supporting and dampening rotation of the containers about their axes.

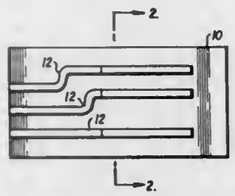
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**5,045,141**

## METHOD OF MAKING SOLDERABLE PRINTED CIRCUITS FORMED WITHOUT PLATING

**George A. Salensky, Whitehouse Station, and Stephen B. Rimsa, Lebanon, both of N.J., assignors to Amoco Corporation, Chicago, Ill.**

Filed Jul. 1, 1988, Ser. No. 214,380
Int. Cl.[5] H05K *1/09*
U.S. Cl. 156—240 32 Claims




1. A process for forming a directly solderable printed circuit article which comprises:
(1) providing a release surface;
(2) applying an ink comprising a thixotropic thermosetting resin composition containing a desired amount of an electrically conductive metal powder and high surface area metal flake to the release surface in a configuration of an unplated, solderable electric circuit element;
(3) the thermosetting resin comprising a mixed resin composition of a cross-linkable resin and a thermoplastic resin possessing functionally reactive groups capable of reacting with functionally reactive groups in the cross-linkable resin;
(4) drying the ink;
(5) printing in registration with the ink circuit element a reactive thixotropic adhesive interface capable of interacting with the thermosetting resin composition of step (2) and a dielectric surface;
(6) drying the thixotropic adhesive;
(7) bringing together the release surface and the dielectric surface so that the unplated, solderable electrical circuit element is facing the dielectric surface and is separated therefrom by the thixotropic adhesive interface; and
(8) applying sufficient heat and pressure to form a composite structure whereby the thermosetting resin is cured and the adhesive is interacted whereby the solderable electrical circuit element is transferred from the release surface to become bonded to the dielectric surface.

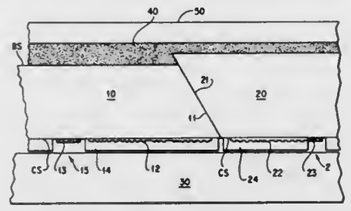
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**5,045,142**

## STAND-OFF STRUCTURE FOR FLIPPED CHIP BUTTING

**Donald J. Drake, and Cathie Burke, both of Rochester, N.Y., assignors to Xerox Corporation, N.Y.**

Filed Nov. 22, 1989, Ser. No. 440,269
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—278 16 Claims




1. A method of fabricating a pagewidth array which includes a plurality of wafer subunits, each subunit having a circuit surface and an opposite base surface, said method comprising the steps of:
inverting said plurality of subunits with each of said circuit surfaces facing toward a support surface to expose the base surfaces of each subunit;
butting each of said subunits against an adjacent subunit to form an end-to-end array of butted subunits;
applying a conformal adhesive to a bonding substrate, and applying the bonding substrate to the base surfaces of said array of butted subunits to form an adhesive layer across each of said subunits;
permitting said adhesive layer to cure to form an assembly; and
protecting said circuit surfaces from damage due to contact with said support surface by applying a stand-off layer of substantially uniform thickness to at least a portion of said circuit surfaces prior to inverting said plurality of subunits.

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**5,045,143**

## METHOD OF PRODUCING ADHESIVELY BONDED METAL FLUROELASTOMER COMPOSITES

**Vincenzo Arcella, Novara; Raffaele Ferro, and Giulio Tommasi, both of Milan, all of Italy, assignors to Ausimont S.p.A., Milan, Italy**

**Continuation of Ser. No. 282,969, Dec. 6, 1988, abandoned, which is a continuation of Ser. No. 173,039, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 886,930, Jul. 18, 1986, abandoned. This application Oct. 16, 1989, Ser. No. 423,559**
Claims priority, application Italy, Jul. 24, 1985, 21701 A/85
Int. Cl.[5] C09J *5/02*
U.S. Cl. 156—307.3 8 Claims

1. In a process for obtaining a high adhesion between a metal surface and a fluoroelastomer by vulcanizing said fluoroelastomer on the metal surface coated with an adhesive, the improvement comprising using as the fluoroelastomer a copolymer containing from 35 to 80 mol % of vinylidene fluoride, from 15 to 35 mol % of hexafluoropropene, from 0 to 30 mol % of another comonomer selected from the class consisting of fluoro-olefins and perfluorovinyl ethers, and from 0.001 to 2 weight % of bromine, using as vulcanizing agent a dihydroxy compound and using as vulcanization accelerator a quaternary ammonium or phosphonium or aminophosphonium compound.



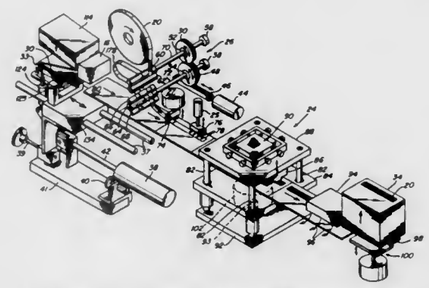
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**5,045,144**

## APPARATUS FOR APPLYING STRIPS TO CARDS

**Jaime Boneml, Stoughton, Mass., assignor to Bostec Systems, Inc., Canton, Mass.**

Filed Jun. 8, 1990, Ser. No. 535,134
Int. Cl.[5] B26D *5/00*; B32B *31/00*; B65C *9/00*
U.S. Cl. 156—361 37 Claims



1. An apparatus for applying a strip material to the surface of plastic card stock comprising:
means for storing blank plastic card stock pieces;
means for transferring in a downstream direction plastic card stock from said means for storing;
means, positioned downstream of said means for transferring, for supplying a predetermined length of strip material from a source at an overlaid position on each of said plastic card stock pieces;
means, positioned downstream of said means for supplying, for cutting said strip material to a predetermined length;
means, positioned downstream of said means for cutting, for spot tacking said overlaid strip material to said card stock surface, said means for spot tacking operating prior to said means for cutting; and
moving lamination head means, positioned downstream of said means for spot tacking, for adhering permanently said strip material to each of said plastic card stock pieces, said lamination head means being disposed to contact and withdraw from said surface of each plastic card stock piece to contact it with predetermined pressure for a predetermined time in the location of tacked and cut strip material while said card stock piece is stationarily positioned relative to said lamination head means.

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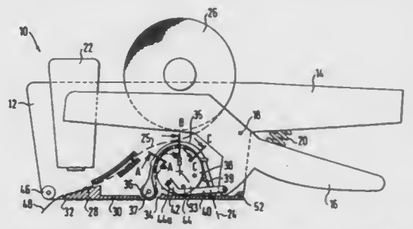
**5,045,145**

## MEANS FOR SUPPLYING A LABEL STRIP

**Werner Becker, Hirschhorn, Fed. Rep. of Germany, assignor to Esselte Meto International Produktions GmbH, Hirschhorn, Fed. Rep. of Germany**

Filed Dec. 19, 1989, Ser. No. 452,345
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3843068
Int. Cl.[5] B65C *11/02*
U.S. Cl. 156—384 3 Claims

1. Means for supplying a label strip to the peripheral face of a transport wheel which is provided with radially projecting driver teeth, mounted on a label printing and/or label dispensing apparatus, rotatably mounted about an axis and engages the label strip by penetration of the driver teeth into transport cuts in the label strip and transports said strip from an entrance point to an exit point in each case through a distance equal to the length of the labels, the pitch of the driver teeth in the peripheral direction of the transport wheel being slightly greater than the pitch of the transport cuts in the label strip in the longitudinal direction thereof, the transport wheel being surrounded between the entrance point and the exit point by a cover which extends in the peripheral direction of the transport wheel and which in its inner face associated with the path along which the driver teeth move on rotation of a transport wheel is provided with at least one groove, characterized in



that the distance of the inner surface of the cover from the peripheral face of the transport wheel in a first region immediately adjoining the entrance point is so dimensioned that the driver teeth on rotation of the transport wheel exert a frictional force on the label strip inserted at the entrance point between the peripheral face of the transport wheel and the cover, in a second region adjoining the first region is dimensioned so that the label strip is not deformed by the driver teeth and in a third region extending from the second region up to the exit point is so dimensioned that the driver teeth penetrate into the groove of the inner face and penetrate through the label strip.

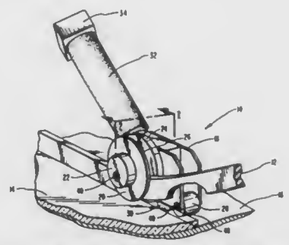
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**5,045,146**

## TAPE APPLICATOR WITH CORNER FORMING DEVICE

**John R. Rundo, Strongsville, Ohio, assignor to Tremco, Inc., Beachwood, Ohio**

Filed Jun. 8, 1989, Ser. No. 363,510
Int. Cl.[5] B32B *31/00*
U.S. Cl. 156—391 17 Claims



1. A tool for applying a flexible adhesive strip onto the surface of an article a predetermined distance from the edge of the article, comprising:
a frame;
a directing roller, comprising:
a cylindrical axis;
a flange disposed on each side of the cylindrical axis; and
an eccentric disk by which the directing roller is mounted to said frame, said eccentric disk configured to permit the directing roller to be mounted to the frame at any one of a plurality of positions; and
a guide attached to the frame and configured to guide said directing roller in a direction substantially parallel to the

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edge of the article a predetermined distance from the edge of the article.

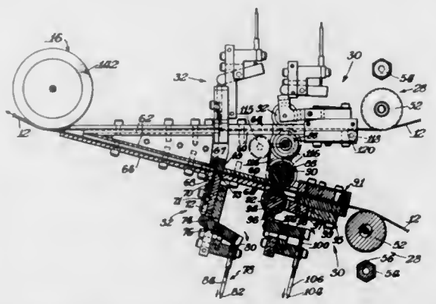
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5,045,147

## FILAMENT WINDING SYSTEM

Vernon M. Benson, South Jordan, Utah; Dee R. Gill, Seattle, Wash.; Boyd L. Hatch, Salt Lake City; John A. Johnson, Magna, both of Utah; Brian Moloney, Billings, Mont.; Noel I. Shepherd, Grantsville, Utah; Keith G. Shupe, Bountiful, Utah, and William J. Weis, Magna, Utah, assignors to Hercules Incorporated, Wilmington, Del.

Filed Nov. 23, 1988, Ser. No. 275,313
Int. Cl.[5] B65H *81/00*; B32B *31/08, 31/18, 31/26*
U.S. Cl. 156—429 22 Claims



1. In a filament winding system using a cut/add delivery head for winding a plurality of tows forming a winding band onto a mandrel to form an irregular shaped object, the improvement being a cut/add delivery head comprising:

a) an upper cut/add assembly wherein half of the tows are conveyed therethrough,

b) a lower cut/add assembly disposed at an angle to said upper assembly wherein the remaining half of the tows are conveyed therethrough,

c) said upper and lower assemblies being spaced from each other at their feed ends and being substantially juxtaposed at their discharge ends so that the tows being fed from each assembly to the mandrel meet in a single plane immediately before passing to applicating means, each assembly comprising

i) distributing means being located at said feed end of said assembly for spacing the tows and feeding the tows inwardly in said head,

ii) ribbonizing means for ribbonizing or spreading the tows to a desired width and thickness,

iii) chilling means for cooling the tows coming from the ribbonizing section,

iv) cutting means to selectively cut individual tows passing through said assembly which are not to be applied to the mandrel as part of the winding band,

v) add means upstream from said cutting means for holding said cut tows and adding said cut tows on demand to permit the application of cut tows to the mandrel as part of the winding band, and

d) applicating means at said discharge ends of said assemblies for receiving the tows in a single plane from each of the upper cut/add assembly and the lower cut/add assembly and applying the tows to the mandrel.

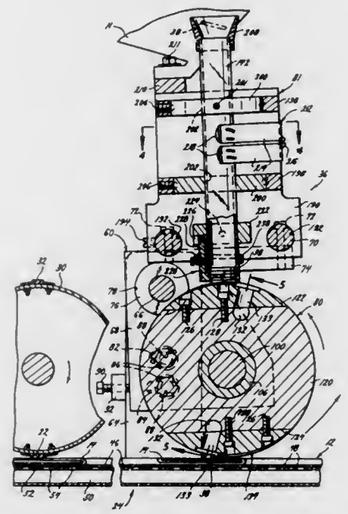
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5,045,148

## ARTICLE ATTACHING APPARATUS

Armand C. L. Hoffstetter, Town & Country, and Ronald L. Schilling, Florissant, both of Mo., assignors to GA-Vehren Engineering Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 919,193, Oct. 15, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 237,303
Int. Cl.[5] B65H *1/00*; B23Q *7/02*
U.S. Cl. 156—567 14 Claims



1. A high speed apparatus for attaching articles to each of a sequence of longitudinally moving sheets, the apparatus comprising:

(a) conveyor means for continuously transporting the sheets,

(b) adhesive means for applying an adhesive area to each sheet as it is being transported,

(c) storage means holding a plurality of articles in a stack above the conveyor means, the storage means having a top end adapted to receive articles, and a bottom end adapted to release them,

(d) a rotatable feed wheel means disposed between the article storage means and the conveyor means and adapted to rotate rapidly therebetween and having a cylindrical surface adjacent the bottom end of the article storage means and with a portion of that cylindrical surface holding articles in the storage means while continuously passing beneath the article release bottom end of the storage means,

(e) a groove substantially the width of the article, formed substantially as an arc of the cylindrical surface, the groove having a feathered forward open end and a rearward closed end, in the direction of rotation, passing beneath the article release bottom end of the article storage means, the groove being tapered from its rearward end to its feathered forward end a distance, given the speed of rotation, for the article to be received in its forward end and to seat in the rearward end to be withdrawn from the bottom end of the article storage means during rotation,

(f) retaining means for retaining the article in place on the feed wheel means during its rotation,

(g) deposit means for depositing the article on a sheet on the conveyor means, and

(h) drive means for driving the feed wheel means.

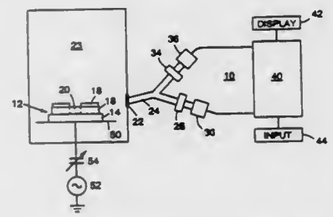


5,045,149

## METHOD AND APPARATUS FOR END POINT DETECTION

James E. Nulty, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 261,780, Oct. 24, 1988, abandoned. This application Jun. 22, 1990, Ser. No. 542,811
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—627 10 Claims



1. A method of determining a time at which a radio frequency powered plasma etching process, etching a first material over a second different material, should be terminated when the first material is etched away exposing the second different material, wherein the method comprising the steps of:

monitoring an optical emission intensity of said plasma etch process by a positive filter, a filter which generates a signal which increases in signal amplitude upon the detection of the first material being etched away, generating a first signal in response thereto, said first signal varying in intensity depending upon the etching process;

simultaneously monitoring the optical emission intensity of said plasma etch process by a negative filter, a filter which generates a signal which decreases in signal amplitude upon the detection of the first material being etched away, generating a second signal in response thereto, said second signal varying in intensity depending upon the etching process;

combining said first signal with said second signal to produce a combined signal; and

detecting a change in said combined signal, wherein said change is indicative of said first material being etched away exposing said second different material.

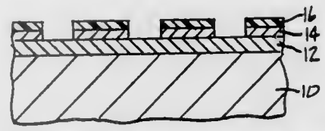
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5,045,150

## PLASMA ETCHING USING A BILAYER MASK

James M. Cleeves, Redwood City; James G. Heard, and Zoilo C. H. Tan, both of Cupertino, all of Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Continuation of Ser. No. 906,346, Sep. 11, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 210,211
Int. Cl.[5] C23F *1/00*
U.S. Cl. 156—643 12 Claims



1. A method for plasma etching a primary aluminum layer formed on a semiconductor substrate, said method comprising:

forming a chromium metal image layer over the primary aluminum layer, said chromium layer having a thickness sufficient to withstand subsequent plasma etching of the aluminum layer;

forming a thin resist layer over the chromium metal layer;

photolithographically patterning the resist to form a first mask;

etching the chromium metal layer through the first mask to form a second mask;

plasma etching the primary aluminum layer through the second mask under the conditions which etch the aluminum layer in preference to the chromium layer and;

removing the remaining portion of the chromium metal layer.

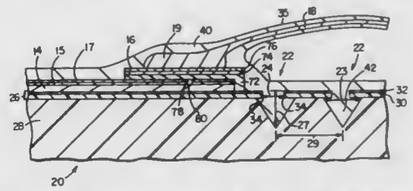
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5,045,151

## MICROMACHINED BONDING SURFACES AND METHOD OF FORMING THE SAME

David J. Edell, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 17, 1989, Ser. No. 422,540
Int. Cl.[5] H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—647 41 Claims



1. A method of encapsulating an electrical conductor exposed at a substrate surface, said method comprising

providing a predefined pattern of cavities in regions of said substrate surface adjacent said conductor, the openings of said cavities in said surface being smaller than portions of the cavities lying below said surface;

applying an encapsulant to said conductor and said regions adjacent said conductor and permitting portions of said encapsulant to enter said cavities; and

causing said encapsulant to harden to form an integral mass including anchor portions interlocked within said cavities and connected to encapsulating portions lying on said conductor and said regions of said surface adjacent said conductor.

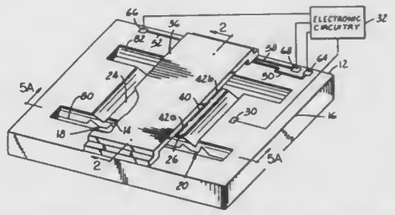
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5,045,152

## FORCE TRANSDUCER ETCHED FROM SILICON

Edward N. Sickafus, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 319,495, Mar. 6, 1989, Pat. No. 4,945,773. This application Jun. 29, 1990, Ser. No. 528,389
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—653 5 Claims



1. A method for fabricating an accelerometer from silicon, comprising the steps of:

etching a pair of cavities through a silicon substrate from an exposed surface of said silicon substrate to define a first suspended beam therebetween, said first suspended beam being deflectable in response to acceleration;

forming a first conductive portion on said first suspended beam;
bonding a silicon based material to an opposite surface of said silicon substrate;
etching a pair of cavities through said silicon based material bonded to said substrate to define a second suspended beam suspended opposite said first suspended beam;
forming second and third conductive portions on said second suspended beam opposite said first conductive portion;
coupling an electrical oscillator circuit between said first and second conductive portions for oscillating said second suspended beam; and
coupling an electrical detector circuit between said first and third conductive portions for sampling electrical power between said first and third conductive portions at sample times provided by said oscillation of second beam.

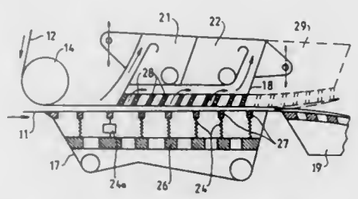
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**5,045,153**

## DOUBLE SCREEN FORMER WITH FLEXIBLE LATHS SPACED GREATER THAN OPPOSITE RIGID LATHS

**Hans-Peter Sollinger; Rudolf Bück; Dieter Egelhof, and Hubert Polifke, all of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany**

**Filed Feb. 11, 1991, Ser. No. 654,784**
**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1990, 4005420**
**Int. Cl.[5] D21F** *9/02, 1/36*
**U.S. Cl. 162—301** **6 Claims**



1. A double screen former for the manufacture of a fiber material web from a fiber material suspension, comprising:
two generally continuous screen loops forming together a double screen zone, each of said loops being formed by a travelling screen; wherein the travelling screen of one screen loop runs in said double screen zone across a plurality of rigid laths, said rigid laths being mutually spaced and arranged on a dewatering box; and wherein the travelling screen of the other screen loop runs in said double screen zone across a plurality of flexibly supported located substantially opposite said rigid laths, said flexibly supported being supported by means of flexible elements structured and arranged so that the flexibly supported laths are pushed on said screen at a selected force; said flexibly supported laths being mutually spaced at a spacing at least approximately twice as large as the spacing between said rigid laths.

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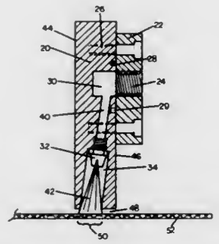
**5,045,154**

## CONVEYOR EDGE PRODUCT CONTAINING DEVICE FOR PAPER MAKING MACHINERY

**Mark R. Baluha, 5690 Hackett Rd., Saginaw, Mich. 48603**

**Filed Jun. 28, 1990, Ser. No. 544,970**
**Int. Cl.[5] D21F** *1/56*
**U.S. Cl. 162—353** **9 Claims**

1. In papermaking machinery, a relatively rigid elongate deckle board acting as a conveyor edge product containing device comprising:
an elongate rectangular main body having a top, a bottom, two elongate sides, and two short sides;
a continuous rectangular nozzle slot defined in a cross section of three sides by the main body and open on the bottom and the two short sides, and positioned at an angle relative to one of the elongate sides;
a central distribution chamber having a length almost the length of the main body and open at said one of the elongate sides;
a seal plate covering said distribution chamber at said open elongate side;



a plurality of angled holes connecting said distribution chamber to said angled slot;
a plurality of spaced solid, flat, fan spray nozzles located in said nozzle slot in said angled holes structured and arranged so that the spray from each nozzle overlaps creating a continuous spray barrier confined in the nozzle slot except on the said two short sides which prevents side discharge of paper pulp slurry along an edge of a continuous conveyor used on the papermaking machine.

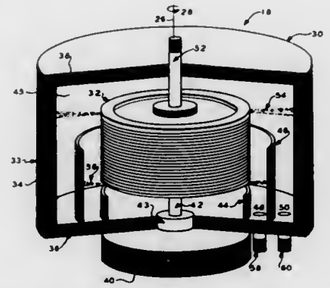
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**5,045,155**

## CENTRIFUGAL DISTILLATION APPARATUS

**Arnold Ramsland, 121 S. Kingman Rd., South Orange, N.J. 07079**

**Filed Sep. 11, 1989, Ser. No. 404,654**
**Int. Cl.[5] B01D** *1/22, 1/26, 3/08*
**U.S. Cl. 202—174** **7 Claims**



1. A centrifugal distillation apparatus comprising:
a stationary outer collector having an axis; a rotatable coaxial inner distiller, said distiller having a central coaxial perforated portion with a distiller inlet and having a plurality of coaxial ring-shaped disks supported by the central portion; said disks having pairs of spaced opposite surfaces forming a plurality of radial passageways and each said pair of opposite surfaces including a first relatively smooth surface and a second relatively grooved surface, wherein the second relatively grooved surface has a plurality of radial grooves, wherein the central coaxial perforated portion comprises:
a plurality of inner spacer rings alternately disposed between said plurality of ring-shaped disks; a bottom center disk; a top center disk; a plurality of rods extending through the ring-shaped disks and the inner spacer rings and the bottom center disk and the top center disk; said inner spacer rings having conduits for fluid flow into the passageways; and a filter cartridge coaxially disposed between the center disks.

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**5,045,156**

## DISTILLATION OF ISOPHTHALONITRILE WITH A HYDROCARBON LIQUID

**Michael K. Poindexter, Sugarland, Tex., assignor to Nalco Chemical Company, Naperville, Ill.**

**Filed Jan. 9, 1991, Ser. No. 638,932**
**Int. Cl.[5] B01D** *3/34;* **C07C** *253/34*
**U.S. Cl. 203—68** **3 Claims**

1. In a process wherein a crude isophthalonitrile (IPN) is fed to a distillation column and a portion of the IPN being distilled is used to solubilize solid impurities formed during the distillation process and which impurities are removed from the distillation column for disposal, the improvement which comprises increasing the yield of IPN by replacing from 1 to 50% by weight of the crude INP feed to the column, with a substantially aromatic free hydrocarbon liquid having an initial boiling point between 570° to 750° F. and continuing the distillation whereby the hydrocarbon liquid replaces the INP used to solubilize the impurities thereby increasing the yield of distilled IPN recovered from the column, and then removing distilled IPN from the column.

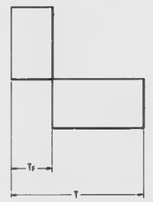
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**5,045,157**

## PROCESS FOR PRODUCING ALUMINUM SUPPORT FOR PRINTING-PLATE

**Atsuo Nishino, and Tsutomu Kakei, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 30, 1989, Ser. No. 330,834**
**Claims priority, application Japan, Mar. 31, 1988, 63-76401**
**Int. Cl.[5] C25F** *3/04;* **C25D** *5/44*
**U.S. Cl. 204—33** **12 Claims**



1. A process for producing a support for an aluminum printing plate having a surface with pits formed therein, the process comprising the steps of:
obtaining a plate comprising one of pure aluminum and aluminum alloy; and
subjecting said plate to electrochemical surface-roughing to form said pits in said surface by using an alternating current as an electrolytic power source for an acid electrolyte, said alternating current having a waveform with a frequency within a range of 80 to 120 Hz, and a ratio of an anode time $t_F$ to a period T ($t_F$/T) in a range of 0.25 to 0.20.

11. A process according to claim 1, wherein after said plate is subjected to said electrochemical surface-roughing, said surface of said plate is coated with a photosensitive layer.

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**5,045,158**

## ELECTRICALLY CONDUCTIVE WATER/OIL MICROEMULSIONS OF THE WATER-IN-OIL TYPE BASED ON PERFLUORINATED COMPOUNDS AND USED AS A CATHOLYTE IN ELECTROCHEMICAL PROCESSES

**Alba Chittofrati, Milan; Angelo Tentorio, Novara, and Mario Visca, Alessandria, all of Italy, assignors to Ausimont S.r.L., Milan, Italy**

**Filed Jun. 19, 1989, Ser. No. 367,860**
**Claims priority, application Italy, Jun. 17, 1988, 21004 A/88**
**Int. Cl.[5] C25B** *1/00*
**U.S. Cl. 204—98** **12 Claims**

1. An electrochemical process comprising reducing oxygen at a cathode using microemulsions of water-in-oil as a catholyte, said microemulsion having an electric conductance by ionic transfer of at least 1 millisiemens $cm^{-1}$ and wherein the microemulsion of the water-in-oil type having a conductant of at least 1 millisiemens $cm^{-1}$ consisting essentially of a liquid, limpid or opalescent, macroscopically single-phase matter obtained by mixing:
(a) an aqueous liquid;
(b) a perfluoropolyether-structured fluid having perfluoroalkyl or functional end groups, with carboxylic, alcoholic, polyoxyalkylene-OH, ester, amide functionally;
(c) a fluorinated surfactant and
(d) a hydrogenated alcohol $C_1$–$C_{12}$.

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**5,045,159**

## DERIVATIVES OF COMPOUNDS CONTAINING A CARBONYL GROUP CONJUGATED TO AN AROMATIC MOIETY AND ELECTROPHILIC METHODS OF FABRICATION THEREOF

**Martin J. Goldberg, Mahopac; Daniel P. Morris, Purchase, and Alfred Viehbeck, Stormville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 18, 1989, Ser. No. 381,552**
**Int. Cl.[5] C25C** *3/00*
**U.S. Cl. 204—59 R** **51 Claims**

1. A method for forming a derivative of a compound having a carbonyl group conjugated at an aromatic moiety to form derivative compound selected from the group consisting of a substituted thioether, an ether, a phosphate and silylether comprising:
supplying at least on electron to said carbonyl group conjugated to an aromatic moiety;
contacting said conbonyl group conjugated to an aromatic moiety with said at least one electron thereon with an electrophile containing at least one atom selected from the group of S, C, P and Si;
there being at least one anionic leaving group bonded to said at least one atom;
said anionic leaving group leaves said atom providing a location at said atom to bond to said carbonyl group conjugated to an aromatic moiety with at least one electron thereon.

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**5,045,160**

## PROCESS FOR THE ELECTROCHEMICAL SEPARATION OF METAL MIXTURES AND METAL ALLOYS

**Jozef Hanulik, Zurich, Switzerland, assignor to Recytec S.A., Neuchatel, Switzerland**

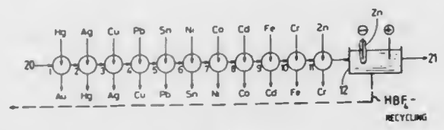
**Continuation-in-part of Ser. No. 249,411, Sep. 26, 1988, abandoned. This application Dec. 5, 1989, Ser. No. 446,109**
**Claims priority, application Switzerland, Sep. 28, 1989, 3748/87**
**Int. Cl.[5] C25C** *1/00, 7/00;* **C22B** *3/00*
**U.S. Cl. 204—105 R** **26 Claims**

1. A process for the electrochemical separation off metal mixtures and metal alloys, which comprises dissolving the starting material in an electrolyte, wherein said electrolyte is

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selected from aqueous solutions of tetrafluoboric acid and salts of said acid, and bringing the electrolytic solution successively in contact with several substitution metals wherein said substitution metals are successively less noble in each case, for substituting the dissolved metals in succession in accordance with their electrochemical potential with electrochemically less noble metals in each case and depositing them.



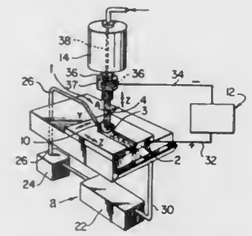

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**5,045,161**

**METHOD AND APPARATUS FOR ELECTROLYTICALLY ASSISTING THE MECHANICAL SHAPING OF A WORKPIECE**

**Gavin McGregor, Gloucester, Canada, assignor to National Research Council, Canada**

**Filed Jan. 17, 1990, Ser. No. 466,241**
**Int. Cl.[5] B23H** *3/04, 3/10, 9/00*
**U.S. Cl. 204—129.46** **14 Claims**




1. A method of electrolytically assisting the mechanical shaping a workpiece, comprising: a) directing a stream of electrolyte to flood a gap immediately ahead of a cutting tool of electrical insulating material between a cathode and a localized, electrically conductive surface layer of a workpiece, b) applying a low voltage, direct current across the gap using localized, surface layer of the workpiece as the anode, c) moving the cutting tool to remove the localized surface layer, and wherein the improvement comprises, d) applying the low voltage direct current at such a magnitude and for sufficient time for the surface layer ahead of the cutting tool to be structurally weakened electrolytically for easy removal by the cutting tool in a discrete, particulate form which is washed away by entrainment in the electrolyte, (A method according to claim 3,) wherein the stream of electrolyte passes along a bore in the tool shank and is delivered to the gap by exit ports in the tool shank.

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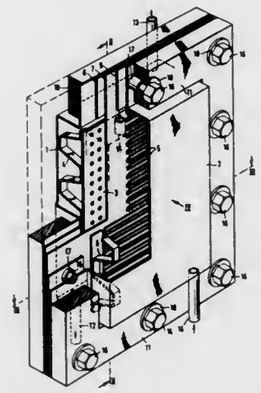
**5,045,162**

**PROCESS FOR ELECTROCHEMICALLY REGENERATING CHROMOSULFURIC ACID**

**Hans Herbst, Meitingen; Jürgen Stenzel, Gersthofen, and Siegfried Benninger, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany**

**Filed Oct. 31, 1990, Ser. No. 606,437**
**Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3940978**
**Int. Cl.[5] C02F** *1/46*
**U.S. Cl. 204—130** **6 Claims**

1. A process for electrochemically regenerating chromosulfuric acid by anodic oxidation of $Cr^{3+}$ ions to $Cr^{6+}$ ions, in which the anolyte contains 20 to 200 g/dm$^3$ total $CrO_3$ and 100 to 600 g/dm$^3$ $H_2SO_4$ and the catholyte contains 50 to 500 g/dm$^3$ $H_2SO_4$, which process comprises carrying out the regeneration in an electrolysis cell which comprises two tub-like metal half shells whose open sides face one another, a metal plate which is provided with holes or slots and which is joined to the anode tub by corrugated fasteners being present in the



anode tub as anode, a metal sheet which is joined to the cathode tub by corrugated fasteners being present in the cathode tub as cathode, anode tub and cathode tub being separated from one another by a current-permeable, hydraulically sealing partition and seals and being held together by a clamping device, the temperature being 40° to 110° C. and the current density 100 to 2500 A/m$^2$.

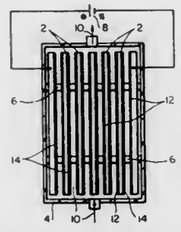
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**5,045,163**

**ELECTROCHEMICAL METHOD FOR MEASURING CHEMICAL SPECIES EMPLOYING ION EXCHANGE MATERIAL**

**Eric D. Nyberg, Belmont; Ken A. Klingman, Menlo Park; Jeff Curtis, San Francisco, and Ray F. Stewart, Redwood City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.**

**Continuation of Ser. No. 422,709, Oct. 17, 1989, abandoned, which is a divislon of Ser. No. 17,375, Feb. 20, 1987, Pat. No. 4,888,098, which is a continuation-in-part of Ser. No. 932,763, Nov. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 831,758, Feb. 20, 1986, abandoned. This application Jun. 5, 1990, Ser. No. 534,316**
**Int. Cl.[5] C25B** *11/00*
**U.S. Cl. 204—153.1** **25 Claims**




1. A method of monitoring an electrolyte to determine a change in the concentration of a chemical species in that electrolyte, or of monitoring the presence of an electrolyte comprising a chemical species, which method comprises:

(I) providing a source of electrical power,



(II) providing an apparatus comprising:

(a) a first electrode which is connectable to the source of electrical power;

(b) a second electrode which is connectable to the source of electrical power, and which is spaced apart from the first electrode, the first and second electrodes being so positioned and arranged that when an electrolyte containing a chemical species is between the electrodes and the source is connected to the electrodes, current passes between the electrodes through the electrolyte; and

(c) an ion exchange material which

(i) is in electrical and physical contact with and substantially entirely surrounds the surface of one of the electrodes and

(ii) has an ionic resistance to the passage of the current, which ionic resistance depends upon the concentration of the chemical species in the electrolyte;

(III) connecting the source of electrical power to the first and second electrodes whereby when the electrolyte is between the electrodes, an electrochemical reaction takes place at the interface of the ion exchange material and the electrode contacted thereby, generating an ionic species, and substantially all the ionic species so generated passes through the ion exchange material; and

(IV) monitoring a voltage change between the electrodes or along at least one of the electrodes, associated with a change in the ionic resistance of the ion exchange material.

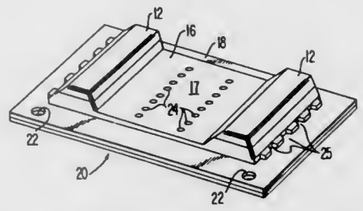
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**5,045,164**

**ELECTROPHORESIS PLATE FOR DIVERTING GENERATED FLUID**

**Aungnapa Tansamrit, and Subphong Tansamrit, both of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.**

**Filed May 23, 1990, Ser. No. 527,358**
**Int. Cl.[5] G01N** *27/26;* **B01D** *57/06*
**U.S. Cl. 204—182.8** **12 Claims**




1. In a process of electrophoretic separation using an electrophoresis plate having a planar layer comprising an electrophoretic medium, the electrophoretic medium including at least some fluid, and a thickened portion provided on two opposing ends of said planar layer, forming an electrophoresis area between the two thickened portions, each of said thickened portions having an edge facing away from the electrophoresis area and including the electrophoretic medium and fluid, the thickened portion functioning as a self-contained fluid reservoir for electrophoresis, the improvement comprising:

diverting water separated during electrophoresis away from the electrophoresis area.

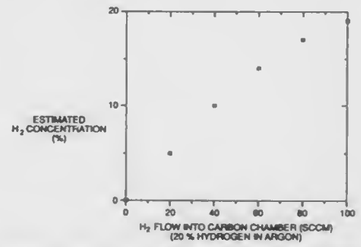
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**5,045,165**

**METHOD FOR SPUTTERING A HYDROGEN-DOPED CARBON PROTECTIVE FILM ON A MAGNETIC DISK**

**Tsutomu T. Yamashita, San Jose, Calif., assignor to Komag, Inc., Milpitas, Calif.**

**Filed Feb. 1, 1990, Ser. No. 473,540**
**Int. Cl.[5] C23C** *14/34*
**U.S. Cl. 204—192.16** **11 Claims**




1. A method for forming a carbon film on a magnetic memory, said magnetic memory comprising a magnetic film formed on a non-magnetic substrate, said method comprising the steps of:

introducing a process gas into a sputtering apparatus; and

sputtering carbon from a sputtering target within said apparatus onto said memory in the presence of said process gas to thereby form said carbon film, said process gas comprising a sufficient amount of gaseous molecules containing hydrogen to substantially enhance wear resistance of the carbon film, said process gas being substantially free of hydrocarbon gases, said carbon film having predominantly SP2 bonding, wherein the process gas introduced into the apparatus in the vicinity of said sputtering target has a concentration of said gaseous molecules containing hydrogen such that said concentration would be greater than or equal to about 15% by volume if sputtering were not taking place.

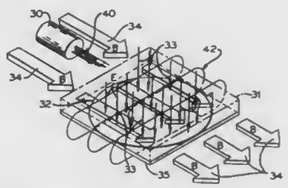
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**5,045,166**

**MAGNETRON METHOD AND APPARATUS FOR PRODUCING HIGH DENSITY IONIC GAS DISCHARGE**

**Stephen M. Bobbio, Wake Forest, N.C., assignor to MCNC, Research Triangle Park, N.C.**

**Filed May 21, 1990, Ser. No. 526,572**
**Int. Cl.[5] B01J** *19/12;* **H01H** *1/46;* **C23F** *4/04;* **C23C** *14/35*
**U.S. Cl. 204—192.32** **52 Claims**




48. A method for generating a high density ionic gas discharge for processing a surface of a substrate, comprising the steps of:

generating a magnetic field (B) across the substrate surface;

generating an electric field (E) perpendicular to the substrate surface;

generating a plasma stream; and

transporting the generated plasma stream adjacent to the substrate surface, to create an E×B electron drift region adjacent to a substrate surface beginning substantially at the substrate surface and extending outwardly a predetermined distance therefrom;

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said transporting step further comprising the step of transporting the generated plasma stream to enter laterally into the E×B region between the substrate surface and the predetermined distance therefrom parallel to the generated magnetic field with minimal movement of the plasma stream perpendicular to the generated magnetic field in travelling from the plasma generator to the E×B region.

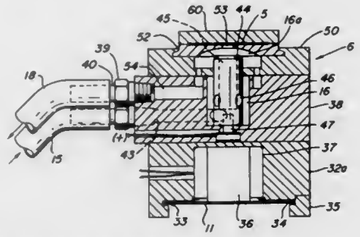
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**5,045,167**

**CONTINUOUS ELECTROPLATING APPARATUS**

**Karl L. Palnik, Huntingdon Valley, Pa., assignor to The Carolinch Company, Ivyland, Pa.**

**Filed Mar. 30, 1990, Ser. No. 502,846**
**Int. Cl.[5] C25D *17/00***
U.S. Cl. 204—206 **18 Claims**



1. An electroplating apparatus comprising:
a carrier moveable in a continuous path;
a product plating station located along a first portion of the path of said carrier, whereby metallic stock in strip form is plated;
means for continuously moving negatively charged stock in strip form along the portion of said path through said plating station;
at least one plating head comprising a reservoir of plating solution, an anode in said reservoir for positively charging the solution relatively to said stock and a masked plating orifice for application of plating solution through the orifice to said stock;
means mounting said head on said carrier for independent movement of the carrier relative to the head, said mounting means further comprising selectively operable means activatible to interconnect the head and the carrier for conjoint movement;
control means including a product sensing means responsive to the presence of a region to be plated on said stock for activating said selectively operable means for conjoint movement of the head and the carrier through the plating station; and
means for maintaining the masked orifice and the stock in contact through said plating station, whereby the area defined by the mask is plated;
said control means further including means for thereafter deactivating said selectively operable means to disconnect the head from the carrier.

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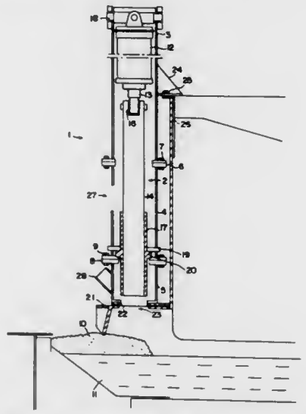
**5,045,168**

**POINT FEEDER FOR ALUMINIUM ELECTROLYSIS CELL**

**Kjell M. Dalen, Haugesund; Alfred Kvalavåg, Kvalavåg, and Bernt Nagell, Haugesund, all of Norway, assignors to Norsk Hydro a.s., Oslo, Norway**

**Filed Jul. 3, 1990, Ser. No. 547,151**
**Claims priority, application Norway, Jul. 3, 1989, 892741**
**Int. Cl.[5] C25C *3/14, 3/22***
U.S. Cl. 204—245 **16 Claims**

1. A point feeder for feeding additives to electrolysis cells, comprising:
a housing, said housing having an upper portion and a lower portion connected to each other;
a piston/cylinder device mounted in said upper portion of said housing, said upper portion of said housing being at least partly open such that said piston/cylinder device is at least partly exposed to the environment outside of said upper portion of said housing;
a bar for breaking a hole in the crust of an electrolysis cell movably mounted in said housing;



said bar being connected to said piston/cylinder device for movement thereby;
pipe means for feeding additives to the hole in the crust made by the bar; and
guide means for guiding said bar as it is moved by said piston/cylinder device, said guide means being mounted at the connection between said upper portion and said lower portion of said housing, and said guide means comprising a bushing.

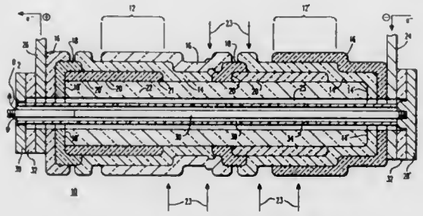
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**5,045,169**

**SOLID OXIDE ELECTROLYTE ELECTROCHEMICAL OXYGEN GENERATOR**

**William Feduska, Edgeworth Boro; Arnold O. Isenberg, Pittsburgh, both of Pa., and Jack T. Brown, Bethesda, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Feb. 5, 1990, Ser. No. 474,899**
**Int. Cl.[5] C25B *9/04, 15/08;* H01M *8/18, 8/04***
U.S. Cl. 204—258 **32 Claims**



1. An electrochemical device, capable of generating oxygen from air upon the application of an electrical current, comprising a plurality of adjacent electrochemical cells electrically connected in series, each cell containing an inner, porous oxygen electrode; a dense, solid oxide electrolyte capable of transporting oxygen ions partly disposed on top of the inner electrode and partly disposed between inner electrodes of adjacent cells; an outer, porous air electrode disposed on top of the electrolyte; and separate, dense, electronically conductive segments of interconnection material disposed between adjacent cells, where solid electrolyte between adjacent cells contacts part of the interconnection to provide a dense, gas impermeable barrier between the outside and the inside of the device, with the interconnection electrically and physically connecting the outer air electrode from one cell, to the inner oxygen electrode from an adjacent cell, to provide a device having gas impermeable, dense, contacting segments of electrolyte and interconnection material between inner electrodes of adjacent cells, and where the device contains positive and negative terminals, the negative terminal being effective to allow feeding of current into a contacting air electrode.



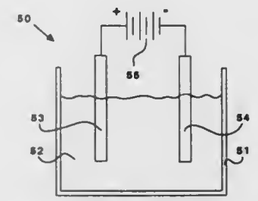
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**5,045,170**

**ELECTRODIES CONTAINING A CONDUCTIVE METAL OXIDE**

**Norma K. Bullock, Pewaukee, and Wen-Hong Kao, Brown Deer, both of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.**

**Filed May 2, 1989, Ser. No. 345,993**
**Int. Cl.[5] C25B *11/00;* H01M *4/14***
U.S. Cl. 204—280 **57 Claims**



52. In an apparatus for the electrolytic synthesis of a product from a reactant in an aqueous sulfuric acid reaction medium, including a container for said medium, a pair of electrodes including an anode and a cathode disposable in said medium, and means for applying an electrical current to said medium through said electrodes to form said compound, the improvement wherein one of said electrodes contains a conductive, sulfuric acid-resistant metal oxide of perovskite structure which remains substantially unreactive during said electrolytic synthesis, wherein said metal oxide consists essentially of a compound selected from the group consisting of $BaPbO_3$, $ZnSnO_3$, $CdSnO_3$, $ZnPbO_3$, $CdPbO_3$, $Cd_2PbO_4$, and $CdPb_2O_5$, and combinations thereof.

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**5,045,171**

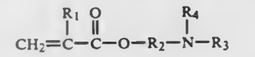
**ACID EFFICIENT MEMBRANE FOR USE IN ELECTRODIALYSIS FOR RECOVERY OF ACID**

**Russell J. MacDonald, Watertown, Mass., assignor to Ionics, Incorporated, Watertown, Mass.**

**Continuation-in-part of Ser. No. 337,203, Apr. 12, 1989, which is a continuation of Ser. No. 177,727, Apr. 5, 1988, Pat. No. 4,822,471. This application Aug. 14, 1989, Ser. No. 393,334**
**Int. Cl.[5] C25B *13/08***
U.S. Cl. 204—296 **6 Claims**

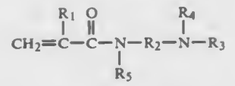
I. An electrodialysis apparatus for recovering acid values containing at least one anion selective membrane having at least a laterally continuous portion of its thickness characterized by dense, crosslinked, polymeric, hydrocarbonaceous anion exchange material having in equilibrium with 0.01 normal hydrochloric acid at room temperature a water content of less than about 5 mols per equivalent of anion exchange capacity, said anion exchange material comprising addition products of compounds belonging to groups a) through k):

a)

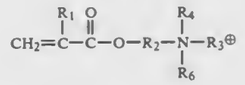


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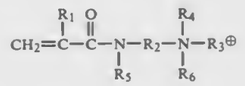
b)



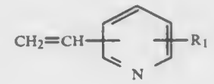
c)



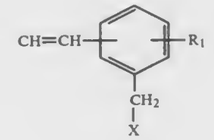
d)



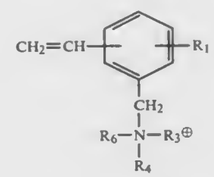
e)



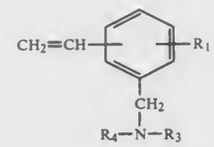
f)



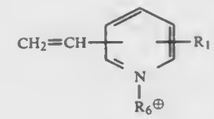
g)



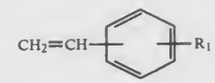
h)



i)



j)



k) aminostyrenes, tertiary butyl n-vinyl carbamate, N,N-dimethyl allylamine, z-vinyl-4,6-diamino-S-triazine, diallylamine, dimethyldiallyl ammonium chloride, divinylpyridines.

where $R_1$ is hydrogen or an alkyl or alkoxy moiety;
$R_2$ is an alkyl group;
$R_3$ and $R_4$ are individually hydrogen and/or an alkyl group;
$R_5$ is hydrogen or an alkyl or alkoxy moiety;
$R_6$ is hydrogen and/or an alkyl group;
x is a halide moiety.

VOL 1130 ISS 1 SE 3 1991 UMI

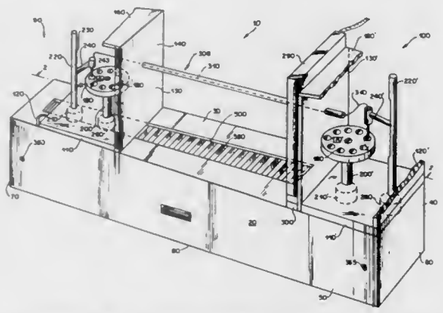


5,045,172

## CAPILLARY ELECTROPHORESIS APPARATUS

Norberto Guzman, East Brunswick, N.J., assignor to Princeton Biochemicals, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 125,544, Nov. 25, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 270,788
Int. Cl.[5] G01N *27/26*; B01D *57/02*
U.S. Cl. 204—299 R 40 Claims



1. Capillary electrophoresis apparatus comprising a capillary tube of the type which can be electrically charged, said capillary tube having first and second ends,

first means at said first end of said capillary tube providing a source of buffer solution and a source of a sample substance to be analyzed,

second means coupled to said apparatus for applying electrical potential across said capillary tube whereby a sample flows through said capillary tube and past a detector,

said first means includes a rotatable table carrying a plurality of sample cups and a holder for holding an end of said capillary tube in operative relation with one of the said cups, said cups containing either buffer solution or a sample to be analyzed, and

a T-shaped section of capillary tube inserted in said capillary tube and coupled to a source of cleaning fluid usable to clean said capillary tube.

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5,045,173

## CONTAINER FOR ELECTROPHORETIC GEL

Philip A. Guadagno, Vidor, and Terry L. McNeely, Beaumont, both of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

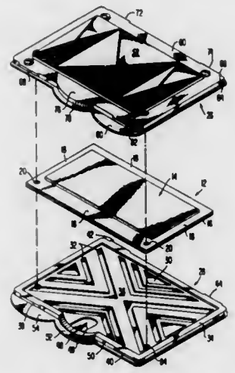
Filed May 23, 1990, Ser. No. 527,354
Int. Cl.[5] B65D *85/48*; B01D *61/42*
U.S. Cl. 204—299 R 12 Claims

1. A container for protecting and enclosing an electrophoresis plate, the electrophoresis plate including a substrate having a generally flat surface and a gel layer adhered to a portion of the generally flat surface of the substrate, the substrate including a periphery which is free of the gel layer, said substrate periphery including alignment means, the container comprising:

a top portion and a bottom portion which when closed are sealingly engageable with one another;

the bottom portion having a cavity for receiving an electrophoresis plate; and

means for securing the top portion and bottom portion together and for preventing movement of an electrophoresis plate received in said cavity, said securing means extending through the alignment means of the electrophoresis plate.



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5,045,174

## PROCESS FOR THE PRODUCTION OF HEARTCUT DISTILLATE RESIN PRECURSORS

Dane C. Grenoble, Houston, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Mar. 21, 1990, Ser. No. 496,719
Int. Cl.[5] C10G *45/00, 9/00*
U.S. Cl. 208—57 56 Claims

1. A process for producing heartcut distillate comprising:

a) hydrogenating a hydrocarbon oil comprising two-ring aromatic molecules to form a hydrogenated hydrocarbon oil comprising partially saturated naphtheno-aromatic molecules; and

b) subjecting a feedstock comprising said hydrogenated hydrocarbon oil to steam cracking under conditions which favor producing a heartcut distillate containing an amount greater than about 4 wt.% yield of heartcut distillate resin precursors.

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5,045,175

## SEPARATION SYSTEM FOR $C_4$ HYDROTREATER EFFLUENT HAVING REDUCED HYDROCARBON LOSS

Robert S. Halzmann, Rolling Meadows, Ill.; Andrew S. Zarchy, Amawalk, and Martin F. Symoniak, Mahopac, both of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 458,267, Jul. 17, 1990, Pat. No. 4,980,046. This application Oct. 22, 1990, Ser. No. 600,790
The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.
Int. Cl.[5] C10G *67/06*
U.S. Cl. 208—99 17 Claims

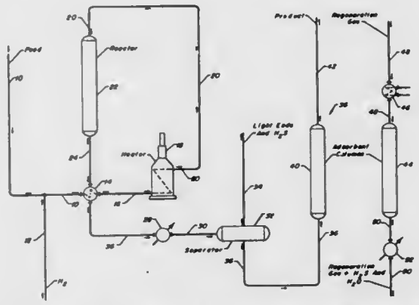
1. A process for treating a sulfurous hydrocarbon stream comprising $C_4$ and larger hydrocarbons and containing a sulfur concentration of at least 20 ppm to convert sulfur compounds to $H_2S$ and reduce the sulfur concentration of said hydrocarbon stream, said process comprising:

a) admixing said sulfurous hydrocarbon feedstream with a hydrogen stream in a ratio of less than 50 SCFB;

b) contacting said sulfurous hydrocarbon stream and said hydrogen in a hydrotreating zone with a hydrotreating catalyst at hydrotreating conditions to convert sulfur compounds to $H_2S$ and produce a hydrotreated effluent stream;

c) passing said hydrotreated effluent feedstream to a flash separator at conditions that will maintain a liquid phase containing at least 75 wt. % of said $H_2S$ and removing hydrogen from said hydrotreated effluent to produce an at least partially stabilized effluent;

d) passing said partially stabilized effluent at liquid phase conditions to an adsorption section and contacting said stabilized effluent with an adsorbent material selective for $H_2S$ to adsorb $H_2S$ from said effluent stream;



e) recovering a desulfurized hydrocarbon stream from said adsorption section;

f) passing a regeneration gas to said adsorption section and contacting said adsorbent material with said regeneration gas to desorb $H_2S$ from said adsorbent material; and,

g) removing regeneration gas containing $H_2S$ from said process.

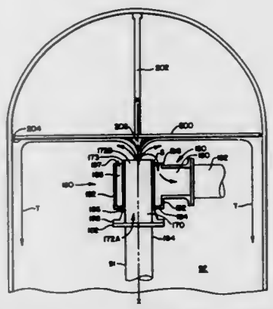
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5,045,176

## CARBOMETALLIC OIL CONVERSION WITH BALLISTIC SEPARATION

Paul W. Walters, Ashland; Roger M. Benslay, Catlettsburg, and Dwight F. Barger, Russell, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 521,504, Aug. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 438,074, Nov. 1, 1982, Pat. No. 4,495,063, which is a division of Ser. No. 263,394, May 13, 1982, Pat. No. 4,390,503. This application Feb. 5, 1990, Ser. No. 474,686
Int. Cl.[5] C10G *11/00, 9/28*
U.S. Cl. 208—113 5 Claims



1. In a method for converting carbo-metallic containing residual oils to form upgraded liquid products by mixing (a) a dispersing diluent material; (b) a 343° C. (650° F.)-plus residual oil feed characterized by a Conradson carbon value of at least about 1 wt % and comprising at least about 4 ppm of heavy metals nickle equivalents; and (c) fluidizable solid particle material to form a flowing suspension comprising all three components (a), (b) and (c) combined at an elevated hydrocarbon conversion temperature in a progressive flow reaction zone, said formed suspension is passed through said reaction zone for a hydrocarbon vapor residence time less than 5 seconds at a temperature providing a hydrocarbon feed conversion to hydrocarbon product vapors in the range of about 50% up to about 90% during deposition of carbonaceous material on said solid particles, said suspension of hydrocarbon product vapors and solid particles pass through a substantially unobstructed open end in said reaction zone into a larger disengaging zone, the improvement which comprises:

(a) discharging said suspension from said reaction zone at a velocity of 55 to 100 ft/sec. imparting greater momentum to said solid particles than to said hydrocarbon product vapors whereby instantaneous separation of at least about 80 wt. % of the vapors from said solid particles occurs;

(b) encouraging separation of solids from remaining vapors following discharge from said reaction zone by diverting solids from said remaining vapors by directional impingement on a target baffle and by providing a lower pressure vapor recovery zone in open communication with one or more cyclone separation zones outside the reaction zone open end;

(c) recovering solid particles separated by momentum from said suspension and diverted laterally from said vapor recovery zone as a mass of collected solid particles;

(d) stripping and regenerating said collected solid particles in a sequence of separate zones; and

(e) recycling hot regenerated solids to said reaction zone for contact with the residual oil feed.

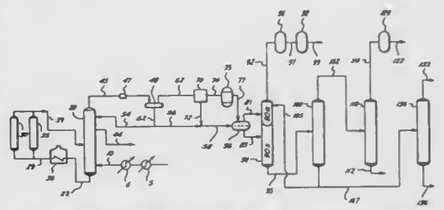
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5,045,177

## DESULFURIZING IN A DELAYED COKING PROCESS

John C. Cooper, Beaumont, and James H. Colvert, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 15, 1990, Ser. No. 567,517
Int. Cl.[5] C10G *9/14*
U.S. Cl. 208—131 9 Claims



1. A delayed coking process for the conversion of high sulfur residual oil feedstock to coke, hydrocarbon liquid and sweet gas fractions, the process comprising the steps of:

a. coking the sour residual oil feedstock at coking conditions thereby converting the feedstock to coke and sour hydrocarbon fluids,

b. separating the sour hydrocarbon fluids from the coke,

c. fractionating the sour hydrocarbon fluids to yield a sour $C_1$–$C_4$ gas fraction, and a hydrocarbon liquid fraction,

d. desulfurizing by amine scrubbing the entire sour $C_1$–$C_4$ gas fraction to yield a sweet $C_1$–$C_4$ gas fraction.

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5,045,178

## PROCESS FOR PRODUCTION OF METHYLNAPHTHALENES

Fumio Maruyama; Shirou Aizawa, both of Toda City, and Kazuo Fujiyoshi, Tokyo, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,033
Claims priority, application Japan, Mar. 20, 1989, 1-66091
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] C10G *35/085*
U.S. Cl. 208—138 9 Claims

1. A process for producing methylnaphthalenes which com-

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prises subjecting a fraction containing at least 50% by volume of components within the boiling range of 195°–215° C., which is obtained by distilling a raffinate resulting from recovery of normal paraffins from a hydrodesulfurized kerosene fraction, to reforming reaction and then recovering methylnaphthalenes from the product oil.

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**5,045,179**

## PROCESS FOR THE HYDROGENATION REPROCESSING OF USED OILS

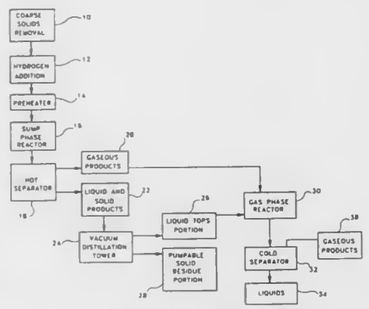
**Josef Langhoff, Dinslaken; Alfons Jankowski, Essen, and Harald Weber, Duisburg-Rahm, all of Fed. Rep. of Germany, assignors to Ruhrkohle AG, Essen, Fed. Rep. of Germany**

**Filed Jul. 15, 1988, Ser. No. 220,139**

**Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723607**

**Int. Cl.[5] C10M *11/00***

**U.S. Cl. 208—262.5** **23 Claims**




1. A process for removing polycholorinated biphenyl from used oil to produce secondary raffinates, said used oil comprising at least one of: an oil, hydraulic fluid, cutting oil and electric transformer coolant oil, said process comprising the steps of:

(a) removing any coarse solid particles from said at least one of said oil, said hydraulic fluid, said cutting oil and said electric transformer coolant oil;

(b) adding hydrogen to said at least one of said oil, said hydraulic fluid, said cutting oil and said electric transformer coolant oil after step (a) to form a hydrogen rich mixture prior to carrying out steps (c) through (k);

(c) preheating said hydrogen rich mixture performed in step (b) to a temperature of about 350° C.;

(d) passing said hydrogen rich mixture preheated to said temperature of about 350° C. in step (c) to a sump phase reactor;

(e) hydrogenating said hydrogen rich mixture in said sump phase reactor at a pressure of about 150 bar and a temperature of about 350° C. to form a combination of reaction products;

(f) heating said reaction products formed in step (e) in a hot separator to a temperature of about 310° C.;

(g) separating said reaction products in said hot separator into gaseous, liquid and solid products;

(h) extracting said gaseous products from an upper portion of said hot separator;

(i) extracting said liquid and said solid products from a lower portion of said hot separator;

(j) passing said liquid and said solid products extracted from said hot separator in step (i) to a vacuum distillation tower;

(k) separating said liquid and said solid products at a temperature of about 350° C. and a pressure of about 20 mbar in said vacuum distillation tower into a liquid portion and a pumpable solids portion containing said polychlorinated biphenyl; and

(l) combining said liquid portion from said vacuum distillation tower obtained in step (k) with said gaseous products from said upper portion of said hot separator obtained in step (h) to form said secondary raffinates, whereby about 80 percent of the used oil is recoverable as said secondary raffinates.

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**5,045,180**

## CATALYTIC TWO-STAGE COAL LIQUEFACTION PROCESS HAVING IMPROVED NITROGEN REMOVAL

**Alfred G. Comolli, Yardley, Pa., assignor to HRI, Inc., Princeton, N.J.**

**Filed Apr. 16, 1990, Ser. No. 509,126**

**Int. Cl.[5] C10G *1/00***

**U.S. Cl. 208—413** **10 Claims**

1. A process for catalytic multi-stage hydrogenation of coal to produce low-boiling hydrocarbon liquid and gaseous products containing minimal nitrogen compounds, comprising:

(a) feeding particulate coal and a hydrocarbon slurrying oil at temperature below about 650° F. into a pressurized first stage catalytic reaction zone containing coal-derived liquid and hydrogen and an ebullated bed of particulate hydrogenation catalyst, said catalyst having at least about 25% of its total pore volume contained in pores having diameter larger than 150 Angstroms;

(b) passing said coal-oil slurry and hydrogen upwardly through said first stage ebullated bed of particulate catalyst, said catalyst bed being maintained at 700°–800° F. temperature, and 1500–3500 psig hydrogen partial pressure and at space velocity of 10–40 lb coal/hr $ft^3$ catalyst settled volume, so as to rapidly heat the coal and catalytically hydrogenate it and recycled solvent oil to produce a partially hydrogenated and hydroconverted coal-derived material;

(c) withdrawing said partially hydrogenated coal-derived material containing gas and liquid fractions from said first stage reaction zone, and passing said material to a second stage catalytic reaction zone together with additional hydrogen, said second stage reaction zone being maintained at 760°–870° F. temperature, 1500–3500 psig hydrogen partial pressure, and at a space velocity at least 10% greater than for said first stage reaction zone for further reacting and hydrocracking the liquid fraction material therein with minimal dehydrogenation reactions to produce gas and lower boiling hydrocarbon liquids;

(d) withdrawing from said second stage catalytic reaction zone the hydrocracked material containing hydrocarbon gas and liquid fractions, and phase separating said material into separate gas and liquid fractions;

(e) passing said liquid fraction to distillation and a liquid-solids separation steps, from which a hydrocarbon liquid stream normally boiling above about 500° F. and containing a reduced concentration of particulate solids is recycled to the coal slurrying step; and

(f) recovering hydrocarbon gas and increased yields of low boiling hydrocarbon distillate liquid products having minimal nitrogen content from the process.

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**5,045,181**

## APPARATUS FOR REMOVING ASH FROM REPULPED WASTEPAPER

**Merle W. North, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Sep. 7, 1989, Ser. No. 404,247**

**Int. Cl.[5] B03B *7/00*; B07B *1/10*; B01D *33/04*; D21B *1/32***

**U.S. Cl. 209—10** **12 Claims**

1. An apparatus for removing ash from repulped wastepaper which contains ash together with cellulosic fibers, said apparatus comprising:

a frame;

a plurality of rolls rotatably secured to said frame such that the axes of rotation of said rolls of said plurality of rolls are spaced and parallel relative to each other;



said plurality of rolls including:

an upstream roll;

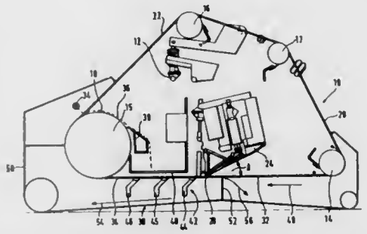
a downstream roll having a cylindrical outer surface;

a porous belt supported by and extending around said plurality of rolls to define and endless loop;

said belt moving between said upstream and downstream rolls for defining a screening portion;

a headbox disposed within said endless loop and adjacent to said screening portion for ejecting the repulped wastepaper through said screening portion;

drainage means disposed on the opposite side of said screening portion relative to said headbox for receiving ash passing through said screening portion;



a shower disposed on the opposite side of said porous belt relative to said cylindrical outer surface for dislodging cellulosic fibers separated from the ash between said headbox and said downstream roll such that the fibers follow said cylindrical outer surface when said belt diverges relative to said outer surface;

a doctor disposed on the opposite side of said porous belt relative to said shower for doctoring the fibers from said outer surface of said downstream roll;

a transverse conveyor disposed adjacent to said outer surface for conveying the fibers transversely relative to said belt so that the fibers separated from the ash can be subsequently used for forming a reprocessed web.

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**5,045,182**

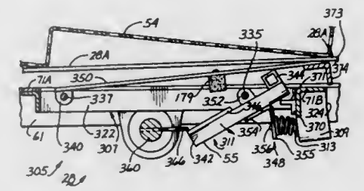
## APPARATUS AND METHOD FOR REMOVING DEBRIS FROM GRANULAR MATERIAL

**Kenneth W. Butler, 111 Pacific Ave., Elm Creek, Nebr. 68836**

**Filed Nov. 21, 1989, Ser. No. 439,557**

**Int. Cl.[5] B07B *1/34, 1/54***

**U.S. Cl. 209—240** **27 Claims**



1. A grain cleaning apparatus comprising:

a housing unit for receiving granular material;

scalping means mounted in said housing unit for removing large debris from the granular material by permitting the granular material to fall through said scalping means;

vertical reciprocation means for raising and lowering said scalping means repeatedly to help facilitate the movement of the large debris along said scalping means;

impact means for striking abruptly to apply a jarring impact to said scalping means from below as said scalping means moves downwardly for helping to facilitate the removal of granular material that may be lodged in said scalping means by jarring lodged granular material from said scalping means; and

actuating means for responding to said scalping means moving downwardly only; and

means responsive to said actuating means responding to said scalping means moving downwardly only for moving said impact means extensively into the downward path of travel of said scalping means for effecting said striking.

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**5,045,183**

## DEVICE FOR SCREENING FIBER SUSPENSIONS

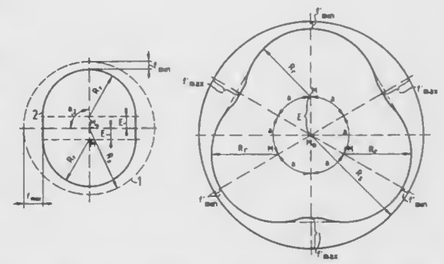
**Peter Schweiss, Langenau, and Reimund Rienecker, Heidenheim, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany**

**Filed Jul. 17, 1990, Ser. No. 554,262**

**Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3925020**

**Int. Cl.[5] D21D *5/16*; B07B *1/04***

**U.S. Cl. 209—273** **5 Claims**



1. A device for screening fiber suspensions comprising:

a rotationally symmetric screen basket having an inside radius $R_2$;

a rotor rotatable about an axis of rotation $M_O$, said rotor being coaxial to and arranged radially inside said screen basket, said rotor having a circumference wherein at any cross section perpendicular to said axis of rotation said circumference is substantially formed of circular arcs having a uniform mutual angular offset and an equal radius $R_r$ that is smaller than said inside radius $R_s$ of said screen basket, according to the formula $R_r = R_s - f_{max}$, where $f_{max}$ is the theoretical greatest spacing of the rotor circumference from the screen basket as the maximum spacing of the common tangent of adjacent circular arcs from said screen basket; $f'_{max}$ is the actual greatest spacing of said rotor circumference from said screen basket when said spacing of said rotor circumference from said screen basket does not follow said common tangent, which spacing is maximally equal to $1.15 \cdot f_{max}$; $f_{min}$ is the least spacing of the rotor circumference from the screen basket wherein the spacing between $f_{min}$ and $f'_{max}$ increases generally steadily and wherein said radius $R_r$ has a maximum variation of 5% of the value as given by said formula in the form of a generally elliptic or similar rotor contour, and wherein said circular arcs have a contour transition therebetween, said contour transition being fashioned as a

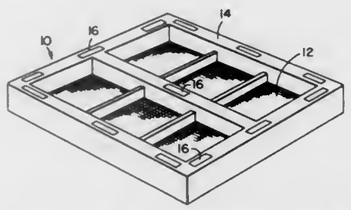
VOL 1130 ISS 1 SE 3 1991 UMI



common tangent or secant of adjacent circular arcs; wherein e is the difference $f_{max}-f_{min}$, said difference $e=f_{max}-f_{min}$ being maximally 60 mm, and $f_{min}$ ranges between 15 mm and 45 mm and E ranges between 5 mm and 100 mm, with $a=360°/2n$, $E=e/(1-\cos a)$ when angle a equals one-half the angular spacing of two rotor contour points that are adjacent in the circumferential direction of the rotor, with the least spacing $f_{min}$ from the screen basket, and E is the offset of the center M of the circular arcs of the rotor from said axis of rotation $M_O$, $e=f_{max}-f_{min}$ and n equals the number of circular arcs of each rotor cross section.

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**5,045,184**
**VIBRATING SCREEN PANEL**
**Basil R. Arkles, P.O. Box 843, Northlands 2116, South Africa**
**Filed Dec. 12, 1989, Ser. No. 448,928**
**Int. Cl.[5] B07B *1/46***
**U.S. Cl. 209—405** **7 Claims**

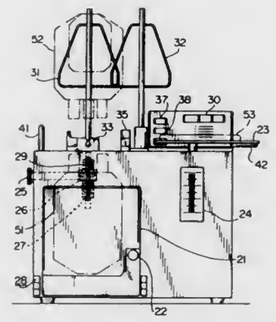



1. A modular screen panel for a vibratory screen deck comprising frame means, screening means secured to said frame means and magnet means associated with said frame means and adapted for magnetically securing the modular panel to a magnetically responsive screen support immediately upon contact therebetween.

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**5,045,185**
**BLOOD SEPARATOR FOR SEPARATING BLOOD COMPONENTS FROM A BLOOD BAG INTO SEPARATION BAGS**
**Yukihiro Ohnaka; Takao Iwasa, both of Fujinomiya, and Tatsumiko Kawaoka, Takatsuki, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan**
**PCT No. PCT/JP87/00866, § 371 Date Jun. 23, 1989, § 102(e) Date Jun. 23, 1989, PCT Pub. No. WO88/03418, PCT Pub. Date May 19, 1988**
**ub. Date DNov. 10, 1987, Ser. No. 360,883**
**Claims priority, application Japan, Nov. 10, 1986, 61-265588; Nov. 10, 1986, 61-265589**
**Int. Cl.[5] B01D *21/36, 21/30***
**U.S. Cl. 210—86** **12 Claims**

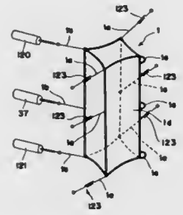
1. A blood separator for separating blood components from a blood bag into separation bags, comprising:
- blood bag pressurizing means for retaining and controllably pressurizing the blood bag at a predetermined pressure after centrifugation;
- bag retaining means for retaining at least two of said separation bags;
- tube means for connecting the at least two of said separation bags with said blood bag to receive separated blood components;
- limiting means, provided at intermediate portions of said tube means between said blood bag and said separation bags retained by said retaining means, for limiting liquid flow in said tube means;
- detection means for detecting an interface level between the blood components in said blood bag retained by said blood bag pressurizing means;
- moving means for moving said detection means relative to said blood bag pressurizing means; and




- control means for controlling said limiting means while receiving detection information supplied as an item of control information from said detection means.

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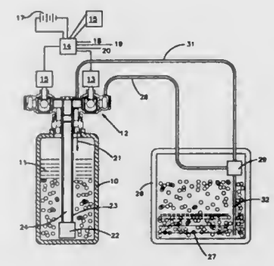
**5,045,186**
**FILTRATION METHOD AND FILTER PRESS FOR EMPLOYING THE METHOD**
**Atsushi Takashima, Kobe, Japan, assignor to Kurita Machinery Manufacturing Company Limited, Osaka, Japan**
**Filed Sep. 20, 1989, Ser. No. 409,878**
**Claims priority, application Japan, Sep. 22, 1988, 63-239426; Sep. 22, 1988, 63-239427; May 1, 1989, 61-113944; Jun. 30, 1989, 1-170806**
**Int. Cl.[5] B01D *25/12, 25/172, 25/32***
**U.S. Cl. 210—90** **5 Claims**



1. A filter press comprising:
- a filter medium having a chamber formed therein;
- a support member;
- a vibrating member comprising means for hanging said filter medium from said support member at upper, middle, and lower locations of said filter medium so as to stretch said filter medium such that said chamber is maintained therein, and means for vibrating said filter medium so as to aid in discharging cake therefrom after filtration;
- wherein said hanging means of said vibrating member comprises a plurality of springs connected between said filter medium and said support member;
- wherein said vibrating means comprises a reciprocable piston/cylinder and a means for connecting said piston/cylinder to said filter medium; and
- wherein said connecting means of said vibrating means comprises a wire connected between said piston/cylinder and the middle of said filter medium.



**5,045,187**
**REGENERATION SYSTEM FOR WATER CONDITIONERS SUCH AS WATER SOFTENERS**
**Steven C. Suchanek, Monona, Wis., assignor to Essef Corporation, Chardon, Ohio**
**Filed Oct. 30, 1989, Ser. No. 428,603**
**Int. Cl.[5] B01D *17/12***
**U.S. Cl. 210—91** **18 Claims**

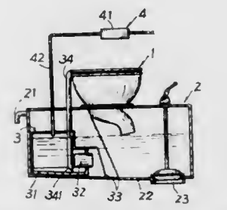


1. A control system for liquid conditioners having a container of treatment material which must be periodically subjected to a reconditioning cycle and which operates to condition said liquid in a service mode between said reconditioning cycles, comprising a housing having an inlet port and an outlet port, said housing defining between said ports a flow path, said flow path providing
- (a) a first substantially straight portion,
- (b) a second substantially straight portion,
- (c) a third portion connecting said first and second portions, said third portion providing a connection with said container intermediate its ends,

first ball valve means including two ball valves in said first portion, second ball valve means including two ball valves in said second portion, actuator means connected to operate said valves, said first valve means being aligned with said first portion and providing unrestricted flow therethrough when in said service mode, said second valve means being aligned with said second portion and providing substantially unrestricted flow therethrough when in said service mode.

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**5,045,188**
**RECIRCULATING TOILET WATER SYSTEM WITH SELF-PURGING VALVE OPERABLE BY A RESTORING SPRING**
**Irwin Y. Tsai, P.O. Box 10160, Taipei, Taiwan**
**Filed Mar. 16, 1990, Ser. No. 494,566**
**Int. Cl.[5] E03D *5/16***
**U.S. Cl. 210—136** **3 Claims**




1. A recirculating toilet water system comprising:
- a toilet;
- a main water tank positioned under the toilet for receiving waste matters discharged from the toilet and filled with water in said water tank;
- a filtered water supply means including a flushing water tank fixed in said main water tank having a flushing pipe connected between said flushing water tank and said toilet for delivering filtered water as filtered through at least a screen provided between said flushing water tank and said main water tank, and a feed water valve formed in said flushing water tank normally opened for directing filtered water through said screen provided beyond said valve and operatively closed for allowing a major water stream flowing through said flushing pipe for flushing said toilet, said feed water valve having at least a purging perforation formed in said valve for ejecting a partial water stream through said perforation for expelling particulate matters clogged on said screen when subject to a boosting pressure in said flushing water tank; and
- an air supply means including an air delivery pipe for directing compressed air into said flushing water tank for boosting the filtered water for flushing the toilet and for purging the screen;

the improvement which comprises:

said feed water valve including: a valve body fixed in a lower portion of said flushing water tank defining a front inlet port formed in a front end portion of said valve body, a middle outlet port formed in a middle portion of said valve body and a rear purging port formed in a rear end portion of said valve body; a plunger reciprocatively held in said valve body; and a restoring spring retained between a front portion of said plunger and a front portion of said valve body; said plunger including; a water passage formed in said plunger normally communicated with said inlet port and said outlet port of said valve body for directing filtered water from said main water tank into said flushing water tank; a solid rear portion formed on a rear portion of said plunger normally sealing said rear purging port of said valve body as urged rearwardly by said restoring spring for matching said water passage in said plunger with said outlet port of said valve body for normally directing filtered water into said flushing water tank, and operatively closing said outlet port of said valve body when frontwardly urged by a boosting pressure of the compressed air of said air supply means for boosting water into said toilet through said flushing pipe; and said purging perforation formed through said solid rear portion communicated with said water passage of said plunger and said inlet port of said valve body for ejecting a partial water stream for purging said screen for expelling particulate matters clogged on said screen when subject to a boosting pressure by the compressed air of said air supply means in said flushing water tank.

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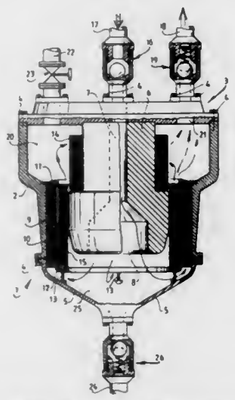
**5,045,189**
**MAGNETIC SEPARATION APPARATUS**
**Geert Van der Vos, Gelrestraat, and Rint Boersma, Zandsestraat, both of Netherlands, assignors to Smit Transformatoren B. V., Nijmegen, Netherlands**
**Filed Nov. 28, 1989, Ser. No. 442,774**
**Int. Cl.[5] B01D *35/06***
**U.S. Cl. 210—184** **19 Claims**

1. A magnetic separation apparatus for separating material from a liquid comprising:
- a vessel;
- means for supplying the liquid to said vessel, said means including a core defining a channel disposed within said vessel;
- a magnetizable filter disposed within said vessel; and
- a discharge channel;

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wherein said core defining said channel is shaped such that the liquid is subjected to speed variations such that at least



a part of the material to be separated precipitates prior to the liquid being passed through the filter.

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**5,045,190**

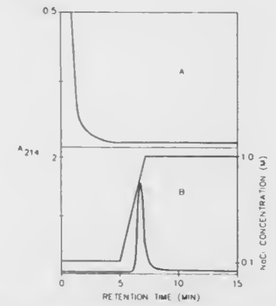
## CHROMATOGRAPHY APPARATUS

**Ruben G. Carbonell, 6105 Godfrey Dr., Raleigh, N.C. 27612; Peter K. Kilpatrick, 5101 Huntingdon Dr.; Juan L. Torres, 1236 Teakwood Pl., both of Raleigh, N.C. 27606, and Roberto Guzman, 2361 McMullan Cir., Raleigh, N.C. 27608**

**Continuation of Ser. No. 268,811, Nov. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 119,020, Nov. 10, 1987, abandoned. This application Sep. 5, 1990, Ser. No. 578,888**

**Int. Cl.[5] B01D** *15/08*

**U.S. Cl. 210—198.2** **11 Claims**




1. An affinity chromatography apparatus, comprising:

an enclosed chamber having an inlet opening and an outlet opening;

a solid support contained within said enclosed chamber, said solid support having hydrophobic functional groups bonded to the surface thereof and forming a hydrophobic layer thereon;

affinity surfactants bonded to said solid support, said affinity surfactants comprising a polar group, a hydrophobic functional group substituted on said polar group, and a ligand substituted on said polar group, with said hydrophobic functional group hydrophobically adsorbed to said hydrophobic layer formed on said solid support, said ligands being free of compounds which selectively bind thereto and available for binding to compounds which are selectively bound thereby; and

covering surfactants bonded to said solid support, said covering surfactants consisting essentially of a nonionic polar group and a hydrophobic functional group substituted on said nonionic polar group, with said hydrophobic functional group being hydrophobically adsorbed to said hydrophobic layer formed on said solid support and with said covering surfactant being provided in a quantity sufficient to cover said hydrophobic layer so that nonspecific binding to said hydrophobic layer during use of the apparatus is reduced.

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**5,045,191**

## NON-CLOGGING FILTRATE OUTLET STOPPER FOR USE IN A PLATE FILTER PRESS

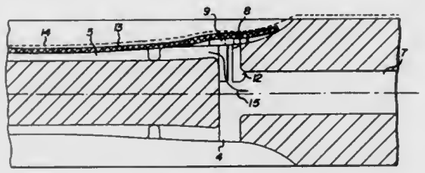
**Jürgen Fresenius, Bad Schwalbach, Fed. Rep. of Germany, assignor to Passavant-Werke AG, Fed. Rep. of Germany**

**Filed Mar. 12, 1990, Ser. No. 492,102**

**Claims priority, application Fed. Rep. of Germany, Mar. 13, 1989, 8903061[U]**

**Int. Cl.[5] B01D** *25/12*

**U.S. Cl. 210—229** **9 Claims**



1. In combination, a filter plate of the type suspended on a horizontal carrier with other similar filter plates to form a filter press for removing water from product and sewage sludges, which plate has grooves in its surface leading to outlet openings which in turn lead to filtrate ducts, said grooves being covered by a filter cloth stiffened by a supporting fabric, at least one of the outlet openings including a stopper, said stopper including a plate-like cover member engaging the surface of the filter plate surrounding said outlet opening and therefore prevented from moving into said outlet opening, a pin means connected to and extending downwardly from said cover member into said outlet opening to secure the stopper in place, the stopper including an open area beneath said cover member and adjacent the pin means so as to permit the filtrate to flow from the grooves into and through said outlet opening as said cover member prevents the filter cloth and supporting fabric from moving down into said outlet opening.

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**5,045,192**

## FILTER ASSEMBLY WITH LOCKABLE LUG MEANS

**Ralph D. Terhune, Broken Arrow, Okla., assignor to Facet Enterprises, Inc., Tulsa, Okla.**

**Continuation-in-part of Ser. No. 870,237, Jun. 3, 1986, Pat. No. 4,871,455**

**Int. Cl.[5] B01D** *27/08*

**U.S. Cl. 210—232** **30 Claims**

1. A filter cartridge assembly comprising

a connecting end member having a fluid flow passage therethrough and an annular channel surrounding said passage, said connecting end member having portions for making connection of said filter cartridge assembly to a filter mounting structure,

a filter medium support including a circular cross-section end received in said channel,

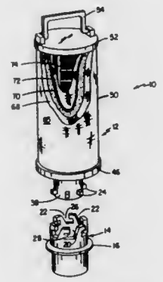
said filter medium support being generally cylindrical in configuration,

said connecting end member and said support defining a means for mechanically locking said support to said connecting end member,

a filter medium supported by said support and having a circular cross-section end received in said channel, and



adhesive in said annular channel permanently securing said end member, said filter medium support and said filter



medium to each other and sealably securing said filter medium to said end member.

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**5,045,193**

## DEVICE FOR DETECTION, ANALYSIS, IDENTIFICATION AND CHARACTERIZATION BY FILTRATION AND IMMUNOFILTRATION

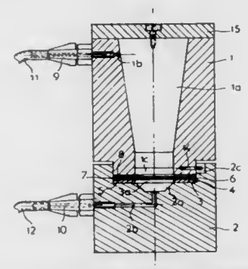
**Jean-Michel Pinon, Reims, and Andre Brandel, Epernay Cedex, both of France, assignors to Hopital Maison Blanche, Reims, France**

**Continuation of Ser. No. 199,037, Jul. 14, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 445,111**

**Claims priority, application France, Sep. 15, 1986, 8612960**

**Int. Cl.[5] B01D** *35/143*

**U.S. Cl. 210—232** **5 Claims**



1. A device for detecting, analyzing, identifying and characterizing a substance by filtration and immunofiltration comprising:

a body comprising first and second parts coupled so that a second end of the first part is inserted into a first end of the second part, each of said parts having a flow path defined therethrough so that when said parts are coupled together, a flow path is defined through the body, one of said parts defining a reservoir and the other part defining a filter-holder;

a retention and reaction system mounted between said first and second parts, said retention and reaction system including, in the order recited, a first perforated plate, a filtering membrane, a first washer, and a second perforated plate, said retention and reaction system being disposed so that said flow path intersects a plane of each of said first perforated plate, said filtering membrane, said first washer, and said second perforated plate; and

gasket means mounted between said one of said parts and said retention and reaction system, said gasket being disposed in surrounding relation to said flow path; and

a second washer mounted between said retention and reaction system and said other part, said second washer being disposed in surrounding relation to said flow path.

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**5,045,194**

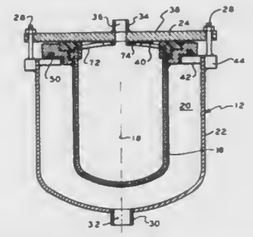
## FILTER APPARATUS HAVING A BAG WITH HANDLES

**Moshe Gershenson, Mohegan Lake, N.Y., assignor to GAF Chemicals Corporation, Wayne, N.J.**

**Filed Apr. 2, 1990, Ser. No. 502,715**

**Int. Cl.[5] B01D** *29/11*

**U.S. Cl. 210—232** **6 Claims**



1. A filter apparatus comprising:

an enclosure subassembly having an axis and having a housing with a top flange for connections for engaging a cover plate;

a basket subassembly having a basket portion and having an annular ring with a bottom surface with a groove with an O-ring in sealing engagement with the top flange;

a bag filter subassembly having a filter bag and an integral resilient gasket ring having a bottom surface in sealing engagement with the annular ring and having a top surface in sealing engagement with the cover plate;

the filter bag having a top end portion;

the gasket ring having a groove which receives and is fixedly connected to the top end portion;

the gasket ring having a pair of handles for axial pulling by a pair of hands;

each of the handles having a loop portion with an opening for gripping the loop portion by a respective hand and having a resilient stem portion;

the stem portion being disposed in an upright axial position and being bendable by the cover plate to a radial position when the cover plate is in engagement with the basket top flange.

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**5,045,195**

## PERSONAL DRINKING WATER PURIFICATION TUBE

**Bruce D. Spangrud, Beaverton, Oreg., and Martin S. Rifkin, Vancouver, Wash., assignors to Accuventure, Inc., Portland, Oreg.**

**Filed Jan. 16, 1990, Ser. No. 465,940**

**Int. Cl.[5] B01D** *24/16*

**U.S. Cl. 210—266** **15 Claims**

10. A combined personal drinking water container and filter, comprising:

(a) a bottle for containing a quantity of water;

(b) means defining an opening into the interior of said bottle;

(c) a drinking tube having a mouthpiece end and a lower end, said drinking tube extending through said opening and said lower end being located within said bottle;

(d) an elongate filter housing located within said bottle, said filter housing being generally tubular and having an outlet end and an inlet end exposed within said bottle;

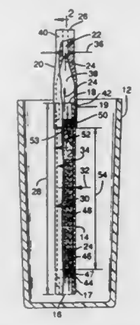
(e) coupling means for interconnecting said outlet end of said filter housing with said lower end of said drinking tube within said bottle; and

(f) a filter contained within said filter housing, said filter being of a multi-layer construction including upper and lower particle filter layers respectively located proximate

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said inlet and outlet ends of said tubular filter housing and including a layer of granular activated charcoal filter medium located between said inlet and outlet particle filter layers, at least one of said upper and lower layers



being sufficiently resistant to flow of water to retain within said multi-layer filter, against the force of gravity, substantially all of a quantity of water drawn into said multi-layer filter until said quantity of water is expelled by introduction of reverse pressure within said filter housing.

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**5,045,196**

## APPARATUS FOR PRE-CONCENTRATION OF A SAMPLE FOR SPECTROSCOPICAL REASONS

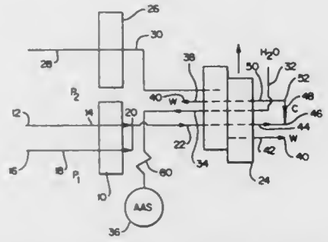
**Zhaolun Fang, Shenyang, China, assignor to Bodenseewerk Perkin Elmer GmbH, Uberlingen, Fed. Rep. of Germany**

**Filed Nov. 30, 1989, Ser. No. 444,185**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842315**

**Int. Cl.[5] B01D** *15/04*

**U.S. Cl. 210—278** **3 Claims**



1. A device for the pre-concentration of a sample for spectroscopical purposes comprising:

a conically tapered ion-exchanger column by which elements to be determined are retained and out of which the elements to be determined are elutable by an eluting liquid and having a first and a second end, said second end being larger than said first end, whereby said sample is pre-concentrated;

first pump means for feeding a sample liquid and a buffer liquid to said ion-exchanger column;

second pump means for feeding an eluating liquid to said ion-exchanger column;

a valve having first and second positions, first conduit means associated with the valve for connecting the first end of the ion-exchanger column to the first pump means and the second end of the ion-exchanger column to a waste outlet when said valve is in the first position; and

second conduit means associated with the valve for connecting the second end of the ion-exchanger column to the second pump means and the first end to a spectroscopical analysis device for eluting the sample from the first end into the spectroscopical analysis device when the valve is in the second position.

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**5,045,197**

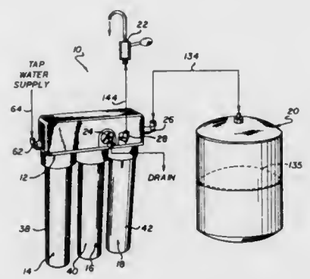
## REVERSE OSMOSIS PURIFICATION SYSTEM WITH UNITARY HEADER MANIFOLD

**Bruce D. Burrows, 25581 Via Paladar, Valencia, Calif. 91355**

**Filed Aug. 3, 1990, Ser. No. 562,239**

**Int. Cl.[5] B01D** *61/08*

**U.S. Cl. 210—321.78** **26 Claims**




1. A reverse osmosis water purification system for receiving a tap water supply or the like and for producing therefrom a relatively purified water supply having impurities substantially removed therefrom, said system comprising:

a unitary header manifold designed for facilitating molding thereof, adapted for connection to and to receive the tap water supply;

a reverse osmosis stage having a reverse osmosis membrane for separating the tap water supply into the purified water supply and a reject water supply having impurities concentrated therein;

at least one filter stage having filter means for filtering a selected one of the tap water supply and the purified water supply;

said reverse osmosis stage and said at least one filter stage being removably mounted onto said header manifold to permit replacement access to said reverse osmosis membrane and to said filter means;

said header manifold defining internal passage means for water flow in series through said reverse osmosis and filter stages, said internal passage means including an elongated gallery passage formed in said manifold, and further including flow control members mounted at spaced positions along said gallery passage to control the water flow in series through said stages;

reservoir means for receiving and storing the purified water supply; and

dispenser means for dispensing the purified water supply.

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**5,045,198**

## FAUCET-MOUNTED MICROBIAL FILTER

**William W. Norton, Buffalo Grove, Ill., assignor to Culligan International Company, Northbrook, Ill.**

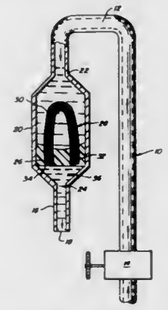
**Continuation-in-part of Ser. No. 389,605, Aug. 4, 1989, Pat. No. 4,980,056. This application Jul. 5, 1990, Ser. No. 548,683**

**Int. Cl.[5] B01D** *61/08*

**U.S. Cl. 210—321.87** **19 Claims**

8. A faucet-mounted filter for water passing therethrough, in combination with a faucet defining a first water line and first flow valve means for controlling flow through said first water flow line, which comprises a housing positioned in said faucet upstream from said first flow valve means in flow transmitting relation with said first water flow line; microporous, hollow fiber filter means positioned in said housing to sealingly occlude water flow through said housing, whereby water flow through said first water flow line passing through said housing must pass through porous walls of hollow fibers of the filter means, the pores of said hollow walls being no larger than 0.22 micron, whereby said filter is capable of microbial filtering,





said housing being integrally positioned in said first water flow line, said faucet also including a second flow line and second flow valve means for the second flow line, said second flow line communicating with the first flow line downstream from said housing.

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**5,045,199**

## STACKED FILTER SUPPORTS WITH CORRESPONDING PROFILE SEALS

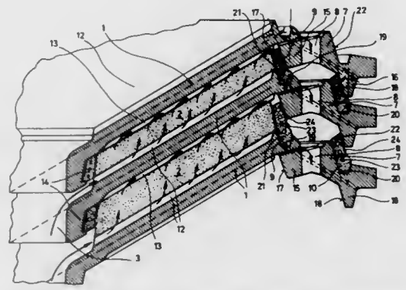
**Udo Fast; Thomas Handtmann, both of Biberach; Wolfgang Kurz; Helmut Schafft, both of Stetten, and Peter Westermeier, Warthausen, all of Fed. Rep. of Germany, assignors to Albert Handtmann Armaturenfabrik GmbH & Co. KG, Fed. Rep. of Germany and EAS Patent- und Knowhow-Verwertungs GmbH, Fed. Rep. of Germany**

**Filed Nov. 2, 1989, Ser. No. 430,352**

**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 8813974**

**Int. Cl.[5] B01D** *29/39*

**U.S. Cl. 210—346** **9 Claims**



1. A filtering apparatus for filtering liquids, comprising:

(a) a plurality of filter supports stacked vertically one on top of the other;

(b) each of said filter supports having a central opening and an outer edge radially spaced from said central opening, said central openings forming a central channel in the middle portion of said apparatus;

(c) a plurality of filter bodies each supported on a corresponding filter support, positioned between adjacent filter supports and extending radially outwardly from said central channel toward an outer edge thereof;

(d) a plurality of first profiled seals each disposed between adjacent filter supports at the outer edge of a corresponding filter body;

(e) a first apron member depending obliquely outwardly and downwardly from each of said filter supports and having an inner wall; and

(f) a first groove formed on the upper side of each of said filter supports, said first groove opening upwardly, having a substantially trapezoidal cross section and having an interior groove wall substantially parallel with the inner wall of the apron member of the adjacent overlying filter support;

each of said first profiled seals having (1) an upper portion of a substantially rectangular cross section positioned between the inner wall of the apron member of the adjacent overlying filter support and the outer edge of its corresponding filter body and (2) a lower portion conforming to the cross section of the first groove in the corresponding filter support and fitted into said first groove.

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**5,045,200**

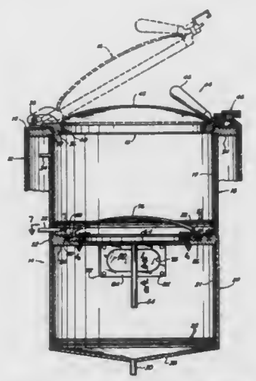
## APPARATUS AND METHOD OF FILTERING FATTY ACIDS FROM COOKING OIL

**Edward E. Brook, 6200 N. Drexel Ave., Oklahoma City, Okla. 73112**

**Filed Oct. 15, 1990, Ser. No. 597,629**

**Int. Cl.[5] B01D** *39/08*

**U.S. Cl. 210—416.5** **2 Claims**



1. Apparatus for filtering free fatty acids and oil discoloring ingredients from liquid cooking oil containing a comminuted powder having an affinity for free fatty acids on the ratio of 2% by weight of the powder to the amount of oil being filtered, the improvement comprising:

a cooker normally containing the oil;

an upright first reservoir having a wall and having vertically spaced wall inlet ports;

a lid for closing the first reservoir;

an upright second reservoir extending downwardly from said first reservoir,

said second reservoir having a bottom wall and a liquid outlet port;

pump and tubing means transferring the oil from the cooker to the first reservoir;

filter means interposed between the reservoirs including a screen and a filter pad pervious to the oil and impervious to a mixture of the powder and free fatty acids overlying the screen; and,

other pump and tubing means for generating air pressure of predetermined value in the first reservoir for forcing only the cooking oil once through the filter pad.

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5,045,201

## GLASS MICROBEADS FOR BIOCHEMICAL SEPARATION OF MATERIAL FROM A FLUID MEDIUM

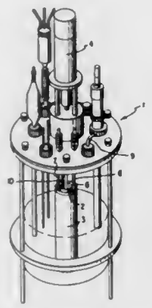
**Dominique Dubois, Brussels; Marcel Deizant, Charleroi; Francois Toussaint, Montignies-le-Tilleul, and Thierry Kemp, Brussels, all of Belgium, assignors to Glaverbel, Brussels, Belgium**

**Filed Sep. 18, 1989, Ser. No. 408,224**

**Claims priority, application United Kingdom, Sep. 21, 1988, 8822180**

**Int. Cl.[5] B01D *39/06***

**U.S. Cl. 210—502.1** **9 Claims**



1. Glass microbeads, comprising:

glass microbeads which are glass microspheres having non-porous surfaces and which bear a coating comprised of at least one binding agent and at least one fixing agent which fixes the at least one binding agent to the non-porous surfaces of the glass microspheres by covalent bonding, and which at least one binding agent is capable of releasably binding, by a biological affinity reaction, a material contained within a fluid medium when in contact therewith, whereby the material can be removed from the fluid medium with the glass microbeads and then stripped from the glass microbeads while leaving the at least one binding agent attached to the glass microbeads.

5,045,202

## CENTRIFUGAL OXYGENATOR FOR TREATMENT OF WASTE WATER AND SYSTEM

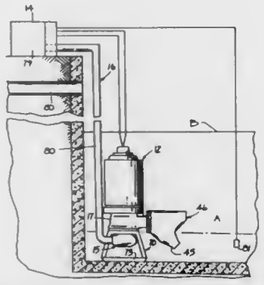
**Donald M. Stearns, 7430 N. Cocoa Blvd., Cocoa, Fla. 32927; Walter D. Haentjens, and Thomas Stirling, both of R.R. #1, Sugarloaf, Pa. 18249**

**PCT No. PCT/US86/02542, § 371 Date Apr. 13, 1987, § 102(e) Date Apr. 13, 1987**

**ub. Date DNov. 18, 1986, Ser. No. 382,677**

**Int. Cl.[5] C02C *1/74***

**U.S. Cl. 210—628** **1 Claim**



1. A continuous pressurized process for increasing the absorption rate of oxygen into biodegradable waste, comprising providing efficient oxygen diffusion in liquid levels as low as about 3 feet to in excess of about 100 feet by the establishing of a collection and agitation zone for collecting biodegradable waste mixed with an oxidizing gas, drawing the gas and biodegradable waste into the collection and agitation zone along the same axis, establishing a pressure zone, vigorously mixing the gas and waste as drawn into the collection and agitation zone, and then establishing a discharge zone which increases the pressure in the collection zone to increase the rate of gas absorption.

5,045,203

## SEPARATION OF PROTEIN ANTIGENS OF BORDETELLA BACTERIA BY AFFINITY CHROMATOGRAPHY

**Marie-Jose Quentin-Millet, Villeurbanne, and Francois Arminjon, Lyons, both of France, assignors to Pasteur Merieux Serums & Vaccins, Lyons, France**

**Division of Ser. No. 38,748, Apr. 15, 1987, Pat. No. 4,985,144. This application Dec. 18, 1990, Ser. No. 629,674**

**Claims priority, application France, Apr. 16, 1986, 86 05457**

**Int. Cl.[5] B01D *15/08***

**U.S. Cl. 210—635** **5 Claims**

1. A process for purifying protein antigens of bacteria of the Bordetella genus comprising

contacting a solution containing said protein antigens with a chromatography material comprising a solid support on which is fixed a ligand having an affinity for pertussis toxin, said ligand being a desialyled protein selected from the group consisting of desialyled fetuin and desialyled haptoglobin and

collecting or eluting the desired antigens.

5,045,204

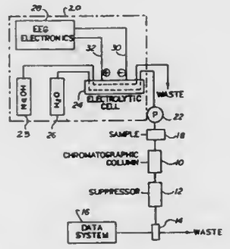
## METHOD AND APPARATUS FOR GENERATING A HIGH PURITY CHROMATOGRAPHY ELUENT

**Purnendu K. Dasgupta; Douglas L. Strong, both of Lubbock, Tex.; John R. Stillian, Pleasanton, and Keith A. Friedman, San Jose, both of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.**

**Filed Feb. 13, 1990, Ser. No. 479,446**

**Int. Cl.[5] B01D *15/08***

**U.S. Cl. 210—635** **32 Claims**




31. A method of generating a high purity, aqueous product stream including one or more selected ionic species and using it as a chromatographic eluent comprising the steps of

(a) flowing an impure aqueous source solution containing said selected ion in hydroxide or acid form through a source channel separated by a first permselective ion exchange membrane from a product channel, said first membrane including exchangeable ions of the same charge as said selected ionic species and allowing transmembrane passage of ions of the same charge as said exchangeable ions and being resistant to transmembrane passage of ions of the opposite charge,



(b) flowing a high purity aqueous stream through said product channel forming a product stream with said selected ionic species which passes across said one membrane,

(c) flowing an aqueous stream through a second source channel separated by a second permselective ion exchange membrane from said product channel, said second membrane including exchangeable ions of the opposite charge to those of said first membrane, said second membrane being resistant to transmembrane passage of selected ionic species and allowing transmembrane passage of ions of the opposite charge,

(d) applying an electrical potential between said first source channel and said second source channel across said product channel, an electrode in said first source channel being of the same charge as said selected ionic species and electrode in said second source channel being of opposite charge,

(e) directing said product stream as an eluent and liquid sample to liquid chromatographic separating medium, and

(f) chromatographically separating components of said liquid sample on passage through said chromatographic separating medium.

5,045,205

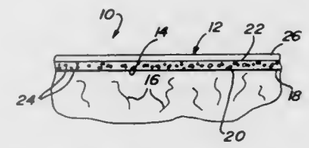
## REACTION VESSEL

**John A. Taylor, Pinckney, Mich., assignor to Separation Dynamics Inc., Southfield, Mich.**

**Filed Jan. 30, 1990, Ser. No. 472,085**

**Int. Cl.[5] B01D *61/24***

**U.S. Cl. 210—638** **14 Claims**




1. A reaction vessel (**10**) comprising: a housing (**12**) including an interior cavity (**14**); water insoluble reaction means (**16,16'**) contained within said cavity (**14**) for producing a water soluble product from reacting with a water soluble precursor; and membrane means defining at least a portion of said housing (**12**) for selectively imbibing the water soluble precursor therethrough in said housing (**12**) for reaction with said reaction means (**16,16'**), imbibing of the product therethrough out of said housing (12), and being impermeable to said reaction means (**16,16'**) for maintaining said reaction means (**16,16'**) within said cavity (**14**). Said membrane means including a porous support (22) having a plurality of pores (**24**) extending therethrough and a nonporous water and water soluble substance permeating membrane (**26**) supported by said porous support (22) over each of said pores (**24**).

5,045,206

## SELECTIVE MULTI-RING AROMATICS EXTRACTION USING A POROUS, NON-SELECTIVE PARTITION MEMBRANE BARRIER

**Tan-Jen Chen, Clearwater, Canada, and James R. Sweet, Baton Rouge, La., assignors to Exxon Research & Engineering Company, Florham Park, N.J.**

**Filed Dec. 5, 1990, Ser. No. 622,706**

**Int. Cl.[5] B01D *3/00***

**U.S. Cl. 210—640** **5 Claims**

1. A process for separating multi-ring aromatic hydrocarbons having less than 75 mole % aromatic carbon content and/or toxins from hydrocarbon feeds boiling in the 320° to 1100° F. range, said process comprising contacting said hydrocarbon feed with one side of a porous, non-selective membrane, said membrane having a pore size of about 100 to 5000 Å, while simultaneously contacting the other side of said membrane with a selective aromatics extraction solvent, whereby the multi-ring aromatic hydrocarbons and/or toxins in the feed selectively permeate through the porous membrane in response to the extraction solvent.

5,045,207

## MULTI-CONCENTRATION DISPOSABLE LIQUID CONCENTRATING DEVICE

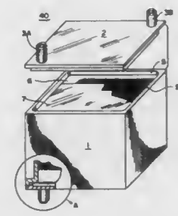
**Luciano Fecondini, Via Borgo San Pietro 134,, I-40126 Bologna, Italy, and Enzo Vassarotti, Villa Charbon, CH-1172 Bougy-Villars, Switzerland**

**Filed Mar. 12, 1990, Ser. No. 491,912**

**Claims priority, application Italy, Nov. 9, 1989, 22328 A/89**

**Int. Cl.[5] B01D *61/14, 61/18***

**U.S. Cl. 210—645** **43 Claims**



1. A filtration device for removing solvent from a solute-containing sample solution to obtain a desired final retentate concentration comprising at least one concentration unit, each said concentration unit comprising:

a) one or more chambers, each chamber comprising at least one chamber wall impermeable to sample solution; and at least one wall, which wall is in opposing spaced relation to said impermeable chamber wall, and which wall is formed of a semipermeable membrane permeable to said solvent and impermeable to the solute to be retained, said membrane having at least two regions of different area, which regions are impermeable to said solvent, each of said regions providing a deadstop preventing filtration to dryness of the solvent through the membrane and providing a different final retentate concentration; and

b) means for drawing said solvent through said membrane.

5,045,208

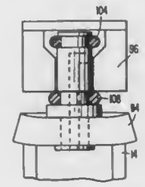
## COLUMN ANALYZER SYSTEM

**James R. M. Sanford, Vidor; Patrick M. Frank, Beaumont; Joseph H. Golias, Beaumont, and William C. Jennings, Beaumont, all of Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.**

**Filed Oct. 27, 1989, Ser. No. 427,346**

**Int. Cl.[5] B01D *15/08***

**U.S. Cl. 210—656** **19 Claims**




1. A system for delivering a constant low pressure to a

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chromatography column positioned within means for holding an array of chromatography columns comprising:

a manifold adapted to be connected to a source of low pressure fluid and adapted to be connected to cylinder means having first and second positions and having a fluid path therethrough;

said first position for preventing fluid from said manifold from entering the fluid path of said cylinder means;

said second position for providing fluid flow from said manifold through the fluid path of said cylinder means;

said cylinder means adapted to engage a chromatographic column in a fluid sealing relationship; and

said cylinder means being normally in said first position and being movable into said second position by contact with said chromatographic column; said second position of said cylinder means thereby allowing said constant low pressure provided to said manifold system to be delivered to said chromatography column.

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**5,045,209**

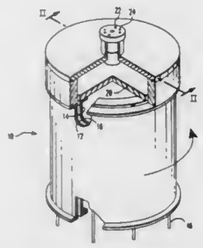
## METHOD FOR CHROMATOGRAPHICALLY RECOVERING SCANDIUM AND YTTRIUM

**Thomas S. Snyder, Oakmont, Pa., and Richard A. Stoltz, Plano, Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 24, 1990, Ser. No. 587,191**

**Int. Cl.[5] B01D *15/08***

**U.S. Cl. 210—656** **10 Claims**



1. A method for chromatographically recovering scandium and yttrium from the residue of a sand chlorinator, comprising the steps of:

providing a residue from a sand chlorinator, the residue containing scandium, yttrium, sodium, calcium and at least one radioactive metal of the group consisting of radium, thorium and uranium;

digesting the residue with an acid to produce an aqueous liquid containing scandium, yttrium, sodium, calcium and at least one radioactive metal of the group consisting of radium, thorium and uranium;

feeding the metal containing liquid through a cation exchanger;

eluting the cation exchanger with an acid eluant to produce:

a first eluate containing at least half of the total weight of the calcium and sodium in the feed liquid;

a second eluate containing at least half of the total weight of the one or more radioactive metals in the feed liquid;

a third eluate containing at least half of the yttrium in the feed liquid, and

a fourth eluate containing at least half of the weight of the scandium in the feed liquid.

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**5,045,210**

## HEAVY METAL REMOVAL PROCESS

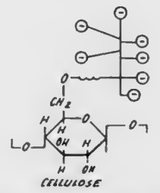
**Wei-Chih Chen, Meriden; Michael A. Michaud, Middletown, and Kenneth C. Hou, S. Glastonbury, all of Conn., assignors to Cuno, Incorporated, Meriden, Conn.**

**Continuation-in-part of Ser. No. 336,164, Apr. 11, 1989, Pat. No. 4,908,137. This application Dec. 8, 1989, Ser. No. 447,873**

**The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.**

**Int. Cl.[5] C02F *1/12***

**U.S. Cl. 210—679** **11 Claims**




1. A method of removing heavy metal ions from an aqueous solution contaminated therewith comprising contacting said aqueous solution with an ion-exchange media comprising a modified polysaccharide material and a modified particulate polymer material, said modified materials comprising a polysaccharide and particulate polymer material covalently bonded to a synthetic polymer, said synthetic polymer comprising a copolymer produced from a polymerization of:

(a) a polymerizable compound having a chemical group capable of covalently coupling, directly or indirectly, to said materials; and

(b) a polymerizable compound containing (i) an ionizable chemical group or (ii) a chemical group capable of transformation to an ionizable chemical group.

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**5,045,211**

## NO DRAIN ACID TREATMENT OF POOLS

**Jock Hamilton, 3741 E. Telegraph Rd., Piru, Calif. 93040**

**Filed Mar. 2, 1990, Ser. No. 487,581**

**The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.**

**Int. Cl.[5] C02F *5/08, 1/66***

**U.S. Cl. 210—697** **21 Claims**

1. The method for removing scale deposits from the scaled surfaces of vessels containing water without draining the vessel which comprises:

a. acidifying the water by the addition of an acid thereto in an amount sufficient to eliminate all total alkalinity from the water;

b. monitoring the total alkalinity of the water after the addition thereto of said acid by repeated determination of total alkalinity, and adding an additional quantity of acid, as necessary to eliminate any detected total alkalinity;

c. permitting the resultant acidified water to remain in contact with said scaled surfaces for a treatment period from ½ to about 240 hours; and

d. neutralizing the water after said treatment period by the addition thereto of magnesium oxide or hydroxide in an amount sufficient to raise the pH value of the water to a value slightly below, but not exceeding, 10.5.

14. The method of providing a pH control of a body of water over an extended time period at a value from 7.0 to about 10.5 by suspending magnesium oxide prills having a diameter and a length between about 0.1 to about 0.5 inch in said water to provide a slow release of magnesium oxide in said water in sufficient amounts to neutralize acidic components therein.



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**5,045,212**

## PROCESS FOR THE SEPARATION OF OIL-IN-WATER EMULSIONS

**Thomas Augustin, Cologne; Rolf Kehlenbach, Bergisch-Gladbach, and Ulrich Litzinger, Hachenburg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed May 24, 1990, Ser. No. 529,007**

**Claims priority, application Fed. Rep. of Germany, Mar. 27, 1990, 4009760**

**Int. Cl.[5] B01D *17/05***

**U.S. Cl. 210—708** **7 Claims**

1. A process for the separation of an oil-in-water emulsion in which the separation is carried out in two steps, whereby in the first step to the oil-in-water emulsion there is added first from about 30 to about 5,000 ppm organic cationic demulsifier followed by from about 50 to about 1,000 ppm inorganic demulsifier, to form a two-phase system comprising an oil phase and an aqueous phase, the oil phase is separated off from the resulting two-phase system and in the second step the remaining aqueous phase is treated first with from about 200 to 2,000 ppm inorganic demulsifier and then with from about 0.3 to 4 ppm organic anionic demulsifier.

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**5,045,213**

## WASTE WATER TREATMENT METHOD AND APPARATUS

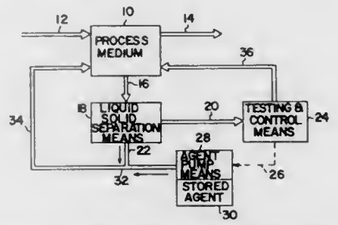
**Gregory S. Bowers, Easley, S.C., assignor to Southern Water Treatment Company, Inc., Greenville, S.C.**

**Continuation-in-part of Ser. No. 205,313, Jun. 10, 1988, Pat. No. 4,923,599. This application Feb. 13, 1990, Ser. No. 479,179**

**The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.**

**Int. Cl.[5] C02F *1/62***

**U.S. Cl. 210—709** **30 Claims**




1. A method of waste water treatment, comprising:

conducting pH treatment of a controlled body of waste water for substantially precipitating non-chelated and non-complexed metals therefrom;

sampling such pH-treated waste water, and substantially removing solid precipitated metals therefrom to provide a clear sample;

testing such clear sample for the presence of any remaining metals in solution therein; and

feeding a group II metal dithiocarbamate to the controlled body of waste water in response to the presence of such remaining metals so as to substantially precipitate same, whereby both pH-precipitated and non-pH-precipitated metals are substantially precipitated from such body of waste water for removal therefrom, with minimized feeding of said group II metal dithiocarbamate.

16. Apparatus for waste water treatment, comprising:

pH treatment means for conducting pH treatment of a controlled body of waste water for substantially precipitating non-chelated and non-complexed metals therefrom;

sampling means for sampling said pH treated waste water;

separation means for substantially removing solid precipitated metals from said sampled pH treated waste water to provide a clear sample;

testing means for testing said clear sample for the presence of any remaining metals in solution therein; and

feeding means for feeding a group II metal dithiocarbamate precipitating agent to the controlled body of waste water in response to the presence of said remaining metals so as to substantially precipitate same, whereby both pH-precipitated and non-pH-precipitated metals are substantially precipitated from such body of waste water for removal therefrom, with minimized feeding of said group II metal dithiocarbamate precipitating agent.

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**5,045,214**

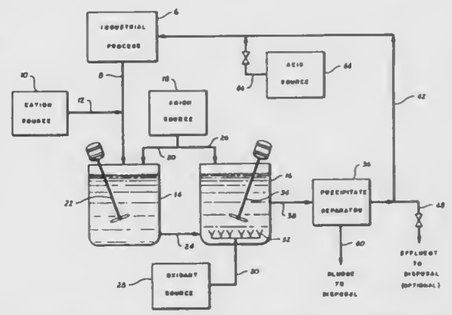
## METHODS FOR REMOVING SUBSTANCES FROM AQUEOUS SOLUTIONS

**Douglas T. Walker, Elk Grove Village, Ill., assignor to Union Oil Company of California, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 42,565, Apr. 16, 1987, which is a continuation of Ser. No. 477,212, Mar. 22, 1983. This application May 31, 1989, Ser. No. 359,872**

**Int. Cl.[5] C02F *1/20***

**U.S. Cl. 210—717** **98 Claims**




1. A method for removing one or more contaminants selected from the group consisting of aluminum ions, beryllium ions, and mixtures thereof from an aqueous solution comprising the contaminants and ferrous ions, the method comprising the steps of:

(a) rapidly oxidizing substantially all the ferrous ions in the solution to ferric ions so as to rapidly form a substantially completely amorphous precipitate comprising a substantial portion of ferric hydroxide and a substantial portion of the contaminants; and

(b) separating the amorphous precipitate from the solution so as to form an effluent solution having a substantially reduced contaminant concentration, wherein substantially all of the ferrous ions in the solution are oxidized to ferric ions within a period of less than about 30 minutes; step (a) includes the steps of introducing air into the solution at a rate of about 1 to about 10 l air per about 1,000 ppm ferrous ion present in the solution prior to step (a), and controlling the pH of the solution so that the pH of the solution is about 6 to about 9.5; and the total concentration of the contaminants in the effluent solution is less than about 10% of the concentration of the contaminants in the aqueous solution prior to step (a).

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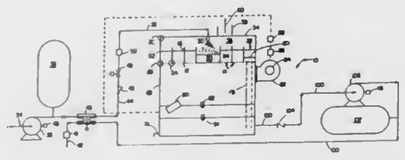


5,045,215

## REMOVING HAZARDOUS CONTAMINANTS FROM WATER

Bruce L. Lamarre, Piermont, N.H., assignor to North East Environmental Products, Inc., Lebanon, N.H.

Division of Ser. No. 257,935, Oct. 14, 1988, which is a continuation-in-part of Ser. No. 72,553, Jul. 13, 1987, Pat. No. 4,869,832. This application Oct. 20, 1989, Ser. No. 424,678
Int. Cl.[5] C02F *1/20*
U.S. Cl. 210—747 12 Claims



1. A method for removing hazardous contaminants from water comprising:
distributing the contaminated water upon the intake portion of a baffled and perforated tray,
flowing the contaminated water in a curved flowpath across said tray from said intake portion toward an output portion, and
causing sufficient air to flow upwardly through perforations in said tray so that the water flowing along said flowpath forms a deep froth while maintaining frothing throughout said flowpath.

5,045,216

## METHOD, SYSTEM AND COLLECTING VESSEL FOR OIL SPILL RECOVERY

J. David Eller, P.O. Drawer "E", 33 NW. 2nd St., Deerfield Beach, Fla. 33441

Filed Feb. 27, 1990, Ser. No. 485,625
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—776 22 Claims



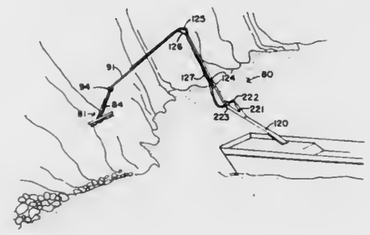

1. A system for recovering floating contaminant from the surface of a body of water, said system comprising:
a main surface vessel propellable on a body of water, said vessel defining reservoir means for receiving the contaminant and water introduced thereinto and separation means operatively associated with said reservoir means for separating the contaminant from the water;
floatable water/contaminant collecting means connected to and movable with said vessel and including intake means being automatically maintainable in a position for allowing intake of a water/contaminant mixture thereinto and submersible pumping means associated with said intake means and being operable for pumping the water/contaminant mixture to said reservoir means;
discharge means being operable for at least pumping the separated water from said reservoir means;
a plurality of secondary, self-propellable surface vessels carriable by said main vessel and off loadable from the main vessel; and,
each of said secondary vessels including submersible pumping means including an intake assembly and an outlet assembly connected to and movable with said secondary vessel, said pumping means being operable for pumping the water/contaminant mixture into said intake assembly and out from said outlet assembly to create a reverse flow of the water/contaminant mixture in a direction which is controlled by the position of said outlet assembly.

5,045,217

## APPARATUS FOR CLEANING AN OIL SPILL OFF OF A BEACH

Charles B. Ronan, 1013 E. Dimond #439; William R. Breedlove, 11711 S. Gambell, both of Anchorage, Ak. 99515, and Siegfried Jokiel, 8461 Long Horn Dr., Anchorage, Ak. 99516

Filed Jan. 26, 1990, Ser. No. 470,569
Int. Cl.[5] C02F *1/40*
U.S. Cl. 210—776 6 Claims




1. Apparatus floatable in a body of water for cleaning land, comprising:
a vessel that floats on a body of water,
means for moving said vessel relative to the land to be cleaned,
means for drawing water from said body and delivering it to said vessel,
means for delivering the water on said vessel, that was drawn from said body, to the land to be cleaned, including means, controllable on said vessel for directing a stream of water on the portions of the land to be cleaned,
said means for delivering the water including an articulated boom for directing the water on the portions of the land to be cleaned,
containing means for containing the floating polluting material washed from said land into said body of water,
said containing means being means that at least partially floats on the water, and
skimming means for recovering the contained floating polluting material.

5,045,218

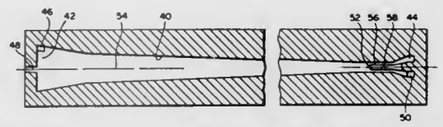
## METHOD OF SEPARATING A LIGHTER DISPERSED FLUID FROM A DENSER LIQUID IN A HYDROCYCLONE HAVING FLOW-MODIFYING MEANS

Gagan J. J. Prendergast, Nt. Waverley, and David A. Webb, Northcote, both of Australia, assignors to Delawood Pty. Ltd., Caulfild, Australia

PCT No. PCT/AU87/00398, § 371 Date May 25, 1989, § 102(e) Date May 25, 1989, PCT Pub. No. WO88/03842, PCT Pub. Date Jun. 2, 1988
ub. Date DNov. 26, 1987, Ser. No. 362,390
Claims priority, application Australia, Nov. 26, 1986, PH9165; Feb. 6, 1987, P10217
Int. Cl.[5] B01D *17/038*
U.S. Cl. 210—787 16 Claims

1. A method of separating a fluid mixture of a dispersed phase of a lighter component in a continuous phase of a denser liquid component, comprising feeding said mixture to a hydrocyclone comprising opposite first and second ends, between which a hydrocyclone axis extends, the hydrocyclone having a cross-sectional area decreasing overall from said first end to said second end; inlet means adjacent to said first end for introducing the mixture into said hydrocyclone; and first and second outlet means for discharging respectively comparatively less and comparatively more dense components separated from said mixture, said first outlet means being located substantially on said hydrocyclone axis; and said second outlet means being adjacent to said second end; the cyclone further having a nominal hydrocyclone diameter $d_2$ defined by:






$$d_2 = \sqrt[3]{\frac{V}{24}}$$

where V represents an effective internal volume of the hydrocyclone not including inlet and outlet ducts; said inlet means comprising a number of inlets in the region of said first end said number being an integer n with a value of at least 1, wherein at least a part of said mixture is fed through one of said inlets designated the $P^{th}$ inlet into said hydrocyclone with a mass flow rate m and a momentum per unit time $L_p$ ($L_p$ being a vector quantity), $<L_p$ being a vector component of $L_p$ parallel to a plane normal to the hydrocyclone axis at the $P_{th}$ inlet, $r_p$ being the minimum radius from the hydrocyclone axis to a point on a line of direction of said vector component $<L_p$, $r_p$ being parallel to the plane normal to said hydrocyclone axis at the $p^{th}$ inlet and $r_p$ being perpendicular to a line of direction of said vector component $<L_p$, $d_i$ being an effective diameter of the said first end being defined as:

$$d_i = \frac{2 \times \sum_{P=1}^{n} r_p |<L_p|}{\sum_{P=1}^{n} |<L_p|}$$

and $A_i$ being an effective inlet area as defined by:

$$A_i = \sum_{P=1}^{n} A_P \left( \frac{|<L_p|}{\sum_{p=1}^{n} |<L_p|} \right)$$

where $A_p$ is a total cross-sectional area at the $P^{th}$ inlet at entry to the hydrocyclone in a plane parallel to said hydrocyclone axis at inlet p and normal to the vector component $<L_p$; the following criteria exist:

A. $3<V_r 28$, where

$$V_r = \frac{\pi d_i d_2}{4 A_i}$$

B. the hydrocyclone measured along said hydrocyclone axis from said first end to said second end is at least $10d_2$ long;

C. said hydrocyclone includes a section situated between said first and second end, of at least $8d_2$ long when measured along said hydrocyclone axis where: $15' < \alpha < 20$ $\alpha$ being an average half angle of convergence of a side wall of said hydrocyclone; and,

D. said first outlet means having a minimum effective cross-section diameter $d_o$ where

$$\frac{d_0}{d_2} < 0.25$$

and there being provided adjacent to said second end, means to convert at least some rotational motion of said liquid about said hydrocyclone axis to a motion which is substantially linear while imposing minimal viscous drag forces on said liquid while said liquid has a substantially rotational velocity.

5,045,219

## USE OF POLYALPHALOLEFIN IN DOWNHOLE DRILLING

David O. Trahan, Abbeville, and Michael B. Faulk, Kaplan, both of La., assignors to Coastal Mud, Incorporated, Abbeville, La.

Continuation-in-part of Ser. No. 145,149, Jan. 19, 1988, Pat. No. 4,876,017. This application Nov. 22, 1988, Ser. No. 275,201
The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.
Int. Cl.[5] C09K *7/02*
U.S. Cl. 252—8.51 11 Claims

1. A drilling fluid compound for lubricating drill pipe in a water base mud system during the drilling process, the compound comprising:
a) a polyalphaolefin liquid at a concentration of at least 5% of the drilling fluid compound;
b) an emulsifier additive added to the polyalphaolefin liquid, in a range of 30% to 5% concentration; and
c) the drilling fluid compound introduced into the water base mud system in a liquid volume concentration of 0.25% to 6.0% of the water base drilling mud for serving as a lubricant in the water base drilling mud system.

9. A process for unsticking drill pipe in a water base mud system, where the drill pipe has become differentially stuck against the formation, the process comprising the following steps:
a) locating the point downhole where the drill pipe has become stuck against the formation;
b) blending a polyalphaolefin in a concentration of at least 5% by volume with an emulsifier; and
c) introducing a certain volume of the polyalphaolefin-emulsifier downhole as a spotting fluid to the depth of the point of the stuck pipe and in a quantity sufficient to displace the water-based mud over the entire stuck interval to unstick the pipe.

5,045,220

## INCREASING THE VISCOSITY OF $CO_2$ SOLUTIONS

Thomas V. Harris, Benicia; Cyrus A. Irani, Hacienda Heights, both of Calif., and Wayne R. Pretzer, Wheaton, Ill., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 73,791, Jul. 14, 1987, Pat. No. 4,913,235, which is a continuation-in-part of Ser. No. 58,690, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 910,041, Sep. 22, 1986, abandoned, which is a continuation of Ser. No. 749,479, Jun. 27, 1985, abandoned. This application Nov. 30, 1989, Ser. No. 444,188
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 20 Claims

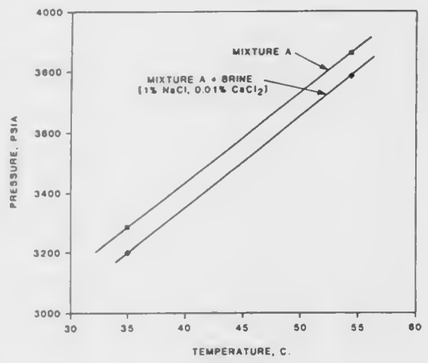
1. A solution comprising $CO_2$, a polymer, and a cosolvent; wherein said polymer has a Minimum Solubility Parameter of about 6.85 $(cal/cc)^{\frac{1}{2}}$ or less; wherein in said solution the weight percent of $CO_2$ is at least 70; and the amount of cosolvent is at least sufficient to dissolve said polymer in said $CO_2$.

17. A method of increasing the viscosity of $CO_2$ by at least three-fold which comprises adding to said $CO_2$ (1) a viscosifying amount of a polymer having a Minimum Solubility Parameter of about 6.85 $(cal/cc)^{\frac{1}{2}}$ or less and a plurality of electron donor atoms selected from the class consisting of O, S, and N, and (2) a sufficient amount of a cosolvent to form a one-phase system, said cosolvent being liquid or a compressible gas and capable of (i) dissolving at a concentration of at least 2% by

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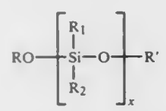


weight in liquid $CO_2$ at 25° C. and about 950 psig and (ii) forming a one-phase mixture with the polymer at ambient temperature and a pressure sufficient to maintain the cosolvent in the liquid phase when said mixture contains 10 weight percent of said cosolvent.




18. The method according to claim 17 wherein the polymer is a liquid polymer selected from the class consisting of:

(i) a polysiloxane having the formula:



where R and R' can be the same or different and can be hydrogen or any hydrocarbyl having from 1 to carbon atoms;

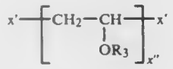
x can be from 100 to 7,000; and

$R_1$ and $R_2$ can be the same or different and can be selected from the group consisting of:

(a) any hydrocarbyl group having from 1 to 10 carbon atoms; and

(b) a siloxane group; and

(ii) a polyvinylether having the formula:



where x' is H, OH, halogen, or

and

where x'' is from 20 to 3,000 and $R_3$ is a hydrocarbyl group having from 1 to 10 carbon atoms and wherein the cosolvent is selected from one or more from the class consisting of alcohols having from 1 to 8 carbon atoms; single ring aromatics having from 6 to 10 carbon atoms; ketones having from 3 to 10 carbon atoms; carboxylic acid esters where the carboxylic acid portion has from 2 to 4 carbon atoms and the ester portion has from 1 to 10 carbon atoms; and hydrocarbons having from 2 to 20 carbon atoms.

**5,045,221**

## POLYSULPHURIZED OLEFIN COMPOSITIONS, THEIR PREPARATION AND THEIR USE AS ADDITIVES FOR LUBRICANTS

**Maurice Born, Nanterre; Lucienne Briquet, Rueil-Malmaison; Jacques Lallement, Aubervilliers, and Guy Parc, Rueil-Malmaison, all of France, assignors to Istitut Francais Du Petrole, Rueil-Malmaison, France**

**Filed Sep. 7, 1989, Ser. No. 403,968**

**Claims priority, application France, Sep. 7, 1988, 88 11773**

**The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.**

**Int. Cl.[5] C10M** *135/02, 135/20*

**U.S. Cl. 252—45** **14 Claims**

1. A process for the preparation of a polysulphurized olefin composition comprising:

a stage (1) in which at least one compound selected from the group consisting of sulphur dichloride and monochloride is reacted with at least one aliphatic monoolefin with 2 to 12 carbon atoms, thus forming an adduct containing chlorine;

a stage (2) in which sulphurized hydrogen and at least one mercaptan is reacted with ammonium or alkali metal hydroxide dissolved in at least one aliphatic monoalcohol with 1 to 4 carbon atoms, which is substantially anhydrous, so as to give an alcoholic solution;

a stage (3) in which contacting takes place between the adduct obtained in stage (1) and the alcoholic solution obtained in stage (2);

a stage (4), in which the resulting mixture is heated and then the aliphatic monoalcohol is eliminated by distillation, while adding a water quantity adequate for maintaining in solution the mineral products formed during the reaction; and

a stage (5) in which the aqueous phase is eliminated and the organic phase containing the polysulphurized olefin composition is recovered.

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**5,045,222**

## USE OF TRIACYLATED ETHANOLAMINES AS LIQUID, WATER-MISCIBLE PEROXIDE ACTIVATORS

**Hajime Endo, Chiba, Japan; Hanspeter Gethöffer, Frankfurt am Main, Fed. Rep. of Germany; Fritz-Feo Grabley, Köigstein/-Taunus, Fed. Rep. of Germany, and Gerd Reinhardt, Kelkheim/Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Dec. 13, 1989, Ser. No. 449,990**

**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1988, 3842008**

**Int. Cl.[5] C11D** *7/54, 3/395, 9/30, 1/18*

**U.S. Cl. 252—102** **6 Claims**

1. A stable liquid bleaching or disinfecting composition comprising:

a. a finely-divided inorganic persalt,

b. a liquid anhydrous nonionic surfactant, and

c. dissolved in said liquid anhydrous nonionic surfactant as a liquid essentially water-soluble activator for said inorganic persalt, a triacylated ethanolamine of the formula

$$(RCO)(R_1CO)N—CH_2CH_2OCOR_2$$

where R, $R_1$ and $R_2$, which may be identical to or different form each other, are each alkyl, alkenyl, or aryl, and the total number of carbon atoms in said triacylated ethanolamine is from 8 to 14, the molar ratio of said persalt to said triacylated ethanolamine being in the range of from 0.5:1 to 10:1.



**5,045,223**

## N-SULFONYLOXAZIRIDINES AS BLEACHING COMPOUNDS

**David J. Batal, Secaucus, N.J., and Stephen A. Madison, Valley Cottage, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

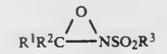
**Filed Mar. 16, 1990, Ser. No. 494,709**

**Int. Cl.[5] C11D** *3/395, 7/54;* **D06L** *3/02*

**U.S. Cl. 252—102** **29 Claims**

1. A bleaching composition comprising:

(i) from about 0.05 to about 10% of an oxygen transfer agent whose structure is:

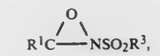


wherein:

$R^1$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl and cycloalkyl radicals;

$R^2$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring,

alkyl, cycloalkyl,



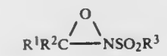
nitro, halo, cyano, alkoxy, keto, carboxylic, and carboalkoxy radicals;

$R^3$ may be a substituted or unsubstituted radical selected from the group consisting of phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, nitro, halo, and cyano radicals;

$R^1$ with $R^2$ and $R^2$ with $R^3$ may respectively together form a cycloalkyl, heterocyclic, and aromatic ring system; and

(ii) from about 0.5 to 50% of a surfactant.

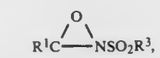
22. A method for bleaching a stained substrate, said method comprising contacting said stained substrate in an aqueous medium with an oxygen transfer agent whose structure is:



wherein:

$R^1$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl and cycloalkyl radicals;

$R^2$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl, cycloakyl,



nitro, halo, cyano, alkoxy, keto, carboxylic and carboalkoxy radicals;

$R^3$ may be a substituted or unsubstituted radical selected from the group consisting of phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, nitro, halo, and cyano radicals;

$R^1$ with $R^2$ and $R^2$ with $R^3$ may respectively together form a cycloalkyl, heterocyclic, and aromatic ring system.

**5,045,224**

## COLOR-CHANGE WASHING SOLUTION, SUITABLE FOR SPRAY COATING DEVICES

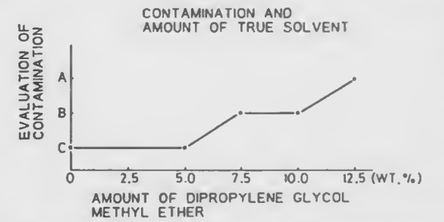
**Ikuo Watanabe, Toyota; Toshio Kai, Okazaki; Gen Kusunoki, Nagoya, and Shiro Oota, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan**

**Filed Jan. 11, 1989, Ser. No. 295,708**

**Claims priority, application Japan, Jan. 12, 1988, 63-3050**

**Int. Cl.[5] C11D** *7/50, 7/24, 7/26, 7/60*

**U.S. Cl. 252—162** **1 Claim**




1. A washing solution for a color-change washing in a rotary type electrostatic spray coating device in which a non-aqueous dispersion paint and a titanium dioxide pigment-incorporated paint are used in combination for a color-change painting, which solution consists essentially of 70 to 80% by weight of a medium boiling true solvent and, optionally, 10 to 15% by weight of a high boiling true solvent, each % by weight based on the total weight of the washing solution, and wherein said medium boiling true solvent is selected form the group consisting of butyl acetate and isobutyl acetate and said high boiling true solvent, if present, is selected from the group consisting of 3-methyl-methoxy butyl acetate and dipropylene glycol methyl ether the balance being solvents selected from the group consisting of alcohols, aromatic hydrocarbons, ketones and mixtures thereof.

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**5,045,225**

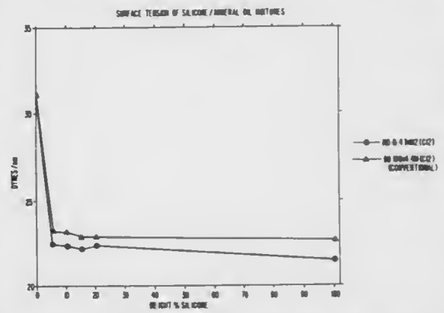
## SELF HYDROPHOBING SILICONE/HYDROCARBON ANTIFOAM COMPOSITIONS

**Michael P. Aronson, West Nyack, N.Y.; Samuel O. Lin, Paramus, N.J., and George A. Policello, Peekskill, N.Y., assignors to Lever Brothers Co., Division of Conopco Inc., New York, N.Y.**

**Continuation of Ser. No. 292,300, Dec. 30, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 455,875**

**Int. Cl.[5] C11D** *3/00, 9/36*

**U.S. Cl. 252—174.15** **36 Claims**

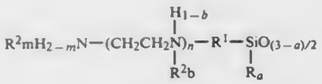


1. A composition which decreases foaming comprising:

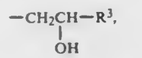
a) an alkylamino silicone having at least one unit of formula A

VOL 1130 ISS 1 SE 3 1991 UMI





wherein a is from 0 to 2, n is from 0 to 5, R is a mono valent radical selected from the group consisting of hydrocarbon radicals, halogenated hydrocarbon radicals, hydrogen, hydroxyl, and alkoxyl groups, $R^1$ is a divalent hydrocarbon radical, $R^2$ is



$R^3$ is a hydrocarbon radical having from 6 to 50 carbon atoms, m is 1 or 2 and b is 0 or 1,

b) finely divided filler particles and

c) a hydrocarbon carrier oil.

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**5,045,226**

**POLYISOCYANATE PREPARATIONS CONTAINING LATENT TIN CATALYSTS AND A PROCESS FOR THEIR PREPARATION**

**Roland Richter, Cologne; Hanns P. Müller, Odenthal; Wilhelm Weber, Cologne; Rudolf Hombach, Leverkusen; Bernd Riberi; Ralf Busch, both of Cologne, and Hans-Gerd Metzinger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany**

**Continuation of Ser. No. 947,014, Dec. 29, 1986, abandoned. This application Jul. 24, 1990, Ser. No. 558,123**

**Claims priority, application Fed. Rep. of Germany, Jan. 4, 1986, 3600093**

**Int. Cl.[5] B01J** *31/00;* **C09K** *3/00;* **C08G** *18/08*

**U.S. Cl. 252—182.2** **17 Claims**

1. A polyisocyanate preparation comprising

(a) at least one organic polyisocyanate and

(b) at least one reaction product of a sulfonyl isocyanate and an organic tin catalyst having at least one tin-oxygen bond, wherein said organic tin catalyst is an organic compound in which each said tin-oxygen bond is present in a structural unit selected from a tin-alkoxy group, a tin-siloxy group, or a distannoxane group.

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**5,045,227**

**LIQUID CRYSTAL CELL**

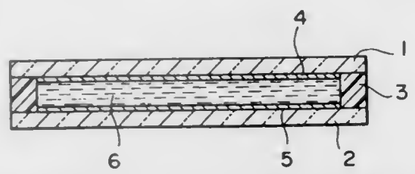
**Hyoe Hatakeyama, Kukizaki; Shigeo Hirose, Matsudo; Hirohisa Yoshida, Kawasaki, and Kunio Nakamura, Yokohama, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan**

**Filed Jun. 1, 1990, Ser. No. 531,707**

**Claims priority, application Japan, Oct. 9, 1987, 62-256022**

**Int. Cl.[5] C09K** *19/54*

**U.S. Cl. 252—299.5** **4 Claims**




1. A liquid crystal cell comprising a pair of opposed substrates defining a space therebetween and each having one or more electrodes disposed thereon, and a liquid crystal material provided in said space, said liquid crystal material being a lyotropic liquid crystal composition consisting essentially of water and a polymeric electrolyte dissolved in the water in an amount sufficient to form a liquid crystal phase, said polymeric electrolyte having (a) a polymer skeleton of chitin, chitosan, alginic acid, gellan gum, hyaluronic acid, pectic acid, heparin, condroitin, polyacrylic acid, polymethacrylic acid, polymaleic acid, polyvinyl alcohol, polystyrene, polyhydroxystryrene or lignin, and (b) one or more dissociation groups bonded to said polymer skeleton and selected from salts of sulfuric acid group, sulfonic acid group, phosphoric acid group, phosphorous acid group and carboxylic acid group.

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**5,045,228**

**OPTICALLY ACTIVE COMPOUND HAVING X1-VALEROLACTONE RING AND LIQUID CRYSTAL COMPOSITION COMPRISING SAME**

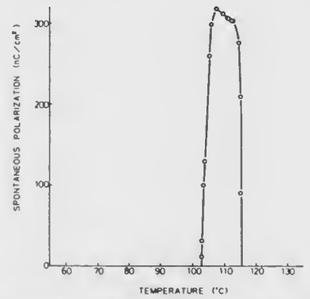
**Jun Nakauchi, Tokyo; Mioko Uematsu, Kawasaki; Keiichi Sakashita, Akishima; Yoshitaka Kageyama, and Kenji Mori, both of Tokyo, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Japan**

**Continuation of Ser. No. 260,207, Oct. 20, 1988, abandoned. This application Jan. 16, 1990, Ser. No. 463,814**

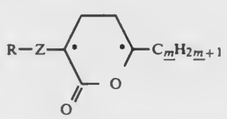
**Claims priority, application Japan, Oct. 23, 1987, 62-267712**

**Int. Cl.[5] C09K** *19/34;* **C07D** *309/30, 239/02*

**U.S. Cl. 252—299.61** **2 Claims**

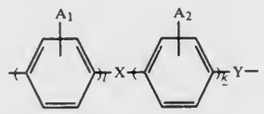



1. An optically active compound having a δ-valerolactone ring, which is a ferroelectric liquid crystal represented by the following general formula (1):



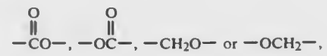
(1)

wherein m is an integer of from 1 to 8, Z is a group represented by the following formula:

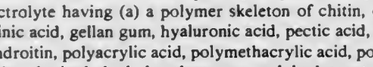


in which each of l and k is a number of 1 or 2 and l and k satisfy the requirement of $2 \leqq (l+k) \leqq 3$,

X stands for a direct bond,

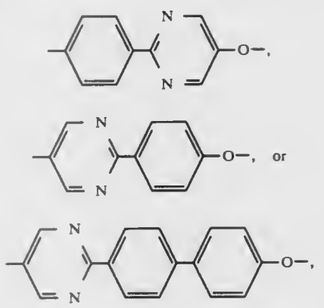


Y stands for

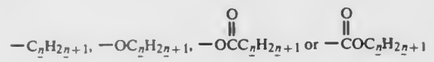


and

$A_1$ and $A_2$ independently stand for —H, —F or —Cl,



R stands for



in which n is an integer of from 1 to 18, and * indicates the asymmetric carbon atom.

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**5,045,229**

**DIFLUOROMETHYLENE COMPOUNDS**

**Ekkehard Bartmann, Erzhausen; Reinhard Hittich, Modautal; Hans-Adolf Kurmeier, Seeheim-Jugenheim; Eike Poetsch, Mühltal, and Herbert Plach, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany**

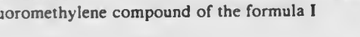
**Filed Mar. 16, 1990, Ser. No. 494,372**

**Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3908945**

**Int. Cl.[5] C09K** *19/34, 19/30;* **G02F** *1/13;* **C07C** *22/00*

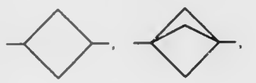
**U.S. Cl. 252—299.01** **16 Claims**

1. A difluoromethylene compound of the formula I



in which

$R^1$ is alkyl or alkenyl of up to 15 C atoms, in each case optionally unsubstituted, monosubstituted by CN or $CF_3$, or mono- or poly-substituted by halogen, or optionally having one or two $CH_2$ groups, in each case independently of one another, replaced by —O—,



—CO—, —CO—O—, —O—CO— or —O—CO—O— in a manner such that O atoms are not linked directly to one another,

$R^2$ is F, Cl or —CN,

$A^1$ and $A^2$ independently of one another, are

(a) trans-1,4-cyclohexylene in which, optionally one or two non-adjacent $CH_2$ groups may be replaced by —O— and/or —S—,





or —O—,

(b) 1,4-phenylene, in which, optionally, one or two CH groups may be replaced by N, or

(c) a radical which is 1,4-cyclohexenylene, 1,3-cyclobutylene, 1,4-bicyclo(2,2,2)octylene, piperidine-1,4-diyl, naphthalene-2,6-diyl, decahydronaphthalene-2,6-diyl or 1,2,3,4-tetrahydronaphthalene-2,6-diyl,

where radicals (a) and (b) may be substituted by one CN or up to four fluorine,

$A^1$ can also be a single bond,

$Z^1$ is —CO—O—, —O—CO—, $CH_2O$—, —$OCH_2$—, —$CH_2CH_2$—, —CH=CH—, —C≡C— or a single bond, and

m is 1, 2 or 3.

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**5,045,230**

**THICKENING AGENTS FOR AQUEOUS SYSTEMS**

**Albert van de Berg, Kreuzau, and Doris Fitzek, Titz, both of Fed. Rep. of Germany, assignors to Akzo NV, Arnhem, Netherlands**

**Filed Aug. 28, 1989, Ser. No. 399,201**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1988, 3829839**

**Int. Cl.[5] B01J** *13/00;* **C08G** *59/40, 65/34;* **C07C** *43/00*

**U.S. Cl. 252—310** **14 Claims**

1. A process for the preparation of thickening agents for aqueous systems by the conversion of higher aliphatic alcohols having 8–22 carbon atoms with ethylene oxide and propylene oxide and the reaction of the resulting alkoxylated alcohols with diepoxides, the process comprising (a) reacting the aliphatic alcohols having 8–22 carbon atoms with an alkylene oxide mixture of ethylene oxide/propylene oxide to produce polyether, the alkylene oxide mixture containing more than 15% by weight of propylene oxide in a molar ratio of alcohol to the alkylene oxide mixture of 1:40–1:150, (b) reacting the polyether with 5–20 moles of ethylene oxide to produce an alkoxylation product and (c) reacting the alkoxylation product with a diepoxide in a ratio of 0.5–3 moles of alkoxylation product per mole of diepoxide.

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**5,045,231**

**AQUEOUS DISPERSIONS OF ORGANOPOLYSILOXANES**

**Rudolf Braun, Kastl; Karl Braunsperger, Burghausen; Herbert Söllradl, Emmerting, and Matthias Wolfgruber, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany**

**Filed Sep. 24, 1990, Ser. No. 587,820**

**Claims priority, application Fed. Rep. of Germany, Sep. 26, 1989, 3932025**

**Int. Cl.[5] B01J** *13/00*

**U.S. Cl. 252—315.1** **18 Claims**

1. An aqueous dispersion of organopolysiloxanes comprising: (A) An organopolysiloxane containing groups which can undergo condensation; (B) a condensation catalyst; (C) an organopolysiloxane resin; and (D) a diorganosilanolate and/or condensation products thereof formed by splitting off water.

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**5,045,232**

**LOW VISCOSITY DEFOAMING/ANTIFORMING FORMULATIONS**

**Manilal S. Dahanayake, Wayne, N.J., assignor to Rhone-Poulenc Specialty Chemicals, L.P., Princeton, N.J.**

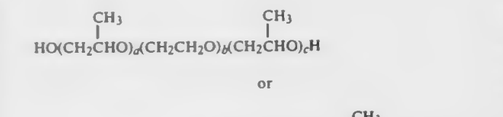
**Filed Jul. 12, 1989, Ser. No. 379,304**

**Int. Cl.[5] B01D** *19/04*

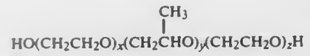
**U.S. Cl. 252—321** **14 Claims**

1. A defoaming/antifoaming liquid composition consisting essentially of

(a) greater than 10 and less than 90% by weight of the composition of a block polymer having the formula



or

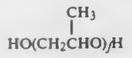


or mixtures thereof;

(b) greater than 10 and less than 90% by weight of trimethylol propane initiated polypropylene oxide having the formula



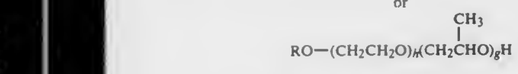
optionally in admixture with polypropylene glycol having the formula



(c) greater than 10 to less than 90% by weight of an alcohol alkoxylate heteric copolymer having the formula



or



wherein R is linear or branched chain alkyl having from 4 to 22 carbon atoms or a mixture thereof, and

(d) between about 0.1 and about 5% by weight hydrophobic silica based on components (a) +(b) +(c), and the lettered subscripts having the following values:

| | |
|---|---|
| the sum of a + c = | 20 to 70, |
| b = | 4 to 30, |
| d = | 0 to 50, |
| e = | 30 to 100, |
| f = | 25 to 100, |
| g = | 4 to 15, |
| h = | 0 to 10, |
| the sum x + z = | 4 to 15, |
| y = | 40 to 80, |

with the proviso that the propylene oxide units, with respect to ethylene oxide units, predominate in the overall composition, and wherein the composition has a viscosity of between about 100 and about 500 cps.

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**5,045,233**

## METHOD FOR INHIBITING POLYMERIZATION OF MALEIMIDES

**Yuichi Kita, Akashi; Kentaro Sakamoto, Hyogo; Masao Baba, and Tomoaki Tobo, both of Himeji, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan**

**Continuation-in-part of Ser. No. 942,182, Dec. 16, 1986, abandoned. This application Oct. 30, 1987, Ser. No. 114,704**

**Claims priority, application Japan, Dec. 19, 1985, 60-284209; Dec. 19, 1985, 60-284210**

**Int. Cl.[5] C09K** *15/04, 15/10, 15/16*

**U.S. Cl. 252—399** **9 Claims**

1. A polymerization proof maleimide composition which composition consists essentially of (a) a maleimide (b) acrylonitrile and (c) at least one polymerization inhibitor selected from the group consisting of thiodipropionic esters, 4-t-butyl catechol, 2,4-dimethyl-6-t-butyl phenol, 2,5-di-t-butyl hydroquinone, 2-t-butyl hydroquinone, 2,4-bis-(n-octylthio) 6-(4-hydroxy-3,5-di-t-butylanilino)-1,3,5-triazine, 2,2'-thiobis-(4-methyl-6-t-butylphenol), 4,4'-thiobis-(6-tbutyl-m-cresol), and triethyleneglycol-bis[3-(3-t-butyl-5methyl-4-hydroxyphenyl)-propionate].

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**5,045,234**

## SOLUTION FOR CONTROLLING THE PERFORMANCE OF THE IONIC EXCHANGE CHROMATOGRAPHY COLUMN OF HPLC (HIGH PERFORMANCE LIQUID CHROMATOGRAPHY) APPARATUSES, AND A PROCESS FOR PREPARING THE SAME

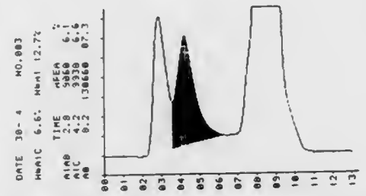
**Francesco Bonicolini, Monte San Savino, and Umberto Basagni, Arezzo, both of Italy, assignors to A. Menarini S.A.S., Florence, Italy**

**Filed May 12, 1988, Ser. No. 193,734**

**Claims priority, application Italy, May 18, 1987, 47948 A/87**

**Int. Cl.[5] G01N** *30/96*

**U.S. Cl. 252—408.1** **12 Claims**




1. A solution for controlling the performance of the ionic exchange chromatography column of a HPLC apparatus, said solution comprising

(a) a lyophilic hemolysate comprising

(1) hemoglobin in the amount of from $4.0\times10^{-4}$ g to $12.0\times10^{-4}$ g;

(2) monobasic potassium phosphate in the amount of from $4.5\times10^{-4}$ g to $13.5\times10^{-4}$ g;

(3) dibasic potassium phosphate in the amount of from $1.5\times10^{-4}$ g to $4.5\times10^{-4}$ g;

(4) α-D-ribose in the amount of from $1.25\times10^{-6}$ g to $3.75\times10^{-6}$ g; and

(5) at least one base selected from the group consisting of cytosine, guanine, thymine and uracil, in an amount totalling from $2.35\times10^{-4}$ to $7.05\times10^{-4}$ micromoles; and

(b) a solvent comprising

(1) nonionic surface active agent in the amount of from $0.75\times10^{-3}$ g to $2.25\times10^{-3}$ g;

(2) sodium azide in the amount of from $1.5\times10^{-4}$ g to $4.5\times10^{-4}$ g; and

(3) water in the amount of 1.5 ml.

8. A process for the preparation of a solution for controlling the performance of the ionic exchange chromatography column of a HPLC apparatus, said process comprising the steps of:

treating whole blood with an anti-coagulating agent;

centrifuging the treated blood to separate cells from a plasma supernatant;

removing the plasma supernatant and adding a physiologic solution to the cells;

repeating the centrifugation step until a clear supernatant is obtained;

suspending the final cell preparation in physiologic solution for approximately 24 hours;

centrifuging to separate the cells from the physiological solution;

removing the supernatant so as to leave washed erythrocytes behind;

adding 50 microliters of an aqueous stabilizing agent for each one (1) ml of washed erythocytes to form an erthrocyte solution, said stabilizing agent comprising α-D-ribose and at least one base selected from the group consisting of cytosine, guanine, thymine and uracil;

gently homogenizing said erythrocyte solution;

diluting the homogenized solution to the ratio of about 1:50 with a solution of monobasic potassium phosphate, dibasic potassium phosphate and water;

keeping the diluted solution at rest for approximately 60 minutes;

filling the diluted solution into a plurality of vials;

placing the vials into a freeze-drying unit until a lyophilic hemolysate with a moisture content of less than 2% is obtained; and

restoring the obtained lyophilic hemolysate with a restoring solution comprising a nonionic surface active agent, a bacteriostatic agent and water.

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**5,045,235**

## TRANSPARENT CONDUCTIVE FILM

**Nobuhiko Ohara, and Hirozumi Izawa, both of Shiojiri, Japan, assignors to Showa Denko K.K., Tokyo, Japan**

**Filed May 24, 1990, Ser. No. 527,969**

**Claims priority, application Japan, May 24, 1989, 1-130740**

**Int. Cl.[5] H01B** *1/08*

**U.S. Cl. 252—501.1** **2 Claims**

1. A transparent conductive film having an electrode resistivity of $2.0\times10^{-4}$ Ω-cm or less and a light transmittance of at least 90%, said transparent conductive film comprising, as the main component, indium oxide, and 6 to 20 mol % of zirconium oxide.

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**5,045,236**

## COPPER CONDUCTIVE COMPOSITION

**Masayuki Tsunaga, Ina; Kazuaki Yuba, Ageo; Yoshiaki Kurimoto, and Maraki Hirosawa, both of Takasaki, all of Japan, assignors to Mitsui Mining & Smelting Co., Tokyo and Gunei Chemical Industry Co., Ltd., Takasaki, both of, Japan**

**Filed Nov. 14, 1989, Ser. No. 436,475**

**Claims priority, application Japan, Jun. 20, 1989, 1-157184**

**Int. Cl.[5] H01B** *1/06*

**U.S. Cl. 252—512** **10 Claims**

1. A copper conductive composition comprising:

100 parts by weight of spherical copper powder coated with silver, the average particle size of said spherical copper powder being from 2 to 20 μm and the amount of the silver coating being from 0.5 to 5 wt %, based on said spherical copper powder;

6 to 18 parts by weight of resol phenolic resin containing 5% or more of dimethylene ether bonds in the bonded formaldehyde, the molar ratio of formaldehyde to phenol (formaldehyde/phenol) in said phenolic resin being from 1.0 to 3.0;

0.05 to 1 parts by weight of dispersant; and

2 to 15 parts by weight of solvent.

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**5,045,237**

## REFRACTORY ELECTRICAL DEVICE

**Malcolm E. Washburn, Princeton, Mass., assignor to Norton Company, Worcester, Mass.**

**Continuation-in-part of Ser. No. 120,291, Nov. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 669,399, Nov. 8, 1984, abandoned. This application Oct. 14, 1988, Ser. No. 258,307**

**Int. Cl.[5] H01B** *1/18*

**U.S. Cl. 252—516** **10 Claims**

1. An igniter for fluid fuels comprised of a hot zone and cold ends consisting essentially of a sintered mixture of 5 to 50% by volume of a molybdenum disilicide and 50 to 95% by volume of a mixture of silicon carbide and aluminum nitride; 4% or less of open porosity, a room temperature flexural strength of at least 30,000 psi (207 MPa), a resistivity range of from 0.0001 to 90 ohm centimeters, a ratio of room temperature resistivity to that at 1200° C. of from 0.2 to 19.8, a response time from room temperature to about 1200° C. of less than 25 seconds, said igniter consuming from about 20 to about 50 watts per square centimeter of radiating surface at 1200° C.

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**5,045,238**

## HIGH ACTIVE DETERGENT PARTICLES WHICH ARE DISPERSIBLE IN COLD WATER

**John M. Jolicoeur, and Frank J. Mueller, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Jun. 9, 1989, Ser. No. 364,732**

**Int. Cl.[5] C11D** *11/00, 1/14, 1/83*

**U.S. Cl. 252—550** **14 Claims**

1. A process for making high active detergent particles which are dispersible in water, comprising:

(a) producing a neutralized $C_{12\text{-}18}$ alkyl sulfate paste having less than about 14 weight % water and less than about 20 weight % additional ingredients by reacting in a continuous neutralization system $C_{12\text{-}18}$ alkyl sulfuric acid with an alkali metal hydroxide solution which is greater than or equal to about 62 weight % hydroxide;

(b) applying mechanical work by a roll mill, extruder, soap plodder, or combination thereof to said paste while maintaining said paste at temperatures between about 10° C. and 45° C.; and

(c) forming detergent particles from said worked paste; said additional ingredients being selected from the group consisting of polyethylene glycol of a molecular weight between about 4,000 and 50,000; ethoxylated nonionic surfactant of the formula $R(OC_2H_4)_nOH$, wherein R is a $C_{12\text{-}18}$ alkyl group or a $C_{8\text{-}16}$ alkyl phenol group and n is from about 9 to about 80, with a melting point of greater than about 48° C; and mixtures thereof; and said mechanical work being applied in an amount sufficient to make said particles substantially disperse after agitation for about 10 minutes in water with a temperature between about 4° C. and 30° C.

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**5,045,239**

## NON-LINEAR OPTICAL MATERIAL

**Seizo Miyata, Hoya; Toshiyuki Watanabe, Higashikurume; Yoshitaka Goto, Tsukuba; Akio Hayashi, Tsukuba, and Masaharu Nakayama, Tsukuba, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan**

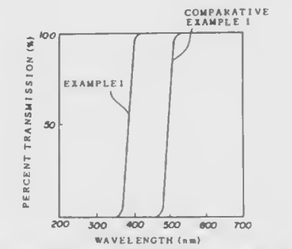
**PCT No. PCT/JP88/00740, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO89/01181, PCT Pub. Date Feb. 9, 1989**

**ub. Date DJul. 22, 1988, Ser. No. 362,464**

**Claims priority, application Japan, Jul. 23, 1987, 62-182317; Oct. 14, 1987, 62-257230**

**Int. Cl.[5] F21V** *9/00;* **G02B** *5/02;* **G03C** *1/00;* **G02F** *1/01*

**U.S. Cl. 252—582** **4 Claims**

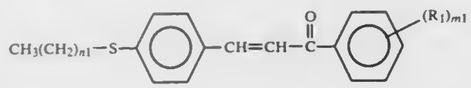



1. In a non-linear optical device in which an organic com-

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pound is disposed in a light beam, the improvement in which the organic compound is a derivative of chalcone represented by the following general formula



wherein $R_1$ is a halogen atom, a hydroxyl group, an amino group, a dimethylamino group, a nitro group, a cyano group, a phenyl group, an alkyl group having 1 to 18 carbon atoms or an alkyloxy group having 1 to 22 carbon atoms; $n_1$ is an integer of from 0 to 21; and $m_1$ is an integer of from 0 to 5.

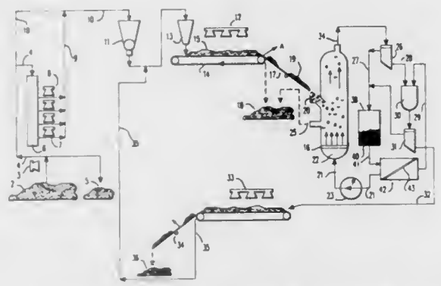
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**5,045,240**

## CONTAMINATED SOIL RESTORATION METHOD

**Michael C. Skriba, Swissvale Boro, and David C. Grant, Gibsonia, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 1, 1989, Ser. No. 345,852**
**Int. Cl.[5] G21F *9/28*; C02F *1/42***
**U.S. Cl. 252—626** **9 Claims**



1. A method of treating waste material contaminated with soluble radioactive species comprising the steps:

(1) providing waste material containing soluble radioactive species and separating that portion of the waste material found to be contaminated, to provide contaminated waste material;

(2) crushing the contaminated waste material so that it has a particle size below 420 micrometers, determining the contaminant, the contaminated waste material density, and identifying the particle size range of the most severely contaminated fraction of the contaminated waste material by separation into a plurality of particle size fractions and scanning each fraction for radioactivity or chemically analyzing each fraction;

(3) passing the contaminated waste material, having a known density, into a fluidized bed apparatus where an aqueous leach solution, having a chemical composition effective to leach soluble contaminants present in the contaminated waste material, contacts the contaminated waste material at an upward velocity effective to entrain and remove, at the top of the apparatus, particles including the particle size range that is determined to contain the most severely contaminated fraction of the contaminated waste material, to provide a severely contaminated, top effluent slurry containing solubilized, severely contaminated species, and a bottom effluent slurry containing disposable, cleaned waste where each slurry contains the aqueous leach solution;

(4) removing the leach solution from the severely contaminated effluent slurry, to provide aqueous leach solution containing solubilized, severely contaminated species, and cleaned solids waste; and

(5) passing the aqueous leach solution from step (4) through an ion removal apparatus effective to remove the solubilized, severely contaminated species from the aqueous leach solution, to provide cleaned, aqueous leach solution.

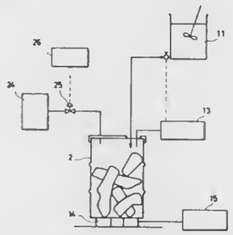
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**5,045,241**

## METHOD FOR SOLIDIFYING RADIOACTIVE WASTES

**Osamu Kuriyama, Hitachi; Kiyomi Funabashi; Tsutomu Baba, both of Katsuta; Masami Matsuda, Hitachi; Koichi Chino, Hitachi, and Makoto Kikushi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**PCT No. PCT/JP88/00596, § 371 Date Mar. 9, 1989, § 102(e) Date Mar. 9, 1989, PCT Pub. No. WO89/00753, PCT Pub. Date Jan. 26, 1989**
**ub. Date DJul. 10, 1987, Ser. No. 330,083**
**Claims priority, application Japan, Jul. 10, 1987, 62-171028**
**Int. Cl.[5] G21F *9/16***
**U.S. Cl. 252—628** **3 Claims**



1. A method of solidifying radioactive wastes comprising:

substituting the atmosphere inside a container for producing a solidified waste form, packed with said radioactive solid wastes, with a condensable vapor; and then

pouring a matrix material into said container for solidifying said radioactive solid wastes in said container and condensing said vapor.

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**5,045,242**

## REMOVAL OF CHOLESTEROL FROM EDIBLE FATS

**Steven Roczniak, 1400 Village Ct., Buffalo Grove, Ill. 60089; John B. Hill, 17819 Garden Valey, Woodstock, Ill. 60098, and Robert A. Erickson, 266 S. Warrington, Des Plaines, Ill. 60016**

**Filed Jan. 11, 1990, Ser. No. 463,588**
**Int. Cl.[5] C11B *3/04***
**U.S. Cl. 260—424** **14 Claims**

1. A process for reducing the amount of cholesterol in an edible fat capable of being solubilized comprising the steps of:

(a) providing a cholesterol containing edible fat in a liquid state;

(b) adding an ionic salt selected from the group consisting of $CaBr_2$ and $MgBr_2$ to said edible fat;

(c) mixing said ionic salt and edible fat for a time sufficient to cause said ionic salt to react with cholesterol present in said edible fat and form a precipitate; and

(d) removing said precipitate from said mixture.



**5,045,243**

## METHOD FOR DRY FRACTIONATION OF FATS AND OILS

**Yuji Kuwabara, Wakayama; Hiroshi Hidaka, Sakai; Kazuhito Asahara, Sennan, and Nobuo Sagi, Sakai, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan**

**Filed Jun. 22, 1989, Ser. No. 370,042**
**Claims priority, application Japan, Jul. 1, 1988, 63-165213; Sep. 16, 1988, 63-233318**
**Int. Cl.[5] C09F *5/10*; C11B *3/00***
**U.S. Cl. 260—428.5** **7 Claims**

1. A method for dry factionation of a fat or oil wherein a non or less-laurin fat or oil is cooled and then fractionated into a solid fraction and a liquid fraction, said method comprising cooling the fat or oil, by permitting it to stand in an apparatus having cooling means, with a gaseous or liquid refrigeration medium at a temperature of 10 to 20° C. at a cooling rate in a linear region of a cooling curve of 0.1 to 2.0° C./min. to crystallize it in a desired crystallization degree, then crushing it physically to fluidize it, and then pressing or filtering it to fractionate into the crystalline solid fraction and the liquid fraction.

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**5,045,244**

## PREPARATION OF METAL HALIDE-AMINE COMPLEXES

**Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.**

**Continuation-in-part of Ser. No. 199,288, May 26, 1988, Pat. No. 4,900,856. This application Nov. 8, 1989, Ser. No. 433,228**
**Int. Cl.[5] C07F *3/00, 3/02, 3/06, 5/06***
**U.S. Cl. 260—665 G** **19 Claims**

1. Process for the preparation of an organic amine complex of a metal halide, other than aluminum halide, said process comprising reacting a reactant mixture composed of the metal and an organic amine hydrohalide selected from a primary organic amine hydrohalide, a secondary organic amine hydrohalide, and a tertiary organic amine hydrohalide.

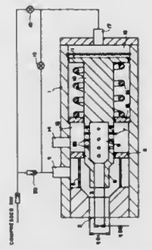
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**5,045,245**

## DEVICE FOR ATOMIZING LIQUID OR FOR COMMINUTING GAS INTO SMALL BUBBLES

**Jogindar M. Chawla, Ettlingen, Fed. Rep. of Germany, assignor to Caldyn Apparatebau GmbH, Ettlingen, Fed. Rep. of Germany**

**Filed Mar. 28, 1990, Ser. No. 500,616**
**Claims priority, application Fed. Rep. of Germany, Apr. 22, 1989, 3913334**
**Int. Cl.[5] B01F *3/04***
**U.S. Cl. 261—44.2** **15 Claims**



1. A device for atomizing a liquid via a gas or for comminuting gas into small bubbles via a liquid, comprising a mixing chamber means, means for conveying said gas and liquid to said mixing chamber means for mixing therein, means for controlling inflow speeds and volumetric flows of said gas and said liquid from an outflow cross section (2) in view of preselected variables affecting a desired resultant mixture and further in view of a selected size of said outflow cross section leading from the mixing chamber means, an insert means (7) insertable into the outflow cross section, for adjustment of the outflow cross section (2), said insert means (7) is hollow and includes radial bores (35) which allows said insert means to function as an additional mixing chamber (9), said inflow speeds and said volumetric flows being selected such that an outflow speed of the resultant mixture is approximately equal to a characteristic sonic velocity of said resultant mixture, the resultant mixture being arranged to exit the mixing chambers (3, 9) with an abrupt pressure reduction, the size of the outflow cross section being adjustable.

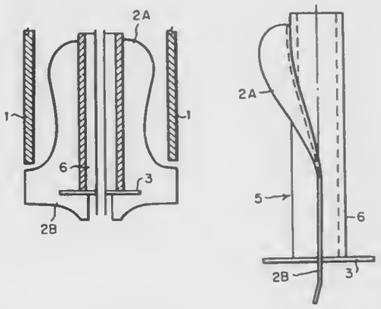
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**5,045,246**

## SUCTION DEVICE

**Siegfried Dörr, Borken, Fed. Rep. of Germany, assignor to Pulmatec Holding, Inc., Zona, Panama**

**Continuation of Ser. No. 78,365, Jul. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 694,461, Jan. 24, 1985, Pat. No. 4,685,444. This application Nov. 15, 1990, Ser. No. 614,955**
**Claims priority, application Switzerland, Nov. 13, 1986, 4528/86**
**Int. Cl.[5] F04D *3/02***
**U.S. Cl. 261—93** **34 Claims**



1. A pump and disperser for the aspiration of a gas into a liquid comprising a rotatable member having attached thereto with respect to a common horizontal plane, a plurality of upper and lower blades; wherein the active surface area of the upper blades is at least three times larger than that of the lower blades, and each of the upper blades is wider at its top than at its bottom and is curved in the form of a half-helix extending longitudinally along the rotatable member and helically thereabout.

25. A suction device for exchanging heat between a gas and a liquid and for removing pollutants from the gas, comprising:

a) a container for holding liquid;

b) a guide tube by which a flow of gas may be directed to the liquid;

c) a rotatable member disposed through the guide tube and having a plurality of blades for forcing gas into the liquid, each of said blades having an upper portion and a lower portion wherein the upper portion is curved in the form of a half helix and extends longitudinally along the rotatable member and wraps helically around the rotatable member, said upper portion being wider at its top than at its bottom, and the lower portion of each blade extends beyond the bottom of the guide tube and has outer edges extending to the outer diameter of the guide tube, and the active surface area of the upper portion of each blade is at least three times larger than that of the lower portion of each blade.

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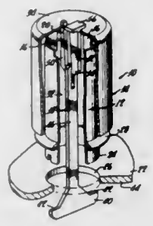


5,045,247

## BUBBLE CAP ASSEMBLY

Steven A. Treese, Placentia, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 30, 1990, Ser. No. 502,048
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—114.2 28 Claims



1. A bubble cap assembly comprising: a conduit defining a passageway for fluids, said conduit having an entry opening to the passageway and an exit opening from the passageway;

a bubble cap located over the exit passageway of the conduit, said bubble cap having a top portion, a downwardly extending skirt portion, and an opening located in the top portion; said opening being formed by two rectangular slots, one being super imposed upon and at substantially right angles to the other forming a cross;

spacer means for maintaining a gap between the exit opening of the conduit and the bubble cap;

a retainer member disposed within the passageway in the conduit and having (1) a lower end portion comprising an outwardly projecting end portion and (2) a stem which is attached to said lower end portion, extends upwardly through the opening in the bubble cap, and has a slot in the upper portion of the stem, which extends above the bubble cap; and

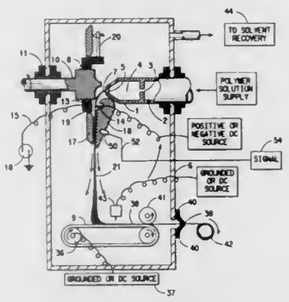
locking means for tightly urging the bubble cap, spacer means and conduit in one direction and simultaneously urging the lower end portion of the retainer member in the opposite direction, said locking means extending through the slot above the bubble cap.

5,045,248

## PROCESS FOR MAKING A NON-WOVEN SHEET

Richard A. Satterfield, Richmond, Va., and David M. Taylor, Llanfairfechan, Fed. Rep. of Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 411,025, Sep. 22, 1989, Pat. No. 4,968,238. This application Jul. 31, 1990, Ser. No. 560,864
Int. Cl.[5] D01D *5/11*
U.S. Cl. 264—13 1 Claim



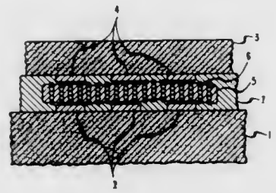

1. In a process for forming a fibrous web that includes the steps of flash spinning a solution to form a plexifilamentary strand, spreading the strand to form a web, electrostatically charging the web and oscillating the electrostatically charged web at a frequency in a path in a generally vertical plane toward a collecting surface, a method for detecting the loss of said web comprising: continuously detecting the presence of the oscillating electrostatically charged web by inducing an electrostatic charge on a detector that builds up and collapses according to the frequency of oscillation of the web, generating a signal proportional to the charge induced on said detector and signaling the absence of said signal.

5,045,249

## ELECTRICAL INTERCONNECTION BY A COMPOSITE MEDIUM

Sungho Jin, Millington; John J. Mottine, Jr., West Keansburg; Robert L. Opila, Jr., Aberdeen; Richard C. Sherwood, New Providence; Thomas H. Tiefel, Piscataway, all of N.J., and William C. Vesperman, Bel Air, Md., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 936,998, Dec. 4, 1986, abandoned, which is a continuation of Ser. No. 728,813, Apr. 30, 1985, abandoned. This application Feb. 9, 1988, Ser. No. 150,485
Int. Cl.[5] H01R *9/09*
U.S. Cl. 264—24 6 Claims



1. A method for making an electrical interconnection medium, said method comprising exposing a layer of a composite material to a magnetic field, said composite material comprising magnetic, electrically conductive, essentially spherical particles in a nonconductive matrix material, said magnetic field having a direction which is essentially perpendicular to said layer,

said magnetic field being applied for a period during which said matrix material undergoes at least partial hardening and while at least one surface of said layer is essentially unconstrained,

whereby, during said period, magnetic particles are aligned into mutually isolated chains essentially perpendicular to said layer and such that end particles of chains protrude from said matrix material at said at least one layer surface.

5,045,250

## METHOD OF APPORTIONING THE QUANTITY OF MATERIAL IN THE MANUFACTURE OF MOLDED PRODUCTS MADE FROM HARDENABLE MOLDING COMPOUNDS

Richard Brüssel, Sulzfeld, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit Beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 9, 1989, Ser. No. 363,997
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819916
Int. Cl.[5] B29C *43/58*
U.S. Cl. 264—40.4 14 Claims

1. A method of successively molding a plurality of products, each with a quantity of a molding material formed of hardenable resin molding compounds, the molding of each product comprising the steps of:

cutting a resin mat panel into a plurality of individual cut pieces;

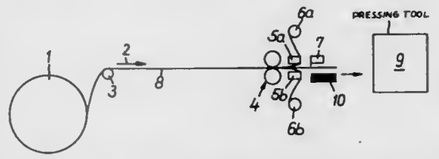


combining the plurality of pieces into a packet;

feeding the packet into a tool of a parallelism controlled press having two clamping plates and two tool halves and equipped with a path measuring system;

compacting the packet between the tool halves to form the product; and

determining a thickness of the product, said step of determining the thickness including the step of measuring with the path measuring system a distance between the clamping plates and the two tool halves, respectively, at a defined point in time, with the packet being compacted to become the product; said step of cutting including the step of cutting the pieces to a size as a function of a desired thickness of the product and the thickness determined during the molding of a previously molded product.

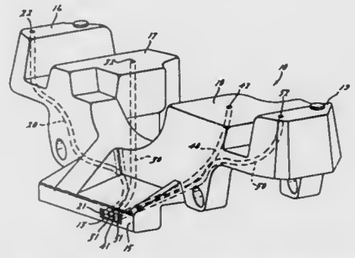



5,045,251

## METHOD OF RESIN TRANSFER MOLDING A COMPOSITE ARTICLE

Carl F. Johnson, New Boston, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 61,762, Jun. 15, 1987, abandoned. This application May 14, 1990, Ser. No. 522,623
Int. Cl.[5] B29C *45/14, 45/34, 45/76*
U.S. Cl. 264—40.1 14 Claims



1. A method of resin transfer molding a composite structure, which method comprises:

(A) providing a core having an outer surface and comprising a plurality of internal communication passages within the core, at least a first of said internal communication passages having an inlet opening and at least one discharge opening extending through the outer surface of said core, and at least a second of said internal communication passages having a discharge opening extending through said outer surface of the core and at least one inlet opening wherein said first internal communication passage does not intersect said second internal communication passage within the core;

(B) affixing fiber reinforcement material to said outer surface of said core to form a resin transfer molding preform;

(C) positioning said preform in a cavity of a molding tool having a first port and a second port;

(D) closing said molding tool and forming a fluid-tight communication between said first port and said inlet opening of said first internal communication passage and forming a fluid-tight communication between said second port and said discharge opening of said second internal communication passage;

(E) introducing uncured resin into said cavity through said first port, to and through said inlet opening of said first internal communication passage, and venting said cavity through said discharge opening of said second internal communication passage, to and through said second port; and

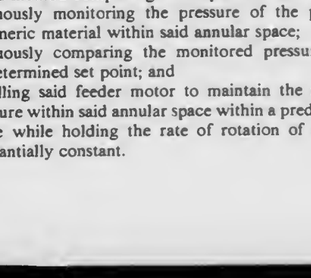
(F) curing said resin to provide said composite structure.

5,045,252

## METHOD AND APPARATUS FOR CONTROLLING ROTARY EXTRUDER

Granville J. Hahn; Allen C. Bailey, both of Big Spring, and Richard D. Antrim, Midland, all of Tex., assignors to Permian Research Corporation, Big Spring, Tex.

Filed Oct. 24, 1989, Ser. No. 425,937
Int. Cl.[5] B29C *47/00, 47/36, 47/92*
U.S. Cl. 264—40.5 5 Claims




1. Apparatus for plasticizing polymeric material, said apparatus comprising in combination:

A rotary extruder having a stationary barrel with an eccentric bore, a rotor that comprises a substantially cylindrical plasticizing surface rotatably mounted within the bore, said barrel and said rotor defining an annular space therebetween; and drive means for rotating said rotor at a desired rate of rotation within said barrel to plasticize said polymeric material and thereby establish a hydraulic pressure within said annular space;

A feeder device for controllably introducing feed comprising polymeric material into the annular space within said rotary extruder, and drive means for actuating said feeder device;

Means for continuously sensing hydraulic pressure of the plasticized polymeric material within said annular space;

Means for comparing the hydraulic pressure sensed within said annular space to a predetermined set point; and

Means for controlling said drive means actuating said feeder device to maintain said hydraulic pressure within a predetermined range around said predetermined set point while holding the rate of rotation of said rotor substantially constant.

4. A method for controlling the operation of a rotary extruder installed in combination with a motor-driven feeder, said rotary extruder having a stationary barrel with an eccentric bore, a rotor that comprises a substantially cylindrical plasticizing surface rotatably mounted within the bore, said barrel and said rotor defining an annular space therebetween, and drive means for rotating said rotor at a desired rate of rotation within said barrel to plasticize said polymeric material and thereby establish a hydraulic pressure within the annular space; said method comprising the steps of:

Continuously monitoring the pressure of the plasticized polymeric material within said annular space;

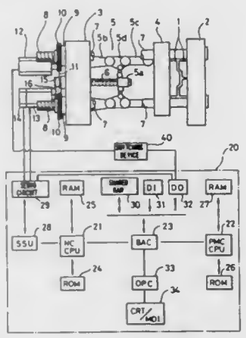
Continuously comparing the monitored pressure with a predetermined set point; and

Controlling said feeder motor to maintain the monitored pressure within said annular space within a predetermined range while holding the rate of rotation of said rotor substantially constant.

5,045,253
**AUTOMATIC MOLD THICKNESS ADJUSTING METHOD FOR A TOGGLE-TYPE MOLD CLAMPING APPARATUS**

Masao Kamiguchi; Masato Yamamura; Yuichi Hosoyo; Minoru Kobayashi, and Shuichi Wakebe, all of Yamanashi, Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP89/00411, § 371 Date Oct. 26, 1989, § 102(e) Date Oct. 26, 1989, PCT Pub. No. WO89/10250, PCT Pub. Date Nov. 2, 1989
ub. Date DApr. 17, 1989, Ser. No. 432,765
Claims priority, application Japan, Apr. 27, 1988, 63-102395
Int. Cl.[5] B29C *45/64, 45/80*
U.S. Cl. 264—40.5 4 Claims



1. An automatic mold thickness adjusting method applied to a mold clamping apparatus, which includes a toggle mechanism, a general-purpose motor for mold thickness adjustment and a servomotor for the toggle mechanism, comprising the steps of:
(a) driving said servomotor, while limiting an output torque of said servomotor, to establish a die-touch state, wherein said toggle mechanism is in a first operating position which permits production of a set mold clamping force; and
(b) advancing a movable platen by said servomotor, and at the same time, retreating a rear platen by said general-purpose motor, so that said toggle mechanism takes a second operating position for the production of the set mold clamping force, while maintaining said die-touch state.

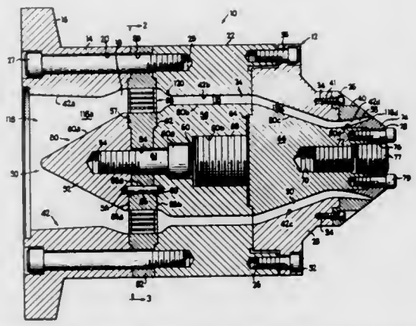
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5,045,254
**PROCESS FOR PRODUCING TUBULAR FILM FROM THERMOPLASTIC MOLTEN MATERIAL**

Paul L. Peelman, Eau Claire, and Edward A. Malosh, Chippewa Falls, both of Wis., assignors to Amoco Corporation, Chicago, Ill.

PCT No. PCT/US90/00216, § 371 Date Mar. 6, 1990, § 102(e) Date Mar. 6, 1990
Continuation-in-part of Ser. No. 299,260, Jan. 23, 1989, Pat. No. 4,931,237. No. WO88/09873, PCT PJan. 17, 1990, Ser. No. 487,981
Int. Cl.[5] B29C *47/20*
U.S. Cl. 264—48 8 Claims

1. A process for producing tubular film from a thermoplastic molten material, comprising:
supplying an annular stream of thermoplastic material through a passageway substantially free of flow interruptions having a plurality of axially aligned-annularly spaced feed ports;
funneling and recombining said annular stream of thermoplastic material after being supplied through said feed ports to evenly recombine said thermoplastic material; and



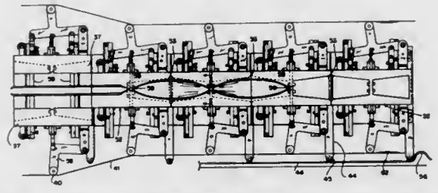
forming a tubular stream of thermoplastic film having a substantially uniform thickness throughout.

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5,045,255
**METHOD FOR CONTINUOUSLY FORMING OPEN-MOUTHED FOAMED PLASTIC CONTAINERS BY BLOW MOLDING TECHNIQUES**

John H. Kurz, Scottsdale, Ariz., assignor to Scott Paper Comany, Philadelphia, Pa.

Continuation of Ser. No. 366,562, Jun. 15, 1989, abandoned.
This application Oct. 30, 1990, Ser. No. 608,581
Int. Cl.[5] B29C *49/04, 49/38*
U.S. Cl. 264—51 4 Claims



1. A method of continuously forming thin walled, foamed plastic containers by a blow molding method comprising the following steps:
(a) introducing foamable plastic material to an extruder;
(b) extruding said material through an orifice to form a tubular parison;
(c) passing the parison into a molding apparatus which includes a plurality of mold sets moving on a continuous conveyor, each of said mold sets including two mold halves which when clamped together form two container molds adjacent to one another in closed-end to closed-end relationship, said mold sets abutting one another to form a series of cavities, each cavity in the shape of two containers abutting one another in mouth-to-mouth relationship;
(d) closing adjacent mold sets in sequence such that any three adjacent mold sets form two complete molding cavities; and
(e) pinching said parison with restriction members located substantially at the mid-point of each mold set, said restriction members having a small space therebetween;
(f) blowing gas through a needle extending into the second of said three mold sets to said small space between said restriction members thereby expanding the parison to take on the contours of the two complete molding cavities and thereby forming two pairs of containers joined in mouth-to-mouth relationship;



(g) further closing the restriction members to substantially eliminate said small space;
(h) severing said containers without a cooling step by passing a cutting means through the plastic material joining said containers in mouth-to-mouth relationship while said mold sets are closed;
(i) continuing to maintain gas in said containers during said severing step to hold the containers against the walls of the cavities to facilitate the passing of the cutting means to sever said material joining said containers; and
(j) opening said molds sets to permit the containers to be removed therefrom.

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5,045,256
**EXPANSION OF SHRUNK FOAM PARTICLES OF PROPYLENE POLYMERS**

Isidoor De Grave, Wachenheim; Udo Haardt, Biblis; Wolfram Koegel, Mannheim; Fritz E. Krueckau, Battenberg, and Hermann Tatzel, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 6, 1990, Ser. No. 549,164
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1989, 3922207
Int. Cl.[5] B29C *67/20*
U.S. Cl. 264—53 2 Claims

1. A process for expansion of foam particles of propylene polymers with a bulk density of from 10 to 30 g/l which have been prepared using $C_3$- to $C_5$-hydrocarbons as blowing agents and have been shrunk to from 40 to 95% of their original volume, which comprises treating the shrunk particles for a sufficient time at 20° C. or more below the softening point with air or nitrogen under a superatmospheric pressure of from 0.5 to 10 bar, subsequently decompressing the particles to atmospheric pressure, during which they regain their original volume, and aging the particles under atmospheric pressure until the pressure in the cells has fully dissipated.

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5,045,257
**PROCESS FOR PRODUCING AROMATIC POLYESTER FIBER**

Junyou Nakagawa, Kurashiki; Yoshio Kishino, Okayama, and Youichi Yamamoto, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 3, 1989, Ser. No. 331,879
Int. Cl.[5] D01D *10/02;* D01F *6/62*
U.S. Cl. 264—83 7 Claims

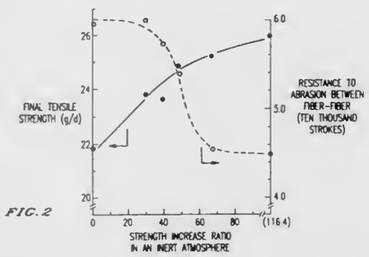



FIG. 2

1. A process for producing an armoatic polyester fiber, which comprises:
(i) extruding an aromatic polyester capable of forming an anisotropic melt through a spinneret at a temperature at least 10° C. higher than the flow temperature of said polymer and at a shear rate sufficiently high to obtain an initial spun fiber having sufficient orientation of its molecules to be heat treatable according to the following steps (ii) and (iii) to obtain increased tensile strength and abrasion resistance; (ii) treating said spun fiber at a temperature below the flow temperature of said fiber in an inert atmosphere for a period of time long enough to increase the tensile strength of said initial spun fibers by at least 30% but that does not allow the tensile strength of said fiber to increase by over 50%, to obtain a heat-treated fiber; and
(iii) heat treating said heat-treated fiber in an active $O_2$-containing atmosphere having a dew point of −40° C. or below for a period of time to increase its tensile strength by at least 50% based on the strength of said initial spun fiber and to increase its abrasion resistance.

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5,045,258
**PROCESS FOR THE PREPARATION OF THERMOPLASTIC FIBERS**

Adriaan W. van Breen; Josephus H. van Deursen, and Franciscus I. M. Wetser, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1989, Ser. No. 394,682
Claims priority, application United Kingdom, Sep. 22, 1988, 8822349
Int. Cl.[5] D01D *5/12;* D01F *6/26*
U.S. Cl. 264—85 4 Claims

1. The process for the preparation of thermoplastic polymer fibers which comprises:
(a) preparing a polymer solution having a viscosity in the range from $10^4$ to $10^5$ m.Pa.s by dissolving from 0.25 to 50% m of an alternating copolymer of an olefinically unsaturated compound and carbon monoxide having a number average molecular weight of at least 5,000 in a solvent,
(b) forming fibers by flowing said polymer solution through an aperture,
(c) removing substantially all of the solvent by submerging said fibers in a solvent extracting agent,
(d) removing said fibers from submersion in said solvent extracting agent, and
(e) stretching the thus obtained substantially solvent-free fibers in a gaseous inert environment having a temperature between the glass-transition temperature of said polymer and (T+20)° C., wherein T is the crystalline melting point of the polymer.

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5,045,259
**EXTRUSION OF VINYLIDENE CHLORIDE COPOLYMERS UNDER INERT ATMOSPHERE**

Jack A. Berdasco; Stephen R. Betso; Kun S. Hyun, all of Midland; Bobby A. Howell, Mount Pleasant, and Bernard C. Obi-Ahuba, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1990, Ser. No. 493,100
Int. Cl.[5] B29C *47/78*
U.S. Cl. 264—85 20 Claims

1. A process for forming an extruded article containing a semicrystalline copolymer of vinylidene chloride and at least one other ethylenically-unsaturated comonomer, said process comprising the step of extruding the vinylidene chloride copolymer in the presence of (1) at least one gas which is inert with respect to the copolymer and does not plasticize the copolymer; and (2) essentially no gases which are not inert with respect to the vinylidene chloride copolymer under conditions such that a shaped article is formed.

VOL 1130 ISS 1 SE 3 1991 UMI



5,045,260

## POLYESTER YARN AND METHOD FOR ITS MANUFACTURE

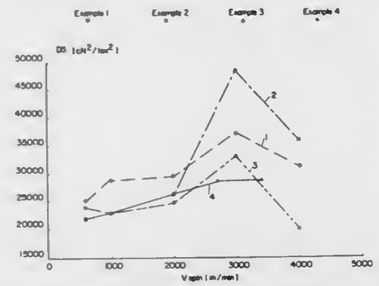
Remy Humbrecht, Littau, and Armin Müller, Emmenbrücke, both of Switzerland, assignors to Rhone-Poulenc Viscosuisse SA, Emmenbrücke, Switzerland

Continuation-in-part of Ser. No. 298,513, Jan. 17, 1989, abandoned, which is a continuation of Ser. No. 29,209, Feb. 11, 1987, abandoned. This application Apr. 12, 1990, Ser. No. 508,907

Claims priority, application Switzerland, Jul. 21, 1985, 02636/85; Jul. 10, 1986, 02330/86

Int. Cl.[5] D01F *6/62*

U.S. Cl. 264—103 10 Claims




1. In a method for production of dimensionally stable, shrinkage-resistant, chemically modified industrial polyester yarns by melt spinning at speeds of 2000 to 4000 m/min., with the use of a copolymer containing at least 85 percent by weight polyethylene terephthalate units and comonomers, with an intrinsic viscosity of 0.80 to 1.00 dl/g and a total titer of at least 500 dtex, the improvement comprising adding 1 to 10 percent by weight of one or more comonomers selected from the group consisting of linear difunctional comonomers having the general formula:

X'—R—X

during the polyester production to lower thermal shrinkage, said linear difunctional comonomers being combined chemically with said copolymer, wherein R is selected from the group consisting of linear alkyl groups having from one to ten carbon atoms, cycloalkyl radicals with more than six carbon atoms and aromatic radicals with more than six carbon atoms, X is selected from the group consisting of OR' and COOR", X' is selected independently from the group consisting of OR' and COOR", and R' and R" are each independently selected from the group consisting of H and alkyl groups.

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5,045,261

## METHOD OF MAKING FIBER-REINFORCED RESIN WHEEL

James B. Weeks, Eaton Rapids, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Oct. 1, 1987, Ser. No. 103,209

Int. Cl.[5] B29C *43/02, 43/18*

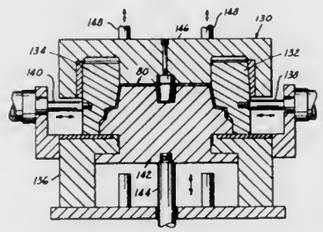
U.S. Cl. 264—108 20 Claims

1. A method of making a cup-shaped member of fiber-reinforced resin construction comprising the steps of:

(a) providing a mandrel of generally cylindrical external geometry having a generally flat top and essentially a cylindrical external sidewall,

(b) forming a plurality of at least two sections of fiber-reinforced sheet molding compound, each of said sections having a central portion with opposed convex side edges and a pair of diametrically opposed radially outwardly projecting integral wings having a common central axis and concave side edges coupled to said convex side edges of said central portion,

(c) placing said sections over said mandrel with said central portions of said sections externally overlying said mandrel top and with said wings externally draping over said




mandrel sidewall to form a cup-shaped mold charge in which wings of said plurality of sections are circumferentially staggered around said sidewall, and

(d) compression molding said mold charge to form an integral cup-shaped member of fiber-reinforced resin construction.

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5,045,262

## METHOD OF MANUFACTURING AN ELONGATE COVER PROFILE

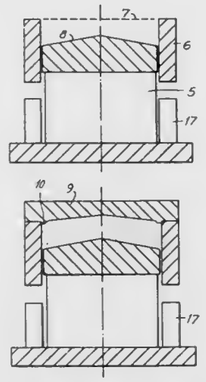
Edmund Munk, Oberstenfeld, Fed. Rep. of Germany, assignor to Werzalit AG+ Co., Oberstenfeld, Fed. Rep. of Germany

Division of Ser. No. 359,095, May 26, 1989. This application Apr. 25, 1990, Ser. No. 514,844

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1988, 88118489

Int. Cl.[5] B29C *43/14;* B32B *21/00*

U.S. Cl. 264—112 2 Claims




1. A method of manufacturing elongate cover profiles having a wall thickness which increases continuously from one of opposite end portions of a profile to the other of opposite end portions of the profile, and a greater packing of the end portion with a greater wall thickness than that of the end portion with a smaller wall thickness, said method comprising the steps of:

filling a molding chamber of a premolding press and having an outer base surface which slopes from inside to outside in accordance with an inclination of the profile, with a mixture from which the cover profiles are made, to a predetermined flat horizontal plane so that a larger amount of the mixture is loaded at an end of the molding chamber than in a middle thereof;

applying a vertical force to an upper part of the premolding press and having an outer surface facing the base surface of the lower part of the premolding press and likewise sloping from inside to outside, to compress the mixture in the molding chamber, whereby the mixture being packed to a greater degree at the end of the molding chamber where the wall thickness of the profile is greater, because of a greater amount of the mixture thereat;

removing the blank of a cover profile from the premolding press and placing the blank in a press for hot pressing having upper and lower parts with facing outer surfaces sloping from outside to inside, the blank being rotated by 180° about its horizontal axis before being placed in the press for hot pressing; and

applying a force to the upper press part of the press for hot pressing to move the upper press part downward and applying heat to form a pressed cover profile.



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5,045,263

## METHOD OF MAKING A DOUBLE WALL STORAGE TANK

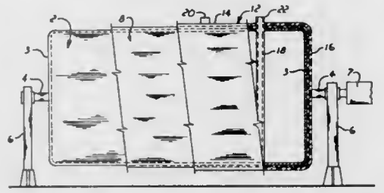
David T. Palazzo, P.O. Box 290676, Tampa, Fla. 33687

Continuation-in-part of Ser. No. 332,806, Apr. 3, 1989, Pat. No. 4,927,050, which is a continuation-in-part of Ser. No. 194,387, May 16, 1988, Pat. No. 4,817,817, which is a continuation-in-part of Ser. No. 105,890, Oct. 7, 1987, Pat. No. 4,780,947, and a continuation-in-part of Ser. No. 105,881, Oct. 7, 1987, Pat. No. 4,780,946, which is a continuation-in-part of Ser. No. 43,634, Jun. 11, 1987, Pat. No. 4,744,137, which is a division of Ser. No. 884,481, Jul. 11, 1986, abandoned, and a continuation-in-part of Ser. No. 884,389, Apr. 7, 1987, Pat. No. 4,655,367, which is a continuation-in-part of Ser. No. 818,258, Jan. 13, 1986, Pat. No. 4,644,627, which is a continuation-in-part of Ser. No. 775,140, Sep. 12, 1985, Pat. No. 4,640,439. This application Feb. 12, 1990, Ser. No. 478,346

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] B29C *39/10, 39/12*

U.S. Cl. 264—137 9 Claims




1. A method of manufacturing a double wall tank from a single wall inner tank for storage of liquids, said inner tank including a generally cylindrical sidewall and a pair of end walls, said method comprising

forming a mixture of an internal lubricating agent and a curable synthetic resin; and

applying over at least a portion of said inner tank exterior surface said mixture of said curable synthetic resin and said lubricating agent to form, when cured, a substantially rigid outer sheath that is substantially fluid tight and that resists bonding to the inner tank.

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5,045,264

## METHOD AND APPARATUS FOR MAKING EXTRUDED PLASTIC FILM WITH STRIPS EMBEDDED THEREIN OF A SECOND THERMOPLASTIC MATERIAL

William A. Kirksey, Midland, Mich., assignor to DowBrands, Inc., Indianapolis, Ind.

Filed Mar. 29, 1990, Ser. No. 502,144

Int. Cl.[5] B29C *47/04*

U.S. Cl. 264—171 18 Claims

1. A method of making a composite film comprised of a first material and a second material in the form of one or more discrete strips of the second material which are embedded in a matrix of the first material at one or both surfaces of the composite film by extrusion apparatus having an adjustable die gap, wherein the method comprises the steps of:

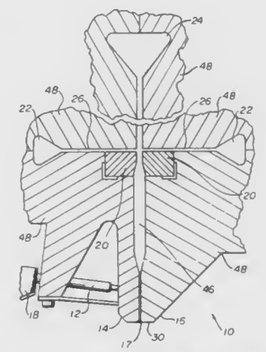
providing a stream of a first, heat-plastified extrudable thermoplastic film material to a cast film die;

cross-currently feeding one or more streams of a heat-plastified second material into the first material flowing through the cast film die;

diverting a portion of the first material adjacent a stream of the second material with respect to the stream of the second material so that the stream is partially encapsulated within a matrix of the first material and forms a composite body of materials with the first material; and

extruding the composite body of materials from the cast film die to form the composite film.

6. An apparatus for making a composite film comprised of a first material and a second material in the form of one or more




discrete strips of the second material which are embedded within a matrix of the first material at one or both surfaces of the composite film, comprising:

a cast film die having two opposed die portions, wherein at least one of the two opposed die portions has a plurality of strip channels defined therethrough which are laterally spaced and offset from the strip channels in the opposed die portion;

an extruding source of the first material which is in fluid communication with the cast film die;

an extruding source of the second material in fluid communication with the plurality of laterally spaced and offset strip channels;

means for partially encapsulating the second material from the strip channels within a matrix of the heat-plastified first material flowing between the opposed die portions to form a composite body of materials; and

means for extruding the composite body of materials to form the composite film.

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5,045,265

## METHOD OF MAKING A VARIABLE MOLDED PART

Dean A. Pettit, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Sep. 17, 1990, Ser. No. 583,298

Int. Cl.[5] B29C *39/02*

U.S. Cl. 264—219 7 Claims

1. A method for making molded parts with a body and variable outer dimensions, comprising the steps of:

providing a mold block for receiving material in a substantially flowable state, said mold block defining a cavity for the body;

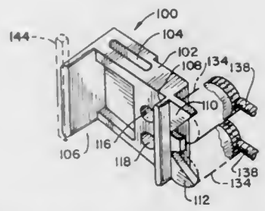
providing a pin pivotable about a longitudinal axis, said pin including a portion which is asymmetric about said axis

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and disposed in a channel in the mold block along at least one side of the defined cavity;

pivoting the pin such that said portion cooperates with said mold block to extend said cavity to a selected outer dimension;




flowing material into the mold block for forming the molded part;

allowing the material to harden into the shape of the molded part; and

removing the molded part from the mold block.

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5,045,266

## PROCESS OF MAKING A HEARING AIR EARMOLD IN SITU

Daniel G. Moro, Randolph; Samuel H. Ronel, Princeton, and Petr Kuzma, Monmouth Junction, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed Nov. 2, 1989, Ser. No. 430,839
Int. Cl.[5] B29C *33/40*
U.S. Cl. 264—222 20 Claims

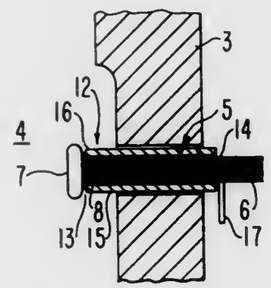
1. A process for producing an earmold suitable for use in a hearing aid which comprises (1) forming a settable paste by homogeneously mixing (a) a particulate water-insoluble, water-swellable, hydrophilic polymer with (b) a hydrophilic monomeric plasticizer which is capable of vinyl polymerization with said polymer, said polymer selected from the group consisting of a hydroxyalkyl 2-alkenoate; a hydroxy ($C_2$–$C_4$ alkoxy$C_2$–$C_4$ alkyl) alkenoate; an alkoxy ($C_2$–$C_4$ alkoxy$C_2$–$C_4$ alkyl) alkenoate; a N-vinylpyrrolidone; a 2-alkenamide; a N-($C_1$–$C_4$ alkyl)-methacrylamide; a N-($C_1$–$C_4$ alkyl)-methacrylamide; a $N_1$N-di($C_1$–$C_4$ alkyl) acrylamide; a $N_1$-N-di($C_1$–$C_4$ alkyl) methacrylamide; a vicinal-epoxyalkyl 2-alkenoate; a vicinal-epoxy ($C_1$–$C_4$ alkyl) acrylate and mixtures thereof and said monomer selected from the group consisting of a hydroxyalkyl 2-alkenoate; a hydroxy ($C_2$–$C_4$ alkoxy$C_2$–$C_4$ alkyl) alkenoate; an alkoxy ($C_2$–$C_4$ alkoxy$C_2$–$C_4$ alkyl) alkenoate; a N-vinylpyrrolidone; a 2-alkenamide; a N-($C_1$–$C_4$ alkyl)-methacrylamide; a N-($C_1$–$C_4$ alkyl)-methacrylamide; a $N_1$N-di($C_1$–$C_4$ alkyl) acrylamide; a $N_1$-N-di($C_1$–$C_4$ alkyl) methacrylamide; a vicinal-epoxyalkyl 2-alkenoate; a vicinal-epoxy ($C_1$–$C_4$ alkyl) acrylate and mixtures thereof, and wherein said monomer is present in an amount sufficient to impart to said paste a setting time period no greater than about one hour and a working time sufficient to shape said paste; (2) shaping said paste into the form of an earmold; (3) allowing said paste to set; (4) modifying the shape of said paste while in such set condition; and (5) subsequent curing said shaped paste in such set condition.

5,045,267

## PROCESS AND APPARATUS FOR PRODUCING BRISTLE ARTICLES

Georg Weibrauch, Wald-Michelbach, Fed. Rep. of Germany, assignor to Coronet-Werke Heinrich Schlerf GmbH, Waldmichelbach, Fed. Rep. of Germany

PCT No. PCT/EP88/00075, § 371 Date Sep. 13, 1989, § 102(e) Date Sep. 13, 1989, PCT Pub. No. WO89/06920, PCT Pub. Date Aug. 10, 1989
ub. Date DFeb. 3, 1988, Ser. No. 401,445
Int. Cl.[5] B29C *45/14, 45/36*
U.S. Cl. 264—243 21 Claims




1. Process for a production of bristle articles comprising a bristle carrier made from one of a mouldable and foamable material and plastic bristles anchored in the bristle carrier the method comprising the steps of introducing the bristles in the form of one of individual bristles and bristle strands into a mould for the bristle carrier through channels and sleeves for extending the bristles into the mould for the bristle carrier, thermally melting an end of the bristles located in the mould for forming a thickened portion, sealingly engaging the thickened portion on the an opening of the sleeve projecting into the mould, and subsequently introducing the bristle carrier material into the mould so as to fill the mould with bristle carrier material, maintaining the bristles in the same relative position within the sleeve during the filling of the mould with the bristle carrier material such that the sleeve and the thickened portion sealingly engaging the opening of the sleeves are enveloped by the bristle carrier material, and removing the sleeve from the bristle after filling the mould with the bristle carrier material.

11. Apparatus for a production of bristle articles comprising a bristle carrier made from one of a mouldable and foamable material and plastic bristles in the form of one of individual bristles and bristle strands, the apparatus comprising a mould having at least a first mould part and a second mould part for shaping the bristle carrier, at least one guide channel and a sleeve provided in said first mould part and extending into the mould cavity for guiding the bristles into the mould cavity, a heat source acting on ends of the bristles projecting beyond an end of the sleeve into the mould cavity for forming a thickened portion at the ends of the bristles from bristle material, means for maintaining the sleeve in a position projecting into the mould cavity at least during a filling of the mould with the bristle carrier material and for enabling a removal of the sleeve from the bristle carrier during the filling of the mould with the bristle carrier material through a relative movement between the mould and the bristle carrier, a clamping device displacably mounted on said first mould part for clamping the bristles inserted into said at least one guide channel in said first mould part and for producing tensile force on the bristles by movement of the clamping device into a position remote from said first mould part, and means for displaceably guiding the clamping device on said first mould part.

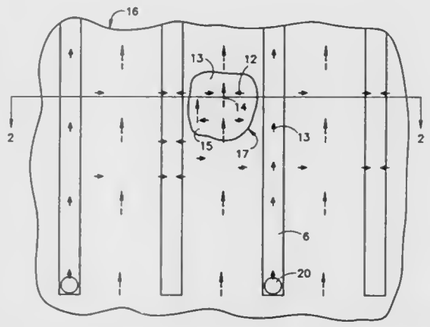


5,045,268

## CROSS-LAMINATION INJECTION MOLDING

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Filed Dec. 11, 1989, Ser. No. 448,763
Int. Cl.[5] B29C *45/16*
U.S. Cl. 264—246 38 Claims




1. A method of injection molding a plastic product, with a cross-laminated section that includes a first plastic layer and a second plastic layer, in a mold system comprising a first mold cavity with a first-layer-defining-mold-cavity-section and a second mold cavity with a second-layer-defining-mold-cavity-section with a second-cavity-section-wall, the method comprising the steps of:

(a) injecting a quantity of first plastic into the first mold cavity so that the first plastic follows in the first-layer-defining-mold-cavity-section in a first predetermined general direction,

(b) solidifying at least partly the flowed first plastic in the first-layer-defining-mold-cavity-section to thereby form said first plastic layer having a first-direction-flow-record,

(c) adjusting the mold system to thereby provide the second mold cavity with the second-cavity-section-wall including said first plastic layer,

(d) injecting a quantity of second plastic into the second mold cavity so that the second plastic flows in the second-layer-defining-mold-cavity-section in a second predetermined general direction, whereby the second plastic in the second-layer-defining-mold-cavity-section fuses with said first plastic layer,

(e) solidifying the flowed second plastic in the second-layer-defining-mold-cavity-section to thereby form said second plastic layer, so that the second plastic layer has a second-direction-flow-record which is positively different from said first-direction-flow-record, to thereby form said plastic product with said cross-laminated section that includes both the first plastic layer and the second plastic layer, and

(f) adjusting the mold system to thereby eject the product,

wherein the first mold cavity comprises a first-cavity-flow-channel which is located adjacent the first-layer-defining-mold-cavity-section, with a flow channel being defined as a portion of a mold cavity which is significantly thicker and wider than the adjacent mold cavity thickness for the purpose of directing the flow of injected plastic, and wherein step (a) comprises the step of:

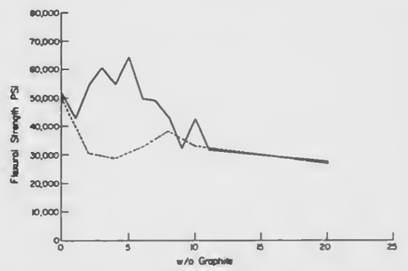
(g) directing the first plastic into the first-layer-defining-mold-cavity-section via the first-cavity-flow-channel, so that the first plastic flows in the first-cavity-flow-channel in a direction which is positively different from said first predetermined general direction.

5,045,269

## METHOD FOR SINTERED SHAPES WITH CONTROLLED GRAIN SIZE

Raymond V. Sara, Strongsville, Ohio, assignor to Union Carbide Coatings Service Technology Corporation, Danbury, Conn.

Continuation of Ser. No. 272,419, Nov. 17, 1988, abandoned.
This application Feb. 1, 1991, Ser. No. 635,383
Int. Cl.[5] C04B *35/58*
U.S. Cl. 264—332 7 Claims




1. A method for producing a molded refractory shape comprising:

(a) providing a grain growth inhibiting powder of a graphite material having a crystal structure;

(b) forming a refractory powder of a transition metal boride having less than 1.5 weight percent oxygen;

(c) mixing between about 95 and about 98 weight percent, based upon the total weight of the mixture, of said refractory powder and between about 2 and about 5 weight percent, based upon the total weight of the mixture of said grain growth inhibiting powder; and

(d) compressing the mixture at pressure and temperature sufficient to sinter the refractory powder.

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5,045,270

Patent Not Issued For This Number

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5,045,271

## PROCESS FOR THE PRODUCTION OF IRREGULAR NON-WOVEN MATERIAL SHEETS

Kurt Mente, Hanover, and Gerhard Knitsch, Wedemark, both of Fed. Rep. of Germany, assignors to J. H. Benecke GmbH, Hanover and Corovin GmbH, Peine, both of, Fed. Rep. of Germany

Continuation of Ser. No. 937,298, Dec. 3, 1986, abandoned. This application Jun. 28, 1989, Ser. No. 373,658
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601201
Int. Cl.[5] D04H *3/00*
U.S. Cl. 264—555 7 Claims

1. A process for the production of irregular non-woven material sheets having a uniform distribution of weight over their surfaces by avoiding filament tangling comprising the steps of:

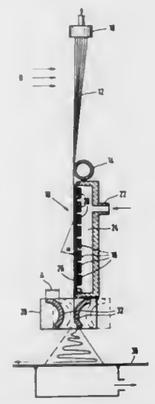
generating gaseous propellant having a relatively high temperature with a compressor means;

drawing said filaments off spinnerets in the form of a warp with said gaseous propellant, said gaseous propellant exiting a plurality of cooled slot nozzles stacked on top of each other on a nozzle wall, said slot nozzles and compres-

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sor means operating polytropically such that said gaseous propellant expands and decreases in pressure so that said



gaseous propellant exiting said slot nozzles is at substantially ambient air temperature; and

depositing said filaments on said substrate.

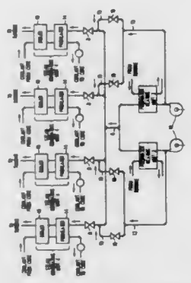
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5,045,272

**FLUID TEMPERATURE BALANCING SYSTEM**

Walter G. Lyman, Monroeville, and Michael D. Heibel, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1990, Ser. No. 481,038
Int. Cl.[5] G21C *7/32*
U.S. Cl. 376—211 14 Claims



1. In a steam generating system, which system includes a heat energy source, a feedwater heating section including at least one heat exchange unit having a feedwater inlet, means for supplying feedwater to the feedwater inlet of the heat exchange unit, and a steam generating section composed of at least two steam generating heat exchange units each having a feedwater inlet connected for receiving heated feedwater from the feedwater heating section and each connected to the heat energy source for transferring heat from the energy source to the feedwater, the improvement comprising means defining a bypass flow path connected between said feedwater inlet of said feedwater heating section heat exchange unit and said feedwater inlet of each said steam generating heat exchange unit, said bypass flow path defining means including two controllable valves each connected between said feedwater inlet of said feedwater heating section heat exchange unit and a respective steam generating heat exchange unit for individually controlling the rate of flow of feedwater via said bypass flow path to said feedwater inlet of each said steam generating heat exchange unit.

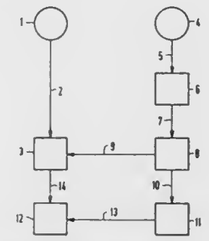
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5,045,273

**METHOD FOR CHEMICAL DECONTAMINATION OF THE SURFACE OF A METAL COMPONENT IN A NUCLEAR REACTOR**

Rainer Gassen, Fuerth; Horst-Otto Bertholdt, Heroldsbach, and Klaus Zeuch, Eckental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 22, 1989, Ser. No. 396,992
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1988, 3828727
Int. Cl.[5] G21C *19/42*
U.S. Cl. 376—309 38 Claims



1. Method for the chemical decontamination of the surface of a metal component of a nuclear reactor plant, which comprises treating the surface of the metal component with an aqueous solution consisting of an aqueous part and an acid part, the acid part consisting essentially of at least one acid selected from the group consisting of ketonic carbonic acids and hydroxycarbonic acids.

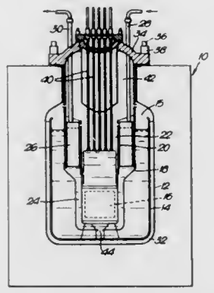
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5,045,274

**WATER COOLED NUCLEAR REACTORS**

Anthony J. Donaldson, Nottingham, England, assignor to Rolls-Royce and Associates limited, Derby, England

Filed Jun. 12, 1989, Ser. No. 364,164
Claims priority, application United Kingdom, Jun. 13, 1988, 8813916
Int. Cl.[5] G21C *23/00*
U.S. Cl. 376—318 9 Claims



1. A pressurized water cooled nuclear reactor comprising a pressure vessel, a reactor core, a primary water coolant circuit, at least one heat exchanger, a pressurizer and an inner vessel,

the inner vessel being positioned within and spaced from the pressure vessel,

the primary water coolant circuit comprising a main portion and a second portion,

the reactor core, the at least one heat exchanger and the main portion of the primary water coolant circuit being positioned within the inner vessel, the second portion of the primary water coolant circuit being positioned in the space between the pressure vessel and the inner vessel, the primary water coolant circuit being arranged to have a water level and a steam space positioned above the inner vessel,

the inner vessel having a first region, the first region of the inner vessel having at least one aperture to interconnect the main portion of the primary water coolant circuit within the inner vessel with the second portion of the primary water coolant circuit between the pressure vessel and the inner vessel above the inner vessel to allow a flow of primary water coolant therebetween, and to prevent a flow of steam from the steam space to the main portion of the primary water coolant circuit.



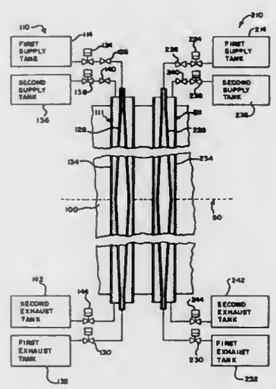
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5,045,275

**GASEOUS REACTOR CONTROL SYSTEM**

Said I. Abdel-Khalik, Atlanta, Ga., assignor to The Georgia Tech Research Corporation, Atlanta, Ga.

Filed May 16, 1989, Ser. No. 352,359
Int. Cl.[5] G21C *7/22*
U.S. Cl. 376—331 9 Claims




1. A nuclear reactor control system for controlling the reactivity of the core of a nuclear reactor comprising:

a control gas having a high neutron cross-section;

a first tank containing a first supply of the control gas;

a first conduit providing a first fluid passage extending into the core, the first conduit being operatively connected to communicate with the first tank;

a first valve operatively connected to regulate the flow of the control gas between the first tank and the first conduit;

a second conduit concentrically disposed around the first conduit such that a second fluid passage is defined between the outer surface of the first conduit and the inner surface of the second conduit;

a second tank containing a second supply of the control gas, the second tank being operatively connected to communicate with the second fluid passage;

a second supply valve operatively connected to regulate the flow of the control gas between the second tank and the second fluid passage;

a first exhaust tank and a first exhaust valve, the first exhaust valve operatively connected to control the flow of the control gas between the first fluid passage and the first exhaust tank, and, hence, the gas pressure in the first fluid passage; and

a second exhaust tank and a second exhaust valve, the second exhaust valve operatively connected to control the flow of the control gas between the second fluid passage and the second exhaust tank.

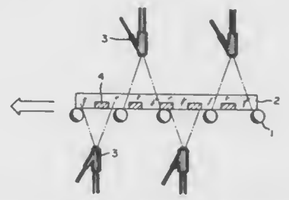
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5,045,276

**METHOD FOR PRODUCTION OF INJECTION MOLDED POWDER METALLURGY PRODUCT**

Yoshio Kijima, Tokyo, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Oct. 11, 1990, Ser. No. 595,409
Int. Cl.[5] B22F *7/00*
U.S. Cl. 419—9 9 Claims



1. A method for the production of an injection molded powder metallurgy product, which method comprises injection molding a mixture obtained by kneading a metal powder with a binder, depriving the molded mass of said binder while keeping said molded mass at least in contact with ceramic powder, projecting beads on said molded mass free from said binder, and thereafter sintering the molded mass studded with said beads.

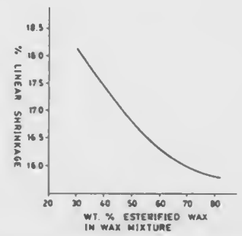
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5,045,277

**METHOD OF PRODUCING METAL CARBIDE GRADE POWDERS AND CONTROLLING THE SHRINKAGE OF ARTICLES MADE THEREFROM**

Joseph J. Penkunas, and Theodore E. Smith, Jr., both of Sayre, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 10, 1990, Ser. No. 579,519
Int. Cl.[5] B22F *1/00*
U.S. Cl. 419—15 5 Claims




1. A method for producing metal carbide grade powders, said method comprising:

a) forming a wax mixture consisting essentially of in percent by weight about 5 to about 15 paraffin oil, with the balance being an esterified wax and paraffin;

b) heating said wax mixture to a temperature above the melting point of said mixture to melt said wax mixture and maintain said wax mixture in the molten state;

c) forming a powder-wax mixture consisting essentially of metal carbide powder, a binder metal, and said wax mixture while heating said carbide powder, said metal binder and said wax mixture to a temperature above the melting point of said wax mixture to maintain said wax mixture in the molten state to result in a uniform distribution of said wax mixture on said carbide and binder metal particles;

d) forming a slurry of said powder-wax mixture and water;

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e) attritor milling said slurry at a temperature below the melting point of said wax mixture; and

f) removing water from the resulting attritor milled powder-wax mixture and agglomerating said attritor milled powder-wax mixture to produce said metal carbide grade powder wherein a densified article made therefrom exhibits less linear shrinkage than in articles made from carbide grade powder absent said esterified wax, said shrinkage decreasing as the content of said esterified wax in said wax mixture increases.

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5,045,278

## DUAL PROCESSING OF ALUMINUM BASE METAL MATRIX COMPOSITES

Sontosh K. Das; Michael S. Zedalis, both of Randolph, N.J., and Paul S. Gilman, Suffern, N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 9, 1989, Ser. No. 433,875
Int. Cl.[5] B22F *1/00*; C22C *21/00, 29/12*
U.S. Cl. 419—16 14 Claims



1. A process for producing a composite having a metal matrix and a reinforcing phase, comprising the steps of:

(a) forming a charge containing, as ingredients, a rapidly solidified aluminum base alloy, a carbidiferous agent in an amount ranging from about 0.01 to 10 % by wt, and particles of a reinforcing material present in an amount ranging from about 0.1 to 50 % by vol. of said charge;

(b) ball milling the charge energetically to mix the carbidiferous agent within the aluminum matrix, and to enfold metal matrix material around each of said particles while maintaining the charge in a pulverulent state; and

(c) consolidating said charge to react the aluminum matrix with the carbidiferous agent resulting in the formation of carbides and oxides, and to provide a mechanically formable, substantially void-free mass.

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5,045,279

## CORROSION-RESISTANT CARBON STEEL WITH GOOD DRAWABILITY CHARACTERISTICS

Jose A. de Queiroz Pinto, Rua Libia, 466; Jose G. de Souza, Rua Antares, 260, and Takuzo Arai, Rua Netuno, 104, all of Ipatinga - MG, Brazil

Filed Jun. 1, 1989, Ser. No. 359,583
Int. Cl.[5] C22C *38/16, 38/60*
U.S. Cl. 420—89 4 Claims

1. A chemical composition for a phosphatized and painted carbon sheet steel having enhanced drawability characteristics and a high resistance to atmospheric corrosion, said chemical composition, consisting of C (0.01–0.15%), Mn (0.10–0.60%), P (≦0.03%), Al (0.03–0.090%), Si (0.03–1.0%), Cu (0.04–0.15%), and Sb (0.02–0.20%), and further consisting of at least one alloy element selected from the group consisting of (0.01–0.10%), Cr (0.02–0.30%), or Ni (0.02–0.10%), wherein all percentages are by weight.

5,045,280

## INTERMETALLIC COMPOUNDS

Janice Hurly, Transvaal Province, South Africa, assignor to Mintek, South Africa

Filed Sep. 28, 1990, Ser. No. 589,509
Claims priority, application South Africa, Oct. 4, 1989, 89/7529
Int. Cl.[5] C22C *5/04*
U.S. Cl. 420—466 9 Claims

1. An intermetallic compound of platinum and aluminium comprising:

i) from 50 to 81 weight per cent platinum;

ii) from 5 to 30 weight per cent of aluminium; and,

iii) from 1 to 47.5 weight per cent copper.

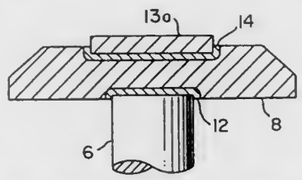
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5,045,281

## CONTACT FORMING MATERIAL FOR A VACUUM INTERRUPTER

Tsutomu Okutomi, Yokohama; Mikio Okawa, Tama; Atsushi Yamamoto; Tsuneyo Seki, both of Fuchu; Yoshinari Satoh, Kawasaki; Mitsutaka Honma, Tokorozawa; Seishi Chiba, and Tadaaki Sekiguchi, both of Yokohama, all of Japan, assignors to Kabusbiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 27, 1990, Ser. No. 486,259
Claims priority, application Japan, Mar. 1, 1989, 1-49066
Int. Cl.[5] C22C *9/00, 30/02*
U.S. Cl. 420—497 11 Claims




1. A contact forming material for a vacuum interrupter comprising: from 25% to 65% by weight of a highly conductive component comprising Ag and Cu; and

from 35% to 75% by weight of an arc-proof component selected from the group consisting of Ti, V, Cr, Zr, Mo, W and their carbides and borides, and mixtures thereof;

said highly conductive component comprising (i) a first highly conductive component region being composed of a first discontinuous phase having a thickness or width of no more than 5 micrometers and a first matrix surrounding the first discontinuous phase, and (ii) a second highly conductive component region being composed of a second discontinuous phase having a thickness or width of at least 5 micrometers and a second matrix surrounding the second discontinuous phase, wherein said first discontinuous phase in said first highly conductive component region is finely and uniformly dispersed in said first matrix at intervals of no more than 5 micrometers, and wherein the amount of the second highly conductive component region based on the total highly conductive component is within the range of from 10% to 60% by weight.

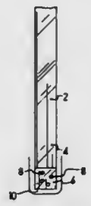


5,045,282

## OPTICAL FIBER SENSING DEVICE FOR ANALYSIS

Amnon Kritzman; Eliezer Falkenstein, both of Zichron Yaakov; Moshe Ish-Shalom; Alla Buch, both of Haifa, and Menuha Beer, Haifa, all of Israel, assignors to Optical Chemical Tech. Ltd., Zichron Yaakov and Israel Ceramic & Silicate Inst., Haifa, both of, Israel

Filed Oct. 14, 1988, Ser. No. 257,929
Claims priority, application Israel, Oct. 16, 1987, 84181; Oct. 16, 1987, 84182; Nov. 19, 1987, 84531; Nov. 19, 1987, 84533
Int. Cl.[5] G01N *21/64, 21/77*
U.S. Cl. 422—56 19 Claims



1. A sensing device for quantitative determination of the chemical properties of a medium in situ, said device comprising at least one glass optical fiber means having a porous fused glass tip, said fused glass tip being treated after fusing with heat, alkali and acid to render it porous internally.

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5,045,283

## MOVING BOUNDARY DEVICE FOR MONITORING SHELF-LIFE OF A PERISHABLE PRODUCT

Gordhanbhai N. Patel, Somerset, N.J., assignor to JP Labs Inc., Piscataway, N.J.

Filed Aug. 2, 1988, Ser. No. 227,901
Int. Cl.[5] G01N *31/22*
U.S. Cl. 422—56 48 Claims




1. A device for measuring the shelf life of a perishable product having a measurable activation energy of product deterioration comprising:

(a) an indicator tape comprised of a transparent polymer film and affixed thereto at least one matrix layer containing an indicator composition:

(b) an activator tape comprised of a substrate and affixed thereto at least one matrix layer containing an activator composition:

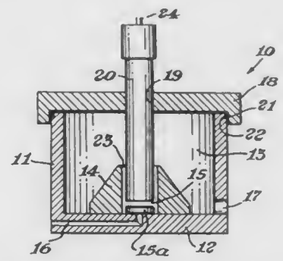
(c) a composite matrix, formed by bonding together said indicator tape and activator tape matrix layer, by means of at least one water-impermeable pressure sensitive adhesive; and wherein at least one matrix layer is of variable thickness, and said activator composition is capable of diffusing through said composite matrix in a predetermined time to contact and chemically react with said indicator composition producing a visually observable color change in said indicator composition, in which the predetermined time for producing said color change, varies transversely along said composite matrix.

5,045,284

## FLOW CELL FOR PRECIPITATION TITRATION FLOW INJECTION ANALYSIS

David D. Smith, Baton Rouge, and Gary D. Deleo, Donaldsonville, both of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1988, Ser. No. 274,581
Int. Cl.[5] G01N *31/02*
U.S. Cl. 422—81 3 Claims




1. A flow injection analysis flow cell suitable for precipitation titration flow injection analysis, comprising:

(a) a housing, the housing having at least side wall, bottom wall and top wall portions which define a cavity, the top wall being perforated by a perforation;

(b) an overflow dam positioned within the cavity, the dam defining a contained space so that a suspension of solid particles in a liquid flowed into the space fills it and then overflows the dam into the cavity of the housing, the contained space of the dam being aligned with the perforation;

(c) a first conduit means for conducting a suspension of solid particles in a liquid into the contained space of the dam;

(d) a second conduit means positioned in or adjacent the bottom wall portion of the housing for conducting any suspension of solid particles in a liquid that overflows the dam from the cavity of the housing to the exterior of the housing; and

(e) a chemical sensing probe positioned through the perforation in the top wall of the housing and in the contained space of the dam so that there is a gap between the chemical sensing probe and the dam, the gap being about 0.05 inches.

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5,045,285

## GASEOUS COMPONENT IDENTIFICATION WITH POLYMERIC FILM SENSOR

Edward S. Kolesar, Jr., Beavercreek, Ohio, assignor to United States of America As Represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 5, 1989, Ser. No. 405,824
Int. Cl.[5] G01N *27/00*
U.S. Cl. 422—98 27 Claims

1. Electronic gaseous component detecting and measuring apparatus comprising the combination of:

a first array of electrical conductors disposed over the surface of an electrically insulating substrate member and connected to a first electrical terminal;

a second array of electrical conductors disposed intermediate of said first array conductors on said electrically insulating substrate member and connected to a second electrical terminal;

a chemically reactive gaseous component responsive polymeric thin film membrane member disposed over the surface of said substrate member and the conductors of said first and second arrays, the resistivity of said membrane member being determinative of the electrical conductivity between said first and second electrical terminals;

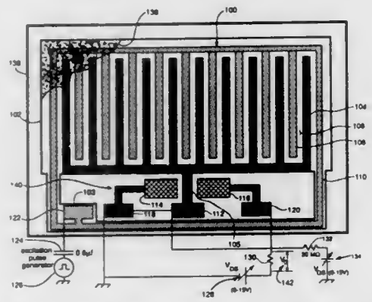
VOL 1130 ISS 1 SE 3 1991 UMI



a source of pulsed electrical energy series coupled with said electrical terminals and generating a pulsed conductivity modulated output signal from said membrane member;

amplifying means series connected with said pulsed electrical energy source and said electrical terminals for enhancing said membrane member conductivity modulated pulsed electrical signal;

Fourier transform means connected with the pulsed output signal of said amplifying means for spectral comparison identification and concentration quantification of unknown gaseous components.



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**5,045,286**

**DEVICE FOR ASPIRATING A FIXED QUANTITY OF LIQUID**

**Masaichi Kitajima, Akigawa; Takayuki Aihara, and Hajime Sakuma, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Feb. 15, 1989, Ser. No. 311,463**

**Claims priority, application Japan, Feb. 25, 1988, 63-40604; Mar. 24, 1988, 63-70731**

**Int. Cl.[5] B01L** *3/02;* **G01F** *23/24*

**U.S. Cl. 422—100** **8 Claims**

1. A device for injecting a fixed quantity of sample liquid, comprising:

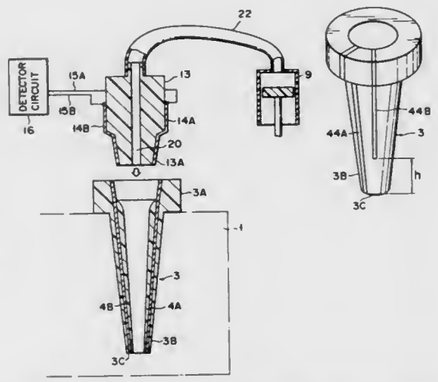
syringe means for aspirating and injecting a liquid sample, including a nozzle connecting portion;

an injection nozzle made of insulation resin and detachably connected to said nozzle connecting portion of said syringe means;

electrode means arranged in said injection nozzle and including a pair of conductive lines embedded in the injection nozzle;

conductive members arranged on the nozzle connecting portion of said syringe means, and positioned so as to be electrically connected to the electrode means in the injection nozzle when the nozzle is attached to the nozzle connecting portion of the syringe means; and

detector means electrically connected to said conductive members for operation in association with said electrode means, for detecting a surface level of the sample liquid while the injection nozzle is attached to said nozzle connecting portion wherein said injection nozzle has an upper end and a lower end, one of said conductive lines extending from said lower end to said upper end of the injection nozzle, and the other of said conductive lines terminating at a point which is a certain distance or height away from said lower end of said injection nozzle, wherein said distance or height corresponds to a fixed quantity of sample liquid to be aspirated through the injection nozzle.



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**5,045,287**

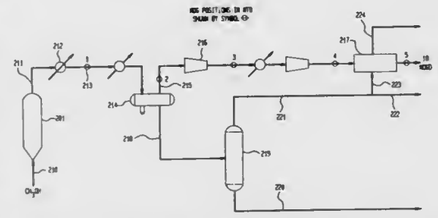
**MULTIREACTOR SYSTEM FOR CONVERSION OF METHANOL TO GASOLINE AND DISTILLATE**

**Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Continuation-in-part of Ser. No. 223,657, Jul. 25, 1988, Pat. No. 4,899,002. This application Oct. 30, 1989, Ser. No. 428,868**

**Int. Cl.[5] B01J** *8/26*

**U.S. Cl. 422—142** **5 Claims**



1. An integrated fluidized bed reactor system with catalyst regeneration, comprising in combination:

first vertical reactor means for containing a fluidized bed of solid zeolite catalyst under moderate severity reaction conditions;

cooling means, receivably connected to a top portion of said first vertical reactor, for cooling reaction effluent therefrom;

second vertical reactor means, receivably connected in a bottom portion to said cooling means, for containing a fluidized bed of zeolite catalyst at low severity reaction conditions;

catalyst regenerator vessel means, operably connected to both first and second vertical reactor means, for regenerating spent catalyst therefrom in a single regeneration zone and returning regenerated catalyst of the same activity thereto;

conduit means for admitting feedstock connected to a bottom portion of said first reactor means; and

conduit means for withdrawing a reaction product effluent stream connected to a top portion of said second reactor means.



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**5,045,288**

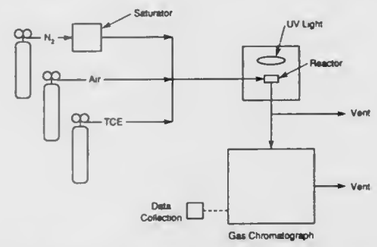
**GAS-SOLID PHOTOCATALYTIC OXIDATION OF ENVIRONMENTAL POLLUTANTS**

**Gregory B. Raupp, Chandler, and Lynette A. Dibble, Tempe, both of Ariz., assignors to Arizona Board of Regents, a body Corporate, acting on behalf of Arizona State University, Tempe, Ariz.**

**Filed Sep. 15, 1989, Ser. No. 407,573**

**Int. Cl.[5] B01J** *19/08, 19/12*

**U.S. Cl. 422—186.3** **21 Claims**




1. The method of removing halogenated and non-halogenated volatile and non-volatile organic contaminants from a gaseous stream comprising the steps of: mixing a gaseous oxygen bearing substance with the contaminated gaseous stream; contacting the contaminated gaseous stream and gaseous oxygen bearing substance mixture with a solid catalyst; and exposing the solid catalyst and contacted contaminated gaseous stream and gaseous oxygen bearing substance mixture to UV light having a wave length not greater than approximately 600 nm, to initiate under reaction conditions preselected to prevent formation of a liquid phase, a gas/solid photocatalytic reaction to convert said halogenated and non-halogenated organic contaminants, volatile and non-volatile, into primarily $H_2O$ and $CO_2$ and HX, where X is selected from the group consisting of chlorine, bromine and iodine.

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**5,045,289**

**FORMATION OF RARE EARTH CARBONATES USING SUPERCRITICAL CARBON DIOXIDE**

**Quintus Fernando, Tucson, Ariz.; Naohisa Yanagihara, Zacopan, Mexico; James T. Dyke, Santa Fe, N. Mex., and Krishna Vemulapalli, Tuscon, Ariz., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.**

**Filed Oct. 4, 1989, Ser. No. 416,885**

**Int. Cl.[5] C01F** *19/00*

**U.S. Cl. 423—21.1** **18 Claims**

1. A process of forming a rare earth carbonate which comprises contacting a rare earth-bearing compound with carbon dioxide under supercritical conditions, said rare earth-bearing compound being effective to react to form a carbonate.

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**5,045,290**

**RECOVERY OF PURE PLATINUM AND PALLADIUM**

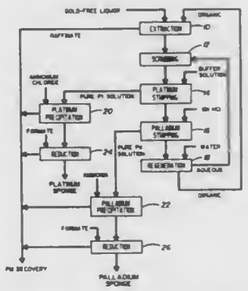
**Bryn G. Harris, Beaconsfield; Serge Monette, Longueuil; Jean-Pierre Barry, Montreal, and Robert Stanley, Kirkland, all of Canada, assignors to Noranda Inc., Toronto, Canada**

**Filed Jun. 12, 1990, Ser. No. 536,796**

**Claims priority, application Canada, Jun. 22, 1989, 603699**

**Int. Cl.[5] C22B** *3/26*

**U.S. Cl. 423—22** **10 Claims**



1. A process for recovery of platinum and palladium from an impure substantially gold-free precious and base metal-bearing acidic chloride or mixed chloride/sulphate solution, comprising the steps of:

(a) contacting the acidic solution having a pH less than about 1.5 with an organic solution comprising an 8-hydroxy quinoline solvent extraction reagent, a phase modifier and an aromatic diluent to extract simultaneously platinum and palladium into the organic solution, thereby resulting in an organic solution loaded with platinum and palladium as well as co-extracted base metal impurities and acid;

(b) scrubbing the loaded organic solution of step (a) to remove the co-extracted base metal impurities and acid;

(c) stripping the scrubbed loaded organic solution of step (b) with a buffer solution operating in the pH range 2–5 at 20–50° C. to selectively recover the platinum, thereby resulting in a platinum-free loaded organic solution;

(d) stripping the platinum-free loaded organic solution of step (c) with 3–8 hydrochloric acid to recover the palladium, thereby resulting in a palladium-free organic solution; and

(e) regenerating the palladium-free organic solution of step (d) by washing with water.

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**5,045,291**

**REACTIVATION OF SPENT ALKANOLAMINE**

**Alfred E. Keller, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.**

**Division of Ser. No. 69,124 Jul. 2, 1987, Pat. No. 4,920,344. This application Aug. 6, 1990, Ser. No. 563,589**

**Int. Cl.[5] C01B** *31/20;* **C07C** *209/84;* **C02F** *1/42;* **B01D** *15/04*

**U.S. Cl. 423—228** **4 Claims**

1. A process for the removal of hydrogen sulfide and carbon dioxide from gases containing these materials and inorganic acids and acid gases which comprises contacting said gases with an aqueous solution of an alkanolamine whereby said hydrogen sulfide, carbon dioxide and inorganic acid gases combine with the alkanolamine to form alkanolamine salts, heating the resulting alkanolamine salt containing solution to decompose the salts of hydrogen sulfide and carbon dioxide and thereby recover these materials, contacting the remaining alkanolamine solutions and remaining salts, which are heat stable, with an alkali metal hydroxide to convert the remaining salts to alkali metal salts of acidic anions, contacting the alkanolamine solution containing alkali metal salts with a basic anion exchange resin to remove heat stable anions from the alkali metal salts and thereafter contacting said solution with

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an acidic cation exchange resin to remove alkali metal ions from the solution and reusing the alkanolamine solution for the removal of additional hydrogen sulfide and carbon dioxide.

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**5,045,292**

## PROCESS FOR THE REMOVAL OF NITRIC OXIDES FROM FLUE GASES

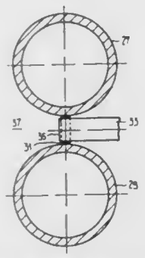
**Hans Rüegg, Wohlen, and René Vock, Bonstetten, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland**

**Continuation of Ser. No. 412,798, Sep. 26, 1989, abandoned. This application Dec. 19, 1990, Ser. No. 630,411**

**Claims priority, application Switzerland, Sep. 27, 1988, 03578/88**

**Int. Cl.[5] C01B *21/00*; B01J *8/00***

**U.S. Cl. 423—235** **5 Claims**




1. A process for the removal of nitric oxides from flue gases produced during incineration, by the spraying of a liquid containing at least one reducing agent into a boiler part of an incineration plant by means of a gaseous pressurized atomizing agent, wherein the atomizing agent is introduced into a central feed pipe for the liquid before a branching of the feed pipe to the individual spray points and the liquid is sprayed into the boiler part transversely to the direction of the flue gases at temperatures of from 700°–1100° C.

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**5,045,293**

## NOVEL CRYSTALLINE ALUMINOPHOSPHATES AND RELATED COMPOUNDS

**David M. Clark, and Ronald J. Dogterom, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed May 15, 1990, Ser. No. 523,676**

**Claims priority, application United Kingdom, Jun. 23, 1989, 8914469**

**Int. Cl.[5] C01B *25/36***

**U.S. Cl. 423—305** **12 Claims**

1. Crystalline aluminophosphate compounds comprising in an as-synthesized anhydrous form a chemical composition: $m'R([X_n]Al_qP_x)O_2$, wherein R represents ethylenediamine, and wherein

$m' = 0.01–0.33$

$q = 0.30–0.60$

$x = 0.30–0.60$

and wherein $q+x=1$,

and wherein said crystalline aluminophosphates have an X-ray diffraction pattern containing at least the following lines:

| d(A) | Intensity |
|---|---|
| 11.3 ± 0.2 | .s |
| 4.19 ± 0.1 | vs |
| 3.97 ± 0.1 | w–m |
| 3.77 ± 0.05 | w–m |
| 3.65 ± 0.05 | m |
| 3.56 ± 0.05 | m–vs |
| 3.17 ± 0.03 | w–m |
| 3.12 ± 0.03 | m–s |

-continued

| d(A) | Intensity |
|---|---|
| 2.99 ± 0.03 | m–s |
| 2.81 ± 0.03 | w. |

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**5,045,294**

## PROCESS FOR PREPARING MEDIUM DENSITY GRANULAR SODIUM PHOSPHATES

**Louis A. Highfill, Union, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Jan. 8, 1990, Ser. No. 461,951**

**Int. Cl.[5] C01B *15/16, 25/26***

**U.S. Cl. 423—315** **7 Claims**

7. A method of producing medium density granular sodium phosphates comprising agglomerating STP fines with mineral acids selected from the group consisting of phosphoric acid and sulfuric acid, air drying the agglomerated fines at room temperature and separating the dry agglomerated fines by screening to recover the granular SP wherein the agglomerated fines contain 35 to 95 weight % STP, 0 to 10 weight % trimetaphosphate, 10 to 60 weight % pyrophosphate and 0 to 25 weight % orthophosphate.

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**5,045,295**

## SILICATE TREATMENT OF MOLECULAR SIEVE AGGLOMERATES

**Medhat K. Tannous, Mobile, Ala.; John D. Sherman, Chappaqua, N.Y., and Alan P. Cohen, New Fairfield, Conn., assignors to UOP, Des Plaines, Ill.**

**Division of Ser. No. 310,121, Feb. 10, 1989. This application Jul. 25, 1990, Ser. No. 558,268**

**The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.**

**Int. Cl.[5] C10B *49/00***

**U.S. Cl. 423—328** **11 Claims**

1. Method for preparing attrition resistant molecular sieve agglomerates comprising:

(a) forming an initial molecular sieve agglomerate comprising a zeolite and a binder comprising kaolin clay;

(b) heating the initial agglomerate at a temperature of from about 550°–650° C. and sufficient to set the binder and form a calcined agglomerate;

(c) contacting said calcined agglomerate with an alkali hydroxide solution comprising from about 5 to about 50% by weight of sodium hydroxide at conditions effective to convert the kaolin binder to Zeolite A to form a converted agglomerate;

(d) contacting the converted agglomerate with an aqueous alkali metal silicate solution containing from about 1 to 10 wt. % alkali metal oxide and from about 2 to 20 wt. % silicon dioxide to form a treated agglomerate; and

(e) drying the treated agglomerate at a temperature of from about ambient temperature to 650° C. and sufficient to remove water therefrom.

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**5,045,296**

## SODIUM CARBONATE PERHYDRATE PROCESS

**Henry A. Pfeffer, Mercerville, N.J., and Charles Adams, Jr., Cartersville, Ga., assignors to FMC Corporation, Philadelphia, Pa.**

**Continuation of Ser. No. 428,729, Oct. 30, 1989. This application Jan. 25, 1991, Ser. No. 646,137**

**Int. Cl.[5] C01B *15/10***

**U.S. Cl. 423—415 P** **12 Claims**

1. A process for manufacturing sodium carbonate perhydrate consisting essentially of (a) uniformly distributing an aqueous solution consisting essentially of 50% to 70% by weight hydrogen peroxide and 1½% to 13% by weight of a $C_2$ to $C_6$ 1-hydroxyalkylidene-1,1-diphosphic acid onto a substantially dry, agitated, particulate reaction mixture initially consisting essentially of substantially anhydrous granular sodium carbonate having a particle size less than 70 mesh, (b) concurrently balancing the heats of hydration and of perhydration of sodium carbonate and the heat of evaporation of water with sufficient sensible heat transfer to maintain the reaction mixture at a temperature between 50° C. and 80° C. and to evaporate substantially all of the free water from the resulting reaction mixture; and (c) cooling the resulting reaction mixture to provide said product as a free-flowing, stable, granular material with a particle size distribution substantially the same as the sodium carbonate, and containing 13.8% to 14.6% active oxygen.



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**5,045,297**

## SELECTIVE OXIDATION OF CARBON MONOXIDE IN A MIXTURE

**Christobal Bonifaz, Conway, Mass., and David R. Corbin, West Chester, Pa.**

**Assignors E.I. duPont de Nemours and Company; Wilmington, Del.**

**Filed Mar. 31, 1989, Ser. No. 341,859**

**Int. Cl.[5] C01B *31/20***

**U.S. Cl. 423—437** **19 Claims**

1. A process for the selective oxidation of carbon monoxide, in the presence of a hydrocarbon mixture and/or a partially oxidized hydrocarbon mixture, comprising contacting the CO and the hydrocarbon and/or a partially oxidized hydrocarbon mixture with a catalyst comprising a metal selected from platinum and palladium loaded on a support selected from silica and polysilicic acid, the latter treated with vanadium and phosphorous oxide, in the presence of oxygen.

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**5,045,298**

## CARBON MATERIAL AND PROCESS FOR PRODUCTION THEREOF

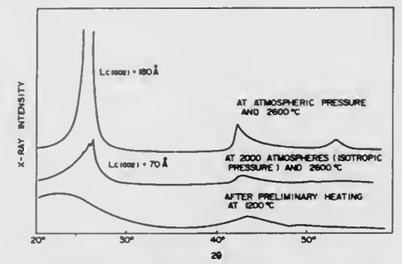
**Kazuo Muramatsu, Kobe; Kazuo Inoue, Kamakura, and Yoshihiko Sakashita, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Filed Aug. 31, 1989, Ser. No. 401,250**

**Claims priority, application Japan, Nov. 4, 1988, 63-279078**

**Int. Cl.[5] C01B *31/02***

**U.S. Cl. 423—445** **7 Claims**




1. A carbon material comprising amorphous carbon containing spherical crystals having a void diameter, in the crystallite structure, of 30 Å or below and apparent specific gravity of 1.80 or over.

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**5,045,299**

## MANUFACTURING METHOD OF CARBON FIBER REINFORCED COMPOUND MATERIALS

**Susumu Takahashi; Hitoshi Yoshinaga, both of Yokohama, and Mochimasa Zusho, Urawashi, all of Japan, assignors to Kanto Yakin Kogyo K.K., Japan**

**Filed Jun. 16, 1989, Ser. No. 367,148**

**Claims priority, application Japan, Jun. 29, 1988, 63-161889**

**Int. Cl.[5] D01F *9/12***

**U.S. Cl. 423—447.4** **5 Claims**

1. In a method of manufacturing carbon fiber reinforced compound materials in which a number of carbon fibers applied or impregnated with binder resins are subjected to a carbonization treatment under a pressure to produce a product having a compounded configuration, the steps comprising forming a first bundle of binder impregnated fibers into the shape of the product, substantially continuously over-wrapping under tension said first bundle with a second bundle of thermal resistant fibers which have a high tensile strength and a negative coefficient of linear expansion, and heating said bundles of fibers whereby the fibers of said second bundle are caused to shrink and to apply sole uniform pressure to said first bundle of fibers.

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**5,045,300**

## PREPARATION OF COMPLEX ALUMINUM FLUORIDES

**Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.**

**Filed Oct. 23, 1990, Ser. No. 601,517**

**Int. Cl.[5] C01F *7/54***

**U.S. Cl. 423—465** **11 Claims**

1. A process comprising the reaction of an amine aluminum trichloride complex and a bifluoride to produce an aluminum fluoride compound.

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**5,045,301**

## MOLDABLE/EXTRUDABLE TITANIUM DIOXIDE PARTICULATES

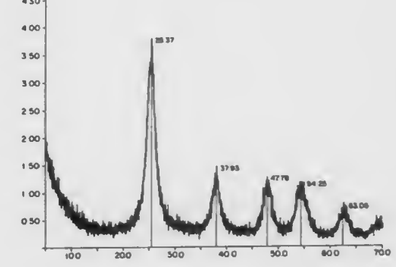
**Thierry Chopin, Saint Denis; Patrick Fourre, Paris, and Eric Quemere, Cormeilles/en/Parisis, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

**Filed Jun. 30, 1989, Ser. No. 373,450**

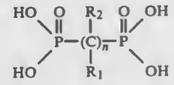
**Claims priority, application France, Jul. 1, 1988, 88 08911**

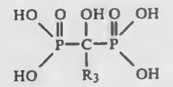
**Int. Cl.[5] C01G *23/04***

**U.S. Cl. 423—610** **17 Claims**




1. A process for the production of shapable titanium dioxide particulates, comprising thermally hydrolyzing a solution of a titanium compound in the presence of at least one acid including organophosphoric acid having one of the formulae:

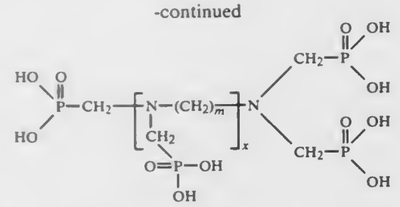


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-continued



wherein n and m are integers ranging from 1 to 6, x is an integer ranging from 0 to 5, and $R_1$, $R_2$ and $R_3$ which may be identical or different, are each a hydroxyl, amino, aralkyl, aryl or alkyl radical, or a hydrogen atom.

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**5,045,302**

**LIGANDS AND CATIONIC COMPLEXES THEREOF WITH TECHNETIUM-99M**

**James D. Kelly, Amersham; Kwok W. Chiu, Gloucester, and Ian A. Latham, West Bridgford, all of England, assignors to Amersham International plc, Buckinghamshire, England**

**Filed Mar. 28, 1989, Ser. No. 329,639**

**Claims priority, application United Kingdom, Apr. 11, 1988, 8808414**

**The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.**

**Int. Cl.[5] A61K** *43/00;* **C07F** *13/00*

**U.S. Cl. 424—1.1** **10 Claims**

1. A ligand having the formula

$$Y_2QZQY_2$$

where each Q is phosphorus,

Z is a —CC— or —CCC— chain or o-phenylene which may be substituted by C1-C3 alkoxy or alkoxyalkyl,

the groups Y may be the same or different and each is a saturated hydrocarbon or saturated fluorohydrocarbon which contains from 2 to 8 carbon atoms and from 1 to 3 ether oxygen atoms, provided that the four groups Y together contain a total of at least 13 carbon atoms.

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**5,045,303**

**RADIOHALOGENATED SMALL MOLECULES FOR PROTEIN LABELING**

**Daniel S. Wilbur, and Alan R. Fritzberg, both of Edmonds, Wash., assignors to NeoRx Corporation, Seattle, Wash.**

**Continuation of Ser. No. 735,392, May 17, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 137,952**

**Int. Cl.[5] A61K** *49/02, 49/00*

**U.S. Cl. 424—1.1** **7 Claims**

1. A composition comprising a nonradioactive compound of the formula X-Ar*-R and a compound having the formula:

*X-Ar-R

wherein

Ar is an aromatic ring;

R is a chemical bond or a substituent containing 1 to 12 straight-chain carbon atoms that does not activate Ar to electrophilic substitution on the order produced by hydroxy or amino substitution of the ring, wherein said bond or said substituent has attached thereto a functional group suitable for covalent linkage to a protein under conditions that preserve the biological activity of the protein, said functional group selected from phenolic ester, imide ester, imidate ester, anhydride, acylsuccinimide, aldehyde, isothiocyanate, diazo, hydrazine, alkyl halide and maleimide;

*X is a radioisotope of iodine, bromine, fluorine or astatine and is para- or meta-positioned relative to substituent R and X is the non-radioactive form of *X; and

wherein said composition has high specific activity.

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**5,045,304**

**CONTRAS AGENT HAVING AN IMAGING AGENT COUPLED TO VIABLE GRANULOCYTES FOR USE IN MAGNETIC RESONANCE IMAGING OF ABSCESS AND A METHOD OF PREPARING AND USING SAME**

**David R. Schneider, Birmingham, and Kostaki G. Bis, Troy, both of Mich., assignors to Wayne State University, Detroit, Mich.**

**Filed Aug. 31, 1988, Ser. No. 238,870**

**Int. Cl.[5] G01N** *31/00, 24/00;* **A01N** *1/02;* **A61K** *33/26*

**U.S. Cl. 424—9** **12 Claims**

1. A method of preparing and using contrast agent in magnetic resonance imaging abscesses in a patient comprising the steps of:

mixing a specific number of viable granulocytes with an aqueous solution of a metallic imaging agent in which said imaging agent binds to and is subsequently incorporated into the granulocytes incubating said aqueous solution to encapsulate said imaging agent in said granulocytes to form labeled granulocytes;

separating said labeled granulocytes from said solution;

suspending said labeled granulocytes in an intravascularly administerable carrier to form said contrast agent;

administering a diagnostically effective amount of said contrast agent by intravenous infusion to said patient; and

subjecting said patient to examination by magnetic resonance imaging.

10. A contrast reagent for MRI of abscesses, said reagent comprising:

a suspension of labelled granulocytes in an intravascularly adminstrable carrier, said granulocytes binding to and subsequently incorporating within a diagnostically effective amount of an imaging agent, said agent having the formula $Fe_2O_3.XO$ where X is one of the group consisting of para-magnetic and ferro-magnetic materials.

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**5,045,305**

**ORAL HYGIENE COMPOSITION**

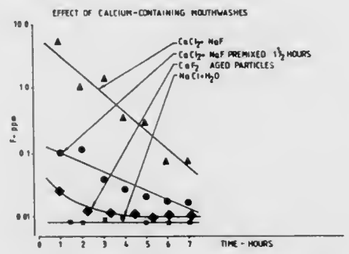
**John R. Clarkson, Wirral; Ralph M. Duckworth, Nr Chester; Andrew M. Murray, Cheshire, and Timothy J. Price, Chester, all of England, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.**

**Continuation of Ser. No. 7/267,582, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 7/102,213, Sep. 29, 1987, abandoned. This application Dec. 11, 1989, Ser. No. 449,489**

**Claims priority, application United Kingdom, Oct. 2, 1986, 8623643**

**Int. Cl.[5] A61K** *7/18, 7/16*

**U.S. Cl. 424—52** **6 Claims**




1. A method of inhibiting dental caries which comprises the steps of:

admixing a first composition containing a source of calcium ions from calcium chloride and a second composition containing a source of fluoride ions from sodium fluoride



thereby forming an oral preparation of calcium fluoride; and

introducing said oral preparation into a mouth, said admixing step occurring outside the dentulous mouth but less than 1.5 hours prior to said introduction into the mouth.

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**5,045,306**

**N-ALKYLAMIDES OF D,L AND L(−)-CARNITINE HAVING ANTIBACTERIAL ACTIVITY, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING SAME**

**Paolo Cavazza; Giulio Fiorentini, both of Rome, Italy, and , assignors to Avantgarde S.p.A., Pomezia, Italy**

**Filed Nov. 4, 1988, Ser. No. 267,185**

**Claims priority, application Italy, Dec. 2, 1987, 48663 A/87**

**Int. Cl.[5] A61K** *7/22, 7/15, 31/16;* **C07C** *237/50*

**U.S. Cl. 424—54** **6 Claims**

1. N-alkylamides of DL and L(−)-carnitine having general formula (I)



(I)

wherein:

$X^-$ is $OH^-$) or the anion of a pharmacologically acceptable acid, and

R is a straight $C_{10}$–$C_{16}$ alkyl radical.

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**5,045,307**

**COMPOSITION THAT PROTECTS DYED HAIR FROM FADING**

**Frank W. Marschner, Whitehouse Station, and Frank Schebece, Edison, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.**

**Filed Jan. 9, 1990, Ser. No. 462,734**

**Int. Cl.[5] A61K** *7/06, 7/42, 7/44*

**U.S. Cl. 424—59** **6 Claims**

1. A method of treating dyed hair to reduce color loss caused by exposure to the ultraviolet rays of the sun consisting essentially of applying an effective amount of a hair treating composition selected from the group consisting of shampoos, liquid groomers, styling gels and cream rinses containing from about 0.1 to 5 percent benzophenone compound selected from the group 2,2',4,4' tetrahydroxybenzophenone and 2,4 dihydroxy benzophenone and 1 to 5 percent of a hair substantive carrier composition.

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**5,045,308**

**COSMETIC COMPOSITION**

**Udo Spiegel, Bielefeld, Fed. Rep. of Germany, and Desmond B. Hagan, Little Sutton, England, assignors to Chesebrough-Pond's U.S.A. Co., Greenwich, Conn.**

**Filed Jun. 16, 1989, Ser. No. 367,070**

**Claims priority, application United Kingdom, Jun. 16, 1988, 8814295**

**Int. Cl.[5] A61K** *7/00, 7/04*

**U.S. Cl. 424—61** **4 Claims**

1. An acid soap complex comprising:

(i) at least two 2-hydroxyalkanoic acid moieties of carbon chain length $c_m$ and $c_n$ respectively, where m and n have the same or different values, and each is an integer of from 6 to 28; and

(ii) a cation selected from the group consisting of lithium, sodium, potassium and ammonium cations; the complex having an elemental analysis of:

$$(C_mH_{2m-1}O_3)(C_nH_{2n-1}O_3M$$

where M is the cation, and wherein said complex is formed in an aqueous solution at a pH value of from 3.5 to <7.

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**5,045,309**

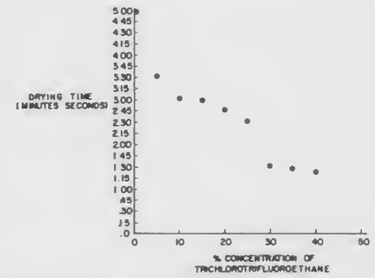
**QUICK DRYING NAIL POLISH**

**Louis Dell'Aquila, 54 Sherwood Ave., Englewood Cliffs, N.J. 07632**

**Filed Dec. 27, 1989, Ser. No. 457,420**

**Int. Cl.[5] A61K** *7/043*

**U.S. Cl. 424—61** **18 Claims**




1. A quick drying nail polish composition comprising a film former, a resin, a plasticizer, a solvent, and a hydrocarbon which is effective to increase the rate at which said nail polish dries selected from the group consisting of fluorinated hydrocarbons, chlorinated hydrocarbons, and fluorinated and chlorinated hydrocarbons and mixtures thereof, wherein about 25 to 50% by volume of the total nail polish composition is the hydrocarbon.

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**5,045,310**

**SILOXANES USEFUL IN PERMANENT WAVING OF HAIR**

**Daniel J. Halloran; Thomas H. Lane, and Robert A. Ekeland, all of Midland County, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Nov. 29, 1989, Ser. No. 442,882**

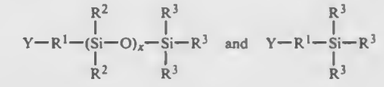
**Int. Cl.[5] A61K** *7/09;* **A45D** *7/04, 7/11*

**U.S. Cl. 424—71** **3 Claims**

1. A method of conditioning hair consisting essentially of

(A) reducing the hair

(B) neutralizing the hair by applying a solution comprising 1 to 50 weight percent of a silicone containing material selected from the groups consisting of the formulas



and mixtures thereof to the hair;

wherein $R^1$ is independently selected from alkylene groups containing 1 to 10 carbon atoms, arylene groups containing 6 to 10 carbon atoms, and alkarylene groups containing 6 to 15 carbon atoms; any of said groups optionally containing an ether oxygen with the aliphatic segments thereof; Y is selected from a halobenzyl group and an epoxy group; $R^2$ is independently selected from an alkyl group containing 1 to 6 carbon atoms and an aryl group containing 6 to 10 carbon atoms; $R^3$ is independently selected from the group $R^2$ and the groups —O—$R^2$ and —$R^1$—Y where $R^1$, $R^2$ and Y are as defined above; and x has the value of 1 to 5.

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5,045,311

## PLANT-PROTECTIVE COMPOSITION OF INCREASED STABILITY CONTAINING NONIONIC SURFACTANT ONLY

Janos Pinter; Josefne Pal; Eva Kiss, all of Budapest; Erzsebet Shüszler, Erd; Sandor Angyan, Budapest; Laszlo Pap, Budapest; Andras Szegö, Budapest; Tamas Detre, Nagymaros, and Tamasne Marmarosi, Biatorbagy, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

PCT No. PCT/HU88/00029, § 371 Date May 12, 1989, § 102(e) Date May 12, 1989, PCT Pub. No. WO88/09122, PCT Pub. Date Dec. 1, 1988

ub. Date DApr. 27, 1988, Ser. No. 306,025

Claims priority, application Hungary, May 18, 1987, 2203/87

Int. Cl.[5] A61K *31/74;* A01N *57/00*

U.S. Cl. 424—78 10 Claims

1. A stable, plant-protective microemulsion composition free from anionic surfactants and having an extinction value of less than 0.05 at a temperature of 25° to 35° C., which consists essentially of:

(a) 20 to 80% by weight of a phosphoric acid ester, a thiophosphoric acid ester, or a mixture thereof as active ingredient;

(b) 5 to 70% by weight of a nonionic surfactant; and

(c) 2 to 50% by weight of water, wherein said composition has improved storage stability in comparison to that of a composition containing the same active ingredient but which contains a mixture of an anionic surfactant and the nonionic surfactant.

5,045,312

## PHYSIOLOGICALLY ACTIVE COMPOSITIONS OF GROWTH HOMONE AND SERUM ALBUMIN OR IG G

Roger Aston; Robert Bomford, both of Beckenham, and Andrew T. Holder, London, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 829,716, Feb. 14, 1986, abandoned. This application Oct. 27, 1988, Ser. No. 265,278

Claims priority, application United Kingdom, Feb. 18, 1985, 8504099

Int. Cl.[5] A61K *37/36, 39/44, 39/395*

U.S. Cl. 424—85.8 9 Claims

1. A method of increasing growth hormone regulated response in a vertebrate which comprises administering to said vertibrate, a composition comprising an effective growth causing or enhancing an amount of non-immunogenic pharmaceutically acceptable, growth stimulating conjugated compound of growth hormone linked to a ligand which is selected from serum albumin or immunoglobulin.

5,045,313

## VACCINE FOR IMMUNIZING CATS AGAINST TOXOPLASMA OOCYST SHEDDING

Jacob K. Frenkel, Overland Park, Kans., and Elmer R. Pfefferkorn, Hanover, N.H., assignors to The University of Kansas, Lawrence, Kans. and Darmouth College, Hanover, N.H.

Filed Jul. 7, 1989, Ser. No. 376,809

Int. Cl.[5] A61K *39/00;* C12N *15/00*

U.S. Cl. 424—88 3 Claims

1. A method of immunizing cats against Toxoplasmosis without concomitant oocyst shedding by said cats, said method consisting essentially of administering to said cats an effective amount of a mutant of *T. gondii*, said mutant being designated as T-263 mutant and having ATCC Accession No. 40615.

5,045,314

## CONTROL OF PARASITIC NEMATODE OVA/LARVAE WITH A *BACILLUS LATEROSPORUS*

Leon W. Bone, Auburn, Ala., and Samuel Singer, Macomb, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 14, 1989, Ser. No. 436,154

Int. Cl.[5] A01N *63/02;* A61K *35/74. 37/02*

U.S. Cl. 424—93 10 Claims

1. A preparation comprising a nematicidal toxin recovered from whole cell culture of *Bacillus laterosporus,* which toxin corresponds to the toxin produced in whole cell cultures of *Bacillus laterosporus* strains selected from the group consisting of NRRL Accession Nos. B-18520, B-18521, B-18522, and B-18523, wherein said toxin is characterized by a molecular weight of approximately 2900 daltons and an apparent UV absorbance at 205, 220 and 268 nm.

5,045,315

## PROCESS FOR TREATING THROMBOSIS BY ADMINISTERING POLY-KRINGLE PLASMINOGEN ACTIVATOR

Paul P. Hung, Bryn Mawr; Narender K. Kalyan, King of Prussia, and Shaw-guang L. Lee, Villanova, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 436,528, Nov. 14, 1989, Pat. No. 4,997,766, which is a division of Ser. No. 884,835, Jul. 11, 1986, Pat. No. 4,916,071, which is a continuation-in-part of Ser. No. 766,163, Aug. 14, 1985, abandoned. This application Oct. 23, 1990, Ser. No. 601,542

Int. Cl.[5] A61K *37/547, 37/54;* C12N *9/48, 9/64*

U.S. Cl. 424—94.64 5 Claims

1. A process for treating thrombosis in a mammal in need thereof which comprises administering into the vascular system of said mammal an effective amount of a human t-PA hybrid comprising at least both kringles of human t-PA and one or two heterologous kringles selected from the group consisting of the human urokinase kringle and either of the human prothrombin kringles.

5,045,316

## PHARMACEUTICAL COMPOSITIONS AND THEIR USE

Ephraim Kaplan, 5 Barnizki Street, Rishon Lezion, Israel

Filed Dec. 21, 1987, Ser. No. 136,100

Claims priority, application Israel, Jan. 5, 1987, 81166

Int. Cl.[5] A61K *9/00;* A01N *59/00*

U.S. Cl. 424—400 19 Claims

1. A pharmaceutically active combination comprising an ionic vanadium compound selected from the group consisting of vanadyl salts of non-toxic organic and inorganic acids and vanadate salts and a sulfur containing compound selected from the group consisting of thiosulfate compounds and sulfite compounds, said combination being in the ratio of

vanadium compound to thiosulfate compound from about 1:4.5 to about 1:40,000, and

vanadium compound to sulfite compound from about 1:4.5 to about 1:10,000.

5,045,317

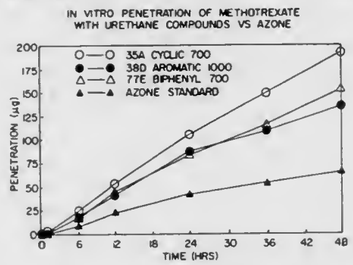
## ENHANCING THE CUTANEOUS PENETRATION OF PHARMACOLOGICALLY ACTIVE AGENTS

Samuel Chess, Newport Beach; Jerry L. McCullough, and Gerald D. Weinstein, both of Irvine, all of Calif., assignors to The Regents of the University of California, Alameda, Calif.

Division of Ser. No. 408,757, Sep. 18, 1989, Pat. No. 4,971,800, which is a continuation-in-part of Ser. No. 216,804, Jul. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 74,262, Jul. 16, 1987, abandoned. This application Sep. 20, 1990, Ser. No. 566,567

Int. Cl.[5] A61K *6/00*

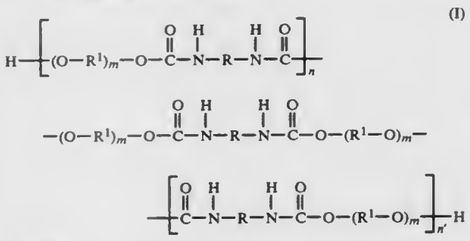
U.S. Cl. 424—401 29 Claims




1. A composition for achieving enhanced cutaneous penetration of a dermally applied pharmacologically active agent, comprising:

(a) a therapeutically effective amount of a pharmacologically active agent; and

(b) a hydroxy-terminated urethane penetration enhancing compound having the formula:



(I)

wherein:

R is an alkylene or alkenylene radical containing from one to about 20 carbon atoms; or a cycloalkylene or cycloalkenylene radical containing from about 5 to about 10 carbon atoms, or a mononuclear or fused ring arylene radical containing from about 6 to about 10 carbon atoms, unsubstituted or substituted with one or more lower alkyl, lower alkoxy, lower alkoxy-substituted lower alkyl, nitro or amino groups or halogen atoms;

$R^1$ is the same or different alkylene or alkenylene radical;

m is an integer selected so as to provide an $(O—R^1)$ moiety having a molecular weight of from about 40 to about 6,000; and

n and n' are the same or different integer of from 0 to 30, inclusive, correlated with m so as to provide a hydroxy-terminated urethane compound having a molecular weight of up to about 200,000.



5,045,318

## ANTI-INFLAMMATORY OXIDIZING AGENT, THE PROCEDURE FOR ITS PRODUCTION AND VARIOUS APPLICATIONS

Pentti Tengvall, Linköping; Lars-Magnus Bjursten, Göteborg, and Ingemar Lundström, Linköping, all of Sweden, assignors to The Institute for Applied Biotechnology, Gotëborg, Sweden

PCT No. PCT/SE89/00015, § 371 Date Sep. 19, 1989, § 102(e) Date Sep. 19, 1989, PCT Pub. No. WO89/06548, PCT Pub. Date Jul. 27, 1989

ub. Date DJan. 19, 1989, Ser. No. 411,466

Claims priority, application Sweden, Jan. 20, 1988, 8800176

Int. Cl.[5] A61F *13/00;* A61K *33/40, 33/26*

U.S. Cl. 424—422 10 Claims

1. An anti-inflammatory oxidizing agent, consisting of an active constituent the reaction product of $H_2O_2$ and metallic titanium, said reaction product being in the form of a gel including a Ti-peroxy radical and titanium peroxide, together with titanium hydroxide.

5,045,319

## TRANSDERMAL DOSAGE UNIT, SYSTEM AND PROCESS

Yie W. Chien, North Brunswick, and Michael Corbo, Piscataway, both of N.J., assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.

Continuation-in-part of Ser. No. 705,194, Feb. 25, 1985, abandoned. This application Oct. 18, 1988, Ser. No. 259,352

Int. Cl.[5] A61F *13/02*

U.S. Cl. 424—448 2 Claims

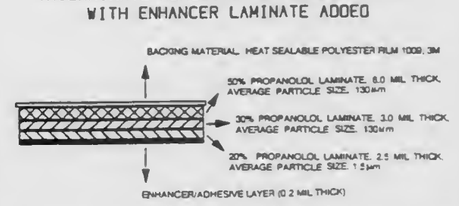
1. A transdermal cardiovascular pharmaceutical dosage unit wherein propanolol is said pharmaceutical, comprising:

a) a backing layer which is substantially impervious to said pharmaceutical;

b) an inner pharmaceutical adhesive first layer having the pharmaceutical dispersed uniformly in a relatively large and effective crystalline form in an amount of at least about 40 percent based on the final weight of said layer and having the predominant weight amount of said pharmaceutical present in a crystalline size of at least 100 microns;

c) a middle pharmaceutical adhesive second layer having the pharmaceutical dispersed uniformly in relatively large and effective crystalline form at a substantially lower concentration than used in said inner first layer in an amount of at least about 20 percent based on the final weight of said layer and having the predominant weight amount of said pharmaceutical present in a crystalline size of at least 100 microns;

d) an outer pharmaceutical adhesive third layer having the




pharmaceutical dispersed uniformly in relatively small and effective crystalline form largely on a weight basis in the range of from about 1 to about 15 microns and in an effective amount up to at least about 40 percent based upon the final weight of said layer; and

e) an outer adhesive fourth layer which contains an effective amount of one or more skin permeation enhancers; said adhesives of said layers being the same or different and being biocompatible, providing a stable environment for said pharmaceutical and permitting release of said pharmaceutical for said absorption; said dosage unit delivering said pharmaceutical for transdermal absorption at substantially zero-order kinetic rate.

5,045,320

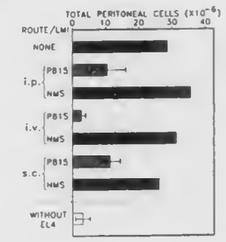
## LARGE MULTIVALENT IMMUNOGEN

Matthew F. Mescher, Del Mar, Calif., assignor to Medical Biology Institute, LaJolla, Calif.

Filed Mar. 23, 1989, Ser. No. 327,822

Int. Cl.[5] A61K *39/385, 37/66, 9/127*

U.S. Cl. 424—450 18 Claims




1. A method of treating a mammal having a tumor to activate cell responses comprising the in vivo administration of large multivalent immunogen consisting essentially of multivalent ligand arrays supported on beads having a major diameter of about 5 microns.

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5,045,321

## STABILIZED PHARMACEUTICAL COMPOSITION AND ITS PRODUCTION

Tadashi Makino; Tetsuro Tabata, both of Osaka, and Shin-ichiro Hirai, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 13, 1987, Ser. No. 14,303

Claims priority, application Japan, Feb. 13, 1986, 61-29567; Feb. 21, 1986, 61-38059

Int. Cl.[5] A61K *9/30, 9/16, 33/12, 33/10*

U.S. Cl. 424—475 3 Claims

1. A pharmaceutical composition, wherein the composition is made up into tablets or granules and then coated by a coating agent, which comprises an effective amount of the anti-ulcer compound 2-[[3-methyl-4-(2,2,2-trifluoroethoxy-2-pyridyl]methylsulfinyl] benzimidazole, and at least one of the basic inorganic salts of magnesium and calcium selected from heavy magnesium carbonate, magnesium carbonate, magnesium oxide, magnesium hydroxide, magnesium metasilicate aluminate, magnesium silicate aluminate, magnesium silicate, magnesium aluminate, synthetic hydrotalcite, aluminum magnesium hydroxide, precipitated calcium carbonate and calcium hydroxide; the amount of the basic inorganic salt relative to parts by weight of the benzimidazole compound being about 0.3–20 parts by weight; the benzimidazole compound being in contact with the basic inorganic salt evenly.

5,045,322

## ANTIMICROBIAL SUPERABSORBENT SANITARY NAPKIN

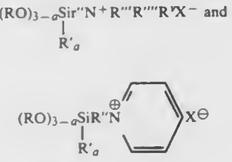
Lynne M. B. Blank, Brighton, N.Y.; Thomas D. Boyce, and William C. White, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 425,277, Oct. 23, 1989, Pat. No. 4,985,023, which is a continuation-in-part of Ser. No. 191,945, May 9, 1988, Pat. No. 4,990,338. This application Aug. 6, 1990, Ser. No. 563,229

Int. Cl.[5] A61F *13/52, 13/46, 13/15, 13/20*

U.S. Cl. 424—486 8 Claims

1. A sanitary napkin comprising an outer layer of an organosilane treated polymer gel, and an inner layer of the polymer gel which is free of the organosilane, the rate at which the outer layer of the organosilane treated polymer gel absorbs a fluid with respect to time being slower than the rate at which the inner layer of the polymer gel which is free of the organosilane absorbs a fluid with respect to time, whereby there is established a differential rate of absorption between the inner layer and the outer layer as a function of time causing initial fluid migration to the inner layer, the polymer gel being a water absorbing crosslinked hydrophilic sodium salt form of a partially neutralized acylic acid-based polymer gel, and the organosilane having a formula selected from the group consisting of



wherein in each formula,

R is an alkyl radical of 1 to 4 carbon atoms or hydrogen;

a has a value of 0, 1 or 2;

R′ is a methyl or ethyl radical;

R″ is an alkylene group of 1 to 4 carbon atoms;

R‴, R⁗ and R⁗′ are each independently selected from the group consisting of alkyl radicals of 1 to 18 carbon atoms, $-CH_2C_6H_5$, $-CH_2CH_2OH$, $-CH_2OH$, and $-(CH_2)_xNHC(O)R^{vi}$, wherein x has a value of from 2 to 10 and $R^{vi}$ is a perfluoroalkyl radical having from 1 to 12 carbon atoms; and X is chloride, bromide, fluoride, iodide, acetate or tosylate.

5,045,323

## COMPOUND AND METHOD OF PREPARING COMPOUND FOR MEDICAL PURPOSES FROM EGGSHELLS

Karol Michálek, Trnava, Czechoslovakia, Assignee: Západoslovanskē hydinārske závody štatny Podnik Trnava, Czechoslovakia

Filed Jun. 26, 1989, Ser. No. 371,427

Claims priority, application Czechoslovakia, Jun. 24, 1988, PV4454-88

Int. Cl.[5] A61K *33/42, 33/06, 33/10*

U.S. Cl. 424—601 6 Claims

1. A method of preparing a composition for medical purposes involving deficiencies of minerals in bone tissues, comprising:

removing the contents of eggshells which include egg white and egg yolk, from the eggshells;

subjecting the eggshells to centrifugal separation to remove additional egg white from the shells;

subsequently washing the eggs shells in water to remove any additional egg white, a sticky film from interior surfaces of the eggshells, and other contaminants;

rinsing the washed eggshells with clear water;

subjecting the washed and rinsed eggshells to centrifugal separation to remove the eggshells from the water;

drying the eggshells which have been separated from the water using hot air;

crushing the dried eggshells;

grinding the crushed eggshells to a powder having a particle size smaller than 150 microns; and

sterilizing the eggshell powder at sufficiently high temperature to devitalize pathogenous and conditionally pathogenous microorganisms.

5,045,324

## PASTY DIALYZING COMPOSITION FOR PERFUSING ARTIFICIAL KIDNEY SYSTEMS AND PROCESS FOR PREPARING SAME

Hisao Mukai, Naruto, Japan, assignor to Tomita Pharmaceutical Co., Ltd., Tokushima, Japan

Filed Nov. 27, 1989, Ser. No. 441,604

Claims priority, application Japan, Nov. 28, 1988, 63-301419

Int. Cl.[5] A61K *33/14, 33/00*

U.S. Cl. 424—678 10 Claims

1. A pasty composition for perfusing artificial kidney systems for dialysis, the composition comprising about 30 to about 70% by weight of solid electrolyte components consisting of NaCl, KCl, $CaCl_2$, $MgCl_2$ and $CH_3COONa$ and about 70 to about 30% by weight of water, and the composition having a viscosity of about 1,000 to about 7,000 cps at 25° C.

5,045,325

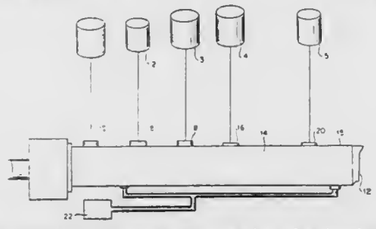
## CONTINUOUS PRODUCTION OF CHEWING GUM USING COROTATING TWIN SCREW EXTRUDER

Albert J. Lesko, Wallington, and Marc Degady, Budd Lake, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 26, 1990, Ser. No. 589,226

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—5 12 Claims



1. A method for continuous preparation of a chewing gum slab from chewing gum ingredients and a liquid gum base in the absence of required separate cooling of said gum slab, said method comprising:



(a) introducing chewing gum ingredients selected from the group consisting of colorants, plasticizers, texturizers, bulking agents, sweeteners, flavors and mixtures thereof and heated liquid gum base into an extruder at a distance from each sufficient to prevent back flow of said liquid gum base and thereby preventing unwanted hot spots and discontinuities in the final gum slab;

(b) extrusion mixing said liquid gum base and said chewing gum ingredients while cooling in said extruder over a distance to provide a substantially homogeneous chewing gum mass and extruding said homogeneous chewing gum mass as a chewing gum slab, said chewing gum slab having a temperature on exit suitable for rolling and scoring in the absence of any additional cooling.

5,045,326

## NON-STALING AERATED BUBBLE GUM

Michael Glass, Fair Lawn, N.J.; Kenneth P. Bilka, Floral Park, N.Y.; Subraman R. Cherukuri, Towaco, N.J.; Gul Mansukhani, Staten Island, N.Y.; Michael J. Killeen, Lafayette, N.J., and James Duggan, Rockford, Ill., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 22, 1989, Ser. No. 441,136

Int. Cl.[5] A23G *3/30*

U.S. Cl. 426—5 19 Claims

1. A non-staling, reduced density bubble gum composition having a density of about 1.07 to about 1.12, said bubble gum composition including a bubble gum base composition that is stable in the presence of an inert gas, said bubble gum base composition comprising in weight percent:

(a) about 0.5% to about 30% non-SBR elastomer selected from the group consisting of synthetic gums, synthetic elastomers, natural gums, natural elastomers and mixtures thereof,

(b) an effective amount of a combination of two polyvinyl acetate polymeric materials selected from:

(1) not more than 14% of a polyvinyl acetate having a lower molecular weight of about 12,000 to about 16,000; and

(2) not more than 35% of a polyvinyl acetate having a medium molecular weight of about 35,000 to 55,000; wherein the polyvinyl acetate polymeric materials are present in a mole ratio of 1:2 to 1:45 based on the low molecular weight polyvinyl acetate to the medium molecular weight polyvinyl acetate; and

(c) about 5% to about 12% acetylated monoglyceride having a saponification value above about 400.

5,045,327

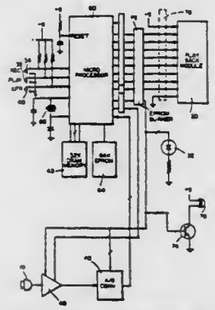
## DIGITAL RECORDING AND PLAYBACK MODULE SYSTEM

Kenneth A. Tarlow, Playa del Rey, Calif.; David Silver, Dallas, Tex. and William Avery, Incline Village, Nev., assignors to Sound Memory Corporation, Dallas, Tex.

Filed Jul. 11, 1990, Ser. No. 551,033

Int. Cl.[5] G10L *5/02*

U.S. Cl. 381—51 17 Claims



1. A new system comprising a sound-recording apparatus and a miniature, self-contained, sound-playback module wherein the recording apparatus comprises:

temporary-storage means for recording sound;

means for playing back the sound as recorded by the temporary-storage means so that a user of the system can determine whether the recording is satisfactory, the temporary-storage means being capable of re-recording the sound if the user of the system so wishes; and

means for transferring the sound as recorded or re-recorded by the temporary-storage means to the playback module as a digital signal; and

wherein the playback module comprises:

a digital memory for storing the digital signal, the digital memory being capable of activation to generate a digital output signal corresponding to the stored digital signal;

a digital-to-analog converter connected to the memory for converting the digital output signal to an analog signal;

speaker means responsive to the analog signal for reproducing the sound;

a power source for powering the memory, digital-to-analog converter and speaker means; and

activator means controllable by a user of the playback module to activate the memory to produce the digital output signal, thereby causing the speaker means to reproduce the sound as recorded by the recording apparatus; and

further comprising connecting means releasably connecting the playback module to the recording apparatus.

5,045,328

## TREATING PARBOILED GRAINS AND PRODUCTS

Victor M. Lewis, and David A. Lewis, both of 19A Boundary Street, Rushcutters Bay, New South Wales, 2011, Australia

Continuation of Ser. No. 356,594, May 23, 1989, abandoned, which is a continuation of Ser. No. 5,156, Dec. 10, 1986, abandoned. This application Nov. 15, 1990, Ser. No. 614,671

Claims priority, application Australia, Apr. 15, 1985, PH00149

Int. Cl.[5] A23L *1/10, 1/105, 1/182*

U.S. Cl. 426—28 14 Claims

1. A process for preparing an improved grain product consisting essentially of treating parboiled grains with water or an aqueous solution or suspension, wherein said solution or suspension is absorbed by the grain thereby raising the moisture content of said grain to a range of 16% to 30%; maintaining said treated grain at a temperature below the gelatinization temperature of said grain; subjecting said grain held below its gelatinization temperature to compression, said compression effective to produce compressed grains without significant cracking of said grains; and, thereafter drying said compressed grains to obtain a quick cooking grain product.

8. A process for preparing an improved grain product comprising treating parboiled grains with an aqueous solution or suspension wherein said solution or suspension is absorbed by the grain thereby raising the moisture content of said grain to a range of 16% to 30% moisture; subjecting said grain to compression, said compression effective to produce compressed grains without significant cracking of said grains and wherein the temperature of the grain is maintained below the gelatinization temperature of said grain prior to and during said compression; drying said compressed grain; and thereafter toasting said dried grain to obtain a crisped grain product.

5,045,329

## PERFORATED PITA BREAD

Alexander Goglanian, 401 E. 15th St., Newport Beach, Calif. 92660

Division of Ser. No. 488,154, Apr. 25, 1983, Pat. No. 4,597,979. This application Mar. 25, 1986, Ser. No. 843,728

Int. Cl.[5] A21D *13/00*

U.S. Cl. 426—106 5 Claims

1. A package containing a plurality of pitas;

each pita within said package comprising:

baked dough having a pair of overlapping layers,

said layers sealed together at their respective edges to form an outside surface and an inside surface;

a weakened line on the outside surface of said pita, said

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line having a thickness which is less than the thickness of the baked dough between said outside surface and said inside surface; and

a baking induced rupture coincident with said weakened line;

the weakened line on each of said plurality of pitas being in substantially the same position.

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**5,045,330**

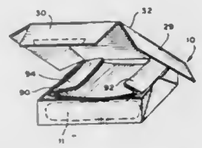
**BIASED FOOD CONTACT CONTAINER AND CONTAINER INSERT**

**Thomas D. Pawlowski, Neenah, Wis., assignor to James River Corporation, Richmond, Va.**

**Filed Aug. 23, 1989, Ser. No. 397,197**

**Int. Cl.[5] B65D** *85/00*

**U.S. Cl. 426— 107** **20 Claims**



12. A package for use in heating food by microwave energy comprising:

carton means for forming an interior food cavity;

an insert located within said food cavity, said insert comprising:

(a) a panel;

(b) bias means for imposing a spring force between said panel and said carton means;

(c) microwave interactive means for converting microwave energy into heat, including a microwave interactive material associated with said panel; and

(d) temperature sensitive restraint means for restraining said spring force between said panel and said carton means at a first temperature and for releasing said spring force at a second higher temperature such that at a first temperature the bias means does not impose a spring force between said panel and said carton means, and upon release of said spring force a spring force is imposed between said carton means and said panel wherein said panel is then urgeable positively into contact with a surface of food placed within said food cavity.

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**5,045,331**

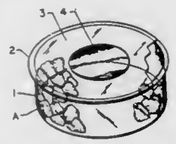
**CONTAINER FOR CONTROLLED ATOMSPHERE PACKAGING**

**Mitchell K. Antoon, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.**

**Continuation-in-part of Ser. No. 87,855, Aug. 14, 1987, abandoned. This application Mar. 30, 1988, Ser. No. 175,468**

**Int. Cl.[5] A23B** *7/148;* **B65D** *85/50, 81/20*

**U.S. Cl. 426—118** **4 Claims**



1. A container for retarding the maturation of respiring fresh produce selected from the group consisting of fruit, vegetables, or flowers contained therein by creating within the container a preselected, controlled carbon dioxide and oxygen concentration in the presence of said respiring fresh fruit, vegetables or flowers, said container being constructed of a substantially gas-impermeable material completely enclosing said produce and having a gas-permeable panel in one or more of its walls to provide a controlled flow or flux of $CO_2$ and $O_2$ through its walls, wherein the panel is a silicone or butadiene-styrene copolymer coated nonwoven fibrous material having a permeance ratio of carbon dioxide to oxygen between about 1 to 1 and 8 to 1 and having an oxygen permeance between about 5,000 and 30,000,000 cc/100 sq. in./day/atmosphere, the permeance and area of the permeable panel being such as to provide a flux of $O_2$ approximately equal to the predicted $O_2$ respiration rate for not more than 3.0 kg. of the enclosed fruit, vegetable or flower, and the carbon dioxide permeance of the panel being such as to maintain the desired optimum ranges of carbon dioxide and oxygen sufficient for optimum retardation of the maturation process of said produce for not more than the said 3.0 kg. of enclosed produce.

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**5,045,332**

**METHODS AND MATERIALS FOR INHIBITING THE DEVELOPMENT OF WARMED-OVER FLAVOR IN MEAT**

**Ernst Graf, New Brighton, Minn., and S. Scott Panter, San Francisco, Calif., assignors to The Pillsbury Company, Minneapolis, Minn.**

**Filed Oct. 10, 1989, Ser. No. 417,528**

**Int. Cl.[5] A23B** *4/02;* **A23L** *1/314*

**U.S. Cl. 426—332** **41 Claims**

1. A method for retarding the development of warmed-over flavor in meat, comprising adding to the meat an effective amount of a compound that diffuses into the meat and provides a WOF-retarding cation to the meat, without coating said meat with an alginate compound.

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**5,045,333**

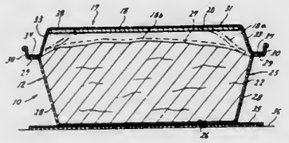
**METHOD FOR SELF-ICING BAKERY GOODS**

**Robert Petrofsky, and David Petrofsky, both of St. Louis, Mo., assignors to Petrofsky's Enterprises, Inc., St. Louis, Mo.**

**Division of Ser. No. 566,847, Aug. 14, 1990, which is a continuation of Ser. No. 281,198, Dec. 7, 1988, abandoned. This application Aug. 30, 1990, Ser. No. 562,732**

**Int. Cl.[5] B65B** *29/08*

**U.S. Cl. 426—394** **12 Claims**



1. A method for baking and icing a bakery product comprising:

(a) placing a non-prebaked dough or batter in a first tray having a floor and an upstanding wall extending therefrom defining a first compartment;

(b) adhering to the inside surface of the floor of a second tray having a floor and an upstanding wall extending therefrom defining a second compartment, an icing composition compatible with the bakery product to be produced;

(c) positioning the second tray in a first position relative to the first tray so that the second tray is removably attached and supported on the first tray with the floor of the second tray being located between the icing and the dough or batter and spaced above the dough or batter;

(d) separating the first tray from the second tray;

(e) placing the separated first tray containing said dough or batter in an oven and baking the dough or batter contained in said separated first tray in the oven to form a baked product while the second tray containing said adhered icing remains outside the oven, and upon completion of baking;

(f) removing the first tray containing said baked product from said oven and then inverting said second tray from its first position and then, while said baked product still has heat emanating from it from the baking step, placing said second tray in its inverted position on said first tray so that the floor of said second tray is positioned not between the icing and the baked product but above both the icing and the baked product and the icing is spaced from the top surface of the baked product;

(g) and allowing said heat emanating from said bakery product to warm said icing to allow the icing to separate from said floor of said second tray and fall to the top surface of the bakery product and coat a substantial portion of the surface of the bakery product.

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**5,045,334**

**PROCESS FOR SEPARATING AND REMOVING CAFFEINE AND CHLOROGENIC FROM RAW COFFEE AND FROM ONE ANOTHER**

**Reiner Kopsch, Schenefeld; Henning Lutz, Halstenbek, and Claus Gösswein, Buchholz, all of Fed. Rep. of Germany, assignors to Kaffee Handelsgesellschaft MBH, Fed. Rep. of Germany**

**Continuation of Ser. No. 315,308, Feb. 24, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 588,501**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3806372**

**Int. Cl.[5] A23F** *5/22*

**U.S. Cl. 426—422** **7 Claims**

1. A process for the separation of caffeine and chlorogenic acids from an aqueous raw coffee extract and from one another by means of gel permeation chromatography on a molecular sieve of crosslinked dextran with water as the eluting agent, wherein caffeine and chlorogenic acids contained in the extract are separated using at least first and second highly crosslinked dextran gels, the second or an additional gel having a higher degree of crosslinking than the first gel and having a maximum bed volume of 6 ml/g in a swollen state;

the caffeine-containing eluate of the first gel being subsequently fed onto the second or additional gel the caffeine being obtained from the eluate of the second or additional gel at temperatures at or above room temperature.

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**5,045,335**

**METHOD FOR IMPROVING THE FLAVOUR CHARACTERISTICS OF POTATO PRODUCTS**

**Johannes F. M. De Rooij, Hilversum; John D. Simmons, Naarden, both of Netherlands, and Willem Van Osnabrugge, Hunt Valley, Md., assignors to Unilever Patent Holdings B.V., Vlaardingen, Netherlands**

**Continuation of Ser. No. 361,378, Jun. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 129,775, Dec. 7, 1987, abandoned. This application Aug. 15, 1990, Ser. No. 569,379**

**Claims priority, application European Pat. Off., Dec. 5, 1988, 88202772**

**Int. Cl.[5] A23L** *1/217*

**U.S. Cl. 426—533** **9 Claims**

1. A method for improving the flavour characteristics of a potato product so as to provide the potato product with a meat-like flavor on frying, which comprises treating the potato product before frying with a previously prepared aqueous flavour mixture consisting essentially of the product obtained by heating an aqueous slurry of a mixture of a reducing sugar, and amino acid selected from the group consisting of lysine, glutamic acid and alanine and a sulphur donor compound selected from the group consisting of cysteine, cystine, allium, $H_2S$ or salts of $H_2S$ to a temperature between 70° and 180° C. whereby the reducing sugar, amino acid and sulphur donor are preliminarily reacted together to form said flavour mixture and thereafter frying the thus-treated potato product in oil.

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**5,045,336**

**METHOD OF MODIFYING SWEET TASTE**

**Michael G. Lindley, Crowthorne, and Elner B. Rathbone, Wokingham, both of England, assignors to Amstar Sugar Corporation, New York, N.Y.**

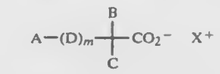
**Continuation of Ser. No. 719,493, Apr. 4, 1985, abandoned. This application May 14, 1986, Ser. No. 865,926**

**Claims priority, application United Kingdom, Apr. 12, 1984, 8409514**

**Int. Cl.[5] A23L** *1/22*

**U.S. Cl. 426—534** **20 Claims**

1. A method of reducing the sweetness of an ingestible product containing a sweetening sugar or sugar alcohol by incorporating therein a sweetness-inhibiting amount which is in the range of 0.0005 to 0.1 weight % of at least one compound of the general formula



(I)

in which m represents 0 or 1; A represents a substituent selected from the group consisting of a homocyclic and an indolyl group; and B represents a substituent selected from the group consisting of a hydrogen atom, a lower aliphatic group with 1–3 carbon atoms and a phenyl group, and, when m represents O, A and B together may also be selected from the group consisting of a bivalent homocyclic aromatic group and an indolyl group, and a methylidene group carrying a substituent selected from the homocyclic or indolyl groups; an aromatic ring of A, or of A and B together, unsubstituted or carrying one to three substituents selected from the group consisting of lower alkoxy groups, lower alkyl groups, lower alkenyl groups, formyl groups, acetyl groups, hydroxy groups, acyloxy groups, and halogen atoms;

C represents a substituent selected from the group consisting of a hydrogen atom, and a lower alkyl group, when m represents 1, and selected from the group consisting of hydrogen, a lower alkyl group, a hydroxy or alkoxy group when m represents O;

D represents a substituent selected from the group consisting of a oxygen atom and a sulphur atom;

$X^+$ represents a hydrogen ion or another physiologically compatible cation;

with the proviso that m represents 1 when A represents a substituted or unsubstituted phenyl group and B and C both represent hydrogen atoms; and m represents 1 when A represents an unsubstituted phenyl group, B represents an alkyl group and C represents a hydrogen atom.

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**5,045,337**

**FOOD MICROEMULSION**

**Magda El-Nokaly, Hamilton; George D. Hiler, Harrison, and Joseph McGrady, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Apr. 19, 1990, Ser. No. 511,154**

**Int. Cl.[5] A23D** *7/00*

**U.S. Cl. 426—602** **15 Claims**

1. A water and oil microemulsion consisting of:

A) from about 90% to about 99.8% lipid

B) from about 0.1% to about 5% polar solvent; and

C) from about 0.1% to about 10% of a polyglycerol mono, diester of an unsaturated or branched chain fatty acid having from 12 to 24 carbon atoms, said polyglycerol consisting of a mixture of 0% to 10% monoglycerol and other polyglycerols, 30% or less diglycerol, 30% to 50% triglycerol and 15% to 50% tetraglycerol.

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**5,045,338**

**SECONDARY AMIDE ESTERS AS LOW CALORIE FAT MIMETICS**

**Lawrence P. Klemann, Somerville; John W. Finley, Whippany, and Ronald G. Yarger, Convent Station, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.**

**Filed Sep. 19, 1989, Ser. No. 409,394**

**Int. Cl.[5] A23D** *7/00;* **C07H** *5/04;* **C09F** *5/00*

**U.S. Cl. 426—611** **59 Claims**

1. A fat mimetic compound of the following formula, useful as fat replacement in edible materials:

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where:
A is an aliphatic group having from 2 to 6 carbons,
m=1 to 3,
n=1 to 3, and
each R is, independently, a $C_1$ to $C_{29}$ aliphatic group,
a $C_2$ to $C_{29}$ ether group of the formula R'—O—RΔ—,
or a $C_2$ to $C_{29}$ ester group of the formula R"—O—(-CO)—R'— or R'—(CO)—O—R"—,
where R'— and R"— are, independentaly, aliphatic groups.

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**5,045,339**
**PET FOOD AND METHOD OF PREPARATION**
Cyril L. Ducharme, Wayzata, Minn., assignor to Huntington Hyde Ltd., Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 299,224, Jan. 23, 1989, Pat. No. 4,910,038. This application Mar. 19, 1990, Ser. No. 495,491
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—641 7 Claims

1. A pet food composition consisting essentially of:
A. about 40% to 55% by weight of the composition of animal meat solids and wherein at least a portion of said solids is selected from the group consisting of poultry meal and meat tankage;
B. about 15% to 30% by weight of the composition of cereal filler having its starch content gelatinized;
C. about 5% to 12% by weight of the composition of soy flour;
D. about 10% to 20% by weight of the composition of moisture;
E. about 1% to 8% of a humectant
wherein the composition has a water activity of about 0.45 to 0.55;
F. about 0.01% to 0.5% of a hydrophillic binder,
wherein the composition has a pH ranging from about 4.0 to 5.0 and wherein said composition is pliable, unexpanded and in the form of meat jerky.

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**5,045,340**
**HARD CONFECTIONERY PRODUCTS CONTAINING MAINLY XYLITOL AND A PROCESS OF PREPARING SAME**
Horst Kohler, Oulu, Finland, assignor to Oy Rettig Ab, Finland
Continuation-in-part of Ser. No. 326,332, Mar. 21, 1989, abandoned. This application Jan. 26, 1990, Ser. No. 469,765
Claims priority, application Finland, Nov. 22, 1988, 885397; European Pat. Off., Nov. 4, 1989, 89312063
Int. Cl.[5] A23G *3/00*
U.S. Cl. 426—660 6 Claims

1. A process of preparing a hard confectionery product mainly composed of xylitol, which process comprises heating a mixture containing from 5 to 20% by weight of xylitol, from 85 to 70% by weight of maltitol, less than 15% by weight of other sugar alcohols, and a small amount of water, to a temperature of from 170° to 175° C., to form a melt; allowing the resulting melt to cool to a temperature ranging from 105° to 120° C.; subsequently rapidly adding to the melt with mixing from 30 to 60% by weight of powdered xylitol, based upon the amount of the melt; and finally shaping the obtained mixture into a confectionery product.

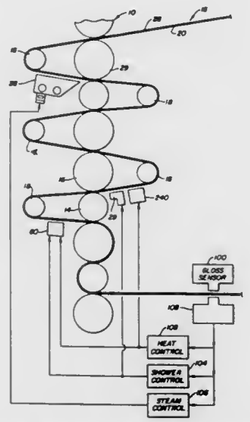
**5,045,341**
**COVERING SUCH AS A SUIT, GLOVE, CONDOM OR SHEATH FORMING A CHEMICAL BARRIER AGAINST HARMFUL AGENTS AND METHODS OF MAKING THE SAME**
Robin R. T. Shlenker, 2165 E. Alameda Ave., Denver, Colo. 80209
Continuation-in-part of Ser. No. 246,337, Sep. 19, 1988, Pat. No. 4,935,260, which is a continuation-in-part of Ser. No. 143,184, Jan. 13, 1988, Pat. No. 4,919,966, which is a continuation-in-part of Ser. No. 74,629, Jul. 17, 1987, Pat. No. 4,771,482. This application Feb. 22, 1990, Ser. No. 482,978
Int. Cl.[5] A01N *1/02;* A41D *19/00*
U.S. Cl. 427—2 57 Claims




16. A method of making a covering for forming a chemical barrier against harmful agents comprising the steps of:
providing a layer of sponge-like material possessing a plurality of chambers numbering at least two hundred and wherein the volume of substantially each chamber is less than one-twentieth cubic milliliter;
providing a chemical barrier capable of neutralizing the harmful characteristics of the harmful agent;
applying the chemical barrier to the sponge-like material layer such that the chemical barrier is contained within the chambers; and
sealing the surfaces of the sponge-like material layer to substantially retain the chemical barrier within the sponge-like material layer.

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**5,045,342**
**INDEPENDENT HEAT MOISTURE CONTROL SYSTEM FOR GLOSS OPTIMIZATION**
Mathew G. Boissevain, Los Altos, Calif.; Pierre Charette, St. Hippolyte; Fernand Ostiguy, St. Lambert, both of Canada, and Barclay W. Wallace, San Jose, Calif., assignors to Measurex Corporation, Cupertino, Calif.
Filed Jan. 27, 1989, Ser. No. 303,480
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—8 13 Claims



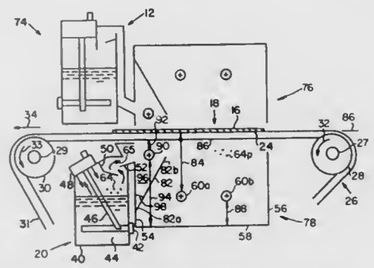

8. A method for calendering a sheet, comprising the steps of:



calendering a sheet between adjacent surfaces;
applying a variable amount of an atomized fluid to the sheet surface substantially immediately before calendering;
applying a variable amount of heat to the sheet substantially immediately before calendering; and
independently controlling the amount of heat and fluid applied to the sheet.

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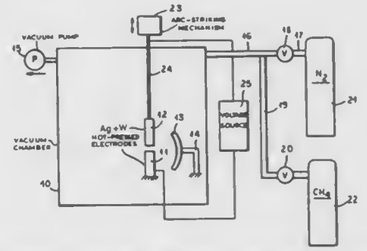
**5,045,343**
**ELECTROSTATICALLY DIRECTING AND DEPOSITING**
Joseph B. Lamirand, Muncie, Ind., and Dwight B. Raddatz, Woodridge, Ill., assignors to Ball Corporation, Muncie, Ind.
Filed Dec. 26, 1989, Ser. No. 457,011
Int. Cl.[5] B05D *1/04, 5/10*
U.S. Cl. 427—33 17 Claims



1. Electrostatic depositing apparatus, comprising
a depositing chamber with first and second ends;
a depositing electrode disposed in said depositing chamber;
means for injecting particles of an electrostatically depositable material into said chamber proximal to said first end;
means for transporting a work piece through said depositing chamber;
means connected with said depositing electrode for electrostatically depositing said particles onto said work piece as said work piece is transported through said depositing chamber;
deflecting means comprising a deflector in said depositing chamber that is interposed between said first end and said depositing electrode, for mechanically directing said particles toward said work piece;
accelerating means comprising an accelerating electrode that is disposed generally between said first end and said deflector for electrostatically directing said particles toward said work piece; and
means for electrostatically neutralizing said work piece subsequent to electrostatically depositing said particles thereupon.

12. A method for electrostatically depositing particles onto a work piece, comprising
injecting particles for deposition into a depositing chamber;
mechanically deflecting said injected particles to direct said particles toward said work piece;
providing an accelerating electrode adjacent the deflected particles;
charging the accelerating electrode to a first polarity to electrostatically charge and direct the deflected particles toward said work piece;
providing a depositing electrode in said depositing chamber;
charging said depositing electrode to said first polarity to electrostatically charge and direct said particles for deposition on said work piece in said depositing chamber; and
electrostatically neutralizing said work piece after electrostatic deposition of said particles.

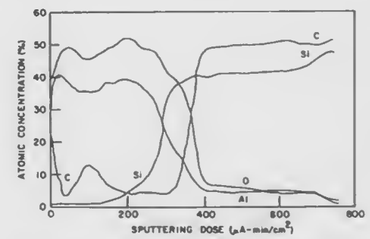
**5,045,344**
**METHOD OF MAKING REFLECTIVE ARTICLES**
Eduard Pinkhasov, Eastchester, N.Y., assignor to Vapor Technologies, Inc., Mt. Vernon, N.Y.
Filed Nov. 16, 1989, Ser. No. 437,834
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—37 17 Claims




1. A method of making a reflector, comprising the steps of:
(a) forming an electrode from a nonalloy mixture of two metals including a highly reflective first metal and a second metal capable of reaction with another substance to form a ceramic;
(b) juxtaposing said electrode with a substrate to be provided with a reflective coating in an evacuatable space;
(c) evacuating said space to a pressure of at most $10^{-3}$ bar;
(d) striking a low-voltage arc between said electrode and another electrode to vaporize said mixture;
(e) admitting said substance into said space to react said substance with the vaporized mixture and cause deposition of a reflective reaction product of said vaporized mixture and said substance on said substrate in a coating; and
(f) controlling the composition of said vaporized mixture, said pressure, and the admission of said substance to said space so that said substance chemically saturates said reaction product in said coating to prevent oxidative change in reflective properties thereof without the need for a protective coating on said reaction product, the composition of said mixture, said pressure, the admission of said substance to said space and a thickness of said reaction product on said substrate are selected to provide a reflectivity of at least 75% by said reaction product on said substrate.

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**5,045,345**
**ENERGY BEAM TREATMENT FOR IMPROVED ADHESION OF COATINGS TO SURFACES**
Irwin L. Singer, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 31, 1989, Ser. No. 429,959
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—38 10 Claims




1. A method of coating a self-supporting substrate with a

VOL 1130 ISS 1 SE 3 1991 UMI



coating material different from and thermodynamically stable to said substrate, comprising the steps of:

ion implanting or surface alloying said substrate by means of an energetic beam in such a manner as to enrich said substrate with respect to an element of said substrate or coating material, or an element selected from the same periodic group as an element of said substrate or coating material, and thus form a phase within said substrate, said phase comprising a mobile atomic species, which is diffusible into or reactive with said coating material;

coating said ion implanted or surface alloyed substrate with said coating material to form an interface between said substrate and said coating material;

thermally activating said interface to move said mobile atomic species to said interface and diffuse said mobile atomic species into said coating material and, thereby bonding said coating material to said substrate.

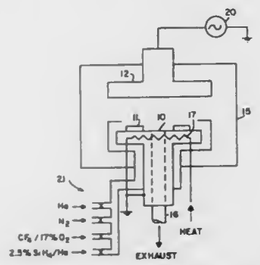
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**5,045,346**

**METHOD OF DEPOSITING FLUORINATED SILICON NITRIDE**

**Marvin J. Tabasky, Peabody, Mass., and Bruce Tweed, Pelham, N.H., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Jul. 31, 1990, Ser. No. 560,688**
**Int. Cl.[5] B05D *3/06***
**U.S. Cl. 427—39** **16 Claims**




8. The method of depositing silicon nitride on a substrate comprising:

placing an electrode in a reaction chamber;

introducing carbon, fluorine, and oxygen into said chamber;

generating a reactive plasma within said chamber;

introducing silane and nitrogen into said chamber;

generating a reactive plasma within said chamber to deposit a coating containing fluorine and silicon on said electrode;

placing said substrate on a support in said chamber;

introducing silane and nitrogen into said chamber; and

applying RF electrical energy between said electrode and said support to generate a reactive plasma within the chamber and deposit fluorinated silicon nitride on said substrate.

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**5,045,347**

**RECLAIMABLE POLYESTER FILM HAVING ADHESION-PROMOTING COATING**

**John D. Gribbin, Schlangenbad; Hermann Dallmann, Wiesbaden; Dieter Engel, Kelsterbach, and Hartmut Hensel, Schlangenbad, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

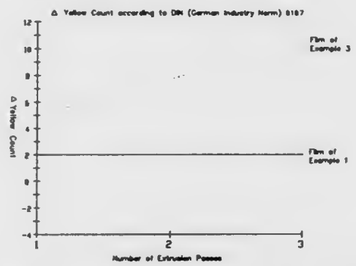
**Division of Ser. No. 113,940, Oct. 28, 1987, Pat. No. 4,942,088. This application Apr. 26, 1990, Ser. No. 514,994**
**Int. Cl.[5] B05D *3/06***
**U.S. Cl. 427—40** **4 Claims**

1. An improved process for the manufacture of coated polyester film, comprising:

coating polyester film with an effective amount of an adhesion-promoting coating applied as an aqueous dispersion, said coating produced by the free radical emulsion polymerization of the following components:

A) 1 to 99% by weight of a polymer having carboxy and epoxy functional groups in the form of an aqueous system, produced by reaction of a hydroxy-functional reactant consisting of polyester containing OH groups, and an anhydrous mixture prepared from the conversion of trimellitic acid anhydride with propane-1,2-diol, with;

B) 1 to 99% by weight of at least one copolymerizable monomer of $\alpha,\beta$-olefinic unsaturation, the percentages each time relating to the total solids content of the components,




C) 0.01 to 10% by weight of at least one polymerizable initiator, relative to the monomer content of component B); and

D) 0 to 20% by weight of anionic or nonionic emulsifiers or of a mixture of the two or of protective colloids, relative to the monomer proportion of component B), said polymerization being performed at a temperature between 0° C. and 150° C.

4. The process of claim 1 wherein said film is subjected to a corona treatment prior to being coated with said adhesion-promoting coating.

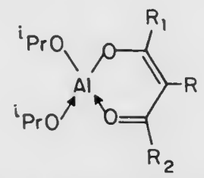
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**5,045,348**

**THIN FILM DEPOSITION PROCESS**

**Crofton J. Brierley, Pattishall, and Clive Trundle, Towcester, both of England, assignors to Plessey Overseas Limited, Ilford, England**

**PCT No. PCT/GB88/00228, § 371 Date Jan. 5, 1989, § 102(e) Date Jan. 5, 1989, PCT Pub. No. WO88/07759, PCT Pub. Date Oct. 6, 1988**
**ub. Date DMar. 25, 1988, Ser. No. 295,212**
**Claims priority, application United Kingdom, Mar. 26, 1987, 8707322**
**Int. Cl.[5] B05D *3/06***
**U.S. Cl. 427—54.1** **4 Claims**




1. A thin film deposition process in which a dielectric layer may be laid down on a substrate body surface at a comparatively low temperature, the process comprising the steps of taking a metal alkoxy substituted beta-diketonate in vapour form, the metal alkoxy substituted beta-diketone being capable of absorbing light in the wavelength range of 240 to 400 nanometers, heating the substrate body to a temperature below the pyrolytic decomposition temperature of the metal alkoxy substituted beta-diketonate in the presence of the vapour, directing light of a predetermined wavelength in the range of 240 to 400 nanometers towards the substrate to cause a photochemical fragmentation of said vapour molecules, the reaction resulting in a deposition of the corresponding metal oxide on said substrate.



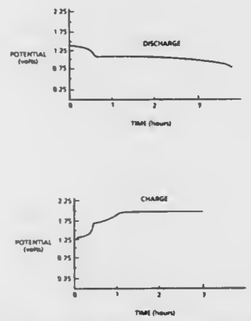
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**5,045,349**

**SILVER-NICKEL COMPOSITE CATHODES FOR ALKALINE SECONDARY BATTERIES**

**William Ferrando, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 16, 1989, Ser. No. 395,547**
**Int. Cl.[5] C23C *18/00***
**U.S. Cl. 427—113** **9 Claims**




1. A method for producing lightweight silver-nickel composite electrodes comprising:

(1) infiltrating a graphite fiber plaque with a suspension of finely divided nickel powder in an aqueous solution of $AgNO_3$, wherein the weight ratio of $AgNO_3$ to nickel is from about 1:6 to about 2:1;

(2) drying the graphite fiber plaque to produce a coating of $AgNO_3$ crystals and nickel particles on the surfaces of the graphite fibers;

(3) heating the coated graphite fiber plaque at a temperature above the melting point but below the decomposition temperature of $AgNO_3$ until the $AgNO_3$ melts and wets the nickel particles and the surfaces of the graphite fibers; and

(4) heating the molten $AgNO_3$ coated graphite fiber plaque at a temperature from the decomposition temperature of $AgNO_3$ to about 600° C. until the $AgNO_3$ decomposes to form a thin, uniform silver metal coating over the nickel particles and the surfaces of the graphite fibers.

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**5,045,350**

**APPLYING TENSION TO LIGHT GAGE GRAIN-ORIENTED SILICON ELECTRICAL STEEL OF LESS THAN 7-MIL BY STRESS COATING TO REDUCE CORE LOSSES.**

**James G. Benford, and Edward Choby, Jr., both of Pittsburgh, Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.**

**Filed Oct. 10, 1989, Ser. No. 418,607**
**Int. Cl.[5] B05D *5/12*; H01F *1/04***
**U.S. Cl. 427—127** **6 Claims**

1. A method for reducing the core losses in light-gage grain-oriented silicon electrical steel of less than 7-mil thickness and having a $\mu 10$ value no greater than 1850 at an operating frequency of at least 60 Hz, said method comprising:

preparing said steel surface by heating the steel in an oxidizing atmosphere at about 800° F. but no more than 1475° F., removing any surface oxides, and then stress relief annealing the steel in an inert atmosphere; thereafter

coating said steel with stress coating capable of inducing at least a 600 psi tensile stress in said steel; and

curing said coating on said steel to impart the stress, said preparation produces a steel surface which will support the stresses exerted by the stress coating without spalling of the coating.

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**5,045,351**

**PROCESS FOR PRODUCING A MAGNETIC RECORDING MEDIUM**

**Tsutomu Okita; Yasuo Nishikawa; Hiroshi Hashimoto, and Hideomi Watanabe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Oct. 18, 1989, Ser. No. 423,290**
**Claims priority, application Japan, Oct. 18, 1988, 63-260503; Oct. 18, 1988, 63-260507**
**Int. Cl.[5] B05D *5/12***
**U.S. Cl. 427—130** **12 Claims**

1. A process for producing a magnetic recording medium which comprises a step of kneading a ferromagnetic powder with a binder in the presence of a solvent, a step of dispersing the resulting blend with the binder and/or solvent, and a step of coating the resulting magnetic coating composition on a non-magnetic support followed by drying;

wherein said step of kneading is carried out by kneading a ferromagnetic powder having a particle size of not more than 350 Å with a glycidyl compound and a binder comprising at least a vinyl chloride copolymer having an OH-terminated side chain bonded via an organic group and also having a polar group and/or a solvent; said binder, and solvent being used in a total amount of from 40 to 70 parts by weight per 100 parts by weight of said ferromagnetic powder; and wherein polyurethane resin having a polar group is added in at least one of said step of kneading and said step of dispersing.

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**5,045,352**

**METHOD FOR CLEANING AND COATING WATER-CONDUCTING PIPES**

**Karl Mueller, Speckweg 69, D-6800 Mannheim 1, Fed. Rep. of Germany**

**Filed Feb. 3, 1989, Ser. No. 306,317**
**Claims priority, application Fed. Rep. of Germany, Feb. 5, 1988, 3803410**
**Int. Cl.[5] B05D *7/22, 3/00***
**U.S. Cl. 427—235** **18 Claims**

1. A method for cleaning and coating interior surface walls of a water-conducting pipe system comprising the steps of:

a.) draining said water-conducting pipe system;

b.) rough cleaning the interior surface walls of said water-conducting pipe system for forcing a mixture of water and air through the water-conducting pipe system;

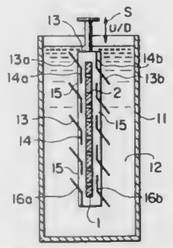
c.) fine cleaning the interior surface walls of said water-conducting pipe system by introducing a pressurized acid into the pipe system for an amount of time to fine clean the interior surface walls, said acid being capable of removing at least one of rust and calcareous products from the interior surface walls;

d.) drying the interior surface walls of said water-conducting pipe system;

e.) coating the interior surface walls of said water conducting pipe system with a coating material to prevent access of water conducted through the pipe to the interior surface walls of the pipe, said coating material being water resistant and capable of forming a smooth homogeneous surface; and

f.) removing any excess coating material not adhering to said interior surface of said water-conducting pipe system.

5,045,353
**METHOD FOR TREATING INTERIOR SURFACES OF HOLES AND APPARATUS THEREFOR**
Yuuzi Takada; Ritsuji Toba; Satoshi Yoshitomi, and Nobuaki Ooki, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Sep. 27, 1989, Ser. No. 413,383
Claims priority, application Japan, Sep. 28, 1988, 63-241107; Mar. 15, 1989, 01-062956
Int. Cl.[5] B05D *5/00*
U.S. Cl. 427—243 8 Claims




1. A method for treating the interior surfaces of holes as well as the surfaces of a perforated workpiece by dipping it into treating liquid, which comprises providing a holding member adapted to be dipped in the liquid not only to hold the workpiece, but also to locate plate-like fins adjacent both ends of the holes of said workpiece, said fins adjacent a first side of the hole ends extending outwardly upwardly with respect to said holes, whereas said fins adjacent a second side of the hole ends extending outwardly downwardly with respect to said holes, repeatedly moving said holding member, including the workpiece, through the treating liquid, and shifting the workpiece to a different holding position relative to said holding member at least once when the holding member is repeatedly moved together with the workpiece within the treating liquid.

3. An apparatus for treating the interior surfaces of holes on a perforated workpiece, comprising a holding member adapted to be dipped in liquid for holding a workpiece, fins provided on this holding member at locations adapted to be adjacent both ends of holes of a workpiece when a workpiece is disposed in said holding member, means for repeatedly moving said holding member, and means for enabling separate movement of the workpiece upwardly and downwardly with respect to said holding member.

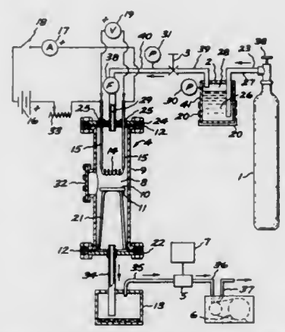
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5,045,354
**PRODUCTION OF SUPPORTED THIN FILM MEMBRANES**
Joseph L. Feimer, Brights Grove, and Bernd A. Koenitzer, Clearwater, both of Canada, assignors to Exxon Research & Engineering Company, Florham Park, N.J.
Filed Dec. 19, 1989, Ser. No. 452,889
Int. Cl.[5] B05D *5/00*
U.S. Cl. 427—245 24 Claims

1. A method for producing a thin film composite (TFC) membrane comprising a thin, dense selective polymeric film about 0.1 to 10 $\mu$ thick on a microporous hydrophobic support backing by wash coating the hydrophobic support with a wetting solution of polymer in solvent, said wetting solution being one which wets the surface of but does not soak into the pores of the microporous hydrophobic support, and having a viscosity in the range of 5 to 100 cps @ 20° C., said polymer in solvent solution comprising 10% or less polymer in a solvent, said solvent comprising a mixture of low surface tension solvent having a surface tension at 20° C. of less than 35 dyne/cm and a high solvency solvent having a high polar solubility parameter at 25° C. of greater than 3(cal/cc)$^{\frac{1}{2}}$ in a ratio of low surface tension solvent/high solvency solvent of 10/90 to 90/10 wt % and further containing a surfactant; draining the excess solution; and evaporating the solvent.

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5,045,355
**CARBON CHALCOGENIDE MACROMOLECULAR COMPOSITION AND PROCESS FOR PREPARATION THEREOF**
Clifford L. Spiro, Niskayuna, and William F. Banholzer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jun. 28, 1990, Ser. No. 545,152
Int. Cl.[5] C23C *16/50*
U.S. Cl. 427—249 13 Claims



1. A process for preparing a carbon chalcogenide macromolecular layer on a substrate comprising:
(a) vaporising a carbon dichalcogenide;
(b) energizing the carbon dichalcogenide vapor to degrade into fragments;
(c) depositing the fragments onto a surface of a thermally stable substrate; and
(d) recombining the fragments on the substrate thereby forming the carbon chalcogenide macromolecular composition.

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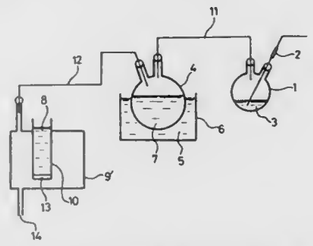
5,045,356
**PROCESS FOR PRODUCING CARBON/CARBON COMPOSITE HAVING OXIDATION RESISTANCE**
Seiichi Uemura, Tokyo; Yoshio Sohda; Yasuji Ido, both of Kanagawa; Toshio Hirai, 3-4-91 Takamori, Sendai-shi, Miyagi-ken; Makoto Sasaki, 3-1-3 Minami-Koizumi, Sendai-shi, Miyagi-ken, and Masayuki Niino, Miyagi, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo; Toshio Hirai; Makoto Sasaki, both of Miyagi and Japan as represented by the Director-General National, Aerospace Laboratory, Tokyo, all of, Japan
Filed Mar. 29, 1989, Ser. No. 329,977
Claims priority, application Japan, Mar. 31, 1988, 63-76006
Int. Cl.[5] C23C *16/30*
U.S. Cl. 427—249 4 Claims

1. A process for producing a carbon/carbon composite having oxidation resistance which comprises treating the surface of a carbon/carbon composite by filling the voids of a carbon/carbon composite comprising 10–70% by volume of carbon fibers and 5–90% by volume of a carbonaceous matrix having a void percentage of 10–55% with carbon and/or a ceramic selected from the group consisting of SiC, ZrC, TiC, HfC, $B_4C$, NbC, WC, $TiB_2$, BN and $Si_3N_4$ by chemical vapor infiltration (CVI), said CVI performed at a temperature of from 1000° to 1500° C. and a pressure from 0.1 to 50 Torr, and then coating the treated surface with a ceramic or both a ceramic and carbon, said ceramic selected from the group consisting of SiC, ZrC, TiC, HfC, $B_4C$, NbC, WC, $TiB_2$, BN and $Si_3N_4$ by chemical vapor deposition (CVD), said CVD performed at a temperature of from 1000° to 2000° C. and a pressure of from 50 to 760 Torr, wherein at least one of temperature, pressure, feed gas rate and feed gas ratio employed in each of said CVI and CVD procedures is changed continuously to provide a continuous change of at least one of texture, structure and composition of said carbon and/or ceramic which effectively increases the carbon's and/or the ceramic's resistance to cracking and delamination.



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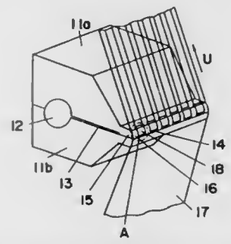
5,045,357
**PROCESS FOR PREPARING A MEMBRANOUS GAS SEPARATOR**
Akira Motonaga, Nagoya; Kensuke Kamada, Hiroshima; Jun Kamo, Hatsukaichi, and Hiroshi Hosokawa, Ohtake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 267,274, Nov. 4, 1988, abandoned. This application Apr. 16, 1990, Ser. No. 509,298
Claims priority, application Japan, Dec. 9, 1987, 62-311325
Int. Cl.[5] C23C *16/00;* B01D *71/60, 53/22*
U.S. Cl. 427—255 13 Claims




1. A process for preparing a membranous gas separator comprising (a) a porous substrate having an average pore diameter of not greater than 100 Å and (b) $\pi$-electron conjugated conducting polymer retained within at least a part of the pores of said porous substrate in such a way that the pores are not blocked thereby, characterized in that a chemical oxidative polymerization is carried out at the gas-liquid interface by bringing one surface side of the porous substrate in contact with an oxidizing agent solution and introducing a monomer vapor of the $\pi$-electron conjugated conducting polymer from the opposite surface side of the porous substrate to retain the $\pi$-electron conjugated conducting polymer within the pores.

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5,045,358
**COATING HEAD ASSEMBLY AND COATING METHOD**
Keigo Watanabe, Neyagawa; Hiroyuki Naka, Osaka, and Takashi Ichiyanagi, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 30, 1989, Ser. No. 428,515
Int. Cl.[5] B05D *3/12, 5/00;* B05C *3/15*
U.S. Cl. 427—172 6 Claims




1. A coating head assembly for applying a coating material to a web, which assembly comprises:
an applicator block;
a reservoir defined in said applicator block for storage of the coating material;
a generally elongated nozzle integral with said applicator block and extending in a direction substantially transverse to the direction of transportation of the web, a free edge of said nozzle opposite to said applicator block having a generally curved nozzle face, said nozzle face having a plurality of applicator grooves defined therein and said nozzle having a plurality of slit-shaped openings defined therein respectively communicating with said plurality of applicator grooves for feeding the coating material under pressure to said plurality of applicator grooves; and
means for feeding the coating material from said reservoir to said plurality of slit-shaped openings.

4. A coating method for coating a coating material on one surface of a web, which comprises the steps of:
transporting the web in sliding contact with a generally curved nozzle face defined in a nozzle, said nozzle face having a plurality of applicator grooves defined therein for the application of the coating material to the web, and said nozzle having a plurality of slit-shaped openings defined therein for feeding the coating material under pressure to said plurality of applicator grooves, respectively; and
applying a predetermined tension to the web during transportation thereof in sliding contact with the nozzle face to cause respective portions of the web aligned with the applicator grooves to protrude into the respective applicator grooves, and coating the coating material onto the web through the slit-shaped openings in the nozzle and through the applicator grooves in the nozzle face.

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5,045,359
**COMPOSITION AND METHOD FOR CORROSION INHIBITION OF METAL SURFACE WITH EPOXY RESIN AND AN N-TALLOW-1,3-DIAMINOPROPANE CURING AGENT**
Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Continuation-in-part of Ser. No. 225,662, Jul. 22, 1988, abandoned, which is a continuation of Ser. No. 698,062, Feb. 4, 1985, abandoned, which is a division of Ser. No. 465,077, Feb. 9, 1983, Pat. No. 4,526,813, which is a continuation of Ser. No. 369,293, Apr. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 181,913, Aug. 27, 1980, abandoned. This application Oct. 31, 1989, Ser. No. 430,690
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—386 56 Claims

1. A method for treating a metal surface to inhibit corrosion thereof, comprising contacting the metal surface with a composition comprising an epoxy resin, an N-tallow-1,3-diaminopropane curing agent for the epoxy resin present in an amount such that the equivalent ratio of the curing agent to the epoxy resin is greater than about 1.5:1 to about 5:1, an aromatic hydrocarbon diluent present in at least an amount sufficient to maintain the composition in an essentially fluid state, and an alcohol selected from the group consisting of methanol, ethanol, 1-propanol, 2-propanol, n-butanol, n-pentanol, n-hexanol, n-heptanol and combinations of any two or more thereof, present in an amount of about 10 to about 60 weight percent of the composition to contact the metal surface for a time sufficient to form a corrosion-inhibiting film thereon.

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### 5,045,360
## SILICONE PRIMER COMPOSITIONS

Jeffrey A. Kosal, Midland, and Terence J. Swihart, Essexville, both of Mich., assignors to Dow Corning Coporation, Midland, Mich.

Division of Ser. No. 426,835, Oct. 26, 1989, Pat. No. 5,008,349.
This application Jan. 31, 1991, Ser. No. 648,757
Int. Cl.[5] B05D *3/02*
U.S. Cl. 427—387 7 Claims

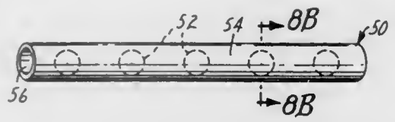
1. In a method for improving the adhesion of a coating to a substrate by applying a primer between said substrate and said coating, the improvement comprising using as said primer the reaction product of:

(A) a resinous copolymeric siloxane consisting essentially of $R_3SiO_{1/2}$ units and $SiO_{4/2}$ units wherein the ratio of $R_3SiO_{1/2}$ units to $SiO_{4/2}$ units is 0.4:1 to 1.2:1 and each R independently denotes a monovalent hydrocarbon radical, said siloxane resin having residual hydroxyl functionality thereon; and

(B) an organosilane selected from the group consisting of those having the formulas

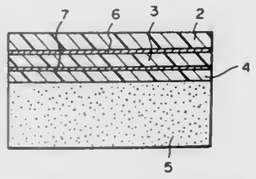
$$(X)_{3-a}SiR'G \quad \text{and} \quad (X)_3SiR'G$$
$$\quad\quad\quad

5,045,368
**SELF-DISPENSING SPACED ELECTRONIC MARKERS**
Armond D. Cosman; Joe T. Minarovic, and David C. Worboys, all of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 409,523, Sep. 18, 1989. This application Nov. 17, 1989, Ser. No. 437,732
Int. Cl.[5] B32B *1/08;* F16L *57/00*
U.S. Cl. 428—34.1 15 Claims




1. An article for supplying an underground utility which may be electronically detected from above ground, comprising:
a plurality of passive electronic markers, each having a coil of wire connected in parallel with a capacitor, forming a resonant circuit; and
a hollow conduit member having a wall, an outer surface, and an inner surface, said markers being attached to said conduit member at predetermined intervals, said predetermined intervals forming a pattern which encodes information about the underground utility.

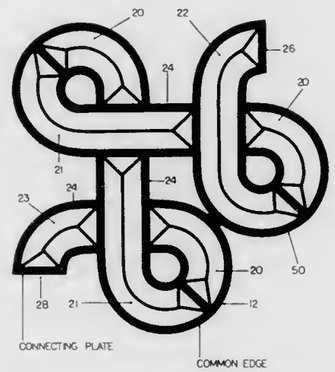
5,045,369
**PLASTIC CONTAINER AND METHOD FOR MANUFACTURING THE SAME**
Yukio Kobayashi; Hidenori Azegami, and Hitoshi Sasaki, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
Filed May 4, 1989, Ser. No. 347,271
Claims priority, application Japan, May 6, 1988, 63-109976; Jul. 11, 1988, 63-172447; Jul. 15, 1988, 63-176347
Int. Cl.[5] B65D *25/00*
U.S. Cl. 428—36.7 7 Claims




1. A container including an inner layer and an outer layer each made of a thermoplastic material, a barrier layer disposed between said inner and outer layers and made of a resin material of which gas barrier property can be improved by stretching, said barrier layer being held between the inner and outer layers with the resin material constituting the barrier layer in a stretched condition, the thermoplastic material in said inner and outer layers being in substantially non-stretched condition.

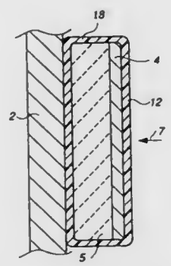
5,045,370
**ORNAMENTAL WINDOW PANE ASSEMBLY**
Randolph J. Raum, Orange, Calif., assignor to Creative Craftsmen Co. Inc., Naperville, Ill.
Filed Feb. 15, 1989, Ser. No. 311,474
Int. Cl.[5] B44F *1/06*
U.S. Cl. 428—38 6 Claims

1. A window pane comprising, at least in part, a plurality of clusters of beveled glass plates, said clusters being in the plane of the window pane and arranged to provide an ornamental pattern within the window pane, each cluster having an outwardly extending end plate having a leading edge of predetermined width, with the width of the leading edges of the end plates of all the clusters forming said ornamental pattern being




essentially of the same dimension, with the end plates of adjacent clusters aligned with each other to arrange the leading edges in registration facing each other.

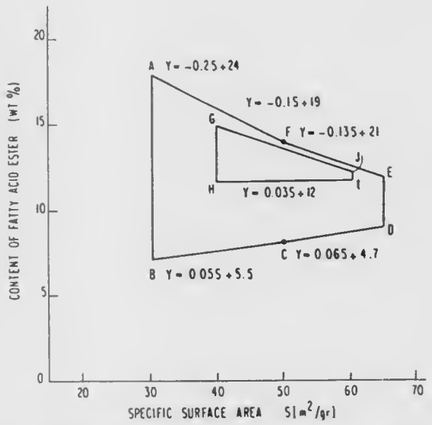
5,045,371
**GLASS MATRIX ARMOR**
Noel C. Calkins, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 5, 1990, Ser. No. 461,597
Int. Cl.[5] B32B *1/06;* F41H *5/04*
U.S. Cl. 428—49 24 Claims



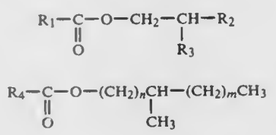

1. An armor system comprised of:
a. a plurality of constraint cells, each cell being comprised of a hollow rectangular parallelepiped having a projectile-receiving wall and lacking a wall opposite said receiving wall;
b. a substrate having a first surface on which said constraint cells are disposed such that said first substrate surface is substantially covered by constraint cells and provides a closure wall for each constraint cell;
c. a front plate located inside each constraint cell, parallel to and in contact with substantially all of the interior surface of said receiving wall; and
d. projectile-abrading filler material which occupies all of the interior volume of each constraint cell except that volume occupied by said front plate, where said projectile-abrading filler material is comprised of a flat plate of (1) glass or (2) a glass matrix having ceramic particles dispersed throughout it, said flat plate being parallel to said front plate.



5,045,372
**MAGNETIC RECORDING MEDIUM CONTAINING FERROMAGNETIC METAL POWDER AND A SPECIFIC FATTY ACID ESTER IN A CONTENT DEPENDENT UPON THE SPECIFIC SURFACE AREA OF THE FERROMAGNETIC METAL POWDER**
Yasushi Endo; Mikihiko Kato; Yasuo Nagashima, and Yasuyuki Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jan. 18, 1990, Ser. No. 466,809
Claims priority, application Japan, Jan. 19, 1989, 1-10299; Nov. 30, 1989, 1-311559
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—64 4 Claims

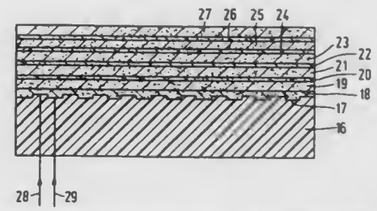



1. A magnetic recording medium having on a non-magnetic support a magnetic layer consisting essentially of a ferromagnetic metal powder and a binder resin, wherein the specific surface area S ($m^2/g$) of the ferromagnetic metal powder is from 30 to 65 and the magnetic layer further contains a fatty acid ester in a content Y (% by weight) to the ferromagnetic metal powder of the range of $0.05S+5.5 \leqq Y \leqq -0.25 +24$ when the specific surface area S is from 30 to less than 50 and the range of $0.06S+4.7 \leqq Y \leqq -0.13S+21$ when the specific surface area S is from 50 to 65, and wherein the fatty acid ester selected from the group consisting of fatty acid esters represented by formula (I) and (II):




wherein $R_1$ represents a straight chain or branched alkyl or alkenyl group having from 15 to 29 carbon atoms; $R_2$ and $R_3$ each represents an alkyl group and the sum of the carbon atoms of $R_2$ and the carbon atoms of $R_3$ is from 14 to 20; $R_4$ represents a straight chain or branched alkyl or alkenyl group having from 7 to 29 carbon atoms; and n and m each represent an integer, n being an integer of 2 or more and the sum of n and m being from 7 to 33.

5,045,373
**LAMINATED PRODUCT, COMPOUND USED IN THE LAMINATED PRODUCT AND OPTICAL INFORMATION CARRIER PROVIDED WITH THE LAMINATED PRODUCT**
Martinus M. Sens, Eindhoven; Theodorus C. J. M. Bertens, Bladel; Hendricus F. J. J. Van Tongeren, Waalre, and Johannes T. H. Thijssen, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 283,415, Dec. 12, 1988, abandoned. This application Feb. 14, 1990, Ser. No. 481,669
Claims priority, application Netherlands, Apr. 13, 1988, 8800955
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 8 Claims

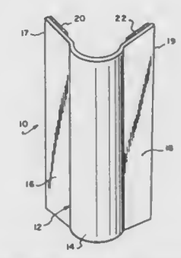



1. A laminated product provided with a substrate and a thin layer of an inorganic dielectric compound, characterized in that the dielectric compound is the suboxide of gallium antimonide or indium antimonide, which corresponds to the formula

$$[R_qSb_{1-q}]_xO_{1-x} \quad (3)$$

wherein R represents the element gallium or indium, q has a value of 45–55 at. % and x has a value of 33–99 at. %.

5,045,374
**DRYWALL EDGE FINISHING STRIP**
Richard E. Tucker, 8161 La Monte Rd., Anaheim, Calif. 92804
Filed Mar. 13, 1990, Ser. No. 492,138
Int. Cl.[5] E04B *2/00*
U.S. Cl. 428—83 19 Claims

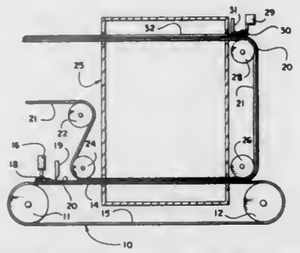



1. A drywall edge finishing strip comprising an elongated length of stiff, water impervious plastic defining an elongated central transversely curved region and a pair of laterally and linearly directed flanges that extend in diverging fashion from said central curved region wherein each of said flanges has a wall contacting surface which is flat and planar throughout, and a layer of pressure sensitive adhesive on each of said wall contacting surfaces of each of said flanges wherein said adhesive layer extends longitudinally therealong throughout said length to establish intimate contact and adhesive bonding with a wall surface against which it is pressed.

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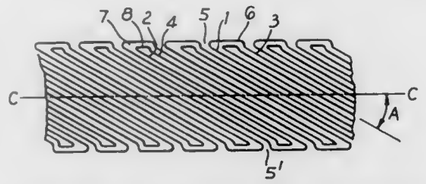


5,045,375
**NONSKID POLYURETHANE COATING**
William L. Davis, Rocky Face; Stanley M. Printz, Lafayette, and Timothy W. Brown, Dalton, all of Ga., assignors to Standard Adhesive & Chemical Co., Inc., Dalton, Ga.
Filed Apr. 7, 1989, Ser. No. 334,363
Int. Cl.[5] B32B *33/00*
U.S. Cl. 428—96 14 Claims



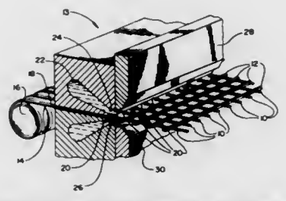
11. A carpet having a nonskid coating, said carpet including a carpet backing having face yarns sewn therein, a precoat adhering said face yarns to said backing, and a secondary coating adhered to said precoat, said secondary coating comprising a polyurethane including a tackifier for rendering said secondary coating permanently tacky, said polyurethane of said secondary coating being the result of a reaction of an isocyanate, a polyol, and an amine, said isocyanate being reduced for enhancing the tackiness provided by said tackifier.

5,045,376
**REINFORCED POLYMERIC ARTICLE**
Eric Holroyd, Knutsford, and David J. B. Perkins, Liverpool, both of England, assignors to Bridgestone/Firestone, Inc., Akron, Ohio
PCT No. PCT/GB88/00987, § 371 Date May 1, 1990, § 102(e) Date May 1, 1990, PCT Pub. No. WO89/04772, PCT Pub. Date Jun. 1, 1989
ub. Date DNov. 14, 1988, Ser. No. 474,131
Claims priority, application United Kingdom, Nov. 13, 1987, 8726630
Int. Cl.[5] B32B *5/12*
U.S. Cl. 428—105 15 Claims



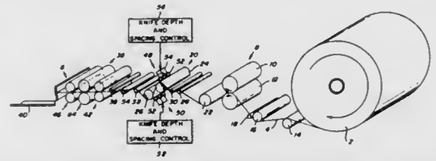
1. A flexible reinforced polymeric article comprising at least one layer (12) of flexible polymeric material and at least two flexible reinforcement elements (1,2) secured to said polymeric material, characterised in that one flexible element (1) extends successively to and fro across the polymeric material from a first edge region (5) toward a second edge region (5') and back to the first edge region (5) and a second flexible element (2) extends successively to and fro across the polymeric material from the second edge region (5') toward the first edge region (5) and back to the second edge region (5'), successive portions (4) of said second flexible element (2) being arranged to lie in spaces between successive portions (3) of the first flexible element (1) extending to and from said first edge region (5) whereby successive portions of each element lie interdigitated with successive portion of the other element in a manner free of cross-over of the elements.

5,045,377
**HIGH PERFORMANCE CONTINUOUS FIBER REINFORCED COMPOSITE GRID**
Charles D. Amata, Plymouth, Minn., assignor to Leucadia, Inc., New York, N.Y.
Continuation of Ser. No. 254,316, Oct. 5, 1988, abandoned. This application Sep. 14, 1990, Ser. No. 583,009
Int. Cl.[5] B32B *3/18, 5/26;* B29C *39/18*
U.S. Cl. 428—107 15 Claims



1. In a plastic grid structure comprised of first and second sets of intersecting generally transverse series of polymeric elongate members in which the members of each set cross and intersect at more or less regular intervals with each other to form a net-like structure, the improvement comprising: providing at least some of the strand members of at least one of the sets with compound composite reinforced structure.

5,045,378
**PAPERBOARD SHEETS WITH A SCRIBED GRID AND A METHOD FOR MAKING THE SAME**
Edward L. Libby, Big Canoe, Ga., assignor to Specialty Paperboard Inc., Keene, N.H.
Continuation-in-part of Ser. No. 195,819, May 19, 1988, abandoned. This application May 2, 1989, Ser. No. 346,453
Int. Cl.[5] B32B *3/00, 31/00;* D21H *11/00*
U.S. Cl. 428—153 6 Claims



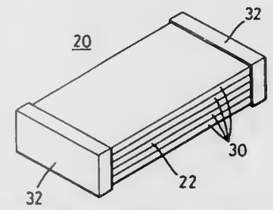
1. A paperboard sheet used for signs and posters, comprising a layer of finished paperboard material having smooth surfaces, a density of 0.8 g/cc and a moisture content of between 6.5 and 7.5% weight, at least one of said layer surfaces containing a plurality of scribed lines extending continuously thereacross between the edges thereof, said lines being formed by delivering a web of finished paperboard from a roll, tensioning the web, scribing the web surface simultaneously with tensioning of the web and shearing the scribed web into individual generally planar sheets.

5,045,379
**POLYESTER FILM FOR HIGH DENSITY MAGNETIC RECORDING MEDIUM**
Tomoyuki Kotani, Machida; Shigeo Utsumi, and Kichinojo Tomitaka, both of Yokohama, all of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan
Filed Jun. 2, 1989, Ser. No. 360,544
Claims priority, application Japan, Jun. 3, 1988, 63-136749; Jun. 13, 1988, 63-145039
Int. Cl.[5] B32B *3/00, 27/00, 27/36*
U.S. Cl. 428—156 8 Claims
1. A polyester film suitable for a base of a high density



magnetic recording medium containing barium ferrite as a magnetic recording medium and containing carbon black, in which the centerline average roughness (Ra) is not more than 0.025 μm, the $F_5$ value in the longitudinal direction is not less than 14 kg/mm$^2$, the light transmittance at a wavelength of 900 nm, when the thickness of said film is 9 μm, is not more than 80% and the number of surface protrusions, the height of which is not less than 0.81 μm, is not more than 80/25 cm$^2$.

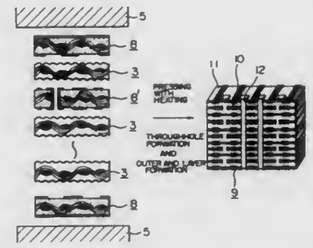
5,045,380
**LAMINATION TYPE INDUCTRO**
Takashi Kobayashi; Hiroyuki Takeuchi, and Minoru Tamada, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan
Filed Aug. 23, 1989, Ser. No. 397,652
Claims priority, application Japan, Aug. 24, 1988, 63-211060
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—195 1 Claim



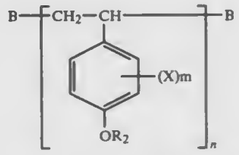
1. A lamination type inductor, comprising:
a ferrite layer having opposite main surfaces each with a periphery including opposite ends having end edges thereat, said ferrite layer further having end edges at the opposite ends of said main surfaces and a through hole therein along the periphery, said ferrite layer having a conductor pattern on each main surface thereof, the conductor pattern on one main surface having a first end portion along one end of said one main surface and extending 0.75 turn from about the middle of said first end portion along the periphery of said one main surface of said ferrite layer to said through hole, and the conductor pattern on the other main surface having a second end portion along the other end of said other main surface and extending 0.75 turn from about the middle of said second end portion along the periphery of said other main surface of said ferrite layer to said through hole, said conductor patterns being electrically connected through said through hole for forming a substantially 1.5-turn coil;
outside ferrite layers laminated onto the opposite main surfaces of said ferrite layer and having outside end portions corresponding to the opposite ends of said ferrite layer; and
outside electrodes on the outside of said laminated body at the respective outside end portions of aid outside ferrite layers and the end edges of said ferrite layer and electrically connected with said first and second end portions.

5,045,381
**THERMOSETTING RESIN COMPOSITION, PRINTED CIRCUIT BOARD USING THE RESIN COMPOSITION AND PROCESS FOR PRODUCING PRINTED CIRCUIT BOARD**
Masao Suzuki, Hitachi; Junichi Katagiri, Ibaraki; Akira Nagai, Hitachi; Masahiro Suzuki, Iwaki, and Akio Takahashi, Hitachiota, all of Japan, assignors to Hitachi, Ltd. and Hitachi Chemical Co., Ltd., both of Tokyo, Japan
Filed Sep. 27, 1989, Ser. No. 413,070
Claims priority, application Japan, Sep. 30, 1988, 63-246978
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 8 Claims
1. A printed circuit board, which comprises a conductor of a metallic foil and an insulating layer made of a fibrous substrate material impregnated and cured with a thermosetting resin composition, the thermosetting resin composition comprising a cyanate compound or an isocyanate compound represented by the following general formula (I):

$$A-R_1-A \quad \text{(I)}$$

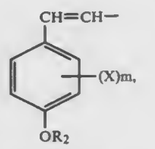


wherein $R_1$ is an aromatic group, an alicyclic group or a mixed group thereof and A is a cyanate group or an isocyanate group, and a poly-(p-hydroxystyrene) derivative represented by the following general formula (II):



(II)

wherein X is a fluorine atom, a bromine atom or a chlorine atom, $R_2$ is an alkenyl group and an unsaturated carboxyl group, each having 2 to 4 carbon atoms, B is any one of a polymerization initiator residue, a polymerization-terminating agent residue, H and



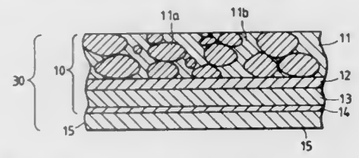
m is an integer of 1 to 4 and n is an integer of 5 to 100; a mixing ratio of the cyanate compound or isocyanate compound represented by the general formula (I) to the poly-(p-hydroxystyrene) derivative represented by the general formula (II) is in the range of 20:80 to 80:20 by weight.

5,045,382
**THERMAL INK-TRANSFER RECORDING MEDIUM**
Eiichi Akutsu; Hiroo Soga; Koichi Saito, and Kiyoshi Horie, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 399,355, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 217,784, Jul. 12, 1988, abandoned. This application Mar. 8, 1990, Ser. No. 492,348
Claims priority, application Japan, Jul. 16, 1987, 62-176043
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—216 5 Claims
1. A thermal ink-transfer recording medium comprising: an inisotropically electroconductive layer formed by dispersing an electroconductive powder with an average particle size of 10 μm to 2 mm in a thermosetting resin, shaping the blend into sheet form, and heat-curing the sheet while being compressed

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in the direction of its thickness, said anisotropically conductive layer having an electrical resistance in the direction of its thicknesses of 10 $\Omega/mm^2$ or less, an electrical resistance in the direction of its width of at least $10^5$ $\Omega/mm^2$, a thickness within the range of 20 μm to 5 mm, and said electroconductive powder being a granular material having a volume resistivity of 10 Ω-cm or less; a heat-generating resistive layer; a pickup elec-




trode layer formed of a material having a volume resistivity not higher than $10^{-1}$ Ω-cm; an ink release layer formed of a thin film having a critical surface tension of 43 dynes/cm or less; and a heat-fusivle ink layer formed of a thermoplastic resin having a melting point not higher than 130° C. and a colorant dispersed therein, said heat-fusible ink layer being capable of being fused by the heat-generated from said heat-generating resistive layer.

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**5,045,383**

**THERMOSENSITIVE IMAGE TRANSFER RECORDING MEDIUM**

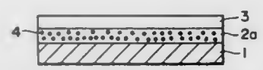
**Mitsuru Maeda, Shizuoka; Minoru Hakiri; Kazuhiro Hasebe, both of Numazu; Masaaki Kobayashi, Tokyo, and Hiroki Sugiyama, Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 296,025, Jan. 12, 1989, abandoned. This application Dec. 26, 1989, Ser. No. 456,465**

**Claims priority, application Japan, Jan. 18, 1988, 63-8876; May 18, 1988, 63-120841; May 8, 1989, 1-113667**

**Int. Cl.[5] B41M *5/26***

**U.S. Cl. 428—216** **51 Claims**




1. A thermosensitive image transfer recording medium, capable of yielding images under application of heat by a thermal head, comprising a support, a release layer formed thereon comprising as the main components an unvulcanized rubber and a thermofusible wax component, and a thermofusible ink layer comprising a coloring agent and a thermofusible resin component, formed on said release layer.

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**5,045,384**

**POLYESTER LAMINATED FILM**

**Satoshi Otonari, Nagahama, Japan, assignor to Diafoil Company, Limited, Tokyo, Japan**

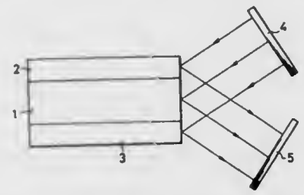
**Filed Mar. 9, 1990, Ser. No. 491,446**

**Claims priority, application Japan, Mar. 16, 1989, 1-64756**

**Int. Cl.[5] B32B *7/02***

**U.S. Cl. 428—218** **7 Claims**

1. A polyester laminated film comprising three discrete layers; an inner layer surrounded by two outer layers, said polyester inner layer having a density greater than 1.3 $g/cm^3$




and said two polyester outer layers on both sides of said inner layer containing fine closed cells and having a density in the range of 0.4 to 1.3 $g/cm^3$.

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**5,045,385**

**FIRE RETARDANT COMPOSITION FOR BUILDING PANELS AND DOOR CORES**

**John S. Luckanuck, Burlington, Canada, assignor to Radixx World, Ltd., Burlington, Canada**

**Filed Aug. 30, 1989, Ser. No. 400,448**

**Int. Cl.[5] C09K *21/02*; E04B *1/94*; E06B *5/16***

**U.S. Cl. 428—220** **2 Claims**

1. A fire retardant core for a wooden door, said core being a cured pressed sheet of a thickness of at least ½" and having a composition consisting essentially of (a) 30 to 75% by weight of an inert mineral filler selected from the group consisting of perlite and vermiculite, (b) 10 to 40% by weight of glass fibers having a diameter in the range of about 10 to 15 microns and lengths under 1" and (c) from 3 to 15% by weight of a binder which is a mixture of an alkali metal silicate and a curable phenolic resin.

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**5,045,386**

**PRESSURE-SENSITIVE FILM COMPOSITE HAVING IMPROVED ADHESION TO PLASTICIZED VINYL SUBSTRATES**

**Lelia A. M. Stan, Duesseldorf; Naimul Karim, Dormagen; Georg H. Feichtmeier, Rommerskirchen, and Heiner Johannsen, Viersen, all of Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Feb. 1, 1989, Ser. No. 305,154**

**Int. Cl.[5] B32B *7/12, 25/02, 25/14***

**U.S. Cl. 428—262** **7 Claims**

1. An article comprising:
(a) a canvas substrate having a surface comprising plasticized polyvinyl chloride;
(b) a first polyurethane polymeric film adhered to said surface with a pressure-sensitive adhesive consisting essentially of at least one nitrile butadiene rubber; and
(c) at least a second polyurethane polymeric film overlaying said first polyurethane polymeric film.

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**5,045,387**

**REWETTABLE POLYOLEFIN FIBER AND CORRESPONDING NONWOVENS**

**A. Chandler Schmalz, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Jul. 28, 1989, Ser. No. 386,316**

**Int. Cl.[5] B32B *27/00***

**U.S. Cl. 428—284** **17 Claims**

1. A nonwoven material formed from one or more webs of polyolefin fiber, fibrillated film or combination thereof, having applied thereon an effective amount of a modifier composition comprising at least one of
(a) a component containing alkoxylated ricinolein with up to about 15%, by weight of modifier composition, of an 18 carbon fatty acid;
(b) a corresponding hydrogenated derivative of component (a); and



(c) a polyalkoxylated polydimethylsiloxane having up to about 80% by weight of modifier composition, of component (a), (b) or combination thereof.

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**5,045,388**

**PROCESS FOR MAKING COMPOSITES OF STRETCH BROKEN ALIGNED FIBERS AND PRODUCT THEREOF**

**Archie R. Bice, Landenberg, Pa.; David H. Edison, Hockessin, Del.; Floyd H. Fish, Jr., Centreville, Del.; Mark W. Hopkins, Newark, Del., and Richard K. Okine, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.**

**Division of Ser. No. 344,973, Apr. 26, 1989. This application Jul. 31, 1990, Ser. No. 560,863**

**Int. Cl.[5] B32B *5/08, 5/12, 31/20***

**U.S. Cl. 428—294** **11 Claims**

1. A tow of a matrix resin reinforced with substantially axially aligned fibers broken in a random manner from a process of: feeding a thermoplastic resin matrix tow reinforced with continuous filament fibers into a tensioning zone; heating said tow in said tensioning zone to soften said thermoplastic resin while tensioning said tow sufficiently to break all of said continuous filament fibers in a random manner; and cooling said tow.

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**5,045,389**

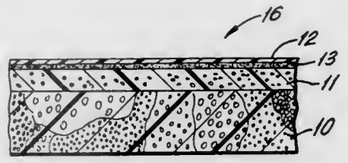
**CARPET PADDING COMPRISING COVER FILM, AND PRIME AND REBOND FOAM LAYERS**

**Joseph A. Campagna, Budd Lake, N.J., assignor to PMC, Inc., Sun Valley, Calif.**

**Filed May 23, 1990, Ser. No. 527,176**

**Int. Cl.[5] B32B *3/26, 5/22, 5/32***

**U.S. Cl. 428—316.6** **30 Claims**




1. An improved laminated article adapted for use as carpet padding comprising a bottom layer of rebonded flexible polyurethane foam, an intermediate layer of flexible prime polyurethane foam and a top layer of polymer film.

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**5,045,390**

**MAGNETIC RECORDING MEDIUM**

**Ryosuke Isobe, and Yasuo Ando, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan**

**Filed Apr. 17, 1989, Ser. No. 339,496**

**Claims priority, application Japan, Apr. 22, 1988, 63-100918; Apr. 28, 1988, 63-107213**

**Int. Cl.[5] G11B *23/00***

**U.S. Cl. 428—329** **5 Claims**




1. A magnetic recording medium comprising a non magnetic support having thereon a magnetic layer comprising a binder and magnetic metal particles dispersed therein, said particles having a specific surface area of at least 45 $m^2/g$ and comprising iron atoms and aluminum atoms in an atomic concentration ratio of 100:1 to 100:20, said particles having a superficial portion which is approximately the outer 100 angstroms of each of said particles, a superficial ratio of said iron atoms to said aluminum atoms in said superficial portion being from 30:70 to 70:30.

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**5,045,391**

**RELEASE COATINGS FOR DIELECTRIC SUBSTRATES**

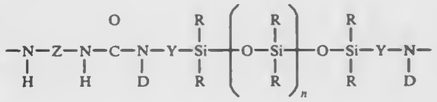
**Patricia J. A. Brandt, Woodbury; Raymond J. Farm, White Bear Lake, and Paul J. Wang, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

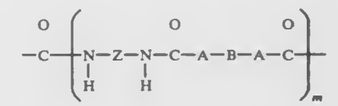
**Filed Feb. 23, 1990, Ser. No. 483,658**

**Int. Cl.[5] B32B *9/04***

**U.S. Cl. 428—336** **13 Claims**

1. An image release sheet comprising:
(a) a substrate on which one major surface thereof is a dielectric-layer; and
(b) a silicone-urea block polymer coating on top of said dielectric layer, said coating being sufficiently thin so as to not substantially affect the dielectric properties of said substrate, said block polymer having a weight percent of 1–65 weight percent of silicone, and represented by the formula:





wherein:
Z is a divalent radical selected from the group consisting of phenylene, alkylene, aralkylene and cycloalkylene;
Y is an alkylene radical of 1 to 10 carbon atoms;
R is at least 50% methyl with the balance of the 100% of all R radicals being selected from the group consisting of methyl and a monovalent alkyl radical having from 2 to 12 carbon atoms, a vinyl radical, a phenyl radical, and a substituted phenyl radical;
D is selected from the group consisting of hydrogen, and an alkyl radical of 1 to 10 carbon atoms;
B is selected from the group consisting of alkylene, aralkylene, cycloalkylene, azaalkylene, cycloazaalkylene, phenylene, polyalkylene oxides, polyethylene adipate, polycaprolactone, polybutadiene, a radical completing a ring structure including A to form a heterocycle and mixtures thereof;
A is selected from the group consisting of



where G is selected from the group consisting of hydrogen, an alkyl radical of 1 to 10 carbon atoms, phenyl, a radical which completes a ring structure including B to form a heterocycle and mixtures thereof;
n is an integer which is 4 or larger; and
m is an integer which is zero to 25.

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5,045,392
**SHEET MATERIAL CARRYING A STRIPPABLE GLOSS-CONTROLLING LAYER**
**Eddie R. Daems, and Luc H. Leenders, both of Herentals, Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium**
**Division of Ser. No. 284,363, Dec. 14, 1988, Pat. No. 4,925,767. This application Feb. 9, 1990, Ser. No. 477,722**
**Claims priority, application France, Jan. 12, 1988, 88200031.8**
**Int. Cl.[5] B32B** *23/04, 23/20;* **G03C** *11/06*
**U.S. Cl. 428—341** **8 Claims**



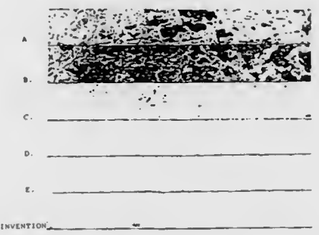

1. A sheet material comprising a cellulose triacetate temporary support carrying a continuous wet-strippable layer in direct contact therewith, wherein said continuous layer is a non-photosensitive layer containing hardened gelatin, the gelatin being applied at a coverage of at most 20 g/m$^2$ and the hardening of the gelatin corresponding with a hardening resulting from the addition of at least 0.001 g of formaldehyde per gram of gelatin.

5,045,393
**METHOD FOR PROVIDING A POLYOLEFIN RESIN SUBSTRATE WITH AN ADHESIVE LAYER**
**Shuichi Kumanoya, Minoo; Makoto Yamamoto, Shiga; Katsumi Sasaki, Osaka, and Masahiko Nishimura, Kawanishi, all of Japan, assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.**
**Filed Aug. 16, 1989, Ser. No. 394,700**
**Int. Cl.[5] B05D** *5/10;* **B32B** *7/12*
**U.S. Cl. 428—353** **8 Claims**

1. A method for providing a polyolefin resin substrate with an adhesive coating having high adhesiveness and thermal resistance comprising the steps of:
(a) coating the surface of said polyolefin resin substrate with a primer film of hydroxy hydrocarbon polymer having at least two hydroxy groups wherein the principal chain is saturated or substantially saturated and the number average molecular weight of said hydroxy hydrocarbon polymer is about 500 to 20,000, said hydroxy hydrocarbon polymer being in a wax state at room temperature, and catalyst which accelerates the reaction of OH radicals with NCO radicals, and
(b) coating said primer film with a molten layer of a moisture setting hot melt urethane adhesive comprising a urethane prepolymer containing at least 2 NCO radicals in its molecular structure, is solid at room temperature and has a viscosity of about 2,000 to 70,000 cps at 120° C., wherein the equivalent ratio of NCO radical in said moisture setting hot melt adhesive to the OH radical in said hydroxy hydrocarbon polymer is 0.8 to about 25,000.

7. A polyolefin resin substrate coated with a first primer film containing a hydroxy hydrocarbon polymer having at least 2 hydroxy groups wherein the principal chain is saturated or substantially saturated and the number average molecular weight of said hydroxy hydrocarbon polymer is about 500 to 20,000, and catalyst which accelerates the reaction of OH radicals with NCO radicals, a hot melt adhesive coating layer of a moisture setting molten urethane prepolymer hot melt adhesive coated on said first primer film, said urethane prepolymer containing at least 2 NCO radicals in its molecular structure and having a viscosity of about 2,000 to 70,000 cps at 120° C., and the equivalent ratio of NCO radicals in said hot melt adhesive to the OH radical in said hydroxy hydrocarbon polymer is 0,8 to about 25,000, thereby providing an instant adhesive surface having a strong initial bond strength.

5,045,394
**WRITEABLE PHOTOGRAPHIC SUPPORT MATERIALS**
**Eckehard Säverin, Osnabrück, and Hans-Udo Tyrakowski, Hasbergen, both of Fed. Rep. of Germany, assignors to Felix Schoeller jr. GmbH & Co. KG, Osnabruck, Fed. Rep. of Germany**
**Filed Oct. 21, 1988, Ser. No. 260,737**
**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1987, 3735871**
**Int. Cl.[5] B32B** *5/16*
**U.S. Cl. 428—402** **12 Claims**




1. A photographic support material for light sensitive layers in the form of a plastic coated paper or plastic foil the backside of which has a further coating thereon, said further coating including a styrene-butadiene-methacrylate terpolymer and an aluminium modified colloidal silica.

5,045,395
**CROSSLINKED BEAD POLYMERS AND THEIR PREPARATION**
**Wolfgang Podszun, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Filed Aug. 15, 1990, Ser. No. 567,844**
**Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930141**
**Int. Cl.[5] C08F** *8/00, 246/00, 230/08*
**U.S. Cl. 428—402** **17 Claims**

1. Bead polymers made from vinyl monomers selected from the group consisting of (meth)acrylates and styrenes and crosslinked by Si—O—Si groups, these polymers having an average particle diameter in the range of from 0.5–10 μm and a particle size distribution represented by a K value of from about 0.001–0.5.

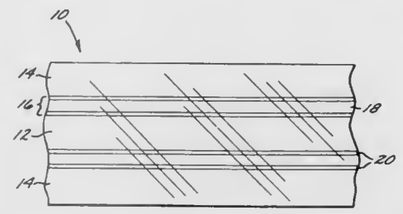
5,045,396
**UV RESISTANT PRIMER**
**Shaow B. Lin, Allison Park, and Gary J. Marietti, Cheswick, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**
**Filed Nov. 23, 1988, Ser. No. 275,494**
**Int. Cl.[5] B32B** *27/36*
**U.S. Cl. 428—412** **10 Claims**

1. An optically transparent, ultraviolet radiation resistant coated article comprising:
a. an optically transparent rigid polycarbonate substrate; and
b. a transparent ultraviolet radiation resistant coating comprising:



(1) an organic compound which absorbs ultraviolet radiation; and
(2) a film-forming polymer comprising a mixture of alkyl acrylates and having a glass transition temperature between 65° C. and 105° C.

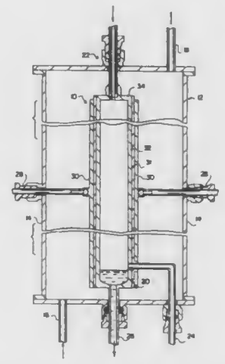
5,045,397
**OPTICAL ADHESIVE SYSTEM HAVING LOW REFRACTIVE INDEX**
**John E. Jensen, Newbury Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**
**Filed Feb. 13, 1987, Ser. No. 14,555**
**Int. Cl.[5] B32B** *9/00;* **C09J** *5/04*
**U.S. Cl. 428—429** **5 Claims**




1. A process for bonding together two transparent pieces of glass to form an optical glass laminate, comprising the steps of:
contacting the glass surfaces to be bonded with a solution of an organosilane coupling agent having at least one functional group capable of reacting with a hydroxyl group;
preparing an adhesive consisting of a mixture of
a monomer selected from the group consisting of pentadecafluorooctyl acrylate, tetrafluoro-3-(heptafluoropropoxy) propyl acrylate, tetrafluoro-3-(pentafluoroethoxy) propyl acrylate, undecafluorohexyl acrylate, nonafluoropentyl acrylate, tetrafluoro-3-(trifluoromethoxy) propyl acrylate, pentafluorovinyl propionate, heptafluorobutyl acrylate, trifluorovinyl acetate, octafluoropentyl acrylate, pentafluoropropyl acrylate, 2-(heptafluorobutoxy) ethyl acrylate, 2,2,3,4,4,4-hexafluorobutyl acrylate, trifluoroethyl acrylate, 2-(1,1,2,2-tetrafluoroethoxy) ethyl acrylate, trifluoroisopropyl methacrylate, 2,2,2-trifluoro-1-methylethyl methacrylate, 2-(trifluoroethoxyethyl) acrylate, trifluoroethyl methacrylate, 4-fluoro-2-trifluoromethylstyrene, 2-methoxyethyl acrylate, butyl acrylate, tert-butyl methacrylate, 3-ethoxypropyl acrylate, and vinyl acetate, and mixtures thereof,
a thickening agent, and
an initiator agent for the polymerization of the monomer;
placing a layer of the adhesive between the pieces of glass; and
polymerizing the adhesive at a temperature at which the adhesive after polymerization is transparent and noncrystalline, thereby bonding together the pieces of glass.

5,045,398
**SILICON CARBIDE PRODUCT**
**Harry Levin, 1983 Friar St., Woodland Hills, Calif. 91367**
**Division of Ser. No. 153,126, Feb. 8, 1988, Pat. No. 4,900,531, which is a continuation-in-part of Ser. No. 749,661, Jun. 28, 1985, Pat. No. 4,668,493, which is a continuation-in-part of Ser. No. 618,712, Jun. 8, 1984, Pat. No. 4,737,348, said Ser. No. 749,661, is a continuation-in-part of Ser. No. 390,920, Jun. 22, 1982, abandoned, said Ser. No. 618,712, is a division of Ser. No. 390,920, Jun. 22, 1982, abandoned. This application Jan. 9, 1990, Ser. No. 462,260**
**Int. Cl.[5] B32B** *33/00*
**U.S. Cl. 428—446** **9 Claims**

1. A silicon carbide no-growth product comprised of a carbon or graphite object being converted to silicon carbide by being in contact with a silicon liquid and vapor for a preselected period of time and temperature sufficient to replace carbon (c) atoms with silicon carbide atoms to substantially fill



all voids whereby an increase in the density of said converted carbon or graphite object is produced with substantially no growth.

5,045,399
**ORGANOBOROSILAZANE POLYMERS**
**Leonard M. Niebylski, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.**
**Continuation-in-part of Ser. No. 147,183, Jan. 22, 1988, abandoned. This application Sep. 9, 1988, Ser. No. 242,493**
**Int. Cl.[5] B32B** *18/00;* **C08G** *77/56, 79/08*
**U.S. Cl. 428—447** **30 Claims**

1. A process which comprises reacting about 0.25–20 parts by weight of a trialkylboroxine or trialkoxyboroxine in which the alkyl or alkoxy groups contain 1–6 carbons with one part by weight of a polysilazane to form an organoborosilazane polymer.

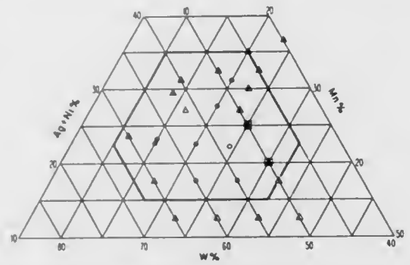
12. An organoborosilazane polymer prepared by the process of claim 1.

23. A composition which comprises a solution of 5–75% by weight of an organoborosilazane polymer in 95–25% by weight of an organic solvent; the polymer being the product obtained by reacting about 0.25–20 parts by weight of a trialkylboroxine or trialkoxyboroxine in which the alkyl or alkoxy groups contain 1–6 carbons with one part by weight of a polysilazane.

5,045,400
**COMPOSITION FOR AND METHOD OF METALLIZING CERAMIC SURFACE, AND SURFACE-METALLIZED CERAMIC ARTICLE**
**Kiyoyuki Esashi, Higashiosaka, Japan, assignor to Nippon Hybrid Technologies Co., Ltd., Osaka, Japan**
**Filed Feb. 1, 1990, Ser. No. 473,326**
**Claims priority, application Japan, Jun. 2, 1989, 1-27296**
**Int. Cl.[5] B32B** *15/04;* **C22C** *27/04, 22/00*
**U.S. Cl. 428—450** **7 Claims**

5. A metallized ceramic article comprising a ceramic body having a surface metallized with a composition consisting essentially of 10 to 32.5% by weight of Mn, 45.0 to 67.5% by

weight of W, up to 5.0% by weight of at least one member selected from Ti and Zr, and Ag and Ni in a total amount of




15.0 to 35.0% by weight, the amount of Ni being 5.0 to 20.0% by weight of the total amount of Ni and Ag.

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**5,045,401**

## NON-ISOTHERMAL CRYSTALLIZABLE ADHESIVE COMPOSITIONS FOR MULTILAYER LAMINATED STRUCTURES

**Ricky L. Tabor, Lake Jackson; Gerald M. Lancaster, Freeport; Michael W. Potts, Angleton, and Thomas I. Butler, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Dec. 21, 1989, Ser. No. 455,537**
**Int. Cl.[5] B32B *27/08***
**U.S. Cl. 428—516** **30 Claims**

1. A method of improving the adhesive strength of an adhesive layer to a polar barrier layer in a laminated multilayer film structure comprising the steps of:
(a) measuring the crystallization rate of an aliphatic polyolefin resin blend capable of forming a film structure and
(b) selecting the aliphatic polyolefin resin blend having a non-isothermal crystallization half-life of less than about 30 seconds for use as the adhesive layer.

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**5,045,402**

## ZIRCONIA TOUGHENING OF GLASS-CERAMIC MATERIALS

**Richard W. Adams, Jr., Marlboro, Mass.; David R. Clarke, Katonah, N.Y.; Sara H. Knickerbocker, Hopewell Junction, N.Y.; Linda L. Rapp, Poughkeepsie, N.Y., and Bernard Schwartz, Hartsdale, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 146,455, Jan. 21, 1988, abandoned, which is a continuation of Ser. No. 892,687, Aug. 1, 1986, abandoned. This application May 9, 1989, Ser. No. 348,980**
**Int. Cl.[5] B32B *15/04*; C03C *10/04***
**U.S. Cl. 428—545** **13 Claims**

1. An article at least a part of which comprises:
a ceramic body consisting essentially of at least about 75 volume percent of a dielectric glass ceramic and the remainder being a finite amount of a material selected from the group consisting of $ZrO_2$, $HfO_2$ and a mixture thereof in the form of particles having a size between about 0.5 and about 8.0 microns, said particles having a tetragonal crystalline structure and being sufficiently dispersed within said ceramic body to increase the fracture toughness of said ceramic body;
said material further containing an oxide compound selected from the group consisting of MgO, CaO, $Y_2O_3$, $TiO_2$ and rare earth oxides, there being at least enough of said oxide to stabilize said tetragonal structure of said material, and
an electrical conductor pattern within said ceramic body, said conductor pattern having a melting temperature greater than the crystallization temperature of said glass ceramic.

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**5,045,403**

## HONEYCOMB BODY WITH INTERNAL LEADING EDGES, IN PARTICULAR A CATALYST BODY FOR MOTOR VEHICLES

**Wolfgang Maus; Helmut Swars, both of Bergisch Gladbach, and Ludwig Wieres, Overath, all of Fed. Rep. of Germany, assignors to Emitec Gesellschaft Für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany**

**Filed Jul. 27, 1990, Ser. No. 559,370**
**Claims priority, application Fed. Rep. of Germany, Jul. 27, 1989, 8909128[U]**
**Int. Cl.[5] B01J *35/04*; F01N *3/28***
**U.S. Cl. 428—593** **30 Claims**



1. Honeycomb body having end surfaces and an interior, comprising at least partly structured metal sheets forming walls of a plurality of channels through which a fluid can flow, some of said sheets having a primary corrugation with crests, troughs and a given corrugation height, and at least one of said crests and said troughs having a plurality of inverted regions with a height being at most equal to said given corrugation height and having a quantity per unit of volume increasing from one of said end surfaces to the other as seen in the direction of said channels formed by said primary corrugation, said inverted regions defining leading edges in the interior of the honeycomb body.

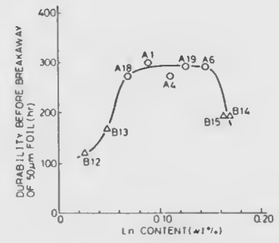
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**5,045,404**

## HEAT-RESISTANT STAINLESS STEEL FOIL FOR CATALYST-CARRIER OF COMBUSTION EXHAUST GAS PURIFIERS

**Keiichi Ohmura; Miko Yamanaka, both of Sagamihara; Fumio Fudanoki, Hikari; Masayuki Tendoh, Sagamihara; Kenji Hirashima, c/o Nippon Steel Corporation Hikari Works, 3434, Oaza Shimada, Hikari; Masaaki Kobayashi, Kitakyushu; Shinji Shibata, Toyota; Tomoyuki Sugino, Toyota; Toshihiro Takada, Toyota; Yoshio Nishizawa, and Akihiko Kasahara, both of Tokyo, all of Japan, assignors to Nippon Steel Corporation, Tokyo; Toyota Jidosha Kabushiki Kaisha, Toyota and Nippon Kinzoku Co., Ltd., Tokyo, all of, Japan**

**Filed Sep. 26, 1990, Ser. No. 588,434**
**Claims priority, application Japan, Mar. 27, 1989, 1-71960; Nov. 28, 1989, 1-306412**
**Int. Cl.[5] C22C *38/18***
**U.S. Cl. 428—606** **7 Claims**




1. A heat-resistant stainless steel foil for a catalyst-carrier of combustion exhaust gas purifiers, consisting essentially in weight percentage of:
more than 0.06 up to 0.15 of Ln, said Ln, being a mixture of La, Ce, Pr and Nd;



from 8x(%Ln+0.015)/45 to 0.1 of P;
from 4.5 to 6.5 of Al;
from 13 to 25 of Cr;
not more than 0.025 of C;
not more than 0.02 of N;
not more than 0.03 of C+N; and
the balance consisting of Fe and unavoidable impurities.

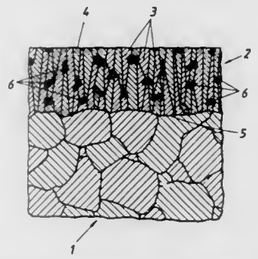
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**5,045,405**

## SLIDING SURFACE BEARING FOR HIGH LOADS

**Franz Koroschetz, and Walter Gartner, both of Gmunden, Austria, assignors to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria**

**PCT No. PCT/AT88/00054, § 371 Date Mar. 16, 1989, § 102(e) Date Mar. 16, 1989, PCT Pub. No. WO89/01094, PCT Pub. Date Feb. 9, 1989**
**ub. Date DJul. 22, 1988, Ser. No. 348,586**
**Claims priority, application Austria, Jul. 24, 1987, 1881/87**
**Int. Cl.[5] B32B *7/02***
**U.S. Cl. 428—612** **12 Claims**




12. A sliding surface bearing for high loads and designed for operation at a maximum operating temperature, which comprises
(a) a carrier comprised of a metal alloy including a main alloying constituent which is more than 50% by weight of the carrier; and
(b) a sliding layer physically applied in a vacuum directly to the carrier, the sliding layer being comprised of
(1) a metal alloy base material including a main alloying constituent which is more than 50% by weight of the sliding layer, and crystallized in the form of columns having a preferred orientation at right angles to the sliding surface, the main alloying constituents of the metal alloys of the carrier and of the base material being metals which do not form intermetallic compounds at the operating temperature, and
(2) finely divided particles embedded in the base material, the embedded particles being at least substantially insoluble in the base material at the operating temperature and having a lower hardness than the base material and a mean particle diameter below 3 μm;
wherein the volume content of the particles embedded in the sliding layer base material amounts to 5% to 45%;
wherein the metal alloys of the carrier and the sliding surface base material have different main alloying constituents and the melting points of the main alloying constituents are at least three times the operating temperature; and
wherein in the carrier and the sliding surface define an interfacial zone therebetween and the interfacial zone is at least substantially free of the embedded particles.

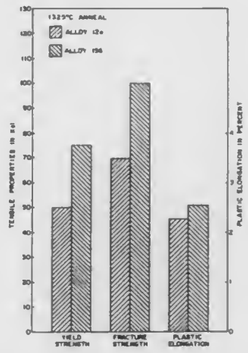
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**5,045,406**

## GAMMA TITANIUM ALUMINUM ALLOYS MODIFIED BY CHROMIUM AND SILICON AND METHOD OF PREPARATION

**Shyh-Chin Huang, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Jun. 29, 1989, Ser. No. 373,078**
**Int. Cl.[5] C22C *14/00*; C21D *1/00***
**U.S. Cl. 428—614** **16 Claims**




1. A chromium and silicon modified titanium aluminum alloy consisting essentially of titanium, aluminum, chromium, and silicon in the following approximate atomic ratio:

$Ti_{56-47}Al_{42-46}Cr_{1-3}Si_{1-4}$.

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**5,045,407**

## SILICON CARBIDE FIBER-REINFORCED TITANIUM BASE COMPOSITES HAVING IMPROVED INTERFACE PROPERTIES

**Ann M. Ritter, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 22, 1989, Ser. No. 455,048**
**Int. Cl.[5] C22C *1/09, 14/00***
**U.S. Cl. 428—614** **9 Claims**




1. A reinforced structural member which comprises,
a matrix of a titanium base alloy having an alpha-2 crystal structure,
an array of reinforcing silicon carbide filaments in said matrix,
a coating of a beta-phase stabilizer selected from the group consisting of Mo, Cr, W, Nb, Ta, Ir, Pd, Pt, Zr, Hf, Re, V, Ag, Mn, Fe, Co, Ni, Cu, Au, and Sn, on said filaments, and
said coating being interdiffused with said matrix to provide a beta-phase stabilized diffusion zone which is substantially free of cracks.

7. The method of reducing cracking at the interface of a silicon carbide filamentary reinforcement and a titanium base alloy matrix having alpha-2 crystal form which comprises,

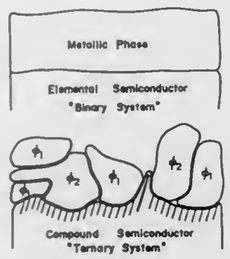
VOL 1130 ISS 1 SE 3 1991 UMI



depositing on the surface of the reinforcing filaments prior to assembly a coating of a beta-phase stabilizer metal,
plasma spray depositing the matrix onto said filamentary reinforcement, and
consolidating the filamentary reinforcement into said matrix by heat and pressure.

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**5,045,408**
**THERMODYNAMICALLY STABILIZED CONDUCTOR/COMPOUND SEMICONDUCTOR INTERFACES**
**R. Stanley Williams, Panorama City, and Jeffrey R. Lince, Los Angeles, both of Calif., assignors to University of California, Oakland, Calif.**
**Filed Sep. 19, 1986, Ser. No. 909,461**
**Int. Cl.[5] B32B *15/00*; H01L *29/46***
**U.S. Cl. 428—620** **5 Claims**

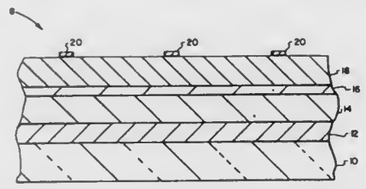



1. A thermodynamically stable intermetallic-compound-/compound semiconductor contact comprising
a compound semiconductor substrate selected from the group consisting of AlP, AlAs, and AlSb; and
a layer of an intermetallic compound formed on said substrate as determined by a pseudobinary tieline on a ternary phase diagram of the elements of said intermetallic compound and said compound semiconductor, said tieline extending between said compound semiconductor and said intermetallic compound and defining an interface behaving as a binary system, said intermetallic compound determined by said pseudobinary tieline being selected from the group consisting of $ScAl_2$, TiAl, $TiAl_3$, VAl, $CrAl_4$, MnAl, $FeAl_2$, $FeAl_3$, CoAl, NiAl, $NiAl_3$, $CuAl_2$, $YAl_2$, ZrAl, $ZrAl_2$, $ZrAl_3$, $Zr_2Al_3$, $MoAl_2$, $MoAl_3$, RuAl, $RuAl_2$, RhAl, PdAl, $Pd_2Al_3$, $PdAl_3$, $LaAl_2$, $HfAl_2$, $HfAl_3$, $TaAl_3$, $WAl_4$, $ReAl_2$, $OSAl_2$, IrAl, $Pt_2Al_3$, $PtAl_2$, $PtAl_3$, AuAl, $CeAl_2$, $CeAl_4$, $SmAl_2$, $SmAl_3$, $ThAl_2$, $YbAl_2$, $YbAl_3$.

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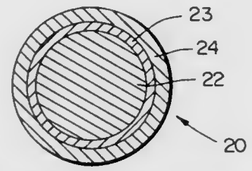
**5,045,409**
**PROCESS FOR MAKING THIN FILM SOLAR CELL**
**Chris Eberspacher, Los Angeles; James H. Ermer, Burbank, and Kim W. Mitchell, Granada Hill, all of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.**
**Continuation of Ser. No. 126,057, Nov. 27, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,616**
**Int. Cl.[5] H01L *29/14, 31/18*; B05D *5/12***
**U.S. Cl. 428—620** **10 Claims**

5. A semiconducting thin film formed on a substrate by the method comprising:
depositing a composite film of copper and indium on a substrate, said film having an atomic copper to indium ratio of about one,
depositing a film of selenium on said composite copper indium film, said selenium film thickness selected to provide an atomic ratio of selenium to copper and indium of less than one, and
heating said substrate with said composite copper indium film and said selenium film in the presence of $H_2S$ gas for a time and at a temperature sufficient to cause interdiffusion of copper, indium, selenium and sulfur to form a semiconductor of the class $CuInSe_{2-x}S_x$ where x is less than two.




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**5,045,410**
**LOW PHOSPHORUS CONTAINING BAND-SHAPED AND/OR FILAMENTARY MATERIAL**
**Heinz G. Hiesbock, Modling, and Karl Bartl, Vienna, both of Austria, assignors to Karl Neumayer, Erzeugung und Vertrieb von Kabeln, Drahten isolierten Leitungen ur Elektromaterial Gesellschaft mit beschrankter Haftung, Gunselsdorf, Austria**
**Continuation-in-part of Ser. No. 145,743, Jan. 19, 1988, abandoned, which is a continuation of Ser. No. 880,014, Jun. 30, 1986, abandoned. This application Jul. 3, 1989, Ser. No. 375,968**
**Claims priority, application Austria, Dec. 13, 1985, A 3610/85**
**The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.**
**Int. Cl.[5] H01R *13/03***
**U.S. Cl. 428—644** **17 Claims**




1. A solderable band-shaped or filamentary material having an extended shelf-life, said solderable material comprising an inner layer consisting essentially of copper 3.5 to 9.5% by weight tin and 0.03 to 0.13% by weight phophorous, based on the total weight of the inner layer, and an outer layer of a lead alloy.

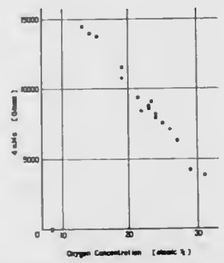
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**5,045,411**
**ALLOY COMPOSITIONS**
**Arthur D. Taylor, Buffalo, and Malcolm Warren, Corfu, Dewy H. Berger, West Amherst, all of N.Y., assignors to P.M. Refining, Inc., Alden, N.Y.**
**Filed Jan. 10, 1990, Ser. No. 463,153**
**Int. Cl.[5] C22C *5/02, 5/08, 9/00***
**U.S. Cl. 428—672** **7 Claims**

6. A clad product comprising a layer of gold alloy on a substrate, the gold alloy consisting of gold in an amount ranging from 25% to 92%, silver in an amount ranging from 1% to 50%, copper in an amount ranging from 1% to 50%, zinc in an amount ranging from 0.1% to 20%, nickel 0.05-5% iron in an amount ranging from 0.01% to 2.0%, indium in an amount ranging from 0.10% to 1.0%, boron in an amount ranging from 0.0% to 1.0%, and phosphorous 0.00% to 0.05%.



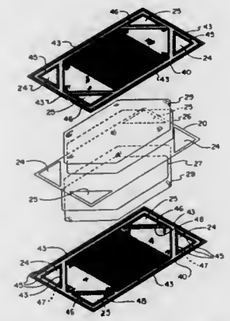
**5,045,412**
**PERPENDICULAR MAGNETIC STORAGE MEDIUM**
**Shogo Nasu, Kobe, and Koji Saiki, Toyonaka, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**
**Filed Mar. 22, 1989, Ser. No. 327,456**
**Claims priority, application Japan, Mar. 29, 1988, 63-77738**
**The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.**
**Int. Cl.[5] G11B *23/00***
**U.S. Cl. 428—694** **1 Claim**



1. A perpendicular magnetic storage medium comprising a substrate and a magnetic anisotropic film formed on said substrate, said magnetic anisotropic film having a magnetic anisotropy in a direction perpendicular to a plane containing said magnetic anisotropic film, wherein said magnetic anisotropic film is a film of a sub-oxide of an Fe-Co alloy described by a formula $Fe_{1-x}Co_x$ (where $0.30 \leqq X \leqq 0.80$);
said magnetic anisotropic film having a saturation magnetization of 500 emu/cm$^3$ or higher, an anisotropic magnetic field of 3 kOe or higher, and a perpendicular coercive force of 200 Ce or higher, and containing oxygen in an atomic ratio of 18% to 27%; and
said sub-oxide having a half-value width not less than 0.7 degrees with respect to a diffracted X-ray peak caused by an oxide phase observed in an X-ray diffraction spectrum.

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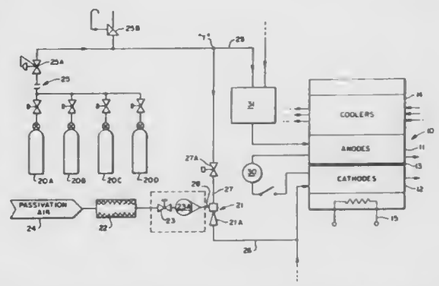
**5,045,413**
**FULLY INTERNAL MAINFOLDED FUEL CELL STACK**
**Marianowski, Leonard G., Mount Prospect, Ill.; Randy J. Petri, Highland, Ind., and Mark G. Lawson, Berwyn, Ill., assignors to Institute of Gas Technology, Chicago, Ill.**
**Continuation-in-part of Ser. No. 346,666, May 3, 1989, Pat. No. 4,963,442. This application Apr. 10, 1990, Ser. No. 505,293**
**The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.**
**Int. Cl.[5] H01M *2/08, 8/14***
**U.S. Cl. 429—13** **19 Claims**



1. In a generally rectangular fuel cell stack comprising a plurality of fuel cell units, each said fuel cell unit comprising an anode and a cathode, an electrolyte in contact with one face of said anode and an electrolyte in contact with an opposite facing face of said cathode, and a separator plate separating said cell unit between said anode and cathode forming an anode chamber between one face of said separator plate and said anode and a cathode chamber between the opposite face of said separator plate and said cathode, said anode chamber in gas communication with fuel gas supply and outlet and said cathode chamber in gas communication with oxidant gas supply and outlet the improvement comprising; said electrolytes and said separator plates extending to the edge of said fuel cell stack, said separator plates having a flattened peripheral wet seal structure extending to contact said electrolytes on each face of said separator plates completely around their periphery forming a separator plate/electrolyte wet seal under cell operating conditions, said electrolytes and said separator plates each having a plurality of aligned perforations said perforations in said separator plates being surrounded by a flattened manifold wet seal structure extending to contact said electrolyte on each face of said separator plate forming a separator plate/electrolyte wet seal under cell operating conditions to form a plurality of gas manifolds extending through said cell stack, conduits through said extended manifold wet seal structure providing fuel gas communication between one set of said manifolds and said anode chambers on one face of said separator plates and conduits through said extended manifold wet seal structure providing oxidant gas communication between the other set of said manifolds and said cathode chambers on the other face of said separator plates, thereby providing fully internal manifolding of fuel and oxidant gases to and from each said unit fuel cell in said fuel cell stack.

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**5,045,414**
**REACTANT GAS COMPOSITION FOR FUEL CELL POTENTIAL CONTROL**
**Calvin L. Bushnell, Glastonbury, and Christopher L. Davis, Tolland, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.**
**Filed Dec. 29, 1989, Ser. No. 458,852**
**The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.**
**Int. Cl.[5] H01M *8/04***
**U.S. Cl. 429—17** **20 Claims**



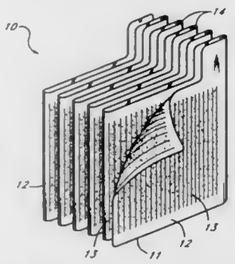

1. A fuel cell system in which the cell potential is controlled within a certain maximum voltage limit, comprising:
an anode section;
a cathode section;
an electrolyte providing electrochemical communication between said anode and said cathode sections; and
a source of gas to said cathode section purging said cathode section with a gaseous mixture, including a small percentage by volume of oxygen during at least some off-power conditions causing the cathode potential to be limited to a voltage potential less than the maximum voltage limit, said source of gas including a source of oxygen as a dilute

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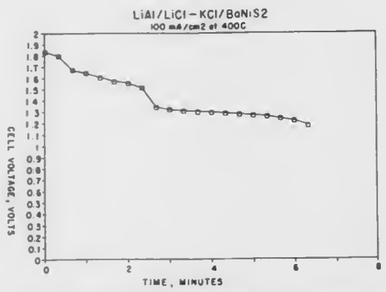
component bled into a stream of a relatively high pressure gas as the majority component.

5,045,415
**ELECTRODE PLATE STRUCTURE**
Pita Witehira, 7 Market Street, Templeview, Hamilton, New Zealand
Filed Jan. 10, 1990, Ser. No. 463,027
Claims priority, application New Zealand, Jan. 26, 1989, 227296
Int. Cl.[5] H01M 2/38, 4/02
U.S. Cl. 429—81 6 Claims



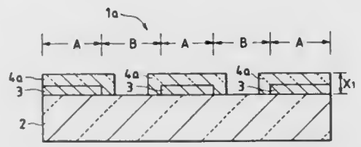
1. An electrode plate for use in an electrochemical cell, comprising:
a single sheet of metal foil having a layer of metal oxide formed thereon which is folded concertina fashion and compressed into a plurality of conductive layers of oxide coated metal foil electrode material, each layer of electrode having surface structure formed thereon for separating it from adjacent layers by a sufficient distance to permit movement of electrolyte material between said layers, each layer being electrically connected to each adjoining layer of said electrode plate, without intervening layers of different polarity or non-electrode separating material.

5,045,416
**HIGH TEMPERATURE MOLTEN SALT THERMAL CELL INCLUDING A TERNARY METAL SULFIDE CATHODE**
Edward J. Plichta, Howell, and Wishvender K. Behl, Ocean Township, Monmouth County, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 10, 1990, Ser. No. 624,940
Int. Cl.[5] H01M 4/58, 10/39
U.S. Cl. 429—103 2 Claims



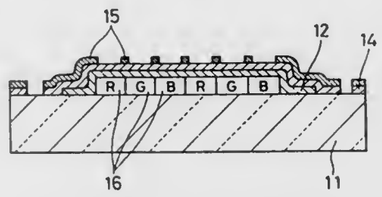

1. A high temperature molten salt electrochemical cell including a lithium-aluminum alloy as the anode, a eutectic mixture of lithium chloride and potassium chloride with a melting point of 352° C. as the electrolyte, and barium nickel sulfide ($BaNiS_2$) as the cathode active material.

5,045,417
**MASK FOR MANUFACTURING SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURE THEREOF**
Yoshihiko Okamoto, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 16, 1989, Ser. No. 437,268
Claims priority, application Japan, Nov. 22, 1988, 63-295350
Int. Cl.[5] G03F 9/00
U.S. Cl. 430—5 37 Claims




1. A mask for manufacturing a semiconductor device comprising:
a transparent substrate having main and back surfaces;
a circuit pattern formed on said main surface and comprising a first region comprising a metal layer and a second region where said transparent substrate is exposed; and
a means for shifting a phase of light, formed at both ends of said first region and in a part of said second region and not in the whole of said second region.

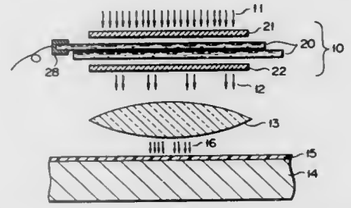
5,045,418
**ELECTRODE PLATE FOR DISPLAY DEVICE AND METHOD FOR PREPARATION THEREOF**
Kenzo Fukuyoshi, Tamana, Japan, assignor to Toppan Printing Co., Ltd., Japan
Filed Jan. 30, 1989, Ser. No. 303,848
Claims priority, application Japan, Jan. 29, 1988, 63-18959; Nov. 18, 1988, 63-291672; Dec. 15, 1988, 63-317942
Int. Cl.[5] G03F 9/00
U.S. Cl. 430—7 4 Claims




1. A protected electrode plate for a display device comprising elements constituting said electrode plate and a protective material for elements constituting said electrode plate which is to be patterned comprising a novolak epoxy resin into which a photosensitive group and a group to make said resin alkaline liquid-soluble were introduced and wherein said protected electrode plate is applied to a color filter coating layer on said elements.

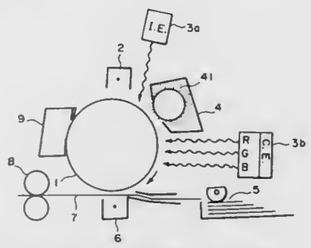


5,045,419
**PATTERN EXPOSURE/TRANSFER METHOD AND PATTERN EXPOSURE/TRANSFER MASK APPARATUS**
Katsuya Okumura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 120,477, Nov. 13, 1987, abandoned.
This application Dec. 26, 1989, Ser. No. 456,210
Claims priority, application Japan, Nov. 20, 1986, 61-277327
Int. Cl.[5] G03C 5/06; G03B 27/32
U.S. Cl. 430—20 6 Claims




1. A method of exposing a pattern onto a photoresist layer deposited on a semiconductor substrate, comprising the steps of:
providing an optical modulating mask including first and second glass plates facing each other, a liquid crystal layer sandwiched between the first and second glass plates, said liquid crystal layer having a liquid crystal molecules, first stripes arranged on an inner surface of said first glass plate, and second stripes arranged on an inner surface of said second glass plate in a direction perpendicular to that of said first stripes to define a plurality of stripe crossing areas in the liquid crystal layer;
selectively applying voltages to said first and second stripes for orienting the liquid crystal molecules in a direction perpendicular to the surfaces of the first and second glass plates at the crossing areas of the voltage-applied selected stripes that correspond to the pattern being exposed; and
applying parallel light beams onto an entire surface of the optical modulating mask with the light beams being transmitted only through the stripe crossing areas of the voltage-applied selected stripes of the liquid crystal layer to produce a desired optical image.

5,045,420
**COLOR IMAGE FORMING METHOD AND PARTICULATE DEVELOPER FOR DEVELOPING ELECTROSTATIC LATENT IMAGE**
Nagao Hosono, Hachiohji; Shinkichi Takahashi, Yokohama, and Hatsuo Tajima, Matsudo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 7, 1989, Ser. No. 447,070
Claims priority, application Japan, Dec. 9, 1988, 63-311463
Int. Cl.[5] G03G 13/01, 9/16
U.S. Cl. 430—45 12 Claims




1. A color image forming method, comprising:
providing a particulate developer comprising at least two species of sensitive particles which are capable of respectively absorbing lights having different wavelengths to be decolorized or faded;
developing an electrostatic latent image with the particulate developer to form an image comprising the developer; and
exposing the developer image to light having a wavelength capable of selectively decolorizing at least one species of the sensitive particles.

5,045,421
**ELECTROPHOTOGRAPHIC PHOTORECEPTOR COMPRISING METAL COMPLEX CHARGE TRANSPORT MATERIAL**
Masahiro Fuse, Machida; Hiromi Horiuchi, Tokyo, and Shigenori Otsuka, Omiya, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan
Filed Aug. 17, 1990, Ser. No. 570,155
Claims priority, application Japan, Aug. 22, 1989, 64-215797
Int. Cl.[5] G03G 5/14
U.S. Cl. 430—58 15 Claims

1. An electrophotographic photoreceptor having on a conductive base at least one charge generation layer and at least one charge transport layer, the charge transport layer containing a metal complex or salt of an aromatic carboxylic acid represented by the following general formula (I):

$$ArCOOH \quad (I)$$

wherein Ar is an aromatic homocyclic residue or an aromatic heterocyclic residue, optionally having one or more substituents.

5,045,422
**ENCAPSULATED TONER COMPOSITIONS**
Grazyna Kmiecik-Lawrynowicz, Burlington; Beng S. Ong, and Fernando Yulo, both of Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 18, 1989, Ser. No. 395,689
Int. Cl.[5] G03G 9/00; G03C 1/72
U.S. Cl. 430—109 41 Claims

1. An encapsulated toner composition comprised of a core comprised of the reaction product of a fluorocarbon with a polymer and wherein said core is derived from the copolymerization of an addition-type monomer and a functionalized fluorocarbon compound represented by Formula (I):

$$A—(CF_2)_x—B \quad (I)$$

wherein A is a structural moiety containing an addition-polymerization functional group; B is a fluorine atom or a structural moiety containing an addition-polymerization functional group; and x is the number of difluoromethylene functions; pigment or dyes; and a polymeric shell.

5,045,423
**TONER AND DEVELOPER COMPOSITIONS WITH CHARGE ENHANCING ADDITIVES**
Joseph R. Weber, Rochester; Edward J. Gutman, Webster; John R. Laing, Rochester, and John L. Haack, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 1, 1990, Ser. No. 531,739
Int. Cl.[5] G03G 9/08
U.S. Cl. 430—110 37 Claims

1. A toner composition comprised of resin particles, pigment particles, and bis-(distearyldimethylammonium) sulfate.

VOL 1130 ISS 1 SE 3 1991 UMI



**5,045,424**

## THERMALLY ASSISTED PROCESS FOR TRANSFERRING SMALL ELECTROSTATOGRAPHIC TONER PARTICLES TO A THERMOPLASTIC BEARING RECEIVER

**Donald S. Rimai, Webster; Louis J. Sorriero, Rochester, and Dinesh Tyagi, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 7, 1990, Ser. No. 476,194**
**Int. Cl.[5] G03G *13/15***
**U.S. Cl. 430—126** **27 Claims**

1. A method of non-electrostatically transferring dry toner particles which comprise a toner binder and which have a particle size of less than 8 micrometers from the surface of an element which has a surface layer which comprises a film-forming, electrically insulating polyester or polycarbonate thermoplastic polymeric resin matrix and a surface energy of not greater than approximately 47 dynes/cm to a receiver which comprises a substrate having a polymeric coating on a surface of the substrate in which the polymeric coating comprises a blend of:

(i) from about 40 to about 90 percent by weight based on the total weight of the blend of a thermoplastic addition polymer having a weight average molecular weight of from about 20,000 to 500,000, a number average molecular weight of from about 5000 to 50,000, and a ratio of weight average molecular weight to number average molecular weight in the range of from about 1:1 to 20:1; and

(ii) from about 10 to about 60 percent by weight based on the weight of the total blend of a thermoplastic addition polymer having a weight average molecular weight of from about 1000 to 20,000, a number average molecular weight of from about 500 to 5000, and a ratio of weight average molecular weight to number average molecular weight in the range of from about 1:1 to 10:1;

wherein the Tg of the thermoplastic addition polymers in the blend is less than approximately 10° C. above the Tg of the toner binder and the surface energy of the thermoplastic polymer coating is approximately 38 to 43 dynes/cm which comprises:

(A) contacting said toner particles with said thermoplastic polymer coating on said receiver;

(B) heating said receiver to a temperature such that the temperature of said thermoplastic polymer coating on said receiver during said transferring is at least approximately 5° C. above the Tg of said thermoplastic addition polymers in said blend; and

(C) separating said receiver from said element at a temperature above the Tg of said thermoplastic polymers,

whereby virtually all of said toner particles are transferred from the surface of said element to said thermoplastic polymer coating on said receiver.

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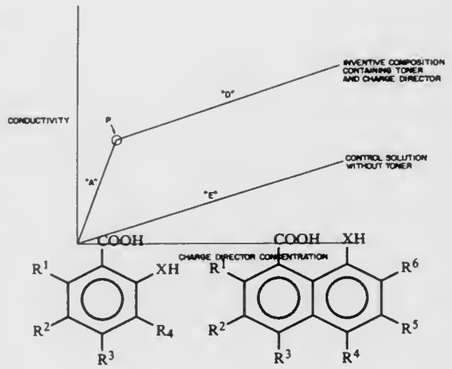
**5,045,425**

## ELECTROPHOTOGRAPHIC LIQUID DEVELOPER COMPOSITION AND NOVEL CHARGE DIRECTORS FOR USE THEREIN

**Ronald Swidler, Palo Alto, Calif., assignor to CommTech International Management Corporation, Menlo Park, Calif.**

**Filed Aug. 25, 1989, Ser. No. 398,460**
**Int. Cl.[5] G03G *9/00, 5/00***
**U.S. Cl. 430—115** **17 Claims**

1. An electrophotographic liquid developer composition comprising, dispersed in an electrically insulating carrier liquid, (a) toner particles of a resinous phase containing a colorant, and (b) a charge director soluble in said carrier liquid which associates with the toner particles to form charged complexes, wherein the charge director consists essentially of a salt of a trivalent metal and an aromatic acid represented by either of structures (I) or (II)




(I) (II)

in which X is O or S, and $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen,

wherein the concentration of the charge director in the liquid developer composition is less than the amount which will saturate the toner particles, such that substantially all of the charge director is associated with the toner particles in the form of said charged complexes, whereby the conductivity of the composition is particle-mediated.

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**5,045,426**

## TONER ADHESION-ENHANCING COATING FOR SECURITY DOCUMENTS

**Theodore Maierson; William H. Mowry, Jr., both of Dayton, and Dianne M. Potter, Union, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio**

**Filed Aug. 21, 1989, Ser. No. 369,295**
**Int. Cl.[5] G03G *13/10***
**U.S. Cl. 430—126** **25 Claims**

1. A toner adhesion-enhancing coated cellulosic product comprising a cellulosic web having first and second major surfaces, at least one of said major surfaces having coated thereon a polymeric toner adhesion-enhancing composition comprising a cross-linked copolymer formed from a mixture of a dispersion of a copolymer of styrene and acrylic acid having a glass transition temperature of between about −16 and 22 degrees C. and about 1 to about 5% by weight zinc as a cross-linking agent for said copolymer.

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**5,045,427**

## PHOTOGRAPHIC MATERIAL CONTAINING NON-PHOTOSENSITIVE SILVER SALT

**Hiroshi Hara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 220,872, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 879,747, Jun. 27, 1986, abandoned. This application Jun. 7, 1989, Ser. No. 363,312**
**Claims priority, application Japan, Jun. 28, 1985, 60-141799**
**The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.**
**Int. Cl.[5] G03C *5/54, 1/06, 7/16***
**U.S. Cl. 430—138** **8 Claims**

1. An image recording method which comprises imagewise exposing a photographic material comprising a support having provided thereon a light-sensitive layer containing at least a photosensitive silver halide, a non-photosensitive silver salt, a reducing agent, a polymerizable compound having one or more carbon-carbon unsaturated bonds, and a color image-forming substance, wherein at least said polymerizable compound and said color image-forming substance are encapsulated in the same microcapsules to form a latent image in the photosensitive silver halide without causing polymerization of the polymerizable compound and heating the photographic material either simultaneously with or after the imagewise exposure to polymerize the polymerizable compound to thereby cure the microcapsules, wherein said non-photosensitive silver salt is selected from compounds represented by formula (I)

$$R—C\equiv C—Ag \qquad (I)$$

wherein R represents a substituted or unsubstituted alkyl group, cycloalkyl group, alkenyl group, alkylnyl group, aralkyl group, aryl group, or heterocyclic group or non-photosensitive silver halide particles which have not been chemically sensitized.



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**5,045,428**

## ENCAPSULATED TONER COMPOSITIONS AND PROCESSES THEREOF

**Guerino Sacripante, Cambridge; Barkev Keoshkerian, Thornhill, and Beng S. Ong, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 22, 1989, Ser. No. 440,552**
**Int. Cl.[5] G03G *9/08***
**U.S. Cl. 430—138** **52 Claims**

1. An encapsulated toner composition comprised of a core comprised of a siloxane-containing resin obtained from the hydrosilylation of olefins, pigment, dyes, or mixtures thereof; and a polymeric shell prepared by interfacial polymerization.

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**5,045,429**

## LIGHT-SENSITIVE PHOTOPOLYMERIZABLE AND DIAZONIUM RESIN CONTAINING COMPOSITION AND RECORDING MATERIAL INCLUDING REACTION PRODUCT OF ANHYDRIDE WITH CARBOXYLIC ACID AND VINYL ALCOHOL

**Gerhard Mack, and Georg Pawlowski, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation of Ser. No. 214,890, Jun. 29, 1988, abandoned, which is a continuation of Ser. No. 891,888, Aug. 1, 1986, abandoned. This application Jul. 30, 1990, Ser. No. 560,284**
**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528309**
**Int. Cl.[5] G03F *7/021, 7/033, 7/032***
**U.S. Cl. 430—175** **14 Claims**

1. A light-sensitive mixture comprising:

(a) from about 5 to 60% by weight of a negative-working light-sensitive diazonium salt polycondensation product comprising repeat units A—$N_2$X and B that are bonded to one another through intermediate members which are derived from condensable carbonyl compounds, A being the radical of an aromatic diazonium compound which is condensable with formaldehyde and B being the radical of a compound which is free of diazonium groups and which is condensable with the formaldehyde and is selected from an aromatic amine, a phenol, a phenol ether, an aromatic thioether, an aromatic hydrocarbon, an aromatic heterocyclic compound and an organic acid amide,

(b) from about 10 to 65% by weight of a free radical-polymerizable compound having at least two terminal, ethylenically-unsaturated groups and a boiling point at atmospheric pressure above 100° C.,

(c) from about 0.05 to 10% by weight of a polymerization initiator which forms free radicals under the action of actinic radiation, and

(d) from about 5 to 80% by weight a water-insoluble polymeric binder which is soluble in organic solvents and in aqueous alkaline solutions, wherein the binder is a reaction product of (i) an intramolecular anhydride of an organic dicarboxylic or tricarboxylic acid and (ii) a polymer that comprises vinyl alcohol units and that comprises no other functional groups capable of reaction with acid anhydrides.

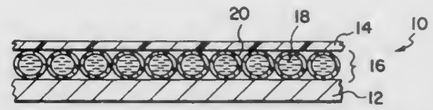
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**5,045,430**

## METHOD FOR MAKING PRINTING PLATES AND ASSEMBLY USEFUL THEREIN

**Dale R. Shackle; Michael J. Cousin; Gerhart Schwab; Christina M. Narrick, and Howard A. Fromson, all c/o The Mead Corporation, Courthouse Plaza Northeast, Dayton, Ohio 45463**

**Filed Oct. 25, 1985, Ser. No. 791,185**
**Int. Cl.[5] G03C *5/54***
**U.S. Cl. 430—138** **19 Claims**




1. A process for producing a printing plate comprising:

image-wise exposing to actinic radiation a transfer sheet including a support having a layer of microcapsules on the surface thereof, said microcapsules enveloping a photohardenable composition,

prior to or after image-wise exposing said transfer sheet, assembling said transfer sheet with a support for a printing plate selected from the group consisting of anodized aluminum, oxidized aluminum, stainless steel, cobalt-plated steel, copper-coated steel, chrome-plated steel, polyolefin-coated paper, and copper-coated epoxy,

subjecting said image-wise exposed transfer sheet assembled with said support for said printing plate to a uniform rupturing force such that said microcapsules rupture and image-wise transfer and photohardenable composition to said support for said printing plate,

removing said transfer sheet from said support for said printing plate, and

hardening said transferred photohardenable composition to form a polymer image which accepts ink and rejects water.

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**5,045,431**

## DRY FILM, AQUEOUS PROCESSABLE PHOTORESIST COMPOSITIONS

**Robert D. Allen; Gregory M. Wallraff, both of San Jose, Calif.; Logan L. Simpson, Austin, Tex., and William D. Hinsberg, III, Fremont, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 513,652, Apr. 24, 1990, abandoned. This application Feb. 13, 1991, Ser. No. 656,103**
**Int. Cl.[5] G03C *1/76***
**U.S. Cl. 430—270** **4 Claims**

1. A photosensitive resist composition which is processable in aqueous media and which forms a laminatable layer when applied as a film from a liquid solution of an organic solvent, the laminatable layer being adapted for lamination onto a target substrate at a lamination temperature in the range from about 100°-120° C., the resist composition consisting essentially of:

(A) from about 99 to 80% by weight of a film forming reactive polymer containing polymer groups which react upon acid catalysis, the polymer chain of the reactive polymer comprising the following polymerizable units: from about 10 to 50% by weight, based on the weight of the film forming reactive polymer, of a first monomer

capable of undergoing an acid catalyzed conversion to render the product of the conversion soluble in an aqueous base developer, the first monomer being selected from the group consisting of tertiary butyl acrylate and tertiary butyl methacrylate,

from about 30 to 70% by weight, based on the weight of the film forming reactive polymer, of a second monomer class which does not undergo an acid catalyzed reaction, the second monomer class comprising a mixture of ethyl acrylate and another monomeric component selected from the group consisting of methyl methacrylate, methyl acrylate and combinations thereof,

from about 5 to 20% by weight, based on the weight of the film forming reactive polymer, of a third monomer selected from the group consisting of acrylic acid and methacrylic acid, and

(B) from about 1 to 20% by weight of an initiator which generates acid upon exposure to radiation, thereby producing acid catalysis of the film forming reactive polymer.

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**5,045,432**

## RADIATION-SENSITIVE COMPOSITION CONTAINING BOTH A POLY(N-ACYLALKYLENEIMINE) AND AN UNSATURATED POLYESTER AND USE THEREOF IN LITHOGRAPHIC PRINTING PLATES

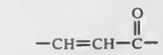
**Paul R. West, Fort Collins; James E. Mitchell, Windsor; Gary R. Miller, Fort Collins; Paul R. Josephson, Jr., Fort Collins, and Raymond W. Ryan, Jr., Fort Collins, all of Colo., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 17, 1990, Ser. No. 554,229**

**Int. Cl.[5] G03C** *1/77;* **G03F** *7/038*

**U.S. Cl. 430—278** **15 Claims**

1. A negative-working lithographic printing plate comprising a support having thereon a radiation-sensitive layer of a composition comprising a mixture of (A) a photocrosslinkable p-phenylene diacrylate polyester containing the photosensitive group



as an integral part of the polymer backbone, (B) a poly(N-acylalkyleneimine) and (C) a copolyester of an unsaturated dicarboxylic acid and an oxyalkylene ether of an alkylidene diphenol.

2. A negative-working lithographic printing plate as claimed in claim 1, wherein said support is an anodized aluminum support.

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**5,045,433**

## SUBSTITUTED ACRIDINE DERIVATIVES AND APPLICATION THEREOF

**Hajime Kakumaru; Yoshitaka Minami, both of Hitachi; Naohiro Kubota, and Shinya Mashimo, both of Urawa, all of Japan, assignors to Hitachi Chemical Co., Ltd. and Adeka Argus Chemical Co., Ltd., both of Tokyo, Japan**

**Division of Ser. No. 269,147, Oct. 18, 1988, abandoned. This application May 30, 1990, Ser. No. 529,707**

**Claims priority, application Japan, Mar. 17, 1987, 62-62209; Apr. 14, 1987, 62-91725**

**Int. Cl.[5] G03F** *7/031*

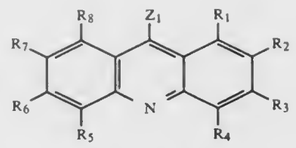
**U.S. Cl. 430—281** **3 Claims**

1. A photopolymerizable composition comprising

(1) 100 parts by weight of a photopolymerizable compound which has a boiling point of 100° C. or higher at atmospheric pressure and has at least one kind of ethylenic unsaturated group,

(2) 0 to 400 parts by weight of a thermoplastic organic polymer, and

(3) 0.01 to 10 parts by weight of a substituted acridine derivative represented by the general formula [1]:



[I]

wherein $R_1$, $R_2$, $R_3$, $R_4$, $R_5$, $R_6$, $R_7$ and $R_8$ are independently hydrogen atoms, alkyl groups having 1 to 8 carbon atoms, alkyl groups having 1 to 8 carbon atoms and being substituted with halogen atoms or alkoxy groups having 1 to 8 carbon atoms, halogen atoms, or alkoxy groups having 1 to 8 carbon atoms, and $Z_1$ is a six-membered heteroaromatic group which has one or two nitrogen atoms in its ring and may have an alkyl substituent having 1 to 8 carbon atoms, or a quinolyl group.

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**5,045,434**

## VISIBLE RADIATION SENSITIVE COMPOSITION CONTAINING SUBSTITUTED 3-(BENZOTHIAZO-2-YL)-7-DIETHYLAMINOCOUMARIN AS SENSITIZERS

**Ichiro Yoshihara; Motoko Okuhara; Takao Yamamoto; Naozumi Iwasawa; Yasuo Doi, all of Kanagawa; Tsukasa Ohyama, Fukuoka; Kazuhiko Murayama, Fukuoka; Yoriaki Matsuzaki, Fukuoka; Susumu Kasamatsu, Fukuoka; Keisuke Takuma, Fukuoka, and Kimitoshi Kato, Fukuoka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan**

**Filed Dec. 18, 1990, Ser. No. 629,484**

**Claims priority, application Japan, Dec. 28, 1989, 1-338279**

**Int. Cl.[5] G03C** *1/73, 7/025;* **C08F** *2/46;* **C08J** *3/28*

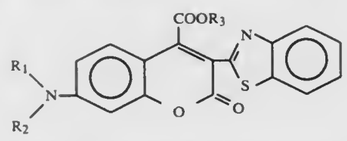
**U.S. Cl. 430—286** **16 Claims**




1. A visible radiation sensitive composition comprising:

(A) a photosetting resin containing a photosensitive group capable of crosslinking or polymerizing by photoirradiation,

(B) a sensitizer represented by the formula (i)



(i)

wherein $R_1$ and $R_2$ are the same or different lower alkyl group, and $R_3$ is a hydrogen atom, lower alkyl group, alkoxyalkyl group, hydroxyalkoxyalkyl group or alkoxycarbonylalkyl group, and

(C) a polymerization initiator.



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**5,045,435**

## WATER-BORNE, ALKALI-DEVELOPABLE, PHOTORESIST COATING COMPOSITIONS AND THEIR PREPARATION

**Diane L. Adams, Lancaster; Wendell A. Ehrhart, Red Lion, and Donald Jones, Leola, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.**

**Continuation-in-part of Ser. No. 275,901, Nov. 25, 1988, abandoned. This application Mar. 12, 1990, Ser. No. 491,978**

**Int. Cl.[5] G03C** *1/73;* **G03F** *7/33*

**U.S. Cl. 430—288** **20 Claims**

1. A photoresist coating composition comprising (a) a multifunctional acrylate monomer, (b) a photoinitiator, and (c) a latex of a water insoluble carboxylated acrylate copolymer having an acid number greater than about 80, wherein further the latex has been neutralized with a base in an amount of at least about 0.25 equivalents per equivalent of acid, and wherein (a), (b), and (c) together are a waterborne, stable, homogeneous coating mixture can form a uniform, homogeneous photoresist layer which is aqueous alkali developable and, after crosslinking, is resistant to etch and plating solutions.

11. A method for preparing a photoresist coating composition which is waterborne, and can form a photoresist layer that is aqueous alkali developable, and is resistant to etch and plating solutions after photopolymerization, the said method comprising the steps of:

(a) adding a base to a latex of a water insoluble carboxylated acrylate copolymer, the said copolymer having an acid number greater than about 80, the base being added in an amount of at least about 0.25 equivalents per equivalent of acid, and

(b) adding a multifunctional acrylate monomer and a photoinitiator to form a stable, homogeneous, waterborne, photoresist coating mixture.

20. A method for producing patterns on a substrate comprising the steps:

(a) applying to a metal substrate a water-borne photoresist coating composition of a water insoluble carboxylated acrylate copolymer latex, the said copolymer having a glass transition temperature greater than 60° C. and an acid number greater than about 80 which further is neutralized with a base in an amount of at least about 0.25 equivalents per equivalent of acid, a multifunctional acrylate monomer and a photoinitiator;

(b) drying the composition to produce a 0.2 to 2.0 mil contact imageable photoresist film;

(c) imaging the photoresist film; and

(d) developing the film with a mild alkaline solution.

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**5,045,436**

## POLYMER COMPOSITIONS CONTAINING A DISSOLVED DIBENZALACETONE PALLADIUM COMPLEX

**Bernd Tieke, Giffers, and Sheik A. Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 217,099, Jul. 6, 1988, abandoned, which is a continuation of Ser. No. 5,975, Jan. 21, 1987, abandoned. This application Mar. 3, 1989, Ser. No. 319,884**

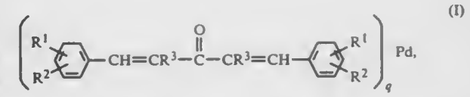
**Claims priority, application Switzerland, Jan. 30, 1986, 348/86**

**Int. Cl.[5] G03F** *7/26;* **B05D** *3/06, 1/18, 3/04*

**U.S. Cl. 430—315** **3 Claims**

1. A process for activating a polymer surface for the purpose of making it receptive to subsequent metallization without current, which comprises

(a) dissolving a dibenzalacetone palladium complex of formula I in a polymer which contains no olefinic double bond,



(I)

$R^1$ is hydrogen, $C_1$-$C^{18}$alkyl, $C_1$-$C_{18}$alkoxy or unsubstituted or substituted phenyl,

$R^2$ has one of the meanings of $R^1$ or is also an amino, nitro or cyano group, an —(O—$C_mH_{2m}$)—$OR^4$, or —O—$CH_2$—$CHOR^4$—$CH_2$—$OR^5$ radical or a halogen atom or a glycidyl ether radical,

$R^3$ is hydrogen or $C_1$-$C_4$alkyl or the two groups $R^3$ together form a $C_2$-$C_4$polymethylene chain,

$R^4$ and $R^5$ have one of the meanings of $R^1$,

q is a value from 1 to 3.5,

m is a value from 2 to 6 and

n is a value from 0 to 20, wherein the complex of formula I is not copolymerizable with the polymer,

(b) applying a coating of said solution of step (a) to a substrate or preparing an unsupported film from said solution of step (a), and

(c) heating said coated substrate of step (b) or unsupported film of step (b) to a temperature over 100° C. to decompose the complex of formula I and concomitantly to liberate finely dispersed, catalytically active $Pd^0$ in the coating or the unsupported film;

(d) metallizing the activated polymer surface by exposing the activated polymer surface to a metallization bath effecting current free metallization of the activated polymer surface.

2. A process according to claim 1, wherein the heating to a temperature above 100° C. is effected by imagewise exposure to IR radiation.

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**5,045,437**

## METHOD FOR PRODUCING A STRUCTURED CERAMIC FILM OR A CERAMIC MEMBER CONSTRUCTED OF SUCH FILMS BY SINTERING AND USEFUL AS ULTRASOUND TRANSDUCERS

**Ulrich Bast, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**PCT No. PCT/DE88/00250, § 371 Date Oct. 27, 1989, § 102(e) Date Oct. 27, 1989, PCT Pub. No. WO88/08360, PCT Pub. Date Nov. 3, 1988**

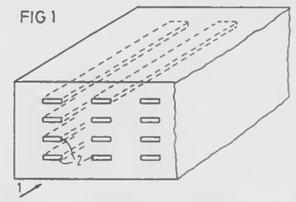
**ub. Date DApr. 27, 1988, Ser. No. 432,724**

**Claims priority, application Fed. Rep. of Germany, Apr. 27, 1987, 3713987**

**The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.**

**Int. Cl.[5] G03C** *5/40*

**U.S. Cl. 430—320** **5 Claims**




1. A method for producing a ceramic film or tape having recesses, comprising the steps of:

using a green film or tape having a binder system contained therein;

providing a surface of the green film with a photoresist layer in which structures having a prescribed, planar distribu-

tion and size of the recesses to be produced are produced in a photolithographic way for employment as a mask;
producing the recesses down to a respective prescribed depth in the green film by erosion with a liquid jet, the photoresist layer being effective as a mask layer for the respective erosion; and
using an agent that has a selective solubility for the binder system contained in the green film for the liquid jet.

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**5,045,438**
**PROCESS FOR PREPARING SUBSTRATE OF OPTICAL DISC**
**Nobuyuki Adachi, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Oct. 3, 1989, Ser. No. 416,418**
**Claims priority, application Japan, Oct. 4, 1988, 63-251571**
**Int. Cl.[5] G11B *7/24***
**U.S. Cl. 430—321** **7 Claims**

1. A process for the preparation of a substrate of an optical disc having thereon a groove or a series of pits at a predetermined track pitch which comprises the steps of:
recording a latent pattern image of the groove or the series of pits on a resist disc comprising a glass disc and a photoresist layer formed thereon, by irradiating a surface of the photoresist layer of the resist disc under rotation at a predetermined velocity with a laser beam or an electron beam emitting from a recording head which moves in a radial direction of said resist disc at a velocity $V_1$ which is defined by the following equation:

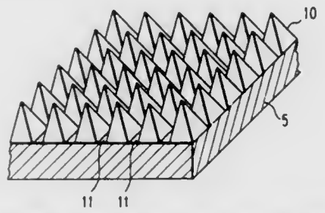
$$V_1 = V_0 \times 1/d$$

wherein $V_0$ is a velocity to record on the photoresist the pattern image at the predetermined track pitch and "d" is a ratio of thermal dimensional variation of material of the substrate to that of material of a stamper mentioned below;
producing a master disc having the recorded pattern image by developing the latent pattern image recorded on the resist disc;
producing a stamper by forming a metal layer on the pattern image of the master disc through electroplating and removing the master disc from the electroplated metal layer; and
producing the substrate having a reverse pattern of the stamper thereon by molding a material of the substrate using the stamper as a mold.

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**5,045,439**
**PROCESS FOR THE LITHOGRAPHIC MANUFACTURE OF ELECTROFORMABLE MICROSTRUCTURES HAVING A TRIANGULAR OR TRAPEZOIDAL CROSS-SECTION**
**Asim Maner, Linkenheim, and Jurgen Mohr, Sulzfeld, both of Fed. Rep. of Germany, assignors to Kernforschungszeotrum Karlsruhe GmbH, Fed. Rep. of Germany**
**Filed Dec. 18, 1989, Ser. No. 452,018**
**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842354**
**Int. Cl.[5] G03C *5/06, 5/00***
**U.S. Cl. 430—394** **13 Claims**

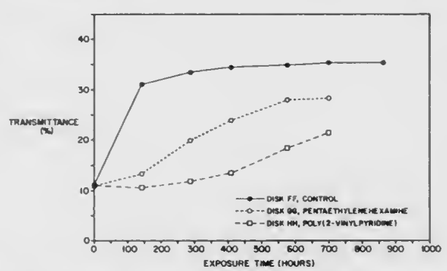
1. A process for the lithographic manufacture of electroformable microstructures having a triangular or trapezoidal cross-section from a resist material, comprising the steps of:
(a) providing a composite body comprised of a layer of resist material on an electrically conductive substrate;
(b) irradiating the resist layer to form irradiated band-shaped regions in the resist layer by conducting a first irradiation in which the substrate having the resist layer thereon is positioned at an angle of $+\alpha$ relative to a plane orthogonal to the incident radiation to form a first set of band-shaped regions in the resist layer, and then conducting a second irradiation in which the substrate is positioned at an angle of $-\alpha$ relative to a plane orthogonal to the incident radiation to form a second set of band-shaped regions in the resist layer which overlap with the first set of band-shaped regions at the interface between the resist layer and the substrate; and




(c) developing the first and second sets of band-shaped irradiated regions of the resist layer to produce spaced-apart microstructures in the resist layer and expose the electrically conductive substrate in the spaces between the microstructures.

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**5,045,440**
**STABILIZATION OF OPTICAL INFORMATION STORAGE MEDIA BY INCORPORATION OF NITROGEN CONTAINING COMPOUNDS**
**Frank J. Onorato, Phillipsburg; David E. Nikles, Colonia; Rachel S. Kohn, Springfield; Susan C. Castles, South River, and Harris A. Goldberg, Colonia, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.**
**Filed Feb. 7, 1990, Ser. No. 477,270**
**Int. Cl.[5] G03C *1/00, 1/72*; B32B *3/02***
**U.S. Cl. 430—495** **9 Claims**

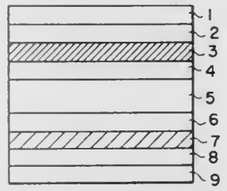



1. A method for stabilizing an optical information recording medium containing an information layer for the storage of optical information, on a substrate, wherein said substrate comprises polycarbonate or epoxy resin, said method comprising incorporating pentaethylene hexamine into the medium in an amount ranging from about 1 weight percent to about 30 weight percent of the information layer.

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**5,045,441**
**SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL INHIBITED IN PRODUCING PIN-HOLES**
**Yasuhiko Takamuki, and Takeshi Habu, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan**
**Filed Feb. 20, 1990, Ser. No. 481,632**
**Claims priority, application Japan, Feb. 23, 1989, 61-44107**
**Int. Cl.[5] G03C *1/35***
**U.S. Cl. 430—529** **12 Claims**

1. A silver halide photographic light sensitive material comprising a support and a plurality of layers on a surface thereof, said layers comprising:
an electric conductive layer consisting essentially of a latex and of an olefinic polymer having a molecular weight of from about 1,000 to about 1,000,000 and having a substantial proportion of monomeric units with an aromatic ring substituent or a heterocyclic ring substituent, wherein said ring substituent has a sulfonic acid group or a salt thereof bound directly to the ring of said ring substituent or bound



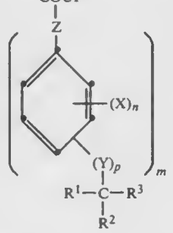

through a divalent group, and wherein said electric conductive layer is crosslinked with a crosslinking agent having an epoxy group to make the swelling degree of said electric conductive layer be within the range of about 0.2% to about 300%; and
a silver halide emulsion layer.

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**5,045,442**
**PHOTOGRAPHIC MATERIALS WITH NOVEL CYAN DYE FORMING COUPLERS**
**David Hoke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Sep. 27, 1990, Ser. No. 589,158**
**Int. Cl.[5] G03C *7/34***
**U.S. Cl. 430—553** **5 Claims**

1. A photographic element comprising a support bearing a silver halide emulsion layer having associated therewith a cyan dye forming coupler having the structure

I.




wherein
m is 1;
n is an integer of 0 through 4;
p is 0 or 1;
COUP is a phenolic or naphtholic cyan dye forming coupler moiety;
Z is oxygen or sulphur;
X is selected from halogen, nitro, cyano, alkyl of 1–12 carbon atoms, alkoxy of 1–12 carbon atoms, COR, $SO_2R$, $SO_2NR$, $NRSO_2$ and CONR, NCOR wherein R is hydrogen, alkyl of 1–12 carbon atoms, alkoxy of 1–12 carbon atoms, aryl of 6–20 carbon atoms, or aryloxy of 6–20 carbon atoms, or two adjacent X groups complete a fused 5 to 7 membered carbocyclic or heterocyclic ring system comprised of carbon, nitrogen, oxygen and sulfur ring atoms;
Y is O, $SO_2$,




NR, $SO_2NR$, CONR, or alkylene of 1–20 carbon atoms where R is as defined above;
$R^1$, $R^2$, $R^3$ are each different and are selected from hydrogen, alkyl of 1–20 carbon atoms, aryl of 6 to 20 carbon atoms, alkaryl or aralkyl of 7–20 carbon atoms,




$SO_2R$, $SO_2NR$, where R is as defined above or is a 5 to 7 membered heterocyclic ring system containing 1 to 3 rings each comprised of carbon, nitrogen, oxygen and sulfur ring atoms.

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**5,045,443**
**SILVER HALIDE PHOTOGRAPHIC EMULSION**
**Shigeharu Urabe, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Jun. 13, 1988, Ser. No. 206,141**
**Claims priority, application Japan, Jun. 12, 1987, 62-146629**
**Int. Cl.[5] G03C *1/35***
**U.S. Cl. 430—567** **12 Claims**



1. A silver halide photographic emulsion comprising a dispersant and silver halide grains, at least 50% of the total projected area of said silver halide grains being occupied by tabular grains having an average aspect ratio of 2 or more, said tabular grains comprising opposing parallel major faces consisting of a (1 1 1) face, and at least 30% of said tabular grains having an indentation or space in the central portion of the major faces thereof and the halogen composition of said tabular grains is arranged so that the solubilities of the central portions of said grains are higher than those of the surrounding portions.

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**5,045,444**
**PHOTOGRAPHIC RECORDING MATERIAL WITH CONTINUOUS TONE GRADATION SUITABLE FOR PROCESSING IN DAYLIGHT**
**Wilfried Bahnmüller, Geretsried/Gelting; Jutta Finkener; Dieter Himmelreich, both of Munich; Wolfgang Reiber, Gauting, and Heinz Schwarz, Munich, all of Fed. Rep. of Germany, assignors to Agfa Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Continuation of Ser. No. 383,200, Jul. 20, 1989, abandoned. This application Jan. 11, 1991, Ser. No. 640,524**
**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826374**
**Int. Cl.[5] G03C *1/02, 1/36***
**U.S. Cl. 430—567** **8 Claims**

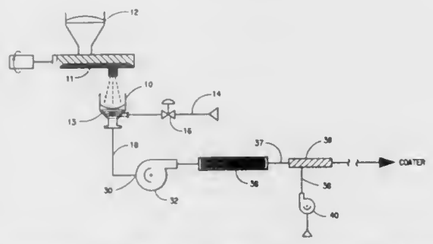
1. Photographic recording material for the production of black-and-white continuous tone reproductions suitable for processing in daylight, containing at least one silver halide emulsion layer applied to a transparent layer support, characterised in that the silver halide consists to an extent of at least 75 mol-% of silver chloride, has an average grain size of less than 0.1 μm and has been prepared in the presence of from 0.5 to 50 mmol of a 1-phenyl-5-mercaptotetrazole compound based on one mol of the total silver nitrate to be used for the precipitation.

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**5,045,445**
**CONTINUOUS IN-LINE PREPARATION OF PHOTOGRAPHIC GELATIN SOLUTIONS**
**Robert R. Schultz, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Filed Jun. 29, 1990, Ser. No. 545,932**
**Int. Cl.[5] G03C *1/025, 1/015***
**U.S. Cl. 430—642** **18 Claims**

1. A process for the in-line preparation of gelatin solutions comprising

(a) mixing gelatin particles with an aqueous solution to wet the gelatin to form a gelatin-aqueous solution mixture containing 0.1 to 50 percent by weight gelatin.
(b) heating rapidly the gelatin-aqueous solution mixture to a heating means and heating the gelatin-aqueous solution




mixture to a temperature capable of digesting the gelatin in the mixture. and
(c) maintaining the digesting gelatin for a period sufficient to dissolve the gelatin particles into the aqueous solution, wherein heating step (b) and maintaining step (c) occur in less than about 25 minutes.

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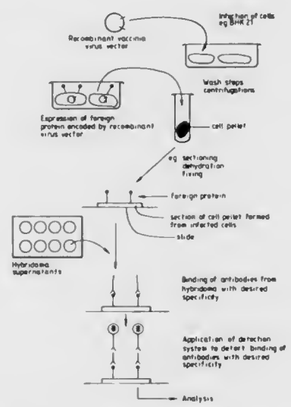
**5,045,446**
**LYOPHILIZATION OF CELLS**
**Raymond P. Goodrich, Jr., and Christine M. Williams, both of Pasadena, Calif., assignors to Cryopharm Corporation, Pasadena, Calif.**
**Continuation-in-part of Ser. No. 237,583, Aug. 25, 1988, abandoned. This application Jul. 11, 1989, Ser. No. 378,349**
**Int. Cl.[5] A01N *1/02;* C12N *5/08***
**U.S. Cl. 435—2** **18 Claims**

1. A process for the lyophilization of cells having a cell membrane, comprising immersing a plurality of cells in a water solution which includes a monosaccharide, which is capable of permeating the membrane of the cells, in a concentration of from about 7.0 to 37.5%; freezing the solution; and drying the frozen cells by sublimation of the water.

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**5,045,447**
**METHOD OF PRODUCING ANTIBODIES TO HPV**
**Anthony C. Minson, 113 Cambridge Road, Great Shelford, Cambridge, England**
**Filed Mar. 15, 1989, Ser. No. 323,682**
**Int. Cl.[5] C12Q *1/02;* G01N *33/569***
**U.S. Cl. 435—5** **17 Claims**

1. In a method of producing an antibody, wherein antibodies are screened for the ability to bind to a specified antigen; the improvement which comprises screening the antibodies with intact fixed or unfixed cells infected with a recombinant virus vector expressing an antigen specific for the desired antibody,




which antigen is a polypeptide comprising an epitope of human papilloma virus (HPV).

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**5,045,448**
**METHOD AND PRODUCTS FOR DETECTION OF HUMAN T CELL LEUKEMIA VIRUS**
**Myron E. Essex, Sharon, and Tun-Hou Lee, Newton, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.**
**Continuation of Ser. No. 598,673, Apr. 13, 1984, Pat. No. 4,743,678, which is a continuation-in-part of Ser. No. 489,187, Apr. 27, 1983, abandoned. This application Dec. 10, 1987, Ser. No. 131,201**
**Int. Cl.[5] G01N *33/569, 33/535***
**U.S. Cl. 435—5** **16 Claims**

1. An essentially purified and essentially isolated antigen comprising human T-cell leukemia virus type I envelope glycoprotein having a molecular weight of approximately 61,000–68,000 daltons, or determinant-containing fragments of it or of its unglycosylated moiety, said envelope glycoprotein being characterized in that it is present in cells infected with human T-cell leukemia virus type I and its unglycosylated moiety is approximately 46,000–48,000 daltons.

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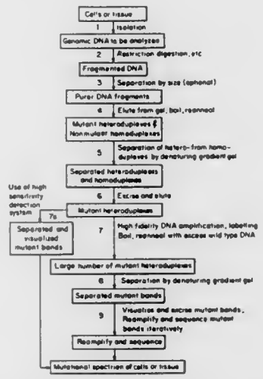
**5,045,449**
**METHODS OF DETECTING A GENETIC PREDISPOSITION FOR VASCULAR ANEURYSMS**
**Leena M. Ala-Kokko, Philadelphia, Pa.; Clinton T. Baldwin, Voorhees, N.J.; Sirpa I. Kontusaari, Philadelphia, Pa.; S. Helena Kuivaniemi, Philadelphia, Pa.; Darwin J. Prockop, Philadelphia, Pa., and Gerardus C. Tromp, Philadelphia, Pa., assignors to Thomas Jefferson University, Philadelphia, Pa.**
**Filed Jun. 14, 1989, Ser. No. 365,848**
**Int. Cl.[5] C12Q *1/68;* C07H *15/12;* C12N *15/00***
**U.S. Cl. 435—6** **4 Claims**

1. A method of detecting a genetic predisposition for vascular aneurysm in a person not otherwise known to have a connective tissue disease, comprising
identifying a person suspected of having a genetic predispositon for vascular aneurysm;
providing a tissue sample from said person;
determining the nucleotide base sequence of at least a portion of DNA coding for proα1(III) derived from said tissue sample; and
determining at least one difference in nucleotide base sequence of corresponding regions of said tissue sample DNA and a standard DNA sequence coding for type III procollagen, whereby a difference in the base sequence of the DNA from the test sample as compared with the standard sequence indicates an increased likelihood of said person suffering a vascular aneurysm.



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**5,045,450**
**DETERMINATION OF A MUTATIONAL SPECTRUM**
**William G. Thilly, Winchester, and Phouthone Keohavong, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**
**Filed Jul. 13, 1989, Ser. No. 379,087**
**Int. Cl.[5] C12Q *1/68;* G01N *27/00***
**U.S. Cl. 435—6** **7 Claims**




1. A method for determining a mutational spectrum in a DNA sequence of interest present in a population of cells comprising the steps of:
(a) providing fragmented double-stranded DNA, which is a mixture of mutant DNA-containing fragments and non-mutant DNA-containing fragments;
(b) separating the fragmented double-stranded DNA on the basis of molecular weight and isolating the DNA sequence of interest;
(c) denaturing a annealing the DNA sequence of interest under conditions appropriate for heteroduplex formation;
(d) separating the products of step c) by denaturing gradient gel electrophoresis thereby resolving heteroduplex molecules and homoduplex molecules, and isolating the heteroduplex molecules from the denaturing gradient gel;
(e) amplifying the isolated heteroduplex molecules from step d) by polymerase chain reaction under conditions appropriate for polymerization with an error rate of about $10^{-5}$ errors per base pair or less to produce a quantity of DNA sufficient for detection following denaturing gradient gel electrophoresis;
(f) denaturing and reannealing the products of step e) under conditions appropriate for heteroduplex formation, each heteroduplex containing a mutant DNA sequence, and separating the products by denaturing gradient gel electrophoresis;
(g) isolating and amplifying separately DNA in each band produced in step f), by polymerase chain reaction under conditions appropriate for polymerization with an error rate of about $10^{-5}$ errors per base pair or less;
(h) determining the nucleotide sequence of DNA from each band after amplification in step g); and
(i) comparing the nucleotide sequence of each band with the nucleotide sequence of corresponding nonmutant DNA to determine the difference in each.

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**5,045,451**
**METHODS FOR SCREENING ANTIBODIES FOR USE AS IMMUNOTOXINS**
**Jonathan W. Uhr, Ellen S. Vitetta, both of Dallas, Tex., assignors to Board of Regents, Austin, Tex.**
**Filed Oct. 26, 1988, Ser. No. 262,974**
**Int. Cl.[5] G01N *33/563, 33/567, 33/577***
**U.S. Cl. 435—7.23** **10 Claims**

1. An in vitro method for assessing the ability of an antibody selected from a group of antibodies to deliver a toxin to a selected target cell, the method comprising the steps of:
(a) incubating target cells with an antibody to be so assessed in an aqueous mixture under conditions appropriate for immunocomplex formation;
(b) introducing into the incubation mixture a toxin convalently linked to a univalent antibody fragment, said fragment having binding affinity for said antibody;
(c) assessing the ability of said antibody to deliver the toxin; and
(d) comparing the toxin-delivering ability of said antibody to the toxin-delivering ability of another member of the group of antibodies to select an antibody having the desired toxin-delivering ability.

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**5,045,452**
**METHOD FOR EVALUATING NEPHROTOXICITY**
**Jocelyn Spragg, Jamaica Plain, and K. Frank Austen, Wellsley, both of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.**
**Filed Sep. 2, 1988, Ser. No. 259,115**
**Int. Cl.[5] G01N *33/535***
**U.S. Cl. 435—7.4** **24 Claims**

1. A method for evaluating the potential nephrotoxic effect of a composition administered to a patient other than a renal allograft recipient, said method comprising:
(a) obtaining a biological sample of urine from a patient before administering said composition;
(b) mixing said sample of step (a) with a monospecific antibody for urokallikrein/kallikrein;
(c) measuring the amount of kallikrein in said sample of step (b) bound to said antibody to determine a baseline value;
(d) administering said composition to said patient;
(e) obtaining a biological sample of urine from said patient to whom said composition has been administered;
(f) mixing said sample of step (e) with a monospecific antibody for urokallikrein/kallikrein;
(g) measuring the amount of kallikrein in said sample of step (f) bound to said antibody; and
(h) comparing the result obtained in step (g) to said patient's baseline kallikrein values;
wherein decreased kallikrein content relative to said baseline value is indicative of nephrotoxic effect.

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**5,045,453**
**METHOD FOR DETERMINING SIALIC ACID IN PLASMA**
**Nonda Katopodis, Stamford, Conn., assignor to Dianon Systems, Inc., Stamford, Conn.**
**Filed Aug. 26, 1988, Ser. No. 236,891**
**Int. Cl.[5] C12Q *1/00;* G01N *33/48***
**U.S. Cl. 435—18** **25 Claims**

1. A method for extracting lipid bound sialic acid from a sample of human plasma or serum and determining the amount of lipid bound sialic acid in the sample which comprises:
(a) adding to the sample a mixture of a lower alkyl alcohol and a chlorinated lower alkyl hydrocarbon so as to form a resulting admixture, the volume ratio of the lower alkyl alcohol to the chlorinated lower alkyl hydrocarbon being in the range from about 70:30 to about 85:15;
(b) mixing the resulting admixture for a period of time sufficient to dissolve lipid bound sialic acid present in the sample;

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(c) treating the admixture so as to form a recoverable, substantially clear lipid bound sialic acid-containing upper phase and a lower phase;
(d) separately recovering from the clear upper phase so formed a predetermined volume of the upper phase; and
(e) determining the amount of lipid bound sialic acid present in the predetermined volume of the upper phase and thereby the amount of lipid bound sialic acid present in the sample.

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**5,045,454**

**SERUM-FREE GROWTH MEDIUM AND USE THEREOF**

**Kiell Bertheussen, Eidkjosen, Norway, assignor to Medi-Cult A/S, Denmark**

**Continuation of Ser. No. 142,069, Jan. 11, 1988. This application Feb. 23, 1990, Ser. No. 484,557**
**Claims priority, application Norway, Jan. 9, 1987, 870095**
**The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.**
**Int. Cl.[5] C12Q** *1/02;* **C12N** *5/02*
**U.S. Cl. 435—29** **50 Claims**

1. A serum-free eukaryotic cell growth medium comprising aurintricarboxylic acid, an iron-containing base cell culture medium and a non-toxic chelating agent.

30. A method for detecting the presence of a toxic substance in a test material comprising:
adding the test material to a volume of serum-free, iron containing cell culture medium comprising aurintricarboxylic acid and an iron chelating agent in a base cell culture medium to form a toxin-detecting concentration of a combination cell culture medium;
adding hybridoma cells to the combination cell culture medium to form a test culture;
preparing a control culture cmprising hybridoma cells and an iron-containing, serum-free cell culture medium comprising aurintricarboxylic acid and an iron chelating agent in a base cell culture medium;
incubating the test culture and the control culture; and
comparing hybridoma growth in the test culture to growth in the control culture;
wherein greater hybridoma growth in the control culture than in the test culture indicates the presence of a toxic substance in the test material.

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**5,045,455**

**FACTOR VIII:C CDNA CLONING AND EXPRESSION**

**George Kuo; Frank Masiarz, both of San Francisco; Martha Truett, Oakland; Pablo Valenzuela, San Francisco, all of Calif.; Mirella E. Rasmussen, Copenhagen, Denmark; Jennifer M. Favaloro, Victoria, Australia; Daniel Caput; Rae L. Burke, both of San Francisco, Calif., and Carol Pachl, Oakland, Calif., assignors to Chiron Corporation, Emeryville, Calif.**

**Continuation of Ser. No. 757,095, Jul. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 689,274, Jan. 7, 1985, Pat. No. 4,716,117, which is a continuation-in-part of Ser. No. 664,919, Oct. 26, 1984, abandoned, which is a continuation-in-part of Ser. No. 570,062, Jan. 12, 1984, Pat. No. 5,004,804. This application Jun. 14, 1990, Ser. No. 538,691**
**Int. Cl.[5] C12N** *15/03, 15/06, 1/21, 5/10, 15/12;* **C12P** *21/02;* **C07H** *15/12*
**U.S. Cl. 435—69.6** **16 Claims**

7. A process for preparing a recombinant human Factor VIII:C polypeptide, said process comprising:
(a) providing a population of host cells produced by introducing into a host cell an exogenous DNA molecule comprising (1) an intron-free sequence coding for the 92.5 kd peptide subunit of human Factor VIII:C wherein said peptide subunit is (i) cleavable by thrombin to yield the 52.5 kd and 40 kd peptide subunits of human Factor VIII:C, and (ii) capable of forming a $Ca^{++}$-bridged complex with the 77/80 kd peptide subunit of human Factor VIII:C, said complex having coagulation activity; wherein said intron-free sequence is flanked by 5' and 3' sequences which are not derived from human Factor VIII:C; and (2) transcriptional and translational signals recognized by said host cell that will provide for expression of said intron-free sequence; and
(b) growing said population of host cells under conditions whereby said intron-free sequence is expressed.

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**5,045,456**

**PROCESS FOR REMOVING BACTERIAL ENDOTOXIN FROM GRAM-NEGATIVE POLYSACCHARIDES**

**Mark S. Rienstra, and Edgar M. Scattergood, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 364,927, Jun. 12, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,722**
**Int. Cl.[5] C12P** *19/04, 1/04;* **C12R** *1/21*
**U.S. Cl. 435—101** **5 Claims**

1. A method for removing endotoxin from the outer cell of Gram-negative bacteria which comprises the steps of:
(a) growing Gram-negative bacteria in fermentation broth, releasing polysaccharide into the broth, and adding alcohol to the broth to remove impurities by precipitation;
(b) isolating the high molecular weight species and resolubilizing them in phenol and extracting other impurities;
(c) centrifuging remaining high molecular weight species and resolubilizing in a counter ion solution; and
(d) adding alcohol to the solution, cooling the solution, and thereafter incrementally adding alcohol to achieve lipopolysaccharide precipitation and lipopolysaccharide/-polysaccharide precipitation by selective alcohol fractionation.

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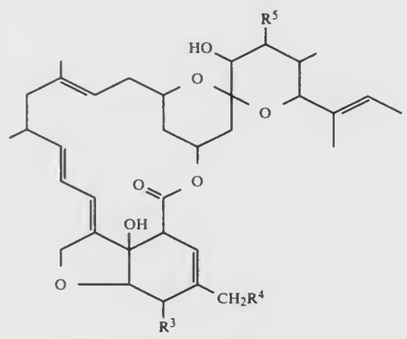
**5,045,457**

**NOVEL COMPOUNDS**

**Rhona M. Banks; Simon E. Blanchflower, and Peter R. Shelley, all of Surrey, England, assignors to Beecham Group p.l.c. of Beecham House, Middlesex, England**

**Filed Jan. 23, 1989, Ser. No. 299,933**
**Claims priority, application United Kingdom, Jan. 22, 1988, 8801488; Oct. 21, 1988, 8824762; Nov. 1, 1988, 8825561**
**Int. Cl.[5] C12N** *1/20;* **C12P** *19/62, 17/08*
**U.S. Cl. 435—124** **2 Claims**

1. A process for the production of a compound having the formula:



wherein $R^3$ is hydroxy optionally being protected; one of $R^4$ and $R^5$ is hydroxy optionally being protected; and the other of $R^4$ and $R^5$ is hydrogen, which process comprises cultivating a microorganism having all of the identifying characteristics of Streptomyces E225 NCIB 12310 and Streptomyces E225B NCIB 12509 or a mutant thereof.



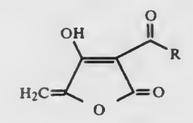
**5,045,458**

**ANTIBIOTICS PB-6042S**

**Tadashi Yoshida, Toyono; Teruo Hattori, Takarazuka; Koichi Matsumoto; Yoshihiro Terui, both of Toyonaka, and Junichi Shoji, Hirakata, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**

**Filed Oct. 19, 1989, Ser. No. 424,366**
**Claims priority, application Japan, Oct. 20, 1988, 63-266575**
**Int. Cl.[5] A61K** *31/365;* **C12P** *17/04;* **C07D** *307/60;* **C12R** *1/01*
**U.S. Cl. 435—126** **4 Claims**

1. A compound of the formula (I):



wherein R is
$(CH_2)_8CH_3$,
$(CH_2)_3CH(\underline{cis})CH(CH_2)_5CH_3$,
$(CH_2)_{10}CH_3$, or
$(CH_2)_4CH(\underline{cis})CH(CH_2)_6CH_3$.
or salt thereof.

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**5,045,459**

**METHOD FOR THE PRODUCTION OF GRANULAR CITRIC ACID**

**Helmut A. Mothes, Granger; Bhalchandra H. Patwardhan, Elkhart, both of Ind.; Theo G. Schroeder, Wuppertal, Fed. Rep. of Germany, and David J. Solow, Elkhart, Ind., assignors to Haarmann & Reimer Corp., Springfield, N.J.**

**Filed Oct. 5, 1990, Ser. No. 594,548**
**Int. Cl.[5] C12R** *1/685, 1/73;* **C12P** *7/48*
**U.S. Cl. 435—144** **10 Claims**

1. In combination with the method for the production of citric acid which comprises the fermentation of an appropriate carbon and hydrogen source as substrate in the presence of an appropriate microorganism to produce a fermentation broth containing citric acid together with impurities including the biomass residue of the microorganism, the improvement which comprises treating the fermentation broth to substantially remove the biomass and thereby provide a partially purified product containing citric acid and from about 2% to 30% (w/w) unreacted substrate and other impurities based on the weight of citric acid and introducing this product, without further purification, into the chamber of a fluidized bed reactor where it is suspended in a flow of upwardly rising air together with seed particles to thereby form granules of citric acid.

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**5,045,460**

**DNA SEQUENCE ENCODING METALLOCARBOXYPEPTIDASE INHIBITOR PROTEIN**

**Belinda M. Martineau, and Kevin E. McBride, both of Davis, Calif., assignors to Calgene, Inc., Davis, Calif.**

**Continuation-in-part of Ser. No. 364,362, Jun. 9, 1989. This application Jun. 13, 1989, Ser. No. 365,950**
**Int. Cl.[5] C12N** *15/09, 15/11, 15/29*
**U.S. Cl. 435—172.3** **14 Claims**

1. A cDNA sequence encoding a plant derived metallocarboxypeptidase inhibitor protein.

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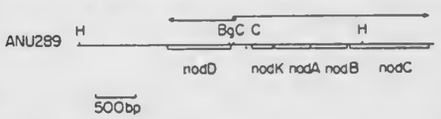
**5,045,461**

**METHOD FOR INCREASING YIELD AND NODULATION BY BRADYRHIZOBIUM**

**Kieran F. Scott, Waverly, Australia, assignor to Lubrizol Genetics, Inc., Wickliffe, Ohio**

**Filed Jun. 30, 1988, Ser. No. 213,906**
**Int. Cl.[5] C12N** *15/09, 1/21, 1/11*
**U.S. Cl. 435—172.3** **10 Claims**

1. A method of enhancing nodulation of a plant capable of being nodulated by Bradyrhizobium sp. (Parasponia) comprising:
infecting said plant with a Bradyrhizobium sp. (Parasponia)




strain mutated so that nodK is interrupted by an insertion, which insertion comprises promoter sequences capable of causing constitutive activation of nodABC.

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**5,045,462**

**BASIC PROTEIN CALLED PHOSPHOLIPASE A2 ISOLATED FROM THE VENOM OF A SNAKE OF THE FAMILY ELAPIDAE AND ITS AMINO ACID SEQUENCE**

**André Menez, St Remy Les Chevreuse, and Serge Chwetzoff, Gif Sur Yvette, both of France, assignors to Commissariat a L'Energie Atomique, Paris, France**

**Filed Nov. 17, 1988, Ser. No. 272,405**
**Claims priority, application France, Nov. 20, 1987, 87 16096**
**Int. Cl.[5] C12N** *9/20*
**U.S. Cl. 435—198** **4 Claims**

1. A cytotoxic agent, which comprises a substantially pure protein of the PLA2 type of 118 amino-acids, said protein having a molecular weight of approximately 13,325 daltons, having an isoelectric point of about 8.6, having the following sequence of amino acids of formula (I) below:

$Asn^{1}$—Leu—Tyr—Gln—Phe—Lys—Asn—Met—Ile—$His^{10}$— (I)
Cys—Thr—Val—Pro—Ser—Arg—Pro—Val—Val—$His^{20}$—
Phe—Ala—Asp—Tyr—Gly—Cys—Tyr—Cys—Gly—$Arg^{30}$ —
Gly—Gly—Lys—Gly—Thr—Pro—Ile—Asp—Asp—$Leu^{40}$—
Asp—Arg—Cys—Cys—Gln—Val—His—Asp—Asn—$Cys^{50}$—
Tyr—Glu—Lys—Ala—Gly—Lys—Met—Gly—Cys—
$Trp^{60}$—Pro—Tyr—Phe—Thr—Leu—Tyr—Lys—Tyr—Lys—
$Cys^{70}$—Ser—Lys—Gly—Thr—Leu—Thr—Cys—Asn—Gly—
$Arg^{80}$—Asn—Gly—Lys—Cys—Ala—Ala—Ala—Val—Cys—
$Asn^{90}$—Cys—Asp—Leu—Val—Ala—Ala—Asn—Cys—
Phe—$Ala^{100}$—Gly—Ala—Pro—Tyr—Ile—Asn—Ala—Asn—
Tyr—$Asn^{110}$—Ile—Asp—Phe—Lys—Lys—Arg—Cys—
$Gln^{118}$—OH

and having both enzymatic activity and cytotoxic activity.

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**5,045,463**

**DNA EXPRESSION VECTOR AND USE THEREOF**

**Michael A. Innis; David H. Gelfand, both of Oakland, and James H. Meade, Pinole, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.**

**Continuation of Ser. No. 563,941, Dec. 20, 1983, abandoned. This application Dec. 19, 1988, Ser. No. 287,688**
**Int. Cl.[5] C12N** *9/34, 1/16, 1/18, 15/00;* **C12P** *21/00, 7/06;* **C07H** *21/04*
**U.S. Cl. 435—205** **38 Claims**

1. A DNA expression vector which comprises:
a promoter fragment which functions in a host organism, wherein said host organism is yeast;
and a DNA segment having a modified DNA sequence, greater than 80% free of introns, which codes for glucoamylase protein from *Aspergillus niger,* or which codes for glucoamylase protein from *Aspergillus awamari;*
the DNA segment being in an orientation with the promoter fragment such that it is expressed in the yeast host to produce a non-native glucoamylase protein.

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5,045,464

## ALKALINE CELLULASE AND PROCESS FOR PRODUCING THE SAME

Susumu Ito; Shuji Kawai; Shitsuw Shikata; Katsuya Ozaki, all of Utsunomiya, and Tadashi Yoshimatsu, Tochigi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 339,592
Claims priority, application Japan, Apr. 25, 1988, 63-101678
Int. Cl.[5] C12N *9/42*
U.S. Cl. 435—209 3 Claims

1. An alkaline cellulase having the following physicochemical characteristics:

(1) Action

Possesses $C_x$ enzyme activity to act on carboxymethyl cellulose and weak $C_1$ enzyme and $\beta$-glucosidase activities.

(2) Substrate specificity

Acts on carboxymethyl cellulose, cellulose cotton, Avicel, filter paper, cellobiose, and p-nitrophenyl cellobioside.

(3) Working pH range and optimum pH range

Has a working pH range of 4–12 and an optimum pH range of 9–10.

(4) Stable pH range

Stable in a pH range of 4.5–10.5 when allowed to stand at 40° C. for 10 minutes and in a pH range of 6.8–10 when allowed to stand at 40° C. for 30 minutes.

(5) Working temperature range and optimum temperature range

Works in a wide temperature range of 10–65° C., with the optimum temperature range being around 40° C.

(6) Effects of chelating agents.

The activity is not inhibited by EDTA, EGTA, NTA, STPP, and zeolite.

(7) Effects of surface active agents.

The activity is hardly inhibited by surface active agents, including sodium (linear alkyl)benzene sulfonate, sodium alkyl sulfate, sodium polyoxyethylenealkyl sulfate, sodium α-olefin sulfonate, sodium α-sulfonated fatty acid ester, sodium alkyl sulfonate, polyoxyethylene secondary alkyl ether, sodium fatty acid, and dimethyldialkyl ammoniumchloride.

(8) Effects of proteinases

Possesses strong resistance against proteinases.

(9) Molecular weight

Molecular weight determined by molecular sieve gel chromatography is 30,000, 45,000, 90,000, 210,000, 240,000, or 300,000.

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5,045,465

## FERMENTATION PROCESS FOR CREATININE IMINOHYDROLASE

Jefferson C. Lievense, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 14, 1989, Ser. No. 393,184
Int. Cl.[5] C12N *9/78*
U.S. Cl. 435—227 18 Claims

1. A fermentative process for production of creatinine iminohydrolase from a creatinine iminohydrolase-producing aerobic soil microorganism comprising:

A. in the first phase, inserting the microorganism in a production medium having a pH in the range of about 7 to about 8 to generate, under aerobic conditions, microorganisms in which creatinine iminohydrolase production has been induced, said production medium representing an aqueous nutrient medium which comprises:

1) a carbon source comprising α-ketoglutaric acid,

2) a nitrogen source comprising a source of ammonia, and

3) trace nutrients, and

B. after the first phase and when ammonia is substantially exhausted, incrementally adding a solution of creatinine at a rate of 0.5 to 3 grams of solution of creatinine per liter per hour,

C. controlling the pH throughout the fermentation at about 7 to 8 by addition of an aqueous solution containing α-ketoglutaric acid, glucose, and inorganic salts, and

D. extracting urease-free creatinine iminohydrolase from said medium in step B.

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5,045,466

## PURIFIED MAMMALIAN CELL BINDING RECEPTOR FOR BACTERIAL LIPOPOLYSACCHARIDE ENDOTOXIN AND MONOCLONAL ANTIBODY

David C. Morrison, Kearney, Mo.; Taiying Chen; Mei-Guey Lei, both of Overland Park, Kans.; Stuart W. Bright, Raytown, and Linda M. Flebbe, Kansas City, both of Mo., assignors to University of Kansas, Kansas City, Kans.

Filed Jul. 7, 1989, Ser. No. 376,704
Int. Cl.[5] C12N *5/20;* C07K *15/28;* C12P *21/08*
U.S. Cl. 435—240.27 10 Claims

1. A monoclonal antibody which specifically binds to a receptor for bacterial lipopolysaccharide endotoxin which is present on mammalian peripheral blood mononuclear cells and murine B-lymphocytes, T-lymphocytes and macrophages, has a molecular weight of 80 kilodaltons as determined by SDS Page, and binds to a lipid A component of said bacterial lipopolysaccharide endotoxin.

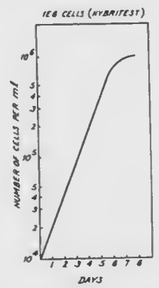
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5,045,467

## SERUM-FREE GROWTH MEDIUM AND USE THEREOF

Kjell Bertheussen, Eidkjosen, Norway, assignor to Medi-Cult A/S, Oslo, Norway and A/S GEA Farmaceutisk Fabrik, Fredriksberg, Denmark

Filed Jan. 11, 1988, Ser. No. 142,069
Claims priority, application Norway, Jan. 9, 1987, 870095
The portion of the term of this patent subsequent to Sep. 3, 2008, has been disclaimed.
Int. Cl.[5] C12N *5/02*
U.S. Cl. 435—240.31 26 Claims




1. A serum-free growth medium comprising:

a) a non-toxic iron chelate; and

b) aurintricarboxylic acid in a base culture medium, and which has a pH of between about 7.0–7.8.

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5,045,468

## PROTEIN-FREE CULTURE MEDIUM WHICH PROMOTES HYBRIDOMA GROWTH

Frederick J. Darfler, Derwood, Md., assignor to Cell Enterprises, Inc., Harrisonburg, Va.

Continuation-in-part of Ser. No. 940,942, Dec. 12, 1986, abandoned. This application Aug. 15, 1989, Ser. No. 394,082
Int. Cl.[5] C12N *5/02, 5/12*
U.S. Cl. 435—240.31 15 Claims

1. A protein-free culture medium comprising (a) a nonproteinaceous organo-iron compound selected free from the group consisting of a nitroprusside salt and hemin, and (b) a selenium compound, in amounts which, in combination, synergistically promote the growth of hybridomas.



5,045,469

## NOVEL BACILLUS THURINGIENSIS ISOLATE DENOTED B. T. PS81F, ACTIVE AGAINST LEPIDOPTERAN PESTS, AND A GENE ENCODING A LEPIDOPTERAN-ACTIVE TOXIN

Jewel Payne, and August J. Sick, both of San Diego, Calif., assignors to Mycogen Corporation, San Diego, Calif.

Filed Oct. 27, 1988, Ser. No. 263,567
Int. Cl.[5] C12N *1/21, 15/32, 15/70, 15/74*
U.S. Cl. 435—252.3 10 Claims

1. DNA encoding a *B.t.* toxin having the amino acid, sequence shown in FIG. 3.

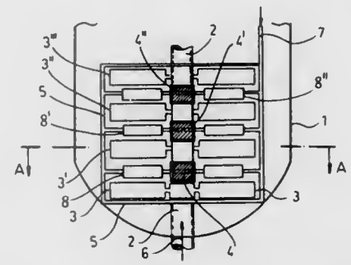
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5,045,470

## DEVICE FOR SUBMERGED CULTURE OF TISSUE CELLS

Gerd Kloss, Kolbermoor, Fed. Rep. of Germany, assignor to Stawag, Schlieren, Switzerland

PCT No. PCT/CH89/00067, § 371 Date Feb. 5, 1989, § 102(e) Date Feb. 5, 1989, PCT Pub. No. WO89/09814, PCT Pub. Date Oct. 19, 1989
ub. Date DApr. 4, 1989, Ser. No. 455,381
Claims priority, application Switzerland, Apr. 5, 1988, 1244/88
Int. Cl.[5] C12M *3/00;* C12N *5/00*
U.S. Cl. 435—284 5 Claims




1. An apparatus for submerged culturing of tissue cells, comprising:

an upright sterilizable container;

a rotatable vertical hollow shaft extending centrally in said container;

a plurality of sets of radially extending blades spaced apart on said shaft and communicating with said hollow shaft, each of said blades being permeable to gas only along an upper surface thereof whereby gas introduced into said shaft flows out of said upper surfaces of said blades into a culture medium in said container, each of said sets comprising at least one pair of said blades, said blades having gas-impermeable lower surfaces;

spacers between said sets along said shaft;

means for feeding said gas to said hollow shaft; and

a cage in said container surrounding said shaft and said sets of blades said cage comprising:

a plurality of vertically spaced hollow baffle plates each disposed between two of said sets,

hollow posts outwardly of said blades attached to said plates and communicating with said plates,

means for feeding gas to said hollow posts, and

gas-permeable means on said plates for discharging gas into said medium.

5,045,471

## CLONED DNA FOR P450SCC AND EXPRESSION THEREOF

Walter L. Miller, San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Dec. 2, 1986, Ser. No. 936,883
Int. Cl.[5] C12N *15/52, 15/70, 15/74, 15/79*
U.S. Cl. 435—320.1 9 Claims

1. An isolated polynucleotide sequence endoding human P450scc.

8. A functional DNA construct capable of expressing human P450scc comprising (a) a transcription initiation region functional in a unicellular organism, (b) a structural gene according to claim 1 encoding human P450scc, and (c) a transcription termination region.

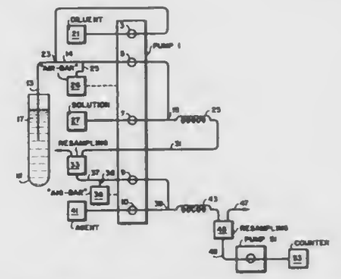
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5,045,472

## REAGENT MIXTURE AND COMPOSITION FOR TREATING RED BLOOD CELLS TO EFFECT SPHERING

Leonard Ornstein, White Plains, and Young R. Kim, Hartsdale, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 425,506, Oct. 20, 1989, abandoned, which is a continuation of Ser. No. 158,124, Feb. 16, 1988, abandoned, which is a continuation of Ser. No. 802,956, Nov. 27, 1985, abandoned, which is a continuation of Ser. No. 510,824, Jul. 5, 1983, abandoned, which is a division of Ser. No. 277,539, Jun. 26, 1981, Pat. No. 4,412,004. This application Jun. 14, 1990, Ser. No. 537,887
Int. Cl.[5] G01N *21/49, 33/48, 15/14*
U.S. Cl. 436—10 34 Claims



1. A composition for use in a cytometer, comprising:

(a) an anticoagulated whole blood sample aliquot, and

(b) a reagent mixture consisting essentially of:

(i) an isotonic aqueous solution;

(ii) a sphering agent; and

(iii) a protein, which reversibly binds said sphering agent;

said protein and sphering agent being present in a weight ratio of protein to sphering agent from about 20:1 to about 70:1, and said sphering agent having a final concentration in the range of about 2 mg per 100 ml to about 10 mg per 100 ml in said reagent mixture.

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5,045,473

## APPARATUS AND METHOD FOR THE SEPARATION AND/OR FORMATION OF IMMICIBLE LIQUID STREAMS

Michael M. Cassaday, Valhalla; Vito F. Christiano, Somers, both of N.Y., and Bachalli Vasudeva, Princeton Junction, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

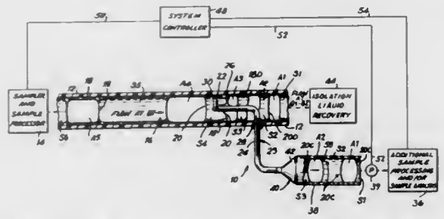
Filed Jul. 14, 1987, Ser. No. 73,049
Int. Cl.[5] G01N *35/08*
U.S. Cl. 436—53 26 Claims

1. In apparatus for the substantial separation of a second liquid from a common stream of said second liquid and a first

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liquid which is immiscible therewith flowing in conduit means, said conduit means including an inner surface which is selectively wettable by said second liquid to the substantial exclusion of said first liquid, and wherein said second liquid is flowing primarily at said inner conduit means surface in substantial contact therewith, and said first liquid is flowing primarily within said second liquid substantially out of contact with said conduit means inner surface, the improvements comprising, liquid separating means in said conduit means for substantially separating said second liquid from said common stream of said first and second immiscible liquids attendant the flow thereof past said liquid separating means in said conduit means, and means operatively connected to said liquid separating means



for flowing the thusly separated second liquid out of said conduit means while enabling the continued flow of the remainder of said common liquids stream through said conduit means, said liquid separating means comprising a porous conduit means portion of a material which is selectively wettable by said second liquid to the substantial exclusion of said first liquid, said porous conduit means portion being disposed in said conduit means so as to be initially contacted substantially only by said second liquid attendant the flow of said first and second immiscible liquids through said conduit means, and means operatively associated with said porous conduit means portion for flowing said second liquid therethrough out of said conduit means.

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**5,045,474**

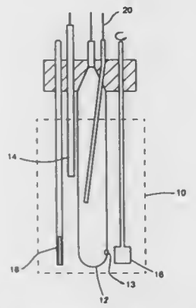
## SEMI-AUTOMATIC PROCESS FOR WHITE CELL DIFFERENTIAL COUNT

**Ruth M. Becker, Sunnyvale, and Sherburne M. Edmondson, Jr., Cupertino, both of Calif., assignors to Sequoia-Turner Corporation (Unipath), Mountain View, Calif.**

**Continuation of Ser. No. 55,138, May 28, 1987, abandoned, which is a continuation of Ser. No. 805,971, Dec. 6, 1985, abandoned. This application Sep. 12, 1989, Ser. No. 406,828**

**Int. Cl.[5] G01N *33/50***

**U.S. Cl. 436—63** **1 Claim**



1. In a process for hematological analysis, including three-part volumetric differential determination of white blood cell types, which consists essentially of the steps of:

a) contacting a whole blood sample with a diluent;

b) lysing red cells and partially lysing white cells in the diluted blood sample with a lysing reagent under precisely controlled time, mixing and volume conditions; and,

c) obtaining a differentiation of partially lysed white cells in the diluted blood sample into distinct sub-populations by carefully timed resistivity measurements of cell size,

the improvement wherein:

off-line diluter means are used to contact the whole blood sample with the diluent, and

on-line means in an automatic instrument are provided to simultaneously mix the diluted blood sample while the lysing reagent is added thereto, said on-line mixing means comprising a motor-driven paddle which commences mixing of the diluted blood sample before the lysing reagent is added and which paddle continues to mix for a short interval after the lysing reagent has been added to the diluted blood sample,

said resistivity measurements of cell size also being performed on-line in the automatic instrument and enabling a white cell differential determination by enumeration and distribution of partially lysed white cells into distinct subpopulations.

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**5,045,475**

## REAGENT FOR DETERMINING CATIONS

**Eddy Chapoteau, Brooklyn; Bronislaw P. Czech, Peekskill; Carl R. Gebauer, Crompond; Koon-Wah Leong, Ossining, and Anand Kumar, Southfields, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.**

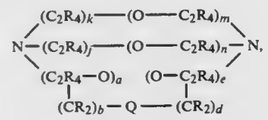
**Division of Ser. No. 38,843, Apr. 15, 1987, Pat. No. 4,808,539. This application Jun. 1, 1988, Ser. No. 201,576**

**Int. Cl.[5] G01N *21/78***

**U.S. Cl. 436—74** **13 Claims**

1. A reagent for determining an amount of cations present in a sample, the reagent comprising:

a compound of the general formula I



I

wherein k and j, either same or different, are equal to 1 to about 5;

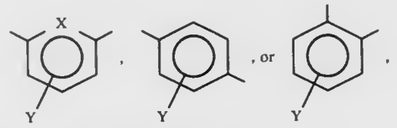
m and n, either same or different, are equal to 0 to about 4;

a and e, either same or different, are equal to 0 to about 2;

b and d, either same or different, are equal to 0 to about 5;

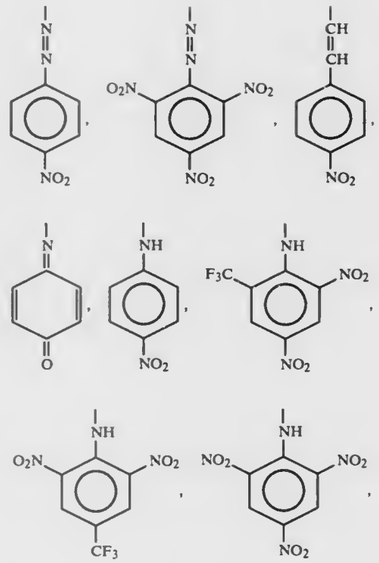
R, either same or different, is hydrogen, lower alkyl, lower alkylidene, lower alkenyl, allyl, or aryl; and

Q is

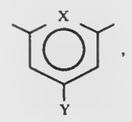


wherein X is CH, N, or COH;

and Y includes



except that when Q is



wherein Y is selected from the group consisting of p-nitrophenylazo, 3-phenyl-isothiazolyl-5-azo, isothiazolyl-5-azo, thiazolyl-5-azo, 2,4,6-trinitrophenylazo, p-nitro styryl, p-benzoquinonemonoimino and bis-(p-dimethylaminophenyl) hydroxymethyl, then the following conditions cannot be present; that simultaneously b is equal to 0 or 1, d is equal to 0 or 1, j is equal to 1, n is equal to 1 or 2, a is equal to 1, e is equal to 1, k is equal to 1, and m is equal to 2; the reagent further comprising at least one interfering cation-complexing compound mask.



**5,045,476**

## METHOD AND DEVICE FOR ANALYZING SOLID SUBSTANCES ON MERCURY

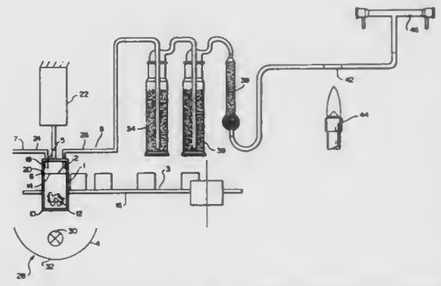
**Bernhard Huber, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin Elmer GmbH, Uberlingen, Fed. Rep. of Germany**

**Filed May 24, 1990, Ser. No. 527,926**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3919042**

**Int. Cl.[5] G01N *21/00***

**U.S. Cl. 436—81** **11 Claims**



1. A method for analyzing a solid substance comprising mercury by measuring the atomic absorption with the method steps:

enclosing the solid substance within at least one sample vessel, with a closure,

heating the at least one sample vessel to vaporize the mercury in the solid substance and destroy the closure to expel the vaporized mercury from the at least one sample vessel,

conveying the generated mercury vapor with a carrier gas flow over a body having a large surface made of an amalgamgenerating material, so that the mercury vapor bonds and is accumulated as amalgam on the surface of this body,

subsequently heating the body in order to vaporize the mercury accumulated as amalgam again, and

conveying the mercury vapor from the amalgam by a carrier gas flow into a measuring vessel of an atomic absorption spectrometer; and

analyzing the vapor for the concentration of mercury.

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**5,045,477**

## ANALYTICAL METHODS UTILIZING REDUCIBLE COMPOUNDS

**Robert T. Belly, Webster; Albert J. Mura, Rochester; Theodore W. Esders, Webster, and Brent A. Burdick, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 824,766, Jan. 31, 1986, Pat. No. 4,857,271 continuation-in-part of Ser. No. 699,386, Feb. 7, 1985, abandoned. This application Apr. 28, 1989, Ser. No. 344,870**

**The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.**

**Int. Cl.[5] G01N *21/00***

**U.S. Cl. 436—164** **8 Claims**

1. A method for the determination of an analyte comprising the steps of:

A. at a pH of 9 or less, contacting a sample of a liquid suspected of containing an analyte with a reducible compound of the structure $CAR—R^1)_n$ wherein CAR— is a substituted or unsubstituted aromatic or quinone nucleus, $R^1$ is a moiety which comprises a shiftable detectable species, and n is 1 or 2,

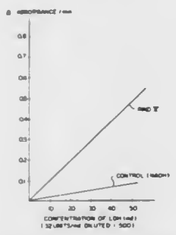
provided said compound is capable of being reduced at said pH to release said shiftable detectable species, and

further provided that when $R^1$ is replaced with H, CA-

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$R—H)_n$ has an $E_{\frac{1}{2}}$ of either at least about +100 mV when measured in water, or of at least about −650 mV when measured in acetonitrile, and



B. detecting the detectable species released as a result of the presence of said analyte.

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**5,045,478**

**VESICLES AND USE THEREOF IN AN ASSAY**

**Daniel B. Wagner, Raleigh, N.C., and Uri Piran, Norwood, Mass., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.**

**Division of Ser. No. 835,781, Mar. 3, 1986, Pat. No. 4,717,676. This application Oct. 9, 1987, Ser. No. 106,385**

**Int. Cl.[5] G01N *33/532***

**U.S. Cl. 436—501** **12 Claims**

1. A composition comprising:

a sac, at least a portion of said sac being formed from a compound having the following structural formula;

X—Y—Z, wherein

X is a hydrophobic radical;

Y is a hydrophilic peptide; and

Z is a radical including a non-hydrolyzable polar group selected from the group consisting of sulfonate, phosphonate, phospinate, and quarternary amine.

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**5,045,479**

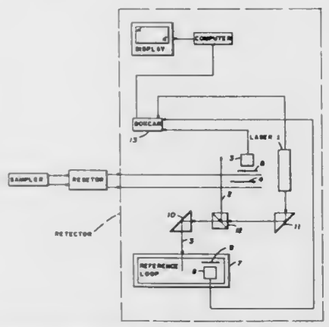
**CONTINUOUS FLOW COMPETETIVE ASSAY WITH REFERENCE SYSTEM**

**Arnold L. Newman, Kensington, and William D. Stanbro, Columbia, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.**

**Filed Jul. 5, 1988, Ser. No. 215,106**

**Int. Cl.[5] C12M *1/40***

**U.S. Cl. 436—518** **26 Claims**



1. A competitive binding reaction apparatus for the continuous detection and measurement of at least one analyte in an environment, said apparatus comprising:

a sample collector assembly for capturing samples of the environment,

a chemical reaction assembly,

a detection asseembly, and

means for continuously flowing the sample from the collector assembly to the reaction assembly and then to the detection assembly;

wherein said chemical reaction assembly comprises:

a first immunochemical immobilized on a surface; and

a second immunochemical provided with tags and specifically bound to said first immunochemical, at least one of said first and second immunochemicals able to specifically bind to the analyte;

wherein said detection assembly comprises:

means for detecting said tags in an exit stream from said chemical reaction assembly and producing first signals representing the total amount of tagged immunochemical in the exit stream;

a reference system comprising:

a closed recirculating reference loop containing a known amount of said tagged second immunochemical,

means for detecting tags in said reference loop and producing second signals;

means for normalizing said first signals by comparing with said second signals;

a model means of a response of said chemical reaction assembly to said tagged second immunochemical when there is no sample present as a function of time, said model means providing the amount of second tagged immunochemical in the exit stream as a function of time;

means comparing said normalized first signals with said model means to adjust the total amount of tagged second immunochemical by the amount of tagged second immunochemical and produce third signals representing the continuous detection and measurement of the analyte; and

output means showing said third signals.

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**5,045,480**

**GEL PARTICLES HAVING HAPTEN MOIETIES BOUND THERETO AS IMMUNOASSAY REAGENT**

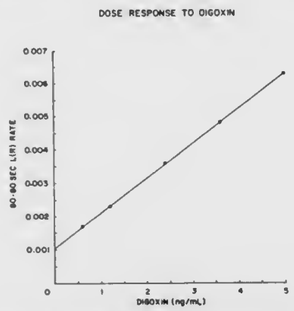
**Richard D. Johnson, Elkhart, Ind.; H.-Volker Runzheimer, Bergisch Gladbach, Fed. Rep. of Germany; Ronald G. Sommer, and Kin F. Yip, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.**

**Filed Feb. 9, 1989, Ser. No. 308,658**

**The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.**

**Int. Cl.[5] G01N *33/547***

**U.S. Cl. 436—532** **33 Claims**




1. A method of preparing a stable immobilized hapten reagent for use in the specific binding assay determination of a hapten or binding analog thereof in a liquid test sample, the method comprising the steps of:

(a) reacting a hapten moiety with a gel particle comprising a plurality of external and internal chemically active functional groups wherein the reaction is performed in a solvent in which the gel particle is substantially nonswollen and under conditions to form a covalent bond between the hapten moiety and said external active functional groups which is substantially stable in aqueous solutions;

(b) washing the gel particle resulting from step(a) with a nonswelling solvent;

(c) washing the gel particle resulting from step(b) with an aqueous solution; and

(d) isolating the immobilized hapten reagent resulting from step(c) comprising said gel particle and said hapten moieties bound thereto wherein substantially all of said bound hapten moieties are covalently linked to the external surface functional groups by a linking group which is substantially stable in aqueous solutions.



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**5,045,481**

**METHOD OF MANUFACTURING A SOLAR CELL**

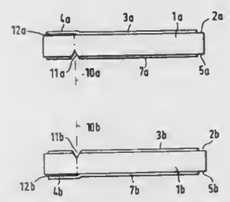
**Roland Schilling, Gemmingen, and Karl-Heinz Tentscher, Heilbronn, both of Fed. Rep. of Germany, assignors to TELEFUNKEN electronic GmbH, Heilbronn, Fed. Rep. of Germany**

**Division of Ser. No. 839,172, Mar. 13, 1986, abandoned. This application Jul. 30, 1990, Ser. No. 563,821**

**Claims priority, application Fed. Rep. of Germany, Mar. 27, 1985, 3511082**

**Int. Cl.[5] H01L *31/18***

**U.S. Cl. 437—2** **9 Claims**




1. A process for manufacturing a solar cell from a semiconductor body, comprising the steps of:

providing a semiconductor base body having first and second opposing major surfaces, wherein an edge zone is defined along an edge of the first major surface of said semiconductor body;

depositing a strip-shaped region on said edge zone, said strip-shaped region preventing bonding of metallic compounds or alloys to said semiconductor base body;

depositing by vaporization a first metallic connection contact on said strip-shaped region and on the first major surface of said semiconductor body, said strip-shaped region preventing said first metallic connection contact from adhering to said semiconductor body;

depositing a second metallic connection contact on the second major surface of said semiconductor body, one of said first and second metallic connection contacts having a comb-like structure; and

severing the portion of the semiconductor body at said edge zone from the remainder of said semiconductor body, whereby said first metallic connection contact projects over the edge of the resulting solar cell.

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**5,045,482**

**METHOD OF MAKING A TANDEM PIN SEMICONDUCTOR PHOTOELECTRIC CONVERSION DEVICE**

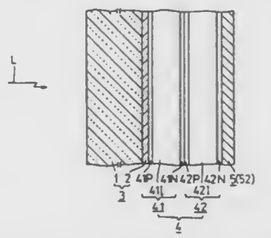
**Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 303,995, Jan. 30, 1989, Pat. No.**

**Claims priority, application Japan, May 15, 1984, 59-97318; May 15, 1984, 59-97319; May 15, 1984, 59-97320**

**Int. Cl.[5] H01L *31/18***

**U.S. Cl. 437—3** **1 Claim**




1. A method for the manufacture of a semiconductor photoelectric conversion device, comprising the steps of:

forming a laminate member on a transparent substrate having a conductive surface by laminating at least first and second PIN structures in that order, each of which has such a construction that a first conductivity type non-single-crystal semiconductor layer, an I-type non-single-crystal semiconductor layer doped with a recombination center neutralizer and a non-single-crystal semiconductor layer of a second conductivity type reverse from the first conductivity type are laminated in that order or in the reverse order;

forming an electrode which is composed of transparent conductive layer formed on the laminate member and a reflecting conductive layer formed on the transparent conductive layer; and

crystallizing the I-type non-single-crystal semiconductor layer of the second PIN structure by light irradiation from the side opposite from the transparent substrate before the formation of the reflecting conductive layer of the electrode.

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**5,045,483**

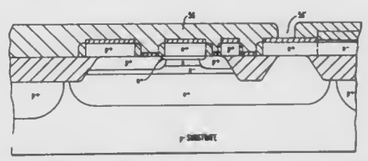
**SELF-ALIGNED SILICIDED BASE BIPOLAR TRANSISTOR AND RESISTOR AND METHOD OF FABRICATION**

**Bancherd DeLong; Christopher S. Blair; George E. Ganschow, and Thomas S. Crabb, all of Puyallup, Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Apr. 2, 1990, Ser. No. 503,340**

**Int. Cl.[5] H01L *21/328***

**U.S. Cl. 437—31** **5 Claims**



5. A method for producing a bipolar transistor and resistor on a substrate, comprising:

selectively doping portions of said substrate to provide a collector layer, a buried layer, and a base layer overlying the collector layer;

depositing a layer of polysilicon on said substrate;

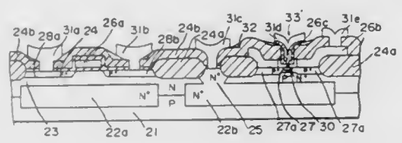
VOL 1130 ISS 1 SE 3 1991 UMI



selectively doping and etching portions of said polysilicon layer to form emitter, base, and collector contacts and a resistor;
depositing a layer of high-temperature oxide over said polysilicon and exposed portions of said substrate at an elevated temperature, while simultaneously driving-in dopants from said polysilicon to increase doping concentrations in said base layer, said depositing taking place in the absence of a layer of nitride overlying said polysilicon;
depositing a masked material on said high-temperature oxide in the region of said resistor, to maintain a layer of high temperature oxide over said resistor;
selectively etching said high-temperature oxide to form sidewalls spacers adjacent said collector and base contacts; and
forming a metal silicide layer on at least the upper surfaces of said collector, emitter, and base contacts and on said substrate adjacent to said base, wherein said sidewalls of said contacts and at least a portion of said resistor remain free of metal silicide.

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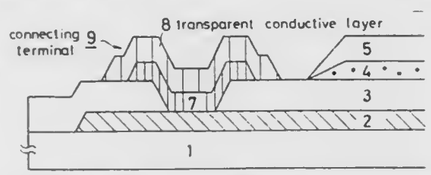
**5,045,484**
**FABRICATION METHOD OF A BIMOS SEMICONDUCTOR DEVICE**
**Shinichi Yamada, and Tunenori Yamauchi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan**
**Filed Jul. 17, 1990, Ser. No. 553,389**
**Claims priority, application Japan, Jul. 17, 1989, 1-184186**
**Int. Cl.[5] H01L** *21/331, 21/336*
**U.S. Cl. 437—31** **6 Claims**



1. A method for fabricating a semiconductor device including a metal-insulator-semiconductor transistor and a bipolar transistor on a common semiconductor layer respectively in correspondence to a first region and a second region defined in the semiconductor layer, said first region and said second region being formed along a surface of the semiconductor layer with a mutual separation therebetween, said method comprising the steps of:
forming a first insulator layer on the semiconductor layer in correspondence to the first region;
providing a gate electrode of the metal-insulator-semiconductor transistor on the first insulator layer in correspondence to the first region of the semiconductor layer;
providing a base electrode on the second region of the semiconductor layer;
introducing impurities into the semiconductor layer in the first region using the gate electrode as a mask to form a self-aligned source region and drain region in the semiconductor layer at both sides of the gate electrode;
introducing impurities into the base electrode and causing a diffusion of the impurities into the semiconductor layer from the base electrode to form a base region in the second region of the semiconductor layer;
providing a second insulator layer so as to cover the first region including the source region, the gate electrode and the drain region, and the second region including the base electrode;
providing an insulator material on the second insulator in the form of liquid and curing subsequently to form a third insulator layer on the second insulator layer with a planarized top surface;
providing a through hole in the second insulator layer in correspondence to the second region of the semiconductor layer, after the step of providing the insulator material forming the third insulator layer, such that the through hole penetrates at least through the second insulator layer and the base electrode to expose a top surface of the semiconductor layer;
forming an emitter region of the bipolar transistor in the second region of the semiconductor layer in correspondence to the top surface of the semiconductor layer exposed by the through hole; and
providing interconnection electrodes for interconnection of the semiconductor device in correspondence to the source region and the drain region of the MOS transistor and further in correspondence to the base region and the emitter region of the bipolar transistor.

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**5,045,485**
**METHOD FOR PRODUCING AMORPHOUS SILICON THIN FILM TRANSISTOR ARRAY SUBSTRATE**
**Sakae Tanaka, and Yoshiaki Watanabe, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan**
**Division of Ser. No. 300,629, Jan. 23, 1989, Pat. No. 4,960,719.**
**This application Jul. 19, 1989, Ser. No. 383,119**
**Claims priority, application Japan, Feb. 4, 1988, 63-24729; Feb. 10, 1988, 63-29181; Feb. 10, 1988, 63-29182**
**Int. Cl.[5] H01L** *21/3205, 21/283*
**U.S. Cl. 437—40** **2 Claims**

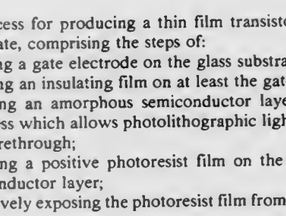


1. In a method for producing an amorphous silicon thin film transistor array substrate comprising coating a gate insulating layer, an amorphous silicon layer, and a protective insulating layer on a glass substrate provided with a gate electrode and a gate wiring, removing said protective insulating layer selectively to expose the amorphous silicon layer to overlap at least a part of said gate electrode, and then after passing through a predetermined procedure, providing at least an amorphous silicon thin film transistor array, a gate wiring, and a source wiring, the improvement wherein said step of coating comprises depositing said gate insulating layer on the whole surface of said glass substrate, depositing said amorphous silicon layer so as to not cover an end part of said gate wiring pattern, and further comprising removing the gate insulating layer to expose only said gate wiring, at a part thereof, by providing an opening part in the gate insulating layer on the gate wiring of the part at the end part of said gate wiring pattern where the amorphous silicon layer is not coated, and forming a conductive layer for a connecting terminal for the gate wiring on the said opening part.

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**5,045,486**
**TRANSISTOR FABRICATION METHOD**
**Sailesh Chittipeddi, Whitehall, and William T. Cochran, New Tripoli; Michael J. Kelly, Orefield, of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**
**Filed Jun. 26, 1990, Ser. No. 543,592**
**Int. Cl.[5] H01L** *21/265*
**U.S. Cl. 437—41** **2 Claims**

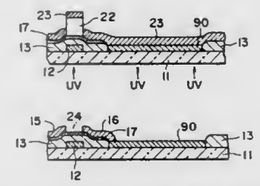
2. A method of semiconductor fabrication comprising:
forming at least two moats upon a substrate, a first moat for an n-tub and a second moat for a p-tub;
forming at least one gate stack within each moat;
forming a first oxide layer by differential oxidation upon each said gate stack and upon said substrate within each moat, said first oxide layer having a thickness over said gate stacks which is greater than its thickness over said substrate;
performing a blanket n-type implant over both exposed moats;
covering said p-tub with first photoresist;
performing a blanket p-type implant;
removing said first photoresist;
forming spacers adjacent said gate in said p-tub and said n-tub;



forming a second oxide layer by differential oxidation upon each gate stack and upon said substrate within each moat, said second oxide layer having a thickness over said gate stacks which is greater than its thickness over said substrate;
covering said n-tub with second photoresist;
performing a blanket n-type implant;
removing said second photoresist;
covering said p-tub with third photoresist;
performing a blanket p-type implant;
removing said third photoresist.

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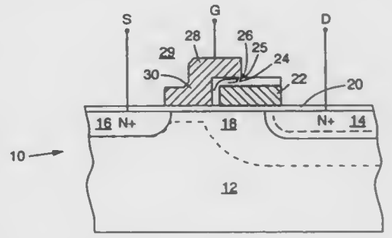
**5,045,487**
**PROCESS FOR PRODUCING A THIN FILM FIELD-EFFECT TRANSISTOR**
**Toshirou Kodama, Yokohama; Satoru Kawai, Kawasaki; Yasuhiro Nasu, Kawasaki; Nobuyoshi Takagi, Kawasaki, and Shintaro Yanagisawa, Atsugi, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**
**Continuation of Ser. No. 302,996, Jan. 27, 1989, abandoned, which is a continuation of Ser. No. 198,581, May 2, 1988, abandoned, which is a continuation of Ser. No. 883,022, Jul. 9, 1986, abandoned, which is a division of Ser. No. 824,319, Jan. 31, 1986, abandoned, which is a continuation of Ser. No. 480,579, Mar. 30, 1983, abandoned. This application Sep. 18, 1989, Ser. No. 408,944**
**Claims priority, application Japan, Mar. 31, 1982, 57-53239**
**Int. Cl.[5] H01L** *21/312*
**U.S. Cl. 437—41** **10 Claims**

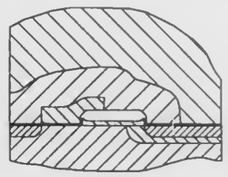


1. A process for producing a thin film transistor having a glass substrate, comprising the steps of:
(a) forming a gate electrode on the glass substrate;
(b) forming an insulating film on at least the gate electrode;
(c) forming an amorphous semiconductor layer having a thickness which allows photolithographic light to permeate therethrough;
(d) forming a positive photoresist film on the amorphous semiconductor layer;
(e) selectively exposing the photoresist film from underneath the glass substrate so that it remains only above the gate electrode;
(f) depositing source and drain electrode material on the remaining photoresist film and on portions of the amorphous semiconductor layer not covered by the remaining photoresist film; and
(g) selectively removing the electrode material which is deposited on the remaining photoresist film, thereby forming source and drain electrodes separated from each other by a gap formed therebetween.

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**5,045,488**
**METHOD OF MANUFACTURING A SINGLE TRANSISTOR NON-VOLATILE, ELECTRICALLY ALTERABLE SEMICONDUCTOR MEMORY DEVICE**
**Bing Yeh, Los Altos Hills, Calif., assignor to Silicon Storage Technology, Inc., Calif.**
**Filed Jan. 22, 1990, Ser. No. 468,003**
**Int. Cl.[5] H01L** *21/265*
**U.S. Cl. 437—43** **7 Claims**





1. A method of making an electrically programmable and erasable memory device comprising the steps of:
defining a substrate;
growing a first layer of dielectric material over said substrate;
depositing a layer of polysilicon or amorphous silicon over said first layer;
covering said layer of silicon with a protective material;
annealing said layer of silicon to form. recrystallized silicon;
removing a portion of said protective material to define a floating gate region;
growing masking oxide on said floating gate region;
removing the remainder of said protective material and the recrystallized silicon thereunder;
depositing a second layer of dielectric material silicon dioxide over said floating gate and said substrate;
patterning and forming a control gate; and
defining a drain and a source region in said substrate.

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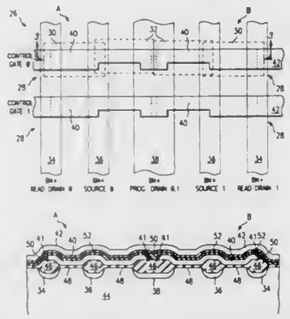


**5,045,489**

## METHOD OF MAKING A HIGH-SPEED 2-TRANSISTOR CELL FOR PROGRAMMABLE/EEPROM DEVICES WITH SEPARATE READ AND WRITE TRANSISTORS

**Manzur Gill, Rosharon, and David D. Wilmoth, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 30, 1989, Ser. No. 374,372**
**Int. Cl.[5] H01L *21/265***
**U.S. Cl. 437—43** **10 Claims**



1. A method of forming a non-volatile memory comprising the steps of:

forming first, second, and third elongate doped regions of a first conductivity type in a substrate of a second conductivity type, said first, second and third doped regions being substantially parallel;

forming a floating gate overlying and separated from said first, second and third doped regions;

forming a control gate defining a first channel between said first and second doped regions and a second channel between said second and third doped regions.

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**5,045,490**

## METHOD OF MAKING A PLEATED FLOATING GATE TRENCH EPROM

**Agerico L. Esquivel, Dallas; Allan T. Mitchell, Garland, and Howard L. Tigelaar, Allen, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 469,814, Jan. 23, 1990, Pat. No. 4,979,004. This application Aug. 21, 1990, Ser. No. 570,655**
**Int. Cl.[5] H01L *21/265***
**U.S. Cl. 437—43** **6 Claims**

1. A method for fabricating a memory device on a semiconductor structure, the device comprising an array of memory cells arranged in rows and columns along a first surface of the structure, each cell having a pleated floating gate, the method comprising the steps of:

forming first and second trenches along at least a first column and beneath the first surface, said trenches each having first and second wall portions and a bottom portion, the trenches separated by a partition extending along the first surface, the partition defining a first wall in the first trench and a second wall in the second trench;

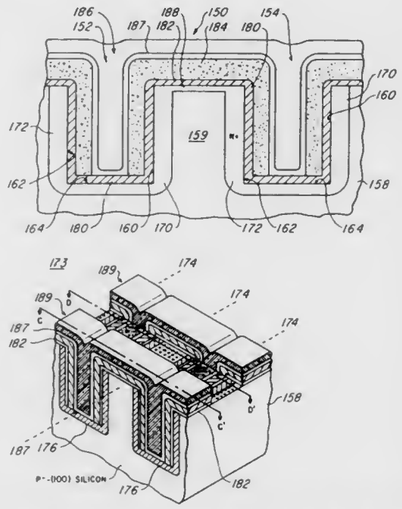
depositing and diffusing a dose of dopant into the trenches in order to create a pair of bit lines along the first column, the bit lines including source and drain electrodes for each memory cell in the first column;

forming a first dielectric layer over the wall portions and the bottom portion of each trench;

forming a first conductive layer over the first dielectric layer and about the partition;

selectively removing portions of the first conductive layer to create a floating gate for each cell in the first column each floating gate having a pleat draped about the substrate partition;

forming a second dielectric layer over the floating gates in the first column; and



forming a second conductive layer over the second dielectric layer to create a control gate over each floating gate in the first column.

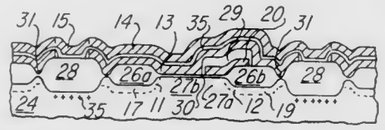
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**5,045,491**

## METHOD OF MAKING A NONVOLATILE MEMORY ARRAY HAVING CELLS WITH SEPARATE PROGRAM AND ERASE REGIONS

**Manzur Gill, Arcola, and Theodore D. Lindgren, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Sep. 28, 1990, Ser. No. 589,342**
**Int. Cl.[5] H01L *21/70***
**U.S. Cl. 437—52** **6 Claims**



1. A method for fabricating a nonvolatile memory cell at a face of a semiconductor layer of a first conductivity-type, comprising:

selectively doping said semiconductor layer with a dopant of a second conductivity-type opposite said first conductivity-type to create a source-column region including a source and to create a drain-column region including a drain, said drain spaced from said source by first and second sub-channels, said first sub-channel adjacent said drain;

differentially growing thermal insulator regions over said source-column region and said drain-column region;

forming a first conductive layer and a first insulator layer over said face;

selectively etching said first conductive layer and said first insulator layer to define field-plate and a field-plate insulator over a part of said drain-column region and over said first sub-channel region;

forming first and second tunnelling windows, said first tunnelling window formed over said source-column region on the side of said source-column region opposite said second sub-channel region, said second tunnelling window formed over said drain-column region on the side of said drain-column region opposite said first sub-channel region;

forming a floating gate and a control gate, said floating gate formed over and insulated from said second sub-channel region, formed over said first tunnelling window and formed over said second tunnelling window, each said control gate formed over and insulated from said floating gate.

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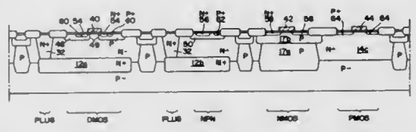


**5,045,492**

## METHOD OF MAKING INTEGRATED CIRCUIT WITH HIGH CURRENT TRANSISTOR AND CMOS TRANSISTORS

**Wing K. Huie, North Wales, Pa.; Alexander H. Owens, Pennington, N.J., and David S. Pan, Fremont, Calif., assignors to Allegro Microsystems, Inc., Worcester, Mass.**

**Filed Sep. 25, 1989, Ser. No. 411,785**
**Int. Cl.[5] H01L *21/76***
**U.S. Cl. 437—57** **9 Claims**



1. In a method for making an integrated circuit having a high-current transistor and a pair of CMOS transistors in which method a silicon die is initially provided having a P-type substrate, an N+ buried layer, an N-type epitaxial layer, and a network of P-type isolation walls in said epitaxial layer dividing said epitaxial layer into a plurality of isolated pockets wherein the improvement comprises:

(a) forming a nitride film over said epitaxial layer and removing portions of said nitride film to leave nitride patches over the device areas at which said high current transistor and CMOS transistors are to be formed, and another nitride patch closely adjacent but spaced from the patch covering said high-current-transistor device area;

(b) growing a heavy field oxide over portions of said epitaxial layer not covered by said nitride patches;

(c) selectively removing said another nitride patch exposing an uncovered area of epitaxial silicon and leaving said patches over said device areas at which said high current transistor and CMOS transistors are to to formed;

(d) heating said die in a phosphorous atmosphere to diffuse phosphorous atoms into said uncovered area but not said device areas which are masked by the device-area patches, for forming an N+ plug through said epitaxial layer and to said N+ buried layer;

(e) removing the remaining of said device-area nitride patches; and

(f) forming said high current transistor, and said CMOS transistors.

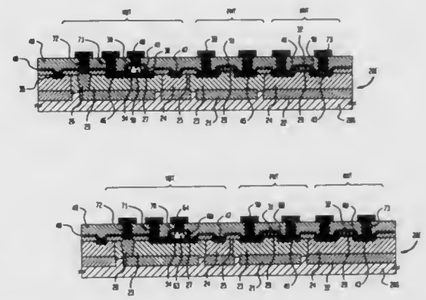
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**5,045,493**

## SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

**Shuichi Kameyama, Itami; Kazuya Kikuchi, Hirakata; Hiroshi Shimomura, Moriguchi, and Mizuki Segawa, Hirakata, all of Japan, assignors to Matsushita Electric Ind., Ltd., Osaka, Japan**

**Filed Apr. 24, 1990, Ser. No. 514,167**
**Claims priority, application Japan, Apr. 26, 1989, 1-108609**
**Int. Cl.[5] H01L *21/70***
**U.S. Cl. 437—59** **10 Claims**



4. A method of manufacturing a semiconductor device comprising at least one vertical bipolar transistor and at least one MOS transistor, said bipolar and MOS transistors being formed on one semiconductor substrate, comprising the steps of:

forming a gate oxide film at least in the MOS transistor region on the main surface of said semiconductor substrate;

forming a gate electrode of said MOS transistor on said gate oxide film, said gate electrode being made of a first conductive thin film;

forming a first deposition film on said semiconductor substrate;

etching said first deposition film at least in the bipolar transistor region to form an emitter diffusion window;

forming an emitter electrode of said bipolar transistor over said emitter diffusion window, said emitter electrode being made of a second conductive thin film and being larger in size than said emitter diffusion window; and

forming a second deposition film on said semiconductor substrate;

etching further said first and second deposition films by using the anisotropic dry etching technique, to form first sidewall spacers on the sides of said gate electrode, said first sidewall spacers being made of said first and second deposition films, to leave said first deposition film under said emitter electrode, and to form second sidewall spacers on the sides of said emitter electrode, said second sidewall spacers being made of said second deposition film.

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**5,045,494**

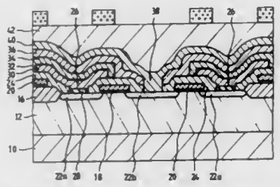
## METHOD FOR MANUFACTURING A DRAM USING SELECTIVE EPITAXIAL GROWTH ON A CONTACT

**Do-chan Choi, and Kyung-tae Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea**

**Filed Mar. 15, 1990, Ser. No. 494,185**
**Claims priority, application Rep. of Korea, May 10, 1989, 89-6206**
**Int. Cl.[5] H01L *21/72, 21/20***
**U.S. Cl. 437—60** **15 Claims**

1. A method for manufacturing a dynamic RAM semiconductor device, comprising the steps of:

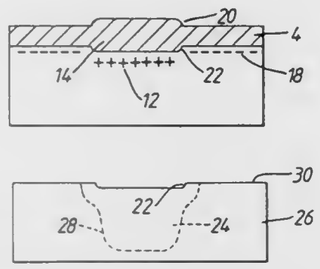
selectively growing a field oxide layer on a surface of a first conduction type semiconductor substrate to define an active region;
providing a gate oxide layer on said active region in a gate electrode pattern;
forming a first conductive layer according to said gate electrode pattern;
doping said active region of said semiconductor substrate with an impurity of a second conduction type using said gate electrode pattern and said field oxide layer as a mask;
forming a first insulating layer on the whole surface of said semiconductor substrate;
etching selectively said first insulating layer to expose a



surface of said impurity-doped region in a first location, thereby forming a first contact hole;
growing an epitaxial layer in said first contact hole using the exposed surface of said impurity-doped region in the first location as a seed;
forming a second conductive layer upon said epitaxial layer;
patterning said second conductive layer to form a lower electrode of a capacitor;
forming a dielectric layer on said second conductive layer;
forming a third conductive layer on said dielectric layer;
patterning said third conductive layer to form an upper electrode of said capacitor; and
forming a second insulating layer on said third conductive layer and said first insulating layer.

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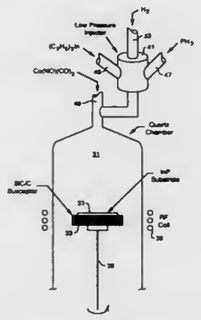
**5,045,495**
**FORMING TWIN WELLS IN SEMICONDUCTOR DEVICES**
**Martin J. Teague, Mid. Glamorgan; Andrew D. Strachan, and Martin A. Henry, both of Cardiff, all of United Kingdom, assignors to Inmos Limited, Bristol, England**
**Filed Mar. 30, 1990, Ser. No. 502,532**
**Claims priority, application United Kingdom, Apr. 7, 1989, 8907897**
**Int. Cl.[5] H01L *21/302, 21/76***
**U.S. Cl. 437—70** **20 Claims**



1. A method of forming a well of one conductivity type in a silicon substrate, which method comprises the steps of:
(a) providing a silicon substrate having a first surface region thereof which is doped with a dopant of one conductivity type and a second surface region thereof which is doped with a dopant of opposite conductivity type, the first and second regions being covered by respective first and second portions of an oxide layer which has been grown on the silicon substrate, the first portion being thicker than the second portion;
(b) oxidizing the substrate thereby to increase the thickness of the oxide layer such that the difference in thickness between the first and second portions is reduced;
(c) heating the substrate to cause diffusion of the said dopant of one conductivity type thereby to form a well of said one conductivity type in the substrate and also diffusion of the said dopant of opposite conductivity type down into the substrate, the heating step being carried out before, during or after oxidizing step (b); and
(d) removing the oxide layer thereby to expose the substrate surface which has a step in the region of the well boundary.

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**5,045,496**
**SEMI-INSULATING COBALT DOPED INDIUM PHOSPHIDE GROWN BY MOCVD**
**Kenneth L. Hess, Simi Valley, and Stanley W. Zehr, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**
**Filed May 13, 1988, Ser. No. 194,676**
**Int. Cl.[5] H01L *21/20***
**U.S. Cl. 437—81** **10 Claims**



1. A process for growing a cobalt doped semi-insulating layer on a substrate, comprising the steps of:
introducing a source of a group III element, a source of a group V element, and cobalt nitrosyl tricarbonyl as a source of cobalt into an inert or reducing atmosphere at a total pressure between about 1/100 atmosphere and one atmosphere; and
heating the substrate in said atmosphere to grow the semi-insulating layer on the substrate.

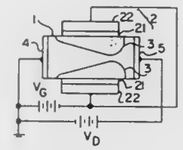
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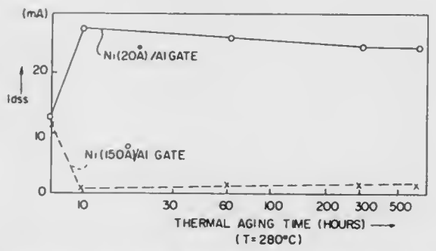
**5,045,497**
**METHOD OF MAKING A SCHOTTKY ELECTRODE**
**Kazuo Hayashi, and Takuji Sonoda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**
**Division of Ser. No. 139,738, Dec. 30, 1987, abandoned. This application Oct. 25, 1989, Ser. No. 426,183**
**Claims priority, application Japan, Jan. 19, 1987, 62-11004**
**Int. Cl.[5] H01L *21/44***
**U.S. Cl. 437—175** **2 Claims**

1. A method of producing a Schottky barrier in a semiconductor device comprising:
depositing a nickel layer having a thickness less than 100 Angstroms on a surface of a semiconductor substrate;



depositing an aluminum layer on said nickel layer opposite the substrate; and

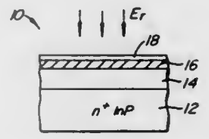





heating the nickel and aluminum layers to a temperature between 250° and 350° C. for about ten minutes to form a nickel aluminum alloy at said surface.

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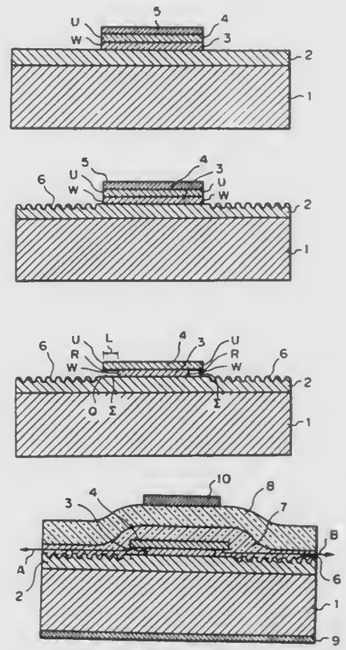
**5,045,498**
**METHOD OF FABRICATING AN ATOMIC ELEMENT DOPED SEMICONDUCTOR INJECTION LASER USING ION IMPLANTATION AND EPITAXIAL GROWTH ON THE IMPLANTED SURFACE**
**Shih-Yuan Wang, Palo Alto, and Michael R. T. Tan, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Aug. 10, 1990, Ser. No. 565,532**
**Int. Cl.[5] H01L *21/20***
**U.S. Cl. 437—129** **2 Claims**



1. A method for fabricating a semiconductor laser, comprising:
providing a body of semiconductor material having a first buffer layer and an active layer on said first buffer layer;
implanting dopant ions into said active layer of said body, said dopant being such that energy transfer between the unimplanted material in the active layer and the dopant ions implanted causes lasing action substantially at a single frequency characteristic of said dopant;
annealing the body to activate the dopant ions; and
growing epitaxially a second buffer layer on said active layer, wherein said two buffer layers confine light emitted by said active layer.

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**5,045,499**
**METHOD OF MANUFACTURING A DISTRIBUTED BRASS REFLECTOR TYPE SEMICONDUCTOR LASER**
**Hideaki Nishizawa; Mitsuo Takahashi, both of Osaka, and Yasuharu Suematsu, Kawasaki, all of Japan, assignors to Research Development Corporation of Japan, Tokyo; Sumitomo Electric Industries, Ltd., Osaka and Tokyo Institute of Technology, Tokyo, all of, Japan**
**Division of Ser. No. 239,120, Aug. 31, 1988, Pat. No. 4,914,670. This application Sep. 26, 1989, Ser. No. 412,422**
**Claims priority, application Japan, Sep. 1, 1987, 62-218461**
**Int. Cl.[5] H01L *21/20, 21/203***
**U.S. Cl. 437—129** **6 Claims**



1. A method of manufacturing a distributed Bragg reflector type semiconductor laser comprising the steps of:
forming a buffer layer (2) on a p- or n-type semiconductor monocrystalline substrate (1) by an epitaxial growth method, said buffer layer (2) having the same electrical polarity as said substrate (1);
forming by epitaxial growth a non-doped active waveguide layer (3) on said buffer layer (2), or on said substrate (1) in the case where no buffer layer is interposed;
forming by epitaxial growth a depression layer (4) having an electrical polarity opposite to that of said substrate (1) on said non-doped active waveguide layer (3);
forming a stripe-shaped film (5) in a central portion of an upper surface of said depression layer (4);
etching both the depression layer (4) and the active waveguide layer (3) while retaining the central portion covered by said film (5);
forming a distributed Bragg reflector (6) serving as a diffraction grating on upper surfaces of the remaining depression layer (4) and the buffer layer (2) which is exposed on both sides of said active waveguide layer (3) or on the upper surface of the substrate (1) by use of an interference exposing method;

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etching edge surfaces of the active waveguide layer (3) in the horizontal direction by using the depression layer (4) as a mask, thereby allowing edge surfaces (W) of the active waveguide layer (3) to be set back by a distance of 0.2 μm to 1.0 μm behind edge surfaces (U) of the depression layer (4);

forming by epitaxial growth on the buffer layer (2) or the substrate (1) with said distributed Bragg reflector (6) formed thereon and on the depression layer (4) an external waveguide layer (7) having an electrical polarity opposite to that of the substrate (1);

forming by epitaxial growth on said external waveguide layer (7) a clad layer (8) having an electrical polarity opposite to that of the substrate (1); and

forming electrodes (9) and (10) on the substrate (1) and said clad layer (8).

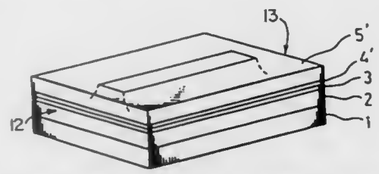
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**5,045,500**

## METHOD OF MAKING A SEMICONDUCTOR LASER

**Shigeru Mitsui; Ryo Hattori, and Tetsuya Yagi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Division of Ser. No. 382,220, Jul. 20, 1989, Pat. No. 4,964,135.**
**This application Jul. 25, 1990, Ser. No. 557,073**
**Claims priority, application Japan, Jul. 22, 1988, 63-184248; Jul. 7, 1989, 1-176877**
**Int. Cl.[5] H01L *21/20***
**U.S. Cl. 437—129** **9 Claims**




1. A method of making a semiconductor laser comprising:

successively depositing on a semiconductor substrate of a first conductivity type a first cladding semiconductor layer of the first conductivity type, an active semiconductor layer, and a second cladding semiconductor layer of a second conductivity type;

removing a portion of the second cladding layer to form a forward mesa in said cladding layer projecting away from the substrate and having a top surface opposite the substrate, lateral sides, and transverse ends;

depositing a current blocking semiconductor layer of the first conductivity type on the second cladding layer to bury the sides and to bury the ends of the mesa at least partially;

depositing a contacting semiconductor layer of the second conductivity type on the current blocking layer and on the top surface of the mesa, at least one of the ends being spaced from the adjacent facet;

forming first and second opposed facets at least partially spaced from the end surfaces of the mesa; and

depositing electrodes on the substrate and contacting layer.

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**5,045,501**

## METHOD OF FORMING AN INTEGRATED CIRCUIT STRUCTURE WITH MULTIPLE COMMON PLANES

**Jan Grinberg, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Continuation of Ser. No. 900,194, Aug. 25, 1986, abandoned.**
**This application Aug. 15, 1988, Ser. No. 338,480**
**Int. Cl.[5] H01L *21/44, 21/48, 21/60***
**U.S. Cl. 437—180** **6 Claims**

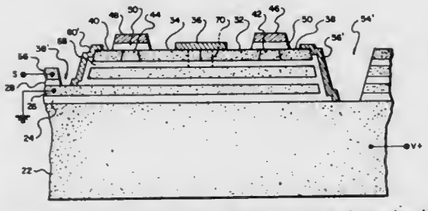
1. A method of forming an integrated circuit structure, comprising:

providing a passive semiconductor substrate,

doping said substrate so that it is sufficiently conductive to serve as a common potential plane,

forming a plurality of layers over said semiconductor substrate, the layers comprising in succession a first layer of insulative material, a layer of conductive material, a second layer of insulative material and a top layer of semiconductor material,

forming a substantially two-dimensional integrated circuit only on the top layer of semiconductor material and not on said substrate or other layers, said first insulative layer being formed directly on said substrate,




providing connections from the substrate and conductive layer through the intervening insulative layers substantially directly to desired locations on the integrated circuit, said connections terminating at said locations on the integrated circuit without extending substantially over the surface of said integrated circuit, and

providing respective signal connections to respective ones of the substrate and conductive layer, the substrate and conductive layer selectively providing respective common planes for a power supply voltage and a ground reference wherever needed on the integrated circuit.

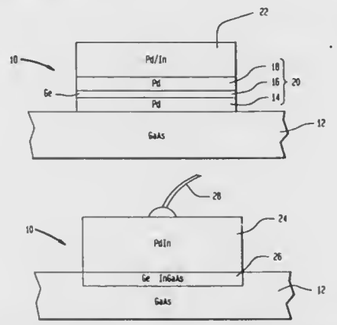
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**5,045,502**

## PDIN OHMIC CONTACT TO GAAS

**Silvanius S. Lau, San Diego, Calif.; Timothy D. Sands, Cranbury, N.J., and Long-Ching Wang, La Jolla, Calif., assignors to Bell Communications Research, Inc., Livingston, N.J. and University of California, Oakland, Calif.**

**Filed May 10, 1990, Ser. No. 522,175**
**Int. Cl.[5] H01L *21/283***
**U.S. Cl. 437—184** **14 Claims**




1. A method of forming an ohmic contact, comprising the steps of:

a first step of depositing a lower layer comprising palladium on a surface of an n-type semiconductor comprising gallium and arsenic;

a second step of depositing an upper layer comprising palladium and indium on said lower layer, wherein a ratio of a total atomic amount of palladium to a total atomic amount of indium contained in a combination of said upper and lower layers lies in a range of 0.9 to 1.5; and

annealing said lower and upper layers at an annealing temperature.



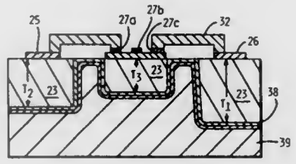
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**5,045,503**

## MICROWAVE MONOLITHIC INTEGRATED CIRCUIT WITH HEAT RADIATING ELECTRODE

**Michihiro Kobiki; Masahiro Yoshida, and Takahide Ishikawa, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 251,677, Sep. 30, 1988, Pat. No. 4,956,697.**
**This application Jun. 26, 1990, Ser. No. 528,564**
**Claims priority, application Japan, Dec. 14, 1987, 62-315595**
**Int. Cl.[5] H01L *21/465***
**U.S. Cl. 437—228** **4 Claims**




1. A method of improving the heat radiating characteristics of a microwave monolithic integrated circuit having an active region and at least one passive region on a first surface of a uniform-thickness substrate with first and second opposed surfaces, said regions being electronically coupled to one another, said method comprising the steps of:

selectively removing material from the second surface of the substrate such that the substrate thickness beneath the active region is smaller than the substrate thickness beneath the at least one passive region and such that the substrate thickness beneath the at least one passive region is adapted to provide the passive region with a terminating impedance of a predetermined magnitude; and

providing a heat sink on the second surface of the substrate beneath at least said active region.

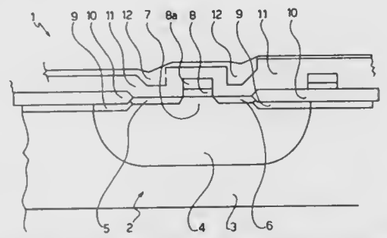
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**5,045,504**

## DIELECTRIC LAYER OF FIRST INTERCONNECTION FOR ELECTRONIC SEMICONDUCTOR DEVICES

**Fabio Gualandris, Bergamo, and Luisa Masini, Milan, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Milan, Italy**

**Filed Jul. 26, 1989, Ser. No. 385,722**
**Claims priority, application Italy, Sep. 29, 1988, 22123 A/88**
**Int. Cl.[5] H01L *21/033***
**U.S. Cl. 437—235** **6 Claims**




1. A method of making a dielectric layer of first interconnection for an electronic semiconductor device, characterized in that it comprises a step of deposition of a first layer of tetraethylorthosilicate to form silicon oxide followed by a step of deposition of a layer of self-planarizing siloxane, subsequent to the siloxane deposition step, at least one heat treatment step of predetermined duration is carried out at a predetermined temperature under a low-pressure nitrogen atmosphere, and following the heat treatment step in nitrogen, the device is subjected to a further final heat treatment step carried out under a stream medium at atmospheric pressure for a predetermined time duration.

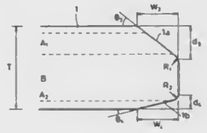
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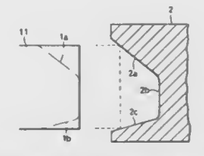
**5,045,505**

## METHOD OF PROCESSING SUBSTRATE FOR A BEVELED SEMICONDUCTOR DEVICE

**Hirokazu Kimura, Joetsu, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Tokyo and Naoetsu Electronics Company, Niigata, both of, Japan**

**Filed Apr. 23, 1990, Ser. No. 512,409**
**Claims priority, application Japan, Apr. 28, 1989, 1-111372**
**Int. Cl.[5] H01L *21/461***
**U.S. Cl. 437—249** **6 Claims**




1. An improved method of processing a substrate for a semiconductor device, comprising the steps of:

diffusing collector regions on both main surface sides of said substrate doped with an impurity at a lower concentration to form a higher concentrated impurity layer;

beveling a front surface edge and a back surface edge of said substrate such that said front surface edge is beveled to a greater depth than said back surface edge and wherein said beveled front surface edge has a greater angle of inclination than said beveled back surface edge;

removing substantially a half of the thickness of said substrate to expose a layer doped with said impurity at said lower concentration on a front surface of said substrate; and

polishing said exposed lower concentrated impurity layer to provide said substrate for the semiconductor device comprising double layers of higher and lower concentrated impurities.

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**5,045,506**

## PROCESS FOR PRODUCING MINERAL FIBERS INCORPORATING AN ALUMINA-CONTAINING RESIDUE FROM A METAL MELTING OPERATION AND FIBERS SO PRODUCED

**Ghyslain Dube, and Gaetan Chauvette, both of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada**

**Filed Jul. 31, 1989, Ser. No. 387,492**
**Int. Cl.[5] C03C *13/00***
**U.S. Cl. 501—35** **15 Claims**

1. A process for producing mineral fibers, which comprises producing a melt incorporating a residue from a metal melting operation containing at least 50% by weight of alumina on a calcined basis and at least one other raw material suitable for

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forming mineral fibers selected from the group consisting of metal melting slags, silica-containing rock, kaolin and mixtures of bauxite and glass sand, dividing the melt into individual streams, and cooling said streams to form said fibers.

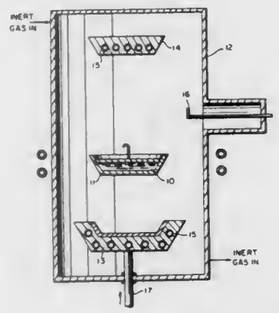
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**5,045,507**

## IN-SITU QUENCHED FLUORIDE GLASSES

**Danh Tran, Bethesda, Md., assignor to Infrared Fiber Systems, Inc., Silver Spring, Md.**

**Filed Jan. 22, 1990, Ser. No. 468,300**
**Int. Cl.[5] C03C *3/32***
**U.S. Cl. 501—40** **16 Claims**




1. A process for producing optical quality fluoride glass in large sizes comprising:
introducing a fluoride glass composition into a crucible;
melting said fluoride glass composition into a crucible;
quenching said glass composition while said glass composition remains in said crucible so as to avoid formation of nucleation sites, said quenching being carried out by positively cooling said crucible and said glass.

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**5,045,508**

## AMMONIA-TREATED PHOSPHATE GLASSES USEFUL FOR SEALING TO METALS METALS

**Richard K. Brow, Albuquerque, N. Mex., and Delbert E. Day, Rolla, Mo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 30, 1990, Ser. No. 516,935**
**Int. Cl.[5] C03C *3/17***
**U.S. Cl. 501—48** **6 Claims**

1. A method of improving the surface-dependent properties of phosphate glass without significantly affecting the thermal expansion coefficient of the glass comprising the step of annealing the glass in a dry ammonia atmosphere at a temperature within 20° C. of the glass transition temperature so that a layer of nitrogen is incorporated into the surface of the glass.

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**5,045,509**

## UV-TRANSPARENT GLASS

**Werner Kiefer, Mainz-Finthen, Fed. Rep. of Germany, assignor to Schott Glaswerke, Mainz, Fed. Rep. of Germany**

**Filed Jan. 19, 1989, Ser. No. 299,166**
**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801840**
**Int. Cl.[5] C03C *4/08, 3/118, 3/091***
**U.S. Cl. 501—59** **15 Claims**

1. A glass transparent to UV radiation, which, for a thickness of 1 mm and the wavelength of 253.7 nm, has a transmission of at least 75%, a linear coefficient of thermal expansion of $3.8\times10^{-6}$ to $4.5\times10^{-6}K^{-1}$ in the temperature range from 20° to 300° C., and a hydrolytic resistance of $<120$ μg of $Na_2O$/g according to DIN 12 111, and having a synthesis composition, calculated on an oxide basis, of

| | |
|---|---|
| $SiO_2$ | 64 to 66.5 |
| $B_2O_3$ | 20 to 22.5 |
| $Al_2O_3$ | 4 to 6 |
| $Li_2O$ | 0.4 to 1 |
| $Na_2O$ | 1.0 to 3.5 |
| $K_2O$ | 1.0 to 2.5 |
| CaO | 0.3 to 0.8 |
| BaO | 0.5 to 2.0 |
| $F^-$ | 0.5 to 2.0 |
| $\Sigma\ Li_2O + Na_2O + K_2O$ | 3.8 to 5.5 |
| $\Sigma$ CaO + BaO | 1.0 to 2.5 |
| one or more non-oxidizing refining agents | 0.2 to 2.0 |
| one or more reducing agents | 0.05 to 0.3. |

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**5,045,510**

## PROCESS FOR PREPARING A SURFACE DARKENED GLASS

**Jeffrey T. Kohli, Alfred, and James E. Shelby, Alfred Station, both of N.Y., assignors to Alfred University, Alfred, N.Y.**

**Continuation-in-part of Ser. No. 431,633, Nov. 3, 1989, Pat. No. 4,944,784. This application Jul. 25, 1990, Ser. No. 557,913**
**The portion of the term of this patent subsequent to Jul. 31, 2007, has been disclaimed.**
**Int. Cl.[5] C03C *3/091, 23/00; C03B 32/00***
**U.S. Cl. 501—66** **13 Claims**

1. A process for preparing a surface-darkened glass, comprising the steps of sequentially:
(a) providing a glass composition comprised of at least about 40 weight percent of silica, from about 0.1 to about 10 weight percent of antimony ion, less than about 20 parts per million of halide ion, less than about 20 parts per million of silver ion, less than about 0.01 weight percent of iron, and less than about 0.01 weight percent of ferric ion; and
(b) subjecting said glass composition to a temperature of from about 350 to about 1,000 degrees Celsius for at least about 30 minutes while contacting said glass composition with hydrogen-containing gas.

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**5,045,511**

## CERAMIC BODIES FORMED FROM YTTRIA STABILIZED ZIRCONIA-ALUMINA

**Paul A. Bosomworth; Cinta M. Kelzenberg, and Kenneth R. Butcher, all of Henderson ville, N.C., assignors to Alusuisse-Lonza Services, Ltd., Zurich, Switzerland**

**Filed Feb. 26, 1990, Ser. No. 484,848**
**Int. Cl.[5] C04B *38/00, 35/48, 35/80***
**U.S. Cl. 501—85** **14 Claims**

1. A porous ceramic body suitable for use as a molten metal filter, said body having an open cell structure characterized by a plurality of interconnected voids surrounded by a web of ceramic, said ceramic comprising a yttria stabilized zirconia-alumina composition consisting essentially of from about 40% to about 80% zirconia, from about 1.1% to about 3.4% yttria, and the balance essentially alumina.



**5,045,512**

## MIXED SINTERED METAL MATERIALS BASED ON BORIDES, NITRIDES AND IRON BINDER METALS

**Dietrich Lange, Kempten, Fed. Rep. of Germany; Lorenz Sigl, Breitenwang, Austria, and Karl-Alexander Schwetz, Sulzberg, Fed. Rep. of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munchen, Fed. Rep. of Germany**

**Filed Nov. 2, 1990, Ser. No. 608,231**
**Claims priority, application Fed. Rep. of Germany, Dec. 15, 1989, 3941536**
**Int. Cl.[5] C04B *35/58, 35/52/35/48, 35/02***
**U.S. Cl. 501—96** **15 Claims**

1. Mixed sintered metal materials comprising:
(1) 40 to 97% by volume of borides selected from the group consisting of titanium diboride, zirconium diboride and solid solutions thereof;
(2) 1 to 48% by volume of nitrides selected from the group consisting of titanium nitride and zirconium nitride;
(3) 0 to 10% by volume of oxides selected from the group consisting of titanium oxide and zirconium oxide, wherein components (2) and (3) may be present, completely or partially, in the form of oxynitrides, selected from the group consisting of titanium oxynitrides and zirconium oxynitrides; and
(4) 2 to 59% by volume of a binder metal selected from low-carbon iron, low-carbon iron alloys and mixtures thereof, said sintered metal material having the following properties;
(a) a density of at least 97% of the theoretical density, relative to the theoretically possible density of the total mixed material,
(b) a grain size of the sintered material phase of at most 5.5 μm,
(c) a hardness (HV 30) of at least 1,200,
(d) a bending fracture strength measured by the 4-point method at room temperature of at least 1,000 MPa, and
(e) a fracture resistance $K_{IC}$ of at least 8.0 MPa $m^{\frac{1}{2}}$.

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**5,045,513**

## SINTERED BODY OF SILICON NITRIDE AND ITS MANUFACTURE

**Kenichi Mizuno, Nagoya; Katsuhisa Yabuta, Komaki, and Masakazu Watanabe, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan**

**Filed Aug. 15, 1989, Ser. No. 393,726**
**Claims priority, application Japan, Aug. 22, 1988, 63-206382**
**Int. Cl.[5] C04B *35/58***
**U.S. Cl. 501—98** **4 Claims**

1. A sintered body of silicon nitride having a relative density of 98% or more, comprising 80 to 94 wt % $Si_3N_4$, 2 to 10 wt % compound calculated in MgO equivalent, and 2 to 10 wt % Y compound calculated in $Y_2O_3$ equivalent, wherein the $Si_3N_4$ contains 5 to 40% α-phase and the $Si_3N_4$ comprises grains 90 vol % or more of which have a minor axis of 1 μm or less.

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**5,045,514**

## SOL-GEL METHOD FOR MAKING COMPOSITE MULLITE/CORDIERITE CERAMICS

**M. G. M. U. Ismail; Zenjiro Nakai, and Hideo Tsunatori, all of Kumagaya, Japan, assignors to Chichibu Cement Co., Ltd., Japan**

**Filed Aug. 30, 1990, Ser. No. 575,180**
**Claims priority, application Japan, Aug. 30, 1989, 1-221544**
**Int. Cl.[5] C04B *35/18***
**U.S. Cl. 501—119** **5 Claims**

1. A method for making composite mullite/cordierite ceramics comprising the steps of:
preparing a mullite-intensive sol by mixing alumina and silica sols together,
preparing a cordierite-intensive sol by mixing alumina, silica and magnesia sols together,
gelating a mixture of the mullite- and cordierite-intensive sols,
calcinating the obtained gel, and
compacting and sintering the calcinated gel material.

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**5,045,515**

## PROCESS FOR PREPARING ZEOLITIC ADSORBENTS

**Chien C. Chao, Millwood, N.Y., and Henry Rastelli, New Fairfield, Conn., assignors to UOP, Des Plaines, Ill.**

**Division of Ser. No. 206,280, Jun. 14, 1988, Pat. No. 4,935,580. This application Jan. 18, 1990, Ser. No. 465,855**
**Int. Cl.[5] B01J *20/12, 20/16, 20/30***
**U.S. Cl. 502—67** **3 Claims**

1. A process for the production of a modified clinoptilolite wherein at least about 40 percent of the ion-exchangeable cations in the clinoptilolite comprise any one or more of lithium, potassium, calcium, magnesium, barium, strontium, zinc, copper, cobalt, iron and manganese cations, said process comprising subjecting a clinoptilolite to ion-exchange with a solution containing sodium cations until at least about 40 percent of the ion-exchangeable non-sodium cations in the clinoptilolite have been replaced by sodium cations, thereby producing a sodium clinoptilolite, and thereafter subjecting said sodium clinoptilolite to ion-exchange with a solution containing any one or more of lithium, potassium, calcium, magnesium, barium, strontium, zinc, copper, cobalt, iron and manganese cations.

2. A process according to claim 1 wherein, after the sodium ion-exchange but before the second ion-exchange, the sodium clinoptilolite is admixed with a binder and heated to produce pellets of clinoptilolite bound together by the binder, and the second ion-exchange is effected on the pellets so formed.

3. A process according to claim 2 wherein the binder is a clay binder.

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**5,045,516**

## PROCESS FOR PRODUCING A CATALYST FOR REDUCING NITROGEN OXIDES IN FLUE GASES

**Doris Vogel, Erlangen; Norbert Landgraf, Rueckersdorf; Josef Sprehe, Fuerth-Vach; Wolfgang Gajewski, Buckenhof; Dietmar Hein, Nuremberg, and Helmut Schmelz, Prien, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Feb. 21, 1989, Ser. No. 313,701**
**Claims priority, application Fed. Rep. of Germany, Feb. 23, 1988, 3805564**
**Int. Cl.[5] B01J *21/06, 23/22, 23/28***
**U.S. Cl. 502—309** **9 Claims**

1. A process for producing a catalyst for reducing the nitrogen oxides in flue gases in the presence of a reducing agent from a catalytically active composition consisting essentially of a mixture of basic titanium oxide, molybdenum trioxide and from 0 to 10% by weight of vanadium as the pentoxide for increasing resistance to catalyst poisons, said titanium oxide comprising
a highly pure titanium dioxide having less than 500 ppm of calcium and less than 100 ppm of iron, said $TiO_2$ being present in a proportion of over 60% as the anastase modification, and having a mean particle size of 10 to 100 nm, a mean pore radius of 10 to 30 nm and a BET surface of 10 to 80 $m^2$ per gram;
which comprises the steps of
a) mixing said oxides and suspending same in water;
b) wet-grinding the suspension of said basic titanium dioxide, vanadium pentoxide and molybdenum trioxide in an agitator mill in proportions of 60–90% by weight of titanium as the dioxide, 10–30% by weight of molybdenum as the trioxide, and 0–10% by weight of vanadium as the pentoxide;
c) drying the ground mixture suspension;
d) comminuting and precalcining the dried material for several hours at 450° to 550° C.;

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e) comminuting the precalcined material to a particle range having particle diameters less than 180 μm;
f) wetting the comminuting material with water to form a wet composition;
g) coating a metal substrate with said wetted composition; and
h) drying said coating on said metal substrate; and subsequently calcining the coating on the metal substrate for several hours at 450° to 550° C. to form a catalytically active material.

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5,045,517

## CATALYST AND PROCESS FOR PREPARATION OF SYNDIOTACTIC POLYSTYRENE

Richard E. Campbell, Jr., Midland, Mich., and John G. Hefner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 64,282, Jun. 17, 1987, abandoned. This application Jan. 5, 1990, Ser. No. 462,861
Int. Cl.[5] C08F *4/642*
U.S. Cl. 502—103 7 Claims

1. A composition of matter comprising the reaction product of polymethylaluminoxane and a complex corresponding to the formula: $CpTiX_3$, wherein Cp is a $\pi$-bonded cfyclopentadienyl group, a ring fused derivative thereof or a substituted derivative f the foregoing wherein the substituents are selected from the group consisting of alkyl, aryl and silyl substituents containing up to 18 carbons, and X is independently each occurrence halide, OR, or $NR_2$, wherein R is independently each occurrence an aliphatic, cycloaliphatic or aromatic hydrocarbon group having from 1 to about 12 carbon atoms and provided further that in at least one occurrence X is OR or $NR_2$.

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5,045,518

## PROCESS FOR THE PREPARATION OF A SULFIDED CATALYST

Jacobus J. L. Heinerman, Amsterdam, and Johannes W. F. M. Schoonhoven, Leusden, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Jun. 8, 1990, Ser. No. 534,914
Claims priority, application Netherlands, Jun. 13, 1989, 8901493
Int. Cl.[5] B01J *27/04, 27/043*
U.S. Cl. 502—216 4 Claims

1. A process for the preparation of a sulfided catalyst for the catalytic hydrotreatment of hydrocarbon-containing feeds, comprising presulfiding ex situ a catalyst comprising a carrier material having one or more catalytically active metals or compounds of metals deposited thereon and subsequently contacting resulting material in situ under sulfiding conditions with hydrogen to which a sulfiding agent has been added or with hydrogen combined with a hydrocarbon-containing feed containing an added sulfiding agent, said sulfiding agent being selected from the group consisting of hydrogen sulfide and compounds that under the prevailing conditions are decomposable into hydrogen sulfide.

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5,045,519

## PROCESS FOR THE PREPARATION OF A CATALYST CARRIER BASED ON ALUMINOSILICATES

Arnold Meyer, St. Michaelisdonn; Klaus Noweck, Brunsbuttel; Ansgar Reichenauer, Marne, and Jurgen Schimanski, Brunsbuttel, all of Fed. Rep. of Germany, assignors to Condea Chemie GmbH, Brunsbuttel, Fed. Rep. of Germany

Filed Sep. 15, 1989, Ser. No. 407,863
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1988, 3839580
Int. Cl.[5] B01J *21/12, 23/10*
U.S. Cl. 502—235 6 Claims

1. A process for the preparation of a high-purity, thermally stable catalyst carrier based on an aluminosilicate with 0.5 to 50% by weight $SiO_2$, comprising the steps of:
mixing an aluminum compound with silicic acid compound in an aqueous medium, said aluminum compound used being a $C_2$ to $C_{20}$, aluminum alkoxide hydrolyzed with water purified by means of ion exchangers;
simultaneously or subsequently adding orthosilicic acid purified by means of ion exchangers; and
subsequently drying or calcining the product obtained, wherein the preparation process is selected from
(A) mixing the alumina/water mixture obtained by neutral hydrolysis with a 0.1 to 5.0% by weight orthosilicic acid purified by means of ion exchangers in a stirring container, and subsequently heat treating the mixture at 90° C. to 235° C.; or
(B) the alumina/water mixture obtained by neutral hydrolysis firstly undergoes heat treatment at 90° C. to 235° C.; and during or after this heat treatment, adding and subsequently stirring the orthosilicic acid solution with a concentration of 0.1 to 5% by weight purified by means of ion exchangers.

5. Process according to claim 1, wherein together with or after the addition of the orthosilicic acid solution, adding a soluble lanthanum compound in a quantity corresponding to 0.5 to 2% by weight $La_2O_3$ in the end product.

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5,045,520

## METHANOL SYNTHESIS CATALYST AND METHOD FOR THE PRODUCTION OF THE CATALYST

Henry E. Curry-Hyde; Mark S. Wainright, and David J. Young, all of Sydney, Australia, assignors to Unisearch Limited, New South Wales, Australia

PCT No. PCT/AU88/00216, § 371 Date Jan. 22, 1990, § 102(e) Date Jan. 22, 1990, PCT Pub. No. WO89/00082, PCT Pub. Date Jan. 12, 1989
ub. Date DJun. 28, 1988, Ser. No. 459,712
Claims priority, application Australia, Jun. 29, 1987, PI2762
Int. Cl.[5] B01J *25/00*
U.S. Cl. 502—301 11 Claims

1. A method for the production of a low temperature methanol synthesis catalyst composition suitable to synthesize methanol by the reaction of carbon monoxide or carbon dioxide or mixtures thereof, with hydrogen, comprising forming an alloy containing 0 to 50 wt % zinc, 30 to 75 wt % aluminum, the balance being substantially all copper and extracting aluminum from the alloy using an effective concentration of zincate ions in an aqueous solution of an alkali metal hydroxide.

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5,045,521

## CATALYST FOR THE PURIFICATION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES WITH REDUCTION OF HYDROGEN SULFIDE EMISSION

Egbert Lox, Hanau; Edgar Koberstein, Alzenau, and Bernd Engler, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 5, 1989, Ser. No. 402,619
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1988, 3830319
The portion of the term of this patent subsequent to Oct. 16, 2007, has been disclaimed.
Int. Cl.[5] B01J *23/00, 8/00;* C01B *21/00*
U.S. Cl. 502—304 16 Claims

1. A catalyst for the purification of the exhaust gases of internal combustion engines comprising an aluminum oxide of the transition series as the carrier, 2 to 70% by weight $CeO_2$ 0 to 20% by weight $ZrO_2$ and with an active phase of 0.01 to 3% by weight platinum, palladium and/or rhodium applied onto the carrier, with a weight ratio between platinum and/or palladium and the optionally present rhodium of 2:1 to 30:1, and further containing 0.1 to 40% by weight of ZnO based on the aluminum oxide.



5,045,522

## ABSORPTION COMPOSITION COMPRISING ZINC TITANATE FOR REMOVAL OF HYDROGEN SULFIDE FROM FLUID STREAMS

Dennis R. Kidd, Dewey, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 27, 1990, Ser. No. 499,847
Int. Cl.[5] B01J *21/08, 20/12;* C01B *17/16, 31/20*
U.S. Cl. 502—405 20 Claims

1. An absorbing composition comprising zinc titanate, alumina, silica and a promoter prepared by calcining a mixture of zinc oxide and titanium dioxide in the presence of free oxygen at a temperature in the range of from about 650° C. to about 1050° C. to form zinc titanate, mixing the thus-formed zinc titanate in a powdered form with a silicated alumina hydrosol to form a mixture, adding ammonium hydroxide to convert said mixture to a hydrogel, drying and thereafter calcining said hydrogel to form a hydrogel derived composition of zinc titanate, alumina, and silica, adding a promoter metal selected from the group consisting of phosphorus, tungsten, molybdenum, metals of Group VIII of the Periodic Table, and mixtures of any two or more thereof to said hydrogel derived composition of zinc titanate, alumina, and silica, and calcining said hydrogel derived composition of zinc titanate, alumina, and silica to which said promoter metal has been added to form said absorbing composition, wherein said promoter metal is present in said hydrogel derived absorbing composition in the oxide form.

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5,045,523

## HEAT-SENSITIVE RECORDING MATERIALS

Haruyoshi Funae, and Tomonori Kiriyama, both of Takasago, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Feb. 6, 1990, Ser. No. 475,983
Claims priority, application Japan, Feb. 6, 1989, 1-028082; Feb. 23, 1989, 1-044766
Int. Cl.[5] B41M *5/40*
U.S. Cl. 503—207 15 Claims

1. A heat-sensitive recording material consisting essentially of a support and a heat-sensitive coloring layer provided on the support, said heat-sensitive coloring layer comprising a coupler, a developer, a binder and spherical, porous, inorganic particles having a total pore volume of 0.4 ml/g or more, an average surface pore diameter of 0.005 μm or more, and an average diameter of 3 μm or less.

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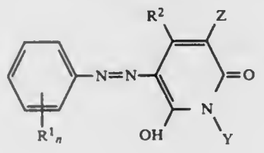
5,045,524

## YELLOW DYE MIXTURE FOR THERMAL COLOR PROOFING

Derek D. Chapman, and Steven Evans, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

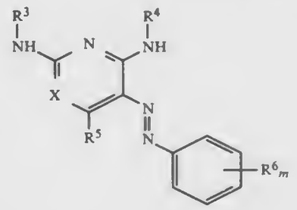
Filed Dec. 14, 1990, Ser. No. 628,817
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 20 Claims

13. In a process of forming a dye transfer image comprising imagewise-heating a yellow dye-donor element comprising a support having thereon a dye layer comprising a mixture of yellow dyes dispersed in a polymeric binder and transferring a yellow dye image to a dye-receiving element to form said yellow dye transfer image, the improvement wherein at least one of said yellow dyes has the formula:



I

wherein:
each $R^1$ independently represents a substituted or unsubstituted alkyl group of from 1 to about 10 carbon atoms, a cycloalkyl group of from about 5 to about 7 carbon atoms; a substituted or unsubstituted allyl group; an aryl group of from about 6 to about 10 carbon atoms; a hetaryl group of from 5 to 10 atoms; acyl; arylsulfonyl; aminocarbonyl; aminosulfonyl; fluorosulfonyl; halogen; nitro; alkylthio; or arylthio;
or any two adjacent $R^1$'s together represent the atoms necessary to form a 5- or 6-membered fused ring;
n represents an integer from 0–4;
$R^2$ represents hydrogen; a substituted or unsubstituted alkyl, cycloalkyl, allyl, aryl or hetaryl group as described above for $R^1$; cyano; acyl; alkylsulfonyl; arylsulfonyl; or alkoxycarbonyl;
Z represents cyano; alkoxycarbonyl; acyl; nitro; arylsulfonyl or alkylsulfonyl;
Y represents hydrogen; a substituted or unsubstituted alkyl, cycloalkyl, allyl, aryl or hetaryl group as described above for $R^1$; amino; alkylamino; arylamino; acylamino; or sulfonylamino;
and at least one of the other of the dyes having the formula:



II

wherein:
$R^3$ and $R^4$ each independently represents the same groups as $R^1$ above;
$R^5$ represents H, a substituted or unsubstituted alkyl, allyl, aryl or hetaryl group as described above for $R^1$; halogen; carbamoyl; cyano; or alkoxycarbonyl;
each $R^6$ independently represents substituted or unsubstituted alkyl, aryl, allyl or hetaryl groups such as those listed above for $R^1$; hydroxy, alkoxy, aryloxy, acyloxy, aminocarbonyl, aminosulfonyl, carbamoyloxy, halogen, aryl, cyano, nitro, trifluoromethyl, fluorosulfonyl, acylamido, alkoxycarbonyl, alkylthio, arylthio, alkylsulfonyl, arylsulfonyl, alkylsulfonamido or arylsulfonamido; or two adjacent $R^6$'s together represent the atoms necessary to complete a 5- or 6-membered fused saturated or aromatic ring;
X represents $CR^7$ or N;
$R^7$ represents the same groups as $R^5$; and
m is an integer from 0 to 5.

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5,045,525

## METHOD FOR THE SYNTHESIS OF A HIGH-TEMPERATURE SUPERCONDUCTOR OF A DEFINED COMPOSITION

Helmut Heide, Kelkheim; Heinrich Winter, Eschborn; Eva Poeschel, Bad Soden, and Eckhard Hinze, Pohlheim, all of Fed. Rep. of Germany, assignors to Battelle Institut E.V., Frankfurt, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,207
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717056; Aug. 17, 1987, 3727381
Int. Cl.[5] B29C *43/02*
U.S. Cl. 505—1 7 Claims

1. A method of producing a substantially stoichiometric, oxidic high-temperature superconductor body from a starting mixture of the general composition $SE_1EA_2Cu_3O_{7-x}$, where

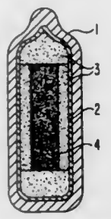
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SE is a rare earth metal or yttrium and EA is an alkaline earth metal, comprising:

adding thermally decomposable barium peroxide to the starting mixture to establish a predetermined oxygen partial pressure in the starting mixture;

covering the starting mixture containing the barium peroxide with a protective layer whose composition corresponds to that of the respective coexisting phases of the mixture in order to thermodynamically stabilize the desired superconductor phase;




enclosing the starting mixture, covered with the protective layer, in a gas-tight container forming a chemically and physically closed system, the protective layer being selected to chemically shield the starting mixture against reaction with the material of the container; and

sintering the starting mixture at elevated pressure while the starting mixture, covered with the protective layer, is enclosed in the container.

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**5,045,526**

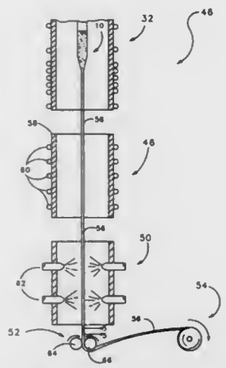
## MAKING INSULATED SUPERCONDUCTOR WIRE

**V. K. Nagesh, Cupertino, and Daniel J. Miller, Sausalito, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 34,867, Mar. 6, 1987. This application May 29, 1987, Ser. No. 56,563**

**Int. Cl.[5] H01L** *39/12;* **C03C** *25/02;* **H01B** *12/00*

**U.S. Cl. 505—1** **4 Claims**




1. A method for making insulated superconductor wire comprising the steps of:

preparing an oxide based superconductor wire-forming powder;

at least partially filing a hollow glass preform with said powder;

drawing a glass insulated superconductor wire structure from said preform and said powder to produce a superconductor core surrounded by a glass sheath; and

annealing said glass insulated wire structure in an oxygen-bearing atmosphere to cause oxygen to permeate said glass sheath and enter said superconductor core.

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**5,045,527**

## METHOD OF PRODUCING A SUPERCONDUCTIVE OXIDE CONDUCTOR

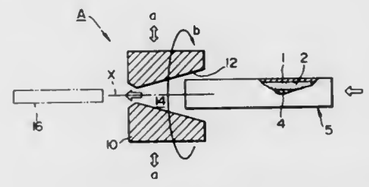
**Yoshimitsu Ikeno; Osamu Kohno; Kenji Goto; Atsushi Kume; Shin'ya Aoki; Nobuyuki Sadakata; Masaru Sugimoto; Toshio Usui; Mikio Nakagawa, and Taichi Yamaguchi, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan**

**Filed Oct. 3, 1988, Ser. No. 251,847**

**Claims priority, application Japan, Oct. 2, 1987, 62-249525; Oct. 2, 1987, 62-249526; Oct. 2, 1987, 62-249527; Oct. 2, 1987, 62-249528; Oct. 16, 1987, 62-261173; Oct. 28, 1987, 62-272302; Oct. 28, 1987, 62-272303; Oct. 28, 1987, 62-272304; Nov. 6, 1987, 62-280450; Nov. 6, 1987, 62-280451; Nov. 6, 1987, 62-280452; Nov. 6, 1987, 62-280453; Nov. 16, 1987, 62-288679; Nov. 25, 1987, 62-296704; Nov. 30, 1987, 62-302178; Dec. 8, 1987, 62-309996; Dec. 8, 1987, 62-309997; Dec. 8, 1987, 62-309998; Dec. 28, 1987, 62-332404; Dec. 28, 1987, 62-332405; Dec. 28, 1987, 62-332407; Dec. 28, 1987, 62-332408; Dec. 28, 1987, 62-332409; Dec. 28, 1987, 62-332411; Dec. 28, 1987, 62-332412; Jan. 11, 1988, 63-3329; Jan. 27, 1988, 63-16305; Jan. 29, 1988, 63-18589; Mar. 8, 1988, 63-54042; Mar. 28, 1988, 63-73928; Mar. 28, 1988, 63-73929**

**Int. Cl.[5] H01L** *39/12*

**U.S. Cl. 505—1** **27 Claims**




1. A method of producing a superconductor including a superconductive oxide represented by the formula

$$A_xB_yCu_zO_{7-\delta}$$

provided that the A is at least one element selected from the group consisting of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, and the B is Sr or Ba, about $0.1 \leqq x \leqq$ about 2.0, about $1 \leqq y \leqq$ about 3, about $1 \leqq z \leqq$ about 3, $0 \leqq \delta \leqq 5$, comprising the steps of:

(a) pressing at least one material, selected from the group consisting of a starting material powder of the superconductive oxide, a powder of the superconductive oxide and a compact made of the starting material powder and/or the superconductive oxide powder, for forming a filling material;

(b) charging the filling material into a metallic pipe to form a preform;

(c) moving the preform along an axis thereof;

(d) during the moving step (c), swaging the preform perpendicularly to the axis thereof at a forging ratio of about 10 to about 40%, rotating a direction of the swaging about the axis, so as to form a composite having a metallic sheath, made of the metallic pipe, and a core sheathed with the metallic sheath;

(e) removing the metallic sheath from the composite for exposing the core; and

(f) heating the exposed core of the composite for producing the superconductive oxide.



**5,045,528**

## ACOUSTIC PLANE WAVE PREFERENTIAL ORIENTATION OF METAL OXIDE SUPERCONDUCTING MATERIALS

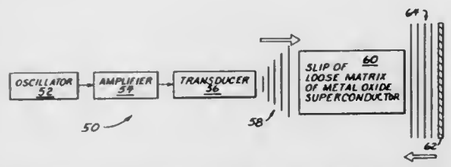
**Thomas L. Tolt, North Olmsted, Ohio, and Roger B. Poeppel, Glen Ellyn, Ill., assignors to ARCH Development Corporation, Argonne, Ill.**

**Filed Sep. 28, 1987, Ser. No. 101,819**

**The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.**

**Int. Cl.[5] H01L** *39/12*

**U.S. Cl. 505—1** **13 Claims**




1. A method of forming a superconducting metal oxide with improved current carrying capacity wherein said superconducting metal oxide has a polycrystalline structure and is anisotropically superconducting having one or more longer crystal axes along which said metal oxide is superconducting, said method comprising the steps of:

reducing the superconducting metal oxide to a flake-like, powder form, wherein the metal oxide powder is comprised of particles of single crystals;

mixing said metal oxide crystal powder with a liquid so as to form a dispersion of said metal oxide crystals in the liquid;

generating a plane pressure wave in a spaced manner from said metal oxide powder;

directing said plate pressure wave onto a surface of the metal oxide powder in orienting said metal oxide single crystal particles along a preferential direction such that said one or more longer axes of each of said metal oxide crystals are in general alignment;

removing the liquid from the aligned metal oxide crystals; and

sintering said metal oxide crystals in converting the superconducting metal oxide to a ceramic form.

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**5,045,529**

## TONOMETRIC FLUID FOR BLOOD GAS AND CO-OXIMETRY INSTRUMENTS

**Ching Chiang, Acton, Mass., assignor to Bionostics, Inc., Acton, Mass.**

**Filed Mar. 27, 1989, Ser. No. 328,622**

**Int. Cl.[5] G01N** *33/72, 33/96*

**U.S. Cl. 514—6** **52 Claims**

1. A stable reference solution which comprises an aqueous mixture containing:

a) a hemoglobin solution comprising fractions of:

i) at least about 95% reduced hemoglobin,

ii) less than about 3% methemoglobin,

iii) less than about 2% carboxyhemoglobin,

iv) less than about 2% oxyhemoglobin, and

v) less than about 0.3% by volume oxygen;

b) a source of bicarbonate ions;

c) a source of thio functional groups;

d) a source of metal ion catalyst;

e) at least one organic polyphosphate; and,

f) an organic buffer.

**5,045,530**

## PHARMACEUTICAL PREPARATIONS

**Henrich H. Paradies, Iserlohn, Fed. Rep. of Germany, assignor to Medici Chem.-Pharm. Fabrik Putter GmbH, Fed. Rep. of Germany**

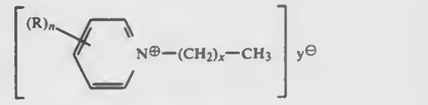
**Filed Apr. 27, 1989, Ser. No. 344,363**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626700**

**Int. Cl.[5] C07K** *7/28, 7/64, 7/66*

**U.S. Cl. 514—9** **28 Claims**

1. A pharmaceutical preparation comprising a micelle or a vesicle comprising a compound of the formula




in which R, n, and x are such that:

R is 4-OH, n is 1, and x is 8–20;

R is 4-{$[CH_3(CH_2)_m]_2CH$—} where m is 8–20, n is 1, and x is 0 or 8–20; or

R is 3,5-di-{$CH_3(CH_2l)_m$—O—C(O)—} where m is 8–20, n is 2, and x is 0 or 8–20;

and $y^{\ominus}$ is a monovalent anion; and a hydrophobic pharmaceutically active substance.

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**5,045,531**

## WOUND TREATMENT EMPLOYING BIOLOGICALLY ACTIVE ION CHANNEL FORMING PEPTIDES AND PROTEINS

**Barry Berkowitz, Ft. Washington; Leonard S. Jacob, Penn Valley, Merion Station, both of Pa., assignors to Magainin Sciences Inc., Plymouth Meeting, Pa.**

**Filed Dec. 18, 1989, Ser. No. 451,777**

**Int. Cl.[5] C07K** *7/08;* **C07C** *7/10;* **A61K** *37/02*

**U.S. Cl. 514—12** **33 Claims**

1. A process for treating a wound in a host, comprising administering to a host having a wound at least one biologically active amphiphilic peptide and/or biologically active protein, said peptide or protein being an ion channel-forming peptide or protein, said at least one biologically active amphiphilic peptide or protein being administered in an amount effective for treating a wound in the host.

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**5,045,532**

## INNER ESTERS OF GANGLIOSIDES WITH ANALGESIC-ANTIINFLAMMATORY ACTIVITY

**Francesco della Valle, Padua, and Aurelio Romeo, Rome, both of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy**

**Filed Oct. 20, 1988, Ser. No. 260,067**

**Claims priority, application Italy, Nov. 2, 1987, 48565 A/87**

**Int. Cl.[5] A61K** *31/70*

**U.S. Cl. 514—25** **20 Claims**

1. A method for treating pain caused by pathologies of the peripheral nervous system comprising administering to a patient in need thereof an effective analgesic and antiinflammatory amount of at least one inner ester ganglioside derivative comprising:

(a) a saccharide part, at least one ceramide and at least one acid part;

(b) said saccharide part containing at least one unit of N-acetylgalactosamine or of N-acetylglucosamine and at least one unit of glucose or of galactose;

(c) said acid unit containing at least one N-acetylneuraminic acid or one N-glycolylneuraminic acid, and

(d) the carboxy group of at least one of said acid parts being bound by esterification to the hydroxy group of one of said carbohydrates or of one of said acid parts to form a lactonic ring.

**5,045,533**

## RETINOIC ESTERS OF ANTIBIOTICS AND PHARMACEUTICAL AND COSMETIC COMPOSITIONS CONTAINING THEM

**Michel Philippe, Antony; Henri Sebag, Paris; Didier Dupuis, Le Raincy, and André Rougier, Dammartin en Goele, all of France, assignors to L'Oreal, Paris, France**

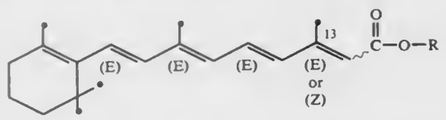
**Continuation-in-part of Ser. No. 46,017, May 5, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 235,853**

**Claims priority, application France, May 6, 1986, 86 06528; Luxembourg, Nov. 4, 1987, 87041**

**Int. Cl.[5] A61K** *31/70;* **C07H** *17/08, 15/16*

**U.S. Cl. 514—29** **12 Claims**

1. An all trans or 13-cis retinoic ester of a macrolide or lincosamide having the formula




(I)

wherein

R represents a macrolide selected from the group consisting of:

erythromycin A substituted in the 2′ position,
roxithromycin substituted in the 2′ position,
oleandomycin substituted in the 2′ position,
oleandomycin substituted in the 4″ position,
oleandomycin substituted in the 2′ and 4″ positions,
josamycin substituted in the 9 position,
josamycin substituted in the 2′ position,
josamycin substituted in the 9 and 2′ positions,
spiramycin (I) substituted in the 2′ position.
spiramycin (I) substituted in the 4″ position,
spiramycin (I) substituted in the 2′ and 4″ positions,
spiramycin (II) substituted in the 2′ position,
spiramycin (II) substituted in the 4″ position,
spiramycin (II) substituted in the 2′ and 4″ positions,
spriamycin (III) substituted in the 2′ position,
spiramycin (III) substituted in the 4″ position,
spiramycin (III) substituted in the 2′ and 4″ positions,

or R represents a lincosamide selected from the group consisting of

lincomycin substituted in the 3 position,
clindamycin substituted in the 3 position,
lincomycin substituted in the 2, 4 and 7 positions and
clindamycin substituted in the 2 and 4 positions.

3. A composition for the treatment of dermatosis comprising in an anhydrous vehicle an amount effective to treat said dermatosis of an all trans or 13-cis retinoic ester of a macrolide or lincosamide of claim 1, a salt thereof or a mixture thereof.

10. A method for treating dermatosis comprising administering to a person affected by said dermatosis an effective amount of the composition of claim 3.

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**5,045,534**

## 4-DEMETHOXY-4′-AMINO-4′-DEOXY-ANTHRACYCLINE DERIVATIVES

**Alberto Bargiotti; Maria Grandi; Antonino Suarato, and Fernando Giuliani, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.R.L., Milan, Italy**

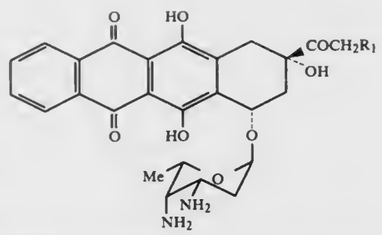
**Continuation of Ser. No. 266,569, Nov. 3, 1988, abandoned. This application Mar. 30, 1990, Ser. No. 501,800**

**Claims priority, application United Kingdom, Nov. 10, 1987, 8726272**

**Int. Cl.[5] A01K** *31/70;* **A01N** *43/08;* **C07H** *15/24*

**U.S. Cl. 514—34** **4 Claims**

1. An anthracycline glycoside of formula I




I

wherein $R_1$ represents a hydrogen atom or a hydroxy group, and pharmaceutically acceptable acid addition salts thereof.

4. A pharmaceutical composition comprising, as the active ingredient, the anthracycline glycoside of formula I in claim 1 or a pharmaceutically acceptable acid addition salt thereof in combination with a pharmaceutically acceptable diluent or carrier.

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**5,045,535**

## METHOD, APPARATUS AND A COMPOSITION FOR A POLYSACCHARIDE-CONTAINING MATRIX HAVING COVALENTLY BOUND HAPTENS

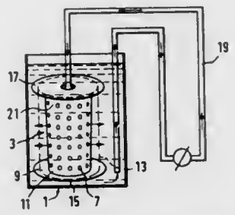
**Thomas Mang, Penzberg, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany**

**Filed Dec. 9, 1988, Ser. No. 282,374**

**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744068**

**Int. Cl.[5] C08B** *1/10, 1/12, 15/06*

**U.S. Cl. 514—57** **12 Claims**




1. A method for the production of a polysaccharide matrix to which a hapten is covalently bound for use in affinity chromatography or immunoassay comprising

rendering a polysaccharide-containing material of the matrix alkaline,

drying the polysaccharide-containing material of the matrix to a water content of less than 5%, reacting the dried polysaccharide-containing material of the matrix with an activated hapten comprising at least one activated carboxyl, amino or hydroxyl functional group whereby the hapten is bound to the polysaccharide in an anhydrous organic solvent in a range of polysaccharide:hapten of $10^4$ to 0.1:1 to form a polysaccharide matrix so that the hapten retains its activity and is so bound to the matrix that it is not removed in solution or during reaction, and

washing the reacted matrix with an organic solvent and an aqueous buffer of pH 6–8.



**5,045,536**

## LIQUID FORMULATIONS

**Ivor P. Baker, Coopers Animal Health Limited, Berkhamsted Hill, Berkhamsted, Hertfordshire, England**

**Continuation of Ser. No. 58,526, Jun. 5, 1987, abandoned. This application Nov. 9, 1989, Ser. No. 434,545**

**Claims priority, application United Kingdom, Jun. 7, 1986, 8613914**

**Int. Cl.[5] A01N** *55/00, 37/34*

**U.S. Cl. 514—63** **8 Claims**

1. A pour-on formulation comprising one or more ectoparasiticides in a solvent system comprising 80 to 98% w/v of a fixed oil and 2 to 20% w/v of a volatile silicone.

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**5,045,537**

## HYDROPHILIC RENIN INHIBITORS, THEIR PREPARATION AND USE

**Beat Weidmann, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland**

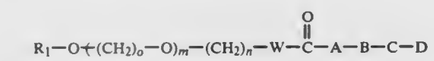
**Filed Sep. 14, 1988, Ser. No. 244,220**

**Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 3730895**

**Int. Cl.[5] A61K** *31/695, 31/455;* **C07D** *213/66;* **C07F** *7/10*

**U.S. Cl. 514—63** **7 Claims**

1. Hydrophilic renin inhibitors of formula




wherein

W is —O—, —$NR_2$— or —$CH_2$, whereby $R_2$ signifies hydrogen or a straight-chain or branched ($C_{1-5}$)alkyl radical,

$R_1$ is pyridinoyl;

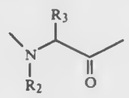
$R_2$ is defined as above;

m is a whole number from 1 to 20,

n is a whole number from 0 to 5, and

o is 2 or 3,

A, B and C are the same or different and signify a bond or a group of formula



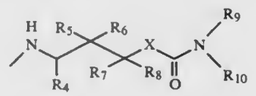

wherein

$R_2$ is defined as above, and

$R_3$ signifies a hydrophilic or lipophilic amino acid side chain, or

$R_2$ and $R_3$ together form a —$(CH_2)_o$— chain, wherein o is defined as above,

D signifies either a group of formula




wherein

$R_4$ has the same significance as $R_3$,

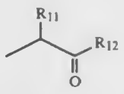
$R_5$ is hydroxyl or an amino group, and

$R_6$ is hydrogen, or

$R_5$ and $R_6$ together form an oxo group,

$R_7$ and $R_8$, independently of one another, signify fluorine or hydrogen;

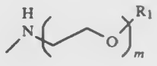
$R_9$ and $R_{10}$ are the same or different and respectively signify hydrogen, a straight-chain or branched ($C_{1-5}$)-alkyl radical, or they respectively signify a group of formula




wherein

$R_{11}$ signifies a straight-chain or branched ($C_{1-5}$)-alkyl radical or a straight-chain or branched ($C_{1-5}$)-hydroxyalkyl radical;

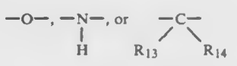
$R_{12}$ is a hydroxyl radical, a straight-chain or branched ($C_{1-5}$)-alkoxy group, an amino group or a ($C_{1-5}$)-alkylamino group, an aminomethylpyridyl group, a benzyl group or a group of formula




wherein

$R_1$ and m are defined as above, or $R_1$ denote a protected or unprotected amino acid;

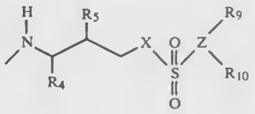
X signifies a bond or denotes




wherein

$R_{13}$ and $R_{14}$, independently of one another, denote hydrogen or fluorine, or respectively possess the definition given above for $R_3$, or

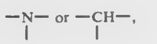
D signifies a group of formula




wherein

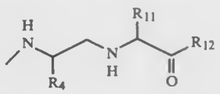
$R_4$, $R_5$, $R_9$, $R_{10}$ and X possess the definitions given above, and

Z is




or

D signifies a group of formula




wherein

$R_4$, $R_{11}$ and $R_{12}$ possess the definitions given above, and their salts.

7. A pharmaceutical composition useful in treating diseases caused by retroviruses comprising an appropriate amount of a compound of claim 1 in free form or in pharmaceutically acceptable salt form, in association with a pharmaceutical carrier or diluent.

**5,045,538**

## INHIBITION OF WASTING AND PROTEIN DEGRADATION OF MAMMALIAN MUSCLE BY TETRACYCLINES

**Bruce Schneider, Great Neck; Robert A. Greenwald, Melville; Jonathan Maimon, Rego Park; Kenneth Gorray, Fresh Meadows; Lorne M. Golub, Smithtown; Thomas F. McNamara, Port Jefferson, and Nangavarum S. Ramamurthy, Smithtown, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.**

**Filed Jun. 28, 1990, Ser. No. 545,395**

**Int. Cl.[5] A61K** *31/65*

**U.S. Cl. 514—152** **24 Claims**

1. A method for treating mammals suffering from skeletal muscle wasting comprising:

administering to said mammal an effective amount of a tetracycline thereby causing a reduction in mammalian skeletal muscle wasting.

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**5,045,539**

## (1H-INDOLO(3,2-C)QUINOLINE-DERIVATIVES, COMPOSITIONS CONTAINING SAME, USEFUL FOR TREATING PAIN, PSYCHOSIS OR CONVULSIONS

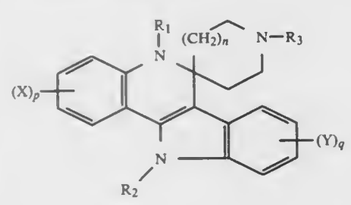
**Grover C. Helsley, Pluckemin; John J. Tegeler, Bridgewater, both of N.J., and Kirk D. Shoger, Minneapolis, Minn., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.**

**Division of Ser. No. 377,341, Jul. 10, 1989, Pat. No. 5,006,531. This application Feb. 6, 1991, Ser. No. 654,113**

**Int. Cl.[5] C07D** *471/20, 487/20;* **A61K** *31/44, 31/55*

**U.S. Cl. 514—212** **13 Claims**

1. A compound of the formula



(I)

where

n is 0 or 2;

p and are each independently 1 ,2 or 3;

each X and each Y, are independently hydrogen, loweralkyl, loweralkoxy, halogen, hydroxy, nitro, amino, loweralkylamino, diloweralkylamino, trifluoromethyl or loweralkylthio;

$R_1$ and $R_2$ are each independently hydrogen or loweralkyl; and

$R_3$ is hydrogen, loweralkyl, loweralkylcarbonyl, arylloweralkyl or aminocarbonyl;

or a pharmaceutically acceptable acid addition salt thereof.

13. A method of treating a patient in need of relief from convulsion which comprises administering to the patient an effective convulsion alleviating amount of a compound as defined in claim 1.

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**5,045,540**

## AMINO ACID DERIVATIVES WITH ANGIOTENSIN II ANTAGONIST PROPERTIES

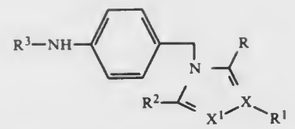
**John C. Hodges, and Ila Sircar, both of Ann Arbor, Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.**

**Division of Ser. No. 529,071, May 25, 1990. This application Apr. 12, 1991, Ser. No. 684,638**

**Int. Cl.[5] C07D** *233/68, 233/64;* **A61K** *31/415*

**U.S. Cl. 514—235.8** **6 Claims**

1. A compound of formula



1

or a pharmaceutically acceptable acid addition or base salt thereof, wherein:

one of X and $X^1$ is nitrogen and the other is carbon;

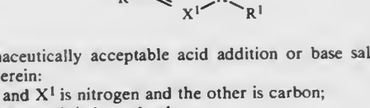
R and $R^1$ are each independently

hydrogen,
halogen,
lower alkyl,
alkyl carboxylate,
trihalomethyl,
acetyl ester,
cyano,
cyanomethyl,
acetamide,
alkoxymethyl,
hydroxymethyl,
alkylthiomethyl,
thiomethyl,
COOH,
CHO,
1-oxoalkyl,
2-oxoalkyl, or
3-oxoalkyl

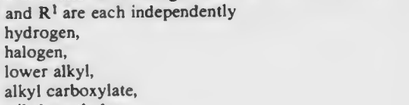
with the proviso that when X is nitrogen, $R^1$ is absent,

$R^2$ is propyl,
butyl,
$-CH_2CH=CH_2$,
$-CH_2CH=CH-CH_3$,
$-CH_2CH_2CH=CH_2$
$-CH_2C\equiv CCH_3$,
$-CH_2CH_2C\equiv CH$,
$-SCH_3$,
$-SC_2H_5$,
$-SC_3H_7$,
$-SC_4H_9$,
$-OCH_3$,
$-OC_2H_5$,
$-OC_3H_7$,
$-OC_4H_9$,
$-SCH_2CH=CH_2$, or
$-OCH_2CH=CH_2$;

and $R_3$ is

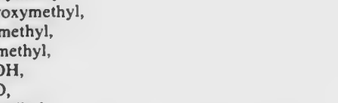


or



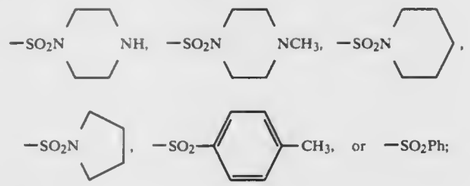
wherein $R_4$ is

CBZ, BOC, $-COPh$, $-COCH_2CH_3$, $-COCH_3$, $-COCF_3$, $-CONH_2$, $-CONHCH_3$, $-CON(CH_3)_2$,





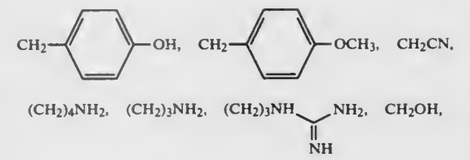
-continued



$R_5$ *1 is*
H,
$CH_3$,
$C_2H_5$,
$t\text{-}C_4H_9$,
$CH_2Ph$;

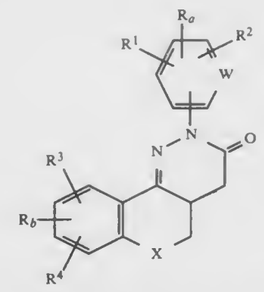
n is 0–3; and

$R_6$ is
H,
$CH_3$,
$C_2H_5$,
$C_3H_7$,
$i\text{—}C_3H_7$,
$C_4H_9$,
$i\text{—}C_4H_9$,
$CH_2CH(CH_3)CH_2CH_3$,
$CH_2CH=CH_2$,
$CH_2$-cyclohexyl,
$CH_2$—Ph,



$CH(CH_3)OH$, $CH_2SH$, $CH_2CH_2SCH_3$, $CH_2CONH_2$, or $CH_2CH_2CONH_2$.

5. A pharmaceutical composition for treating hypertension associated with the renin angiotensin system in mammals comprising an antihypertensive amount of a compound according to claim 1 together with a pharmaceutically acceptable carrier.



wherein $R^1$, $R^2$, $R^3$ and $R^4$ are the same or different and are respectively hydrogen, a halogen, hydroxy, nitro, amino, cyano, trifluoromethyl, a straight- or branched-chain $C_{1\text{-}8}$ alkyl, a straight- or branched-chain $C_{1\text{-}8}$ alkoxy or $C_{2\text{-}5}$ alkanoylamino; $R_a$ is a group of the formula

$$—O—Y—NR^5R^6$$

wherein $R^5$ and $R^6$, the same or different, are respectively hydrogen, a straight- or branched-chain $C_{1\text{-}8}$ alkyl or a phenyl-$C_{1\text{-}4}$ alkyl in which the alkyl moiety is a straight- or branched-chain or a substituted phenyl-$C_{1\text{-}4}$ alkyl having, on the phenyl ring, 1 to 3 substituent(s) selected from the group consisting of halogens, hydroxy, nitro, amino, cyano, trifluoromethyl, straight- or branched-chain $C_{1\text{-}8}$ alkyls, straight- or branched-chain $C_{1\text{-}8}$ alkoxys and $C_{2\text{-}5}$ alkanoylaminos or a group forming a 5- or 6-membered saturated heterocycle together with the adjacent nitrogen atom selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl, 4-substituted-1-piperazinyl wherein the substituent is a straight- or branched-chain $C_{1\text{-}8}$ alkyl, a hydroxy-$C_{1\text{-}8}$ alkyl, phenyl, a phenyl-$C_{1\text{-}4}$ alkyl, or a substituted phenyl-$C_{1\text{-}4}$ alkyl having, on the phenyl ring, 1 to 3 substituent(s) selected from halogens, hydroxy, nitro, amino, cyano, trifluoromethyl, straight- or branched-chain $C_{1\text{-}8}$ alkyls, straight- or branched-chain $C_{1\text{-}8}$ alkoxys and $C_{2\text{-}5}$ alkanoylaminos, and Y stands for a straight- or branched-chain $C_{1\text{-}8}$ alkylene which may have a hydroxy group as a substituent on the chain, and; W is =CH— or =N—; X is $CH_2$, S, SO, $SO_2$ or O; and the bond designated by a broken line represents a single bond or a double bond, or a pharmaceutically acceptable salt or hydrate thereof.

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**5,045,541**

## FUSED PYRIDAZINE COMPOUNDS AND THEIR PHARMACEUTICAL USE

**Toru Nakao, Nakatsu; Minoru Kawakami, Fukuoka; Masao Hisadome, and Tetsuya Tahara, both of Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan**

**PCT No. PCT/JP88/01109, § 371 Date Jul. 2, 1989, § 102(e) Date Jul. 2, 1989, PCT Pub. No. WO89/04306, PCT Pub. Date May 18, 1989**

**ub. Date DOct. 29, 1988, Ser. No. 391,603**

**Claims priority, application Japan, Nov. 2, 1987, 62-278099; Sep. 30, 1988, 63-248295**

**Int. Cl.[5] A61K** *31/50;* **C07D** *487/04, 403/04, 237/36*

**U.S. Cl. 514—248** **4 Claims**

1. A fused pyridazine compound of the formula

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**5,045,542**

## IMMUNE SUPPRESSION METHOD EMPLOYING ARYL-SUBSTITUTED NAPHTHYRIDINE AND PYRIDOPYRAZINE DERIVATIVES

**Marvin I. Siegel, Woodbridge, and Sidney R. Smith, Ridgewood, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Division of Ser. No. 921,288, Oct. 20, 1986, Pat. No. 4,882,332. This application Jul. 31, 1989, Ser. No. 401,324**

**Int. Cl.[5] A01N** *43/60;* **A61K** *31/495, 31/44*

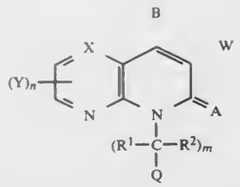
**U.S. Cl. 514—255** **12 Claims**

1. A method for suppressing T cell functions of the immune response in a mammal which comprises administering to a mammal in need of such treatment an immunosuppressing effective amount of a compound having the structural formula

I

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or a pharmaceutically acceptable salt or solvate thereof, wherein:

X represents CH or N;

A represents O or S;

m is an integer of from 0 to 2;

n is an integer of from 0 to 2;

$R^1$ and $R^2$ are the same or different and each is independently selected from H or alkyl containing 1 to 6 carbon atoms;

W represents a convalent bond or a group selected from $—N(R^4)—$, —NH—, $—N(COR^4)—$, or $—N(SO_2R^4)—$ wherein $R^4$ is alkyl;

B represents alkylene having from 2 to 8 carbon atoms, which alkylene may be optionally substituted with a group selected from —OH, —F, alkyl having from 1 to 4 carbon atoms, $—CH_2OH$, —CHO, $—CO_2H$, $—COR^3$ wherein $R^3$ is selected from $—NHR^4$, $—N(R^4)_2$ or $—OR^4$ wherein $R^4$ is alkyl of 1 to 6 carbon atoms or —CN, with the proviso that OH or F is not on a carbon of B when W is —NH—, $—N(R^4)—$, $—N(COR^4)$ or $—N(SO_2R)$;

Q represents an aryl group containing 6 to 15 carbon atoms or an aromatic heterocyclic group containing from 3 to 14 carbon atoms and having at least one O, S or N in the ring, which aryl or aromatic heterocylic group can optionally be substituted with up to 3 substituents Y as defined below; and

each Y substituent is independently selected from —OH, $—NO_2$, alkoxy containing from 1 to 6 carbon atoms, $—CF_3$, —CN, cycloalkyl containing 3 to 7 carbon atoms, alkenyloxy containing from 3 to 6 carbon atoms, alkynyloxy containing from 3 to 6 carbon atoms, $—S(O)_p—R^4$ wherein $R^4$ is as defined above and p is an integer of from 0 to 2, —CO— $R^5$ wherein $R^5$ represents —OH, $—NH_2$, $—NHR^4$, $—N(R^4)_2$ or $—OR^4$ in which $R^4$ is as defined above, —O—D—$COER^5$ wherein D represents alkylene having from 1 to 4 carbon atoms and $R^5$ is as defined above, $—NH_2$, $—NHR^4$, $—N(R^4)_2$ wherein $R^4$ is as defined above or —NHCOH.

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**5,045,543**

**5-AMINO OR SUBSTITUTED AMINO 1,2,3-TRIAZOLES USEFUL AS ANTIMETASTATIC AGENTS**

**Donald Hupe, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 87,494, Aug. 20, 1987, Pat. No. 4,847,257. This application May 8, 1989, Ser. No. 348,823**

**Int. Cl.[5] A61K *31/41***

**U.S. Cl. 514—359** **8 Claims**

7. A method of treating a cancer susceptible to treatment with a compound which is 5-amino-1-(4-[4-chlorobenzoyl]-3,5-dichlorobenzyl)-1,2,3-triazole-4-carboxamide, said cancer in a patient with a surgically excised cancer tumor with a high probability of metastasis comprising:

administration to a patient in need of such treatment a non-toxic therapeutically effective amount of compound which is 5-amino-1-(4-[4-chlorobenzoyl]-3,5-dichlorobenzyl)-1,2,3-triazole-4-carboxamide.

**5,045,544**

**N'-ALKYL-SPIRO-ISOQUINOLINE-PYRROLIDINE TETRONES AND ANALOGS THEREOF USEFUL AS ALDOSE REDUCTASE INHIBITORS**

**Michael S. Malamas, Jamison, Pa., assignor to American Home Products Corporation, New York, N.Y.**

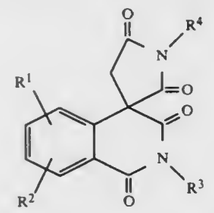
**Filed May 21, 1990, Ser. No. 526,362**

**The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.**

**Int. Cl.[5] A61K *31/44*; C07D *417/14***

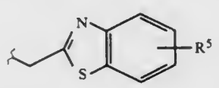
**U.S. Cl. 514—278** **9 Claims**

1. The compounds of structural formula (I)



(I)

wherein $R^1$ and $R^2$ are independently hydrogen, alkyl containing 1 to 6 carbon atoms, halogen, lower alkoxy containing 1 to 6 carbon atoms, trifluoromethyl, nitro, aryl or aryl(lower alkyl)oxy wherein aryl contains 6 to 10 carbon atoms and lower alkyl contains 1 to 6 carbon atoms; $R^3$ is hydrogen, lower alkyl containing 1 to 6 carbon atoms, aryl, aryl(lower alkyl) or halogen substituted aryl(lower alkyl) wherein aryl contains 6 to 10 carbon atoms and lower alkyl contains 1 to 6 carbon atoms, or benzothiazole of structural formula



wherein $R^5$ is hydrogen, alkyl containing 1 to 6 carbon atoms, lower alkoxy containing 1 to 6 carbon atoms, trifluoromethyl, nitro, aryl or aryl(lower alkyl)oxy wherein aryl contains 6 to 10 carbon atoms and lower alkyl contains 1 to 5 carbon atoms; and $R^4$ is alkyl containing 1 to 12 carbon atoms, aryl, aryl(lower alkyl) wherein aryl contains 6 to 10 carbon atoms and lower alkyl contains 1 to 6 carbon atoms, acyl, carboalkoxy, or $—(CH_2)_nCO_2H$, $—(CH_2)_n$ OH, wherein n is 1 to 6.

9. A method of preventing or relieving neuropathy, nephropathy, retinopathy, or cataracts in a diabetic mammal, which comprises administering to said mammal an alleviating or prophylatic amount of a compound of claim 1.

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**5,045,545**

**[(IMIDAZOL-4(AND 5)-YL)METHYL] TETRACYCLIC KETONES HAVING 5-$HT_3$ ANTAGONIST ACTIVITY**

**David E. Bays, Ware; Ian H. Coates, Hertford; John Bradshaw, Royston, and William L. Mitchell, London, all of England, assignors to Glaxo Group Limited, London, England**

**Filed May 26, 1989, Ser. No. 357,183**

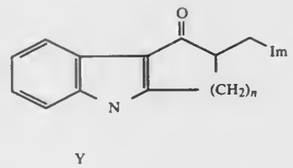
**Claims priority, application United Kingdom, May 27, 1988, 8812636**

**Int. Cl.[5] C07D *521/00, 403/06*; A61K *31/415***

**U.S. Cl. 514—284** **7 Claims**

1. A compound of the formula (I)





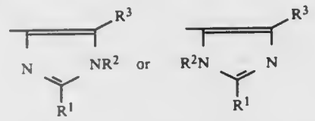
(I)

Y

wherein

n represents 1, 2 or 3;

Im represents an imidazolyl group of the formula:



wherein one of the groups represented by $R^1$, $R^2$ and $R^3$ is a hydrogen atom or a $C_{1-6}$alkyl, $C_{3-7}$cycloalkyl, $C_{3-6}$alkenyl, phenyl or phenyl$C_{1-3}$alkyl group, and each of the other two groups, which may be the same or different, represents a hydrogen atom or a $C_{1-6}$alkyl group;

Y represents a group $—(CH_2)_m—$, where m represents 3

or a physiologically acceptable salt or solvate thereof.

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**5,045,546**

**8-AZABICYCLO[3.2.1]OCTYLALKYLTHIAZOLIDINES**

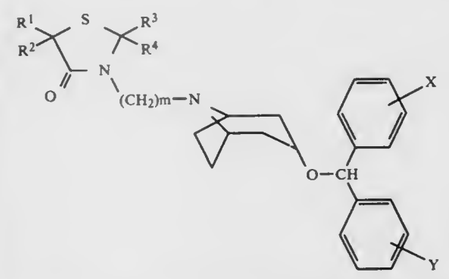
**Nicholas J. Hrib, Somerville, and John G. Jurcak, Somerset, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.**

**Filed Oct. 26, 1990, Ser. No. 603,491**

**Int. Cl.[5] A61K *31/44*; C07D *417/06***

**U.S. Cl. 514—304** **6 Claims**

1. A compound of the formula



I

wherein $R^1$ and $R^2$ are independently hydrogen or loweralkyl; $R^3$ and $R^4$ are independently hydrogen or loweralkyl; X and Y are independently hydrogen, loweralkyl, loweralkoxy, halogen or trifluoromethyl; m is 2, 3, or 4; or an optical isomer thereof; or a pharmaceutically acceptable salt thereof.

**5,045,547**

**LEUKOTRIENE-INHIBITING SUBSTITUTED (QUINOLIN-2-YL-METHOXY)PHENYL-N,N'-SULPHONYLUREAS AND USE THEREAS**

**Siegfried Raddatz, Cologne; Klaus Mohrs, Wuppertal; Romanis Fruchtmann, Cologne; Christian Kohlsdorfer, Erftstadt; Reiner Müller-Peddinghaus, and Pia Theisen-Popp, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

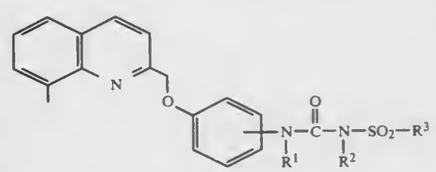
**Filed Feb. 23, 1990, Ser. No. 484,726**

**Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908298**

**Int. Cl.[5] C07D *215/14, 215/16, 401/02*; A61K *31/47***

**U.S. Cl. 514—311** **15 Claims**

1. A substituted (quinolin-2-yl)methoxy)phenyl-N,N'-sulphonylurea of the formula



(I)

in which

$R^1$ and $R^2$ are identical or different and represent hydrogen,

cycloalkyl having 3 to 8 carbon atoms, or represent straight-chain or branched alkyl having up to 12 carbon atoms, which is optionally substituted by halogen, nitro, cyano, hydroxyl, trifluoromethyl, phenyl, cycloalkyl having 3 to 8 carbon atoms or by a group of the formula $—NR^4R^5$,

$R^3$ has the above mentioned meaning of $R^1$ and $R^2$ is identical or different to this, or represents a heterocycle from the group consisting of thienyl, furonyl, pyrryl, pyrimidyl or pyridyl) having 6 to 10 carbon atoms, optionally being monosubstituted to trisubstituted by identical or different substituents from the group consisting of halogen, nitro, cyano, hydroxyl, straight-chain or branched alkyl, alkylthio or alkoxy having up to 8 carbon atoms, trifluoromethyl, trifluoromethoxy and a group of the formula $—NR^4R^5$, and

$R^4$ and $R^5$ are identical or different and denote hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or aryl having 6 to 10 carbon atoms,

or a physiologically acceptable salt thereof.

14. A method of inhibiting leukotriene in a patient in need thereof which comprises administering to such patient an amount effective therefor of a compound or salt thereof according to claim 1.

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**5,045,548**

**QUINOLYL METHOXY COMPOUNDS AND THEIR USE AS ANTIASTHMATIC AGENTS**

**Teruo Oku; Yoshio Kawai; Hiroshi Kayakiri; Kazuyoshi Kuratani, and Masashi Hashimoto, all of Tsukuba, Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan**

**Division of Ser. No. 329,317, Mar. 27, 1989, Pat. No. 4,965,274, which is a continuation-in-part of Ser. No. 181,174, Apr. 13, 1988, Pat. No. 4,923,881. This application Jul. 9, 1990, Ser. No. 550,086**

**Claims priority, application United Kingdom, Apr. 28, 1987, 8710008; Aug. 21, 1987, 8719778; Jan. 15, 1988, 8800872**

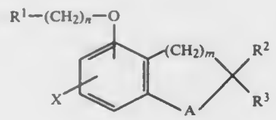
**The portion of the term of this patent subsequent to May 8, 2007, has been disclaimed.**

**Int. Cl.[5] C07D *215/02, 215/14*; A61K *31/47***

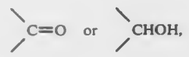
**U.S. Cl. 514—311** **3 Claims**

1. A method of treating asthma in a subject in need thereof,

which comprises administering to the subject an effective amount of a compound of the formula:



wherein
A is

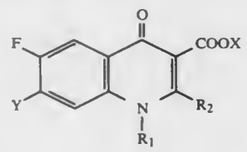


$R^1$ is quinolyl,
$R^2$ is hydrogen or lower alkyl,
$R^3$ is lower alkyl,
X is hydrogen, halogen, hydroxy or lower alkyl,
m is an integer 1 or 2, and
n is an integer 1 to 4, or a pharmaceutically acceptable salt thereof.

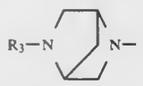
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**5,045,549**
**SUBSTITUTED 4-PYRIDONE 3-CARBOXYLIC ACID DERIVATIVES, METHOD FOR THEIR PRODUCTION AND THEIR PHARMACEUTICAL COMPOSITIONS**
**Fritz Sauter; Ulrich Jordis; Manfred Rudolf, all of Vienna; Josef Wieser, and Karl Baumann, both of Linz, all of Austria, assignors to Chemie Linz Gesellschaft m.b.H., Linz, Austria**
**Filed Jul. 6, 1987, Ser. No. 70,351**
**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622509**
**Int. Cl.[5] A61K *31/47*; C07D *471/04, 513/04***
**U.S. Cl. 514—312** **6 Claims**

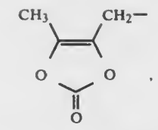
1. A compound of the formula



wherein
$R_1$ is 2,4-difluorophenyl,
$R_2$ is hydrogen,
X is hydrogen or a physiologically removable ester,
Y is a base of the formula



wherein $R_3$ is hydrogen, lower alkyl, benzyl, formyl, acetonyl or a moiety of the formula

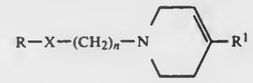


or a pharmaceutically acceptable acid addition salt thereof.

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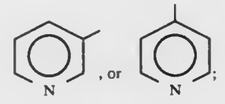
**5,045,550**
**SUBSTITUTED TETRAHYDROPYRIDINES AS CENTRAL NERVOUS SYSTEM AGENTS**
**Juan C. Jaen, Plymouth; David G. Nickell, Ann Arbor; Donna M. Reynolds, Plymouth; Sarah J. Smith, Ann Arbor; Lawrence D. Wise, Ann Arbor, and David J. Wustrow, Ann Arbor, all of Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.**
**Filed Sep. 20, 1990, Ser. No. 585,758**
**Int. Cl.[5] A61K *31/44*; C07D *213/04***
**U.S. Cl. 514—332** **6 Claims**

1. A compound of Formula I



I

wherein R is



X is



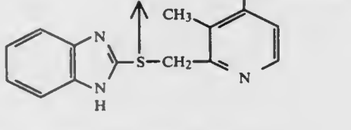
or $—CH_2—$;
n is an integer of 2 to 4;
$R^1$ is aryl; or a pharmaceutically acceptable acid addition salt thereof.

3. A method of treating psychoses, depression, hypertension, galactorrhead, amenorrhead, menstrual disorders, sexual dysfunction, Parkinson's disease, or Huntington's chorea comprising administering to a host suffering therefrom a therapeutic effective amount of a compound according to claim 1 in unit dosage form.

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**5,045,551**
**ACETYLENES DISUBSTITUTED WITH A HETEROAROMATIC GROUP AND A 2-SUBSTITUTED CHROMANYL, THIOCHROMANYL OR 1,2,3,4-TETRAHYDROQUINOLINYL GROUP HAVING RETINOID-LIKE ACTIVITY**
**Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.**
**Filed Sep. 19, 1989, Ser. No. 409,476**
**Int. Cl.[5] A61K *31/44*; C07D *401/04***
**U.S. Cl. 514—337** **44 Claims**

1. Compounds of the formula



where X is S, or O;
$R_1$, $R_2$ and $R_3$ are hydrogen or lower alkyl;
$R_4$ and $R_5$ are hydrogen or lower alkyl with the proviso that $R_4$ and $R_5$ both are not hydrogen;
n is an integer from 0 to 5;
A is pyridyl, and
B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $COONR_9R_{10}$, $—CH_2OH$, $CH_2OR_{11}$, $CH_2OCOR_{11}$, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, —COR", $CR"(OR_{12})_2$, or $CR"OR_{13}O$, where R" is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, $R_8$ is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or $R_8$ is phenyl or lower alkylphenyl, $R_9$ and $R_{10}$ independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or phenyl or lower alkylphenyl, $R_{11}$ is lower alkyl, phenyl or lower alkylphenyl, $R_{12}$ is lower alkyl, $R_{13}$ is divalent alkyl radical of 2–5 carbons.

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**5,045,552**
**PYRIDINE DERIVATIVES HAVING ANTI-ULCERATIVE ACTIVITY**
**Shigeru Souda, Ushiku; Norihiro Ueda, Niihari; Shuhei Miyazawa, Toride; Katsuya Tagami, Niihari; Seiichiro Nomoto, Ushiku; Makoto Okita, Tsuchiura; Naoyuki Shimomura, Niihari; Toshihiko Kaneko; Masatoshi Fujimoto, both of Tsukuba, all of Japan; Manabu Murakami, Rockville, Md.; Kiyoshi Oketani, Tsukuba, Japan; Hideaki Fujisaki, Niihari, Japan; Hisashi Shibata, Tsuchiura, Japan, and Tsuneo Wakabayashi, Mito, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan**
**Continuation of Ser. No. 119,386, Nov. 10, 1987, abandoned. This application Dec. 28, 1989, Ser. No. 462,328**
**Claims priority, application Japan, Nov. 13, 1986, 61-270536; Feb. 2, 1987, 62-21989; Mar. 31, 1987, 62-77784**
**Int. Cl.[5] A61K *31/44*; C07D *401/12***
**U.S. Cl. 514—338** **6 Claims**

1. A compound represented by the formula:



or a pharmaceutically acceptable salt thereof.

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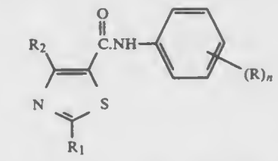
**5,045,553**
**PHARMACEUTICAL COMPOSITION FOR PERCUTANEOUS DRUG ABSORPTION AND PERCUTANEOUS DRUG ABSORPTION PROMOTER**
**Yoshio Ueda, Kobe; Takehisa Hata, Muko; Rinta Ibuki, Ashiya; Kazutake Kado, Toyonaka, and Hiroshi Ishikuro, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Company, Ltd., Osaka, Japan**
**Filed Jun. 17, 1988, Ser. No. 208,071**
**Claims priority, application Japan, Jun. 24, 1987, 62-157234; Sep. 10, 1987, 62-227113**
**Int. Cl.[5] A61K *31/44***
**U.S. Cl. 514—344** **8 Claims**

1. A pharmaceutical composition for percutaneous drug absorption which comprises as an active ingredient 5-isopropyl 3-methyl 2-cyano-6-methyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylate, ethanol and oleic acid, wherein the content of the active ingredient is 0.01–20% by weight, the content of the ethanol is 5–95% by weight and the content of the oleic acid is 0.1–40% by weight of the composition.

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**5,045,554**
**SUBSTITUTED THIAZOLES AND THEIR USE AS FUNGICIDES**
**Gerhard H. Alt, University City; W. Gary Phillips, Glenco; John K. Pratt, St. Peters, and Gabriel H. Srouji, Kirkwood, all of Mo., assignors to Monsanto Company, St. Louis, Mo.**
**Continuation-in-part of Ser. No. 277,375, Nov. 29, 1988, abandoned. This application Oct. 3, 1989, Ser. No. 414,667**
**Int. Cl.[5] C07D *277/56*; A01N *43/78***
**U.S. Cl. 514—365** **26 Claims**

1. A compound represented by the formula:

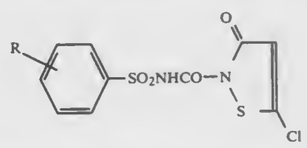


wherein each R is independently halo, halomethyl, 1-haloethyl, halomethoxy, 1-haloethoxy, halomethylthio, 1-haloethylthio, pentafluorosulfur, halomethylsulfinyl, 1-haloethylsulfinyl, halomethylsulfonyl or 1-haloethylsulfonyl; $R_1$ and $R_2$ are independently methyl, ethyl or fluoromethyl, provided that at least $R_1$ or $R_2$ is difluoromethyl or trifluoromethyl; and n is an integer from 3 to 5; or an agronomically acceptable salt thereof.

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**5,045,555**
**N-ALKYLBENZENESULFONYLCARBAMOYL-5-CHLOROISOTHIAZOLE DERIVATIVES AND MICROBICIDES CONTAINING THE SAME**
**Kuniomi Matsumoto, Kanagawa; Mikio Munakata; Tadao Ishii, both of Tokyo, and Tetsuro Watanabe, Kanagawa, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan**
**Continuation of Ser. No. 227,660, Aug. 3, 1988, abandoned. This application Aug. 20, 1990, Ser. No. 569,508**
**Claims priority, application Japan, Aug. 3, 1987, 62-192686**
**Int. Cl.[5] A01N *43/80*; C07D *275/02***
**U.S. Cl. 514—372** **5 Claims**

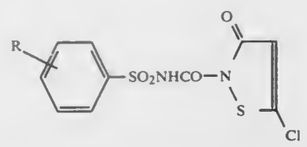
1. A compound represented by formula (I)



(I)

wherein R represents a lower alkyl group having 1 to 4 carbon atoms.

3. A microbicide which comprises at least one compound represented by formula (I)



(I)

wherein R represents a lower alkyl group having 1 to 4 carbon atoms in a microbicidal effective amount and an appropriate carrier.

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5,045,556

## ARALKYL-4H-1,2,4-TRIAZOLE DERIVATIVES

Hans Allgeier, Lörrach-Haagen, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

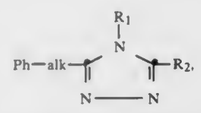
Continuation of Ser. No. 333,378, Apr. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 290,817, Dec. 22, 1988, abandoned, which is a continuation of Ser. No. 103,147, Oct. 1, 1987, abandoned. This application Dec. 3, 1990, Ser. No. 622,130

Claims priority, application Switzerland, Oct. 9, 1986, 4035/86

Int. Cl.[5] A61K *31/41;* C07D *249/08*

U.S. Cl. 514—383 17 Claims

1. Method for the treatment of convulsions characterised in that an anti-convulsively effective amount of a compound of the formula



(I)

in which Ph represents phenyl substituted by lower alkyl, halogen and/or by trifluoromethyl, alk represents lower alkylidene, $R_1$ is lower alkyl, and $R_2$ represents carbamoyl that is unsubstituted or is substituted by lower alkyl or by lower alkanoyl, in each case in free form or in form of a pharmaceutically acceptable salt, is administered a subject in need of such treatment.

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5,045,557

## IMIDAZABLE FUNGICIDES AND USE THEREOF

Antony D. Buss, Amersham; Philip J. Dudfield, and John H. Parsons, both of Saffron Walden, all of England, assignors to Schering Agrochemicals Ltd., England

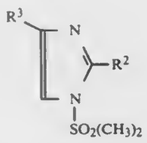
Continuation-in-part of Ser. No. 169,845, Mar. 18, 1988, abandoned. This application Aug. 28, 1990, Ser. No. 573,723

Claims priority, application United Kingdom, Mar. 21, 1987, 8706679; Sep. 22, 1987, 8722329

Int. Cl.[5] A01N *43/50;* C07D *233/90*

U.S. Cl. 514—398 12 Claims

1. A compound of formula I



in which $R^2$ is CN or —C(S)NHR[9]; $R^3$ is arylcarbonyl, in which the aryl group is phenyl, substituted by one or more of the same or different groups, selected from the group consisting of cyano, alkyl, trifluoromethyl, nitro and alkoxy, or alkylaryl-sulfamoyl, in which the aryl group is phenyl, optionally substituted by one or more of the same or different groups, selected from the group consisting of halogen, cyano, alkyl, trifluoromethyl, nitro and alkoxy; $R^9$ is hydrogen or alkanoyl; and in any group which is or includes alkyl contains up to 4 carbon atoms.

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5,045,558

## N-SUBSTITUTED IMIDAZOLES AND THEIR USE IN PHARMACEUTICAL AGENTS

Peter Strehlke; Rolf Bohlmann; David Henderson, and Yukishige Nishino, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

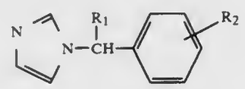
Filed Mar. 31, 1989, Ser. No. 331,399

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811574

Int. Cl.[5] C07D *233/60, 233/61;* A61R *31/415*

U.S. Cl. 514—399 17 Claims

1. An imidazole of the formula



in which

$R_1$ is a saturated or unsaturated, straight-chain or branched-chain hydrocarbon radical having 1 to 10 carbon atoms, a cycloalkyl radical having 3 to 9 carbon atoms, a cycloalkylalkyl radical having 4 to 12 carbon atoms or an arylalkyl radical with 7 to 10 carbon atoms; and

$R_2$ is a formyl group or an amine-containing derivative of a formyl group, said derivative resulting from the reaction of a formyl group with hydroxylamine, O-methylhydroxylamine, O-ethylhydroxylamine, O-allylhydroxylamine, O-benzylhydroxylamine, O-4-nitrobenzyloxyhydroxylamine, 0-2,3,4,5,6-pentafluorobenzyloxyhydroxylamine, semicarbazide, thiosemicarbazide, ethylamine or aniline,

an alkanoyl group with 2 to 10 carbon atoms,

an alkanoyl group having 2 to 10 carbon atoms which is substituted with halogen, $C_{1-4}$-alkoxy, amino, hydroxyl, and/or cyano,

a benzoyl group, or

a benzoyl group which is substituted with halogen, $C_{1-4}$-alkyl, methoxy, amino, hydroxyl, and/or cyano;

or a pharmaceutically acceptable salt thereof.

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5,045,559

## TREATMENT OF SKIN DISORDERS

Ian R. Scott, Wellingborough, England, assignor to Unilever Patent Holdings B.V., Vlaardingen, Netherlands

Filed May 15, 1989, Ser. No. 351,749

Claims priority, application United Kingdom, May 13, 1988, 8811410.3

Int. Cl.[5] A61K *31/40*

U.S. Cl. 514—423 7 Claims

1. A method for the treatment of a skin disorder in man and other mammals selected from the group consisting of:

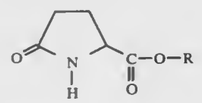
Ichthyosiform dermatoses,
Conradi's syndrome,
Localised hyperkeratotic conditions,
Dandruff,
Callous-forming disorders,
Psoriasis,
Eczema,
Xerosis,
Warts,
Dermatomycoses,
Pityriasis rosea and Pityriasis alba,
Lichen planus and Lichen simplex chronicus,
Cicatricial alopecia with dry flaky scalp,
Darier's disease,



Pruritus,
Seborrhoeic dermatitis,
Seborrhoeic eczema,
Acne, and
Scabies,

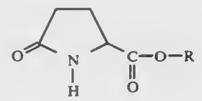
said method comprising applying to involved areas of the body a composition comprising:

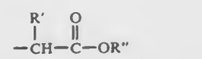
(i) an effective amount of an ester of pyroglutamic acid having the structure:



where

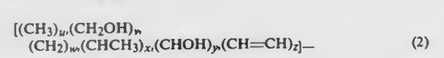
R is a group:





where

R′ and R″ are the same or different and are each represented by H or the group:



(2)

where either

u or v is 1 and the other of them is zero
w is zero, or an integer of from 1 to 21
x is zero, or an integer of from 1 to 4
y is zero, or an integer of from 1 to 2
z is zero, or an integer of from 1 to 4; and
u+v+w+x+y+z is an integer of from 1 to 22

the subgroups within the group (2) being in any sequence provided that when the subgroup (CH=CH) is present, then the total number of carbon atoms in said group (2) will be from 10 to 22; and

(ii) a therapeutically acceptable vehicle for the ester.

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5,045,560

## PESTICIDAL TAUTOMERS OF 3-ARYL-PYRROLIDINE-2,4-DIONES AND USE THEREAS

Reiner Fischer, Monheim; Bernd Baasner, Bergisch-Gladbach; Hermann Hagemann, Leverkusen; Andreas Krebs, Odenthal-Holz; Albrecht Marhold, Leverkusen; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt; Klaus Lürssen, both of Bergisch-Gladbach, all of Fed. Rep. of Germany; Benedikt Becker, Bolzano, Italy; Klaus Schaller, Wuppertal, and Harry Strang, Duesseldorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

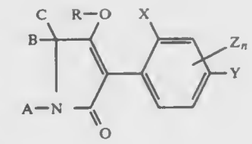
Filed Jan. 2, 1990, Ser. No. 460,208

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1989, 3900301; Aug. 18, 1989, 3927222

Int. Cl.[5] A01N *43/36;* C07D *207/36, 207/38*

U.S. Cl. 514—425 15 Claims

1. A 3-aryl-pyrrolidine-2,4-dione



(I)

in which

X represents $C_1$–$C_6$-alkyl, halogen or $C_1$–$C_6$-alkoxy,

Y represents hydrogen, $C_1$–$C_6$-alkyl, halogen, $C_1$–$C_6$-alkoxy or $C_1$–$C_3$-halogenoalkyl,

Z represents $C_1$–$C_6$-alkyl, halogen or $C_1$–$C_6$-alkoxy,

n represents a number from 0–3,

R represents hydrogen (Ia) or represents the groups of the formula

—CO—$R^1$

or

—CO—O—$R^2$,

in which

$R^1$ represents $C_1$–$C_{20}$-alkyl, $C_2$–$C_{20}$-alkenyl, $C_1$–$C_8$-alkoxy-$C_2$–$C_8$-alkyl, $C_1$–$C_8$-alkylthio-$C_2$–$C_8$-alkyl, $C_1$–$C_8$-polyalkoxy-$C_2$–$C_8$-alkyl or cycloalkyl which has 3–8 ring atoms and which can be interrupted by oxygen and/or sulphur, each of which radicals is optionally substituted by halogen,
or represents phenyl which is optionally substituted by halogen, nitro, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, $C_1$–$C_6$-halogenoalkyl or $C_1$–$C_6$-halogenoalkoxy,
or represents phenyl-$C_1$–$C_6$-alkyl which is optionally substituted by halogen, $C_1$–$C_6$-alkyl, $C_1$–$C_6$-alkoxy, $C_1$–$C_6$-halogenoalkyl or $C_1$–$C_6$-halogenoalkoxy,

$R^2$ represents $C_1$–$C_{20}$-alkyl, $C_2$–$C_{20}$-alkenyl, $C_1$–$C_8$-alkoxy-$C_2$–$C_8$-alkyl or $C_1$–$C_8$-polyalkoxy-$C_2$–$C_8$-alkyl, each of which radicals is optionally substituted by halogen,
or represents phenyl or cycloalkyl which has 3–8 ring atoms, each of which radicals is optionally substituted by halogen, nitro, $C_1$–$C_6$-alkyl. $C_1$–$C_6$-alkoxy or $C_1$–$C_6$-halogenoalkyl,

A represents straight-chain or branched $C_1$–$C_{12}$-alkyl, $C_3$–$C_8$-alkenyl, $C_3$–$C_8$-alkinyl, $C_1$–$C_{10}$-alkoxy-$C_2$–$C_8$-alkyl, $C_1$–$C_8$-polyalkoxy-$C_2$–$C_8$-alkyl, $C_1$–$C_{10}$-alkylthio-$C_2$–$C_8$-alkyl or cycloalkyl which has 3–8 ring atoms and which can be interrupted by oxygen and/or sulphur, each of which radicals is optionally substituted by halogen, or represents aryl-$C_1$–$C_6$-alkyl which is optionally substituted by halogen, $C_1$–$C_6$-alkyl-$C_1$–$C_6$-haloalkyl, $C_1$–$C_6$-alkoxy or nitro, and

B and C* independently of one another represent hydrogen, straight-chain or branched $C_1$–$C_{12}$-alkyl or $C_1$–$C_8$-alkoxy-alkyl.

14. A method of combating insects or acarids which comprises applying thereto or to a host from which it is desired to exclude them an amount effective therefor of a compound according to claim 1.

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5,045,561

## SUBSTITUTED FURAN SULFONAMIDES AS ANTIGLAUCOMA AGENTS

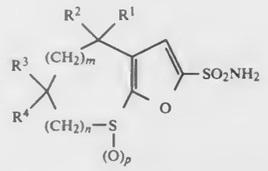
John J. Baldwin, Gwynedd Valley; Gerald S. Ponticello, Lansdale, and Harold G. Selnick, Ambler, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 12, 1990, Ser. No. 507,806

Int. Cl.[5] A61K *31/38;* C07D *327/02*

U.S. Cl. 514—432 7 Claims

1. A compound of structural formula:



the individual diastereomers, the individual enantiomers or mixtures thereof, or an ophthalmologically acceptable salt thereof wherein:

$R^1$ is
1) hydrogen,
2) $-NR^5R^6$, wherein $R^5$ and $R^6$ independently are:
a) hydrogen, or
b) $C_{1-6}$alkyl;

$R^2$ is hydrogen; or

$R^1$ and $R^2$ taken together represent=0;

$R^3$ is
1) hydrogen,
2) $C_{1-6}$alkyl, either unsubstituted or substituted with
a) hydroxy,
b) $C_{1-3}$alkoxy,
c) $C_{1-3}$alkoxy-$C_{2-3}$alkoxy,
d) hydroxy-$C_{2-3}$alkoxy, or
e) $-NR^7R^8$ wherein $R^7$ and $R^8$ independently are:
i) hydrogen, or
ii) $C_{1-6}$alkyl,
3) $C_{2-6}$alkenyl, or
4) $C_{2-6}$alkynyl;

$R^4$ is hydrogen or $C_{1-6}$alkyl;

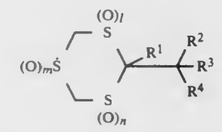
m and n are independently 0, or 1 with the proviso that m+n must be equal to 1; and

p is 0 or 2.

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**5,045,562**
**1,3,5-TRITHIANE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS THEREOF**
**Masashi Nagamine, Nishinomiya; Kunikazu Hiraga, Osaka; Atsushi Sakai, and Matazaemon Uchida, both of Kawachinagano, all of Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan**
**Division of Ser. No. 73,449, Jul. 14, 1987, Pat. No. 4,816,475. This application Oct. 17, 1988, Ser. No. 258,667**
**Claims priority, application Japan, Jul. 15, 1986, 61-166167**
**Int. Cl.[5] A61K** *31/385;* **C07D** *341/00*
**U.S. Cl. 514—435** **18 Claims**

10. A medicinal composition comprising a pharmaceutically acceptable carrier and as active ingredient a trithiane derivative represented by the formula (I):



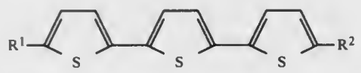
(I)

wherein $R^2$, when taken together with $R^1$, forms a double bond between the carbon atom of the trithiane ring and the one to which $R^3$ and $R^4$ are bonded, and each of l, m and n is zero, and wherein in formula (I) $R^3$ is a substituted phenyl group having as the substituent a phenoxy group (which is optionally substituted by one or two substituents selected from the group consisting of halogen atoms, $C_1$- to $C_5$-alkyl groups and $C_1$- to $C_5$-alkoxy groups), and $R^4$ is selected from the group consisting of a $C_1$- to $C_5$-alkyl group and a hydroxycarbonyl $C_1$- to $C_5$-alkyl group.

**5,045,563**
**PHOTOTOXIC COMPOUNDS FOR USE AS INSECT CONTROL AGENTS**
**Peter Morand; John T. Arnason, both of Ottawa; Bernard J. R. Philogene, Gloucester; Anita M. MacEachern; Leonard C. Leitch, both of Ottawa, and Jerzy Kaminski, Gloucester, all of Canada, assignors to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada**
**Filed Aug. 26, 1986, Ser. No. 901,054**
**Int. Cl.[5] C07D** *409/14, 409/04;* **A01N** *43/10*
**U.S. Cl. 514—444** **31 Claims**

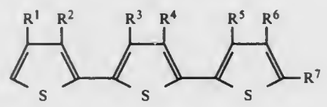
1. A pesticidal composition comprising a carrier and a biocidal-amount of a phototoxic naturally-occurring thiophene, acetylene or synthetic, structurally-related derivatives, analogue or acetylenic compound selected from the group consisting of

(a) compound of the formula



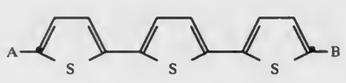
wherein
$R^1$=$R^2$=$CO_2H$;
$R^1$=$CO_2H$; $R_2$=H;
$R^1$=tritium; $R^2$=$COCH_3$;
$R^1$=$R^2$=$COCH_3$;
$R^1$=$CH_2OH$; $R^2$=H;
$R^1$=CHO; $R^2$=H;
$R^1$=$R^2$=CHO;
$R^1$=$R^2$=C≡N;
$R^1$=$NH_2$; $R^2$=H;
$R^1$=$(CH_2)_2OH$; $R^2$=H;
$R^1$=C≡N; $R^2$=H;
$R^1$=CH=$CHCO_2H$(cis), $R^2$=H; and
$R^1$=CH=$CHCO_2H$(trans); $R^2$=H;

(b) compound of the formula



wherein
$R^1$=$R^2$=$R^3$=$R^4$=$R^5$=$R^6$=$CH_3$; $R^7$=H;
$R^1$=$R^2$=$R^5$=$R^6$=$R^7$=H; $R^3$=$R^4$=$CH_3$;
$R^1$=$R^4$=$R^6$=$R^7$=H; $R^2$=$R^3$=$R^5$=$CH_3$; and
$R^1$=$R^2$=$R^5$=$R^6$=$R^7$=H; $R^3$=$R^4$=$CH_3CH_2$; and

(c) an α-terthienyl of the formula (where a dot indicates the point of attachment):



wherein



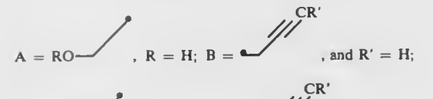


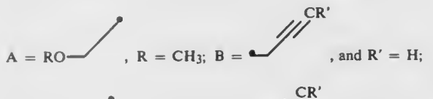


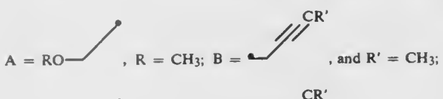
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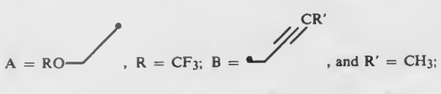


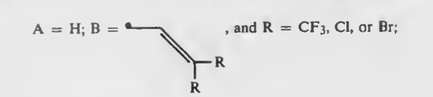




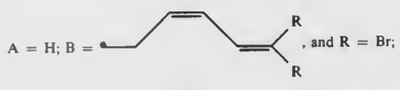


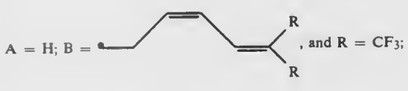




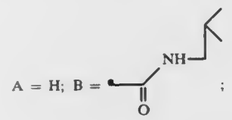


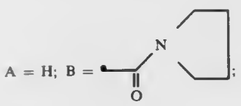




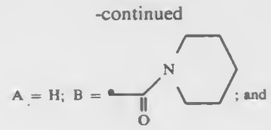


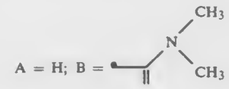




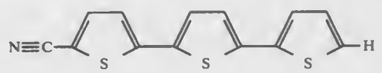


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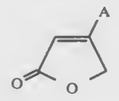
5. A pesticidal composition comprising a carrier and a biocidal-amount of a phototoxic, naturally-occurring compound of the following Formula:



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**5,045,564**
**ANTI-INFLAMMATORY 2-FURANONES**
**Gary C. M. Lee, Laguna Hills, Calif., assignor to Allergan, Inc., Irvine, Calif.**
**Continuation-in-part of Ser. No. 281,126, Dec. 7, 1988, abandoned. This application Oct. 25, 1989, Ser. No. 427,202**
**Int. Cl.[5] A61K** *31/34;* **C07D** *307/28;* **C07F** *9/28*
**U.S. Cl. 514—471** **10 Claims**

1. A compound of the formula:



in which:
A is $CH(R_1)R$;
R is $C_7$–$C_{20}$alkyl;
$R_1$ is $OCOR_2$, 2-(methoxy)ethoxymethoxy, halogen and $NHR_3$;
$R_3$ is H, $C_1$–$C_6$ alkanoyl, $COCF_3$ and $C_1$–$C_6$ sulfonyl;
$R_2$ is $C_1$–$C_{14}$alkyl or amino N-substituted by one α-($C_1$–$C_4$alkyl)benzyl group, by one or two $C_1$–$C_4$alkyl groups or by one phenyl group; or $OP(R_4R_5)$; or
R is 2-(methoxy)ethoxymethoxymethyl and $R_1$ is OCO-($C_7$–$C_{14}$alkyl); or
R is $CH(OCOC_1$–$C_4$alkyl)$C_7$–$C_{20}$alkyl and $R_1$ is $OCO(C_1$–$C_4$alkyl); and
$R_4$=$R_5$ is H or $C_1$–$C_4$ alkyl.

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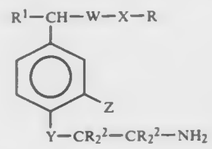
**5,045,565**
**NOVEL COMPOUNDS, PHARMACEUTICAL COMPOSITIONS, AND METHODS FOR TREATING INFLAMMATION AND PAIN**
**Joseph H. Gardner, Cincinnati; Gerald B. Kasting, Wyoming; Thomas L. Cupps, Oxford; Richard S. Echler, Fairfield; Thomas W. Gibson, and Joel I. Shulman, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**
**Continuation-in-part of Ser. No. 359,598, Jun. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 149,618, Feb. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 23,598, Mar. 9, 1987, abandoned. This application Sep. 8, 1989, Ser. No. 404,924**
**Int. Cl.[5] C07C** *125/00, 103/30, 103/38;* **C61K** *31/27*
**U.S. Cl. 514—487** **24 Claims**

1. Beta-aminoethyl-substituted phenyl compounds which are

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effective as anti-inflammatory or analgesic agents, and the pharmaceutically-acceptable salts and amides thereof, having the general structure:



wherein:

(a) the —W—X— moiety is selected from the group consisting of —C(O)NH—, —C(S)NH—, —S(O)$_2$NH—, —NHC(O)O—, —NHC(S)O—, —NHC(O)NH— and —NHC(S)NH— wherein either available bond of the —W—X— moiety is bonded to the —R moiety and the remaining bond is attached to the benzyl carbon atom;

(b) —Y— is a moiety selected from the group consisting of —O—, —S— and —NR$^4$—, where —R$^4$ is selected from hydrogen and C$_1$-C$_4$ alkanyl;

(c) —Z is selected from the group consisting of hydrogen, hydroxy, and methoxy;

(d) —R is an alkyl group having from about 1 to about 24 carbon atoms;

(e) —R$^1$ is selected from the group consisting of hydrogen, hydroxy, alkyl esters of hydroxy having from about 1 to about 5 carbon atoms, alkyl having from about 1 to about 5 carbon atoms, and alkoxy having from about 1 to about 5 carbon atoms; and

(f) each —R$^2$ is independently selected from hydrogen, halogen, unsubstituted or substituted alkyl having from about 1 to about 6 carbon atoms, substituted or unsubstituted aryl, and carboxylate, or two —R$^2$ moieties are covalently bonded to form a substituted or unsubstituted alkyl or aryl ring having from about 3 to about 8 carbon atoms in the ring; wherein any alkyl ring substituent is selected from the group consisting of halogen, hydroxy, amino, aryl, carboxylate, and —OR$^3$ wherein —R$^3$ is unsubstituted alkyl having from about 1 to about 3 carbon atoms; and wherein any aryl substituent is selected from the group consisting of halogen, hydroxy, C$_1$-C$_{16}$ alkoxy, amino, nitro, cyano, phenyl, benzyl, benzyloxy, trifluoromethyl, formylamino, carboxylate and C$_1$-C$_6$ alkyl.

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**5,045,566**

**IMIDATE INSECTICIDES**

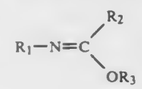
**Michael D. Broadhurst, Novato; Thomas H. Cromartie, Albany; Karl J. Fisher, Fairfax, and William G. Haag, Martinez, all of Calif., assignors to ICI Americas Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 263,605, Oct. 31, 1988, abandoned, and a continuation-in-part of Ser. No. 264,746, Oct. 31, 1988, abandoned, each is a continuation-in-part of Ser. No. 122,877, Nov. 17, 1987, abandoned. This application Apr. 27, 1989, Ser. No. 343,552**

**Int. Cl.$^5$ A61K *37/52***

**U.S. Cl. 514—508** **134 Claims**

1. A compound having the formula



(I)

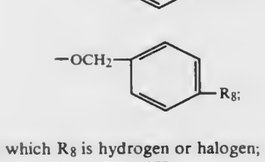
in which

R$_1$ is naphthyl, optionally substituted by up to 2 halogens; or phenyl, optionally substituted by one or more of: C$_2$-C$_5$ carboalkoxy, C$_1$-C$_4$ alkylsulfonyl, C$_1$-C$_4$ haloalkylsulfonyl, C$_2$-C$_5$ alkylcarbonyl, C$_2$-C$_4$ alkenyl, C$_3$-haloalkenoxy; C$_1$-C$_4$ haloalkylthio, C$_3$-C$_6$ cycloalkyl, phenyl, mono-substituted phenyl, pyridyloxy, C$_2$-C$_4$ alkyleneoxy, C$_1$-C$_2$ perhaloalkyleneoxy; C$_1$-C$_4$ alkylenedioxy, C$_1$-C$_3$ haloalkylenedioxy, C$_2$-C$_4$ alkylene, amido, nitro, cyano, up to two C$_1$-C$_4$ alkylthio groups, up to three C$_1$-C$_4$ alkoxy groups, up to three C$_1$-C$_4$ haloalkoxy groups, up to three C$_1$-C$_4$ alkyl groups, up to three C$_1$-C$_4$ haloalkyl groups, or up to five halogens;

R$_2$ is methyl; ethyl; n-propyl; C$_3$-C$_7$ branched alkyl; C$_1$-C$_6$ haloalkyl, cyclobutyl substituted by up to 4 methyl groups or up to 2 halogens, cyclobutyl, cyano, C$_2$-C$_4$ alkoxyalkyl, C$_2$-C$_6$ alkenyl or C$_2$-C$_6$ haloalkenyl; and

R$_3$ is

(a)



in which m is 0 or 1;

A, B and C are each carbon or nitrogen, provided that A, B and C are not all nitrogen and if two of A, B and C are nitrogen, then A and C are nitrogen;

R$_4$ is hydrogen, monohalo or dihalo;

R$_6$ is hydrogen, methyl, fluoro or ethynyl; and

R$_7$ is

(i)



in which D and E are each carbon or nitrogen provided that both D and E are not nitrogen, and further provided that if any of A, B or C is nitrogen, then D and E are both carbon; and

R$_5$ is hydrogen, C$_1$-C$_4$ alkyl, C$_1$-C$_4$ alkoxy, trifluoromethyl, cyano, C$_1$-C$_4$ alkylthio, C$_1$-C$_4$ alkylsulfonyl, or mono- or polyhalo;

(ii)

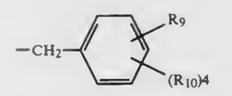


in which R$_8$ is hydrogen or halogen; or

(iii) —O—CH$_2$—CH=CH$_2$;

(b)



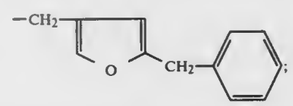


in which

(i) R$_9$ is 4-fluoro, 4-methoxymethyl, or 4-propargyl, and R$_{10}$ is fluoro or

(ii) R$_9$ is 3- or 4-allyl, 3- or 4-propargyl, or 3- or 4-(mono- or dihalo)allyl, and R$_{10}$ is hydrogen or fluoro;

(c)



(d) 4-phenoxy-2-butyn-2-yl;

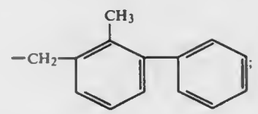
(e) 3-bromo-4-fluorobenzyl;

(f) 4-(benzyloxy)benzyl;

(g) 4-(4-fluorobenzyloxy)benzyl;

(h) 4-(4-trifluoromethyl-2-pyridyloxy)benzyl; or

(j)



provided that:

(i) R$_1$ is not 2,3-dichlorophenyl, 2,6-difluorophenyl, 2,6-di(C$_1$-C$_4$ alkyl)phenyl, 2,4,6-tribromophenyl or 2,4,6-tri(C$_1$-C$_4$ alkoxy) phenyl;

(ii) when R$_2$ is tertiary butyl, R$_1$ is not phenyl, 3-methylphenyl, 4-(n-butyl)phenyl or 4-(t-butyl)phenyl; and

(iii) when R$_2$ is a C$_5$ alkyl group, R$_1$ is not 4-isopropylphenyl.

**103**. A method for controlling insects comprising applying to an insect, the locus of an insect or a locus at which insecticidal control is desired, an insecticidally effective amount of a compound according to claim **1**.

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**5,045,567**

**PROPANOLAMINE DERIVATIVES HAVING ANTI-DIABETIC EFFECTS**

**Frank Kienzle, Fluh, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.**

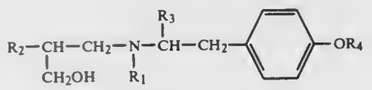
**Continuation of Ser. No. 363,242, Jun. 8, 1989, abandoned. This application Oct. 31, 1990, Ser. No. 608,610**

**Claims priority, application Switzerland, Jun. 10, 1989, 2245/88**

**Int. Cl.$^5$ A61K *31/24, 31/135*; C07C *229/34, 215/08***

**U.S. Cl. 514—539** **20 Claims**

1. A compound of the formula



I

wherein

R$^1$ is hydrogen or a group of formula



(a)

n is the number 0 or 1;

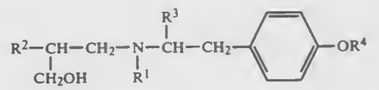
R$^2$ and R$^5$ are phenyl, m-halophenyl or m-trifluoromethylphenyl;

R$^3$ is hydrogen or methyl;

R$^4$ is hydrogen, —CH$_2$COOH, —CH$_2$COO—C$_{1-4}$-alkyl, —(CH$_2$)$_2$O—C$_{1-4}$-alkyl or —(CH$_2$)$_2$O(Ch$_2$)$_{1-4}$—C$_6$H$_5$; or a physiologically compatible salt thereof.

**17**. A composition for treating obesity or diabetes mellitus comprising:

a) a compound of the formula



I

wherein

R$^1$ is hydrogen or a group of formula



(a)

n is the number 0 or 1;

R$^2$ and R$^5$ are phenyl, m-halophenyl or m-trifluoromethylphenyl;

R$^3$ is hydrogen or methyl;

R$^4$ is hydrogen, —CH$_2$COOH, —CH$_2$COO—C$_{1-4}$-alkyl, —(CH$_2$)$_2$O—C$_{1-4}$-alkyl or —(CH$_2$)$_2$O(CH$_2$)$_{1-4}$—C$_6$H$_5$; or a physiologically compatible salt thereof, in an amount which is effective in treating obesity or diabetic mellitus, and

b) a pharmaceutically acceptable carrier.

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**5,045,568**

**PROCESS AND APPARATUS FOR PERFORMING CHEMICAL REACTIONS UNDER PRESSURE IN A MULTI-STAGE REACTION ZONE WITH EXTERNAL INTERMEDIARY THERMAL CONDITIONING**

**Dang V. Quang, Neuilly; Pierre Ham, La Celle Saint Cloud; Daniel Gelas, Croissy sur Seine, and Christian Legrand, Cergy, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France**

**Filed Jan. 21, 1988, Ser. No. 146,665**

**Int. Cl.$^5$ C07C *27/06***

**U.S. Cl. 518—706** **18 Claims**

1. In a process for conducting alcohol synthesis from hydrogen and carbon oxides in a cylindrical reaction zone having essentially a circular cross-section, comprising at least two compartments, each of which contains, at least partly, at least one solid catalyst, wherein a reaction fluid containing hydrogen and carbon oxides is introduced into at least one compartment and circulates therethrough, a first reaction effluent is recovered from said at least one compartment and undergoes heat exchange outside said reaction zone with an external heat exchange medium, said first reaction effluent, after said heat exchange, is introduced into at least one subsequent compartment and circulates therethrough and a second reaction effluent is recovered from said subsequent compartment, said reaction zone being of elongated shape and comprising a casing with at least one generatrix, said casing defining an enclosed section intersecting said generatrix, the improvement comprising:

circulating said reaction fluid through said at least one compartment cross-wise and in a direction which is perpendicular to said generatrix, and circulating said first reaction

effluent through said subsequent compartment cross-wise and in a direction which is perpendicular to said generatrix,

said compartments being elongated in the direction of said generatrix and said compartments being fluid-tight,

each of said compartments being adjacent to one or two other compartments, and

each group of two adjacent compartments having a common partition-wall wherein said common partition-wall is in fluid-tight connection with said casing.

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**5,045,569**

## HOLLOW ACRYLATE POLYMER MICROSPHERES

**Joaquin Delgado, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 30, 1988, Ser. No. 276,767**

**The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.**

**Int. Cl.[5] C08J *9/32*; B01J *13/02***

**U.S. Cl. 521—60** **14 Claims**

1. Hollow, polymeric, acrylate, inherently tacky, infusible, solvent-insoluble, solvent-dispersible, elastomeric pressure-sensitive adhesive microspheres having a diameter of at least 1 micrometer.

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**5,045,570**

## ENDOTHERMIC BLOWING AGENTS FOR SURFACE MIGRATION OF COMPONENTS IN FOAMED PRODUCTS, COMPOSITIONS AND APPLICATIONS

**Gerry Mooney, West Ajax, Canada; Rod A. Garcia, Orange, Tex.; Michael E. Tarquini, Havre de Grace, and John A. Kosin, Bel Air, both of Md., assignors to J. M. Huber Corporation, Rumson, N.J.**

**Continuation-in-part of Ser. No. 352,307, May 16, 1989. This application Jan. 19, 1990, Ser. No. 467,585**

**The portion of the term of this patent subsequent to Jun. 24, 2008, has been disclaimed.**

**Int. Cl.[5] C08J *9/08***

**U.S. Cl. 521—88** **10 Claims**

1. A composition for producing a foamed product which comprises:

at least one polymer component;

an additive which comprises platelet fillers, flame retardants, polar resin systems, and dormant chemical blowing agents; and

a blowing agent which causes said additive to migrate through said polymer component during a foaming process, said blowing agent comprising a mixture of a polycarboxylic acid and an inorganic carbonate, wherein said polycarboxylic acid and said inorganic carbonate have been surface treated with a component selected from the group consisting of mono- and di-glycerides, stearic acid, silane coupling agents, fatty acids, fatty acid salts, hydrotitinates, zirconates, and mixtures thereof.

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**5,045,571**

## SILICONE POLYETHER COPOLYMERS AND POLYURETHANE FOAMS PREPARED THEREFROM

**Charles H. Blevins, Beacon; George H. Greene, Croton-On-Hudson; Paul L. Matlock, Ossining, and Gerald J. Murphy, Wappingers Falls, all of N.Y., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.**

**Division of Ser. No. 268,187, Nov. 7, 1988, Pat. No. 4,962,218. This application Jun. 19, 1990, Ser. No. 540,173**

**Int. Cl.[5] C08G *18/14***

**U.S. Cl. 521—111** **3 Claims**

1. A high resilient polyurethane foam slab prepared from a formulation comprising as at least one silicone polyether copolymer surfactant comprised of a polyether backbone having an average at least three pendant groups of the formula:

$$-SiR'_aO_{\frac{(3-a)}{2}}R''_b$$

attached to said polyether backbone through a divalent aliphatic group having 2 to 10 carbon atoms and which may contain at least one heteroatom of the group of O, N and S, said heteroatom being located within said divalent aliphatic group and wherein R' represents $C_1$–$C_3$, R'' or OR'''; R'' represents

$$SiR'_cO_{\frac{(4-c)}{2}}$$

and R''' represents $C_1$–$C_3$; and a, b and c have a value from 0 to 3; said silicone polyether copolymer surfactant being characterized by

(a) a narrow uni-modal distribution;

(b) being essentially free of silicone oils and process polyethers; and

(c) any unreacted unsaturated groups on said polyether backbone are deactivated.

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**5,045,572**

## RADIATION CURABLE CROSS LINKABLE COMPOSITIONS CONTAINING AN ALIPHATIC POLYFUNCTIONAL ALKENYL ETHER

**Jeffrey S. Plotkin, Monsey, N.Y.; James A. Dougherty, Pequannock, N.J.; Fulvio J. Vara, Chester, N.J., and Paul D. Taylor, West Milford, N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.**

**Filed Jan. 26, 1990, Ser. No. 470,487**

**Int. Cl.[5] C08F *2/46*; C08G *85/00*; C08J *3/28***

**U.S. Cl. 522—31** **13 Claims**

1. A radiation curable, cross linkable composition comprising (a) from about 0.1 to about 5 wt. % of an initiator containing at least 25% cationic initiator, (b) from about 0 to about 60 wt. % of a polymerizable vinyl ether, epoxy ether, epoxy aorylate and/or vinyloxy alkyl urethane and (c) from about 35 to about 99.9% wt. % of an aliphatic polyfunctional alkenyl ether having the formula

$$A[(CH_2O)_m(Z)_rCH{=}CHR]_n$$

wherein A is a carbon atom, —OCH=CHR or [$C_1$ to $C_{10}$ alkyl]$_{4-n}$; R is $C_1$ to $C_6$ alkyl; Z is $C_2$ to $C_8$ alkyleneoxy; r has a value of from 0 to 6; m has a value of from 0 to 1 and n has a value of from 1 to 4, with the proviso that m is 0 and n is one when A is —OCH=CHR, n has a value of 2 or 3 when A is [$C_1$ to $C_{10}$ alkyl]$_{4-n}$ and n has a value of 4 when A is carbon.

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**5,045,573**

## PHOTOINITIATORS FOR PHOTOPOLYMERIZATION OF UNSATURATED SYSTEMS

**Manfred Köhler, Darmstadt; Jörg Ohngemach, Ohngemach; Gregor Wehner, Darmstadt, and Jürgen Gehlhaus, Lautertal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany**

**Division of Ser. No. 948,305, Dec. 3, 1986, Pat. No. 4,861,916. This application Apr. 13, 1989, Ser. No. 337,773**

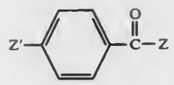
**Claims priority, application Fed. Rep. of Germany, Apr. 3, 1985, 3512179**

**Int. Cl.[5] C08F *2/50, 220/06, 226/02*; C08G *59/17***

**U.S. Cl. 522—42** **7 Claims**

1. A process for the photopolymerization of an ethylenically unsaturated compound or a system containing said compound, comprising exposing said compound or said system to activating radiation whereby polymerization is commenced, wherein said radiation is applied in the presence of a photoinitiator of formula I





wherein

Z is $CR^1R^2(OR^3)$,

$R^1$ being H, $C_{1-6}$-alkyl or phenyl,

$R^2$ being H, $C_{1-6}$-alkyl or $C_{1-6}$-alkoxy and

$R^3$ being H, $C_{1-6}$-alkyl or $C_{1-6}$-alkanoyl and

Z' is $Y—[(CH_2)_m—X]_n—$,

X being $CH_2$ or O,

Y being OH; COOH; $SO_3H$; an alkali metal, alkaline earth metal or ammonium salt thereof; a salt thereof with an organic nitrogen base; NRR' in which R and R' are in each case H, $C_{1-20}$-aikyl or $C_{1-4}$-hydroxyalkyl, or quaternized NRR' or NRR' in the form of an acid addition salt, and n and m each being a number 1–4.

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**5,045,574**

## FILM-FORMING AGENT

**Satoshi Kuwata, Annaka; Takashi Ohkawara, Myogi, and Takaaki Shimizu, Joetsu, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan**

**Filed Jan. 19, 1990, Ser. No. 467,387**

**Claims priority, application Japan, Jan. 26, 1989, 1-18457**

**Int. Cl.[5] C08K *9/06***

**U.S. Cl. 523—212** **6 Claims**

1. A film-forming agent which comprises:

(a) 100 parts by weight of a silica organosol which is a dispersion of, in an organic solvent, from 1 to 50% by weight of spherical fine silica particles having an average particle diameter in the range from 1 to 100 nm and a specific surface area of at least 300 $m^2/g$ and wherein after a trimethylsilylating treatment of the surface of said silica organosol said treated surface will have a density of the trimethyl silyl groups in the range from 0.5 to 10 $\mu$ moles/$m^2$, density of the alkoxy groups in the range from 0.5 to 10 $\mu$ moles/$m^2$ and density of the silanol groups in the range from 0.5 to 5 $\mu$ moles/$m^2$; and

(b) from 1 to 100 parts by weight of a diorganopolysiloxane having a viscosity in the range from 5 to 10,000 centistokes at 25° C. and terminated at each molecular chain end with a silanolic hydroxy group.

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**5,045,575**

## METHOD OF REDUCING VOIDS IN THERMOSET RESIN PRODUCTS

**Solomon M. Gabayson, San Diego, Calif., assignor to General Dynamics Corporation, Convair Division, San Diego, Calif.**

**Filed Dec. 18, 1989, Ser. No. 451,693**

**Int. Cl.[5] C08K *5/00, 5/52*; C08L *67/00***

**U.S. Cl. 523—458** **13 Claims**

1. The method of preparing a resin mixture suitable for potting structures which when used is substantially free from voids and discoloration which comprise the steps of: providing a quantity of a liquid synthetic resin precursor; mixing therewith from about 0.1 to 0.5 weight percent, based on resin precursor weight of a titanate or zirconate coupling agent having the general formula:

$$(R—O)_4—M.(HP—(OR^1)_2$$

where: R is an alkoxy, alkyl, alkenyl, alkynyl or aralkyl L group having from 1 to about 30 carbon atoms or a substituted derivative thereof;

M is zirconium or titanium; and

$R^1$ is independently an aryl, aralkyl, alkaryl, alkyl or alkeno group having from 1 to about 30 carbon atoms.

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**5,045,576**

## LATEX CONVERSION TO CATIONIC FORM USE, FOR EXAMPLE, IN CATIONIC ASPHALT EMULSION

**Jesse S. Roeck; James G. Galloway, and Ronald E. Snyder, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 4, 1988, Ser. No. 228,100**

**Int. Cl.[5] C08K *95/00***

**U.S. Cl. 524—60** **4 Claims**

1. A process for preparing an asphalt emulsion which comprises:

(a) emulsion polymerizing monomers to prepare an emulsion polymerized anionic latex wherein the anionic latex monomers are selected from the group consisting of,

(i) at least one monovinyl aromatic monomer, at least one acrylic monomer and at least one monoethylenically unsaturated carboxylic acid monomer;

(ii) at least one monovinyl aromatic monomer, at least one aliphatic conjugated diene monomer and at least one monoethylenically unsaturated carboxylic acid monomer; and

(iii) at least one acrylic monomer and at least one monoethylenically unsaturated carboxylic acid monomer;

(b) converting the emulsion polymerized anionic latex to a cationic latex by adding an effective amount of steric stabilizer and an effective amount of a cationic surfactant,

(c) adding the cationic latex to an emulsifier solution which comprises water, cationic surfactant and acid to form a mixture,

(d) adding the mixture to asphalt to form an asphalt emulsion.

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**5,045,577**

## PROCESS FOR THE PREPARATION OF HEAT-STABLE OLEFIN POLYMERS

**Rolf Mülhaupt, and Paul Dubs, both of Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jun. 21, 1989, Ser. No. 369,428**

**Claims priority, application Switzerland, Jun. 30, 1988, 2501/88-5**

**Int. Cl.[5] C08K *5/5393, 5/524***

**U.S. Cl. 524—99** **14 Claims**

1. A process for the preparation of olefin polymers stable to heat and oxidation by polymerization on a solid catalyst obtained by reaction of an aluminium alkyl with a solid product comprising a magnesium dihalide in active form and a titanium compound, which process comprises adding to the polymerization zone at least one 2,2,6,6-tetramethylpiperidine compound as a stabilizer and at least one phosphorus-III ester as a costabilizer.

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**5,045,578**

## POLYMER MIXTURE COMPRISING POLYPHENYLENE ETHER, STERICALLY HINDERED AMINE AND EPOXY COMPOUND AND ARTICLES MANUFACTURED THEREFROM

**Christianus A. A. Claesen, CA Bergen op Zoom, Netherlands, and Hideo Koike, Utsunomiya, Japan, assignors to General Electric Co., Selkirk, N.Y.**

**Filed Oct. 13, 1988, Ser. No. 256,936**

**Claims priority, application Netherlands, Oct. 16, 1987, 8702473**

**Int. Cl.[5] C08K *5/04, 5/05, 5/34***

**U.S. Cl. 524—101** **11 Claims**

1. A polymer mixture comprising the following constituents:

A. a polyphenylene ether or a mixture of a polyphenylene ether and an, optionally rubber-modified, polystyrene,

B. a sterically hindered amine,

C. an epoxy compound, and

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D. a salt of a fatty acid, present at a level of 0.1–10 parts by weight per 100 parts by weight of constituent A.

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**5,045,579**
**SELECTIVE ABSORBENTS**

**Gerald Sugerman, Allendale, N.J., assignor to Liquid Waste Corporation, Las Cruces, N. Mex.**

**Filed May 18, 1990, Ser. No. 525,778**
**Int. Cl.[5] C08K** *5/51, 5/06*
**U.S. Cl. 524—128** **15 Claims**

1. An absorbent aggregate comprising particulate polynorbornene, hydrocarbon plasticizer, minor proportions of an organo-titanium phosphate or oligophosphate and optionally minor amounts of a hard resin particulate.

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**5,045,580**
**ANTISTATIC THERMOPLASTIC POLYESTER RESIN COMPOSITION**

**Hiroshi Kitamura, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan**

**Filed Nov. 30, 1989, Ser. No. 443,135**
**Claims priority, application Japan, Dec. 2, 1988, 63-305515**
**Int. Cl.[5] C08K** *5/524*
**U.S. Cl. 524—147** **6 Claims**

1. An antistatic thermoplastic polyester resin composition comprising:

(A) a thermoplastic polyester base resin which is normally susceptible to degradation by sulfonate-type antistatic agents;

(B) an antistatic effective amount of between about 0.02 to about 10 wt.%, based on the total weight of the composition, of a sulfonate-type anionic antistatic agent which is selected from (i) alkali metal or alkaline earth metal aliphatic sulfonates in which the alkyl group has 1 to 35 carbon atoms, (ii) alkali metal or alkaline earth metal salts of sulfonic acids comprising 1 to 3 aromatic nuclei substituted with an alkyl group having 1 to 35 carbon atoms or (iii) metal alkyl-aromatic sulfonates; and

(C) an amount effective to stabilize said thermoplastic polyester base resin against degradation by said sulfonate-type antistatic agent which is between about 0.005 to about 10 wt.%, based on the total weight of the composition, of one or more compounds selected from ($C_1$) organophosphorus compounds selected from triphenyl phosphite, tridecyl phosphite, diphenyl mono (2-ethylhexyl) phosphite, diphenyl isodecyl phosphite, phenyl diisodecyl phosphite and tris (nonylphenyl) phosphite and ($C_2$) organic chelating agents selected from ethylenediaminetetraacetic acid, cyclohexane- and diaminetetraacetic acid, ethylenediaminediacetic acid, nitrilotriacetic acid, hydroxyethylethylenediaminetriacetic acid, diethylenetriaminepentaacetic acid, triethylenetetramine-hexaccetic acid, hydroxyethyliminodiacetic acid, dihydroxyethylglycine, gluconic acid, tartaric acid and citric acid.

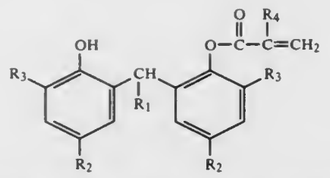
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**5,045,581**
**BUTADIENE POLYMER COMPOSITION CONTAINING PHENOLIC COMPOUND AND PHOSPHORUS-CONTAINING COMPOUND**

**Takeshi Takata, Nishinomiya; Shinichi Yachigo, Toyonaka; Manji Sasaki, Ibaraki; Kikumitsu Inoue, Nishinomiya, and Shinya Tanaka, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

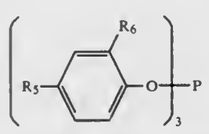
**Filed Dec. 21, 1988, Ser. No. 287,287**
**Claims priority, application Japan, Dec. 26, 1987, 62-331288**
**Int. Cl.[5] C08K** *5/524*
**U.S. Cl. 524—151** **16 Claims**

1. A butadiene polymer composition comprising a butadiene polymer, a phenolic compound and a phosphorus-containing compound; the phenolic compound being represented by the formula (I):



(I)

wherein $R_1$ is an alkyl having 1 to 4 carbon atoms, $R_2$ and $R_3$ are each independently a group represented by $—C(CH_3)_2—R'$ in which R' is an alkyl having 1 to 5 carbon atoms or phenyl, and $R_4$ is hydrogen or methyl, the phosphorus-containing compound being represented by the formula (II):



(II)

wherein $R_5$ and $R_6$ are each independently an alkyl having 1 to 9 carbon atoms, the weight ratio of said phenolic compound (I) and said phosphorus-containing compound (II) being

(I):(II) = 1:0.5–10,

and the total amount of said phenolic compound (I) and said phosphorus-containing compound (II) being 0.05 to 3 parts by weight per 100 parts by weight of the butadiene polymer.

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**5,045,582**
**FIRE-RETARDANT POLYCARBONATE RESIN COMPOSITION**

**Kouji Hashimoto, and Noboru Yamanishi, both of Matsuyama, Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan**

**Filed Mar. 26, 1990, Ser. No. 498,735**
**Claims priority, application Japan, Mar. 27, 1989, 64-71998**
**Int. Cl.[5] C08K** *3/30, 3/28, 5/521*
**U.S. Cl. 524—156** **4 Claims**

1. A fire-retardant polycarbonate resin composition comprising 100 parts by weight of a halogen atom-free conventional polycarbonate resin having a viscosity-average molecular weight of 10,000, to 30,000, a fire retardant in an amount necessary for imparting fire retardance, and 5 to 60 parts by weight of a halogen atom-free ultrahigh-molecular-weight polycarbonate resin having a viscosity-average molecular weight of 100,000 to 250,000, said composition showing a flow value of 0.01 to 0.3 $cm^3$/sec when measured at 280° C. under a load of 180 $kg/cm^2$ using a die having a hole diameter of 1 mm and a length of 10 mm and performance rated at class V-0 when conducting a burning test in accordance with a UL-94 test about a test piece having a thickness of 1 mm.

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**5,045,583**
**O-ALKENYL SUBSTITUTED HYDROXYLAMINE STABILIZERS**

**Paul A. Odorisio, Edgewater, N.J.; Joseph E Babiarz, Amawalk, N.Y.; Roger Meuwly, Givisiez, and Werner Rutsch, Fribourg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

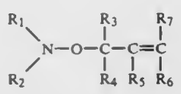
**Filed Apr. 24, 1990, Ser. No. 515,024**
**Int. Cl.[5] C07C** *239/20;* **C08K** *5/32*
**U.S. Cl. 524—236** **24 Claims**

1. A stabilized composition which comprises

(a) an organic material subject to oxidative, thermal or actinic-induced degradation, and



(b) an effective stabilizing amount of a compound of formula I



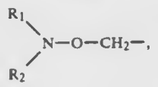
(I)

wherein

$R_1$ and $R_2$ are independently hydrogen, a straight or branched chain alkyl of 1 to 36 carbon atoms, alkyl of 1 to 18 carbon atoms terminated by a group $—OR_8$, $—NR_9R_{10}$, $—SR_{11}$, $—COOR_{12}$ or $—CONR_{13}R_{14}$ or interrupted by arylene of 6 to 10 carbon atoms, —O—, —S—, —SO—, $—SO_2—$, —COO—, —OCO—, $—CONR_{15}—$, $—NR_{15}CO—$ or $—NR_{16}—$ where $R_8$, $R_9$, $R_{10}$, $R_{11}$, $R_{12}$, $R_{13}$, $R_{14}$, $R_{15}$ and $R_{16}$ are independently hydrogen, alkyl of 1 to 18 carbon atoms or alkenyl of 3 to 6 carbon atoms; or $R_1$ and $R_2$ are independently cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, said phenylalkyl substituted on the phenyl ring by alkyl of 1 to 18 carbon atoms or by α-cumyl; aryl of 6 to 14 carbon atoms or said aryl substituted by one or two alkyl of 1 to 24 carbon atoms,

$R_3$ and $R_4$ are independently hydrogen, alkyl of 1 to 9 carbon atoms, said alkyl substituted by —OH or by acetoxy; alkenyl of 3 to 6 carbon atoms or aryl of 6 to 10 carbon atoms, and

$R_5$, $R_6$ and $R_7$ are independently hydrogen, alkyl of 1 to 9 carbon atoms, said alkyl substituted by —OH or by acetoxy; alkenyl of 3 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, or a group of formula II



(II)

or

$R_3$ and $R_4$, or $R_3$ and $R_5$, or $R_3$ and $R_7$, or $R_4$ and $R_5$, or $R_4$ and $R_7$, or $R_5$ and $R_6$, or $R_6$ and $R_7$ together are a straight or branched chain alkylene of 2 to 8 carbon atoms to form a cycloalkyl or cycloalkenyl ring with 5 or 6 ring atoms.

2. A composition according to claim 1 wherein component (a) is a synthetic polymer.

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**5,045,584**
**POLISH CONTAINING SILICONE ELASTOMER PARTICLES**

**Atushi Sasaki; Asao Harashima, and Keiji Yoshida, all of Chiba, Japan, assignors to Toray Silicone Company, Limited, Tokyo, Japan**

**Filed Nov. 3, 1989, Ser. No. 431,123**
**Claims priority, application Japan, Nov. 29, 1988, 63-301653**
**Int. Cl.[5] C08L** *91/06*
**U.S. Cl. 524—277** **9 Claims**

1. A polish comprising a film forming wax material and an organopolysiloxane elastomer, the elastomer being in the form of particles mixed with the film forming wax.

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**5,045,585**
**RAPID-CRYSTALLIZING POLYPHENYLENE SULPHIDE COMPOSITIONS**

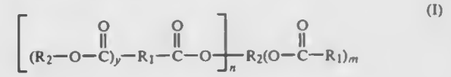
**Peter Bier, Pittsburgh, Pa.; Klaus Reinking, Wermelskirchen, Fed. Rep. of Germany; Ludwig Bottenbruch, and Erhard Tresper, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany**

**Continuation of Ser. No. 19,016, Feb. 26, 1987, Pat. No. 4,942,194. This application May 4, 1990, Ser. No. 519,175**
**Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607712**
**Int. Cl.[5] C08K** *5/10, 5/11*
**U.S. Cl. 524—281** **2 Claims**

1. An injection molded product prepared from a highly crystalline, rapid-crystallizing, thermoplastic mixture consisting of

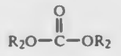
a) 70–99.5% by weight of a polyphenylene sulphide having a melt viscosity of at least 5 Pas (measured at 306° C. under a shearing stress of $10^3$ Pa) and

b) 0.5–30% by weight, relative to a) and b), of a monomeric carboxylic acid ester selected from



(I)

and



(II)

where

$R_1$ represents identical or different radicals of a linear or branched $C_1$–$C_{25}$-alkyl, cycloaliphatic, $C_{10}$–$C_{24}$-aromatic or $C_7$–$C_{24}$-araliphatic carboxylic acid,

$R_2$ represents identical or different radicals of a linear or branched alkyl, cycloaliphatic, araliphatic or aromatic alcohol having 1 to 20 carbon atoms,

m represents the number 0, 1, 2, 3 or 4,

n represents the number 1, when m represents the number 0, and represents the number 0, when m represents the number 1, 2, 3 or 4 and

y represents the number 1, 2 or 3,

by the process comprising first mixing the carboxylic acid ester with the polyphenylene sulphide, when the polyphenylene is in a melt, and homogenizing the mixture in the melt, then casting the homogenized mixture into a mould which has a temperature of no more than 120° C., the amount of carboxylic acid ester being chosen in such a way that the injection-moulded polyphenylene sulphide was at least 70% of the crystallinity which is obtained in injection moulding a moulding from unmodified polyphenylene sulphide at mould temperatures of at least 130° C.

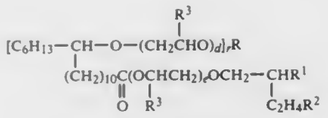
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**5,045,586**
**LUBRICANTS FOR THERMOPLASTIC RESINS**

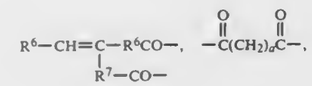
**Anthony J. O'Lenick, Jr., 743 Ridgeview Dr., Lilburn, Ga. 30247**

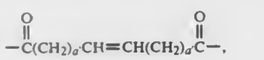
**Continuation-in-part of Ser. No. 228,214, Aug. 4, 1988, abandoned. This application May 1, 1989, Ser. No. 345,853**
**Int. Cl.[5] C08F** *5/08;* **C08K** *5/11*
**U.S. Cl. 524—291** **20 Claims**

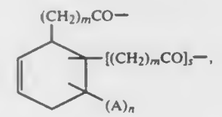
1. A branched polyester having the formula

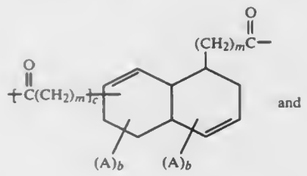


wherein $R^1$ and $R^2$ are each independently alkyl or alkenyl having from 5 to 25 carbon atoms; $R^3$ is hydrogen methyl or ethyl; d and e each have a value of from 0 to 150; r has a value of from 2 to 4 and, when r is 2, R is selected from the group of

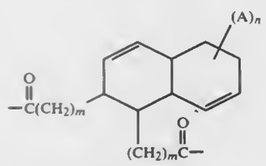




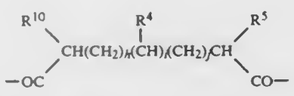




and



wherein A is alkyl, alkenyl or a mixture f; m has a value of from 1 to 10; n has a value of from 0 to 2; each of b and c has a value of 0 or 1; s has a value of from 1 to 3 and the sum of s+n is from 1 to 3; each $R^6$ is alkyl; $R^7$ is alkylene; a has a value of from 1 to 36 and a' has a value of from 0 to 36, and when r has a value greater than 2, R is



where each of h, i and j have a value of from 0 to 12, and $R^{10}$, $R^4$ and $R^5$ can be hydrogen, —COOH or —CO—, except that one of $R^{10}$, $R^4$ and $R^5$ is —CO— when r is 3 and two of $R^{10}$, $R^4$ and $R^5$ are —CO— when r is 4.

**15**. A polycarbonate resin composition containing an effective lubricating amount of the compound of claim **1**.

**5,045,587**
**METHOD OF MAINTAINING FLOWABILITY OF ACRYLIC POLYMER DISPERSION**
**Katsutoshi Tanaka, Chigasaki, Japan, assignor to Kyoritsu Yuki Co., Ltd., Tokyo, Japan**
**Filed Dec. 12, 1989, Ser. No. 449,023**
**Claims priority, application Japan, Dec. 12, 1988, 63-312003**
**Int. Cl.[5] C08K** *5/01, 5/06, 5/10, 2/16*
**U.S. Cl. 524—310** **6 Claims**

**1**. A method of maintaining the flowability of an acrylic polymer dispersion comprising:

1) polymerizing a monomer composition composed of:
   a. 85 to 100% by weight of at least one monomer selected from acrylic acid, acrylamide and acrylonitrile, wherein the proportion of the acrylic acid is from 0 to 100% by weight, that of acrylamide i from 0 to 90% by weight, and that of acrylonitrile is from 0 to 20% by weight, and
   b. 0 to 15% by weight of other monomer in an aqueous inorganic salt solution with agitation to prepare a dispersion wherein the formed polymer is precipitated as fine particles, and
2) adding to said dispersion 0.05 to 1% by weight of a nonionic surfactant and 2 to 10% by weight of an oleaginous liquid based upon the dispersion to maintain flowability of said dispersion.

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**5,045,588**
**HIGH POLYMER SUSPENSION**
**Alexander B. Arranaga, Sierra Madre, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**
**Continuation-in-part of Ser. No. 252,932, May 8, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 523,104**
**Int. Cl.[5] C08K** *3/34, 5/19, 9/04*
**U.S. Cl. 524—445** **19 Claims**

**1**. A non-reactive high polymer slurry suspension consisting of:
polyacrylamide;
a liquid carrier; and
an organic derivative of clay.

**5**. A non-reactive high polymer slurry suspension comprising:
a polymer;
a liquid carrier;
an organic derivative of clay; and
a fibrous silicate material.

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**5,045,589**
**POLYPROPYLENE COMPOSITION**
**Kouhei Ueno, Sakai, Japan, assignor to UBE Industries, Ltd., Japan**
**Filed Nov. 20, 1989, Ser. No. 438,878**
**Claims priority, application Japan, Nov. 21, 1988, 63-294432**
**Int. Cl.[5] C08K** *53/00*
**U.S. Cl. 524—505** **9 Claims**

**1**. A polypropylene composition comprising:
(A) 35–74% by weight of a crystalline ethylene-propylene block copolymer having an ethylene content of 5–20% by weight and a melt flow index of 11–90,
(B) 20–40% by weight of a thermoplastic elastomer,
(C) 1–15% by weight of an amorphous propylene-α-olefin random copolymer having a number-average molecular weight of 1,000–20,000 and a propylene content of 40–95% by weight, and
(D) 5–25% by weight of an inorganic filler.



**5,045,590**
**CONSTRUCTION MATERIAL CONTAINING BITUMINOUS SUBSTANCES**
**Masatoshi Motomura; Ichiro Muramatsu, botb of Icbihara; Noboru Okoshi, Sodegaura; Yoshitami Araki, Kisai; Takahiko Ito, Chiba, and Toru Sato, Sagamihara, all of Japan, assignors to Dainippon Ink and Chemicals, Tokyo, Japan**
**Filed Jul. 19, 1989, Ser. No. 381,926**
**Claims priority, application Japan, Jul. 20, 1988, 63-180695**
**Int. Cl.[5] C08G** *18/12*
**U.S. Cl. 524—705** **14 Claims**

**1**. A construction material comprising
(A) a polyol component, said polyol component consisting essentially of
   (a-1) a hydroxy-polyoxyalkylene ether of bisphenol A and/or bisphenol F, and
   (a-2) an aliphatic polyol,
(B) a polyisocyanate component, and
(C) a bitumen.

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**5,045,591**
**INTERNAL MOLD RELEASE COMPOSITIONS**
**Louis W. Meyer, Livingston, Tex.; J. Alan Vanderhider, Fruthwilen, Switzerland, and Robert Carswell, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**
**Division of Ser. No. 570,141, Jan. 12, 1984, Pat. No. 4,876,019, which is a continuation-in-part of Ser. No. 466,826, Feb. 16, 1983, abandoned. This application Oct. 23, 1989, Ser. No. 425,767**
**Int. Cl.[5] C08G** *18/30*
**U.S. Cl. 524—731** **8 Claims**

**1**. A process for preparing polymeric products which process comprises mixing and injecting into a suitable mold an "A-side" component comprising a polyisocyanate and/or polyisothiocyanate and a "B-side" component comprising at least one material containing at least one primary and/or secondary amine group per molecule or a mixture of such materials, and a metal salt of a carboxy functional siloxane consisting essentially of from 0.5 to 20 mole percent of $R_aR'_bSiO_{4-a-b/2}$ units and from 80 to 99.5 mole percent of $R''_cSiO_{4-c/2}$ units wherein R is a carboxy functional radical, a has an average value from 1 to 3, R' is a hydrocarbon or substituted hydrocarbon radical, b has an average value from 0 to 2, the sum of a+b is from 1 to 3, R'' is a hydrocarbon or substituted hydrocarbon radical, and c has an average value from 0 to 3, wherein said metal is selected from Groups II-A or II-B of the Periodic Table of the Elements, aluminum, lithium, copper, iron cobalt or nickel.

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**5,045,592**
**METASTABLE SILANE HYDROLYZATES**
**Keith D. Weiss, and Cecil L. Frye, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**
**Division of Ser. No. 386,450, Jul. 28, 1989, Pat. No. 4,999,397. This application Oct. 1, 1990, Ser. No. 590,710**
**Int. Cl.[5] C08K** *5/15*
**U.S. Cl. 524—755** **5 Claims**

**1**. A stable silane hydrolyzate solution comprising:
a non-sulfur containing polar organic solvent containing therein a composition of the formula $(RSi(OH)_xO_{3-x/2})_n$ where R is hydrogen or a methyl, provided R is at least 50% hydrogen, n is an integer greater than about 8, and x is a number between 0 and 2, and where the silanol content in said composition is from about 1–10% by weight.

**5,045,593**
**ORGANOPHILIC MODIFIED POLYMERS**
**Jack C. Cowan, Lafayette, La.; Roy F. House, Houston, Tex., and Victor M. Granquist, Beaufort, S.C., assignors to Venture Chemicals, Inc., Lafayette, La.**
**Division of Ser. No. 360,020, Jun. 1, 1988, Pat. No. 4,956,104, which is a division of Ser. No. 161,478, Feb. 29, 1988, Pat. No. 4,863,980, which is a continuation-in-part of Ser. No. 887,360, Jul. 21, 1986, Pat. No. 4,737,295. This application Jul. 2, 1990, Ser. No. 546,904**
**Int. Cl.[5] C08G** *63/48, 63/91;* **C08B** *37/04*
**U.S. Cl. 525—54.3** **14 Claims**

**1**. An organophilic polymer comprising an adduct of (1) a water soluble anionic or cationic synthetic polymer wherein said anionic synthetic polymer is prepared by reacting under polymerizing conditions one or more ethylenically unsaturated acids with one or more ethylenically unsaturated non-ionic monomers, and wherein said cationic synthetic polymer is prepared by reacting under polymerizing conditions one or more ethylenically unsaturated amino or ammonium monomers with one or more of said non-ionic ethylenically unsaturated monomers, and (2) one or more phosphatides having the empirical formula

$$R_1—CO—O—CH_2—CH(R_2)—CH_2—Q$$

where: $R_1$ is an aliphatic group containing from 8 to 29 carbon atoms; $R_2$ is selected from the group consisting of H, OH, $R_1COO$, and $OP(O)(O^-zM^{a+})OZ$; Q is selected from the group consisting of $R_1COO$ and $OP(O)(O^-zM^{a+})OZ$; Z is selected from the group consisting of $xM^{a+}$, $C_6H_6(OH_5)$ and $CH_2—CH(Y)—N(R_3)(R_4)(R_5)_y(A^{b-})_v$; Y is selected from the group consisting of H and $COO(xM^{a+})$; $R_3$, $R_4$, and $R_5$ are independently selected from the group consisting of H, aliphatic groups containing from 1 to 30 carbon atoms, and $R_6CO$; $R_6$ is an aliphatic group containing from 1 to 29 carbon atoms; M is a cation selected from the group consisting of H, an alkali metal, an alkaline earth metal, ammonium, and mixtures thereof; A is an anion of valence b; y=0 or 1; w, x, and z=0 or 1/a where a is the valence of M; v=0 or a/b; and where Q is $R_1COO$ only when $R_2$ is $OP(O)(O^-zM^{a+})OZ$.

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**5,045,594**
**CONTAINER CLOSURES AND SEALED CONTAINERS**
**David N. Samuel, Great Gransden, Nr. Sandy, and Richard S. Williams, Impingtnn, both of England, assignors to W. R. Grace & Co.-Conn., New York, N.Y.**
**Filed Jun. 23, 1989, Ser. No. 370,548**
**Claims priority, application United Kingdom, Jun. 29, 1988, 8815486; Aug. 26, 1988, 8820282**
**Int. Cl.[5] C08L** *23/12, 29/04;* **B65D** *41/00*
**U.S. Cl. 525—57** **14 Claims**

**1**. A plastic container closure consisting of a polymer matrix formed of polypropylene and an ethylene vinyl alcohol polymer present in an amount and mixed in such fashion so as to reduce oxygen permeability of the matrix by at least 5%.

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**5,045,595**
**POLYORGANOSILOXANE/POLYVINYL-BASED GRAFT POLYMERS, PROCESS AND THERMOPLASTIC COMPOSITIONS CONTAINING THE SAME**
**I-Chung W. Wang, Williamstown, Mass., assignor to General Electric Company, Parkersburg, W. Va.**
**Filed Nov. 14, 1988, Ser. No. 271,250**
**The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.**
**Int. Cl.[5] C08L** *51/08*
**U.S. Cl. 525—66** **64 Claims**

**1**. A multi-stage polyorganosiloxane/polyvinyl-based graft polymer composition comprising:
(a) as a first stage, a substrate selected from
   (i) a polymeric co-homopolymerized substrate comprised

of, in combination, an organosiloxane polymer and at least one vinyl-based polymer;
(ii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which are derived from a cross-linking agent or agents;
(iii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which serve as a graft-linking agent or agents;
(iv) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, units which are derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; or
(v) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and a mixture of any of units which are derived from a cross-linking agent or agents, units which serve as a graft-linking agent or agents, or units derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; and
(b) at least one subsequent stage or stages graft polymerized in the presence of any previous stages and which is comprised of a vinyl-based polymer or a cross-linked vinyl-based polymer.

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**5,045,596**

## IMPACT RESISTANT POLYCARBONATE BLEND

**Michael K. Laughner, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 256,450, Oct. 12, 1988, Pat. No. 4,904,729. This application Jan. 9, 1990, Ser. No. 462,189**
**The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.**
**Int. Cl.[5] C08L** *69/00, 67/02*
**U.S. Cl. 525—67** **20 Claims**

1. A thermoplastic molding composition, comprising:
A. an aromatic polycarbonate:
B. an aromatic polyester:
C. a polyalkyleneoxide rubber having a glass transition temperature (Tg) lower than 0° C.; and optionally
D. a grafted copolymer or mixture of grafted copolymers.

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**5,045,597**

## α-OLEFIN BLOCK COPOLYMERS AND PROCESSES FOR PREPARING THE SAME

**Tadashi Asanuma; Kazuhiko Yamamoto; Junko Ohnaka, all of Osaka, and Yoshiko Tokura, Wakayama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Division of Ser. No. 271,864, Nov. 16, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 489,783**
**Claims priority, application Japan, Nov. 17, 1987, 62-288304; Dec. 9, 1987, 62-309427; Feb. 8, 1988, 63-193200; May 20, 1988, 63-123483; May 24, 1988, 63-124957; May 26, 1988, 63-126913; Jul. 11, 1988, 63-171020**
**Int. Cl.[5] C08L** *53/00, 23/00;* **C08F** *293/00, 297/08*
**U.S. Cl. 525—72** **57 Claims**

1. A process for preparing a rigid crystalline α-olefin block copolymer comprising:
(a) polymerizing an alkenylsilane in the presence of a stereoregular catalyst; and
(b) polymerizing an α-olefin compound in the presence of a stereoregular catalyst wherein the the stereoregular catalyst of (a) and (b) comprises a transition metal compound and an organoaluminum compound.

**5,045,598**

## SLIT FILM YARN BASED ON PROPYLENE POLYMER AND ITS USE FOR THE MANUFACTURE OF SYNTHETIC LAWN

**Jean Duez, and Daniel Van Houcke, both of Brussels, Belgium, assignors to Solvay & Cie (Soci/ té Anonyme), Brussels, Belgium**

**Filed Sep. 14, 1989, Ser. No. 407,450**
**Claims priority, application Belgium, Sep. 16, 1988, 08801069**
**Int. Cl.[5] C08L** *53/00;* **C08F** *297/08*
**U.S. Cl. 525—88** **10 Claims**

1. A slit film yarn resistant to postfibrillation, comprising: a block copolymer of propylene and ethylene made up of chain segments consisting of propylene homopolymer and of chain segments consisting of random copolymer of propylene and ethylene.

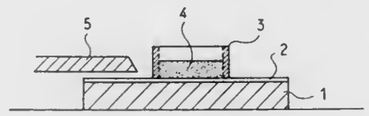
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**5,045,599**

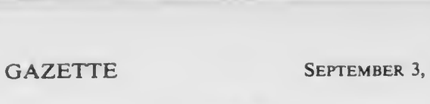
## ANTI-ICING COATING COMPOSITIONS

**Heihachi Murase, Kanagawa, Japan, assignor to Kansai Paint Company Limited, Kyogo, Japan**

**Filed Apr. 18, 1989, Ser. No. 339,831**
**Claims priority, application Japan, Apr. 27, 1988, 63-106450**
**Int. Cl.[5] C09L** *83/10*
**U.S. Cl. 525—102** **12 Claims**




1. An anti-icing coating composition comprising as vehicle components:
(a) a copolymer having hydroxyl, or hydroxyl and a reactive group other than hydroxyl comprised of units from a fluoroolefin monomer and a vinyl monomer, the vinyl monomer having hydroxyl,
(b) a silicone compound represented by the formula




wherein n is an integer of 6 to 300, k is an integer of 0 to 6, h is 0 or 1, m is an integer of 0 to 6, Y is (a) hydroxyl, or (b) a group reactive with the hydroxyl or the reactive group in the copolymer (a) and is selected from the group consisting of carboxyl, epoxy and a monovalent or divalent group containing one or two free isocyanate groups, and j is 1 when Y is a hydroxyl or other monovalent group and j is 2 when Y is a divalent group and
(c) a polyisocyanate compound different from component (b).

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**5,045,600**

## ABRASION-RESISTANT FLUOROCARBON POLYMER COMPOSITES

**James L. Giatras, Port Huron, Mich.; Kevin P. Kray, Phoenixville, and Charles P. Marino, Philadelphia, both of Pa., assignors to Markel Corporation, Norristown, Pa.**

**Filed Oct. 27, 1988, Ser. No. 263,182**
**Int. Cl.[5] C08L** *79/08;* **F16C** *1/26*
**U.S. Cl. 525—180** **20 Claims**

1. An abrasion resistant paste extruded tubular product having high frictional efficiency in the dry state, said tubular product comprising a major proportion by weight of fluorocarbon polymer resin and from about 5% by weight to about 15% by weight of polyamide-imide resin, said product being made according to a process comprising mixing fluorocarbon polymer resin particles and polyamide-imide resin particles under conditions sufficient to produce a uniform, homogenous blend of said resin particles; preforming said blend and paste extruding said preform.



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**5,045,601**

## PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS SUITABLE FOR MEDICAL USES

**Christopher C. Capelli, Kenosha, and Kevin Zamzow, Madison, both of Wis., assignors to Biointerface Technologies, Inc., Madison, Wis.**

**Filed Jun. 13, 1989, Ser. No. 365,313**
**Int. Cl.[5] C08L** *75/00*
**U.S. Cl. 525—327.1** **53 Claims**

1. An adhesive composition comprising a polymer adhesive that is soluble or dispersible in water and is low-temperature curable to form a solid which is single-phase at ambient temperature, pressure-sensitive, dermatologically acceptable, moisture vapor-permeable, and resistant to dissolution when exposed to water.

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**5,045,602**

## MOISTURE-HARDENING BINDER COMPOSITIONS CONTAINING COPOLYMERS AND BLOCKED POLYAMINES

**Christian Wamprecht, Neuss; Harald Blum, Wachtendonk, and Josef Pedain, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Apr. 20, 1990, Ser. No. 511,671**
**Claims priority, application Fed. Rep. of Germany, Apr. 26, 1989, 3913679**
**The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.**
**Int. Cl.[5] C08F** *24/00, 220/08, 222/06*
**U.S. Cl. 525—327.2** **11 Claims**

1. A moisture-hardening binder composition comprising
A) 30 to 99 parts by weight of at least one copolymer prepared from olefinically unsaturated compounds, having a weight average molecular weight of about 1,500 to 75,000 and containing both carbonate groups and intramolecular carboxylic anhydride groups, said copolymer having an anhydride equivalent weight of 327 to 9,800 and a carbonate equivalent weight of 465 to 18,600 and
B) 1 to 70 parts by weight of at least one organic polyamine containing blocked amino groups,
said binder composition containing a total of 0.2 to 8 anhydride and carbonate groups for each blocked amino group.

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**5,045,603**

## CHLORINATED EPDM WITH SUPERIOR STABILITY

**Stephen C. Davis, Bright's Grove; Janet B. Fulton, Sarnia, and Peter P. M. Hoang, Clearwater, all of Canada, assignors to Polysar Limited, Sarnia, Canada**

**Division of Ser. No. 430,010, Nov. 1, 1989, Pat. No. 4,959,420. This application Jul. 19, 1990, Ser. No. 554,435**
**The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.**
**Int. Cl.[5] C08F** *8/20, 8/22*
**U.S. Cl. 525—356** **11 Claims**

1. A process for preparing a chlorinated ethylene-alpha olefin-nonconjugated diolefin terpolymer characterized by a superior stability on storage or exposure to elevated temperatures and containing from about 0.5 to about 14 weight percent chlorine substituted in the allylic position wherein the base ethylene-alpha olefin-nonconjugated diolefin terpolymer comprises:
(i) about 40 to 80 mol percent ethylene,
(ii) about 20 to 60 mol percent of a $C_3$ to $C_8$ alpha olefin, and
(iii) about 0.5 to 10 mol percent of a $C_7$ to $C_{16}$ nonconjugated diolefin wherein one olefinic bond is monosubstituted and terminal and the other olefinic bond is trisubstituted, which comprises the steps of:
(A) forming a solution of said base ethylene-alpha olefin-nonconjugated diolefin terpolymer in an inert organic solvent wherein there is dispersed from about 0 to 10 percent by volume per volume of inert organic solvent of water,
(B) adding to said terpolymer solution molecular chlorine in a quantity sufficient to achieve the desired level of chlorination,
(C) subjecting the resulting solution to a temperature of from about 0° C. to 50° C. in the absence or near absence of light, whereby said ethylene-alpha olefin-nonconjugated diolefin terpolymer becomes chlorinated, adding
(D) an alkaline solution to the solution of the chlorinated ethylene-alpha olefin-nonconjugated diolefin terpolymer sufficient to neutralize said solution, and
(E) recovering from the solution the chlorinated ethylene-alpha olefin-nonconjugated diolefin terpolymer.

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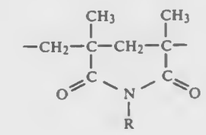
**5,045,604**

## SELECTIVE FORMATION OF METHACRYLIMIDE CONTAINING POLYMERS

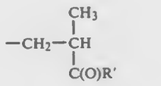
**Brian R. Maurer, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 447,770, Dec. 8, 1989, abandoned. This application Nov. 21, 1990, Ser. No. 616,717**
**Int. Cl.[5] C08F** *8/32*
**U.S. Cl. 525—378** **10 Claims**

1. A process for preparing a resin comprising methacrylimide moieties corresponding to the formula:




wherein R independently each occurrence is hydrogen or a $C_{1\text{-}20}$ alkyl, cycloalkyl or aryl group, and methacrylate ester moieties corresponding to the formula:




wherein R' is $C_{2\text{-}20}$ alkyl or cycloalkyl group, and substantially devoid of methyl methacrylate functionality; the steps of the process comprising a) contacting a prepolymer comprising the methacrylate esters of formula (II) and methyl methacrylate in a molar ratio from 100:1 to 1:100 with an amine under amidization conditions to selectively convert substantially all of the

methyl methacrylate functionality to the corresponding methacrylamide; b) heating the resulting product under imidization conditions to form the methacrylimide moieties of formula (I); and c) recovering the resulting product having less than 1 weight percent residual methyl methacrylate.

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**5,045,605**

## PROCESS FOR THE STABILIZATION OF FLUOROPOLYMERS

**Marlin D. Buckmaster, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

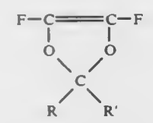
**PCT No. PCT/US89/02203, § 371 Date Jun. 7, 1990, § 102(e) Date Jun. 7, 1990, PCT Pub. No. WO89/11495, PCT Pub. Date Nov. 30, 1989**

**Continuation-in-part of Ser. No. 199,443, May 27, 1988, Pat. No. 4,946,902. No. WO88/09873, PCT PMay 25, 1989, Ser. No. 543,781**

**Int. Cl.[5] C08F *8/32***

**U.S. Cl. 525—378** **15 Claims**

1. Process for improving the thermal and hydrolytic stability of a copolymer of at least two comonomers selected from the group consisting of tetrafluoroethylene; chlorotrifluoroethylene; $R_fCF{=}CF_2$ wherein $R_f$ is a primary fluoroalkyl group of 1-5 carbon atoms; $R_gOCF{=}CF_2$ wherein $R_g$ is $R_f$ or a primary fluoroalkyl group containing ether oxygen and 4-12 carbon atoms; and a fluorodioxole of the formula



wherein each of R and R', independently, is fluorine or trifluoromethyl; said copolymer having —COOH and/or —COF groups on the polymer chains, said process comprising contacting said copolymer at a temperature of about 160°-400° C. with at least a catalytic amount of an anhydrous or aqueous secondary or tertiary amine having a boiling point at atmospheric pressure of no greater than 200° C., for a time sufficient to convert —COOH and/or —COF groups into stable $-CF_2H$ groups, removing volatiles from the reaction product, and recovering copolymer having a reduced number of —COOH and/or —COF groups.

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**5,045,606**

Patent Not Issued For This Number

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**5,045,607**

## ACETAL POLYMER BLENDS

**Kurt F. Wissbrun, Short Hills; Hongkyu Kim, Basking Ridge; George L. Collins, Maplewood, and Diane Terrone, Toms River, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.**

**Continuation-in-part of Ser. No. 243,381, Sep. 12, 1988, Pat. No. 4,898,925. This application Apr. 5, 1989, Ser. No. 333,511**

**The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.**

**Int. Cl.[5] C08L *61/02*; C08F *283/06*; C08G *65/32***

**U.S. Cl. 525—398** **11 Claims**

1. A blend of a normally crystalline acetal polymer and a normally non-crystalline elastomeric copolymer of about 15 to 45 mol % of trioxane, about 55 to 85 mol % of 1,3-dioxolane based on the total of trioxane and 1,3-dioxolane, and about 0.005 to 0.15 wt. % of 1,4-butanediol diglycidyl-ether or butadiene diepoxide as a bifunctional monomer, based on the total weight of copolymer.

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**5,045,608**

## POLYIMIDE-POLY(PHENYLQUINOXALINE) BLOCK COPOLYMERS

**James L. Hedrick, Jr., Santa Clara; Donald C. Hofer, San Martin; Jeffrey W. Labadie, Campbell; Sally A. Swanson, and Willi Volksen, both of San Jose, all of Calif., assignors to IBM Corporation, Armonk, N.Y.**

**Filed Sep. 27, 1989, Ser. No. 413,361**

**Int. Cl.[5] C08L *77/06***

**U.S. Cl. 525—436** **4 Claims**

1. A block copolymer of polyimide and poly (phenylquinoxaline).

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**5,045,609**

## TOUGHENED, HIGH TEMPERATURE RESIN MATRIX SYSTEM

**Frank W. Lee, Danville; Kenneth S. Baron, San Ramon, and Maureen Boyle, Oakland, all of Calif., assignors to Hexcel Corporation, Dublin, Calif.**

**Filed Jul. 7, 1989, Ser. No. 377,166**

**Int. Cl.[5] C08L *75/04***

**U.S. Cl. 525—438** **16 Claims**

1. A matrix resin system suitable for incorporation in a matrix resin/oriented fiber composite material, said resin system comprising:

A) a dicyanate ester, present in a major amount, and

B) an isocyanate-extended epoxy, said extended epoxy being obtained by recovering the reaction product of a mixture of an isocyanate and a polyfunctional epoxy resin, mixed at a temperature of 150°-180° C., for a period of time of 2-26 hours.



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**5,045,610**

## BLEND OF COPOLYESTERCARBONATE POLYMER DERIVED FROM DIARYL DICARBOXYLIC ACID

**Stephen E. Bales; Kenneth A. Burdett, and Guo-Shuh J. Lee, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Aug. 31, 1989, Ser. No. 401,213**

**Int. Cl.[5] C08L *67/02, 69/00*; C08G *63/64***

**U.S. Cl. 525—439** **15 Claims**

1. A thermoplastic polymer blend comprising a thermoplastic polymer and a copolyestercarbonate polymer characterized in that the copolyestercarbonate polymer is prepared by contacting a dihydroxy compound with a dicarboxylic acid compound and a carbonate precursor wherein the (a) at least 50 mole percent of the dicarboxylic acid compound employed consists of a diaryl dicarboxylic acid compound containing two or more aromatic rings which are connected together by a positionally and angularly well defined rigid internal linking group, and (b) the mole ratio of dicarboxylic acid compounds to carbonate precursor is such that the polymer has molar ratio of diester:carbonate groups from about 0.02:1 to about 20:1 and in that the polymer blend contains at least 0.5 weight percent of the said copolyestercarbonate by total weight of thermoplastic polymer and copolyestercarbonate polymer present.

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**5,045,611**

## PROCESSES FOR THE PREPARATION OF POLYMERS

**Daniel M. McNeil, Georgetown, Canada, assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 25, 1990, Ser. No. 544,291**

**Int. Cl.[5] C08F *2/18***

**U.S. Cl. 526—81** **26 Claims**

1. A process for the preparation of polymers which comprises forming an aqueous phase comprised of water and a surfactant; adding to the aqueous phase monomers; subsequently initiating polymerization of the monomers, subject to the provision that no suspension stabilizing component is present during initiation of polymerization; thereafter adding a suspension stabilizing component; and completing the polymerization.

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**5,045,612**

## CATALYST AND PROCESS FOR POLYMERIZING OLEFINS

**Joseph G. Schell, Jr.; Larry A. Meiske, and Gary R. Marchand, all of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 18, 1990, Ser. No. 510,492**

**Int. Cl.[5] C08F *4/646***

**U.S. Cl. 526—124** **14 Claims**

1. A process for polymerizing one or more α-olefins or one or more α-olefins and one or more polymerizable ethylenically unsaturated monomers which process comprises conducting the polymerization under solution polymerization conditions in the presence of the solid catalytic product resulting from removing the liquid components from the product resulting from admixing in an inert diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium compound;

(B) at least one organic hydroxyl-containing compound;

(C) at least one reducing halide (X) source;

(D) at least one transition metal (Tm) alkoxide; and wherein

(a) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C); and

(b) the components are employed in quantities so as to provide the following atomic ratios Mg:Tm of from about 0.1:1 to about 100:1; and X:Mg of from about 3:1 to about 20:1; and

(c) the organic hydroxyl-containing compound is employed in a quantity such that for every metal atom present in component (A) there remains on the average not more than about 0.9 hydrocarbon group attached to such metal atoms.

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**5,045,613**

## ACRYLIC RESIN COMPOSITION

**Bill R. Edwards 22108 Rickasia, Edmond, Ok. 73034**

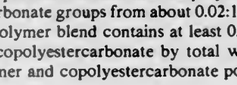
**Continuation-in-part of Ser. No. 528,728, May 23, 1990, which is a division of Ser. No. 386,501, Jul. 25, 1989, Pat. No. 4,945,122. This application Aug. 15, 1990, Ser. No. 568,194**

**Int. Cl.[5] C08F *4/00***

**U.S. Cl. 526—209** **12 Claims**

1. A method for producing an article of an acrylic resin such that the article is substantially bubble and void free, while exhibiting improved clarity, the method comprising:

admixing from about 300 to about 1000 parts by volume of an acrylic monomer represented by the formula



wherein R is an alkyl moiety containing 1 to about 18 carbon atoms with effective minor amounts of a nonperoxide oxygen donator selected from the group of 2,2-bis(allyloxymethyl)-butan-1-ol and diallylphthalate, a mercaptan and a crosslinking agent compatible with the acrylic monomer to form an intimate blend containing from about 0.1 to about 1 part by volume of the nonperoxide oxygen donator, from about 0.5 to about 5 parts by volume of the mercaptan and from about 0.3 to about 40 parts by volume of the crosslinking agent;

heating the blend at a temperature of from about 80 degrees Centigrade to about 110 degrees Centigrade for a period of time effective to provide the blend with a predetermined viscosity;

incorporating into the polymerization syrup a catalytic amount of a polymerization catalyst to affect polymerization of the syrup;

introducing the catalyst activated blend into a mold;

subjecting the catalyst activated blend to radiation generated by one of a visible light source or an ultraviolet light source mold for a period of time to affect curing; and

removing a resulting article from the mold.

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**5,045,614**

## PROCESS FOR POLYMERIZING VINYL MONOMERS USING AMINE CONTAINING COMPOUNDS WHICH SIMULTANEOUSLY ACT AS INITIATORS AND CROSSLINKING AGENTS AS PART OF A REDOX INITIATOR SYSTEM

**Fredric L. Buchholz, and James W. Ringer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 7, 1989, Ser. No. 334,824**

**Int. Cl.[5] C08F *4/00***

**U.S. Cl. 526—219.5** **10 Claims**

1. An improved process for producing a water-swellable polymer having excellent free swell capacity and relatively low extractable polymer content, comprising:

polymerizing an aqueous solution of an α,β-ethylenically unsaturated monomer with an amine having a functionally effective amount of α-hydrogens that act as an initiator site and as a crosslinking site for development of a polymer chain and a persulfate initiator component, wherein the amine and persulfate are present in an amount of about 0.05 to about 2.0 molar ratio of amine to persulfate.



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**5,045,615**

## FLUORINATED POLYMERS DERIVED FROM ACRYLAMIDE-FUNCTIONAL MONOMERS

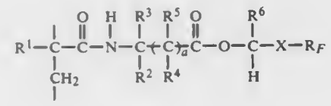
**Steven M. Heilmann, Afton; Larry R. Krepski, White Bear Lake; Dean M. Moren, North St. Paul; Jerald K. Rasmussen, Stillwater, and Howell K. Smith, II, Grant Township, Washington County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 267,186, Nov. 4, 1988, Pat. No. 4,931,582. This application Mar. 22, 1990, Ser. No. 498,044**

**Int. Cl.[5] C08F** *120/24*

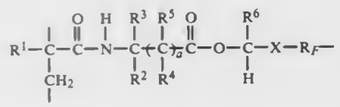
**U.S. Cl. 526—245** **7 Claims**

1. A polymer comprising units having at least one of the formulae

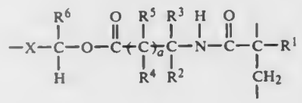


VI

and



VII



where

$R^1$ and $R^6$ are independently hydrogen or methyl;

$R^2$ and $R^3$ independently are alkyl, cycloalkyl, or aryl group, or $R^2$ and $R^3$ taken together with the carbon to which they are form a carbocylic ring containing 4 to 12 ring atoms;

$R^4$ and $R^5$ are independently hydrogen or lower alkyl; a is 0 or 1; [b is 1 or 2];

X is a single bond, $CH_2$, $CH_2OCH_2$, or $CH_2CH_2OCH_2$; and

$R_F$ is an alkyl, cycloalkyl, or aryl group in Formula VI and alkylene in Formula VII, wherein at least 50 percent of the hydrogen atoms have been replaced by fluorine, and the open dashes (—) mean attachment to a polymer main-chain.

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**5,045,616**

## DISPERSON POLYMERS WHICH CONTAIN UREA GROUPS AND ARE BASED ON ETHYLENICALLY UNSATURATED MONOMERS, PROCESS FOR THEIR PREPARATION AND THEIR USE

**Karl J. Rauterkus, Kelkheim; Hans-Ullrich Huth, Egelsbach, and Karl-Hans Angelmayer, Eltville, all of Fed. Rep. of Germany, assignors tn Hoechst AG, Fed. Rep. of Germany**

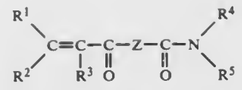
**Filed May 19, 1989, Ser. No. 354,110**

**Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817469**

**Int. Cl.[5] C08F** *26/06*

**U.S. Cl. 526—258** **9 Claims**

1. A polymer based on ethylenically unsaturated monomers, which contains monomer units of urea derivatives with $\alpha,\beta$-ethylenically unsaturated carboxyl or carboxamide radicals and has been produced by solution, emulsion, suspension or bead polymerization or copolymerization, or a solution or aqueous dispersion of this polymer, wherein the polymer contains at least 1% by weight of monomer units of ethylenically unsaturated urea derivatives of the formula

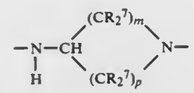


(I)

the radicals $R^1$ to $R^5$ and Z have the following meaning in formula I:

$R^1$, $R^2$, $R^3$, which may be identical or different, =H or $CH_3$,

Z=



$R^7$ =H or $CH_3$and m, p=in each case at least the number 1, $R^4$, $R^5$, which may be identical or different, =H, an optionally substituted ($C_1$–$C_{30}$)-alkyl, an optionally substituted —($C_kH_{2k}$)—OH with k=1 to 8, an optionally substituted ($C_6$–$C_{10}$)-aryl, an optionally substituted ($C_7$–$C_{30}$)-aralkyl, an optionally substituted ($C_5$–$C_8$)-cycloalkyl, an optionally substituted 5- to 7-membered heterocycle or an optionally substituted heterocycle formed from $R^4$ and $R^5$ jointly with the nitrogen atom.

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**5,045,617**

## ZWITTERION TERPOLYMERS OF A VINYL LACTAM, AN AMINO ALKYL ACRYLAMIDE OR ACRYLATE, AND A POLYMERIZABLE CARBOXYLIC ACID

**Jenn S. Shih, Paramus, and Terry E. Smith, Morristown, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 236,395, Aug. 25, 1988, Pat. No. 4,923,694. This application Oct. 16, 1989, Ser. No. 422,318**

**The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.**

**Int. Cl.[5] C08F** *26/10, 226/10, 220/10;* **C08L** *39/00*

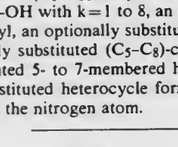
**U.S. Cl. 526—264** **8 Claims**

1. A zwitterion terpolymer formed in aqueous solution from the terpolymer consisting essentially of the reaction product of:

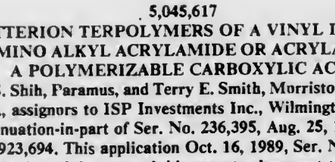
(a) a vinyl lactam;

(b) an amino alkyl acrylamide or acrylate, and

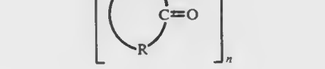
(c) a polymerizable carboxylic acid represented by the formula:



(a)



(b)



(c)

where R is alkylene having from 3 to 8 carbon atoms; $R_1$ and $R_2$ are each independently hydrogen or methyl; $R_3$ and $R_4$ are each alkylene having from 1 to 18 carbon atoms optionally substituted with alkyl; the sum of r and t is one or two; $R_5$ and $R_6$ are each independently lower alkyl; Z is oxygen or nitrogen; if oxygen, $R_2$ is absent; M is a polymerizable carboxylic acid; n has a value of from 1 to 99 mole %; m has a value of from 1 to 99 mole %; p has a value of from 1 to 99 mole %; the sum of m+n+p is 100 mole %; preferably n is 50 to 90 mole %; m is 7 to 25 mole % and p 3 to 25 mole % by internal transfer of the proton of the carboxylic acid group to the amino group of the acrylamide or acrylate group.



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**5,045,618**

## FLAME-RETARDANT COMPOSITIONS

**Nurit Kornberg, Lehavim; Michael R. Peled, Beer-Sheva, and Jacob Scheinert, Omer, all of Israel, assignors to Bromine Compounds Ltd., Beer Sheva, Israel**

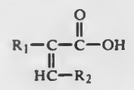
**Filed Sep. 27, 1990, Ser. No. 589,200**

**Claims priority, application Israel, Sep. 28, 1989, 91820; Aug. 14, 1990, 95382**

**Int. Cl.[5] C08F** *18/20*

**U.S. Cl. 526—292.5** **24 Claims**

1. A flame-retardant material comprising a copolymer of pentabromobenzyl-acrylate with a metal salt of a compound of Formula I:



(I)

and wherein $R_1$ is H or lower alkyl, and $R_2$ is selected from H, lower alkyl and



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**5,045,619**

## N-ALKENYLCARBAMATE MACROMER

**Nobuyuki Kuroda; Hiroshi Kobayashi, both of Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Minato, Japan**

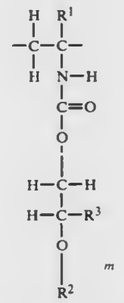
**Continuation-in-part of Ser. No. 171,378, Mar. 21, 1988, abandoned. This application Apr. 10, 1989, Ser. No. 336,588**

**Claims priority, application Japan, Mar. 27, 1987, 62-71719**

**Int. Cl.[5] C08F** *26/02*

**U.S. Cl. 526—301** **6 Claims**

1. A comb shaped uncross-linked polymer comprising the repetitive unit



where $R^1$ is H or an alkyl group of 1 to 5 carbon atoms, $R^2$ is an alkyl group of 1 to 10 carbon atoms, $R^3$ is H or an alkyl group of 1 to 3 atoms and m is a whole number ranging from 3 to 30.

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**5,045,620**

## ORIENTED POLYETHYLENE FILM AND PRODUCTION THEREOF

**Yasushi Itaba; Yutaka Yoshifuji; Takayoshi Kondo, and Ichiro Sakamoto, all of Kanagawa, Japan, assignors to Tonen Sekiyukagaku K.K., Tokyo, Japan**

**Filed Sep. 7, 1989, Ser. No. 404,100**

**Claims priority, application Japan, Sep. 8, 1988, 63-223640**

**Int. Cl.[5] C08F** *10/02;* **B29C** *35/08*

**U.S. Cl. 526—348.1** **3 Claims**

1. An oriented and differentially crosslinked film of a material selected from the group consisting of polyethylene and copolymers of ethylene having a density of at least 0.935 g/cm$^3$ and a melt index of at least 0.05 g/10 minutes, wherein the degree of crosslinking inwardly decreases across the thickness of said film, said film further having a longitudinal elongation of not more than 75% and a lateral elongation of 50 to 300%, said longitudinal elongation being lower than said lateral elongation.

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**5,045,621**

## METHOD FOR MANUFACTURING AN ORGANOPOLYSILOXANE IN WHICH A POLYMERIZABLE FUNCTIONAL GROUP IS PRESENT AT ONE END

**Toshio Suzuki, East Sussex, England, assignor to Toray Silicone Company, Ltd., Tokyo, Japan**

**Filed Sep. 26, 1989, Ser. No. 412,684**

**Claims priority, application Japan, Sep. 30, 1988, 63-248440**

**Int. Cl.[5] C08G** *77/06*

**U.S. Cl. 528—14** **9 Claims**

1. A method for manufacturing an organopolysiloxane represented by the formula

$$R^1R_2SiO(R_2SiO)_nB$$

in which a polymerizable functional group is present at one end, said method comprising polymerizing a cyclic trisiloxane represented by the formula



using an alkali metal salt of an organosilane or organopolysiloxane represented by the formula

$$R^1R_2SiO(R_2SiO)_mA$$

as a polymerization initiator in the presence or absence of an organosilane or organopolysiloxane represented by the formula

$$R^1R_2SiO(R_2SiO)_pH$$

as a molecular weight control agent and in which the reaction is subsequently terminated; wherein $R^1$ is a monovalent organic group which contains an acrylic group, methacrylic group, or vinylphenyl group; the individual R groups, which may be identical to or different from one another, are monovalent hydrocarbon groups; A is an alkali metal; m and p are 0 or an integer of 1 or above; B is a monovalent group selected from the group consisting of a hydrogen atom and endcapping groups; n is a number which is equal to, or greater than, the value of m+3; and the polymerization initiator/molecular weight control agent molar ratio has a value of from 100/0 to 0.1/100.

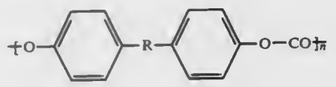
5,045,622

## POLYCARBONATE POLYOL, AROMATIC POLYCARBONATE POLYURETHANE RESIN, COATING AGENT, CAST FILM, MAGNETIC RECORDING MEDIUM

Kenji Kohno, Nagaokakyo; Yoshiyuki Nagataki, Osaka; Kazushi Miyata, Osaka, and Hiroshi Higashi, Osaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jun. 20, 1989, Ser. No. 368,607
Claims priority, application Japan, Jun. 22, 1988, 63-154373
Int. Cl.[5] C08G *18/44*; C09D *175/06*
U.S. Cl. 528—48 8 Claims

1. An aromatic polycarbonate polyurethane resin comprising the reaction product of from a polycarbonate polyol having a main chain of the formula:



wherein R is an aliphatic hydrocarbon group having 4 to 10 carbon atoms or an alicyclic hydrocarbon group having 4 to 10 carbon atoms and n is a number of 2.00 to 20.00, and having an aliphatic OH group at the terminal; and a polyisocyanate compound having two or more isocyanate groups in the molecule; and optionally other component.

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5,045,623

## TRANSPARENT, STEAM STERILIZABLE, NONCELLULAR POLYURETHANE COMPOSITIONS A PROCESS FOR THEIR PREPARATION AND THEIR USE ESPECIALLY FOR MEDICINAL ARTICLES

Peter Horn, Heidelberg; Werner Hinz, Frankenthal; Walter Heckmann, Weinheim; Falko Ramsteiner, Ludwigshafen, and Friedrich Gerold, Haar, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 8, 1990, Ser. No. 564,224
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1989, 3927244
Int. Cl.[5] C08G *18/10*
U.S. Cl. 528—60 14 Claims

1. Transparent, steam sterilizable, essentially non-cellular polyurethane casting compositions, prepared by reacting:

A) modified diphenylmethane diisocyanates with:

B) at least one compound having at least two reactive hydrogen atoms;

in the presence of or absence of:

C) catalysts; wherein the modified diphenylmethane diisocyanates (A) are prepared by reacting:

A1) 4,4'-diphenylmethane diisocyanate; or

A2) 2,4'-diphenylmethane diisocyanate; or

A3) a diphenylmethane diisocyanate isomeric mixture, with:

A4) at least one polyoxypropylene polyol having an average functionality of from 4 to 8 and a hydroxyl number of from 230 to 500, prepared while using sorbitol, sucrose, or mixtures of sorbitol and sucrose as initiator molecules whereby additionally water, propylene glycol, glycerine, or mixtures of at least two of the aforesaid are used as a costarter;

A5) at least one polyoxypropylene-polyoxyethylenepolyol initiated with sucrose, or more preferably sorbitol, containing 1 to 80 weight percent of ethylene oxide units polymerized in situ, based on the total weight, and having a hydroxyl number of from 150 to 500; or,

A6) a polyoxyalkylene polyol mixture having an average functionality of at least 4, prepared from at least one of the aforesaid sucrose- or sorbitol-polyoxypropylene-polyols (A4), or sucrose- or sorbitol-polyoxypropylene-polyoxyethylene-polyols (A5) and from a polyoxypropylene- and/or polyoxyethylene- polyol having a hydroxyl number of from 350 to 950, prepared by reacting glycerine, trimethylolpropane or a mixture of glycerine and trimethylolpropane with 1,2-propylene oxide or ethylene oxide in a mole ratio of from 1:1 to 1:8;

or mixtures of at least two of said components (A4) through (A6), in a NCO:OH-group ratio of from 2.5:1 to 15:1.

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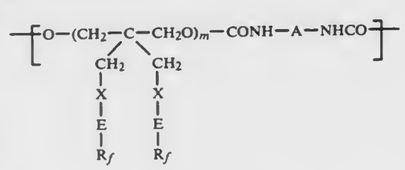
5,045,624

## HETEROATOM CONTAINING PERFLUOROALKYL TERMINATED NEOPENTYL GLYCOLS AND COMPOSITIONS THEREFROM

Robert A. Falk, New City, N.Y.; Kirtland P. Clark, Bethel, Conn.; Athanasios Karydas, Brooklyn, N.Y., and Michael Jacobson, Stratford, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

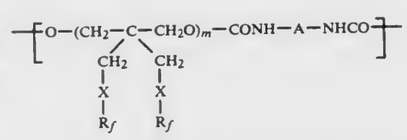
Division of Ser. No. 339,326, Apr. 14, 1989, Pat. No. 4,946,992, which is a continuation-in-part of Ser. No. 209,743, Jun. 20, 1988, Pat. No. 4,898,981. This application Jun. 5, 1990, Ser. No. 533,619
Int. Cl.[5] C08G *18/38*
U.S. Cl. 528—70 11 Claims

1. A linear polyurethane having recurring structural units of the formula Ia or IIa:



(Ia)

or



(IIa)

wherein

$R_f$ is a straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

E is branched or straight chain alkylene of 1 to 10 carbon atoms or said alkylene interrupted by one to three groups selected from the group consisting of —NR—, —O—, —S—, $-SO_2-$, —COO—, —OOC—, —CONR—, —NRCO—, $-SO_2NR-$, and $-NRSO_2-$, or terminated at the $R_f$ end with —CONR— or $-SO_2NR-$, where $R_f$ is attached to the carbon or sulfur atom, and for formula Ia, X is —S—, —O—, $-SO_2-$, or —NR—, and for formula IIa, X is —CONR— or $-SO_2NR-$, where $R_f$ is attached to the carbon or sulfur atom, and where R is independently hydrogen, alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 2 to 6 carbon atoms, and m is 1, 2 or 3, and A is a divalent aliphatic, cycloaliphatic or aromatic group.

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5,045,625

## THERMOSETTING POLYIMIDE PREPOLYMERS

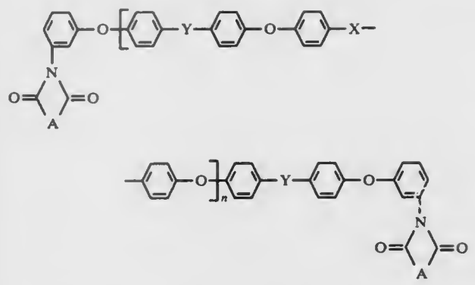
Eui W. Choe, Randolph, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Division of Ser. No. 312,273, Feb. 21, 1989. This application Feb. 8, 1990, Ser. No. 476,952
Int. Cl.[5] C08G *8/02, 73/00, 75/00, 69/14*
U.S. Cl. 528—170 3 Claims

1. A thermosetting composition comprising

(a) a polyamine component; and (b) a prepolymer corresponding to the formula:





where X is a single bond, or an oxy, thio, carbonyl, sulfonyl radical, or an alkylene, haloalkylene or aralkylene radical containing between about 1-18 carbon atoms; Y is a $C_1$–$C_6$ alkylene, carbonyl or sulfonyl radical; A is a divalent $C_2$–$C_{12}$ organic radical having olefinic unsaturation; and n is a number having an average value between about 1-5.

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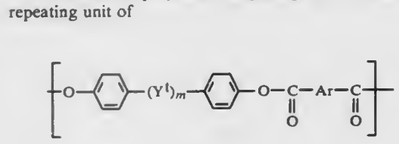
5,045,626

## AROMATIC COPOLYESTER

Shinichi Koide; Toshiaki Suzuki, and Hiroshi Takeshita, all of Tokyo, Japan, assignors to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo, Japan

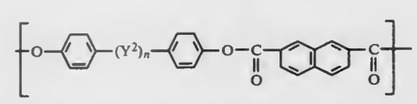
Filed Jun. 26, 1990, Ser. No. 543,399
Int. Cl.[5] C08G *8/02, 75/00, 63/02, 63/18*
U.S. Cl. 528—193 12 Claims

1. Aromatic copolyester comprising 10 to 90 mol % of a repeating unit of



(I)

and 90 to 10 mol % of a repeating unit of



(II)

wherein $Y^1$ and $Y^2$ are the same or different and are selected from the group consisting of a lower alkylene group, a lower alkylidene group, an oxygen atom, a sulfur atom, a carbonyl group and a sulfonyl group; m and n are zero or one and Ar is an aryl group having linkage chains in one and the same direction or in two directions parallel to each other.

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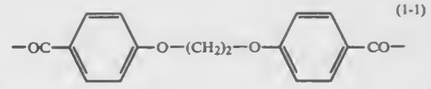
5,045,627

## MELT-PROCESSABLE COPOLYESTER

Hiroka Tanisake; Koji Yamamoto, and Toshizumi Hirota, all of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

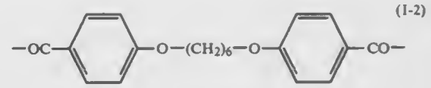
Continuation-in-part of Ser. No. 228,312, Aug. 4, 1988, abandoned. This application Aug. 16, 1989, Ser. No. 394,419
Claims priority, application Japan, Aug. 11, 1987, 62-199084; Mar. 17, 1988, 63-61872; Mar. 17, 1988, 63-61873
Int. Cl.[5] C08G *63/02, 63/18*
U.S. Cl. 528—271 7 Claims

1. A melt-processable copolyester consisting essentially of a structural unit (I) of formula (1—1)



(1-1)

and formula (1—2)



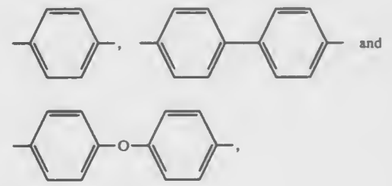
(1-2)

wherein the amount of the species of formula (1—2) is 5 to 95 mole% of the structural unit (I),

a structural unit (II) of formula (2)

—O—X—O— (2)

wherein X is at least one selected from the group consisting of

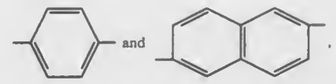


and

a structural unit (III) of formula (3)

—O—Y—CO— (3)

wherein Y is at least one selected from the group consisting of



the proportion of the structural unit (III) being 10 to 80 mole% of the structural units (I)+(II)+(III) in total, the structural unit (I) being substantially equimolar to the structural unit (II), the inherent viscosity ($1n\ \eta_{rel}$)/C, measured in a concentration of 0.16 g/dl in pentafluorophenol at 60° C., being not less than 0.5 dl/g.

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5,045,628

## PRODUCTION AND RECOVERY OF POLY(ARYLENE SULFIDE KETONE) AND POLY(ARYLENE SULFIDE DIKETONE) RESINS

Afif M. Nesheiwat, Madison, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 29, 1989, Ser. No. 459,036
Int. Cl.[5] C08G *75/14, 2/00*
U.S. Cl. 528—388 30 Claims

1. A process to prepare a high bulk density particulate polymeric resin, having improved processability, comprising the steps of:

(a) preparing a heated first slurry comprising a solid component and a liquid component in an enclosed vessel,

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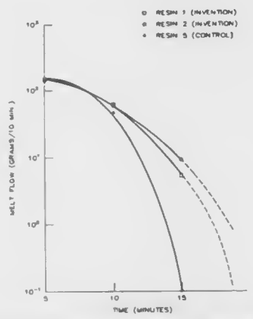


wherein the solid component of said first slurry comprises a first particulate polymeric resin selected from the group consisting of poly(arylene sulfide ketone)s and poly(arylene sulfide diketone)s, and wherein the liquid component of said first slurry comprises a polar organic compound and water;

(b) venting vapors from said enclosed vessel containing said heated first slurry, thereby removing at least a portion of said water;

(c) substantially liquifying said first particulate resin contained in said first heated slurry to form a first mixture comprising said substantially liquified resin and said polar organic compound;

(d) adding, to said first mixture, a sufficient amount of at least one separation agent, to produce a second mixture; and




(e) reducing the temperature of said second mixture sufficiently to solidify said substantially liquified resin and form a second slurry comprising a solid component and a liquid component, wherein the solid component of said second slurry comprises a second particulate resin, wherein the bulk density of said second particulate resin is greater than said bulk density of said first particulate resin and wherein the amount of said liquid phase separation agent added to said first mixture, during step (d), is sufficient to result in said second particulate resin having a bulk density greater than about 10 lbs/ft$^3$;

(f) recovering said second particulate resin from said second slurry; and

(g) treating said recovered second particulate resin at an elevated temperature with a caustic treating solution.

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**5,045,629**

**METHOD TO RECOVER PARTICULATE POLY(ARYLENE SULFIDES WITH VAPORIZED SEPARATION AGENT**

**Afif M. Nesheiwat, Chatham, N.J., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Continuation-in-part of Ser. No. 224,265, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 104,613, Oct. 5, 1987, abandoned. This application May 8, 1989, Ser. No. 349,562**

**Int. Cl.$^5$ C08G *75/14***

**U.S. Cl. 528—481** **16 Claims**

1. A method for recovering a crystalline poly(arylene sulfide) from a slurry comprising a particulate poly(arylene sulfide), a polar organic compound, and water, said method comprising:

(a) substantially liquifying said particulate poly(arylene sulfide) to form a liquid mixture comprising said substantially liquified poly(arylene sulfide) and said polar organic compound;

(b) contacting said liquid mixture with a vaporized separation agent in an amount sufficient to effect a separation between said poly(arylene sulfide) and said polar organic compound;

(c) reducing the temperature of said liquid mixture sufficiently to solidify said substantially liquified poly(arylene sulfide) to form a slurry comprising a particulate poly(arylene sulfide); and

(d) recovering said particulate poly(arylene sulfide) from said slurry.

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**5,045,630**

**POLY(ARYLENE THIOETHER-KETONES) IMPROVED IN MELT STABILITY AND PREPARATION PROCESS THEREOF**

**Ken Kashiwadate; Yoshikatsu Satake, both of Iwaki; Takashi Kaneko, Tokyo; Masahito Tada, Matsudo, and Takayuki Katto, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo K.K., Japan**

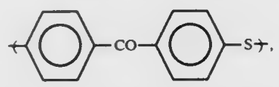
**Division of Ser. No. 431,118, Nov. 3, 1989, Pat. No. 5,008,370. This application Jan. 17, 1991, Ser. No. 642,584**

**Claims priority, application Japan, Nov. 11, 1988, 63-283553; Oct. 17, 1989, 1-268072**

**Int. Cl.$^5$ C08F *6/00***

**U.S. Cl. 528—503** **5 Claims**

1. A poly(arylene thioether-ketone), which has been improved in melt stability, prepared by the following steps: subjecting a poly(arylene thioether-ketone) to a heat treatment for 5–5×10$^3$ minutes in a powdery state and a temperature range of 200°–350° C., said poly(arylene thioether-ketone) having predominant recurring units of the formula




wherein the —CO— and —S— are in the para position to each other, and having the following physical properties (a)–(c):

(a) melting point, Tm being 310°–380° C.;

(b) melt crystallization temperature, Tmc (420° C./10 min) being at least 210 ° C., and residual melt crystallization enthalpy, ΔHmc (420° C./10 min) being at least 10 J/g, wherein Tmc (420° C./10 min) and ΔHmc (420° C./10 min) are determined by a differential scanning calorimeter at a cooling rate of 10° C./min after the poly(arylene thioether-ketone) is held at 50° C. for 5 minutes in an inert gas atmosphere, heated to 420° C. at a rate of 75° C./min and then held for 10 minutes at 420° C.; and

(c) reduced viscosity being 0.2–2.0 dl/g as determined by viscosity measurement at 25° C. and a polymer concentration of 0.5 g/dlin 98 percent by weight sulfuric acid.

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**5,045,631**

**POLYPEPTIDES WITH CELL-SPREADING ACTIVITY**

**Fusao Kimizuka, Ohmihachiman; Tatsuru Kinoshita, Kyoto; Yoh'ichi Ohdate, Amagasaki; Yuki Taguchi, Otsu, and Ikunoshin Kato, Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan**

**Filed Feb. 13, 1989, Ser. No. 310,170**

**Claims priority, application Japan, Feb. 16, 1988, 63-31820**

**Int. Cl.$^5$ C07K *13/60***

**U.S. Cl. 530—350** **2 Claims**

1. A polypeptide with cell-spreading activity which consists of the following amino acid sequence beginning with the amino terminus:

Pro Thr Asp Leu Arg Phe Thr Asn Ile Gly
Pro Asp Thr Met Arg Val Thr Trp Ala Pro
Pro Pro Ser Ile Asp Leu Thr Asn Phe Leu
Val Arg Tyr Ser Pro Val Lys Asn Glu Glu
Asp Val Ala Glu Leu Ser Ile Ser Pro Ser
Asp Asn Ala Val Val Leu Thr Asn Leu Leu



-continued

Pro Gly Thr Glu Tyr Val Val Ser Val Ser
Ser Val Tyr Glu Gln His Glu Ser Thr Pro
Leu Arg Gly Arg Gln Lys Thr Gly Leu Asp
Ser Pro Thr Gly Ile Asp Phe Ser Asp Ile
Thr Ala Asn Ser Phe Thr Val His Trp Ile
Ala Pro Arg Ala Thr Ile Thr Gly Tyr Arg
Ile Arg His His Pro Glu His Phe Ser Gly
Arg Pro Arg Glu Asp Arg Val Pro His Ser
Arg Asn Ser Ile Thr Leu Thr Asn Leu Thr
Pro Gly Thr Glu Tyr Val Val Ser Ile Val
Ala Leu Asn Gly Arg Glu Glu Ser Pro Leu
Leu Ile Gly Gln Gln Ser Thr Val Ser Asp
Val Pro Arg Asp Leu Glu Val Val Ala Ala
Thr Pro Thr Ser Leu Leu Ile Ser Trp Asp
Ala Pro Ala Val Thr Val Arg Tyr Tyr Arg
Ile Thr Tyr Gly Glu Thr Gly Gly Asn Ser
Pro Val Gln Glu Phe Thr Val Pro Gly Ser
Lys Ser Thr Ala Thr Ile Ser Gly Leu Lys
Pro Gly Val Asp Tyr Thr Ile Thr Val Tyr
Ala Val Thr Gly Arg Gly Asp Ser Pro Ala
Ser Ser Lys Pro Ile Ser Ile Asn Tyr Arg
Thr Glu Ile Asp Lys Pro Ser Gln Met.

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**5,045,633**

**EXPRESSION OF BIOLOGICALLY ACTIVE PDGF ANALOGS IN EUCARYOTIC CELLS**

**Mark J. Murray, and James D. Kelly, both of King County, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.**

**Division of Ser. No. 705,175, Feb. 25, 1985. This application Aug. 23, 1988, Ser. No. 235,984**

**Int. Cl.$^5$ A61K *37/36;* C12N *1/22***

**U.S. Cl. 530—399** **7 Claims**



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**5,045,632**

**NOVEL BIS(PHOSPHORANYLIDENE) AMMONIUM SALTS**

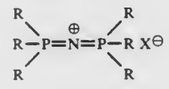
**Theodore L. Parker, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 358,297, May 25, 1989, abandoned. This application Dec. 19, 1990, Ser. No. 630,146**

**Int. Cl.$^5$ C07C *303/00, 307/00***

**U.S. Cl. 562—45** **10 Claims**

1. A novel bis(phosphoranylidene) ammonium salt which exhibits activity as a catalyst/initiator, consisting essentially of a compound of the formula



wherein

R is independently in each occurrence a $C_{1\text{-}20}$ monovalent hydrocarbon radical; and

X is an anion selected from the group consisting of: $R^1SO_3^{\ominus}$, and $(R^3SO_2)_2N^{\ominus}$.

wherein

$R^1$ is a $C_{1\text{-}12}$ monovalent hydrocarbon radical or $C_{1\text{-}12}$ monovalent halohydrocarbon radical,

and

$R^3$ is a $C_{1\text{-}12}$ monovalent hydrocarbon radical.

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**5,045,634**

**FLUORINATION OF HALOOLEFINS**

**Richard E. Fernandez, Bear; William H. Gumprecht, and Kaplan, Ralph B., both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jun. 28, 1990, Ser. No. 545,248**

**Int. Cl.$^5$ C07C *17/20, 19/08, 21/18***

**U.S. Cl. 570—170** **6 Claims**

1. A process for the fluorination of a haloolefin having at least one halogen selected from the group consisting of chlorine and fluorine attached to an unsaturated carbon atom to a saturated fluorinated addition produce having at least one more fluorine in the molecule than said haloolefin which comprises the following steps: (1) contacting the haloolefin with an anhydrous substantially molten composition containing an alkali metal acid fluoride, at a temperature below the decomposition temperature of said haloolefin or said fluorinated product, whichever is lower, to form a reaction mixture; (2) agitating said mixture at said temperature and at a pressure and for a time sufficient to yield at least one saturated fluorinated addition product having at least one more fluorine in the molecule than said haloolefin; and (3) isolating and recovering said fluorinated product.

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1. A protein homodimer consisting essentially of human PDGF B-chains, said protein being essentially free of the A-chain of PDGF.

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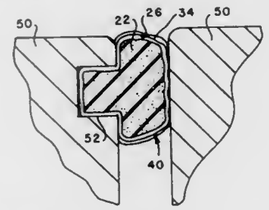


5,045,635

## CONDUCTIVE GASKET WITH FLAME AND ABRASION RESISTANT CONDUCTIVE COATING

Joseph J. Kaplo, Pittsford; William Hoge, Palmyra, and Craig Lund, Lima, all of N.Y., assignors to Schlegel Corporation, Rochester, N.Y.

Filed Jun. 16, 1989, Ser. No. 367,210
Int. Cl.[5] H05K 9/00; H01S 4/00
U.S. Cl. 174—35 GC 12 Claims




1. An apparatus comprising:

first and second electrically conductive bodies having conductive surfaces arranged to bear towards one another;

a conductive seal body disposed on at least one of the electrically conductive bodies and arranged to be interspersed between the electrically conductive bodies for defining an electrically conductive path and shielding against passage of electromagnetic effects and environmental effects, the conductive seal body defining a highly conductive metal path of at least one of aluminum, nickel, tin, copper, silver, gold, copper clad steel, and an alloy including at least two of nickel, copper, iron and manganese, the highly conductive metal path disposed between the conductive surfaces of the first and second electrically conductive bodies; and,

A sheath on the external surface of the conductive seal body formed by a protective conductive coating including a dispersion of conductive particles in a flexible elastomeric binder, the elastomeric binder including at least one of a curable elastomer, silicone, neoprene and nylon and the conductive particles being chosen from the group carbon black, graphite and elemental metal of size and density to provide a surface resistance in the coating of about 0.5 to 1.0 ohms per cm;

whereby the conductive particles complete a conductive path including the conductive seal body, the conductive path bridging between the electrically conductive bodies, and the elastomeric binder minimizes corrosion at the surfaces of the electrically conductive bodies.

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5,045,636

## LOW CLOSURE FORCE EMI/RFI SHIELDED DOOR

Eivind Johnasen, Weare, N.H., and James McQueeney, Natick, Mass., assignors to Chomerics, Inc., Woburn, Mass.

Filed Jun. 6, 1989, Ser. No. 362,194
Int. Cl.[5] H05K 9/00; E05F 1/04
U.S. Cl. 174—35 MS 17 Claims

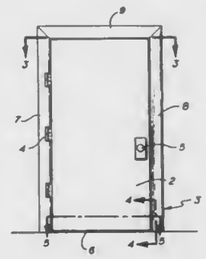
1. A shielded door assembly comprising:

a) an electrically conductive frame having two side members, a top member and a bottom threshold, the top member and bottom threshold interconnecting the side members respectively along the top and bottom portion of the frame; the frame being mounted in an opening in an enclosure and being in electrical connection with the opening;

b) an electrically conductive door stop attached to the two side members and top member of the frame and in electrical connection with the frame;

c) an electrically conductive door pivotally secured to the frame and adapted for pivoting between an open and closed position, the door having an outer edge which is generally parallel to the frame and doorstop and cooperating with the doorstop when the door is in its closed position so that the door is in electrical connection with the doorstop;

d) the doorstop having one or more electrically conductive resilient gaskets secured to a surface of the door stop with which the door is in electrical connection, the gaskets being secured to the doorstop and in electrical connection with the doorstop, the gaskets being adapted for engagement with the outer edge of the door when the door is in its closed position so as to establish an electrical connection between the door and the doorstop;




e) the door having a recess along a bottom portion of the door, the recess being substantially parallel to the threshold of the frame, the recess containing a rotatable electrically conductive sealing device to establish an electrical contact between the threshold and the door when the door is in its closed position; and,

f) a latching device mounted on the door for maintaining the door in its closed position.

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5,045,637

## MAGNETIC SHIELDING MATERIAL

Takashi Sato; Toshio Yamada, both of Kawasaki, and Masami Kobayashi, Tokyo, all of Japan, assignors to Nippon Steel Corp., Tokyo, Japan

Continuation of Ser. No. 296,207, Jan. 12, 1989, abandoned. This application Jul. 17, 1990, Ser. No. 554,082
Claims priority, application Japan, Jan. 14, 1988, 63-2600[U]
Int. Cl.[5] H05K 9/00
U.S. Cl. 174—35 MS 12 Claims




1. A magnetic shielding material having a laminate structure comprising a basic laminate comprised of (a) a ferromagnetic sheet having a high saturation magnetic flux density, (b) a non-magnetic sheet and (c) an amorphous ferromagnetic sheet having a high magnetic permeability, said sheets (a), (b) and (c) in the basic laminate being superposed in this order and so that the ferromagnetic sheet (a) confronts a magnetic field-generating source; the ferromagnetic sheet (a) having a saturation magnetic flux density of at least 1.5 Tesla, and the amorphous ferromagnetic sheet (c) having a specific initial permeability of at least 1,000 and composed of an alloy having a composition represented by the formula:

$$FE_a—X_b—M_c$$

wherein X represents at least one metal selected from the group consisting of Co, Ni, Cr, Mo, Nb, V and Mn, M represents at least one metalloid element selected from the group consisting of B, Si, C, P and Ge; when X is Co or Ni, b is 0 to 40 atomic % and is not larger than a, and c is 10 to 30 atomic %, (a+b+c) is 100 atomic %.

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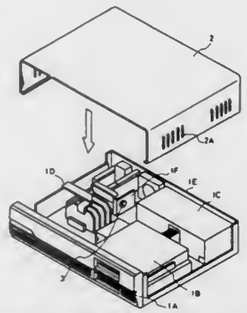


5,045,638

## APPARATUS FOR SHIELDING ELECTROMAGNETIC RADIATION

Hideaki Wada; Naoto Kitahara; Masami Koshimura, and Mikiya Ono, all of Saitama, Japan, assignors to Mitsubishi Mining & Cement Co., Ltd., Tokyo, Japan

Filed May 18, 1989, Ser. No. 353,773
Claims priority, application Japan, May 18, 1988, 63-122660
Int. Cl.[5] H05K *9/00*
U.S. Cl. 174—35 R 10 Claims



1. An apparatus for shielding electromagnetic radiation comprising:
a casing comprised of electromagnetic wave shielding material;
an electromagnetic wave suppressor member interior of the casing comprised of a material having at least one of high permeability and high permittivity at a high frequency and having electromagnetic loss; and
a circuit having said suppressor member positioned proximate thereto.

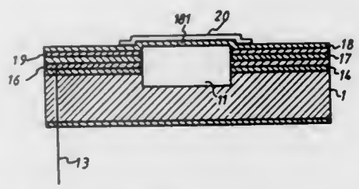
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5,045,639

## PIN GRID ARRAY PACKAGE

Henry Liu, and Heinz Ru, both of Taipei, Taiwan, assignors to Tong Hsing Electronic Industries Ltd., Taipei, Taiwan

Filed Aug. 21, 1990, Ser. No. 570,332
Int. Cl.[5] H01L *23/02*
U.S. Cl. 174—52.4 1 Claim



1. A pin grid array package comprising:
a substrate being made out of a dry molded ceramic with at least a 90% concentration of $Al_2O_3$, and formed by using a thick-film method, said substrate having a cavity adapted for receiving a chip, a plurality of through-holes drilled for receiving pins made from a copper material and plated with Ni and Au, a Pd/Ag layer with a donut shape surrounding all said through-holes on an upper surface of said substrate;
an Ag layer being provided as traces to form connection between said upper Pd/Ag layer and Au bonding pads provided on an outer periphery of said cavity of said substrate, which provide electrical connection between the pins and chip, a dielectric layer being provided on said Ag layer to prevent migration and contamination from moisture; and
a window frame with a sealing glass formed on a lower surface thereof being provided to encompass said dielectric layer and the chip received in said cavity of said substrate.

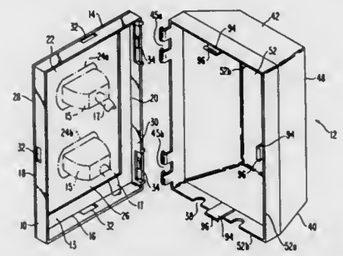
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5,045,640

## CHILD CARE ELECTRICAL OUTLET SAFETY COVER

Robert G. Riceman, West Caldwell, N.J., assignor to Randolph-Rand Corporation, New York, N.Y.

Filed Mar. 30, 1990, Ser. No. 502,282
Int. Cl.[5] H01R *13/447*
U.S. Cl. 174—67 3 Claims



1. A safety cover for an electrical receptacle, comprising:
a receiving plate capable of being affixed to an electrical receptacle for lockingly receiving a cover assembly, said receiving plate having a raised flange extending along the edge thereof and having a free edge;
a cover assembly having a lateral opening with a peripheral shape corresponding to the shape of said raised flange and a cover edge extending around the periphery of said lateral opening and having a corner at the junction of said edge and the interior of said cover assembly, said cover assembly being hinged to said receiving plate for pivoting movement relative to said receiving plate between a closed position in which said cover edge abuts said free edge of said raised flange and an open position in which said cover edge is spaced from said raised flange to expose and electrical receptacle when said receiving plate is attached thereto, said cover assembly having at least three locking means spaced around the periphery of said lateral opening at positions other than a position adjacent the hinged connected of said cover assembly to said receiving plate, the spacing of said locking means being sufficient for making said locking means incapable of simultaneous operation by a hand below a predetermined size, said raised flange having a locking hook receiving aperture therein extending substantially transversely of said raised flange at a position along said raised flange corresponding to the positions of each of said locking means along the periphery of said lateral opening, said locking means having a locking projection extending out of said lateral opening at said corner of said cover edge and having a free end with a locking hook thereon which extends transversely of said locking projection in the direction of the transverse dimension of said cover edge and which is spaced along said projection from said cover edge a distance substantially equal to the distance from the free edge of said raised flange to the edge of said locking hook receiving aperture which is closest to said free edge, whereby when said cover assembly is moved to the closed position, said locking hooks are engaged in said locking hook receiving apertures and said cover edge is snugly abutted against the free edge of said raised flange, and said cover assembly can be moved to the open position only by simultaneous deformation of said cover assembly at the positions of said locking means sufficient to move said locking hooks sufficiently far inwardly of said raised flange to free said locking hooks from said locking hook receiving apertures.

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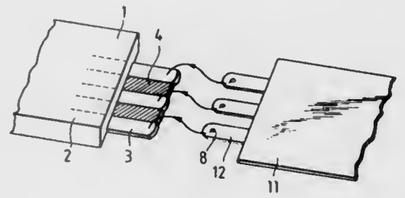


5,045,641

## MOULDED ELECTRICAL CONNECTOR AND METHOD FOR MANUFACTURING SAME

Kenichi Urushibata; Keiichi Kojima; Kiyoto Sugawara; Tatsuo Matsuda; Haruo Saen, all of Tochigi; Tetsuo Yumoto, Tokyo; Norio Yoshizawa, Tokyo, and Tooru Kanno, Tokyo, all of Japan, assignors to Sankyo Kasei Co., Ltd., Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Jan. 23, 1990, Ser. No. 468,936
Claims priority, application Japan, Jan. 26, 1989, 1-16787
Int. Cl.[5] H02G *15/02;* H01R *4/02*
U.S. Cl. 174—74 R 28 Claims



1. A molded electrical connector for connecting electrical conductors comprising:
a central retaining section in which a plurality of metallic circuits are arranged in parallel with one another at predetermined intervals and central portions of the metallic circuits are fixedly molded with resin; and
a first connecting section monolithically extending from a first side of the central retaining section, comprising:
exposed first end portions of the metallic circuits functioning as first connecting terminals with upper and lower surfaces of the first connecting terminals being exposed; and
connecting terminal reinforcing means to reinforce the exposed first connecting terminals, wherein the connecting terminal reinforcing means comprises resin layers formed between the first connecting terminals, the resin layers being generally equal in thickness to the first connecting terminals.

9. A method for manufacturing a molded electrical connector comprising the steps of:
arranging a plurality of metallic circuits in parallel with one another;
molding central portions of the metallic circuits into a central retaining section such that upper and lower surfaces of first end portions of the metallic circuits are exposed in a first connector section monolithically extending from a first side of the central retaining section and upper and lower surfaces of second end portions of the metallic circuits are exposed in a second connector section monolithically extending from a second side of the central retaining section, the first and second connector sections for connecting together different sets of electrical conductors through the metallic circuits.

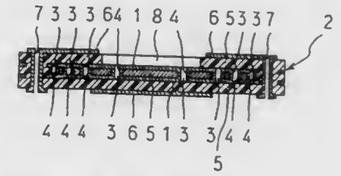
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5,045,642

## PRINTED WIRING BOARDS WITH SUPERPOSED COPPER FOILS CORES

Hideo Ohta, Nara; Kenji Miyamoto, Izumi, both of Japan; Wilson O. W. San, Singapore, Singapore, and Alfred M. Martini, Redwood City, Calif., assignors to Satosen, Co., Ltd., Osaka, Japan and Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 17, 1990, Ser. No. 509,833
Claims priority, application Japan, Apr. 20, 1989, 1-101474; Apr. 28, 1989, 1-50376[U]
Int. Cl.[5] H05K *1/00*
U.S. Cl. 174—266 4 Claims



1. A printed wiring board comprising:
a plurality of resin layers;
a plurality of copper foil cores superposed over one another and spaced away from one another by said resin layers, end portions of each of the copper foil cores exposed at end surfaces thereof for dissipating heat;
a plurality of holes extending vertically through the plurality of copper foil cores and some of the resin layers and having hole-defining internal surfaces so plated as to connect the plurality of copper foil cores to one another; and
wiring elements formed on top and bottom resin layers.

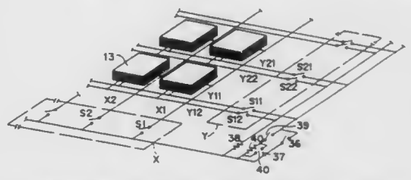
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5,045,643

## POSITIONAL INFORMATION INPUTTING DEVICE USING SHEET-LIKE PHOTO-CONDUCTIVE SWITCH OR THE LIKE

Takeshi Miyabayashi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jun. 19, 1990, Ser. No. 540,496
Claims priority, application Japan, Jun. 19, 1989, 1-158020; Jun. 19, 1989, 1-158021
Int. Cl.[5] G08C *21/00*
U.S. Cl. 178—18 26 Claims



5. A positional information inputting device comprising:
a sheet-like storage battery including a plurality of battery cells arranged in matrix form, each battery cell having an anode, a cathode, an anode-connected collector, and a cathode-connected collector;
sheet-like photo-electric converting means having an equal plurality of photo-electric converting elements provided in one-to-one correspondence to the battery cells, said photo-electric converting elements being provided on one of the anode-connected and the cathode-connected collectors, wherein said storage battery and said converting means constitute an optical memory having an equal plurality of optical memory cells;
irradiating means for irradiating an optical beam onto the converting elements, the converting elements selectively

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charging the associated battery cells corresponding to the irradiation of the optical beam; and

measurement means for measuring amounts of charges in the battery cells while discharging the battery cells to a predetermined voltage.

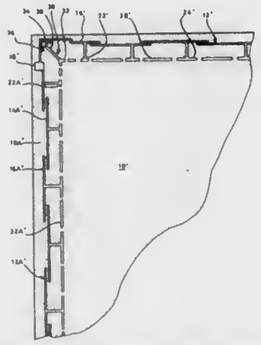
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**5,045,644**

**TOUCH SENSITIVE SCREEN WITH IMPROVED CORNER RESPONSE**

**David I. Dunthorn, Anderson County, Tenn., assignor to Elographics, Inc., Oak Ridge, Tenn.**

**Filed Apr. 16, 1990, Ser. No. 509,601**
**Int. Cl.[5] G08C *21/00***
**U.S. Cl. 178—18** **11 Claims**



1. A position touch sensor having resistive electrodes which provides a linear output response over an enhanced proportion of the surface area of said sensor by reducing the ripple and bow or equipotential lines along edges of said sensor and reducing ripple or equipotential lines in corner areas, which comprises:

a resistive surface having a selected resistivity throughout said surface, said resistive surface defining perimeter edges and corners;

a resistor chain positioned proximate each of said perimeter edges of said resistive surface for providing orthogonal electrical fields on said resistive surface, each of said resistor chains having opposite ends joined at junction points proximate said corners to proximate ends of adjoining resistor chains;

a plurality of edge tee electrodes positioned on, and electrically connected to, said resistive surface along a path proximate each perimeter edge of said surface, said edge tee electrodes each being electrically connected to selected points along said resistor chains and having a selected spacing and an effective length along said path, said length and spacing selected to produce a selected voltage gradient at each of said edge tee electrodes to compensate for any cumulative voltage drop along said resistor chain perpendicular to current flow in said resistive surface to thereby reduce bow in said equipotential lines at said edges; and

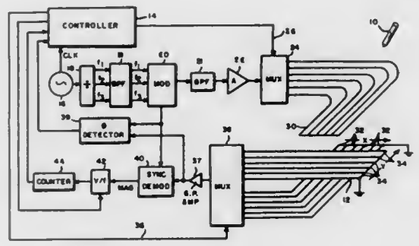
a corner electrode positioned so as to be at an intersection of adjacent of said paths of said edge tee electrodes proximate each corner of said resistive surface, and electrically connected to said resistive surface, said corner electrode connected by an electrical connection to an adjacent of said junctions joining said resistor chains so as to be electrically in parallel with said resistor chains and produce a selected voltage at said corner electrode, said corner electrode provided for the reduction of ripple of equipotential lines in said resistive surface along said edges and at said corners.

**5,045,645**

**DIGITIZER SYSTEM WITH PASSIVE POINTER**

**Jason Hoendervoogt, and Brian Abernethy, both of Phoenix, Ariz., assignors to CalComp Inc., Anaheim, Calif.**

**Filed May 22, 1990, Ser. No. 527,027**
**Int. Cl.[5] G08C *21/00***
**U.S. Cl. 178—19** **28 Claims**




1. A graphic digitizer comprising:

signal generating means for generating a composite driving signal having first and second frequency components;

a grid of spaced conductors;

movable pointer means inductively coupled to said signal generating means and to said conductors, said pointer means comprising a first tuned circuit responsive to the first frequency component of the composite driving signal and a second tuned circuit responsive to the second frequency component of the composite driving signal; and

means for detecting signals inductively coupled in selected ones of said conductors by said second tuned circuit to determine the location of the said pointer means relative to said conductors.

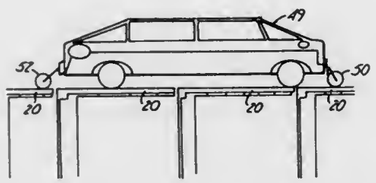
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**5,045,646**

**ELECTRICAL VEHICLE TRANSPORTATION SYSTEM**

**Nicholas R. Musachio, 862 W. Iowa, St. Paul, Minn. 55117**

**Filed Jul. 20, 1989, Ser. No. 383,036**
**Int. Cl.[5] B60L *9/00***
**U.S. Cl. 191—6** **21 Claims**




18. An electric vehicle transportation system, comprising:

a roadway having a load bearing surface;

an electric power rail extending longitudinally on the roadway and having a default electrical potential level;

means for energizing selected portions of the power rail at a second potential level upon application of an actuation signal to the power rail; and

an electric vehicle adapted for operation on the roadway by having a power take up and a return trolley, the trolleys being longitudinally spaced from one another by a predetermined interval such that the return trolley is in electrical contact with a portion of the power rail at the default potential level and the power take-up trolley is in electrical contact with the portion of the power rail energized at the second potential level.

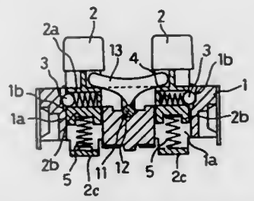


**5,045,647**

**INTERLOCKING DEVICE FOR PUSH-BUTTON SWITCH**

**Shigeru Kato, Osaka, Japan, assignor to Shinkoh Electric To., Ltd., Osaka, Japan**

**Filed Mar. 9, 1990, Ser. No. 491,426**
**Int. Cl.[5] H01H *9/20***
**U.S. Cl. 200—5 E** **2 Claims**




1. A push-button switch having an interlocking device, said switch comprising:

two spaced side-by-side push-buttons each movable downwardly in substantially parallel directions from an inoperative to an operative position;

means supporting said push-buttons for said movement;

a pin positioned between said two push-buttons and having a horizontal longitudinal axis extending transversely to a vertical plane between said push-buttons;

means supporting said pin so as to be free to rotate around said axis;

an interlocking lever extending between said push-buttons and having opposite ends engaged with respective ones of said push-buttons, said interlocking lever having a fulcrum projecting downwardly from the central portion thereof and, when both said push-buttons are in the inoperative position, having the lower end supported on said rotatable pin; and

means supporting said lever for tilting movement in one or the other direction around said fulcrum depending on which push-button is pushed downwardly and for maintaining engagement of the ends of said lever in engagement with said push-buttons during tilting movement, said lever being movable for, when one of the push-buttons is moved downwardly, being tilted toward the downwardly moved push-button and having the fulcrum engaging said pin and causing said pin to rotate in the opposite direction from the tilting direction of said lever to move the lower end of said fulcrum to a position on the opposite side of the pin from the downwardly moved push-button, whereby downward movement of the other push-button is blocked by the lever being blocked against tilting movement toward the other push-button by the engagement of the fulcrum with the pin.

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**5,045,648**

**LOCKING ROCKER SWITCH**

**Eric W. Fogleman, Sr., Four Oaks, N.C., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Mar. 23, 1990, Ser. No. 498,237**
**Int. Cl.[5] H01H *9/20***
**U.S. Cl. 200—43.16** **9 Claims**

1. A locking rocker switch comprising, in combination:

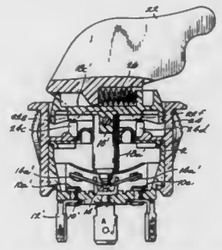
an insulating housing defining an interior chamber and having an access opening thereto;

a rocker actuator pivotally mounted to said housing in said opening about an axis;

switch contacts in said housing actuated by pivotal movement of said actuator;

abutments defined within said chamber below said access opening at opposite sides of said axis of said pivotally mounted actuator; and

a lock slidably mounted on said actuator and spring biased to a first position and slidable against said bias to a second position, said lock having a plurality of feet depending therefrom and extending into said chamber, each foot being respectively aligned with a corresponding abutment in said first position of said lock blocking pivotal movement of said actuator, said feet being clear of all of said abutments in said second position of said lock permitting pivotal movement of said actuator.



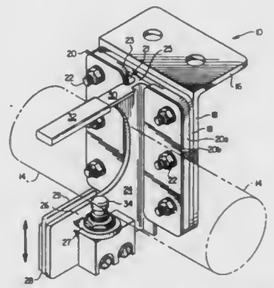
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**5,045,649**

**SELF-ADJUSTING SLIDE ASSEMBLY FOR WEIGHT ON GEAR SWITCH**

**William D. Ramsey, Hurst, and George H. Bailey, Fort Worth, both of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.**

**PCT No. PCT/US89/04220, § 371 Date Oct. 3, 1989, § 102(e) Date Oct. 3, 1989**
**ub. Date DOct. 3, 1989, Ser. No. 424,291**
**Int. Cl.[5] H01H *35/00; B64C 27/00***
**U.S. Cl. 200—52 R** **12 Claims**



1. A slide assembly for mounting an aircraft weight on gear switch, comprising:

a mounting bracket rigidly attached to the aircraft and having mounting structure of a predetermined shape formed therein; and

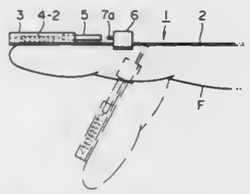
a slidable member having structure formed therein to slidably mate with said mounting structure of said mounting bracket, said slidable member including means for mounting the weight on gear switch a predetermined distance from the mean position of the oscillatory movement of the aircraft landing gear, a first member and a second member, said first and second members extending, respectively, above and below a component of the aircraft landing gear;

whereby said slidable member is responsive to contact by the oscillatory movement of the aircraft landing gear about a mean position to move and to maintain the switch at a substantially constant predetermined distance from the mean position.

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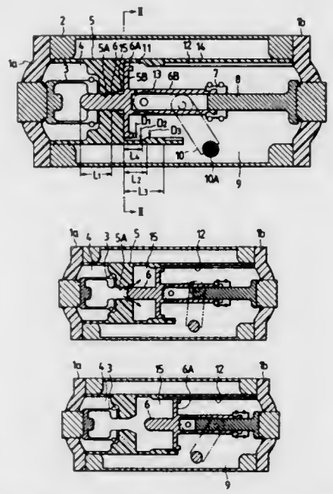
5,045,650
FINGER SWITCH
Hideo Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Division of Ser. No. 161,176, Feb. 26, 1988, Pat. No. 4,920,848. This application Jan. 17, 1990, Ser. No. 466,203
Claims priority, application Japan, Feb. 27, 1987, 62-44233; Feb. 27, 1987, 62-44234
Int. Cl.[5] H01H *35/00*
U.S. Cl. 200—52 R 3 Claims



1. A finger switch comprising:
(a) a thin plate made of a bendable material, one edge of said thin plate being mounted near a finger base portion of a player's finger, while another edge of said thin plate is stretched toward a finger tip edge portion of the player's finger, whereby said thin plate can be bent and stretched in response to bending and stretching actions of the player's finger;
(b) a gate member having a gate shape, said gate member being mounted, independently of said thin plate, between said finger base and said finger tip edge of the player's finger, whereby said thin plate is inserted through the inside of said gate member so as to be movable therethrough;
(c) a contact switch mounted to said gate member in a direction of the finger tip edge portion thereof; and
(d) a contact switch driving member mounted to said thin plate at said another edge thereof, said contact driving member driving said contact switch to turn on and off in response to the bending and stretching movement of said thin plate.

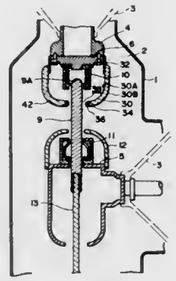
5,045,651
SWITCH
Takahide Seki; Yasuharu Seki; Masanori Tsukushi; Syunji Itoh, and Haruo Honda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 26, 1990, Ser. No. 470,584
Claims priority, application Japan, Feb. 8, 1989, 1-27659
Int. Cl.[5] H01H *33/82*
U.S. Cl. 200—148 11 Claims

1. A switch comprising:
a stationary cylindrical portion with one end thereof closed so as to form a booster chamber therewithin;
an insulating nozzle provided at the other end of said stationary cylindrical portion;
a first contact secured to the interior of said stationary cylindrical portion;
a second contact which can be brought into and out of contact with said first contact through the throat portion of said insulating nozzle;
a negative pressure chamber for generating a negative pressure by the separating operation of said second contact and sucking the fluid in said booster chamber; and
a means for supplying said fluid to said negative pressure chamber so as to suppress the negative pressure in said negative pressure chamber during the initial stage of said



separating operation of said second contact, said means being connected to said negative pressure chamber.

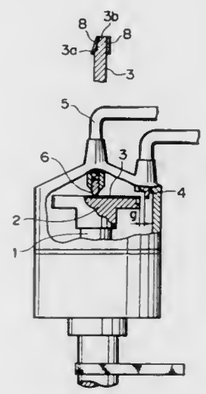
5,045,652
DISCONNECTOR OF GAS INSULATED SWITCHGEAR
Satoru Yanabu, Machida; Susumu Nishiwaki, Yokohama; Masayuki Ishikawa, Kawasaki, and Hirokuni Aoyagi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 2, 1989, Ser. No. 361,032
Claims priority, application Japan, Jun. 2, 1988, 63-134494
Int. Cl.[5] H01H *33/24, 31/32*
U.S. Cl. 200—148 R 6 Claims



1. A disconnector for gas insulated switchgear, comprising:
a metallic container filled with an insulating gas,
a stationary electrode having a contact,
a stationary electrode shield electrically connected to the stationary electrode to surround the contact, the stationary electrode shield being made of an electrically resistant material and having a free end portion and inner and outer surfaces;
a movable electrode arranged to face the contact and be movable into an electrical contact with and out of electrical contact with the contact, and in which the stationary electrode shield is arranged to flow discharge current therethrough due to an interelectrode voltage applied between the stationary electrode and the movable electrode and;
an annular metallic electrode coaxially mounted on the free end portion of the stationary electrode shield so as to allow the movable electrode to pass therethrough, the metallic electrode having an exposed surface exposed to the insulating gas, the exposed surface of the metallic electrode being larger in field strength than the inner and outer surfaces of the stationary electrode shield for producing a discharge between the exposed surface of the metallic electrode and the movable electrode.

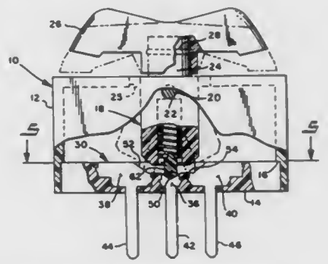


5,045,653
DISTRIBUTION FOR INTERNAL COMBUSTION ENGINE
Yutaka Ohashi, Hyogo, Japan, assignor to Mitsubishi Denki K. K., Tokyo, Japan
Filed May 14, 1990, Ser. No. 522,936
Claims priority, application Japan, May 15, 1989, 1-118760; May 29, 1989, 1-132854; May 30, 1989, 1-134733; Mar. 1, 1990, 2-47276
Int. Cl.[5] H01H *19/00;* F02P *7/02*
U.S. Cl. 200—19 DR 11 Claims



1. A distributor for an internal combustion engine, comprising:
a rotary shaft connected so as to be rotated in a synchronized relationship by rotation of a crankshaft of said internal combustion engine,
a distributor rotor secured to said rotary shaft,
a rotor electrode on said distributor rotor,
a plurality of side electrodes disposed along a locus of rotation of said rotor electrode with a discharge gap left therebetween, and
a dielectric layer formed on a face of said rotor electrode adjacent an end opposing said side electrodes so as to expose said end of said rotor electrode, wherein said rotor electrode is tapered such that a thickness thereof is reduced toward said end thereof and said end of said rotor electrode is one of corrugated and notched.

5,045,654
SWITCH ASSEMBLY
Conrad M. Pastwa, W. Chicago, and Richard L. Lauritsen, Hoffman Estates, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio
Filed Dec. 14, 1989, Ser. No. 450,896
Int. Cl.[5] H01H *1/00*
U.S. Cl. 200—291 6 Claims



1. An electric switch assembly comprising:
(a) housing means;
(b) an actuator lever means disposed for movement between first and second positions about a pivot on said housing, said lever having first portions thereof extending exteriorly of said housing means and second portions thereof disposed interiorly of said housing means;
(c) movable contact means mounted on said second portions of said lever means and movable therewith;
(d) a pair of contact strips disposed interiorly of said housing means in spaced generally parallel arrangement, one of said strips is a common bus and the other has a discontinuity therealong dividing said strip into plural electrically separate segments, said one strip and said segments having integrally formed therewith terminal means extending exteriorly of said housing means, said strips further having formed integrally therewith auxiliary surfaces at a common station therealong; and movement of said actuator lever means alternately between said first and second positions causes said movable contact means to alternately make a circuit between said bus and one of said segments, wherein said auxiliary surfaces provide detent action for said contact means.

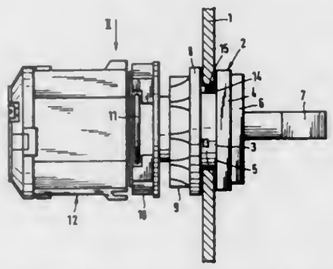
5,045,655
PANEL MOUNTED ELECTRICAL MODULE
Bernd Ludwig, and Heinz Kleine, both of Marienhelde, Fed. Rep. of Germany, assignors to Square D Company (Deutschland) GmbH, Fed. Rep. of Germany
Filed Nov. 19, 1990, Ser. No. 615,688
Claims priority, application European Pat. Off., Nov. 23, 1989, 89121648
Int. Cl.[5] H01H *9/02*
U.S. Cl. 200—296 20 Claims

1. A housing adapted to be affixed to an assembly plate through a substantially circular bore hole thereof which selectively includes or excludes a notch opening radially inwardly into the bore hole comprising a rib carried by said housing adapted for entry into a radially inwardly opening notch of an associated assembly plate, said rib possessing high shear resistance in a direction substantially tangential to said housing, and said rib including weakening means for effecting relatively low

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force break off of said rib upon the application of radial or axial forces thereto whereby said housing can be readily affixed to a



substantially circular bore hole exclusive of a radially inwardly opening notch.

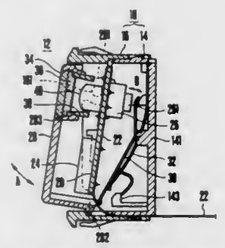
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5,045,656

## SWITCH PROVIDED WITH INDICATOR

Hisanao Kojima, Amagasaki, Japan, assignor to Idec Izumi Corporation, Osaka, Japan

Filed Nov. 9, 1989, Ser. No. 433,943
Claims priority, application Japan, Jul. 5, 1989, 1-079750[U]; Jul. 7, 1989, 1-080676[U]; Oct. 13, 1989, 1-267633
Int. Cl.[5] H01H *21/02*
U.S. Cl. 200—314 12 Claims



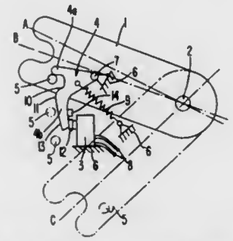
1. A built-in indicator switch unit comprising:
- a casing made of an insulating material and having a substantially open front portion and a rear portion;
- a printed circuit board arranged in said casing, substantially in parallel to said front portion of said casing, said printed circuit including a part projecting outside said casing;
- an indicator attached to a front side of said printed circuit board in said casing and facing said open front portion;
- a switch attached to a rear side of said printed circuit board;
- a light-transmissible operation cover fitted in said front portion of said casing and movable in a direction of a pushing force exerted on said operation cover; and
- an operation mechanism for actuating said switch, said operation mechanism inverting said pushing force to a reversed force in response to a pushing operation applied on said operation cover, whereby said switch is actuated by said reversed force.

5,045,657

## ACTUATING DEVICE FOR THE MECHANICAL POSITIVE ACTUATION OF A PRESSURE-RESPONSE SWITCH

Klaus Claar, Gechingen; Jürgen Schrader, Stuttgart, and Josef Berger, Wolfschlugen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 478,833
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1989, 3905543
Int. Cl.[5] H01H *3/42*
U.S. Cl. 200—332.1 10 Claims



1. An actuating device for a mechanical positive actuation of a pressure-response switch, comprising a control component movable in relation to the switch to effect an additional mechanical function, a pivotably movable, spring-loaded switch lever actuatable by movement of the control component in the same rotation direction and pivotable out of a lift-off position separate from the switch into a switch-triggering position bearing on the switch and thereafter maintained in the switch triggering position, and a spring motionally coupling the switch lever to the control component until the switch-triggering position is reached, the switch lever being pivotable about a joint and the spring loading the switch lever in a direction of switch-triggering actuating advance, wherein the control component is configured to be uncoupled from the switch lever and further movable after the switch-triggering position of the switch lever has been reached and the switch lever is maintained in the switch-triggering position by the spring and wherein the control component is pivotable between two end positions for effecting the mechanical function during an actuating cycle such that the switch is positively actuated during an advance of the pivoting control component over a substantially smaller pivoting angle than is defined by the two end positions in one direction of movement from one of the two end positions to the other of the two end positions, and in the course of a pivoting advance in another direction of movement, the switch lever is taken up by the pivoting control component into the lift-off position, with the spring having energy stored for a next positive actuation of the switch.

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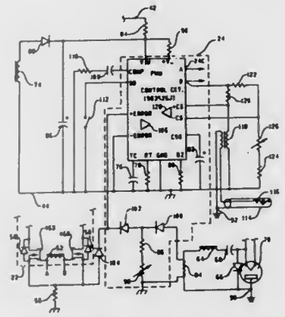
5,045,658

## MAGNETRON WITH TEMPERATURE PROBE ISOLATION

Peter H. Smith, deceased, late of Anchorage, Ky. by Pamela Sheila Smith, executor , assignor to General Electric Company, Louisville, Ky.

Filed Dec. 28, 1987, Ser. No. 138,714
Int. Cl.[5] H05B *6/68*
U.S. Cl. 219—10.55 B 23 Claims

1. A cooking system comprising:
- an AC power source receiving power from an AC input line;
- a cooking element for heating food, said cooking element operatively connected to receive power from said AC power source;
- a control circuit having a floating signal ground, said control circuit connected to said AC power source and operable to control the power of said AC power source;
- a temperature probe for sensing the temperature of the food being heated, said probe having an impedance which varies with changes in temperature, said temperature probe being grounded to a ground of the AC input line; and an isolation transformer having a primary winding connected to said control circuit and a secondary winding connected to said temperature probe; and



wherein said control circuit is operable to change the power of the AC power source upon said variable impedance reaching a value corresponding to a predetermined temperature of food being subjected to said cooking element.

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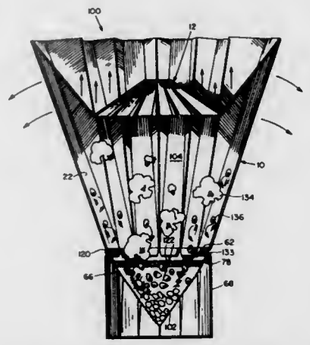


5,045,659

## DISPOSABLE MICROWAVE POPCORN CONTAINER

Robert E. Wolfe, Millis, and John S. Sklenak, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jul. 24, 1989, Ser. No. 383,781
Int. Cl.[5] H05B *6/80*; B65D *81/34*
U.S. Cl. 219—10.55 E 15 Claims



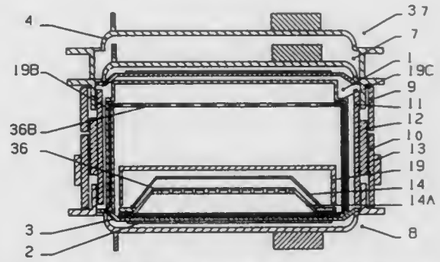
1. A disposable package adapted for popping popcorn kernels in a microwave oven, said package comprising:
- a lower region for holding unpopped kernels in a clump and having a rim disposed along an upper portion of said lower region; and
- an upper region comprising a continuous wall connected to said rim and a cover connected to said continuous wall, said wall having a plurality of substantially vertical folds, and being expandable from a storage configuration where said wall is substantially vertical to a popped configuration where said wall is inclined to direct unpopped kernels disturbed from the lower region back to the lower region.

5,045,660

## INVERTIBLE, MICROWAVE OVEN APPARATUS

Melvin L. Levinson, 8 Stratford Cir., Edison, N.J. 08820

Continuation-in-part of Ser. No. 141,692, Jan. 7, 1988, Pat. No. 4,906,806, which is a continuation of Ser. No. 737,502, May 24, 1985, abandoned, and a continuation-in-part of Ser. No. 106,240, Oct. 7, 1987, Pat. No. 4,923,704, which is a division of Ser. No. 737,502, May 24, 1985, abandoned. This application Nov. 6, 1989, Ser. No. 431,752
The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 E 36 Claims



1. For use in a microwave oven, an invertible microwave cooking apparatus comprising:
- first heat-generating member which includes a first heat-conductive metal grill surface having in contact with its reverse surface a first microwave-absorptive material;
- a second heat-generating member which includes a second heat-conductive metal grill surface having in contact with its reverse surface a second microwave-absorptive material;
- a retaining means to retain said first and second heat-generating members in engagement while the obverse of said first and second grill surfaces oppose each other in spaced-apart relation and while the said apparatus is inverted;
- an enclosed cooking chamber defined by, at least, said first heat-generating member and said second heat-generating member and said retaining means;
- said first heat-generating member which in its grill surface up position, supports food in contact with said first grill surface when said food is being heated; said first grill surface being below but not in contact with said second grill surface; and
- said first heat-generating member being further adapted, in its grill surface down position, to heat and confine vaporous cooking by-products released from food cooking in contact with said second heat-conductive metal grill.

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5,045,661

## WIRE ELECTRODE GUIDE APPARATUS IN A WIRE-CUT ELECTRIC DISCHARGE MACHINE

Gotaro Gamo, Hachioji; Toshiyuki Aso, Oshino, and Sadahiro Watanabe, Kunitachi, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

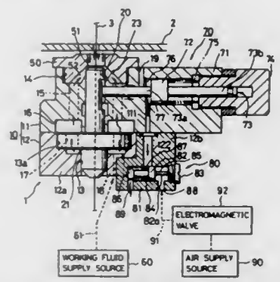
PCT No. PCT/JP89/00281, § 371 Date Nov. 3, 1989, § 102(e) Date Nov. 3, 1989, PCT Pub. No. WO89/08526, PCT Pub. Date Sep. 21, 1989
ub. Date DMar. 15, 1989, Ser. No. 432,773
Claims priority, application Japan, Mar. 15, 1988, 63-59228
Int. Cl.[5] B23H *7/10*
U.S. Cl. 219—69.12 8 Claims

1. A wire electrode guide apparatus for use in a wire-cut electric discharge machine, comprising:
- a guide body adapted to receive a wire electrode;
- a movable guide member disposed to be movable toward and away from said guide body for cooperating with said guide body to support said wire electrode;

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a fluid supply source for supplying a pressurized fluid;
a fluid-operated actuator having a fluid-supplied section for receiving the pressurized fluid and an operating member arranged to apply an urging force to said movable guide member and release the urging force in response to prevention of and permission of supply of the pressurized fluid; respectively, to the fluid-supplied section;




switch means for causing said fluid-supplied section of said fluid-operated actuator to be selectively communicated to either one of said fluid supply source and to the outside of said wire electrode guide apparatus; and
a nozzle disposed adjacent one end of said guide body and formed with a nozzle hole for injecting a working fluid toward a workpiece.

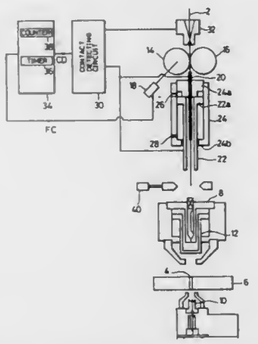
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**5,045,662**

## AUTOMATIC WIRE FEEDING METHOD AND APPARATUS FOR ELECTRODISCHARGE MACHINING

**Hisashi Yamada, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 16, 1990, Ser. No. 480,984**
**Claims priority, application Japan, Feb. 23, 1989, 1-43836**
**Int. Cl.[5] B23H** *7/10*
**U.S. Cl. 219—69.12** **16 Claims**



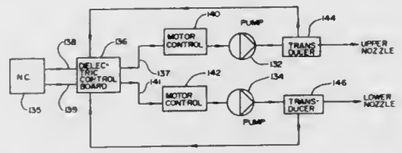
1. An automatic wire feeding method for inserting a wire electrode through a starting hole in a workpiece, comprising steps of:
feeding said wire electrode through a pipe guide toward said starting hole;
causing said wire electrode to vibrate within said pipe guide;
detecting contact between said wire electrode and said pipe guide; and
initiating corrective action if said contact continues for a certain length of time.

**5,045,663**

## SYSTEM FOR CONTROL OF FLUSHING FLOW IN A SPARK DISCHARGE (EDM) MACHINE

**James T. Neal, Mooresville, and Darrel D. Huff, Jr., Huntersville, both of N.C., assignors to Elox Corporation, Davidson, N.C.**

**Filed Feb. 27, 1990, Ser. No. 485,615**
**Int. Cl.[5] B23H** *7/02, 7/36*
**U.S. Cl. 219—69.12** **10 Claims**




1. A control system for an electro-erosion machine tool having a translatable filamentary erosion electrode and spaced first and second electrode guide and fluid delivery means, said first electrode guide and fluid delivery means having a first outlet for discharging fluid in a first direction generally along said electrode, said second electrode guide and fluid delivery means having a second outlet for discharging fluid in a second direction generally along said electrode, said control system comprising:
means for developing first and second electrical signals in response to required fluid conditions at said first and second outlets, said first and second electrical signals representing a flow rate at said required flow conditions below a threshold flow rate and said first and second electrical signals representing a pressure at said required flow conditions above said threshold flow rate;
first means for controlling the fluid flow output of said first outlet in response to said first electrical signal, said first fluid flow output control means including a first motor means for developing a first pump control signal, said first motor means being responsive to said first electrical signal, and a first pump responsive to said first pump control signal to provide said required fluid flow conditions at said first outlet; and
second means for controlling the fluid flow output of said second outlet in response to said second electrical signal, said second fluid flow output control means including a second motor means for developing a second pump control signal, said second motor means being responsive to said second electrical signal, and a second pump responsive to said second pump control signal to provide said required fluid flow conditions at said second outlet.

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**5,045,664**

## MACHINE TOOL WITH GRINDING FUNCTION AND TRUING/DRESSING METHOD OF GRINDING STONE USING IT

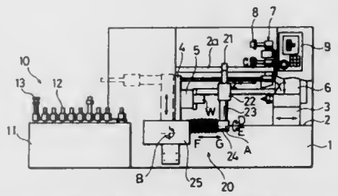
**Takeo Nakagawa, 223-4, Ichinotsubo, Nakahara-ku, Kawasaki-shi, Kanagawa-ken; Kiyoshi Suzuki, Kanagawa; Tetsutaro Uematsu, Tokyo; Norihiko Shimizu; Sakae Hatano, both of Aichi; Munetada Kurita, Gifu; Kanji Sato, Aichi, and Yoshiharu Takada, Chiba, all of Japan, assignors to Yamazaki Mazak Corporation, Aichi and Takeo Nakagawa, Kanagawa, both of, Japan**

**Continuation of Ser. No. 277,883, Aug. 3, 1988, abandoned. This application Jul. 9, 1990, Ser. No. 550,794**
**Claims priority, application Japan, Aug. 3, 1987, 62-194031; Aug. 3, 1987, 62-194032; Aug. 3, 1987, 62-194033**
**Int. Cl.[5] B23H** *1/00*
**U.S. Cl. 219—69.2** **16 Claims**

1. A machine tool having an electric discharge truing and dressing apparatus with a grinding function, comprising:
a single machine body;



a workpiece spindle mounted on said machine body so as to be free to be rotated;
a holding means on said workpiece spindle for selectively holding a workpiece or an electrode for performing electric discharge truing and dressing on a grinding stone for performing grinding machining on the workpiece;
a tool rest mounted on said machine body so as to be free to be moved and driven;
a turning tool for turning an electrode and a grinding stone installed on said tool rest so as to be free to be selectively used;



an electricity feed means and a contact means for electrically contacting said electricity feed means with said holding means and said tool rest when electric discharge truing and dressing is performed on said grinding stone while an electrode is held by said holding means;
a storage magazine for storing a plurality of workpieces and a plurality of electrodes; and
a loading means for carrying a workpiece or an electrode between said storage magazine and said workpiece spindle.

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**5,045,665**

## FLUID COOLED TORCH

**Vicken R. Sarkissian, Woodland Hills, Calif., assignor to Delaware Capital Formation, Burbank, Calif.**

**Filed Apr. 16, 1990, Ser. No. 510,355**
**Int. Cl.[5] B23K** *9/00*
**U.S. Cl. 219—75** **4 Claims**



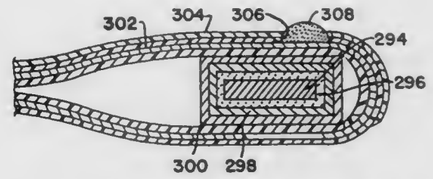
1. Torch system having concentric tubes, comprising:
a torch head having an axial bore and a face at one end substantially normal to said axial bore;
a center tube coaxial with said axial bore and communicating therewith;
said head having a chuck recess adapted to hold an electrode;
a passageway communicating with said axial bore and adapted to flow shielding gas to the electrode;
an inner tube coaxially circumjacent said center tube and having one end abutting said face, an interior region of said inner tube comprising a first axial passage in heat transfer relation with said face;
an outer tube concentric with and circumjacent said inner tube, the annular region between the walls of said inner and outer tubes comprising a second axial passage;
said one end of said inner tube having passage means through the wall of said inner tube to provide fluid passage between said first axial passage and said second axial passage;
whereby fluid may flow through one of said axial passages to said face, through said passage means, and thence through the other said axial passage, with consequent heat exchange between said torch head and the fluid.

**5,045,666**

## SELF-SOLDERING FLEXIBLE CIRCUIT CONNECTOR

**Harold B. Kent, San Carlos, Calif., assignor to Metcal, Inc., Menlo Park, Calif.**

**Continuation of Ser. No. 252,738, Oct. 3, 1988, abandoned, which is a division of Ser. No. 746,796, Jun. 20, 1985, Pat. No. 4,788,404. This application Apr. 30, 1990, Ser. No. 515,333**
**Int. Cl.[5] B23K** *1/00*
**U.S. Cl. 219—85.22** **12 Claims**




1. The method of connecting a flexible circuit board having a plurality of conductors imbedded in the insulation of the board to further electrical circuits comprising the steps of
removing insulation from a length of conductor on at least one side of a predetermined array of conductors to expose such lengths of conductors,
bringing the exposed lengths of the predetermined array of conductors into contact with an array of a second group of conductors,
supplying solder to the surfaces of contact between the arrays,
contacting the entire surface of the board immediately opposite the array of exposed conductors with an incrementally temperature variable self regulating electric heater and
energizing the heater,
whereby each individual solder connection receives only that amount of heat energy necessary to melt the solder and bond the conductors to one another.

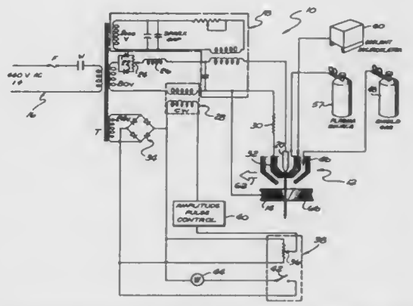
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**5,045,667**

## MANUAL KEYHOLE PLASMA ARC WELDING SYSTEM

**William F. Iceland, Los Alamitos, and Charles D. Rosen, Huntington Beach, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jun. 6, 1990, Ser. No. 534,572**
**Int. Cl.[5] B23K** *9/00*
**U.S. Cl. 219—121.54** **9 Claims**



1. A manual key hole plasma arc welding system, comprising:
(a) a power source for providing a sinewave alternating current;

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(b) a manual plasma arc welding torch assembly, including,
(i) a shield cup having a terminal edge having a centrally disposed longitudinal axis,
(ii) a orifice subassembly concentrically disposed within said shield cup, said orifice subassembly having a terminal end, a shield gas discharge annulus being formed between the terminal edge of the shield cup and the terminal end of the hollow orifice subassembly,
(iii) an electrode, being connected to a first terminal of said power source, said electrode being concentrically disposed within said orifice subassembly, a plasma gas discharge annulus being formed between the terminal end of the hollow orifice subassembly and a terminus of said electrode,
said terminal edge of the shield cup being extended beyond the terminal end of the orifice subassembly and so constructed to produce a laminar shield gas discharge flow through said discharge annulus providing cooling of the orifice subassembly;
(c) a shield gas source in fluid communication with said shield gas discharge annulus, for providing a flow of an inert shield gas through said shield gas discharge annulus to said workpiece;
(d) a plasma gas source in fluid communication with said plasma gas discharge annulus, for providing a flow of inert plasma gas through said plasma gas discharge annulus, said flow being substantially collimated;
a second terminal of said power source being connected to the workpiece so as to provide a transferred arc between said electrode and said workpiece, the power density being sufficient to provide keyhole welding, the reversing sinewave polarities providing simultaneous keyhole penetration and cathodic cleaning eliminating the requirement of substantial workpiece surface preparation and/or removal of internal workpiece defects.

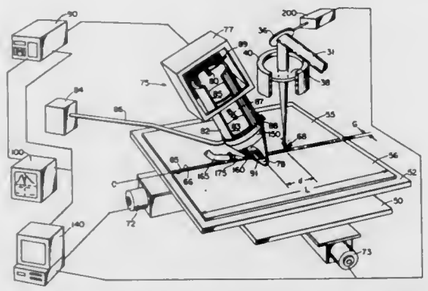
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**5,045,668**

## APPARATUS AND METHOD FOR AUTOMATICALLY ALIGNING A WELDING DEVICE FOR BUT WELDING WORKPIECES

**Gary L. Neiheisel, Cincinnati; William W. Nagle, Hillsboro; Robert J. Justice, Hamilton, and Bradley R. Hoover, Hamilton, all of Ohio, assignors to Armco Inc., Middletown, Ohio**

**Filed Apr. 12, 1990, Ser. No. 508,904**
**Int. Cl.[5] B23K** *26/02*
**U.S. Cl. 219—121.83** **30 Claims**



1. An apparatus for automatically and continuously aligning a welding device along approximately the center of a continuous gap defined by confronting proximal edges of at least two workpieces to be joined, wherein relative motion between said welding device and said workpieces along a longitudinal axis substantially parallel to said gap permits joining of said confronting edges of said workpieces by said welding device by application of welding energy at a welding zone along said edges, said aligning apparatus comprising:
(a) an imaging system for determining the location of said gap center relative to a predetermined two dimensional coordinate system, wherein an image of a vision area spaced downstream of said welding zone along said longitudinal axis is produced, said vision area designed to span said gap and include said confronting edges of said workpieces;
(b) means for receiving and transforming said image of said vision area into an output signal defining the location of said gap center relative to said welding device;
(c) means for automatically adjusting the relative positions of said welding device and said center of said gap in response to said output signal such that said welding device and said center are continuously aligned at all times; and
(d) means for effectively isolating said vision area from said welding zone, said isolating means including a jet of inert gas provided adjacent said welding zone to divert weld plume, smoke, spatter and other welding debris from said vision area.

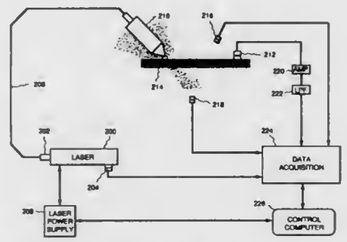
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**5,045,669**

## METHOD AND APPARATUS FOR OPTICALLY/ACOUSTICALLY MONITORING LASER MATERIALS PROCESSING

**Angel L. Ortiz, Jr., Scotia, and John L. Schneiter, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 2, 1990, Ser. No. 487,092**
**Int. Cl.[5] B23K** *26/02*
**U.S. Cl. 219—121.83** **16 Claims**




1. An apparatus for monitoring laser materials processing of a workpiece, said apparatus comprising:
means for optically monitoring the processing and generating a processing signal representative of the processing, said optical monitoring means comprising a first optical sensor disposed so as to view the workpiece on a same side that a laser beam is to be applied;
means for acoustically monitoring the processing and generating a processing signal representative of the processing;
means for interpreting said processing signals and generating an interpreted output; and
means for controlling the materials processing based upon said interpreting means interpreted output and by generating a control signal applied to a laser materials processing component.

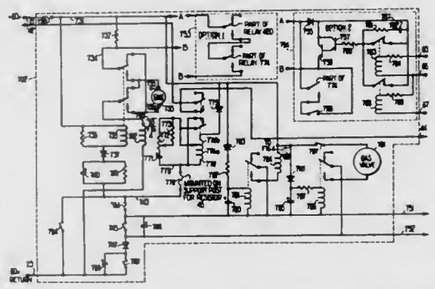


**5,045,670**

## METHOD AND APPARATUS FOR EXTENDING THE BRUSH LIFE OF A COOLING FAN IN AN ELECTRONIC WELDER

**Malcolm T. Gilliland, 310 Pine Valley Rd., Marietta, Ga. 30067**

**Division of Ser. No. 62,543, Jun. 12, 1987, Pat. No. 4,896,018, which is a continuation-in-part of Ser. No. 791,224, Oct. 25, 1985, Pat. No. 4,716,274. This application Nov. 3, 1989, Ser. No. 431,197**
**Int. Cl.[5] B23K** *9/10*
**U.S. Cl. 219—130.1** **17 Claims**



7. An improved welding system, comprising:
a welding station having at least a first operating mode and a second operating mode;
a fan, having at least one pair of contact brushes, for providing cooling for said welding station;
first means for providing a first operating voltage;
second means for providing a second operating voltage;
third means for providing a third operating voltage for said fan to said pair of brushes by providing said first operating voltage when said welding station is in said first operating mode, and by providing said second operating voltage when said welding station is in said second operating mode; and
fourth means, responsive to each transition of said welding station from said second operating mode to said first operating mode, for reversing the polarity of said third operating voltage;
wherein the operating life of said pair of brushes is extended by causing said pair of brushes to be alternately subjected to operating voltage of a first polarity and then of a second polarity; and
wherein said operating life of said pair of brushes is extended by causing said fan to operate at a higher speed when said welding station is in said first operating mode and to operate at a lower, non-zero speed when said welding station is in said second operating mode.

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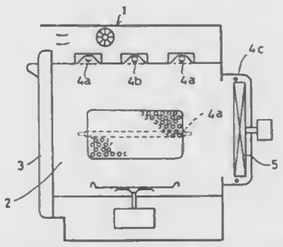
**5,045,671**

## OVEN USING HALOGEN LAMPS

**Yoshihiro Kanaya, and Makoto Morishima, both of Nagoya, Japan, assignors to Rinnai Kabushiki Kaisha, Japan**

**Filed May 16, 1990, Ser. No. 524,204**
**Claims priority, application Japan, May 19, 1989, 64-57763**
**Int. Cl.[5] A21B** *1/00*
**U.S. Cl. 219—411** **3 Claims**

1. An oven having a plurality of heat sources for cooking by heating a material inside an oven chamber, the capacities of said heat sources being arranged to be capable of independent control, the operating time thereof being arranged to be set by a timer, wherein heat sources not operated or operated at a reduced capacity are operated substantially at their full capacities for a predetermined period of time after a cooking time set by the timer has elapsed.



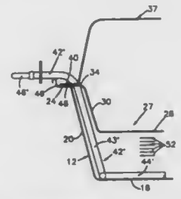
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**5,045,672**

## CHAFING DISH AND METHOD OF USING SAME

**Chester B. Scott, 35 Broadwalk Villas, Lexington, S.C. 29072**

**Continuation-in-part of Ser. No. 438,777, Nov. 17, 1989, abandoned. This application Oct. 10, 1990, Ser. No. 595,187**
**Int. Cl.[5] H05B** *3/78*
**U.S. Cl. 219—439** **22 Claims**



1. A chafing dish comprising:
(a) a water pan including a base and side walls defining a water retaining space;
(b) a flanged food pan including side walls and an imperforate bottom defining a food retaining space;
(c) the food pan flanges and upper surfaces of the water pan side walls being complementally configured to provide coacting food pan support surfaces for supporting the food pan bottom above the water pan base and above the intended level of water in the water pan when the dish is in use;
(d) an immersion heater having a heat generating capacity appropriate to maintain any quantity of water in the water pan which quantity is within the operating range of the dish at an elevated temperature below the boiling point while the dish is in use, said heat generating capacity being insufficient to cause the water to reach its boiling point during normal operation of the dish the heater being adapted for direct connection to a power source without intervening electrical controls;
(e) the heating element being a lift out element including an immersible water heating portion sized and configured to rest on the water pan base the element including an upstanding arm for projecting upwardly above the intended level of water in the water pan and outwardly for connection to a power source, the heater including the arms having continuous imperforate walls extending upwardly above the intended water level; and,
(f) one of the pans complemental surfaces being notched to receive said up standing arms.

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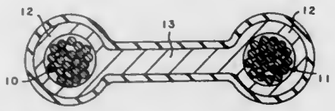


**5,045,673**

## PTC DEVICES AND THEIR COMPOSITION

**Cornelius J. N. Kelly, Simsbury, Conn., assignor to General Signal Corporation, Stamford, Conn.**

**Filed Apr. 4, 1990, Ser. No. 504,499**
**Int. Cl.[5] H05B *3/00***
**U.S. Cl. 219—553** **14 Claims**




1. An electrically conductive self-regulating heater article capable of operation at high temperatures, said article comprising at least two spaced elongated electrodes electrically interconnected by and embedded in a self-regulating semiconductive composition exhibiting a positive temperature coefficient of electrical resistance, said composition containing (a) a fluoropolymer having (i) at least 20% crystallinity as determined by X-ray diffraction and (ii) a melting point of at least 170° C. and (b) a particulate filler component which is dispersed in the polymer and which comprises carbon black in an amount from 12 to 20% by weight of the composition the improvement which comprises:

the carbon black comprising three carbon blacks, each characterized by low structure and high resistivity, first and second ones of the carbon blacks being selected to impart the positive temperature coefficient and the third carbon black being selected to adjust the resistive properties of the composition into the range of commercial usage.

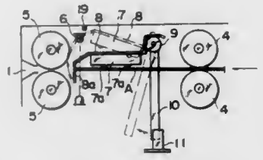
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**5,045,674**

## IC CARD READER/WRITER HAVING ROTATING CONTACT SUPPORT WITH PIN-CHECK VERIFICATION

**Katsuya Mita, Kyoto, and Muneki Morisbita, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Oct. 18, 1988, Ser. No. 258,885**
**Claims priority, application Japan, Oct. 21, 1987, 62-267456**
**Int. Cl.[5] G06K *7/00, 7/06, 13/00, 13/08***
**U.S. Cl. 235—439** **8 Claims**




1. An IC card reader/writer comprising:

a conveying means for conveying an IC card;

a position sensor for detecting that an IC card conveyed by said conveying means has reached a predetermined position;

a movable supporting member which is supported along a conveying path of said conveying means, said supporting member being provided with a connector having contact members adapted to come into contact with contacts of the IC card upon movement of said supporting member to a read/write position;

a driving means for moving said supporting member between a standby position at which said contact members do not make contact with said contacts and said read/write position at which said contact members make contact with said contacts;

a state sensor means for detecting that said supporting member has been moved to said read/write position;

a pin check means for checking whether said contact members have properly come into contact with said contacts of the IC card and for generating a first signal indicating no error when proper contact is made or a second signal indicating an error when proper contact is made;

a first control means for controlling said conveying means to cause an IC card carried by said conveying means to stop at said predetermined position in response to a signal from said position sensor and to reposition the IC card at said predetermined position in response to a signal from said state sensor means indicating said supporting member is not in the read/write position after said supporting member has been moved toward said read/write position; and

a second control means for controlling said driving means to move said supporting member from said standby position to said read/write position in response to said signal from said position sensor and to again try moving said supporting member to said read/write position in response to a signal from said state sensor means indicating that said supporting member is in the read/write position and said second signal representing that an error has occurred.

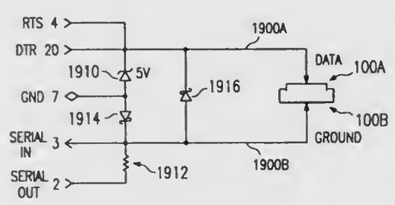
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**5,045,675**

## SERIAL PORT INTERFACE TO LOW-VOLTAGE LOW-POWER DATA MODULE

**Stephen M. Curry, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.**

**Filed May 15, 1989, Ser. No. 351,999**
**Int. Cl.[5] G06K *7/06***
**U.S. Cl. 235—441** **3 Claims**




1. A method for read/write interfacing from a serial port to a portable battery-powered open-collector electronic token data module over a one-wire-bus, comprising the steps of:

programming a receiver/transmitter chip, which has connections for a serial port's transmit-data line and a receive-data line, to operate at a baud rate which is specified in terms of invariant units, and which is much higher than the highest bit rate at which the module could be relied on to provide a reliable bit-by-bit interface;

operatively connecting said receiver/transmitter chip to the module through an output network which includes a substantial admittance between said transmit-data line and said receive-data line; and

when data is sought to be written to said module, writing one byte of data onto said transmit-data line for each bit of data which is sought to be written into said module;

when data is sought to be read from said module, writing one byte of data onto said transmit-data line for each bit of data which is sought to be written into said module, and monitoring data values which are seen on said receive-data line while said transmit-data line is being driven, to ascertain the state of said module.

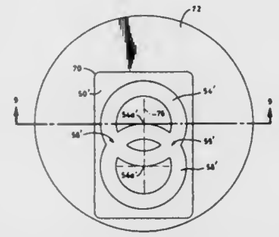


**5,045,676**

## OPTICAL MEDIA HAVING INTERLACED DATA RINGS

**Milford B. Kime, 221 Mt. Auburn St., Cambridge, Mass. 02138**

**Continuation-in-part of Ser. No. 130,065, Dec. 8, 1987, abandoned. This application Mar. 15, 1988, Ser. No. 168,643**
**Int. Cl.[5] G06K *19/00***
**U.S. Cl. 235—487** **16 Claims**




1. An optical information storage card of the type that can be read and/or written on by an optical reader and/or writer by way of an optical beam, the reader and/or writer being of the type configured for servo tracking, said card comprising:

a substrate having a generally rectangular format and;

a plurality of generally annular, axially offset and interlacing data bands, comprising a continuous spiral track or a plurality of concentric tracks, of an optical recording medium on a surface of said substrate, said recording medium being of a type which can be optically read and/or written on;

each of said bands being arranged and having a corresponding axis of rotation about which said card can be relatively rotated with respect to an optical reader and/or writer device, and each of said bands being formatted with prerecorded data sector and servo tracking information, so that information of each of said data bands can be read and/or written on without hinderance from any other band in areas where the paths of such bands intersect while facilitating maintenance of servo tracking.

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**5,045,677**

## COMBINING BAR CODE READ DATA FROM A PLURALITY OF SCANNING LINES FORMED FROM ONE-DIMENSIONAL IMAGES

**Hideki Okamura, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Sep. 28, 1988, Ser. No. 250,181**
**Claims priority, application Japan, Sep. 28, 1987, 62-245293; Sep. 28, 1987, 62-245294**
**Int. Cl.[5] G06K *7/01, 5/00***
**U.S. Cl. 235—462** **3 Claims**

1. A method for reading and combining fragmentary bar code data from a bar code having a first and second edge, said method comprising the steps of:

emitting a plurality of one-dimensional images from a scanner, each said image having an address corresponding to a point in time;

moving once in a single direction said scanner relative to said bar code over a duration of a plurality of said points in time, thereby forming a plurality of scanning lines from a sequence of said one-dimensional images corresponding to said plurality of points in time, said scanning lines being parallel to each other, each of said scanning lines having along its length a sequence of said addresses corresponding to said sequence of one-dimensional images;

reading a bar code data segment from each said scanning line, each said bar code data segment have a location corresponding to said address sequence, said reading step comprising the steps of:

scanning said bar code data from a first of said scanning lines,

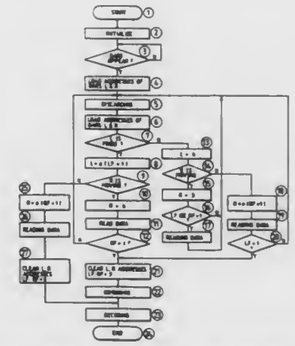
determining whether a first occurrence of a fixed edge at said first edge of said bar code has occurred,

determining whether a second occurrence of a fixed edge at said second edge of said bar code has occurred,

reading a bar code data segment from a next adjacent scanning line only if said first edge and said second edge are both determined to be fixed edges, and

repeating said step of determining whether said first occurrence has occurred with respect to said bar code data scanned from another of said scanning lines until said first edge and said second edge are both determined to be said respective fixed edges;

determining for each of said bar code data segments a data head and a data tail; and



combining said data tail from each said scanning line with a data head from said next adjacent scanning line, thereby combining the fragmentary bar code data, said combining step comprising the steps of:

determining an address difference between said data trail of said scanning line and said data head from said next adjacent scanning line,

comparing said bar code segment from said scanning line and an overlapping bar code data located, in accordance with said address difference, before said data head on said next adjacent scanning line,

connecting said data head of said next adjacent scanning line to said data tail of said scanning line if said comparison falls within a predetermined range of similarity, and

repeating said connecting step until said data tail is said second fixed edge.

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**5,045,678**

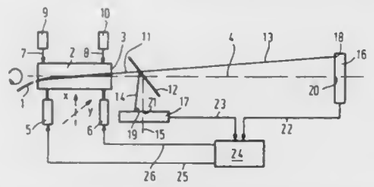
## METHOD OF AND ARRANGEMENT FOR DETERMINING THE POSITION OF THE OPTICAL AXIS OF AN OPTICAL WAVEGUIDE

**Hildegard Esser, Cologne, and Michael Jechalik, Essen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.**

**Filed Oct. 25, 1989, Ser. No. 428,266**
**Claims priority, application Fed. Rep. of Germany, Oct. 29, 1988, 3836954**
**Int. Cl.[5] G01J *1/20;* G02B *6/02***
**U.S. Cl. 250—201.1** **18 Claims**

1. A method of determining the position of the optical axis of an optical waveguide (1) relative to a nominal axis (4), in which method the position of a light spot (18, 19) formed on detector surfaces of at least one detector (16, 17) by a light beam (11) leaving the optical waveguide (1) is determined relative to a nominal position (20, 21), wherein the light beam (11) is guided onto said detector surfaces (16, 17) arranged at two different distances from an end face of the optical waveguide (1) and the

deviations of the light spots (18, 19) formed on the detector surfaces from their nominal positions (20, 21) are evaluated as



criteria for the relative values of angular and lateral positions of the optical waveguide (1).

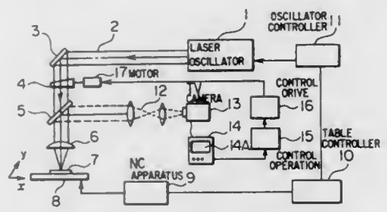
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**5,045,679**

## OPTICAL PATH ADJUSTING SYSTEM WITH DUAL-AXIS WEDGE PRISMS

**Minoru Suzuki, and Kazuo Mera, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 1, 1989, Ser. No. 443,502**
**Claims priority, application Japan, Dec. 9, 1988, 63-310036**
**Int. Cl.[5] G01J** *1/20*
**U.S. Cl. 250—201.1** **12 Claims**



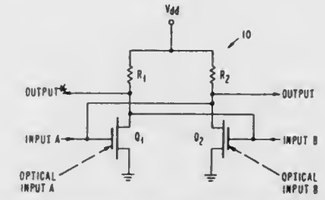

1. An optical path adjusting system comprising:
a condenser lens to which a light beam is incident;
wedge prism means displaceably disposed on the incident optical path side of said condenser lens;
detection means for detecting a position of irradiation of said light beam;
control means responsive to an irradiation position signal from said detection means for producing an error correction signal representing an error of the position of irradiation relative to a reference position; and
driving means responsive to said error correction signal from said control means for displacing said wedge prism means so as to make the light beam parallel to an optical axis of said condenser lens;
wherein said wedge prism means includes an X-axis wedge prism and a y-axis wedge prism disposed in opposition to each other so as to be displaceable in the directions of x and y axes of a surface of a work respectively, said x-axis wedge prism and y-axis wedge prism being displaced in said x and y directions by said driving means, and display means is provided between said detection means and said control means so as to display thereon coordinates of x and y axes of a surface of a work, said reference position and said position of irradiation.

**5,045,680**

## INTEGRATED CIRCUIT OPTOELECTRONIC TOGGLE F/F

**Bunsen Fan, Peekskill, and Ricky A. Rand, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 18, 1990, Ser. No. 466,902**
**Int. Cl.[5] H01J** *31/50*
**U.S. Cl. 250—213 A** **20 Claims**




1. Clock generator integrated circuit apparatus for generating a periodic electrical signal comprising:
set-reset flip/flop means comprised of a first switching means and of a second switching means both of which are fabricated upon a common substrate, an output electrical terminal of the clock generator integrated circuit apparatus being coupled to an output terminal of one of the switching means; and
means for receiving pulses of optical radiation integrally formed on the common substrate with each of the switching means, the receiving means comprising a first optical receiver means and a second optical receiver means each being coupled to an input of an associated one of the switching means for causing, in response to the receipt of a pulse of optical radiation by one of the optical receiver means, the associated switching means to toggle between an off-state and an on-state for generating a change of state of an electrical signal at the output electrical terminal of the clock generator integrated circuit apparatus.

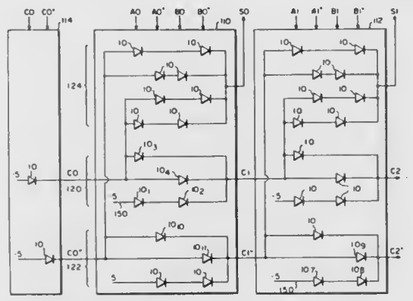
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**5,045,681**

## OPTOELECTRIC RIPPLE CARRY ADDER

**Steven E. Elrod, Kent; R. Aaron Falk, Renton, and Keith H. Hill, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sep. 29, 1989, Ser. No. 414,006**
**Int. Cl.[5] H01J** *31/50*
**U.S. Cl. 250—213 A** **25 Claims**



1. An apparatus, comprising:
a semiconductor substrate;
element defining means for defining a plurality of photoconductive elements in said semiconductive substrate;
connecting means for connecting a plurality of said photoconductive elements to form a ripple carry adder comprising a plurality of similar cells each having complementary inputs, a sum output, a carry output and a complementary carry output such that said ripple carry adder comprises only AND and OR gates and
light directing means positioned above said semiconductor substrate for directing light representing logic parameters to selected photoconductor elements of said logic gates.



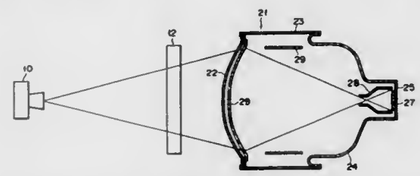
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**5,045,682**

## X-RAY IMAGE INTENSIFIER HAVING COLUMNAR CRYSTALS HAVING A CROSS SECTION DECREASE AS IT GOES TOWARDS THE EDGE

**Katsuhiro Ono, Kawasaki, and Hidero Anno, Ootawara, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 22, 1990, Ser. No. 526,907**
**Claims priority, application Japan, May 23, 1989, 1-129842**
**Int. Cl.[5] H01J** *31/50, 40/14*
**U.S. Cl. 250—213 VT** **8 Claims**



1. An X-ray image intensifier comprising:
an input screen for converting incident X-rays into photoelectrons; and
an output screen opposed to the input screen and adapted to convert the photoelectrons from the input screen into visible radiation;
said input screen including a substrate, a phosphor layer having a large number of columnar crystals of a phosphor formed with gaps therebetween on the substrate, and a photoemissive layer directly or indirectly provided on the phosphor layer; and
the cross section of said columnar crystals at a peripheral edge portion of the input screen being smaller than that of the columnar crystals at a central portion of the input screen.

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**5,045,683**

## LIGHT ABSORPTION DETECTOR WITH LIGHT EMITTING AND LIGHT RECEIVING ELEMENTS

**Masahiko Kanda, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Jan. 16, 1990, Ser. No. 465,928**
**Claims priority, application Japan, Jan. 17, 1989, 1-4137[U]; May 10, 1989, 1-116757**
**Int. Cl.[5] G01J** *1/32*
**U.S. Cl. 250—205** **7 Claims**



1. A light absorption detector, comprising:
a film substrate light emitting means ($LED_1$, $LED_2$) secured on a flat surface of said film substrate for directing light to a subject; a first light receiving element spaced, on said film substrate, a predetermined distance apart from said light emitting means, for receiving light from said subject; a second light receiving element located near said light emitting means, for detecting a change in the quantity of light with a change in the temperature of said light emitting means; said second light receiving element being arranged together with said light emitting means on the same flat surface of said film substrate for directly receiving light from said light emitting means; control means (14, 15, 16) for controlling a current flowing through said light emitting element so as to correct the change in the quantity of light with the change in the temperature of said light emitting element in accordance with a power of received light of said second light receiving element; said detector further comprising a transparent semispherical resin cover (13) on said film substrate for covering said light emitting means and said second light receiving element, said second light receiving element being positioned for receiving a portion of light received from said light emitting means and reflected by a semi-spherical inner surface of said resin cover (13); and wherein said resin cover (13) comprises an evaporated silver film (131) on its surface.

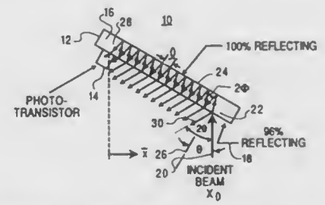
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**5,045,684**

## LIGHT DETECTION WITH WAVEGUIDE HAVING FULLY AND PARTIALLY REFLECTING SIDES

**Michael J. Burns, Earleton, Fla., assignor to University of Florida, Gainesville, Fla.**

**Filed Feb. 28, 1990, Ser. No. 485,892**
**Int. Cl.[5] H01J** *40/14*
**U.S. Cl. 250—206.1** **23 Claims**




1. A light detection system comprising:
an elongate light conducting member having a substrate of transparent material with a first side and a second side, said first side having a partially reflecting surface, said second side having a reflecting surface which is at least partially reflecting, said light conducting member having an incident zone for entry of light into said light conducting member and a detection zone for detection of light which is a portion of the light which has entered into said light conducting member, which portion has a magnitude determined by multiple reflections between said first side and said second side; and
a photodetector mounted to sense said portion of the light at said detection zone, said photodetector being an individual detector which provides an output dependent on the position and intensity of light which hits the light conducting member at said incident zone, and wherein said first side is planar and said second side is planar and is parallel to said first side.

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**5,045,685**

## ANALOG TO DIGITAL CONVERSION ON MULTIPLE CHANNEL IC CHIPS

**Llewellyn E. Wall, Concord, Mass., assignor to Irvine Sensors Corporation, Costa Mesa, Calif.**

**Continuation-in-part of Ser. No. 329,003, Mar. 27, 1989, abandoned. This application Jun. 6, 1990, Ser. No. 534,969**
**Int. Cl.[5] H01J** *40/14*
**U.S. Cl. 250—208.1** **35 Claims**

1. In an electronic system containing a densely packaged three-dimensional structure which includes circuitry for ob-

VOL 1130 ISS 1 SE 3 1991 UMI

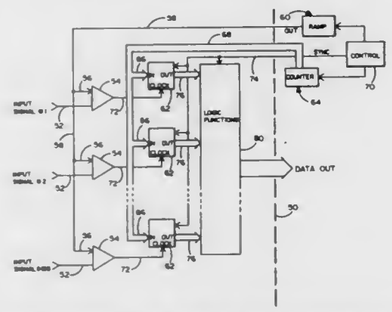


taining and processing analog photodetector signals, such structure (a) being formed by a plurality of stacked circuitry-carrying layers, each having a plurality of parallel signal channels, and (b) having a two-dimensional array of photodetectors located on one surface of the structure, each in contact with a separate signal channel; analog to digital conversion circuitry comprising:

a comparator in each channel having two analog signal inputs and one digital output, one of its input signals being received from the photodetector in the same channel;

a storage register in each channel adapted to receive and store digital values;

an analog voltage ramp generator which has its analog




output connected to one input of each comparator in each of a plurality of channels;

a counter which develops a changing digital value incrementally proportional to the simultaneous analog signal of the ramp generator, and which has its output connected to each storage register in each of a plurality of channels;

each comparator being so arranged that its output changes from one digital value to the other when its two analog voltage inputs reach substantial equality; and

the connection of each comparator to the same channel storage register being such that the storage register maintains the specific output counter value existing at the time of change of the output signal of the same channel comparator.

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**5,045,686**

**SEMICONDUCTOR OPTICAL-READING DEVICE**

**Eiichi Iwanami; Kawahara Yukito, and Hiroshi Mukainakano, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan**

**Continuation-in-part of Ser. No. 177,829, Mar. 23, 1988, Pat. No. 4,906,856, which is a divisIon of Ser. No. 799,413, Nov. 19, 1985, abandoned. This application Mar. 6, 1990, Ser. No. 489,452**

**Claims priority, application Japan, Nov. 20, 1984, 59-245601**

**Int. Cl.[5] H01J** *40/14*

**U.S. Cl. 250—208.1** **12 Claims**

1. A semiconductor reading device comprising:

an insulated substrate;

a plurality of IC reading chips disposed on the insulated substrate, each IC reading chip comprising

a semiconductor substrate having a major surface portion,

a plurality of bipolar transistors for producing video signals in response to incident light, the bipolar transistors being formed in the substrate major surface portion and being equi-distantly aligned in the longitudinal direction of the substrate, and

drive means arranged parallel to the bipolar transistors, the drive means comprising a plurality of signal transmitting elements and shift register means, each of the signal transmitting elements being connected to a respective one of the bipolar transistors, and the shift register means being coupled to the signal transmitting elements for sequentially reading the video signals from the bipolar transistors;

and wherein the distance between the two adjacent bipolar transistors of each two respective adjacent IC reading chips is the same as the distance between the bipolar transistors arranged on the semiconductor substrates.

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**5,045,687**

**OPTICAL INSTRUMENT WITH TONE SIGNAL GENERATING MEANS**

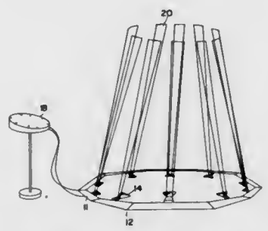
**Asaf Gurner, 4, Ha'avot Street, Holon, Israel**

**Continuation of Ser. No. 349,837, May 10, 1989, abandoned. This application Sep. 26, 1990, Ser. No. 590,505**

**Claims priority, application Israel, May 11, 1988, 86331; Sep. 19, 1988, 87801**

**Int. Cl.[5] G01V** *9/04*

**U.S. Cl. 250—221** **21 Claims**




1. Optical instrument, comprising tone signal-generating means comprising emitter and sensor means and means for producing tone signals responsive to signals produced or transmitted by the sensor means, characterized in that the emitter means emit radiations into an elongated emission space and the sensor means are sensitive to radiation directed towards them from any point of an elongated sensing space, the emission and the sensing spaces being in only partial overlapping relationship, the optical instrument further comprising means for decoding the tone signals and transmitting the same to an interface to a device to be controlled by the instrument.

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**5,045,688**

**METHOD AND APPARATUS FOR INSPECTION OF BOTTLE THREAD HAVING A UNITARY IMAGE PLANE**

**Samuel C. Domenico, Golden, and Thomas S. Lincoln, Arvada, both of Colo., assignors to Coors Brewing Company, Golden, Colo.**

**Filed Dec. 4, 1989, Ser. No. 445,975**

**Int. Cl.[5] G01N** *9/04*

**U.S. Cl. 250—223 B** **13 Claims**

1. A bottle thread inspection apparatus for inspecting a bottle thread arranged in a generally spiral configuration about the periphery of a bottle neck having a central longitudinal axis comprising:

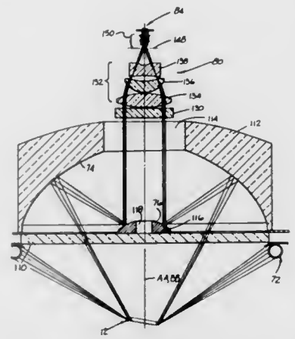
a) light source means for illuminating said bottle thread;

b) mirror means for reflecting light received from said bottle thread into imaging lens means;

c) imaging lens means for focusing an image of said bottle thread on a unitary image plane;

d) signal generating means for generating a data signal representative of said image of said bottle thread focused on said unitary image plane;

e) data analysis means for analyzing said data signal based upon predetermined criteria for detecting flaws in said bottle thread;




said mirror means comprising at least two separate mirror surfaces whereby imaging light from said bottle thread is reflected at least twice by said mirror means.

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**5,045,689**

**METHOD OF ANALYZING GUIDED OPTICS COMPONENTS, OPTICAL FIBERS OR OPTICAL GUIDE NETWORKS BY TIME REFLECTOMETRY AND REFLECTOMETER IN THE TIME SPHERE**

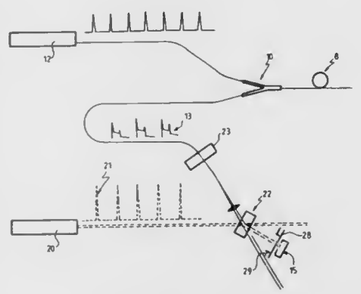
**Claude Froehly, 25 Rue des Sablons, 87100 Limoges; Paul Facq, 73 Rue des Fougéres, 87350 Panazol; Dominique Pagnoux, 29 Avenue du Président Coty, and Pierre Faugeras, 15 rue Camille St. Saens, both of 87000 Limoges, all of France**

**Filed Dec. 14, 1989, Ser. No. 450,689**

**Claims priority, application France, Dec. 14, 1988, 88 16459**

**Int. Cl.[5] H01J** *5/16*

**U.S. Cl. 250—227.15** **10 Claims**




1. A method of analyzing a system comprising guided optical components, optical fibers or optical guide networks by a reflectometry in a time sphere, said method comprising the steps of creating a light probe signal formed of short periodic pulses, feeding the light probe signal into a guide connected to the system; creating a pump signal being formed of a short periodic light pulse with a repetition frequency of the pulses of the pump signal being a frequency that is selected to be one close to the signals of the probe signal, close to a multiple of the frequency of the probe signal and close to a sub-multiple of said frequency of the probe signal, obtaining a backscatter response signal from the system, sampling the backscattered response signal by interacting the pump signal therewith to produce a sampled signal, receiving the sampled signal with a photodetector which is blind to the pump signal and the backscatter response signal, said photodetector recomposing the backscattered response signal from said sampled signal.

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**5,045,690**

Patent Not Issued For This Number

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**5,045,691**

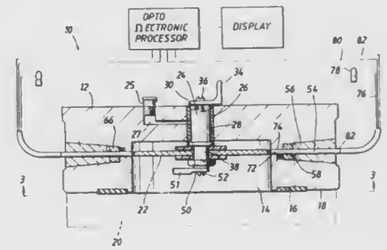
**OPTO-ELECTRONIC SYSTEM FOR MEASURING AND DISPLAYING ROTARY MOVEMENT**

**W. Paul Steward, Humble; Peter M. Sevick, Spring, and Thomas J. Poorman, Houston, all of Tex., assignors to Sensors Unlimited Inc., Houston, Tex.**

**Filed Jan. 29, 1990, Ser. No. 471,546**

**Int. Cl.[5] G01D** *5/34*

**U.S. Cl. 250—231.16** **18 Claims**




1. An optical fiber measurement sensing system for flow meters and other rotating mechanical devices, comprising:

(a) an encoder element disposed for driven rotation and having a plurality of alternating light absorbing and light reflecting areas thereon with sharp lines of demarcation at the intersections thereof;

(b) a source of light;

(c) optical fiber sensor means having at least one light emitting optical fiber receiving light from said source and disposed for projection of light onto said light absorbing and light reflecting areas, said optical fiber sensor further having at least two light pick-up optical fibers disposed to receive light reflected from said light reflecting and light absorbing areas, said pick-up optical fibers being positioned relative to said light emitting optical fiber such that when said light emitting optical fibers is directed at one of said lines of demarcation, one of said pick-up optical fibers

is positioned to receive reflected light from a light reflective surface and another of said pick-up optical fiber is positioned to receive reflected light from an adjacent light absorbing surface, thereby inducing sequential light pulses in said pick-up optical fibers when said lines of demarcation traverse said optical fiber sensor means, as said encoder element is rotated said reflected light forming light pulses being representative of incremental angular rotation and direction of rotation of said encoder element;

(d) opto-electronic signal processing means having input means receiving said sequential light pulses and translating said light pulses into sequentially organized electrical pulses; and

(e) display means receiving said sequentially organized electrical pulses and providing a display representative of the direction and angular rotation of said encoder element.

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**5,045,692**

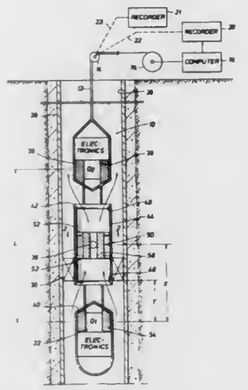
## SIMULTANEOUS FLUID FLOW AND FLUID DENSITY MEASUREMENTS USING ROTAMETER AND NUCLEAR TECHNOLOGY

**Dan M. Arnold, Katy, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.**

**Filed Feb. 22, 1990, Ser. No. 483,499**

**Int. Cl.[5] G01V *5/08***

**U.S. Cl. 250—266** **14 Claims**




1. A method of measuring fluid flow in a well borehole which comprises the steps of:

(a) directing the fluid flow in a well upwardly through a tube having upper and lower ends wherein the tube is vertically positioned in the well borehole;

(b) positioning a float in the tube wherein the float allows flow thereby within the tube;

(c) positioning a radioactive source within the float;

(d) positioning spaced lower and upper detectors near the ends of the tube;

(e) with said detectors, dynamically detecting the position of the float relative to the detectors;

(f) determining the volume flow rate of fluid flowing through the tube as a function of float position in the tube; and

(g) determining simultaneously the density of the fluid.

**5,045,693**

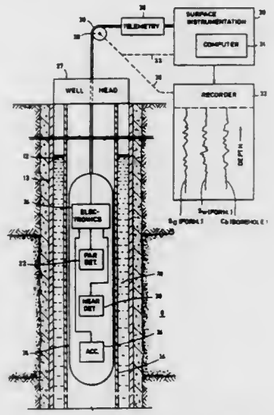
## CARBON/OXYGEN WELL LOGGING METHOD AND APPARATUS

**Donald C. McKeon, Houston; Bradley A. Roscoe, Pasadena, and Christian Stoller, Kingwood, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.**

**Continuation of Ser. No. 401,579, Aug. 24, 1989, Pat. No. 4,937,446, which is a continuation of Ser. No. 203,397, Jun. 7, 1988, abandoned. This application Apr. 26, 1990, Ser. No. 514,915**

**Int. Cl.[5] G01V *5/10***

**U.S. Cl. 250—270** **8 Claims**




1. A method for determining the hydrocarbon saturation $S_o$ of an earth formation surrounding a borehole, comprising the steps of:

emitting fast neutrons into said formation from a neutron source in said borehole,

detecting gamma rays resulting from the interaction between said neutrons and materials from said borehole and said formation;

forming gamma ray spectrum signals from said gamma rays and deriving from said signals the carbon yield and oxygen yield;

expressing said carbon yield as a first linear function of $S_o$ and of the oil percentage in the borehole ($C_b$), and expressing said oxygen yield as a second linear function of $S_o$ and of $C_b$; and

deriving $S_o$ from said first and second linear functions.

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**5,045,694**

## INSTRUMENT AND METHOD FOR THE LASER DESORPTION OF IONS IN MASS SPECTROMETRY

**Ronald C. Beavis, and Brian T. Chait, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.**

**Filed Sep. 27, 1989, Ser. No. 413,321**

**Int. Cl.[5] B01D *59/44*; H01J *49/00***

**U.S. Cl. 250—287** **24 Claims**

1. An instrument system in mass spectrometry to measure the mass of organic molecules including:

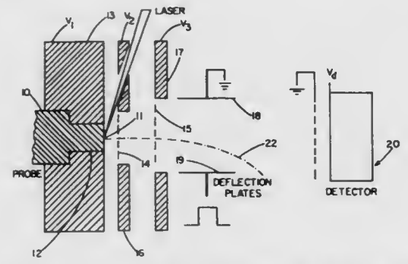
(a) a time of flight mass spectrometer means to analyze the mass of said molecules, including a spectrometer tube, vacuum means to apply a vacuum to the tube, electrical potential means within the tube to apply an accelerating electrical potential, and a probe having a tip face, said probe being removably inserted into said spectrometer means;

(b) laser beam means to produce a laser beam directed at said tip and providing a laser spot on the said tip face having an



area in the range of from 0.1-1.0 $mm^2$ to desorb said organic molecules;

(c) detector means to detect the mass weights with a resolution of the peaks of the ion molecular signals of higher than 50 full width at half-maximum definition (FWHM); and




(d) deflection means comprising a pair of spaced-apart deflection electron plates within said spectrometer tube forming an electrical field between the plates to deflect low mass ions of less than 10,000 Dalton so that they do not reach the detector means.

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**5,045,695**

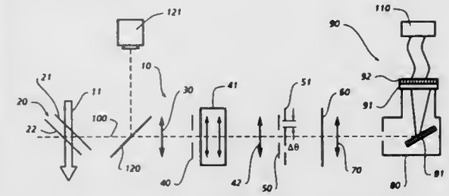
## TRANSITION RADIATION INTERFERENCE SPECTROMETER

**Donald W. Rule, and Ralph B. Fiorito, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 4, 1990, Ser. No. 532,765**

**Int. Cl.[5] H01J *49/44***

**U.S. Cl. 250—305** **14 Claims**



1. A transition radiation interference spectrometer for determining the energy and divergence of a charged particle beam at a location along the beamline comprising:

means for creating a transition radiation interference pattern at said location;

means for defining an angular element of said interference pattern, said angular element having an angle of emission measured with respect to a specular reflection of said interference pattern; and

means for measuring intensity of said angular element as a function of wavelength as an indication of the energy and divergence of the charged particle beam.

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**5,045,696**

## PHOTOELECTRON MICROSCOPE

**Hideo Hirose, Otsushi, Japan, assignor to Shimadzu Corporation, Kyoto, Japan**

**Filed Mar. 16, 1990, Ser. No. 494,443**

**Claims priority, application Japan, Mar. 31, 1989, 1-82462; Aug. 25, 1989, 1-219473**

**Int. Cl.[5] H01J *40/00, 40/12***

**U.S. Cl. 250—306** **19 Claims**

1. A photoelectron microscope comprising:

a) a specimen holder for holding a specimen to be observed;

b) an electromagnetic radiation source for producing an electromagnetic radiation within a predetermined short wavelength range;

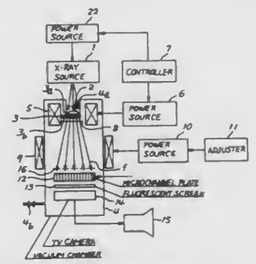
c) a normal conductive coil arranged adjacent to said specimen holder;

d) a first power source connected to said coil;

e) a second power source connected to said connected to said electromagnetic radiation source;

f) a chamber for defining an evacuated space;

g) a controller for producing a first signal to cause said first power source to energize said coil for a predetermined short period of time to produce a divergent magenetic




field in said evacuated space and, in synchronism with said first signal, a second signal to cause said second power source to actuate said electromagnetic radiation source to emit an electromagnetic radiation pulse, which irradiates said specimen to emit photoelectrons in said evacuated space;

h) photoelectron image forming means disposed in said evacuated space for receiving said photoelectrons to form a photoelectron image of said specimen; and

i) image converting means for converting said photoelectron image to a visible image.

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**5,045,697**

## DIRECTLY IMAGE PRINTING OR FORM CYLINDER, AND METHOD OF IMAGING

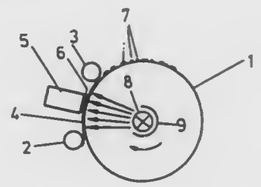
**Josef Schneider, Diedorf-Lettenbach, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany**

**Filed May 24, 1990, Ser. No. 528,585**

**Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917844**

**Int. Cl.[5] G03G *5/16***

**U.S. Cl. 250—316.1** **20 Claims**



1. A system for directly imaged printing, said system including

a form cylinder (1, 11) for a printing machine, and

means (4, 5, 6) for selectively transferring head meltable particles to the surface of said cylinder,

wherein said cylinder comprises a hollow cylindrical wall of radiation transmissive material, defining within the hollow wall an inner space; and

at least one radiation source (8; 18, 19, 20, 21) located in said

inner space directing radiation at an inner surface of at least a portion of said cylindrical wall to assist in melting said heat meltable particles.

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**5,045,698**

## RADIATION IMAGE INFORMATION RECORDING AND READING SYSTEM

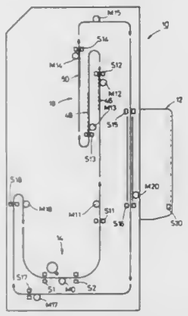
**Kazuyuki Kurashima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Oct. 19, 1990, Ser. No. 599,934**

**Claims priority, application Japan, Oct. 20, 1989, 1-274368; Oct. 20, 1989, 1-274372**

**Int. Cl.[5] G03B *42/02*; G01T *1/105***

**U.S. Cl. 250—327.2** **5 Claims**



1. A radiation image information recording and reading system comprising:

circulatory feed means for feeding stimulable phosphor sheets, which can record radiation images, along a circulatory path;

an image recording device in said circulatory path for applying radiation which bears image information to one at a time of the stimulable phosphor sheets to record radiation image information in the stimulable phosphor sheet;

a stimulating light source in said circulatory path for emitting stimulating light rays to scan the stimulable phosphor sheet with the radiation image information recorded therein;

an image reading device having a photoelectric transducer for reading light emitted from the stimulable phosphor sheet upon exposure to the stimulating light rays and producing an image signal from the read light;

a remaining image erasing device in said circulatory path for discharging radiation energy remaining on the stimulable phosphor sheet after the recorded radiation image information has been read in said image reading device and before another radiation image is recorded in the stimulable phosphor sheet in said image recording device;

memory means for storing the number of stimulable phosphor sheets loaded in the radiation image information recording and reading system;

sheet detecting means disposed in said circulatory path, for detecting stimulable phosphor sheets;

counting means for counting the number of stimulable phosphor sheets detected by said sheet detecting means;

actuating means for actuating said circulatory feed means to feed the stimulable phosphor sheets to predetermined positions;

control means for controlling said actuating means when the radiation image information recording and reading system starts to operate; and

comparing means for comparing the number of stimulable phosphor sheets stored in said memory means with the number of stimulable phosphor sheets counted by said counting means when the radiation image information recording and reading system starts to operate.

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**5,045,699**

## HEAT IMAGING CAMERA WITH A COOLED DETECTOR MOSAIC

**Bernd Schulze, Taufkirchen; Siegfried Craubner, Wessling, and Guenter Lange, Egmating, all of Fed. Rep. of Germany, assignors to Deutsche Airbus GmbH, Hamburg, Fed. Rep. of Germany**

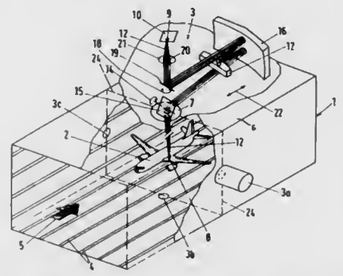
**PCT No. PCT/DE89/00513, § 371 Date Apr. 2, 1990, § 102(e) Date Apr. 2, 1990, PCT Pub. No. WO90/01688, PCT Pub. Date Feb. 22, 1990**

**ub. Date DAug. 3, 1989, Ser. No. 466,294**

**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1988, 3826379**

**Int. Cl.[5] G01M *9/00*; G01J *5/00*; G01P *5/10***

**U.S. Cl. 250—330** **8 Claims**



1. A heat imaging camera system, comprising cooled detector means sensitive within the long-wave infrared range for sensing convective conditions on a model surface, means for cooling said model surface at the temperature of liquid nitrogen, means for cooling said detector means with liquid helium, optical means cooled with liquid nitrogen, said optical means including means for automatically focussing said optical means on said model surface and arranged to transmit infrared signals representing said convective conditions onto said helium cooled detector means, and a computer connected for converting a temperature image into a displayable image.

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**5,045,700**

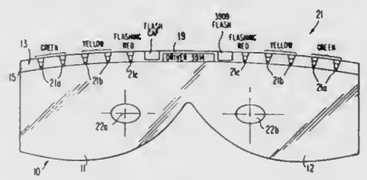
## HEADGEAR-MOUNTED INDICATOR FOR IONIZING RADIATION

**Robert H. Crowson, 1 Main St., Silver Park, Nev. 89047, and Francis R. Crowson, 3844 Mount Airy Dr., Mount Airy, Md. 21771**

**Filed Aug. 29, 1989, Ser. No. 399,232**

**Int. Cl.[5] G01T *1/00, 1/16, 1/18, 1/185***

**U.S. Cl. 250—336.1** **14 Claims**



1. A combination comprising:

headwear means structurally adapted for being worn on or at about the head of a wearer;

a high energy ionizing radiation detector for providing a signal representative of the level of ionizing radiation in a vicinity;

circuit means for receiving said signal and providing a display driver signal representative thereof; and

display means, including a visual indicator located on said headwear means at a location at least peripherally visible to the wearer, for displaying in nearly real time a visual signal representative of the level of ionizing radiation in said vicinity where the bearer cannot avoid and can view the visual indication without body movement other than eye movement, or physical intervention.



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**5,045,701**

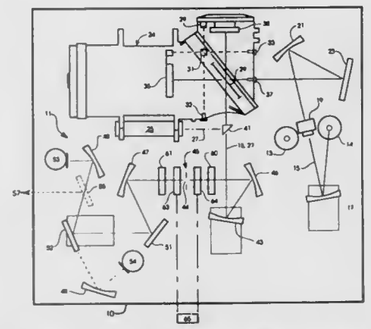
## INFRARED SPECTROPOLARIMETER

**Dennis H. Goldstein, Niceville, Fla., and Russell A. Chipman, Madison, Ala., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Sep. 27, 1989, Ser. No. 413,414**

**Int. Cl.[5] G01J *3/447***

**U.S. Cl. 250—339** **4 Claims**



1. An infrared spectropolarimeter system for making spectroscopic measurements of electro-optic properties of materials over a large wavelength range in the infrared, comprising:

(a) a Fourier transform infrared spectrometer having a sample region for receiving a sample for making spectroscopic measurement thereon and a source of light for providing a sample beam of selected wavelength range in the infrared for projection through said sample region, said sample region defined between first and second focusing elements, said first focusing element disposed for selectively focusing said sample beam within said sample region, said second focusing element disposed for collimating said sample beam and providing an output beam for analysis;

(b) first and second polarizers disposed between said first and second focusing elements with said sample region therebetween, for selectively polarizing said sample beam;

(c) first and second rotatable optical retarders disposed between said first and second polarizers with said sample region therebetween, for selectively retarding one linear polarization component of said sample beam with respect to the orthogonal component of said sample beam;

(d) means for controllably rotating said first and second optical retarders; and

(e) detection means for analyzing said output beam.

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**5,045,702**

## INFRARED INTRUSTION DETECTOR

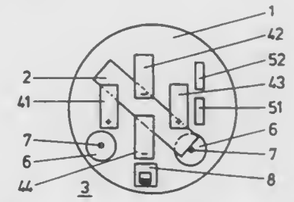
**Kurt A. Mulleer, Stafa, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland**

**Filed Nov. 22, 1989, Ser. No. 441,362**

**Claims priority, application Switzerland, Nov. 25, 1988, 4397/88**

**Int. Cl.[5] G01B *13/18*; G01J *1/00, 5/10***

**U.S. Cl. 250—342** **17 Claims**



1. In a passive infrared detector of the type wherein optical means are arranged to focus infrared radiation on a pyroelectric sensor for detecting changes in infrared radiation and an evaluation circuit coupled to the sensor is arranged to develop signals indicative of detected changes in infrared radiation, a pyroelectric sensor comprising:

a plurality of elongated radiation sensitive sensor elements, arranged in a pattern of laterally spaced pairs with at least one element of each pair longitudinally spaced from an element of a different pair, comprising a first pair of opposite polarity sensor elements interconnected electrically and a second pair of opposite polarity sensor elements interconnected electrically, said first and second pairs of elements being electrically connected in series;

output means for coupling signals to a single evaluation channel; and

coupling means, comprising first resistive means coupled to said first pair of sensor elements and second resistive means coupled to said second pair of sensor elements, for developing a composite signal in response to signals developed by said sensor elements and coupling said composite signal to said output means;

whereby the operation of said detector benefits from the differential interconnection of each of said pairs of sensor elements in combination with the increased sensitivity provided by the combination of said pairs of elements, while requiring only a single evaluation channel.

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**5,045,703**

## COLD TRAPPING APPARATUS FOR INFRARED TRANSMISSION ANALYSIS INCLUDING A METHOD AND SUBSTRATE THEREFOR

**Richard C. Wieboldt, Verona, and Gregory E. Adams, Madison, both of Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.**

**Filed Mar. 30, 1988, Ser. No. 175,204**

**Int. Cl.[5] G01N *21/01, 1/22***

**U.S. Cl. 250—352** **45 Claims**

1. A rotatable cold trap support for supporting a transmissive substrate in a vacuum chamber enclosure, comprising:

a) a transmissive substrate that is transmissive to a desired region of the electromagnetic spectrum;

b) a frame which holds the transmissive substrate and which defines a transmissive surface region thereon;

c) inlet means for depositing and solidifying a sample onto said transmissive surface region;

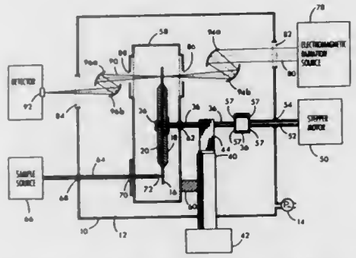
d) a heat transfer means, in conductive communication with the transmissive substrate, for maintaining said transmissive surface region at a sufficiently low temperature to solidify the sample thereon, wherein the heat transfer means includes a flexible strap connected in thermal com-

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munication with the transmissive substrate, wherein the strap is made of a thermally conductive material;

e) a rotatable support means for rotatably supporting the frame on a longitudinal axis; and



f) a drive means, cooperating with the rotatably supported frame, for rotating the frame about said longitudinal axis.

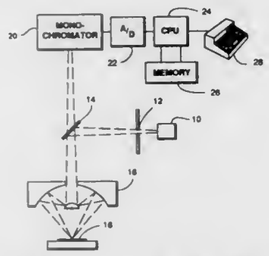
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**5,045,704**

**METHOD FOR DETERMINING ABSOLUTE REFLECTANCE OF A MATERIAL IN THE ULTRAVIOLET RANGE**

**Vincent J. Coates, Palo Alto, Calif., assignor to Nanometrics Incorporated, Sunnyvale, Calif.**

**Filed Feb. 1, 1990, Ser. No. 473,649**
**Int. Cl.[5] G01J** *1/42*
**U.S. Cl. 250—372** **5 Claims**




1. A method for determining an absolute reflectance of material from a microscopic measurement of its measured reflectance in the ultraviolet radiation range, said method comprising the steps of:

determining a value of absolute reflectance of a known material at a predetermined wavelength;

measuring the reflectance of said known material to obtain a value of measured reflectance with a microscope illuminated with radiation at said predetermined wavelength;

with said values of absolute reflectance and measured reflectance, calculating an efficiency coefficient representing all absorption and losses caused by the microscope optical system, its reflectance detectors and its illumination system at said predetermined wavelength;

measuring the reflectance of an unknown material to obtain a second value of measured reflectance with said microscope illuminated with said radiation at said predetermined wavelength;

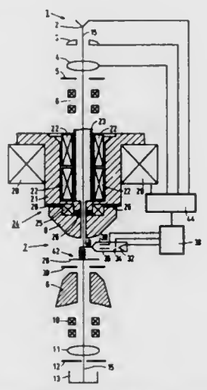
applying said efficiency coefficient to said second value of measured reflectance to obtain a value of absolute reflectance of said unknown material.

**5,045,705**

**CHARGED PARTICLE BEAM APPARATUS WITH CHARGE-UP COMPENSATION**

**Gottfried Mollenstedt, Tübingen, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.**

**Filed Sep. 10, 1990, Ser. No. 579,910**
**Claims priority, application European Pat. Off., Sep. 15, 1989, 89202328**
**Int. Cl.[5] H01J** *37/26*
**U.S. Cl. 250—398** **5 Claims**



1. A charged particle beam apparatus comprising a particle source for generating a particle beam to irradiate a specimen located in a lens field space of a lens which forms part of a charged particle lens system for the particle beam apparatus, characterized in that near to the lens field space there is provided an auxiliary particle source for generating a particle beam of relatively low energy particles to be injected into the lens field space and to be directed to the surface of the specimen by the same field as used for a main particle beam.

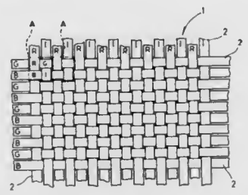
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**5,045,706**

**FLUORESCENT SCREEN**

**Satoru Tanaka, and Yasushi Murata, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Apr. 5, 1990, Ser. No. 505,164**
**Claims priority, application Japan, Oct. 30, 1989, 1-282156**
**Int. Cl.[5] G01T** *1/20*
**U.S. Cl. 250—483.1** **20 Claims**



1. A fluorescent screen specially adapted for use in an image display device of rear-projection or front-projection type and having a plurality of picture elements which emit light when stimulated by a scanning beam of stimulating light impinging onto the fluorescent screen in the form of a spot, comprising a fabric plate woven or knitted from one or more threads, each of said threads including an organic fluorescent substance, said fabric plate comprising a plurality of picture elements wherein at least three intersected portions of said threads exist within each picture element.

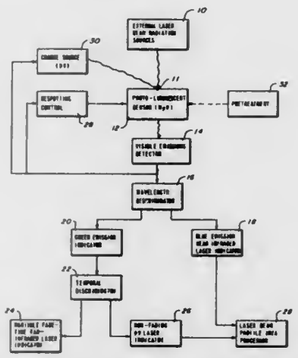


**5,045,707**

**LASER DETECTION AND DISCRIMINATION SYSTEM**

**Kishalaya Chakrabarti, Rockville, and Veerendra K. Mathur, Beltsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 16, 1989, Ser. No. 394,457**
**Int. Cl.[5] G01J** *5/54, 5/56*
**U.S. Cl. 250—484.1** **21 Claims**



1. For use in identifying external radiation from different laser sources by exposure of solid photoluminescent material to said external radiation resulting in detection of stimulated emissions from said material when charged, the improvement residing in the steps of: treating said photoluminescent material to enable charging thereof; and discriminating between substantially different fading behaviors of the stimulated emissions detected.

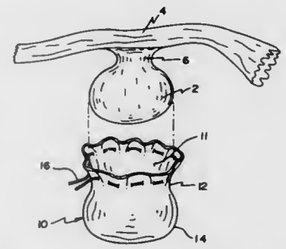
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**5,045,708**

**RADIATION SHIELD FOR PROTECTING INTERNAL BODY ORGANS**

**William I. Cooper, 300 N. Fourteenth St., Easton, Pa. 18042**

**Filed Aug. 15, 1990, Ser. No. 567,799**
**Int. Cl.[5] G21F** *3/02*
**U.S. Cl. 250—519.1** **8 Claims**



1. A radiation shield for protecting an internal body organ during radiation of a nearby body member, said shield comprising:

a flexible radiopaque pouch having an open end and a closed end and configured for fitting over said body organ to enclose at least a portion thereof; and,

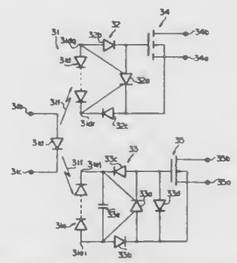
means for securing said radiopaque pouch on said body organ.

**5,045,709**

**OPTICALLY COUPLED SOLID STATE RELAY WITH DUAL DISCHARGING CIRCUITS**

**Kenji Ogawa, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Jun. 18, 1990, Ser. No. 539,903**
**Claims priority, application Japan, Jun. 19, 1989, 1-157609**
**Int. Cl.[5] G02B** *27/00*
**U.S. Cl. 250—551** **10 Claims**



1. An optically coupled solid state relay comprising

(a) an optical coupler having a light-emitting element coupled between controlling terminals for producing an optical radiation in the presence of a driving current, first photovoltaic means for producing a first photocurrent at a first voltage level in the presence of said optical radiation and second photovoltaic means for producing a second photocurrent at a second voltage level in the presence of said optical radiation,

(b) a first output circuit having an enhancement mode field effect transistor coupled to said first photovoltaic means and provided in association with normally-open output terminals,

(c) a first discharging circuit activated in the absence of said optical radiation and discharging said first voltage level,

(d) a second output circuit having a depletion mode field effect transistor coupled to said second photovoltaic means and provided in association with normally-closed output terminals, and

(e) a second discharging circuit activated in the absence of said optical radiation and discharging said second voltage level, in which the amount of said second photocurrent is larger than that of said first photocurrent and said enhancement mode field effect transistor is larger in the absolute value of a threshold level than said depletion mode field effect transistor so that said depletion mode field effect transistor turns off before said enhancement mode field effect transistor turns on, wherein said first discharging circuit starts in a discharging operation thereof earlier than said second discharging circuit so that said enhancement mode field effect transistor turns off before said depletion mode field effect transistor turns on.

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**5,045,710**

**COPLANARITY INSPECTION MACHINE**

**Frank V. Linker, Sr., Springfield, and Edward T. Claffey, Aston, both of Pa., assignors to American Tech Manufacturing, Corp., Glenolden, Pa.**

**Continuation-in-part of Ser. No. 427,797, Oct. 27, 1989, Pat. No. 4,996,439. This application May 21, 1990, Ser. No. 526,162**
**The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.**
**Int. Cl.[5] G01V** *9/04*
**U.S. Cl. 250—561** **11 Claims**

1. Apparatus for determining coplanarity of a plurality of points, comprising:

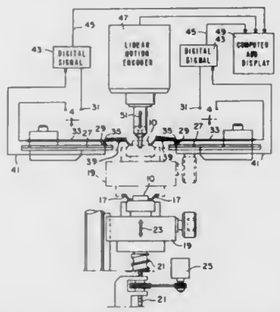
linear motion means for moving an object along an linear axis, said object having a plane generally perpendicular to said axis;

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gage means defining a known plane also perpendicular to said axis and having a plurality of points thereon corresponding to points on said object, said gage means also being adapted to move along said axis by said linear motion means;

digital signal means having individual sensors aligned on said axis for contact with said object and said gage to provide



a set of signals to indicate the position of said object along said axis at each of said points and to provide a reference set of signals when contacted by said corresponding points on said gage plane; and

comparator means for comparing said signals with said reference signals for each point and the corresponding point in said gage plane to identify the deviation of each point from coplanarity.

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**5,045,711**

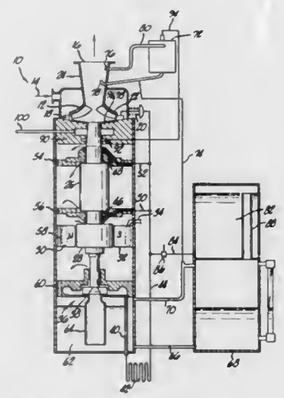
**TURBOEXPANDER-GENERATOR**

**Judson S. Swearingen, Glendora, Calif., assignor to Rotoflow Corporation, Gardena, Calif.**

**Filed Aug. 21, 1989, Ser. No. 396,866**

**Int. Cl.[5] F01D *25/20;* H02K *7/18***

**U.S. Cl. 290—52** **19 Claims**



1. A turboexpander comprising

a rotatably mounted drive train including a vertical shaft;

a turbine including a rotor affixed to said drive train at the upper end of said shaft;

variable inlet nozzles communicating with the periphery of said rotor;

a lubricant pump fixed to said drive train at the lower end of said shaft;

an actuator coupled to said variable inlet nozzles to selectively open and close said nozzles and hydraulically coupled to the outlet of said lubricant pump to control said actuator by the pressure of the outlet of said lubricant pump.

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**5,045,712**

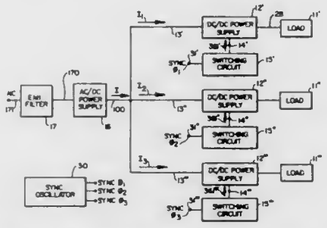
**SYNCHRONIZED SWITCHED MODE POWER SUPPLIES**

**Paul M. Baggenstoss, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.**

**Continuation of Ser. No. 717,469, Mar. 28, 1985, abandoned, which is a continuation of Ser. No. 408,969, Aug. 17, 1982, abandoned. This application Jun. 13, 1986, Ser. No. 874,800**

**Int. Cl.[5] H02M *7/00***

**U.S. Cl. 307—29** **3 Claims**



1. An electrical circuit used in reducing ripple of the output current of an ac/dc power supply comprising:

an ac/dc power supply;

a plurality of dc/dc switched power supplies having their inputs connected to the dc output of said ac/dc power supply;

the dc output having a ripple component of current which is the sum of the ripple components of the input currents of said dc/dc power supplies;

switching means connected to each of said dc/dc power supplies providing a plurality of control pulses for repetitively switching each dc/dc power supply to a conductive state for a controllably predetermined time duration and at a controllably predetermined phase with respect to each other thereby reducing said ripple component of ac/dc supply output current by addition of the input ripple currents of each dc/dc/ power supply;

a plurality of electrical loads, each of said loads being connected to the output of a different one of said dc/dc power supplies.

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**5,045,713**

**MULTI-FEEDBACK CIRCUIT APPARATUS**

**Takeshi Shima, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 7, 1990, Ser. No. 476,602**

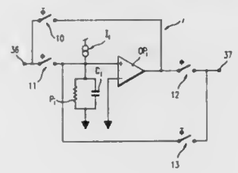
**Claims priority, application Japan, Feb. 10, 1989, 1-29609**

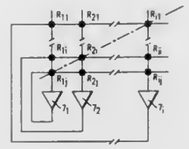
**Int. Cl.[5] G06F *7/00***

**U.S. Cl. 307—201** **8 Claims**

1. In a multi-feedback circuit apparatus having N units for providing nonlinear conversion performance, each unit including a pair of terminals, one terminal being an input terminal and the other terminal being an output terminal, multiplying means and summing means, said multiplying means multiplying respective values at said output terminals of said units by individual coefficients different to each other, said summing means summing the thus multiplied values, whereby the summed values are then fed back, the improvement comprising:

changeover means provided in each of said units, said changeover means defining one terminal of said pair of terminals as an input terminal or as an output terminal, and also defining the other terminal of said pair of terminals as





an output terminal or as a input terminal in accordance with a given control signal.

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**5,045,714**

**MULTIPLEXER WITH IMPROVED CHANNEL SELECT CIRCUITRY**

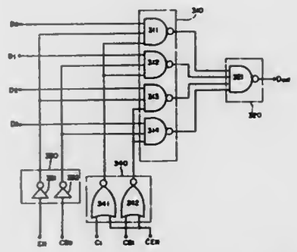
**Hyungmoo Park, Chungnam, and Hyunchul Ki, Seoul, both of Rep. of Korea, assignors to Korea Electronics and Telecommunications Research Institute, Rep. of Korea**

**Filed Aug. 14, 1989, Ser. No. 393,652**

**Claims priority, application Rep. of Korea, Aug. 18, 1988, 88-10505**

**Int. Cl.[5] H04J *15/00;* H03K *17/56***

**U.S. Cl. 307—243** **18 Claims**



1. A multiplexer for receiving m data input signals and providing an output signal, where m>1, the output signal being selected from the m data input signals, said multiplexer comprising:

a data input stage including m data input gate circuits, each data input gate circuit receiving a uniquely associated data input signal and having an output;

a channel select control stage including a plurality of channel select buffer circuits, each channel select buffer circuit receiving a uniquely associated channel select control signal and having an output;

an enable/disable control stage including a plurality of enable/disable gate circuits, each enable/disable gate circuit receiving a common enable/disable control signal and a uniquely associated channel select control and having an output;

means connecting the outputs of said channel select control stage and said enable/disable control stage to inputs of said data input gate circuits, said data input gate circuits being responsive to each possible unique combination of received channel select control signals for causing a selected one of said data input gate circuits, being selected in response to said uniquely associated data input signals, to pass a received data input signal to the output of the selected one of said data input gate circuits while inhibiting passage of received data input signals by the remaining data input gate circuits, and inhibiting passage of received data input signals by all of said data input gate circuits in response to receipt by said enable/disable gate circuits of a disabling enable/disable control signal; and

output means, including an output terminal, for applying the output from the selected one of said data input gate circuit to said output terminal as the multiplexer output signal.

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**5,045,715**

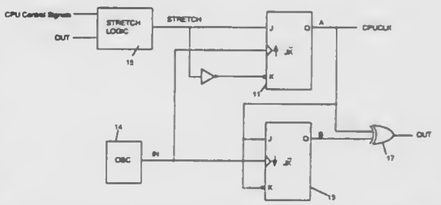
**CIRCUIT FOR GENERATING STRETCHED CLOCK PHASES ON A CYCLE BY CYCLE BASIS**

**Jonathan M. Fitch, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.**

**Filed Mar. 19, 1990, Ser. No. 495,329**

**Int. Cl.[5] H03K *3/02, 3/64, 5/13;* H03L *7/085***

**U.S. Cl. 307—269** **6 Claims**



1. A circuit for generating first and second clock signals, each cycle of said first and second clock signals having a first phase and a second phase, said second clock signal being twice the frequency of the first clock signal, such that said first and second clock signals are edge and phase coherent during predetermined stretched phases of said first clock signal, said circuit comprising:

a) oscillator means for generating an input clock signal having a frequency which is twice the frequency of said first clock signal;

b) first flip-flop means having a clock input coupled to said oscillator means for generating said first clock signal;

c) stretch logic means coupled to a first input of said first flip-flop means for receiving control signals generated by a processor and for generating a stretch signal indicating phases of said first and second clock signals which are to be stretched based upon said received control signals;

d) inverter means coupled to said stretch logic means and said first flip-flop means for inverting said stretch signal and supplying said inverted stretch signal to a second input of said first flip-flop means;

e) second flip-flop means having a clock input coupled to said oscillator means, and first and second inputs coupled to an output of said first flip-flop means;

f) exclusive OR gate means having a first input coupled to said output of said first flip-flop means for receiving said first clock signal and a second input coupled to an output of said second flip-flop means, said exclusive OR gate means for generating said second clock signal which is input to said stretch logic means and which is twice the frequency said first clock signal and is edge and phase coherent therewith during all phases and all stretched phases of said first clock signal.

5,045,716

## INTEGRATED CIRCUIT IN COMPLEMENTARY CIRCUIT TECHNOLOGY COMPRISING A SUBSTRATE BIAS VOLTAGE GENERATOR

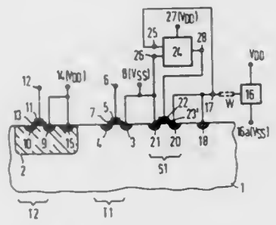
Dezsö Takacs, Munich, and Josef Winnerl, Landshut, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

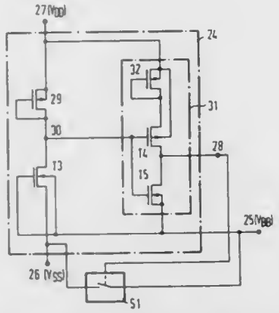
Continuation of Ser. No. 895,308, Aug. 11, 1986, abandoned. This application Feb. 23, 1989, Ser. No. 314,251

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1985, 3530427

Int. Cl.[5] H03K *3/013, 17/16;* H01L *27/10, 27/04*

U.S. Cl. 307—296.2 15 Claims




1. In an integrated circuit of the type which is constructed in complementary circuit technology, which includes at least one first field effect transistor arranged in a doped semiconductor substrate of a first conductivity type, which includes a tub-shaped semiconductor zone of a second, opposite conductivity type in the substrate connected to a supply voltage, which includes at least one second field effect transistor arranged in the tub-shaped zone, one of the terminals of the at least one first field effect transistor connected to ground, and which includes a substrate bias voltage generator for biasing the pn-junction between the terminal region connected to ground and the substrate in the non-conducting direction, the improvement therein comprising:

a comparator including a first input connected to ground, a second input connected to the substrate bias voltage generator, and an output; and

an electronic switch connected between the substrate bias voltage generator and ground and including a control input connected to said output of said comparator,

said electronic switch comprising a field effect transistor integrated on said substrate, including terminal regions of the second conductivity type and a gate as said control input, and

said comparator including a first series circuit comprising a load element and a first field effect transistor having a low threshold, said first series circuit connected between a supply voltage and ground, said field effect transistor including a gate connected to the substrate bias voltage generator.

5,045,717

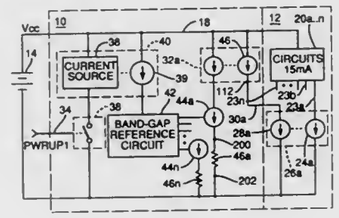
## COMBINED BIAS SUPPLY AND POWER SHUT-OFF CIRCUIT WITH SELECTIVE BIASING

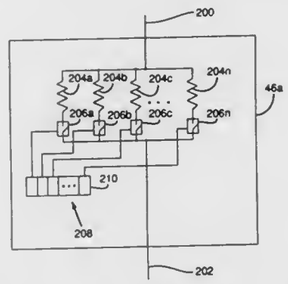
Russell R. Moen, Jr., Tigard, and Richard R. Suter, Beaverton, both of Oreg., assignors to AT&E Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 380,914, Jul. 17, 1989, Pat. No. 4,999,516. This application Dec. 21, 1990, Ser. No. 631,539

Int. Cl.[5] H03K *3/01, 5/13*

U.S. Cl. 307—296.3 2 Claims




1. A microcircuit having a plurality of microcircuit elements, and comprising:

a voltage source supplying operating voltage to the microcircuit;

a functional circuit connected to the voltage source;

means connected to the voltage source for generating a selective magnitude bias current for operating the functional circuit, said selective magnitude bias current generating means including select means for modifying the resistance of a bias current circuit path; and

means for disabling the selective magnitude bias current generating means thereby shutting off the bias current to the functional circuit, whereby power dissipation in the microcircuit is limited to leakage currents of the plurality of microcircuit elements.

5,045,718

## CIRCUIT FOR DETECTING POWER SUPPLY VOLTAGE VARIATION

Kris T. P. Vanderhoydonck, Zolder, Belgium, and Bernardus H. J. Cornelissen, Bergeljk, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 350,827, May 11, 1989, abandoned. This application Sep. 24, 1990, Ser. No. 590,452

Claims priority, application Netherlands, May 16, 1988, 8801253

Int. Cl.[5] H03K *3/01, 3/38, 5/153*

U.S. Cl. 307—296.4 3 Claims

1. A circuit for generating a pulse signal on an output terminal of the circuit to indicate a predetermined variation of the supply voltage above or below its nominal operating value on two power-supply terminals of the circuit, comprising:

a first field effect transistor of a first conductivity type, having its main current path coupled between a first power-supply terminal and a first junction point,

a second field effect transistor of the first conductivity type, having its main current path coupled between the first power-supply terminal and a second junction point,

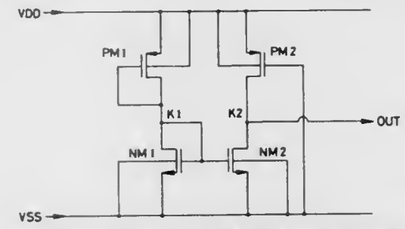
a first field effect transistor of a second conductivity type, having its main current path coupled between a second power-supply terminal and the first junction point,

a second field effect transistor of the second conductivity type, having it main current path coupled between the second power-supply terminal and the second junction point,

the output terminal being connected to the second junction point,

the gate terminals of the first and the second transistors of the first conductivity type being connected to each other






and to the first junction point, and the gate terminal of the second transistor of the second conductivity type being connected to the first power-supply terminal,

characterized in that the gate terminal of the first transistor of the second conductivity type is connected to the first junction point,

and means for controlling the voltage on the output terminal, said means comprising dimensioning the transistors such that in operation in the case of a supply voltage above a predetermined limit value the voltage on the output terminal approximates the voltage on the first power-supply terminal and in the case of a supply voltage below the predetermined limit value but substantially above zero volts the voltage on the output terminal approximates the voltage on the second power-supply terminal.

5,045,719

## DEFLECTION CELL FOR POWER LASER BEAMS

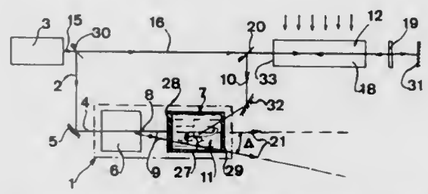
Jean-Luc Ayral, and Jean P. Huignard, both of Paris, France, assignors to Thomson-CSF, Puteaux, France

Filed Mar. 14, 1990, Ser. No. 493,245

Claims priority, application France, Mar. 31, 1989, 89 04259

Int. Cl.[5] H01S *3/108*

U.S. Cl. 359—327 8 Claims




1. A deflection cell for a laser beam comprising:

a first generating means for generating an incident laser beam;

a deflection means for adjustably deflecting said incident laser beam towards a predetermined target;

a second generating means for generating a high-power laser pump beam;

a nonlinear Brillouin diffusion medium for receiving said incident laser beam and laser pump beam to transmit power from said laser pump beam to said incident laser beam to thereby amplify said incident laser beam, wherein said laser pump beam forms a nonzero angle with said deflected incident laser beam.

5,045,720

## METHOD FOR SELECTING A SPARE COLUMN AND A CIRCUIT THEREOF

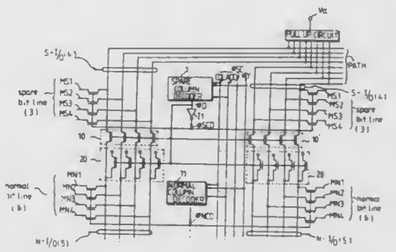
Myung-Ho Bae, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 306,986, Feb. 6, 1989, abandoned. This application Sep. 5, 1990, Ser. No. 579,209

Claims priority, application Rep. of Korea, May 13, 1988, 88-5598

Int. Cl.[5] H03K *19/003, 19/094;* G11C *7/00*

U.S. Cl. 307—441 8 Claims



1. A method for selecting a spare column of a memory device in which a spare input/output line unit pair is connected to a spare bit line pair and a normal input/output line pair is connected to a normal bit line pair, the method comprising electrically separating the spare input/output line unit pair and the normal input/output line pair from each other when the spare column is selected, and connecting the spare and normal input/output pairs to each other when the normal column is selected.

5,045,721

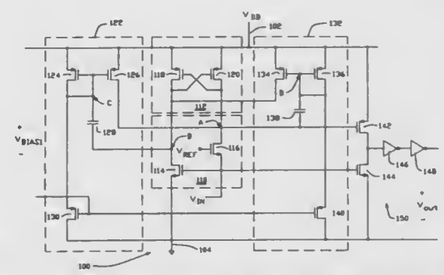
## ZERO STATIC CURRENT HIGH SPEED TTL COMPATIBLE BUFFER

Raymond C. Yan, Daly City, Calif., assignor to Teledyne Industries, Mountain View, Calif.

Filed Mar. 16, 1989, Ser. No. 324,438

Int. Cl.[5] H03K *17/16, 5/12, 3/26*

U.S. Cl. 307—443 16 Claims




1. A circuit for providing a high-speed translation between first and second sets of logic signals, said circuit comprising:

a) means for buffering an input signal of the first set, said buffering means including means, responsive to said input

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signal, for comparing said input signal to a reference voltage and latch means, responsive to said comparing means, for latching a logic state corresponding to the logic state of said input signal relative to said reference voltage;

b) means, responsive to the logic state latched by said latch means, for providing a output signal of said second set; and

c) means, directly responsive to said comparing means, for accelerating the switching of said latch means in latching at least one logic state corresponding to a logic state of said input signal relative to said reference voltage.

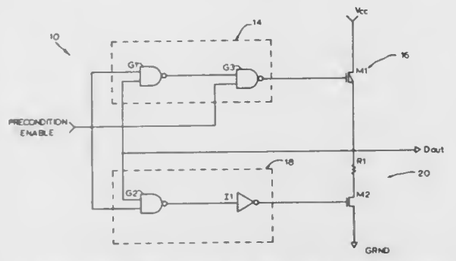
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**5,045,722**

**OUTPUT BUFFER PRECONDITIONING CIRCUIT**

**Mann-Lu Yang, Cupertino, and Sinan Doluca, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Nov. 14, 1989, Ser. No. 436,206**
**Int. Cl.[5] H03K** *19/01, 17/10*
**U.S. Cl. 307—443** **19 Claims**




1. A preconditioning circuit for use with a buffer comprising:

means for detecting an output level of said buffer, including an output low level detector and an output high level detector, said output low level detector including first logic circuit means for receiving an enable signal and providing a first intermediate output signal in response to said enable signal and the output level of said buffer, and said output high level detector including second logic circuit means for receiving said enable signal and providing a second intermediate output signal in response to said enable signal and the output level of said buffer;

pullup means for increasing the output level of said buffer when said detected output level is below a predetermined low detection level; and

pulldown means for decreasing the output level of said buffer when said detected output level is above a predetermined high detection level.

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**5,045,723**

**MULTIPLE INPUT CMOS LOGIC CIRCUITS**

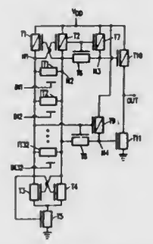
**Robert S. Mao, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 31, 1990, Ser. No. 560,381**
**Int. Cl.[5] H03K** *19/094*
**U.S. Cl. 307—451** **7 Claims**

1. A multiple input MOS logic circuit, including:

a complementary MOS output buffer having a first translation connection, a second translation connection, and an output connection and providing at said output connection a MOS logic signal in response to respective first and second level signals at said first and second translation connections, said MOS logic signal having a first state when said first and second level signals are substantially unequal and a second state when said first and second level signals are substantially equal;

a bistable CMOS input circuit having a first multi-contact connection point coupled to said first translation connection and a second multi-contact connection point coupled to said second translation connection, said bistable CMOS input circuit providing substantially unequal level signals at said first and second multi-contact connection points in response to a first state of conductivity between said first and second multi-contact connection points, and providing substantially equal level signals at said first and second multi-contact connection points in response to a second state of conductivity between said first and second multi-contact connection points; and




a plurality of input CMOS transistor circuits, each having a first current conducting terminal connected to said first multi-contact connection point, a second current conduction terminal connected to said second multi-contact connection point, and at least one gate terminal for establishing said first or said second state of conductivity between said first and second current conducting terminals in response to the state of one of a plurality of CMOS signals input to said circuit.

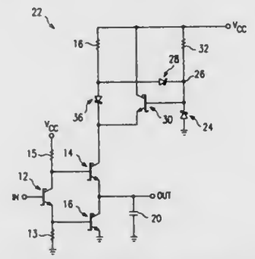
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**5,045,724**

**CIRCUIT FOR LIMITING THE SHORT CIRCUIT OUTPUT CURRENT**

**Kevin M. Ovens, Garland; Jeffrey A. Niehaus, Dallas, and Bob D. Strong, Sachse, all of Tex., assignors to Texas Instruments Corporation, Dallas, Tex.**

**Filed Oct. 18, 1989, Ser. No. 423,085**
**Int. Cl.[5] H03K** *19/088, 19/013*
**U.S. Cl. 307—456** **6 Claims**




1. A circuit for limiting the short circuit output current of a logic gate including at least one transistor, comprising:

(a) a capacitive element operable to store a charge;

(b) a resistive element operable to regulate the discharge time of said capacitive element;

(c) switching circuitry including an NPN transistor having an emitter, base and collector;

(d) charging circuitry, including a voltage source operable to charge said capacitive element;

(e) wherein said emitter is coupled to the logic gate transistor, said base is coupled to said resistive element, and said collector is coupled to said voltage source;

(f) whereby said capacitive element is enable to discharge a limited impulse current through said logic gate transistor,



to provide a fast output transition while limiting current through said transistor.

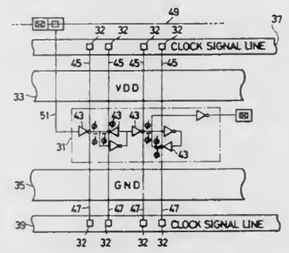
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**5,045,725**

**INTEGRATED STANDARD CELL INCLUDING CLOCK LINES**

**Tohru Sasaki, Kanagawa; Kazuyuki Omote, and Jun Iwamura, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 30, 1989, Ser. No. 330,613**
**Claims priority, application Japan, Mar. 31, 1988, 63-78967**
**Int. Cl.[5] H01L** *27/04*
**U.S. Cl. 307—465** **11 Claims**




1. A row of standard cells, each cell including:

a Vdd line for supplying a high voltage to the cell;

a Vss ground line for supplying a low voltage to the cell; and

a clock signal line for supplying clock pulses to the cell;

wherein said Vdd, Vss and clock lines are connected directly to the corresponding lines of an adjacent cell at a boundary therebetween in the row in order to form a continuous line respectively.

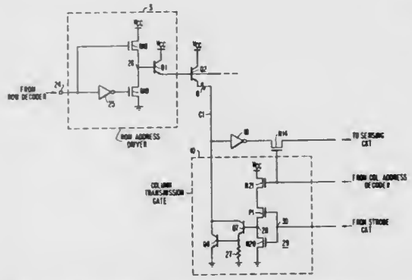
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**5,045,726**

**LOW POWER PROGRAMMING CIRCUIT FOR USER PROGRAMMABLE DIGITAL LOGIC ARRAY**

**Raymond T. Leung, Palo Alto, Calif., assignor to North American Philips Corporation, Tarrytown, N.Y.**

**Filed May 16, 1990, Ser. No. 524,329**
**Int. Cl.[5] H03K** *17/12*
**U.S. Cl. 307—466** **4 Claims**




1. A programming circuit for a user programmable logic array of bipolar transistors of the same conductivity type and which are arranged in rows and columns, the respective transistors in a given column being connected by respective thermal links to a common conductor for such column; the array being programmable by altering the conductive state of the thermal link of the transistor at any selected row and column address, such selection being effected by a row address decoder and a column address decoder producing concurrent selection signals at outputs thereof corresponding to the selected row and column addresses; said programming circuit comprising a plurality of row drivers which respectively connect the outputs of the row address decoder for the respective rows to all transistors in the relevant row and a plurality of column transmission gates which respectively connect the column outputs of the column address decoder to the respective common conductors for such columns; characterized in that:

the row driver for any row comprises a bipolar transistor (Q1) of said conductivity type and a FET gate for coupling transistor Q1 to the relevant row output of the row address decoder, said FET gate turning transistor Q1 on in response to a row selection pulse at said row output of the row address decoder and maintaining transistor Q1 off in the absence of such a row selection pulse, transistor Q1 being connected to all of the transistors in said row so that during selection of any of the transistors in such row transistor Q1 forms a first Darlington pair with the selected transistor, said Darlington pair supplying current to the thermal link of the selected transistor which alters the conductive state of such thermal link; and

the transmission gate for any column comprises

an FET switch having a control terminal connected to the relevant column output of the column address decoder and which in response to a column selection signal at said column output causes said FET switch to turn on and thereby provide a supply voltage at an output terminal thereof;

a CMOS inverter coupled to said FET switch to receive said supply voltage therefrom, said inverter having a control terminal for receiving a programming strobe pulse and an output at which said inverter produces a control voltage which changes in response to a strobe pulse at said control terminal; and

a second Darlington pair of bipolar transistors having an input coupled to the output of said inverter to receive said control voltage therefrom, and an output connected to said common conductor for said column, said control voltage rendering said second Darlington pair conductive during said strobe pulse and otherwise maintaining said second Darlington pair non-conductive.

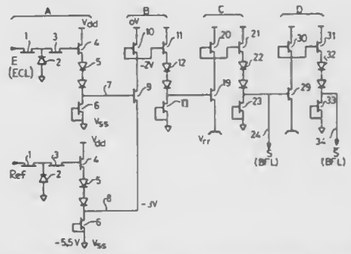
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**5,045,727**

**INTERFACE CIRCUIT BETWEEN TWO CIRCUITS OF DIFFERENT LOGIC TYPES**

**Jean-Yves Danckaert, Les Ults, and Ernesto Perea, Gif Sur Yvette, both of France, assignors to Thomson Composants Microondes, Puteaux, France**

**Filed Jun. 15, 1990, Ser. No. 538,703**
**Claims priority, application France, Jun. 20, 1989, 89 08182**
**Int. Cl.[5] H03K** *19/02, 17/16*
**U.S. Cl. 307—475** **9 Claims**




1. An interface circuit between first and second digital circuits for adapting output voltages of the first digital circuit to input limit values of the second digital circuit, said interface circuit comprising:

a first shifter stage (A), formed by two parallel-mounted shifters, a first shifter of which receives the output voltage

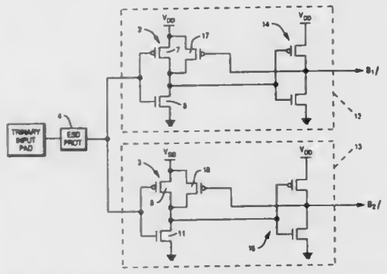
VOL 1130 ISS 1 SE 3 1991 UMI



of the first digital circuit at an input thereof (E) and a second shifter of which shifts a reference voltage;
a second comparator stage (B) formed by a first BFL type inverter, an input transistor of which receives an output signal coming from the first shifter at a gate thereof and a signal coming from the second shifter at a source thereof;
a third amplifier stage (C) formed by a second BFL type inverter, which delivers, at an output thereof, a signal (S) in accordance with the input limit value of the second digital circuit.

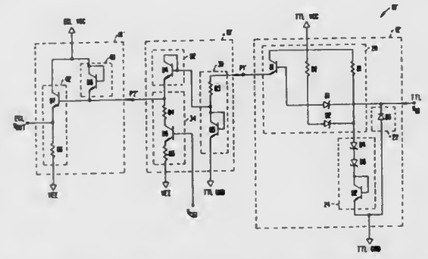
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**5,045,728**
**TRINARY TO BINARY LEVEL CONVERSION CIRCUIT**
**Harold S. Crafts, Fort Collins, Colo., assignor to NCR Corporation, Dayton, Ohio**
**Continuation of Ser. No. 353,284, May 17, 1989, abandoned. This application Apr. 10, 1991, Ser. No. 683,581**
**Int. Cl.[5] H03K** *17/30, 17/693*
**U.S. Cl. 307—475** **7 Claims**



1. An electronic circuit for converting trinary level input signals on a first line to binary level output signals on a second and a third line, comprising:
a first CMOS field effect transistor inverter connected to receive said trinary level input signals from the first line and generate binary level output signals on the second line, characterized in that the transconductance of the p-channel pull-up field effect transistor exceeds the transconductance of the n-channel pull-down field effect transistor by a first factor nominally greater than 5;
a second CMOS field effect transistor inverter connected to receive said trinary level input signals from the first line and generate binary level output signals on the third line, characterized in that the transconductance of the n-channel pull-down field effect transistor exceeds the transconductance of the p-channel pull-up field effect transistor by a second factor greater than 5;
a first feedback circuit connected to receive the binary level output signals generated by said first CMOS inverter from said second line and connected to said first CMOS inverter for biasing said first factor, whereby said first feedback circuit introduces hysteresis in the conversion of the trinary level input signals to related binary level output signals in the first CMOS inverter; and
a second feedback circuit connected to receive the binary level output signals generated by said second CMOS inverter from said third line and connected to said second CMOS inverter for biasing said second factor, whereby said second feedback circuit introduces hysteresis in the conversion of the trinary level input signals to related binary level output signals in the second CMOS inverter.

**5,045,729**
**TTL/ECL TRANSLATOR CIRCUIT**
**Loren Yee, Milpitas, and Nguyen X. Sinh, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**
**Filed Nov. 15, 1989, Ser. No. 436,842**
**Int. Cl.[5] H03K** *19/08*
**U.S. Cl. 307—475** **13 Claims**



12. A circuit for translating TTL level input signals, which have a high voltage state and a low voltage state, to ECL level output signals, which have a high voltage state and a low voltage state, the circuit comprising:
(a) first and second voltage nodes;
(b) a TTL input buffer, coupled to the first voltage node, for receiving the TTL level input signals and for generating a first intermediate voltage at the first voltage node corresponding to the TTL level input signals;
(c) a translation means, coupled to the first and second voltage nodes, responsive to the first intermediate voltage, for generating a second intermediate voltage at the second voltage node corresponding to the first intermediate voltage;
(d) an ECL current source, coupled to the translation means, for providing current to the translation means;
(e) an ECL output driver, coupled to the second voltage node, responsive to the second intermediate voltage, for generating ECL level output signals at the ECL output node corresponding to the second intermediate voltage; and
(f) a low level clamp, coupled to the second voltage node and the ECL output driver, for preventing the ECL output driver from generating a continuous low voltage ECL output signal.

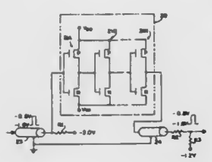
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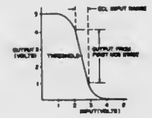
**5,045,730**
**ELECTRICAL CIRCUITRY PROVIDING COMPATIBILITY BETWEEN DIFFERENT LOGIC LEVELS**
**Michael Cooperman, Framingham, and Richard Sieber, Attleboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**
**Filed Dec. 22, 1989, Ser. No. 455,533**
**Int. Cl.[5] H03K** *19/092, 19/094, 19/003, 19/086*
**U.S. Cl. 307—475** **7 Claims**

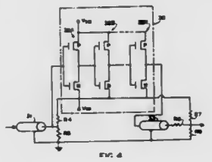
1. Electrical circuitry including:
input circuit means coupled to a source of reference potential for producing at its output an input signal at a first input voltage or at a second input voltage with respect to said reference potential;
switching circuit means having an input connected directly to the output of said input circuit means and having an output;
a first voltage source for producing a first supply voltage different from the reference potential connected to said switching circuit means;
a second voltage source for producing a second supply voltage different from the reference potential connected to said switching circuit means;



said switching circuit means being operable in a first operating state when the voltage at its input is greater than a threshold voltage between said first and second supply voltages, and said switching circuit means being operable in a second operating state when the voltage at its input is less than the threshold voltage;
the first and second supply voltages of said first and second voltage sources, respectively, setting said threshold voltage between said first input voltage and said second input voltage;
a resistance coupling arrangement between the source of reference potential and said first voltage source; and
the output of said input circuit means being connected to the input of the switching circuit means and to a point in the resistance coupling arrangement to establish an impedance match between the input circuit means and the switching circuit means.



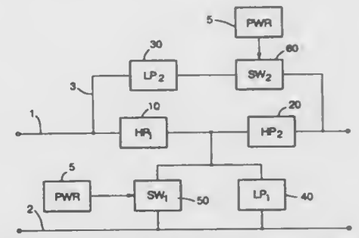




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**5,045,731**
**ULTRAMINIATURE 180 DEGREE PHASE SHIFTER**
**Alfred N. Riddle, Milpitas, Calif., assignor to Avantek, Inc., Milpitas, Calif.**
**Filed Oct. 27, 1989, Ser. No. 427,787**
**Int. Cl.[5] H03L** *7/00;* **H03K** *5/159;* **H01P** *3/00*
**U.S. Cl. 307—511** **5 Claims**

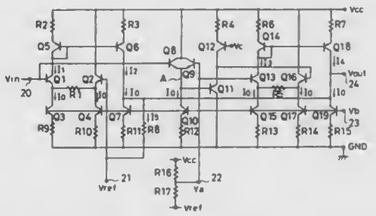
1. A phase shifter circuit, comprising:
(a) a first signal path having a first high pass network and a second high pass network connected in series;
(b) a second signal path connected in parallel with said first signal path;
(c) a first switching device which is connected from a point between said first and second high pass networks of said first signal path and said second signal path;
(d) a first low pass network which is connected in parallel with said first switching device;
(e) a branch line which is connected in parallel with said first signal path and having a second low pass network in series with a second switching device;



(f) means for selectively actuating said first and second switching devices.

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**5,045,732**
**POLYGON CIRCUIT**
**Hiroaki Sugiura, and Hiroyuki Takenaga, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Filed Feb. 27, 1990, Ser. No. 493,829**
**Claims priority, application Japan, Mar. 2, 1989, 1-51502; Sep. 21, 1989, 1-247478**
**Int. Cl.[5] H03K** *5/153;* **H03B** *19/00*
**U.S. Cl. 307—529** **2 Claims**



1. A polygon circuit comprising:
means for producing a first current proportional to the difference between an input signal voltage Vin and a reference voltage Vref;
a clip circuit for clipping said input signal voltage Vin at a break-point setting voltage Va;
means for producing a second current proportional to the difference between the output voltage of said clip circuit and said break-point setting voltage; and
means for performing addition or subtraction on said first current and said second current to output a voltage signal proportional to the sum or the difference.

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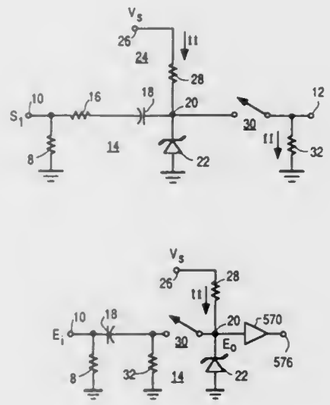
**5,045,733**
**SWITCHING APPARATUS WITH CASCADED SWITCH SECTIONS**
**Gene K. Sendelweck, Indianapolis, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**
**Filed Nov. 28, 1989, Ser. No. 441,901**
**Int. Cl.[5] H03K** *5/08, 3/06*
**U.S. Cl. 307—566** **15 Claims**

1. Switching apparatus comprising:
an L-type attenuator and a switch connected in cascade between a signal input terminal and a signal output terminal;
said L-type attenuator having a series branch including an impedance and having a shunt branch including a Zener diode; and
a bias network coupled to said attenuator for controlling the conductance of said Zener diode;

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said bias network being responsive to an open condition of said switch for biasing said Zener diode to conduct a predetermined operating current, said bias network being responsive to a closed condition of said switch for biasing







said Zener diode at a predetermined quiescent bias voltage level; and wherein:

said Zener diode is directly connected without intervening elements between an output of said attenuator and a point of fixed reference potential.

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5,045,734

HIGH POWER SWITCH

Byron R. Mehl, Belvidere, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 8, 1990, Ser. No. 535,321

Int. Cl.[5] H03K *17/10, 17/08, 17/56, 17/687*

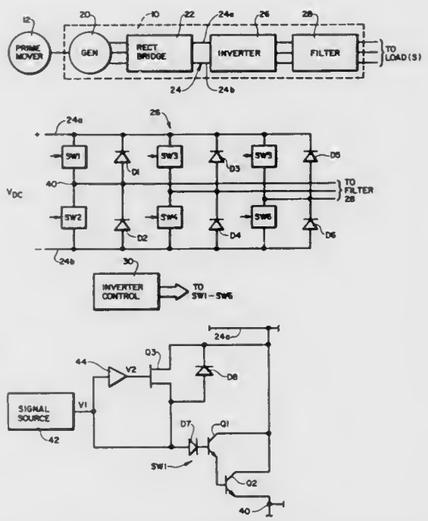
U.S. Cl. 307—570 4 Claims

1. A power switch responsive to drive signals developed by a signal source, comprising:

first and second transistors connected in a Darlington configuration each having a control electrode and first and second main current path electrodes wherein the first main current path electrodes of the first and second transistors are coupled together, the control electrode of the second transistor is coupled too the second main current path electrode of the first transistor and the control electrode of the first transistor is coupled to the signal source and receives the drive signals;

a diode coupled between the signal source and the control electrode of the first transistor; and

a MOSFET having a control electrode and first and second main current path electrodes wherein the first main current path electrode of the MOSFET is coupled to the first main current path electrodes of the first and second transistors, the second main current path electrode of the MOSFET is coupled to the control electrode of one of the




first and second transistors and the control electrode of the MOSFET receives the drive signals.

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5,045,735

DEVICE COMPRISING AN ACTUATOR, METHOD FOR USE IN THE DEVICE, AND SYSTEM FOR CONTROLLING A GAS OR LIQUID FLOW, COMPRISING THE DEVICE

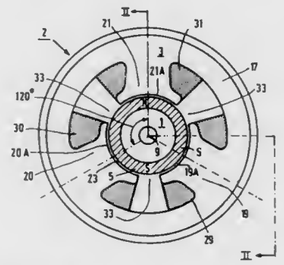
Aloïs E. Christiaens, Liederkerke, Belgium, assignor to N.V. Airpax S.A., Brussels, Belgium

Filed Nov. 28, 1989, Ser. No. 442,035

Claims priority, application Netherlands, Dec. 23, 1988, 8803148

Int. Cl.[5] H02K *33/12*

U.S. Cl. 310—38 10 Claims



1. A device comprising

an electrical actuator,

a current source, and



an actuating unit, which actuator comprises

a first actuator body having two diametrally opposed magnetic poles, and

a soft-magnetic second actuator body which is coaxial with the first actuator body and which comprises at least three circumferentially equi-spaced teeth, each provided with an energizing coil, the first actuator body and the second actuator body cooperating with each other via an air gap and being pivotable through an angle relative to one another about a pivotal axis, characterized in that

the actuating unit has a limited operating range, and

the device comprises a control unit for dividing the operating range of the actuating unit into a plurality of sub-ranges and, depending on said sub-ranges, controllably feeding a current through one of the energizing coils, through at least two but not all the energizing coils, and through all the energizing coils, respectively.

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5,045,736

END CAP FOR AN ACTUATOR

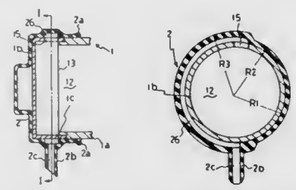
Hiroyuki Amano; Kouji Hirao; Shinichiro Iwasaki; Kazubiro Matsukawa, and Hiroyuki Takagi, all of Aichi, Japan, assignors to Aisin Seiki K.K., Aichi, Japan

Filed Sep. 28, 1990, Ser. No. 590,703

Claims priority, application Japan, Sep. 29, 1989, 1-115405[U]

Int. Cl.[5] H02K *5/136, 5/132*

U.S. Cl. 310—88 5 Claims



1. An actuator end cap for a cylindrical actuator housing having circumferentially extending joint means and a breather hole, said end cap comprising

a cup-shaped body mounted on an end of said housing in overlying fluid tight relation to said joint means,

air passage means in said cup-shaped body having a first end in communication with said breather hole and a second end remote from said first end and

vent means extending through said cup-shaped body in communication with said second end.

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5,045,737

STARTER MOTOR

Hayato Yamauchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabusbiki Kaisha, Tokyo, Japan

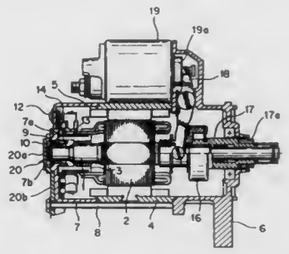
Filed Jun. 29, 1990, Ser. No. 545,738

Claims priority, application Japan, Jun. 30, 1989, 1-77997

Int. Cl.[5] H02K *5/04, 7/10*

U.S. Cl. 310—89 3 Claims

1. A starter motor, comprising: a machine frame (4), an armature rotary shaft (1) supported for rotation within said machine frame, a front bracket (6) disposed forwardly of said machine frame, a rear bracket (7) disposed rearwardly of said machine frame, a retaining member (10) secured to a rear end portion of said armature rotary shaft and engaging with said rear bracket to prevent said armature rotary shaft from moving axially forwardly, a plurality of headed through bolts (8) extending exteriorly, alongside of and closely proximate outer peripheries of said rear bracket and machine frame, and into said front bracket for fastening said rear bracket and said machine frame together to said front bracket, a plurality of supports (20*b*) formed separately from said rear bracket and individually engaging the heads of said through bolts, and a cover (20*a*) centrally disposed on the rear end of said rear bracket and overlying said retaining member, wherein said cover is integrally formed with said supports, said supports extend radially outwardly from said cover beyond outermost periph-



eries of said rear bracket and machine frame, and outermost ends of said supports define planar seats for the heads of said through bolts, perpendicular to a longitudinal axis of said starter motor.

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5,045,738

SPINDLE MOTOR

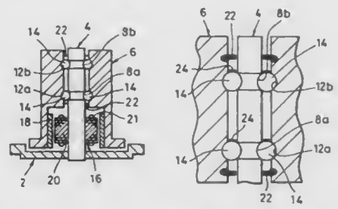
Noriaki Hishida, and Kuniyasu Iwazaki, both of Kyoto, Japan, assignors to Nippon Densan Corporation, Kyoto, Japan

Filed Feb. 15, 1990, Ser. No. 480,277

Claims priority, application Japan, Feb. 22, 1989, 1-443445; Nov. 25, 1989, 1-136218[U]

Int. Cl.[5] H02K *5/16*

U.S. Cl. 310—90 16 Claims



1. A spindle motor comprising a fitting member, a shaft member secured to said fitting member, a rotary hub member disposed about said shaft member for carrying a recording disk thereabout and for rotation relative to said shaft member, a rotor magnet fitted to said rotary member and a stator positioned in such a manner as to confront said rotor magnet, wherein:

a pair of inner annular grooves are formed directly in the outer surface of said shaft member;

a pair of outer annular grooves are formed directly in the inner surface of said rotary hub member in such a manner that said pair of outer annular grooves confront said pair of inner annular grooves;

said pair of inner annular grooves and said pair of outer annular grooves define a pair of ball-accommodating annular spaces positioned at a certain spaced apart interval in the axial direction of said shaft member in cooperation with one another; and

a plurality of ball members are rotatably and movably accommodated in each of said pair of ball-accommodating annular spaces.

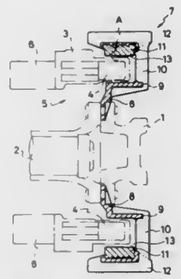
VOL 1130 ISS 1 SE 3 1991 UMI



**5,045,739**
**COATED ROTOR FOR EDDY CURRENT TYPE RETARDER**

Touru Kuwahara, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,659
Claims priority, application Japan, Jun. 20, 1989, 1-155763
Int. Cl.[5] H02K *7/12, 49/04;* B32B *15/01*
U.S. Cl. 310—105 14 Claims

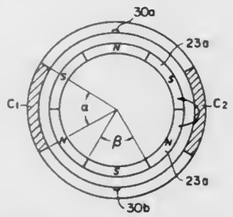


1. A rotor for an eddy current type retarder of the type including a rotatable shaft, a plurality of magnets and a stationary member, the shaft having an axial direction and a radial direction, comprising:
a base member mounted on the shaft and facing the plurality of magnets, the base member being made from a material containing steel and having part of the surface thereof facing the magnets;
a thin film on the surface of the base member and formed from a material containing rust-preventative material; and
heat radiation fins integrally formed on the base member and defined by a casting including a material having good castability.

**5,045,740**
**BRUSHLESS MOTOR**

Nitaro Hishinuma, Sukagawa, Japan, assignor to Yamamoto Electric Corporation, Sukagawa, Japan

Continuation-in-part of Ser. No. 245,362, Sep. 16, 1988, abandoned, and a continuation-in-part of Ser. No. 245,363, Sep. 16, 1988, abandoned. This application Mar. 23, 1990, Ser. No. 498,232
Int. Cl.[5] H02K *21/12*
U.S. Cl. 310—156 7 Claims

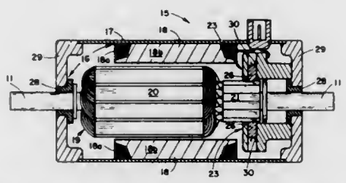


1. A brushless motor comprising:
a rotor constituted by a permanent magnet having a plurality of circumferentially alternately equally magnetized N and S magnetic poles;
a stator having a plurality of excitation coils equidistantly disposed around said rotor;
a rotor position detecting member such as a magneto-sensitive element; and
a printed circuit board having a commutation circuit for switching the electric current, for said excitation coils based on a detection signal of said rotor position detecting member;
wherein the number of said magnetic poles of said rotor is selected so that the number of said magnetic poles of said rotor located within an area between respective center lines of two adjacent excitation coils is an odd number not smaller than three;
wherein the width of each excitation coil is selected so that an angle $\alpha$ formed between lines connecting the circumferential opposite ends of each excitation coil commonly to a center of said rotor is made equal to an angle $\beta$ formed between lines connecting the circumferential opposite ends of each magnetic pole of said rotor commonly to said center of said rotor;
wherein said stator includes a plurality of bobbin members on which said plurality of excitation coils are wound correspondingly respectively, and a plate-like field core made of a magnetic material and having an opening for housing said rotor therein and having a plurality of supports for respectively holding said plurality of bobbin members, said supports being disposed along the inner circumference of said opening at positions in opposition to each other through said opening; and
wherein said stator and said rotor are housed within a casing having an opening for passing wind generated by rotation of said rotor.

**5,045,741**
**DUAL-MOTION APPARATUS**

James E. Dvorsky, Hilliard, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Feb. 23, 1990, Ser. No. 483,685
Int. Cl.[5] H02K *19/02, 23/44, 7/06, 13/12*
U.S. Cl. 310—209 35 Claims



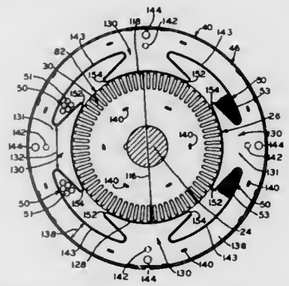
1. Apparatus for providing selectively from time to time in the same member either rotary motion about an axis or linear movement in an axial direction from one predetermined position to another predetermined position, comprising
electric motor means including stator means comprising housing means and means or providing a first magnetic field within the housing means; rotor means comprising armature means for providing a second magnetic field within the housing means, on shaft means in the housing means; all of said means being coaxial; and
commutating means and associated circuit means for conducting electrical energy to the motor means in such manner as to provide rotation of the shaft means in a predetermined direction and to provide axial movement of the shaft means in a predetermined direction;
the circuit means comprising first connecting means for providing a magnetic field in the rotor means substantially perpendicular to the magnetic field of the stator means and second connecting means for providing a magnetic field in the rotor means substantially parallel to the magnetic field of the stator means.



**5,045,742**
**ELECTRIC MOTOR WITH OPTIMUM CORE DIMENSIONS**

Frederick J. Armstrong; Lynn E. Bradtmueller; Ronnie G. Smitley, all of Fort Wayne, Ind., and James P. Alexander, Schenectady, N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Filed Feb. 23, 1990, Ser. No. 484,597
Int. Cl.[5] H02K *1/14, 1/26*
U.S. Cl. 310—254 19 Claims

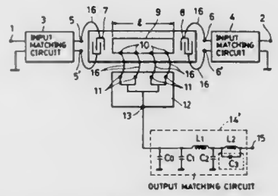


1. A dynamoelectric machine comprising:
a shell;
a stator assembly comprising a stator core formed of ferromagnetic material having a cylindrical bore therein and disposed within the shell;
stator winding means operatively positioned on the stator core; and
a rotor core comprising a plurality of ferromagnetic laminations, each of the rotor core laminations having a plurality of equally circumferentially spaced semi-closed slots extending radially proximate the outer periphery of the lamination, the slots having sufficient area for receiving conducting means therein, wherein the ratio of the number of rotor lamination slots to the rotor outer diameter measured in inches is greater than 14.0.

**5,045,743**
**SURFACE ACOUSTIC WAVE DEVICE**

Katsuo Furukawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Jan. 25, 1990, Ser. No. 469,931
Claims priority, application Japan, Jan. 27, 1989, 1-18093
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 D 4 Claims

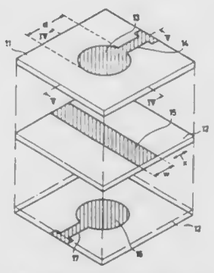



1. A surface acoustic wave convolver element comprising:
two input transistors disposed on a piezoelectric substrate;
a rectangular output gate disposed between said two input transducers, said gate including a plurality of gate output terminals;
a binary tree structure having a plurality of tree input terminals connected to said gate output terminals and having a tree output terminal; and
a matching circuit connected between said binary tree output terminal and a matching circuit output terminal, said matching circuit being a Tchebycheff type impedance transforming circuit.

**5,045,744**
**ENERGY-TRAPPING-BY-FREQUENCY-LOWERING-TYPE PIEZOELECTRIC-RESONANCE DEVICE**

Akira Ando; Toshihiko Kittaka; Hiroshi Tamura, and Isao Toyoshima, all of Nagaokakyo, Japan, assignors to Murata Mfg. Co., Japan

Filed Dec. 21, 1989, Ser. No. 454,362
Claims priority, application Japan, Dec. 23, 1988, 63-327253; Dec. 23, 1988, 63-327254; Dec. 23, 1988, 63-327255
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—320 8 Claims



1. An energy-trapping-by-frequency-lowering-type-piezoelectric-resonance device utilizing a higher harmonic in the mode of thickness-extensional vibration, comprising:
a plate-shaped body made of piezoelectric material subjected to polarization processing; and
at least three electrodes for energy trapping arranged so as to be overlapped with each other in the direction of thickness of said body through layers of the piezoelectric material, and comprising a pair of outermost electrodes and at least one inner electrode;
the dimension of diameter or of one polygonal side of at least one of said outermost electrodes being made larger than the dimension of diameter or of one polygonal side of said inner electrode.

**5,045,745**
**SPINNING PIEZOELECTRIC BEAM OF A DUAL-AXIS ANGULAR RATE SENSOR AND METHOD FOR ITS ADJUSTMENT**

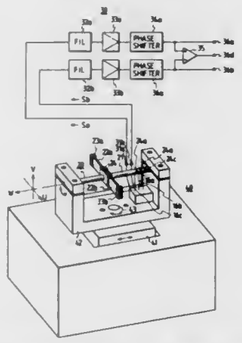
Kaneyuki Umemoto; Toshio Tamura, and Teruo Yano, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed May 25, 1990, Ser. No. 528,604
Claims priority, application Japan, May 29, 1989, 1-136657
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—329 4 Claims

1. A method for adjusting a piezoelectric beam in which two beam-shaped piezoelectric sensors are affixed to a rotary shaft at right angles thereto and symmetrically with respect thereto while being gripped by support washers in parallel to each other and each of said piezoelectric sensors carries weights at its free end, said method comprising:
a first step of applying vibrational acceleration excitation to said piezoelectric beam in a direction perpendicular to said rotary shaft and to the lengthwise direction of said piezoelectric sensors, detecting output signals of said two piezoelectric sensors and measuring said signals by sue of a signal measuring circuit, and grinding a bending portion of at least one of said two piezoelectric sensors until the detected signals of said two piezoelectric sensors measured by said signal measuring circuit each becomes

smaller than a predetermined first value and until the difference between said signals becomes smaller than a predetermined second value; and

a second step of applying vibrational acceleration excitation to said piezoelectric beam in the lengthwise direction of said piezoelectric sensors at right angles to said rotary



shaft, and grinding at least one of said weighted until the detected signals of said two piezoelectric sensors measured by said signal measuring circuit each becomes smaller than a predetermined third value and until the difference between said signals becomes smaller than a predetermined fourth value.

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**5,045,746**

**ULTRASOUND ARRAY HAVING TRAPEZOIDAL OSCILLATOR ELEMENTS AND A METHOD AND APPARATUS FOR THE MANUFACTURE THEREOF**

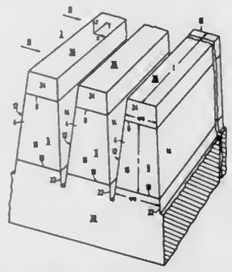
**Wolfram Wersing, Kirchheim; Karl Lubitz, Ottobrunn; Reinhard Lerch, Heroldsberg; Hans Kaarmann, Buckenhof, and Martina Vogt, Fuerth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Feb. 22, 1990, Ser. No. 484,352**

**Claims priority, application European Pat. Off., Feb. 22, 1989, 89103112.2**

**Int. Cl.[5] H01L** *41/08*

**U.S. Cl. 310—334** **10 Claims**



1. An ultrasound array comprising:

a plurality of identical separated side-by-side oscillator elements each having a core of piezoelectric material and first and second spaced trapezoidal electrode surfaces at opposite sides of the core coated with electrode material, said first electrode surface facing an emission direction of the array and, said second electrode surface being disposed at a base region of the array, said first electrode surface being smaller in area in a plane substantially normal to said emission direction than said second electrode surface, and each oscillator element further having first and second non-parallel boundary surfaces extending between said first and second electrode surfaces so that each oscillator element has a cross-section which changes identically in a direction from said second electrode surface to said first electrode surface.

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**5,045,747**

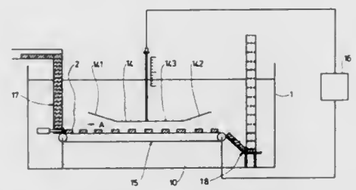
**APPARATUS FOR POLING A PIEZOELECTRIC CERAMIC**

**Yun-Tien Chen, Hsinchu; Syh-Yuh Cheng, Taichung, and Shu-Fen Liao, Yun Lin, all of Taiwan, assignors to Industrial Technology Reseerch Institute, Chutung, Taiwan**

**Filed Feb. 28, 1990, Ser. No. 486,139**

**Int. Cl.[5] H01L** *41/08*

**U.S. Cl. 310—357** **3 Claims**



1. An apparatus for poling a piezoelectric ceramic comprising:

first and second electrodes which are connected to a DC power supply, said first electrode including a first portion spaced apart from said second electrode at a certain distance so as to create a uniform poling field between said first and second electrodes, said electrode being adapted to convey said ceramic past said first electrode in a direction from a front end of said first portion to a rear end thereof, each of said front and rear ends of said first portion being joined to one of two second portions of said first electrode, each of said second portions comprising an inclined electrode portion which extends away from its corresponding end in a direction overlying said second electrode and at an increasing distance therefrom in a direction away from said first portion, whereby said ceramic is exposed to a gradually increasing poling field as it is conveyed by said second electrode towards said first portion and to a gradually decreasing poling field as it is conveyed away from said first portion, and an insulating medium provided between said first and second electrodes.

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**5,045,748**

**TUNGSTEN-HALOGEN INCANDESCENT AND METAL VAPOR DISCHARGE LAMPS AND PROCESSES OF MAKING SUCH**

**Frederic F. Ahlgren, Shaker Heights; John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike, and John J. Karikas, Shelby, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 285,576, Dec. 16, 1988, Pat. No. 4,891,555, which is a division of Ser. No. 798,646, Nov. 15, 1985, Pat. No. 4,810,932. This application Sep. 28, 1989, Ser. No. 414,162**

**Int. Cl.[5] H01K** *1/28*

**U.S. Cl. 313—113** **3 Claims**

1. A reflector-type incandescent lamp comprising:

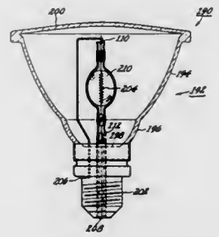
(a) a reflector having a base, a focal point, and a pair of electrical terminals at said base,

(b) a tipless incandescent light source supported within said reflector comprising:

(b1) a double-ended elongated inner envelope comprising a shaped hollow central portion of vitreous material having an outer surface of general ellipsoidal form and tubular neck portions of vitreous material integral with said central portion and extending in generally opposite directions therefrom to outer ends of the neck portions, said neck portions and said central portion being disposed on a common longitudinal axis of said envelope that extends centrally of said neck portions and said central portion,

(b2) a filament within said central portion having an axis extending generally parallel to said longitudinal axis and having a region located at generally said focal point of the reflector,

(b3) a pair of conductive inleads respectively located within said neck portions and having inner ends connected to opposite ends of said filament for supporting said filament within said central portion in a position substantially on said common longitudinal axis, the



inleads having outer ends extending to the outer ends of said neck portions,

(b4) shrink seals within said neck portions for sealing said inleads with respect to their associated neck portions, each of said shrink seals being the produce of a sealing operation in which a pressure differential between atmospheres outside and inside one of each said neck portions causes vitreous material of said one neck portion when softened by applied heat to collapse about the inlead surrounded thereby,

(b5) a reflective film covering said ellipsoidal outer surface of said central portion and effective to reflect infrared radiation from said filament back onto said filament, and

(c) means for electrical connecting the respective outer ends of said inleads to said electrical terminals.

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**5,045,749**

**ELECTRON BEAM GENERATOR AND ELECTRONIC DEVICES USING SUCH A GENERATOR**

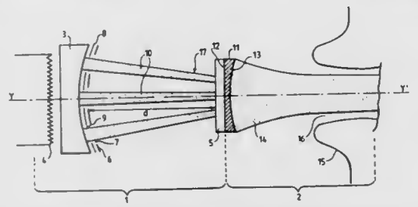
**Henri Desmur, Sevres, France, assignor to Thomson Tubes Electroniques, Boulogne Billancourt, France**

**Filed Mar. 1, 1990, Ser. No. 486,749**

**Claims priority, application France, Mar. 7, 1989, 89 02966**

**Int. Cl.[5] H01J** *1/20, 1/46*

**U.S. Cl. 313—305** **13 Claims**



1. An adjustable electron beam generator operating in one of a pulse and continuous mode, comprising:

a main electron gun including a thermionic cathode for emitting an adjustable electron beam towards an apertured anode thereof, the main electron gun being free from a grid and the adjustable electron beam being controlled without using a grid in front of the thermionic cathode, and

an auxiliary electron gun located behind the thermionic cathode including an emitting auxiliary cathode, an auxiliary solid anode in thermal and electric contact with the thermionic cathode, and a control grid between the auxiliary cathode and the auxiliary anode, the auxiliary cathode emitting an auxiliary electron beam towards the auxiliary anode modulated by the control grid, this auxiliary electron beam controlling the emission of the adjustable electron beam emitted by the thermionic cathode.

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**5,045,750**

**COLOR PICTURE TUBE HAVING A PHOSPHOR SCREEN WITH A SEMITRANSPARENT BLACK LIGHT ABSORPTION**

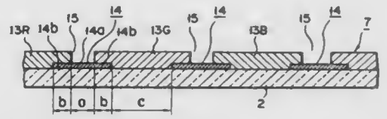
**Takeo Itou, Kumagaya; Hideml Matsuda, Oomiya; Kazuhiko Shimizu, Fukaya, and Hajime Tanaka, Fujioka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 25, 1990, Ser. No. 557,066**

**Claims priority, application Japan, Jul. 27, 1989, 1-195211**

**Int. Cl.[5] H01J** *29/10, 29/30*

**U.S. Cl. 313—466** **4 Claims**



1. A color picture tube comprising:

a vacuum envelope having a faceplate;

a phosphor screen including semitransparent black light-absorption layers coated on a first region of said faceplate in one of strips and a matrix, and phosphor layers of blue, red and green emitting phosphors coated on a second region of said faceplate in one of stripes and dots; and

an electron gun, arranged within the vacuum envelope, for emitting and focusing electron beams,

wherein end portions of said phosphor layers extend over the black light-absorption layers, thereby forming overlapped portions, and gaps are provided between the phosphor layers and over the black light-absorption layers;

wherein the light transmittance of each of said black light-absorption layers is set between 20% and 70%; and

wherein, when the width a of a portion of each black light-absorption layer, on which no phosphor layer is provided, the width b of the overlapped portion of each black light-absorption layer and each phosphor layer, and the distance c between adjacent ones of the black light-absorption layers have the relationship, $a+2b+c=100\%$, the ratio of a, b and c is set such that $c=40$ to 80%, $a=3$ to 50%, and $2\times b$=the balance.

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**5,045,751**

**CATHODE RAY TUBE OF IMPROVED BREAKDOWN VOLTAGE CHARACTERISTIC**

**Takashi Numata, Chiba; Yusuke Kobayashi, Komae; Yoshihito Katayama, Tokyo; Junichi Iura, Yokohama; Toshiyasu Kawaguchi, Atsugi, and Tsunehiko Sugawara, Chiba, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan**

**Filed Oct. 20, 1989, Ser. No. 424,871**

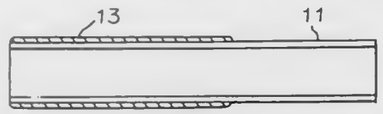
**Claims priority, application Japan, Oct. 25, 1988, 63-267131; Nov. 4, 1988, 63-277306; Nov. 4, 1988, 63-277307; May 17, 1989, 1-121566**

**Int. Cl.[5] H01J** *31/00*

**U.S. Cl. 313—479** **7 Claims**

1. A cathode ray tube of improved breakdown voltage char-

acteristic comprising an insulating layer formed in at least a part of the outer surface of its neck tube having the electron




gun, and coinciding at least in part with the extent of said electron gun.

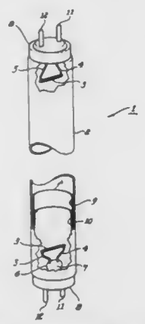
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**5,045,752**

## MINIMIZING MERCURY CONDENSATION IN TWO LAYER FLUORESCENT LAMPS

**Jon B. Jansma, University Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 24, 1989, Ser. No. 426,635**
**Int. Cl.[5] H01J** *61/44, 61/48*
**U.S. Cl. 313—487** **22 Claims**



1. A fluorescent lamp comprising a glass envelope enclosing electrodes, a discharge sustaining fill of mercury, an ionizable inert gas and having two layers of phosphor, a first layer and a second layer, wherein the composition of the phosphor in said first layer is different from the composition of the phosphor in said second layer and wherein said first layer comprises a mixture of particles of phosphor and alumina and is disposed on the inner surface of said envelope and wherein said second layer is disposed on said first layer and contains phosphor particles having a median particle size smaller than the median size of said phosphor particles in said first layer and wherein the median size of said alumina particles is less than that of said phosphor particles in said first layer, but not less than about 0.25 micron, with said alumina particles being present in said first layer in an amount of from about 10–30 wt. % of said first layer to inhibit said mercury from depositing onto said inner surface of said envelope.

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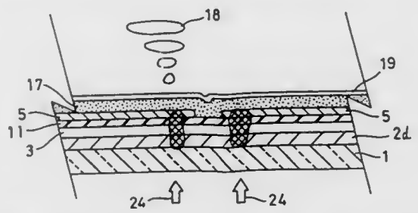
**5,045,753**

## MATRIX DISPLAY APPARATUS WITH REPAIR WIRES

**Mikio Katayama, Ikoma; Hiroaki Kato, Nara; Kiyoshi Nakazawa, Fujiidera; Hidenori Negoto, Ikoma; Yuzuru Kanemori, Tenri; Motokazu Inui, Kawachinagano; Akihiko Imaya, and Takayoshi Nagayasu, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 28, 1990, Ser. No. 500,131**
**Claims priority, application Japan, Mar. 28, 1989, 1-77825**
**Int. Cl.[5] H01J** *1/54*
**U.S. Cl. 313—494** **2 Claims**

1. A matrix display apparatus comprising:
a pair of substrates, at least one of which is translucent,
a display medium that is placed between said pair of substrates and that modulates its optical characteristics in response to voltage that is applied,
display electrodes that are formed on the inner surface of at least one of said pair of substrates,
driving wires for the driving of said display electrodes, and




repair wires for the repair of said driving wires,
wherein said matrix display apparatus has a layered structure in which said driving wires are layered on and along said repair wires to sandwich an insulating film therebetween.

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**5,045,754**

## PLANAR LIGHT SOURCE

**Jean-Frédéric Clerc, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, France**

**Filed Feb. 15, 1990, Ser. No. 480,582**
**Claims priority, application France, Feb. 15, 1989, 89 01960**
**Int. Cl.[5] H01J** *29/00*
**U.S. Cl. 313—495** **1 Claim**




1. A planar light source, characterized in that it comprises a vacuum enclosure (1) bounded by two parallel, insulating, planar walls (3,4) and a side wall (2), on each of the planar walls and within the enclosure (1) is placed a conductive electrode (5,6) covered with an insulating layer (7,8) comprising an assembly and at least one of these two wall-electrode-insulating layer assemblies is transparent, on one of the insulating layers (8) is placed a cathodoluminescent material layer (9), in the vicinity of the side wall (2) and externally of the two conductive electrodes (5,6) is provided an electron source (11) and a voltage source (10) is also provided for alternatively applying to the two conductive electrodes (5,6) two different potentials ($V_{anode}$, $V_{rest}$), so that the electrons emitted by said electron source are alternatively collected by said electrodes.

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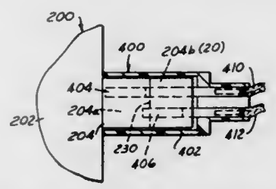
**5,045,755**

## ELECTROLUMINESCENT PANEL LAMP WITH INTEGRAL ELECTRICAL CONNECTOR

**Gustaf T. Appelberg, Fairfield, Conn., assignor to E-Lite Technologies, Inc., Watertown, Conn.**

**Continuation of Ser. No. 54,532, May 27, 1987, abandoned. This application Jan. 24, 1990, Ser. No. 469,098**
**Int. Cl.[5] H05B** *33/06*
**U.S. Cl. 313—498** **20 Claims**

1. An electroluminescent panel lamp comprising: a main body having a thickness including a first conductive layer, second conductive layer and electroluminescent layer there between and including an integral electrical connector tab contiguous with and extending from the main body in a direction substantially perpendicular to said thickness dimension with at least a portion of the integral electrical connector tab having said first conductive layer and second conductive layer with the electroluminescent layer there between, each layer in said portion of said tab being in the same plane as the corresponding layer consisting of the same material in the main body and at least one of said first and second conductive layers in




said integral electrical connector tab defining a direct electrical and physical connection and the other of said first and second conductive layers in said integral electrical connector tab defining a second direct electrical and physical connection for said lamp.

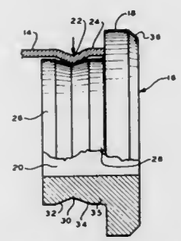
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**5,045,756**

## NON-CONDUCTIVE COLLAR FOR THE CONDUCTIVE SHELL OF AN ELECTRICAL DISCHARGE DEVICE

**Phillip A. Livera, East Hanover, N.J., assignor to E.G.L. Corporation, Inc., Newark, N.J.**

**Filed Jan. 2, 1991, Ser. No. 638,194**
**Int. Cl.[5] H01J** *61/06*
**U.S. Cl. 313—631** **14 Claims**




1. In an electric discharge device having a conductive shell mounted in a nonconductive tube, a nonconductive collar for mounting in said conductive shell and comprising:
an annular neck encircled by a central annular groove located between a spaced pair of circumferential plateaus radially dimensioned to fit in said conductive shell; and
an annular flange coaxially affixed to and radially larger than said annular neck.

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**5,045,757**

## METAL VAPOR DISCHARGE LAMP

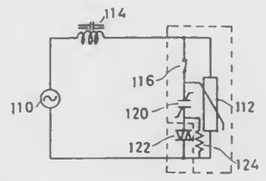
**Iida Takenobu, Urawa, and Shiina Jojiro, Gyouda, both of Japan, assignors to Iwasaki Electric Co., Ltd., Tokyo, Japan**

**Filed Oct. 19, 1990, Ser. No. 599,825**
**Claims priority, application Japan, Oct. 21, 1989, 1-271513**
**Int. Cl.[5] H05B** *41/14;* **H01J** *7/44, 17/34*
**U.S. Cl. 315—59** **3 Claims**

1. A metal vapor discharge lamp comprising a built-in starting circuit including a serial circuit having a ferrous electric capacitor, a semiconductor switch and a thermal response switch; wherein
the thickness of said ferrous electric capacitor is 0.45 to 0.8 mm;



the breakover voltage of said semiconductor switch is 60 to 100 V;




the open time of said thermal response switch is not less than 30 seconds; and
the supply voltage is 100 to 130 V.

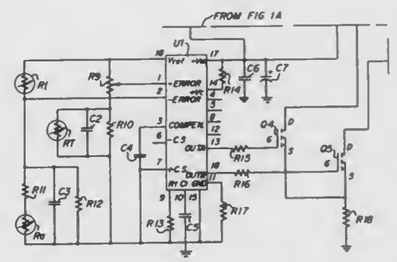
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**5,045,758**

## SOLID STATE REGULATED POWER SUPPLY FOR LUMINESCENT LAMP

**Cleve R. Hildebrand, 22435 Shadycroft Ave., Torrance, Calif. 90505**

**Filed Apr. 25, 1990, Ser. No. 514,274**
**Int. Cl.[5] H05B** *37/02*
**U.S. Cl. 315—151** **6 Claims**




1. A regulated solid state power supply for a luminescent lamp, and the like, in an external signal to maintain the signal effective and visible over a range of ambient light levels, said power supply comprising: a power transformer having a secondary winding across which a luminescent lamp may be connected and having a primary winding; a switching regulator circuit having an output connected to said primary winding; and a sensor bridge circuit connected to the input of said switching regulator circuit including a first light sensor for monitoring ambient light brightness and a second light sensor for monitoring the brightness of the luminescent lamp, said bridge circuit controlling the power introduced to said primary winding by said switching regulating circuit as a function of the ratio of lamp brightness to ambient light brightness so as to maintain the lamp power at a value required to establish a constant contrast between the light level of the signal and the ambient light level.

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**5,045,759**

## POWER SUPPLY FOR LASER FLASHLAMP

**Biqing Ye, University of Florida, College of Medicine, P.O. Box J-277 JHMHC, Gainesville, Fla. 32610, and Zhonglin Ma, Apt. 403, Building 4, Lane 55, Wensu Road, Jading, Shanghai, Switzerland 200433**

**Filed Feb. 26, 1990, Ser. No. 484,427**
**Int. Cl.[5] H01S** *3/00*
**U.S. Cl. 315—171** **19 Claims**

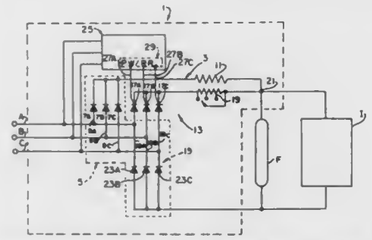
1. An N-phase power supply for operation of a laser flashlamp comprising:
first electrical circuit means interconnected between an

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N-phase source of electrical energy and the flashlamp for continuously supplying electrical current thereto; and,

second electrical circuit means interconnected between the source of electrical energy and the flashlamp for supplying pulses of electrical current to the flashlamp, the sec-



ond electrical circuit means including an N-phase bridge having electronic switch means in each branch thereof, and control means for controlling operation of each switch means to produce the current pulses supplied to the flashlamp, and wherein N>1.

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**5,045,760**

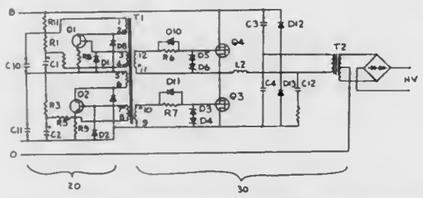
**NEON SIGN TRANSFORMER**

**Hieronim Teresinski, Don Mills, Canada, assignor to Williams Sign Supplies Ltd., Mississauga, Canada**

**Filed May 29, 1990, Ser. No. 529,460**

**Int. Cl.[5] H05B *41/36***

**U.S. Cl. 315—209 R** **8 Claims**



1. A neon sign transformer for operating a neon tube from a mains frequency alternating current comprising:

(a) filter means for filtering electro-magnetic interference from said alternating current;

(b) first rectifying means for rectifying said filtered mains frequency alternating current to a low level direct current;

(c) electrical circuit driver means for generating a high frequency low level alternating driving current, including:

(i) first transistor means for generating said high frequency low level current;

(ii) drive transformer means.

(d) electrical power circuitry means for generating a high frequency high level alternating current for energizing said neon tube including:

(i) second transistor means for generating said high frequency power;

(ii) high voltage transformer means for generating said high level voltage;

(iii) second rectifying means for generating a high voltage direct current for energizing said neon tubes.

**5,045,761**

**METHOD OF GATING ELECTRON TUBE AND THE ELECTRON TUBE OPERATED BY SAID METHOD**

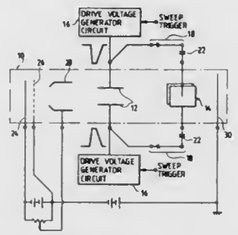
**Akira Takahashi, Shizuoka, Japan, assignor to Hamamatsu Photonics K. K., Shizuoka, Japan**

**Filed Jul. 11, 1990, Ser. No. 550,982**

**Claims priority, application Japan, Aug. 4, 1989, 1-202584**

**Int. Cl.[5] H01J *29/74***

**U.S. Cl. 315—410** **16 Claims**



1. An electron tube comprising:

a photocathode for emitting electrons in response to incident light;

drive voltage generating means for generating a drive voltage;

main deflection plates provided with the drive voltage, for sweeping the electrons in a main sweeping direction;

gate means provided with the drive voltage, for gating the electrons so that the electron tube does not produce, in a gating period, an output signal corresponding to the electrons; and

delay means for providing the drive voltage to the gate means with a predetermined delay from an end of a main sweep by the main deflection plates.

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**5,045,762**

**APPARATUS FOR CONTROLLING A BRUSHLESS MOTOR**

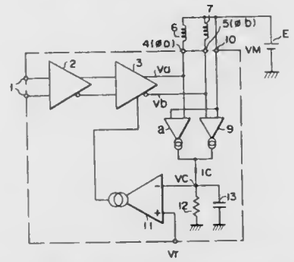
**Toshiro Shimada, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Aug. 10, 1990, Ser. No. 565,343**

**Claims priority, application Japan, Aug. 14, 1989, 1-207845**

**Int. Cl.[5] H02P *6/02*; H01L *27/02***

**U.S. Cl. 318—254** **3 Claims**



1. A motor-controlling apparatus for controlling a brushless motor having motor coils, said apparatus comprising:

amplification means for receiving a signal generated while said brushless motor is rotating and for outputting a plurality of motor-driving voltages which are at a predetermined level and different in phase;

a plurality of output means for applying the motor-driving voltages to the motor coils of the brushless motor;

external voltage input means for applying an external voltage to the motor coils of the brushless motor;



comparator means for comparing the motor-driving voltage applied from each output terminal of said output means with the external voltage applied from said external voltage input means, and outputting a signal representing the difference between the voltages compared; and

feedback means for feeding the signal output by said comparator means back to said amplification means.

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**5,045,763**

**MOTOR-CONTROL DEVICE FOR IMAGE FORMING APPARATUS**

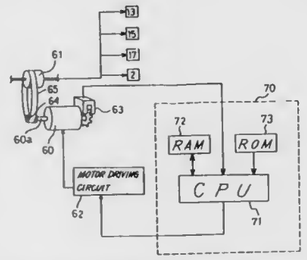
**Masanari Kobayashi, Ichinomiya; Michitoshi Akao, Nagoya; Kenji Sakakibara, Ichinomiya; Takesi Izaki, Nagoya; Tokunori Katoh, Ichinomiya, and Hiroshi Morisaki, Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Jan. 25, 1990, Ser. No. 470,311**

**Claims priority, application Japan, Jan. 28, 1989, 1-19066; Jan. 30, 1989, 1-20411**

**Int. Cl.[5] H04H *1/04***

**U.S. Cl. 318—270** **15 Claims**



1. A motor control device for an image forming apparatus comprising:

a motor;

speed signal generating means for generating a speed signal relative to the rotation speed of the motor;

operation means for cyclically providing a driving signal based upon the speed signal generated by the speed signal generating means;

drive means for driving the motor based upon the driving signal provided by the operation means; and

operating cycle determining means for determining an operating cycle of the operation means based upon the speed signal generated by the speed signal generating means, said operation cycle determining means determining the operating cycle to correspond to more than one complete cycle of the motor when the predetermined target speed signal is above a reference speed signal and determining the operating cycle to correspond to one complete cycle of the motor when the predetermined target speed signal is less than said reference speed signal.

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**5,045,764**

**MOTOR MONITOR SWITCHING SYSTEM**

**Dieter Eller, Essen, Fed. Rep. of Germany, assignor to EUBA-Antriebstechnik Eller GmbH, Essen, Fed. Rep. of Germany**

**Filed Apr. 5, 1990, Ser. No. 507,414**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 8904581[U]**

**Int. Cl.[5] H02H *7/085***

**U.S. Cl. 318—280** **4 Claims**

1. A motor monitor switching system for a reversible electric motor, comprising:

a motor reversing circuit having a plurality of reversing switch contacts for reversing the motor rotational direction, wherein said reversing circuit is connected to the power supply lines of the motor; and

a monitoring circuit connected between the reversing circuit and the motor for monitoring said power supply lines;

wherein said monitoring circuit comprises:

at least one current transformer connected to the power supply line to be monitored;

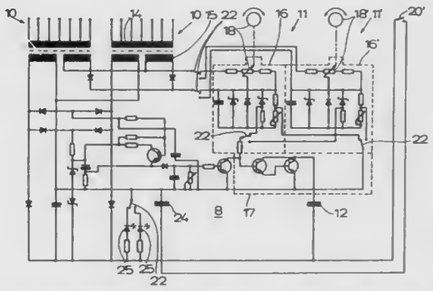
two secondary variable monitoring circiuts preferably of identical circuit design, for measuring actual current value of the motor:

an overload protection switch;

change-over contacts;

a voltage supply circuit; and

a control means;



wherein each secondary variable monitoring circuit has an actual value analyzer means, and is connected at its input to a secondary coil of the current transformer and at its output to the overload protection switch;

wherein the control means is connected to the actual value analyzer means;

wherein the change-over contacts are connected to the input side of each of the secondary variable monitoring circiuts via the change-over contacts, whereby one of the secondary variable monitoring circiuts is switched on and the other is switched off; and

wherein the change-over contacts are controlled by the reversing switch contacts or in accordance with the control of the reversing switch contacts.

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**5,045,765**

**PROCESS AND ARRANGEMENT FOR VENTILATING THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE**

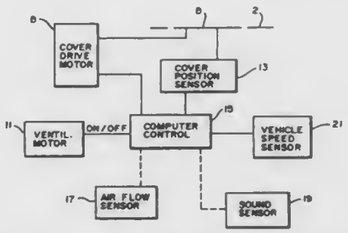
**Thomas Wissler, Munich, Fed. Rep. of Germany, assignor to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany**

**Filed Jul. 11, 1990, Ser. No. 551,019**

**Claims priority, application Fed. Rep. of Germany, Jul. 12, 1989, 3922941**

**Int. Cl.[5] H02P *1/00***

**U.S. Cl. 318—382** **18 Claims**



1. Process for ventilating the interior of a motor vehicle having a ventilating device and a roof with at least one roof opening which can be opened and closed by displacement of at

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least one cover by means of an actuating device, the roof being of a type from the group consisting of a sliding-lifting roof, a sliding roof, a lifting roof, a spoiler roof and a folding roof, comprising the steps of sensing when the roof is at least partially open and activating the ventilating device if it is off and increasing its operating speed if it is on less than maximum for increasing the exchange of air in the vehicle interior when an at least partially open roof is sensed.

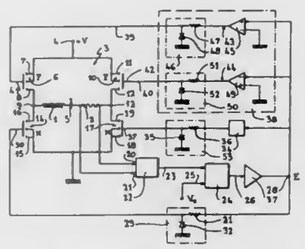
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**5,045,766**

## EXCITATION DEVICE FOR ELECTROMAGNETIC ACTUATOR

**Alain Vermersch, Velizy, France, assignor to Thomson Tubes Electroniques, Boulogne Billancourt, France**

**Filed May 23, 1990, Ser. No. 528,033**
**Claims priority, application France, May 30, 1989, 89 07083**
**Int. Cl.[5] H02P** *1/22*
**U.S. Cl. 318—293** **6 Claims**



1. A device for the electrical excitation of the coil or coils of an electromagnetic actuator, said device capable of causing a shift of said actuator in either direction, said device comprising a bridge consisting of two pairs of transistors, said bridge electrically connected to and capable of directly supplying electrical current to said coil(s) in either direction to obtain said shift of said actuator in either direction, said device further comprising means for measuring an error voltage, said error voltage being the difference between a reference voltage representing the current to be applied to said coil(s) and a voltage proportional to a current actually flowing through said coil(s), said error voltage consisting of an absolute value and a sign positive or negative; said device further comprising means which, in response to one sign of said error voltage, turns off a first pair of said two pairs of transistors of said bridge and turns entirely on one transistor of a second pair of said two pairs of transistors, while simultaneously the other transistor of said second pair of transistors is caused to operate in a substantially linear mode, causing a current proportional to said error voltage to flow through said coil(s) in a first direction, and, conversely, in response to the opposite sign of said error voltage, turns off said second pair of said two pairs of transistors of said bridge and turns entirely on one transistor of said first pair of said two pairs of transistors, while simultaneously the other transistor of said first pair of transistors is caused to operate in a substantially linear mode, causing a current proportional to said error voltage to flow through said coil(s) in a second direction.

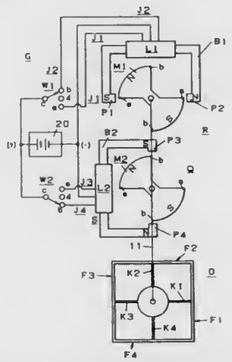
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**5,045,767**

## ROTATING DISPLAY ELEMENT AND DISPLAY UNIT USING THE SAME

**Yoshimasa Wakatake, 26-11 Kamiyoga 5-chome, Setagaya-ku, Tokyo 158, Japan**

**Filed Oct. 11, 1989, Ser. No. 420,149**
**Claims priority, application Japan, Oct. 12, 1988, 63-256104**
**Int. Cl.[5] G09F** *11/00*
**U.S. Cl. 318—696** **2 Claims**



1. A rotating display element, comprising:
a display surface member having four display surfaces;
and a permanent-magnet type motor mechanism;
wherein the display surface member is mounted on a rotor of the permanent magnet type motor mechanism housed therein;
wherein the display surfaces of the display surface member are arranged side by side around the axis of the rotor;
wherein either one of the rotor and the stator of the permanent magnet type motor mechanism has first and second double-pole permanent magnet members respectively having north and south magnetic poles and disposed side by side in the axial direction of the rotor;
wherein the north and south magnetic poles of the first double-pole permanent magnet member are spaced an angular distance of 180 degrees apart around the axis of the rotor;
wherein the north and south magnetic poles of the second double-pole permanent magnet member are disposed around the axis of the rotor at an angular distance of $\pm\alpha^\circ$ (where $0^\circ \leqq \alpha^\circ < 180^\circ$) from the north and south magnetic poles of the first double-pole permanent magnet member and at an angular distance of 180 degrees from each other;
wherein the other of the rotor and the stator of the permanent magnet type motor mechanism has a first magnetic member provided with first and second magnetic poles which act on the north and south magnetic poles of the first double-pole permanent magnet member, a second magnetic member provided with third and fourth magnetic poles which act on the north and south magnetic poles of the second double-pole permanent magnet member, a first exciting winding wound on the first magnetic member in manner to excite its first and second magnetic poles in reverse polarities, and a second exciting winding wound on the second magnetic member in a manner to excite its third and fourth magnetic poles in reverse polarities;
wherein the first and second magnetic poles of the first magnetic member are disposed around the axis of the rotor at an angular distance of 180 degrees;
wherein the third and fourth magnetic poles of the second magnetic member are disposed around the axis of the rotor at an angular distance of $\pm 90$ $\pm\alpha$ from the first and second magnetic poles of the first magnetic member and at an angular distance of 180 degrees from each other;
wherein the north and south magnetic poles of the first and second double-pole permanent magnet members each extend over an angular range of approximately 90 degrees about axis of the rotor; and
wherein the first and second magnetic poles of the first magnetic member and the third and fourth magnetic poles of the second magnetic member each extend over an angular range of 45 degrees or less about the axis of the rotor.

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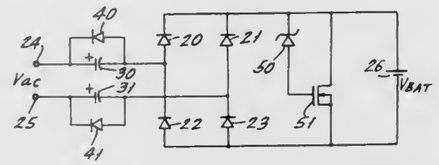


**5,045,768**

## OFF-LINE BATTERY CHARGER

**Brian R. Pelly, Palos Verdes Estates, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.**

**Filed Oct. 27, 1989, Ser. No. 428,163**
**Int. Cl.[5] H02J** *7/00*
**U.S. Cl. 320—2** **13 Claims**



1. A battery charger circuit comprising, in combination: an a-c to d-c converter circuit having a pair of a-c input terminals and a pair of d-c terminals; a pair of input terminals for connection to an a-c source; first, and second polarized d-c capacitors having anode and cathode terminals connected between respective ones of said pairs of input terminals and a-c terminals; first and second diodes having anode and cathode terminals; said anodes of said first and second diodes connected to said cathodes of said first and second capacitors respectively; said cathodes of said first and second diodes connected to said anodes of said first and second capacitors, respectively; said first and second diodes comprising bypass diodes for biasing said first and second polarized d-c capacitors respectively; and voltage clamp circuit means connected to said d-c terminals to clamp the output voltage which can be applied to a battery connected to said d-c terminals.

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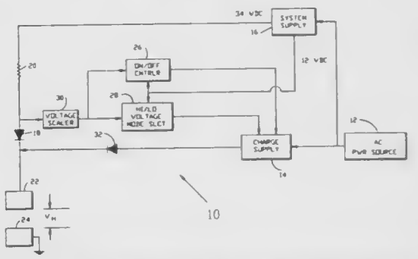
**5,045,769**

## INTELLIGENT BATTERY CHARGING SYSTEM

**Hobart R. Everett, Jr., San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 14, 1989, Ser. No. 436,277**
**Int. Cl.[5] H02J** *7/00*
**U.S. Cl. 320—2** **20 Claims**

1. A battery charging system, comprising:
a first electric terminal;
a second electric terminal electrically isolated from said first terminal and grounded;
an alternating current power source having an output;
a system power supply having an input connected to said output of said alternating current power source, and first and second direct current outputs;
a current-limiting resistor having a first resistor terminal electrically connected to said first direct current output of said system power supply and a second resistor terminal;
a first diode having an input electrically connected to said second resistor terminal of said resistor and an output electrically connected to said first terminal;
charging power supply means having a power input electrically connected to said output of said alternating current power source, first and second control inputs, and a direct current power output;
a second diode having an input electrically connected to said power output of said charging power supply means and an output electrically connected between said output of said first diode and said first terminal;
voltage scaler means having an input electrically connected between said second resistor terminal of said resistor and said input of said first diode and an output, for providing a voltage output that is linearly related to a voltage potential of said first terminal detected at said input of said voltage scaler means;
on/off controller means having a power input electrically connected to said second direct current output of said system supply, a voltage sensing input electrically connected to said output of said voltage scaler means, and an



output electrically connected to said first control input of said charging power supply means, for providing an output whenever $V_1 < V_H < V_2$, $V_1$ is a first reference voltage, $V_H$ is a voltage across said first and second terminals, and $V_2$ is a second reference voltage, said on/off controller means being electrically grounded in common with said second terminal; and
a voltage mode selector means having a power input electrically connected to said second direct current output of said system supply, a voltage sensing input electrically connected to said output of said voltage scaler means, and an output electrically connected to said second control input of said charging power supply means, for providing an output whenever said voltage $V_H$ is less than a third reference voltage, $V_3$, said voltage mode selector means being electrically grounded in common with said second terminal.

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**5,045,770**

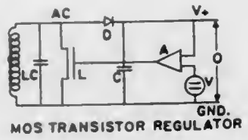
## SHUNT REGULATOR FOR USE WITH RESONANT INPUT SOURCE

**David R. Brooks, Perth, Australia, assignor to Magellan Corporation (Aust.) Pty. Ltd., Australia**

**PCT No. PCT/AU89/00035, § 371 Date Jan. 10, 1990, § 102(e) Date Jan. 10, 1990, PCT Pub. No. WO89/07295, PCT Pub. Date Aug. 10, 1989**
**ub. Date DFeb. 3, 1989, Ser. No. 459,766**
**Claims priority, application Australia, Feb. 4, 1988, PI6580**
**Int. Cl.[5] G05F** *1/613*
**U.S. Cl. 323—223** **27 Claims**

1. A regulator adapted for shunt operation, said regulator being operatively coupled to a resonant inductive means, said regulator obtaining input power from said inductive means, said regulator comprising

regulating means for regulating output power by shunting said input power;



MOS TRANSISTOR REGULATOR

said regulator having separate current paths for shunt current and output current.

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**5,045,771**

## METHOD AND CIRCUIT FOR PREVENTING TRANSIENTS FROM DAMAGING A SWITCHING REGULATOR

**Andre Kislovski, Neuenegg, Switzerland, assignor to Ascom Hasler AG, Bern, Switzerland**

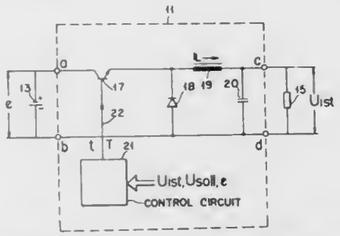
**PCT No. PCT/CH88/00188, § 371 Date Apr. 21, 1989, § 102(e) Date Jul. 10, 1989, PCT Pub. No. WO89/03608, PCT Pub. Date Apr. 20, 1989**

**ub. Date DOct. 12, 1988, Ser. No. 362,452**

**Claims priority, application Switzerland, Oct. 15, 1987, 04033/87**

Int. Cl.[5] G05F *1/575*

U.S. Cl. 323—282 **7 Claims**




1. A method for preventing transients from damaging a switching regulator, which includes at least a switch, a recovery diode, a choke and a capacitor, comprising the steps of: providing a switch control that actuates said switch throughout a continuous series of period intervals (T) of variable length for switch-on interval (t) in each of said period intervals that is virtually constant, and determining prior to the beginning of each switch-on interval (t) whether or not the current flowing through the choke will surpass a predetermined maximum value ($i_{max}$), and in the event of such excess, holding the switch open until, at the end of the finally initiated switch-on interval (t), maximum current ($i_{max}$) is reached but not exceeded.

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**5,045,772**

## REFERENCE VOLTAGE GENERATOR

**Kunio Nishiwaki, San Jose, and Kevin A. Norman, Belmont, both of Calif., assignors to Altera Corporation, San Jose, Calif.**

**Filed Oct. 1, 1990, Ser. No. 591,363**

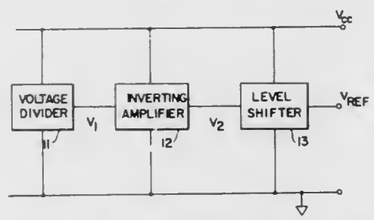
Int. Cl.[5] G05F *3/24*

U.S. Cl. 323—313 **9 Claims**

1. A circuit for generating a reference voltage which varies inversely with a supply voltage, comprising:

means for generating an intermediate voltage which varies substantially in proportion to said supply voltage; and

means for translating simultaneous increases in said intermediate voltage and said supply voltage into a decrease in said reference voltage, and for translating simultaneous




decreases in said intermediate voltage and said supply voltage into an increase in said reference voltage.

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**5,045,773**

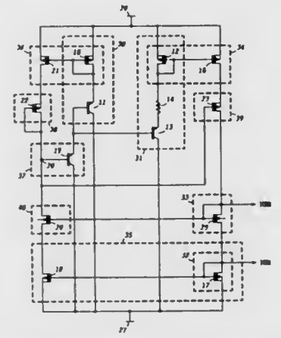
## CURRENT SOURCE CIRCUIT WITH CONSTANT OUTPUT

**Alan L. Westwick, Austin, and Roger A. Whatley, Georgetown, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 1, 1990, Ser. No. 590,859**

Int. Cl.[5] G05F *3/28*

U.S. Cl. 323—316 **17 Claims**



1. A current source circuit having a constant output which comprises:

a diode connected first transistor having a first current electrode connected to a first supply voltage, a second current electrode and a control electrode connected to the second current electrode;

a second transistor having a first current electrode connected to the control electrode of the first transistor, a second current electrode coupled to a second supply voltage, and a control electrode;

a diode connected third transistor having a first current electrode coupled to the first supply voltage, and a second current electrode and a control electrode connected to the second current electrode;

a means for providing resistance having a first terminal coupled to the control electrode of the third transistor, and a second, terminal;

a fourth transistor having a first current electrode coupled to the second terminal of the means for providing a resistance, a second current electrode coupled to the second supply voltage, and a control electrode;

a fifth transistor having a control electrode coupled to the control electrode of the third transistor, a first current electrode coupled to the first supply voltage, and a second current electrode;

a sixth transistor having a first current electrode coupled to the second current electrode of the fifth transistor, a second current electrode, and a control electrode;

a seventh transistor having a control electrode and first current electrode coupled to the second current electrode of the sixth transistor, and a second current electrode;

an eighth transistor having a first current electrode and control electrode coupled to the second current electrode of the seventh transistor, and a second current electrode coupled to the second supply voltage;

a ninth transistor having a first current electrode coupled to the second supply voltage, a control electrode coupled to the control electrode of the eighth transistor, and a second current electrode;

a tenth transistor having a first current electrode coupled to the second current electrode of the ninth transistor, a control electrode coupled to the control electrode of the seventh transistor, and a second current electrode;

an eleventh transistor having a control electrode coupled to the control electrode of the first transistor, a first current electrode coupled to the first supply voltage, and a second current electrode;

a twelfth transistor having a first current electrode coupled to the second current electrode of the eleventh transistor, a second current electrode and a control electrode connected to the second current electrode; and

a common node coupling the second current electrode of the twelfth transistor, a control electrode of the sixth transistor, the second current electrode of the tenth transistor, to the control electrodes of the second and the fourth transistor.



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**5,045,774**

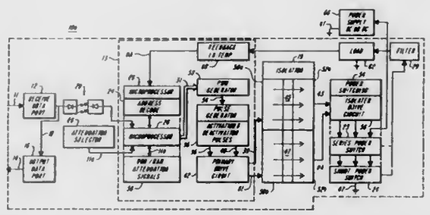
## FULL SCALE AC OR DC POWER ATTENUATOR

**Michael A. Bromberg, Brookline, N.H., assignor to R. Morley, Inc., Amherst, N.H.**

**Filed Dec. 28, 1989, Ser. No. 458,172**

Int. Cl.[5] G05B *24/02*

U.S. Cl. 323—322 **39 Claims**



2. An AC and DC power attenuator, for attenuating both AC and DC input power to a load as a function of an input control signal which represents a selected percentage of power to be applied to the load comprising:

pulse width modulation means, responsive to the input control signal, for providing a pulse width modulated signal having an active signal portion and an inactive signal portion, the ratio of said active signal portion to the sum of said active and inactive signal portions corresponding to the percentage of power to be applied to the load;

means, responsive to said pulse width modulated signal, for providing a plurality of activation pulses during the active portion of said pulse width modulated signal, and a plurality of deactivation pulses during the inactive portion of said pulse width modulated signal;

isolation means, responsive to said means for providing activation and deactivation pulses, and having an input section and an output section, for receiving said activation and deactivation pulses at a first voltage potential and for providing said activation and deactivation pulses at a second voltage potential; and

power switching means, coupled to said isolation means, and including bidirectional series power switch means having at least a first switch element responsive to power of a first polarity and at least a second switch element responsive to power of a second, opposite polarity, for providing bidirectional current flow through the power switch means and for connecting power to the load during receipt of said activation pulses, and for disconnecting the power from the load during receipt of said deactivation pulses.

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**5,045,775**

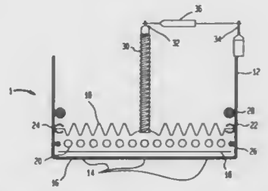
## ENVIRONMENTAL CORROSION MONITOR SYSTEM INCORPORATING DEPOSITED CONTAMINANTS AND CORROSION PRODUCTS

**Malcolm L. White, Bethlehem, Pa., and Henry Leidheiser, Jr., Venice, Fla., assignors to Lehigh University, Bethlehem, Pa.**

**Filed Oct. 31, 1989, Ser. No. 429,833**

Int. Cl.[5] G01N *27/28*

U.S. Cl. 324—71.2 **10 Claims**



1. A corrosion monitor system for measuring the effect of corrosion in a structure, which comprises:

a corrosion element of substantially the same material as the structure to be monitored and having means for allowing corrosion products and environmental contaminants and debris to collect underneath said corrosion element;

a galvanic cell, for generating an electric signal indicative of the corrosion on said corrosion element, having as a first electrode said corrosion element;

means for collecting corrosion products and environmental contaminants and debris within said galvanic cell underneath said corrosion element while allowing water to drain away from said corrosion element whereby the environment of said corrosion element parallels the environment of said structure; and

means for receiving and storing said electric signal generated.

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**5,045,776**

## METERING APPARATUS

**Ronald D. Claridge, Bedfordshire, Great Britain, assignor to ABB Kent plc, Luton, Great Britain**

**PCT No. PCT/GB88/01097, § 371 Date Dec. 14, 1989, § 102(e) Date Dec. 14, 1989, PCT Pub. No. WO89/05497, PCT Pub. Date Jun. 15, 1989**

**ub. Date DDec. 5, 1988, Ser. No. 382,645**

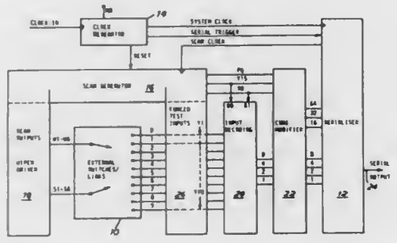
**Claims priority, application United Kingdom, Dec. 4, 1987, 8728359**

Int. Cl.[5] G08S *23/00*

U.S. Cl. 324—73.1 **6 Claims**

**1.** Metering apparatus comprising a metering device having an output; a plurality of indicator elements driven in response to the meter output such that the orientation of the respective indicator elements is indicative of the meter output; for each indicator element an array of position contacts, corresponding position contacts from each said array being connected with a corresponding one of a plurality of position terminals, and a wiper contact disposed to make contact successively with the position contacts of the array on driving of the corresponding indicator element; generator means for applying, in a measurement mode, measurement signals in sequence to the wiper

contacts and for applying, in a test mode alternating with the measurement mode, test signals in sequence to the position terminals; encoder means connected with the position terminals and adapted to provide an encoded output representative of the signals on said position terminals; and data output means arranged to receive said encoded output and adapted, in synchronism with operation of the generator means, to provide a data output, said data representing in the measurement mode the position of the respective indicator elements and, in the test mode, a test output in which departure from a predetermined value is representative of short circuiting of two or more position contacts.



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5,045,777

**ELECTRIC SIGNAL PRODUCING SYSTEM**

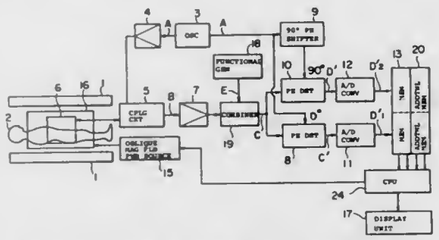
**Hidenobu Itagaki, Amagasaki, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan**

**Filed Apr. 26, 1989, Ser. No. 343,307**

**Claims priority, application Japan, Apr. 26, 1988, 63-101394; Sep. 13, 1988, 63-227624**

**Int. Cl.[5] G01R** *23/16;* **G01V** *3/00;* **H03M** *1/12*

**U.S. Cl. 324—77 R** **6 Claims**



1. An electric signal producing system comprising:

known signal generating means for generating a known signal having a predetermined frequency chosen so as to correspond to frequency components of a reception signal which are low in amplitude as compared to a maximum amplitude frequency component of said reception signal,

adding means for adding the known signal to said reception signal to generate a mixture signal,

an A/D converter for converting said mixture signal to digital data, and

a computer for controlling said A/D converter to oversample said mixture signal by a frequency of twice or more as large as a Nyquist sampling frequency.

5,045,778

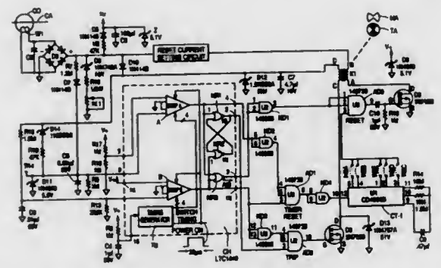
**FAULT INDICATOR WITH INRUSH RESTRAINT**

**Joseph R. Thibodeau, Dedham, and Matthew G. Dillon, Hingham, both of Mass., assignors to Sigma Instruments, Inc., Weymouth, Mass.**

**Filed Jan. 30, 1989, Ser. No. 303,761**

**Int. Cl.[5] H02H** *3/08*

**U.S. Cl. 324—133** **9 Claims**



1. A faulted circuit indicator, comprising:

reset means responsive to a first current value in a cable for producing a reset signal;

trip means responsive to a second current value in the cable for producing a trip signal;

disabling means coupled to said reset means and said trip means for disabling said trip means in response to changes in current values in the cable from values below the first current value to values above the second current value within a predetermined period;

said disabling means otherwise enabling said trip means for changes in current values in the cable from values above the first current value of said reset means to values above the second current value of said trip means within the predetermined period.

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5,045,779

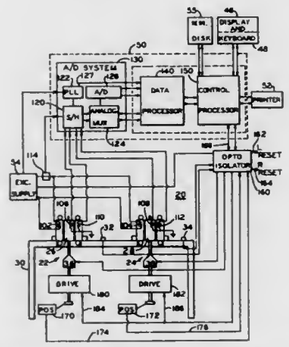
**METHOD AND APPARATUS FOR TESTING DYNAMOELECTRIC MACHINE ROTORS**

**Phillip R. Herrick; Daniel C. Ewing; Floyd H. Wright, and Kevin M. Truelove, all of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.**

**Division of Ser. No. 269,500, Nov. 10, 1988, Pat. No. 4,940,932, which is a division of Ser. No. 860,240, May 6, 1986, Pat. No. 4,801,877. This application Apr. 9, 1990, Ser. No. 506,661**

**Int. Cl.[5] G01R** *31/06*

**U.S. Cl. 324—158 MG** **16 Claims**



1. Test apparatus for testing dynamoelectric machine rotors, comprising:



a test fixture including means for accepting and rotating a rotor, and exciting means for magnetizing the rotor during rotation;

skew sensing means for sensing an effective electrical skew of the rotor and for generating an effective skew signal responsive thereto: and

signal processing means for determining the effective electrical skew of the rotor in response to the effective skew signal.

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5,045,780

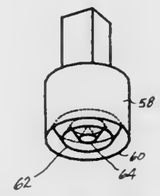
**ELECTRICAL TEST PROBE CONTACT TIP**

**Mark A. Swart, Upland, Calif., assignor to Everett/Charles Contact Products, Inc.**

**Filed Dec. 4, 1989, Ser. No. 445,979**

**Int. Cl.[5] G01R** *1/02, 1/04*

**U.S. Cl. 324—158 P** **8 Claims**



1. A plunger for an electrical test probe having an outer barrel and means for supporting the plunger within the barrel by spring pressure for allowing spring biased relative axial motion between the plunger and the barrel so the plunger applies a probing force to a test point on a unit under test, the plunger comprising an elongated shaft for extending axially through the barrel and having an outer portion for extending through an open end of the barrel and terminating in a contact tip outside the barrel for contact with a test point on the unit under test, the contact tip comprising a head having a working end with a substantially continuous outer blade edge of generally V-shaped cross-section extending around a periphery of the head and positioned thereon to engage a test point on the unit under test, and at least one further substantially continuous inner blade edge of generally V-shaped cross-section inside said outer blade edge and positioned on the head to engage the test point on the unit under test, the inner blade edge being spaced inwardly from the outer blade edge to form a continuous annular groove between the blade edges with the groove having side walls converging into the depth of the head, the inner and outer blade edges also having continuous knife edges lying substantially in a common plane at the outermost extremely of the working end of the head, so that upon contact with a projecting surface of the test point, the inner and outer blade edges cooperate to produce spring biased pressure against the surface of the test point to enhance contact with the test point.

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5,045,781

**HIGH-FREQUENCY ACTIVE PROBE HAVING REPLACEABLE CONTACT NEEDLES**

**K. Reed Gleason, Portland, and Keith E. Jones, Aloha, both of Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.**

**Division of Ser. No. 364,091, Jun. 8, 1989, Pat. No. 5,006,793. This application Mar. 4, 1991, Ser. No. 663,708**

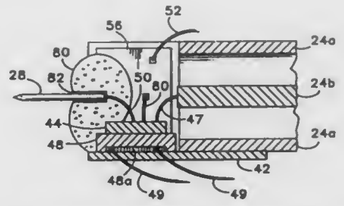
**Int. Cl.[5] G01R** *1/06, 31/02*

**U.S. Cl. 324—158 P** **6 Claims**

1. A circuit probe having an assembly within said probe for detachably mounting a contact needle, said circuit probe comprising:

(a) a support location on said circuit probe adapted to conductively receive said contact needle;

(b) heating means on said circuit probe for selectively generating heat; and



(c) heat conduction means on said circuit probe for conducting heat from said heating means to said support location.

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5,045,782

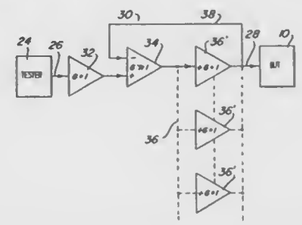
**NEGATIVE FEEDBACK HIGH CURRENT DRIVER FOR IN-CIRCUIT TESTER**

**Hiroshi Koyama, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jan. 23, 1990, Ser. No. 469,668**

**Int. Cl.[5] G01R** *15/00, 15/12*

**U.S. Cl. 324—158 R** **18 Claims**



1. Apparatus for externally overdriving an in-circuit generated signal supplied to a device under test (DUT) in the circuit comprising:

a) first means for receiving as inputs (i) a first signal indicative of an overdriving test signal desired to be applied to the DUT and (ii) a second signal indicative of an actual signal received by the DUT and for providing as an output a signal indicative of the difference between the first and second signals; and,

b) second means including high current output driver means for receiving as an input the output signal provided by the first means and applying the same as a high current overdriving output signal to the DUT;

the second signal being derived from the high current overdriving output signal, the high current overdriving output signal substantially cancelling any remaining component of the in-circuit generated signal appearing at the DUT.

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5,045,783

**METHOD FOR TESTING A PRINTED CIRCUIT BOARD WITH A PARTICLE PROBE**

**Matthias Brunner, Kirchheim, and Hermann Wessely, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed May 18, 1990, Ser. No. 524,850**

**Claims priority, application European Pat. Off., Jun. 13, 1989, 89110728-6**

**Int. Cl.[5] G01R** *31/00, 31/02*

**U.S. Cl. 324—158 R** **11 Claims**

1. A method for testing a printed circuit board which com-

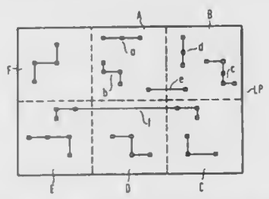
prises a plurality of networks composed of contact points and interconnects, comprising the steps of:

(a) dividing the printed circuit board into a plurality of adjoining regions;

(b) charging all contact points lying within a selected first region;

(c) measuring the charge states of the contact points of a selected second region by

(c1) scanning the contact points of the selected second region with a particle probe;




(d) comparing the measured charge states with reference charge states which are anticipated on the basis of network geometry;

(e) repeating the steps (b) through (d) for each of the other regions such that during each repetition a different region is the selected first region; and

(f) before each repetition of the step (b), discharging the networks of the printed circuit board,

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**5,045,784**

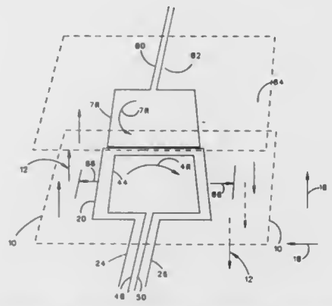
**TACHOMETER NOISE REDUCTION SYSTEM USING A PICKUP COIL TO CANCEL THE NOISE FROM THE TACHOMETER SIGNAL**

**Frank A. Pizzarello, Yorba Linda, and Clifford D. Dax, Mission Viejo, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Aug. 21, 1989, Ser. No. 396,581**

**Int. Cl.[5] G01P** *3/46, 3/52*

**U.S. Cl. 324—163** **12 Claims**




1. An electric tachometer motor system comprising:

an external magnet which produces temporally fixed lines of magnetic flux;

a drive coil, energized by a source of varying current, said drive coil being movable with respect to the external magnet, and producing temporally varying lines of magnetic flux;

a tachometer coil, which is stationary with respect to the drive coil, and which is situated and constructed to produce a motion voltage component from its motion through the lines of flux produced by the external magnet and a drive noise voltage component from the temporal variations in the lines of magnetic flux produced by the drive coil, the motion voltage component and drive noise voltage component combining to form a tachometer voltage;

a pickup coil which is situated adjacent to the drive coil, and at least approximately parallel to, and at least approximately concentric with, the drive coil, and which is constructed to produce a pickup voltage from the temporal variations in the lines of magnetic flux produced from the drive coil; and

means for combining the tachometer voltage and the pickup voltage into an output voltage differing from the motion voltage in an amount less than the difference between the tachometer voltage and the motion voltage.

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**5,045,785**

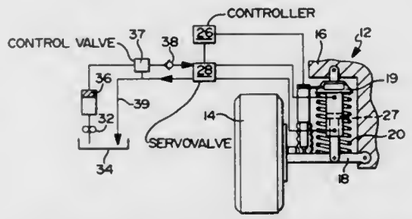
**LINEAR POSITION SENSOR WITH MOVABLE TAPERED ELEMENT**

**James A. Hansen, Morton Grove, Ill., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.**

**Filed Mar. 5, 1990, Ser. No. 488,579**

**Int. Cl.[5] G01B** *7/14*

**U.S. Cl. 324—207.16** **15 Claims**




1. A height sensor for producing a linear current signal upon movement between first and second relatively moveable members having a coil carried by one of the relatively moveable members adapted to be connected to control means for processing the linear current signal and wherein the other of the relatively movable members carrying a sensor element moveable relative to the coil to change the inductance therein in accordance with changes in the position of the sensor element during movement of said first and second relatively moveable members between fully retracted and fully extended positions thereof characterized by:

said sensor element having an outer surface of varying dimension, a free end and a fixed end connected to said other of said first and second relatively moveable members;

said one of said relatively moveable members having a terminal end with an axially open ended annular groove extending through said inner surface of said one of said relatively moveable members for directly exposing the windings of said coil;

said sensing coil formed as a doughnut shaped ring having an exposed inner surface;

said outer surface of said sensor element and said inner surface of said ring forming an air gap therebetween which varies in width in accordance with the relative movement between said relatively moveable members; and

said sensing coil being position by said terminal end at said fixed end of said sensor element when said first and second moveable members are in their fully retracted position.



**5,045,786**

**CIRCUIT FOR MEASURING A VARIABLE INDUCTANCE CONNECTED IN SERIES WITH A FIXED INDUCTANCE**

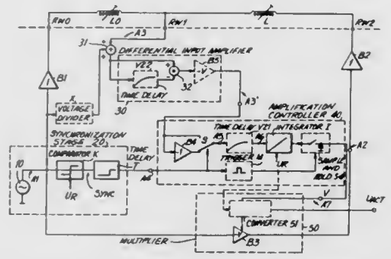
**Fischer, Werner, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**PCT No. PCT/EP88/00376, § 371 Date Dec. 4, 1989, § 102(e) Date Dec. 4, 1989, PCT Pub. No. WO89/11105, PCT Pub. Date Nov. 16, 1989**

**ub. Date DMay 5, 1988, Ser. No. 449,892**

**Int. Cl.[5] G01R** *27/26;* **G01B** *7/14*

**U.S. Cl. 324—207.16** **7 Claims**




1. A circuit for evaluating a variable inductance (L) connected in series with a fixed inductance (L0), comprising:

a signal generator (10) for generating a first signal (A1) having a fixed frequency and a fixed amplitude;

a first path for feeding said first signal to a free end (RW0) of said fixed inductance;

a controllable inverting amplifier (B3) connected with said signal generator to invert said first signal into a second signal having said fixed frequency at opposite phase and being controllable as to its amplitude;

a second feeding path for applying said second signal to a free end (RW2) of said variable inductance;

means for processing a third signal resulting at a common connection point of said fixed and variable inductances, said processing means including a matching circuit having an input connected to said common connection point to adjust said third signal (A3) toward a level of a d.c. reference voltage, an amplification control circuit including controllable rectifying means connected to an output of said matching circuit, integrating means connected with said rectifying means to integrate into a control value a deviation from the d.c. reference voltage of a rectified signal (A6) at the output of said rectifying means, means for quantizing said control value into a control signal (A7) applied to a control input of said controllable inverting amplifier (B3); and means for converting said control signal into an output signal ($U_{act}$) representative of a value of said variable inductance when said third signal (A3) is balanced to zero.

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**5,045,787**

**APPARATUS AND METHOD FOR MEASURING INSULATED TRACK JOINT RESISTANCES**

**John H. Auer, Jr., Fairport, and Klaus H. Frielinghaus, Rochester, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.**

**Filed Dec. 27, 1989, Ser. No. 457,661**

**Int. Cl.[5] B61K** *9/10;* **G01N** *27/82*

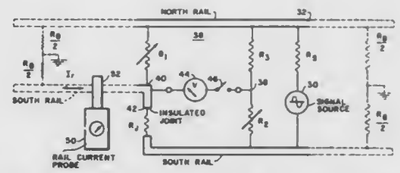
**U.S. Cl. 324—217** **6 Claims**

1. Apparatus for measuring the insulation resistance of an insulated rail joint in the presence of leakage ground resistance and the like, comprising:

a track defined by a pair of rails carrying current;

an insulated joint in one of said rails;

a bridge circuit, including a leg having the insulated joint therein; three other legs, each including a resistor, a first and a second of said resistors being variable, and a third having a fixed, known value;




whereby said variable resistors are varied to obtain both the null point of the rail current and balance of the bridge circuit such that the resistance value of the insulated joint is then determined.

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**5,045,788**

**DIGITAL SQUID CONTROL SYSTEM FOR MEASURING A WEAK MAGNETIC FLUX**

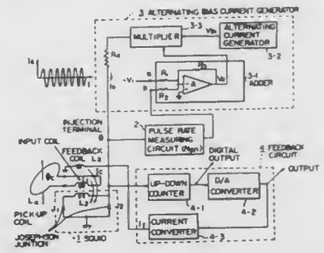
**Hajime Hayashi, Yamato; Yutaka Igarashi, Yokohama; Takehiko Hayashi; Takao Goto, both of Kawasaki, and Shinichi Amemiya, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Mar. 27, 1990, Ser. No. 499,963**

**Claims priority, application Japan, Mar. 30, 1989, 1-79299**

**Int. Cl.[5] G01R** *33/035*

**U.S. Cl. 324—248** **4 Claims**




1. A digital SQUID control system for measuring a weak magnetic flux irradiated from an object, comprising:

a SQUID having Josephson junctions and a superconductivity coil connected in series with said Josephson junctions so as to form a loop circuit, said SQUID outputting positive and negative pulses;

detecting means having a pick-up coil, said pick-up and input coils forming a loop circuit, said pick-up coil detecting the weak magnetic flux from the object and flowing a measuring current in said pick-up coil, and said input coil being magnetically coupled to said superconductivity coil through the measuring current;

a feedback coil magnetically coupled to said superconductivity coil through a feedback current;

a feedback circuit, operatively connected to said SQUID at an input side thereof and operatively connected to said feedback coil at an output side thereof, for counting the positive and negative pulses output from said SQUID, for converting count values to an analog voltage, and for converting the analog voltage to the feedback current;

an alternating bias current generating circuit, operatively connected to said SQUID through an injection terminal, for generating an alternating bias current and supplying said alternating bias current to said SQUID through said injection terminal; and

a pulse rate measuring circuit, operatively connected to said SQUID through said injection terminal at an input side thereof and operatively connected to said alternating bias current generating circuit at an output side thereof, for

calculating a sum of a number of the positive and negative pulses which are output from said SQUID when the alternating bias current is supplied to said SQUID through said injection terminal and outputting a voltage;

wherein said alternating bias current generating circuit controls an amplitude of said alternating bias current in such a way that said sum of the number of the positive and negative pulses per a unit of time becomes a constant value, and at which time the frequency of the output pulses from said SQUID have the largest gradient for said alternating bias current;

said feedback circuit controlling the feedback current under control of the amplitude of said alternating bias current in such a way that a difference between the positive pulses and the negative pulses becomes zero by flowing the feedback current through said magnetically coupled superconductivity coil.

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**5,045,789**

## DETECTOR FOR DETECTING FOREIGN MATTER IN OBJECT BY USING DISCRIMINANT ELECTROMAGNETIC PARAMETERS

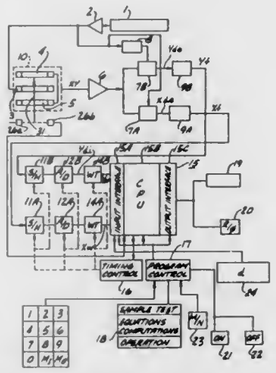
**Shinichi Inoue, Kobe, and Kazuo Nakayama, Akashi, both of Japan, assignors to Yamato Scale Company, Limited, Akashi, Japan**

**Continuation-in-part of Ser. No. 336,213, Apr. 11, 1989. This application Jul. 26, 1989, Ser. No. 385,681**

**Claims priority, application Japan, Jul. 26, 1988, 63-185771**

**Int. Cl.[5] G01N *27/72*; G01R *33/12***

**U.S. Cl. 324—225** **35 Claims**



1. A detector for detecting foreign matter in an object comprising:

means for providing first and second detected signals representative of an electromagnetic parameter of the object;

means connected to said providing means for converting said detected signals into first and second series of digital values, respectively;

means connected to said converting means for determining a representative value for the object from each said series of digital values; and

means for comparing the representative values to reference values for the object;

said comparing means comprising means for obtaining a deviation vector calculated from the difference between the vector of said representative values and the vector of said reference values, means for discriminating whether said deviation vector of said reference values reaches outside of a region which is mathematically defined by a discriminant equation and which includes said reference values; and means for indicating the presence of foreign matter in the object when the deviation vector is outside the region.

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**5,045,790**

## INVESTIGATING A SAMPLE USING NMR

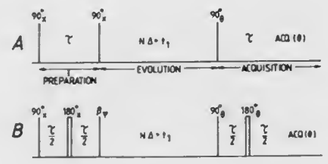
**Laurance D. Hall, 22 Long Road, Cambridge CB2 2QS, and Timothy J. Norwood, 49 Jesus Lane, Cambridge, both of England**

**Filed Aug. 5, 1988, Ser. No. 229,156**

**Claims priority, application United Kingdom, Aug. 7, 1987, 8718723**

**Int. Cl.[5] G01R *33/20***

**U.S. Cl. 324—307** **10 Claims**




1. A method of investigating a sample using nuclear magnetic resonance, the method comprising

i) applying a magnetic field across said sample;

ii) creating zero quantum coherences (ZQCs) within said sample during a preparation period of duration $\tau$;

iii) allowing said zero quantum coherences to evolve for a period of at least $N\Delta+t_1$, where $\Delta$, $t_1$ are constant time intervals and N is an integer;

iv) at the end of the step iii) applying a coherence transfer pulse to create single quantum coherences whereafter a free induction decay signal is generated;

v) after a period $\tau$, collecting said free induction decay signal from said sample;

vi) repeating steps ii) to v) with different values of N; and,

vii) combining at least some of the free induction decay (FID) signals collected to generate an FID due to a single ZQC.

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**5,045,791**

## NUCLEAR MAGNETIC RESONANCE IMAGING METHOD

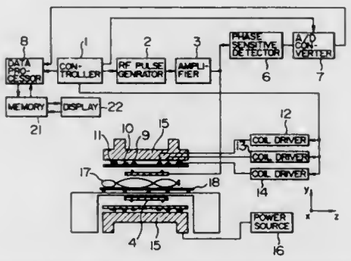
**Etsuji Yamamoto, Akishima, and Hideki Kohno, Tama, both of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Tokyo, Japan**

**Filed Mar. 13, 1990, Ser. No. 492,121**

**Claims priority, application Japan, Mar. 15, 1989, 1-61016**

**Int. Cl.[5] G01B *33/20***

**U.S. Cl. 324—309** **15 Claims**




1. A nuclear magnetic resonance imaging method of obtaining an image from nuclear magnetic resonance signal derived from an object placed in a space to which a predetermined static magnetic field is applied, comprising:



(a) a step of exciting nuclear spins in said space;

(b) a step of applying a phase encoding field gradient along at least one direction to said static magnetic field to provide information of the location along said direction to the phase of excited nuclear spins, said phase encoding field gradient being applied with one of a plurality of magnitudes of gradient prepared for said phase encoding field gradient;

(c) a step of measuring a resonance signal of said nuclear spins;

(d) a step of repeating said steps (a) to (c) while successively selecting, among the plurality of magnitudes of gradient prepared for said phase encoding field gradient, magnitudes of gradient which belong to a first group of magnitudes of gradient not larger than a predetermined value;

(e) a step of performing an image reconstruction processing based on Fourier transformation for data trains acquired by said step (d), thereby obtaining a crude image;

(f) a step of repeating said steps (a) to (c) while successively selecting, among the plurality of magnitudes of gradient prepared for said phase encoding field gradient, magnitudes of gradient which belong to a second group of magnitudes of gradient exceeding said predetermined value; and

(g) a step of performing an image reconstruction processing based on Fourier transformation for all of data trains acquired through the whole of the repetition in said step (d) and the repetition in said step (f), thereby obtaining a detailed image.

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**5,045,792**

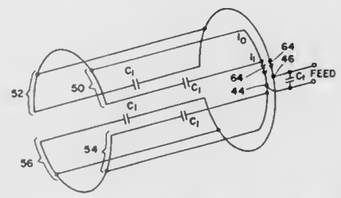
## SPLIT AND NON-CIRCULAR MAGNETIC RESONANCE PROBES WITH OPTIMUM FIELD UNIFORMITY

**Mahrdad Mehdizadeh, University Hts., Ohio, assignor to Picker International, Inc., Highland Hts., Ohio**

**Continuation-in-part of Ser. No. 234,278, Aug. 19, 1988, Pat. No. 4,918,388, and a continuation-in-part of Ser. No. 199,202, May 26, 1988, Pat. No. 4,879,516, which is a continuation-in-part of Ser. No. 120,475, Nov. 13, 1987, Pat. No. 4,839,594, and Ser. No. 86,277, Aug. 17, 1987, Pat. No. 4,841,248, each is a continuation-in-part of Ser. No. 931,726, Nov. 17, 1986, Pat. No. 4,752,738, and Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Aug. 11, 1989, Ser. No. 392,653**

**Int. Cl.[5] G01R *33/20***

**U.S. Cl. 324—318** **12 Claims**




1. An R.F. magnetic resonance probe comprising:

a first coil section including a first plurality of conductor branches connected electrically in parallel;

a second coil section including a second plurality of conductor branches connected in parallel, the first and second sections being connected in series with their parallel branches lying physically parallel along a first half cylinder;

a third coil sections including a third plurality of conductor branches connected electrically in parallel;

a fourth coil section including a third plurality of conductor branches connected electrically in parallel, the third and fourth sections being connected in series with their conductor branches lying in parallel at non-uniform intervals along a second half cylinder;

a capacitor means connected in series with at least one of the conductor branches of each of the first, second, third, and fourth sections for adjusting a ratio of RF currents among the parallel connected branches for RF field uniformity within the first and second half cylinders; and

an electrical connection coupling for electrically connecting the third and fourth coil sections to the first and second coil sections as the first and second half cylinders are brought together into a cylinder.

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**5,045,793**

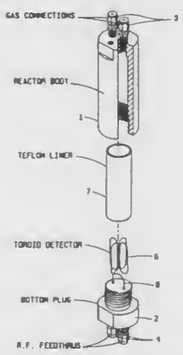
## TOROIDS AS NMR DETECTORS IN METAL PRESSURE PROBES AND IN FLOW SYSTEMS

**Jerome W. Rathke, Bolingbrook, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Jan. 31, 1990, Ser. No. 472,924**

**Int. Cl.[5] G01R *33/20***

**U.S. Cl. 324—318** **4 Claims**




1. An apparatus to carry out nuclear magnetic resonance (NMR) measurements on a sample under a pressure, said apparatus comprising:

a pressure vessel configured to permit the transfer of a pressurized fluid into and out of said vessel through fluid connectors, and a toroidal coil positioned within said pressure vessel, and means to transfer an electrical signal to and from said coil by means of electrical devices transcending said pressure vessel by means of feedthroughs and terminating at electrical connectors.

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**5,045,794**

## METHOD OF OPTIMIZING PASSIVE SHIM PLACEMENT IN MAGNETIC RESONANCE MAGNETS

**Bizhan Dorri, Clifton Park, and Mark E. Vermilyea, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 4, 1989, Ser. No. 445,510**

**Int. Cl.[5] G01R *33/20***

**U.S. Cl. 324—320** **7 Claims**

1. A method of passively shimming a magnet having a central bore, comprising the steps of:

a) measuring the field strength in the bore of the magnet at a predetermined number of points;

b) determining the field inhomogeneity from the measured field strengths;

c) determining the fields created by a single shim of known size when positioned at different predetermined positions in the bore of the magnet;

d) determining the shim locations in the bore of the magnet and shim size using a linear programming solver to minimize the field inhomogeneity and total amount of shims used, the shim size being determined based on the mea-

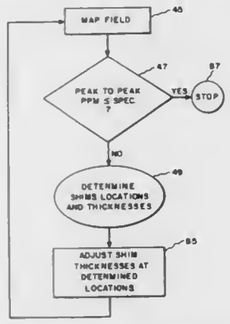
VOL 1130 ISS 1 SE 3 1991 UMI



sured field in the bore of the magnet and the field created by a single shim when positioned at a predetermined number of positions;

e) adjusting the shim size at the appropriate location to the determined values;

f) measuring the field strength of the magnet with shims in




position at the predetermined number of points in the magnet;

g) determining the field inhomogeneity from the measured field strengths;

h) comparing the field inhomogeneity to a desired value; and

i) repeating steps d, e, f, g, and h until the field inhomogeneity is less than or equal to the desired inhomogeneity.

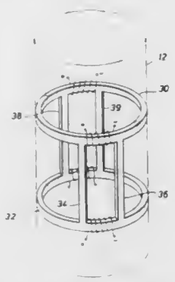
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**5,045,795**

## AZIMUTHALLY ORIENTED COIL ARRAY FOR MWD RESISTIVITY LOGGING

**Stanley C. Gianzero, Austin; Paul Sinclair, Clearlake Shores; Roland E. Chemali, and Shey-Min Su, both of Austin, all of Tex., assignors to Halliburton Logging Services Inc., Houston, Tex.**

**Filed Jul. 10, 1990, Ser. No. 550,842**
**Int. Cl.[5] G01V *3/28***
**U.S. Cl. 324—342** **9 Claims**



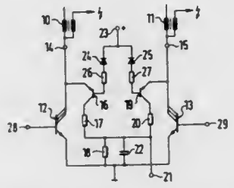

1. A coil array for a MWD resistivity logging system wherein the coils are installed on an elongate generally cylindrical support member, and the coils comprise a pair of first and second circumferential coil support forms each of which supports separate first and second coils thereon and wherein said first circumferential form is positioned at a specified location along said support member, and having two diametrically opposite coils wound thereon, said second and parallel circumferential coil support form having two diametrically opposite coils wound thereon, and wherein all of said coils are collectively connected to switching means for combining signals therefrom and for generating signals corresponding to various connections of the several coils.

**5,045,796**

## APPARATUS FOR RECOGNIZING MISSING OR POOR FIRINGS IN OTTO ENGINES

**Ulrich Bentel, Wiernsheim-Iptingen, and Adolf Dreyer, Hemmingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jun. 29, 1990, Ser. No. 547,056**
**Claims priority, application Fed. Rep. of Germany, Jul. 20, 1989, 3924130**
**Int. Cl.[5] F02P *17/00***
**U.S. Cl. 324—399** **27 Claims**




1. Circuit for recognizing missing or poor firings in Otto engines with a plurality of ignition circuits comprising

for each ignition circuit, a transistor **(16,19)** responsive to a respective primary-side spark voltage is provided;

each of said transistors **(16, 19)** has an output terminal connected to a common junction point **(21)**, from which signals representative of respective control states of said transistors can be detected;

further comprising

an evaluation circuit **(32)** connected to said common junction point **(21)**, comparing an actual voltage pattern picked up at said junction point **(21)** with a predetermined good-combustion voltage pattern, and generating an error indication if deviation between said voltage patterns exceeds a predetermined maximum deviation.

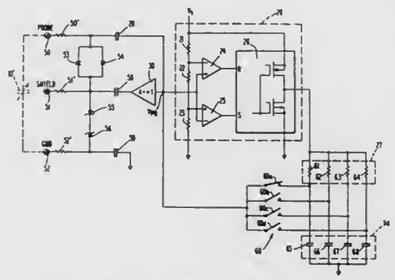
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**5,045,797**

## CONTINUOUS CONDITION SENSING SYSTEM DETERMINING LIQUID LEVEL BY ADMITTANCE MEASUREMENT

**L. Jonathan Kramer, Warminster; Steven R. Petersen, Ambler, and Herbert A. Shauger, Jr., Doylestown, all of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.**

**Continuation of Ser. No. 222,498, Jul. 21, 1988, Pat. No. 4,950,998, which is a continuation of Ser. No. 917,958, Oct. 14, 1986, Pat. No. 4,788,488. This application Mar. 19, 1990, Ser. No. 495,733**
**The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.**
**Int. Cl.[5] G01R *27/26***
**U.S. Cl. 324—667** **15 Claims**



1. A material condition monitoring system comprising:



(a) first means for providing a first signal having a period that varies with changes in the monitored condition;

(b) second means for providing a second signal having a period that is determined according to the value of fixed timing components associated therewith; and

(c) third means receiving the first and second signals for providing a third signal indicative of the ratio of the periods of the first and second signals, the third signal having a generally fixed period and a duty cycle that varies in accordance with changes in the condition of the material.

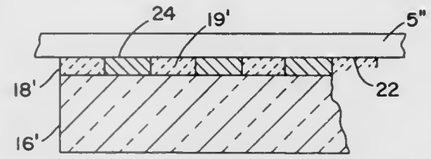
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**5,045,798**

## PLANAR INTERDIGITATED DIELECTRIC SENSOR

**Kendall B. Hendrick, Landenberg, Pa., assignor to TA Instruments, Inc., New Castle, Del.**

**Continuation-in-part of Ser. No. 274,461, Nov. 21, 1988, abandoned. This application Jan. 24, 1990, Ser. No. 472,412**
**Int. Cl.[5] G01R *27/26***
**U.S. Cl. 324—687** **11 Claims**




1. A planar interdigitated dielectric sensor useful for measuring surface properties of a material comprising:

(a) an insulating substrate;

(b) a metallic AC voltage accepting excitation electrode attached to the surface of said substrate, the excitation electrode being comb-shaped and having a planar upper surface;

(c) a metallic response electrode attached to the surface of said substrate, the response electrode being comb-shaped, having a planar upper surface coplanar with said planar upper surface of the excitation electrode and interdigitatedly positioned with respect to said excitation electrode; and

(d) an insulating glass with known dielectric properties attached to the surface of the substrate, filling the space between the excitation and response electrodes and having an upper surface coplanar with respect to the coplanar upper surfaces of said excitation electrode and said response electrode, whereby the upper surfaces of the excitation electrode, the response electrode, and the insulating glass are adapted for placement against a surface of a viscous material that is being tested such that no air gaps are present between said upper surfaces and the surface of the viscous material.

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**5,045,799**

## PEAK TO AVERAGE POWER RATIO REDUCTION IN A POWER AMPLIFIER WITH MULTIPLE CARRIER INPUT

**Charles L. Holecek, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Sep. 28, 1989, Ser. No. 413,804**
**Int. Cl.[5] H03B *19/00*; H03K *5/13***
**U.S. Cl. 328—14** **17 Claims**

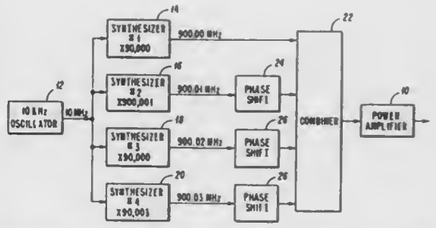
1. A method for producing an output signal having a high average power, the method comprising the steps of:

providing a standard frequency signal;

forming a plurality of input signals from said standard frequency signal such that each of said input signals has a predetermined frequency which is different from the frequencies of the other input signals;

phase shifting at least one of said input signals such that at least one of said input signals has a phase different from the phase of the other input signals;

combining all of the input signals to produce a combined signal; and




amplifying said combined signal to produce said output signal.

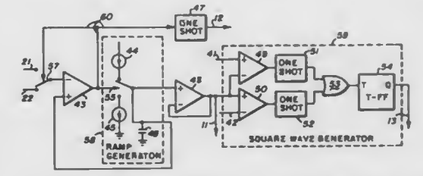
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**5,045,800**

## PULSE WIDTH MODULATOR CONTROL CIRCUIT

**David Kung, San Carlos, Calif., assignor to Power Integrations, Inc., Mountain View, Calif.**

**Filed Mar. 23, 1990, Ser. No. 498,829**
**Int. Cl.[5] H03K *5/01, 5/153***
**U.S. Cl. 328—59** **12 Claims**




1. A circuit which generates control signals used in pulse width modulation, the control signals including a square wave signal and a sawtooth signal, the sawtooth signal oscillating between a maximum voltage level and a minimum voltage level, the circuit comprising:

sawtooth signal generating means, for generating the sawtooth signal; and,

square wave signal generating means, coupled to the sawtooth signal generating means, for receiving the sawtooth signal, for comparing the voltage level of the sawtooth signal with a first voltage slightly above the minimum voltage level and with a second voltage slightly below the maximum voltage level, and for generating a square wave with a rising edge that occurs only when voltage of the sawtooth signal is increasing and reaches the first voltage and with a falling edge that occurs only when voltage of the sawtooth signal is increasing and reaches the second voltage.

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**5,045,801**

## METASTABLE TOLERANT ASYNCHRONOUS INTERFACE

**David L. Mowery, Highland, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed May 29, 1990, Ser. No. 530,706**
**Int. Cl.[5] H03K *17/16, 5/156***
**U.S. Cl. 328—72** **4 Claims**

1. An Anti-Metastable Flip-flop (AMF) comprising an input latch and an output latch, each said latch having a data input, a clock input and an output, the data input of the input latch being coupled to an asynchronous control line of one control circuit, the output of the output latch being coupled to a syn-

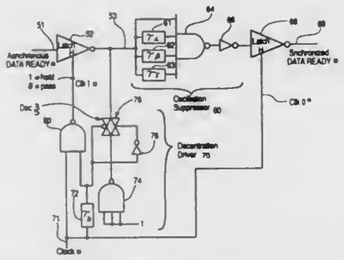
VOL 1130 ISS 1 SE 3 1991 UMI



chronized control line of an other control circuit, a flip-flop clock lead coupled from a source of clock pulses for said other control circuit to the clock input of the output latch;

a decentration driver comprising a transmission gate having an input, an output, and control means for operating the transmission gate between a high impedance off state and a low impedance on state, a logic gate having a plurality of inputs connected together at one logic level and an output coupled to the input of the transmission gate, with the output of the transmission gate coupled to the output of the input latch, a delay device connected from said flip-flop clock lead to said control means of the transmission gate;

an input clock gate having inputs connected respectively to said flip-flop clock lead and said delay device and an output coupled to the clock input of the input latch, to



thereby stretch clock signals to the input latch to overlap clock signals to the output latch;

whereby the decentration driver handles cases in which the output of the input latch is balanced and floating or balanced and driven by tugging the output of the input latch toward a given logic state soon after an active edge of a signal on the flip-flop clock lead has caused the input latch to close;

an oscillation suppressor comprising AND gate means and a plurality of delay means for eliminating oscillation by delaying output signals from the input latch by various times and anding the differently delayed signals together, said delay means being connected from the output of the input latch to separate inputs of the AND gate means, and an output of the AND gate means being coupled to the data input of the output latch.

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**5,045,802**

**FREQUENCY CHARACTERISTIC SETTING CIRCUITRY FOR AN AMPLIFIER**

**Takashi Miyake; Junichi Fuse; Yoshikatsu Ikata; Shuichi Mori; Hisashi Kihara, and Nobuo Utsugi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Apr. 4, 1990, Ser. No. 504,180**

**Claims priority, application Japan, Apr. 7, 1989, 1-88639**

**Int. Cl.[5] G01R** *23/00*

**U.S. Cl. 330—2** **3 Claims**

1. A frequency characteristic setting circuitry for an amplifier comprising:

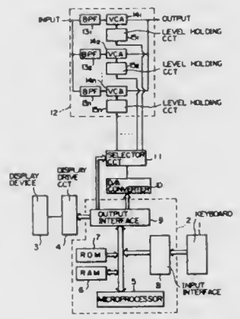
memory means in which a plurality of characteristic pattern data groups, each of said data groups corresponding to one of a plurality of variations of frequency response characteristics, are previously stored;

means for designating a characteristic pattern data group among said plurality of characteristic pattern data groups and for designating a frequency band;

means for retrieving a designated characteristic pattern data group from said memory means;

generating means for generating frequency band data by making each data of a retrieved characteristic pattern data group correspond to each frequency in a designated frequency band and for storing generated data;

combining means for combining data groups generated by said generating means for a plurality of frequency bands; and



control means for controlling an equalizing characteristic of said amplifier at a frequency characteristic corresponding to a characteristic pattern data group obtained by said combining means.

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**5,045,803**

**AMPLIFICATION CIRCUIT WITH A DETERMINED INPUT IMPEDANCE AND VARIOUS TRANSCONDUCTANCE VALUES**

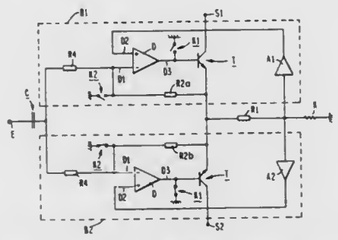
**Philippe Perroud, Meylan, and Jean-Luc Jaffard, Saint-Egreve, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France**

**Filed Aug. 15, 1990, Ser. No. 567,580**

**Claims priority, application France, Aug. 16, 1989, 89 11226**

**Int. Cl.[5] H03F** *1/14*

**U.S. Cl. 330—51** **4 Claims**



1. A voltage-current amplification circuit connected between an input terminal and first or second output terminals, said circuit comprising first and second sub-circuits, each sub-circuit comprising:

(a) a first differential amplifier, a first input of which is connected to the input terminal through a first resistor,

(b) a transistor, the having a base connected to the output of the differential amplifier and having an emitter and a collector, and,

(c) a first switch connected between the transistor base and ground,

the first sub-circuit comprising a second amplifier, the output of which is connected to a second input of the differential amplifier, and a second resistor connected between the transistor emitter and the first input of the differential amplifier,

the second sub-circuit comprising a third amplifier, the output of which is connected to the second input of the differential amplifier, and a third resistor connected between the transistor emitter and the first input of the differential amplifier,



the transistor collectors of the first and second sub-circuits being connected to the first and second output terminals, respectively, and the inputs of the second and third amplifiers being connected to ground through a common fourth resistor and to the emitters of the two transistors through a common fifth resistor,

wherein each said first and second sub-circuits further comprises a second switch connected between the first input of the differential amplifier and ground, each of said second switches being formed by a single transistor.

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**5,045,804**

**AMPLIFYING CIRCUIT**

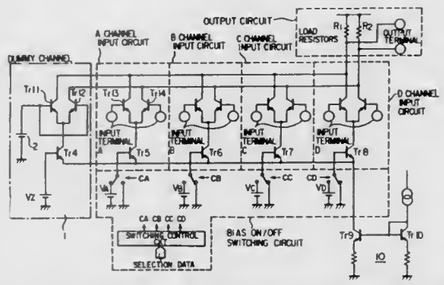
**Mitsutoshi Sugawara, and Shinji Nozawa, both of Tokyo, Japan, assignors to NEC Corporation, Japan**

**Filed Nov. 14, 1989, Ser. No. 436,449**

**Claims priority, application Japan, Nov. 14, 1988, 63-288589**

**Int. Cl.[5] H03K** *17/56*

**U.S. Cl. 330—51** **7 Claims**



1. An amplifying circuit comprising a plurality of signal input circuits for multi-channel input, each of which receives a corresponding signal input, a load circuit commonly connected to the outputs of the signal input circuits, an output terminal connected to said load circuit, a current source responsive to a voltage being applied thereto for supplying a current, selecting means for selectively connecting said current source to one of said signal input circuits and for applying a voltage to said current source in response to selection data, said voltage lowering during a transient period in which said selection data changes, and dummy channel means connected to said load circuit and said current source and responsive to said lowering of voltage during said transient period to connect said current source to said load circuit without passing through said signal input circuits.

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**5,045,805**

**HIGH PRECISION COMPOSITE AMPLIFIER WITH IMPROVED HIGH SPEED RESPONSE**

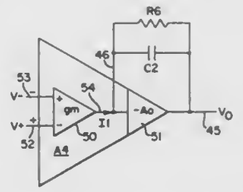
**Paul C. Schanen, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.**

**Filed Jun. 29, 1990, Ser. No. 546,469**

**Int. Cl.[5] H03F** *3/191*

**U.S. Cl. 330—107** **8 Claims**

1. In a high precision composite amplifier which includes first and second operational amplifier stages connected in cascade and a compensation network which produces a pole/zero open loop frequency response for the composite amplifier having a zero at a first frequency, a first pole at a second frequency, and a second pole at a third frequency, the improvement wherein the compensation network is formed from a net of compensation components, with the set of compensation components having component values which result in the third frequency for the second pole being approximately equal to the first frequency for the zero, thereby resulting in mutual



cancellation of the zero with the second pole and reducing the settling time of the composite amplifier.

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**5,045,806**

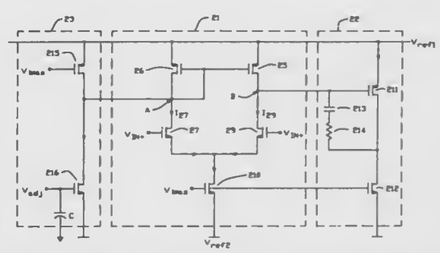
**OFFSET COMPENSATED AMPLIFIER**

**Raymond C. Yan, Daly City, Calif., assignor to Teledyne Industries, Mountain View, Calif.**

**Continuation of Ser. No. 178,530, Apr. 17, 1988, abandoned. This application Sep. 26, 1990, Ser. No. 588,489**

**Int. Cl.[5] H03F** *3/45*

**U.S. Cl. 330—252** **25 Claims**



1. A circuit for providing adjustment of quiescent output voltage of a differential input amplifier, the differential input amplifier having a first current path controlled by a first input signal and a second current path controlled by a second input signal, the circuit comprising:

(a) adjustment receiving means for receiving a variable adjustment signal; and

(b) current means, coupled to said first current path and said adjustment receiving means, for selectively removing current from said first current path or introducing current into said first current path or neither introducing current into nor removing current from said first current path in response to said variable adjustment signal.

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**5,045,807**

**AMPLIFIER CIRCUIT USING FEEDBACK LOAD**

**Noboru Ishihara, and Haruhiko Ichino, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan**

**Filed Nov. 20, 1989, Ser. No. 439,636**

**Claims priority, application Japan, Nov. 21, 1988, 63-294007**

**Int. Cl.[5] H03F** *3/45*

**U.S. Cl. 330—260** **2 Claims**

1. An amplifier circuit using a feedback load, comprising:

a first-stage amplifier including a 3-terminal first amplifier element having an input terminal and two output terminals; and

a feedback load for said first-stage amplifier,

wherein said input terminal of said first amplifier element receives an input signal, and one output terminal of said first amplifier element is connected to a first potential,

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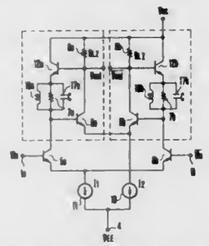


said feedback load comprises

3-terminal second and third amplifier elements each having an input terminal and two output terminals, and

first and second impedance elements,

said input terminal of said second amplifier element and said first impedance element are connected to the other output terminal of said first amplifier element, one output terminal of said second amplifier element is connected to a second potential, and the other output terminal of said second amplifier element is connected to a third potential through said second impedance element,



said input terminal of said third amplifier element is connected to said other output terminal of said second amplifier element, one output terminal of said third amplifier element is connected to a fourth potential, and the other output terminal of said third amplifier element is connected to said first impedance element, and

an output is extracted from a connecting node between said second impedance element and said other output terminal of said second amplifier element.

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**5,045,808**

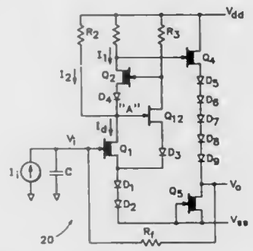
**SINGLE-STAGE HIGH-GAIN AMPLIFIER**

**Stewart S. Taylor, Beaverton, Oreg., assignor to TriQuint Semiconductor, Inc., Beaverton, Oreg.**

**Filed Feb. 26, 1990, Ser. No. 485,356**

**Int. Cl.[5] H03F** *1/34*

**U.S. Cl. 330—277** **19 Claims**



1. A high-gain, low-noise solid-state amplifier, comprising:

an amplification stage including a transistor through which a transistor current flows and having a transistor current-dependent transconductance, the transistor operatively coupled to a load impedance to provide a voltage gain that approximately equals the transconductance of the transistor times the load impedance;

supplemental bias current means for providing a supplemental bias current that forms a component of the transistor current, the supplemental bias current affecting the transconductance of the transistor and enabling a change in the voltage gain with substantial mutual independence of the transconductance of the transistor and the load impedance; and

negative feedback means electrically connected to the transistor for providing the amplification stage with an output impedance of relatively high value and thereby permitting the load impedance to be of relatively high value to increase the voltage gain.

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**5,045,809**

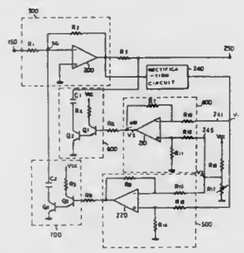
**AUTOMATIC GAIN CONTROL (AGC) CIRCUIT FOR A TRUNK INTERFACE IN A PRIVATE BRANCH EXCHANGE (PBX)**

**Won-Sang Cho, Puch-city, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea**

**Filed Aug. 31, 1989, Ser. No. 400,936**

**Int. Cl.[5] H03G** *3/30*

**U.S. Cl. 330—284** **32 Claims**



14. An automatic gain control circuit said circuit comprising:

circuit means having a first input port and an output node, for receiving input signals;

rectification means for receiving from said circuit means and converting said input signals into direct current signals exhibiting voltage amplitudes corresponding to said input signals;

a plurality of differential amplifiers for providing intermediate signals by making comparisons between said direct current signals and automatic gain control signals; and

a plurality of impedance control means connected to output ports of respective ones of said differential amplifiers, for controlling output impedances in response to corresponding ones of said intermediate signals, a first one of said impedance control means being connected to said input port of the circuit means and a second one of said impedance control means being connected to said output node of the circuit means, respectively.

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**5,045,810**

**BROADBAND AMPLIFIER WITH A CONSTANT GAIN AND A DETERMINED INPUT IMPEDANCE AT HIGH FREQUENCY**

**Philippe Perroud, Meylan, and Jean-Luc Jaffard, Saint-Egreve, both of France, assignors to SGS-Thomson Microelectronics S.A., Gentilly, France**

**Filed Jun. 22, 1990, Ser. No. 542,383**

**Claims priority, application France, Jun. 23, 1989, 89 08567**

**Int. Cl.[5] H03F** *1/34*

**U.S. Cl. 330—293** **3 Claims**

1. A broadband amplifier comprising:

an input terminal;

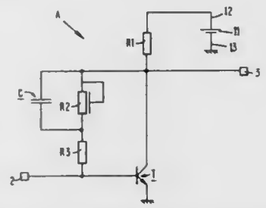
an output terminal;

a bipolar transistor having a base connected to the input terminal, a collector connected to the output terminal which is in turn connected to a supply source through a first resistor, and an emitter grounded,

a second resistor, the value of which varies simultaneously with the current gain of the transistor connected between the output terminal and the transistor base,



a capacitor connected in parallel across the terminals of the second resistor, and



a third resistor connected between the second resistor and the transistor base.

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**5,045,811**

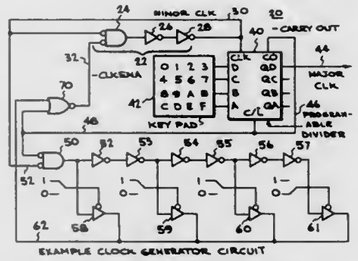
**TUNED RING OSCILLATOR**

**David M. Lewis, Santa Cruz, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.**

**Filed Feb. 2, 1990, Ser. No. 474,183**

**Int. Cl.[5] H03B** *5/00*

**U.S. Cl. 331—1 A** **8 Claims**




EXAMPLE CLOCK GENERATOR CIRCUIT

1. A tuned ring oscillator circuit, comprising:

a ring oscillator including a plurality of inverting stages connected in series in an oscillator ring;

programmable frequency divider means for providing coarse control of the repetition rate of an output clock pulse, said programmable divider means having an input terminal coupled to said oscillator ring and having an output terminal at which is provided the output clock pulse;

means for interrupting said ring oscillator for a predetermined time including control gate means for inhibiting propagation of an oscillating signal through said oscillator ring, said control gate means connected in series with said plurality of inverting stages and having a control terminal for controlling propagation of said oscillating signal;

programmable delay line means for providing fine control of the repetition rate of the output clock pulse, said programmable delay line means including delay-time programming means for setting a delay time, said programmable delay line means having program input terminals for receiving control signals, having an input terminal coupled to the output terminal of the programmable frequency divider, and having an output terminal coupled to the control terminal of the control gate means;

comparison means for comparing the output clock pulse frequency with the frequency of a system reference pulse and for generating control signals for the programmable delay line means to provide fine adjustment of the delay time of an output clock pulse to tune the frequency of the ring oscillator to the frequency of the system reference pulse.

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**5,045,812**

**PLL CIRCUIT FOR PRODUCING A CLOCK SIGNAL**

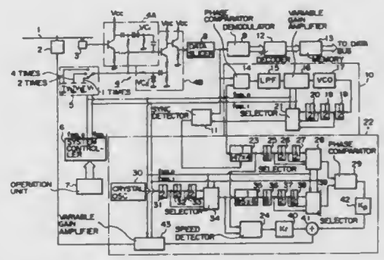
**Kiyoshi Tateishi, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Aug. 23, 1990, Ser. No. 571,065**

**Claims priority, application Japan, Jan. 16, 1990, 2-8002**

**Int. Cl.[5] H03L** *7/107*; **G11B** *19/28*

**U.S. Cl. 331—10** **1 Claim**



1. A clock producing PLL circuit for use in a disk playing apparatus which has designating means for designating predetermined linear velocity and reads recorded information from a disk at the linear velocity designated by the designating means, in which a clock signal synchronized in phase with a clock component included in a read signal from the disk is produced and generated as a reproduction clock signal, said PLL circuit comprising:

a voltage controlled oscillator having a predetermined center frequency;

frequency dividing means for frequency dividing an oscillation output of the voltage controlled oscillator at a frequency dividing ratio corresponding to the designated linear velocity and for outputting a divided signal as said reproduction clock signal;

phase comparing means for generating a phase error signal corresponding to a phase difference between the clock component in the reading signal and the reproduction clock signal; and

a variable gain amplifier which amplifies the phase error signal and uses an amplified signal as a control voltage of said voltage controlled oscillator and whose gain is variable in accordance with the designated linear velocity.

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**5,045,813**

**SLIP PHASE CONTROL PLL**

**Kazuo Yamashita; Akiharu Inoue, and Masahiko Egawa, all of Mitaka, Japan, assignors to Nihon Musen Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 21, 1990, Ser. No. 483,056**

**Claims priority, application Japan, Oct. 19, 1989, 1-272640; Oct. 24, 1989, 1-278203**

**Int. Cl.[5] H03L** *7/197*

**U.S. Cl. 331—16** **15 Claims**

1. A slip phase control phase-locked loop comprising:

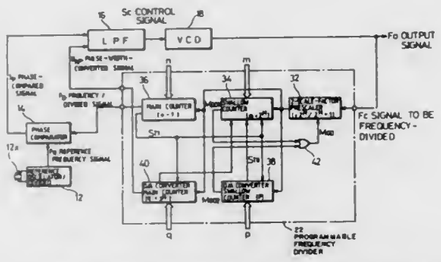
a voltage-controlled oscillator for generating a frequency signal;

binary programmable frequency dividing means for receiving said frequency signal and for producing a frequency-divided signal in response to said frequency signal supplied thereto, said binary programmable frequency dividing means including a 2-scale-factor prescaler, a swallow counter, and a main counter;

phase-comparing/integrating means for comparing phase of said frequency-divided signal with the phase of a reference frequency signal and producing a phase-compared signal, said phase-comparing/integrating means further including means for integrating said phase-compared signal and producing an integrated signal, and means for

applying the integrated signal to said voltage-controlled oscillator; and

D/A converting means having a D/A converter swallow counter and a D/A converter main counter and operable




with said binary programmable frequency dividing means for D/A-converting a signal derived from said frequency signal into a pulse-width-modulated signal corresponding to said phase-compared signal at a preset count ranging from 0 to $2^M-1$, where M is a positive integer.

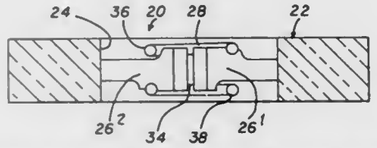
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**5,045,814**

## HIGH IMPEDANCE CIRCUIT FOR INJECTION LOCKED MAGNETRONS

**Robert C. English, Montoursville, Pa.; Geoffrey Thornber, Aptos, Calif., and Christopher M. Walker, Montoursville, Pa., assignors to Litton Systems, Inc., Beverly Hills, Calif.**

**Filed Mar. 14, 1990, Ser. No. 493,496**
**Int. Cl.[5] H03B *9/10*; H01J *23/22, 25/50***
**U.S. Cl. 331—86** **9 Claims**




1. A high impedance circuit for an anode ring in an injection locked oscillator, said anode ring having an inner cavity, said circuit comprising:

a plurality of first radial vanes coaxially positionable in said cavity;

a plurality of second radial vanes interdigitating with said first vanes to form a vane structure;

said first and second vanes each having a relatively narrow high inductance portion;

a first toroidal strap coaxially disposed along a first side of said vane structure, said first strap interconnecting said first vanes;

a second toroidal strap coaxially disposed along the second side of said vane structure, said second strap interconnecting said second vanes;

said first and second straps each having a relatively low capacitance due to said toroidal shape; and

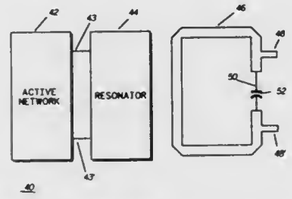
said first vanes, said second vanes, said first strap, and said second strap being dimensioned so that said circuit has a high single cavity impedance commensurate with an interaction impedance of said oscillator which is sufficient to sustain oscillation for a preselected injection locking bandwidth of said oscillator.

**5,045,815**

## AMPLITUDE AND PHASE BALANCED VOLTAGE-CONTROLLED OSCILLATOR

**Branko Avanic, Coral Gables; Leng H. Ooi, and Peter J. Yeh, both of Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 3, 1990, Ser. No. 620,957**
**Int. Cl.[5] H03B *1/00***
**U.S. Cl. 331—96** **15 Claims**




1. An oscillator comprising:

a resonator for providing an oscillation frequency for the oscillator;

an active network, coupled to the resonator, for driving the resonator;

a first split-ring resonator, having at least a first edge and a second edge, the first edge being coupled to the resonator, and the second edge having a gap therein, and a first terminal located at one side of the gap in the second edge of the first split-ring resonator, and a second terminal symmetrically located at the other side of the gap in the second edge of the first split-ring resonator.

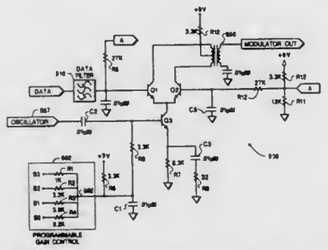
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**5,045,816**

## BINARY PHASE SHIFT KEY MODULATOR WITH PROGRAMMABLE LEVEL CONTROL

**Charles R. Bramhall, Norcross; Lamar E. West, Jr., Maysville; Jesse M. Still, Woodstock, and Emory L. McGinty, Jr., Lilburn, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.**

**Continuation of Ser. No. 498,083, Mar. 20, 1990, and a continuation of Ser. No. 498,084, Mar. 20, 1990. This application Apr. 2, 1990, Ser. No. 503,423**
**Int. Cl.[5] H04L *27/20***
**U.S. Cl. 332—105** **11 Claims**




1. A BPSK modulator for modulating a binary data signal onto a carrier signal for transmission comprising

a center tap transformer having first and second windings,

first and second transistors, each having a collector, an emitter and a base, the first and second transistors connected together in a mirror configuration, the bases of the first and second transistors for receiving the binary data signal, the collectors of the first and second transistors being coupled to the first winding of the center tap transformer, the center tap of the transformer being DC biased,



and the second winding providing the BPSK modulated carrier output signal,

a third transistor having a collector, an emitter and a base, the collector being coupled to the emitters of the first and second transistors, the base being coupled to the carrier signal, and

programmable gain control means also coupled to the base of the third transistor for providing step-wise level control of the BPSK modulated carrier output signal.

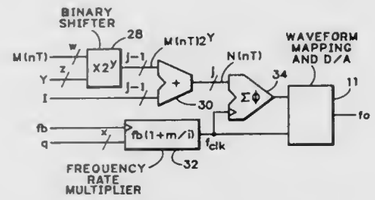
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**5,045,817**

## FM DEVIATION CONTROL OF DIRECT DIGITAL SYNTHESIZERS

**Tzafrir Sheffer, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.**

**Filed Sep. 7, 1990, Ser. No. 579,032**
**Int. Cl.[5] H03C *3/06, 3/09***
**U.S. Cl. 332—117** **11 Claims**




1. In a direct digital synthesizer operating according to a system clock rate and responsive to a modulation input value for generating a cyclic frequency modulated waveform, a circuit for enhancing system frequency modulation deviation resolution comprising:

means for bit shifting said modulation input value in order to select frequency modulation deviation, and

means for varying the system clock rate at which said direct digital synthesizer operates for adjusting said frequency modulation deviation.

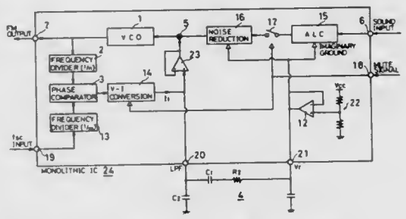
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**5,045,818**

## PLL FREQUENCY MODULATOR HAVING BIAS VOLTAGE APPLIED TO FILTER CAPACITOR

**Katsunori Miura, Shijonawate, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Sep. 17, 1990, Ser. No. 583,549**
**Claims priority, application Japan, Sep. 19, 1989, 1-244016**
**Int. Cl.[5] H03C *3/09*; H03L *7/093***
**U.S. Cl. 332—127** **9 Claims**




1. A frequency modulation circuit, comprising:

a phase locked loop (PLL) which includes a frequency variable oscillator (VCO) having a control input and an output and a loop filter having a capacitor which is charged by a current from a current source, said PLL further including a phase-comparing circuit which phase-compares a signal associated with an output of said VCO with a reference signal and applies an output thereof to said loop filter, and said control input receiving a modulation signal and an output of said loop filter, so that said VCO outputs a signal frequency-modulated by said modulation signal; and

biasing means for biasing said capacitor with a bias voltage when a power source is turned-on.

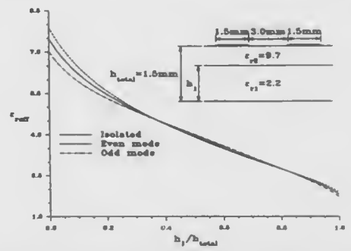
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**5,045,819**

## MULTILAYER-MULTICONDUCTOR MICROSTRIPS FOR DIGITAL INTEGRATED CIRCUITS

**Constantine A. Balanis, Mesa, and James P. K. Gilb, Tempe, both of Ariz., assignors to Arizona Board of Regents, a body corporate acting on behalf of Arizona State University, Tempe, Ariz.**

**Filed Jun. 6, 1990, Ser. No. 533,926**
**Int. Cl.[5] H01P *3/08***
**U.S. Cl. 333—1** **16 Claims**




1. A microstrip having a plurality of independent propagating modes and comprising a plurality of coplanar center conductors and a plurality of substrates disposed in a vertical stack upon a ground plane and including an uppermost substrate, a lowermost substrate, said uppermost substrate having a dielectric constant which is substantially greater than the dielectric constant of said lowermost substrate, each substrate having a height sufficient to enable the effective dielectric constants of said independent propagating modes to be substantially equal, said center conductors being disposed upon said uppermost substrate.

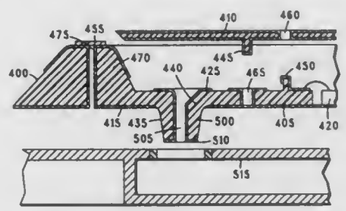
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**5,045,820**

## THREE-DIMENSIONAL MICROWAVE CIRCUIT CARRIER AND INTEGRAL WAVEGUIDE COUPLER

**John L. Leicht, Hawthorn Woods, Ill.; Hugh R. Malone, Phoenix; Douglas J. Mathews, Mesa, both of Ariz.; James E. Mitzlaff, Arlington Heights, Ill.; Scott D. Munier, Arlington Heights, Ill.; Michele G. Oehlerking, Riverside, Ill., and Vernon R. Scott, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 413,348, Sep. 27, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 624,946**
**Int. Cl.[5] H01P *5/107***
**U.S. Cl. 333—26** **40 Claims**




1. A microwave circuit carrier, comprising:

(a) substrate means located in a first plane for receiving at

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least one electronic device which processes microwave signals; and

(b) waveguide coupler means integrally molded with the substrate means for coupling microwave signals between the at least one electronic device and a waveguide, the waveguide having a wall located in a second plane adjacent and substantially parallel to the first plane wherein one of the first and second planes is substantially disposed above the other plane.

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**5,045,821**

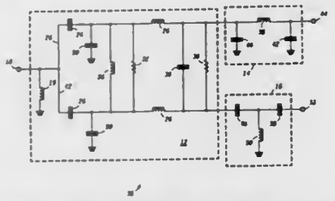
## BROADBAND MULTI-PHASE HYBRID

**Joseph Staudinger, and Warren L. Seely, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 431,404, Nov. 3, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 610,732**

**Int. Cl.[5] H03H** *7/01, 7/21, 7/46*

**U.S. Cl. 333—118** **4 Claims**



1. A multi-phase hybrid coupler comprising:

a passive in-phase power divider with lumped elements having first and second output terminals and an input terminal, said passive in-phase power divider having additional lumped elements providing high isolation between said first and second output terminals;

a passive high pass filter with lumped elements having an input terminal coupled to the first output terminal of said in-phase power divider and an output terminal for supplying a first output signal with a first phase;

a passive low pass filter with lumped elements having an input terminal coupled to the second output terminal of said in-phase power divider and an output terminal for supplying a second output signal with a second phase approximately ninety degrees from the phase of said first output signal.

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**5,045,822**

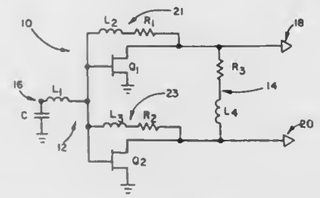
## ACTIVE POWER SPLITTER

**Clifford A. Mohwinkel, San Jose, Calif., assignor to Pacific Monolithics, Sunnyvale, Calif.**

**Filed Apr. 10, 1990, Ser. No. 508,362**

**Int. Cl.[5] H03H** *7/48*

**U.S. Cl. 333—124** **5 Claims**



1. An active power splitter for splitting power input on an input port between first and second output ports, comprising:

a pair of transistor means, each having a control terminal coupled to the input port, and two current-conducting terminals, one of the current-conducting terminals of each transistor means being coupled to a reference voltage, and the other current-conducting terminal of one transistor means being coupled to the first output port, and the other current-conducting terminal of the other transistor means being coupled to the second output port, whereby a signal input on one of the output ports is out of phase with the same signal passing through the two transistor means to the other output port· and

impedance means coupling only the two output ports, thereby defining a signal path devoid of any other lumped impedance extending between the two output ports for feeding a signal of reduced amplitude between the first and second output ports having a phase generally opposite to that of the corresponding signal passing between the output ports through the two transistor means.

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**5,045,823**

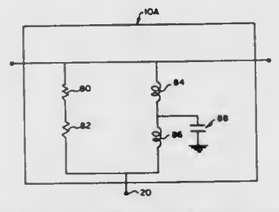
## TERMINATING SCHEME FOR TRANSMITTING MULTIPLE SIGNALS ON A COAXIAL CABLE TO MULTIPLE TAP OUTLETS

**Edward L. Nichols, III, Annapolis, Md., assignor to Smart House Limited Partnership, Upper Marlboro, Md.**

**Filed Aug. 18, 1989, Ser. No. 395,593**

**Int. Cl.[5] H03H** *7/46*

**U.S. Cl. 333—132** **9 Claims**



1. An apparatus for coupling a plurality of signals of various frequencies from a coaxial cable to a device, comprising:

means for receiving said plurality of signals from said coaxial cable;

means for outputting said plurality of signals to said device;

high frequency coupling means connected between said receiving means and outputting means for coupling signals having a frequency greater than substantially 30 megahertz to said outputting means from said receiving means; and

low frequency coupling means connected between said receiving means and outputting means for coupling signals having a frequency less than substantially 5 megahertz to said outputting means from said receiving means, said low frequency coupling means comprising:

a first inductor means for filtering signals having a frequency substantially between 5 and 50 megahertz, and

a second inductor means for filtering signals having a frequency substantially greater than 50 megahertz, said first and second inductor means connected in series between said receiving means and said outputting means and also being connected in parallel with said high frequency coupling means.

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**5,045,824**

## DIELECTRIC FILTER CONSTRUCTION

**Michael P. Metroka, Algonquin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

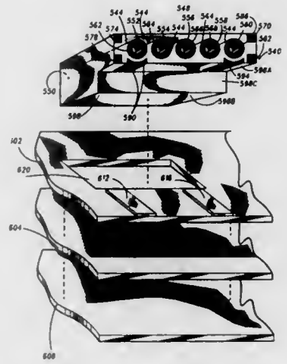
**Filed Sep. 4, 1990, Ser. No. 577,172**

**Int. Cl.[5] H01P** *1/202*

**U.S. Cl. 333—206** **33 Claims**

1. A filter mountable upon a multi-layer circuit board having at least a top layer, a middle layer comprised of an electrically-conductive material, and a bottom layer for generating filtered signals of desired frequencies responsive to application of an input signal thereto, said filter comprising:

a dielectric block having means forming at least one cavity extending along at least a portion of the length of the dielectric block to form a resonator thereby, said dielectric block having at least one mounting surface for matingly engaging with a corresponding mating area formed



of the top layer of the multi-layer circuit board to mount the dielectric block in position thereat; and

means for supplying the input signal to the resonator of the dielectric block.

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**5,045,825**

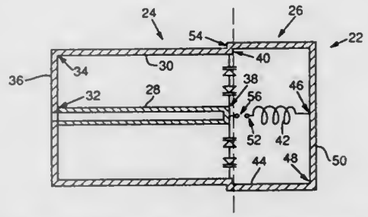
## COUPLING PORT FOR MULTIPLE CAPACITOR, DISTRIBUTED INDUCTOR RESONATOR

**Barton L. McJunkin, Spokane, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jul. 5, 1990, Ser. No. 549,332**

**Int. Cl.[5] H01P** *7/04*

**U.S. Cl. 333—222** **11 Claims**



1. A resonator having an inner conductor coaxially disposed within a cavity defined by a side wall and first and second end walls, the inner conductor being connected at a first end thereof to the first end wall but terminating at its second end short of the second end wall, the resonator further including a plurality of capacitors coupling the second end of the inner conductor to the side wall, an improvement wherein the resonator further includes an inductive conductor having a first end directly connecting a central region of the second end wall and a second end of said inductive conductor coupled to the inner conductor of the resonator, said inductive conductor further defining a coupling gap at said second end thereof across which external circuitry can be coupled to the resonator.



**5,045,826**

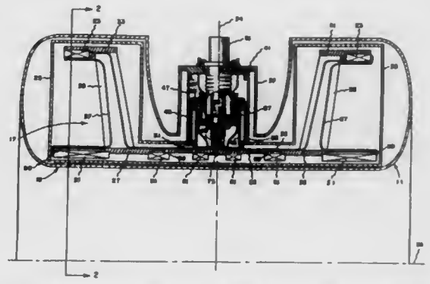
## ACTIVELY SHIELDED MAGNETIC RESONANCE MAGNET WITHOUT CRYOGENS

**Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Apr. 5, 1990, Ser. No. 504,822**

**Int. Cl.[5] H01F** *7/22*

**U.S. Cl. 335—301** **3 Claims**



1. An actively shielded refrigerated superconductive magnet comprising:

a generally cylindrical vacuum vessel having an axially extending bore;

a plurality of superconductive main coils in said vacuum vessel concentrically surrounding and spaced away from said bore;

a pair of superconductive shield coils situated in said vacuum vessel, concentric with the superconductive main coils and having a larger diameter than the superconductive main coils, said superconductive shield coils situated at either end of the superconductive main coils, said superconductive shield coils and said superconductive main coils electrically connected to one another so that the superconductive shield coils and the superconductive main coils are capable of carrying current in opposite circumferential directions;

thermal shield means enclosing said superconductive main and shield coils, said thermal shield spaced away from said vacuum vessel; and

two stage cryocooler means for cooling said superconductive main and shield coils, and said thermal shield.

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**5,045,827**

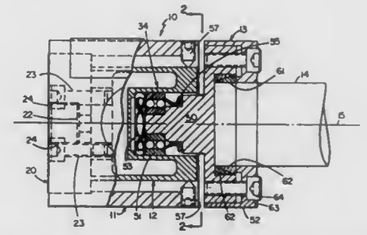
## LOW-FORCE TRANSDUCER

**Rolf P. Haggstrom, East Walpole, Mass., assignor to BLH Electronics, Inc., Canton, Mass.**

**Continuation of Ser. No. 500,578, Mar. 28, 1990, abandoned, which is a continuation of Ser. No. 297,596, Jan. 17, 1989, abandoned. This application Nov. 15, 1990, Ser. No. 614,158**

**Int. Cl.[5] G01L** *1/22;* **G01B** *7/16*

**U.S. Cl. 338—2** **8 Claims**



1. A low level strain gage transducer for measuring the

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amount of strain caused by a strain generating element comprising:

a measurement means having a fixed end member adapted to be secured to a housing, and a free end member, said free end member comprising a base with an extension means connected thereto, and when in use, said free end member receiving a portion of the strain generating member,

a beam means attached to said fixed end member,

said beam means having a first end connected to said extension means at its end opposite said free end member base, said beam means deforming when strain force is applied to said free end member.

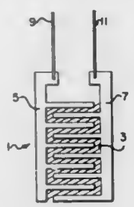
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**5,045,828**

## FLUOROPOLYMER HUMIDITY SENSORS

**Bernard M. Kulwicki, N. Attleboro, Mass.; Robert T. McGovern, Chepachet, R.I., and Thomas C. Conlan, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jul. 27, 1989, Ser. No. 386,335**
**Int. Cl.[5] H01C** *7/00*
**U.S. Cl. 338—35** **5 Claims**




1. A humidity sensor comprising:

(a) a substrate having an electrically insulative surface,

(b) a pair of spaced electrodes on said surface; and

(c) a film having a thickness of approximately 5 microns or less on said surface interconnecting said electrodes, said film comprising:

the reaction product of polytetrafluorethylene with ionogenic grouping appended thereto and an aqueous solution of a compound taken from the class consisting of lithium compounds, ammonium compounds, sodium compounds, silver compounds, magnesium compounds and combinations thereof.

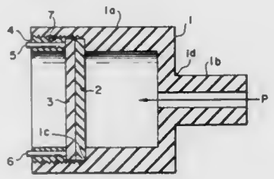
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**5,045,829**

## PRESSURE SENSOR UTILIZING EXTENSION TYPE CONDUCTIVE RUBBER

**Hiroshi Kuramochi, 20-34-603, Kamiaokinishi 1 Chome; Yasuo Okuda, and Sigeyosi Ogihara, both of c/o Kabushiki Kaisha Fine Rubber Kenkyuusho, 3-21 Namiki 3 Chome, all of Kawaguchi-shi, Saitama-ken, Japan**

**Filed Mar. 2, 1990, Ser. No. 487,133**
**Int. Cl.[5] G01C** *10/10*
**U.S. Cl. 338—36** **7 Claims**




1. A pressure sensor comprising: a housing; a sheet of an electrically insulative elastomer; a like-shaped sheet of an extension type conductive elastomer overlaying said electrically insulative elastomer and having a plurality of spaced radial recesses formed around the periphery thereof, which extension type conductive elastomer, when extended, exhibits a decrease in its electrical resistance value in response to the magnitude of an applied extension; first and second spaced electrodes that are each electrically connected to said extension type conductive elastomer at the periphery thereof; and first and second support means, each of which are cylindrical or ring shape and are made of an electrically insulative material for mounting in said housing to sandwich said overlaying extension type conductive elastomer and said electrically insulative elastomer around their periphery, with said electrically insulative elastomer squeezed therebetween continuously around the periphery thereof and with said extension type conductive rubber squeezed therebetween discontinuously around the periphery thereof in the sections between the electrodes.

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**5,045,830**

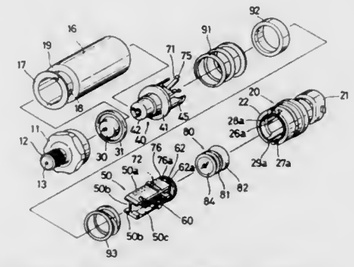
## HYDRAULIC ACTUATING APPARATUS

**Toshiji Shibazaki; Junio Chuzenji; Mikio Sasahara; Masaru Okano; Yoshihiro Ozaki, and Naoto Kishida, all of Saitama, Japan, assignors to Toyo Denso Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 17, 1989, Ser. No. 297,448**

**Claims priority, application Japan, Jan. 18, 1988, 63-4501[U]; Jan. 18, 1988, 63-4503[U]; Feb. 15, 1988, 63-18619[U]; Feb. 15, 1988, 63-18620[U]; Feb. 15, 1988, 63-18621[U]; Feb. 15, 1988, 63-18622[U]; Apr. 16, 1988, 63-51486[U]; Jun. 30, 1988, 63-87615[U]**

**Int. Cl.[5] H01C** *10/10*
**U.S. Cl. 338—41** **19 Claims**




1. A hydraulic actuating apparatus comprising:

a cylindrical case having a fitting at one end connectable to a source of pressurized oil, said fitting having a passage for communication with the pressurized oil;

a slider slidably carried by said cylindrical case, said slider being slidable in response to the oil pressure;

first spring means for biasing said slider in a predetermined direction to resist the force on said slider applied by the oil pressure;

slidable contact means carried by said slider;

an oil pressure sensor which includes a resistor and a ground conductor, said slidable contact means being slidably engaged with said resistor, said resistor being fixed with respect to said slidable contact means;

second spring means for biasing said slider in said predetermined direction, said second spring means being connected to said slider, said second spring means having a smaller spring constant than said first spring means;

a fuel pump switch having a movable contact and a fixed contact, movement of said movable contact relative to said fixed contact causing one of contact and release of said fuel pump switch, and

said fuel pump switch is assembled integrally in said case, and said resistor comprises a flat resistor.



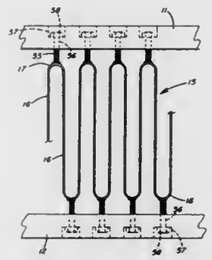
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**5,045,831**

## VERTICAL FLIGHT RESISTOR GRID

**Victor V. Kirilloff, Lincoln, Nebr.; Robert Cummins, and William A. Benson, both of Pittsburgh, Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.**

**Filed Jan. 16, 1990, Ser. No. 465,389**
**Int. Cl.[5] H01C** *3/00*
**U.S. Cl. 338—280** **12 Claims**




1. In an upright resistor grid having a top member, two side members, a bottom member, and a fan-folded resistance element supported therein, the improvement comprising said top and bottom members being insulating members, said side members being conducting members, said resistance element being a flat strip, and including mounting fittings carried by said top member for suspending said fan-folded strip by the folds of said strip, and mounting fittings for said fan-folded strip carried by said bottom member for maintaining tension in said flat strip.

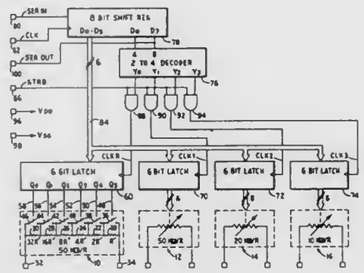
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**5,045,832**

## DIGITALLY CONTROLLED VARIABLE RESISTOR

**Ambrose W. C. Tam, Hong Lok Yuen Taipo, Hong Kong, assignor to Astec International Limited, Kowloon, Hong Kong**

**Filed Dec. 27, 1989, Ser. No. 457,333**
**Int. Cl.[5] H01C** *13/00*
**U.S. Cl. 338—334** **20 Claims**




1. A variable resistor, comprising:

a pair of terminals for providing a variable resistance to an external circuit;

a plurality of individual resistances connected in series between the pair of terminals, each individual resistance including a compensating resistance and a basic resistance;

a plurality of electronic switches, each electronic switch being connected in a parallel with an associated one of the individual resistances, wherein each of the electronic switches, when in a closed state, exhibits a significant resistance, corresponding to the compensating resistance, and effectively shorts out the associated individual resistance; and

latch means capable of receiving and holding a data signal and having outputs controlling the switching of the electronic switches between open and closed states, so that the value of resistance between the pair of terminals can be set by the data signal.

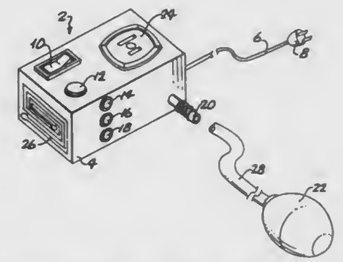
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**5,045,833**

## APPARATUS AND SYSTEM FOR ALERTING DEAF PERSONS

**Edward R. Smith, 53 Belcher Rd., Blairstown, N.J. 07825**

**Filed May 30, 1989, Ser. No. 359,037**
**Int. Cl.[5] G08B** *5/06*
**U.S. Cl. 340—332** **7 Claims**




1. An apparatus to alert a deaf person of an emergent situation, comprising:

a housing equipped with a reception means for supplying electrical power thereto and an outlet means including a power supply outlet for transmitting electrical power therefrom, said housing equipped with a switch and indicator means for detecting and indicating presence of electrical power supplied to said housing, said housing carrying a conduit for transmitting a pneumatic pressure differential exterior from said housing to a pneumatic pressure switch means capable of detecting said pressure differential within said housing, such that when said pneumatic pressure differential is detected, said pressure switch means effects connection of electrical power to the power supply outlet and thus to an alerting device exterior from said housing.

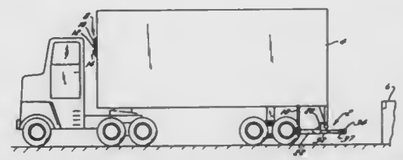
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**5,045,834**

## DOCK AND TRAILER PROTECTOR

**Wesley H. Hutchcraft, 7402 Ireland Dr., Louisville, Ky. 40219**

**Filed Aug. 3, 1989, Ser. No. 389,069**
**Int. Cl.[5] B60Q** *1/00*
**U.S. Cl. 340—436** **3 Claims**



1. A warning device to protect a movable object and a stationary object, such as a trailer and a dock, respectively, from impact with each other, comprising:

a fixed member adapted to be rigidly mounted on one of the objects to be protected;

a movable member movably mounted on the fixed member by a mounting means consisting solely of a single telescopic mounting connection in which the movable member slides in a substantially straight line relative to the fixed member;

said movable member being adapted to contact the other object to be protected and to move relative to the fixed member as the movable object approaches the stationary object; and further comprising means for generating at

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least two warning signals in a preselected sequence in response to the relative motion of the fixed and movable members as the movable object approaches the stationary object.

said fixed member comprising a plurality of switch means, each switch means including a movable projection, whereby when the movable member slides into engagement with a first projection a first warning signal is activated, and when the movable member slides into engagement with a second projection a second unique warning signal is activated.

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**5,045,835**

## APPARATUS AND METHOD FOR DETERMINING THE EXISTENCE OF AN ABNORMALITY IN A VEHICLE OPERATOR PROTECTION SYSTEM

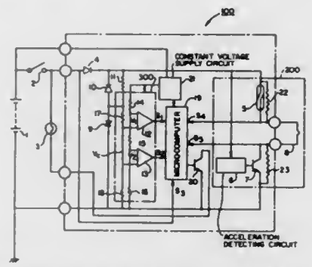
**Mitsuhiko Masegi, Nukata; Masao Sakurai, Oobu; Motobaru Naitou, Okazaki; Akira Kondo, Nagoya, and Toshiaki Ota, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Jan. 4, 1989, Ser. No. 293,412**

**Claims priority, application Japan, Apr. 25, 1988, 63-101587**

**Int. Cl.[5] B60Q** *1/00*; **B60R** *21/32*

**U.S. Cl. 340—438** **21 Claims**




1. Apparatus for determining the existence of an abnormality in a vehicle operator protection system, comprising:

a battery;

an actuating device for actuating the vehicle operator protection system;

a capacitor connected in parallel with said actuating device for supplying power to said actuating device;

means for detecting a discharging condition of said capacitor after said capacitor is normally disconnected from a power source and for determining the existence of an abnormality in said capacitor and said actuating device based on the detected discharging condition; and

means for generating an indication of an abnormality connected to said detecting means.

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**5,045,836**

## VEHICLE ANTI-FREEZE MONITOR

**Eugene R. Nobles, Jr., 4184 Gwynne Rd., Memphis, Tenn. 38117**

**Filed Jul. 13, 1990, Ser. No. 552,078**

**Int. Cl.[5] B60Q** *1/00*

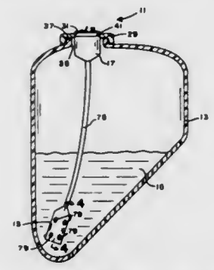
**U.S. Cl. 340—450** **11 Claims**

1. A vehicle anti-freeze monitor for monitoring the capability of the vehicle's coolant mixture in the cooling system of the vehicle to resist freezing, said monitor comprising:

a) indicator means;

b) proximity switch means for coupling said indicator means to a source of electricity and for selectively activating and deactivating said indicator means; and

c) float means for submersion in the vehicle's coolant mixture, said float means including a buoyant body and magnet means attached to said buoyant body, said float means being floatable upwardly to a position in proximity to said proximity switch means for the activation of said proximity switch means by said magnet means, said float means having a certain selected specific gravity corresponding to the lowest temperature point of a base coolant mixture above which the base coolant mixture is considered to be safe as to its capability of resisting freezing whereby when the specific gravity of the vehicle's coolant mixture is greater than said certain specific gravity, said float means



rises to a position in which said magnet means is in proximity to said proximity switch means to activate said indicator means and indicate that the vehicle's coolant mixture is in a safe condition against freezing when the temperature of the vehicle's coolant mixture is above said lowest temperature point.

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**5,045,837**

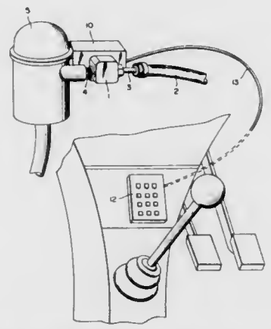
## FUEL CUT-OFF ANTI-THEFT DEVICE

**Brendan G. Gosker, Dublin, Ireland, assignor to Patrick Sheeran, Dublin, Ireland**

**Continuation of Ser. No. 483,981, Feb. 23, 1990, abandoned, which is a continuation of Ser. No. 396,770, Aug. 21, 1989, abandoned, which is a continuation of Ser. No. 225,376, Jul. 28, 1988, abandoned. This application Oct. 19, 1990, Ser. No. 600,269**

**Int. Cl.[5] B60Q** *1/00*; **B60R** *25/00*

**U.S. Cl. 340—450.2** **7 Claims**



1. A fuel cut-off anti-theft device for a vehicle having a fuel tank and a fuel line connected to the fuel tank comprising:

an electrically operated fuel control valve connected in the fuel line having a valve inlet and a valve outlet;

valve operating means for moving said fuel control valve between an open position for allowing fuel flow through the fuel line and a closed position for cutting off said fuel flow;

electrical control means for controlling the operation of said valve operating means, said control means comprising a local control device, a remote command input means, and an electrical conducting cable interconnecting said remote command input means and said local control device, said remote command input means outputting a data signal to said local control device via said cable;

said local control device being operatively connected to said fuel control valve and an electric power source and comprising data verification means for verifying said data signal from said remote command input means and valve enabling means for said fuel control valve; and

tamper-proof means comprising an encapsulating compound enclosing said local control device and at least a portion of said fuel control valve to prevent tampering with said fuel control valve and said local control device.



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**5,045,838**

## METHOD AND SYSTEM FOR PROTECTING AUTOMOTIVE APPLIANCES AGAINST THEFT

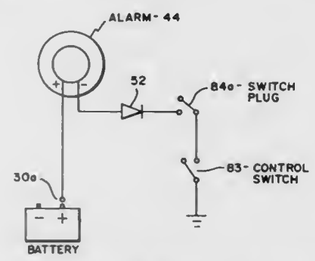
**John Ghazarian, 13313 Oxnard St. #226, Van Nuys, Calif. 91401**

**Filed Jun. 11, 1990, Ser. No. 535,656**

**The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.**

**Int. Cl.[5] G08B** *13/14*

**U.S. Cl. 340—457** **13 Claims**




1. A method of protecting against theft an electronic appliance installed in an automotive vehicle comprising the step of releasably connecting the appliance to an indicating circuit to produce an alert signal when the operator leaves the vehicle without removing the appliance from a predetermined position in the vehicle.

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**5,045,839**

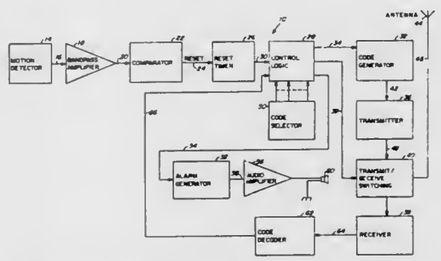
## PERSONNEL MONITORING MAN-DOWN ALARM AND LOCATION SYSTEM

**Rand G. Ellis; Richard L. Abrahams, both of Lauderhill, and James M. Rosenthal, Cooper City, all of Fla., assignors to Rand G. Ellis, Fla.**

**Filed Mar. 8, 1990, Ser. No. 490,334**

**Int. Cl.[5] G08B** *1/08, 13/14*

**U.S. Cl. 340—539** **25 Claims**




1. A personnel activity sensor and alarm system adapted to be worn by user personnel, comprising:

(a) a housing adapted to be attached to the user personnel and having therein motion sensor means being operative in any plane and capable of detecting motion of said housing and providing an electrical output signal reflecting any motion detected thereby;

(b) reset timer and control logic circuitry being located in said housing and being disposed to receive said electrical output signal of said motion sensor means and developing an electrical alert command signal responsive to the absence of detected motion of said housing for a predetermined period of time; and

(c) a portable radio transmitter being coupled in interactive relation with said reset timer and control logic circuitry and upon receiving said electrical alert command signal providing a radio alarm signal output indicating an emergency in response to said electrical alert command signal, whereby said radio alert signal output is transmitted only when said reset timer and control logic circuitry reaches an alarm condition.

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**5,045,840**

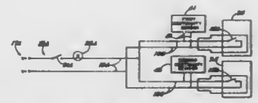
## DEVICE FOR SENSING CONTINUITY IN A CIRCUIT HAVING AN OPEN CIRCUITED APPARATUS

**Gene C. Berrier, Fort Worth, Tex., and Wolf S. Landmann, Fair Lawn, N.J., assignors to Benz Companies, Inc., Fort Worth, Tex.**

**Filed Jun. 6, 1989, Ser. No. 362,842**

**Int. Cl.[5] G08B** *21/00*

**U.S. Cl. 340—652** **16 Claims**



11. A system for sensing the continuity of conductors in a circuit, said circuit comprising said conductors, first and second detector means, and power source means, said first and second detector means being connected to said power source means by said conductors, said conductors forming first and second branches, with said first detector means connected to said first branch and said second detector means connected to said second branch such that said first and second detector means are connected in parallel with respect to each other, each of said detector means having an open circuit mode where there is no continuity between said conductors in said respective branch and a closed circuit mode where continuity between said conductors in said respective branch is provided, said power source means for selectively providing power to said first and second detector means, comprising:

(a) a first device having a first switch means adapted to be connected across said first branch of said conductors at a location near said first detector means;

(b) a second device having a second switch means adapted to be connected across said second branch of said conductors at a location near said second detector means;

(c) each of said first and second switch means being operable between open and closed states, with said closed state of said respective first and second switch means being adapted to provide continuity between said respective branch conductors and said open state of said respective first and second switch means not providing continuity between said respective branch conductors;

(d) each of said first and second devices having control means for operating said respective switch means between said open and closed states, said respective control means being connected with said respective switch means;

(e) each of said first and second devices having power storage means for storing power from said power source means, said respective power storage means adapted to be

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connected with said power source means and being connected with said respective control means, said respective power storage means providing power to said respective control means for the operation of said respective control means, said respective power storage means charges when first and second switch means are in the open state;

(f) said respective control means operating said respective switch means upon the application of power by said power source means such that said respective switch means is alternately in the closed state to provide continuity and in the open state and such that said respective switch means is in the open state for a substantially longer period of time than said respective switch means is in the closed state, said control means of said first device operating said first switch means at a different frequency than said control means of said second device operating said second switch means, each of said control means being energized by said respective power storage means upon the application of power from said power source means, wherein upon the application of power by said power source means, each of said power storage means becomes energized;

(g) said first device having first detecting means for detecting when said second switch means is in the closed state, said first detecting means detecting said second switch means closed state when said first switch means is in the open state, said first detecting means being connected to said control means of said first device;

(h) said control means of said first device, when said first detecting means detects said second switch means closed state, operates said first switch means sure that said first switch means is alternately in the closed state and in the open state, with said first switch means being in the closed state for a substantially longer period of time than said first switch means is in the open state;

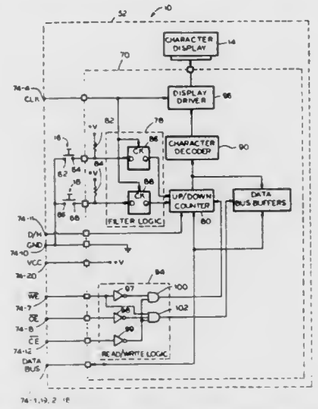
(i) said second device having second detecting means for detecting when said first switch means is in the closed state for a substantially longer period of time than in the open state, said second detecting means being connected to said control means of said second device;

(j) said control means of said second device, when said second detecting means detects said first switch means closed state, operates said second switch means such that said second switch means in in the open state.

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**5,045,841**
**ELECTRONIC THUMBWHEEL SWITCH**
**Richard A. Shrock, c/o American Cootrol Technology, 825 Village Quarter Rd., West Dundee, Ill. 60118**
**Continuation of Ser. No. 285,513, Dec. 16, 1988, abandoned. This application Oct. 4, 1990, Ser. No. 595,682**
**Int. Cl.[5] G09G** *3/04*
**U.S. Cl. 340—706** **18 Claims**

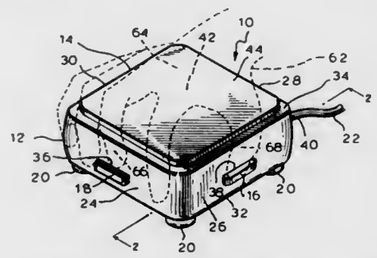
1. An electronic thumbwheel comprising:
means for storing a thumbwheel count value;
a display device coupled to the storing means for displaying the count value;
manual input means coupled to the storing means for selecting a desired count value to be displayed on the display device; and
a data bus interface circuit for connection via a bidirectional data bus to an external control element and coupled to the storing means, the data bus interface circuit including writing means for writing an output to the data bus representing the stored count value, reading means for reading a count value received from the data bus into said storing means for display on said display device and means for selectively enabling at most one of said writing means or




said reading means to control transfer of data between the data bus and said storing means.

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**5,045,842**
**COMPUTER INPUT DEVICE**
**James J. Galvin, 111 Kirby Ave., Bellevue, Nebr. 68005**
**Filed Oct. 23, 1989, Ser. No. 425,062**
**Int. Cl.[5] G09G** *5/08*
**U.S. Cl. 340—709** **10 Claims**



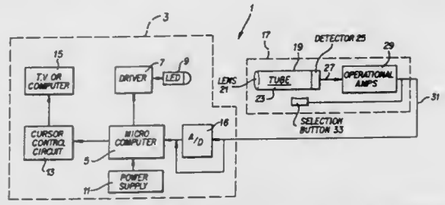
7. An inputting device controller for a computer, comprising:
a) a box-like housing having a top, a a front, a back, a thumb side, and a side opposite the thumb side, said front containing a first substantially centrally rectangular cutout, said thumb side containing a second substantially centrally rectangular cutout, said back containing a third cutout, and said top containing a substantially centrally circular cutout;
b) a flat substantially square palm pad being movably disposed on said top of said box like housing;
c) an automatic firing button being disposed on said thumb side of said box like housing;
d) a manual firing button being disposed on said front of said box like housing;
e) a plurality of suction cups disposed on said bottom of said box like housing so that the inputting device controller for the computer will not move;
f) sufficient wire necessary for connecting the computer inputting device controller to the computer;
g) a first button being disposed through said cutout contained in said front of said box like housing so that individual firing can be accomplished;



h) a second button disposed through said cutout contained in said thumb side of said box like housing so that automatic firing can be accomplished; and
i) a wire exiting said box like housing through said third cutout contained in said back and attaching to a computer.

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**5,045,843**
**OPTICAL POINTING DEVICE**
**Per K. Hansen, Burlington, Vt., assignor to Selectech, Ltd., South Burlington, Vt.**
**Filed Dec. 6, 1988, Ser. No. 280,509**
**Int. Cl.[5] G09G** *3/02;* **H04N** *5/44*
**U.S. Cl. 340—709** **18 Claims**

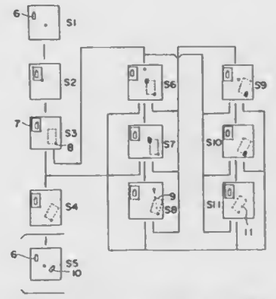



1. An optical pointing device for use within a prescribed space and adapted to be interconnected into a display device having a display screen, a cursor movably displayed on said display screen and a cursor control circuit which controls the position of said cursor on said display screen, said optical pointing device comprising:
a) a first unit including a single light source and computer means for controlling operation of said light source, said first unit being fixedly located in adjacency to said display device with said computer means connected to said cursor control circuit;
b) a second unit moveably contained within said space, said space including a region defined by a substantially conical shape having an angle of diversion of at least 20°, said region extending a finite distance from said display screen along an axis substantially perpendicular to said display screen, said second unit comprising light detector means for detecting light emitted from said light source and, responsive thereto, for generating currents related to the angular rotative and/or translational relationship between said light source and said light detector means, said light detector means including a light sensitive surface and an alignment axis substantially perpendicular to said light sensitive surface;
c) transmission means for transmitting signals related to said currents to said computer means, said computer means receiving said signals and, responsive thereto, activating said cursor control circuit to move said cursor substantially in alignment with said alignment axis;
d) said device being operable to move said cursor to substantially any location on said display screen responsive to translational and/or rotational movements of said light detector means anywhere within said region.

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**5,045,844**
**IMAGE PARALLELING AND ROTATING SYSTEM**
**Sakuharu Takano, and Sumio Kita, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**
**Filed Oct. 27, 1988, Ser. No. 263,194**
**Claims priority, application Japan, Oct. 29, 1987, 62-274173**
**Int. Cl.[5] G09G** *1/06*
**U.S. Cl. 340—724** **1 Claim**

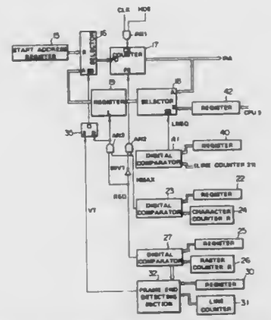
1. An image information processing apparatus including a combined display and input unit, the input unit comprising:
coordinate specifying means for specifying and displaying on a screen on the input unit, a rectangular area containing an image and for further specifying and displaying the rectangular area of a destination to which the image is desired to be moved;
mode specifying means for specifying a move mode for the rectangular area to be one of a paralleling mode and a rotating mode;
position specifying means for enabling specification of the desired destination wherein, the rectangular area specified by the coordinate specifying means is displayed on the screen as moved to the desired destination and enabled by the position specifying means, in accordance with the mode specified by the mode specifying means; and




determination means for determining whether or not the coordinate specifying means has specified a predetermined neighboring portion of a corner of the rectangular area so displayed, and for validating, if a result of the determination indicates that the coordinate specifying means has specified the neighboring portion of the corner of the rectangular area, specifications from the mode specifying means and the coordinate specifying means, thereby avoiding an erroneous result.

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**5,045,845**
**IMAGE PROCESSING APPARATUS**
**Shigemitsu Yamaoka, and Kenji Iwamoto, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan**
**Filed Oct. 29, 1987, Ser. No. 114,571**
**Claims priority, application Japan, Oct. 31, 1986, 61-259804**
**Int. Cl.[5] G06F** *3/153*
**U.S. Cl. 340—726** **1 Claim**



1. An image processing apparatus for sequentially reading image data corresponding to an area to be displayed from an image memory in accordance with a scanning of a display screen and for controlling a display based on read image data under a control of a central processing unit comprising:
(a) first detecting means for outputting a first detection signal at a timing when one line is constituted by predetermined number of rasters is completely scanned;

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(b) second detecting means for outputting a second detection signal at a timing when one frame is completely scanned;
(c) third detecting means for outputting a third detection signal at a timing when an access address for said image memory coincides with a boundary address designated by predetermined boundary data;
(d) initial address setting means for outputting the last address of a precedingly displayed line on said display screen as an initial address when said first detection signal is outputted from said first detecting means, said initial address setting means outputting a predetermined start address as said initial address when said second detection signal is outputted from said second detecting means, and said initial address setting means outputting a predetermined jump destination address as said initial address when said third detection signal is outputted from said third detecting means;
(e) counter means for counting a count value thereof from a value of said initial address set by said initial address setting means, and said counter means outputting the count value thereof as said access address for said image memory; and
(f) wherein said initial address setting means comprises
(i) second memory means for storing data representative of said predetermined jump destination address therein,
(ii) first selector means for selecting one of said access address outputted from said counter means and said predetermined jump destination address, said first selector means selecting said predetermined jump destination address when said third detection signal is outputted from said third detecting means, and
(iii) second selector means for selecting one of said predetermined start address and the address outputted from said first selector means, said second selector means selecting said predetermined start address when said second detection signal is outputted from said second detecting means.

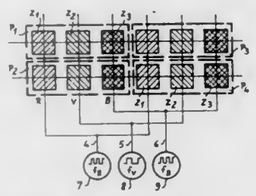
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**5,045,846**

## METHOD OF ADJUSTING THE COLORS OF A POLYCHROME PLASMA PANEL AND A PLASMA PANEL USING SUCH A METHOD

**Michel Gay, Le Fontanil, and Jacques Deschamps, Grenoble, both of France, assignors to Thomson-CSF, Paris, France**

**Continuation of Ser. No. 167,378, Mar. 14, 1988, abandoned. This application May 8, 1990, Ser. No. 520,467**
**Claims priority, application France, Mar. 13, 1987, 87 03456**
**Int. Cl.[5] G09G** *3/28*
**U.S. Cl. 340—772** **6 Claims**



1. A glow discharge panel comprising:
means for providing a plurality of red, blue, and green color sources on said panel;
means for providing a first alternating frequency holding signal to all of said red color sources;
means for providing a second alternating frequency holding signal to all of said blue color sources;
means for providing a third alternating frequency holding signal to all of said green color sources;
means for adjusting the frequency of at least two of said alternating frequency holding signals; and
wherein each of said color sources comprises two plates, with electrodes on at least one plate, and an ionizable gas between the plates which ionizable gas emits ultra-violet radiation in response to the gas being ionized by signals, including said holding signal, being applied to said electrodes, and further comprising luminescent material on one of said plates and which emits the colored light when said emitted ultra-violet radiation is received thereon from said ionized gas;
whereby in accordance with the adjusted frequencies of said holding signals, a desired color balance of said panel is achieved.

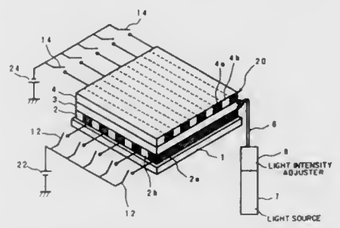
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**5,045,847**

## FLAT DISPLAY PANEL

**Hisaki Tarui, Hirakata; Takao Matsuyama, Neyagawa; Noboru Nakamura; Shoichi Nakano, both of Hirakata, and Yukinori Kuwano, Katano, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Jan. 18, 1989, Ser. No. 298,095**
**Claims priority, application Japan, Jan. 19, 1988, 63-10413**
**Int. Cl.[5] G09G** *3/34*
**U.S. Cl. 340—783** **13 Claims**




1. A flat display panel, comprising:
a light wave guide, including
(a) pair of generally parallel clad layers, and
(b) a core layer sandwiched between said clad layers and having an index of refraction greater than that of said clad layers;
an optical means for transmitting light to said core layer; and
voltage applying means for applying voltage to at least a selected portion of said core layer for decreasing the index of refraction of said selected portion of core layer to an index of refraction less than that of at least one of said clad layers, such that light is output through a portion of at least one of said clad layers corresponding to said selected portion of said core layer.

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**5,045,848**

## METHOD OF ENCODING MARKET DATA AND TRANSMITTING BY RADIO TO A PLURALITY OF RECEIVERS

**Anthony C. Fascenda, Pacifica, Calif., assignor to FNN, New York, N.Y.**

**Continuation of Ser. No. 598,694, Apr. 10, 1984, abandoned. This application Sep. 29, 1987, Ser. No. 104,563**
**Int. Cl.[5] H04Q** *3/00*
**U.S. Cl. 340—825.26** **10 Claims**

1. A method of transmitting stock market data for the listed stocks of at least one stock exchange including stock symbol, and last, open, high and low prices and transmitting such data in the form of bits via radio to a plurality of one way receivers comprising the following steps:
encoding said stock data before transmission to limit the number of said bits;
said encoding includes the steps of selecting a group of stocks of a said exchange having last prices less than $64 or $2[x] where x is an integer 6 or greater and having offsets of less than $4 or $2[y] where y is an integer 2 or greater,



said offsets including the transmitting to said receivers on a repetitive cyclical basis said data for all listed stocks of said exchange in a single cycle;
during trading hours of a predetermined stock exchange inserting in said cylindrical data said last stock prices substantially as they occur and are reported during transmission of a cycle of said cyclical data;
receiving via radio and storing in said receiver stock data, transmitted on said cyclical basis, for selected stocks and updating during trading hours said stored data with said inserted data being received;
and immediately displaying, in response to the command of a user of said one-way receiver, a said last stock price of a predetermined said listed stock which is the result of sale of said stock having just occurred in time or having occurred previously, which ever is the case.

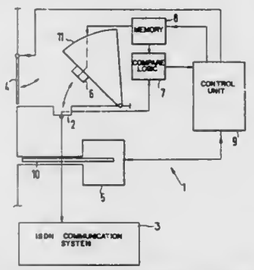
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**5,045,849**

## ACCESS DEVICE FOR AN ISDN CONNECTING DEVICE OF A PUBLIC TERMINAL

**Werner Willhaus, Stuttgart, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany**

**Filed Dec. 26, 1989, Ser. No. 456,324**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843785**
**Int. Cl.[5] H04M** *1/00;* **H04L** *9/00*
**U.S. Cl. 340—825.34** **16 Claims**




1. Access control device for permitting an authorized user to connect a user terminal device to a communications network via an electro-mechanical access connector, the access control device comprising
a movable protective member having a first position which prevents access to the connecting device and a second position which permits such access,
first means for checking a user's access authorization,
second means for checking the correct functioning of the electro-mechanical connector, and
a control unit responsive to the first means and the second means for causing the protective member to assume the second position when the user is authorized to access the connecting device and the connecting device is functioning correctly.

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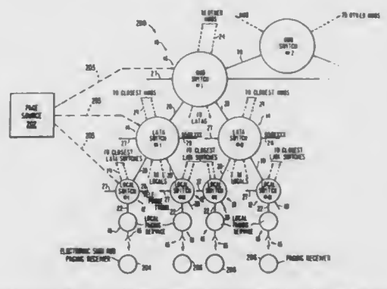
**5,045,850**

## PAGING SYSTEM WITH CENTRALIZED PAGE SOURCE AND DISTRIBUTED PAGE SOURCES

**Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Jr., Chicago, Ill., assignors to Telefind Corporation, Coral Gables, Fla.**

**Filed Dec. 26, 1989, Ser. No. 456,742**
**Int. Cl.[5] H04Q** *7/00*
**U.S. Cl. 340—825.44** **31 Claims**

1. A paging network containing a plurality of switches which are connected together for transmitting pages between switches including a plurality of local switches with a plurality of the local switches containing at least one subscriber file with a subscriber file containing an identification number identifying a paging receiver receiving pages transmitted in the network and a programmable destination field associated with a subscriber file for storing an identification of any destination switch in the network where a page is to be transmitted by the network for transmission to a paging receiver and at least one other switch through which pages are transmitted from one local switch to at least one other local switch comprising:
a page source storing a plurality of the identification numbers chosen from identification numbers stored by a plurality of local switches, an identification number stored by the page source identifying a paging receiver to which pages generated by the page source are to be transmitted by the network, the page source generating pages to be transmitted to a plurality of paging receivers receiving pages in the network including information from the page source and the identification number of the paging receiver chosen from one of the plurality of stored identification numbers which is to receive the page and the page source being connected to one of the switches in the



network for receiving pages generated by the page source; and wherein
the network transmits a page generated by the page source to the local switch having a subscriber file storing a number identical to the identification number contained in the page; and
the local switch to which the page was transmitted by the network receiving the page determines the destination switch to which the page generated by the page source is to be transmitted by the network by matching the identification number contained in the page with an identification number stored in the subscriber file storing an identical identification number stored by the local switch receiving the page from the network and retrieves the destination switch from the destination field of the matched subscriber file to which the page generated by the page source is to be transmitted by the network, adds the destination switch to the page and couples the page to the network for transmission to the destination switch by the network.

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**5,045,851**

## ANALOG SIGNAL MULTIPLEXER WITH NOISE REJECTION

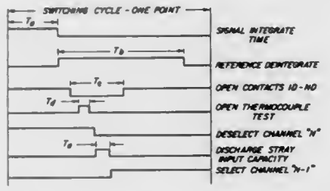
**Frederick B. Davis, III, Drexel Hill; Stephen P. Glaudel, Harleysville, both of Pa., and Sanjay Jhunjhunwala, Patna, India, assignors to General Signal Corporation, Stamford, Conn.**

**Filed Dec. 21, 1988, Ser. No. 288,323**
**Int. Cl.[5] G08C** *15/06*
**U.S. Cl. 340—870.13** **4 Claims**

1. A method for rejecting common mode noise in a multiplexed analog data acquisition system which utilizes a plurality of thermocouple pairs for making temperature measurements, a normal mode filter across each of said pairs which includes a capacitor and a switch in series connection across each of said pairs, input lines for each of said pairs for connecting the parallel combinations of said pairs and their associated filter

capacitors across a measuring circuit, and relay contacts in each of the input lines for selectively connecting said thermocouple pairs to the measuring circuit one at a time during periods of signal acquistion, comprising the step of

opening during the switching cycle for each channel the switchable shunt capacitor circuit for at least the channel




to be selected next, said opening being for a period which is an integral number of full cycles of the a.c. line frequency and is timed to span the deselection of the presently selected channel and the selection of the next channel as well as the period during which transient current flows due to said selection while at the same time avoiding overlap with the input signal acquisition period.

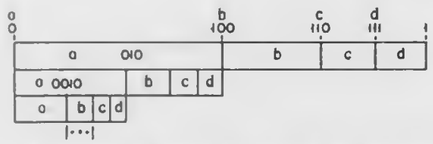
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**5,045,852**

## DYNAMIC MODEL SELECTION DURING DATA COMPRESSION

**Joan L. Mitchell, Ossining; William B. Pennebaker, Carmel, both of N.Y., and Jorma J. Rissanen, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Mar. 30, 1990, Ser. No. 502,909**
**Int. Cl.[5] H03M *7/48***
**U.S. Cl. 341—51** **20 Claims**




1. A computerized method of maximizing the compression of a stream of input symbols by dynamically selecting the best of a plurality of data compression models for respectively encoding each of successive portions of said stream, wherein each model, in response to input symbols, generates encoded data, based on model characteristics, in the form of respective strings of data, comprising the steps of:

beginning with the same input symbol in said stream, using each model to generate respective strings of data from the stream of input symbols;

compression coding said strings of data to produce blocks of compressed data, each of said blocks being at least equal to a given size;

selecting the respective block of compressed data for which the most input symbols have been compressed;

adding the selected block of compressed data to an output data stream; and

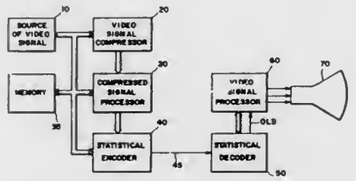
beginning with the input symbol following the last symbol input to said selected model, reiterating the foregoing steps on the next succeeding portion of said input symbol stream.

**5,045,853**

## METHOD AND APPARATUS FOR STATISTICALLY ENCODING DIGITAL DATA

**Brian Astle, Cranbury, and Stuart J. Golin, East Windsor Township, Mercer County, both of N.J., assignors to Intel Corporation, Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 63,040, Jun. 17, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 175,915**
**Int. Cl.[5] H03M *7/40***
**U.S. Cl. 341—67** **9 Claims**




1. Apparatus for encoding digital samples comprising:

a source of digital samples;

means, coupled to said source, for determining only digital samples from said source wherein the statistical frequencies of occurrence of said determined digital samples exhibit a generally monotonic decrease in their respective values; and

encoding means, coupled to receive said determined digital samples, including calculating means programmed to generate a plurality of parameter values defining a statistical code suitable for encoding only said determined digital samples, wherein said parameter values describes a set of successive code values representing a set of successive possible values of said determined digital samples.

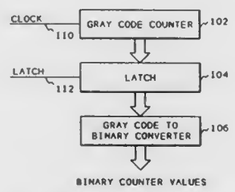
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**5,045,854**

## INTEGRATED HIGH SPEED SYNCHRONOUS COUNTER WITH ASYNCHRONOUS READ-OUT

**Keith A. Windmiller, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Mar. 1, 1990, Ser. No. 487,490**
**Int. Cl.[5] H03M *7/16***
**U.S. Cl. 341—97** **14 Claims**




1. A high speed synchronous digital counter circuit having asynchronous read-out capability, said counter comprising:

a plurality of lower bit storage means;

a plurality of upper bit storage means;

means for causing said lower bit and said upper bit storage means to count using a gray code; and

multiple count look-ahead qualification means for transferring a count overflow from said lower bit storage means to said upper bit storage means.

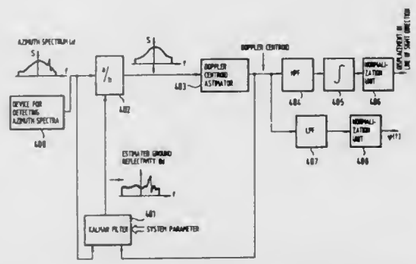


**5,045,855**

## METHOD FOR EXTRACTING MOTION ERRORS OF A PLATFORM CARRYING A COHERENT IMAGING RADAR SYSTEM FROM THE RAW RADAR DATA AND DEVICE FOR EXECUTING THE METHOD

**Joao Moreira, Landsberg, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany**

**Filed Jul. 6, 1990, Ser. No. 548,792**
**Claims priority, application Fed. Rep. of Germany, Jul. 7, 1989, 3922427**
**Int. Cl.[5] G01S *13/90***
**U.S. Cl. 342—25** **4 Claims**




1. A method for the extraction of motion errors of a platform carrying a coherent imaging radar system from raw radar data, for imaging terrains with mainly homogenous ground reflectivities comprising the steps of:

forming azimuth spectra continuously successive in time over a set period of time;

estimating, using a prediction filter, a ground reflectivity part of the azimuth spectra from the formed azimuth spectra and entered system parameters as platform's forward velocity, radar range delay, and radar pulse repetition frequency;

dividing the azimuth spectrum by said estimated ground reflectivity part to obtain an antenna pattern part of the azimuth spectra;

determining a doppler centroid of the antenna pattern part;

separating the drift angle part $2 V_r(t)\sin(\phi(t)/\lambda)$ of the doppler centroid signal by low pass filtering the doppler centroid signal and a subsequent normalization using the equation

$$\arcsin(\text{low-pass-filter-output} * \lambda/2\, V_r(t)),$$

in order to obtain the drift angle $\phi(t)$, where $V_r(t)$ is the platform's forward velocity and $\lambda$ the wavelength of the transmitted radar signal; and

separating the velocity in line of sight direction part $(2 V_b(t)/\lambda)$ of the doppler centroid signal by high pass filtering the doppler centroid signal, in order to obtain the motion errors (displacement) in line of sight direction of the antenna after an integration and subsequent normalization with $(\lambda/2)$.

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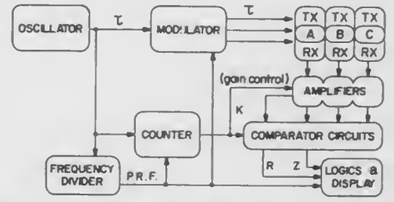
**5,045,856**

## VEHICULAR ANTICOLLISION RADAR SYSTEM FOR DRIVING IN THE FOG

**Paolo A. Paoletti, No. 62, Via Luigi Rizzo, 00136 Roma, Italy**

**PCT No. PCT/IT89/00002, § 371 Date Jun. 29, 1990, § 102(e) Date Jun. 29, 1990, PCT Pub. No. WO89/06808, PCT Pub. Date Jul. 27, 1989**
**ub. Date DJan. 16, 1989, Ser. No. 474,812**
**Claims priority, application Italy, Jan. 18, 1988, 47545 A/88**
**Int. Cl.[5] G01S *13/93, 13/48***
**U.S. Cl. 342—70** **7 Claims**

1. A vehicular anticollision radar system for driving in foggy condition having a bidimensional display device adapted for direct vision or for projecting an image of the space in front of the vehicle upon its windscreen, so as to furnish a symbolic representation of an obstacle with information as to its distance (R) and angular position (Z) with respect to the vehicle, characterized in that it comprises an oscillator circuit to generate a continuous square wave signal with a period $\tau$, connected to a modulator circuit, to a frequency divider circuit and to a counter circuit; said frequency divider circuit generating a square wave signal (P.R.F.) with a period T and being connected to said counter circuit and to said modulator circuit; said modulator circuit having a number n of output terminals and being adapted to generate a first voltage ($V_1$) responsive to said square wave signal from said oscillator circuit and a second voltage ($V_2$) responsive to said square wave frequency-divided signal from the frequency divider circuit; said modulator circuit being also adapted to normally furnish said first voltage ($V_1$) through said n output terminals and to successively furnish said second voltage ($V_2$) through said n output terminals in turn to n varactor diodes included in n resonant




cavities each of which also includes a Gunn diode and a Schottky diode, respectively; said Gunn diodes generating a radiofrequency signal and being individually connected to n horn type or parabolic type fixed transmitting-receiving antennas; said Schottky diodes revealing echo signals received by said antennas and being connected to n variable gain amplifier circuits the outputs of which are individually connected to n comparator circuits to which also said counter is connected and wherein comparisons are made between the output signals of said amplifier circuits and the count signal (k) of said counter circuit so as to furnish a first signal (R) responsive to the time needed by a signal emitted from one of said antennas to reach an obstacle and to return upon reflection therefrom to one or more of said antennas and a second signal (Z) responsive to and representative of which of these antennas receive(s) an echo signal as well as a logic and display circuitry which is connected to said frequency divider circuit and to said comparator circuits so as to receive said P.R.F., R and Z signals in order to accordingly drive said bidimensional display device.

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**5,045,857**

## HIGH-SPEED BEAM SWITCHING PROCESSOR

**Richard A. Hills, LaMesa, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Continuation-in-part of Ser. No. 329,262, Jan. 15, 1973, Pat. No. 4,472,719. This application Oct. 23, 1974, Ser. No. 517,354**
**Int. Cl.[5] G01S *7/38***
**U.S. Cl. 342—374** **10 Claims**

1. A beam switching processor comprising:

N receiving antenna ports;

N detector means for receiving N receiving antenna port signals from said N receiving antenna ports and for outputting N detector signals proportional to said N receiving antenna port signals;

comparator means for receiving said N detector signals, for comparing each of said N detector signals with M reference levels and for providing comparator output signals whenever a detector signal exceeds a reference level;

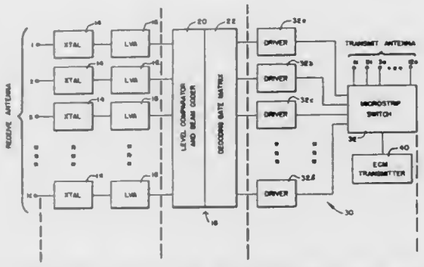
logic means for receiving said comparator output signals and for providing a coded output signal indicative of which

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one of said N receiving antenna port signals has the highest signal amplitude;

N transmit antenna ports;




switch means connected to said logic means and to said N transmit antenna ports for enabling energization of one of said N transmit antenna ports corresponding to said receiving antenna port having the highest signal amplitude.

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**5,045,858**

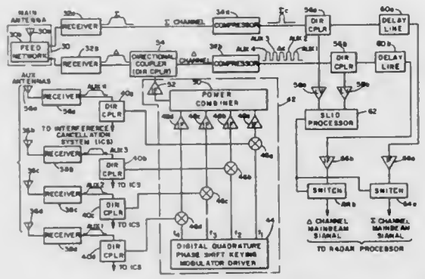
**SIDELOBE IDENTIFICATION AND DISCRIMINATION SYSTEM WITH SIGNAL MULTIPLEXER-SEPARATOR**

**Paul R. Eberhardt, Encinitas, and William F. McNaul, Ramona, both of Calif., assignors to Cubic Defense Systems, Inc., San Diego, Calif.**

**Filed Aug. 16, 1989, Ser. No. 395,275**

**Int. Cl.[5] G01S** *3/16, 13/52;* **H04J** *3/00;* **G06G** *7/00*

**U.S. Cl. 342—379** **11 Claims**




1. In a receiver system for receiving and preprocessing chirped RF pulses, a system for identifying main antenna sidelobe received pulses, said receiver system having a main antenna system with a directional antenna that has a mainlobe and at least one sidelobe for collecting said RF pulses and providing corresponding sum and difference channel pulses according to the directional position of said directional antenna relative to the source of said RF pulses, a sum channel and a difference channel pulse compressor each having an input coupled to said main antenna system for respectively receiving said sum and difference channel pulses and providing corresponding compressed pulses at respective outputs thereof for coupling to a pulse processor, and said receiver system further having a plurality of auxiliary antennas for receiving ones of said RF pulses coincident upon the sidelobes of said direction antenna and providing corresponding auxiliary channel pulses, said sidelobe identification system comprising:

multiplexer-separating means coupled to each auxiliary antenna system for, receiving each of said auxiliary channel pulses, conditioning each auxiliary channel pulse according to a predetermined conditioning parameter, combining said conditioned auxiliary channel pulses with said difference channel pulse as input to said difference channel pulse compressor, wherein said difference channel pulse processor provides an output sequence of spaced apart compressed pulses each corresponding to a respective one of said difference channel and auxiliary channel pulses; and

sidelobe identification means coupled to sum and difference channel pulse compressors for, receiving said sum channel compressed pulse and said sequence of difference channel and auxiliary channel compressed pulses, comparing the amplitude of said sum channel compressed pulse with the amplitude of each pulse in said sequence of pulses, and providing a sidelobe identification signal when the amplitude of one of said pulses in said sequence of pulses is at least as great as the amplitude of said sum channel compressed pulse.

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**5,045,859**

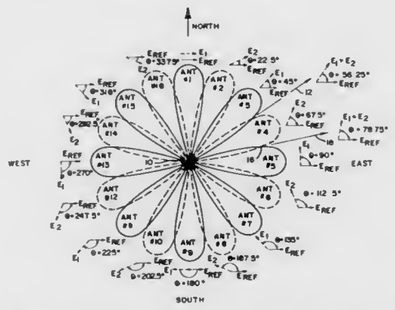
**PHASE REFERENCE NAVIGATION SYSTEM AND METHOD**

**Forrest G. Yetter, Alexandria, Va., assignor to Aviation Systems Concepts, Inc., Annandale, Va.**

**Filed Sep. 15, 1988, Ser. No. 244,289**

**Int. Cl.[5] G01S** *1/14, 5/04*

**U.S. Cl. 342—414** **17 Claims**




1. A navigation system comprising antenna means having n elements for radiating a plurality of fixed beams of RF energy in respective different predetermined angular directions; means for supplying RF energy to said antenna means to cause RF radiation therefrom; means for impressing upon each radiated beam a variable signal having a phase corresponding to the predetermined angular direction of the beam; and means for combining at a receiver the variable signals of first and second ones of the beams to form a resultant signal having a phase which varies as a function of angle between phases corresponding to the predetermined angular directions of the first and second beams and wherein said impressing means comprises means for generating first and second subcarriers of different frequencies; first means for modulating the first and second RF beams with the first and second subcarriers, respectively; and second means for modulating each subcarrier with the variable signal and wherein the first modulating means comprises means for modulating the RF energy radiated by each beam with a reference signal which has a phase that is constant with angular direction, and means for delaying the subcarriers which are supplied to at least n-1 of said elements so that the variable signal on each subcarrier has a phase relative to the reference signal that corresponds to the angular direction of the beam radiated by that element.



**5,045,860**

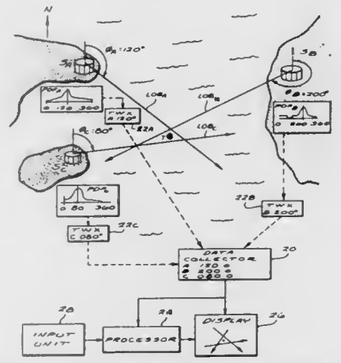
**METHOD AND ARRANGEMENT FOR PROBABILISTIC DETERMINATION OF A TARGET LOCATION**

**Eric S. Hodson, Coronado, Calif., assignor to R & D Associates, Marina Del Rey, Calif.**

**Filed Jun. 27, 1990, Ser. No. 544,842**

**Int. Cl.[5] G01S** *3/02*

**U.S. Cl. 342—451** **15 Claims**




1. A system for determining the position of a target in a target area including:

a plurality of signal sensing stations, with each station comprising a high-frequency direction finding station and including bearing sensing means having a predetermined measurement probability distribution function for generating a sensed target bearing signal corresponding to a sensed bearing between the target and the station;

processing means:

a) for generating a representation of the target area as a pattern of target area segments;

b) for assigning to each target area segment a partial probability value corresponding to a discrete representation of the measurement probability distribution function for said station; and

c) for each target area segment, for calculating a composite probability value;

display means for generating a representation of the pattern of target area segments as a pattern of displayed segments with likelihood markings corresponding to the composite probability value for each respective target area segment;

data transmission and receiving means for applying the sensed target signals to the processing means; input means for designating chosen ones of the target area segments as a potential target region; and said processing means being provided with means for applying to the display means composite probability value signals corresponding to said composite probability values.

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**5,045,861**

**NAVIGATION AND TRACKING SYSTEM**

**Peter J. Duffett-Smith, Cambridgeshire, England, assignor to The Lynxvale - Cril Partnership, England**

**PCT No. PCT/GB88/00617, § 371 Date Feb. 7, 1990, § 102(e) Date Feb. 7, 1990, PCT Pub. No. WO89/01637, PCT Pub. Date Feb. 23, 1989**

**ub. Date DJul. 28, 1988, Ser. No. 458,615**

**Claims priority, application United Kingdom, Aug. 10, 1987, 8718881; Feb. 18, 1988, 8803754**

**Int. Cl.[5] G01S** *3/02*

**U.S. Cl. 342—457** **20 Claims**

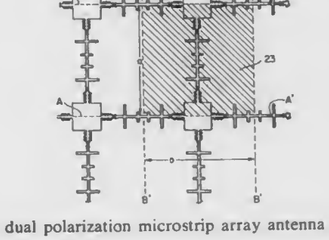
1. A navigation and tracking system for receiving signals transmitted by at least one transmission source (A, B, C) equal in number at least to the number of dimensions in which the movement of a roving object is to be monitored, the system comprising:

a pair of receiving stations (D, E), the first of the receiving stations (D) being at a known position and the second (E) being located on the roving object, each receiving station having:

a reference oscillator;

means for deriving from the reference oscillator a local reference signal; and

means for generating a signal representative of the difference in frequency and hence the difference in phase between the local reference signal and the signal received from each of the transmission sources;




means (F) for passing, as a link signal from one of the receiving stations to the other receiving station, said receiving station-generated signal representative of the phase difference between the derived local reference signal and the signal received from at least a single one of the transmission sources; and

means (R, S, T, U) at said other receiving station for comparing the information received from said one receiving station with the representative signal generated at said other receiving station and for determining the phase difference or time delay between the received signals, and hence the change in phase difference or time delay of the signals, in order to determine the position or change in position of the roving object.

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**5,045,862**

**DUAL POLARIZATION MICROSTRIP ARRAY ANTENNA**

**Adrian W. Alden, Sainte Cecile de Masham, and Tom T. Ohno, Carp, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Communications, Ottawa, Canada**

**Filed Dec. 7, 1989, Ser. No. 447,401**

**Claims priority, application Canada, Dec. 28, 1988, 587182**

**Int. Cl.[5] H01Q** *1/38*

**U.S. Cl. 343—700 MS** **16 Claims**




1. A dual polarization microstrip array antenna for power

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reception or transmission of electromagnetic waves comprising:

a plurality of identical antenna units facing the same direction, arranged symmetrically in an array in two orthogonal directions,

each of the said antenna units comprising a patch antenna element and a plurality of substantially identical feedlines extending along axes, each axis being in a respective one of said two directions, said feedlines being attached symmetrically to the said patch antenna element on opposite sides thereof along respective axes microstrip filters connected to each of the said plurality of feedlines, microstrip matching stubs connected to each of the feedlines at positions remote from the patch antenna element and microstrip filters for shorting electromagnetic waves propagating along the said feedlines at fundamental and second harmonic frequencies, and a terminal for a rectifier connected to each feedline between said filters and said matching stubs,

a dielectric layer of a predetermined thickness,

said plurality of identical antenna units being arranged symmetrically in the said array on said dielectric layer,

means for dc connecting feedlines of adjacent antenna units at positions to the side of said stubs remote from the patch elements, and

a common ground plane disposed on the other side of the said dielectric layer,

whereby isolated transmission lien cells and separate antenna units connected in parallel are formed.

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**5,045,863**

**Patent Not Issued For This Number**

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**5,045,864**

**INK-RECEIVING TRANSPARENT RECORDING ELEMENTS**

**William A. Light, Victor, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 3, 1990, Ser. No. 625,711**

**Int. Cl.[5] B41M** *5/00*

**U.S. Cl. 346—1.1** **17 Claims**

1. A transparent image-recording element comprising a support and an ink-receptive layer in which the element is adapted for use in a printing process where liquid ink dots are applied to the ink-receptive layer wherein the ink-receptive layer is capable of controlling ink dot size and the surface of which exhibits improved or enhanced smoothness, said ink-receptive layer comprising:

(i) a vinyl pyrrolidone;

(ii) particles of a polyester which is a poly(cyclohexylenedimethylene-co-xylylene terephthalate-co-malonate-co-sodioiminobis(sulfonylbenzoate));

(iii) a homopolymer or a copolymer of an alkylene oxide containing from 2 to 6 carbon atoms;

(iv) a polyvinyl alcohol;

(v) a fluorocarbon surfactant of the formula:

$$CF_3(CF_2)_mCH_2CH_2O—CH_2CH_2O)_nR$$

wherein m is an integer of 2 through 10, n is an integer of 1 through 18 and R is hydrogen or alkyl of 1 through 10 carbon atoms, and

(vi) inert particles.

**5,045,865**

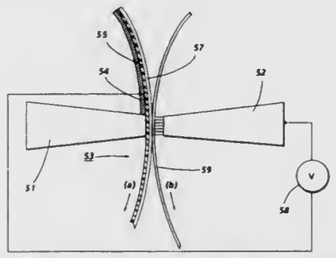
**MAGNETICALLY AND ELECTROSTATICALLY ASSISTED THERMAL TRANSFER PRINTING PROCESSES**

**Richard G. Crystal, Los Altos, Calif., and Hardy Sonnenberg, Puslinch, Canada, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 21, 1989, Ser. No. 454,810**

**Int. Cl.[5] G01D** *9/00;* **B41J** *2/315*

**U.S. Cl. 346—1.1** **37 Claims**




1. A thermal transfer printing process which comprises incorporating into a thermal transfer printing apparatus with a thermal printhead a transfer element comprising a substrate upon which is contained an ink, contacting the transfer element with a receiver sheet, applying heat imagewise from the printhead to the transfer element, and applying a field between the transfer element and the receiver sheet to enhance imagewise transfer of the ink from the transfer element to the receiver sheet, wherein the strength of the field is modulated to meter the amount of ink released from the transfer element.

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**5,045,866**

**IMAGE PRINTING DEVICE**

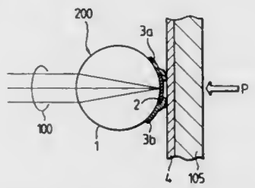
**Kazuhiro Chiba, and Noriko Bamba, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 317,284, Feb. 28, 1989, Pat. No. 4,959,663. This application Jul. 6, 1990, Ser. No. 530,748**

**Claims priority, application Japan, Feb. 29, 1988, 63-47333; Apr. 11, 1988, 63-88527**

**Int. Cl.[5] G01D** *15/10;* **G03G** *5/16*

**U.S. Cl. 346—76 PH** **13 Claims**




17. An image printing method for generating an image from an input image signal, modulated by a laser beam, including heat and optical sensitivity components, generated by a low powered laser, comprising the steps of:

a) receiving said modulated laser beam and decreasing resistance (r) of an image transformation means in response to at least one of said heat and optical sensitivity components of said laser beam;

b) supplying voltage (v) to said image transformation means;

c) increasing power (p) of said laser beam, said increase in power governed by the equation $p=v^2/r$;

d) generating heat in accordance with said increased power;

e) receiving said modulated laser beam and generated heat and thereafter transferring thermal coloring material onto a recording medium to thus form said image.



**5,045,867**

**OPTICAL WRITING HEAD WITH CURVED SURFACE FORMED BY ONE END OF ANY OPTICAL FIBER BUNDLE**

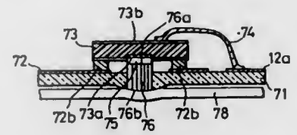
**Masashi Fuse, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 228,886, Aug. 4, 1988, Pat. No. 4,929,965. This application Apr. 13, 1990, Ser. No. 509,004**

**Claims priority, application Japan, Sep. 2, 1987, 62-220007; Sep. 2, 1987, 62-220008; Nov. 7, 1987, 62-281342; Nov. 7, 1987, 62-281343; Nov. 7, 1987, 62-281344; Nov. 7, 1987, 62-281345**

**Int. Cl.[5] G01D** *15/14;* **G02B** *6/08;* **B41J** *2/46, 6/08;* **H04N** *1/036*

**U.S. Cl. 346—107 R** **2 Claims**




1. An optical writing head, comprising:

a light emitting element;

a substrate on which said light emitting means is mounted in a flip chip manner such that a light emitting portion thereof may be opposed to a face of said substrate;

a transparent resin block having a first surface facing said light emitting portion, and a second surface facing said face of said substrate; and

a fiber bundle including a plurality of optical fibers buried in said substrate such that one end portion thereof may oppose to said second surface of said transparent resin block, the other end portion of said fiber bundle being formed into a curved surface.

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**5,045,868**

**OPTICAL RECORDING APPARATUS FOR VARYING PIT WIDTH ACCORDING TO RECORDING WAVELENGTH**

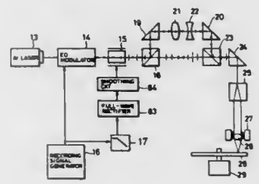
**Osamu Tajima, Ibaraki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**

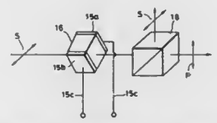
**Continuation of Ser. No. 1,467, Jan. 8, 1987. This application May 18, 1989, Ser. No. 355,849**

**Claims priority, application Japan, Jan. 8, 1986, 61-1514; Jan. 8, 1986, 61-1515; Jan. 8, 1986, 61-1516**

**Int. Cl.[5] C01D** *9/42*

**U.S. Cl. 346—108** **4 Claims**




1. An optical information signal recording apparatus for recording an information signal on an information signal recording medium by means of a pit formed in a geometric concave or convex configuration by irradiating a light spot obtained by condensing a light beam intensity-modulated in accordance with said information signal, the pit width of said pit being varied in accordance with a frequency of said information signal to be recorded, said recording apparatus comprising a deflection device made of an electro-optical crystal and placed within the intensity-modulated light beam path for dividing the intensity-modulated light beam symmetrically into two directions with respect to an optical axis of the intensity-modulated light beam, said deflection device changing a cross-sectional configuration of the intensity-modulated light beam by intensity-modulated light beam division so as to vary the pit width of said pit in accordance with the frequency of the information signal.

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**5,045,869**

**PRINTING CONTROLLER FOR PRINTING AT SELECTED RESOLUTIONS**

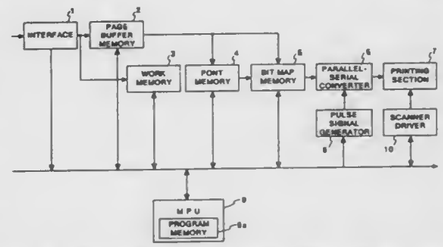
**Yukio Isaka, Yokohama; Tetsuya Morita, Kawasaki; Hiroshi Yamano, Yokohama; Masahiko Murata, Tama, and Masahiko Sakai, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 14, 1989, Ser. No. 407,311**

**Claims priority, application Japan, Sep. 16, 1988, 63-229729; Dec. 28, 1988, 63-329137; Jan. 13, 1989, 1-004721; Jan. 27, 1989, 1-016370**

**Int. Cl.[5] G01D** *9/42;* **H04N** *1/21*

**U.S. Cl. 346—108** **26 Claims**




23. A printer controller for a printer, said controller comprising:

input means for inputting a character code and image data;

resolution setting means for setting the printing resolution of the printer; and

designating means for designating a first resolution in which the input image data is to be printed and a second resolution in which a character pattern corresponding to the input character code is to be printed;

wherein said resolution setting means sets one of the first and second resolutions as the printing resolution.

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**5,045,870**

**THERMAL INK DROP ON DEMAND DEVICES ON A SINGLE CHIP WITH VERTICAL INTEGRATION OF DRIVER DEVICE**

**Patrick Lamey, Manassas, and Richard Kachmarik, Bealeton, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 2, 1990, Ser. No. 503,353**

**Int. Cl.[5] B41J** *2/05*

**U.S. Cl. 346—140 R** **8 Claims**

1. A vertically integrated thermal ink jet printhead comprising:

an pulse driver device disposed on a semiconductor substrate;

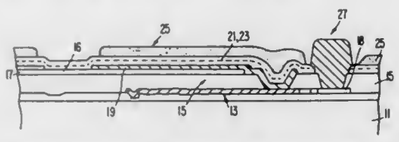
a planarized thermal barrier layer disposed on said pulse driver device;

a thermal ink jet device disposed on said planarized thermal

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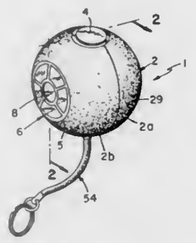
barrier layer at least a portion of which is disposed directly over said pulse driver device; and,



a conducting material which electrically connects said pulse driver device with said thermal ink jet device through said planarized thermal barrier layer.

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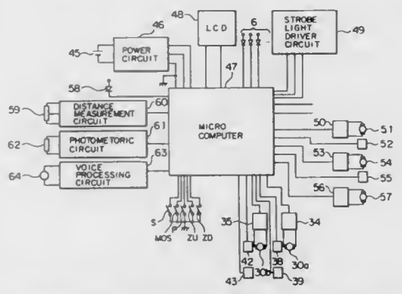
5,045,871
DISPOSABLE CAMERA
Mark R. Reinholdson, 5040 Madison St., NE., Minneapolis, Minn. 55421
Filed Jun. 30, 1989, Ser. No. 375,272
Int. Cl.[5] G03B *29/00, 17/04*
U.S. Cl. 354—76 23 Claims



1. A disposable camera, comprising:
(a) a disposable camera housing having a substantially spherical shape;
(b) an elongated attachment member detachably connected to the camera housing; and
(c) locating means for finding said disposable camera after propelling said camera away from the vicinity of a perpetrator.

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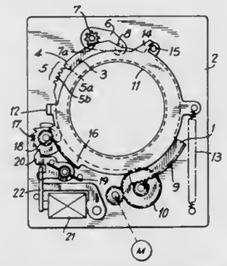
5,045,872
CAMERA FOR TAKING PANORAMIC PHOTOGRAPHY
Masaji Yoshimura, and Tsuyoshi Kakita, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Oct. 16, 1990, Ser. No. 598,551
Claims priority, application Japan, Oct. 16, 1989, 1-268329
Int. Cl.[5] G03B *29/00*
U.S. Cl. 354—94 4 Claims




1. A camera for photographing a panoramic photography consisting of a plurality of separated picture frames, comprising;
means for detecting an angle of photographing view of said camera,
means for determining a rotation angle of said camera according to said angle of photographing view, and
means for rotating said camera in said rotation angle when each of said separated picture frames is photographed,
wherein said rotation means rotates said camera so that an optical axis of said camera stays on a same plane.

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5,045,873
MOTOR DRIVEN SHUTTER
Nobuo Shinozaki, and Hiroto Tsuyuki, both of Yotsukaido, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan
Filed May 11, 1990, Ser. No. 522,424
Claims priority, application Japan, May 12, 1989, 1-55046[U]
Int. Cl.[5] G03B *9/08*
U.S. Cl. 354—234.1 10 Claims



1. A mechanism for opening and closing a shutter means, comprising a rotatably mounted drive member, a motor means operable to rotatably drive said drive member, actuating means for opening and closing said shutter means when said drive member is rotated, and operating means between said drive member and said actuating means operable to provide a gear driving relationship between said drive member and said actuating means during one part rotation of said drive member and a non-driving relationship between said drive member and said actuating means during another part rotation of said drive member, said operating means comprising gear teeth on said actuating means, one of said gear teeth having notch means which is positioned juxtaposed to said drive member to enable said drive member to rotate without driving said actuating means.

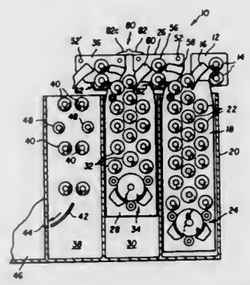
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5,045,874
WATER DISTRIBUTOR SYSTEM FOR CROSSOVER ASSEMBLIES IN A FILM PROCESSOR
William A. Craig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 5, 1990, Ser. No. 609,481
Int. Cl.[5] G03D *3/06, 3/08*
U.S. Cl. 354—322 5 Claims

1. In an improved water distributor system for crossover assemblies in a film processor, the film processor having first, second and third containers for liquids through which film is successively passed for developing the film, a first crossover assembly located between the first and second containers and a second crossover assembly located between the second and third containers, each crossover assembly comprising an elongate trough for holding water and a rotatable roller located with respect to the trough so that the roller is partially immersed in water in the trough to clean the roller, the film contacting the roller of one of the crossover assemblies as the film travels from one container to another, the improved distribution system comprising:
a water distributor having means defining an elongate path



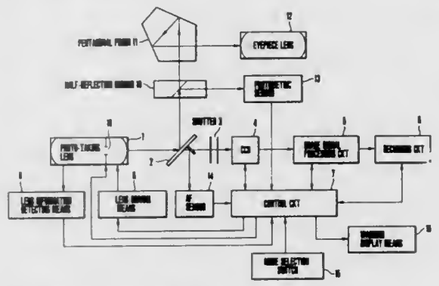
for water, the path defining means having one end located to deliver water to the trough of the first crossover assembly and a second end located to deliver water to the trough of the second crossover assembly, means for metering water to the path defining means at a position be-



tween the ends thereof, and means for separating the water from the metering means into a first stream of water directed along the path toward the one end of the path and a second stream of water directed along the path toward the second end of the path.

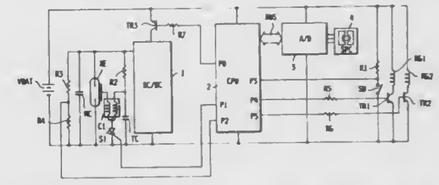
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5,045,875
CAMERA WITH AUTOMATIC FOCUSING DEVICE
Yoshitaka Murata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 292,008, Dec. 30, 1988, abandoned.
This application May 18, 1990, Ser. No. 525,311
Claims priority, application Japan, Jan. 11, 1988, 63-003426; Jan. 18, 1988, 63-007900; Jan. 20, 1988, 63-010042
Int. Cl.[5] G03B *7/095, 13/36*
U.S. Cl. 354—400 6 Claims



1. A camera comprising:
a light measuring circuit;
an automatic focusing circuit for automatically effecting focal adjustment for an object to be photographed;
an exposure control circuit for controlling an aperture on the basis of an output of said light measuring circuit, said control circuit having a first mode for controlling the aperture within a range from a full aperture value to a predetermined stopped down aperture value, and a second mode for controlling the aperture within a range from an aperture value stopped down by a predetermined step from the full aperture value to said predetermined stopped down aperture value; and
a selection member for selecting said first mode or said second mode while said automatic focusing circuit is operating.

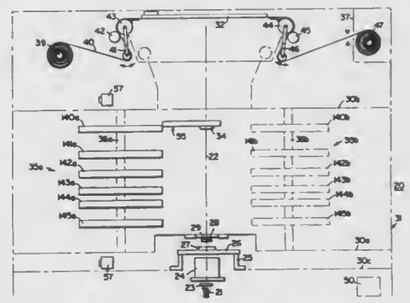
5,045,876
CAMERA WITH FLASH DEVICE
Yoshihiko Aihara, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 28, 1989, Ser. No. 386,891
Claims priority, application Japan, Aug. 3, 1988, 63-194038; Aug. 3, 1988, 63-194039; Aug. 3, 1988, 63-194040
Int. Cl.[5] G03B *15/05*
U.S. Cl. 354—418 14 Claims



1. A flash device for a camera in which exposure is started after an exposure preparatory operation is performed with a release signal provided by a release control circuit on operation of a release operation member, comprising:
(a) a capacitor for storing flashing energy;
(b) a detection circuit for detecting whether or not a charging level of said capacitor has reached a predetermined level;
(c) a charging and sequence control circuit which is actuated by operation of said release operation member to start the charging to the capacitor, said circuit performing a further charging of said capacitor for a predetermined time after detection by said detection circuit that the charge level of said capacitor has reached said predetermined level and then stopping the charging to said capacitor and forming a release signal.

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5,045,877
PHOTOGRAPHIC PRINTER
Orren J. Lucht, 1481 240th St., Farmington, Minn. 55024; Charles R. Lucht, Bloomington, and Wayne D. Gunderson, Plymouth, both of Minn., assignors to Orren J. Lucht, Farmington, Minn.
Filed Feb. 21, 1990, Ser. No. 483,073
Int. Cl.[5] G03B *27/72*
U.S. Cl. 355—71 3 Claims



1. A photographic printer comprising:
(a) a light source;
(b) an adjustable mixing chamber, including:
(i) a plurality of walls, said walls having an interior face, a side edge and a top edge, and wherein each of said side edges is located proximate an interior face of an adjacent wall; and

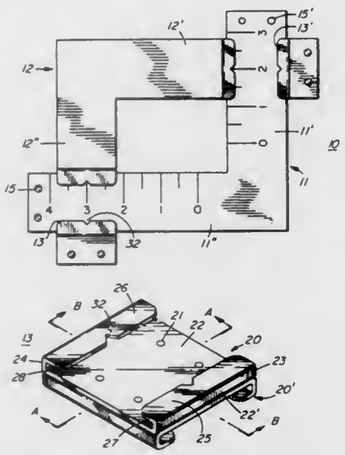
VOL 1130 ISS 1 SE 3 1991 UMI



(ii) drive means, cooperatively connected to said walls for moving said walls relative to one another;
(c) a negative holder for holding a negative having an image to be transferred to a light sensitive medium, the cross sectional area formed by said top edges of said mixing chamber being adjusted by said drive means to correspond to the negative;
(d) a lens holder for focusing the image onto the light sensitive medium; and
(e) an exposure station for holding the light sensitive medium.

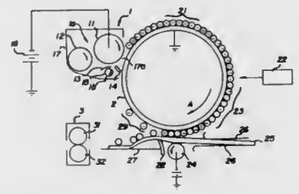
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**5,045,878**
**CROPPING DEVICE**
**Bernd Taeger, 537 King Street East, Hamilton, Ontario, Canada L8N 1E3**
**Filed Jun. 8, 1990, Ser. No. 535,166**
**Claims priority, application Canada, Jul. 28, 1989, 606889**
**Int. Cl.[5] G03B *27/58***
**U.S. Cl. 355—74** **18 Claims**



1. A cropping device for scaling and formatting copy, photographs and design graphics, comprising:
a pair of movable members disposed in overlying, laterally displaceable relation for circumferentially defining a polygon;
a first clip for retaining a first pair of the arms in crossed, mutually slidable, spaced relation, comprising:
a base wall;
a pair of opposing first side walls upstanding from the base wall to form a broad, open first channel within which a first arm is slidably disposed, each first side wall including a free end portion inwardly turned to define a pair of opposing first narrow channels adapted to slidably engage and guide the edges of the first arm; and
a pair of opposing second side walls positioned orthogonally to the pair of first side walls in the plane of the base wall, each second side wall depending from the base wall to form a broad, open second channel within which a second arm is slidably disposed and including a free end portion inwardly turned to define a pair of opposing second narrow channels adapted to slidably engage and guide the edges of a crossed second arm, the first pair of crossed arms being spaced apart by the thickness of the base wall; and
a second clip corresponding to the first clip for retaining a corresponding second pair of arms of the members in crossed, mutually slidable, spaced relation.

**5,045,879**
**IMAGE FORMING APPARATUS USING PHOTOSENSITIVE TONER**
**Kazuhito Takaoka, Kadoma; Kazushige Inoue, Takatsuki; Masatoshi Uehara, Hirakata, and Yumiko Sano, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**
**Filed Sep. 10, 1990, Ser. No. 580,038**
**Claims priority, application Japan, Sep. 29, 1989, 1-256799**
**Int. Cl.[5] G03G *15/00***
**U.S. Cl. 355—200** **6 Claims**



1. An image forming apparatus comprising:
an electrically-conductive drum which rotates in a predetermined direction;
a toner storage means facing said electrically-conductive drum and having a housing which contains a photosensitive toner electrically charged in a prescribed polarity, said toner storage means including a toner feed system mounted in said housing for feeding said photosensitive toner onto said rotating electrically-conductive drum, thereby forming a thin toner layer thereon;
an exposure means located downstream in the rotation of said electrically-conductive drum with respect to said toner storage means, said exposure means selectively illuminating said thin toner layer so as to selectively electrically discharge said photosensitive toner of said thin toner layer, thereby forming an electrostatic latent image in said thin toner layer; and
a transfer means located downstream in the rotation of said electrically-conductive drum with respect to said exposure means, said transfer means selectively transferring the photosensitive toner of said electrostatic latent image onto a copy sheet, thereby forming a final image thereon;
wherein said toner storage means further includes a toner collecting system mounted in said housing and positioned upstream in the rotation of said electrically-conductive drum with respect to said toner feed system, said toner collecting system removing the photosensitive toner remaining on said electrically-conductive drum after the formation of said toner image, so as to collect the removed photosensitive toner into said housing, and thereafter delivering the collected photosensitive toner into said toner feed system.

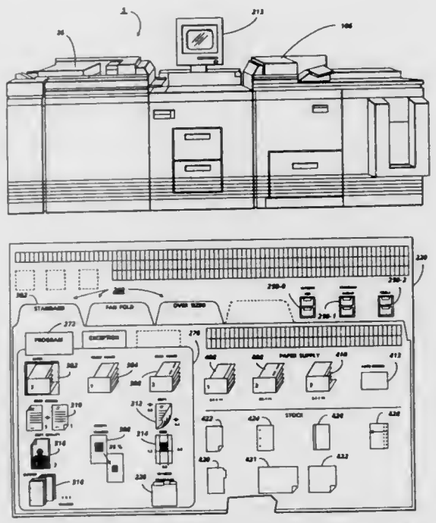
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**5,045,880**
**PRE-PROGRAMMING DURING JOB RUN**
**Eugene S. Evanitsky, Pittsford; Joseph L. Filion, Rochester, and Thomas J. Herceg, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Oct. 3, 1988, Ser. No. 252,479**
**Int. Cl.[5] G03G *15/00, 21/00***
**U.S. Cl. 355—200** **12 Claims**

1. In a reproduction machine having a programming device capable when actuated by an operator to establish a plurality of discrete pre-programmed set-up configurations in order that the machine produce production runs in accordance with a selected one of the set-up configurations, the programming device comprising:
a screen providing a display of selections for programming said plurality of discrete pre-programmed set-up configurations of said machine;

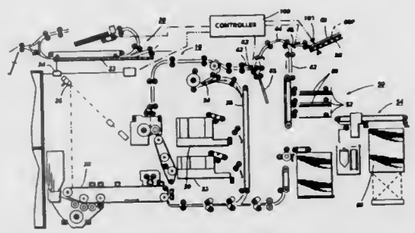


memory means for storing each of the selected set-up configurations;
means effective when actuated by the operator for selecting a desired one of said stored set-up configurations to configure the machine for a current production run in accordance with the selected configurations;
wherein the improvement comprises the means for activating said selections for pre programming on said display during said current production run.



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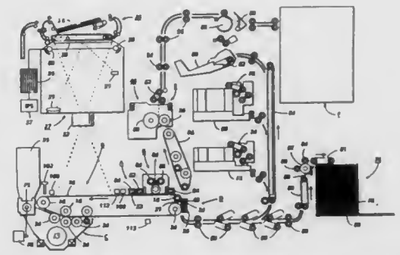
**5,045,881**
**SYSTEM FOR SEGREGATING PURGE SHEETS AND CONTINUED PRINTING**
**Carla J. Kinder, Ontario; William M. OuYang, Pittsford, and Michael E. Farrell, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Aug. 30, 1990, Ser. No. 574,877**
**Int. Cl.[5] G03G *15/00***
**U.S. Cl. 355—206** **6 Claims**



1. In a method of copying or printing in which properly printed copy sheets generated from the printing operation may be selectably operator directed to various different copy sheet output compiling stations, and wherein copy sheets to be purged may be directed to a said copy sheet output compiling station which is being designated as a purged sheets output compiling station;
the improvement wherein, as long as said properly printed copy sheets are selectably directed to a said copy sheet output compiling station which is not the said copy sheet output compiling station into which said purged sheets had been directed in the same said printing operation, then said properly printed copy sheets will continue to be printed without stopping said printing operation,
unless said properly printed copy sheets are selectably directed to said purged sheets output compiling station after any of said purged sheets have been directed thereto, but not removed therefrom, in the same said printing operation, in which event said printing operation of said properly printed copy sheets will be stopped to prevent intermixing of said purged sheets with said properly printed copy sheets in the same said copy sheet output compiling station.

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**5,045,882**
**XEROGRAPHIC SETUP AND OPERATING SYSTEM FOR ELECTROSTATOGRAPHIC REPRODUCTION MACHINES**
**Daniel C. Roehrs, Webster; Angelo T. Caruso, Rochester; Robert E. Grace; Robert M. Mara, both of Fairport; John G. Elliot, Penfield; Patricia J. Saraceno, Rochester, and James M. Pacer, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Division of Ser. No. 344,774, Apr. 27, 1989. This application Jun. 6, 1990, Ser. No. 533,743**
**Int. Cl.[5] G03G *15/00***
**U.S. Cl. 355—208** **3 Claims**



2. A process for setting up the xerographic system of a multi-mode electrostatographic reproduction machine, said machine having a photoreceptor, corona means for charging said photoreceptor in preparation for imaging, exposure means for exposing said charged photoreceptor to produce latent electrostatic images on said photoreceptor, and developer means including at least one magnetic brush for developing said latent electrostatic images, comprising the steps of:
a) adjusting bias on said corona charging means and the intensity of said exposure means;
b) operating said xerographic system to generate image test patches representative of image background and relatively high density and relatively low density images on said photoreceptor;
c) measuring the potentials of said image test patches generated on said photoreceptor;
d) comparing the potentials of said image background and said relatively high density images with one another to obtain a high contrast voltage;
e) comparing the potentials of said image background and said relatively low density images with one another to obtain a low contrast voltage;
f) repeating steps a–e until predetermined high and low contrast potentials are obtained;
g) operating said xerographic system to generate additional test image patches on said photoreceptor;
h) measuring the potentials of said additional image patches;
i) from the potentials obtained in step h, determining the

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developer means bias requirements for said developer means; and

j) from the developer means bias requirements obtained in step i determining the developer bias to be applied to said magnetic brush.

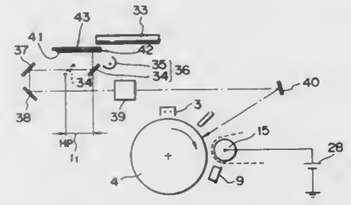
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5,045,883

## IMAGE DENSITY CONTROL METHOD USING EXCLUSIVE PATTERNS FOR AN IMAGE FORMING APPARATUS

**Kouji Ishigaki, Yokohama, and Yasuji Takagi, Matsudo, both of Japan, assignors to Ricoh Company, Ltd., Japan**

**Filed Nov. 28, 1989, Ser. No. 442,503**
**Claims priority, application Japan, Dec. 1, 1988, 63-302305**
**Int. Cl.[5] G03G *21/00***
**U.S. Cl. 355—214** **7 Claims**



1. An image density control method for an image forming apparatus having optics which includes a scanner for forming an exclusive pattern having a predetermined density on an image carrier and controlling an image forming condition on the basis of said exclusive pattern, said method comprising the steps of:

(a) preparing a plurality of exclusive patterns for controlling the image forming condition, said patterns including a high density black pattern and a low density white pattern;

(b) moving the scanner of the optics to s predetermined position and stopping said scanner at said predetermined position;

(c) electrostatically forming a latent image representative of said low density white pattern on the circumference of the image carrier while the scanner is stopped; p1 (d) causing the scanner to reciprocate between said predetermined position and a scanner home position; and

(e) electrostatically forming a latent image representative of said high density black pattern on the image carrier while the scanner reciprocates.

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5,045,884

## TONER SUPPLY ARRANGEMENT

**Tadashi Ohira, and Akira Ohhata, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 6, 1990, Ser. No. 488,873**
**Claims priority, application Japan, Mar. 8, 1989, 1-055381**
**Int. Cl.[5] G03G *15/06***
**U.S. Cl. 355—245** **20 Claims**

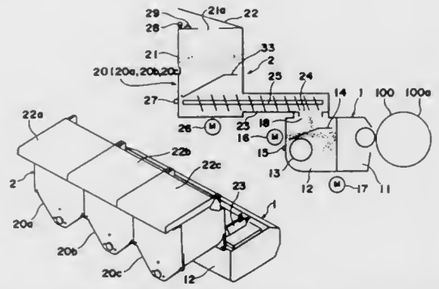
14. In an image forming apparatus, a developing apparatus for developing an electrostatic latent image formed on an image support member comprises:

a developing means for supplying toner to said electrostatic latent image;

a plurality of toner accommodating containers, each containing toner therein;

a toner transport means for transporting toner to said developing means from any one of said plurality of toner accommodating containers;

a driving means for driving said toner transport means; and



a control means for applying a driving signal to said driving means in a predetermined order.

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5,045,885

## LINK MECHANISM PROVIDED BETWEEN AN UPPER FRAME AND A LOWER FRAME OF AN IMAGE FORMING APPARATUS

**Yukio Nishio, Tama, Japan, assignor to Fujitsu Ltd., Kawasaki, Japan**

**This application Mar. 5, 1990, Ser. No. 488,506**
**Claims priority, application Japan, Oct. 5, 1987, 62-250992**
**Int. Cl.[5] G03G *15/00***
**U.S. Cl. 355—245** **11 Claims**



1. An image forming apparatus for transcribing a toner image produced on the rotating surface of an image forming drum onto a recording medium, said image forming apparatus comprising:

a developing unit for visualizing the toner image on the image forming drum by developing an electrostatic image formed on the image forming drum, said developing unit being juxtaposed the image forming drum so as to produce a first gap between said developing unit and the image forming drum at a predetermined value when an upper and a lower frame are closed relative to each other;



said upper frame supporting the image forming drum and said developing unit;

said lower frame being pivotally connected to said upper frame so that said upper frame is openable, leaving said lower frame stationary, said lower frame including first connecting means for rotatably connecting said upper frame and said lower frame; and

link means pivotally coupled to both said upper and lower frames for moving said developing unit away from the image forming drum, when said upper frame is opened, the link means being expandable and contractible in accordance with movement of the upper frame so as to produce a second gap between said developing unit and the image forming drum, said second gap being sufficiently wide to permit the developing unit and the image forming drum to be dismounted from or mounted to said upper frame without contacting each other.

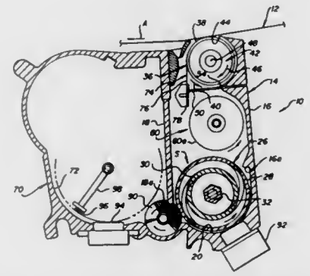
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5,045,886

## DEVICE FOR IMPROVING MIXING IN A MAGNETIC BRUSH DEVELOPMENT APPARATUS

**Richard A. Weitzel; Larry W. Speer, both of Hilton, and Susan P. Westbrook, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 1, 1989, Ser. No. 444,256**
**Int. Cl.[5] G03G *15/09***
**U.S. Cl. 355—253** **5 Claims**



1. In an improved development apparatus for applying developer material to a latent image on a moving image carrying member, said apparatus including a housing having a wall portion defining a sump adapted to contain a supply of developer material, applicator means located substantially within said housing in spaced relation to said sump portion for applying developer material to the latent image, feed means located within said housing between said sump portion and said applicator means for transporting developer material from said sump portion to said applicator means, and a ribbon blender located in said sump portion below said feed means, said ribbon blender being rotatable about its longitudinal axis for agitating developer material and transporting developer material to said feed means, the improvement comprising:

means, located in said housing adjacent to said sump portion, for directing flow of developer material away from the wall of said housing toward the longitudinal axis of said ribbon blender to enhance developer material mixing in said housing.

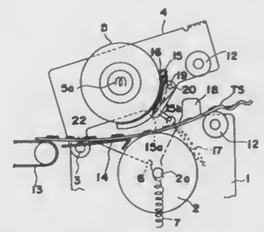
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5,045,887

## FIXING DEVICE WITH A SELECTIVELY MOVABLE COVER

**Yasuo Nakamura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 8, 1990, Ser. No. 564,435**
**Claims priority, application Japan, Aug. 9, 1989, 1-207479**
**Int. Cl.[5] G03G *15/20, 15/00***
**U.S. Cl. 355—282** **17 Claims**



13. An image forming apparatus comprising:

accommodating means having a first unit and a second unit pivotally movable in an upward direction with respect to said first unit;

fixing means accommodated within said accommodating means and including a first fixing roller and a second fixing roller which is supported so as to be capable of separating from said first fixing roller, a predetermined portion of said second fixing roller surface being exposed when the second unit is pivotally moved; and

cover means for covering the exposed portion of the second fixing roller surface in interlocking relation with the pivotal movement of the second unit.

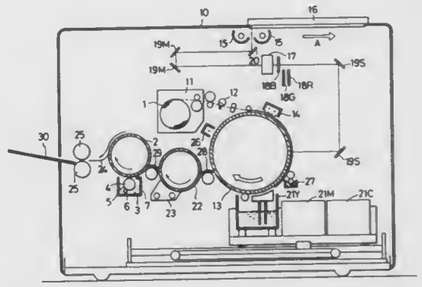
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5,045,888

## IMAGE FIXING DEVICE AND METHOD FOR FIXING IMAGE

**Mikio Imaeda, Bisai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed May 10, 1990, Ser. No. 521,359**
**Claims priority, application Japan, May 30, 1989, 1-136560; Jul. 5, 1989, 1-173744; Aug. 11, 1989, 1-208958**
**Int. Cl.[5] G03G *15/20***
**U.S. Cl. 355—282** **20 Claims**



1. An image fixing device for fixing an output image on an imaging surface of an image recording medium by providing a transparent protective resin layer over the imaging surface, the device comprising;

means for mounting the recording medium with the imaging surface facing outwardly;

means for accumulating a material of the resin layer;

means for supplying the material on the accumulating means

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toward the imaging surface, the supplying means being positioned in the accumulating means; and

means for applying the material onto the imaging surface, the applying means being positioned between the supplying means and mounting means;

wherein the material of the resin layer comprises resin particles.

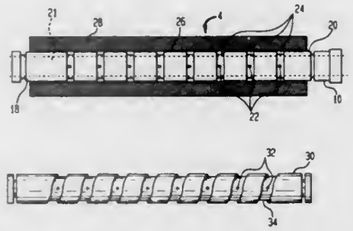
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**5,045,889**

## RELEASE LIQUID APPLYING WICK HAVING A GROOVED FEED TUBE

**Linn C. Hoover, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 20, 1990, Ser. No. 569,335**
**Int. Cl.[5] G03G *15/20***
**U.S. Cl. 355—284** **12 Claims**



1. For use in a rotatable release liquid applying device for applying release liquid to a fusing member, a wick comprising:

a feed tube having a plurality of distribution holes through which release liquid can flow under pressure,

groove means in the outer surface of said feed tube, said groove means extending around said tube with said distribution holes opening into said groove means,

a thin porous sheath around said tube, said sheath covering the grooves means while leaving an air space between each distribution hole and the sheath, and

wicking material wrapped around the outside of said sheath.

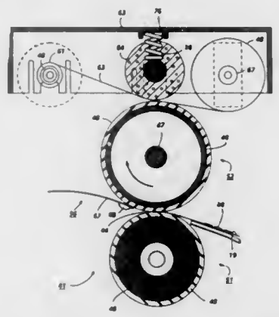
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**5,045,890**

## FUSER APPARATUS WITH RELEASE AGENT DELIVERY SYSTEM

**Frederick C. DeBolt, Penfield; Andrew C. LaRocca, Fairport, and Kenneth R. Rasch, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 7, 1989, Ser. No. 334,414**
**Int. Cl.[5] G03G *15/20, 21/00***
**U.S. Cl. 355—284** **11 Claims**



1. Fuser apparatus for heat fusing toner images to a print substrate comprising a fuser roll and a pressure roll forming a fusing nip therebetween, means to deliver liquid release agent to said fuser roll comprising a movable web having a first side and a second side supported between a web supply roll and a web take-up roll, a housing supporting said supply roll and take-up roll such that one of said supply and take-up rolls is on one side of the fuser roll and the other is on the other side of the fuser roll and the first side of the movable web is in contact with the fuser roll along a path parallel to its longitudinal axis, said movable web being impregnated with a liquid release agent, said movable web, supply roll and take-up roll being reversibly mounted in said housing to deliver liquid release agent to said fuser roll initially from said first side of said movable web, means to enable reversing the location of said supply roll and take-up roll in said support housing so that the second side of said impregnated web is in contact with said fuser roll to deliver release agent thereto, said movable web being urged into delivery engagement with said fuser roll by an open celled foam pinch roll impregnated with liquid release agent.

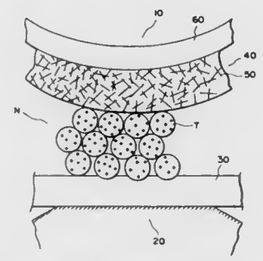
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**5,045,891**

## IMAGE FIXING DEVICE AND ROLLER THEREFOR HAVING A LOW RESISTANCE SURFACE LAYER

**Hisaaki Senba, Yokohama; Michio Sbigenobu, Tokyo; Toshiyuki Hatta, Itami, and Masaya Nishi, Osaka, all of Japan, assignors to Canon Kabushiki Kaisha & Sumitomo Electric Ind., Inc., Tokyo, Japan**

**Filed Feb. 3, 1988, Ser. No. 152,037**
**Claims priority, application Japan, Feb. 4, 1987, 62-025402**
**Int. Cl.[5] G03C *15/20***
**U.S. Cl. 355—289** **39 Claims**



7. A roller for fixing a toner image on a recording material, comprising:

a base member; and

a surface layer outside said base member, said surface layer containing low resistance fibers which are single-crystal fibers,

wherein said fibers are of carbon.

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**5,045,892**

## RECORDING PAPER TRANSPORT MECHANISM

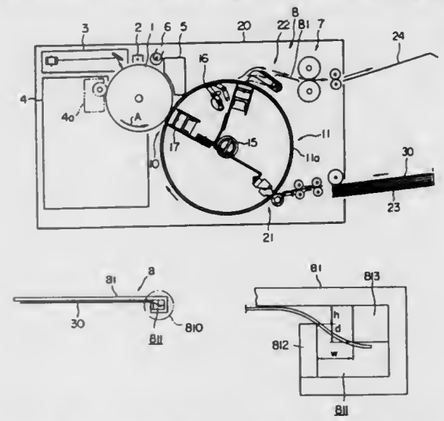
**Satoru Morisawa, and Masato Matsubara, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 30, 1988, Ser. No. 251,180**
**Claims priority, application Japan, Sep. 30, 1987, 62-149546[U]; Feb. 24, 1988, 63-23586[U]; Mar. 22, 1988, 63-37295[U]; Mar. 22, 1988, 63-37296[U]; Mar. 22, 1988, 63-37297[U]; Mar. 22, 1988, 63-37298[U]**
**Int. Cl.[5] G03G *15/00***
**U.S. Cl. 355—309** **6 Claims**

1. A recording paper transport mechanism in an imaging device employing an electrophotographic process, comprising guide members having upward and downward projections that interface with each other for restricting an up and down displacement of a side edge of a recording paper which is provided on at least one lateral side of a recording paper feed path



extending from a transfer unit to a fixing unit, said guide members being spaced from each other to allow said recording paper to pass through said space to restrict said up and down displacement of said lateral edge of said recording paper,



whereby said recording paper is held and guided in its feed direction, while a means for transporting said recording paper operates to transport said recording paper to said fixing unit by said transporting means.

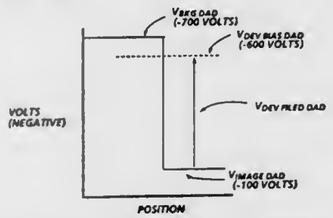
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**5,045,893**

## HIGHLIGHT PRINTING APPARATUS

**Charles H. Tabb, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jul. 2, 1990, Ser. No. 548,327**
**Int. Cl.[5] G03G *15/01***
**U.S. Cl. 355—328** **19 Claims**




1. The method of forming plural images, said method including the steps of:

uniformly charging a charge retentive belt;

discharging portions of said uniformly charged retentive belt to form relatively high and low voltage areas of the same polarity on said belt;

providing a high resolution development system;

providing an electrical bias for said development system such that a relatively large development field is provided between said developer structure forming a part of said development system and said relatively low voltage areas;

using said high resolution development system, developing said areas of relatively low voltage with first toner material contained in said developer structure;

discharging portions of said relatively high voltage areas of said charge retentive belt to form areas at a voltage level intermediate said relatively high and low voltage areas; and

developing the remaining areas of high voltage level with a second toner material which is distinct and of opposite polarity from said first toner material leaving said intermediate voltage background level undisturbed.

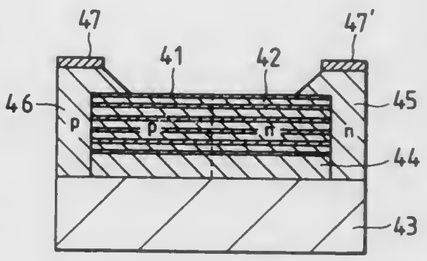
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**5,045,894**

## COMPOUND SEMICONDUCTOR LIGHT EMITTING DEVICE

**Masahito Migita, Hachioji; Akira Taike, Kokubunji, and Masatoshi Shiiki, Musashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 22, 1989, Ser. No. 369,822**
**Claims priority, application Japan, Jun. 29, 1988, 63-159413; Aug. 22, 1988, 63-206469**
**Int. Cl.[5] H01L *33/00***
**U.S. Cl. 357—17** **17 Claims**



1. A compound semiconductor light emitting device comprising at least:

strained-layer superlattices formed on a substrate, the strained-layer superlattices each being comprised of a plurality of first compound semiconductor layers and a plurality of second compound semiconductor layers, the strained-layer superlattices each being formed by alternately laminating one of the plurality of first compound semiconductor layers with one of the plurality of second compound semiconductor layers, each of the plurality of first compound semiconductor layers being comprised of a II–IV compound semiconductor epitaxial layer, and each of the plurality of second compound semiconductor layers being comprised of a compound semiconductor epitaxial layer selected from a group consisting of II–VI compound semiconductors epitaxial layers and III–V compound semiconductor epitaxial layers and having a different composition from that of said plurality of first compound semiconductor layers the plurality of second compound semiconductor layers each having a smaller lattice constant than that of the plurality of first compound semiconductor layers, a degree of lattice mismatch between each of the plurality of first compound semiconductor layers and adjacent ones of the plurality of second compound semiconductor layers being not more than 20%;

a first conductivity type impurity diffusion region formed in at least each of said plurality of first compound semiconductor layers of the strained-layer superlattice, extending into the strained-layer superlattice from a first end side surface of the first conductivity type impurity diffusion region;

a second conductivity type region having an opposite conductivity type to said first conductivity type and so formed as to be adjacent to said first conductivity type impurity diffusion region, said second conductivity type region having a second end side surface furthest from the first conductivity type impurity diffusion region; and

electrodes provided on the first and second end side surfaces respectively of said first conductivity type impurity diffusion region and said second conductivity type region.

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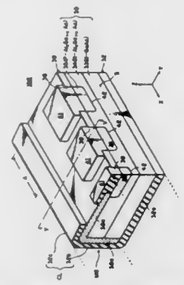


5,045,895

## LIGHT EMITTING DIODE ARRAY WITH ELECTRODES

Susumo Yoshida, Itami, and Takafumi Nishioka, Fukuyama, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1990, Ser. No. 513,878
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 7 Claims



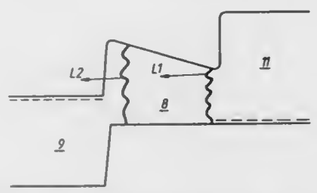
1. A light emitting diode array comprising:
(a) a semiconductor layer of a first conductivity type;
(b) semiconductor regions of a second conductivity type which are selectively formed in a top surface of said semiconductor layer and which form PN junctions with said semiconductor layer, said PN junctions being exposed at a first side surface of said semiconductor layer;
(c) a first electrode layer provided on a bottom surface of said semiconductor layer; (d) an electrode pattern which has second electrode layers provided on top surfaces of said semiconductor regions, respectively; and
(e) a multi-layer structure having an insulating layer and a conductivity layer and provided on at least a second side surface of said semiconductor layer so that said insulating layer is sandwiched between said semiconductor layer and said conductive layer, said conductive layer having a first portion connected to one of said first electrode layer and said electrode pattern and a second portion located on a surface on which the other of said first electrode layer and said electrode pattern is located, said first and second portions of said conductive layer being electrically connected to each other, wherein said second side surface is located on an opposite side of said first side surface.

5,045,896

## SOLID STATE LIGHT SOURCE FOR EMITTING LIGHT OVER A BROAD SPECTRAL BAND

Richard M. Ash, Northampton, and Andrew Carter, Northants, both of England, assignors to Siemens Plessey Controls Limited, Dorset, England

Filed Mar. 21, 1989, Ser. No. 326,555
Int. Cl.[5] H01L *33/00*
U.S. Cl. 357—17 5 Claims



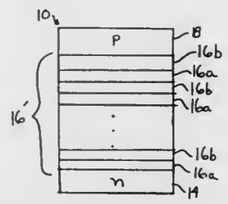
1. A broad band emitting semiconductor source of incoherent light, the source comprising a monolithic structure having an active semiconductor region located between cladding layers of a wide energy bandgap compound, said active region being formed of single crystal semiconductor materials selected from a group consisting of compounds of aluminum, arsenic, gallium, indium and phosphorus, and having a graded bandgap which varies through a thickness thereto, with the single crystal semiconductor materials having differing chemical composition and differeing center wavelengths of light emission, at least one of said materials having a direct energy bandgap, such that, in operation, a charge carrier recombination will occur at different places throughout the thickness of the active region thus causing a light emission at wavelengths which are spaced over a broad spectral range.

5,045,897

## QUATERNARY II-VI MATERIALS FOR PHOTONICS

William L. Ahlgren, Goleta, Calif., assignor to Santa Barbara Research Center, Calif.

Filed Mar. 14, 1990, Ser. No. 493,493
Int. Cl.[5] H01L *28/161, 29/205, 33/00, 27/14*
U.S. Cl. 357—17 16 Claims



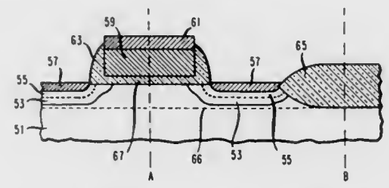
1. A photonic device including a region comprised of a quaternary Group II-VI alloy containing Hg as one atomic constituent and a substrate supporting the region, the substrate having a characteristic lattice constant, and wherein the quaternary Group II-VI alloy has a composition selected for substantially lattice matching the region to the substrate and also for providing the region with an energy bandgap associated with a wavelength of interest.

5,045,898

## CMOS INTEGRATED CIRCUIT HAVING IMPROVED ISOLATION

Min-Liang Chen, Lower Macungie Township, Lehigh County; William T. Cochran, Lynn Township, Lehigh County, and Chung W. Leung, South Whitehall Township, Lehigh County, all of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 30, 1988, Ser. No. 238,362
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.11 5 Claims



1. a CMOS integrated circuit having p-channel field effect transistors formed in a n-type region, and n-channel field effect transistors formed in a p-type region, wherein a field oxide isolation region overlies a portion of said p-type region adjacent to a source-drain region of a n-channel field effect transistor, and wherein a gate electrode overlies a channel region located between source-drain of said transistor,
characterized in that said p-type region of said integrated circuit comprises a p-type impurity threshold adjust implant region extending across said channel region, and still further comprises a p-type impurity channel stop implant region extending under said channel region and said field oxide isolation region throughout said portion of said p-type region that is overlaid by said field oxide isolation region, whereby the concentration of said p-type impurity threshold adjust implant region is at a first maxima at the surface of said p-type region, and the concentration of said p-type impurity channel stop implant region is at a second maxima immediately below said field oxide isolation region overlying said p-type region.

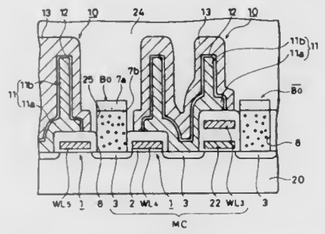


5,045,899

## DYNAMIC RANDOM ACCESS MEMORY HAVING STACKED CAPACITOR STRUCTURE

Kazutami Arimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1990, Ser. No. 524,769
Claims priority, application Japan, Dec. 1, 1989, 1-313744
Int. Cl.[5] H01L *29/68, 27/10, 27/02, 29/06*
U.S. Cl. 357—23.6 25 Claims



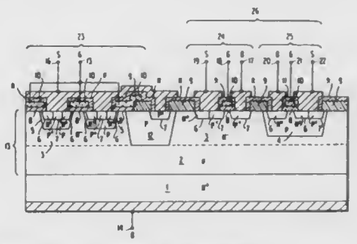
1. A DRAM structure comprising:
a first conductivity-type semiconductor substrate having a main surface;
a plurality of word lines extending in parallel direction on said main surface;
a plurality of bit lines extending in a direction orthogonally crossing said word lines; and
a plurality of memory cells arranged in a direction diagonal to said word lines and said bit lines,
each of said memory cells comprising:
a switching device comprising one pair of second conductivity-type impurity regions formed in said semiconductor substrate in a direction diagonally intersecting a word line, and a gate electrode layer formed of a part of the intersecting word line, a first one of said impurity regions being in contact with a portion of a respective bit line at a contact area on the main surface of the substrate; and
a capacitor arranged between adjacent bit lines and having a portion positioned at least as high above said main surface as the height of said bit lines;
said capacitor comprising:
a first electrode layer connected to a second one of said impurity regions of said switching device;
a dielectric layer covering the surface of said first electrode layer; and
a second electrode layer covering the surface of said dielectric layer and extending higher above the substrate surface than a respective bit line and in non-overlapping relation therewith above said contact area.

5,045,900

## SEMICONDUCTOR DEVICE HAVING A VERTICAL POWER MOSFET FABRICATED IN AN ISOLATED FORM ON A SEMICONDUCTOR SUBSTRATE

Akio Tamagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 263,215, Oct. 27, 1988, abandoned.
This application Jan. 22, 1991, Ser. No. 643,105
Claims priority, application Japan, Oct. 27, 1987, 62-272223
Int. Cl.[5] H01L *29/10*
U.S. Cl. 357—23.4 11 Claims



1. A semiconductor device comprising:
a semiconductor substrate having a high concentration layer of one conductivity type and a low concentration layer formed on said high concentration layer;
a first electrode formed on an upper surface of said low concentration layer;
a second electrode formed on a bottom surface of said high concentration layer;
a vertical MOSFET formed in said semiconductor substrate for switching a current flowing between said first electrode and said second electrode said vertical MOSFET having a source and a base, and said source and said base being electrically connected to said first electrode;
at least one circuit element formed in said low concentration layer within a first depth; and
a diffused region of the other conductivity type formed in said low concentration layer between said vertical MOSFET and said circuit element with a second depth deeper than said first depth, said diffused region being electrically connected to said first electrode.

5,045,901

## DOUBLE DIFFUSION METAL-OXIDE-SEMICONDUCTOR DEVICE HAVING SHALLOW SOURCE AND DRAIN DIFFUSED REGIONS

Shigeki Komori, and Katsuhiro Tsukamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 410,203, Sep. 21, 1989, Pat. No. 4,978,629.
This application Sep. 5, 1990, Ser. No. 577,711
Claims priority, application Japan, Oct. 3, 1988, 63-249347
Int. Cl.[5] H01L *29/10, 29/78, 27/02, 29/04*
U.S. Cl. 357—23.4 5 Claims

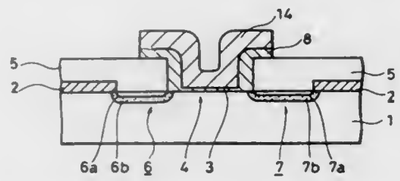
1. A metal-oxide-semiconductor transistor device, comprising:
a semiconductor substrate of a first conductivity type and having a major surface;
source and drain impurity regions of a second conductivity type formed in said semiconductor substrate;
source and drain electrodes made of polysilicon formed on said major surface of said substrate and contacting said source and drain impurity regions;
a gate electrode having a first portion separated by a first insulating layer having a first thickness from the major surface of said semiconductor substrate and a second portion separated from said source and drain electrodes by a second insulating layer having a second thickness greater than said first thickness, said second insulating

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layer extending over said source and drain electrodes, said first and second insulating layers being contiguous to each other,

each of said source and drain impurity regions being formed of a first portion having a first impurity concentration and




located in said semiconductor substrate substantially only under said source and drain electrode and a second portion adjacent to the gate electrode and having a second impurity concentration lower than said first impurity concentration.

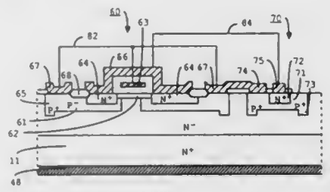
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**5,045,902**

## VDMOS/LOGIC INTEGRATED CIRCUIT COMPRISING A VERTICAL DEPLETED MOS TRANSISTOR AND A ZENER DIODE AND A METHOD OF MAKING SAME

**Bernard Bancal, Aix En Provence, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France**

**Filed Jul. 16, 1990, Ser. No. 552,627**
**Claims priority, application France, Jul. 17, 1989, 89 09911**
**Int. Cl.[5] H01L** *29/78, 21/265*
**U.S. Cl. 357—23.4** **25 Claims**




1. In combination, a semiconductor substrate having front and back faces,

a metallization layer on the back face connected to a bias voltage,

lateral logic transistors having all electrodes thereof on the front face,

a VDMOS power transistor having source and gate electrodes on the front face and a drain electrode formed by the metallization layer on the back face,

and means for coupling the bias voltage from the metallization layer on the back face through the substrate to a metal region on the front face independently of the operation of the VDMOS power transistor without affecting the operation of the lateral logic transistors and the VDMOS power transistor,

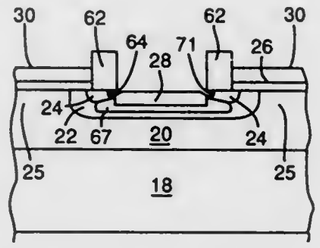
the means for coupling including another VDMOS transistor having source and gate electrodes son the front face, the metallization on the back face forming a drain electrode of the another VDMOS transistor, the metal region including the source electrode of the another VDMOS transistor, and means for biasing the gate electrode of the another VDMOS transistor to cause a low impedance to subsist between the source and drain electrodes of the another VDMOS transistor.

**5,045,903**

## TOPOGRAPHIC PATTERN DELINEATED POWER MOSFET WITH PROFILE TAILORED RECESSED SOURCE

**Theodore O. Meyer; John W. Mosier, II; Douglas A. Pike, Jr., all of Bend; Theodore G. Hollinger, Redmond, and Dah W. Tsang, Bend, all of Oreg., assignors to Advanced Power Technology, Inc., Bend, Oreg.**

**Division of Ser. No. 194,874, May 17, 1988, Pat. No. 4,895,810.**
**This application Nov. 16, 1989, Ser. No. 439,101**
**Int. Cl.[5] H01L** *29/10, 29/78, 29/68, 29/06*
**U.S. Cl. 357—23.4** **16 Claims**




1. A self-aligned vertical double-diffused insulated gate transistor, comprising:

a silicon substrate with doping of a first dopant type and having an upper surface,

an oxide layer on he upper surface of the substrate,

an opening in the oxide layer having a defined outline characteristic,

a trench having sidewalls and a base formed in the substrate within the opening,

double-diffused dopant means of opposite second and first dopant types disposed within the substrate defining first and second P-N junctions spaced laterally apart under the oxide layer and contoured in accordance with the defined outline characteristic, the P-N junctions being arranged to define a field effect transistor including a source region of the first dopant type, the source region being formed in he substrate along the trench sidewalls subjeacent the defined outline characteristic and bounded by the first P-N junction, a drain of the first dopant type bounded by the second P-N junction and spaced laterally from the defined outline characteristic and extending downward into the substrate, and a region of the second dopant type defining a conduction channel extending between the first and second P-N junctions along the oxide layer at the upper surface of the substrate operable upon inversion to conduct current between the source and drain, and

a gate conductive layer on the oxide layer insulated from the conduction channel and a source conductive layer on the upper surface of the substrate within said opening, the source conductive layer being deposited in the trench and thereby spaced below the gate conductive layer so that the conductive layers are electrically separate,

the dopant means being introduced to the substrate via the upper surface thereof prior to forming the trench so that the substrate silicon underlying the source conductive layer is substantially defect free.

and the region of the second dopant type including a first portion alongside the source region having a first doping concentration and a second portion contained within the first portion and extending laterally beneath the source region and the source conductive layer and having a second doping concentration greater than the first doping concentration for withstanding reverse-bias avalanche current flow.

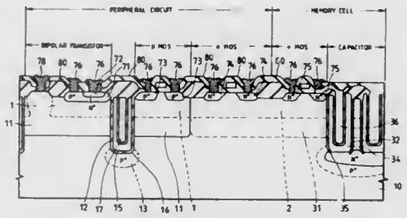


**5,045,904**

## SEMICONDUCTOR DEVICE INCLUDING AN IMPROVED TRENCH ARRANGEMENT

**Yutaka Kobayashi, 2773-6, Mawatari, Katsuta-shi, Ibaraki-ken; Akihiro Tanba, 6-20-3, Ayukawa-cho, Hitachi-shi, Ibaraki-ken; Ryoichi Hori, 2196-125, Hirai, Hinode-cho, Nishitama-gun, Tokyo; Kyoichiro Asayama, 1-3-17, Wakaba-cho, Tachikawa-shi, Tokyo; Seigoh Yukutake, 3-10-12, Suehiro-cho, Hitachi-shi, Ibarakiken; Hiroyuki Miyazawa, 1–436, Ogawacho, Kodaira-shi, Tokyo; Kazumasa Yanagisawa, 1-41-5, Hikari-cho, Kokubunji-shi, Tokyo, and Goro Kitsukawa, 2196-468, Hirai, Hinode-cho, Nishitama-gun, Tokyo, all of Japan**

**Filed Dec. 20, 1988, Ser. No. 286,870**
**Claims priority, application Japan, Dec. 21, 1987, 62-321376**
**Int. Cl.[5] H01L** *29/68*
**U.S. Cl. 357—23.6** **7 Claims**




1. A semiconductor device with trenches comprising:

a substrate of a first conductivity type on which at least a bipolar transistor and a memory cell having a MOSFET and a capacitor are formed,

wherein the substrate includes an isolation trench for isolating the bipolar transistor from other semiconductor elements, and a capacitor trench for providing the capacitor for the memory cell,

wherein said isolation trench has a multiple-layer structure in which insulating layers and resilient conductive layers are alternately formed,

wherein an interior of the isolation trench is kept in a floating state with respect to a semiconductor region surrounding the isolation trench by an insulating film formed over an inside surface of the isolation trench, and

wherein the capacitor trench includes at least one pair of conductive layers which are isolated from each other, one conductive layer being coupled to the MOSFET at a surface of the substrate, and the other conductive layer being electrically coupled to a fixed potential at a bottom of the capacitor trench.

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**5,045,905**

## AMORPHOUS SILICON THIN FILM TRANSISTOR

**Noboru Motai; Yoshihisa Ogiwara, both of Tochigi, and Yasunari Kanda, Tokyo, all of Japan, assignors to Nippon Precision Circuits Ltd. and Seikosha Co., Ltd., both of Tokyo, Japan**

**Continuation of Ser. No. 422,475, Oct. 17, 1989, abandoned, which is a division of Ser. No. 322,842, Mar. 13, 1989, Pat. No. 4,916,090. This application Dec. 12, 1990, Ser. No. 626,375**
**Claims priority, application Japan, Mar. 23, 1988, 63-68697**
**Int. Cl.[5] H01L** *29/78*
**U.S. Cl. 357—23.7** **7 Claims**

1. An amorphous silicon thin film transistor comprising:

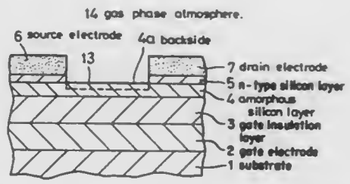
a gate electrode on an insulating substrate,

a gate insulating layer on said gate electrode and on said insulating substrate,

an amorphous silicon layer on said gate insulating layer,

first and second spaced apart n-type silicon layers formed directly on said amorphous silicon layer, said n-type silicon layers forming a source and a drain of said transistor,

each of said n-type silicon layers having an edge that faces the other n-type silicon layer, and




an impurity layer for reducing an off current of said transistor, said impurity layer including a p-type impurity and being formed directly on said amorphous silicon layer only in a region thereof between said edges.

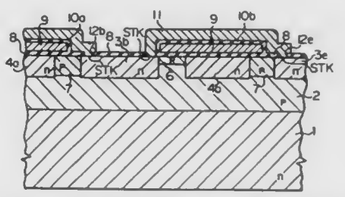
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**5,045,906**

## SOLID STATE IMAGE PICKUP DEVICE HAVING PHOTO-SHIELD PLATE IN CONTACT WITH PHOTO-ELECTRIC CONVERTING REGION VIA SCHOTTKY BARRIER

**Kazuhisa Nagaya, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jul. 30, 1990, Ser. No. 559,035**
**Claims priority, application Japan, Jul. 28, 1989, 1-196075**
**Int. Cl.[5] G11C** *19/28;* **H01L** *29/78*
**U.S. Cl. 357—24** **13 Claims**




1. A solid state image pickup device fabricated on a semiconductor substrate of a first conductivity type, comprising:

a) a well having a second conductivity type opposite to said first conductivity type and formed in a surface portion of said semiconductor substrate;

b) a plurality of photo-electric converting regions of said first conductivity type arranged in rows and columns and converting parts of an optical radiation into electric charges, respectively;

c) a plurality of charge transferring regions of said first conductivity type associated with the columns of said photo-electric converting regions, respectively, and conveying said electric charges, each of said charge transferring regions being spaced apart from the associated column of said photo-electric converting regions by a channel forming region;

d) charge transferring means provided over said charge transferring regions and allowing said charge transferring regions to convey said electric charges; and

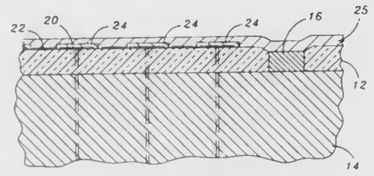
e) a metallic photo-shield plate preventing said charge transferring regions each being contiguous to said channel forming region from said optical radiation and exposing said photo-electric converting regions to the parts of said optical radiation, in which said metallic photo-shield plate is in contact with said photo-electric converting regions for forming Schottky barriers therebetween and in which excess electric charges overflow beyond said Schottky barrier into said metallic photo-shield plate.

5,045,907

## GRAPHOTAXIALLY FORMED PHOTOSENSITIVE DETECTOR ARRAY

Allen L. Solomon, Fullerton, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 419,211, Oct. 10, 1989, Pat. No. 4,988,641.
This application Oct. 9, 1990, Ser. No. 594,713
Int. Cl.[5] H01L 27/14
U.S. Cl. 357—30 4 Claims



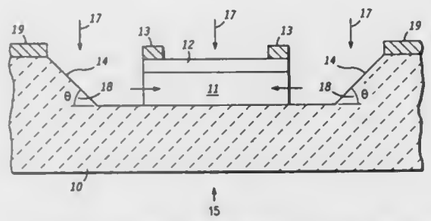
1. A detector-side illuminated photosensitive detector array having a plurality of detector elements comprising:
(a) a substrate having first and second surfaces;
(b) a glass layer formed upon the first surface of said substrate;
(c) a plurality of electrodes formed upon the glass layer, the number of electrodes corresponding to the number of detector elements;
(d) a conductive grid formed upon said glass layer, said conductive grid forming a common electrode for said plurality of detector elements;
(e) a seed crystal disposed within said glass layer by liquefying the glass layer so as to cause the seed crystal to sink into and be sealed to the glass layer, the seed crystal abutting the first surface of said substrate;
(f) a graphataxially grown single crystalline layer extending from said seed crystal across said glass layer; and
(g) a plurality of P-N junctions disposed within said single crystalline layer above said plurality of electrodes such that said P-N junctions, said plurality of electrodes, and said grid define a photosensitive detector array;
(h) wherein detector-side illumination is facilitated by the formation of said plurality of P-N junctions above said plurality of electrodes.

5,045,908

## VERTICALLY AND LATERALLY ILLUMINATED P-I-N PHOTODIODE

Michael S. Lebby, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1990, Ser. No. 587,840
Int. Cl.[5] H01L 27/14
U.S. Cl. 357—30 11 Claims



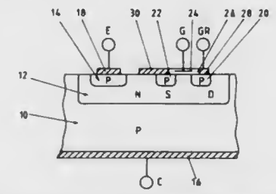
I. A method for improving efficiency of p-i-n photodiode device comprising:
providing a reflector on the photodiode device to direct incident light into a receptor area so reflected light travels into and in a parallel direction to the receptor area and along the length of the receptor area of the photodiode device.

5,045,909

## POWER SWITCHING SEMICONDUCTOR DEVICE

John Z. Lucek, and Roger H. Moult, both of Birmingham, England, assignors to Lucas Industries public limited company, Birmingham, England

Filed Jun. 21, 1990, Ser. No. 541,899
Claims priority, application United Kingdom, Jun. 24, 1989, 8914554
Int. Cl.[5] H01L 29/72, 29/10, 29/747, 27/02
U.S. Cl. 357—34 12 Claims



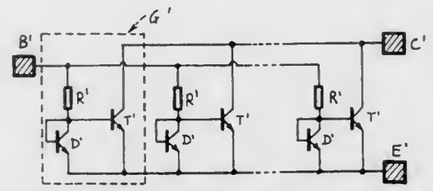
1. A semiconductor power switching device for switching power from a supply rail to a load, said drive comprising:
a body of semiconductor material having a surface and a collector region of a first conductivity type;
an emitter region of the first conductivity type on said body;
a base region of a second conductivity type disposed on said body between the emitter and collector regions, said base region having a portion extending to said surface;
a first terminal connected to the collector region;
a second terminal connected to the emitter region;
means defining two further regions in said base region;
an insulated gate, overlying said portion of the base region, for establishing charge carrier flow between said two further regions;
a gate terminal connected to the insulated gate;
a fourth terminal connected to one of said further regions; and
a conductive path connecting the other of said further regions to said base region.

5,045,910

## INTEGRATED POWER TRANSISTOR COMPRISING MEANS FOR REDUCING THERMAL STRESSES

Flavio Villa, Milan, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Jul. 17, 1989, Ser. No. 381,340
Claims priority, application Italy, Jul. 29, 1988, 21598 A/88
Int. Cl.[5] H01L 29/72
U.S. Cl. 357—35 9 Claims



I. An integrated power transistor comprising:
a plurality of transistor means having emitter regions which are mutually connected and define a common emitter terminal, collector regions which are mutually short-circuited and define a common collector terminal, and base regions which are mutually connected and define a common base terminal,
a plurality of diode means including a diode means associated to each said transistor means, each said diode means being connected between the base and emitter regions of a respective transistor means of said plurality of transistor means and forming therewith a current mirror circuit, and
a plurality of resistors, each of said resistors being interposed between the base region of a respective transistor means and said common base terminal.

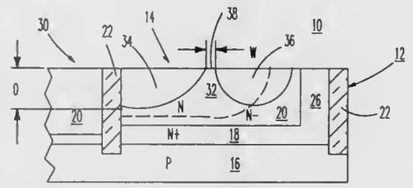


5,045,911

## LATERAL PNP TRANSISTOR AND METHOD FOR FORMING SAME

Peter A. Habitz, Wappingers Falls; Chang-Ming Hsieh, Fishkill, and Yi-Shiou Huang, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 317,877, Mar. 2, 1989, Pat. No. 4,996,164.
This application Oct. 30, 1990, Ser. No. 608,609
Int. Cl.[5] H01L 29/72
U.S. Cl. 357—35 10 Claims



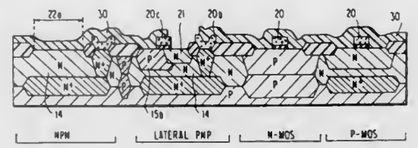
1. A lateral PNP transistor, comprising:
a body of semiconductor material including an electrically isolated N— device region;
an N implant region formed in said device region;
an emitter region of opposite conductivity type to said device region formed in the surface of said N implant region; and
a collector region of same conductivity type as said emitter region formed in the surface of said device region at least partially within said N implant region;
said emitter and collector regions spaced to define a base region therebetween in said N implant region;
said N implant region having a relatively higher dopant concentration proximate the bottom of said emitter region and a relatively lower dopant concentration proximate the surface of said base region.

5,045,912

## BI-CMOS INTEGRATED CIRCUIT DEVICE HAVING A HIGH SPEED LATERAL BIPOLAR TRANSISTOR

Masaru Ohki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 23, 1990, Ser. No. 513,463
Claims priority, application Japan, Apr. 21, 1989, 1-102427
Int. Cl.[5] H01L 27/02, 29/72
U.S. Cl. 357—43 8 Claims



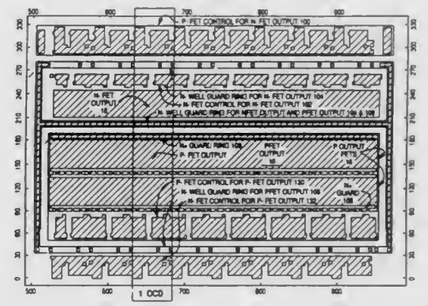
1. An integrated circuit having a PNP transistor formed on a semiconductor substrate, an NPN transistor formed on said semiconductor substrate, an N-channel field effect transistor formed on said semiconductor substrate and a P-channel field effect transistor formed on said semiconductor substrate, said PNP transistor comprising:
a N-type base region including first and second portions, said first portion being formed on said semiconductor substrate and said second portion being selectively formed in said first portion with an impurity concentration higher than the impurity concentration of said first portion;
a P-type collector region selectively formed in said first portion of said base region with an impurity concentration higher than the impurity concentration of said first portion and smaller than the impurity concentration of said second portion, said collector region having a side surface portion that is in contact with a side surface portion of said second portion of said base region to form a PN junction therebetween; and
a P-type emitter region selectively formed in said second portion of said base region with an impurity concentration higher than the impurity concentration of said second portion, said emitter region having a side surface portion forming a PN junction with said second portion along with said side surface portion of said second portion; wherein a part of said second portion of said base region sandwiched between said side surface portion of said emitter region and said side surface portion of said collector region forms an active base region through which a current substantially flows between emitter and collection regions.

5,045,913

## BIT STACK COMPATIBLE INPUT/OUTPUT CIRCUITS

Robert P. Masleid, Austin, and Parsotam T. Patel, Round Rock, both of Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 471,892, Jan. 29, 1990, Pat. No. 4,988,636.
This application Oct. 4, 1990, Ser. No. 592,764
Int. Cl.[5] H01L 27/02, 27/10, 29/34
U.S. Cl. 357—52 12 Claims



7. A group of input/output circuits on an integrated circuit semiconductor substrate containing other circuits, said input-/output circuits comprising;
a plurality of columns of circuit components, each column representing input/output circuit components for processing a single data bit in a group of bits;
a plurality of rows positioned across said columns, each row containing like devices among said input/output circuits; and
at least one guard ring containing at least one of said plurality of rows.

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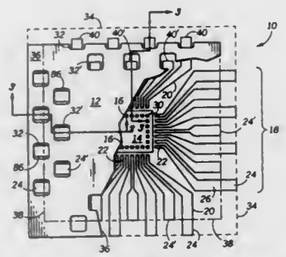


**5,045,914**

## PLASTIC PAD ARRAY ELECTRONIC DEVICE

James J. Casto; Michael B. McShane, and Paul T. Lin, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 456,996, Dec. 26, 1989, abandoned.
This application Mar. 1, 1991, Ser. No. 663,225
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—70 17 Claims



1. A method for making a pad array electronic device for mounting on a substrate comprising the steps of:
placing an electronic component having a plurality of bonding pads thereon inside a lead frame, where the lead frame has a plurality of leads, each lead having a proximal end and a distal end, the proximal end being closer to the electronic component than the distal end;
electrically connecting the bonding pads on the electronic component to the proximal ends of the leads;
providing a molded package body having a periphery which completely encapsulates the electronic component, the proximal and distal ends of the plurality of leads, and the electronic connections, where the package body has an array of holes therethrough, each hole exposing a portion of one of each of the plurality of leads and where all of the plurality of leads are contained within the periphery of the package body; and
providing a flowable coupling material disposed within each of the holes through the package body which is electrically coupled to the exposed portions of the leads therein.

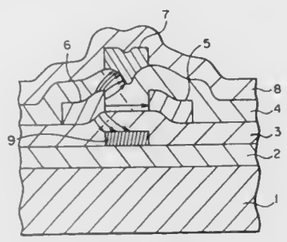
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**5,045,915**

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kiyonobu Hinooka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1989, Ser. No. 439,856
Claims priority, application Japan, Nov. 21, 1988, 63-295009
Int. Cl.[5] H01L *23/48, 29/46, 29/54, 29/62*
U.S. Cl. 357—71 1 Claim



1. A semiconductor integrated circuit device comprising a semiconductor wafer substrate, a first insulating film formed on said semiconductor wafer substrate, two wirings formed proximately and in parallel with each other on said first insulating film, a second insulating film formed over said two wirings, a first constant voltage wiring for constant voltage and formed on said second insulating film, said first constant voltage wiring being formed of aluminum material and being positioned above said two wirings and extending over a space therebetween, and a second constant voltage wiring for constant voltage and formed in said first insulating film, said second constant voltage wiring being formed of polycrystal silicon and being positioned below said two wirings and extending under a space therebetween.

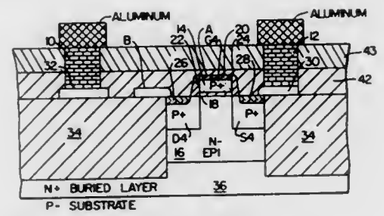
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**5,045,916**

## EXTENDED SILICIDE AND EXTERNAL CONTACT TECHNOLOGY

Madhukar B. Vor, Los Gatos; Gregory N. Burton, Burlingame, and Ashok K. Kapoor, Palo Alto, all of, assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Continuation of Ser. No. 817,231, Jan. 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 693,062, Jan. 22, 1985, abandoned. This application Jul. 19, 1989, Ser. No. 383,245
Int. Cl.[5] H01L *23/48, 27/02, 29/78, 21/44*
U.S. Cl. 357—71 12 Claims




1. A field effect transistor comprising:
a semiconductor substrate having a surface;
an insulating region extending into the substrate from the surface to surround a first region of the substrate;
a gate electrode disposed above the substrate to divide the first region of the substrate into a source, a drain, and a channel; and
an electrically separate source electrode and a drain electrode in electrical contact with the source and drain, respectively, and extending into the insulating region, each of the source and drain electrodes consisting of a layer of metal silicide where in contact with the substrate and a metal where in contact with the insulating region, the metal and the metal silicide being a contiguous layer.

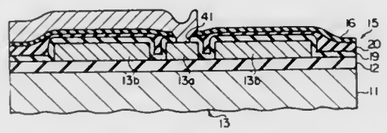
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**5,045,917**

## MULTI-LEVEL SEMICONDUCTOR STRUCTURE AND PROCESS OF FABRICATING THEREOF

Kazuyuki Mizushima, Tokyo, Japan, assignor to NEC Corporation, Japan

Division of Ser. No. 454,709, Dec. 21, 1989, Pat. No. 4,970,177.
This application Oct. 9, 1990, Ser. No. 594,645
Claims priority, application Japan, Dec. 25, 1988, 63-326504
Int. Cl.[5] H01L *23/48, 29/34*
U.S. Cl. 357—71 8 Claims



1. A multi-level semiconductor structure forming a part of a semiconductor device, comprising:
a) a lower insulating film;
b) a plurality of lower wiring strips including a narrow wiring strip and a wide wiring strip and formed on said lower insulating film;
c) an inter-level insulating film structure covering said narrow wiring strip and said wide wiring strip;
d) an upper level insulating film covering said inter-level insulating film structure, contact holes being formed through said upper level insulating film and said inter-level insulating film structure for exposing said narrow wiring strip and said wide wiring strip, respectively; and
e) upper metal wiring strips respectively projecting through said contact holes and reaching a contact area of said narrow wiring strip and a contact area of said wide wiring strip, respectively, in which a plurality of moats are formed in said wide wiring strip for surrounding the contact area of said wide wiring strip.



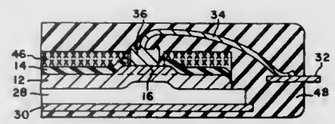
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**5,045,918**

## SEMICONDUCTOR DEVICE WITH REDUCED PACKAGING STRESS

Myron R. Cagan; Douglas F. Ridley, and Daniel J. Belton, all of San Jose, Calif., assignors to North American Philips Corp., New York, N.Y.

Continuation of Ser. No. 944,268, Dec. 19, 1986, abandoned.
This application Apr. 4, 1990, Ser. No. 504,710
Int. Cl.[5] H01L *23/28, 29/34*
U.S. Cl. 357—72 24 Claims



1. A semiconductor device in which an electrically insulating layer lies on an electrical interconnection system contacting a semiconductive body, openings extend through the insulating layer down to bond pads of the interconnection system, each pad is in contact with abonding portion of a different one of a set of electrical conductors that lead through the openings away from the interconnection system, and an electrically insulating coating covers the body, the interconnection system, the insulating layer, and the bonding portions such that a part of each conductor protrudes through the coating, characterized by a further layer that lies on the insulating layer under the coating but does not extend over the bonding portions, the further layer consisting substantially of a specified electrically insulating material that has a glass transition temperature $T_G$ below of 25° C. or less.

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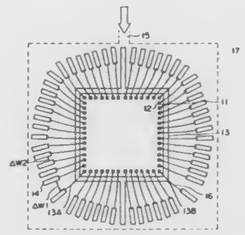
**5,045,919**

## PLASTIC PACKAGED SEMICONDUCTOR DEVICE HAVING BONDING WIRES WHICH ARE PREVENTED FROM COMING INTO CONTACT WITH EACH OTHER IN PLASTIC SEALING STEP

Tetsuya Nagaoka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 10, 1990, Ser. No. 579,664
Claims priority, application Japan, Sep. 12, 1989, 1-236408
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—72 5 Claims

1. A plastic packaged semiconductor device comprising:
a gel plastic injection port;
a pellet having semiconductor elements and bonding pads for leading out electrodes of the semiconductor elements to the exterior;
a bed on which said pellet is mounted, including two corners remote from said gel plastic injection port;
inner lead portions arranged on a portion surrounding said bed and radially extending away from said bed, a distance between those of said inner lead portions in position corresponding to the two corners remote from said gel plastic injection port being set larger than a distance between those of said inner lead portions disposed in other positions;



bonding wires for electrically connecting said bonding pads to said inner lead portions; and
a plastic package for sealing said pellet, bed, inner lead portions and bonding wires.

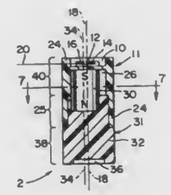
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**5,045,920**

## DUAL-HALL FERROUS-ARTICLE-PROXIMITY SENSOR

Ravi Vig, Concord, N.H.; Daniel P. Demingware, Ft. Wayne, Ind., and Aung T. Tu, Concord, N.H., assignors to Allegro Microsystems, Inc., Worcester, Mass.

Filed Jun. 28, 1990, Ser. No. 545,168
Int. Cl.[5] H01L *27/22, 23/04*
U.S. Cl. 357—74 5 Claims



1. A proximity sensor assembly of a magnet and a dual Hall integrated-circuit chip comprising:
a) an integrated-circuit chip including two spaced apart Hall elements formed in one face of said chip, said chip having an axis orthogonal to said one face and equidistant from said two Hall elements, and a differential Hall voltage circuit means connected series opposing to the two outputs of said two Hall elements, respectively, for providing an output signal with one parameter that is a function of he differential voltage between said Hall element outputs;
b) a first housing having a cylindrical hole, said dual Hall chip fixedly mounted at one end of said hole with said chip axis coincident with the axis of said cylindrical hole;
c) a magnet;
d) a second housing having a cylindrical portion enclosing and holding said magnet with the north-south axis of said magnet parallel to but spaced away from the axis of said cylindrical housing;
said cylindrical portion of said second housing having been snugly fitted into and rotated in said hole of said first housing until the circuit means output signal parameter equals a predetermined target value,
said second housing being fixedly fastened to said first housing.

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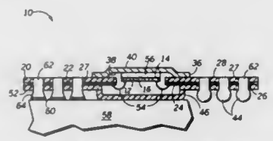


5,045,921

## PAD ARRAY CARRIER IC DEVICE USING FLEXIBLE TAPE

Paul T. Lin, and Howard P. Wilson, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1989, Ser. No. 457,002
Int. Cl.[5] H01L *23/34, 23/12, 23/14*
U.S. Cl. 357—74 6 Claims



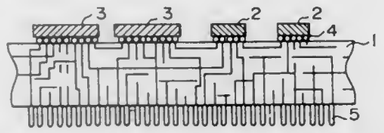
1. An electronic pad array carrier IC device for mounting on a printed circuit board (PCB) or flex circuit substrate comprising:
an integrated circuit die having a plurality of bonding pads thereon;
a thin, flexible tape substrate having a thickness less than about 0.5 mm and having
a plurality of traces thereon wherein each trace is visible through the substrate and, where each trace has an inner bonding area and an outer bonding area, where the outer bonding areas each additionally comprise a via through the thin, flexible tape substrate; and
a cavity for receiving the integrated circuit die;
a die support structure bonded to the back side of the thin, flexible tape substrate, the die support structure having
a front surface holding the integrated circuit die in the cavity; and
a back surface opposite the front surface;
electrical connections between the bonding pads of the integrated circuit die and the inner bonding areas of the thin, flexible tape substrate;
solder balls on the outer bonding areas; and
a package body covering the integrated circuit die, the electrical connections and the inner bonding areas and attached to a portion of the tape substrate adjacent to the cavity, wherein the package body has a height to standoff the tape substrate from the PCB a predetermined distance and provides support for the tape substrate.

5,045,922

## INSTALLATION STRUCTURE OF INTEGRATED CIRCUIT DEVICES

Hironori Kodama; Satoru Ogihara; Hideo Arakawa, all of Hitachi; Hirokazu Inoue, Ibaraki; Yoshiyuki Yasutomi, Katsuta, and Tadahiko Miyoshi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1990, Ser. No. 583,144
Claims priority, application Japan, Sep. 20, 1989, 1-242036
Int. Cl.[5] H01L *23/12, 23/14*
U.S. Cl. 357—75 9 Claims



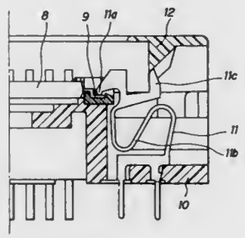
1. An installation structure of integrated circuit devices comprising a plurality of integrated circuit devices of different base materials installed in parallel onto a substrate formed with wirings,
wherein thermal conductivities of the different base materials are mutually different and a wiring density of the integrated circuit device made of the base material having a larger thermal conductivity is higher than a wiring density of the integrated circuit device made of the base material having a smaller conductivity.

5,045,923

## CONTACT STRUCTURE IN SOCKET WITH IC CARRIER PLACED THEREON

Noriyuki Matsuoka, Tokyo, Japan, assignor to Yamaichi Electric MFG. Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,135
Claims priority, application Japan, Mar. 30, 1989, 1-79093
Int. Cl.[5] H01L *23/42, 23/44, 23/46, 39/02*
U.S. Cl. 357—79 16 Claims



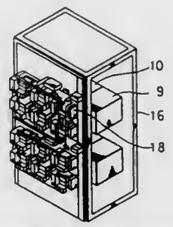
1. An apparatus comprising:
an IC package having a plurality of contact pieces extending outwardly therefrom;
an IC carrier frame having an accommodating portion defined therein for accommodating said IC package and having an upper surface with means thereon for receiving said plurality of contact pieces of said IC package when said IC package is accommodated in said IC package accommodating portion; and
an IC socket having an IC carrier frame accommodating portion for accommodating said IC carrier frame, and contact means for electrically contacting said contact pieces of said IC package when said IC package is accommodated in said IC package accommodating portion of said IC carrier frame and said IC carrier frame is accommodated in said IC carrier frame accommodating portion of said IC socket.

5,045,924

## MOUNTING STRUCTURE OF SEMICONDUCTOR CONVERTER

Hiroo Ikegame, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 161,045, Feb. 26, 1988, abandoned.
This application Mar. 8, 1990, Ser. No. 492,402
Int. Cl.[5] H01L *23/02, 23/12*
U.S. Cl. 357—81 4 Claims



1. A mounting structure of a semiconductor converter comprising a frame and individual circuit components, each circuit component being separately packaged from other circuit components to be individually accessible, the circuit components being arranged on the frame in first and second groups, the second group of circuit components being of a larger size than



circuit components in the first group and requiring a first degree of cooling, the first group of circuit components being smaller than the circuit components of the second group and requiring a second degree of cooling, the second degree of cooling being substantially less than the first degree of cooling, the first group of circuit components including a semiconductor element and other circuit components requiring a maintenance and a short distance connection with the semiconductor element, the individual circuit components of the first group being arranged in units exclusively, on a front side of the frame, the second group of circuit components being arranged exclusively within the frame behind the units.

5,045,925

## APPARATUS FOR ACHIEVING COMPRESSION ENCODING ON COMPONENTS OF IMAGE SIGNAL

Osamu Saito, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 15, 1990, Ser. No. 480,658
Claims priority, application Japan, Feb. 16, 1989, 1-35077
Int. Cl.[5] H04N *7/133, 11/04*
U.S. Cl. 358—13 11 Claims

| SWITCH SIGNAL $S_2$ $S_1$ $S_0$ | OPERATION |
|---|---|
| 0 0 1 | Y-DC PROCESSING |
| 0 1 0 | Cr-DC PROCESSING |
| 0 1 1 | Cb-DC PROCESSING |
| 1 0 1 | Y-AC PROCESSING |
| 1 1 0 | Cr-AC PROCESSING |
| 1 1 1 | Cb-AC PROCESSING |
| 0 0 0 | INITIALIZATION |

1. An image signal compression encoding apparatus in which digital image data representative of an image frame is subdivided into a plurality of blocks to conduct a two-dimensional orthogonal transformation encoding on image data of each of said blocks, comprising:
orthogonal transform means for achieving a two-dimensional orthogonal transformation on the plurality of blocks of the digital image data;
normalize means for normalizing data resultant from the orthogonal transformation achieved by said orthogonal transform means;
encode means for encoding data resultant from the orthogonal transformation and data resultant from noralization by said normalize means; and
control means for detecting when an output from said orthogonal transform means reaches an amount of data of respective components of the digital image data constituting the image frame, said respective components being processed in different manners and for producing control signals according to the detection;
said control means switching processing of said normalize means and said encode means depending on said control signals.

5,045,926

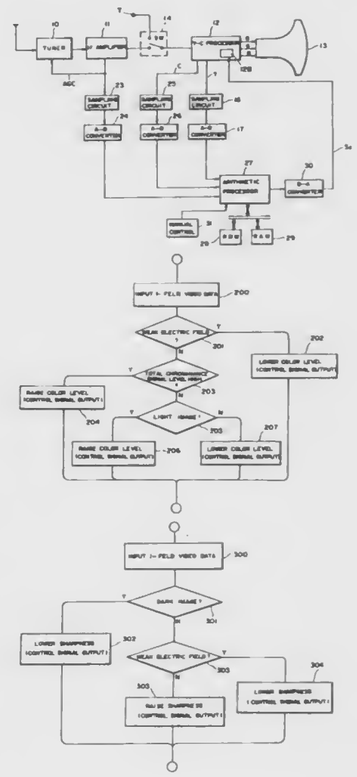
## TELEVISION IMAGE DISPLAY APPARATUS

Toshio Amano, Kanagawa, and Osamu Oda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 5, 1990, Ser. No. 489,254
Claims priority, application Japan, Mar. 7, 1989, 1-052837; Mar. 7, 1989, 1-052838; Mar. 7, 1989, 1-052839
Int. Cl.[5] H04N *9/64*
U.S. Cl. 358—21 R 9 Claims

1. A television image display apparatus in which an input video signal is processed to form an output image signal for display on a display screen, said apparatus comprising:
sampling means for dividing a field of said input video signal into a plurality of areas and for sampling image information in each of said areas which includes a chrominance signal;
memory means for storing preset adjustment date; and
arithmetic processing means for receiving the sampled image information and said preset adjustment data and, on the basis thereof, generating a video control signal which controls a color level of said output image signal to be displayed.

5. A television image display apparatus in which an input video signal is processed to form an output image signal for display on a display screen, said apparatus comprising:



sampling means for dividing a field of said input video signal into a plurality of areas and for sampling image information in each of said areas which includes data representing the electrical field strength of said input video signal, and data representing a luminance component of said input video signal and from which the lightness of a respective image can be determined;
memory means for storing preset adjustment data; and
arithmetic processing means for receiving the sampled image information and said preset adjustment data and, on the basis thereof, generating a video control signal which controls sharpness of said output image signal so as to increase said sharpness in response to a luminance compo-

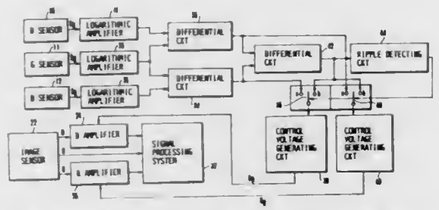
VOL 1130 ISS 1 SE 3 1991 UMI



nent corresponding to a light image and a strong electrical field, and so as to decrease said sharpness in response to a luminance component corresponding to a dark image and a weak electrical field.

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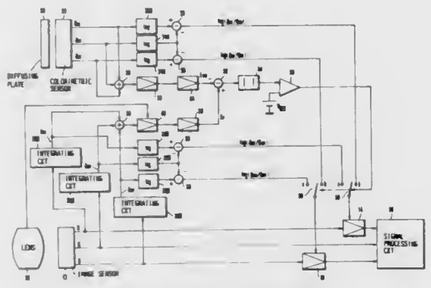
**5,045,927**
**WHITE BALANCE ADJUSTING DEVICE**
**Masao Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Jul. 28, 1989, Ser. No. 387,002**
**Claims priority, application Japan, Aug. 8, 1988, 63-196032**
**Int. Cl.[5] H04N** *9/73 C*
**U.S. Cl. 358—29** **12 Claims**



1. A white balance adjusting device comprising at least three optical sensors of different sensitivity characteristics from one another, computing means for calculating a ratio of outputs of said optical sensors, ripple detecting means for detecting whether or not light incident on said optical sensors contains ripples, selecting means for selecting outputs of said computing means in accordance with an output of said ripple detecting means, and control signal forming means for forming control signals for controlling gains of color components of a color video signal in accordance with an output selected by said selecting means.

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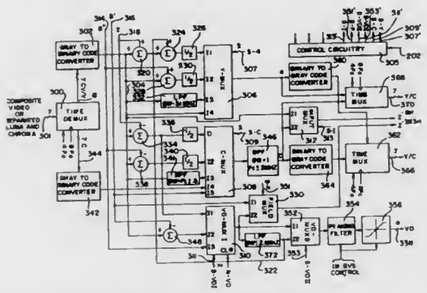
**5,045,928**
**WHITE BALANCE CONTROL WITH CHOICE OF CONTROL DEPENDENT ON BRIGHTNESS**
**Kan Takaiwa, Tokyo; Kenji Kyuma, and Teruo Hieda, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Apr. 11, 1989, Ser. No. 336,046**
**Claims priority, application Japan, Apr. 21, 1988, 63-096916; Apr. 22, 1988, 63-099635**
**Int. Cl.[5] H04N** *9/73*
**U.S. Cl. 358—29 C** **27 Claims**



1. An image sensing apparatus comprising:
a) first control signal forming means for forming a first control signal for controlling color balance on the basis of an output of a colorimetric sensor;
b) second control signal forming means for forming a second control signal for controlling color balance on the basis of an output of color image sensing means;
c) comparing means for comparing a first brightness signal obtained from said colorimetric sensor and a second brightness signal obtained from said image sensing means;
d) selection means for selecting one of said first and second control signals in accordance with a result of comparison effected by said comparing means; and
e) said color image sensing means for producing an image signal having a color balance controlled in accordance with said first or second control signal selected by said selection means.

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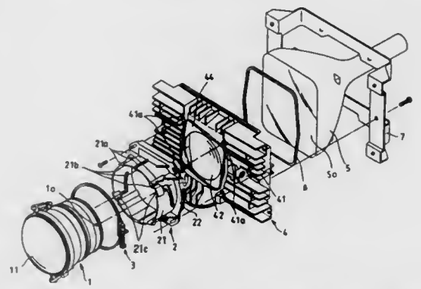
**5,045,929**
**THREE DIMENSIONAL LUMA/CHROMA SEPARATION AND VERTICAL DETAIL GENERATION**
**Khosro M. Rabii, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**
**Filed May 13, 1989, Ser. No. 356,024**
**Int. Cl.[5] H04N** *9/78*
**U.S. Cl. 358—31** **15 Claims**



1. A video processing system comprising:
first means for selecting one of a plurality of luma separation techniques, said first means comprising first multiplexer means responsive to control signals for selecting one of a plurality of inputs, each input comprising a video signal containing separated luma components from a received video signal as a result of a separation technique distinct from each of the other inputs;
second means for selecting one of a plurality of chroma separation techniques, said second means comprising second multiplexer means responsive to control signals for selecting one of a plurality of inputs, each input comprising a video signal containing separated chroma components from said received video signal as a result of a separation technique distinct from each of the other inputs;
third means for generating a corresponding vertical detail signal, said third means comprising third multiplexer means responsive to control signals for selecting one of a plurality of inputs, each input comprising a signal representative of the vertical detail in said received video signal;
said third multiplexer means further comprising
an initial multiplexer adapted to receive a plurality of input signals representative of the vertical detail in said received video signal and to provide one of said inputs as an output; and
a secondary multiplexer adapted to receive said output from said initial multiplexer as one input and the said output in a low pass filtered form as another input and to provide one of said one and said another inputs as an output vertical detail signal.



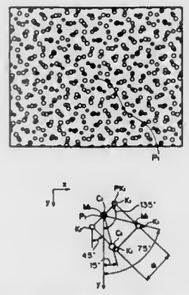
**5,045,930**
**OPTICAL SYSTEM FOR A THREE-TUBE PROJECTION TELEVISION SET**
**Shinichi Hasegawa, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**
**Filed Aug. 21, 1989, Ser. No. 396,569**
**Claims priority, application Japan, Oct. 26, 1988, 63-268307**
**Int. Cl.[5] H04N** *9/31;* **G03B** *3/00*
**U.S. Cl. 358—60** **4 Claims**



1. An optical system for optically projecting an image from a face of an outside projecting tube of a three-tube projection television, said system comprising:
an image surface correcting lens;
a focusing lens;
first means for optically and mechanically coupling said image surface correcting lens to a face of said projecting tube, said first means positioning said correcting lens at an angle $\theta$ corresponding to the Scheimpflug angle for one size projecting screen; and
second means for optically and mechanically coupling said focusing lens to said image surface correcting lens, said second means including an angle adjustment means for selectively changing the angle between said focusing lens and said image surface correcting lens to accommodate different sized projecting screens.

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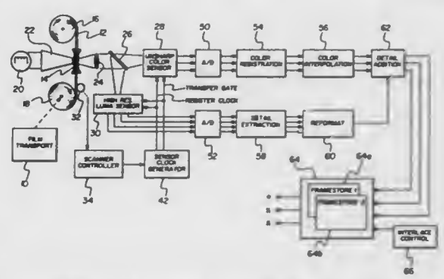
**5,045,931**
**METHOD OF AND APPARATUS FOR RECORDING HALFTONE IMAGES AND HALFTONE IMAGES PRODUCED THEREBY**
**Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan**
**Filed Nov. 6, 1989, Ser. No. 432,425**
**Claims priority, application Japan, Nov. 15, 1988, 63-288075**
**Int. Cl.[5] H04N** *1/23*
**U.S. Cl. 358—75** **22 Claims**



1. A method of recording halftone images to be employed in reproducing a color image, comprising the steps of
(a) deriving from said color image first to third image data representing first to third color separation images of said color image, respectively,
(b) producing first to third halftone images as a function of said first to third image data, respectively, while
(i) setting first to third screen angles of said respective first to third halftone images so that each of the differences between said first and third screen angles and between said third and second screen angles is about 30 degrees,
(ii) placing respective ones of the halftone dots of each of said first and second halftone images at a reference position on an image plane of a color image to be reproduced, and
(iii) placing one halftone dot of said third halftone image a prescribed distance from said reference position in one of a first direction representing said third screen angle and a second direction inclined at 90 degrees away from said first direction.

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**5,045,932**
**METHOD AND APPARATUS FOR GENERATING A HIGH DEFINITION ELECTRONIC SIGNAL FROM A LINE SCAN OF A COLOR ORIGINAL**
**Richard A. Sharman, Dunstable, and Roger T. Lees, Rickmansworth, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Jun. 29, 1989, Ser. No. 373,309**
**Int. Cl.[5] H04N** *1/46*
**U.S. Cl. 358—76** **38 Claims**



1. Apparatus for generating a high definition electrode signal corresponding to a predetermined line resolution by scanning a color original, said apparatus comprising:
means for generating a high definition detail signal, said detail signal generating means including high definition scanning means having a linear structure of high definition photosites that substantially provide the predetermined line resolution;
means for generating an unsharp color signal of lesser resolution than the predetermined line resolution, said unsharp signal generating means including color scanning means having a linear structure of color photosites that are individually larger than the high definition photosites;
means for operating said high definition scanning means and said color scanning means at a common frame rate; and
means for combining the high definition detail signal with the unsharp color signal to form the high definition electronic signal, whereby the larger size of the color photosites improves the signal-to-noise performance of the apparatus.

VOL 1130 ISS 1 SE 3 1991 UMI



5,045,933

## METHOD AND APPARATUS FOR COLOR CORRECTING DIGITIZED IMAGES

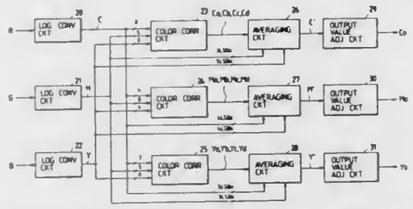
Setsuji Tatsumi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 18, 1989, Ser. No. 395,632

Claims priority, application Japan, Aug. 22, 1988, 63-206249; Aug. 22, 1988, 63-206250; Aug. 22, 1988, 63-206251; Feb. 13, 1989, 1-31195

Int. Cl.[5] H04N *1/46;* G03F *3/08*

U.S. Cl. 358—80 4 Claims



1. An image processing method, comprising the steps of: scanning an original to produce input color signals in three primary colors or complementary primary colors; for each of said input color signals, generating a plurality of variable data to be used for producing a respective color-corrected output signal, said variable data for each of said input color signals being produced by addressing a memory with each of said input color signals with a bit length determined in accordance with a degree of correlation with the respective input color signal to be corrected; producing a plurality of correction coefficients by an averaging operation on said variable data for each of said input color signals so as to reduce the amount of error contained in color signals produced as a result of said transformation operations; and producing final color output signals by carrying out convolution operations with said correction coefficients and said variable data.

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5,045,934

## ELECTRONIC ENDOSCOPE APPARATUS CAPABLE OF INDICATING OVER-EXPOSURE AREA ON FUNCTIONAL IMAGE

Katsuya Kikuchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 7, 1990, Ser. No. 489,051

Claims priority, application Japan, Apr. 12, 1989, 1-90569

Int. Cl.[5] H04N *7/18;* A61B *1/04, 1/06*

U.S. Cl. 358—98 7 Claims

1. An electronic endoscope apparatus comprising:

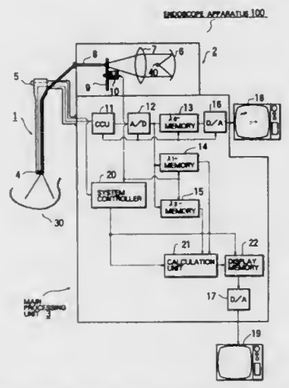
a light source for illuminating an interior portion of a biological body under medical examination;

filter means selectively interposed between the light source and illuminated interior portion of the biological body for filtering out light having a preselected transmission wavelength, and for projecting said filtered light to the interior portion thereof;

image sensor means for imaging the illuminated interior portion by receiving the filtered light therefrom to thereby produce a functional information image signal;

means for processing said functional information image signal so as to detect a region having an exposure level exceeding over an allowable maximum exposure level, and for superimposing said region having the over-exposure level on said functional information image signal; and,

means for displaying both a functional information image of the biological body and said over-exposure region superimposed thereon based upon said functional information image signal and said over-exposure region.



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5,045,935

## ELECTRONIC ENDOSCOPE SYSTEM INCLUDING IMAGE PROCESSING UNIT WITH PHOTOGRAPHING UNIT

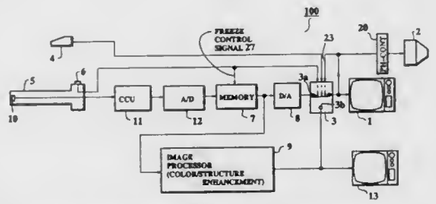
Katsuya Kikuchi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 9, 1990, Ser. No. 506,244

Claims priority, application Japan, Apr. 12, 1989, 1-90570

Int. Cl.[5] H04N *7/18;* A61B *1/04*

U.S. Cl. 358—98 12 Claims



1. An electronic endoscope system comprising:

endoscopic image producing means for producing an endoscopic image signal of an object under medical examination as original endoscopic image data of said object;

endoscopic image processing means for processing said original endoscopic image data so as to obtain endoscopically-processed image data;

photographic means for successively photographing said original endoscopic image data and said endoscopically-processed image data;

image confirming means for successively receiving said original endoscopic image data and said endoscopically-processed image data so as to confirm the contents of said original and endoscopically-processed image data; and,

image data transferring means for simultaneously transferring said original endoscopic image data and said endoscopically-processed image data to at least both said photographing means and image confirming means in response to an instruction signal, whereby said original and endoscopically-processed image data simultaneously transferred to said image data confirming means are successively photographed by said photographing means while the contents thereof are confirmed by the image confirming means.



5,045,936

## LASER SCANNING IMAGING APPARATUS AND METHOD OF RANGING

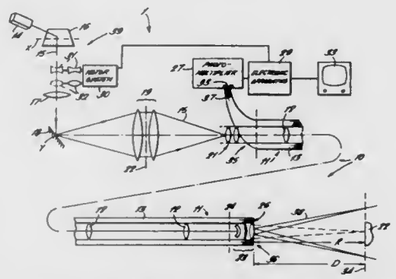
Daniel R. Lobb, and Robert N. West, both of Chislehurst, United Kingdom, assignors to Keymed (Medical and Industrial Equipment) Limited, Southend-On-Sea, United Kingdom

Filed Jul. 19, 1989, Ser. No. 382,746

Claims priority, application United Kingdom, Jul. 25, 1988, 8817672

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—100 17 Claims



1. A method of range measurement comprising the steps of passing a laser beam through an optical system so as to be projected into an object field containing an object to be ranged, detecting light reflected from the object, varying the focus distance between an output of the optical system and the position at which the beam is focused by operation of a focus distance varying means, measuring a parameter of the detected light which is characteristic of laser speckle, determining a setting of the focus distance varying means at which the value of the speckle parameter is consistent with the beam being focused onto the object, and determining from calibration of the focus distance varying means the corresponding value of focus distance as a measurement of range, wherein the beam is directed onto a selected area of the object and scanned across the selected area, the reflected light being detected by means of a photodetector producing an electrical output signal, the speckle parameter being measured as the output of circuit means responsive to noise in the output signal and the presence of maximum noise in the output signal being taken as being consistent with the beam being focused onto the object.

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5,045,937

## GEOGRAPHICAL SURVEYING USING MULTIPLE CAMERAS TO OBTAIN SPLIT-SCREEN IMAGES WITH OVERLAID GEOGRAPHICAL COORDINATES

E. L. Myrick, Merritt Island, Fla., assignor to Space Island Products & Services, Inc., Merritt Island, Fla.

Filed Aug. 25, 1989, Ser. No. 398,600

Int. Cl.[5] H04N *7/18*

U.S. Cl. 358—109 26 Claims

1. An infrared earth surface survey system for mounting in a survey vehicle comprising:

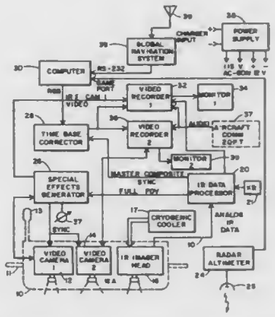
a video camera having a first field of view, said camera producing a sequence of television frames;

an infrared imager head having a field of view coincident with said video camera field of view;

an infrared data processor connected to said imager head for receiving analog infrared data therefrom, said processor processing said infrared data to produce a sequence of infrared television frames compatible with said sequence of video television frames, said processor producing a plurality of colors in said frames, each of said colors indicative of a temperature range of a portion of an earth surface within said image head field of view;

a split-screen generator connected to said infrared data processor and said video camera for combining said sequence of said video television frames to produce a sequence of composite television frames, each of such frames having a first part of one of said infrared television frames and a second part of a corresponding one of said video television frames;

video recorder means connected to said split-screen generator for recording said sequence of composite television frames;



a global navigation system for determining coordinates of said survey vehicle;

a computer for receiving said coordinates from said global navigation system and programmed to produce alphanumeric representations thereof; and

means connected to said computer and said video recorder means for overlaying respective determined coordinates on each of said composite television frames.

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5,045,938

## METHOD AND APPARATUS FOR ENCODING USING VARIABLE LENGTH CODES

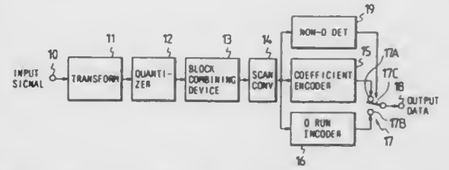
Kenji Sugiyama, Noda, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jul. 24, 1990, Ser. No. 556,494

Claims priority, application Japan, Aug. 19, 1989, 1-213939

Int. Cl.[5] H04N *7/12*

U.S. Cl. 358—133 4 Claims



1. A method for variable-length codes, comprising the steps of:

transforming a video signal into first blocks each containing transform coefficients;

combining a plurality of adjacent first blocks into a single second block;

rearranging transform coefficients of the second block and making transform coefficients of equal-components of the first blocks successive to form successions of the transform coefficients of the equal-components of the first blocks;

arranging the successions in a predetermined order to compose a one-dimensional sequence of the transform coefficients;

encoding non-zero transform coefficients of the sequence into corresponding variable-length codes; and

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encoding successively-appearing zero transform coefficients of the sequence into a corresponding variable-length code.

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**5,045,939**

**APPARATUS UTILIZING MOTION DETECTOR FOR CONVERTING A MAXIMUM MOTION PORTION OF A WIDE SCREEN TV SIGNAL TO A NORMAL SCREEN TV SIGNAL**

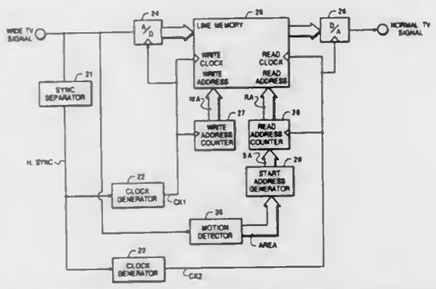
**Mutsuyuki Okayama, Kobe; Atsuo Ochi, Moriguchi, and Akihiro Takeuchi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jul. 6, 1990, Ser. No. 549,062**

**Claims priority, application Japan, Jul. 6, 1989, 1-174722**

**Int. Cl.[5] H04N** *7/01*

**U.S. Cl. 358—140** **3 Claims**




1. An apparatus for converting a wide screen television signal for producing a wide screen television picture having a larger aspect ratio than a normal aspect ratio of a normal screen television picture into a normal screen television signal for producing a desired normal screen television picture, comprising:

extracting means for selectively extracting from the wide screen television signal a portion of the wide screen television signal which corresponds to the normal screen television picture to thereby obtain the desired normal screen television signal;

motion detecting means for detecting a motion of the wide screen television picture produced by the wide screen television signal; and

control means for controlling the extracting means to extract the portion of the wide screen television signal according to a motion detection result of the motion detecting means.

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**5,045,940**

**VIDEO/AUDIO TRANSMISSION SYSTSEM AND METHOD**

**Eric C. Peters, Carlisle, and Stanley Rabinowitz, Westford, both of Mass., assignors to Avid Technology, Inc., Burlington, Mass.**

**Filed Dec. 22, 1989, Ser. No. 455,567**

**Int. Cl.[5] H04N** *7/00*

**U.S. Cl. 358—143** **16 Claims**

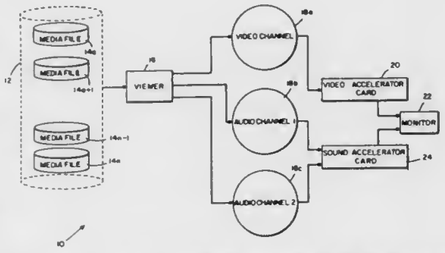
1. A media pipeline system for displaying digitized audio and video, comprising:

a media file database for accepting and making available a plurality of media files, at least one of said media files having digitized audio media data and at least another one of said media files having video media data, each of said media files being divided into a plurality of frames;

a plurality of ring buffers;

a viewer module comprising procedures to synchronize the transfer of media data from the media files into said plurality of ring buffers, said ring buffers storing the media data before it is displayed;

a video accelerator connected to receive an output of at least one of said ring buffers for generating a video display output; and




a sound accelerator connected to receive an output of at least one of said ring buffers for generating an audio output.

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**5,045,941**

**FRAMING CODE WINDOWS REPOSITIONING APPARATUS AND METHOD FOR TELETEXT DECODER**

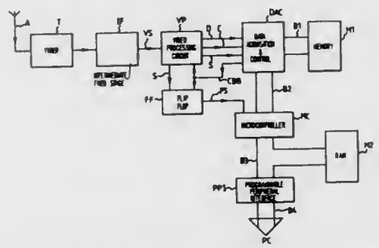
**Andrew K. Davies, Purley, England, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 7, 1990, Ser. No. 534,799**

**Claims priority, application United Kingdom, Jun. 16, 1989, 8913905**

**Int. Cl.[5] H04N** *7/04*

**U.S. Cl. 358—147** **20 Claims**



1. A teletext decoder for use in a receiver which is suitable for receiving teletext transmissions of a type in which coded data pulses representing teletext data packets are transmitted in a television signal in respective television lines where no picture signals representing normal picture information are present, said teletext decoder comprising framing code detection means operable on signals which are derived from respective line signal portions of the television signal for detecting a framing code therein in a predefined framing code window and means for changing the position of said framing code window in a television line in respect of signals which are derived from line signal portions in said television signal where teletext data packets do not occur, whereby the chances of detecting an apparently valid framing code in non-teletext signals are reduced.



**5,045,942**

**DIGITAL VIDEO COMMUNICATION SYSTEM HAVING A NETWORK CLOCK SOURCE**

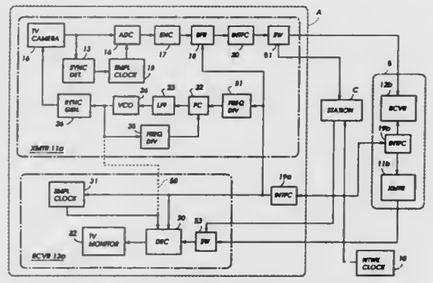
**Shuzo Tsugane, Miyagi; Sadaharu Hiratsuka, Tokyo; Toshio Kawaji, Tokyo, and Yasushi Sano, Tokyo, all of Japan, assignors to NEC Corporation, Japan**

**Filed Nov. 17, 1988, Ser. No. 272,709**

**Claims priority, application Japan, Nov. 18, 1987, 62-289573; Sep. 29, 1988, 63-242279**

**Int. Cl.[5] H04N** *7/04*

**U.S. Cl. 358—148** **13 Claims**




1. A digital video communication system comprising:

a network clock source for generating a network clock pulse synchronized with a transmission speed of said video communication system;

frequency generator means for receiving said network clock pulse through a transmission channel and deriving therefrom a sampling frequency and a reference subcarrier frequency;

a video signal source for generating an analog composite television signal by using said reference subcarrier frequency;

quantizer means for quantizing said analog composite television signal at said sampling frequency to produce a quantized composite television signal;

buffer means synchronized with said network clock pulse for transmitting the quantized composite television signal to a receiving station at the transmission speed of said communication system; and

dequantizer means for receiving a quantized composite television signal from said receiving station and dequantizing the received signal by using said sampling frequency to recover an analog composite television signal.

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**5,045,943**

**SYNCHRONOUS SIGNAL SEPARATION CIRCUIT**

**Ikuo Kurihara, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 125,775, Nov. 25, 1987, abandoned, which is a continuation of Ser. No. 28,006, Mar. 18, 1987, abandoned, which is a continuation of Ser. No. 832,215, Feb. 24, 1986, abandoned. This application Sep. 1, 1989, Ser. No. 403,032**

**Claims priority, application Japan, Feb. 28, 1985, 60-37385**

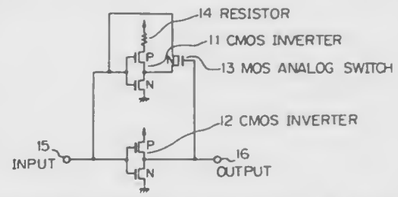
**Int. Cl.[5] H04N** *5/08*

**U.S. Cl. 358—153** **3 Claims**

1. An integrated circuit for separating a synchronous signal from a video signal including the synchronous signal comprising:

comparator means (**12**) for receiving the video signal and for generating a pulse signal whose voltage assumes one of two levels in response to the voltage of the video signal, said comparator means outputting the pulse signal as a separated synchronous signal; and

biasing means (**11, 13, 14**) comprising a bias voltage generating means (**11, 14**) for generating a bias voltage, and switch means (**13**) for receiving the pulse signal and for applying the bias voltage to the comparator means,




wherein said comparator means comprises an inverter including a MOS transistor, and said bias voltage generating means comprises an inverter including a MOS transistor.

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**5,045,944**

**VIDEO SIGNAL GENERATING CIRCUIT FOR USE IN VIDEO TAPE RECORDER AND TELEVISION RECEIVER**

**Yong-Je Kim, Jinhae, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Dec. 30, 1988, Ser. No. 292,354**

**Claims priority, application Rep. of Korea, Dec. 30, 1987, 1987-15390**

**Int. Cl.[5] H04N** *5/14, 9/74, 5/262*

**U.S. Cl. 358—160** **24 Claims**



1. A sub-screen generator, comprising:

a microcomputer for producing ON/OFF signals to enable or disable a sub-screen and a plurality of signals including a signal directing a start position of a current sub-screen;

a destination location decoder coupled to the microcomputer for decoding a destination location of the current sub-screen on the main screen and generating control signals;

a first register for storing row starting locations of a plurality of sub-screens;

a second register for storing column starting locations of said sub-screens;

first and second multiplexers respectively receiving the control signals of said destination location decoder and input data defining the row and column starting locations of said first and second registers, and therefrom deliver each output to third and fourth registers;

the third and fourth registers respectively providing the starting location data from the multiplexers to first and second adjusting means;

the first and second adjusting means providing as output signals said starting location data for display, at respective output terminals, said respective output terminals provid-

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ing said output signals as feedback data to said third and fourth registers, respectively;

offset means for providing deviation data to said adjusting means, to be added to or subtracted from said feedback data to produce further output signals of said respective outputs for display and feedback, thereby adjusting the row and column positions; and

counter means for generating a signal for controlling the period of the data applied from the registers to the adjusting means.

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**5,045,945**

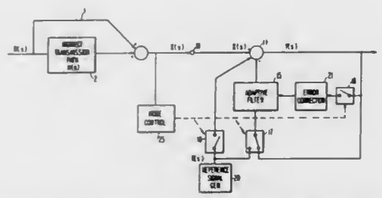
## METHOD OF ADAPTIVE GHOST CANCELLATION

**Stephen Herman, Monsey, and Charles A. Lisb, Yorktown Heights, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.**

**Filed Oct. 6, 1989, Ser. No. 418,430**

**Int. Cl.[5] H04N** *5/213*

**U.S. Cl. 358—167** **3 Claims**



1. A method of adaptive ghost cancellation, comprising:

providing a sparse transversal filter having M delay taps and N multipliers, where N<M;

providing a video signal containing a predetermined reference signal;

generating a reference signal identical to the predetermined reference signal in the video signal;

filtering the generated reference signal with said sparse transversal filter;

subtracting the filtered reference signal and the generated reference signal from the part of the video signal containing the reference signal;

comparing the result of the subtraction with a threshold value;

connecting said filter multipliers to said filter delay taps on correspondence to the results of the subtraction which exceed the threshold value; and

adjusting the multiplier values to minimize the result of the subtraction.

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**5,045,946**

## METHOD FOR MULTI-SCREEN OPERATION IN A PICTURE-IN-PICTURE SYSTEM

**Jae-Chun Yu, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Nov. 21, 1989, Ser. No. 439,323**

**Claims priority, application Rep. of Korea, Dec. 31, 1988, 1988-18101**

**Int. Cl.[5] H04N** *5/50, 5/45*

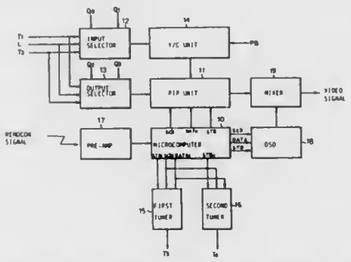
**U.S. Cl. 358—191.1** **5 Claims**

1. A method for performing a multi-screen in a picture-in-picture system, said method comprising the steps of:

(a) outputting a rotation data from a microcomputer to perform a strobe-stop, if a screen program key is pressed;

(b) judging whether a channel up/down key is pressed by calling a skip channel on-screen-display of the strobe-step condition, increasing a pointer value if said channel up/-down key is pressed, selecting a channel presently flickering if said key is not pressed but a rotate key is pressed, and thereby outputting the rotation data; and

(c) clearing said skip channel on-screen-display if the screen program key is pressed while the rotate key is not pressed



at the step (b) and outputting a strobe data to release the strobe-stop condition.

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**5,045,947**

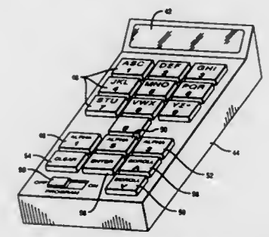
## TELEVISION RECEIVER HAVING MEMORY CONTROL FOR TUNE-BY-LABEL FEATURE

**Jack Beery, 907 6th St. SW., Apt. 815-C, Washington, D.C. 20024**

**Continuation-in-part of Ser. No. 359,155, May 31, 1989. This application Apr. 26, 1990, Ser. No. 514,693**

**Int. Cl.[5] H04N** *5/50*

**U.S. Cl. 358—192.1** **4 Claims**



1. In a television control system apparatus for selecting a television channel corresponding to a preassigned channel tuning designation, the system apparatus comprising:

tuner means for receiving a processor signal and a multi-channel input signal, and in response to said processor signal, tuning out all but one channel corresponding to a selected one of said preassigned channel tuning designations;

memory means for storing at least one operator-assigned channel select designation for at least one of said channel tuning designations;

first operator-actuated control means for generating a first control output signal comprising a first data set representative of a desired channel select designation for one of said channel tuning designations;

second operator-actuated control means for generating a second control output signal comprising a second data set representative of a desired viewing channel identified by an operator selected one of said channel select designations;

processor means for receiving said first and second control output signals from said first and second operator-actuated control means, and upon receipt of said first data set, causing said memory means to store said desired channel select designation as corresponding to said one channel tuning designation, and upon receipt of said second data set, retrieving from said memory means the one of said channel tuning designations corresponding to said operator selected channel select designation, and generating said processor signal to correspond to said one channel tuning designation;

said first control output signal comprising a first one of said channels of said multi-channel input signal;

said processor means including means for generating said processor signal to cause said tuner means to tune out all but said first one of said channels, and for receiving from said turner means said first control output signal comprising said first one of said channels.



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**5,045,948**

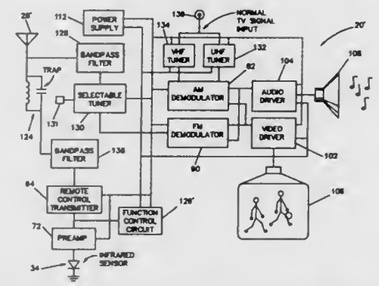
## TELEVISION LOCAL WIRELESS TRANSMISSION AND CONTROL

**Donald A. Streck, 832 Country Dr., Ojai, Calif. 93023, and Jerry R. Iggulden, 21600 Cleardale St., Newhall, Calif. 91321, assignors to Donald A. Streck, Ojai and Jerry R. Iggulden, Santa Clarita, both of, Calif., a part interest**

**Division of Ser. No. 96,929, Sep. 15, 1987, Pat. No. 4,916,532. This application Dec. 27, 1989, Ser. No. 457,575**

**Int. Cl.[5] H04N** *5/46, 5/44, 5/38*

**U.S. Cl. 358—194.1** **6 Claims**



1. A television set adapted for receiving wirelessly broadcast local television signals on a carrier frequency of at least 900 MHz comprising:

a) a receiving antenna means for receiving the wirelessly broadcast local signals;

b) first tuner means connected to said receiving antenna means for detecting the wirelessly broadcast local television signals and for producing an electrical signal reflecting the wirelessly broadcast local television signals;

c) first demodulator means connected to said first tuner means for demodulating the wirelessly broadcast local television signals to produce first video and audio signals therefrom;

d) modulator means for receiving said first video and audio signals from said first demodulator means and for incorporating them onto a standard television broadcast band television signal at an output thereof;

e) signal input means for inputting television signals in a standard television broadcast band connected to said output of said modulator means;

(f) second tuner means connected to said signal input means for detecting and producing an electrical signal reflecting standard television broadcast band television signals input at said signal input means;

g) second demodulator means connected to said second tuner means for demodulating said standard television broadcast band television signals to produce second video and audio signals therefrom;

h) a speaker;

i) a video display monitor;

j) an audio driver connected between said second demodulator means and said speaker;

k) a video driver connected between said second demodulator means and said video display monitor; and

l) power supply means operably connected for supplying power to said first tuner means, said first demodulator means, said second tuner means, said modulator means, said second demodulator means, said monitor, said audio driver, and said video driver.

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**5,045,949**

## IMAGE RECORDING APPARATUS FOR RECORDING STILL IMAGE AND LETTERS WITHOUT DISTORTION

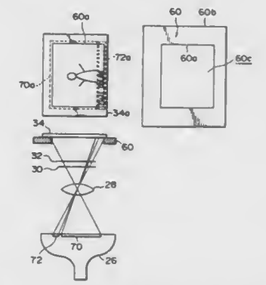
**Kazuo Shiota, Tokyo, Japan, assignor to Fuji Pboto Film Co., Ltd., Kanagawa, Japan**

**Filed Aug. 10, 1988, Ser. No. 230,603**

**Claims priority, application Japan, Aug. 18, 1987, 62-203526**

**Int. Cl.[5] H04N** *5/84*

**U.S. Cl. 358—244** **21 Claims**



1. An image recording apparatus for projecting an image onto a rectangular image recording medium so as to record the image in an ultimately visualized form on the rectangular image recording medium, comprising:

video display means for displaying both information and an image represented by video signals read out from a video signal recording medium;

projecting means for projecting said image and said information displayed on said video display means onto said rectangular image recording medium; and

shading means disposed in front of said rectangular image recording medium and surrounding only three sides of said image, so that said information is projected on a side of said rectangular image recording medium corresponding to a fourth unsurrounded side of said image, light incident on said shading means is shaded to provide a smooth contour on said three sides of said recorded image.

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**5,045,950**

## CIRCUIT FOR DETECTING AND COMPENSATING FOR JITTER PRODUCED BY A RECORDING/REPRODUCING APPARATUS

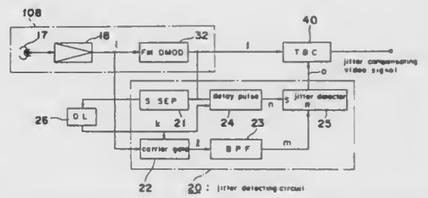
**Soichi Iwamura, Fuchi; Satoshi Murakami, Nagareyama; Masakazu Ishikawa, Abiko, and Naoki Koide, Yachiyo, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 28, 1988, Ser. No. 187,441**

**Claims priority, application Japan, May 1, 1987, 62-108532; Apr. 15, 1988, 63-93180**

**Int. Cl.[5] H04N** *9/89*

**U.S. Cl. 358—319** **14 Claims**



1. A jitter detecting method for detecting jitter generated in

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a video signal, the video signal generated by multiplying a luminance signal and chrominance signal in time bases thereof, comprising the steps of:

generating a synchronous signal;

synchronizing a phase of a leading edge of the synchronous signal with a phase of a constant frequency carrier corresponding to a sync tip portion of the video signal for every horizontal period during frequency modulation to generate a modulated video signal; and

detecting a specific zero-crossing timing of a train of the constant frequency carrier corresponding to the sync tip portion, after passage of the constant frequency carrier through a band pass filter, base on a trailing edge of a frequency-demodulated synchronous signal during reproduction of the modulated video signal to thereby detect jitter.

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**5,045,951**

## VIDEO SIGNAL PROCESSOR AND VIDEO SIGNAL PROCESSING METHOD FOR A VIDEO PRINTER

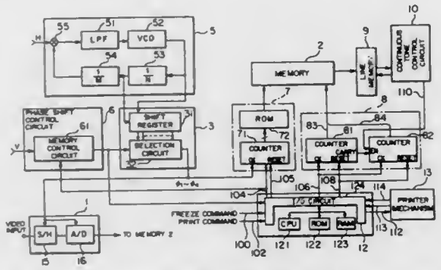
**Hiroyuki Kimura, Kanagawa; Kentaro Hamma, Katsuta; Yasunori Kobori, and Takashi Omata, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

Filed Aug. 31, 1989, Ser. No. 400,940

Claims priority, application Japan, Sep. 2, 1988, 63-219694

Int. Cl.[5] H04N *1/04*

U.S. Cl. 358—445 22 Claims




1. A video signal process controller for a video printer having sampling means for sampling a video signal, analog-to-digital conversion means for converting the sampled video signal into a digital signal, memory means for storing the converted digital signal, and printer means for reading out contents of said memory means and for recording the contents on a recording medium, said controller comprising:

extraction means for extracting a horizontal sync signal and a vertical sync signal from the video signal;

oscillation means for oscillating in synchronism with the extracted horizontal sync signal in order to generate a pixel clock signal having a pixel clock signal frequency;

frequency division means for dividing the frequency of the pixel clock signal generated by the oscillation means to produce a frequency divided clock signal;

phase shift means which produces, by shifting the frequency divided clock signal in accordance with the pixel clock signal, multiple types of frequency divided clock signals out of phase from each other by 1-pixel clock signal period;

selection means for selecting one of the multiple types of frequency divided clock signals from said phase shift means as a sampling pulse signal in response to which the video signal is sampled by the sampling means; and

selection control means for operating on said selection means in order to sequentially select a different type of frequency divided clock signal in response to the vertical sync signal from said extraction means.

**5,045,952**

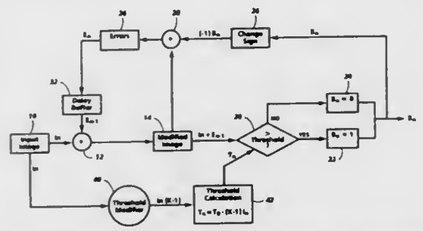
## METHOD FOR EDGE ENHANCED ERROR DIFFUSION

**Reiner Eschbach, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

Filed Aug. 21, 1989, Ser. No. 396,272

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—447 11 Claims




1. In a system for manipulating and displaying digital images represented by a plurality of pixels, each pixel having a given value, the system having a memory for digitally storing the image pixels and a screen for displaying an image as a raster of pixels having a plurality of output states, the method of image encoding including the steps of:

(a) comparing the value of the pixel, read from memory, with a threshold,

(b) generating the output state for the pixel depending upon the relationship of the pixel value relative to the threshold,

(c) displaying the output state of the pixel on the display screen,

(d) calculating a variance value indicative of the deviation of the pixel value from the output state,

(e) storing the variance value,

(f) combining the variance value stored in step e with the next pixel value stored in memory to produce a new pixel value,

(g) repeating steps b through f for each pixel within the digital image memory, thereby producing an encoded display image representative of the stored digital image, and

selectively changing the threshold used in steps a and b by analyzing the value of each pixel read from memory in order to determine if the threshold level should be changed.

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**5,045,953**

## IMAGE DATA TRANSMISSION APPARATUS WITH DETACHABLE READER

**Matahira Kotani, Ikoma; Masayuki Hachinoda, Nara; Motohiko Hayashi, Yamatokoriyama; Naomitsu Murata, Nagoya, and Mitsunobu Kondo, Yokohama, all of Japan, assignors to Sharp Kabushi Kaisha, Osaka and Nippon Telegraph and Telephone Corporation, Tokyo, both of, Japan**

Filed Mar. 15, 1989, Ser. No. 323,856

Claims priority, application Japan, Mar. 15, 1988, 63-62665

Int. Cl.[5] H04N *1/024*

U.S. Cl. 358—473 6 Claims

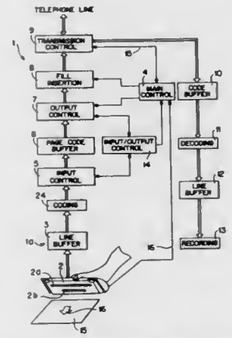
1. An image data transmission apparatus, in which a unit quantity of image data is encoded in variable length and transmitted into a transmission line, the apparatus comprising:

a transmission apparatus main body, and

a manually movable image reading unit detachably mounted on the transmission apparatus main body the image reading unit being movable over the data to be read;

the transmission apparatus main body including a memory for storing image data read by the image reading unit in unit quantities, and

means for transmitting the image data in unit quantities at a first minimum time, and when quantities of image encoded data to be transmitted which is stored in the memory is less than a predetermined quantity, because of slow movement of the image unit, false data is added to the encoded unit quantity so that the transmission time of the unity




quantity is a second minimum time exceeding the first minimum time so that transmission can be continued without disruption.

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**5,045,954**

## MAGNETIC RECORDING AND PLAYBACK APPARATUS FOR SERIAL DATA HAVING A VARIABLE BIT TRANSFER RATE

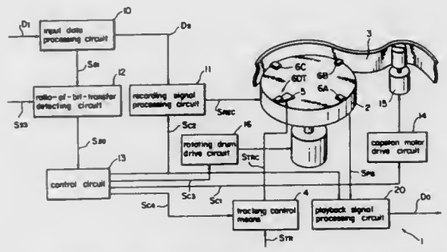
**Hiroaki Oishi, Tokyo; Shinji Aoki, Kanagawa, and Hideo Kawamoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

Filed Jan. 30, 1989, Ser. No. 302,957

Claims priority, application Japan, Jan. 30, 1988, 63-21076; Jan. 30, 1988, 63-21077

Int. Cl.[5] G11B *5/00, 15/46, 5/584, 21/04*

U.S. Cl. 360—8 6 Claims




1. A magnetic recording and playback apparatus having a dynamic tracking magnetic head disposed on a rotating drum for scanning successive oblique recording tracks on a magnetic tape to record or play back serial digital data along the tracks, comprising:

tracking control means for controlling the position of said dynamic tracking magnetic head on said rotating drum in a direction perpendicular to said recording tracks in accordance with a bit transfer rate of said serial digital data;

speed control means for controlling at least one of a rotating speed of said rotating drum and a traveling speed of said magnetic tape in accordance with the bit transfer rate of said serial data; and

processor means for time-compressing said serial data to produce time-compressed serial data, said dynamic tracking magnetic head being coupled to receive said time-compressed serial data for recording said time-compressed serial data while said dynamic tracking magnetic head scans said recording tracks.



**5,045,955**

## DIGITAL DATA RECORDING AND REPRODUCING APPARATUS FOR RECORDING AND PRODUCING AN IMAGE ON AND FROM A VIDEO TAPE THROUGH MATRIX CONVERSION

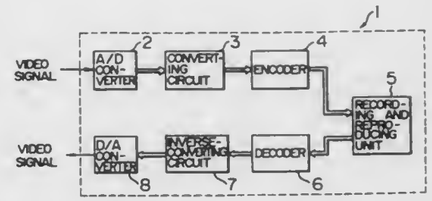
**Shigeyuki Ikeda, Tokyo, Japan, assignor to Hitachi Medical Corporation, Tokyo, Japan**

Continuation of Ser. No. 26,674, Mar. 17, 1987, abandoned. This application Nov. 27, 1989, Ser. No. 442,395

Claims priority, application Japan, Mar. 17, 1986, 61-57013

Int. Cl.[5] H04N *5/78*

U.S. Cl. 360—9.1 8 Claims




1. A digital data recording and reproducing apparatus comprising:

A/D converter means for A/D-converting an input video signal having a predetermined image matrix size into digital image data;

matrix converting means for temporarily storing the digital image data corresponding to one A/D converted image in a memory means having a memory address corresponding to said predetermined image matrix size, for dividing the digital image data corresponding to the one image into a predetermined number of digital image data having another predetermined image matrix size smaller than the predetermined image matrix size of the input video signal when the predetermined image matrix size is of a size greater than the capability of a recording/reproducing means of the digital data recording and reproducing apparatus, and for adding position information to the respective divided digital image data;

coding means for adding an error correction code to the digital image data from said matrix converting means, said error code enabling correction of a code error caused at a time of recording at a time of reproducing;

recording/reproducing means for recording the digital image data from said coding means on a magnetic tape at data rate of said another predetermined matrix size and for reproducing the recording digital image data;

decoding means for correcting the code error in the digital image data outputted from said recording/reproducing means in accordance with said error correction code added by said encoding means;

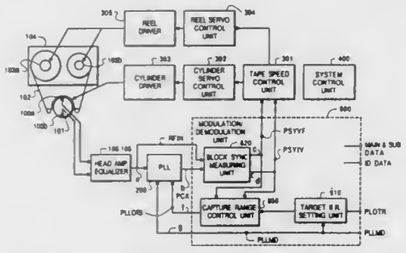
inverting matrix converting means for temporarily storing the digital image data outputted from said decoding means in a memory means having a memory address corresponding to said predetermined image matrix size in accordance with the address before division on the basis of said position information, and for sequentially reading out the temporarily stored digital image data; and

D/A converter means for converting the digital image data outputted from said inverse matrix converting means into analog image data.

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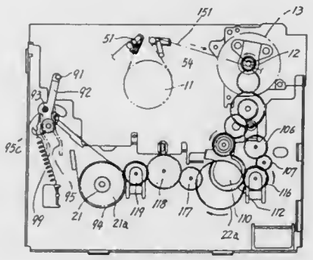


5,045,956
**DATA REPRODUCING APPARATUS**
Naoki Ejima, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 23, 1988, Ser. No. 274,816
Claims priority, application Japan, Dec. 1, 1987, 62-305047; Dec. 10, 1987, 62-312702
Int. Cl.[5] G11B *5/09*
U.S. Cl. 360—51 14 Claims




1. A data reproducing apparatus comprising:
read means for reading a recording medium to obtain a reproduced signal;
bit rate measuring means for measuring a bit rate of the reproduced signal;
a clock reproducing phase locked loop circuit for extracting a clock from the reproduced signal;
capture range control means for controlling a capture range of the phase locked loop circuit;
bit rate target value setting means for setting a plurality of bit rate target values;
system control means for switching an operating frequency range of the clock reproducing phase locked loop circuit corresponding to respective bit rate target values; and
capture range control signal creating means for supplying a signal corresponding to a difference data between the bit rate target values and the output data of the bit rate measuring means to the clock reproducing phase locked loop circuit,
said clock reproducing phase locked loop circuit including:
mode switching means for switching the operating frequency range of the clock reproducing phase locked loop circuit by inputting a control signal from the system control means; and
capture range control means for varying parameters of a voltage controlled frequency oscillator by inputting a signal from the capture range control signal creating means;
wherein the bit rate measuring means includes judging means which judge the reliability of the measured data and outputs a judgment signal to the capture range control signal creating means, and
wherein said capture range control signal creating means creates a control signal based on the difference between the bit rate target values and the output data of the bit rate measuring means, and supplies the control signal to the clock reproducing phase locked loop circuit when the judgment signal shows that the reliability falls within a predetermined range, and
creates a control signal based on the difference from the bit rate target value using latest output data in that the reliability falls within a predetermined range among output data of the bit rate measuring means obtained previously in place of output data of the present bit rate measuring means and supplies the control signal to the clock reproducing phase locked loop circuit when the judgement signal shows that the reliability falls outside of the predetermined range.

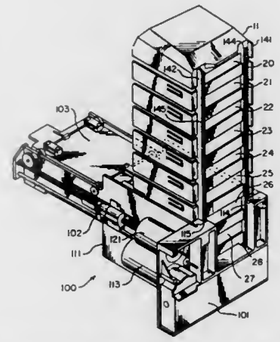
5,045,957
**RECORDING-REPRODUCTION SYSTEM HAVING A HEAD CYLINDER AND CAPSTAN SYSTEM CONTROLLER**
Nobuhide Doutsubo, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Aug. 29, 1989, Ser. No. 400,295
Claims priority, application Japan, Aug. 31, 1988, 63-217431
Int. Cl.[5] G11B *15/44*
U.S. Cl. 360—71 3 Claims



1. A recording-reproduction system, comprising:
a head cylinder and a capstan rotatable by a capstan motor and disposed at a tape outlet side of the head cylinder, wherein a magnetic tape is transported from the head cylinder toward the capstan in a play mode with the tape held in pressing contact with the capstan by a pinch roller; and
a stop mode setting apparatus which comprises a system controller means to be given a command for a change to a stop mode to stop the head cylinder and the capstan in the play mode, and a driver means for driving the capstan motor in response to a control signal from the system controller means, the system controller means having capstan control means for controlling the starting, stopping and rotational direction of the capstan motor, the system controller means being operable to produce the control signal outputted to the driver means for reversibly rotating the capstan motor only for a predetermined period of time when given the change command, wherein the capstan motor is coupled to a swing idler, and one of a pair of reel supports, the predetermined period of time being set to a length of time required for the swing idler to swingably move out of operative connection with one of the reel supports to a neutral position so as not to be in operative connection with either one of the reel supports.

5,045,958
**POSITIONER FOR MAGNETIC TAPE CARTRIDGE MAGAZINE**
Robert E. Leonard, Denver; Joseph A. Fryberger, Longmont, and Lynn C. Jacobs, Louisville, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.
Filed Mar. 5, 1990, Ser. No. 488,723
Int. Cl.[5] G11B *15/68, 17/22*
U.S. Cl. 360—92 22 Claims

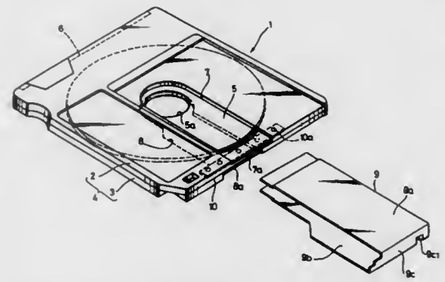
1. In an autoloader connected to an associated tape drive, said tape drive having an opening through which said autoloader can access a drive hub located in said tape drive, apparatus for transferring magnetic tape cartridges between said drive hub and a magnetic tape cartridge magazine that is disjunct from said autoloader and bidirectionally moveable in a vertical direction that holds a plurality of preloaded magnetic tape cartridges in individual positions therein, comprising:
a gear train engagable with a mating rack on said magnetic tape cartridge magazine for controllably moving said magnetic tape cartridge magazine bidirectionally in a vertical direction;
means for positioning said magnetic tape cartridge magazine such that a selected one of said individual positions is located opposite said tape drive opening for access to said magnetic tape cartridge located therein; including:
a motor for powering said gear train; and



means for coupling said motor and said gear train to enable said motor to rotate said gear train and to prevent the rotation of said gear train when said motor is not rotating.

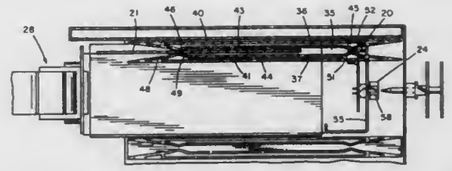


5,045,959
**DISC CARTRIDGE WITH OPENING FOR EXPOSING DISC EXTENDING TO THIN PORTION OF PERIPHERAL WALL PROVIDED WITH REINFORCEMENT**
Yoshikazu Ishimatsu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Feb. 2, 1990, Ser. No. 474,400
Claims priority, application Japan, Feb. 28, 1989, 1-22572[U]
Int. Cl.[5] G11B *23/033*
U.S. Cl. 360—133 17 Claims



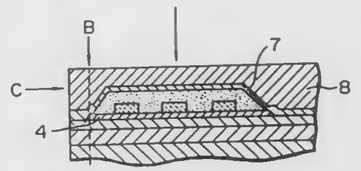
1. A disc cartridge comprising:
a disc-shaped record medium;
a cartridge body including a pair of cartridge halves of synthetic resin, at least one of said cartridge halves having an opening extending from a central portion thereof to a peripheral wall so as to expose a portion of said disc-shaped record medium accommodated in said body, a portion of said peripheral wall which extends across the outer end of said opening being thin relative to the remainder of said peripheral wall; and
reinforcing means of a material having a mechanical strength higher than that of said resin of said cartridge halves for reinforcing said thin portion of said peripheral wall.

5,045,960
**SELF-ALIGNING GUIDE AND TRACK FOR REMOVABLE DISK DRIVE MODULE**
Lon Eding, Zeeland, Mich., assignor to Zenith Data Systems Corporation, Buffalo Grove, Ill.
Filed Jun. 13, 1989, Ser. No. 365,322
Int. Cl.[5] G11B *17/02, 31/00, 5/02;* H05K *7/16*
U.S. Cl. 360—97.01 13 Claims



1. A computer component with a removable disk drive module, comprising: a computer component housing including an opening with stationary guide means, a terminal connector in the housing opening at its inner end, said drive module removably received in the housing opening and having guides interengageable with the stationary guide means, a connector fixed to a forward end of the drive module releasably engageable with the housing terminal connector, and an installation assembly for engaging the two connectors to hold the drive module in position in the housing, said stationary guide means in the housing and the drive module guides constructed to guide the drive module as it is inserted into the housing and including means to release a forward portion of the module relative to the housing just prior to connector engagement so that the forward end of the drive module is free to move in at least one orthogonal direction just prior to connector engagement, and alignment means adjacent to and separate from the connectors and separate from the drive module guides and the stationary guide means for aligning the connectors as the forward portion of the drive module is released by the stationary guide means.

5,045,961
**THIN FILM MAGNETIC HEAD**
Tetsuo Kobayashi, Kanagawa, and Sadanori Nagaike, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 758,464, Jul. 24, 1985, Pat. No. 4,749,439.
This application Jun. 6, 1988, Ser. No. 202,555
Claims priority, application Japan, Jul. 25, 1984, 59-152820
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[5] G11B *5/12*
U.S. Cl. 360—126 4 Claims

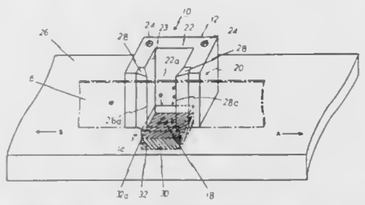



1. A thin film magnetic head having a predetermined small gap depth controlled with high precision formed by a process comprising the steps of:
forming a lower magnetic layer over a substrate, said substrate serving to support said lower magnetic layer;
forming a gap layer on said lower magnetic layer in such a manner that first and second end portions of said gap layer stand back from underlying first and second end portions of said lower magnetic layer to at least partly expose said first and second underlying end portions of said lower

magnetic layer, said first and second end portions of said lower magnetic layer being opposite to each other;
forming a conductor coil on said gap layer;
forming an insulating layer on said gap layer and on said conductor coil so that said conductor coil is buried in said insulating layer, wherein first and second end portions of said insulating layer overlie said first and second end portions of said gap layer;
removing, by selectively etching, a part of said first and second end portions of said insulating layer which overlie said first and second end portions of said gap layer so that each of said first and second end portions of said insulating layer stand back a predetermined distance from an edge of each of said first and second end portions of said gap layer to expose a predetermined part of each of said first and second end portions of said gap layer, said predetermined distance corresponding to said predetermined small gap depth;
forming an upper magnetic layer on said insulating layer, the exposed parts of said underlying first and second end portions of said lower magnetic layer and the exposed predetermined parts of said first and second end portions of said gap layer so that said upper magnetic layer is in contact with said lower magnetic layer at said first and second underlying end portions of said lower magnetic layer across said conductor coil from each other, and said predetermined exposed parts of said first and second end portions of said gap layer are sandwiched by said upper and lower magnetic layers;
forming a protective film on said upper magnetic layer; and
grinding one end of the resulting laminate assembly which includes said underlying first end portion of said lower magnetic layer until said first end portion of said gap layer is exposed, whereby said upper magnetic layer is kept contacted to said second end portion of said lower magnetic layer with said predetermined exposed part of said second end portion of said gap layer being kept sandwiched by said upper and lower magnetic layers, and a gap depth and a gap width of the magnetic head can be accurately defined, the gap depth being substantially identical to said predetermined distance by which each of said first and second end portions of said insulating layer stands back from an edge of each of said first and second end portions of said gap layer.

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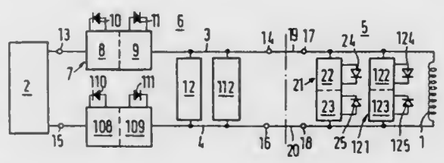
**5,045,962**
**MAGNETIC TAPE CLEANER**
**Yoshihisa Inoue, Hannou, and Shinichi Ishizuka, Higashikurume, both of Japan, assignors to Nakamichi Corporation, Kodaira, Japan**
**Filed Oct. 31, 1989, Ser. No. 429,838**
**Claims priority, application Japan, Oct. 31, 1988, 63-142451[U]; May 22, 1989, 1-58832[U]**
**Int. Cl.[5] G11B** *3/58*
**U.S. Cl. 360—128** **8 Claims**



1. A magnetic tape cleaner comprising:
tape scraper means engaging a magnetic tape to scrape magnetic powder from a recording face of said magnetic tape;
and magnetic means disposed relatively below said scraper in a direction in which said scraped magnetic powder falls to attract and adhere said scraped powder thereto.

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**5,045,963**
**PROTECTIVE CIRCUIT FOR THE INDUCTION COIL OF A MAGNETICALLY INDUCTIVE FLOW METER**
**Henning M. Hansen, Nydamvej, and Allan S. Pedersen, Kastanieallé, both of Denmark, assignors to Danfoss A/S, Nordborg, Fed. Rep. of Germany**
**Continuation of Ser. No. 135,567, Dec. 21, 1987, abandoned, which is a continuation of Ser. No. 928,792, Nov. 10, 1986, abandoned. This application Mar. 13, 1989, Ser. No. 323,246**
**Claims priority, application Fed. Rep. of Germany, Nov. 28, 1985, 3541974**
**Int. Cl.[5] H02H** *9/00*
**U.S. Cl. 361—87** **4 Claims**

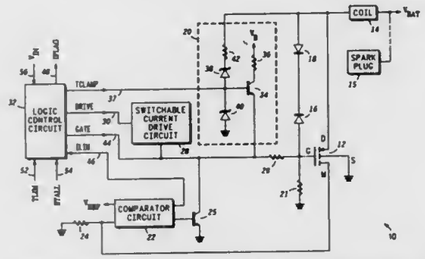


1. A magnetically inductive flow meter installation, comprising, an explosion risk zone and an explosion risk-free zone, an induction coil, a current reception circuit in said risk zone which includes said induction coil, first and second transistors each being effectively in parallel with said coil and arranged in mutually oppositely passing directions, a current supplying circuit in said risk-free zone connected to said current reception circuit for supplying positive and negative current pulses to said induction coil, control means for said transistors connected in parallel with said induction coil, said control means being operable during each of said positive and negative pulses to first bias a corresponding one of said transistors to a short circuiting conducting state and then to a blocking state, said control means being similarly operable to effect short circuiting of said induction coil through one of said transistors whenever the voltage in said current reception circuit rises due to an interruption of current flow in said current supplying circuit; and bidirectional current limiting means in said current supplying current being operable during normal operation whenever said short circuiting occurs by reason of said transistors being biased to short circuit conducting states by said positive and negative pulses.

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**5,045,964**
**THERMAL CLAMP FOR AN IGNITION COIL DRIVER**
**Paul T. Bennett, Phoenix, and Dunn William C., Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**
**Filed Apr. 30, 1990, Ser. No. 516,952**
**Int. Cl.[5] F02P** *11/00*
**U.S. Cl. 361—254** **14 Claims**

1. A circuit for driving an inductive load coupled thereto, comprising:
charging means for providing current through the inductive load when enabled and for inhibiting current through the inductive load when disabled;
a control circuit being responsive to a first input logic signal for providing a first output logic signal for enabling and disabling said charging means when said first output logic signal respectively is in a first and second logic state, said control circuit being responsive to a second input logic signal for both providing a second output logic signal and causing said first output logic signal to be in said second logic state; and
thermal clamping means responsive to said second output logic signal and being coupled between the inductive load and said charging means for providing current to said charging means thereby enabling said charging means to



both discharge the inductive load at a predetermined rate and clamp the voltage across the inductive load to a predetermined voltage wherein a collapse of current through the inductive load is prevented.

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**5,045,965**
**ELECTRICAL CAPACITOR**
**Ferdinand Utner, Regensburg, and Udo Hieber, Heidenheim-Schnaith, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**
**Filed Nov. 29, 1989, Ser. No. 442,700**
**Claims priority, application European Pat. Off., Dec. 14, 1988, 88120854.0**
**Int. Cl.[5] H01G** *1/11, 9/10*
**U.S. Cl. 361—275** **7 Claims**

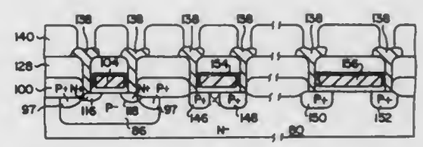


1. An electrical capacitor comprising:
a metallic housing;
a stiff metallic cover connected to enclosing said housing in a moisture-tight and gas-tight seal; and
at least one pair of spaced insulating bushings connected to and extending through said cover to define a lead-through spacing,
said cover comprising the shape of a spherical cap having an outwardly-directly arch and being sufficiently stiff so as to prevent the cover from bellying out and thus enlarging the lead-through spacing.

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**5,045,966**
**METHOD FOR FORMING CAPACITOR USING FET PROCESS AND STRUCTURE FORMED BY SAME**
**Martin J. Alter, Los Altos, Calif., assignor to Micrel Semiconductor, Sunnyvale, Calif.**
**Filed Sep. 17, 1990, Ser. No. 583,779**
**Int. Cl.[5] H01G** *4/06;* **H01L** *21/70*
**U.S. Cl. 361—313** **25 Claims**

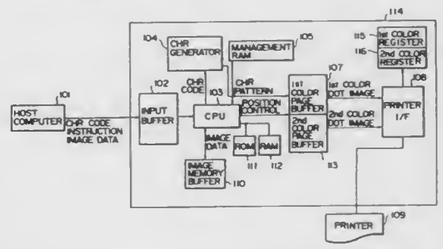
1. A method of forming a capacitor on a same substrate as an MOS transistor comprising the steps of:
forming a dielectric layer over a top surface of a substrate of a first conductivity type;
forming a conductive plate over said dielectric layer;
depositing dopants of a second conductivity type into said substrate to form bottom plate regions in said substrate aligned with peripheral portions of said plate;
driving in said dopants such that said dopants within said bottom plate regions side-diffuse under said plate, said plate having a length less than a permissible gate length of a lateral MOS transistor if said MOS transistor was formed in said substrate so as to have source and drain



junction depths substantially equal to junction depths of said bottom plate regions after said step of driving in said dopants, given a specified operating voltage for said MOS transistor and said capacitor; and
electrically connecting said bottom plate regions and said plate within a circuit so as to act as a capacitor in said circuit,
wherein said dielectric is of a thickness to not allow tunnelling of electrons through said dielectric under said specified operating voltage for said capacitor.

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**5,045,967**
**MULTI-COLOR IMAGE FORMING APPARATUS**
**Masaru Igarashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Apr. 8, 1988, Ser. No. 179,263**
**Claims priority, application Japan, Apr. 15, 1987, 62-090977**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—518** **9 Claims**



1. A multi-color image forming apparatus comprising:
a first memory means for storing a plurality of image data together with corresponding color data;
output means for outputting image data onto an output medium;
designation means for designating desired ones of the plurality of image data stored in said first memory means, and positions on said output medium at which the designated image data are to be output;
a plurality of second memory means each for storing designated image data for a different color;
control means for controlling said output means and said second memory means to output the designated image data at their respective positions and in their different colors on said output medium
comparison means for comparing a color in which the image data can be output by said output means with a color corresponding to the color data of the image data designated by said designation means; and
alarm means for, when a comparison by said comparison



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means shows no correspondence, providing an indication to that effect.

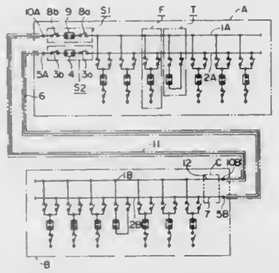
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**5,045,968**

## GAS INSULATED SWITCHGEAR WITH BUS-SECTION-UNIT CIRCUIT BREAKER AND DISCONNECT SWITCHES CONNECTED TO EXTERNAL LEAD-OUT MEANS CONNECTABLE TO OTHER GAS INSULATED SWITCHGEAR

**Hiroshi Suzuyama, Hitachi; Yoshirou Suzuki, Kuji; Takehiro Kikuchi, and Minoru Sakaguchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 9, 1989, Ser. No. 321,102**
**Claims priority, application Japan, Mar. 11, 1988, 63-56109**
**Int. Cl.[5] H02B** *7/01, 5/06, 1/20*
**U.S. Cl. 361—335** **33 Claims**



1. A gas insulated switchgear equipment device included in a substation equipment device, said substation equipment device comprising at least one gas insulated main bus bar arranged in a line on an attachment surface and a plurality of feeder units arranged along a longitudinal direction of said gas insulated main bus bar, each of said plurality of feeder units having one end connected to said gas insulated main bus bar and another end connected to an insulating terminal and including a circuit breaker, wherein:

a bus-section-unit is arranged on a portion of said gas insulated main bus bar of said substation equipment device;

said bus-section-unit is insulated by gas and has at least one bus-section-unit circuit breaker having a first and a second end and disconnecting switches connected to both ends of the bus-section-unit circuit breaker; and

one end of said bus-section-unit is connected to said gas insulated main bus bar of said substation equipment device and another end of said bus-section-unit is provided with at least one external lead-out means connectable to external connecting means of another substation equipment device provided at a location other than a location of said substation equipment device in which said gas insulated switchgear equipment device is included.

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**5,045,969**

## KEYED DISCONNECT OF ELECTRIC SERVICE AT AN ELECTRIC METER LOCATION

**Steven G. Menasco, Brentwood, Tenn., assignor to CIC Systems, Inc., Brentwood, Tenn.**

**Filed Feb. 1, 1990, Ser. No. 473,572**
**Int. Cl.[5] H02B** *1/00*
**U.S. Cl. 361—364** **1 Claim**

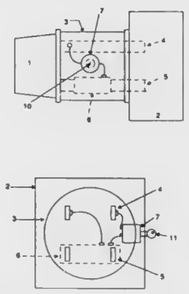
1. A metering system for measuring electric power usage, comprising:

(a) an electric meter and socket therefor;

(b) a sleeve adapted for being seated into the socket and for supporting the electric meter, the sleeve having line-side busses and load-side busses so that electrical connection is made between the electric meter and the socket through the busses in the sleeve;

(c) a disconnect switch, mounted in the sleeve, for enabling the opening and closing of the busses providing the electric power; and

(d) a key-activated switch mounted in the sleeve adjacent a key slot therein and in electrical connection between the



load-side busses and the disconnect switch so as to activate and deactivate the disconnect switch, whereby in turning the key in one direction or the other, the disconnect switch may be alternately opened and closed.

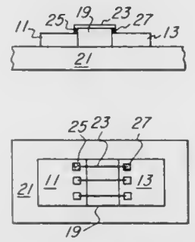
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**5,045,970**

## JOINED SUBSTRATES HAVING PLANAR ELECTRICAL INTERCONNECTION OF HYBRID CIRCUITS

**Curt R. Raschke, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 248,706, Sep. 26, 1988, abandoned, which is a division of Ser. No. 53,459, May 22, 1987, Pat. No. 4,815,208. This application Jan. 26, 1990, Ser. No. 470,404**
**Int. Cl.[5] H05H** *7/20*
**U.S. Cl. 361—386** **12 Claims**



1. An electronic hybrid circuit which includes:

(a) a first semiconductor substrate having an electronic circuit formed on a first surface thereof;

(b) a second semiconductor substrate spaced from said first semiconductor substrate and having an electronic circuit formed on a first surface thereof;

(c) a unitary volume of electrically insulating material secured to said first and second substrates, disposed therebetween and having a first surface, each of said first surfaces of said first semiconductor substrate, said second semiconductor substrate and said unitary volume being coplanar; and

(d) interconnect lines disposed on said electrically insulating material, said interconnect lines extending onto and connected on said first surface of each of said first and second substrates.

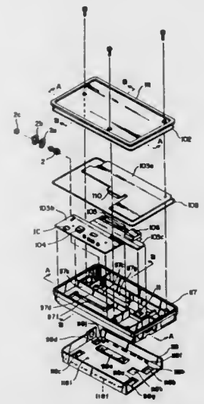


**5,045,971**

## ELECTRONIC DEVICE HOUSING WITH TEMPERATURE MANAGEMENT FUNCTIONS

**Hideyo Ono; Kunitoshi Yoshitake, and Nobuyuki Kakuta, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 6, 1989, Ser. No. 376,041**
**Claims priority, application Japan, Apr. 18, 1989, 1-96480**
**Int. Cl.[5] H05K** *9/00*
**U.S. Cl. 361—386** **78 Claims**



1. A housing for an electronic device having a first circuit with an operating parameter affected by variations in temperature and a second circuit developing undesired heat to be removed therefrom, said housing comprising:

a case having a bottom and sides formed of a relatively thermally non-conductive material having at least first and second thermally separated cavities for receiving said first and second circuits respectively, said case having an opening between said second cavity and the exterior of said case;

a cover for said case;

a heat transfer plate, thermally communicating between said second circuit and the exterior of said case through said opening for removing heat to the exterior of the case;

said first circuit being thermally isolated from the environment by said thermally non-conductive case while undesired heat is removed from said second circuit via said heat transfer plate to thereby efficiently control the temperature of said first and second circuits.

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**5,045,972**

## HIGH THERMAL CONDUCTIVITY METAL MATRIX COMPOSITE

**Edward C. Supan, Chatsworth; Joseph F. Dolowy, Jr., West Hills, both of Calif., and Bradley A. Webb, Las Vegas, Nev., assignors to The Standard Oil Company, Cleveland, Ohio**

**Filed Aug. 27, 1990, Ser. No. 573,609**
**Int. Cl.[5] H02B** *1/00*
**U.S. Cl. 361—387** **8 Claims**

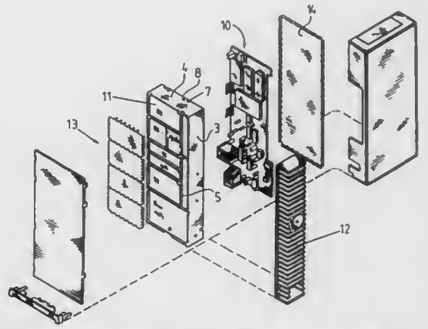
1. An electronic device having on at least one surface thereof a thermally conductive composite layer as a heat sink consisting essentially of a metal matrix selected from the group consisting of aluminum, magnesium, copper, silver and alloys thereof and diamond particles having a particulate size ranging from about 1 to 50 $\mu$m.

**5,045,973**

## PROCEDURE FOR MANUFACTURING A RADIO TELEPHONE CHASSIS AND A CHASSIS MANUFACTURED ACCORDING TO THIS PROCEDURE

**Matti J. Saarela, Halikko; Lasse J. Uronen, Salo, and Heikki A. J. Salo, Teijo, all of Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland**

**Filed Jan. 31, 1990, Ser. No. 473,922**
**Claims priority, application Finland, Feb. 3, 1989, 890543**
**Int. Cl.[5] H05K** *1/14, 3/36*
**U.S. Cl. 361—395** **14 Claims**



1. A radio telephone chassis on which a first and second circuit board with components fixed thereto are mounted, comprising:

a box-like body formed by cutting off square areas at the corners of a rectangular board blank to form marginal parts and bending the marginal parts by 90 degrees in the same direction, whereby a first set of side walls is formed;

the box-like body having a bottom formed by strip-like parts created by punching out areas of the board blank and bending nearly the entire the part of the remaining material strips 90 degrees about their longitudinal axes so that said parts are parallel to at least one side wall, the first circuit board being mounted on said bent strip-like parts; and

the height of said strip-like parts is equal to or greater than the height of the component extending farthest from the surface of the first circuit board.

8. A procedure for manufacturing a radio telephone chassis and for mounting circuit boards on the chassis, comprising the steps of:

cutting off square areas at the corners of a rectangular board blank outside of an imaginary line connecting inner corners on the board blank to form side and end marginal areas;

punching out areas of the board blank within the imaginary line such that only strip-like parts are left over in the board blank in that area;

bending the entire surface of the strip-like parts 90 degrees about their longitudinal axis so that said parts are parallel to at least one edge of the board blank; and

bending the marginal parts by 90 degrees in the same direction as the strip like parts, whereby a box-like radio telephone chassis with side walls formed by the side and end marginal parts and a bottom with strip-like parts is created.

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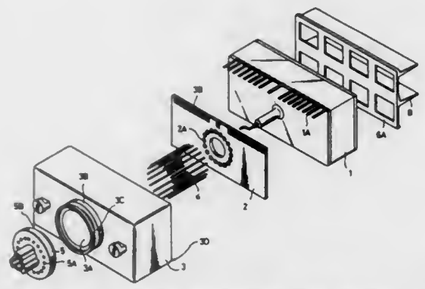


5,045,974

## DISPLAY TUBE ASSEMBLY AND MOUNTING PROCESS THEREOF

Akio Ohkoshi, Tokyo; Hideaki Nakagawa, Kanagawa; Koji Tsuruta, and Hiroshi Kato, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1990, Ser. No. 573,793
Claims priority, application Japan, Aug. 28, 1989, 1-221022
Int. Cl.[5] H05K *7/00*; H04N *5/64*
U.S. Cl. 361—399 4 Claims



1. A method of assemblying a display tube assembly comprising:
a display tube having a plurality of leads;
a corresponding plurality of plug pins respectively connected to said plurality of leads;
a printed circuit board mounted on said display tube; and
a case covering said display tube and said printed circuit board with said plug pins protruding outwardly, from said case characterized in that said display tube assembly is assembled by the following steps:
a first step of mounting said plug pins on said printed circuit board;
a second step of mounting said printed circuit board on said display tube with said plug pins connected through corresponding conductive patterns to said leads of said display tube;
a third step of putting said display tube in said case with said plug pins protruding outwardly through an opening thereof; and
a fourth step of making said case watertight.

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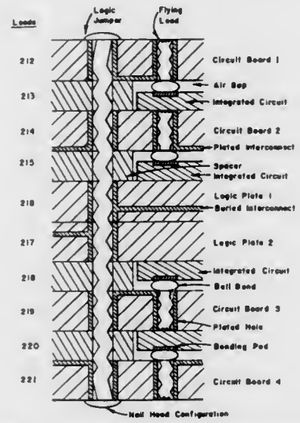
5,045,975

## THREE DIMENSIONALLY INTERCONNECTED MODULE ASSEMBLY

Seymour R. Cray, Chippewa Falls, and Nicholas J. Krajewski, Elk Mound, both of Wis., assignors to Cray Computer Corporation, Colorado Springs, Colo.

Continuation of Ser. No. 53,142, Mar. 21, 1987. This application Jul. 27, 1989, Ser. No. 386,290
Int. Cl.[5] H05K *1/10*
U.S. Cl. 361—412 36 Claims

1. A three-dimensionally electrically interconnected circuit board module apparatus, comprising:
a plurality of circuit boards coplanar in a plane defined by an x axis and a y axis, each of the circuit boards located along a z axis, each circuit board having a prefabricated conductor pattern, a plurality of unpackaged integrated circuit chips mounted to the conductor pattern of at least one circuit board, a plurality of power through-plated holes electrically connected to the conductor pattern of each circuit board, and a plurality of logic through-plated holes electrically connected to the conductor pattern of each circuit board;
at least one power plate coplanar with and located along the z axis from said circuit boards and having a prefabricated conductor pattern for distributing electrical power, a plurality of through-plated holes electrically connected to the conductor pattern of the power plate, at least two of the through-plated holes on the power plate located substantially in respective axial alignment along the z axis with said power through-plated holes on said coplanar circuit boards;
at least one logic board coplanar with and located along the z axis from said circuit boards and having a prefabricated conductor pattern for communicating electrical signals therealong, a plurality of through-plated holes electrically connected to the conductor pattern of the logic board, at least two of the through-plated holes on the logic board located substantially in respective axial alignment along




the z axis with said logic through plated holes on said coplanar circuit boards;
a plurality of electrically conductive z-axis power jumpers, each power jumper electrically connected to a through-plated hole on said power plate and an axially aligned power through-plated holes on said circuit boards;
a plurality of electrically conductive z-axis logic jumpers, each logic jumper electrically connected to a through-plated hole on said logic board and to an axially aligned logic through-plated hole on-said circuit boards;
a power input means for applying electrical power to the conductor pattern of said power plate; and
a spacer means for maintaining each of said circuit boards, said power plate and said logic board in a spaced, fixed, and coplanar relationship located along the z axis.

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5,045,976

## DEVICE FOR MOUNTING A METAL ELEMENT ON A BOARD

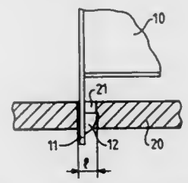
Pierre Guilleminot, Rambouillet, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 362,716, Jun. 6, 1989. This application Oct. 15, 1990, Ser. No. 598,569
Claims priority, application France, Jun. 14, 1988, 88 07908
Int. Cl.[5] H05K *7/02*
U.S. Cl. 361—417 3 Claims

1. An assembly comprising an element (10) provided on a printed circuit board (20) having a slot (21), said element comprising a fixing lug (11) extending from said element and comprising a projection (12) extending from said fixing lug (11) and



engaging a side of said slot (21), said projection being quarter sphere shaped and said projection having a thickness at least




equal to the width (l) of said slot and minimizing solder containing capacity of said slot.

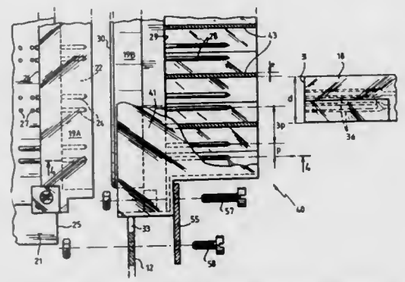
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5,045,977

## SHIELDING ASSEMBLY FOR A TERMINAL STRIP CONNECTED TO AN ELECTRICAL DEVICE LOCATED INSIDE A CHASSIS

Charles Cesar, Saint Martin D'Heres, France, assignor to Bull S.A., Paris, France

Filed Sep. 18, 1990, Ser. No. 584,452
Claims priority, application France, Sep. 19, 1989, 89 12288
Int. Cl.[5] H05K *9/00*
U.S. Cl. 361—424 9 Claims



1. A shielding assembly and a terminal strip connected to an electrical device located inside a chassis, the terminal strip including an elongated insulating body **23A, 23B** having a coupling face **29** designed to receive a plurality of complementary shielded connectors **18**, the elongated insulating body being provided with contact elements of a first type **28**, connected to the circuits of the electrical device and designed to be connected to contact elements of a second type **36** of each of said complementary shielded connectors, said shielding assembly being characterized by the insulating body being positioned inside the chassis so that its contact elements **28** pass through an opening **33** in one metal housing panel **12** of said chassis, said shielding assembly comprising:
two metal walls **41, 42**, of a shield unit covering two faces **34, 35** in the insulating body, said metal walls adjacent to said coupling face **29**, said metal walls extending from the interior to the exterior of said chassis through opening **33** so that their outer external edges **47, 49**, are parallel to said housing panel **12**, and extend beyond ends of the contact elements **28** of said insulating body; and
a plurality of metal partitions **43** located between walls **41, 42** and perpendicular thereto and to said coupling face **29**, said partitions each extending from said face **29** as far as said outer external edges **47, 49** of said walls, forming with these walls, a plurality of receiving recesses **50** for complementary shielded connectors, each recess being so dimensioned that the walls and partitions delimiting it come in contact with the shielding of the complementary connector inserted into this recess, said shielding assembly being connected electrically to housing panel **12** through a conducting element **55** that does not enter the interior of the chassis.

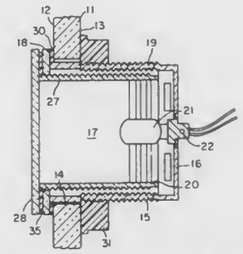
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5,045,978

## UNDERWATER LIGHTING FIXTURE

Benjamin H. Gargle, 5440 Los Estados, Yorba Linda, Calif. 92689

Continuation of Ser. No. 361,241, Jun. 5, 1989, abandoned. This application Apr. 18, 1990, Ser. No. 512,533
Int. Cl.[5] F21V *33/00*
U.S. Cl. 362—101 2 Claims



1. An underwater lighting fixture for use in a water enclosure defined by an integral wall providing access after installation of the enclosure only to an interior surface thereof comprising:
(a) an outer housing shell having a body defining inner and outer cylindrical surfaces and an open forward end and a closed base end thereof, an outwardly extending circular flange being integral with the forward end, and screwthreads disposed uniformly upon the inner surface, the body being adapted to be disposed through an aperture in the wall, the forward end being in communication with the water enclosure;
(b) a lamp axially mounted in the base end of said outer housing shell;
(c) a first sealing gasket disposed about the outer cylindrical surface of the body and being substantially adjacent to and in firm contact with the flange;
(d) an annular locking member removeably coupled about the outer surface of the body and adapted to urge said sealing gasket into forced engagement between the flange and the wall;
(e) a lens assembly having a cylindrical body having first and second ends and a circular lens member enclosing the first end and concentrically extending outwardly therefrom, the inner surface of said cylindrical body at the second end thereof being disposed about said lamp, the outer surface of the cylindrical body of said lens assembly being adapted to be disposed within the forward end of, and be in engagement with the spiral screwthreads in the inner cylindrical surface of the body of said outer housing shell whereby the disengagement of said lens assembly from said outer housing shell allows replacement of the lamp from the interior surface of said water enclosure; and
(f) a second sealing gasket disposed about the cylindrical body of said lens assembly and adapted to be place din forced engagement with the flange and the lens member creating a watertight seal.

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5,045,979

## SAFETY LIGHT BELT

Katrine B. Stevens, 10 Hamilton St., Salem, Mass. 01970

Filed Oct. 22, 1990, Ser. No. 600,741
Int. Cl.[5] F21L *15/20*
U.S. Cl. 362—108 7 Claims

1. A safety light belt worn by a person comprising:
a belt having two ends, an outer face and an inner face, said

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belt having a fastener positioned and attached centrally on its outside face;

a holder attached centrally to the belt outer face, said holder having a back with a fastener attached thereto, a top, bottom, two sides, an open front, and a quadrilaterally



shaped cross-section, wherein said holder is attached to said belt fastener by means of said holder back fastener; and

a miniature flashlight inserted into said holder and positioned therein so that said miniature flashlight illuminates an area from one to three feet in front of the belt wearer.

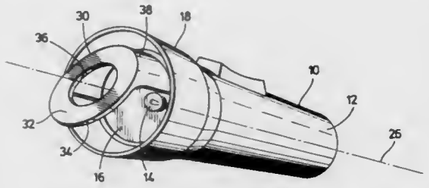
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**5,045,980**

**FLASHLIGHT ADAPTER**

**Richard T. Harvey, Roswell, Ga., assignor to Roy Anderson, Fort Worth, Tex.**

**Filed Apr. 9, 1990, Ser. No. 506,479**
**Int. Cl.[5] F21L *7/00***
**U.S. Cl. 362—202** **8 Claims**



1. An adapter for a flashlight, the flashlight having a body extending along a longitudinal axis and containing a light source for emitting light, a reflector element for reflecting emitted light outwardly through a lens end of the flashlight body, a lens through which the emitted light passes, and a removable hollow globe mounted at and concentric to the lens end for focusing the emitted light along a path generally parallel to the longitudinal axis of the flashlight body, the globe further having an internal shoulder for retaining the lens sandwiched between the internal shoulder and the flashlight body, the adapter comprising:

a mounting flange adapted to be sandwiched between the internal shoulder of the globe and the lens end for mounting the adapter to the flashlight while permitting the light to continue through the globe substantially unimpeded;

a collar connected to the mounting flange, extending outward through the globe of the flashlight and having an outer end adapted to be located outward of the globe; and

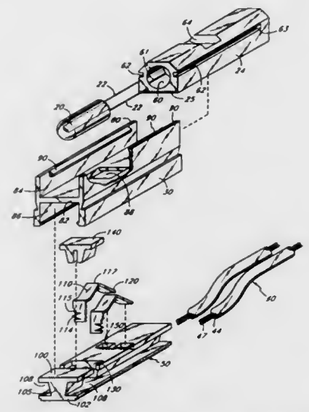
an outer flange having a reflecting surface and a centrally located aperture and mounted by its reflecting surface to the outer end of the collar, the outer flange adapted to be mounted in the path of light emitted from the lens end and at an angle transverse to the longitudinal axis of the flashlight, wherein the longitudinal axis passes through the centrally located aperture, for permitting the reflecting surface to intercept and redirect a portion of the emitted light along and generally parallel to a second axis which passes through the centrally located aperture in the outer flange for permitting a user to view through the centrally located aperture and along the second axis an area illuminated by the redirected light.

**5,045,981**

**LIGHTING SYSTEM WITH EASILY REPLACEABLE BULBS AND RETROFITTING COVER**

**Thomas T. Nagano, Cerritos, Calif., assignor to Tivoli Industries, Inc., Santa Ana, Calif.**

**Filed Feb. 9, 1990, Ser. No. 477,615**
**Int. Cl.[5] F21S *1/14***
**U.S. Cl. 362—219** **24 Claims**



15. A low-voltage light fixture for use with a decorative lighting system, said fixture configured to facilitate the insertion and removal of light bulbs, said fixture further configured to improve the conductive contact with said bulb in said fixture despite repeated replacement of said bulbs, said fixture comprising:

the light bulb, which has a pair of conductive leads;

a socket having an underside, a pair of sides, and a topside, said socket holding said light bulb so that a portion of said conductive leads is exposed on the underside of said socket, said socket including a depression formed on the underside of said socket so that said conducting leads extend over said depression;

a carriage including two walls separated by a cross-piece, said cross-piece forming an upper slot and a lower slot in said carriage and having an aperture therethrough;

a pair of conducting wires;

a base within said lower slot, said base having a pair of lateral slots for the insertion of said conducting wires; and

a pair of conducting terminals, each of said conducting terminals including a contacting portion which is in electrical contact with said conducting wires, an arcuate portion which protrudes through said aperture in said cross-piece and is in electrical contact with one of said conductive leads, said arcuate portion being proximate to said depression on the underside of said socket, said arcuate portion exerting a force against said depression to hold said socket on said carriage and contact said leads in said depression.

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**5,045,982**

**WIDE ANGLE WARNING LIGHT**

**H. Wayne Lyons, Killingworth, Conn., assignor to Whelen Technologies, Inc., Chester, Conn.**

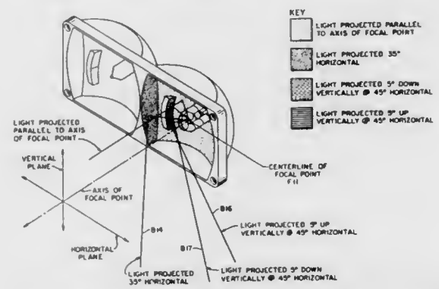
**Continuation-in-part of Ser. No. 324,892, Mar. 17, 1989, abandoned. This application Dec. 19, 1989, Ser. No. 452,966**
**Int. Cl.[5] F21V *7/00***
**U.S. Cl. 362—241** **24 Claims**

1. A light having a wide angle radiation pattern comprising:

housing means comprising at least a pair of laterally spaced socket means for mounting respective light generators,



each said socket means having an associated concave reflector, each said reflector comprising a first reflective surface which is a portion of a paraboloid of revolution about a first axis through said socket means, the axes of said reflector first surfaces defining a plane, each said reflector further comprising second and third laterally spaced reflective surfaces which are portions of paraboloids of revolution respectively about second and third



axes, said paraboloids of revolution all having a common focal point located on said first axis, said second and third axes generally lying in said plane and being canted relative to said first axis whereby said housing means defines at least six coplanar directional axes of high intensity light emission; and

a light generator supported in each of said socket means, a light emitting portion of each said generator being located on said common focal point.

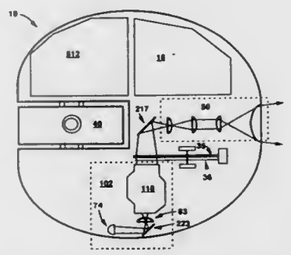
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**5,045,983**

**COMPUTER CONTROLLED LIGHT WITH CONTINUOUSLY VARIABLE COLOR TEMPERATURE, COLOUR, MAGNIFICATION, FOCUS, AND POSITION**

**Gary A. Shields, 134 Northgate Drive, Welland, Ontario, Canada L3C 5Y5**

**Filed Apr. 25, 1990, Ser. No. 514,466**
**Claims priority, application United Kingdom, Apr. 26, 1989, 8909515**
**Int. Cl.[5] F21V *9/00***
**U.S. Cl. 362—293** **1 Claim**



1. A lighting system for controlling the colour, colour temperature, magnification and focus of a light beam comprising:

a) means for providing a source of wide spectrum light of predetermined intensity,

b) means for deflecting that portion of said beam having a wavelength of from 380 nm to 700 nm through a heat absorbing condenser lens,

c) an electronically controlled colour generating prism having:

i) means for separating said deflected beam of light into a first portion, a second portion and third portion,

ii) a first liquid crystal window for controlling the intensity of said first portion and a first colour mixing window immediately downstream from said crystal window for passing said first portion having a wavelength of from 524 nm to 535 nm and thereby producing a first colour portion of said light,

iii) a second liquid crystal window for controlling the intensity of said second portion and a second colour mixing window immediately downstream therefrom for passing said second portion having a wavelength of from 555 nm to 570 nm and thereby produce a second colour portion of said light,

iv) a third liquid crystal window for controlling the intensity of said third portion and a third colour mixing window immediately downstream of said crystal window for passing said second portion having a wavelength of from 445 nm to 450 nm and thereby produce a third colour portion of said light,

v) means for discharging said first, said second and said third colour portions of light from said prism,

d) means for recombining said first, second and said third colour portions of light downstream of said prism to provide a composite beam, said means including an electronically responsive circuit for varying the intensity of each of said colour portions separately to thereby provide said composite beam with a predetermined colour and intensity.

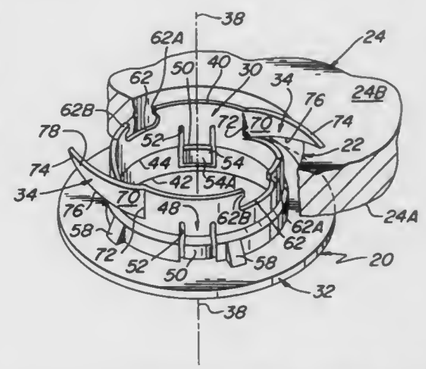
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**5,045,984**

**MOUNTING DEVICE FOR RELEASABLE SECUREMENT TO A PANEL**

**Charles Trowbridge, 368 Thompson Mill Rd., New Hope, Pa. 18938, and John Rodgers, 2152 Bethel Rd., Lansdale, Pa. 19446**

**Filed Aug. 10, 1990, Ser. No. 565,533**
**Int. Cl.[5] F21V *7/70***
**U.S. Cl. 362—365** **44 Claims**



1. A device for holding a first means therein and for releasable mounting within a hole in a panel, said panel having first and second opposed surfaces through which said hole extends, said device comprising a body portion, a flanged portion, and releasable securement means, said body portion being hollow for receiving said first means therein and having a central longitudinal axis and a pair of end portions, said body portion being configured to be readily inserted within said hole, said flanged portion being secured to one of said end portions of said body portion and extending outward beyond the outer periphery of said body portion, said releasable securement means comprising a projection having a free end portion, said projection extending outward from the periphery of said body portion at an acute angle to the tangent of said body portion at the location from which said projection extends and being

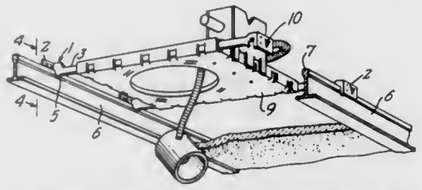
VOL 1130 ISS 1 SE 3 1991 UMI



moveable from an extended position to a retracted position and vice versa, said free end portion being spaced away from said central axis by a distance greater than the radius of said hole when said projection is in said extended position but less than the radius of said hole when in said retracted position, said projection being arranged to be moved from said extended position to said retracted position as said body portion is inserted within said hole by twisting said device about said axis in a first rotational direction while pushing said device into said hole, said flanged portion engaging a portion of said first surface of said panel contiguous with said hole when said body portion is in a predetermined position within said hole, said projection moving back to said extended position by the time that said body portion is in said predetermined position to hold said device in place, said device being readily removable from within said hole by pulling said device out of said hole while twisting said device about said axis in said first rotational direction, whereupon said projection moves to said retracted position.

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**5,045,985**
**SELF LOCKING ADJUSTABLE MOUNTING BARS**
**Neil Russo, Howell, N.J., and Kingsley Chan, Mission Viejo, Calif., assignors to Lightolier, Inc., Secaucus, N.J.**
**Filed Mar. 15, 1990, Ser. No. 493,906**
**Int. Cl.[5] B42F *13/00***
**U.S. Cl. 362—366** **12 Claims**

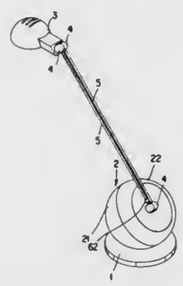


1. An L-shaped mounting bar for mounting a lighting fixture in a ceiling, said L-shaped mounting bar being adapted for attachment to an inverted T-shaped ceiling runner having an upstanding leg with an upper edge extending along the length of said inverted T-shaped ceiling runner, said L-shaped mounting bar comprising:
- a main bar section having first and second end portions, said first end portion further having a notch adapted to receive said upper edge of said inverted T-shaped ceiling runner;
- an end bar section orthogonally projecting from said first end portion of said main bar section; and
- a tab projecting from said first end portion of said main bar section, adjacent said notch, and capable of being bent toward said notch so as to engage a portion of said upstanding leg of said inverted T-shaped ceiling runner.

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**5,045,986**
**STRUCTURE OF DESK LAMP**
**Jack Lin, 4F, No. 112, Wen Lin North Rd., Taipei, Taiwan**
**Filed Nov. 30, 1990, Ser. No. 620,121**
**Int. Cl.[5] F21V *21/26***
**U.S. Cl. 362—413** **2 Claims**

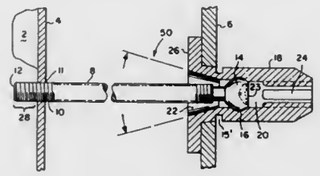
1. A desk lamp, comprising:
- a base comprising a circular recess in its center having a round hole therethrough;
- a rotary stand comprising a hemi-spherical shell having a cap secured thereto by means of bolts and nuts, said rotary stand being secured to said base and permitted to rotate on its own axis, said cap having a plane surface with a bolt hole made thereon;
- a lamp holder having an axial hole therethrough with an internal circular groove made thereon for the insertion therein of an axle, said axle comprising a front rod portion having a circular groove with a rubber ring mounted thereon, said front rod being inserted in said axial hole with its rubber ring set in said internal circular groove permitting said lamp holder to rotate through an angle of 360° relative to said axle, said axle also comprising a plane surface having a bolt hole theren;
- two pairs of rotary connectors each pair being respectively fastened to the plane surface of said cap and said axle, said rotary connectors each comprising an axle sleeve having an upper circular groove with a rubber ring mounted thereon and a lower circular groove, and a shielding



cover covering on said axle sleeve, said shielding cover having two opposite axial holes thereon; and
- a connecting rod assembly adjustably connecting said lamp holder to said rotary stand and comprising first and second rods in parallel with each other and having both ends respectively secured to the axial holes of the shielding cover of said rotary connectors by means of bolts and movably positioned in the lower circular grooves of the sockets of said rotary connectors.

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**5,045,987**
**VEHICLE HEADLAMP POSITION ADJUSTMENT ASSEMBLY**
**David J. Hebert, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio**
**Filed Oct. 4, 1990, Ser. No. 592,435**
**Int. Cl.[5] F21M *3/18***
**U.S. Cl. 362—421** **5 Claims**

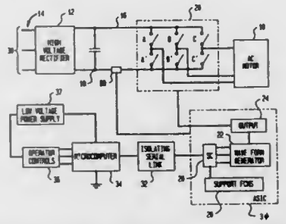


1. An assembly for adjusting position of a vehicular headlamp mounted on a movable frame relative to a fixed frame on the vehicle, said assembly comprising:
- a screw having external threads extending over at least a portion of the length away from a first end thereof and adapted to threadingly engage threads of a threaded opening in one of the fixed and movable frames so as to cause the movable frame to move in opposite directions for adjusting the position thereof in response to rotation of the screw in opposite directions, said screw having a boss at an opposite end thereof that is configured to enable the screw to pivot thereabout and is provided with means for receiving an adjustment tool for rotating the screw;
- a support member adapted to extend through an opening in the other of the fixed and movable frames and be removably secured thereto by a clip;
- a cavity disposed within the support member, said cavity configured to receive the screw boss thereinto to provide a ball and socket type coupling operative to enable the screw to pivot threat relative the support member;
- a first access opening extending in one direction through the support member and communicating with the cavity, said access opening adapted to receive the adjustment tool therethrough for receipt by the boss adjustment means; and
- a second opening extending in an opposite direction through the support member and communicating with the cavity, said opening adapted to receive the screw boss therethrough and lockingly couple the screw to the support member and enable the screw to pivot thereat a predetermined amount relative thereto.



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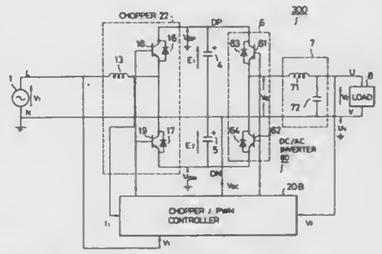
**5,045,988**
**ISOLATED ADJUSTABLE FREQUENCY AC INVERTER CONTROL**
**David J. Gritter, Racine, Wis.; Michael A. Shanblatt, and Elias G. Strangas, both of East Lansing, Mich., assignors to Eaton Corporation, Cleveland, Ohio**
**Filed Jul. 31, 1990, Ser. No. 560,113**
**Int. Cl.[5] H02M *3/335***
**U.S. Cl. 363—35** **7 Claims**



7. An induction motor control circuit comprising:
- a low voltage user interface circuit including a user input device for entering operator commands and a controller connected to said user input device for receiving said operator commands and generating corresponding motor control commands;
- a source of high voltage DC electricity;
- a plurality of semiconductor controlled switching devices connected to said source of high voltage DC electricity and the induction motor having selectable conducting and nonconducting states;
- a waveform generator directly connected to said plurality of semiconductor controlled switching devices for controlling said conducting and nonconducting states of said plurality of semiconductor switching devices in accordance with received motor commands for control of the motion of the induction motor, whereby the waveform generator is connected to the high voltage DC electricity; and
- an isolation device coupled to said user interface circuit and said waveform generator circuit for transmitting said motor commands from said user interface circuit to said waveform generator circuit while isolating said user interface circuit from said source of high voltage DC electricity.

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**5,045,989**
**PWM POWER SUPPLY ELIMINATING MODULATION-FREQUENCY COMPONENTS FROM GROUND POTENTIALS**
**Shigetoshi Higaki, Tokyo, and Hata, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Sep. 6, 1989, Ser. No. 403,467**
**Claims priority, application Japan, Sep. 6, 1988, 63-221255; Jan. 27, 1989, 1-16174**
**Int. Cl.[5] H02M *5/45***
**U.S. Cl. 363—37** **14 Claims**



1. A power supply apparatus comprising:
- chopper means, coupled to an AC (alternating current) power source capable of supplying a first AC voltage having a low frequency from a pair of output terminals, for chopping said first AC voltage by switching first and second chopper switching elements to obtain a positive DC (direct current) voltage from a positive half cycle of said first AC voltage appearing at one output terminal of said output terminals and a negative DC voltage from a negative half cycle of said first AC voltage appearing at said one output terminal with a common voltage appearing at another output terminal of said output terminals which is a common voltage output terminal; and
- DC-to-AC inverter means including a pair of third and fourth inverter switching elements and a chopper/PWM (pulse width modulation) controller for controlling chopper operations of said first and second chopper switching elements so as to obtain corresponding voltages to said positive and negative DC voltages and also for controlling switching operations of said third and fourth inverter switching elements in a PWM control mode so as to invert said positive and negative DC voltages into a second AC voltage having a modulation frequency higher than said low frequency with respect to said common voltage output terminal, whereby said second AC voltage contains no modulation frequency component.

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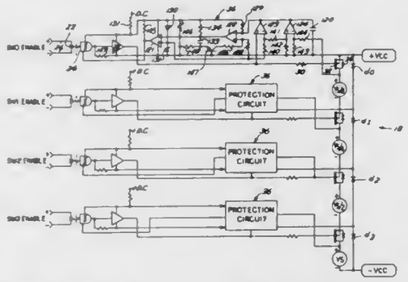
**5,045,990**
**SIXTEEN LEVEL POWER SUPPLY WITH ASYNCHRONOUS CONTROLLER**
**Gerald R. Stanley, Osceola, Ind., assignor to Crown International, Inc., Elkhart, Ind.**
**Filed May 3, 1990, Ser. No. 518,759**
**Int. Cl.[5] H02M *7/537***
**U.S. Cl. 363—43** **7 Claims**

1. A device for converting a plurality of analog voltage sources into a digital multibit word, said device including a plurality of comparing means each having an input for connection to one of said voltage sources and to a shared analog reference voltage source for comparing the value of said shared analog reference voltage source to the value of said one voltage source, each comparing means having an output voltage constituting one bit of said digital multibit word, said plurality of comparing means operatively associated with one another such that the output voltage of one of said comparing means constitutes a most significant bit of said digital multibit word and the output voltage of another of said comparing

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means constitutes the least significant bit of said multibit word, the remaining said comparing means operatively associated with said most significant bit comparing means and said significant bit comparing means such that their output voltages constitute bits of said multibit word being of lesser significance than said most significant bit and greater significance than said




least significant bit, said output voltage of each of said comparing means being a binary true voltage level when the value of the voltage source associated with the comparing means is greater than the value of said shared reference voltage source, each of said comparing means for asynchronously switching said output voltage between said binary true voltage level and a binary false voltage level.

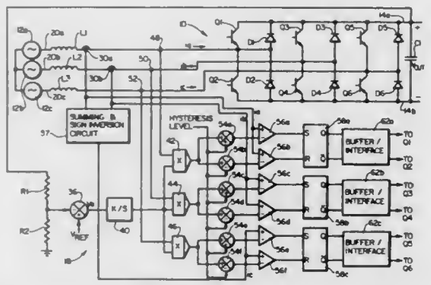
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**5,045,991**

## UNITY POWER FACTOR AC/DC CONVERTER

**P. John Dhyanchand, and Vietson Nbuyen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Dec. 28, 1989, Ser. No. 458,440**
**Int. Cl.[5] H02M *7/217*; G05F *1/70***
**U.S. Cl. 363—89** **9 Claims**




**1.** A control for an AC/DC power converter which converts an AC voltage supplied by an AC source into a DC voltage on DC output conductors, comprising:

means for developing an error signal representing the deviation of the DC voltage from a desired level;

means coupled to the developing means and responsive to the AC voltage for deriving a current command signal representing a desired current magnitude from the AC source;

means coupled to the AC source for generating a current magnitude signal representing the magnitude of the current from the AC source;

means having a hysteresis characteristic for comparing the current magnitude signal with the current command signal to obtain a comparison signal; and

means coupled to the comparing means for operating the AC/DC power converter in accordance with the comparison signal to in turn cause the DC voltage to approach the desired level and to cause the current from the AC power source to have a certain phase relationship with respect to the AC voltage supplied thereby.

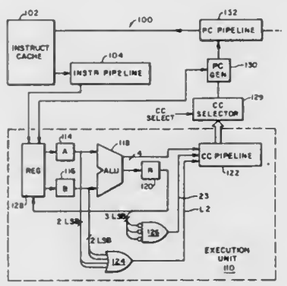
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**5,045,992**

## APPARATUS FOR EXECUTING INSTRUCTION REGARDLESS OF DATA TYPES AND THEREAFTER SELECTIVELY BRANCHING TO OTHER INSTRUCTION UPON DETERMINING OF INCOMPATIBLE DATA TYPE

**John S. Yates, Jr., and Stephen J. Ciavaglia, both of Nashua, N.H., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Oct. 19, 1988, Ser. No. 259,792**
**Int. Cl.[5] G06F *7/38, 9/302, 9/305, 9/308***
**U.S. Cl. 364—200** **12 Claims**




**1.** A processor execution unit, for identifying and processing integer and non-integer data types, comprising:

means for providing first and second operands, each of said first and second operands including a data portion and a tag identifier portion, said tag identifier portion of each of said first and second operands comprised of a specified number of least significant bits of each of said corresponding first and second operands, for identifying the corresponding operand data portion as one of integer and non-integer data types;

means for sequentially providing processor instructions, at least one of said processor instructions defined as a proper instruction, said proper instruction properly executable on first and second operands having integer type data portions only;

arithmetic logic unit means, for sequentially receiving first and second operands and an associated processor instruction, and for providing a result according to said first and second operands and said associated processor instruction, said arithmetic logic unit means providing said result regardless of whether a given associated processor instruction is a proper instruction; and

a first operand identifier unit, responsive to said specified number of least significant bits from each of said first and second operands, for identifying the data type of at least one of said first and second operands, and for providing a first, single bit condition code in response to the data type identification of said at least one of said first and second operands, said first, single bit condition code provided simultaneously with and independent of said result provided by said arithmetic logic unit means, said first condition code forming at least part of a processor instruction branch indicator, for indicating that an improper processor instruction was executed in conjunction with at least one of said first and second operands, and for altering the sequence of processor instructions provided by said means for sequentially providing processor instructions.



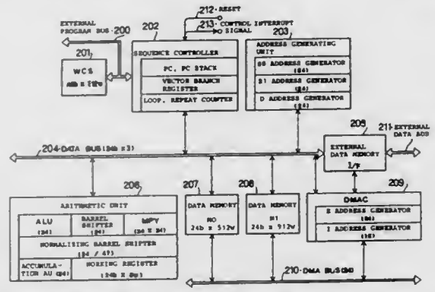
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**5,045,993**

## DIGITAL SIGNAL PROCESSOR

**Tokumichi Murakami; Koh Kamizawa; Yoshiaki Katoh; Hideo Ohira; Masatoshi Kameyama, and Naoto Kinjo, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 3, 1988, Ser. No. 201,208**
**Claims priority, application Japan, Jun. 5, 1987, 62-140872; Jul. 27, 1987, 62-186858; Aug. 6, 1987, 62-197009; Oct. 29, 1987, 62-273763; Oct. 30, 1987, 62-274810; Nov. 25, 1987, 62-296611; Nov. 25, 1987, 62-296612; Dec. 15, 1987, 62-316553**
**Int. Cl.[5] G06F *9/38, 9/26***
**U.S. Cl. 364—200** **13 Claims**




**1.** A digital signal processor comprising:

an instruction fetch unit for reading a microinstruction every machine cycle through a program bus from an instruction memory previously storing microinstructions specifying various internal operations;

a sequence control unit for controlling the execution of the microinstruction in every machine cycle by separating the steps of microinstruction execution procedure in a 5-stage pipeline including an instruction fetch stage, an instruction decode stage, a data read stage, execution stage and a write/accumulation stage, to execute one word of the microinstruction in one machine cycle;

a plurality of data input buses for the parallel transfer of two input data for binomial operation in the data read stage of the 5-stage pipeline;

an execution unit for processing the two input data transferred by the data input buses through a single operation or combinational operations both in the execution stage and data write/accumulation stage of the 5-stage pipeline;

a plurality of working registers capable of storing the results of operation of the execution unit and reading data through the data input buses;

a single or a plurality of data output buses for transferring the output data of the execution unit in the data write/accumulation stage of the 5-stage pipeline;

an output control unit for selecting one of the data output buses or one of the working registers to provide the output of the execution unit;

a plurality of 2-port memories for individually storing the two data or for storing the two data block by block for the binomial operation and the results of the binomial operation, each having a read port and a read/write port and capable of concurrently reading data from or writing data through both the ports;

a read control unit for selecting one or the plurality of read ports of the plurality of 2-port memories to read the input data from the 2-port memories and to provide the input data on the data input buses;

an external data memory interface unit for selecting one or the plurality of data input buses to read data from an external data memory and for writing data provided on one or the plurality of data output buses in the external data memory;

a direct memory access bus separated from the data input buses and the data output buses for selectively connecting one or the plurality of the read/write ports of the plurality of 2-port memories to the external data memory interface unit;

a direct memory transfer control unit for transferring the block by block data through the direct memory transfer bus between the external data memory interface and the 2-port memories independently of the internal operation of the sequence control unit;

an external data memory arbitration unit which controls contention in connecting the data input buses, the data buses and the direct memory transfer bus to the external memory interface unit;

an address generating unit comprising a plurality of address generators each having a plurality of address registers and a plurality of index registers connected to the data input buses for data transfer therebetween, and capable of parallel generation of read and write addresses for the 2-port memory or the external memory at least of the two input data and one output data of the execution unit in the decode stage of the 5-stage pipeline;

an address selecting unit for selecting the 2-port memory or the external memory interface unit corresponding to the read and write addresses provided by the address generating unit each synchronized with the read and write stages of the 5-stage pipeline; and

a direct memory access address generating unit comprising a plurality of transfer address control registers for pre-setting data through the data input buses to control data transfer range, and for simultaneously generating the 2-port memory address for direct memory access and an address for the external memory interface unit.

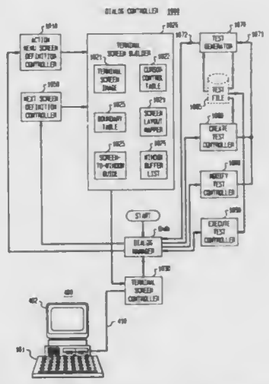
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**5,045,994**

## EMULATION PROCESS HAVING SEVERAL DISPLAYED INPUT FORMATS AND OUTPUT FORMATS AND WINDOWS FOR CREATING AND TESTING COMPUTER SYSTEMS

**Daniel F. Belfer, Piscataway; Ann G. Lech, Middlesex; Isaac M. Perelmuter, West Orange, and Jerry J. Ward, Matawan, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.**

**Filed Sep. 23, 1986, Ser. No. 910,668**
**Int. Cl.[5] G06F *9/455, 3/14***
**U.S. Cl. 364—200** **9 Claims**



**1.** In a processing system having a processing system environment and comprising a processor, a keyboard, a display device and a storage medium, a method for creating an input-output transaction executable by an autonomous, screen-driven computer application system having an input-output interface environment, the input-output transaction being cre-

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ated by a user of the systems, said method comprising the steps of

emulating said input-output interface environment by replicating said input-output interface environment in the processing system environment, said interface environment including a plurality of emulated input screen formats and emulated output screen formats from the application system, each of said input formats and said output formats being individually callable into view on the display device by the user so that said processing system is operational even if said application system is inoperative,

upon a keyboard entry by the user, displaying on the device a selected one of said emulated input screen formats,

supplying input information to the device from the keyboard by the user in accordance with said displayed emulated input screen format,

processing said input information with the processor to obtain processed input information,

storing said processed input information in the storage medium,

upon another keyboard entry by the user, displaying on the device one of said emulated output screen formats in correspondence to said selected one of said emulated input screen formats,

supplying output information to the device from the keyboard by the user in accordance with said displayed emulated output screen format,

processing said output information with the processor to obtain processed output information, and

storing said processed output information in the storage medium,

wherein the input-output transaction comprises a combination of said processed input information and said processed output information stored in the storage medium.

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**5,045,995**

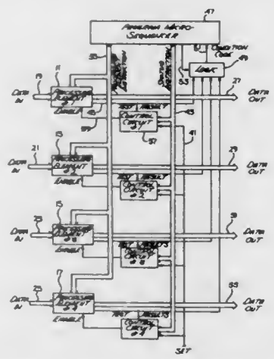
**SELECTIVE OPERATION OF PROCESSING ELEMENTS IN A SINGLE INSTRUCTION MULTIPLE DATA STREAM (SIMD) COMPUTER SYSTEM**

**Adam E. Levinthal, Corte Madera; Thomas K. Porter, Fairfax, both of Calif.; Thomas D. S. Duff, No. Plainfield, N.J., and Loren C. Carpenter, Novato, Calif., assignors to Vicom Systems, Inc., San Jose, Calif.**

**Continuation of Ser. No. 175,621, Mar. 25, 1988, abandoned, which is a continuation of Ser. No. 748,409, Jun. 24, 1985, abandoned. This application Dec. 3, 1990, Ser. No. 622,229**

**Int. Cl.[5] G06F** *15/16, 15/80*

**U.S. Cl. 364—200** **3 Claims**



1. A processing system for providing parallel processing in a conditional branching environment without prescheduling and pre-formatting of instructions, said processing system comprising:

a plurality of processing means, said processing means coupled in parallel to a first bus;

a plurality of data lines, each of said plurality of said processing means coupled to corresponding one of said plurality of data lines;

a plurality of control registers, each of said control registers coupled to corresponding one of said plurality of processing means, said control registers for enabling and disabling said processing means, said control registers coupled in parallel to a second bus;

programming means coupled to said first and second bus, said programming means for providing instructions to said processing means on said first bus for testing data produced by said processing means and for providing enable signals to said control registers on said second bus;

a plurality of output buses, each of said output buses coupled to corresponding one of said plurality of processing means and to said programming means;

said programming means providing an instruction sequence of at least first and second instructions on said first bus to each of said processing means in time sequence, said first instruction executed by each of said processing means producing data on said plurality of output buses, said data tested by said programming means against a common condition, said programming means outputting on said second bus an enable signal to certain of said plurality of control registers, said certain of said control registers providing said enable signal to said processing means such that said second instruction is executed only in those processing means where said test of said data has provided a certain pre-defined result, said programming means then outputting a signal which enables the disabled processing means and disables the previously enabled processing means, and at least a third instruction nested between said first and second instructions is executed in those now enabled processing means where said test of said data has not provided said certain pre-defined result;

storage means coupled to said control registers for temporarily storing the contents of said control registers when said at least third instruction is executed between said first and second instructions during conditional branching of said instruction sequence, said storage means retaining the results of the test of said first instruction and providing said results to said control registers for execution of said second instruction when said conditional branching is completed.

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**5,045,996**

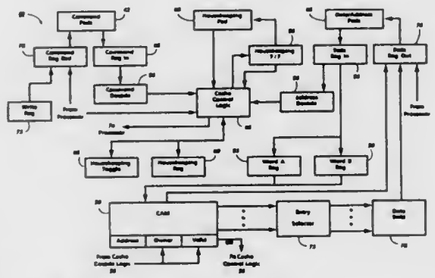
**MULTIPROCESSOR CACHE MEMORY HOUSEKEEPING**

**Richard M. Barth, and Jeffrey H. Hoel, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.**

**Continuation of Ser. No. 929,967, Nov. 12, 1986, abandoned. This application Nov. 15, 1989, Ser. No. 436,960**

**Int. Cl.[5] G06F** *12/08, 12/12*

**U.S. Cl. 364—200** **27 Claims**



1. A cache memory comprising:



memory circuitry for storing cache entries, the memory circuitry comprising address portion means for storing address portions of cache entries, flag portion means for storing flag portions of cache entries, and data portion means for storing data portions of cache entries, the address portion means including an address bit position for storing a respective bit from a cache entry's address portion;

control circuitry for responding to housekeeping commands, each housekeeping command requesting a respective housekeeping operation and including respective first and second numbers that together define a set of addresses on which the respective housekeeping operation is to be performed, the respective first number including a first bit and the respective second number including a second bit; each respective housekeeping operation including a first suboperation, the first suboperation being one of a write back operation that can be performed on a cache entry's data portion and a flag reset operation that can be performed on a cache entry's flag portion; the control circuitry comprising first suboperation means connected to the data portion means and the flag portion means of the memory circuitry for performing the first suboperation; the control circuitry further comprising number providing means for responding to one of the housekeeping commands by providing the respective first and second numbers; and

matching circuitry connected to the control circuitry for receiving the first and second numbers from the number providing means and connected to the memory circuitry for receiving a cache entry's address portion from the address portion means; the matching circuitry comprising match signal means for providing a match signal in response to the first and second numbers and a cache entry's address portion if the address portion is in the set of addresses defined by the first and second numbers; the matching circuitry further comprising bit position logic connected for receiving the first bit of the first number and the second bit of the second number from the number providing means and for receiving the respective bit of a cache entry's address portion from the address bit position; the bit position logic providing a bit position match signal, the bit position match signal depending on the value of the respective bit stored in the address bit position if the first and second bits together are in a first set of values, the bit position match signal being independent of the value of the respective bit if the first and second bits together are in a second set of values; the match signal means providing the match signal based on the bit position match signal;

the first suboperation means further being connected to the matching circuitry for receiving the match signal from the match signal means, the first suboperation means performing the first suboperation on a cache entry's data portion or flag portion only if the match signal means provides the match signal in response to the first and second numbers and the cache entry's address portion.

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**5,045,997**

**DATA PROCESSOR**

**Akira Watanabe, Kamakura, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan**

**Filed Oct. 28, 1988, Ser. No. 264,056**

**Claims priority, application Japan, Dec. 3, 1987, 62-306212**

**Int. Cl.[5] G06F** *13/14*

**U.S. Cl. 364—200** **2 Claims**

1. A data processor to be connected to another data processor via a bus for transmitting or receiving data to execute a predetermined process, which comprises:

(a) a central processing unit;

(b) a high-speed memory; and

(c) a memory competition circuit, said memory competition circuit including:

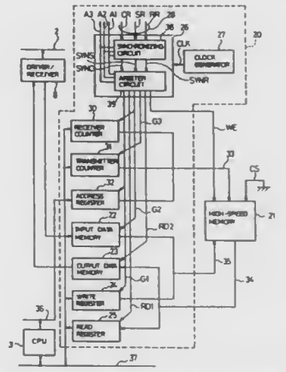
(i) an input data memory connected to said bus for temporarily storing data to be input to said high-speed memory from said bus;

(ii) an output data memory connected to said high-speed memory for temporarily storing data to be output to said bus from said high-speed memory;

(iii) a read register connected to said high-speed memory for temporarily latching data read out of said high-speed memory by said central processing unit;

(iv) a write register connected to said central processing unit for temporarily latching data to be written in said high-speed memory by said central processing unit;

(v) a competition control section connected to said input and output data memories and said central processing unit for receiving a write request from said input data memory, a read request from said output data memory,



a read request from said central processing unit, and a write request from said central processing unit to execute access to said high-speed memory by said requests according to a predetermined priority order among said input data memory, output data memory, read register and write register, or issuing a wait signal to said central processing unit when access is not in time,

(vi) a clock generator for generating a clock signal independent of that of said central processing unit;

(vii) a synchronizing circuit connected to said clock generator for synchronizing access requests to be input to said memory competition circuit; and

(viii) an arbiter connected to said synchronizing circuit for selecting a request of the highest priority to control competition among said access requests for access to said high-speed memory.

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**5,045,998**

**METHOD AND APPARATUS FOR SELECTIVELY POSTING WRITE CYCLES USING THE 82385 CACHE CONTROLLER**

**Ralph M. Begun, Boca Raton; Patrick M. Bland, and Mark E. Dean, both of Delray Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 198,893, May 26, 1988. This application Jun. 1, 1989, Ser. No. 359,794**

**Int. Cl.[5] G06F** *12/00*

**U.S. Cl. 364—200** **6 Claims**

1. A microcomputer system comprising:

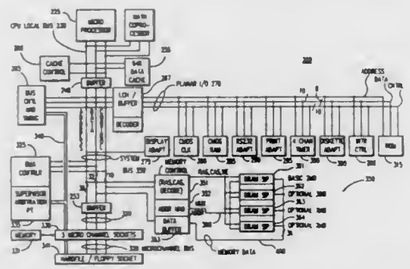
a CPU including means for executing instructions including write operations and for generating address, data and control information at the initiation of said write operations;

a cache subsystem having an assigned range of addresses and including means for generating a first ready signal during each write operation;

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a CPU local bus connecting said CPU and cache subsystem;
an addressable random access memory;
a plurality of addressable functional units each of said functional units assigned a respective address within said range of addresses or outside of said range;
a system bus connecting said memory and functional units;
buffer means coupling the CPU local bus and the system bus;
address decoder means connected to the CPU local bus and responsive to address information generated by the CPU at the initiation of write operations for determining whether thee address information is within or outside of said range;
logic means coupled to and controlled by said address decoder means at the initiation of a write operation for coupling said first ready signal to the CPU to initiate a



next instruction and for posting the write operation to the buffer means when said generated address information lies within said range of addresses;
means coupled to said system bus for completing each posted write operation;
means coupled to the system bus for generating a system bus ready signal upon completion of each write operation;
said logic means controlled by said address decoder means at the initiation of a write operation when said generated address information lies outside said address range for preventing the coupling of said first ready signal to the CPU and for preventing posting of the write operation;
means including said CPU and buffer for completion each write operation after posting is prevented and for coupling said system bus ready signal to the CPU upon completion of said write operation to initiate a next instruction.

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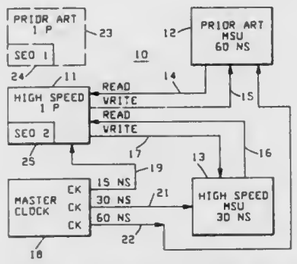
**5,045,999**

## MULTI-FUNCTION TIMING SEQUENCER FOR DIFFERENT SPEED MAIN STORAGE UNITS

**Michael Danilenko, West Saint Paul; David J. Tanglin, Anoka, and Lawrence R. Fontaine, Minneapolis, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.**

**Filed Sep. 6, 1989, Ser. No. 403,622**
**Int. Cl.[5] G06F** *1/04*
**U.S. Cl. 364—200** **7 Claims**

1. A multi-function timing sequencer of the type employed in high speed computing systems, comprising:
said computing system having a plurality of at least one slow and one fast speed main storage units (MSU) connected to processor means by read and write buses,
said computer system being adapted to be connected to MSUs having different access times,
a multi-function timing sequencer in said procesor means for producing a fast sequence and a slow sequence of MSU enabling singals,
master clock means coupled to said MSUs, said processor means to said multi-function sequencer,
logic means in said processor means for raising a start signal and a signal identifying one of said fast or said slow speed MSUs to be accessed,
said multi-function sequencer having an input coupled to said start signal and to said MSU identifying signal for producing an odd and an even sequence of 1X to NX signals,
said multi-function sequencer comprising a plurality of series connected odd and even principal latches 1X to NX for producing said 1X to NX sequencer signals to be em-




ployed by said processor logic means for accessing an identified high speed MSU to be accessed, and
said multi-function sequencer further having a plurality of staging latches, each being coupled between one of said odd and said even principal latches for producing odd and even secondary sequence signals to be employed by said processor logic means for accessing a slow speed MSU.

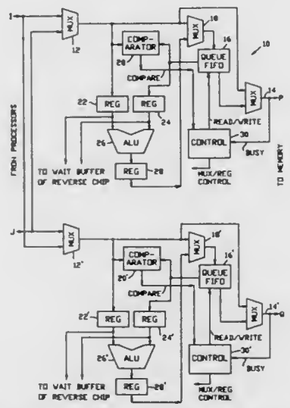
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**5,046,000**

## SINGLE-FIFO HIGH SPEED COMBINING SWITCH

**Yarsun Hsu, Pleasantville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 27, 1989, Ser. No. 303,699**
**Int. Cl.[5] G06F** *13/00, 7/00*
**U.S. Cl. 364—200** **18 Claims**




1. Digital switching apparatus having an input node means and an output node means, comprising:
storage means having a plurality of storage locations for storing messages received from the input node means prior to transmission of the messages to the output node means, a first portion of a message including an identification of a destination for a second portion of the message;
comparator means, having a first input coupled to the input node means and a second input coupled to the storage means, for comparing the first portion of a received message to the first portions of all previously received messages, if any, that are stored within the storage means, the comparator means having an output for indicating if the first portion of the received message matched a first portion of a stored message;
combining means, coupled to the output of the comparator means, having a first input coupled to the input port means and a second input coupled to the storage means, for combining the second portion of a received message with the second portion of the stored message that caused the comparator means to generate the output signal, the combining means having an output for expressing the combined second portions; and
means, coupled to the output of the combining means for directing the combined second portions from the output of the combining means to the storage means for storage at a location wherein the stored message which generated a match with the received message is stored.



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**5,046,001**

## METHOD FOR ACCESSING SELECTED WINDOWS IN A MULTI-TASKING SYSTEM

**Barbara A. Barker, Round Rock; Thomas R. Edel, Austin, and Jeffrey A. Stark, Grapevine, all of Tex., assignors to IBM Corporation, Armonk, N.Y.**

**Filed Jun. 30, 1988, Ser. No. 213,421**
**Int. Cl.[5] G06F** *3/00, 15/00*
**U.S. Cl. 364—200** **4 Claims**

4. A computer system for accessing one of a plurality of computer application programs which are simultaneously active and displayed on said computer system in a plurality of windows which at least partially overlap, said computer system comprising:
a display attribute associated with at least a selected one of said plurality of windows, said display attribute having a first state which permits the provision of an unencumbered display of said selected one of said plurality of windows in response to the position of a cursor within said selected one of said plurality of windows and having a second state which prohibits said provision;
means for monitoring user inputs to said computer system to determine if the position of a cursor is within said selected one of said plurality of windows; and
means for automatically providing an unencumbered display of said selected one of said plurality of windows on said computer system upon the display attribute being said first state in response to the position of said cursor therein in the event said selected one of said plurality of windows is at least partially overlapped and otherwise, upon said display attributes being in said second state, the display of said selected one of said plurality of windows remain unchanged.

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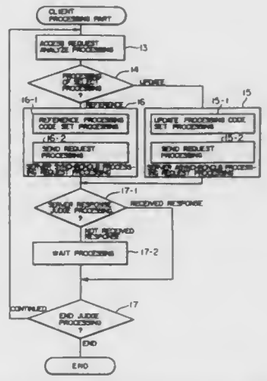
**5,046,002**

## DISTRIBUTED DATA BASE ACCESS REQUEST PROCESSING SYSTEM

**Rinichi Takashi, Yokohama, and Hiromichi Ishikawa, Fujisawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 126,348, Nov. 30, 1987, abandoned. This application Apr. 26, 1990, Ser. No. 515,364**
**Claims priority, application Japan, Dec. 1, 1986, 61-286162**
**Int. Cl.[5] G06F** *15/16, 15/40*
**U.S. Cl. 364—200** **8 Claims**

7. A method for parallel processing by a client side system and a server side system in a distributed data base access request system comprising:
selectively coding for distinguishment requests comprising an update access request and a reference access request by the client side system to the server side system;
processing the requests in the server side system;
first responding by the server side system to the client side system after completion of the processing of the reference access request;
second responding by the server side system to the client side system before completion of processing of the update access request wherein the client side system may process




and code a next request during the processing of the update access request by the server side system.

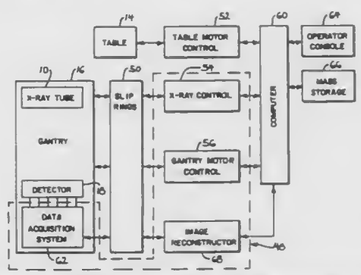
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**5,046,003**

## METHOD FOR REDUCING SKEW IMAGE ARTIFACTS IN HELICAL PROJECTION IMAGING

**Carl R. Crawford, Milwaukee, Wis., assignor to General Electric Company, Milwaukee, Wis.**

**Filed Jun. 26, 1989, Ser. No. 371,332**
**Int. Cl.[5] G06F** *15/42, 15/64*
**U.S. Cl. 364—413.15** **7 Claims**




1. A method of acquiring projection data on a tomographic imaging system including a means for acquiring a series of projections of an imaged object within an imaging plane at a plurality of angles about a z axis, and a table for translating the imaged object along said z axis with respect to the imaging plane, comprising the steps of:
identifying a slice plane at a position relative to the imaged object;
translating the table along the z-axis to move the slice plane through the imaging plane;
acquiring a tomographic projection set comprised of a plurality of projections of the imaged object; and
decreasing the translational velocity of the imaged object during a first period of the acquisition of the tomographic projection set prior to the slice plane crossing the imaging plane and increasing the translational velocity of the imaged object during a second period of acquisition of the tomographic projection set subsequent to the slice plane crossing the imaging plane.

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**5,046,004**

## APPARATUS FOR REPRODUCING MUSIC AND DISPLAYING WORDS

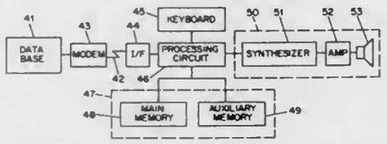
**Mihoji Tsumura, and Shinnosuke Taniguchi, both of Osaka, Japan, assignors to Mihoji Tsumura, Osaka, Japan**

**Filed Jun. 27, 1989, Ser. No. 372,029**

**Claims priority, application Japan, Dec. 5, 1988, 63-308503; Jan. 10, 1989, 1-3086; Jan. 12, 1989, 1-5793; Jan. 19, 1989, 1-11298; Feb. 15, 1989, 1-35608; Feb. 21, 1989, 1-40717; Mar. 1, 1989, 1-50788**

Int. Cl.[5] **G10H** *7/00*

U.S. Cl. 364—419 **24 Claims**




1 A music-reproducing and words-displaying apparatus connected via public communication line to a host computer having a data base of binary-coded music and words, wherein a data unit of said data base comprises composite music data including binary-coded instrumental music data, binary-coded words data, and a data code for retrieval of said data unit from said data base, said apparatus comprising:

selection means for selecting desired composite music data by designation of said data code;

memory means for storing the composite music data thus selected;

operating means for processing said selected composite music data;

conversion means for converting into an analog form a signal processed by said operating means;

amplifier means for amplifying the analog signal thus obtained; and

display means for visually representing words corresponding to said words data;

said memory means comprising a main memory for storing selected composite music data, and an auxiliary memory for storing a plurality of data units transmitted from said data base.

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**5,046,005**

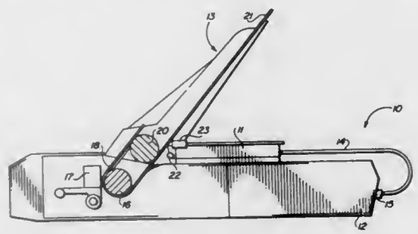
## TEST SCORING MACHINE

**Angelina N. Vilardebo, and Charles K. Vilardebo, both of Satellite Beach, Fla., assignors to Versatile Suppliers, Inc., Satellite Beach, Fla.**

**Filed May 15, 1989, Ser. No. 352,345**

Int. Cl.[5] **G06F** *15/38;* **G09B** *7/00*

U.S. Cl. 364—419 **7 Claims**



1. A test scoring machine comprising:

a computer printer for printing on single sheets of paper, said computer printer having an input for single sheets of paper and an output for single sheets of paper to exit said printer and said computer printer having a printer driver and a print head for printing onto single sheets of paper passing through said computer printer;

a cut sheet feeder attached to said computer printer for feeding single sheets of paper from a stack of sheets of paper to said printer;

a light source attached to said printer adjacent said cut sheet feeder in a position for directing a light onto the surface of a sheet of paper being fed from said sheet feeder into said computer printer;

an optical reader attached to said computer printer adjacent said light source and cut sheet feeder for reading the reflected light from said light source off the surface of a sheet of paper being fed from said sheet feeder into said computer printer, whereby marks on each said sheet of paper being fed into said printer are read by said optical reader;

computer means attached to said computer printer and operatively coupled to said optical reader for receiving the output from said optical reader and producing an output signal analogous to a score of the signals read by said optical reader, said computer means including storage means for storing a scanned master document containing positional placement of test answers and comparing means for comparing each scanned test sheet with said storage means stored master document; and

printer interface means coupling said computer means output to said computer printer print driver for driving said printer print head for printing a score on a test paper being fed from said sheet feeder through said printer whereby a test paper fed into a printer has the score printed thereon as it exits the computer printer.

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**5,046,006**

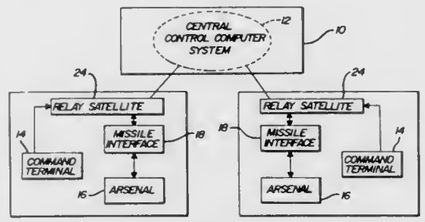
## MUTUAL MISSILE CONTROL SYSTEM

**Raoul D. Revord, 323 Maple St., Munising, Mich. 49862, and Jeffrey Shaya, Ann Arbor, Mich., assignors to Raoul D. Revord, Munising, Mich.**

**Continuation-in-part of Ser. No. 200,034, May 27, 1988, abandoned. This application Feb. 28, 1989, Ser. No. 317,192**

Int. Cl.[5] **G06G** *15/20, 15/50;* **F41G** *9/00*

U.S. Cl. 364—423 **30 Claims**




1. A system to control the firing of a plurality of armaments, control of which is divided between first and second adversaries, each adversary controlling a separate geographic territory, comprising:

a central computer remote from the territories of the first and second adversaries;

a first computer terminal under the control of a first adversary;

a firing control system operatively associated with each of the armaments, the system having a first normal inactive state wherein the armament is prevented from being fired, and a second active sate wherein firing of the armament is enabled;

a first communication channel between the central computer and each of said first and second computer terminals and a second communication channel between the firing control system of each of the armaments and at least one of the central computer and the computer terminal controlling such armaments;

means for transmitting a request from either of said computer terminals to said central computer, said request specifying that the firing control systems of the armaments controlled by the requesting terminal be switched from said first state to said second state;

means associated with the central computer, operative, upon receipt of said request from the terminal of a first of said adversaries, to: (1) transmit a signal to the second of said adversaries, switching the firing control systems of the armaments of said second adversary from said first state to said second sate, and (2) further operative to transmit a signal to the first adversary, switching its firing control systems from the first state to the second state only after a predetermined time period,

whereby a request by either of the adversaries to activate their armaments is answered by activation of the other adversaries armaments, and delayed activation of the requesting parties armaments.



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**5,046,007**

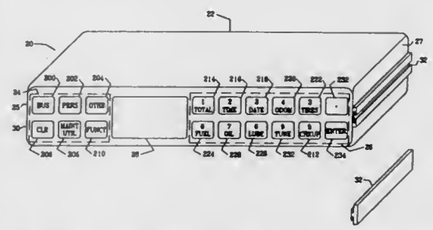
## MOTOR VEHICLE DATA COLLECTION DEVICE

**Shawn F. McCrery, College Place, and Thomas A. Seim, Richland, both of Wash., assignors to Accutek Industries, Inc., Walla Walla, Wash.**

**Filed Jun. 7, 1989, Ser. No. 362,744**

Int. Cl.[5] **G06F** *7/70;* **G01D** *9/00;* **B60Q** *1/00;* **B60L** *1/00*

U.S. Cl. 364—424.04 **21 Claims**



18. A method for collecting usage data for a motor vehicle having an ignition system activated for starting deactivated for stopping the engine of the vehicle, the method comprising the steps of:

generating a distance travelled pulse for each incremental distance of travel;

generating a clock signal;

generating a vehicle on signal responsive to the activation of the ignition system;

generating a vehicle off signal responsive to the deactivation of the ignition system;

storing trip record data including an initial odometer reading and a trip start time in a memory;

generating a trip start time from the clock signal upon receipt of the vehicle on signal;

determining an initial odometer reading from the current odometer reading upon receipt of the vehicle on signal;

updating the current odometer reading in accordance with a number of the distance travelled pulses received upon receipt of the vehicle on signal and receipt of the vehicle off signal;

connecting the device directly to an external microcomputer; and downloading the stored trip record data to the external microcomputer.

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**5,046,008**

## CONTROL DEVICE FOR STABILIZING THE ROLLING MOTION OF A VEHICLE

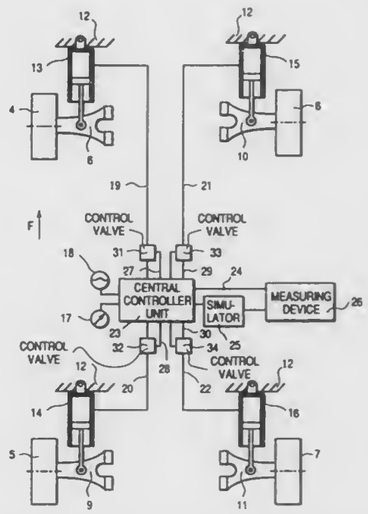
**Konik Dieter, Herrsching, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany**

**Filed Jun. 27, 1989, Ser. No. 371,754**

**Claims priority, application Fed. Rep. of Germany, Jun. 27, 1988, 3821609**

Int. Cl.[5] **B60G** *17/015*

U.S. Cl. 364—424.05 **14 Claims**




1. A control device for stabilizing the rolling motion of a vehicle comprising:

control elements arranged between at least one of wheel carriers and wheel suspension members of the vehicle and a body of the vehicle; and

controller means for operating the control elements as a function of at least one cross-dynamic motional quantity to generate a stabilizer torque $M_V$ at a front axle of the vehicle and a stabilizer torque $M_H$ at a rear axle of the vehicle;

the controller means including means for generating the stabilizer torques $M_V$ and $M_H$ as a function of measured or determined quantities of a yaw velocity $\psi(t)$, or an inertial roll angle $\gamma(t)$ and of a roll angle rate $\gamma(t)$ according to the following principles:

$$M_V(t) = k_{11}(V(t), i_M)\cdot\psi(t) + k_{12}\cdot\gamma(t) + k_{13}\gamma(t) \quad \text{(I)}$$

$$M_H(t) = k_{21}(V(t), i_M)\cdot\psi(t) + k_{22}\cdot\gamma(t) + k_{23}\cdot\gamma(t) \quad \text{(II)}$$

wherein $k_{11}$ and $k_{21}$ are coefficients depending on the driving speed V (t) and on the stabilizer torque distribution

$$i_M = \frac{M_H}{M_V + M_H}$$

during steady-state cornering, and $K_{12}$, $k_{22}$, $k_{13}$, and $k_{23}$ are vehicle-specific constant coefficients which are larger than zero.

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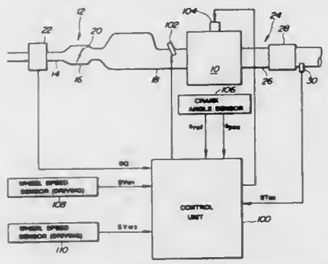


**5,046,009**

## SLIP SUPPRESSIVE DRIVE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE WITH REDUCTION OF POWER OUTPUT OF INTERNAL COMBUSTION ENGINE

**Toshimi Abo; Takeshi Fujishiro, and Katsunori Oshiage, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Nov. 3, 1988, Ser. No. 266,759**
**Claims priority, application Japan, Nov. 5, 1987, 62-280170; Nov. 5, 1987, 62-280171; Nov. 24, 1987, 62-294157**
**Int. Cl.[5] B60K *31/00***
**U.S. Cl. 364—426.02** **46 Claims**



1. A slip control system for an automotive vehicle, comprising:
- first sensor means for monitoring engine revolution speed to produce engine speed indicative data;
- second sensor means for monitoring rotation speed of a driving wheel, which is driven by an output of an automotive internal combustion engine, and producing driving wheel speed representative data;
- third sensor means for monitoring vehicle speed to produce vehicle speed representative data;
- fourth means for detecting wheel slippage greater than a predetermined wheel slippage threshold on the basis of said driving wheel speed representative data; and said vehicle speed representative data; and
- fifth means for controlling said engine revolution speed based on preselected engine control parameters, said fifth means being responsive to said fourth means detecting said driving wheel speed representative data and said vehicle speed representative data for initiating a slip control mode operation in which a target engine speed achieving a predetermined allowable wheel slippage is derived on the basis of said engine speed data and is variable depending upon a ratio of said driving wheel speed representative data versus said vehicle speed representative data, and said engine revolution speed is controlled toward said target engine speed.

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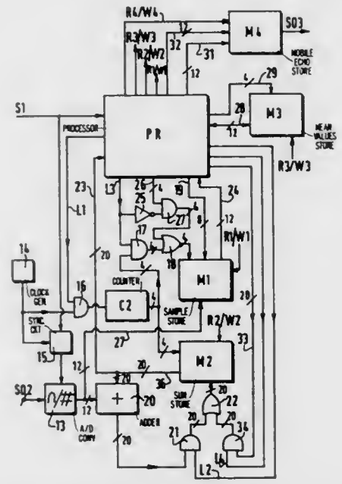
**5,046,010**

## FIXED-ECHO CANCELLING RADIO ALTIMETER AND METHOD OF OPERATING SAME

**Jean-Pierre Tomasi, Brive, France, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 19, 1989, Ser. No. 452,985**
**Claims priority, application France, Dec. 20, 1988, 88 16839**
**Int. Cl.[5] G01S *13/34***
**U.S. Cl. 364—433** **9 Claims**

1. A fixed-echo cancelling radio altimeter for use in an aircraft for measuring low altitudes, comprising:
- means for generating a linearly frequency-modulated signal in the form of a series of identical sawteeth separated by plateaus;
- means for transmitting to the ground a wave corresponding to said frequency-modulated signal and which is reflected back as an echo wave;
- means for receiving said echo wave and mixing it with a portion of the transmitted wave so as to derive a beat frequency signal $Fb_t$ which corresponds to the frequency difference between the transmitted wave and the echo wave, said signal $Fb_t$ being representative of the accumulation of fixed and mobile components of said echo waves;
- digitizing means for sampling the beat frequency signal $Fb_t$ at fixed time intervals following the start of each sawtooth so as to derive n samples of such signal per sawtooth;



- a first memory (M1) for storing the n×k samples $S_j^i$ of k successive sawteeth, where i varies from 1 to k and j varies from 1 to n;
- a second memory (M2) for storing n sums of said samples, each such sum being the accumulation of corresponding samples of the k successive sawteeth, of the form:

$$\sum_{i=1}^{i=k} S_j^i, \ldots, \sum_{i=1}^{i=k} S_n^i;$$

first computing means for computing the n mean values of said n sums:

$$\frac{1}{k}\sum_{i=1}^{i=k} S_1^i, \ldots, \frac{1}{k}\sum_{i=1}^{i=k} S_n^i;$$

each such mean value being a fixed echo component $Fb_f$ of said beat frequency signal $Fb_t$;
- a third memory (M3) for storing said n mean sum values; and
- further computing and storage means for computing the n×m differences $Fb_t - Fb_f$ of a number m ($m \leqq k$) of said samples of said beat frequency signal $Fb_t$ and supplying signals corresponding to such differences, such difference signals constituting the mobile echo components $Fb_m$ of said samples of the signal $Fb_t$; and
- means for determining from each of said mobile echo components $Fb_m$ the altitude H corresponding thereto, in accordance with:

$$H = \frac{c}{2}\,\frac{T1}{\Delta F}\,Fb_m$$

where c is the velocity of an electromagnetic wave in air, and T1 and ΔF are respectively the duration and frequency range of each of said sawteeth.

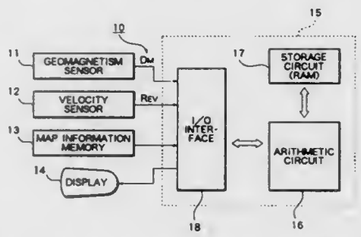


**5,046,011**

## APPARATUS FOR NAVIGATING VEHICLE

**Masaki Kakihara, Hiroshima, and Masao Sasaki, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jun. 30, 1989, Ser. No. 374,262**
**Claims priority, application Japan, Jul. 5, 1988, 63-166026**
**Int. Cl.[5] G06F *15/50***
**U.S. Cl. 364—449** **14 Claims**




1. An apparatus for navigating vehicle comprising:
- a conjecture means for conjecturing the current position of a vehicle by a dead-reckoning method on the basis of the vehicle travel direction and the vehicle travel distance;
- a node storage means for storing road information in the form of the positions of a plurality of nodes provided on the roads concerned,
- a non-memory road judging means for making a judgment as to whether or not the road on which the vehicle is running is one which is stored in said storage means, and
- a target node specifying means for specifying, when the vehicle is judged by said non-memory road judging means to be traveling on a road which is not stored in said node storage means, a target node toward which the vehicle is running, comprising:
- a first candidate node extracting means for extracting candidate nodes from said plurality of nodes stored in said node storage means;
- a determining means for determining if the candidate nodes cannot be the target node by comparing the respective directions between a conjectured current position of the vehicle and these candidate nodes with the direction in which the vehicle is running; and
- a first deleting means for deleting a candidate node which is determined not able to be the target node from the candidate nodes.

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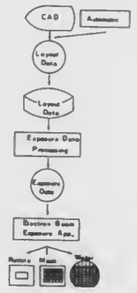
**5,046,012**

## PATTERN DATA PROCESSING METHOD

**Kazumasa Morishita, Seto; Yoshitada Aihara, Kawasaki; Yoshihisa Komura, Tajimi; Masaaki Miyajima, Inuyama, and Minoru Suzuki, Seto, all of Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu Vlsi Limited, Kasugai, both of, Japan**

**Filed Jun. 15, 1989, Ser. No. 366,483**
**Claims priority, application Japan, Jun. 17, 1988, 63-150851; Jul. 8, 1988, 63-171418**
**Int. Cl.[5] G06F *15/40***
**U.S. Cl. 364—468** **15 Claims**

1. A pattern data processing method for processing hierarchical pattern data which as a hierarchical structure and describes in each level thereof one or a plurality of internal cells constituting one or a plurality of logic blocks of a semiconductor integrated circuit device which is to be produced, said pattern processing method comprising the steps of:
- defining a frame at a boundary between a level i of the hierarchical structure and a level i+1 which is higher than the level i;
- cutting a first portion of a pattern which protrudes out of the frame from the level i to the level i+1 and defining the cut first portion as a pattern of the level i+1, said pattern being made up of line segments;
- cutting a second portion of a pattern which protrudes out of the frame from the level i+1 to the level i and deleting the cut second portion; and




repeating said steps of cutting the first and second portions for a predetermined number of levels for increasing values of i, where i = 1, 2, . . . , n, n is an arbitrary integer and the pattern of the semiconductor integrated circuit device is described in a highest level n+1.

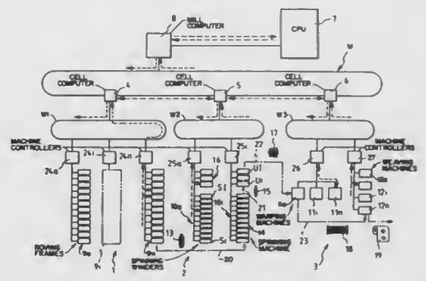
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**5,046,013**

## QUALITY CONTROL SYSTEM IN A SPINNING MILL

**Yutaka Ueda, Nara, and Yoshihiko Samoto, Kusatsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Feb. 23, 1989, Ser. No. 314,502**
**Claims priority, application Japan, Mar. 1, 1988, 63-49116**
**Int. Cl.[5] G06F *15/46***
**U.S. Cl. 364—470** **8 Claims**




7. A quality control method in a spinning mill having a plurality of sequential yarn processing steps including first and second yarn processing steps for processing a yarn material in the first yarn processing step and, thereafter, in the second yarn processing step, a communication network connecting the plurality of processing steps for communication therebetween, abnormality detection means associated with the second processing step for detecting an abnormality of yarn processed by the second processing step, means for checking the operation of the second processing step; and means for communicating between the first and second processing steps through the communication network, the method comprising the steps of:
- processing yarn in the plurality of processing steps;
- detecting an abnormality of yarn processed by the second processing step;
- checking the operation of the second processing step upon a detection of an abnormality of yarn processed by the second processing step; and

communicating information for tracing the cause of the yarn abnormality through the communication network, from the second processing step to the first processing step upon the step of checking the operation of the second processing step revealing that the second processing step operates substantially correctly.

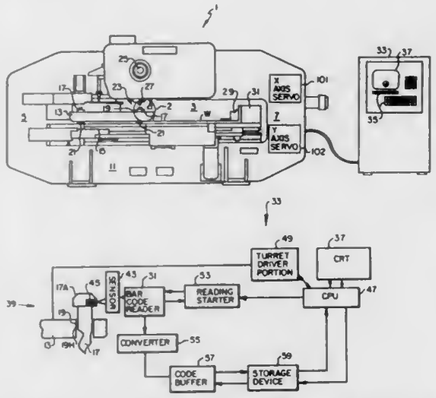
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5,046,014

## AUTOMATIC TOOL POSITION RECOGNIZING DEVICE RECOGNIZING BAR CODES ON TOOLS

Toshiaki Anjo, Tanaka Apartment B-6, 7058 Okazaki, Isheara-shi, Kanagawa-ken, Japan

Filed Jul. 6, 1988, Ser. No. 215,484
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.02 15 Claims




1. A tool-recognizing device for use with a numerically controlled turret punch press including a rotatable tool holder having a plurality of tool installation stations each having a tool installation number, each adapted to hold a tool marked with a symbol corresponding to a tool number assigned to the tool, said tool-recognizing device comprising:

sensor means, disposed adjacent said tool holder, for reading a symbol from a tool;

storage means for storing a correspondence between tool numbers and each of said read symbols, and for converting the output signal from the sensor into a corresponding tool number and storing said corresponding tool numbers;

means for moving said tools in a way such that each symbol on each tool at each tool installation station is sequentially read by said sensor means and sent to said storage means;

control means for determining each tool installation number of said moving means and storing a map of tool installation numbers at each of said positions of said moving means and said tool number in each said tool installation station; and

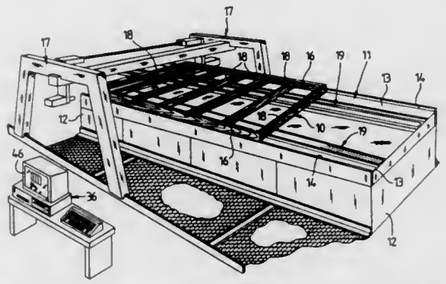
display means, which is connected with the storage means, for visually displaying a tool number stored in the storage means in a correspondence with each respective said tool installation number.

5,046,015

## ELECTRONIC LAYOUT SYSTEM

Theodore E. Dasher, 1220 33rd St. S., Birmingham, Ala. 35205; Lowell T. Wood, 3607 Queenstown Rd., Trussville, Ala. 35173, and Theodore E. Dasher, Jr., 122 33rd St., Birmingham, all of Ala. 35205

Filed Oct. 18, 1989, Ser. No. 423,773
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—474.09 30 Claims



1. An apparatus for projecting a full scale structural image for use in the automated production of building components on a component layout table comprising:

(a) a plurality of visible linear arrays;

(b) means for generating a plural signals for display on said linear array to identify the position and type of selected structural members.

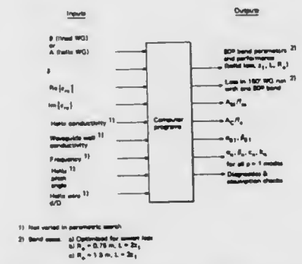
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5,046,016

## COMPUTER AIDED DESIGN FOR $TE_{01}$ MODE CIRCULAR WAVEGUIDE

Jerry A. Krill, Ellicott City; Melrose M. Jesurun, Silver Spring, and William H. Zinger, Columbia, all of Md., assignors to The Johns Hopkins University, Balimore, Md.

Filed Feb. 13, 1989, Ser. No. 310,193
Int. Cl.[5] G06F *15/60;* H01P *3/16*
U.S. Cl. 364—488 10 Claims




1. A computer aided method for designing a circular overmoded waveguide of the dielectric lined type, comprising the steps of programming said computer to receive selected input waveguide design parameters and to characterize and predict operational waveguide system performance based thereupon, said input design parameters including:

selected waveguide operating frequency,

selected waveguide dimensions, including

a) waveguide inner diameter within the range 1.75 to 2.0 wavelengths for operating frequency up to approximately the low millimeter band (30 GHz), and

b) dielectric lining thickness approximately 7.5% of waveguide inner diameter,

selected waveguide system configurations, including the length of straight waveguide and the number of waveguide bends,

characteristics of selected waveguide material, including

c) real part of lining dielectric constant within the range 4 to 6, and

d) imaginary part of lining dielectric constant within the range −0.0005 to −0.005, and

said steps of programming said computer includes programming said computer to perform the following operations:

(A) calculate operational losses for each selected waveguide system configuration based upon said selected input waveguide design parameters for the total waveguide length and number of bends in said configuration, and whereby an optimal waveguide system configuration is indicated, and

(B) generate an optimized waveguide design based upon the results of the preceding step.



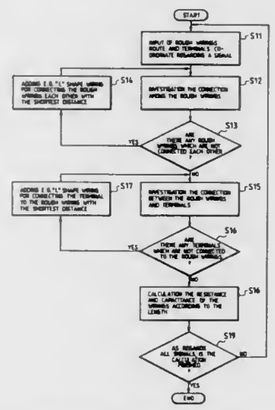
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5,046,017

## WIRING DESIGN FOR SEMICONDUCTOR INTEGRATED CIRCUIT

Kyoji Yuyama, Shiroyama, and Kouichi Nishizawa, Aizuwakamatsu, both of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,059
Claims priority, application Japan, Dec. 23, 1987, 62-324072
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—491 9 Claims




1. A method of designing a semiconductor integrated circuit device comprising the steps of:

positioning a first circuit block in said semiconductor integrated circuit device;

positioning a signal terminal on said first circuit block;

positioning a second circuit block in said semiconductor integrated circuit device;

positioning a signal terminal on said second circuit block;

positioning a first partial wiring which constitutes only a portion of a first wiring to be formed in said semiconductor integrated circuit device for connecting said signal terminal of said first circuit block and said signal terminal of said second circuit block; and

estimating characteristics of said first wiring based on position information of said terminal of said first circuit block, position information of said terminal of said second circuit block, and position information of said first partial wiring.

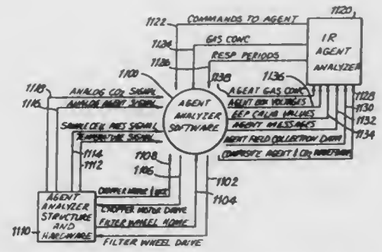
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5,046,018

## AGENT GAS ANALYZER AND METHOD OF USE

Ross F. Flewelling, Oakland; Eric T. Johansson, Dublin; Lucille A. Ferus, Oakland; John A. Culver, San Francisco, and Keith H. Breton, San Ramon, all of Calif., assignors to Nellcor, Inc., Hayward, Calif.

Filed Sep. 11, 1989, Ser. No. 406,230
Int. Cl.[5] G01N *21/35;* G06F *15/42*
U.S. Cl. 364—497 23 Claims




1. A method for simultaneously determining concentrations of N gases in a respiratory gas stream, where N>1, comprising the steps of:

(a) irradiating a portion of said respiratory gas stream with radiation;

(b) positioning each of N different filters to intercept said radiation after said radiation passes through and is partially absorbed by said portion of said respiratory gas stream to produce N different bands of wavelengths of said radiation;

(c) detecting the amount of radiation in each of said N different bands of wavelengths of said radiation;

(d) generating N electrical absorption signals representative of said amount of radiation in said N bands; and

(e) computing simultaneously the concentrations of each of said N gases in the respiratory gas stream using matrix equations with a dimension of the matrix equal to N, and including said N electrical absorption signals as variables which are at least second order variables in said matrix equations.

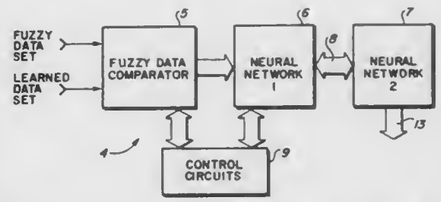
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5,046,019

## FUZZY DATA COMPARATOR WITH NEURAL NETWORK POSTPROCESSOR

Paul M. Basehore, Sanford, Fla., assignor to Chip Supply, Inc., Orlando, Fla.

Filed Oct. 13, 1989, Ser. No. 421,019
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 9 Claims




1. A system for comparing sequentially transmitted digital data patterns with known patterns of data comprising:

a plurality of random access memory means for storing a plurality of differing patterns of known digital data;

a plurality of comparator means having inputs connected to each other for receiving the sequentially transmitted digital data patterns, for comparing said sequentially transmit-

ted digital data patterns with each of said stored patterns of known data and for providing a result of said comparison;

a plurality of accumulator means connected to respective ones of said plurality of comparator means for temporary storing the results of each of said comparisons;

a plurality of neural network means for determining from the comparison results a network solution corresponding to the pattern of known digital data that most closely matches the sequentially transmitted digital data pattern; and

processor means, having a preselected stored threshold, for receiving the network solution from said neural network, and outputting the network solution thereof when said network solution is less than the preselected stored threshold and providing an indication when the network solution is greater than the preselected stored threshold.

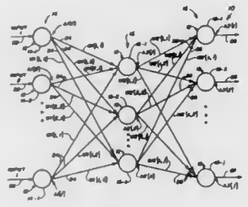
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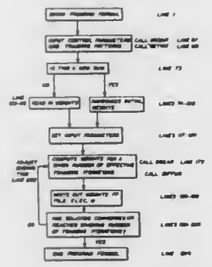
**5,046,020**

## DISTRIBUTED PARALLEL PROCESSING NETWORK WHEREIN THE CONNECTION WEIGHTS ARE GENERATED USING STIFF DIFFERENTIAL EQUATIONS

**David L. Filkin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

Filed Dec. 16, 1988, Ser. No. 285,534
Int. Cl.[5] G06F *15/18*
U.S. Cl. 364—513 12 Claims





1. In a parallel distributed processing network implemented in hardware alone or in a digital computer operating in accordance with a program, the network being of the type having:

a first, input, set of from one to i processing elements, each input processing element having an input port and an output port, each of the i input processing elements being connectible to an input signal at the input port thereof and each being operable to produce an activation signal A1[i] at the output port thereof;

a second, intermediate, set of from one to k processing elements, each processing element having an input port and an output port, each of the k intermediate processing elements being operable to produce an activation signal A2[k] at the output port thereof;

a third, output, set of from one to j processing elements, each processing element having an input port and an output port, each of the j output processing elements being operable to produce an activation signal A3[j] at the output port thereof;

each of the i processing elements in the input set of processing elements being connected to at least one of the k processing elements in the intermediate set of processing elements with each such interconnection having a connection weight W1[i,k] associated therewith,

each of the k processing elements in the set of intermediate processing elements being connected to at least one of the j processing elements in the set of output processing elements with each such interconnection having a connection weight W2[k,j] associated therewith,

the network being arranged such that a set of p training signals, applied at the input ports of the input processing element produces activation signals A1[i,p], A2[k,p] and A3[j,p],

each of the p training signals being associated with a predetermined one of a set of V predetermined desired output signals,

wherein the improvement comprises:

the activation signals A1, A2, and A3 and the connection weights W1, W2 of the interconnections between the input processing elements and the output processing elements being related by a first set of stiff differential equations

$$d/dtW1[i,k] = \sum_{p} A1[i,p]A2[k,p](1 - A2[k,p]) \times \sum_{j} (V[j,p] - A3[j,p])A3[j,p](1 - A3[j,p])W2[k,j]$$

the activation signals A2 and A3 and the connection weights W2 of interconnections between the intermediate processing elements and the output processing elements are related by a second set of stiff differential equations

$$d/dtW2[kj] = \sum_{p} A2[k,p]A3[j,p](1 - A3[j,p])(V[j,p] - A3[j,p])$$

and wherein the weights W1 and W2 are, respectively, calculated by converging to the steady state solutions of the first and second sets of stiff differential equations.

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**5,046,021**

## ROBOTIC ASSEMBLY AND DISASSEMBLY STATION FOR REMOVABLY CLAMPING A SUCCESSION OF WORKPIECES TO A SUCCESSION OF SUPPORT PALLETS

**Guido Salvagnini, Sarego, Italy, assignor to Salvagnini Transferica S.P.A., Sarego, Italy**

Filed Dec. 21, 1989, Ser. No. 454,421
Claims priority, application Italy, Dec. 22, 1988, 23058 A/88
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 364—513 9 Claims

1. Apparatus for assembling workpiece clamping fixtures to a workpiece support pallet and for disassembling said workpiece clamping fixtures from said workpiece support pallet, said apparatus comprising:

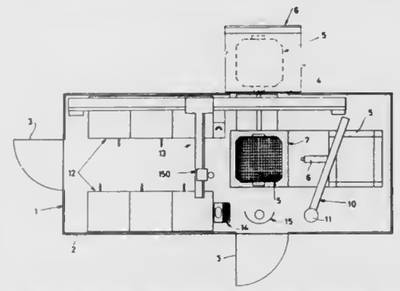
a base pedestal;

a table revolvably supported on said base pedestal;

means for removably mounting on said table a pallet which has a support face provided with a two-dimensional array of adjustable anchoring elements;

a magazine for storing a supply of clamping fixture modules demountably mountable directly or via one another to respective ones of said adjustable anchoring elements;

a programmable robot having grasping organ means operating between said table and said magazine, for adjusting said adjustable anchoring elements, for grasping and transferring said clamping fixture modules between said magazine and said adjustable anchoring elements, and for applying said clamping fixture modules directly or indirectly



to and separating said clamping fixture modules directly or indirectly from said adjustable anchoring elements; and

a control center for programming said robot by example, to respetitively adjust anchoring elements and mount and demount clamping fixture modules to or from a succession or like pallets successively mounted on said table; said control center comprising an electronic computer operatively connected with said robot and arranged to be operated by a sole operator.



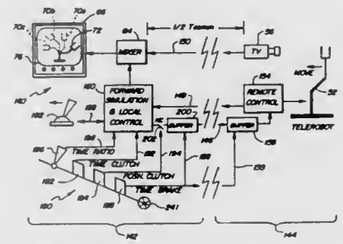
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**5,046,022**

## TELE-AUTONOMOUS SYSTEM AND METHOD EMPLOYING TIME/POSITION SYNCHRONY/DESYNCHRONY

**Lynn A. Conway, Ann Arbor; Richard A. Volz, Saline, and Michael W. Walker, Ann Arbor, all of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.**

Filed Mar. 10, 1988, Ser. No. 166,337
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—513 29 Claims



1. In a system for enabling a cognitive agent to operate in real time a controlled agent to perform automatically movements corresponding to a sequence of command data stored in the system representing a planned path in space and time of at least a selected portion of the controlled agent, a method of generating the sequence of command data used to control the controlled agent, comprising the steps of:

(a) providing first input means operable by the cognitive agent for producing in real time successive command signals that specify the planned path in space and time of at least the selected portion of the controlled agent;

(b) providing second input means operable by the cognitive agent for selectively enabling and disabling time synchrony;

(c) generating command data to be added to the sequence of command data representing the planned path by deriving from the successive command signals at predetermined intervals of time information related to desired position, and sequentially storing such derived positional information as command data in a manner indicating relative order of acquisition, thereby providing time synchronized path planning;

(d) when the time synchrony is enabled, also storing the derived positional information in a manner which indicates relative time of acquisition, as well as relative order of acquisition; and

(e) when the time synchrony is disabled, deriving from the command signals at predetermined intervals of time information related to desired position by also storing the derived positional information in a manner which indicates its independence from its relative time of acquisition.

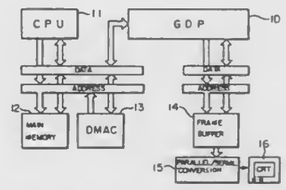
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**5,046,023**

## GRAPHIC PROCESSING SYSTEM HAVING BUS CONNECTION CONTROL CAPABLE OF HIGH-SPEED PARALLEL DRAWING PROCESSING IN A FRAME BUFFER AND A SYSTEM MEMORY

**Koyo Katsura, Hitachiota; Shigeru Matsuo, Hitachi; Jun Sato, Musashino; Takashi Sone, Tokyo; Yoshikazu Yokota, Kodaira, and Masahiko Kikuchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan**

Filed Oct. 6, 1987, Ser. No. 105,292
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—518 29 Claims



1. A graphic processing system comprising:

first store means for storing a program having a plurality of program steps and information corresponding to a plurality of pixels;

first processor means for executing at least one of the program steps transferred from said first store means by said first processor means and a program step supplied to said first processor means by an external device so as to control said graphic processing system;

output means for outputting image information generated by controlling pixels arranged in a plurality of dimensions;

second store means connected to said output means for storing information corresponding to pixels to be outputted by said output means; and

second processor means responsive to a command and parameter information transferred from at least one of said first store means and said first processor means for generating character and graphic data in accordance with a predetermined processing procedure, and controlling a transfer of the data selectively to one of said first store means and said second store means.

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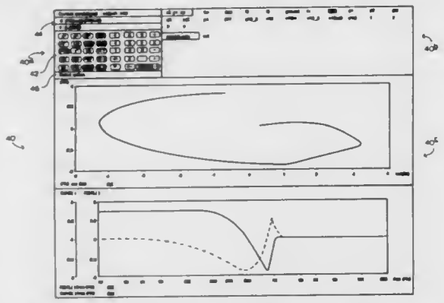


5,046,024

## VECTOR CALCULATOR APPARATUS FOR GRAPHIC WAVEFORM MANIPULATION

David W. Smith, Forest Grove, and Scott A. Majdecki, Newberg, both of Oreg., assignors to Analogy, Inc., Beaverton, Oreg.

Filed Feb. 26, 1987, Ser. No. 19,418
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—518 10 Claims



1. A vector data manipulation system, for use in conjunction with a computer terminal having a display monitor with a cursor, and a cursor control device with a push button, comprising:

means for depicting a pad of plural vector operator keys for display on such monitor;

means, responsive to such cursor control device, for positioning such cursor within the display on the monitor and adjacent one of said keys to select one of said vector operators;

means, responsive to such push button, for reading the position of such cursor to determine which vector operators is selected;

means, responsive to such cursor control device and such push button, for determining which vector data are selected as vector operands;

means for manipulating such vector operands in accordance with such selected vector operator to produce a graphic waveform; and

means for displaying said graphic waveform on a monitor.

5,046,025

## DATA TRANSMISSION OPTIMIZER INCLUDING MULTI-PASS SYMBOL BUFFER OPTIMIZATION, TRIAL GENERATION FEATURE AND MDT RESET VOTING FEATURE

Thomas A. Harper, Sugar Land, and Philip V. Wiles, Jr., Houston, both of Tex., assignors to BMC Software, Inc., Sugar Land, Tex.

Continuation of Ser. No. 225,036, Jul. 27, 1988, abandoned. This application Apr. 30, 1990, Ser. No. 517,963
Int. Cl.[5] G06F *15/68*
U.S. Cl. 364—518 8 Claims

1. A method for optimizing the transmission of an outgoing signal generated by a host unit for processing by a peripheral unit having a programmable symbol buffer,

said symbol buffer having information contents that are organized into a plurality of "symbol slots" each of which is selectively displayable in a plurality of display colors,

said outgoing signal including a command to write a representation of a symbol to a symbol slot in said symbol buffer,

said method comprising the steps of:

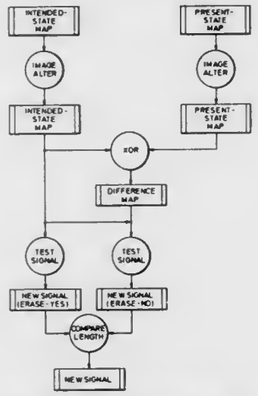
(a) designating one said display color as a "designated display color";

(b) maintaining a present-state map of the information contents of the symbol buffer;

(c) accessing said outgoing signal;

(d) generating an updated-state map of the information contents of said symbol buffer expected to exist if said outgoing signal were to be processed by the peripheral unit;

(e) scanning said present-state map and said updated-state map in search of a "hit" symbol slot (1) that is selected for display in said designated display color, and (2) at




which the information contents of said present-state map and said updated-state map are nonidentical;

(f) writing, to a substitute outgoing signal, a command to download to the peripheral unit symbol buffer a representation of the symbol stored in the updated-state map at the hit symbol slot, in the designated display color; and

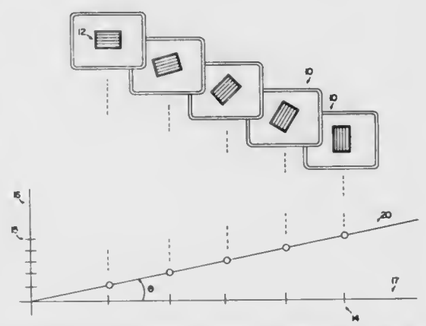
(g) overwriting the present-state map at the hit symbol slot with the information contents of the corresponding updated-state map at the hit symbol.

5,046,026

## METHOD AND APPARATUS FOR PRECISELY VARYING THE DISPLAY RATE OF COMPUTER GENERATED GRAPHIC IMAGES

Victor Tolomei, Milpitas, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jun. 13, 1989, Ser. No. 365,532
Int. Cl.[5] G09G *1/00*
U.S. Cl. 364—521 11 Claims



1. A method of precisely varying the display rate of an



animated graphic image generated by a computer system, said animated graphic image being comprised of a plurality of graphic cells, said graphic cells displayed in a sequence from first graphic cell 1 to a last graphic cell N, said method comprising the steps of:

(a) entering a desired display rate into said computer system;

(b) converting said display rate into a cell display vector located in the first quadrant of an x-y rectangular coordinate system having an x-axis and an y-axis, the x-axis of said coordinate system representing increasing time, the y-axis of said coordinate system representing increasing displayed graphic cell number, said cell display vector being displaced from the x-axis of said coordinate system through an angle, the measure of said angle, being a predetermined function of said desired display rate;

(c) displaying the first cell of said N cells on a display of said computer system;

(d) waiting a predetermined period of time;

(e) calculating the height of said cell display vector above said x-axis, and if said cell display vector is above a predetermined height, displaying the next cell in said sequence;

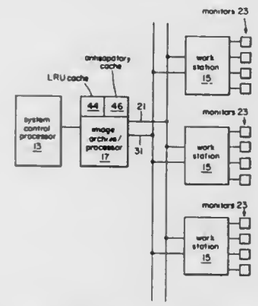
(f) repeating steps (d) and (e) until all N cells in said sequence forming said animated graphic image have been displayed.

5,046,027

## APPARATUS AND METHOD FOR PROCESSING AND DISPLAYING IMAGES IN A DIGITAL PROCESOR BASED SYSTEM

James L. Taaffe, Arlington, and Maria Kaldis, Boston, both of Mass., assignors to Massachusetts General Hospital, Boston, Mass.

Filed Nov. 8, 1988, Ser. No. 268,781
Int. Cl.[5] G06F *15/32*
U.S. Cl. 364—521 44 Claims




1. An image display system for displaying images stored in a remote source, comprising:

a plurality of display means viewable by a user;

a plurality of display controllers, for each display means one display controller at a time being connectable to the display means to drive the display means, each display controller when connected to a display means providing the display means image data indicative of an image to be displayed, at any given time at least one display controller being unconnected to any display means while all display means are being driven by the other display controllers; and

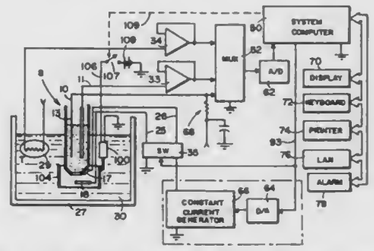
means for changing connections between display controllers and display means such that an unconnected display controller becomes connected to a display means and a display controller currently connected to the display means becomes disconnected, the display means thereby being driven in a paint-free fashion from image data from the currently connected display controller and then from image data from the unconnected display controller, such that the display means displays a succession of images with a substantially instantaneous whole image change-over between images.

5,046,028

## SYSTEM FOR CALIBRATING, MONITORING AND REPORTING THE STATUS OF A PH SENSOR

Avron I. Bryan, 26 Country Club Rd., Cocoa Beach, Fla. 32931, and Michael R. Cushman, 521 Brandonwood Rd., Kingsport, Tenn. 37662

Continuation-in-part of Ser. No. 306,064, Feb. 6, 1989, Pat. No. 5,016,201. This application Dec. 10, 1990, Ser. No. 624,961
Int. Cl.[5] G06F *15/46;* G01N *27/26*
U.S. Cl. 364—550 13 Claims




1. In a real time, on-line calibration, test and monitoring system for measurement of pH having a pH sensor immersed in a process solution, the pH measuring system having a permeable membrane, the improvement comprising:

a) a first electrolysis electrode disposed in the process solution adjacent said permeable membrane;

b) a second electrolysis electrode immersed in said process solution and spaced apart from said first electrode;

c) a source of direct current for selective connection to said first and second electrodes;

d) control means for periodically connecting and controlling said direct current source to cause said direct current to flow through said solution between said first electrode and said second electrode for producing electrolysis in said process solution to thereby produce temporary changes in the concentration of hydrogen ions incident on said sensor, said changes in hydrogen ions producing temporary changes in pH relative to the pH due to the process, each of said changes characterized by a rise time, a maximum amplitude, and a decay time;

e) means for comparing said rise times, magnitudes, and decay times of said changes with calibrated values and for detecting deviations from calibrated values indicative of a change in characteristics of said pH sensor;

f) a movable shield having an extended position surrounding said membrane of said sensor, and said first and second electrolysis electrodes during flow of said current, and a retracted position exposing said membrane to a flow of said process solution; and

g) means for moving said shield between said extended position and said retracted position.

5,046,029

## ELECTRONIC ODO/TRIP METER FOR AUTOMOBILES

Hiroshi Ikeda, Kanagawa, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Dec. 8, 1988, Ser. No. 281,772
Claims priority, application Japan, Dec. 9, 1987, 62-311722
Int. Cl.[5] G01C *22/00*
U.S. Cl. 364—561 13 Claims

1. An electronic odo/trip meter for automobiles comprising:

count means for enumerating travel distance and for outputting travel distance data;

display means connected to said count means for displaying said travel distance data derived from said count means;

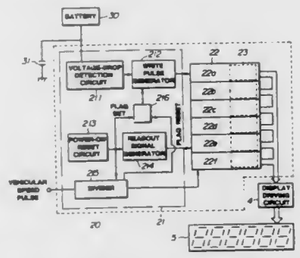
non-volatile memory means directly connected to exactly corresponding locations of said count means so as to provide parallel data transfer between said count means and said non-volatile memory;

control means for controlling write/readout operation of said travel distance data to and from said non-volatile memory means;

said control means comprising:

first detection means for detecting a first state wherein power supply from a battery attains one of two conditions including a power cut off condition and a condition wherein an output voltage provided by the battery becomes less than a predetermined threshold voltage, said first detection means generating a first signal indicating that the battery is in said first state;

second detection means for detecting a second state wherein the power supply from the battery becomes greater than said threshold voltage, said second detection means generating a second signal indicating that the battery is in said second state;




said control means controlling said write/readout operation such that the travel distance data of said non-volatile memory means is renewed with the travel distance data of said count means only when said count means receives the first signal from said first detection means, while the travel distance data of said count means is renewed with the travel distance data of said non-volatile memory means only when said count means receives the second signal from said second detection means; and

a back-up power source connected to said count means for supplying power required for a data transfer operation from said count means to said non-volatile memory means for a predetermined period determined to allow completion of the data transfer operation, said back-up power source including a back-up condenser for temporarily supplying power to said count means only when the power supplied from the battery is in said first state.

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**5,046,030**

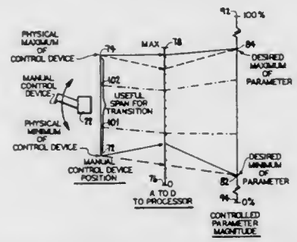
**METHOD AND APPARATUS FOR DYNAMIC REMAPPING OF VIDEO SWITCHER CONTROL INPUTS**

**David W. Bitter, Newark, Calif.; Anthony E. Zortea, Exeter, and Douglas C. Crawford, Pottstown, both of Pa., assignors to Videotek Incorporated, Pottstown, Pa.**

**Filed Feb. 16, 1990, Ser. No. 481,505**
**Int. Cl.[5] G01D *18/00*; G09G *3/02***
**U.S. Cl. 364—571.02** **9 Claims**

1. A manually variable control apparatus for setting a magnitude of a controlled parameter between a maximum and a minimum during a period of transition of the parameter defining an effect, the manually variable control apparatus having a control device with a movable part and producing an electrical output which varies in response to position of the movable part, and the controlled parameter being responsive to a magnitude regulator operable to set the level of the controlled parameter in response to an input to the magnitude regulator, the apparatus comprising:

a remapping means operable to digitize the electrical output of the control device and storage means operable to register the level of the controlled parameter, the remapping means providing the input to the magnitude regulator, the remapping means varying the input to the magnitude regulator as a function of changes in the electrical output of the control device during the transition, and the remapping means also mathematically scaling and shifting changes in the input to the magnitude regulator relative to




changes in the digitized electrical output of the control device, so that full displacement of the manually variable control device between a minimum and maximum physical position thereof corresponds linearly to a predetermined span of the controlled parameter which predetermined span is less than or equal to a full possible span of the controlled parameter.

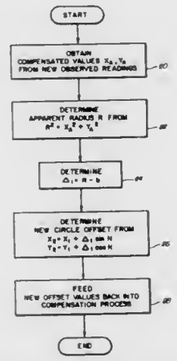
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**5,046,031**

**METHOD AND APPARATUS FOR AUTOMATIC FLUX-GATE COMPASS CALIBRATION**

**Richard E. Wanous, Lomita, Calif., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.**

**Filed Feb. 6, 1989, Ser. No. 306,416**
**Int. Cl.[5] G01C *25/00***
**U.S. Cl. 364—571.02** **16 Claims**




6. A method for automatic and continuous calibration of a flux-gate compass installed in a vehicle, comprising the steps of:

(a) operating the vehicle and, in so doing, continually changing its angular orientation;

(b) subjecting the vehicle to possible changes in permanent magnetism;

(c) while the vehicle is being operated, obtaining successive two-axis readings from the flux-gate compass, for use in navigating the vehicle;

(d) transforming the two-axis readings to conform to a circular performance characteristic;



(e) determining a reference radius and a current offset position of the circular performance characteristic;

(f) determining a measured radius of the circular performance characteristic from a pair of the readings obtained in steps (c) and (d);

(g) determining a correction value by subtracting the reference radius from the measured radius;

(h) calibrating the flux gate compass by determining a new offset position for the circular performance characteristic, derived from the current offset position and the correction value determined in step (g);

(i) using the new offset position in the transformation of subsequent compass readings to conform to the circular performance characteristic;

(j) saving the new offset position for subsequent use as the current offset position; and

(k) repeating steps (f) through (j) for successive sets of flux-gate compass readings obtained at different angular orientations of the vehicle, to obtain successive new offset positions.

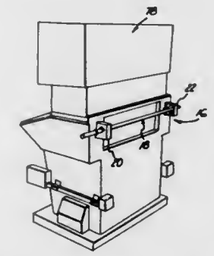
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**5,046,032**

**CALIBRATION BAR**

**Michael P. Alusick, Hartland; Michael J. Kling, III, Meguon, and Peter A. Puetz, Waukesha, all of Wis., assignors to Bear Automotive Service Equipment Company, Milwaukee, Wis.**

**Filed Dec. 1, 1989, Ser. No. 445,882**
**Int. Cl.[5] G01B *7/315***
**U.S. Cl. 364—571.02** **19 Claims**



1. An apparatus for correcting for errors in calibration equipment used in calibrating cross toe angle measurements in wheel alignment system having a left head unit and a right head unit which provide cross toe angle measurement signals comprising:

a support structure;

bracket means mounted to the support structure;

a bar rotatably mounted in the bracket means, the bar rotatable between a first position and a second position and the bar includes a left mounting area adapted for receiving the left head unit and a right mounting area adapted for receiving the right head unit;

means for accepting first cross toe angle measurement signals from the left head unit and the right head unit when the bar is in the first position and second cross toe angle measurement signals from the left head unit and the right head unit when the bar is in the second position; and

means for correcting for errors associated with the bar and for calculating a cross toe angle calibration factor for the left and right head units based upon the first and second cross toe angle measurement signals wherein the cross toe angle calibration factor is independent of deformities in the bar.

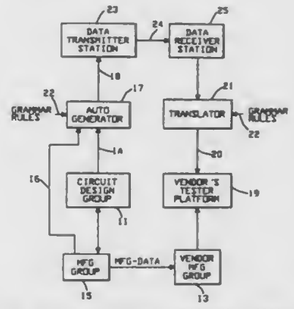
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**5,046,033**

**SYSTEM FOR TRANSFERRING TEST PROGRAM INFORMATION**

**David A. Andreasen, Blue Bell, Pa.; Dean J. Shea, Minneapolis, Minn., and Gregory P. Hackney, Ramona, Calif., assignors to UNISYS Corporation, Blue Bell, Pa.**

**Filed Aug. 9, 1989, Ser. No. 391,075**
**Int. Cl.[5] G01R *31/28***
**U.S. Cl. 364—580** **17 Claims**




1. A system for transmitting information from a source of designing electrical circuits to a source of manufacturing electrical circuits, which information is used in testing an electrical circuit at said source of manufacturing electrical circuits, comprising in combination:

electric circuit design means formed to design at least one particular circuit;

autogeneration means connected to said electrical circuit design means to receive information therefrom related to said particular circuit, said autogeneration means formed to create a compacted information program including truth table concepts, related to said particular circuit, whereby when said information program is implemented said truth table concepts cause certain aspects of said particular circuit to be tested;

information communication means having first and second stations with said first station connected to said autogeneration means to receive said compacted information program therefrom, said first station formed to transmit said compacted information program to said second station;

translation means connected to said second station to receive said compacted information program therefrom, said translation means formed to expand said compacted information program into said truth table concepts; and

testing means connected to said translation means to receive said truth table concepts and formed to apply signals representing said truth table concepts to said particular circuit to effect testing thereof.

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**5,046,034**

**ARRAY STRUCTURE FOR USE IN AN ADAPTIVE INFERENCE TESTING DEVICE**

**William D. Stark, Ithaca, and Gregory C. Prestas, Candor, both of N.Y., assignors to Array Analysis, Inc., Ithaca, N.Y.**

**Filed Nov. 7, 1989, Ser. No. 433,608**
**Int. Cl.[5] G05B *19/02*; G01R *31/28***
**U.S. Cl. 364—580** **20 Claims**

1. An adaptive inference system having a program for providing the system with the ability to predict the cause of a previously unobserved fault from the relationships with other known fault information when testing electric and electronic devices or assemblies, said adaptive inference system comprising:

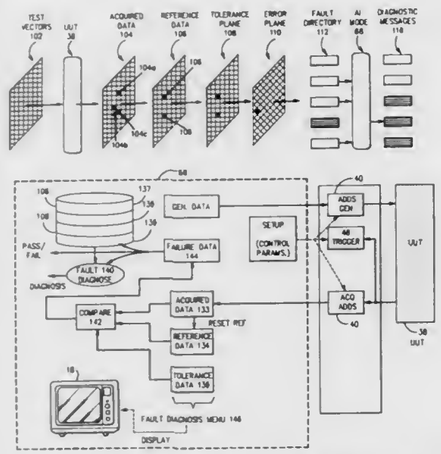
a) testing means for performing positiondependent, time-ordered tests upon electrical or electronic devices or assemblies to provide test failure data;

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b) conversion means operatively connected to said testing means for converting said test failure data to specific error patterns defining relationships with prior test failure data;
c) input means operatively connected to said conversion means for introducing operator analysis information to said specific error patterns;
d) storage means operatively connected to said conversion means and said input means for storing operator-defined error patterns; and

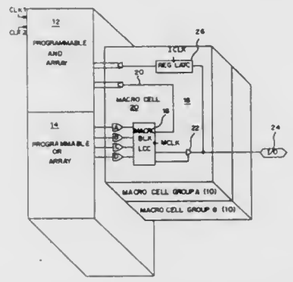



e) comparison means associated with said program, said storage means, and said testing means for comparing current test failure data with stored operator-defined error patterns to predict a probable cause of current failures based upon stored error failures, said comparison means being operative to provide an adaptive inference to test failure data not experienced or operator-defined in prior tests.

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**5,046,035**
**HIGH-PERFORMANCE USER PROGRAMMABLE LOGIC DEVICE (PLD)**
**Robin J. Jigour, San Jose; Shueh-Mien J. Lee, Sunnyvale, and Ali Pourkeramati, Santa Clara, all of Calif., assignors to ICT International CMOS Tech., Inc., San Jose, Calif.**
**Continuation-in-part of Ser. No. 89,644, Aug. 26, 1987, Pat. No. 4,918,641. This application Feb. 28, 1990, Ser. No. 487,022**
**The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.**
**Int. Cl.[5] G06F *7/38*; H03K *19/173***
**U.S. Cl. 364—716** **18 Claims**

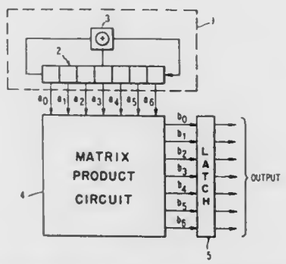
1. A user programmable logic device comprising
a user programmable AND gate array having inputs for receiving input signals and generating a plurality of product terms,
a user programmable OR gate array connected to receive product terms from said AND gate array and producing sum terms of products, said individual sum terms from said OR gate array serving multiple functions based upon programming of said macrocell,
a plurality of user programmable macrocells each connected to receive a plurality of said sum terms from said user programmable OR gate array, each macrocell including
a first user programmable register means for receiving sum terms,
and I/O terminal means connected to receive outputs from said user programmable register means,
a first feedback from said register means to said AND gate array, and
a second feedback from said I/O terminal to said AND gate array wherein said register means and said I/O terminal means can function independently, each macrocell being




functional in simultaneously implementing two independent sum-of-product logic functions combinatorially and sequentially with each of said logic functions being programmably routed as feedback signals to said AND gate array or as an output to an I/O terminal.

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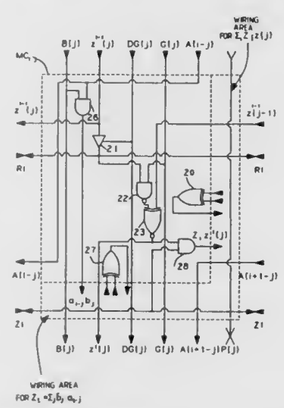
**5,046,036**
**PSEUDORANDOM NUMBER GENERATOR**
**Shu Tezuka, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.**
**Continuation of Ser. No. 773,486, Sep. 9, 1985, abandoned. This application Mar. 18, 1988, Ser. No. 171,213**
**Claims priority, application Japan, Oct. 15, 1984, 59-214467**
**Int. Cl.[5] G06F *7/38***
**U.S. Cl. 364—717** **9 Claims**




1. A pseudorandom number generator comprising:
a polynomial circuit comprising a feedback shift register; and
matrix multiplication means for receiving parallel data from said feedback shift register and performing matrix multiplication A×G wherein A is a vector and G is a matrix.



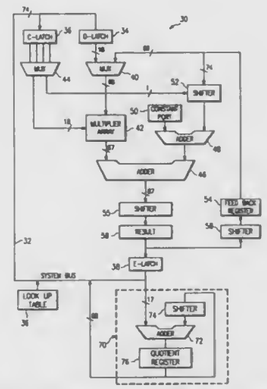
**5,046,037**
**MULTIPLIER-ADDER IN THE GALOIS FIELDS, AND ITS USE IN A DIGITAL SIGNAL PROCESSING PROCESSOR**
**Marc Cognault, Clichy; José Sanches, Montmagny, and Dominique Brechard, Paris, all of France, assignors to Thomson-CSF, Puteaux, France**
**PCT No. PCT/FR89/00101, § 371 Date Nov. 3, 1989, § 102(e) Date Nov. 3, 1989, PCT Pub. No. WO89/08882, PCT Pub. Date Sep. 21, 1989**
**ub. Date DMar. 10, 1989, Ser. No. 439,042**
**Claims priority, application France, Mar. 17, 1988, 88 03431**
**Int. Cl.[5] G06F *7/00***
**U.S. Cl. 364—746.1** **4 Claims**




1. A multiplier-adder in one of
the Galois fields up to $CG(2^N)$ where N is a predetermined integer, having three multiple inputs intended to receive the coefficients of polynomial operands A, B and C of degree m−1 less than N for the polynomial operation P in the Galois field of degree m, $CG(2^m)$:$P=(A*B)+C$, where * and + are respectively multiplication and addition, performed Modulo G, in the Galois field $CG(2^m)$ of generator polynomial G, and a data input for applying parameters, for this generator polynomial, comprising:
a decoder (10) constituted from a line of N elementary identical cells $CD_j$, arranged in order from j=0 to N−1, receiving the coefficients of the generator polynomial G(N:O) and transmitting the coefficients of this polynomial without the one having the highest degree G(N−1:0) and a polynomial with a significant coefficient derived by the logical combination of the generator polynomial marking the degree m of the chosen Galois field, DG(N−1:0)
a computing matrix (20) constituted from p lines of identical elementary computing cells for performing the polynomial computation of p steps, the cells of the last line supplying the terms of degrees 0 to m−1 of the resulting polynomial P,
characterized in that, for a computation in p=2N−1 steps, the computing matrix comprises 2N−1 lines from i =0 to 2(N−1) and N columns of j=0 to N−1 of cells $CM_{i,j}$ connected in a tree structure, the non-connected inputs receiving logic "0" levels, each elementary computing cells $MC_{i,j}$ comprising:
five vertical inputs connected to the vertical outputs of the preceding cell of the same column, receiving the terms of degree j, G(j), DG(j) and B(j) of the generator polynomial, of the degree polynomial, and of the polynomial B, the term of degree i−j of the polynomial A, where i is the index of the matrix line and i=0 to 2(N−1), and the term of degree j of an intermediate result $z^{i-1}(j)$ where i is the index of matrix column and j=0 to N−1, two lateral inputs receiving from the cell of the column of inferior rank of the same line the term of degree j−1 of the intermediate result $z^{i-1}(j-1)$ and the term of degree (i+1−j), A(i+1−j) of the polynomial A,
two lateral outputs to be applied to the cell of superior rank of the same line supplying the term of degree j of the intermediate result $z^{i-1}(j)$ and the term of degree i−j, A(i−j) of the polynomial A.

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**5,046,038**
**METHOD AND APPARATUS FOR PERFORMING DIVISION USING A RECTANGULAR ASPECT RATIO MULTIPLIER**
**Willard B. Briggs, Carrolton, and David W. Matula, Dallas, both of Tex., assignors to Cyrix Corporation, Dallas, Tex.**
**Continuation-in-part of Ser. No. 376,753, Jul. 7, 1989, abandoned. This application Aug. 2, 1989, Ser. No. 389,051**
**Int. Cl.[5] G06F *7/52***
**U.S. Cl. 364—765** **26 Claims**




1. A circuit for performing exact division of a dividend by a divisor, comprising:
a rectangular array multiplier;
circuitry associated with said multiplier for obtaining a short reciprocal of said divisor;
circuitry associated with said multiplier for facilitating the multiplication of said short reciprocal by said dividend to yield a first product;
circuitry associated with said multiplier for truncating said first product to have less bits than said divisor to yield a first quotient digit value;
circuitry associated with said multiplier for facilitating the generation of a product of said first quotient digit value and said divisor;
circuitry associated with said multiplier for computing the difference between said dividend and said product of said first quotient digit value and said divisor to yield a first partial remainder;
circuitry associated with said multiplier for facilitating the multiplication of said short reciprocal by said first partial remainder to yield a subsequent product;
circuitry associated with said multiplier for truncating said subsequent product to have less bits than said divisor to yield a subsequent quotient digit value;
circuitry associated with said multiplier for facilitating the generation of a product of said subsequent quotient digit value and said divisor; and
circuitry associated with said multiplier for computing the difference between said first partial remainder and said product of said subsequent quotient digit value and said divisor to yield a new partial remainder, said first quotient

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digit value and said subsequent quotient digit value calculated such that said partial remainder and said new partial remainder have magnitudes corresponding to less than one unit in the last place of said first quotient digit value and said subsequent quotient digit value, respectively.

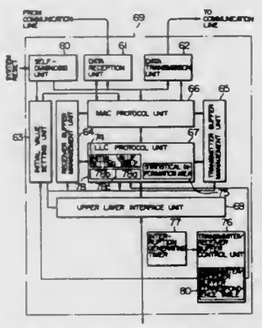
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**5,046,039**

## BUFFER MANAGEMENT SYSTEM

**Atsushi Ugajin; Hisashi Matsumura, and Tokuhiro Niwa, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 20, 1988, Ser. No. 196,540**
**Claims priority, application Japan, May 25, 1987, 62-125773**
**Int. Cl.[5] G05B *23/02***
**U.S. Cl. 364—900** **14 Claims**



1. A buffer management system for a communication apparatus having a plurality of transmitter buffers and a plurality of receiver buffers, comprising:
a transmitter/receiver buffer having a transmitter buffer area and a receiver buffer area, said transmitter buffer area and said receiver buffer area corresponding to said plurality of transmitter and receiver buffers, respectively, and the ratio of said transmitter buffer area to said receiver buffer area being alterable;
means for transmitting data loaded in said transmitter buffer area;
means for loading received data in said receiver buffer area;
means for counting a number of occurrences of busy state of said receiver buffer area during a predetermined time duration; and
control means for dynamically changing said ratio of said transmitter buffer area to said receiver buffer area respectively of said transmitter/receiver buffer, in accordance with said counted buffer busy number.

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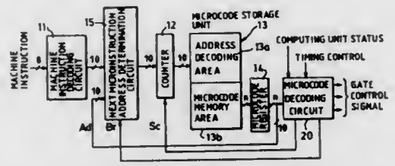
**5,046,040**

## MICROPROGRAM CONTROL APPARATUS USING DON'T CARE BITS AS PART OF ADDRESS BITS FOR COMMON INSTRUCTIONS AND GENERATING VARIABLE CONTROL BITS

**Akio Miyoshi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Japan**

**Filed Dec. 30, 1986, Ser. No. 947,642**
**Claims priority, application Japan, Jan. 16, 1986, 61-6672**
**Int. Cl.[5] G06F *9/26, 9/32***
**U.S. Cl. 364—900** **6 Claims**

6. A microprogram control device for use with a microcomputer, which comprises:
(a) decoding means for decoding machine instruction codes input from a program memory of the microcomputer to the decoding means to create a microcode start address for each of said machine instruction codes;
(b) counter means, connected to said decoding means, for counting responsive to the receipt of each said microcode start address to produce a required number of microcode addresses;
(c) microcode storage means, coupled to said counter means, comprising a microcode address decoding area, responsive to said microcode address from said counter means, for designating microcodes corresponding to said microcode addresses and a microcode memory area in which microcodes of microprograms defining said machine instruction codes are stored, at least one microcode of a first instruction code and at least one microcode of a second instruction code being common, said microcode storage means storing a function of "don't care" at a predetermined bit position of said microcode address for said at least one common microcode; and



(d) microcode register and decode means, connected to said microcode storage means, for latching the microcodes read from said microcode memory area, for outputting said microcodes for controlling circuitry to be controlled, and for outputting at least a part of said microcodes for controlling said counter means as control binary data Sc, said control binary data Sc being variable and determined by said microcode register and decode means, and wherein said counter means, responsive to said control binary data Sc, creates said microcode addresses for each microstep of microcode.

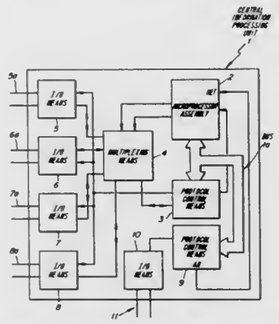
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**5,046,041**

## DEVICE FOR TRANSMITTING INFORMATION BETWEEN A PLURALITY OF ELEMENTS OF AN AUTOMOBILE VEHICLE, AND A CENTRAL INFORMATION PROCESSING UNIT

**Jean-Luc Lecocq, Sevres, and Anselmo Soria-Mangano, Villepreux, both of France, assignors to Automobiles Peugeot, Paris; Automobiles Citroen, Neuilly/Seine and Regie Nationale des Usines Renault, Boulogne Billancourt, all of, France**

**Filed Dec. 15, 1988, Ser. No. 284,604**
**Claims priority, application France, Dec. 17, 1987, 87 17647**
**Int. Cl.[5] G06F *13/26***
**U.S. Cl. 364—900** **4 Claims**



1. A device for transmitting information comprising:
a plurality of elements of an automobile vehicle, some of said elements performing functions having high priority characteristics and other of said elements performing functions having low priority characteristic and
a central processing unit comprising:
a microprocessor assembly for controlling said plurality of elements and having an interruption input for receiving an interruption signal,
first information input/output means for passing signals to and from said elements having low priority characteristics,
first protocol control means connected to said microprocessor assembly for conducting signals between said elements having low priority characteristics and said microprocessor assembly,
multiplexing means connecting said first protocol control means to said first information input/output means,
low priority buses for connecting said elements having low priority characteristics to said first information input/output means,
second input/output means for passing signals to and from said elements having high priority characteristics,
second protocol control means connected to said second input/output means and to said microprocessor assembly for conducting signals between said elements having high priority characteristics and said microprocessor assembly and having an acknowledgement output for outputting said interruption signal,
a high priority bus of the collision type for connecting said elements having high priority characteristics to said second information input/output means,
said low priority buses comprising buses adapted to operate on a given operating frequency and said high priority bus comprising a bus adapted to operate on a different operating frequency than the given operating frequency to adapt information transmission over the buses to an environment and reduce electromagnetic interferences,
said microprocessor assembly being adapted to process in priority information coming from said high priority bus and information coming from said low priority buses, and
wherein said acknowledgement output of said second protocol control means is connected to said interruption input of said microprocessor assembly for causing the microprocessor assembly to process in priority information coming from said high priority bus before proceeding to a processing of information coming from said low priority buses responsive to said microprocessor assembly receiving said interruption signal.

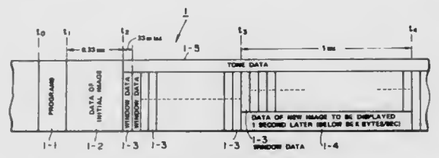
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**5,046,042**

## DATA PROCESSING SYSTEM

**Takashi Nitatori; Hirokazu Kato; Takatoshi Okumura, and Shigemitsu Yamaoka, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan**

**Filed Mar. 24, 1986, Ser. No. 846,925**
**Claims priority, application Japan, Mar. 25, 1985, 60-60459**
**Int. Cl.[5] G06F *3/06***
**U.S. Cl. 364—900** **9 Claims**



1. A data processing system comprising:
digital information outputting means for outputting digital information including a plurality of groups of data at a predetermined entire transfer rate, each of said plurality of groups of data including control data for defining characteristics of said each of said plurality of groups of data, said outputting means including means for outputting different groups of data at different transfer rates, a transfer rate of each of said plurality of groups of data outputted from said outputting means varying with a lapse of time, relative to the transfer rate of at least one other group, within a range of said entire transfer rate; and
data processing means responsive to each of said plurality of groups of data for separating said control data therefrom and analyzing said separated control data, said data processing means processing each of said plurality of groups of data in accordance with results of said analysis of said separated control data.

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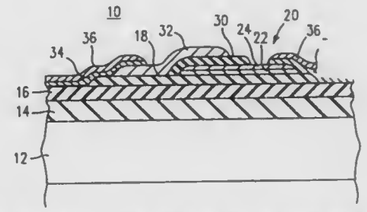


**5,046,043**

## FERROELECTRIC CAPACITOR AND MEMORY CELL INCLUDING BARRIER AND ISOLATION LAYERS

**William D. Miller, Rio Rancho; Joseph T. Evans; Wayne I. Kinney, both of Albuquerque, and William H. Shepherd, Corrales, all of N. Mex., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Oct. 8, 1987, Ser. No. 105,578**
**Int. Cl.[5] G11C *11/22***
**U.S. Cl. 365—145** **14 Claims**



1. A ferroelectric capacitor structure for integrated fabrication with a metal-oxide-semiconductor (MOS) device on a semiconductor substrate, comprising:
a dielectric layer formed on a surface of said substrate;
a diffusion barrier layer formed on a surface of said dielectric layer;
an isolation layer formed on a surface of said diffusion barrier layer;
a bottom electrode formed on a surface of said isolation layer;
a layer of ferroelectric material formed on a surface of said bottom electrode; and,
a top electrode formed on a surface of said ferroelectric layer, wherein said bottom electrode, said ferroelectric layer, and said top electrode define said ferroelectric capacitor, and said diffusion barrier layer prevents contamination of said substrate by material of said ferroelectric layer.

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**5,046,044**

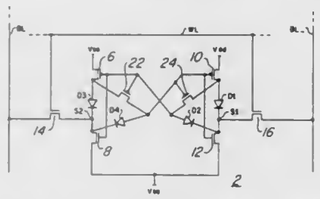
## SEU HARDENED MEMORY CELL

**Theodore W. Houston, Richardson, and Terence G. Blake, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 288,541, Dec. 21, 1988, abandoned. This application Aug. 1, 1990, Ser. No. 563,722**
**Int. Cl.[5] G11C *11/40***
**U.S. Cl. 365—156** **4 Claims**

1. A memory cell comprising:
two cross-coupled inverters each including a p-channel transistor and an n-channel transistor, said p and n channel transistors in a respective inverter sharing a common gate, each inverter further including a first diode connected to and between the n-channel transistor and the p-channel transistor;
second diodes connected between and to the gate of one

inverter and a drain of a selected transistor of the other inverter, wherein the gate common to said p and n channel transistors of an inverter also overlies said first and second



diodes, and wherein each second diode connects to the drain of said n-channel transistor; and

coupling transistors each connected to an anode of said second diode and the drain of the p-channel transistor.

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**5,046,045**

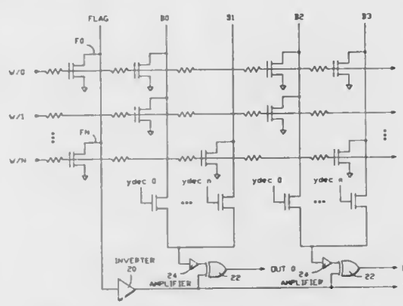
**METHOD OF STORING DATA IN A READ ONLY MEMORY TO ENHANCE ACCESS TIME**

**Mark S. Ebel, and Michael R. McCoy, both of Los Altos, Calif., assignors to Chipware, Inc., Los Altos and International Microelectronic Products, San Jose, both of, Calif.**

**Filed Mar. 16, 1990, Ser. No. 495,359**

**Int. Cl.[5] G11C** *17/10, 7/00*

**U.S. Cl. 365—189.01** **5 Claims**



1. A method of enhancing access time in reading data stored in a digital memory comprising the steps of

a) assigning a weight to data storage locations along each wordline of a memory, said weight being based on the resistance-capacitance (RC) load associated with said data storage locations and a distance between respective ones of said data storage locations and a worldline drive,

b) weighting each bit of a word to be stored along a wordline in accordance with the assigned weight and the "1" or "0" value of a bit corresponding to each storage location,

c) summing the weighted bits of said wordline,

d) determining a ratio of the summed weighted bits to a maximum possible sum of weighted bits,

e) inverting all bits in on said wordline if said ratio exceeds a preselected value, and

f) storing all bits said said word on said data storage locations along said wordline in memory.

**5,046,046**

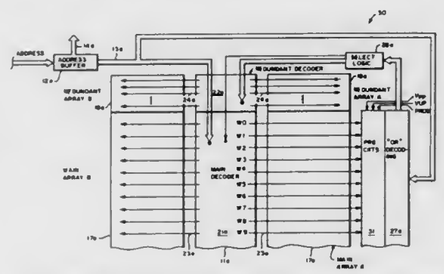
**REDUNDANCY CAM USING WORD LINE FROM MEMORY**

**Sherif Sweha, Citrus Heights; Mark Bauer, and Phil Kliza, both of Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Mar. 10, 1978, Ser. No. 321,904**

**Int. Cl.[5] G11C** *15/04, 11/34, 7/00*

**U.S. Cl. 365—200** **7 Claims**



1. A redundant memory circuit for a memory array comprising:

a memory having a preselected number of rows and columns having addresses associated therewith, and one or more redundant rows or columns having initially unspecified addresses associated therewith;

a redundancy decoder coupled to said memory for decoding addresses associated with said memory and activating said one or more redundant rows or columns if a selected location of said memory is defective;

programming means coupled to said redundancy decoder for causing said redundant rows or columns having initially unspecified addresses associated therewith to be associated with addresses of said memory which are defective, wherein programming of said association is achieved by providing programming signals on one or more word lines having addresses associated therewith.

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**5,046,047**

**CIRCUIT ARRANGEMENT FOR VERIFYING DATA STORED IN A RANDOM ACCESS MEMORY**

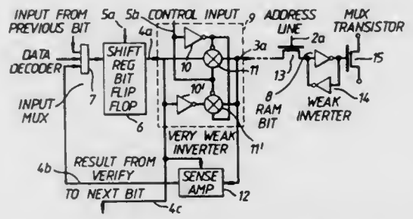
**Richard G. Cliff, and Neil S. Hastie, botb of Devon, Great Britain, assignors to Plessey Overseas Limited, Ilford, England**

**Filed Feb. 2, 1990, Ser. No. 473,665**

**Claims priority, application United Kingdom, Feb. 10, 1989, 8902983**

**Int. Cl.[5] G11C** *19/08, 29/00*

**U.S. Cl. 365—201** **4 Claims**



1. A circuit arrangement for verifying data stored in a random access memory comprising, for each bit location of a column of the random access memory, input shift register means arranged to store an input data bit, multiplexer means arranged, during a write cycle, to write the input data bit into a bit position in the column of the random access memory, and



during a verification cycle, arranged to write an inverse data bit into the bit position of the input data bit in column of the random access memory, and a comparator arranged to compare, after completion of the verification cycle, an output of the bit position in the random access memory with the inverse data bit and the result is stored in the input shift register means, wherein the multiplexer means comprises first and second transmission gates, wherein the first transmission gate is arranged to pass the input data bit to the bit location of the random access memory during a write cycle, and the second transmission gate in conjunction with an inverter connected to an input of the second transmission gate is arranged to pass the inverse data bit to a bit location of the random access memory during a verification cycle, wherein the inverter and second transmission gate act as a weak inverter circuit, and the weak inverter circuit is arranged so as not to overwrite a fully operational random access memory bit location, and wherein an input multiplexer is connected to an input of the input shift register, and is arranged to receive an input data bit, the result from the comparator and an input from a previous bit location.

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**5,046,048**

**SEMICONDUCTOR INTEGRATED CIRCUIT INCLUDING OUTPUT BUFFER**

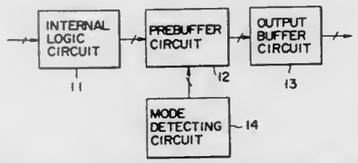
**Shigeru Atsumi; Sumio Tanaka, both of Tokyo; Junichi Miyamoto, Yokohama; Nobuaki Ohtsuka, Yokohama, and Keniti Imamiya, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 13, 1989, Ser. No. 379,280**

**Claims priority, application Japan, Jul. 15, 1988, 63-176721; Feb. 21, 1989, 1-40536**

**Int. Cl.[5] G11C** *7/00*

**U.S. Cl. 365—201** **20 Claims**



1. A semiconductor integrated circuit having a test mode in addition to a normal mode, comprising:

mode detecting means for detecting the test mode or normal mode and generating a mode signal corresponding to the detected mode;

prebuffer means, having at least two selectable output driving capacities, for receiving the mode signal generated by said detecting means, the prebuffer means including means for amplifying an input signal in accordance with an output driving capacity corresponding to the mode signal, and for outputting the amplified signal; and

output buffer means for receiving the amplified signal output from said prebuffer means and for outputting the amplified signal.

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**5,046,049**

**METHOD OF FLASH WRITE FOR TESTING A RAM**

**Hoon Choi, Taegu, and Seo Dong-Il, Seoul, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

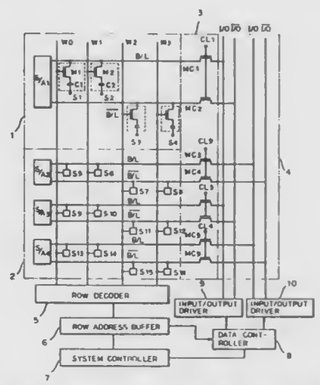
**Filed Mar. 20, 1990, Ser. No. 496,517**

**Claims priority, application Rep. of Korea, Nov. 18, 1989, 89-16775**

**Int. Cl.[5] G11C** *13/00*

**U.S. Cl. 365—201** **2 Claims**

1. A flash write method for testing RAM's in a RAM device including a transfer means for transferring row address signals to a memory cell array, said transfer means including a row address buffer and a row decoder, a data supply means for supplying data to be written into each cell of the memory cell array, said data supply means having input/output drivers and a data supply block, a memory cell array having memory areas such as first memory area and second memory area, said memory areas each comprising sense amplifiers and memory cells, and a gate means for connecting the first and second memory areas of the memory cell array with the data supply means, said



gate means being inserted between the bit lines (B/L and $\overline{B/L}$) and the input lines (I/O and $\overline{I/O}$), which comprises arranging the pair of bit lines (B/L and $\overline{B/L}$) in an alternating manner wherein the relative positions of the pair of bit lines (B/L and $\overline{B/L}$) in the first and second memory areas are the same throughout the memory cell array.

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**5,046,050**

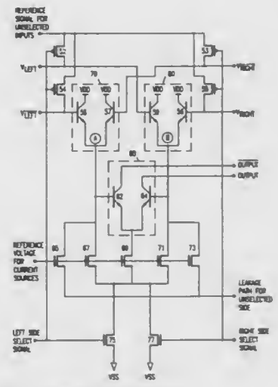
**SHARED BICMOS SENSE AMPLIFIER**

**Robert A. Kertis, Puyallup, Wash., assignor to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Apr. 10, 1990, Ser. No. 506,972**

**Int. Cl.[5] G11C** *11/40*

**U.S. Cl. 365—208** **10 Claims**



8. A memory system comprising:

a first block of memory cells having a first output and first complement output;

a second block of memory cells having a second output and second complement output;

first logic means coupled to the first block of memory cells and controllably connectable to a source of reference signals in response to a first select signal for connecting the first output and first complement output to the refer-

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ence signals and in response to a second select signal for connecting the first output and first complement output to a logic output;

second logic means coupled to the second block of memory cells and controllably connectable to the source of reference signals in response to the first select signal for connecting the second output and second complement output to the logic output and in response to a second select signal for connecting the second output and second complement output to the reference signals; and

a detection means coupled to each of the first and second logic means for detecting the logic output of one of the first and second logic means.

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**5,046,051**

## SERIAL MEMORY WITH ADDRESS COUNTER WHICH CAN BE PRESET USING A MULTI-PURPOSE INPUT, AND PICTURE MEMORY APPARATUS USING SAME

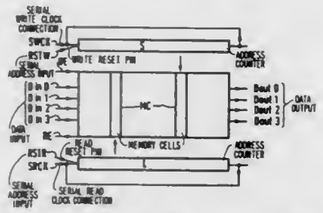
**Laurens Doornhein, and Jeroen Kettenis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 9, 1988, Ser. No. 269,229**

**Claims priority, application Netherlands, Nov. 9, 1987, 8702672**

**Int. Cl.[5] G11C** *5/06, 8/00*

**U.S. Cl. 365—221** **26 Claims**




1. A serial memory, comprising a series of memory cells, data input means, data output means, control signal input means, clock signal input means and serial address input means sharing a particular terminal with said control signal input means, characterized in that the memory is suitable for the non-shifting storage of information and furthermore comprises at least one address counter suitable for accepting, under the control of an activation signal provided by said control signal input means, a preset address accompanied by at least one of header information identifying a beginning of said preset address and termination information identifying an end of said preset address provided by said serial address input means, said at least one address counter receiving address incrementation signals from said clock signal input means.

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**5,046,052**

## INTERNAL LOW VOLTAGE TRANSFORMATION CIRCUIT OF STATIC RANDOM ACCESS MEMORY

**Fumio Miyaji, and Yukio Aoki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed May 31, 1989, Ser. No. 359,153**

**Claims priority, application Japan, Jun. 1, 1988, 63-135101; Jul. 29, 1988, 63-191547**

**Int. Cl.[5] G11C** *8/00, 11/41*

**U.S. Cl. 365—226** **4 Claims**

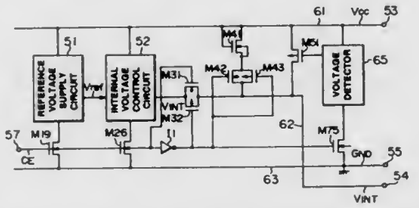
1. A static random access memory comprising:

a plurality of memory cells, each memory cell having an operating mode and a standby mode and including a flip-flop circuit and a pair of word transistors, each word transistor having a gate electrode,

a pair of bit lines in which each bit line is connected to a respective word transistor of each of the pairs of word transistors,

a word line connected to said gate electrode of each of said pairs of word transistors, and

internal low voltage supply means including a reference voltage supply circuit and an internal voltage control circuit for supplying an internal low voltage pulled down from a power source voltage to said plurality of memory cells in said operating mode,




said internal low voltage supply means setting said reference voltage supply circuit and said internal voltage control circuit to an off state in said standby mode, said internal low voltage supply means further including voltage pull-down means for supplying a data hold voltage to said plurality of memory cells in said standby mode and having a power consumption lower than that of a circuit including said reference voltage supply circuit and said internal voltage control circuit in an on state.

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**5,046,053**

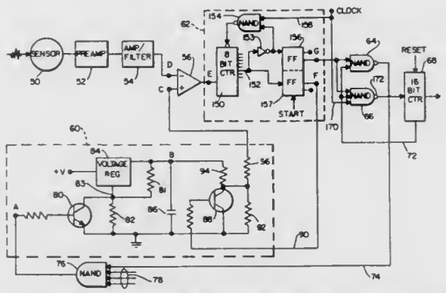
## ACOUSTIC SIGNAL DETECTION CIRCUIT

**Ian R. Gilchrist, Timooium, Md., assignor to Cyber Scientific, Baltimore, Md.**

**Filed Oct. 31, 1990, Ser. No. 606,582**

**Int. Cl.[5] G01S** *15/00, 3/80;* **G08C** *21/00*

**U.S. Cl. 367—98** **9 Claims**




1. A circuit for receiving an acoustic signal produced by a transmitter in response to a start signal, and for providing an output signal which enables a distance to be determined between said transmitter and sensor means in said circuit, said circuit comprising:

sensor means for receiving noise signals and, after a time delay, said acoustic signal from said transmitter, said time delay indicative of the distance of said transmitter from said sensor;

level control means for providing a plurality of output potentials, including a ramp voltage and a neutral voltage, said ramp voltage produced in response to said start signal manifestation;

comparator means having a pair of inputs connected to said level control means and sensor means respectively, for producing a first output signal in response to a potential on one input transitioning past a potential on another input, a first such output signal being produced when a voltage transition of said received acoustic signal passes a voltage manifested by said ramp;

signal detection means responsive to said first output signal from said comparator means to cause said level control means to apply said neutral voltage to said comparator means, whereby said comparator means produces a second output signal upon a subsequent transition of said received acoustic signal past said neutral voltage; and

circuit means responsive to said start signal to commence an interval manifestation and to a subsequent detection of said second output signal to terminate said interval manifestation.



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**5,046,054**

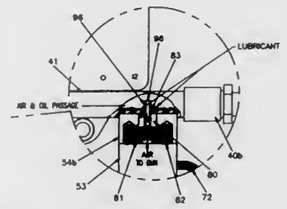
## APPARATUS FOR DISTRIBUTING LUBRICANT TO AIR GUNS IN A SINGLE AIRLINE AIR GUN SUBARRAY

**Otis A. Johnston, 203 Rampart Ct., League City, Tex. 77573**

**Filed Jun. 14, 1990, Ser. No. 538,387**

**Int. Cl.[5] G01V** *1/04, 1/38*

**U.S. Cl. 367—144** **1 Claim**




1. Apparatus for controlling lubricant flow into an air gun of a single airline subarray which utilizes an air-lubricant mixture, the airline having an opening, comprising:

(a) an adapter having a top and a bottom surface and a through cavity which is partially threaded a certain distance starting from the bottom surface, the adapter sealingly attached to the airline around the opening to form a through passageway from the airline to the bottom surface of the adapter; and

(b) a lubricant metering device having a cylindrical member with cylindrical top and bottom surfaces, the cylindrical surfaces being threaded to mate with the threaded cavity of the adapter, the cylindrical member also having a through hole extending from its bottom to the top surface, a through tube having an upper and a lower end connected to the top surface of the cylindrical member at its lower end to provide a through passageway, said tube having a hole near the upper end, said lubricant metering device screwed in the adapter so that the upper end of the tube protrudes inside the airline.

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**5,046,055**

## MODIFICATION TO TOWED ARRAY BULKHEADS

**Anthony A. Ruffa, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 27, 1990, Ser. No. 576,263**

**Int. Cl.[5] G01V** *1/38*

**U.S. Cl. 367—154** **9 Claims**

1. A hydrophone assembly adapted for towing by a vessel wherein said hydrophone assembly comprises:

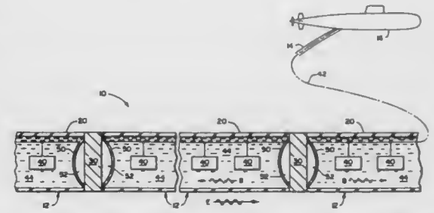
housing means comprising an elongated sleeve-like section for forming a module wall;

bulkhead means disposed at an end portion of said section;

fluid means disposed in said housing means;

hydrophone means disposed in said section for sensing a pressure wave in said fluid and generating an electrical signal indicative thereof; and

bulge wave suppressor means mounted in said housing means adjacent to said bulkhead means for suppressing a longitudinal bulge wave traversing said fluid, said bulge wave suppressor including a bladder mounted to said bulkhead means.




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**5,046,056**

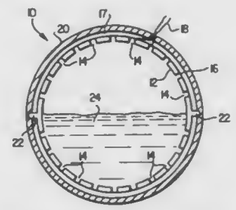
## SELF-ORIENTING VERTICALLY SENSITIVE ACCELEROMETER

**John J. Sallas, and Jack G. Clemens, both of Plano, Tex., assignors to Halliburton Geophysical Services, Inc., Houston, Tex.**

**Filed Jun. 5, 1990, Ser. No. 533,656**

**Int. Cl.[5] H04R** *17/00;* **G01P** *15/09*

**U.S. Cl. 367—166** **23 Claims**




1. A self-orienting seismometer comprising:

a spherical shell having at least one perforation thereof;

a thin film of piezoelectric polymer bonded to said spherical shell wherein a portion of the thin film overlies at least one perforation forming a diaphragm;

a fluid substance disposed within said spherical shell occupying a fraction of the volume thereof and in contact with said diaphragm and;

means for detecting a vertical component of acceleration applied to said seismometer including means coupled to said thin film of piezoelectric polymer for detecting an output from said thin film in response to pressure applied to said diaphragm by said fluid substance in contact therewith.

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**5,046,057**

## MARINE STREAMER CABLE

**Albert J. Berni, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Dec. 10, 1982, Ser. No. 448,541**

**Int. Cl.[5] H04R** *15/00*

**U.S. Cl. 367—170** **1 Claim**

1. A marine seismic cable, comprising:

a central core member;

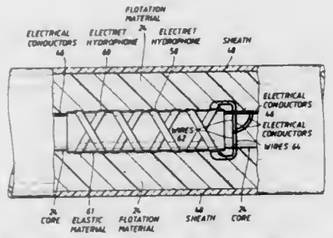
flotation material disposed around said core member;

a plurality of electret detectors acoustically isolated from and wrapped around said core member such that said electret detectors overlap;

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acoustically transparent material disposed around said detectors; and




outer sheath member having a fixed diameter disposed around said flotation material and said transparent material.

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**5,046,058**

## TRACK ACCESS APPARATUS HAVING A LEARNING CONTROL FOR POSITIONING A TRANSDUCER FOR A DISC-SHAPED RECORDING MECHANISM

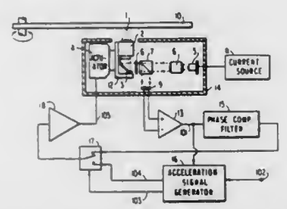
**Shigeru Shimonou, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Continuation of Ser. No. 65,671, Jun. 22, 1987, abandoned, which is a continuation of Ser. No. 910,295, Sep. 17, 1986, abandoned, which is a continuation of Ser. No. 549,842, Nov. 8, 1983, abandoned. This application May 25, 1988, Ser. No. 520,493**

**Claims priority, application Japan, Nov. 8, 1982, 57-195489**

**Int. Cl.[5] G11B** *7/085*

**U.S. Cl. 369—32** **4 Claims**




1. A track access apparatus for positioning a transducer in alignment with recording tracks formed approximately concentrically on a disc-shaped recording medium, said transducer being accelerated and decelerated for an acceleration period and a deceleration period, respectively, when said transducer is moved from one of said tracks to another, said track access apparatus comprising:

detecting means operable in cooperation with said transducer for detecting an error signal representative of an error of said transducer relative to said tracks;

signal producing means which is supplied with said error signal and which controllably maintains first and second values indicative of said acceleration and said deceleration periods, for producing an acceleration-deceleration signal during said acceleration and said deceleration periods, respectively, both of which define a period of a transfer mode for transferring said transducer, said transfer mode being followed by an adjusting mode for adjusting a position of said transducer with respect to a track being reproduced, said signal adjusting mode by using said error signal so as to modify said acceleration and deceleration periods of said acceleration-deceleration signal;

switching means supplied with said error signal and said acceleration-deceleration signal for selectively outputting said acceleration-deceleration signal during said transfer mode and said error signal during said adjusting mode; and

an actuator coupled to said switching means and energized by said acceleration-deceleration signal during said transfer mode and by said error signal during said adjusting mode for moving said transducer in a direction across said tracks, said actuator accelerating and decelerating said transducer during said acceleration and deceleration periods as determined solely by said first and second values, respectively, in said transfer mode, and moving said transducer using said error signal in said adjusting mode.

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**5,046,059**

## MULTIPLE DISC PLAYER WITH MECHANISM FOR CHANGING OF DISCS

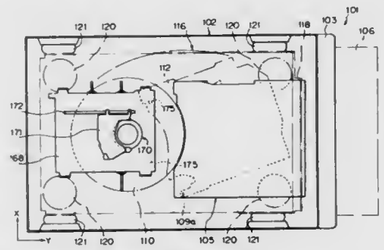
**Susumu Yoshida; Kiyoshi Morikawa; Selichio Matsuki, and Testuro Kamimura, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jun. 21, 1988, Ser. No. 209,317**

**Claims priority, application Japan, Aug. 22, 1987, 62-208763; Aug. 22, 1987, 62-208766**

**Int. Cl.[5] G11B** *17/04, 17/22, 33/02*

**U.S. Cl. 369—36** **12 Claims**




1. A multiple-disc player comprising:

a player housing;

playback means disposed in said player housing and including a turntable having a disc carrying surface;

support means for supporting said playback means;

a disc holder magazine insertably mounted in a storage area in said player housing and having a disc outlet opening, for storing an array of discs in a direction transverse to the disc carrying surface of said turntable, said disk holder magazine having a disc holder casing and a plurality of plate-like trays for holding the discs, respectively, in their major surfaces, said plate-like trays being movable into and out of said disc holder casing along the major surfaces; and

a disc transfer mechanism for selecting and transferring a selected one, at a time, of the discs in said disc holder magazine onto said disc carrying surface, said disc transfer mechanism having positioning means for positioning said support means relative to said disc holder magazine, and pusher means for pushing one, at a time, of said trays out of said disc holder casing, wherein said support means comprises:

a support member supporting said playback means by a vibration-resistant mechanism;

a holder mechanism for holding said support member movably between a retracted position and a rest position corresponding to the passage of said tray into and out of said disc holder casing;

support member driving means for positioning said support member at either one of said retracted and rest positions;

a lock mechanism for fixing said playback means to said player housing when said support member is in said rest position; and

link means connecting said support member to said housing for permitting the movement of said support member between said retracted position and said rest position, said link means including a swing arm, a first pin fixed to said housing and a second pin fixed to said support member, said swing arm being pivotably mounted to said first and second pins; and

disc holding means mounted on said support member for movement into and out of the disc carrying surface of said turntable, said disc holding means having a disc engaging surface for abutting a disc transferred to said playback means upon movement of said support member to said retracted position, said disc holding means maintaining a disc transferred to the turntable substantially parallel to said disc carrying surface.



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**5,046,060**

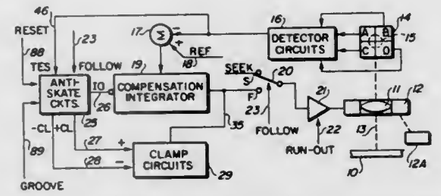
## SERVO ERROR CONTROLS

**William W. Chow; Alan A. Fennema, both of Tucson, Ariz., and Ronald J. Kadlec, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 14, 1990, Ser. No. 538,049**

**Int. Cl.[5] G11B** *17/22*

**U.S. Cl. 369—44.32** **9 Claims**




1. In an optical disk player, servo control circuits including tracking means for sensing spatial relationships of a head to a record member having grooves and lands respectively physically identifying record tracks and inter-track areas and a track following servo connected to the head for receiving a tracking error signal TES and supplying a track following signal to an actuator that moves the head;

the improvement including, in combination:

skate detection means connected to said tracking means for receiving said TES and being responsive to the received TES to indicate the actual radial velocity value of the head, threshold means in the skate detection means indicating an unexpected head velocity value; a comparator means in the skate detection means for comparing the actual radial velocity value with said indicated unexpected head velocity value to indicate an unexpected actual head velocity as the actual radial velocity is not less than said indicated unexpected head velocity for generating a skate flag signal for indicating the actual head velocity value exceeds the indicated unexpected head velocity value;

velocity means connected to the tracking means for receiving the TES and responding to such received TES for generating a direction of velocity change signal;

skate control means connected to said velocity means and said skate detection means for combining the direction of velocity change signal and said flag signal to generate a slow-down signal having a first polarity for reducing velocity in a first radial direction and a second polarity for reducing velocity in a second radial direction which is opposite to the first radial direction;

asymmetric current limiting means electrically interposed between said tracking means and said actuator, said asymmetric current limiting means being connected to said skate control means for receiving said slow-down signal and said asymmetric current limiting means being responsive to said slow-down signal to clamp operation of the servo control signals to slow the head down in the direction indicated by the slow-down signal; and

said skate detection mans having means indicating a predetermined value of head velocity, said skate detection means having compare means for comparing the indicated value of head velocity with the actual value of head velocity for for indicting a reduction of the head velocity to a predetermined value and said skate detection means being operatively connected to said skate control means for actuating said skate control means to terminate said asymmetric current limiting means operation.

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**5,046,061**

## OPTICAL LIGHT BEAM SCANNER WITH ZERO ORDER BEAM REFLECTOR

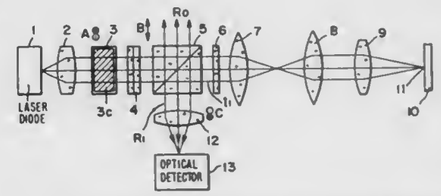
**Masahiko Chaya, and Tatsuya Narahara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Aug. 16, 1988, Ser. No. 232,690**

**Claims priority, application Japan, Aug. 26, 1987, 62-211568; Aug. 28, 1987, 62-214624**

**Int. Cl.[5] G11B** *7/135*

**U.S. Cl. 369—112** **4 Claims**




1. An optical recording and/or reproducing apparatus, comprising:

laser beam source means for generating a laser beam that is information modulated during recording and has a fixed intensity during reproducing;

collimation means for receiving the laser beam and transforming it into a collimated laser beam;

acousto-optic deflector means for receiving the collimated laser beam and generating therefrom a zero order beam that is in the same direction as the collimated laser beam and a deflected first order beam that is linearly polarized in a direction perpendicular to a direction of polarization of the collimated laser light beam for scanning an optical record medium;

polarized beam splitting means having a polarized beam splitting surface for receiving and separating from each other the zero order beam and the linearly polarized first order beam to produce in a first direction the zero order beam and to produce in a second direction a separated, deflected first order beam;

circular polarizing means arranged in said second direction relative to said polarized beam splitting means for receiving the separated, deflected first order beam and producing therefrom a circularly polarized, deflected first order beam; and

focusing means for receiving and focusing the polarized, deflected first order beam on the optical record medium.

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**5,046,062**

## MOVABLE BODY DRIVING APPARATUS

**Hiroshi Yamashita, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Filed Oct. 28, 1988, Ser. No. 265,169**

**Claims priority, application Japan, Oct. 31, 1987, 62-274646**

**Int. Cl.[5] B25B** *1/06*

**U.S. Cl. 369—219** **6 Claims**

1. An assembly for driving an optical head along a path of movement aligned with a radial direction of an optical disc, comprising:

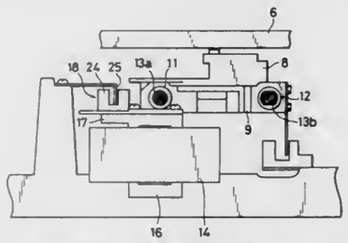
first and second spaced guide shafts, arranged generally parallel to one another, extending in the radial direction and defining the path of movement;

slide means extending between said first and second guide shafts for sliding the optical head along said first and

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second guide shafts in the path of movement, including mounting means for mounting the optical head to said slide means with a center of gravity of the optical head intermediate said first and second guide shafts, and first and second bearing means for slidably connecting the slide means to each of said first and second guide shafts, said first bearing means including two spaced bearing portions




cooperating with said first guide shaft, and said second bearing means including a single bearing portion cooperating with said second guide shaft; and

drive means for driving said slide means along said first and second guide shafts in the path of movement, mounted to said slide means with a center of gravity of said drive means positioned substantially beneath said first guide shaft.

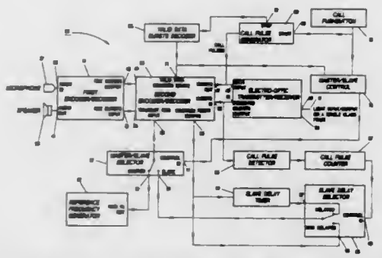
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**5,046,063**

**METHOD AND APPARATUS FOR ACHIEVING COMMUNICATION AT ALL LOCATIONS ALONG A PING PONG COMMUNICATIONS CHANNEL**

**Eric T. LaGess, Mineral Wells, Tex., assignor to Industrial Technology, Inc., Mineral Wells, Tex.**

**Filed Feb. 13, 1990, Ser. No. 479,114**
**Int. Cl.[5] H04L *5/14***
**U.S. Cl. 370—29** **5 Claims**



3. An apparatus for communicating with ping pong communication methods at all locations along a ping pong communications channel, comprising:

a) transceiver means for transmitting and receiving signals over said channel, said signals comprising data bursts and call signals, said transceiver means being coupled to said channel, said transceiver means transmitting outgoing data bursts over said channel and receiving incoming data bursts from said channel, said transceiver means having a trigger input for triggering the transmission of an outgoing data burst;

b) call signal generator means for generating said call signals to initiate communications over said channel, said call signal generator means being connected with said transceiver means for the transmission of said call signals over said channel;

c) first switch means for switching between a master state and a slave state, said first switch means being connected to said trigger input, wherein when said first switch means is in said master state, said trigger input is connected with a clock means so that said transceiver means transmits outgoing data bursts at periodic intervals of time, and when said first switch means is in said slave state said trigger input is connected with a trigger means for triggering the transmission of an outgoing data burst after the reception of an incoming data burst from said channel;

d) second switch means for switching between delay states, said second switch means being connected with said trigger means and said slave state of said first switch means, wherein said second switch means connects plural delay states with said trigger means and said trigger input;

e) delay means for providing time delay in the transmission of outgoing data bursts by said transceiver means, said delay means being connected with said second switch means such that when said second switch means is in one of said delay states said trigger means is connected to said trigger input through said delay means;

f) call signal detector means for detecting the reception of said call signals over a predetermined period of time, said call signal detector means switching said second switch means if said call signals are received from said channel for said predetermined period of time.

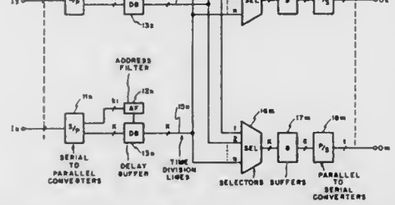
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**5,046,064**

**PACKET SWITCHING SYSTEM**

**Toshio Suzuki, and Atsuo Itoh, both of Tokyo, Japan, assignors to NEC Corporation, Japan**

**Filed Jan. 26, 1990, Ser. No. 471,276**
**Claims priority, application Japan, Jan. 27, 1989, 1-16224**
**Int. Cl.[5] H04J *3/26***
**U.S. Cl. 370—60** **2 Claims**




1. A packet switching network for receiving information packets on a plurality of input lines, each of said packets having a fixed bit length and consisting of data and an address indicative of a destination of said data, switching said packets responsive to said addresses so that said data are sent to desired destinations, and sending said switched packets via a plurality of output lines, said network comprising:

a plurality of time division lines each being associated with a respective one of a plurality of input lines and having a time division multiplex channel, each of the channels being associated with a respective one of a plurality of output lines;

a plurality of serial-to-parallel converting means, each of said serial-to-parallel converting means being associated with a respective one of the input lines for delivering an input packets to an associated one of said time division lines;

a plurality of address filter means, each of said filter means being associated with a respective one of the input lines for identifying one of the output lines to which a packet is destined on a basis of the address of said packet and for



indicating a channel position associated with said one output line on an associated one of said time division lines;

a plurality of rearranging means, each rearranging means being associated with a respective one of the input lines for rearranging each packet on a time division multiplex channel in response to an indication from an associated one of said address filter means, said packet being outputted at a particular channel position that is assigned to said packet in response to said rearrangement, and delivering said rearranged packet to an associated one of said time division lines, each of said rearranging means comprising buffer means for temporarily storing an output of an associated one of said serial-to-parallel converting means and, in response to a command from an associated one of said filter means, delivering said stored output to an associated one of said time division lines while delaying said stored output;

a plurality of selector means, each of said selector means being associated with a respective one of the output lines and being connected to a plurality of said time division lines for periodically selecting and outputting packets on associated ones of said time division lines; and

a plurality of parallel-to-serial converting means, each of said parallel-to-serial converting means being associated with a respective one of the output lines for delivering the packet selected by the associated one of said selector means;

each of the time division lines having a bus-connection construction for being terminated respectively at corresponding ones of input terminals of all of the selector means to input the same packet to all of the selector means;

all of said time division lines being related with respect to channel positions so that only a single channel that corresponds to one of the output lines exists at any one position on a time division multiplex channel, whereby the packets to be fed out to the same output are prevented from conflicting with each other.

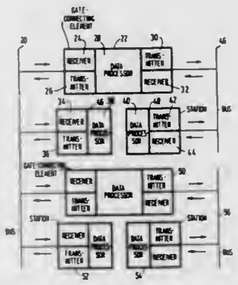
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**5,046,065**

**COMMUNICATION SYSTEM, A STATION TO BE USED IN SUCH A SYSTEM, AND A GATE CONNECTING ELEMENT TO BE USED IN SUCH A SYSTEM, AS WELL AS A DEVICE COMPRISING SUCH A GATE CONNECTING ELEMENT**

**Hendrik M. H. g. Göertz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 24, 1989, Ser. No. 398,111**
**Claims priority, application Netherlands, Aug. 30, 1988, 8802132**
**Int. Cl.[5] H04J *3/02***
**U.S. Cl. 370—85.13** **14 Claims**




1. A communication system comprising:

a) a first bus;

b) a second bus;

c) a gate connecting element for connecting the first and second buses;

d) a receiver station connected to either of said first or second buses;

e) a transmitter station connected to said first bus, having a frame generator for generating a frame including

i) a frame length indicator including

A) a first content for specifying short-frame format including a first address length and a first fixed data item length; or

B) a second content for specifying a long-frame format including a second fixed address length and a second specifiable data item length;

ii) an address field which is usable on only said first bus, in the case of said long-frame format said address field being:

I) a destination address field for identifying said receiver station, when said receiver station is connected to the same bus as the transmitter station, or

II) a target address field for identifying the gate connecting element, when the receiver station is connected to the other bus, said long-frame format then also accommodating said receiver station's destination address field; and

iii) a data item which in the case of said short-frame format is usable on only said first bus; and

f) transposing means, within the gate connecting element, for transposing data in the destination address field with data in the target address field.

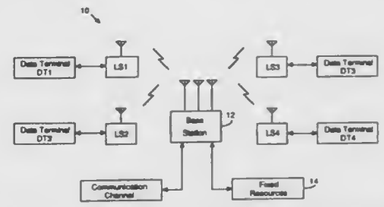
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**5,046,066**

**WIRELESS LOCAL AREA NETWORK**

**Steven Messenger, Scarborough, Canada, assignor to Telesystems SLW Inc., Don Mills, Canada**

**Filed Feb. 12, 1987, Ser. No. 13,936**
**Claims priority, application Canada, Feb. 9, 1987, 529275**
**Int. Cl.[5] G06F *13/00***
**U.S. Cl. 370—94.1** **3 Claims**




1. A wireless local area network for transfer of digitized data within a building as spread spectrum encoded packets transmitted through air, the network being adapted to respond to physical obstruction of transmission paths by objects displaced within the building, the network comprising:

a multiplicity of stations including a base station and a plurality of local stations;

each of the multiplicity of stations comprising means for transmitting digitized data through air in the form of packets on electromagnetic carriers, including means for spread spectrum modulating each packet prior to transmission according to a pseudo-random noise code;

each of the multiplicity of stations comprising means for receiving digitized data transmitted through air in the form of packets on electromagnetic carriers, including spread spectrum demodulation means for spread spectrum demodulating the received packets;

the base station comprising means regulating transmission of packets by the multiplicity of network stations such that all packets transmitted by the multiplicity of stations are transmitted through air temporally spaced-apart relative to one another, the means regulating transmission of packets causing the transmitting means of the base station to transmit polling packets through air at spaced-apart intervals, each of the polling packets requesting transmission of

a packet by one of the local stations identified by the polling packet, each of the local stations transmitting a packet, through air, only in response to receipt of a polling packet requesting transmission by the local station:

the base station further comprising:

a. a plurality of spaced-apart antennas, the base station using only one of the plurality of antennas at any given time to transmit and receive packets,

b. means for detecting errors in transmission of packets between the base station and each of the local stations,

c. transmission gating means for changing the antenna used by the base station to another of the antennas, and

d. control means for actuating the transmission gating means to change the antenna used by the base station to transmit packets to and receive packets from any one of the local stations to another of the antennas in response to detection of errors in transmission of packets between the base station and the one of the local stations thereby switching to an alternative transmission path in response to transmission errors arising from physical obstruction by an object of a transmission path used by the base station to transmit and receive packets from the one of the local stations.

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**5,046,067**

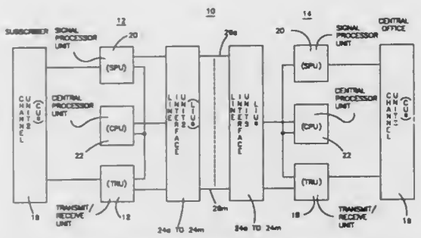
## DIGITAL TRANSMISSION SYSTEM

**Mahlon D. Kimbrough, Norcross, Ga., assignor to Reliance Comm/Tec Corporation, Chicago, Ill.**

**Continuation of Ser. No. 261,771, Oct. 24, 1988, abandoned. This application Jul. 2, 1990, Ser. No. 547,430**

**Int. Cl.[5] H04J** *3/12*

U.S. Cl. 370—110.1 27 Claims



1. In a digital transmission system for providing service to a multiplicity of subscribers by a multiplicity of channel units, said system having two terminals interconnected to each other by transmission means, said transmission means carrying supervisory and nonsupervisory information for each of said channel units from one of said terminals to the other of said terminals and from said other terminal to said one terminal, said one terminal comprising:

at least one channel bank having one or more of said channel units, each of said channel units associated with a predetermined number of said subscribers;

interface means connected to said transmission means for receiving said supervisory and nonsupervisory information from said other terminal to said one terminal and for transmitting to said other terminal said supervisory and nonsupervisory information from said one terminal;

a first single data line connected between said interface means and said at least one channel bank, said first single data line for carrying from said interface means to said at least one channel bank all of said supervisory information from said other terminal for said at least one channel bank and not for carrying from said interface means to said at least one channel bank any of said nonsupervisory information from said other terminal for said at least one channel bank; and

a second single data line connected between said interface means and said at least one channel bank, said second single data line for carrying from said at least one channel bank to said interface means all of said supervisory information from said at least one channel bank for said other terminal and not for carrying from said at least one channel bank to said interface means any of said nonsupervisory information from said at least one channel bank for said other terminal.

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**5,046,068**

## MULTI-PROCESSOR SYSTEM TESTING METHOD

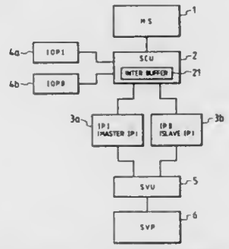
**Masaya Kubo, and Kaoru Suzuki, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 18, 1989, Ser. No. 340,081**

**Claims priority, application Japan, Apr. 21, 1988, 63-96924**

**Int. Cl.[5] G06F** *11/00*

U.S. Cl. 371—16.1 7 Claims



1. A method for testing the fault handling function of a multi-processor system including a first processor, a second processor and a shared unit shared by said first and second processors, comprising the steps of:

synchronizing issuance of an operation request from said first processor to said shared unit with issuance of an operation request from said second processor to said shared unit such that said operation requests are issued without an interval therebetween sufficient for said shared unit to respond;

generating a pseudo-fault during synchronized issuance of said operation requests; and

collecting fault information resulting from said pseudo-fault.

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**5,046,069**

## DATA INTEGRITY SECURING MEANS

**Jean Calvignac, LaGaude; Michel Dauphin; Raymond Lenoir, both of Vence, and Jean-Louis Picard, LaColle sur Loup, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 17, 1988, Ser. No. 259,025**

**Claims priority, application European Pat. Off., Oct. 30, 1987, 87480017.0**

**Int. Cl.[5] H03M** *13/00*

U.S. Cl. 371—53 7 Claims

1. A process for updating the frame checking sequence (FCS) of a data frame including a polynomial information section I(x), a polynomial header section $H_i(x)$ and the FCS corresponding to the Remainder of the polynomial division of $I(x)+H_i(x)$ by a predetermined polynomial generator G(x), with the operations being performed in the Galois field, said process including:

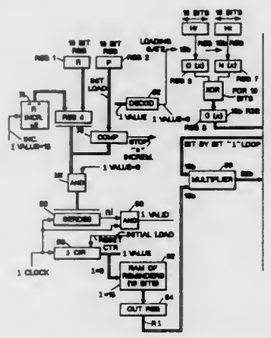
partitioning the frame into the polynomial header section $H_i(x)$ to be varied into $H_i(x)$ and the polynomial information section I(x) to be kept unchanged;

computing a difference or variation polynomial D(x) over header sections $H_i(x)$ and $H_i(x)$ only.

$$D(x)=H_i(x)-H_i(x);$$



computing a differential FCS dFCS(x)=Remainder $|D(x)\ x^{16}, G(x))$; and



adding the differential FCS to an original $FCS_i(x)$ to generate an updated FCS, (i.e. FCS).

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**5,046,070**

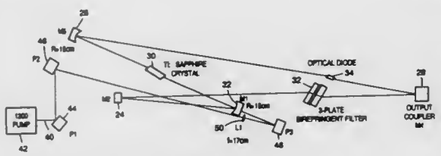
## LONGITUDINALLY LASER PUMPED LASER WITH COMPENSATION FOR THERMAL LENS EFFECTS

**Daniel K. Negus, La Honda, Calif., assignor to Coherent, Inc., Palo Alto, Calif.**

**Filed May 22, 1990, Ser. No. 527,013**

**Int. Cl.[5] H01S** *3/00*

U.S. Cl. 372—33 4 Claims



1. A laser system comprising:

a resonant cavity;

a gain medium having a longitudinal axis, said gain medium being located within said resonant cavity;

a pump laser generating a beam of radiation for exciting said gain medium and creating a cavity beam; and

focusing means for directing said beam of radiation from said pump laser into said gain medium along said longitudinal axis thereof, with the absorption of the pump beam radiation in the gain medium creating a thermal lens therein and with the focal power of the thermal lens being dependent upon the longitudinal position in the gain medium, said focusing means being configured to modify the shape of the pump beam to match the shape of the cavity beam within the gain medium, with said focusing means having a focal length, angle of incidence and location selected to take into account the varying thermal lens effects created along the longitudinal axis of the gain medium.

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**5,046,071**

## COMMUNICATION SYSTEM CAPABLE OF IMPROVING TRANSMISSION EFFICIENCY BY CLASSIFYING A BLOCK SEQUENCE INTO SIGNIFICANT AND LESS SIGNIFICANT BLOCKS

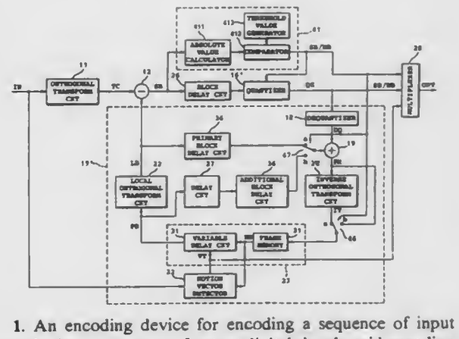
**Toshiyuki Tanoi, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Jul. 24, 1989, Ser. No. 384,545**

**Claims priority, application Japan, Jul. 23, 1988, 63-182816**

**Int. Cl.[5] H04B** *14/06*

U.S. Cl. 375—27 10 Claims



1. An encoding device for encoding a sequence of input samples into a sequence of output digital signals, said encoding device comprising forward transform means for carrying out predetermined code transform on said input samples to produce a sequence of transformed code signals, subtracting means responsive to said transformed code signals and a sequence of local decoded signals for calculating differences between said transformed code signals and said local decoded signals to produce a sequence of error signals which are representative of said differences and which are divided into a sequence of blocks, each being composed of at least one of said error signals, quantizing means responsive to said error signals for quantizing said error signals into a sequence of quantized signals, local decoding means coupled to said quantizing means for carrying out local decoding operation of said quantized signals to produce said local decoded signals, and signal supply means coupled to said local decoding means and to said subtracting means for supplying said local decoded signals to said subtracting means as said local decoded signals, said encoding device further comprising:

classifying means coupled to said subtracting means for classifying each of said blocks into a significant block and a less significant block to produce significant and less significant block signals representative of said significant and said less significant blocks, respectively;

multiplexing means coupled to said quantizing means and said classifying means for multiplexing said quantized signals and said significant and said less significant block signals into said output digital signals; and

operation control means coupled to said classifying means and said local decoding means for controlling said local decoding operation to put said local decoding means into a normal mode in response to said significant block signal and to put said local decoding means into a specific mode different from said normal mode in response to said less significant block signal.

VOL 1130 ISS 1 SE 3 1991 UMI

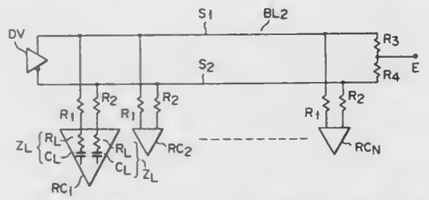


**5,046,072**

## SIGNAL DISTRIBUTION SYSTEM

**Fumihiko Shimizu, Yokohama, and Taro Shibagaki, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 8, 1990, Ser. No. 490,328**
**Claims priority, application Japan, Mar. 14, 1989, 1-61639**
**Int. Cl.[5] H04B** *3/00*
**U.S. Cl. 375—36** **2 Claims**




1. A signal distribution system in a substrate on which an electronic circuit is formed, comprising:

a bus transmission path which has such a length as to be able to neglect an influence of wavelength of a transmission signal and on which at least one terminal of a transmission line terminates in a proper potential through a resistor equal in value to a line-to-ground characteristic impedance $Z_0$;

at least one transmission circuit having an output terminal connected to the transmission line over the bus transmission path and delivering a transmission signal of a fundamental frequency f;

a plurality of reception circuits, N, for receiving the transmission signal from said transmission circuit through said bus transmission path, an input terminal of each of said reception circuits having a characteristic of an input impedance $Z_L$

$$Z_L = R_L + 1/j2\pi fC_L$$

where $R_L$ and $C_L$ represent a real resistive component and a capacitive component, respectively, of the reception circuit; and

a plurality of branch resistors, N, for connecting a plurality of branch points, N, which are spaced away from one another by distance l on said bus transmission path to the input terminals of said plurality of reception circuits, said distance l satisfying the following equation with respect to wavelength λ of a basic frequency f of the transmission signal:

$$\lambda >> l$$

and said branch resistors each having a resistive value R so set as to satisfy the following relations:

$$R < 1/\pi fC_L - R_L$$

$$R > NZ_0 - |Z_L|.$$

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**5,046,073**

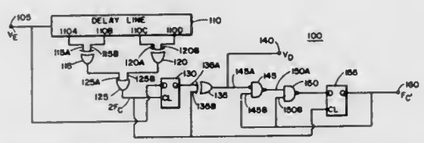
## SIGNAL PROCESSING APPARATUS FOR RECOVERING A CLOCK SIGNAL AND A DATA SIGNAL FROM AN ENCODED INFORMATION SIGNAL

**Daniel W. Sexton, Charlottesville, Va., assignor to GE Fanuc Automation North America, Inc., Charlottesville, Va.**

**Filed Aug. 10, 1989, Ser. No. 391,743**
**Int. Cl.[5] H04L** *27/14*
**U.S. Cl. 375—82** **8 Claims**

1. A signal processing apparatus for recovering information from an encoded information signal, said information signal being encoded with a digital data signal including logical 1's and 0's having a predetermined bit length and a predetermined clock rate, first frequency symbols being employed to represent logical 1's and second frequency symbols being employed to represent logical 0's in said encoded information signal, each of said first and second symbols exhibiting a predetermined time duration substantially equal to said bit length, said apparatus comprising:

a delay line, responsive to said encoded information signal, including first, second, third and fourth taps spaced apart in time by approximately one quarter of said symbol length;




a first exclusive OR gate including first and second input terminals coupled to said first and second taps, respectively, and further including an output terminal;

a second exclusive OR gate including first and second input terminals coupled to said third and fourth taps, respectively, and further including an output terminal; and

a first OR gate including first and second input terminals coupled respectively to the output terminals of said first and second exclusive OR gates, said first OR gate including an output terminal at which a first recovered clock signal is generated which exhibits a frequency approximately equal to twice the predetermined clock rate.

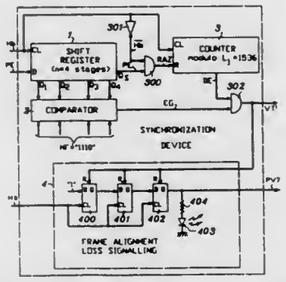
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**5,046,074**

## SYNCHRONIZATION METHOD AND SYNCHRONIZATION RECOVERY DEVICES FOR HALF-DUPLEX COMMUNICATION

**Jacques Abiven, Plouaret, and Gilles Ramel, Lannion, both of France, assignors to L'Etat Francais represente par le Ministre des Postes, Telecommunications et de l'Espace (Centre d'Etudes des Telecommunications, Issy-Les-Moulinfaux, France**

**Filed Aug. 16, 1989, Ser. No. 394,322**
**Claims priority, application France, Aug. 19, 1988, 88 11038**
**Int. Cl.[5] H04L** *7/04*
**U.S. Cl. 375—111** **19 Claims**




1. A method to synchronize a communication signal in a half-duplex bidirectional link extending between a first end and a second end,

said signal being transmitted from said first end in said link and being received into said second end via said link, and comprising alternated first and second time intervals,

useful data from said first end being received by said second end during said first time intervals,

a given logic state meaning that no useful data is received in said second end, being applied to said second end during said second time intervals,

each of said first time intervals beginning by a predetermined digital synchronization pattern derived by said first end, and

in said second end, said pattern being series-received with said given logic state in said second time intervals, thereby constituting synchronization words, and said synchronization words being detected in said communication signal thereby recovering synchronization of said signal words which are detected in said communication signal thereby recovering synchronization of said signal.



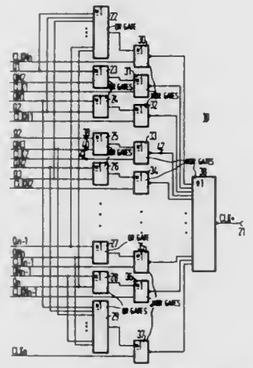
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**5,046,075**

## METHOD AND ARRANGEMENT FOR ADAPTING A CLOCK TO A PLESIOCHRONOUS DATA SIGNAL AND FOR CLOCKING THE DATA SIGNAL WITH THE ADAPTED CLOCK

**Horst Kraemer, Grafing-Bahnhof, and Karlheinz Klinger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Dec. 1, 1989, Ser. No. 444,833**
**Claims priority, application European Pat. Off., Feb. 23, 1989, 89103170**
**Int. Cl.[5] H03D** *03/24*
**U.S. Cl. 375—119** **10 Claims**



1. A method of adapting a clock, having an arbitrary phase relation and a pulse duty factor of 1:1±10%, to a plesiochronous, spike-free data signal and for clocking the data signal with the adapted clock, comprising the steps of:

generating a sequence of at least four first clocks of identical frequency and identical phase spacings beginning with the first clock of the sequence and having ordering numbers;

clocking each of the first clocks by the selected edges of the data signal

inverting each of the clocked first clocks;

amplifying and inverting each of the first clocks;

ORing, a first time, each of the clocked first clocks with the respective inverted clocked first clock of the next higher ordering number;

NORing each of the ORing results of the first ORing step with the respective amplified first clocks having the ordering number of the clocked first clock introduced in the ORing step;

ORing, a second time, each of the inverted clocked first clocks with the respective clocked first clock of the next higher ordering number;

NORing, a second time, each result of the second ORing step with a respective inverted amplified first clock having the ordering number of the inverted clocked first clock introduced into the second ORing step;

ORing, a third time, all of the clocked first clocks;

NORing, a third time, each result of the third ORing step with the inverted amplified first clock of the last ordering number;

ORing, a fourth time, all of the inverted clocked clocks;

NORing, a fourth time, the result of the fourth ORing step with the amplified first clock having the last ordering number;

NORing, a fifth time, the results of the first through fourth NORing steps to produce the adapted clocks;

delaying the data signal through the first through fourth ORing steps and the first through fifth NORing steps; and

clocking the delayed data signal with the adapted clock.

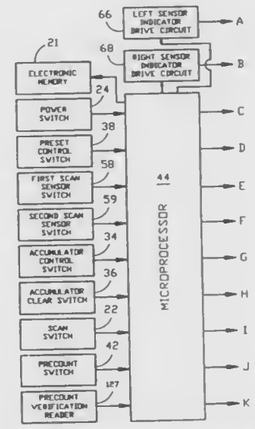
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**5,046,076**

## CREDIT CARD COUNTER WITH PHASE ERROR DETECTING AND PRECOUNT COMPARING VERIFICATION SYSTEM

**James E. Hill, Wheeling, Ill., assignor to Dynetics Engineering Corporation, Lincolnshire, Ill.**

**Division of Ser. No. 246,516, Sep. 19, 1988. This application Feb. 7, 1990, Ser. No. 476,565**
**Int. Cl.[5] H03K** *21/40;* **G06M** *3/12, 9/00*
**U.S. Cl. 377—8** **23 Claims**




1. In a card counter with first and second means for counting a box of cards to simultaneously obtain first and second final card counts for the box, the improvement being a count verification system, comprising:

means for determining if the first and second card counts differ from one another during a period of counting before the first and second final counts are reached; and

means responsive to said determining means for detecting a phase error if the first and second counts differ during said counting period even if the final first and second card counts are the same.

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**5,046,077**

## CONTINUOUS LATTICE CONSTANT MEASURMENTS AND APPARATUS THEREFOR WITHIN A HEAT FURNACE

**Hiromu Murayama, Tokyo, Japan, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 15, 1990, Ser. No. 539,091**
**Claims priority, application Japan, Jun. 16, 1989, 1-152208**
**Int. Cl.[5] G01N** *23/20, 23/207*
**U.S. Cl. 378—80** **3 Claims**

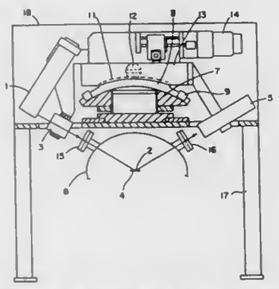
1. A method of measuring lattice constant ratios of crystals comprising the steps of:

turning a goniometer on the outside of a heating furnace in

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an arbitrary direction about a crystal substrate disposed inside said heating furnace;
radiating said substrate with X-radiation from an X-ray tube;
stopping the rotation of said goniometer at the position at which X-ray diffraction radiated on said substrate from an X-ray tube is detected by a detector;
prescribing the crystal orientation of said substrate and the position of said X-ray tube;



growing a crystal different from said substrate crystal on said substrate; and
measuring the ratio of the lattice constant of said different crystal to that of said substrate while said crystal different from said substrate crystal is being grown on said substrate.

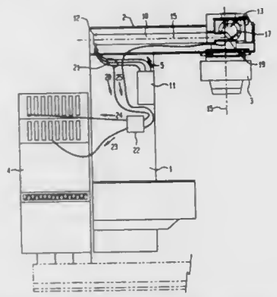
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**5,046,078**

## APPARATUS AND METHOD FOR INHIBITING THE GENERATION OF EXCESSIVE RADIATION

**Francisco Hernandez, Concord, and Jerry Chamberlain, Pittsburg, both of Calif., assignors to Siemens Medical Laboratories, Inc., Concord, Calif.**

**Filed Aug. 31, 1989, Ser. No. 401,605**
**Int. Cl.[5] H05G *1/54***
**U.S. Cl. 378—119** **16 Claims**



1. An apparatus for generating electron radiation upon impingement of an electron beam on a scattering foil, said apparatus comprising:
accelerator means including an electron injector for emitting injector pulses, an electron gun for receiving said injector pulses, a waveguide for receiving electrons from said electron injector and emitting electrons, and a high frequency source for supplying RF signals for the generation of an electric field for accelerating said electrons in said waveguide and generating said electron beam;
sensing means coupled to said electron injector for sensing said injector pulses and generating sensing signals having a characteristic representative of the amplitude of said injector pulses; and
inhibiting means coupled to said accelerator means and responsive to said sensing signals for inhibiting the generation of said electron beam if said sensing signal characteristic exceeds a predetermined reference value assigned to a predetermined intensity level.

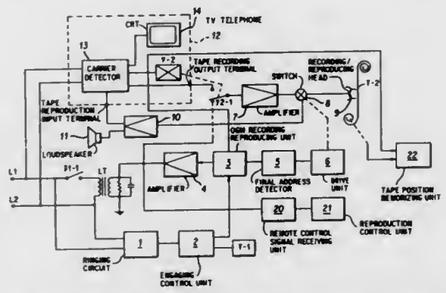
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**5,046,079**

## TELEPHONE ANSWERING DEVICE WITH TV TELEPHONE

**Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan**

**Filed Oct. 13, 1989, Ser. No. 421,105**
**Claims priority, application Japan, Oct. 14, 1988, 63-259189**
**Int. Cl.[5] H04M *1/64, 11/00***
**U.S. Cl. 379—53** **5 Claims**



5. In combination with a TV telephone system operable to transmit through a telephone line a picture signal between ringing signals generated in response to dial data of a calling party, a telephone answering device and a TV telephone at a location of a called party, comprising:
means for transmitting said picture signal during the time between ringing signals;
means for displaying an image corresponding to said picture signal received between ringing signals;
means for releasing said telephone answering device from a standby mode by engaging said telephone line after a predetermined number of ringing signals and
means for separately recording an incoming voice message and said picture signal in a recording medium of said telephone answering device.

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**5,046,080**

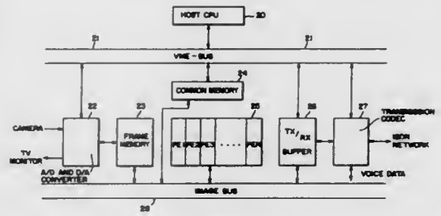
## VIDEO CODEC INCLUDING PIPELINED PROCESSING ELEMENTS

**Jong S. Lee; Oh W. Kwon; Joo H. Jeong; Ji H. Kim, and Myoung H. Lee, Kyungki-Do, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon and Korea Telecommunication Authority, Seoul, both of, Rep. of Korea**

**Filed May 29, 1990, Ser. No. 529,887**
**Claims priority, application Rep. of Korea, May 30, 1989, 1989-7234**
**Int. Cl.[5] H04N *1/42***
**U.S. Cl. 379—53** **2 Claims**

1. In videophone system for providing videophone service within narrow band digital network, including transmission codec means for connecting to the narrow band digital network, VME (Versa Module Europe) bus and image bus coupled to the transmission codec means, camera, TV monitor, A/D (Analog to Digital) and D/A converter coupled to the camera and the TV monitor, and frame memory means coupled to the A/D and D/A converter and the image bus, a videophone system further comprising;
source codec means coupled to the image bus, including a plurality of processing elements of which processing element has DSP (Digital Signal Processor) module, local memory module coupled to the DSP module, FIFO (First Input First Output) memory module coupled to the DSP module and the local memory module, and image bus interface module coupled to the DSP module, the local memory module and the image bus, wherein communications between the processing elements are performed via pipeline, and
common memory means coupled to the VME bus and the image bus, for storing message data for synchronization and communication between the processing elements.





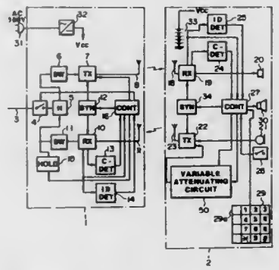
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**5,046,081**

## RADIO TELEPHONE WITH VARIABLE ATTENUATOR FOR CONTROLLING MODULATED SIGNAL

**Yuji Umemoto, Hachioji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 13, 1990, Ser. No. 492,927**
**Claims priority, application Japan, Mar. 15, 1989, 1-62619**
**Int. Cl.[5] H04M *11/00***
**U.S. Cl. 379—58** **17 Claims**



1. A radio telephone system, comprising:
a base unit connected to a cable telephone line;
a radio telephone connected with the base unit via a radio circuit;
means for transmitting a control signal via the radio circuit from the radio telephone to the base unit;
means for transmitting a voice signal via the radio circuit from the radio telephone to the base unit;
voice switching means for sending therethrough the voice signal received from the radio telephone to the cable telephone line; and
signal level changing means for decreasing the level of the control signal sent by the control signal transmitting means when the control signal designates the turning off of the voice switching means.

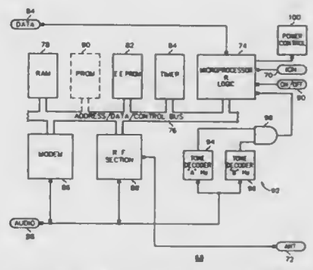
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**5,046,082**

## REMOTE ACCESSING SYSTEM FOR CELLULAR TELEPHONES

**Robert G. Zicker, Houston; John K. Dion, The Woodlands; Kevin B. Blair, and William J. Austin, both of Spring, all of Tex., assignors to GTE Mobile Communications Service Corporation, Houston, Tex.**

**Filed May 2, 1990, Ser. No. 518,774**
**Int. Cl.[5] H04M *11/00***
**U.S. Cl. 379—59** **53 Claims**



1. A remotely accessible cellular telephone (RACT) having operational data stored therein, said RACT comprising:
an erasable, non-volatile memory for storing said operational data;
processing means coupled to said memory and being programmed to manipulate said operational data;
an audio bus for the transmission of audio frequency signals;
a modem having an audio port coupled to said audio bus and a data port coupled to said processing means, said modem being operable to communicate data between said processing means and said audio bus; and
signal detection means, having an input coupled to said audio bus and an output coupled to said processing means, for detecting the occurrence of an audio signal having predetermined parameters.

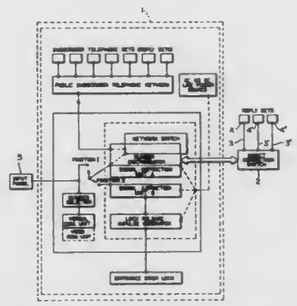
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**5,046,083**

## ENTRANCE COMMUNICATION SYSTEM

**Anders E. Trell, Högalidsgatan 27, Stockholm, Sweden S-117 30**

**Filed Oct. 24, 1989, Ser. No. 425,859**
**Int. Cl.[5] H04M *11/00***
**U.S. Cl. 379—93** **17 Claims**



1. An entrance communication system comprising:
a programmable number discriminator, arranged to perform an automatic dial-up operation via a public subscriber telephone network to a selected subscriber telephone set when addressed from at least one entrance set, and to establish voice communication therebetween and accepting control instructions sent as digits from the called party

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at the entrance set, wherein at least one local communication circuit is included for direct communication between the entrance set and at least one dedicated reply set which is not connected to the public subscriber telephone number, and wherein each dedicated reply set is connected by means of individual and parallel local communication circuits.

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**5,046,084**

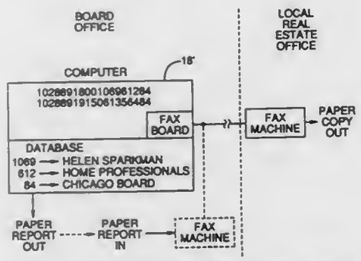
## ELECTRONIC REAL ESTATE LOCKBOX SYSTEM WITH IMPROVED REPORTING CAPABILITY

**Iral D. Barrett, and Walter G. Henderson, both of Salem, Oreg., assignors to Supra Products, Inc., Salem, Oreg.**

**Continuation-in-part of Ser. No. 263,174, Oct. 27, 1988, Pat. No. 4,916,443, which is a continuation-in-part of Ser. No. 192,834, May 11, 1988, abandoned, which is a division of Ser. No. 15,864, Feb. 17, 1987, Pat. No. 4,766,746, which is a continuation-in-part of Ser. No. 831,601, Feb. 21, 1986, Pat. No. 4,727,368, which is a continuation-in-part of Ser. No. 814,364, Dec. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 788,072, Oct. 16, 1985, abandoned. This application Nov. 8, 1989, Ser. No. 433,578**

**Int. Cl.[5] H04M *11/00***

**U.S. Cl. 379—100** **15 Claims**




1. A method of operating an electronic real estate lockbox system, the system including an electronic lockbox, an electronic key, and a central computer, the method comprising:

placing a dwelling key in a lockable compartment inside the lockbox, the dwelling key permitting access to a property listed for sale by a listing real estate agent, the listing agent being affiliated with one of a plurality of local real estate offices, said local real estate office in turn being affiliated with a regional real estate board;

providing the lockbox with a lockbox identification code;

providing the electronic key with a key identification code;

entering a user code on a keypad associated with the key;

verifying from the user code that the user enterjng the code is an authorized user of the key;

relaying data between the electronic key and lockbox;

providing visual feedback from the key to a user of the key indicating the user's progress in accessing the lockbox compartment;

unlocking the lockbox compartment to allow access to the dwelling key contained therein in response to the data relayed between the key and lockbox;

storing transaction data specifying the date and time of the unlocking transaction, together with at least one of either the lockbox identification code or the key identification code, in a memory, said data being in raw numeric form;

transferring the transaction data from the memory to the central computer, said central computer being located remotely from the local real estate office;

providing the computer with interpretive data permitting the computer to correlate the key or lockbox identification code to a textual counterpart identifying the key or lockbox, respectively;

interpreting the transaction data with said interpretive data to produce an interpreted activity report that includes interpreted textual, rather than raw numeric, data;

establishing a telephone link between the central computer and the real estate office with which the listing agent is affiliated; and

transmitting by facsimile the interpreted activity report to the real estate office with which the listing agent is affiliated.

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**5,046,085**

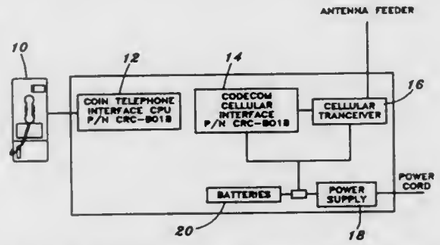
## INTERFACING SYSTEM FOR AN INTERNATIONAL-TYPE PAY-TELEPHONE

**Randall D. Godsey, 170 Austin Ave., Carpentersville, Ill. 60110; Charles T. Walneck, 120 Lakesbore Dr., Cary, Ill. 60013; James Santee, 24675 N. Jensen Ave., Cary, Ill. 60013; Ronald J. Gaulke, 11706 Kenneth Ave., Huntley, Ill. 60142; Luis R. Ortez Perez, 10-D-5 Chestnut Hill Ave., Cambridge Park, Rio Piedras, P.R. 00926, and Alexis T. Ramos, Lomas de Carolina, Calle 7, Bloque L #3, Carolina, P.R. 00630**

**Filed May 15, 1990, Ser. No. 524,192**

**Int. Cl.[5] H04M *17/00, 15/10, 7/16***

**U.S. Cl. 379—112** **34 Claims**




24. An apparatus for providing central-office functions locally at a pay-phone terminal, comprising:

an international-type pay-telephone;

interfacing means coupled too said pay-telephone for providing two-way communications between said pay-telephone and a telephone network;

a cellular transceiver; and

a cellular interface coupling said cellular transceiver too said interfacing means, whereby calls may be made over the cellular system on said international-type of pay-telephone.

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**5,046,086**

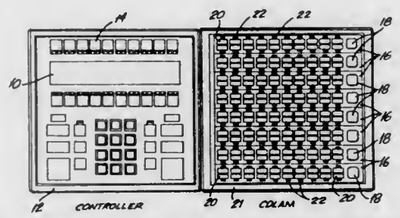
## PAGE-MAPPED MULTI-LINE TELEPHONE COMMUNICATION SYSTEM

**Henry Bergen, Darien; Thomas R. Kelly, Milford; Edward J. Mazeiko, Jr., New Haven, and Wellseley Smith, Stamford, all of Conn., assignors to Contel IPC, Inc., Stamford, Conn.**

**Filed Apr. 11, 1990, Ser. No. 508,133**

**Int. Cl.[5] H04M *1/276, 3/44***

**U.S. Cl. 379—164** **19 Claims**




1. In a telephone system wherein voice communication is available through any one of the plurality of external lines at any one of several operator stations said telephone system providing external line station information and single key line selection at each operator station the improvement comprising:

a dynamic line activity module including a line description display of all said external liens in a page group type organization, said page group description transferrable to a display module having a line selection switch.

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**5,046,087**

## ATTENDANT CONSOLE FOR TELEPHONE EXCHANGE

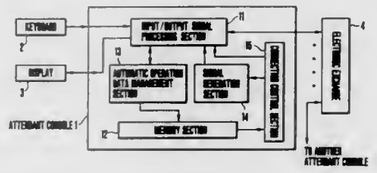
**Nobuyuki Sakai, Tokyo, Japan, assignor to Nec Corporation, Tokyo, Japan**

**Filed Dec. 12, 1989, Ser. No. 448,082**

**Claims priority, application Japan, Dec. 12, 1988, 63-314110**

**Int. Cl.[5] H04M *1/27, 1/53, 3/42***

**U.S. Cl. 379—201** **7 Claims**




1. An attendant console comprising:

first means capable of storing automatic operation data representing whether call handling sequences are automatically operated;

second means for setting said automatic operation data into said first means in accordance with a keyboard operation performed by a console operation;

third means for reading out said automatic operation data set in said first means and for outputting a signal representing an event equivalent to said keyboard operation performed by said console operator in accordance with said automatic operation data read out from said first means; and

fourth means for transmitting said signal representing said event equivalent to said keyboard operation from said third means to a telephone exchange in response to a keyboard signal from a keyboard.

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**5,046,088**

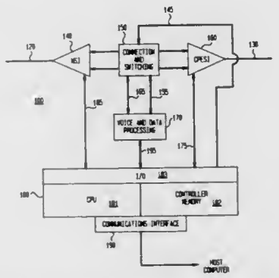
## CONVERTER FOR IN-BAND ROUTING AND/OR ORIGINATION INFORMATION

**Edwin K. Margulies, Solebury, Pa., assignor to Dialogic Corporation, Parisppany, N.J.**

**Filed Oct. 31, 1989, Ser. No. 429,849**

**Int. Cl.[5] H04M *7/00***

**U.S. Cl. 379—211** **28 Claims**




1. Apparatus for interfacing between a first telephone equipment and a second telephone equipment, which first telephone equipment outputs a first telephone call signal which is comprised of first in-band network routing and/or origination information, which apparatus comprises:

at least one network signalling interface for receiving the first telephone call signal in response to commands from a controller means;

at least one customer premises equipment signalling interface for sending a second telephone call signal comprised of second in-band network routing and/or origination information to the second telephone equipment in response to commands from the controller means;

at least one voice and data processing means which is switchably interconnected to at least one of the at least one network signalling interface and to at least one of the at least one customer premises equipment signalling interface: (a) for detecting the first in-band network routing and/or origination information, (b) for transmitting the first in-band network routing and/or originating information to the controller means, (c) for transmitting audio signals, in response to commands and information sent thereto from the controller means, to at least one of the at least one network signalling interface or to at least one of the at least one customer premises equipment signalling interface, and (d) for transmitting the second in-band network routing and/or origination information sent thereto from the controller means;

a connection and switching means, in response to commands from the controller means, for connecting and switching at least one of the at least one network signalling line interface to either at least one of the at least one voice and data processing means or at least one of the least one customer premises equipment signalling interface and for connecting and switching at least one of the at least one voice and data processing means to at least one of the at least one customer premises equipment signalling interface;

wherein the controller means comprises means which causes the apparatus: (a) to respond to the first telephone call signal input to one of the at least one network signalling interface and to detect and decode the first in-band network routing and/or origination information by interaction with the one of the at least one network signalling interface, one of the at least one voice and data processing means and the connection and switching means; (b) to obtain the second in-band network routing and/or origination information by retrieving information pertaining to a predetermined portion of the second telephone equipment from a data base system which uses at least a portion of the first in-band network routing and/or origination information as a retrieval key; and (c) to send the second telephone signal which is comprised of the second in-band network routing and/or origination information to the second telephone equipment by interaction with one of the at least one customer premises equipment signalling interface, the one of the at least one voice and data processing means, and the connection and switching means;

wherein at least a portion of the first in-band network routing and/or origination information is different from the second in-band network routing and/or origination information.

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**5,046,089**

## SUBSCRIBER LINE INTERFACE CIRCUIT WITH POWER-DOWN MODE

**Angelo Pariani, Novara; Walter Rossi, and Vanni Saviotti, both of Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.L., Milan, Italy**

**Filed Oct. 18, 1989, Ser. No. 422,892**

**Claims priority, application Italy, Oct. 31, 1988, 22474 A/88**

**Int. Cl.[5] H04M *4/00***

**U.S. Cl. 379—399** **6 Claims**

1. A method of lowering the power absorbed by an interface circuit, when in its inactive power-down state thereof, as incorporated to a telephone exchange and connected to a telephone subscriber line while retaining the ability to activate the

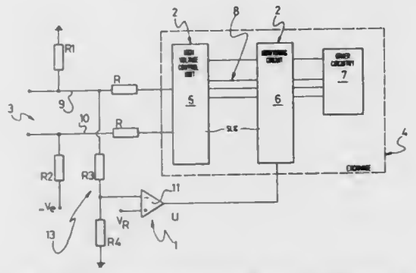
VOL 1130 ISS 1 SE 3 1991 UMI



exchange in response to a change in the state of the subscriber line, said interface circuit being of a type which comprises a monitoring circuit portion connected between said subscriber line and said exchange, characterized in that it comprises the steps of,

detecting the polarization level of at least one conductor in the subscriber line,

comparing said detected level with a reference value by



means of a comparator having an input connected to the line and an output connected to said monitoring circuit portion,

in response to the output of said comparator changing, switching the interface circuit from its power-down to its standby state, and

once again detecting the polarization level of the subscriber line directly through the interface circuit while in its standby state without the aid of the comparator.

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5,046,090

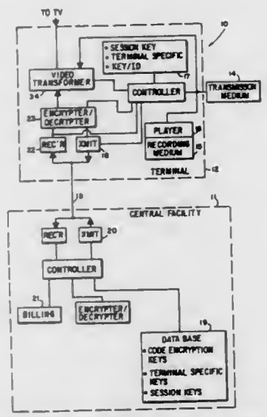
**RECORDED MEDIUM FOR VIDEO CONTROL SYSTEM**

**Stephen S. Walker, Marlborough; Clarence M. Sidlo, and Melvin J. Teare, both of Framingham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

Filed Mar. 29, 1990, Ser. No. 501,683

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—5 1 Claim



1. A video recording medium storing a video program including a series of television fields containing both a random digital code encrypted according to one of a plurality of code encryption keys and program identification data, and an unintelligible video signal previously transformed from an intelligible video signal according to said random digital code, and wherein a desired code encryption key is selected from said plurality of code encryption keys in accordance with code encryption key identification data corresponding to the random digital code encrypted with said desired code encryption key.

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5,046,091

**EXTENDED DEFINITION TELEVISION TRANSMISSION SYSTEM**

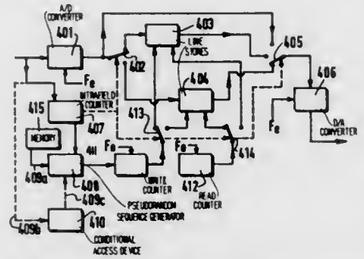
**Gérard Marie, Santeny-Villecresnes, and Olivier Chantelou, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.**

Filed Jan. 26, 1990, Ser. No. 471,172

Claims priority, application France, Jan. 27, 1989, 89 01020

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—14 32 Claims



1. An apparatus for use in an extended definition television system wherein a television picture comprising a conventional television signal and a picture characteristic extension video signal comprising a plurality of line signals are derived from a television source signal, said apparatus comprising:

(a) means for scrambling said picture characteristic extension video signal so as to form a scrambled signal, said scrambling means comprising:

a first pseudorandom sequence generator for supplying for each line signal an address x, where x is an integer, which determines a position of a signal cut point from which a cyclic permutation can be effected on said line signal; and

first and second line stores for alternatingly writing a current line signal into said first and second line stores from an initial position of said first and second line stores, and for alternatingly reading a previous line signal from said second and first line stores, respectively, from said signal cut point position; and

(b) means for transmitting said scrambled signal as part of said television picture.

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5,046,092

**VIDEO CONTROL SYSTEM FOR TRANSMITTED PROGRAMS**

**Stephen S. Walker, Marlborough; Clarence M. Sidlo, and Melvin J. Teare, both of Framingham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

Filed Mar. 29, 1990, Ser. No. 501,682

Int. Cl.[5] H04N *7/167*

U.S. Cl. 380—20 4 Claims

1. A video system comprising:

a central facility;

a terminal; and

means for transmitting to said terminal a video program including a series of television fields including a first field containing both a random digital code encrypted according to a code encryption key and program identification data, and a second field containing an unintelligible video signal previously transformed from an intelligible video signal according to said random digital code;

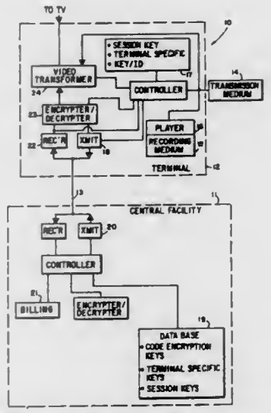
said terminal including means for sending said program identification data to said central facility;

said central facility including a data base for storing and



retrieving at least one code encryption key corresponding to the program identification data and means for sending said code encryption key from said central facility to said terminal;

said terminal further including means for receiving the code



encryption key from said central facility, decrypting means for decrypting the encrypted digital code of said first frame in accordance with said code encryption key and means for transforming said unintelligible video signal of said second frame to said intelligible video signal using the decrypted random digital code.

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5,046,093

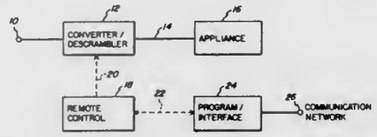
**CATV SUBSCRIBER APPARATUS WITH INTELLIGENT REMOTE CONTROL**

**David E. Wachob, Elkins Park, Pa., assignor to General Instrument Corporation, New York, N.Y.**

Filed Sep. 5, 1989, Ser. No. 402,804

Int. Cl.[5] H04N *7/167*; H04H *1/02*; H04B *10/04, 10/06*

U.S. Cl. 380—20 44 Claims



1. Subscriber apparatus comprising a converter and a remote control,

said converter including:

input terminal means for coupling a plurality of program signals to a signal path,

descrambler means, coupled to said signal path, for descrambling premium program signals included in said plurality, and

means, coupled to said signal path and responsive to said remote control, for outputting a descrambled premium program signal for reproduction upon authorization from said remote control;

and wherein said remote control includes:

memory means for storing data authorizing the reproduction of a premium program signal;

means for selecting said premium program signal for reproduction, and

transmitter means, responsive to said selecting means and data stored in the memory means, for transmitting a signal to said converter authorizing the output of the selected premium program signal for reproduction.

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5,046,094

**SERVER-AIDED COMPUTATION METHOD AND DISTRIBUTED INFORMATION PROCESSING UNIT**

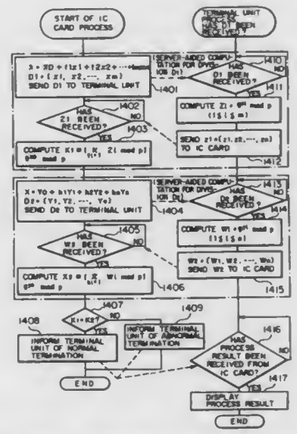
**Shinichi Kawamura; Atsushi Shimbo, and Kyoto Takabayashi, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

Filed Feb. 2, 1990, Ser. No. 474,404

Claims priority, application Japan, Feb. 2, 1989, 1-24723; May 18, 1989, 1-122849; May 31, 1989, 1-139593; Jul. 20, 1989, 1-189677; Sep. 21, 1989, 1-243349; Dec. 15, 1989, 1-323926

Int. Cl.[5] H04L *9/02*

U.S. Cl. 380—46 12 Claims



1. A server-aided computation method for computing d-th power of integer C modulo n using a main unit for executing said computation with secret key d and at least one auxiliary unit for supporting a computation that said main unit executes, said method comprising the steps of:

generating d' from a secret key d using m random numbers $R_i$ (where i=1, ..., m) generated by said main unit having secret keys n and d;

transferring d' and n from said main unit to said auxiliary unit;

computing the following equation from a message block C in said auxiliary unit

$$M' = C^{d'} \bmod n$$

computing X using said random numbers $R_i$ and n in said main unit while computing M' in said auxiliary unit;

transferring M' from said auxiliary unit to said main unit; and

computing a message block M using the following equation in said main unit

$$M = M' \cdot X \bmod n.$$

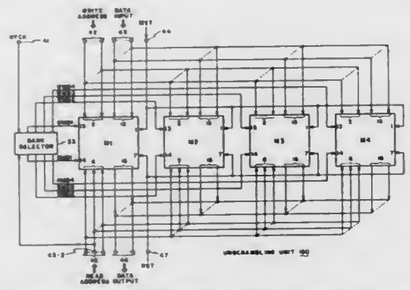
VOL 1130 ISS 1 SE 3 1991 UMI



5,046,095
## DIGITAL DATA PROCESSOR HAVING DATA-UNSCRAMBLING FUNCTION

Kazuhiro Akiyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 31, 1988, Ser. No. 265,021
Claims priority, application Japan, Oct. 30, 1987, 62-276622
Int. Cl.[5] H04L 9/02
U.S. Cl. 380—50 15 Claims

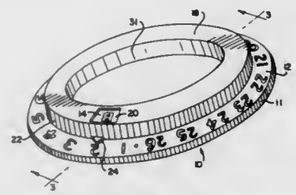


1. A data processor comprising a memory circuit, first means for supplying a write address to said memory circuit to write data therein, second means for supplying a read address to said memory circuit to read data therefrom, said memory circuit including a set of first terminals for receiving said write address, a set of second terminals for receiving said read address, a plurality of word lines, a plurality of bit lines crossing said word lines, a plurality of memory cells disposed at intersections of said word and bit lines, fourth means coupled to said set of first terminals for selecting one of said word lines in response to a value of said write address, and fifth means coupled to said set of second terminals for selecting one of said word lines in response to a value of said read address, said fourth means selecting a first one of said word lines in response to a first value of said write address, said fifth means selecting a second one of said word lines that is different from said first word line when said read address takes said first value and selecting said first word line when said read address takes a second value that is different from said first value.

5,046,096
## WINDOWED ROTATABLE COVER WHICH REVEALS ONE INDICIA ON ONE SURFACE AND A SECOND INDICIA ON A SECOND SURFACE CORRESPONDING TO THE FIRST THAT ENCODES AND DECODES MESSAGES

Marvin G. Kuhlman, Des Plaines; Frank Cullotta, Elk Grove Village, and J. A. Brbel, Des Plaines, all of Ill., assignors to NCM International, Inc., Arlington Heights, Ill.

Filed Apr. 9, 1990, Ser. No. 506,433
Int. Cl.[5] G09C 1/06
U.S. Cl. 380—57 4 Claims



1. A device for encoding and decoding messages comprising:

a main body portion including a ring having an outer ring portion defining a first surface and an inner ring portion defining a second surface, said first surface having a first series of indicia and said second surface having a series of alphanumeric characters, each of said alphanumeric characters corresponding to a unique one of said indicia;

a second body portion rotatably secured to said main body portion and including a surface;

means for rotating said second body portion through a plurality of positions relative to said main body portion; and

means in said second body portion for sequentially revealing a single one of said indicia and its corresponding alphanumeric character.

5,046,097
## SOUND IMAGING PROCESS

Danny D. Lowe, and John W. Lees, both of Los Angeles, Calif., assignors to QSound Ltd., Calgary, Canada

Filed Sep. 2, 1988, Ser. No. 239,981
Int. Cl.[5] H04S 5/00
U.S. Cl. 381—17 2 Claims




1. A method for producing an locating an origin of a selected sound in a predetermined position within the three-dimensional space containing a listener from an electrical signal corresponding to the selected sound, comprising the steps of:

separating said electrical signal into respective first and second channel signals;

altering the amplitude and shifting the phase of said signals in at least one of said first and second channels, both on a predetermined frequency dependent basis, thereby producing at least a first or a second channel modified signal; and

respectively applying said first and second channel signals including said modified signal to first and second sound transducer means located within the three-dimensional space and spaced apart from the listener to produce a sound originating at a predetermined location in the three-dimensional space different than the location of said sound transducer means; further including the step of

applying at least one of said signals in first and second signal channels to at least one all pass filter containing an operational amplifier portion, said filter having a predetermined frequency response and topology as characterized by a transfer function T(s) for the Laplace complex frequency variable s of the form

$$T(s)=[1-(1/R_1)\,(R_1+R_2)/(1+sCR_3)]$$

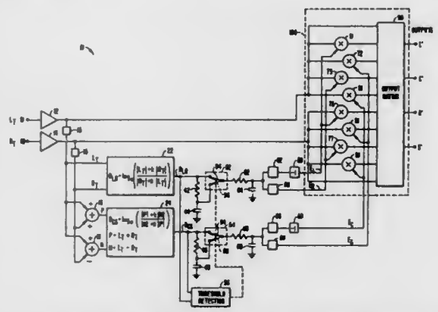
where $R_1$ and $R_2$ represent the input and feedback impedances, respectively connected to the inverting input of the operational amplifier section of the filter, while c and $R_3$ represent the input and ground elements connected to the noninverting input of the operational amplifier section; or equivalent means of obtaining a transfer function equivalent to that of T(s) defined above.



5,046,098
## VARIABLE MATRIX DECODER WITH THREE OUTPUT CHANNELS

Douglas E. Mandell, Sausalito; Craig C. Todd, Mill Valley, and Roger Dressler, Martinez, all of Calif., assignors to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 708,982, Mar. 7, 1985, abandoned, and a continuation-in-part of Ser. No. 833,120, Feb. 26, 1986, Pat. No. 4,799,260, and a continuation-in-part of Ser. No. 222,847, Jul. 22, 1988. This application Jun. 1, 1989, Ser. No. 359,970
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] H04S 3/00
U.S. Cl. 381—22 23 Claims



1. A decoder for decoding two or more channel signals in a directional information system wherein one or more input signals containing directional information are encoded into the two or more channel signals, said decoder comprising:

first means for generating at least a first dominance signal indicative of the ratio of the amplitudes of said two channel signals;

second means for generating at least a second dominance signal indicative of the ratio of the amplitudes of the sum of and the difference between said two channel signals; and

matrix means responsive to said two or more channel signals and to said at least two dominance signals for generating a plurality of output signals for which directional effects of the output signals are enhanced, wherein the first dominance signal $D_{LR}$ and the second dominance signal $D_{CS}$ are given by:

$$D_{LR} = \log_a \frac{|L_T|}{|R_T|}$$

$$D_{CS} = \log_a \frac{|P|}{|M|}$$

where $L_T$, $R_T$ are two channel signals $P=L_T+R_T$, $M=L_T-R_T$, and a is a constant,

and wherein said matrix means includes means for deriving three directional control signals $E_L$, $E_R$, $E_C$.

5,046,099
## ADAPTATION OF ACOUSTIC PROTOTYPE VECTORS IN A SPEECH RECOGNITION SYSTEM

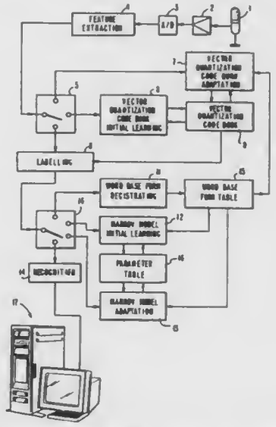
Masafumi Nishimura, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 27, 1990, Ser. No. 485,402
Claims priority, application Japan, Mar. 13, 1989, 1-57760
Int. Cl.[5] G10L 5/00
U.S. Cl. 381—43 9 Claims

1. A speech recognition system performing a frequency analysis of an input speech for each period to obtain feature vectors, producing the corresponding label train using a vector quantization code book, matching a plurality of word baseforms expressed by a train of Markov models each corresponding to labels, with said label train, and recognizing the input speech on the basis of the matching result, and comprising:

a means for dividing each of a plurality of word input speeches into N segments (N is an integer number more than 1) and producing a representative value of the feature vector of each segment of each of said word input speeches;

a means for dividing word baseforms each corresponding to said word input speeches and producing a representative value of each segment feature vector of each word baseform on the basis of prototype vectors of said vector quantization code book;



a means for producing displacement vectors indicating the displacements between the representative values of the segments of the word input speeches and the representative values of the corresponding segments of the corresponding word baseforms;

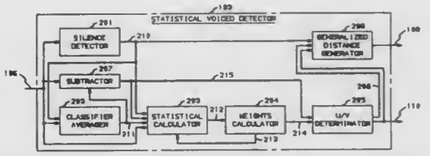
a means for storing the degree of relation between each segment of said each word input speech and each label in a label group of the vector quantization code book; and

a prototype adaptation means for correcting a prototype vector of each label of said vector quantization code book by said each displacement vector in accordance with the degree of relation between the label and the segment.

5,046,100
## ADAPTIVE MULTIVARIATE ESTIMATING APPARATUS

David L. Thomson, Warrenville, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation of Ser. No. 34,296, Apr. 3, 1987, abandoned. This application Nov. 1, 1989, Ser. No. 430,079
Int. Cl.[5] G10L 9/02
U.S. Cl. 381—49 38 Claims




1. An apparatus for determining the presence of a fundamental frequency in non-training set speech signals, comprising:

means responsive to said non-training set speech signals for

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sampling said speech signals to produce digital speech signals, to form frames of said digital non-training set speech signals, and to process each frame to generate a set of classifiers defining speech attributes;

first means responsive to said set of classifiers defining speech attributes of one of said frames of digital non-training set speech for calculating a set of statistical distributions;

second means responsive to the calculated set of statistical distributions based on said one of said frames of digital non-training set speech for calculating a set of weights each associated with one of said classifiers;

third means responsive to the calculated set of weights and classifiers and said set of statistical distributions for determining the presence of said fundamental frequency in said frame of non-training set speech; and

means responsive to the determination of said fundamental frequency in said frame of said digital non-training set speech signals for transmitting a signal to a data unit for subsequent use in speech processing.

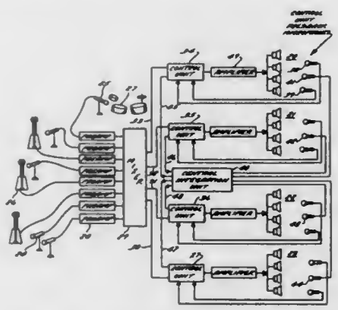
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**5,046,101**

## AUDIO DOSAGE CONTROL SYSTEM

**Kim A. Lovejoy, Waukesha, Wis., assignor to Lovejoy Controls Corp., Waukesha, Wis.**

**Filed Nov. 14, 1989, Ser. No. 436,207**
**Int. Cl.[5] H03G *3/20***
**U.S. Cl. 381—57** **23 Claims**



1. An audio system wherein generated sound is emitted from a speaker for being heard by a listener and the system is adapted for controlling the sound dosage to which said listener is exposed, comprising:

means for producing a first signal representative of a generated sound spectrum whose amplitude varies with time,

means for producing a feedback signal representative of the sound spectrum emitted by said speaker and of sound existing in the environment of the speaker, the amplitude of said signal varying with time,

signal processing means having input means for said feedback signal and having output means, said processing means including means operative to produce data representative of the levels of particular frequency spectral bands contained in the sound spectrum emitted by said speaker and sound sources in the environment of the means for producing said feedback signal and to compare the produced data with stored data representative of standard levels of the respective particular spectral bands which it is permissible for the listener to hear and to produce attenuation control signals respectively corresponding to the amounts by which the values of the produced data exceed the values of said stored data,

a plurality of first attenuating means respectively for attenuating particular frequency bands, said attenuating means having input means for said first signal representative of said generated sound spectrum and having output means, said means for attenuating particular frequency bands each having control means for responding to input of an attenuation control signal corresponding to the particular frequency band in the first signal which the particular means for attenuating attenuates by attenuating said frequency band in said first signal for maintaining the dose of each frequency band to no greater than the permissible level, and

means for coupling said output means of said means for attenuating to said speaker.

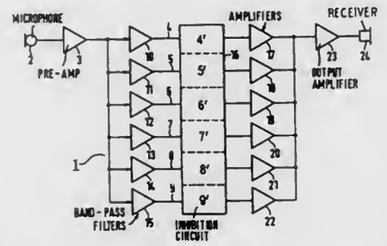
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**5,046,102**

## HEARING AID WITH ADJUSTABLE FREQUENCY RESPONSE

**Eberhard Zwicker, Icking; Thomas Beckenbauer, Munich, and Guenther Beer, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Oct. 14, 1986, Ser. No. 918,468**
**Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536881**
**Int. Cl.[5] H04R *25/00***
**U.S. Cl. 381—68.2** **18 Claims**




1. A hearing aid comprising:

means for receiving incoming audio signals and generating an electrical signal therefrom;

a plurality of frequency selecting channels connected to said means for receiving, said channels respectively transmitting electrical signals in different frequency ranges;

circuit means in each of said channels for generating an intermediate signal corresponding to the strength of the electrical signal in the frequency range for that channel;

means in at least one of said channels for combining said intermediate signals with intermediate signals from the circuit means in each of the other of said channels respectively representing the signal strength of each of the other of said plurality of channels;

means in each channel having a means for combining connected to said means for combining for generating a channel output which increases as the strength of the electrical signal for that channel increases relative to the signal strength of the other channels;

means for combining all of the channel outputs to generate an output signal; and

means for supplying said output signal to a hearing-impaired person.

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**5,046,103**

## NOISE REDUCING SYSTEM FOR VOICE MICROPHONES

**Glenn E. Warnaka, and Lynn A. Poole, both of State College, Pa., assignors to Applied Acoustic Research, Inc., State College, Pa.**

**Filed Jun. 7, 1988, Ser. No. 203,078**
**Int. Cl.[5] G10K *11/16***
**U.S. Cl. 381—71** **3 Claims**

1. A noise attenuating system for attenuating ambient noise in an acoustical field into which intelligible speech sound is provided from a source located within said acoustical field, said system comprising:

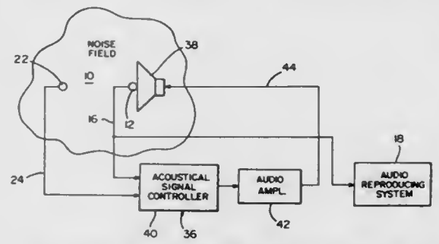
primary sensing means positioned within said acoustical field for picking up said intelligible speech sound together with unwanted ambient noise and generating an output signal representative thereof;

reference sensing means positioned within said acoustical field for picking up at least said ambient noise and generating an output signal representative thereof;

signal processing means programmed for cancelling said ambient noise and receiving as input a data input signal and a feedback error input signal, the output of said reference sensing means being said data input signal, and for generating an output signal which is computed according to a modified deterministic algorithm;

summing means receiving as input the output signal of said primary sensing means and the output signal of said signal processing means, and for generating an output signal which is fed to said signal processing means as said feedback error input signal and corresponds to a noise attenuated output signal, said feedback error input signal being used by said signal processing means for adjusting said output signal to better effect the cancellation of said ambient noise.





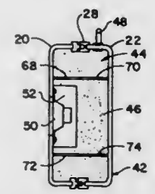

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**5,046,104**

## LOUDSPEAKER SYSTEM

**Henry E. Kloss, Cambridge, Mass., assignor to Cambridge Soundworks, Inc., Newton, Mass.**

**Filed Nov. 30, 1989, Ser. No. 444,115**
**Int. Cl.[5] H04R *1/02***
**U.S. Cl. 351—90** **12 Claims**



1. A portable loudspeaker system including at least one loudspeaker assembly for reproducing relatively high audio frequencies, and amplifier means, said system comprising, in combination:

a carrying case formed as a mating pair of shells which, when mated, define an enclosed interior space; at least one of said shells having mounted in an opening through a wall thereof at least one woofer for reproducing only relatively low audio frequencies as acoustic waves radiating substantially away from said case, said case being formed of a stiff material that will not deform substantially at the acoustic pressures and frequencies generated by said woofer, and;

a body of sound absorbing material so shaped and disposed within said interior space behind said woofer for preventing formation of air column resonances and standing waves of said low audio frequencies within said interior space and for providing a stiff-air spring to effect a restoring force on the speaker cone of said woofer during operation of said woofer, that said enclosed interior space constitutes a low-frequency speaker enclosure for said woofer;

said body having therein a plurality of relatively large voids dimensioned for respectively storing said loudspeaker assembly and said amplifier means.

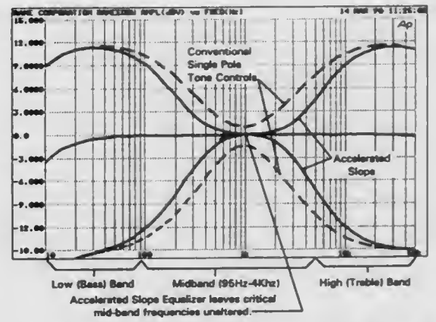
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**5,046,105**

## AUDIO SIGNAL EQUALIZER HAVING ACCELERATED SLOPE PHASE SHIFT COMPENSATED FILTERS

**Dennis A. Bohn, Everett, Wash., assignor to Rane Corporation, Everett, Wash.**

**Filed Apr. 30, 1990, Ser. No. 516,608**
**Int. Cl.[5] H03G *5/00***
**U.S. Cl. 381—98** **19 Claims**




5. An active equalizer circuit for controllably altering the amplitude versus frequency response characteristics of an audio signal having a frequency range that includes a mid-band and an adjacent band, high or low thereto, that is to be controllably altered in relative amplitude, comprising:

a filter means for said adjacent band, and means for controllably setting signal output for said filter means, said filter means having at least first and second poles and at least one compensation zero, said first and second poles and said at least one compensation zero selected in value so as to cause a multiple-pole frequency dependent amplitude change in said adjacent band and wherein said at least one compensation zero is at an offset from said poles so as to cause cancellation of one of said poles for frequencies approaching and within said mid-band, whereby the multiple poles provide a sharper amplitude versus frequency change in said adjacent band without causing excessive phase shift of the audio signal at the frequencies occupying said mid-band.

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**5,046,106**

## VARYING LOUDSPEAKER SPATIAL CHARACTERISTICS IN A VEHICLE

**Craig Liebel, Framingham, and Richard McFadyen, Worcester, both of Mass., assignors to Bose Corporation, Framingham, Mass.**

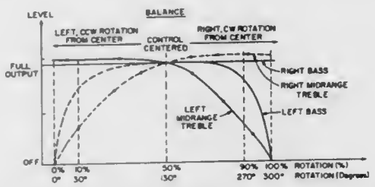
**Filed Jan. 18, 1990, Ser. No. 466,994**
**Int. Cl.[5] H03G *9/00***
**U.S. Cl. 381—102** **15 Claims**

1. In a multi-loudspeaker audio system for use with a plurality of loudspeakers formable in pairs where an audio unit supplies an audio signal having treble, midrange and bass components to an adjustable control network, the network being capable of varying the intensity of the treble and midrange components as it is applied from the audio unit to any loud-

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speaker or pair of loudspeakers in the system while the bass component remains essentially unchanged so as to effectively change the perceived origin of the sound energy radiated by the system, the control network being adjustable via a shifting control device having an adjustable range embracing an intermediate range separating two end ranges, the improvement comprising wherein the shifting control device is characterized by two operative range, the first range being said intermediate range and providing variable attenuation only of the treble and midrange components supplied to the shifting control device and the second range being said end ranges providing for substantially complete attenuation of all components supplied to the shifting control device so that in the first range the bass component received by each loudspeaker remains essentially unchanged while in the second range at least one loudspeaker receives no treble, midrange or bass components.




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**5,046,107**

**INPUT LEVEL ADJUSTING CIRCUIT**

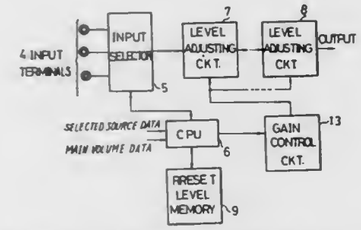
**Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan**

**Continuation of Ser. No. 101,856, Sep. 28, 1987, abandoned. This application Sep. 28, 1989, Ser. No. 414,580**

**Claims priority, application Japan, Sep. 30, 1986, 61-230140**

**Int. Cl.[5] H03G** *3/00*

**U.S. Cl. 381—107** **6 Claims**




1. An input level adjusting circuit comprising:

input selection means for selecting one of input signals from plural input sources and outputting the selected signal and also outputting information concerning the selected input signal;

level adjusting means connected to said input selection means for adjusting the level of the selected input signal in accordance with a command value substantially uniformly for all frequencies to provide a level-adjusted output;

memory means for prestoring input level setting offset amounts which are relative differences in an amount of level adjustment for said plural input sources; and

control means responsive to the information concerning the selected input signal supplied from said input selection means for reading out one of the input level setting offset amounts for the corresponding input source and controlling said level adjusting means in accordance with a single value determined from both the command value and the read out input level setting offset amount, wherein the offset amounts can be set to compensate for differences in levels of signals from each of the plural input sources so that substantially the same level is output from said level adjusting circuit in response to selection of any input source for a given command value.

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**5,046,108**

**IMAGING PROCESSING METHOD AND APPARATUS SUITABLY USED FOR OBTAINING SHADING IMAGE**

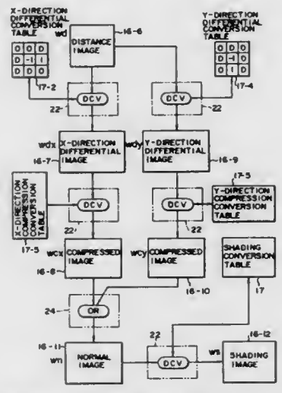
**Yoichi Inoue, Tokyo, and Akira Kasano, Kokubunji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Oct. 26, 1988, Ser. No. 262,639**

**Claims priority, application Japan, Oct. 31, 1987, 62-276014; Oct. 31, 1987, 62-276015**

**Int. Cl.[5] G06K** *9/00;* **G06F** *15/00;* **H01J** *15/00*

**U.S. Cl. 382—6** **21 Claims**




20. An image processing apparatus for obtaining from a distance image a shading image when an object is viewed from a given direction, said distance image having density data representing in gradation, distances from a pre-designated area on a pre-designated plane in a space to an image of the object in the space, said apparatus comprising;

first obtaining means for obtaining from said distance image a normal image which has as density data parts of components of normal vectors of the object; and

second obtaining means for obtaining said shading image having as density data luminance data from the normal image density data and direction data representing the given direction,

wherein said first obtaining means includes:

means for obtaining an x-direction differential image having as density data x-direction differential data obtained form the density data of the distance image consecutive in the x-direction;

means for obtaining a y-direction differential image having as density data y-direction differential data obtained from the density data of the distance image consecutive in the y-direction;

third obtaining means for obtaining said normal image having as the density data linked data of portions of the density data of the obtained x- and y-direction differential images,

means for compressing the density data of the x-direction differential image;

means for compressing the density data of the y-direction differential image; and

means for linking the x- and y-direction compressed data.



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**5,046,109**

**PATTERN INSPECTION APPARATUS**

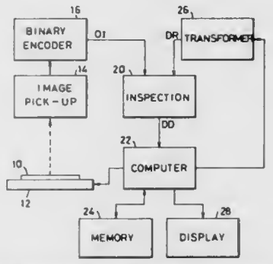
**Yoshihiko Fujimori, and Keiichi Hirose, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Continuation of Ser. No. 342,657, Apr. 19, 1989, abandoned, which is a continuation of Ser. No. 186,668, Apr. 20, 1988, abandoned, which is a continuation of Ser. No. 23,850, Mar. 9, 1987, abandoned. This application Feb. 1, 1990, Ser. No. 473,103**

**Claims priority, application Japan, Mar. 12, 1986, 61-54489; May 16, 1986, 61-112272; May 23, 1986, 61-118833; May 29, 1986, 61-123985**

**Int. Cl.[5] G06K** *9/00*

**U.S. Cl. 382—8** **9 Claims**




1. An apparatus for inspecting a pattern formed on an object in accordance with design data, comprising:

image data forming means for picking up an image of said pattern and forming image data from the image;

first cut out means for cutting out first portion data of said image data corresponding to a local region of said pattern;

first template means having a multiplicity of templates prepared for detecting each of plural characteristic portions having a substantially linear form of reference edge forming said pattern and an edge bent from said reference edge, each of said multiplicity of templates being applied to said first portion data to produce a template output;

said first template means including a group of templates each prepared for detecting a plurality of characteristic portions including a characteristic portion at which said reference edge is parallel to a predetermined direction on said pattern, a characteristic portion at which said reference edge slants at 45 degrees with respect to said predetermined direction and a characteristic portion at which said reference edge slants at 90 degrees with respect to said predetermined direction, and a group of templates each prepared for detecting a plurality of characteristic portions including a characteristic portion at which said reference edge slants at an angle between 0 and 45 degrees with respect to said predetermined direction and a characteristic portion at which said reference edge slants at an angle between 45 and 90 degrees with respect to said predetermined direction;

means for sorting said template outputs of said first template means into a plurality of groups corresponding to different ranges of said slant angles of said reference edge and for producing image character data outputs;

means for producing reference data corresponding to said image data based upon said design data;

second cut out means for cutting out second portion data of said reference data corresponding to said local region of said pattern;

second template means having a multiplicity of templates prepared for detecting each of plural characteristic portions having a substantially linear form of reference edge forming said pattern and an edge bent from said reference edge, each of said multiplicity of templates being applied to said second portion data to produce a template output;

said second template means including a group of templates each prepared for detecting a plurality of characteristic portions including a characteristic portion at which said reference edge has a direction the same as a predetermined direction on said pattern, a characteristic portion at which said reference edge slants at 45 degrees with respect to said predetermined direction and a characteristic portion at which said reference edge slants at 90 degrees with respect to said predetermined direction, and a group of templates each prepared for detecting a plurality of characteristic portions including a characteristic portion at which said reference edge slants at an angle between 0 and 45 degrees with respect to said predetermined direction and a characteristic portion at which said reference edge slants at an angle between 45 and 90 degrees with respect to said predetermined direction;

means for sorting said template outputs of said second template means into a plurality of groups corresponding to different ranges of said slant angles of said reference edge and for producing reference character data outputs; and

comparing means for comparing said image character data outputs and said reference character data outputs with each other in a predetermined positional relationship thereof and for producing a signal showing any defect on the basis of the difference between said image character data and said reference character data.

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**5,046,110**

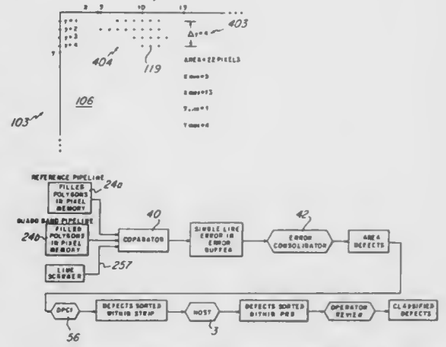
**COMPARATOR ERROR FILTERING FOR PATTERN INSPECTOR**

**Lori A. Carucci, Arlington, Mass.; Don J. Weeks, Southlake, and William G. Manns, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Mar. 25, 1988, Ser. No. 173,322**

**Int. Cl.[5] G06K** *9/00, 9/46;* **H04N** *7/18*

**U.S. Cl. 382—8** **3 Claims**




1. A computerized method of filtering miscompared pixel data bits in a pattern inspection system, comprising the steps of:

inputting pixel data bits, each of which represents a pixel of an inspected target having a pattern;

inputting reference data bits of a bit-mapped representation of an ideal target having an ideal pattern;

logically comparing each pixel data bit with its corresponding reference data bit;

counting the number of consecutive logical miscompares;

comparing the number of consecutive logical miscompares with a predetermined minimum recordable error length greater than one pixel;

saving the X-Y coordinates of the first logically miscompared pixel data bit if and only if the number of consecu-

tive logical miscompares is greater than or equal to the predetermined minimum recordable error length; and

continuing to count logical comparisons as logical miscompares, after the predetermined minimum recordable error length has been exceeded, until the number of consecutive logically compared good pixel data bits equals a predetermined number of good bits.

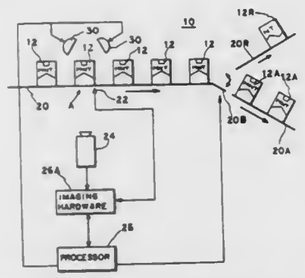
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**5,046,111**

## METHODS AND APPARATUS FOR OPTICALLY DETERMINING THE ACCEPTABILITY OF PRODUCTS

**Kenneth A. Cox, Richmond, and Robert J. Maher, Midlothian, both of, assignors to Philip Morris Incorporated, New York, N.Y.**

**Filed Feb. 9, 1989, Ser. No. 308,739**
**Int. Cl.[5] G06K *9/00***
**U.S. Cl. 382—8** **34 Claims**




31. The method of determining whether or not an image to be inspected has substantially the same appearance as a plurality of training images, said method comprising the steps of:

digitizing each training image i to produce corresponding training image data $\underline{I}^{(i)}$;

converting said training image data to a plurality of orthogonal eigenimages given by the equation:

$$\phi^{(i)} = \sum_{i=1}^{n} I^{(i)} B_{ij}$$

where n is the total number of training images and the transformation matrix B is orthogonal;

computing a discriminant image F from a truncated linear combination of said eigenimages given by the equation:

$$F = \sum_{j=1}^{s} C_j \phi^{(i)}$$

where s is an integer less than n selected as a value which gives the minimum value for V(s) in the equation:

$$V(s) = \frac{1}{(n-s)^2}\left\{ \sum_{i=1}^{n} a_i^2 - \sum_{j=1}^{s}\left[\sum_{i=1}^{n} a_i B_{ij}\right]^2 \right\}$$

where $a_i$ is a nonzero constant for all good training images and zero for any bad training images, and where the values $C_j$ are given by the equation:

$$C_j = \frac{1}{\gamma_j} \sum_{i=1}^{n} a_i B_{ij}$$

where the eigenvalues $\gamma_j$ are the diagonal elements of a matrix G given by the equation $AB=BG$, where A is the real, symmetric matrix given by the dot product of every possible training image pair, and the transformation matrix B, is such that $BB^+=B^+B=1$;

digitizing said image to be inspected;

forming the dot product of said discriminant image and said digitized image to be inspected; and

comparing said dot product to a predetermined reference value.

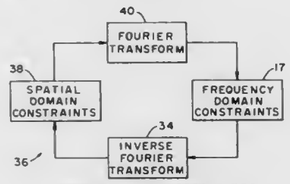
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**5,046,112**

## SUPPRESSION OF MACHINE MARKS ON IMAGE OF WORKPIECE SURFACE

**Robert C. Chang, Murrysville; Nabeel W. H. Sufi, Franklin Township, Westmoreland County, and Christopher W. Carroll, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.**

**Filed Nov. 28, 1989, Ser. No. 442,522**
**Int. Cl.[5] G06K *9/00***
**U.S. Cl. 382—8** **8 Claims**




GENERATION OF AN APPROXIMATE FILTER KERNEL

1. A method of inspecting the surface of an object for the detection and analysis of surface variations that exceed established acceptable surface conditions, said surface having at least one directionally specific pattern that tends to obscure said surface variations in a spatial domain, said method comprising:

exposing a surface of the object to electromagnetic visible and/or invisible energy,

detecting the presence of one or more surface variations with sensors located to view the surface and thereby acquire an electronic image of an area of the surface containing said variations and directionally specific pattern,

transmitting said electronic image from one or more of the sensors to a device for storing said image for subsequent display and analysis,

transforming the spatial domain of the acquired image into a two dimensional frequency domain to obtain a spectral response of the acquired image,

evaluating frequency components of the two dimensional spectral response to identify the direction of the directionally specific pattern,

providing a band eliminating filter having a spectral response that corresponds with said pattern, and

using said filter to remove or at least suppress the pattern from the image stored for subsequent display and analysis.

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**5,046,113**

## METHOD OF AND APPARATUS FOR DETECTING PATTERN DEFECTS BY MEANS OF A PLURALITY OF INSPECTING UNITS EACH OPERATING IN ACCORDANCE WITH A RESPECTIVE INSPECTING PRINCIPLE

**Tetsuo Hoki, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co. Ltd, Japan**

**Filed Jan. 12, 1989, Ser. No. 296,435**
**Claims priority, application Japan, Jan. 12, 1988, 63-3960**
**Int. Cl.[5] G06K *9/00***
**U.S. Cl. 382—8** **19 Claims**

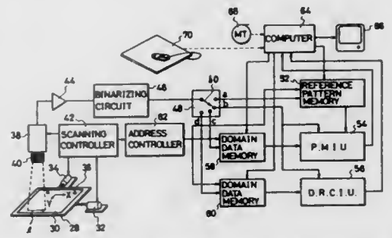
1. A method of inspecting an object to detect pattern defects thereof, comprising the steps of:

(a) providing a plurality of inspecting units each of which operates in accordance with a respective inspecting principle;

(b) defining, in a defining means, an inspection domain which forms a source of the inspection signals and an inhibition domain which forms a source of the inhibition signals, said inspection and inhibition domains being defined for each inspecting unit on the object;

(c) obtaining groups of domain signals on the basis of each image of the defining means, each said group of domain signals comprising inspection signals and inhibition signals;






(d) storing groups of domain signals in a memory in addresses thereof which correspond to positions on the object, each said group of domain signals having a particular relation to a respective one of the inspecting units;

(e) binarizing an image of the object;

(f) reading out the domain signals of every group of the domain signals from the memory according to inspection position addresses on the object;

(g) controlling the operation of each inspecting unit according to the type of domain signals read out therefor from the memory; and

(h) forming an inspection decision according to an output signal of the inspecting units.

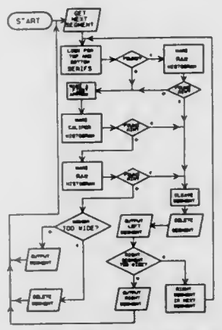
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**5,046,114**

## METHOD AND STRUCTURE FOR SEPARATING JOINED PATTERNS FOR USE IN PATTERN AND CHARACTER RECOGNITION SYSTEM

**David H. Zobel, Redwood City, Calif., assignor to The Palantir Corporation, Santa Clara, Calif.**

**Filed Oct. 1, 1985, Ser. No. 782,744**
**Int. Cl.[5] G06K *9/34***
**U.S. Cl. 382—9** **50 Claims**




1. A method for separating a data segment representing an array of pixels having a plurality of rows and columns into a plurality of segments comprising the steps of:

fetching a data segment;

creating a first histogram selected from the group of histograms consisting of a caliper histogram indicating the distance between the topmost and bottommost "on" pixels for a plurality of columns of said array of pixels and a raw histogram indicating the number of "on" pixels in a plurality of columns of said array of pixels;

determining if a satisfactory minimum of said first histogram exists;

if a satisfactory minimum of said first histogram does not exist, creating a second histogram of a type other than said first histogram, said second histogram selected from said group of histograms consisting of a caliper histogram and a raw histogram, and determining if a satisfactory minimum of said second histogram exists; and

cleaving said data segment about said satisfactory minimum of said first histogram or said satisfactory minimum of said second histogram, thereby forming a left segment and a right segment.

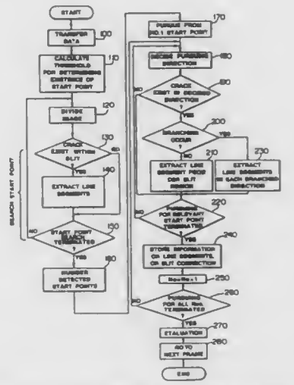
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**5,046,115**

## METHOD OF PROCESSING IMAGE DATA ON CRACK

**Tatsuya Maruyama, and Toshihiko Fukuhara, both of Kanagawa, Japan, assignors to Kabushiki KaishaKomatsu Seisakusho, Tokyo, Japan**

**PCT No. PCT/JP88/01087, § 371 Date Jun. 22, 1989, § 102(e) Date Jun. 22, 1989, PCT Pub. No. WO89/04018, PCT Pub. Date May 5, 1989**
**ub. Date DOct. 26, 1988, Ser. No. 378,522**
**Claims priority, application Japan, Oct. 26, 1987, 62-270017; Nov. 6, 1987, 62-280776**
**Int. Cl.[5] G06K *9/48, 9/00; H04N 7/18***
**U.S. Cl. 382—22** **7 Claims**




1. A method of processing image data indicative of cracks wherein data of a picture-taken road surface is stored in an image memory and a group of line segments corresponding to the cracks are then extracted from the data of the road surface stored in the image memory, the method comprising:

a first step of dividing the image memory into a plurality of frame regions and further dividing each of the frame regions into a plurality of slit regions;

a second step of previously selecting some slit regions from the plurality of slit regions in one frame regions, determining whether or not image data indicative of a crack exist in each of the selected slit regions on the basis of a fact that, among pixels within each of the selected slit regions, whether or not the number of pixels having a density near to black tone more than a predetermined density exceeds a predetermined number, and selecting as a pursuing start point region the slit region being determined that the crack exists therein among the selected slit regions;

a third step of extracting from the pursuing start point region a line segment having a rectangular contour corresponding to a crack and having parameters of position coordi-

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nates in the slit region, a line width, a line length, and a line direction;

a fourth step of previously setting some slit regions to be pursued from among a plurality of slit regions adjacent to the selected slit region in correspondence with the line direction as one of the parameters of the line segment corresponding to the crack, and determining a slit region to be next pursued among the plurality of slit regions adjacent to the pursuing start point region on the basis of the content previously set corresponding to the line direction of the line segment of the selected pursuing start point region;

a fifth step of determining whether or not crack data exists in the determined slit region to be next pursued on the basis of a fact that, among pixels within each slit region, whether or not the number of pixels having a density near to black tone more than a predetermined density exceeds a predetermined number and extracting, only in the region which has been determined that the crack exists therein, a line segment having a rectangular contour corresponding to the crack and having as parameters a line width, a line length, a line direction, and position coordinates in the determined slit region;

a sixth step of determining a slit region to be next pursued which is adjacent to the selected slit region on the basis of the set content corresponding to the line direction of the extracted line segment, determining whether or not a crack exists in the determined slit region on the basis of a fact that, among pixels within each slit region, whether or not the number of pixels having a density near to black tone more than a predetermined density exceeds the predetermined number, and repeatedly executing the processing of extracting a line segment having a rectangular contour corresponding to a crack and having as parameters a line width, a line length, a line direction, and position coordinates in the slit region only in the region which has been determined that the crack exists therein until pursuing is terminated, wherein the extracting of line segments in the frame region is executed by performing the fourth to sixth steps for each pursuing start point selected in the second step.

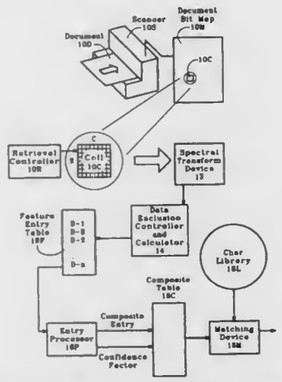
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**5,046,116**

## SYMBOL ANALYZING SYSTEM AND METHOD WITH DATA EXCLUSION AND CONFIDENCE FACTORS

**Roger D. Melen, Los Altos Hills, Calif., assignor to Canon Research Center America, Inc., Palo Alto, Calif.**

**Filed Dec. 14, 1990, Ser. No. 627,336**
**Int. Cl.[5] G06K** *9/62*
**U.S. Cl. 382—36** **42 Claims**




1. A symbol analysis system which receives and processes symbol data from symbols for deriving feature information concerning the symbols represented by the symbol data, and for generating a confidence factor indicating the reliability of the derived symbol feature information, by progressively reducing the bandwidth of the processed symbol data, comprising:

digitizer means for receiving an input document containing the symbol data and providing an input bit stream;

document memory means for receiving and storing the input bit stream in a bit map of the input document;

retrieval means for identifying symbol bit maps within the document bit map and systematically addressing selected symbol bit maps along retrieval passes to provide bit streams of symbol data;

spectral transform means for transforming the bit streams of symbol data into a spectral response having a lower frequency end and an upper frequency end;

data exclusion means for receiving the spectral response and providing a set of symbol feature information entries based on progressively reducing the bandwidth of the spectral response by excluding a progressively larger portion of the upper frequency end; and

processor means for receiving the set of symbol feature information entries and forming a single composite entry for the symbol feature information with a confidence factor indicating the reliability of the composite entry.

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**5,046,117**

## IMAGE DATA SCALING SYSTEM

**Jun Yamashita, Iwatsuki, Japan, assignor to Fuji Xerox Co., Ltd., Saitama, Japan**

**Filed May 11, 1990, Ser. No. 522,152**
**Claims priority, application Japan, May 16, 1989, 1-121896**
**Int. Cl.[5] G06K** *9/00*
**U.S. Cl. 382—47** **16 Claims**

1. An image-data scaling system comprising:

a plurality of memory means;

distributing means for sequentially distributing original image data to sequentially write the original image data into said plurality of memory means;

reading means for parallelly reading out image data stored in said plurality of memory means at a speed corresponding to a desired scaling factor;

selection means for receiving the image data parallelly read out by said reading means from said plurality of memory means and selectively outputting two adjacent image data;

first interpolation means for storing therein combinations of first interpolation coefficients, receiving one of the image data outputted from said selection means, multiplying the received image data by the first interpolation coefficients and outputting a multiplied value;

second interpolation means for storing therein combinations of second interpolation coefficients, receiving the other one of the image data outputted from said selection means, multiplying the received image data by the second interpolation coefficients and outputting a multiplied value; and

image-data forming means for forming scale-changed image data corresponding to an image having the desired scaling factor by adding together outputs of said first and second interpolation means.

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**5,046,118**

## TONE-SCALE GENERATION METHOD AND APPARATUS FOR DIGITAL X-RAY IMAGES

**Isaac A. Ajewole, Rochester, and Ralph Schaetzing, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 6, 1990, Ser. No. 475,522**
**Int. Cl.[5] G06K** *9/36*
**U.S. Cl. 382—51** **16 Claims**

1. A method of processing a digital diagnostic X-ray image comprising the steps of:



a. in a digital computer, generating a tone-scale transformation function by,

i forming a histogram of the digital image;

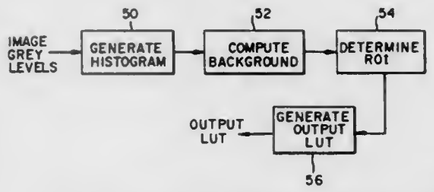
ii dividing the histogram into a region of interest and a background region by;

(a) assuming the histogram is comprised of two modes; and

(b) determining the grey level that separates the two modes by maximizing the a posteriori entropy of the image by;

(i) modeling the background grey level distribution as a uniform distribution having substantially the same entropy as the background distribution, and computing the width W of the model uniform distribution;

(ii) determining the location of a window of width W with the greatest number of pixels in the background region; and




(iii) if the window is located at the upper end of the background distribution choosing the beginning of the window as the start of the background, else compute a new window based on the average of the grey levels in the window, until the window is located at the upper end of the background distribution, and choosing the beginning of the new window as the start of the background;

iii constructing a tone-scale transformation function having a linear portion substantially over the region of interest, smoothly joined with a first portion extending from the start of the histogram to the linear portion, and a second portion extending from the linear portion to the beginning of the background region; and

b. transforming the digital image with the tone-scale transformation function.

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**5,046,119**

## METHOD AND APPARATUS FOR COMPRESSING AND DECOMPRESSING COLOR VIDEO DATA WITH AN ANTI-ALIASING MODE

**Eric M. Hoffert, San Francisco; Gavin S. P. Miller, Mountain View, both of Calif., and Lee S. Mighdoll, Chagrin Falls, Ohio; Stephanie L. Winner Santa Clara, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed Mar. 16, 1990, Ser. No. 495,428**
**Int. Cl.[5] G06K** *9/36*
**U.S. Cl. 382—56** **26 Claims**

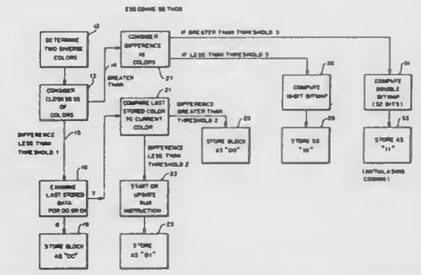
1. A method for compressing digital video color data comprising the steps of:

considering the video data in blocks of n×n pixels;

determining two diverse colors for each of said blocks by examining the $n^2$ pixels in each of said blocks;

determining if the difference in said two diverse colors for each of said blocks is greater than a first threshold value, and

if said difference is greater than said first threshold value, representing said block with four colors and a 2 n×n bitmap, two of said four colors being intermediate colors calculated from said two diverse colors, said bitmap for selecting among said four colors,



if said difference is less than said first threshold value, representing said block as one color.

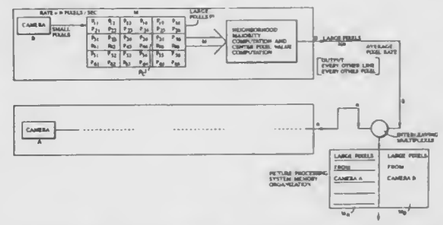
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**5,046,120**

## METHOD OF AND APPARATUS FOR INCREASING THE PROCESSING SPEED IN THE SCANNING INSPECTION OF CIRCUIT BOARDS AND OTHER OBJECTS

**Robert Bishop, Brookline, Mass., assignor to Beltronics, Inc., Brookline, Mass.**

**Filed Apr. 10, 1989, Ser. No. 335,283**
**Int. Cl.[5] G06K** *9/60, 9/56*
**U.S. Cl. 382—54** **11 Claims**




1. A method of increasing the processing speed of optical scanning in which an object is scanned by a camera to determine defects, features or differences, that comprises, scanning the object to generate binary value small pixels corresponding to the presence or absence of physical characteristics; generating from the small pixels a set of larger pixels each constituted of a group of the small pixels; incorporating into the larger pixels defect, feature or difference information contained in one or more of the small pixels constituting the larger pixels, by examining a neighborhood within an array of small pixels equivalent to the set of larger pixels to determine the majority binary value of the small pixels constituting the neighborhood, and setting the value of the center larger pixel composed of the center group of small pixels to the said value of the neighborhood if a certain or minimum number of the pixels of the center group is equal to the said value of the neighborhood, and otherwise setting the value of the center larger pixel to the opposite binary value to accentuate at least one small pixel therein that is different; and processing the larger pixels at a data rate or processing speed that is a multiple of that achievable in processing the small pixels, while maintaining the information from the scanning that is contained in the small pixels.

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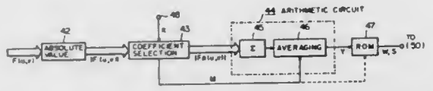


5,046,121

## IMAGE DATA COMPRESSION APPARATUS

Hisashi Yonekawa; Yoshiyuki Ishimitsu, and Junichirou Akune, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 30, 1990, Ser. No. 472,669
Claims priority, application Japan, Jan. 31, 1989, 1-21903; Jan. 31, 1989, 1-21904
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 2 Claims



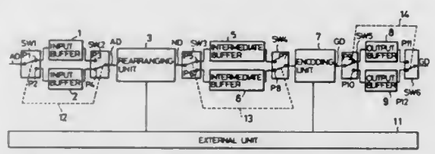

1. An apparatus for compressing image data, comprising:
(i) means for generating a first transform coefficient corresponding to said image data using an orthogonal transform;
(ii) estimating means for generating estimation signals in accordance with said first transform coefficient to include a quantization width and a first threshold value;
(iii) means for generating a quantized second transform coefficient in accordance with said quantization width and said first threshold value to have a plurality of first transforming value signals corresponding to transform frequencies;
(iv) means for generating an original cutoff frequency in accordance with said first transform coefficient; and
(v) means for generating coded data based on said second transform coefficient and said cutoff frequency wherein said coding means cuts off from said second transform coefficient portions of said first transforming value signals of frequency having a lower limit that can be higher than said original cutoff frequency, said lower limit becoming a new cutoff frequency.

5,046,122

## IMAGE COMPRESSION DEVICE

Daisuke Nakaya, and Hiroshi Horikawa, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 28, 1989, Ser. No. 458,463
Claims priority, application Japan, Dec. 28, 1988, 63-333837
Int. Cl.[5] G06K 9/48; H04N 1/40
U.S. Cl. 382—56 10 Claims



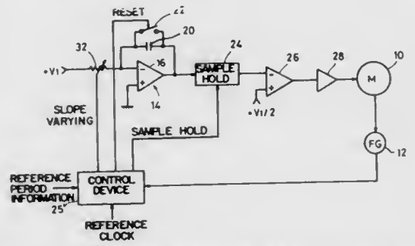

1. An image compression device for compressing binary image data, said binary image data having corresponding address information and being formed by data received from a plurality of pixels, wherein each bit of said binary image data corresponds to an individual one of said pixels, comprising:
means to rearrange said binary image data in accordance with at least a first conversion table; and
means to encode said rearranged data in accordance with a second conversion table, wherein said second conversion table contains data comprising a first code, said first code being predetermined for each possible logical bit value; a second code, said second code being determined according to a count of an uninterrupted series of the same logical bit value; and a third code, said third code being determined in accordance with a unit of said rearranged data having an uninterrupted series of the same logical bit value, where the leading edge bit of said third code differs from the leading edge bit of said first code; and
wherein upon the occurrence of a first situation, said first situation being when the same logical bit value continues in an uninterrupted series in said rearranged data said encoding means adds in series said second code to said third code thus creating a combined code, said encoding means encodes said combined code in place of said uninterrupted series, and upon the occurrence of a second situation, said second situation being when said first situation does not occur, said encoding means encodes said first code.

5,046,123

## ERROR SIGNAL DETECTION CIRCUIT IN A SERVO CONTROL DEVICE

Mamoru Horino, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 1, 1988, Ser. No. 239,997
Claims priority, application Japan, Sep. 7, 1987, 62-223789
Int. Cl.[5] H62P 5/16
U.S. Cl. 388—814 7 Claims




1. An error signal detection circuit in a servo control device comprising:
reference signal generation means for selectively generating reference signals of different periods, each having a slope which changes from a reference value at a substantially constant gradient;
error detection timing generation means for generating timing of detection of an error signal of an object of control;
error signal detection means for generating an error signal by detecting the value of a reference signal generated by said reference signal generation means at a timing provided by said error detection timing generation means; and
slope varying means for varying the slope of the reference signal in accordance with the period of the reference signal.

5,046,124

## FREQUENCY MODULATED RADIO FREQUENCY BROADCAST NETWORK EMPLOYING A SYNCHRONOUS FREQUENCY MODULATED BOOSTER SYSTEM

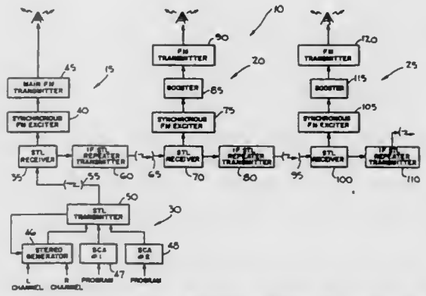
Joseph C. Wu, Saratoga; Charlie L. Hu, San Jose, and Yee S. Law, Milpitas, all of Calif., assignors to TFT, Inc., Santa Clara, Calif.

Filed Mar. 21, 1989, Ser. No. 326,744
Int. Cl.[5] H04B 7/15
U.S. Cl. 455—20 30 Claims

14. A synchronous frequency modulated booster system for re-transmitting a frequency modulated broadcast signal comprising:
a. transmitting means for re-transmitting a frequency modulated broadcast signal;
b. receiving means for receiving a frequency modulated intermediate frequency signal; and



c. a synchronous frequency modulated exciter receiving said frequency modulated intermediate frequency signal from said receiving means and applying to said transmitting means a frequency modulated broadcast signal for re-



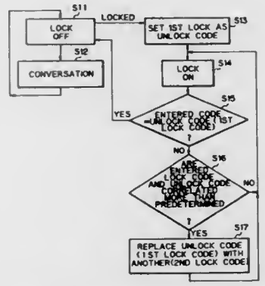

transmission by said transmitter means, said synchronous frequency modulated exciter synchronizing said frequency modulated broadcast signal with said frequency modulated intermediate frequency signal.

5,046,125

## LOCK CONTROL METHOD FOR ON-BOARD TERMINAL EQUIPMENT OF A MOBILE TELECOMMUNICATIONS SYSTEM

Hiroshi Takizawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jul. 26, 1990, Ser. No. 558,053
Claims priority, application Japan, Jul. 28, 1989, 1-196151
Int. Cl.[5] H04K 1/00
U.S. Cl. 455—26.1 6 Claims



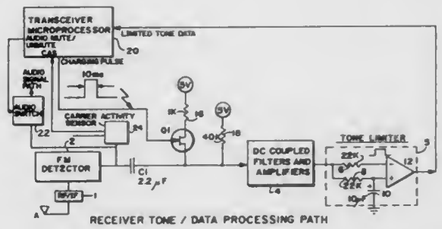

1. A lock control method for on-board terminal equipment of a mobile telecommunications system which has a locking function for locking said equipment to inhibit a call to be originated on said equipment and an unlocking function for unlocking said equipment, said method comprising the steps of:
(a) providing a first and a second lock code which are selectively used as an unlock code;
(b) setting either one of said first and second lock codes as said unlock code;
(c) entering a certain lock code;
(d) determining whether or not the entered lock code is identical with said unlock code;
(e) unlocking the equipment if the entered lock code is identical with said unlock code;
(f) determining, if the entered lock code is not identical with said unlock code, whether or not said entered lock code and said unlock code have a correlation greater than a predetermined correlation; and
(g) substituting, if the correlation is greater than the predetermined correlation, said second lock code for said first lock code and setting said second lock code as a new unlock code.

5,046,126

## FAST SETTLING TONE/DATA PROCESSING CIRCUIT FOR A RADIO RECEIVER

Norbert D. Ingram, Lynchburg, Va., assignor to Ericsson GE Mobile Communications Inc., Lynchburg, Va.

Continuation of Ser. No. 236,369, Aug. 25, 1988, abandoned.
This application Dec. 19, 1989, Ser. No. 453,074
Int. Cl.[5] H04B 1/16
U.S. Cl. 455—35 47 Claims




1. In a radio having an FM detector for receiving predetermined audio signals and a predetermined pattern of tones or digital data, a fast settling tone, data processing circuit comprising:
processing means for receiving a pattern of tones or digital data from said FM detector and for generating radio enabling data; and
bias voltage control means coupled to the output of said FM detector and to said processing means for providing a bias voltage to said processing means and including means responsive to the detection of an RF carrier for initiating a high speed generation of the bias voltage required for the processing means to enable the processing means to rapidly generate valid radio enabling data, whereby a predetermined pattern of valid enabling data may be detected to enable the predetermined audio signals to be heard.

5,046,127

## TRANSMISSION PATH TESTER FOR BROADCASTING

Gunter Luber, Schlesierstr. 22; Wolfgang Heuer, Hinter dem Kirchdorf 4, both of 3200 Hildesheim; Rudolf Messerschmdit, Gartenstr. 2, 3226 Sibbesse, and Uwe Mätzold, Neue Reihe 8, 3320 Salzgitter 61, all of Fed. Rep. of Germany

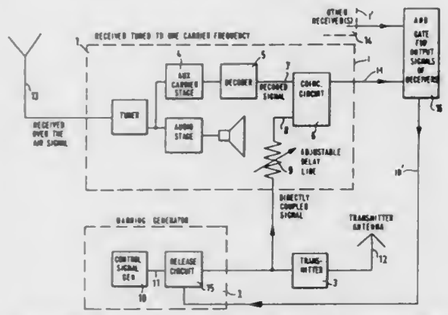
Filed Feb. 7, 1989, Ser. No. 307,353
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805190
Int. Cl.[5] H04B 1/00, 1/16, 17/00
U.S. Cl. 455—51 3 Claims

3. Warning broadcast system for an alarm center which can be networked on demand with a plurality of transmitters (3). comprising
means (10) in said alarm center for generating and transmitting a control signal;
means (3, 12), connected to said control signal generating means (10), for broadcasting said control signal;
means (13, 4, 1) for receiving said broadcast control signal;
a decoder (5), coupled to said receiving means, in said alarm center (2), for decoding said control signal;
a coincidence circuit (6), in said receiving means, connected to an output of said decoder (5);
means (9) in said alarm center for coupling said control signal, with a delay, directly from said control signal generating means (10) to said coincidence circuit (6);

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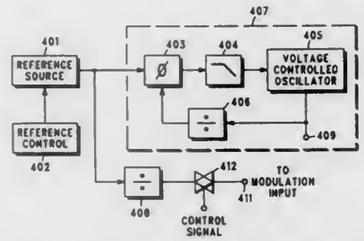
said coincidence circuit comparing said directly-coupled control signal and said broadcast control signal, and




means (15) in said alarm center, coupled to an output (14) of said coincidence circuit, for releasing warning broadcasts when said directly-coupled and broadcast control signal coincide.

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**5,046,128**
**FREQUENCY EQUALIZED SIMULCAST BROADCASTING SYSTEM AND METHOD**
**Richard L. Bennett, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**
**Filed Aug. 11, 1989, Ser. No. 392,496**
**Int. Cl.[5] H04B *7/005***
**U.S. Cl. 455—51** **4 Claims**




1. In a simulcast system having first and second remote means for transmitting information using a carrier frequency, a method of equalizing the carrier frequency for both the first and second remote means, comprising the steps of:

A) providing each of the first and second remote means with a frequency source;

B) generating, in each of the first and second remote means, a carrier signal and a modulation signal using the frequency source;

C) transmitting, from each of the first and second remote means, the carrier signal and the modulation signal as modulated on the carrier signal;

D) receiving, at a monitor site, the carrier signals from both of the first and second remote means;

E) recovering the modulation signals from the first and second remote means;

F) comparing the recovered modulation signal from the first remote means with a reference signal to provide a first difference signal;

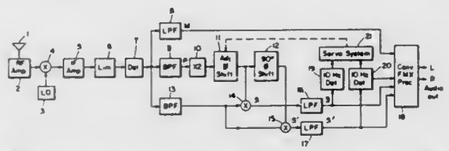
G) comparing the recovered modulation signal from the second remote means with the reference signal to provide a second difference signal;

H) comparing the first difference signal with the second difference signal to provide a third difference signal;

I) adjusting the frequency source in at least one of the first and second remote means as a function, at least in part, of the third difference signal.

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**5,046,129**
**REDUCING PHASE ERROR IN RECEIVED FM MULTIPLEX SIGNAL**
**William R. Short, Ashland, Mass., assignor to Bose Corporation, Framingham, Mass.**
**Filed Jan. 24, 1989, Ser. No. 301,162**
**Int. Cl.[5] H04B *1/10, 7/01;* H04H *5/00***
**U.S. Cl. 455—72** **11 Claims**




8. A method of reducing phase error which method includes the steps of receiving a transmitted signal comprising first and second bandwidth limited component signals modulating a single high frequency carrier in phase quadrature with said first component signal as originally transmitted, said transmitted signal including an identification signal,

processing the received transmitted signal to provide a reference signal subject to phase error,

combining the received transmitted component signals with said reference signal to provide first and second demodulated signals characteristic of said first and second component signals respectively,

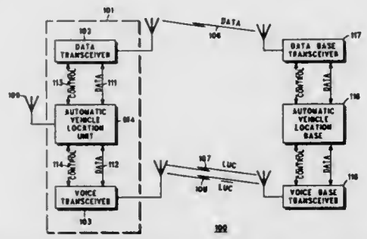
detecting first and second components of said identification signal in said first and second demodulated signals respectively,

processing the detected first and second components of the identification signal to provide a correction signal,

and altering the phase of the reference signal in accordance with the correction signal to reduce the phase error.

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**5,046,130**
**MULTIPLE COMMUNICATION PATH COMPATIBLE AUTOMATIC VEHICLE LOCATION UNIT**
**Scott M. Hall, Fort Worth, Tex., and Thomas R. Berger, Crystal Lake, Ill., assignors to Motorola, Inc., Schaumburg, Ill.**
**Filed Aug. 8, 1989, Ser. No. 391,204**
**Int. Cl.[5] H04B *1/44***
**U.S. Cl. 455—78** **8 Claims**




1. A location reporting device, for use with a voice resource communicating means operably coupled to the location reporting device for selectively communicating location of the device to a reporting site, and with a data resource communication means operably coupled to the location reporting device for selectively communicating the location of the device to a reporting site, such that both the voice resource communicating means and the data resource communicating means are able to communicate the location to the reporting site, the location reporting device comprising:

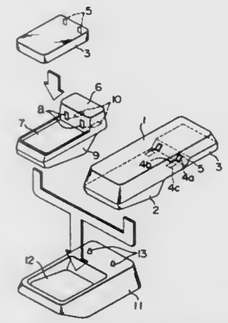
A) location determining means for determining at least an approximate geographic location of the device; and

B) control means for automatically causing the location of the device to be communicated to the reporting site by only one of the voice resource communicating means and the data resource communicating means as a function of at least one predetermined criteria.



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**5,046,131**
**PORTABLE RADIO TRANSCEIVER APPARATUS**
**Akira Takahashi; Ryoichi Kaiwa, and Naotomo Adachi, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Sep. 29, 1989, Ser. No. 414,299**
**Int. Cl.[5] H04B *1/38***
**U.S. Cl. 455—90** **2 Claims**



1. A portable radio transceiver apparatus comprising: p1 a radio transceiver having a fitting section and having incorporated therein a removable battery pack;

an adapter having a fitting section, said adapter for carrying thereon an auxiliary battery pack identical to said removable battery pack;

a holder having a holding section for alternately receiving and holding said fitting section of said radio transceiver and said fitting section of said adapter;

a charge means disposed in said holder, for charging said battery pack in said radio transceiver when said radio transceiver is set on said holder and for charging said auxiliary battery when said adapter carrying said auxiliary battery pack is set on said holder alternatively to said radio transceiver.

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**5,046,132**
**OPEN FIELD TEST SITE REFERENCE ANTENNA WITH INTEGRAL BATTERY POWERED SIGNAL GENERATOR**
**Ralph P. Trefney, Mariposa, Calif., assignor to C.K. Consultants, Inc., Mariposa, Calif.**
**Filed May 19, 1989, Ser. No. 354,642**
**Int. Cl.[5] H04B *1/04;* H04Q *11/12***
**U.S. Cl. 455—119** **16 Claims**

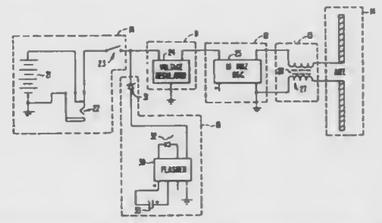
1. A circuit for emitting precise and unvarying electrical signals over a broadband range of frequencies, comprising:

an antenna element for radiating said signals over said broadband of frequencies;

a power supply subcircuit;

a voltage regulating subcircuit coupled to said power supply subcircuit;

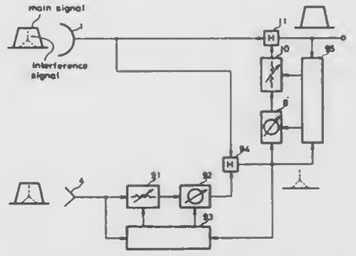
an oscillator subcircuit, having an output signal with a rise time faster than 10 nanoseconds to emit said broadband range of frequencies, coupled to said voltage regulating subcircuit; and




a balun network coupling said oscillator subcircuit to said antenna element.

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**5,046,133**
**INTERFERENCE CANCELLATION CIRCUIT**
**Kazuzi Watanabe; Masahiko Ito, and Hideaki Matue, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan**
**Filed Feb. 28, 1989, Ser. No. 317,246**
**Claims priority, application Japan, Feb. 29, 1988, 63-47221; Feb. 29, 1988, 63-47222; Feb. 29, 1988, 63-47223; Oct. 6, 1988, 63-253038**
**Int. Cl.[5] H04B *7/08***
**U.S. Cl. 455—138** **16 Claims**




1. An interference cancellation circuit comprising:

two receiver circuits which each respectively receive a signal, each received signal including a main signal component and an interference signal component;

a first adjustment means for adjusting a relative amplitude and phase of the received signals from respective outputs of the two receiver circuits;

a first combining means which combines adjusted received signals which have been adjusted in amplitude and phase by the first adjusting means;

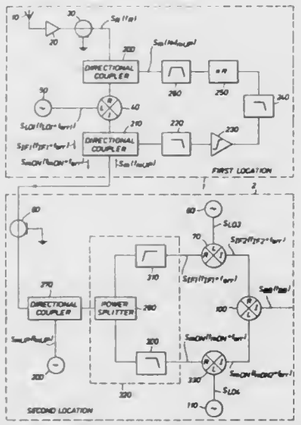
first control means for controlling said first adjusting means in a manner to make the interference signal component contained in the output from the first combining means larger than the main signal component;

a second adjusting means for adjusting amplitude and phase of outputs of said first combining means;

a second combining means for combining outputs from the second adjusting means with at least one of said received signals; and

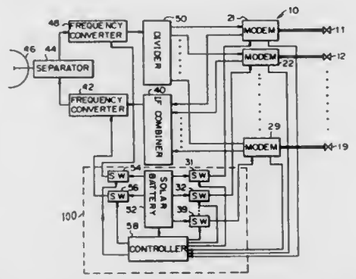
a second control means for controlling said second adjusting means in a manner to minimize the interference signal component in the output from said second combining means.

5,046,135
**METHOD AND APPARATUS FOR FREQUENCY STABILIZATION OF A DOWN CONVERTER**
G. Stephen Hatcher, Kent, Wash., assignor to John E. Chance & Associates, Lafayette, La.
Filed Nov. 30, 1989, Ser. No. 443,145
Int. Cl.[5] H04B *1/26*
U.S. Cl. 455—303 12 Claims




1. A receiver for converting a high frequency received signal including a band of signal frequencies to a lower band of signal frequencies comprising:
a first local oscillator which produces a first oscillator signal of a first oscillator frequency, said first oscillator frequency varying in frequency by an error frequency:
means for generating a marker signal having a marker frequency;
mixer means which is:
(a) responsive to said received signal and said first oscillator signal for generating a first intermediate band of signal frequencies superimposed thereon, and
(b) responsive to said marker signal and said first oscillator signal for generating a first intermediate marker signal of a first intermediate marker frequency;
base band mixer means responsive to a signal including said first intermediate signal band and to a signal including said first intermediate marker signal for intermediate marker signal for generating a base band signal, said base band signal having a frequency band definition which includes the difference between said frequency band of said received signal and said marker frequency of said marker signal, wherein said base band signal is substantially free of said error frequency of said first oscillator frequency, and
wherein said first intermediate band of signal frequencies and said first intermediate marker signal are generated on a single cable,
said receiver further comprising,
diplexer means for separating said signals on said single cable such that said first intermediate signal band is applied to a first signal path and said first intermediate marker signal is applied to a second signal path,
a second local oscillator which produces a second oscillator signal of a second oscillator frequency,
second mixer means which is responsive to said first intermediate signal band on said first signal path and to said second oscillator signal for generating a second intermediate signal band of frequencies superimposed thereon,
a third local oscillator which produces a third oscillator signal of a third oscillator frequency,
third mixer means which is responsive to said intermediate marker signal and to said third oscillator signal for generating a second intermediate marker signal of a second intermediate marker frequency, and
wherein said second intermediate signal band and said second intermediate marker signal are applied to said base band mixer means for generating said base band signal having a frequency definition which includes the difference between said frequency of said frequency band of said received signal and said marker frequency of said marker signal and in addition said base band signal frequency definition includes the difference between said frequency of said second oscillator signal and said frequency of said third oscillator signal.

5,046,136
**RADIO COMMUNICATION APPARATUS INCLUDING POWER SUPPLY DEVICE**
Tadatsugu Tokunaga, and Kazuo Tomimura, both of Tokyo, Japan, assignors to NEC Corporation, Japan
Continuation of Ser. No. 181,731, Apr. 14, 1988, abandoned.
This application Sep. 26, 1990, Ser. No. 590,588
Claims priority, application Japan, Apr. 15, 1987, 62-59903[U]
Int. Cl.[5] H04B *1/16*
U.S. Cl. 455—343 4 Claims

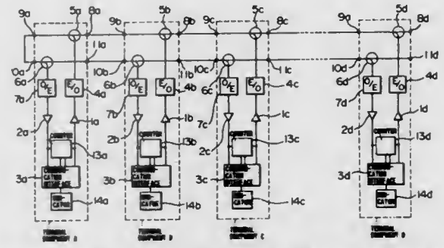



1. A radio communication apparatus including a power supply device, comprising:
a plurality of switch means each being associated with a respective one of a plurality of communication channels for selectively feeding power from a solar battery to portions of said apparatus;
means for detecting voltage levels of the solar battery; and
control means for turning on or off said switch means in a stepwise manner upon detection of respective predetermined voltage levels of said solar battery by said detecting means and on the basis of a predetermined priority order assigned to said communication channels.

5,046,137
**OPTICAL COMMUNICATION SYSTEM**
Akio Kurobe, Moriguchi; Hiromasa Nakatsu, Osaka; Masao Ikezaki; Nobuo Sugino, both of Neyagawa, and Yosihisa Mochida, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 23, 1990, Ser. No. 469,065
Claims priority, application Japan, Jan. 27, 1989, 1-017992
Int. Cl.[5] G02F *1/00;* H04J *1/00*
U.S. Cl. 359—136 3 Claims

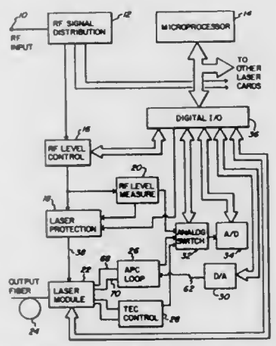
1. An optical communication system comprising a plurality of terminal equipments, each of said terminal equipments including: a communication interface section having a driver circuit for transmission of an electric signal and a receiver circuit for reception of an electric signal; and electro-optic converter section for modulating an output signal of said driver circuit and for converting it into an optical signal; an optical amplifier for amplifying an optical output signal of said electro-optic converter section with a suitable amplification factor based on a signal sent from said communication interface section to thereby make is possible to send the amplified onto a bus; and an opto-electric converter section for converting an optical signal received from said bus into an electric signal and for demodulating a frequency-modulated or phase-modulated signal so as to lead the demodulated signal to said receiver circuit; whereby communication between said terminal equipments is enabled to be performed through execution of: a first sequence in which each terminal equipment transmits a packet addressed to itself while increasing said amplification factor of said optical amplifier successively from a minimum





value to recognize the lowest limit of said amplification factor to enable said terminal equipment to receive said packet at the time of the starting of said system; a second sequence in which each terminal equipment transmits a packet addressed to each of the other terminal equipments to inform each of the other terminal equipments of the value of the amplification factor recognized in said first sequence; and a third sequence in which each terminal equipment selects the largest one of the values of the amplification factor received by said terminal equipment in said second sequence so that each terminal equipment establishes the amplification factor of its optical amplifier to be the selected largest value.

5,046,138
**SELF-ALIGNING ANALOG LASER TRANSMITTER**
David Grubb, III, Doylestown, Pa., assignor to General Instrument Corporation, New York, N.Y.
Filed Jun. 26, 1989, Ser. No. 371,336
Int. Cl.[5] H04B *10/04*
U.S. Cl. 359—188 16 Claims




1. Apparatus for aligning an analog laser transmitter to provide proper modulation of a signal for fiber optic communication, comprising:
a laser having a rated output power $P_{nom}$ and an input impedance R;
means for monitoring the magnitude of an analog communication signal coupled to modulate said laser;
means coupled to said laser for determining operational characteristics including the slope efficiency SE thereof;
means for deriving, from the determined operational characteristics, the level L required of said communication signal to properly modulate said laser for communication across an optical communication path; and
means for adjusting the magnitude of said communication signal to said level;
wherein said deriving means comprise:
means for calculating said level L for a desired modulation index M from the relationship:

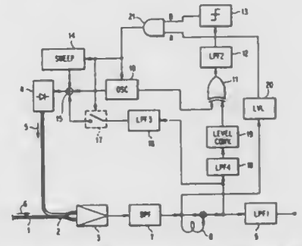
$$L=\tfrac{1}{8}*(P_{nom}/SE)^2*R*M^2.$$

5,046,139
**OPTICAL RECEIVER FOR SUBCARRIER FREQUENCY DIVISION MULTIPLEXING SIGNALS**
David A. Kahn, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Jun. 28, 1990, Ser. No. 545,446
Int. Cl.[5] H04B *10/00*
U.S. Cl. 359—124 8 Claims




1. An optical receiver for subcarrier frequency division multiplexing signals comprising:
an amplifier having an input and an output;
a photodiode, which is reversed biassed, coupled to the input of the amplifier; and
a transmission line of predetermined length coupled to the input of the amplifier, the transmission line thereby comprising an open circuit;
the predetermined length being selected in dependence upon a subcarrier frequency.

5,046,140
**AUTOMATIC OPTICAL FREQUENCY ACQUISITION AND TRACKING APPARATUS FOR OPTICAL COHERENT COMMUNICATION SYSTEM**
Shuntaro Yamazaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jul. 31, 1990, Ser. No. 560,665
Claims priority, application Japan, Jul. 31, 1989, 1-199612
Int. Cl.[5] H04B *9/00*
U.S. Cl. 359—191 6 Claims




1. An automatic optical frequency acquisition and tracking apparatus for optical coherent communication system, comprising:
local optical oscillation means for producing a local optical oscillation light;

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intermediate frequency band signal producing means responsive to an optical input signal and the local optical oscillation light to produce an intermediate frequency band signal;

frequency discrimination means for frequency-discriminating the intermediate frequency band signal;

switch means responsive to a control signal to allow a d.c. component of an output of said frequency discrimination means to pass through;

frequency sweep means responsive to the control signal to produce a frequency sweep signal for sweeping an oscillation frequency of said local optical oscillation means;

oscillation means responsive to the control signal to produce a frequency deviation signal for causing the oscillation frequency of said local optical oscillation means to be deviated periodically;

oscillation frequency control means responsive to outputs of said switch means, said frequency sweep means and said oscillation means for controlling said oscillation frequency of said local optical oscillation means; and

control means for phase-comparing frequency components of the outputs of said oscillation means and said frequency discrimination means which correspond to the frequency shift signal to determine whether or not the oscillation frequency of said local optical oscillation means is within a predetermined range and for producing the control signal causing said switch means to be closed to interrupt a frequency sweep operation of said frequency sweep means and to terminate the frequency shift signal to said oscillation means, when the oscillation frequency is within the predetermined range,

and causing said switch means to be opened to terminate the d.c. component, said frequency sweep means to sweep the frequency and said oscillation means to output the frequency shift signal, when the oscillation frequency is out of the predetermined frequency range.

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**5,046,141**

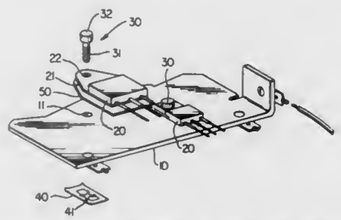
**LOW CONDUCTIVITY MOUNTING STUD AND A METHOD AND APPARATUS FOR FASTENING AN ELECTRONIC COMPONENT USING THE SAME**

**Richard E. Walker, Pinehurst, Tex., assignor to Compaq Computer Corporation, Houston, Tex.**

**Filed Feb. 10, 1988, Ser. No. 154,207**

**Int. Cl.[5] H01L** *23/40;* **F16B** *21/18, 19/00*

**U.S. Cl. 174—1** **9 Claims**



1. A mounting stud for attaching an electronic component to a base structure comprising:

a cylindrical shaft with a head at a first end thereof and a tapered portion at a second end thereof, the shaft, head and tapered portion being formed of partially stabilized zirconia.

3. An apparatus for fastening an electronic component to a base structure comprising:

a member formed of partially stabilized zirconia, said member having a first end and a second end and a cylindrical shaft therebetween, and a head at the first end thereof, the shaft adapted to be inserted through a first mounting hole in a portion of an electronic component, the second end of the shaft adapted to extend through a corresponding second mounting hole in a base structure; and

a press-on fastener engageable to the shaft, the fastener being biased to urge the head against the electronic component when the shaft is positioned through aligned mounting holes in the electronic component and the base structure with the head positioned against the electronic component.

7. A method for fastening a semiconductor device to a heat sink comprising the steps of:

positioning a low conductivity shaft through aligned holes in a semiconductor device and a heat sink, said low conductivity shaft formed of partially stabilized zirconia; and

engaging a press-on fastener to one end of the shaft, the fastener biased to urge the semiconductor device against the heat sink.

8. An apparatus for insulatively fastening an electronic component to a base structure comprising:

a tab member having a top side and an electrically conductive bottom side, said top side including a first section where an electronic component is mountable thereto and a second section having an opening therein;

a mica insulator attached to the bottom side of said tab member;

a low conductivity mounting stud formed of partially stabilized zirconia, said low conductivity mounting stud having a shaft with first and second ends and a head at said first end thereof, said shaft inserted through said opening in said tab member and said mica insulator and insertable through an opening in a base structure for mounting said electronic component to said base structure, said head positioned on said top side of said tab member and a first portion of said shaft extendable below a bottom side of said base structure; and

a press-on fastener engaged to said first portion of said shaft, said press-on fastener urging said head against said top side of said tab member.

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**5,046,142**

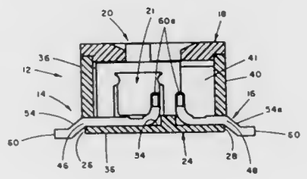
**SLIDE SWITCH**

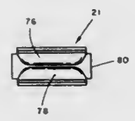
**Ralph Ipcinski, Hollis, N.H., assignor to C&K Components, Inc.**

**Continuation-in-part of Ser. No. 419,651, Oct. 11, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 552,331**

**Int. Cl.[5] H01H** *11/00, 15/00*

**U.S. Cl. 200—16 F** **3 Claims**





1. A slide switch comprising a case, a cover, a first fixed contact, a second fixed contact, and a movable contact assembly, the case having a base, the first and second fixed contacts each having an integral first free terminal end an integral second free terminal end, the first and second free terminal ends spaced from each other with the second free terminal ends positioned within the case in close proximity to the base and the first free terminal ends positioned outside of the case, the movable contact assembly comprising an actuator and a movable contact, each of the second free terminal ends in angular relation to the remaining portion of its respective fixed contact, in spaced, apposed, parallel relation to each other, the movable contact engaged with the actuator, and including first and second flexible arms in spaced opposed relation to each other, the first and second flexible arms engageable with the second free terminal ends, the case having side walls, the side walls having top edges, the cover engaged to the top edges.

2. A slide switch as set forth in claim 1 wherein the movable contact comprises a generally rectangular bottom portion having first and second long edges, a flexible first arm extending upward from the first long edge and a flexible second arm extending upward from the second long edge, the first and second arms in spaced opposed relation to each other, the first and second arms each having a free terminal end and each of the free terminal ends being bowed inwardly bringing the free terminal ends in close proximity to each other.



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**5,046,143**

**SWITCH ACTUATING EXTENSION**

**Roy A. Uher, 6444 W. 112th St., Worth, Ill. 60482**

**Filed Jun. 11, 1990, Ser. No. 535,576**

**Int. Cl.[5] H01H** *3/20*

**U.S. Cl. 200—331** **3 Claims**



1. An actuating extension for a switch that is complete in itself and installed in a structure, and having a movable element for actuating the switch that is exposed, when the switch is so installed, for manual manipulation for so actuating the switch, and the switch being fully actuatable without the use of this actuating extension,

wherein, the actuating extension is complete in itself, being made up of components separate and apart from the switch,

the actuating extension being made up of,

three components separate from each other, namely, a handle, a gripper, and a connector,

each the handle, the gripper, and the connector, being constituted by a piece cut from aggregate material of indeterminate length and uniform throughout its length,

the handle being elongated and having an upper end,

the gripper being tubular in shape of flexible, stretchable material, and adapted to have an upper end thereof telescopically fitted over said movable switch element and normally held thereon by friction, and having a transverse hole therethrough at a lower end, and

the connector having a straight front transverse element detachably extended through the hole in the gripper and a straight rear transverse element detachably extended into, and nearly but not entirely through, a hole in the upper end of the handle, the connector having a side element releasably engaging the handle, and the connector being thereby normally held in a fixed position on the handle and the gripper being swingable on said front transverse element and thereby on the axis of that element which is transverse to the longitudinal axis of the handle, that transverse axis being at a position spaced from the upper end of the handle.

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**5,046,144**

**METHOD AND FURNACE FOR THE PREPARATION OF A MELT FOR MINERAL WOOL PRODUCTION**

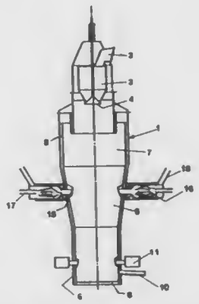
**Leif M. Jensen, Roskilde, Denmark, assignor to Rockwool International A/S, Hedehusene, Denmark**

**Filed Oct. 13, 1988, Ser. No. 257,083**

**Claims priority, application Denmark, Oct. 15, 1987, 5396/87**

**Int. Cl.[5] B23K** *9/00*

**U.S. Cl. 219—121.36** **10 Claims**



1. A method for the preparation of a melt for mineral wool production in a shaft furnace having an inlet for raw material at the top of the furnace and an outlet for discharging melt at the bottom thereof, comprising plasma heating a gas to form a high temperature gas and introducing said high temperature gas into a zone of the shaft furnace which is located adjacent to the bottom of the shaft furnace to melt material located in said zone and to preheat material located above said zone, generating a stream of hot gas by combustion of at least one gaseous hydrocarbon and introducing said stream of hot gas into the shaft furnace through at least one gas inlet located above the melting zone and at a level at which the temperature does not exceed 1250° C.

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**5,046,145**

**IMPROVED ARC REACTOR WITH ADVANCEABLE ELECTRODE**

**Michel G. Drouet, St-Bruno, Canada, assignor to Hydro-Quebec, Montreal, Canada**

**Filed Apr. 20, 1990, Ser. No. 512,166**

**Int. Cl.[5] B23K** *9/00*

**U.S. Cl. 219—121.36** **10 Claims**

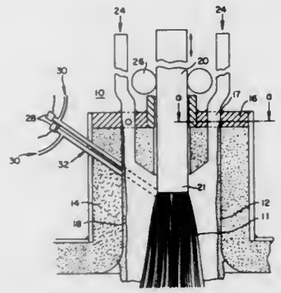
1. An arc reactor used in treating a powder material that is conductive at very high temperatures, comprising:

a vertical electrically-insulated sleeve having an upper end, a lower end, and a cylindrically-shaped internal wall;

an upper electrode which is made of a consumable material and which is coaxially mounted at the upper end of the sleeve;

a bottom electrode cooperating with the upper electrode, both electrodes being connected to an electric power source, the electric power source producing an arc column between the upper and bottom electrodes;

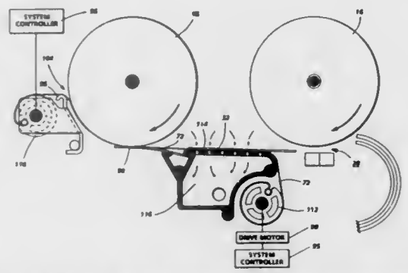
means for injecting a first gas tangentially into the sleeve, the first gas creating a vortex inside the sleeve;
means for introducing the powder material inside the sleeve near the upper end beside the upper electrode, the means for introducing said powder material forming a substantially uniform cylindrical curtain of particles falling down into the sleeve, the particles being centrifugally projected against the internal wall of the sleeve by the vortex, the particles entirely covering and shielding the internal wall while simultaneously being radiated by the arc column,



the particles being transformed into a molten form by the arc column;
a crucible which is positioned under the lower end of the sleeve and which collects the particles in molten form that drip down from the lower end of the sleeve, the particles in molten form being in conductive contact with the bottom electrode; and
positioning means for adjusting a vertical position of the upper electrode by sliding the upper electrode through the upper end of the sleeve.

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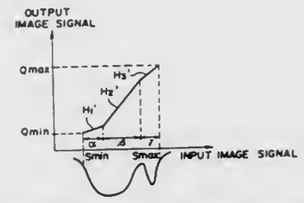
**5,046,146**
**FUSER SYSTEM UTILIZING A RECIPROCATING PRESSURE WEB**
**David A. Bartman, Rochester; Emilio J. Giuseppetti, Webster, and Donald L. Pease, Honeoye, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Nov. 5, 1990, Ser. No. 609,317**
**Int. Cl.[5] G03G *15/20***
**U.S. Cl. 219—216** **5 Claims**



1. A heat and pressure apparatus for fixing toner images to a copy substrate, said apparatus comprising:
a fuser roll;
a web member having an elongated surface area contacting said fuser roll to form a pressure fusing area therebetween through which a copy substrate carrying toner images is conveyed, said fusing area having an entrance nip area and an exit area,
means for biasing said web member into contact with said fuser roll surface along said fusing area, and reciprocating means for moving said web member in the same direction as the copy substrate movement, and coincident with the leading edge of said copy sheet as it enters said nip area.

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**5,046,147**
**RADIATION IMAGE PROCESSING METHOD**
**Takeshi Funahashi; Kazuo Shimura, and Nobuyoshi Nakajima, all of Kanagawa, Japan, assignors to Fujl Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Oct. 17, 1989, Ser. No. 422,483**
**Claims priority, application Japan, Oct. 17, 1988, 63-261174; Oct. 17, 1988, 63-261175**
**Int. Cl.[5] G01N *23/04***
**U.S. Cl. 250—327.2** **9 Claims**




1. A radiation image processing method for use in a radiation image read-out and reproducing system wherein a read-out operation is carried out in which a stimulable phosphor sheet, having a radiation image stored thereon, is exposed to stimulating rays, which cause the stimulable phosphor sheet to emit light in proportion to an amount of energy stored thereon during exposure to radiation, and wherein the emitted light is photoelectrically detected and a read-out image signal which represents the radiation image is thereby obtained, said read-out image signal being made up of a series of components and being used to reproduce the radiation image as a visible image, the radiation image processing method comprising the steps of:
i) calculating characteristic values from said read-out image signal, which are used during processing to extract only those image signal components which are related to a diagnosis or the like from said read-out image signal,
ii) carrying out image signal normalizing transformation processing on said read-out image signal, wherein said characteristic values control said transformation processing in order to correct a read-out gain and/or a scale factor, and
iii) using a visible image signal generated by said image signal normalizing transformation processing, which is carried out upon said read-out image signal, thereby reproducing the radiation image as a visible image.

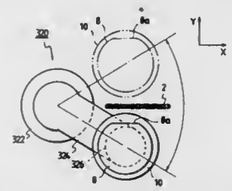
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**5,046,148**
**ION IMPLANTATION APPARATUS**
**Mamoru Nogami, and Nobuo Nagai, both of Kyoto, Japan, assignors to Nissin Electric Company, Limited, Kyoto, Japan**
**Filed May 14, 1990, Ser. No. 522,786**
**Claims priority, application Japan, May 15, 1989, 1-122450; Jun. 26, 1989, 1-163557**
**Int. Cl.[5] H01J *37/302, 37/317***
**U.S. Cl. 250—492.2** **3 Claims**

1. An ion implantation apparatus, comprising:
scanning means for electrically scanning an ion beam in and X direction;
a scanning power supply for supplying a scanning power to said scanning means;
a drive unit for mechanically scanning a target in a Y direction substantially perpendicular to said X direction;
a beam current measurement device disposed at one end section of a scanning area of said ion beam for measuring a beam current of said ion beam; and



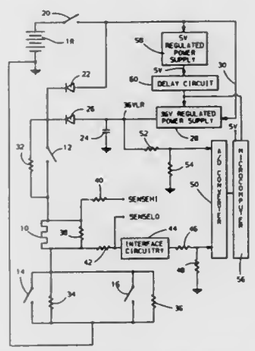
a control unit for computing a scanning speed of said target based on said beam current measured by said beam current measurement device and for controlling said drive unit so that said target is driven at the computer speed;
wherein said control unit outputs a trigger signal whenever the computation process of said scanning speed of said target is completed, and said scanning power supply out-



puts said scanning power for one reciprocative scanning operation of said ion beam at every time said scanning power supply receives said trigger signal from said control unit; and
wherein said drive unit comprises an arm for supporting a holder for holding said target, and a reversibly rotatable motor for rotating said arm so that said target is scanned in an arc form while said target faces to said ion beam.

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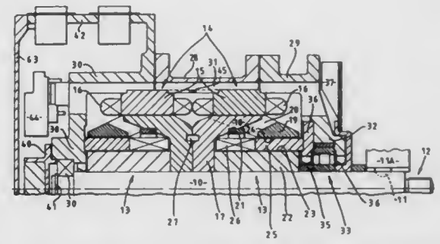
**5,046,149**
**INFLATABLE RESTRAINT FIRING CIRCUIT DIAGNOSTICS**
**Douglas A. Nunan, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.**
**Filed Dec. 8, 1989, Ser. No. 447,997**
**Int. Cl.[5] B60R *21/16***
**U.S. Cl. 307—10.1** **5 Claims**




1. A circuit for energizing the firing means of an inflatable restraint system for a vehicle, comprising a vehicle storage battery, a storage capacitor, power supply means, an ignition switch operable from an off position to an on position to connect said battery to said power supply means, said power supply means connected to said capacitor and adapted when enabled for charging said capacitor to a voltage greater than the voltage of said battery, impact sensor switch means actuable from a normal state to a firing state in the event of vehicle impact, circuit means connecting said switch means in series with said firing means and in parallel with said battery and said capacitor, computer means for monitoring the voltage applied to said firing means, and time delay means for enabling said power supply means a predetermined interval of time after closure of said ignition switch.

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**5,046,150**
**ALTERNATORS**
**Terence Rom, and Barrie C. Skinner, both of London, England, assignors to Lucas Industries public limited company, Birmingham, England**
**Filed Jul. 30, 1990, Ser. No. 559,323**
**Claims priority, application United Kingdom, Aug. 14, 1989, 8918430**
**Int. Cl.[5] H02K *23/50***
**U.S. Cl. 310—68 D** **6 Claims**



1. An alternator for mounting on an internal combustion engine comprising:
a pair of stator assemblies mounted in end to end relationship, each stator assembly carrying an output winding,
a rotary shaft extending through the stator assemblies and
a pair of rotors mounted on the shaft for producing in the stator assemblies rotating magnetic fields, respectively,
one end of said shaft being adapted to be driven by said engine, each rotor comprises:
a first rotor part having axially directed pole teeth formed integrally with a base portion located about the shaft,
a second rotor part having axially directed pole teeth which are alternately arranged with the first rotor part pole teeth, the second rotor part pole teeth being formed integrally with an annular member,
a non-magnetic means for securing said first and second rotor parts together,
an annular yoke member mounted about the shaft and being secured at one end to said base portion, said yoke member and said annular member defining spaced cylindrical surfaces,
an annular bridging member located with clearance between said cylindrical surfaces and an annular field winding carried by said bridging member, said rotors being mounted on said shaft so that the base portions are in back to back relationship, said bridging members and the associated field windings being mounted on respective end portions of the casing of the alternator wherein one of said yoke members is secured to the shaft and the respective base portion is secured to the yoke member, the other of said yoke members and respective base portions are secured together and said other yoke member and respective base portion is secured to the shaft by means of adhesive, the two rotors being located relative to each other by a dowel.

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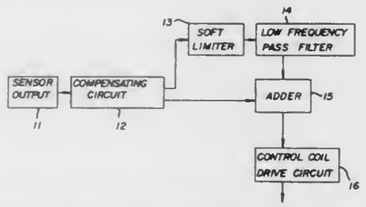
**5,046,151**
**MAGNETIC BEARING DEVICE**
**Akira Yamamura, Tokyo, Japan, assignor to Nippon Ferrofluidics Corporation, Tokyo, Japan**
**Continuation of Ser. No. 383,788, Jul. 24, 1989, abandoned. This application Jul. 9, 1990, Ser. No. 549,983**
**Int. Cl.[5] H02K *7/09***
**U.S. Cl. 310—90.5** **1 Claim**

1. A magnetic bearing device comprising: a control coil which supports a rotor in a vertical direction; and current control means which increases a control current in response to an increase of clearance between the control coil and the rotor and to a rotary frequency of the rotor, said current control

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means including gain control means which controls the control current with a larger gain when the clearance between the control coil and the rotor is less than a certain distance, and with a smaller gain when the clearance between the control coil and the rotor is more than the distance wherein said current control means further includes a frequency response means which suspends control with said gain control means in response to a high rotary frequency of the rotor, while controlling the control current with a substantially constant gain over the clearance between the control coil and the rotor that can be controlled.




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**5,046,152**

## IGNITION CIRCUIT FOR A GAS DISCHARGE LAMP

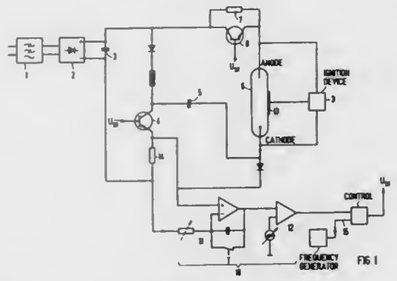
**Bernd Bartscher, Wiesbaden, Fed. Rep. of Germany, assignor to Heimann GmbH, Fed. Rep. of Germany**

**Filed May 21, 1990, Ser. No. 526,010**

**Claims priority, application Fed. Rep. of Germany, Sep. 20, 1989, 3931407**

**Int. Cl.[5] H05B** *39/04*

**U.S. Cl. 315—307** **4 Claims**




1. Ignition circuit for a gas discharge lamp having at least an anode and a cathode and operated from a main source of power, comprising:

first power source means for generating a heating current for the gas discharge lamp, the first power source connected to said main source of power and, via means for providing a voltage drop across which is connected a first means for switching, connected to the anode of the gas discharge lamp;

second power source means for ignition of the gas discharge lamp, the second power source means connected, via a second means for switching, to the cathode of the gas discharge lamp and connected to the main source of power; and

means for controlling for holding constant the current-time integral of current pulses through the gas discharge lamp during ignition, the means for controlling having at least one input for receiving a signal corresponding to current flowing through the gas discharge lamp and an output connected to said first and second means for switching.

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**5,046,153**

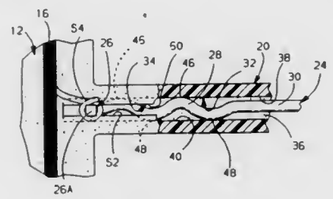
## COIL TERMINAL CONNECTION

**Richard L. Konopa, and James E. Thompson, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 10, 1990, Ser. No. 580,028**

**Int. Cl.[5] H01F** *15/10*

**U.S. Cl. 336—192** **8 Claims**




1. An electrical terminal connection to a coil of a coil winding assembly that has a coil spool formed of electrical insulating material that carries the coil comprising, a terminal supporting portion integral with said coil spool, said supporting portion having an axially extending so defined by a plurality of walls, a metallic terminal having a rippled portion and an electrical connector portion, said rippled portion having a sinuous shape and being defined by a plurality of axially spaced undulations, said undulations having alternately occurring outer surface portions that are respectively opposed and axially spaced, said rippled portion being disposed within said slot with said opposed and axially spaced outer surface portions engaging opposed walls of said slot to thereby oppose movement of said terminal in a direction axially of said slot, and means electrically connecting said coil to said connector portion.

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**5,046,154**

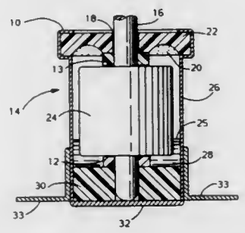
## ENCAPSULATED ARMATURE AND SHAFT ASSEMBLY

**Daniel C. MacManus, Owosso, Mich., assignor to Delco Electronics Corporation, Kokomo, Ind.**

**Filed Oct. 9, 1990, Ser. No. 594,470**

**Int. Cl.[5] G01R** *1/20*

**U.S. Cl. 324—146** **7 Claims**



1. An improved encapsulated armature and shaft assembly comprising:

a shaft with an armature capable of being magnetically charged to form a permanent magnet mounted thereon near one end of the shaft;

a first bearing surrounding said one end of the shaft within which the shaft can rotate;

a second bearing, surrounding a portion of the shaft opposite the armature from said one end, within which the shaft can rotate;

an outer shell constructed of magnetically permeable material defining a cylindrical cavity with a closed end and an open end, the first bearing mounted within the cavity at the closed end, the open end sealed around the second bearing, holding the second bearing in the open end and forming a substantially fluid impermeable capsule, the shaft mounted in the bearings so that the armature is freely rotatable within the cavity in response to fluctuating magnetic fields applied to the capsule, the outer shell having an outer surface being within a distance of the armature allowing the armature to be charged to become the permanent magnet while it is within the capsule from a strong magnetic field created outside of the capsule.



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**5,046,155**

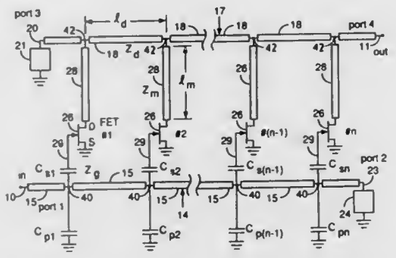
## HIGHLY DIRECTIVE, BROADBAND, BIDIRECTIONAL DISTRIBUTED AMPLIFIER

**James B. Beyer, Madison, and Joseph W. Byrne, Waukesha, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Filed Apr. 6, 1990, Ser. No. 505,377**

**Int. Cl.[5] H03F** *3/60*

**U.S. Cl. 330—54** **8 Claims**




1. A highly directive distributed amplifier comprising:

(a) an input line comprised of a series of artificial transmission line elements connected together at nodes;

(b) an output line comprised of a series of artificial transmission line elements connected together at nodes;

(c) a plurality of FETs connected in a common source configuration between the nodes on the input and output lines;

(d) means for binomially scaling the effective transconductances of the FETs so that the effective transconductance of the ith FET is proportional to a coefficient $c_i^N$ determined in accordance with the expression

$$C_i^N = \frac{N!}{(N-i)!i!}$$

where N is the total number of FETs.

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**5,046,156**

## TEMPERATURE SWITCH WITH A BIMETALLIC SWITCH MECHANISM

**Peter Hofsäss, Strietweg 45, D-7530 Pforzheim, Fed. Rep. of Germany**

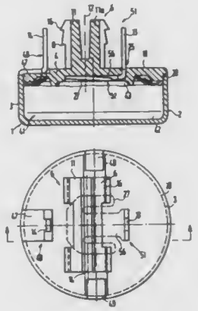
**Filed Jul. 20, 1990, Ser. No. 554,921**

**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 8908999[U]; Dec. 23, 1989, 8915123[U]**

**Int. Cl.[5] H01H** *37/04, 37/52*

**U.S. Cl. 337—380** **20 Claims**

1. Temperature switch for an electric motor, the temperature switch comprising a bimetallic switch means accommodated in an inner casing, an outer casing including an insulating cover part, a shoulder formed in one piece with said cover part, undercuts provided in said shoulder, connecting contacts positioned adjacent to said shoulder, and a spring means for resiliently engaging the cover part and the inner casing,



wherein the spring means is constructed in one piece with one of said connecting contacts.

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**5,046,157**

## TIME CONTROL DEVICE FOR APPLIANCES

**Stephen W. Smith, 108 Pinecroft Dr., Raleigh, N.C. 27609; Leland W. Poole, 4600 Yates Pond Rd., Raleigh, N.C. 27606, and William C. Stewart, 7616 Elliott Dr., Raleigh, N.C. 27612**

**Filed Feb. 3, 1988, Ser. No. 152,032**

**Int. Cl.[5] G08B** *1/00*

**U.S. Cl. 340—309.15** **6 Claims**




1. A device for allowing a parent to control the use of an appliance by one or more children comprising:

(a) a plurality of child user cards, each encoded with a different user identification code;

(b) control means responsive to input of a user identification code from a valid user card for actuating the controlled appliance, the control means including:

1) a memory device for storing the amount of actual user time allotted individually to each user;

2) card reading means for allowing a user to input his user identification code;

3) means for actuating the controlled appliance when amount of actual user time allotted to such user is greater than zero;

4) tabulating means for automatically decrementing the amount of actual user time allotted to the then current user once the controlled appliance is actuated until the appliance is deactuated;

5) means for deactuating the controlled appliance when the amount of actual user time allotted to the then current user reaches zero; and

6) programming means for allowing an administrator to manually increment or decrement the amount of actual user time previously allotted to any user to positively reinforce desired behavior and to discourage undesired behavior.

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**5,046,158**

## OPTICAL SCANNING APPARATUS WITH CONTROL CIRCUIT FOR OPTIMIZING THE OPERATING RANGE OF AN A/D CONVERTER

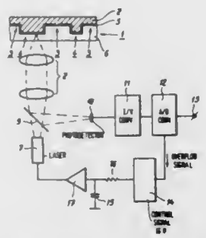
**Robertus W. C. Groen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 8, 1990, Ser. No. 491,383**

**Claims priority, application Netherlands, Aug. 14, 1989, 8902058**

**Int. Cl.**[5] **H03M** *1/12*

**U.S. Cl. 341—137** **8 Claims**



1. Optical scanning apparatus comprising a radiation source, an optical system for projecting radiation produced by said source on an optical record carrier, and at least one radiation-sensitive detector for receiving reflected radiation from said record carrier and producing an analog signal proportional to the detected radiation intensity; characterized in that said apparatus further comprises a control circuit which includes:

an A/D converter for receiving said analog signal and converting it into a digital output signal of corresponding value, said converter having a conversion range such that a maximum value of the digital output signal corresponds to a predetermined value of said analog signal, said converter further producing a binary overflow signal which signifies whether said analog signal is below or above said predetermined value thereof; and

a control signal generator connected to said converter to receive said binary overflow signal and produce a feedback control signal which increases or decreases depending on the value of said overflow signal, said control signal being returned to one of said radiation source and said converter so as to cause the maximum value of said analog signal to be maintained substantially at said predetermined value thereof which corresponds to said conversion range of said converter.

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**5,046,159**

## IMAGE TRANSMITTING ELEMENT AND PROCESS FOR PRODUCING SAME

**Kenjiro Hamanaka, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan**

**Filed Nov. 13, 1990, Ser. No. 611,601**

**Claims priority, application Japan, Nov. 24, 1989, 1-305893**

**Int. Cl.**[5] **G03B** *27/00;* **H01J** *40/14;* **H04N** *3/14, 5/335*

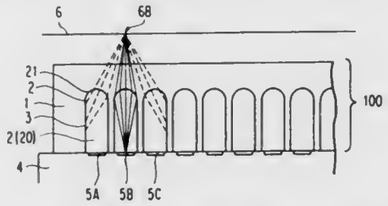
**U.S. Cl. 355—001** **2 Claims**

1. An image transmitting element comprising:

a transparent substrate;

photo-transmissible holes one-dimensionally or two-dimensionally formed as an array in said transparent substrate, each of said holes having one end opened at one surface of said substrate and the other end made blind and provided with a substantially spherical top end within a thickness of said substrate;

a photo-absorptive surface formed on at least a part of an inner surface of each of said photo-transmissible holes except the surface of said spherical top end thereof; and



a transparent material with which said photo-transmissible holes are filled, said transparent material having a refractive index higher than that of said substrate.

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**5,046,160**

## MASTERSLICE INTEGRATED CIRCUIT DEVICE HAVING AN IMPROVED WIRING STRUCTURE

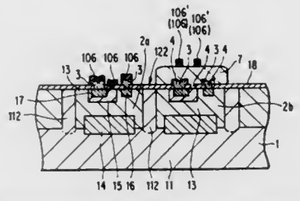
**Kazuo Adachi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jul. 2, 1990, Ser. No. 547,000**

**Claims priority, application Japan, Jun. 30, 1989, 1-169071**

**Int. Cl.**[5] **H01L** *21/94, 21/78*

**U.S. Cl. 357—68** **10 Claims**



1. A masterslice integrated circuit device comprising a masterslice substrate, an insulating layer pattern and a wiring structure,

said masterslice substrate including a plurality of basic cells formed on a semiconductor substrate and arranged in a matrix form, said plurality of basic cells being divided into a first group and a second group, each of said basic cells having a quadrangular shape, said basic cells belonging to said first group being connected to said wiring structure to form a prescribed circuit in said device, and each of said basic cells belonging to said second group being electrically isolated from other basic cells belonging to said first and second groups so that said prescribed circuit in said device is constructed without using said basic cells belonging to said second group,

said insulating layer pattern including a plurality of quadrangular sections each having substantially the same size as said quadrangular shape of said basic cells, said quadrangular sections of said insulating layer pattern being exclusively formed on said basic cells of said second group to substantially cover said basic cells belonging to said second group, respectively, and said quadrangular sections of said insulating layer pattern being absent on said basic cells belonging to said first group so that said basic cells belonging to said first group are free from said insulating layer pattern thereon, and

said wiring structure being connected to said basic cells belonging to said first group and extending on said insulating layer pattern above said basic cells belonging to said second group.



**5,046,161**

## FLIP CHIP TYPE SEMICONDUCTOR DEVICE

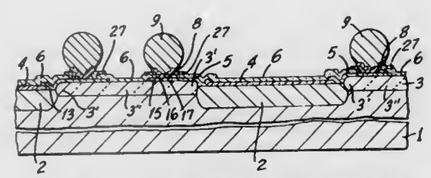
**Norimasa Takada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Feb. 22, 1989, Ser. No. 314,166**

**Claims priority, application Japan, Feb. 23, 1988, 63-41180**

**Int. Cl.**[5] **H01L** *21/66, 29/34*

**U.S. Cl. 357—69** **10 Claims**



1. A flip chip type semiconductor device comprising

a semiconductor substrate including a central portion and a peripheral portion and having a major surface on said central portion and said peripheral portion;

an insulating layer selectively formed on said major surface of said central portion and entirely covering said major surface of the peripheral portion;

circuit elements formed on said central portion;

electrode pads formed on said insulating layer provided on said peripheral portion, said electrode pads being electrically connected to said circuit elements;

a passivation layer of inorganic material formed over the entire surface of said central portion and the entire surface of said peripheral portion so as to cover said circuit elements and said insulating layer;

said passivation layer being formed with openings provided over said electrode pads so as to expose areas of said electrode pads of substantially rectangular configuration;

polyimide films formed in said openings and only on such parts of said passivation layer which are positioned near said openings and surround said openings, so that said central portion of said substrate remains free of said polyimide films;

said polyimide films being formed with windows provided within said openings of said passivation layer so as to expose areas of said electrode pads of a substantially circular configuration;

barrier metal films formed in said windows of said polyimide films, respectively; and

solder bump terminals formed on and electrically connected to said areas of substantially circular configuration of said electrode pads via said barrier metal films, respectively, whereby degradation of circuit characteristics in the semiconductor device is avoided.

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**5,046,162**

## IMAGE INPUT DEVICE HAVING COLOR FILTERS AND FILTER POSITION DETECTOR

**Yujiro Ishikawa, Toyata, and Makoto Suzuki, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Aug. 31, 1989, Ser. No. 401,122**

**Claims priority, application Japan, Aug. 31, 1988, 63-217490; Oct. 31, 1988, 63-143894[U]; Oct. 31, 1988, 63-274773; Nov. 14, 1988, 63-287212**

**Int. Cl.**[5] **H04N** *9/04*

**U.S. Cl. 358—42** **6 Claims**

1. An image input device for inputting a light image of an object, comprising:

filter means comprising at least two color filter elements for receiving the light image and separating the light image into color light components corresponding to the color filter elements;

image pickup means having a photosensitive portion for separately receiving the color light components and converting the color light components to electrical signals, said filter means being movably disposed with respect to said image pickup means;

filter position detecting means for detecting a position of each of the color filter elements and outputting a position signal representative of the position of each of the color filter elements;



filter drive means for moving said filter means so that the color filter elements selectively receive the light image;

comparison means for comparing the position signal with a reference signal and outputting a comparison signal; and

control means responsive to the comparison signal for controlling the filter drive means so that the position signal and the reference signal are in synchronism with each other.

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**5,046,163**

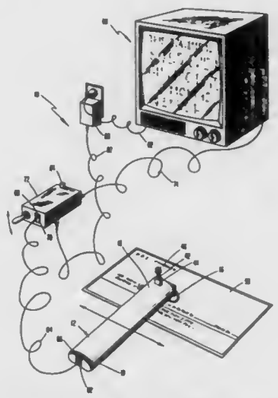
## HAND HELD INTERNALLY ILLUMINATED VIDEO READING AID

**Ronald A. Priest, 8046 Bayhaven Dr., Seminole, Fla. 34646, and Orion T. Ayer, Jr., 200 Driftwood La. SE., St. Petersburg, Fla. 33705**

**Filed Mar. 16, 1990, Ser. No. 494,653**

**Int. Cl.**[5] **H04N** *7/00*

**U.S. Cl. 358—94** **7 Claims**



1. A low vision reading aid, comprising:

an elongate, narrow housing having a leading end and a trailing end;

an elongate narrow camera disposed within said housing;

said camera having a pin hole lens;

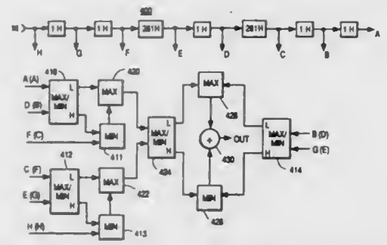
a small opening being formed in said housing near said leading end thereof;

said small opening being in registration with said pin hole lens to admit light thereinto;

a low intensity light source disposed adjacent said small opening;
said light source providing continuous illumination when activated and being mounted to said housing in closely spaced relation to said small opening;
an elongate flexible support plate having a leading end and a trailing end;
said support plate being positioned in underlying relation to said housing;
the trailing end only of said support plate being secured to the trailing end of said housing;
a transversely disposed wheel means that facilities lateral displacement of said housing being rotatably mounted to a leading end of said support plate;
said housing and said support plate having a plurality of positions of functional adjustment therebetween, including a first position where said housing and support plate abut one another along their respective extents and including plural positions of angular adjustment where the respective leading ends only of said housing and support plate are vertically spaced apart from one another;
an opening formed in said support plate leading end, said opening having a size sufficient to accommodate said light source when said housing and support plate abut one another along their respective extents and said opening having a size also sufficient to admit light into the small opening in the housing;
angular adjustment means for selectively adjusting the angular orientation between the housing and the support plate to thereby adjust the field of view of said camera; and
means for transmitting video data from said camera to a remote monitor.

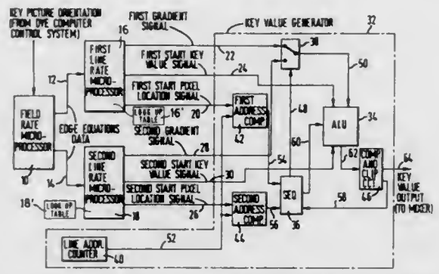
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**5,046,164**
**INTERSTITIAL LINE GENERATOR FOR AN INTERLACE TO NON-INTERLACE SCAN CONVERTER**
**Robert N. Hurst, Jr., Hopewell, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.**
**Filed Sep. 18, 1989, Ser. No. 408,969**
**Int. Cl.[5] H04N** *7/01*
**U.S. Cl. 358—140** **4 Claims**



1. Video signal processing apparatus for increasing the number of raster scan lines of a displayed image including an interstitial line generator comprising:
a source of video signal;
means coupled to said source for producing a plurality of relatively delayed signals representing horizontal lines disposed temporally and spatially about the location of an interstitial line;
means responsive to said plurality of relatively delayed signals for excluding the relatively positive and relatively negative extrema of said plurality of relatively delayed signals; and
means for combining the remaining of said relatively delayed signals in predetermined proportions to generate said interstitial line of signal.

**5,046,165**
**CONTROLLING THE COMBINING OF VIDEO SIGNALS**
**James B. Pearman, Basingstoke, and David J. Hedley, Winchester, both of England, assignors to Sony Corporation, Tokyo, Japan**
**Filed Jan. 24, 1990, Ser. No. 469,367**
**Claims priority, application United Kingdom, Apr. 7, 1989, 8907876**
**Int. Cl.[5] H04N** *5/262, 9/74*
**U.S. Cl. 358—183** **17 Claims**



1. Apparatus for controlling the combining of video signals, so as to produce a composite picture in which a first picture represented by a first video signal is inserted into a second picture represented by a second video signal with such composite picture having a plurality of horizontal scanning lines, and each of said scanning lines including a row of pixels, said apparatus comprising:
generating means for generating edge data defining respective edges of a polygon which correspond to edges of said first picture;
line rate microprocessor means responsive to said edge data to generate information for each horizontal scanning line of said composite picture in which the row of pixels corresponding to the respective scanning line is intersected by edges of said first picture, said information representing horizontal locations of first and second start pixels, said first and second start pixels being pixels in which first and second edges, respectively, of said first picture start to intersect said row of pixels corresponding to said respective scanning line; gradients of said first and second edges; and a start key value for each of said first and second start pixels which is equal to a proportion of said first picture to said composite picture contained in said first and second start pixels, respectively; and
key value generator means responsive to said information for each horizontal scanning line of said composite picture to generate a respective key value for each successive pixel in the respective row of pixels in which the key values for pixels preceding said first start pixel are zero, said key values for pixels following said first start pixel are incremented by an amount per pixel determined by said gradient of said first edge until the key value reaches a value of unity; and said key values for pixels following said second start pixel are decremented by an amount per pixel determined by said gradient of said second edge until the key value reaches zero.

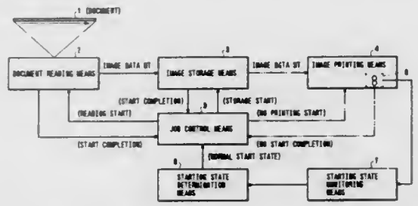
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**5,046,166**
**DIGITAL ELECTROPHOTOGRAPHIC COPYING APPARATUS**
**Hiroshi Takayanagi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan**
**Filed Oct. 10, 1990, Ser. No. 595,619**
**Int. Cl.[5] H04N** *1/29, 1/21*
**U.S. Cl. 358—300** **8 Claims**

1. A digital electrophotographic copying apparatus, comprising:



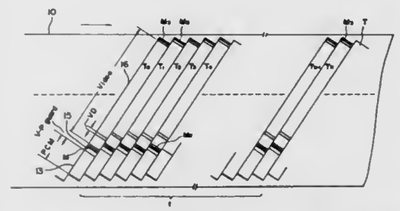
document reading means having a start-up process for reading documents and producing corresponding image data;
image storage means having a start-up process for temporarily storing the image data obtained from said document reading means;
image printing means having a start-up process for printing documents copies according to an electrophotographic process based on the image data stored in said image storage means;



job control means for starting document reading by said document reading means and image data storing by said image storage means upon switching electrical power to the digital electrophotographic copying apparatus and upon an indication of completion of the document reading means start-up process and the image storage means start-up process and before receiving an indication of completion for the image printing means start-up process.

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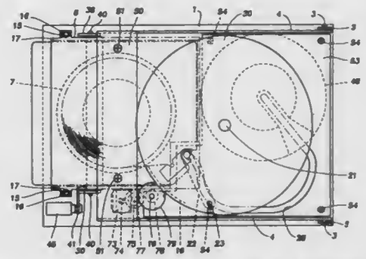
**5,046,167**
**VIDEO TAPE RECORDER WITH A VIDEO PRINTING CONTROLLER**
**Kenji Nakano, and Kazuyuki Ogawa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**
**Continuation of Ser. No. 238,092, Aug. 29, 1988, abandoned. This application Mar. 8, 1991, Ser. No. 667,235**
**Claims priority, application Japan, Sep. 14, 1987, 62-228438; Sep. 14, 1987, 62-228439**
**Int. Cl.[5] H04N** *5/782*
**U.S. Cl. 358—335** **8 Claims**



1. A video tape recorder of the type in which a digitized audio signal is recorded together with a video signal in a video signal recording area on skewed tracks on a magnetic tape, incorporating a video printing controller for use with an external monitor and a video printer of the type having its own system controller, comprising:
a rotary magnetic head for scanning the skewed tracks formed on the magnetic tape to reproduce information signals recorded on the skewed tracks;
marker signal detecting means connected to the rotary magnetic head for detecting marker signals coded in digital signals and recorded by said rotary magnetic head in an area between a PCM data area and the video signal recording area on each of a selected plurality of successive, skewed tracks formed on the magnetic tape carrying information signals to be printed, during real time playback of the information signals, and outputting a corresponding marker signal detection signal;
system control means connected to the marker signal detecting means, for generating a print control signal to the video printer upon the receipt of the marker signal detection signal;
bilateral bus lines for connecting the system control means of the video tape recorder with the system controller of the video printer to exchange control signals therebetween and to give printer control signals to the video printer; and
a video cable for outputting reproduced video signals to the video printer and an external monitor.

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**5,046,168**
**APPARATUS FOR CONTROLLING THE LEADER BLOCK DRIVE IN A DEVICE**
**Mitsuhiro Ohsaki, Kodaira, Japan, assignor to Nakamichi Corporation, Kodaira, Japan**
**Filed Nov. 6, 1989, Ser. No. 432,533**
**Claims priority, application Japan, Nov. 10, 1988, 63-146989[U]**
**Int. Cl.[5] G11B** *15/32*
**U.S. Cl. 360—95** **5 Claims**



1. A magnetic recording and reproducing apparatus comprising a leader block drawing mechanism for drawing a leader block provided at a leading end of a magnetic tape from a tape cartridge having a single reel provided therein and containing said magnetic tape, said leader block drawing mechanism characterized by:
a cartridge holder to hold said tape cartridge and movable between a cartridge loading/unloading position and an operative position relative to a chassis of said apparatus;
an engagement portion to engage with said leader block, said engagement portion having first and second ends;
leader block drive means provided on said chassis to drive said first end of said engagement portion along a predetermined guide path;
and prevention means provided in said cartridge holder to engage said second end of said engagement portion so as to prevent movement of said leader block drive means at said loading/unloading position of said cartrige holder and to allow movement of said leader block drive means at said operative position of said cartridge holder.

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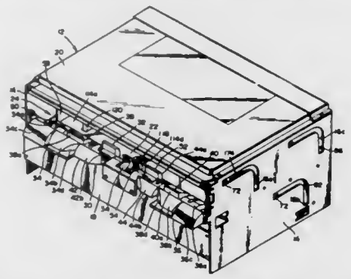
**5,046,169**
**MAGNETIC TAPE CASSETTE LOADING AND GUIDING SYSTEM**
**Yukihiko Tsujino, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**
**Filed Dec. 12, 1989, Ser. No. 448,991**
**Claims priority, application Japan, Dec. 20, 1988, 63-321418; Dec. 20, 1988, 63-321419**
**Int. Cl.[5] G11B** *15/675*
**U.S. Cl. 360—96.5** **10 Claims**

1. A cassette loading system for a recording and/or reproducing apparatus, comprising:
a loading system body defining a space; and
cassette holding means for receiving and holding a cassette therein, said cassette holding means including a first cas-

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sette holder means for moving within said space defined by the loading system body in horizontal and vertical directions respectively between an ejected position for a cassette and a loaded position, and a second cassette holder means for supporting said cassette therein and being supported on said first cassette holder for movement thereon in a horizontal direction, wherein said first cas-



sette holder operates to move a cassette vertically between the loaded position and then horizontally to the ejected position in which said cassette can be removed, and said second cassette holder means moves relative to said first cassette holder means, said first and said second cassette holder means both moving from the position horizontally, said first cassette holder means moving vertically to the loaded position.

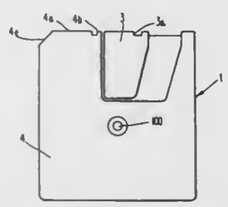
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**5,046,170**

**INFORMATION CARRIER DISK HOUSING HAVING INCORRECT INSERTION PREVENTION**

**Yutaka Oshima, Yokohama; Hiroshi Nishizawa, Hanamaki, and Manabu Murata, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 26, 1989, Ser. No. 412,759**
**Claims priority, application Japan, Sep. 29, 1988, 63-244924**
**Int. Cl.[5] G11B** *23/03, 5/016*
**U.S. Cl. 360—133** **8 Claims**



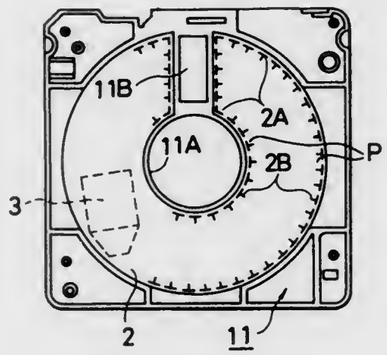
1. An information carrier disk housing comprising: a cassette having a first end and a second end, said cassette rotatably housing a recording medium which allows storage of playback signals, a shutter which is slidably mounted on said first end of the cassette, the shutter opening and closing to allow a recording or playback head to contact the recording medium, said shutter including a first retainer means for contacting a pin of a swingable arm of a cassette holder to cause the shutter to slide open as the cassette is inserted into said cassette holder, and second retainer means formed on the cassette for preventing the completion of an incorrect insertion of said information carrier disk in said holder by contacting said pin.

**5,046,171**

**WELDING PATTERN FOR A CLEANER LINER IN A MAGNETIC DISK CARTRIDGE**

**Kazuhiko Yamashita, and Tadashi Saito, both of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan**

**Filed Jan. 3, 1990, Ser. No. 460,375**
**Claims priority, application Japan, Jan. 19, 1989, 1-4951; Mar. 29, 1989, 1-36190**
**Int. Cl.[5] G11B** *23/03*
**U.S. Cl. 360—133** **22 Claims**




1. A magnetic disk cartridge comprising:
a case, said case being formed from a cover member and a bottom member, each of said members having an interior surface and a substantially rectangular transducer access opening;
a magnetic disk accommodated within said case, said disk being o-shaped and having a first and a second planar surface, an outer peripheral edge, an inner peripheral edge, at least one of said planar surfaces having an effective recording area extending from inward of said outer peripheral edge to outward of said inner peripheral edge; and
a first and a second cleaner liner, said first liner being located between said first planar surface and said interior surface of said cover member, said second liner being located between said second planar surface and said interior surface of said bottom member, each of said liners having an exterior circumferential edge, interior circumferential edge, and a pair of intercommunicating edges, each of said intercommunicating edges connecting said exterior circumferential edge to said interior circumferential edge to form an opening generally corresponding to the dimensions of said rectangular transducer access opening, and said first and second liners being welded to said interior surface of said cover member and said bottom member, respectively, and being adapted to clean the corresponding planar surface of said magnetic disk, each of said liners being welded by a first welding pattern including a discontinuous line extending substantially parallel to and inwardly adjacent to said exterior circumferential edge and outwardly adjacent to said interior circumferential edge and at least one straight line intersecting with each portion of said discontinuous line, the length of each said straight line being limited such that each said straight line does not extend to overlay said effective recording area of said disk, and being welded by a second welding pattern, said second welding pattern being located along each of said intercommunicating edges.

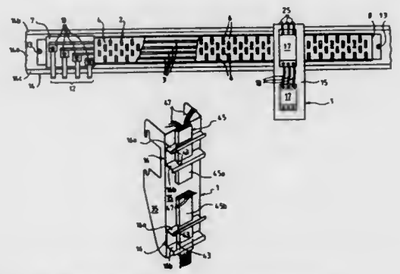


**5,046,172**

**REMOVABLE SUPPORT PLATE AND ELECTRIC APPARATUS FOR A POWER DISTRIBUTOR DEVICE**

**Alain Moreux; Daniel Nourry, both of Dijon, and Jean-Pierre Thierry, Couternon, all of France, assignors to Telemecanique, France**

**Filed Jul. 6, 1990, Ser. No. 548,713**
**Claims priority, application France, Jul. 6, 1990, 89 09095**
**Int. Cl.[5] H02B** *5/00*
**U.S. Cl. 361—332** **6 Claims**



1. Power distributor device which comprises:
(i) a set of horizontal bars;
(ii) an insulating elongate case housing said bars and provided with a plurality of orifices located opposite said bars;
(iii) a profiled rail comprising a web and first and second lateral flanges, said web and said flanges delimiting a central space wherein said elongate case is fixedly engaged;
(iv) a removable support element having two vertical parallel flanges connected by a flat vertical bottom, said bottom having a front face and a rear face bearing at least an electrical apparatus and said parallel flanges being provided with first and second notches for removable engagement of said first and second flanges of said profiled rail by engaging said first notches on said first flange and by effecting thereafter a transversal rocking motion of said support element so as to engage said second notcher and said second flange;
(v) a removable electrical connector mounted with a clearance on said front face of the said bottom, said connector comprising:
removable contact members pluggable on said bars through said orifices of said case and electrically connected to said apparatus;
means for guiding said contact members in a direction perpendicular to said bars so as to allow plugging and unplugging of said contact members on said bars, during the rocking motion.

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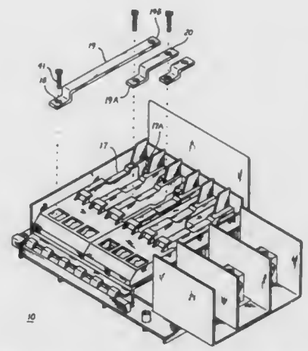
**5,046,173**

**SINGLE BRANCH CIRCUIT BREAKER SUPPORT**

**Robert A. Wall, Jr., Salisbury, N.C., assignor to General Electric Company, New York, N.Y.**

**Filed Oct. 18, 1990, Ser. No. 599,608**
**Int. Cl.[5] H02B** *1/04*
**U.S. Cl. 361—353** **10 Claims**

1. A molded case circuit breaker insulative support comprising in combination:
a planar plastic bottom having a pair of upstanding rails extending along opposing sides thereon;
an angulated plastic insulative barrier having an upstanding back part and a planar bottom part extending perpendicular to said upstanding back part attached to said plastic bottom, said planar bottom part including a plurality of rectangular apertures providing access to a plurality of Z-shaped load straps;
a plurality of electrical bus conductors attached to said plastic bottom; and
a plastic base attached to said plastic bottom and having a plurality of apertures, said plastic base extending across said upstanding rails and adapted to provide support to a plurality of circuit breakers;



said Z-shaped load straps being attached to said bus conductors and adapted to provide electrical and mechanical connection to circuit breakers, said Z-shaped load straps being accessible through said apertures in said plastic base.

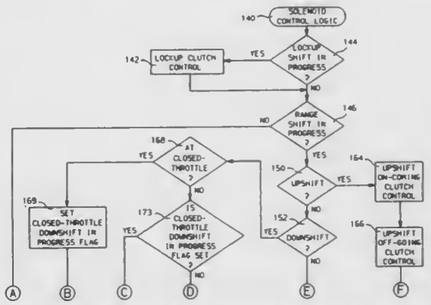
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**5,046,174**

**METHOD OF CLUTCH-TO-CLUTCH CLOSED THROTTLE DOWNSHIFT IN AN AUTOMATIC TRANSMISSION**

**Carl A. Lentz, Mooresville, Ind., and John A. Hibner, Coldwater, Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 11, 1990, Ser. No. 464,054**
**Int. Cl.[5] B60K** *41/02*
**U.S. Cl. 364—424.1** **7 Claims**




1. In a vehicular automatic transmission having an input and an output, a turbine connected to the input to couple driving torque thereto, in which a closed throttle downshift from a first transmission speed ratio to a second transmission speed ratio is carried out through concurrent disengagement of an off-going fluid pressure operated torque transmitting device associated with the first of such speed ratios and engagement of an on-coming fluid pressure operated torque transmitting device associated with the second of such speed ratios, and further having turbine and output speed sensing means, a method of electronically controlling the torque transmitting devices to effect a shifting under closed throttle conditions from the first speed ratio to the second speed ratio comprising the steps of:

commanding a fill pressure on the on-coming torque transmitting device for a fill time for filling the device,
commanding a predetermined pressure on the off-going torque transmitting device for a time less than the fill time and then exhausting the off-going device,
detecting turbine speed pullup due to initial slippage of the off-going device,
initiating a closed-loop control period of the on-coming torque transmitting device when turbine speed pullup is detected,
during the closed-loop control period, establishing a slip profile, determining the slip of the on-coming torque transmitting device, and controlling the pressure of the on-coming torque transmitting device to control the slip of the on-coming torque transmitting device in accord with the profile, and
determining synchronization of input and output elements of the on-coming torque transmitting device from the turbine speed and the output speed and increasing the pressure of the on-coming torque transmitting device to a maximum value when synchronization is detected.

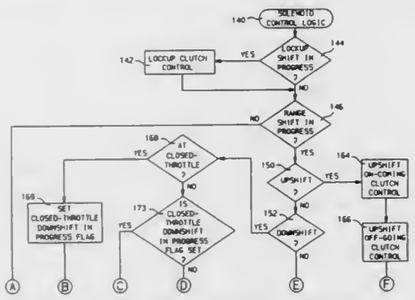
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**5,046,175**

## METHOD OF DETECTING CLUTCH TIE-UP DURING TRANSMISSION SHIFTING

**Carl A. Lentz, Mooresville; Christopher R. Wiles, Indianapolis, both of Ind.; John A. Hibner, Coldwater, Ohio, and Jon M. Huber, Plainfield, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 11, 1990, Ser. No. 463,562**
**Int. Cl.[5] B06K *41/08*; G60F *15/50***
**U.S. Cl. 364—424.1** **6 Claims**



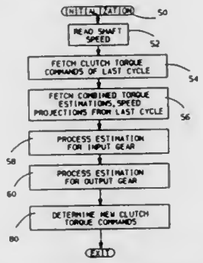

1. In a vehicular automatic transmission having an input and an output, a turbine connected to the input to couple driving torque thereto, turbine and output speed sensing means, and electronic control means coupled to the outputs of the speed sensing means, in which a shift from an initial transmission range to a target range requires disengagement of an off-going fluid pressure operated torque transmitting device and failure of such disengagement results in a tie-up condition, and in which the device is controlled by an initial release command and a final exhaust command, the method of testing whether there is a tie-up condition of the off-going torque transmitting device comprising the steps of:
determining the absence of tie-up as soon as possible in a shift by periodically testing for slip of the off-going torque transmitting device from the time of the release command and issuing a pass indication when a given number of slip detections occur,
periodically testing for the absence of slip beginning a set time after the exhaust command of the off-going device, and issuing a fail signal when the absence of slip is detected a given number of times, and
terminating the testing when a pass indication is issued.

**5,046,176**

## CLOSED-LOOP CLUTCH CONTROL OF AN AUTOMATIC SHIFT TRANSMISSION

**William C. Lin, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Feb. 20, 1990, Ser. No. 481,541**
**Int. Cl.[5] B60K *41/78***
**U.S. Cl. 364—424.1** **6 Claims**




1. In a power transmission having first and second clutches alternately engageable to define first or second speed ratios between input and output shafts of the transmission, a shift from said first ratio to said second ratio involving concurrent disengagement of said first clutch and engagement of said second clutch, a method of operation comprising the steps of:
periodically measuring input and output shaft speeds in a series of computation intervals during the shift, and in each such interval;
estimating input and output shaft torques based on previous torque estimates and the deviation between the measured speed values and predicted speed values from a prior computation interval;
computing first and second torque commands for said first and second clutches for achieving predetermined input and output shaft acceleration levels based on the estimated input and output shaft torques;
controlling said first and second clutches to transmit torques in accordance with said first and second torque commands; and
predicting input and output shaft speeds for a succeeding computation interval based on previous speed predictions, the first and second torque commands, the estimated input and output shaft torques, and said deviation between the measured speed values and predicted speed values from a prior computation interval.

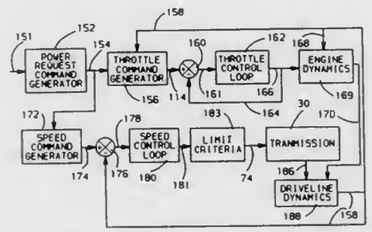
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**5,046,177**

## ENGINE-CVT PERFORMANCE MODE SYSTEM

**Hamid Vahabzadeh, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 1, 1990, Ser. No. 531,675**
**Int. Cl.[5] B60K *41/18***
**U.S. Cl. 364—424.1** **10 Claims**




1. An engine-CVT control system for a vehicle having an engine with various speeds, various output torques, including an instantaneous output torque, a throttle with various positions corresponding to various angles, including a wide-open position, means for positioning said throttle in response to a throttle angle command, and controller means controlling the throttle position command, the improvement wherein the controller means;
determines, from an operator demand, a demand signal indicative of a desired engine power level;
determines an ideal throttle angle signal in relation to said power demand signal and a chosen engine operating line;
determines a CVT ratio rate command in response to the demand signal;
determines a signal indicative of instantaneous engine speed;
determines, in relation to said power demand signal and the chosen engine operating line, a signal indicative of desired engine torque;
determines the throttle angle command in response to said desired engine torque signal wherein the throttle angle command corresponds to a throttle angle which would raise the instantaneous engine output torque to the desired engine torque, if achievable;
limits said throttle angle command to a command indicating wide-open throttle if said desired engine torque is not achievable; and
limits said throttle angle command to the ideal throttle angle signal if said throttle angle command is less than said ideal throttle angle signal;
and applies the throttle angle command and CVT ratio rate command to the throttle and CVT.



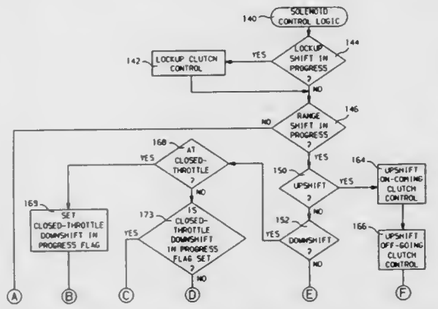
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**5,046,178**

## CONTROL METHOD FOR AUTOMATIC TRANSMISSION GARAGE SHIFTS

**John A. Hibner, Coldwater, Ohio, and Carl A. Lentz, Mooresville, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jan. 11, 1990, Ser. No. 464,055**
**Int. Cl.[5] B60K *41/18***
**U.S. Cl. 364—424.1** **7 Claims**




1. In a vehicular automatic transmission having an input and an output, a turbine connected to the input to couple driving torque thereto, in which garage shifts to a target range are carried out by the controlled engagement of on-coming fluid pressure operated torque transmitting means associated with the target range, and further having turbine and output speed sensing means, a method of electronically controlling the torque transmitting means to effect a garage shift to a target range comprising the steps of:
defining a turbine speed profile beginning at an initial turbine speed and ending at a target speed at which a shift is substantially complete, and
effecting a closed-loop control by controlling the on-coming pressure to control the turbine speed to the profile, and terminating the closed-loop control when the turbine speed reaches the target speed.

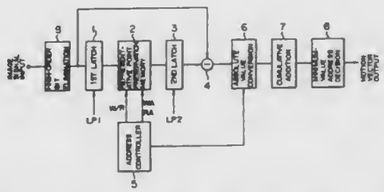
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**5,046,179**

## CORRELATION COMPUTING DEVICE FOR IMAGE SIGNAL

**Kenya Uomori, Katano; Hirofumi Ishii, Moriguchi, and Atsushi Morimura, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Mar. 8, 1990, Ser. No. 490,420**
**Claims priority, application Japan, Mar. 14, 1989, 1-61781**
**Int. Cl.[5] G06F *15/336***
**U.S. Cl. 364—728.03** **4 Claims**




1. A correlation computing device, comprising:
a higher-order bit elimination means for receiving a digital input image signal and providing an output signal in which higher-order bits up to 50% have been eliminated as a maximum effective word length of a digital input image signal;
a representative point preservation memory means for temporarily storing said output signal from said higher-order bit elimination means;
a correlation determining means for determining a correlation between a signal stored in said representative point preservation memory means and said output signal from said higher-order bit elimination means; and
a minimum-value address decision means for selecting a minimum value of said correlation computed by said correlation computing means and for determining a motion vector for the digital input image signal.

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**5,046,180**

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE COMPRISING NON-REPROGRAMMABLE INTERNAL MEMORY DEVICE

**Osamu Ueda, and Kikuo Muramatsu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

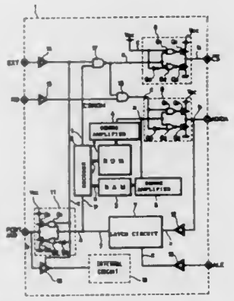
**Filed May 15, 1989, Ser. No. 351,223**
**Claims priority, application Japan, May 23, 1988, 63-126133**
**Int. Cl.[5] G11C *8/00*; G06F *12/00***
**U.S. Cl. 365—189.03** **25 Claims**

1. A semiconductor integrated circuit device comprising non-reprogrammable internal memory means, in which programmable external memory means can be used in place of the non-reprogrammable internal memory means, comprising:
a first input terminal receiving a first control signal having a first state and a second state;
a second input terminal receiving a signal indicating an address;
a first output terminal; and
control means, responsive to said first control signal applied to said first input terminal; wherein
when said first control signal is in said first state, said control means brings said non-reprogrammable internal memory means to an operating state, applies said address to said non-reprogrammable internal memory means, and applies to said first output terminal a select signal of a first state to bring said external memory means to a non-operating state, and

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when said first control signal is in said second state said control means brings said non-reprogrammable internal memory means to the non-operating state and applies to



said first output terminal a select signal of a second state to bring said external memory means to an operating state, and passes said address to said external memory means.

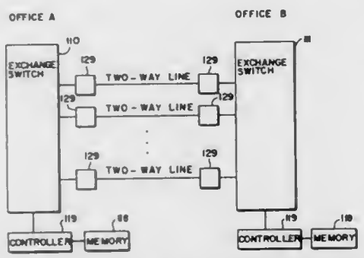
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5,046,181

## SWITCHING SYSTEM WITH TWO-WAY LINE MANAGING SYSTEM

Mamoru Higuchi, Yamato, and Yoshihiro Kaneko, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 19, 1990, Ser. No. 495,438
Claims priority, application Japan, Mar. 17, 1989, 01-063869
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—58.1 30 Claims




1. A switching system having a plurality of two-way lines connected between a primary office and an opposite office for communicating through a selected one of said plurality of two-way lines, said primary office having control means for selecting one of said plurality of two-way lines to be used for communication, said control means comprising:

outgoing connection process controlling means for detecting a release of a two-way line which has been activated by said primary office;

incoming connection process controlling means for detecting a release of a two-way line which has been activated by said opposite office; and

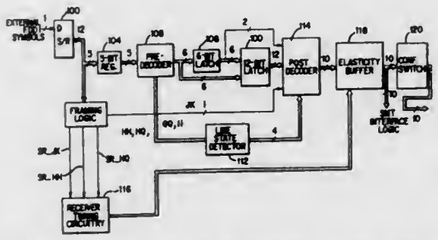
two-way line managing means for deciding a priority for selection of a plurality of two-way lines and for modifying the priority depending on whether the released two-way line had been activated by the primary office or by the opposite office.

5,046,182

## CODE POINTS FOR TRANSFERRING DATA FROM A NETWORK TRANSMISSION MEDIUM TO A STATION ON THE NETWORK

James R. Hamstra, Shorewood, Minn.; Ronald S. Perloff, Poway, and Louise Y. Yeung, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 1, 1989, Ser. No. 444,561
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—79 16 Claims



1. Apparatus for transferring an information stream comprising a sequence of multi-bit information characters from a transmission medium to a receiving node, the information stream having one of a plurality of possible line states associated therewith, each multi-bit information character comprising an external code pattern that uniquely identifies the multi-bit information character, the apparatus comprising:

(a) means for identifying external code patterns in the information stream;

(b) means for converting identified external code patterns to corresponding internal code symbols;

(c) means for detecting the line state of the received information stream; and

(d) means for adjusting the internal code symbols to convey information corresponding to the detected line state.

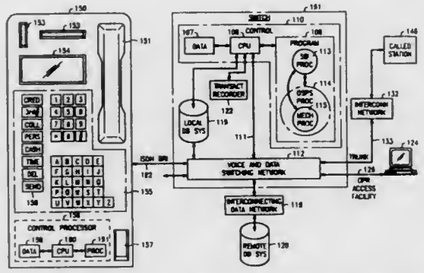
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5,046,183

## SEMI-AUTOMATED OPERATOR ASSISTANCE TELECOMMUNICATION CALLS

Gary L. Dorst, Brookfield, and Francis J. Pope, III, Naperville, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 31, 1989, Ser. No. 388,188
Int. Cl.[5] H04M *15/00*
U.S. Cl. 370—110.1 19 Claims



1. A method of setting up an operator assistance call from a back party station to a forward party station, comprising the steps of:

collecting call information at the back party station, the information comprising operator assistance class of charge (COC) data for the back party station;

sending a call setup data message, comprising the collected call information from the back party station to an operator assistance system, said operator assistance system for setting up connections among a plurality of lines, trunks and operator positions connected thereto; and

responsive to a receipt of the setup message, processing said call setup data message in the system, for extending a connection from the back party toward the forward party if the COC is one of a predetermined class of charge types.



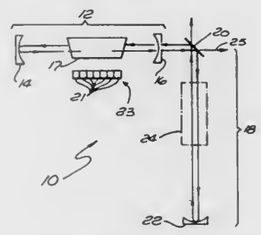
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5,046,184

## METHOD AND APPARATUS FOR PASSIVE MODE LOCKING HIGH POWER LASERS

Joseph K. Chee, Los Angeles; Eric C. T. Cheung, San Francisco; Mo-Nga Kong, and Jia-Ming Liu, both of Los Angeles, all of Calif., assignors to University of California, Los Angeles, Calif.

Filed Apr. 5, 1990, Ser. No. 505,709
Int. Cl.[5] H01S *3/098*
U.S. Cl. 372—18 15 Claims



1. A passively mode-locked laser, comprising:

a main cavity including a first mirror and a second mirror spaced apart from and oriented toward one another so as to form an optical axis;

a lasing medium, disposed along said optical axis, having a long fluorescene relaxation time;

exciter means for inducing a population inversion in the lasing medium and causing the main cavity alone to emit a continuous non mode-locked beam of coherent radiation;

optical means, disposed to intercept and transmit a portion of the continuous, non mode-locked, coherent beam travelling along said optical axis, for inducing a phase shift in the transmitted beam;

a third mirror positioned to reflect the beam transmitted through the optical means back into said optical means, with said first, second and third mirrors forming a coupled cavity wherein the laser is mode-locked and pulsed; and

output coupling means for emitting the pulsed radiation from said coupled cavity.

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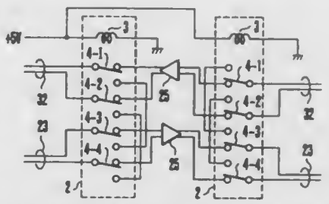
5,046,185

## REGENERATIVE REPEATER

Masato Hirai; Yoshinori Bekki; Sinzi Ikezawa, and Teruo Moriguchi, all of Hadano, Japan, assignors to Hitachi, Ltd., Chiyoda and Hitachi Computer Electronic Co., Ltd., Hadano, both of, Japan

Filed Jul. 28, 1989, Ser. No. 386,482
Claims priority, application Japan, Sep. 3, 1988, 63-220672
Int. Cl.[5] H04L *25/60*
U.S. Cl. 375—4 3 Claims

1. A network system comprising transmission line means, a regenerative repeater inserted in said transmission line means for regenerating and repeating a signal to be transmitted, and loop back circuit means inserted in said transmission line upstream of said repeater whereby when a power supply to said regenerative repeater is not established, said circuit means isolates said transmission line means from said regenerative



repeater and establishes a continuous loop of said transmission line means upstream of said repeater.

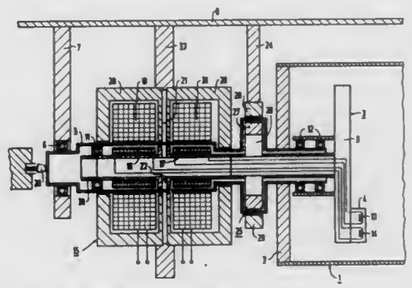
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5,046,186

## ROTATING X-RAY TUBE

Josef Rohmfeld, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 22, 1990, Ser. No. 600,680
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1990, 4004013
Int. Cl.[5] H01J *35/10*
U.S. Cl. 378—125 6 Claims



1. A rotating x-ray tube comprising:

a vacuum housing;

a rotationally mounted hollow shaft rigidly attached to said housing;

an interior shaft disposed inside said hollow shaft with said hollow shaft free to rotate, with said housing, around said interior shaft, said interior shaft having an end extending into said housing through said hollow shaft;

a cathode assembly disposed in said housing and mounted on said end of said interior shaft, said cathode assembly having a cathode eccentrically disposed thereon; and

a filament transformer electrically connected to said cathode and having a secondary coil disposed in said hollow shaft and mounted on said interior shaft.

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5,046,187

## METHOD AND APPARATUS FOR NOTIFYING COMPLETION OF DATA COMMUNICATION FOR MOBILE RADIO TELEPHONE

Chusei Takahashi, Tokyo, Japan, assignor to OKI Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 824,962, Jan. 31, 1986, abandoned. This application Jan. 31, 1989, Ser. No. 305,106
Claims priority, application Japan, Feb. 8, 1985, 60-15807
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—93 3 Claims

1. In a mobile radiotelephone for data communication, comprising a tone signal generating circuit for generating a dial tone, a transmitter-receiver having a speaker connected to said tone signal generating circuit, and a control circuit for control-

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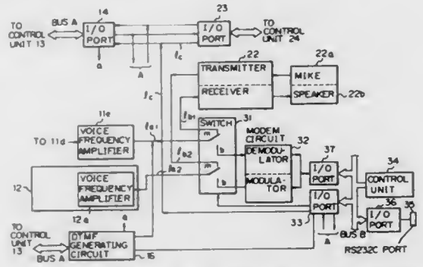


ling the general operation of said mobile radiotelephone, connected through an I/O port to a data terminal equipment, and a changeover switch for changing the connection of a circuit for the conversational mode to a communication channel to the connection of a circuit for the data communication mode to enable data communication, a method for notifying completion of data communication for a mobile radio telephone comprising steps in which:

(a) said control circuit maintains said circuit for the conversational mode in an off-hook state during the operation of said data terminal equipment for data communication;

(b) said control circuit monitors the status of said data terminal equipment through said I/O port during data communication, and provides a control signal to said changeover switch upon the recognition of the completion of data communication from the detection of the change of the status of said data terminal equipment to an OFF state;

(c) said changeover switch changes the connection of the communication channel to said circuit for the data communication mode for the connection of the communication channel to said circuit for the conversational mode upon the reception of said control signal from said control circuit;




(d) said control circuit feeds a restoration command signal to said tone signal generating circuit after transmitting said control signal;

(e) said tone signal generating circuit, upon the reception of said restoration command signal, feeds a tone signal of at least one audible frequency in an audible frequency band to said speaker of said transmitter-receiver while said restoration command signal is applied thereto, to notify the operator of said mobile radiotelephone of the completion of data communication; and

(f) said control circuit places said circuit for the conversational mode in the on-hook state after sending out said restoration command signal for a predetermined time period to disconnect said mobile radiotelephone from the telephone line.

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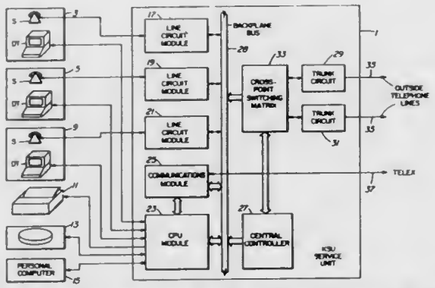
**5,046,188**

## DATA INTERFACE FOR TELEPHONE SYSTEM

**Gerald Molnar, Ottawa, Canada, assignor to Trillium Telephone Systems, Inc., Ontario, Canada**

**Filed Feb. 21, 1989, Ser. No. 313,036**
**Claims priority, application Canada, Mar. 1, 1988, 560245**
**Int. Cl.[5] H04M** *11/00, 3/42*
**U.S. Cl. 379—94** **13 Claims**

1. In a communication system connecting to outside lines and comprised of local subscriber ports and a central controller for interconnecting predetermined ones of said ports and said lines; a data interface comprised of at least one data terminal which is associated with a corresponding at least one port for generating digital command signals designating predetermined special features, and a CPU module connected to said central controller and interfacing said at least one data terminal, for receiving and interpreting said digital command signals from said at least one data terminal and in response initiating execution by said central controller of said predetermined special features.



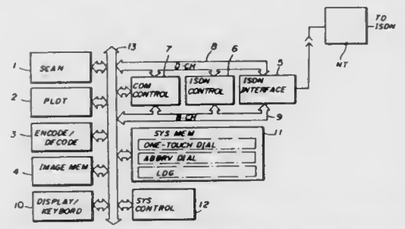

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**5,046,189**

## FACSIMILE APPARATUS AND METHOD OF TRANSMITTING MANAGEMENT INFORMATION

**Hirosuke Kainuma, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jan. 10, 1990, Ser. No. 463,319**
**Claims priority, application Japan, Jan. 23, 1989, 1-11970**
**Int. Cl.[5] H04M** *11/00;* **H04N** *1/00, 1/42*
**U.S. Cl. 379—100** **5 Claims**




1. A facsimile apparatus for communicating via an integrated service digital network, comprising:

scanning means for extracting an image information from a document;

first communication control means connected to the network for at least one of establishing and disconnecting a communication channel to other terminals via the network by at least one of sending and receiving predetermined messages including a call setup message to and from the network;

second communication control means provided between the scanning means and the network for at least one of sending the extracted image information to the network and receiving an image information from the network along the established communication channel;

memory means connected to the first communication control means for storing management information at least including information arbitrarily registered by an operator for controlling the operation of the first communication control means and a log of communications carried out by the facsimile apparatus;

outputting means connected to the network via the second communication control means for outputting the received image information on a sheet;

first reading means connected to the first communication control means for reading the content of a user information attached to the call setup message upon reception and acceptance of a call from other terminals sent via the network;



discrimination means connected to the reading means for discriminating the existence, in the user information, of a request for sending a management information to the terminal which has sent the call and further for identifying the type of the requested management information;

second reading means connected to the memory means for reading out the requested management information according to the type identified by the discrimination means; and

conversion means provided between the second reading means and the second connection control means for converting the requested management information into an image information and for supplying the requested management information thus converted to the second communication control means for transmission to the terminal requesting the management information via the network;

wherein said discrimination means further discriminates, on the basis of the user information read by the first reading means, whether an accounting fee for sending the requested information is to be paid by the side of the facsimile apparatus or the side of the terminal requesting the information, the facsimile apparatus further comprises a system controller connected to the discrimination means for controlling the first and second communication control means such that the requested information is immediately sent to the terminal requesting the information when it is discriminated that the side of the terminal requesting the information is to pay the accounting fee and such that the requested information is sent to the terminal requesting the information after the established connection is once disconnected and again established by calling the terminal requesting the information from the side of the facsimile apparatus when it is discriminated that the side of the facsimile apparatus is to pay the accounting fee.

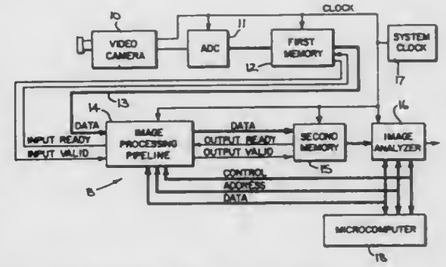
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**5,046,190**

## PIPELINE IMAGE PROCESSOR

**Thomas Daniel, and Paul Ortais, both of Verrieres le Buisson, France, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.**

**Filed Sep. 6, 1988, Ser. No. 240,523**
**Int. Cl.[5] G06K** *9/54*
**U.S. Cl. 382—49** **14 Claims**




1. An image processing system comprising:

a plurality of processing stages interconnected in a cascade manner, each of the stages for performing a morphological transformation of image data supplied to a data input of that respective stage and applying the results of the transformation to a data output of that respective stage, each stage comprising:

a first data flow control circuit including a first input terminal for receiving a first signal indicating the availability of image data at the data input of the respective stage, means for delaying the first signal by a first given period of time, and means for coupling the delayed first signal to a first output terminal;

a second data flow control circuit including a second input terminal for receiving a second signal indicating the availability of a device connected to the data output of the respective stage to receive the transformed image data from that stage, means for delaying the second signal by a second given period of time, and means for coupling the delayed second signal to a second output terminal; and

means for halting the morphological transformation of image data in response to the absence of at least one of the first and second signals.

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# DESIGN PATENTS

## GRANTED SEP. 3, 1991

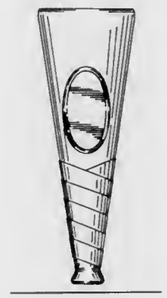
### ERRATA

| For CLASS | See PATENT NO. |
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| D13-140 | 319,609 |

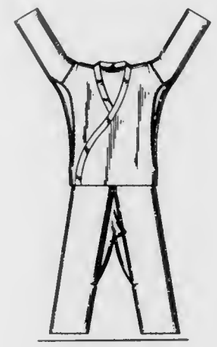
VOL
1130
ISS
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1991
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319,524
ICE CREAM CONE
Tino Antonacci, 500 Edgemont La., Park Ridge, Ill. 60068
Filed Jan. 23, 1989, Ser. No. 299,252
Term of patent 14 years
U.S. Cl. D1—118



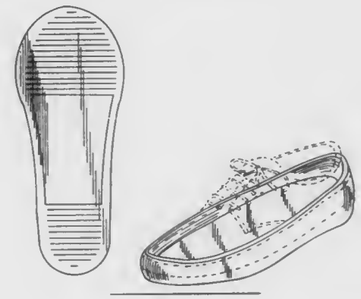
319,525
UNIFORM FOR MARTIAL ARTS OR THE LIKE
Robert W. Clark, 1906 Rose Valley Rd., Kelso, Wash. 98626
Filed Apr. 13, 1987, Ser. No. 37,578
Term of patent 14 years
U.S. Cl. D2—30



319,526
INFANT COSTUME
Judith A. Dube, 304 Morey Ave., Bellingham, Wash. 98225
Filed Jul. 15, 1988, Ser. No. 220,095
Term of patent 14 years
U.S. Cl. D2—79



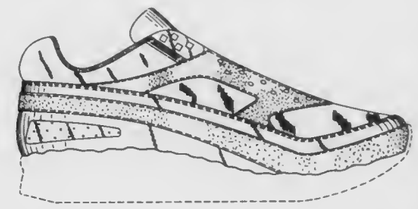
319,527
BOWLING SHOE SOLE GUARD
Jean Hartmann, 1930 W. San Marcos Blvd. #168A, San Marcos, Calif. 92069
Filed Oct. 3, 1988, Ser. No. 252,910
Term of patent 14 years
U.S. Cl. D2—277



319,528
SHOE COVER
Lauretta B. Letourneau, and Alfred J. Letourneau, Jr., both of 3115 Shadow Walk La., Tucker, Ga. 30084
Filed Jul. 24, 1989, Ser. No. 384,668
Term of patent 14 years
U.S. Cl. D2—277



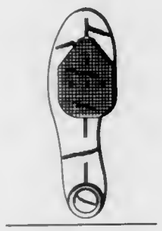
319,529
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Dec. 7, 1990, Ser. No. 624,289
Term of patent 14 years
U.S. Cl. D2—314



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319,530
SOLE FOR BICYCLE SHOE
Bruce J. Kilgore, Lake Oswego, Oreg., assignor to Nike Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Mar. 30, 1990, Ser. No. 501,519
Term of patent 14 years
U.S. Cl. D2—317



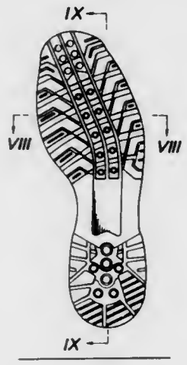
319,531
SHOE SOLE
Glenn A. Barrett, Amherst, and Gary G. Pontbriand, Holland, both of Mass., assignors to G2 Corporation, Palmer, Mass.
Filed Jan. 9, 1989, Ser. No. 294,588
Term of patent 14 years
U.S. Cl. D2—320



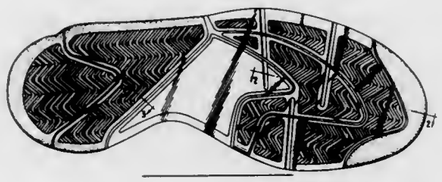

319,532
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed May 19, 1989, Ser. No. 354,256
Claims priority, application Japan, Nov. 25, 1988, 63-46221
Term of patent 14 years
U.S. Cl. D2—320



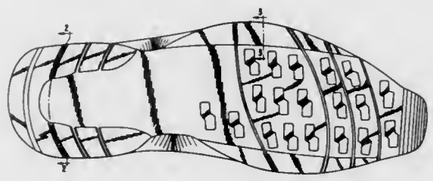
319,533
SHOE SOLE
Takahiro Shibasaki, Toyonaka, and Shinsuke Inoue, Kobe, both of Japan, assignors to Asics Corporation, Kobe, Japan
Filed May 19, 1989, Ser. No. 354,279
Claims priority, application Japan, Nov. 25, 1988, 63-46224
Term of patent 14 years
U.S. Cl. D2—320




319,534
SHOE OUTSOLE BOTTOM
Bruce Rogers, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beavertoo, Oreg.
Filed Jun. 15, 1990, Ser. No. 539,524
Term of patent 14 years
U.S. Cl. D2—320



319,535
CUP SHAPED SHOE SOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Continuation-in-part of Ser. No. 559,580, Jul. 27, 1990. This application Jan. 10, 1991, Ser. No. 635,792
Term of patent 14 years
U.S. Cl. D2—320

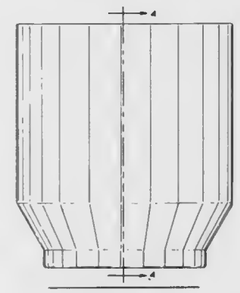




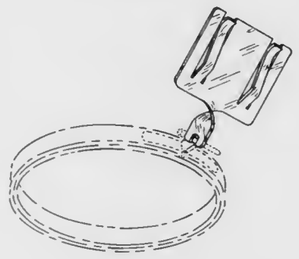
319,536
UMBRELLA HANDLE
Ann S. Cain, Cincinnati, Ohio, assignor to 'totes', incorporated, Loveland, Ohio
Filed Feb. 1, 1991, Ser. No. 649,807
Term of patent 14 years
U.S. Cl. D3—12



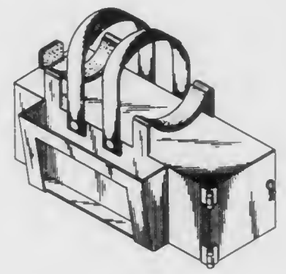
319,537
SPOOL CAN
James L. Gott, Meigs County, Tenn., assignor to Decatur Plastics, Inc., Decatur, Tenn.
Filed Mar. 2, 1988, Ser. No. 163,012
Term of patent 14 years
U.S. Cl. D3—14



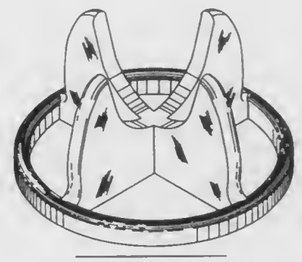
319,538
HAND HELD PATTERN HOLDER
Peggy A. Winstead, P.O. Box 1011, Havelock, N.C. 28532
Filed Apr. 29, 1988, Ser. No. 187,898
Term of patent 14 years
U.S. Cl. D3—26



319,539
HOLDER FOR VEHICLE FIRE EXTINGUISHER, FLARE AND MAPS
Ronald W. Brown, P.O. Box 26, R.R. 1, and Russell A. Wegner, P.O. Box 146, both of Fredericksburg, Iowa 50630
Filed Apr. 11, 1988, Ser. No. 180,258
Term of patent 14 years
U.S. Cl. D3—40



319,540
HUB FOR CASSETTE STORAGE CONTAINERS
Bruce A. Hehn, Massillon, Ohio, assignor to Alpha Enterprises, Inc., East Canton, Ohio
Filed May 31, 1989, Ser. No. 360,702
Term of patent 14 years
U.S. Cl. D3—35



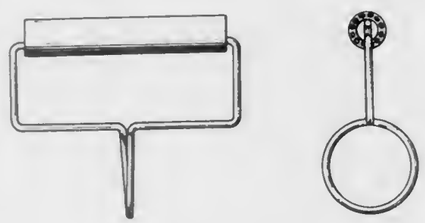
319,541
PICTURE FRAME OR SIMILAR ARTICLE
Brian S. Stewart, San Francisco, Calif., assignor to Acme Frame Products, Inc., Chicago, Ill.
Filed Aug. 23, 1988, Ser. No. 235,383
Term of patent 14 years
U.S. Cl. D6—300



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319,542
HANGER HOLDER
Barry N. Greene, P.O. Box 10541, Beverly Hills, Calif. 90213
Filed Mar. 14, 1988, Ser. No. 167,456
Term of patent 14 years
U.S. Cl. D6—328



319,543
CHILD'S SAFETY SEAT
Takehiko Takahashi; Hideo Saito; Takashi Watanabe, and Tomihiro Kaneko, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Jul. 28, 1988, Ser. No. 225,514
Term of patent 14 years
U.S. Cl. D6—333



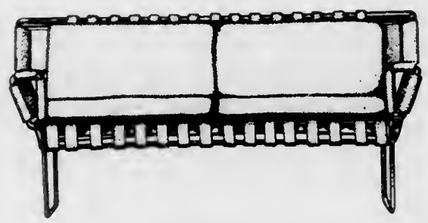
319,544
ROCKING CHAIR
Charles Desnoyers, St-Pie, Canada, assignor to Dutailier Inc., St-Pie, Canada
Filed Mar. 16, 1988, Ser. No. 168,748
Term of patent 14 years
U.S. Cl. D6—344



319,545
CHAIR
Paul Fairbank, 390A N. Euclid Ave., St. Louis, Mo. 63108
Filed Jul. 29, 1988, Ser. No. 226,216
Term of patent 14 years
U.S. Cl. D6—373



319,546
CHAIR
Erich Oelschlager, Weidgasse 3, CH-5304 Endingen, Switzerland, and Robert Oelschlager, 121 Glenwood La., Barrington, Ill. 60010
Filed Jul. 22, 1988, Ser. No. 223,211
Claims priority, application Hague, Jun. 22, 1988, DMA000794
Term of patent 14 years
U.S. Cl. D6—381

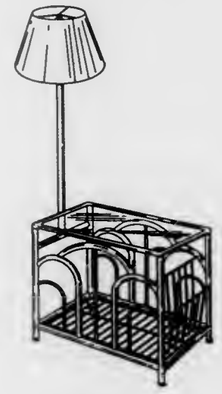


319,547
VANITY TABLE
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Jeffersonville, Ind.
Division of Ser. No. 295,474, Jan. 10, 1989, Pat. No. Des. 309,063. This application Jan. 26, 1990, Ser. No. 471,364
The portion of the term of this patent subsequent to Jul. 31, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—397

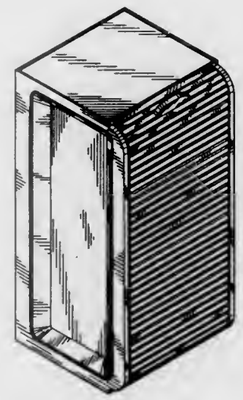




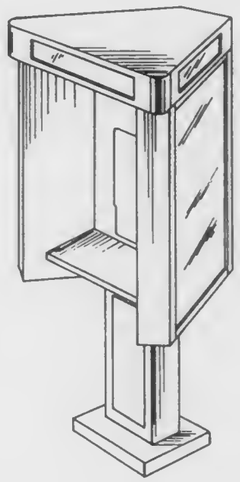
319,548
COMBINED TABLE AND LAMP
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Jeffersonville, Ind.
Division of Ser. No. 295,474, Jan. 10, 1989, Pat. No. Des. 309,063. This application Jan. 26, 1990, Ser. No. 471,354
The portion of the term of this patent subsequent to Nov. 13, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—399



319,549
STORAGE UNIT FOR COMPACT DISKS
Paul C. J. van der Burg, Oosterhout, Netherlands, assignor to Vandermolen B.V., Purmerend, Netherlands
Filed Feb. 27, 1989, Ser. No. 316,442
Claims priority, application Hague, Aug. 26, 1988, DM/011595
Term of patent 14 years
U.S. Cl. D6—407



319,550
COMBINATION TELEPHONE BOOTH AND SIGN
John W. Nichols, and Stevens Van Pinkerton, Jr., both of St. Joseph, Mo., assignors to Acoustics Development Corporation, St. Joseph, Mo.
Filed Dec. 30, 1987, Ser. No. 139,370
Term of patent 14 years
U.S. Cl. D6—421



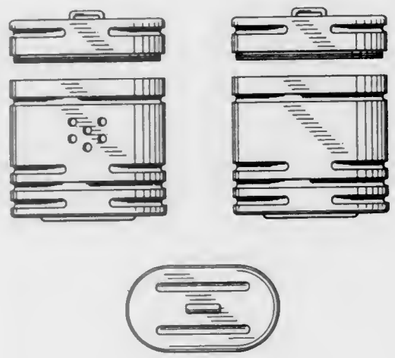
319,551
WALL ATTACHABLE TABLE
Sally S. Lewis, 8950 St. Ives Dr., Los Angeles, Calif. 90069
Filed May 31, 1988, Ser. No. 200,192
Term of patent 14 years
U.S. Cl. D6—450



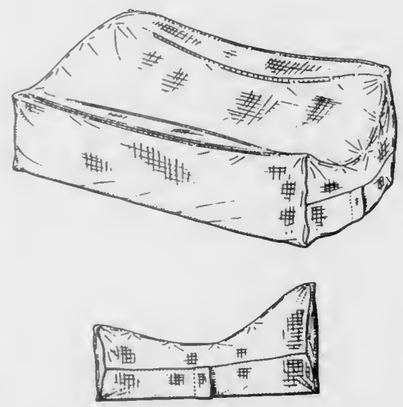
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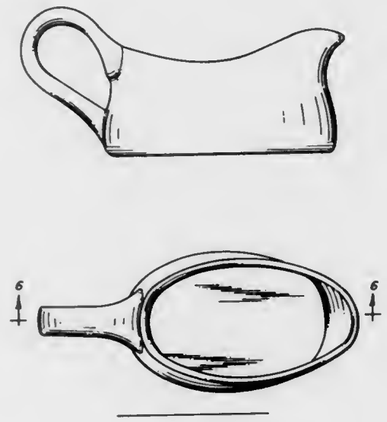
319,552
TOILET TISSUE CANISTER
Paul E. Christensen, 7431 Preston Trail, San Antonio, Tex. 78244
Filed Mar. 27, 1989, Ser. No. 328,594
Term of patent 14 years
U.S. Cl. D6—520



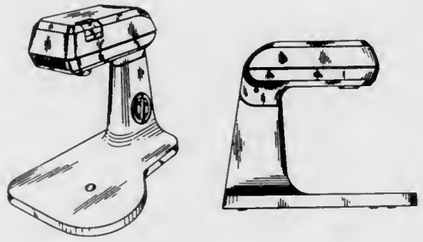
319,553
COVERED PILLOW
Ewan J. Main, Guelph, Canada, assignor to Woodbridge Foam Corporation, Ontario, Canada
Filed Sep. 7, 1989, Ser. No. 407,768
Claims priority, application Canada, Apr. 21, 1989, 2104895
Term of patent 14 years
U.S. Cl. D6—601



319,554
SAUCE BOAT OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 10, 1989, Ser. No. 321,549
Term of patent 14 years
U.S. Cl. D7—319

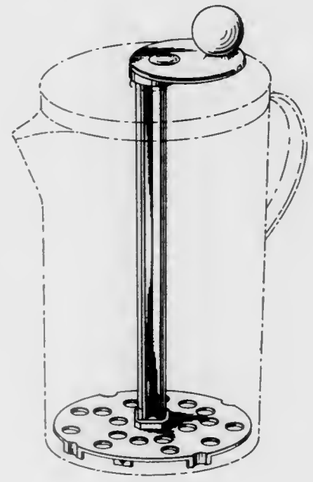


319,555
FOOD MIXER
Richard K. Thomas, 807 Victoria La., Elk Grove Village, Ill. 60007
Filed Jan. 25, 1989, Ser. No. 303,774
Term of patent 14 years
U.S. Cl. D7—379





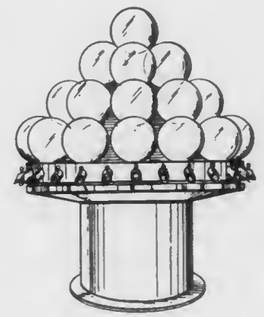
319,556
COMBINED GRINDER AND DRINK MIXER FOR A PITCHER
Emerson J. Purkapile, Chicago, Ill., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Nov. 23, 1988, Ser. No. 275,735
Term of patent 14 years
U.S. Cl. D7—414



319,557
CUP OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Division of Ser. No. 163,932, Mar. 3, 1988, Pat. No. Des. 313,921. This application Sep. 25, 1990, Ser. No. 588,313
Term of patent 14 years
U.S. Cl. D7—536



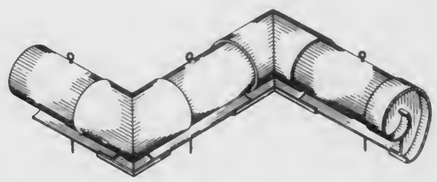
319,558
CANDY DISPENSER
J. De Regt, Prinsendijk, Netherlands, assignor to Van Melle Nederland B.V., Breda, Netherlands
Filed Jun. 9, 1989, Ser. No. 363,948
Claims priority, application Int'l Pat. Institute, Dec. 9, 1988, DMA/000903
Term of patent 14 years
U.S. Cl. D7—601



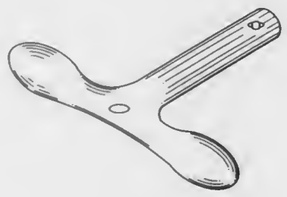
319,559
PLANT TIE
Norman D. Weiss, 250 Kings Road, London, England SW3 5UE
Filed Mar. 13, 1989, Ser. No. 322,242
Claims priority, application United Kingdom, Aug. 28, 1987, 8720450
Term of patent 14 years
U.S. Cl. D8—1



319,560
SNAIL BARRIER UNIT
Michael D. Perry, 5541 Oakleaf Cir., Placerville, Calif. 95667
Filed Jul. 27, 1989, Ser. No. 385,480
Term of patent 14 years
U.S. Cl. D8—1



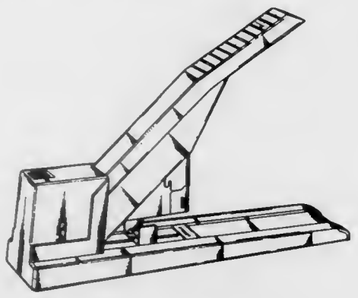
319,561
WIRE TENSIONING TOOL OR SIMILAR ARTICLE
Kenneth C. Moses, P.O. Box 1543, Rockport, Tex. 78382
Filed Sep. 26, 1988, Ser. No. 249,437
Term of patent 14 years
U.S. Cl. D8—14



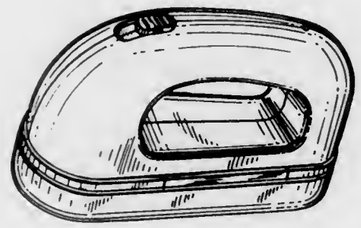
319,562
FRICTION SOCKET WRENCH
Aaron B. Ballard, 954 Lundy La., Los Altos, Calif. 94022
Filed Sep. 26, 1988, Ser. No. 249,580
Term of patent 14 years
U.S. Cl. D8—29

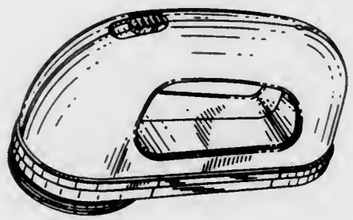


319,563
STAPLER
Lars-Göran Rosenblad, Huskvarna, Sweden, assignor to Isaberg AB, Hestra, Sweden
Filed Dec. 7, 1989, Ser. No. 447,117
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 891385
Term of patent 14 years
U.S. Cl. D8—50

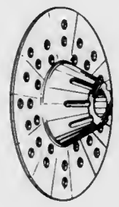


319,564
FABRIC SHAVER WITH COVER
Keiko Okayasu, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 3, 1988, Ser. No. 266,976
Claims priority, application Japan, Jun. 2, 1988, 63-21911
Term of patent 14 years
U.S. Cl. D8—61



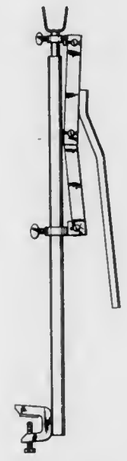


319,565
ARBOR HOUSING
Donald H. Krogsgaard, 11833 Tannas Ave., Fountain Valley, Calif. 92708
Filed Oct. 11, 1988, Ser. No. 255,401
Term of patent 14 years
U.S. Cl. D8—70





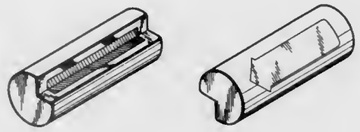
319,566
BRAKE PEDAL DEPRESSOR TOOL
William E. Hillock, Jr., 7653 Avon Pkwy., Danville, Ind. 46122
Filed Nov. 4, 1988, Ser. No. 267,513
Term of patent 14 years
U.S. Cl. D8—71



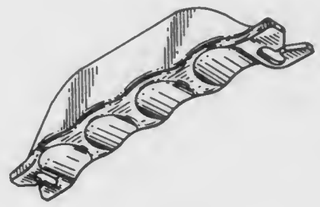
319,567
NAIL HOLDER ATTACHMENT FOR A HAMMER
Thomas Furey, 218 Middlesex Ave., Voorhees, N.J. 08043
Filed Nov. 7, 1988, Ser. No. 269,103
Term of patent 14 years
U.S. Cl. D8—80



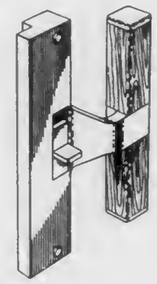
319,568
SKI SHARPENER
Frederick R. Sherman, 525 Willard, Pocatello, Id. 83201
Division of Ser. No. 105,692, Oct. 8, 1987, Pat. No. Des. 314,499. This application Nov. 1, 1990, Ser. No. 607,504
Term of patent 14 years
U.S. Cl. D8—91



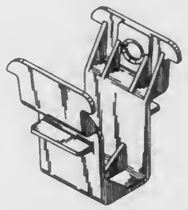
319,569
CARRYING HANDLE
Ian Clark, 69 Dorking Road, Box Hill, Victoria, Australia
Filed Nov. 3, 1988, Ser. No. 266,934
Claims priority, application Australia, May 6, 1988, 1465/88
Term of patent 14 years
U.S. Cl. D8—300



319,570
SLIDING DOOR HANDLE
Barry Yane, Hampstead, Canada, assignor to Standard Building Components, Lachine, Canada
Filed May 9, 1989, Ser. No. 349,841
Claims priority, application Canada, Mar. 31, 1989, 31038921
Term of patent 14 years
U.S. Cl. D8—302



319,571
TIE DOWN ANCHOR FOR PICKUP TRUCKS
Vernon N. Bennett, Des Moines, and Dennis R. Cox, Pleasantville, both of Iowa, assignors to Professional Advisory & Distribution Company, Des Moines, Iowa
Filed Jul. 28, 1988, Ser. No. 225,144
Term of patent 14 years
U.S. Cl. D8—356

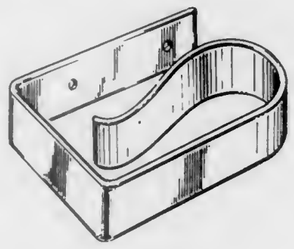


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319,572
MOUNTING CLIP FOR BROOMS OR THE LIKE
Sandra Robinson, 3125 Old Hobart Rd., Lake Station, Ind. 46405
Filed Jan. 4, 1989, Ser. No. 293,483
Term of patent 14 years
U.S. Cl. D8—380



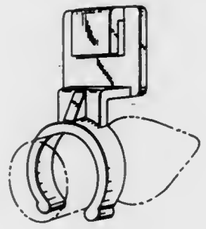
319,573
SUPPORT BRACKET FOR CLOTHES CLOSET ROD
David Rogers, 5 Prince Way, Sharon, Mass. 02067
Filed Oct. 18, 1989, Ser. No. 423,100
Term of patent 14 years
U.S. Cl. D8—380



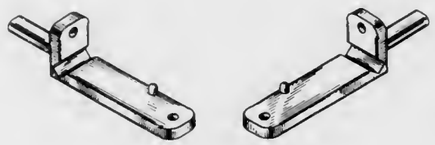
319,574
BOLT FOR EXHAUST MANIFOLD
Roy L. Gallagher, 13294 E. Harney La., Lodi, Calif. 95240
Filed Sep. 12, 1988, Ser. No. 243,012
Term of patent 14 years
U.S. Cl. D8—387



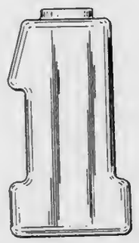
319,575
OUTDOOR LIGHT HOLDER
Clemens H. Young, Warren, Mich., assignor to Handy Products Company, Warren, Mich.
Filed Oct. 31, 1989, Ser. No. 429,344
Term of patent 14 years
U.S. Cl. D8—395



319,576
PIVOT BAR COMPONENT OF A TILTABLE WINDOW SASH
Dennis Westphal, Galva, and Jonathan Piles, McPherson, both of Kans., assignors to CertainTeed Corporation, Valley Forge, Pa.
Filed Jan. 13, 1989, Ser. No. 297,532
Term of patent 14 years
U.S. Cl. D8—400

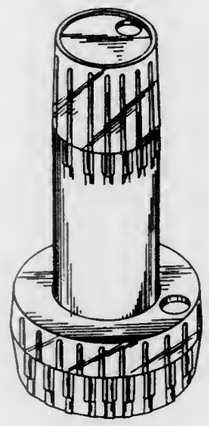


319,577
BOTTLE
Richard T. Schwarz, 1084 Indigo Rd., Ormond Beach, Fla. 32074
Filed Oct. 3, 1988, Ser. No. 251,861
Term of patent 14 years
U.S. Cl. D9—333

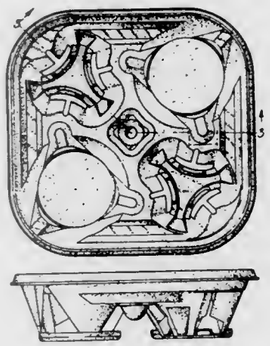




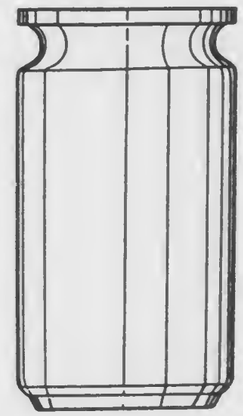
319,578
CONTAINER FOR TOOLS
Pi-Chi Chen, No. 1-1, East Lane, Lai Tsuo, Taichung, Taiwan
Filed Jun. 6, 1989, Ser. No. 362,299
Term of patent 14 years
U.S. Cl. D9—341



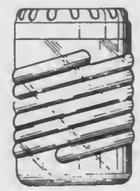
319,579
FOUR CUP BEVERAGE TRAY
Henry R. Vigue, Waterville, Me., assignor to Keyes Fibre, Waterville, Me.
Filed Jun. 16, 1989, Ser. No. 367,115
Term of patent 14 years
U.S. Cl. D9—341



319,580
BEVERAGE CAN
Gino A. Cassai, Brooklyn, N.Y., and Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 733,322, May 13, 1985, Pat. No. Des. 302,116. This application Jul. 24, 1989, Ser. No. 383,990
Term of patent 14 years
U.S. Cl. D9—352



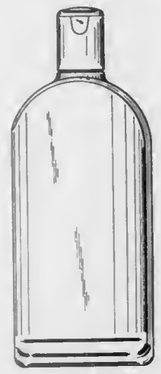
319,581
LIQUID DETERGENT DISPENSER OR SIMILAR ARTICLE
Hans Halm, Herne, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Apr. 18, 1989, Ser. No. 340,318
Claims priority, application Hague, Oct. 18, 1988, DM/000856
Term of patent 14 years
U.S. Cl. D9—366



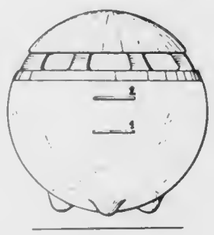
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319,582
COMBINED BOTTLE AND CAP
John Crawford, Mahopac, N.Y., assignor to Colgate-Palmolive Company, Piscataway, N.J.
Filed Nov. 7, 1989, Ser. No. 433,088
Term of patent 14 years
U.S. Cl. D9—367



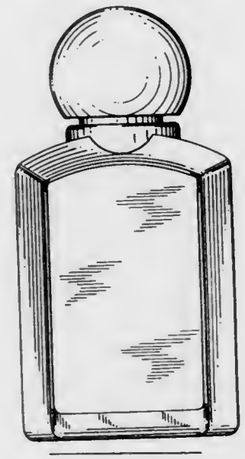
319,583
LIQUID DETERGENT DISPENSER OR SIMILAR ARTICLE
Hans Halm, Herne, and Herbert Bücheler, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Jan. 19, 1989, Ser. No. 299,842
Term of patent 14 years
U.S. Cl. D9—370



319,584
BOTTLE
Frederick N. Biesecker, Boyertown, Pa., assignor to Drug Plastics and Glass Company, Inc., Boyertown, Pa.
Continuation-in-part of Ser. No. 209,755, Jun. 20, 1988. This application Sep. 8, 1988, Ser. No. 242,011
Term of patent 14 years
U.S. Cl. D9—378



319,585
COMBINED BOTTLE AND CAP
Mary Beth Poandl, Rumson, N.J., assignor to Guest Supply, Inc., North Brunswick, N.J.
Filed Jun. 12, 1989, Ser. No. 365,035
Term of patent 14 years
U.S. Cl. D9—412

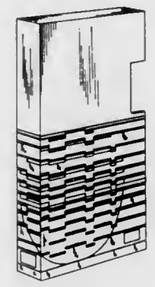


319,586
PACKAGING CONTAINER
Per Nylander, Jönköping, Sweden, assignor to Roby Teknik AB, Lund, Sweden
Division of Ser. No. 143,614, Jan. 13, 1988. This application Nov. 26, 1990, Ser. No. 618,096
Claims priority, application Sweden, Jul. 13, 1987, 871584; Jul. 13, 1987, 871585; Jul. 13, 1987, 871586; Jul. 13, 1987, 871587; Jul. 13, 1987, 871588; Jul. 13, 1987, 871589; Jul. 13, 1987, 871590; Jul. 13, 1987, 871591; Jul. 13, 1987, 871592; Jul. 13, 1987, 871593
Term of patent 14 years
U.S. Cl. D9—417

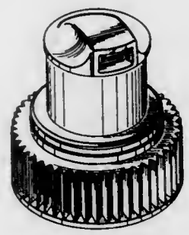




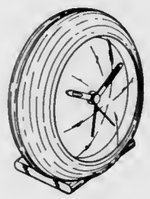
319,587
VIDEO CASSETTE JACKET
Jeoung W. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Apr. 13, 1988, Ser. No. 181,263
Claims priority, application Rep. of Korea, Nov. 19, 1987, 17396-87
Term of patent 14 years
U.S. Cl. D9—432



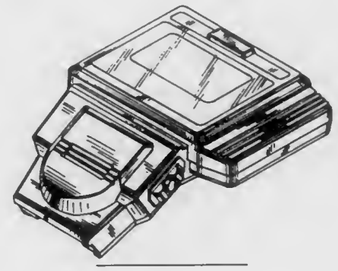
319,588
DISPENSING CLOSURE
James M. Beck, Carol Stream, Ill., assignor to Creative Packaging Corp., Wheeling, Ill.
Filed Nov. 29, 1989, Ser. No. 442,935
Term of patent 14 years
U.S. Cl. D9—447



319,589
CLOCK
Siegfried Unruh, Milan, Italy; Ewald Kussmaul, Hornberg, Fed. Rep. of Germany, and Christian Frommherz, Kowloon, Hong Kong, assignors to Junghans Uhren GmbH, Schramberg, Fed. Rep. of Germany
Filed Sep. 30, 1987, Ser. No. 102,892
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1987, MR13190B
Term of patent 14 years
U.S. Cl. D10—23



319,590
COMBINED WATCH WITH PAGER
John T. Houlihan, Watertown, Conn., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 17, 1988, Ser. No. 259,003
Term of patent 14 years
U.S. Cl. D10—31



319,591
COMBINED WATCH AND BAND PORTIONS THEREOF
Enrico Coveri, 19, Lungarno Guicciardini, 20122 Florence, Italy
Filed Nov. 5, 1987, Ser. No. 116,970
Claims priority, application Italy, May 15, 1987, 11641/87[U]
Term of patent 14 years
U.S. Cl. D10—32



319,592
EAR-PLUG TIMER
Yasuo Inora, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 2, 1988, Ser. No. 227,324
Claims priority, application Japan, Feb. 17, 1988, 63-6158
Term of patent 14 years
U.S. Cl. D10—40



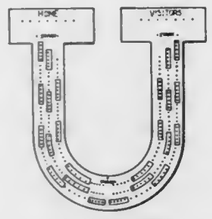
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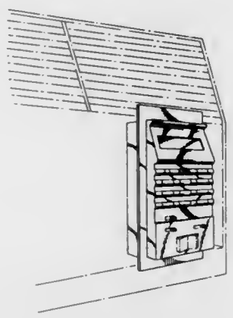
319,593
EAR-PLUG TIMER
Yasuo Inora, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 2, 1988, Ser. No. 227,180
Claims priority, application Japan, Feb. 17, 1988, 63-6157
Term of patent 14 years
U.S. Cl. D10—40



319,594
CRIBBAGE BOARD
Robert K. DuMond, Jr., 316 W. Montcalm St., Greenville, Mich. 48838
Filed Sep. 15, 1989, Ser. No. 407,773
The portion of the term of this patent subsequent to Aug. 20, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—46.1



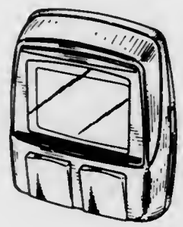

319,595
FRONT PANEL AND SIDES OF AN ELECTRONIC THERMOSTAT FOR A PROGRAMMABLE ROOM AIR CONDITIONER
Vinay Mehta, Germantown, and Dick Pearce, Memphis, both of Tenn., assignors to Hunter-Melnor, Inc., Memphis, Tenn.
Filed May 11, 1989, Ser. No. 350,689
Term of patent 14 years
U.S. Cl. D10—50



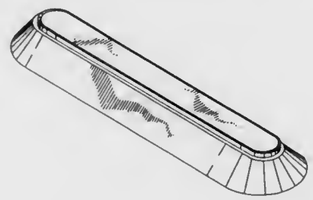
319,596
GAS DETECTOR
Rudy Krolopp, Elk Grove, Ill., assignor to J and N Associates, Inc., Wheeler, Ind.
Filed May 5, 1989, Ser. No. 347,789
Term of patent 14 years
U.S. Cl. D10—81



319,597
BICYCLE METER
Joe Kagayama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Osaka, Japan
Filed May 19, 1988, Ser. No. 196,083
Claims priority, application Japan, Nov. 20, 1987, 62-47781
Term of patent 14 years
U.S. Cl. D10—98

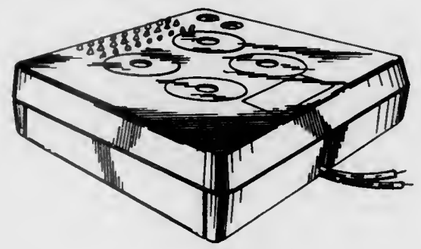


319,598
FUEL GAUGE
Michel Bourret, Drummondville, and Bernard Guy, Sherbrooke, both of Canada, assignors to Bombardier Inc., Canada
Filed Jun. 22, 1989, Ser. No. 369,906
Claims priority, application Canada, Feb. 13, 1989, 13-02-89-1
Term of patent 14 years
U.S. Cl. D10—101





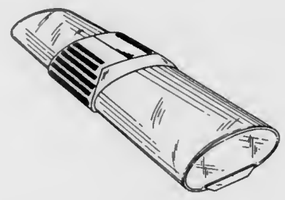
319,599
REMOTE SIREN FOR AN ALARM SYSTEM
Paul Jackman; Lowell C. Schirado, both of Grand Rapids; Kenneth Roberts; Miles Conklin, both of Battle Creek, all of Mich.; Mark Salander, Barrington, R.I., and Doug Wolff, Marshall, Mich., assignors to Amway Corporation, Ada, Mich.
Filed Sep. 15, 1989, Ser. No. 407,772
Term of patent 14 years
U.S. Cl. D10—106



319,600
SMOKE ALARM
David W. Kaiser, North Haven, and Richard J. Carbone, Derby, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 13, 1989, Ser. No. 436,386
Term of patent 14 years
U.S. Cl. D10—100



319,601
COMBINED WARNING LIGHT AND SIREN HOUSING FOR EMERGENCY VEHICLE
Hiroki Sasaki, Ikoma, and Hiroshi Enjyoji, Osaka, both of Japan, assignors to Kabushiki Kaisha Sasaki Denki Seisskusho, Osaka, Japan
Filed Jun. 2, 1989, Ser. No. 361,571
Term of patent 14 years
U.S. Cl. D10—114



319,602
WATCH MOVEMENT
Nobuhiro Tanaka, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jun. 1, 1988, Ser. No. 201,095
Claims priority, application Japan, Dec. 26, 1987, 62-53174
Term of patent 14 years
U.S. Cl. D10—129



319,603
CLOCK MOVEMENT
Sumumu Ikuma, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 12, 1988, Ser. No. 243,666
Claims priority, application Japan, Apr. 14, 1988, 63-15118
Term of patent 14 years
U.S. Cl. D10—129



319,604
PENDANT
Eugenia N. Peterson, 4080 S. Highland Dr., Salt Lake City, Utah 84124
Filed Mar. 7, 1990, Ser. No. 489,597
Term of patent 14 years
U.S. Cl. D11—79



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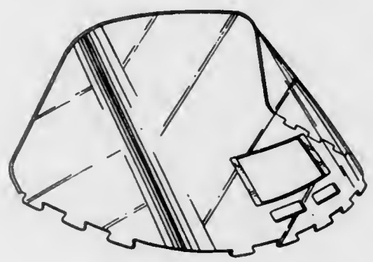
319,605
FIGURINE
Sally P. Jenks, 175 E. Paradise La., Alpine, Utah 84004
Filed Jul. 3, 1989, Ser. No. 375,296
Term of patent 14 years
U.S. Cl. D11—131



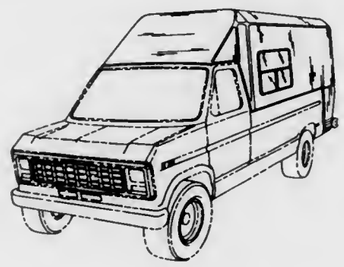
319,606
FLOWER POT
Gerolamo Etro, Milan, Italy, assignor to Etro S.p.A., Milan, Italy
Filed Sep. 25, 1987, Ser. No. 100,973
Claims priority, application Italy, Mar. 27, 1987, 21277 B 87
Term of patent 14 years
U.S. Cl. D11—153



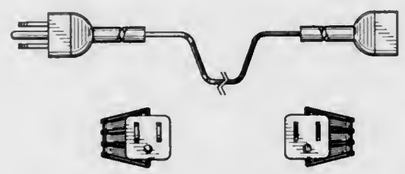
319,607
SNOWMOBILE WINDSHIELD
Y. Anselme, Lapointe St-Eli d'Orford, Canada, assignor to Bombardier Inc., Canada
Filed Nov. 15, 1989, Ser. No. 436,680
Claims priority, application Canada, Jun. 1, 1989, 01-06-89-1
Term of patent 14 years
U.S. Cl. D12—7



319,608
VAN MOUNTED CAMPER BODY
John N. Dodgen, Fort Dodge, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa
Filed Jan. 9, 1989, Ser. No. 294,804
Term of patent 14 years
U.S. Cl. D12—100

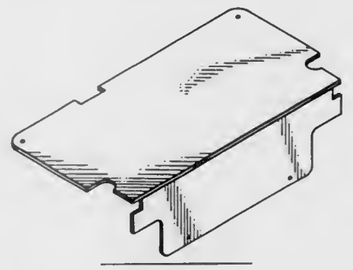


319,609
POWER EXTENSION CORD
Brian T. Brown, 14042 Ryan St., Sylmar, Calif. 91342
Filed Jun. 21, 1989, Ser. No. 369,670
Term of patent 14 years
U.S. Cl. D13—140

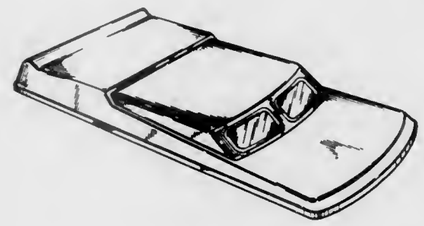




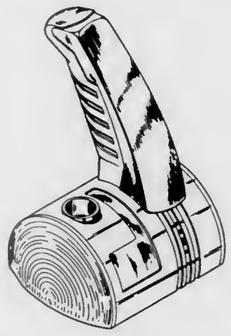
319,610
AUTOMOBILE STORAGE COMPARTMENT COVER
Oliver Janke, 1380 Garnet Ave., #E182, San Diego, Calif. 92109
Filed Mar. 31, 1989, Ser. No. 331,883
Term of patent 14 years
U.S. Cl. D12—155



319,611
VAN TOP
Paul Thomas, Jr., Daleville, Ala., assignor to VMC Fiberglass, Inc., Daleville, Ala.
Filed Sep. 15, 1989, Ser. No. 407,802
Term of patent 14 years
U.S. Cl. D12—156



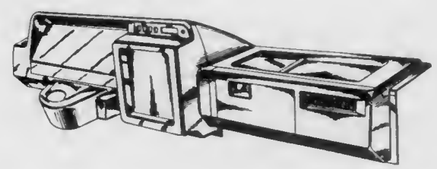
319,612
GEAR SHIFTING CONSOLE FOR A BICYCLE
William H. Ropp, Centerville, and Wayne Beiser, Fairfield, both of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio
Filed Nov. 6, 1989, Ser. No. 432,276
Term of patent 14 years
U.S. Cl. D12—179



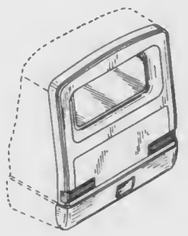
319,613
SPOILER
Ryozo Mikawa, Yokohama, Japan, assignor to Leonard Co., Ltd., Yokohama, Japan
Filed Apr. 27, 1989, Ser. No. 344,154
Term of patent 14 years
U.S. Cl. D12—181



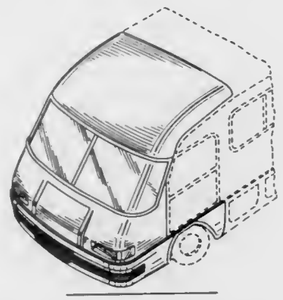
319,614
MOTORHOME DASHBOARD
John Slayter, Riverside, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.
Filed Aug. 8, 1989, Ser. No. 391,364
Term of patent 14 years
U.S. Cl. D12—192



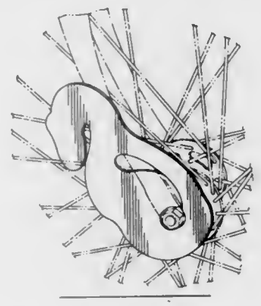
319,615
MOTOR HOME BODY REAR PANEL EXTERIOR SURFACE
Wade F. B. Thompson, New York, N.Y., and David Willis, Huntsville, Ohio, assignors to Airstream, Inc., Jackson Center, Ohio
Filed Nov. 28, 1988, Ser. No. 277,055
Term of patent 14 years
U.S. Cl. D12—196



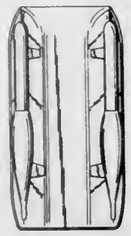
319,616
MOTOR HOME BODY FRONT PANEL EXTERIOR SURFACE
Wade F. B. Thompson, New York, N.Y., and David Willis, Huntsville, Ohio, assignors to Airstream, Inc., Jackson Center, Ohio
Filed Nov. 28, 1988, Ser. No. 277,056
Term of patent 14 years
U.S. Cl. D12—196



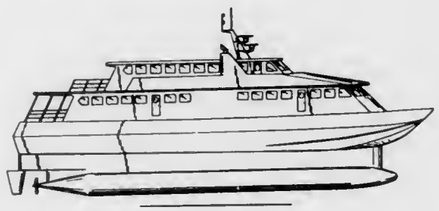
319,617
BICYCLE SPOKE RATTLER
Gerald R. Sorensen, Elgin, Ill., assignor to National Creative Merchandising Corp., Arlington Heights, Ill.
Filed Apr. 5, 1989, Ser. No. 333,595
Term of patent 14 years
U.S. Cl. D12—213



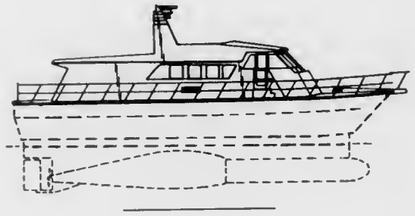
319,618
LOWER HULL OF BOAT
Paul Kotzebue, San Diego, Calif., assignor to Swath Ocean Systems, Inc., Chula Vista, Calif.
Filed Feb. 10, 1989, Ser. No. 309,623
Term of patent 14 years
U.S. Cl. D12—310



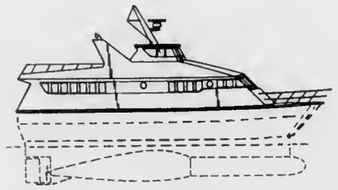
319,619
PASSENGER BOAT
Paul Kotzebue, San Diego, Calif., assignor to Swath Ocean Systems, Inc., Chula Vista, Calif.
Filed Aug. 23, 1989, Ser. No. 398,362
Term of patent 14 years
U.S. Cl. D12—315



319,620
BOAT'S DECK
Paul Kotzebue, San Diego, Calif., assignor to Swath Ocean Systems, Inc., Chula Vista, Calif.
Filed Feb. 10, 1989, Ser. No. 309,622
Term of patent 14 years
U.S. Cl. D12—318

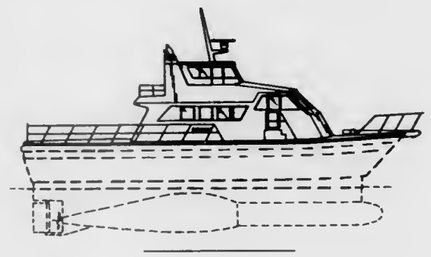


319,621
PASSENGER BOAT'S DECK
Paul Kotzebue, San Diego, Calif., assignor to Swath Ocean Systems, Inc., Chula Vista, Calif.
Filed Feb. 10, 1989, Ser. No. 309,763
Term of patent 14 years
U.S. Cl. D12—318

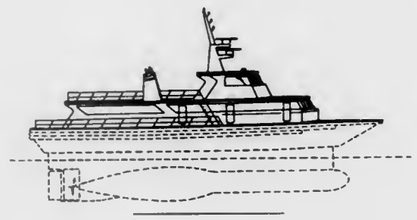




319,622
PASSENGER BOAT'S DECK
Paul Kotzebue, San Diego, Calif., assignor to Swath Ocean Systems, Inc., Chula Vista, Calif.
Filed Feb. 13, 1989, Ser. No. 310,580
Term of patent 14 years
U.S. Cl. D12—318



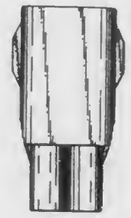
319,623
PASSENGER BOAT'S DECK
Paul Kotzebue, San Diego, Calif., assignor to Swath Ocean Systems, Inc., Chula Vista, Calif.
Filed May 22, 1989, Ser. No. 355,235
Term of patent 14 years
U.S. Cl. D12—318



319,624
IMPEDANCE ADAPTER FOR ELECTRONIC CIRCUITRY
Richard Blackburn, Co. Portneuf, Canada, assignor to Mux Lab Inc., Ville St-Laurent, Canada
Filed Apr. 17, 1989, Ser. No. 338,655
Term of patent 14 years
U.S. Cl. D13—133



319,625
ELECTRICAL CONNECTOR HOUSING
Yasuhiro Nagasaka; Yasuo Hirayama, Ichiro Shibata, all of Toyota; Tadahiro Sueyoshi, Shizuoka; Masanori Tsuji, Shizuoka; Yoshihiro Murakami, Shizuoka; Takayuki Yamamoto, Shizuoka, and Masaru Fukuda, Shizuoka, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jul. 3, 1989, Ser. No. 374,856
Claims priority, application Japan, Jan. 6, 1989, 1-55
Term of patent 14 years
U.S. Cl. D13—146

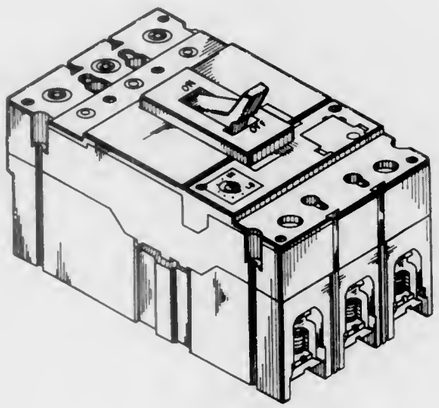




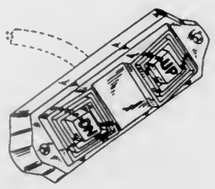
319,626
SPARK PLUG TERMINAL COVER
Takao Murakami, Kosai, Japan, assignor to Yazaki Corporation, Japan
Filed Mar. 23, 1988, Ser. No. 172,919
Term of patent 14 years
U.S. Cl. D13—156



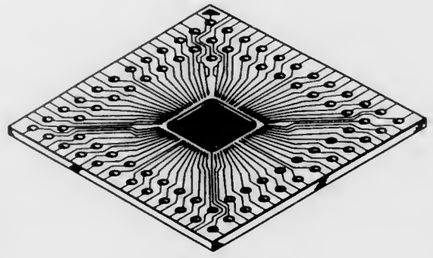
319,627
ELECTRONIC-TRIP MOLDED-CASE CIRCUIT BREAKER
James I. Smith; Dennis W. Heath, both of Avon, and Richard E. Saunders, Granby, all of Conn., assignors to General Electric Company, New York, N.Y.
Filed Jun. 16, 1989, Ser. No. 367,513
The portion of the term of this patent subsequent to Jul. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—160



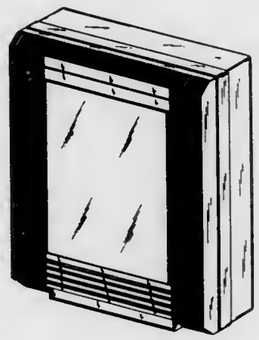
319,628
REMOTE CONTROL SWITCH
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Aug. 24, 1989, Ser. No. 397,794
Term of patent 14 years
U.S. Cl. D13—171



319,629
SEMICONDUCTOR SUBSTRATE WITH CONDUCTING PATTERN
Terutomi Hasegawa, Ogaki, and Nobumichi Goto, Seki, both of Japan, assignors to Ibiden Co., Ltd., Ogaki, Japan
Filed Apr. 13, 1988, Ser. No. 181,253
The portion of the term of this patent subsequent to Jul. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—182

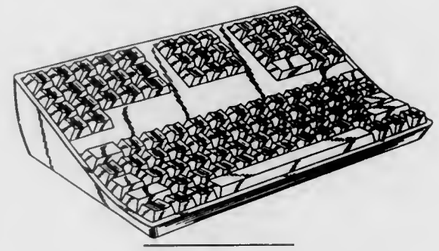


319,630
MULTI-PURPOSE ENCLOSURE FOR CONTROL MODULES OR DEVICES
Hugh F. Hudson, Wauwatosa, Wis.; Joseph F. Munsch, Boulder Creek, and Josepb A. McArdle, Mountain View, both of Calif., assignors to Johnson Service Company, Milwaukee, Wis.
Filed Nov. 30, 1989, Ser. No. 443,962
Term of patent 14 years
U.S. Cl. D13—184

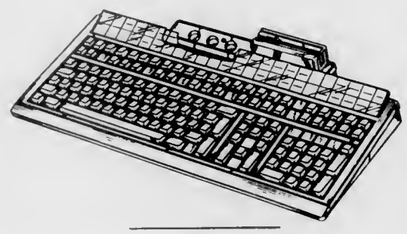




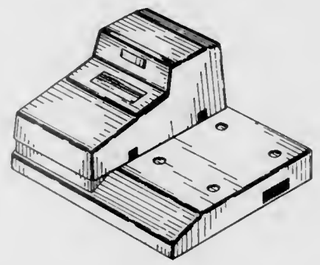
319,631
MINIATURE KEYBOARD
Robert H. Twyford, Great Falls, Va., assignor to Datalux Corporation, Winchester, Va.
Filed Mar. 18, 1988, Ser. No. 171,512
Term of patent 14 years
U.S. Cl. D14—100



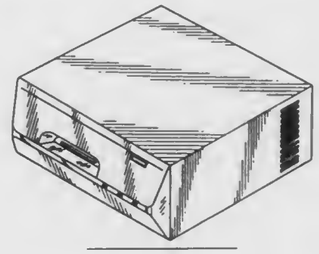
319,632
MULTI-FUNCTIONAL KEYBOARD FOR DATA PROCESSING SYSTEMS
Alfons Heimburger, Niedereschach, Fed. Rep. of Germany, assignor to Mannesmann Kienzle GmbH, Villingen, Fed. Rep. of Germany
Filed May 3, 1989, Ser. No. 347,412
Claims priority, application World Int. Prop. O., Nov. 8, 1988, DM/012143
Term of patent 14 years
U.S. Cl. D14—100



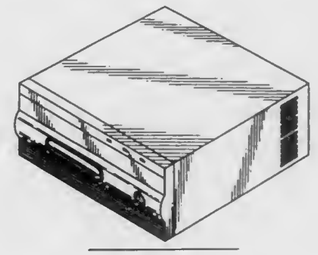
319,633
POINT OF SALES TERMINAL
Masahiro Nogawa, Kawasaki, Japan, assignor to Nitsuko Corporation, Kawasaki, Japan
Filed Jul. 19, 1988, Ser. No. 221,192
Claims priority, application Japan, Jan. 19, 1988, 63-1370
Term of patent 14 years
U.S. Cl. D14—105



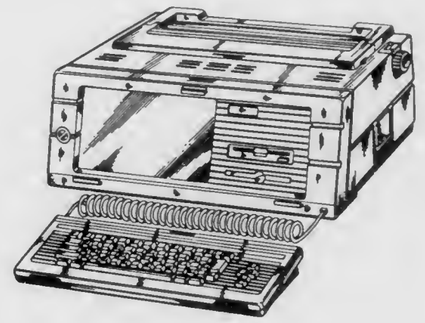
319,634
OPTICAL CARD READER/WRITER
Tetsuya Honda, Shiki, Japan, assignor to Kabushiki Kaisha Nippon Conlux, Japan
Filed May 5, 1989, Ser. No. 348,020
Claims priority, appilcation Japan, Nov. 15, 1988, 63-44574
Term of patent 14 years
U.S. Cl. D14—105



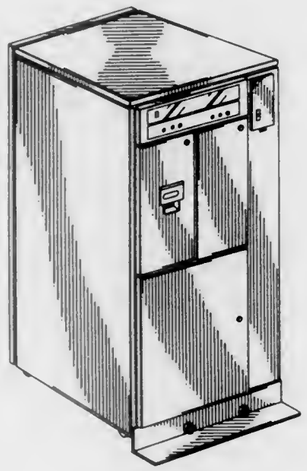
319,635
OPTICAL CARD READER/WRITER
Tetsuya Honda, Shiki, Japan, assignor to Kabushiki Kaisha Nippon Conlux, Japan
Filed May 5, 1989, Ser. No. 348,022
Claims priority, application Japan, Nov. 15, 1988, 63-44576
Term of patent 14 years
U.S. Cl. D14—105



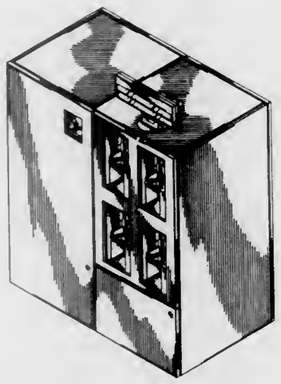
319,636
WORD PROCESSOR
Mark J. Lampe, Syracuse, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Nov. 27, 1989, Ser. No. 441,928
Term of patent 14 years
U.S. Cl. D14—106



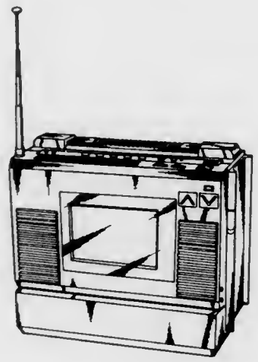
319,637
TAPE DRIVE
Richard D. Kusel; Martin J. Marotti, and Roland Zapfe, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 1, 1989, Ser. No. 402,591
Term of patent 14 years
U.S. Cl. D14—108



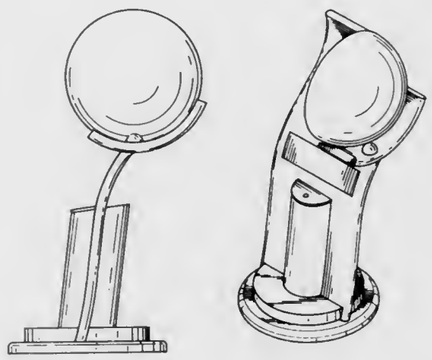
319,638
TAPE DRIVE
Martin J. Marotti; Kenneth R. Shelley, and Roland Zapfe, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 23, 1989, Ser. No. 426,365
Term of patent 14 years
U.S. Cl. D14—108



319,639
COMBINED VIDEO TAPE RECORDER AND TELEVISION SET
Terumi Ihara, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Division of Ser. No. 160,489, Feb. 24, 1988. This application Jul. 6, 1990, Ser. No. 549,683
Claims priority, application Japan, Sep. 26, 1987, 62-39327; Oct. 20, 1987, 62-42843; Oct. 20, 1987, 62-42844; Oct. 20, 1987, 62-42845
Term of patent 14 years
U.S. Cl. D14—129

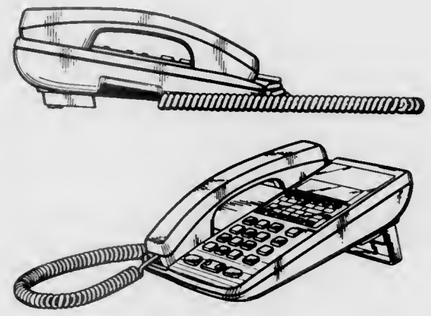


319,640
TELEPHONE SET
Bill Goralski, 110 Wigton Cir., Perkasie, Pa. 18944
Filed Sep. 21, 1989, Ser. No. 410,681
Term of patent 14 years
U.S. Cl. D14—143





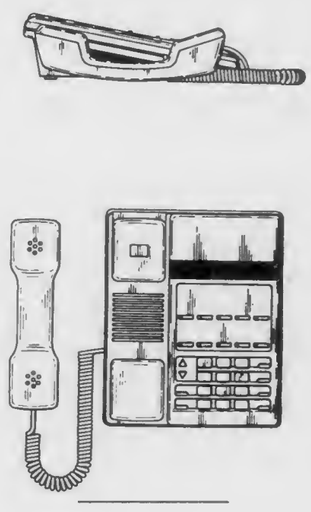
319,641
TELEPHONE
Tetsuo Sugi; Fumiharu Ota, and Satoshi Yonai, all of Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 13, 1990, Ser. No. 493,096
Claims priority, application Japan, Sep. 25, 1989, 1-34878
Term of patent 14 years
U.S. Cl. D14—151



319,642
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 11, 1990, Ser. No. 536,240
Claims priority, application Japan, Dec. 12, 1989, 1-44931
Term of patent 14 years
U.S. Cl. D14—151



319,643
TELEPHONE
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 11, 1990, Ser. No. 536,091
Claims priority, application Japan, Dec. 12, 1989, 1-44934
Term of patent 14 years
U.S. Cl. D14—151



319,644
LAWN TRIMMER
Franco Clivio, Zürich, Switzerland, assignor to Gardena Kress+Kastner GmbH, Fed. Rep. of Germany
Filed Dec. 12, 1989, Ser. No. 450,011
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, M8904724.9
Term of patent 14 years
U.S. Cl. D15—16



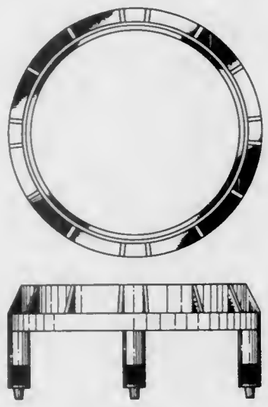


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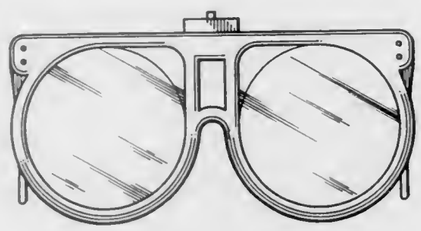
VOL 1130 ISS 1 SE 3 1991 UMI



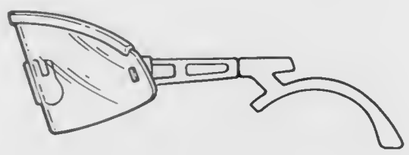
319,645
CARBURETOR INSPECTION AND REPAIR STAND
Todd P. Geib, 15 Warwick Dr., Fairport, N.Y. 14450
Continuation-in-part of Ser. No. 149,194, Jan. 28, 1988, Pat. No. Des. 315,162. This application Jul. 5, 1988, Ser. No. 215,425
Term of patent 14 years
U.S. Cl. D15—140



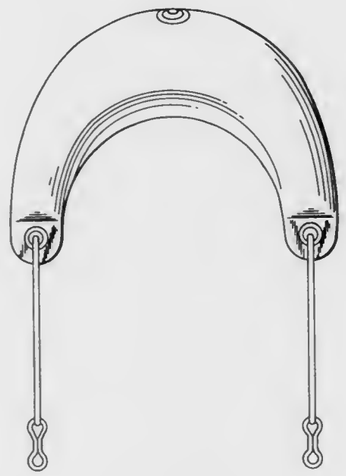
319,646
EYEGLASSES
Edward L. Staelens, 1723 E. Flower St., Space D-18, Phoenix, Ariz. 85016
Filed Sep. 2, 1988, Ser. No. 240,108
Term of patent 14 years
U.S. Cl. D16—102



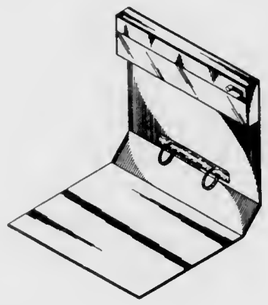
319,647
SUNGLASSES
Ken Wilson, 12269 Calle Albara #3, El Cajon, Calif. 92019
Filed Apr. 20, 1989, Ser. No. 340,690
Term of patent 14 years
U.S. Cl. D16—102



319,648
EYEGLASS RETAINER WITH INTEGRAL FLOATING PRESERVER
Edouard Girard, Paris, France, assignor to Locaplast S.A.R.L., Paris, France
Filed Apr. 8, 1987, Ser. No. 35,946
Claims priority, application France, Oct. 8, 1986, 865.260
Term of patent 14 years
U.S. Cl. D16—129

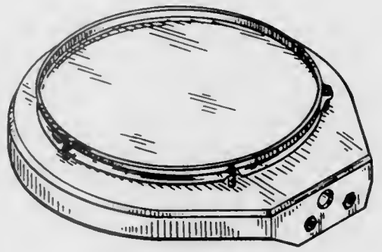


319,649
COMBINED FILM HOLDER AND VIEWER
Maila P. Silvennoinen, Kauniainen, Finland, assignor to KUVA-SAMPO OY, Helsinki, Finland
Filed Feb. 18, 1988, Ser. No. 158,987
Claims priority, application Finland, Aug. 20, 1987, 654/87
Term of patent 14 years
U.S. Cl. D16—225

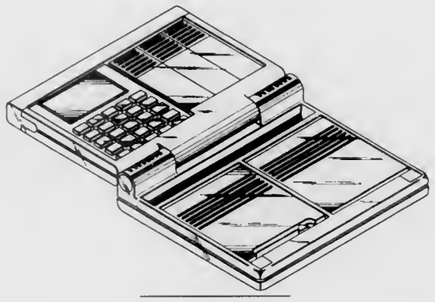




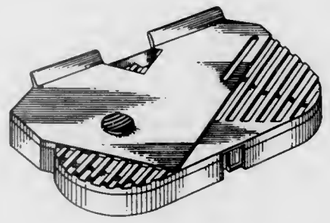
319,650
ELECTRONIC DRUM OR SIMILAR ARTICLE
Peter Hart, Tampa, Fla., assignor to Hart Systems, Inc., Tampa, Fla.
Filed Sep. 27, 1989, Ser. No. 413,046
Term of patent 14 years
U.S. Cl. D17—22



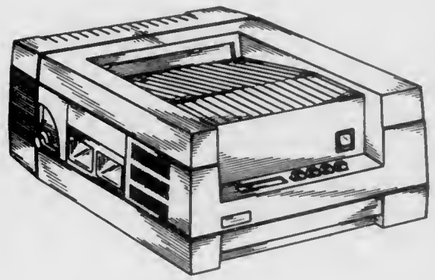
319,651
MULTIPURPOSE CALCULATOR CASE
Li-Chen Hu Huang, Taipei, Taiwan, assignor to Pro Eton Trading Co., Ltd., Taiwan
Filed Oct. 10, 1989, Ser. No. 418,642
Term of patent 14 years
U.S. Cl. D18—7



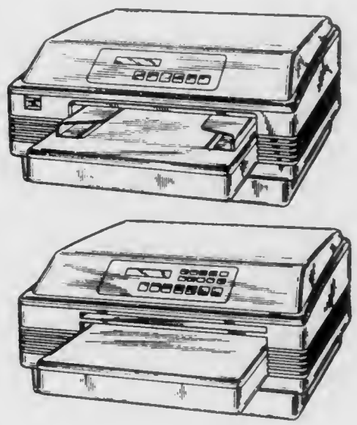
319,652
RIBBON CASSETTE
Mark J. Lampe, Syracuse, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Jan. 12, 1990, Ser. No. 464,461
Term of patent 14 years
U.S. Cl. D18—12



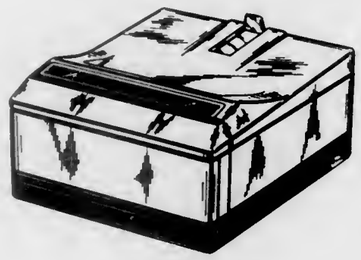
319,653
PRINTER
Jens Reese, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 192,896
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 95MR5908NZ
Term of patent 14 years
U.S. Cl. D18—13



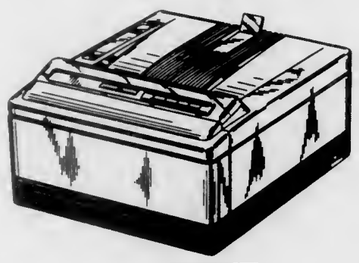
319,654
LINE PRINTER FOR ELECTRONIC COMPUTER
Junji Kohayashi; Hideaki Hasegawa; Tsutomu Omine, all of Katsuta; Hideki Takayama, and Masayuki Tamasaku, both of Kokubunji, all of Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed Jan. 3, 1989, Ser. No. 292,962
Claims priority, application Japan, Jul. 1, 1988, 63-26473
Term of patent 14 years
U.S. Cl. D18—13



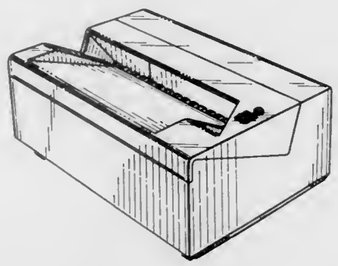
319,655
LASER BEAM PRINTER
Hiroyuki Tokuda, Yokohama, and Masaaki Sakai, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1989, Ser. No. 296,759
Claims priority, application Japan, Jul. 13, 1988, 63-28135
Term of patent 14 years
U.S. Cl. D18—13



319,656
LASER BEAM PRINTER
Naoki Tashiro, Tokyo; Hiroyuki Tokuda, Yokohama, and Masaaki Sakai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 23, 1989, Ser. No. 299,526
Claims priority, application Japan, Jul. 22, 1988, 63-29344
Term of patent 14 years
U.S. Cl. D18—13



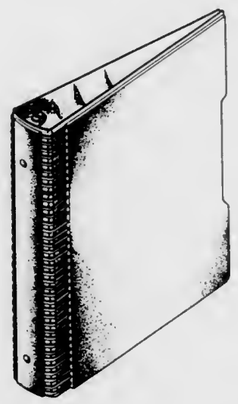
319,657
DOCUMENT SHREDDER
Carl Yurdin, Port Washington, N.Y., assignor to Oztec Business Machines, Inc., Port Washington, N.Y.
Filed Oct. 19, 1988, Ser. No. 260,355
Term of patent 14 years
U.S. Cl. D18—34



319,658
TONER CONTAINER FOR PHOTO-COPIER
Ei Yamamoto, and Yutaka Ban, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 418,469
Claims priority, application Japan, Apr. 13, 1989, 1-13761
Term of patent 14 years
U.S. Cl. D18—43

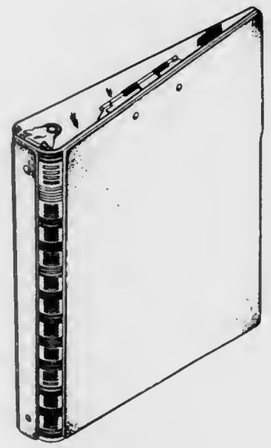


319,659
BINDER
Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 252,970, Sep. 22, 1988, Pat. No. Des. 313,619, which is a continuation-in-part of Ser. No. 231,559, Aug. 12, 1988, Pat. No. 4,856,817. This application Apr. 21, 1989, Ser. No. 341,327
Term of patent 14 years
U.S. Cl. D19—27





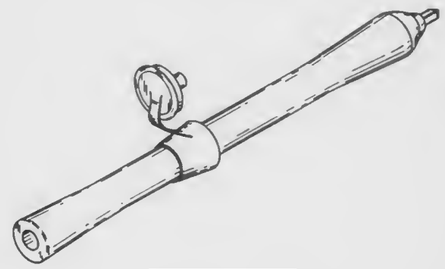
319,660
LOOSE LEAF BINDER
Marc L. Moor, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 341,327, Apr. 21, 1989, which is a continuation-in-part of Ser. No. 252,970, Sep. 22, 1988, Pat. No. Des. 313,619, which is a continuation-in-part of Ser. No. 231,559, Aug. 12, 1988, Pat. No. 4,856,817. This application Apr. 28, 1989, Ser. No. 344,942
Term of patent 14 years
U.S. Cl. D19—27



319,661
RECORDING PEN
Toshio Kimura, and Shigenobu Miyamoto, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan
Filed Dec. 28, 1988, Ser. No. 291,193
Term of patent 14 years
U.S. Cl. D19—41



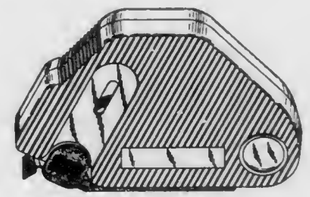
319,662
COMBINED WRITING INSTRUMENT AND ADJUSTABLE CAP THEREFOR
Rohan Henry, 51 Carey Ave., Apt. #G-2, Watertown, Mass. 02172
Filed Dec. 30, 1988, Ser. No. 291,989
Term of patent 14 years
U.S. Cl. D19—43



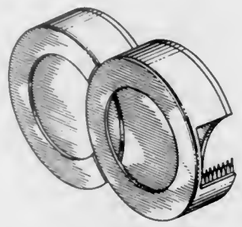
319,663
DESIGN FOR A PEN
Kazunori Katami, Tokyo, Japan, assignor to Tombow Pencil Co. Ltd., Tokyo, Japan
Filed Mar. 20, 1989, Ser. No. 326,869
Term of patent 14 years
U.S. Cl. D19—51



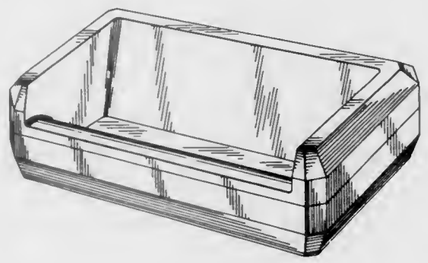
319,664
ADHESIVE STRIP APPLICATOR CASSETTE
Michele De Lucchi, Milan, Italy, assignor to Pelikan AG, Hanover, Fed. Rep. of Germany
Filed May 3, 1988, Ser. No. 189,576
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1987, 82MR2930
Term of patent 14 years
U.S. Cl. D19—69



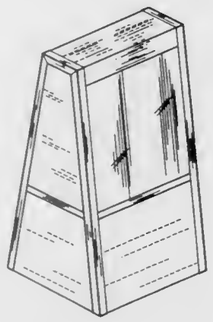
319,665
WALL-MOUNTABLE TAPE DISPENSER
Jerrilyn C. Kiyokane, Seal Beach, Calif., assignor to Namkung Promotions, Inc., Costa Mesa, Calif.
Filed Nov. 7, 1988, Ser. No. 267,771
Term of patent 14 years
U.S. Cl. D19—69



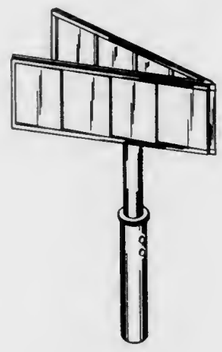
319,666
BUSINESS CARD HOLDER
Heng G. Kheng, Singapore, Singapore, assignor to Metro Plastic Industry Pte. Ltd., Singapore, Singapore
Filed Jun. 2, 1988, Ser. No. 201,623
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D19—75



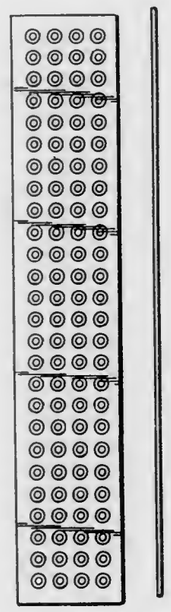
319,667
PORTABLE DISPLAY SIGN
William J. Gray, 4857 S. Braden, #3E, Tulsa, Okla. 74135
Filed Jan. 27, 1988, Ser. No. 149,692
Term of patent 14 years
U.S. Cl. D20—10



319,668
ROTATABLE SIGN
Francis N. Hector, Sr., P.O. Box 81024, Las Vegas, Nev. 89180
Filed Oct. 30, 1989, Ser. No. 428,645
Term of patent 14 years
U.S. Cl. D20—21

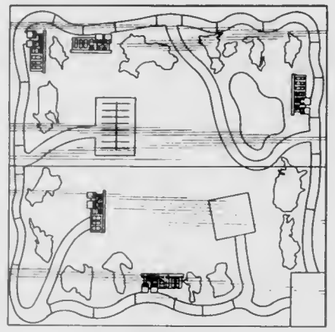


319,669
MEDICINE RECORD STRIP
Richard E. Kronberg, 4646 Bryant Ave. North, Minneapolis, Minn. 55412
Filed Mar. 27, 1989, Ser. No. 329,080
Term of patent 14 years
U.S. Cl. D20—22

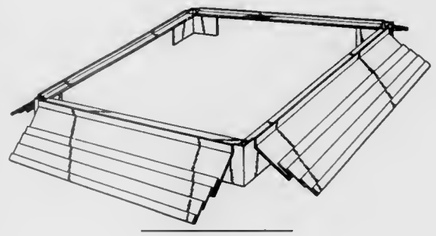




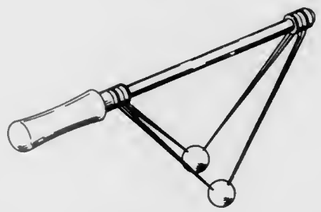
319,670
GAME BOARD
Lisa Wagner, and Jacqueline Wagner, both of 4492 Sunderland, Flint, Mich. 48507
Filed Dec. 2, 1988, Ser. No. 278,933
Term of patent 14 years
U.S. Cl. D21—31



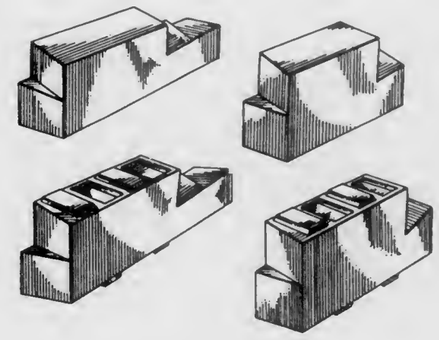
319,671
COMBINED CARDHOLDER AND GAMEBOARD SUPPORT ASSEMBLY
Edmond H. Lim, and Delores S. Middleton, both of El Cerrito, Calif., assignors to Limardee Enterprises, Ltd., El Cerrito, Calif.
Division of Ser. No. 49,077, May 12, 1987, Pat. No. Des. 312,101. This application Aug. 17, 1990, Ser. No. 569,346
Term of patent 14 years
U.S. Cl. D21—55



319,672
COLLIDING BALL TOY
Larry E. Blecha, 2834 Old Mill Way, Crestveiw, Fla. 32536
Filed Dec. 9, 1988, Ser. No. 281,795
Term of patent 14 years
U.S. Cl. D21—62



319,673
TOY BUILDING BLOCK
John F. Lewis, P.O. Box 363, Quebec, Canada J0P 1J0
Filed Sep. 21, 1989, Ser. No. 410,533
Claims priority, application Canada, Mar. 22, 1989, 22-03-89-13
Term of patent 14 years
U.S. Cl. D21—108



319,674
DOLL
Melvin S. Johnson, Medford, Mass., assignor to DollTECH Corp., Arlington, Mass.
Filed May 13, 1987, Ser. No. 49,096
Term of patent 14 years
U.S. Cl. D21—171

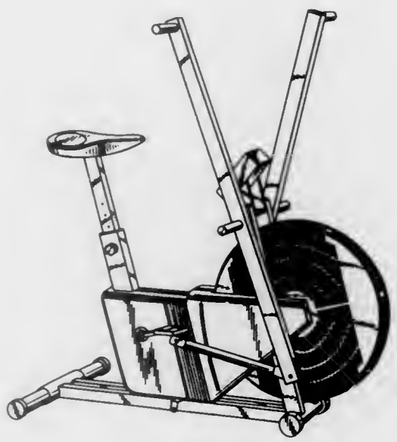


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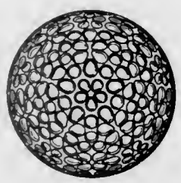
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319,675
CYCLE EXERCISER
Michael R. Byrd, Opelika; James F. Lucas, Auburn, and Bruce F. Coody, Opelika, all of Ala., assignors to Diversified Products Corporation, Opelika, Ala.
Filed Oct. 12, 1989, Ser. No. 420,218
Term of patent 14 years
U.S. Cl. D21—194



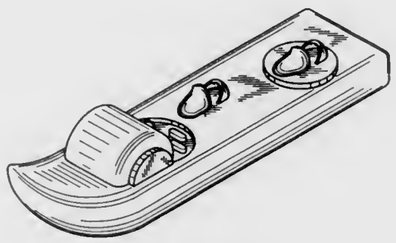
319,676
GOLF BALL
Keisuke Ihara, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 10, 1988, Ser. No. 269,933
Claims priority, application Japan, May 27, 1988, 63-20690
Term of patent 14 years
U.S. Cl. D21—205



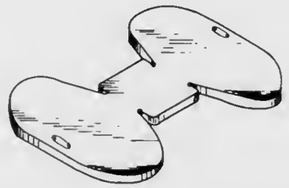
319,677
GOLF GRIP COVER
William G. Rendall, Jr., 69180 Victoria #5, Cathedral City, Calif. 92234
Filed Apr. 10, 1989, Ser. No. 335,526
Term of patent 14 years
U.S. Cl. D21—221



319,678
WINTER/SUMMER SKI
Kenneth W. Loverme, 5 Winsor St., Jamestown, N.Y. 14701
Filed Sep. 5, 1989, Ser. No. 402,425
Term of patent 14 years
U.S. Cl. D21—228

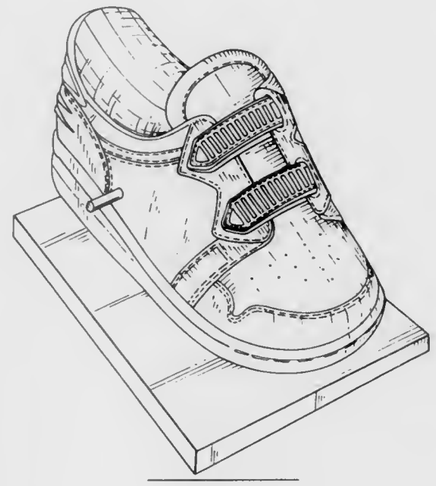


319,679
FLOAT
Eugene M. Haley, 1715 Pleasant View Dr., Fairview Heights, Mo. 62208
Filed Nov. 15, 1989, Ser. No. 437,495
Term of patent 14 years
U.S. Cl. D21—237





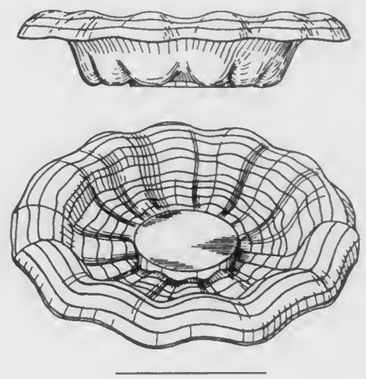
319,680
AMUSEMENT RIDE
Gerard Reda, Plainview, N.Y., assignor to Toddler University Inc., Westport, Conn.
Filed Jan. 3, 1989, Ser. No. 293,472
Term of patent 14 years
U.S. Cl. D21—247



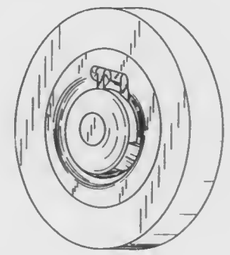
319,681
FISHING NET
Alfred Mengo, Kenosha, Wis., assignor to Mengo Industries, Inc., Kenosha, Wis.
Continuation of Ser. No. 111,529, Oct. 22, 1987, abandoned.
This application Oct. 12, 1990, Ser. No. 597,291
Term of patent 14 years
U.S. Cl. D22—135



319,682
BOWL FOR A FOUNTAIN
Robert R. Sharp, Seminole, and Jack A. Sharp, St. Petersburg, both of Fla., assignors to Pinellas Cast Stone, Inc., Largo, Fla.
Filed Nov. 14, 1988, Ser. No. 270,292
Term of patent 14 years
U.S. Cl. D23—201



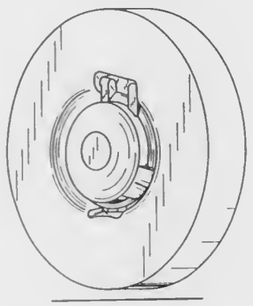
319,683
CHECK VALVE
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170
Filed Jun. 15, 1987, Ser. No. 62,047
The portion of the term of this patent subsequent to Sep. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—237



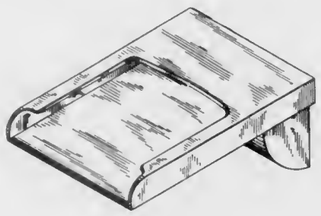
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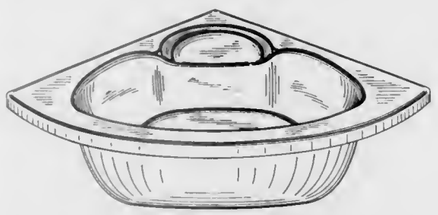
319,684
SWING CHECK VALVE
John P. Scaramucci, 10724 Woodridden, Oklahoma City, Okla. 73170
Continuation-in-part of Ser. No. 49,383, May 13, 1987, Pat. No. 4,809,738. This application Jun. 15, 1987, Ser. No. 62,048
The portion of the term of this patent subsequent to Sep. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—237



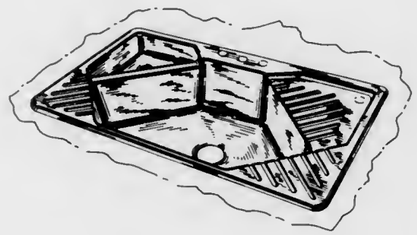
319,685
SPOUT
Herbert V. Kohler, Jr., Kohler; Alan D. Bengtson, Sheboygan; Thomas E. Gaffney, Sheboygan, and Mary J. Reid, Sheboygan, all of Wis., assignors to Kohler Co., Kohler, Wis.
Continuation-in-part of Ser. No. 130,842, Dec. 9, 1987, Pat. No. Des. 312,681. This application Dec. 20, 1988, Ser. No. 288,043
Term of patent 14 years
U.S. Cl. D23—255



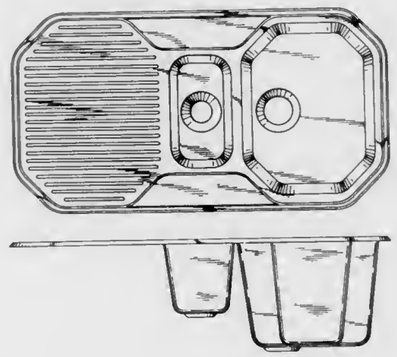
319,686
BATHTUB
Robin Levien, London, England, assignor to American Standard Inc., New York, N.Y.
Filed May 24, 1989, Ser. No. 356,718
Term of patent 14 years
U.S. Cl. D23--281



319,687
SINK
Herbert V. Kohler, Jr., and Bruce M. Sauter, both of Kohler, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 12, 1988, Ser. No. 144,435
Term of patent 14 years
U.S. Cl. D23—287

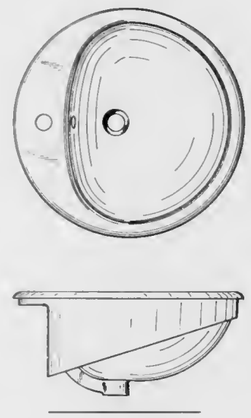


319,688
SINK
Karl-Heinz Jung, Münsingen-Dottingen, and Manfred Mück, Kürnbach, both of Fed. Rep. of Germany, assignors to Blanco GmbH & Co. KG, Oberderdingen, Fed. Rep. of Germany
Filed Mar. 17, 1988, Ser. No. 169,350
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 10 AR 158/87
Term of patent 14 years
U.S. Cl. D23—287

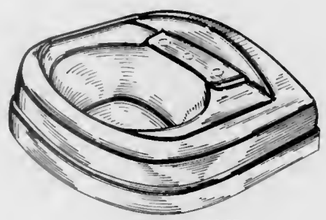




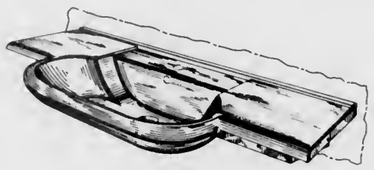
319,689
LAVATORY
Robin Levien, London, England, assignor to American Standard Inc., New York, N.Y.
Filed May 20, 1988, Ser. No. 196,511
Claims priority, application United Kingdom, Nov. 20, 1987, 1046476
Term of patent 14 years
U.S. Cl. D23—294



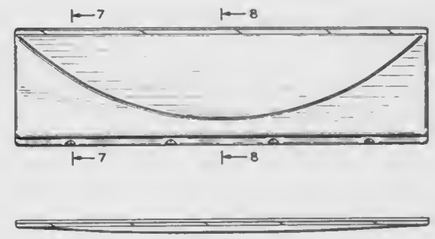
319,690
LAVATORY
Mary J. Reid, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jul. 1, 1988, Ser. No. 214,709
Term of patent 14 years
U.S. Cl. D23—294



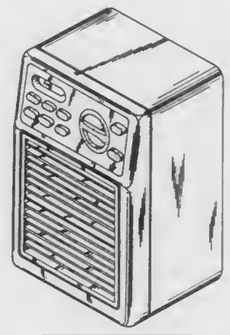
319,691
LAVATORY
Roger J. Yvetot, Conflans Saint Honorine, France, assignor to Jacob Delafon, Paris, France
Filed Nov. 6, 1989, Ser. No. 433,086
Term of patent 14 years
U.S. Cl. D23—294



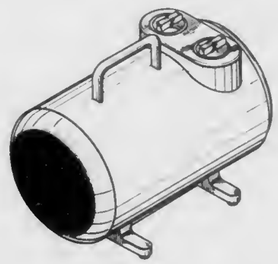
319,692
APRON FOR A BATHTUB OR THE LIKE
Henry M. Stairs, Jr., Ligonier, Pa., assignor to American Standard Inc., New York, N.Y.
Filed Mar. 1, 1989, Ser. No. 317,695
Term of patent 14 years
U.S. Cl. D23—306




319,693
ELECTRIC HEATER
Wen T. Lee, Tainan, Taiwan, assignor to Chao-Yang Electric Manufacturing Co. Ltd., Tainan, Taiwan
Filed Apr. 14, 1989, Ser. No. 337,543
Term of patent 14 years
U.S. Cl. D23—335



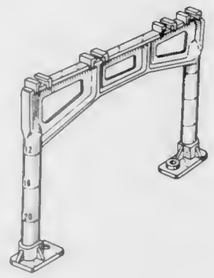
319,694
FAN HEATER
Brent J. Wortham, Pasadena, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.
Filed Aug. 6, 1990, Ser. No. 562,953
Term of patent 14 years
U.S. Cl. D23—336



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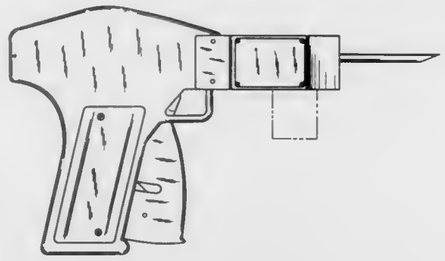
319,695
MOUNTING STAND FOR SUSPENSION OF A PIECE OF AIR CONDITIONING EQUIPMENT AT A UNIFORM HEIGHT ABOVE A FLAT HORIZONTAL ROOF
Robert G. Johnston, Jr., 323-B N. Federal Hwy., Boynton Beach, Fla. 33435
Filed Sep. 26, 1989, Ser. No. 412,392
Term of patent 14 years
U.S. Cl. D23—354



319,696
DENTAL INSTRUMENT HANDLE
Wendell Guthrie, Missoula, Mont., assignor to Hu-Friedy Mfg. Co., Inc., Chicago, Ill.
Filed Jun. 22, 1989, Ser. No. 369,924
Term of patent 14 years
U.S. Cl. D24—154



319,697
VETERINARY PELLET IMPLANTER
Gordon E. Prindle, Schaumburg, and Thomas J. Kelm, Forest Park, both of Ill., assignors to Ideal Instruments, Inc., Chicago, Ill.
Filed Feb. 25, 1988, Ser. No. 160,090
Term of patent 14 years
U.S. Cl. D24—113



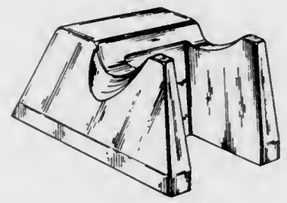
319,698
MEDICINAL LIQUID STORAGE CONTAINER
Tetsuya Arioka, Tokyo; Toshiaki Takagi, and Masato Nishimura, both of Fujinomiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 9, 1989, Ser. No. 295,158
Claims priority, application Japan, Jul. 22, 1988, 63-29524
Term of patent 14 years
U.S. Cl. D24—117



319,699
COMBINED DOUCHE CONTAINER AND NOZZLE
Walter B. Dunning, Pleasanton, Calif., assignor to Tambrands, Inc., Palmer, Mass.
Filed Oct. 5, 1988, Ser. No. 254,291
Term of patent 14 years
U.S. Cl. D24—115

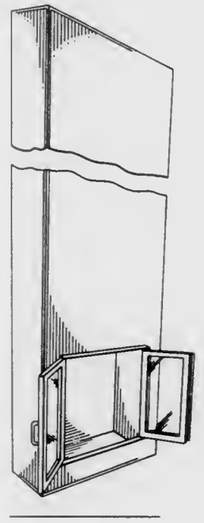


319,700
SPINAL SUPPORT CHEST BOLSTER
Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291
Filed Oct. 31, 1988, Ser. No. 264,683
Term of patent 14 years
U.S. Cl. D24—183

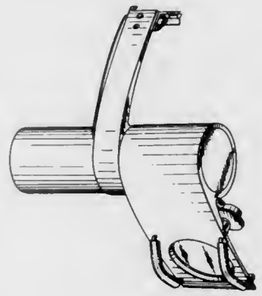




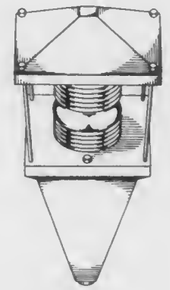
319,701
FOOD DELIVERY CONVEYOR MODULE FOR DRIVE-IN RESTAURANTS
Edward F. Bavis, 201 Grandin Rd., Maineville, Ohio 45039
Division of Ser. No. 83,089, Aug. 10, 1987. This application Sep. 25, 1990, Ser. No. 588,303
Term of patent 14 years
U.S. Cl. D25—52



319,702
ADJUSTABLE LIGHTING FIXTURE
Kenneth Kane, Southport, Conn., assignor to Lighting Services, Inc., Stony Point, N.Y.
Filed Jul. 28, 1989, Ser. No. 386,132
Term of patent 14 years
U.S. Cl. D26—63



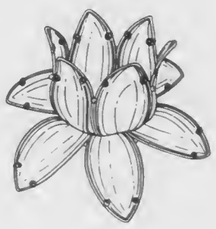
319,703
EXTERIOR LIGHTING FIXTURE
Kevork P. Hazerjian, West Roxbury, Mass., and Amos Levitt, South Orange, N.J., assignors to Sturdy Lantern Mfg. Co., Inc., North Attleboro, Mass.
Filed Aug. 31, 1989, Ser. No. 400,973
Term of patent 14 years
U.S. Cl. D26—67



319,704
TABLE LAMP
Franca Miserendino, Rome, Italy, assignor to Cil Italia S.R.L., Rome, Italy
Filed Jun. 15, 1989, Ser. No. 367,093
Claims priority, application Italy, Dec. 20, 1988, 36082/88[U]
Term of patent 14 years
U.S. Cl. D26—107



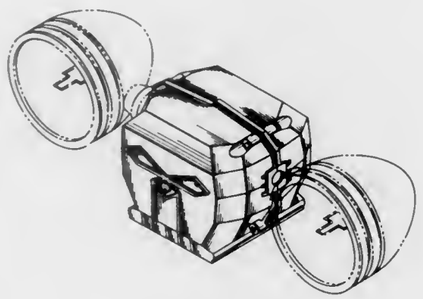
319,705
LAMP SHADE
C. T. Tsai, 102, Hwa An Street, Chung Ho City, Taipei Shien, Taiwan
Filed Jul. 24, 1989, Ser. No. 383,571
Term of patent 14 years
U.S. Cl. D26—127



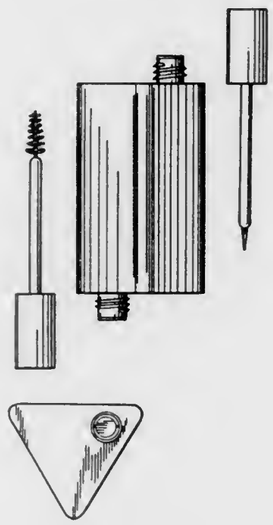
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319,706
WEATHERPROOF HOUSING FOR A REMOTELY CONTROLLED ADJUSTABLE SPOTLIGHT SYSTEM
Danny C. Jones, Clifton, Tex., assignor to Star Beam Inc., Dallas, Tex.
Filed May 2, 1988, Ser. No. 189,601
Term of patent 14 years
U.S. Cl. D26—140



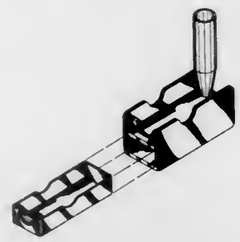
319,708
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, Brooklyn, N.Y., assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 329,500, Mar. 28, 1989, Pat. No. Des. 307,336, which is a division of Ser. No. 730,448, May 25, 1985, abandoned. This application Aug. 23, 1989, Ser. No. 397,300
Term of patent 14 years
U.S. Cl. D28—7



319,709
COMBINED SAFETY RAZOR HANDLE AND DISPENSER
Denis P. Drahus, Hvalstad, Norway, assignor to BTI, Inc Columbus, Ga.
Filed Dec. 13, 1989, Ser. No. 449,742
Term of patent 14 years
U.S. Cl. D28—46

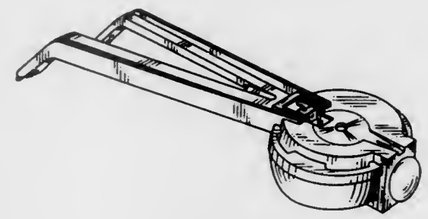


319,707
CIGARETTE ASHBIN
Shing-Hwei Hwang, No. 13, Lane 42, Kan Chou St., Taipei, Taiwan
Filed Sep. 10, 1990, Ser. No. 579,391
Term of patent 14 years
U.S. Cl. D27—102





319,710
DENTAL FLOSS TOOL
Moises B. Lorenzana, 601 Lake Hinsdale Dr.-Unit 310F, Willowbrook, Ill. 60559, and Vance A. Lorenzana, 698 Spring Hill Cir., Naperville, Ill. 60540
Filed Jul. 26, 1990, Ser. No. 559,558
Term of patent 14 years
U.S. Cl. D28—64



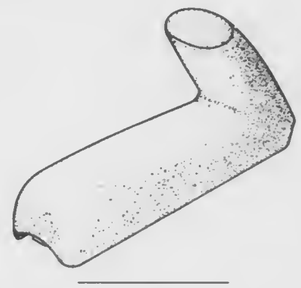
319,711
ELECTRIC SHAVER FOR VIBRISSAE AND CAP THEREFOR
Hiroshi Fujisawa, Sakura, Japan, assignor to Kabushiki Kaisha Kawasaki Seiki Seisakusho, Tokyo, Japan
Filed May 2, 1989, Ser. No. 346,756
Term of patent 14 years
U.S. Cl. D28—50



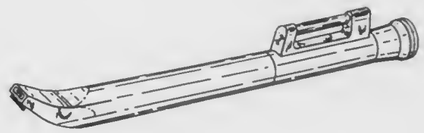
319,712
HAIR CLIPPER
Carol J. Nikolaus, 2825A N. 52 St., Milwaukee, Wis. 53210
Filed May 1, 1987, Ser. No. 46,052
Term of patent 14 years
U.S. Cl. D28—53



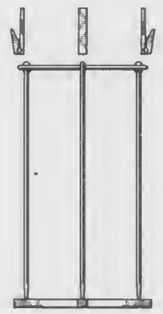
319,713
HOOF BUFFER
Leslie Emery, 1901 SW. Childs Rd., Lake Oswego, Oreg. 97034
Filed Oct. 26, 1987, Ser. No. 112,432
Term of patent 14 years
U.S. Cl. D30—159



319,714
PORTABLE BLOWER
Martin P. Gierke, Baltimore; Jonathan L. Miner, Timonium, and Vernon R. Lacher, Fallston, all of Md., assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 13, 1987, Ser. No. 120,001
The portion of the term of this patent subsequent to Aug. 13, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—15



319,715
TRASH BAG SUPPORT
Elmore P. Omdahl, 3110 Chapel La., Rapid City, S. Dak. 57702
Filed Dec. 7, 1989, Ser. No. 446,404
Term of patent 14 years
U.S. Cl. D34—5



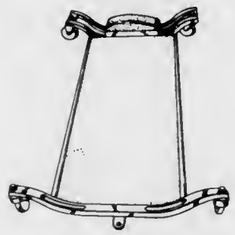
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319,716
**QUALITY CONTROL DISPLAY DECK**
Thomas E. Addison, Racine, Wis., assignor to Qualtech of Racine, Inc., Racine, Wis.
Filed Nov. 13, 1989, Ser. No. 434,165
Term of patent 14 years
U.S. Cl. D34—21



319,717
**AUTO MECHANIC'S CREEPER**
Thorston Schultz, 374 W. 8th St., San Pedro, Calif. 90731
Filed Nov. 27, 1989, Ser. No. 441,428
Term of patent 14 years
U.S. Cl. D34—23



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 3RD DAY OF SEPTEMBER, 1991

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Abiven, Jacques; and Ramel, Gilles, to L'Etat Francais represente par le Ministre des Postes, des Telecommunications et de l'Espace (Centre d'Etudes des Telecommunications). Synchronization method and synchronization recovery devices for half-duplex communication. 5,046,074, Cl. 375-111.000.

Abo, Toshimi; Fujishiro, Takeshi; and Oshiage, Katsunori, to Nissan Motor Company, Limited. Slip suppressive drive control system for automotive vehicle with reduction of power output of internal combustion engine. 5,046,009, Cl. 364-426.020.

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Abrahamson, Gerald R.; and Duwell, Ernest J., to Minnesota Mining and Manufacturing Company. Method of making rotary brush with removable brush elements. 5,045,091, Cl. 51-293.000.

Abu-Shumays, Ibrahim K.; and Abu-Shumays, Mary D. Slidable sun visors for automobiles. 5,044,687, Cl. 296-97.110.

Abu-Shumays, Mary D.: *See*—
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Acenbrack, Donald F. Retractable horizontal conveyance shade apparatus. 5,044,686, Cl. 296-97.700.

Ackeret, Peter, to Licinvest AG. Device for the cyclic rearrangement of a pile of rectangular or square sheets. 5,044,101, Cl. 40-511.000.

Ackerman, Myron H. Crease resistant interliner and method of making the same. 5,044,013, Cl. 2-144.000.

Acoustic Imaging Technologies Corporation: *See*—
Kopel, Leroy A.; and Plank, Randy G., 5,044,053, Cl. 29-25.350.

Ad-Tech Medical Instrument Corporation: *See*—
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Adachi, Kazuo, to NEC Corporation. Masterslice integrated circuit device having an improved wiring structure. 5,046,160, Cl. 357-68.000.

Adachi, Naotomo: *See*—
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Adachi, Nobuyuki, to Fuji Photo Film Co., Ltd. Process for preparing substrate of optical disc. 5,045,438, Cl. 430-321.000.

Adair, William A., to Teledyne Industries, Inc. Method and means of notching sheets. 5,044,082, Cl. 30-476.000.

Adams, Charles, Jr.: *See*—
Pfeffer, Henry A.; and Adams, Charles, Jr., 5,045,296, Cl. 423-415.00P.

Adams, Diane L.; Ehrhart, Wendell A.; and Jones, Donald, to Armstrong World Industries, Inc. Water-borne, alkali-developable, photoresist coating compositions and their preparation. 5,045,435, Cl. 430-288.000.

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Ahlgren, Frederic F.; Davenport, John M.; Hansler, Richard L.; and Karikas, John J., to General Electric Company. Tungsten-halogen incandescent and metal vapor discharge lamps and processes of making such. 5,045,748, Cl. 313-113.000.

Ahlgren, William L., to Santa Barbara Research Center. Quaternary II-VI materials for photonics. 5,045,897, Cl. 357-17.000.

AIDA Engineering Ltd.: *See*—
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Aizawa, Tokushi, to Cybernet Co., Ltd. Cutting apparatus. 5,044,243, Cl. 83-558.000.

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Andoe, Inc.: *See—*
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Barker, Barbara A.; Edel, Thomas R.; and Stark, Jeffrey A., to International Business Machines Corporation. Method for accessing selected windows in a multi-tasking system. 5,046,001, Cl. 364-200.000.

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Bartman, David A.; Giuseppetti, Emilio J.; and Pease, Donald L., to Xerox Corporation. Fuser system utilizing a reciprocating pressure web. 5,046,146, Cl. 219-216.000.

Bartmann, Ekkehard; Hittich, Reinhard; Kurmeier, Hans-Adolf; Poetsch, Eike; and Plach, Herbert, to Merck Patent Gesellschaft mit beschrankter Haftung. Difluoromethylene compounds. 5,045,229, Cl. 252-299.010.

Barton, John A.; and Ricles, Thomas D., to Dresser Industries, Inc. Perforating gun pressure bleed device. 5,044,388, Cl. 137-15.000.

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Becker, Ruth M.; and Edmondson, Sherburne M., Jr., to Sequoia-Turner Corporation (Unipath). Semi-automatic process for white cell differential count. 5,045,474, Cl. 436-63.000.

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Ohmura, Keiichi; Yamanaka, Miko; Fudanoki, Fumio; Tendoh, Masayuki; Hirashima, Kenji; Kobayashi, Masaaki; Shibata, Shinji; Sugino, Tomoyuki; Takada, Toshihiro; Nishizawa, Yoshio; and Kasahara, Akihiko, 5,045,404, Cl. 428-606.000.

Fuji Kiko Co., Ltd.: *See—*
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Fuji Koki Mfg. Co. Ltd.: *See—*
Tanaka, Hazime; and Watanabe, Kazuhiko, 5,044,551, Cl. 236-92.00B.

Fuji Machine Mfg. Co., Ltd.: *See—*
Asai, Koichi; Tsuda, Mamoru; Muto, Yasuo; and Kodama, Jiro, 5,044,069, Cl. 29-740.000.

Fuji Oil Company, Limited: *See—*
Kuwabara, Yuji; Hidaka, Hiroshi; Asahara, Kazuhito; and Sagi, Nobuo, 5,045,243, Cl. 260-428.500.

Fuji Photo Film Co., Ltd.: *See—*
Adachi, Nobuyuki, 5,045,438, Cl. 430-321.000.
Endo, Yasushi; Kato, Mikihiko; Nagashima, Yasuo; and Yamada, Yasuyuki, 5,045,372, Cl. 428-64.000.
Funahashi, Takeshi; Shimura, Kazuo; and Nakajima, Nobuyoshi, 5,046,147, Cl. 250-327.200.
Hara, Hiroshi, 5,045,427, Cl. 430-138.000.
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Nakaya, Daisuke; and Horikawa, Hiroshi, 5,046,122, Cl. 382-56.000.
Nishino, Atsuo; and Kakei, Tsutomu, 5,045,157, Cl. 204-33.000.
Okita, Tsutomu; Nishikawa, Yasuo; Hashimoto, Hiroshi; and Watanabe, Hideomi, 5,045,351, Cl. 427-130.000.
Saito, Osamu, 5,045,925, Cl. 358-13.000.
Shibata, Norio; and Sato, Tsunehiko, 5,044,305, Cl. 118-73.000.
Shiota, Kazuo, 5,045,949, Cl. 358-244.000.
Takahashi, Kunio; Yamane, Osamu; Hori, Yasunori; and Endo, Takanori, 5,044,307, Cl. 118-325.000.
Tatsumi, Setsuji, 5,045,933, Cl. 358-80.000.
Urabe, Shigeharu, 5,045,443, Cl. 430-567.000.
Watanabe, Seiichi, 5,044,925, Cl. 425-542.000.
Yuhki, Hirokazu; Kumazawa, Sadao; Yamaguchi, Shigeru; and Ohnishi, Hiroshi, 5,044,761, Cl. 366-139.000.

Fuji Xerox Co., Ltd.: *See—*
Akutsu, Eiichi; Soga, Hiroo; Saito, Koichi; and Horie, Kiyoshi, 5,045,382, Cl. 428-216.000.
Takayanagi, Hiroshi, 5,046,166, Cl. 358-300.000.
Yamashita, Jun, 5,046,117, Cl. 382-47.000.

Fujikoki Mfg. Co., Ltd.: *See—*
Tanaka, Hazime, 5,044,170, Cl. 62-225.000.

Fujikura Ltd.: *See—*
Ikeno, Yoshimitsu; Kohno, Osamu; Goto, Kenji; Kume, Atsushi; Aoki, Shin'ya; Sadakata, Nobuyuki; Sugimoto, Masaru; Usui, Toshio; Nakagawa, Mikio; and Yamaguchi, Taichi, 5,045,527, Cl. 505-1.000.
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Fujimori, Yoshihiko; and Hirose, Keiichi, to Nikon Corporation. Pattern inspection apparatus. 5,046,109, Cl. 382-8.000.

Fujimoto, Masatoshi: *See—*
Souda, Shigeru; Ueda, Norihiro; Miyazawa, Shuhei; Tagami, Katsuya; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Fujimoto, Masatoshi; Murakami, Manabu; Oketani, Kiyoshi; Fujisaki, Hideaki; Shibata, Hisashi; and Wakabayashi, Tsuneo, 5,045,552, Cl. 514-338.000.

Fujimoto, Takenobu; Fujiwara, Michinobu; and Sakaiya, Naoto, to Aderans Co., Ltd. Blind washing apparatus. 5,044,036, Cl. 15-88.100.

Fujimoto, Yoshiaki: *See—*
Hidaka, Sachio; and Fujimoto, Yoshiaki, 5,044,608, Cl. 254-266.000.

Fujio, Kazuyoshi: *See—*
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Fujisaki, Hideaki: *See—*
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Fujishiro, Takeshi: *See—*
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Fujitani, Takashi, to Kabushiki Kaisha Gakushu Kenkyusha. Air-cushion vehicle toy. 5,045,013, Cl. 446-179.000.

Fujitsu Limited: *See—*
Hayashi, Hajime; Igarashi, Yutaka; Hayashi, Takehiko; Goto, Takao; and Amemiya, Shinichi, 5,045,788, Cl. 324-248.000.
Higuchi, Mamoru; and Kaneko, Yoshihiro, 5,046,181, Cl. 370-58.100.
Kodama, Toshirou; Kawai, Satoru; Nasu, Yasuhiro; Takagi, Nobuyoshi; and Yanagisawa, Shintaro, 5,045,487, Cl. 437-41.000.
Morishita, Kazumasa; Aihara, Yoshitada; Komura, Yoshihisa; Miyajima, Masaaki; and Suzuki, Minoru, 5,046,012, Cl. 364-468.000.
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Kawabata, Kazunobu, to Nissan Motor Company, Limited. Active suspension system with enhanced suspension control characteristics at on/off transition of suspension control. 5,044,662, Cl. 280-707.000.

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Elbe, Hans-Ludwig; Marhold, Albrecht; Lurssen, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Krauskopf, Birgit, 5,045,108, Cl. 71-94.000.
Fischer, Reiner; Baasner, Bernd; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Schaller, Klaus; and Strang, Harry, 5,045,560, Cl. 514-425.000.

Luttropp, Hans-Henrik: *See—*
Werner, Olof; Luttropp, Hans-Henrik; Thomasson, Ronnie; and Psaros, Georgios, 5,044,361, Cl. 128-204.160.

Lutz, Henning: *See—*
Kopsch, Reiner; Lutz, Henning; and Gosswein, Claus, 5,045,334, Cl. 426-422.000.

Lyman, Walter G.; and Heibel, Michael D., to Westinghouse Electric Corp. Fluid temperature balancing system. 5,045,272, Cl. 376-211.000.

Lynch, Bobby R.; and Lynch, Robert L., to TRI-L Manufacturing, Inc. Farm implement attaching fitment. 5,044,448, Cl. 172-272.000.

Lynch, Robert L.: *See—*
Lynch, Bobby R.; and Lynch, Robert L., 5,044,448, Cl. 172-272.000.

Lynxvale - Cril Partnership, The: *See—*
Duffett-Smith, Peter J., 5,045,861, Cl. 342-457.000.

Lyons, H. Wayne, to Whelen Technologies, Inc. Wide angle warning light. 5,045,982, Cl. 362-241.000.





M.B.O. Binder and Company of America: *See—*
Roberts, Randall J., 5,044,617, Cl. 270-45.000.

Ma, Zhonglin: *See—*
Ye, Biqing; and Ma, Zhonglin, 5,045,759, Cl. 315-171.000.

MaCarthur, Charles D.: *See—*
Noel, Bruce W.; Borella, Henry M.; Cates, Michael R.; Turley, W. Dale; MaCarthur, Charles D.; and Cala, Gregory C., 5,044,765, Cl. 374-29.000.

MacDonald, Robert I., to Alberta Telecommunications Research Centre. Tapered fibre sensor. 5,044,723, Cl. 385-12.000.

MacDonald, Russell J., to Ionics, Incorporated. Acid efficient membrane for use in electrodialysis for recovery of acid. 5,045,171, Cl. 204-296.000.

MacEachern, Anita M.: *See—*
Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, 5,045,563, Cl. 514-444.000.

Machek, John A., to Lincoln. Grease gun cartridge adapter. 5,044,471, Cl. 184-105.200.

Macier, James E.: *See—*
Binversie, Gregory J.; Capodarco, Joseph E.; and Macier, James E., 5,044,599, Cl. 248-640.000.

Mack, Gerhard; and Pawlowski, Georg, to Hoechst Aktiengesellschaft. Light-sensitive photopolymerizable and diazonium resin containing composition and recording material including reaction product of anhydride with carboxylic acid and vinyl alcohol. 5,045,429, Cl. 430-175.000.

MacManus, Daniel C., to Delco Electronics Corporation. Encapsulated armature and shaft assembly. 5,046,154, Cl. 324-146.000.

Madison, Stephen A.: *See—*
Batal, David J.; and Madison, Stephen A., 5,045,223, Cl. 252-102.000.

Maeda, Kenji: *See—*
Hirotsu, Takashi; Mori, Yukiyasu; Tsuji, Hiroshi; Sugiyama, Tatsuo; Watanabe, Yoshihiro; and Maeda, Kenji, 5,045,101, Cl. 65-106.000.

Macda, Mitsuru; Hakiri, Minoru; Hasebe, Kazuhiro; Kobayashi, Masaaki; and Sugiyama, Hiroki, to Ricoh Company, Ltd. Thermosensitive image transfer recording medium. 5,045,383, Cl. 428-216.000.

Magainin Sciences Inc.: *See—*
Berkowitz, Barry; Jacob, Leonard S.; and Zasloff, Michael A., 5,045,531, Cl. 514-12.000.

Magellan Corporation (Aust.) Pty. Ltd.: *See—*
Brooks, David R., 5,045,770, Cl. 323-223.000.

Magnani, Charles F., to Chevron Research and Technology Company. Steam injection profiling with unstable radioactive isotopes. 5,044,436, Cl. 166-247.000.

Magnavox Government and Industrial Electronics Company: *See—*
Wanous, Richard E., 5,046,031, Cl. 364-571.020.

Magnetic Metals Corporation: *See—*
Frame, Charles, 5,044,237, Cl. 83-41.000.

Mahaney, John T.; and Hubben, Edward B., to Pass & Seymour, Inc. Deformable mounting strap for wiring device. 5,044,983, Cl. 439-539.000.

Maher, Robert J.: *See—*
Cox, Kenneth A.; and Maher, Robert J., 5,046,111, Cl. 382-8.000.

Maier, Ulrich: *See—*
Raff, Friedrich; and Maier, Ulrich, 5,044,220, Cl. 74-473.00R.

Maierson, Theodore; Mowry, William H., Jr.; and Potter, Dianne M., to Standard Register Company, The. Toner adhesion-enhancing coating for security documents. 5,045,426, Cl. 430-126.000.

Maimon, Jonathan: *See—*
Schneider, Bruce; Greenwald, Robert A.; Maimon, Jonathan; Gorray, Kenneth; Golub, Lorne M.; McNamara, Thomas F.; and Ramamurthy, Nangavarum S., 5,045,538, Cl. 514-152.000.

Mains, Charles A.: *See—*
Bojas, Edward J.; Campbell, Lester R., Jr.; Williams, Lawrence H., Jr.; and Mains, Charles A., 5,044,477, Cl. 192-3.290.

Majdecki, Scott A.: *See—*
Smith, David W.; and Majdecki, Scott A., 5,046,024, Cl. 364-518.000.

Maki, Voldi E., Jr., to Halliburton Logging Services, Inc. Focused planar transducer. 5,044,462, Cl. 181-103.000.

Makino, Tadashi; Tabata, Tetsuro; and Hirai, Shin-ichiro, to Takeda Chemical Industries, Ltd. Stabilized pharmaceutical composition and its production. 5,045,321, Cl. 424-475.000.

Malamas, Michael S., to American Home Products Corporation. N'-alkyl-spiro-isoquinoline-pyrrolidine tetrones and analogs thereof useful as aldose reductase inhibitors. 5,045,544, Cl. 514-278.000.

Malbec, Edouard. Cartridge for peristaltic pump with a flexible tube, and peristaltic pump fitted with such a cartridge. 5,044,902, Cl. 417-477.000.

Mallik, Donald W., to American Bank Note Holographics, Inc. Holograms with discontinuous metallization including alpha-numeric shapes. 5,044,707, Cl. 359-2.000.

Malloy, James W.: *See—*
Dzwonczyk, Luke; Sullivan, Richard; Wesolowski, William E.; and Malloy, James W., 5,044,992, Cl. 439-608.000.

Malone, Hugh R.: *See—*
Leicht, John L.; Malone, Hugh R.; Mathews, Douglas J.; Mitzlaff, James E.; Munier, Scott D.; Oehlerking, Michele G.; and Scott, Vernon R., 5,045,820, Cl. 333-26.000.

Malosh, Edward A.: *See—*
Peelman, Paul L.; and Malosh, Edward A., 5,045,254, Cl. 264-48.000.

Malras, M. Jean-Claude: *See—*
Gosset, M. Serge; and Malras, M. Jean-Claude, 5,045,130, Cl. 148-257.000.

MAN Nutzfahrzeuge Aktiengesellschaft: *See—*
Henkel, Dietmar, 5,044,157, Cl. 60-274.000.

MAN Roland Druckmaschinen AG: *See—*
John, Thomas, 5,044,277, Cl. 101-367.000.
Schneider, Josef, 5,045,697, Cl. 250-316.100.

Mandell, Douglas E.; Todd, Craig C.; and Dressler, Roger, to Dolby Laboratories Licensing Corporation. Variable matrix decoder with three output channels. 5,046,098, Cl. 381-22.000.

Maner, Asim; and Mohr, Jurgen, to Kernforschungszentrum Karlsruhe GmbH. Process for the lithographic manufacture of electroformable microstructures having a triangular or trapezoidal cross-section. 5,045,439, Cl. 430-394.000.

Mang, Thomas, to Boehringer Mannheim GmbH. Method, apparatus and a composition for a polysaccharide-containing matrix having covalently bound haptens. 5,045,535, Cl. 514-57.000.

Mann, David W.; and Senecal, Bruce J., to Karman Rubber. Resilient motor mounting structure. 5,044,598, Cl. 248-638.000.

Manning, Kenneth G. Pull-away mud flap. 5,044,667, Cl. 280-851.000.

Manns, William G.: *See—*
Carucci, Lori A.; Weeks, Don J.; and Manns, William G., 5,046,110, Cl. 382-8.000.

Mansberger, Robert L., II: *See—*
Haley, Edmund J.; Mansberger, Robert L., II; and Weber, Robert N., 5,044,720, Cl. 385-88.000.

Mansukhani, Gul: *See—*
Glass, Michael; Bilka, Kenneth P.; Cherukuri, Subraman R.; Mansukhani, Gul; Killeen, Michael J.; and Duggan, James, 5,045,326, Cl. 426-5.000.

Mao, Robert S., to International Business Machines Corporation. Multiple input CMOS logic circuits. 5,045,723, Cl. 307-451.000.

Mara, Robert M.: *See—*
Roehrs, Daniel C.; Caruso, Angelo T.; Grace, Robert E.; Mara, Robert M.; Elliot, John G.; Saraceno, Patricia J.; and Pacer, James M., 5,045,882, Cl. 355-208.000.

Marathon Equipment Company: *See—*
Robbins, James K.; Brown, Ronald L.; and Spiers, Kent, 5,044,271, Cl. 100-53.000.

Marburger, Heinz: *See—*
Birkert, Karl; Marburger, Heinz; and Kullik, Gunter R., 5,044,263, Cl. 99-327.000.

Marchand, Gary R.: *See—*
Schell, Joseph G., Jr.; Meiske, Larry A.; and Marchand, Gary R., 5,045,612, Cl. 526-124.000.

Margulies, Edwin K., to Dialogic Corporation. Converter for in-band routing and/or origination information. 5,046,088, Cl. 379-211.000.

Marhold, Albrecht: *See—*
Elbe, Hans-Ludwig; Marhold, Albrecht; Lurssen, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Krauskopf, Birgit, 5,045,108, Cl. 71-94.000.
Fischer, Reiner; Baasner, Bernd; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Schaller, Klaus; and Strang, Harry, 5,045,560, Cl. 514-425.000.

Marianowski, Leonard G.; Petri, Randy J.; and Lawson, Mark G., to Institute of Gas Technology. Fully internal mainfolded fuel cell stack. 5,045,413, Cl. 429-13.000.

Marie, Bruno A. E.; and Teissier, Etienne M., to Adl Automation. Free transfer machine, with independent, motorized carriages and with module for orientation of such carriages. 5,044,283, Cl. 104-88.000.

Marie, Gerard; and Chantelou, Olivier, to U.S. Philips Corporation. Extended definition television transmission system. 5,046,091, Cl. 380-14.000.

Marietti, Gary J.: *See—*
Lin, Shaow B.; and Marietti, Gary J., 5,045,396, Cl. 428-412.000.

Marine Muffler Corporation: *See—*
Miles, Charles C., Jr., 5,045,005, Cl. 440-89.000.

Marino, Armando V.: *See—*
Cordingley Lowell A.; Dougherty, Lawrence W.; Kautz, Allan D.; and Marino, Armando V., 5,045,009, Cl. 445-30.000.

Marino, Charles P.: *See—*
Giatras, James L.; Kray, Kevin P.; and Marino, Charles P., 5,045,600, Cl. 525-180.000.

Marion, Louis. Machine and method for packaging folded swabs. 5,044,499, Cl. 206-438.000.

Markel Corporation: *See—*
Giatras, James L.; Kray, Kevin P.; and Marino, Charles P., 5,045,600, Cl. 525-180.000.

Marko, Kenneth A.: *See—*
James, John V.; Dosdall, James M.; and Marko, Kenneth A., 5,044,194, Cl. 73-112.000.
James, John V.; Dosdall, James M.; and Marko, Kenneth A., 5,044,195, Cl. 73-117.300.

Marlett, Everett M., to Ethyl Corporation. Preparation of metal halide-amine complexes. 5,045,244, Cl. 260-665.00G.

Marlett, Everett M., to Ethyl Corporation. Preparation of complex aluminum fluorides. 5,045,300, Cl. 423-465.000.

Marmarosi, Tamasne: *See—*
Pinter, Janos; Pal, Josefne; Kiss, Eva; Shuszler, Erzsebet; Angyan, Sandor; Pap, Laszlo; Szego, Andras; Detre, Tamas; and Marmarosi, Tamasne, 5,045,311, Cl. 424-78.000.

Marpal AG: *See—*
Degen, Hugo, 5,044,587, Cl. 248-158.000.

Marrelli, John C.: *See—*
Rutledge, Gary L., 5,044,775, Cl. 383-72.000.
Rutledge, Gary L., 5,045,042, Cl. 493-225.000.

Marri, Pietro: *See—*
Bracci, Riccardo; Catelani, Guglielmina; Fantozzi, Massimo; Grimaldi, Luigi; Marri, Pietro; and Lippi, Paolo, 5,044,628, Cl. 272-96.000.

Marschner, Frank W.; and Schebece, Frank, to Colgate-Palmolive Company. Composition that protects dyed hair from fading. 5,045,307, Cl. 424-59.000.

Martin, James R.: *See—*
Knight, Robert N., Jr., 5,044,940, Cl. 432-30.000.

Martin, Michael J.; Gibson, William C.; and Massey, Lee R., to IT-McGill Pollution Control Systems, Inc.; and Tulsa Heaters, Inc. Nitrogen oxide control using internally recirculated flue gas. 5,044,932, Cl. 431-116.000.

Martineau, Belinda M.; and McBride, Kevin E., to Calgene, Inc. DNA sequence encoding metallocarboxypeptidase inhibitor protein. 5,045,460, Cl. 435-172.300.

Martini, Alfred M.: *See—*
Ohta, Hideo; Miyamoto, Kenji; San, Wilson O. W.; and Martini, Alfred M., 5,045,642, Cl. 174-266.000.

Maruyama, Fumio; Aizawa, Shirou; and Fujiyoshi, Kazuo, to Nippon Mining Co., Ltd. Process for production of methylnaphthalenes. 5,045,178, Cl. 208-138.000.

Maruyama, Kochi: *See—*
Shindo, Yoshihiro; Kobayakawa, Masanao; and Maruyama, Kochi, 5,044,869, Cl. 414-785.000.

Maruyama, Tatsuya; and Fukuhara, Toshihiko, to Kabus..iki KaishaKomatsu Seisakusho. Method of processing image data on crack. 5,046,115, Cl. 382-22.000.

Maschinenfabrik J. Dieffenbacher GmbH & Co.: *See—*
Bielfeldt, Friedrich B., 5,044,269, Cl. 100-38.000.

Maschinenfabrik Rieter AG: *See—*
Demuth, Robert; Faas, Jurg; Brutsch, Peter; Staheli, Paul; and Konaszweski, Janusz, 5,044,045, Cl. 19-80.00R.
Schwager, Martin, 5,044,047, Cl. 19-159.00R.

Mase, Yasukazu; and Abe, Masahiro, to Kabushiki Kaisha Toshiba. Plasma chemical vapor deposition apparatus. 5,044,311, Cl. 118-723.000.

Masegi, Mitsuhiko; Sakurai, Masao; Naitou, Motoharu; Kondo, Akira; and Ota, Toshiaki, to Nippondenso Co., Ltd. Apparatus and method for determining the existence of an abnormality in a vehicle operator protection system. 5,045,835, Cl. 340-438.000.

Mashiko, Kouichi: *See—*
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,044,429, Cl. 165-104.260.

Mashimo, Satoshi; Yamaguchi, Yoshio; Takeda, Kazuhiro; and Kitahama, Koji, to Mitsuboshi Belting Ltd. Method of forming power transmission belt tensile cord. 5,045,138, Cl. 156-137.000.

Mashimo, Shinya: *See—*
Kakumaru, Hajime; Minami, Yoshitaka; Kubota, Naohiro; and Mashimo, Shinya, 5,045,433, Cl. 430-281.000.

Masiarz, Frank: *See—*
Kuo, George; Masiarz, Frank; Truett, Martha; Valenzuela, Pablo; Rasmussen, Mirella E.; Favaloro, Jennifer M.; Caput, Daniel; Burke, Rae L.; and Pachl, Carol, 5,045,455, Cl. 435-69.600.

Masini, Luisa: *See—*
Gualandris, Fabio; and Masini, Luisa, 5,045,504, Cl. 437-235.000.

Maskens, Geoffrey D.; and Doe, Brian D., to Blakell Systems Limited. Printed circuit board assembly apparatus. 5,044,062, Cl. 29-566.300.

Maskin AB Tube: *See—*
Jonasson, Karl-Jonas; Tiback, Bo; Hedberg, Lars-Ake; and Wallin, Alf, 5,044,446, Cl. 172-4.500.

Masleid, Robert P.; and Patel, Parsotam T., to International Business Machines Corp. Bit stack compatible input/output circuits. 5,045,913, Cl. 357-52.000.

Masom, Ronald A., to Smiths Industries Public Limited Company. Locking mechanism for pyrometers. 5,044,771, Cl. 374-208.000.

Mason, Richard A.; and Weidner, Archie A., to Tennant Company. Method of removing debris and dust from a carpet. 5,045,118, Cl. 134-21.000.

Massachusetts General Hospital: *See—*
Taaffe, James L.; and Kaldis, Maria, 5,046,027, Cl. 364-521.000.

Massachusetts Institute of Technology: *See—*
Edell, David J., 5,045,151, Cl. 156-647.000.
Thilly, William G.; and Keohavong, Phouthone, 5,045,450, Cl. 435-6.000.

Massey, Lee R.: *See—*
Martin, Michael J.; Gibson, William C.; and Massey, Lee R., 5,044,932, Cl. 431-116.000.

Masson, Rudy. People entertainment with hand-held sound-emitting devices. 5,045,017, Cl. 446-415.000.

Master Lock Company: *See—*
Lebrecht, Horst, 5,044,180, Cl. 70-48.000.

Mastercraft Industries, Inc.: *See—*
Goldberg, Harry, 5,045,099, Cl. 55-367.000.

Mastroianni, Joseph: *See—*
Young, John L.; Burns, David B.; and Mastroianni, Joseph, 5,044,044, Cl. 16-323.000.

Mathews, Douglas J.: *See—*
Leicht, John L.; Malone, Hugh R.; Mathews, Douglas J.; Mitzlaff, James E.; Munier, Scott D.; Oehlerking, Michele G.; and Scott, Vernon R., 5,045,820, Cl. 333-26.000.

Mathur, Veerendra K.: *See—*
Chakrabarti, Kishalaya; and Mathur, Veerendra K., 5,045,707, Cl. 250-484.100.

Matkovic, Zvonko. Foldable paint brush hook assembly. 5,044,038, Cl. 15-159.00R.

Matlock, Paul L.: *See—*
Blevins, Charles H.; Greene, George H.; Matlock, Paul L.; and Murphy, Gerald J., 5,045,571, Cl. 521-111.000.

Matson, Charles B.: *See—*
Lambert, Edward L., Jr.; Matson, Charles B.; and Vaillette, Bernard D., 5,044,125, Cl. 51-165.930.

Matsubara, Masato: *See—*
Morisawa, Satoru; and Matsubara, Masato, 5,045,892, Cl. 355-309.000.

Matsuda, Hidemi: *See—*
Itou, Takeo; Matsuda, Hidemi; Shimizu, Kazuhiko; and Tanaka, Hajime, 5,045,750, Cl. 313-466.000.

Matsuda, Masami: *See—*
Kuriyama, Osamu; Funabashi, Kiyomi; Baba, Tsutomu; Matsuda, Masami; Chino, Koichi; and Kikushi, Makoto, 5,045,241, Cl. 252-628.000.

Matsuda, Masayuki; Nishimura, Toyoharu; Takagi, Yasuji; Tanaka, Mamoru; and Norimatsu, Naoki, to Nichirin Rubber Industrial Co., Ltd.; NHK Spring Co., Ltd.; and Nissan Motor Co., Ltd. Oil cooler and process for manufacturing the same. 5,044,545, Cl. 228-183.000.

Matsuda, Takashi; and Iijima, Tatsuya, to Casio Computer Co., Ltd. Timbre setting device for an electronic musical instrument. 5,044,251, Cl. 84-615.000.

Matsuda, Takashi: *See—*
Kawai, Tatsuya; and Matsuda, Takashi, 5,045,068, Cl. 604-246.000.

Matsuda, Tatsuo: *See—*
Urushibata, Kenichi; Kojima, Keiichi; Sugawara, Kiyoto; Matsuda, Tatsuo; Saen, Haruo; Yumoto, Tetsuo; Yoshizawa, Norio; and Kanno, Tooru, 5,045,641, Cl. 174-74.00R.

Matsui, Katsuyoshi: *See—*
Toda, Yasuhiko; Hatta, Moriyuki; Okamoto, Masao; and Matsui, Katsuyoshi, 5,044,071, Cl. 29-827.000.

Matsukawa, Kazuhiro: *See—*
Amano, Hiroyuki; Hirao, Kouji; Iwasaki, Shinichiro; Matsukawa, Kazuhiro; and Takagi, Hiroyuki, 5,045,736, Cl. 310-88.000.

Matsuki, Seiichio: *See—*
Yoshida, Susumu; Morikawa, Kiyoshi; Matsuki, Seiichio; and Kamimura, Testuro, 5,046,059, Cl. 369-36.000.

Matsuki, Yumi: *See—*
Kamoi, Sumio; and Matsuki, Yumi, 5,044,733, Cl. 359-81.000.

Matsumoto, Koichi: *See—*
Yoshida, Tadashi; Hattori, Teruo; Matsumoto, Koichi; Terui, Yoshihiro; and Shoji, Junichi, 5,045,458, Cl. 435-126.000.

Matsumoto, Kuniomi; Munakata, Mikio; Ishii, Tadao; and Watanabe, Tetsuro, to Meiji Seika Kaisha Ltd. N-alkylbenzenesulfonylcarbamoyl-5-chloroisothiazole derivatives and microbicides containing the same. 5,045,555, Cl. 514-372.000.

Matsumura, Hisashi: *See—*
Ugajin, Atsushi; Matsumura, Hisashi; and Niwa, Tokuhiro, 5,046,039, Cl. 364-900.000.

Matsumura, Teruyuki: *See—*
Miyata, Mitsuto; Matsumura, Teruyuki; and Kawasumi, Masashi, 5,044,842, Cl. 409-66.000.

Matsuo, Shigeru: *See—*
Katsura, Koyo; Matsuo, Shigeru; Sato, Jun; Sone, Takashi; Yokota, Yoshikazu; and Kikuchi, Masahiko, 5,046,023, Cl. 364-518.000.

Matsuoka, Noriyuki; Kato, Yoshiyuki; and Uratsuji, Kazumi, to Yamaichi Electric Mfg. Co., Ltd. IC socket having cover with locking member. 5,044,810, Cl. 403-93.000.

Matsuoka, Noriyuki, to Yamaichi Electric Mfg. Co., Ltd. Contact structure in socket with IC carrier placed thereon. 5,045,923, Cl. 357-79.000.

Matsushita Electric Ind., Ltd.: *See—*
Kameyama, Shuichi; Kikuchi, Kazuya; Shimomura, Hiroshi; and Segawa, Mizuki, 5,045,493, Cl. 437-59.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ejima, Naoki, 5,045,956, Cl. 360-51.000.
Kurobe, Akio; Nakatsu, Hiromasa; Ikezaki, Masao; Sugino, Nobuo; and Mochida, Yosihisa, 5,046,137, Cl. 359-136.000.
Okayama, Mutsuyuki; Ochi, Atsuo; and Takeuchi, Akihiro, 5,045,939, Cl. 358-140.000.
Oshima, Yutaka; Nishizawa, Hiroshi; and Murata, Manabu, 5,046,170, Cl. 360-133.000.
Takahashi, Akira; Kaiwa, Ryoichi; and Adachi, Naotomo, 5,046,131, Cl. 455-90.000.
Tomita, Hironori; Nakamura, Tohru; Kikuchi, Noboru; and Mohri, Masanari, 5,044,729, Cl. 359-824.000.
Uomori, Kenya; Ishii, Hirofumi; and Morimura, Atsushi, 5,046,179, Cl. 364-728.030.
Watanabe, Keigo; Naka, Hiroyuki; and Ichiyanagi, Takashi, 5,045,358, Cl. 427-172.000.

Matsushita Electric Works, Ltd.: *See—*
Tatsu, Kunihiko; Torigoe, Masao; Hongo, Syoichi; and Yamamoto, Masao, 5,044,233, Cl. 81-429.000.

Matsushita, Kouji: *See—*
Yuge, Shizuo; Matsushita, Kouji; and Kawabata, Hidetoshi, 5,044,313, Cl. 118-658.000.

Matsusima Electrical Machinery Co., Ltd.: *See—*
Ako, Shigeichi; Fujio, Kazuyoshi; and Takeuchi, Shuzo, 5,044,143, Cl. 53-448.000.



Matsuura, Kazuo: *See—*
Kuroda, Nobuyuki; Kobayashi, Hiroshi; and Matsuura, Kazuo, 5,045,619, Cl. 526-301.000.

Matsuyama, Takao: *See—*
Tarui, Hisaki; Matsuyama, Takao; Nakamura, Noboru; Nakano, Shoichi; and Kuwano, Yukinori, 5,045,847, Cl. 340-783.000.

Matsuzaki, Yoriaki: *See—*
Yoshihara, Ichiro; Okuhara, Motoko; Yamamoto, Takao; Iwasawa, Naozumi; Doi, Yasuo; Ohyama, Tsukasa; Murayama, Kazuhiko; Matsuzaki, Yoriaki; Kasamatsu, Susumu; Takuma, Keisuke; and Kato, Kimitoshi, 5,045,434, Cl. 430-286.000.

Matthews, Donald W. Face pillow. 5,044,026, Cl. 5-435.000.

Matthews, Robert: *See—*
Davis, Cecil J.; Matthews, Robert; and Bowling, Robert A., 5,044,871, Cl. 414-786.000.

Mattis, Donald J.: *See—*
El-Haj, Ali; Mattis, Donald J.; and Michael, Mark, 5,044,993, Cl. 439-668.000.

Matue, Hideaki: *See—*
Watanabe, Kazuzi; Ito, Masahiko; and Matue, Hideaki, 5,046,133, Cl. 455-138.000.

Matula, David W.: *See—*
Willard, Stuart B.; and Matula, David W., 5,046,038, Cl. 364-765.000.

Matzold, Uwe: *See—*
Luber, Gunter; Heuer, Wolfgang; Messerschmdit, Rudolf; and Matzold, Uwe, 5,046,127, Cl. 455-51.000.

Maurer, Brian R., to Dow Chemical Company, The. Selective formation of methacrylimide containing polymers. 5,045,604, Cl. 525-378.000.

Maus, Wolfgang; Swars, Helmut; and Wieres, Ludwig, to Emitec Gesellschaft fur Emissionstechnologie mbH. Honeycomb body with internal leading edges, in particular a catalyst body for motor vehicles. 5,045,403, Cl. 428-593.000.

Mauser-Werke GmbH: *See—*
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Funae, Haruyoshi; and Kiriyama, Tomonori, 5,045,523, Cl. 503-207.000.
Mitsubishi Rayon Company, Ltd.: *See*—
Motonaga, Akira; Kamada, Kensuke; Kamo, Jun; and Hosokawa, Hiroshi, 5,045,357, Cl. 427-255.000.
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; and Mori, Kenji, 5,045,228, Cl. 252-299.610.
Mitsuboshi Belting Ltd.: *See*—
Mashimo, Satoshi; Yamaguchi, Yoshio; Takeda, Kazuhiro; and Kitahama, Koji, 5,045,138, Cl. 156-137.000.
Mitsui Mining & Smelting Co.: *See*—
Tsunaga, Masayuki; Yuba, Kazuaki; Kurimoto, Yoshiaki; and Hirosawa, Maraki, 5,045,236, Cl. 252-512.000.
Mitsui, Shigeru; Hattori, Ryo; and Yagi, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Method of making a semiconductor laser. 5,045,500, Cl. 437-129.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Asanuma, Tadashi; Yamamoto, Kazuhiko; Ohnaka, Junko; and Tokura, Yoshiko, 5,045,597, Cl. 525-72.000.
Mittag, Michael T.; Elliott, Donald A.; and Roberts, Alan S., to Electrovert Ltd. Method for cleaning electronic and other devices. 5,045,120, Cl. 134-26.000.
Mitzlaff, James E.: *See*—
Leicht, John L.; Malone, Hugh R.; Mathews, Douglas J.; Mitzlaff, James E.; Munier, Scott D.; Oehlerking, Michele G.; and Scott, Vernon R., 5,045,820, Cl. 333-26.000.
Miura, Katsunori, to Sanyo Electric Co., Ltd. PLL frequency modulator having bias voltage applied to filter capacitor. 5,045,818, Cl. 332-127.000.
Miura, Shinji: *See*—
Inoue, Yoshinori; Endo, Masao; and Miura, Shinji, 5,044,172, Cl. 62-335.000.
Miura, Takeo: *See*—
Iiga, Tsuyoshi; Kitasei, Yasuji; Kikuno, Junji; Yamaguchi, Nobuo; Nakagomi, Yoshio; and Miura, Takeo, 5,044,646, Cl. 180-219.000.
Mix, P. Todd. Automatic latching swinging mast mount. 5,044,410, Cl. 114-90.000.
Miyabayashi, Takeshi, to Brother Kogyo Kabushiki Kaisha. Positional information inputting device using sheet-like photo-conductive switch or the like. 5,045,643, Cl. 178-18.000.
Miyaji, Fumio; and Aoki, Yukio, to Sony Corporation. Internal low voltage transformation circuit of static random access memory. 5,046,052, Cl. 365-226.000.
Miyajima, Masaaki: *See*—
Morishita, Kazumasa; Aihara, Yoshitada; Komura, Yoshihisa; Miyajima, Masaaki; and Suzuki, Minoru, 5,046,012, Cl. 364-468.000.
Miyake, Takashi; Fuse, Junichi; Ikata, Yoshikatsu; Mori, Shuichi; Kihara, Hisashi; and Utsugi, Nobuo, to Pioneer Electronic Corporation. Frequency characteristic setting circuitry for an amplifier. 5,045,802, Cl. 330-2.000.
Miyako Jidosha Kogyo Kabushikikaisha: *See*—
Watanabe, Mamoru; and Miyama, Yasuhiro, 5,044,701, Cl. 303-115.000.
Miyama, Yasuhiro: *See*—
Watanabe, Mamoru; and Miyama, Yasuhiro, 5,044,701, Cl. 303-115.000.
Miyamoto, Junichi: *See*—
Atsumi, Shigeru; Tanaka, Sumio; Miyamoto, Junichi; Ohtsuka, Nobuaki; and Imamiya, Keniti, 5,046,048, Cl. 365-201.000.
Miyamoto, Kenji: *See*—
Ohta, Hideo; Miyamoto, Kenji; San, Wilson O. W.; and Martini, Alfred M., 5,045,642, Cl. 174-266.000.
Miyata, Kazushi: *See*—
Kohno, Kenji; Nagataki, Yoshiyuki; Miyata, Kazushi; and Higashi, Hiroshi, 5,045,622, Cl. 528-48.000.
Miyata, Mitsuto; Matsumura, Teruyuki; and Kawasumi, Masashi, to Fanuc, Ltd. Round screw thread machining method. 5,044,842, Cl. 409-66.000.
Miyata, Seizo; Watanabe, Toshiyuki; Goto, Yoshitaka; Hayashi, Akio; and Nakayama, Masaharu, to Nippon Oil and Fats Co., Ltd. Non-linear optical material. 5,045,239, Cl. 252-582.000.
Miyauchi, Tatsuo: *See*—
Sekine, Yoshitada; Miyauchi, Tatsuo; Abe, Kazuyoshi; Nishiyama, Tohru; and Ono, Hiroyuki, 5,044,541, Cl. 228-6.100.
Miyazaki, Shuichi: *See*—
Sachdeva, Rohit C. L.; Miyazaki, Shuichi; and Farzin-Nia, Farrokh, 5,044,947, Cl. 433-20.000.
Miyazawa, Hiroyuki: *See*—
Kobayashi, Yutaka; Tanba, Akihiro; Hori, Ryoichi; Asayama, Kyoichiro; Yukutake, Seigoh; Miyazawa, Hiroyuki; Yanagisawa, Kazumasa; and Kitsukawa, Goro, 5,045,904, Cl. 357-23.600.
Miyazawa, Shuhei: *See*—
Souda, Shigeru; Ueda, Norihiro; Miyazawa, Shuhei; Tagami, Katsuya; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Fujimoto, Masatoshi; Murakami, Manabu; Oketani, Kiyoshi; Fujisaki, Hideaki; Shibata, Hisashi; and Wakabayashi, Tsuneo, 5,045,552, Cl. 514-338.000.
Miyoshi, Akio, to Kabushiki Kaisha Toshiba. Microprogram control apparatus using don't care bits as part of address bits for common instructions and generating variable control bits. 5,046,040, Cl. 364-900.000.
Miyoshi, Tadahiko: *See*—
Kodama, Hironori; Ogihara, Satoru; Arakawa, Hideo; Inoue, Hirokazu; Yasutomi, Yoshiyuki; and Miyoshi, Tadahiko, 5,045,922, Cl. 357-75.000.

Mizuma, Hiroyuki; Asano, Yasushi; and Kataumi, Yoshimasa, to Nissan Motor Co., Ltd.; and Fuji Kiko Co., Ltd. Pedal depression assisting mechanism. 5,044,223, Cl. 74-512.000.

Mizuno, Akira; Komai, Hiroshi; Ina, Toshio; and Suzuki, Tadao, to Shizuoka Seiki Co., Ltd. Liquid fuel combustion type infrared ray irradiating apparatus. 5,044,353, Cl. 126-91.00A.

Mizuno, Kenichi; Yabuta, Katsuhisa; and Watanabe, Masakazu, to NGK Spark Plug Co., Ltd. Sintered body of silicon nitride and its manufacture. 5,045,513, Cl. 501-98.000.

Mizushima, Kazuyuki, to NEC Corporation. Multi-level semiconductor structure and process of fabricating thereof. 5,045,917, Cl. 357-71.000.

Mizushima, Yoshihiko: *See*—
Ogawa, Ichizo; Warashina, Yoshihisa; Mizushima, Yoshihiko; Ichie, Koji; Takeichi, Morio; and Takeshima, Akira, 5,044,744, Cl. 356-5.000.

MJP Marine Jet Power AB: *See*—
Torneman, Gerard; and Lundberg, Nils E., 5,045,002, Cl. 440-38.000.

Mobil Oil Corporation: *See*—
Bullard, Edward M.; Guerrera, Stephen K.; Herrington, Fox J.; and Wolpin, Ivy, 5,044,774, Cl. 383-34.100.
Harandi, Mohsen N.; and Owen, Hartley, 5,045,287, Cl. 422-142.000.

Mochida, Yosihisa: *See*—
Kurobe, Akio; Nakatsu, Hiromasa; Ikezaki, Masao; Sugino, Nobuo; and Mochida, Yosihisa, 5,046,137, Cl. 359-136.000.

Mochizuki, Masataka: *See*—
Sakaya, Masuji; Okiai, Ryuichi; Mochizuki, Masataka; and Mashiko, Kouichi, 5,044,429, Cl. 165-104.260.

Mocivnik, Josef: *See*—
Mock, Franz; Pacnik, Peter; Schantl, Werner; Mocivnik, Josef; and Muller-Spath, Hans-Jorg, 5,044,398, Cl. 137-596.180.

Mock, Franz; Pacnik, Peter; Schantl, Werner; Mocivnik, Josef; and Muller-Spath, Hans-Jorg, to Bohler Pneumatik International Gesellschaft m.b.H. Control valve for counterblow-tap hole-boring machine. 5,044,398, Cl. 137-596.180.

Modges, John C.; and Sircar, Ila, to Warner-Lambert Co. Amino acid derivatives with angiotensin II antagonist properties. 5,045,540, Cl. 514-235.800.

Moedritzer, Kurt; and Rogers, Michael D., to Monsanto Company. Herbicidal substituted pyrazoles. 5,045,106, Cl. 71-92.000.

Moen, Russell R., Jr.; and Suter, Richard R., to AT&E Corporation. Combined bias supply and power shut-off circuit with selective biasing. 5,045,717, Cl. 307-296.300.

Mogi, Shinobu, to Nippon Seiko Kabushiki Kaisha. Passive seat belt system with adjustable anchor for shoulder webbing. 5,044,664, Cl. 280-804.000.

Mohr, Jurgen: *See*—
Maner, Asim; and Mohr, Jurgen, 5,045,439, Cl. 430-394.000.

Mohri, Masanari: *See*—
Tomita, Hironori; Nakamura, Tohru; Kikuchi, Noboru; and Mohri, Masanari, 5,044,729, Cl. 359-824.000.

Mohrs, Klaus: *See*—
Raddatz, Siegfried; Mohrs, Klaus; Fruchtmann, Romanis; Kohlsdorfer, Christian; Muller-Peddinghaus, Reiner; and Theisen-Popp, Pia, 5,045,547, Cl. 514-311.000.

Mohwinkel, Clifford A., to Pacific Monolithics. Active power splitter. 5,045,822, Cl. 333-124.000.

Moisan, Hubert. Coin operated cosmetic dispensing machine. 5,044,520, Cl. 222-2.000.

Mojtabaj, Fatemeh. Device and method for fluorescence microscopic controlled formation of monomolecular layers of organic films. 5,044,308, Cl. 118-402.000.

Molex Incorporated: *See*—
Baumanis, Bruno, 5,044,986, Cl. 439-548.000.
Colleran, Stephen; Krehbiel, Fred L.; and Wilson, Bill, 5,044,991, Cl. 439-595.000.

Molins PLC: *See*—
Cahill, Michael J.; and Wiese, Paul R., 5,044,379, Cl. 131-280.000.

Molleker, Daniel; and Klempel, David H., to Artistic Photo Plate Creations, Inc. Rotary precision circle cutter. 5,044,245, Cl. 83-886.000.

Mollenstedt, Gottfried, to U.S. Philips Corp. Charged particle beam apparatus with charge-up compensation. 5,045,705, Cl. 250-398.000.

Molnar, Gerald, to Trillium Telephone Systems, Inc. Data interface for telephone system. 5,046,188, Cl. 379-94.000.

Moloney, Brian: *See*—
Benson, Vernon M.; Gill, Dee R.; Hatch, Boyd L.; Johnson, John A.; Moloney, Brian; Shepherd, Noel I.; Shupe, Keith G.; and Weis, William J., 5,045,147, Cl. 156-429.000.

Monarch Marking Systems, Inc.: *See*—
Huggins, Orville C., 5,044,276, Cl. 101-292.000.

Moncrief, Rick L.: *See*—
Behensky, Max L.; Moncrief, Rick L.; Durfey, Erik J.; and Loper, Milton H., III, 5,044,956, Cl. 434-45.000.

Monden, Hiroshi: *See*—
Shinya, Yoshiyuki; and Monden, Hiroshi, 5,044,230, Cl. 74-866.000.

Monette, Serge: *See*—
Harris, Bryn G.; Monette, Serge; Barry, Jean-Pierre; and Stanley, Robert, 5,045,290, Cl. 423-22.000.

Monro, Richard J. Heat generator. 5,044,424, Cl. 165-5.000.

Mons, Francis: *See*—
Kamata, Masahiro; Katayama, Shitomi; Mons, Francis; and Porter, Robert, 5,044,460, Cl. 181-102.000.

Monsanto Company: *See*—
Alt, Gerhard H.; Phillips, W. Gary; Pratt, John K.; and Srouji, Gabriel H., 5,045,554, Cl. 514-365.000.
Highfill, Louis A., 5,045,294, Cl. 423-315.000.
Moedritzer, Kurt; and Rogers, Michael D., 5,045,106, Cl. 71-92.000.
Paranjpe, Prabhakar D., 5,045,094, Cl. 55-97.000.

Montgomery Industries International Inc.: *See*—
Montgomery, Robert C., Sr., 5,044,570, Cl. 241-294.000.

Montgomery, Robert C., Sr., to Montgomery Industries International Inc. Shaver rotor assembly. 5,044,570, Cl. 241-294.000.

Moody, Paul E., to United States of America, Navy. Submarine weapon launch system using an external impulse tank. 5,044,253, Cl. 89-1.810.

Moon, Benny C. Cushion construction. 5,044,027, Cl. 5-448.000.

Mooney, Frank: *See*—
Rubbo, Dick; Luke, Mike; Bouldin, Brett; and Mooney, Frank, 5,044,441, Cl. 166-382.000.

Mooney, Frank X.: *See*—
Rubbo, Richard P.; Luke, Mike A.; Bouldin, Brett; and Mooney, Frank X., 5,044,433, Cl. 166-120.000.

Mooney, Gerry; Garcia, Rod A.; Tarquini, Michael E.; and Kosin, John A., to J. M. Huber Corporation. Endothermic blowing agents for surface migration of components in foamed products, compositions and applications. 5,045,570, Cl. 521-88.000.

Morand, Peter; Arnason, John T.; Philogene, Bernard J. R.; MacEachern, Anita M.; Leitch, Leonard C.; and Kaminski, Jerzy, to Canada, Her Majesty the Queen in right of, as represented by Minister of National Defence of Her Majesty's Canadian Government. Phototoxic compounds for use as insect control agents. 5,045,563, Cl. 514-444.000.

More, Iain; Harper, Ian W.; and Camarco, Wayne M., to Exxon Chemical Patents Inc. Chemical compositions and use as fuel additives. 5,045,088, Cl. 44-393.000.

Moreira, Joao, to Deutsche Forschungsanstalt fur Luft- und Raumfahrt e.V. Method for extracting motion errors of a platform carrying a coherent imaging radar system from the raw radar data and device for executing the method. 5,045,855, Cl. 342-25.000.

Moren, Dean M.: *See*—
Heilmann, Steven M.; Krepski, Larry R.; Moren, Dean M.; Rasmussen, Jerald K.; and Smith, Howell K., II, 5,045,615, Cl. 526-245.000.

Moreux, Alain; Nourry, Daniel; and Thierry, Jean-Pierre, to Telemecanique. Removable support plate and electric apparatus for a power distributor device. 5,046,172, Cl. 361-332.000.

Morgan Adhesives Company: *See*—
Shramer, Kurt M.; and Snavely, K. Randy, 5,044,776, Cl. 383-89.000.

Morgan, William M.; and Williams, Bill E., to Mountain Cat, Inc. Wood fiber crumbles. 5,044,324, Cl. 119-171.000.

Mori, Kenji: *See*—
Nakauchi, Jun; Uematsu, Mioko; Sakashita, Keiichi; Kageyama, Yoshitaka; and Mori, Kenji, 5,045,228, Cl. 252-299.610.

Mori, Shuichi: *See*—
Miyake, Takashi; Fuse, Junichi; Ikata, Yoshikatsu; Mori, Shuichi; Kihara, Hisashi; and Utsugi, Nobuo, 5,045,802, Cl. 330-2.000.

Mori, Yukiyasu: *See*—
Hirotsu, Takashi; Mori, Yukiyasu; Tsuji, Hiroshi; Sugiyama, Tatsuo; Watanabe, Yoshihiro; and Maeda, Kenji, 5,045,101, Cl. 65-106.000.

Moriguchi, Teruo: *See*—
Hirai, Masato; Bekki, Yoshinori; Ikezawa, Sinzi; and Moriguchi, Teruo, 5,046,185, Cl. 375-4.000.

Morikawa, Kiyoshi: *See*—
Yoshida, Susumu; Morikawa, Kiyoshi; Matsuki, Seiichio; and Kamimura, Testuro, 5,046,059, Cl. 369-36.000.

Morimura, Atsushi: *See*—
Uomori, Kenya; Ishii, Hirofumi; and Morimura, Atsushi, 5,046,179, Cl. 364-728.030.

Morin, Hans, to Oy Suomen Selkapalvelu. Treatment bench. 5,044,358, Cl. 128-71.000.

Morisaki, Hiroshi: *See*—
Kobayashi, Masanari; Akao, Michitoshi; Sakakibara, Kenji; Izaki, Takesi; Katoh, Tokunori; and Morisaki, Hiroshi, 5,045,763, Cl. 318-270.000.

Morisawa, Satoru; and Matsubara, Masato, to Asahi Kogaku Kogyo Kabushiki Kaisha. Recording paper transport mechanism. 5,045,892, Cl. 355-309.000.

Morishima, Makoto: *See*—
Kanaya, Yoshihiro; and Morishima, Makoto, 5,045,671, Cl. 219-411.000.

Morishita, Kazumasa; Aihara, Yoshitada; Komura, Yoshihisa; Miyajima, Masaaki; and Suzuki, Minoru, to Fujitsu Limited; and Fujitsu Vlsi Limited. Pattern data processing method. 5,046,012, Cl. 364-468.000.

Morishita, Muneki: *See*—
Mita, Katsuya; and Morishita, Muneki, 5,045,674, Cl. 235-439.000.

Morita, Tetsuya: *See*—
Isaka, Yukio; Morita, Tetsuya; Yamano, Hiroshi; Murata, Masahiko; and Sakai, Masahiko, 5,045,869, Cl. 346-108.000.

Moro, Daniel G.; Ronel, Samuel H.; and Kuzma, Petr, to National Patent Development Corporation. Process of making a hearing air earmold in situ. 5,045,266, Cl. 264-222.000.

Morris, Daniel P.: *See*—
Goldberg, Martin J.; Morris, Daniel P.; and Viehbeck, Alfred, 5,045,159, Cl. 204-59.00R.



Morris-Thurgood, Jayne A.: *See*—
Webb, Stuart C.; Lewis, Leland M.; and Morris-Thurgood, Jayne A., 5,044,365, Cl. 128-419.0PG.

Morrison, David C.; Chen, Taiying; Lei, Mei-Guey; Bright, Stuart W.; and Flebbe, Linda M., to University of Kansas. Purified mammalian cell binding receptor for bacterial lipopolysaccharide endotoxin and monoclonal antibody. 5,045,466, Cl. 435-240.270.

Moruzzi, James A.: *See*—
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Mosebach Manufacturing Company: *See*—
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Mosier, John W., II: *See*—
Meyer, Theodore O.; Mosier, John W., II; Pike, Douglas A., Jr.; Hollinger, Theodore G.; and Tsang, Dah W., 5,045,903, Cl. 357-23.400.

Mosley, Keith B.: *See*—
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Moss, Kathyleen A. Dabic, as Trustee & Her Successor Under Trust Agreement for Moss; Kathyleen A. Dabic: *See*—
Moss, Kathyleen D., 5,044,822, Cl. 405-52.000.

Moss, Kathyleen D., to Moss, Kathyleen A. Dabic, as Trustee & Her Successor Under Trust Agreement for Moss; Kathyleen A. Dabic. Open bottom pit seal. 5,044,822, Cl. 405-52.000.

Mosser, Bruce T.; Pells, Dale F.; and Weaver, James R., to AMP Incorporated. Stackable connector assembly and bracket therefor. 5,044,984, Cl. 439-540.000.

Mossner, Frank: *See*—
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Motai, Noboru; Ogiwara, Yoshihisa; and Kanda, Yasunari, to Nippon Precision Circuits Ltd.; and Seikosha Co., Ltd. Amorphous silicon thin film transistor. 5,045,905, Cl. 357-23.700.

Mothes, Helmut A.; Patwardhan, Bhalchandra H.; Schroeder, Theo G.; and Solow, David J., to Haarmann & Reimer Corp. Method for the production of granular citric acid. 5,045,459, Cl. 435-144.000.

Motomura, Masatoshi; Muramatsu, Ichiro; Okoshi, Noboru; Araki, Yoshitami; Ito, Takahiko; and Sato, Toru, to Dainippon Ink and Chemicals. Construction material containing bituminous substances. 5,045,590, Cl. 524-705.000.

Motonaga, Akira; Kamada, Kensuke; Kamo, Jun; and Hosokawa, Hiroshi, to Mitsubishi Rayon Company, Ltd. Process for preparing a membranous gas separator. 5,045,357, Cl. 427-255.000.

Motor Wheel Corporation: *See*—
Weeks, James B., 5,045,261, Cl. 264-108.000.

Motorola, Inc.: *See*—
—Avanic, Branko; Ooi, Leng H.; and Yeh, Peter J., 5,045,815, Cl. 331-96.000.
—Bennett, Paul T.; and Dunn William C., 5,045,964, Cl. 361-254.000.
—Bennett, Richard L., 5,046,128, Cl. 455-51.000.
—Billings, David; and Hong, Soon C., 5,044,912, Cl. 425-116.000.
—Casto, James J.; McShane, Michael B.; and Lin, Paul T., 5,045,914, Cl. 357-70.000.
—Farace, Louis P.; and Titus, John D., 5,044,201, Cl. 73-503.000.
—Hall, Scott M.; and Berger, Thomas R., 5,046,130, Cl. 455-78.000.
—Jaskie, James E.; and Moyer, Curtis D., 5,044,736, Cl. 359-291.000.
—Landreth, Bobby D.; Pennisi, Robert W.; Davis, James L.; and Nounou, Fadia, 5,045,128, Cl. 148-23.000.
—Lebby, Michael S., 5,045,908, Cl. 357-30.000.
—Leicht, John L.; Malone, Hugh R.; Mathews, Douglas J.; Mitzlaff, James E.; Munier, Scott D.; Oehlerking, Michele G.; and Scott, Vernon R., 5,045,820, Cl. 333-26.000.
—Lin, Paul T.; and Wilson, Howard P., 5,045,921, Cl. 357-74.000.
—Metroka, Michael P., 5,045,824, Cl. 333-206.000.
—Staudinger, Joseph; and Seely, Warren L., 5,045,821, Cl. 333-118.000.
—Westwick, Alan L.; and Whatley, Roger A., 5,045,773, Cl. 323-316.000.

Mottine, John J., Jr.: *See*—
Jin, Sungho; Mottine, John J., Jr.; Opila, Robert L., Jr.; Sherwood, Richard C.; Tiefel, Thomas H.; and Vesperman, William C., 5,045,249, Cl. 264-24.000.

Motus Incorporated: *See*—
Baker, William; Benson, Raymond G., Jr.; and Gudgel, Robert C., 5,044,680, Cl. 292-278.000.

Moult, Roger H.: *See*—
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Mountain Cat, Inc.: *See*—
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Mouret, Edmund M.: *See*—
Skeels, Harold B.; Cunningham, Christopher E.; Mouret, Edmund M.; Underwood, Donald M.; and Krenek, Michael J., 5,044,672, Cl. 285-98.000.

Mouton, Pierre C., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Turbojet compressor blow off valves with water collecting and discharge means. 5,044,153, Cl. 60-39.093.

Mowery, David L., to United States of America, Air Force. Metastable tolerant asynchronous interface. 5,045,801, Cl. 328-72.000.

Mowry, William H., Jr.: *See*—
Maierson, Theodore; Mowry, William H., Jr.; and Potter, Dianne M., 5,045,426, Cl. 430-126.000.

Moyer, Curtis D.: *See*—
Jaskie, James E.; and Moyer, Curtis D., 5,044,736, Cl. 359-291.000.

Mozer, Albrecht; and Kersten, Peter, to Alcatel N.V. Optical isolator. 5,044,713, Cl. 385-11.000.

MTD Products Inc: *See*—
Kaesgen, Jurgen; and Siegrist, Rudolf, 5,044,478, Cl. 192-4.00R.

Mudd, Daniel T.: *See*—
Drexel, Charles F.; and Mudd, Daniel T., 5,044,199, Cl. 73-202.000.

Muderlak, Kenneth J.: *See*—
Bankier, Jack D.; and Muderlak, Kenneth J., 5,044,453, Cl. 177-25.160.

Mueller, Frank J.: *See*—
Jolicoeur, John M.; and Mueller, Frank J., 5,045,238, Cl. 252-550.000.

Mueller, Karl. Method for cleaning and coating water-conducting pipes. 5,045,352, Cl. 427-235.000.

Mukai, Hisao, to Tomita Pharmaceutical Co., Ltd. Pasty dialyzing composition for perfusing artificial kidney systems and process for preparing same. 5,045,324, Cl. 424-678.000.

Mukainakano, Hiroshi: *See*—
Iwanami, Eiichi; Kawahara Yukito; and Mukainakano, Hiroshi, 5,045,686, Cl. 250-208.100.

Mulder, Christiaan E. G.: *See*—
Grossmann, Klaus; Mulder, Christiaan E. G.; and Wuerzer, Bruno, 5,045,105, Cl. 71-74.000.

Mulder, Jan P.: *See*—
Vader, Mattheus; Noordegraaf, Jan; Klein Nagelvoort, Edward H.; and Mulder, Jan P., 5,045,110, Cl. 75-338.000.

Mulhaupt, Rolf; and Dubs, Paul, to Ciba-Geigy Corporation. Process for the preparation of heat-stable olefin polymers. 5,045,577, Cl. 524-99.000.

Mulleer, Kurt A., to Cerberus AG. Infrared intrustion detector. 5,045,702, Cl. 250-342.000.

Muller, Armin: *See*—
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Muller, Hanns P.: *See*—
Richter, Roland; Muller, Hanns P.; Weber, Wilhelm; Hombach, Rudolf; Riberi, Bernd; Busch, Ralf; and Metzinger, Hans-Gerd, 5,045,226, Cl. 252-182.200.

Muller-Peddinghaus, Reiner: *See*—
Raddatz, Siegfried; Mohrs, Klaus; Fruchtmann, Romanis; Kohlsdorfer, Christian; Muller-Peddinghaus, Reiner; and Theisen-Popp, Pia, 5,045,547, Cl. 514-311.000.

Muller-Spath, Hans-Jorg: *See*—
Mock, Franz; Pacnik, Peter; Schantl, Werner; Mocivnik, Josef; and Muller-Spath, Hans-Jorg, 5,044,398, Cl. 137-596.180.

Munakata, Mikio: *See*—
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Ohmura, Keiichi; Yamanaka, Miko; Fudanoki, Fumio; Tendoh, Masayuki; Hirashima, Kenji; Kobayashi, Masaaki; Shibata, Shinji; Sugino, Tomoyuki; Takada, Toshihiro; Nishizawa, Yoshio; and Kasahara, Akihiko, to Nippon Steel Corporation; Toyota Jidosha Kabushiki Kaisha; and Nippon Kinzoku Co., Ltd. Heat-resistant stainless steel foil for catalyst-carrier of combustion exhaust gas purifiers. 5,045,404, Cl. 428-606.000.

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Ohnaka, Yukihiro; and Kiso, Yoshikazu, to Terumo Kabushiki Kaisha. Breakaway tube assembly. 5,045,067, Cl. 604-244.000.

Ohnaka, Yukihiro; Iwasa, Takao; and Kawaoka, Tatsumiko, to Terumo Kabushiki Kaisha. Blood separator for separating blood components from a blood bag into separation bags. 5,045,185, Cl. 210-86.000.

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Schlumberger Industries Limited: *See*—
Atkinson, David I. H.; and Doe, Steven C., 5,044,207, Cl. 73-861.370.
Kulczyk, Konrad; and Smith, George W., 5,044,769, Cl. 374-119.000.

Schlumberger Technology Corporation: *See*—
Kamata, Masahiro; Katayama, Shitomi; Mons, Francis; and Porter, Robert, 5,044,460, Cl. 181-102.000.
McKeon, Donald C.; Roscoe, Bradley A.; and Stoller, Christian, 5,045,693, Cl. 250-270.000.

Schmalz, A. Chandler, to Hercules Incorporated. Rewettable polyolefin fiber and corresponding nonwovens. 5,045,387, Cl. 428-284.000.

Schmelz, Helmut: *See*—
Vogel, Doris; Landgraf, Norbert; Sprehe, Josef; Gajewski, Wolfgang; Hein, Dietmar; and Schmelz, Helmut, 5,045,516, Cl. 502-309.000.

Schmidt, Hans: *See*—
Hadwiger, Helmut; and Schmidt, Hans, 5,044,074, Cl. 29-848.000.

Schmidt, Karlwalter. Device for transferring the vibrations of strings to the walls of a hollow body. 5,044,246, Cl. 84-291.000.

Schmidt, Robert R.: *See*—
Elbe, Hans-Ludwig; Marhold, Albrecht; Lurssen, Klaus; Santel, Hans-Joachim; Schmidt, Robert R.; and Krauskopf, Birgit, 5,045,108, Cl. 71-94.000.
Fischer, Reiner; Baasner, Bernd; Hagemann, Hermann; Krebs, Andreas; Marhold, Albrecht; Santel, Hans-Joachim; Schmidt, Robert R.; Lurssen, Klaus; Becker, Benedikt; Schaller, Klaus; and Strang, Harry, 5,045,560, Cl. 514-425.000.

Schmidt, Thomas W., to Phillips Petroleum Company. Method and apparatus for continuously feeding particulate solid material into a pressurized system without pressure loss. 5,044,837, Cl. 406-85.000.

Schmidt, William C.: *See*—
Satterfield, William C.; Foytik, Joan E.; Bailey, Joe W.; and Schmidt, William C., 5,045,074, Cl. 604-317.000.

Schmitt, Paul F.: *See*—
Sundquist, Douglas F.; Filion, Joseph L.; Schmitt, Paul F.; Evanitsky, Eugene S.; and Smith, Charles E., 5,044,619, Cl. 270-58.000.

Schneider, Bruce; Greenwald, Robert A.; Maimon, Jonathan; Gorray, Kenneth; Golub, Lorne M.; McNamara, Thomas F.; and Ramamurthy, Nangavarum S., to Research Foundation of State University of New York, The. Inhibition of wasting and protein degradation of mammalian muscle by tetracyclines. 5,045,538, Cl. 514-152.000.

Schneider, David R.; and Bis, Kostaki G., to Wayne State University. Contras agent having an imaging agent coupled to viable granulocytes for use in magnetic resonance imaging of abcess and a method of preparing and using same. 5,045,304, Cl. 424-9.000.

Schneider, Gottfried: *See*—
Pohn, Johann; Oexler, Rudolf; Schneider, Gottfried; Schuller, Edmund; and Domke, Ernst, 5,044,151, Cl. 57-417.000.

Schneider, Josef, to MAN Roland Druckmaschinen AG. Directly image printing or form cylinder, and method of imaging. 5,045,697, Cl. 250-316.100.

Schneiter, John L.: *See*—
Ortiz, Angel L., Jr.; and Schneiter, John L., 5,045,669, Cl. 219-121.830.

Schoonhoven, Johannes W. F. M.: *See*—
Heinerman, Jacobus J. L.; and Schoonhoven, Johannes W. F. M., 5,045,518, Cl. 502-216.000.

Schott Glaswerke: *See*—
Kiefer, Werner, 5,045,509, Cl. 501-59.000.

Schrader, Jurgen: *See*—
Claar, Klaus; Schrader, Jurgen; and Berger, Josef, 5,045,657, Cl. 200-332.100.

Schrecengost, Robert A.: *See*—
Breen, Bernard P.; Schrecengost, Robert A.; and Gabrielson, James E., 5,044,286, Cl. 110-165.00A.

Schroeder, Theo G.: *See*—
Mothes, Helmut A.; Patwardhan, Bhalchandra H.; Schroeder, Theo G.; and Solow, David J., 5,045,459, Cl. 435-144.000.

Schroll, Ross E.: *See*—
Minerd, Timothy M.; Barnard, Larry R.; Lavery, Lawrence P.; and Schroll, Ross E., 5,044,964, Cl. 439-67.000.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See*—
Pohn, Johann; Oexler, Rudolf; Schneider, Gottfried; Schuller, Edmund; and Domke, Ernst, 5,044,151, Cl. 57-417.000.

Schuller, Edmund: *See*—
Pohn, Johann; Oexler, Rudolf; Schneider, Gottfried; Schuller, Edmund; and Domke, Ernst, 5,044,151, Cl. 57-417.000.

Schulling, Christof. Scoop for counting serving portions of food. 5,044,914, Cl. 425-169.000.

Schultz, Robert R., to Du Pont de Nemours, E. I., and Company. Continuous in-line preparation of photographic gelatin solutions. 5,045,445, Cl. 430-642.000.

Schultz, William J.: *See*—
Almer, Carl J.; and Schultz, William J., 5,045,363, Cl. 427-410.000.

Schulze-Beckinghausen, Joerg E., to Weatherford U.S., Inc. Active jaw for a power tong. 5,044,232, Cl. 81-57.180.

Schulze, Bernd; Craubner, Siegfried; and Lange, Guenter, to Deutsche Airbus GmbH. Heat imaging camera with a cooled detector mosaic. 5,045,699, Cl. 250-330.000.

Schulze, Darrell G.: *See*—
Gaultney, Lawrence D.; Van Scoyoc, George E.; Schulze, Darrell G.; and Shonk, Jason L., 5,044,756, Cl. 356-446.000.

Schutz, Udo. Bunghole-equipped barrel. 5,044,510, Cl. 220-4.050.

Schwab, Gerhart: *See*—
Shackle, Dale R.; Cousin, Michael J.; Schwab, Gerhart; Narrick, Christina M.; and Fromson, Howard A., 5,045,430, Cl. 430-138.000.

Schwager, Martin, to Maschinenfabrik Rieter AG. Can-filling apparatus for a textile machine. 5,044,047, Cl. 19-159.00R.

Schwartz, Bernard: *See*—
Adams, Richard W., Jr.; Clarke, David R.; Knickerbocker, Sara H.; Rapp, Linda L.; and Schwartz, Bernard, 5,045,402, Cl. 428-545.000.

Schwarz, Heinz: *See*—
Bahnmuller, Wilfried; Finkener, Jutta; Himmelreich, Dieter; Reiber, Wolfgang; and Schwarz, Heinz, 5,045,444, Cl. 430-567.000.

Schwarz, Reinhard; and Nobis, Dieter, to Deere & Company. Drive engagement for a selectively engageable wheelset. 5,044,458, Cl. 180-248.000.
Schweiss, Peter; and Rienecker, Reimund, to J. M. Voith GmbH. Device for screening fiber suspensions. 5,045,183, Cl. 209-273.000.
Schweitzer, Jeffrey A.; Seifert, George P.; and Proctor, Keith J., to Medtronic, Inc. Fiber-optic oxygen saturation sensor with beveled distal end. 5,045,690, Cl. 250-227.290.
Schwelling, Hermann, to H S M - Pressen GmbH. Shredder and compactor with protective guard. 5,044,270, Cl. 100-53.000
Schwetz, Karl-Alexander: *See*—
Lange, Dietrich; Sigl, Lorenz; and Schwetz, Karl-Alexander, 5,045,512, Cl. 501-96.000.
Scientific-Atlanta, Inc.: *See*—
Bramhall, Charles R.; West, Lamar E., Jr.; Still, Jesse M.; and McGinty, Emory L., Jr., 5,045,816, Cl. 332-105.000.
Scobie, William B., to Keystone International Holdings Corp. Rotary actuator and method for forming a rotary piston. 5,044,257, Cl. 92-120.000.
Scott, Chester B. Chafing dish and method of using same. 5,045,672, Cl. 219-439.000.
Scott, Fraser; and Budden, Raymond G., to Ring Sights International Limited. Collimator gun sight. 5,044,748, Cl. 356-251.000.
Scott, Ian R., to Unilever Patent Holdings B.V. Treatment of skin disorders. 5,045,559, Cl. 514-423.000.
Scott, Kieran F., to Lubrizol Genetics, Inc. Method for increasing yield and nodulation by bradyrhizobium. 5,045,461, Cl. 435-172.300.
Scott, Melvin E.; and McCue, Alfred D., to Simmons-Rand Company. Vehicle with lateral moving lift. 5,044,858, Cl. 414-10.000.
Scott Paper Company: *See*—
Kurz, John H., 5,045,255, Cl. 264-51.000.
Scott, Vernon R.: *See*—
Leicht, John L.; Malone, Hugh R.; Mathews, Douglas J.; Mitzlaff, James E.; Munier, Scott D.; Oehlerking, Michele G.; and Scott, Vernon R., 5,045,820, Cl. 333-26.000.
Sea-Land Corporation, Inc.: *See*—
Grogan, Charles W., 5,044,544, Cl. 228-119.000.
Seagate Technology, Inc.: *See*—
Lewis, David M., 5,045,811, Cl. 331-1.00A.
Sebag, Henri: *See*—
Philippe, Michel; Sebag, Henri; Dupuis, Didier; and Rougier, Andre , 5,045,533, Cl. 514-29.000.
Sedun, Frederick S., to Safer, Inc. Method for protecting wood from infestation with sapstain fungi and mold. 5,045,366, Cl. 427-440.000.
Seeger, Kurt: *See*—
Anhauser, Dieter; and Seeger, Kurt, 5,044,372, Cl. 128-743.000.
Seely, Warren L.: *See*—
Staudinger, Joseph; and Seely, Warren L., 5,045,821, Cl. 333-118.000.
Segawa, Mizuki: *See*—
Kameyama, Shuichi; Kikuchi, Kazuya; Shimomura, Hiroshi; and Segawa, Mizuki, 5,045,493, Cl. 437-59.000.
Seidel, Bobby R.; Tracy, Donald B.; and Griffiths, Vernon, to United States of America, Energy. Apparatus for injection casting metallic nuclear energy fuel rods. 5,044,911, Cl. 425-110.000.
Seifert, C. Vaughan; Downey, Wolcott M.; and Shank, Peter J., to C. R. Bard, Inc. Balloon catheter and locking guidewire system. 5,045,061, Cl. 604-96.000.
Seifert, George P.: *See*—
Schweitzer, Jeffrey A.; Seifert, George P.; and Proctor, Keith J., 5,045,690, Cl. 250-227.290.
Seiko Instruments Inc.: *See*—
Iwanami, Eiichi; Kawahara Yukito; and Mukainakano, Hiroshi, 5,045,686, Cl. 250-208.100.
Seikosha Co., Ltd.: *See*—
Motai, Noboru; Ogiwara, Yoshihisa; and Kanda, Yasunari, 5,045,905, Cl. 357-23.700.
Shinozaki, Nobuo; and Tsuyuki, Hiroto, 5,045,873, Cl. 354-234.100.
Tanaka, Sakae; and Watanabe, Yoshiaki, 5,045,485, Cl. 437-40.000.
Tashiro, Mitsuo, 5,044,799, Cl. 400-643.000.
Seim, Thomas A.: *See*—
McCrery, Shawn F.; and Seim, Thomas A., 5,046,007, Cl. 364-424.040.
Seizert, Robert D., to Solvay Automotive, Inc. Blow molded airbag with fabric reinforcements. 5,044,663, Cl. 280-730.000.
Seki, Takahide; Seki, Yasuharu; Tsukushi, Masanori; Itoh, Syunji; and Honda, Haruo, to Hitachi, Ltd. Switch. 5,045,651, Cl. 200-148.000.
Seki, Tsuneyo: *See*—
Okutomi, Tsutomu; Okawa, Mikio; Yamamoto, Atsushi; Seki, Tsuneyo; Satoh, Yoshinari; Honma, Mitsutaka; Chiba, Seishi; and Sekiguchi, Tadaaki, 5,045,281, Cl. 420-497.000.
Seki, Yasuharu: *See*—
Seki, Takahide; Seki, Yasuharu; Tsukushi, Masanori; Itoh, Syunji; and Honda, Haruo, 5,045,651, Cl. 200-148.000.
Sekiguchi, Tadaaki: *See*—
Okutomi, Tsutomu; Okawa, Mikio; Yamamoto, Atsushi; Seki, Tsuneyo; Satoh, Yoshinari; Honma, Mitsutaka; Chiba, Seishi; and Sekiguchi, Tadaaki, 5,045,281, Cl. 420-497.000.
Sekimura, Tsuyoshi: *See*—
Sakaue, Osamu; Sekimura, Tsuyoshi; and Shimoda, Seiichi, 5,044,518, Cl. 221-95.000.
Sekine, Yoshitada; Miyauchi, Tatsuo; Abe, Kazuyoshi; Nishiyama, Tohru; and Ono, Hiroyuki, to Nissan Motor Co., Ltd. Method and apparatus for assembling vehicle body. 5,044,541, Cl. 228-6.100.
Selas Corporation of America: *See*—
Van Eerden, John J.; Gottschlich, Chad F.; and Gensler, Wayne C., 5,044,931, Cl. 431-8.000.
Selectech, Ltd.: *See*—
Hansen, Per K., 5,045,843, Cl. 340-709.000.
Selnick, Harold G.: *See*—
Baldwin, John J.; Ponticello, Gerald S.; and Selnick, Harold G., 5,045,561, Cl. 514-432.000.
Selph, Lottie J. Pet carrier and restraint for vehicle use. 5,044,321, Cl. 119-96.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 5,044,406, Cl. 138-143.000.
Yamazaki, Shunpei, 5,045,482, Cl. 437-3.000.
Senba, Hisaaki; Shigenobu, Michio; Hatta, Toshiyuki; and Nishi, Masaya, to Canon Kabushiki Kaisha; and Sumitomo Electric Ind., Inc. Image fixing device and roller therefor having a low resistance surface layer. 5,045,891, Cl. 355-289.000.
Sendelweck, Gene K., to Thomson Consumer Electronics, Inc. Switching apparatus with cascaded switch sections. 5,045,733, Cl. 307-566.000.
Senecal, Bruce J.: *See*—
Mann, David W.; and Senecal, Bruce J., 5,044,598, Cl. 248-638.000.
Sens, Martinus M.; Bertens, Theodorus C. J. M.; Van Tongeren, Hendricus F. J. J.; and Thijssen, Johannes T. H., to U.S. Philips Corporation. Laminated product, compound used in the laminated product and optical information carrier provided with the laminated product. 5,045,373, Cl. 428-64.000.
Sensors Unlimited Inc.: *See*—
Steward, W. Paul; Sevick, Peter M.; and Poorman, Thomas J., 5,045,691, Cl. 250-231.160.
Separation Dynamics Inc.: *See*—
Taylor, John A., 5,045,205, Cl. 210-638.000.
SePro Healthcare Inc.: *See*—
Murphy, Edward, 5,045,041, Cl. 493-194.000.
Sequoia-Turner Corporation (Unipath): *See*—
Becker, Ruth M.; and Edmondson, Sherburne M., Jr., 5,045,474, Cl. 436-63.000.
Serey, Jean-Pierre R.: *See*—
Odoul, Christian; Paty, Marc G. F.; and Serey, Jean-Pierre R., 5,044,885, Cl. 416-196.00R.
Serizawa, Masayuki: *See*—
Itoh, Takashi; Serizawa, Masayuki; and Ohkawara, Masaaki, 5,044,093, Cl. 34-57.00R.
Settimo, Jack R.: *See*—
Biera, Leonard W.; Crawford, William F.; Kobane, John, Jr.; and Settimo, Jack R., 5,044,841, Cl. 408-36.000.
Seubert, Hans P.: *See*—
Goldhorn, Klaus; and Seubert, Hans P., 5,044,354, Cl. 128-24.0EL.
Sevick, Peter M.: *See*—
Steward, W. Paul; Sevick, Peter M.; and Poorman, Thomas J., 5,045,691, Cl. 250-231.160.
Sexton, Daniel W., to GE Fanuc Automation North America, Inc. Signal processing apparatus for recovering a clock signal and a data signal from an encoded information signal. 5,046,073, Cl. 375-82.000.
Seynhaeve, Andre, to Delsey S.A. Rigid or semi-rigid suitcase made of plastic material. 5,044,476, Cl. 190-18.00A.
SGS-Thomson Microelectronics S.r.l.: *See*—
Gualandris, Fabio; and Masini, Luisa, 5,045,504, Cl. 437-235.000.
Pariani, Angelo; Rossi, Walter; and Saviotti, Vanni, 5,046,089, Cl. 379-399.000.
Villa, Flavio, 5,045,910, Cl. 357-35.000.
SGS-Thomson Microelectronics S.A.: *See*—
Bancal, Bernard, 5,045,902, Cl. 357-23.400.
Perroud, Philippe; and Jaffard, Jean-Luc, 5,045,803, Cl. 330-51.000.
Perroud, Philippe; and Jaffard, Jean-Luc, 5,045,810, Cl. 330-293.000.
Shackle, Dale R.; Cousin, Michael J.; Schwab, Gerhart; Narrick, Christina M.; and Fromson, Howard A. Method for making printing plates and assembly useful therein. 5,045,430, Cl. 430-138.000.
Shaffer, James E., to Consulier Engineering, Inc. Wide angle viewing system. 5,044,738, Cl. 359-504.000.
Shaker, Holly J.; and Roberts, Norma J. Device for storing and dispensing waste containers. 5,044,501, Cl. 206-499.000.
Shamble, Edward M., to National Semiconductor Corporation. Method for checking lithography critical dimensions. 5,044,750, Cl. 356-372.000.
Shanblatt, Michael A.: *See*—
Gritter, David J.; Shanblatt, Michael A.; and Strangas, Elias G., 5,045,988, Cl. 363-35.000.
Shank, Peter J.: *See*—
Seifert, C. Vaughan; Downey, Wolcott M.; and Shank, Peter J., 5,045,061, Cl. 604-96.000.
Shannon, Steven L. Ice cube dispenser. 5,044,600, Cl. 249-121.000.
Shapland, J. Edward: *See*—
Bach, Stanley M., Jr.; Shapland, J. Edward; Lang, Douglas J.; and Dahl, Roger W., 5,044,375, Cl. 128-786.000.
Sharman, Richard A.; and Lees, Roger T., to Eastman Kodak Company. Method and apparatus for generating a high definition electronic signal from a line scan of a color original. 5,045,932, Cl. 358-76.000.
Sharp Kabushiki Kaisha: *See*—
Iwamura, Soichi; Murakami, Satoshi; Ishikawa, Masakazu; and Koide, Naoki, 5,045,950, Cl. 358-319.000.
Katayama, Mikio; Kato, Hiroaki; Nakazawa, Kiyoshi; Negoto, Hidenori; Kanemori, Yuzuru; Inui, Motokazu; Imaya, Akihiko; and Nagayasu, Takayoshi, 5,045,753, Cl. 313-494.000.



Kimura, Naofumi; Ishii, Yutaka; and Kozaki, Shuichi, 5,044,732, Cl. 359-53.000.
Kotani, Matahira; Hachinoda, Masayuki; Hayashi, Motohiko; Murata, Naomitsu; and Kondo, Mitsunobu, 5,045,953, Cl. 358-473.000.
Takano, Sakuharu; and Kita, Sumio, 5,045,844, Cl. 340-724.000.
Shauger, Herbert A., Jr.: *See*—
Kramer, L. Jonathan; Petersen, Steven R.; and Shauger, Herbert A., Jr., 5,045,797, Cl. 324-667.000.
Shaver, Carol J.; and Purdy, Donna M. Method for diagnosing and treating psychological trauma. 5,044,959, Cl. 434-236.000.
Shaw, David N.: *See*—
Field, Michael G.; and Shaw, David N., 5,044,894, Cl. 417-310.000.
Shaya, Jeffrey: *See*—
Revord, Raoul D.; and Shaya, Jeffrey, 5,046,006, Cl. 364-423.000.
Shea, Dean J.: *See*—
Andreasen, David A.; Shea, Dean J.; and Hackney, Gregory P., 5,046,033, Cl. 364-580.000.
Shean, James J.; and Spector, George. Adjustable animal boxing (cage). 5,044,317, Cl. 119-17.000.
Sheen, Light. Type of fixed sleeve for a cigarette lighter seat. 5,044,985, Cl. 439-544.000.
Sheeran, Patrick: *See*—
Gosker, Brendan G., 5,045,837, Cl. 340-450.200.
Sheffer, Tzafrir, to John Fluke Mfg. Co., Inc. FM deviation control of direct digital synthesizers. 5,045,817, Cl. 332-117.000.
Shelby, James E.: *See*—
Kohli, Jeffrey T.; and Shelby, James E., 5,045,510, Cl. 501-66.000.
Shell Offshore Inc.: *See*—
Forster, Larry D., 5,044,826, Cl. 405-169.000.
Shell Oil Company: *See*—
Berni, Albert J., 5,046,057, Cl. 367-170.000.
Clark, David M.; and Dogterom, Ronald J., 5,045,293, Cl. 423-305.000.
van Breen, Adriaan W.; van Deursen, Josephus H.; and Wetser, Franciscus I. M., 5,045,258, Cl. 264-85.000.
Shell Research Limited: *See*—
Vader, Mattheus; Noordegraaf, Jan; Klein Nagelvoort, Edward H.; and Mulder, Jan P., 5,045,110, Cl. 75-338.000.
Shelley, Peter R.: *See*—
Banks, Rhona M.; Blanchflower, Simon E.; and Shelley, Peter R., 5,045,457, Cl. 435-124.000.
Shelton, Randolph A., to Siemens Automotive L.P. Fuel rail vibration damper. 5,044,338, Cl. 123-469.000.
Shepherd, Noel I.: *See*—
Benson, Vernon M.; Gill, Dee R.; Hatch, Boyd L.; Johnson, John A.; Moloney, Brian; Shepherd, Noel I.; Shupe, Keith G.; and Weis, William J., 5,045,147, Cl. 156-429.000.
Shepherd, William H.: *See*—
Miller, William D.; Evans, Joseph T.; Kinney, Wayne I.; and Shepherd, William H., 5,046,043, Cl. 365-145.000.
Sheridan, John J. Dental space and periodontal cavity measuring instrument. 5,044,951, Cl. 433-72.000.
Sherlock, John E., to GKN Axles Limited. Limited slip differentials. 5,045,038, Cl. 475-235.000.
Sherman, John D.: *See*—
Tannous, Medhat K.; Sherman, John D.; and Cohen, Alan P., 5,045,295, Cl. 423-328.000.
Sherwood, John J.; Thibodeau, David L.; and Foster, Philip R., to Foster, Philip R.; and Thibodeau, David L. Passive rewarming articles. 5,044,031, Cl. 5-481.000.
Sherwood, Richard C.: *See*—
Jin, Sungho; Mottine, John J., Jr.; Opila, Robert L., Jr.; Sherwood, Richard C.; Tiefel, Thomas H.; and Vesperman, William C., 5,045,249, Cl. 264-24.000.
Shewchenko, Nicholas; and Halgrimsson, Bjarki, to Biokinetics and Associates Ltd. Helmet restraining device. 5,044,019, Cl. 2-421.000.
Shiba, Haruo: *See*—
Tanaka, Kimio; and Shiba, Haruo, 5,044,496, Cl. 206-387.000.
Shibagaki, Taro: *See*—
Shimizu, Fumihiko; and Shibagaki, Taro, 5,046,072, Cl. 375-36.000.
Shibata, Hisashi: *See*—
Souda, Shigeru; Ueda, Norihiro; Miyazawa, Shuhei; Tagami, Katsuya; Nomoto, Seiichiro; Okita, Makoto; Shimomura, Naoyuki; Kaneko, Toshihiko; Fujimoto, Masatoshi; Murakami, Manabu; Oketani, Kiyoshi; Fujisaki, Hideaki; Shibata, Hisashi; and Wakabayashi, Tsuneo, 5,045,552, Cl. 514-338.000.
Shibata, Norio; and Sato, Tsunehiko, to Fuji Photo Film Co., Ltd. Curtain-type coating device. 5,044,305, Cl. 118-73.000.
Shibata, Shinji: *See*—
Ohmura, Keiichi; Yamanaka, Miko; Fudanoki, Fumio; Tendoh, Masayuki; Hirashima, Kenji; Kobayashi, Masaaki; Shibata, Shinji; Sugino, Tomoyuki; Takada, Toshihiro; Nishizawa, Yoshio; and Kasahara, Akihiko, 5,045,404, Cl. 428-606.000.
Shibazaki, Toshiji; Chuzenji, Kunio; Sasahara, Mikio; Okano, Masaru; Ozaki, Yoshihiro; and Kishida, Naoto, to Toyo Denso Kabushiki Kaisha. Hydraulic actuating apparatus. 5,045,830, Cl. 338-41.000.
Shields, Gary A. Computer controlled light with continuously variable color temperature, color, magnification, focus, and position. 5,045,983, Cl. 362-293.000.
Shields, Jack W. Vaginal diaphragms with medicament dispensing foam pads. 5,044,376, Cl. 128-837.000.
Shigemizu, Akihiko, to Takachiho Kogyo Yuugen Kaisha. Hand crusher with rotatably mounted handle. 5,044,568, Cl. 241-169.000.
Shigemori, Kazuhisa: *See*—
Kobayashi, Masahiro; Kobayashi, Noboru; and Shigemori, Kazuhisa, 5,044,768, Cl. 374-109.000.
Shigenobu, Michio: *See*—
Senba, Hisaaki; Shigenobu, Michio; Hatta, Toshiyuki; and Nishi, Masaya, 5,045,891, Cl. 355-289.000.
Shigeru, Terada; and Terada, Shu. Joining method and structure in a wooden building. 5,044,137, Cl. 52-286.000.
Shih, Jenn S.; and Smith, Terry E., to ISP Investments Inc. Zwitterion terpolymers of a vinyl lactam, an amino alkyl acrylamide or acrylate, and a polymerizable carboxylic acid. 5,045,617, Cl. 526-264.000.
Shiiki, Masatoshi: *See*—
Migita, Masahito; Taike, Akira; and Shiiki, Masatoshi, 5,045,894, Cl. 357-17.000.
Shikata, Shitsuw: *See*—
Ito, Susumu; Kawai, Shuji; Shikata, Shitsuw; Ozaki, Katsuya; and Yoshimatsu, Tadashi, 5,045,464, Cl. 435-209.000.
Shikoku Kakoki Co., Ltd.: *See*—
Iwano, Fumiyuki; and Sasaki, Kazuo, 5,044,140, Cl. 53-167.000.
Shill, David, to Thermoguard Equipment, Inc. Stack dividing mechanism for a corrugated sheet unstacking and feeding apparatus. 5,044,874, Cl. 414-796.000.
Shim-A-Line, Inc.: *See*—
Specktor, Gerald A.; and Specktor, John, 5,044,659, Cl. 280-661.000.
Shima, Takeshi, to Kabushiki Kaisha Toshiba. Multi-feedback circuit apparatus. 5,045,713, Cl. 307-201.000.
Shimada, Toshiro, to Kabushiki Kaisha Toshiba. Apparatus for controlling a brushless motor. 5,045,762, Cl. 318-254.000.
Shimadzu Corporation: *See*—
Hirose, Hideo, 5,045,696, Cl. 250-306.000.
Shimano Industrial Co., Ltd.: *See*—
Nagano, Masashi, 5,044,213, Cl. 74-142.000.
Shimbo, Atsushi: *See*—
Kawamura, Shinichi; Shimbo, Atsushi; and Takabayashi, Kyoto, 5,046,094, Cl. 380-46.000.
Shimizu, Fumihiko; and Shibagaki, Taro, to Kabushiki Kaisha Toshiba. Signal distribution system. 5,046,072, Cl. 375-36.000.
Shimizu, Kazuhiko: *See*—
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Bussan, Marc R.; Hupfer, Ronald K.; and Weis, Marion J., 5,044,704, Cl. 312-214.000.

Weis, William J.: *See*—
Benson, Vernon M.; Gill, Dee R.; Hatch, Boyd L.; Johnson, John A.; Moloney, Brian; Shepherd, Noel I.; Shupe, Keith G.; and Weis, William J., 5,045,147, Cl. 156-429.000.

Weisburn, James T.; and Burdett, Ronald K., to Alpha Enterprises, Inc. Audiocassette storage container having offset post members. 5,044,497, Cl. 206-387.000.

Weiser, Martin: *See*—
Wolff, Reinhard; Miesseler, Hans-Joachim; and Weiser, Martin, 5,044,205, Cl. 73-800.000.

Weiss, Keith D.; and Frye, Cecil L., to Dow Corning Corporation. Metastable silane hydrolyzates. 5,045,592, Cl. 524-755.000.

Weiss, Sheldon M.: *See*—
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Weitzel, Richard A.; Speer, Larry W.; and Westbrook, Susan P., to Eastman Kodak Company. Device for improving mixing in a magnetic brush development apparatus. 5,045,886, Cl. 355-253.000.

Wella Aktiengesellschaft: *See*—
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Weller, Michael C.: *See*—
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Wells, Jeff P.: *See*—
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Welsch, Wolfgang: *See*—
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Weng, Hsi K. Air pressure measuring head. 5,044,197, Cl. 73-146.800.

Wermer, Richard I.: *See*—
Hoff, Steven R.; and Wermer, Richard I., 5,044,190, Cl. 72-402.000.

Werner, Malcolm J., to United Technologies Corporation. Spring supported damping system. 5,044,781, Cl. 384-99.000.

Werner, Olof; Luttropp, Hans-Henrik; Thomasson, Ronnie; and Psaros, Georgios, to Zenova Aktiebolag; and Siemens-Elema Aktiebolag. Method and apparatus for reuse of anesthetics. 5,044,361, Cl. 128-204.160.

Wersing, Wolfram; Lubitz, Karl; Lerch, Reinhard; Kaarmann, Hans; and Vogt, Martina, to Siemens Aktiengesellschaft. Ultrasound array having trapezoidal oscillator elements and a method and apparatus for the manufacture thereof. 5,045,746, Cl. 310-334.000.

Werzalit AG & Co.: *See*—
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Wesolowski, William E.: *See*—
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Wessely, Hermann: *See*—
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West, Hazel R., to Prosthex Limited. Method for alleviating female urinary incontinence. 5,045,079, Cl. 604-329.000.

West, Lamar E., Jr.: *See*—
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West, Paul R.; Mitchell, James E.; Miller, Gary R.; Josephson, Paul R., Jr.; and Ryan, Raymond W., Jr., to Eastman Kodak Company. Radiation-sensitive composition containing both a poly(N-acylalkyleneimine) and an unsaturated polyester and use thereof in lithographic printing plates. 5,045,432, Cl. 430-278.000.

West, Robert N.: *See*—
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Westbrook, Susan P.: *See*—
Weitzel, Richard A.; Speer, Larry W.; and Westbrook, Susan P., 5,045,886, Cl. 355-253.000.

Westermeier, Peter: *See*—
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Westinghouse Electric Corp.: *See*—
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Richardson, Raymond V., 5,044,846, Cl. 410-47.000.
Skriba, Michael C.; and Grant, David C., 5,045,240, Cl. 252-626.000.
Snyder, Thomas S.; and Stoltz, Richard A., 5,045,209, Cl. 210-656.000.

Westwick, Alan L.; and Whatley, Roger A., to Motorola, Inc. Current source circuit with constant output. 5,045,773, Cl. 323-316.000.

Wetser, Franciscus I. M.: *See—*
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Wheadon, Ellis G.; and Forrer, Larry L., to Caltec International, Inc. Method for the manufacture of lead acid batteries and an associated apparatus and associated lead-acid battery. 5,044,067, Cl. 29-730.000.
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Whirlpool Corporation: *See—*
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Whitaker, Ann F., to United States of America, National Aeronautics and Space Administration. Method for determining the effects of oxygen plasma on a specimen. 5,044,211, Cl. 73-866.000.
White, Malcolm L.; and Leidheiser, Henry, Jr., to Lehigh University. Environmental corrosion monitor system incorporating deposited contaminants and corrosion products. 5,045,775, Cl. 324-71.200.
White, Thomas H.; and Remedios, Miguel A. Universal cabin sidewall panel for aircraft. 5,044,578, Cl. 244-119.000.
White, William C.: *See—*
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Wieboldt, Richard C.; and Adams, Gregory E., to Nicolet Instrument Corporation. Cold trapping apparatus for infrared transmission analysis including a method and substrate therefor. 5,045,703, Cl. 250-352.000.
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Wieser, Josef: *See—*
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Wiest, Peter P.; and Fuchs, Hubert G., to Wiest, Peter P. Pressure measurement device for fluids flowing in lines. 5,044,203, Cl. 73-730.000.
Wijmans, Johannes G.; and Baker, Richard W., to Membrane Technology & Research, Inc. Refrigeration process with purge and recovery of refrigerant. 5,044,166, Cl. 62-85.000.
Wilbur, Daniel S.; and Fritzberg, Alan R., to NeoRx Corporation. Radiohalogenated small molecules for protein labeling. 5,045,303, Cl. 424-1.100.
Wiles, Christopher R.: *See—*
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Wilfiker, William K. Reinforced soil retaining wall and connector therefor. 5,044,833, Cl. 405-267.000.
Wilhelm, Alfred. Wind power engine. 5,044,878, Cl. 415-4.200.
Willard, Stuart B.; and Matula, David W., to Cyrix Corporation. Method and apparatus for performing division using a rectangular aspect ratio multiplier. 5,046,038, Cl. 364-765.000.
Willhaus, Werner, to Standard Elektrik Lorenz AG. Access device for an ISDN connecting device of a public terminal. 5,045,849, Cl. 340-825.340.
Williams, Anthony J., to British Aerospace PLC. Flexible closing device for a wing leading edge. 5,044,580, Cl. 244-214.000.
Williams, Bill E.: *See—*
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Williams, Clarence O. Flea trap utilizing night-light. 5,044,112, Cl. 43-113.000.
Williams, David, to Lucas Industries public limited company. Control system for and method of controlling an internal combustion engine. 5,044,337, Cl. 123-436.000.
Williams, Graham R. Structural load analysis apparatus. 5,044,206, Cl. 73-804.000.
Williams, Lawrence H., Jr.: *See—*
Bojas, Edward J.; Campbell, Lester R., Jr.; Williams, Lawrence H., Jr.; and Mains, Charles A., 5,044,477, Cl. 192-3.290.
Williams, R. Stanley; and Lince, Jeffrey R., to University of California. Thermodynamically stabilized conductor/compound semiconductor interfaces. 5,045,408, Cl. 428-620.000.
Williams, Richard S.: *See—*
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Willner, Wilfried, to FAG Kugelfischer George Schafer (KGaA). Pocket surface for separator for ball bearings. 5,044,783, Cl. 384-523.000.
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Witehira, Pita. Electrode plate structure. 5,045,415, Cl. 429-81.000.
Witherell, Donald R., to Rockwell International Corporation. System for removing flux residues from printed wiring assemblies. 5,045,117, Cl. 134-21.000.
Wittrisch, Christian, to Institut Francais du Petrole. Method and device for performing perforating operations in a well. 5,044,437, Cl. 166-250.000.
Witwer, Keith A., to Advanced Machine and Tool Corporation. Blade pack extension and wedge guide support. 5,044,068, Cl. 29-734.000.
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Wolff, Reinhard; Miesseler, Hans-Joachim; and Weiser, Martin, to Strabag Bau-AG. Method for monitoring deformations with light waveguides. 5,044,205, Cl. 73-800.000.
Wolfgruber, Matthias: *See—*
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Worthington, Charles L., Jr., to Worthington-Kemp. Ladder leveling device. 5,044,468, Cl. 182-202.000.
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Wu, Shih-Jang; Chih, Hsu H.; Liao, Paul; and Huang, Shun C. Motor-driven car window fan assembly. 5,044,258, Cl. 98-2.020.
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Wyslotsky, Ihor, to Redex Packaging Corp. Multiple component pressurized package for articles and methods of pressurization thereof. 5,044,495, Cl. 206-315.900.
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Kamiguchi, Masao; Yamamura, Masato; Hosoyo, Yuichi; Kobayashi, Minoru; and Wakebe, Shuichi, 5,045,253, Cl. 264-40.500.
Yamamura, Tomohiro; Sugasawa, Fukashi; Yokote, Masatsugu; and Imaseki, Takashi, to Nissan Motor Company, Limited. Suspension control system for automotive vehicle with adjustment of wheel slippage dependent wheel load distribution. 5,044,660, Cl. 280-707.000.
Yamanaka, Miko: *See—*
Ohmura, Keiichi; Yamanaka, Miko; Fudanoki, Fumio; Tendoh, Masayuki; Hirashima, Kenji; Kobayashi, Masaaki; Shibata, Shinji; Sugino, Tomoyuki; Takada, Toshihiro; Nishizawa, Yoshio; and Kasahara, Akihiko, 5,045,404, Cl. 428-606.000.

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Yamane, Kouichi; Nishimoto, Koji; and Uchinami, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Automotive fuel injection system. 5,044,342, Cl. 123-492.000.

Yamane, Osamu: *See—*
Takahashi, Kunio; Yamane, Osamu; Hori, Yasunori; and Endo, Takanori, 5,044,307, Cl. 118-325.000.

Yamanishi, Noboru: *See—*
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Yamano, Hiroshi: *See—*
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Yamaoka, Shigemitsu; and Iwamoto, Kenji, to Yamaha Corporation. Image processing apparatus. 5,045,845, Cl. 340-726.000.

Yamaoka, Shigemitsu: *See—*
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Yamashita, Hiroshi, to Kabushiki Kaisha Toshiba. Movable body driving apparatus. 5,046,062, Cl. 369-219.000.

Yamashita, Jun, to Fuji Xerox Co., Ltd. Image data scaling system. 5,046,117, Cl. 382-47.000.

Yamashita, Kazuhiko; and Saito, Tadashi, to Kao Corporation. Welding pattern for a cleaner liner in a magnetic disk cartridge. 5,046,171, Cl. 360-133.000.

Yamashita, Kazuo; Inoue, Akiharu; and Egawa, Masahiko, to Nihon Musen Kabushiki Kaisha. Slip phase control PLL. 5,045,813, Cl. 331-16.000.

Yamashita, Tsutomu T., to Komag, Inc. Method for sputtering a hydrogen-doped carbon protective film on a magnetic disk. 5,045,165, Cl. 204-192.160.

Yamato Scale Company, Limited: *See—*
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Yamato Works Co., Ltd.: *See—*
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Yamauchi, Hayato, to Mitsubishi Denki Kabushiki Kaisha. Starter motor. 5,045,737, Cl. 310-89.000.

Yamauchi, Tunenori: *See—*
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Yamazaki Mazak Corporation: *See—*
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Yamazaki, Mikiya; and Ushiki, Hiroshi, to Kabushiki Kaisha Shinkawa. Wire bonding method and apparatus. 5,044,543, Cl. 228-110.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Pipe made from a superconducting ceramic material. 5,044,406, Cl. 138-143.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of making a tandem PIN semiconductor photoelectric conversion device. 5,045,482, Cl. 437-3.000.

Yamazaki, Shuntaro, to NEC Corporation. Automatic optical frequency acquisition and tracking apparatus for optical coherent communication system. 5,046,140, Cl. 359-191.000.

Yan, Raymond C., to Teledyne Industries. Zero static current high speed TTL compatible buffer. 5,045,721, Cl. 307-443.000.

Yan, Raymond C., to Teledyne Industries. Offset compensated amplifier. 5,045,806, Cl. 330-252.000.

Yanabu, Satoru; Nishiwaki, Susumu; Ishikawa, Masayuki; and Aoyagi, Hirokuni, to Kabushiki Kaisha Toshiba. Disconnector of gas insulated switchgear. 5,045,652, Cl. 200-148.00R.

Yanagihara, Naohisa: *See—*
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Yang, James C. H. Windproof lighter. 5,044,933, Cl. 431-144.000.

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Yang, Pai-Sung. Sun visor system. 5,044,685, Cl. 296-97.600.

Yano, Teruo: *See—*
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Yates, John S., Jr.; and Ciavaglia, Stephen J., to Hewlett-Packard Company. Apparatus for instruction regardless of data types and thereafter selectively branching to other instruction upon determining of incompatible data type. 5,045,992, Cl. 364-200.000.

Yazaki Corporation: *See—*
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Ye, Biqing; and Ma, Zhonglin. Power supply for laser flashlamp. 5,045,759, Cl. 315-171.000.

Yee, Loren; and Sinh, Nguyen X., to National Semiconductor Corporation. TTL/ECL translator circuit. 5,045,729, Cl. 307-475.000.

Yeh, Bing, to Silicon Storage Technology, Inc. Method of manufacturing a single transistor non-volatile, electrically alterable semiconductor memory device. 5,045,488, Cl. 437-43.000.

Yeh, Peter J.: *See—*
Avanic, Branko; Ooi, Leng H.; and Yeh, Peter J., 5,045,815, Cl. 331-96.000.

Yemington, Charles R.: *See—*
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Yetter, Forrest G., to Aviation Systems Concepts, Inc. Phase reference navigation system and method. 5,045,859, Cl. 342-414.000.

Yeung, Louise Y.: *See—*
Hamstra, James R.; Perloff, Ronald S.; and Yeung, Louise Y., 5,046,182, Cl. 370-79.000.

Yip, Kin F.: *See—*
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Yokoyama, Nobuyoshi; and Ejiri, Susumu, to Paloma Kogyo Kabushiki Kaisha. Pulse combustion device. 5,044,928, Cl. 431-1.000.

Yonekawa, Hisashi; Ishimitsu, Yoshiyuki; and Akune, Junichirou, to Konica Corporation. Image data compression apparatus. 5,046,121, Cl. 382-56.000.

Yonezawa, Keitaro, to Kabushiki Kaisha Kosmek. Control valve assembly for pressurized oil. 5,044,400, Cl. 137-596.180.

Yoon, Hyun-Nam: *See—*
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Yoshida, Hirohisa: *See—*
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Yoshida, Masahiro: *See—*
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Yoshida, Susumu; and Nishioka, Takafumi, to Mitsubishi Denki Kabushiki Kaisha. Light emitting diode array with electrodes. 5,045,895, Cl. 357-17.000.

Yoshida, Susumu; Morikawa, Kiyoshi; Matsuki, Seiichio; and Kamimura, Testuro, to Pioneer Electronic Corporation. Multiple disc player with mechanism for changing of discs. 5,046,059, Cl. 369-36.000.

Yoshida, Tadashi; Hattori, Teruo; Matsumoto, Koichi; Terui, Yoshihiro; and Shoji, Junichi, to Shionogi & Co., Ltd. Antibiotics PB-6042S. 5,045,458, Cl. 435-126.000.

Yoshida, Takeshi; and Goto, Yoshinori, to AIDA Engineering Ltd Apparatus for adjustment of knock-out timing for press. 5,044,481, Cl. 192-67.00R.

Yoshifuji, Yutaka: *See—*
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Yoshihara, Ichiro; Okuhara, Motoko; Yamamoto, Takao; Iwasawa, Naozumi; Doi, Yasuo; Ohyama, Tsukasa; Murayama, Kazuhiko; Matsuzaki, Yoriaki; Kasamatsu, Susumu; Takuma, Keisuke; and Kato, Kimitoshi, to Kansai Paint Co., Ltd. Visible radiation sensitive composition containing substituted 3-(benzothiazo-2-yl)-7-diethylaminocoumarin as sensitizers. 5,045,434, Cl. 430-286.000.

Yoshimatsu, Tadashi: *See—*
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Yoshinaga, Hitoshi: *See—*
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You, Hee S., to SamSung Electronics Co., Ltd. Dust collector for an air cleaner. 5,045,095, Cl. 55-139.000.

Younes, Magdy, to University of Manitoba. Lung ventilator device. 5,044,362, Cl. 128-204.210.

Young, David J.: *See—*
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Young, Joe A. Wellhead bowl protector and retrieving tool. 5,044,438, Cl. 166-250.000.

Young, John L.; Burns, David B.; and Mastroianni, Joseph, to GenFold Corporation. Hinged structure and method of integration in a standard ski construction. 5,044,044, Cl. 16-323.000.

Young, Lori S. Protective covering device for the heel of a ladies shoe. 5,044,097, Cl. 36-72.00B.

Young, Timothy M.; Coppedge, Charles D.; and McCasland, Charles S., to Halliburton Company. Burner nozzle with replaceable air jetting assembly. 5,044,558, Cl. 239-391.000.

Youngeberg, Judy L.; and Colberg, Richard A., to Herrmidifier Company, Inc. Self-cleaning solenoid controlled water spray nozzle and valve assembly. 5,044,555, Cl. 239-117.000.

Yu, Jae-Chun, to SamSung Electronics Co., Ltd. Method for multiscreen operation in a picture-in-picture system. 5,045,946, Cl. 358-191.100.

Yuba, Kazuaki: *See—*
Tsunaga, Masayuki; Yuba, Kazuaki; Kurimoto, Yoshiaki; and Hirosawa, Maraki, 5,045,236, Cl. 252-512.000.

Yuge, Shizuo; Matsushita, Kouji; and Kawabata, Hidetoshi, to Minolta Camera Kabushiki Kaisha. Electrostatic latent image developing apparatus. 5,044,313, Cl. 118-658.000.

Yugen Kaisha R.I. Electronic Industry: *See—*
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Yuhki, Hirokazu; Kumazawa, Sadao; Yamaguchi, Shigeru; and Ohnishi, Hiroshi, to Fuji Photo Film Co., Ltd. Dissolving and deaerating method. 5,044,761, Cl. 366-139.000.

Yukutake, Seigoh: *See—*
Kobayashi, Yutaka; Tanba, Akihiro; Hori, Ryoichi; Asayama, Kyoichiro; Yukutake, Seigoh; Miyazawa, Hiroyuki; Yanagisawa, Kazumasa; and Kitsukawa, Goro, 5,045,904, Cl. 357-23.600.

Yulo, Fernando: *See—*
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Yumoto, Tetsuo: *See—*
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Yuyama, Kyoji; and Nishizawa, Kouichi, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Wiring design for semiconductor integrated circuit. 5,046,017, Cl. 364-491.000.

Zaccardelli, Michael R.; and Koski, Gérald L., to USG Interiors, Inc. Ceiling suspension structure adapted for unopposed intersections. 5,044,138, Cl. 52-667.000.

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Zamzow, Kevin: *See—*
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Zapadoslovanske hydinaarske zavody statny podnik: *See—*
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Zappa, Oswald L.: *See—*
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Zarchy, Andrew S.: *See—*
Haizmann, Robert S.; Zarchy, Andrew S.; and Symoniak, Martin E., 5,045,175, Cl. 208-99.000.

Zasloff, Michael A.: *See—*
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Zedalis, Michael S.: *See—*
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Zehr, Stanley W.: *See—*
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Zeni Lite Buoy Co., Limited: *See—*
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Zenith Data Systems Corporation: *See—*
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Zenith Electronics Corporation: *See—*
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Zicker, Robert G.; Dion, John K.; Blair, Kevin B.; and Austin, William J., to GTE Mobile Communications Service Corporation. Remote accessing system for cellular telephones. 5,046,082, Cl. 379-59.000.

Zimmerman, Ward H., to Boeing Company, The. Aircraft propulsion control system. 5,044,155, Cl. 60-224.000.

Zinger, William H.: *See—*
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Zinser Textilmaschinen GmbH: *See—*
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Zobel, David H., to Palantir Corporation, The. Method and structure for separating joined patterns for use in pattern and character recognition system. 5,046,114, Cl. 382-9.000.

Zortea, Anthony E.: *See—*
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Zusho, Mochimasa: *See—*
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Zwicker, Eberhard; Beckenbauer, Thomas; and Beer, Guenther, to Siemens Aktiengesellschaft. Hearing aid with adjustable frequency response. 5,046,102, Cl. 381-68.200.

Zymark Corporation: *See—*
Hutchins, Burleigh M.; Dunlap, Raymond R.; Abrahams, Louis; and Amato, Susan M., 5,045,047, Cl. 494-17.000.

ZymoGenetics, Inc.: *See—*
Murray, Mark J.; and Kelly, James D., 5,045,633, Cl. 530-399.000.

501 Greif Bros.: *See—*
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911105 Ontario Limited: *See—*
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# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF SEPTEMBER, 1991

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allen, Louanne M.; Hagerty, Robert O.; and Mohring, Richard O., to Mobil Oil Corporation. Catalyst composition for polymerizing alpha-olefins. Re. 33,683, Cl. 502-107.000.

Bundy, Donald E.; and Bundy, Ronald W., to Judd & Judd, Inc. Apparatus for mounting a trailer hitch on a vehicle. Re. 33,681, Cl. 293-117.000.

Bundy, Ronald W.: *See*—
Bundy, Donald E.; and Bundy, Ronald W., Re. 33,681, Cl. 293-117.000.

Campbell, Michael J.; Smolarek, James; and Van Lente, Timothy S., to Union Carbide Industrial Gases Technology Corporation. Membrane separation system and process. Re. 33,678, Cl. 55-16.000.

Drabish, Steve. Reusable greeting card. Re. 33,680, Cl. 281-5.000.

General Safety Corporation: *See*—
Schmidt, Timothy J., Re. 33,679, Cl. 242-107.40A.

Hagerty, Robert O.: *See*—
Allen, Louanne M.; Hagerty, Robert O.; and Mohring, Richard O., Re. 33,683, Cl. 502-107.000.

Hiramatsu, Tatsuo, to Sanyo Electric Co., Ltd. Auto focus circuit for video camera. Re. 33,682, Cl. 358-227.000.

Judd & Judd, Inc.: *See*—
Bundy, Donald E.; and Bundy, Ronald W., Re. 33,681, Cl. 293-117.000.

Mobil Oil Corporation: *See*—
Allen, Louanne M.; Hagerty, Robert O.; and Mohring, Richard O., Re. 33,683, Cl. 502-107.000.

Mohring, Richard O.: *See*—
Allen, Louanne M.; Hagerty, Robert O.; and Mohring, Richard O., Re. 33,683, Cl. 502-107.000.

Sanyo Electric Co., Ltd.: *See*—
Hiramatsu, Tatsuo, Re. 33,682, Cl. 358-227.000.

Schmidt, Timothy J., to General Safety Corporation. Combination seat belt retractor mechanism. Re. 33,679, Cl. 242-107.40A.

Smolarek, James: *See*—
Campbell, Michael J.; Smolarek, James; and Van Lente, Timothy S., Re. 33,678, Cl. 55-16.000.

Union Carbide Industrial Gases Technology Corporation: *See*—
Campbell, Michael J.; Smolarek, James; and Van Lente, Timothy S., Re. 33,678, Cl. 55-16.000.

Van Lente, Timothy S.: *See*—
Campbell, Michael J.; Smolarek, James; and Van Lente, Timothy S., Re. 33,678, Cl. 55-16.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Brichard, Edgard; Jaupain, Maurice; Plumat, Emile; and Deschepper, Pierre, to Glaverbel SA. Method of forming refractory masses. B1 3,684,560, 9-3-91, Cl. 427-140.000.

Conner, Arlie R.; and Gulick, Paul E., to In Focus Systems, Inc. Color display system. B1 4,917,465, 9-3-91, Cl. 350-335.000.

Denny, William D., Jr.; and Wetzel, Thomas A., to Proctor & Gamble Co., The. Toothpaste composition. B1 4,314,990, 9-3-91, Cl. 424-52.000.

Deschepper, Pierre: *See*—
Brichard, Edgard; Jaupain, Maurice; Plumat, Emile; and Deschepper, Pierre, B1 3,684,560, Cl. 427-140.000.

Distler, Klaus; Enders, Rolf; and Gohlich, Dieter, to Rheinisch-Westfalisches Elektrizitatswerk Aktiengesellschaft. Apparatus for simulation of the operation of a pressurized water nuclear reactor. B1 4,828,787, 9-3-91, Cl. 376-245.000.

Enders, Rolf: *See*—
Distler, Klaus; Enders, Rolf; and Gohlich, Dieter, B1 4,828,787, Cl. 376-245.000.

Glaverbel SA: *See*—
Brichard, Edgard; Jaupain, Maurice; Plumat, Emile; and Deschepper, Pierre, B1 3,684,560, Cl. 427-140.000.

Gohlich, Dieter: *See*—
Distler, Klaus; Enders, Rolf; and Gohlich, Dieter, B1 4,828,787, Cl. 376-245.000.

Gulick, Paul E.: *See*—
Conner, Arlie R.; and Gulick, Paul E., B1 4,917,465, Cl. 350-335.000.

Hamada, Mitsuo: *See*—
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Hughes, Gordon A.; and Smith, Herschel. Synthesis of gon-4-enes. B1 4,002,746, 9-3-91, Cl. 514-178.000.

In Focus Systems, Inc.: *See*—
Conner, Arlie R.; and Gulick, Paul E., B1 4,917,465, Cl. 350-335.000.

Jaupain, Maurice: *See*—
Brichard, Edgard; Jaupain, Maurice; Plumat, Emile; and Deschepper, Pierre, B1 3,684,560, Cl. 427-140.000.

Plumat, Emile: *See*—
Brichard, Edgard; Jaupain, Maurice; Plumat, Emile; and Deschepper, Pierre, B1 3,684,560, Cl. 427-140.000.

Proctor & Gamble Co., The: *See*—
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Wilson, Ken. Sunglasses. 319,647, 9-3-91, Cl. D16-102.000.
Winstead, Peggy A. Hand held pattern holder. 319,538, 9-3-91, Cl. D3-26.000.
Wolff, Doug: *See—*
Jackman, Paul; Schirado, Lowell C.; Roberts, Ken; Conklin, Miles; Salander, Mark; and Wolff, Doug, 319,599, Cl. D10-106.000.
Woodbridge Foam Corporation: *See—*
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Wortham, Brent J., to Tatung Company of America, Inc. Fan heater. 319,694, 9-3-91, Cl. D23-336.000.
Yamamoto, Ei; and Ban, Yutaka, to Canon Kabushiki Kaisha. Toner container for photo-copier. 319,658, 9-3-91, Cl. D18-43.000.
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Yane, Barry, to Standard Building Components. Sliding door handle. 319,570, 9-3-91, Cl. D8-302.000.
Yazaki Corporation: *See—*
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Nagasaka, Yasuhiro; Hirayama, Yasuo; Shibata, Ichiro; Sueyoshi, Tadahiro; Tsuji, Masanori; Murakami, Yoshihiro; Yamamoto, Takayuki; and Fukuda, Masaru, 319,625, Cl. D13-146.000.
Yokogawa Electric Corporation: *See—*
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Yonai, Satoshi: *See—*
Sugi, Tetsuo; Ota, Fumiharu; and Yonai, Satoshi, 319,641, Cl. D14-151.000.
Young, Clemens H., to Handy Products Company. Outdoor light holder. 319,575, 9-3-91, Cl. D8-395.000.
Yurdin, Carl, to Oztec Business Machines, Inc. Document shredder. 319,657, 9-3-91, Cl. D18-34.000.
Yvetot, Roger J., to Delafon, Jacob. Lavatory. 319,691, 9-3-91, Cl. D23-294.000.
Zapfe, Roland: *See—*
Kusel, Richard D.; Marotti, Martin J.; and Zapfe, Roland, 319,637, Cl. D14-108.000.
Marotti, Martin J.; Shelley, Kenneth R.; and Zapfe, Roland, 319,638, Cl. D14-108.000.

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# LIST OF PLANT PATENTEES

Carrier, Leonard E.; and Garton, Stephen, to Native Plants, Inc. Alstroemeria named Erica. 7,639, 9-3-91, Cl. 68.000.

Carrier, Leonard E.; and Garton, Stephen, to Native Plants, Inc. Alstroemeria named Cilla. 7,640, 9-3-91, Cl. 68.000.

DeVor Nurseries, Inc.: *See*—
Marciel, Stanley G., 7,637, Cl. 7.000.
Marciel, Stanley G., 7,638, Cl. 8.000.

Garton, Stephen: *See*—
Carrier, Leonard E.; and Garton, Stephen, 7,639, Cl. 68.000.
Carrier, Leonard E.; and Garton, Stephen, 7,640, Cl. 68.000.

Geo J. Ball, Inc.: *See*—
Trees, Scott C., 7,641, Cl. 68.000.

Gomberoff, Ismael. Pepino plant, Cascade Gold. 7,643, 9-3-91, Cl. 89.000.

Mack, Grace H.; and VandenBerg, Cornelis P., to Mack, Grace H. Chrysanthemum plant named Grace. 7,642, 9-3-91, Cl. 74.000.

Marciel, Stanley G., to DeVor Nurseries, Inc. Miniature pot rose named Deveclipsar. 7,637, 9-3-91, Cl. 7.000.

Marciel, Stanley G., to DeVor Nurseries, Inc. Miniature pot rose named Devamarillo. 7,638, 9-3-91, Cl. 8.000.

Native Plants, Inc.: *See*—
Carrier, Leonard E.; and Garton, Stephen, 7,639, Cl. 68.000.
Carrier, Leonard E.; and Garton, Stephen, 7,640, Cl. 68.000.

Trees, Scott C., to Geo J. Ball, Inc. Variety of Geranium named Red Satisfaction. 7,641, 9-3-91, Cl. 68.000.

VandenBerg, Cornelis P.: *See*—
Mack, Grace H.; and VandenBerg, Cornelis P., 7,642, Cl. 74.000.

# LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 3RD DAY OF SEPTEMBER, 1991

American Telephone and Telegraph Company: *See*—
Davis, Paul C.; Forgues, Scott L.; and Koullias, Iconomos A., H965, Cl. 330-254.000.

Arff, Dwayne E.: *See*—
Olson, Martin D.; and Arff, Dwayne E., H964, Cl. 324-174.000.

Caterpillar Inc.: *See*—
Olson, Martin D.; and Arff, Dwayne E., H964, Cl. 324-174.000.

Davis, Paul C.; Forgues, Scott L.; and Koullias, Iconomos A., to American Telephone and Telegraph Company. Differential amplifier with digitally controlled gain. H965, 9-3-91, Cl. 330-254.000.

Forgues, Scott L.: *See*—
Davis, Paul C.; Forgues, Scott L.; and Koullias, Iconomos A., H965, Cl. 330-254.000.

Fuji Photo Film Co., Ltd.: *See*—
Hirai, Hiroyuki; Furuya, Keizo; and Nakamura, Koki, H963, Cl. 430-559.000.

Furuya, Keizo: *See*—
Hirai, Hiroyuki; Furuya, Keizo; and Nakamura, Koki, H963, Cl. 430-559.000.

Heckman, John E.; and Van Dorn, Joseph P., to United States of America, Navy. Projectile terminal delivery vehicle assembly. H959, 9-3-91, Cl. 102-489.000.

Hirai, Hiroyuki; Furuya, Keizo; and Nakamura, Koki, to Fuji Photo Film Co., Ltd. Color light-sensitive material. H963, 9-3-91, Cl. 430-559.000.

Huerta, Joseph, to United States of America, Army. Discarding rotating band/obturator. H960, 9-3-91, Cl. 102-522.000.

Koullias, Iconomos A.: *See*—
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Kovach, Lawrence J., to United States of America, America. Automated stability/compatibility apparatus. H962, 9-3-91, Cl. 422-68.100.

Mariotti, Razvan, to United States of America, Energy. High speed, long distance, data transmission multiplexing circuit. H967, 9-3-91, Cl. 370-112.000.

Nakamura, Koki: *See*—
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Olson, Martin D.; and Arff, Dwayne E., to Caterpillar Inc. Apparatus for sensing the speed of an element within a torque converter. H964, 9-3-91, Cl. 324-174.000.

Temes, Clifford L.: *See*—
Waters, William M.; and Temes, Clifford L., H966, Cl. 342-361.000.

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Army: *See*—
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Yu, Daniel K., H961, Cl. 165-163.000.
Energy: *See*—
Mariotti, Razvan, H967, Cl. 370-112.000.
Navy: *See*—
Heckman, John E.; and Van Dorn, Joseph P., H959, Cl. 102-489.000.
United States: *See*—
Waters, William M.; and Temes, Clifford L., H966, Cl. 342-361.000.

Van Dorn, Joseph P.: *See*—
Heckman, John E.; and Van Dorn, Joseph P., H959, Cl. 102-489.000.

Waters, William M.; and Temes, Clifford L., to United States of America, United States. Two-beam scanning antenna requiring no rotary joints. H966, 9-3-91, Cl. 342-361.000.

Yu, Daniel K., to United States of America, Army. Heat exchanger and heater. H961, 9-3-91, Cl. 165-163.000.



# CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 3, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

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192.16 5,045,165
192.32 5,045,166
206 5,045,167
245 5,045,168
258 5,045,169
280 5,045,170
296 5,045,171
299 R 5,045,172
5,045,173

**CLASS 206**

69 5,044,492
293 5,044,493
299 5,044,494
315.9 5,044,495
387 5,044,496
5,044,497
429 5,044,498
438 5,044,499
456 5,044,500
499 5,044,501
595 5,044,502
621.3 5,044,503

**CLASS 208**

57 5,045,174
99 5,045,175
113 5,045,176
131 5,045,177
138 5,045,178
262.5 5,045,179
413 5,045,180

**CLASS 209**

10 5,045,181
240 5,045,182
273 5,045,183
405 5,045,184
539 5,044,504

**CLASS 210**

86 5,045,185
90 5,045,186
91 5,045,187
136 5,045,188
184 5,045,189
198.2 5,045,190
229 5,045,191
232 5,045,192
5,045,193
5,045,194
266 5,045,195
278 5,045,196
321.78 5,045,197
321.87 5,045,198
346 5,045,199
416.5 5,045,200
502.1 5,045,201
628 5,045,202
635 5,045,203
5,045,204
638 5,045,205
640 5,045,206
645 5,045,207
656 5,045,208
5,045,209
679 5,045,210
697 5,045,211
708 5,045,212
709 5,045,213
717 5,045,214
747 5,045,215
776 5,045,216
5,045,217
787 5,045,218

**CLASS 211**

22 5,044,505
41 5,044,506
203 5,044,507
207 5,044,508

**CLASS 215**

366 5,044,509

**CLASS 219**

10.55 B 5,045,658
10.55 E 5,045,659
5,045,660
69.12 5,045,661
5,045,662
5,045,663
69.2 5,045,664
75 5,045,665
85.22 5,045,666
121.36 5,046,144
5,046,145
121.54 5,045,667
121.83 5,045,668
5,045,669
130.1 5,045,670
216 5,046,146
411 5,045,671
439 5,045,672
553 5,045,673

**CLASS 220**

4.05 5,044,510
85 B 5,044,511
90.2 5,044,512
318 5,044,513
411 5,044,514
630 5,044,515

**CLASS 221**

2 5,044,516
11 5,044,517
95 5,044,518
212 5,044,519

**CLASS 222**

2 5,044,520
23 5,044,521
108 5,044,522
207 5,044,523
212 5,044,524
326 5,044,525
377 5,044,526
451 5,044,527
504 5,044,528
508 5,044,529
521 5,044,530
541 5,044,531
600 5,044,532
606 5,044,533

**CLASS 223**

94 5,044,534
95 5,044,535

**CLASS 224**

30 R 5,044,536
42.45 R 5,044,577
245 5,044,537
258 5,044,538

**CLASS 227**

111 5,044,539
175 5,044,540

**CLASS 228**

6.1 5,044,541
37 5,044,542
110 5,044,543
119 5,044,544
183 5,044,545
194 5,044,546

**CLASS 229**

40 5,044,547
120.03 5,044,548
125.27 5,044,549
160.1 5,044,550

**CLASS 235**

439 5,045,674
441 5,045,675
462 5,045,677
487 5,045,676

**CLASS 236**

92 B 5,044,551

**CLASS 239**

8 5,044,552
11 5,044,553
17 5,044,554
117 5,044,555
135 5,044,556
302 5,044,557
391 5,044,558
406 5,044,559
476 5,044,560
491 5,044,561
543 5,044,562
585 5,044,563
690.1 5,044,564

**CLASS 241**

1 5,044,565
46.04 5,044,566
73 5,044,567
169 5,044,568
266 5,044,569
294 5,044,570

**CLASS 242**

18.1 5,044,571
35.5 R 5,044,572
54 R 5,044,573
68.3 5,044,574
107.2 5,044,575
107.4 A Re.33,679

**CLASS 244**

13 5,044,576
119 5,044,578
158 R 5,044,579
214 5,044,580

**CLASS 248**

48.1 5,044,581
57 5,044,582
62 5,044,583
68.1 5,044,584
100 5,044,585
124 5,044,586
158 5,044,587
214 5,044,588
265 5,044,589
309.1 5,044,590
317 5,044,591
408 5,044,592
442.2 5,044,593
454 5,044,594
460 5,044,595
479 5,044,596
530 5,044,597
638 5,044,598
640 5,044,599

**CLASS 249**

121 5,044,600
194 5,044,601

**CLASS 250**

201.1 5,045,678
5,045,679
205 5,045,683
206.1 5,045,684
208.1 5,045,685
5,045,686
213 A 5,045,680
5,045,681
213 VT 5,045,682
221 5,045,687
223 B 5,045,688
227.15 5,045,689
227.29 5,045,690
231.16 5,045,691
266 5,045,692
270 5,045,693
287 5,045,694
305 5,045,695
306 5,045,696
316.1 5,045,697
327.2 5,045,698
5,046,147
330 5,045,699
336.1 5,045,700
339 5,045,701
342 5,045,702
352 5,045,703
372 5,045,704
398 5,045,705
483.1 5,045,706
484.1 5,045,707
492.2 5,046,148
519.1 5,045,708
551 5,045,709
561 5,045,710

**CLASS 251**

1.1 5,044,602
1.3 5,044,603
120 5,044,604
180 5,044,605
214 5,044,606

**CLASS 252**

8.51 5,045,219
8.554 5,045,220
45 5,045,221
102 5,045,222
5,045,223
162 5,045,224
174.15 5,045,225
182.2 5,045,226
299.01 5,045,229
299.5 5,045,227
299.61 5,045,228
310 5,045,230
315.1 5,045,231
321 5,045,232
399 5,045,233
408.1 5,045,234
501.1 5,045,235
512 5,045,236
516 5,045,237
550 5,045,238
582 5,045,239
626 5,045,240
628 5,045,241

**CLASS 254**

266 5,044,608

**CLASS 256**

13.1 5,044,609

**CLASS 257**

17 5,045,896

**CLASS 259**

50.3 5,044,607

**CLASS 260**

424 5,045,242
428.5 5,045,243
665 G 5,045,244

**CLASS 261**

44.2 5,045,245
93 5,045,246
114.2 5,045,247

**CLASS 264**

13 5,045,248
24 5,045,249
40.1 5,045,251
40.4 5,045,250
40.5 5,045,252
5,045,253
48 5,045,254
51 5,045,255
53 5,045,256
83 5,045,257
85 5,045,258
5,045,259
103 5,045,260
108 5,045,261
112 5,045,262
137 5,045,263
171 5,045,264
219 5,045,265
222 5,045,266
243 5,045,267
246 5,045,268
332 5,045,269
555 5,045,271

**CLASS 266**

45 5,044,610
105 5,044,611
135 5,044,612
170 5,044,613

**CLASS 267**

221 5,044,614

**CLASS 269**

231 5,044,615
309 5,044,616

**CLASS 270**

45 5,044,617
53 5,044,618
58 5,044,619

**CLASS 271**

9 5,044,620
11 5,044,621
121 5,044,622
223 5,044,623
274 5,044,624
293 5,044,625

**CLASS 272**

68 5,044,626
73 5,044,627
96 5,044,628
118 5,044,629
130 5,044,630
134 5,044,631
5,044,632
144 5,044,633

**CLASS 273**

32 R 5,044,634
127 R 5,044,635
138 A 5,044,636
164 5,044,637
232 5,044,638
342 5,044,639
422 5,044,640

**CLASS 277**

11 5,044,641
134 5,044,642

**CLASS 279**

60 5,044,643

**CLASS 280**

47.35 5,044,644
79.4 5,044,645
250.1 5,044,647
283 5,044,648
288.4 5,044,649
304.1 5,044,650
407 5,044,651
416.1 5,044,652
421 5,044,653
613 5,044,654
615 5,044,655
618 5,044,656
625 5,044,657
631 5,044,658
661 5,044,659
707 5,044,660



5,044,661
5,044,662
730 5,044,663
804 5,044,664
5,044,665
808 5,044,666
851 5,044,667

**CLASS 281**

5 Re.33,680

**CLASS 283**

81 5,044,669
058 5,044,668

**CLASS 285**

16 5,044,670
55 5,044,671
98 5,044,672
134 5,044,673
168 5,044,674
256 5,044,675
334 5,044,676

**CLASS 290**

52 5,045,711

**CLASS 292**

39 5,044,677
144 5,044,678
207 5,044,679
278 5,044,680
288 5,044,681

**CLASS 293**

117 Re.33,681

**CLASS 296**

39.2 5,044,682
65.1 5,044,683
93 5,044,684
97.11 5,044,687
97.6 5,044,685
97.7 5,044,686
136 5,044,688
183 5,044,689

**CLASS 297**

16 5,044,690
239 5,044,691
391 5,044,692
452 5,044,693
5,044,694
481 5,044,695

**CLASS 299**

41 5,044,696

**CLASS 303**

14 5,044,697
33 5,044,698
100 5,044,700
5,044,702
115 5,044,701

**CLASS 307**

10.1 5,046,149
29 5,045,712
201 5,045,713
243 5,045,714
269 5,045,715
296.2 5,045,716
296.3 5,045,717
296.4 5,045,718
441 5,045,720
443 5,045,721
5,045,722
451 5,045,723
456 5,045,724
465 5,045,725
466 5,045,726
475 5,045,727
5,045,728
5,045,729
5,045,730
511 5,045,731
529 5,045,732
566 5,045,733
570 5,045,734

**CLASS 310**

38 5,045,735
68 D 5,046,150
88 5,045,736
89 5,045,737
90 5,045,738
90.5 5,046,151
105 5,045,739
156 5,045,740
209 5,045,741
254 5,045,742
313 D 5,045,743
320 5,045,744
329 5,045,745
334 5,045,746
357 5,045,747

**CLASS 312**

201 5,044,703
214 5,044,704
228 5,044,705

**CLASS 313**

113 5,045,748
305 5,045,749
466 5,045,750
479 5,045,751
487 5,045,752
494 5,045,753
495 5,045,754
498 5,045,755
631 5,045,756

**CLASS 315**

59 5,045,757
151 5,045,758
171 5,045,759
209 R 5,045,760
307 5,046,152
410 5,045,761

**CLASS 318**

254 5,045,762
270 5,045,763
280 5,045,764
293 5,045,766
382 5,045,765
696 5,045,767

**CLASS 320**

2 5,045,768
5,045,769

**CLASS 323**

223 5,045,770
282 5,045,771
313 5,045,772
316 5,045,773
322 5,045,774

**CLASS 324**

71.2 5,045,775
73.1 5,045,776
77 R 5,045,777
133 5,045,778
146 5,046,154
158 MG 5,045,779
158 P 5,045,780
5,045,781
158 R 5,045,782
5,045,783
163 5,045,784
207.16 5,045,785
5,045,786
217 5,045,787
225 5,045,789
248 5,045,788
307 5,045,790
309 5,045,791
318 5,045,792
5,045,793
320 5,045,794
342 5,045,795
399 5,045,796
667 5,045,797
687 5,045,798

**CLASS 328**

14 5,045,799
59 5,045,800
72 5,045,801

**CLASS 330**

2 5,045,802
51 5,045,803
5,045,804
54 5,046,155
107 5,045,805
252 5,045,806
260 5,045,807
277 5,045,808
284 5,045,809
293 5,045,810

**CLASS 331**

1 A 5,045,811
10 5,045,812
16 5,045,813
86 5,045,814
96 5,045,815

**CLASS 332**

105 5,045,816
117 5,045,817
127 5,045,818

**CLASS 333**

1 5,045,819
26 5,045,820
118 5,045,821
124 5,045,822
132 5,045,823
206 5,045,824
222 5,045,825

**CLASS 335**

301 5,045,826

**CLASS 336**

192 5,046,153

**CLASS 337**

380 5,046,156

**CLASS 338**

2 5,045,827
35 5,045,828
36 5,045,829
41 5,045,830
280 5,045,831
334 5,045,832

**CLASS 340**

309.15 5,046,157
332 5,045,833
436 5,045,834
438 5,045,835
450 5,045,836
450.2 5,045,837
457 5,045,838
539 5,045,839
652 5,045,840
706 5,045,841
709 5,045,842
5,045,843
724 5,045,844
726 5,045,845
772 5,045,846
783 5,045,847
825.26 5,045,848
825.34 5,045,849
825.44 5,045,850
870.13 5,045,851

**CLASS 341**

51 5,045,852
67 5,045,853
97 5,045,854
137 5,046,158

**CLASS 342**

25 5,045,855
70 5,045,856
374 5,045,857
379 5,045,858
414 5,045,859
451 5,045,860
457 5,045,861

**CLASS 343**

700 MS 5,045,862

**CLASS 346**

1.1 5,045,864
5,045,865
76 PH 5,045,866
107 R 5,045,867
108 5,045,868
5,045,869
140 R 5,045,870

**CLASS 350**

6.8 5,044,710
96.14 5,044,712
96.2 5,044,711
171 5,044,727
335 B1 4,917,465

**CLASS 351**

50 5,044,741
90 5,046,104
161 5,044,742
163 5,044,743

**CLASS 354**

76 5,045,871
94 5,045,872
234.1 5,045,873
322 5,045,874
400 5,045,875
418 5,045,876

**CLASS 355**

71 5,045,877
74 5,045,878
001 5,046,159
200 5,045,879
5,045,880
206 5,045,881
208 5,045,882
214 5,045,883
5,045,884
245 5,045,885
253 5,045,886
282 5,045,887
5,045,888
284 5,045,889
5,045,890
289 5,045,891
309 5,045,892
328 5,045,893

**CLASS 356**

5 5,044,744
155 5,044,746
246 5,044,747
251 5,044,748
345 5,044,749
372 5,044,750
375 5,044,751
400 5,044,752
402 5,044,753
432 5,044,754
440 5,044,755
446 5,044,756

**CLASS 357**

17 5,045,894
5,045,895
5,045,897
23.11 5,045,898
23.4 5,045,900
5,045,901
5,045,902
5,045,903
23.6 5,045,899
5,045,904
23.7 5,045,905
24 5,045,906
30 5,045,907
5,045,908
34 5,045,909
35 5,045,910
5,045,911
43 5,045,912
52 5,045,913
68 5,046,160
69 5,046,161
70 5,045,914
71 5,045,915
5,045,916
5,045,917
72 5,045,918
5,045,919
74 5,045,920
5,045,921
75 5,045,922
79 5,045,923
81 5,045,924

**CLASS 358**

13 5,045,925
21 R 5,045,926
29 5,045,927
29 C 5,045,928
31 5,045,929
42 5,046,162
60 5,045,930
75 5,045,931
76 5,045,932
80 5,045,933
94 5,046,163
98 5,045,934
5,045,935
100 5,045,936
109 5,045,937
133 5,045,938
140 5,045,939
5,046,164
143 5,045,940
147 5,045,941
148 5,045,942
153 5,045,943
160 5,045,944
167 5,045,945
183 5,046,165
191.1 5,045,946
192.1 5,045,947
194.1 5,045,948
227 Re.33,682
244 5,045,949
300 5,046,166
319 5,045,950
335 5,046,167
445 5,045,951
447 5,045,952
473 5,045,953

**CLASS 359**

2 5,044,707
8 5,044,708
13 5,044,709
49 5,044,734
53 5,044,732
75 5,044,735
81 5,044,733
124 5,046,139
136 5,046,137
188 5,046,138
191 5,046,140
291 5,044,736
327 5,045,719
357 5,044,706
463 5,044,737
504 5,044,738
561 5,044,726
603 5,044,740
813 5,044,728
824 5,044,729
838 5,044,731
864 5,044,739
890 5,044,730

**CLASS 360**

8 5,045,954
9.1 5,045,955
51 5,045,956
71 5,045,957
92 5,045,958
95 5,046,168
96.5 5,046,169
97.01 5,045,960
126 5,045,961
128 5,045,962
133 5,045,959
5,046,170
5,046,171

**CLASS 361**

87 5,045,963
254 5,045,964
275 5,045,965
313 5,045,966
332 5,046,172
335 5,045,968
353 5,046,173
364 5,045,969
386 5,045,970
5,045,971
387 5,045,972
395 5,045,973
399 5,045,974
412 5,045,975
417 5,045,976
424 5,045,977

**CLASS 362**

101 5,045,978
108 5,045,979
202 5,045,980
219 5,045,981
241 5,045,982
293 5,045,983
365 5,045,984
366 5,045,985
413 5,045,986
421 5,045,987

**CLASS 363**

35 5,045,988
37 5,045,989
43 5,045,990
89 5,045,991

**CLASS 364**

200 5,045,992
5,045,993
5,045,994
5,045,995
5,045,996
5,045,997
5,045,998
5,045,999
5,046,000
5,046,001
5,046,002
413.15 5,046,003
419 5,046,004
5,046,005
423 5,046,006
424.04 5,046,007
424.05 5,046,008
424.1 5,046,174
5,046,175
5,046,176
5,046,177
5,046,178
426.02 5,046,009
433 5,046,010
449 5,046,011
468 5,046,012
470 5,046,013
474.02 5,046,014
474.09 5,046,015
488 5,046,016
491 5,046,017
497 5,046,018
513 5,046,019
5,046,020
5,046,021
5,046,022
518 5,045,967
5,046,023
5,046,024
5,046,025
521 5,046,026
5,046,027
550 5,046,028
561 5,046,029
571.02 5,046,030
5,046,031
5,046,032
580 5,046,033
5,046,034
716 5,046,035
717 5,046,036
728.03 5,046,179
746.1 5,046,037
765 5,046,038
900 5,046,039
5,046,040
5,046,041
5,046,042

**CLASS 365**

145 5,046,043
156 5,046,044
189.01 5,046,045
189.03 5,046,180
200 5,046,046
201 5,046,047
5,046,048
5,046,049
208 5,046,050
221 5,046,051
226 5,046,052

**CLASS 366**

76 5,044,757
77 5,044,758
88 5,044,759
97 5,044,760
139 5,044,761
286 5,044,762
309 5,044,763

**CLASS 367**

98 5,046,053
144 5,046,054
154 5,046,055
166 5,046,056
170 5,046,057

**CLASS 369**

32 5,046,058
36 5,046,059
44.32 5,046,060
112 5,046,061
219 5,046,062

**CLASS 370**

29 5,046,063
58.1 5,046,181
60 5,046,064
79 5,046,182
85.13 5,046,065
94 1 5,046,066
110.1 5,046,067
5,046,183

**CLASS 371**

16.1 5,046,068
53 5,046,069

**CLASS 372**

18 5,046,184
33 5,046,070

**CLASS 374**

16 5,044,764
29 5,044,765
43 5,044,766
44 5,044,767
109 5,044,768
119 5,044,769
208 5,044,770
5,044,771

**CLASS 375**

4 5,046,185
27 5,046,071
36 5,046,072
82 5,046,073
111 5,046,074
119 5,046,075

**CLASS 376**

211 5,045,272
245 B1 4,828,787
309 5,045,273
318 5,045,274
331 5,045,275

**CLASS 377**

8 5,046,076

**CLASS 378**

80 5,046,077
119 5,046,078
125 5,046,186

**CLASS 379**

53 5,046,079
5,046,080
58 5,046,081
59 5,046,082
93 5,046,083
5,046,187
94 5,046,188
100 5,046,084
5,046,189
112 5,046,085

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164 5,046,086
201 5,046,087
211 5,046,088
399 5,046,089

**CLASS 380**

5 5,046,090
14 5,046,091
20 5,046,092
5,046,093
46 5,046,094
50 5,046,095
57 5,046,096

**CLASS 381**

17 5,046,097
22 5,046,098
43 5,046,099
49 5,046,100
51 5,045,327
57 5,046,101
68.2 5,046,102
71 5,046,103
98 5,046,105
102 5,046,106
107 5,046,107

**CLASS 382**

6 5,046,108
8 5,046,109
5,046,110
5,046,111
5,046,112
5,046,113
9 5,046,114
22 5,046,115
36 5,046,116
47 5,046,117
49 5,046,190
51 5,046,118
54 5,046,120
56 5,046,119
5,046,121
5,046,122

**CLASS 383**

11 5,044,772
22 5,044,773
34.1 5,044,774
37 5,044,699
72 5,044,775
89 5,044,776
100 5,044,777

**CLASS 384**

7 5,044,778
15 5,044,779
44 5,044,780
99 5,044,781
482 5,044,782
523 5,044,783
536 5,044,784
5,044,785
549 5,044,786
572 5,044,787
577 5,044,788
581 5,044,789

**CLASS 385**

4 5,044,718
5 5,044,714
11 5,044,713
12 5,044,723
16 5,044,745
33 5,044,717
42 5,044,715
51 5,044,716
53 5,044,721
76 5,044,719
88 5,044,720
113 5,044,722
127 5,044,724
130 5,044,725

**CLASS 388**

814 5,046,123

**CLASS 400**

76 5,044,790
134.4 5,044,791
146 5,044,792
157.3 5,044,793
208 5,044,794
234 5,044,795
323 5,044,796
335 5,044,797
472 5,044,798
643 5,044,799
660 5,044,800
692 5,044,801
695 5,044,802

**CLASS 401**

9 5,044,803
34 5,044,804
82 5,044,805
88 5,044,806

**CLASS 402**

80 L 5,044,807

**CLASS 403**

2 5,044,808
24 5,044,809
93 5,044,810
134 5,044,811
154 5,044,812
225 5,044,813
290 5,044,814
338 5,044,815
344 5,044,816
370 5,044,817

**CLASS 404**

26 5,044,818
72 5,044,819
84 5,044,820

**CLASS 405**

50 5,044,821
52 5,044,822
152 5,044,823
156 5,044,824
166 5,044,825
169 5,044,826
173 5,044,827
202 5,044,828
203 5,044,829
210 5,044,830
259 5,044,831
260 5,044,832
267 5,044,833
284 5,044,834
287 5,044,835

**CLASS 406**

22 5,044,836
85 5,044,837

**CLASS 407**

103 5,044,838
114 5,044,839
5,044,840

**CLASS 408**

36 5,044,841

**CLASS 409**

66 5,044,842
126 5,044,843
178 5,044,844

**CLASS 410**

3 5,044,845
47 5,044,846
101 5,044,847
102 5,044,848

**CLASS 411**

38 5,044,849
43 5,044,850
44 5,044,851
258 5,044,852
311 5,044,853
344 5,044,854
386 5,044,855
551 5,044,856

**CLASS 412**

19 5,044,857

**CLASS 414**

10 5,044,858
273 5,044,859
287 5,044,860
332 5,044,861
392 5,044,862
409 5,044,863
459 5,044,864
477 5,044,865
495 5,044,866
523 5,044,867
627 5,044,868
785 5,044,869
786 5,044,870
5,044,871
5,044,872
792.5 5,044,873
796 5,044,874
797.9 5,044,875
798.2 5,044,876
798.9 5,044,877

**CLASS 415**

4.2 5,044,878
150 5,044,879
158 5,044,880
173.3 5,044,881
182.1 5,044,882
214.1 5,044,883

**CLASS 416**

189 5,044,884
196 R 5,044,885
215 5,044,886
223 B 5,044,887

**CLASS 417**

22 5,044,888
53 5,044,889
87 5,044,890
214 5,044,891
269 5,044,892
279 5,044,893
310 5,044,894
354 5,044,895
365 5,044,896
423.7 5,044,897
462 5,044,898
5,044,899
466 5,044,900
474 5,044,901
477 5,044,902
500 5,044,903

**CLASS 418**

55.2 5,044,904
126 5,044,905
150 5,044,906
168 5,044,907
179 5,044,908
201.2 5,044,909
253 5,044,910

**CLASS 419**

9 5,045,276
15 5,045,277
16 5,045,278

**CLASS 420**

89 5,045,279
466 5,045,280
497 5,045,281

**CLASS 422**

56 5,045,282
5,045,283
81 5,045,284
98 5,045,285
100 5,045,286
142 5,045,287
186.3 5,045,288

**CLASS 423**

21.1 5,045,289
22 5,045,290
228 5,045,291
235 5,045,292
305 5,045,293
315 5,045,294
328 5,045,295
415 P 5,045,296
437 5,045,297
445 5,045,298
447.4 5,045,299
465 5,045,300
610 5,045,301

**CLASS 424**

1.1 5,045,302
5,045,303
9 5,045,304
52 5,045,305
B1 4,314,990
54 5,045,306
59 5,045,307
61 5,045,308
5,045,309
71 5,045,310
78 5,045,311
85.8 5,045,312
88 5,045,313
93 5,045,314
94.64 5,045,315
400 5,045,316
401 5,045,317
422 5,045,318
448 5,045,319
450 5,045,320
475 5,045,321
486 5,045,322
601 5,045,323
678 5,045,324

**CLASS 425**

110 5,044,911
116 5,044,912
135 5,044,913
169 5,044,914
174.8 R 5,044,915
345 5,044,916
373 5,044,917
397 5,044,918
443 5,044,919
445 5,044,920
451.9 5,044,921
503 5,044,922
525 5,044,923
542 5,044,924
5,044,925
562 5,044,926
567 5,044,927

**CLASS 426**

5 5,045,325
5,045,326
28 5,045,328
106 5,045,329
107 5,045,330
118 5,045,331
332 5,045,332
394 5,045,333
422 5,045,334
533 5,045,335
534 5,045,336
602 5,045,337
611 5,045,338
641 5,045,339
660 5,045,340

**CLASS 427**

2 5,045,341
8 5,045,342
33 5,045,343
37 5,045,344
38 5,045,345
39 5,045,346
40 5,045,347
54.1 5,045,348
113 5,045,349
127 5,045,350
130 5,045,351
140 B1 3,684,560
172 5,045,358
235 5,045,352
243 5,045,353
245 5,045,354
249 5,045,355
5,045,356
255 5,045,357
386 5,045,359
387 5,045,360
388.2 5,045,361
400 5,045,362
410 5,045,363
423 5,045,365
440 5,045,366
719 5,044,315

**CLASS 428**

34.1 5,045,368
36.7 5,045,369
38 5,045,370
49 5,045,371
64 5,045,372
5,045,373
83 5,045,374
96 5,045,375
105 5,045,376
107 5,045,377
153 5,045,378
156 5,045,379
195 5,045,380
209 5,045,381
216 5,045,382
5,045,383
218 5,045,384
220 5,045,385
262 5,045,386
272 5,045,367
284 5,045,387
294 5,045,388
316.6 5,045,389
329 5,045,390
336 5,045,391
341 5,045,392
353 5,045,393
402 5,045,394
5,045,395
411.1 5,045,364
412 5,045,396
429 5,045,397
446 5,045,398
447 5,045,399
450 5,045,400
516 5,045,401
545 5,045,402
593 5,045,403
606 5,045,404
612 5,045,405
614 5,045,406
5,045,407
620 5,045,408
5,045,409
644 5,045,410
672 5,045,411
694 5,045,412

**CLASS 429**

13 5,045,413
17 5,045,414
81 5,045,415
103 5,045,416

**CLASS 430**

5 5,045,417
7 5,045,418
20 5,045,419
45 5,045,420
58 5,045,421
109 5,045,422
110 5,045,423
115 5,045,425
126 5,045,424
5,045,426
138 5,045,427
5,045,428
5,045,430
175 5,045,429
270 5,045,431
278 5,045,432
281 5,045,433
286 5,045,434
288 5,045,435
315 5,045,436
320 5,045,437
321 5,045,438
394 5,045,439
495 5,045,440
529 5,045,441
553 5,045,442
567 5,045,443
5,045,444
642 5,045,445

**CLASS 431**

1 5,044,928
5,044,929
5,044,930
8 5,044,931
116 5,044,932
144 5,044,933
153 5,044,934
182 5,044,935
344 5,044,936

**CLASS 432**

5 5,044,937
8 5,044,938
25 5,044,939
30 5,044,940
58 5,044,941
99 5,044,942
121 5,044,943
128 5,044,944

**CLASS 433**

8 5,044,945
18 5,044,946
20 5,044,947
31 5,044,948
58 5,044,949
69 5,044,950
72 5,044,951
84 5,044,952
92 5,044,953
159 5,044,954
229 5,044,955

**CLASS 434**

45 5,044,956
82 5,044,957
127 5,044,958
236 5,044,959
274 5,044,960
304 5,044,961

**CLASS 435**

2 5,045,446
5 5,045,447
5,045,448
6 5,045,449
5,045,450
7.23 5,045,451
7.4 5,045,452
18 5,045,453
29 5,045,454
69.6 5,045,455
101 5,045,456
124 5,045,457
126 5,045,458
144 5,045,459
172.3 5,045,460
5,045,461
198 5,045,462
205 5,045,463
209 5,045,464
227 5,045,465
240.27 5,045,466
240.31 5,045,467
5,045,468
252.3 5,045,469
284 5,045,470
320.1 5,045,471

**CLASS 436**

10 5,045,472
53 5,045,473
63 5,045,474
74 5,045,475
81 5,045,476
164 5,045,477
501 5,045,478
518 5,045,479
532 5,045,480

**CLASS 437**

2 5,045,481
3 5,045,482
31 5,045,483
5,045,484
40 5,045,485
41 5,045,486
5,045,487
43 5,045,488
5,045,489
5,045,490
52 5,045,491
57 5,045,492
59 5,045,493
60 5,045,494
70 5,045,495
81 5,045,496
129 5,045,498
5,045,499
5,045,500
175 5,045,497
180 5,045,501
184 5,045,502
228 5,045,503
235 5,045,504
249 5,045,505

**CLASS 439**

21.5 5,044,971
54 5,044,962
55 5,044,963
67 5,044,964
76 5,044,965
78 5,044,966
79 5,044,967
164 5,044,968
188 5,044,969
196 5,044,970
268 5,044,972
296 5,044,973
307 5,044,974
352 5,044,975
368 5,044,976
374 5,044,977
394 5,044,978
404 5,044,979
496 5,044,980
533 5,044,981
5,044,982
539 5,044,983
540 5,044,984
544 5,044,985
548 5,044,986
560 5,044,987
571 5,044,988
578 5,044,989
5,044,990
595 5,044,991
608 5,044,992
668 5,044,993
681 5,044,994
757 5,044,995
783 5,044,996
835 5,044,997
856 5,044,998
879 5,044,999
892 5,045,000

**CLASS 440**

1 5,045,001
38 5,045,002
45 5,045,004
89 5,045,005
042 5,045,003

**CLASS 441**

75 5,045,006

**CLASS 445**

2 5,045,007
26 5,045,008
30 5,045,009
5,045,010

**CLASS 446**

46 5,045,011
62 5,045,012
179 5,045,013
236 5,045,014
355 5,045,015
409 5,045,016
415 5,045,017

**CLASS 450**

31 5,045,018
74 5,045,019

**CLASS 452**

21 5,045,020
74 5,045,021
165 5,045,022
185 5,045,023
5,045,024

**CLASS 455**

20 5,046,124



26.1 5,046,125
35 5,046,126
51 5,046,127
5,046,128
72 5,046,129
78 5,046,130
90 5,046,131
119 5,046,132
138 5,046,133
303 5,046,135
343 5,046,136

**CLASS 460**

66 5,045,025

**CLASS 464**

29 5,045,026
63 5,045,027

**CLASS 474**

17 5,045,028
112 5,045,029
138 5,045,030
5,045,031
140 5,045,032
197 5,045,033

**CLASS 475**

5 5,045,034
42 5,045,035
149 5,045,036
215 5,045,037
235 5,045,038

**CLASS 493**

1 5,045,039
194 5,045,040
5,045,041
225 5,045,042
245 5,045,043
328 5,045,044
363 5,045,045

**CLASS 494**

10 5,045,046
17 5,045,047
41 5,045,048
70 5,045,049

**CLASS 501**

35 5,045,506
40 5,045,507
48 5,045,508
59 5,045,509
66 5,045,510
85 5,045,511
96 5,045,512
98 5,045,513
119 5,045,514

**CLASS 502**

67 5,045,515
103 5,045,517
107 Re.33,683
216 5,045,518
235 5,045,519
301 5,045,520
304 5,045,521
309 5,045,516
405 5,045,522

**CLASS 503**

207 5,045,523
227 5,045,524

**CLASS 505**

1 5,045,525
5,045,526
5,045,527
5,045,528

**CLASS 514**

6 5,045,529
9 5,045,530
12 5,045,531

**CLASS 518**

706 5,045,568
25 5,045,532
29 5,045,533
34 5,045,534
57 5,045,535
63 5,045,536
5,045,537
152 5,045,538
178 B1 4,002,746
212 5,045,539
235.8 5,045,540
248 5,045,541
255 5,045,542
278 5,045,544
284 5,045,545
304 5,045,546
311 5,045,547
5,045,548
312 5,045,549
332 5,045,550
337 5,045,551
338 5,045,552
344 5,045,553
359 5,045,543
365 5,045,554
372 5,045,555
383 5,045,556
398 5,045,557
399 5,045,558
423 5,045,559
425 5,045,560
432 5,045,561
435 5,045,562
444 5,045,563
471 5,045,564
487 5,045,565
508 5,045,566
539 5,045,567

**CLASS 521**

60 5,045,569
88 5,045,570
111 5,045,571

**CLASS 522**

31 5,045,572
42 5,045,573

**CLASS 523**

212 5,045,574
458 5,045,575

**CLASS 524**

60 5,045,576
99 5,045,577
101 5,045,578
128 5,045,579
147 5,045,580
151 5,045,581
156 5,045,582
236 5,045,583
277 5,045,584
281 5,045,585
291 5,045,586
310 5,045,587
445 5,045,588
505 5,045,589
705 5,045,590
731 5,045,591
755 5,045,592

**CLASS 525**

54.3 5,045,593
57 5,045,594
66 5,045,595
67 5,045,596
72 5,045,597
88 5,045,598
102 5,045,599
180 5,045,600
327.1 5,045,601
327.2 5,045,602
356 5,045,603
378 5,045,604
5,045,605
397 5,045,606
398 5,045,607
436 5,045,608
438 5,045,609
439 5,045,610

**CLASS 526**

81 5,045,611
124 5,045,612
209 5,045,613
219.5 5,045,614
245 5,045,615
258 5,045,616
264 5,045,617
292.5 5,045,618
301 5,045,619
348.1 5,045,620

**CLASS 528**

14 5,045,621
15 B1 4,742,142
48 5,045,622
60 5,045,623
70 5,045,624
170 5,045,625
193 5,045,626
271 5,045,627
388 5,045,628
481 5,045,629
503 5,045,630

**CLASS 530**

350 5,045,631
399 5,045,633

**CLASS 562**

45 5,045,632

**CLASS 570**

170 5,045,634

**CLASS 600**

9 5,045,050
16 5,045,051
32 5,045,052

**CLASS 604**

21 5,045,053
22 5,045,054
33 5,045,055
49 5,045,056
50 5,045,057
55 5,045,058
82 5,045,059
93 5,045,060
96 5,045,061
110 5,045,062
5,045,063
132 5,045,064
167 5,045,065
198 5,045,066
244 5,045,067
246 5,045,068
253 5,045,069
271 5,045,070
280 5,045,071
5,045,072
310 5,045,073
317 5,045,074
5,045,075
5,045,076
321 5,045,077
329 5,045,078
5,045,079
362 5,045,080
411 5,045,081
892.1 5,045,082

**CLASS 7.5**

499 5,045,112

## CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D1— | 118 | 319,524 | | 536 | 319,557 | | 31 | 319,590 | D13— | 133 | 319,624 | | | 319,655 | | 287 | 319,687 |
| D2— | 30 | 319,525 | | 601 | 319,558 | | 32 | 319,591 | | 140 | 319,609 | | | 319,656 | | | 319,688 |
| | 79 | 319,526 | D8— | 1 | 319,559 | | 40 | 319,592 | | 146 | 319,625 | | 34 | 319,657 | | 294 | 319,689 |
| | 277 | 319,527 | | | 319,560 | | | 319,593 | | 156 | 319,626 | | 43 | 319,658 | | | 319,690 |
| | | 319,528 | | 14 | 319,561 | | 46.1 | 319,594 | | 160 | 319,627 | D19— | 27 | 319,659 | | | 319,691 |
| | 314 | 319,529 | | 29 | 319,562 | | 50 | 319,595 | | 171 | 319,628 | | | 319,660 | | 306 | 319,692 |
| | 317 | 319,530 | | 50 | 319,563 | | 81 | 319,596 | | 182 | 319,629 | | 41 | 319,661 | | 335 | 319,693 |
| | 320 | 319,531 | | 61 | 319,564 | | 98 | 319,597 | | 184 | 319,630 | | 43 | 319,662 | | 336 | 319,694 |
| | | 319,532 | | 70 | 319,565 | | 100 | 319,600 | D14— | 100 | 319,631 | | 51 | 319,663 | | 354 | 319,695 |
| | | 319,533 | | 71 | 319,566 | | 101 | 319,598 | | | 319,632 | | 69 | 319,664 | D24— | 113 | 319,697 |
| | | 319,534 | | 80 | 319,567 | | 106 | 319,599 | | 105 | 319,633 | | | 319,665 | | 115 | 319,699 |
| | | 319,535 | | 91 | 319,568 | | 114 | 319,601 | | | 319,634 | | 75 | 319,666 | | 117 | 319,698 |
| D3— | 12 | 319,536 | | 300 | 319,569 | | 129 | 319,602 | | | 319,635 | D20— | 10 | 319,667 | | 154 | 319,696 |
| | 14 | 319,537 | | 302 | 319,570 | | | 319,603 | | 106 | 319,636 | | 21 | 319,668 | | 183 | 319,700 |
| | 26 | 319,538 | | 356 | 319,571 | D11— | 79 | 319,604 | | 108 | 319,637 | | 22 | 319,669 | D25— | 52 | 319,701 |
| | 35 | 319,540 | | 380 | 319,572 | | 131 | 319,605 | | | 319,638 | D21— | 31 | 319,670 | D26— | 63 | 319,702 |
| | 40 | 319,539 | | | 319,573 | | 153 | 319,606 | | 129 | 319,639 | | 55 | 319,671 | | 67 | 319,703 |
| D6— | 300 | 319,541 | | 387 | 319,574 | D12— | 100 | 319,608 | | 143 | 319,640 | | 62 | 319,672 | | 107 | 319,704 |
| | 328 | 319,542 | | 395 | 319,575 | | 155 | 319,610 | | 151 | 319,641 | | 108 | 319,673 | | 127 | 319,705 |
| | 333 | 319,543 | | 400 | 319,576 | | 156 | 319,611 | | | 319,642 | | 171 | 319,674 | | 140 | 319,706 |
| | 344 | 319,544 | D9— | 333 | 319,577 | | 179 | 319,612 | | | 319,643 | | 194 | 319,675 | D27— | 102 | 319,707 |
| | 373 | 319,545 | | 341 | 319,578 | | 181 | 319,613 | D15— | 16 | 319,644 | | 205 | 319,676 | D28— | 7 | 319,708 |
| | 381 | 319,546 | | | 319,579 | | 192 | 319,614 | | 140 | 319,645 | | 221 | 319,677 | | 46 | 319,709 |
| | 397 | 319,547 | | 352 | 319,580 | | 196 | 319,615 | D16— | 102 | 319,646 | | 228 | 319,678 | | 50 | 319,711 |
| | 399 | 319,548 | | 366 | 319,581 | | | 319,616 | | | 319,647 | | 237 | 319,679 | | 53 | 319,712 |
| | 407 | 319,549 | | 367 | 319,582 | | 213 | 319,617 | | 129 | 319,648 | | 247 | 319,680 | | 64 | 319,710 |
| | 421 | 319,550 | | 370 | 319,583 | | 310 | 319,618 | | 225 | 319,649 | D22— | 135 | 319,681 | D30— | 159 | 319,713 |
| | 450 | 319,551 | | 378 | 319,584 | | 315 | 319,619 | D17— | 22 | 319,650 | D23— | 201 | 319,682 | D32— | 15 | 319,714 |
| | 520 | 319,552 | | 412 | 319,585 | | 318 | 319,620 | D18— | 7 | 319,651 | | 237 | 319,683 | D34— | 5 | 319,715 |
| | 601 | 319,553 | | 417 | 319,586 | | | 319,621 | | 12 | 319,652 | | | 319,684 | | 21 | 319,716 |
| D7— | 319 | 319,554 | | 432 | 319,587 | | | 319,622 | | 13 | 319,653 | | 255 | 319,685 | | 23 | 319,717 |
| | 379 | 319,555 | | 447 | 319,588 | | | 319,623 | | | 319,654 | | 281 | 319,686 | 112— | 7 | 319,607 |
| | 414 | 319,556 | D10— | 23 | 319,589 | | | | | | | | | | | | |

## CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | | 7,637 | | | | | | | | | | | | |
| | 8 | 7,638 | | 68 | 7,639 | | 7,640 | | 7,641 | | 74 | 7,642 | 89 | 7,643 |

## STATUTORY INVENTION REGISTRATIONS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 102— | 489 | H959 | 165— | 163 | H961 | 330— | 254 | H965 | 370— | 112 | H967 | 422— | 68.1 | H962 | 430— | 559 | H963 |
| | 522 | H960 | 324— | 174 | H964 | 342— | 361 | H966 | | | | | | | | | |

# GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)


| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1 | Kentucky | 21 | Oregon | 41 |
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### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2 on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991 due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O.G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46 on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees ( in U.S. dollars) is as follows:

| | |
|---|---|
| Transmittal fee: | 170.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 550.00 |
| —Corresponding prior U.S. national application filed | 380.00 |
| —Supplemental search fee, per additional invention | 150.00 |
| European Patent Office as ISA | 1320.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —Search fee paid to USPTO as ISA | 400.00 |
| —Additional examination fee, per additional invention | 130.00 |
| —ISA not the USPTO | 600.00 |
| —Additional examination fee, per additional invention | 200.00 |
| International fees | |
| Basic fee | 490.00 |
| Basic Supplemental fee (for each page over 30) | 10.00 |
| Designation fee per country or region for the first 10 national or regional offices | 119.00 |
| Designation fee for 11th and subsequent designations | No Charge |
| Handling fee | 150.00 |

U.S. National Stage fees

| | Small Entity | Regular |
|---|---|---|
| USPTO was IPEA | 165.00 | 330.00 |
| USPTO was ISA but not IPEA | 185.00 | 370.00 |
| USPTO was neither ISA nor IPEA | 250.00 | 500.00 |
| USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4) | 25.00 | 50.00 |
| —For each independent claim in excess of 3 | 18.00 | 36.00 |
| —For each claim in excess of 20 | 6.00 | 12.00 |
| —For each application containing a multiple dependent claim | 60.00 | 120.00 |
| —Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1) | 60.00 | 120.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) | 30.00 | 30.00 |

June 27, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks.*

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### Updated Patent Cooperation Treaty

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss franc, the dollar amount of the international fees for international applications filed in the United States Receiving Office will decrease, effective Aug. 1, 1991.

Effective Aug. 1, 1991, the amount of the international applications filed in the United States Receiving Office will be:

| | |
|---|---|
| Basic fee(first 30 pages) | $490.00 |
| Basic Supplemental fee(for each page over 30) | $10.00 |
| Designation fee(per country or region up to 10) | $119.00 |
| Handling fee | $150.00 |

June 27, 1991

HARRY F. MANBECK
*Assistant Secretary and Commissioner of Patents and Trademarks*

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### Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 6, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:





Utility Patents 4,768,231 through 4,769,853
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 4, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,468,815 through 4,470,154
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED JUNE 30, 1991*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,389,733 | 06/234,929 | 6/28/83 |
| 4,389,737 | 06/302,590 | 6/28/83 |
| 4,389,740 | 06/261,601 | 6/28/83 |
| 4,389,742 | 06/222,207 | 6/28/83 |
| 4,389,748 | 06/267,017 | 6/28/83 |
| 4,389,750 | 06/272,540 | 6/28/83 |
| 4,389,757 | 06/265,137 | 6/28/83 |
| 4,389,762 | 06/259,580 | 6/28/83 |
| 4,389,763 | 06/219,514 | 6/28/83 |
| 4,389,764 | 06/248,296 | 6/28/83 |
| 4,389,765 | 06/260,030 | 6/28/83 |
| 4,389,771 | 06/222,442 | 6/28/83 |
| 4,389,775 | 06/286,052 | 6/28/83 |
| 4,389,781 | 06/291,526 | 6/28/83 |
| 4,389,793 | 06/238,407 | 6/28/83 |
| 4,389,801 | 06/334,326 | 6/28/83 |
| 4,389,808 | 06/268,694 | 6/28/83 |
| 4,389,809 | 06/222,755 | 6/28/83 |
| 4,389,812 | 06/295,697 | 6/28/83 |
| 4,389,815 | 06/318,837 | 6/28/83 |
| 4,389,817 | 06/268,714 | 6/28/83 |
| 4,389,821 | 06/282,926 | 6/28/83 |
| 4,389,829 | 06/219,262 | 6/28/83 |
| 4,389,834 | 06/245,210 | 6/28/83 |
| 4,389,843 | 06/248,226 | 6/28/83 |
| 4,389,860 | 06/254,392 | 6/28/83 |
| 4,389,861 | 06/271,586 | 6/28/83 |
| 4,389,866 | 06/226,869 | 6/28/83 |
| 4,389,875 | 06/220,708 | 6/28/83 |
| 4,389,879 | 06/241,035 | 6/28/83 |
| 4,389,886 | 06/239,338 | 6/28/83 |
| 4,389,890 | 06/257,451 | 6/28/83 |
| 4,389,891 | 06/277,030 | 6/28/83 |
| 4,389,896 | 06/267,506 | 6/28/83 |
| 4,389,897 | 06/252,227 | 6/28/83 |
| 4,389,912 | 06/237,330 | 6/28/83 |
| 4,389,914 | 06/275,082 | 6/28/83 |
| 4,389,915 | 06/217,911 | 6/28/83 |
| 4,389,917 | 06/286,580 | 6/28/83 |
| 4,389,920 | 06/236,493 | 6/28/83 |
| 4,389,922 | 06/294,545 | 6/28/83 |
| 4,389,928 | 06/368,215 | 6/28/83 |
| 4,389,931 | 06/284,972 | 6/28/83 |
| 4,389,938 | 06/249,214 | 6/28/83 |
| 4,389,949 | 06/315,995 | 6/28/83 |
| 4,389,951 | 06/238,773 | 6/28/83 |
| 4,389,952 | 06/277,388 | 6/28/83 |
| 4,389,961 | 06/216,408 | 6/28/83 |
| 4,389,966 | 06/330,372 | 6/28/83 |
| 4,389,976 | 06/257,494 | 6/28/83 |
| 4,389,992 | 06/235,724 | 6/28/83 |
| 4,389,995 | 06/216,433 | 6/28/83 |
| 4,389,996 | 06/260,844 | 6/28/83 |
| 4,389,999 | 06/378,544 | 6/28/83 |
| 4,390,005 | 06/365,594 | 6/28/83 |
| 4,390,006 | 06/227,592 | 6/28/83 |
| 4,390,010 | 06/243,264 | 6/28/83 |
| 4,390,013 | 06/220,274 | 6/28/83 |
| 4,390,016 | 06/314,188 | 6/28/83 |
| 4,390,018 | 06/379,109 | 6/28/83 |
| 4,390,025 | 06/255,178 | 6/28/83 |
| 4,390,035 | 06/256,527 | 6/28/83 |

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| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,390,036 | 06/251,470 | 6/28/83 |
| 4,390,052 | 06/255,010 | 6/28/83 |
| 4,390,054 | 06/281,409 | 6/28/83 |
| 4,390,067 | 06/251,587 | 6/28/83 |
| 4,390,068 | 06/250,894 | 6/28/83 |
| 4,390,069 | 06/280,693 | 6/28/83 |
| 4,390,080 | 06/228,679 | 6/28/83 |
| 4,390,084 | 06/233,077 | 6/28/83 |
| 4,390,100 | 06/230,403 | 6/28/83 |
| 4,390,105 | 06/289,059 | 6/28/83 |
| 4,390,112 | 06/314,167 | 6/28/83 |
| 4,390,117 | 06/278,346 | 6/28/83 |
| 4,390,121 | 06/309,357 | 6/28/83 |
| 4,390,122 | 06/281,886 | 6/28/83 |
| 4,390,127 | 06/245,266 | 6/28/83 |
| 4,390,133 | 06/272,676 | 6/28/83 |
| 4,390,143 | 06/252,072 | 6/28/83 |
| 4,390,162 | 06/265,438 | 6/28/83 |
| 4,390,173 | 06/287,413 | 6/28/83 |
| 4,390,182 | 06/271,131 | 6/28/83 |
| 4,390,184 | 06/302,529 | 6/28/83 |
| 4,390,188 | 06/258,396 | 6/28/83 |
| 4,390,189 | 06/248,922 | 6/28/83 |
| 4,390,208 | 06/257,650 | 6/28/83 |
| 4,390,219 | 06/244,159 | 6/28/83 |
| 4,390,228 | 06/267,684 | 6/28/83 |
| 4,390,233 | 06/256,142 | 6/28/83 |
| 4,390,239 | 06/262,992 | 6/28/83 |
| 4,390,256 | 06/243,795 | 6/28/83 |
| 4,390,257 | 06/237,084 | 6/28/83 |
| 4,390,272 | 06/288,049 | 6/28/83 |
| 4,390,275 | 06/216,182 | 6/28/83 |
| 4,390,289 | 06/292,756 | 6/28/83 |
| 4,390,297 | 06/219,197 | 6/28/83 |
| 4,390,298 | 06/313,367 | 6/28/83 |
| 4,390,301 | 06/306,541 | 6/28/83 |
| 4,390,303 | 06/290,019 | 6/28/83 |
| 4,390,308 | 06/300,826 | 6/28/83 |
| 4,390,319 | 06/263,997 | 6/28/83 |
| 4,390,326 | 06/220,816 | 6/28/83 |
| 4,390,335 | 06/351,482 | 6/28/83 |
| 4,390,352 | 06/245,354 | 6/28/83 |
| 4,390,354 | 06/291,858 | 6/28/83 |
| 4,390,358 | 06/362,124 | 6/28/83 |
| 4,390,363 | 06/272,523 | 6/28/83 |
| 4,390,365 | 06/216,058 | 6/28/83 |
| 4,390,367 | 06/275,337 | 6/28/83 |
| 4,390,370 | 06/342,308 | 6/28/83 |
| 4,390,371 | 06/289,986 | 6/28/83 |
| 4,390,374 | 06/266,648 | 6/28/83 |
| 4,390,376 | 06/338,219 | 6/28/83 |
| 4,390,378 | 06/279,829 | 6/28/83 |
| 4,390,379 | 06/277,412 | 6/28/83 |
| 4,390,396 | 06/256,599 | 6/28/83 |
| 4,390,406 | 06/401,257 | 6/28/83 |
| 4,390,409 | 06/271,054 | 6/28/83 |
| 4,390,410 | 06/375,077 | 6/28/83 |
| 4,390,430 | 06/237,866 | 6/28/83 |
| 4,390,431 | 06/261,818 | 6/28/83 |
| 4,390,436 | 06/346,711 | 6/28/83 |
| 4,390,438 | 06/312,066 | 6/28/83 |
| 4,390,441 | 06/251,035 | 6/28/83 |
| 4,390,446 | 06/262,890 | 6/28/83 |
| 4,390,447 | 06/285,031 | 6/28/83 |
| 4,390,448 | 06/313,685 | 6/28/83 |
| 4,390,451 | 06/274,250 | 6/28/83 |
| 4,390,455 | 06/330,772 | 6/28/83 |
| 4,390,466 | 06/258,887 | 6/28/83 |
| 4,390,476 | 06/318,647 | 6/28/83 |
| 4,390,480 | 06/269,616 | 6/28/83 |
| 4,390,487 | 06/343,016 | 6/28/83 |
| 4,390,501 | 06/237,942 | 6/28/83 |
| 4,390,507 | 06/257,116 | 6/28/83 |
| 4,390,508 | 06/333,294 | 6/28/83 |
| 4,390,509 | 06/254,647 | 6/28/83 |
| 4,390,511 | 06/286,887 | 6/28/83 |
| 4,390,535 | 06/240,666 | 6/28/83 |
| 4,390,547 | 06/259,507 | 6/28/83 |
| 4,390,548 | 06/257,102 | 6/28/83 |
| 4,390,556 | 06/296,950 | 6/28/83 |
| 4,390,557 | 06/297,485 | 6/28/83 |
| 4,390,559 | 06/223,942 | 6/28/83 |
| 4,390,565 | 06/411,753 | 6/28/83 |
| 4,390,567 | 06/242,807 | 6/28/83 |
| 4,390,568 | 06/244,708 | 6/28/83 |
| 4,390,575 | 06/326,740 | 6/28/83 |
| 4,390,578 | 06/239,193 | 6/28/83 |
| 4,390,580 | 06/296,498 | 6/28/83 |
| 4,390,588 | 06/255,023 | 6/28/83 |
| 4,390,591 | 06/316,583 | 6/28/83 |
| 4,390,592 | 06/323,333 | 6/28/83 |
| 4,390,610 | 06/316,368 | 6/28/83 |
| 4,390,614 | 06/244,523 | 6/28/83 |
| 4,390,622 | 06/303,725 | 6/28/83 |
| 4,390,633 | 06/286,593 | 6/28/83 |
| 4,390,639 | 06/332,773 | 6/28/83 |
| 4,390,641 | 06/336,681 | 6/28/83 |
| 4,390,642 | 06/281,290 | 6/28/83 |
| 4,390,644 | 06/264,503 | 6/28/83 |
| 4,390,654 | 06/372,762 | 6/28/83 |
| 4,390,656 | 06/223,605 | 6/28/83 |
| 4,390,663 | 06/351,840 | 6/28/83 |
| 4,390,672 | 06/318,473 | 6/28/83 |
| 4,390,690 | 06/273,027 | 6/28/83 |
| 4,390,697 | 06/317,858 | 6/28/83 |
| 4,390,703 | 06/276,117 | 6/28/83 |
| 4,390,706 | 06/235,985 | 6/28/83 |
| 4,390,718 | 06/279,492 | 6/28/83 |
| 4,390,719 | 06/280,356 | 6/28/83 |
| 4,390,732 | 06/347,482 | 6/28/83 |
| 4,390,749 | 06/253,091 | 6/28/83 |
| 4,390,756 | 06/222,957 | 6/28/83 |
| 4,390,757 | 06/311,415 | 6/28/83 |
| 4,390,762 | 06/240,157 | 6/28/83 |
| 4,390,773 | 06/231,606 | 6/28/83 |
| 4,390,775 | 06/234,362 | 6/28/83 |
| 4,390,777 | 06/245,487 | 6/28/83 |
| 4,390,778 | 06/309,488 | 6/28/83 |
| 4,390,786 | 06/257,031 | 6/28/83 |
| 4,390,792 | 06/281,238 | 6/28/83 |
| 4,390,807 | 06/337,718 | 6/28/83 |
| 4,390,811 | 06/244,433 | 6/28/83 |
| 4,390,812 | 06/277,241 | 6/28/83 |
| 4,390,821 | 06/289,169 | 6/28/83 |
| 4,390,824 | 06/273,173 | 6/28/83 |
| 4,390,830 | 06/311,870 | 6/28/83 |
| 4,390,838 | 06/230,558 | 6/28/83 |
| 4,390,846 | 06/226,995 | 6/28/83 |
| 4,390,849 | 06/258,490 | 6/28/83 |
| 4,390,850 | 06/244,445 | 6/28/83 |
| 4,390,852 | 06/253,471 | 6/28/83 |
| 4,390,853 | 06/292,202 | 6/28/83 |
| 4,390,862 | 06/254,825 | 6/28/83 |
| 4,390,869 | 06/225,097 | 6/28/83 |
| 4,390,911 | 06/259,269 | 6/28/83 |
| 4,390,921 | 06/310,473 | 6/28/83 |
| 4,390,923 | 06/290,423 | 6/28/83 |
| 4,390,935 | 06/253,332 | 6/28/83 |
| 4,390,937 | 06/274,624 | 6/28/83 |
| 4,390,947 | 06/217,070 | 6/28/83 |
| 4,390,981 | 06/220,375 | 6/28/83 |
| 4,390,992 | 06/284,151 | 6/28/83 |
| 4,675,914 | 06/862,262 | 6/30/87 |
| 4,675,916 | 06/837,151 | 6/30/87 |
| 4,675,923 | 06/813,056 | 6/30/87 |
| 4,675,925 | 06/847,957 | 6/30/87 |
| 4,675,926 | 06/726,897 | 6/30/87 |
| 4,675,929 | 06/712,629 | 6/30/87 |
| 4,675,931 | 06/748,592 | 6/30/87 |
| 4,675,932 | 06/893,607 | 6/30/87 |
| 4,675,936 | 06/801,231 | 6/30/87 |
| 4,675,939 | 06/696,271 | 6/30/87 |
| 4,675,946 | 06/830,380 | 6/30/87 |
| 4,675,949 | 06/848,496 | 6/30/87 |
| 4,675,954 | 06/822,473 | 6/30/87 |
| 4,675,956 | 06/843,244 | 6/30/87 |



| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,675,958 | 06/866,339 | 6/30/87 |
| 4,675,959 | 06/735,025 | 6/30/87 |
| 4,675,965 | 06/811,422 | 6/30/87 |
| 4,675,968 | 06/811,362 | 6/30/87 |
| 4,675,979 | 06/863,311 | 6/30/87 |
| 4,675,980 | 06/863,312 | 6/30/87 |
| 4,675,984 | 06/777,736 | 6/30/87 |
| 4,675,990 | 06/670,115 | 6/30/87 |
| 4,676,003 | 06/849,837 | 6/30/87 |
| 4,676,005 | 06/869,627 | 6/30/87 |
| 4,676,007 | 06/701,775 | 6/30/87 |
| 4,676,012 | 06/783,673 | 6/30/87 |
| 4,676,014 | 06/821,997 | 6/30/87 |
| 4,676,019 | 06/819,823 | 6/30/87 |
| 4,676,020 | 06/901,801 | 6/30/87 |
| 4,676,022 | 06/842,130 | 6/30/87 |
| 4,676,026 | 06/844,843 | 6/30/87 |
| 4,676,027 | 06/809,576 | 6/30/87 |
| 4,676,028 | 06/848,405 | 6/30/87 |
| 4,676,029 | 06/721,292 | 6/30/87 |
| 4,676,030 | 06/903,219 | 6/30/87 |
| 4,676,031 | 06/902,186 | 6/30/87 |
| 4,676,049 | 06/651,797 | 6/30/87 |
| 4,676,067 | 06/594,030 | 6/30/87 |
| 4,676,073 | 06/873,253 | 6/30/87 |
| 4,676,078 | 06/767,837 | 6/30/87 |
| 4,676,089 | 06/869,539 | 6/30/87 |
| 4,676,098 | 06/767,755 | 6/30/87 |
| 4,676,105 | 06/850,269 | 6/30/87 |
| 4,676,107 | 06/855,502 | 6/30/87 |
| 4,676,110 | 06/886,121 | 6/30/87 |
| 4,676,120 | 06/869,771 | 6/30/87 |
| 4,676,122 | 06/820,571 | 6/30/87 |
| 4,676,130 | 06/832,963 | 6/30/87 |
| 4,676,133 | 06/784,313 | 6/30/87 |
| 4,676,138 | 06/836,114 | 6/30/87 |
| 4,676,141 | 06/624,126 | 6/30/87 |
| 4,676,144 | 06/814,230 | 6/30/87 |
| 4,676,146 | 06/757,599 | 6/30/87 |
| 4,676,151 | 06/772,038 | 6/30/87 |
| 4,676,163 | 06/643,122 | 6/30/87 |
| 4,676,164 | 06/815,663 | 6/30/87 |
| 4,676,169 | 06/855,838 | 6/30/87 |
| 4,676,170 | 06/873,489 | 6/30/87 |
| 4,676,171 | 06/809,424 | 6/30/87 |
| 4,676,181 | 06/787,257 | 6/30/87 |
| 4,676,182 | 06/591,936 | 6/30/87 |
| 4,676,185 | 06/774,857 | 6/30/87 |
| 4,676,186 | 06/803,153 | 6/30/87 |
| 4,676,188 | 06/872,260 | 6/30/87 |
| 4,676,196 | 06/747,031 | 6/30/87 |
| 4,676,202 | 06/859,553 | 6/30/87 |
| 4,676,204 | 06/812,987 | 6/30/87 |
| 4,676,214 | 06/707,472 | 6/30/87 |
| 4,676,220 | 06/703,030 | 6/30/87 |
| 4,676,222 | 06/659,216 | 6/30/87 |
| 4,676,228 | 06/791,219 | 6/30/87 |
| 4,676,229 | 06/849,887 | 6/30/87 |
| 4,676,234 | 06/829,893 | 6/30/87 |
| 4,676,240 | 06/773,991 | 6/30/87 |
| 4,676,243 | 06/666,316 | 6/30/87 |
| 4,676,245 | 06/781,101 | 6/30/87 |
| 4,676,254 | 06/837,008 | 6/30/87 |
| 4,676,256 | 06/843,275 | 6/30/87 |
| 4,676,257 | 06/684,127 | 6/30/87 |
| 4,676,260 | 06/555,580 | 6/30/87 |
| 4,676,264 | 06/778,846 | 6/30/87 |
| 4,676,265 | 06/245,187 | 6/30/87 |
| 4,676,269 | 06/837,521 | 6/30/87 |
| 4,676,272 | 06/219,493 | 6/30/87 |
| 4,676,281 | 06/847,657 | 6/30/87 |
| 4,676,283 | 06/781,456 | 6/30/87 |
| 4,676,288 | 06/703,893 | 6/30/87 |
| 4,676,291 | 06/794,782 | 6/30/87 |
| 4,676,295 | 06/825,670 | 6/30/87 |
| 4,676,301 | 06/844,075 | 6/30/87 |
| 4,676,311 | 06/668,515 | 6/30/87 |
| 4,676,313 | 06/793,129 | 6/30/87 |
| 4,676,316 | 06/798,663 | 6/30/87 |
| 4,676,318 | 06/936,564 | 6/30/87 |
| 4,676,332 | 06/831,214 | 6/30/87 |
| 4,676,341 | 06/887,193 | 6/30/87 |
| 4,676,342 | 06/824,890 | 6/30/87 |
| 4,676,345 | 06/828,946 | 6/30/87 |
| 4,676,346 | 06/648,421 | 6/30/87 |
| 4,676,348 | 06/836,948 | 6/30/87 |
| 4,676,349 | 06/836,930 | 6/30/87 |
| 4,676,355 | 06/854,335 | 6/30/87 |
| 4,676,357 | 06/830,107 | 6/30/87 |
| 4,676,358 | 06/792,300 | 6/30/87 |
| 4,676,369 | 06/819,555 | 6/30/87 |
| 4,676,374 | 06/820,267 | 6/30/87 |
| 4,676,382 | 06/882,188 | 6/30/87 |
| 4,676,383 | 06/821,842 | 6/30/87 |
| 4,676,388 | 06/867,316 | 6/30/87 |
| 4,676,392 | 06/270,468 | 6/30/87 |
| 4,676,393 | 06/887,837 | 6/30/87 |
| 4,676,394 | 06/796,597 | 6/30/87 |
| 4,676,396 | 06/786,602 | 6/30/87 |
| 4,676,397 | 06/833,[illegible]42 | 6/30/87 |
| 4,676,400 | 06/749,292 | 6/30/87 |
| 4,676,403 | 06/873,880 | 6/30/87 |
| 4,676,407 | 06/713,894 | 6/30/87 |
| 4,676,413 | 06/808,802 | 6/30/87 |
| 4,676,416 | 06/871,258 | 6/30/87 |
| 4,676,418 | 06/839,126 | 6/30/87 |
| 4,676,419 | 06/925,501 | 6/30/87 |
| 4,676,424 | 06/827,715 | 6/30/87 |
| 4,676,425 | 06/805,296 | 6/30/87 |
| 4,676,431 | 06/942,802 | 6/30/87 |
| 4,676,433 | 06/716,169 | 6/30/87 |
| 4,676,436 | 06/667,853 | 6/30/87 |
| 4,676,443 | 06/744,756 | 6/30/87 |
| 4,676,451 | 06/794,763 | 6/30/87 |
| 4,676,465 | 06/690,776 | 6/30/87 |
| 4,676,468 | 06/849,959 | 6/30/87 |
| 4,676,469 | 06/777,672 | 6/30/87 |
| 4,676,472 | 06/806,660 | 6/30/87 |
| 4,676,485 | 06/843,737 | 6/30/87 |
| 4,676,486 | 06/831,169 | 6/30/87 |
| 4,676,492 | 06/750,021 | 6/30/87 |
| 4,676,493 | 06/796,199 | 6/30/87 |
| 4,676,495 | 06/836,966 | 6/30/87 |
| 4,676,502 | 06/503,731 | 6/30/87 |
| 4,676,506 | 06/805,287 | 6/30/87 |
| 4,676,508 | 06/829,509 | 6/30/87 |
| 4,676,521 | 06/861,913 | 6/30/87 |
| 4,676,523 | 06/780,617 | 6/30/87 |
| 4,676,526 | 06/891,772 | 6/30/87 |
| 4,676,527 | 06/829,443 | 6/30/87 |
| 4,676,538 | 06/884,028 | 6/30/87 |
| 4,676,541 | 06/808,371 | 6/30/87 |
| 4,676,542 | 06/815,916 | 6/30/87 |
| 4,676,547 | 06/926,679 | 6/30/87 |
| 4,676,554 | 06/803,395 | 6/30/87 |
| 4,676,555 | 06/780,999 | 6/30/87 |
| 4,676,558 | 06/692,790 | 6/30/87 |
| 4,676,562 | 06/747,410 | 6/30/87 |
| 4,676,565 | 06/782,673 | 6/30/87 |
| 4,676,595 | 06/814,368 | 6/30/87 |
| 4,676,599 | 06/765,428 | 6/30/87 |
| 4,676,602 | 06/742,784 | 6/30/87 |
| 4,676,617 | 06/738,823 | 6/30/87 |
| 4,676,619 | 06/837,044 | 6/30/87 |
| 4,676,620 | 06/748,270 | 6/30/87 |
| 4,676,622 | 06/837,944 | 6/30/87 |
| 4,676,626 | 06/816,528 | 6/30/87 |
| 4,676,638 | 06/595,337 | 6/30/87 |
| 4,676,640 | 06/650,320 | 6/30/87 |
| 4,676,648 | 06/654,494 | 6/30/87 |
| 4,676,652 | 06/498,200 | 6/30/87 |
| 4,676,656 | 06/895,784 | 6/30/87 |
| 4,676,674 | 06/619,556 | 6/30/87 |
| 4,676,684 | 06/703,923 | 6/30/87 |
| 4,676,686 | 06/898,634 | 6/30/87 |
| 4,676,687 | 06/587,497 | 6/30/87 |

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| Patent Number | Serial Number | Issue Date | 4,677,122 | 06/844,058 | 6/30/87 |
|---|---|---|---|---|---|
| | | | 4,677,128 | 06/705,558 | 6/30/87 |
| 4,676,688 | 06/733,131 | 6/30/87 | 4,677,135 | 06/890,558 | 6/30/87 |
| 4,676,691 | 06/901,013 | 6/30/87 | 4,677,139 | 06/734,430 | 6/30/87 |
| 4,676,698 | 06/698,589 | 6/30/87 | 4,677,149 | 06/940,637 | 6/30/87 |
| 4,676,705 | 06/826,353 | 6/30/87 | 4,677,159 | 06/788,133 | 6/30/87 |
| 4,676,711 | 06/832,983 | 6/30/87 | 4,677,190 | 06/861,461 | 6/30/87 |
| 4,676,712 | 06/746,476 | 6/30/87 | 4,677,210 | 06/746,436 | 6/30/87 |
| 4,676,713 | 06/805,857 | 6/30/87 | 4,677,211 | 06/759,537 | 6/30/87 |
| 4,676,716 | 06/794,958 | 6/30/87 | 4,677,223 | 06/842,208 | 6/30/87 |
| 4,676,717 | 06/736,664 | 6/30/87 | 4,677,229 | 06/754,972 | 6/30/87 |
| 4,676,727 | 06/849,731 | 6/30/87 | 4,677,238 | 06/906,851 | 6/30/87 |
| 4,676,739 | 06/838,137 | 6/30/87 | 4,677,261 | 06/765,117 | 6/30/87 |
| 4,676,745 | 06/756,163 | 6/30/87 | 4,677,279 | 06/829,993 | 6/30/87 |
| 4,676,750 | 06/695,167 | 6/30/87 | 4,677,281 | 06/927,264 | 6/30/87 |
| 4,676,752 | 06/809,253 | 6/30/87 | 4,677,282 | 06/833,284 | 6/30/87 |
| 4,676,754 | 06/827,937 | 6/30/87 | 4,677,283 | 06/900,409 | 6/30/87 |
| 4,676,768 | 06/851,043 | 6/30/87 | 4,677,290 | 06/722,890 | 6/30/87 |
| 4,676,770 | 06/756,315 | 6/30/87 | 4,677,304 | 06/729,115 | 6/30/87 |
| 4,676,775 | 06/624,959 | 6/30/87 | 4,677,316 | 06/659,552 | 6/30/87 |
| 4,676,777 | 06/588,142 | 6/30/87 | 4,677,323 | 06/757,335 | 6/30/87 |
| 4,676,780 | 06/831,799 | 6/30/87 | 4,677,348 | 06/728,704 | 6/30/87 |
| 4,676,790 | 06/779,808 | 6/30/87 | 4,677,351 | 06/746,509 | 6/30/87 |
| 4,676,846 | 06/832,296 | 6/30/87 | 4,677,353 | 06/810,764 | 6/30/87 |
| 4,676,857 | 06/820,525 | 6/30/87 | 4,677,363 | 06/833,842 | 6/30/87 |
| 4,676,859 | 06/426,897 | 6/30/87 | 4,677,371 | 06/773,210 | 6/30/87 |
| 4,676,862 | 06/740,768 | 6/30/87 | 4,677,393 | 06/789,450 | 6/30/87 |
| 4,676,870 | 06/869,767 | 6/30/87 | 4,677,406 | 06/808,127 | 6/30/87 |
| 4,676,872 | 06/854,422 | 6/30/87 | 4,677,410 | 06/889,620 | 6/30/87 |
| 4,676,874 | 06/795,866 | 6/30/87 | 4,677,424 | 06/691,868 | 6/30/87 |
| 4,676,875 | 06/816,576 | 6/30/87 | 4,677,439 | 06/603,891 | 6/30/87 |
| 4,676,891 | 06/718,857 | 6/30/87 | 4,677,440 | 06/476,129 | 6/30/87 |
| 4,676,899 | 06/809,151 | 6/30/87 | 4,677,441 | 06/693,549 | 6/30/87 |
| 4,676,900 | 06/658,825 | 6/30/87 | 4,677,463 | 06/755,043 | 6/30/87 |
| 4,676,904 | 06/640,506 | 6/30/87 | 4,677,472 | 06/799,797 | 6/30/87 |
| 4,676,908 | 06/672,952 | 6/30/87 | 4,677,511 | 06/686,641 | 6/30/87 |
| 4,676,909 | 06/789,701 | 6/30/87 | 4,677,514 | 06/671,693 | 6/30/87 |
| 4,676,917 | 06/833,696 | 6/30/87 | 4,677,515 | 06/735,832 | 6/30/87 |
| 4,676,924 | 06/749,809 | 6/30/87 | 4,677,520 | 06/775,591 | 6/30/87 |
| 4,676,930 | 06/780,052 | 6/30/87 | 4,677,536 | 06/840,274 | 6/30/87 |
| 4,676,938 | 06/819,047 | 6/30/87 | 4,677,543 | 06/651,538 | 6/30/87 |
| 4,676,945 | 06/684,036 | 6/30/87 | 4,677,559 | 06/692,090 | 6/30/87 |
| 4,676,950 | 06/576,811 | 6/30/87 | 4,677,567 | 06/684,899 | 6/30/87 |
| 4,676,952 | 06/603,521 | 6/30/87 | 4,677,574 | 06/642,339 | 6/30/87 |
| 4,676,954 | 06/861,822 | 6/30/87 | 4,677,594 | 06/696,329 | 6/30/87 |
| 4,676,962 | 06/901,496 | 6/30/87 | 4,677,600 | 06/807,836 | 6/30/87 |
| 4,676,972 | 06/759,777 | 6/30/87 | 4,677,604 | 06/698,109 | 6/30/87 |
| 4,677,001 | 06/658,748 | 6/30/87 | 4,677,613 | 06/698,410 | 6/30/87 |
| 4,677,010 | 06/824,380 | 6/30/87 | 4,677,628 | 06/746,307 | 6/30/87 |
| 4,677,014 | 06/807,783 | 6/30/87 | 4,677,629 | 06/781,812 | 6/30/87 |
| 4,677,020 | 06/765,198 | 6/30/87 | 4,677,636 | 06/790,594 | 6/30/87 |
| 4,677,029 | 06/800,479 | 6/30/87 | 4,677,653 | 06/874,577 | 6/30/87 |
| 4,677,041 | 06/835,769 | 6/30/87 | 4,677,654 | 06/753,116 | 6/30/87 |
| 4,677,050 | 06/903,888 | 6/30/87 | 4,677,662 | 06/643,426 | 6/30/87 |
| 4,677,060 | 06/680,078 | 6/30/87 | 4,677,666 | 06/632,832 | 6/30/87 |
| 4,677,076 | 06/496,525 | 6/30/87 | 4,677,670 | 06/750,739 | 6/30/87 |
| 4,677,079 | 06/496,526 | 6/30/87 | 4,677,675 | 06/776,937 | 6/30/87 |
| 4,677,081 | 06/785,320 | 6/30/87 | 4,677,683 | 06/609,300 | 6/30/87 |
| 4,677,091 | 06/903,912 | 6/30/87 | 4,677,686 | 06/503,321 | 6/30/87 |
| 4,677,097 | 06/784,403 | 6/30/87 | 4,677,693 | 06/824,426 | 6/30/87 |
| 4,677,112 | 06/800,853 | 6/30/87 | | | |

## NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

| Patent No. | Serial No. | Patent Date | Application Filing Date | Delayed Payment Acceptance Date |
|---|---|---|---|---|
| 4,473,335 | 06/275,247 | 9/25/84 | 6/19/81 | 7/19/91 |
| 4,482,251 | 06/312,676 | 11/13/84 | 10/19/81 | 7/18/91 |
| 4,557,877 | 06/563,764 | 12/10/85 | 12/21/83 | 7/18/91 |
| 4,599,258 | 06/715,286 | 7/08/86 | 3/25/85 | 7/17/91 |
| 4,601,384 | 06/300,348 | 7/22/86 | 9/08/81 | 5/15/91 |
| 4,607,050 | 06/430,884 | 8/19/86 | 9/30/82 | 7/18/91 |



| Patent No. | Serial No. | Patent Date | Application Filing Date | Delayed Payment Acceptance Date |
|---|---|---|---|---|
| 4,607,999 | 06/387,769 | 8/26/86 | 6/14/82 | 7/19/91 |
| 4,619,468 | 06/693,536 | 10/28/86 | 1/22/85 | 7/17/91 |
| 4,628,928 | 06/684,841 | 12/16/86 | 12/21/84 | 7/19/91 |
| 4,630,554 | 06/709,887 | 12/23/86 | 3/08/85 | 7/16/91 |
| 4,634,355 | 06/841,159 | 1/06/87 | 3/19/86 | 7/16/91 |
| 4,634,356 | 06/841,162 | 1/06/87 | 3/19/86 | 7/18/91 |
| 4,636,007 | 06/773,183 | 1/13/87 | 9/06/85 | 7/16/91 |
| 4,669,446 | 06/869,013 | 6/02/87 | 5/28/86 | 7/10/91 |

### Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

**4,732,684**, Re. S. N. 07/740,639, Filed Aug. 5, 1991, Cl. 210/631, METHOD FOR PREVENTING THE BULKING OF ACTIVATED SLUDGE, Kiyoharu Fujino, Owner of Record: *Mitsubishi Kasei Polytec Co., Tokyo, Japan*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 138

**4,734,821**, Re. S. N. 07/703,814, Filed May 21, 1991, Cl. 361/507, ELECTROLYTIC CAPACITOR, Takeshi Morimoto, et. al., Owner of Record: *Asahi Glass Co., and Elna Co., Ltd., Tokyo and Fujisawa, Japan*, Attorney or Agent: Richard D. Kelly, Ex. Gp.: 211

**4,803,653**, Re. S. N. 07/736,749, Filed July 26, 1991, Cl. 364/900, MEMORY CONTROL SYSTEM, Kenji Suzuki, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: James N. Dresser, Ex. Gp.: 237

**4,857,052**, Re. S. N. 07/740,531, Filed Aug. 5, 1991, Cl. 604/085, INTRAVENOUS SYSTEM FOR DELIVERING A BENEFICIAL AGENT, Felix Theeuwes, Owner of Record: *Alza Corp., Palo Alto, Calif.*, Attorney or Agent: Paul L. Sabatine, Ex. Gp.: 336

**4,975,478** Re. S. N. 07/739,332, Filed Aug. 1, 1991, Cl. 524/086, WEATHER-RESISTANT POLYACETAL RESIN COMPOSITION, Sadatsugu, Owner of Record: *Poly Plastics Co., Ltd., Osaka, Japan*, Attorney or Agent: Bryan H. Davidson, Ex. Gp.: 153

**4,989,419**, Re. S. N. 07/738,116, Filed July 30, 1991, Cl. 062/457.2, CHILL-RETENTION FOOD SERVICE TRAY, Michael Brando, et. al., Owner of Record: *Branello Industries, Inc., Bensenville, Ill.*, Attorney or Agent: Thomas E. Dorn, Ex. Gp.: 344

### Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**4,948,922**, Reexam. No. 90/002,396, Requested Aug. 7, 1991, Cl. 174/35GC, ELECTROMAGNETIC SHIELDING AND ABSORPTIVE MATERIALS, Vijay K. Varadan, et. al., Owner of Record: *The Pennsylvania Research Corp., University Park, Pa.*, Attorney or Agent: Regis E. Slutter, Burns, Doane, Swecker & Mathis, Alexandria, Va., Ex. Gp.: 213, Requester: The Trustees of the University of Pennsylvania, Philadelphia, Pa.

**4,813,934**, Reexam. No. 90/002,397, Requested Aug. 8, 1991, Cl. 604/099, VALVED CATHETER DEVICE AND METHOD, Erick T. Engelson, et. al., Owner of Record: *Target Therapeutics, San Jose, Calif.*, Attorney or Agent: Thomas E. Ciotti, Irell & Manella, Menlo Park, Calif., Ex. Gp.: 336, Requester: Owner

**4,751,087**, Reexam. No. 90/002,398, Requested Aug. 9, 1991, Cl. 424/449, TRANSDERMAL NYTROGLYCERIN DELIVERY SYSTEM, Steven M. Wick, Owner of Record: *Riker Laboratories, Inc., St. Paul, Minn.*, Attorney or Agent: Robert M. Sprague, St. Paul, Minn., Ex. Gp.: 150, Requester: Shusaku Yamamoto, c/o Irell & Manella, Menlo Park, Calif.

### Errata

"All reference to Patent No. 5,009,948 to Mark K. Debe of Stillwater, Mn. for `LOW GRAVITY ENHANCED GROWTH OF PHTHALOCYANINE POLYMORPH FILMS' appearing in the Official Gazette of Apr. 23, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,030,808 to Yasdushi Nakamura, Japan for `PASSBOOK TRANSPORT MECHANISM' appearing in the Official Gazette of July 9, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,031,292 to Giovanni Aquino of Kenmore, N.Y. for `MAINROTOR MACHINING PROCESS AND APPARATUS' appearing in the Official Gazette of July 16, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,033,576 to Kazuo Inoue, et. al., Tokyo, Japan for `MOUNTING STRUCTURE FOR THE POWER UNIT OF A MOTOR VEHICLE' appearing in the Official Gazette of July 23, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,034,407 to David C. Horwell, Foxton, England for `7-((SUBSTITUTED) CARBONYL)-METHYLAMINO)-1-OXASPIRO(4,5)DECNAES AS DIURETICS ANTIINFLAMMATORY, AND CEREBROVASCULAR AGENTS' in the Official Gazette of July 23, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,036,049 to Tapan Audhya, et. al., of N.J. for `LYOPHILIZED PEPTIDE FORMULATIONS' appearing in the Official Gazette of July 30, 1991 should be deleted since no patent was granted."

### Patents Available for License or Sale

4,702,704 "TETRAHEDRAL CONDON STEREO TABLE", Leonard R. Svensson, Birch, Stewart, Kolasch & Birch, P. O. Box 747, Falls Church, Va. 22046

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4,719,912 APPARATUS FOR CONTROLLING THE PHOTOCOAGULATION OF BIOLOGICAL TISSUE, Mike Perkins, Bonnet Resources Corp., 910 Travis, Suite 1225, Houston, Tex. 77001

4,880,001 "PROCESS FOR CONTROLLING THE PHOTOCOAGULATION OF BIOLOGICAL TISSUE, Mike Perkins, Bonnet Resource Corp., 910 Travis, Suite 1225, Houston, Tex. 77001

4,875,880 TEMPORARY SUPPORT SURFACES FOR USE ON MUDDY OR MARSHY LAND AREAS, Gordon T. Arnold, Special Counsel to Trustee in Bankruptcy of. Assignee, Kirk & Lindsay, P. C., 3555 Timmons, Suite 700, Houston, Tex. 77027

4,881,338 TELESCOPIC GAFF HOOK DEVICE, Destin Machine, Inc., 322 Calhoun Ave., Destin, Fla. 32541

4,903,963 ABDOMINAL MUSCLE EXERCISER, Douglas E. White, Esq., 101 California St., Suite 980, San Francisco, Calif. 94111

4,953,372 INEXPENSIVE KEYLESS USER CUSTOM CODED WINDOW SASH LOCK, Robert L. Nathans, 36 Stag Dr., Billerica, Mass. 01821

4,979,375 MAT FOR COOLING A PERSON DURING HOT WEATHER WITHOUT WETTING HAVING A LOW MANUFACTURING COST, Robert L. Nathans, 36 Stag Dr. Billerica, Mass. 01821

5,003,895 EMBROIDERY PANTOGRAPH ASSEMBLY, Lev Talanker, Owner, 1445 Geneva Loop, Apt. 6H, Brooklyn, N.Y. 11239

Re. 31,457 VISCOSE RAYON, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

Re. 31,380 4,144,079 RAYON FIBERS CONTAINING STARCH, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,399,255 ALLOY RAYON FIBERS OF REGENERATED CELLULOSE AND COPOLYMERIC ACRYLIC ACID SALTS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,295,886 FLAME-RETARDANT POLYESTER FIBER COMPOSITIONS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,289,824 HIGH FLUID-HOLDING ALLOY RAYON FIBER MASS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,273,118 FIBERS OF HIGH FLUID HOLDING CAPACITY, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,242,405 VISCOSE RAYON AND METHOD OF MAKING SAME, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,199,367 ALLOY RAYON, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,179,416 ALLOY RAYON FIBERS HAVING DISPERSED THEREIN AN AMIDE POLYMER AND A POLYACRYLIC ACID SALT, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,161,577 CATIONIC DYEABLE COPOLYESTERS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

Re. 30,029 3,844,287 ABSORBENT MASS OF ALLOY FIBERS OF REGENERATED CELLULOSE AND POLYACRYLIC ACID SALT OF ALKALI-METALS OR AMMONTIUM, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,141,447 TRAY SUPPORT FOR SHIPPING WOUND MATERIAL PACKAGES, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,136,697 FIBERS OF HIGH FLUID-HOLDING CAPACITY, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,121,012 CRIMPED, HIGH-STRENGTH RAYON YARN AND METHOD FOR ITS PREPARATION, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,111,701 FLAME RETARDANT REGENERATED CELLULOSE FILAMENTS CONTAINING CROSS-LINKED POLYMERIC PHOSPHANES, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,101,528 COPOLYESTERS OF ETHYLENE 2,6-NAPHTHALENE DISCARBOXCLYATE AND HALOGENATED COMONOMERS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,082,731 METHOD FOR PRODUCING A HIGH MODULE POLYESTER YARN, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,063,558 ARTICLE AND METHOD FOR MAKING HIGH FLUID-HOLDING FIBER MASS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,059,546 TEXTILE FIBER BLEND COMPRISING CELLULOSIC FIBERS AND ETHYLENE 2,6-NAPHTHALENE DICARBOXYLATE-HALOGENATED COMONOMERS COPOLYESTER, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire



4,045,513 ETHYLENE 2, 6-NAPHTHALENE DICARBOXYLATED-ALKYLENE-2,5 DIBROMOTEREPHTHALATE FLAME-RETARDANT COPOLYESTERS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,041,121 METHOD FOR MAKING HIGH FLUID-HOLDING FIBER MASS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,040,843 FLAME RETARDANT REGENERATED CELLULOSE FILAMENTS CONTAINING OLIGOMERIC PHOSPHONITRILIC COMPOUNDS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

4,003,878 METHOD OF PREPARING AN ALKALI-METAL SALT OF AN ALKOXYSULFONATED BENZOIC ACID GLYCOL ESTER, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,994,996 POLYMERIC PHOSPHAZENES, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,990,900 POLYMERIC PHOSPHAZENES, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,986,882 FLAME RETARDANT REGENERATED CELLULOSE FILAMENTS CONTAINING POLYMERIC PHOSPHAZENES, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,985,858 TREATMENT OF ZINC HYDROXIDE SLURRY, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,951,889 HIGH FLUID-HOLDING FIBER MASS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,947,423 NOVEL FLAME-RETARDANT FOR POLYESTERS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,944,633 FLAME RETARDANT POLYESTER FIBER COMPOSITIONS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

3,919,385 PROCESS FOR PRODUCING HIGH FLUID HOLDING FIBER MASS, Avtex Fibers, Inc., c/o Reed, Smith, Shaw & McClay, 2500 One Liberty Place, 1650 Market St., Philadelphia, Pa. 19103, Attention: Robert C. Podwil, Esquire

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Aug. 15, 1991 HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks*

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**Department of Commerce**
**Patent and Trademark Office**
**[Docket No. 910235-1173]**

*Agency:* Patent and Trademark Office, Commerce.
*Action:* Notice.

**Notice of Termination of Status of International Depository Authority under Budapest Treaty**

*Summary:* Notice is hereby given that In Vitro International, Inc.'s status as an international depository is terminated effective Sept. 25, 1991.

*Address:* Questions should be submitted to H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231.
*For Further Information Contact:* H. Dieter Hoinkes, Office of Legislation and International Affairs, (703) 557-3065.
*Supplementary Information:* Since Nov. 30, 1983, In Vitro International, Inc. (IVI) of Linthicum, Maryland, has been recognized as an international depository authority under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. The Patent and Trademark Office has received a letter from Dr. Rex A. D'Agostino, President of IVI, dated May 24, 1991, stating that IVI can no longer continue to perform its functions as an international depository authority under the Budapest Treaty.

By letter dated June 25, 1991, the Patent and Trademark Office has notified the Director General of the World Intellectual Property Organization that "the United States withdraws its declaration of assurances made on behalf of IVI on Sept. 9, 1983". As a consequence, the termination of the status of IVI as an international depository authority takes effect on Sept. 25, 1991.

All deposits stored with IVI under the Budapest Treaty were transferred on June 20, 1991, to a substitute authority, which is the American Type Culture Collection (ATCC), 12301 Parklawn Dr., Rockville, Md., 20852, (Telephone No. (301) 881-2600). All mail or other communications addressed to IVI regarding those deposits, including all files and other relevant information, have also been transferred to ATCC. In its capacity as a substitute authority, ATCC has agreed to store all deposits transferred from IVI for an initial period of not less than three months from July 5, 1991, the date of first notice in the Federal Register of IVI's termination as an international depository authority. Patent owners and applicants who wish to preserve their date of original deposit must contact ATCC by Oct. 5, 1991, to make arrangements to pay ATCC's fee for continued maintenance and storage of their deposits past the initial storage period. ATCC will not accept responsibility for continued storage of deposits in respect of which depositors have failed to make appropriate arrangements by Oct. 5, 1991.

For further information, contact H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231; telephone (703) 557-3065.

July 10, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks*

# PATENT NOTICES

**Certificates of Correction For Week of September 10, 1991**

| | | | |
|---|---|---|---|
| D. 306,733 | 4,877,870 | 4,907,270 | 4,927,562 |
| D. 307,508 | 4,879,315 | 4,907,713 | 4,928,048 |
| D. 308,982 | 4,880,312 | 4,908,369 | 4,928,195 |
| 4,638,265 | 4,880,622 | 4,909,078 | 4,929,019 |
| 4,649,730 | 4,880,675 | 4,909,909 | 4,929,223 |
| 4,723,209 | 4,883,037 | 4,910,104 | 4,929,288 |
| 4,740,916 | 4,884,453 | 4,910,265 | 4,929,349 |
| 4,751,181 | 4,886,658 | 4,910,475 | 4,930,496 |
| 4,795,855 | 4,886,943 | 4,910,597 | 4,930,910 |
| 4,795,911 | 4,887,507 | 4,910,760 | 4,931,030 |
| 4,796,075 | 4,887,725 | 4,910,785 | 4,932,291 |
| 4,797,779 | 4,888,602 | 4,911,031 | 4,932,347 |
| 4,803,843 | 4,888,801 | 4,911,084 | 4,933,694 |
| 4,806,633 | 4,889,465 | 4,911,810 | 4,933,975 |
| 4,809,497 | 4,889,568 | 4,912,177 | 4,934,187 |
| 4,821,826 | 4,889,608 | 4,912,179 | 4,934,426 |
| 4,824,361 | 4,890,863 | 4,913,870 | 4,935,144 |
| 4,829,030 | 4,891,744 | 4,914,254 | 4,935,330 |
| 4,839,744 | 4,892,924 | 4,914,319 | 4,935,560 |
| 4,840,408 | 4,893,384 | 4,914,421 | 4,935,845 |
| 4,840,793 | 4,894,957 | 4,915,152 | 4,936,411 |
| 4,842,060 | 4,895,730 | 4,916,469 | 4,936,472 |
| 4,844,560 | 4,895,741 | 4,917,702 | 4,936,980 |
| 4,848,899 | 4,895,784 | 4,917,842 | 4,937,088 |
| 4,851,065 | 4,896,281 | 4,918,056 | 4,937,300 |
| 4,852,979 | 4,898,456 | 4,918,861 | 4,938,349 |
| 4,853,733 | 4,899,471 | 4,920,035 | 4,938,550 |
| 4,855,590 | 4,899,599 | 4,920,203 | 4,938,706 |
| 4,856,529 | 4,899,649 | 4,920,377 | 4,939,008 |
| 4,859,152 | 4,900,300 | 4,921,192 | 4,939,096 |
| 4,862,202 | 4,900,969 | 4,921,538 | 4,939,297 |
| 4,864,534 | 4,901,109 | 4,921,790 | 4,939,770 |
| 4,865,907 | 4,902,091 | 4,922,401 | 4,940,373 |
| 4,866,261 | 4,902,417 | 4,923,296 | 4,941,773 |
| 4,866,761 | 4,902,786 | 4,923,501 | 4,942,069 |
| 4,867,789 | 4,903,164 | 4,923,561 | 4,944,715 |
| 4,868,674 | 4,903,552 | 4,924,821 | 4,945,836 |
| 4,870,357 | 4,904,032 | 4,924,978 | 4,945,897 |
| 4,870,441 | 4,904,625 | 4,925,246 | 4,946,203 |
| 4,870,483 | 4,905,082 | 4,925,858 | 4,947,241 |
| 4,874,884 | 4,905,098 | 4,926,189 | 4,947,529 |
| 4,876,564 | 4,905,157 | 4,926,268 | 4,954,459 |
| 4,876,604 | 4,905,818 | 4,926,720 | 4,986,153 |
| 4,877,061 | 4,906,572 | 4,926,731 | 5,011,430 |
| 4,877,715 | 4,907,027 | 4,927,418 | |

**Erratum**

4,767,708,—*Edwin G. Minkley, Jr.*; *William E. Brown*, both of Pittsburg, Pa. ENZYME AMPLIFICATION AND PURIFICATION In the Notice of Disclaimers appearing on page 1114 OG 79 in the Official Gazette of May 29, 1990, all references to patent no. 4,767,708 should be deleted as the patent should not have been disclaimed.



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| INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—GERALD GOLDBERG, Director | 308-0754 |
| PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—CARLTON CROYLE Director | 308-0771 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—JOSEPH J. ROLLA, Director. | 308-0956 |
| COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 B. R. GRAY, Director | 308-0962 |
| DESIGN, GROUP 290—ROBERT E. GARRETT, Director | 308-0511 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—F. R. SCHMIDT, Director | 308-1113 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Director | 308-1148 |
| MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director | 308-0858 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—JOHN KITTLE, Director | 308-0861 |
| GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director | 308-0651 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during August 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,827,085 to 3,832,735 inclusive
Plant Patents ..... 3,581 to 3,603

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## ERRATA

Note: Sept. 10, 1991 should start with printed page number 767 and end on printed page number 1454. Adjustments in page numbers will occur in Sept. 17, 1991 issue.

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# REEXAMINATIONS

SEPTEMBER 10, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,604,097 (1549th)**
**BIOABSORBABLE GLASS FIBERS FOR USE IN THE REINFORCEMENT OF BIOABSORBABLE POLYMERS FOR BONE FIXATION DEVICES AND ARTIFICIAL LIGAMENTS**
**George A. Graves, Jr., Bellbrook, and Binod Kumar, Centerville, both of Ohio, assignors to University of Dayton, Dayton, Ohio**
**Reexamination Request No. 90/002,217, Dec. 5, 1990.**
**Reexamination Certificate for Patent No. 4,604,097, issued Aug. 5, 1986, Ser. No. 702,526, Feb. 19, 1985.**
**Int. Cl.[5] C04B** *33/24, 35/44*
**U.S. Cl. 623—11**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2**, **4**, **5**, **9** and **13** are cancelled.

Claims **3**, **6**, **7**, **8**, **10**, **14**, **15** are determined to be patentable as amended.

Claims **11** and **12**, dependent on an amended claim, are determined to be patentable.

New claims **16** and **17** are added and determined to be patentable.

*16. A spun or drawn glass fiber having a diameter in the range of 1–100 microns, which is bioabsorbable and useful in the area of medical implants, comprising by weight*

| | |
|---|---|
| CaO | 15–25% |
| $P_2O_5$ | 65–90% |
| $CaF_2$ | 0–5% |
| $H_2O$ | 0–5% |
| XO | 0–10% |

*wherein X is selected from the group consisting of a single magnesium, zinc, or strontium ion and two sodium, potassium, lithium, or aluminum ions, and when X is aluminum, O is three oxygen ions.*

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**B1 4,698,289 (1550th)**
**PROCESS FOR MAKING FERRITE SPHERICAL PARTICULATE TONER CORE FROM RAW FLY ASH**
**Robert G. Aldrich, Manlius; Geoffrey H. Earl, Erieville, and David W. Trunko, Lafayette, all of N.Y., assignors to Halomet, Inc.**
**Reexamination Request No. 90/002,121, Sep. 4, 1990.**
**Reexamination Certificate for Patent No. 4,698,289, issued Oct. 6, 1987, Ser. No. 833,992, Feb. 27, 1986.**
**Int. Cl.[5] G01G** *9/00;* **C01G** *9/14, 9/10, 49/08*
**U.S. Cl. 430—106.6**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

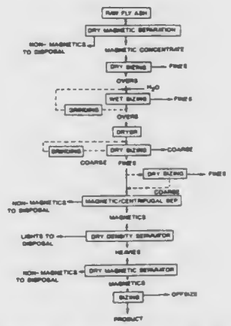
Claim **1** is cancelled.

[1. A process for making a ferrite spherical particulate toner carrier core from raw fly ash obtained from burning coal comprising

(a) recovering the magnetic particles from the non-magnetic particles of the raw fly ash:

(b) selecting a desired size for the particles of the raw fly ash and screening the fly ash to obtain the desired sized particles; and

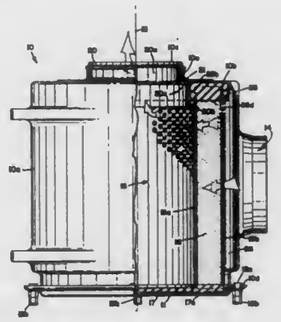
(c) purifying the raw fly ash treated according to steps (a) and (b) to obtain a ferrite composition having a particle size from 20–300 microns, in which the particles are essentially spherical, having an apparent density of at least 1.8




g/cm$^3$; a saturation magnetization of 43–70 emu/g; a remanence of 5 emu/g or less; a Hall Flow of 20 sec. or greater/50 g.]

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**B1 4,720,292 (1551st)**
**CYLINDRICAL AIR FILTER WITH LIGHTWEIGHT HOUSING AND RADIALLY DIRECTED SEAL**
**Donald F. Engel, Prior Lake, and Steven S. Gieseke, Richfield, both of Minn., assignors to Donaldson Company, Inc.**
**Reexamination Request No. 90/002,095, Jul. 23, 1990.**
**Reexamination Certificate for Patent No. 4,720,292, issued Jan. 19, 1988, Ser. No. 884,992, Jul. 14, 1986.**
**Int. Cl.[5] B01D** *46/02*
**U.S. Cl. 55—337**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1** to **10** are cancelled.

New claims **11** to **28** are added and determined to be patentable.

*11. An air filter, comprising:*

*(a) a lightweight housing having a longitudinal axis, a first generally closed end having an axial outlet opening, a gener-*

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*ally open second end closeable by a removable cover, and a peripherol air inlet opening;*

*(b) a generally cylindrical element comprising: an inner liner; a filter; and, an outer liner; said cylindrical element being carried within said housing and coaxial therewith and having a first end engageable with said closed end of said housing and having a second, closed end engageable with said cover;*

*(c) said closed end of said housing comprising a cylindrical outlet member in said outlet opening having a short inner portion extending axially inwardly into said housing and said filter element, said inner portion having a first outside diameter; and,*

*(d) said first end of said filter element comprising a ring-like end cap having a relatively soft, rubber-like consistency,*

*(i) said end cap having a generally soft, rubber-like radially inwardly facing elastomer end cap portion having a cylindrical rodially inwardly facing surface of a diameter smaller than said first diameter; said elastomer end cap portion being constructed and arranged to fit over said inner portion of said outlet member and said inner liner to sealingly engage said inner portion of said outlet member by compression of said soft, rubber-like, end cap portion between and against said inner liner and said outlet member inner portion;*

*(ii) whereby air flowing from said air inlet into said housing is forced to flow through said filter element to said outlet opening.*

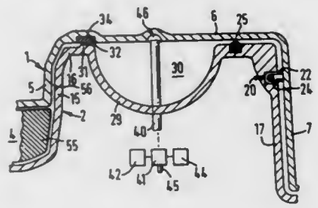
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**B1 4,767,308 (1552nd)**

## MOULD FOR MOULDING AN ARTICLE

**Alfred A. Adams, Bungay, England, assignor to Group Lotus plc, Norwich, England**

**Reexamination Request No. 90/002,103, Aug. 6, 1990.**
**Reexamination Certificate for Patent No. 4,767,308, issued Aug. 30, 1988, Ser. No. 793,804, Jan. 21, 1986.**
**Int. Cl.[5] B29C *43/36, 43/56***
**U.S. Cl. 425—405.1**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13–16** is confirmed.

Claims **1, 2, 8, 9, 10, 11, 12** and **17** are cancelled.

Claims **3–6** and **18** are determined to be patentable as amended.

Claim 7, dependent on an amended claim, is determined to be patentable.

New claims **19–24** are added and determined to be patentable.

[1. A mould for moulding an article, said mould comprising:
first and second mould parts shaped to define a moulding cavity between the parts,
means allowing relative movement of said first and second mould parts so that, upon said movement, volume of said moulding cavity changes between a first, minimum volume and a second larger volume,
means for introducing flowable moulding material into said moulding cavity,
means defining a collection chamber located outwardly of said moulding cavity, said collection chamber communicating with said moulding cavity to receive any excess flowable moulding material during said relative movement of said mould parts,
means acting between said mould parts to restrict flow of said flowable moulding material into said collection chamber as said mould parts relatively move to a position corresponding to minimum moulding cavity volume,
sealing means operative to said said moulding cavity and said collection chamber against ambient atmosphere throughout said movement of said mould parts between said first and second positions, and
means for communicating said mould cavity with a vacuum source to effect said relative movement of said mould parts, said communicating means comprising a tube extending into said collection chamber with the tube opening above the level of the flowable moulding material in said chamber.]

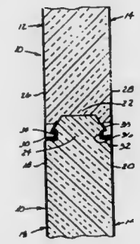
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**B1 4,769,963 (1553rd)**

## BONDED PANEL INTERLOCK DEVICE

**Steven C. Meyerson, Largo, Fla., assignor to Republic Bank**

**Reexamination Request No. 90/002,027, May 16, 1990.**
**Reexamination Certificate for Patent No. 4,769,963, issued Sep. 13, 1988, Ser. No. 71,245, Jul. 9, 1987.**
**Int. Cl.[5] E04B *1/80;* E04C *1/14***
**U.S. Cl. 52—309.9**



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–4** and **5** is confirmed.

New claims **6–35** are added and determined to be patentable.

*6. In a rigid building panel with substantially parallel planar front and rear metal sheets separated by an insulating rigid foam core bonded to the sheets and having a first pair of opposite parallel and substantially straight end edges, the improvements comprising*

*a second pair of opposite longitudinal edges having complimentary first and second interlocking elements forming the longitudinal edge of each metal sheet,*

*the first interlocking element forming a U-shaped projection along matching edges of the front and rear metal sheets spaced from the core to permit the U-shaped member to ride up independently from the core backed portion of the skin with a first core edge between the first interlocking elements having an inwardly projecting dish-shaped geometrical configuration,*

*the second interlocking element forming a ramp and a groove behind the ramp along matching edges of the front and rear metal sheets with a second core edge between the second interlocking elements having an outwardly projecting geometric shape conforming to the dish-shaped geometric configuration of the first core edge,*

*the first interlocking U-shaped projections on the second pair of edges of the metal sheets capable of riding up over the ramp of the second interlocking elements and snapping in place in the groove behind the ramp forming a tight interlock fit and forming an edge to edge insulating fit between the first and second core edges.*



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**B1 4,808,413 (1554th)**

## PHARMACEUTICAL COMPOSITIONS IN THE FORM OF BEADLETS AND METHOD

**Yatindra M. Joshi, Piscataway; William R. Bachman, North Brunswick, and Nemichand B. Jain, Monmouth Junction, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Reexamination Request No. 90/002,213, Nov. 28, 1990.**
**Reexamination Certificate for Patent No. 4,808,413, issued Feb. 28, 1989, Ser. No. 140,281, Dec. 31, 1987.**
**Continuation-in-part of Ser. No. 43,584, Apr. 28, 1987, abandoned**
**Int. Cl.[5] A61K *9/14, 9/26, 9/52***
**U.S. Cl. 424—458**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **4–8, 16, 17** are cancelled.

Claims **1, 13, 18, 19, 21, 22, 27–29, 33–35** are determined to be patentable as amended.

Claims **2, 3, 9–12, 14, 15, 20, 23–26, 30–32**, dependent on an amended claim, are determined to be patentable.

1. A modified release formulation in the form of an extruded-spheronized beadlet from which medicament is released at a controlled rate, said beadlet comprising a medicament *which is captopril*, an organic carboxylic acid to facilitate spheronization, to impart hardness to the beadlet and aid in obtaining a desired narrow particle size distribution of beadlets, and a non-lipophilic non-fat binder, said medicament being present in a weight percent of from about 3 to about 60%, and said organic carboxylic acid being present in an amount within the range of from about 5 to about 50% by weight of said beadlet, said beadlet having a hardness of at least about 2 Strong-Cobb units.

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# REISSUES

SEPTEMBER 10, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 33,684**

**Patent Not Issued For This Number**

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**Re. 33,685**

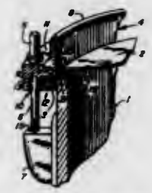
**DRUM HOOP**

**Robert Andre, Hilton Head, S.C., and Alfred J. LeMert, Fort Myers, Fla., assignors to The Selmer Company, L.P., New York, N.Y.**

**Original No. 4,428,272, dated Jan. 31, 1984, Ser. No. 324,003, Nov. 23, 1981. Continuation of Ser. No. 353,217, May 18, 1989, abandoned, which is a continuation of Ser. No. 825,015, Jan. 31, 1986, abandoned, which is a continuation of Ser. No. 89,512, Oct. 30, 1979, abandoned. Application for reissue Jan. 19, 1990, Ser. No. 469,741**

**Int. Cl.[5] G10D** *13/02*

**U.S. Cl. 84—413** **6 Claims**



[1. A counter hoop for a musical drum, said drum comprising

a flexible and tensionable drum head including a peripheral edge,

a locking ring secured to the peripheral edge of the drum head,

a shell having at least one surface with which said drum head contacts and against which it is held tightly when the drum is assembled,

adjustable head tensioning means for varying the tension of the drum head by drawing it over said shell contact surface, said loop comprising

a main body portion, including an inner channel, and an outer channel formed by a pair of extensions extending from the main body portion,

said outer channel comprising a smooth outer surface substantially free of protuberances extending therefrom,

one of said extensions together with a surface of said counter hoop and the drum shell being in substantial flat surface contact with three sides of said head channel to prevent rotation of the same when tension is applied to said tensioning means.]

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**Re. 33,686**

**URINE SPECIMEN COLLECTORS AND METHOD OF DETECTING SPURIOUS URINE SPECIMENS**

**James M. Parrish, Midlothian, Va., assignor to Medical Implements, Inc., Richmond, Va.**

**Original No. 4,832,046, dated May 23, 1989, Ser. No. 140,254, Dec. 31, 1987. Continuation-in-part of Ser. No. 65,933, Jun. 24, 1987, abandoned. Application for reissue Oct. 18, 1989, Ser. No. 423,787**

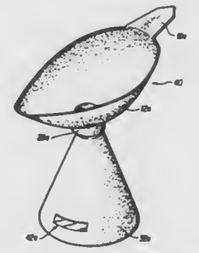
**Int. Cl.[5] A61B** *5/00*

**U.S. Cl. 128—771** **7 Claims**

*6. In a single use urine specimen collector container for detecting spurious, fraudulent, non-authentic or non-current urine specimens, the combination which comprises:*

*a. a urine specimen collection container,*

*b. and a temperature sensitive member which includes at least one portion which will indicate a temperature for the specimen that is slightly less than normal body temperature and at least one portion which will indicate a temperature for the specimen that is slightly in excess of the normal body temperature secured externally of said urine specimen collection container at a height below the level of a urine specimen to be deposited within said collection container with said temperature sensitive member being capable of signalling a spurious urine specimen by heat conduction through said urine specimen collection container.*



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**Re. 33,687**

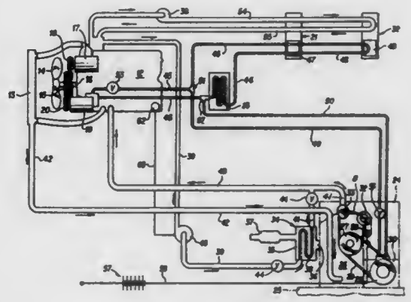
**AUXILIARY AIR CONDITIONING, HEATING AND ENGINE WARMING SYSTEM FOR TRUCKS**

**J. Rex Greer, Fort Sumner, N. Mex., assignor to Pony Pack, Inc., Fort Sumner, N. Mex.**

**Original No. 4,682,649, dated Jul. 28, 1987, Ser. No. 869,607, Jun. 2, 1986. Application for reissue Mar. 22, 1989, Ser. No. 327,036**

**Int. Cl.[5] F02N** *17/06;* **B60H** *1/32*

**U.S. Cl. 165—43** **23 Claims**



*18. In combination, a truck including a cab, a water cooled primary engine, an air conditioning system including a first compressor driven by said engine, air conditioning means and condenser means, and a heating system operatively connected to the coolant of the engine,*

*an auxiliary engine mounted on said truck and including a second air conditioner compressor driven thereby, condenser means operatively connected to said second compressor,*

*an alternator mounted on and driven by said auxiliary engine, said alternator being operatively connected to the truck's electrical system to supply electricity thereto when said primary engine is not running,*

*means operatively connecting one side of said condenser means to said air conditioning means,*

*means connecting the air conditioning means to said second air conditioner compressor,*

*and control means for selectively supplying refrigerant from either said second compressor or said first compressor to said air conditioning means whereby the interior of said cab may be cooled without operating the engine of said truck.*

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**Re. 33,688**

**AUTOMATIC TRANSACTION MACHINE**

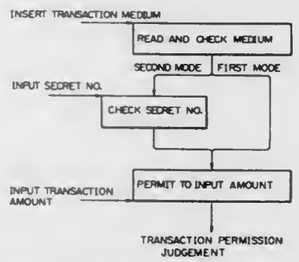
**Setsuo Tsukui, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Original No. 4,788,418, dated Nov. 29, 1988, Ser. No. 5,777, Jan. 21, 1987. Application for reissue Sep. 26, 1989, Ser. No. 412,922**

**Claims priority, application Japan, Jan. 21, 1986, 61-010866; Jan. 21, 1986, 61-010867; Jan. 21, 1986, 61-010868; Jan. 22, 1986, 61-011667**

**Int. Cl.[5] G06F *15/30***

**U.S. Cl. 235—379** **12 Claims**




1. An automatic transaction machine *for processing data including grade data indicating a level of a card owner, the data being recorded on a transaction medium,* comprising:

reading means for reading *the* data recorded on **[**a**]** *the* transaction medium **[**for a user**]**;

validity checking means for checking the validity of the data read by said reading means;

operation guidance means for providing operation guidance information to **[**the**]** *a* user *of said machine;*

input means for imputting data input by the user in response to said operation guidance information; and

control means, having first and second input processing modes, for selecting the first input processing mode *in accordance with the grade data so as* to control said operation guidance means so that a transaction amount can be immediately input through said input means directly after a validity check of the read data, and for selecting the second input processing mode *in accordance with the grade data so as* to control said operation guidance means so that the transaction amount can be input only after inputting a user identification number through said input means after the validity check.

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**Re. 33,689**

**OBJECTIVE LENS SYSTEM FOR ENDOSCOPES**

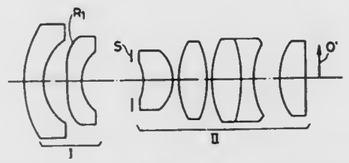
**Kimihiko Nishioka, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Original No. 4,662,725, dated May 5, 1987, Ser. No. 701,039, Feb. 12, 1985. Application for reissue May 3, 1989, Ser. No. 346,909**

**Claims priority, application Japan, Feb. 15, 1984, 59-25183**

**Int. Cl.[5] G02B *9/34, 9/62, 9/64, 13/18***

**U.S. Cl. 359—708** **30 Claims**




*22. A retrofocus-type objective for endascopes comprising, a front lens group having negative refractive power, a rear lens group having positive refractive power in the order from the object side, and a stop arranged between said front and rear lens groups, said front lens group comprising at least one lens element, one of which is a negative lens element having a concave surface having a selected curvature which is strong, and said rear lens group having at least two positive lens components, and at least one lens element in said front lens group having an aspherical surface on the object side thereof including portions whose curvature is gradually increased as the distance thereof increases from the optical axis.*

*25. A retrofocus-type objective for endoscopes comprising a front lens group having negative refractive power, a rear lens group having positive refractive power in the order from the object side, and a stop arranged between said front and rear lens groups, said front lens group comprising at least one lens element, one of which is a negative lens element having a concave surface having a selected curvature which is strong, and said rear lens group having at least two positive lens components, and at least one lens element in said front lens group having an aspherical suface on the image side thereof including portions whose curvature gradually decreases as the distance thereof increases from the optical axis.*

# PLANT PATENTS

## GRANTED SEPTEMBER 10, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**7,644**

**GRAPVINE NAMED KAT.E.LIN**

**William L. Lounsbury, Sr., 1016 Cedar St., Dunnville, Ontario, Canada N1A 2K5 , and Maurice W. Lounsbury, 187 Margaret St., Smithville, Ontario, Canada L0R 2A0**

**Filed Sep. 1, 1989, Ser. No. 406,921**

**Int. Cl.[5] A01H *5/00***

**U.S. Cl. Plt.—47** **1 Claim**

1. A new and distinct variety of grapevine, substantially as herein shown and described, characterized by excellent vigor and producitvity, early ripening, hardiness to below −18° C. temperatures, mildew resistant, long shelf life and high sugar content.

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**7,645**

**ALSTROEMERIA NAMED CYNTHIA**

**Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah**

**Filed Apr. 20, 1990, Ser. No. 511,789**

**Int. Cl.[5] A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large purple-pink colored flowers which are borne in attractive inflorescences on relatively dwarf flower stalks.

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**7,646**

**ALSTROEMERIA NAMED EMILIA**

**Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah**

**Filed Apr. 20, 1990, Ser. No. 512,138**

**Int. Cl.[5] A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large purple and white colored flowers which are borne in attractive inflorescences on relatively dwarf flower stalks.

**7,647**

**ALSTROEMERIA NAMED DEBRA**

**Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah**

**Filed Apr. 20, 1990, Ser. No. 512,139**

**Int. Cl.[5] A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large red-pink colored flowers which are borne in attractive inflorescences on relatively dwarf flower stalks.

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**7,648**

**ALSTROEMERIA NAMED LEONA**

**Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah**

**Filed Apr. 20, 1990, Ser. No. 512,806**

**Int. Cl.[5] A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large lavender-purple colored flowers which are borne in attractive inflorescences on relatively dwarf flower stalks.

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**7,649**

**ALSTROEMERIA NAMED VICIA**

**Leonard E. Carrier, Encinitas, Calif., and Stephen Garton, West Jordan, Utah, assignors to Native Plants, Inc., Salt Lake City, Utah**

**Filed Apr. 20, 1990, Ser. No. 512,811**

**Int. Cl.[5] A01H *5/00***

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinctive Alstroemeria hybrid, substantially as shown and described herein, characterized by a dwarf habit and large deep pink colored flowers which are borne in attractive inflorscences on relatively dwarf flower stalks.



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# PATENTS

## GRANTED SEP. 10, 1991

### ERRATA

| For CLASS | See PATENT NO. |
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| 452-030 | 5,046,219 |
| 530-230 | 5,046,258 |
| 172-071 | 5,046,346 |
| 277-001 | 5,046,718 |
| 385-034 | 5,046,798 |
| 385-098 | 5,046,799 |
| 385-130 | 5,046,801 |
| 385-122 | 5,046,803 |
| 385-043 | 5,046,804 |
| 385-031 | 5,046,805 |
| 385-016 | 5,046,806 |
| 385-013 | 5,046,808 |
| 385-049 | 5,046,809 |
| 385-038 | 5,046,810 |
| 385-015 | 5,046,811 |
| 385-096 | 5,046,812 |
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| 385-117 | 5,046,816 |
| 351-206 | 5,046,835 |
| 353-082 | 5,046,837 |
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| 356-005 | 5,046,839 |
| 356-028 | 5,046,840 |
| 356-071 | 5,046,841 |
| 356-136 | 5,046,842 |
| 356-152 | 5,046,843 |
| 356-238 | 5,046,844 |
| 356-241 | 5,046,845 |
| 356-326 | 5,046,846 |
| 356-338 | 5,046,847 |
| 356-345 | 5,046,848 |
| 356-357 | 5,046,849 |
| 356-367 | 5,046,850 |
| 356-375 | 5,046,851 |
| 356-398 | 5,046,852 |
| 356-440 | 5,046,853 |
| 356-440 | 5,046,854 |
| 417-518 | 5,046,935 |

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ERRATA—Continued

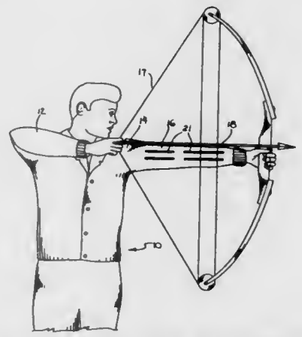
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| 514-277 | 5,047,544 |
| 359-330 | 5,047,668 |
| 332-151 | 5,047,705 |
| 392-370 | 5,047,786 |
| 359-192 | 5,048,120 |

# PATENTS

GRANTED SEPTEMBER 10, 1991

## GENERAL AND MECHANICAL

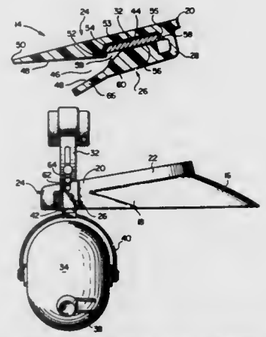
**5,046,191**
**PROTECTIVE CLOTHING**
**Victor M. Serikow, 57846 CR 27, and Philip C. Barker, 1002 Zollinger Rd., both of Goshen, Ind. 46526**
**Filed Aug. 16, 1990, Ser. No. 568,467**
**Int. Cl.[5] A41D** *13/08*
**U.S. Cl. 2—2** **6 Claims**



1. Protective upperware clothing for bowhunters and bow sportsmen, said protective comprising a portion for covering a torso area, and integral sleeves to accommodate the arms of a wearer, each sleeve having a forearm portion for covering a forearm, a protective member permanently connected directly to one of said sleeve forearm portions adjacent an inner portion of a user's forearm exposed to bowstrip slap, said protective member including an elongated strip of semi-rigid material connected to said protective member to cushion the forearm against bowstring slap.

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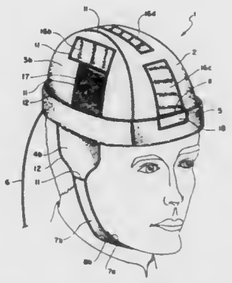
**5,046,192**
**HEADSET SUN VISOR**
**Francis E. Ryder, Arab, Ala., assignor to Ryder International Corporation, Arab, Ala.**
**Filed Sep. 26, 1989, Ser. No. 412,458**
**Int. Cl.[5] A61F** *9/04;* **H04R** *5/033*
**U.S. Cl. 2—12** **9 Claims**



5. A visor releasably attachable to a headband portion of a headset worn on a person's head, the headband portion of the headset having an inside surface facing a person's head on which it is worn and an outside surface facing an opposite direction, the headband portion of the headset extends over the top of a person's head in an arch, said visor comprising: a brim portion projecting in front of a person's head being formed with two side portions extending rearwardly therefrom for attachment to said headband portion for shielding a person's eyes from visually adverse conditions; a clip member including two flanges being integrally formed on the ends of each of said side portions for removably attaching said visor to a headband of a headset, said two flanges extending rearwardly from each of said side portions, said clip member compressibly retaining a headband extending transverse thereto and engaged therein for retaining said visor in a fixed position on a headband portion.

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**5,046,193**
**AQUATIC THERMAL HEAD COVERING**
**Timothy W. Foresman, and Joyce L. Foresman, both of 342 Moreno Ct., Henderson, Nev. 89014**
**Filed Feb. 19, 1990, Ser. No. 473,629**
**Int. Cl.[5] A42B** *1/12*
**U.S. Cl. 2—68** **8 Claims**



1. A waterproof aquatic thermal head covering adapted to be worn on a user's head while in or on water and while engaged in sports and other aquatic activities, which comprises:

a) a cap conforming to the user's head curvature and formed of: a center panel of flexible laminated material extending from the front of said cap to the rear of said cap and consisting of an inner layer of closed-cell material and outer layers of water-resistant fabric material, and side panels of like flexible laminated material, said side panels at their edges being mated and bonded to the edges of said center panel, said center and side panels at their mated and bonded edges bearing edge-securing stitching, and said cap presenting at its lower edge portion an adjustable brim foldable upwardly along a circumferential fold line against the outer surface of said cap; and

b) ear flaps affixed to the inside of the cap and extending downwardly therefrom on each side panel thereof proximate the fold line of the adjustable brim, said ear flaps including chin strap means bearing hook and loop fasteners for securing the cap to the user's head and for alternatively securing the chin strap means across the outer top portion of the cap.

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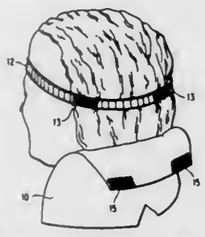


5,046,194
SUIT FOR WEIGHT LIFTERS
Irma P. Alaniz, 921 Rickey, and Pedro M. Alaniz, III, 901 Lansdown, both of Corpus Christi, Tex. 78412
Continuation-in-part of Ser. No. 387,527, Jul. 31, 1989. This application Feb. 19, 1991, Ser. No. 658,309
Int. Cl.[5] A41D *1/08, 13/00*
U.S. Cl. 2—69 10 Claims



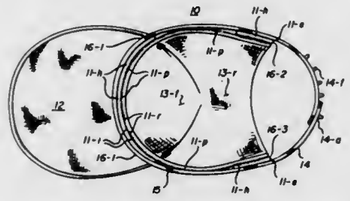
1. A weight lifting suit comprising
a torso section having a front, a back and shoulder straps and a pants section having a crotch and legs extending from the crotch, the torso and pants section being made of panels having edges overlapping one another along a narrow path adjacent the panel edges and having
a pair of first seams joining the panels together in an overlapped joint extending over and down the front and back of the torso section along the shoulder straps and diverging in the torso section to opposite sides of the suit and
a pair of second seams joining the panels together in an overlapped joint and joining with the first seams and converging into the crotch.

5,046,195
HEAD BAND WITH NECK SHIELD
Gilbert Koritan, Phoenix, Ariz., assignor to Cap-Mate Company, Del.
Continuation of Ser. No. 404,548, Sep. 8, 1989, abandoned. This application Mar. 8, 1991, Ser. No. 666,566
Int. Cl.[5] A41D *1/00;* A42B *1/06*
U.S. Cl. 2—172 2 Claims



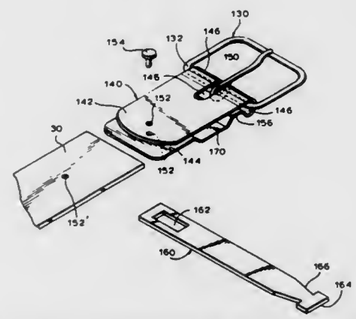
1. A head band and neck shield combination consisting essentially of an independent annular elastic head bank, a neck shield consisting essentially of a substantially rectilinear sheet of material and fastening means directly and detachably connecting said neck shield to said electric head band.

5,046,196
SANITIZATION AND ADAPTATION OF HEADGEAR
William W. Sullivan, 17 Old Oak Ave., Westminster, Mass. 01473
Filed Mar. 19, 1990, Ser. No. 495,146
Int. Cl.[5] A42C *5/00*
U.S. Cl. 2—181.4 9 Claims



1. The method of adapting headgear formed by a cover having a interior for shielding selected portions of the head, which comprises the steps of
(a) installing into the interior of the headgear, against a complementary fastening material, a removable segment which is shaped to fit around only a portion of said interior; and
(b) removing said segment to permit the replacement thereof by a different segment to achieve an alternate adaptation of said headgear with the replaced segment;
wherein the complementary fastening material has an unequal length in comparison with the removable segment.

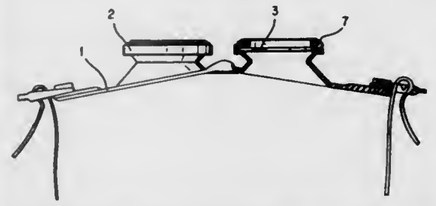
5,046,197
MOLDED PLASTIC BELT AND BUCKLE
Michael Chernuchin, New York, N.Y., and Richard Satin, Swampscott, Mass., assignors to Fashion Technologies, Inc., New York, N.Y.
Division of Ser. No. 276,677, Nov. 28, 1988. This application Jan. 16, 1990, Ser. No. 464,947
Int. Cl.[5] A41F *9/00*
U.S. Cl. 2—322 9 Claims



9. A belt designed to simulate the appearance of a leather belt comprising:
(A) an elongate belt strap formed substantially exclusively of molded plastic and having its front face and edge substantially uniformly machine finished; and
(B) fastening means secured to said belt strap adjacent one end thereof for operatively fastening said strap end to the other strap end, said fastening means including
(i) buckle means having a back bar and being operatively connected to said belt strap adjacent one strap end thereof for operatively fastening said one belt strap end to the other belt strap end, and
(ii) connector apparatus operatively connecting said one belt strap end and said buckle means, including a rivet and a metal strip folded back on itself to define a pair of generally parallel front and rear panels and a bight connecting said panels, said strip receiving therein adjacent said bight said back buckle bar and intermediate said panels said one belt strap end, each of said panels containing a rivet aperture therethrough adjacent the free ends thereof, said rivet apertures being aligned and receiving said rivet passing through said one belt strap end to operatively join said buckle means and said one belt strap end.



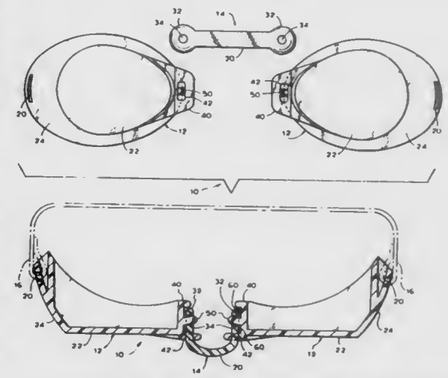
5,046,198
GAS GOGGLES
Volker Hunnebeck, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany
Filed May 21, 1990, Ser. No. 526,581
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1989, 3928696
Int. Cl.[5] A61F *9/02*
U.S. Cl. 2—440 4 Claims



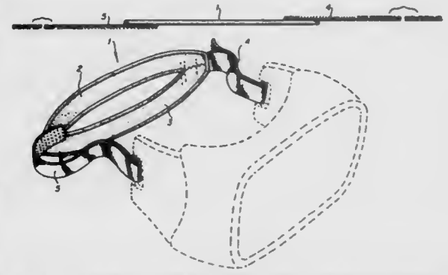
1. Safety eyeglasses which protect against gases comprising: a resilient frame with two eye spaces, each one for surrounding an eye of a user; a lens for each eye space which is held therein by a mount; wherein each mount externally surrounds an outer edge of the corresponding lens and has a front edge, a rear edge and a recess therebetween for receiving the outer edge of the lens; wherein a peripheral groove is formed on the surface of the front edge of each mount; and wherein a flat rigid ring of substantially rectangular cross-section and having an inside diameter smaller than an outside diameter of the lens is removably secured in the peripheral groove thereby sealingly holding the lens in the recess.

5,046,199
GOGGLES
Stephen J. Hall, Langley, Canada, assignor to S. Acquisition Corp., Van Nuys, Calif.
Filed Jul. 23, 1990, Ser. No. 557,118
Int. Cl.[5] A61F *9/02*
U.S. Cl. 2—446 19 Claims

1. In goggles comprising:
(A) a pair of eyepieces;
(B) an elongate nosepiece connecting said pair of eyepieces to form an assembly; and
(C) means for securing said assembly on a wearer's head;
the improvement wherein:
(i) said nosepiece has a flexible bridgepiece adapted to pass over the bridge of the wearer's nose and, at each end of the bridgepiece, an end ring defining an aperture, and
(ii) each of said eyepieces is rigid and defines a lug extending inwardly towards said bridgepiece and a pin disposed rearwardly of said lug and extending inwardly, said lug defining a passageway therethrough for a respective one of said end rings, and said pin being configured and dimensioned to enter and engage said aperture of said respective one end ring, said pin and said lug cooperatively precluding accidental disengagement of said end ring aperture and said pin, whereby said nosepiece and said eyepieces are releasably locked together to form said assembly.



5,046,200
REVERSIBLE, QUICK-ADJUSTABLE DIVER'S FACE MASK STRAP
Irving Feder, 331 Poinciana Island Dr., Miami Beach, Fla. 33160
Filed Aug. 29, 1990, Ser. No. 575,374
Int. Cl.[5] A61F *9/02;* G02C *3/00*
U.S. Cl. 2—452 10 Claims

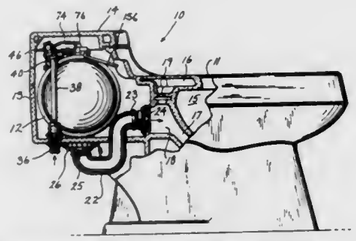


1. A reversible, quick-adjustable diver's face mask strap, comprising a body portion formed of a flexible, elastic material having first and second opposite surfaces for contacting the head of a diver, said body portion including two band portions being partially spaced apart defining an opening therebetween, first and second ribbons attached to said body portion, each of said ribbons having an attachment surface and another surface, each of said other surfaces being connected to a respective one of said opposite first and second surfaces, each of said ribbons having means disposed on said attachment surface for releasably fastening said attachment surface to itself when folded to form a loop passing through an opening formed in a diver's face mask, whereby one of said ribbons remains adjustable without removing the mask strap from the diver's head regardless of which one of said opposite surfaces contacts the head of the diver.

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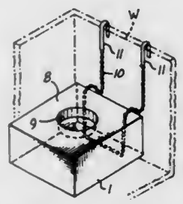


5,046,201
**PRESSURIZED FLUSH TOILET TANK**
Michael D. Steinhardt, Kiel; Mark A. Risberg, and John M. Bloemer, both of Sheboygan, all of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Apr. 16, 1990, Ser. No. 510,304
Int. Cl.[5] E03D *3/10*
U.S. Cl. 4—354 3 Claims



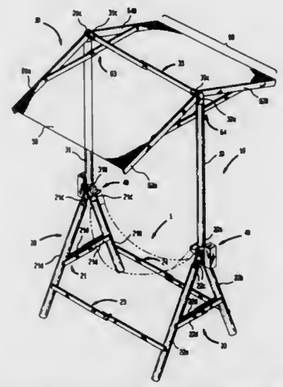
1. A pressurized flush toilet system, comprising:
a toilet having a toilet bowl and a rim around the upper periphery of the toilet bowl;
a reservoir tank for containing a pressurized volume of flush water for said toilet, said reservoir tank having an inlet and an outlet, said outlet being below the toilet bowl rim and connected to the toilet to deliver water to the toilet bowl;
a flush valve operable by a toilet user for selectively providing communication between the reservoir tank and the toilet bowl; and
a backflow preventer upstream of the tank inlet having an inlet valve, an outlet valve and an atmospheric vent between said inlet and outlet valves, wherein a positive pressure differential across the backflow preventer opens the valves and closes the vent to allow the flow of water through the backflow preventer toward the tank and a negative pressure differential across the backflow preventer closes the valves and opens the vent to prevent reverse flow through the backflow preventer away from the tank;
wherein the toilet bowl rim has a rim distribution channel in its interior and further comprising a conduit for providing communication between the vent of the backflow preventer and the rim distribution channel above the spill level of the toilet bowl.

5,046,202
**WATER-SAVING TANK CONSTRUCTION, ATTACHMENT AND METHOD FOR FLUSH TOILETS**
Beverley M. Huhnke, 1623 Palm Ave., Everett, Wash. 98203
Filed Apr. 12, 1990, Ser. No. 508,770
Int. Cl.[5] E03D *1/00*
U.S. Cl. 4—415 4 Claims



1. In a toilet tank construction including a reservoir and a water-supply valve for introducing water into the reservoir and including a float, the water-supply valve being effective to fill the reservoir to a predetermined level determined by the position of the float, the improvement comprising the combination of a buoyant block disposed beneath the float and positioning the float above the surface of the water in the reservoir, and means for tethering said block in the reservoir for maintaining said block approximately centered beneath the float, whereby the predetermined level to which the tank is filled is lower than it otherwise would be if said block were removed.

5,046,203
**COLLAPSIBLE HAMMOCK SUPPORT**
Graciela V. O. de Cuadros, 53-00 65 Place, Maspeth, N.Y. 11378
Filed Sep. 14, 1990, Ser. No. 582,413
Int. Cl.[5] A45F *3/24*
U.S. Cl. 5—128 9 Claims

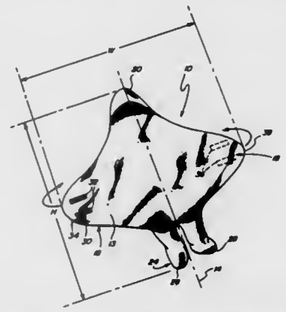


1. An interconnected collapsible transportable hammock support including sunshade means comprising,
an interconnected collapsible ground engaging hammock support frame assembly; comprising first and second A-shaped collapsible structures formed by respective first and second tubular legs having flat end members; and transverse bracing members being rotatably attached at ends thereof to the respective first and second tubular legs of the respective first and second A-shaped structures,
an interconnected collapsible hammock shade support frame assembly,
a flexible collapsible sunshade attached to said hammock shade support frame assembly,
means to interconnectedly and pivotally attach said hammock shade support frame assembly to said hammock support frame assembly,
means for selective attachment of a hammock to said hammock support, said means for selective attachment of a hammock to said hammock support comprising a mounting bracket having a hammock hook portion and a frame assembly's attachment portion.

5,046,204
**INFANT WRAPPING ARTICLE**
Steven Mohler, 1020 E. Chestnut Ave., Santa Ana, Calif. 92701
Filed Mar. 18, 1991, Ser. No. 671,101
Int. Cl.[5] A47G *9/08*
U.S. Cl. 5—413 5 Claims

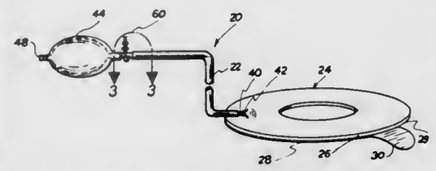
1. An article for wrapping an infant, the article comprising a sheet of fabric material having a left-hand side flap, a right-hand side flap, foot means at lower regions of the sheet for receiving the feet of an infant, and hood means in upper regions of the sheet for receiving portions of the head of an infant, said side flaps each having a sufficient sideward length to enable the flaps to wrap sidewardly over an infant resting along a vertical center region of the sheet and to overlap one another by a substantial amount, said left-hand and said right-hand side flaps being generally triangular in shape and being transversely aligned with one another, and including means for releasably securing said side flaps together when they are in said over-





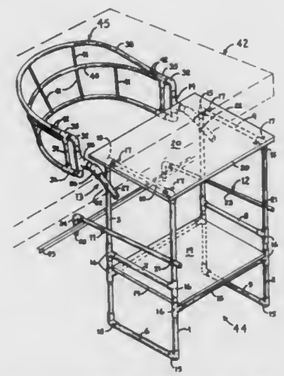
lapped condition, said foot means comprising first and second stocking feet or booties each of which is configured for receiving a foot portion of an infant resting along said vertical center region of the sheet.

5,046,205
**INFLATABLE RING CUSHION DEVICE**
Luis A. Garciá, 530 SW - 42 Ave. Apt. 13, Miami, Fla. 33134
Continuation-in-part of Ser. No. 912,384, Sep. 26, 1986, abandoned. This application Oct. 26, 1987, Ser. No. 124,716
Int. Cl.[5] A47C *20/00*
U.S. Cl. 5—431 4 Claims



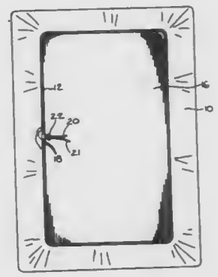
1. An inflatable ring cushion device, comprising:
A. an inflatable toroid shaped cushion having a center hole, said cushion having dimensions that substantially coincide with the buttocks area of a user and said cushion including a rubber nipple to permit the passage of air to said cushion, a flat annular-shape stiff rubber base molded on one side of said cushion end having a rough bottom surface molded on one side of said base;
B. a rubber hose having two ends and one of said ends being connected to said nipple;
C. a T-coupler having a ring mounted thereon and said T-coupler further including first, second and third connecting tubular members and said first tubular connection being connected to the other end of said hose, and said second tubular member includes an air exhaust valve of the stem type housed therein for releasing the air inside said cushion when activated, said ring being mounted at the periphery to the head of said T-coupler between said first and third tubular members;
D. a manually operated rubber bulbous pump having a one-way air admission valve, said pump being connected to said third tubular member and so arranged and designed to permit the pumping of air through said third and first tubular members and said hose into the inside of said cushion and wherein said T-coupler may be removably attached to the inside of the garment of a user by insertion of an attachment device through said ring when said cushion is placed inside said garment.

5,046,206
**COMBINED BED CHAIR, TRAY, AND FOOTREST**
James H. Broyles, 2286 Hickory Dr., Culpeper, Va. 22701
Filed Jan. 15, 1991, Ser. No. 641,302
Int. Cl.[5] A47C *20/02*
U.S. Cl. 5—432 6 Claims



1. A combination bedchair, footrest, and tray device for a bedridden patient, said device being adapted to be releasably secured to a bed, and comprising a rectangular table and footrest frame resting on the floor and having four vertical corner posts, a plurality of horizontal connecting members securing the corner posts together and forming support means for an upper tray or table surface member and a lower footrest, a table surface member and a footrest secured to the frame at appropriate upper and lower locations, first arm means on the frame adapted to releasably and firmly secure the frame to the side of a bed, a patient back and side support bedchair member having a back and sides adapted to be releasably connected to the frame so as to rest on the bed and extend around the back of the patient supporting and allowing the patient to sit directly on the side of the bed, and second arm means mounted on the frame adapted to releasably connect the bedchair member to the frame such that the bedchair member will support the patient and bias the frame toward the bed.

5,046,207
**ADJUSTABLE BED SHEET**
W. James Chamberlain, Elkhart, Ind., assignor to Coachmen Industries, Inc., Elkhart, Ind.
Filed Dec. 21, 1990, Ser. No. 631,979
Int. Cl.[5] A47G *9/02*
U.S. Cl. 5—496 2 Claims



1. In a bed sheet including a sheet of fabric having multiple

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side edges joined at corners, said sheet having an elastic band attached to the fabric at each corner thereof to snugly secure the sheet to a bed, the improvement wherein said sheet further includes connected to the sheet at the side edges thereof for adjusting the length of the side edges within the sheet may be fitted snugly against mattresses of many different shapes and sizes, said means for adjusting including an elastic band connected to the side edges of the sheet, a drawstring fitted in said elastic band and terminating outside of the band.

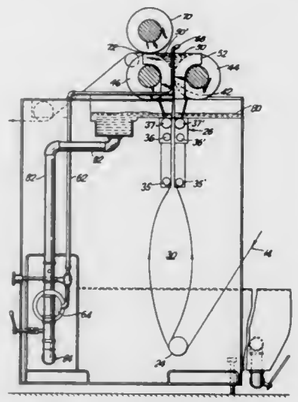
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**5,046,208**

## METHOD AND APPARATUS FOR APPLYING ADDITIVES IN A BALLOONED FABRIC EXTRACTION SYSTEM

**Frank Catallo, 84 Wheatley Rd., Old Westbury, N.Y. 11568**

**Filed Mar. 26, 1990, Ser. No. 498,439**
**Int. Cl.[5] D06B** *3/18*
**U.S. Cl. 8—151** **10 Claims**



1. In a ballooned fabric extraction apparatus comprising:
(a) an extraction chamber for treating tubular knitted fabrics;
(b) said extraction chamber including a fluid and liquid fabric application arrangement in the internal portion of said extraction chamber;
(c) means for the extraction chamber to move the tubular knitted fabric to the internal portion thereof;
(d) first- means for the extraction chamber to guide said tubular knitted fabric in a predetermined direction in said extraction chamber;
(e) said fluid and liquid fabric application arrangement acting on said tubular knitted fabric to cause same to balloon;
(f) first and second roll means on said extraction chamber to form a first nip for receiving said tubular knitted fabric in a desired direction and in ballooned form from said extraction chamber;
(g) said first nip operative to smooth said tubular knitted fabric;
(h) one of said first and second rolls being driven so that said driven roll functions to move said tubular knitted fabric through said first nip wherein excess liquid in said fabric is removed;
(i) a third roll disposed relative one of said first and second rolls to form a second nip;
(j) an additive supply reservoir formed by said first and second rolls to serve as a bath for said tubular knitted fabric when it is desired to apply an additive to same;
(k) a dam means at each of the ends of said rolls to cooperate with the first nip to limit leakage of said additive from said reservoir;
(l) said third roll also being driven by the first or second roll whereby said tubular knitted fabric moves through the reservoir to the second nip so that excess liquid is removed therefrom;
(m) condensate disposal means arranged relative said second nip to receive excess additive therefrom; and
(n) an additive supply means connected to said reservoir.

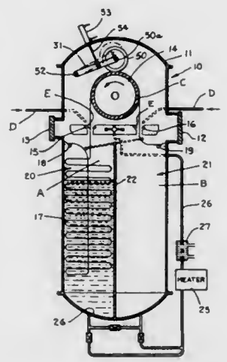
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**5,046,209**

## BATCH DYEING AND WASHING APPARATUS AND METHOD

**Hans O. Keilhack, Charlotte, N.C., assignor to Keiltex Corporation, Charlotte, N.C.**

**Filed Apr. 20, 1990, Ser. No. 511,466**
**Int. Cl.[5] D06B** *3/16, 3/32*
**U.S. Cl. 8—152** **14 Claims**



4. Apparatus for dyeing and then washing a length of fabric comprising:
a pair of adjacent imperforate compartments;
means for feeding said length of fabric from an open top of one of said compartments through an open top of and into the other of said compartments;
means for pumping used wash liquid from a compartment onto said length of fabric while feeding said length of fabric from said one of said compartments into the other of said compartments; and
means for simultaneously pumping fresh wash liquid onto said length of fabric and into said other of said compartments while feeding said length of fabric therein;
whereby liquid is applied twice to said fabric thus reducing the amount of liquid required for washing.

12. The method of washing a length of fabric in a batch dyeing machine comprising:
providing a pair of adjacent imperforate compartments;
transporting said length of fabric from one of said compartments to the other while applying fresh wash liquid on said fabric as it enters the other of said compartments; and
simultaneously pumping wash liquid collected in a compartment and applying same on said fabric as it is transported from the said one of said compartments.

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**5,046,210**

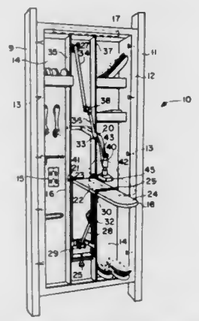
## WALL MOUNTABLE SHOE SHINING APPARATUS

**Charles N. Garrett, Sr., 2223 Jumpin Run Dr., Wilmington, N.C. 28403**

**Filed Oct. 2, 1989, Ser. No. 416,053**
**Int. Cl.[5] A43D** *3/00;* **A47L** *23/16, 23/18*
**U.S. Cl. 12—123** **16 Claims**

1. An apparatus for use in shoe shining comprising:
a vertical frame;
support means pivotally mounted on said vertical frame for receiving a shoe;
said support means being pivotable between a position parallel and adjacent to the frame and a horizontal position substantially perpendicular to the frame;
shoe retaining means pivotally mounted on said vertical frame above said support means for engaging the inner sole of the shoe at the heal area;
said shoe retaining means being pivotable between a position parallel and adjacent the frame and a substantially horizontal position above the horizontal position of the support means;
said shoe retaining means including clamping means for contacting the inner sole of the shoe at the heel area; and
the clamping means being vertically adjustable to provide a clamping force for securing the shoe onto the support means.





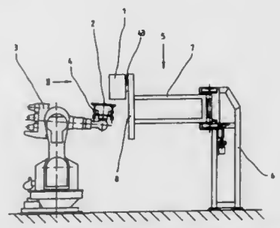
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**5,046,211**

## DEVICE FOR CLEANING VEHICLE PARTS, IN PARTICULAR GLASS PANES OF VEHICLES

**Wilhelm Steinhart, Friedberg; Mohann Maischberger, Dinkelscherben; Thomas Biewald, Memmingen, and Gerwin Berens, Augsburg, all of Fed. Rep. of Germany, assignors to Kuka Schweissan & Roboter GmbH, Augsburg, Fed. Rep. of Germany**

**Filed Apr. 4, 1990, Ser. No. 504,583**
**Claims priority, application Fed. Rep. of Germany, Apr. 5, 1989, 39110370**
**Int. Cl.[5] A47L** *1/02*
**U.S. Cl. 15—102** **17 Claims**



1. A device for automatically cleaning vehicle parts, in particular glass panes of vehicles, for preparing vehicle parts for subsequent treatment and/or installation processes comprising: a multiaxial manipulator including means for holding a vehicle part; a cleaning device including a wiping element having a plurality of wiping surfaces provided one after another and means for cyclically feeding the wiping element forward to sequentially position one of said plurality of wiping surfaces at a cleaning location; and, means for moving said vehicle part held by said multiaxial manipulator and said cleaning device relative to one another as said vehicle part is in contact with said cleaning zone of said wiping element.

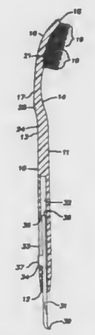
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**5,046,212**

## TOOTHBRUSH

**James R. O'Conke, 4245 E. 71st St., Cleveland, Ohio 44105**

**Filed Jan. 25, 1990, Ser. No. 470,084**
**Int. Cl.[5] A46B** *9/04*
**U.S. Cl. 15—105** **5 Claims**



1. A toothbrush comprising a substantially rigid elongated body providing a curved bristle head at one end having a concave side, said bristle head having a length and a width, said length being substantially greater than said width, the curve of the bristle head being substantially in a single imaginary plane that extends along the elongated body, said body having a back side on the side of said body opposite said concave side, said body providing a neck portion joined at one end to said bristle head and at the other end to a substantially straight elongated handle portion, said neck portion providing an offset section adjacent said handle extending toward said back side, a first plane connecting ends of said bristle head being angled with respect to the length of said handle portion at an angle of about 15 degrees, a plurality of bristle bundles mounted on said concave side of said bristle head extending substantially perpendicularly to said first plane to free ends in a second plane substantially parallel to said first plane, said bristle bundles comprising an array, said array of bristle bundles having a length and a width, sid length being substantially greater than said width, said second plane containing said free ends of said bristles being inclined and offset relative to the length of said handle to allow said bristles adjacent the extremity of said bristle head to reach and efficiently clean embrasures and posterior surfaces of teeth throughout the mouth, the lengths of the bristles in relation to the curve of the bristle head being such that the major portions of the lengths of the majority of the bristles lie outside of said first plane, said bristle head extending from said neck portion to its extremity with a decreasing radius of curvature, said neck portion providing a substantially straight section extending from said offset to said bristle head, said straight section of said neck portion tangentially joining said bristle head, the first plane being oriented such that it intersects the straight section of the neck portion at a point intermediate said offset and said bristle head.

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**5,046,213**

## PLAQUE REMOVING TOOTHBRUSH

**John P. Curtis, Bloomsbury; Kedar N. Rustogi, Kendall Park, both of N.J.; John C. Crawford, Lake Mahopac, N.Y.; James H. Kemp, Piscataway, N.J.; Thomas E. Mintel, Rahway, N.J.; Bert D. Heinzelman, Tenafly, N.J.; Donald R. Lamond, Lynbrook, and Laura H. Edelman, New York, both of N.Y., assignors to Colgate-Palmolive Company, Piscataway, N.J.**

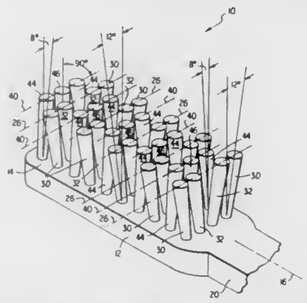
**Filed Mar. 29, 1990, Ser. No. 501,454**
**Int. Cl.[5] A46B** *9/04*
**U.S. Cl. 15—167.1** **20 Claims**

9. A toothbrush head having a longitudinal axis and termi-

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nating in a free end, the head having a generally flat surface from which tufts of bristles extend generally upwardly, the head having a plane vertically bisecting the brush head and which contains said head longitudinal axis, the tufts defining (1) surface bristle tufts for cleaning the broad surfaces of teeth, said surface bristle tufts arranged in transverse, longitudinally spaced rows with the tufts of adjacent rows tilted alternately toward and away from said plane, (2) interproximal bristle tufts



being perpendicular to the head surface and bisected by said plane, (3) gumline bristle tufts arranged in longitudinally spaced rows and tilting laterally outwardly away from said plane, said interproximal bristle tufts and said surface bristle tufts which tilt toward said plane positioned in respective transverse rows, said gumline bristle tufts and said surface bristle tufts which tilt away from said plane positioned in respective transverse rows.

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**5,046,214**

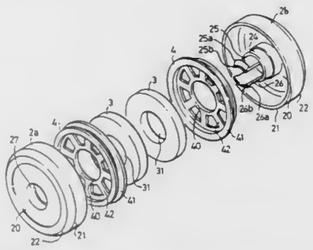
**SPOOL CONSTRUCTION AND OIL DIPSTICK WIPER INCLUDING SUCH CONSTRUCTION**

**Itzbak Keidar, Tel Aviv, Israel, assignor to Penta Inventions, Ltd., Tel Aviv, Israel**

**Filed Jan. 25, 1990, Ser. No. 470,204**

**Int. Cl.[5] B65H *75/14***

**U.S. Cl. 15—210 B** **19 Claims**



1. A spool comprising:

two like spool sections each including an axially-extending hollow stem terminating in a plurality of jaws separated from each other by spaces around the circumference of the stem;

the jaws of one section fitting into the spaces between the jaws of the other section to define the hub of the spool when the two sections are assembled together;

the outer faces of the jaws being formed with outer shoulders; and

the inner faces of the hollow stems being formed with inner shoulders, such that, when the two sections are assembled together by inserting the jaws of one section into the spaces between the jaws in the hollow stem of the other section, the inner shoulder of the stem of one section is engageable by the outer shoulders of the jaws of the other section to firmly retain the two sections in assembled relation.

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**5,046,215**

**WIPER FOR VEHICLES**

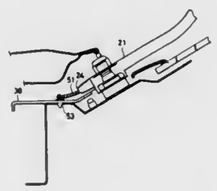
**Toshio Kobayashi, Hatano, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

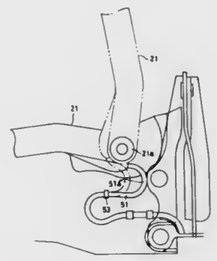
**Filed Aug. 3, 1989, Ser. No. 389,232**

**Claims priority, application Japan, Aug. 11, 1988, 63-198791**

**Int. Cl.[5] B60S *1/34***

**U.S. Cl. 15—250.2** **6 Claims**





5. A wiper for sweeping off a glass surface of a vehicle, comprising:

a wiper shaft;

an arm head pivotally mounted on the wiper shaft, including a wiper section for sweeping off the glass surface when the arm head is pivoted around the wiper shaft;

means for adjusting thrust pressure of the wiper section against the glass surface, the adjusting means being arranged in the arm head; and

cord means for supplying electric power to the adjusting means,

the arm head also including:

a pivot mount portion where the arm head is pivotally mounted on the wiper shaft; and

a come-out portion formed near the pivot mount portion, for leading out the cord means in a tangential line direction of a locus of the pivoting pivot mount portion, the come-out portion including a guide portion for defining an opening of the come-out portion and guiding the cord means taken out of the come-out portion, the guide portion including a top plate having a round end and front and rear guide plates mounted to front and rear sides of the arm head, the front and rear guide plates being coupled to both sides of the top plate.



**5,046,216**

**WINDSHIELD WIPER SYSTEM**

**Peter Baungarter, Steinheim; Bruno Egner-Walter, Heilbronn; Hans Prohaska, Bietigheim-Bissingen; Eckhardt Schmid, Brackenheim, and Melitta Teutsch, Ludwigsburg, all of Fed. Rep. of Germany, assignors to SWF Auto-Electric GmbH, Bietigheim-Bissingen, Fed. Rep. of Germany**

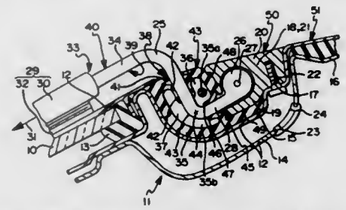
**PCT No. PCT/EP88/00332, § 371 Date Dec. 20, 1988, § 102(e) Date Dec. 20, 1988, PCT Pub. No. WO88/08382, PCT Pub. Date Nov. 3, 1988**

**PCT Filed Apr. 20, 1988, Ser. No. 294,633**

**Claims priority, application Fed. Rep. of Germany, Apr. 29, 1987, 3714224**

**Int. Cl.[5] B60S *1/24***

**U.S. Cl. 15—250.29** **25 Claims**



1. A windshield wiper system comprising at least one longitudinally extending windshield wiper which is at least substantially linearly moved to and fro by means of a first driving member extending transversely to the longitudinal direction of the windshield wiper, wherein said first driving member is guided in a first frame and the windshield wiper is at least on one end connected with the said first driving member via a carrier projecting from said first frame and wherein in a first and second emergence area of said first carrier from said first frame there is provided a first seal, characterized in that said first seal (35) is at least substantially formed as a hollow cylinder which is penetrated by said first carrier (25) at least substantially diametrically.

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**5,046,217**

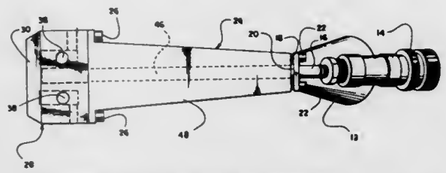
**HORIZONTIAL MINI BLIND CLEANER**

**Robert W. Cornell, 4401 Pinetree Close, and William A. Cain, Rte. 1, Cloud Clr., botb of Cumming, Ga. 30130**

**Filed Mar. 20, 1990, Ser. No. 496,363**

**Int. Cl.[5] A47L *7/00, 5/00, 9/06***

**U.S. Cl. 15—322** **4 Claims**



1. A cleaning tool comprising two segments;

(a) the first segment including a vertical operating handle connected to a lateral operating handle forming a vacuum chamber connected to a vacuum source at the bottom of said vertical operating handle, an elongated nipple passing through said chamber and extending the length of said lateral operating handle through which water flows,

(b) the second segment including a front operating center, said center including a plurality of foramina through which water and at least one cleaning chemical flows and a plurality of vacuum holes, connected to said lateral operating handle, said foramina covered by a thin piece of rectangular material bonded to said front operating center with contact cement, said rectangular material being surrounded by foam detachably connected to the front operating center by detachable means, whereby water and cleaning chemical pass out of the foramina, through the foam after having been dispersed by the rectangular material and thereafter returns through the vacuum holes and into a recovery tank by means of a vacuum applied to the vertical operating handle.

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**5,046,218**

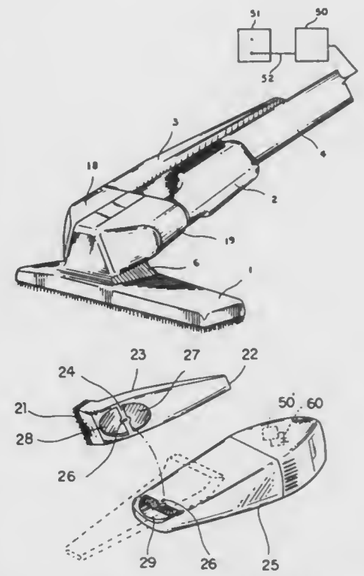
**NOZZLE INTEGRATING ASSEMBLY FOR VACUUM CLEANERS**

**David D. Cerri, 1505 Paula Dr., Silver Spring, Md. 20903**

**Filed Nov. 15, 1989, Ser. No. 436,683**

**Int. Cl.[5] A47L *9/06***

**U.S. Cl. 15—416** **18 Claims**

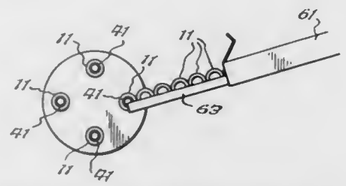


15. A nozzle assembly for connection to a vacuum source which supplies a flow of air through a vacuum flow opening, comprising integral nozzle means including at least two nozzles, each said nozzle having a functional end, an interior for directing air flow therethrough and at least one wall distal from said functional end and common to at least two of said nozzles, each said nozzle interior having an air flow port formed therein adjacent said common wall, said integral nozzle means including attachment means formed on the exterior of said common wall for rotatable displacement and connection to said vacuum source, each said air flow port of said integral nozzle means and the vacuum flow opening of said vacuum source being substantially the same configuration, whereby rotation of said integral nozzle means upon said vacuum source aligns only one said integral nozzle air flow port with said vacuum flow through the respective nozzle of said only one aligned air flow port aligned with said vacuum flow opening.

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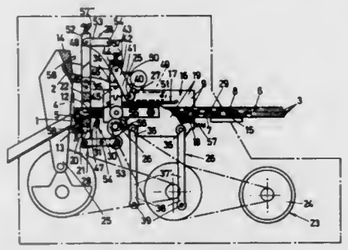
**5,046,219**
**PREPACKAGED SHIRRED FOOD EMULSION CASING WITH INTEGRAL CASING SIZING AND BRAKE CONTROL**
**Thomas R. Stanley, Kansas City, Mo., assignor to Teepak, Inc., Westchester, Ill.**
**Filed Aug. 22, 1990, Ser. No. 570,666**
**Int. Cl.[5] A22C *21/00***
**U.S. Cl. 452—30** **20 Claims**



1. A packaged shirred food emulsion casing stick comprising:
a) a length of shirred food emulsion casing having an end-closure formed therein, said end-closure which includes, incorporated therewith, a hanger means;
b) a plastic tube within which said length of said casing is packaged;
c) said plastic tube which includes integrated therewith means, operable in conjunction with a food emulsion stuffing horn, for applying frictional pressure, at an oblique angle, to said food emulsion casing as said food emulsion casing is drawn from said plastic tube by the extrusion of food emulsion through said stuffing horn;
d) said plastic tube which includes, in combination with said means for applying frictional pressure, means for controlling the diametrical size of the food emulsion product which results from the stuffing by extrusion of said food emulsion into said casing; and
e) means for relieving the build-up of gas pressure in said casing as said food emulsion is being extruded into said casing, said means for relieving which are incorporated into said plastic tube.

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**5,046,220**
**METHOD FOR FEEDING FIBRES TO A FIBRES CUTTING MACHINE AND FIBRE CUTTING MACHINE FOR IMPLEMENTING SUCH METHOD**
**Hubert Pierret, Rue du Tambour, 29; Gabriel L. Pierret, Rue du Tambour, 33; Maurice J. Pierret, Rue de l'Eglise, 15, and Jean-Marie M. Pierret, Rue du Sommet, 14, all of, 6838 Corbion, Belgium**
**Filed Apr. 2, 1990, Ser. No. 474,101**
**Claims priority, application Belgium, Oct. 2, 1987, 08701125**
**Int. Cl.[5] D01G *1/04***
**U.S. Cl. 19—0.6** **18 Claims**

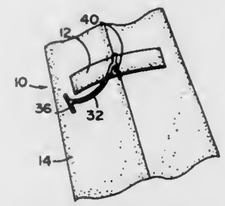


7. An apparatus for feeding a band of fibres in the direction of a fixed knife and a mobile knife of a fibre cutter, comprising:
a mobile support and a mobile plate mounted in parallel spaced apart relation, each having a horizontal support surface substantially parallel to a plane of said band of fibres, said mobile support being substantially U-shaped in cross-section having a base for engaging one of a top and a bottom surface of said band of fibres and first and second lateral supports for engaging lateral surfaces of said band of fibres, the surface area of the support plate and the surface area of the mobile support in contact with the band of fibres being substantially greater than a length of fibres to be cut by the mobile and fixed knives.
means for driving one of said mobile plate and mobile support towards and away from the other of said mobile plate and mobile support and reciprocally towards and away from said fixed and movable knives from a first position, spaced from said knives, to a second position adjacent said knives;
means for driving the other of said mobile plate and said mobile support reciprocally towards and away from said fixed and mobile knives from a first position, spaced from said fixed and mobile knives, to a second position adjacent said knives;
claw means disposed between said mobile support and said knives, said claw means comprising two parallel chucks extending transversely to a longitudinal centerline of said band of fibres, one of said chucks being fixed and being disposed substantially at the same level as an edge of said fixed knife, said band being disposed so as to move horizontally between said two chucks;
means for alternatingly moving the mobile chuck of the claw means in a direction substantially perpendicular to the longitudinal centerline of the band so as to selectively pinched the band between the mobile and stationary chuck; and
means for reciprocally driving said mobile knife towards and away from said fixed knife so as to periodically cooperate with said fixed knife to cut fibres therebetween,
whereby the mobile support, mobile plate and mobile chuck can be driven in synchrony so that when said mobile plate and said mobile support are each at their first position, said one of said mobile plate and mobile support is moved towards the other to clamp the band therebetween, the mobile chuck is moved away from the stationary chuck, the mobile plate and mobile support are thereafter advanced together from the first positions thereof to the second positions thereof, the mobile chuck moves towards the stationary chuck to clamp the band therebetween, the mobile knife can move to cut the fibres disposed between the mobile knife and the fixed knife while the band is held at a standstill by at least one of said claw means and said mobile plate and support, the one of the mobile plate and mobile support is moved away from the other and the mobile plate and mobile support are returned to their first positions, with the mobile plate and mobile support spaced apart, whereupon the driving process is repeated.

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**5,046,221**
**TIE HOLDER**
**Frank I. Walker, 1141 Locksley, Wyoming, Mich. 49509**
**Filed Apr. 16, 1990, Ser. No. 510,193**
**Int. Cl.[5] A41D *25/04***
**U.S. Cl. 24—49 R** **7 Claims**

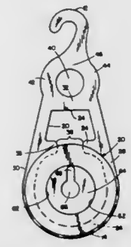
1. A one piece device for holding a necktie in place, comprising:
a filament portion with a first and a second end portion;
said first end portion being a detachable clip for grasping the decorative strip on the back of a necktie said detachable clip portion comprises a U-shaped member having first and a second prong, said first prong of said U-shaped member having a flat surface and the said second prong of said U-shaped member having a configured surface for cooperating with said first prong in gripping the decorative loop on the back of said tie; and



said second end portion member being a rod-like member for attachment to the shirt front of the necktie wearer by inserting said second portion through a buttonhole.

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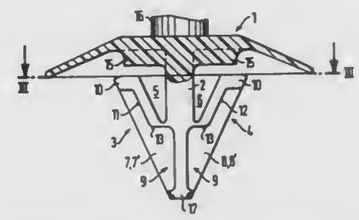
**5,046,222**
**CLASP DEVICE FOR FABRICS, FILMS AND SHEET MATERIALS**
**Timothy W. Byers, and Gary L. Byers, both of Whitefish, Mont., assignors to Creative Sales & Mfg. Co., Inc., Whitefish, Mont.**
**Filed Oct. 26, 1990, Ser. No. 804,812**
**Int. Cl.[5] A44B *21/00***
**U.S. Cl. 24—343** **5 Claims**



1. A clasp device for holding and securing flexible sheet-like materials, comprising:
(a) a one piece body member constituting a frame of predetermined length, width and thickness and being made of a predetermined resiliency for limited flexing and having an upper end and a lower end and further having an elongated main opening in said body defined by integrally joined bottom, side and top frame sections, said main opening having a pair of spaced apart projections extending inwardly from said side frame section to define a button member engaging area to coact with said body for holding sheet material and the like, said body also including a closed second opening above said top frame section and also including a hook means at the upper end thereof, and
(b) a coacting shallow, cylindrically shaped button member having peripheral annular side walls and a peripheral annular grove between said side walls, said button member also having a central hub section including a key slot opening therethrough so that said button member can be secured to another structure if desired, whereby said button member and said body may be engaged with each other to hold sheet materials and the like.



**5,046,223**
**HOLDING ELEMENT OF PLASTIC**
**Willibald Kraus, Grünstadt, Fed. Rep. of Germany, assignor to TRW United Carr GmbH & Co., Eakenbach-Alsenborn, Fed. Rep. of Germany**
**Filed Nov. 16, 1989, Ser. No. 437,168**
**Claims priority, application Fed. Rep. of Germany, Oct. 5, 1989, 8911881[U]**
**Int. Cl.[5] A44B *21/00*; F16B *19/00***
**U.S. Cl. 24—453** **3 Claims**



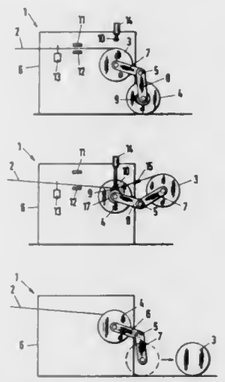
1. A holding element fastener formed of molded plastic for fastening within a support opening and having a base body and two resilient fingers arranged thereon lying opposite each other for extending through the support opening, said fingers standing at an acute angle to each other, and when in the mounted condition gripping behind said support opening, the base body and the resilient fingers, defining an approximately V-shape open triangular inter-space, each of the resilient fingers (3, 4) are provided on their outer circumference with two inwardly extending open areas which reduce the total amount of plastic required and simplify the molding operation of said holding element fastener, said open area (7, 7'; 8, 8'') located on opposite sides of laterally extending middle stay in the form of a relatively thin rib, the middle stay of each resilient finger extending outwardly from the middle of the respective finger and being aligned with the middle stay of the other resilient finger, the upper limit of each middle stay being defined by a separate transverse outwardly extending cross stay which joins to the upper end of the respective resilient finger and the associated middle stay.

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**5,046,224**
**PROCESS FOR CHANGING WARP BEAM ON A WARPING ARRANGEMENT AND APPARATUS THEREFOR**
**Bogdan Bogucki-Land, Offenbach, and Karl W. Michelmann, Grundau, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany**
**Filed Apr. 9, 1990, Ser. No. 506,681**
**Claims priority, application Fed. Rep. of Germany, Apr. 22, 1989, 3913249**
**Int. Cl.[5] D02H *5/00*; B65H *19/28***
**U.S. Cl. 28—190** **18 Claims**

1. A process for the changing of a plurality of beams and for winding a thread sheet, comprising the steps of:
winding a first one of the beams in a winding position;
moving the first one of the beams from the winding position into a packing position wherein the first one of the beams is accessible from all sides;
loading a non-wound, second one of the beams from a loading/removal position into the winding position;
bringing the thread sheet into contact with the second one of the beams;
attaching the thread sheet to said second one of the beams;
severing said thread sheet from the first one of the beams while the first one of the beams is at said packing position;
moving said first one of the beams to said loading/removal position;

removing said first one of the beams from said loading-/removal position; and



loading a third one of the beams into the loading/removal position while the second one of the beams is being wound.

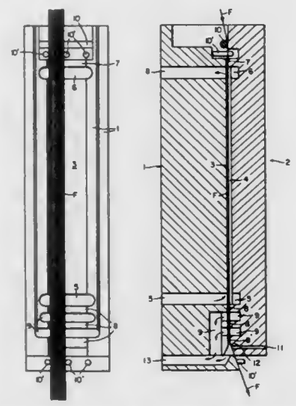
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5,046,225

## DRAWING BATH

Felix Graf, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Feb. 23, 1990, Ser. No. 484,186
Claims priority, application Switzerland, Feb. 24, 1989, 00684/89
Int. Cl.[5] D01D *5/14*
U.S. Cl. 28—246 24 Claims



1. In a process for drawing synthetic filaments, the steps of providing a drawing bath; and

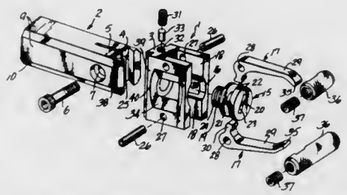
guiding a plurality of synthetic filaments in a parallel manner and in a narrow ribbon shaped pattern into the drawing bath and effectively hydrodynamically braking said filaments while simultaneously drawing said filaments.

5,046,226

## CONVERTIBLE BAR-PULLER/KNURLING-TOOL

Hue N. Che, 5636 Aldama St., Los Angeles, Calif. 90042

Filed Apr. 12, 1989, Ser. No. 337,079
Int. Cl.[5] B23B *25/00, 15/00*
U.S. Cl. 29—57 11 Claims



1. A convertible bar-puller for fitting into internal cutting tool housing and external cutting tool housing on a turret of a lathe, said bar-puller comprising:

a shank having flat surfaces adapted for receipt in an external cutting tool housing and having rounded corners adapted for receipt in an internal cutting tool housing;

a housing head having a first moiety of a connection means receivable in a second moiety of the connection means in the shank, the connection means adjustable in a direction perpendicular to the shank for positioning the first moiety within the second moiety,

means for locking the connection means to fix the adjusted position of the head relative to the shank,

a pair of jaws, each pivotally attached to the housing head and having finger portions projecting from the head opposite the connection means to form a symmetrical jaw opening,

adjustment means engaging the jaws for varying the jaw opening; and

means for locking the adjustment means.

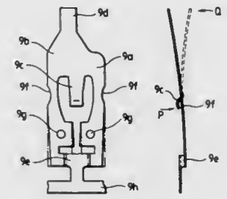
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5,046,227

## METHOD FOR MAKING AN INVERSION SPRING FOR THERMAL OVERLOAD RELAY

Katsumi Akiike; Nobuhiro Sekine; Tadashi Matsuoka, and Tsutomu Oyama, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Division of Ser. No. 7/407,290, Sep. 14, 1989. This application Aug. 17, 1990, Ser. No. 568,898
Claims priority, application Japan, Sep. 20, 1988, 63-235463
Int. Cl.[5] B23P *13/00*
U.S. Cl. 29—173 9 Claims



1. A method for manufacturing an inversion spring unit for an electrical relay, comprising the steps of:

cutting a spring plate out of a single piece of metal, the plate having a central axis, coplanar side portions disposed on either side of the central axis, a first end and a second end, a coupling portion extending between and connecting said side portions at said first end, a lug portion disposed intermediate said ends between said side portions, and openings disposed in said side portions, said openings being spaced a predetermined distance from said coupling portion;

bending said coupling portion to cause said side portions to move towards each other proximate said first end and to cause said second end of said spring to curve away from said central axis; and

fastening said spring plate in an area intermediate said first and second ends to a support member.

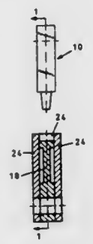
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5,046,228

## TOOL SET FOR CONNECTING SHEET METAL PIECES

Gerd-Jurgen Eckold, Silberhutte 11, 3424, St. Andreasberg, and Hans Maass, Germelmannstra. 12, 3422, Bad Lauterberg, both of Fed. Rep. of Germany

Continuation of Ser. No. 314,007, Feb. 23, 1989, abandoned. This application Mar. 13, 1991, Ser. No. 668,727
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1988, 3805688
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—243.53 10 Claims



1. A tool set adapted to be mounted in a reciprocative press for connecting sheet metal pieces, the tool set comprising:

a punch,

a die comprising an anvil in which a cavity is defined by a contour having a lower end press surface and at least two pairs of opposing sides, means to limit flow of deformed material including one of said pairs of opposing sides being defined by fixed upstanding anvil portions, said upstanding anvil portions extending upwardly from said lower end press surface, said press surface comprising a lower end of said cavity contour, and means to allow flow of deformed material including another pair of opposing sides defined by blades, said blades being positioned opposing one another adjacent said upstanding anvil portions when said blades are in a first position, means to bias said blades toward said first position, each of said blades having a free end and an opposite end, said opposite end being pivotally mounted adjacent said anvil,

said blades being elastically deflectabie away from said first position toward a second position when said punch penetrates into said sheet metal pieces and into said die cavity,

said punch having an exterior contour smaller than said die cavity contour, said punch contour being spaced at least a first and a second distance from said die cavity contour, said first distance in a first plane of symmetry extending in a first direction towards said blades and a second distance in a second plane of symmetry extending orthogonally to said first plane in a second direction, said first distance being smaller than said second distance when said blades are in said first position,

said punch contour being sufficiently spaced from said die contour to prevent cutting of said sheet metal pieces when said punch penetrates into said sheet metal pieces and into said die cavity.

such that said sheet metal pieces flow non-isotropically toward said elastically yielding blades when said punch penetrates into said sheet metal pieces and into said die cavity so as to produce a sheet metal connection which exhibits substantially isotropic strength when subjected to stress in a direction substantially parallel to said sheet metal pieces.

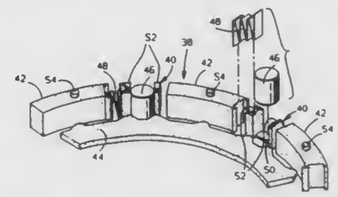
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5,046,229

## METHOD FOR MANUFACTURING AND ASSEMBLING A CONTROL CAR ROLLER CLUTCH WITH FOUR PIECES

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1990, Ser. No. 577,239
Int. Cl.[5] B23P *17/00;* F16D *3/34*
U.S. Cl. 29—418 3 Claims



1. A method for manufacturing and assembling a control car roller clutch of the type that is adapted to be installed between a pathway race and cam race, said pathway race having a cylindrical pathway, said cam race having an inner surface comprised of a plurality of sloped cam ramps separated by a plurality of partially cylindrical bearing surfaces disposable in coaxial confronting relation to said pathway, said method comprising the steps of,

providing a pair of generally annular end rings having inner surfaces and sized to fit radially between said races, each of said end rings having a generally circumferentially extending track on the inner surface thereof,

providing a plurality of control cars, each of said control cars being sized to fit radially between a respective cam ramp and confronting pathway and, each of said control cars also having axial ends comprising a track follower adapted to freely slidably interfit with a respective end ring track,

providing a plurality of journal blocks sized to fit closely radially between said cam race bearing surfaces and confronting pathway,

frangibly joining said control cars and journal blocks in circumferentially alternating and coaxial relation to a carrier ring thereby creating an integral unit with each control car circumferentially aligned with a respective cam ramp and each journal block circumferentially aligned with a respective bearing surface,

coaxially aligning each end ring with said integral unit and axially moving each end ring toward said integral unit until said control car track followers move axially into said end ring tracks,

securing said end rings to said journal blocks, and,

breaking and removing said carrier ring, thereby freeing said control cars to slide in said end ring tracks.

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5,046,230

## METHOD OF MOUNTING AN IMPLEMENT TO A PRIME MOVER

Joseph C. Hurlburt, Lancaster, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.

Division of Ser. No. 377,662, Jul. 10, 1989, Pat. No. 4,930,295. This application Mar. 19, 1990, Ser. No. 495,673
Int. Cl.[5] B23P *19/00*
U.S. Cl. 29—426.1 2 Claims

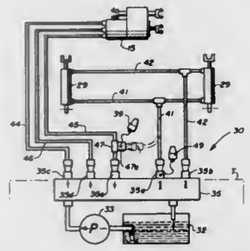
1. A method of mounting an implement to a prime mover provided with a hydraulic system operable to supply a source of hydraulic fluid under pressure to power operation of said implement, said implement having header means supported

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from an articulated frame detachably connectable to said prime mover, articulated movement of said frame being effected by hydraulic cylinder means operably connected in flow communication with said hydraulic system by first and second hoses to power the operation of said hydraulic cylinder means in first and second opposing directions, said implement further having a hydraulically powered motor operably connected to at least one implement component to power operation thereof, said motor being connected in flow communication with said hydraulic system by a pressure line and by a return line having a connector therein including an externally directed port permitting a connection of a third line for flow communication with said return line, comprising the steps of:

manipulating said hydraulic cylinder means by controlling the flow of hydraulic fluid thereto through said first and



second hoses for selectively articulating said articulated frame for alignment thereof with said prime mover;

connecting said articulated frame to said prime mover to mount said implement on said prime mover;

manually disconnecting said first hose from said hydraulic cylinder means and manually reconnecting said first hose to said externally directed port of said connector so that said first hose is in flow communication with said return line, thereby permitting said hydraulic cylinder means to be operably powered in only one direction due to connection thereof to said hydraulic system through only said second hose; and

utilizing said hydraulic means as a single acting cylinder for selectively raising said header means relative to said prime mover.

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**5,046,231**

**DEVICE FOR MOUNTING AND DISMOUNTING RIGID EXPANDABLE SLEEVES**

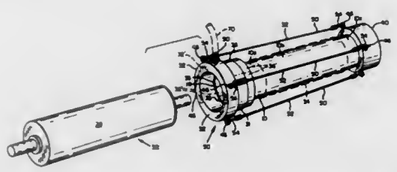
**William L. Thompson, Vancouver, Wash., assignor to International Composites Corporation, Vancouver, Wash.**

**Division of Ser. No. 293,131, Jan. 3, 1989, Pat. No. 4,979,278. This application Feb. 1, 1990, Ser. No. 474,554**

**The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.**

**Int. Cl.[5] B23P** *19/00*

**U.S. Cl. 29—426.6** **26 Claims**



1. A device for axially, externally mounting a rigid, expandable sleeve onto, and dismounting a rigid, expandable sleeve from, a cylinder, wherein the longitudinal dimension of said sleeve is equal to or less than the longitudinal dimension of said cylinder, said device comprising:

a first collar having a first bore of a first diameter, a second bore having a diameter greater than said first diameter, a planar surface joining said first and second bores, and fluid interjection means located within said planar surface, within said first bore, or within both said planar surface and said first bore, such that said cylinder is received within said first and second bores when said first collar is placed around said cylinder and said sleeve is received within said bore; and,

external fluid transmission means for expanding the diameter of said expandable sleeve by introducing a fluid through said fluid interjection means and between said sleeve and said cylinder, such that the diameter of said expandable sleeve is expanded without transmitting a fluid from within said cylinder during said mounting and dismounting operations.

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**5,046,232**

**WORKING APPARATUS HAVING A PLURALITY OF WORKING HEADS**

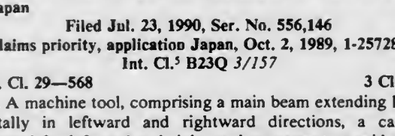
**Tomoki Mise, Kagamihara, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan**

**Filed Aug. 16, 1990, Ser. No. 568,674**

**Claims priority, application Japan, Aug. 18, 1989, 1-212619**

**Int. Cl.[5] B23Q** *5/22;* **B21D** *28/00*

**U.S. Cl. 29—564** **2 Claims**



1. A working apparatus having a plurality of working heads which comprises:

a plurality of working heads for processing a piece of work;

a device for moving said work;

first control means for controlling said moving device and a designated one of said working heads, so that said work may be located in a position based on said designated working head so as to be thereby processed; and

second control means for controlling said moving device and an undesignated one of said working heads, so that said work may be located in a position based on said undesignated working head so as to be thereby processed, when said moving device fails to locate said work in said position based on said designated working head.

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**5,046,233**

**MACHINE TOOL**

**Isao Shoda, 116-4, Okaba-cho, Hamamatsu-shi, Shizuoka-ken, Japan**

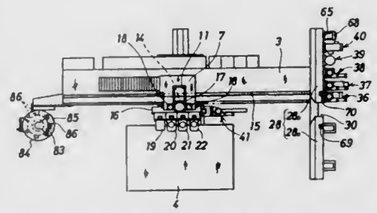
**Filed Jul. 23, 1990, Ser. No. 556,146**

**Claims priority, application Japan, Oct. 2, 1989, 1-257286**

**Int. Cl.[5] B23Q** *3/157*

**U.S. Cl. 29—568** **3 Claims**

1. A machine tool, comprising a main beam extending horizontally in leftward and rightward directions, a carrier mounted for leftward and rightward movement on said main beam, a ram mounted for upward and downward sliding movement on said carrier, at least one standing working head mounted for upward and downward movement on said carrier, a plurality of head holders, an extra working head held on each of said head holders, a sub beam extending in forward and backward directions and having a front portion and a rear portion defining therebetween a gap adjacent an end of said main beam, first guide means provided on said front and rear portions of said sub beam for guiding said head holders for the extra working heads in a forwardly and backwardly juxtaposed relationship for forward and backward sliding movement thereon, a carriage mounted on said sub beam for slidably moving said head holders along said first guide means, and second guide means provided on said ram for carrying a single head holder thereon, wherein, when said carrier is moved to



said end of said main beam to align said second guide means on said ram with said first guide means in said gap and then said head holders for said extra working heads are slidably moved along said first guide means by said carriage, one of said head holders which has been carried on said second guide means is transferred to said first guide means while one of those of said head holders which have been carried on said first guide means is transferred to said second guide means.

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**5,046,234**

**METHOD OF MANUFACTURING A CORE UNIT FOR A LINEAR PROBE MOTOR**

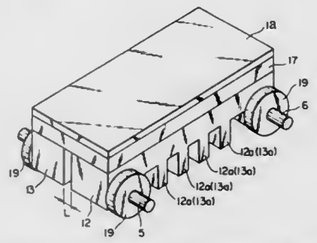
**Tsukasa Yoshizaki, Mie, Japan, assignor to Shinko Electric Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 339,911, Apr. 14, 1989, abandoned, which is a continuation of Ser. No. 11,861, Feb. 4, 1987, abandoned. This application Aug. 21, 1990, Ser. No. 570,959**

**Claims priority, application Japan, Feb. 8, 1986, 61-26348**

**Int. Cl.[5] H02K** *15/02*

**U.S. Cl. 29—596** **2 Claims**



1. A method of manufacturing a core unit in a linear pulse motor, said core unit being composed of integrally united first and second cores each including a plurality of magnetic poles formed on the central portions thereof, and leg parts formed on both ends thereof, each having concave grooves, said method comprising the steps of:

(a) disposing first and second supporting shafts in parallel to each other for supporting rotating rollers;

(b) fitting said first and second supporting shafts in said concave grooves;

(c) disposing said first and second cores in parallel to each other and spaced apart a prescribed interval with the contact grooves of each core contacting the shaft into which it is fitted thereby determining the vertical position of the cores relative to each other; and

(d) bonding said first and second supporting shafts to bottom surfaces of said concave grooves as disposed in step (c), above.

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**5,046,235**

**METHOD OF AND APPARATUS FOR ASSEMBLING A TRANSFORMER CORE**

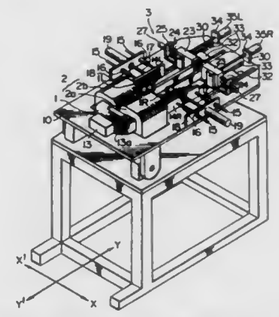
**Yukinori Taneda, Yokohama; Sei Hoshizawa, Shibata; Katsuya Nagayama, and Tatsukichi Matsuura, both of Tokyo, all of Japan, assignors to Hitachi, Ltd. and The Tokyo Electric Power Co., Ltd., both of Tokyo, Japan**

**Filed Feb. 13, 1991, Ser. No. 654,665**

**Claims priority, application Japan, Jul. 4, 1990, 2-175244**

**Int. Cl.[5] H01F** *41/02*

**U.S. Cl. 29—606** **11 Claims**



1. A method of assembling a transformer core in which a lamination of rectangular plates formed of a magnetic material is inserted in spaces defined in windings of primary and secondary transformer coils, and in which the opposite ends of the magnetic material lamination are brought into abutment on each other to form the lamination into an annular shape, said method comprising the steps of:

bending the lamination of the rectangular magnetic material plates into a U shape while the lamination of the magnetic material plates extends through the transformer coils;

magnetizing the magnetic material plates by electrically energizing the transformer coils, while restraining the opposite end portions of the U-shaped lamination of the magnetic material plates so as to prevent said end portions from being brought closer to each other;

successively releasing the opposite end portions of the U-shaped lamination of the magnetic material plates from being restrained from the insides; and

causing the released opposite end portions of the U-shaped lamination of the magnetic material plates to attract and closely contact each other by the magnetic force.

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**5,046,236**

**METHOD OF FABRICATING CERAMIC ELECTRONIC COMPONENT OF MULTILAYERED TYPE**

**Nobuyuki Wada; Yoshiaki Kohno, and Noriyuki Kubodera, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed Oct. 10, 1990, Ser. No. 595,392**

**Claims priority, application Japan, Oct. 11, 1989, 1-264579**

**Int. Cl.[5] H01G** *7/00;* **H01C** *17/00*

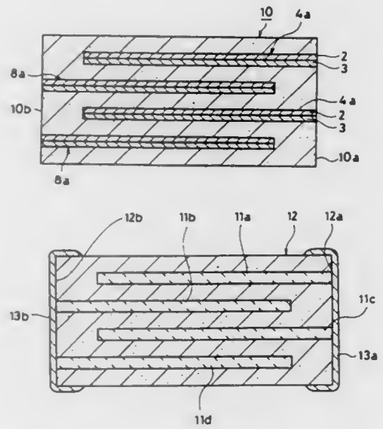
**U.S. Cl. 29—610.1** **7 Claims**

1. A method of fabricating an electronic component of multilayered type having a structure in which a plurality of inner electrodes each composed of an alloy are arranged in a ceramic sintered body so as to be overlapped with each other through ceramic layers, comprising the steps of:

sequentially laminating a plurality of metal films respectively having different metal compositions for constituting

the alloy composition of an inner electrode by the thin film forming process, to obtain a laminated metal film;

laminating a plurality of ceramic green sheets with laminated metal films such that the laminated metal film is




arranged between the ceramic green sheets, to obtain a laminated body; and

firing said laminated body and thereby alloying the laminated metal films to form the inner electrodes.

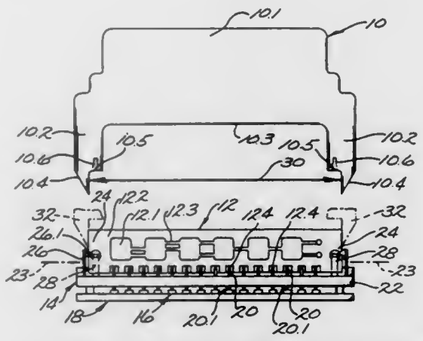
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**5,046,237**

**EXTRACTOR TOOL**

**Carl J. Conforti, Fall River; Walter L. Walas, Reboboth, and John G. Spadaro, North Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 21, 1990, Ser. No. 570,471**
**Int. Cl.[5] H01R *43/00***
**U.S. Cl. 29—764** **7 Claims**




1. A tool for removing a circuit module from an electrical connector where the module is of substantial length and has latch means at opposite ends receiving engagement from separate latches on the connector for detachably retaining the module on the connector with a plurality of electrical module contacts resiliently engaged with respective electrical connector contacts comprising a body having a pair of legs with selected spacing therebetween extending in generally parallel relation to each other from one side of the body adjacent respective opposite ends of the body to be engaged with respective latches adjacent the module latch means, the legs having respective tapered portions at distal ends thereof to intercept and be pressed against respective connector latches by movement of the tool to release engagement with both the module latch means at the same time for permitting separation of the resiliently engaged contacts and removal of the module from the connector free of damage to the module, latches and contacts, the tapered portions of the body legs having tapered surfaces facing generally outward from respective opposite ends of the body, and the legs having a selected spacing to fit over and accommodate the length of the module between the legs to permit the tapered legs surfaces to press apart connector latches which are biased toward each other to engage latch means disposed on opposite ends of the module facing outward from the respective module ends, the body having wedge-shaped surfaces provided thereon adjacent the distal ends of the legs facing generally outward from respective flat opposite sides of the body to engage and press against the module for rotating the module in separating the module and connector contacts.

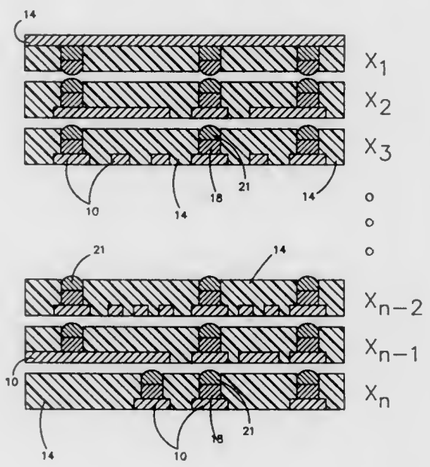
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**5,046,238**

**METHOD OF MANUFACTURING A MULTILAYER CIRCUIT BOARD**

**Robert Daigle, Sterling; Samuel Malbaurn, Dayville, both of Conn., David Noddin, Eau Claire, Wis., and G. Robert Traut, Danielson, Conn., assignors to Rogers Corporation, Rogers, Conn.**

**Filed Mar. 15, 1990, Ser. No. 493,975**
**Int. Cl.[5] H05K *3/36***
**U.S. Cl. 29—830** **12 Claims**




1. A method of making a multilayer circuit comprising the steps of:

providing at least two circuit boards wherein said first circuit board comprises a first substrate of fusible dielectric material and a first conductive circuit formed thereon and said second circuit board comprises a second substrate of fusible dielectric material and a second conductive circuit formed thereon and wherein at least said first conductive circuit includes fusible conductive material provided on at least one selected location thereof;

stacking said at least two circuit boards one on top of the other so that said fusible conductive material on said first circuit aligns with a selected location on said second circuit;

laminating said stacked circuit boards under heat and pressure effective to fuse both said fusible dielectric material and said fusible conductive material so as to form a cohesive multilayer circuit having a solid conductive interconnect between said first and second circuits, said solid conductive interconnect being defined by said fusible conductive material.



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**5,046,239**

**METHOD OF MAKING A FLEXIBLE MEMBRANE CIRCUIT TESTER**

**Brian S. Miller, Stafford, and David R. Kaplan, Burke, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Division of Ser. No. 551,370, Jul. 10, 1990. This application Feb. 22, 1991, Ser. No. 658,806**
**Int. Cl.[5] H01K *3/10***
**U.S. Cl. 29—852** **1 Claim**




1. A method of making a flexible membrane tester for a planar electrical circuit including the steps of:

preparing a frame to hold said membrane;

affixing a relatively thin flexible membrane to said frame;

depositing a plurality of electrodes on one side of said membrane in a desired pattern;

forming respective holes through said membrane concentric with said electrodes, but of smaller size than said electrodes;

depositing electrical lead lines on the opposite side of the membrane from said electrodes, one for each electrode, and extending from a respective electrode to another region of said membrane;

and forming a high-dielectric layer on the side of each electrode opposite to the membrane side of the electrode.

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**5,046,240**

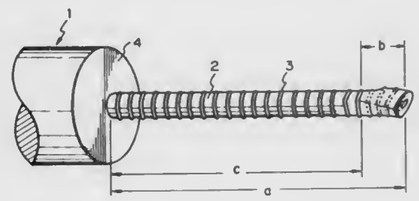
**METHOD OF TERMINATING WIRE WOUND TYPE NOISE PREVENTING RESISTANCE CABLE**

**Terutsugu Fujimoto, Mie, Japan, assignor to Sumitomo Wiring System, Ltd., Mie, Japan**

**Filed Jul. 26, 1990, Ser. No. 558,243**
**Claims priority, application Japan, Aug. 7, 1989, 1-205507**
**Int. Cl.[5] H01R *43/00***
**U.S. Cl. 29—857** **2 Claims**

1. A method of terminating a wire wound noise preventing resistance cable, the cable including a core formed of an elastomeric material, a resistance wire traversely wound around the core, and a covering layer surrounding the core and resistance wire, said method comprising:

stripping the covering layer from the core and resistance wire at an end of the cable to expose a length of the core and resistance wire;




applying heat and pressure to an end portion of the exposed length of the core and resistance wire until the resistance wire is entirely embedded in the core at the end portion of the exposed length.

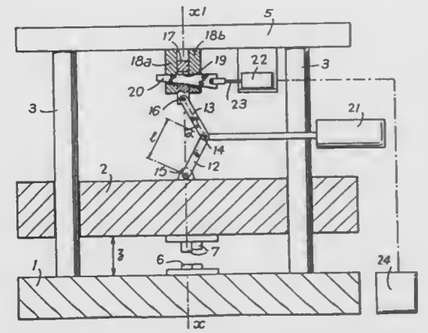
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**5,046,241**

**PROCESSES AND DEVICES FOR MECHANICALLY CRIMPING TERMINALS ON CONDUCTING WIRES**

**Claude F. Ricard, Villa Sainte Madeleine - 52 Cours Gambetta, 13100 Aix-en-Provence, France**

**Filed Sep. 22, 1989, Ser. No. 411,323**
**Int. Cl.[5] H01R *43/04*; B23P *19/00***
**U.S. Cl. 29—863** **7 Claims**




1. A process for mechanically crimping a terminal on a conducting wire by means of a press comprising a fixed plate and a mobile plate, said process comprising the following steps of:

displacing said mobile plate by means of two connecting

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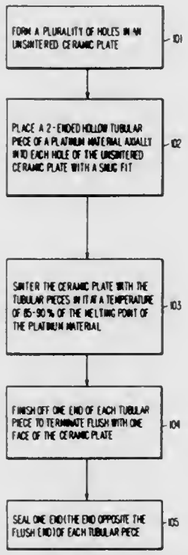
rods, which articulated on each other, and of which the point of articulation is displaced to bring it on the line passing through the ends of the two rods, of which one is articulated on said mobile plate and the other is articulated on an adjustable point of support, which point of support is borne by a slide block mobile in a guide parallel to the direction of displacement of said plates, which block is traversed by an opening having an inclined edge,

and displacing said point of support parallel to the direction of displacement of said plates in order to modify the height of crimping, by engaging a wedge in said opening and in the said guide, and by driving in said wedge more or less in order to vary the position of said slide block and said point of support.

4. A device for crimping a terminal on an electric wire and adjusting with precision the height of crimping and of the type in which a terminal is crimped on a conducting wire by placing said wire and said terminal between a fixed press plate and a mobile press plate,

wherein said mobile press plate is connected by an articulation to a first connecting rod which is articulated on a second connecting rod, of which the other end is articulated on a point of support which is located on a line parallel to the direction of displacement of said plates passing through the articulation of the first connecting rod, and the device comprises means for displacing the articulation common to the two connecting rods and for bringing it on said line passing through the ends of the two connecting rods, wherein said point of support is constituted by a piece which slides in a guide perpendicular to said plates, which sliding piece comprises a transverse opening having an inclined lower edge, in which a wedge is engaged, and the device comprises means for driving said wedge more or less in said opening, which wedge driving means is controlled step-by-step by a servo-motor.

reaction bond between the platinum of said tube and the ceramic of said carrier around the entire circumference of




said tube and to create a resultant hermetic seal between said tube and said ceramic carrier, and

(d) hermetically sealing at least one end of said tube.

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**5,046,243**

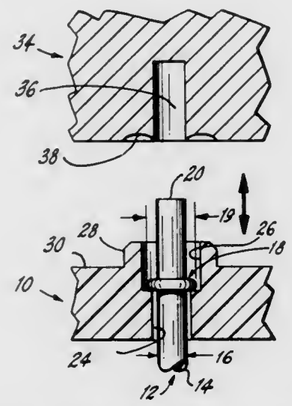
**METHOD OF MOUNTING ELECTRICAL CONTACTS IN CONNECTOR BODY**

**Richard P. Walker, Saegertown, Pa., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Nov. 5, 1990, Ser. No. 609,314**

**Int. Cl.[5] H01R** *43/02*

**U.S. Cl. 29—878** **3 Claims**




1. In a method of fixing an electrical contact into a connector body, said electrical contact having a first portion with a first major dimension, a second portion with a second major dimension, and a third portion extending from said second portion in a direction opposite to said first portion; said connector body having an aperture with a first section formed to receive said first portion of said electrical contact and a second section formed to receive said second portion of said contact; a boss surrounding said second section of said aperture and extending above a surface of said connector body whereby said second portion is positioned in a well, the steps comprising: inserting said electrical contact into said aperture with said first portion of said contact in said first section and said second portion in said second section; positioning said contact and connector body at a work station which includes an ultrasonic horn; causing relative movement between said connector body and said horn until said third portion of said contact engages a horn aperture in said horn and a depression surrounding said horn aperture engages said boss; and ultrasonically vibrating said horn to melt said boss and cause said melting material to flow into and substantially fill said well, thereby securing said contact.

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**5,046,242**

**METHOD OF MAKING FEEDTHROUGH ASSEMBLIES HAVING HERMETIC SEALS BETWEEN ELECTRICAL FEEDTHROUGH ELEMENTS AND CERAMIC CARRIERS THEREFOR**

**Janusz Kuzma, Stanmore, Australia, assignor to Commonwealth of Australia, Canberra, Australia**

**Continuation of Ser. No. 402,227, Jul. 27, 1982, abandoned. This application May 11, 1989, Ser. No. 350,574**

**Int. Cl.[5] H01R** *43/00*

**U.S. Cl. 29—878** **7 Claims**

1. A method of making a feedthrough assembly having an hermetic seal between an electrical feedthrough element and a ceramic carrier therefor, comprising the steps of:

(a) forming a hole in an unsintered ceramic carrier,

(b) placing a 2-ended hollow tube of platinum, constituting said feedthrough element, axially into said hole, with a snug fit between said tube and said hole in said ceramic carrier, prior to the sintering of said ceramic carrier,

(c) subjecting said ceramic carrier with said tube therein to a temperature of about 85-90% of the melting point of the platinum for sintering said ceramic carrier and causing the latter to shrink during the sintering and exert pressure against the exterior of said tube, thereby to develop a



**5,046,245**

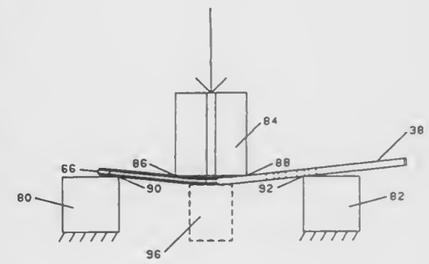
**METHODS OF FABRICATING IMPELLER BLADES FOR MIXING APPARATUS**

**Ronald J. Weetman, and Richard A. Hawk, both of Rochester, N.Y., assignors to General Signal Corporation, Stamford, Conn.**

**Continuation of Ser. No. 415,511, Oct. 2, 1989, abandoned, which is a division of Ser. No. 31,307, Mar. 26, 1987, Pat. No. 4,896,971. This application Sep. 21, 1990, Ser. No. 587,507**

**Int. Cl.[5] B21D** *53/00*

**U.S. Cl. 29—889.7** **8 Claims**




1. The method of making an impeller blade from a metal plate which comprises the steps of locating said plate with respect to tools on opposite sides thereof, which tools have edges which define a first pair of lines contacting said plate on one side thereof and a second pair of lines generally in the same direction as said first pair of lines and generally in the same direction as said first pair of lines and having greater separation than said first pair of lines and contacting said plate on the opposite side thereof, bringing said tools toward each other to apply a bending moment to said plate bending said plate beyond its elastic limits to define a section curved along an arc between where said first pair of lines contact said plate, which arc continues into a region of lesser curvature than said arc beyond where said second lines contact said plate to provide camber in said blade.

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**5,046,244**

**METHOD FOR MANUFACTURING STATORS, IN PARTICULAR EXTENDED STATORS, FOR PUMPS OR MOTORS WITH ECCENTRIC SHAFTS**

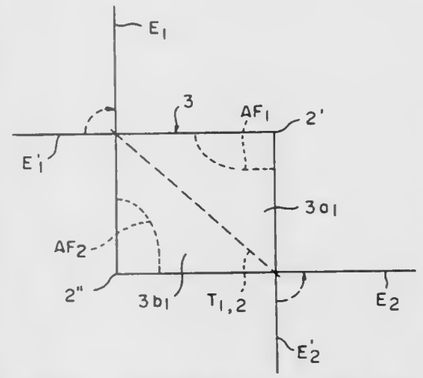
**Alois Anreiter, Schwanenstadt, Fed. Rep. of Germany, assignor to Linsinger Maschinenbau GmbH, Steyrermuhl, Austria**

**Filed Jan. 16, 1990, Ser. No. 465,676**

**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1989, 3902740**

**Int. Cl.[5] B23P** *15/00*

**U.S. Cl. 29—888.02** **13 Claims**




1. A method for the manufacture of an extended stator for devices with eccentric shafts, where the stator is provided with multi-thread inner bore profile in the direction of its long axis, and said stator has interior work faces periodically repeated profile pitches of predetermined lead, the improvement comprising the steps of:

machining rod-like work pieces (3, 3', 3") which are partial segments of an inner bore profile (14) of the stator (1) and which are machined in the form of exterior working surfaces ($AF_1$, $AF_2$, $AF_3$, $AF_4$);

separating said work pieces (3, 3', 3") in the direction of their long axes into a predetermined number of partial work pieces ($3a_1$, $3b_1$, $3a_2$ and $3b_2$) wherein each partial work piece has a partial segment of the inner bore profile (14); and

assembling said partial work pieces ($3a_1$, $3b_1$, $3a_2$ and $3b_2$) to combine the partial segments into the complete inner bore profile (14).

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**5,046,246**

**SECURING MACHINE PARTS TOGETHER WITH THE AID OF CONNECTING PINS**

**Spencer H. Shepard; Phillip D. Lloyd; Eddie J. Reames, all of Charlotte, N.C.; Jon P. Freudenthal, Rock Hill, S.C., and Albert J. Partington, Winter Springs, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 12, 1990, Ser. No. 580,990**

**Int. Cl.[5] F01D** *5/32*

**U.S. Cl. 29—889.21** **12 Claims**

1. A method for securing machine parts together to form an assembly having two opposed surfaces, the parts being formed to define a passage receiving at least one connecting pin which extends between, and is substantially flush with, the two opposed surfaces of the assembly, comprising;

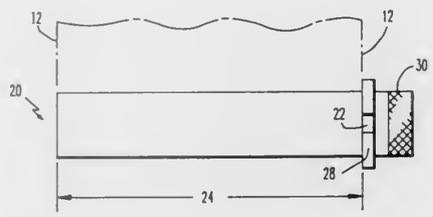
providing a connecting pin having a length greater than the distance between the two opposed surfaces;

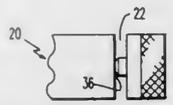
forming a groove in the connecting pin at a distance from a first end of the pin which is equal to the distance between the two opposed surfaces;

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mounting a positioning member in the groove and inserting the pin into the passage so that the first end is flush with one opposed surface and the positioning member bears against the other opposed surface; and




breaking off the pin at the groove so that the portion of the pin between the first end and the groove remains secured in the passage.

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**5,046,247**

**METHOD FOR MANUFACTURING HEAT TRANSFER MODULE WITH HYDROGEN ADSORPTION ALLOY**

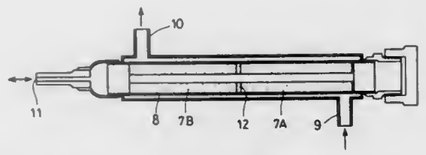
**Keisuke Oguro; Hiroshi Ishikawa; Hiroshi Suzuki; Akihiko Kato; Teruya Okada, and Shizuo Sakamoto, all of Osaka, Japan, assignors to Agency of Industrial Science & Technology, Tokyo and Kurimoto Ltd., Osaka, both of, Japan**

**Filed Aug. 15, 1989, Ser. No. 393,933**

**Claims priority, application Japan, May 10, 1989, 1-116572**

**Int. Cl.[5] F17C** *11/00*

**U.S. Cl. 29—890.032** **2 Claims**




1. A method for manufacturing a heat transfer module, comprising the steps of:

coating hydrogen adsorption alloy particles with a metal different than the alloy;

forming the coated particles into at least two cylindrical compacts by compressively molding the coated particles until the formed compacts have a substantially uniform specific gravity;

inserting the cylindrical compacts into a pipe comprising a metal different than the alloy, said pipe having an internal diameter in the range of

$$Do = D \times \sqrt[3]{\frac{92}{100} \times E}$$

$$\text{to} = D \times \sqrt[3]{\frac{96}{100} \times E}$$

wherein:

D=the diameter of the cylindrical compact; and

E=the free expansion coefficient of the cylindrical compact; and

placing a flexible ring between adjacent compacts.

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**5,046,248**

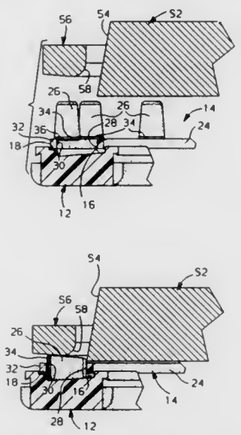
**THRUST ROLLER BEARING WITH IMPROVED ASSEMBLY**

**Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Division of Ser. No. 397,205, Aug. 23, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 566,204**

**Int. Cl.[5] B21D** *53/12*

**U.S. Cl. 29—898.041** **2 Claims**




1. A method of manufacturing a thrust roller bearing having a pair of bearing races, each of said races having an annular pathway formed around an axis and being axially opposable to each other, comprising the steps of,

molding an integral plastic roller and separator unit having an annular separator with a cricumferentially spaced array of pockets opening therethrough, said separator being concentric with said pathways, each of said pockets having a radially outer edge symmetrical to a radial plane of said separator,

said roller and separator unit further including a plurality of generally cylindrical rollers, each of said rollers having an outer end integrally molded at a joint to the outer edge of a respective pocket with the central axis of each of said rollers disposed in said separator radial plane and substantially perpendicular to said separator and said respective pocket, said joint sufficiently strong to allow said unit to withstand normal handling but frangible when a pressing force is applied to each of said rollers.

placing said unit against one of said races concentric to the pathway of said one race,

applying a pressing force to each of said rollers, thereby fracturing said joints and pivoting each of said rollers axially downwardly and radially inwardly relative to said separator until said rollers are each filly seated into said respective pocket, and,

placing the other of said races into coaxial relation to said one race, thereby completing said bearing.

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**5,046,249**

**MOTOR DRIVEN OSCILLATING RAZOR**

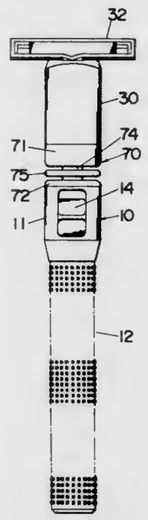
**Manabu Kawara, Otsu; Masao Tanahashi, and Masao Matsumoto, both of Hikone, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan**

**Filed Jul. 23, 1990, Ser. No. 555,637**

**Claims priority, application Japan, Aug. 19, 1989, 1-214012; Dec. 25, 1989, 1-335470**

**Int. Cl.[5] B26B** *19/28, 19/38, 21/16*

**U.S. Cl. 30—45** **10 Claims**




1. In a motor-driven oscillating razor comprising:

a grip housing adapted to be gripped by a user;

a shaver head carrying a razor blade element, said shaver head incorporating an oscillation inducing weight;

a damper member singly supporting said shaver head on the top of said grip housing in such a manner that said shaver head is allowed to move with respect to said grip housing;

a motor operatively connected to oscillate said weight for imparting oscillatory movement to said shaver head; and

said razor being characterized in that said motor is accommodated within said shaver head in order to isolate an oscillatory system substantially from said grip housing by said damper member such that said shaver head can oscillate substantially independently of said grip housing.

**5,046,250**

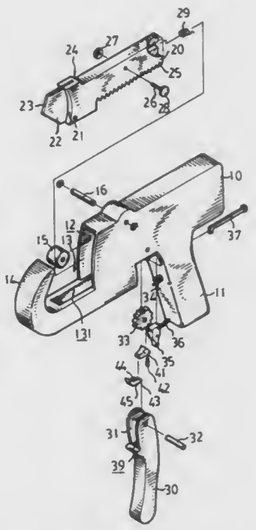
**PIPE CUTTING DEVICE**

**Chi C. Huang, No. 9, Feng Sheh Rd., Ta Sheh Village, Shen Kang Hsiang, Taichung Hsien, Taiwan**

**Filed Nov. 8, 1990, Ser. No. 610,845**

**Int. Cl.[5] B23D** *21/06;* **A21C** *5/00;* **B26B** *17/00, 17/00*

**U.S. Cl. 30—92** **4 Claims**




1. A pipe cutting device comprising:

a body having a bore longitudinally formed therein, a fixed jaw member being provided on a front end of said body so that a mouth is formed between said fixed jaw member and said body in order to receive a plastic pipe to be cut, a grip member extending downward from said body;

a movable member slidably provided in said bore of said body, a front end of said movable member being extendible out of said bore and movable toward said fixed jaw member, a rack being formed on a lower surface of said movable member;

a cutting element being fixed to said front end of said movable member;

a first spring being coupled between a rear end of said movable member and a rear end of said body in order to bias said movable member rearward;

a pair of ears being formed on an upper end of a handle and being pivotally coupled to said body by a pin, said handle being located in front of said grip member;

a second spring being coupled between a middle portion of said handle and said grip member for biasing said handle forward;

a gear being rotatably provided on said pin and engaging with said rack of said movable member;

a middle portion of a catch pawl being pivotally coupled between said ears, a rear end of said catch pawl being biased by a third spring in order to engage with said gear so that said gear can be caused to rotate in an active direction by a pulling of said handle and so that said cutting element can be caused to move forward in order to cut said plastic pipe, a wedge member being provided to cause a front end of said catch pawl to move up and down so that an engagement between said catch pawl and said gear can be controlled by a movement of said wedge member; and

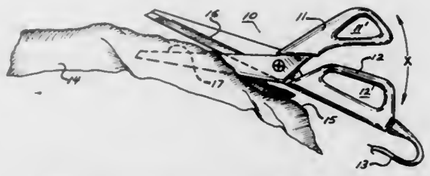
a middle portion of a check pawl being pivotally coupled in

said body, an upper end of said check pawl being biased by a fourth spring in order to engage with said gear so that said gear can be prevented from rotating in a reverse direction relative to said active direction; and

when said handle is repeatedly pulled and released, said cutting element and said movable member can be caused to move forward toward said fixed jaw member so that said plastic pipe can be cut by said cutting element.

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**5,046,251**
**THERMOPLASTIC-FABRIC SEAR-CUTTING HANDTOOL**
**Pamela C. Scott, 4521 Vista De La Patria, Del Mar, Calif. 92014**
**Filed Jun. 18, 1990, Ser. No. 539,883**
**Int. Cl.[5] B23F *3/00***
**U.S. Cl. 30—140** **11 Claims**



1. A improved handtool for convenient sear-cutting of substantially thermoplastic type woven fabrics, whereby the fabric may remain stationary while the handtool is moved relatively into the edge of the fabric, thereby melting the fiberous strands apart in a severing action while simultaneously searing the resulting fiberous ends so as to thus unite the exposed local fibers in a momentary melting action which eliminates the otherwise tendancy for such fibers to subsequently fray along the cut edge; comprising:

a.) a line-current powering means;

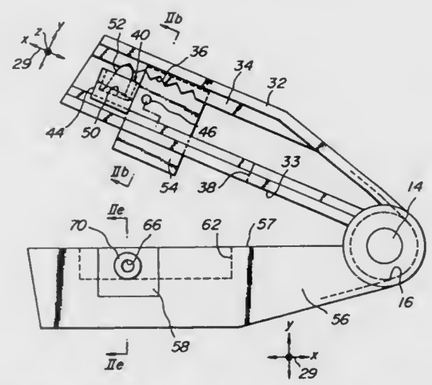
b.) a handle means for insulatively grasping and manually guiding of the tool; said blade comprised of two parts, one said part containing a fiber cutting straight blade means;

c.) an electric resistance heating element situated in such proxmity to said cutting blade part member as to efficiently conduct heat into the blade over a range of 400 F.-1600 F./degrees.

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**5,046,252**
**CUTTER FOR OPTICAL FIBERS**
**Tokuichi Ayuta, and Kazuhiro Ohtsuki, both of Tokyo, Japan, assignors to Daiichi Denshi Kogyo Kabushiki Kaisha, Japan**
**Filed Apr. 23, 1990, Ser. No. 512,945**
**Claims priority, application Japan, Apr. 28, 1989, 1-50837[U]**
**Int. Cl.[5] B26B *13/00*; H01R *43/00***
**U.S. Cl. 30—258** **8 Claims**

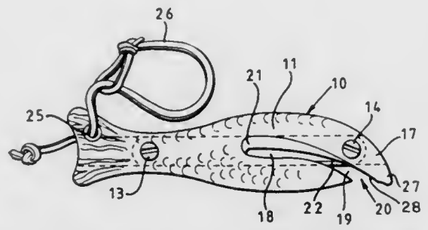
1. A cutter for optical fibers comprising, two frames pivotally connected at their ends pivotally movable relative to each other, a cutting blade provided on one of the frames for cutting optical fibers and means provided on the other frame for supporting an optical fiber to be cut, said frame having the cutting blade including regulating means for moving the cutting blade in its longitudinal direction and stopping and fixing the cutting blade, said regulating means including guiding means having recesses, cutter guiding means slidably movable in said guiding means for supporting the cutter blade, resilient means supported by the cutter guiding means and adapted to be fitted in one of the recesses and permitted to disengage from the one



recess and engage in an adjacent recess when the cutter guiding means is intentionally pushed along the longitudinal direction of the cutting blade, and confirming means for visibly confirming a position where the cutting blade is fixed.

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**5,046,253**
**KNIVES**
**William A. Ireland, 257 Pirton Lane, Churchdown, Gloucestershire GL3 2QJ, England**
**Continuation of Ser. No. 299,634, Jan. 23, 1989, abandoned. This application Apr. 13, 1990, Ser. No. 508,462**
**Claims priority, application United Kingdom, Mar. 30, 1988, 8807577**
**Int. Cl.[5] B26B *3/00***
**U.S. Cl. 30—289** **5 Claims**



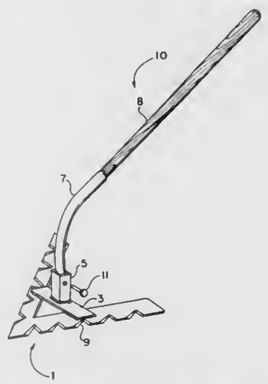
1. A knife comprising an elongate handle formed with an elongate narrow slot which extends transversely completely through the handle from one lateral surface thereof to the other, and which extends lengthwise of the handle from a slot mouth in an outer surface of the handle, adjacent one extremity



thereof, to a location within the handle, therebeing encased within the handle a blade having an exposed operative cutting edge which extends across the slot at a location spaced inwardly from the mouth of the slot, one side of the slot, adjacent the mouth thereof, being defined by a longitudinal surface of a tapered tip portion of the handle which points generally longitudinally away from the rest of the handle at said one extremity thereof, the exposed operative cutting edge of the blade extending at an obtuse angle to said longitudinal surface of the tapered tip portion so as to form generally a continuation thereof, and the slot having a surface, opposite said longitudinal surface of the tapered tip portion, forming an acute angle with the exposed operative cutting edge of the blade, which surface is formed with a longitudinal groove which is wider than the thickness of the blade and into which the operative cutting edge of the blade partly extends at said acute angle, the handle being formed in two parts having means for clamping the two parts together with the blade sandwiched between them, said means for clamping the two parts of the handle together being also engageable with part of the blade so as to assist in securing the blade between the two parts of the handle.

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**5,046,254**
**GARDENING TOOL**
**Sam C. Russell, 15609 E. 42nd Pl., Independence, Mo. 64055**
**Filed Mar. 13, 1990, Ser. No. 492,133**
**Int. Cl.[5] B25G *1/06*; B26B *3/00***
**U.S. Cl. 30—309** **5 Claims**



1. An improved gardening tool comprising:

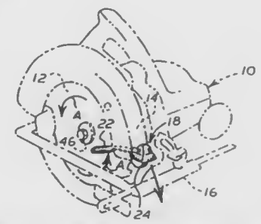
a) a tool portion, said tool portion further comprising a V-shaped member having first and second legs meeting at a vertex, each leg having a top surface, a bottom surface and an axis of elongation, said V-shaped member includes a first beveled edge, said V-shaped member further including a plurality of V-shaped cutting edges therein, each said V-shaped cutting edge consisting of second and third beveled edges, each of said second and third beveled edges terminating in a sharp edge at said bottom surface, each said cutting edge being configured to create a V-shape in said V-shaped cutting edge with each of said third beveled edges being generally perpendicular to the axis of elongation of the leg on which it is located;

b) a handle; and

c) a connecting means for removably connecting said tool portion to said handle with said handle having a connecting portion generally perpendicular to said tool portion.

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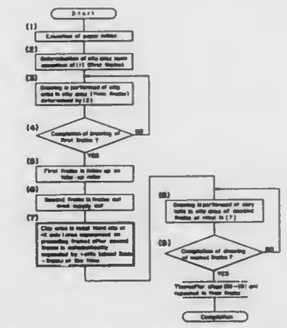
**5,046,255**
**AIR DEFLECTOR FOR CIRCULAR SAW**
**Michel F. Lebreux, 8595, Pierre Boucher, St-Francois, Laval, Quebec H7A 1X5, Canada**
**Filed Nov. 27, 1989, Ser. No. 441,292**
**Int. Cl.[5] B23D *45/16***
**U.S. Cl. 30—390** **12 Claims**



1. An air deflector adapted to be mounted on a blade protector of a circular saw having a circular blade for projecting air on a location forward to a working portion of the circular saw, said circular saw being provided with a circular blade, said blade protector having an aperture therethrough, said deflector comprising a lamella laterally adapted to extend along the side of the blade between a location adjacent the center of the saw blade and the surface of said protector adjacent said aperture for deflecting air movement produced by the rotation of the blade in the direction of said aperture, an annular member connected to said lamella, said annular member adapted to be fittingly mounted inside said aperture, an arched roof member connected to said annular member for deflecting downwardly said air passing through said aperture, in a location in front of the blade, and means for retaining said annular member in said aperture.

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**5,046,256**
**METHOD OF CONNECTION DRAWING IN AUTOMATIC DRAFTER**
**Toshiaki Matsushima, Tokyo, Japan, assignor to Mutoh Industries, Ltd., Tokyo, Japan**
**Filed Nov. 15, 1989, Ser. No. 441,152**
**Claims priority, application Japan, Dec. 29, 1988, 63-332592; Feb. 28, 1989, 1-48362**
**Int. Cl.[5] B65H *17/36*; B43L *13/00***
**U.S. Cl. 33—18.1** **1 Claim**



1. In a method of operating an automatic drafter for producing a long drawing having successive parts, the improvement comprising:

after drawing on a long sheet a preceding frame of the drawing corresponding to a preceding part of the long drawing, expanding the area in which the next frame is to be drawn by moving the leading edge of the area to form a

portion overlapping the trailing portion of the preceding frame; and

redrawing on said sheet the lines of the trailing portion of the preceding frame which are to extend across the junction between the successive parts of the sheet in said overlapping portion and then continuing said lines in said next frame while drawing the remainder of the lines in the next frame on the sheet in the remainder of the area in which the next frame is to be drawn.

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**5,046,257**

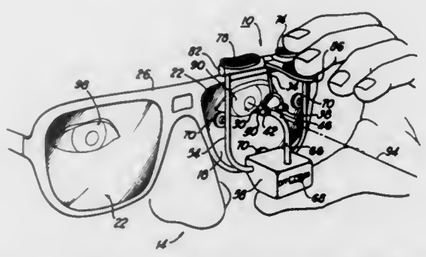
## DETERMINING AND MARKING APPARATUS AND METHOD FOR USE IN OPTOMETRY AND OPHTHALMOLOGY

**Forrest A. Marshall, P.O. Box 649, Dublin, Ga. 31021**

**Continuation-in-part of Ser. No. 467,269, Jan. 19, 1990. This application Jan. 17, 1991, Ser. No. 642,299**

**Int. Cl.[5] B43L *13/00***

**U.S. Cl. 33—28** **13 Claims**



1. A device for marking a lens worn by a patient having a visual axis, comprising:

a. a frame for positioning the device adjacent the lens;

b. a light source connected to the frame and positionable in a selected relationship with the visual axis; and

c. a first marker connected to the frame for marking the lens.

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**5,046,258**

## WRAPPING MACHINES

**Michael J. Cahill, Coventry; Dennis Hinchcliffe, Orpington; Jeffrey J. Patchett; Geoffrey W. Vernon, both of Coventry, and Peter White, Bristol, all of England, assignors to Molins PLC, Milton Keynes, England**

**Filed Feb. 2, 1989, Ser. No. 305,345**

**Claims priority, application United Kingdom, Feb. 10, 1988, 8802973**

**Int. Cl.[5] B65B *11/06***

**U.S. Cl. 530—230** **17 Claims**

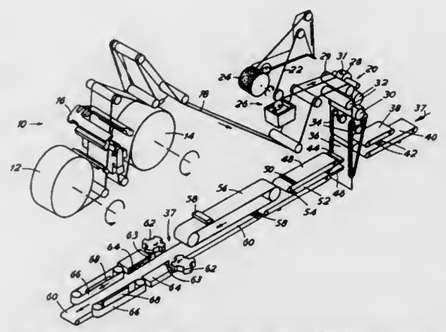
1. A wrapping machine for wrapping articles in succession including:

means for conveying said articles in succession and in spaced relationship at a predetermined speed along a path,

means for delivering wrappers in succession to said articles, including means for locating a first part of each said wrapper with respect to one of said articles moving on said path whereby each wrapper is associated with an article, and

means adapted to cause relative movement of a second part of the wrapper with respect to the associated article so as to cause the wrapper to be tightened around at least part of the article,

said means adapted to cause relative movement of the wrapper comprising means providing at least one surface, adapted to move generally in the direction of said path at



a speed which differs from said predetermined speed of said article, for engaging said second part of said wrapper, said at least one surface being adapted to provide sufficient friction between said at least one surface and said second part of said wrapper to cause drag on said second part of said wrapper.

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**5,046,259**

## UNDERWATER MEASURING SYSTEMS AND METHODS

**Robert F. Tusting, Ft. Pierce, Fla., assignor to Harbor Branch Oceanographic Institution, Inc., Ft. Pierce, Fla.**

**Filed May 14, 1990, Ser. No. 522,638**

**Int. Cl.[5] G01C *3/14***

**U.S. Cl. 33—272** **4 Claims**

3. A method for making underwater measurements of relative positions of objects positioned on an ocean or lake floor which comprises:

projecting a pair of collimated light beams from first and second lasers spaced vertically one above the other in a common vertical plane, each laser being at a location of known height above such floor,

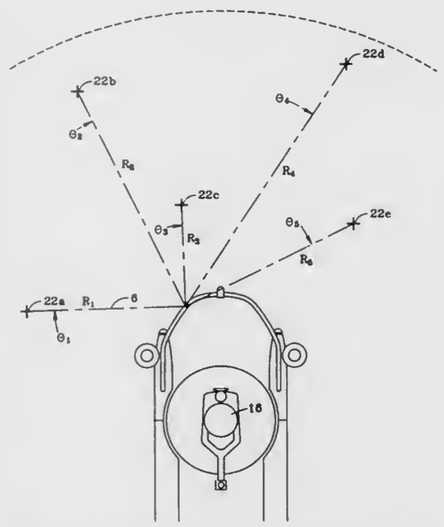
moving said light beams from both lasers simultaneously in a horizontal arc to a first position and individually angularly in a common vertical plane at said first position so that the beams illuminate a first of said objects,

measuring at said first position the vertical inclinations relative to the horizontal of the longitudinal axis of each of said light beams and determining the bearing of the vertical plane position of the light beams in the first position relative to magnetic north or other azimuth position,

moving said light beams angularly in a vertical plane and in a horizontal arc to at least a second position wherein they illuminate a second of said objects, and

measuring the vertical inclinations of the longitudinal axis of said light beams in said second position and determining the bearing of the vertical plane position of said light





beams in said second position relative to magnetic north or other azimuth position.

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**5,046,260**

## ELECTRONIC COMPASS

**Heinz Wellhausen, Trockener Kamp 92, 3200 Hildesheim, Fed. Rep. of Germany**

**PCT No. PCT/EP88/00104, § 371 Date Jul. 13, 1989, § 102(e) Date Jul. 13, 1989, PCT Pub. No. WO88/06274, PCT Pub. Date Aug. 25, 1988**

**PCT Filed Feb. 12, 1988, Ser. No. 397,439**

**Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704934**

**Int. Cl.[5] G01C *17/28***

**U.S. Cl. 33—356** **14 Claims**

1. An electronic compass comprising:

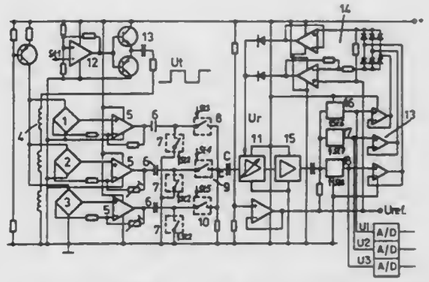
three magnetic field sensors disposed to be traversed by a primary magnetic field at an angle of 120° to one another to prevent errors caused by variations in signal amplification, and a coil disposed for producing an exciter magnetic field which traverses the sensors such that each sensor produced an output signal which is dependent on the magnitude and direction of the magnetic fields traversing the sensor and which may contain a dc offset voltage;

a clock voltage source connected for supplying to said coil a clock voltage which causes the polarity of the exciter magnetic field to be periodically reversed, each cycle of the clock voltage being composed of a first half cycle during which the exciter magnetic field as a first polarity and a second half cycle during which the exciter magnetic field has a second polarity opposite to the first clarity;

offset voltage removing means connected for receiving the output signal from each sensor and for producing three corrected output signals corresponding to the sensor output signals with the dc offset voltage removed from each sensor output signal;

a primary signal amplifier common to said corrected output signals, and having an input, a signal amplification path and an output, and means providing alternating voltage coupling with direct current separation in said amplification path;

signal combining means connected between said offset voltage removing means and said amplifier signal amplification path for supplying signals derived form the corrected output signals of said sensors in time succession during



each second half cycle of the clock voltage such that the signal supplied to said amplifier input is based on the corrected output signal of only one sensor at any given time; and

signal separating means connected to said amplifier output for transforming the signal at said amplifier output into three simultaneous, continuous signals each based on the corrected output signal from a respective sensor.

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**5,046,261**

## LEVELING DEVICE FOR LEVELING TOOLS AND WORKPIECES

**Jimmie D. Scott, Cedar Rapids, Iowa, assignor to Kwik-Way Manufacturing Co., Marion, Iowa**

**Filed Jan. 30, 1990, Ser. No. 472,169**

**Int. Cl.[5] G01C *9/06***

**U.S. Cl. 33—366** **1 Claim**

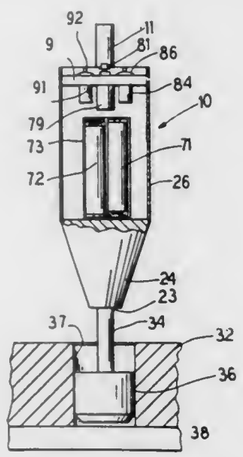
1. A leveling device comprising a cylindrical-shaped body member, at least one reference shaft extending therefrom which is adapted to be received into an opening of a member which is to be leveled, a mercury switch mounted in said boy member, and an indicator connected to said mercury switch so as to indicate when said body member is level, wherein said mercury switch has first, second and third contacts and said indicator comprises two lights with one light connected to said second contract and said second light is connected to said third contact, wherein said mercury switch has first and second ends and said first contact has two ends with one of said ends of the first contact at said first end of said mercury switch and the other of said ends of the first contact at said second end of said mercury switch and said second contact is mounted in said first end and said third contact is mounted in said first end and extending adjacent said second end of said mercury switch, including metallic mercury in said mercury switch which is moveable in said switch between said first and second ends to make electrical contact between said first and second contacts and said first and third contacts and including a battery connected to said one and said second lights and to said first

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contact, said one reference shaft extending from said body member in a first direction and a second reference shaft extending from said body member in a second direction which is opposite to said first direction.




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**5,046,262**

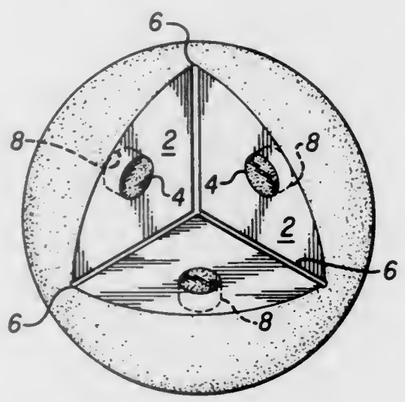
**SPHERICAL EDGE LOCATOR FOR MACHINING**

**Steven M. Kerbaugh, 119 Clement Dr., Somerdale, N.J. 08083**

**Filed Sep. 26, 1990, Ser. No. 588,468**

**Int. Cl.[5] G01B** *5/25*

**U.S. Cl. 33—644** **12 Claims**




1. An edge locator comprising a body bounded by:

a partial spherical surface, said partial spherical surface defined by a constant radius about a center point;

a plurality of plane locator surfaces, each of said plane locator surfaces passing through said center point; and

attachment means for removably attaching said locator to a workpiece having a plurality of plane workpiece surfaces, the plane workpiece surfaces so disposed that each one of the plane workpiece surfaces may be made coplanar with a respective one of said plane locator surfaces, said attachment means adapted to hold the respective surfaces mutually coplanar; whereby

when said locator is attached to the workpiece, each point of said partial spherical surface is equidistant from the mutual intersection of all of the plane workpiece surfaces if there are more than two of the plane workpiece surfaces, and each point of said partial spherical surface is equidistant from the midpoint of the line of mutual intersection of both of the plane locator surfaces if there are exactly two plane workpiece surfaces.

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**5,046,263**

**OIL LEVEL MONITORING DEVICE FOR AUTOMOTIVE AUTOMATIC POWER TRANSMISSION**

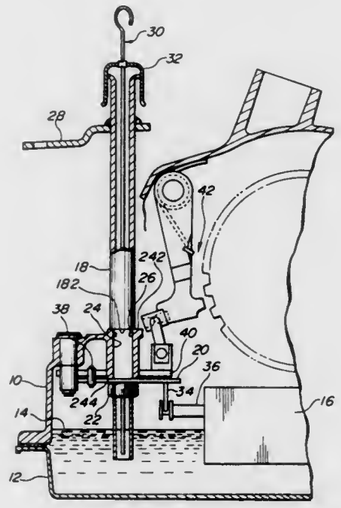
**Toshiyasu Yoshida, Shizuoka, Japan, assignor to Jatco Corporation, Fuji, Japan**

**Filed Jul. 27, 1990, Ser. No. 558,343**

**Claims priority, application Japan, Jul. 27, 1989, 1-87495[U]**

**Int. Cl.[5] G01F** *23/04*

**U.S. Cl. 33—722** **4 Claims**




1. An oil level monitoring device for an automatic power transmission in an automotive vehicle, comprising:

a transmission casing;

an automatic power transmission mechanism housed within said casing;

an essentially vertically extending conduit means forming a component of a transmission operational mode selecting mechanism and further defining an essentially vertical conduit for receiving an oil level gauge; and

an oil level gauge insertable through said conduit for dipping the lower end therein in a lubricant oil.



**5,046,264**

**METHOD AND APPARATUS FOR CONTINUOUSLY DRYING BOARDS COATED ON BOTH SIDES**

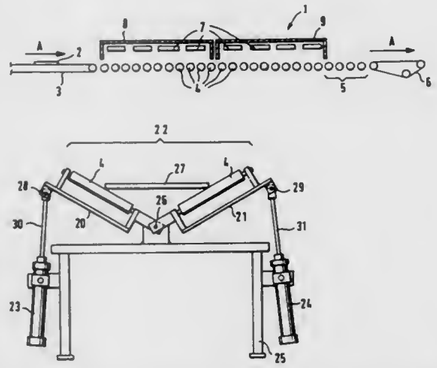
**Guenter Hultzsch, Wiesbaden; Hermann Idstein, Oestrich-Winkel, and Reinhard Nies, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed May 3, 1990, Ser. No. 517,079**

**Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915278**

**Int. Cl.[5] F26B** *23/04*

**U.S. Cl. 34—4** **18 Claims**




1. A method for continuously drying boards coated on both sides, comprising:

a. conveying each of said boards horizontally through a drying zone via a plurality of conveyor rollers, said step of conveying comprising the steps of

providing said conveyor rollers in the form of two rows of parallel conveyors mounted on respective plate frames which are inclined with respect to one another, and

adjusting the inclination of each of said plate frames to accommodate different sized boards;

b. heating a top surface of each of said boards as it passes through said drying zone; and

c. cooling a bottom surface of each of said boards as it passes through said drying zone by cooling each of said conveyor rollers from the inside to thereby remove heat from each of said boards via contact with cooled circumferential surfaces of said conveyor rollers.

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**5,046,265**

**METHOD AND SYSTEM FOR REDUCING THE MOISTURE CONTENT OF SUB-BITUMINOUS COALS AND THE LIKE**

**G. William Kalb, 190 Oakmont Rd., Wheeling, W. Va. 26003**

**Filed Dec. 4, 1989, Ser. No. 445,499**

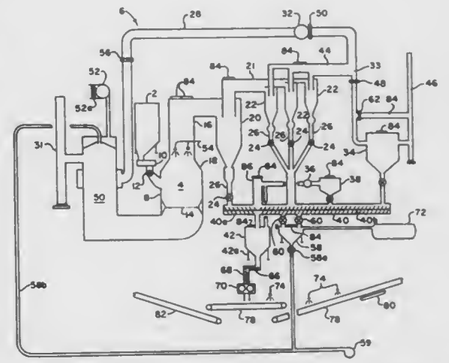
**Int. Cl.[5] F26B** *5/04*

**U.S. Cl. 34—15** **43 Claims**

1. A method of increasing the BTU value of carbonaceous particulate fuel material by reducing the inherent moisture content thereof, said method comprising the steps of:

introducing a pressurized heated gas stream into an inlet of a chamber and introducing a feed of carbonaceous particulate fuel material into said chamber, said chamber having a sub-atmospheric oxygen content; and

heating said particulate material using said pressurized heated gas stream introduced into said chamber until such time that particles introduced into said chamber achieve a reduced inherent moisture content and an attendant particle size reduction essentially at or below a predetermined maximum particle size and a predetermined maximum moisture content whereat the velocity of said heated pressurized gas stream is sufficient to entrain in said gas stream and carry from an outlet of said chamber of the fuel particles introduced into said chamber.




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**5,046,266**

**MULTI-CYLINDER DRYER WITH TWIN-WIRE DRAW AND WEB TRANSFER BETWEEN THE CYLINDER GROUPS**

**Jukka Autio, Jyväskylä , Finland, assignor to Valmet Paper Machinery Inc., Finland**

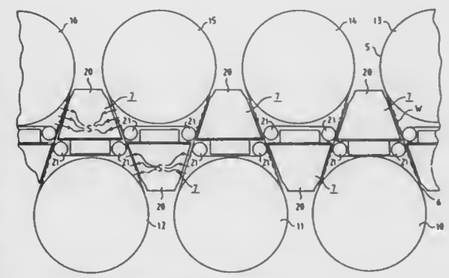
**Division of Ser. No. 444,810, Dec. 1, 1989, Pat. No. 4,967,489.**

**This application Jul. 2, 1990, Ser. No. 546,876**

**Claims priority, application Finland, Dec. 14, 1988, 885789; Dec. 14, 1988, 885790**

**Int. Cl.[5] D21F** *5/00, 5/04*

**U.S. Cl. 34—120** **9 Claims**




1. A multi-cylinder dryer comprising:

a set of drying cylinders including a plurality of upper drying cylinders and a plurality of lower drying cylinders,

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said drying cylinders being arranged to define a path for travel of a web of paper to run in a meandering fashion from one cylinder to a next cylinder of said set of cylinders so that the paper web is brought into direct contact with each cylinder within a sector that is larger than 180°,

an upper wire draw and a lower wire draw each comprising wires for support of the paper web and for urging the paper web against the drying cylinder,

a plurality of air-flow boxes for generating air streams, said air-flow boxes being selected from a class of boxes including suction boxes and blow boxes,

a plurality of fragmentary rolls mounted on said air-flow boxes for guiding the paper web past the air streams; and

wherein the wires of said upper draw and said lower draw press the paper web to be dried against faces of said drying cylinders, the wires being located for continuously supporting the paper web during travel of the web from one cylinder to a next cylinder of said set of cylinders;

there are at least two of said fragmentary rolls supported by each of said air-flow boxes; and

said air-flow boxes direct the air streams at the wires of said upper and said lower draws to improve support contact between the paper web and said wires.

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**5,046,267**

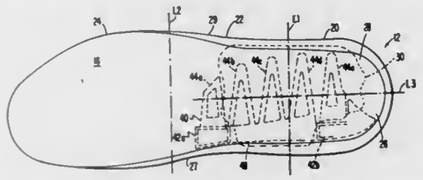
## ATHLETIC SHOE WITH PRONATION CONTROL DEVICE

**Bruce J. Kilgore, Lake Oswego, and Martyn R. Shorten, Portland, both of Oreg., assignors to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.**

**Continuation of Ser. No. 115,661, Nov. 6, 1987, abandoned. This application Nov. 8, 1989, Ser. No. 433,436**

**Int. Cl.[5] A43B** *13/12, 5/00*

**U.S. Cl. 36—114** **47 Claims**



1. A cushioning sole for use in footwear with a pronation control device to control the pronation motion of a wearer's foot comprising:

a sole member extending along at least the heel and arch areas of the cushioning sole, said sole member being compressible and resilient for cushioning foot impact, and

means, incorporated into said sole member, for gradually increasing the resistance to compression of said sole member from its lateral side to a maximum adjacent its medial side to control pronation motion, said gradual compression resistance increasing means including:

a substantially rigid member formed of substantially non-compressible material and extending vertically through at least a portion of a vertical extent of said sole member; and

a plate extending in a cantilever manner from said substantially rigid member toward the lateral side of said sole member;

wherein said plate extends from adjacent the top of said substantially rigid member and along an area adjacent the top of said sole member; and

wherein said plate includes a plurality of separate plate members.

**5,046,268**

## SKI BOOT WITH ADJUSTABLE SPOILER

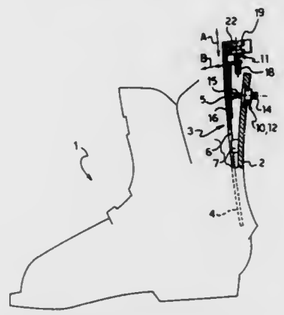
**Giovanni B. Munari, Montebelluna, Italy, assignor to Dolomite S.p.A., Montebelluna, Italy**

**Filed Dec. 6, 1989, Ser. No. 446,749**

**Claims priority, application Italy, Dec. 6, 1988, 22881 A/88**

**Int. Cl.[5] A43B** *5/04*

**U.S. Cl. 36—117** **7 Claims**



1. A ski boot comprising:

a shell including a foot portion and a leg portion,

a rear support plate extending at least in part within said leg portion and adjustably projecting outwardly therefrom and means for adjusting the rear support plate position relative to said leg portion,

said adjusting means comprising first and second adjusting means operatively connected between said rear support plate and said leg portion for adjustably shifting said rear support plate relative to said leg portion along two directions lying substantially perpendicular to each other, one of said directions being a vertical adjustment of the depth to which the rear support plate is inserted into the shell.

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**5,046,269**

## DEVICE FOR ADJUSTING THE FLEXIBILITY IN A SKI BOOT

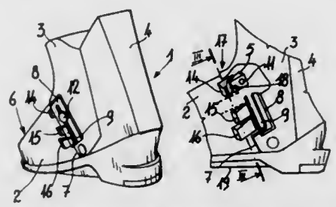
**Alessandro Pozzobon, Paderno di Ponzano Veneto, Italy, assignor to Nordica S.p.A., Montebelluna TV, Italy**

**Filed Feb. 29, 1988, Ser. No. 161,635**

**Claims priority, application Italy, Mar. 6, 1987, 82516 A/87**

**Int. Cl.[5] A43B** *5/04*

**U.S. Cl. 36—120** **11 Claims**



1. In a ski boot including a substantially rigid elongate shell with a toe portion, a heel portion and a sole, a semirigid front quarter with an upper and a lower portion, a pivotal connection between said front quarter and said shell to allow forward flexion of the lower leg of the skier in use, said lower portion of said front quarter having a forward peripheral edge extending transverse to the longitudinal direction of said shell, a device for adjusting the flexibility of said ski boot at said pivotal connection, said device comprising at least one fixed interference element located on said shell to project from the outer surface thereof and at least one adjustable interference element arranged on said front quarter, guide means being located on said shell for slidably guiding said at least one adjustable interference element, releasable locking means being associated with said adjustable interference element to selectively lock said adjustable interference element on said guide means, wherein said guide means extend over one lateral region of said lower portion of said quarter proximately to said forward peripheral edge thereof, said adjustable interference element being movable along said guide means between an inoperable position in which said adjustable interference element is not engageable with said fixed interference element and at least one operable position in which said adjustable interference element is frictionally and at least partially resiliently engageable with said at least one fixed interference element upon forward flexion of said front quarter, to thereby selectively adjust the flexibility of the ski boot.



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**5,046,270**

## MOBILE BALLAST CLEARING AND PLANING MACHINE

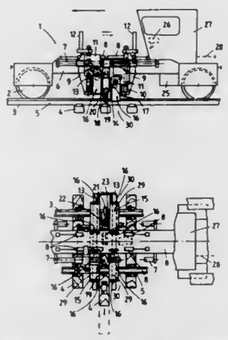
**Josef Theurer, Vienna; Johann Hansmann, Klosterneuburg, and Wörgötter, Linz, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria**

**Continuation of Ser. No. 164,792, Mar. 7, 1988, abandoned. This application May 15, 1989, Ser. No. 353,185**

**Claims priority, application Austria, Jul. 23, 1987, 1875/87**

**Int. Cl.[5] E02F** *5/22*

**U.S. Cl. 37—104** **12 Claims**



1. A mobile machine for clearing and planing ballast supporting a railroad track consisting of rails extending in a longitudinal direction and fastened to ties defining cribs therebetween, which comprises

(a) a machine frame,

(b) undercarriages supporting the machine frame for mobility on the railroad track,

(c) at least one ballast clearing tool defining a plane extending in the longitudinal direction of the track, the ballast clearing tool being vertically and transversely adjustable with respect to the rails and being connected to the machine frame for clearing ballast laterally outwardly of a respective one of the rails and beyond an end of a respective one of the ties, and for planing the ballast upon vertical adjustment of the tool into engagement with the ballast in a respective one of the cribs and transverse adjustment of the vertically adjusted tool in an outward direction transversely to the track, the tool being longitudinally displaceably mounted on the machine frame for horizontal displacement in the longitudinal direction of the track rails into alignment with the respective crib,

(d) respective drives for vertically and transversely adjusting, and for longitudinally displacing the tool, and

(c) means for laterally displacing the one tie.

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**5,046,271**

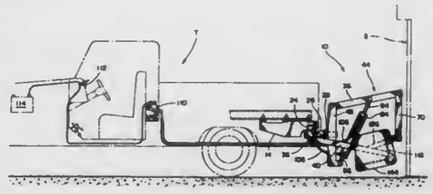
## POWERED SNOW PLOW FOR ATTACHMENT TO REAR OF VEHICLE

**Gregory J. Daniels, 15N365 Old Sutton Rd., East Dundee, Ill. 60118**

**Filed Apr. 2, 1990, Ser. No. 503,152**

**Int. Cl.[5] E01H** *5/06*

**U.S. Cl. 37—231** **9 Claims**



1. A snow plow apparatus for use with a motor vehicle by connecting the snow plow apparatus to the rear of a vehicle hitch to plow close to a structure without striking the structure, comprising;

a snow plow support means on a vehicle for stabilizing and supporting a snow plow means during travel and during plowing operations;

a raising and lowering mechanism for raising said snow plow means during travel and lowering said snow plow means during plowing, where said mechanisms is mounted on a vehicle;

said snow plow means connected to said snow plow support on a vehicle and to said raising and lowering mechanism connected to the same vehicle, where said snow plow means is supported by said raising and lowering mechanism and said support means during travel and during plowing operations;

said raising and lowering mechanism including a mechanical means operated by a hydraulically operated power means connected at one end to said snow plow support means at a first vertical support means, a second vertical support means pivotally connected to the other end of said pivotal arm means where the pivotal movement of said pivotal arm means raises said second vertical support as said pivotal arm means is raised and lowered as said pivotal arm means is lowered; a hydraulic cylinder connected at one end to the lower end of said first vertical support and the other end connected at or about the mid point of said pivotal arm means, for raising and lowering said pivotal arm means;

said snow plow means connected to said second vertical support means to respond to the raising and lowering said snow plow means, said snow plow means having a reinforced blade body with end plate means to trap plowed snow between said blade body and said end plate means, a pair of stabilizing and pivoting arm means affixed to said blade body at one end and pivotally connected to said snow plow support means on the vehicle at the other end where said pair of stabilizing and pivoting arms means partially support said snow plow means during travel, and pulls said snow plow means during plowing operations;

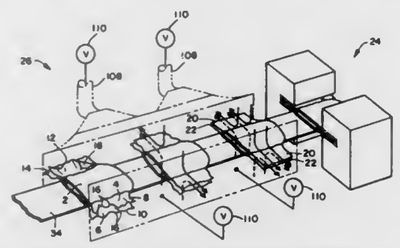
said second vertical arm means is pivotally connected to the rear of said blade body whereby as said snow plow means is raised said blade body is tilted forward to remove snow from said snow plow means, and whereas said snow plow means is lowered said blade body is tilted backward to capture snow to be plowed and;

where said snow plow means is pulled by a vehicle to plow and capture snow in front of said blade body and between said end plate means, and said raising and lowering mechanism controls the raising and lowering of said blade body.

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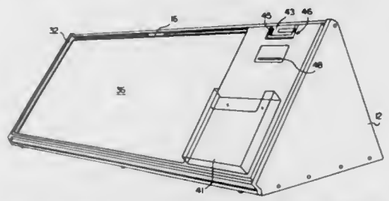
5,046,272
## FLUID-OPERATED STABILIZING APPARATUS AND METHOD
Robert E. Vogt; Robert D. McQuiggin; Kenneth R. Schmidt, all of Neenah, Wis., and Jark C. Lau, Roswell, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed May 1, 1990, Ser. No. 514,291
Int. Cl.[5] D06C *3/00*; D06F *67/04*
U.S. Cl. 38—143 38 Claims



1. A fluid-operated stabilizing system comprising:
a fluid handling assembly comprising an entrance region and an exit region,
a conveyor means extending at least between said entrance region and said exit region and defining therebetween a generally horizontally disposed travel path, whereby said conveyor means conveys along said travel path an article having wrinkled overlapping surfaces,
said fluid handling assembly further comprising a generally vertically disposed fluid channel along one edge portion of and spaced apart from said generally horizontally disposed travel path, whereby a fluid flow is directed through said fluid channel onto the wrinkled overlapping surfaces of the conveyed article to substantially smooth-out the wrinkles.
said fluid handling assembly further comprising a generally horizontally disposed fluid conduit in fluid communication with said fluid channel, whereby at least a portion of the overlapping surfaces is received therein and the fluid flow is directed through said fluid conduit and along the overlapping surfaces to further substantially smooth-out the wrinkles and to maintain the overlapping surfaces in a smoothed-out condition while the article is conveyed to said exit region, and
a vortex-generating means in said fluid conduit for varying turbulence in a fluid zone therein, whereby the overlapping surfaces are fluttered or rapidly shaken to assist in the smoothing out thereof.

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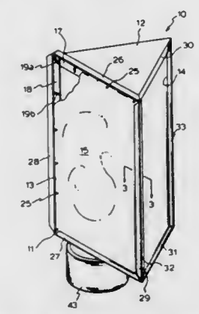
5,046,273
## PORTABLE DISPLAY SYSTEM
Alexander Virvo, 33 Glenn Ter., Stamford, Conn. 06902
Filed Jun. 12, 1989, Ser. No. 364,801
Int. Cl.[5] G09F *13/04*
U.S. Cl. 40—571 3 Claims



1. A modular display device for presenting information comprising:
a bottom panel;
a front panel hinged to said bottom panel;
a back panel hinged to said front panel;
a pair of end members each hinged along one side thereof to opposite edges of one of said bottom, front and back panels, whereby said device maybe folded into a rigid enclosed triangular structure;
said front panel having a cutout section for providing a viewing area and having pocket means formed therein for receipt of materials within the pocket means;
a translucent panel secured in place over said cutout section;
a transparent panel secured in place over said translucent panel; and
means holding said transparent panel over said translucent panel for forming an unobstructed slot between a top edge of said transparent panel and a top edge of said translucent panel whereby graphic messages may be received in the viewing area,
wherein said front panel has a raised rib along a first side and a raised portion along a second side opposite to said first side with said raised rib and said raised portion having tab receiving slots therein, and wherein opposite edges of said transparent panel have tab means for receipt into said tab receiving slots to support said transparent panel over said translucent panel to form a slight space therebetween.

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5,046,274
## BANNER DISPLAY APPARATUS
Henry B. David, 4420 San Fernando Rd., Glendale, Calif. 91204
Filed Apr. 3, 1990, Ser. No. 503,782
Int. Cl.[5] G09F *17/00*
U.S. Cl. 40—604 2 Claims

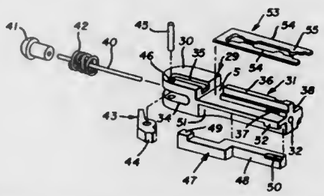


1. A banner display apparatus comprising:
(a) a display enclosure having three rectangular display frames each including an upper and lower horizontal support and a pair of parallel vertical supports, each vertical support being adjacent a vertical support of an adjacent display frame forming a trilateral polyhendron, the vertical supports of each display frame intersecting the horizontal supports of said display frame at each apex thereof, each vertical support where intersecting a horizontal support, has disposed therethrough an elongated aperture extending along an axis bisecting the angle between the intersecting horizontal and vertical supports and further including a plurality of aligned elongated aperatures disposed therethrough, each extending along an axis which is parallel to said horizontal supports, each horizontal support having disposed therethrough a plurality of aligned elongated apertures disposed therethrough, each extending along an axis parallel to the vertical supports;
(b) a stationary base comprising a cylindrical wall and including an elongated conduit coupled within said cylinder along the axis thereof and extending upwardly therefrom, said display enclosure being coupled to said conduit along its vertical axis of rotation;
(c) rotation means for supporting and rotating said display enclosure, said rotation means being coupled within the cylindrical wall of said stationary base;
(d) a light source coupled to the conduit within said display enclosure;
(e) means for securing a banner at each of the elongated apertures disposed in the horizontal and vertical supports of each display frame placing the banners under uniform tension whereby the banner is mounted without folds or other causes of visual distortion; and
(f) covering members pivotally coupled to each of the horizontal and vertical supports, each adapted to be rotated and placed adjacent the coupling between the banner and said horizontal and vertical supports.

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5,046,275
## CONVERSION KIT FOR SEMIAUTOMATIC WEAPONS
Michael W. Brown, 215 Steedly Dr., Louisville, Ky. 40214
Continuation-in-part of Ser. No. 347,225, May 4, 1989, Pat. No. 4,920,678. This application Feb. 12, 1990, Ser. No. 478,956
Int. Cl.[5] F41A *11/02, 15/08, 19/28*
U.S. Cl. 42—25 4 Claims

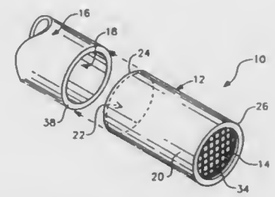


1. An improvement to a caliber conversion kit for semiautomatic firearms having an original replaceable barrel, an original replaceable ammunition clip, an original replaceable bolt assembly before the modification to small caliber ammunition use, the improvement comprises a replacement barrel of a reduced caliber bore, a replaceable bolt assembly for the original bolt assembly, said replacement bolt assembly comprising a bolt housing and a striker bolt assembly affixed in said bolt housing, said striker bolt assembly comprising a multi-portion main body member, one of said portions being multi-configured with an upstanding stepped rib, said rib having oppositely disposed aligned recesses adjacent one end thereof a bifurcated ejection clip having oppositely disposed locking tabs engageable in said aligned recesses on said rib, a firing pin resiliently positioned in a bore in said main body member, a firing arm slideably abutting said main body member, means for engaging said firing arm and said firing pin, means for registering said striker bolt with one end of said replacement barrel.

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5,046,276
## SAFETY CAP
James K. Morris, 312 N. Stadium Way, Apartment #402, Tacoma, Wash. 98403
Filed May 21, 1990, Ser. No. 526,053
Int. Cl.[5] F41A *17/00*
U.S. Cl. 42—70.01 16 Claims

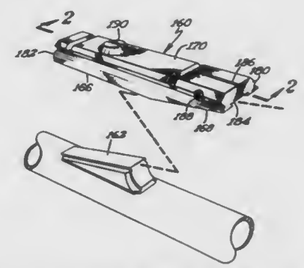
1. A safety cap for a gun barrel; comprising:
means for fragmenting a jelled pellet of paint as it is discharged from the gun barrel, said fragmenting means being positioned substantially across the discharge end of the gun barrel; and



means for removably attaching said fragmenting means to the discharge end of the gun barrel.

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5,046,277
## MOUNTING DEVICE FOR SIGHT VIEWING APPARATUS
Ronald J. Sanders, P.O. Box 658, Floodwood, Minn. 55736
Filed Jan. 2, 1990, Ser. No. 459,544
Int. Cl.[5] F41G *1/38, 1/32, 1/16*
U.S. Cl. 42—101 17 Claims



1. Device for mounting sighting apparatus on apparatus requiring sighting or aiming and having sight ramps of a dovetail shape comprising, in combination: a body including an upper portion, a lower portion, a first end, and a second end, with the lower portion having a bottom surface; means formed on the upper portion of the body for mounting the sighting apparatus to the body; a bevel surface extending from the bottom surface intermediate the first and second ends of the body at an angle corresponding to the angle of the sight ramp and to the first end; a dovetail groove formed in and parallel to the bevel surface of a size and shape complementary to and for slidable receipt on the sight ramp; means for capturing the sight ramp in the dovetail groove; and means for canting the body relative to the sight ramp.

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5,046,278
## FISH CALLER
Frank Szilagyi, New Freedom, and Steven W. Hayes, York, both of Pa., assignors to York Marine Products, York, Pa.
Filed May 29, 1990, Ser. No. 529,552
Int. Cl.[5] A01K *79/00*
U.S. Cl. 43—17.1 15 Claims

1. A fish caller including:
a. a noise source having a first digital oscillator generating a clock frequency output, and a first random number generator driven by the digital oscillator output to generate a noise source output signal consisting of random frequency components in at least the range of 25 Hz to 200 Hz;
b. a modulator having a second digital oscillator and a second random number generator driven by the output of the second digital oscillator to generate a modulator output signal having a period randomly changing from a mini-

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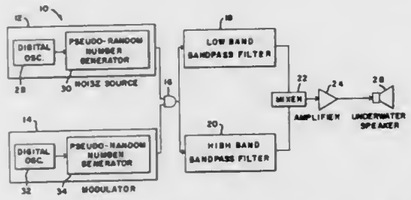


mum duration of about 0.5 seconds to a maximum duration of about 10.0 seconds and a signal within each period and separate from the signal of adjacent periods, the signal having a minimum duration of from about 0.25 seconds to a maximum duration of about 9.75 seconds;

c. a low bandpass filter having a bandpass range of from about 25 Hz to 50 Hz;

d. a high band bypass filter having a bandpass range of from about 100 Hz to 200 Hz;

e. an AND gate connecting outputs of the noise source and




the modulator to the input of each of said filters, the gate output signal comprising a digital waveform with successive randomly changing periods and a random signal made up of frequency components;

f. a mixer connected to the outputs of said filters for combining the two filtered random digital signals;

g. an amplifier connected to the output of the mixer for amplifying the pulsed, filtered and mixed signal; and

h. an underwater loudspeaker connected to the output of the amplifier for transmitting an output signal into underwater acoustic signal for attracting fish.

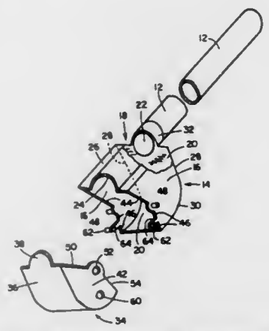
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**5,046,279**

**CARRYING CASE FOR FISHING ROD AND REEL**

**Murray A. Smith, 382 North 100 West, #4, Logan, Utah 84321, and Mark W. Lichfield, P.O. Box 13, Wellsville, Utah 84339**

**Filed Sep. 24, 1990, Ser. No. 587,216**
**Int. Cl.[5] A01K** *97/08*
**U.S. Cl. 43—26** **3 Claims**



3. A carrying case for a fishing rod and reel comprising:

an elongate hollow tube that is closed at its first end and is adapted to receive a fishing rod therein from its open, second end;

a reel receiving chamber attached to the open, second end of said tube, said chamber having opposite, substantially planar sides, a closed top and a forward wall having an opening in alignment with the open end of said tube, with the rearward end of said chamber being open such that a rod and an attached reel can be received through the open rearward end of said chamber to position the rod in the tube and the reel in said chamber;

a closure member for fitting against and closing the open rearward end of said chamber; and

means for pivotally attaching said closure member to the sides of said chamber such that the closure member can be pivoted downwardly beneath said chamber to expose the open rearward end of said chamber, wherein the means for pivotally attaching the closure member to the sides of said chamber comprises side members extending from the closure member to lie alongside exterior surfaces of the sides of said chamber and a pair of pivot connectors for pivotally connecting said side members to the sides of said chamber; and

releasable locking means fore retaining said closure member in its position closing the open rearward end of said chamber, wherein the releasable locking means comprises

an opening in at least one of the side members; and

a push button extending from said chamber to engage the opening in said side member when the closure member is in its position closing the open rearward end of said chamber.

wherein the push button can be depressed to release its engagement with said opening in the side member thereby allowing the side member to move in its pivotal movement relative to said chamber.

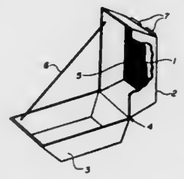
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**5,046,280**

**DEVICE FOR KILLING INSECTS**

**James P. Foster, Chadds Ford, Pa., and Philip V. Jennings, Wilmington, Del., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del.**

**Filed Apr. 19, 1989, Ser. No. 340,286**
**Int. Cl.[5] A01M** *1/20*
**U.S. Cl. 43—131** **12 Claims**



1. A device for killing insects consisting essentially of these two components that are movable in relation to one another:

(i) a toxin-containing target with an optional mesh covering and an optional attractant for the insects; and

(ii) a reservoir closable with the target so that the target is not exposed and openable so that the target is exposed; when the device is open, the target is positioned above the reservoir which serves to hold insects which fall into it after being killed by contact with the exposed target; the target containing tetrahydro-2-(nitromethylene)-2H-1,3-thiazine as the toxin.

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**5,046,281**

**TREE DOSING APPARATUS**

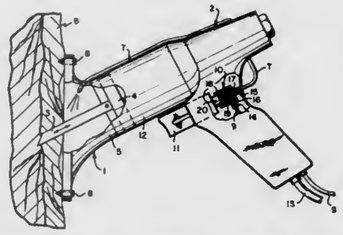
**Allan P. Murphy, Dubbo, Australia, assignor to N. J. Phillips Pty. Limited**

**Continuation of Ser. No. 183,189, Feb. 5, 1988, abandoned. This application Jul. 5, 1989, Ser. No. 375,577**
**Claims priority, application Australia, Jun. 5, 1986, PH06264**
**Int. Cl.[5] A01G** *29/00*
**U.S. Cl. 47—57.5** **13 Claims**

1. A tree dosing apparatus, comprising:

a pistol-like hand gun which includes an internal combustion chamber slidably receiving a piston, a blade attached to said piston, a trigger movable between a depressed position and a non-depressed position, an ignitor located in said internal chamber, means responsive to said trigger being moved into said depressed position for admitting fuel into said combustion chamber and for thereafter activating said ignitor which results in combustion in said internal combustion chamber, said piston and therefore said blade moving in a predetermined direction away from said internal combustion chamber in response to said combustion taking place; and





a housing with one end attached to said gun, said housing surrounding said blade and providing an opening through which passes said blade in response to said piston moving in said predetermined direction, said housing having an inclined surface defining said opening, said blade moving in response to said combustion from a retracted position with respect to said inclined surface to a projected position with respect to said inclined surface, said inclined surface being inclined so that said blade forms an oblique angle with respect to said inclined surface when said blade is in said projected position.

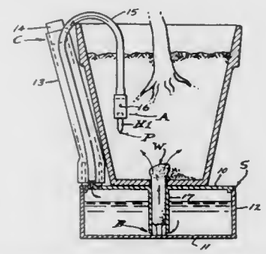
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**5,046,282**

**AUTOMATIC WICK WATERER FOR PLANTS**

**Dale Whitaker, Hacienda Height, Calif.**

**Continuation-in-part of Ser. No. 341,481, Apr. 21, 1989. This application Jun. 6, 1990, Ser. No. 534,694**
**Int. Cl.[5] A01G** *27/00*
**U.S. Cl. 47—79** **23 Claims**



18. An automatic soil waterer for potted plants and responsive to and controlling dampness in the soil, and including;

an airtight water supply chamber in the form of a vessel having a top to serve as a platform and having an air transfer opening to admit control air and having a water discharge from its bottom for delivery of water into the soil,

an air suction control means comprised of a hydrophilic probe element having a strong affinity to and passing water with soil air and followed by a hydrophobic element lacking affinity to water and passing only soil air through said transfer opening for displacement of water from the supply chamber water discharge and into the soil,

and water control means comprised of a well open from the water discharge at the bottom of the water supply chamber and through the top of the vessel, and capillary material in and exposed to rise of water in the well and extending upwardly therefrom and into the soil.

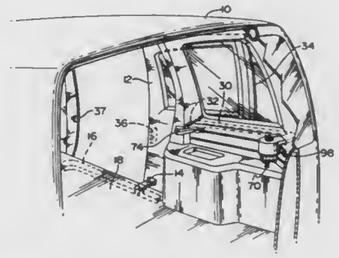
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**5,046,283**

**POWER SLIDING DOOR CLOSER**

**David E. Compeau, Stanford, Calif.; Mark Manuel, Mt. Clemens, Mich.; William L. Priest, Rochester Hills, Mich.; Lloyd W. Rogers, Jr., Utica, Mich., and Mark D. Nicholas, Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Continuation of Ser. No. 514,453, Apr. 25, 1990, abandoned. This application Feb. 12, 1991, Ser. No. 653,995**
**Int. Cl.[5] E05F** *15/00*
**U.S. Cl. 49—138** **6 Claims**



1. Apparatus for opening and closing a closure slidably mounted on a vehicle body comprising:

cable means attached to the closure and having first and second ends;

a first reel having the first end of the cable means connected thereto so that rotation of the first reel to wind the cable means thereon slides the closure toward the closed position;

a second reel having the second end of the cable means connected thereto so that rotation of the second reel to wind the cable means thereon slides the closure toward the open position;

rotary drive means adapted to drivingly engage and rotate the first reel to wind the cable means thereon when the rotary drive means is energized in one direction and adapted to drivingly engage and rotate the second reel to wind the cable means thereon when the motor drive means is energized in the other direction;

and spring means acting to urge rotation of the first and second reels in their respective direction of rotation to wind the cable ends thereon so that the cable means remains in tension during the unwinding thereof from the reels.

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**5,046,284**

**ANTI-THEFT VEHICLE WINDOW**

**David Harper, 8105 E. 93rd St., Apt. 905, Tulsa, Okla. 74133**

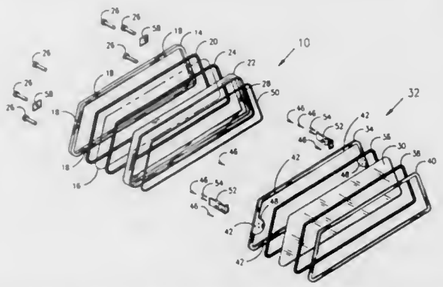
**Filed Sep. 10, 1990, Ser. No. 580,074**
**Int. Cl.[5] E06B** *3/32*
**U.S. Cl. 49—463** **4 Claims**

1. An anti-theft device for a vehicle haVing a Window pane supported within a rim forming an opening in said vehicle, which device comprises; an interior frame having a plurality of openings extending there through; an exterior frame capable of mating with said interior frame, said exterior frame having a recess extending around said frame and a plurality of openings extending into but not through said exterior frame, said exterior frame openings mating with said interior frame openings; a sheath extending around and receiving the edge of said window pane, said sheath having at least one handle extending therefrom; latch means extending from said sheath and engagable with said interior frame; a plurality of fasteners receivable

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through said interior frame openings and into said exterior frame openings so that said window pane within said surrounding sheath may be placed in said recess and engaged with said interior frame by use of said latch means.



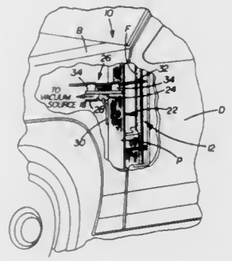
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**5,046,285**

## VACUUM SYSTEM FOR DEFLATING WEATHERSTRIPS

**Albert V. Fratini, Jr., and Jack E. Smith, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sep. 17, 1990, Ser. No. 583,107**
**Int. Cl.[5] E06B *7/16***
**U.S. Cl. 49—477** **8 Claims**



1. An apparatus for sealing between closures and a body such as a door and door jamb of a vehicle, comprising:
- a plurality of deflattable sealing members for resilient interference engagement between respective cooperating closures and said body when inflated;
- a central vacuum source;
- a flow control circuit including sensor means for sensing closing movement of a particular closure;
- valve means for selectively connecting a particular cooperating sealing member to said vacuum source for vacuum operation independently of all other sealing members;
- actuator means for said valve means operative only in response to the detected closing movement by said sensor means so as to deflate the sealing member, the deflation being sufficient to provide a reduced cross section of the sealing member resulting in reduced closing effort and allowing passage of air from said vehicle around said sealing member to substantially eliminate compression shock;
- vent means cooperating with said valve means and being operative to open sid sealing member to atmosphere at all other times so as to allow said sealing member to be at ambient pressure and expanded by resilient memory to full cross section so as to thereby provide the interference engagement and seal between said body and said closure.

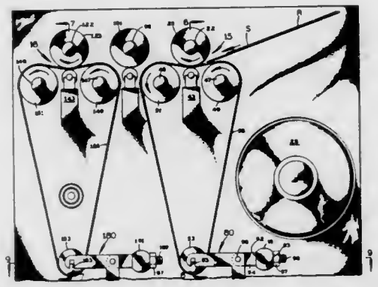
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**5,046,286**

## APPARATUS AND METHOD FOR REMOVING PHOTOGRAPHIC IMAGES FROM A FLEXIBLE FILM MEMBER

**Robert H. Holyoke, 4001 N. Ocean Blvd., Apt. 301B, Boca Raton, Fla. 33431**

**Filed Apr. 19, 1990, Ser. No. 511,305**
**The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.**
**Int. Cl.[5] B24B *21/00***
**U.S. Cl. 51—137** **23 Claims**



1. A photographic image removal apparatus for use with a flexible film member having photographic images on one face thereof, said apparatus comprising:
- an endless flexible belt having an abrasive face and an opposite face;
- belt drive means for moving said belt repeatedly along an endless path at a predetermined speed;
- belt deflection means having a curved periphery in confronting relationship to said abrasive face of the belt and positioned to deflect said belt to follow the contour of said curved periphery for part of its extent;
- means for tensioning said belt to thereby cause said belt to follow the contour of said curved periphery of said belt-deflection means for said part of its extent;
- movable film-advance means next to said belt-deflection means, said film advance means having a periphery for engaging the film member beyond said belt;
- drive means for moving said periphery of said film-advance means at e speed many times less than said predetermined speed of said belt;
- and pressure means positioned in confronting relationship to said periphery of said film-advance means to engage the film member between them and cause said film member to move between said belt-deflection means and said belt substantially at the speed of said periphery of said film-advance means.

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**5,046,287**

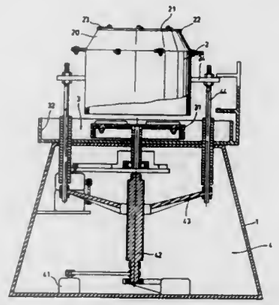
## WET GRINDING TYPE OF GRINDER WITH IMPROVED MATERIAL DISCHARGE MECHANISM

**Chao-Tong Lin, 3F., No. 1-5, Lane 101, Ta Tung S. Rd., San Chung City, Taipei Hsien, Taiwan**

**Filed Feb. 20, 1991, Ser. No. 658,147**
**Int. Cl.[5] B24B *31/108, 31/16***
**U.S. Cl. 51—163.1** **1 Claim**

1. A grinder of the type comprising a centrifugal disc mounted on the top of a base to centrifugal liquid grinding compound in a grinding cylinder for grinding, a grinding cylinder automatic lifting mechanism to automatically lift said grinding cylinder from said centrifugal disc, a centrifugal disc material discharge mechanism to deliver liquid grinding compound and working pieces from said grinding cylinder out of said base, and a water circulation system to alternatively pump liquid grinding compound and clean water into said grinding cylinder for grinding operation or washing; characterized in that:

said grinding cylinder automatic lifting mechanism comprises a main screw rod vertically fastened in said base and driven to rotate by a motor, a three-arm supporting member mounted on said main screw rod, and three columns respectively connected between said three-arm supporting member and said grinding cylinder, and wherein rotating said motor causes said three-arm supporting member to move upwards or downwards on said main screw rod so as to further drive said columns to lift said grinding cylinder from said centrifugal disc for material discharge operation or carry said grinding cylinder to cover said centrifugal disc for grinding operation.



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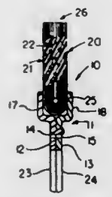


**5,046,288**

## ROTARY FINISHING TOOL

**Alfred F. Scheider, Orange, and R. Brown Warner, Westlake, both of Ohio, assignors to Jason, Inc., Cleveland, Ohio**

**Division of Ser. No. 384,759, Jul. 25, 1989, Pat. No. 4,945,687.**
**This application Jul. 23, 1990, Ser. No. 556,625**
**Int. Cl.[5] B24B *33/00***
**U.S. Cl. 51—206 NF** **15 Claims**



1. A rotary finishing tool, comprising:
- (a) a hub adaptable to be power driven;
- (b) an array of abrasive monofilaments secured to and projecting from the hub, where the abrasive monofilament is a polymeric material which has abrasive grit dispersed throughout; and
- (c) an abrasive grit containing foamed, elastomeric bond, having greater than 5% voids, secured to the hub and encapsulating the array of monofilaments; the abrasive containing elastomeric bond containing a first abrasive grit of medium grade and a second abrasive grit of fine grade.

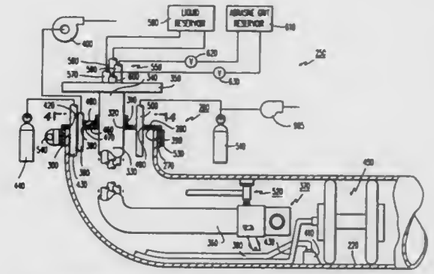
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**5,046,289**

## SYSTEM AND METHOD FOR CLEANING THE INNER SURFACE OF TUBULAR MEMBERS

**Thomas G. Bengel; Edward A. Ray, both of Plum Boro; Phillip E. Miller, Greensburg; Frank I. Bauer, Perry, and James Sejvar, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Feb. 6, 1989, Ser. No. 307,103**
**Int. Cl.[5] B24C *3/16, 9/00***
**U.S. Cl. 51—411** **15 Claims**



1. A system for cleaning the inside surface of a tubular member, the tubular member defining a longitudinal axis therethrough, comprising:
- (a) cleaning means capable of being positioned in the tubular member for displacing a cleaning composition onto the inside surface of the tubular member to clean the inside surface of the tubular member;
- (c) inflatable seal means disposed to one side of said cleaning means, said inflatable seal means capable of contacting the inside surface of the tubular member for confining the cleaning composition to a predetermined portion of the inside surface of the tubular member, said seal means being positionable along the inside surface of the tubular member independently of said cleaning means; and
- (c) an adjustable brace assembly connected to said cleaning means for stabilizing said cleaning means in the tubular member, for aligning said cleaning means along the longitudinal axis of the tubular member and for adjusting said cleaning means to tubular members having different inside diameters.

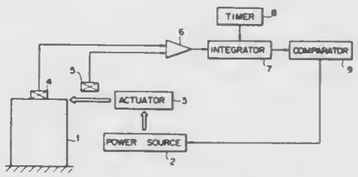
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**5,046,290**

## SAFETY MONITORING DEVICE FOR USE IN ACTIVE SEISMIC RESPONSE AND WIND CONTROL SYSTEM

**Koji Ishit; Masao Iizuka; Jun Tagami, all of Chofu; Toshikazu Yamada, Tokyo; Katsuyasu Sasaki, Tokyo, and Yoshiki Ikeda, Tokyo, all of Japan, assignors to Kajima Corporation, Tokyo, Japan**

**Filed Feb. 20, 1990, Ser. No. 481,979**
**Claims priority, application Japan, Feb. 23, 1989, 1-43563**
**Int. Cl.[5] E04H *9/02***
**U.S. Cl. 52—1** **5 Claims**




1. In a seismic induced vibration and/or wind control system for protecting a structure including first sensor means to detect

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seismic tremor and/or wind induced movement of a building and to produce a first signal responsive to said movement, building movement attenuation means; actuator means to actuate said building movement attenuation means; power means to energize said actuator; second sensor means to detect actuation of said building movement attenuation means and to produce a second signal responsive to said actuation; and computer control means adapted to receive and to process said first and second signals and to produce a third signal to control said actuator means, a safety system to prevent overload and/or malfunction of said vibration and/or wind control system comprising: sensor means to detect the speed of movement of said building induced by seismic tremor and/or wind, and to produce a fourth signal responsive to said movement; a seismic response control load meter adapted to detect the induced load on said actuator responsive to said third signal and to produce a fifth signal responsive to said load; signal processing means adapted to receive said fourth and fifth signals and to determine whether said signals indicate movements of said building and said actuator within a predetermined range of values; and said processing means being further adapted to de-energize said actuator if said movements exceed said predetermined range of values.

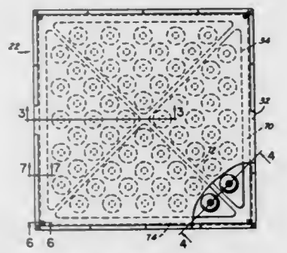
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**5,046,291**

## FLOOR PANEL ASSEMBLY

**Badri Narayan, Ann Arbor, Mich., assignor to Unistrut Corporation, Ann Arbor, Mich.**

**Filed Jun. 7, 1990, Ser. No. 534,396**
**Int. Cl.[5] E04B *5/43***
**U.S. Cl. 52—126.6** **11 Claims**



1. A floor panel for use in supporting loads, comprising:
a first, substantially flat, rectangular panel;
a second panel having a plurality of generally hemispherical domes formed therein, each said dome having a pole in contact with said first rectangular panel, each said pole adapted to transfer said load from said first panel to said second panel; and
wherein said panel has a plurality of holes spaced about its periphery and wherein said panel further includes a resilient trim member having an arched longitudinal body and a plurality of staking projections integral to and extending from said arched body, each projection adapted to be received within a respective panel hole upon the deforming of said arched body, whereby upon placing of each staking projection in its respective panel hole releasing of a deforming force upon said arched body, said body urges said staking projections against the side walls of said panel holes whereby said urging keeps said trim member in place during the manufacture of said panel.

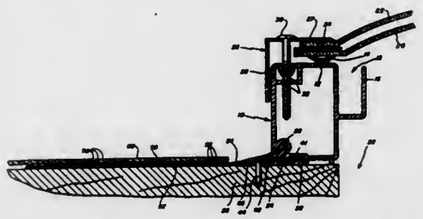
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**5,046,292**

## SKYLIGHT SEALING

**Robert Sampson, Sanford, and Sean Flanigan, Wells, both of Me., assignors to Wasco Products, Inc., Sanford, Me.**

**Continuation of Ser. No. 94,870, Sep. 10, 1988, which is a continuation of Ser. No. 857,940, Apr. 30, 1986, which is a continuation-in-part of Ser. No. 839,419, Mar. 14, 1986, which is a continuation-in-part of Ser. No. 749,947, Jun. 27, 1985. This application Sep. 13, 1989, Ser. No. 406,559**
**The portion of the term of this patent subsequent to May 20, 2003, has been disclaimed.**
**Int. Cl.[5] E04B *7/18***
**U.S. Cl. 52—200** **24 Claims**



1. In a skylight for covering an opening in a building having a rigid curb frame with means associated therewith for supporting a cover means, means for securing the curb frame to the building, and a flexible flashing flange co-extruded with and extending from the base of the curb frame and disposed about the periphery of the curb frame, said flashing flange having at least one elongated rib that forms a flow diverter extending peripherally around the curb frame.

2. An attachment system used when covering an opening in a structure comprising, a rigid curb frame with means associate therewith for supporting a cover means, means for securing the curb frame to the structure, and a flexible flashing flange co-extruded with and extending from the base of the curb frame and disposed about the periphery of the curb frame.

3. An attachment system as set forth in claim 2 wherein said rigid curb frame as well as said flexible flashing flange are commonly sealed to join the curb frame miters and also simultaneously secure the flashing flange at the curb frame miters to provide a continuous seal about the curb frame.

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**5,046,293**

## ARRANGEMENT FOR MOUNTING A WINDOW UNIT TO A BUILDING FRAME

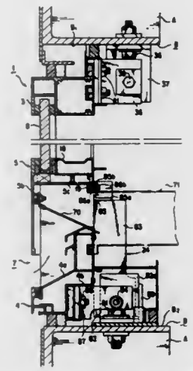
**Masaru Kajiura, Kowloon, Hong Kong, assignor to Yoshida Kogyo K. K., Tokyo, Japan**

**Filed Jun. 15, 1989, Ser. No. 366,747**
**Claims priority, application Japan, Apr. 8, 1988, 63-46906[U]; Apr. 8, 1988, 63-46907[U]**
**Int. Cl.[5] E06B *7/02*; E04H *14/00***
**U.S. Cl. 52—209** **11 Claims**

1. An arrangement for mounting in an opening of a building frame a window unit having at least one panel mounted in a rectangular framework formed by a pair of left and right longitudinal frames, and an upper transverse frame means and a lower transverse frame means, the upper and lower transverse frame means are connected to the longitudinal frames at upper and lower positions of the longitudinal frames, respectively, the arrangement comprising:
upper connecting metal fixtures fixedly secured to an upper part of said opening of the building frame, and
lower connecting metal fixtures fixedly secured to a lower part of said opening of the building frame, wherein an indoor side of said upper transverse frame means of said window unit is connected to said upper connecting metal fixtures, wherein an indoor side of said lower transverse frame means of said window unit is connected to said lower connecting metal fixtures, and



wherein said lower transverse frame means comprises a lower transverse frame connected to the building frame and to said lower connecting metal fixtures, and a lower window frame disposed above the adjacent to said lower



transverse frame, an indoor side of said lower window frame being connected to an upper position of said lower connecting metal fixtures, and wherein a wall-through portion is formed between said lower transverse frame and said lower window frame.

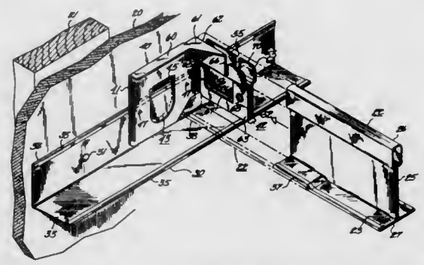
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**5,046,294**

## PERIMETER CLIP

**William J. Platt, Aston, Pa., assignor to National Rolling Mills, Inc., Frazer, Pa.**

**Filed May 14, 1990, Ser. No. 522,765**
**Int. Cl.[5] E06B *3/54***
**U.S. Cl. 52—489** **6 Claims**



1. For use in a dropped grid ceiling for a room with a perimeter wall, the ceiling having
(1) intersecting beams of inverted T-shape with a flange and a web, and
(2) a right angle wall molding having a wall face and a support ledge fastened to the wall; a perimeter clip formed from a single piece of sheet metal for securing a beam end to the wall molding comprising
(a) a first leg having a top and side, and a second leg positioned at right angles to the first leg, said top being perpendicular to said side of said first leg;
(b) the first leg having tab means for securing the first leg to the wall molding wall face wherein the wall molding wall face and the first leg lie in abutting parallel relationship, and the bottom of the leg rests on the wall molding support ledge;
(c) the second leg formed
(1) from a bend at the top of the first leg and a bend at the side of the first leg and
(2) into opposing clip webs extending
(a) parallel to one another, and
(b) at right angles to the first leg, the distance between the clip webs being substantially equal to the thickness of the beam web;
wherein the end of the beam is secured at its web between the clip webs, and the flange of the beam rests on, and is supported by, the wall molding ledge.

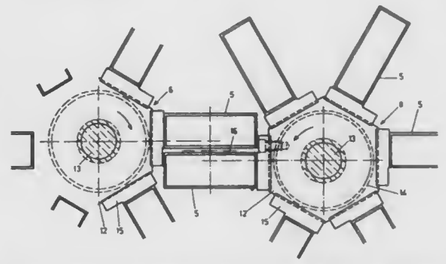
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**5,046,295**

## CIGARETTE PACKAGING METHOD AND APPARATUS

**Siegfried Knecht, Gevelsberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany**

**Filed Dec. 14, 1990, Ser. No. 627,709**
**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1989, 3941601**
**Int. Cl.[5] B65B *51/00***
**U.S. Cl. 53—202** **17 Claims**



1. In a cigarette packaging machine, the machine including a pair of conveyors for transporting formed and glued cigarette packs to a dryer wherein the glue will set, the improvement comprising:
at least a first rotatable drying turret, said drying turret having a plurality of spatially displaced cells located about its circumference, each of said drying turret cells defining a pair of open-ended pack receiving spaces, opposed sidewalls which define each of said receiving spaces being substantially parallel to one another;
means for transferring packs from the conveyors to said first drying turret, said transferring means including:
a first rotatable transfer turret, said first transfer turret carrying a plurality of open-ended cells which are each sized and shaped to receive a pack, said first transfer turret having an axis of rotation and being positioned relative to a first of the conveyors so that packs may be transferred from the first conveyor into cells of said first transfer turret when the transfer turret cells are rotated into a receiving position where they are juxtapositioned to the conveyor during stepwise rotation of said first transfer turret, said first transfer turret also being positioned such that cells thereon may be placed in registration with a first receiving space of a cell on said first drying turret; and
a second rotatable transfer turret, said second transfer turret carrying a plurality of open-ended cells which are each sized and shaped to receive a pack, said second transfer turret having an axis of rotation and being positioned relative to the second conveyor so that packs may be transferred from the second conveyor into cells of said second transfer turret when the cells are rotated into a receiving position where they are juxtapositioned to the second conveyor during stepwise rotation of said second transfer turret, said second transfer turret also being positioned such that cells thereon may be placed in registration with a second receiving space of a cell on said drying turret, the axis of rotation of said second

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transfer turret being parallel to but spaced from the axis of rotation of said first transfer turret, the spacing of said axes being selected such that a pair of cells respectively on said first and second transfer turrets will be located adjacent to one another and substantially parallel to one another when said cells are in registration with respective receiving spaces of a cell on said drying turret; and

double slide means for simultaneously transferring a pair of cigarette packs from adjacent transfer turret cells into the receiving spaces of a drying turret cell.

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**5,046,296**

## BULK MATERIAL PACKAGING APPARATUS

**David J. Drury, Gainsborough, and Norman Drury, Neat Brigg, both of United Kingdom, assignors to Wrap-A-Round Limited, Lincoln, England**

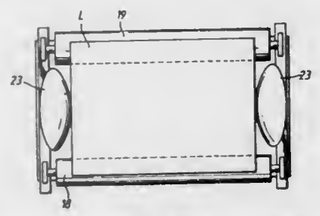
**Continuation-in-part of Ser. No. 364,424, Jul. 27, 1989. This application Sep. 7, 1989, Ser. No. 404,181**

**Claims priority, application United Kingdom, Sep. 7, 1988, 8821033**

**The portion of the term of this patent subsequent to Aug. 27, 2008, has been disclaimed.**

**Int. Cl.[5] B65B** *11/04*

**U.S. Cl. 53—211** **9 Claims**



1. Apparatus for wrapping a load with wrapping material comprising:

a frame, a platform, pivot means pivotally connecting the platform to the frame about a horizontal axis to permit the platform to be tilted between a generally horizontal position and an inclined position, and tilting means for tilting the platform with respect to the frame about the axis defined by said pivot means;

a load support, turning means mounting the load support to the platform to permit the load support to be turned about a turning axis perpendicular to the platform, and load rotating means mounted on the load support for rotating said load about a rotating axis transverse to the turning axis;

dispensing means selectively positionable with respect to the frame for dispensing a strip of wrapping material to wrap said load as the load is rotated by the load rotating means and as the load support is turned with respect to the platform;

arresting means coupled to said tilting means for arresting the turning of the load support at a preselected position with respect to the platform prior to the tilting of the platform with respect to the frame to discharge the load; and

extended area rotatable means coupled to the load support for contacting predetermined regions of a load as the load and load support turn about the turning axis to prevent displacement of the load on the load support.

**5,046,297**

## WRAPPING MACHINE FOR PAPER NAPKINS

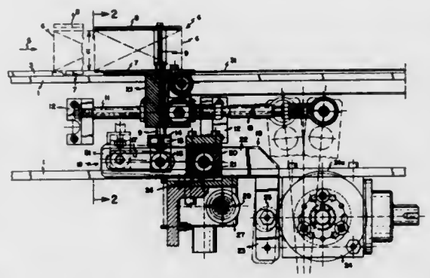
**Wolfgang Lippert, and Franz Hadzelek, both of Bremen, Fed. Rep. of Germany, assignors to Christian Senning Verpackungautomaten GmbH & Co., Bremen, Fed. Rep. of Germany**

**Filed Sep. 11, 1990, Ser. No. 580,833**

**Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930786**

**Int. Cl.[5] B65B** *11/08*

**U.S. Cl. 53—228** **14 Claims**



1. A device for packaging a multilayered stack of compressible material, the device comprising a receiving station into which the stack is inserted for packaging, said station comprising:

a base plate;

one or more lateral supports;

a cover plate connected to said lateral supports and arranged by means of said lateral supports parallel with said base plate;

means for displacing said base plate and cover plate in a direction parallel to the plane of the base plate;

first spacing adjusting means connected to said lateral supports for moving said cover plate in a direction orthogonal to the plane of said base plate between a starting position and a final position, said first spacing adjusting means comprises means to change the spacing between the base plate and the cover plate cyclically by a fixed measure during the displacement of said base and cover plates; and

second spacing adjusting means connected to said lateral supports for modifying the starting position relative to the base plate during the displacement of said base and cover plates.

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**5,046,298**

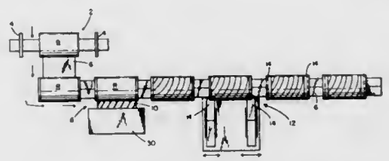
## METHOD AND APPARATUS FOR WRAPPING A ROLL WITH STRETCH WRAP

**Joseph Norkoski, Cosmopolis; Norman E. Dornblaser, Elma; William H. Mehaffey, Olympia, and Frank H. Lamb, Aberdeen, all of Wash., assignors to Haines and Emerson, Inc., Hoquiam, Wash.**

**Filed May 8, 1990, Ser. No. 520,789**

**Int. Cl.[5] B65B** *11/58*

**U.S. Cl. 53—399** **23 Claims**



1. A method for wrapping a roll, the steps comprising:



wrapping a roll having a width and two ends with a sleeve wrap, the sleeve wrap being of a width substantially equal to the width of the roll;

securing a head to each end of the roll, the size of the heads being substantially equal to the size of the ends of the roll; and

wrapping each end of the roll with a stretchable stretch wrap material while simultaneously providing tension to the stretch wrap so that the stretch wrap stretches and covers both a portion of the width of the roll and a portion of the end of the roll to secure the heads and the sleeve wrap to the roll and create a seal at an edge of the roll where the roll width meets the roll ends without the need of additional equipment or a separate adhesive to hold the stretch wrap against the roll.

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**5,046,299**

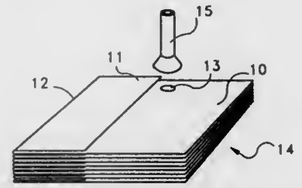
## METHOD IN PREPARING DIRECT MAIL ADVERTISING PARCELS

**Bill Hansen, Österportagatan 2 A, S-211 28 Malmö , Sweden**

**Filed Oct. 6, 1989, Ser. No. 462,722**

**Int. Cl.[5] B65H** *3/08;* **B41L** *45/00*

**U.S. Cl. 53—411** **7 Claims**



1. Method in preparing parcels or envelopes for direct mail advertising to several addressees, comprising the steps of:

preparing for each individual addressee an envelope addressed to said addressee;

preparing for each individual addressee a set of a predetermined number of individual and separate printed papers, all of substantially the same size, said papers of each set having different senders and the number of said papers being substantially the same for all addressees;

printing on each of the printed papers of each individual set of said prepared sets information personified with regard to the actual addressee;

putting all printed papers of each set one upon the other:

stacking said sets after printing of said information:

picking each set as a whole from the top of the stack thus formed; and

enclosing each picked set into the envelope addressed to the addressee personified on the printed papers in the set.

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**5,046,300**

## METHOD AND APPARATUS FOR FORMING A RECLOSABLE PACKAGE

**Richard G. Custer; Richard R. Kosiorek, and Michael P. Kolosso, all of Appleton, Wis., assignors to Reynolds Consumer Products, Inc., Appleton, Wis.**

**Filed Oct. 19, 1990, Ser. No. 600,756**

**Int. Cl.[5] B65B** *9/06, 61/18*

**U.S. Cl. 53—412** **29 Claims**

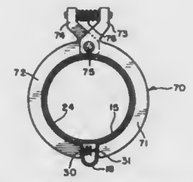
**29**. A method for producing product filled packages having reclosable profile elements for reclosing the package once the package is opened, comprising the steps of:

(a) forming a flat packaging film over a forming shoulder and into a tubular shape about a central member having an outer tube and an internal tube, said internal tube having an outer perimeter less than the outer perimeter of said outer tube, said internal tube extending beyond the bottom end of said outer tube;

(b) advancing the packaging film vertically downward along the length of the central member;

(c) threading a reclosable profile element along the length of the internal tube and inside the tubular shape of said packaging film;

(d) deforming the tubular packaging film to form a longitudinally extending loop of packaging film, said loop being formed from the packaging film made available as the packaging film is advanced between contacting the outer perimeter of the outer tube to contacting the outer perimeter of the internal tube extending beyond the bottom end of the outer tube;



(e) guiding the reclosable profile element along the vertical length of the internal tube of the central member and into said loop;

(f) adhering said reclosable profile element to the inner surface of said loop of packaging film.

(g) forming a cross seal in the tubular packaging film to form the bottom of the package;

(h) introducing product contents into the tubular packaging film above the cross seal;

(i) forming a second cross seal in the tubular packaging film to form the top of the package; and

(j) severing the package from the tubular packaging film.

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**5,046,301**

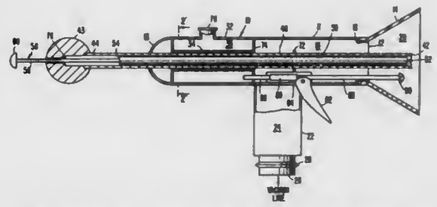
## ASBESTOS BULK EXTRACTOR AND METHOD THEREFOR

**Wayman L. Adkins, 17549B Ashbourne La., Boca Raton, Fla. 33496**

**Filed Jan. 8, 1990, Ser. No. 462,043**

**Int. Cl.[5] B65B** *63/00*

**U.S. Cl. 53—435** **21 Claims**



17. A method for extracting an asbestos bulk sample under substantially continuous negative pressure relative to the ambient atmospheric pressure comprising the steps of:

establishing and maintaining a substantially continuous negative pressure in an extraction region about an extraction site;

manually boring and obtaining a core of said asbestos bulk sample at said extraction site;

withdrawing said sample core from said extraction site;

wetting said extraction site after the step of withdrawing;

depositing said sample core into a container;

wherein the steps of boring, withdrawing and wetting all occur substantially under said substantially continuous negative pressure.

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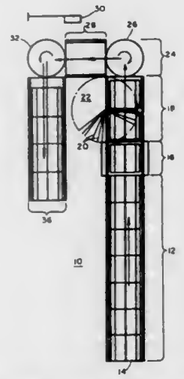


5,046,302

## METHOD AND APPARATUS FOR BAGGING PRODUCT UNITS

Kevin J. Bolejack, and Frederick Forgnone, both of Salinas, Calif., assignors to Transfresh Corporation, Salinas, Calif.

Filed Feb. 15, 1989, Ser. No. 311,225
Int. Cl.[5] B65B *41/00, 43/50*
U.S. Cl. 53—459 4 Claims



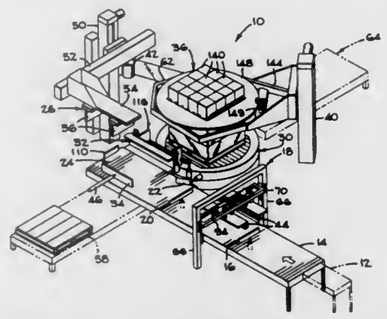
1. In a method for bagging a succession of product units, moving one said unit into a first predetermined position underneath a frame from which bags depend, said frame comprising an automatically rotatable hub at the upper end of a vertical member with a plurality of arms extending horizontally and radially outward from said vertical member, rotating said hub automatically to position one of said arms having a bag depending therefrom above said first predetermined position each time a unit is moved to said first predetermined position, placing an opening of said bag around a top of said unit and enclosing said unit with said bag, moving said enclosed unit to a second predetermined position, and sealing said bag closed with said unit inside.

5,046,303

## AUTOMATED SYSTEM FOR PALLETIZING/UNITIZING UNSTABLE ARTICLES

Kenneth F. Becicka, Alvin; Neal C. Chamberlain, Hoopeston; Thomas R. Reed; Russell J. Hurliman, both of Danville, all of Ill., and Bahman Daneshjoo, Warren, Mich., assignors to FMC Corporation, Chicago, Ill.

Filed May 18, 1990, Ser. No. 525,791
Int. Cl.[5] B65B *11/04, 35/50*
U.S. Cl. 53—540 3 Claims



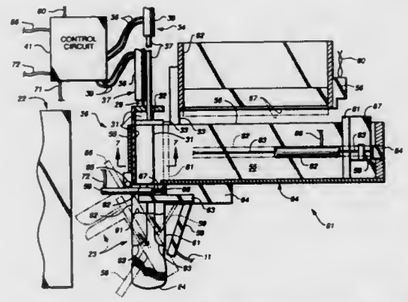
1. In a palletizer system for stacking layers of articles in a consolidated stack, said palletizer including a stacking station and an integral wrapping station having a turntable upon which said layers are vertically stacked and which station wraps each said layer on said turntable as the layers are being stacked, the improvement comprising restraining means for restraining unstable articles on said stacking station prior to the wrapping of said unstable articles on said stacking station, said restraining means having a supporting frame, means for vertically moving said frame on a vertical mast adjacent said stacking station relative said turntable, said frame means supporting a rotatable circular plate, means for rotating said circular plate, said circular plate defining a rectangular opening therein, said rectangular opening equipped with article guide means for resiliently supporting a stacked layer of said articles prior to and during partial wrapping of said articles at said integral wrapping station.

5,046,304

## APPARATUS AND METHOD FOR BAGGING FRAGILE LEAFY VEGETABLES

Robert Alameda, Northport, Wash., and Daniel Alameda, Pacific Grove, Calif., assignors to Gabilan Manufacturing, Inc., Salinas, Calif.

Filed Feb. 26, 1990, Ser. No. 484,412
Int. Cl.[5] B65B *43/26*
U.S. Cl. 53—570 9 Claims



1. An apparatus for bagging a quantity of relatively fragile leafy vegetables comprising:

bag distending means holding an open ended bag in a distended condition for receipt of said vegetables through the open end thereof;

sleeve-like inserter means mounted proximate said distending means and dimensioned to receive said quantity of said vegetables in a loose substantially uncompacted condition therein and dimensioned for insertion into said open end of said bag while said bag is in said distended condition and said vegetables are in said uncompacted condition;

insertion drive means coupled to and driving at least one of said distending means and said inserter means and producing relative displacement of said inserter means and said distending means between an inserted position, in which said inserter means is inserted inside said bag to a depth positioning substantially all of said quantity of said vegetables inside said bag, and a removed position, in which said inserter means is positioned outside of said bag;

barrier means movably mounted inside said inserter means, said inserter means extending substantially around three sides of said barrier means, and said barrier means extending transversely across said inserter means to cooperate with an interior surface of said inserter means to carry said vegetables into said bag in said uncompacted condition;

barrier drive means coupled to said barrier means for displacement thereof; and

control means coupled to said insertion drive means and said barrier drive means and substantially maintaining the relative position of said barrier means and said inserter means during insertion of said inserter means into said bag, and substantially maintaining the relative position of said barrier means and said bag during removal of said inserter means from said bag to prevent withdrawal of said vegetables from said bag during removal of said inserter means.

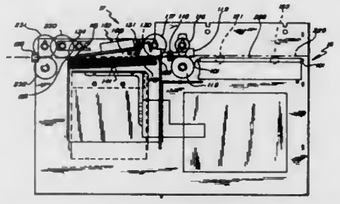


5,046,305

## SLEEVER MODULE FOR DISK PACKAGING UNIT

Robert L. Skuble, Bloomington, and John S. Lee, Coon Rapids, both of Minn., assignors to Rimage Corporation, Eden Prairie, Minn.

Filed Apr. 6, 1990, Ser. No. 505,929
Int. Cl.[5] B65B *43/22, 43/30*
U.S. Cl. 53—572 11 Claims



1. An apparatus for sequentially inserting flat disk products into an open-ended sleeves, wherein the open end of each sleeve respectively comprises a shorter edge and a longer edge, comprising:

a) a hopper for retaining a stack of said sleeves with said shorter edges up and said longer edges down;

b) a disk conveying means for transporting unsleeved disks along an axis aligned with the topmost sleeve stacked in said hopper;

a stationary air blower assembly positioned above said hopper, said assembly having at least one air blower positioned above and proximate the shorter edges of said stack for directing air flow upwardly away from said stack means for fixedly mounting said assembly along an inclined angle relative to said axis for transporting unsleeved disks with said at least one air blower at the opened of said angle and the apex of said angle being located closely adjacent said axis for transporting unsleeved disks downstream along the transporting direction; said air blower assembly further comprising a leaf spring affixed at one end proximate the apex of said angle and having a second end facing downstream and biased toward said axis for transporting; and

c) means for actuating said at least one air blower, whereby said air flow develops a negative pressure to lift the shorter edge of said topmost sleeve into contact against said air blower assembly.

5,046,306

## SECONDARY OIL SYSTEM

Ronald J. Borre, Jr., Indianapolis, Ind., assignor to General Motors Corporatioo, Detroit, Mich.

Filed Jul. 23, 1990, Ser. No. 556,689
Int. Cl.[5] F01M *1/18;* F02C *7/06*
U.S. Cl. 60—39.08 4 Claims

1. In a gas turbine engine having

a source of compressed air,

a rotor bearing in a bearing sump of said engine, and

a primary oil system for lubricating said rotor bearing with oil at a primary oil system pressure when said engine is operating normally,

a secondary oil system comprising:

a reservoir in said bearing sump,

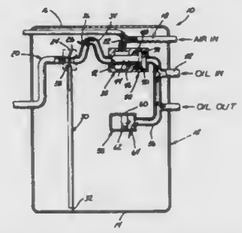
means defining an oil inlet between said primary oil system and said reservoir for filling said reservoir with oil from said primary oil system,

a mist tube in said reservoir having a first end connected to said compressed air source and a second end connected to a secondary oil system nozzle in said bearing sump,

means defining a first orifice in said mist tube at a first elevation relative to the bottom of said reservoir and above the elevation of said secondary oil system nozzle relative to the bottom of said reservoir,

means defining a pick-up tube for conducting oil from said reservoir near said bottom thereof to said first orifice,

a shut-off valve means in said mist tube between said first orifice and said first end of said mist tube responsive to said primary system oil pressure to block said mist tube when said primary system oil pressure is above a predetermined magnitude and to unblock said mist tube when said primary system oil pressure is below said predetermined magnitude thereby to initiate compressed air flow in said mist tube when said primary system oil pressure is below said predetermined magnitude,




means defining a second orifice in said mist tube open to said reservoir at a second elevation relative to the bottom of said reservoir exceeding said first elevation and between said first orifice and said shut-off valve means so that said reservoir is pressurized with compressed air through said second orifice when said mist tube is open, and

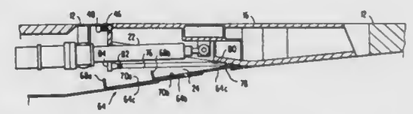
means in said mist tube at said first orifice operative to mix oil issuing from said first orifice with compressed air in said mist tube when said mist tube is open to create an air and oil mist for transport by said mist tube from said first orifice to said secondary oil system nozzle.

5,046,307

## THRUST REVERSER FOR HIGH BYPASS TURBOFAN ENGINE

Ram K. Matta, Loveland, and Pupinder K. Bbutiani, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 173,800, Mar. 28, 1988, Pat. No. 4,922,712.
This application Oct. 17, 1989, Ser. No. 422,717
Int. Cl.[5] F02K *1/70*
U.S. Cl. 60—226.2 3 Claims



1. A thrust reverser for a gas turbine engine of the type which includes an outer wall spaced from the center body of a core engine to define a bypass duct therebetween, said thrust reverser comprising

(a) a plurality of circumferentially displaced blocker doors, each of said doors being movable between a normal position generally aligned with said outer wall and a thrust reversing position extending transversely of said bypass

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duct for blocking exhaust of air through said bypass duct and directing the air through an opening in said outer wall for thrust reversal;

(b) each of said blocker doors being of light-weight construction and including a pit in the inner surface thereof in said normal position;

(c) means for covering said pit during normal flow of air through said bypass duct to reduce pressure drop in said bypass duct and reduce noise;

(d) said covering means comprising an extensible and retractable ramp fairing wherein said ramp fairing comprises a plurality of relatively movable elements movable between an extended position in which said elements are in substantially end-to-end relationship to cover the pit and a retracted position in which said elements are in overlapping relationship to provide for flow of thrust reversal air, and

(e) means for extending said ramp fairing to cover said pit when said blocker door is in its position for normal operation and for retracting said ramp fairing during thrust reversal operation.

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**5,046,308**

## EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINES PROVIDED WITH A DEVICE FOR HOUSING FILTERS DESIGNED TO TRAP SOLID PARTICLES AND UNBURNED HYDROCARBONS ENTRAINED IN EXHAUST GASES

**Roberto Longobardi, and Raffaele Longobardi, both of Viale Europa, 2/E, Castellammare Di Stabia 80053, Italy**

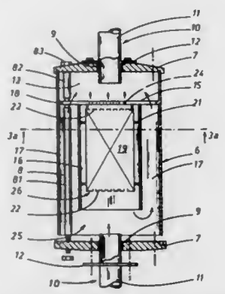
**PCT No. PCT/IT88/00065, § 371 Date May 11, 1989, § 102(e) Date May 11, 1989, PCT Pub. No. WO89/02778, PCT Pub. Date Apr. 6, 1989**

**PCT Filed Sep. 23, 1988, Ser. No. 372,373**

**Claims priority, application Italy, Sep. 25, 1987, 48420 A/87**

**Int. Cl.[5] F01N *3/02***

**U.S. Cl. 60—311** **17 Claims**



1. An exhaust system for internal combustion engines provided with a device for housing filters designed to trap solid particles and unburned hydrocarbons entrained and dissolved in exhaust gases, of the type comprising exhaust components which include an exhaust manifold, a first pipe, at least one silencer and a second pipe, the exhaust manifold being connected by way of the first pipe and the silencer to the second pipe from which the gases are ultimately exhausted, the exhaust system being suitable for use with petrol and diesel engines, comprising:

a device, located at any given point along the system, having an axially hollow outer case with open ends which are sealed tight by rigidly attached and substantially identical caps each affording an opening at a center thereof, each of said caps serving to accept a respective hermetically attached fitting by which the device itself is connected axially to one of the exhaust components;

the case encompassing a space that is divided internally into two chambers of dissimilar volume by a baffle that is disposed traversely and fastened peripherally to the case, said space accommodating a hollow housing rigidly associated with and supported by the side of the baffle and directed toward the chamber of greater volume and open at the end farthest from the baffle, said hollow housing being disposed coaxial with the case in such a way that an external surface of said hollow housing and the internal surface of he case combine to create a peripheral void that is open at an end which is farther from the baffle and able to communicate at the remaining end with the chamber of lesser volume by way of a plurality of openings in a corresponding peripheral part of the baffle, the housing accommodating at least one removable filter element disposed axially and held in position in such a way that a passage interconnecting two ends of the housing is crated between an outer surface of the filter element and the inner surface of the housing and such that an end of the filter element designed to admit the exhaust gases is located at the open end of the housing, and another end of the filter element from which filtered gases are expelled is breasted against the baffle and against the base of the housing;

the open end of the housing being located at a given distance from the corresponding end of the coaxial outer case and the respective cap creating a terminal void of similar shape to the smaller chamber but no greater volume in such a way that gases exhausted from the engine are admitted by way of one fitting into said terminal void and expelled following filtration by way of the smaller chamber and the other fitting which is remaining; and

the total cross-sectional area offered to gases exhausting through the peripheral void and the corresponding openings in the baffle being at least equal to that of any one of the exhaust components.

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**5,046,309**

## ENERGY REGENERATIVE CIRCUIT IN A HYDRAULIC APPARATUS

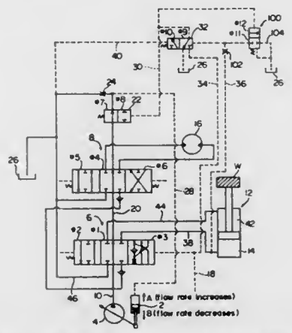
**Kazunori Yoshino, Kobe, Japan, assignor to Shin Caterpillar Mitsubishi Ltd., Japan**

**Filed Jan. 16, 1991, Ser. No. 641,893**

**Claims priority, application Japan, Jan. 22, 1990, 2-3941[U]; Jan. 31, 1990, 2-7617[U]**

**Int. Cl.[5] F16D *31/02***

**U.S. Cl. 60—445** **1 Claim**




1. An energy regenerative circuit of a hydraulic apparatus comprising a direction control valve that controls an actuator and that is connected to a discharge fluid line of a variable displacement pump controlled by a capacity control mechanism, wherein when said direction control valve is at an actuator unloaded-side chamber acting position;

the discharge fluid line of said variable displacement pump is connected to a fluid tank through a by-pass fluid line change-over valve and a by-pass fluid line that has a signal orifice;



said by-pass fluid line is connected to the capacity control mechanism of said variable displacement pump via a signal fluid line on the upstream side of said signal orifice;

the loaded-side chamber of said actuator is so connected that the pressurized fluid thereof is partly added through said direction control valve to the fluid line through which the pressurized fluid discharged from said variable displacement pump is fed to said unloaded-side chamber;

a first pilot valve is connected to said loaded-side chamber via a control fluid line having an orifice so as to be controlled by the pressurized fluid of said loaded-side chamber;

said control fluid line is connected to a fluid tank via a return fluid line that is opened and closed by a second pilot valve;

said by-pass fluid line change-over valve is constituted to be controlled by said first pilot valve to open said by-pass fluid line when the operation device descends due to its own weight and to close said by-pass fluid line at the time of compacting operation; and

said second pilot valve is constituted to be controlled by said first pilot valve to close said return fluid line when said operation device descends due to its own weight and to open said return fluid line at the time of compacting operation.

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**5,046,310**

## LOAD-INDEPENDENT CONTROL DEVICE FOR HYDRAULIC LOAD DEVICES

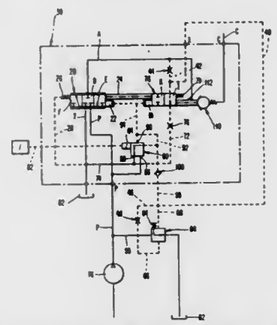
**Wolfgang Kauss, Lohr/Wombach, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany**

**Filed Apr. 2, 1990, Ser. No. 502,995**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 3910895**

**Int. Cl.[5] F15B *11/02***

**U.S. Cl. 60—468** **9 Claims**



1. A load-independent control device for conducting hydraulic fluid from a hydraulic pump to a hydraulic device, said pump supplying hydraulic fluid to a pump line, a pressure limiting valve communicating with said pump and being movable between a first position communicating said pump with a reservoir and a second position blocking communication between said pump and said reservoir, said control device comprising:

a servo valve movable from a neutral position to at least one working position for admitting hydraulic fluid from said pump line to the hydraulic device,

a load indicating line for communicating said pump with a control side of said pressure limiting valve and with said reservoir,

a directional control valve movable independently of said servo valve between a first position communicating said load indicating line with said reservoir, and a second position blocking communication between said load indicating line and said reservoir, whereby a pressure build-up in said load indicating line moves said pressure limiting valve to its second position increasing the hydraulic pressure in said pump line,

said servo valve and said directional control valve being movable in response to the application of hydraulic pressure thereto from a common control pressure line such that said directional control valve is moved to its second position before said servo valve is moved out of its neutral position, and

pressure valve means for admitting hydraulic fluid from said pump line to said common control pressure line for moving said servo valve and said directional control valve,

said common control pressure line communicating with said load indicating line through a one-way valve.

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**5,046,311**

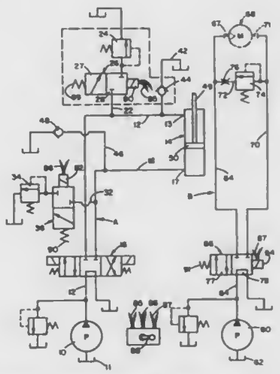
## HYDRAULIC CONTROL SYSTEM

**Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725**

**Filed Dec. 14, 1989, Ser. No. 450,414**

**Int. Cl.[5] F16D *31/02***

**U.S. Cl. 60—468** **20 Claims**



1. A hydraulic control system comprising:

a pump for pressurizing a hydraulic fluid;

a hydraulic cylinder having a piston mounted for reciprocation therein;

a cylinder hydraulic circuit interconnecting said pump and said cylinder so as to allow a movement of said piston in said cylinder when pressurized fluid is transmitted from said pump, said circuit comprising:

a first hydraulic fluid line extending between said pump and a first end of said cylinder,

a control valve located in said first fluid line for controlling the communication of fluid between said pump and said cylinder first end,

a second hydraulic fluid line in fluid communication with said first fluid line at a location between said control valve and said cylinder,

a first relief valve located in said second fluid line, and

a first shut off valve located in said second fluid line and interposed between said first relief valve and said first fluid line, said shut off valve being solenoid actuated to a closed position;

a motor hydraulic circuit comprising:

a third hydraulic fluid line,

a motor control valve for controlling a flow of fluid through said third hydraulic fluid line; and,

an interconnect means for operating said first shut off valve and said motor control valve in unison in order to simultaneously prevent the flow of fluid through said second and third fluid lines.

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5,046,312

## SWIVEL SPEED CONTROL CIRCUIT FOR WORKING VEHICLE

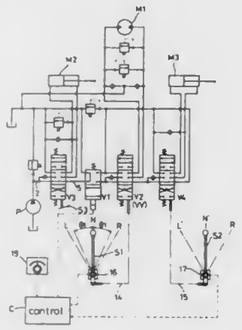
Akira Tsuda, and Kazuyoshi Arii, both of Sakai, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 8, 1989, Ser. No. 349,456

Claims priority, application Japan, Jul. 8, 1988, 63-171494; Jul. 13, 1988, 63-176054; Nov. 2, 1988, 63-278461; Nov. 4, 1988, 63-279865; Dec. 27, 1988, 63-333116

Int. Cl.[5] F15B 7/00

U.S. Cl. 60—493 13 Claims




1. A hydraulic circuit structure for a working vehicle including a swivel deck comprising:

a hydraulic actuator operable to rotate said swivel deck,

a first control valve (V) for controlling a rate of oil flow to said hydraulic actuator to set a swivel speed of said swivel deck,

a second control mechanism connected in series to said first control valve for switching an operating direction of said hydraulic actuator,

a manual control device (S1) operatively connected to said first control valve and said second control mechanism,

maximum swivel speed setting means including:

a setter (19) for setting a maximum swivel speed, a comparator for comparing a first swivel speed value input from said setter (19) with a second swivel speed value input from said manual control device (S1), and

means for generating a swivel speed signal to said first control valve (V1), said means generating a swivel speed signal based on the second swivel speed value unless the second swivel speed value exceeds the first swivel speed value, while generating a swivel speed signal based on the first swivel speed value when the second swivel speed value exceeds the first swivel speed value,

wherein the greater amount said manual control device is operated from a neutral position, to the greater extent said first control valve is shifted in a flow increasing direction, and said second control mechanism is operable to switch oil lines in a predetermined direction in response to an operation of said manual control device.

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5,046,313

## MASTER CYLINDER WITH FLUID LEVEL AND PRESSURE FAILURE DETECTION

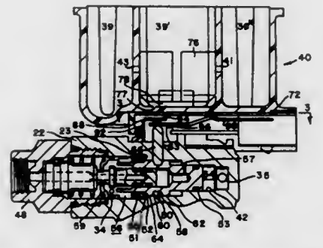
Donald A. Crumb, Granger; William F. Dillon, Jr., South Bend, both of Ind.; Robert F. Gaiser, Stevensville, and Richard A. Zander, Niles, both of Mich., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 27, 1989, Ser. No. 385,529

Int. Cl.[5] F15B 7/00; H01H 35/38; B60Q 11/00

U.S. Cl. 60—535 6 Claims

1. A master cylinder comprising a first housing having a first bore for retaining a pair of pistons which are moved to develop fluid pressure in a pair of pressure chambers to effect a brake application, a second bore for receiving a differential area piston and first and second passages for connecting said pair of pressure chambers with said second bore, said differential area piston responding to said fluid pressure developed during a brake application to actuate a signal circuit in response to a failure mode in either pressure chamber, a reservoir attached to said first housing and containing fluid which is in communication with the pair of pressure chambers when the pistons are in a rest position, a float located in the reservoir and having a magnet for actuating a switch in the signal circuit when the fluid level in the reservoir is below a predetermined level, characterized in that said switch has a second housing and which is located between said first housing and reservoir, said second housing being aligned with said reservoir and first housing through a slot in said reservoir, said switch having a first pin for attaching a first blade to said second housing, said first blade having an end which cantilevers from said first pin with a first contact thereon, said switch having a second pin for attaching a second blade to said second housing, said second



blade having an end which cantilevers from said second pin with a second contact thereon, said second blade resiliently urging a projection thereon into engagement with said first housing to position said second contact at substantially a fixed distance from said first housing, said first blade being connected through a reed switch to a second blade, said alignment of said second housing allowing said reed switch to respond to said magnet by closing said signal circuit to inform an operator of the predetermined fluid level in said reservoir, said switch having an actuation pin that extends though said first housing into engagement with a groove in said differential area piston, said first blade resiliently engaging said actuation pin to urge said actuation pin into said groove to define a gap between said first and second contacts, said gap being a function of the length of said actuation pin, said differential area piston in responding to said failure mode moving to correspondingly move said actuation pin out of said groove and up a ramp to a land to bring said first contact into engagement with said second contact to closed said signal circuit and inform an operator of the failure mode in one of the pressure chambers.

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5,046,314

## CONTROL DEVICE OF A BRAKE BOOSTER, APPLYING ADDITIONAL FORCE WHEN A PRESSURE DIFFERENCE BETWEEN A FRONT AND REAR BOOSTER CHAMBER EXCEEDS A PRE-DETERMINED THRESHOLD

Roland Levral, Stains, France, assignor to Bendix France, Drancy, France

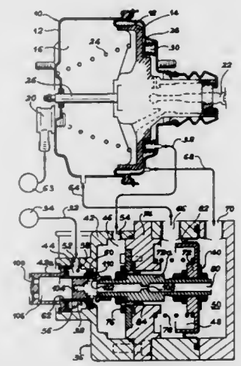
Filed Oct. 31, 1989, Ser. No. 430,741

Claims priority, application France, Nov. 10, 1988, 8814729; May 31, 1989, 8907146

Int. Cl.[5] B60T 13/20

U.S. Cl. 60—555 15 Claims

1. A control device and a booster, the booster comprising a housing in which a drive piston separating a front chamber from a rear chamber can move in the event of an actuation of an input control member generating a pressure difference between the rear chamber and the front chamber, and an auxiliary drive member having a pressure chamber located in the rear chamber of the booster, the control device for exerting an additional boosting force automatically on said drive piston and located between the pressure chamber of the booster and a pressure source and further comprising a normally closed valve via which the pressure chamber communicates with the pressure source, and means for actuating said valve and which is sensitive to a pressure difference between the rear chamber and front chamber in order to open the valve automatically when said difference exceeds a predetermined threshold, the control device further comprising a hollow body in which is formed a pressurized-fluid inlet chamber communicating with



the pressure source, a pressurized-fluid outlet chamber communicating with the pressure chamber, a first control chamber communicating with the front chamber and a second control chamber communicating with the rear chamber, said inlet and outlet chambers forming therebetween a first valve seal against which a shutter is normally kept bearing sealingly by first elastic means, the first and second control chambers being separated sealingly by means forming a piston which is axially aligned with the valve seat and an extension of which carries a second valve seat capable of coming to bear sealingly on the shutter and of moving the latter away from the first valve seat, and second elastic means normally keeping the second valve seat away from the shutter.

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5,046,315

## MASTER CYLINDER

Yoshihiro Nakamura; Naganori Koshimizu, both of Yamanashi, and Hideaki Ishii, Chiba, all of Japan, assignors to Tokico, Ltd., Kanagawa, Japan

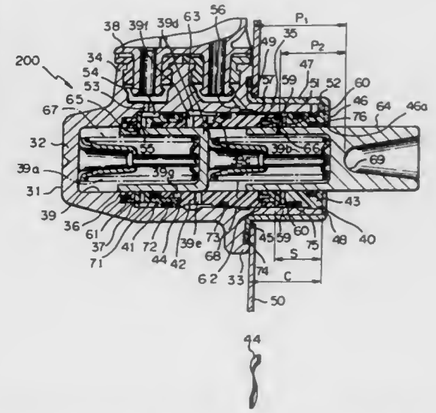
Filed Nov. 16, 1989, Ser. No. 437,435

Claims priority, application Japan, Nov. 18, 1988, 63-291483

Int. Cl.[5] B60T 11/20; F01B 11/02

U.S. Cl. 60—562 6 Claims

1. A master cylinder comprising: a cylinder defining a cylinder bore therein, the cylinder bore extending from an inner portion of the cylinder to one end of the cylinder such that said one end of said cylinder is open, a sleeve fitted to said cylinder within said cylinder bore, a piston slidably disposed in said sleeve, stop means disposed at a predetermined position at said one end of the cylinder and axially immovable from said position relative to said cylinder for abutting said sleeve to prevent the sleeve from coming off said cylinder, said sleeve comprising at least two sleeve members fitted to said cylinder within said cylinder bore in serial alignment in a direction from the inner portion to the open end of said cylinder, a cup seal disposed between two adjacent sleeve members of said at least two sleeve members, and a resilient member forcing the inner sleeve member of said two adjacent sleeve members onto the other sleeve member of said two adjacent sleeve members,



thereby forcing said other sleeve member toward said stop means.

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5,046,316

## TANDEM MASTER CYLINDER WITH FILTERS ARRANGED IN CENTRAL VALVES

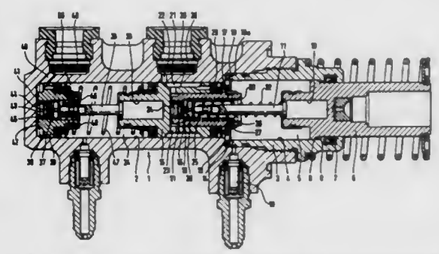
Helmut Steffes, Hattersheim, and Philipp Kilb, Eppstein, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 10, 1990, Ser. No. 566,198

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1989, 3927003

Int. Cl.[5] B60T 11/20, 11/28; F15B 7/08

U.S. Cl. 60—562 6 Claims



1. A tandem master cylinder for a hydraulic brake unit of an automotive vehicle, said tandem master cylinder comprising:

a housing having a longitudinal bore;

a primary piston;

a secondary piston;

a valve accommodating element positioned within said secondary piston and having radial passages through which hydraulic fluid flows;

a first central valve positioned within said valve accommodating element;

a second central valve spaced from said secondary piston and positioned within said longitudinal bore at an end thereof;

filter means for filtering hydraulic fluid flow through said radial passages of said valve accommodating element;

a spring retaining cup sealedly positioned in said valve accommodating element and forming, with said valve ac-

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commodating element, an annular chamber between said spring retaining cup and said valve accommodating element through which hydraulic fluid passes to said first central valve when a brake, to which tandem master cylinder is responsive, is released;

a first stationary stop positioned to control movement of said primary piston;

and a second stationary stop positioned to control movement of said secondary piston.

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**5,046,317**

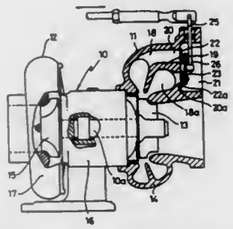
**WASTEGATE VALVE FOR TURBOCHARGER**

**Akira Satokawa, Tokyo, Japan, assignor to Allied-Signal Inc., Morristown, N.J.**

**Filed Mar. 27, 1990, Ser. No. 500,433**

**Int. Cl.[5] F02D *23/00*; F01B *25/02***

**U.S. Cl. 60—602** **11 Claims**



1. Exhaust gas driven turbocharger comprising a housing, a shaft mounted for rotation within said housing and defining a pair of opposite ends, a compressor wheel mounted on one end of the said shaft for compressing ambient air, a turbine wheel mounted on the opposite end of the said shaft and responsive to engine exhaust gases to turn said shaft and thereby turn said compressor wheel, a divided inlet passage for carrying exhaust gases to said turbine wheel, said divided inlet passage defining a pair of inlet passages, an outlet port in each of said passages for communicating each of the latter to ambient atmosphere thereby bypassing said turbine wheel, and a pair of wastegate valve members for closing each of said outlets, a support, a pair of mounting members securing each of said wastegate valve members to said support, an arm member for operating said support and said wastegate valve members, said arm member being pivotally connected to said support to permit shifting of said support relative to said arm to permit said wastegate valve members to close their corresponding outlet openings despite variations between the height of said ports and the pressure of the exhaust gas in said passages.

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**5,046,318**

**TURBINE POWER PLANT AUTOMATIC CONTROL SYSTEM**

**Edward Y. Hwang, Winter Park, and John R. Doyle, Winter Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

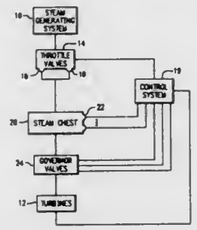
**Filed Mar. 5, 1990, Ser. No. 489,439**

**Int. Cl.[5] F01K *13/02***

**U.S. Cl. 60—646** **3 Claims**

1. A method of controlling a pilot valve of a throttle valve and a governor valve of a steam turbine including a steam chest coupled to the throttle and governor valves, comprising the step of:

(a) overlapping operation of the pilot valve of the throttle valve and the governor valve by lowering the governor valve and opening the pilot valve and thereby partially




pressurizing the steam chest of the turbine and maintaining rolling speed during start up.

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**5,046,319**

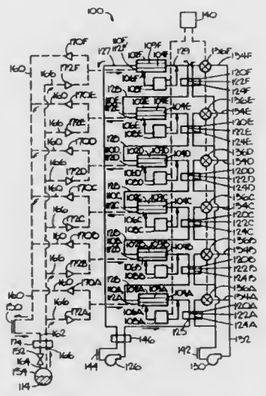
**REGENERATIVE ADSORBENT HEAT PUMP**

**Jack A. Jones, Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.**

**Filed Oct. 16, 1990, Ser. No. 598,525**

**Int. Cl.[5] F17C *11/00***

**U.S. Cl. 62—46.2** **43 Claims**



1. A regenerative sorbent heat pump process for cooling an interior space and for simultaneously regenerating at least a portion of the heat of adsorption comprising:

(a) confining a sorbent in a plurality of compressor zones, the number of compressor zones being at least four;

(b) introducing a working fluid vapor from an evaporation zone into at least one of the number of compressor zones and sorbing the working fluid vapor on the sorbent therein over a predetermined first temperature range and a predetermined first pressure or $P_L$;

(c) desorbing working fluid vapor from the sorbent in at least one of the remaining number of compressor zones and removing working fluid vapor therefrom over a predetermined second temperature range which is higher than the predetermined first temperature range and at a predetermined second pressure or $P_H$ which is higher than the predetermined first pressure, a part of the predetermined first temperature range overlapping a part of the predetermined second temperature range;

(d) condensing working fluid vapor removed from said at least one of the remaining number of the compressor zones at $P_H$ and transferring heat from the working fluid to the environment thereby forming a working fluid liquid;



(e) evaporating the working fluid liquid and forming the working fluid vapor in the evaporation zone at $P_L$ by transferring heat from an interior space to the evaporation zone thereby cooling the interior space;

(f) circulating a heat transfer fluid in series flow through the compressor zones and preventing the heat transfer fluid from directly contacting the sorbent;

(g) removing heat from the heat transfer fluid and transferring it to the environment;

(h) adding heat from a heat source to a predetermined one of the compressor zones over a predetermined period of time;

(i) repeating step (h) sequentially in each of the compressor zones;

(j) indirectly transferring heat from the sorbent in the compressor zones which are sorbing working fluid vapor to the heat transfer fluid and from the heat transfer fluid to the sorbent in the compressor zones which are desorbing working fluid vapor thereby regenerating heat; and,

(k) maintaining the $P_H/P_L$ ratio sufficiently low so that at least a portion of the heat of adsorption is regenerated.

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**5,046,320**

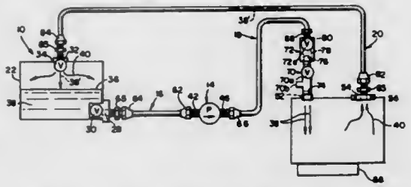
**LIQUID REFRIGERANT TRANSFER METHOD AND SYSTEM**

**George R. Loose, Bridgeton, N.J., and Robert S. Michny, Morris, Pa., assignors to National Refrigeration Products, Plymouth Meeting, Pa.**

**Filed Feb. 9, 1990, Ser. No. 477,681**

**Int. Cl.[5] F25B *45/00***

**U.S. Cl. 62—77** **9 Claims**



1. A method of environmentally safely transferring low-pressure liquid refrigerant between a closed refrigeration system and a transportable, liquid refrigerant storage container, the refrigeration system including a drain valve and drain fitting located below a normal level of liquid refrigerant in the system and a fill valve and fill fitting located above the normal level of liquid refrigerant in the system, the liquid refrigerant storage container including at least two separate fittings providing separate access to the container interior, comprising the steps of:

sealingly coupling a liquid refrigerant pump between the drain fitting and one of the two storage container fittings through drain hosing, the drain hosing including at an end proximal the storage container one of a pair of mating, quick disconnect fittings of a quick disconnect coupling, the drain hosing further including a shut-off valve in the one quick disconnect fitting, the valve closing automatically when the pair of mating quick disconnect fittings are uncoupled, sealingly coupling the remaining one of the two storage container fittings and the refrigeration system fill fitting through vent hosing, and opening the system drain and fill valves;

activating the pump to transfer low-pressure liquid refrigerant from the system through the drain hosing into the storage container;

conducting refrigerant vapor and any liquid refrigerant overflow from the storage container back to the refrigeration system through the vent hosing;

deactivating the pump;

closing the drain hosing valve and disconnecting the drain hosing from the storage container by disconnecting the pair of fittings of the quick disconnect coupling and further disconnecting the vent hosing from the storage container;

coupling the drain hosing and vent hosing with a second storage container and opening the drain hosing valve; and

reactivating the pump to transfer liquid refrigerant from the system into the second storage container.

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**5,046,321**

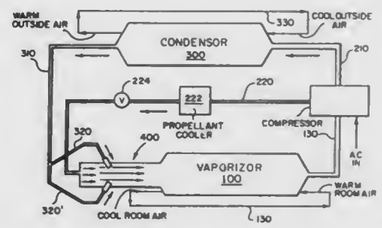
**METHOD AND APPARATUS FOR GAS CONDITIONING BY LOW-TEMPERATURE VAPORIZATION AND COMPRESSION OF REFRIGERANTS, SPECIFICALLY AS APPLIED TO AIR**

**Sherwood F. Webster, Washington, D.C., assignor to Thermotek, Inc.**

**Division of Ser. No. 268,878, Nov. 8, 1988, Pat. No. 4,866,947. This application May 10, 1989, Ser. No. 349,779**

**Int. Cl.[5] F25B *1/08***

**U.S. Cl. 62—116** **1 Claim**




1. A thermodynamic constant volume vapor compression refrigeration method the steps of which are performed within a closed fluid loop having first, intermediate and second treatment stations, comprising:

A) initially injecting a vaporizable liquid refrigerant fluid under high pumping pressure through a first treatment station before evaporation thereof wherein an accelerating propulsion applied to the injected refrigerant fluid is conducted by valve injection under high pressure of a diverted minor portion of refrigerant which has been vaporized and wherein an atomization of the liquid refrigerant fluid is obtained by propelling droplets thereof through a matrix of contiguously disposed screens, at least an upstream screen comprising a coarse mesh of between #30 and #100 mesh and a downstream of #100–#300 mesh and counter-flowing a comparatively warmer fluid under treatment, which said latter fluid is propelled in conduction heat-exchange relation to the refrigerant fluid, while disturbing the laminar flow of the former fluid at no greater than one atmosphere;

B) thereafter compressing the now vaporized refrigerant at an intermediate station, while diverting no greater a measure than 10% thereof to augment propulsion of oncoming liquid refrigerant from a second treatment station through the first treatment station;

C) thence passing a major measure of said compressed refrigerant through a second treatment station under high pumping pressure, wherein said compressed refrigerant is sequentially condensed by reverse evaporation, said com-

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pressed refrigerant being subjected at said second station to external conductive influence of a coolant fluid, said respective coolant and refrigerant being divisively confined in counterflow heat-exchange conduction relation at said second station;

E) repeating the steps aforesaid cyclically.

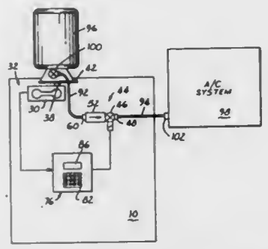
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**5,046,322**

## ELECTRONIC REFRIGERANT TRANSFER SCALE

**Don A. Bulla, Bryan; Byron J. Dunham, Sherwood, and Gary P. Murray, Montpelier, all of Ohio, assignors to Kent-Moore Corporation, Warren, Mich.**

**Filed May 8, 1989, Ser. No. 348,555**
**Int. Cl.[5] F25B *49/00***
**U.S. Cl. 62—126** **11 Claims**




1. An electronic scale assembly for transferring refrigerant charge between a tank and refrigeration equipment that comprises:

an enclosure including handle means positioned along one side edge of said enclosure for manually transporting said enclosure, and a cover for selectively opening and closing said enclosure.

a scale including a platform mounted within said enclosure at a position to support a refrigerant tank when said cover is disposed to open said enclosure, and means for providing an electrical signal as a function of weight supported by said platform.

a transfer valve and means including hose fittings for connecting said transfer valve between a tank mounted on said scale and refrigeration equipment for selectively transferring refrigerant between the tank and equipment through said valve, and

electronic control means responsive to said electrical signal for indicating weight of refrigerant transferred through said transfer valve,

said enclosure comprising an open rectangular base, means mounting said scale, and said transfer valve, said electronic control means and said indicating means within said base, said cover being open and rectangular, hinge means interconnecting said cover and said base, and latch means for selectively fastening said cover in a closed function to said base,

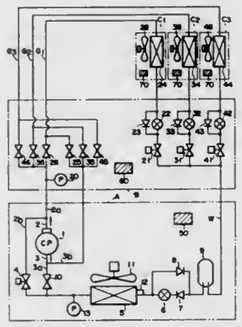
said electronic control means comprising a microprocessor-based controller and an alphanumeric keypad for operator entry of information into said controller, and said mounting means comprising a panel enclosing said scale, said controller and said transfer valve within said base with said keypad and said indicating means being carried in exposed position on said panel, with said scale platform being positioned above said panel, and with said fittings protruding through apertures in said panel for connecting said transfer valve to refrigerant hoses.

**5,046,323**

## MULTI-SYSTEM AIR CONDITIONER

**Eiji Kuwahara, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 2, 1990, Ser. No. 546,885**
**Claims priority, application Japan, Jul. 3, 1989, 1-171405**
**Int. Cl.[5] F25D *21/02, 21/06***
**U.S. Cl. 62—140** **9 Claims**



1. A multi-system air conditioner comprising:

an outdoor unit including a compressor for sucking a refrigerant, compressing it and delivering it and an outdoor heat exchanger for allowing an exchange of a heat of an incoming refrigerant and a heat of outdoor air;

a plurality of indoor units each including an indoor heat exchanger for allowing an exchange of a heat of an incoming refrigerant and a heat of indoor air and requesting either one of a cooling operation mode and cooling power level and a heating operation mode and heating power level;

means for determining a cooling operation mode when a total of a cooling power level or levels requested from one or more indoor units is greater than a total of a heating power level or levels requested from one or more remaining indoor units;

means for enabling the refrigerant which is delivered from the compressor to pass through the outdoor heat exchanger, when the cooling operation mode is determined, and to be returned back to the compressor through one or more indoor units calling for the cooling operation mode;

means for enabling a stream of the refrigerant which is delivered from the compressor to pass through one or more indoor units calling for the heating operation mode, when the cooling operation mode is determined, and to enter the stream of the refrigerant flowing into one or more indoor units calling for the cooling operation mode;

means for determining the heating operation mode when a total of a heating power level or levels requested from one or more indoor units is greater than a total of a cooling power level or levels requested from one or more remaining indoor units;

means for enabling the refrigerant which is delivered from the compressor to pass through one or more indoor units calling for the heating operation mode, when the heating operation mode is determined, and to be returned back to the compressor via the outdoor heat exchanger;

means for enabling one stream of the refrigerant which passes through one or more indoor units calling for the heating operation mode to flow through one or more indoor units calling for the cooling operation mode, when the heating mode is determined, and to be returned back to the compressor;

means for setting a defrost mode, as required, when the heating operation mode is determined;

means for enabling the refrigerant which is delivered from the compressor to pass through one or more indoor units calling for the heating operation mode, when the defrost mode is set, and to be returned back to the compressor through one or more indoor units calling for the cooling operation mode;

means for enabling one stream of the refrigerant which is delivered from the compressor to pass through the outdoor heat exchanger, when the defrost mode is set, and to enter the stream of the refrigerant flowing into one or more indoor units calling for the cooling operation mode;

first pressure control means for maintaining, at a preset level, a pressure prevalent in one or more indoor units calling for the heating operation mode, when the defrost mode is set; and

second pressure control means for maintaining, at a preset level, a pressure prevalent in the refrigerant flowing into the outdoor heat exchanger, when the defrost mode is set.



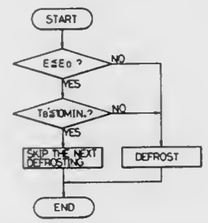
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**5,046,324**

## DEFROSTING CONTROLLER FOR REFRIGERATION SYSTEMS

**Tadao Otoh, Ohta; Yoshihisa Ishida; Satoshi Obya, both of Gunma, and Masaki Ishiguro, Ohta, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Jun. 20, 1990, Ser. No. 541,886**
**Int. Cl.[5] F25D *21/06***
**U.S. Cl. 62—155** **2 Claims**




1. A defrosting controller for refrigeration systems, comprising:

a compressor;

a condenser;

an evaporator;

an electronic motor-driven valve for regulating the flow rate of the refrigerant to be supplied to the evaporator;

an evaporator temeperature sensor provided for detecting the temperature of the evaporator; and

a controller for providing control signals for controlling the electronic motor-driven valve based on the measurement with the evaporator temperature sensor and providing defrosting signals as needed,

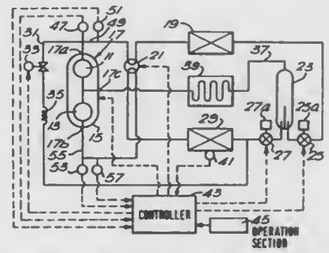
wherein the controller has a decision means for deciding whether the next defrosting operation be skipped or not, based on the refrigerating operation rate determined by the frost melting period measured with the evaporator temperature sensor during defrosting and by the ratio of the (total) period of the electronic motor-driven valve open in a refrigeration period to the refrigeration period.

**5,046,325**

## REFRIGERATING CIRCUIT APPARATUS WITH TWO STAGE COMPRESSOR AND HEAT STORAGE TANK

**Eiji Kuwahara, Shizuoka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 318,792, Mar. 3, 1989, Pat. No. 4,962,647.**
**This application Aug. 7, 1990, Ser. No. 563,612**
**Claims priority, application Japan, Jun. 30, 1988, 63-160780**
**Int. Cl.[5] F25D *21/06;* F25B *47/02***
**U.S. Cl. 62—156** **14 Claims**




1. A refrigerating circuit apparatus comprising:

two stage compressing means including a lower stage compressor element and an upper stage compressor element connected in series for compressing refrigerant, each compressor element respectively having an input port and output port, the output port of the lower stage compressor element being in communication with the input port of the upper stage compressor element, the two stage compressing means having an intermediate port communicating with the output port of the lower stage compressor element and the input port of the upper stage compressor element;

liquid separation means for separating liquid and gaseous refrigerant, the liquid separation means including an inlet port, an outlet port and intermediate port;

upper stage side variable opening valve means disposed in-line between the output port of the upper stage compressor element and the input of the liquid separation means for controlling the flow amount of refrigerant exiting the output port of the upper stage compressor element between a fully open position and a fully closed position;

lower stage side variable opening valve means disposed in-line between the output port of the liquid separation means and the input port of the lower stage compressor element for controlling the flow amount of refrigerant into the input port of the lower stage compressor element between a fully open position and a fully closed position;

heat storage means, disposed in-line between the intermediate port of the two stage compressor means and the intermediate port of the liquid separation means, for storing heat therein from the refrigerant or for discharging heat therefrom to the refrigerant;

heat-exchange means, disposed in-line between the lower stage side variable opening means and the input port of the lower stage compressor element, for exchanging heat with refrigerant, the heat-exchange means including an external heat-exchanger subject to accumulation of frost thereon;

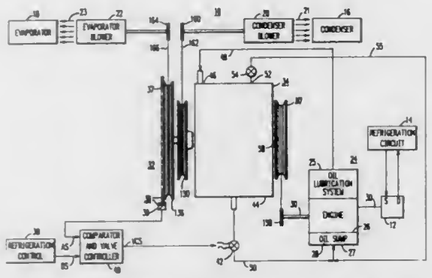
bypass pipe means, disposed between the output port of the upper stage compressor element and the output port of the liquid separation means, for bypassing a selected amount of refrigerant from the output port of the upper stage compressor element to the external heat-exchanger; and

means for controlling the bypass pipe means and for controlling the lower stage side variable opening valve means for carrying out a defrost operation wherein refrigerant flows from the upper stage side variable opening valve means to the intermediate port of the two stage compressing means

through the heat storage means to absorb heat into the refrigerant from the heat storage means, and refrigerant flows from the output port of the upper stage compressor element to the external heat-exchanger through the bypass pipe means to discharge absorbed heat from the refrigerant to the external heat-exchanger thereby removing frost accumulated on the external heat-exchanger.

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**5,046,326**
**TRANSPORT REFRIGERATION SYSTEM**
**Robert K. Havemann, and Loyal V. Pittman, both of Bloomington, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.**
**Filed Oct. 24, 1990, Ser. No. 603,033**
**Int. Cl.[5] F25D *17/06*; F25B *27/00*; F16D *33/06***
**U.S. Cl. 62—180** **11 Claims**

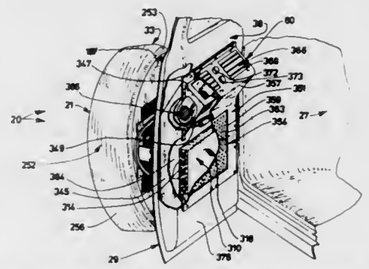


1. A transport refrigeration system having an evaporator, an evaporator blower, a condenser, a condenser blower, and a refrigerant compressor driven by an internal combustion engine, with the internal combustion engine having an output shaft, a pressurized oil lubrication system and a crankcase having an oil sump, the improvement comprising:
a variable speed drive for the evaporator blower which includes an input shaft, a fluid coupling, a first output shaft, and a second output shaft concentric with the first output shaft,
said input shaft being connected to the output shaft of the internal combustion engine,
said fluid coupling including an impeller connected to said input shaft, a turbine connected to said first output shaft, a housing surrounding said impeller and turbine, an oil inlet on said housing, and an oil outlet on said housing,
said first coupling being connected to receive oil from the oil lubrication system of the internal combustion engine via said oil inlet, and to return oil to the oil sump via said oil outlet,
said first output shaft being connected to the evaporator blower,
and said second output shaft being connected to the condenser blower.

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**5,046,327**
**AIR CONDITIONER CONVERSION KITS FOR VANS AND RECREATIONAL VEHICLES**
**Steve A. Walker, 1713 Delano, Malvern, Ark. 72104, and Wayne S. Reese, 6400 E. Bradley Dr., Haltom City, Tex. 78117**
**Filed Jul. 17, 1990, Ser. No. 553,398**
**Int. Cl.[5] B60H *1/32***
**U.S. Cl. 62—244** **12 Claims**

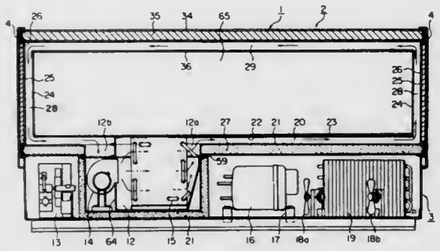
1. An air conditioning system for vehicles, said system comprising:
compressor means for compressing gaseous refrigerant;
condenser means for cooling gaseous refrigerant received from said compressor means to provide liquid refrigerant;
fan means for cooling said condenser means;
Continental kit housing means for mounting said compressor means, said condenser means, and said fan means externally of said vehicle in a generally circular configuration;
evaporator means disposed within said vehicle for cooling



air, said evaporator means interconnected with said kit means; and,
means for mounting said evaporator means within a door or panel of said vehicle.

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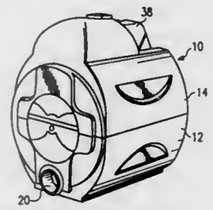
**5,046,328**
**REFRIGERATION APPARATUS WITH ARTICLE PRESERVING AND DISPLAYING CHAMBER**
**Akiyoshi Yoshida; Junichi Tosaki, and Yuji Wakatuki, all of Toyoake, Japan, assignors to Hoshizaki Electric Co., Ltd., Toyoake, Japan**
**Filed Mar. 1, 1990, Ser. No. 486,973**
**Int. Cl.[5] A47F *3/04***
**U.S. Cl. 62—248** **21 Claims**



1. A refrigeration apparatus comprising:
a machine chamber accommodating therein at least a compressor and a condenser;
a display chamber for accommodating therein articles to be displayed, said display chamber being constituted by an inner box, and an outer box;
coolant passage means defined between said inner and outer boxes;
a cooler chamber defined within said machine chamber and substantially enclosed by a heat insulating material so as to be in communication only with said coolant passage means, said cooler chamber containing therein a cooler and cooling air circulating means for cooling air in said cooler chamber and circulating the cooled air only through said coolant passage means and back to said cooler chamber without flow communication through said display chamber; and wherein
a partitioning plate provided at a portion of a return passage for said cooling air passage means divides said return passage into a subpassage on the side of said outer box and an auxiliary coolant circulating passage on the side of said inner box.



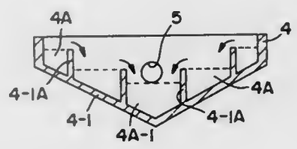
**5,046,329**
**PORTABLE AIR CONDITIONING UNIT**
**John P. Travis, III, 8820 Southwestern Blvd., #1109, Dallas, Tex. 75206**
**Filed May 26, 1989, Ser. No. 358,553**
**Int. Cl.[5] F25D *23/12***
**U.S. Cl. 62—259.3** **4 Claims**



1. A portable cooling unit, comprising:
a case defining a passage therethrough opening to the ambient air at an inlet and an outlet;
a first cold object having a temperature less than the temperature of the ambient air positioned in the passage;
a second cold object having a temperature less than the temperature of the ambient air positioned in the passage;
the passage being configured so that air flowing through the passage from the inlet first passes the first cold object and subsequently passes the second cold object;
a fan to force ambient air through the passage from the inlet, past the cold objects and from the outlet; and
first, second and third cold objects, and at least four aluminum baffles mounted in the case to define the passage, the air flow passing over each of the cold objects sequentially, the aluminum baffles assisting the cooling of the air by conduction and convection.

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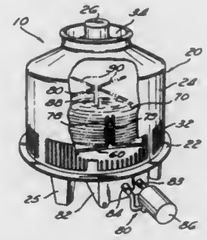
**5,046,330**
**REFRIGERATOR HUMIDIFIER WITH TERRACED CONDENSATE COLLECTION TRAY**
**Sang-Uk Kim, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**
**Filed Sep. 14, 1989, Ser. No. 407,139**
**Claims priority, application Rep. of Korea, Sep. 14, 1988, 88-15151**
**Int. Cl.[5] F25D *21/14***
**U.S. Cl. 62—289** **6 Claims**



1. A refrigerator, comprised of:
a door;
a plurality of walls forming a chamber having an interior wall, said chamber being tightly closed by said door;
an evaporator mounted on and spaced apart from said interior wall;
means disposed beneath said evaporator, for collecting water dripping from said evaporator, said collecting means providing a plurality of successively adjoining chambers each open to receive the water, with said plurality of chambers sharing common dividing means for enabling some of the water from an upper chamber to flow into a lower adjoining chamber while retaining other of the water within the upper chamber, a lowermost one of said chambers containing an overflow conduit communicating through one of said plurality of walls with an orifice spaced vertically above a lowermost depth of said lowermost one of said chambers;
said collecting means comprising a hopper divided into a serial arrangement of said plurality of chambers each open to receive the water dripping from said evaporator, with a central and lowermost one of said chambers separating a plurality of other ones of said chambers arranged in ascending heights on opposite sides of said central one of said chambers, in terraces disposed for each one of said chambers to retain some of the water received and to enable excess of the water received in the other ones of said chambers in the terraces overflow and drain successively, thereby maintaining within said chambers of the hopper some of water collected.

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**5,046,331**
**EVAPORATIVE CONDENSER**
**Robert G. O'Neal, and Kenneth E. Vogel, both of Yuma, Ariz., assignors to Russell A Division of Ardco, Inc., Brea, Calif.**
**Filed Jul. 25, 1989, Ser. No. 384,839**
**Int. Cl.[5] F28D *5/00***
**U.S. Cl. 62—304** **20 Claims**



1. An evaporative condenser, comprising:
a housing having an air inlet port and an air outlet port;
a condensing coil having a conically stressed planar spiral configuration wherein said spiral includes an inlet port and an outlet port;
a fluid distribution system adapted to disperse a fluid on said condensing coil; and
a carriage adapted to receive said coil, said carriage including a central core, said core adapted to be received within an inner periphery of said condensing coil, and a plurality of spokes extending from said core.

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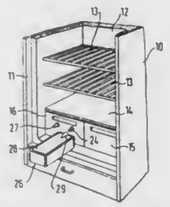
**5,046,332**
**REFRIGERATION UNIT, IN PARTICULAR A REFRIGERATOR OR THE LIKE**
**Franz Herrmann, Olaz/Navarra, Spain; Udo Wenning, and Theo Haftlmeier, both of Giengen, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Munich, Fed. Rep. of Germany**
**Filed Jul. 25, 1990, Ser. No. 557,633**
**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 3924589**
**Int. Cl.[5] F25D *3/12***
**U.S. Cl. 62—388** **10 Claims**

1. A refrigerator with a storage space, comprising at least one container at least partially occupying the storage space for storing perishables; a pressure-proof closure and a valve device associated with said container for closing said container in a pressure-proof manner; a device for partially evacuating a remaining air volume surrounding the perishables in said at

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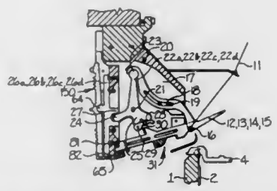
least one container for lowering the pressure prevailing in said at least one container; and a device for filling said at least one



container with a gas atmiosphere for increasing the storage life of the stored perishables.

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**5,046,333**
**YARN CHANGING APPARATUS FOR CIRCULAR KNITTING MACHINE**
**Masatoshi Sawazaki, and Hiroyuki Ueda, both of Hyogo, Japan, assignors to Precision Fukuhara Works, Ltd., Hyogo, Japan**
**Filed May 14, 1990, Ser. No. 522,729**
**Claims priority, application Japan, Jul. 5, 1989, 1-175243**
**Int. Cl.[5] D04B** *15/61*
**U.S. Cl. 66—140 R** **3 Claims**



**1**. A yarn changing apparatus for a multi-feed circular knitting machine having a plurality of individual yarn feed fingers arranged adjacent to each other and selectively moveable to an operative position wherein yarn feeding to a needle is performed and a nonoperative position wherein yarn feeding is terminated and comprising

(a) lever arm means being operatively connected to said yarn feeding fingers,

(b) vertically moveable sliders operatively connected to said lever arm means and slidable between raised and lowered positions to move said lever arm means and yarn feeding fingers connected thereto so as to place said yarn feeding fingers in operative and nonoperative positions,

(c) vertically moveable rocking jacks pivotally connected to said sliders, each rocking jack having respective upper and lower selection butts, guide butts and cancelling butts,

(d) remotely programmed selection unit means being rotatable synchronously with the needle cylinder around the axis of the knitting machine and being operative with said rocking jacks for aiding in moving said lever arm means and said connected yard feeding fingers between operative and nonoperative positions, said selection unit means including selection means engageable with respective selection butts for pivoting said rocking jacks, and upper and lower electromagnetic block units positioned adjacent said selection means and each being individually and selectively energizable by instructions generated from an information program, said upper electromagnetic block unit being operable for moving said selection means into engagement with upper selection butts for pivotably moving said rocking jack lower end inward, said lower electromagnetic block unit being operable for moving said selection means into engagement with lower selection butts for pivotably moving said rocking jack upper end inward,

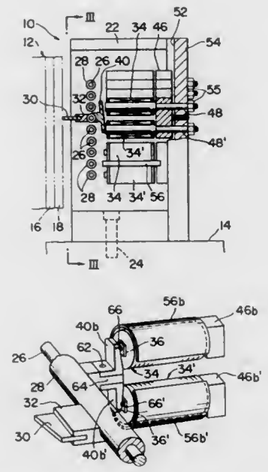
(e) raising cam means engageable with said lower cancelling butts when said lower end is pivoted inward for raising said rocking jack, and

(f) lowering cam means engageable with said upper cancelling butts when said upper end is pivoted inward for lowering said rocking jack,

wherein selective controlled movement of said selection means by selective energization of said upper and lower electromagnetic block units provides selective pivotable movement of said rocking jacks to pivotably move said cancelling butts into engagement with either said raising or lowering cam means so as to move said yarn feeding fingers into either operative or nonoperative positions.

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**5,046,334**
**ELECTROMAGNETIC NEEDLE SELECTOR FOR CIRCULAR KNITTING MACHINES**
**Kakuji Maruyama, and Buichi Oda, both of Bunsui, Japan, assignors to Nagata Seiki Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 239,591, Sep. 1, 1988, Pat. No. 4,972,686.**
**This application May 24, 1990, Ser. No. 528,841**
**Claims priority, application Japan, Oct. 7, 1987, 62-153607; Oct. 8, 1987, 62-154200; Dec. 22, 1987, 62-194389**
**Int. Cl.[5] D04B** *9/26, 15/78*
**U.S. Cl. 66—221** **7 Claims**



**1**. An electromagnetic needle selector for circular knitting machines, comprising:

(a) a knitting cylinder rotatable about an axis extending vertically;

(b) a multiciplicity of needle jacks mounted to the knitting cylinder for independent vertical displacement;

(c) fixed frame means adjacent to the knitting cylinder;

(d) a plurality of horizontal shafts mounted to the frame means and disposed in parallel spaced relation to one another in a plane parallel to the axis of the knitting cylinder;

(e) a plurality of sleeves rotatably fitted one over each fixed shaft;

(f) a plurality of selector fingers secured one to each sleeve and all aligned vertically, the selector fingers being capable of selective engagement with the jacks on the knitting cylinder;

(g) a plurality of pairs of electromagnet assemblies immovably supported by the frame means in opposed relation to the respective sleeves on the shafts, with each pair of electromagnet assemblies positioned side by side vertically, each of the electromagnet assemblies comprising a magnetic core having a pair of opposite ends, and a coil wound on the magnetic core;

(h) a plurality of armatures secured one to each sleeve and disposed one opposite each pair of electromagnet assemblies so as to be alternately attracted by one ends of the magnetic cores, with the consequent bidirectional rotation of the sleeves on the fixed shafts, and

(i) means for forming a closed magnetic circuit for each electromagnet assembly in action together with one associated armature when the electromagnet assembly is being energized, said closed magnetic circuit forming means comprising;

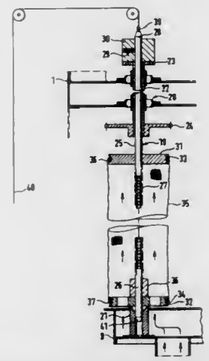
(j) a pair of end blocks of magnetic material in contact respectively with the other ends of the cores of each pair of electromagnet assembly; and

(k) a pair of substantially tubular members of magnetic material each encircling approximately half the circumference of the coil of one electromagnet assembly, each substantially tubular member being coupled at one end to one associated end block and having another end disposed adjacent to one associated armature.



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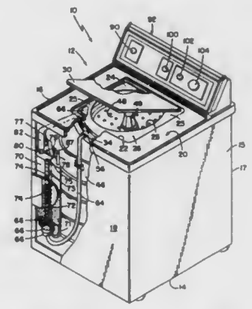
**5,046,335**
**TUNNEL FINISHER WITH AIR ROLLERS**
**Gunther Riba, Rosenbergstrasse 26, D-5455 Hardert, Fed. Rep. of Germany**
**Continuation of Ser. No. 328,224, Feb. 14, 1989, abandoned.**
**This application Feb. 19, 1991, Ser. No. 657,276**
**Claims priority, application Fed. Rep. of Germany, Jun. 22, 1987, 3720581**
**Int. Cl.[5] D06F** *61/06;* **D06B** *3/30, 23/02, 23/18*
**U.S. Cl. 68—5 C** **8 Claims**



**1**. A tunnel finisher with air rollers for restricting the inlet or outlet, respectively, of a clothing processing area of the tunnel finisher, the air rollers having a substantially cylindrical envelope-shaped jacket having a bottom and top region and a bottom and top disk arranged in the respective region of the jacket, the jacket being placed around the edges of the disks, and an axis between both disks, the axis extending in substantially vertical direction and having its upper end supported in an upper bearing and its lower end supported in a lower bearing, further comprising means for supporting the air rollers and a flexible non-rigid section in a region between both disks of the axis, so that one end of the axis can be removed from the corresponding bearings permitting the jacket to be replaced via the removed free end.

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**5,046,336**
**BATTERY POWERED DISPENSER**
**Christopher Ferguson, Framingham, and Joseph R. Adamski, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.**
**Continuation of Ser. No. 458,109, Dec. 28, 1989, abandoned.**
**This application Nov. 9, 1990, Ser. No. 610,740**
**Int. Cl.[5] D06F** *39/02*
**U.S. Cl. 68—17 R** **7 Claims**



**1**. A clothes washing machine comprising:

a cabinet;

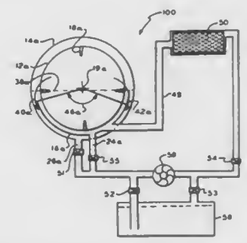
tub means including a spin tub rotatably disposed within a stationary drain tub for processing a wash load in said cabinet;

an additive liquid dispensing means disposed in said cabinet for providing an injection of additive liquid into said wash load, said dispensing means including an electrical battery for serving as a source of direct current in the operation of said dispensing means; and

said spin tub being rotated from a source of alternating current.

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**5,046,337**
**CLOTHES WASHER AND DRY CLEANER**
**Abraham E. Ro, 45 Deerfield Rd., Whippany, N.J. 07981**
**Filed Feb. 22, 1990, Ser. No. 483,452**
**Int. Cl.[5] D06F** *39/08*
**U.S. Cl. 68—18 F** **8 Claims**



**1**. A clothes washer or dry cleaner device comprising:

an outer casing having and axis;

an inner perforated drum rotatable relative to the outer casing about the axis;

a middle cylinder portion, disposed radially between the outer casing and the inner perforated drum;

fluid supply means for filling the middle cylinder portion with fluid and for overflow of the fluid therefrom;

passage means for draining the overflow fluid from the middle cylinder portion to the outer casing; and

fluid drainage means for draining the overflow fluid from

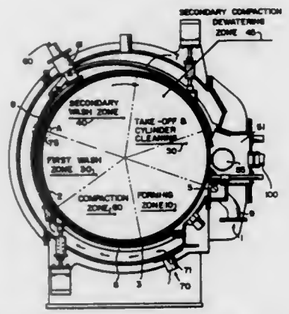
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the outer casing, wherein the inner perforated drum has a plurality of inner vanes; and wherein the inner perforated drum has a plurality of perforations; and wherein the inner perforated drum has a drive means connected thereto; wherein the outer casing has a drain hole, and wherein the outer casing drain hole is connected to a shutoff valve having an actuating air cylinder with two air lines; and wherein the shutoff valve is connected to a drain tank having a lint trap basket.

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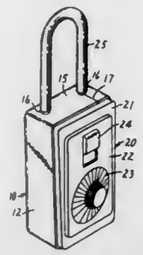
**5,046,338**
**MULTIPHASE PULP WASHER**
**Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.**
**Filed Jun. 13, 1990, Ser. No. 537,249**
**Int. Cl.[5] D21C *1/02***
U.S. Cl. 68—43 **9 Claims**




1. A multiphase pulp washer comprising:
a generally drum shaped rotatable filter having segregated low-volume interior deck filtrate drainage channels;
means for rotating said drum shaped filter about its axis;
means for feeding pulp, at 4% to 6% consistency, to the filter surface to form a pulp mat;
means for pressing the pulp mat on the filter surface to increase the consistency thereof by more than 150% and to thereby decrease the required volume of wash liquor;
at least two wash phases; and
one wash liquor supply pump means for each wash phase for maintaining uniform constant fluid pressure about the entire circumference of said drum shaped filter.

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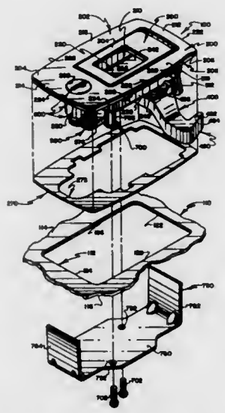
**5,046,339**
**PROTECTIVE COVER FOR KEY SAFE**
**Darrnell D. Krell, 12087 Evergreen St., Coon Rapids, Minn. 55433**
**Filed Apr. 8, 1987, Ser. No. 35,873**
**Int. Cl.[5] E05B *67/38***
U.S. Cl. 70—55 **8 Claims**




1. A jacket for mounting on and protectively covering the back and sides of a key safe while leaving the front of the key safe exposed, said key safe comprising a hollow metal body having a removable front panel normally closed with a lock to control access to the hollow interior of the body, said interior being adapted to receive and contain a key that opens a lock, a 2-legged U-shaped shackle extending from one end of the key safe to permit attachment to door knobs, handles, and the like, said jacket being in the form of a unitary open shallow box having a back panel, two end panels, and two side panels, the interior dimensions of said jacket corresponding to the exterior dimensions of the back, ends, and sides of the key safe on which it is to be mounted, one of the end panels being provided with two small spaced holes to accommodate the two legs of the shackle of the key safe, said jacket being capable of retaining its shape prior to being applied to the key safe and formed of light weight flexible, resiliently stretchable, compressible, shock-absorbing polymeric material, whereby a key safe fitted with said jacket is prevented from damaging surfaces with which the key safe body would otherwise contact when in use.

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**5,046,340**
**LATCH AND LOCK ASSEMBLIES WITH SPRING-BIASED PIVOT BOLTS**
**Lee S. Weinerman, Medina; David F. Worden, Brookpark, both of Ohio; Norman Lauterbach, Ormond Beach, Fla., and Wilton T. Farmer, Jr., Mechanicsville, Va., assignors to The Eastern Company, Cleveland, Ohio**
**Continuation-in-part of Ser. No. 327,545, Mar. 23, 1989, Pat. No. 4,969,916, which is a continuation-in-part of Ser. No. 72,174, Jul. 10, 1987, Pat. No. 4,850,208, which is a continuation-in-part of Ser. No. 859,194, Apr. 28, 1986, Pat. No. 4,683,736, which is a continuation-in-part of Ser. No. 601,648, Apr. 18, 1984, abandoned. This application Jul. 17, 1990, Ser. No. 554,331**
**The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.**
**Int. Cl.[5] E05B *13/10***
U.S. Cl. 70—208 **28 Claims**

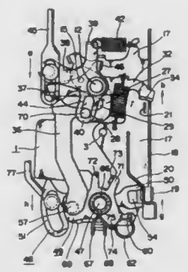


1. A flush-mountable latch, comprising:
a) housing means including a pan-shaped housing having a front wall, and having recess-defining wall formations that define a forwardly facing recess, with portions of the front wall forming a mounting flange that surrounds the recess;
b) the housing being formed as a rigid, one-piece molded structure, with the recess-defining wall formations including a substantially continuous sidewall that extends perimetrically about a back wall that is located at the rear of the recess, and with the back wall defining a rearwardly facing mounting surface that extends between first and second opposed portions of the sidewall;
c) fastener means rigidly connected to the back wall, including first and second post-like fasteners that are rigidly, connected to the back wall at first and second spaced locations near the first and second opposed portions of the sidewall, with the first and second post-like fasteners extending rearwardly from the mounting surface along a first axis and a second axis, respectively;
d) handle means including a handle that resides in the recess, that is connected to the housing, and that is movable relative to the housing between a normal, non-operated position and an operated position;
e) opening means formed through the recess-defining wall formations of the housing to establish a path of communication between the forwardly facing recess and a region that is located behind the back wall;
f) handle-connected means extending through the opening means and along said path of communication for connecting to the handle to a part of the handle-connected means that resides in said region located behind the back wall and that moves within said region along a first path of travel in response to movement of the handle between its non-operated and operated positions;
g) latch bolt means including an elongate latch bolt having a central region that extends between a first end region and a second end region, with the first end region being pivotally connected to the first post-like fastener for mounting the latch bolt on the housing for pivotal movement about said first axis, with the central region extending in a side-to-side direction across a portion of the back wall and having first portions thereof that extend beyond said first opposed portion of the sidewall for joining with the second end region, and with the second end region defining a hook-shaped formation for releasably latchingly engaging a suitably configured striker formation, whereby the latch bolt is pivotally movable relative to the housing as by pivoting the latch bolt about said first axis to move selected portions of the central region along a second path of travel as the latch bolt is moved between a latched position and an unlatched position;
h) operating means including:
i) an operating arm that has an elongate portion, with mounting formation means provided thereon for pivotally connecting the operating arm to said first post-like fastener for mounting the operating arm on the housing for pivotal movement about said first axis, and with drive formation means provided thereon at a location that is spaced from the location of the mounting formation means, whereby the drive formation means is caused to move about said first axis as the operating arm is pivoted about said first axis;
ii) said drive formation means including structure that is positioned along both of the first and second paths of travel for:
A) being interposed between the handle-connected means and the latch bolt means so as to transmit driving force directly from the handle-connected means through said structure to the latch bolt means so as to effect movement of the latch bolt means from its latched position to its unlatched position in response to movement of the handle from its non-operated position to its operated position; and,
B) being positioned by the operating arm at one end of said second path of travel when the operating arm is in its normal position so as to normally not obstruct said second path of travel and to thereby permit pivotal movement of the latch bolt means about said first axis as may be needed to enable the hook-shaped end region of the latch bolt to be "slammed" into latching engagement with said suitably configured striker formation but without causing movement of the operating arm that would, in turn, cause the handle means to move out of its non-operated position as the hook-shaped end region is "slammed" into latching engagement with said striker formation; and,
i) biasing means interposed between the latch bolt and the housing for biasing the latch bolt about the first axis in a direction extending away from the unlatched position toward the latched position.



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**5,046,341**
**CAR LOCKING DEVICE**
**Yozo Ogino, 1200 Nishiwari Shimojo, Okusamachi Nirasaki-shi, Yamanashi-ken; Kazuo Ogawa, 518-38 Higashinagaoka, and Naoyoshi Morita, 115-1 Shimokobayashi, both of Oota-shi, Gunma-ken, all of Japan**
**Filed Jan. 10, 1990, Ser. No. 463,200**
**Claims priority, application Japan, Jan. 19, 1989, 1-10625**
**Int. Cl.[5] E05B *53/00***
U.S. Cl. 70—264 **4 Claims**



1. A car locking device, which is composed of a latch to be engaged with a striker fixed on a car body, a ratchet for preventing the reversal of said latch, an intermediate lever connected with said ratchet, an opening lever for turning said intermediate lever for disengaging said ratchet from said latch, a locking lever for changing over said intermediate lever and said opening lever between an engaged state (unlocked state) and a disengaged state (locked state), a change-over lever connected to the key device of a door in order to selectively and rotationally move said locking lever between the locking position and the unlocking position, and a switch to be turned "ON" when said change-over lever is excessively turned beyond the unlocking position, whereby when said switch is turned "ON", the locking devices of other doors are interlocked so as to be set into the unlocked state, comprising said change-over lever divided into a first change-over lever and a second change-over lever, said key device connected to the first change-over lever, and said locking lever connected to the second change-over lever, so that both said first and second change-over levers may be rotationally moved by key operation between the locking position and the unlocking position but so that in the case of the excessive turning beyond the unlocking position, said first change-over lever only may be rotationally moved.

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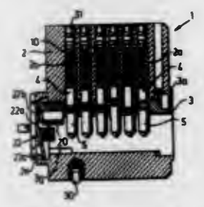
**5,046,342**
**CYLINDER LOCK**
**Lars Urby, Eskilstuna, Sweden, assignor to ASSA AB, Eskilstuna, Sweden**
**PCT No. PCT/SE89/00093, § 371 Date Aug. 22, 1990, § 102(e) Date Aug. 22, 1990, PCT Pub. No. WO89/08761, PCT Pub. Date Sep. 21, 1989**
**PCT Filed Mar. 2, 1989, Ser. No. 566,394**
**Claims priority, application Sweden, Mar. 8, 1988, 8800818**
**Int. Cl.[5] E05B *35/08***
U.S. Cl. 70—337 **21 Claims**

1. A cylinder lock provided with a plug or cylinder (3) which is mounted for rotation in a plug housing (2) and which is provided with a keyway (3c) and a row of pin-channels (3a)

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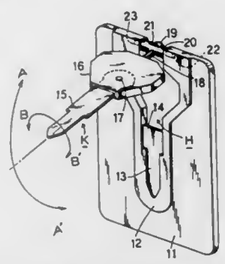
accommodating pins (5) for co-action with at least two rows of pin-channels (2a; 2b) which accommodate spring-biased pins (4; 4', 6) in the plug housing (2), namely a first row of pin-channels (2a) corresponding to a standard plug mode position, in which a standard key (8) can be inserted and the plug (3) turned, and a second row of pin-channels (2b) located at an angle to the first row and corresponding to a service plug mode, one or more of which pin-channels (2b) in said second row accommodating intermediate pins (6) in addition to upper pins (4'), characterized in that the plug (3) is so arranged as to be movable axially through a distance which is smaller than a



pin radius from an initial position (I) to a position of displacement (II) subsequent to insertion of a standard key (8) with the lock in its standard mode or subsequent to inserting a service key (9) with the lock in its service mode, the pin-channels (3a) of the plug (3) in the last mentioned position of plug displacement (II) being out of register with pin-channels (2a, 2b) located in the plug housing, so that an intermediate pin (6), irrespective of the position of said intermediate pin in a channel (2a, 2b) belonging to the plug housing (2) or the plug (3), subsequent to the insertion of a key, will remain in said channel, at least until the plug is moved axially to the initial position (I).

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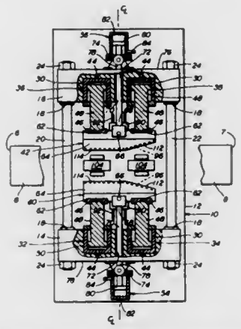
**5,046,343**
**INSERT-MOLDED CARD KEY**
**Takao Miwa, Tokyo, Japan, assignor to Fuki Company Ltd., Tokyo, Japan**
**Filed Sep. 20, 1989, Ser. No. 410,105**
**Claims priority, application Japan, Sep. 26, 1988, 63-124770[U]**
**Int. Cl.[5] A47G *29/10***
**U.S. Cl. 70—408** **6 Claims**



1. An insert-molded card key comprising:
a planar card body formed of molded resin and having a key-shaped recess lying in the plane of the card body;
a key having a storage position in the key-shaped recess, the key having a plane lying in the plane of the card body in the storage position and having a major axis, the key comprising a grip member made of molded resin and a key body made of metal and integrally insert-molded with and at least partially in the grip member so that the grip member is fixedly connected to the key body; and
connecting means connected between the grip member and the card body, said connecting means permitting the key to be moved into a use position out of the plane of the card body and out of the key-shaped recess, the connecting means further permitting rotation of the key about the major axis of the key, the connecting means comprising a C-shaped member connected to the grip member and movably connected to the card body.

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**5,046,344**
**APPARATUS FOR SIZING A WORKPIECE**
**Vladimir B. Ginzburg, Pittsburgh; Robert H. Ellis, Oakmont, and Herbert Lemper, McMurray, all of Pa., assignors to United Engineering, Inc. and International Rolling Mill Consultants, Inc., both of Pittsburgh, Pa.**
**Filed Jan. 19, 1990, Ser. No. 467,802**
**Int. Cl.[5] B21J *7/02***
**U.S. Cl. 72—20** **20 Claims**



1. A sizing press for reducing a width dimension of a metal workpiece, said sizing press comprising:
a. a pair of generally axially opposed pressing tools rotatably supported on said sizing press, each pressing tool including a first workpiece-contacting surface and an adjacent second workpiece-containing surface, said first surface and said second surface extending outwardly and rearwardly thereby positioning said first surface and said second surface in different planes;
b. an oscillating means supported on said sizing press and operatively connected with at least one of said pair of pressing tools for oscillating said opposed pressing tools toward and away from one another, said oscillating means includes at least two force transmitting piston cylinder assemblies, one of said two force transmitting piston cylinder assemblies engaging said pressing tools behind said first surface adjacent a first end thereof and a second of said two force transmitting piston cylinder assemblies engaging said pressing tool behind said second surface adjacent a second end thereof; and
c. at least one feed means positioned on said sizing press for successively feeding such workpiece between said pair of pressing tools during operation of said sizing press.

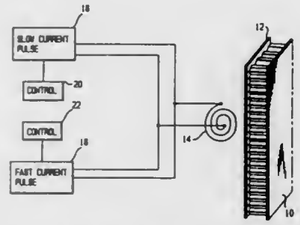
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**5,046,345**
**POWER SUPPLY FOR ELECTROMAGNETIC PROOF LOAD TESTER AND DENT REMOVER**
**Peter B. Zieve, 5766 27th Ave. NE., Seattle, Wash. 98105**
**Filed Dec. 15, 1989, Ser. No. 451,106**
**Int. Cl.[5] B21D *1/06***
**U.S. Cl. 72—56** **21 Claims**

1. A power supply for an electromagnetic force system, which includes a work coil positioned adjacent a workpiece such that there is a gap therebetween, comprising:
a slow current pulse system;
means for discharging said slow current pulse system at a selected time;



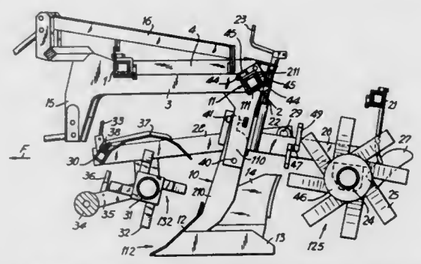
a fast current pulse system, wherein the fast current pulse is of opposing polarity to the slow current pulse;
means for discharging the fast current pulse system through said coil such that the current through the coil decreases rapidly and the magnetic field in the gap decreases substantially while the magnetic field in and behind the workpiece decreases only slightly, resulting in a large field gradient across the workpiece and the creation of a pulse of tension force on the workpiece; and




means for crowbarring the current through the coil following discharge of the fast pulse system to clamp the current through the coil at a selected level, the crowbar means including an SCR capable of withstanding the voltage of the slow current pulse system, at least one diode in series with the SCR capable of blocking the voltage of the fast current pulse system, and means for triggering the SCR to cause the crowbar means to conduct.

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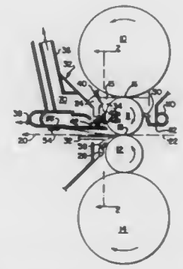
**5,046,346**
**AGRICULTURAL MACHINE**
**Vittorio Pegoraro, Via Torri di Confine 7, Gambellara 36053, Italy**
**Continuation of Ser. No. 945,657, Feb. 6, 1987, abandoned, and a continuation of Ser. No. 368,921, Jun. 19, 1989, abandoned.**
**This application Nov. 22, 1989, Ser. No. 440,512**
**Claims priority, application Italy, Apr. 3, 1985, 12471 A/85**
**Int. Cl.[5] A01B *9/00***
**U.S. Cl. 172—71** **23 Claims**



1. An agricultural machine for soil cultivation comprising:
a plurality of rows of soil cultivating elements, each of said rows being parallel to each other, each said row of elements being arranged at an axis extending at an angle to the direction of travel of said machine, said direction angle being between about 5° to about 45°; said plurality of rows of cultivating elements comprising, in the direction of travel of said machine, a first device for breaking plant material comprising an element for bending said plant material toward said soil and, following said plant bending element, a row of rotating blades for breaking up said bent plant material against the soil.

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**5,046,347**
**COOLANT CONTAINMENT APPARATUS FOR ROLLING MILLS**
**Bruno Crosato, Kingston, and Gordon Harrison, Napanee, both of Canada, assignors to Alcan International Limited, Montreal, Canada**
**Filed Oct. 10, 1989, Ser. No. 419,099**
**Int. Cl.[5] B21B *27/06, 45/02***
**U.S. Cl. 72—201** **20 Claims**



1. In a rolling mill for metal reduction, including upper and lower work rolls defining a roll bite through which the metal is passed, for reduction, from an entry side to an exit side of the mill; at least one backup roll, in contact with the upper work roll along a line of contact; means supporting said backup and work rolls; and means for applying liquid coolant to the outer surface of said upper work roll on only the exit side of the mill above said roll bite; coolant containment apparatus comprising:
(a) enclosure means disposed on the exit side of the mill, generally surrounding the coolant-applying means and open toward said work roll outer surface, for confining a region containing the coolant-applying means and adjacent surface portions of said one backup roll and said upper work roll so as to restrict fluid flow into and out of said region, said enclosure means having upper and lower edges respectively facing said one backup roll and said upper work roll;
(b) vacuum means for withdrawing air from the interior of the enclosure to maintain a subatmospheric air pressure in said region;
(c) means for collecting and withdrawing coolant liquid from the interior of the enclosure;
(d) a rigid upper air dam member disposed at the upper edge of said enclosure means and extending, parallel to the axis of said one backup roll, in closely adjacent but spaced relation to the outer surface of said one backup roll, above said coolant-applying means, over substantially the entire length of said one backup roll, for defining therewith a narrow gap through which air is drawn into said region over said backup roll outer surface when said region is at a subatmospheric pressure;
(e) a rigid lower air dam member disposed at the lower edge of said enclosure means and extending, parallel to the axis of said upper work roll, in closely adjacent but spaced relation to the outer surface of said upper work roll, below said coolant-applying means but above said roll bite, over substantially the entire length of the upper work roll, for defining therewith a narrow gap through which air is drawn into said region over the work roll outer surface when the interior of said region is at a subatmospheric pressure;
(f) a first pair of slippers, connected to and respectively disposed at opposite ends of said upper air dam member in rubbing contact with said backup roll outer surface, for maintaining said upper air dam member at a constant spacing from said one backup roll;
(g) a second pair of slippers, connected to and respectively

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disposed at opposite ends of said lower air dam member in rubbing contact with said work roll outer surface, for maintaining said lower air dam member at a constant spacing from said upper work roller;

(h) a pair of seal members, mounted on said roll-supporting means and respectively disposed at opposite ends of said upper work roll, each of said seal members being in rubbing contact with an end portion of said work roll outer surface and an adjacent end surface of said one backup roll at and adjacent said line of contact, for cooperating with said enclosure means in confining said region as aforesaid; and

(i) means for moving said upper and lower air dam members with their associated pairs of slippers in directions transverse to the lengths of said air dam members to enable use of the apparatus with rolls of differing diameters.

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**5,046,348**

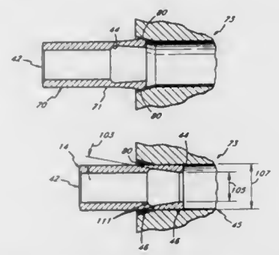
## BLIND FASTENER FOR COMPOSITE MATERIALS

**John D. Pratt, Rancho Cucamonga, Calif., assignor to Textron, Inc., Providence, R.I.**

**Division of Ser. No. 417,281, Oct. 5, 1989, abandoned. This application May 31, 1990, Ser. No. 531,044**

**Int. Cl.[5] B21K *1/70***

U.S. Cl. 72—356 **1 Claim**



1. A method of forming a buckle sleeve to be used in a blind fastener assembly, comprising the steps of:

forming a semi-finished buckle sleeve into a tubular shape having a leading section with a constant inner diameter and a trailing section with a constant but smaller inner diameter with an internal shoulder being formed at the intersection of said sections, said semi-finished sleeve having a constant outer diameter through said trailing section which flares outwardly in said leading section to a thickened leading edge; and

deforming the leading section of said semi-finished buckle sleeve to produce a constant outer diameter throughout the length of the sleeve by moving said thickened leading edge radially inwardly and creating a taper which extends from a smaller inner diameter at the leading edge to a larger inner diameter at said shoulder, said deforming step including inserting the leading edge of said semi-finished sleeve into a die having an outwardly flared entry leading to a cylindrical main section, and forcing said semi-finished sleeve axially into said die so that the leading edge of said semi-finished sleeve is deformed radially inwardly by the cylindrical section of said die.

**5,046,349**

## EXPANSION TOOL FOR HOLLOW WORKING PARTS

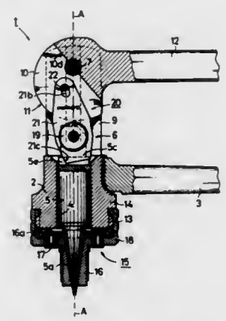
**Karl-Heinz Velte, Weilrod, Fed. Rep. of Germany, assignor to Rothenberger Werkzeuge-Maschinen GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Sep. 12, 1990, Ser. No. 581,569**

**Claims priority, application Fed. Rep. of Germany, Sep. 14, 1989, 3930710; May 30, 1990, 4017404**

**Int. Cl.[5] B21D *41/02***

U.S. Cl. 72—393 **16 Claims**



1. Expansion tool for hollow working parts, said tool comprising

a basic tool body having a borehole with a central axis and a first hand lever fixed thereto,

an expanding mandrel placed in an axially sliding position in said borehole, said mandrel having an exterior tapered end protruding from said borehole and an inner end with two parallel sidewalls defining a channel therebetween,

a freely rotatable member having a cylindrical surface located in said channel and journaled on a cylinder pin placed in said sidewalls, said pin having an axis which is perpendicular to the central axis of the borehole,

a control mechanism mounted for rotation about a swivel pin in said tool body and having a second hand lever fixed thereto, said mechanism acting on said cylindrical surface to move said mandrel through a preset stroke when said first and second hand levers are moved relative to each other,

a set of radially movable expanding wedges connected to the basic tool body and acted upon by said exterior tapered end of said mandrel when said mandrel moves through said stroke, and

a withdrawal device which connects the mandrel to the second hand lever.

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**5,046,350**

## APPARATUS FOR ATTACHING SURGICAL SUTURE COMPONENTS

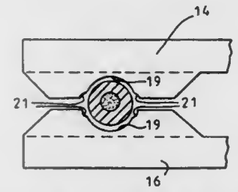
**George R. Proto, West Haven, and Francis D. Colligan, Waterbury, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.**

**Filed Nov. 3, 1989, Ser. No. 431,303**

**Int. Cl.[5] B21D *37/10***

U.S. Cl. 72—416 **13 Claims**

1. Apparatus for attaching two members, at least a first elongated member having a generally arcuate outer surface portion and defining an elongated aperture of generally arcuate cross-section, and a second member including at least an end portion of generally arcuate outer configuration corresponding in configuration and dimension to the elongated aperture of the first member, which comprises a pair of dies each having a pair of extensions having a space therebetween and correspondingly defining a pair of generally arcuate spaced surface portions corresponding in dimension and configuration to the generally arcuate outer configuration of the first member, said space defining a relief zone between said pair of extensions such that when said end portion of the second member is positioned within the aperture of the first member and said dies are positioned about the corresponding portion of the first member with said pair of spaced generally arcuate surface portions of a first die facing the first member on one side, and said pair of spaced generally arcuate surface portions of said second die facing the first member on the opposite side and inward force is applied to said dies to displace said dies



toward each other, said generally arcuate surface portions of said dies engage the first member and cause crimping thereof while portions of material forming part of the first member adjacent the areas subject to said inward force are permitted to be deformed and to collect within said adjacent relief zones defined by said space between each of said pair of spaced extensions of said dies so as to attach the members while maintaining substantially the same arcuate cross-sectional character of the outer surface portion of the first member thereby crimped.

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**5,046,351**

## MOLD FOR FORMING A GROOVE IN A TUBE

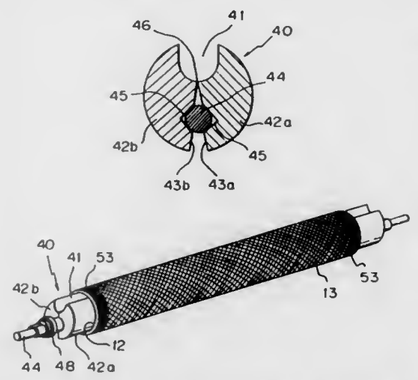
**Nagashige Takahashi, and Teruo Ouchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 328,542, Mar. 24, 1989, Pat. No. 4,944,287. This application Mar. 30, 1990, Ser. No. 501,835**

**Claims priority, application Japan, Mar. 29, 1988, 63-77817; Mar. 29, 1988, 63-77818; Apr. 8, 1988, 63-87739**

**Int. Cl.[5] B21D *9/00***

U.S. Cl. 72—478 **8 Claims**



1. A mold for forming a groove in a tube, comprising:

a split round bar having a groove extending in a substantially straight line along the longitudinal axis thereof, said groove having a bottom, said round bar being longitudinally split into two halves along said groove so that said two halves have respective opposed inner surfaces, said two halves being joined together so as to be in contact with each other only at a point of contact at the bottom of said groove, whereby said two halves are able to pivot about said point of contact; and

a spacer removably located between said opposed inner surfaces of said two halves.

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**5,046,352**

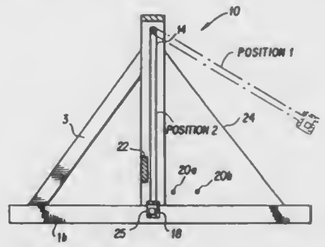
## DISPLACEMENT CUBE CALIBRATOR DEVICE

**Charles N. Kingery, Aberdeen, and Edmund J. Glon, Havre de Grace, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 10, 1990, Ser. No. 464,061**

**Int. Cl.[5] G01L *27/00***

U.S. Cl. 73—4 R **9 Claims**



1. A device for calibrating cubes which are used in the determination of the magnitude and dynamic pressure of an air blast comprising:

a base;

a pedestal mounted on said base;

a pendulum having a first end and a second end, said pendulum pivotally attached at the first end near a top of said pedestal;

means located at the second end of said pendulum for releaseably holding said cube;

means for determining the velocity during the swing of said pendulum;

means for stopping the swing of said pendulum when said pendulum is vertical so as to impart an initial velocity of $V_o$ to said cube.

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**5,046,353**

## UNDERGROUND PIPE LEAK DETECTION SYSTEM

**Glenn M. Thompson, Tuscon, Ariz., assignor to Tracer Research Corporation, Tucson, Ariz.**

**Filed Jan. 26, 1989, Ser. No. 303,459**

**Int. Cl.[5] G01M *3/20***

U.S. Cl. 73—40.7 **33 Claims**



1. An apparatus for detecting a leak from at least one of a plurality of subsurface fluid pipes containing fluids therein and surrounded by a backfill material, comprising:

volatile liquid phase tracer means for providing a gas phase detectable component in a fluid leak, a quantity of said volatile liquid phase tracer means being mixed with the fluid in said at least one of a plurality of subsurface fluid pipes;

at least one of a plurality of gas permeable tubular members disposed in the backfill material above at least a portion of the at least one of a plurality of subsurface fluid pipes,

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wherein said at least one of a plurality of gas permeable tubular members further comprises a scintered rubber hose having an air permeability of about 6.9 liters ±0.7 liters per minute per meter at 10.7 cm Hg pressure differential at 27° C.; and

access means disposed in the backfill material for accessing at least one end of said at least one of a plurality of gas permeable tubular members.

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**5,046,354**

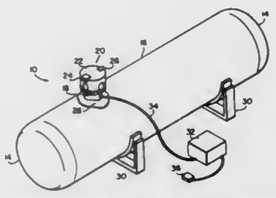
## PRESSURIZED STORAGE TANK WITH AUTOMATIC SHUT-DOWN IN CASE OF LEAKAGE

**Robert R. Mungia, 929 N. Pierre Rd., Walnut, Calif. 91789, and Charles L. Papish, 2426 Valewood, San Dimas, Calif. 91773**

**Filed Sep. 29, 1989, Ser. No. 414,856**

**Int. Cl.[5] G01M *3/04***

**U.S. Cl. 73—49.2** **10 Claims**



1. A pressurized storage apparatus for storing fluid under pressure, the apparatus comprising:

a pressure vessel tank for storing the fluid under pressure;

at least one outlet valve communicating with said pressure vessel for releasing the fluid in a controlled flow;

shut-down means connected to an upstream side of said outlet valve for permitting and blocking the flow of fluid to said outlet valve in response to a control signal;

sensor means positioned external to said pressure vessel in the vicinity thereof for detecting fluid leaking from said vessel or from said outlet valves for generating signals responsive to the presence or absence of fluid sensed by said sensor means; and

control means that is responsive to said sensor means and is connected to said shut-down means for signalling said shut-down means to permit flow to said outlet valve when said sensor means senses no fluid leakage and to block flow of fluid to said outlet means when fluid leakage is detected by said sensor means.

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**5,046,355**

## PROCESS FOR ASSESSING COLD START PERFORMANCE OF A WAX CONTAINING FUEL

**Robert D. Tack, Abingdon, and Sean A. Creedon, Derby, both of United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.**

**Filed Aug. 31, 1989, Ser. No. 401,252**

**Claims priority, application United Kingdom, Sep. 8, 1988, 8821079**

**Int. Cl.[5] G01N *31/02***

**U.S. Cl. 73—61.4** **7 Claims**

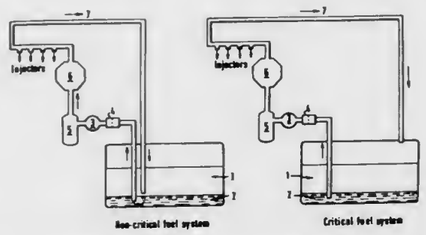
1. A method for assessing the cold start performance in an engine of a wax-containing fuel, which comprises:

(a) cooling said fuel in a container to a test temperature;

(b) drawing fuel from the container through a filter, said filter also being at the test temperature;

(c) measuring the rate at which the cooled test fuel flows through the filter;

(d) performing steps (a), (b) and (c) above on a fuel of known cold start performance under the same and standardized conditions of test temperature, of the differential pressure across the filter, of filter dimensions and permeability, and of position in the container from which the fuel is drawn; and




(e) comparing the rate measured for the test fuel with that measured for the fuel of known cold start performance.

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**5,046,356**

## APPARATUS FOR DETERMINING WATER CONTENT OF POWDER/GRANULE

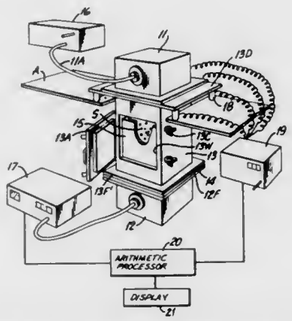
**Shigeyoshi Osaki, Takarazuka; Kiyokazu Sakai, Nishinomiya, and Shinichi Nagata, Matsubara, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Sep. 27, 1989, Ser. No. 413,323**

**Claims priority, application Japan, Sep. 28, 1988, 63-126705[U]**

**Int. Cl.[5] G01N *5/02***

**U.S. Cl. 73—73** **10 Claims**




1. An apparatus for determining water content of powder/granule sample including a rectangular waveguide system substantially set up in the upright or vertical disposition, consisting of a microwave transmitting converter, a microwave waveguide, and a microwave receiving converter, the apparatus comprising:

a sample container for containing powder or granular sample and being accommodated inside of the microwave waveguide;

said waveguide being provided with an inlet hole communicated to an inner space of said waveguide system at one of side walls, and having a door for opening and closing said hole and means for supporting said sample container within said waveguide;

a buffer weighing system for supporting a hollow waveguide on a supporting table in the upright or vertical disposition and generates electric signals designating a supported weight; and

signal processing means for receiving signal output from said microwave receiving converter and from said buffer weighing system, storing and arithmetically processing these signals whereby said signal processing means computes water content of sample container.



**5,046,357**

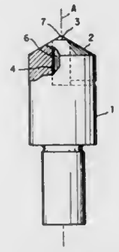
## HARDNESS TESTING DIAMOND INDENTER

**William T. Marston, Milton, Mass., assignor to Crafts Precision Industries, Inc., Canton, Mass.**

**Filed Jan. 19, 1990, Ser. No. 467,499**

**Int. Cl.[5] G01N *3/42***

**U.S. Cl. 73—85** **19 Claims**



1. A hardness testing indenter for penetrating a material under test comprising:

a cylindrical metal body having a frusto-conical end and a cone shaped diamond secured concentrically with the body and coincident with its conical end; wherein:

the body has a concentrically cylindrical recess extending axially from its conical end;

a cylindrical hard metal rod is bonded concentrically in the body recess; and

the cone is a polycrystalline diamond bonded to the end of the hard metal rod;

whereby the body can be thrust axially on the surface of a material under test so that the diamond cone indents the material to a measurable extent allowing for accurately indicating the hardness of the material.

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**5,046,358**

## DEFORMABLE WALL

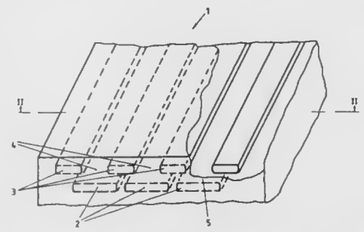
**Rudolf Wulf, Göttingen; Burkhard Binder, Göttingen-Hetjershausen, and Beatrix Hieronimus, Rosdorf-Mengershausen, all of Fed. Rep. of Germany, assignors to Deutsche Forschuhgsanstalt fur Luft-und Raumfahrt F.V., Fed. Rep. of Germany**

**Filed Nov. 8, 1989, Ser. No. 433,143**

**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 3837970**

**Int. Cl.[5] G01M *9/00*; B64B *3/46***

**U.S. Cl. 73—147** **10 Claims**



1. A deformable wall including a first surface of relatively rigid construction and a second surface of relatively flexible construction, a series of elongated parallel cavities formed within the wall in rows, with the rows of cavities arranged in a plurality of layers of rows between said first and second surfaces and with the cavities of one row offset from the cavities of an adjacent row, inflation means for inflating and deflating said cavities with fluid so as to change the shape of said cavities and thus change the shape of said second surface of the wall, said inflation means comprising means to impart different fluid pressures to different ones of said cavities.

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**5,046,359**

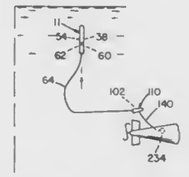
## UNDERWATER LAUNCHED CARRIER

**John L. Layport, Mattapoisett, Mass., assignor to The Sippican Corporation, Marion, Mass.**

**Filed Jan. 24, 1975, Ser. No. 543,691**

**Int. Cl.[5] G01W *1/08*; B63G *8/22*; G01K *13/00***

**U.S. Cl. 73—170 A** **13 Claims**



1. An assembly capable of being launched from a submarine to carry into seawater an element responsive to a property of the water to be measured by a measurement circuit, comprising

a carrier member coupled to said element,

a lifting body shaped to provide hydrodynamic lift,

a tether,

said tether being connected at one end to said lifting body, so that when the free end of said tether is connected to a moving submarine said lifting body will move through the water at a distance above said submarine,

a supply of electrically conductive cable connected to said element for electrically connecting said element in said measurement circuit, said lifting body including means for storing at least part of said cable for payout to accommodate movement of said submarine relative to said member, and

releasable coupling means for holding said member and said lifting body together during their launch from the submarine and thereafter releasing said lifting body from said member.

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**5,046,360**

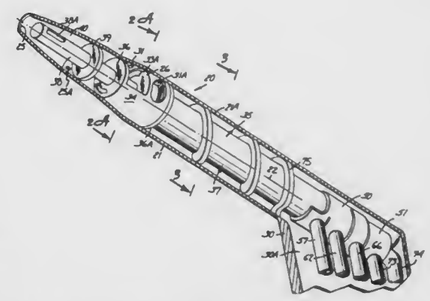
## AERODYNAMIC PROBE INTERNAL CONSTRUCTIONS

**Eric A. Hedberg, Burnsville, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.**

**Filed Dec. 15, 1989, Ser. No. 451,437**

**Int. Cl.[5] G01C *21/00*; G01F *1/46***

**U.S. Cl. 73—182** **17 Claims**



1. An air data sensing probe for determining air data parameters of fluid moving past the probe, and including an elongated probe barrel with a longitudinal axis, said probe barrel having a plurality of port means in the walls thereof for sensing pres-

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sures of a fluid relative, to which the probe is moving, a separate assembly internal of the probe for carrying individual pressures from each of the port means comprising a support, axially spaced bulkhead means fixed with respect to the support for-engaging the inner surface of the probe barrel and adapted to be sealingly mounted thereagainst, wall means between the bulkhead means to define at least first and second annularly extending chambers between adjacent bulkhead means, each of said first and second chambers being open to at least one different port, and means on the assembly forming longitudinally extending passageways for carrying fluid pressures open to each of the first and second chambers and extending from a leading end of said barrel toward a trailing end of said barrel.

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**5,046,361**

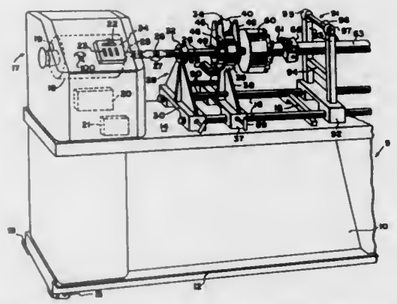
## METHOD AND APPARATUS FOR BALANCING ROTATABLE MEMBERS

**Kenneth A. Sandstrom, 9668 Fieldstone Dr., Minocqua, Wis. 54548**

**Continuation of Ser. No. 427,293, Oct. 26, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 666,473**

**Int. Cl.[5] G01M** *1/22*

**U.S. Cl. 73—460** **12 Claims**



1. Apparatus for balancing an unbalanced rotatable member comprising:

(a) support means for supporting said member for rotation about an axis;

(b) drive means for rotating said member about said axis, said drive means bein bi-directional for rotating said member selectively in first and second opposite directions; Kenneth A. Sandstrom

(c) speed control means coupled to said drive means for establishing a selected and equal rotational speed of said member in each of said first and second pposite directions;

(d) sensing means operatively associated with said member for generating a signal in response to the maximum extent of imbalance in each of said first and second opposite directions;

(e) encoder means operatively associated with said member for generating a series of signals to identify circumferential positions on said member in each of said first and second opposite directions;

(f) signal processing means operable in cooperation with said sensor and said encoder means to combine said signals and establish first and second circumferentially spaced points of apparent maximum imbalance relative to said member in response to rotation thereof in said first and second opposite directions; and

(g) means for identifying the mid-point between said first and second points of apparent maximum imbalance upon further rotation of said member, said identifying means including display means remote from said member for displaying the spacing between said first and second points in linear relationship relative to a mid-point indicator forming a part of said display means.

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**5,046,362**

## GRAIN LOSS MONITORS FOR HARVESTING MACHINES

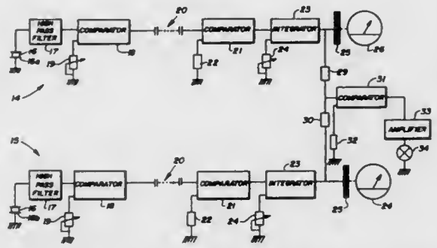
**Gilbert J. I. Strubbe, Zedelgem, Belgium, assignor to Ford New Holland, Inc., New Holland, Pa.**

**Continuation-in-part of Ser. No. 335,653, Apr. 10, 1989, abandoned. This application Feb. 1, 1991, Ser. No. 649,639**

**Claims priority, application European Pat. Off., Apr. 28, 1988, 82200801**

**Int. Cl.[5] A01D** *75/28*

**U.S. Cl. 73—579** **25 Claims**



1. A grain loss monitor for a harvesting machine operable to harvest crop material by separating grain kernels from debris contained in said crop material, comprising:

detector means for detecting a loss of grain from said harvesting machine and including a sensor plate and transducer means operably connected to said sensor plate, said detector means being disposed for engagement with said crop material such that said sensor plate can register impacts of said grain kernels which cause a first high frequency vibration and the impact of said debris which causes a second low frequency vibration, said transducer means having a resonant frequency in the range of 8 to 25 KHz and is operable to convert physical vibrations from said sensor plate caused by the impacts of said grain kernels and said debris into electrical output signals having a dominate frequency corresponding to said resonant frequency, said resonant frequency being selected such that said first high frequency vibration effects a response of said transducer means more than said second low frequency vibration; and

circuit means operable to process said electrical output signals from the transducer means and utilize said dominate resonant frequency to indicate the amount of grain kernels striking said sensor plate and thereby express an indication of grain loss from said harvesting machine.

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**5,046,363**

## APPARATUS FOR RAPID NON-DESTRUCTIVE MEASUREMENT OF DIE ATTACH QUALITY IN PACKAGED INTEGRATED CIRCUITS

**Thomas M. Moore, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 172,735, Mar. 23, 1988, abandoned. This application Oct. 13, 1989, Ser. No. 423,519**

**Int. Cl.[5] G01N** *29/04*

**U.S. Cl. 73—588** **29 Claims**

1. A method for non-destructive measurement of die attach quality in plastic packaged integrated circuits using acoustic waves, comprising the steps of:

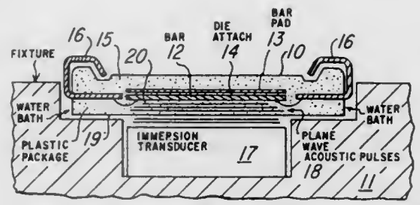
contacting the integrated circuit with an acoustic delay/coupling medium;

pulsing the integrated circuit with an acoustic wave through the delay/coupling medium;



measuring the intensity of reflection of the pulse reflected from package/bar interface and from the bar/die attach interface;

comparing the intensity of the reflection of the pulse reflected from the package/bar interface with the intensity




of the pulse reflected from the bar/die attach interface to form a ratio; and

comparing said ratio to a predetermined threshold value to determine the total bonded area at the bar/die attach interface.

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**5,046,364**

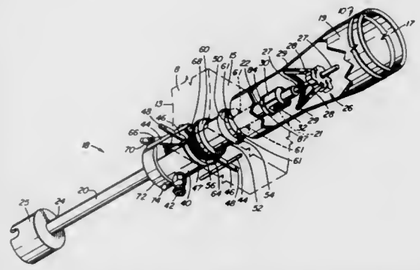
## HAND-HELD ULTRASONIC PROBE

**David G. Stasuk, 8275 Burnlake Drive, Burnaby, British Columbia, Canada V5A 3L1 , and Roger A. Strukoff, 214-5140 Saunders Street, Burnaby, British Columbia, Canada V5H 1T2**

**Filed Oct. 22, 1990, Ser. No. 601,455**

**Int. Cl.[5] G01N** *29/24, 29/04*

**U.S. Cl. 73—623** **17 Claims**



1. A hand-held probe for inspecting the thickness of an elongate conduit having an open outer end in communication with the interior of a drum, comprising:

(a) an apertured housing;

(b) an elongate hollow wand having an inner end and an outer end, wherein said wand is adapted for sliding reciprocal movement through said housing along the longitudinal axis of said conduit and for rotational movement relative to said housing and said conduit,

(c) a transducer for transmitting and receiving ultrasonic signals mounted at said wand inner end transversely of the wand longitudinal axis, wherein said transducer is connectable to an ultrasonic signal processing instrument remote from said probe;

(d) sealing means encircling said wand at an axial position thereof for releasably sealing said conduit outer end;

(e) liquid delivery means connectable to an inlet on said housing for providing coupling liquid to and drawing said liquid from a portion of said conduit above said sealing means which includes said transducer;

(f) self-centering means coupled to the inner end of said wand for centering said wand coaxially with said conduit, such that ultrasonic pulses generated by said transducer are ordinarily transmitted in a path normal to the inner surface of said conduit;

wherein said wand is manually pivotable about said sealing means away from a scanning position coaxial with said conduit to a scanning position offset from the longitudinal axis of said conduit, such that said ultrasonic pulses generated by said transducer are transmitted in a path oblique to said conduit inner surface.

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**5,046,365**

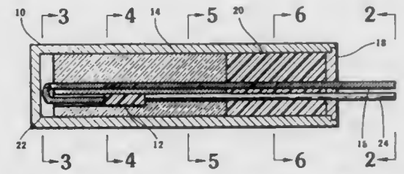
## TRANSDUCER THERMAL PROTECTION SYSTEM

**Marvin A. Kumley, Dallas, Oreg.; Daniel L. Simpson, San Diego, Calif.; Kurt W. Swanson, Kent, Wash., and Bryan L. Beck, Temecula, Calif., assignors to General Dynamics Corporation/Space Systems Div, San Diego, Calif.**

**Filed Jul. 16, 1990, Ser. No. 553,033**

**Int. Cl.[5] G01L** *19/04*

**U.S. Cl. 73—708** **8 Claims**



1. A solid to liquid phase transducer thermal protection system comprising:

an outer shell having a hollow cavity therein;

at least one transducer within said hollow cavity:

electrical conductors connected to said at least one transducer and extending external of said shell;

part of said hollow cavity adjacent to said at least one transducer being filled with a solid metal which melts at a preselected elevated temperature; and

part of said hollow cavity adjacent to said solid metal being filled with molded insulation material.

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**5,046,366**

## APPARATUS FOR MEASURING DEFLECTION OR DEFORMATION IN PAVEMENT STRUCTURES

**John E. B. Basson; Daniel F. Botha, and Otto J. Wijnberger, all of Pretoria, South Africa, assignors to CSIR, Pretoria, South Africa**

**Filed Mar. 9, 1990, Ser. No. 489,822**

**Claims priority, application South Africa, Mar. 9, 1989, 89/1806**

**Int. Cl.[5] G01N** *3/00*

**U.S. Cl. 73—784** **10 Claims**

1. A system for measuring deflection and/or deformation of a layer in a pavement structure under load comprising:

apparatus comprising electronic means sensitive to relative movement between itself and a separately anchored member;

the apparatus also comprising means for securing the electronic sensitive means in a hole in the structure in a region close to the layer;

the securing means being connected to the electronic sensitive means and comprising two longitudinally spaced, relatively moveable circular disc-like members and a circular cylindrical body of a resilient, transversely expandable material sandwiched between the spaced members;

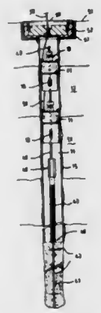
the apparatus further comprising means actuable to urge the two members towards one another causing the body transversely to expand beyond the peripheries of the disc-like members thereby to secure the electronic sensitive means against a wall of the hole;

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the disc-like members and circular cylindrical body defining at least one longitudinally extending peripheral slot;

the apparatus also comprising ducting for electric wiring extending from the electronic sensitive means, the ducting being located in the peripheral slot to extend from the electronic sensitive means to the disc-like member furthest away from the electronic sensitive means; and



the separately anchored member, in use, being anchored in the structure in a region thereof that does not deflect under the load so that relative movement between the stationary separately anchored member and the electronic sensitive means secured to the layer may be measured.

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**5,046,367**

## DYNAMIC VISCOELASTICITY MEASUREMENT APPARATUS WITH OUTPUT SIGNAL OFFSET CORRECTION

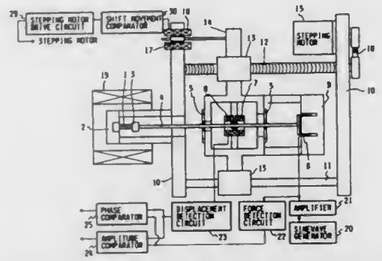
**Nobuo Iizuka, Tokyo, Japan, assignor to Seiko Instruments, Inc., Tokyo, Japan**

**Filed Mar. 28, 1990, Ser. No. 500,289**

**Claims priority, application Japan, Mar. 31, 1989, 1-82955**

**Int. Cl.[5] G01D** *1/16, 7/02;* **G01U** *27/72;* **G01R** *33/00*

**U.S. Cl. 73—789** **6 Claims**



1. Apparatus for effecting dynamic measurement of the viscoelasticity of a sample by applying an oscillating deformation force to the sample, said apparatus comprising: detecting means positioned for detecting deformation of the sample relative to a reference deformation value and producing a corresponding deformation signal with maximum and minimum values which are spaced apart by an amount corresponding to the deformation of the sample in response to the oscillating deformation force, the deformation signal having an average value midway between the maximum and minimum values; drive means coupled to said detecting means for displacing said detecting means relative to the sample along the direction of the oscillating deformation force; a measurement circuit connected to said detecting means for determining the maximum and minimum values of the deformation signal relative to the reference value; and calculating means connected for calculating the average value of the deformation signal from the determined values of the maximum and minimum peaks of the deformation signal and for supplying a compensative signal based on the calculated average value to said drive means for causing said drive means to displace said detecting means relative to the sample through a distance for eliminating any difference between the average value of the deformation signal and the deformation signal value associated with the reference deformation value.

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**5,046,368**

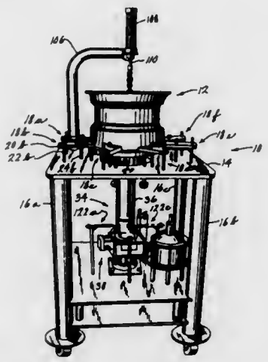
## APPARATUS AND METHOD FOR FATIGUE TESTING A WHEEL

**Stanley J. Baumel, 3400 Lagoon Dr., Burlington, Wis. 53105**

**Continuation-in-part of Ser. No. 443,217, Nov. 29, 1989, Pat. No. 4,998,440. This application Oct. 31, 1990, Ser. No. 606,148**

**Int. Cl.[5] G01N** *3/32*

**U.S. Cl. 73—810** **13 Claims**



1. An apparatus for fatigue testing a vehicle wheel having a pair of spaced lips, comprising:

a wheel support assembly for maintaining said wheel stationary during testing of said wheel, and including first support means engageable with one side of said wheel inwardly of a first one of said lips, and second support means engageable with the other side of said wheel inwardly of a second one of said lips, said first and second support means cooperating to fix the vertical and lateral position of said wheel on said apparatus during testing; and

fatigue stress inducing means connectable to said wheel for inducing fatigue stress in said wheel.

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**5,046,369**

## COMPENSATED TURBINE FLOWMETER

**Charles L. Boyd; Steven L. Skinner, both of Duncan, Okla., and Kurt L. Werner, Cupertino, Calif., assignors to Halliburton Company, Duncan, Okla.**

**Filed Apr. 11, 1989, Ser. No. 336,282**

**Int. Cl.[5] G01F** *1/90*

**U.S. Cl. 73—861.03** **2 Claims**

1. An apparatus for determining a flow rate of gas at standard conditions, said apparatus comprising:

turbine flow meter means for sensing gas flow rate and outputting an uncompensated flow rate signal based thereupon;

temperature sensing means for providing an uncompensated temperature signal, based upon a temperature of said gas;

pressure sensing means for providing an uncompensated pressure signal, based upon a pressure of said gas;

processing means for receiving said uncompensated flow rate signal, said uncompensated temperature signal and said uncompensated pressure signal, for determining the flow rate of said gas in standard units, and for outputting a digital signal based upon said uncompensated signals and representative of said standard flow rate;

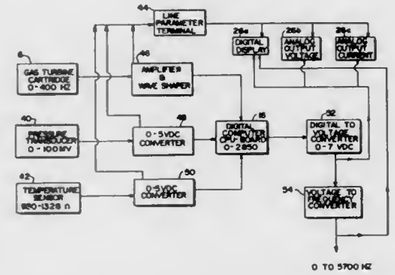
first conversion means for converting said digital signal into a voltage signal representative of said standard flow rate;

second conversion means for converting said voltage signal into a frequency signal representative of said standard flow rate;

a housing having said processing means, said first conversion means and said second conversion means disposed therein, said housing connected to said turbine flow meter means; and

at least one output means, disposed in said housing, for outputting signals in response to each of said uncompensated signals and for outputting a signal in response to at least one of said voltage signal and said frequency signal,






wherein said at least one output means is selected from among the group consisting of:

digital display means, responsive to said frequency signal and said uncompensated signals, for allowing said standard flow rate and a value corresponding to each of said uncompensated signals to be locally monitored;

voltage analog output means, responsive to said voltage signal and said uncompensated signals, for transmitting said standard flow rate and a value corresponding to each of said uncompensated signals to a compatible remote interface unit; and

current analog output means, responsive to said voltage signal and said uncompensated signals, for transmitting said standard flow rate and a value corresponding to each of said uncompensated signals to a compatible remote interface unit.

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**5,046,370**

## FLOW METER WITH IMPROVED TURBINE BLADES

**Robert E. Hall, Wichita, Kans., assignor to Great Plains Industries Inc., Wichita, Kans.**

**Continuation-in-part of Ser. No. 99,132, Sep. 21, 1987, Pat. No. 4,856,348, and a continuation-in-part of Ser. No. 826,297, Feb. 5, 1986, Pat. No. 4,700,579, and a continuation-in-part of Ser. No. 553,793, Nov. 21, 1983, abandoned. This application Aug. 2, 1989, Ser. No. 389,275**

**The portion of the term of this patent subsequent to Aug. 15, 2006, has been disclaimed.**

**Int. Cl.[5] G01F** *1/10*

**U.S. Cl. 73—861.89** **6 Claims**

1. An improved turbine rotatingly supported in a fluid opening of a meter housing of a flow meter, the flow meter mounted in a fluid delivery line for dispensing fluids, the turbine comprising:

a turbine rotor; and

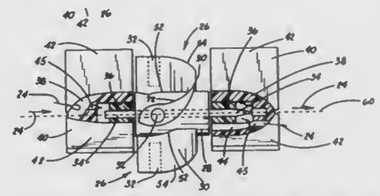
a plurality of turbine blades extending from the turbine rotor, each such turbine blade comprising:

a first end attached to the turbine rotor with the turbine blade extending outwardly therefrom and a second end;

a ferrous slug supported at the second end of the turbine blade;

a rounded leading edge;

a feathered trailing edge;



a first blade surface concave in shape along the length of the blade, the concave first blade surface disposed to receive fluid flow thereagainst to rotate the turbine; and

an opposed convex second blade surface tapered from the rounded leading edge into the feathered trailing edge so that the blade has a hydrofoil shape.

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**5,046,371**

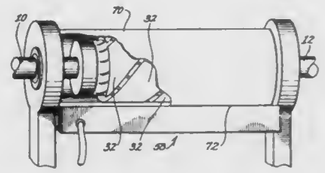
## IN-LINE ROTATING CAPACITIVE TORQUE SENSOR

**James W. Kronberg, P.O. Box 385, Beach Island, S.C. 29841**

**Filed Jan. 8, 1990, Ser. No. 461,962**

**Int. Cl.[5] G01L** *3/10*

**U.S. Cl. 73—862.33** **19 Claims**



1. A torque sensor for use with a first shaft and a second shaft, said first shaft and said second shaft in axial alignment, said sensor comprising:

a rotating portion positioned between and attached to said first and said second shafts, said rotating portion having

a nominal radial configuration when no torque is applied to said shafts, and

a means for varying said radial configuration responsive to torque applied to said shafts;

a stationary portion in spaced relation and concentric to said rotating portion, said stationary portion and said rotating portion having confronting electrically conductive surfaces which establish a capacitance therebetween, said capacitance varying with changes in the radial configuration of said rotating portion;

a conductive shell surrounding said stationary portion; and

circuit means in electrical connection with said stationary portion and responsive to changes in said capacitance for generating an output signal having a value in accordance with said capacitance.

VOL 1130 ISS 2 SE 10 1991 UMI



5,046,372

## TORQUE SENSOR

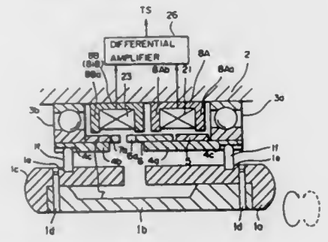
Manabu Taniguchi; Hidenobu Nagano; Toshihiko Daido; Isao Kuramoto; Makoto Nohara, and Hirochika Ueyama, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 224,538, Jul. 26, 1988, Pat. No. 4,907,460. This application Oct. 5, 1989, Ser. No. 417,279

Claims priority, application Japan, Oct. 30, 1987, 62-167137; Nov. 26, 1987, 62-299593; Dec. 25, 1987, 62-198734; Mar. 25, 1988, 63-72270; Mar. 25, 1988, 63-72269; Mar. 25, 1988, 63-39842; Apr. 22, 1988, 63-54841

Int. Cl.[5] G01L *3/10*

U.S. Cl. 73—862.33 13 Claims




1. A torque sensor comprising:

first and second shafts which are connected through a torsion bar;

a first cylinder of magnetic material attached to said first shaft;

a second cylinder of magnetic material attached to said second shaft, the magnetic coupling state thereof with said first cylinder changing in response to a relative rotation of said shafts with respect to each other;

a coil for detecting a change in said magnetic coupling state between said first and second cylinders;

a compensating coil for compensating for temperature variations of said change in said magnetic coupling state detected by said detecting coil; and

means for detecting the magnetic coupling state corresponding to a relative rotation of said first and second cylinders and thereby a torque acting on said torsion bar, said detecting means including means for detecting changes of self impedances of said coils, said compensating coil being free of detecting any change caused by the torque.

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5,046,373

## STARTER MOTOR CONSTRUCTION

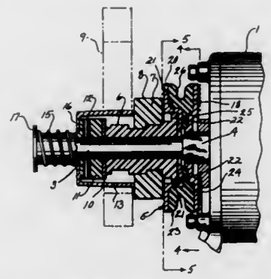
Geoffrey P. Zabrowski, Racine, and Robert L. Blohm, Milwaukke, both of Wis., assignors to Briggs & Stratton Corp., Wauwatosa, Wis.

Filed Aug. 7, 1989, Ser. No. 390,974

Int. Cl.[5] F02N *15/06*

U.S. Cl. 74—7 R 10 Claims

1. A starter motor construction for an internal combustion engine, comprising a motor having a drive shaft, a first gear disposed concentrically outward of said drive shaft, means responsive to rotation of said drive shaft for moving said first gear axially of said drive shaft to engage said first gear with a second gear of said engine, and cushioning means interconnecting said drive shaft and said first gear and including a first annular member disposed concentrically of said drive shaft and secured to said drive shaft, a second annular member disposed concentrically of said drive shaft and operably connected to said first gear, and a resilient annular disc disposed between said first and second annular members and secured to opposed faces of said members, said disc having a circumferential groove spaced axially from said members, said groove being bordered by a pair of generally parallel side surfaces and a bottom surface, the junction between said side surfaces and said bottom surface being generally curved, axial deformation of said disc acting to absorb axial shock and circumferential



deformation of said disc acting to absorb torque generated by engagement of said first gear and said second gear.

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5,046,374

## APPARATUS FOR PREFORMING WORK

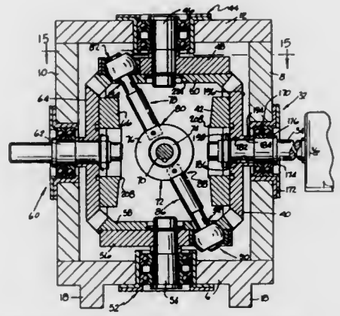
Warren R. Williams, Fort Collins, Colo., assignor to Coors Brewing Company, Golden, Colo.

Continuation of Ser. No. 402,608, Sep. 5, 1989, Pat. No. 4,956,990. This application Mar. 27, 1990, Ser. No. 499,773

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.[5] F16H *25/08, 53/06*

U.S. Cl. 74—55 17 Claims



1. Apparatus for performing work comprising:

support structure installed at a fixed location;

said support structure having at least a first wall portion and a second wall portion opposite thereto;

a first member rotatably mounted on said first wall portion and having an axis of rotation;

a second member rotatably mounted on said second wall portion and having an axis of rotation aligned with said axis of rotation of said first member;

drive means for producing counter rotation between said first and second members;

a movable member for performing work mounted on said support structure for reciprocating linear sliding movement; and

connecting means for connecting said first and second members to said movable member so that rotation of said first and second members reciprocates said movable member in linear directions.



5,046,375

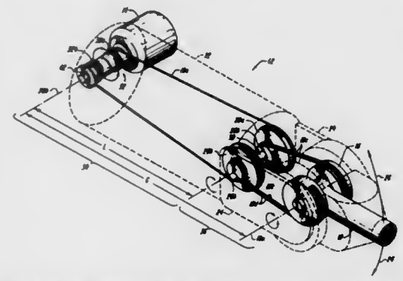
## COMPACT CABLE TRANSMISSION WITH CABLE DIFFERENTIAL

J. Kenneth Salisbury, Jr., Cambridge; William T. Townsend, Somerville, both of Mass.; David M. DiPietro, Webster, N.Y., and Brian S. Eberman, Rochester, Minn., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 184,273, Apr. 21, 1988, Pat. No. 4,905,536. This application Nov. 17, 1989, Ser. No. 438,524

Int. Cl.[5] B25J *17/00*

U.S. Cl. 74—89.22 13 Claims



1. Means for transmitting mechanical power from an actuator having a rotary output, comprising,

at least first and second elongated links said first link extending from said rotary output over a distance L to said second link,

means for coupling said first and second link to pivot about at least one axis,

cable means formed from at least two lengths of cable,

an output pulley operatively connected to said second link,

a reducer including at least two pulleys of different diameters, the larger diameter being operatively connected by said cable means to said rotary output and said smaller diameter pulley being operatively connected by said cable means to said output pulley,

means for pretensioning the cable means,

said reducer being positioned distal from said rotary output so that cable means has a long high speed, low tension section extending between said rotary output and said reducer and a short, low speed, high tension section extending between said reducer and said output pulley.

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5,046,376

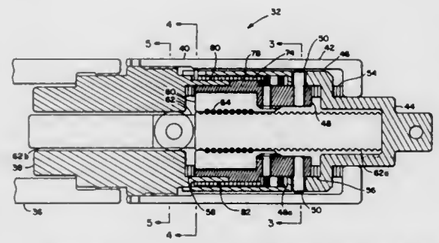
## SHAFT LOCKING OR MANUAL OPERATING APPARATUS

Gerald S. Baker, Houston, Tex., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 3, 1991, Ser. No. 679,918

Int. Cl.[5] F16K *31/143*

U.S. Cl. 74—424.8 VA 18 Claims



1. A manual operator for use with a valve having a valve body, a valve member controlling flow through the valve, a valve stem connected to the valve member and moving therewith between relative positions, the valve stem having an outer end which is engageable from the exterior of the valve body, said operator comprising

a housing having means to connect to the valve body in a position surrounding and aligned with the valve stem,

a ball nut,

a ball screw shaft,

balls interconnecting the ball nut and the ball screw shaft so that relative rotation causes axial movement of the shaft,

means for rotating one of the ball nut and the ball screw shaft,

means for retaining the other of the ball nut and the ball screw shaft against rotation to cause the ball screw shaft to move axially into position engaging the end of the valve stem with the valve member in its innermost position,

a locking spring engaging a rotary surface and a stationary surface in the relaxed position of the spring to prevent relative rotation between such surfaces, and

means associated with said rotating means to move said spring out of retaining engagement with at least one of said surfaces during initial movement of said rotating means to allow axial movement of said ball screw shaft.

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5,046,377

## VEHICLE DOOR LATCH AND LIKE ACTUATORS

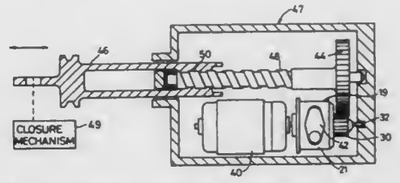
Steven F. Wilkes, Wolverhampton, and John F. Dean, Bromsgrove, both of Great Britain, assignors to Rockwell Automotive Body Systems Ltd, England

Filed Aug. 21, 1989, Ser. No. 396,543

Claims priority, application United Kingdom, Aug. 23, 1988, 8819943

Int. Cl.[5] F16H *57/00;* F16C *17/02*

U.S. Cl. 74—431 9 Claims




1. A power actuator unit for selective servo operation of a motor vehicle body closure which is also subjected to selective non-servo-operation in use, said unit including a high speed electric actuator motor, a movable output element to be coupled to the closure in use, and drive transmission means comprising a step down gear train acting between a rotary input element powered by said motor and said output element to convert high speed low torque power input from said motor to low speed high torque power output for positive servo movement of said output element in use, and a clutch device acting between said motor and said rotary input element operating to apply loading from said motor to said gear train but disconnecting said motor from loading in the opposite sense whereby free wheeling rotation of said gear train including said input element relative to said motor takes place on movement of said output element during said non-servo-operation of the closure, said rotary input element having a female bearing surface which is a running fit on a complementary male bearing surface, one of said surfaces being at a constant radius from the axis of relative revolution of said surface and the other of said surfaces being formed to having a plurality of facets or other sections not at constant radius from said axis to provide line or point contact with said one of said surfaces at sufficient angularly spaced locations to ensure that said bearing surfaces run substantially true to each other, said sections or facets not being otherwise in contact with said one of said surfaces for unrestricted high speed freewheel running of said input element on said male bearing surface.

5,046,378

## ANTI-JAMMING GEAR ARRANGEMENT

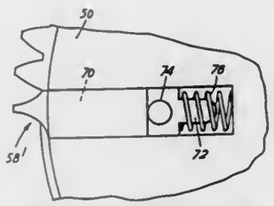
Ray L. Bannister, Richmond; Frederick C. Close, Great Amwell, and Peter J. Loeber, Earith, all of United Kingdom, assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 14, 1986, Ser. No. 931,363

Claims priority, application European Pat. Off., Nov. 18, 1985, 85308400

Int. Cl.[5] G07B *17/00*

U.S. Cl. 74—435 3 Claims




1. A gear arrangement for a print drum shaft of a postage meter, the arrangement comprising:

a print drum shaft and a further shaft arranged parallel thereto;

at least one value selection gear set mounted on said print drum shaft, said gear set including at lesat one rotatable gear wheel;

at least one value selection rack slideably positioned in a slot of the print drum shaft, the rack being driveably connected to the gear set such that rotation of said rotatable gear wheel with respect to the shaft is translated into a corresponding displacement of the value-selection rack;

an aligning gear disposed on said further shaft, said aligning gear being operable for meshing with the rotatable gear wheel of the value selection gear set.

said aligning gear having gear teeth about the periphery except at a section of said periphery, said aligning gear being arranged such that while said section is positioned adjacent said rotatable gear wheel, said rotatable gear wheel may rotate with respect to said print drum shaft;

said aligning gear having a resiliently movable tooth located adjacent the section of missing teeth, the peak of said resiliently movable tooth being offset toward an adjacent tooth of said gear teeth; the resiliently movable tooth being operable when the print drum shaft rotates to move inwardly against a resilient means in an inward radial direction when urged by an opposing tooth of the rotatable gear and to align the rotatable gear wheel when the resiliently movable tooth engages the rotatable gear.

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5,046,379

## REMOTE CONTROL APPARATUS

William L. Brown, 17373 Roxbury, Southfield, Mich. 48075

Continuation of Ser. No. 799,287, Nov. 20, 1985, Pat. No. 4,611,501, which is a continuation of Ser. No. 459,512, Jan. 20, 1983, abandoned. This application May 27, 1986, Ser. No. 867,045

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[5] F16C *1/10;* F16H *1/18;* G02B *5/08*

U.S. Cl. 74—502.1 2 Claims

1. In combination:

a bushing element having an axis of rotation and comprising an exterior and an internal axial opening;

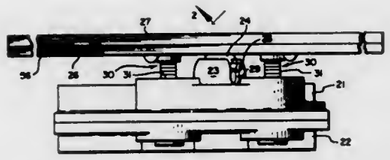
worm gear means around said exterior of the bushing element;

a radial slot extending between said internal axial opening and said exterior and defining an opening in said exterior;

an externally threaded member having an axis parallel to the axis of said bushing and received within said radial slot;

said externally threaded member being separate and discrete from said bushing element and non-integral therewith;

means, comprising said radial slot, mounting said externally threaded member for revolving movement about the axis of said bushing element in response to axial rotation of said bushing element;




and means, located at the exterior of said bushing element, normally urging said externally threaded member radially inwardly in said slot toward said internal axial opening in the bushing element.

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5,046,380

## THROTTLE CABLE FITTING STRUCTURE

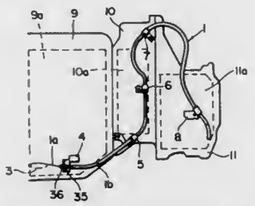
Akio Matsumoto; Hidehiko Mishima, and Tatsutoshi Mizobe, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 26, 1989, Ser. No. 426,954

Claims priority, application Japan, Oct. 26, 1988, 63-270062; Mar. 31, 1989, 1-37722[U]

Int. Cl.[5] F16C *1/10*

U.S. Cl. 74—502.4 6 Claims




1. In combination, a cable for operationally coupling a throttle cam which operates a throttle valve of an automatic transmission and an output control member of an automotive vehicle engine, so as to cause said throttle cam and output control member to cooperate with each other, and a cable fitting means, said cable including an outer cable tube which is connected to a housing of said automatic transmission at one end and to a housing of said automotive vehicle engine at the other end by means of said cable fitting means, and an inner cable extending through the inside of said outer cable tube and connected between said throttle cam and said output control member, said cable fitting means comprising:

a cable fitting bracket secured to said housing of said automotive vehicle engine and having a base plate and a mounting wall bent upwardly substantially at a right angle relative to said base plate;

a connecting sleeve secured to said other end of said outer cable tube;

a brace, electively attachable to said mounting wall of said cable fitting bracket, said brace being adjustable to firmly grasp said connecting sleeve and securely attach said connecting sleeve to said cable fitting bracket; and

a spring interposed between said brace and said connecting sleeve so as to apply a predetermined force between said outer cable tube and said inner cable to avoid slackening of said inner cable before said brace firmly grasps said connecting sleeve.



5,046,381

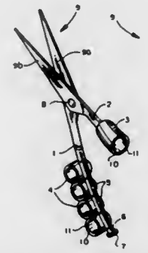
## GRIP SYSTEM FOR HAND TOOLS AND INSTRUMENTS

Lawrence P. Mueller, 3700 Ithaca, Merced, Calif. 95348, assignor to Lawrence P. Mueller, Merced, Calif.

Filed Jun. 16, 1989, Ser. No. 367,234

Int. Cl.[5] G05G *1/04;* B26B *13/00, 27/00*

U.S. Cl. 74—558 20 Claims




1. A combination of a grip system and a tool controlled by hand and having a first working portion and a first receiving stem extending from said first working portion, said grip system comprising:

a plurality of finger pieces, each having an inner surface for receiving a single finger, and

a plurality of discrete mounting means, each having a cavity, an outer wall and a pair of ends, at least one of which ends is shaped for interdigitation with the adjacent end of another discrete mounting means,

each of said mounting means being interconnected to only one of said finger pieces and being slidably received on said first receiving stem.

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5,046,382

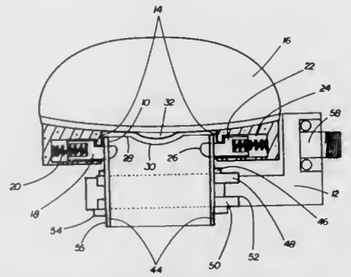
## CLIPLESS BICYCLE PEDAL SYSTEM

John D. Steinberg, 320 Lake St. #304, Huntington Beach, Calif. 92648

Filed Feb. 20, 1990, Ser. No. 481,951

Int. Cl.[5] G05G *1/14*

U.S. Cl. 74—594.6 19 Claims




1. A clipless bicycle pedal system including

a cylindrical member for a bicycle rider's shoe,

a cylindrical member for a bicycle pedal, the cylindrical pedal member being sized to interfit with the cylindrical shoe member,

at least one pin, means attaching said pin to one of said cylindrical members such that the main axis of the pin is transverse to the main axis of the cylindrical members, said attaching means permitting reciprocating movement of the pin relative to the cylindrical members, the other of said cylindrical members including at least one slot therein for receiving the transverse pin of said one member when the two members have been interfitted,

compressible means urging the pin to a position for engagement with said slot,

means for mechanically camming the pin to permit interfitting of the members by pressing the members together, and

means for mechanically camming the pin to allow separation of the members by rotational movement of one member relative to the other.

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5,046,383

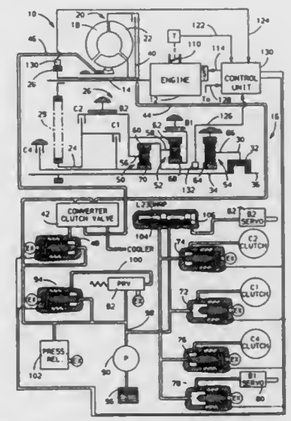
## ACCELERATION-BASED CONTROL OF POWER-ON CLUTCH-TO-CLUTCH UPSHIFTING IN AN AUTOMATIC TRANSMISSION

Kenneth R. Butts, Grosse Pointe Woods; Kumaraswamy V. Hebbale, Troy, both of Mich., and Kon-Well Wang, State College, Pa., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 16, 1990, Ser. No. 552,979

Int. Cl.[5] B60K *41/22*

U.S. Cl. 74—862 10 Claims




1. In a vehicle drivetrain including an engine connected to transmit torque to a drive axle through a multiple speed ratio power transmission, where upshifting from a lower speed ratio to an upper speed ratio involves (A) supplying fluid to an on-coming torque transmitting device associated with the upper speed ratio during a fill phase to prepare it for engagement, (B) increasing the pressure supplied to the on-coming device while reducing the pressure of an off-going torque transmitting device associated with the lower speed ratio to effect a transfer of torque capacity from the off-going device to the on-coming device during a torque phase, and (C) completing the engagement and disengagement of the on-coming and off-going devices during an inertia phase to complete the speed change of the upshift, the improvement wherein:

an initial acceleration value developed during the fill phase and indicative of the drive axle acceleration at the onset of the torque phase is used to compute a target acceleration value corresponding to the drive axle acceleration which is expected to occur at the end of the torque phase; and

the progression of the drive axle acceleration from the initial value to the target value due to increasing torque capacity of the on-coming device during the torque phase is used to trigger successive reductions of the pressure supplied to the off-going device.



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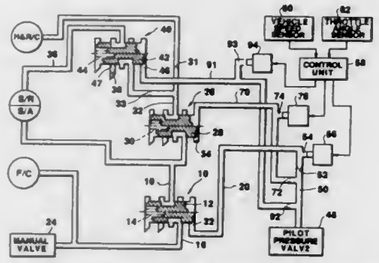


5,046,384

## SHIFT CONTROL SYSTEM FOR AUTOMATIC POWER TRANSMISSION

Hiroyuki Imamura, Shizuoka, Japan, assignor to Jatco Corporation, Shizuoka, Japan

Filed Feb. 5, 1990, Ser. No. 475,273
Int. Cl.[5] B60K *20/02*
U.S. Cl. 74—866 11 Claims



1. A shift control system for an automotive power transmission comprising:

gear means including a plurality of gears which have variable rotating states, for establishing a plurality of transmission speed ratios;

a first friction means, associated with said gear means and having variable states between an engaged state and a released state, for varying a rotational state of said gears;

a second friction means, associated with said gear means in cooperation with said first friction means and having variable states between said engaged state and said released state, for establishing a plurality of speed ratios in combination with the states of said first friction means;

a first hydraulic means, associated with said first friction means, for varying a state thereof between said engaged state and said released state;

a second hydraulic means, associated with said second friction means, for varying a state thereof between said engaged state and said released state; and

an electronic control network monitoring preselected transmission shifting control parameters and selecting one of said transmission speed ratios adapted to the vehicle driving condition represented by said control parameters for producing a first control signal for establishing engagement of said first friction means, and a second control signal for releasing said second friction means, and said control network being responsive to a downshifting command commanding downshifting of a transmission speed ratio from a higher speed ratio to a lower speed ratio across a neutral state, for supplying a second control signal for said second hydraulic means for operating said second friction means with a given delay period from supply of said first control signal so as to provide an overlapping state when said first and second friction means are in an engaged state during shifting during a transition period for varying the speed ratio.

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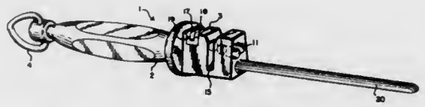
5,046,385

## CUTTING EDGE STRAIGHTENING, ALIGNING AND SHARPENING DEVICE

Ivo Cozzini, Lincolnwood; George T. Bowers, Evanston, both of Ill., and Alvin G. Rohrbaugh, Ft. Wayne, Ind., assignors to Cozzini, Inc, Chicago, Ill.

Filed Jan. 25, 1991, Ser. No. 646,682
Int. Cl.[5] B21K *5/12*
U.S. Cl. 76—89.2 11 Claims

1. A cutting edge sharpening device including a base member having a longitudinally extending central axis; a slot defined in said base member and transverse to the central axis thereof to allow passage of a cutting blade therethrough, said slot defining first and second walls on opposite sides thereof; and first and second edge sharpening members each mounted in said base member on opposite sides of said slot, said first edge sharpening member having a surface extending into said slot and said second edge sharpening member having a surface extending into said slot, said first and second edge sharpening



members defining therebetween a V-shaped groove through which the cutting edge is designed to pass and at least one tapered slope defined in said base member, said slope extending outwardly and downwardly from a bottom wall of said slot to an outer wall of said base member to protect against contact between a point of a cutting edge and said base member.

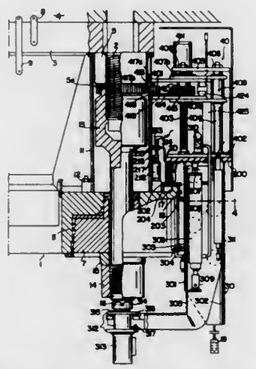
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5,046,386

## APPARATUS FOR SCREWING AT LEAST ONE NUT ONTO AND OFF CONNECTION MEMBERS

Alain Frizot, Montcenis, France, assignor to Framatome, Courbevoie, France

Filed Sep. 27, 1989, Ser. No. 414,151
Claims priority, application France, Sep. 27, 1988, 88 12604
Int. Cl.[5] B25B *29/02*
U.S. Cl. 81—57.38 14 Claims



1. Apparatus for screwing a clamp nut and an extension piece onto or off a plurality of connection members (2), two components comprising said clamp nut (5) and extension piece (13) of each connection member (2) cooperating with a ring (1) for simultaneously tensioning said connection members, one of said two components being moved by said apparatus relative to the other of said components, said apparatus comprising

(a) carriage means (20) for the guiding and displacement of said apparatus around the ring (1) tensioning said connection members (2);

(b) first disengageable means (30) for the displacement and rotational driving of the extension piece (13) which is to be screwed on or off a connection member, said first disengageable means comprising a compensation arm (305) adapted to compensate for the weight of said extension piece and movable vertically on slideways (301, 302) attached to an underside of a plate (200) of said carriage means (20), said compensation arm having a horizontal end operatively connected to said extension piece,



whereby vertical movements of said compensation arm are transmitted to said extension piece; and

(c) second disengageable means (40) for the rotational driving of said clamp nut (5) which is to be screwed on or off a connection member, said second disengageable means comprising a smooth shaft (404) and a worm (403) mounted on said plate (200), a gear train (401, 410, 414, 415, 418) displaced on said smooth shaft and worm, said second disengageable means being supported by said carriage means (20) and being displaceable along an axis parallel to an axis of said connection member (2) and at a speed identical to that of said component being moved by said apparatus relative to the other said component in the course of its screwing or unscrewing.

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5,046,387

## STABILIZED, MULTIFUNCTIONAL TOOL HANDLE

Rodney D. Levake, 1100 N. Black Canyon, Stage 1, Phoenix, Ariz. 85027

Filed Oct. 2, 1987, Ser. No. 103,759
Int. Cl.[5] B25G *1/01*
U.S. Cl. 81—489 39 Claims



1. Means for increasing the working life, strengthening and stabilizing, and increasing the functionality of hand held tools employed in moisture rich working environments comprising:

means for gripping and manipulating a tool, said means comprising moisture resistant materials for an extended working lifetime in moisture rich environments;

bubble means coupled to said gripping and manipulating means whereby a workpiece, acted upon by a tool to which said gripping and manipulating means is a part may be leveled;

a light reflective surface coupled to said bubble level to reflect light up through the level whereby the user is aided in establishing the position of the bubble within the level;

said light reflective surface comprising a mirrored surface;

said gripping and manipulating means further comprising coupling means for coupling said gripping and manipulating means to any one of a variety of commercially available tools whereby said available tool may be upgraded for extended use in a moisture rich environment;

said coupling means comprises a tang coupled to a first end of said gripping and manipulating means whereby said gripping and manipulating means may be coupled to the head of any one of a variety of tools selected from the group of tools which comprises; hammers and axes; and

a side protuberance coupled to said gripping and manipulating means below said tang whereby said bubble level may be utilized without reference to a surface on a tool head coupled to said tang.

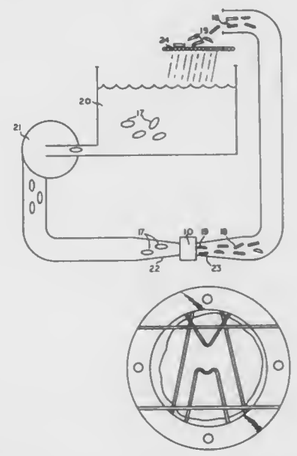
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5,046,388

## DECORATIVE FORM HYDRAULIC CUTTING BLADE ASSEMBLY

George A. Mendenhall, 4252 S. Eagleson Rd., Boise, Id. 83705

Continuation-in-part of Ser. No. 460,849, Dec. 8, 1989, abandoned, which is a continuation of Ser. No. 268,676, Nov. 7, 1988, Pat. No. 4,911,045, which is a continuation of Ser. No. 59,614, Jun. 8, 1987, abandoned. This application Mar. 26, 1990, Ser. No. 498,944
Int. Cl.[5] B26D *7/06, 1/03*
U.S. Cl. 83—98 18 Claims



1. In a system for the cutting of food products, having a product receiving tank adapted to be filled with a fluid medium, means to discharge said products into said tank, a food pump for withdrawing said medium and said products from said tank, a product feed line, said pump discharging said products into said product feed line, a tapered section in said feed line to separate, align, accelerate and feed said products into a cutter blade assembly, and means posterior to said cutter blade assembly, to discharge cut product, comprising a cutter blade assembly having:

a perimeter frame having an inner longitudinal passage of size and shape for the longitudinal passage of product and fluid medium there through;

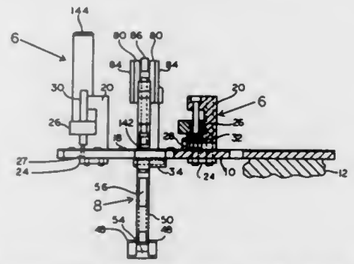
a plurality of sequentially arranged strip knives disposed one after another within the longitudinal passageway of said perimeter frame and further disposed and configured to define a multisegmented peripheral volume of said longitudinal passage way and a residual cross sectional core area in the shape of a non-triangular, non-rectilinear, non-circular decorative food product;

said plurality of knives including strip knives being of size and shape so as to define said multisegented peripheral volume of the longitudinal passageway which results in the cross sectional shape of the core having a non-triangular, non-rectilinear, non-circular decorative perimeter geometry and shape.

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**5,046,389**
**UNIVERSAL PUNCH BLOCK APPARATUS**
**Ted L. Thompson, and David R. Hembree, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**
**Filed Dec. 6, 1989, Ser. No. 446,785**
**Int. Cl.[5] F16H *27/02***
**U.S. Cl. 83—140** **15 Claims**



I. A punch block apparatus for removing a portion of an integrated circuit (IC) die lead from a lead frame such that when the absence of the removed IC die lead is noted said IC die is rejected, comprising:

a. a machine base;

b. a back rail mounted to the machine base;

c. a punch block assembly mounted on the back rail and further comprising:

i. a punch block;

ii. a slotted die push pin mounted within a first bore of the punch block;

iii. a die insert mounted within a second bore of the punch block aligned with the first bore and above the push pin;

iv. an actuating means to move the die insert and die push pin from a lower inoperative position to an upper operative position;

v. a stripper guide bushing mounted within a third bore of the punch block aligned with the first bore above the die insert;

vi. a punch within a fourth bore of the punch block aligned with the first bore and interfitting within the stripper guide bushing;

vii. a punch and stripper guide bushing actuating means to move the punch and the stripper guide bushing from an upper inoperative position to a lower operative position; and

d. a pair of frame locator assemblies mounted above the back rail, whereby a punch tip interfits within a die insert bore thereby removing the die lead portion when the punch is in the lower operative position and the die insert is in the upper operative position.

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**5,046,390**
**MITER SAW**
**Katsuhiko Sasaki, Anjo, Japan, assignor to Makita Electric Works, Ltd., Anjo, Japan**
**Filed Jul. 6, 1990, Ser. No. 549,073**
**Claims priority, application Japan, Jul. 7, 1989, 1-176410**
**Int. Cl.[5] B27B *5/18***
**U.S. Cl. 83—471.2** **4 Claims**

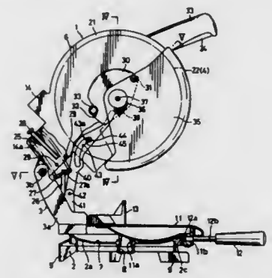
1. A miter saw comprising:

a base on which a workpiece is placed:

a miter saw unit substantially vertically pivotally mounted on said base;

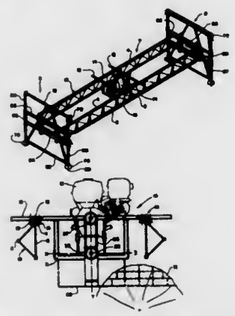
drive means supported by said miter saw unit for driving a rotary tool; and

a linear compression spring disposed between support portions formed on said base and said miter saw unit, respectively, said compression spring being apart from the fulcrum of the pivotal movement of said miter saw unit and being elastically extensible in its longitudinal direction so as to normally urge said miter saw unit upwardly wherein at least one of said support portions includes a support member pivotally mounted thereon around a point within the abutting range of the corresponding end of said compression spring, whereby said compression spring is maintained substantially in linear form irrespective of the pivotal movement of said miter saw unit, so that an effective bias force is always applied to said miter saw unit.



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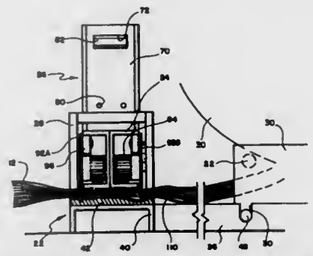
**5,046,391**
**SAW MILL**
**David J. Lewis, Location 1423, Barrabup Rd., and Kevin R. Inkster, Forrest Street, both of Nannup, Western Australia, Australia**
**Continuation of Ser. No. 353,805, May 17, 1989, abandoned. This application Aug. 27, 1990, Ser. No. 572,350**
**Claims priority, application Australia, May 19, 1988, PI8336**
**Int. Cl.[5] B27B *7/00***
**U.S. Cl. 83—489** **17 Claims**



1. A saw mill for cutting timber, having a motor and saw assembly mounted for linear movement along a support frame, said assembly including a motor coupled to a circular saw blade to drive said saw blade for rotation about an axis, at least said saw blade of said assembly being mounted for selective adjustment among three positions, comprising a first position with said rotation axis of the saw blade substantially vertical and second and third positions wherein in each of said second and third positions said rotation axis of the saw blade is substantially horizontal and displaced from the first position in respective opposite directions from said first position through 90°, said rotation axis remaining substantially perpendicular to the direction of said linear movement in each of said first, second and third positions.



**5,046,392**
**CUTTER FOR PREPARING AN INSULATION BATT FOR INSTALLATION**
**Richard Keon, P.O. Box 240062, Charlotte, N.C. 28224, and Luther Morris, 343 Scaleybark Rd., Charlotte, N.C. 28220**
**Filed Apr. 6, 1989, Ser. No. 334,302**
**Int. Cl.[5] B26D *3/06***
**U.S. Cl. 83—862** **13 Claims**



1. Apparatus for severing a length of insulation batting from a supply thereof along a severing path, the insulation batting having insulating material mounted on a backing, and for cutting along a cutting path through the insulating material substantially without cutting of the backing to create a discrete band of insulating material which is easily removable to expose the strip of backing thereunder, comprising:

means having a surface for supporting the portion of the insulation batting between and adjacent the severing path and the cutting path;

first cutter means movable relative to said support surface means;

said support surface means having a severing path support portion for supporting the insulation batting at a position along the severing path, said severing path support portion being positioned with respect to said first cutter means to cooperate therewith for allowing said first cutter means to cut through the insulating material and the backing along the severing path, thereby severing the insulation batting length from the insulating batting supply; and

second cutter means movable relative to said support surface means,

said support surface means having a cutting path support portion for supporting the insulation batting at a position along the cutting path, said cutting path support portion being positioned with respect to said second cutter means to cooperate therewith for allowing said second cutter means to cut through the insulation material substantially without cutting the backing and said cutting path support portion being formed of a generally deflectable material such that said cutting path support portion deflects in response to the force applied thereagainst by said second cutter means during said cutting of the insulating material by said second cutter means to permit the backing to be accommodated between said second cutter means and said cutting path support portion with substantially no penetration of the backing by said second cutter means, thereby creating a discrete band of insulating material adjacent one edge of the insulation batting which is easily removable to expose the backing thereof.

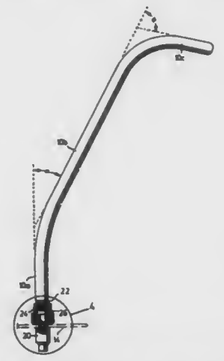
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**5,046,393**
**TREMOLO ARM AND ATTACHMENT MEANS FOR AN ELECTRIC GUITAR**
**Phil Xenidis, 1760 Grosvenor Place, Mississauga, Canada L5L 3V8**
**Filed Apr. 12, 1990, Ser. No. 508,163**
**Int. Cl.[5] G10D *3/00***
**U.S. Cl. 84—313** **12 Claims**

1. A demountable and adjustable tremolo arm for an electric guitar with a tremolo bridge unit having an anchor or attachment of a tremolo arm thereto, comprising:

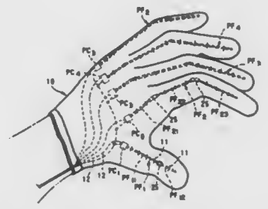
(a) a bar having a first linear portion for connection at the bottom end thereof to said anchor to extend outwardly from said bridge unit and a second linear portion integral with the top end of said first linear portion and inclined at an acute angle between 0° and about 45° to the axis thereof, so that in use said bar extends substantially away from the face of the guitar; and

(b) coupling means for detachably connecting said first portion of the bar to said anchored fitting with the second portion of the bar set at a selected clockwise angular disposition to the guitar strings in a plane parallel to the face of the guitar.



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**5,046,394**
**MUSICAL TONE CONTROL APPARATUS**
**Hideo Suzuki, and Jun Sugiyama, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan**
**Filed Sep. 21, 1989, Ser. No. 410,291**
**Claims priority, application Japan, Sep. 21, 1988, 63-236835**
**Int. Cl.[5] H01J *5/16***
**U.S. Cl. 84—600** **17 Claims**



I. A musical tone control apparatus comprising:

(a) a light emitting element;

(b) a photo-conductive member, in which the transmitted amount of the light emitted from said light emitting element varies in response to a bend of said photo-conductive member;

(c) a light receiving element for receiving the light transmitted through said photo-conductive member;

(d) a mounting member to be mounted to a certain portion of a human body, said photo-conductive member being attached to said mounting member; and

(e) control means for generating a musical tone control signal in response to the amount of the light received by said light receiving element, said control means including comparator means for comparing the amount of the re-

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ceived light to a predetermined threshold value, so that said control means generates said musical tone control signal based on said comparison of the amount of the received light and the predetermined threshold value.

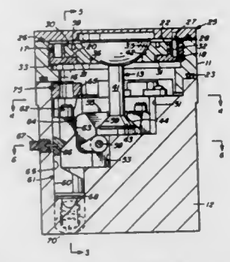
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5,046,395

## TWO FAULT TOLERANT TOGGLE-HOOK RELEASE

Thomas J. Graves, Parker, Colo., and Christopher W. Brown, Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 25, 1990, Ser. No. 603,337
Int. Cl.[5] B64D *1/12*
U.S. Cl. 89—1.14 9 Claims



9. A two fault tolerant releasable fastener for releasably joining separable structures, said fastener comprising:

a fastener plate and a fastener body, each of which is separately attachable to a different one of the structures to be joined;

a toggle member for releasably fastening the fastener plate to the fastener body, said toggle member being supported at a first end by the fastener plate and mounted thereon by a swivel coupling for universal pivotal movement about said first end, said fastener body having an opening in the face disposed towards the fastener plate of a size sufficient to receive a second end of the toggle member while allowing limited pivotal movement of the toggle member about the first end which is supported by the fastener plate, said second end of the toggle member having latching surfaces;

three latch hooks arranged in symmetrical equiangular spacing about said second end portion of the toggle member, each latch hook being mounted on said fastener body for pivotal movement between an unlatching position in noncontact relation with said toggle member and a latching position wherein each said latch hook is in engagement with a different one of the contact latching surfaces of the toggle member;

means for selectively applying an axial preload on the toggle member when the fastener plate and fastener body are coupled together by the toggle member; and

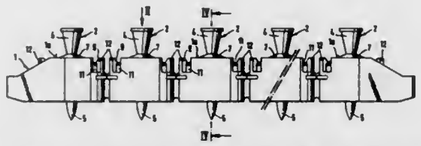
means for releasably locking each said latch hook in said latching position wherein the toggle member couples said fastener plate to said fastener body and whereby the unlocking of at least one of the latch hooks from its latching position results in the decoupling of the fastener plate from said fastener body.

5,046,396

## FASTENING ELEMENT CARRIER STRIP FOR EXPLOSIVE POWDER CHARGE OPERATED SETTING TOOLS

Norbert Pfister, Buchs, Switzerland, assignor to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed May 30, 1990, Ser. No. 530,888
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917846
Int. Cl.[5] F16B *15/08*
U.S. Cl. 89—35.01 14 Claims



1. Carrier strip (1) for explosive powder charge operated setting tools, said carrier strip having an elongated direction, receiving bores (3) formed in and equidistantly spaced apart in the elongated direction of said carrier strip, said receiving bores having an inside diameter, a leading end facing in the direction nails are to be driven from the carrier strip and a trailing end facing in the opposite direction, an axially extending nail (2) displaceably supported in each said receiving bore, each said nail comprises a head (4), a shank (5) extending axially from the said head, and guide disks (6, 7) fitted on said shank in spaced relation for supporting said nail within one said receiving bore (3), said head (4) having a maximum outside diameter not exceeding the inside diameter of the receiving bore, wherein the improvement comprises stop means in said receiving bores for at least one of said guide disks for retaining said nails in said receiving bore.

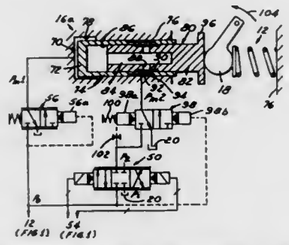
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5,046,397

## ELECTROHYDRAULIC AND HYDROMECHANICAL VALVE SYSTEM FOR DUAL-PISTON STROKE CONTROLLER

Larry O. Ezell, Clinton; John Schmid, and Peter Tovey, both of Jackson, all of Miss., assignors to Vickers, Incorporated, Troy, Mich.

Division of Ser. No. 308,054, Feb. 9, 1989, Pat. No. 4,934,143, which is a division of Ser. No. 43,829, Apr. 29, 1987, Pat. No. 4,823,552. This application Feb. 20, 1990, Ser. No. 481,624
Int. Cl.[5] F16H *39/46;* F15B *11/18*
U.S. Cl. 91—167 R 7 Claims



1. An electrohydraulic fluid control system comprising:

means for providing a source of hydraulic fluid under pressure,

means responsive to hydraulic fluid at metered pressure for performing a preselected operation,

electrohydraulic valve means having fluid ports coupled between said source and said pressure-responsive means, and a control input responsive to electronic valve control signals for metering fluid from said source to said pressure-responsive means as a function of said valve control signals, and

hydromechanical valve means having a control input port coupled to said source, and primary fluid ports connected between said source and said pressure-responsive means in parallel with said electrohydraulic valve means for metering fluid to said pressure-responsive means as a function of pressure of fluid at said control port,

fluid pressure at said pressure-responsive means being controlled by said electrohydraulic valve means and said hydromechanical valve means independently,

said pressure-responsive means comprising an actuator having a first piston slidable within a first cavity and a first port coupling said first cavity to one of said electrohydraulic and hydromechanical valve means, and a second piston slidable within a second cavity in said first piston and a second port coupling said second cavity to the other of said electrohydraulic and hydromechanical valve means, motion of said pistons being a function of the sum of metered pressures in said first and second cavities.



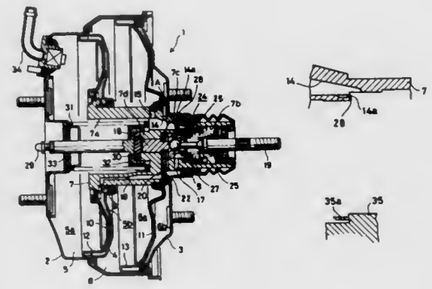
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5,046,398

## NEGATIVE PRESSURE BOOSTER WITH A GROOVE FORMED BY A DIE

Fumihiro Hamamiya, and Hidefumi Inone, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1989, Ser. No. 453,873
Claims priority, application Japan, Dec. 26, 1988, 63-167856[U]
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—369.2 1 Claim



1. A negative pressure booster equipment, comprising a valve body movably mounted in the space formed by a front shell and a rear shell and airtightly and slidably passing through said rear shell, a power piston connected with said valve body and divided into a constant pressure chamber where negative pressure is introduced through said space and a variable pressure chamber where the air at atmospheric pressure is introduced during operation, an input shaft movably mounted in said valve body, and a control valve mounted in said valve body and switched over to selectively provided the communication of said variable pressure chamber with the atmospheric air or with said constant pressure chamber when operated by said input shaft, characterized in that a vacuum passage communicating said control valve with said constant pressure chamber is furnished with a groove formed into a nail-like recession by a right side forming die of said valve body having a nail-like projection for contacting a tip of a left side die for forming the constant pressure passage when the valve body is molded.

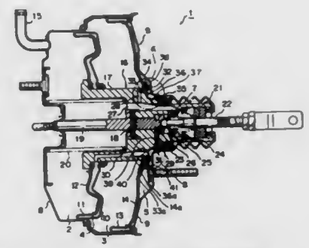
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5,046,399

## TANDEM TYPE BRAKE BOOSTER

Naganori Koshimizu, Yamanashi, Japan, assignor to Tikico Ltd., Kanagawa, Japan

Filed Nov. 9, 1989, Ser. No. 433,772
Claims priority, application Japan, Nov. 11, 1988, 63-147371[U]
Int. Cl.[5] F15B *9/10*
U.S. Cl. 91—369.3 19 Claims



1. A tandem type brake booster comprising:

a booster body including a front shell and a rear shell;

a partitioning wall mounted in an interior of said booster body and dividing said interior of said booster body into front and rear chambers, said partitioning wall having a center hole formed therein;

a valve body extending axially movably through said center hole of said partitioning wall, said valve body having a bore formed therein and being mounted in said booster body with a rear end of said valve body extending outwardly of said booster body through said rear shell, said valve body having a large diameter portion with a stepped portion which is smaller in diameter than a remainder of said large diameter portion and which is located adjacent a rear end of said large diameter portion, a small diameter portion smaller in diameter than said stepped portion and including a groove formed at least partially circumferentially about an outer surface of said small diameter portion, and a shoulder portion connecting said large diameter portion to said small diameter portion;

a front power piston mounted in said front chamber;

a rear power piston mounted in said rear chamber;

a front diaphragm mounted in said front chamber and dividing said front chamber into a front constant pressure chamber and a front variable pressure chamber, said front diaphragm and said front power piston having inner circumferential portions secured together and to said valve body;

a rear diaphragm mounted in said rear chamber and dividing said rear chamber into rear constant pressure chamber and a rear variable pressure chamber, said rear diaphragm and said rear power piston having inner circumferential portions secured together and to said valve body;

an input shaft having front and rear ends;

a plunger operatively connected to said front end of said input shaft and being axially slidably mounted in said bore of said valve body;

a valve means, disposed in said bore of said valve body and

cooperating with said plunger, for selectively controlling introduction of atmospheric air and negative pressure into said front and rear variable pressure chambers;

a passage formed in said valve body and communicating between said front variable pressure chamber and said rear variable pressure chamber, said passage opening through a surface of said shoulder portion and into said rear variable pressure chamber; and

a retainer mounted on said valve body and including an engaging means for engaging in said groove of said small diameter portion and fixing said retainer to said valve body, a retaining means for securing said inner circumferential portions of said rear diaphragm and said rear power piston together and to said stepped portion of said large diameter portion, and a detent means, comprising a portion of said retaining projecting into said passage, for preventing said retainer from rotating relative to said valve body.

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**5,046,400**

## CONTROL VALVE SYSTEM

**Tadao Karakama; Naoki Ishizaki, and Yosuke Oda, all of Kanagawa, Japan, assignors to Kabushiki Kaisha/Komatsu Seisakusho, Tokyo, Japan**

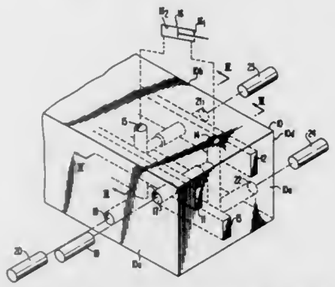
**PCT No. PCT/JP89/00204, § 371 Date Oct. 17, 1989, § 102(e) Date Oct. 17, 1989, PCT Pub. No. WO89/08197, PCT Pub. Date Sep. 8, 1989**

**PCT Filed Feb. 28, 1989, Ser. No. 425,176**

**Claims priority, application Japan, Feb. 29, 1988, 63-44103**

**Int. Cl.[5] F15B *11/08, 13/04***

**U.S. Cl. 91—462** **2 Claims**



1. A control valve system comprising: a valve housing which is provided with a predetermined lateral width, a predetermined longitudinal width, and a predetermined height, and assumes a substantially rectangular parallelepiped form; a first and a second pump port passage formed in said valve housing so that each has the same height, parallelly spaced apart from each other in said longitudinal width direction of said valve housing, to horizontally extend in said lateral width direction of said valve housing and to communicate with a hydraulic pump; a tank port passage so formed in said valve housing as to be disposed in a lower portion of said valve housing, and in a central position of said longitudinal width of said valve housing, to horizontally extend in said lateral width direction of said valve housing and to communicate with a drain tank; a first and a second port passage formed in said valve housing so as not to be aligned with each other in either said lateral width direction or said longitudinal width direction, to extend vertically to open into an upper surface of said valve housing and to communicate with hydraulic equipment; a first meter-in valve inserted into a first valve receiving bore so as to selectively shut off said first pump port passage from said first port passage in operation, said first valve receiving bore being formed in an upper portion of said valve housing so as to open into a side surface of said valve housing perpendicular to said longitudinal width direction thereof, so as to horizontally extend in said longitudinal width direction to penetrate said first pump port passage and as to communicate with said first port passage; a first meter-out valve inserted into a second valve receiving bore so as to selectively shut off said tank port passage from said second port passage, said second valve receiving bore being formed in a lower portion of said valve housing so as to open into said side surface of said valve housing perpendicular to said longitudinal width direction thereof, as to horizontally extend in said longitudinal width direction to sequentially communicate with said second port passage and said tank port passage; a second meter-in valve inserted into a third valve receiving bore so as to selectively shut off said second pump port passage from said second port passage in operation, said third valve receiving bore being formed in said upper portion of said valve housing so as to open into the other side surface of said valve housing perpendicular to said longitudinal width direction thereof, so as to horizontally extend in said longitudinal width direction to penetrate said second pump port passage and to communicate with said second port passage; and a second meter-out valve inserted into a fourth valve receiving bore so as to selectively shut off said tank port passage from said first port passage, said fourth valve receiving bore being formed in said lower portion of said valve housing so as to open into the other side surface of said valve housing perpendicular to said longitudinal width direction thereof, to horizontally extend in said longitudinal width direction to sequentially communicate with said first port passage and said tank port passage.

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**5,046,401**

## WOBBLE PLATE COMPRESSOR WITH A ROTATION PREVENTION MECHANISM

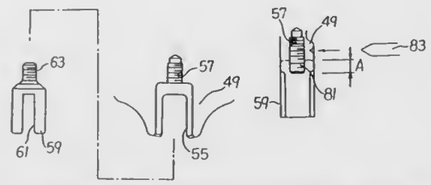
**Shigemi Shimizu, Sawa, Japan, assignor to Sanden Corporation, Gunma, Japan**

**Filed Aug. 9, 1990, Ser. No. 564,837**

**Claims priority, application Japan, Aug. 10, 1989, 1-205810**

**Int. Cl.[5] F01B *3/00, 13/04***

**U.S. Cl. 92—12.2** **10 Claims**




1. In a wobble plate compressor comprising a compressor housing having a cylinder block provided with a plurality of cylinders and a crank chamber adjacent said cylinder block, a piston slidably fitted within each of said cylinders, a drive shaft rotatably supported in said housing, a rotor fixed on said drive shaft and connected to an inclined plate, a wobble plate adjacent said inclined plate with each of said plurality of pistons coupled at one end with said wobble plate, such that rotational motion of said inclined plate is converted into nutational motion of said wobble plate, and a rotation preventing mechanism to prevent rotation of said wobble plate, said rotation preventing mechanism having a guide plate extending within and fixed in said crank chamber, a cylindrical block including a vertical groove formed therein and retaining means for retaining said cylindrical block on said wobble plate such that said vertical groove is slidably fitted on said guide plate, the improvement comprising:

said retaining means including a female screw formed on one of said wobble plate and the upper surface of said cylindrical block and a male screw provided on the other of said wobble plate and the upper surface of said cylindrical block, said male screw being screwed in said female screw.



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**5,046,402**

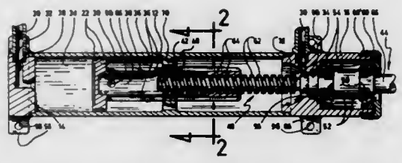
## ROTARY TO AXIAL MOTION CONVERTING DEVICE WITH GROOVE IN PISTON GUIDE

**Jean-Hugues Lagace, 118 Grande-Ligne, Lac Etchemin, Quebec, Canada G0R 1S0**

**Filed Apr. 23, 1990, Ser. No. 512,802**

**Int. Cl.[5] F01B *3/00;* F15B *13/04;* B66D *1/08;* E06C *7/08***

**U.S. Cl. 92—33** **1 Claim**




1. A device for converting rotary motion into hydraulic pressure and vice versa, comprising a cylinder closed at both ends, a piston assembly entirely located within said cylinder and including a piston head and a piston stem fixed to said piston head, said piston assembly dividing said cylinder into two distinct variable volume first and second chambers to be filled with a fluid, said piston assembly preventing fluid transfer from one chamber to the other, means preventing rotation of said piston assembly while allowing its longitudinal movement relative to said cylinder, a rotary shaft extending through the one closed end of said cylinder which is adjacent said first chamber and including an outer portion exteriorly of said cylinder and an inner portion interiorly of said cylinder, said stem and said shaft inner portion being co-axial and complementarily threaded and being in telescopic and threaded engagement, means preventing axial shifting of said shaft while allowing its rotation and fluid ports at the ends of said cylinder in communication with the respective chambers for allowing a fluid to alternately exit from and enter into said chambers, whereby rotation of said shaft by a torque applied to its external portion will cause longitudinal displacement of said piston assembly within said cylinder, or displacement of said piston assembly under hydraulic pressure will cause rotation of said shaft; wherein said shaft inner portion is hollow with a closed end and with inner threads and said piston stem forms a rod member with outer threads and telescopically engages within the hollow inner shaft portion; and wherein the inner end of said hollow shaft portion is in communication with said first chamber through an opening made therein; wherein said means preventing rotation of said piston assembly comprises a partition fixed to said cylinder and extending within said first chamber and surrounding said shaft inner portion, said partition having through-bores and guide rods fixed to said piston head extending longitudinally within said first chamber and through said throughbores to be guided by the same.

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**5,046,403**

## AXIAL PISTON MACHINE WITH SWASH PLATE CONSTRUCTION

**Josef Riedhammer, Horb am Neckar, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Fed. Rep. of Germany**

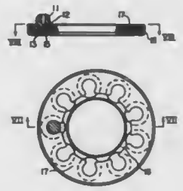
**Filed Aug. 28, 1990, Ser. No. 573,848**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1989, 3928942**

**Int. Cl.[5] F01B *13/04***

**U.S. Cl. 92—57** **21 Claims**

1. An axial piston machine having a housing, a housing cover, a swash plate, an elongated rotary shaft extending through said swash plate and said housing with an end in said housing cover and a cylindrical drum connected to said shaft for rotation therewith, said cylindrical drum abutting against a surface of a control member located in said housing adjacent to said housing cover and a plurality of concentrically arranged cylindrical passages formed in said cylindrical drum, a longitudinally moveable piston located in each of said cylindrical passages, a slide shoe at one end of each of said pistons, each of said slide shoes being in working connection with said swash plate, each of said slide shoes having a slide shoe plate, a slide shoe neck and a slide shoe head connecting with one of said pistons, the faces of said slide shoe plates opposite from said



swash plate being in contact with an annular, spring-loaded retaining plate, said retaining plate being provided with a plurality of concentrically arranged recesses corresponding in number and spacing to the number and spacing of said cylindrical passages in said cylindrical drum to receive said slide shoe necks, said faces of said slide shoe plates facing said swash plate being supported on an annular sliding disk, means connecting said annular sliding disk and said retaining plate for rotation of said annular sliding disk and said retaining plate relative to said swash plate.

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**5,046,404**

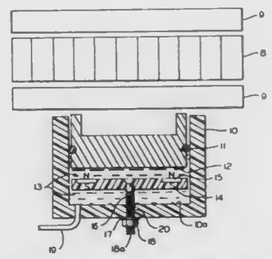
## MAGNETIC DISK BRAKE RETRACTOR

**Walter H. Schnorenberg, Jr., 4000 Crystie La., Casper, Wyo. 82609**

**Filed Nov. 19, 1990, Ser. No. 615,393**

**Int. Cl.[5] F01B *31/00***

**U.S. Cl. 92—130 B** **12 Claims**



1. In a hydraulic brake mechanism, the combination comprising:

a housing for enclosing a piston, a chamber for hydraulic fluid, and means to connect said chamber with a source of hydraulic fluid; and

magnetic means within said chamber for urging said piston in a predetermined manner.

VOL 1130 ISS 2 SE 10 1991 UMI

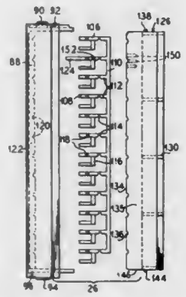


5,046,405
**AIR DIFFUSER**
Michel Roy, 856 du Parc, Duvernay, Laval, Quebec, Canada H7E 2T6
Filed Jan. 28, 1991, Ser. No. 646,367
Int. Cl.[5] F24F *13/06*
U.S. Cl. 98—40.15 15 Claims



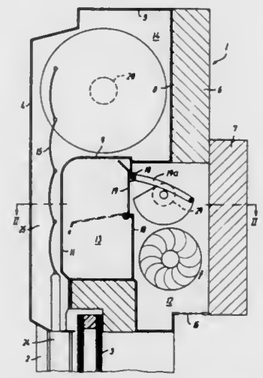
1. An air diffuser comprising an upper polygonal plate adapted to be horizontally positioned in a ceiling opening and provided with connector means to attach the same to an air supply duct which will discharge air through a central hole in said upper plate, an air deflector lower plate, suspension means suspending said lower plate in an horizontal position spaced below said upper plate to provide a peripheral gap of a substantially uniform width between the two plates, said lower plate subtantially co-extensive with said upper plate and of the same polygonal shape defining a plurality of substantially straight peripheral edges, as many substantially rectangular baffle plates as the number of peripheral edges of said lower plate, each baffle plate located in said gap having a free longitudinal edge and an opposite longitudinal hinge edge, hinge means hinging said baffle plates to one of said upper and lower plates, the hinge axis of each baffle plate being substantially parallel to a peripheral edge of said lower plate and located inwardly of said peripheral edge, each baffle plate angularly adjustable in said gap between a fully opened position substantially parallel to said upper and lower plates and a fully closed position in which the free longitudinal edge of said baffle plate rests against the other one of said upper and lower plates, and means to maintain each baffle plate in angularly adjusted position.

5,046,406
**ADJUSTABLE LOUVER ASSEMBLY FOR A ROOM AIR CONDITIONER**
James E. Harris, Hermitage, and Leonard T. Farfaglia, deceased, late of Brentwood, both of Tenn. by Mary M. Farfaglia, legal representative , assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed May 11, 1990, Ser. No. 522,198
Int. Cl.[5] F24F *7/00*
U.S. Cl. 98—40.24 19 Claims



1. An adjustable louver assembly comprising:
a box-like member having
walls forming the top, bottom and two lateral sides of said member,
an open front and back side,
two opposite of said walls each having at least one detent thereon,
vertical side rails adjacent to said two lateral side walls, a common face of said rails having a plurality of vertically spaced notches therein;
a horizontal louver member having
a plurality of horizontal louvers,
at least one vertical link connecting said horizontal louvers,
a plurality of pivot pins projecting laterally outwardly from said horizontal louvers about which said horizontal louvers will pivot, said pins receivable in said notches in said box-like member; and
a vertical louver member having
a plurality of vertical louvers,
a top and bottom wall for supporting said vertical louvers,
a pair of vertical walls positioned at lateral sides of said horizontal louvers, a common face of said walls having a plurality of vertically spaced notches therein for receiving said pivot pins of said horizontal louver member,
two opposite of said walls each having at least one detent thereon engageable with said detents in said box-like member;
wherein said horizontal louver member is sandwiched between said box-like member and said vertical louver member with said pins engaging in both sets of said notches and with said box-like member detents engaging said vertical louver member detents to hold said assembly together without additional fasteners.

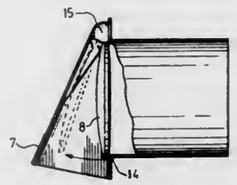
5,046,407
**ROOF WINDOW**
Elgard S. Nielsen, Soborg, and Arne B. Jensen, Charlottenlund, both of Denmark, assignors to V. Kann Rasmussen Industri A/S, Soborg, Denmark
Filed Nov. 8, 1989, Ser. No. 433,123
Claims priority, application Denmark, Nov. 11, 1988, 6297/88
Int. Cl.[5] E06B *7/02*
U.S. Cl. 98—94.1 10 Claims



1. A roof window for installation in an inclined roof, wherein the roof window has a rectangular main frame structure having external surfaces on an external side of the roof, the main frame structure including at least an upper horizontal frame member at least partially designed as a hollow box-like structure having opposite end walls, and the frame member including a closeable passage for ventilating air between an internal side of the box-like structure and an external side thereof, characterized in that the box-like structure includes
an inner ventilating compartment having an opening through which the inner ventilating compartment communicates with the internal side of the box-like structure,
an outer ventilating compartment having air exhausts positioned at both end walls of the box-like structure, said end walls forming, in a mounted state of the roof window, part of the external surfaces of the main frame structure and extending in vertical planes from the external side of the roof, and
a flow passage between the inner ventilating compartment and the outer ventilating compartment, the flow passage being provided with an adjustable damper.

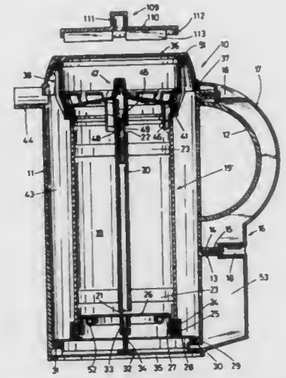


5,046,408
**HOODED EXHAUST VENT**
John Eugenio, 74 Chimney Hill Dr., Cambridge, Ontario, Canada
Filed Jul. 13, 1990, Ser. No. 552,017
Int. Cl.[5] F24F *13/10*
U.S. Cl. 98—119 3 Claims



1. An air venting apparatus for connecting to the exhaust outlet of a fan or blower, which fan or blower when in operation exhaust air from the interior of building or structure through an exhaust duct into the venting apparatus for discharge therefrom to exterior of building or structure, said venting apparatus comprising:
a. an air duct having an inlet end and an outlet end, said inlet end being connected to the exhaust duct for discharging air therethrough;
b. a hood communicating with the air duct discharge end, said hood having a lower outlet for the exhaust of air therefrom;
c. a hingedly suspended movable valve flap operatively connected to the upper portion of said hood for opening and closing said air duct discharge end, said valve flap having an inside face and an outside face, said valve flap inside face facing toward the air duct discharged end for closing said air discharge outlet by pivotable movement against said discharge end upon the absence of blower impelled air through said air duct; and
d. a spring clip means comprising at least one leaf spring clip being made of plastic or metal fastened at the lower outlet of the hood, said valve flap outside face being in contact with and being subject to the pressure of said spring clip and outside atmosphere, said spring clip means operative in the absence of blower impelled air against the said inside face of said valve flap to hold said valve flap in its closed position regardless of any changes in pressure to which the said outside face of said valve flap may be subjected, spring clip acting at center or thereabout on outside face of said valve flap and out of the air stream, said spring clip means being inoperative to hold said valve flap in the presence of fan or blower air pressure against said inner side of said valve flap.

5,046,409
**MACHINE FOR BREWING HOT BEVERAGES**
Stefan Henn, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG., Solingen, Fed. Rep. of Germany
Filed Aug. 16, 1989, Ser. No. 394,749
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829417
Int. Cl.[5] A47J *31/12*
U.S. Cl. 99—307 45 Claims



1. A machine for brewing hot beverages by contacting a flavoring agent with a heated liquid, particularly an automatic coffee or tea maker, comprising a substantially carafe-shaped hollow housing having at least one partition dividing the interior of the housing into a first chamber for a liquid and a second chamber for the beverage; a filtering unit disposed in said housing above said partition and having means for receiving a supply of flavoring agent; means for heating and thus pressurizing the liquid in said first chamber, said heating means including at least one thick film conductor; means for conveying heated and pressurized liquid from said first chamber into said unit, said unit having means for discharging the thus obtained beverage into said second chamber; and a cover for said unit, said housing and said cover comprising means for sealingly but separably connecting said cover to said housing with a force which suffices to resist the pressure of heated fluid in said first chamber.

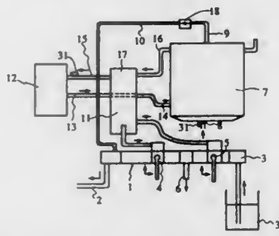
5,046,410
**SELF CLEANING LIQUID CIRCULATOR**
Yasuhiro Shimizu, Isehara, Japan, assignor to Toshin Technical Co., Ltd., Kanagawa, Japan
Division of Ser. No. 329,237, Mar. 27, 1989, Pat. No. 4,989,668.
This application Oct. 10, 1990, Ser. No. 595,328
Claims priority, application Japan, Dec. 12, 1988, 63-313501
Int. Cl.[5] A23B *5/00*; A23C *23/00*
U.S. Cl. 99—455 3 Claims

1. A liquid circulator for circulating liquid through a casing having a drain port and a supply port comprising:
a one-way valve connected at a first end to the drain port for allowing liquid to flow only out of the drain port;
a drain pipe connected to a second end of the one-way valve, and terminating in an outlet port;
a supply tank for supplying liquid to flow through the casing and connected to an inlet port;
a first valve having two positions and a body and connected at a first end to the inlet port;
a feed port connected to a second end of the first valve and to the supply port;
a second valve having two positions and a body and con-

nected at a first end to the feed port and connected at a second end to the outlet port; and

a pump connected between the body of the first valve and the body of the second valve;

wherein the first and second valves both being in a first position, liquid circulates from the supply tank via the inlet port through the first valve, to the pump, to the



second valve, to the feed port to the supply port, through the casing, and out through the drain port, to the one way valve, to the drain pipe, to the outlet port; and

wherein the first and second valves both being in a second position, liquid in the casing circulates out of the casing via the supply port, to the feed port, to the first valve, to the pump, to the second valve, and to the outlet port.

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**5,046,411**

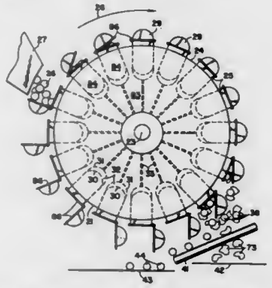
**APPARATUS FOR PEELING FOOD PRODUCTS**

**Ferdinand le Grand, and Ned C. Stevens, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.**

**Filed Oct. 26, 1990, Ser. No. 603,919**

**Int. Cl.[5] A23N *7/00***

**U.S. Cl. 99—472** **16 Claims**



1. An apparatus for continuously removing the outer covering of a natural food having a flexible, parable outer covering which comprises:

a. a continuously rotatable drum having a generally cylindrical outer surface and a horizontal axis about which said drum rotates;

b. a plurality of individual compartments mounted on said outer surface and having covers which are selectively individually openable and closable;

c. means for supplying a hot gaseous fluid to each said compartment at selected times;

d. means for supplying a vacuum to each said compartment at selected times;

e. means to remove vapors and condensate from each said compartment at selected times;

f. means for filling each said compartment with said natural food having said outer covering thereon; and

g. means to remove said food and said outer coverings from each said compartment and to separate the edible center of said food from said outer coverings.

**5,046,412**

**FIXED PRINTING AXIS PRINTING MACHINE WITH MULTIRATIO TRANSMISSION MEANS VARYING THE LOCATION OF THE OBJECT TO BE PRINTED**

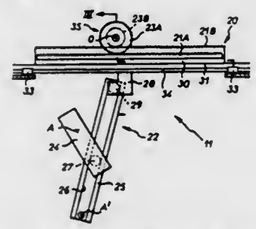
**Jean-Louis Dubuit, Paris; Eric Rouly, Pontaut Combault, and Jean-Pierre Douville, Gagny, all of France, assignors to Societe D'Exploitation Des Machines Dubuit, Noisy Le Grand, France**

**Filed Nov. 15, 1989, Ser. No. 436,719**

**Claims priority, application France, Dec. 5, 1988, 88 15898**

**Int. Cl.[5] B41F *17/22***

**U.S. Cl. 101—39** **16 Claims**



1. A printing machine for printing on an object, comprising a mobile assembly having a support for flat printing means, rotation means for rotating an object to be printed about a fixed printing axis in contact with the printing means, correction means for varying the distance between the printing axis and the printing means, a drive shaft, transmission means coupling said rotation means to said drive shaft and having at least two transmission ratios for selectively rotating an object about the printing axis through corresponding different angular displacements for a given angular displacement of said drive shaft, said transmission means comprising a carriage, at least two parallel racks mounted on said carriage, reciprocating means coupling said carriage to said drive shaft, and at least two pinions of different diameters coaxial with a respective one of said racks for defining one of said transmission ratios.

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**5,046,413**

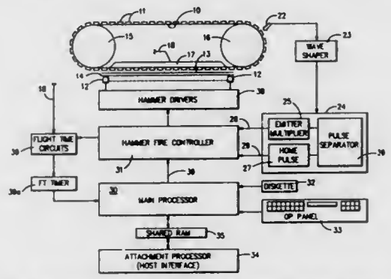
**METHOD AND APPARATUS FOR BAND PRINTING WITH AUTOMATIC HOME COMPENSATION**

**John S. Gregor, Endicott; Clarence C. Hubbell, Vestal, and Susan K. Lichtensteiger, Endicott, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Oct. 5, 1990, Ser. No. 593,138**

**Int. Cl.[5] B41J *1/20***

**U.S. Cl. 101—93.01** **13 Claims**




1. In a printer system wherein a printer mechanism comprises type elements movable relative to a plurality of print hammers electrically operable for impacting said type elements during motion thereof for printing imprints of said type elements on a print medium and a print control with timing means including sensor means located at a home position relative to a particular print hammer and operable for generating timing signals for operating the hammers in synchronism with said the motion of said type elements, a method for compensating for inaccuracies in the location of said sensor means at said home position comprising the steps of

operating a particular hammer to locate the edge of a particular type element during motion thereof, and

deriving a time adjustment value on the basis of the distance said edge is from the center of said particular type element, and

supplying said adjustment value to said print control for adjusting the timing of the operation of said print hammers in synchronism with the motion of said type elements.



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**5,046,414**

**SCREEN PRINTING MACHINE**

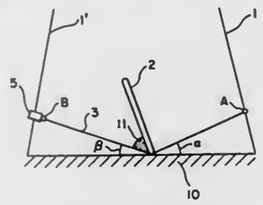
**Masanao Oozeki, 47-6-301 Sakuradai, 3-chome, Nerima-ku, Tokyo, Japan**

**Division of Ser. No. 422,891, Oct. 18, 1989, which is a continuation of Ser. No. 300,342, Jan. 23, 1989, abandoned. This application Aug. 24, 1990, Ser. No. 573,714**

**Claims priority, application Japan, Apr. 28, 1988, 63-103900; Jun. 6, 1988, 63-137448**

**Int. Cl.[5] B05C *17/04***

**U.S. Cl. 101—123** **1 Claim**



1. A screen printing machine comprising:

a screen stencil having two ends supported over a surface of a material to be printed;

a squeegee supported for forward and backward movement on said screen stencil so as to apply tension thereto;

said screen stencil having the first end parallel to sides of said squeegee which are perpendicular to the direction of movement of said squeegee on said screen stencil;

stencil holder means for holding a first end of the screen stencil;

an elastic material holder fixed to the screen printing machine; and

an elastic material connected between the stencil holder means and the elastic material holder for moving the first end of the screen stencil in accordance with the movement of the squeegee across the screen stencil so as to maintain the tension caused by the movement of the squeegee across the screen stencil constant.

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**5,046,415**

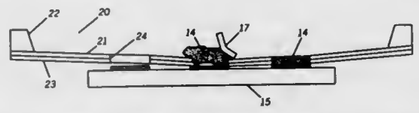
**COMPOSITE STENCIL FOR SCREEN PRINTING**

**William L. Oates, Pompano Beach, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 293,918, Jan. 6, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 651,103**

**Int. Cl.[5] B05C *17/06***

**U.S. Cl. 101—128.21** **7 Claims**



5. A composite stencil as defined in claim 1, in which the resilient material is plastic.

**5,046,416**

**PRINTING UNIT FOR ROTARY PRINTING PRESSES**

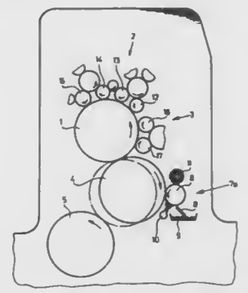
**Norbert Freyer, Grossaschsen, and Norbert Thunker, Heidelberg, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany**

**Filed Jan. 12, 1989, Ser. No. 296,434**

**Claims priority, application Fed. Rep. of Germany, Jan. 12, 1988, 3800570**

**Int. Cl.[5] B41F *7/26, 31/20, 35/04***

**U.S. Cl. 101—148** **9 Claims**



1. A rotary printing press comprising at least one printing unit with at least one ink-conducting cylinder for printing on a material and an inking unit for supplying ink to the one ink-conducting cylinder, the printing press having means for stopping the printing unit from printing on a printing material while the inking unit continues to supply ink to the one ink-conducting cylinder, an ink-reducing unit having means engageable with and disengageable from the one ink-conducting cylinder, said ink-reducing unit having at least one roller, a doctor blade engageable with said one roller, and an ink-collection trough disposed below said doctor blade; means maintaining said one roller, while the printing is stopped and while ink is being supplied to the one ink-conducting cylinder, in engagement with the one ink-conducting cylinder for removing from the one ink-conducting cylinder substantially a like portion of ink film which would otherwise be removed by the printing material being printed in the printing unit so as to provide an ink profile suitable for a production run as well as to establish a stable ink solution equilibrium.

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**5,046,417**

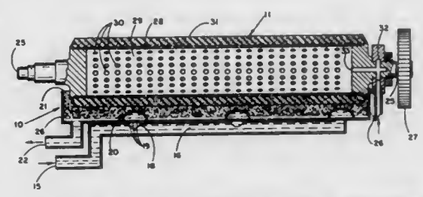
**VAPOR FILM EQUALIZER DAMPENING SYSTEM FOR PRINTING PLATE CYLINDER**

**Harold E. Paulson, 360 Wynland Trace, Dunwoody, Ga. 30350**

**Filed Oct. 1, 1990, Ser. No. 590,957**

**Int. Cl.[5] B41F *7/26, 7/32;* B41L *25/02;* B41M *25/18***

**U.S. Cl. 101—148** **8 Claims**



1. In a printing press, a system for applying to the surface of a printing plate on a printing cylinder a thin coating film of an anti-inking liquid solution, comprising:

a container of anti-inking liquid solution for coating the surface of a printing cylinder;

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an axially rotatable pan roller partially immersed in said liquid solution, said pan roller comprising a hollow core surrounded by a coarsely porous rigid tubular support having an outer covering layer of microporous material;

an axially rotatable metering roller having an outer surface of highly polished chrome finish, the axis of said metering roller parallel to said pan roller with the outer surfaces of said pan roller and said metering roller being in contact for transferring liquid solution from said pan roller to said metering roller.;

a form roller axially rotatable parallel to said metering roller, the outer surface of said form roller being in contact with the outer surface of said metering roller for transferring liquid solution from said metering roller to said form roller;

the outer surface of said form roller being in contact with the surface of a printing plate on a rotatable printing press printing cylinder for transferring liquid solution from said form roller to said printing plate.

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**5,046,418**

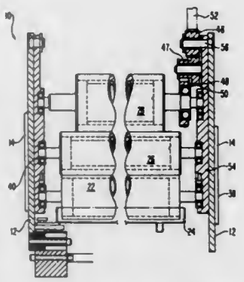
## DAMPENING METHOD AND APPARATUS FOR AUTOMATIC INK/WATER CONTROL FOR LITHOGRAPHIC PRINTING PRESS

**James E. Koehler, Montreal, Canada; David W. Paularena, Marietta, and Richard G. McCaffrey, Woodstock, both of Ga., assignors to Dahlgren International, Inc., Dallas, Tex.**

**Filed Feb. 23, 1990, Ser. No. 482,917**

**Int. Cl.[5] B41F** *7/26*

**U.S. Cl. 101—148** **17 Claims**



1. In a lithographic press having a rotatable plate cylinder for carrying a lithographic printing plate, drive means for rotating the plate cylinder, and an inking system for providing ink to said plate cylinder, a dampening unit for automatically applying a controlled quantity of dampening fluid with ink to a lithographic printing plate on said plate cylinder comprising:

dampener support means;

metering roll means mounted for free rotating upon said dampener support means, said metering roll means including a metering roller having a hard hydrophylic surface for supporting a layer of dampening fluid;

a transfer roller mounted for free rotation upon said dampener support means and in continuous pressure contact with said metering roller to form a first nip therebetween, said transfer roller having a resilient ink-receptive surface for supporting an ink film;

a dampener form roller having an ink receptive surface mounted for rotation upon said support means in continuous pressure contact with said transfer roller to form a second nip therebetween, said dampener support means mounting said dampener form roller for pressure contact with said plate cylinder whereby said dampener form roller receives ink from said plate cylinder and provides a film of ink to said transfer roller;

dampener drive means connected to said dampener form roller for rotating said dampener form roller, and dampening fluid supply means for providing an abundant supply of dampening fluid to said metering roller, said dampening fluid supply means and metering roll means operating to provide a supply of dampening fluid to said first nip in excess of the amount of dampening fluid to be accepted by ink on the transfer roller and to return excess dampening fluid to said dampening fluid supply means;

wherein, said dampener support means mounts said metering roller in free wheeling relationship with said transfer roller at a present pressure sufficient to cause said metering roller to be rotated solely by friction with an ink layer on said transfer roller with substantially no shear of the ink and dampening fluid passing through said first nip, said dampener support means mounting said transfer roller in free wheeling relationship with said dampener form roller at a preset pressure sufficient to cause said transfer roller to be rotated solely by friction with said dampener form roller with substantially no shear of the ink and dampening fluid passing through said second nip.

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**5,046,419**

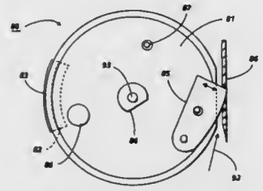
## ROTARY INK STAMP FOR A COPIER/PRINTER APPARATUS

**John D. Zoltner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Continuation-in-part of Ser. No. 105,074, Oct. 5, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,488**

**Int. Cl.[5] B41F** *13/24*

**U.S. Cl. 101—235** **15 Claims**



15. In a printing apparatus adapted to place original page image information onto a photoconductive surface and to print copies of the page image information onto copy sheets and forward them into an output tray, the improvement of a low-cost stamping mechanism for use in such a printing apparatus for inking a special message onto the copy sheets, comprising:

a multi-mode printwheel;

stamp means positioned on a portion of the outer circumference of said printwheel;

copy sheet transport means through which a copy sheet is driven by said printwheel; and

latch means including a pawl attached to said printwheel for preventing movement of said printwheel except when said printwheel is in a first mode, said pawl resting solely due to gravity in contacting relation in a cut-out portion of said copy sheet transport path means with respect to copy sheets passing through said copy sheet transport means, said pawl being lifted from said cut-out portion of said copy sheet transport means by the leading edge of a driven copy sheet and falls due solely to gravity and centrifugal force back into said cut-out portion of said copy sheet transport path means once the trailing edge of the copy sheet passes said pawl, and when said printwheel is in a second mode said pawl does not prevent movement of said printwheel while simultaneously being lifted out of and returned to said cut-out portion of said transport by movement of copy sheets through said copy sheet transport means.



**5,046,420**

## INK DUCT FOR PRINTING PRESSES INCLUDING FANS FOR HEATING INK

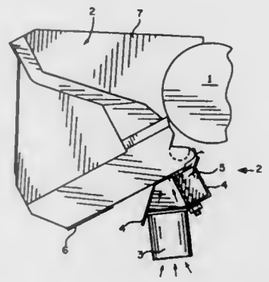
**Werner Sondergeld, Offenbach; Bert Cappel; Gunter Schniggenfittig, both of Muhlheim; Nicola Puplc, Heusenstamm; Valentin Gensheimer, Muhlheim, and Georg Hartung, Augsburg, all of Fed. Rep. of Germany, assignors to MAN Roland Druckmaschinen, Fed. Rep. of Germany**

**Filed Jul. 24, 1990, Ser. No. 557,361**

**Claims priority, application Fed. Rep. of Germany, Jul. 28, 1989, 3925034**

**Int. Cl.[5] B41F** *31/00*

**U.S. Cl. 101—350** **3 Claims**



1. An irk duct for use on a printing press, said printing press having a ductor roller with a circumferential surface, a metering means for regulating the thickness of an ink layer on said ductor roller, said metering means including a ductor blade extending along the length of said ductor roller, said ink duct comprising:

a duct body, including an underside, a rear portion and a mid-section portion;

side plates connected to the duct body and disposed on the circumferential surface of the ductor roller;

a heat insulating material secured to the underside of the duct body;

means including a plurality of fans for providing an airflow from the printing press toward said duct body, said airflow being of a higher temperature than the ambient air;

said plurality of fans being located at the mid-section portion of said duct body, arranged along the length of said ductor roller, and being positioned to face the ductor roller.

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**5,046,421**

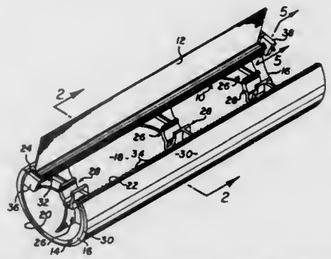
## NET CARTRIDGE ASSEMBLY FOR USE WITH TRANSFER AND DELIVERY CYLINDERS IN ROTARY PRINTING PRESSES

**Howard W. DeMoore, 2552 Royal La., Dallas, Tex. 75299**

**Filed Dec. 19, 1989, Ser. No. 452,839**

**Int. Cl.[5] B41F** *21/00*

**U.S. Cl. 101—420** **19 Claims**



1. In a combination with a cylinder of the type used in supporting and conveying printed sheets between processing stations in a rotary printing press, the cylinder having a support surface defined between axially spaced sides and an opening along the axial width thereof forming a cylinder leading edge and a cylinder trailing edge, a cartridge assembly for use in providing a source of supply of anti-smear fabric net material for covering the support surface, said cartridge assembly comprising:

a pair of axially spaced mounting brackets secured to said cylinder adjacent said trailing edge and projecting generally radially inwardly relative to said support surface;

a rotatable axle assembly removably coupled to said mounting brackets and extending therebetween along an axis substantially parallel with said edge, said axle assembly comprising a cylindrical axle and a movable plunger projecting axially from one end thereof and rotatably supported in one of said brackets;

means for releasably locking said axle assembly against removal from said brackets;

means for releasably locking said axle assembly against rotation in one direction with respect to said brackets, said means for locking said axle against rotation in one direction comprising lock means mounted to said one bracket for releasably engaging said plunger to prevent rotation thereof in said one direction but permitting rotation in the opposite direction; and

a cartridge roll carrying a continuous supply of fabric net material wound there around, said roll being mounted on said axle and coupled thereto for rotation therewith.

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**5,046,422**

## INK REMOVING SYSTEM FOR AN OFFSET PRINTING MACHINE

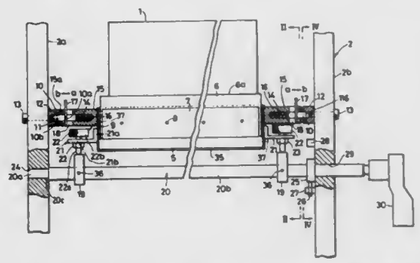
**Takahiko Shinmoto, Hiroshima, Japan, assignor to Ryobi Ltd., Hiroshima, Japan**

**Continuation-in-part of Ser. No. 144,719, Jan. 14, 1988, which is a continuation of Ser. No. 844,045, Mar. 25, 1986. This application Jun. 27, 1989, Ser. No. 372,144**

**Claims priority, application Japan, Mar. 26, 1985, 60-44093[U]**

**Int. Cl.[5] B41F** *35/00;* **A46B** *15/00*

**U.S. Cl. 101—425** **7 Claims**



1. An ink removing system for an offset printing machine, said offset printing machine including an inking roller mounted for rotation about its axis horizontally between a pair of parallel vertical frame walls, said system comprising:

a pair of cleaning tank mounting guides fixedly secured to the vertical frame wall, respectively, facing each other and to one side of said ink roller,

an elongated rectangular, vertically upwardly open cleaning tank,

means on opposed ends of said cleaning tank for supporting a pair of axially displaceable spring biased mounting pins projecting away from said tank and to opposite ends thereof,

recesses sized slightly larger than the diameter of the mount-

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ing pins carried within the ends of the tank mounting guides facing said cleaning tank,

said cleaning tank interposed between said mounting guides, with the axially displaceable pins being spring biased into contact with the mounting guides and received within said recesses, such that said tank is supported for rotation about the axes of said mounting pins,

a cam shaft rotatably mounted for rotation between said vertical frame wall and parallel with said inking roller and in juxtaposition to and below the cleaning tank,

said cam shaft carrying one or more radial cams operatively engaging said cleaning tank to a side of said tank pivot axis as defined by said mounting pins remote from said inking roller,

a cleaning blade projecting outwardly from the top of said cleaning tank and extending longitudinally of said cleaning tank and having an outer edge parallel to said inking roller for contact with the inking roller periphery,

an adjusting screw support bracket fixedly mounted to said tank and projecting across and facing the periphery of said at least one cam,

an adjusting screw threadably projecting through said adjusting screw mounting bracket and having a threaded end in contact with the periphery of the radial cam such that adjusting said screw axially varies the pressure exerted by said at least one cam through said cleaning blade edge on the periphery of said inking roller,

wherein the position of said mounting pins on said cleaning tank is such that said tank tends to rotate by gravity to a position where the edge of the cleaning blade is spaced from the periphery of said ink roller and to cause and maintain operative contact between said at least one radial cam and said cleaning tank; and

wherein said cam shaft includes a reduced diameter portion at one end rotatably received within a correspondingly sized hole within said one of said vertical frame walls, the other end of said cam shaft projecting through a hole within the other of said vertical frame walls, a collar fixedly mounted to said cam shaft adjacent said other frame wall and forming a first stop to prevent axial shifting of said cam shaft, a shoulder defined by said reduced diameter portion of said cam shaft which abuts the face of said one vertical frame wall to prevent axial shifting of said cam shaft in that direction, and wherein a limit pin is fixedly mounted to said collar and extends radially thereof, and a pair of stops are fixedly mounted to said other frame wall and projects outwardly thereof and in the path of said radially projecting pin to limit rotation of said cam shaft between said first and second cam shaft positions in which said cleaning tank blade edge is in contact with the periphery of said ink roller and remote therefrom, and wherein the angle of rotation corresponds to low and high points on said at least one radial cam,

whereby, rotation of said cam shaft causes said at least one radial cam, in operative engagement with said cleaning tank, to cam said cleaning tank about its axis of rotation and to place the edge of said cleaning blade in contact with the periphery of said inking roller to facilitate cleaning of said inking roller.

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**5,046,423**

## LASER-DRIVEN FLYER PLATE

**Dennis L. Paisley, Santa Fe, N. Mex., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.**

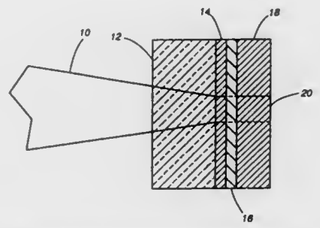
**Filed Apr. 2, 1990, Ser. No. 502,956**
**Int. Cl.[5] F42C *19/08*; F42B *3/113***
**U.S. Cl. 102—201** **5 Claims**

1. Apparatus for producing a flyer plate from laser irradiation comprising:

a. a substrate transparent to said laser irradiation;

b. a first metal layer deposited onto said substrate;

c. a layer of dielectric material deposited onto said first metal layer; and




d. a second metal layer deposited onto said layer of dielectric material.

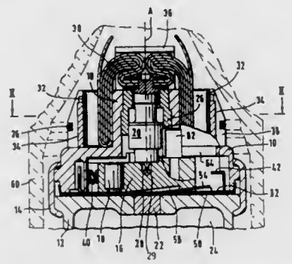
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**5,046,424**

## FUZE FOR A BOMBLET PROJECTILE

**Gerhard Skowasch, Gelsenkirchen, and Wolfgang Hoffmann, Velbert, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsselforf, Fed. Rep. of Germany**

**Filed Jul. 30, 1990, Ser. No. 559,350**
**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1989, 3925236**
**Int. Cl.[5] F42B *12/58*; F42C *9/14, 15/184, 15/22***
**U.S. Cl. 102—226** **11 Claims**



1. In a fuze for a bomblet projectile including: a fuze housing; a firing pin mounted for axial displacement in said housing; a detonation charge mounted on a slide disposed within said housing for displacement in a direction transverse to the longitudinal direction of the housing and its center axis between a safety position, wherein said detonation charge is not aligned with said firing pin, and an armed position, wherein said detonation charge is aligned with said firing pin; and a plurality of spin braking fins pivotally mounted to the exterior of said fuze housing for movement between a non-deployed position, wherein said fins are disposed adjacent to an exterior surface of said housing, and a deployed position, wherein said fins extend transversely to said center axis; the improvement comprising: an opening provided in said side wall of said fuze housing; and a safety pin mounted on said slide for movement therewith such that said safety pin takes on a position within said fuze housing when said slide is in said safety position and passes, at least in part, through said opening to take on a final position which, at least in part, is outside of said fuze housing after displacement of said slide to said armed position.



**5,046,425**

## MANUFACTURE OF EXPLOSIVE CIRCUITS USING SILK SCREENING TECHNIQUES AND EXPLOSIVE INKS

**Gould Gibbons, Jr., Finksburg, Md., and Denis A. Silvia, Corpus Christi, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Oct. 23, 1990, Ser. No. 607,433**
**Int. Cl.[5] F42C *19/00***
**U.S. Cl. 102—293** **12 Claims**

1. A method for manufacturing explosive logic circuits comprising:

developing a graphic representation of the logic circuit based on required reaction rates;

developing an explosive ink composition which would satisfy the reaction rate required;

calculating the film thickness needed of said explosive ink to satisfy the reaction rate;

developing an inert substrate ink;

producing silk screens of the explosive trail and inert substrate;

silk screening the inert substrate design using said inert substrate ink onto a base;

curing said inert substrate design;

inspecting said design for voids;

silk screening the explosive trail design using said explosive ink composition;

curing said explosive trail design;

inspecting said design for voids;

repeating the steps until the circuit is complete; and

applying a protective covering to said complete explosive logic circuit.

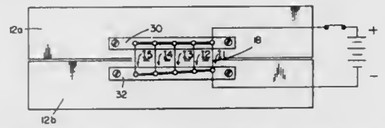
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**5,046,426**

## SEQUENTIAL STRUCTURAL SEPARATION SYSTEM

**Gerald J. Julien, Puyallup, and Steven P. Robinson, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Oct. 31, 1989, Ser. No. 429,525**
**Int. Cl.[5] F42B *15/00***
**U.S. Cl. 102—377** **10 Claims**




9. An electrically operated releasable mechanical connector between two structural members, comprising:

a first terminal block adapted to be fastened to one structural members;

a second terminal block adapted to be fastened to the other structural member;

a first module having a nitinol element mechanically and electrically connected between said terminal blocks;

means for connecting said terminal blocks and said nitinol element across a source of electrical power;

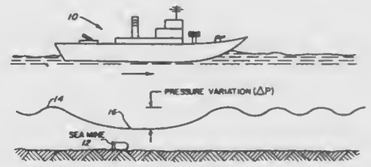
whereby said nitinol element will be heated by passage of electrical current through said element and will fuse to release the mechanical connection between said members.

**5,046,427**

## DIFFERENTIAL PRESSURE SENSOR

**Charles A. Rowzee, Burtonsville, and John D. Sherman, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Nov. 1, 1982, Ser. No. 445,329**
**Int. Cl.[5] F42B *22/04***
**U.S. Cl. 102—418** **8 Claims**




1. A pressure sensor for use with a sea mine for sensing variations in water pressure at ambient induced by hydrodynamic flow caused by a passing vessel to emit a responsive signal comprising:

a casing entrapping a volume of gas for pressurization;

means allowing equalization of pressure ($P_A$) within the casing to initially pressurize the trapped air at ambient;

said casing including means adapted for movement ($\Delta L$) against the pressurized gas in response to pressure variations ($\Delta P$) from the ambient according to the formula:

$$\Delta L \sim \frac{\Delta P}{P_A^2},$$

wherein $P_A$=pressure at ambient;

means generating a first signal ($\Delta e_o$) responsive to pressure variation from the ambient, the magnitude of which varies according to the formula

$$\Delta e_o \sim \frac{\Delta P}{P_A^2};$$

means generating a second signal ($e_A$) responsive to ambient pressure;

means squaring the second signal to ($e_A^2$); and

means multiplying the first signal and squared second signal to emit the responsive signal ($\Delta e'_o$) according to the formula:

$$\Delta e_o' = e_o \Delta e_A^2 = \frac{K \Delta P}{P_A^2} K'^2 P_A^2$$

whereby $\Delta e'_0 \sim \Delta P$

thereby providing an emitted signal which is independent of the pressure at ambient ($P_A$) resulting from various water depths at which the sea mine may be laid but responsive to pressure variations ($\Delta P$) from the ambient.

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**5,046,428**

## SHELL FOR A PROPELLANT CHARGE

**Ernst D. Jungblut, Herschback; Werner Knopf, Vallendar, and Gerald Rotter, Weltersburg, all of Fed. Rep. of Germany, assignors to Hubner Gummi-und Kunststoff GmbH, Kassel, Fed. Rep. of Germany**

**Filed Jun. 27, 1989, Ser. No. 371,715**
**Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 3821669**
**Int. Cl.[5] F42B *5/26***
**U.S. Cl. 102—469** **6 Claims**

1. A composite propellent charge cartridge comprising:

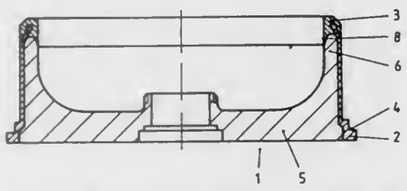
a cartridge case having a bottom portion and a tubular por-

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tion, and an extractor rim extending circumferentially around the bottom portion of the case,

a molding surrounding the cartridge case, the molding at least partially forming the extractor rim, and




an elastic cuff carried by the tubular portion of the case, the cuff being joined to the molding.

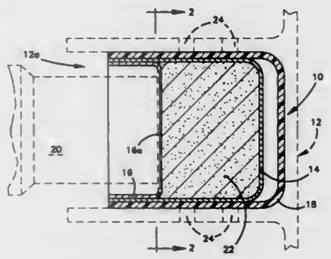
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**5,046,429**

**IGNITION MATERIAL PACKET ASSEMBLY**

**Timothy A. Swann, and John D. Skouson, both of Mesa, Ariz., assignors to Talley Automotive Products, Inc., Phoenix, Ariz.**

**Filed Apr. 27, 1990, Ser. No. 515,820**
**Int. Cl.[5] B60R *21/28***
**U.S. Cl. 102—530** **11 Claims**




1. An ignition material packet assembly which comprises:

a) first cup means adapted for electrically insulating a pyrotechnic material stored within said assembly, said first means having a base, a sidewall coextensive with said base and formed integrally therewith and an open top portion;

b) second cup means inserted at least partially within said open top of said first means, configured and adapted for storing said pyrotechnic material, said second means having a base, a sidewall coextensive with said base and formed integrally therewith and an open top portion;

c) a pyrotechnic material stored within said second cup means, adapted to produce a quantity of a gaseous combustion product upon ignition by initiating means located adjacent thereto; and

d) a lid member closing said open top of said second cup means, said lid member adapted for sealing said pyrotechnic material within said second cup means;

said sidewalls of said first and second cup means being substantially circular in shape and the open tops of said first and said second cup means both facing in the same direction;

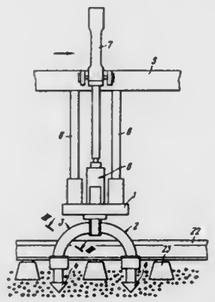
said first cup means being retained within said second cup means by a friction fit created therebetween and a compression gap being formed between said base of said first and said second cup means upon construction of said assembly to facilitate positioning of said assembly within a corresponding inflator device.

**5,046,430**

**TAMPING MECHANISM OF TIE-TAMPING OUTFIT**

**Sergei L. Zayarny; Vladimir S. Notkin, and Alexei A. Ilyashenko, all of Kaluga, U.S.S.R., assignors to Kaluzhskoe Proizvodstvennoe Obiedinenie Putevykh Mashin I Gidraprivodok "Kalugaputmash" , Kaluga, U.S.S.R.**

**PCT No. PCT/SU89/00170, § 371 Date Feb. 21, 1990, § 102(e) Date Feb. 21, 1990, PCT Pub. No. WO89/12718, PCT Pub. Date Dec. 28, 1989**
**PCT Filed Jun. 23, 1989, Ser. No. 477,846**
**Claims priority, application U.S.S.R., Jun. 24, 1988, 4484168**
**Int. Cl.[5] E01B *27/16***
**U.S. Cl. 104—12** **3 Claims**



1. A tamping mechanism for a tie-tamping outfit, comprising:

a casing;

at least two vibrators rigidly linked mounted on said casing;

tamping tools rigidly linked to said vibrators, each vibrator communicating with a hydraulic source of vibration excitation;

a drive for moving said frame vertically, each vibrator being in the form of at least one tubular spring having an internal space which communicates with the hydraulic source of vibration excitation.

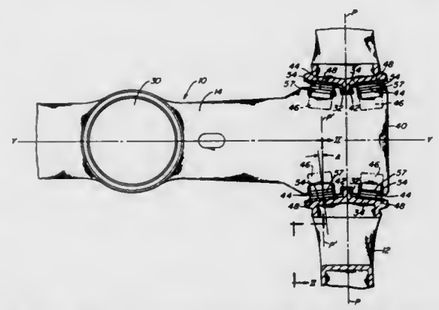
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**5,046,431**

**RAILWAY TRUCK**

**John H. Wagner, Bradford Woods, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.**

**Continuation of Ser. No. 504,687, Apr. 4, 1990, abandoned, which is a continuation of Ser. No. 284,676, Dec. 15, 1988, abandoned. This application Aug. 31, 1990, Ser. No. 577,053**
**Int. Cl.[5] B61B *12/10***
**U.S. Cl. 105—198.4** **19 Claims**




1. In a railway truck including a pair of laterally spaced



elongated side frames each having a pair of spaced apart upstanding column portions and an elongated bolster which is adapted to be assembled with such side frames by having the longitudinally opposed ends thereof received longitudinally intermediate such column portions, respectively, the combination for limiting movement of such bolster with respect to such a side frame comprising:

such column portions including column surface means to provide in such side frames a pair of opposed column surface means which are spaced longitudinally apart to receive such a bolster end therebetween;

each such bolster end including longitudinally outwardly opening pocket means disposed for confronting relation with said column surface means respectively, when such a bolster end is received therebetween;

friction means received within said pocket means and extending intermediate each bolster end and the respective said column portions, and having surface means which are engageable in frictional engagement with the respective said column surface means;

means for biasing said friction means into said pockets, respectively, and for maintaining said surface means thereof in biased engagement with said column surface means, respectively;

said friction means being laterally slideable on said column surface means and cooperable with said pocket means in a manner to accommodate relative lateral movement of such a bolster with respect to such side frames;

a first rigid retention means carried by such a bolster end;

a second rigid retention means carried by such a side frame and cooperable with said first rigid retention means to limit the magnitude of such relative lateral movement of such a bolster with respect to such a side frame; and

said second rigid retention means being disposed entirely within the lateral extent of said column surface means.

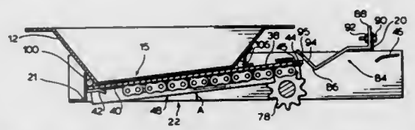
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**5,046,432**

**UNLOADING GATE FOR BULK MATERIAL HANDLING CONTAINERS**

**Bert J. Bowler, Regina, Canada, assignor to DeGelman Industries Limited, Regina, Canada**

**Filed May 17, 1989, Ser. No. 353,394**
**Claims priority, application Canada, Apr. 28, 1989, 598280**
**Int. Cl.[5] B61D *7/26, 7/20***
**U.S. Cl. 105—282.1** **15 Claims**




14. A gate mechanism for selectively opening or closing a hopper, comprising:

a chute attachable to the bottom of the hopper having downwardly inclined side walls and end walls defining a discharge opening;

a frame mounted to the side walls of the chute;

gate means mounted to the frame for selectively opening and closing the discharge opening, including a gate slide;

slider means mounted to the frame for providing a non-metallic low friction contact surface between the gate slide and the frame;

drive means for moving the gate slide between an open position and a closed position; and

lock means for locking the gate slide in the closed position wherein the lock means comprises a shaped spring bar made of resilient metal mounted to the frame such that the spring bar is releasably secured to a portion of the gate slide while the gate slide is in its fully closed position, wherein the spring bar applies sufficient force to the said portion of the gate slide to keep it in its closed position, and wherein the spring bar is shaped so that it can be deflected out of the way when the gate slide is moved towards an open position by operation of the drive means.

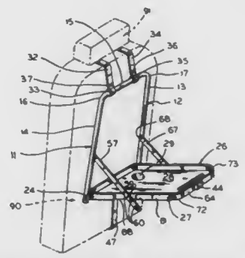
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**5,046,433**

**ADJUSTABLE FOLDING TRAY APPARATUS FOR ATTACHMENT TO A VEHICLE SEAT BACK**

**Randall Kramer, and Mary Kramer, both of 2401 Fir St., Glenview, Ill. 60025**

**Filed May 22, 1989, Ser. No. 355,157**
**Int. Cl.[5] A47B *23/00***
**U.S. Cl. 108—44** **19 Claims**




1. An adjustable folding table apparatus for attachment to a seat back having first and second sides, a bottom, a top, and a head-rest on said top for use primarily within an automobile or other vehicle comprising:

a tray portion pivotally rotatable between a substantially vertical, stored position and a substantially horizontal, extended position and positioned adjacent said first side of said seat back;

frame means for supporting said tray portion from said frame means, said frame means abutting said first side of said seat back;

pivot means operably interposed between said frame means and said tray portion so as to pivotally attach said tray portion to said frame means;

adjustment means operably associated with said frame means and said tray portion for varying and maintaining the angular orientation of said tray portion relative to said frame means;

mounting means operably attached to said frame means and extending around a portion of said head-rest and being substantially flexible, so as to secure said frame means to said seat back and allow for vertical adjustment of said tray portion along the height of said seat back;

locking means operably interposed between said tray portion and said frame means for maintaining said tray portion in said retracted position; and

retaining means extending from said bottom of said apparatus and releasably attached to a portion of said bottom of said seat back for maintaining said frame means substantially in contact with said seat back.

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**5,046,434**

**PLASTIC REINFORCED THERMOFORMED PALLET**

**Harlon W. Breezer, and William F. Price, both of Portage, Wis., assignors to Penda Corporation, Portage, Wis.**

**Filed May 2, 1990, Ser. No. 518,012**
**Int. Cl.[5] B65D *19/00***
**U.S. Cl. 108—51.1** **5 Claims**

1. A twin-sheet thermoformed thermoplastic pallet comprising:

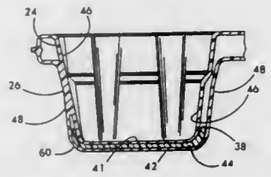
(a) a substantially planar load-bearing member formed from an upper sheet of thermoplastic material of a selected thickness and a lower sheet of thermoplastic material of a selected thickness located generally in fixed parallel relationship to each other;

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(b) a plurality of feet depending from the load-bearing member, each foot being a downwardly protruding portion of each of the two sheets of material joined together and terminating in a foot floor extending substantially parallel to the load-bearing member; and

(c) wherein each foot floor includes an inner foot floor formed from the upper sheet of thermoplastic material and an outer foot floor formed from the lower sheet of ther-



moplastic material, and additionally includes a quantity of reinforcing thermoplastic material located bewteen the inner and outer foot floors of each foot and fused thereto, the fused inner foot floor, reinforcing material and outer foot floor comprising an integral reinforced foot floor having a thickness substantially greater than the combined thickness of the material of the upper and lower sheets at that location.

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**5,046,435**

**PROCESS AND APPARATUS FOR COMBUSTION OF WASTE, SUCH AS HOUSEHOLD AND OTHER WASTE, AND AFTERBURNING OF RESIDUES FROM THE COMBUSTION**

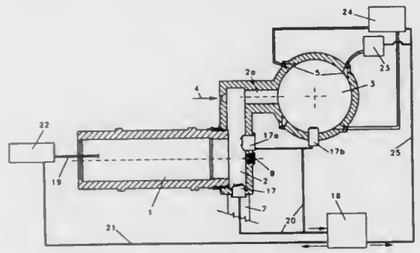
**Kurt Kugler, Markt Indersdorf, Fed. Rep. of Germany, assignor to K+K Ofenbau GmbH, Neuss, Fed. Rep. of Germany**

**Filed Aug. 23, 1990, Ser. No. 572,482**

**Claims priority, application Fed. Rep. of Germany, Jan. 5, 1989, 3900285; Sep. 30, 1989, 3931280**

**Int. Cl.[5] F23G** *5/00*

**U.S. Cl. 110—346** **25 Claims**



1. A process for the combustion of waste in a combustion apparatus, said process comprising the steps of:

conducting the waste to said combustion apparatus, said combustion apparatus having a loading end, a discharge end, and a combustion chamber between said loading end and said discharge end;

loading the waste into said loading end of said combustion apparatus;

flowing combustion air into said combustion chamber;

combusting the waste in said combustion chamber at a combustion chamber temperature at which at least a portion of the waste forms a molten slag;

flowing the molten slag from said combustion chamber of said combustion apparatus, out said discharge end of said combustion apparatus and into a molten slag cooling area, the molten slag flow having a flow rate;

monitoring the flow rate of the molten slag; and

adjusting at least one of:

the quantity of combustion air flowing into said combustion chamber, and

said combustion chamber temperature relative to the flow rate of the molten slag.

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**5,046,436**

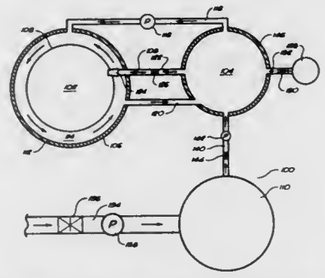
**APPARATUS AND METHOD FOR THE PREHEATING OF LIQUID WASTES IN A WASTE DISPOSAL PROCESS**

**Benjamin P. Fowler, 805 S. Country Club Dr., LaPorte, Tex. 77057**

**Filed Oct. 15, 1990, Ser. No. 598,848**

**Int. Cl.[5] F23B** *7/00*

**U.S. Cl. 110—349** **19 Claims**



1. A process for the disposal of waste comprising:

passing a liquid waste in heat exchange relationship with the surface of a sealed container so as to heat said liquid waste;

transmitting the heated liquid waste to a tank having said liquid waste contained therein;

delivering said liquid waste from said tank into said sealed container; and

heating the delivered liquid waste to a temperature sufficient to convert said liquid waste into a gas.

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**5,046,437**

**DEVICE IN A BUTTON SEWING MACHINE FOR MAINTAINING LOOSENESS IN NEEDLE THREAD WHILE PREVENTING THE THREAD FROM BEING PULLED OUT OF THE SEWING NEEDLE**

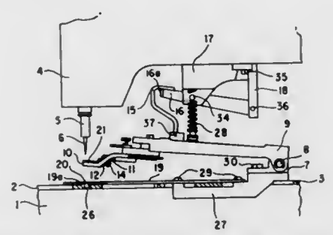
**Katsuo Hiratsuka, Tochigi; Imao Yazaki; Koichi Nakayama, both of Utsunomiya, and Masanori Ayuta, Tochigi, all of Japan, assignors to SSMC Inc., Edison, N.J.**

**Filed Dec. 15, 1989, Ser. No. 454,582**

**Claims priority, application Japan, Jan. 31, 1989, 1-9354[U]**

**Int. Cl.[5] D05B** *3/14*

**U.S. Cl. 112—110** **1 Claim**



1. A device for use in a button sewing machine for sewing a button on material, said button having two opposite surfaces, and having a bed for maintaining looseness in a needle thread



while preventing the thread from being pulled out of an eye of a needle, said device comprising:

a throat plate fixed to said bed, the throat plate having a needle threading hole and a projection at the periphery of the needle threading hole;

a feeding plate mounted on the bed for moving said material placed thereon along a surface of the throat plate, the feeding plate having an opening for receiving the projection;

a button clamping arm swingably supported at one end by the feeding plate and having a free end;

a pair of button holding arms secured to the free end of the button clamping arm for holding the button; and

a wire made of elastic material having a base end fixed to the button clamping arm and a tip end held by the button holding arms, the wire being positioned under one surface of the button; the button, the wire, and the material being pressed toward the projection of the throat plate by the button holding arms.

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**5,046,438**

**NEEDLE FOR USE IN TUFTING MACHINE**

**Tamotsu Hakui, Osaka, Japan, assignor to Asahi Trading Co., Ltd., Osaka, Japan**

**Filed Dec. 8, 1989, Ser. No. 447,827**

**Claims priority, application Japan, Dec. 20, 1988, 63-165253[U]**

**Int. Cl.[5] D05B** *85/00*

**U.S. Cl. 112—222** **2 Claims**



1. A needle for a tufting machine, having:

a bottom end, a top end and a central longitudinal axis;

a pointed tip at said bottom end;

a flattened lower portion having two longitudinal side edges, one of which is chamfered to form a tapered edge; and

an elongated yarn insert hole formed transversely through said flattened lower portion above said pointed tip and adapted to carry yarn therein, said elongated yarn insert hole being inclined relative to said central longitudinal axis and having an uppermost and a lowermost point, said lowermost point being offset from said central longitudinal axis toward said tapered edge, and said uppermost point being offset from said central longitudinal axis toward said longitudinal side edge opposite said tapered edge;

such that yarn carried by said needle is adapted to engage a periphery of said elongated yarn insert hole at said uppermost point when the needle is moving downwardly and is adapted to engage the periphery of said elongated yarn insert hole at said lowermost point when the needle is moving upwardly.

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**5,046,439**

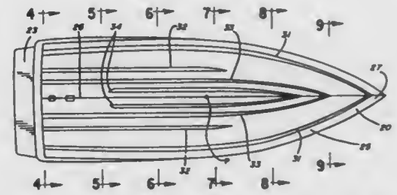
**HULL FOR AN INBOARD POWERED BOAT**

**Norman R. Goodson, and William D. Farris, both of Maryville, Tenn., assignors to MasterCraft Boat Company, Maryville, Tenn.**

**Filed Jul. 24, 1989, Ser. No. 384,565**

**Int. Cl.[5] B63B** *1/00*

**U.S. Cl. 114—56** **5 Claims**



1. A hull for an inboard boat with a propeller disposed adjacent the stern end of the boat, said hull comprising: a bow portion which has a substantially V-shaped bottom in transverse cross section; a stern portion which has a substantially flat bottom in transverse cross section, said stern portion terminating in a stern end; and a midship portion whose bottom tapers from a V-shape to a substantially flat shape; said hull defining a keel area and a first pair of generally parallel strake portions straddling said keel area and lying adjacent thereto, said first pair of strake portions commencing at a point between said bow and said midship portions and extending to a point ahead of the propeller; said hull further defining a second pair of strake portions lying outwardly of said first pair of strake portions and commencing forwardly thereof and extending to said stern portion; said hull defining yet a third pair of strake portions lying outwardly of said second pair of strake portions and commencing rearwardly of said first and second pairs of strake portions and extending to said stern portion.

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**5,046,440**

**SAIL RIG AND STAYSAIL SYSTEM**

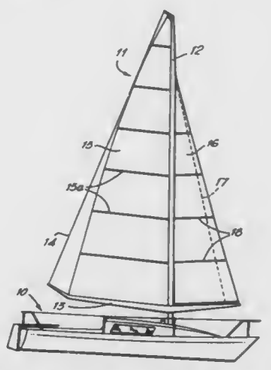
**Ian C. Howlett, Chestnut Cottage, Beaulieu, Hampshire, S042, 7YB, England**

**Filed Apr. 11, 1990, Ser. No. 508,151**

**Claims priority, application United Kingdom, Apr. 12, 1989, 8908276**

**Int. Cl.[5] B63H** *9/06*

**U.S. Cl. 114—102** **9 Claims**



1. A sail rig for a vessel having a hull, the rig comprising:

a mast which is unstayed to the hull and which has a base connected to the hull;

a continuous yard/boom mounted to the mast, the yard/-

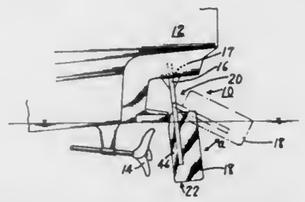
VOL 1130 ISS 2 SE 10 1991 UMI



boom having forward and aft portions extending in opposite directions from the mast, the forward and aft portions being fixed to each other, yard/boom being rotatable relative to the hull;
a pretensioned backstay extending between and upper end of the mast and outer end of the yard/boom aft portion;
a main sail located between the mast and the backstay;
a pretensioned forestay extending between the mast and an outer end of the yard/boom forward portion, pretensioning of the forestay being transmitted to the pretensioned backstay through the yard/boom;
a staysail mounted to the forestay, the staysail having a leading edge and the forestay being positioned rearwardly of the leading edge; and
a plurality of ribs to which the staysail is connected, the ribs being slidably mounted on the forestay.

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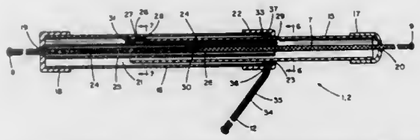
**5,046,441**
**RUDDER MECHANISM FOR SHIP**
**Kihachiro Kanazaki, 168-2 Oaza Usuki, Usuki, Ohita, Japan**
**Filed Feb. 15, 1990, Ser. No. 480,639**
**Claims priority, application Japan, Mar. 2, 1989, 1-51197**
**Int. Cl.[5] B63H** *25/06*
**U.S. Cl. 114—165** **8 Claims**



1. A rudder mechanism for a ship, comprising:
a support bearing fixed to a lower part of a stern of the ship;
a rudder shaft of which one end is rotatably supported by said support bearing;
a free rotation means connected to the other end of said rudder shaft;
a swayable shaft member connected to said free rotation means; and
a rudder wing connected to said swayable shaft member and disposed behind a propeller of the ship,
said swayable shaft member and rudder wing forming a swayable wing portion that is swayable in a direction away from the stern of the ship through said free rotation means.

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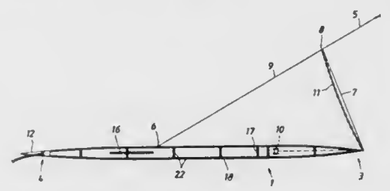
**5,046,442**
**STANDOFF MOORING BAR FOR BOATS**
**Duff M. Hay, 1509 Lake Holiday, Sandwich, Ill. 60548**
**Filed Feb. 21, 1990, Ser. No. 482,772**
**Int. Cl.[5] B63B** *17/00, 21/00*
**U.S. Cl. 114—230** **6 Claims**



1. A standoff mooring bar for a boat comprising an adjustable length mooring bar body having an elongated inner cylindrical tube telescoping within an elongated outer cylindrical tube, with each tube defining an elongated bore; a mooring rope extending through the bore of the telescoping pair of cylindrical tubes; and an automatic locking assembly fixing the adjustable length of the telescoping pair of tubes when subjected to a collapsing mooring force with the locking assembly including a generally cylindrical locking tube housed within a cavity defined by the inner and outer tubes and with the mooring rope also passing through a bore in the locking tube, and a flexible locking rope having one end portion anchored to the inner tube and the other rope end portion extending through the bore of the locking tube and fixed to the mooring rope so that the tensioning of the mooring rope causes the locking assembly to fix the relative position of the inner and outer tubes to prevent collapsing of the mooring bar.

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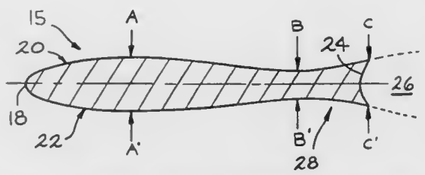
**5,046,443**
**STEEL-FIBERGLASS FLOAT**
**Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**
**Filed Sep. 8, 1986, Ser. No. 904,428**
**Int. Cl.[5] H04R** *1/02*
**U.S. Cl. 114—244** **5 Claims**



1. A seismic float comprising:
an upper hull which is foam-filled fiberglass contained within a truss; and
a metallic lower hull attached to the upper hull.

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**5,046,444**
**BASE VENTED SUBCAVITATING HYDROFOIL SECTION**
**William S. Vorus, Gregory, Mich., assignor to Michigan Wheel Corp., Grand Rapids, Mich.**
**Filed Apr. 10, 1990, Ser. No. 506,952**
**Int. Cl.[5] B63B** *1/24*
**U.S. Cl. 114—274** **2 Claims**

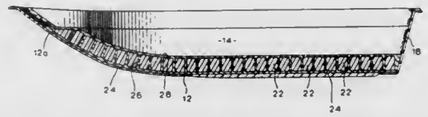


1. A high efficiency and low drag section of a hydrofoil for use in a liquid medium and comprising:
an elongated body having upper and lower surfaces, said body exhibiting a lateral cross-sectional shape being symmetrical about a medial axis, said cross-sectional shape having a leading edge, a midchord, a fishtail flare and a concave trailing edge forming a generally elongated depression at one end of said cross-sectional shape, said body laterally increasing in thickness from said leading edge along convex portions of said upper and lower surfaces to a point near said midchord, said body thereafter decreasing in thickness first along convex portions of said surfaces and thereafter along concave portions of said surfaces until reaching a local minimum thickness near said fishtail flare, said body thereafter increasing in thickness along concave portions of said surfaces in said fishtail flare, said increase in thickness in said fishtail flare decreasing liquid flow velocities over said body and thereby retarding vapor cavitation development along said surfaces of said body, said fishtail flare terminating in a local maximum thickness at said concave trailing edge, said concave trailing edge developing a negative pressure area adjacent thereto, said negative pressure area inducing gas flow along said trailing edge thereby fully ventilating said negative pressure area and reducing drag associated therewith.



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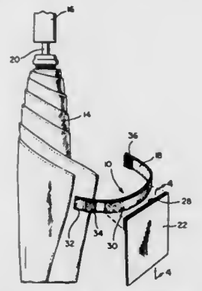
**5,046,445**
**BOAT HAVING A COMPOSITE V-SHAPED FOAM BLOCK BOTTOM STRUCTURE**
**George D. Simpson, Jr., and George D. Simpson, Sr., both of Rte. 1, Box 315, Beaufort, N.C. 28516**
**Filed Jul. 30, 1990, Ser. No. 559,720**
**Int. Cl.[5] B63B** *5/24*
**U.S. Cl. 114—357** **6 Claims**



1. A v-shaped foam block boat hull having improved strength properties, comprising: a boat hull having a v-shaped bottom panel; a series of foam blocks supported over the v-shaped bottom panel and extending transversely thereacross; each foam block having a lower v-shaped bottom that corresponds in shape to the v-shaped bottom panel of the boat hull; fiberglass laminate interposed between the foam blocks and the v-shaped bottom panel and between adjacent foam blocks so as to bond the foam blocks together as well as bond the foam blocks to the v-shaped bottom panel; the fiberglass laminate including a series of longitudinally spaced vertical v-shaped fiberglass walls extending upwardly from the v-shaped bottom panel between respective foam blocks; and wherein the foam blocks, bottom v-shaped panel, and the fiberglass laminate form a composite v-shaped bottom boat structure that is strong and durable and which resists buckling and delamination.

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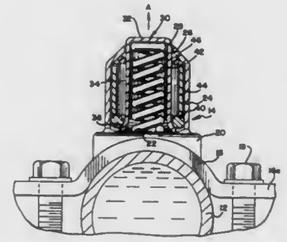
**5,046,446**
**REMINDER DEVICE**
**Curtis E. Sumrall, 5814 Woodchase Dr., and William J. Wilkens, 430 Tomahawk Trail, both of Anniston, Ala. 36206**
**Filed Aug. 21, 1990, Ser. No. 570,511**
**Int. Cl.[5] A45B** *25/30;* **B60Q** *11/00*
**U.S. Cl. 116—200** **5 Claims**



1. A device for reminding an individual to retrieve a forgotten umbrella which has been taken from a vehicle and forgotten when the person using the umbrella returned to the vehicle, said reminder device comprising a panel having a distinguishable color, first means on the panel detachably mounting the panel on an umbrella and second means on the panel detachably mounting the panel on the exterior of a vehicle door adjacent the door handle in position for observation by a person approaching the vehicle door handle thereby reminding the person to retrieve the umbrella if it has been forgotten and to replace the panel on the umbrella if the umbrella is in the possession of the person approaching the vehicle door.

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**5,046,447**
**LIMIT SENSING INDICATOR**
**Karl O. Steinke, Renton, and Milton R. Knight, Kirkland, both of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.**
**Filed May 17, 1990, Ser. No. 525,389**
**Int. Cl.[5] H01K** *1/14, 11/06*
**U.S. Cl. 116—217** **21 Claims**

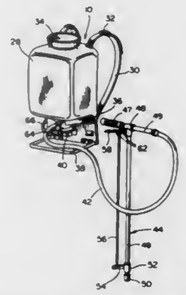


1. A limit sensing device for permanently indicating when a predetermined temperature limit has been reached in a fluid conduit, comprising:
housing means including a heat conductive base adapted for mounting said device on said fluid conduit in a heat transfer relationship with said fluid and including an opening spaced away from said base;
indicator means in said housing means movable between an unactivated, first position inside said housing means and a second, activated position, projecting outwardly of said opening of said housing means for indicating that said temperature limit has been reached, said indicator means having an open inner end formed with a flange and a closed outer end portion closing said opening when said indicator means is in said first position;
biasing means mounted in said indicator means for urging said indicator means to move outwardly from said first position to said second position, said biasing means engaged between said base and said closed outer end portion of said indicator means;
retainer means in said housing means formed of a selected material that retains a solid state until said predetermined temperature limit is reached in said fluid, said retainer means interposed between said flange of said indicator means and said base of said housing means for securing said indicator means in said first position against the force of said biasing means with said flanged end adjacent said heat conductive base until said retainer means fuses into a liquid state upon said fluid reaching said temperature limit thereby releasing said indicator means for movement to said second position as urged by said biasing means;
said retainer means comprising a unitary ring of said selected fusible material mounted in a heat transfer relationship with heat conductive base adjacent said fluid conduit while in said solid state; and
said flange limiting the outward movement of said indicator means relative to said opening in said housing means after said retainer means fuses into a liquid state.

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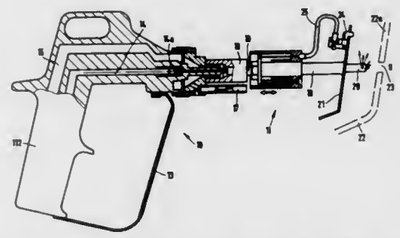


5,046,448
**RAILROAD TIE TREATING METHOD AND APPARATUSES**
Joseph T. Crisafulli, P.O. Box 865, Glendive, Mont. 59330
Filed Nov. 21, 1989, Ser. No. 439,321
Int. Cl.[5] B05B *13/02*; B05C *5/00*
U.S. Cl. 118—305 10 Claims



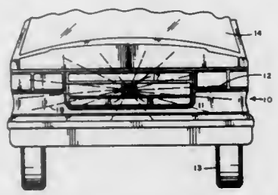
7. An apparatus for injecting wood treating material through unoccupied holes in a railroad rail tie plate secured to a wood tie by spikes comprising a mobile tank and pump assembly movable without constraint laterally, longitudinally and vertically in relation to a railroad rail and tie plates, a flexible hose connected to said mobile tank and pump assembly, a manually manipulated and handles injector connected with said hose, said injector including an elongated, rigid tubular member having a nozzle thereon, resilient means on said nozzle sealingly engaged with an unoccupied spike hole in the tie plate to inject treating material and manually operated valve means controlling discharge of treating material from the nozzle.

5,046,450
**APPARATUS FOR INTERIOR COATING OF CAVITIES**
Willi Klingen, Markdorf, Fed. Rep. of Germany, assignor to J. Wagner GmbH, Fed. Rep. of Germany
Filed Jun. 15, 1990, Ser. No. 538,897
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919959
Int. Cl.[5] B05C *7/02*
U.S. Cl. 118—668 10 Claims



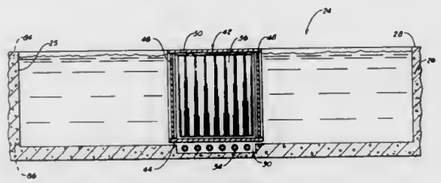
1. An apparatus for the interior coating of cavities comprising a spray gun having a spray nozzle plug-in coupling and a spray shot trigger means and comprising nozzle probes pluggable to the spray gun, each nozzle probe being composed of a nozzle tube having a plug-in end, nozzle end and positioning detent, wherein the positioning detent is provided with at least one contact sensor that is in an interactive connection with the spray shot trigger means of the spray gun.

5,046,449
**VEHICLE SPRAY APPARATUS**
Riley H. Nelson, 131 E. Highway 50, Winter Garden, Fla. 32787
Filed Dec. 26, 1989, Ser. No. 456,504
Int. Cl.[5] B05B *3/02, 12/14*
U.S. Cl. 118—315 7 Claims



1. A spray apparatus attached to a vehicle for coating a front end of the vehicle with a liquid to prevent the adherence of insects thereto comprising:
a vehicle having a front end and a rear end; and a battery;
a reservoir for a liquid material, said reservoir being mounted to the vehicle for coating the front of the vehicle;
a pump coupled to said reservoir for pumping liquid therefrom;
a fan located on the front end of the vehicle; and
a dispensing tube connected to said pump at one end and having the other end thereof mounted adjacent said fan for dispensing pumped liquid into said fan whereby liquid pumped from said reservoir is sprayed onto the front end of the vehicle by said fan.

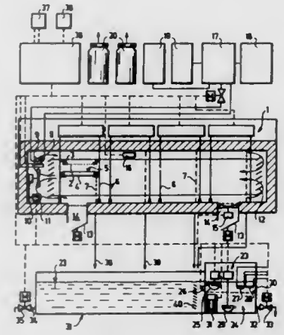
5,046,451
**FISH FARM AND HYDROPONIC GREENHOUSE**
Glenn E. Inslee, P.O. Box 294, Fittstown, Okla. 74824; Donald W. Inslee, Rt. I, Box 220-C, Roff, Okla. 74865; Theophilus D. Inslee, 601 W. 17th, Ada, Okla. 74820, and Phillip D. Inslee, P.O. Box 96, Connerville, Okla. 74836
Filed May 19, 1988, Ser. No. 196,364
Int. Cl.[5] A01K *63/04*
U.S. Cl. 119—3 18 Claims



1. A fish tank assembly, comprising:
a fish tank adapted for containing water and fish therein;
one or more air lines positioned at the bottom of the fish tank wherein the one or more airlines are adapted for receiving air and for releasing the air in a column of rising bubbles; and
a biofilter characterized by a surface adapted for supporting microorganisms, wherein the surface is at least partly defined by a plurality of vertical channels, and wherein the biofilter is positioned in the fish tank so that when the tank is filled with water the biofilter will be submerged and the vertical channels will be above the one or more air lines.

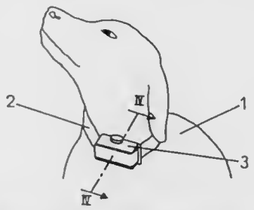


5,046,452
**METHOD AND APPARATUS FOR BREEDING ROES OR EGGS OF AQUATIC ANIMALS**
Lajos Lászlzló , Sasvár u. 86., H-1163 Budapest; Miklós Bercsényi, Vöröshadsereg u. 125., H-1183 Budapest, and András Nagy, Szépvölgyi u. 217, H-1025 Budapest, all of Hungary
PCT No. PCT/HU89/00034, § 371 Date Apr. 9, 1990, § 102(e) Date Apr. 9, 1990, PCT Pub. No. WO90/00004, PCT Pub. Date Jan. 11, 1990
PCT Filed Jul. 3, 1989, Ser. No. 466,252
Claims priority, application Hungary, Jul. 1, 1988, 3453/88
Int. Cl.[5] A01K *61/00*
U.S. Cl. 119—3 4 Claims



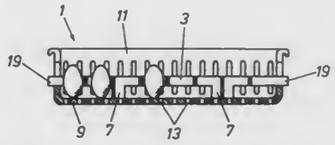
1. A method for breeding roe or eggs of aquatic animals, comprising maintaining the roe or eggs in an oxygen-containing gaseous environment in direct contact with the gas of the oxygen-containing gaseous environment, humidifying the gaseous environment to avoid desiccation of the roe or eggs.

5,046,453
**ANIMAL TRAINING APPARATUS**
René Vinci, 4 rue Raymond Bistors, F 66028 Perpignan, France
Filed Jul. 12, 1989, Ser. No. 378,901
Int. Cl.[5] A01K *15/02*
U.S. Cl. 119—29 13 Claims



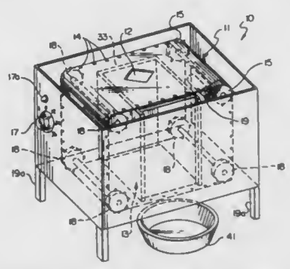
1. An apparatus for controlling the behavior of a dog, the apparatus being disposed near the skin of a dog to release a fluid contained within the apparatus upon the skin of the dog, the dog having a body and the dog wearing a collar, the apparatus comprising:
(a) means for detecting a barking sound of the dog, the detecting means generating a signal in response to the barking of the dog;
(b) means for supplying a stream of fluid, in response to the signal; and
(c) tubular member in contact with the means for supplying a stream of fluid, the tubular member being in contact with the skin of the dog, the tubular member directing the fluid onto the dog; and
wherein the means for supplying the fluid is effective to rapidly lower the temperature of the tubular member, thereby applying a cooling sensation onto the skin of the dog.

5,046,454
**TRAY SYSTEM FOR INCUBATION AND HATCHING OPERATIONS, METHOD DURING USE OF THE TRAY SYSTEM AND USE OF THE TRAY SYSTEM**
Jorgen B. Jensen, Sunds, Denmark, assignor to Funki A/S, Herning, Denmark
Filed Dec. 13, 1989, Ser. No. 450,595
Claims priority, application Denmark, Dec. 20, 1988, 7108/88
Int. Cl.[5] A01K *41/00*
U.S. Cl. 119—43 7 Claims



1. Tray systems for use in the transport, incubation and hatching of eggs during hatching operations, the tray system having a tray including a perforated bottom, sides extending uniformly upwardly from edges of the bottom, and an insert in the tray disposed essentially parallel to the bottom, said insert having an extent generally the same as said bottom and having openings arranged to support eggs standing on their tapered ends, the improvement comprising
the bottom being substantially even with no protruding pins or partition walls, and the insert including means freely supported said insert within said tray at a position above said bottom, with said insert being spaced from said sides.

5,046,455
**AUTOMATIC ANIMAL FEEDER**
Steven A. Christiansen, 2345 Franklin Ave., and Phillip G. Christiansen, 1607 Hayes, both of Meeteetse, Wyo. 82433
Filed Dec. 17, 1990, Ser. No. 628,454
Int. Cl.[5] A01K *5/00*
U.S. Cl. 119—56.1 20 Claims



1. An automatic feeder for animals and the like, comprising:
storage means to enclose a predetermined amount of material for dispensing by gravity at a predetermined time and in a predetermined amount;
said storage means including means for directing said material to be dispensed in a predetermined direction terminating in a discharge opening having a preselected size and configuration;
movable surface means located to normally seal said discharge opening, and including a hole means permitting said material discharged through said discharge opening

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and said movable surface means when said surface means is moved in a predetermined manner;

material measuring compartment means located in a fixed position under said discharge opening for metering a preset amount of said material when said movable surface means is moved in said predetermined manner, said compartment means having an opening for receiving said material at a first position and an opening for dispensing said material at a second position; and

said movable surface means including means for normally sealing said compartment means opening at said second position, and including means for moving said hole means to said second position permitting said preset amount of said material to be dispensed;

whereby said material is moved automatically from said storage means to said measuring compartment means when said movable surface means is moved in said predetermined manner; said movable surface means then sealing said storage means, and said movable surface means then moving from said position of sealing said compartment means opening at said second position for permitting material within said compartment means to be dispensed through said opening at said second position and through said hole means.

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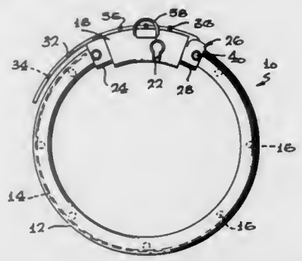
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**5,046,456**

## ILLUMINATED COLLAR

**Barbara C. Heyman, Beverly Hills; William J. Inman, and Scott A. Kraft, both of Agoura Hills, all of Calif., assignors to Protect A Pet, Inc., Beverly Hills, Calif.**

**Filed Mar. 18, 1991, Ser. No. 671,129**
**Int. Cl.[5] A01K** *27/00*
**U.S. Cl. 119—106** **3 Claims**




1. An illuminated collar comprising: a hollow flexible light-permeable tube having first and second ends, a plurality of lights mounted within said tube;

a housing mounted on said first tube end, said housing having a compartment for containing circuit means for operating said lights and for containing battery means for providing power for said circuit means and said lights;

a buckle including a retaining ring mounted on said second tube end, a connector strap projecting from said retaining ring, and a plurality of buckle holes in said connector strap; and

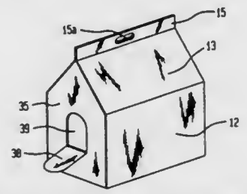
a plurality of catch pins projecting from said housing so that said catch pins and said buckle holes are selectively engageable and disengageable for connecting and disconnecting said first and second tube ends with respect to each other.

**5,046,457**

## ANIMAL ENCLOSURE APPARATUS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

**Richard N. Ashcroft, 13 Walnut, and John J. Jennings, 202 North Dr., both of Wyandotte, Mich. 48192**

**Filed Mar. 16, 1990, Ser. No. 494,432**
**Int. Cl.[5] A01K** *1/035*
**U.S. Cl. 119—168** **17 Claims**




1. An animal enclosure apparatus, comprising:

a blank formed of a sheet of substantially stiff foldable material;

said blank including:

an oblong bottom wall portion;

opposite side and roof wall portions extending symmetrically outwardly from, and coextensively with, first and second relatively longer sides of said oblong bottom wall portion; and

opposite front and back wall portions extending symmetrically outwardly from, and coextensively with, third and fourth relatively shorter sides of said bottom wall portion;

fold lines being provided along said first, second, third and fourth sides of said bottom wall portion, and between said side and roof wall portions of said combined portions; four triangular gusset portions, each said gusset portion joining a said side wall portion and one of said front and back walls; and

portions of said blank being folded upwardly at said fold lines in an assembled state of said apparatus such that said front, back and side wall portions are arranged in substantially vertical planes, said bottom wall portion is arranged in a substantially horizontal plane, and said roof wall portions are arranged in inclined planes extending upwardly and inwardly from said side wall portions, such that said apparatus defines a complete enclosure.

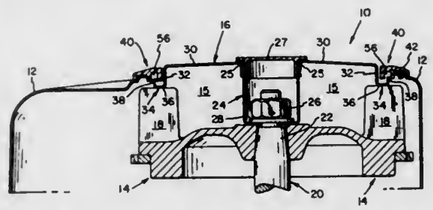
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**5,046,458**

## AIR-COOLED ENGINE FLYWHEEL FAN ROTATIONAL DEBRIS INLET SCREEN

**Peter G. Kronich, Sheboygan, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.**

**Filed Sep. 11, 1990, Ser. No. 580,636**
**The portion of the term of this patent subsequent to Jul. 5, 1991, has been disclaimed.**
**Int. Cl.[5] F01P** *7/04*
**U.S. Cl. 123—41.63** **17 Claims**




1. An air-cooled internal combustion engine, comprising:

a rotatable crankshaft;

a flywheel- attached to one end of said crankshaft for rotation therewith, said flywheel having blower means connected thereto for blowing air over said engine;

a screen connected to and rotatable with said flywheel, said screen having a generally annular main portion and upwardly turned lip radially outwardly from the outer periphery of said main portion;

a housing surrounding said screen and having an air intake opening generally coaxial with said flywheel; and

a ring attached to said housing and positioned circumjacent said main portion of said screen, said ring having a downwardly extending groove into which extends said upwardly turned lip, whereby a tortuous entry path is formed for any foreign matter entering through the air intake between the outer periphery of said main portion of said screen and the inner periphery of said ring.

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**5,046,459**

## OSCILLATORY MOTION APPARATUS

**Alfred H. Stiller, and James E. Smith, both of Morgantown, W. Va., assignors to West Virginia University, Morgantown, W. Va.**

**Continuation of Ser. No. 519,259, May 2, 1990, abandoned, which is a continuation of Ser. No. 394,244, Aug. 15, 1989, abandoned, which is a continuation of Ser. No. 265,184, Oct. 31, 1988, abandoned, which is a continuation of Ser. No. 14,420, Feb. 12, 1987, abandoned, which is a division of Ser. No. 832,324, Feb. 24, 1986, Pat. No. 4,682,569, which is a division of Ser. No. 706,153, Feb. 27, 1985, Pat. No. 4,641,611, which is a continuation-in-part of Ser. No. 628,248, Jul. 6, 1984, abandoned. This application Jan. 10, 1991, Ser. No. 639,362**
**Int. Cl.[5] F02B** *75/22*
**U.S. Cl. 123—55 R** **18 Claims**

1. An internal combustion engine comprising

first substantially rigid connecting rod means mounted for oscillating movement in a first direction,

second substantially rigid connecting rod means mounted for oscillating movement in a second direction,

first trammel gear means pivotally secured to said first substantially rigid connecting rod means,

said first trammel gear means pivotally secured to said second rod means, whereby coordinated oscillating movement of said first substantially rigid rod means and said second substantially rigid connecting rod means will effect responsive rotational movement of said trammel gear means,

output gear means operatively associated with said trammel gear means for effecting rotational movement thereof responsive to rotation and translation of said trammel gear means,

an engine block for an internal combustion engine,

first and third cylinders generally aligned on a first axis,

second and fourth cylinders generally aligned on a second axis,

said second axis being oriented substantially perpendicular with respect to said first axis,

first and third pistons disposed respectively within said first and third cylinders and adapted for reciprocating movement therein,

said first substantially rigid connecting rod means fixedly secured to said first and third pistons,

second and fourth pistons disposed respectively within said second and fourth cylinders,

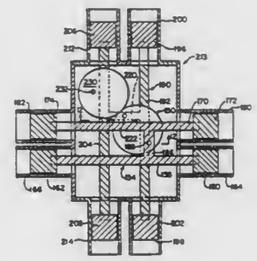
said second substantially rigid connecting rod means oriented generally perpendicularly with respect to said first connecting rod means,

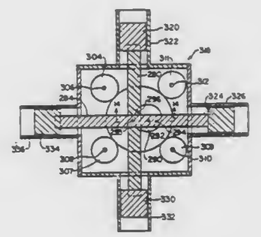
said second connecting rod means being fixedly secured to said second and fourth pistons,

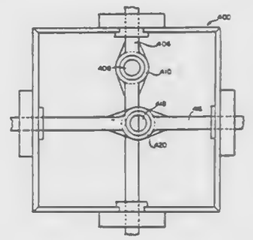
first pivot means connecting said first trammel gear means with said first connecting rod means,

second pivot means connecting said first trammel gear means with said second connecting rod means,

said first and second pivot means including pivot pins,







said second connecting rod means having a first connecting rod and a second connecting rod,

said first connecting rod being connected to said first trammel gear means,

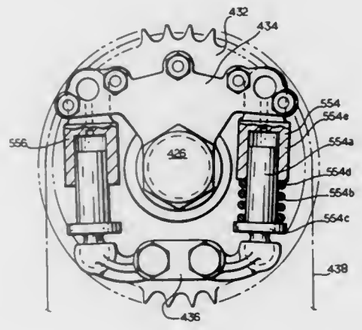
second trammel gear means connected to said second connecting rod and said first connecting rod means, and

second output gear means operatively associated with said second trammel gear means.

**5,046,460**
**VARIABLE CAMSHAFT TIMING FOR INTERNAL COMBUSTION ENGINE**

Roger P. Butterfield, Interlaken; Franklin R. Smith, Slaterville Springs, and Stanley K. Dembosky, Ithaca, all of N.Y., assignors to Borg-Warner Automotive Transmission & Engine Components Corporation, Sterling Heights, Mich.

Continuation-in-part of Ser. No. 422,353, Oct. 16, 1989, Pat. No. 5,002,023. This application Sep. 19, 1990, Ser. No. 584,913
The portion of the term of this patent subsequent to Mar. 26, 2008, has been disclaimed.
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.15 16 Claims



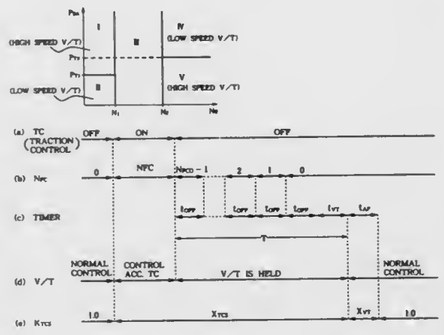

8. An internal combustion engine comprising:
a rotatable crankshaft;
a camshaft, said camshaft being rotatable about its longitudinal central axis and being subject to a unidirectionally acting torque during the rotation thereof;
first means mounted on said camshaft, said first means being oscillatable with respect to said camshaft about said longitudinal central axis of said camshaft at least through a limited arc;
second means keyed to said camshaft for rotation therewith;
rotary movement transmitting means interconnecting said crankshaft and one of said first means and said second means for transmitting rotary movement from said crankshaft to said camshaft;
a first hydraulic cylinder having a body end pivotably attached to one of said first means and said second means and a piston end pivotably attached to the other of said first means and said second means;
a second hydraulic cylinder having a body end pivotably attached to said one of said first means and said second means and a piston end pivotably attached to said other of said first means and said second means, said second hydraulic cylinder and said first hydraulic cylinder being disposed to act in opposite directions with respect to said longitudinal central axis of said camshaft and being hydraulically interconnected so that one of said first hydraulic cylinder and said second hydraulic cylinder extends as the other of said first hydraulic cylinder and said second hydraulic cylinder retracts;
resilient means acting on one of said first means and said second means to impose a countertorque on said camshaft during the rotation thereof, the countertorque being opposed in direction to the unidirectionally acting torque; and
control means for selectively permitting the extending of one of said first hydraulic cylinder and said second hydraulic cylinder and the retracting of the other of said first hydraulic cylinder and said second hydraulic cylinder in reaction to torque pulsations in said camshaft.

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**5,046,461**
**VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES**

Masaki Kanehiro, and Masakazu Sakaguchi, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,051
Claims priority, application Japan, Apr. 19, 1989, 1-99640; Apr. 19, 1989, 1-99641; Apr. 19, 1989, 1-99642
Int. Cl.[5] B60K *28/16;* F01L *1/26*
U.S. Cl. 123—90.15 21 Claims



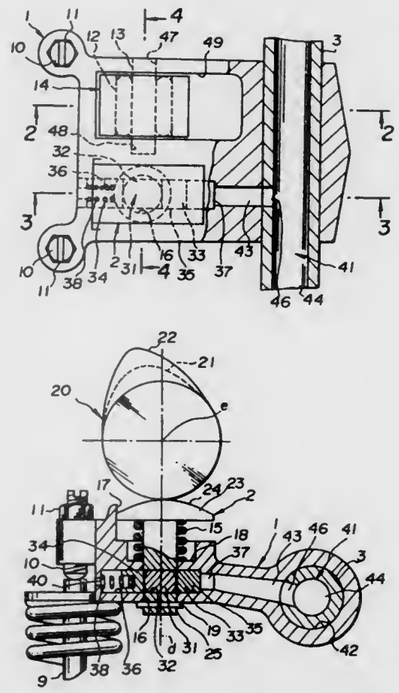

1. In a valve control system for controlling the valve lift characteristic of at least one set of a set of inlet valves and a set of exhaust valves of an internal combustion engine installed in an automotive vehicle having driving wheels, including driving wheel slip-detecting means for detecting an excessive slip state of at least one of said driving wheels, and valve lift characteristic-changing means responsive to an output from said driving wheel slip-detecting means for changing the valve lift characteristic of said at least one set of said set of inlet valves and said set of exhaust valves, the improvement comprising:
determining means for determining whether said engine is in a specific engine operating region; and
changing operation-inhibiting means for inhibiting said valve lift characteristic-changing means from changing the valve lift characteristic when said determining means determines that said engine is in said specific engine operating region.



**5,046,462**
**ROCKER ARM ARRANGEMENT FOR VARIABLE VALVE TIMING TYPE INTERNAL COMBUSTION ENGINE VALVE TRAIN**

Yutaka Matayoshi, Yokosuka; Makoto Nakamura, Yokohama; Shigeru Sakuragi, and Shigeo Muranaka, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 5, 1990, Ser. No. 593,202
Claims priority, application Japan, Oct. 12, 1989, 1-265911
Int. Cl.[5] F01L *1/34*
U.S. Cl. 123—90.16 11 Claims

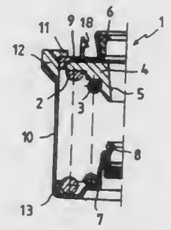



1. In a valve train for an internal combustion engine having a cylinder head, a poppet valve which is associated with said cylinder head and a rocker shaft which is supported on said cylinder head:
a rocker arm, said first rocker arm being pivotally mounted on the rocker shaft, said rocker arm having a portion adapted to engage said poppet valve:
a first cam follower supported on said rocker arm, said first cam follower being arranged to engage a first cam provided on a cam shaft;
a second cam follower which is reciprocatively mounted on said rocker arm, said second cam follower comprising:
resilient means for biasing said second cam follower into contact with a second cam provided on the cam shaft;
means defining a first bore in said second cam follower in which a first plunger is reciprocatively disposed;
means defining a second bore in said rocker arm, said second bore being arranged to align with said first bore under a predetermined rocker arm operation; and
hydraulically controlled means for causing said plunger to slide axially in said first bore and for causing a portion of said plunger to project into said second bore.

**5,046,463**
**ASSEMBLING DEVICE FOR VALVE ACTUATING COMPONENTS OF INTERNAL-COMBUSTION ENGINES**

Clifford R. Worsley, Langenfeld, Fed. Rep. of Germany, assignor to Goetze AG, Burscheid, Fed. Rep. of Germany

Filed Dec. 27, 1990, Ser. No. 634,509
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1989, 3943115
Int. Cl.[5] F01L *3/10*
U.S. Cl. 123—90.67 10 Claims



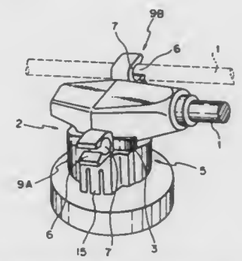

1. An assembling device arranged for receiving a valve-actuating subassembly intended for installation about a valve stem; the subassembly including a valve spring having opposite first and second ends and a valve spring retainer abutting said valve spring at the first end thereof; the assembling device comprising
a holder being arranged for abutting the valve spring retainer; and
an axial extension surrounding said holder and being axially displaceable relative to said holder, said axial extension having opposite first and second ends; said axial extension including
stop means at said first end of said axial extension for preventing said holder from separating from said axial extension; and
hold-back means at said second end of said axial extension for releasably engaging the valve spring at the second end thereof, whereby said stop means and said hold-back means are together arranged to releasably secure the subassembly to the assembling device.

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**5,046,464**
**CLAMP FOR IGNITION CABLES**

Masahiro Hisatomi, Kanagawa, and Hiroyuki Itoh, Mie, both of Japan, assignors to Nissan Motor Co., Yokohama and Sumitomo Wiring System, Ltd., Yokkaichi, both of, Japan

Filed Mar. 29, 1990, Ser. No. 501,131
Claims priority, application Japan, Apr. 7, 1989, 1-41550[U]
Int. Cl.[5] F02P *23/00, 1/00;* H02G *3/00*
U.S. Cl. 123—143 C 6 Claims




1. A clamp for ignition cables comrprising: a band-like clamp holder adapted to be tightly engaged around the body portion

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of a rubber ignition plug cap enclosing therein one end of an ignition cable and having inserting and fixing portions formed on the outer circumference thereof, and a clamp piece having an inserting and fixing leg piece insertable into said inserting and fixing portion so as to be releasably fixed in position therein in a locking manner and having a cord holding portion with a cord inserting port at the upper portion of said cord holding portion, said clamp holder and clamp piece being formed from a non-rubber rigid material, said clamp piece being inserted into said clamp holder tightly engaged around said ignition plug cap so as to be locked in position in an erect fashion, whereby an ignition cable can be inserted into said cord holding portion so as to be held in position therein.

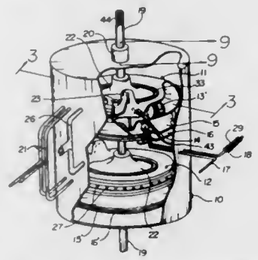
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**5,046,465**

## ROTARY INTERNAL COMBUSTION ENGINE

**Chong S. Yi, 4D-15 79st #40, Elmhurst, N.Y. 11373**

**Filed Aug. 16, 1989, Ser. No. 394,535**
**Int. Cl.[5] F02B** *53/00*
**U.S. Cl. 123—248** **8 Claims**



1. A rotary internal combustion engine comprising:
a housing;
an axle mounted to rotate in the center of said housing,
a first toroidal casing having a first circular chamber disposed within said housing, said first toroidal casing containing a first rotor rotatably disposed therein, said first rotor being fixedly mounted to said axle,
a first piston connected to said first rotor and slidably engaged within said first circular chamber for slidably moving along said first circular chamber,
a second toroidal casing having a second circular chamber disposed in parallel with said first toroidal casing within said housing, said second toroidal casing containing a second rotor rotatably disposed therein, said second rotor being fixedly mounted to said axle, said first and second rotors including a plurality of oil conduits and a pair of anti-leakage rings which extend from the circumferential portions of the top and bottom surfaces thereof, respectively, for preventing the compressed air from leaking from the chamber, said anti-leakage rings being provided with an anti-leakage spring, respectively, for easily receiving the piston in the toroidal casing,
a second piston connected to said second rotor and slidably engaged within said second circular chamber for slidably moving along said second circular chamber, said first and second pistons including a pair of rings disposed at the periphery thereof, respectively, and a plurality of oil conduits extending from said oil conduits of the rotors for supplying lubricating oil between walls of the chambers and the pistons so as to lubricate the pistons and prevent the pressured air from leaking from the chambers.
a first valve member and a second valve member disposed within said first and second toroidal casings, respectively, said first and second valve members including first and second valve doors which are adapted to open or close so as to permit or prevent the piston from passing, respectively, said first and the second valve members containing a pair of valve doors connected to first and second valve rollers through a connecting rod member for opening and closing the valve doors depending on the rotary position of first and second valve rollers,
a first valve plate fixedly mounted to said axle and disposed in parallel with said first toroidal casing within the housing, said first valve plate having a peripheral edge portion and an extended edge portion for operatively guiding the rotation of the first valve roller therealong, said first valve roller being connected to said first valve doors,
a first gas plate fixedly mounted to said axle and disposed in parallel with said first valve plate within the housing, said first gas plate having a peripheral edge portion and an extended edge portion for operatively guiding the rotation of a first gas roller therealong;
a second valve plate fixedly mounted to said axle and disposed in parallel with said second toroidal casing within the housing, said second valve plate having a peripheral edge portion and an extended edge portion for operatively guiding the rotation of the second valve roller therealong, said second valve roller being connected to said second valve doors,
said second gas plate fixedly mounted to said axle and disposed in parallel with said second valve plate within the housing, said second gas plate having a peripheral edge portion and an extended edge portion for operatively guiding the rotation of a second gas roller therealong,
refrigeration means are connected to said first and second toroidal casings through a wall of said housing for cooling the first and second chambers,
connecting means are connected to said first and said second toroidal casings through a wall of said housing for exhausting combustion gases from the first and second circular chambers,
first and second air and gas intakes are connected to said first and said second circular chambers, respectively, for supplying a compressed air-fuel mixture to the first and second circular end chambers, and
spark forming means associated with an ignition and explosion zone formed between said first and second pistons and said first and second valve members respectively, in said first and said second circular chambers, whereby the rotation of the rotor within the internal combustion engine is achieved by transferring the compressed air-fuel mixture to the ignition and explosion zone, igniting and simultaneously exploding the mixture, and exhausting the gases of combustion whereby rotation of the rotors together with the axle is achieved.

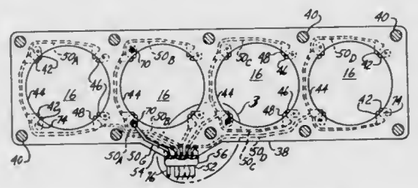
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**5,046,466**

## SPARK-IGNITION ENGINE

**Frank F. Lipski, 14634 Fonseca St., La Mirada, Calif. 90638**

**Filed Sep. 20, 1990, Ser. No. 585,497**
**Int. Cl.[5] F02P** *15/08*
**U.S. Cl. 123—310** **32 Claims**



1. An internal combustion engine comprising:
(a) cylinder means having at least one piston movable therein;
(b) head means forming a combustion chamber in fluid communication with the piston, the head means being removably connected to the cylinder means;
(c) gas flow control means whereby intake air is admitted into the combustion chamber for compression by the piston and subsequently expelled from the combustion chamber as exhaust gas by the piston;
(d) fuel flow means for controllably admitting fuel into the combustion chamber, the fuel being mixed with the intake air;
(e) pulse means for generating a high voltage intermittent electric signal, the signal being synchronized with movement of the piston; and
(f) a planar circuit module clampingly located between the cylinder means and the head means, the module comprising:
(i) an electrically insulative substrate;
(ii) a pair of electrode members;
(iii) circuit means providing a plurality of foil conductor members on the substrate for connecting the electrode members to the pulse means for producing spark ignition of the fuel within the combustion chamber;
(iv) first seal means for sealingly connecting the substrate to one of the cylinder means and the head means; and
(v) second seal means for sealingly connecting the substrate to the other of the cylinder means and the head means.



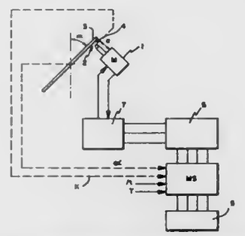
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**5,046,467**

## SYSTEM FOR SETTING THE THROTTLE FLAP ANGLE FOR AN INTERNAL COMBUSTION ENGINE

**Herbert Arnold, Eberdingen; Michael Horbelt, Kleinglattbach; Rüdiger Jautelat, Tamm; Peter Werner, Wiernsheim; Manfred Mezger, Markgröningen, and Günther Plapp, Filderstadt, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 202, Mar. 30, 1988, abandoned. This application Dec. 19, 1989, Ser. No. 452,408**
**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720255**
**Int. Cl.[5] F02D** *31/00*
**U.S. Cl. 123—339** **8 Claims**



1. A system for adjusting the angle of the throttle flap of an internal combustion engine, the system comprising:
an electronic device for controlling the throttle flap angle in dependence upon the position of the accelerator pedal and upon parameters specific to the engine;
an adjustable throttle flap idle stop for stopping the angular movement of the flap in an idle angle position defining a throttle flap angle value ($\alpha 1$) and corresponding to the idle operation of the engine;
memory means for buffer-storing said throttle flap angle value ($\alpha 1$);
a positioning motor connected to said electronic device and being adapted to adjust the position of said idle stop;
said electronic device including means for measuring the actual value of the throttle flap angle ($\alpha 2$) when said throttle flap is in contact engagement with said idle stop; and, comparison means for comparing said actual value ($\alpha 2$) with the buffer-stored throttle flap angle value ($\alpha 1$); and,
said electronic device being adapted to issue a signal to said positioning motor for displacing said stop in the direction of the buffer-stored throttle flap angle value ($\alpha 1$) in response to a difference between said values $\alpha 1$ and $\alpha 2$.

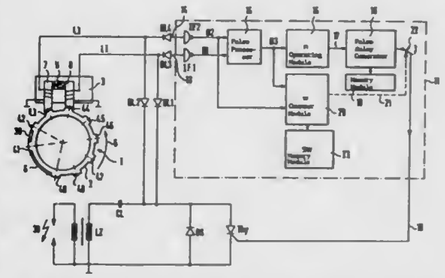
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**5,046,468**

## METHOD AND SYSTEM WITH INDUCTIVE ROTARY EMITTER FOR THE CONTROL ESPECIALLY OF THE IGNITION TIMING OF INTERNAL COMBUSTION ENGINES

**Werner Erhard, Cadolzburg, Fed. Rep. of Germany, assignor to Prüfrex-Elektro-Apparatebau Inh. Helga Müller, geb.-/Dutschke, Cadolzburg, Fed. Rep. of Germany**

**Filed Jul. 27, 1990, Ser. No. 558,736**
**Claims priority, application Fed. Rep. of Germany, Jul. 27, 1989, 3924843**
**Int. Cl.[5] F02P** *5/145, 5/15, 9/00, 3/08*
**U.S. Cl. 123—414** **18 Claims**



18. In a control system using an inductive rotary emitter for controlling the instant of ignition of an internal combustion engine, comprising a rotatable yoke wheel having a plurality of circumferentially spaced projecting tooth-like segments distributed about its circumference, said yoke wheel being mounted to be moved past a coil for the induction of first pulses therein, a first pair of adjacent said segments being spaced by a first distance, and at least two adjacent ones of said segments being spaced by a second distance different from said first distance, means for determining the speed of said engine, and means responsive to said first pulses for generating ignition pulses, the improvement wherein said means for generating ignition pulses comprises means for generating said ignition pulses in response to first pulses responsive to the passage of different segments past said coil, as a function of the speed of the engine.

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**5,046,469**

## FUEL DISTRIBUTOR FOR FUEL INJECTION SYSTEMS OF INTERNAL COMBUSTION ENGINES

**Karl Gmelin, Flein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

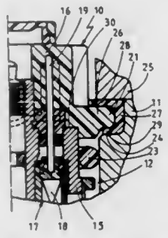
**Filed Jan. 11, 1990, Ser. No. 463,575**
**Claims priority, application Fed. Rep. of Germany, Mar. 10, 1989, 3907765**
**Int. Cl.[5] F02M** *61/14*
**U.S. Cl. 123—470** **20 Claims**

I. A fuel distributor for fuel injection systems of internal combustion engines, having at least one fuel injection valve including a valve housing (15), a valve carrier (11) that has at least one axial, open, stepped bore (12) for receiving the at least one fuel injection valve, this bore communicating with a fuel supply line, a bearing shoulder (24) of said valve carrier (11) surrounding the receiving bore, said bearing shoulder (24) including a bearing surface, a collar (21) which forms a shoulder of the fuel injection valve housing (15), said collar (21) surrounded by a shaped ring (27) of an elastomer material, which fits over a portion of the collar (21) on upper and lower

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faces, said shoulder of said housing, said collar and said shaped ring firmly fastened by means of an end holder **25** at



least in a vicinity of the bearing surface of the bearing shoulder (**24**) of said receiving bore.

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**5,046,470**

## METHOD OF AND DEVICE FOR MONITORING COMBUSTION IN A SPARK IGNITION INTERNAL COMBUSTION ENGINE

**Robert Entenmann, Benningen; Karl-Heinz Kugler, Vaihingen; Siegfried Rhode, Oberriexingen; Ulrich Rothaar, Stuttgart; Bernhard Stengel, Tamm; Oskar Torno; Stefan Unland, both of Schwieberdingen, and Matthias Philipp, Stuttgart, all of Fed. Rep. of Germany, assignors to RobertBosch GmbH, Stuttgart, Fed. Rep. of Germany**

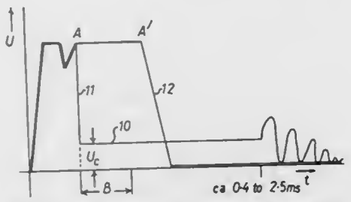
**PCT No. PCT/EP88/00277, § 371 Date Dec. 4, 1989, § 102(e) Date Dec. 4, 1989, PCT Pub. No. WO89/09333, PCT Pub. Date Oct. 5, 1989**

**PCT Filed Apr. 2, 1988, Ser. No. 449,897**

**The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.**

**Int. Cl.[5] F02D** *41/26, 41/14;* **F02P** *17/00*

**U.S. Cl. 123—481** **7 Claims**



1. A method of monitoring combustion in a spark ignition internal combustion engine having a combustion chamber and a discharge system with an ignition coil having a primary winding, said method comprising the step of monitoring duration of a discharge voltage at the primary winding of the ignition coil and evaluation of the discharge voltage in accordance with operating parameters of the internal combustion engine for determining whether combustion in the combustion chamber takes place.

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**5,046,471**

## ARRANGEMENT FOR FEEDING OF FUEL FROM SUPPLY TANK TO INTERNAL COMBUSTION ENGINE OF POWER VEHICLE

**Werner Schmid, Tamm, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

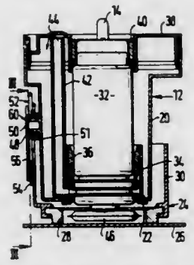
**Filed Mar. 22, 1990, Ser. No. 497,396**

**Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914081**

**Int. Cl.[5] F02M** *37/10*

**U.S. Cl. 123—509** **9 Claims**

1. An arrangement for feeding of fuel to an internal combustion engine of a power vehicle, comprising a supply tank having a tank bottom; a feeding aggregate arranged in said supply tank; a receiving part holding said feeding aggregate; a holder mounted on said tank bottom; and vibration damping means through which said receiving part is connected with said holder, said vibration damping means including a metal spring and a rubber elastic buffer through which said metal spring is



mounted on at least one of said receiving part and said holder, said receiving part being cup-shaped and having a cup in which said feeding aggregate is arranged, said holder being bowl-shaped and having a bowl bottom connected to said tank bottom, said metal spring having one end connected with said cup and another end connected with said bowl.

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**5,046,472**

## APPARATUS FOR COMBINED BLOW-INJECTION OF FUEL AND AIR FOR FUEL INJECTION SYSTEMS OF INTERNAL COMBUSTION ENGINES

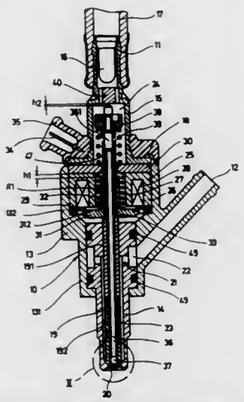
**Ernst Linder, Muehlacker, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 21, 1990, Ser. No. 482,602**

**Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914636**

**Int. Cl.[5] F02M** *39/00*

**U.S. Cl. 123—533** **21 Claims**



1. An apparatus for a combined blow-injection of fuel and air for fuel injection systems of internal combustion engines, having a housing including a fuel connection (**11**), an air connection (**12**), and a flow-injection opening (**20**) communicating with said fuel connection and said air connection, an air valve (**4**), and a fuel valve (**42**) in said housing, each valve having a valve seat and a valve member disposed in the housing with said valves actuated by an electromagnet, said air valve is located in a communication between said air connection and said blow-injection opening and said fuel valve is located in a communication between said fuel connection and said blow-injection opening for a dosed metering of air and fuel, respectively, said air valve (**41**) and said fuel valve (**42**) are disposed concentrically to one another with their valve seats immediately at the blow-injection opening (**20**) and are embodied such that a valve member (**36**) of said fuel valve (**42**), including a valve seat (**46**) is spring-loaded in a closing direction and lifts outwardly to open the valve away from an associated valve seat (**45**), and a valve member (**23**) of said air valve (**41**) is spring-loaded in the closing direction and lifts inwardly away from an associated valve seat (**43**), said valve member of said air valve (**23**), is formed by a hollow shaft and includes said valve seat (**45**) of the fuel valve (**42**), said valve member of said air valve (**23**) is actuatable by an electromagnet (**25**) which opens said air valve (**41**) and said fuel valve (**42**); a stroke stop (**40**) is disposed in a stroke path of the hollow shaft valve member (**23**) and of the valve member (**36**) of the fuel valve (**42**) in such a manner that a maximum stroke path of the hollow shaft valve member (**23**) is longer than that of the valve member (**36**) of the fuel valve (**42**) so that both air and fuel valves (**41,42**) are opened.



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**5,046,473**

## AUTOMATIC AIR INTAKE TEMPERATURE REGULATOR APPARATUS AND METHOD

**Larry D. Hokenson, Isanti, Minn., assignor to Onan Corporation, Minneapolis, Minn.**

**Filed Apr. 19, 1990, Ser. No. 510,949**

**Int. Cl.[5] F02M** *31/00*

**U.S. Cl. 123—556** **22 Claims**



1. An automatic air intake temperature regulator for regulating the temperature of air entering an internal combustion engine, comprising:

a housing having an ambient air inlet to an interior of the housing connectable to a source of ambient air, the housing further having a preheated air inlet to the interior of the housing connectable to a source of preheated air, and the housing further having an air outlet from the interior of the housing to the engine;

a shutter pivotally mounted to the housing movable between two positions wherein the shutter closes the ambient air inlet and opens the preheated air inlet in a first position and the shutter closes the preheated air inlet and opens the ambient air inlet in a second position;

biasing means for biasing the shutter toward the first position to open the preheated air inlet; and

temperature responsive means for only sensing temperature of the ambient air on the exterior of the housing and urging the shutter toward the second position to open the ambient air inlet as the ambient air temperature increases, the temperature responsive means including temperature sensing means located external of the ambient and preheated air inlets on the exterior of the housing for sensing the temperature of the ambient air on the exterior of the housing.

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**5,046,474**

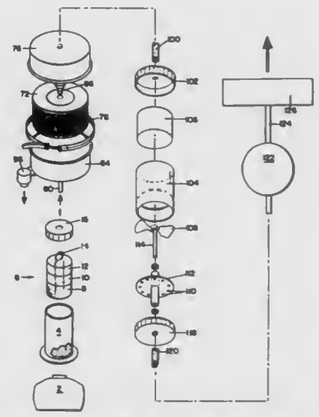
## CRANKCASE VENTILATOR/EVACUATION SYSTEM

**Donald W. Percy, Pillsbury Rd., Southview Condo 9, Londonderry, N.H. 03053**

**Filed May 4, 1990, Ser. No. 519,095**

**Int. Cl.[5] F02M** *25/00*

**U.S. Cl. 123—573** **1 Claim**



1. Vacuum-controlled apparatus for removing contaminates from fumes and vapors emanating from the crankcase of a diesel engine and for returning the cleansed vapors to the engine combustion chamber and consisting of an in seriatim series of filter stages comprising:

a primary filter stage including

a rocker arm bonnet fitted to the engine rocker arm and communicating therewith, sand

a series of layers of filter elements disposed within the bonnet and arranged as a stack of layers in face-to-face confrontation as to each other with the layers differing in porosity from a most coarse inboard layer to a most fine outboard layer with a layer of intermediate porosity sandwiched therebetween,

a secondary filter stage including

a secondary housing,

a first conduit interconnecting the primary stage filter and the secondary housing into which it is extendable,

a magnetic disc within the housing and circumscribing the first conduit,

a seal at the upper extremity of the first conduit for directing the incoming flumes and vapors from the first conduit into the housing and past the magnetic disc for the capture of any ferrous particulates therewith,

a filter cartridge spaced upwardly of the disc,

housing seal means for forcing all fumes and vapors through the filter cartridge for the capture of the nonferrous particulates therewith preliminary to discharge from the secondary housing,

an apertured core tube disposed centrally of and within the filter cartridge, and

an outlet in the secondary housing communicating with the core tube for the discharge of the filtered fumes and vapors from the secondary housing,

a tertiary filter stage including

a tertiary housing,

a second conduit interconnecting the secondary stage outlet and the tertiary housing,

a filter element disposed within the tertiary housing,

a fan disposed beneath the filter element, and

an activator plate disposed beneath the fan,

and a compressor having a vacuum side connected to the tertiary housing and a pressure side connected to the

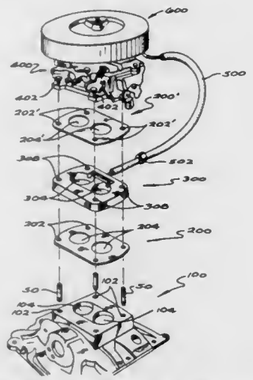
VOL 1130 ISS 2 SE 10 1991 UMI



engine intake manifold for the forced in seriatim withdrawal of the fumes and vapors from the rocker arm and through the primary and secondary and tertiary filter stages and returnably to the engine intake manifold.

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**5,046,475**
**EMISSION CONTROL DEVICE FOR CARBURETED ENGINES**
**Richard W. Thompson, Tujunga, Calif., assignor to Thompson Devices, Inc., Glendale, Calif.**
**Filed Sep. 14, 1990, Ser. No. 583,876**
**Int. Cl.[5] F02M *23/00***
**U.S. Cl. 123—585** **42 Claims**



22. An emission control device for use with a carburetor having a base, said base defining therein an opening and a fuel port, said fuel port opening into said opening, said device comprising:

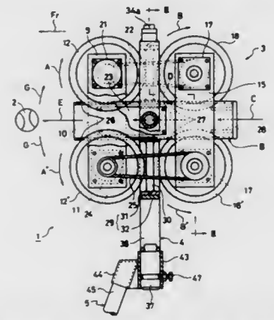
a body member of predetermined thickness and having an upper surface, said body member having at least one through opening, said through opening communicating with said at least one opening in said base, said through opening being of greater diameter than said opening defined in said base;

and an air passageway defined in said upper surface of said body member to form an indentation therein, said air passageway communicating through a single opening with said through opening and lying generally adjacent said base and said fuel port so that air passed through said air passageway passes into said through opening by first entering said through opening generally directly under said fuel port such that fuel exiting said fuel port is essentially immediately mixed with the air passing through said air passageway.

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**5,046,476**
**SUPPORT STRUCTURE FOR BALL THROWING MACHINE**
**Fujio Nozato, Osaka, Japan, assignor to Toa Sports Machines Co., Ltd., Osaka, Japan**
**Filed Feb. 2, 1990, Ser. No. 473,799**
**Claims priority, application Japan, Sep. 1, 1989, 1-227964**
**Int. Cl.[5] F41B *4/00***
**U.S. Cl. 124—78** **5 Claims**

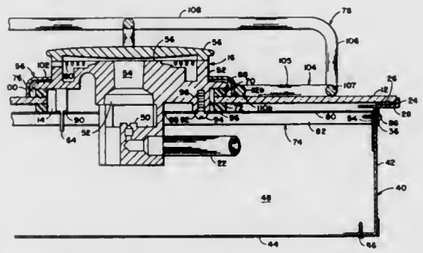
1. A support structure for a ball throwing machine including a frame extending in the ball throwing direction, a pair of front rotary wheels disposed with said frame held therebetween, a pair of rear rotary wheels disposed rearwardly of said pair of front rotary wheels and with said frame held therebetween, operatively connecting means for operatively connecting said front and rear rotary wheels, and a support block having a support member for supporting said frame, wherein a ball fed from the rear side of same frame is nipped between the outer peripheral surfaces of said pair of rear rotary wheels and thrown forward and then it is nipped between the outer peripheral surfaces of said pair of front wheels and thrown forward, said support structure being characterized in that it includes an annular bracket fitted on an intermediate portion of same frame between said front and rear rotary wheels and attached to said



frame, said annular bracket being pivotally supported at its right and left sides by said support member and being composed of an inner ring coaxial with and attached to said frame and an outer ring pivotally supported by said support member and having said inner ring only circumferentially slidably fitted therein, said operatively connecting means being disposed within said annular bracket.

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**5,046,477**
**GAS COOK-TOP WITH GLASS TOP**
**James L. Bennett; John D. Robeson, both of Cedar Rapids, and Ralph E. Biddle, Iowa City, all of Iowa, assignors to Amana Refrigeration Inc., Amana, Iowa**
**Filed Dec. 28, 1990, Ser. No. 635,080**
**Int. Cl.[5] F24C *3/00***
**U.S. Cl. 126—39 B** **16 Claims**



1. A gas cook-top comprising:

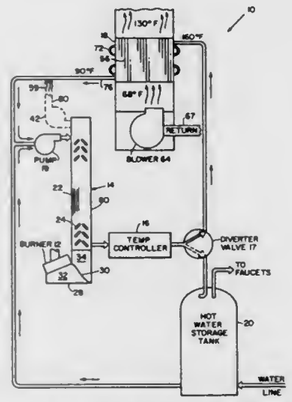
a glass top panel having at least first and second apertures;

first and second gas burners extending up through said respective first and second apertures in said glass top panel;

a grate adapted for supporting cooking utensils above said respective burners, said grate being supported on said glass top panel and having first and second locator members each surrounding at least a portion of a respective one of said first and second burners wherein the horizontal alignment of said grate on said glass top panel is fixed by abutment with said first and second burners.



**5,046,478**
**RECUPERATIVE FURNACE SYSTEM FOR SPACE AIR AND DOMESTIC HOT WATER**
**Lawrence G. Clawson, Dover, Mass., assignor to Raytheon Company, Lexington, Mass.**
**Filed Nov. 30, 1990, Ser. No. 620,970**
**Int. Cl.[5] F24H *3/02***
**U.S. Cl. 126—110 R** **31 Claims**




1. A method of heating space air, comprising the steps of:

burning a fuel to provide combustion products;

raising the dew point of said combustion products;

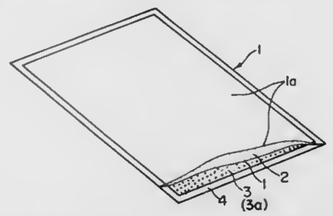
transferring sensible heat and heat of condensation from said dew point elevated combustion products to a liquid in a tube of a first heat exchanger wherein said dew point elevated combustion products and said liquid move in counter-flow directions;

conveying said liquid to a second heat exchanger and transferring heat from said liquid to space air in said second heat exchanger wherein said liquid and said space air are moved in substantially counter-flow directions; and

conveying said liquid so cooled by said space air in said second heat exchanger in a loop back to said first heat exchanger to be reheated by dew point elevated combustion products.

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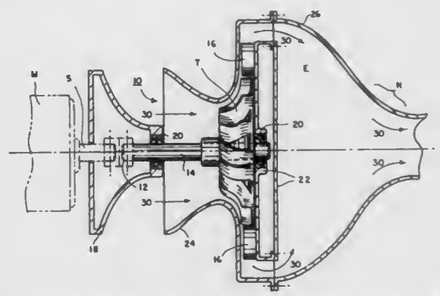
**5,046,479**
**DISPOSABLE BODY WARMER**
**Akio Usui, Tochigi, Japan, assignor to Mycoal Warmers Company Limited, Tochigi, Japan**
**Filed Nov. 21, 1989, Ser. No. 439,696**
**Claims priority, application Japan, Nov. 30, 1988, 63-300795**
**Int. Cl.[5] A61F *7/00*; F24J *1/00***
**U.S. Cl. 126—204** **15 Claims**




1. A disposable body warmer comprising a flat bag having an air-permeable first surface having an air permeability per unit time of 5,000 to 10,000 sec/100 cc so as to bring about a reduction in the pressure accompanying oxidative heat generation of a heat generating agent packed in said flag bag, said heat generating agent comprising iron powder as a main ingredient and, mixed therewith, 9 to 11% by weight of a water-retaining agent, 18 to 22% by weight of water, an oxidation promoter and sodium chloride and being packed in a flat form having a thickness of 2 to 5 mm in said flat bag, and a nontransferable self-adhesive layer being attached to a second surface of said flat bag.

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**5,046,480**
**COMPRESSION FURNACE**
**William E. Harris, 3001 S. Loop 289 C105, Lubbock, Tex. 79423**
**Filed Jun. 8, 1990, Ser. No. 535,061**
**Int. Cl.[5] F24C *9/00***
**U.S. Cl. 126—247** **12 Claims**



1. An apparatus for the heating and delivery of air to an enclosed human environment comprising:

a housing having ambient air inlet and heated air outlet means and said housing defining a continuous unidirectional airflow path,

rotary compression means occupying a limited interior portion of said housing and disposed downstream of said housing inlet to compress, impart angular velocity, and raise the temperature of the air,

diffuser means occupying a limited interior portion of said housing and disposed downstream of said rotary compression means said diffuser means having arcuate diffuser vanes disposed transverse to the airflow path and extending at a selected angle to the airflow path whereby said diffusing vanes are adapted to remove angular velocity from the air and to increase static pressure, and

an expansion chamber occupying a limited interior portion of said housing and disposed downstream of said diffuser means and communicating with said heated air outlet means and having air volume increasing means to thereby decrease the pressure of the air discharged from said diffuser means, and

wherein the housing heated air outlet means has compression means to further raise the delivery temperature of the air by the heat of compression.

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**5,046,481**
**HEATING APPARATUS**
**Dean M. Warwick, North Trinity, Bowmont Street, Kelso, Roxburghshire TD5 7JH, Great Britain**
**PCT No. PCT/GB87/00851, § 371 Date Jul. 27, 1989, § 102(e) Date Jul. 27, 1989, PCT Pub. No. WO88/04014, PCT Pub. Date Jun. 2, 1988**
**PCT Filed Nov. 27, 1987, Ser. No. 359,658**
**Claims priority, application United Kingdom, Nov. 28, 1986, 8628563**
**Int. Cl.[5] F24B *1/189***
**U.S. Cl. 126—522** **16 Claims**

1. Heating apparatus for heating an environment comprising:

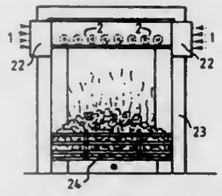
VOL 1130 ISS 2 SE 10 1991 UMI



a container means having inlet and outlet means and defining a flow path for heated fluid;

a plurality of heat exchange tubes disposed in said container means substantially transversely to said flow path and in spaced relationship in the direction of flow of said flow path, said tubes forming at least a part of at least one heat exchange conduit means for the flow of secondary fluid to be heated therethrough and having an inlet and an outlet; and

fluid flow inducing means operatively connected to said at



least one conduit means for inducing a flow of secondary fluid therethrough from said inlet to said outlet thereof;

said tubes being spaced so that the spacing between adjacent tubes gradually decreases in the direction of downstream flow of said heated fluid in said flow path so that the flow of secondary fluid through said tubes is balanced and said heated fluid is progressively compressed between said inlet and outlet means of said container means and the temperature of said heated fluid is increased in said downstream direction for improving the rate of heat exchange between said heated fluid and secondary fluid.

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**5,046,482**

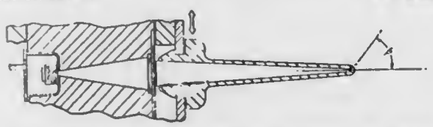
## DISPOSABLE INFRARED THERMOMETER INSERTION PROBE

**Charles E. Everest, Santa Ana, Calif., assignor to IVAC Corporation, San Diego, Calif.**

**Continuation of Ser. No. 176,169, Mar. 31, 1988, abandoned. This application Oct. 27, 1989, Ser. No. 428,416**

**Int. Cl.[5] A61B *1/22*; G01K *1/08***

**U.S. Cl. 128—9** **4 Claims**



3. In combination with an infrared thermometer, an apparatus for focusing infra-red radiation on an infrared radiation sensor mounted in the thermometer, said apparatus comprising:

a) a probe comprising:

1) a generally tubular, frusto-conical, thermally insulating body portion having a narrow forward end and a wide rearward end, said body portion having an inner reflective surface which is continually frusto-conical in shape from the forward end to the rearward end; and

2) flange means projecting radially outward from said body portion for abutting a portion of said thermometer, said flange means including a shoulder for abutting the thermometer and also including a detent;

whereby said probe functions as an objective lens of said infrared thermometer;

b) releasable retaining means for retaining the probe in a predetermined position on the thermometer and for releasing the probe from said predetermined position so that it may be replaced with another probe, said retaining means including locking means for engaging the detent of the flange means for locking the probe in the predetermined position on the thermometer;

c) a focusing lens disposed in the thermometer at the rearward end of the probe; and

d) a positive cone channel condenser lens coupled between the focusing lens and the sensor.

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**5,046,483**

## APPARATUS FOR DISINTEGRATING CALCULUSES

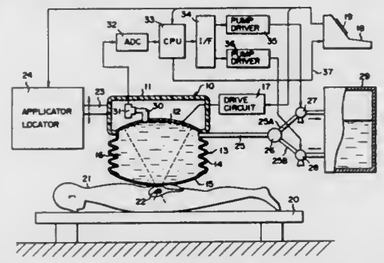
**Ichiro Ogura, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 23, 1990, Ser. No. 483,648**

**Claims priority, application Japan, Feb. 28, 1989, 1-47201**

**Int. Cl.[5] A61B *17/22***

**U.S. Cl. 128—24 OEL** **11 Claims**




1. An apparatus for disintegrating calculuses of the type in which a calculus in the body of a patient is disintegrated by means of a shock wave, comprising:

means for generating a shock wave;

expandable container means for housing a liquid medium and coupled to the shock wave generating means to allow the shock wave to propagate therethrough;

means for storing said liquid medium;

pressure detecting means for detecting pressure in said expandable container means; and

liquid control means for, when the detected pressure exceeds a preset value, draining the liquid medium from said expandable container means to said storing means until the detected pressure drops below the preset value.

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**5,046,484**

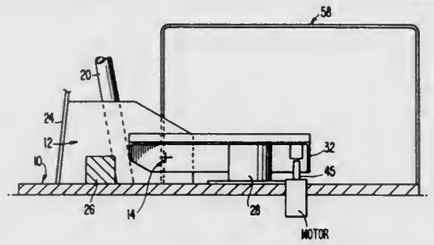
## METHOD AND DEVICE FOR TREATING BONE DISORDERS CHARACTERIZED BY LOW BONE MASS

**C. Andrew L. Bassett, Bronxville, N.Y., and Govert L. Bassett, Charlotte, N.C., assignors to Osteo-Dyne, Inc., Durham, N.C.**

**Continuation of Ser. No. 227,994, Aug. 3, 1988, Pat. No. 4,967,737. This application Jan. 29, 1990, Ser. No. 455,183**

**Int. Cl.[5] A61H *1/02***

**U.S. Cl. 128—25 B** **10 Claims**




1. A method for providing passive exercise treatment for increasing the amount, strength and proper anatomical distribution of skeletal tissue in a patient suffering from a bone disorder, the method comprising the steps of:

(1) determining a value, based upon characteristics of the patient's skeletal tissue, for impact load, impact rate, and treatment duration for the patient to provide treatment for the bone disorder, the impact load and impact rate being



lies between 0.1 Hz and 1 kHz, with the peak amplitude values lying between 15 and 16 Hz;

(2) lifting the patient's heel to perform a prescribed drop excursion by using a mechanical device, the prescribed drop excursion being determined according to the determined impact load value, the lifting step including the substeps of:

(a) placing the patient onto one end of a platform of the mechanical device, and

(b) raising the one end of the platform to perform the prescribed drop excursion by a piston, said piston is driven by a drive means;

(3) allowing the patient's heels to gravitationally drop the prescribed drop excursion to impact the determined impact load value on the patient's skeletal tissue; and

(4) repeating, at the determined impact rate for the determined treatment duration, the steps of lifting the patient's heels and allowing the patient's heels to drop.

7. A device for use in treating a patient suffering from bone disorders, said device comprising:

(1) a pivoting platform having a first lifted end designed to support the patient's heels and a second end opposite the first end, the second end being depressed to raise the first end of the platform;

(2) means for alternately depressing said second end of said platform to lift the patient's heels to perform a prescribed drop excursion so that a gravitational drop of the patient's heels imparts a desired load to the skeletal tissue of the patient, said prescribed drop excursion being determined in accordance with a desired impact load to be imparted to the patient; and

(3) drive means coupled to said depressing means for causing the depressing means to be actuated to alternately depress and lift said first end of said platform, said drive means including:

(a) rate adjustment means for controlling the speed of said drive means, and thus the rate of the depressing means, to cause said desired load to be imparted to the patient at a desired rate such that said desired impact load at said desired rate causes the patient's skeletal tissue to generate an electrical signal having the majority of its energy between 0.01 Hz and 1 kHz, with the peak amplitude values lying between 15 and 16 Hz; and

(b) switch means for activating said drive means.

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**5,046,485**

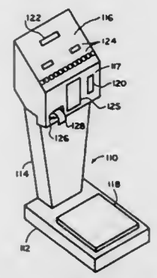
## SCALE-PLATFORM MASSAGER APPARATUS

**Daniel Slater, 2340 Westwood La., Palatine, Ill. 60067**

**Continuation-in-part of Ser. No. 315,329, Feb. 24, 1989. This application Mar. 9, 1990, Ser. No. 491,241**

**Int. Cl.[5] A61H *1/00***

**U.S. Cl. 128—33** **11 Claims**



5. A commercial coin-operated scale-platform massager apparatus, comprising the combination of:

a frame supporting a display and control panel;

a foot platform, a foot platform support, and snubber means mounting the foot platform and foot platform support relative to one another and allowing slight horizontal and vertical movements of one relative to the other;

an elongated weight cell, and opposite end connections between the weight cell, and the frame and the foot platform support, respectively; and the end connection of the weight cell to the foot platform support being generally centered relative to the foot platform;

the weight cell providing the primary support for the foot platform, operable to bear the weight of a person standing on the foot platform and being calibrated to determine the weight of the person and provide an output at the display and control panel;

a driving vibrator and means mounting the driving vibrator directly onto the foot platform, operable when the driving vibrator is activated to vibrate the foot platform relative to the frame;

said driving vibrator being in the form of an electric motor having an output shaft and an eccentric weight keyed to the motor shaft; and

a money-collector, to receive the appropriate denomination of money, to allow the operation of the weight cell and driving vibrator to proceed.

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**5,046,486**

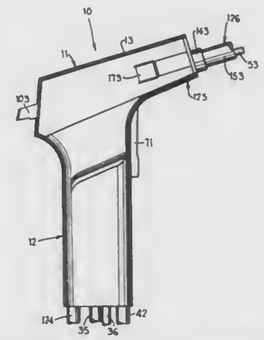
## COMPACT PULSING PUMP FOR IRRIGATION HANDPIECE

**David H. Grulke, Battle Creek; Douglas L. Tyler, Sr., and William M. Booth, III, both of Paw Paw, all of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.**

**Filed Jan. 13, 1989, Ser. No. 297,841**

**Int. Cl.[5] A61H *9/00***

**U.S. Cl. 128—66** **27 Claims**



1. A surgical irrigation handpiece, comprising:

a piston-like housing having a handle and a barrel extending forwardly from the top of said handle at an angle;

a finger actuable trigger adjacent the joinder of said handle and barrel;

an axially elongate pulsing motor/pump unit confined in said handle and extending longitudinally from near the handle bottom to near the top of said handle, said motor/pump unit including a motor in the bottom portion of said handle and a pump in the top portion of said handle,

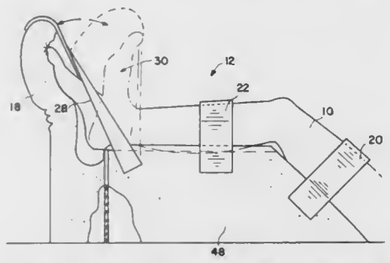
means inside the bottom of said handle for directing a (1) a high pressure gas supply to the adjacent bottom portion of said motor and (2) an irrigation liquid supply to said pump, the latter means being arranged to effect connection of said motor and pump to supply tubes from respective remote pressure gas and irrigation liquid sources; and

an outlet tube extending from the top of said pump into said barrel and forward toward the front end of said barrel, said trigger controlling pulsed liquid outflow of said pulsing pump through said outlet tube.

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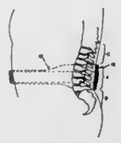
5,046,487
**THERAPEUTIC LEG ELEVATOR**
James W. Scott, 403 W. 16th St., Tifton, Ga. 31794
Filed Dec. 12, 1989, Ser. No. 448,834
Int. Cl.[5] A61F *5/04;* A47C *20/00, 16/00*
U.S. Cl. 128—25 B 18 Claims




11. A therapeutic leg elevator for use in promoting venous flow during patient recuperation comprising:
means for underlying and supporting a lower portion of a patient's leg in an elevated position when a patient is in a supine recuperative posture, said means for underlying and supporting being,
a substantially homogeneous solid polygonal-shaped member composed of elastic foam having external surfaces including,
a first inclined surface for supporting a back portion of a patient's thigh,
a second surface inclined with respect to said first inclined surface for supporting a patient's lower leg,
a generally vertical distal end surface,
two generally vertical lateral side surfaces, and
a substantially flat bottom surface;
resistance means comprising a cantilever vertical member releasably connected to a distal end of said means for underlying and supporting a lower portion of a patient's leg and being operable to be adjacent to a sole portion of a patient's foot to provide resistance exercise whereby a patient positioned in a supine recuperative posture may utilize foot flexion about an ankle joint and against said resistance means to promote lower limb venous flow during patient recuperation, said resistance means having, an elongated concave channel fashioned near a lower end of said cantilever vertical member whereby the concave channel operably serves as a hinge for said resistance means; and
means for releasably connecting said resistance means to a distal end of said means for underlying and supporting, said means for releasably connecting being one of a hook and pile connecting combination connected to said means for underlying and supporting and the other of said hook and pile combination connected to said resistance means.

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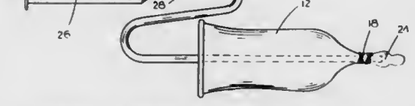
5,046,488
**SUPPORT BELT FOR THE LUMBAR VERTEBRAE**
James W. Schiek, Sr., 513 B Saratoga Ave., Fond du Lac, Wis. 54935
Filed Mar. 9, 1990, Ser. No. 491,349
Int. Cl.[5] A61F *5/02*
U.S. Cl. 128—78 10 Claims



1. A support device for the lumbar vertebrae of the human spinal column, the support device of the type including a belt of a pliable, nonelastic material and adapted to encircle the waist area of the human body, the support device comprising:
a. a back section having vertical and horizontal axes and opposed sides laterally spaced along the horizontal axis and a vertical dimension along the vertical axis spanning at least a portion of the lumbar vertebrae defining top and bottom edges and adapted to bear upon the back musculature on both sides of at least one of said lumbar vertebrae;
b. first means including a pair of straps extending laterally outward from the opposed sides of said back section, each of said straps extending along an axis forming a downwardly acute angle with respect to the horizontal axis of said back section and having outer ends spaced outwardly from said back section; and
c. means for securing the outer ends of said straps to one another to form a belt for encircling the human body about the waist, so that when the outer ends of said straps are secured together, said back section and straps define a tapered, truncated, conical belt, having a larger diameter at the top than at the bottom and conforming generally to the natural taper of the human body in the lumbar region.

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5,046,489
**PROSTHETIC DEVICE**
Greg Gibson, 474 Mount Vernon, Council Bluffs, Iowa 51503
Filed Dec. 18, 1990, Ser. No. 629,396
Int. Cl.[5] A61F *2/50, 5/41*
U.S. Cl. 128—79 5 Claims

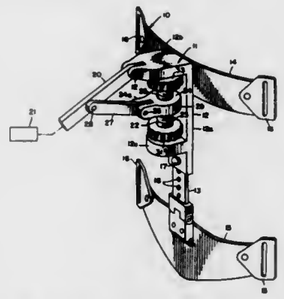



1. A prosthetic apparatus, comprising:
a conventional condom having elastic characteristics, and having a closed tip end and an open end;
restriction means located on said condom between said open and closed ends forming a fluid-sealed chamber in said tip end; and
fluid under pressure in said fluid-sealed chamber so as to expand said tip end of said condom.

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5,046,490
**ORTHOPAEDIC BRACE AND MOTION CONTROL MECHANISM THEREFOR**
David E. Young, Watlington, and Kenneth P. Davis, Hillington, both of England, assignors to Protectair Limited, Abingdon, England
Filed Jun. 4, 1990, Ser. No. 533,119
Claims priority, application United Kingdom, Jun. 15, 1989, 8913759
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—87 B 6 Claims

1. An orthopaedic brace comprising a threaded guide rod; mounted means adapted for supporting said rod against at least longitudinal movement with respect to a first part of a patient's body; a collar having an opening receiving said rod for longitudinal sliding movement therealong; support means adapted for engaging a second body part to be braced with respect to said first part; a connecting member connecting said support means to said collar; first and second stoop means for limiting the extent of longitudinal sliding movement of said collar along said rod; at least one of said first and second stop means comprising an adjustment nut threadedly receiving said rod for selectively and variably controlling the extent of sliding movement of said collar along said rod; and antirotation means

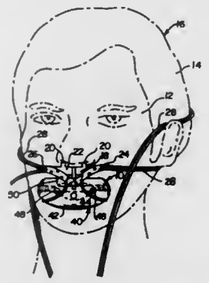


provided by said brace for preventing rotation of said collar upon said rod.

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5,046,491
**APPARATUS AND METHOD FOR RESPIRED GAS COLLECTION AND ANALYSIS**
Steven J. Derrick, 1077 Huston Dr., West Mifflin, Pa. 15122
Continuation of Ser. No. 499,977, Mar. 27, 1990, abandoned. This application Oct. 17, 1990, Ser. No. 611,429
Int. Cl.[5] A61M *15/08;* A61B *5/08*
U.S. Cl. 128—200.24 18 Claims



1. Apparatus for collecting, transporting, sampling and analyzing nasal and oral gases respired by a patient, said apparatus comprising
cannula means constructed and arranged for placement in at least one of the patient's nares,
said cannula means having at least one opening distal from the patient's nare for conducting respired nasal gases,
a nasal respired gas conduit having at least two spaced openings, with one of said openings connected in fluid communication with the respired gas opening of the cannula means and the other end of said nasal respired gas conduit connected to respired gas distribution means,
oral respired gas capture means for placement near the patient's mouth,
said oral respired gas capture means comprising a hollow member having at least one aperture therein to permit aggregation of oral respired gases therein and having at least one effluent opening for the removal of oral respired gases therefrom, and
an oral respired gas conduit independent from said nasal respired gas conduit, having at least two spaced openings therein, with one of said openings connected in fluid communication with the effluent opening of said oral respired gas capture means and the other end of said oral respired gas conduit connected to said respired gas distribution means.

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5,046,492
**CLEAN ROOM HELMET SYSTEM**
Wyman H. Stackhouse, 3201 Poinsettia Ave., Manhattan Beach, Calif. 90266, and Ian M. Williamson, 555 No. Harbor Dr., Redondo Beach, Calif. 90277
Filed Jul. 15, 1988, Ser. No. 219,220
Int. Cl.[5] A62B *18/02, 7/00*
U.S. Cl. 128—200.27 1 Claim



1. A Clean Room Helmet System for substantially isolating a person from the environment and the environment from the person comprising:
a helmet for covering the head portion of a user,
said helmet having a solid translucent face plate and an inlet port and an exhaust port for allowing intake air to enter the helmet and exhaust air to leave the helmet respectively.
a portable and mobile pressure filtering system adapted to be carried on the person of the user and connected to said inlet port on said helmet for supplying filtered air to said helmet,
said pressure filtering system consisting of an electric motor, battery pack and filtering element connected in circuit to filter all air supplied to said helmet,
a portable and mobile vacuum filtering system adapted to be carried on the person of the user and connected to said outlet port on said helmet for exhausting and filtering all air removed from the interior of said helmet portion,
said vacuum filtering system consisting of an electric motor, battery pack and filtering element connected in circuit to filter all air removed from said helmet, and
an air deflector located in said helmet between said inlet port and said outlet port for deflecting the filtered incoming air from the inlet port into the vicinity of the user's nose portion whereby optimum breathing efficiency is obtained before the air is exhausted out the exhaust port,
and in which said helmet includes a chin portion and said deflector fits inside said chin portion between said inlet port and said exhaust port and is attached to said helmet with double faced adhesive tape.

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5,046,493
**NASAL DISPENSER**
James Kropkowski, 166 E. Passaic, Rutherford, N.J. 07070, and Jesse L. Colodner, 22 Walter St., Pearl River, N.Y. 10965
Filed Feb. 16, 1988, Ser. No. 156,473
Int. Cl.[5] A61M *15/00*
U.S. Cl. 128—203.15 6 Claims

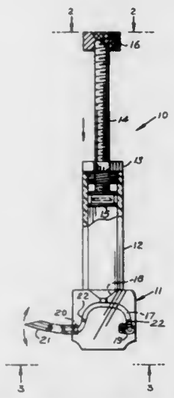
1. A nasal dispenser for self-dispensation of medication to the nostril of the user, comprising:
a hollow cylindrical barrel having a first open end for receipt of medication therein and a second open end;
means for regulating the flow of medication from said barrel, said regulating means comprising a piston plunger including a plunger having a knurled head attached at one end of said plunger and a rubber piston attached at the opposite end of said plunger, said piston plunger being moveably and coaxially disposed in said barrel with said piston being within said barrel and said plunger and said knurled head extending out of said first open end of said barrel to permit

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the piston plunger to be moved longitudinally within said barrel;

a main body integral with said barrel and disposed at the second open end of said barrel, said main body having an elongated chamber and means for passing medication from said barrel to said chamber formed therein, said passing means comprising a frusto-conical sump fluidly connected at its apex with said chamber and at its base with the second open end of said barrel, said chamber



extending to the exterior wall of said main body at two distinct points;

means for enabling air to be blown through said chamber by the user for dispensation of medication held therewithin, said enabling means comprising an oral blow tube fixedly attached to said chamber at said first distinct point; and

means for passing said medication from said chamber to the nostril of the user, said passing means comprising a nasal tube fixedly attached to said chamber at said second distinct point.

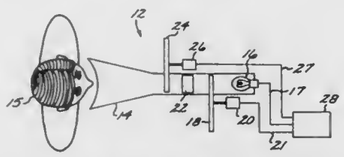
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**5,046,494**

**PHOTOTHERAPY METHOD**

**John Searfoss, 70 E. Arrow, Box 70, Marshall, Mo. 65340, and Robert L. Searfoss, III, 1370-3 Chalmette Dr. NE., Atlanta, Ga. 30306**

**Filed Aug. 27, 1990, Ser. No. 573,531**
**Int. Cl.[5] A61N** *5/06*
**U.S. Cl. 128—395** **2 Claims**



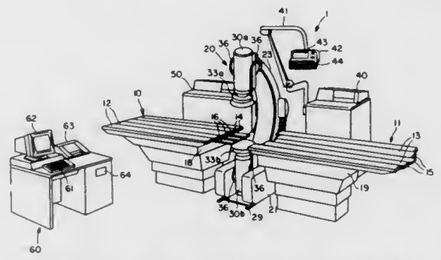
1. A method for achieving a therapeutic effect in an observer, comprising the steps of directing towards said observer's eyes a pulsing field of light controllable in terms of wavelength, intensity, area, and pulse rate in a sequence commencing with a relatively long wavelength, low intensity, small area and slow pulse rate and progressing to a light field of relatively short wavelength, high intensity, large area, and high pulse rate.

**5,046,495**

**HIGH FREQUENCY HEAT THERAPY SYSTEM**

**Noriyuki Takahashi, Kyoto; Jun Shimoyama, Uji; Eiji Kasai, Muko, and Akitoshi Miki, Ibaraki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Apr. 4, 1989, Ser. No. 332,925**
**Claims priority, application Japan, Apr. 4, 1988, 63-82485; Jul. 9, 1988, 63-171599; Jul. 9, 1988, 63-171600; Aug. 24, 1988, 63-209892; Aug. 26, 1988, 63-112467**
**Int. Cl.[5] A61N** *1/00;* **A61G** *13/08*
**U.S. Cl. 128—399** **13 Claims**



1. A high frequency heat therapy system, comprising:

an applicator equipped with an electrode and a bolus bag;

high frequency generator means for generating high frequency electric current that is to be applied to said electrode;

cooling fluid circulating means for circulating cooling fluid through said bolus bag;

a therapeutic table for adjustably supporting a patient;

applicator support means for adjustably applying said applicator to said patient;

temperature measuring means for measuring a temnperature of a bodily part of said patient that is to be treated;

temperature control means for processing a temperature signal from said temperature measuring means and controlling said high frequency generator means and said cooling fluid circulating means;

therapeutic data input means for specifying therapeutic data including data related to positioning of said therapeutic table and said applicator support means;

therapeutic data storage means for storing therapeutic data including said data related to positioning of said therapeutic table and said applicator support means;

drive control means for drivingly controlling said therapeutic table and said applicator support means according to said data related to positioning of said therapeutic table and said applicator support means stored in said storage means; and

central control means for transmitting data stored in said therapeutic data storage means and, if any, said therapeutic data specified by said therapeutic data input mean to said drive control means.

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**5,046,496**

**SENSOR ASSEMBLY FOR MEASURING ANALYTES IN FLUIDS**

**Ronald E. Betts, LaJolla, and David W. Deetz, Del Mar, both of Calif., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Apr. 26, 1989, Ser. No. 343,234**
**Int. Cl.[5] A61B** *5/00*
**U.S. Cl. 128—635** **14 Claims**

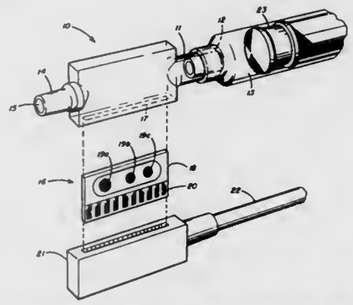
1. Sensor assembly for measuring analytes in fluids comprising:

a syringe having a body portion with a piston slidable therein, said syringe having a distal end with an outlet port formed therein;

a housing that is a flow through cell having a proximate end with a port formed therein and a distal end with another



port formed therein, where the proximate end of the housing engages with and connects to the distal end of the syringe so that a sample of fluid can be drawn through the housing by the syringe, the distal end of the housing adapted for engagement with means for withdrawing a sample of fluid;



sensing means disposed within said housing as an electrode assembly having at least one microsensor prepared by thick film processing for sensing at least one analyte in the sample of fluid including means for connecting said sensing means into a circuit and transmitting a signal to monitor means which measures and displays the value of the analyte sensed by the sensing means.

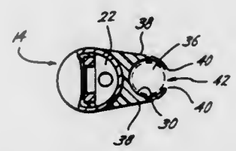
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**5,046,497**

**STRUCTURE FOR COUPLING A GUIDEWIRE AND A CATHETER**

**Huntly D. Millar, Houston, Tex., assignor to Millar Instruments, Inc., Houston, Tex.**

**Continuation of Ser. No. 119,616, Nov. 12, 1987, Pat. No. 4,850,358, which is a continuation-in-part of Ser. No. 931,273, Nov. 14, 1986, Pat. No. 4,771,782. This application Dec. 19, 1988, Ser. No. 286,480**
**The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.**
**Int. Cl.[5] A61B** *5/00*
**U.S. Cl. 128—637** **17 Claims**



1. A system for connecting a diagnostic or therapeutic device to a guidewire having a distal section for introduction into a biological vessel, comprising:

an elongated body containing a diagnostic or therapeutic device;

an elongated catheter connected to the body in longitudinal alignment therewith;

coupling means depending from the body adapted for slidably engaging a guidewire, such that with the distal section of the guidewire positioned in the vessel and the coupling means engaging the guidewire, the body is slidable along the length of the guidewire in the vessel, the coupling means including

a pair of spaced-apart fingers depending from the body and defining a guidewire-receiving groove therebetween, the ends of each finger spaced from the body being oriented towards one another and defining a slot therebetween.

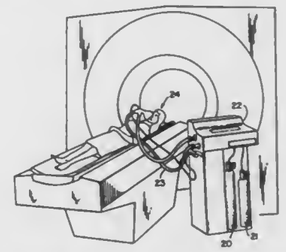
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**5,046,498**

**MAGNETIC RESONANCE HUMAN MEDICAL AND VETERINARY IMAGING METHOD**

**Royce S. Fishman, Iselin, N.J., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.**

**Filed Jan. 16, 1991, Ser. No. 641,789**
**Int. Cl.[5] A61B** *5/055*
**U.S. Cl. 128—653 CA** **13 Claims**



1. A metnod for carrying out magnetic resonance imaging with imProved contrast comprising:

(A) providing a living organic subject, having nuclei;

(B) providing stable neon to said subject;

(C) applying a magnetic field to the subject to align at least some of the subject's nuclei;

(D) providing radio energy for absorption and re-emission by said aligned nuclei; and

(E) gathering data based on the re-emitted radio energy to produce an image with improved contrast.

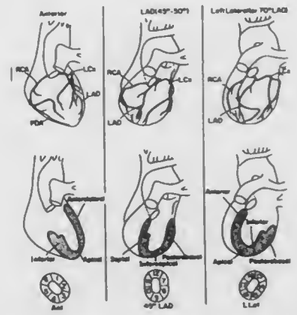
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**5,046,499**

**METHOD FOR MYOCARDIAL INFARCT RISK ASSESSMENT**

**Harvey J. Berger, Devon, Pa., assignor to Centocor, Inc., Malvern, Pa.**

**Filed Jun. 13, 1988, Ser. No. 206,437**
**Int. Cl.[5] A61B** *6/00*
**U.S. Cl. 128—654** **3 Claims**



1. A method for screening patients with chest pain due to myocardial ischemia to identify patients having a high risk of developing myocardial infarction comprising the steps of:

a) administering an antimyosin imaging agent to the patient;

b) measuring the quantity and location of antimyosin imaging agent uptake in the myocardium of the patient in a plurality of planar projections;

c) displaying the planar projections simultaneously to gener-

ate a bullseye image having a preselected number of segments showing quantitatively the localization of antimyosin uptake in the myocardium of the patient; and

d) correlating the antimyosin uptake with the risk of myocardial infarction wherein said step of correlating comprises classifying a patient having antimyosin uptake in less than about 30% of the bullseye image segments as a low-risk patient and a patient having antimyosin uptake in about 30% or more of the bullseye image segments as a high risk patient.

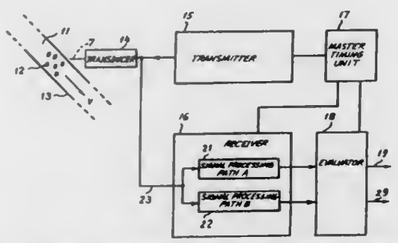
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**5,046,500**

## DOPPLER FLOW VELOCITY METER

**Rainer Fehr, Hofstetten, Switzerland, assignor to Kontron Instruments Holding N.V., Caracao, Netherlands Antilles**

**Filed Sep. 7, 1989, Ser. No. 404,295**
**Claims priority, application Canada, Oct. 3, 1988, 3684/88**
**Int. Cl.[5] A61B** *8/06*
**U.S. Cl. 128—661.09** **4 Claims**




1. A Doppler measuring device to measure flow velocity of a fluid which carries particles which reflect ultrasonic waves comprising:

transmitter means for producing transmit pulses at a predetermined pulse repetition rate, said transmit pulses having a periodic sequence with a frequency spectrum of at least two adjacent but separate frequency bands;

ultrasonic transducer means connected to the transmitter means for receiving said transmit pulses which excite the transducer means to produce corresponding ultrasonic wave pulses to irradiate the fluid and thereby the particles carried by the fluid and to produce at least two groups of corresponding echo waves, the echo waves being received by the ultrasonic transducer means and delivered as corresponding echo signals;

receiver means connected to the ultrasonic transducer means and having an input end, an output end, and separate signal processing paths for receiving the echo signals from the ultrasonic transducer means and for processing adjacent but separate frequency bands of the echo signals in each of the separate signal processing paths to produce Doppler information; and

evaluator means connected to the output end of the receiver means for evaluating the echo signals received from the receiver means to determine the flow velocity of the fluid; wherein the transmitter means comprises:

a first shift register having an input end, an output end and memory cells, the output end being connected to the input end of the first shift register;

a second shift register having an input end, an output end and memory cells, the memory cells corresponding in number to a number of the memory cells in the first shift register, and the output end being connected to the input end of the second shift register;

loading means connected to the first and the second shift registers for loading each of the shift registers with the same number of words of equal length and for loading complementary bits in corresponding memory cells of each of the registers;

a timing unit connected to each of the shift registers to produce timing signals to cause a shift of contents in each of the registers over a predetermined period of time to produce corresponding output signals at the output ends of each of the first and second shift registers; and

a power amplifier having an input and an output, the input of the amplifier being connected to the output ends of the first and the second shift registers, and the amplifier producing an output signal which is supplied as the transmit pulses to the transducer means, the output signal being formed as a difference between output signals produced by each of the shift registers.

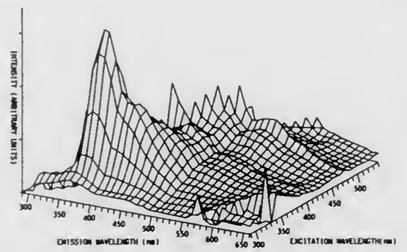
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**5,046,501**

## ATHEROSCLEROTIC IDENTIFICATION

**Richard Crilly, Ontario, Canada, assignor to Wayne State University, Detroit, Mich.**

**Filed Jan. 18, 1989, Ser. No. 298,576**
**Int. Cl.[5] A61B** *6/00*
**U.S. Cl. 128—665** **4 Claims**




1. A method of identifying atherosclerotic plaque versus structurally viable tissue, said method including the steps of: emitting a beam of light at a single excitation wavelength of between 350 an 390 nm at a tissue; detecting an quantifying the fluorescence emission spectrum of the emitted beam at critical points of optimum distinguishing emission from atherosclerotic plaque and structurally viable tissue; and distinguishing the presence of atherosclerotic plaque from structurally viable tissue by the presence of absence of the quantity of intensity of emissions at the critical points of optimum distinguishing emission.

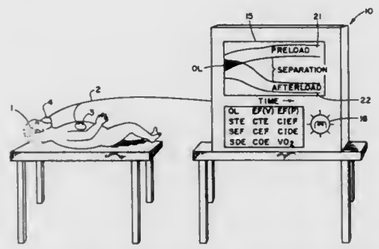
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**5,046,502**

## METHOD AND APPARATUS FOR MEASURING CARDIAC EFFICIENCY

**Horst E. Kunig, R.D. #1, Box 577, Saltsburg, Pa. 15681**

**Continuation-in-part of Ser. No. 468,137, Jan. 22, 1990. This application May 9, 1990, Ser. No. 521,154**
**Int. Cl.[5] A61B** *5/02*
**U.S. Cl. 128—670** **21 Claims**




1. A cardiac monitoring device for determining efficiency of the heart of an individual, said device including:

means for generating volume and pressure signals representative of end systolic volume, end diastolic volume, systolic blood pressure, and diastolic blood pressure, and

means responsive to said signals for producing signals representing stroke preload and afterload potentials for determining efficiency of the heart.



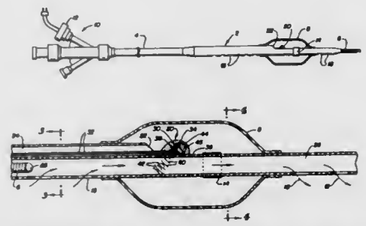
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**5,046,503**

## ANGIOPLASTY AUTOPERFUSION CATHETER FLOW MEASUREMENT METHOD AND APPARATUS

**Gary Schneiderman, Walnut Creek, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**

**Filed Apr. 26, 1989, Ser. No. 343,426**
**Int. Cl.[5] A61B** *5/02, 8/06;* **A61M** *25/00*
**U.S. Cl. 128—692** **26 Claims**



1. An improved autoperfusion angioplasty catheter system of the type incorporating a balloon located near distal tip of the catheter, an autoperfusion lumen within the balloon, and autoperfusion orifices located proximally and distally from said balloon, said orifices providing means to allow the flow of blood through said autoperfusion lumen when said balloon is inflated, said improvement comprising:

measurement means located adjacent said autoperfusion lumen and in communication therewith for measuring the flow of blood through said autoperfusion lumen;

means to activate said measurement means from a remote location; and

indication means to provide at said remote location an indication of flow movement as measured by said measurement means.

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**5,046,504**

## METHOD AND APPARATUS FOR ANALYZING AND INTERPRETING ELECTROCARDIOGRAMS USING SPECTRO-TEMPORAL MAPPING

**David E. Albert, McAlester, and Paul Lander, Norman, both of Okla., assignors to Corazonix Corporation, Oklahoma City, Okla.**

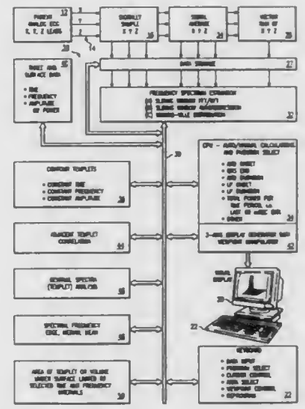
**Division of Ser. No. 305,293, Feb. 1, 1989, Pat. No. 4,947,897. This application Apr. 6, 1990, Ser. No. 505,782**
**Int. Cl.[5] A61B** *5/04*
**U.S. Cl. 128—696** **19 Claims**

1. The method of evaluating electrocardiogram (ECG) signals of a patient which comprises:

digitizing a large number of successive, repetitive ECG waveforms, each waveform representing an amplitude with respect to time from the patient, at sampling points equal to a sampling rate greater than about 500 per second;

averaging the digital sample values at corresponding sample points on the successive ECG waveforms to produce a single digitized signal averaged, high resolution ECG (HRECG) waveform having significantly enhanced signal-to-noise ratio;

producing a set of digital spectrum values representative of an approximate power density spectrum at each of a large number of generally equally spaced sampling time intervals over the HRECG waveform, each spectrum value being a function of the power of the HRECG waveform in a finite time/amplitude window having a time deviation substantially less than the time period of the HRECG waveform which is of interest; and



determining the presence of late potentials from the set of power density spectrums.

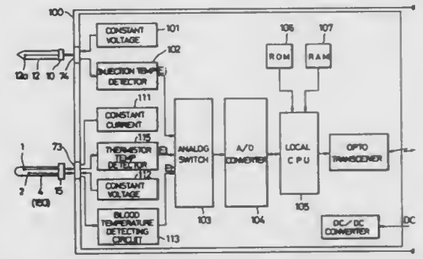
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**5,046,505**

## APPARATUS AND METHOD FOR MEASURING CARDIAC OUTPUT

**Shigekazu Sekii; Makoto Ikeda, and Kouji Tsuchida, all of Fuji, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan**

**PCT No. PCT/JP88/00239, § 371 Date Sep. 5, 1989, § 102(e) Date Sep. 5, 1989, PCT Pub. No. WO88/06426, PCT Pub. Date Sep. 7, 1988**
**PCT Filed Mar. 4, 1988, Ser. No. 415,298**
**Claims priority, application Japan, Mar. 5, 1987, 62-48821; Mar. 5, 1987, 62-48822; Mar. 5, 1987, 62-48823; Mar. 5, 1987, 62-48824; Mar. 5, 1987, 62-48825; Mar. 5, 1987, 62-48826**
**Int. Cl.[5] A61B** *5/028*
**U.S. Cl. 128—713** **21 Claims**




1. An apparatus for measuring cardiac output by a thermal dilution method, comprising:

injection means for injecting an indicator into a blood vessel;

data setting means for manually inputting indicator data on the indicator prior to injection into the blood vessel;

measuring means for measuring injectate data on the indicator prior to injection into the blood vessel;

fault detection means for detecting that said measuring means is inoperative;

blood data detection means for detecting blood data on blood diluted by the indicator injected into the blood vessel;

integration means for integrating the blood data obtained by

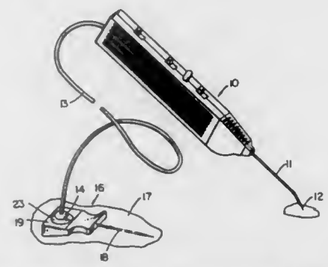
VOL 1130 ISS 2 SE 10 1991 UMI



said blood data detection means to produce an integral value;
selection means for selecting the indicator data set by said setting means when said fault detection means detects that said measuring means is inoperative and otherwise selecting the injectate data, as selected data; and
cardiac output indication means for indicating cardiac output from the selected data and the integral value.

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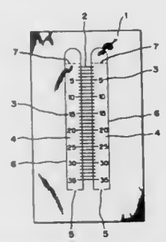
**5,046,506**
**MOLDED NEEDLE WITH ADHESIVE**
**Theodore Singer, Northbrook, Ill., assignor to Singer Medical Products, Inc., Bensenville, Ill.**
**Filed Feb. 9, 1990, Ser. No. 478,246**
**Int. Cl.[5] A61H *39/02***
**U.S. Cl. 128—741** **3 Claims**



1. A grounding medical needle comprising, a body member formed with at least one planar side, an electrically conducting needle attached to said body member and making an obtuse angle with said one planar side, adhesive on said one planar side, a first electrical connector mounted on said body member and in electrical contact with said needle, and a peel away cover on said adhesive on said one planar side which can be removed so as to attach said body member to a patient.

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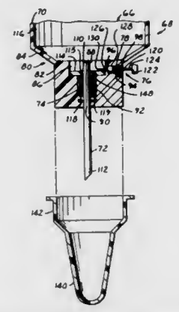
**5,046,507**
**TEAR PRODUCTION MEASURING SHEET AND PACKAGE THEREFOR**
**Makoto Nagase, Kawasaki; Kuniaki Asami, Tokyo; Shuichi Kobayashi, Tokyo; Yasunori Arai, Tokyo; Kazuo Ito, Tokyo, and Motohiro Oka, Tokyo, all of Japan, assignors to Showa Yakuhin Kako Co., Ltd., Japan**
**Filed Mar. 19, 1990, Ser. No. 495,324**
**Claims priority, application Japan, Mar. 20, 1989, 1-31567**
**Int. Cl.[5] A61B *5/00***
**U.S. Cl. 128—745** **4 Claims**



1. A tear production measuring sheet comprising a measuring sheet made of a water-absorbing base material, said measuring sheet having on the surface thereof a scale printed on the surface of the sheet at its longitudinal center and a set of numbers printed on the sheet surface on either side of said scale, and a pair of measuring strips for the right and left eyes disposed side by side in such a manner that each of said measuring strips has on the surface thereof a part of said scale and one set of said numbers, a cut formed in said measuring sheet in such a manner as to extend around each of the measuring strips with a connection between the measuring strip and the remaining part of said measuring sheet positioned at the bottom end of the measuring strip.

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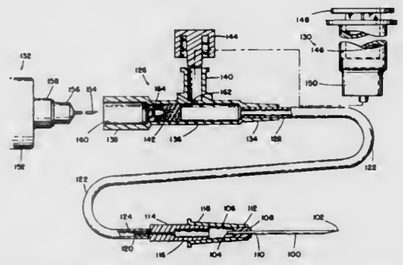
**5,046,508**
**SYRINGE WITH RETRACTABLE NEEDLE**
**Jonathan Weissler, 584 Hanna, Birmingham, Mich. 48009**
**Filed Dec. 19, 1989, Ser. No. 452,727**
**Int. Cl.[5] A61B *5/00***
**U.S. Cl. 128—763** **17 Claims**



1. A medical instrument comprising a needle and means for mounting said needle for movement between an extended operative position relative to said medical instrument where said needle is exposed for use and a retracted inoperative position where said needle is covered so as to reduce the likelihood of inadvertent contact with said needle;
wherein said mounting means comprises support means, needle biasing means, and actuating means, said support means mounting said needle in said extended and retracted positions, said needle biasing means being interposed between said support means and said needle and normally urging said needle toward said retracted position, said actuating means being mounted on said support means for movement between inner and outer positions and adapted to be disposed to retain said needle at said extended position in said inner position of said actuating means, said actuating means further being adapted to be disposed out of engagement with said needle when said actuating means is moved toward said outer position to permit said needle biasing means to act on said needle thereby to force said needle to said retracted position;
said actuating means comprising engaging means adapted to be disposed to engage said needle, to retain said needle in said extended position in said inner position of said actuating means, said engaging means being further adapted to be disposed out of engagement with said needle when said actuating means is moved toward said outer position;
said mounting means further comprises actuator biasing means interposed between said actuating means and said support means, and normally urging said actuating means toward said inner position, such that said engaging means is in a position of interference with movement of said needle to said retracted position, said actuating means being adapted to be moved toward said outer position, against forces exerted thereon by said actuator biasing means, to dispose said engaging means out of a position, and wherein said actuating means being movable relative to said support means through a limited axial distance, there being stops provided on said actuating means to prevent it from moving further than said limited axial distance within said support means.



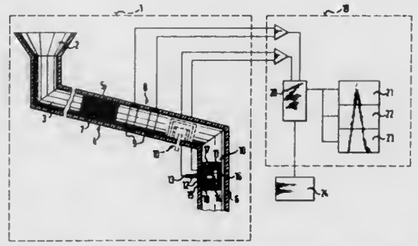
**5,046,509**
**DEVICE FOR THE CONDITIONING, HANDLING AND MEASUREMENT OF BLOOD**
**John A. R. Kater, Santa Ana, Calif., assignor to SpaceLabs, Inc., Bothell, Wash.**
**Filed Dec. 30, 1988, Ser. No. 292,490**
**Int. Cl.[5] A61B *5/00***
**U.S. Cl. 128—764** **35 Claims**



1. A blood sampling device for use by medical personnel to withdrawn and store a blood sample from a patient comprising:
needle means adapted to be inserted in the patient to withdraw the blood sample; and
coupling means for coupling said needle means to blood storage devices, said coupling means including first and second ports and being adapted to conduct blood from said needle means to said first and second ports, said second port being intermediate said needle means and said first port; and
means for venting air trapped within said coupling means through said first port while blocking the flow of blood.

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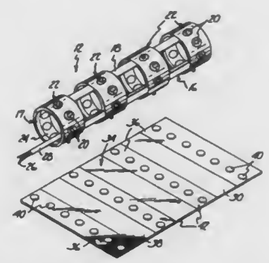
**5,046,510**
**APPARATUS FOR MEASURING THE THROUGHFLOW OF A BODY LIQUID**
**Felix Ams, Kämpfelbach; Manfred Baier, Knittlingen, and Roland Schäfer, Bretten-Dürrenbüchig, all of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany**
**Filed Jul. 3, 1990, Ser. No. 547,727**
**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1989, 3926630**
**Int. Cl.[5] A61B *5/00***
**U.S. Cl. 128—771** **11 Claims**



1. Apparatus for measuring the throughflow of a body liquid; the apparatus comprising:
a vessel for collecting the liquid, the vessel having an open base;
a tube connected to said open base at one end to receive liquid flowing from said vessel and being open at its other end;
a first transducer in the tube for continuously determining the electrical conductivity of the quantity of liquid flowing through the tube from said vessel;
a second transducer in the tube located downstream of the first transducer for determining the specific electrical conductivity of the liquid; and
an electronic evaluation system connected to said transducers for determining the throughflow of the liquid upon the basis of the values determined by said transducers.

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**5,046,511**
**VAGINAL ELECTRODE WITH SNAP-ON ELECTRODE PAD AND METHOD FOR PREPARING ELECTRODE FOR USE**
**Donald D. Maurer, and Stacy D. Mattson, both of Anoka, Minn., assignors to Empi, Inc., St. Paul, Minn.**
**Filed Nov. 28, 1989, Ser. No. 442,248**
**Int. Cl.[5] A61N *1/05, 1/18***
**U.S. Cl. 128—788** **37 Claims**



1. A vaginal electrode, including:
a carrier for insertion into a vagina, comprising;
an elongated member having an exterior surface;
at least two first conductive fastener sections mounted to the elongated member and communicating with the exterior surface, each first conductive fastener section including a plurality of fasteners arranged in a ring around the elongated member; and
leads for coupling electrical energy to the first conductive fastener sections; and
an electrode pad removably mounted to the carrier, including:
a generally rectangular flexible pad member conformable to the elongated member by wrapping around the elongated member so that a vaginal contact surface is facing outward and a carrier contact surface is facing inward, and so that first and second side edges are adjacent one another;
at least two electrically isolated electrode sections on the vaginal contact surface of the pad member; and
at least two second conductive fastener sections, each mounted to the pad in electrical contact with one of the electrode sections and communicating with the carrier contact surface, each of the second conductive fastener sections including a plurality of fasteners arranged in a band and cooperable with the fasteners of the first fastener sections to removably secure the electrode pad to the carrier and couple electrical energy to the electrode sections.

VOL 1130 ISS 2 SE 10 1991 UMI

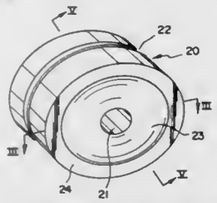


chosen to generate signals in the patient's skeletal tissue such that the majority of energy of the electrical signals

5,046,512
## METHOD AND APPARATUS FOR TREATMENT OF SNORING

John A. Murchie, 202 - 1050, Jarvis Street, Vancouver, British Columbia, Canada V6E 2C1

Filed Aug. 30, 1989, Ser. No. 400,353
Claims priority, application Canada, Mar. 10, 1989, 593417
Int. Cl.[5] A61F 5/56
U.S. Cl. 128—848 4 Claims

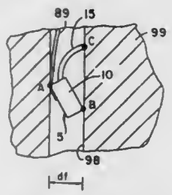



1. A method of treating snoring in a human subject having two nostrils, a mouth and tongue, comprising:
a) measuring the combined cross-sectional area of said nostrils in a direction generally perpendicular to the flow of air through said nostrils;
b) providing a device for lodging between the subject's lips thereby forming an airtight seal, said device comprising:
i) a body portion sized to sealingly fit in said subject's mouth, and having a front and a rear surface;
ii) an air passage formed in said body portion having a cross-sectional area measured in a direction generally perpendicular to the direction of flow of air through said air passage of between 30 percent greater and 30 percent less than the combined cross-sectional area of said nostrils; and
iii) an aperture formed in said rear surface of said body portion communicating with said air passage and sized to permit said subject to releasably seal said air passage with said tongue; and
c) placing said device in said subject's mouth during sleep, and permitting said subject to block or unblock said air passage with said tongue according to the subject's need for air through said passage during sleep.

5,046,513
## METHOD FOR ANCHORING SUTURE TO BONE

Roland F. Gatturna, Walpole; James E. Nicholson, Lincoln, and James O'Leary, Medford, all of Mass., assignors to Mitek Surgical Products, Inc., Norwood, Mass.

Continuation of Ser. No. 51,367, May 18, 1987, Pat. No. 4,898,156. This application Nov. 20, 1989, Ser. No. 439,452
Int. Cl.[5] A61B 17/00
U.S. Cl. 128—898 9 Claims




1. A method for anchoring one end of a suture in bone, said method comprising the steps of:
(a) providing a suture anchor comprising (1) a coupling member, and (2) a barb made of a resilient, elastic material, said barb having a first end and a second end and having a curved configuration in its normal unstressed state, said barb also being capable of being elastically deformed to a substantially straight configuration, said barb being attached to said coupling member so that said second end of said barb is substantially displaced from said coupling member when said barb is in its normal unstressed state but is capable of being aligned with said coupling member when said barb is deformed to a substantially straight configuration;
(b) deforming said barb to a substantially straight configuration and retaining said barb in said deformed configuration;
(c) attaching one end of a length of suture to said coupling member so that the opposite end of said length of suture is free for use in attaching an object to a bone when said suture anchor is anchored in the bone;
(d) forming a hole in a bone which is to have said object attached thereto;
(e) inserting said suture anchor with deformed barb into said hole; and
(f) releasing said barb while said suture anchor is disposed in said hole, whereby said barb will restore itself to its normal curved state so as to fix said suture anchor to said bone;
with step (d) occurring before or after step (c).

5,046,514
## SMOKING MATERIAL AND PROCESS FOR MAKING SAME

Anthony J. N. Bolt, Henbury, England, assignor to Imperial Tobacco Limited, Bristol, England

Filed Mar. 22, 1988, Ser. No. 171,833
Claims priority, application United Kingdom, Mar. 23, 1987, 8706812; Dec. 23, 1987, 8730066
Int. Cl.[5] A24B 15/16; A24D 1/18
U.S. Cl. 131—359 36 Claims

1. A smoking material consisting of an open-structured substrate of cellulosic material having a crystallizable or semi-crystallizable coating including at least one sugar, the proportion of the coating to the weight of the smoking material being in the range of 50–95%.

5,046,515
## PERMANENT SHAPING AGENT FOR HUMAN HAIR AND THE METHOD FOR THE PERMANENT SHAPING OF HUMAN HAIR

Dieter Heinz, Gustavsburg; Siegfreid Kingeter, Dieburg; Burkhard Rose, Darmstadt-Eberstadt, all of Fed. Rep. of Germany; Hirotsugu Segawa, Osaka, Japan, and Jürgen Tennigkeit, Seehelm, Fed. Rep. of Germany, assignors to Goldwell GmbH, Darmstadt-Eberstadt, Fed. Rep. of Germany

Continuation of Ser. No. 777,088, filed as PCT EP84/00421 on Dec. 21, 1984, published as WO85/02998 on Jul. 18, 1985, abandoned. This application May 21, 1987, Ser. No. 54,143
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1984, 3401221
Int. Cl.[5] A45D 7/04
U.S. Cl. 132—204 6 Claims

1. A composition for permanent shaping of human hair which comprises one or more hair keratin-reducing active substances and at least one viscosity modifying agent compatible therewith, said agent being present in an amount sufficient to impart to said composition at room temperature, an initial viscosity of at least 100 mPa/s and to impart thereto a lowered viscosity, at temperatures in the range 25°–42° C., of below about 50 mPa/s.

5,046,516
## HAIR CURLING IRON

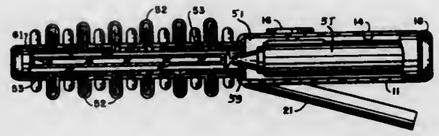
George Barradas, 15 Riverview Ct., Glenville, Conn. 06830

Filed Oct. 31, 1988, Ser. No. 264,856
Int. Cl.[5] A45D 1/04
U.S. Cl. 132—232 4 Claims

2. A hair curling device comprising a handle having a silicone covering, a hollow cylindrical heat transmitting part



being connected to said handle and being provided with a plurality of heat transmitting teeth mounted on the periphery of said cylindrical part and extending substantially perpendicular thereto, said teeth being covered with a resilient silicone

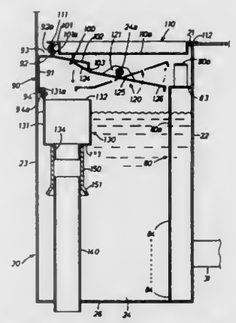



covering, and internal heating means for heating said part and said teeth whereby when hair is wound around said cylindrical part heat is transferred through said teeth and the resilient silicone covering to a user's hair.

5,046,517
## DISHWASHING MACHINE

Fumio Maruyama, Nagoya; Osamu Nagata; Tomio Suyama, both of Toyoake; Yukimasa Takeda, Nagoya; Hiroaki Kamino, Toyoake, and Koji Suyama, Shimane, all of Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan

Filed Aug. 29, 1990, Ser. No. 574,018
Claims priority, application Japan, Aug. 31, 1989, 1-225296
Int. Cl.[5] A47L 15/42
U.S. Cl. 134—95 3 Claims

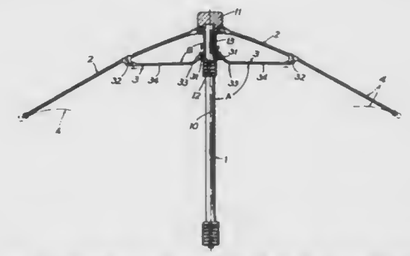


1. A dishwashing machine including a washing chamber having a bottom, a vertical wash tank provided at the bottom of said washing chamber to store an amount of hot wash water therein, a wash pump mounted to a bottom portion of said wash tank to pump up the hot wash water therefrom, first spray means for applying jet streams of the hot wash water supplied thereto from said wash pump over a rack of dishes placed in said washing chamber, a rinse pump arranged to pump up fresh hot water supplied thereto from a source of hot water, and second spray means for applying jet streams of the fresh hot water supplied thereto from said rinse pump over the rack of dishes placed in said washing chamber,
wherein said dishwashing machine comprises a drain box arranged within an upper portion of said wash tank to receive the wash water flowing down from the rack of dishes and associated with a side wall of said wash tank to form an opening in communication with the bottom portion of said wash tank; an upstanding drain pipe connected to a bottom wall of said drain box and being extended outwardly through the bottom wall of said wash tank to drain therethrough the wash water received by said drain box; an upstanding overflow pipe secured at its intermediate portion to the bottom wall of said drain box to permit the upward flow of wash water from the bottom of said wash tank into said drain box, said overflow pipe extending upward into the interior of said drain box in a predetermined distance to define the level of wash water stored in said wash tank; a tiltable plate arranged above said drain box to introduce the wash water flowing down from the rack of dishes into said drain box when placed in a first position and to introduce the wash water or fresh hot water flowing down from the rack of dishes into the bottom portion of said wash tank through said opening when placed in a second position; and a drive mechanism for placing said tiltable plate in the first position when the rack of dishes is prewashed by jet streams of the wash water applied from said first spray means and for placing said tiltable plate in the second position when the rack of dishes is washed by jet streams of the wash water applied from said first spray means after prewashing operation and is rinsed by the fresh hot water applied from said second spray means.

5,046,518
## FOLDING FRAME FOR USE IN UMBRELLA OR THE LIKE

Ching-Ming Chang, P.O. Box 10160, Taipei, Taiwan

Filed Mar. 6, 1990, Ser. No. 488,619
Int. Cl.[5] A45B 29/12
U.S. Cl. 135—37 2 Claims



1. A folding frame for use in umbrella or the like comprising:
a central shaft having an upper notch formed on a top portion of the shaft and a lower runner reciprocatively mounted on said shaft and positioned below said upper notch;
a plurality of stretcher ribs each stretcher rib pivotally secured to the lower runner; and
a plurality of top ribs for securing an umbrella cloth thereon, each said top rib pivotally secured to said upper notch and to a respective said stretcher rib;
each said stretcher rib having an inner end portion pivotally secured to said lower runner and having an outer end portion pivotally secured to each said top rib;
the improvement which comprises:
each said stretcher rib having a flat portion defining a plane adjacent said top ribs and an arcuate portion curving upwardly from said flat portion towards said upper notch whereby a pivot point is defined for each rib above the plane of said flat portion and positioned to be adjacent to the inner end portion of the stretcher rib, and a stop means provided on said central shaft between said upper notch and lower runner for stopping the movement of said lower runner at a predetermined location whereby said flat rib portion is generally perpendicular to said central shaft but defines an angle of less than ninety degrees between the plane of said flat rib portion and shaft below said stretcher ribs.

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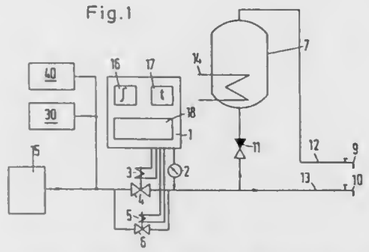


**5,046,519**
**METHOD AND APPARATUS FOR MONITORING A FLUID CONDUIT SYSTEM**

**Theiss Stenstrom; Jens J. Molbaek, both of Nordborg; Poul E. Hyldig, Augustenborg, and Bjarne Straede, Sydals, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark**

**Continuation of Ser. No. 479,052, Feb. 12, 1990, abandoned.**
**This application Oct. 29, 1990, Ser. No. 605,175**
**Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905054**
**Int. Cl.[5] F16K** *21/00*
**U.S. Cl. 137—1** **20 Claims**

Fig.1



1. A method of monitoring a fluid conduit system for leaks, the system comprising a main supply closable by a main valve, wherein, during a period when no fluid is being withdrawn from the conduit system, the main valve is closed, the pressure downstream of the main valve is measured permanently and, after the pressure has dropped to a predetermined first value, fluid is replenished, characterised in that a first time is measured during which the pressure in the conduit system drops from the maximum pressure directly after blocking the supply of fluid to the first value, that, during replenishment, a second time is measured during which the pressure in the conduit system rises from the first value to a predetermined second value, and that the leakage volume is calculated from the first and second pressures and a constant for the conduit system.

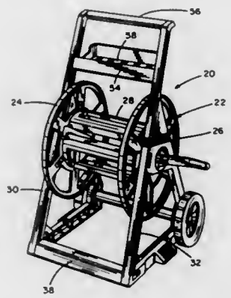
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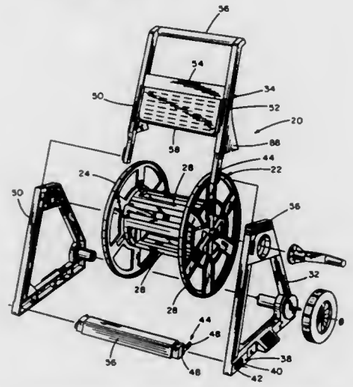
**5,046,520**
**PORTABLE HOSE CART**

**Joseph J. Sanchez, Jr., and Stephen P. Whitehead, both of Elgin, Ill., assignors to Suncast Corporation, Batavia, Ill.**

**Filed Feb. 5, 1990, Ser. No. 475,365**
**Int. Cl.[5] B65H** *75/34*
**U.S. Cl. 137—355.27** **12 Claims**

1. A portable garden hose cart for windably holding a garden hose and for use in transporting said garden hose between a storage location and a use location, said cart comprising:
- a frame including a pair of generally vertical frame sides each of which has a bearing with a bearing surface;
- a reel for windably receiving said garden hose disposed between said frame sides, said reel having a pair of reel sides and a hose support surface extending between said reel sides, each reel side including a generally horizontally extending hub, each hub being rotatably received in the corresponding bearing surface of its associated frame side;
- an outlet tube carried by said reel for rotation therewith and having an end adapted for attachment to one end of said garden hose;
- an inlet tube mounted in one of said hubs so that said inlet tube does not rotate with said reel, and with said inlet tube and said outlet tube being in fluid communication; and
- a handle assembly of one-piece molded thermoplastic construction, said assembly including a first leg adapted for connection to one of said frame sides, a second leg adapted for connection to the other of said frame sides, a crossbar interconnecting said legs, and a tray connected in its entirety to said crossbar by hinge means, said tray being movable in its entirety from an as-molded condition wherein said tray is not positioned to hold accessories to a





use condition wherein said tray is positioned to hold accessories.

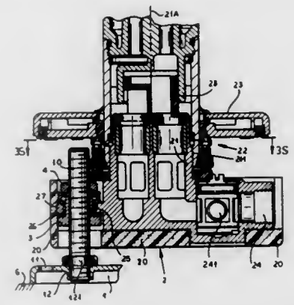
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**5,046,521**
**MOUNTING ASSEMBLY FOR IN-THE-WALL PLUMBING FITTING**

**Hans-Jürgen Jensen, Welver, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany**

**Filed Mar. 1, 1990, Ser. No. 487,428**
**Claims priority, application Fed. Rep. of Germany, Mar. 9, 1989, 3907588**
**Int. Cl.[5] F16L** *5/00*
**U.S. Cl. 137—360** **9 Claims**

1. An assembly for mounting a fitting to a wall, the assembly comprising:
- an anchor fixable in the wall;
- a threaded stud fixed to and projecting longitudinally forward from the anchor;
- a formation on the fitting formed with a throughgoing aperture through which the stud projects;
- a back nut threaded on the stud, spaced longitudinally forward of the anchor, and having a front face bearing forward on the formation at the aperture; and
- a front nut threaded on the stud and having a back face bearing backward on the formation of the aperture, whereby the formation is longitudinally captured between



the nuts and same can be screwed along the stud to longitudinally displace and position the fitting therealong.

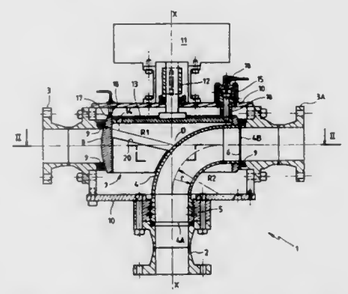
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**5,046,522**
**ROTARY ELBOW FLUID DISTRIBUTION/COLLECTION VALVE**

**Eugene Le Devehat, Saligny, and Pierre Colle, Beaumont-Le-Roger, both of France, assignors to FMC Corporation, Chicago, Ill.**

**Filed Aug. 2, 1990, Ser. No. 561,554**
**Claims priority, application France, Aug. 2, 1989, 89 10442**
**Int. Cl.[5] F16K** *35/00, 37/00, 5/06*
**U.S. Cl. 137—385** **16 Claims**



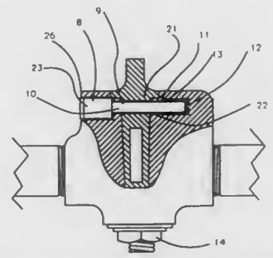
1. A fluid transfer valve (1) adapted to be cleaned by scraping, comprising a main fluid transfer section (2), a plurality of secondary fluid transfer sections distributed angularly about the axis (X—X) of the main section and disposed at equal distances from and at equal inclinations to said axis, and a rotary tubular elbow (4) connected at one end (4A) by a rotary coupling (5) to said main section and adapted, depending on its angular position about the axis of said main section, to have its other end (4B) aligned with any selected one (3A) of said secondary sections, said main and secondary sections and said rotary elbow having identical inside diameters, said rotary elbow constituting part of a rotatable pipe closure element (7) comprising a ring (8) coaxial with said rotary coupling (5) through which said other end (4B) of said rotary elbow discharges, said ring (8) at all times in fluid-tight contact with the radially innermost edges of said secondary sections so as to close off in a fluid-tight manner said secondary sections other than said selected secondary section.

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**5,046,523**
**LOCK CORE SERVICE VALVE**

**George Horhota, 43 A Montgomery Rd., Neshanic Station, N.J. 08853**

**Filed Jun. 2, 1989, Ser. No. 360,289**
**Int. Cl.[5] F16K** *35/06, 35/10*
**U.S. Cl. 137—385** **17 Claims**



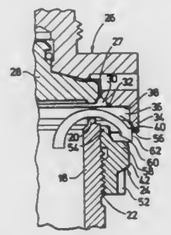
1. Apparatus for securely and selectively locking and unlocking a rotary plug valve in a pipeline, said valve comprising:
- housing means for housing a locking and an armoring apparatus along an axis parallel to the pipeline and for housing a rotary plug valve along an axis substantially perpendicular to an axis of a pipeline in which said valve is provided said housing means having a substantially smooth external contour from end to end along the axis parallel to the pipeline and from end to end across the axis of the pipeline so as to also constitute means for concealing and camouflaging the location of the locking and the armoring apparatus contained therein making the location of the locking and the armoring apparatus difficult to detect;
- valve core means, coaxially rotatably mounted in said housing member for rotation between a first open position for passing fluid in said pipeline and a second closed position for blocking the flow of fluid in said pipeline;
- said valve core means further comprising a locking pin passageway means, oriented parallel to and located in close proximity to the pipeline along said axis parallel to the pipeline when said valve core means is in the closed position for receiving locking pin means;
- retaining cap means for engaging and retaining the inner end of said locking pin means and for preventing said locking pin means from being removed from said locking pin passageway means.

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**5,046,524**
**SAFETY RELIEF VALVE**

**Richard H. Crichton, Jr., Pineville, La., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jul. 23, 1990, Ser. No. 556,773**
**Int. Cl.[5] F16K** *17/32*
**U.S. Cl. 137—478** **10 Claims**



1. A safety relief valve comprising:

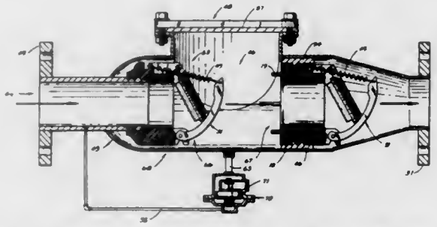
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a) a valve body having a fluid inlet, a fluid outlet and a valve seat encircling said inlet;
b) a disc member movable toward and away from said seat;
c) a disc carrier member for said disc having a downwardly projecting skirt flange with an interior surface perpendicular to an annular surface within said disc carrier member and adjacent a free end having an inwardly facing bevel, said flange forming an outer chamber;
d) an adjustable spring biasing said disc into sealing engagement with said seat until a fluid pressure in said inlet exceeds a predetermined value; and
e) a ring member movably located on said seat, said ring member having an outer peripheral surface forming a peripheral orifice with said bevel of said free end of said flange.

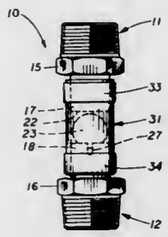
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**5,046,525**
**DIFFERENTIAL LOADING FLUID CHECK VALVE**
**Douglas H. Powell, El Macero, Calif., assignor to Ames Company, Inc., Woodland, Calif.**
**Filed Jun. 15, 1990, Ser. No. 538,716**
**Int. Cl.[5] F16K *15/03***
**U.S. Cl. 137—512** **18 Claims**



1. A differentially loading fluid check valve subassembly, comprising:
a. a base, having an inlet side and an outlet side, and an aperture extending therethrough;
b. a clapper having a proximal edge and an opposing distal edge;
c. first means for pivotally mounting said proximal edge of said clapper about a first axis, said first means being located on said outlet side of said base adjacent said aperture for movement of said clapper from a closed position over said aperture to an open position at least partially uncovering said aperture;
d. a cam arm having a fixed end, a movable end and a cam surface therebetween for engagement with said distal edge of said clapper;
e. second means for pivotally mounting said fixed end of said cam about a second axis parallel to said first axis, said second means being located on said outlet side of said base across said aperture from said first pivot means for movement of said cam arm from a closed position to an open position;
f. means for biasing said cam toward a closed position, said biasing means being overcome by a predetermined amount of pressure from fluid flowing through said aperture, and thereafter differentially loading said clapper in response to increasing flow rates.

**5,046,526**
**ONE-WAY CHECK VALVE**
**Morley Longmore, 14262 Meadow Dr., Grass Valley, Calif. 95945, and Bobby Pelton, 13339 Dog Bar Rd., Grass Valley, Calif. 95949**
**Filed Nov. 28, 1990, Ser. No. 618,875**
**Int. Cl.[5] F16K *15/04***
**U.S. Cl. 137—515.5** **13 Claims**



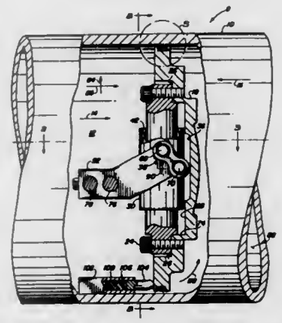
1. A one-way check valve comprising:
a pair of fittings, a first fitting and a second fitting, with each of said fittings having a threaded portion at one end, an intermediate nut portion and a nipple portion at the other end insertible into a tubing;
a generally open ended cylindrical tubing of a resilient material having a smooth walled inner surface, said nipple portions being receivable in opposite ends of said tubing, each of said nipple portions having means thereon biting into the material of said smooth walled inner surface firmly holding each of said fittings in said tubing in a fluid tight manner;
the first of said fittings having an apertured valve seat on the terminal end of its respective nipple portion conforming to the outer configuration of a ball valve whereby, when said ball valve seats in said valve seat, fluid flow is cut off from the second of said fittings to said first of said fittings, the second of said fittings having an open end on the terminal end of its respective nozzle portion providing a seat for a ball valve, said open end having at least one spaced opening in said open end; and
a ball valve loosely disposed in said tubing between said nipple portions having an outer configuration conforming to both said valve seat and said open end, said ball valve being movable from a first position sealing off the aperture in said valve seat to a second position seating in the seat of said open end yet permitting fluid flow about said ball valve and through said spaced opening and into said second of said fittings.

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**5,046,527**
**BUTTERFLY-TYPE CHECK VALVE**
**John N. Tervo, Scottsdale, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.**
**Filed Mar. 6, 1991, Ser. No. 665,390**
**Int. Cl.[5] F16K *15/03***
**U.S. Cl. 137—527.8** **7 Claims**

1. A butterfly-type check valve, comprising in combination;
a flow body forming a flow path;
a valve plate disposed in the flow path and movable in response to fluid-exerted pressure to permit flow in one direction and substantially prevent flow in an opposite direction;
support means secured to the flow body and extending across the flow path for supporting the valve plate;
a rod rigidly secured to the plate, at least a longitudinally extending portion of the rod being spaced from the plate;
guide means operatively associated with the rod for guiding translational movement of the plate in directions parallel to the rod, the guide means being secured to the support means so as to rotate with the plate during rotational movement of the latter; and

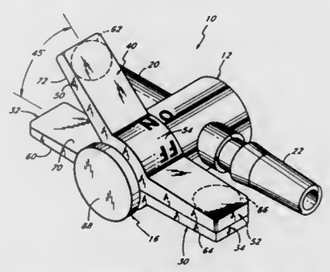




linkage means, pivotally secured to both the plate and the support means for translationally moving the plate incident to the rotational movement.

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**5,046,528**
**STOPCOCK VALVE**
**Wayne E. Manska, 1921 Kellogg Dr., Anaheim, Calif. 92807**
**Continuation of Ser. No. 429,630, Oct. 31, 1989, abandoned.**
**This application Oct. 9, 1990, Ser. No. 595,791**
**Int. Cl.[5] F16K *37/00***
**U.S. Cl. 137—556** **38 Claims**

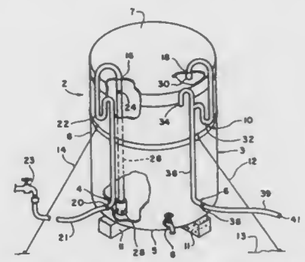


27. A method of operating a stopcock valve having a member which rotates about an axis of rotation to control fluid flow through IV lines and the like, the method comprising switching between first and second operational states of said valve correspondign to a closed position flow and a fully open position flow, respectively, by squeezing portions of said valve between two fingers of one hand such that torque is applied to rotate said member about said axis of rotation without application of torque about an axis other than said axis of rotation.

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**5,046,529**
**POTABLE WATER STORAGE SYSTEM**
**Arthur P. Corella, 8166 Vanscoy Ave., North Hollywood, Calif. 91602**
**Filed Aug. 10, 1990, Ser. No. 565,675**
**Int. Cl.[5] E03B *11/02***
**U.S. Cl. 137—590.5** **15 Claims**

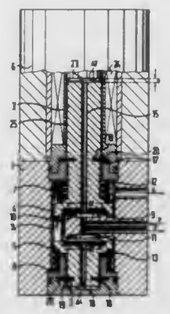
1. A potable water storage system comprising:
a water container having a top and bottom;
an inlet flow line passing through the container and having one end terminating near the bottom and an opposite end being connectable to a main supply of water, wherein the inlet flow line includes a substantially U-shaped trap disposed outside the container for sealing the inlet flow line from ambient;
an outlet flow line passing through the container and having one end terminating near the top and an opposite end connectable to an exchange hose line and to atmosphere so as to maintain ambient pressure conditions; and



a tap disposed in the container near the bottom for releasing water from the container.

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**5,046,530**
**FORCE-BALANCED LIFTING VALVE**
**Matthias Gossner, Malente; Joachim Trenkmann, Kiel/Ellerbek; Lutz Bungeroth, Oldenburg/Holstein; Uwe Thomsen, Malente, and Peter Leu, Dendendorf, all of Fed. Rep. of Germany, assignors to H. Kuhnke GmbH KG, Malente, Fed. Rep. of Germany**
**Filed Jan. 24, 1990, Ser. No. 468,749**
**Claims priority, application Fed. Rep. of Germany, Jan. 28, 1989, 8900960**
**Int. Cl.[5] F15B *13/044*; F16K *31/06, 39/02, 41/00***
**U.S. Cl. 137—596.17** **12 Claims**



1. A force-balanced lifting valve for the control of a fluid, said valve comprising:
a valve housing defining flow paths for the fluid;
an axially movable valve component comprising shaft means mounted to the valve housing for axial movement therein and a valve body device provided on said shaft means for opening and closing at least one valve opening and having an effective area which is exposed to fluid pressure, said movable component having a forcebalancing compensation area associated with the said effective area;
sealing means for sealing said axially movable component with respect to said housing;
a subsidiary channel for conducting fluid to act upon said compensation area, said shaft means having at least one abutment shoulder and said sealing means comprising an elastic, axially effective sealing ring sealingly engaging the valve housing and said axially movable component, a radial portion of said ring resting axially and sealingly against said at least one abutment,
wherein said sealing means comprises an annular flat sealing

ring and two opposed annular grooves disposed substantially in a common radial plane, said grooves being formed in said valve shaft and said housing, respectively, said sealing ring extending into said grooves with clearance.

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5,046,531

## SYNTHETIC RESIN PIPE FOR UNDERGROUND USE

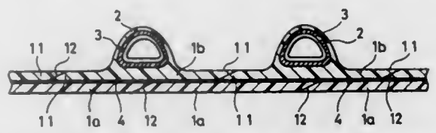
Shiro Kanao, No. 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan

Continuation of Ser. No. 691,809, Jan. 16, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,841

Claims priority, application Japan, Oct. 22, 1984, 59-159601[U]

Int. Cl.[5] F16L *11/00, 9/14*

U.S. Cl. 138—122 19 Claims



1. A pipe for withstanding internal pressure and constant external pressure due to underground use, the pipe comprising:

a pipe wall formed by at least an inner and an outer layer, both said inner and outer layers being made of a synthetic resin material;

a first reinforcing layer disposed in said pipe wall, said reinforcing layer comprising a belt made of metal and being helically wound around said inner layer; and

a reinforcing rib constituted by a hollow corrugated pipe with a cover layer which is made of a synthetic resin material having a high fusibility with said synthetic resin material of said inner and outer layers and is formed around said corrugated pipe, said reinforcing rib being helically wound around said outer layer at a predetermined pitch, said rib having a substantially semicircular cross-section with a substantially flat lower surface disposed in contact with said outer layer, and having its cover layer integrally fused with said outer layer.

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5,046,532

## IMPROPER WEFT REMOVING DEVICE FOR AIR JET LOOM

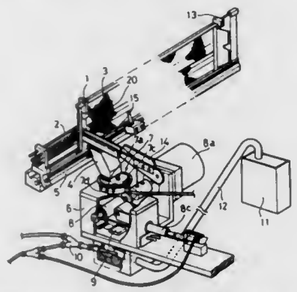
Yoshio Kano, Nikawa, and Tetsuya Fujioka, Komatsu, both of Japan, assignors to Kabushiki Kaisha Ishikawa Seisakusho Ltd., Kanazawa, Japan

Filed Jul. 24, 1990, Ser. No. 556,527

Claims priority, application Japan, Aug. 11, 1989, 1-210831

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—116.2 2 Claims



1. An improper weft removing device for an air jet loom comprising:

a downward pressure air nozzle for blowing pressure air in a direction substantially perpendicular to a weft inserting path, said downward pressure air nozzle being disposed between a main nozzle for inserting a weft into an open shed of warps and an outer end of the warps,

a suction box member for sucking an improper weft existing in the open shed of the warps, said suction box member being disposed below said downward pressure air nozzle,

a pair of feed rollers for delivering the improper weft toward a discharge dust box, said feed rollers being disposed in said suction box member,

a discharge nozzle for making the inside of said suction box member at a negative pressure and for blowing pressure air so as to deliver the improper weft on an air stream to the discharge dust box, said discharge nozzle being disposed below said pair of feed rollers in said suction box member,

an improper weft end control means for controlling the running attitude of the end portion of the improper weft by blowing pressure air against the end portion of the improper weft, said improper weft end control means being disposed upstream of and adjacent to said suction box member,

detecting means for detecting the passage of the improper weft, said detecting means being disposed downstream and in the vicinity of said feed rollers,

improper weft length measuring means for measuring the length of the improper weft according to a detection signal outputted from said detecting means, and

discharge nozzle pressure control means for controlling the blowing pressure of said discharge nozzle.

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5,046,533

## LOOM REED WITH PREASSEMBLED PACKS OF BLADE

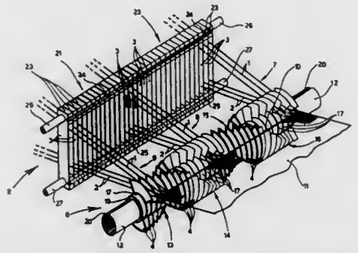
Luciano Corain; Gianni Maitan, both of Vicenza; Renato Perlini, Verona, and Giullo Bortoli, Schio, all of Italy, assignors to Nuovopignone-Industrie Meccaniche E Fonderia S.p.A., Florence, Italy

Filed Nov. 14, 1989, Ser. No. 436,240

Claims priority, application Italy, Nov. 25, 1988, 22733 A/88

Int. Cl.[5] D03D *49/62*

U.S. Cl. 139—192 8 Claims



1. A bladed loom reed including a support base for internally supporting at least two preassembled packs of blades, each preassembled pack being of a predetermined lenght and comprising a succession of blades which are fixedly bonded to one another by a bonding means wherein each of the preassembled packs are arranged on the support base to be individually inserted or removed therefrom.



5,046,534

## WEAVING MACHINE WITH MAIN SHAFT LOCK

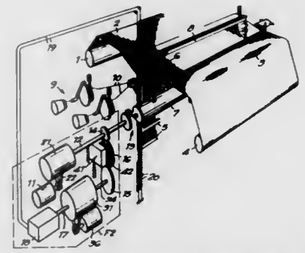
André Vandenbroucke, Langemark; Johny Grimmonprez, Ieper, and Walter Blicke, Geluveld-Zonnebeke, all of Belgium, assignors to Picanol N.V., naamloze vennootschap, Belgium

Filed Jun. 29, 1990, Ser. No. 545,825

Claims priority, application Belgium, Jun. 29, 1989, 8900716

Int. Cl.[5] D03D *51/00*

U.S. Cl. 139—336 17 Claims



1. A weaving machine including a main shaft coupled to a loom motion drive shaft, and electromagnetic brake means for braking the main shaft, when activated by electric energization, said wearing machine further comprising means including a lock for locking the main shaft against rotation, said lock including a locking element having means for positively engaging gear teeth on a wheel coupled to both the main shaft and said drive shaft.

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5,046,535

## AUTOMATIC REPAIR OF BROKEN WARP THREADS IN WEAVING MACHINES

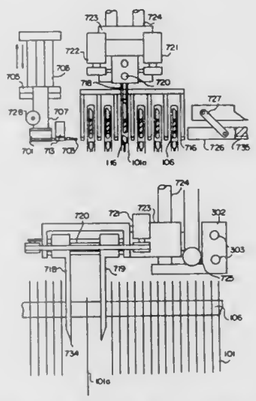
Roberto E. Prat, Barcelona, Spain, assignor to Texipat, S. A., San Jose, Costa Rica

Filed Oct. 5, 1989, Ser. No. 417,312

Claims priority, application United Kingdom, Oct. 10, 1988, 8823734

Int. Cl.[5] D03D *51/20, 51/28*

U.S. Cl. 139—351 20 Claims



11. Apparatus for automatically repairing broken warp threads in weaving machines or looms, comprising:

a) a computerized control system having a memory storing predetermined characteristics for harness drawing-in and reeding of each of a plurality of weaving machines as well as characteristics of selvages and a number of threads used, as well as characteristics of warp threads used in said weaving machines; means for receiving information on a row of drop wires which has brought about a stoppage in one of said weaving machines as well as information given by a device detecting a position of a fallen drop wire in relation to a row; means for processing said information and sending a transfer order for a moving reed space counting device to position itself opposite a reed space corresponding to said fallen drop wire; data processing means for sending orders to operation devices constituting repair apparatus, as well as for sending orders and controlling displacement of support means;

b) a moving detecting device adapted to count weaving machine drop wires so as exactly to determine a numerical position of said fallen drop wire in relation to a row where it is located;

c) a moving reed space counting device having means for positioning itself directly opposite the reed space corresponding to a space occupied by a broken warp thread;

d) a device for removing the broken warp thread which is joined to a cloth;

e) a device for removing the broken warp thread which is joined to the warp;

f) a device for selecting and feeding an auxiliary yarn having the same characteristics as the broken warp thread;

g) means for joining said auxiliary yarn to the broken warp thread which is joined to the warp;

h) a drawing-in device for drawing said auxiliary yarn into the corresponding drop wire of said broken warp thread, once said auxiliary yarn has been joined to said broken warp thread;

i) a threading device for picking up said auxiliary yarn which has been drawn in by said drawing-in device and threading it in a heddle of a harness and in a corresponding reed space; and

j) means for retaining and tensioning said auxiliary yarn which has been drawn in the heddle of the harness and in the reed and has been positioned on the cloth for its binding into the cloth by means of weft courses, including means for cutting off excess yarn once said joining has been carried out.

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5,046,536

## DEVICE FOR COUNTING TURNS UNWINDING FROM WEFT FEEDERS

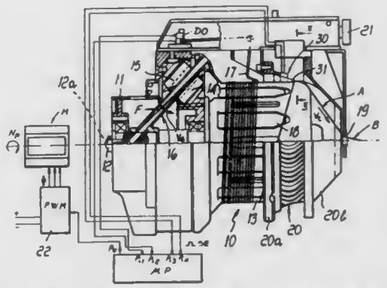
Pietro Zenoni, Leffe, Italy, assignor to L.G.L. Electronics S.p.A., Bergamo, Italy

Filed May 23, 1990, Ser. No. 527,393

Claims priority, application Italy, Jun. 6, 1989, 67444 A/89

Int. Cl.[5] D03D *47/34*

U.S. Cl. 139—452 8 Claims



1. In a weft feeder for weaving looms including a fixed drum, a rotating arm winding, a plurality of thread turns on said drum, an asynchronous motor for said rotating arm, braking means for breaking thread unwinding from said fixed drum and a guiding ring for guiding unwound thread, said unwinding thread describing a solid of revolution, a device for count-

VOL 1130 ISS 2 SE 10 1991 UMI



ing turns of thread unwinding from the fixed drum, comprising detecting means for detecting passage of the unwinding thread, said detecting means being arranged laterally to the solid of revolution described by the unwinding thread, being responsive to a tangential component of the thread movement to detect passage of the thread and generating an electric pulse upon each passage of the thread, wherein said detecting means comprises a feeler and a transducer in contact with said feeler, said transducer generating said electric pulse upon each passage of the thread at a generatrix of said solid of revolution arranged in a meridian plane passing through said feeler.

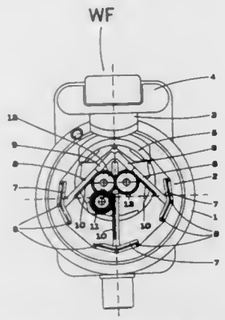
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**5,046,537**

## WEFT YARN RESERVE WINDING UNIT WITH ADJUSTABLE DIAMETER WINDING DRUM

**Bruno Maina, Valdengo, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy**

**Filed Oct. 16, 1989, Ser. No. 421,935**
**Claims priority, application Italy, Oct. 14, 1988, 22325 A/88**
**Int. Cl.[5] D03D *47/34***
**U.S. Cl. 139—452** **7 Claims**




1. In a weft yarn reserve winding unit wherein the length of the turns of weft yarn thereon is variable, for use in measuring weft feeders for fluid jet looms, comprising a drum of adjustable diameter formed by a fixed eccentric cylinder and plurality of movable rods, parallel to the axis of said cylinder and surrounding a wide portion of the periphery of the cylinder, the distance of said rods from said cylinder being variable and adjustable for each rod or for groups of rods; the improvement comprising, for each rod or group of rods, a control arm slidable in a guide of the winding unit positioned perpendicularly to the axis of said unit, said arms being movable simultaneously in the respective guides under the control of a single operating member that moves the rods simultaneously toward or away from the periphery of the cylinder, and means releasably to lock said arms in said guides in any of a plurality of positions of adjustment.

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**5,046,538**

## MIXING VALVE NOZZLE

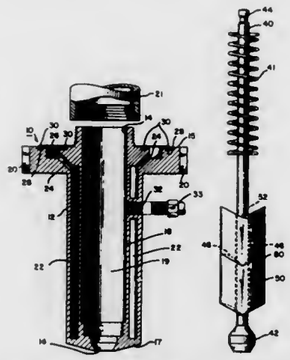
**George Allison, Brick Town; Roy Valeo, Toms River, both of N.J., and Ernest P. Caputo, Nashua, N.H., assignors to Fluid Packaging Co., Inc., Lakewood, N.J. and The Dow Chemical Co., Midland, Mich.**

**Filed Sep. 26, 1988, Ser. No. 248,599**
**Int. Cl.[5] B65B *1/20, 1/04***
**U.S. Cl. 141—12** **1 Claim**

1. A method for the homogeneous blending and homogeneous mixing of a first fluid stream and a second fluid stream in a mixing valve nozzle and the dispensing of the mixed product comprising the steps of:

a. introducing said first fluid stream into a passageway extending through said mixing valve nozzle, said first fluid stream comprising a laundry soil and stain remover composition, said passageway extending through said mixing valve nozzle and having positioned therein a mixing means mounted on a spring biased valve stem, said valve stem having a valve plug secured thereto, said valve plug maintaining said mixing valve nozzle in a closed position, said mixing means comprising a plurality of interlocking mixing plugs having non-aligned, non-vertical tortuous conduits passing therethrough and communicating with said cavity defined by said interlocking of said mixing plugs;

b. introducing said second fluid stream into said passageway, said second fluid stream comprising an enzyme;



c. opening said valve stem and said valve plug forcing said first fluid stream and said second fluid stream through said non-aligned, non-vertical tortuous conduits in said mixing plugs and said cavity between said plugs, homogeneously mixing said first fluid stream and said second fluid stream;

d. dispensing said mixed product, and

e. simultaneously maintaining a selective, adjusted temperature in said mixing valve nozzle during steps a through d by means of a jacketed sleeve surrounding said passageway,

f. repeating steps a through e.

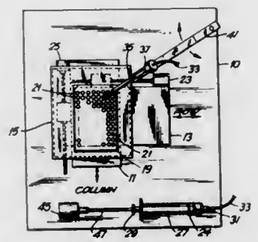
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**5,046,539**

## AUTOMATIC FLUID DISPENSER FOR MULTI-WELLED DISH

**Peter MacLeish, New York; Michael Chen, Elmhurst, and Henry Shao, Sunnyside, all of N.Y., assignors to The Rockefeller University, New York, N.Y.**

**Filed May 26, 1989, Ser. No. 357,897**
**Int. Cl.[5] B65B *3/04***
**U.S. Cl. 141—234** **13 Claims**



1. A fluid dispensing system for dispensing fluid into a receptacle having a plurality of spaced apart receiving wells comprising:

(a) a first linearly translatable plate adapted to carry the receptacle;

(b) a second linearly translatable plate mounted below said first linearly translatable plate at 90 degrees relative thereto;

(c) means operatively associated with said first linearly translatable plate to cause a finite predetermined displacement thereof in one direction;

(d) means operatively associated with said second linearly translatable plate to cause a finite predetermined displacement thereof in a second direction;

(e) means for dispensing fluid in each well of said receptacle; and

(f) means operatively associated with said fluid dispensing means to cause a predetermined amount of fluid to be dispensed from said fluid dispensing means into each well of said receptacle.



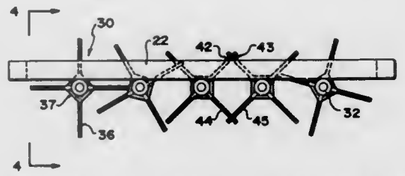
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**5,046,540**

## TREE DELIMBING APPARATUS

**Herbert Bresky, Box 938, Swan River, Manitoba, Canada R0L 1Z0**

**Filed Sep. 14, 1990, Ser. No. 582,149**
**Int. Cl.[5] B27L *1/00***
**U.S. Cl. 144—2 Z** **9 Claims**



1. An apparatus for delimbing trees comprising a frame, means for mounting the frame on a vehicle for movement with the vehicle in a direction of movement longitudinally along a plurality of felled trees, and at least three delimbing elements mounted on the frame at spaced positions across the width of the frame and arranged to project from the frame for engaging and delimbing the trees, each delimbing element comprising a central hub portion, means mounting the hub portion on the frame for unrestricted rotational movement of the hub portion around an axis parallel to said direction of movement and at least three blade members projecting outwardly from the hub portion at spaced positions around the axis.

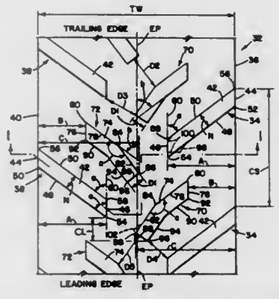
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**5,046,541**

## TRACTOR TIRE

**Mark L. Bonko, Hartville, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Oct. 11, 1989, Ser. No. 419,912**
**Int. Cl.[5] B60C *11/11***
**U.S. Cl. 152—209 B** **32 Claims**




1. A tire having an equatorial centerplane and a tread having first and second lateral edges defining the width of the tread, the tread comprising:

(a) two sets of primary lugs, the first set of primary lugs being spaced circumferentially about the tread of the tire and extending from the first lateral edge of the tread, the second set of primary lugs being spaced circumferentially about the tread of the tire and extending from the second lateral edge of the tread, each of the second set of primary lugs being similar to the first set of primary lugs but opposite in hand, in a footprint of the tire each lug of the first and second set of the primary lugs having a surface area at least 90% of which lies within a parallelogram having a first side parallel to the respective lateral edge of the tread and a second side positioned axially inwardly from and parallel to the first side, the second side being located between 25% and 45% of the tread width from the first side, both first and second sides having leading and trailing edges, the parallelogram having third and fourth parallel sides spaced perpendicularly a distance N, the distance N being from 5% to 11% of the tread width, the third side extending from the leading edge of the first side to the leading edge of the second side and the fourth side extending from the trailing edge of the first side to the trailing edge of the second side, the third and fourth sides both forming angles with respect to the equatorial centerplane of the tire in the range from 45 to 60 degrees;

(b) two sets of secondary lugs, the lugs of the first set of secondary lugs being disposed circumferentially between the lugs of the first set of primary lugs, the secondary lug having a first end disposed from the first lateral edge axially inwardly a distance in the range of 19% to 32% of the tread width, the lugs of the second set of secondary lugs being disposed circumferentially between the lugs of the second set of primary lugs and axially inwardly from the second lateral edge a distance in the range of 19% to 32% of tread width and being similar to the first set but opposite in hand, in a footprint of the tire each lug of the first and second sets of secondary lugs having a surface area 85 to 100% of which lies within a six-sided polygon having a first side having a leading and trailing ends, the first side being parallel to the equatorial centerplane of the tire and located an axial distance from the nearest tread edge of between 19% to 32% of the tread width, the polygon having a second side having first and second ends, the first end of the second side being attached to the trailing end of the first side and extending from the first side at an inclination with respect to the equatorial centerplane of the tire in the range of 45 to 60 degrees, the polygon having a third side having first and second ends, the third side having its first end at the second ends, the third side and the third side having its second end of the second side and the third side having its second end located an axial distance from the tread edge from 47% to 57% of the tread width, and extending from the second side at an inclination with respect to the equatorial plane less than the inclination of the second side, the second and third sides having an angle formed between them in the range of 158 to 168 degrees, the polygon having a fourth side extending perpendicularly from the second end of the third side a distance D1, of from 5% to 11% of the tread width, the fourth side having leading and trailing ends, the polygon having a fifth side parallel to the second side and separated from the second side the perpendicular distance D1, the fifth side having first and second ends, the first end being connected to the leading end of the first side, and the polygon having a sixth side extending between the second end of the fifth side and the leading end of the fourth side.

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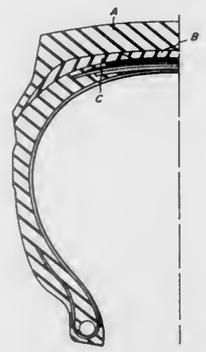


5,046,542

## RADIAL TIRES FOR CONSTRUCTION VEHICLES INCLUDING TREAD CAP AND DIVIDED TREAD BASE

Yasushi Ohta, Kodaira, and Junichi Otsuka, Higashikurume, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 232,749, Aug. 16, 1988, abandoned.
This application Feb. 14, 1990, Ser. No. 481,653
Claims priority, application Japan, Aug. 20, 1987, 62-204974
Int. Cl.[5] B60C *9/18, 11/00*
U.S. Cl. 152—209 R 4 Claims




1. A radial tire for construction vehicles comprising; a casing reinforcement consisting of a carcass of radial structure and a belt surrounding an outer periphery of a crown portion of said carcass and having a tread of a two layer structure composed of a tread base rubber covering an outer portion in radial direction of said belt and both side portions in widthwise direction of the tire and a tread cap rubber (A) arranged outside said tread base rubber in the radial direction, said tread base rubber consists of a first tread base rubber (B) at crown center portion arranged outside said belt in the radial direction and a second tread base rubber (C) at tire shoulder portions arranged at both sides of said crown center portion first tread base rubber in the widthwise direction of the tire and radially outside said belt, said second tread base rubber superimposed over at least a belt end, said tread cap rubber (A) extends in said tire widthwise directions to radially cover both said first and second tread base rubbers and said tread base and cap rubbers satisfy the following relations:

$$\tan\delta(B) < \tan\delta(C) < \tan\delta(A) \quad (1a)$$

$$\tan\delta(C) - \tan\delta(B) \geqq 0.02 \quad (1b)$$

(where tanδ (A), tanδ (B) and tanδ (C) are loss factors measured at 50° C., a frequency of 50 Hz and gravity strain of 1%, of the rubbers (A), (B) and (C), respectively);

$$E'(A) > E'(C) > E'(B) \quad (2a)$$

$$E'(C) - E'(B) \geqq 5.0 \times 10^6 \ (dyn/cm^2) \quad (2b)$$

(where E'(A), E'(B) and E'(C) are storage moduli of elasticity, measured at 50° C., a frequency of 50 Hz and gravity strain of 1%, of the rubbers (A), (B) and (C), respectively); and

$$15 \times 10^{-7} \geqq M_{300}(B)/E'(B) - M_{300}(C)/E'(C) \geqq 2 \times 10^{-7} \ (kg/dyn)$$

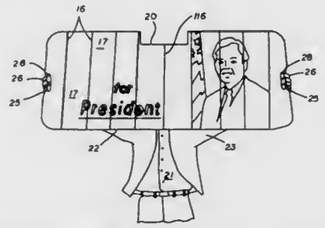
(where $M_{300}$(B) and $M_{300}$(C) are 300% moduli at room temperature of the rubbers (B) and (C), respectively).

5,046,543

## MOTOR VEHICLE SUNSHIELD AND POSTER SYSTEMS

Abraham Levy, P.O. Box 17212, Tel Aviv, Israel 61171

Filed Aug. 25, 1988, Ser. No. 236,599
Int. Cl.[5] B60J *3/00*
U.S. Cl. 160—84.1 22 Claims




1. In a method of making a sunshield for shading a motor vehicle inside a window thereof, the improvement comprising, in combination, the steps of:

providing a substantial portion of said sunshield with a poster-like message publicly displaying through said windown and also publicly displayable apart from any motor vehicle by a person holding up said sunshield;

making said sunshield foldable accordion style; and

making said sunshield stretchable by said person for a public display of said message apart from any motor vehicle by providing said sunshield with lateral handles for manual engagement by several fingers of each hand of said person, said handles being provided by:

forming in said sunshield adjacent each of two lateral edges thereof an opening of sufficient size to accommodate said several fingers;

leaving imperforate parts of said sunshield in the elongate openings; and

bending said imperforate parts out of the openings without diminution in size toward the next-adjacent one of said two lateral edges at each opening.

5,046,544

## ROLLUP DOOR VIBRATING DAMPING DEVICE FOR TRUCKS AND THE LIKE

Joseph Coluccio, 232 Seaview Ave., Staten Island, N.Y. 10305

Filed Jun. 8, 1990, Ser. No. 535,547
Int. Cl.[5] E05D *15/06*
U.S. Cl. 160—201 3 Claims

1. A vibrating damping device for a roll up door on a truck and the like, the roll up door having a plurality of door panels hinged together that ride within a frame, said device comprising:

a) a compression mechanism mounted to the uppermost door panel, wherein said compression mechanism includes:

i) an L-shaped bracket mounted to the uppermost door panel;

ii) a spring carried on said L-shaped bracket; and

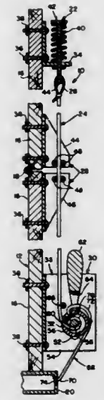
iii) a T-shaped rod extending through said spring and said L-shaped bracket, in which the upper end of said cable is attached to the lower end of said T-shaped rod;

b) an elongated cable attached at its upper end to said compression mechanism;

c) a guide mechanism for properly extending said cable downwardly past the door panels; and

d) a tension mechanism mounted to the lowermost door panel with the lower end of said cable attached thereto, said tension mechanism can be hooked to the lowermost portion of the frame, causing tension in said cable and placing the door panels in compression, thus preventing vibration of the door panels when the truck is in motion.



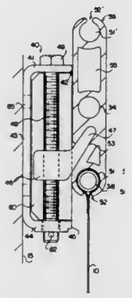


5,046,545

## TENSION MOUNTING SYSTEM AND ASSEMBLY

Russell M. Loomis, Palos Heights, Ill., and Joseph K. Favata, 1801 S. Austin Blvd., Cicero, Ill. 60650, assignors to Joseph K. Favata, Cicero, Ill.

Continuation-in-part of Ser. No. 99,056, Sep. 21, 1987. This application Dec. 10, 1987, Ser. No. 131,217
Int. Cl.[5] E06B *3/00*
U.S. Cl. 160—368.1 20 Claims



1. A tension mounting assembly for suspending flexible sheet material in a taut condition comprising:

a flexible sheet;

at least one rigid retaining member, at least a portion of at least one peripheral edge of said flexible sheet forming a closed loop, said at least one rigid retaining member mounted within said closed loop;

a generally planar support surface, bracket means attached to said generally planar support surface at locations corresponding to said at least one peripheral edge of said flexible sheet, said bracket means comprising a rigid, generally C-shaped bracket, a threaded adjustment means mounted on said generally C-shaped bracket, and an adjustable arm means threadedly engaged on said threaded adjustment means, said adjustable arm means comprising an angled projection extending away from said flexible sheet; and

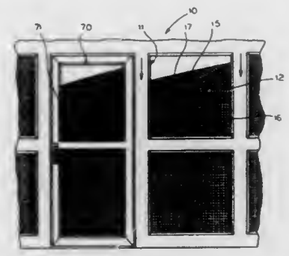
at least one rigid support means engaging each said at least one rigid retaining member mounted within said closed loop and each said rigid support means having engagement means engaging said adjustable arm means, whereby rotation of said threaded adjustment means causes axial displacement of said adjustable arm means, said rigid support means and said rigid retaining member, said axial displacement capable of tautening said flexible sheet.

5,046,546

## SCREEN ENCLOSURE APPARATUS

Joseph C. Benedyk, Lake Zurich, and Ronald J. Basar, Geneva, both of Ill., assignors to Alumax Extrusions, Inc., St. Charles, Ill.

Filed Sep. 4, 1990, Ser. No. 577,260
Int. Cl.[5] E06B *9/00*
U.S. Cl. 160—371 15 Claims




1. A screen enclosure apparatus for use in screened windows, porches, doors and other screenable building structures, said apparatus being capable of controllably breaking away in the presence of high wind and/or hurricane conditions to, in turn, automatically reduce resultant wind pressures on the frames of said windows, porches, doors and other structures, said screen enclosure apparatus comprising:

one or more frame means, each having a front surface and a back surface opposite said front surface, two oppositely positioned sides, a longitudinal dimension and a transverse dimension;

one or more channel means integrally formed within said frame means, said one or more channel means spanning at least a portion of said longitudinal dimension of said frame means;

one or more screen sheet means capable of being operably attached within at least a portion of said frame means, said one or more screen sheet means having a front surface and a back surface opposite said front surface, a top edge, a bottom edge opposite said top edge, a first side edge and a second side edge opposite said first side edge,

at least a portion of one or more of said first and second side edges, top edges and bottom edges of said one or more screen sheet means being operably disposed within an interior portion of a respective one of said one or more channel means of said one or more frame means; and

displaceable spline means operably positioned within said channel means to operably bear against said screen sheet means portions within said one or more channel means for securing, and alternatively controllably releasing, at least a portion of said one or more screen sheet means upon displacement of said displaceable spline means as a function of pressure exerted against said screen sheet means by outside wind forces;

at least a portion of said displaceable spline means being capable of controllably releasing said portion of said screen sheet means upon exertion of a predetermined amount of said outside wind force pressure upon said front surface of said one or more screen sheet means,

said controlled release of said portion of said displaceable spline means, and in turn, a portion of said one or more

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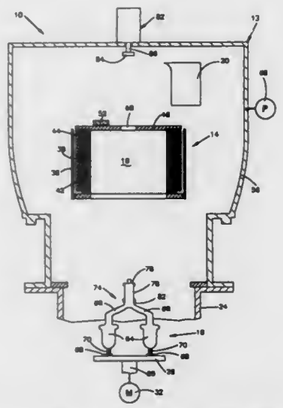
screen sheet means, from said channel means of said frame means permitting the passage of said outside wind force pressures more freely therethrough to, in turn, preclude wind force damage which could otherwise result to both said screen sheet means as well as said frame means structures.

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**5,046,547**
**CASTING METHOD**

**James A. Oti, Richmond Heights, Ohio, assignor to PCC Airfoils, Inc., Cleveland, Ohio**

**Filed Feb. 9, 1990, Ser. No. 477,717**
**Int. Cl.[5] B22D** *27/04*
**U.S. Cl. 164—122.1** **36 Claims**



1. A method of casting, said method comprising the steps of providing a mold structure having an open upper end portion connected in fluid communication with an article mold cavity, moving the mold structure into a furnace chamber, blocking the upper end portion of the mold structure to block movement of fluid through the upper end portion of the mold structure into the article mold cavity, preheating the mold structure while the mold structure is at least partially in the furnace chamber and while blocking the upper end portion of the mold structure, unblocking the upper end portion of the mold structure after preheating the mold structure and while the mold structure is at least partially in the furnace chamber, thereafter, conducting a flow of molten metal through the upper end portion of the preheated mold structure into the article mold cavity, thereafter, again blocking the upper end portion of the mold structure by engaging the upper end portion of the mold structure with a cover, and withdrawing the mold structure from the furnace chamber while blocking the upper end portion of the mold structure by maintaining the cover in engagement with the upper end portion of the mold structure.

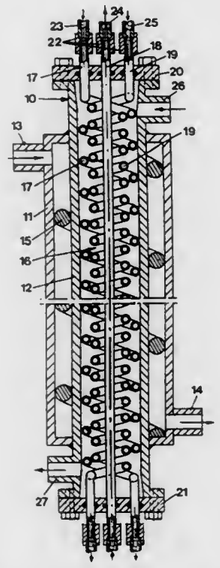
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**5,046,548**
**DEVICE FOR PREPARING PUTTY AND SIMILAR MASSES**

**Leif Tilly, Blankavägen 15, S-433 62 Partille, Sweden**

**PCT No. PCT/SE88/00549, § 371 Date Apr. 18, 1990, § 102(e) Date Apr. 18, 1990, PCT Pub. No. WO89/03723, PCT Pub. Date May 5, 1989**
**PCT Filed Oct. 20, 1988, Ser. No. 473,970**
**Claims priority, application Sweden, Oct. 20, 1987, 8704073**
**Int. Cl.[5] F28D** *7/10*
**U.S. Cl. 165—1** **9 Claims**

1. A device for heating and homogenizing a viscous mass, comprising:
a tube defining a flow passage for the viscous mass, the tube having an inlet for viscous material at one end of the flow passage and having an outlet spaced away from the inlet along the tube at the other end of the flow passage for outlet of the viscous material;
a first helically coiled tube heat exchanger disposed inside the tube between the inlet and the outlet for guiding the viscous mass through the flow passage inside the tube and for mixing and homogenizing and for heating the viscous mass;
a second tube heat exchanger disposed generally centrally in the tube between the inlet and the outlet, the first helically coiled tube heat exchanger being coiled around the second heat exchanger, the second heat exchanger also being for heating the viscous mass moving through the flow passage;
a third helically coiled tube heat exchanger disposed inside the tube between the inlet and the outlet, the third heat exchanger also being helically coiled around the central second heat exchanger, and the helical coil of the third heat exchanger having the opposite pitch from the helical coil of the first heat exchanger.



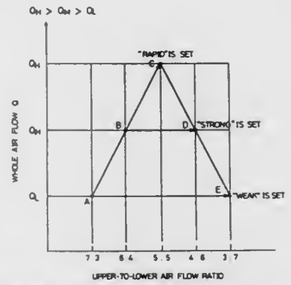
9. A method for heating and homogenizing a viscous mass, comprising:
feeding the viscous mass under pressure through a tube from an inlet in the tube to an outlet from the tube through a flow passage defined between the inlet and the outlet;
heating the viscous mass while feeding the viscous mass through the tube from the inlet and outlet;
the heating step comprising heating the viscous mass by first heating means extending straight through the center of the tube and by second heating means helically coiling around inside the tube, and directing the viscous mass through the flow passage along a pathway having many directional changes caused by the feeding of the viscous mass over the helical tube heat exchanger, for both homogenizing the viscous mass and for heating the entire viscous mass as it passes through the flow passage and comprising further heating the viscous mass by applying heat to the exterior of the tube in a heated casing around the tube.



**5,046,549**
**SEPARATE AIR-CONDITIONER**

**Kazuaki Isono, Shizuoka, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan**

**Filed Jun. 30, 1988, Ser. No. 214,043**
**Claims priority, application Japan, Jul. 2, 1987, 62-165738; Jul. 2, 1987, 62-165739; Oct. 2, 1987, 62-249231**
**Int. Cl.[5] F29B** *29/00;* **F25D** *17/06;* **F24F** *11/02, 11/053*
**U.S. Cl. 165—39** **2 Claims**



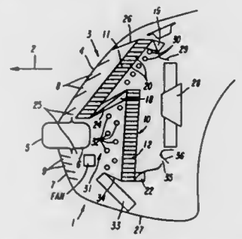

1. A separate air conditioner comprising:
a unit casing which is to be put in a room and has an upper outlet, a central inlet, and a lower outlet on a front wall thereof;
a heat exchanger opposed to said central inlet;
an upper fan opposed to said upper outlet for taking air from said room through said heat exchanger and blowing it out through said upper outlet;
a lower fan opposed to said lower outlet for taking air from said room through said heat exchanger and blowing it out through said lower outlet;
first air flow control means for controlling said upper and lower fans in an initial heating period prior to said heat exchanger reaching a predetermined temperature such that a ratio of an upper air flow from said upper fan to a total air flow from both said upper and lower fans decreases as said total air flow increases; and
second air flow control means for controlling said upper and lower fans in a stable heating state after said heat exchanger has reached said predetermined temperature such that said ratio decreases as said total air flow decreases.

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**5,046,550**
**COOLING-AIR DUCTING SYSTEM IN THE FRONT-END SPACE OF A MOTOR VEHICLE**

**Wolf Boll, Weinstadt, and Reinhard Steinkämper, Winnenden, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany**

**Filed Sep. 11, 1990, Ser. No. 580,598**
**Claims priority, application Fed. Rep. of Germany, Sep. 9, 1989, 3930076**
**Int. Cl.[5] B60K** *11/02, 11/04;* **F01P** *3/18*
**U.S. Cl. 165—41** **20 Claims**



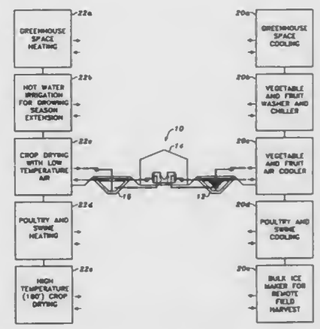
1. Cooling-air ducting system in the front-end space of a motor vehicle, which front-end space is delimited towards the front by a front-end wall having an air inlet opening for cooling air and in which front-end space is arranged a cooling-air fan, at least one cooler through which cooling air flows, having a cooling-air ducting space, delimited by partition walls, between the front-end wall and the cooler, wherein the cooler is divided into an upper cooler component part and a lower cooler component part which are arranged staggered relative to one another in such a way that the upper and lower cooler component parts partially overlap in height and are spaced relative to one another in the driving direction of the motor vehicle, wherein a space formed by the partial overlapping in height and the spacing between the upper and lower cooler component parts serves for the removal of cooling air from the upper cooler component part and a separate feeding of cooling air to the lower cooler component part, each of said upper cooler component part and said lower cooler component part having a principal extensions, a partition wall lying obliquely to the principal extension of each of the upper and lower cooler component parts and separating a suction side downstream of the upper cooler component part from a pressure side upstream of the lower cooler component part, and that the upper and lower cooler component parts are acted upon in common by the cooling-air fan.

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**5,046,551**
**LONG TERM THERMAL ENERGY PRODUCTION, STORAGE AND RECLAIM SYSTEM**

**Thomas L. Davis; Robert N. Elliott, III, both of Raleigh, and Joseph A. Gregory, Angier, all of N.C., assignors to Carolina Power & Light Company, Raleigh and North Carolina Alternative Energy Corporation, Research Triangle Park, both of, N.C.**

**Filed Jun. 25, 1990, Ser. No. 543,169**
**Int. Cl.[5] F28F** *7/00*
**U.S. Cl. 165—45** **18 Claims**

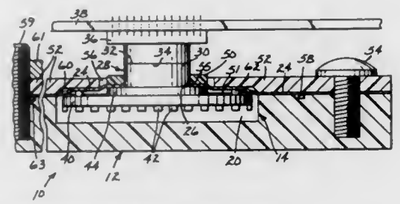



1. In the provision of the cooling or heating requirements to a series of disconnected thermal loads which occur over a cycle measured in weeks, a long-term thermal energy production, storage and reclaim system for shifting energy usage from a spiked, high power, direct acting basis operated largely during peak demand periods to a long-term level load at a low power level, said system comprising:
a low power prime mover for operating over a long term period measured in months, said prime mover being less than about 20 percent of the size of the prime mover that would be required to satisfy the series of disconnected thermal loads by a direct acting mode of operation;
at least one thermal energy storage tank;
means for supplying thermal energy from said low power prime mover to said storage tank;
heat transfer means associated with said storage tank for

transferring thermal energy on demand from said tank to satisfy the series of disconnected thermal loads;
the size and thermal insulating properties of said storage tank and the size of said prime mover being so selected as to provide sufficient thermal energy output and storage throughout the long term period of operation of the prime mover to supply the thermal energy to the series of disconnected loads without discharging the thermal energy contained in the storage tank below a predetermined level and without charging the thermal energy in the storage tank above a predetermined level;
whereby the operation of the prime mover is decoupled from the power demands of the series of disconnected thermal loads to thereby shift energy usage from a spiked, high power, direct acting basis occurring largely during peak demand periods to a long term level load at a low power level resulting in a high utility capacity factor for the system.

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**5,046,552**
**FLOW-THROUGH HEAT TRANSFER APPARATUS WITH MOVABLE THERMAL VIA**
**Lew A. Tousignant, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.**
**Filed Jul. 20, 1990, Ser. No. 556,021**
**Int. Cl.[5] F24D** *19/02;* **F28F** *5/00;* **H01L** *25/04*
**U.S. Cl. 165—46** **6 Claims**

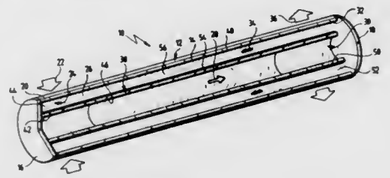


1. Heat transfer apparatus comprising:
a frame having a channel for the flow of heat transfer fluid, said channel having an inlet and an outlet;
a sheet of flexible material connected to said frame, a portion of said sheet extending along said channel, said portion of said sheet being movable and having a hole;
a thermal via extending through said hole and having a first portion and a second portion, said via being connected to said sheet for movement therewith, said first portion extending outwardly from said sheet and said channel for thermal connection with a heat generating component, said second portion being located in said channel for contact with said heat transfer fluid and having a wall facing said sheet;
structure connected to said frame and extending across at least said portion of said sheet adjacent said via for limiting outward movement of said sheet when heat transfer fluid is directed through said channel; and
at least one pin connected to said second portion of said via and extending toward said sheet forming means for substantially preventing said portion of said sheet from contacting said wall during movement of said via.

6. Heat transfer apparatus comprising:
a frame having a channel for the flow of heat transfer fluid, said channel having an inlet and an outlet;
a sheet of flexible material connected to said frame, a portion of said sheet extending along said channel, said portion of said sheet being movable and having a hole;
a thermal via extending through said hole and having a first portion and a second portion, said via being connected to said sheet for movement therewith, said first portion extending outwardly from said sheet and said channel for thermal connection with a heat generating component, said second portion being integrally connected to said first portion and being located in said channel for contact with said heat transfer fluid;
structure connected to said frame and extending across at least said portion of said sheet adjacent said via for limiting outward movement of said sheet when heat transfer fluid is directed through said channel; and
a lock ring releasably connected to said via and surrounding said first portion of said via for sealingly connecting said via to said sheet.

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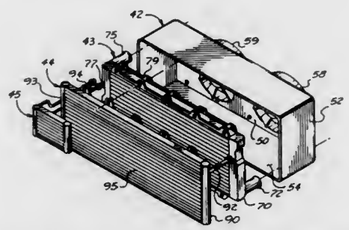
**5,046,553**
**HEAT PIPE**
**Friedrich Lindner, Leinfelden-Echterdingen, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Fed. Rep. of Germany**
**Filed Aug. 28, 1990, Ser. No. 575,197**
**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1989, 3929024**
**Int. Cl.[5] F28D** *15/02*
**U.S. Cl. 165—104.26** **12 Claims**



1. A heat pipe comprising:
a housing containing a heat transporting medium;
an evaporation region in said housing;
a condensation region in said housing;
a vapor channel for carrying vapor from said evaporation region to said condensation region;
a condensate channel for guiding condensate from said condensation region to said evaporation region; and
an unwettable porous structure arranged between said vapor channel and said condensate channel in said condensation region, said structure having a pore size that renders it impermeable for the condensate to preclude condensate from entering said vapor channel.

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**5,046,554**
**COOLING MODULE**
**Masashi Iwasaki, Phoenix; Refki El-Bourini, Chandler, and David L. Martin, Phoenix, all of Ariz., assignors to Calsonic International, Inc., Irvine, Calif.**
**Filed Feb. 22, 1990, Ser. No. 484,046**
**Int. Cl.[5] F28D** *7/16;* **F01P** *7/02*
**U.S. Cl. 165—140** **2 Claims**



1. A heat transfer device for placement in a stream of cooling medium and for simultaneously cooling a first circulating fluid and a second circulating fluid, said unit comprising:
a) a first heat exchanger including

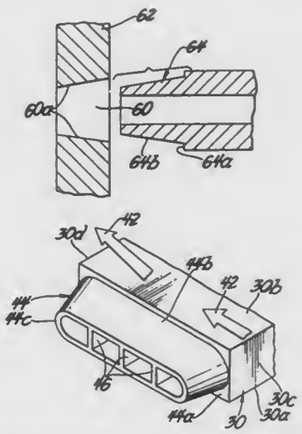


i) first inlet means for receiving said first fluid;
ii) first outlet means for emitting said first fluid; and
iii) a first plurality of conduits communicating between said first inlet means and said first outlet means for conducting said first fluid along a first path of selected configuration, each of said conduits having a predetermined cross-sectional area;
b) a second heat exchanger including
i) second inlet means for receiving said second fluid;
ii) second outlet means for emitting said second fluid; and
iii) a second plurality of conduits communicating between said second inlet means and said second outlet means for conducting said second fluid along a second path of selected configuration, each of said conduits having a cross-sectional area equal to the cross-sectional area of the conduits in said first heat exchanger; and
c) alignment means for detachably securing said second heat exchanger to said first heat exchanger in a predetermined superimposed relationship such that each of said conduits in said first plurality extends along an axis which is parallel to an axis extending through a corresponding conduit in said second plurality, said axes lying in a plane substantially parallel to the axis of said stream of cooling medium, wherein said alignment means includes
i) a first tubular member projecting from said first inlet means;
ii) a second tubular member projecting from said first outlet means in a common direction with said first tubular member;
iii) a third tubular member projecting from said second inlet means in said common direction;
iv) a fourth tubular member projecting from said second outlet means in said common direction;
v) a first recess in one of said first inlet means and said second inlet means for removably receiving one of said first tubular member and said third tubular member; and
vi) a second recess in one of said first outlet means and said second outlet means for removably receiving one of said second tubular member and said fourth tubular member.

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**5,046,555**
**EXTENDED SURFACE TUBE-TO-HEADER CONNECTION FOR CONDENSER**
**Hung P. Nguyen, East Amherst, N.Y., assignor to General Motors Corporation, Detroit, Mich.**
**Filed Sep. 6, 1990, Ser. No. 578,119**
**Int. Cl.[5] F28F** *9/16*
**U.S. Cl. 165—173** **8 Claims**

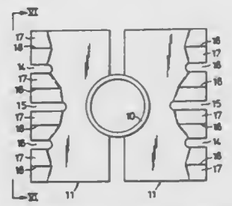
1. A heat exchanger assembly having brazed connections between the ends of tube passes and the walls of spaced headers and wherein the tube passes are arranged in generally spaced parallelism and with end portions that are arranged with longitudinal axes thereof generally perpendicular to header walls characterized by:
each of said tube passes having an end portion with reinforcing ribs internal thereof and a distal end and a longitudinal axis and said end portion having a predetermined axial length greater than the wall thickness of a header connected to the end portion;
said end portion having a tapered outer surface having a length greater than the predetermined axial length of said end portion;
each of said header walls having an inboard surface and an outboard surface and a mating hole therein extending between said inboard and outboard surfaces for receiving said end portion; said mating hole having an axial length equal to the thickness of said header wall; said mating hole having a tapered surface thereon with a length greater than the thickness of said header wall but less than the length of said end portion;
said tapered surface of said mating hole engaged with said tapered outer surface of said end portion to locate said distal end of said end portion inside of said inboard surface of said header wall and means forming a brazed joint at



said header wall and each of said tube end portions which is longer than the axial length of each of said end portions.

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**5,046,556**
**SURFACE ENLARGING ELEMENTS FOR HEAT-EXCHANGER TUBES**
**Erik Andersson, Södertälje, Sweden, assignor to Gadelius Sunrod AB, Sweden**
**PCT No. PCT/SE89/00448, § 371 Date Dec. 28, 1990, § 102(e) Date Dec. 28, 1990, PCT Pub. No. WO90/02917, PCT Pub. Date Mar. 22, 1990**
**PCT Filed Aug. 28, 1989, Ser. No. 634,119**
**Claims priority, application Sweden, Sep. 13, 1988, 8803215**
**Int. Cl.[5] F28F** *1/20*
**U.S. Cl. 165—181** **8 Claims**

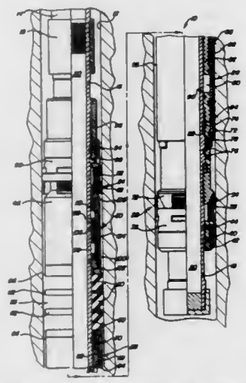


1. A surface enlarging element for heat-exchanger tubes, comprising a substantially rectangular piece of sheet-metal (**11**) provided in the mid-region of one long side with a substantially circular recess extending through an angle of less than 180° and designed to be welded to the tube, characterized in that the piece of sheet-metal is provided with slits (**14, 15, 16**) extending from the other long side of the piece of metal and running generally parallel with the short sides of the piece of sheet-metal (**11**), said slits (**14, 15, 16**) decreasing in length from the middle of said piece of metal towards its short sides.

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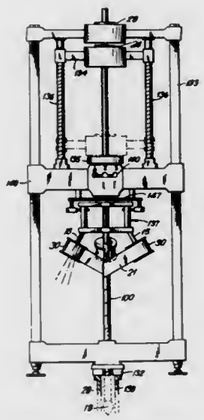
5,046,557
WELL PACKING TOOL
Phillip H. Manderscheid, Cypress, Tex., assignor to MASX Energy Services Group, Inc., Houston, Tex.
Filed Apr. 30, 1990, Ser. No. 516,645
Int. Cl.[5] E21B *33/129*
U.S. Cl. 166—120 32 Claims



12. A well packing tool for setting in a casing, said packing tool comprising:
an inner mandrel having a fluid passageway;
a lower slip assembly mounted to said mandrel, said lower slip assembly including a slip cone and a plurality of slip elements selectively expansible into engagement with the casing;
an upper slip assembly mounted to said mandrel, said upper slip assembly including a slip cone and a plurality of slip elements selectively expansible into engagement with the casing;
a plurality of packing elements mounted to said mandrel between said upper and lower slip assemblies, said packing elements resiliently compressible between lower and upper seal retainers into sealing engagement with the casing upon setting of the tool; and
load transfer means mounted to said mandrel, said means responsive to downhole fluid pressures acting on said tool to maintain sealing engagement of said packing elements and the engagement of said upper and lower slip assemblies with the well casing;
said load transfer means including an upper transfer assembly interconnected between said slip cone of said upper slip assembly and said upper seal retainer, said upper transfer assembly including a cylinder fluidly communicating with said fluid passageway of said mandrel and the annulus surrounding said tool through an upper exterior fluid passageway, a piston slidably captured within said cylinder.

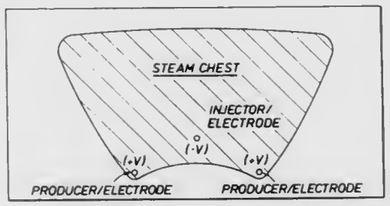
5,046,558
METHOD AND APPARATUS FOR REPAIRING CASINGS AND THE LIKE
Charles H. Koster, Alvin, Tex., assignor to Nu-Bore Systems, Wichita Falls, Tex.
Division of Ser. No. 295,290, Jan. 10, 1989, Pat. No. 4,913,758. This application Jan. 4, 1990, Ser. No. 460,810
Int. Cl.[5] B65H *81/00*; E21B *29/10*
U.S. Cl. 166—243.000 9 Claims

1. A machine for preparing a tool designed to repair leaking sections of well casing which comprises:
(1) a rectangular frame having upper and lower openings at substantially the center line;
(2) a fixed crosshead in said frame;
(3) a movable crosshead bearing a first collet means;
(4) said fixed crosshead bearing rotatable material payoff means, drive means therefor and brake means permitting rotation of said material payoff means in a single direction only;
(5) means for elevating and lowering said movable crosshead;
(6) a second collet means fixed about the said upper opening on said frame;



(7) means for feeding mandrel material through said first collect means, said drive means and said material payoff means and through the lower opening in said frame; and
(8) means for holding strip material on said material payoff means whereby mandrel material may be wrapped portion by portion with said material to a desired length to form a tool for repairing oil well casings.

5,046,559
METHOD AND APPARATUS FOR PRODUCING HYDROCARBON BEARING DEPOSITS IN FORMATIONS HAVING SHALE LAYERS
Carlos A. Glandt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Aug. 23, 1990, Ser. No. 571,381
Int. Cl.[5] E21B *43/24*
U.S. Cl. 166—248 10 Claims

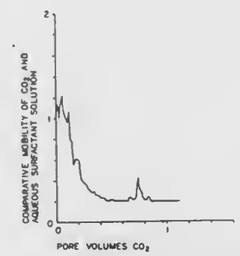



1. A process for recovering hydrocarbons from hydrocarbon-bearing deposits comprising:
providing at least two horizontal production wells near the bottom of a target production area, wherein the production wells are horizontal electrodes during an electrical heating stage, and production wells during a production stage;
providing a horizontal injection well essentially centrally located between and above the production wells, wherein the injection well is a horizontal electrode during an electrical heating stage, and an injection well during a production stage;
electrically exciting the electrodes during a heating stage such that current flows between the injection well and the horizontal production wells, creating preheated paths between the injection well and the horizontal production wells having increased injectivity;
injecting through the injection well steam to form a steam vapor containing portion of the formation thereby mobilizing formation oil and permitting the formation oil to flow by gravity to near the bottom of the target production area; and
recovering hydrocarbons from the production wells.

5. An apparatus for recovering hydrocarbons from hydrocarbon bearing deposits using an improved steam assisted gravity drainage process, the apparatus comprising:
at least two horizontal production wells near the bottom of a target production area, wherein the production wells are horizontal electrodes during an electrical heating stage, and production wells during a production stage; and
a horizontal injection well essentially centrally located between and from about 30 to about 140 feet from the producer wells, wherein the injection well is a horizontal electrode during an electrical heating stage, and an injection well during a production stage.



5,046,560
OIL RECOVERY PROCESS USING ARKYL ARYL POLYALKOXYOL SULFONATE SURFACTANTS AS MOBILITY CONTROL AGENTS
Gary F. Teletzke, SugarLand, and Ronald L. Reed, Houston, both of Tex., assignors to Exxon Production Research Company, Houston, Tex.
Filed Jun. 10, 1988, Ser. No. 205,715
Int. Cl.[5] E21B *43/22, 43/24*
U.S. Cl. 166—272 20 Claims




1. A method for recovering oil from a subterranean oil-containing formation comprising injecting into the formation through an injection well in communication therewith a gas as the primary oil displacing fluid selected from the group consisting of carbon dioxide, hydrocarbon gas, inert gas, inert gas, and steam, and injecting into the formation an aqueous solution containing a surfactant characterized by the formula

$$R-Ar-O[CH_2CH(CH_3)O]_x[CH_2CH_2O]_yH$$
$$\quad\quad\quad

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60:20:20 and a molecular weight range of from about 10,000 to 3,000,000, the ratio of copolymer to terpolymer being in the range of 20:80 to 80:20.

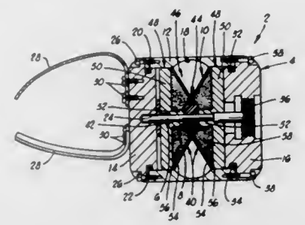
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**5,046,563**

## APPARATUS AND METHOD FOR CUTTING AN OBJECT IN A WELL

**William T. Engel, Arlington, and Hector A. Tamayo, Ft. Worth, both of Tex., assignors to Jet Research Center, Inc., Alvarado, Tex.**

**Filed Nov. 7, 1989, Ser. No. 432,708**
**Int. Cl.[5] E21B *43/11***
**U.S. Cl. 166—297** **8 Claims**



1. A method of cutting an object in a well, comprising:
transporting a first explosive to a field location in individual quantities which are less than a predetermined limit quantity;
transporting a second explosive to the field location in a quantity less than the predetermined limit quantity, which second explosive is a more sensitive explosive than the first explosive;
consolidating, at the field location, the individual quantities of first explosive into a shaped charge having a total quantity of the first explosive greater than the predetermined limit;
assembling a cutting tool at the field location, including supporting the second explosive adjacent the shaped charge;
lowering the cutting tool into the well to an object therein to be cut; and
detonating the shaped charge in response to detonating the second explosive so that the detonated shaped charge generates a force which cuts the object.

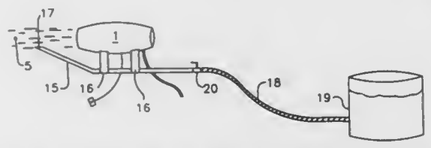
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**5,046,564**

## HIGH VELOCITY FIRE FIGHTING NOZZLE

**Thomas E. Poulsen, Box 19, Jiggs, Nev. 89801**

**Continuation of Ser. No. 363,415, Jun. 5, 1989, abandoned, which is a continuation of Ser. No. 225,646, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 882,605, Jul. 7, 1986, abandoned. This application Mar. 1, 1990, Ser. No. 490,519**
**Int. Cl.[5] A62C *3/02, 39/00***
**U.S. Cl. 169—47** **13 Claims**



9. A method of fire fighting comprising: using a mechanical means to produce a gas stream of sufficient velocity to entrain water or another fire retardant;
aiming said gas stream above a fire, or above flammable material near a fire, so that said gas stream is not aimed at the flames of said fire;
directing water or another fire retardant into said gas stream so that said water or other fire retardant will become entrained in said gas stream and be transported some distance above the ground, so that at least some of said water or other fire retardant will fall from said gas stream in which said water or other fire retardant was entrained, onto said fire or flammable material near said fire.

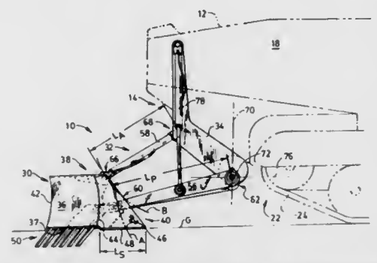
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**5,046,565**

## BLADE AND LINKAGE MECHANISM WITH DOWNDRAFT CONTROL

**Robert J. Purcell, 409 Daniel Pkwy., Washington, Ill. 61571**

**Filed Oct. 10, 1989, Ser. No. 419,293**
**Int. Cl.[5] F41H *11/12*; E02F *3/76***
**U.S. Cl. 172—239** **14 Claims**



12. A blade and linkage mechanism adapted for use on a work vehicle includes a blade having an operating position at which the blade is in contact with the surface of the ground, said blade has a moldboard, a top portion and a bottom portion connected to and rearward of the moldboard, said linkage mechanism has a push arm having first and second end portions and being pivotally attached at the first end portion to the bottom portion of the blade and pivotally attached at the second end portion thereof to the work vehicle and a tilt arm having first and second end portions and being pivotally attached at the first end portion to the top portion of the blade and pivotally attached at the second end portion to the work vehicle, the blade and linkage mechanism comprising:
the blade and linkage mechanism being attachable to one front side portion of the vehicle and selectively movable between the preselected operative position and a carry position, the axis of the pivotal connection of the push arm to the vehicle is disposed at an acute angle with respect to a transverse horizontal plane of the vehicle and the axis of the pivotal connection of the push arm to the blade is at an acute angle with a transverse vertical plane.

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**5,046,566**

## PORTABLE HANDHELD TOOL HAVING A HANDLE ARRANGEMENT DECOUPLED BY ANTIVIBRATION ELEMENTS

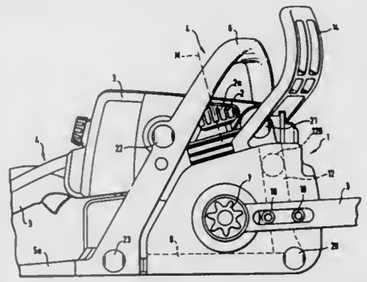
**Wolfgang Dorner, Rottenburg; Helmut Lux, Bittenfeld; Klaus Höppner, Marbach; Hermann Weiss, Steinheim, and Georg Leppla, Waiblingen, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany**

**Filed Mar. 15, 1990, Ser. No. 493,772**
**Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3908947; Jan. 27, 1990, 4002459**
**Int. Cl.[5] B27B *17/02***
**U.S. Cl. 173—162.002** **19 Claims**

1. A portable, handheld tool such as a motor chain saw, cutoff machine or the like, the portable handheld tool having a work tool and comprising:
a housing;



an engine having an output drive member for driving the work tool; said drive member defining a plane;
said engine having a cylinder defining a cylinder axis lying in a vertical cylinder plane and being mounted in said housing; said plane of said drive member and said cylinder plane being substantially parallel;
said engine having a first side with respect to said cylinder plane on which said drive member is disposed and a second side with respect to said cylinder plane facing away from said first side;
a handle arrangement for holding and guiding the handheld tool during operation thereof;
a plurality of antivibration elements for mounting the handle arrangement on said engine;



a first one of said antivibration elements being mounted on said second side of said engine at a predetermined first distance to said cylinder plane and the remainder of said antivibration elements being mounted on said first side of said engine at respective predetermined second distances to said cylinder plane;
the product of the stiffness of said first antivibration element and said first distance being a first product; the product of the stiffness of each one of said remaining ones of said antivibration elements and the second distance corresponding thereto being a plurality of second products; and,
the sum of said second products being very much greater than said first product.

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**5,046,567**

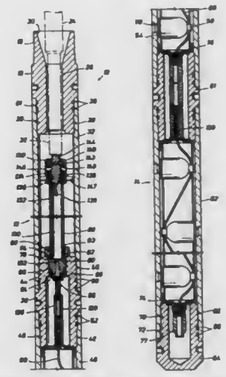
## ADIABATICALLY INDUCED IGNITION OF COMBUSTIBLE MATERIALS

**John Aitken, Houston, Tex., and Victorio L. Oria, Pilar BsAs, Argentina, assignors to Mecano-Tecb, Inc., Tex. and Explosivos Tecnologios Argentino S.A., Argentina**

**Filed Nov. 13, 1989, Ser. No. 435,061**
**Int. Cl.[5] E21B *43/1185, 43/263*; F42D *1/04, 3/00***
**U.S. Cl. 175—4.6** **43 Claims**

1. A method for achieving direct adiabatic heat ignition of, a high explosive composition comprising:
(a) providing a hollow cylinder defining a chamber and having a gas disposed therein and having a piston movable linearly within said hollow chamber for compression of said gas;
(b) releasably retaining said piston against movement within said cylinder;
(c) entrapping a quantity of gas in a chamber, said chamber being in communication with said high explosive composition;
(d) controllably releasing said piston, thus permitting said force to sudden compression of said quantity of gas to the extent that the temperature thereof is increased adiabatically to the ignition temperature of said high explosive composition; and
(e) establishing a force acting on said piston and being of sufficiently great magnitude to cause said piston, when released, to suddenly compress said gas within said chamber to the extent that the temperature of said gas is elevated adiabatically to the ignition temperature of said high explosive.

22. Adiabatic heat initiation apparatus for, a high explosive composition comprising:
(a) a combustion barrel forming a combustion chamber said combustion barrel forming a rod bore;
(b) a quantity of said high explosive composition being disposed within said combustion chamber;
(c) a cylinder forming a piston chamber in communication with said combustion chamber and having a gas disposed therein;



(d) a piston disposed within said cylinder for gas compressing movement therein;
(e) means developing a force acting on said piston and urging said piston in a gas compressing direction, said force being sufficiently great to induce sudden gas compressioning movement of said piston to raise the temperature of said gas adiabatically to the ignition temperature of said high explosive composition for initiation of combustion thereof; and
(f) means releasably restraining said piston against said gas compressing movement and being selectively controllable for release of said piston.

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**5,046,568**

## DRIVEN GROUNDWATER SAMPLING DEVICE

**Kent E. Cordry, 308 Mountaire Parkway, Clayton, Calif. 94517**

**Filed Mar. 15, 1990, Ser. No. 494,984**
**Int. Cl.[5] E21B *7/26***
**U.S. Cl. 175—21** **9 Claims**

1. A device adapted to be inserted into the ground for obtaining a groundwater sample, the device comprising:
a) an elongated hollow housing;
b) a drive cone removably mounted by means of frictional engagement on the bottom end of the housing, the drive cone adapted to penetrate the ground and configured to be restrained by the ground once in place below the ground surface so that the frictional engagement between the drive cone and housing is overcome when the housing is withdrawn from the ground toward the ground surface, thereby leaving the drive cone in place separated from the housing; and
c) a sample collection and containment unit removably mounted within the hollow housing, the collection and containment unit comprising an inlet assembly adjacent the bottom end of the housing spaced from an outlet assembly adjacent the top end of the housing, wherein the space between the inlet and outlet assemblies define a sample chamber, wherein the inlet assembly includes a one-way check valve through which a water sample can

flow from the ground into the sample chamber when the drive cone has been separated from the housing, and



wherein the outlet assembly includes a one-way check valve through which water can flow out from the chamber.

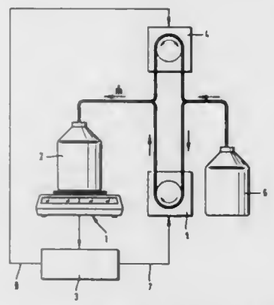
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**5,046,569**

## METHOD AND DEVICE FOR A PULSATION-FREE, CONTINUOUS AND GRAVIMETRIC DOSING

**Paul von der Haar, Göttingen; Madhukar Pandit, Kaiserslautern, and Hermann Merz, St. Ingbert, all of Fed. Rep. of Germany, assignors to Sartorius AG, Göttingen, Fed. Rep. of Germany**

**Filed Nov. 16, 1990, Ser. No. 614,131**
**Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938898**
**Int. Cl.[5] G01G** *19/52, 13/02, 23/10;* **B67D** *5/08*
**U.S. Cl. 177—50** **10 Claims**



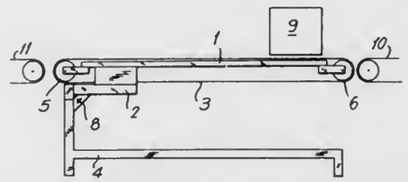
8. In a device for the gravimetric control of a mass flow with a dosing pump which doses the material to be dosed from or into a container located on a balance, whereby the delivery force of the dosing pump comprises pulsating components, with a control unit which regulates the delivery force of the dosing pump on the basis of the output signal of the balance in such a manner that the average time value of the delivery force achieves a set theoretical value, comprising wherein an auxiliary dosing pump is connected in parallel to the dosing pump, the delivery force of the auxiliary dosing pump is regulated by the control unit in such a manner that the sum of the delivery forces of the two pumps is free of pulsations and the delivery force of the main dosing pump is regulated by the control unit in such a manner that the sum of the delivery forces is maintained at the set theoretical value.

**5,046,570**

## WEIGHING DEVICE FOR CHECKOUT COUNTERS AND THE LIKE

**Nils-Erik Emme, Jonkoping, and Rune Olsson, Anderstorp, both of Sweden, assignors to Abo Metall AB, Jonkoping, Sweden**

**Filed Feb. 13, 1990, Ser. No. 479,298**
**Claims priority, application Sweden, Feb. 13, 1989, 8900474-1**
**Int. Cl.[5] G01G** *19/00, 19/40*
**U.S. Cl. 177—145** **25 Claims**



1. A device for transporting and weighing articles at a checkout counter, comprising:
- a plurality of successively-arranged conveyors movable for transporting articles on and along and from one to another of said conveyors; one of said conveyors comprising a scale conveyor for conveying an article to be weighed between preceding and succeeding ones of said conveyors, and having a surface on which said article is continuously supported between said preceding and succeeding conveyors;
- means operable for moving said scale conveyor so as to transport an article on and along the scale conveyor; said operable means including means for selectively halting the movement of said scale conveyor while determining the weight of an article on said scale conveyor; and
- means for weighing an article, said weighing means comprising a scale table disposed immediately under and in substantial abutment with said scale conveyor for determining the weight of an article on said scale conveyor.

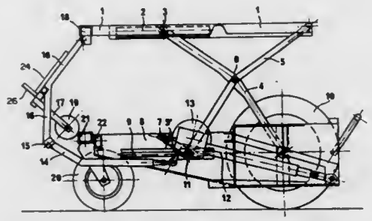
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**5,046,571**

## VERTICALLY ADJUSTABLE WHEEL CHAIR

**Björn Kullerud, Selerstenv. 4, Dröbak, Norway**

**PCT No. PCT/NO89/00004, § 371 Date Jul. 3, 1990, § 102(e) Date Jul. 3, 1990, PCT Pub. No. WO89/06118, PCT Pub. Date Jul. 13, 1989**
**PCT Filed Jan. 6, 1989, Ser. No. 488,083**
**Claims priority, application Norway, Jan. 11, 1988, 880074**
**Int. Cl.[5] B60K** *1/00*
**U.S. Cl. 180—65.1** **8 Claims**



1. An electrically driven wheel chair comprising:
- a lower frame;
- a front pair of wheels and a rear pair of wheels rotatably mounted on front and rear wheel shafts on said lower frame;
- a pair of laterally spaced lower slide members mounted on said lower frame;
- an upper frame;



- a pair of laterally spaced upper slide members mounted on said upper frame;
- two pairs of laterally spaced scissors-type bars, each pair of said bars comprising a first bar and a second bar pivotally connected at central portions thereof by a common shaft, said first and second bars each having upper and lower ends;
- said lower ends of said first bars being pivotally connected to said rear wheel shaft and said respective upper ends of said first bars being pivotally and slidably connected to respective ones of said upper slide members for sliding and pivotal movement relative to said upper frame;
- said upper ends of said second bars being pivotally connected to said upper frame and said respective lower ends of said second bars being pivotally and slidably connected to said lower sliding member for sliding and pivotal movement relative to said lower frame;
- an extension on said lower end of each said second bar extending upwardly at right angles to the portion of said second bar between said common shaft and said lower end;
- an upper end on each said extension;
- a transverse bar connecting said upper end of each said extension;
- drive means pivotally connected to said transverse bar for moving said transverse bar reciprocally relative to said lower frame;
- a first pair of laterally spaced supporting bars pivotally connected to said lower ends of said second bars adjacent said lower slide members and extending to front ends thereof in front of said front wheels;
- linkage means on said front ends of said first supporting bars;
- a pair of second supporting bars each having one end connected to respective linkage means and the other end pivotally connected to a front portion of said upper frame;
- calf supports and a footrest attached to said second supporting bars; and
- operating means on said upper frame for operating said drive means for raising and lowering said upper frame relative to said lower frame via said scissors-type bars.

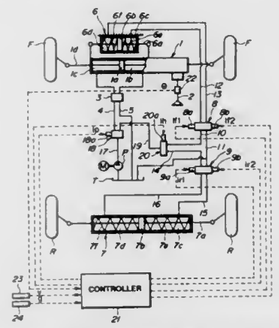
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**5,046,572**

## STEERING CONTROL SYSTEM FOR VEHICLE

**Koichi Komatsu, Kanagawa, Japan, assignor to Atsugi Unisia Corporation, Kanagawa, Japan**

**Filed Apr. 24, 1990, Ser. No. 513,845**
**Claims priority, application Japan, Apr. 27, 1989, 1-50167[U]**
**Int. Cl.[5] B62D** *6/02*
**U.S. Cl. 180—140** **5 Claims**




1. A system for controlling steering operations of front and rear wheels of a vehicle comprising:
- monitoring means for monitoring traveling condition parameters of the vehicle to provide a signal indicative thereof;
- a first actuator for actively steering the front wheels;
- a second actuator for actively steering the rear wheels;
- a third actuator for providing assistance in steering the front wheels below a preselected vehicle speed so as to reduce effort required by a driver to steer the front wheels;
- a single driving source for applying a driving force to said first, second, and third actuators;
- a first line directing the driving force from said driving source to said first and second actuators;
- a second line directing the driving force from said driving source to said third actuator;
- first means, disposed between said driving source and said first and second lines, for controlling a supply rate of the driving source to said first and second lines;
- second means, disposed between said first line and said first and second actuators, for controlling a supply rate of the driving force to said first and second actuators; and
- control means for controlling said first means to provide a supply rate of the driving force to said second line higher than that to said first line when turning below the preselected vehicle speed, said control means being responsive to the signal from said monitoring means to control said second means to adjust a supply rate of the driving force to said first and second actuators for providing a preselected steering angular relationship between the front and rear wheels when turning.

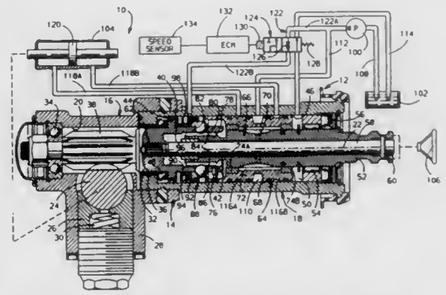
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**5,046,573**

## AUTOMOTIVE POWER STEERING SYSTEM

**Dennis J. Jones, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Jnn. 18, 1990, Ser. No. 539,947**
**Int. Cl.[5] B62D** *5/083*
**U.S. Cl. 180—143** **5 Claims**




1. An automotive power steering system comprising:
- a power steering pump,
- a fluid reservoir,
- a power steering gear having a housing with a valve chamber therein,
- a discharge between said pump and said valve chamber for conducting fluid from said pump to said valve chamber,
- a return between said valve chamber and said reservoir for conducting fluid from said valve chamber to said reservoir,
- a rotary control valve in said valve chamber including a spool rotatable as a unit with an input shaft of said steering gear and a sleeve around said spool rotatable as a unit with an output shaft of said steering gear and a torsion bar between said input and said output shafts biasing said rotary control valve to an open-center condition wherein the pressure in said discharge at the connection thereof to said valve chamber in said open-center condition of said rotary control valve exceeds the pressure in said return at the connection thereof to said valve chamber by an open-center backpressure,
- a detent reaction means in said housing including a variable

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volume detent pressure chamber, an annular collar defining a wall of said detent pressure chamber movable in a first direction from a retracted position and detent means engagable by said annular collar when said annular collar moves in said first direction and operative upon such engagement to increase resistance to relative angular displacement between said input and said output shafts,

spring means biasing said annular collar in a second direction opposite said first direction toward said retracted position,

a detent pressure branch having a first end connected to said discharge between said pump and said valve chamber and exposed to said open-center backpressure in said open-center condition of said rotary control valve and a second end connected to said detent pressure chamber so that said open-center backpressure is the source of fluid pressure for said detent pressure chamber in said open-center condition of said rotary control valve, and

a detent pressure valve means connected to said detent pressure branch and to said return having a first position in a low vehicle speed range blocking said detent pressure branch and connecting said detent pressure chamber to said return so that said spring means moves said collar to said retracted position and a second position at vehicle speeds above said low speed range connecting said discharge to said detent pressure chamber so that at least a fraction of said open center backpressure reacts against said annular collar and moves said collar in said first direction away from said retracted position.

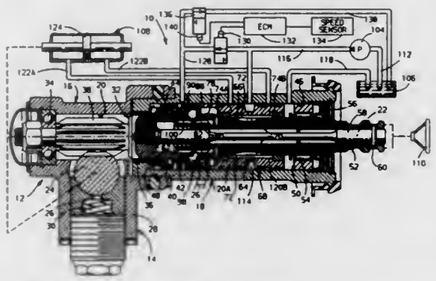
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**5,046,574**

## AUTOMOTIVE POWER STEERING GEAR

**Stanley R. Goodrich, Jr., Reese, and Michael C. Melvin, Freeland, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 15, 1990, Ser. No. 538,440**
**Int. Cl.[5] B62D *5/083***
**U.S. Cl. 180—143** **2 Claims**



1. A power steering gear comprising:

a housing having a cylindrical inside wall defining a valve chamber,

an input shaft and an output shaft each supported on said housing for independent rotation about a centerline of said valve chamber,

an annular flange on said output shaft having a fluid sealed sliding interface at said cylindrical inside wall,

a pump,

a reservoir,

a rotary valve in said valve chamber including a valve spool rotatable with said input shaft and a valve sleeve around said valve spool longitudinally spaced from said annular flange and rotatable as a unit with said output shaft,

first conduit means connecting a discharge of said pump to said rotary valve and said valve chamber such that when said rotary valve is in an open-center condition a substantially constant fluid back pressure develops in said valve chamber downstream of said rotary valve,

means on one of said input shaft and said output shaft defining a tubular sleeve between said valve sleeve and said annular flange rotatable as a unit with said one of said input and said output shafts and spaced radially inboard of and cooperating with said cylindrical inside wall in defining an annular chamber between said tubular sleeve and said cylindrical inside wall,

means on the other of said input shaft and said output shaft defining a stem extending inside said tubular sleeve and rotatable as a unit with said other of said input and said output shafts,

means defining a plurality of radial sockets in said tubular sleeve,

a plurality of spherical detent elements in respective ones of said radial sockets shiftable radially relative to said centerline,

means on said stem defining a plurality of grooves engaged by said detent elements to restrict relative rotation between said input shaft and said output shaft as a function of the magnitude of inward radial forces on said detent elements,

an annular collar disposed in said annular chamber and longitudinally slidable on said tubular sleeve and having a fluid sealed sliding interface at said cylindrical inside wall,

means on said annular collar defining a wedge surface directly exposed to said substantially constant fluid back pressure in said valve chamber downstream from said rotary valve and engageable on said detent elements and exerting thereon inward radial forces the magnitudes of which increase as said annular collar slides longitudinally toward said valve sleeve, and

conduit and control means operative in a low vehicle speed range to connect said annular chamber between said annular flange and said annular collar to said reservoir independently of said first conduit means so that said fluid back pressure in said valve chamber produces a net fluid pressure force on said annular collar away from said valve sleeve in said low vehicle speed range and in a higher vehicle speed range to connect said pump discharge to said annular chamber between said annular flange and said annular collar to substantially eliminate said net fluid pressure force on said annular collar away from said valve sleeve.

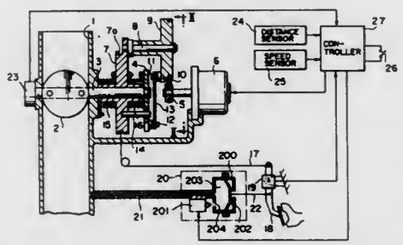
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**5,046,575**

## THROTTLE CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

**Yoshiaki Asayama, Himeji City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 5, 1990, Ser. No. 461,491**
**Claims priority, application Japan, Jan. 7, 1989, 1-1633; Jan. 9, 1989, 1-2532; Jan. 9, 1989, 1-2533**
**Int. Cl.[5] B60K *31/04***
**U.S. Cl. 180—178** **11 Claims**



1. A throttle control apparatus for an internal combustion engine, comprising:

a throttle valve disposed in an intake pipe for adjusting the flow rate of intake air supplied to the engine;

a valve shaft rotatably supported on the intake pipe and fixedly mounting thereon said throttle valve for rotation therewith;

throttle lever means fixedly mounted on said valve shaft for rotation therewith;

a motor operatively connected with said throttle lever means for driving said throttle lever means to thereby adjust the opening degree of said throttle valve;

power-transmitting means operatively connected between said throttle lever means and said motor for transmitting power from said motor to said throttle lever means in such a manner that said throttle lever means is forced to rotate by said motor;

an accelerator pedal adapted to be operated by an operator;

rotary disk means rotatably mounted on said valve shaft and operatively connected with said accelerator pedal in such a manner that it is rotated around said valve shaft as said accelerator pedal is operated by the operator; and

rotation-limiting means for limiting relative rotation between said throttle lever means and said throttle disk means to a predetermined rotational range whereby the maximum opening degree of said throttle valve due to said motor is limited to a certain level which corresponds to the amount of operation of said accelerator pedal due to the operator.



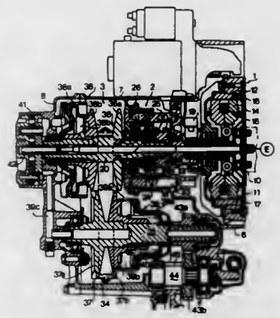
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**5,046,576**

## CONTROL SYSTEM FOR A TRANSFER DEVICE OF A FOUR-WHEEL DRIVE VEHICLE WITH A CONTINUOUSLY VARIABLE BELT-DRIVE TRANSMISSION

**Motohisa Miyawaki, Nakanoshima, Japan, assignor to Fuji Juokogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 11, 1989, Ser. No. 419,733**
**Claims priority, application Japan, Oct. 17, 1988, 63-261112**
**Int. Cl.[5] B60K *17/34***
**U.S. Cl. 180—233** **5 Claims**



1. A control system for a four-wheel drive vehicle with a continuously variable transmission for transmitting power of an automotive engine to main drive wheels of a motor vehicle, the transmission having a drive pulley including a hydraulically shiftable disc and a hydraulic cylinder for operating the disc, a driven pulley including a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the driven pulley, and a belt engaging with both of said pulleys, the control system comprising a transfer clutch engaged in a four-wheel drive condition of the vehicle for transmitting output of the transmission to auxiliary drive wheels of the vehicle, and respectively, disengaged in a two-wheel drive condition of the vehicle, and a hydraulic circuit including a pressure regulator valve having a valve body and a spool slidably mounted in the valve body for regulating line pressure of oil in the hydraulic circuit for the hydraulic cylinders of the pulleys of the transmission, an actuator with a first port and a second port, for selectively engaging the transfer clutch in response to oil pressure to be applied to the first and second ports, and a transfer valve with an inlet port for supplying oil from the inlet port to one of the first and second ports, the control system further comprising:

a line pressure level changing port formed on the pressure regulator valve for changing level of the line pressure in response to oil pressure applied thereto;

a conduit connecting the pressure level, changing port to the inlet port of the transfer valve;

a solenoid operated valve connected to the conduit for supplying the line pressure to the pressure level changing port in order to set the line pressure to a low level; and

means for temporarily restricting supplying of the line pressure to the conduit for changing the line pressure to a high level in response to supply of oil in the conduit to the actuator through the transfer valve when a driving condition of the vehicle is changed between the four-wheel drive condition and the two-wheel drive condition, so as to prevent slipping of the belt on the pulleys.

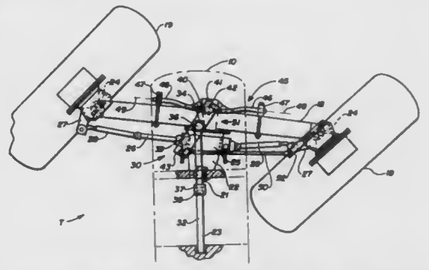
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**5,046,577**

## STEERING MECHANISM FOR TRACTORS

**Joseph C. Hurlburt, Lancaster, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.**

**Filed Mar. 8, 1990, Ser. No. 490,245**
**Int. Cl.[5] B60K *17/30*; B62D *5/26***
**U.S. Cl. 180—266** **29 Claims**



1. A vehicle having a chassis including a longitudinally extending centerline and being supported above the ground by a pair of transversely extending axles, each of said axles having a pair of ground wheels rotatably mounted thereon for mobilely supporting said chassis above the ground, one of said axles constituting a steering axle on which said ground wheels are steerable by being pivotally supported by pivotal mounts located on opposite sides of said steering axle to permit a turning of said vehicle, said vehicle further having steering means operably connected with the ground wheels on said steering axle for selectively controlling the pivotal movement of said ground wheels relative to said steering axle, the improvement comprising:

said steering axle being pivotally connected to said chassis by pivot means for permitting pivotal movement of said steering axle relative to said chassis, said pivot means being operatively associated with said steering means such that a pivotal movement of said steerable wheels effects a corresponding pivotal movement of said steering axle such that one of said pivotal mounts is positioned closer to said chassis centerline than the other said steerable wheel when said steering axle is pivotally moved to effect a turning of said vehicle.

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5,046,578

## DRIVE SYSTEM FOR AUTOMOBILE

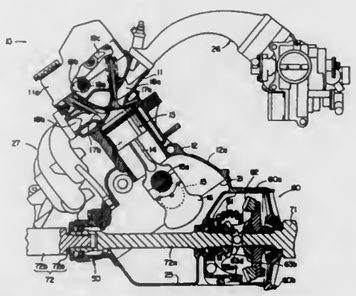
Hiroshi Nakayama; Tomokazu Takeda; Toshiyuki Yumoto; Mitsuo Kitada; Shoji Ohta, and Masatoshi Chosa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1988, Ser. No. 282,476

Claims priority, application Japan, Dec. 11, 1987, 62-313827; Dec. 11, 1987, 62-313828; Dec. 11, 1987, 62-313829; Dec. 11, 1987, 62-313830; Feb. 4, 1988, 63-95283

Int. Cl.[5] B60K *1/00*

U.S. Cl. 180—291 6 Claims



1. A drive system in an automobile, comprising:

an engine disposed in a front portion of the automobile and having a crankshaft extending in a longitudinal direction of the automobile;

a transmission coupled to a rear end of said engine and having an output shaft;

a final speed reduction gear unit disposed laterally of said engine and separate from said transmission, said final speed reduction gear unit having an input shaft;

an intermediate shaft interconnecting said output shaft of aid transmission and said input shaft of said final speed reduction gear unit; and

a steering mechanism for turning front wheels of said automobile, said steering mechanism including a steering tie rod coupled to said front wheels and disposed downwardly of said intermediate shaft between said transmission and said final speed reducer gear unit,

wherein said engine includes a cylinder having an axis inclined from the vertical in a transverse direction of said automobile, said steering mechanism including a steering gearbox disposed on a side of said engine toward which said axis of the cylinder is inclined.

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5,046,579

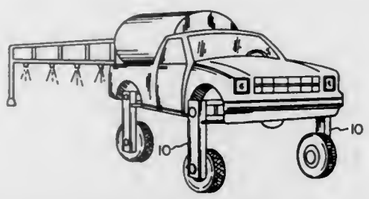
## WHEEL MOUNTING APPARATUS

Jack W. Anderson, 2200 Stoney Point Rd., East Berlin, Pa. 17316

Filed Aug. 13, 1990, Ser. No. 566,662

Int. Cl.[5] B60K *17/354*

U.S. Cl. 180—340 4 Claims



1. An apparatus for elevating a wheeled vehicle when attached to an axle suspension of the vehicle, said axle suspension supporting an axle and first wheel hub for rotation, said apparatus comprising:

a support frame with a top, bottom and opposite ends, said frame enclosing said first wheel hub and being attached at the top and bottom near one end to the axle suspension such that translation and rotation of the frame relative to the axle suspension are minimized;

a hollow riser, having an upper and lower end, said riser fixed to and extending downward from the end of the support frame not attached to the axle suspension;

a universal joint attached to said first wheel hub of the vehicle;

an axle extension extending from the universal joint and journaled in the support frame;

a short axle journaled in the lower end of the riser;

a second wheel hub attached to the short axle outside the riser;

a means of attaching a tire to the second wheel hub; and

means between the axle extension and the short axle for transferring torque therebetween.

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5,046,580

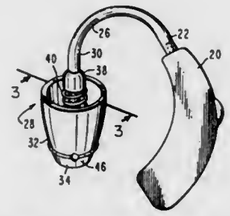
## EAR PLUG ASSEMBLY FOR HEARING AID

James I. Barton, 31315 E. Nine Dr., Laguna Niguel, Calif. 92677

Filed Aug. 17, 1990, Ser. No. 569,392

Int. Cl.[5] A61B *7/02*

U.S. Cl. 181—135 6 Claims



1. An improved ear plug assembly for use with a hearing aid comprising an electronic package which includes a receiver, an ear plug assembly and a tube having a first end which connects to the receiver and a second end which connects to the ear plug assembly, said improved ear plug assembly comprising:

a flexible hollow generally conical shell member having an interior surface and an exterior surface and a large open end and a small open end;

means for securing said second end of said tube to the interior surface of the small open end of said shell member;

a spring, having an inner diameter greater than an outside diameter of said tube, mounted upon and circumscribing the tube and having a first end proximate said means for securing; and

slidable annular nut means mounted upon said tube for contacting a second end of said spring.

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5,046,581

## LOUDSPEAKER SYSTEM

James E. Mitchell, Little Rock, Ark., assignor to Sound-Craft Systems, Inc., Morrilton, Ark.

Filed May 16, 1989, Ser. No. 352,357

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—152 4 Claims

1. A speaker system for converting electric signals to acoustic energy for transfer of said acoustic energy to a listening position, said system comprising:

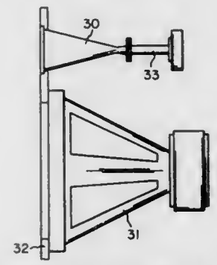
a plurality of acoustic radiation devices each having drivers for converting electrical to mechanical energy and having acoustic energy exits,



said plurality of acoustic radiation devices including at least one horn-type acoustic radiation device defined by a driver for converting electrical to mechanical energy and a horn being a ridged, non-absorbing, tapered duct for directing acoustic energy away from the driver, said horn having larger and smaller ends, the larger end being the acoustic energy exit of the horn-type acoustic radiation device,

said plurality of acoustic radiation devices being mounted such that the acoustic energy exits thereof define a geometric surface, and

said at least one horn-type acoustic radiation device being provided with an acoustic waveguide between the driver



and the horn, said waveguide having a substantially constant cross-sectional area between the driver and the horn, said waveguide spacing the driver a selected distance from the acoustic radiation exit of the horn-type acoustic radiation device such that the selected distance is substantially the same as the distance from the driver of at least one other of said plurality of acoustic radiation devices to the acoustic radiation exit of said at least one other acoustic radiation device whereby the sound generated by the driver of the at least one horn-type acoustic radiation device and sound simultaneously generated by the driver of said at least one other of said plurality of acoustic radiation devices reach the listening position at the same time.

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5,046,582

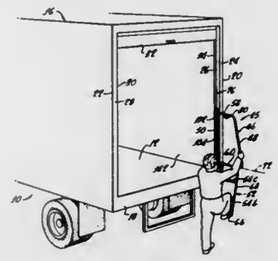
## FOLDABLE LADDER COMBINATION WITH TRUCK CARGO CARRIER

Leonard N. Albrecht, 12 Moss Glen, Irvine, Calif. 92715

Filed Oct. 3, 1990, Ser. No. 592,278

Int. Cl.[5] E06C *5/00*

U.S. Cl. 182—127 9 Claims



2. In combination with a truck cargo carrier, said truck cargo carrier including an elongated approximately horizontal cargo bed elevated a substantial distance above ground level, and an elongated structural cargo enclosure extending upwardly from and substantially covering said cargo bed, said cargo bed having a rear end from which cargo is loaded into and unloaded from the cargo carrier, and said structural cargo enclosure having right and left side edges extending approximately vertically upward from adjacent the rear end of the cargo bed, and at least one rear door adjoining at least one of said vertical side edges for providing loading and unloading rear access to the structural cargo enclosure and cargo bed, the improvement which comprises:

(a) a folding ladder disposed approximately vertically and including an upper open ladder portion having dual hand rails, and a lower ladder portion having rungs;

(b) the upper open ladder portion and the lower runged ladder portion both having upper and lower ends and right and left longitudinal edges;

(c) means pivotally connecting the upper end of the lower runged ladder portion to the lower end of the upper open ladder portion for pivotal movement about an approximately horizontal axis between a folded pivotal position for storage and an open pivotal position deployed for use;

(d) said upper open and lower runged ladder portions being configured so that the lower runged ladder portion nests in the upper open ladder portion between the dual hand rails thereof in the folded pivotal position;

(e) means for releasably retaining the lower runged ladder portion in the folded pivotal position;

(f) means for limiting the open pivotal position of the lower runged ladder portion; and,

(g) means for mounting the upper open ladder portion to the structural cargo enclosure above the cargo bed and adjacent said juncture of the rear door with said one side edge of the structural cargo enclosure, with the upper open ladder portion being disposed approximately vertically and with the lower end of the upper open ladder portion being disposed above but proximate to the same elevation as the cargo bed;

(h) said means for mounting the upper open ladder portion to the structural cargo enclosure comprising:

(1) pivot means mounted to the structural cargo enclosure and defining an approximately vertical pivot axis;

(2) support members connected to the upper open ladder portion at or adjacent one of said longitudinal edges thereof; and,

(3) means including said support members for pivotally mounting said upper open ladder portion to said pivot means, whereby the ladder in the folded position may be pivoted about said vertical pivot axis forwardly toward the cargo enclosure to a stable stowed position, and whereby the ladder in the folded position may be pivoted about said vertical pivot axis rearwardly away from the cargo enclosure to a stable position outboard of the rear end of the cargo bed to facilitate the lower runged ladder portion to in turn be pivoted about said horizontal pivot axis and deployed to its open position, for ladder across by the user from ground level to said elevated cargo bed.

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5,046,583

## OIL LEVEL SENSOR FOR AN INTERNAL COMBUSTION ENGINE

Asao Sasaki, Noda, and Yosuke Kubota, Kita, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1990, Ser. No. 528,036

Claims priority, application Japan, May 25, 1989, 1-132089

Int. Cl.[5] F01M *1/18*

U.S. Cl. 184—6.4 7 Claims

1. An oil level sensor for sensing a level of oil in an oil pan, comprising:

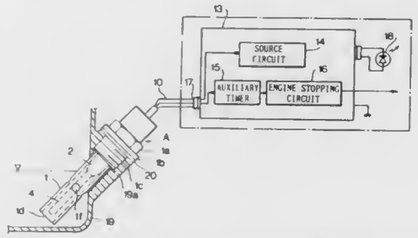
a cylindrical sensor body having a cylindrical hollow portion, said cylindrical sensor body being made of electrically conductive resin having low heat conductivity including carbon;

an elongated inner electrode made of electrically conductive resin having low heat conductivity;

an inner electrode guide made of an insulator and supporting said elongated inner electrode so as to provide a predeter-

mined space between an inner surface of said cylindrical sensor body and said inner electrode; and

an oil level detecting circuit electrically connected to the




inner electrode and the sensor body for detecting resistance between said sensor body and said inner electrode and for producing a logical level signal when said predetermined space is filled with the oil.

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**5,046,584**

**ELEVATOR OCCUPANT LOAD WEIGHING SENSOR MOUNTING ASSEMBLY**

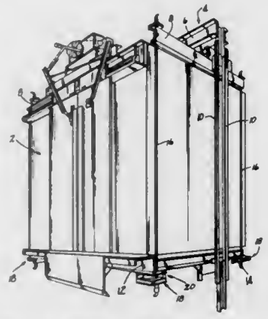
**Young S. Yoo, Avon, and John K. Salmon, South Windsor, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.**

**Filed Sep. 13, 1990, Ser. No. 582,276**

**The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.**

**Int. Cl.[5] B66B *5/14***

**U.S. Cl. 187—1 R** **6 Claims**



1. An elevator car assembly having improved load weighing capabilities, said assembly comprising:

a. a car assembly frame;

b. an occupant-carrying cab;

c. a plurality of pendulum support rods connecting said cab to said frame, said rods being disposed one at each corner of said cab and having one end connected to said frame and an opposite end connected to said cab whereby said rods are tensioned in proportion with the weight of said cab and its occupants;

d. a load weighing cell assembly mounted on at least one of said rods and operable to measure cab and occupant load at said one of said rods, said cell assembly including a load weighing cell and an associated load support means operable to limit the load imposed upon said cell to a fraction of actual load at said one of said rods.

**5,046,585**

**UPRIGHT ASSEMBLY FOR FORK LIFT TRUCK**

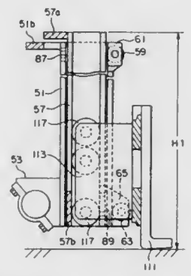
**Shuji Ohta, and Toshiyuki Takeuchi, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusbo, Kariya, Japan**

**Filed Feb. 21, 1990, Ser. No. 482,695**

**Claims priority, application Japan, Feb. 23, 1989, 1-44294; Feb. 23, 1989, 1-44295**

**Int. Cl.[5] B66B *9/20***

**U.S. Cl. 187—9 E** **14 Claims**



1. An upright assembly for a forklift truck, comprising a U-shaped cross-sectional outer mast having an upper end and a lower end and oriented facing a side of said truck to thereby provide an outer mast front leg having inner and outer surfaces and an outer mast rear leg having inner and outer surfaces, and a U-shaped cross-sectional inner mast having an upper end and a lower end and slidably received within the U-shape of said outer mast to thereby provide an inner mast front leg having an outer surface cofacing said outer mast front leg inner surface and an inner mast rear leg having an outer surface cofacing said outer mast rear leg inner surface, an outer mast roller mounted on said upper end of the outer mast in rolling engagement with said inner mast front leg outer surface, a rear liner attached to said outer mast rear leg inner surface adjacent to said outer mast upper end and in sliding engagement with said inner mast rear leg outer surface, an inner mast roller mounted on said lower end of the inner mast in rolling engagement with said outer mast front leg outer surface, and a front liner attached to said inner mast front leg outer surface adjacent to said inner mast lower end and in sliding engagement with said outer mast front leg inner surface.

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**5,046,586**

**CONTROL VALVE FOR A HYDRAULIC ELEVATOR**

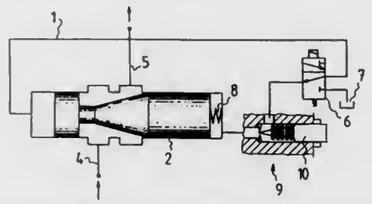
**Raimo Pelto-Huikko, Vantaa, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland**

**Filed Dec. 19, 1990, Ser. No. 629,793**

**Claims priority, application Finland, Dec. 19, 1989, 896103**

**Int. Cl.[5] B66B *9/04***

**U.S. Cl. 187—17** **7 Claims**



1. A control valve for a hydraulic elevator comprising:

(a) a main hydraulic channel, through which the main flow of the hydraulic fluid passes;

(b) a speed regulating plug, disposed in said main channel and responsive to the flow of hydraulic fluid, the position of said speed regulating plug determining the flow of hydraulic fluid into the actuating cylinder of the elevator;

(c) a system of hydraulic channels, connected to each end of said speed regulating plug and communicating with said main hydraulic circuit, such that when said speed regulating plug is closing, one component of hydraulic fluid flow passes out of the space at one end of said speed regulating plug, and a second flow component of hydraulic fluid flows into the space at the other end of said speed regulating plug; and

(d) A flow resistance component disposed in said system of hydraulic channels near either end of said speed regulating plug; the setting of said flow resistance component being varied on the basis of the temperature of the hydraulic fluid such that the rate of flow through said flow resistance component is maintained essentially constant throughout the operating range of temperatures of the hydraulic fluid.



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**5,046,587**

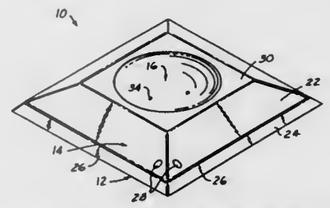
**TRAILER TONGUE WHEEL CHOCK AND SUPPORT**

**Duane C. Jones, 523 Spruce St., Manistee, Mich. 49660**

**Filed Nov. 30, 1989, Ser. No. 444,046**

**Int. Cl.[5] B60T *3/00*; A47H *1/10***

**U.S. Cl. 188—32** **11 Claims**



1. A wheel chock comprising, a one piece unitary body of an elastomeric material having a base, said base having a generally planar bottom surface, a ramp extending around the entire periphery of the base, said ramp having a lower portion extending around the periphery of said base and inclined to said bottom surface at an acute included angle of 45° to 75° and an upper wall portion inclined to said bottom surface at an acute included angle of 30° to 60°, said upper and lower wall portions being inclined to each other at an obtuse included angle, said ramp sloping upwardly and inwardly to provide an approach for a wheel around the entire periphery of said base, and a receiver, said receiver being inboard of the upper edge of said upper wall portion of said ramp and having a generally bowl shape and concave recess for releasably receiving a wheel and supporting the load thereon.

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**5,046,588**

**CAM-OPERATED RAIL CLAMP**

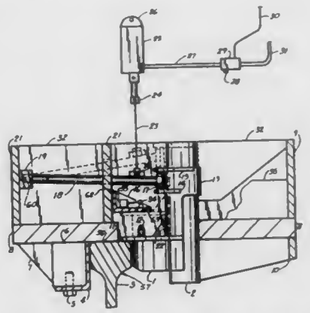
**Ronald Boben, 503 N. Ingleside, Fairhope, Ala. 36532**

**Filed Sep. 14, 1990, Ser. No. 582,669**

**Int. Cl.[5] B61H *7/12***

**U.S. Cl. 188—41** **2 Claims**

1. A cam operated rail clamping device for preventing movement of a vehicle on a rail comprising: a base; a vertically disposed post projecting upwardly from said base and secured thereto; a tubular member rotatably and slidably mounted on said post; means for raising said tubular member; a vertically disposed beam extending upwardly from said base and secured thereto; a horizontally disposed flange secured to the lower end of said tubular member; a clamping jaw carried by said flange and provided with a high point and a plurality of teeth for engagement with a first side of a rail; a wearing shoe carried by said base for engagement with a second side of said rail; said flange being mounted for rotation about said post to bring said high point of said jaw into wedging action with said first side of said rail when said flange engages a top portion of said



rail, and means for positioning said clamping jaw in a lowered operative position and a raised inoperative position.

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**5,046,589**

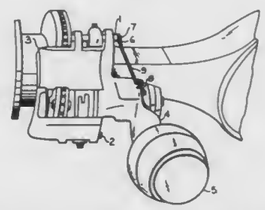
**REDUCTION OF CALIPER LINING WEAR IN AIR BRAKES**

**Larry G. Bright, 4057 Kingsway Dr., Crown Point, Ind. 46307**

**Filed Apr. 10, 1990, Ser. No. 506,943**

**Int. Cl.[5] F16D *55/22***

**U.S. Cl. 188—72.3** **10 Claims**



1. The method of reducing friction and wear in the caliper brake lining and the outboard surface of the rotor in an air brake system wherein a caliper suspended on upper and lower slide pins moves a brake shoe against the outboard side of a rotor while, concurrently, a piston moves a brake shoe against the inboard side of the rotor and in which an air chamber is suspended from said caliper by an air chamber bracket, said friction and wear being caused by the frictional force imposed by the weight of the suspended air chamber acting upon the slide pins to prevent return of the caliper after brake release which method comprises suspending a portion of the weight of said air chamber from an elastic member attached between the upper slide pin at the end of the slide pin nearest the air chamber and the air chamber bracket at an angle providing a component of force opposite to the direction of the caliper when the caliper applies a braking force to the rotor.

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**5,046,590**

**BRAKING DEVICE FOR A ROTARY ELEMENT**

**Daniel Trema, Bezons, France, assignor to Elf France, Courbevoie, France**

**Continuation of Ser. No. 526,768, May 18, 1990, abandoned, which is a continuation of Ser. No. 272,633, Nov. 17, 1988, abandoned. This application Jan. 16, 1991, Ser. No. 641,819**

**Claims priority, application France, Dec. 4, 1987, 87 16863**

**Int. Cl.[5] F16D *55/228***

**U.S. Cl. 88—72.5** **3 Claims**

1. A braking device for a wheel carried by a single wheel carrier and suspension arm of a motorcycle, comprising first

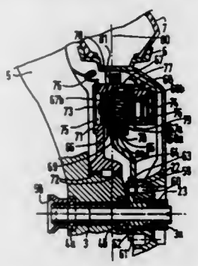
VOL 1130 ISS 2 SE 10 1991 UMI



and second centrally-splined brake disks associated with respective first and second brake linings, each disk having substantially the same inside and outside diameter and a braking surface and a rear surface, said disks being mounted on a rotating shaft carrying splines matching those of said disks with the respective rear surfaces back-to-back in contact over substantially the entire surface area of said rear surfaces, whereby said disks rotate integrally with said shaft while undergoing axial displacement along said shaft;

a central abutment integral with said shaft for limiting the axial displacement of said disks;

pairs of hydraulic cylinder-pistons mounted on respective arms of a brake caliper straddling said first and second brake disks, said pistons adapted to limit the axial displacement of the disks when in a fully retracted position in cooperation with said central abutment and adapted to engage said first and second brake linings, said first disk and said first lining being, respectively, composed of a heat resistant ferrous metallic material and a carbon-free friction material, said second disk and said second lining composed of a fibrous carbon-base material, said second disk being substantially thicker than said first disk, said



brake caliper being rigidly fastened to said arm at a position such that said cylinder-piston pairs lie on each side of a median vertical plane of said wheel, wherein the reaction forces resulting from the application of a braking force to said disks are transferred to said arm at a point substantially coinciding with said median vertical axis; and

master cylinder means hydraulically connected to said hydraulic cylinder-piston pairs and adapted, upon an initial application of said braking force thereto, to actuate only one of said pistons whereby, in cooperation with said central abutment, said contacting rear faces of said first and second disks adopt a position substantially coinciding with said median vertical axis of said wheel, and with the initial application of said braking force to said first disk at a position that also lies approximately on said median vertical plane thermal energy produced by said braking force from said first disk is transferred to said second disk with the corresponding cooling of said first disk, and said master cylinder means adapted to actuate said second piston to urge said second lining into contact with said heated second disk only when said initial braking force exceeds a predetermined offset value.

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**5,046,591**

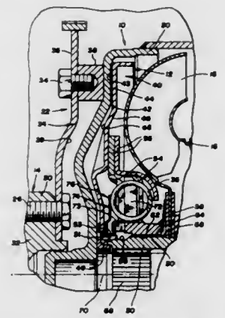
**TORQUE CONVERTER CLUTCH WITH FLUID PRESSURE APPLIED VARIABLE FRICTION DAMPING**

**John B. Hageman, Vandalila, and Gerald C. Danielewicz, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 13, 1990, Ser. No. 627,119**
**Int. Cl.[5] F16H** *45/02*
**U.S. Cl. 192—3.29** **3 Claims**

3. A damper for a selectively engageable frictional clutch disposed within a torque converter functionally interposed between a vehicle engine and a vehicle transmission, the torque converter having an input shell rotatively fixed to the engine and a torque converter output element rotatively fixed to the transmission, the clutch having a two sided pressure plate with an apply side and a release side with a friction pad, and being selectively engageable with the torque converter input shell and rotatable relative to the output element comprising:

a damper piston coaxial with the pressure plate and with a friction element fixed on a damper piston surface adjacent to the pressure plate, applied against the pressure plate by fluid pressure simultaneous to fluid pressure on the apply



side of the pressure plate applying the pressure plate against the input shell, being rotatively fixed to the output element and axially movable relative to the pressure plate; and

means for allowing fluid trapped radially inward of the friction element between the pressure plate and the damper piston during an apply of the clutch to escape from the apply side to the release side of the pressure plate element.

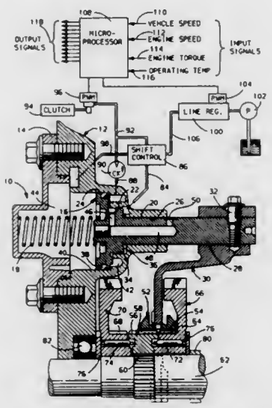
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**5,046,592**

**SERVO SHIFT CONTROL FOR A FORWARD/REVERSE MECHANISM**

**James K. Mainquist, Clarkston; Robert C. Downs, Ortonville, and Larry T. Nitz, Troy, all of Mich., assignors to Saturn Corporation, Troy, Mich.**

**Filed Oct. 5, 1990, Ser. No. 593,728**
**Int. Cl.[5] B60K** *41/22*
**U.S. Cl. 192—3.58** **3 Claims**




1. A forward/reverse servo controller in a shift mechanism comprising: a shaft; forward gear means; reverse gear means;



clutch means including shift fork means movable to a first position for connecting said forward gear means to said shaft and to a second position for connecting said reverse gear means to said shaft; fluid operated piston means for controlling movement of said shift fork means between said first and second positions; housing means for enclosing said piston means and cooperating therewith to form a first fluid chamber on one side of said piston means, a second fluid chamber on the one side of said piston means; spring means disposed between said housing means and said piston means for urging said piston means to move said shift fork to said first position and to position said piston means in said housing means with said first chamber sealed from fluid communication with said said second chamber; and fluid pressure source means selectively connectible with said first chamber for providing a fluid pressure controlled at a first pressure level insufficient to move said piston means against said spring means and controlled at a second level pressure sufficient to move said piston means against said spring means to move said shift fork to said second position and to establish fluid communication between said first and second chambers, and said first pressure level then being sufficient to maintain said piston means and said shift fork in said second position.

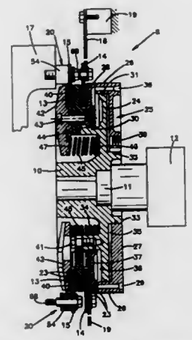
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**5,046,593**

**COUPLING ASSEMBLY**

**Marcus H. Collins, Akron, and Ronald W. Diesch, Lodi, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Jul. 31, 1990, Ser. No. 560,904**
**Int. Cl.[5] F16D** *67/04, 3/70*
**U.S. Cl. 192—18 A** **11 Claims**



1. A coupling assembly operable from a disengaged condition to an engaged condition to retard relative rotation between first and second elements, said coupling assembly comprising an axially movable coupling member, connector means for connecting said coupling member with the first element, friction surface means connected with the second element, and actuator means for operating said coupling assembly from the disengaged condition to the engaged condition by pressing said friction surface means against said coupling member to apply axial and rotational forces to said coupling member, said connector means including a polyurethane bushing connected with the first element and force transmitting surface means connected with said coupling member and disposed in abutting engagement with an outer side surface of said polyurethane bushing, said force transmitting surface means being effective to transmit rotational forces between said coupling member and the outer side surface of said polyurethane bushing when said coupling assembly is in the engaged condition.

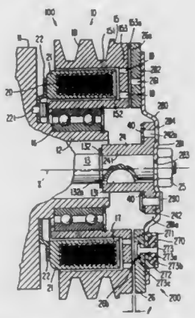
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**5,046,594**

**ELECTROMAGNETIC CLUTCH**

**Katsuhiko Kakinuma, Maebasi, Japan, assignor to Sanden Corporation, Gunma, Japan**

**Filed Oct. 12, 1990, Ser. No. 596,538**
**Claims priority, application Japan, Oct. 13, 1989, 1-119153[U]**
**Int. Cl.[5] F16D** *27/00*
**U.S. Cl. 192—84 C** **4 Claims**



1. In an electromagnetic clutch assembly including a first member rotatable about an axis and having an axial end plate of magnetic material, a second member rotatable about said axis and comprising a tubular member and a flange portion extending from an outer peripheral surface of said tubular member, said second rotatable member frictionally held on a drive shaft, an annular armature plate of magnetic material coupled to said flange portion of said tubular member so that said annular armature plate is capable of limited movement relative said tubular member along said axis, said annular armature plate facing said axial end plate of said first rotatable member with an axial air gap therebetween and electromagnetic means associated with said first rotatable member for attracting said armature plate into contact with said axial end plate such that the rotation of said first rotatable member can be transmitted to said second rotatable member through said annular armature plate when said electromagnetic means is activated, said flange portion of said tubular member comprising a plurality of holes for use in detaching said tubular member from said drive shaft, an improvement comprising:

blocking means for blocking water from entering said electromagnetic clutch assembly from outside the assembly through said holes.

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**5,046,595**

**TORQUE TRANSMISSION COUPLING**

**Masaharu Sumiyoshi, and Masaaki Noguchi, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan**

**Continuation of Ser. No. 232,532, Aug. 16, 1988, abandoned, which is a continuation of Ser. No. 942,404, Dec. 16, 1986, abandoned. This application Apr. 9, 1990, Ser. No. 507,107**
**Claims priority, application Japan, Dec. 26, 1985, 60-295802**
**Int. Cl.[5] F16D** *25/02, 43/28*
**U.S. Cl. 192—85 AA** **1 Claim**

1. A torque transmission coupling which comprises:

(a) a first rotary shaft;

(b) a second rotary shaft;

(c) a hydraulic pump means which includes:

(i) a first rotor having a prescribed form and disposed on said first rotary shaft so as to e rotated together therewith;

(ii) a second rotor disposed on said second rotary shaft so as to be rotated together therewith and so as to act so that, when a revolution speed difference has occurred between first and second rotary shafts, said first and second rotary shafts are relatively slided on each sliding surface thereon

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by a relative rotation corresponding to said difference to heighten the pressure of liquid-tightly interposed oil and then to supply the pressure-heightened oil; and

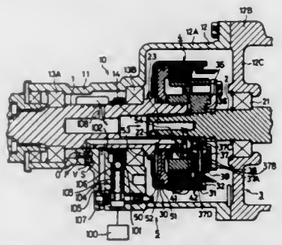
(iii) means for allowing a slight rotational speed difference between said first and second rotary shafts when said hydraulic pump means produces the pressure-heightened hydraulic oil in response to the relative rotation of said first and second rotors;

(d) a multiple-disc clutch means which includes:

(i) a group of engaging members disposed on said first rotary shaft so as to be rotated together therewith and so as to be movable in the axial direction thereof relative to said first rotary shaft and

(ii) another group of engaging members which are disposed on said second rotary shaft so as to be rotated together therewith and which are placed between the former engaging members so as to constitute a multiple-disc clutch, thus making it possible to engage both said groups of engaging members with each together to transmit torque; and

(e) a pushing means which includes:



(i) a hydraulic operating chamber to which the pressure of the oil from said hydraulic pump means is applied through an oil pressure passage means and

(ii) a pushing member which is separate from said means for allowing a slight rotational speed difference and which is defined on one part of the inner surface of said hydraulic operating chamber and which is moved depending on said oil pressure so as to move at least one of said groups of engaging members in such a direction as to reduce the distance between said groups of engaging members to engage said members with each other, wherein:

(f) when said revolution speed difference has occurred between said first and second rotors of said hydraulic pump means, said oil pressure is produced by said relative rotating corresponding to said difference and is then applied to said hydraulic operating chamber through said oil pressure passage means to move said pushing member to engage both said groups of engaging members of said multiple-disc clutch means with each other to transmit said torque in response to said relative rotating from said first rotary shaft to said second rotary shaft.

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**5,046,596**

**METHODS AND APPARATUS FOR CONTROLLING THE FRICTIONAL ENGAGEMENT BETWEEN A HUB AND A SHAFT AT A POWER TRANSMISSION INTERFACE**

**R. Bruce Dennert, Waukesha, Wis., assignor to Harley-Davidson, Inc., Milwaukee, Wis.**

**Filed Mar. 27, 1990, Ser. No. 499,905**
**Int. Cl.[5] F16D *3/14***
**U.S. Cl. 192—106.1** **20 Claims**

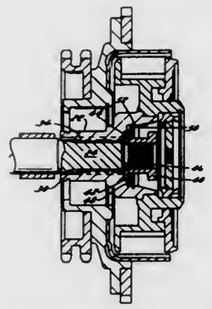
1. An apparatus for controlling relative angular motion between a hub and a shaft configured for rotation therewith, comprising:

a hub having a bore extending therethrough and a first surface disposed transverse to the axis of said bore;

a shaft journalled through said bore and having a first end disposed proximate said first surface of said bore;

friction means, secured to said shaft proximate said first end, for frictionally engaging a portion of said first surface; and

control means, cooperating with said hub and said shaft, for applying a predetermined amount of force to said friction



means to thereby inhibit relative angular motion between said shaft and said hub, said control means being configured to be free of contact with said portion of said first surface which is engaged by said friction means.

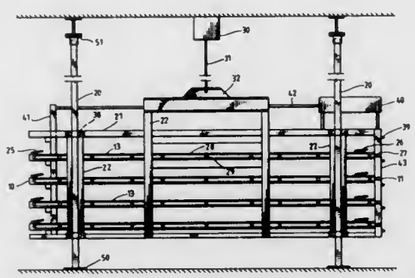
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**5,046,597**

**MODULAR TRAY ACCUMULATOR SYSTEM**

**Lloyd H. Smith, College Station, Tex., assignor to The Texas A&M University System, College Station, Tex.**

**Filed Jun. 7, 1989, Ser. No. 362,573**
**Int. Cl.[5] B65G *37/00***
**U.S. Cl. 198—347.4** **4 Claims**



1. A modular tray accumulator system for conveying and storing dish trays and the like, comprising:

a plurality of conveyors disposed in a module having vertical columns and horizontal rows, each conveyor independently advancing dish trays from a tray receiving end to a tray removal end;

drive means adapted to advance a conveyor forward at least one dish tray position when a dish tray is placed on the tray receiving end of the conveyor for providing an open dish tray position at the tray receiving end of the conveyor; wherein the drive means comprises a drive mechanism for each conveyor, detecting means for detecting the placement of a dish tray on the tray receiving end of a conveyor, and switching means responsive to the detecting means for activating the drive mechanism for a preselected period; and

means for raising and lowering the module.

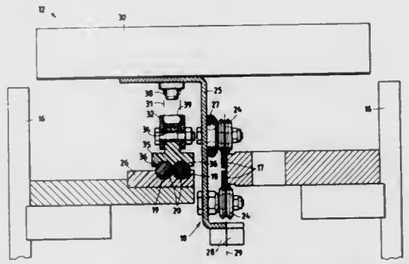


**5,046,598**

**APPARATUS FOR CONVEYING, ACCUMULATING IN SUCCESSION AND ARRANGING PRODUCTS OR READY-MADE ARTICLES IN GROUPS**

**Arturo Colamussi, Ferrara, Italy, assignor to Vortex Systems S.r.l., Fossalta di Copparo, Italy**

**Filed Nov. 8, 1988, Ser. No. 268,737**
**Claims priority, application Italy, Nov. 13, 1987, 22645 A/87; May 25, 1988, 20730 A/88**
**Int. Cl.[5] B65G *29/00***
**U.S. Cl. 198—465.1** **11 Claims**



1. An apparatus for conveying, accumulating in succession and arranging articles in groups, said conveying apparatus receiving articles from at least one feed conveyor and discharging the received articles upon a discharging conveyor, said conveying apparatus comprising an article collecting conveyor having at least one continuous closed-loop driving element being driven by a drive pulley which is driven by a central motor unit, said at least one continuous closed-loop element being moved along a closed-loop pathway positioned inside a framework of said article collecting conveyor, container means being arranged in side-by-side relation to each other for receiving the received articles, said container means being moved from the at least one feed conveyor along said article collecting conveyor to the discharging conveyor by said at least one continuous closed-loop driving element, a plurality of saddles with each saddle providing support for at least one of said container means carrying an article of the received articles, each saddle being slidingly moved independently from one another by said at least one continuous closed-loop driving element and on guide elements, friction means for frictionally retaining each saddle to said at least one continuous closed-loop driving element, each saddle having an appendix element, at least one stopping element being positioned along the pathway for contacting said appendix element of each saddle whereby said friction means of each saddle is frictionally released from said at least one continuous closed-loop driving element to slide, first sensor means for detecting articles on the article feeding conveyor and activating said at least one stopping element being provided, said at least one continuous closed-loop driving element being slidably guided on recessed guides made from an anti-friction material along the closed-loop path, both said recessed guides and said friction means of said saddles having on mutually opposite faces seats of complementary shape relatively to said at least one continuous closed-loop driving element.

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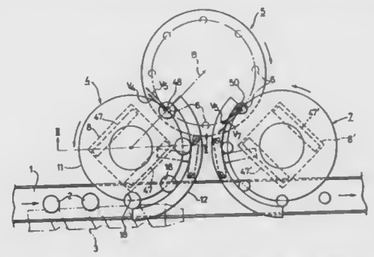
**5,046,599**

**ARTICLE HAND-OFF APPARATUS**

**Itirou Hamano, Ishikawa, Japan, assignor to Shibuya Kogyo Co., Ltd., Ishikawa, Japan**

**Filed Jul. 7, 1989, Ser. No. 376,848**
**Claims priority, application Japan, Aug. 17, 1988, 63-204235**
**Int. Cl.[5] B65G *29/00***
**U.S. Cl. 198—481.1** **8 Claims**

1. Article hand-off apparatus including a rotatable body supported for rotation about a rotational axis and having a plurality of article receiving pockets formed around its outer peripheral surface, a rigid, arcuate guide member which is fixed relative to said rotational axis and disposed in surrounding relationship with the outer peripheral surface of the rotatable body, and regulating means for adjusting the size of the pockets in accordance with the size of articles to be conveyed and for adjusting a clearance between such article and the inner peripheral surface of the arcuate guide member to a given value, the arrangement being such that an article handed



off an upstream machine is received within one of the pockets and then angularly driven to move along the inner peripheral surface of the arcuate guide member to be delivered to a downstream machine; wherein the rotatable body and the arcuate guide member are disposed so as to be capable of integrally and in unison adjusting their positions, including the position of said rotational axis, in a direction substantially perpendicular to a direction in which an article moves at an article hand-off position between said rotatable body and one of the upstream machine and the downstream machine.

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**5,046,600**

**APPARATUS AND METHOD FOR AUTOMATICALLY LIFTING CONVEYOR SECTIONS**

**Alain Cerf, 10650 72nd St. North, Bldg. 402, Largo, Fla. 34647**

**Filed Dec. 21, 1989, Ser. No. 454,663**
**Int. Cl.[5] B65G *15/44***
**U.S. Cl. 198—697** **20 Claims**



1. A method for lifting preselected buckets of a bucket-type conveyor above the plane of the conveyor, comprising the steps of:

affixing to each of a plurality of sets of preselected pivotally mounted buckets a member that rigidly depends therefrom;

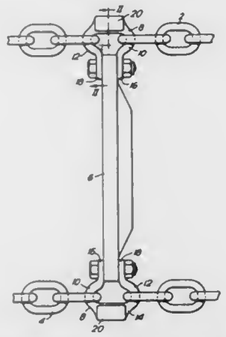
positioning below said buckets at least one movably mounted elongate rail member for each set having two positions of vertical adjustment; and

raising a preselected elongate rail member to a height where it is disposed in the path of travel of said members depending from said preselected set of buckets so that each of said members pivots upwardly in response to encountering said elongate rail.

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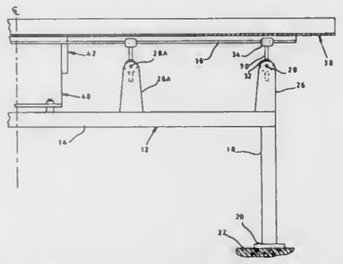


5,046,601
**SCRAPER CHAIN CONVEYOR ASSEMBLIES**
Christopher Burdon; Michael J. Millington, and Kevin S. Ward, all of Kidderminster, England, assignors to Parsons Chain Company Limited, Worcestershire, England
Filed Oct. 12, 1990, Ser. No. 596,548
Claims priority, application United Kingdom, Oct. 19, 1989, 8923566
Int. Cl.[5] B65G *19/24*
U.S. Cl. 198—731 7 Claims



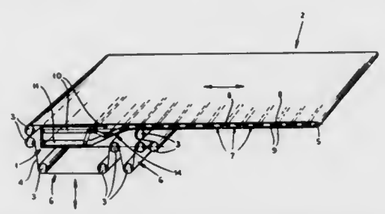
1. A shackle connector for a scraper chain conveyor assembly, the shackle connector including a pair of semi-toroidal crown portions having one pair of opposed extremities connected together by a leg portion provided with an enlarged portion or pad and the other pair of opposed extremities connected to respective laterally extending limbs adapted to be secured to a scraper bar of the scraper chain conveyor assembly, wherein the surface or surface and sub-surface hardness value of the enlarged portion or pad of the shackle connector is substantially less than the surface hardness value of the remainder of the shackle connector.

5,046,602
**INERTIAL CONVEYOR SYSTEM**
Alfred E. Smalley, Knox County, and Joseph C. Gundlach, Anderson County, both of Tenn., assignors to Smalley Mfg. Co., Knoxville and Acraloc Corp., Oak Ridge, both of, Tenn.
Filed Jan. 25, 1990, Ser. No. 470,844
Int. Cl.[5] B65G *27/00*
U.S. Cl. 198—750 20 Claims



1. An inertial-type conveyor system for the moving of articles therewith, said conveyor system having reduced detrimental vibration, said conveyor system comprising:
a frame member;
a conveyor tray mechanism, including a tray member for support and movement of said articles, mounted on said frame member, said tray member adapted for longitudinal movement relative to said frame member;
means for moving said tray member in a forward longitudinal stroke of a first selected distance relative to said frame member at an acceleration less than that at which frictional contact between said articles and said tray member is overcome for a first selected time period whereby said articles move with said tray member, and for moving said tray member in an opposite return longitudinal stroke of said first selected distance relative to said frame member at an acceleration greater than that at which said frictional contact is overcome for a second selected time period whereby said . articles continue to move on said tray member by inertia while said tray member moves in said opposite direction; and
means associated with said frame member for offsetting reaction forces produced by movement of said tray member during said forward and return strokes.

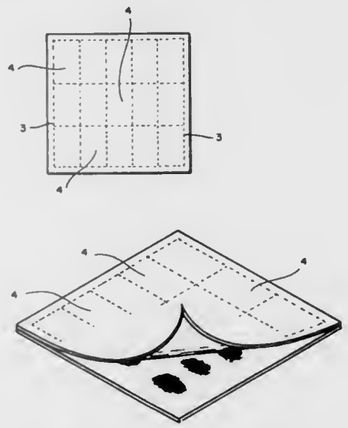
5,046,603
**TRANSFER APPARATUS, ESPECIALLY FOR PACKAGING EQUIPMENT FOR PAPER STACKS IN THE PAPER INDUSTRY**
Heinz F. Odenthal, Zülpich, Fed. Rep. of Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Fed. Rep. of Germany
Filed Jan. 9, 1990, Ser. No. 462,419
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1989, 3903820
Int. Cl.[5] B65G *21/14*
U.S. Cl. 198—812 4 Claims



1. A transfer device, especially for a packaging apparatus for paper stacks in the paper industry, comprising:
a support frame;
a plurality of bar-shaped transfer table elements interconnected at opposite ends by pivotal links to form a chain having respective pivots, said elements being provided with running rollers at said pivots;
guide means on said frame for guiding said chain between an extended position wherein said elements define a substantially rigid transfer table in a generally horizontal plane cantilevered from said frame and a retracted position wherein said elements are drawn together on said frame;
an endless transfer belt passing over said transfer table; and
a plurality of deflecting rollers around which said belt passes and defining at least one compensating loop which contracts as said table is extended and expands as such table is retracted, said guide means being constructed and arranged to guide said elements into a zigzag orientation upon retraction of said table and including upper and lower guide rails, said lower guide rail having a branch rail segment directing said running rollers into said upper guide rail.

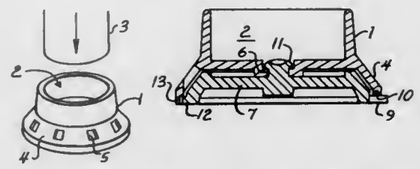


5,046,604
**ODOR-ABSORBING LINER**
Dawn V. Forbetz, and Scott A. Forbetz, both of 609 E. Main St., Collinsville, Ill. 62234
Filed Dec. 24, 1990, Ser. No. 632,929
Int. Cl.[5] A41B *9/04*; F17S *13/00*; B65D *75/28*
U.S. Cl. 206—0.5 3 Claims



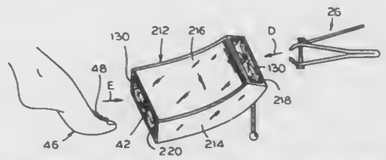
1. An odor-absorbing drawer liner, comprising:
(a) upper and lower porous sheets stitched together to form pouches;
(b) an odor-absorbing material contained in at least one of said pouches.

5,046,605
**CONTACT LENS CONTAINER HOLDER**
Paul Levrant, London, United Kingdom, assignor to Boulevard Products Ltd., Great Britain
Filed Feb. 23, 1990, Ser. No. 485,107
Int. Cl.[5] A45C *11/04*
U.S. Cl. 206—5.1 9 Claims



1. A holder for retaining a contact lens container comprising:
retaining means having at least one wall defining a well for receiving a contact lens container wherein the retaining means defines an aperture;
first and second visual indications disposed on said retaining means, corresponding to first and second states respectively of the contents of a contact lens container, the first and second visual indications comprising a first region and a second region, the first and second regions being of different colors; and
manually actuable means for switching between said first and second visual indications comprising a display member bearing the first and second regions, the display member being movable between a first position in which the first region is visible through the aperture in the retaining means and a second position in which the second region is visible through the aperture.

5,046,606
**CONTAINER FOR NAIL CLIPPINGS**
Louis A. Morelli, 118 Saddle Brook Dr., Oak Brook, Ill. 60521
Filed Jul. 6, 1990, Ser. No. 549,483
Int. Cl.[5] B65D *85/00*; A45D *29/00*
U.S. Cl. 206—37 7 Claims



1. A container for retaining nail clippings trimmed by a cutting tool comprising a hollow shell having a first opening and a second opening, wherein said first opening and said second opening are partially covered by a grommet and are diametrically opposed to one another, said first opening for receiving a digit and said second opening for receiving said cutting tool, whereby when said digit is inserted through said first opening and said cutting tool is inserted through said second opening and applied to the nail of the digit, the shell retains the nail clippings trimmed from said digit.

4. A container for retaining nail clippings trimmed by a cutting tool comprising a hollow shell having a first opening and a second opening, said first opening for receiving a digit and said second opening for receiving said cutting tool, whereby when said digit is inserted through said first opening and said cutting tool is inserted through said second opening and applied to the nail of the digit, the shell retains the nail clippings trimmed from said digit, said container further comprising at least one slidably movable actuator means for elevating said digit within said container, each of said actuator means extending through an opening on the underside of said container.

6. A container for retaining clipped nails after they have been trimmed by a cutter, comprising a hollow shell having a first opening, a second opening, and at least two grommets, said first opening and said second opening being diametrically opposed to one another, said first opening for receiving at least one digit and said second opening for receiving said cutter, wherein said grommets cover said first opening and said second opening, whereby when said digit is inserted through said first opening and said cutter is inserted through said second opening and applied to the nail of the digit, the shell retains the nail clippings trimmed from said digit.

7. A container for retaining clipped nails after they have been trimmed by a cutter, comprising a hollow shell having a first opening, a second opening, and at least two grommets, said first opening for receiving at least one digit and said second opening for receiving said cutter, wherein said grommets cover said first opening and said second opening, whereby when said digit is inserted through said first opening and said cutter is inserted through said second opening and applied to the nail of the digit, the shell retains the nail clippings trimmed from said digit, said container further comprising a slidably movable actuator means for elevating said digit within said container, said actuator means extending partially through an opening in said container, and locking means associated with

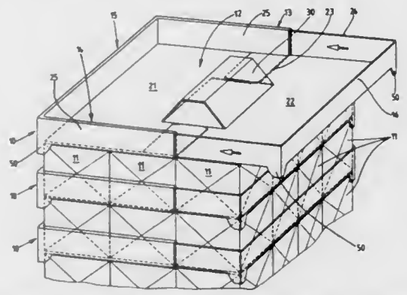
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said actuator means for maintaining said actuator means in a desired position.

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**5,046,607**
**PACK CONTAINER, ESPECIALLY TRAY, FOR RECEIVING (CARDBOARD) PACKS**
**Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co. (GmbH), Verden, Fed. Rep. of Germany**
**Filed Apr. 30, 1990, Ser. No. 516,650**
**Claims priority, application Fed. Rep. of Germany, May 11, 1989, 3915408**
**Int. Cl.[5] B65D** *71/70*
**U.S. Cl. 206—44.12** **9 Claims**



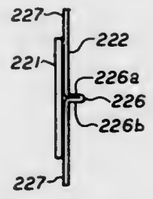
1. Pack container, in the form of a tray made from a single-piece blank of foldable material, for receiving a plurality of packs (**11**), said tray comprising:
a bottom wall (**12**) on which the packs (**11**) stand and which has lateral edges provided with mutually opposite upstanding longitudinal rims (**13, 14**) and upstanding transverse rims (**15, 16**); said bottom wall (**12**) being divided and comprising two part bottoms (**21, 22**) for varying a base surface of said bottom wall (**12**) in accordance with an amount of partial overlap (**23**) of said two part bottoms; and
a folding piece (**31**) connecting said two part bottoms (**21, 22**) to one another to form the single-piece blank; said folding piece (**31**) being upwardly foldable, upon pushing together of said two part bottoms (**21, 22**), to form an upstanding filling piece (**30**) between packs (**11**) standing on said bottom wall (**12**),
said longitudinal rims (**13, 14**) being divided in a corresponding way to said bottom wall (**12**) and comprising two part rims (**24, 25**), one part rim (**24**) being single-walled and the other part rim (**25**) being double-walled, such that said one part rim (**24**) can penetrate displaceably by means of a guide piece (**29**) into a cavity (**28**) between rim walls (**26, 27**) of said other part rim (**25**).

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**5,046,608**
**COMBINED FLUID STORAGE CONTAINER AND APPLICATOR DEVICE AND METHOD**
**Thomas C. Laippiy, 13530 Fox Den East, Russell, Ohio 44072**
**Continuation-in-part of Ser. No. 99,121, Sep. 21, 1987, abandoned, which is a division of Ser. No. 781,236, Sep. 23, 1985, Pat. No. 4,696,393, which is a continuation-in-part of Ser. No. 312,879, Oct. 19, 1981, Pat. No. 4,427,115, and a continuation-in-part of Ser. No. 312,880, Oct. 19, 1981, Pat. No. 4,427,111. This application Jul. 20, 1988, Ser. No. 221,765**
**The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.**
**Int. Cl.[5] B65D** *85/67*; **A61B** *17/20*
**U.S. Cl. 206—209** **25 Claims**

1. A combined fluid storage container and applicator device for relatively inviscid fluids, said device comprising a sheet-like fluid impermeable material having opposed portions positioned in generally flat parallel overlying relation to each other whose inside surfaces are substantially in a plane, a pair of respective edges of said opposed portions being securely joined along an effective fold line as an effectively single integral sheet of said opposed portions, temporary fluid impermeable seal means sealing said opposed portions to each other along a temporary seal line beginnning and ending at said fold line forming a cavity and enclosing fluid between said opposed portions and within said temporary seal line and said fold line, separation means for applying simultaneously and continuously in at least two opposing directions continuous separating manual resultant forces substantially transverse to said plane and at an angle that is no greater than substantially perpendicular as measured from the edges opposite to the fold line, to peel open said temporary seal means along at least a part of the length of said seal line to form a flat surface covered with the fluid while the integrity of said sheet is maintained.

21. A method of using an inviscid fluid applying health care device in which containment means for containing fluid material is attached as an integral device to a fluid impermeable means having a fold line defining a handle when the containmant means is opened and that is temporarily sealed by the inner border of a temporary fluid impermeable seal zone beginning and ending at the fold line and is spaced inwardly from the periphery of said device to form a fluid tight chamber for such fluid contained by such containmant means, comprising grasping the unsealed edges of the device using the distal ends of the fingers and thumbs and applying simultaneous, opposing and generally perpendicular resultant forces substantially perpendicular to the plane as measured from the edges opposite to the fold line to each side of the device and to peel the device




open and expose such containment means without separating the device into multiple parts, grasping the handle with distal end of a thumb and a finger of the same hand, and applying such fluid from such containment means.

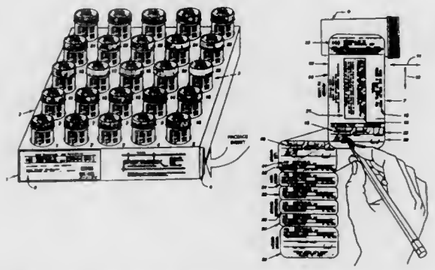
22. A method of using a fluid applying health care device in which containmant means for containing fluid material is sealed to form a fluid tight chamber containing such fluid, such device having a fold line and temporary seal zone proximate to the periphery of such containment means with a fluid impermeable seal at least at the peripherally inward portion of such seal zone, comprising using manual digits manipulating such device to open such chamber by applying simultaneous, opposing and generally perpendicularly directed resultant forces as measured from the edges opposite to the fold line to each side of the device rapidly to peel open the same and to expose such fluid, and applying such fluid from such containment means, said applying comprising holding the device proximate opposing peripheral edges including such seal zone thereof using only the distal parts of the fingers and the thumbs without touching such fluid during such wiping.

23. A method of making a fluid storage and applicator device comprising adhering an absorbent pad to at least one surface of sheet-like fluid impermeable material, positioning two opposed flat portions of such sheet-like fluid impermeable material in generally flat parallel overlying relation to each other with their inside surfaces being substantially in a plane, and sealing such portion to each other by separable peripheral temporary fluid impermeable seal lines which begin and end at a fold line itself comprising a peripheral seal zone at at least one border of the two flat portions of sheet-like impermeable material such that a continuation of simultaneous separating resultant forces substantially transverse to said plane and at angle that is no greater than a perpendicular to said plane as measured from the edges opposite to the fold line, used to peel the temporary seal lines separates the two portions of the flat sheet-like impermeable material, the fold line further providing a handle comprising a pair of opposing graspable flaps when the device is opened.



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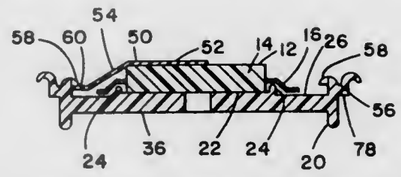
**5,046,609**
**KIT FOR DISTRIBUTING PHARMACEUTICAL PRODUCTS**
**Richard J. Mangini, Redwood City, and William J. Hartig, Pleasanton, both of Calif., assignors to Pharmedix, Hayward, Calif.**
**Continuation of Ser. No. 359,514, Jun. 1, 1989, Pat. No. 4,976,351. This application Jul. 13, 1990, Ser. No. 553,154**
**Int. Cl.[5] B65D** *69/00*
**U.S. Cl. 206—232** **4 Claims**



1. A kit for distributing pharmaceutical products which are prepackaged in individual containers comprising:
a tray having a plurality of said containers removably stored therein, each of said containers having a flag label which has an end portion permanently attached to the container which remains intact when said pharmaceutical products are dispensed form said container, with the remainder of said flag label being loosely wrapped about the container, said end portion bearing pre-printed information required by government regulations for all containers of drugs which are distributed, said pre-printed information being orientated in a direction parallel to the minor axis of said label, and each of said labels being provided with indicia for indicating the sequence in which said containers are to be dispensed from said tray.

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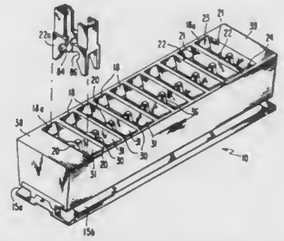
**5,046,610**
**ELECTRONIC COMPONENT CARRIER**
**John F. Runyon, St. Paul, and Ted T. Christianson, Bloomington, both of Minn., assignors to Christianson Systems, Inc., Blomkest, Minn.**
**Continuation of Ser. No. 471,828, Jan. 29, 1990, abandoned. This application Oct. 31, 1990, Ser. No. 607,604**
**Int. Cl.[5] B65D** *73/02*
**U.S. Cl. 206—330** **19 Claims**




1. A carrier for use in handling and protecting electronic surface mounted components which have a body portion and extending leads comprising:
a carrier body having a bottom member with a flat upper surface portion defining a smaller component supporting surface, said bottom member having a plurality of locator ribs surrounding said component supporting surface, said carrier body further having restraining means mountable thereon so as to extend over at least a portion of said component supporting surface to hold a selected component body portion within a chamber defined by said ribs, said supporting surface and said restraining means, with the leads thereof extending over said ribs, said restraining means including a spring latch having two latch tips and a resilient latch actuator connecting said latch tips, said spring latch movable between a component restrained position where said latch tips extend over at least a portion of said component supporting surface and a component unrestrained position where said latch tips are positioned away from said component supporting surface, said latch actuator resiliently biasing said latch tips from said component unrestrained position to said component restrained position, said carrier body further having spring latch mounting means for mounting said spring latch to said carrier body.

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**5,046,611**
**HEMOSTATIC CLIP CARTRIDGE**
**Seik Oh, Raleigh, N.C., assignor to Edward Weck Incorporated, Princeton, N.J.**
**Filed Oct. 22, 1990, Ser. No. 602,449**
**Int. Cl.[5] B65D** *85/24*
**U.S. Cl. 206—339** **2 Claims**



1. A cartridge for holding hemostatic clips comprising:
an elongated body forming a plurality of longitudinally spaced chambers, each chamber for receiving a hemostatic clip and comprising:
a central post for supporting an open hemostatic clip,
a pair of facing transverse walls extending across said body, each said transverse wall having a downwardly extending transverse wall surface and an integrally formed resilient flap downwardly and inwardly extending from said wall surface towards the longitudinal central plane of said chamber, the bottommost end of said wall surfaces adapted to contact a hemostatic clip.

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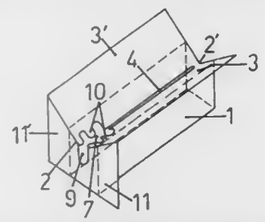
**5,046,612**
**SAFETY APPARATUS FOR EXTRACTING HYPODERMIC NEEDLES FROM THE RESPECTIVE SYRINGE**
**Jorge F. Mostarda, and Ricardo A. Brizuela, both of Calle 23 No. 1949 (1900), La Plata, Prov. of Buenos Aires, Argentina**
**Filed May 30, 1990, Ser. No. 530,599**
**Claims priority, application Argentina, Jun. 1, 1989, 314.058**
**Int. Cl.[5] B65D** *85/64*
**U.S. Cl. 206—365** **8 Claims**

1. A safety apparatus for extracting hypodermic needles from the respective syringe, comprising a rigid receptacle for

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containing the extracted needles, said receptacle being of longitudinal configuration, horizontally arranged and open at its upper face; the upper edges of the front and rear ends of said receptacle being provided with respective V-shaped notches, integrally linked by respective rigid flaps converging towards the inside of the receptacle, said flaps in their convergence zone forming a narrow slot, longitudinally extended between said front and rear ends, and capable of permitting the passage of a hypodermic needle horizontally arranged to the inside of said receptacle, said slot having in the front end, an enlargement capable of permitting the passage of the enlarged rear end of the needle; the front end of said receptable being provided




with a second slot projecting downwardly from the apex of the corresponding notch, said second slot being capable of permitting the introduction of the nozzle of a syringe with the corresponding hypodermic needle arranged therein, and capable of permitting the retention and extraction of said needle; the longitudinally extended slot having in its enlargement, means for preventing the exit to the outside of the rear end of the hypodermic needle extracted from its seat in the syringe nozzle; said front end of the receptacle being further provided with respective projections frontally extended and integral with the converging rigid flaps at the respective front ends of the flaps.

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**5,046,614**

**NEEDLE DISPOSAL CONTAINER**

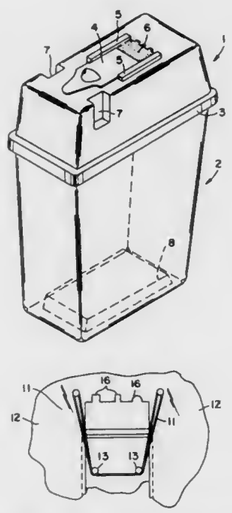
**Jonathan K. Torres, 172 Harland Rd., Norwich, Conn. 06360, and John M. Wiprud, 1662 S. 116th #3, West Allis, Wis. 53214**

**Continuation of Ser. No. 359,708, May 31, 1989, abandoned. This application Jul. 26, 1990, Ser. No. 559,398**

**Int. Cl.[5] B65D** *25/00*

**U.S. Cl. 206—366** **21 Claims**

on the lid and one spur located on the slide, and wherein the lid is further provided with a pair of notches on both




sides of the slide, which notches facilitate grasping by the user of the gathering box.

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**5,046,613**

**BOX FOR GATHERING DANGEROUS REFUSE**

**Jean-Paul Baudry, Chamalleres, and Joëlle Bourg, Royat, both of France, assignors to Centre Specialities Pharmaceuticals,**

**PCT No. PCT/FR88/00543, § 371 Date May 4, 1990, § 102(e) Date May 4, 1990, PCT Pub. No. WO89/04182, PCT Pub. Date May 18, 1989**

**PCT Filed Nov. 7, 1988, Ser. No. 487,943**

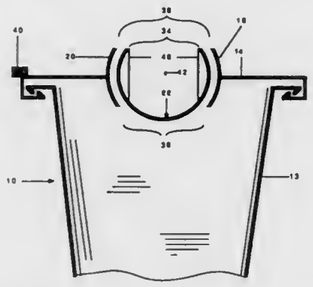
**Claims priority, application France, Nov. 6, 1987, 87 15803**

**Int. Cl.[5] B65D** *83/10*

**U.S. Cl. 206—366** **3 Claims**

1. A gathering box for dangerous products or small objects, said box comprising

a receptacle and a lid which can be irreversibly latched one on the other, the lid having at least one spur and a slide-trap type closable opening which is formed of slide having at least one spur and a pair of slideways, said slide further having means to prevent the box from opening by simple pressure on the slide, wherein the transverse edge of the opening is provided with notches, which notches permit engagement with parts of the dangerous produces or small objects such as the tip of injection needles, and wherein the slide of the slide-trap is constantly urged into the closed position over the opening by a rubber band, which rubber band is stretched between at least one spur located




1. A disposal container comprising:

a. a hollow container body;

b. a top;

c. a complete barrier means positioned within said top allowing the deposit of waste material into the interior of said container body while also maintaining a constant and complete barrier between the interior of the container body and the environment outside of the disposal container at all times, said barrier means comprising:

i. a rotatable cylinder rotatably secured to said top, said rotatable cylinder being rotatable around a horizontal



axis, at least a portion of the rotatable cylinder comprising a rotatable slot; said rotatable slot being of dimensions not larger than the dimensions of said curved surface such that the rotatable slot is never open to the inside of the container body and to the environment outside said disposal container simultaneously during any degree of rotation of said rotatable cylinder, and said stationary curved surface completely covering said rotatable slot at some degree of rotation of said rotatable cylinder,

ii. a stationary elongated curved surface affixed to said top, said curved surface being of dimension equal to or greater than said rotatable slot, said curved surface preventing direct communication between environment outside of the container and the inside of the container at all degrees of rotation of the cylinder; and

d) an external rotating device affixed to said rotatable cylinder whereby said rotatable cylinder can be rotated around said horizontal axis.

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**5,046,615**

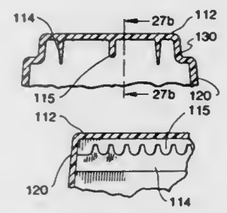
**DISK SHIPPER**

**Robert J. Nentl, Lakeville, and Dale A. Maenke, Chaska, both of Minn., assignors to Fluoroware, Inc., Chaska, Minn.**

**Continuation-in-part of Ser. No. 332,038, Apr. 3, 1989, abandoned. This application Sep. 26, 1989, Ser. No. 412,810**

**Int. Cl.[5] B65D** *85/48*

**U.S. Cl. 206—454** **23 Claims**




1. A disk shipper containing:

a shipper bottom including a generally rectangular floor member having a disk bed comprising a set of at least three disk supporting longitudinally parallel denticulate rows of ridges to cooperatingly provide at least two arcuate points of support for each disk for maintaining disks in upright lateral parallel spaced-apart axial alignment, and at least one arcuate point of location intermediate the arcuate points of support for maintaining disk position where the shipper bottom is moved out of normal horizontal resting position, the disks optimally containing a central hole concentric with the disk circumference, one part of a two part latch means integrally on each of two opposite sides of the shipper bottom, respectively, the disk bed and the latch configured so that the disks are accessible to internal diameter handling of disks having a central hole and to external diameter handling of disks substantially below the disk horizontal centerline;

a shipper cover including a generally rectangular top member having at least a longitudinal parallel pair of downwardly extending resilient flanges and at least a longitudinal row of downwardly extending crenate scallops parallel to and intermediate between the pair of flanges, said flanges being in cooperating alignment with the denticulate rows of ridges in the disk bed in the shipper bottom for providing two arcuate points of retention for each disk for maintaining the disks in upright lateral parallel spaced-apart axial alignment, and the crenate scallops being in cooperating alignment with the intermediate denticulate row of ridges in the shipper bottom for providing an arcuate point of location for maintaining disk position when the shipper is moved out of normal horizontal resting position, four side walls angled downwardly and slightly outwardly from the top member in minimum non-contact with the peripheral contour of the disks, and part two of a two part latch means integrally on each of two opposite walls, respectively, in cooperating alignment with part one of a two part latch means on the bottom;

so that the shipper cover is matable with the shipper bottom with the flanges and scallops in the cover cooperating with the denticulate rows of ridges in the disk bed in the bottom to Provide upright lateral parallel spaced apart axial alignment of the disks, and with each one part of the two part latch means in the bottom cooperating with a part two of the two part latch means on the cover to provide latching of the bottom with the cover, thus provided a secure package for transportation, handling and storage of disks.

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**5,046,616**

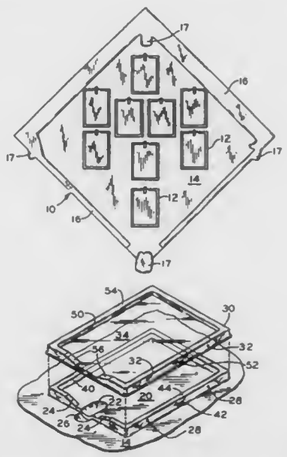
**CARD DISPLAY PLAQUE**

**Jeffrey S. Makowski, and Mark A. Makowski, both of 1105 Echo La., Bluffton, Ind. 46714-2804**

**Filed Jul. 5, 1990, Ser. No. 548,003**

**Int. Cl.[5] B65D** *73/00*

**U.S. Cl. 206—467** **10 Claims**




1. A device for holding and displaying collectable cards comprising:

a base including a generally planar portion having a card receiving area thereon for receiving a collectable card, said base including a ridge upstanding from said planar portion and substantially circumscribing said card receiving area, except for an opening through said ridge that permits lateral access by a person's finger to an edge of a card received on said card receiving area, aid ridge including an outer wall upstanding from said planar portion, an inner wall spaced from said outer wall and upstanding from said card receiving area wherein said inner wall delimits said card receiving area, and a top wall spanning between and connecting said outer wall and said inner wall, said opening through said ridge being delimited by ramps tapering from the top wall of said ridge to a position level with said card receiving area, said base including a depression extending below said card receiving area and extending through said opening through said ridge for receiving one's fingernail under a collector card received on the card receiving area;

a depression extending below the planar portion outside of said card receiving area and aligned with the depression in said card receiving area; and

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a transparent removable cover including a generally planar portion having a card retaining area thereon for lying atop and retaining a card received on said card receiving area of said base, said cover including a groove shaped complementary to said ridge of said base portion and receiving said ridge therein in form-fitting relationship such that a card received on said card receiving area of said base is sandwiched between said planar portion of said base and said planar portion of said cover.

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**5,046,617**

## APPARATUS FOR THE FEEDING OF BLANKS TO A PACKAGING MACHINE

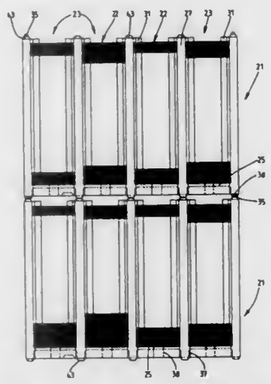
**Heinz Focke, and Oskar Balmer, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany**

**Filed Jul. 31, 1989, Ser. No. 387,664**

**Claims priority, application Fed. Rep. of Germany, Aug. 17, 1988, 3827916**

**Int. Cl.[5] B65D** *21/04, 81/24*

**U.S. Cl. 206—507** **7 Claims**



1. A cassette, having a bottom wall and side webs, for holding and feeding stacks of blanks, from which cigarette packs are produced, to a cigarette-packaging machine, wherein:

said cassette (**21**) is divided into several elongate individual chambers (**23**) which adjoin one another along sides thereof and which hold one blank stack (**22**) each;

lateral limitations of the individual chambers (**23**) are each formed by one row of a plurality of column-shaped webs (**26, 27, 29, 30**) extending vertically from the bottom wall (**25**);

the column-shaped webs (**26, 27, 29, 30**) terminate at a distance from the bottom wall (**25**) above the blank stacks (**22**) to be received and include projections (**43**) protruding from the underside of the bottom wall (**25**);

the column-shaped webs (**26, 27, 29, 30**) include conical centering lugs at their top sides, and the projections (**43**) located at the underside of the bottom wall (**25**) have corresponding conical depressions (**36**);

the elongate chambers (**23**) are open across their complete width along an open side (**24**) forming a front side, and said elongate chambers (**23**), at a closing side (**28**) opposite said open side (**24**), have stack-supporting strips (**31**) which at least partially close said chambers (**23**), which directly adjoin webs (**30, 27; 27, 27**) located at said closing side (**28**), which form the termination of the lateral limitation of the chambers (**23**) and which are arranged on both sides of the chambers, said supporting strips (**31**) beginning at the bottom wall (**25**) and ending above the blank stack (**22**) to be held;

the web rows include webs which directly adjoin the open side (**24**) of the chamber (**23**), and each of the other webs (**26, 27, 29, 30**) of each row forming the lateral limitation is spaced from an adjacent web by a distance which corresponds to the longitudinal dimension of the web which directly adjoins the open side;

between the webs (**26, 27, 29, 30**) of each of the rows, the bottom wall (**25**) has a plurality of first orifices (**37, 39**) each of which dimensionally corresponds to the cross-section of the web (**29**) which directly adjoins the open side; and parallel to the first orifices (**37**) are second orifices (**38**) which are of the same shape and size as the first orifices and which are located in the longitudinal mid-plane of each chamber (**23**); and

webs (**29, 30**), forming the outer lateral limitations of outer ones of the chambers (**23**), are arranged to directly adjoin the bottom wall (**25**).

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**5,046,618**

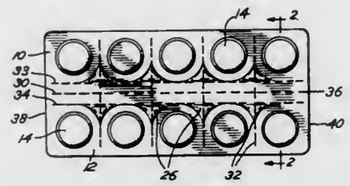
## CHILD-RESISTANT BLISTER PACK

**Anthony J. G. Wood, Nr. Chippenham, Great Britain, assignor to R. P. Scherer Corporation, Troy, Mich.**

**Filed Nov. 19, 1990, Ser. No. 615,489**

**Int. Cl.[5] B65D** *17/28, 83/04*

**U.S. Cl. 206—532** **6 Claims**



1. A child-resistant blister pack for enclosing one or more unit dosage forms, comprising in combination:

a blister film sheet having one or more depressions extending from the plane of said blister film sheet, each depression being adapted to receive a unit dosage form, and said depressions arranged substantially linearly;

a lidding sheet for sealably enclosing a unit dosage form within each said depression area;

means for attaching said blister film sheet to said lidding sheet, while avoiding attachment to said depressions, thereby sealing each said unit dosage form within a selected depressions;

entry access means, comprising a first line of weakening located between said rows of depressions and extending substantially from side to side of said blister pack, but short of the edge;

a dosage unit containing one depression, each depression formed within a dosage unit defined by additional lines of weakening, said additional lines terminating short of the edge of said blister pack, said additional lines being substantially transverse to said first line, at least one corner of each said dosage unit having an unsealed portion between said lidding sheet and said blister film sheet, said unsealed portion being separate from said depression; and

each dosage unit including a tear strip, defined by a third line of weakening, said third line starting at an interior corner of said unit and extending across a portion of said unit, but terminating short of an edge of said blister pack, thereby exposing for grasping an unsealed corner region of said lidding sheet upon removal of said tear strip.



**5,046,619**

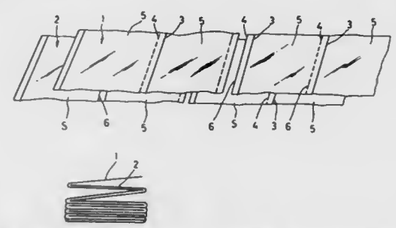
## MINI-PACKAGE STRUCTURE OF RUBBISH BAGS

**Feng-Lin Hwang, No. 21, Pa Te Rd., Chi Tu District, Keelung City, Taiwan**

**Filed Apr. 5, 1990, Ser. No. 506,962**

**Int. Cl.[5] B65D** *85/62*

**U.S. Cl. 206—554** **1 Claim**



1. A mini-package structure of rubbish bags comprising:

a first rubbish-bag-belt:

said belt comprising a series of rubbish bags;

each of said rubbish bags having an opening end connected by a separating line to the closed end of the next adjacent rubbish bag;

a second rubbish-bag-belt identical to said first rubbish-bag-belt;

wherein said first rubbish-bag-belt and said second rubbish-bag-belt are overlapped and offset prior to folding and packaging so that the separating lines of said first rubbish-bag-belt lies between the separating lines of said second rubbish-bag-belt;

wherein the overlapped and offset rubbish-bag-belts are folded beginning from one end of said belts in one direction along the separating lines of said first rubbish-bag-belt and in the opposite direction along the separating lines of said second rubbish-bag-belt until all said rubbish bags in said belts have been folded flat;

a packing box with a drawing hole in which the folded rubbish-bag-belts are stored;

and wherein a user can draw out a rubbish bag while at the same time drawing out part of the next rubbish bag to facilitate its use.

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**5,046,620**

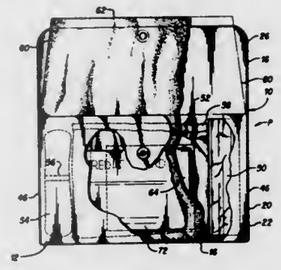
## PORTEMONNAIE ASSEMBLY

**William A. Barabino, 5 Westchester Dr., North Reading, Mass. 01864**

**Filed Sep. 17, 1990, Ser. No. 583,568**

**Int. Cl.[5] A45G** *1/02, 3/06*

**U.S. Cl. 206—581** **13 Claims**



1. A portemonnaie assembly comprising;

a housing including a front panel joined to a rear panel along a bottom edge and defining a storage area therebetween having a top access,

a flap extending from said rear panel and foldable to at least partially overlie said front panel and enclose said top access,

an insert element disposed within said storage area and having an inner surface, said insert element including a partition section joined to a privacy section,

means securing said partition section within said storage area and dividing said storage area into main and secondary storage areas,

said inner surface of said partition section opposed to said housing rear panel,

a plurality of personal hygiene articles within said main storage area contiguous with said partition section inner surface, and

said privacy section foldable over said personal hygiene articles to partially enclose said top access and insertable into said main storage area intermediate said personal hygiene articles and said housing rear panel, whereby

said personal hygiene articles are secluded from view while other type of articles may be inserted and removed from said main storage area intermediate said folded privacy section and housing rear panel.

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**5,046,621**

## TAMPER EVIDENT NOTCHED SEALING ENVELOPE

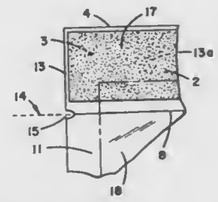
**Gary M. Bell, Crystal, Minn., assignor to Kapak Corporation, St. Louis Park, Minn.**

**Continuation of Ser. No. 443,821, Nov. 30, 1989, Pat. No. 4,961,503, which is a continuation of Ser. No. 169,376, Mar. 17, 1988, abandoned. This application May 30, 1990, Ser. No. 530,926**

**The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.**

**Int. Cl.[5] B65D** *3/26*

**U.S. Cl. 206—627** **4 Claims**



1. An arrangement comprising:

(a) an envelope having an open orientation and a closed orientation; said envelope having front and rear walls of flexible material characterized by the absence of perforations therein; said envelope open orientation having:

(i) said front and rear walls sealed to one another along upper and lower ends and opposite side edges to define an envelope interior;

(ii) an incision in said front wall for providing access to said envelope interior, said incision being below said upper ends of said front and rear walls;

(iii) a double wall thickness flap whereat said front and rear walls are sealed to one another; said flap being oriented between said incision and said front and rear wall upper ends;

(iv) pressure sensitive adhesive oriented on a portion of said flap comprising said front wall and oriented between said incision and said front wall upper end;

(v) a flap fold along which said flap is foldable over said front wall incision; said flap fold extending between said first and second side edges; and, said front wall not being sealed to said rear wall along a central portion of said flap fold between said side edges;

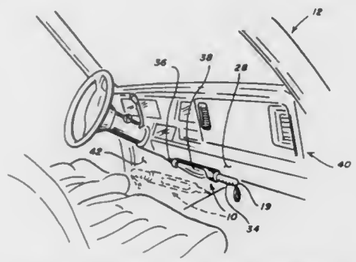
VOL 1130 ISS 2 SE 10 1991 UMI



(b) said closed orientation having said flap folded along said flap fold and over said incision; and,
(c) means facilitating opening of said envelope, when in said closed orientation, by stripping said flap therefrom, along said flap fold.

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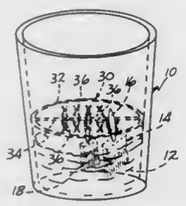
**5,046,622**
**UMBRELLA HOLDER**
Norman S. Wood, 934 du Pre' Cir., St. Peters, Mo. 63376
Filed Jan. 3, 1991, Ser. No. 637,269
Int. Cl.[5] A47G *25/12*
U.S. Cl. 211—63 8 Claims



1. A one-piece umbrella holder that is substantially symmetrical about a plane passing through its midline and functional in any orientation for grasping a collapsed umbrella comprising a tubular member having first and second substantially identical encircling ends, said encircling ends grasping the collapsed umbrella loosely enough so that a user can push the collapsed umbrella through the ends but tightly enough such that the collapsed umbrella does not jar loose in ordinary use, said tubular member open between said ends and forming a strip connecting the first and second encircling ends, said strip serving to guide the collapsed umbrella as it is inserted into the holder from the first end towards and through the second end and said opening in the tubular member easing friction on the collapsed umbrella as it is inserted into the holder.

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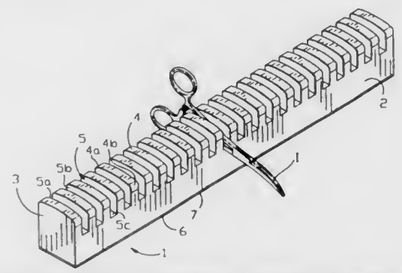
**5,046,623**
**BRUSH RACK**
Donald Takacs, 1527 Warmsville Center Rd., So. Euclid, Ohio 44121
Filed Jul. 9, 1990, Ser. No. 550,315
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—65 1 Claim



1. A brush holuer for supporting at least one brush having a handle portion and a bristle portion in a container part partially filled with an appropiate cleaning fluid, said brush holder comprising:
a circular support ring sized to engage the inner surface of said container at a height between the bottom and top of said container;
at least one transverse rod having it's respective ends affixed to said circular support ring;
and at least one means for gripping said handle portion of said brush, said means for gripping affixed to said transverse rod along its intermediate portion.

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**5,046,624**
**SURGICAL INSTRUMENT STAND**
Susan A. Murphy, and Paul G. Murphy, both of 3929 Highway U, Warrenton, Mo. 63383
Filed Aug. 13, 1990, Ser. No. 566,141
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.6 10 Claims



1. A stand for use in supporting a plurality of ring-handled surgical instruments in an ordered series with each instrument held upright and on edge in generally parallel relationship with the other instruments in the series, said stand comprising:
an elongated, one-piece, unitary body having a longitudinally extending base and a plurality of upstanding transverse partitions integral with and projecting upwardly from said base,
said partitions being arranged in an aligned row extending longitudinally from one end to the other end of the base and in longitudinally spaced relations to one another to present a longitudinally extending series of transverse, open-top, instrument-receiving compartments immediately above and long the length of the base,
said base having a top wall spanning the distance between front and rear sides of the body whereby to define a solid floor for each of said compartments respectively, and each of said partitions having oppositely facing planar surfaces rising from said floor and spanning the distance between the front and rear sides of the body whereby to define a pair of solid and planar sidewalls for each of said compartments respectively,
said base having a width which is substantially less than the length of the instruments to be supported by the stand whereby when the stand is placed on a supporting surface with the base resting on the surface and the compartments facing upwardly, instruments inserted into the compartments project outwardly in opposite directions beyond the front and rear sides of the body and into superimposed relationship with the supporting surface.

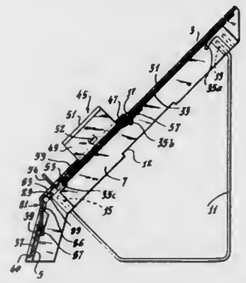
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**5,046,625**
**MODULAR DISPLAY STAND FOR PERSONAL CARE APPLIANCES AND THE LIKE**
Thomas Rushing, Denville, N.J., assignor to Conair Corporation, Stamford, Conn.
Filed Aug. 30, 1990, Ser. No. 575,170
Int. Cl.[5] A47F *7/00*
U.S. Cl. 211—70.6 10 Claims

1. A display stand for displaying appliances, said display stand including
an upper face plate made of transparent material, supporting means for holding said upper face plate at an angle away from vertical, said upper face plate having display card guide means on the under side thereof, said upper face plate having a horizontal slot extending substantially the width thereof,



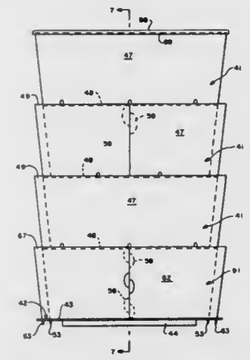
a lower face plate mounted on said supporting means and below said upper face plate, the upper edge of said lower face plate and the lower edge of said upper face plate defining a line cord opening,
at least one appliance holder having appliance holding arms,



means to secure said appliance holder to said horizontal slot, and
a wire lock clip dimensioned to fit over said opening, said wire lock clip having a line cord opening to receive a line cord from said appliance, and means to secure said wire lock clip over said opening.

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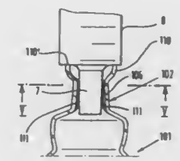
**5,046,626**
**DISPLAY RACK FOR DOCUMENTS**
Robert S. Hansen, P.O. Box 2238, Rohnert Park, Calif. 94928
Filed Dec. 20, 1983, Ser. No. 563,684
Int. Cl.[5] A47F *3/14*
U.S. Cl. 211—131 4 Claims



1. In a document holder for holding a plurality of papers in a generally upright position: a rotary base rotatable about a vertically extending axis, a first upwardly and outwardly inclined frustroconical side wall mounted on the base and positioned coaxially of the vertically extending axis, a horizontally extending wall positioned midway between the upper and lower margins of the first side wall, and a second upwardly and outwardly inclined frustroconical side wall resting on the horizontally extending wall and being disposed coaxially of and spaced radially inward from the first side wall to form a paper holding compartment having an annular profile in horizontal section for receiving a plurality of papers in side-by-side relation and constraining said papers to an upwardly and outwardly inclined, outwardly curved configuration which confers rigidity to the papers and enables them to stand in a generally upright position and extend a substantial distance above the first side wall without bending under their own weight, the side walls and the horizontally extending wall being releasably joined together in a manner permitting ready assembly and disassembly of the document holder, with the side walls being fabricated of sheets of flexible material which lie flat when the document holder is disassembled and have interlocking tabs at the end portions thereof which hold the sheets in a circular configuration when engaged.

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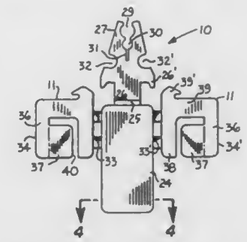
**5,046,627**
**AMPULE**
Bernd Hansen, Heerstrasse 16, 7166 Sulzback-Laufen 2, Fed. Rep. of Germany
Filed May 10, 1990, Ser. No. 521,378
Claims priority, application Fed. Rep. of Germany, May 24, 1989, 3916840
Int. Cl.[5] A61J *1/06*; B65D *85/42*
U.S. Cl. 215—31 7 Claims



1. An ampule, especially made of plastic, for a liquid to be removed from the ampule by a hypodermic syringe with a conical member at one end thereof to be introduced into the ampule, comprising:
an ampule body extending along a longitudinal axis; and
a neck extending along said axis from one axial end of said body, said neck having an inside wall with seating means for receiving the concial member and for allowing air to pass betwen the conical member and said inside wall but preventing liquid from passing between the conical member and said inside wall, said neck having a free axial end with surface means generally transverse to said axis for engaging a front surface of the hypodermic syringe.

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**5,046,628**
**DEVICE FOR HOLDING DRINKING STRAWS**
Peter Florjancic, Isarstrasse 25, 8901 Wallau, Fed. Rep. of Germany
Filed Oct. 13, 1989, Ser. No. 421,243
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 8812923; Nov. 21, 1988, 8814485
Int. Cl.[5] A47G *19/22, 21/18, 23/00*
U.S. Cl. 215—100 R 14 Claims



1. Device for holding a drinking straw on and in a drinking receptacle in defined position, comprising
a base element,
a first holding element for holding the drinking straw, and
a second holding element for holding said base element on the drinking receptacle,
wherein the first and second holding elements are side por-

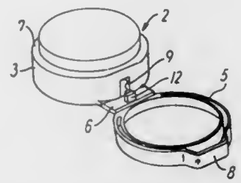
VOL 1130 ISS 2 SE 10 1991 UMI



tions arranged substantially in a plane with the base element,
the side portions being mounted upon said base element to be foldable into position for use and application about joints connected to the base element,
means for folding said side portions about said joints into position for use, and
a recess is arranged in each of the side portions,
said recess in said first side portion being arranged to receive the drinking straw and said recess in said second side portion being arranged to receive a rim of the drinking receptacle,
wherein said base element comprises three sides, and
additionally comprising a side portion arranged as a third holding element for holding said base element on the drinking receptacle,
said second and third holding elements arranged on two sides of the base element and on a side of said base element therebetween, said first holding element is arranged.

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**5,046,629**
**CONTAINER WITH SCREW CAP**
**Charlotte Weile, Copenhagen, Denmark, assignor to A/S Dumex, Copenhagen, Denmark**
**PCT No. PCT/DK89/00031, § 371 Date Sep. 25, 1990, § 102(e) Date Sep. 25, 1990, PCT Pub. No. WO89/07558, PCT Pub. Date Aug. 24, 1989**
**PCT Filed Feb. 15, 1989, Ser. No. 555,451**
**Claims priority, application Denmark, Feb. 15, 1988, 769/88**
**Int. Cl.[5] B65D *51/18, 55/02***
**U.S. Cl. 215—221** **9 Claims**

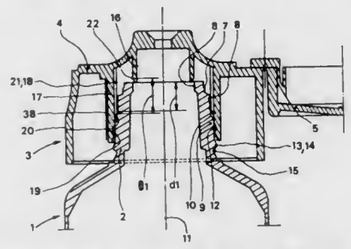


1. A container comprising a mouth with an external thread covering only part of the periphery of the mouth to provide at least one axially extending thread-free zone, a screw cap having a skirt for onscrewing onto the thread and comprising a safety element which is hinge-connected to the screw cap and is provided with a projection which by swinging the safety element about the hinge may be moved into and out of engagement with the thread-free zone, wherein the safety element is hinge-connected to the exterior side of the screw cap near the free end of the skirt of the screw cap, wherein a hole for the projection is provided in the skirt in the area adjacent the position at which the safety element is hinge-connected to the skirt, and wherein the safety element is so adapted that it can be swung over and be engaged with the free end of the screw cap with a part of the safety element protruding outside the periphery of the screw cap distally of the position at which the safety element is hinge-connected to the skirt.

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**5,046,630**
**CAP AND RECEPTACLE WITH CONSTANT ORIENTATION**
**Bernard Schneider, and René Hoslet, both of Sainte Menehould, France, assignors to Cebal, Clichy, France**
**Filed Jul. 26, 1990, Ser. No. 557,793**
**Claims priority, application France, Jul. 28, 1989, 89 10455**
**Int. Cl.[5] B65D *45/34***
**U.S. Cl. 215—321** **11 Claims**

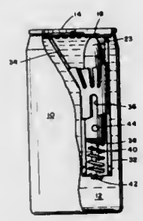
1. A unit made up of a cap (3) and a receptacle (1) with a neck (2) made of plastics, the cap (3) comprising a base (4) or stub (4) made of plastics and an opening part (5) which can seal the base (4), wherein the base (4) includes a sealing means (16) inside the neck (2) and can be fixed on the neck (2) simply by pushing and snapping it on, wherein:
a) the base (4) and neck (2) comprise means for relative immobilisation in rotation (18 and 9) by longitudinal insertion; and wherein
b) a mating longitudinal insertion means (18 and 9) and a



mating snapping on means (19, 13 and 15) on the base (4) and neck (2) respectively, and the sealing means on the base (4), are configured whereby when the base (4) is pushed onto the neck (2):
insertion with a full cross-section of the insertion means is initiated;
then forced insertion of the sealing means (16) in the neck (2) is initiated; and
then a snapping-on action is initiated.

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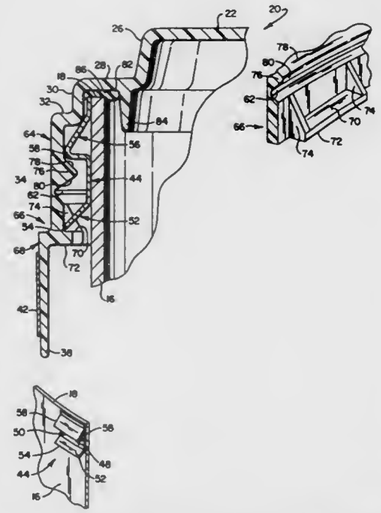
**5,046,631**
**PREMIUM DISPENSING CONTAINER**
**Gene W. Goodman, 327 Old Norwalk Rd., New Canaan, Conn. 06840**
**Filed Nov. 21, 1989, Ser. No. 439,550**
**Int. Cl.[5] B65D *35/00***
**U.S. Cl. 220—85 R** **29 Claims**



1. In a sealed container having a body and a top enclosing a fluid therein, said top including an inwardly displaceable flap for producing an opening, the improvement which comprises:
an object within said container and fluid dimensioned to pass through said opening, said object being in alignment with said opening and normally urged toward said top when said container is in an upright position; and
means within said body and mounted to said top for retaining said object in alignment with said opening while permitting motion of said object away from said top upon inward displacement by the flap and guiding said object to and through said opening, said inward displacement of said flap causing said object to move away from said top.

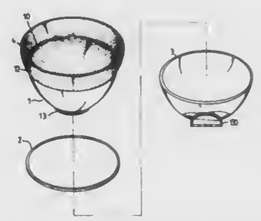


**5,046,632**
**CLOSURE ASSEMBLY FOR FIBER CONTAINER INCLUDING A MOLDED LID WITH MULTI-MODE CLOSURE ORIENTATIONS**
**Paul G. Bordner, 7803 Fairlawn Dr., Pickerington, Ohio 43147**
**Filed Feb. 22, 1990, Ser. No. 483,353**
**Int. Cl.[5] B65D *17/40***
**U.S. Cl. 220—276** **33 Claims**



1. A closure assembly for a container of a variety having a sidewall with external and internal surfaces extending from a bottom rim to a top portion having a top edge, comprising:
discrete fastener means connected in predetermined spacedapart relationship with said sidewall, extending downwardly along the external surface thereof sustantially from said top edge, said fastener means including primary detent means and secondary detent means each extending outwardly from said external surface; and
a molded lid for closure over said container including:
a lid top portion formed of resilient plastic material extensible across said container top portion to an outer periphery locatable adjacent said top edge,
a skirt assembly integrally formed with said lid top portion and extending downwardly from said periphery to a lower edge locatable below said primary detent means, said skirt assembly including a parting groove extending thereabout to define upper and lower skirt portions and hand graspable means configured with said skirt lower portion for effecting the manual removal of said skirt lower portion from along said parting groove,
primary latching ledge means formed within discete, spaced apart regions of said skirt assembly lower skirt portion in correspondence with said predetermined spaced apart relationship of said fastener means for non-releasing engagement with said primary detent means when said lid is rotationally oriented for engaing contact therewith,
secondary latching detent means formed substantially continuously within said skirt assembly upper skirt portion for removable latching engagement with said fastener means secondary detent means in substantially all rotational orientations of said lid uopn said container, and
a sealing channel formed within said lid top portion outer periphery for abutting, container closure engagement against said container top edge.

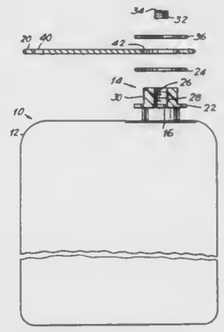
**5,046,633**
**STRUCTURE OF RICE BOWL**
**Chin-Fu Chung, No. 18, Hsin Hsing Rd., Tainan, Taiwan**
**Filed Jan. 18, 1990, Ser. No. 467,105**
**Int. Cl.[5] B65D *6/24, 21/00, 25/16*; H05B *6/80***
**U.S. Cl. 220—407** **1 Claim**



1. A rice bowl, including
a deep, rounded body comprising a base having thereon an outer thread, two inner circular channels internally around its inner bottom and inner flank portion, said two inner circular channels having each a cross-section including a wider inner bottom and a relatively narrower upper opening, and an external circular channel around its outer flank portion;
a retainer ring having an arrow-like cross-section and being externally mounted on said body to seat in said external circular channel;
a set of plastic films covering over the inner surface of said body and firmly clamped by said inner channels with its edge inserted in said external circular channel and firmly retained therein by said retainer ring;
a body holder in shape suitable for holding said body, having an inner thread portion to screw up with the outer thread of the base of said body;
characterized in that the set of plastic films can be split off one after another each time after meal, so that the rice bowl can be repeatedly used without the need to wash.

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**5,046,634**
**DRUM LINER ASSEMBLY**
**George P. McFarlin, El Toro, and Chester Savage, Irvine, both of Calif., assignors to Scholle Corporation, Irvine, Calif. and PRB Industries, Inc., Sutton, Mass.**
**Filed Jan. 16, 1990, Ser. No. 465,383**
**Int. Cl.[5] B65D *25/20***
**U.S. Cl. 220—465** **19 Claims**



1. A drum liner assembly comprising:
bag means for holding material therein;
fitting means connected to said bag means for providing

access to the inside of said bag, wherein said fitting means comprises:

mounting ring means for connecting said bag means to said fitting means;

shoulder means connected to said mounting ring means for providing a support surface;

mouth means integral with said shoulder means having internal and external threads, wherein said mouth means has a plurality of vertical keyways cut through said external threads;

drum lid means supported by said shoulder means, having a bung hole cut therein, wherein said bung hole is configured with a plurality of inwardly directed keys for engaging said keyways of said mouth means;

lock ring means for mating with said external threads of said mouth means to lock said fitting means in said drum lid means; and

securing means for securing said drum lid to a drum.

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**5,046,635**

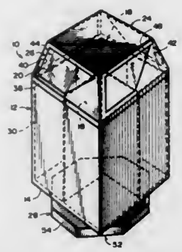
**TRASH SEPARATOR CONTAINER**

**Karen Haas, and Stephen P. Cielatka, both of P.O. Box 759, Mattituck, N.Y. 11952**

**Filed Mar. 8, 1991, Ser. No. 666,373**

**Int. Cl.[5] B65D *1/24***

**U.S. Cl. 220—524** **12 Claims**



1. An improved trash separator container which comprises:

a) a housing having a closed bottom wall and an open top;

b) means within said housing for dividing said housing into multiple compartments to separately store different types of trash items which ar to be recycled therefrom;

c) a top cover to fit over the open top of said housing;

d) means in said top cover, for gaining access into each of the compartments so as to deposit the different types of trash items into the compartments, wherein said means for gaining access includes said top cover having an aperture formed in each side thereof; and a plurality of doors, each of which is hinged along its tops edge to an aperture in said top cover so that each said door must be pushed inwardly to gain access to one of said compartments, each said door is in the shape of a trapezoid so that when opened will expose only one of said compartments; and

e) means connected to the bottom wall of said housing, for rotating said housing latitudinally along its axis when placed upon a flat surface so that one portion of said access means will always face a person, allowing the person to deposit the trash items into one of the selective compartments.

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**5,046,636**

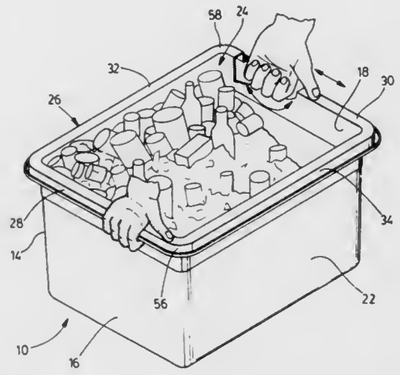
**REFUSE RECYCLING BOX**

**Stephen Coskery, Mississauga, Canada, assignor to Busch-Coskery of Canada Inc., Barrie, Canada**

**Filed Sep. 28, 1989, Ser. No. 413,616**

**Int. Cl.[5] A65D *8/00***

**U.S. Cl. 220—571** **1 Claim**



1. A unitary injection-molded plastic refuse collection box permitting reduction of back strain during lifting of refuse contained in the box and permitting limited accumulation of liquid within the box and discharge of excess liquid from beneath the box without freezing of the box in cold weather to pavement on which the box is rested, comprising:

a bottom;

a generally rectangular sidewall comprising a first pair of opposing sides, a second pair of opposing sides generally perpendicular to the first pair of sides, and an upper sidewall portion defining a opening for receiving the refuse and surrounded by the first and second pairs of sides, the sidewall defining with the bottom a compartment for storing the received refuse;

a pair of handle portions formed with the upper sidewall portion external to the compartment, each of the pair of handle portions extending from and being associated with a different one of the first pair of opposite sides, each handle portion having a substantially uniform inverted L-shape cross-section transverse to the associated side, the cross-sectional dimensions of each handle portion being sufficiently large that a person can insert his fingers between the handle portion and the associated sidewall to the second segment of his fingers, each of the handles extending along substantially the full horizontal width of the associated side such that the user can insert his fingers between the handles and the first pair of sides at positions along the first pair of sides corresponding to any location within the compartment of the centre of gravity of the contained refuse, thereby reducing back strain during lifting;

the bottom comprising an inner surface, an outer surface, a plurality of deflected portions, and a connecting portion surrounding the deflected portions and joining the deflected portions to one another and to the sidewall, the deflected portions being deflected downwardly relative to the connecting portion to define in the inner surface a plurality of liquid-trapping recesses and to define in the outer surface a plurality of projections corresponding to the recesses and a plurality of flow channels separating the projections and open at the sidewall for escape of liquids beyond the sidewall, the bottom comprising a plurality of drainage apertures formed in the connecting portion thereby permitting excess liquid overflowing from the recesses to escape into the flow channels beneath the bottom and outwardly through the channels away from the box to avoid freezing of the box to the pavement.



**5,046,637**

**CAN END SHELLS**

**Mark C. Kysh, Reading, England, assignor to CMB Foodcan plc, England**

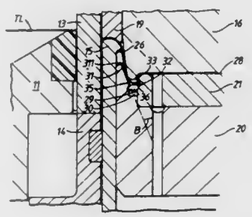
**PCT No. PCT/GB89/00434, § 371 Date Dec. 1, 1989, § 102(e) Date Dec. 1, 1989, PCT Pub. No. WO89/10216, PCT Pub. Date Nov. 2, 1989**

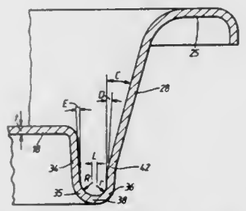
**PCT Filed Apr. 24, 1989, Ser. No. 435,459**

**Claims priority, application United Kingdom, Apr. 29, 1988, 8810229**

**Int. Cl.[5] B21D *51/44, 43/00***

**U.S. Cl. 220—610** **6 Claims**





5. A method of forming a reinforced pressure-resistant can end shell comprising the steps of providing a substantially planar metallic blank having a central portion and a peripheral portion, deforming the blank in a first deformation stage to cause movement apart of the central and peripheral portions to offset said portions out of a common plane, thus drawing the blank into a generally flanged cup-shaped configuration defined by the central portion, a generally U-shaped channel extending about the central portion, a frustoconical wall and an annular seaming panel, and, in a second deformation stage, causing movement towards one another of the central portion and annular seaming panel to deform at least a part of the metal of the frusto-conical wall into the U-shaped channel to form an anti-peaking bead of the can end shell; and, during the second stage and simultaneously therewith, pushing the frusto-conical wall progressively radially inwardly toward the central portion.

6. A can end comprising a peripheral seaming panel (**25**), a frusto-conical chuck wall (**26**) depending from the inner periphery of the peripheral seaming panel, a generally U-shaped anti-peaking bead extending radially inward from the frusto-conical chuck wall, an annular wall extending upwardly in an axial direction from the inner periphery of the anti-peaking bead, a generally flat central panel supported within the frusto-conical chuck wall by said annular wall, characterized in that the anti-peaking bead comprises a first annular portion (**35**) of arcuate cross section extending outward from the annular wall (**34**), a second annular portion (**36**) of arcuate cross section extending inward from the substantially frusto-conical chuck wall (**26**), an annular connecting portion (**38**) joining said first annular portion (**35**) to said second annular portion (**36**), the radius of curvature R of the first annular portion (**35**) being less than the radius of curvature r of the second annular portion (**36**), said radius r being in a range between 0.18 mm and 0.43 mm, and the frusto-conical chuck wall (**26**) includes a kink (**42**) joining the second annular portion (**36**) to the frusto-conical chuck wall (**26**) at a level between the central panel and the connecting portion (**38**) and most immediately adjacent the connecting portion (**38**).

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**5,046,638**

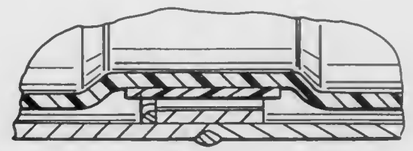
**SEAMLESS PRESSURE VESSEL WITH RECESSED INDENTATION**

**Raymond D. Wolf, Chaska, Minn., assignor to Fluoroware, Inc., Chaska, Minn.**

**Filed Mar. 22, 1990, Ser. No. 498,049**

**Int. Cl.[5] B65D *25/18***

**U.S. Cl. 220—679** **20 Claims**



1. In a pressurizable vessel for fluid chemicals having an inner plastic liner and an outer overpack permanently heat welded in place around the inner liner in spaced relationship therefrom, the improvement comprising providing a recessed indentation in the area immediately behind the formed heat weld and a sacrificial layer of plastic retained within the recessed indentation between the liner and overpack to protect the liner from the heat of weld formation on the overpack and said recessed indentation further provides space for the formed weld preventing deformation of the liner thereby.

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**5,046,639**

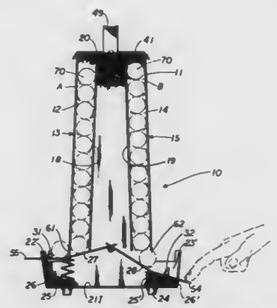
**FLARE DISPENSER**

**Daniel L. Deberry, West Sacramento, Calif., assignor to American Security & Technology, Inc., Davis, Calif.**

**Filed Mar. 2, 1990, Ser. No. 487,103**

**Int. Cl.[5] B65G *59/00***

**U.S. Cl. 221—127** **14 Claims**



1. A road flare dispenser apparatus comprising:

a. a housing having spaced generally vertical outer front and rear walls, each of which has a bottom edge, spaced side walls disposed normal to the front and rear walls, and a pair of generally vertical interior walls spaced from each other and spaced from the front and rear walls to thereby form a pair of storage sections within the housing;

b. a pair of downwardly openable independently operable interconnected spring biased doors, each of which in a first position closes off one of the storage sections, and when moved to a second position permits the egress of a

flare from within the respective storage section through a slot temporarily formed between the bottom edge of the respective outer wall and the respective door of said storage section;

c. a bottom wall on said housing, said doors being springingly connected to said bottom wall;

wherein each of said spaced side walls includes a pair of oppositely outward extending portions to which front and rear lower walls are each respectively normally disposed to and extend from; as well as a pair of oppositely outward extending portions to which front and rear lower walls are each respectively normally disposed to and extend from; each of said front and rear lower walls having a central cutout therein which cutouts adapted to receive a means to effectuate the manual actuation of said doors.

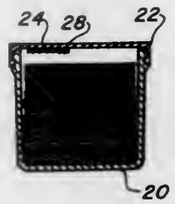
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**5,046,640**

## STACKED PRE-MOISTENED PAD SEPARATOR

**Scott M. Carroll, 1301 W. Woodcrest St., Fullerton, Calif. 92633**

**Filed Oct. 3, 1990, Ser. No. 592,265**
**Int. Cl.[5] B65H *3/22***
U.S. Cl. 221—213 **10 Claims**




1. A separator for stacked pre-moistened pads packaged in a container with a lid comprising;

a hook closure tape having a plurality of thermoplastic hooks extending from a woven fabric, said tape smaller than the container lid,

pressure sensitive adhesive disposed upon the tape on a side opposite the hooks for attachment, and,

said tape fixably secured to an inside surface of said container lid with said adhesive, allowing a single pre-moistened pad to be impaled and retained on the hooks when the container is sharply oscillated in opposite directions, causing the pad to be separated from the stack when the lid is removed.

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**5,046,641**

## ARTICLE DISPENSING MACHINE AND METHOD OF DISPENSING ARTICLES

**Andrew P. P. Gray, The Point, 35 Moor Lane, Copmanthorpe, York YO2 3TJ, England**

**Filed Jan. 26, 1990, Ser. No. 470,777**
**Claims priority, application United Kingdom, Jan. 26, 1989, 8901693**
**Int. Cl.[5] G07F *11/26***
U.S. Cl. 221—253 **30 Claims**

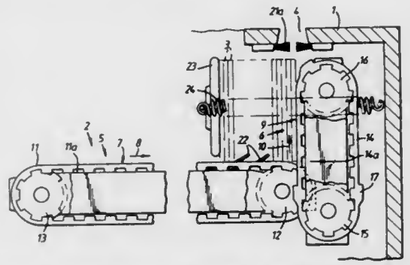
1. A machine for dispensing generally planar articles such as newspapers comprising:

a housing having an outlet through which an article is dispensed,

an article feed system comprising first and second conveyor means, said first conveyor means comprising a first movable conveying surface extending and movable in a first conveying direction towards said second conveyor means and for supporting an array of articles arranged generally vertically side by side in said first conveying direction, said second conveyor means being arranged to convey the leading article in the array in a second conveying direction transverse to said first conveying direction towards said outlet for removal therefrom, said second conveyor means comprising engagement means movable in said second conveying direction and adapted to positively engage the leading article in the array to move said article towards said outlet,

said machine also comprising:

drive means for driving said article feed system,



article retaining means for bearing against the last article in an array of articles on said first conveying surface for retaining the array upright on said conveying surface, and

biassing means for biassing said article retaining means in the direction of said second conveyor means, said biassing means being independent of said first conveyor means.

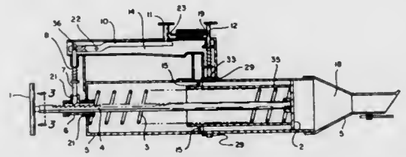
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**5,046,642**

## AUTOMATIC SPRING-LOADED TUCKPOINTING GUN

**John C. Cathcart, Sr., Marissa; John Coke, Jr., Coulterville; Roland D. Young, and Eugene K. Cathcart, Sr., both of Marissa, all of Ill., assignors to Arthur Macke, Marissa, Ill.**

**Filed Dec. 26, 1989, Ser. No. 457,143**
**Int. Cl.[5] B67D *5/42***
U.S. Cl. 222—153 **4 Claims**



4. An automatic dispensing gun for cement, grout or similar viscous material, comprising:

(a) at least one detachable front material receiving cylinder for receiving unpackaged viscous material having a front conical section, a tapered nozzle and an adjustable guide shaft and a plurality of locking pins;

(b) a rear drive mechanism cylinder detachably and lockably connected to said front cylinder by a front locking collar corresponding to said locking pins and containing a drive means;

(c) a trigger means for actuating said drive means; and

(d) a safety means comprising a vertical safety pin having a tapered flange thereon wherein said safety pin protrudes through both the front and rear cylinder locking them together, and a sliding lock pin connecting said safety pin to said notched trigger; whereby the drive means is locked in place when said front and rear cylinders are disengaged.

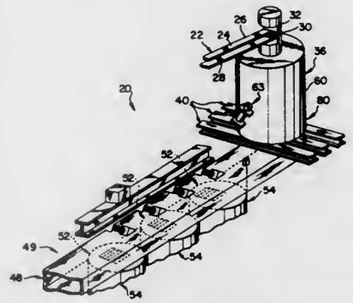


**5,046,643**

## VIBRATORY TYPE STORAGE BIN ARRANGEMENT WITH INTERNAL BAFFLING AND LOW PROFILE BOTTOM

**George D. Dumbaugh, Louisville, Ky., assignor to Kinergy Corporation, Louisville, Ky.**

**Division of Ser. No. 347,240, May 4, 1989, Pat. No. 4,960,229, which is a continuation-in-part of Ser. No. 131,942, Dec. 11, 1987, Pat. No. 4,844,289. This application Jun. 7, 1990, Ser. No. 534,543**
**Claims priority, application Canada, Oct. 18, 1988, 580,494; South Africa, Nov. 21, 1988, 88/8715; Mexico, Nov. 29, 1988, 13,965; Australia, Dec. 1, 1988, 25475/88; United Kingdom, Dec. 5, 1988, 8828371; Fed. Rep. of Germany, Dec. 8, 1988, 3841375**
**Int. Cl.[5] B67D *5/64***
U.S. Cl. 222—161 **3 Claims**



1. In a bin defining a central vertical axis and having a frustoconical lower portion for receiving, storing, and discharging bulk solid materials that are of types that are responsive to vibratory conveying action, including:

means for stationarily mounting the bin,

and a bin activator flexibly secured to the lower end of said bin lower portion,

said bin activator comprising a cylindrical side wall having upper and lower ends that is symmetrical about the bin vertical axis,

means for imparting to said activator a helical vibrating movement about the bin vertical axis to the bulk materials for effecting movement of the bulk materials received in said activator downwardly thereof for discharge from aid activator,

vibration isolator means for mounting said activator to be vibrated by said helical vibrating imparting means,

said vibrating means being mounted on said activator,

said activator being formed to define a bottom section,

said bottom section comprising a shallow cone centered on the axis and extending short of said side wall about the periphery of same,

said cone having its axial center pointed upwardly, and defining about said center thereof a conveying surface,

said bottom section also including at least one discharge port arrangement disposed adjacent said lower end of said cylindrical side wall and defining a vertically rectilinear discharge chute having a vertical central axis that said conveying surface conveys the bulk material to and that is spaced laterally of said cone axial center,

said discharge port arrangement chute communicating through said cone adjacent said periphery of said cone,

said activator having at least one internal baffle means fixed thereto above said bottom section for restricting gravity flow of said materials vertically of said activator and defining down feed porting for accommodating said downward vertical flow of said materials.

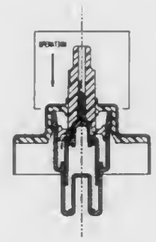
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**5,046,644**

## ATOMIZING FLUID DISPENSER ONE

**Miro S. Cater, Newtown, Conn., assignor to American Dispensing Systems Inc., Marlboro, N.J.**

**Filed Nov. 27, 1989, Ser. No. 441,761**
**Int. Cl.[5] G01F *11/06***
U.S. Cl. 222—321 **13 Claims**



1. An atomizing dispenser for dispensing incompressible fluid from a container of this fluid, the dispenser comprising:

a vertical hollow elongated body having a vertical axis, an open upper end and a lower end, the body having an opening centered on the body axis and disposed between the upper and lower ends;

a hollow sleeve having an axis coincident with the body axis and disposed within the body, the sleeve being vertically slidable up and down along the axis, the sleeve having a relatively large open lower end and a relatively small open upper end;

a vertical member having an axis coincident with the body axis and being vertically movable along its axis both between fully raised and fully lowered positions and with respect to the sleeve, the member having a lower enlarged section disposed within the sleeve and an upper section extending upwardly through the upper end of the sleeve;

spring means disposed within the body to bear against the lower body end and against the lower section of the member, the spring means having fully extended and fully compressed positions;

a hollow piston having upper and lower open ends and having an axis coincident with the body axis, the upper section of the member extending through the lower end of the piston into the hollow interior of the piston, the lower end of the piston slidably engaging the inner surface of the open upper end of the body, the piston being vertically movable along its axis;

a pump chamber defined by a hollow region bounded by adjacent portions of the body, member, piston and sleeve, the chamber cooperating with said adjacent portions to establish a first chamber port for fluid entry and a second chamber port for fluid discharge, the chamber, after the dispenser is primed, being normally filled with fluid and sealed at both ports to prevent fluid from leaking out of the chamber when the piston, member and sleeve are in fully raised positions, the first port being at least partially unsealed to allow fluid to enter the chamber when the member is being raised from fully lowered to fully raised position and the member and the piston are engaged, the second port being at least partially unsealed to allow fluid to be discharged from the chamber when the member is being lowered from fully raised to fully lowered position and the member is disengaged from the piston; and

actuator means provided with a fluid discharge orifice and having an axis coincident with the body axis, the actuator means being disposed above and engaging the piston in a normal fully raised position at which the member, sleeve and piston are in fully raised positions, both chamber ports are sealed and the spring means is in fully extended position, the actuator means, when subjected to downward

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pressure, establishing a force which moves the piston, member and sleeve downwardly with the piston and member being disengaged, thereby producing a spray discharge of fluid through the orifice, until the piston and member are engaged in fully lowered positions and the spring means is in fully compressed position, the spring means, when the downward pressure on the actuator means is released, automatically returning to its fully extended position, thereby returning the actuator means to its normal raised position.

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**5,046,645**

## SYPHON PACKAGE WITH MECHANICALLY ATTACHED VALVE

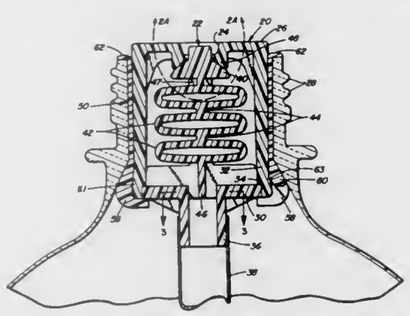
**Richard J. Hagan, Millbrae, and Michael D. Clausen, Turlock, both of Calif., assignors to McKesson Corporation, San Francisco, Calif.**

**PCT No. PCT/US89/00599, § 371 Date Sep. 28, 1990, § 102(e) Date Sep. 28, 1990, PCT Pub. No. WO89/07559, PCT Pub. Date Aug. 24, 1989**

**Continuation-in-part of Ser. No. 158,229, Feb. 19, 1988, abandoned. This PCT application Feb. 17, 1989, Ser. No. 566,348**

**Int. Cl.[5] B65D** *83/00*

**U.S. Cl. 222—394** **23 Claims**



1. A package for a pressurized fluid, which comprises a container having a necked opening, a normally closed valve insert in the necked opening of said container, said container having a portion of increased width immediately below the necked opening, and a plurality of attaching members extending between said normally closed valve insert and the portion of increased width and mechanically holding said normally closed valve insert within the necked opening, said plurality of attaching members being provided on a sleeve positioned in the necked opening between said normally closed valve insert and the necked opening, said normally closed valve insert being dimensioned for an interference fit in said sleeve, said plurality of attaching members being held in a splayed position by said normally closed valve insert to hold said normally closed valve insert and said sleeve within the necked opening, said plurality of attaching members comprising spaced apart projections extending downward from said sleeve a first distance and a plurality of castellations between each of the spaced apart projections, said plurality of castellations extending downward from said sleeve a second distance less than the first distance.

**5,046,646**

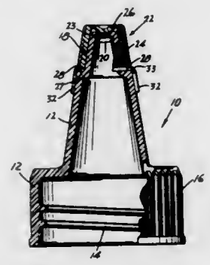
## NON-RESEALABLE DISPENSER CAP CONSTRUCTION

**Gene Stull, 1086 Hacklebarney Rd., Chester Township, Morris County, N.J. 07930**

**Filed Apr. 4, 1990, Ser. No. 504,006**

**Int. Cl.[5] B65D** *47/10*

**U.S. Cl. 222—541** **10 Claims**



1. A non-resealable dispenser cap construction comprising, in combination:

a) an elongate tapered, stepped hollow spout member having an exterior shoulder intermediate its ends to form a tip portion of reduced girth in which there is a discharge orifice,

b) means for attaching the spout member over the opening of a container,

c) a tapered closure cap member in the form of a cup having a transverse closure wall, said cap member being mounted on the tip portion of the spout member with the transverse wall of the cap member engaging and closing over the said discharge orifice, said transverse closure wall being distorted and biased thereby,

d) said spout and cap members having exterior conical surfaces which essentially constitute continuations of each other,

e) one of said members having a frangible tab which overlies and is permanently attached to the other member,

f) said tab having a zone of weakness which can be readily ruptured upon the application of opposing rotative forces to the members whereby the cap member can be removed to expose said orifice for the discharge of the container contents through the spout member,

g) said transverse closure wall of the cap member interfering with and preventing retentive return of the cap member on the spout member.

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**5,046,647**

## NOZZLE FOR DISCHARGING MOLTEN METAL USED IN A CASTING DEVICE

**Kazuhide Kawai, Nishio; Hiroyuki Mori, Higashi-Sonogi; Satoshi Oya, Anjo; Seiya Sugita, Kariya; Morio Kawasaki, and Norifumi Kasai, both of Kashima, all of Japan, assignors to Toshiba Ceramics Co., Ltd. and Sumitomo Metal Industries, Ltd., both of, Japan**

**Continuation of Ser. No. 512,034, Apr. 13, 1990, abandoned, which is a continuation of Ser. No. 238,640, Aug. 30, 1988, abandoned. This application Aug. 22, 1990, Ser. No. 571,032**

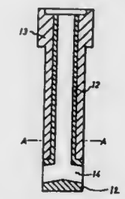
**Claims priority, application Japan, Sep. 3, 1987, 62-220691; Nov. 6, 1987, 62-279132**

**Int. Cl.[5] B22D** *41/08*

**U.S. Cl. 222—594** **2 Claims**

1. A nozzle for discharging molten metal used in a casting device, wherein an inner surface portion defining a nozzle bore of said nozzle is made of a refractory including at least CaO and $SiO_2$,

a ratio of said CaO to said $SiO_2$ being from 0.18 to 1.86, and $Al_2O_3$ content of said inner surface portion being not more than 10 wt % of a total sum weight of said CaO and $SiO_2$, said inner surface portion being adapted so as to be capable of forming a compound having a melting point lower than a melting temperature by reacting CaO and $SiO_2$ with $Al_2O_3$ wherein $Al_2O_3$ is deposited on said inner surface portion.



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**5,046,648**

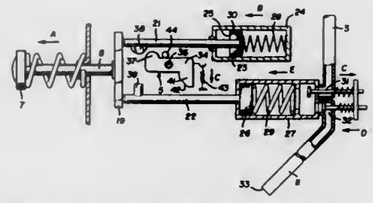
## HYGIENIC DISPENSER

**Remedios E. Herbstzuber, 8643 Miramar Pkwy., Miramar, Fla. 33025**

**Filed Jan. 2, 1990, Ser. No. 460,038**

**Int. Cl.[5] B67D** *3/00*

**U.S. Cl. 222—638** **10 Claims**



1. A dispenser for liquid germicide, comprising a container for germicide having an outlet, a metering device for metering a given amount of germicide to be dispensed fluidly communicating with said outlet, a spout fluidly communicating with said metering device for dispensing metered germicide, and timing means coupled to said metering device for timingly controlling the frequency of dispensing said metered amount of germicide;

said timing means including a delay device in engagement with said dispenser for inhibiting the dispensing of said given amount of germicide until elapse of a given time determined by said delay device;

said delay device including a timing cylinder containing a viscous liquid, a timing piston axially movable in said cylinder, and friction means for allowing said piston to move slowly in one direction and fast in the opposite direction, and release linkage coupling said timing piston to said metering means for timed releasing of said metering means.

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**5,046,649**

## GARMENT HANGER HAVING COOPERATIVE INTERCONNECTED RESILIENT AND FLEXIBLE MEMBERS

**Martin G. Hazenveld, Unit 13/8 Wilmette Place, Mona Vale, Sydney NSW 2103, Australia**

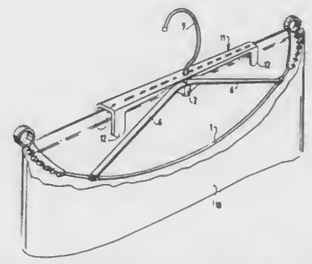
**Filed Mar. 21, 1990, Ser. No. 496,578**

**Claims priority, application Netherlands, Mar. 23, 1989, 8900731**

**Int. Cl.[5] A47G** *25/62, 25/66, 25/64, 25/48*

**U.S. Cl. 223—95** **9 Claims**

1. A garment hanger comprising a base element including an elongated body of resiliently bendable material, said elongated body having a central portion and opposite end portions, means at said opposite end portions for engaging a garment, a top element of flexible material having a central portion and opposite end portions, each top element end portion being disposed between said elongated body central portion and an associated one of said elongated body end portions, means for suspending the garment hanger from an associated support,



and elongated attachment means adjacent said top element central portion for augmenting the positioning of a garment engaged by said garment engaging means.

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**5,046,650**

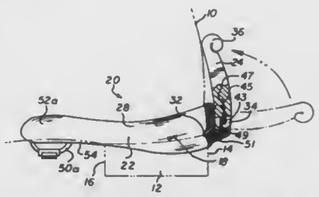
## PORTABLE BOOT REMOVABLE DEVICE ATTACHABLE TO HEEL

**Oscar Rothenberg, and Carl Rothenberg, both of 681 Kingman Ave., Santa Monica, Calif. 90402**

**Filed May 17, 1990, Ser. No. 525,129**

**Int. Cl.[5] A47G** *25/80*

**U.S. Cl. 223—113** **8 Claims**



1. In combination with an article of footwear having a heel, said heel having a rear portion, a forward edge and a land, an apparatus to be normally worn with said footwear and for assisting in the removal of said footwear from a foot of a wearer thereof, said apparatus comprising:

a generally U-shaped boot collar having an inner surface, an outer surface, a rear portion and a rib disposed along said inner surface generally coextensive with said boot collar, said boot collar being received by said article of footwear at said rear of said heel, said rib being engageable with said land;

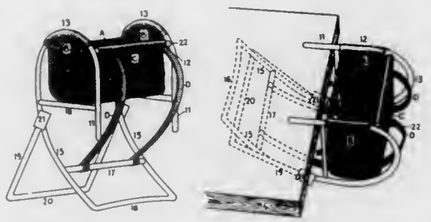
a generally elongated removal arm having a first end and a second end, said first end being pivotally mounted to said rear portion of said boot collar, said removal arm being pivotable between a normally biased stowed position and an operable position, said second end of said removal arm projecting generally orthogonally upwardly from said boot collar when in said stowed position to extend along a rear edge of said footwear above said heel and generally rearwardly from said boot collar when in said operable position wherein said removable arm provides a cantilever projecting backwardly from said article of footwear; and

means for securing said boot collar to said article of footwear.

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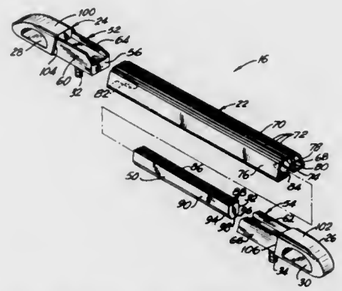


5,046,651
**TUBULAR FRAME SUPPORT FOR CONVERTIBLE CHILD CARRIER**
Leon Dagdagan, 156 Pacer Dr., Vallejo, Calif. 94591
Filed Jun. 5, 1989, Ser. No. 361,993
Int. Cl.[5] A45F *4/02*
U.S. Cl. 224—155 1 Claim



1. A child carrier comprising:
a pair of parallel tubular frames; each frame consisting of a first elongated section having a first end and a second end, and a second elongated section having a first end and a second end; said first elongated section being longer than said second elongated section; said second end of said first elongated section and said first end of said second elongated section being connected by a curved connecting section structured such that said first end of said first elongated section extends beyond the second end of said second elongated section to form a gap between the two ends and the first end of said first elongated section extends to a point where it would meet the second end of said second elongated section if further extended;
each parallel tubular frame further including a side bar having a first end connected near the second end of said first elongated section and a second end connected in the middle of said second elongated section;
said pair of parallel tubular frames being connected together by a first tubular cross bar at the first ends of the first elongated sections, a second tubular cross bar at a distance of approximately one-third of the length of the first elongated sections from the first ends of the first elongated sections, and a third tubular cross bar at the first ends of the second elongated sections;
a pair of leg members each having a first end and a second end, the first ends of said leg members being connected to a fourth tubular cross bar and the second ends of said leg members being pivotally connected near the second ends of the first elongated sections;
a seat made of flexible material having a front portion, a back portion, two side portions and a bottom portion; said front portion having means for releasably attaching said seat to said third tubular cross bar, and two holes sized to accommodate the legs of a child; said back portion having means for releasably attaching said seat to said third tubular cross bar; said two side portions having means for releasably attaching said seat to said pair of parallel tubular frames;
and a pair of shoulder straps each having a first end connected to said front portion of said seat and an second end connected to said second tubular cross bar;
whereby said carrier is convertible to three positions; the first position being as a backpack where said side portions of the seat are attached to the curved connecting section and said front portion of the seat is attached to the third tubular cross bar; the second position being a highchair where said side portions of the seat are attached to the second elongated section and said back portion of the seat is attached to the third tubular cross bar and a table is inserted into said gap; and the third position being a seat where the first elongated sections and leg members are pivoted apart to form a ground support for the carrier.

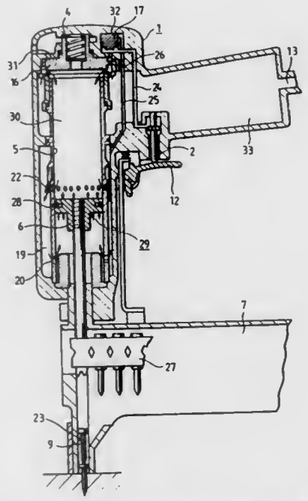
5,046,652
**SUPPORT ASSEMBLY FOR LUGGAGE RACK, DOOR HANDLE AND THE LIKE**
Victor Shanok; Jesse P. Shanok, both of New York, N.Y., and Joseph Limansky, East Brunswick, N.J., assignors to Silvatrim Associates, South Plainfield, N.J.
Filed Mar. 26, 1990, Ser. No. 498,425
Int. Cl.[5] B60R *9/06*
U.S. Cl. 224—326 21 Claims



1. A support assembly for a luggage rack, said support assembly comprising:
an extruded one piece elongated tubular support member having a top wall, side walls and a bottom wall providing a longitudinally extending opening therethrough;
said support member being fabricated from a plastic material;
reinforcement means provided within said support member to provide additional strength thereto, said reinforcement means being an elongated insert member;
said insert member bearing against inner surfaces of said top and bottom walls of said support member;
said top wall of said support member having a corrugated-like construction to provide longitudinally extending grooves in an outer surface of said top wall and longitudinally extending projections on said inner surface of said top wall;
first attachment means for engaging one end of said support member, said first attachment means being secured to a mounting surface upon which the luggage rack is mounted;
second attachment means for engaging an opposite end of said support member, said second attachment means also being secured to the mounting surface; and
said first and second attachment means fixedly securing said support member therebetween so that said support member is held in a fixed position relative to the mounting surface.

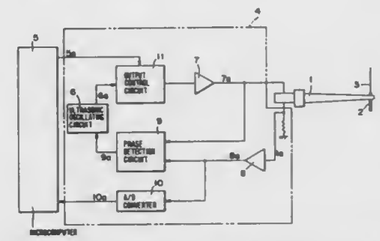


5,046,653
**FASTENER DRIVING TOOL**
Akira Uno, Hitachioota, Japan, assignor to Hitachi Koki Company, Limited, Japan
Filed Mar. 31, 1989, Ser. No. 331,203
Claims priority, application Japan, Apr. 1, 1988, 63-81807
Int. Cl.[5] B25C *1/04*
U.S. Cl. 227—130 20 Claims



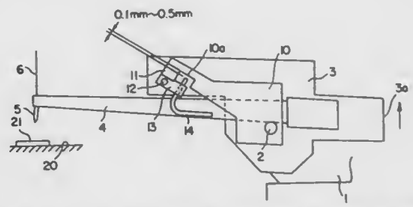
1. A fastener driving tool for driving a fastener into a workplace under the pressure of a fluid, comprising:
a cylinder;
a piston reciprocally movably disposed in said cylinder and dividing an interior space of said cylinder into first and second chambers;
repetitive valve means operable for repeating reciprocating movement of said piston;
driver element means connected to said piston door driving the fastener in successive power strokes of said piston; and
main valve means for supplying the fluid under pressure into said first chamber to move said piston in a power stroke, wherein
said cylinder comprises communication means for providing fluid communication between said first and second chambers through an intermediate fluid chamber when said piston reaches a first predetermined position in a power stroke, to allow the fluid under pressure to flow from said first chamber into said second chamber for making the pressure of the fluid in said second chamber substantially equal to or higher than the pressure of the fluid in said first chamber before said piston reaches a second predetermined position in the power stroke, wherein said first predetermined position of the piston corresponds to a maximum value of the total volume of said second chamber and said intermediate chamber and said second predetermined position of the piston corresponds to said fastener coming to a stop in said power stroke of the piston, and
said communication means has a cross-sectional area which is at least 8/1000 of the maximum value of the total volume of said second chamber and said intermediate chamber (said area and volume being expressed in consistent units) when said piston reaches said predetermined position.

5,046,654
**ULTRASONIC WIRE BONDING APPARATUS**
Nobuto Yamazaki; Yoshimitsu Terakado; Yuji Ohashi, and Hijiri Hayashi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan
Filed Oct. 25, 1989, Ser. No. 426,788
Claims priority, application Japan, Oct. 28, 1988, 63-270842
Int. Cl.[5] H01L *21/607*
U.S. Cl. 228—1.1 2 Claims



1. An ultrasonic wire bonding apparatus wherein a transducer which has a bonding tool fastened at one end is caused to vibrate by ultrasonic oscillating voltage of an ultrasonic oscillating circuit comprising an output control circuit provided between said ultrasonic oscillating circuit and transducer, said output control circuit controlling an output voltage of said ultrasonic oscillating circuit and a microcomputer which reads a current value of said transducer and outputs ultrasonic oscillating output data to said output control circuit so that a correction is made for differences in transducer characteristics.

5,046,655
**DEVICE FOR DETECTING HEIGHT OF BONDING SURFACE**
Yuji Ohashi; Yoshimitsu Terakado; Minoru Torihata, and Hiroshi Ushiki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan
Filed Oct. 16, 1989, Ser. No. 422,988
Claims priority, application Japan, Oct. 18, 1988, 63-260448
Int. Cl.[5] H01L *21/60*
U.S. Cl. 228—9 1 Claim




1. A device for detecting the height of a bonding surface used in a wire bonding machine which comprises a rotatable shaft provided on a bonding head, a vertically moving block pivotally mounted on said rotatable shaft, a bonding arm fixed on said rotatable shaft, and a bonding tool provided at one end of said bonding arm, said height detecting device comprising:
a lever fixed on said rotatable shaft, said lever including a first stopper at one end and a detecting surface near said first stopper;
a second stopper provided on said vertically moving block, said second stopper being urged to contact said first stopper;
a sensor fixture fixed on said second stopper; and a proximity sensor mounted on said sensor fixture, said sensor facing said detecting surface.

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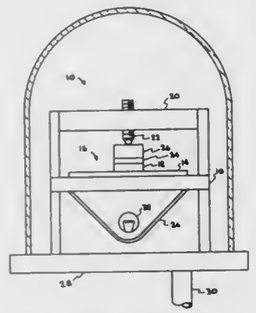


5,046,656

## VACUUM DIE ATTACH FOR INTEGRATED CIRCUITS

Edward H. Schmitt, and David B. Tuckerman, both of Livermore, Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Sep. 12, 1988, Ser. No. 243,535
Int. Cl.[5] B23K *1/03*
U.S. Cl. 228—123 10 Claims



1. A method for forming a thin film eutectic bond between a silicon integrated circuit die and a circuit substrate, comprising:
coating a bonding surface of the die with a gold layer of about 2 microns thickness and coating the substrate with a gold layer of about 1 micron thickness;
positioning the die on the substrate after coating with gold to form a die-substrate assembly;
compression loading the die against the substrate in the die-substrate assembly;
forming a vacuum surrounding the die-substrate assembly;
heating the die-substrate assembly to an alloying temperature.

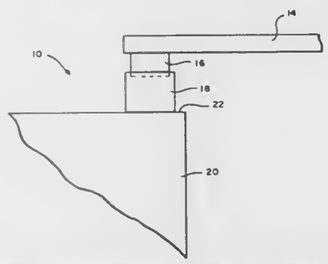
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5,046,657

## TAPE AUTOMATED BONDING OF BUMPED TAPE ON BUMPED DIE

Venkat Iyer, Santa Clara; Jagdish Belani, Cupertino; Hem P. Takiar, Fremont, and Rajenda Pendse, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 153,870, Feb. 9, 1988, abandoned. This application Jan. 5, 1990, Ser. No. 462,857
Int. Cl.[5] B23K *101/40;* H01L *21/603;* H05K *3/32*
U.S. Cl. 228—123 15 Claims



1. An interconnection structure, which comprises a semiconductor die having a surface and a plurality of conductive contact bumps on the surface of said semiconductor die and extending above the surface, a like plurality of conductive interconnection leads having a principal portion extending along an entire length of said like plurality of conductive interconnection leads and terminating in a distal end, the principal portion having a lead surface facing toward the surface of said semiconductor die, said like plurality of conductive interconnection leads having tips defined by additional material on the principal portion, giving a region at the distal end of greater thickness than a remainder of said principal portion, which tips project beyond the lead surface of the remainder toward said plurality of conductive contact bumps, said plurality of contact bumps being of the same material as the tips, or said plurality of conductive contact bumps being formed from a ductile material having a first hardness, said like plurality of conductive interconnection leads having at least their tips formed from a material having a second hardness greater than the first hardness and the tips of said like plurality of conductive interconnection leads being bonded with each tip penetrating into its associated one of said plurality of conductive contact bumps, the tips of one of said like plurality of conductive interconnection leads each being bonded to one of said plurality of conductive contact bumps.

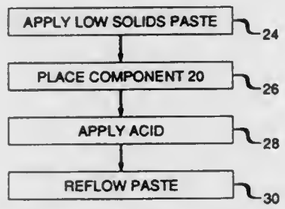
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5,046,658

## METHOD AND APPARATUS FOR SOLDERING ARTICLES

John R. Morris, Princeton Junction, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 27, 1989, Ser. No. 386,548
Int. Cl.[5] B23K *35/362*
U.S. Cl. 228—206 6 Claims




1. A method for fabricating an object by soldering at least one article to a metallized area on a major surface of the object with a reduced incidence of solder residues comprising the steps of:
applying a low solids, rosin containing soldering paste to a metallized area on a major surface of an object;
placing an article on the solder paste-coated metallized area;
applying an acid to the solder paste;
subjecting the object to a substantially inert atmosphere; and
reflowing the acid-treated solder paste on the object while the object and article are subjected to the inert atmosphere to bond the object to the article with reduced incidence of solder paste residues.

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5,046,659

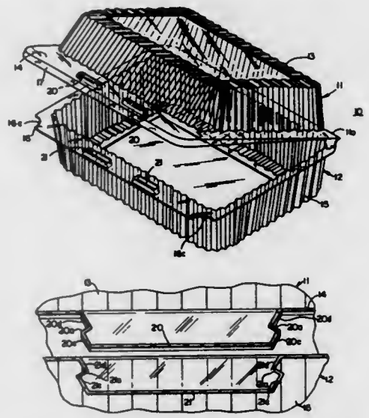
## LATCHING STRUCTURE FOR FOOD CONTAINER

Richard T. Warburton, Canandaigua, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 13, 1990, Ser. No. 611,576
Int. Cl.[5] B65D *1/22*
U.S. Cl. 229—2.500 12 Claims

1. A container for food or other articles comprising:
a lid having a horizontal flange extending around the periphery thereof,
a base having a horizontal flange extending around the periphery thereof and adapted for engagement with the horizontal flange of said lid when said container is in closed condition,
means for latching said lid to said base, said latching means including:
at least one substantially rectangular male rib depending from said horizontal flange of said lid, the opposite ends of said rib having outwardly extending shoulder structure, the sides of said rib being substantially straight,
at least one substantially rectangular female recess in said flange of said base dimensioned to receive a cooperating said male rib in said lid, the opposite ends of said female recess having inwardly extending shoulder structure adapted to mate with said outwardly extending shoulder





structure of said male rib in said lid, said sides of said female recess being substantially straight, said ends of said male rib and said ends of said female recess being constructed and arranged to deflect with respect to each other so that when said male rib is pressed into said female recess said shoulder structure on said male rib will snap into position beneath said shoulder structure in said female recess and interlock therewith to latch said lid to said base.

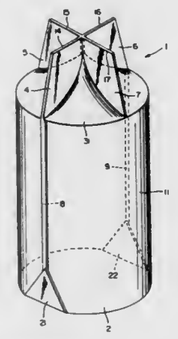
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5,046,660

## CONTAINER COMPRISING A PLANAR BOTTOM AND A SUBSTANTIALLY CYLINDRICAL BODY SURFACE

Giordano Magnoni, Via Emilia EST 207, Modena, Italy I-41100

Filed Nov. 2, 1989, Ser. No. 430,439
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1988, 8813832[U]
Int. Cl.[5] B65D *3/04*
U.S. Cl. 229—4.5 14 Claims



1. A container comprising
a planar bottom,
a substantially cylindrical body surface having two ends, the bottom being located at one end of the body surface,
an upper closed end being located at the other end of the body surface, opposite the bottom,
a plurality of upwardly directed vanes formed at the upper closed end,
upper end edges of the vanes extend in a place parallel to the bottom, and
a plurality of upwardly directed tabs adjoin the bottom.

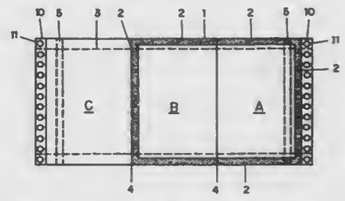
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5,046,661

## POSTAL LEAFLETS FOR DIRECT MAILS

Yoshikazu Kimura, 36, Kakadacho, Karahashi, Minamiku, Kyoto, Japan 601

Filed Dec. 6, 1989, Ser. No. 446,862
Int. Cl.[5] B65D *27/34*
U.S. Cl. 229—92.1 7 Claims




1. A postal leaflet for use as direct mail, the leaflet comprising:
three folded pages carrying information, the pages being adhered to each other at their upper, lower and side joining fringes to form two end pages and an underlying page;
lateral cuts disposed inward of the upper and lower joined fringes; and
vertical cuts disposed on the front side and back side of the leaflet in double lines inward of each joined fringe and which form segments of respective page faces between said cuts, wherein the vertical cuts forming the segments of the respective page faces between the double lines constitute means for permitting each page upon which each of said vertical cuts are formed to be peeled from the underlying page without tearing the underlying page, whereby the postal leaflet can be opened into a continuous flat sheet.

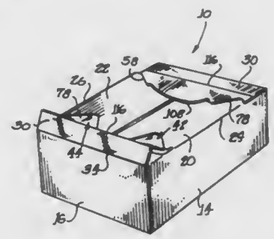
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5,046,662

## SELF-LOCKING CONTAINER

Dean E. Cowles, Fremont, Calif., assignor to Inland Container Corporation, Indianapolis, Ind.

Filed Nov. 2, 1990, Ser. No. 608,259
Int. Cl.[5] B65D *5/10*
U.S. Cl. 229—157 7 Claims



1. A carton apparatus comprising:
a tubular body with a pair of opposed sidewalls and a pair of opposed endwalls;
at least one closure extending from the sidewalls and end-

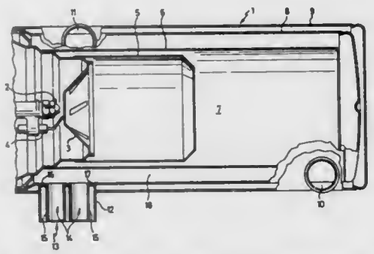
VOL 1130 ISS 2 SE 10 1991 UMI



walls so as to form at least a partially enclosed interior therewith, said at least one closure comprising:
end panels joined to the endwalls with a hinge line so as to be foldable into a common plane;
the end panels each having a discontinuous free edge remote from the hinge line and a pair of free corners remote from the hinge line and extending from the free edge, the end panels further comprising a fold line between the free edge and the hinge line so as to divide the end panels into two parts to allow the part carrying the free edge to be swung out of the plane of the other end panel part;
the end panels including a recessed edge located between the free corners of the end panels and extending adjacent the end panel free edge, the recessed edge including a pair of spaced, generally U-shaped locking edge portions extending from the end panel free edge and a generally arcuate intermediate portion disposed therebetween, with the U-shaped locking edge portions defining a pair of opposed, generally arcuate panel-receiving slits;
the U-shaped locking edge portions cooperating with the end panel free edge to define a pair of opposed locking ears extending toward one another, one on either side of the intermediate arcuate edge portion;
side panels joined to the sidewalls with a hinge line so as to be foldable toward the common plane;
a pair of locking recesses formed in each side panel, each recess including an arcuate edge portion having an exterior end adjacent the sidewall hinge line and an interior end remote therefrom, and a generally truncated V-shaped edge portion extending generally between the interior and exterior ends of said arcuate recess edge, with a part of the truncated V-shaped edge immediately adjacent the interior end comprising a locking edge which is matingly engageable with the U-shaped locking edge portions of the end panels, and with the truncated V-shaped edge portions of a side panel extending toward one another with adjacent converging ends; and
the side panels and end panels foldable toward a common plane, with the locking tabs of the end panel deflecting the hinge tabs into the interior of the carton to form recesses in the side panels into which the locking tabs are inserted so that the locking edge of the tab engages the locking edge of the side panels.

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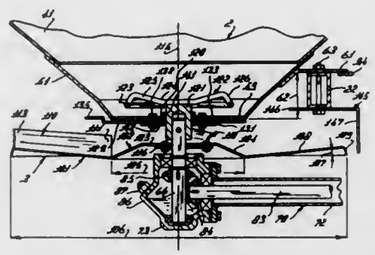
**5,046,663**
**HEATER**
**Michael Bittmann, Munich, Fed. Rep. of Germany, assignor to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany**
**Filed Nov. 15, 1989, Ser. No. 436,799**
**Claims priority, application Fed. Rep. of Germany, Nov. 21, 1988, 3839242**
**Int. Cl.[5] B60H** *1/02*
**U.S. Cl. 237—12.3 C** **11 Claims**



1. A motor vehicle heater of the type comprising a burner placed in a combustion chamber, a heater exchanger surrounding the burner, and an exhaust gas outlet by which a flow of hot combustion gases generated in the combustion chamber are released from the heater after passing through the heat exchanger; wherein a muffler insert is incorporated into the heater within the flow of the gases in an area of the exhaust gas outlet, said muffler comprising means for dividing the flow of gases into at least two partial streams before leaving said exhaust gas outlet.

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**5,046,664**
**SPREADER**
**Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely, N.W., Maasland, Netherlands**
**Division of Ser. No. 325,127, Nov. 27, 1981, abandoned, and a continuation-in-part of Ser. No. 35,075, May 1, 1979, and Ser. No. 89,755, Oct. 30, 1979. This application Oct. 26, 1983, Ser. No. 549,241**
**Claims priority, application Netherlands, Nov. 27, 1980, 8006454**
**Int. Cl.[5] A01C** *17/00*
**U.S. Cl. 239—661** **35 Claims**



1. A spreader for spreading granular and/or powdery material which comprises: hopper means having two spaced apart delivery means for discharging material carried by said hopper; two rotating distribution means for receiving said material discharged from said hopper means through said delivery means and broadcasting said material simultaneously in patterns which overlap for substantially their entire widths, each said distribution means adapted to receive material from a respective said delivery means; means for revolving said distribution means comprising a mechanical linkage between said distribution means, a single hydraulic motor connected to said linkage, said linkage and said connection being so constructed and arranged that said distribution means both revolve at the same rpm and in opposite directions, control means for controlling the rpm of said hydraulic motor, and momentum conservation means for continuing the rotation of said motor for at least a limited period of time when there is an abrupt cessation or reduction of the energy which provides power to said motor; a rigid framework interconnecting said linkage and said delivery means which retains said delivery means and the levels and axes of rotation of said distribution means in fixed dispositions relative to each other.

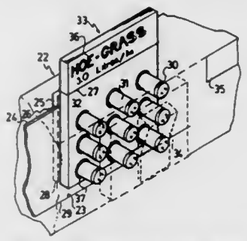
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**5,046,665**
**CONTROL MEANS FOR INJECTION SYSTEMS OF AGRICULTURAL SPRAYERS**
**Bouko J. Kor, and William Porter, both of Winnipeg, Canada, assignors to Westeel, A Division of Jannock Steel Fabricating Company, Winnipeg, Canada**
**Filed Apr. 19, 1990, Ser. No. 511,339**
**Int. Cl.[5] B67D** *5/08*
**U.S. Cl. 239—71** **12 Claims**

1. For use with an agricultural sprayer comprising:
a vehicle for propelling the sprayer over the ground and having an operator's station;



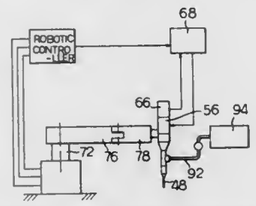
spray booms transported by the vehicle and having spray nozzles thereon;
a water tank;
a water pump;
water lines delivering water from the water tank to the water pump and from the water pump to the nozzle;
a chemical supply;
a metering pump; and
chemical lines for delivering chemical from the chemical supply to the metering pump and from the metering pump to the water lines, control means for controlling operation of at least the metering pump, said control means comprising:
a key having information coded thereon in machine readable



form, said information including at least a rate of chemical application;
visible indicia on the key reproducing information coded on the key, including a least the chemical application;
key decoding means for receiving and holding the key, for decoding the information code on the key and for generating signals representing the decoded information, the decoding means being mounted in the vehicle adjacent an operator's station for continuing observation by an operator, the key decoding means retaining the key with the visible indicia displayed for continuing observation of the indicia by the operator;
processor means responsive to said signals for controlling operation of at least the metering pump thereby controlling application and dilution parameters of the chemical.

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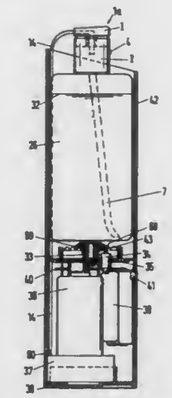
**5,046,666**
**METERING DISPENSER WITH SCREW PUMP**
**Tuneo Ono, Nagata, Japan, assignor to Heishin Sobi Kabushiki Kaisha, Kobe, Japan**
**Continuation-in-part of Ser. No. 45,019, Apr. 30, 1987, abandoned. This application May 22, 1989, Ser. No. 355,295**
**Claims priority, application Japan, May 15, 1986, 61-112378**
**Int. Cl.[5] B05B** *12/00*
**U.S. Cl. 239—73** **8 Claims**




1. The combination of a dispensing system for dispensing a controlled quantity of a high viscosity material for application to a substrate, and a robotic system used therewith, comprising:
reservoir means for holding the high viscosity material;
nozzle means adapted to be manipulated by the robotic system in response to commands generated thereby;
a screw pump having an inlet port communicating with said reservoir means and an outlet port connected to said nozzle means, said screw pump comprising a stator formed with a spiral cavity and a sprial rotor rotatably disposed within said cavity;
a variable speed type drive motor having its drive shaft connected to the rotor of said screw pump;
means responsive to said commands for determing the velocity of said nozzle means and providing a first signal representative of the velocity of the nozzle means;
sensor means for sensing the rotational speed of said drive motor and providing a second signal representative of the motor speed;
means responsive to said first signal for providing a third signal representative of a desired motor speed; and
means responsive to said second and third signals for providing a motor drive signal supplied to said drive motor, whereby the nozzle means delivers a controlled quantity of the high viscosity material as it moves over the substrate.

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**5,046,667**
**AUTOMATIC SPRAY NOZZLE**
**Wolfgang Fuhrig, Wiesbaden, Fed. Rep. of Germany, assignor to Oeco-Tech Entwicklung und Vertrieb Von Verpackungssystemen GmbH, Wiesbaden, Fed. Rep. of Germany**
**Filed Sep. 12, 1989, Ser. No. 406,406**
**Claims priority, application Fed. Rep. of Germany, Sep. 28, 1988, 3832852**
**Int. Cl.[5] B05B** *7/24, 11/02;* **B65D** *83/44*
**U.S. Cl. 239—124** **19 Claims**



1. A spray apparatus for spraying or frothing liquid products having a products container (26) disposed in a casing cover (42) and having a spray head (1*a*, 1–5) which is provided with a channel (51) for the products, and an air supply line (14) having one end connected to a pressure connection (60) of an air pump (37), said spray head (1*a*, 1–5) has a closure part (2), a control part (1) which is displaceable towards said closure part, and mechanisms (13, 34) for introducing compressed air into a nozzle (4) of said spray head (1*a*, 1–5), said spray apparatus being characterized in that said closure part (2) has a slide valve comprising a passageway (61) and a control slider (13), said passageway (61) having an upper annular recess (65), and said passageway (61) being in communication with a first air connection (20) and with a liquid products connection (27), where said first air connection (20) and said liquid products connection (27) lead to said nozzle (4), and said control slider (13) is slidably received in said passageway (61), movable by means of said control part (1) and pre-stressed by a return spring (15), said control slider (13) having a connecting passage (62), products passage means (22, 71), venting passage (28), and

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upper (30) and lower (29) sealed reinforcements, said apparatus further comprising air supply passage means (70, 19, 21') for supplying air pressure from said air supply line (14) to said passageway (61), said control slider (13) being cooperable with said passageway (61), such that when said control part (1) is in a spraying position, said control slider (13) is axially positioned within said passageway (61) such that said connecting passage (62) of said control slider (13) connects said first air connection (20) in said closure part (2) to said air supply passage means (70, 19, 21'), and said products passage means (22, 71) is connected to said liquid products connection (27), and when said control part (1) is in a venting position, said control slider (13) is axially positioned within said passageway (61) such that said liquid products connection (27) in said closure part (2) is sealed by said control slider (13), and said first air connection (20) is vented to the atmosphere through said connecting passage (62) and venting passage (28), and when in a closure position, said control slider (13) is in its uppermost position in said passageway (61), and said liquid products connection (27) and said first air connection (20) are sealed by said control slider (13).

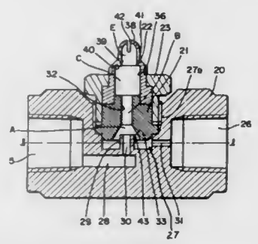
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**5,046,668**

## TWO-FLUID NOZZLE

**Hiroshi Ikeuchi, Ashiaya, and Norio Ohnishi, Nishiwaki, both of Japan, assignors to H. Ikeuchi & Co., Ltd., Osaka, Japan**

**Filed Mar. 2, 1990, Ser. No. 487,248**
**Claims priority, application Japan, Apr. 14, 1989, 1-96081**
**Int. Cl.[5] B05B *7/04***
**U.S. Cl. 239—432** **2 Claims**



1. A two-fluid nozzle, comprising:
a gas inlet means and a liquid inlet means;
a first mixing chamber having a gas feed means connected to said gas inlet means for feeding a gas along an axial center line in a direction toward a discharge end of the nozzle and having a liquid feed means for feeding a liquid into the outer periphery of the gas at the downstream end of said gas inlet means;
a substantially uniform diameter rectifying chamber opening out of said first mixing chamber and extending along the axial center line toward the discharge end for receiving the mixture of gas and liquid and conveying it therealong;
a second mixing chamber having a larger diameter than the rectifying chamber and into which the downstream end of the rectifying chamber opens, said second mixing chamber having a wall face at the downstream end thereof spaced from and opposed to the downstream end of said rectifying chamber and against which the outer peripheral portion of the mixture of gas and liquid discharged into the second mixing chamber from the rectifying chamber collides; and
a nozzle tip on the downstream end of said second mixing chamber having a discharge opening at a discharge end thereof and a jetting chamber extending along the axial center line from said second mixing chamber to said discharge opening, said nozzle tip having an end face portion in which said discharge opening is located having a hemispherical shape and a cylindrical peripheral wall around the base of the hemisphere, said discharge opening being a uniform width slit extending across the hemispherical shape end face portion and into said cylindrical peripheral wall in a diametrically extending plane, the ends of said slit having a circular arc shape.

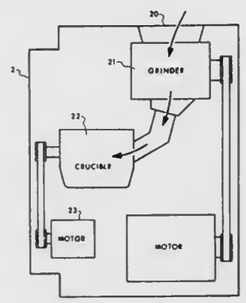
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**5,046,669**

## SYRINGE DISPOSAL APPARATUS AND METHOD

**Arthur W. Wallace, Aurora; Jack R. Sorwick, Parker; Thomas Pearce; Philip E. Clements, both of Littleton, and David E. Wood, Englewood, all of Colo., assignors to National Syringe Disposal, Inc., Englewood, Colo.**

**Continuation-in-part of Ser. No. 316,465, Feb. 27, 1989, Pat. No. 4,905,916. This application Feb. 27, 1990, Ser. No. 485,594**
**The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.**
**Int. Cl.[5] B02C *19/14***
**U.S. Cl. 241—23** **24 Claims**




1. An apparatus for disposal of used syringes made primarily of plastic components and a metal needle, said apparatus including:
means for grinding said syringes into particles of plastic and metal,
a crucible for receiving said particles produced by said grinding means, said crucible having heating means and means for controlling said heating means, said controlling means selectively activating said heating means to heat said crucible and the particles therein to a temperature above the melting point of said plastic particles and thereafter deactivating said heating means to allow said crucible and the contents therein to cool to a temperature below said melting point to produce a solid puck of plastic with said metal particles suspended and encapsulated therein,
means for rotating said crucible about a horizontal axis into a substantially inverted position, and
means for vibrating said crucible while in said inverted position to assist discharge of said puck out of said crucible.

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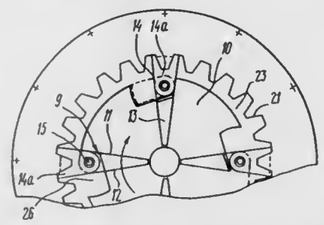
**5,046,670**

## CRUSHING DEVICE

**Vladimir Z. Leikin, prospekt Suslova, 21, korpus 6, kv. 89; Viktor P. Neradov, Beloostrov, Alexandrovskoe shosse, 41; Ivan M. Dianov, Zverinskaya ulitsa 17a, kv. 9; Pavel M. Luzin, Institutsky prospekt, 9, kv.68, all of Leningrad; Evgeny D. Gorbunov, ulitsa Shkolnaya, 5, kv. 12, Syzran; Vladimir D. Gerasimov, ulitsa Lensoveta, 76, kv. 40, Leningrad, and Vladimir A. Baranchugov, ulitsa Bubnova, 15, kv. 39, Chelyabinskaya oblast, Kusa, all of U.S.S.R.**

**Filed Dec. 8, 1989, Ser. No. 448,159**
**Int. Cl.[5] B02C *13/00***
**U.S. Cl. 241—194** **10 Claims**

1. A crushing device, comprising:
a causing having an inner wall;
a rotor having a vertical axis of rotation, mounted in said casing and formed by a disk having a working surface with radially oriented fractionating blades mounted thereon, each of said fractionating blades having a working lateral face and a lateral face opposite to said working lateral face and consisting of a main portion rigidly secured relative to said rotor disk and located closer to the axis of said rotor and a peripheral portion attached to said rotor disk by means of a hinge, mounted rotatably about the vertical axis, and having a section radially extending beyond said disk;



stationary grinding elements mounted on said inner wall of the casing coaxially with said rotor disk, formed by projections facing the rotor axis and located directly above said sections of the peripheral portions of the blades extending beyond said disk and spaced from said working surface of the rotor disk by a distance corresponding to a predetermined maximum size of pieces in a final crushed product;
said projections being spaced from said rotor disk by a radial clearance; and
a drive for rotating the rotor.



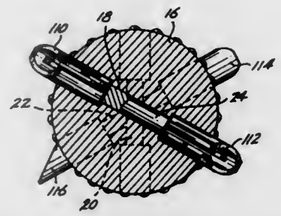
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**5,046,671**

## SPRING-LOADED TEETH FOR COMMINUTER ROLLS

**John H. Hughes, 439 Monte Elma Rd., Montesano, Wash. 98563**

**Filed Jan. 18, 1989, Ser. No. 298,454**
**Int. Cl.[5] B02C *18/18***
**U.S. Cl. 241—294** **8 Claims**



1. A comminuter roll having at least one hole formed in an outer surface thereof and including a substantially cylindrical resiliently compressible tooth member having a noncontinuous outer perimeter of a size larger than said hole, said tooth member constructed and arranged of rolled spring steel sheet to be received in said hole and compressed upon entry into said hole, the resiliency of said tooth member producing a force that acts against an interior surface of said hole to hold said tooth member in place in said hole, said tooth member having a substantially G-shaped cross section, providing a mass at the center of said tooth, and hollow areas on each side of said mass.

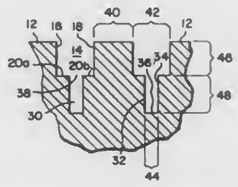
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**5,046,672**

## REFINER PLATE GROOVE CONFIGURATION

**Christopher L. Demler, Westfield, Mass., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Aug. 31, 1990, Ser. No. 579,426**
**Int. Cl.[5] B02C *7/12***
**U.S. Cl. 241—296** **13 Claims**



1. In a pulp refiner plate for mechanically treating pulp fibers to alter physical characteristics of the fibers, said refiner plate having a plurality of refiner bars separated by refiner grooves, the bars and grooves being arranged in patterns suitable for treating a slurry of pulp passed between opposed relatively rotating surfaces of two of said refiner plates, each groove having a groove bottom, the improvement comprising sub-grooves disposed in the groove bottom of at least some of the refiner grooves, each said sub-groove being narrower in width than its respective groove and communicating openly with its respective groove bottom, each said sub-groove with its respective groove forming a cross sectional area that decreases stepwise where the sub-groove communicates openly with its respective groove bottom.

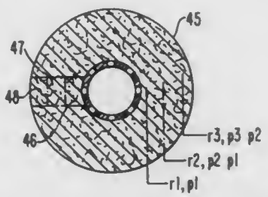
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**5,046,673**

## CONTROLLED PROGRAMMABLE ELECTRONIC WINDING

**Francis S. Moussalli, Charlottesville, Va., assignor to Institute of Textile Technology, Charlottesville, Va.**

**Continuation of Ser. No. 265,767, Nov. 1, 1988, abandoned. This application Jun. 7, 1990, Ser. No. 534,373**
**Int. Cl.[5] B65H *54/00, 59/20***
**U.S. Cl. 242—18 R** **20 Claims**



1. A method for winding yarn, comprising the steps of:
providing a length of yarn; and
winding said length of yarn in a package having multiple layers of yarn wrap the winding step including a step of starting the winding at a first low tension in order to achieve low density and then programmably variably progressively increasing the tension on the yarn during the winding step from the innermost layers to outermost layers radially of the yarn package according to a predetermined sequence to obtain a progressively higher yarn density profile radially outward from the core to produce an improved package geometry in a yarn package with a variable density profile.

15. A package of tensioned yarn comprising:
a core; and
yarn wrapped on said core in a plurality of layers of yarn wraps on said core and having a progressively increasing tension profile from a low tension at the innermost layers

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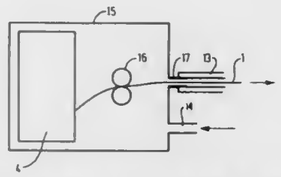
to a higher tension at outermost layers of the yarn package radially outward from the core to result in a higher density for the inner to the outer layers on said core.

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**5,046,674**
**METHOD OF BLOWING A LINE INTO AN EMPTY SHEATH**

**Veit M. Kolschbach, Cologne; Dieter E. Lachmann, Siegburg, and Gerald Znoyek, Leverkusen, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 5, 1989, Ser. No. 446,508**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843777**
**Int. Cl.[5] B65H** *49/02, 55/02*
**U.S. Cl. 242—54 R** **24 Claims**



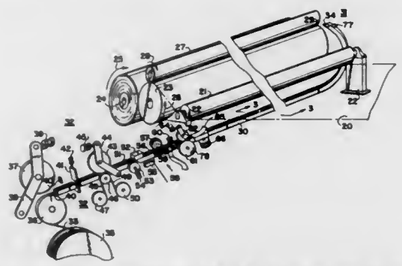

1. In a method of blowing a line (1) into an empty sheath (13), in which method the line (1) is unreeled from a storage reel and is transported in the empty sheath (13) by means of compressed air blown into the empty sheath (13), the improvement wherein the storage roll consists of a self-supporting criss-crossed roll (4) having no coil former and the line comprises a sheath which envelopes a light waveguide (6) or an electrical conductor (7) which sheath when wound in the criss-crossed roll (4) has a flattened cross-sectional contour which is widened in the direction of the winding plane (2).

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**5,046,675**
**SYSTEM AND METHOD FOR CUTTING AND SPOOLING A WEB OF PAPER**

**Peter A. Rodriguez, 1785 Selva Marina Dr., Atlantic Beach, Fla. 32233**

**Continuation of Ser. No. 318,127, Feb. 2, 1989, abandoned. This application Mar. 16, 1990, Ser. No. 494,418**
**Int. Cl.[5] B65H** *19/26, 19/28*
**U.S. Cl. 242—56 R** **20 Claims**



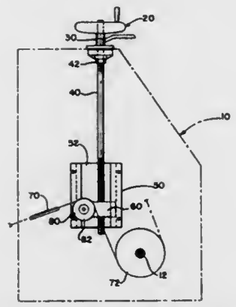
1. A system for cutting with a tape a travelling web of paper being wound on a first spool and for transferring the web to an empty spool for continued winding by attaching to the far end of an empty spool a cutting tape emerging from a guideway, the tape being fed from a supply and processing area adjacent the near end of the empty spool, the guideway extending transversely beneath the web and having a lengthwise slot facing generally upwardly toward the web or spools, the tape having a forward cut end portion coated with an adhesive for a short distance along the center portion thereof and leaving the edges free of adhesive, the tape being slidingly supported in the guideway along the edges that are free of adhesive, a propelling means for feeding the forward cut end portion of an endless supply of tape through the guideway and through an applicator means for applying to the cut end portion adhesive along the central portion of the tape while leaving the edges of the tape free of adhesive, means for cutting the tape forwardly of said endless supply of tape, and means for advancing said cut end portion from adjacent said far end to contact with said empty spool, the improvement which comprises a sensor adjacent said near end to detect the presence of said adhesive on said cut end portion, and means adjacent said near end for selectively directing said tape toward said far end of the guideway when said sensor detects the presence of said adhesive on said cut end portion.

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**5,046,676**
**DEVICE AND METHOD FOR ADJUSTING BELT TENSION ON A WEB SLITTER-REWINDER**

**James A. McClintock, Burton, Ohio, assignor to Electrolock, Inc., Burton, Ohio**

**Filed Mar. 5, 1990, Ser. No. 488,290**
**Int. Cl.[5] B65H** *35/02;* **F16H** *7/08*
**U.S. Cl. 242—56.2** **3 Claims**




1. On a slitter-rewinder having a drive belt assembly, a device for adjusting the tension on a drive belt assembly which comprises:

a continuously closed drive belt and a idler roll;

a bracket having a top and bottom edge and being permanently secured to an inside wall of said slitter-rewinder, said bracket having a groove cut from the top edge to the bottom edge, said groove being defined by parallel inner walls on each side of the bracket, each inner wall having a lip running the length of said wall, extending inward over said groove;

a cross brace with a width which is slightly less than the distance between the two inner walls of said bracket such that said cross brace slidingly engages said bracket, said cross brace having a threaded aperture cut vertically therein and having a means to receive and secure a idler roll which rotates in a plane parallel to the top and bottom edge of said bracket wherein such threaded aperture and the rotational axis of the idler roll are on opposed lateral sides of the midpoint of the cross-brace;

an adjustment means for moving the cross brace within said bracket comprising: a threaded rod having a first and second ends, a rotating means for turning the threaded rod, a locking means for securing the adjustment means in a fixed position, and a means for securing said adjustment means to said slitter-rewinder;

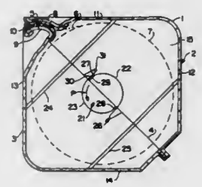
said threaded rod engages the threaded aperture of said cross brace at the first end and the adjustment means at the second end, such that a rotation of the adjustment means rotates the threaded rod which causes said cross brace to move in said bracket, thereby changing the tension which said idler roll exerts on said drive belt.

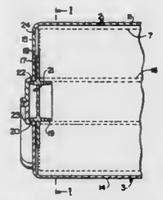


**5,046,677**
**CASSETTE FOR HOLDING A ROLL**

**Erhard Loewe, Waldesch, and Ludger Bertels, Nottuln, both of Fed. Rep. of Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 1, 1989, Ser. No. 347,387**
**Claims priority, application Fed. Rep. of Germany, May 11, 1988, 3816183**
**Int. Cl.[5] G03B** *1/04;* **B65H** *23/06*
**U.S. Cl. 242—71.1** **10 Claims**





1. A cassette for holding a roll of web material, the cassette comprising a housing having a pair of side walls, a substantially cylindrical bearing on each of the side walls, and at least one friction brake, characterized in that a pair of inserts are adapted to be rotatably supported on the substantially cylindrical bearings, each one of the inserts with an insertion element and a bearing element on distal sides of the insert, the cylindrical bearings form bearing sockets and the insertion elements protrude in the direction of the side walls to fit into the bearing sockets, the inserts are for holding a core of the roll, and the friction brake has a spring strip formed in one piece with a first one of the cylindrical bearings such that the spring strip, in a relaxed position, projects into a space that a section of one of the inserts occupies when the inserts are holding the core of the roll in the housing.

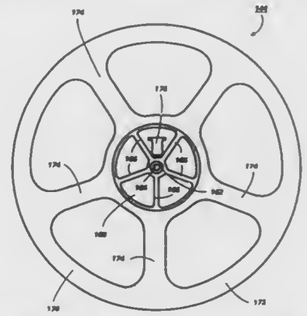
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**5,046,678**
**BINDING TAPE REEL HAVING A TAPE CLEANING TOOL**

**Ted A. Beer, Rochester, and Geoffrey C. Williams, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Sep. 26, 1988, Ser. No. 248,705**
**Int. Cl.[5] B65H** *75/18*
**U.S. Cl. 242—71.8** **6 Claims**

1. A reel for storing a supply of binding tape, including a cleaning member molded integrally with the reel so as to be transportable therewith, said cleaning member having a weakened region so as to be readily operator breakable at the weakened region enabling the operator to remove said cleaning member from the reel to clean the tape.

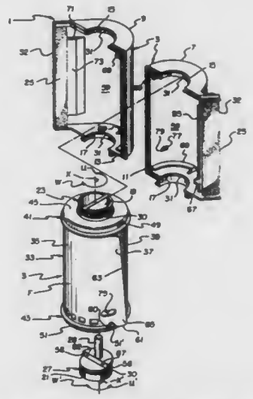


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**5,046,679**
**FILM THRUSTING CASSETTE**

**Michael T. Wolf; Joseph E. Yokajty, both of Rochester, and Bradley S. Bush, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jan. 12, 1990, Ser. No. 464,265**
**The portion of the term of this patent subsequent to Aug. 20, 2008, has been disclaimed.**
**Int. Cl.[5] G03B** *17/26*
**U.S. Cl. 242—71.1** **9 Claims**



1. In a film cassette, a film spool comprising (a) a spool core supported for rotation in a film unwinding direction to thrust a leader section of a filmstrip coiled about said spool core to the exterior of said cassette and in a film winding direction to return said leader to the interior of the cassette, and (b) a pair of flanges positioned along said spool core to overlie opposite sides of said film roll to radially confine the film roll within skirted peripheries of said flanges and having respective central openings through which the spool core axially extends to normally permit each of the flanges to be independently rotated relative to the spool core in the film unwinding and film winding directions, is characterized in that:

said spool core includes a core piece connected to a remaining portion of the spool core for rotation within the central opening of one of said flanges, relative to said remaining portion substantially in the film unwinding direction,

to engage the flange to rotate the flange in unity with the spool core when the spool core is rotated in the film unwinding direction, to improve the ability of said film spool to thrust said leader from said cassette, and relative to the remaining portion substantially in the film winding direction, to disengage the flange to permit the flange to be independently rotated when the spool core is rotated in the film winding direction, to generally ensure the leader can be rewound within said skirted periphery of the flange.

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**5,046,680**

## FILM CASSETTE

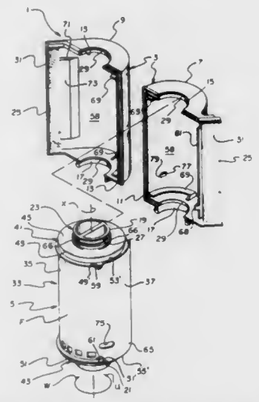
**John J. Niedospial, and Christopher P. McCormick, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 8, 1990, Ser. No. 490,234**

**The portion of the term of this patent subsequent to Jul. 16, 2008, has been disclaimed.**

**Int. Cl.[5] G03B *1/04***

**U.S. Cl. 242—71.1** **4 Claims**



1. A film cassette comprising (a) a spool core supported for rotation in an unwinding direction to thrust a leader section of a filmstrip coiled about said spool core through a passageway with light-trapping means to the exterior of said cassette and (b) a pair of flanges arranged in spaced relation along said spool core for overlying opposite longitudinal edges of said filmstrip to radially confine the filmstrip coiled about the spool core and adapted to permit said longitudinal film edges to force said flanges farther apart to allow the filmstrip to escape the confinement of the flanges to permit said leader section to be thrust outside the cassette, is characterized in that:

said leader section of the filmstrip includes integral means at said longitudinal film edges for permitting the leader section to be thrust through said passageway to at least partially beyond said light-trapping means before the longitudinal film edges begin to force said flanges farther apart, whereby when said spool core is rotated in the unwinding direction the leader section will first overcome any resistance the light-trapping means initially presents to film movement and the longitudinal film edges will then overcome any resistance the flanges initially present to being forced farther apart.

**5,046,681**

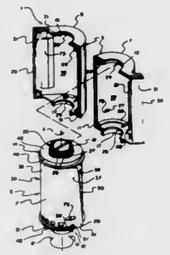
## FILM CASSETTE

**John J. Niedospial, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 8, 1990, Ser. No. 490,233**

**Int. Cl.[5] G03B *1/04, 17/26***

**U.S. Cl. 242—71.1** **6 Claims**



1. A film cassette comprising (a) a spool core supported in a cassette shell for rotation in film winding and film unwinding directions, (b) a filmstrip having opposite ends one of which is attached to said spool core to permit the spool core to wind said filmstrip from outside said shell onto winding direction, and (c) a pair of flanges arranged in coaxial spaced relation along said spool core, including respective skirted peripheries for overlying opposite longitudinal edges of said filmstrip to radially confine the filmstrip about the spool core, and adapted to be flexed farther apart at said skirted peripheries to permit the filmstrip to readily enter the confinement of said flanges for storage within said shell when the spool core is rotated in the winding direction and to readily escape the confinement of the flanges to exit the shell when the spool core is rotated in the unwinding direction, is characterized in that:

said flanges are sufficiently flexible relative to said filmstrip to permit the filmstrip at its longitudinal edges normally to flex the flanges farther apart at the skirted peripheries when the filmstrip enters or escapes the confinement of the flanges; and

said filmstrip has a relatively short longitudinal section proximate said end of the filmstrip attached to said spool core which is sufficiently reduced in width to be moved inwardly of said skirted peripheries of the flanges without having to flex said flanges farther apart when the spool core is rotated in the winding direction to wind the filmstrip from outside said cassette shell onto the spool core.

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**5,046,682**

## FILM CASSETTE

**John J. Niedospial, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 9, 1990, Ser. No. 506,320**

**The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.**

**Int. Cl.[5] G03B *1/00***

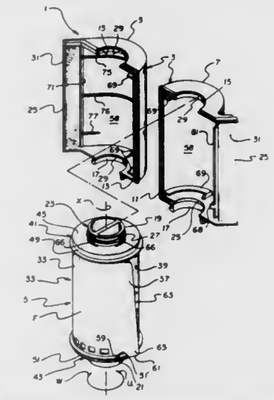
**U.S. Cl. 242—71.1** **7 Claims**

1. An improved film cassette wherein (a) a unitary spool core is supported for rotation in an unwinding direction within a cassette shell, (b) a convoluted film roll whose outermost convolution is a film leader is coiled about said spool core, (c) a pair of flanges are coaxially arranged along said spool core to normally radially confine said film roll coiled about the spool core within respective skirted peripheries of said flanges to prevent said film leader from uncoiling against an interior curved wall of said cassette shell, and (d) a film stripper proximate a lighttight passageway to the exterior of said cassette shell is received between said film leader and the next-inward convolution of said film roll responsive to rotation of said spool core in the unwinding direction to remove the leader from the confinement of said skirted peripheries to permit it to longitudinally enter said passageway, and wherein the improvement comprises:

said flanges are sufficiently flexible to allow said film leader at respective longitudinal film edges to force the flanges farther apart to uncoil from the confinement of said skirted peripheries, only when said spool core is rotated in the unwinding direction with said stripper received between the leader and the next-inward convolution of said film roll;

respective means fixed to said cassette shell are positioned for restraining said flanges against being forced farther apart relatively remote from said passageway to prevent said film leader from uncoiling from the confinement of said skirted peripheries in the vicinity of said restraining means, to allow the leader to uncoil from the confinement





of the skirted peripheries only closer to the passageway; and

a plurality of substantially parallel curved film supporting ribs project from said interior curved wall to longitudinally extend along the entire location at which said film leader can uncoil from the confinement of said skirted peripheries, when said spool core is rotated in the unwinding direction with said stripper received between the leader and the next-inward convolution of said film roll, to severely limit the radial extent to which the leader can uncoil from between said flanges, and thus support the leader wherever it is uncoiled to maintain sufficient longitudinal rigidity for it to overcome any resistance said passageway may present to movement of the leader to the exterior of said cassette shell.

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**5,046,683**

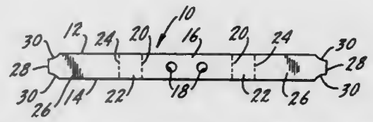
## CASSETTE REEL SPRING TIP CONFIGURATION

**William M. Carroll, 1111 E. Dean Rd., Milwaukee, Wis. 53217**

**Filed Jul. 13, 1989, Ser. No. 379,228**

**Int. Cl.[5] G03B *1/04*; G11B *15/32***

**U.S. Cl. 242—199** **6 Claims**



1. In a magnetic tape cassette, a reel spring comprising an elongated strip of resilient material having first and second parallel edges extending substantially throughout its length, the spring having a central base portion and adjoining end portions extending out of the plane of the base portion with the end portion terminating at transversely extending tip edges which are perpendicular to the parallel edges, the tip edges adjoining relieved cutout edges which adjoin the first and second parallel edges such that the width of the each tip edge is less than that of the strip.

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**5,046,684**

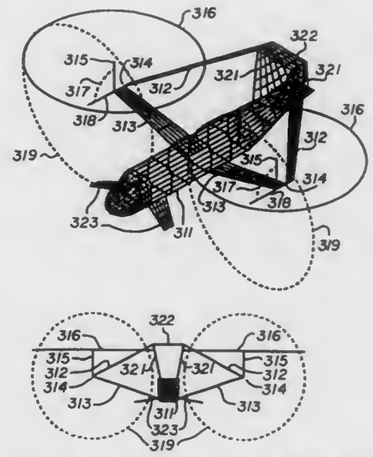
## AIRPLANE WITH BRACED WINGS AND PIVOTING PROPULSION DEVICES

**Julian Wolkovitch, 28603 Trailriders Dr., Rancho Palos Verdes, Calif. 90274**

**Filed Feb. 9, 1989, Ser. No. 308,656**

**Int. Cl.[5] B64C *27/22***

**U.S. Cl. 244—7 A** **20 Claims**



1. A hybrid aircraft capable of vertical takeoff and highly efficient hovering flight, and of forward cruising flight at intermediate speeds approaching roughly four hundred knots, and comprising:

a fuselage;

self-bracing means for providing aerodynamic lift in forward cruising flight at speeds approaching roughly four hundred knots, and comprising, on each side of the fuselage:

a first wing, fixed at substantially the bottom of the fuselage, that is substantially unperforated in hovering as well as forward flight, and

a second wing, fixed at substantially the top of the fuselage, or fixed to structure extending above the fuselage, and likewise substantially unperforated in hovering as well as forward flight;

each wing having thickness-to-chord ratio less than eighteen percent, and at least one of the first and second wings having dihedral so that the wings converge to join or nearly join at their tips;

unducted-rotor means for providing aerodynamic lift sufficient for highly efficient hovering flight, and for propelling the aircraft at speeds approaching roughly four hundred knots in forward cruising flight, said lift-and-propelling means being:

supported on said self-bracing lift means, at or near said tips of the first and second wings,

pivoted for operation in different orientations in hovering and forward flight respectively, and

of radius sufficient to extend, when pivoted for operation in forward flight, nearly to the fuselage.

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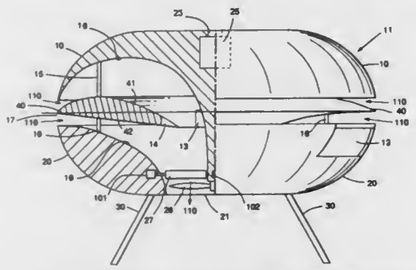


5,046,685

## FIXED CIRCULAR WING AIRCRAFT

Phillip R. Bose, 2088 Ahneita Dr., Pleasant Hill, Calif. 94523

Continuation-in-part of Ser. No. 117,194, Nov. 3, 1987, abandoned. This application Jul. 7, 1989, Ser. No. 376,716
Int. Cl.[5] B64C *29/00*
U.S. Cl. 244—23 C 19 Claims



1. A heavier-than-air aircraft having a generally circular external configuration comprising

a single annular airfoil forming a stationary circumferential lift member for said aircraft;

a circular fuselage having an upper section and a lower section of substantially the same diameter overlying and underlying the outer periphery of said annular airfoil,

said annular airfoil being affixed to each of said upper and lower sections of said circular fuselage at circumferentially spaced-apart locations to form axial openings in said fuselage above and below said annular airfoil and around the periphery thereof,

said axial openings above and below the periphery of said airfoil being not greater than the axial spacing along the radial chords of the upper and lower surfaces, respectively, of said annular airfoil from said overlying and underlying surfaces of said upper section and said lower section, respectively, of said fuselage for radial air flow through said fuselage over and under the full circumference of said annular airfoil;

said circular fuselage having a central opening formed in at least one surface thereof to permit air to flow through said fuselage between said central opening and the peripheral axial opening and radially over the upper and lower surfaces of said annular airfoil;

air drive means supported in a central portion of said fuselage member for generating an axial flow of air through the open inner circular area of said annular airfoil and said central opening in said fuselage to generate radial air flow over the circumference of the lift surfaces of said annular airfoil, and control surface

means pivotable relative to portions of the radial surface of said annular airfoil to modify radial air flow through said axial openings between said upper and lower sections of said fuselage and over said airfoil for directing the flight path of said aircraft.

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5,046,686

## CLACK VALVE AND FLAP VALVE WITH A CONTROLLED VALVE AS WELL AS AIRCRAFT WITH CONTROLLED VALVE OF THIS TYPE

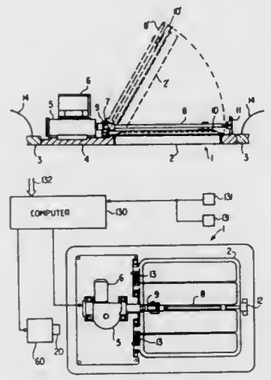
Francis Carla, St. Orens de Gameville; Bruno Baroux, Toulouse; Jacques Fraisse, Auzielle, and Jacques Signoret, Toulouse, all of France, assignors to ABG-SEMCA, Toulouse, France

Filed Apr. 14, 1989, Ser. No. 338,173
Claims priority, application France, Apr. 18, 1988, 88 05067
Int. Cl.[5] B64D *13/04*
U.S. Cl. 244—118.5 4 Claims

1. A device for limiting a pressure difference comprising:

a controlled valve, said controlled valve comprising means for regulating, on command, a fluid flow rate; and

at least two clack valves each comprising two faces, at least one of said at least two clack valves being positioned on the surface of the controlled valve, said at least one clack valve providing for the balancing of pressure if the pressure difference on the two faces of the clack valve exceeds a threshold, wherein the flow passing through an opened



clack valve can be controlled by said regulating means, and each clack valve comprises pull-back means enabling the closing of the clack valve when an opening criterion is not met, said opening criterion being different for each clack valve.

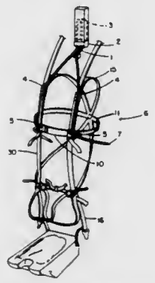
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5,046,687

## ADAPTIVE TORSO RESTRAINT SYSTEM

Gerald F. Herndon, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 22, 1988, Ser. No. 223,166
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[5] B64D *25/115*
U.S. Cl. 244—122 AG 12 Claims



1. A torso restraint apparatus comprising:

a seat;

a restraint system, including a stationary harness and haulback straps, said stationary harness including a strap extending over each shoulder, along the side, and to the lower torso region of a user, the haulback straps being slidably attached to said stationary harness straps at a plurality of locations on each respective strap, a first attachment point being generally adjacent said shoulder region and a second attachment point generally adjacent at a mid-torso position on the user on each of said respective straps; and

a retraction device of retracting the haulback straps, said haulback straps being connected at one end to the retraction device and at the other end to the seat.



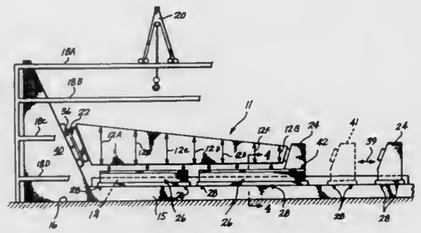
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5,046,688

## WING MAJOR ASSEMBLY JIG

Quentin T. Woods, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 28, 1988, Ser. No. 263,686
Int. Cl.[5] B64C *1/100*
U.S. Cl. 244—123 16 Claims



1. A wing major assembly jig, comprising:

an elongated base;

at least one elongated strongback module removably mounted to said base, said module having means for supporting a lower spar of a wing box in a generally horizontally extending position, said module being mounted to said base in a manner so that said module may be interchanged with another strongback module;

an inner stand-off module having means defining the position of the wing box's root end; and

an outer stand-off module having means defining the position of the wing box's tip end.

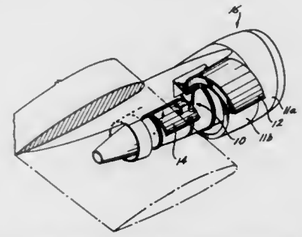
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5,046,689

## COWLING INTERLOCK SYSTEM

Paul R. Shine, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 19, 1989, Ser. No. 340,275
Int. Cl.[5] B64C *1/14, 1/16*
U.S. Cl. 244—129.4 9 Claims



1. An aircraft engine cowling interlock system for sequencing the closure of a first cowling and a second cowling disposed substantially forward and aft of each other, the first and second cowlings being mounted on the engine for movement between an open position and a closed position, with the first cowling overlapping the second cowling when both cowlings are in the closed position, the cowling interlock system comprising:

means for holding the first cowling in the open position, said holding means having a first end attached to the first cowling and a second end attached to the engine frame, said holding means having an extended configuration wherein the first cowling is held in the open position by said holding means and a retracted configuration wherein the first cowling is in the closed position;

means for locking said holding means in the extended configuration; and

means for operatively connecting said locking means to the second cowling, such that when the second cowling is in the open position, said locking means locks said holding means in the extended configuration to prevent closure of the first cowling, and when the second cowling is in the closed position, said locking means unlocks said holding means to allow closure of the first cowling.

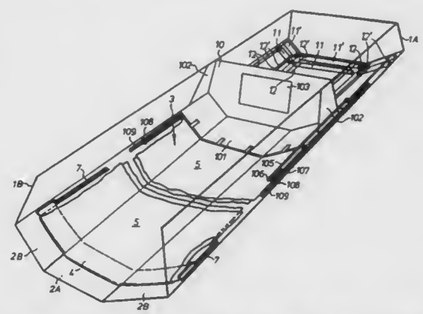
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5,046,690

## DEVICE FOR MOVING GOODS IN THE CARGO SPACE OF AN AIRCRAFT

Claes Nordström, John Lundvallsgatan 66, S-230 44 Vintrie, Sweden

PCT No. PCT/SE86/00469, § 371 Date Mar. 8, 1988, § 102(e) Date Mar. 8, 1988, PCT Pub. No. WO87/03857, PCT Pub. Date Jul. 2, 1987
PCT Filed Oct. 13, 1986, Ser. No. 166,963
Claims priority, application Sweden, Oct. 23, 1985, 8506108
Int. Cl.[5] B64D *9/00*
U.S. Cl. 244—137.1 10 Claims



1. Device for moving goods in the cargo space (1) of an aircraft, comprising at least one transport path (3; 3A, 3B) which is substantially parallel to the floor of the cargo space (1) and on which the goods is to be placed, and a drive assembly (11, 13–19, 13'–17'; 40–47) for driving said transport path backwards and forwards, characterized in that the transport path comprises a mat (5) and has a lower run arranged to rest directly on the floor of the cargo space (1), and an upper run arranged to rest over the lower run in such a manner that the weight of the goods placed on the transport path is supported via said runs by the floor of the cargo space, both during displacement of goods in the cargo space and during flight.

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5,046,691

## ORU LATCH

Raymond J. Hart, Villa Park, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Sep. 5, 1989, Ser. No. 402,299
Int. Cl.[5] B64G *1/22, 1/64*
U.S. Cl. 244—158 R 30 Claims

15. The combination comprising:

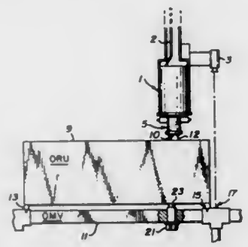
an orbital maneuverable vehicle, said orbital maneuverable vehicle including bolt receiving nut means having a threaded opening for receiving and therein fastening a bolt means;

an orbital replaceable unit for attachment to said orbital maneuverable vehicle, said orbital replaceable unit including:

a wall, with said wall containing an opening;

first shaft means;

mounting means for rotatably mounting said first shaft means;
drive socket means, said drive socket means being coupled to said first shaft means and said drive socket means being accessible from the exterior of said orbital replaceable unit;
bolt means;
said bolt means being coupled for rotation by said shaft means;
said bolt means extending through said opening in said wall for engagement with said nut means of said orbital maneuverable vehicle; and
grip means;
tool means; said tool means including;
motor means;
socket drive means;
gripper means;
means for coupling said motor means to said socket drive means for rotating said drive means responsive to supply of electrical power to said motor means;

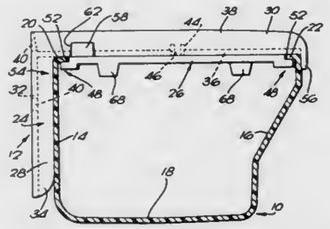


said socket drive means being adapted to releasibly matingly engage said drive socket means and, responsive to operation of said motor means, for rotating said drive socket means and thereby said first shaft means of said orbital replaceable unit to drive said bolt means into said bolt receiving nut means of said orbital maneuverable vehicle, whereby said orbital replaceable unit is fastened to said orbital maneuverable vehicle;
said gripper means being adapted to engage said grip means on said orbital replaceable unit to prevent rotation of said orbital replaceable unit responsive to rotation of said shaft means, whereby counter torque is applied to said grip means, and to permit portage of said orbital replaceable unit between a place of storage and a position in fastened relationship with said orbital maneuverable vehicle and vice-versa and said tool means being disengagable form said grip means to permit said tool means to disengage said socket drive means from said drive socket means and be moved to a location remote from said orbital replaceable unit.

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**5,046,692**
**DEVICE FOR SUPPORTING RAINWATER GUTTER**
**Terry G. Nicholas, Chippenham, England, assignor to Wavin B.V, Netherlands**
**Filed Nov. 30, 1989, Ser. No. 443,329**
**Claims priority, application United Kingdom, Dec. 7, 1988, 8828608**
**Int. Cl.[5] E04D** *13/00*
**U.S. Cl. 248—48.2** **6 Claims**

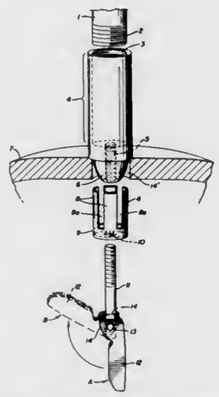
6. A device for hangingly supporting a rainwater gutter having inturned top edges, the device comprising bracket means and an elongate member pivotally attached to the bracket means and pivotable relative thereto such that opposite ends of said elongate member hangingly support the gutter by location under the inturned top edges of the gutter, said elongate member cooperating with said bracket means to engage the inturned top edges of the gutter when the member is pivoted to a predetermined position relative to the bracket means, and further comprising releasable snap-fitting means provided



on said bracket means and elongate member for releasably retaining said member in said predetermined position.

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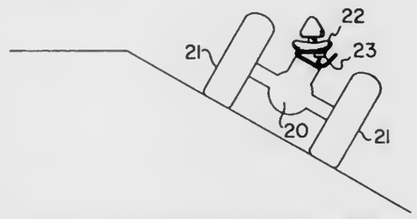
**5,046,693**
**MICROPHONE STAND COUPLER**
**William A. Browne, 16838 Weddington St., Encino, Calif. 91436**
**Filed Sep. 26, 1990, Ser. No. 589,198**
**Int. Cl.[5] F16B** *2/00*
**U.S. Cl. 248—159** **8 Claims**



1. A microphone stand coupler for connecting a threaded microphone stand pole to a microphone stand base having a hole normally for receiving the microphone stand pole, comprising:
a. a tube having a first end threaded to receive the microphone pole, and a second end adapted to receive a tension shaft;
b. a cam lever movable between a first position and a second position;
c. a tension shaft having a first end pivotably coupled to the cam lever and a second end coupled to the second end of the tube;
d. a collet and spring means interposed between the cam lever and the second end of the tube, for providing a spring force opposing the movement of the cam lever between the first position and the second position;
wherein the microphone stand pole is attachable to the microphone stand base by screwing the microphone stand pole into the first end of the tube, inserting the second end of the tube through the hole of the microphone stand base, and moving the cam lever from the first position to the second position.



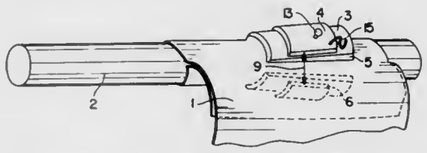
**5,046,694**
**SEAT LEVELLING DEVICE**
**Gerry W. Martin, 59 Assiniboia Avenue, Yorkton, Saskatchewan, Canada S3N 1N7**
**Filed Jul. 5, 1990, Ser. No. 548,259**
**Int. Cl.[5] B60N** *2/10*
**U.S. Cl. 248—188.2** **6 Claims**



1. A seat levelling device for the driver's seat of an agricultural machine consisting essentially of:
(i) a seat support means attached to the machine;
(ii) a seat base means for the driver's seat;
(iii) at least one hinge means joining together a lateral side of each of the seat support and the seat base, and providing an axis of rotation therebetween parallel to the longitudinal axis of the machine;
(iv) a first shaft means rotatably attached to the seat support on a transverse axis of the machine and including a handle portion extending beyond the side of the support remote from the pivot;
(v) a second shaft means pivotally attached to the support means on a longitudinal axis parallel to the pivot axis including a pair of level gears with the first shaft whereby rotation of the first shaft induces rotation in the second shaft;
(vi) at least one support arm attached to the second shaft carrying at its upper end a roller means; and
(vii) at least one channel means attached laterally to the underside of the seat base adapted to engage the roller means;
whereby when the handle portion of the first shaft is rotated from a first position to a second position the seat base is caused to rotate through a limited arc about the pivot means, said limited arc corresponding to an angle between the seat base and the seat support of from about 10 degrees to about 20 degrees.

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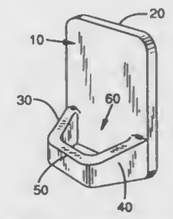
**5,046,695**
**DEVICE INTENDED FOR ATTACHMENT TO THE OUTER SURFACE OF A CYLINDRICAL OBJECT**
**Pauli O. Vuorenmaa, Veppebyvägen 8, S-198 00 Bålsta, Sweden, assignor to Pauli Vuorenmaa, Balsta, Sweden**
**PCT No. PCT/SE88/00600, § 371 Date Apr. 25, 1990, § 102(e) Date Apr. 25, 1990, PCT Pub. No. WO89/04428, PCT Pub. Date May 18, 1989**
**PCT Filed Nov. 7, 1988, Ser. No. 473,991**
**Claims priority, application Sweden, Nov. 5, 1987, 8704318; Mar. 4, 1988, 8800792**
**Int. Cl.[5] A47B** *96/06*
**U.S. Cl. 248—230** **18 Claims**



1. A device fitted externally to a rod-like object comprising an internal tubular member and an outer, rigid, tubular member, both the internal and external tubular members having a longitudinally extending opening extending along an entire length thereof, the rod-like object being insertable into and removable from the internal and outer tubular members through the longitudinally extending openings;
the internal tubular member having a generally smooth outer peripheral surface in cross section with a circumference at least partially decreasing in one longitudinal direction and having a generally smooth internal surface in cross section with a shape corresponding approximately to a shape of the rod-like object, the internal tubular member being an elastic material having high friction, the longitudinally extending opening in the internal tubular member having a smaller width than a smallest width of the rod-like object when the internal tubular member is in an unloaded condition, and an angle of contact of the internal tubular member against the rod-like object in a mounted position exceeds 180°;
the outer tubular member having an internal surface which abuts with the outer peripheral surface of the internal tubular member and which has a circumference correspondingly decreasing in the one longitudinal direction as the outer peripheral surface of the internal tubular member,
the internal tubular member and outer tubular member being fit over the rod like-object and axially displaced towards one another until an inner surface of the internal member lockingly presses against the rod-like object, the internal and outer tubular members being locatable at an arbitrary position along the rod-like object.

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**5,046,696**
**EYEGLASS HOLDER**
**Tim Lee, P.O. Box 139, Glendale, Oreg. 97442**
**Filed Jul. 10, 1990, Ser. No. 451,422**
**Int. Cl.[5] A47F** *5/00*
**U.S. Cl. 248—309.1** **14 Claims**



1. A holder for a pair of eyeglasses having a lens frame and a pair of temples, said holder comprising:
a first member of injection molded thermoplastic, said first member being flat and planar and having a first side and a second side;
a second member integrally molded to said first member, said second member protruding from the first side of said first member and forming a bounded opening between said first member and said second member for receiving a temple of said eyeglasses the second member forming a loop having an upper surface sloping downwardly away from the first member when the first member is vertically oriented, whereby an eyeglass supported in said holder slides downwardly are away from the first member; and
an attachment means on said second side of said first member for attaching said first member to a surface.

VOL 1130 ISS 2 SE 10 1991 UMI

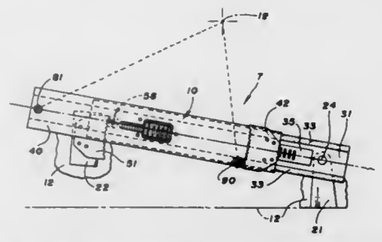


5,046,697

## SIX-WAY ADJUSTER APPARATUS AND METHOD

Clement A. Detloff, Southfield, and Joseph J. Magyar, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 331,998, Apr. 3, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 627,900
Int. Cl.[5] B60N *1/02*
U.S. Cl. 248—394 5 Claims



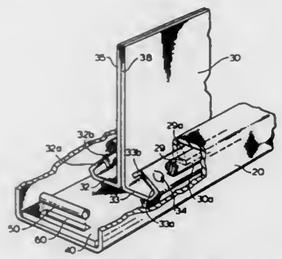
1. A six-way non-manually powered vehicle seat adjuster, said adjuster in combination comprising:
- a first link pivotally connected with said vehicle along a first rearward end of said first link;
- a second link with first and second ends, said second link being slidably mounted to said first link;
- means for pivotally connecting said vehicle seat to said second link generally adjacent to said second link second end; and
- a first powered gear means adjustably connecting said first link to said vehicle at an end of said first link generally opposite said first link first end, second powered gear means for adjustably setting the position of said second link with respect to said first link, third powered gear means for adjustably setting the position of said seat with respect to said first end of second link whereby the elevation of a second end of said seat is controlled by said first powered gear means, and the elevation of a first end of said seat is controlled by said third powered gear means, and the longitudinal position of said seat is controlled by said second powered gear means.

5,046,698

## INTERLOCKING STRUCTURAL TRACK

Fabio Venier, Downsview, Canada, assignor to Magna International Inc., Markham, Canada

Filed May 15, 1989, Ser. No. 352,731
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—430 22 Claims



1. A track assembly comprising a fixed track having two sides a top and a bottom engaged with a moveable track slidable with respect to the fixed track, the moveable track having two sides a top and a bottom and having disposed therewith anchoring means for securing a passenger to the moveable track, the fixed track having first and second portions engaging and being substantially U-shaped in cross-section, the fixed track having substantially inwardly extending second engaging portions disposed proximate the tops of the U-shaped fixed track extending inwardly towards one another and having a disposed proximate the terminus of each inwardly extending second engaging portion a substantially downwardly extending portion extending towards the bottom of the track and having disposed proximate the terminus of each downwardly extending portion first engaging portions extending towards each side of the fixed track in a direction away from one another and laterally towards the moveable track proximate the opening of the U-shaped cross-section, the moveable track having a top, bottom and sides and being of substantially double J form in cross-section, one of the J structures being a mirror image of the other, each J structure having a larger leg extending from proximate the bottom to proximate the top of the moveable track, and angled smaller leg extending substantially from proximate the bottom toward the top of the moveable track, wherein the smaller leg having disposed proximate the terminus thereof remote from the bottom of the J structure a third engaging portion disposed in a direction extending inwardly and then downwardly towards each larger leg of the double J form terminating with a hooking portion, each third portion being an extension of the smaller leg extending towards the larger leg, the bottom of each J structure providing a fourth engaging portion, the third and fourth engaging portions for interengagement with each first engaging portion of the U-shaped fixed track disposed substantially between each third and fourth engaging portions of the double J form moveable track in use, each fist and second engaging portion of the fixed track for interengagement with each third engaging portion of the moveable track disposed substantially between each first and second engaging portions of the fixed track in use; whereby when a force is exerted upon the track assembly through the anchor means in a direction tending to separate the tracks, the second engaging portions of the fixed track will engage the third engaging portions of the moveable track causing the third engaging portions to collapse towards the fourth engaging portions thus interlocking the first engaging portions therebetween and resisting the force tending to seperate the tracks, wherein bearing means is disposed between the fixed and moveable track between each second and third portions of the track assembly to assist in the collapse of the third portions toward the fourth portions when the track assembly is subjected to a force tending to separate the track assembly, normally the bearing means assisting movement of the moveable track engaged with the fixed track.

5,046,699

## ANCHORING DEVICE FOR POST

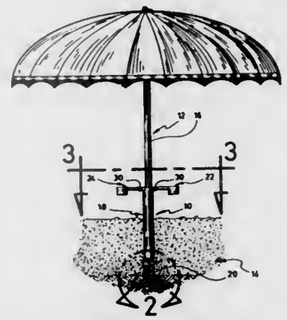
Gilles R. Perreault, 88, rue Principale, Frampton, Quebec, Canada G0R 1M0 , and Pierre P. Gagnon, 905, de Bourgchemin, Terrebonne, Quebec, Canada J6X 1X6

Filed Oct. 10, 1990, Ser. No. 594,936
Int. Cl.[5] A45B *9/00, 25/16;* A45F *3/44*
U.S. Cl. 248—533 4 Claims

1. An anchoring device for securing a post into the ground comprising:
- a hollow tubular member opened at the upper end thereof, said tubular member adapted to vertically support a tubular post extending through said upper end,
- a screw member secured at the lower end of said tubular member, said screw member adapted to facilitate the penetration of the device into the ground,
- a handle member fixed adjacent the upper end of said tubular member and projecting sideways on said tubular member, said handle member comprising a pair of lever members diametrically disposed relative to said tubular member, said lever members being pivotally connected to said tubular member for pivoting in a vertical plane, means for stopping said lever members for pivoting in a vertical plane, said handle member adapted to rotate said tubular member and said screw member into the ground,



means located at the upper end of said tubular member for tightening said post when the latter is mounted inside said tubular member, said tightening means comprising a curved leaf spring fixed to each of said lever members



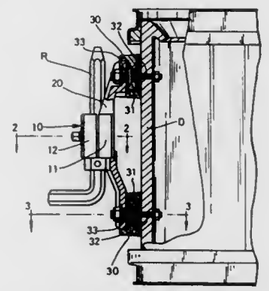
adjacent said tubular member and progressively projecting inside the latter, whereby upon a pivoting action of each of the lever members from a vertical position to a horizontal position, the leaf springs are adapted to tighten the post inside the tubular member.

5,046,700

## DRUM MOUNT FOR SECURING CLAMP

Yoshihiro Hoshino, Nagoya, Japan, assignor to Hoshino Gakki Co., Ltd., Japan

Continuation of Ser. No. 209,507, Jun. 21, 1988, abandoned. This application May 16, 1989, Ser. No. 353,193
Claims priority, application Japan, Oct. 2, 1987, 62-151276
Int. Cl.[5] G10G *5/00*
U.S. Cl. 248—638 9 Claims



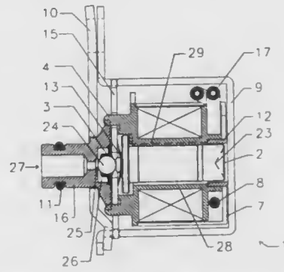
1. A mount for a clamp for mounting the clamp on the side of a drum body, the clamp being for mounting the drum body on a rod, the mount comprising:
- a fixed installation part to be fixed to the side of the drum body;
- a movable clamping part movable toward and away from the fixed installation part for clamping the rod;
- a rigid installation member to which the fixed installation part is secured; the installation member having first and second spaced apart attachment areas, and the attachment areas being attached to the drum body at vertically spaced locations along the drum body;
- a first vibration absorption seat at said first attachment area of the installation member; the first vibration absorption seat being made of resilient vibration absorbing material; first attachment means for attaching the seat on the side of the drum body with said resilient vibration absorbing material contacting the side of the drum body; and separated second attachment means for attaching the seat of the installation member;
- a second vibration absorption seat at said second attachment area of the installation member; the second vibration absorption seat being made of resilient vibration absorbing material, said resilient vibration absorbing material of said second seat being separated and vertically spaced apart from said resilient vibration absorbing material of said first seat; third attachment means for attaching the second seat on the side of the drum body with said resilient vibration absorbing material of said second seat contacting the side of the drum body; and separated fourth attachment means for attaching the second seat to the installation member;
- wherein each seat is for reducing the transmission of vibrations to the rod and where both seats avoid concentration of the load on any part of the drum body.

5,046,701

## MOLDED BALL/SEAL

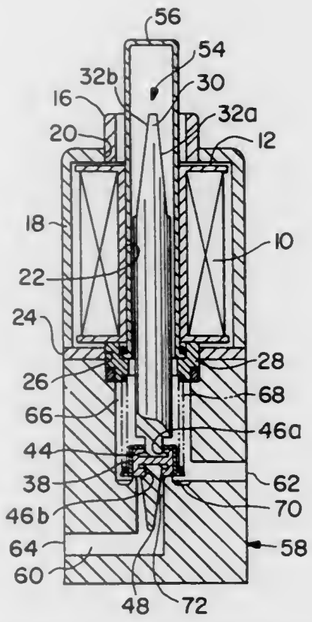
Michael Barber, Mississauga, Canada, assignor to CTS Corporation, Ind.

Filed Nov. 3, 1989, Ser. No. 431,507
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.02 5 Claims



1. A valve for allowing passage of a fluid or alternatively blocking said passage comprising:
- an actuator means for providing a first force to a closing apparatus, said first force having sufficient magnitude to overcome any opposing forces so as to alter the positioning of said closing apparatus, said actuator means being actuatable so as to either provide said first force or to fail to provide said first force;
- said closing apparatus having a valve seat defining a fluid passage, a valve seat restricting means operable to close or highly restrict said fluid passage when said restricting means is immediately adjacent to said valve seat, a means for flexibly retaining said valve seat restricting means, said valve seat restricting means being of relatively less flexible composition than said retaining means;
- said retaining means composed of a material which is formed using said valve seat restricting means as a part of a shaping mold such that said retaining means and said valve seat restricting means are bonded together so as to be impervious to passage of said fluid therethrough;
- said closing apparatus having a means for providing a second force opposite to any first force which might be present when said actuator means is actuated to provide said first force;
- said adjacency between said restricting means and said valve seat controlled by said provision or said failure to provide said first force.

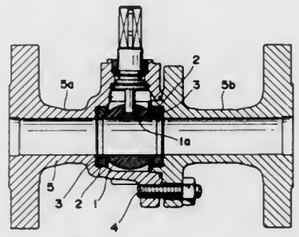
5,046,702
**SOLENOID DEVICE**
Shozo Miyazawa, and Takanori Kobayashi, both of Suzaka, Japan, assignors to Kabushiki Kaisha Kambayashi Seisakujo, Nagano, Japan
PCT No. PCT/JP88/00266, § 371 Date Sep. 14, 1989, § 102(e) Date Sep. 14, 1989, PCT Pub. No. WO88/07152, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 11, 1988, Ser. No. 415,333
Claims priority, application Japan, Mar. 14, 1987, 62-59898; Mar. 20, 1987, 62-67605
Int. Cl.[5] F16K *31/06*
U.S. Cl. 251—129.04 6 Claims




1. A solenoid device for use as an electromagnetic valve in controlling fluid flow by inputting voltage or pulse comprising an electromagnetic coil having an axial direction, a plunger made of magnetizable material, said plunger being moveable in the axial direction of said coil, a displacement body, and a displacement sensor for measuring the amount of displacement of said displacement body by measuring the change of the reactance or the frequency of said coil to determine the amount of mutual relative movement between said plunger and said coil,

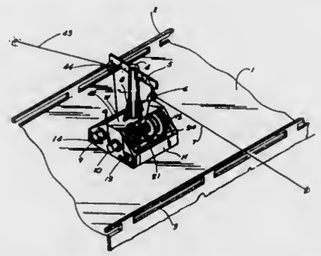
wherein said plunger includes a middle section, said middle section having a predetermined width, an upper end section having an upper end face and being disposed within said coil, a parallel peripheral surface, said parallel peripheral surface extending parallel to the longitudinal axis of said plunger from said middle section to intersect with said upper end face to form more than one portion of a peripheral edge of said upper end face, and at least one non-parallel peripheral surface, said non-parallel peripheral surface being non-parallel to the longitudinal axis of said plunger and extending from said peripheral edge of said upper end face toward said middle section.

5,046,703
**CARBONACEOUS SINTERED COMPACT AND FLUID SEALING MEMBER WITH THIS CONTACT**
Minehiro Kamiyama, Zentsuji; Takashi Matsumoto, Kagawa, and Yoshihiro Watanabe, Osaka, all of Japan, assignors to Toyo Tanso Co., Ltd., Osaka, Japan
Continuation of Ser. No. 274,548, Nov. 22, 1988, abandoned. This application Jun. 28, 1990, Ser. No. 544,805
Claims priority, application Japan, Nov. 24, 1987, 62-297202
Int. Cl.[5] F16K *31/44*
U.S. Cl. 251—368 9 Claims




1. A heat resistant fluid sealing member comprising an annular slide contact member of impermeable carbonaceous material which is a sintered compact composed of graphite and mesocarbon microbeads.

5,046,704
**METHOD AND APPARATUS IMPROVEMENTS IN OYSTER AND SHRIMP WINCHES**
Christopher A. Liner, Box 13-D, Theriot, La. 70397
Filed Jan. 11, 1989, Ser. No. 295,553
Int. Cl.[5] F16D *19/00*; B66D *1/14*
U.S. Cl. 254—348 12 Claims



1. A winch device for use in conjunction with the dredging of oysters and the like, comprising:

load bearing means, said means including a load bearing member flexible along its length such as rope, cable, chain or the like,

spool means for spooling said load bearing means,

shaft means for turning said spooling means,

braking means for braking said spooling means,

drive means for driving said shaft means,

engagement means for engaging or disengaging said spooling means with said driving means,

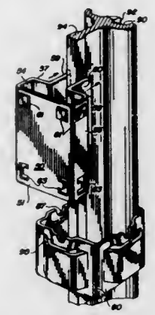
wear reduction means associated with said engagement means, said wear reduction means further comprising plates of metal juxtaposed said engagement means, said plates of metal comprised of material softer than said engagement means,

frame means for framing said winching means, and

support means for supporting and guiding said load bearing means over said spooling means, said support means including a vertical support member associated with said frame means.



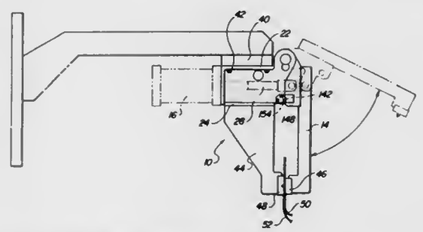
5,046,705
**WEDGE FOR MOUNTING FENCE POST COLLARS**
Jeffery D. Williams, Tumacacori, Ariz., assignor to Wedge-Loc Co., Inc., Rio Rico, Ariz.
Filed Aug. 31, 1990, Ser. No. 576,070
Int. Cl.[5] E04H *12/22*
U.S. Cl. 256—36 17 Claims



1. A mounting wedge for attaching a collar to a fence T-post where the T-post has a rear leg extending from substantially the center of a front face, and where the collar is a hollow collar member, having a predetermined length with a top edge and a bottom edge, and with a substantially rectangular internal cross-section dimensioned in at least the diagonal thereof, to permit said collar member to slideably fit over a fence T-post, with a space between the interior of said collar member and such fence T-post, said wedge comprising:

a wedge member shaped to straddle the rear leg of said T-post for wedging engagement between the rear of the front face of said post and the inside of said collar member adjacent the edge of the rear leg of said T-post, to hold said collar member wedged onto said fence T-post, and aligned therewith, said wedge member having a substantially uniform cross-section throughout the length thereof, in the form of a hollow "T" shape, with a pair of legs thereon for straddling the rear leg of said T-post.

5,046,706
**POWER CLAMP**
Jeffrey S. McNamara, Rochester Hills, and Kosta Dimefski, Warren, both of Mich., assignors to Peninsular, Inc., Roseville, Mich.
Continuation of Ser. No. 192,329, May 10, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 496,122
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—32 17 Claims



1. A power clamp comprising:

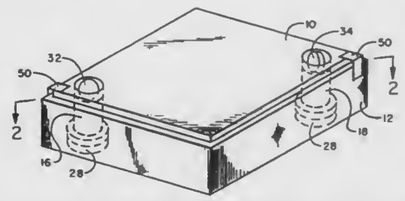
a clamp head enclosure;

a reciprocating actuating cylinder having a piston rod with a major axis;

movable clamp arm means for clamping a workpiece; and

coupling means removably fixed with the piston rod and having a link attached at one end thereof, said coupling means and link moving in a direction substantially in line with the movement of the piston rod, a body member pivotally coupled for rotation at the other end of said link wherein the actuation point of attachment and the pivot are located on the bottom surface of the clamping arm with the actuation point of attachment being located between the pivot and the clamping surface, said body member coupled with said clamp arm for pivoting the arm to a release position when the rod is extended from the cylinder, with said coupling means, link and body member pivoting the arm to a clamping position for clamping the workpiece when the piston rod is substantially retracted into the cylinder whereby said coupling means, link and body member are positioned in and substantially enclosed by the clamp head enclosure protected form abuse during performing operation son the workpiece while clamped.

5,046,707
**SPHERICAL POSITIONING PIN**
Calvin G. Allen, Memphis, Tenn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Nov. 30, 1988, Ser. No. 278,110
Int. Cl.[5] B23Q *1/06*
U.S. Cl. 269—309 6 Claims




1. A datum line establishing tool for fixing a workpiece in an X plane and a Y plane, said X and Y planes being perpendicular to each other, said workpiece having a planar surface having first and second index holes disposed in opposite corners, said datum line establishing tool comprises:

a tool base which has a first and a second tool base cavity disposed in opposite corners;

a spherical pin assembly mounted in said first tool base cavity in said tool base, and which projects upwards through said first index hole in said planar surface of said workpiece, said spherical pin assembly thereby maintaining said workpiece in said X plane;

a cylindrical pin assembly mounted in said second tool base cavity in said tool base, and which projects upwards through said second index hole in said planar surface of said workpiece, said cylindrical pin assembly having an elongated transverse cross-section which is elongated along an axis which is perpendicular to a line which runs between said spherical pin assembly and said cylindrical pin assembly, said cylindrical pin assembly thereby maintaining said workpiece in said Y plane;

a means for fixing said workpiece to said data line establishing tool; and

a means for providing an upward bias to said spherical pin assembly and said cylindrical pin assembly so that they respectively project upwards through said first and second index holes.

VOL 1130 ISS 2 SE 10 1991 UMI

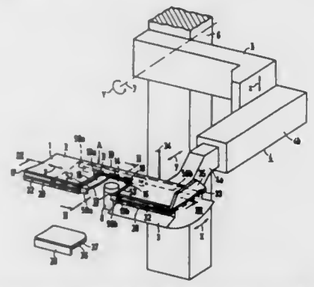


5,046,708

## PATIENT SUPPORTING TABLE HAVING A SUPPORT PLATE ADJUSTABLE IN THE DIRECTION OF THE LONGITUDINAL AXIS OF THE PATIENT SUPPORTING TABLE

Willi Schaefer, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 18, 1990, Ser. No. 539,889
Claims priority, application European Pat. Off., Jun. 30, 1989, 89111991.9
Int. Cl.[5] A61G *13/00*
U.S. Cl. 269—322 11 Claims



1. A patient supporting table having a support plate comprising:
- a seating surface for a patient and having a base member that caries said support plate such that said support plate is adjustable relative to said base member, wherein an underside of the support plate facing away from the seating surface is fashioned as a surface of action that interacts with a correspondingly-shaped surface of action of the base member;
- the support plate and the base member each comprising a recess, whereby the recess of the support plate extends through the surface of action thereof and the recess of the base member extends through its surface of action, the recesses being alignable, at least essentially, with one another given a corresponding adjustment of the support plate relative to the base member; and
- wherein the surfaces of action of the support plate and of the base member slide on one another when the support plate is adjusted relative to the base member.

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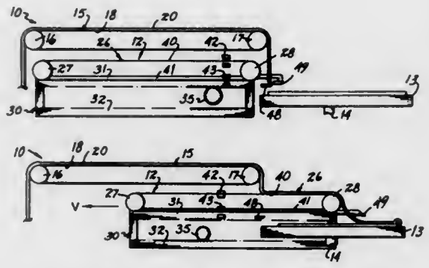
5,046,709

## APPARATUS FOR CUTTING OR STACKING WEB MATERIALS

Lawrence E. Beal, Wadsworth, Ohio, assignor to Illinois Tool Works, Inc., Glenview, Ill.

Filed Apr. 17, 1989, Ser. No. 340,867
Int. Cl.[5] B65H *29/46*
U.S. Cl. 270—30 3 Claims

1. Apparatus for stacking a web in a cut or a zigzag folded condition comprising:
- a skid,
- an endless supply belt, said supply belt having a horizontal upper run and a discharge end adjacent said skid,
- means for driving said belt to move said upper run toward said skid,
- an endless transport belt below said supply belt, said transport belt having a horizontal upper run and a horizontal lower run,
- means for clamping said transport belt upper run,
- means for clamping said transport belt lower run, and
- means for horizontally reciprocating said transport belt with respect to said supply belt,
- said means for clamping said upper run and said means for clamping said lower run being selectively operable to provide a cut and stack operation when said upper run is intermittently clamped and to provide a zigzag fold operation when said upper and lower runs are alternatively clamped.



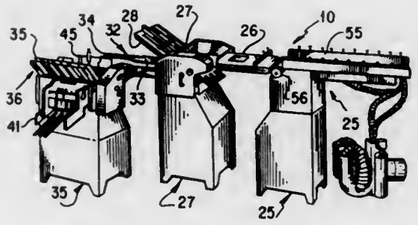
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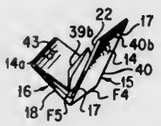
5,046,710

## FOLDED LEAFLET AND METHOD AND APPARATUS FOR MAKING SAME

Robert Vijuk, Downers Grove, Ill., assignor to Vijuk Equipment, Inc., Elmhurst, Ill.

Division of Ser. No. 5,422, Jan. 20, 1987, Pat. No. 4,817,931.
This application Mar. 23, 1989, Ser. No. 327,543
Int. Cl.[5] B41L *43/12*
U.S. Cl. 270—37 9 Claims





1. In an apparatus for folding a folded, enclosed leaflet formed from an integral sheet having fold lines and cross folds normal to the fold lines therein and having adhesive interior of the leaflet to join folded halves of the leaflet together, the leaflet having an interior lip portion and having cross folds and fold lines along exterior edges of the leaflet so as not to leave a loose edge on the leaflet, said apparatus comprising:
- first conveyor means for feeding sheets in a first direction to a first folding station,
- a first folding means at the first folding station for folding the sheet with fold lines extending normal to the direction of travel of the sheet into the folding station,
- means for delivery of the folded sheets with fold lines to the transfer station,
- second conveyor means for feeding the folded sheets in a direction substantially at right angles to the first direction of travel,



- adhesive application means for applying adhesive to a portion of the folded sheet,
- second folder means at a second folding station to fold the folded sheet in a direction perpendicular to the fold lines formed at the first folding station thereby forming cross folds and including means to form one leg longer than the other leg to leave a lip portion on the longer leg, and
- said second folder means including a folder to make a final cross fold which joins the leaflet halves together and to push the lip portion against a folded panel to adhere the latter to the lip portion to form a folded leaflet with adhered panels and without a loose edge.

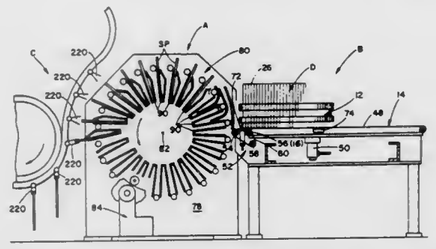
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5,046,711

## HIGH SPEED DRUM TYPE PROCESSING APPARATUS

Richard J. Merwarth, Westlake, and Brian K. Happel, Bay Village, both of Ohio, assignors to Hall Processing Systems, Westlake, Ohio

Continuation of Ser. No. 149,699, Jan. 29, 1988, Pat. No. 4,813,662. This application Mar. 16, 1989, Ser. No. 324,463
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[5] B65H *5/08*
U.S. Cl. 271—11 17 Claims



12. An apparatus for processing an associated stack of sheet products comprising:
- a drum rotatable about a central axis;
- plural, generally radially disposed pockets defined in said drum and having first and second sidewalls defining pocket openings at selected peripheral portions of said drum adapted to receive the sheet products therein;
- plural rollers disposed adjacent the periphery of said drum between said pocket openings adapted to operatively engage one of the sheet products from the associated stack; and facilitate entry into a selected pocket; and,
- means for tilting said pockets relative to the drum to assist ingress and egress of sheet products from said pockets.

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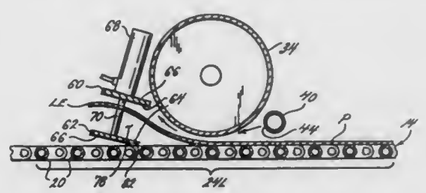
5,046,712

## APPARATUS FOR HANDLING WORKPIECES OF LIMP SHEET MATERIAL

Timothy G. Clapp, Raleigh, N.C., and William R. Cole, Jr., Shelbyville, Tenn., assignors to ARK, Inc., Shelbyville, Tenn.

Filed Sep. 10, 1990, Ser. No. 579,807
Int. Cl.[5] B65H *29/66*
U.S. Cl. 271—65 8 Claims

1. Apparatus for handling workpieces of limp sheet material, such as fabric sheet material, the apparatus comprising:
- an endless conveyor having a forward-traveling upper reach for conveying workpieces in a forward direction, each workpiece having a leading edge and a trailing edge;
- pick-up means for grasping a portion of the workpiece adjacent its leading edge and holding said leading edge portion stationary as the upper reach moves continuously forwardly under said pick-up means, said pick-up means comprising airfoil means extending transversely across the upper reach of the conveyor, means for delivering a jet of air in a generally forward direction between the upper reach of the conveyor and said airfoil means, means forward of said airfoil means for clamping said leading edge portion of the workpiece, and sensor means operable to activate said clamping means;
- said air jet means being adapted to deliver a jet of air as the workpiece travels forwardly under said airfoil means such that said leading edge portion of the workpiece raises up from the conveyor toward said airfoil means and is received in said clamping means, said sensor means detecting the presence of said leading edge portion in said clamping means and generating a signal in response to which said clamping means clamps said leading edge portion.



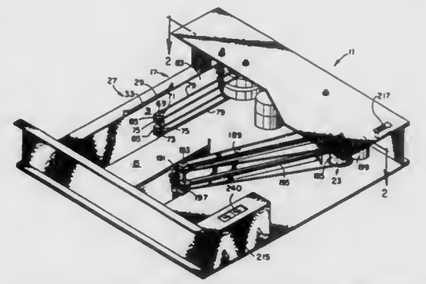
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5,046,713

## DOCUMENT IMPRINTING DEVICE

N. Allen Cargill, Warminster, Pa., assignor to Technitrol, Inc., Philadelphia, Pa.

Division of Ser. No. 354,140, May 19, 1989. This application Oct. 9, 1990, Ser. No. 594,358
Int. Cl.[5] B65H *1/02*
U.S. Cl. 271—149 1 Claim

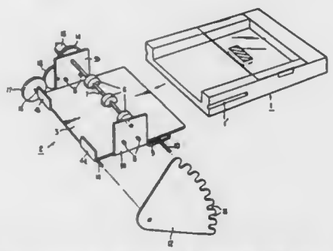


1. A follower apparatus for use on devices that separate and count documents such as checks, comprising
- an arm mechanism mounted on the underside of a hopper having a first end portion and a second end portion,
- the arm mechanism having a first pulley at its first end portion and a second non-rotating pulley at its second end portion,
- a continuous belt extending between the first and second pulleys,
- a slot formed in the hopper,
- a rotatable shaft being fixed to the first pulley and extending through the slot, and
- a panel fixed to the shaft,
- said panel forming the rear wall of the hopper, and
- said panel being rotatable with the shaft to maintain its orientation in the hopper as the shaft moves laterally back and forth in the slot.

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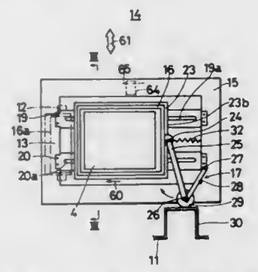


5,046,714
**PAPER FEEDER FOR A COPYING MACHINE**
Nag-Hyo Hwang, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea
Filed Dec. 6, 1989, Ser. No. 446,872
Claims priority, application Rep. of Korea, Mar. 30, 1989, 1989-4108
Int. Cl.[5] B65H *1/00*
U.S. Cl. 271—162 6 Claims



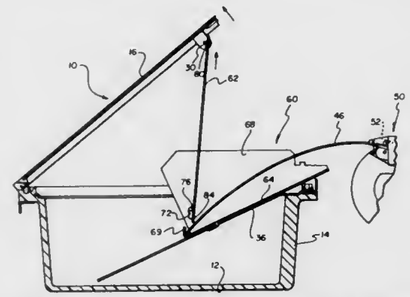
4. A paper feeder accessory for a copying machine, comprising:
sub-member including projecting means for guiding a paper tray into alignment with a copying machine;
means attached to said sub-member, for enabling said sub-member to pivotally engage the copying machine;
a lever mounted on the underside of said sub-member; and
means attached to the copying machine, for engaging said lever and thus maintaining said sub-member in a horizontal position or in one of a plurality of positions oblique to said horizontal position.

5,046,715
**PAPER FEEDING APPARATUS FOR IMAGE FORMING MACHINE**
Tadasu Taniguchi; Yuji Sugimoto, and Ken-ichi Iwamoto, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 19, 1990, Ser. No. 511,191
Claims priority, application Japan, May 13, 1989, 1-119771
Int. Cl.[5] B65H *1/22*
U.S. Cl. 271—164 13 Claims



1. A paper feeding apparatus for an image forming machine having a paper feed opening, the paper feeding apparatus comprising:
a paper feed roller rotatably supported by a roller shaft on the image forming machine;
a paper feed table freely movable in an axial direction of the roller shaft toward and away from the paper feed opening of the image forming machine;
a paper feed hopper guided and supported by the paper feed table, the paper feed hopper being movable in the axial direction of the roller shaft with the paper feed table and further being movable in a direction generally orthogonal to the axial direction to horizontally move toward and away from the paper feed roller; and
interlocking means for moving the paper feed hopper in the direction generally orthogonal to the axial direction in response to movement of the paper feed table.

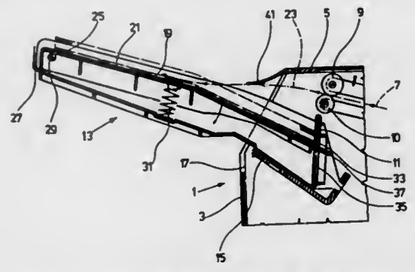
5,046,716
**LIGHTTIGHT FILM BOX HAVING A FILM CLASPING TRAY**
Steven R. Lippold, Oakfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 304,085, Jan. 31, 1989, Pat. No. 4,948,113. This application Dec. 15, 1989, Ser. No. 451,400
Int. Cl.[5] B65H *31/04, 1/00*
U.S. Cl. 271—214 4 Claims



1. In a lighttight box for positively removing a photosensitive sheet from a workstation, the invention comprising:
said box having a lid movable (a) between a closed position and a partially open position, (b) between said partially open position and a fully open position, and, (c) between said fully open position and said closed position;
a tray located within said box for receiving a photosensitive sheet; and
a member, coupled at one end to said lid and at its other end to said tray, said member being responsive (a) to movement of said lid between said closed position and said partially open position to move said tray from a position internal to said box forwardly to a position for receiving from a workstation the rearward portion of a photosensitive sheet buckling said sheet against a point where said member engages said tray; (b) to movement of said lid between said partially open position and said fully open position to move said tray to a fully forward position wherein said member is raised from said tray and said photosensitive sheet passes between said member and said tray substantially releasing said buckle; and (c) to movement of said lid between said fully open position and said closed position, to clasp said rear portion of said substantially unbuckled sheet between said member and said tray and to move said tray to said position internal to said box, wherein as said member and tray are moved to a position internal to said box they positively remove said clasped sheet from said workstation and return it to a lighttight position in said box.

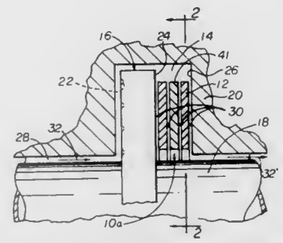


5,046,717
**DEVICE FOR COLLECTING SHEETS**
Helmut Ettischer, Ostfildern; Ulrich Fischer, Kirchheim-Teck, and Heinz Wagner, Wiesensteig, all of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Apr. 16, 1990, Ser. No. 509,275
Claims priority, application Fed. Rep. of Germany, May 29, 1989, 3917373
Int. Cl.[5] B65H *31/14*
U.S. Cl. 271—219 7 Claims



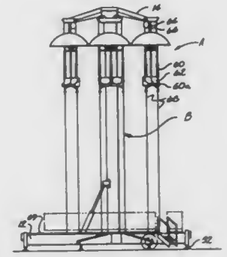
1. Device for collecting sheets, said collecting device comprising:
means (9, 10) for moving sheets (25) in a direction of transport (7) along an at least approximately horizontal portion of an imaginary trajectory (23); and
a collection tray (13) to which sheets (25) that are moved by said moving means can be fed individually, said collection tray including a movably mounted bottom portion (21) upwardly inclined toward the horizontal in the direction of transport (7) and intersecting the imaginary trajectory (23), an adjusting element for adjusting the position of said bottom portion (21), said adjusting element controllable by weight of the sheets (25) collected on said bottom portion (21), said adjusting element including a journal (29) associated with said bottom portion (21), said journal extending at least substantially horizontally relative to the direction of transport (7) of sheets (25) and located vertically above the imaginary trajectory (23), said bottom portion (21) being pivotally mounted on said journal in the area of its higher end, and a deflectable hold-down element provided adjacent to the lower end of bottom portion (21) intersecting the imaginary trajectory (23).

5,046,718
**FLOATING RING LABYRINTH-TYPE DYNAMIC SHAFT SEAL AND PROCESS FOR USING SAME**
Robert A. Hay, II, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 28, 1989, Ser. No. 458,019
Int. Cl.[5] F16J *15/447*
U.S. Cl. 277—1 23 Claims



1. A process for providing a seal around a relatively movable shaft, comprising the step of at least locally dividing a flow channel defined by an operationally required local clearance h between the shaft and a stationary member associated with the shaft into a plurality of flow subchannels of average dimension h/n (n − 1) free floating elements into said flow channel, where n is the number of flow subchannels locally so created.

5,046,719
**PORTABLE PARACHUTE AMUSEMENT RIDE**
Wayne P. Comstock, 23 Selwyn Dr., Greenville, S.C. 29615, and Earl W. Rodrigue, 144 Pine Gate Ct., Greenville, S.C. 29607
Filed Jun. 14, 1990, Ser. No. 537,585
Int. Cl.[5] A63J *5/12*
U.S. Cl. 272—6 25 Claims



1. A portable amusement ride comprising:
a tower having a base;
a trailer for supporting said tower base;
track means for guiding said tower from a retracted position in which said tower is carried in an inclined position by said trailer, and an erect position in which said tower is carried in a vertical position by said trailer;
drive means for moving said tower from said retracted position to said erect position on said trailer;
a foldable arm assembly having a plurality of arms carried near an upper end of said tower having a first position in which said arms are folded toward a longitudinal axis of said tower, and a second position in which said arms are unfolded and extend outwardly from said tower; and
deployment means for moving said arm assembly from said first position to said second position upon movement of said tower to said second position.

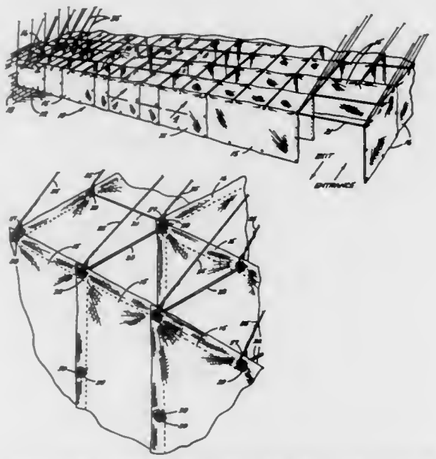
5,046,720
**CEILING-SUSPENDED WALKING MAZE**
Timothy D. Bolly, 8797 Mariner Dr., Machesny Park, Ill. 61111
Filed May 17, 1990, Ser. No. 524,583
Int. Cl.[5] A63J *11/00*
U.S. Cl. 272—19 9 Claims

1. A maze for installation in a building having sidewalls and a ceiling, said maze defining a labyrinth walking path having an entrance and an exit, said maze being defined by parallel longitudinal rows of upright flexible panels with each of said longitudinal rows having a plurality of first panels and with at least some of said longitudinal rows having spaces between selected ones of the first panels in the row, said maze further being defined by parallel lateral rows of upright flexible panels with each of said lateral rows having a plurality of second panels and with at least some of said lateral rows having spaces between selected ones of the second panels in the row, said longitudinal and lateral rows extending generally perpendicular to one another, a plurality of first ropes extending along selected upper portions of said longitudinal rows and connected to selected ones of said second panels, each of said first ropes extending generally perpendicular to one of said sidewalls, some of said first ropes each having one end portion anchored to said one sidewall, a plurality of second ropes extending along selected upper portions of said lateral rows

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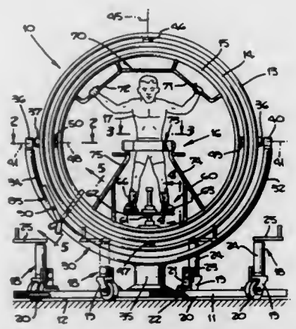
and connected to selected ones of said first panels, and upwardly extending wires connected to said panels and anchored



to said ceiling to suspend said panels and said ropes from said ceiling.

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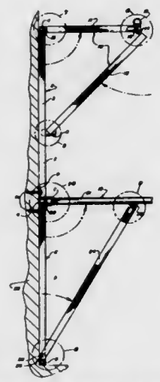
**5,046,721**
**MAN POWERED GYROSCOPE**
**William C. Altare, 8222 Mason Ave., Winnetka, Calif. 91306**
**Continuation-in-part of Ser. No. 412,138, Sep. 25, 1989, abandoned. This application Sep. 28, 1990, Ser. No. 589,727**
**Int. Cl.[5] A63G *1/00***
**U.S. Cl. 272—36** **13 Claims**



1. A gyroscopic structure for manipulation by an operator in the guise of a human occupant, said gyroscopic structure comprising a supporting base, a ring assembly comprising a plurality of concentrically disposed rings of different diameters on said base for reception of the operator, an operator station positioned generally centrally of and attached to an innermost of said rings, a yoke on the base having a pivotally supporting engagement with laterally opposite sides of an outermost of said rings, said yoke being mounted on a single centrally positioned pedestal, there being a plurality of bearing assemblies interconnecting the innermost ring with the outermost ring at diametrically opposite locations, and operator mounting means cooperating with the operator station for releasably securing the operator in operating position on the operator station, said operator station being mounted to said innermost ring through flexible elements.

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**5,046,722**
**EXERCISING DEVICE**
**John M. Antoon, 808 Woodyard Dr. #7, Natchitoches, La. 71457**
**Filed Oct. 16, 1989, Ser. No. 422,104**
**Int. Cl.[5] A63B *17/00***
**U.S. Cl. 272—63** **14 Claims**



1. An exercising device comprising a frame; a pair of inside segments having one end pivotally secured to the upper end of said frame in spaced relationship and a pair of outside segments having one end pivotally secured to the opposite ends of said inside segments, respectively, for deployment against said frame in retracted configuration and outwardly of said frame in a first exercising configuration; chin bar means secured to said inside segments for supporting an exerciser in said first exercising configuration; a pair of channel members provided on said frame in spaced relationship, said channel members aligned with said outside segments, respectively, for removably receiving and supporting said opposite ends of said outside segments, respectively, when said chin bar means is deployed in said first exercising configuration; middle arm means pivotally carried by said frame beneath said inside segments and said outside segments for deployment inwardly of said frame in retracted configuration and outwardly of said frame in a second exercising configuration; and lower arm means pivotally carried by said frame beneath said middle arm means for deployment inwardly of said frame in retracted configuration and outwardly of said frame for engaging and supporting said middle arm means in said second exercise configuration.

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**5,046,723**
**BOX BEAM BICYCLE TYPE FRAME**
**Eugene J. Szymski, Skokie, and Rene Mraz, Evanston, both of Ill., assignors to Schwinn Bicycle Company, Chicago, Ill.**
**Filed Mar. 8, 1990, Ser. No. 490,940**
**The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.**
**Int. Cl.[5] A63B *21/00***
**U.S. Cl. 272—73** **2 Claims**

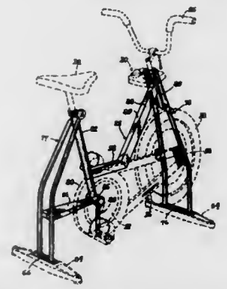
1. A reach tube or down tube of a bicycle type exerciser, namely a tubular member joining the handlebar head tube to a lower portion of the seat tube, and having an angular configuration in side view including a rear horizontal section secured at its rear end to the seat tube and a front diagonal section



extending upwardly and forwardly and secured at its front end to the head tube,

the improvement wherein

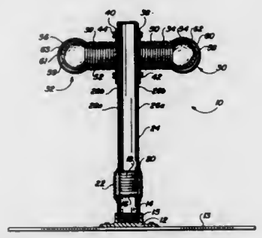
the reach tube is characterized in that it has less than 0.11 pounds of steel per running inch and has a vertically elongated, hollow rectangular cross section uniform along



its length which has a height-to-width ratio providing a vertical rigidity enabling the top of the seat tube to deflect less than 0.0060" per 100 pound load applied vertically thereto when a rear foot plate connected to the bottom of the seat tube is clamped against horizontal movement and a front foot plate connected to the bottom of the head tube is mounted to move freely forwardly.

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**5,046,724**
**PUNCHING DEVICE FOR BOXERS**
**Manuel F. Sotomayer, 1363 W. Placita Bronce, Tucson, Ariz. 85745**
**Filed Jun. 12, 1989, Ser. No. 364,163**
**Int. Cl.[5] A63B *69/24***
**U.S. Cl. 272—78** **15 Claims**



1. A punching device for utilization by two boxers simulating boxing and sparing matches comprising:

a first punching bag available to a first boxer to receive strikes;

a vertically oriented upright post operably attached to said first punching bag, said upright post suspending said first punching bag proximate the first boxer;

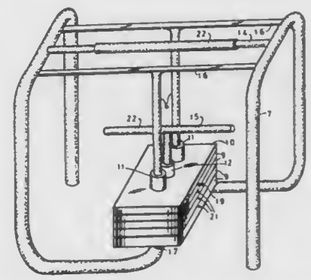
a second punching bag operably attached to said upright post and suspended proximate a second boxer, said second punching bag available to the second boxer to receive strikes;

a base adapted to be fixedly attached to a ground surface; and,

an upright extension spring having two ends, one end of which is fixedly attached to said base and the other end of which is fixedly attached to said upright post, said upright extension spring characterized such that when said other end is perturbed, said other end returns to its original position without overshoot whereby the first boxer may strike said first punching bag and thereby influence the position and movement of said second punching bag through said commonly connected upright post and thus present said second punching bag as a moving target to the second punching bag as a moving target to the second boxer who in turn, in striking said second punching bag, influences the position and movement of said first punching bag for strikes by the first boxer.

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**5,046,725**
**VARIABLE WEIGHT GRIP EXERCISER**
**Dean R. Brennan, 4263 Memorial Hwy., North Miami, Fla. 33161**
**Filed May 12, 1988, Ser. No. 193,073**
**Int. Cl.[5] A63B *21/06***
**U.S. Cl. 272—118** **11 Claims**



1. A grip exercise machine for exercising the gripping muscles of the hands comprising:

(a) a support frame;

(b) a pair of horizontally arranged support bars connected to said support frame in spaced parallel relation;

(c) a pair of spaced parallel vertical guide members, a first said guide member connected at its upper end to a first said support bar and a second said guide member connected at its upper end to a second said support bar and each said guide member connected at its lower end to said support frame;

(d) a first horizontal handle bar arranged between said support bars and substantially paralllel thereto, said first handle bar fixedly connected at its ends to said support frame;

(e) a carriage means arranged for vertical reciprocation;

(f) anti-friction means on said carriage means for engaging about said vertical guide members for guiding said carriage means for vertical reciprocation, said carriage means being guided only by said guide members and not engaging said support frame at any position of said vertical reciprocation;

(g) a plurality of weights capitively mounted for vertical sliding movement on said guide members beneath said carriage means;

(h) weight connecting means depending from said carriage means for selective connection to said weights for moving the connected weights with said carriage means on vertical sliding movement of said carriage means;

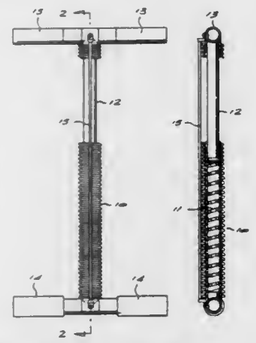
(i) rigid connecting means extending upward from said carriage means between said vertical guide members; and

(j) a second horizontal handle bar fixedly connecting to said rigid connecting means substantially at right angles thereto, said second handle bar arranged parallel to and beneath said first handle bar in such manner that the two said handle bars may be approximated and may be encircled by said hands, wherein said exercising of said gripping muscles raises and lowers said second handle bar toward and away from said first handle bar, thereby raising and lowering said carriage means and said selected weights connected to said carriage means.

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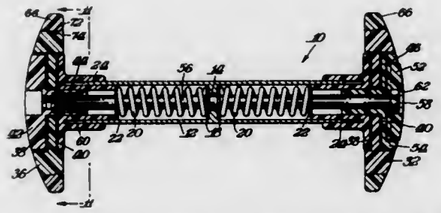
5,046,726
**EXERCISER**
Willem J. Van Straaten, Transvaal, South Africa, assignor to Verimark Close Corporation, Transvaal, South Africa
Filed Feb. 14, 1990, Ser. No. 480,122
Claims priority, application South Africa, Feb. 1, 1990, 90/0762
Int. Cl.[5] A63B *21/05*
U.S. Cl. 272—141 4 Claims



1. An exercising device comprising:
a strut comprising first and second telescoping members, the first member having a first end and a second end, said second member arranged telescopically with the first member, the second member being of tubular form with an open first end and a closed second end, the first end of the first member being axially slidable within the second member and being capable of withdrawal through the first end of the second member,
the first and second members including first and second transverse elements, respectively, the first transverse element extending transversely across the second end of the first member, the second transverse element extending transversely across the second end of the second member, one of the first and second elements defining handles at opposite ends thereof, and the other of the first and second elements having padded ends for resting comfortably against the thighs or lap of a user,
a compression spring removably located in the second member between the first end of the first member and the second end of the second member, whereby axial movement of the first member into the second member compresses the spring; and
an elastic cord interconnecting the first and second members for yieldably biasing the first and second members together in their telescopic relationship, the elastic cord being elastically stretchable sufficiently to permit the first end of the first member to be removed from the first end of the second member to permit replacement of the spring.

5,046,727
**WRIST EXERCISE DEVICE**
William T. Wilkinson, Chesapeake City, Md., and Gregory J. Gayle, Wilmington, Del., assignors to Whatnot, Inc., Cleveland, Ohio
Filed Jul. 31, 1990, Ser. No. 560,781
Int. Cl.[5] A63B *21/105, 21/045, 21/012*
U.S. Cl. 272—141 17 Claims

1. A wrist exercise device comprising a hollow shaft; inner abutting means in the central portion of said shaft dividing the interior of said shaft into a pair of equal length chambers; a compression spring mounted in each of said chambers in said shaft on one side of and against said inner abutting means; an inner tension disk non-rotatably mounted to said shaft at each end of said shaft and disposed against a respective one of said springs; a first and second outer tension disk respectively mounted outwardly of each of said inner tension disks for joint rotational movement therewith, wherein said first outer tension disk has a stem with an internally threaded opening; a handle between each of said inner tension disks and its respective outer tension disk, each of said handles being rotatably mounted with respect to said shaft and said tension disks; at least one resistance pad between each of said handles and at least one of its associated tension disks; a turning knob mounted outwardly of said second outer tension disk, said turning knob



having a recess; an elongate screw having a head at one end and being threaded at its other end, said screw extending through said second tension disk and through said inner tension disks and through said springs and through said abutting means in said shaft, said head of said screw being mounted in said recess of said turning knob, and said threaded end of said screw being threadably engaged with said threaded opening of said stem for selectively moving, by turning said turning knob, said outer tension disks toward and away from each other to vary the amount of resistance of said resistance pads with respect to the rotational movements of said handles.

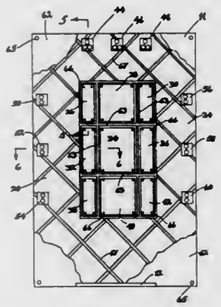
5,046,728
**CHALK HOLDER AND SCUFF GAUGING DEVICE**
John Haddock, RR #1, 4th Concession, Uxbridge, Ontario, L0C 1K0, Canada
Filed Oct. 16, 1990, Ser. No. 598,520
Int. Cl.[5] A63B *71/00*
U.S. Cl. 273—18 5 Claims



1. A chalking and scuffing device for use with a billiard cue comprising in combination:
a) a plate member having a face, a portion of which is of the magnetizable metal, a serrated scuffing surface on a least a portion of said face and a gauge for measuring the tip contour of a billiard cue on at least one edge of said plate;
b) means on said plate for securing said plate to the user thereof;
c) a chalk holder having a bottom wall and side walls, an opening between said side walls for receiving and holding a block of billiard chalk, and a means for releasably securing said chalk holder onto said plate, comprising a magnet on the bottom wall of said chalk holder for releasably engaging said magnetizable metal.



5,046,729
**BASEBALL PITCHERS PRACTICE TARGET**
William E. Yancey, 8741 South Justine, Chicago, Ill. 60620
Filed Sep. 12, 1990, Ser. No. 581,378
Int. Cl.[5] A63B *69/00*
U.S. Cl. 273—26 A 20 Claims

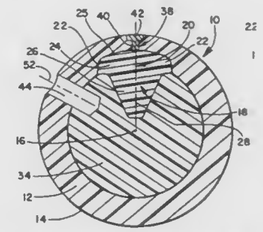


1. A baseball pitching skill evaluator and game apparatus, comprising:
a) a backboard;
b) a resilient cover attached to and substantially covering a front surface of said backboard, said cover having a target thereon;
c) a matrix of panels movably attached to said backboard underlying said cover, said matrix having left, center and right columns and at least two rows of panels, said matrix of panels being between knee and shoulder height of a batter and representing a strike zone;
d) means for resiliently biasing each of said panels outwardly from said backboard;
e) switch means associated with each of said panels, said switch means normally being in an open position, and whereby the impact of a pitched ball to the cover overlying a said panel will move the panel inwardly towards said backboard causing the associated said switch means to momentarily close, where after the said associated switch means will re-open as a result of the biasing means moving the said panel outwardly from said backboard;
f) a horizontal array of plural lamps mounted to said backboard adjacent the top of said backboard, one lamp of said horizontal array in vertical alignment with each of said columns of panels;
g) a left vertical array of plural lamps mounted to said backboard adjacent the left edge of said backboard, one lamp of said left vertical array in horizontal alignment with each of said rows of panels;
h) a right vertical array of plural lamps mounted to said backboard adjacent the right edge of said backboard, one lamp of said right vertical array in horizontal alignment with each of said rows of panels;
i) a power source;
j) means for electrically connecting each said switch means associated with a said panel in said left column of panels to the lamp in said horizontal array that is in vertical alignment with said left column, and to the respective lamp in said left vertical array that is in horizontal alignment with the respective ones of said panels, whereby movement of any panel in said left column will cause the switch associated with that panel to momentarily close and thereby light the lamp in vertical alignment with that panel and the lamp in said left vertical array that is in horizontal alignment with that panel;
k) means for electrically connecting each said switch means associated with a said panel in said right column of panels to the lamp in said horizontal array that is in vertical alignment with said right column, and to the respective lamp in said right vertical array that is in horizontal alignment with the respective ones of said panels, whereby movement of any panel in said right column will cause the switch associated with that panel to momentarily close and thereby light the lamp in vertical alignment with that panel and the lamp in said right vertical array that is in horizontal alignment with that panel; and
l) means for electrically connecting each said switch means associated with a said panel in said center column of panels to the lamp in said horizontal array that is in vertical alignment with said center column, and to the respective lamps in both said left and right vertical arrays that are in horizontal alignment with the respective ones of said panels, whereby movement of any panel in said center column will cause the switch associated with that panel to momentarily close and thereby light the lamp in vertical alignment with that panel and the lamps in horizontal alignment with that panel.

5,046,730
**GOLF TEE**
Casey V. Golden, Evergreen; Ronald L. Turner, Golden; John A. Elverum, Elizabeth, and Ray L. Hauser, Boulder, all of Colo., assignors to Bio Dynamics, Ltd., Golden, Colo.
Filed Dec. 10, 1990, Ser. No. 624,849
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—33 14 Claims

1. A golf tee having an elongated right shaft, said shaft having a concaved ball support first end and a pointed second end said tee being formed of a moldable composition comprising a fibrous material and a sugar base binder said composition having a dry mechanical strength sufficient to allow said tee to be inserted into the ground and to support a golf ball, and said composition being readily degradable upon exposure to moisture.

5,046,731
**BOWLING BALL**
George Zelinski, 17311 McCarron Rd., Lockport, Ill. 60441
Filed Nov. 14, 1990, Ser. No. 612,819
Int. Cl.[5] A63B *37/06*
U.S. Cl. 273—63 E 21 Claims



1. A bowling ball having a spherical mass of preselected density and a spherical surface equidistant from a center of the spherical mass, the improvement being a weight block of a density, greater than said preselected density in which said weight block comprises:
a first elongate section having a pair of opposite ends with an intermediate portion therebetween adjacent the spherical surface; and
another elongate section having an axis of symmetry extending in a direction generally transverse of the first elongate

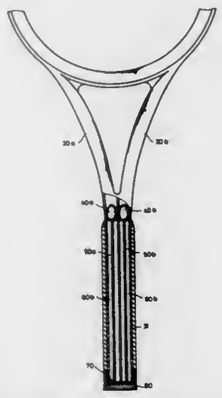
VOL 1130 ISS 2 SE 10 1991 UMI



section and extending from the intermediate portion and located between the center of the spherical mass and the first elongate section.

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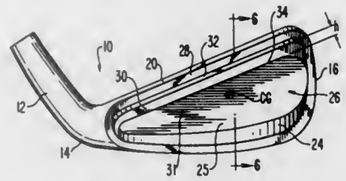
**5,046,732**
**STRUCTURE OF A SHOCK ABSORBING RACQUET**
**Dennis Chen, 293 Pei Tun Road, Taichung, Taiwan**
**Filed Aug. 29, 1990, Ser. No. 574,591**
**Int. Cl.[5] A63B** *49/08*
U.S. Cl. 273—73 J **3 Claims**



1. A shock absorbing racquet structure comprising a head frame, a handle, and a pair of yoke bars extending from said head frame and concomitantly joining with said handle, wherein:
said yoke bars each have separate elongate hollow cavities that extend to the base of said handle;
a resilient body is disposed within each said hollow cavity, with one end of a vibration absorbing rod attached to and extending from each said resilient body;
a substantial portion of the outer surface of each said resilient body are in contact with the walls of respective said hollow cavities;
the ends of said vibration absorbing rods, opposite from said resilient bodies, are attached to a butt plate secured to the base of said handle.
whereby, shock transmitted from said head frame is absorbed by the action of said resilient bodies and said vibration absorbing rods.

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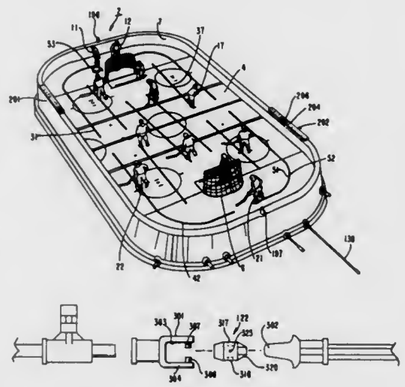
**5,046,733**
**IRON TYPE GOLF CLUB HEAD WITH IMPROVED PERIMETER WEIGHT CONFIGURATION**
**Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204**
**Filed Dec. 4, 1989, Ser. No. 445,791**
**Int. Cl.[5] A63B** *53/04*
U.S. Cl. 273—77 A **32 Claims**



1. An iron type golf club head including a hossel, a heal, a toe, a ball striking face to hit a ball along an intended line of flight, a rear wall opposite said ball striking face, an upper surface including a top ridge, a lower surface including a sole, a longitudinal axis bisecting said ball striking face between said top ridge and said sole, a center of gravity centrally located with respect to said ball striking face and an outer peripheral mass located on said club heat at an outer peripheral edge thereof and having a top rear surface projecting rearwardly from said rear wall of said club head; said outer peripheral mass and said rear wall defining a centrally located cavity formed within said outer perhipheral mass wherein the improvement comprises: a secondary, inner peripheral mass formed to lie on said outer peripheral mass and inwardly spaced from and parallel to at least a portion of said outer peripheral edge; said secondary inner peripheral mass being adjacent said cavity and extending rearwardly beyond a plane defined by said top rear surface of said outer peripheral mass and in a direction between said heel and said toe; said secondary inner peripheral mass being further defined as being located between said center of gravity and said outer peripheral edge.

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**5,046,734**
**TABLE HOCKEY GAME**
**Klas I. Laine, 21600 Parainen, Simonby, Finland**
**Filed Nov. 30, 1988, Ser. No. 277,719**
**Int. Cl.[5] A63F** *7/06*
U.S. Cl. 273—85 B **6 Claims**

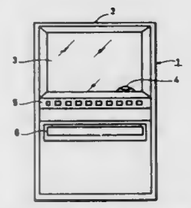


5. A table hockey game comprising:
a playing surface;
goals;
a plurality of of toy hockey players;
means for moving two toy players to and from positions behind an opponent's goal; said means comprising:
guide means for restricting movement of a toy hockey player, said guide means comprising:
a first pair of horizontally spaced parallel edges at the playing surface;
a second pair of horizontally spaced parallel edges, in vertically spaced parallel relation to the first pair of edges;
actuator means for moving the player along the guide means, and for rotating the player, said actuator means comprising:
a vertical shaft;
a shaft tube housing the vertical shaft;
two pairs of arms, each pair on a side of the shaft tube;
each arm comprising a slider means for running along a surface adjacent the second pair of edges;
a pair of rotatable actuator shafts connected to each other by a universal joint;
transmission means for connecting the vertical shaft to one of the actuator shafts and for rotationally driving the vertical shaft by rotation of the actuator shafts.



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**5,046,735**
**SYMBOL ASSORTING GAMING MACHINE**
**Junichi Hamano, Hyogo, Japan; Michael Wood, Denham Springs, La.; Lee Dunlap, and Terry Wilson, both of Baton Rouge, La., assignors to Takasago Electric Industry Co., Ltd., Osaka, Japan**
**Filed Oct. 11, 1989, Ser. No. 419,934**
**Claims priority, application Japan, Jun. 28, 1989, 1-166100**
**Int. Cl.[5] A63F** *9/00, 9/22*
U.S. Cl. 273—85 CP **6 Claims**

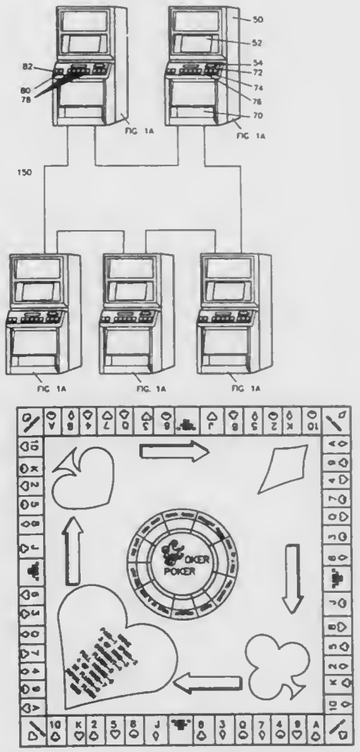


1. A symbol assorting gaming machine comprising:
displaying means for displaying a first predetermined number of first display symbols selected from a group of a second predetermined number of various symbols, said second number being greater than said first number; holding means for selectively holding one or more of said first display symbols on said display;
a first operator control;
replacing means responsive to operation of said first operator control for replacing the first display symbols other than those being held with the other symbols extracted for display from said group of various symbols to provide a resultant display that includes said held display symbols and said other symbols;
judging means for judging whether the resultant display symbol combination pattern after replacement coincides with a symbol combination pattern related to winning;
calculating means for determining an optimum symbol combination of a number of symbols equal to said first predetermined number of said various symbols from all of the symbols of said group of various symbols, that includes at least one of said first display symbols, for determining the symbol combination that has the greatest probability of corresponding to a symbol pattern related to winning;
a second operator control; and
training means responsive to said calculating means and operation of said second operator control for displaying said optimum symbol combination to train a user of the gaming machine.

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**5,046,736**
**IMITATIVE-OPPONENT GAMBLING GAMES**
**James L. Bridgeman; Nancy L. Bridgeman, and Robert J. Bridgeman, all of 9582 Hamilton Ave., Huntington Beach, Calif. 92646**
**Filed Oct. 11, 1988, Ser. No. 255,656**
**Int. Cl.[5] A63F** *7/06*
U.S. Cl. 273—85 G **15 Claims**

1. An electronic gaming machine for enabling a player to play a card gambling game in which an imaginary opponent of said player is imitated and simulated, comprising:
(a) a microprocessor control circuit, including a memory, a read-only memory, and a random-access memory for storing a set of playing rules and parameters;
(b) means for enabling said player to cause said machine to simulate one or more imaginary opponents to oppose said player during a round of play;
(c) display means for displaying a plurality of game cards of a player, the same plurality of game cards of said imaginary opponent, and a pot;
(d) means for simulating a deal of a hand of cards to said player and a hand of game cards to said imaginary opponent, and for causing said display means to display said hands of said player and said imaginary opponent, said player's cards being displayed in a faceup manner;
(e) means for enabling said player to ante, bet, and fold on said player's dealt cards;
(f) means for simulating each of said imaginary opponents by causing said display means to display an imitation of the anteing, betting, and folding of said player by each of said imaginary opponents such that said imaginary opponents imitates the actions of said player and so that said player




will be able to compete against each of said imaginary opponent;
(g) means for enabling the bets of said player and said imaginary opponent to go into a pot, for continually updating the status of said pot, and for causing said display means to display the status of said pot;
(h) means for calculating a housetake;
(i) winning means for detecting the completion of a round in which a winner is determined, for distributing winnings equal to said pot minus said housetake, and for causing said display means to display an indication of the completion of said round and said winnings; and
(j) means for repeatedly activating said means of clauses (b) to (g), supra, until said winning means determines that said round is complete.

VOL 1130 ISS 2 SE 10 1991 UMI

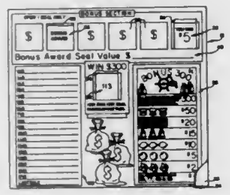


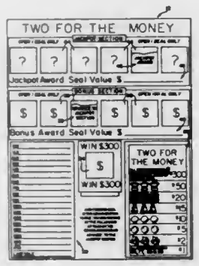
5,046,737

## LOTTERY-TYPE GAME SYSTEM WITH BONUS AWARD

Debra Fienberg, Chicago, Ill., assignor to Douglas Press, Inc., Bellwood, Ill.

Filed Nov. 23, 1990, Ser. No. 617,361
Int. Cl.[5] A63F 3/06; B42D 15/00
U.S. Cl. 273—139 7 Claims






1. A lottery-type game system providing multiple levels of play, comprising:

a plurality of playing cards each of which can be purchased by game players for a predetermined price per playing card,

each of said playing cards having a plurality of groups of game symbols displayed thereon, with each of said cards including selectively removable means for concealing the groups of game symbols thereon prior to purchase by a player, said means for concealing said game symbols being removed by the player after purchase for providing a first level of play, and

a master game card for use in conjunction with said playing cards,

at least one of said master game card and said plurality of playing cards having displayed thereon means for establishing the eligibility of a plurality of selected game players having playing cards displaying predetermined selected ones of said game symbols,

said master game card including means for identifying at least one of said eligible players, and selectively removable means for concealing said identifying means prior to establishing all of said eligible game players for providing a second level of play,

said master game card further including award identifying means comprising a plurality of award values displayed on said master game card, and selectively removable means for concealing said award values, so that said selected one of said eligible players can determine the award to be received by removing the concealing means associated with one of said award values for providing a third level of play.

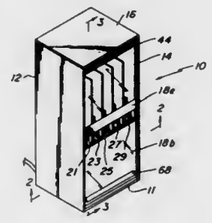
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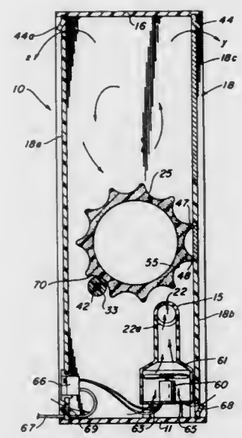
5,046,738

## RANDOM SYMBOL SELECTOR

Francis W. Coates, Hatfield Village-AK2-12, Hatfield, Pa. 19440

Filed Oct. 22, 1990, Ser. No. 600,619
Int. Cl.[5] A63F 3/06
U.S. Cl. 273—143 R 17 Claims





1. A random selection device comprising:

(a) a housing which is divided into a number of compartments;

(b) an upwardly oriented air source located within said housing;

(c) support means located within said housing and extending across said compartments;

(d) a plurality of rotatable disk means where one said disk being located in a different compartment of said housing;

(e) said disk means having a plurality of indicia located around their respective peripheries;

(f) viewing means located in said housing for observing said disk indicia; and

(g) whereby when said air source is activated, said plurality of disk means assumes a random spinning motion and when said air source is de-activated, the disks come to rest upon said support means such that one indicia on each disk means appears in said viewing means, the various indicia appearing within said viewing means providing a randomized selection thereof.

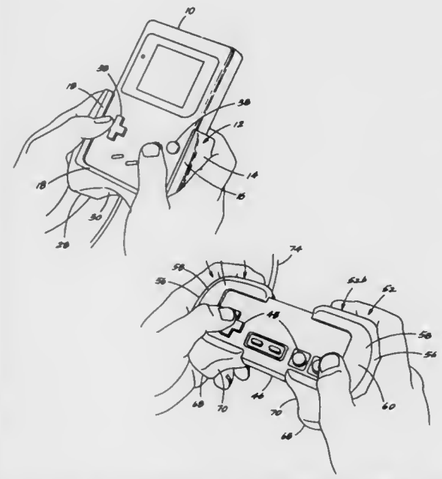


5,046,739

## ERGONOMIC HANDLE FOR GAME CONTROLLER

James R. Reichow, Brooklyn Park, Minn., assignor to Dynasound Organizer, Inc., New Brighton, Minn.

Filed Oct. 31, 1990, Ser. No. 606,630
Int. Cl.[5] A63B 71/00
U.S. Cl. 273—148 B 12 Claims



1. An ergonomic handle for a hand-held controller, the controller having controls on a front face thereof, the handle comprising:

a) controller holding means;

b) a side portion adapted for fitting the palm of the hand;

c) a front ridge portion extending along a side of the controller and adapted for providing support for the base of the thumb;

d) a bottom portion having a curving segment curving inward with the palm and forming a peak, the bottom portion curving back toward the device and adapted for providing a resting pad for at least one finger; and

e) a back portion having an outer shoulder forming a recess in the center of the back portion adapted for receiving one or more fingers wrapping around the back of the handle.

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5,046,740

## GOLF PUTTER

Roger A. D'Eath, 954 Country Club Dr., St. Clair Shores, Mich. 48042

Filed Jun. 26, 1989, Ser. No. 371,456
Int. Cl.[5] A63B 53/04, 53/08
U.S. Cl. 273—164 9 Claims

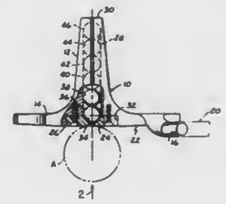
1. A golf putter comprising, in combination:

a member substantially T-shaped in plan view having a longitudinal body portion and a transverse head portion and having a shaft connected, thereto, and extending angularly upwardly, therefrom;

a generally flat face on the transverse head portion disposed perpendicular to said longitudinal body portion and facing in the direction of an intended putt;

a bore extending longitudinally within the body portion and perpendicular to said face and aligned with the direction of an intended putt; and

a plurality of weighted balls arranged longitudinally in diametrically abutting relation and disposed within said bore and formed of a material having a greater density than the density of said member whereby during a putt a transfer of kinetic energy from said weighted balls collectively being swung in the direction of an intended putt to a golf ball



substantially aligned with said weighted balls drives the golf ball in the same direction as the alignment of the weighted balls.

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5,046,741

## GOLF MAT

Markham D. Ahn, 8115 Redlands St. #107, Playa del Rey, Calif. 90293

Filed Apr. 16, 1990, Ser. No. 509,701
Int. Cl.[5] A63B 69/36
U.S. Cl. 273—195 A 1 Claim




1. A golf mat comprising:

a wedge-shaped base of polyurethane foam having a circular configuration approximately thirty inches in diameter and being approximately one-quarter inch thick at a first narrow end thereof and approximately three inches thick at a second diametrically opposite end thereof;

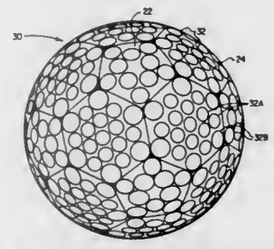
a layer of artificial turf of irregular contour disposed on said wedge-shaped base; and

means for retaining said layer of artificial turf on said wedge-shaped base.

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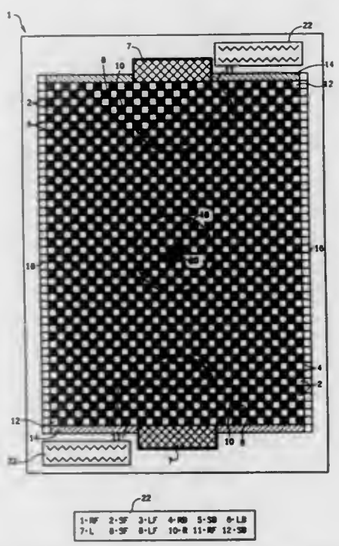
5,046,742
**GOLF BALL**
Gary T. Mackey, 311 Country Club Dr., Argyle, Tex. 76226, assignor to Gary T. Mackey, Carrollton, Tex.
Continuation of Ser. No. 271,526, Nov. 15, 1988, abandoned.
This application Dec. 26, 1989, Ser. No. 455,901
Int. Cl.[5] A63B *37/14*
U.S. Cl. 273—232 6 Claims



1. A golf ball having a spherical surface with a plurality of dimples formed therein, said dimples being arranged by dividing said spherical surface into twelve identical spherical pentagons and twenty identical identical spherical hexagons.

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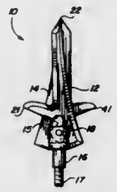
5,046,743
**STRATEGY-TYPE SOCCER BOARD GAME**
John Salerno, 3136 Natchez Ave., San Diego, Calif. 92117
Filed Aug. 21, 1990, Ser. No. 570,409
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—247 5 Claims



1. A board game of soccer strategy for two players comprising:
a game board having a rectangular grid of individually identified squares, two goal areas at opposing ends of said board, and a plurality of areas indicated within said grid from which play is initiated;
a plurality of playing pieces for each said player for placement on squares of said grid, said plurality of playing pieces being identified as belonging to one player or the other;
a ball having a means for movement by said playing pieces and for scoring points by moving said ball into said goal areas;
at least three dice having numerical indication of a value of a throw of said dice; and
at least one table for providing a correlation between said numerical indication of said dice and a direction of movement of said playing pieces.

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5,046,744
**HUNTING POINT FOR ARROWS**
Byron C. Eddy, 10441 Calle Trece, Tucson, Ariz. 85748
Filed Aug. 13, 1990, Ser. No. 565,931
Int. Cl.[5] F42B *6/08*
U.S. Cl. 273—421 5 Claims

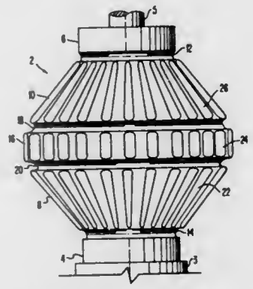


1. A hunting point for attachment to an arrow used in bow hunting which metamorphoses from a flight sharpened end to a sharpened wide "V" after penetration of a game animal's hide and for continued movement through the animal, said hunting point comprising:
a body adapted to be attached to the arrow;
an elongated first blade having a first end and a second end, said first end terminating in a sharpened point, and a spaced apart first side and a second side each having a length running from said first end to said second end, said second side having an outstanding barb with a forward portion and a rearward portion, said first side having a sharpened edge from said first end to said second end and said second side having a sharpened edge from said first end to and including said barb forward portion, said first and second side edge being substantially parallel to each other from a first location adjacent said barb to a second location near but behind said point, said second side edge being angled towards said first side edge from said second location and extending to meet said first side edge at said point, said first blade pivotally attached to said body proximate said second end;
an elongated second blade having a first end and a second end, said first end terminating in a sharpened point, and a spaced apart first side and a second side each having a length running from said first end to said second end, said second side having an outstanding barb with a forward portion and a rearward portion, said first side having a sharpened edge from said first end to said second end and said second side having a sharpened edge from said first end to and including said barb forward portion, said first and second side edge being substantially parallel to each other from a first location adjacent said barb to a second location near but behind said point, said second side edge being angled towards said first side edge from said second location and extending to meet said first side edge at said point, said second blade pivotally attached to said body proximate said second end, said first blade and said second blade being in pivotable relationship to each other;
said first and second blade being pivotal to and extending forward of said body; and
said first end of both said first blade and said second blade overlapping to lead in flight and remaining overlapped in penetration of the game animal's hide and movement through the animal, said angled side edge portions serving to maintain said first and second blade in a closed position during initial penetration, both said first and second blade first and second side sharpened edge engaging the animal's hide and penetrating the animal along their length to a depth until said barb forward portion of both said first blade and said second blade engages the animal's hide to cause both said first and second blade to pivot said second end of both said first blade and second blade to become the leading members of the sharpened wide "V" configuration.



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5,046,745
**CONSTANT VOLUME PROTECTIVE BOOT**
Roger D. Sweetland; Christopher L. Clarke, and Michael J. Marthaler, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.
Filed Sep. 15, 1988, Ser. No. 244,826
Int. Cl.[5] F16J *3/04, 15/52;* H01F *7/08*
U.S. Cl. 277—212 FB 15 Claims

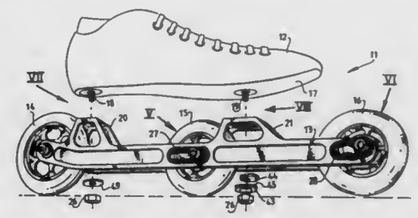


1. A protective boot having a body formed of a resilient elastomeric material, said body forming a fluid chamber and comprising: first and second ring portions forming openings in said body, at least a first and a second truncated conical section each being hingedly connected at their narrow portion with a respective one of said ring portions by resilient hinge section, an intermediate portion hingedly connected between widened portions of said truncated conical sections by third and fourth resilient hinge section, and means for maintaining a constant volume within said protective boot, said means comprising stabilizing means for maintaining said conical sections and said intermediate portion axially rigid and for permitting said body to be circumferentially expansible and contractible.

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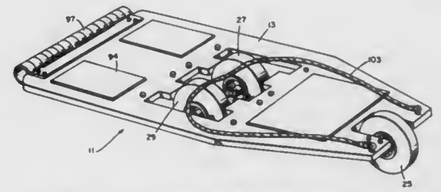
5,046,746
**FRAME FOR A SKATE, METHOD FOR THE MANUFACTURE THEREOF, SKATING SHOE AND SKATE**
Johan Gierveld, Wierden, Netherlands, assignor to Gierveld Beheer B.V., Wierden, Netherlands
Filed Feb. 27, 1989, Ser. No. 315,839
Int. Cl.[5] A63C *17/02, 1/00*
U.S. Cl. 280—11.22 12 Claims

1. An elongated frame for attachment to a skating shoe that includes a sole plate and two longitudinally spaced apart connection members extending away from the sole plate, said elongated frame having first and second spaced-apart fastening brackets with openings through which said two connection members can respectively extend, one of said openings comprising a slot which extends transversely of said elongated frame to enable adjustable transverse attachment of said frame to said skating shoe.



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5,046,747
**RECREATIONAL AND SPORTING DEVICE**
Anker J. Nielsen, Jr., 410 Bailey Rd., Holden, Mass. 01520
Filed Dec. 18, 1989, Ser. No. 451,829
Int. Cl.[5] B62M *1/00*
U.S. Cl. 280—11.28 8 Claims



1. A board type recreational and sporting device comprising:
a. an elongated platform configured for supporting a rider in a generally upright position, said platform having a front portion, a central portion and a back portion, the central portion being between the front portion and the back portion,
b. a front wheel,
c. means rotatably mounting said front wheel on the front portion of the platform,
d. a pair of back wheels,
e. first means for rotatably and pivotally mounting one of said back wheels on the central portion of the platform and second means for rotatably and pivotally mounting the other of said back wheels on the central portion of the platform, wherein said first means is separate from said second means and wherein said first means and said second means permit steering of the device in accordance with the position of the feet of the rider on the platform and the distribution of the weight of the rider on the platform, said platform includes an opening through which each of said rear wheels extends.

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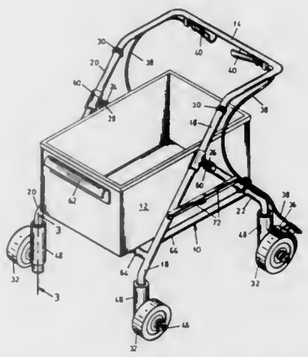
5,046,748
**WALKER WITH AUTOMATIC BRAKING MECHANISM**
Patricia C. Oat-Judge, 7 Rosewood Dr., Farmington, Conn. 06032
Filed Apr. 6, 1990, Ser. No. 505,839
Int. Cl.[5] B62B *5/04*
U.S. Cl. 280—47.34 4 Claims

1. A walker comprising a basket, a handle for use in pushing said walker along an upwardly facing surface, a plurality of legs connected to said basket and to said handle, each said leg having a lower end portion leading into a lower end, a wheel and a braking element associated with each said lower end, and means for automatically actuating said braking elements by causing same to engage the upwardly facing surface if a prede-

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termined weight is applied to said handle or to said basket thus to stop said walker, wherein said means for automatically actuating each said braking element include a sleeve with an upper end and a lower end and surrounding said lower end portion with an annular space between said lower end portion and said sleeve, and a coil spring within said annular space and



having an upper end that is fixed with respect to said lower end portion of its associated said leg, said spring also having a lower end that is fixed with respect to its associated said sleeve, and wherein said wheel is affixed to said sleeve near its said lower end with the axis of rotation of said wheel perpendicular to the axis of said sleeve and said wheel having a rim located below said lower end of said sleeve.

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**5,046,749**

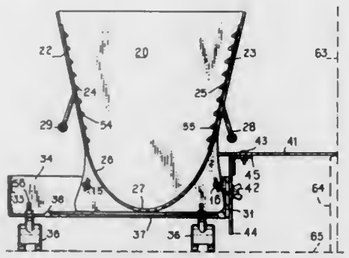
**PAINT PAIL FOR ROLLER WITH LINER, CADDY, AND PAINT SHIELD**

**R. Larry Owens, 5121 E. Shore Dr., Conyers, Ga. 30208**

**Filed Apr. 10, 1989, Ser. No. 335,581**

**Int. Cl.[5] B05C *21/00***

**U.S. Cl. 280—79.5** **1 Claim**



1. In a paint dispenser apparatus for use with a roller applicator, the apparatus having a paint pail, wherein the improvement comprises:

(a) a caddy for supporting the paint pail, the caddy having at least one flat side wall which is disposed generally vertically;

(b) an elongated, flat structure with at least one straight edge of substantially the same length as the structure; the flat structure having a cutout in the shape of a horizontal cross-section of one end including said side wall of the caddy, the cutout being dimensioned to fit closely about said end;

(c) means for attaching the elongated, flat structure on the flat side wall so that the structure is disposed generally horizontally and the straight edge is situated away from the caddy;

(d) means for adjusting the height of the structure so that said straight edge can ride atop any baseboard present and can protect both it and the floor from splattering; and

(e) four casters and means for limiting the direction of rotation of two of the casters, said two casters being spaced from each other along a common axis of rotation, the casters being rotatable only about said axis of rotation, so that when the caddy is positioned with said axis of rotation disposed perpendicularly to a wall being painted, the caddy, as it is being pushed along, tends to move parallel to the wall.

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**5,046,750**

**ROLLING COASTER FOR SMALL CHILDREN**

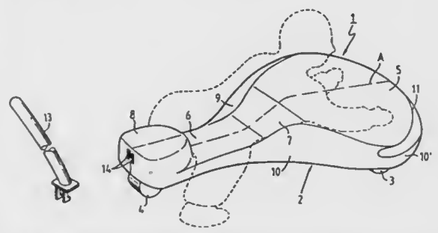
**Ulrike Heubl, An der Pilzbuche 116, 7900 Ulm, Fed. Rep. of Germany**

**Continuation of Ser. No. 327,960, filed as PCT DE88/00429 on Jul. 7, 1988, published as WO89/00126 on Jan. 12, abandoned. This application Sep. 19, 1990, Ser. No. 585,035**

**Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722442**

**Int. Cl.[5] B62M *29/00***

**U.S. Cl. 280—87.021** **6 Claims**



1. Rolling apparatus for small children comprising in combination,

a riding platform having a continuous upper surface adapted to receive upon an upper weight bearing surface the stomach and hands of a small child face down thereupon, said riding platform having a shape with a narrow rear end with side portions permitting a child's feet to slide thereover and reach a planar surface upon which the platform is moved and an oval shaped front end presenting a support surface for supporting the child's breast and stomach substantially horizontally disposed with respect to the surface upon which the platform is moved and dimensioned to receive the hands of the child thereupon to support lifting and movement of the head and keep a child's hands off the support surface,

an intermediate portion of said riding platform comprising a broadening crotch support surface extending between the narrow rear end and the oval shaped front end, said crotch support surface being disposed at a height from the planar surface less than that of both a terminal rear end raised platform and said oval shaped front end support surface, said raised platform including a rear end upwardly directed surface extending from the intermediate portion and serving as a rear stop for the buttocks of the child, and said intermediate portion sloping downwardly from the front end for supporting a child's stomach, and

a set of three wheels attached beneath the supporting platform for movement thereof over the planar surface, said wheels located with one attached to the rear end and the other two attached respectively on opposite sides of the oval shaped front end.



**5,046,751**

**CONNECTING ARRANGEMENT**

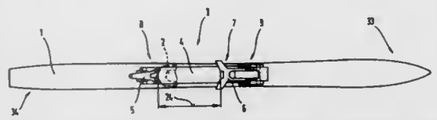
**Franz Scherübl, Radstadt, Austria, assignor to Varpat Patentverwertungs AG, Littau, Switzerland**

**Filed Sep. 28, 1989, Ser. No. 415,130**

**Claims priority, application Austria, Sep. 30, 1988, 2429/88**

**Int. Cl.[5] A63C *9/00***

**U.S. Cl. 280—607** **2 Claims**



1. A connecting arrangement for fixing a ski boot to a ski extending in a longitudinal direction between opposite ends of the ski, comprising a supporting element having opposite ends; a coupling device arranged on the supporting element, the coupling device having coupling parts for the ski boot; and two mounting devices for fixing the supporting element to the ski at a predeterminable distance from the ski ends and extending in a plane extending transversely to the longitudinal direction of the ski, at least one of said mounting devices including structure arranged between the ends of the supporting element and of the ski said at least one mounting device including two mounting parts, one of the mounting parts being fixed to the ski and the other mounting part being pivotal on the fixed mounting part about a horizontal pivot pin extending perpendicularly to the longitudinal direction, said one of the mounting devices further including a longitudinal guide device, the longitudinal guide device comprising two guide elements longitudinally displaceable relative to each other, one of the guide elements being connected to the pivotal mounting part of the one mounting device for pivoting therewith while the other guide element is coupled to the suporting element.

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**5,046,752**

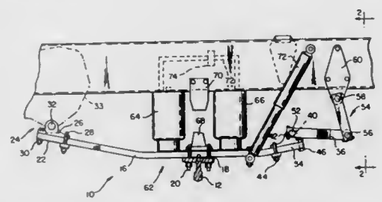
**AXLE SUSPENSION SYSTEM**

**Donald L. Stephens, LaConner, and James Saunders, Burlington, both of Wash., assignors to Paccar Inc., Bellevue, Wash.**

**Continuation-in-part of Ser. No. 394,099, Aug. 15, 1989, which is a continuation-in-part of Ser. No. 175,745, Mar. 31, 1988, Pat. No. 4,856,812. This application Aug. 6, 1990, Ser. No. 562,835**

**Int. Cl.[5] B60G *5/00***

**U.S. Cl. 280—678** **21 Claims**



1. A suspension system for a vehicle, comprising:

a frame;

an axle having wheels attached thereto;

a rigid torsionally stiff beam coupled to said axle and to said frame, said beam having a first end, a second end and a body portion between said first end and said second end, and said first end being spaced from said body portion;

first pivot means fixed to said beam and coupled to said frame at said first end of said beam to pivotally couple said beam to said frame at said first end portion and prevent said beam from moving laterally or twisting with respect to said frame but allowing vertical pivotal movement of the second end of the beam; and

resilient means coupled between said axle and said frame to resiliently support said frame on said axle while allowing free vertical movement but minimal lateral movement of said beam and axle.

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**5,046,753**

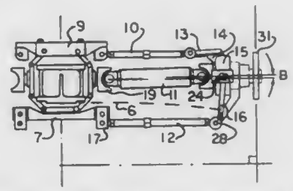
**REAR SUSPENSION SYSTEM ADJUSTABLE TO MAKE THE REAR WHEELS ASSUME A PREDETERMINED TOE ALIGNMENT DURING CORNERING WITHOUT EFFECTING THE WHEELS CAMBER ANGLE SETTING**

**John Giovanni, 83 Rugby St., Cranston, R.I. 02910**

**Filed Dec. 26, 1989, Ser. No. 456,470**

**Int. Cl.[5] B60G *11/08***

**U.S. Cl. 280—699** **3 Claims**



1. In a suspension and final drive system for a rear wheel assembly of a motor vehicle comprising:

a control arm extending in the longitudinal direction of the vehicle, said control arm having a front portion connected to a frame of the vehicle and a rear portion connected to the wheel assembly;

a differential carrier having a yoke shaft extending from a side thereof;

a leaf spring extending transversely of the vehicle, and end of said leaf spring connected to said control arm and another section connected to said differential carrier;

a drive shaft connected by means of a universal joint to the wheel assembly and to the yoke shaft; and

a lower link strut extending transverse to the vehicle frame and connected between the differential carrier and the wheel assembly;

the improvement comprising:

an upper link strut extending transverse to the vehicle frame, said upper link strut having an outboard and pivotally mounted to said control arm and an inboard end pivotally mounted to the top of the differential carrier;

said lower link strut having an outboard end connected to an extension plate which is secured to a bracket connected to the lower part of the differential carrier and which projectss downwardly therefrom; and

wherein said upper link struct is shorter than said lower link strut and the outboard end of said upper link strut is inboard of the outboard end of the lower link strut, and wherein said yoke shaft is free to move into and out of the differential carrier.

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**5,046,754**

**VEHICLE HEIGHT CONTROL DEVICE ADAPTED ALSO FOR OPERATION AFTER TURN OFF OF IGNITION SWITCH**

**Mayumi Kimura; Yasuhiro Ashida, and Masami Ito, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed May 10, 1990, Ser. No. 521,544**

**Claims priority, application Japan, May 13, 1989, 1-119381; May 13, 1989, 1-119382**

**Int. Cl.[5] B60G *17/15***

**U.S. Cl. 280—707** **4 Claims**

1. A vehicle height control device comprising:

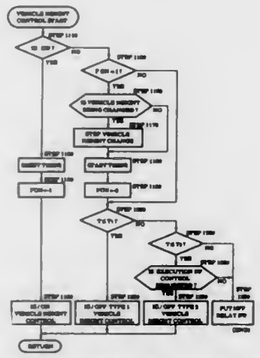
a vehicle height adjustment means disposed between a vehicle body and a vehicle wheel to be capable of raising and

lowering the body relative to the wheel for adjustment of vehicle height;

a vehicle height detection means for detecting the vehicle height of the body relative to the wheel;

a switch state detection means for detecting on and off states of an ignition switch of the vehicle; and

an operation control means which operates said vehicle height adjustment means so that, when the ignition switch is detected as being in the on state by said switch state detection means, the vehicle height detected by said vehi-



cle height detection means is within a range of vehicle height determined by a first upper and a first lower limit value, and when the ignition switch is detected as being in the off state by said switch state detection means, within a first period thereafter, the vehicle height detected by said vehicle height detection means is lowered, if it is higher than a second predetermined upper limit value which is higher than said first upper limit value, toward a second predetermined lower limit value which is higher than the first upper limit value.

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**5,046,755**

**HYDROPNEUMATIC SUSPENSION SYSTEM**

**Walter Runkel; Kurt M. Hummel, both of Wuppertal, and Rudolf Schulte, Ennepetal, all of Fed. Rep. of Germany, assignors to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany**

**Filed Mar. 22, 1990, Ser. No. 496,982**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1989, 3910119**

**Int. Cl.[5] B60G** *11/26, 15/12*

**U.S. Cl. 280—708** **23 Claims**

1. A hydropneumatic suspension system comprising:

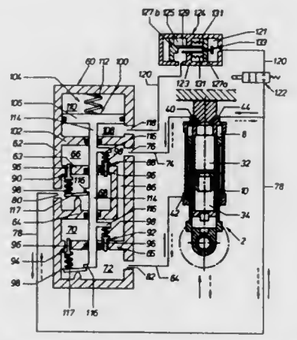
at least one shock and vibration damper including a cylinder-piston unit (2) arranged in a hydraulic circulation with a damping valve (60);

said cylinder-piston unit (2) including a gas storer (34) coating with said damping valve (60);

said damping valve (60) provided with choke valves (88, 90, 92, 94) arranged in said hydraulic circulation;

said choke valves (88, 90, 92, 94) including valve elements (96) biased with springs (98) in a closing direction of said valve elements (96) opposite to an opening direction of said valve elements (96); and

setting means (100) acting upon said springs (98) in common in at least one of said closing and opening directions of said valve elements (96) to provide a variable bias tension



for said springs (98) for permitting a load-dependent damping adjustment.

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**5,046,756**

**WHEEL AXLE ADJUSTMENT ASSEMBLY**

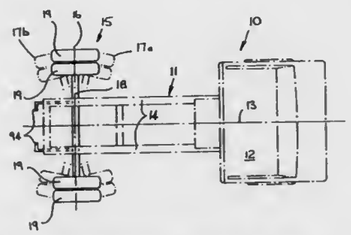
**Bradley J. Hertrick, 31 Andrew Street, Rocklea, Queensland, 4106, Australia**

**Filed Jun. 18, 1990, Ser. No. 539,893**

**Claims priority, application Australia, Jun. 21, 1989, PJ4838**

**Int. Cl.[5] B60G** *11/02*

**U.S. Cl. 280—718** **14 Claims**



1. A suspension system for a vehicle including

a) a chassis having a longitudinal axis,

b) at least one wheel axle extending transversely to the longitudinal axis of said chassis,

c) leaf spring assemblies extending longitudinally along opposite sides of said chassis for supporting said wheel axle,

d) an adjustment assembly for moving said wheel axle along said leaf spring assemblies,

e) said adjustment assembly comprising a pair of opposed bearing plates bearingly interengageable with each other,

f) locating means defined on one of said bearing plates to locate said plate against axial movement relative to said suspension system.

g) resilient bearing means securing the other of said bearing plates against axial movement relative to said wheel axle, and

h) each one of said bearing plates including a bearing surface configured to allow the bearing plates to be interlocked against movement relative to each other when bearingly interengaged at a plurality of positions.



**5,046,757**

**AIR BAG RESTRAINT SYSTEMS**

**Stephen J. Sadler, Nuneaton; David Coleman, Solihuli, and Stanley Edge, Moseley, all of England, assignors to Jaguar Cars Limited and Sheller-Clifford Limited, both of, England**

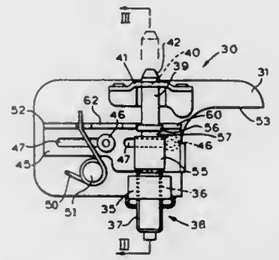
**Division of Ser. No. 420,142, Oct. 11, 1989, Pat. No. 4,960,292.**

**This application Oct. 1, 1990, Ser. No. 591,543**

**Claims priority, application United Kingdom, Nov. 1, 1988, 8825540**

**Int. Cl.[5] B60R** *21/16*

**U.S. Cl. 280—731** **8 Claims**



1. An air bag restraint system comprising; an air bag module adapted to be located centrally of a steering wheel and secured with respect thereto by at least one fastening means, said air bag module including an inflator and screw means for arming said inflator; a slide which is moveable between a first position in which it is clear of said fastening means and a second position in which it prevents release of said fastening means, said slide being resiliently loaded from its first position to its second position and a first formation being provided on the screw means to engage a complimentary formation on the slide to lock the slide in its second position when the inflator is armed; means being provided to give an indication of the inflator being armed and disarmed.

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**5,046,758**

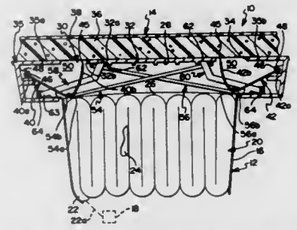
**MULTI-CUTTER SELF-PIERCING COVER ASSEMBLY FOR AIRBAG**

**Scott Rafferty, Dover; Bruce Batchelder, Barrington, and Mark Dupuis, Rochester, all of N.H., assignors to Davidson Textron Inc., Dover, N.H.**

**Filed Nov. 13, 1990, Ser. No. 611,978**

**Int. Cl.[5] B60R** *21/16*

**U.S. Cl. 280—732** **15 Claims**



1. A cover assembly for concealing an airbag restraint system including an airbag, a housing for the airbag, a gas generator located in the housing for supplying gas to the air bag in response to vehicle impact the cover assembly comprising:

an outer shell, a backing layer of foam on said shell and a retainer insert member for securing the cover assembly on a support;

a cover insert member inboard of said foam layer having side edges thereon forming an an opening with respect to said retainer insert member;

multiple cutter means pivotally connected to said retainer insert member at a recessed position inboard of said outer shell; said multiple cutter means each including a sharp cutting edge located adjacent one of said side edges prior to deployment of said airbag;

actuator means responsive to deployment of said airbag to cause said multiple cutter means to pivot with respect to said retainer insert member to cause said sharp cutting edges to sequentially cut through said foam layer and said outer shell at said opening between said insert cover member and said retainer insert member for forming a three sided opening in said outer shell before said cover insert member is displaced and said cover insert member thereafter being engaged by said airbag during its deployment to open so as to define a passage for deployment of said airbag into a vehicle passenger compartment.

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**5,046,759**

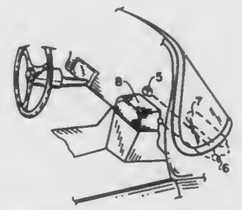
**BRAIDED FABRIC STRUCTURE FOR SEAMLESS FABRIC CONFINEMENTS**

**James P. Enniss, Granger, Ind., and Delbert A. Davis, Mishawaka, both of Ind., assignors to Uniroyal Plastics Co., Inc., Mishawaka, Ind.**

**Filed Apr. 7, 1989, Ser. No. 335,001**

**Int. Cl.[5] B60R** *21/16;* **D03D** *15/08;* **D04B** *39/00*

**U.S. Cl. 280—743** **32 Claims**



1. An air bag restraint system for protecting an occupant of a vehicle during a collision comprising:

a seamless inflatable confinement adapted for attachment to said vehicle and being inflatable upon collision of said vehicle, said confinement being constructed from a seamless fabric comprising braided fibers or yarns; and

inflating means for inflating said inflatable confinement with a fluid upon the occurrence of a collision;

wherein said confinement is inflated by said inflating means to a predetermined shape upon a collision, said shape being determined by characteristics of said braided fabric.

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**5,046,760**

**GENERAL PURPOSE CLIPBOARD**

**Charles M. Krepp, 7868 Lowtide Cir., Huntington Beach, Calif. 92648**

**Filed Dec. 18, 1989, Ser. No. 451,613**

**Int. Cl.[5] B42D** *3/00*

**U.S. Cl. 281—45** **5 Claims**

1. An improved clipboard comprising:

a. a panel having a flat bottom surface;

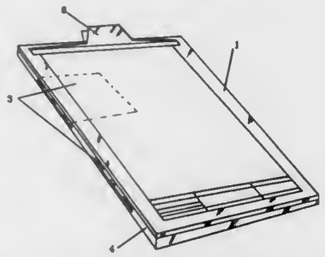
b. a panel having a top surface which is a hard and smooth surface to draw on;

c. a means of attachment between the panel having a flat bottom surface and panel having a top surface shaped wherein cavities are formed between the two surfaces and the cavities are of sufficient size and shape to allow drawing aids to be stored in the cavity and having the cavity located such that the aid may be withdrawn by extracting the aid from between the top surface and bottom surface;

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d. a standard clipping mechanism at top of the panel having a top surface to hold papers in place; and



e. The drawing aids comprise a straight edge, protractor, template and triangle.

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**5,046,761**

**TELESCOPABLE VACUUM-CLEANER SUCTION PIPE**

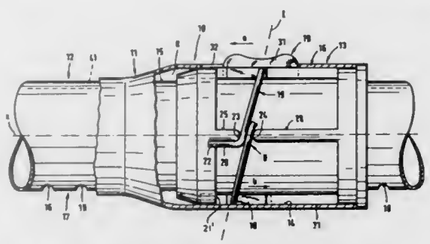
**August Cordes, Sundern-Hachen, Fed. Rep. of Germany, assignor to Carl Froh Rohrenwerk GmbH & Co., Sundern/Hachen, Fed. Rep. of Germany**

**Filed May 18, 1990, Ser. No. 526,229**

**Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916531**

**Int. Cl.[5] F16L *21/00***

**U.S. Cl. 285—7** **9 Claims**



1. A telescopable vacuum-cleaner pipe, comprising:

an outer tube formed with a generally cylindrical enlarged end;

an inner tube received in said enlarged end of said outer tube and having a wall portion formed with a detent strip having a row of outwardly opening detent recesses axially spaced along said inner tube, said enlarged end of said outer tube defining with said inner tube an annular space;

a detent body in said annular space shiftable into a selected one of said recesses for retaining said inner tube in place within said outer tube;

a retaining element in said space adjacent said strip slidable axially relative to said detent body and positioned to retain said detent body in a selected one of said recesses in one position of said retaining element and to release said detent body from a recess in another position of said retaining element;

a guide body received in said space between said tubes;

a slider axially shiftable in said space on said guide body and protruding through an opening formed in said enlarged end for manual displacement by a user, said slider being located diametrically opposite said strip and said retaining element across the pipe;

a bar spring in said space having at least one end braced against said guide body, around said guide body in said space, and resiliently urging said retaining element into said one position thereof, said bar spring coupling said slider and said retaining element for shifting of said retaining element into said other position upon actuation of said slider, said bar spring having an overlapping portion between ends thereof at an overlap zone along the periphery of said guide body and extends at least a full turn thereabout, said overlap zone being disposed between free ends of a pair of axially-spaced parallel finger-like ribs formed on said guide body and extending parallel to an axis thereof.

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**5,046,762**

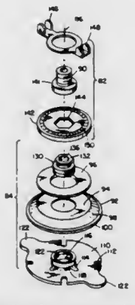
**VACUUM BAG PROBE**

**Masato H. Konishi, Woodinville, Wash., assignor to Macro Technologies, Inc., Redmond, Wash.**

**Filed May 25, 1989, Ser. No. 357,334**

**Int. Cl.[5] F16L *17/00***

**U.S. Cl. 285—38** **11 Claims**



1. A vacuum bag probe for connecting a vacuum source to a sealed environment such as a forming tool sealed by a vacuum bag, comprising:

a base section having a lower surface, an upper sealing surface defining a base aperture about an axis, and air passage means for passing air through the lower surface to the base aperture and mating means for mating the base section with an engagement mechanism;

a top section having a sealing flange engageable with the upper sealing surface on the base section and defining a top aperture axially alignable with the base aperture; and

an engagement mechanism rotatably fixed to and axially movable over a limited distance with respect to the top section for mating with the base section and for applying a compressive force between the sealing flange on the top section and the upper sealing surface on the base section and for permitting substantial axial compressive movement between the top and base sections after the top and base sections have been fully engaged so that operation of the engagement mechanism effects a substantially airtight seal between the top and base sections and so that subsequent application of a pressure differential between the top and base sections enhances the seal, such as when the probe is applied to a sealed environment and a vacuum is drawn through the top aperture.

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**5,046,763**

**QUICK CONNECT HOSE COUPLING ASSEMBLY**

**Norman S. Martucci, Birmingham, and Richard Barton, Algonac, both of Mich., assignors to Teleflex Incorporated, Limerick, Pa.**

**Filed Feb. 1, 1990, Ser. No. 473,571**

**Int. Cl.[5] F16L *21/08***

**U.S. Cl. 285—81** **24 Claims**

1. A quick connect hose coupling assembly (10) comprising:

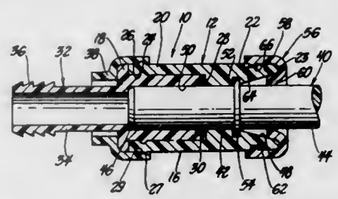
a female member (12) having an annular portion (20) and a plurality of fingers (22) extending longitudinally from said annular portion (20) to a distal end (23) and expandable radially outwardly;



a male member (40) adapted for mating engagement with at least a portion of said female member (12);

locking means (62) for disposition around the exterior of said female member (12) for selectively locking said fingers (22) by preventing outward radial movement of said distal end (23) of said fingers (22);

said female member (12) including sealing means (56) for disposition on said distal ends (23) of said fingers (22) between said fingers (22) and said male member to provide



a seal between said fingers (22) and said male member (40) to prevent contamination from entering said female member (12);

said assembly (10) characterized by said sealing means (56) being integral with said locking means (62) and for extending from said locking means (62) about said distal ends (23) of said fingers (22) and interiorly of said distal ends (23) of said fingers (22) and into contact with said male member (40).

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**5,046,764**

**FLEXIBLE SUPPORTING SHEATH FOR CABLES AND THE LIKE**

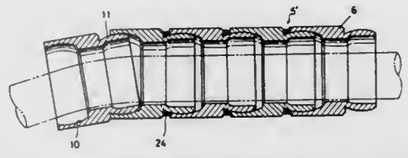
**Akira Kimura, Kyoto; Nobuo Kitao, Yamatokouriyama; Hiroshi Yasuda, Takatsuki; Yoshimasa Shimomura, Daito; Kiyoshi Isozaki, and Hiroshi Nishimura, both of Osaka, all of Japan, assignors to Tsubakimoto Chain Co., Japan**

**Continuation of Ser. No. 177,526, Apr. 4, 1988, abandoned, which is a division of Ser. No. 849,029, Apr. 7, 1986, Pat. No. 4,739,801. This application Apr. 12, 1990, Ser. No. 511,858**

**Claims priority, application Japan, Apr. 9, 1985, 60-75698; Apr. 22, 1985, 60-86983; Feb. 15, 1986, 61-29917; Feb. 17, 1986, 61-30951; Feb. 18, 1986, 61-31932; Feb. 19, 1986, 61-32879**

**Int. Cl.[5] F16L *27/04***

**U.S. Cl. 285—166** **3 Claims**



1. A combined flexible supporting sheath and cable or the like wherein the sheath comprises a series of interconnected links, each link having an internal passage, with circular cross-sections transverse to said link length, extending through it from one end to the other, an inner concave spherical surface formed in the passage at one end of the link, and an outer convex spherical surface formed on the outer surface of the link at its opposite end, in which for each pair of adjoining links of the sheath, the convex surface of one of said adjoining links is engaged with a concave surface of the other one of said adjoining links, in which the centers of the engaged convex and concave surfaces coincide, and in which the concave surface of said other link overlaps the convex surface of said one link to an extent such as to prevent separation of the links, said pair of adjoining links having means for limiting their articulation, the internal passage of each of said pair of links having an intermediate portion located between the concave surface of its passage and the end portion of the passage inside the portion of the link having the outer convex surface, characterized by the fact that the diameter of said end portion of the passage of said one link, from its opening to a location spaced inwardly from said opening a by a distance substantially greater than the distance from said opening to the center of curvature of said outer convex surface, is greater than the minimum diameter of the intermediate portion of the passage of said other link, whereby said pair of adjoining links form a continuous hollow passage for a cable or the like to pass through, and in which said diameter of said end portion is sufficiently greater than the minimum diameter of the intermediate portion of the passage of the other one of said pair of adjoining links, that, when said one link and said other link are bent relative to each other to their limit of articulation, said end of said one link does not extend beyond said intermediate portion of said other link into said continuous hollow passage, whereby flexing of the sheath is prevented from imparting shear and tension to said cable or the like, and in which at least one pair of adjoining links of the sheath has stop means inserted between the outer surfaces of the last-mentioned adjoining links for substantially preventing any articulating movement of said last-mentioned links in any direction.

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**5,046,765**

**TUBULAR FITTING FOR CONNECTION OF A BRANCH PIPE**

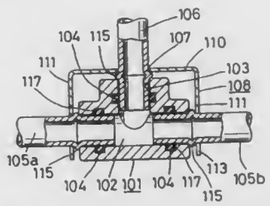
**Masayoshi Usui, Shizuoka, Japan, assignor to Usui International Industry Ltd., Shimizu, Japan**

**Filed May 23, 1989, Ser. No. 355,520**

**Claims priority, application Japan, May 31, 1988, 63-72233; May 31, 1988, 63-72234**

**Int. Cl.[5] F16L *41/00***

**U.S. Cl. 285—197** **13 Claims**



1. A tubular fitting for connection of a branch pipe to a main pipe, comprising:

a fitting body;

through hole means defined within said fitting body for housing said main pipe;

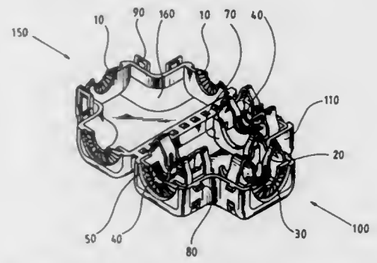
branch hole means defined within said fitting body for housing said branch pipe and intersecting said through hole means so as to provide fluidic communication between said main pipe and said branch pipe; and

a single-piece engaging means having a first portion thereof engaged directly with said branch pipe, and a second portion thereof engaged with either one of said main pipe, or an external surface of said fitting body, so as to directly envelop said main pipe, or clampingly engage said fitting body, respectively, thereby fixedly maintaining said main pipe and said branch pipe mounted within said fitting body.

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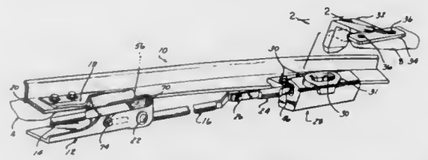
5,046,766
**CONNECTOR FOR CORRUGATED TUBES**
M. Marc Lomberty, Baume-les-Dames, and M. Gabriel Rougeot, Roulans, both of France, assignors to Sofanou, S.A., Anteuil, France
Filed Jun. 4, 1990, Ser. No. 532,925
Claims priority, application France, Jun. 7, 1989, 89 07749
Int. Cl.[5] F16L *21/00*
U.S. Cl. 285—419 7 Claims




1. A connector for corrugated tubes, comprising a lower shell and an upper cover that can be closed together, the shell and cover having lateral walls having therein corresponding semi-circular openings that define, when the cover is closed on the shell, circular openings for receiving corrugated tubes, the lateral walls having inner faces provided behind and parallel to said openings with arcuate ribs for longitudinally holding fitted tubes, wherein the ribs are situated on flexible arcuate tongues connected to said inner faces in a plane parallel to the corresponding opening, each semi-circular opening being fitted with a series of flexible fingers in the shape of truncated segments of a circle forming a crown-like skirt for each circular opening.

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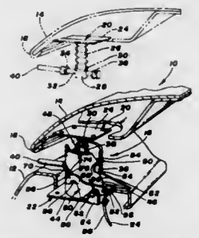
5,046,767
**CONVERTIBLE TOP LATCHING MECHANISM**
Mario Muscat, Livonia, Mich., assignor to Jubbu Designer's Inc., Plymouth, Mich.
Filed Dec. 13, 1989, Ser. No. 450,234
Int. Cl.[5] E05C *9/02*
U.S. Cl. 292—34 2 Claims



1. A convertible top latching mechanism for drawing together a header member for a convertible top frame and an upper windshield frame member including;
a locking housing attached to one of said members;
an operating rod extending horizontally within said locking housing for sliding movement therein;
said locking housing formed with a generally verticals opening extending to intersect the path of said operating rod movement therein;
a locking tang piece attached to the other of said members and having a generally vertically extending blade shaped tang aligned to enter said locking housing opening as said header is moved towards said upper windshield frame member;
said operating rod having an intermediate segment cutaway recess located to pass into said opening during said sliding movement in said locking housing, said cutaway recess bounded on either side by adjacent surfaces formed by said cutaway recess;
said tang having a cutaway recess formed with a sloping cam surface extending across the width of said tang and engagable with one of said adjacent surfaces on said operating rod said cutaway recess, said rod surface configured to act on said sloping cam surface to draw said tang further into said housing opening upon sliding movement of said operating rod in one direction;
handle means selectively movable to cause sliding movement of said operating rod in said one direction i said locking housing to cause camming of said tang into said opening and drawing together of said header and upper windshield frame members
said tang formed with a horizontal latching detent surface adjacent one end of said sloping cam surface of said tang cutaway recess;
means spring biasing said operating rod to a position whereat said surface adjacent said cutaway recess of said operating rod overlies said latching detent surface; and, said tang formed with outer slopping side surface operable to engage said operating rod surface and cam the same against said spring bias, said operating rod moved back by said spring bias means to position said operating rod adjacent surface overlying said detent surface upon bringing said tang into said opening to sufficient extent to allow said operating rod adjacent surface to enter said cutaway recess in said tang, thereby locking said members together.

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5,046,768
**PRIMARY AND SECONDARY HOOD LATCH WITH POP-UP AND PRESENTER LEVER**
Robert J. Myslicki, W. Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 16, 1990, Ser. No. 552,641
Int. Cl.[5] E05C *5/04*
U.S. Cl. 292—68 5 Claims

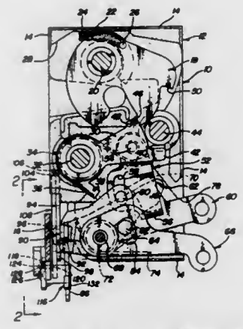


1. A latch mechanism for a vehicle closure panel hingedly mounted on a vehicle body panel and movable between an opened position and a closed position, the latch mechanism latching the closure panel in the closed position comprising:
a striker post rotatably carried by one of the panels and projecting laterally therefrom;
a handle connected to the striker post by which the striker post may be manually rotated when rotation of the striker post to an extended position extends the handle outwardly of the vehicle body panel;
a striker guide mounted on the other of the panels and having an open ended slot therein engaged by the striker post upon closing movement of the closure panel, the slot being angularly disposed to rotate the striker post from the extended position upon movement of the closure panel toward the closed position;
a primary latch means for retaining the vehicle closure panel in the closed position and being releasable to allow movement of the vehicle closure panel from the closed position toward the opened position;
a pop-up spring means for moving the vehicle closure panel from the closed position toward the opened position so that the slot rotates the striker post toward the extended position; and
a retaining abutment projecting into the slot for limiting movement of the closure panel toward the opened position until manual movement of the handle disengages the striker post from the retaining abutment to allow further opening movement of the vehicle closure panel.

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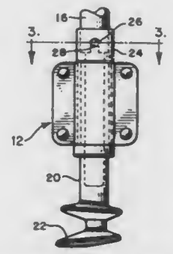


5,046,769
**DOOR LATCH COUPLING ARRANGEMENT**
Ronald P. Rimbey, Utica, and Rita M. Paulik, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 6, 1990, Ser. No. 564,478
Int. Cl.[5] E05B *3/00*
U.S. Cl. 292—216 4 Claims



1. In a vehicle door latch having frame means, latch bolt means mounted on the frame means for movement between latched and unlatched positions, detent means mounted on the frame means for movement between detented and undetented positions with respect to the latch bolt means, and operating means for moving the detent means to undetented position, a coupling arrangement for selectively coupling and uncoupling the operating means and detent means comprising, in combination, a detent release lever pivotally mounted on the frame means, means operatively connecting the detent release lever and detent means for moving the detent means to undetented position upon pivotal movement of the detent release lever, means slidably coupling the detent release lever and the operating means whereby the operating means freewheels with respect to the detent release lever, an intermittent member, means mounting the intermittent member on the frame means for shifting movement of the intermittent member between coupled and uncoupled positions with respect to the detent release lever and pivotal movement of the intermittent member with respect to the frame means in each position, control means for moving the intermittent member between coupled and uncoupled positions, means coupling the intermittent member and the operating means during pivotal movement of the intermittent member in each position thereof and permitting shifting movement of the intermittent member relative to the operating means during movement of the intermittent member between coupled and uncoupled positions, and cooperating means on the detent release lever and intermittent member engageable with each other in the coupled position of the intermittent member for pivoting the detent release lever to release the detent means upon pivotal movement of the intermittent member by the operating means.

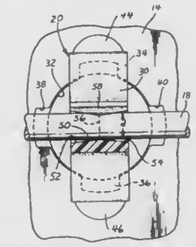
5,046,770
**BAR LOCK MODULE AND ASSEMBLY SYSTEM**
Randall C. Hansen, Lake Forest, Ill., assignor to A. L. Hansen Manufacturing Co., Waukegan, Ill.
Filed Jan. 18, 1991, Ser. No. 643,555
Int. Cl.[5] E05C *9/08*
U.S. Cl. 292—218 18 Claims




1. A bar lock latch module comprising:
a shaft having first and second ends;
a bar lock latch located on the first end of the shaft;
means, located on the second end of the shaft, for releasably coupling the shaft to an elongated bar such that rotation of the bar causes rotation of the shaft and the latch, said coupling means comprising a keyed portion configured to mate with a complementary keyed portion on the elongated bar; and
a mounting bracket comprising:
a mounting plate shaped to be secured to a panel;
a bearing carried by the mounting plate and disposed around the shaft intermediate the two ends;
means for capturing the shaft in the bearing such that the shaft is free to rotate in the bearing but is prevented from moving axially out of the bearing; and
means for securing the mounting plate and the bearing in place on the shaft prior to installation of the bar lock latch module such that said shaft, latch, coupling means, and mounting bracket form a preassembled unit mountable on the panel as a single module to speed assembly of a bar lock comprising the module.

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5,046,771
**DOOR CONTROL ROD ANTI RATTLE SHOE**
Paul M. Dedrich, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 26, 1990, Ser. No. 618,147
Int. Cl.[5] E05C *21/00*
U.S. Cl. 292—336.3 3 Claims




1. A shoe for slidably and rotatably mounting a door latch control rod on a vehicle door, comprising:
a molded plastic body having a mounting portion adapted for attachment on the vehicle door;
and a slot formed in the body for receiving the rod, said slot being defined by conical converging walls defining a

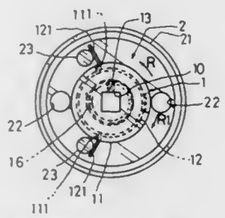
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C-shaped edge circumjacently engaging the rod in slip fitting rattle free relationship therewith so that the rod may slide through the shoe upon operation of the door latch control rod by the occupant.

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5,046,772
**DOOR HANDLE MEANS SUITABLE FOR MOUNTING SLIM LEVER HANDLE**
Frank Su, P.O. Box 55-1670, Taipei, Taiwan
Filed Oct. 2, 1990, Ser. No. 592,540
Int. Cl.[5] E05B *3/06*
U.S. Cl. 292—336.5 1 Claim

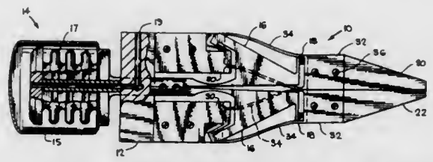


1. A door handle means comprising:
a restoring means including a spring holder having a restoring spring held therein with two spring ends radially separated and retained on an arcuate extension circumferentially formed in said spring holder, and a spindle sleeve secured and adjacent to said spring holder for adjustably securing a spindle in a spindle hole formed through said restoring means;
a fixing washer secured in a door for rotatably mounting said restoring means thereon, having two limiting stems formed on said washer respectively retaining two spring ends of said restoring spring radially protruding outwardly from said spring holder of said restoring means;
said spindle adjustably secured in said spindle sleeve of said restoring means by a set screw inserted in said spindle sleeve with respect to a thickness of the door in order for connecting an inner end portion of said spindle to a latch bolt mechanism of a latch bolt for retracting or extending the latch bolt for door opening or closing operation; and
a handle means selected from a lever handle and a knob having a handle sleeve portion secured on an outer end portion of said spindle, whereby upon a depression or rotation of said handle means, one spring end of said restoring spring is retained on one said limiting stem and the other spring end as retained on the arcuate extension will be rotated to store an elastic force of said restoring spring, and said spindle will be rotated for retracting the latch bolt for opening the door, and upon a releasing of the depression or rotation of the handle means, the restoring spring in said restoring means will restore said spindle to counter rotate said handle means to its original position;
the improvement which comprises:
said restoring means including a ring groove annularly formed therein between said spring holder and said spindle sleeve, having a retainer ring embedded in said ring groove for rotatably mounting said restoring means in said fixing washer.

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5,046,773
**MICRO-GRIPPER ASSEMBLY**
D. Bruce Modesitt, San Carlos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 2, 1990, Ser. No. 459,928
Int. Cl.[5] B66C *1/42*; B25J *19/02*
U.S. Cl. 294—100 15 Claims

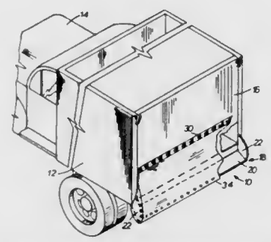
1. A micro-gripper assembly comprising:
a first parallelogram spring mechanism having a free end and having an opposing fixed end coupled to a support frame, the free end transcribing an arc about an axis of rotation and remaining generally parallel to the fixed end;
a first flexural lever coupled to the parallelogram spring mechanism near said free end, the flexural lever having a substantially fixed flex point generally coinciding with said axis of rotation, and having an end coupled to said support frame;



actuator means coupled to the lever for causing said flexural lever to bend at the substantially fixed flex point, whereby said free end of the parallelogram spring mechanism follows the motion of said flexural lever while remaining generally parallel to the fixed end.

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5,046,774
**DEBRIS CATCHER**
Sean D. Stockell, 10825 Watson Rd., Sunset Hills, Mo. 63127, and Donald M. Stockell, 5701 Horneker Rd., Pacific, Mo. 63069
Filed Oct. 10, 1989, Ser. No. 418,673
Int. Cl.[5] B60P *1/28*
U.S. Cl. 296—38 18 Claims



1. A debris catcher which is suspended from and attached to the rear of a truck bed, for catching or collecting debris from the rear of a truck bed, comprising:
means for collecting debris, the collecting means being inherently flexible;
means for attaching collecting means to a vehicle in order to collect debris from the vehicle; and
means for fastening collecting means to the vehicle, whereby attaching and fastening means cooperate to connect the collection means to the vehicle.

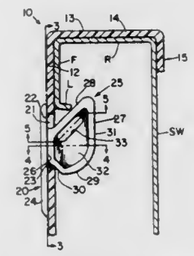
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5,046,775
**SNAP-LOCK FASTENER FOR TRUCK BED LINERS**
Howard W. Marcum, Jr.; John R. Snyder, both of Wapakoneta, and Robert E. Stebens, Columbus, all of Ohio, assignors to LRV Acquisition Corporation, Wapakoneta, Ohio
Filed Apr. 6, 1990, Ser. No. 505,783
Int. Cl.[5] B60R *13/01*; F16B *5/00*
U.S. Cl. 296—39.2 35 Claims

1. A fastener for mechanically securing a sheet-form panel to a supporting element including a flange, said fastener comprising:
a base plate having a base surface for engagement with a surface of a panel to be secured; and
a locking tongue of generally planar configuration attached to said base plate and extending laterally outwardly from said base surface, said tongue having a peripheral edge and

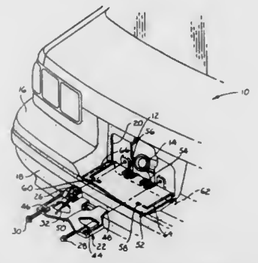


further comprising a clamping surface, a cam surface, and a locking surface arranged in series about said peripheral edge with said cam surface interposed between said clamping and locking surfaces, said clamping and locking surfaces joined to said base surface in spaced relationship to each other, each of said clamping and locking surfaces disposed in angled relationship to said base surface and defining therewith first and second V-shaped throats extending in relatively opposite directions, said first throat formed between said locking and base surfaces and receiving portions of said panel in edgewise secured relationship to effect a locking engagement in use, said cam surface being of arcuate configuration and operable to slide over said panel upon insertion of said fastener to facilitate movement of said first V-shaped throat into said locking engagement with said panel and to effect a mechanical leveraging of said tongue and causing said clamping surface to bear against said flange thereby providing both downward and horizontal locking forces to said panel relative to said supporting element.



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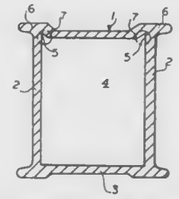
5,046,776
**FASCIA PROTECTOR FOR FUEL TANK FILLER**
Glenn E. Shaw, Farmington, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 22, 1991, Ser. No. 660,453
Int. Cl.[5] B60R *27/00*
U.S. Cl. 296—97.22 3 Claims



1. In a motor vehicle having a fuel tank filler disposed behind a rear fuel tank door which is pivotably mounted to the motor vehicle, the fuel tank filler being accessible through the door, and a fascia with a slot mounted to the vehicle, the improvement comprising:
a flexible splash shield mounted to the rear fuel tank door and having a lip which depends downward between the fascia and the motor vehicle for guiding the flow of fuel away from the motor vehicle and the fascia.

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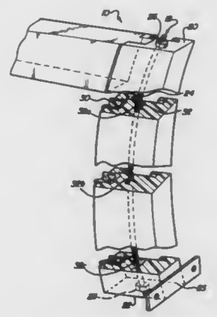
5,046,777
**IMPACT GIRDER IN AN AUTOMOBILE WALL ASSEMBLY WITH INTENTIONAL BUCKLING OF EDGE PORTIONS**
Peter Garnweidner, Lamprechtshausen, and Peter Üblacker, Bürmoos, both of Austria, assignors to Austria Metall Aktiengesellschaft, Braunau, Austria
Filed Apr. 23, 1990, Ser. No. 521,722
Int. Cl.[5] E04B *1/18*
U.S. Cl. 296—189 8 Claims



1. An automobile wall assembly for an automobile having a passenger compartment, said assembly comprising a vehicle body frame, an outer sheet metal covering, and an impact girder secured at its ends to said frame inwardly of said covering and between said covering and said compartment, said impact girder comprising:
an impact girder for a motor vehicle which comprises a one-piece elongated beam integrally formed with a longitudinally extending hollow space, a compression flange, a tension flange spaced from and generally parallel to said compression flange and lateral webs connecting said flanges and general perpendicular thereto, said compression flange projecting laterally beyond the respective lateral webs to form opposite edge portions of said compression flange unitary therewith and overhanging said webs, said edge portions being raised between a respective lateral web and an outer boundary of the compression flange relative to a recessed portion of said compression flange between said lateral webs, said lateral webs unitarily adjoining said compression flange along said hollow space in a sharp corner imparting a notch separation effect upon buckling of the girder.

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5,046,778
**REDUCED WEIGHT VEHICLE DOOR PILLAR**
Douglas C. Larsen, Milford, Mich., assignor to The Standard Products Company, Cleveland, Ohio
Filed Jun. 29, 1990, Ser. No. 545,843
Int. Cl.[5] B60J *5/00*
U.S. Cl. 296—202 4 Claims



1. In a motor vehicle including an engine, a body and at least

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one vehicle door, a reduced weight pillar construction for said vehicle door comprising:

a preformed pillar having a first predetermined shape, said pillar being made of a reduced weight material and having a light weight structurally substandard initial construction, said pillar including a first and a second end and having a means for forming a bore therethrough;

a stressing member inserted into said bore and secured to said first end and said second end in such a manner to form a second final curvature in the pillar, and to place the pillar under stress to increase the structural integrity of the pillar to an acceptable level wherein said stressing member is adjustable the curvature of the pillar; and

a means for allowing attachment of said pillar to said vehicle door.

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**5,046,779**

**SUNROOF STRUCTURE FOR AUTOMOTIVE VEHICLE**

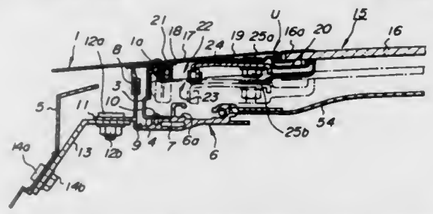
**Hisao Ichinose, Atsugi, and Yoshimitsu Takeda, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan**

**Filed Feb. 26, 1990, Ser. No. 484,554**

**Claims priority, application Japan, Feb. 27, 1989, 1-21584[U]; Feb. 27, 1989, 1-45771**

**Int. Cl.[5] B60J** *7/04*

**U.S. Cl. 296—216** **11 Claims**



1. A sunroof structure for an automotive vehicle, comprising:

a roof panel having a roof opening;

a guide rail disposed under level of said roof panel and extending in a lengthwise direction of the vehicle;

a sunroof lid fittable within said roof opening and slidable along said guide rail, said sunroof lid including a center panel through which light passes, and a surrounding panel securely connected to said center panel and disposed around the periphery of said center panel, said surrounding panel being formed of hard sheet to define thereunder a link receiving space, said surrounding panel including a flat main section having an upper surface which is generally flush with an upper surface of said center panel; and

a driving link mechanism through which said sunroof lid is drivably connected to said guide rail, said driving mechanism including a link bracket connected to said surrounding panel, said link bracket being disposed under said flat main section.

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**5,046,780**

**SUSPENSION MECHANISM FOR CONNECTING CHAIR BACKS AND SEATS TO A PEDESTAL**

**Lloyd B. Decker, Colon; Barron J. Gulliver, Sturgis, both of Mich., and Steven S. Wogoman, Elkhart, Ind., assignors to Harter Corporation, Sturgis, Mich.**

**Continuation-in-part of Ser. No. 364,996, Jun. 9, 1989, Pat. No. 4,911,501**

**This application Jan. 9, 1990, Ser. No. 463,241**

**Int. Cl.[5] A47C** *3/00*

**U.S. Cl. 297—302** **3 Claims**

1. A suspension mechanism for connecting the seating and back supporting portions from a pedestal assembly in a chair, the suspension mechanism comprising:

a spring support supported from an upper end portion of the pedestal assembly;

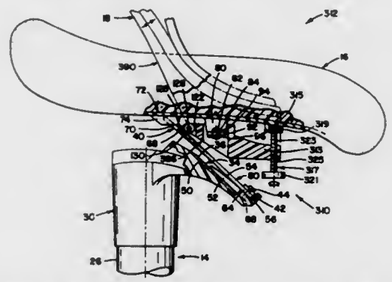
at least one primary seat spring having first and second ends;

said first end of said primary seat spring secured to said spring support;

a seating portion;

said second end portion of said primary seat spring secured to said seating portion;

a back supporting portion secured to said seating portion and being pivotable in relation thereto;



means operative between said seating portion and said back supporting portion selectively to adjust the disposition of said back supporting portion with respect to said seating portion;

an interactive spring being secured to said spring support and being cantilevered outwardly therefrom; and,

follower means attached to said back supporting portion operatively to engage said cantilevered, interactive spring.

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**5,046,781**

**ARRANGEMENT FOR HEIGHT ADJUSTMENT**

**Wei C. Ling, "B" 11/F., 324 Nathan Rd., Kowloon, Hong Kong**

**Filed Dec. 7, 1989, Ser. No. 447,239**

**Claims priority, application United Kingdom, Jan. 11, 1989, 8900591**

**Int. Cl.[5] A47C** *1/02*

**U.S. Cl. 297—338** **3 Claims**



1. An arrangement for adjusting the position of a first member with respect to a second longitudinal member and for withstanding a force substantially parallel to the second member, the arrangement comprising the first member having a contact surface for abutting the second member and for facilitating the arrangement to withstand the force, and means for pivoting the first member with respect to the second member whereby pivoting the first disjoins the contact surface of the first member from the second member, enabling the first member to move longitudinally to a new position with respect to the second member, said pivoting means comprising a pivot



point on a line substantially perpendicular to the longitudinal member, an upper end of the contact surface being disposed along the line, the contact surface and the surface of the longitudinal member providing a sufficient frictional force for facilitating the arrangement to withstand said parallel force, said contact surface and the surface of the longitudinal member each being crenellated, for correspondence therebetween, said first member including a flat surface adjacent to said crenellated contact surface, said flat surface being oriented at an angle with respect to said contact surface such that said flat surface can move generally parallel to said longitudinal member when the first member is being moved vertically with respect to said longitudinal member.

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**5,046,782**

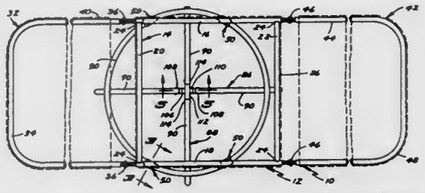
**ROTATABLE SUN CHAIR**

**Jack M. Lundeen, 13608 Upton Ave. South, Burnsville, Minn. 55337**

**Filed May 29, 1990, Ser. No. 529,463**

**Int. Cl.[5] A47C** *7/62*

**U.S. Cl. 297—349** **20 Claims**



1. A rotatable sun chair comprising a ring member having an underside and an upper side, seat means having an underside, leg means attached to the underside of said ring member for supporting said ring member, a plurality of angularly spaced channel-shaped bracket members, each having web portion secured to the underside of said seat means and having a pair of laterally spaced side panels extending downwardly from said web portion, and a roller journaled between the side panels of each of said bracket members, said rollers riding on the upper side of said ring member whereby said seat means is supported for rotation on said ring member via said rollers and said bracket members.

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**5,046,783**

**TUNNEL BORING MACHINE**

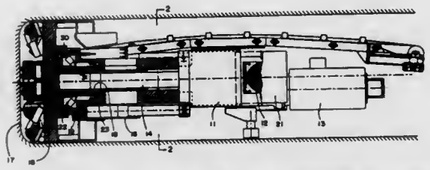
**Kaj B. I. Emanuelsson, Saltsjö-Boo, and Carl S. M. Hartwig, Täby, both of Sweden, assignors to Atlas Copco MCT AB, Nacka, Sweden**

**Filed Dec. 13, 1989, Ser. No. 450,045**

**Claims priority, application Sweden, Dec. 23, 1988, 8804645**

**Int. Cl.[5] E21D** *9/10;* **E21C** *29/02*

**U.S. Cl. 299—31** **6 Claims**



1. Tunnel boring machine having a transmission housing which comprises a transmission driven by at least one driving motor arranged on said transmission housing, an outgoing shaft connected to said transmission for driving a boring head, and means for pressing the boring head against a tunnel front, said transmission housing during boring being fixed relative to the tunnel by means of a plurality of clamping shoes, said boring head being axially displaceable relative to said outgoing shaft while transferring torque from the outgoing shaft to the boring head, said means for pressing the boring head against the tunnel front comprising a plurality of fluid cylinders arranged between said transmission housing and a bearing housing for said boring head.

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**5,046,784**

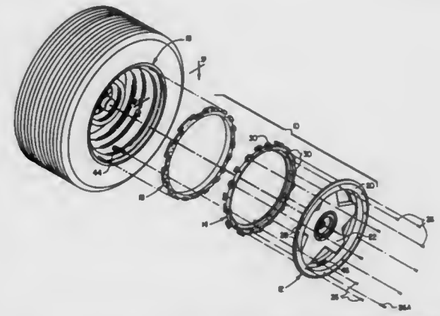
**WHEEL COVER RETENTION SYSTEM**

**George A. Carter, III, 6614 Lakeshore Dr., Garland, Tex. 75042**

**Filed Mar. 20, 1990, Ser. No. 496,339**

**Int. Cl.[5] B60B** *7/06*

**U.S. Cl. 301—37 PB** **29 Claims**



17. A retention system for removably securing a decorative wheel cover having annular inner and outer rim portions to an ordinary automotive wheel having an outer peripheral edge portion, said retention system comprising:

first engaging means disposed along one of said inner of said outer rim portions of said decorative wheel cover; and

second engaging means disposed radially inwardly of said outer peripheral edge portion of said automotive wheel;

said first and second engaging means being adapted for releasable engagement with each other;

said first and second engagement means being cooperative in a manner permitting said engagement of said first and second engaging means to be effected by holding said wheel cover against said automotive wheel, thereby placing said first engaging means in contact with said second engaging means, and

rotating said wheel cover in either the clockwise or counterclockwise direction.

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**5,046,785**

**TRACTION WHEEL FOR CENTER PIVOTS AND THE LIKE**

**Bernard J. Bockerman, Route 1, Box 14, Prosser, Nebr. 68868-9407**

**Filed Sep. 29, 1989, Ser. No. 414,675**

**Int. Cl.[5] B60B** *15/02*

**U.S. Cl. 301—52** **15 Claims**

1. A traction wheel adapted to be mounted on an axle assembly, said traction wheel comprising,

a pair of axially spa ed apart annular rims, said rims presenting ground engagement surfaces which are inclined radially and axially inwardly toward one another,

a plurality of generally edge shaped lugs connected to and extending between said pair of rims in circumferentially spaced apart relation, thereby to form openings through said wheel between said rims and adjacent pairs of lugs,

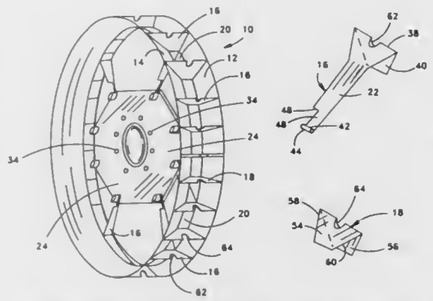
each lug including leading and trailing sides with respect to the direction of rotation of said wheel,

one side of a first plurality of is lugs extending generally radially inwardly of said rims to serve as a spoke thereof,

VOL 1130 ISS 2 SE 10 1991 UMI



hub means connected to said one sides of said first plurality of lugs, said hub means including means for mounting said wheel on an axle assembly,



each lug being generally V-shaped with an apex directed radially outwardly, and

at least one lug having an opening through the apex thereof.

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**5,046,786**

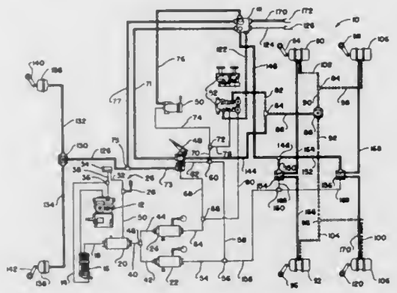
**COMBINATION BRAKE VALVE MODULE**

**Jeffery S. Johnston, Haslett; Michael G. Smith, Owosso, and Mark Karpinski, Rochester Hilis, all of Micb., assignors to Midland Brake, Inc., Kansas City, Mo.**

**Filed Jun. 12, 1990, Ser. No. 537,083**

**Int. Cl.[5] B60T** *13/00*

**U.S. Cl. 303—7** **9 Claims**



1. A tractor-trailer brake actuation and release circuit comprising:

a pressurized fluid, a pressure source, at least one fluid pressure reservoir, service brake means, parking brake means, a foot-actuated treadle assembly service brake valve, a hand-actuated trailer service brake valve, a manifold push/pull valve and a pressurized fluid control module,

said pressurized fluid control module comprising pressure inlet means for receiving said pressurized fluid, a plurality of interconnected pressure chambers, proportioning means to vary the fluid pressure to at least a portion of said service brake means depending on the presence of said trailer, protection means to prevent the loss of pressurized fluid within said brake actuation and release circuit upon separation of said trailer from said tractor, porting means to release residual fluid pressure in said pressurized fluid control module, and pressure actuated valve means for selectively preventing fluid transportation between two or more of said interconnected chambers, switching means to energize the vehicle rear stop lamps upon the presence of fluid pressure in at least one of said interconnected pressure chambers, and a plurality of pressure outlet means;

said pressurized fluid control module being a single, integrated, multifunctional unit for selectively communicating said pressurized fluid to at least a portion of said service brake means or a portion of said parking brake means depending on the presence of said trailer, the position of said foot-actuated treadle assembly service brake valve, the position of said hand-actuated trailer service brake valve, and the position of said manifold push/pull valve.

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**5,046,787**

**ANTI-SKID CONTROL SYSTEM**

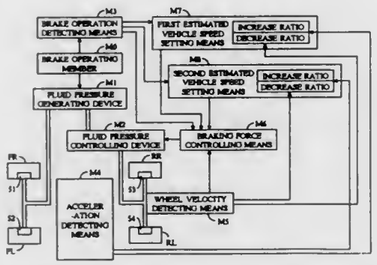
**Kazutaka Kuwana; Kuniaki Okamoto; Tsuyoshi Yoshida; Hiroyuki Ichikawa; Masaru Kamikado; Nobuyasu Nakanishi, all of Aichi; Tatsuo Sugitani, Shizuoka, and Kazunori Sakai, Aichi, all of Japan, assignors to Aisin Seiki K.K., Aichi, Japan**

**Filed Aug. 6, 1990, Ser. No. 563,143**

**Claims priority, application Japan, Aug. 4, 1989, 1-203489**

**Int. Cl.[5] B60T** *8/60*

**U.S. Cl. 303—103** **2 Claims**




1. An anti-skid control system which is provided with wheel cylinders installed on the individual wheels, including the driving wheels, of a motor vehicle and furnishing braking force to the said wheels, a fluid pressure generating device, which supplies brake fluid pressure in accordance with the brake operation on the brake operating member to each of the said wheel cylinders, a fluid pressure controlling device set in the fluid pressure channels connected to form intercommunicating links betweenn the wheel cylinders installed on the said fluid pressure generating device and the said driving wheels, a brake operation detecting means, which detects the brake operation of the said brake operating member, an acceleration detecting means, which is installed on the said motor vehicle and detects the acceleration of the said motor vehicle, a wheel velocity detecting means, which detects the wheel velocity of the said driving wheels, and a braking force controlling means, which controls the brake fluid pressure fed to the wheel cylinders installed on the said driving wheels, driving and controlling the fluid pressure controlling device in accordance with the output signals from the said wheel velocity detecting means and the said acceleration detecting means when the said brake operation detecting means has detected any brake operation, wherein the said anti-skid control system is characterized by being equipped with a first estimated vehicle speed setting means, which sets the prescribed increase ratio to the said wheel velocity in accordance with the output signals from the said acceleration detecting means, finding a first set speed through arithmetic operations performed on the basis of the said increase ratio, and also sets the prescribed decrease ratio to the said wheel velocity, finding a second set speed through



arithmetic operations performed on the basis of the said decrease ratio, and sets a first estimated vehicle speed by selecting the median value of the said second set speed, the said first set speed, and the said wheel velocity, and a second estimated vehicle speed setting means, which sets the second estimated vehicle speed, setting an increase ratio corresponding to the prescribed increase ratio for the said wheel velocity and yet smaller than the prescribed increase ratio for the said first set speed in accordance with the output signals from the acceleration detecting means mentioned above, finding a third set speed through arithmetic operations performed on the basis of the said increase ratio, also setting the prescribed decrease ratio for the said wheel velocity and finding a fourth set speed on the basis of the said decrease ratio, and selecting the median value of the said fourth set speed, the said third set speed and the said wheel velocity, and also by driving the said fluid pressure controlling device in accordance with the result of comparison with the said wheel velocity, finding the said first estimated vehicle speed through arithmetic operations performed with the said prescribed decrease ratio for the said second set speed switched to a decrease ratio smaller than that set prior to the detection of the brake operation, when the brake operation detecting means mentioned above has detected any brake operation, and yet driving the said fluid pressure controlling device in accordance with the result of comparison with the said second estimated vehicle speed and the said wheel velocity, when the said brake operation detecting means has not detected any brake operation.

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**5,046,788**

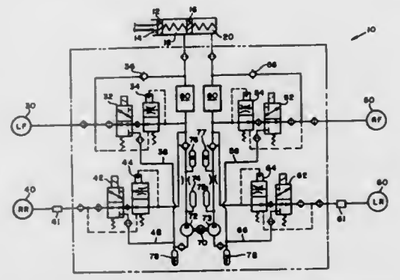
**PRESSURE PILOTED RELEASE VALVE**

**Charles E. Lindenman, South Bend, Ind., assignor to Allied-Signal Inc., Morristown, N.J.**

**Filed Jul. 19, 1990, Ser. No. 555,281**

**Int. Cl.[5] B60T** *8/32*

**U.S. Cl. 303—116** **20 Claims**



I. A pressure piloted valve comprising a valve body received within an opening of a receptacle, the valve body extending within said opening to a reduced valve body diameter portion to define a receptacle chamber between said diameter portion and said opening, the valve body including a stepped bore comprising an enlarged diameter bore section communicating with a small diameter bore section, a release valve disposed within said bore and comprising a large diameter section received within the enlarged diameter bore section and a small diameter section received within said small diameter bore section, the release valve having first and second ends, a longitudinal through passage, and a seal disposed about said large diameter section and sealing means disposed about said small diameter section to define with said valve body an intermediate vented chamber, first resilient means disposed between said release valve and valve body to bias said release valve toward a first end opening of the valve body, the small diameter bore section extending to a valve body chamber which communicates with a radial passage in the valve body, the radial passage communicating with the receptacle chamber, the second end of the release valve disposed opposite a sloped end wall of said body chamber, the valve body including a poppet check valve passage communicating with said body chamber, a poppet check valve disposed at an end of said valve body and at said receptacle chamber, the poppet check valve biased by second resilient means disposed within said receptacle chamber so that the check valve controls fluid flow received via a receptacle end opening and communicating with said poppet check valve passage, fluid pressure received at said first end opening causing said release valve to be displaced and the second end of the release valve to engage sealingly said sloped end wall, such that the fluid pressure communicates via said longitudinal through passage with said body chamber and causes said poppet check valve to open and permit fluid communication with said receptacle end opening, and fluid pressures received at both said first end opening and said receptacle end opening causing said release valve to be displaced such that the release valve engages said sloped end wall and said poppet check valve closes to prevent fluid communication through said poppet check valve passage.

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**5,046,789**

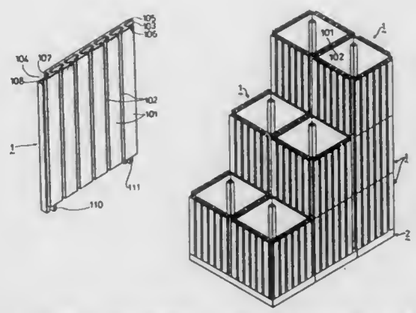
**MODULAR PANEL ASSEMBLY**

**Yeou-Ching Lee, Taipei City, Taiwan, assignor to Alvin Lee Jewelry, Inc., Taipei, Taiwan**

**Filed Apr. 5, 1990, Ser. No. 505,232**

**Int. Cl.[5] A47B** *87/00*

**U.S. Cl. 312—108** **3 Claims**



1. A modular panel assembly, comprising more than one first modular unit, each first modular unit having a plate member with a front face, a rear face, two oppositely disposed side faces connecting said front face to said rear face, and a bottom edge and a top edge; said rear face having a first connecting corner piece and a second connecting corner piece longitudinally and oppositely disposed near said side faces, said first connecting corner piece having a longitudinal groove, said second connecting corner piece having a longitudinal tongue, said first connecting corner piece of each of said first modular units being engageable with said second connecting corner piece of another said first modular unit; said first modular unit further having a plurality of substantially T-shaped protrusions projecting from said front face of said plate member and form-

ing a plurality of substantially T-shaped grooves between them, each of said T-shaped protrusions having a pair of oppositely extending flange ends, each of said T-shaped grooves having a restricted opening between two said flange ends and being open at said to pand said bottom edges of said first modular units, said T-shaped protrusions of each of said first modular units being engageable with said T-shaped grooves of another said first modular unit; wherein each of said first modulat units has two longitudinal side grooves oppositely formed at said side faces and two pairs of flanks, each pair of said flanks defining one of said side grooves, one of said flanks in each pair being longer than the other said flank, one of said flanks in each pair being adjacent to said rear face and having an inclined edge face.

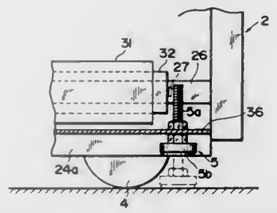
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**5,046,790**

## APPARATUS FOR IMMOBILIZING MOVABLE CABINET

**Ryuichi Onomoto, Kusatsu, Japan; Masaru Sato, Atsugi; Ryuichi Onomoto, Kusatsu, all of Japan, and Hiroshi Fujikura, Yokohama, assignors to International Business Machines Corporation, Armonk, N.Y. and Omron Tateisi Electronics Co., Kyoto, Japan**

**Filed Feb. 10, 1989, Ser. No. 308,772**
**Claims priority, application Japan, Feb. 15, 1988, 63-32581**
**Int. Cl.[5] A47B *91/00***
**U.S. Cl. 312—250** **2 Claims**



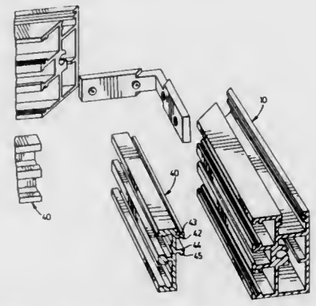

1. An apparatus for immobilizing a movable cabinet comprising:
- an apparatus body capable of being housed in the cabinet and of being drawn out therefrom;
- a first caster means disposed on a rear bottom surface of the cabinet;
- a second caster means disposed on a front bottom surface of the cabinet, said first and second caster means being at least three in number by means of which the cabinet is movable with the apparatus body housed therein;
- a leg member disposed on a front bottom surface of the cabinet, said leg member being capable of projecting to a position below a lower end of said second caster means of the apparatus body housed in the cabinet and being capable of retracting to a position above a lower end of said second caster means;
- rails disposed on the cabinet;
- a slide member fixed on said apparatus body and slidably engaged with said rails in a longitudinal direction thereof; and
- means for retracting said leg member in a direction toward at least one of said slide member and said rail such that a portion thereof engages with a portion of said one of said slide member and said rail so as to prevent said apparatus body from being drawn out from the cabinet.

**5,046,791**

## EXTRUSION FRAME AND COMPONENTS THEREFOR

**Jerry Kooiman, 27 Moncrieff Drive, Rexdale, Ontario, Canada M9W 2P9**

**Continuation of Ser. No. 339,700, Apr. 18, 1989, abandoned. This application Jul. 6, 1990, Ser. No. 549,633**
**Int. Cl.[5] A47B *47/00***
**U.S. Cl. 312—265.1** **15 Claims**




1. A frame component for framing cabinetry comprising a tandem channel configuration having an inner channel bounded by a floor, side walls and a pair of opposed inner lips and an outer channel bounded by the pair of opposed inner lips, side walls and a pair of opposed outer lips,

an accessory strip including means for engaging a cabinet panel projecting from and extending longitudinally along a face of the accessory strip and interlocking means projecting from and extending longitudinally along an opposite face of the accessory strip comprising a pair of spaced apart ribs, each rib including an outwardly directed flange for engaging the outer channel of the frame component, and further including a connecting element having an arm engaging the inner channel of the frame component.

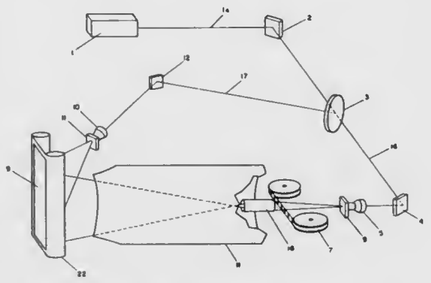
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**5,046,792**

## HOLOGRAPHIC PRINTER

**Britton Zabka, 705 Horsesboe Trail SE., Albuquerque, N. Mex. 87123**

**Filed Dec. 13, 1989, Ser. No. 449,768**
**Int. Cl.[5] G03H *1/04***
**U.S. Cl. 359—26** **16 Claims**




1. A holographic printer comprising:
- a. a source of coherent light;
- b. means for dividing said source into first and second beams, said first beam defining a first optical axis, said second beam defining a second optical axis;
- c. first means, positioned along said first optical axis, for supporting one or more transparent images;



- d. recording means positioned along both said first and second optical axes;
- e. optical projection means positioned along said first optical axis between said recording means and said first supporting means, said projection means focusing the image of said transparent image on the front surface of said recording means;
- f. second means for supporting said first supporting means, said projection means and said recording means and for simultaneously rotating said first supporting means, said projection means and said recording means about said first optical axis; and
- g. means for projecting said second beam onto said recording means in such a manner that said second beam is fully superimposed over said first beam.

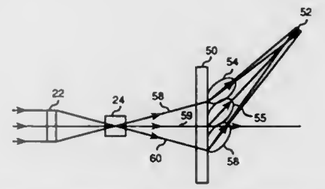
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**5,046,793**

## CHROMATICALLY CORRECTED DIRECTIONAL DIFFUSING SCREEN

**Bernard S. Hockley, Georgetown, and Romauld Pawluczyk, Bramalea, both of Canada, assignors to Litton Systems, Inc., Beverly Hills, Calif.**

**Filed May 26, 1989, Ser. No. 357,119**
**Int. Cl.[5] G03H *1/20***
**U.S. Cl. 359—12** **16 Claims**




1. A method for forming a directional chromatically corrected light diffuser, comprising the steps of:

placing a diffusing screen at a selected location;

recording a first hologram on a first holographic medium using the diffusing screen as an object;

illuminating the first hologram to form a first real image of the diffusing screen at a defined eyebox;

recording a second hologram on a second holographic medium using the real image as an object;

illuminating the second hologram to form a second real image of the diffusing screen; and

recording a third hologram on a third holographic medium using the real image reconstructed from the second hologram as an object by a process that includes the steps of:

exposing the third holographic medium with a first selected spectral component;

exposing the third holographic medium with a second selected spectral component; and

exposing the third holographic medium with a third selected spectral component.

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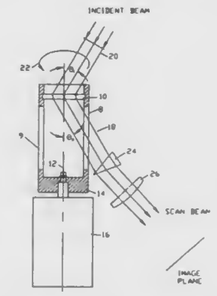
**5,046,794**

## HOLOGON SCANNER SYSTEM

**Joachim A. Ritter; Mehdi N. Araghi, both of Webster, and Charles J. Kramer, Rochester, all of N.Y., assignors to Holotek Ltd., Rochester, N.Y.**

**Filed Mar. 30, 1990, Ser. No. 503,400**
**Iot. Cl.[5] G02B *5/32, 26/10***
**U.S. Cl. 359—18** **15 Claims**

1. A hologon scanning system, for providing a beam of light which scans across an image plane, which comprises: a member having a planar diffraction grating with grating lines in a plane; means for holding and rotating said member about an axis of rotation perpendicular to said plane; means for illuminating said grating with a beam of light which is incident on said grating where said axis intersects said grating and at an angle of incidence of from about 25° to 45° and is diffracted




therefrom to provide two sequential scans across said image plane per revolution of said member.

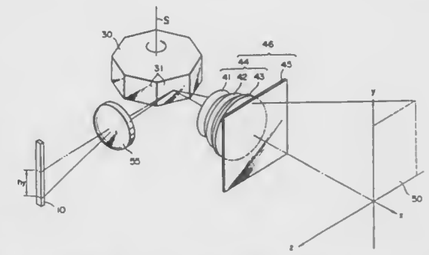
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**5,046,795**

## APPARATUS FOR PRODUCING A DISTORTION-FREE TWO-DIMENSIONAL IMAGE OF A SCANNED OBJECT

**Akira Morimoto, Tokyo, and Takashi Iizuka, Shiki, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 23, 1988, Ser. No. 288,980**
**Claims priority, application Japan, Dec. 23, 1987, 62-326274; Dec. 23, 1987, 62-326275; Jan. 12, 1988, 63-4423**
**Int. Cl.[5] G02B *26/10***
**U.S. Cl. 359—206** **4 Claims**




1. A scanning device for scanning a predetermined surface, said surface being defined by first and second axes intersecting at a right angle, with a light beam to create a two-dimensional image on said surface, said device comprising:

a linear light source comprising a plurality of light emitting elements linearly arranged along said first axis, each of said light emitting elements emitting said light beam in a predetermined direction;

refracting means for refracting said light beam from said light emitting elements in such a fashion that said light beam is emitted from said refracting means at an angle $\theta y$ in a first plane with respect to the optical axis of said refracting means, so that:

$$\Theta y = g_y^{-1}(hy/fc)$$

where,

hy represents the distance between a light emitting element from which a light beam is emitted and the optical axis of said refracting means, and

wherein fc represents the focal length of the refracting means, and

$g_y$ represents a predetermined transformation function;

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deflecting means for deflecting said light beam passed through said refracting means; and

converging means for converging the light beam deflected by said deflecting means at a point (y,z) defined by the following equations on said predetermined surface:

$$y = fy \cdot gy\ (\Theta y)$$

$$z = fz \cdot gz\ (\Theta z)$$

where

y represents a position along said first axis,

z represents a position along said second axis, and

fy represents the focal length of said converging means on said first plane defined by the optical axis of said converging means and said first axis, and

fz represents the focal length of the converging means on said second plane defined by the optical axis of said converging means and said second axis,

gz represents a predetermined transformation function, and

$\Theta_z$ represents an angle between said light beam and the optical axis of said converging means detected on said second plane.

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**5,046,796**

**APPARATUS FOR CORRECTING SCANNING BEAMS ON BASIS OF TILTING OF SURFACE SEGMENTS OF POLYGONAL MIRROR USED IN SCANNING PATTERN DRAWING APPARATUS**

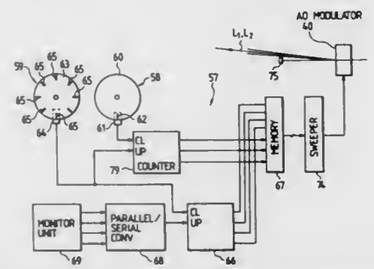
**Hiroaki Andoh; Michio Ohshima; Yuji Matsui; Takashi Okuyama; Toshitaka Yoshimura; Hidetaka Yamaguchi; Yasushi Ikeda; Jun Nonaka; Tamihiro Miyoshi; Mitsuo Kakimoto; Masatoshi Iwama; Hideyuki Morita; Satoru Tachihara; Akira Morimoto, and Akira Ohwaki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan**

**Filed Dec. 1, 1989, Ser. No. 444,230**

**Claims priority, application Japan, Dec. 1, 1988, 63-304782**

**Int. Cl.[5] G02B** *26/10*

**U.S. Cl. 359—216** **4 Claims**




1. An apparatus for correcting a scanning beam produced by directing a light beam from a light source to a rotating polygonal mirror composed of a plurality of surface segments, comprising:

a light deflector disposed in an optical path of said light beam between said light source and said polygonal mirror;

means for correcting a direction of said scanning beam emerging from said polygonal mirror by applying to said light deflector a signal to compensate for tilting of a plurality of small areas within each of said surface segments;

wherein said correcting means comprises a memory for storing data indicative of an amount of tilting of each of said plurality of small areas;

wherein said correcting means further comprises means for addressing said memory with data indicative of a present position of said light beam from said light source on said polygonal mirror; and

wherein said addressing means comprises means for producing a first pulse signal containing one pulse for each revolution of said polygonal mirror; means for producing a second pulse signal containing pulses indicative of edge positons of each of said surface segments; means for producing a third pulse signal containing pulses indicative of each of said plurality of small areas; first counter means receiving said first pulse signal as a clear signal and said second pulse signal as a count signal; and second counter means receiving said second pulse signal as a clear signal and said third pulse signal as a count signal, outputs of said first and second counter means together forming said data indicative of a present positon of said light beam from said light source on said polygonal mirror.

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**5,046,797**

**LIGHT BEAM SCANNER WITH FOREIGN MATTER REMOVING FEATURE**

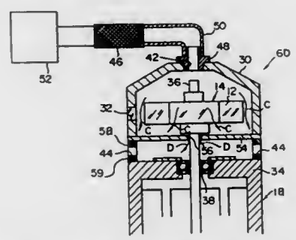
**Akira Kurisu, Kanagawa, and Kiyoshi Suzuki, Saitama, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 14, 1989, Ser. No. 322,872**

**Claims priority, application Japan, Mar. 15, 1988, 63-61239**

**Int. Cl.[5] G02B** *26/08;* **G03B** *11/04*

**U.S. Cl. 350—6.8** **19 Claims**




5. A light beam scanner, comprising:

a rotary polygonal mirror fixedly secured adjacent a free end portion of a rotary shaft supported by a bearing, said rotary polygonal mirror being adapted to reflect radiated light beams while being rotated by the rotary shaft, with the rotary shaft extending through a center axis of the rotary polygonal mirror, and having both end faces lying substantially perpendicular to the rotary shaft and a peripheral wall carrying thereon a plurality of mirrors for reflecting the light beams; a protective cover covering the rotary polygonal mirror, said protective cover defining an air inlet opening capable of introducing therethrough air into the inside of the cover, an air outlet hole in which a portion of the rotary shaft, said portion being between the bearing of the rotary shaft and the rotary polygonal mirror, is loosely-fitted, permitting discharge of air from the inside of the protective cover, and at least one window for allowing the light beams to travel therethrough to the rotary polygonal mirror and to come out therethrough subsequent to their reflection by the rotary polygonal mirror; and

an air-introducing means for causing air to flow into the inside of the protection cover through the air inlet opening.



**5,046,798**

**SEMICONDUCTOR LIGHT EMITTING DEVICE AND APPARATUS USING THE SAME**

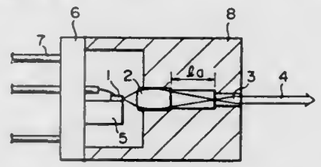
**Yasutoshi Yagiu; Tetsuo Kumazawa, both of Ibaraki; Makoto Shimaoka, Ushiku, and Kunio Aiki, Komoro, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Aug. 1, 1989, Ser. No. 387,984**

**Claims priority, application Japan, Aug. 11, 1988, 63-200622**

**Int. Cl.[5] G02B** *6/36, 7/26*

**U.S. Cl. 350—96.20** **13 Claims**




1. A semiconductor light emitting device comprising:

a semiconductor light emitting element;

a first lens for converging light from said semiconductor light emitting element; and

a second lens disposed with a focal position thereof aligned with the converging point of said first lens for converting the converged light into a collimated beam.

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**5,046,799**

**Patent Not Issued For This Number**

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**5,046,800**

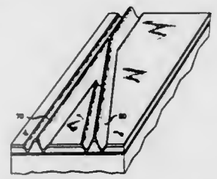
**ARTICLE COMPRISING A PASSIVE OPTICAL WAVEGUIDE**

**Lee L. Blyler, Jr., Basking Ridge; Edwin A. Chandross; Leonard G. Cohen, both of Berkeley Heights, and Louis T. Manzione, Summit, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Oct. 9, 1990, Ser. No. 594,775**

**Int. Cl.[5] G02B** *6/10;* **B29D** *11/00;* **C08F** *120/18*

**U.S. Cl. 350—96.12** **8 Claims**




1. An article, comprising:

a base member having a substantially planar surface; and

a polymer film on the surface, the film comprising an elongate first region extending in a direction substantially parallel to the surface and adapted for guiding electromagnetic radiation of a given wavelength, the region to be termed the "first waveguiding channel";

characterized in that

the film comprises first and second polymeric materials, the former having a higher refractive index than the latter at the given wavelength;

the first polymeric material has a glass transition temperature $T_g$ and the second polymeric material has a melting point or glass transition temperature that is higher than $T_g$;

the first waveguiding channel comprises a core of first polymeric material and a cladding of second polymeric material, the cladding overlying and at least partially surrounding the core;

the core has a substantially planar lower surface in contact with the base-member surface, and an upper surface in contact with the cladding; and

in at least a portion of the first waveguiding channel, the upper core surface approaches the lower core surface within a distance such that radiation of the given wavelength can be guided in the portion with less than about 1 dB of mode loss.

8. A method for forming a waveguide in a polymeric film, comprising the step of shaping the film such that at least one waveguiding channel is defined in the film,

characterized in that

the film comprises a core layer comprising a first polymeric material having a glass transition temperature $T_g$ and a first refractive index;

the film further comprises an upper cladding layer overlying the core layer, the upper cladding layer comprising a second polymeric material having a melting point or glass transition temperature that is greater than $T_g$ and a second refractive index that is smaller than the first refractive index;

the method further comprises, before or during the shaping step, the step of heating the film to a temperature that is greater than $T_g$ but less than the melting point or glass transition temperature of the upper cladding layer; and

the shaping step comprises applying a force to the heated film such that at least some first polymeric material is caused to flow out of at least one pair of elongate regions of the core layer and into adjacent regions of the core layer, such that the waveguiding channel is formed between the elongate regions.

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**5,046,801**

**OPTICAL WAVEGUIDE HAVING LOW OPTICAL DAMAGE**

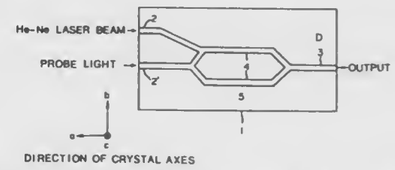
**Akira Terashima, Oume; Takumi Fujiwara, Nishitama; Hiroshi Mork, Oume, and Takeshi Yokoyama, Kunitachi, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan**

**Filed Sep. 24, 1990, Ser. No. 587,110**

**Claims priority, application Japan, Sep. 27, 1989, 1-249244**

**Int. Cl.[5] G02B** *6/10*

**U.S. Cl. 385—130** **2 Claims**




1. An optical waveguide produced from a lithium niobate single crystal substrate diffused thereon titanium, wherein, the substrate is a single crystal of lithium niobate having an optical absorption coefficient of 0.03 $cm^{-1}$ or less for a light 420 nm in wavelength.

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**5,046,802**

**LIGHT WAVELENGTH CONVERTER**

**Osamu Yamamoto, and Toshihiko Yoshida, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan**

**Filed Mar. 26, 1990, Ser. No. 498,573**

**Claims priority, application Japan, Mar. 28, 1989, 1-77823**

**Int. Cl.[5] H03F** *7/00;* **G02B** *6/10*

**U.S. Cl. 359—328** **8 Claims**

1. A light wavelength converter comprising:

a substrate that is made of a material with a non-linear optical effect and

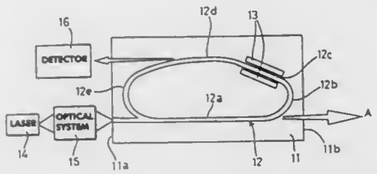
a loop-shaped optical waveguide that is formed on said substrate,

wherein said loop-shaped optical waveguide has a second harmonic wave generating part in which a second harmonic wave emanates from a fundamental wave that has

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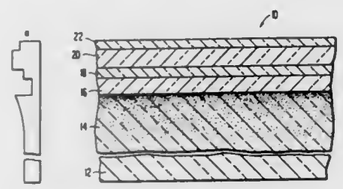
been propagated and a circulating part for returning a fundamental wave which is not converted into a second




harmonic wave to said second harmonic wave generating part.

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**5,046,803**
**ACTIVELY PHASED MATCHED FREQUENCY DOUBLING OPTICAL WAVEGUIDE**
**Sel B. Colak, Ossining, N.Y., assignor to North American Philips Corp., New York, N.Y.**
**Filed Dec. 8, 1989, Ser. No. 448,032**
**Int. Cl.[5] G02B *6/10***
**U.S. Cl. 385—122** **9 Claims**

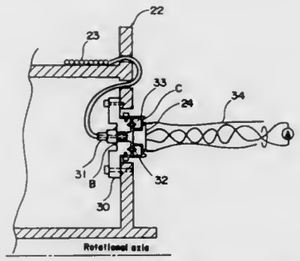



1. A tunable waveguide structure comprising:
a waveguide having first and second layers of non-linear optical material, said first and second layers having differing indexes of refraction;
a transparent semiconductor layer disposed on one surface of said waveguide, said transparent semiconductor layer having an index of refraction which varies by the Franz-Keldysh effect in response to an applied electrical field; and
means for applying an electrical field to said transparent semiconductor layer to vary the index of refraction of said semiconductor layer to thereby control the phase matching of the waveguide as a whole.

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**5,046,804**
**METHOD FOR MANUFACTURING A FIBER TYPE COUPLER**
**Masumi Fukuma, and Masayuki Shigematsu, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan**
**Filed Nov. 8, 1989, Ser. No. 433,343**
**Claims priority, application Japan, Nov. 21, 1988, 63-294414; Nov. 25, 1988, 63-297489**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—43** **19 Claims**

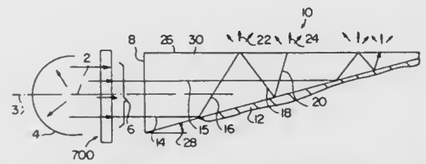
1. A method for manufacturing a fiber type coupler by fusing and elongating a plurality of optical fibers werein a multi-wire optical fiber wire is employed as said plurality of optical fibers and wherein said multi-wire optical fiber wire is




wound on a rotatable bobbin and connected to a light detector through an optical rotary joint.

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**5,046,805**
**TAPERED OPTICAL WAVEGUIDES FOR UNIFORM ENERGY (LIGHT) DISTRIBUTION INCLUDING ENERGY BRIDGING**
**Jerome H. Simon, 17 Suffolk Rd., Chestnut Hill, Mass. 02167**
**Filed Jul. 16, 1990, Ser. No. 552,904**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—31** **26 Claims**



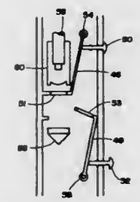

20. An electromagnetic waveguide for control and distribution of energy rays in combination:
an object of higher refractive index than the surrounding medium, said object shaped with:
two flat sides opposite to each other, said sides constructed at an angle to each other forming a wedge structure,
a lower surface
an upper surface, said upper and lower surfaces connected to said sides,
a first and a second end surface opposite each other, joining said sides and said upper and lower surfaces,
said lower surface having adjacent to said first end surface, an entrance port surface which accepts said energy rays into said object,
said first end surface having a parabolic reflective surface which collimates said rays,
said lower surface having a flat surface, said flat surface being adjacent to said entrance port and extending to said second end surface between said side surfaces, said flat surface arranged and constructed at an inclined angle to the path of said collimated energy rays where said collimated rays strike and reflect from said surface, since the refractive index of said object is greater than said surrounding medium and the angle of incidence of said rays striking said flat surface is small, said ray reflection from said lower surface being proportional along the length of said flat surface,
said wedge shape of said side surfaces having the apex of said wedge opposite said first end surface such that said side and said lower surface from a tapered channel extending away from said first end surface and said light source,



a top surface which receives said reflected rays, said top surface coated to modify said rays and emits said rays into the surrounding air,
said combination of said collimated energy rays, said flat surface and said coated top surface modifier are arranged and constructed to emit a uniform distribution of energy intensity from said top surface.

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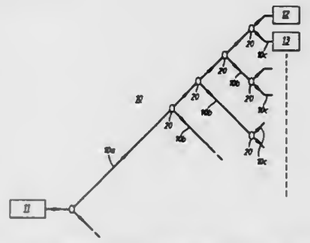
**5,046,806**
**SINGLE FIBRE CONTROL SWITCHES**
**John S. Kidder, and Derek Montgomery, both of Vancouver, Canada, assignors to CST Coldswitch Holdings Inc., Vancouver, Canada**
**Filed Feb. 22, 1990, Ser. No. 482,913**
**Int. Cl.[5] G02B *6/26, 6/42***
**U.S. Cl. 385—16** **30 Claims**



1. A fiber optic switch comprising:
an actuator reversibly movable between at least two switch positions;
an actuator position detector;
optical fiber path means connected between the actuator and the actuator position detector;
means for coupling light from a light source into said fiber path means so a to travel towards said actuator;
a filter coupled to said actuator selectably insertable into a light path of light emanating from an end of said fiber at said actuator;
a retro-reflector positioned at said actuator to reflect light from said optical fiber path means 180 degrees so as to travel back along the optical fiber path means towards said actuator position detector; and
means for directing reflected light returning down said optical fiber path means from said actuator toward said actuator position detector.

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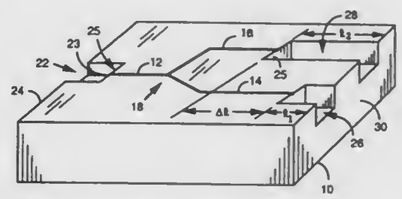
**5,046,807**
**FIBRE OPTIC TRANSMISSION SYSTEM**
**Brian M. Unitt, Herts, Great Britain, assignor to STC plc, London, England**
**Filed Feb. 22, 1990, Ser. No. 484,188**
**Claims priority, application United Kingdom, Mar. 1, 1989, 8904632**
**Int. Cl.[5] G02B *6/28***
**U.S. Cl. 350—96.16** **10 Claims**




1. A passive distribution system for electromagnetic radiation using waveguides and couplers wherein radiation from a source is distributed to a number of destination points, including means at destination points for determining radiation power levels received at the destination points and means for transmitting from the destination points to the source location information representing said received radiation power levels.

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**5,046,808**
**INTEGRATED OPTICS CHIP AND METHOD OF CONNECTING OPTICAL FIBER THERETO**
**Chin-Lung Chang, West Covina, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.**
**Filed Dec. 18, 1989, Ser. No. 451,588**
**Int. Cl.[5] G02B *6/30***
**U.S. Cl. 385—13** **8 Claims**




1. A fiber optic rotation sensor, comprising:
an optical signal source;
a substrate formed of a chip of an optically active material;
first, second and third optical waveguides formed in the substrate to guide optical signals from the optical signal source along selected axes of propagation, first, second and third slots being formed in edges of the integrated optics chip to correspond to the optical waveguides such that an end wall of each slot includes an end surface of the corresponding optical waveguide, the end surfaces of the optical waveguides being formed to make selected angles with the axes of propagation of light in the optical waveguides to reduce the effects of light reflected at the end surfaces of the optical waveguides in the direction of propagation of light in the optical waveguides, the first second and third optical waveguide being connected at a junction to form a Y-coupler such that optical signals input to the integrated optics chip at the first optical waveguide propagate to the Y-coupler and divide between the first and second optical waveguides and optical signals input to the integrated optics chip at the second and third optical waveguides combine at the Y-coupler and interfere with one another, the second and third optical waveguides having different optical path lengths from the junction to their respective end surfaces to reduce polarization cross coupling;
a first optical fiber mounted in the first slot to guide light from the optical signal source to the first optical waveguide;
an optical fiber sensing coil having its ends mounted in the second and third slots, the optical fibers being butt-coupled to the end surfaces of the optical waveguides to form interfaces where light may propagate between the optical waveguide and the optical fiber, the angles of the end of the optical waveguides being formed such that a portion of the light reflected at the interfaces back into the optical fibers refracts into the cladding;
means for controlling the polarization of light guided by the optical waveguides;
means for modulating the phase of light guided by the optical waveguides;
means for detecting the interference pattern of light waves that combine in the Y-coupler; and
signal processing means for determining the rotation rate of the optical fiber sensing coil.

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5,046,809

## COUPLING ARRANGEMENT FOR OPTICALLY COUPLING A FIBER TO A PLANAR OPTICAL WAVEGUIDE INTEGRATED ON A SUBSTRATE

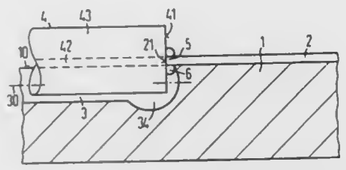
Karl-Ulrich Stein, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,171

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932688

Int. Cl.[5] G02B *6/30*

U.S. Cl. 350—96.17 10 Claims



1. A coupling arrangement for optically coupling a fiber to a planar optical waveguide comprising:

a fiber having a fiber end face; a planar optical waveguide having an end surface for communicating with said fiber; a substrate having said planar optical waveguide integrated thereon, and having a V-shaped groove formed into a surface of said substrate, said fiber arranged axially supported inside said groove along a length of said groove, said substrate having a projection portion projecting into said groove, and said end surface of said planar optical waveguide faces said fiber end face of said fiber, said end surface arranged at a free end of said projection portion into said groove, the end surface in close contact with said fiber end face of said fiber.

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5,046,810

## LASER LIGHT APPLICATOR

Rudolf Steiner, Ulm/Söflingen, and Liu Xiao-Meng, Ulm, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 542,472

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 3924491

Int. Cl.[5] G02B *6/32*

U.S. Cl. 385—38 4 Claims



1. A laser light applicator comprising a laser light conductor fiber (1) and a light conductor element (2) of greater diameter than said fiber (1), said conductor element being connected to the distal end of said fiber and terminating in a circular, wedge-shaped head (3') defined by two planar, blackened surfaces (5) converging to a truncated, unblackened edge (4) at its tip, said planar, blackened surfaces functioning as an absorbent for laser light to serve as a heated cutter, and said planar, blackened surfaces converging at an angle which avoids excessive heating of the truncated, unblackened edge.

5,046,811

## JUNCTION BOX FOR OPTICAL COMMUNICATIONS CORDS, AND GLAND ASSEMBLY FOR CORD

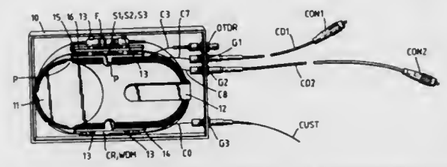
Roger E. Jung, 38 Tufton Road, Chingford, London E4 8LE, and Edward K. George, 93 Nelson Road, Rainham, Essex, RM13 8AP, both of England

Filed Jun. 7, 1990, Ser. No. 534,558

Claims priority, application United Kingdom, Jul. 17, 1989, 8916333

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—15 7 Claims



1. A junction box for linking a first optical communications cord with a plurality of second optical communications cords, each cord having an optical fiber core, a sheath and an intermediate layer of non-metallic strength members, the junction box comprising: a sealable, generally flattened housing having walls, opposite major faces, and integrally molded internal formations for organizing internal optical fibers within the housing; a plurality of terminals along one wall of the housing for connection to at least one of said second cords; a plurality of passive optical components, including a 1×2 fiber-optic coupler, all interconnected by the internal fibers with said terminals, at least one of said internal fibers having a splice along its length, and the internal fibers all being organized together in a single loop lying generally parallel to the major faces of the housing and having a curvature, the internal fibers of the loop being resiliently biased against the curvature of the loop; and a plurality of clamps for retaining the passive optical components within the housing, said clamps extending along two parallel walls of the housing so that all the passive optical components and the splice of said at least one internal fiber extend generally parallel to one another, said clamps including resiliently deformable pads between which the passive optical components are retained; each terminal including a gland assembly for a respective cord, the gland assembly including a hollow tube through which the respective cord extends, said tube having an outer wall and external formations for connecting the tube to the housing through which the tube extends, and a tubular end cap having an inner wall and an apertured base for the passage of the core of the respective cord, said outer wall of the tube bounding an annular clearance space with the inner wall of the end cap, said strength members of the respective cord within the tube being routed exteriorly of the tube through the annular clearance space for entrapment therein when the end cap is mounted on the tube.

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5,046,812

## APPARATUS AND METHOD FOR JOINING COATED OPTICAL FIBERS BY FUSION

Tooru Yanagi, and Yasuo Asano, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Filed Dec. 14, 1989, Ser. No. 450,453

Claims priority, application Japan, Jan. 23, 1989, 1-14638

Int. Cl.[5] G02B *6/38;* C03B *25/00;* H05B *7/18*

U.S. Cl. 385—96 8 Claims

1. A method for joining two optical fibers each consisting of a bare fiber coated with a thin carbon-based layer with the layer being covered with a jacket, the method comprising the steps of:

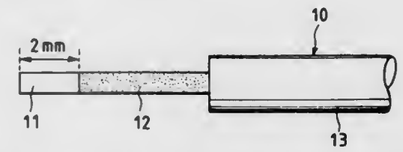
removing the jacket from a length of the two optical fibers, thereby exposing the carbon-based layer for the length of the jacket removed;

removing the thin carbon-based layer from a second length less than said length without deteriorating a transmission characteristic of the optical fibers so as to expose the bare fibers;

aligning the bare fibers so that a core of one fiber is aligned with the core of the second fiber; and

fusing the two fibers together without ever replacing the thin carbon-based layer.

8. An apparatus for stripping a carbon-based layer from an optical fiber comprising:



an optical fiber holder;

two electrodes being which an electric arc is generated which strips the carbon-based layer from the optical fiber without damaging a transmission characteristic of the fiber, the arc generating a temperature of 500° to 100° C.;

a power source which applies power to the electrodes; and

means for regulating an intensity of the electric arc produced between the two electrodes.

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5,046,813

## METHOD AND APPARATUS FOR ALIGNING A PLURALITY OF SINGLE-FIBER CABLES, AND METHOD OF SIMULTANEOUSLY FUSION-SPLICING SUCH CABLES

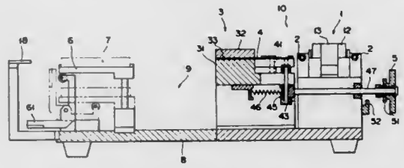
Kenichiroh Itoh, Sakura, and Mikio Yoshinuma, Yachiyo, both of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Sep. 1, 1989, Ser. No. 402,896

Claims priority, application Japan, Sep. 7, 1988, 63-223988; Sep. 7, 1988, 63-223989

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 10 Claims



9. A method of fusion-splicing a plurality of single-fiber cables, comprising the steps of:

passing single-fiber cables of a first group through reinforcing tubes made of heat-shrinking material;

aligning the cables of the first group and also the single-fiber cables of a second group, by means of a cable-aligning apparatus comprising

a base,

a cover hinged to said base and forming a gap along with the base when closed, said gap being substantially equal to the diameter of the single-fiber cables, and

a pair of pawl members inserted in said gap and movable within said gap, for aligning the single-fiber cables in the same plane;

holding the cables of both groups by means of two cable holders;

setting the fiber holders in a fusion-splicing apparatus designed for fusion-splicing multi-fiber cables, such that the ends of the cables of the first group oppose those of the cables of the second group;

operating the fusion-splicing apparatus, thereby fusion-splicing the cables of the first group simultaneously to the cables of the second group;

moving the reinforcing tubes to the fusion-spliced portions of the cables of both groups, and

heating the reinforcing tubes to shrink each tube, thereby simultaneously reinforcing the fusion-spliced portions of the cables of both groups.

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5,046,814

## LONGITUDINAL SEALING DEVICE FOR AN OPTICAL CABLE CORE

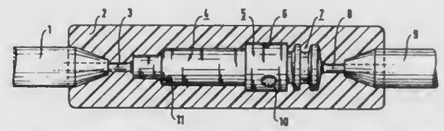
Francois Crespo-Ruiz, Paris; Jacques Cachot, Saint Michel Sur Orge, and André Pelet, Maurepas, all of France, assignors to Alcatel Cit, Paris, France

Filed Dec. 12, 1990, Ser. No. 626,153

Claims priority, application France, Dec. 13, 1989, 8916499

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—113 4 Claims



1. A longitudinal sealing device for the core of an optical cable including a bundle of optical fibers disposed inside the cavity of a metal tube; the sealing device being interposed between a first length and a second length of the tube, and comprising:

holding means situated at one end of the first length of tube for the purpose of holding a plastic material;

a block of covering plastic material covering both the holding means and the optical fibers of the bundle over a portion of the bundle situated between the two lengths of tube;

a metal sleeve surrounding the block of plastic material and fixed in sealed manner to the end of the second length of tube; and

a metal plug fixed to the end of the first length of tube and fixed in sealed manner to a mouth of the sleeve which it closes;

wherein the holding means for holding a plastic material comprise a barrel integral with the metal plug, said barrel having a cavity extending the cavity of the first length of tube and opening out from said barrel at the end thereof which is furthest from the first length of tube; the cross-section of said cavity being greater than the cross-section of the bundle of fibers, which bundle of fibers passes through said cavity; and the outside surface of said barrel including at least one transverse groove.

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5,046,815

## OPTICAL FIBER CABLING

Michael B. Cain, Corning; Rengan Kannabiran, Big Flats, and Emily M. Squires, Elmira, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

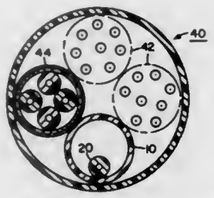
Filed May 17, 1990, Ser. No. 525,077

Int. Cl.[5] G02B *6/44*

U.S. Cl. 350—96.23 10 Claims

1. A telecommunications cable comprising at least one plastic duct adapted for the blow-in installation of one or more

coated low-loss optical fibers, wherein at least the inner sidewall of the duct consists predominantly of polyvinyl chloride




polymer which comprises 0.5-20% by weight of a fluorocarbon polymer.

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5,046,816

## DEVICE FOR ARRANGING OPTICAL FIBERS IN AN ENDOSCOPE OPTICAL SYSTEM

Helmut Lehmann, Kraichtal-Menzingen, and Siegfried Karst, Eisingen, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany

Filed Jul. 20, 1990, Ser. No. 556,043

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1989, 3929285

Int. Cl.[5] G02B *23/26*

U.S. Cl. 385—117 7 Claims




1. An endoscope optical system, comprising:
an inner tube accommodating optical components of said system;
an outer tube enclosing the inner tube whereby said tubes define a chamber therebetween;
optical fibers disposed between said tubes; and
separately formed wires extending longitudinally of said tubes and bridging said chamber thereby to subdivide it into subchambers, said fibers being accommodated in said subchambers.

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5,046,817

## GENERATION OF PARALLEL SECOND HARMONIC LIGHT RAYS USING AN OPTICAL FIBER

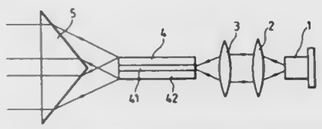
Naota Uenishi, and Takafumi Uemiya, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 9, 1989, Ser. No. 350,007

Claims priority, application Japan, May 14, 1988, 117897

Int. Cl.[5] G02B *6/02, 6/16*

U.S. Cl. 359—328 10 Claims




1. Apparatus for generating parallel second harmonic light rays comprising:
a laser light source capable of emitting a light at a fundamental frequency/wavelength;
an optical fiber made of a material having non-linear optical characteristic for generating second harmonic light using Cherenkov radiation in response to said fundamental frequency/wavelength light from said laser light source, said second harmonic light exiting as a ring of light and having a conical wave surface; and
a collimator lens having an inclined circular symmetrical surface for converting said ring of second harmonic light output from said optical fiber into parallel light rays.

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5,046,818

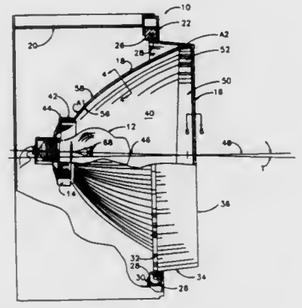
## SIGNAL REFLECTOR AND OPTICAL SYSTEM

Josh T. Barnes, Charlevoix, Mich., assignor to Lexalite Corporation, Charlevoix-the-Beautiful, Mich.

Filed Jun. 29, 1989, Ser. No. 373,941

Int. Cl.[5] G02B *5/12;* F21V *21/26*

U.S. Cl. 359—527 17 Claims




1. A traffic signal device comprising:
a housing;
illuminating means for emitting light;
lens means for receiving and for redirecting said reflected emitted light;
reflector means for receiving and reflecting said emitted light; said reflector means having a substantially parabolic contour and having a portion extending proximate to said lens means; and
said illuminating means and said reflector means being aligned along a first axis, said first axis being vertically inclined relative to a central horizontal axis of the traffic signal device in a range between approximately 2 degrees and 4 degrees.

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5,046,819

## OBJECTIVE LENS SUPPORT HAVING ROTARY AND AXIAL MOTIONS FOR USE IN AN OPTICAL DISK APPARATUS

Edwin R. Childers, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

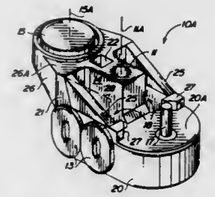
Filed Apr. 16, 1990, Ser. No. 509,393

Int. Cl.[5] G02B *7/02*

U.S. Cl. 359—814 12 Claims

1. A rotary actuator for use in an optical disk player for carrying an objective lens;
including, in combination:
an elongated beam having a lens aperture in a first end portion of the beam and having an optical axis extending through the lens aperture, said first end portion having upper and lower surface means extending in respective planes which are transverse to said optical axis;
the elongated beam having a pivot aperture in a central portion of the beam and having a pivot axis extending through the pivot aperture, said central portion having an upper surface means having a surface portion extending transverse to the pivot axis and having a surface portion in a plane juxtaposed to the upper surface means of said first end portion and lower surface means extending in a plane transverse to said pivot axis and being displaced from the lower surface means of said first end portion;
the elongated beam having a pair of rectangular apertures each having an magnet axis and the pair of rectangular apertures respectively extending longitudinally of the elongated beam to be longitudinally co-extensive with the central portion and with said pivot aperture being disposed therebetween;
the elongated beam having a lower portion with position indicating means located at a second longitudinal end portion of the elongated beam opposite to said first end portion, an upper surface means extending in a plane transverse to said optical axis and displaced from said






upper surface means of said first end portion along the optical axis toward said lower surface means of said first end portion;
a pair of spaced-apart longitudinally extending walls on the beam extending through said central portion between said first and second end portions, a lower surface of each of said walls being a portion of the lower surface means of said central portion and an upper surface of each of said walls extending between the upper surface means of said first and second end portions such that the walls each have side walls with a area of at least one-half of an area defined as a rectangle formed by the upper surface means of said first and second end portions and the boundaries between said central portion and both said end portions; and
said pivot and optical axes being substantially parallel to each other.

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5,046,820

## OBJECTIVE LENS DRIVING APPARATUS

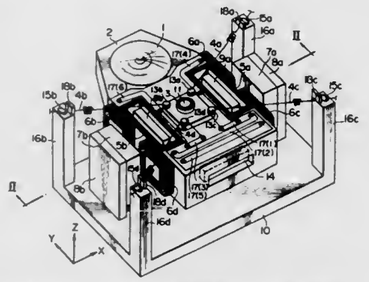
Shozo Saekusa, Ibaraki; Seiichi Katob, Chigasaki; Akira Ikuma, Hiratsuka; Hiroshi Saito, Chigasaki, and Isao Shimizu, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 17, 1990, Ser. No. 510,123

Claims priority, application Japan, Apr. 21, 1989, 1-100150

Int. Cl.[5] G02B *7/02*

U.S. Cl. 359—814 15 Claims




1. An objective lens driving apparatus comprising:
a base provided with focusing permanent magnets and tracking permanent magnets;
a supporting shaft mounted on said base;
a lens holder for holding an objective lens at an extension thereof, said lens holder being rotatably and slidably fitted onto said supporting shaft at a position of the center of gravity of said lens holder and being provided with focusing coils and tracking coils; and
a plurality of substantially identical elastic members stretched between said base and said lens holder in a plane substantially perpendicular to said supporting shaft and in axi-symmetrical relation with respect to Y-axis line joining said supporting shaft and said objective lens and X-axis line substantially perpendicular to said Y-axis.

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5,046,821

## OPTICS SUPPORT FOR AN OPTICAL DISK DRIVE

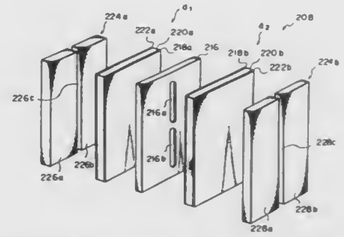
Masaaki Seino, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1989, Ser. No. 430,834

Claims priority, application Japan, Nov. 2, 1988, 63-278886; Mar. 2, 1989, 1-51149

Int. Cl.[5] G02B *7/02;* G11B *7/00*

U.S. Cl. 359—823 15 Claims




7. A device for supporting an optical system of an optical disk drive such that an objective lens forming a part of said optical system is movable in a focussing and a tracking direction relative to a recording surface of an optical disk, comprising:
a pair of first thin resilient support members positioned face-to-face for supporting the optical system, each of said first resilient support members comprising a thin substrate configured as a thin leaf spring and a film of resin provided on one of opposite major surfaces of said substrate;
a second resilient support member configured as a single thin plate for supporting the optical system, said second resilient support member comprising a metal substrate configured as a thin leaf spring, first layers of soft resin provided on opposite major surfaces of said substrates, plates of hard resin provided on outer surfaces of said first layers, second layers of soft resin provided on outer surfaces of said plates of hard resin, and metal plates provided on outer surfaces of said second layers; and
drive means for driving said first and second resilient support members to displace the objective lens in the focussing and tracking directions;
said first resilient support members generating a reaction in response to a driving force which said drive means exerts in the focussing direction, and said second resilient support member generating a reaction against a drive force which said drive means exerts in the tracking direction.

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5,046,822

## LIQUID CRYSTAL DEVICE

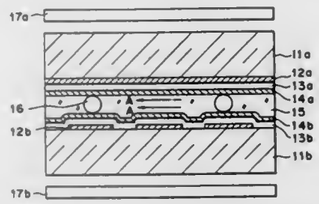
Hiroshi Matsuda, Isehara; Hisaaki Kawade, Atsugi; Yuko Morikawa, Kawasaki; Toshiharu Uchimi, Atsugi; Ken Eguchi, and Haruki Kawada, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1990, Ser. No. 575,802

Claims priority, application Japan, Sep. 1, 1989, 1-226631; Sep. 26, 1989, 1-251218

Int. Cl.[5] G02F *1/133, 1/137*

U.S. Cl. 359—75 17 Claims




1. A liquid crystal device comprising a pair of substrates and a liquid crystal material disposed between said pair of substrates, wherein at least one of said substrates is provided with a film comprising a polyimide compound having in its polyimide main-chain structural unit at least one alkyl side chain containing an alkyl chain moiety having a length of 2 to 10 carbon atoms.

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5,046,823

## FERROELECTRIC LIQUID CRYSTAL ELECTRO-OPTIC APPARATUS AND MANUFACTURING METHOD THEREOF

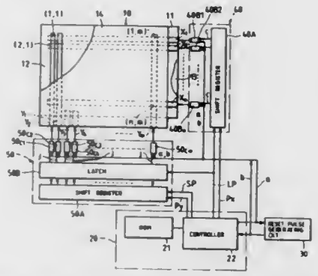
Kahoru Mori, Anjo; Yuichiro Yamada, Nagoya; Norio Yamamoto, Kariya; Masao Tokunaga, Gamagori; Ichiro Kawamura, Yamato; Yoshiichi Suzuki, Zama; Takashi Hagiwara; Yoshihiko Aihara, both of Yokohama; Noriko Yamakawa, Atsugi, and Shigenori Sakuma, Yokohama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Showa Shell Sekiyu K.K., Tokyo, both of, Japan

Filed Mar. 24, 1989, Ser. No. 328,363

Claims priority, application Japan, Mar. 24, 1988, 63-70212; May 2, 1988, 63-109724; May 19, 1988, 63-122679; Dec. 7, 1988, 63-309615; Dec. 27, 1988, 63-331308; Dec. 28, 1988, 63-331593

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—56 7 Claims



1. A matrix type liquid crystal display apparatus comprising:
a liquid crystal cell having first and second electrode substrates disposed to be parallel to each other, said first and second electrode substrates including n striped row electrodes and m striped column electrodes, respectively, which are perpendicular to each other, a ferroelectric liquid crystal being disposed between said first and second electrode substrates so as to form n by m indication picture elements; and
scanning drive means adapted to supply, on the basis of stored indication data, a scanning signal to the n striped row electrodes and a data signal to the m striped column electrodes for sequentially scanning, at every (1/n) of a time period for indication of one image plane on the liquid crystal, the respective row electrodes to supply a first combination signal, which is a combination of said scanning signal and said data signal, so as to cause the remaining indication picture elements to enter in an OFF state;
wherein said ferroelectric liquid crystal has three stable states in accordance with an applied voltage and has a light transmittance with a hysteresis sufficient to a dynamic drive in accordance with increase or decrease in the applied voltage in a predetermined voltage range, and said scanning drive means produces said first combination signal as a signal running to an alternating-current-like variation from a voltage below a reference voltage in a predetermined one polarity voltage range to a voltage above said reference voltage and produces said second combination signal as a signal which does not exceed said reference voltage in said predetermined one polarity voltage range, and supplies a predetermined signal, for keeping the states of the indication elements due to said first and second combination signals, between the n striped row electrodes and the m striped column electrodes after the supply of said first and second combination signal thereto.

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5,046,824

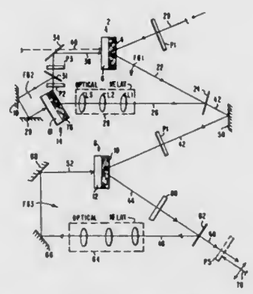
## ADAPTIVE OPTICS SYSTEM AND METHOD

David M. Pepper, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 9, 1989, Ser. No. 308,300

Int. Cl.[5] G02F *1/13; G01J 1/20*

U.S. Cl. 359—72 16 Claims



1. An adaptive optics system comprising:
at least a first spatial light modulator capable of effecting aberration correction of a first type to receive an aberrated beam having aberrations of first and second types and reflect a first reflected beam;
first means for feeding back to said first spatial light modulator a portion derived from said first reflected beam and indicative of the aberrations of the first type in said aberrated beam, said first spatial light modulator thereafter acting upon the aberrations of the first type in said aberrated beam in response thereto to generate a beam having partial aberration compensation;
at least a second spatial light modulator, capable of effecting aberration correction of a second type to receive said beam having partial aberration compensation from said first spatial light modulator and provide a second reflected beam in response thereto; and
second means for feeding back to said second spatial light modulator, a portion derived from said second reflected beam and indicative of the aberrations of the second type in said aberrated beam, said second spatial light modulator acting upon the aberrations of the second type in the beam having partial aberration compensation in response thereto.

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5,046,825

## LIQUID CRYSTAL CELL WITH PICTURE ELECTRODE INTERFERENCE LAYER COVERING METALLIC FEED LINES

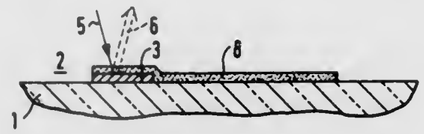
Werner Fertig, Darmstadt, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 152,616, Feb. 5, 1988, abandoned. This application Aug. 24, 1990, Ser. No. 576,122

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705259

Int. Cl.[5] G02F *1/133*

U.S. Cl. 350—336 3 Claims




1. A liquid crystal display cell comprising
a plurality of picture electrodes; and
a plurality of metallic conductor paths serving as feed lines to respective ones of the picture electrodes; and
wherein each of said picture electrodes overlies a respective one of the conductor paths and has a predesignated thickness to serve as an interference layer covering the metallic conductor path for reduction of reflection of light from the metallic conductor path.

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5,046,826

## ILLUMINATOR AND DISPLAY PANEL EMPLOYING THE ILLUMINATOR

Hirofumi Iwamoto, Hiratsuka; Takashi Yamamoto, Atsugi; Yoshihiro Onitsuka, Yokohama, and Tadashi Mihara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1988, Ser. No. 244,299

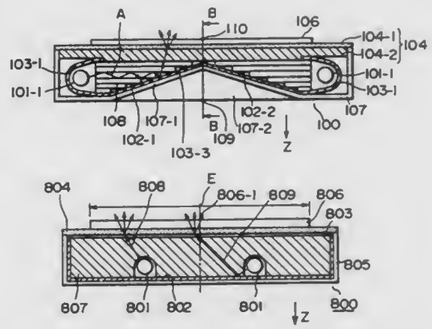
Claims priority, application Japan, Sep. 19, 1987, 62-235993; Oct. 21, 1987, 62-265999

Int. Cl.[5] G02F *1/133*

U.S. Cl. 350—339 D 11 Claims

6. An illuminator comprising:
light source means and a light-scattering member for illuminating an object to be illuminated from its back surface, and
a light-transmitting member having space therein for disposing said light source, with said light-scattering member being disposed between said light source and said object to be illuminated, said light-transmitting member being formed of a solid material capable of propagating a light ray outgoing from said light source toward said light-scattering member, and said space being provided within an effective illumination region of said object to be illuminated, wherein said light-transmitting member and said light-scattering member are independently disposed, and a light screen having opaque portions is closely fixed between said light-transmitting member and said light-scattering member.

10. A display apparatus comprising:
an illuminator comprising a set of first and second light-transmitting members each formed of a plurality of transparent sheet-like members having light-outgoing ends and being laminated to each other, with said light-transmitting members being disposed so that said ends of said first and second light-transmitting members face each other;
a light source disposed on a light-incoming side of each of said light-transmitting members;
a light-reflecting member disposed at said light-outgoing ends of said light-transmitting members; and




a sheet-like member having a scattering area at which a light ray reflected from said light-reflecting member is converted into scattered light and coming into surface contact with said light-transmitting members; and
a chiral smectic liquid crystal display panel fixed to said illuminator and disposed so as to come into contact with said sheet-like member.

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5,046,827

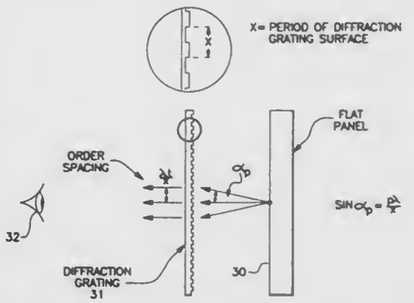
## OPTICAL RECONSTRUCTION FILTER FOR COLOR MOSAIC DISPLAYS

Keith L. Frost, Scottsdale; Karen E. Jachimowicz, Goodyear, and Michael J. Johnson, Phoenix, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 20, 1989, Ser. No. 382,514

Int. Cl.[5] G02F *1/13*

U.S. Cl. 359—54 26 Claims




1. An improved flat panel color mosaic (or matrix) display apparatus which uses a diffraction grating reconstruction filter to reduce image artifacts, the apparatus comprising:
a flat panel color matrix display, the flat panel color matrix display having a viewing face and comprising a regular structure of pixels which are selectively energized to create an image having high frequency energy, the color matrix display being subject to an inherent underlying

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grid structure which results in objectionable visual artifacts called sampling noise which lowers image quality; and

a two-dimensional diffraction grating reconstruction filter positioned proximate and in front of said matrix display viewing face which diffracts the image to substantially filter the image, the diffraction grating breaking each pixel image up into various diffraction orders in two-dimensions as it passes through the grating, whereby the diffracted pixels overlap and cause interpolation among the pixels thereby minimizing the high frequency energy and detection of the underlying grid structure and improving the image.

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**5,046,828**

## APPARATUS FOR READING OUT A CHARGE LATENT IMAGE

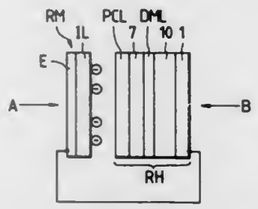
**Itsuo Takanashi, Kamakura; Shintaro Nakagaki, Fujisawa; Hirohiko Shinonaga; Tsutou Asakura, both of Yokohama; Masato Furuya, and Hiromichi Tai, both of Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan**

**Filed Nov. 22, 1989, Ser. No. 439,660**

**Claims priority, application Japan, Nov. 25, 1988, 63-297538**

**Int. Cl.[5] G02F *1/13***

**U.S. Cl. 359—72** **3 Claims**




1. An apparatus for reading out a charge latent image from a recording medium, comprising:

a photo-modulation member exposed to an electric field from the recording medium and exposed to reading light, the photo-modulation member varying a condition of the reading light in accordance with the electric field;

a photoconductive member disposed between the recording medium and the photo-modulation member; and

means for applying control light to the photoconductive member, wherein the control light has an intensity which varies with respect to time.

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**5,046,829**

## LIQUID CRYSTAL DISPLAY BACKLIGHTING APPARATUS HAVING COMBINED OPTICAL DIFFUSER AND SHOCK DAMPENING PROPERTIES

**Nicholas J. Worp, Lantana, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed May 1, 1989, Ser. No. 345,742**

**Int. Cl.[5] G02F *1/13***

**U.S. Cl. 359—49** **11 Claims**

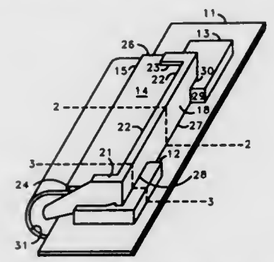
1. A display system comprising:

a platform;

first means for providing a display;

second means for providing light; and

third means optically coupled to said second means and engagingly positioned between said first means and said platform, said third means having a flange and a body, said flange securing said first means to said body, for securing




said first means to said platform, and for both damping vibrations from and backlighting said first means.

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**5,046,830**

## FERROELECTRIC LIQUID CRYSTAL DEVICE WITH SPECIFIC PITCH IN EACH OF A CHOLESTERIC AND A SMECTIC I HASE

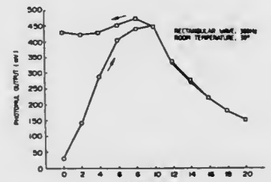
**Jun Nakanowatari, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 321,482, Mar. 8, 1989, abandoned. This application Jan. 28, 1991, Ser. No. 649,117**

**Claims priority, application Japan, May 30, 1988, 63-132493**

**Int. Cl.[5] G02F *1/13***

**U.S. Cl. 359—90** **1 Claim**




1. A ferroelectric liquid crystal device, in which orientation is applied for either one or both of two substrates having transparent electrodes formed thereon for arranging the liquid crystal molecules in parallel with the substrates and a ferroelectric liquid crystal is filled into the gap between two sheets of said substrate, wherein

said ferroelectric liquid crystal has a helical texture pitch in the smectic phase ranging from 1 micrometer to 3.5 micrometers, while said liquid crystal has a pitch in the cholesteric phase of not less than 25 micrometers, and the gap between said substrates ranges from 6 micrometers to 13 micrometers.



**5,046,831**

## LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE HAVING MICRO-DOMAINS

**Shunpei Yamazaki, Tokyo; Masahiko Sato, Isehara, and Toshiji Hamatani, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan**

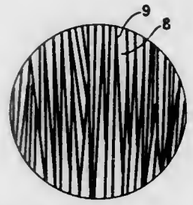
**Division of Ser. No. 470,725, Jan. 26, 1990, which is a continuation of Ser. No. 250,411, Sep. 28, 1988, Pat. No. 4,906,074. This application Mar. 6, 1990, Ser. No. 489,106**

**Claims priority, application Japan, Sep. 29, 1987, 62-244808; Oct. 7, 1987, 62-253178; Oct. 7, 1987, 62-253179; Oct. 7, 1987, 62-253180**

**The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.**

**Int. Cl.[5] G02F *1/13***

**U.S. Cl. 359—76** **1 Claim**




1. A liquid crystal device comprising:

a pair of substrates;

a chiral smectic liquid crystal layer consisting of a plurality of individual micro-domains interposed between said substrates;

an electrode arrangement provided on the inside surface of said pair of substrates for applying an electric field to said chiral smectic liquid crystal layer;

an orientation control means formed on at least one inside surface of said substrates;

wherein each micro-domain is in contact with its adjacent micro-domain and wherein in each of said micro-domains, liquid crystal molecules are aligned in accordance with one direction which is different from adjacent micro-domains contiguous thereto.

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**5,046,832**

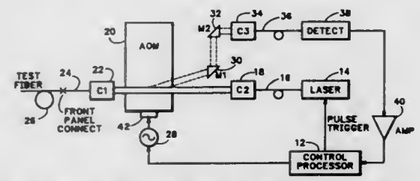
## MULTIMODE ACOUSTO-OPTIC SWITCH AND DEAD ZONE CORRECTION METHOD

**Florian G. Bell, Bend, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Jan. 11, 1990, Ser. No. 463,703**

**Int. Cl.[5] G01N *21/00*; G02F *1/11, 1/33***

**U.S. Cl. 359—305** **2 Claims**




1. An improved optical time domain reflectometer of the type having a laser for generating an optical pulse for insertion into an optical fiber under test and a detector for converting backscattered optical energy from the optical fiber into an electrical signal, the improvement comprising an acousto-optic modulator coupled between the laser, the detector and the optical fiber having an ON state and an OFF state, the optical pulse passing through the acousto-optic modulator from the laser to the optical fiber undiffracted in the OFF state and the backscattered optical energy from the optical fiber being diffracted to the detector in the ON state, the acousto-optic modulator being of an active material and having a transducer configuration to efficiently diffract multiple modes of the backscattered optical energy to the detector at the optical frequency of the laser.

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**5,046,833**

## ZOOM LENS SYSTEM

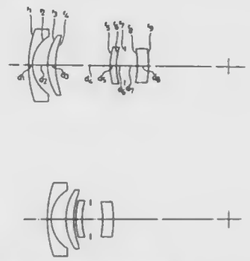
**Hirofumi Tsuchida, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Sep. 15, 1989, Ser. No. 407,956**

**Claims priority, application Japan, Sep. 16, 1988, 63-229788**

**Int. Cl.[5] G02B *15/14, 13/04, 13/18***

**U.S. Cl. 359—654** **7 Claims**



1. A zoom lens system comprising:

a plural number of lens units, including a first lens unit on the object side and having negative refractive power and at least one image-side lens unit which is disposed on the image side thereof, separated from one another with an airspace and so adapted as to change the focal length of the zoom lens system as a whole by displacing at least one of said lens units along the optical axis to perform zooming,

an aperture stop on the image side of said first lens unit, and

a radial GRIN lens component on the image side of said aperture stop and having (1) a concave surface on its object side, (2) a thickness larger at a marginal portion thereof than that on the optical axis and (3) positive refractive power.

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**5,046,834**

## MICROSCOPE HAVING IMAGE BRIGHTNESS EQUALIZATION

**Peter Dietrich, Oberkochen, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany**

**Filed Jun. 6, 1990, Ser. No. 534,502**

**Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3918990**

**Int. Cl.[5] G02B *21/02, 7/16, 5/22***

**U.S. Cl. 350—520** **10 Claims**

1. A microscope comprising:

a mounting structure having an optical axis defining a beam path;

an objective turret having a plurality of objectives seated therein and said objectives having different light intensities;

said objective turret being rotatably mounted on said mounting structure for rotatably indexing said objectives into said beam path; and,

an arrangement for equalizing image brightness when indexing said objectives into said beam path, the arrangement including:

a first slider corresponding to a first one of said objectives and a second slider corresponding to a second one of said objectives;

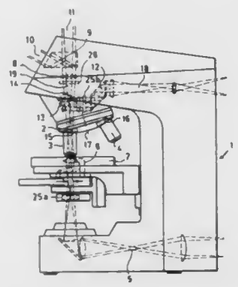
VOL 1130 ISS 2 SE 10 1991 UMI



first and second light-absorbing optical elements mounted in said first and second sliders, respectively;

said first light-absorbing optical element and said first object conjointly defining a first optical unit and said second light-absorbing optical element and said second objective conjointly defining a second optical unity;

said first and second light-absorbing optical elements having first and second coefficients of transmission selected so as to cause said optical units to provide equal image brightness;



each of said objectives defining an objective lens axis which is coincident with said beam path when the objective is indexed thereinto; and,

said turret including mounting means for insertingly receiving each of said sliders so as to permit the slider to be moved between a first position wherein the element does not intersect the lens axis and a second position wherein the element is transverse to said axis and in said beam path when the objective is indexed thereinto.

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**5,046,835**

## APPARATUS FOR TESTING VISUAL FUNCTIONS OF HUMAN EYES

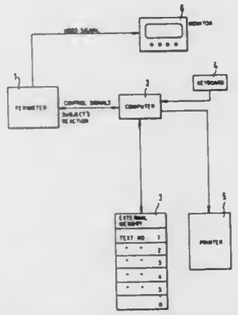
**Ernst Billeter, Bergdietikon, and Hans Bebie, Oberbottigen, both of Switzerland, assignors to Interzeag AG, Schlieren, Switzerland**

**Filed Sep. 21, 1989, Ser. No. 410,477**

**Claims priority, application Switzerland, Sep. 22, 1988, 3507/88**

Int. Cl.[5] **A61B** *3/14*

U.S. Cl. 351—206 **18 Claims**



1. Apparatus for testing visual functions of a human eye which is located in or close to a predetermined position while its optical axis is maintained in a predetermined orientation, comprising a first source of radiation including means for directing radiation toward said position; means for presenting to the eye in said position a sequence of stimuli at selected intervals and at selected locations in the region of the optical axis of the eye; and optical means interposed between said source and said position and including means for producing sharp images of stimuli on the retina of the eye in said position, said presenting means forming part of said optical means and said means for producing sharp images including an eyepiece which is focused upon a predetermined plane, said predetermined position being spaced apart from said predetermined plane by a distance which is shorter than the sharp visual distance; a second source of radiation; and a partially transmitting mirror extending across the optical axis of said eyepiece and located in the path of propagation of radiation from the second source to establish on the optical axis of said eyepiece a mark for the eye in said position.

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**5,046,836**

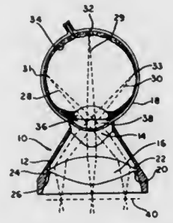
## DIAGNOSTIC INDIRECT OPHTHMALMOSCOPY CONTACT LENS SYSTEM

**Donald A. Volk, 9378 Jackson, Mentor, Ohio 44060**

**Filed Oct. 27, 1989, Ser. No. 428,504**

Int. Cl.[5] **A61B** *3/00*

U.S. Cl. 351—219 **20 Claims**



1. An indirect ophthalmoscopy device used to observe the fundus of the eye comprising,

a holding means to support and position a plurality of lenses relative to one another,

said plurality of lenses including a contact lens element having a concave posterior surface and convex anterior surface, wherein said anterior surface is an aspheric surface of revolution having continuous and progressive variation in curvature peripheralward, said anterior surface being non-spherical over its extent, and

at least one anterior lens element having first and second convex surfaces wherein said first and second convex surfaces are surfaces of revolution,

said contact element and at least one anterior element being positioned relative to one another and acting in conjunction with one another to refract light rays from a biomicroscope illumination system to form a sharply defined and distortion free image of the biomicroscope light source aperture onto the fundus of an examined eye and to collect light rays emerging from the fundus of the eye and refracting said emerging light rays to form an aerial image of the fundus anterior to said at least one anterior element with said image being substantially free of optical aberrations.



**5,046,837**

## ILLUMINATION SYSTEM

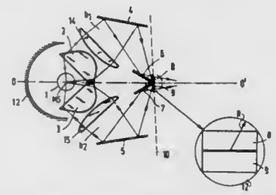
**Martinus V. C. Stroomer, and Wilhelmus A. C. Timmers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 2, 1989, Ser. No. 318,090**

**Claims priority, application Netherlands, May 26, 1988, 8801348**

Int. Cl.[5] **F21V** *13/04;* **G03B** *21/28*

U.S. Cl. 353—82 **10 Claims**



1. A low-throughput illumination system for emitting radiation along a principal axis of said system, comprising:

a radiation source;

condenser means, positioned in relation to said radiation source so as to receive source radiation from at least two different directions, for forming at least two radiation beams;

first reflector means, positioned in the paths of said at least two radiation beams, for reflecting said at least two radiation beams towards the principal axis; and

second reflector means, positioned at a location where said at least two radiation beams would otherwise intersect one another after reflection by said first reflector means, for reflecting said at least two radiation beams towards the principal axis so that the beams have their narrowest constriction in an exit plane of the system located proximate to the second reflector means, are separated from one another and are located substantially symmetrically with respect to the principal axis.

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**5,046,838**

## ILLUMINATION SYSTEM FOR USE IN IMAGE PROJECTION APPARATUS

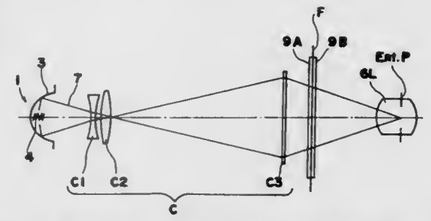
**Satoshi Iwasaki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 15, 1990, Ser. No. 496,194**

**Claims priority, application Japan, Mar. 17, 1989, 1-65192**

Int. Cl.[5] **G03B** *3/02;* **F21V** *5/04*

U.S. Cl. 353—101 **8 Claims**



1. An illumination system for use in an image projection apparatus, the illumination system being compact and illuminating an original which retains an image to be projected, the image projection apparatus having a projection lens unit in an exchangeable manner to project the image of said original onto an image receiving plane with a different magnification, the illumination system comprising:

a light source assembly which emits convergent light to illuminate the original; and

an illumination lens group including, as arranged from the light source assembly side, a first lens unit of a negative power, a second lens unit of a positive power which is movable along the optical axis and a third lens unit of a positive power, wherein the illumination lens group fulfills the following equation,

$$\phi 1+\phi 2<0$$

where $\phi 1$ and $\phi 2$ represent the powers of said first and second lens units, respectively.

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**5,046,839**

## GOLF COURSE RANGE FINDER SYSTEM

**Robert S. Krangle, Rio Rancho, N. Mex., assignor to Locker Enterprises, Inc., Minneapolis, Minn.**

**Filed Jul. 30, 1990, Ser. No. 559,906**

Int. Cl.[5] **G01C** *3/08;* **A63B** *55/00*

U.S. Cl. 356—5 **10 Claims**



1. Apparatus for measuring the distance between a golfer and a pin located on a golf course, comprising:

(a) an optical retroreflector mounted on said pin;

(b) a transceiver adapted for operation by said golfer, the transceiver further comprising:

(i) a hand holdable pistol shaped housing, the housing being formed so as to have a body portion, a handle portion and a barrel portion;

(ii) optical transmitter means for generating optical pulses at a first repetition rate and for sending said optical pulses to said retroreflector, the optical transmitter further comprising an electronics module and an optical system, the electronics module residing in the body portion of the housing and the optical system residing in the barrel portion of the housing;

(iii) optical receiver means for receiving and detecting optical pulses reflected from said retroreflector, and for generating a detected pulse signal indicative of said optical pulses, the optical receiver means residing with the optical transmitter means; and

(iv) timing means for measuring the time difference between the leading edge of one said transmitted optical pulses and the corresponding leading edge of said corresponding detected pulse signal, the timing means further comprising:

(A) a trigger, the trigger residing in the handle portion of the housing, operation of the trigger causing the optical transmitter means to generate and emit a pulsed wave train of coherent light, thereby creating a square waveform having a plurality of leading and trailing edges; and

(B) a differentiator, the differentiator generating a plurality of control signals indicative of each edge position of the plurality of leading and trailing edges of the square waveform, the differentiator generating the control signals in response to the detected pulsed signal generated by the optical receiver means, thereby permitting the distance measurement to be accomplished by recording a time period between the leading edge of the emitted pulsed wave and the control signal generated in response to detection of the same leading edge of the reflected signal.

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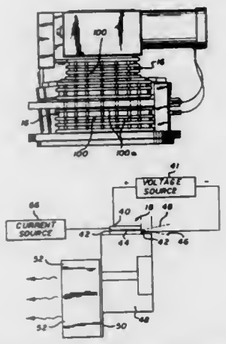


**5,046,840**

## IMPROVEMENTS IN A SYSTEM FOR DETERMINING ATMOSPHERIC DATA RELATING TO THE MOVEMENTS OF AN AIRBORNE VEHICLE

John B. Abbiss, Irvine; Anthony E. Smart, Costa Mesa, and Roger P. Woodward, San Francisco, all of Calif., assignors to The Titan Corporation, San Diego, Calif.

Filed Dec. 19, 1988, Ser. No. 286,334
Int. Cl.[5] G01P *3/36;* H01S *3/04*
U.S. Cl. 356—28 32 Claims




1. In combination for use in an airborne vehicle,
a manifold,
a plurality of lasers supported by the manifold in a relationship for directing beams of light into space for reflection by the particles in space,
a lens system supported by the manifold for receiving light reflected from the particles in space and for converting the light into beams and for collimating and focussing the beams,
detector means responsive to the focused beams for producing signals in accordance with the characteristics of such beams, and
means associated with the manifold for regulating the temperature of the manifold at a substantially constant value, the regulating means including means for converting a fluid between a liquid state and a gaseous state in accordance with the temperature at different positions on the manifold.

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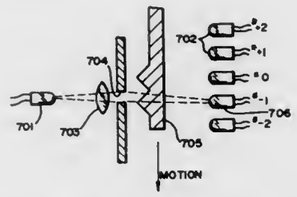
**5,046,841**

## TOKEN HAVING A PREDETERMINED OPTICAL CHARACTERISTIC, AND A TOKEN VALIDATION DEVICE FOR USE THEREWITH

Scott Juds, Everett, Wash.; Johnny H. Halsey, and James H. Halsey, both of El Dorado, Ark., assignors to IDX, Inc., El Dorado, Ark.

Filed Jan. 19, 1989, Ser. No. 299,183
Int. Cl.[5] G06K *9/74*
U.S. Cl. 356—71 25 Claims

1. A token validation device for use with a token operated device, wherein said token validation device includes:
optical sensing means for testing a token substantially independent of orientation of the token with respect to predetermined optical characteristics that are disposed in a substantially radially symmetrical manner with respect to the token; and




validation means responsive to said optical sensing means for validating said token as a valid token when said token has said predetermined optical characteristics.

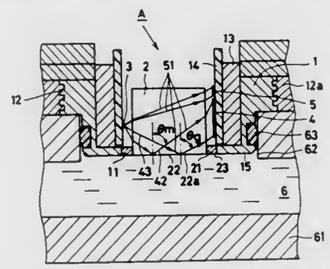
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**5,046,842**

## MIXING RATIO DETECTING DEVICE FOR COMPOSITE LIQUID

Shigeru Miyata, and Yoshitaka Yamada, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Dec. 12, 1990, Ser. No. 626,024
Claims priority, application Japan, Dec. 15, 1989, 1-326585
Int. Cl.[5] G01N *21/42*
U.S. Cl. 356—136 3 Claims




1. A mixing ratio detecting device for composite liquid comprising;
an optically permeable column placed so that a bottom of the column is in contact with a mixing liquid, a refractive index of which is smaller than that of the column;
a light emitting diode disposed so that light beams therefrom are incident on one side of the column to pass therethrough so as to impinge on an interface between the bottom of the column and the mixing liquid, the light beams impinged on the interface less than a critical angle being refracted to the mixing liquid, while the light beams impinged on the interface more than the critical angle being totally reflected therefrom to pass within the column, and escape from other side of the column, the critical angle depending on a mixing degree of the liquid;
a photo diode provided to receive the light beams escaped from the other side of the column so as to generate an output in accordance with the quantity of the light beams received:
an effective photo-receiving area of the photo diode being shaped to progressively increase its width dimension as it is remote from the interface so as to compensate for characteristics of the output from the photo diode.

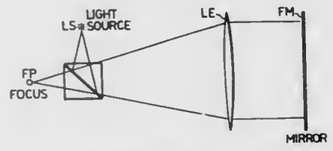


**5,046,843**

## METHOD AND APPARATUS FOR MEASURING THE THREE-DIMENSIONAL ORIENTATION OF A BODY IN SPACE

Eliezer Kereo, Arad, Israel, assignor to Rotlex Optics Ltd., Doar Na Arava, Israel

Filed Aug. 13, 1990, Ser. No. 566,576
Claims priority, application Israel, Aug. 11, 1989, 91285
Int. Cl.[5] G01B *11/26;* G01C *1/00*
U.S. Cl. 356—152 15 Claims




1. A method of measuring the orientation of a body in space with respect to first, second and third orthogonal axes, comprising:
projecting a collimated beam of light onto non-axially-symmetrical mirror means carried by said body in space;
directing the light beam reflected from said mirror means through a deflectometer having two spaced gratings perpendicular to the optical axis;
and measuring beam deflections or curvatures about said three axes to determine the orientation of the body in space with respect to said three axes;
said measuring of the beam deflections or curvatures being effected by:
measuring the average fringe shift to determine the angle of the body with respect to said first orthogonal axis;
measuring the fringe density or orientation to determine the angle of the body with respect to said second orthogonal axis;
rotating two gratings 90°; and
repeating the measurement of the fringe shift to determine the angle of the body with respect to said third orthogonal axis.

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**5,046,844**

## APPARATUS FOR INSPECTING AND HANGERING SHIRTS

David W. Milton, Middletown, Ohio, assignor to Cintas Corporation, Cincinnati, Ohio

Filed Jun. 10, 1988, Ser. No. 204,870
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—238 13 Claims

1. Apparatus for inspecting an open-necked garment for defects, comprising:
a support post;
a garment form carried by said support post, said garment form being adapted to contact the inside of a garment at the shoulders so that the garment hangs vertically downwardly in an extended position atop said garment form;
illumination means positioned with respect to said garment form so that said illumination means is located substantially inside of the garment carried on said garment form, said illumination means being effective to shine light through the garment carried on said garment form to permit visual inspection of defects in the garment;
a mirror carried on a bracket positioned at the back of the garment carried on said garment form to permit visual



inspection of the back side of the garment by looking into said mirror while standing at the front side of the garment.

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**5,046,845**

## TECHNOSCOPE FOR CHECKING DAMAGE TO SURFACES

Jörg Diener, Oberderdingen, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jul. 11, 1989, Ser. No. 378,026
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1988, 3823554
Int. Cl.[5] G01N *21/88*
U.S. Cl. 356—241 9 Claims



1. A technoscope for checking a surface of a technical component for damage and determining the extent thereof, the technoscope comprising; a shaft having a distal end and a proximal end and lighting system for illuminating said surface; an optical system received in said shaft for visual inspection of said surface and having at the proximal end of said shaft an eyepiece provided with focussing means therefor; a measuring attachment for determining the depth of a damaged area of said surface, said measuring attachment comprising a measuring probe and a supporting element which are secured in alignment radially of said shaft on thrust elements, and pneumatically actuable means for displacing said thrust elements in mutually opposite direction; and means for releasably fixing said measuring attachment to the distal end of said shaft against rotation relative thereto.

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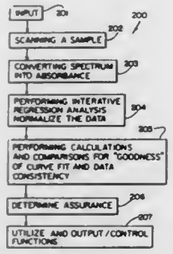


**5,046,846**

## METHOD AND APPARATUS FOR SPECTROSCOPIC COMPARISON OF COMPOSITIONS

**James C. Ray, Mentor-on-the-Lake, and Logan R. Asari, Willoughby, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio**

**Filed Mar. 22, 1989, Ser. No. 327,069**
**Int. Cl.[5] G01J** *3/32;* **G01N** *21/35;* **G06F** *15/46*
**U.S. Cl. 356—326** **29 Claims**




1. A method of analysis, comprising the steps of:
(A) examining at least one characteristic of a sample as a function of a variable parameter to obtain data,
(B) normalizing the data with respect to a model by:
(1) establishing a plurality of data pairs which are characteristic values for the sample and a reference, both established at a single value of the variable parameter;
(2) performing a regression analysis with the data pairs to obtain normalization parameters by:
(a) performing a first regression, using all data pairs, to obtain a set of regression parameters;
(b) determining acceptability of the regression parameters by comparing variability of the data pairs around the model to predetermined variability limits;
(c) if the regression parameters are not acceptable, excluding data pairs which do not fall within a predetermined statistical limit around the model, and performing a further regression using a diminished set of data pairs to obtain further regression parameters; and
(d) repeating steps (b) and (c) in an iterative manner until acceptable regression parameters are obtained, or until a predetermined number of iterations are completed, whichever first occurs; and
(3) using the normalization parameters to normalize characteristic sample values to reference values,
(C) making a comparison of the normalized sample data with reference data, and
(D) determining from the comparison quality of the sample.

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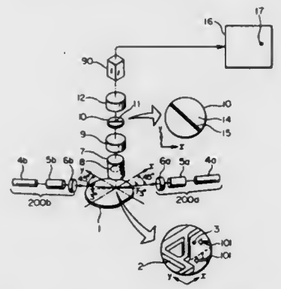
**5,046,847**

## METHOD FOR DETECTING FOREIGN MATTER AND DEVICE FOR REALIZING SAME

**Toshihiko Nakata; Nobuyuki Akiyama; Yoshihiko Yamuchi; Mitsuyoshi Koizumi, and Yoshimasa Oshima, all of Yokohama, Japan, assignors to Hitachi Ltd., Tokyo, Japan**

**Filed Oct. 25, 1988, Ser. No. 262,573**
**Claims priority, application Japan, Oct. 30, 1987, 62-272958; Dec. 11, 1987, 62-311904; Feb. 26, 1988, 63-42001**
**Int. Cl.[5] G01N** *21/00*
**U.S. Cl. 356—338** **33 Claims**

1. A method for detecting foreign matter on a sample comprising the steps of:
illuminating the sample in a stripe-shaped illumination region with illuminating light having a high directivity to create reflected light using an illuminating apparatus;
intercepting selected portions of the reflected light reflected by a regular pattern on the sample using a light intercepting apparatus for intercepting said portions of the reflected light and allowing to pass through the non-intercepted portions of said reflected light;
leading the non-intercepted reflected light, reflected by the sample, which has passed through the light intercepting



means, to a photo-electric converting device having a detecting region corresponding to said stripe-shaped illumination region provided within a photo-detector; and,
detecting the non-intercepted reflected light by said photo-electric converting device.

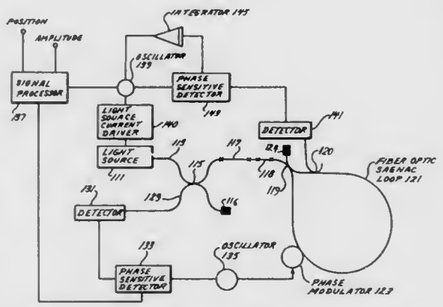
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**5,046,848**

## FIBER OPTIC DETECTION SYSTEM USING A SAGNAC INTERFEROMETER

**Eric Udd, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.**

**Filed Sep. 8, 1989, Ser. No. 405,876**
**Int. Cl.[5] G01B** *9/02*
**U.S. Cl. 356—345** **46 Claims**




1. A fiber optic sensor, comprising:
optical path means for facilitating the propagation of light, said optical path means having first and second ends;
light emitting means for producing light energy;
first beam splitting means, having first, second and third ports, for directionally transporting light energy incident on said first port to said second port, and for directionally transporting light energy incident on said second port to said third port, said first port coupled to said light emitting means;
second beam splitting means having first, second, and third ports for directionally transporting light energy incident on said first port to said second and third ports, and for directionally transporting light energy incident on said second and third ports to said first port, said first port of said second beam splitting means coupled to said second port of said first beam splitting means said second port of said second beam splitting means being connected to said first end of said optical path means, said third port of said second beam splitting means being connected to said second end of said optical path means;
third beam splitting means having first, second and third ports, for directionally transporting light energy incident on said first port to said second port, and for directionally transporting light energy incident on said second port to said first and third ports, said first port of said third beam splitting means being coupled to said second port of said second beam splitting means;
phase modulation means connected along said optical path means and being coupled to said second port of said third beamsplitting means, for impressing a modulation frequency on light propagating in both directions along said optical path means, said phase modulation means being at least slightly offset from the center of said optical path means with respect to said second beam splitting means;
first phase sensitive detection means, optically connected to said third port of said first beam splitting means, and also connected to said phase modulation means, for detecting light from said first beam splitting means;
second phase sensitive detection means, optically connected to said third port of said third beam splitting means and to said light emitting means, for detecting light from said third beam splitting means, said second phase sensitive detection means comprising:
a detector, optically connected to said third port of said third beam splitting means, for detecting light from said third beam splitting means and producing a signal indicative of the characteristics of said second beam of light;
a phase sensitive detector, electrically connected to said detector, for demodulating said phase modulated frequency impressed upon said light propagating along said optical path means;
an integrator having an input connected to said phase sensitive detector and an output; and
variable oscillation means, having an input coupled to said output of said integrator and a first output coupled to said phase sensitive detector of said second phase sensitive detection means, a second output coupled to said light emitting means, and a third output connected to a signal processor means, said processor means being connected to said first and said second phase sensitive detection means for providing a position output and an amplitude output for the location and severity, respectively, of an environmental disturbance along said optical path means.

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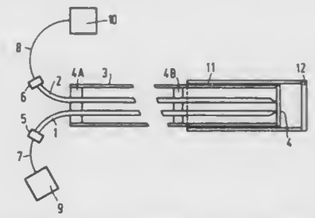
**5,046,849**

## DEVICE HAVING AN EXCHANGEABLE SUBSTRATE SLEEVE FOR MEASURING LAYER THICKNESS

**Petrus J. W. Severin, and Gerrit Verspui, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 474,318, Jan. 29, 1990, abandoned, which is a continuation of Ser. No. 396,743, Aug. 18, 1989, abandoned, which is a continuation of Ser. No. 210,059, Jun. 22, 1988, abandoned. This application Jun. 28, 1990, Ser. No. 548,422**
**Claims priority, application Netherlands, Jun. 23, 1987, 8701463**
**Int. Cl.[5] G01B** *9/02*
**U.S. Cl. 356—357** **5 Claims**

1. A device for the continuous measurement of the thickness of layers which are deposited on a substrate at low pressure, comprising:
a light source, a pipe, two light conductors within the pipe, the pipe closed at one end by an optical window made from a material that can withstand the conditions in the space when the deposition is carried out; and
an exchangeable sleeve slidably and removable mounted on said pipe which sleeve has substrate window at one end and which can be slid so as to fit on the pipe in which the light conductors are present, on which substrate window a layer is deposited by said process, and in which one of the conductors guides the light to the deposited layer and the other light conductor guides the light reflected from



the interface between substrate and deposited layer and the light reflecting from the interface between the deposited layer and the surrounding atmosphere to a detector.

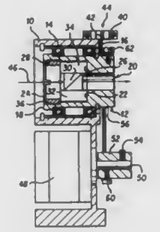
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**5,046,850**

## DRIVING MECHANISM FOR DRIVING AN OSCILLATING POLARIZER

**Toma Tomoff, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin Elmer GmbH, Uberlingen, Fed. Rep. of Germany**

**Filed Aug. 29, 1989, Ser. No. 400,304**
**Claims priority, application Fed. Rep. of Germany, Sep. 7, 1988, 3830398**
**Int. Cl.[5] G01J** *4/00*
**U.S. Cl. 356—367** **8 Claims**



1. A polarimeter comprising:
a polarizer
a stepper motor for driving said polarizer in an oscillatory manner,
computer means for controlling said stepper motor to make a reciprocating movement wherein the oscillation amplitude as determined by the number of steps of the stepper motor is variable in a controlled manner,
a reference position sensor connected to said polarizer for providing a reference signal when the oscillating polarizer is in a well-defined position,
said reference position sensor comprising a stationary light barrier and a vane connected to the oscillating polarizer which cooperates with said stationary light barrier, and
wherein the stepper motor spaces said reference position sensor a predetermined number of steps from a predetermined reference position to establish a zero position for said reference position sensor relative to the position in which the reference position sensor responds.

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5,046,851

## POSITION SENSING METHOD AND APPARATUS

Colin G. Morgan, Oxford, United Kingdom, assignor to Davy McKee (Poole) Limited, England

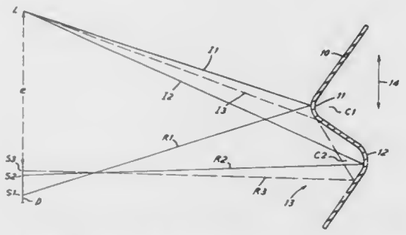
PCT No. PCT/GB88/00194, § 371 Date Sep. 15, 1989, § 102(e) Date Sep. 15, 1989, PCT Pub. No. WO88/07173, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 11, 1988, Ser. No. 411,461

Claims priority, application United Kingdom, Mar. 18, 1987, 8706388

Int. Cl.[5] G01B *11/14;* B23P *21/00*

U.S. Cl. 356—375 17 Claims



1. A method of sensing the position of a specularly reflecting, rounded corner of a strongly reflecting object, the method comprising:

providing an electro-optical sensing device, said sensing device comprising light source means for providing a single static fan beam of light, and light detector means;

said light source means being operative to provide a fan beam of light orientated across the rounded corner of the reflecting object;

said source means and said detector means being positioned such that a relatively large amount of the light reaching said detector means is light reflected from a narrow stripe-shaped region of said object extending along said corner; and

determining with said detector means the amount of light reflected from said object along a linear scale of positions defined relative to the direction of alignment between said source means and said detector means.

5,046,852

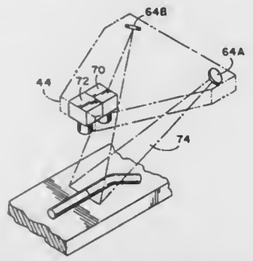
## METHOD AND APPARATUS FOR BENDING AN ELONGATE WORKPIECE

Albert L. Hametner, Seattle, and Larry L. Tammell, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 245,455, Sep. 16, 1988, Pat. No. 4,947,666. This application Aug. 23, 1989, Ser. No. 397,677

Int. Cl.[5] G01B *11/24*

U.S. Cl. 356—398 4 Claims



1. A method for determining whether an elongate workpiece at an arbitrary location in a frame of reference conforms to a desired configuration, comprising:

carrying out a first inspection of the workpiece and generating first information representative of the actual configuration of the workpiece,

comparing the first information with information representative of the desired configuration,

using the result of the comparison to estimate the location and orientation of the workpiece in the frame of reference and determine an optimum path for scanning the workpiece,

using a position sensor to carry out a second data collection, by transporting the position sensor along the optimum path, and generate second information representative of the actual configuration of the workpiece, and

comparing the second information with the information representative of the desired configuration.

5,046,853

## MEASURING THE DEGREE OF DISPERSION IN FLOWING SUSPENSIONS

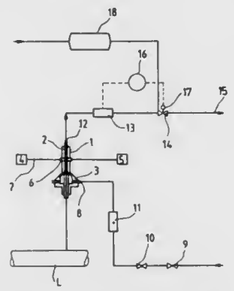
Ralf Hemel, Lampertheim, and Friedrich Linhart, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 365,131

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820902

Int. Cl.[5] G01N *15/06, 21/05*

U.S. Cl. 356—440 1 Claim



1. An arrangement for measuring the degree of dispersion in flowing suspensions, comprising a sample stream flow cell which is constructed as an enveloping stream cell and is equipped with a laser-optical measuring means, a constant pressure and flow means upstream of the inlet for the enveloping stream, and a regulating means downstream of the outlet from the cell for the sample and enveloping stream flow rate, the regulating means for the sample and enveloping stream consisting of a flow rate meter, a regulator driven thereby and a pinch valve connected via an adjusting member to the output of the regulator.



5,046,854

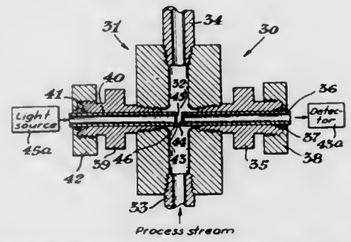
## PHOTOMETRIC CELL AND PROBE HAVING WINDOWS FUSION SEALED TO A METALLIC BODY

Joseph P. Weller, Lake Jackson; David P. Denton, Richwood; Sandra V. Lange; Chester R. Norman, both of Lake Jackson, all of Tex.; Mary A. Leugers, Midland, Mich.; Stuart Farquharson, Surfside, and Jean P. Chauvel, Jr., Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 474,702, Feb. 1, 1990, abandoned, which is a continuation of Ser. No. 149,320, Jan. 28, 1988, abandoned. This application Jan. 24, 1991, Ser. No. 647,179

Int. Cl.[5] G01N *21/05, 21/09*

U.S. Cl. 356—440 2 Claims




1. A non-leaking photometric cell suitable for high temperature and/or high pressure industrial applications, comprising: a first window; a second window; a first metallic tube; a second metallic tube; a metallic body defining a cavity therein, the metallic body having at least a first aperture and a second aperture thereinto each in communication with the cavity, the first window positioned entirely in the cavity and near an end of the first metallic tube, the first metallic tube being positioned through and removably sealed to the first aperture, the second window positioned entirely in the cavity and near an end of the second metallic tube, the second metallic tube being positioned through and removably sealed to the second aperture; a first continuous brazed seal between the first metallic tube and the first window; and a second continuous brazed seal between the second metallic tube and the second window, so that light can be passed through the first window into a sample positioned between the two windows in the cavity and then through the second window to a photodetector essentially without any of the sample leaking between the first window and the metallic body or between the second window and the metallic body.

5,046,855

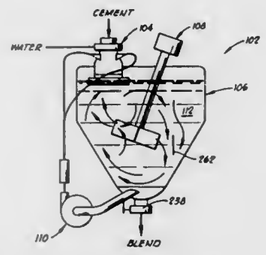
## MIXING APPARATUS

Thomas E. Allen, Comanche, and Kevin D. Edgley, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 21, 1989, Ser. No. 412,255

Int. Cl.[5] B01F *15/02*

U.S. Cl. 366—137 43 Claims




1. An axial flow mixer, comprising:

a first inlet member, said first inlet member having defined therein an entry port and an axial opening, said axial opening including an exit port communicating with said entry port;

a second inlet member, said second inlet member received in said axial opening of said first inlet member and said second inlet member having an axial passageway defined therethrough;

an orifice plate connected to said first inlet member, said orifice plate having defined therein a plurality of orifices disposed below said exit port of said first inlet member; and

a valve plate having a plurality of apertures defined therein, said valve plate disposed between said first inlet member and said orifice plate for movement relative thereto so that said apertures of said valve plate can be selectably registered with said orifices of said orifice plate to control the flow of a liquid communicated through said entry port of said first inlet member for mixing with a substance received through said axial passageway of said second inlet member.

5,046,856

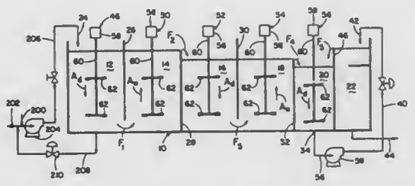
## APPARATUS AND METHOD FOR MIXING FLUIDS

William R. McIntire, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Sep. 12, 1989, Ser. No. 406,212

Int. Cl.[5] B01F *7/16*

U.S. Cl. 366—291 12 Claims



1. An apparatus for providing rapid hydration of a hydratable polymer in an aqueous well treatment fluid comprising:

(a) means for injecting an effective amount of an oil-based polymer concentrate slurry into water conduit means;

(b) pump means attached to said water conduit means to effect transport of fluids within said water conduit means into a plurality of essentially plug flow tanks in series fluid communication;

(c) at least one radial flow impeller means having an axis of rotation positioned parallel to an axial fluid flow path within at least one of said plurality of tanks;

(d) means for rotating said at least one radial flow impeller means, and

(e) means for removing fluid from an outlet of said plurality of tanks.

5,046,857

## PLASTIC THERMAL PROBE ASSEMBLY WITH PRESS FIT SENSOR

John R. Metzger, Cortland, and George R. Smith, Mineral Ridge, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed May 23, 1990, Ser. No. 527,482

Int. Cl.[5] G01K *13/02, 7/22, 1/08*

U.S. Cl. 374—135 16 Claims

1. A temperature responsive probe assembly having a thermistor for sensing the temperature of a medium in heat transfer relationship with the probe assembly and for producing an electrical signal which varies in accordance with changes in the temperature of the medium; and a pair of terminals connected to the thermistor that are adapted to be connected to an electrical connector comprising in combination:

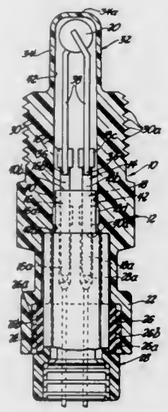
VOL 1130 ISS 2 SE 10 1991 UMI



a premolded unitary one piece plastic shell having an open receptacle end and an opposite end defining a probe portion and means for mounting the plastic shell on a member so that the probe portion is in heat exchange relationship with a medium whose temperature is to be sensed;

the plastic shell further including a bore for containing the pair of terminals a premolded member, and the thermistor, the bore being formed by deformable walls of the plastic shell;

a sub-assembly comprising the thermistor, the pair of terminals and the premolded mounting member formed around the pair of terminals;



the sub-assembly being insertable into the bore of the plastic shell for positioning the thermistor in the bore of the plastic shell; and

interlock means between the premolded mounting member and an inside surface of the plastic shell defining the probe for locking the pair of terminals to the plastic shell and for locating said thermistor in the plastic shell in spaced relationship with the probe portion;

the pair of terminals having end portions extending from an end of the premolded mounting member for connection with an electrical connector plugable into the receptacle end of the plastic shell.

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**5,046,858**

**TEMPERATURE REFERENCE JUNCTION FOR A MULTICHANNEL TEMPERATURE SENSING SYSTEM**

**Roger L. R. Tucker, Farnborough, United Kingdom, assignor to Schlumberger Technologies Limited, Farnborough, England**

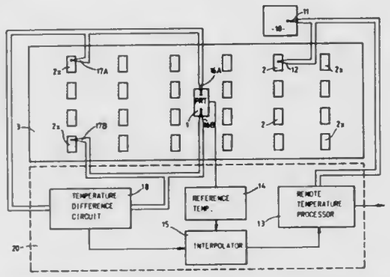
**Filed Jun. 20, 1990, Ser. No. 541,142**

**Claims priority, application United Kingdom, Jun. 21, 1989, 89 14244.2**

**Int. Cl.[5] G01K** *7/00*

**U.S. Cl. 374—179** **7 Claims**

1. A reference temperature assembly for a multichannel remote temperature sensing data system comprising an array of components each adapted to make thermal contact with a reference junction of a remote-temperature-sensing thermocouple, an absolute reference thermometer situated within the array for measuring an absolute reference temperature, a thermocouple for sensing a temperature difference between the absolute reference thermometer and a component of the array, and data processing means for calculating the temperature of




the component of the array from the absolute reference temperature and the temperature difference.

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**5,046,859**

**TEMPERATURE MEASURING DEVICE AND THERMAL HEAD DEVICE HAVING THE SAME**

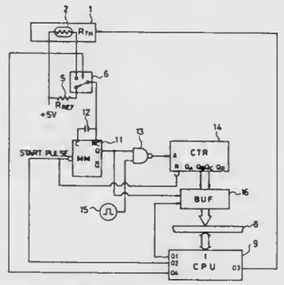
**Shingo Yamaguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jun. 8, 1989, Ser. No. 363,499**

**Claims priority, application Japan, Jun. 17, 1988, 63-148192; Jul. 29, 1988, 63-188299; Jan. 6, 1989, 64-411**

**Int. Cl.[5] G01D** *15/10, 23/20*

**U.S. Cl. 374—185** **15 Claims**




1. A thermal head device comprising:

a thermal head including a plurality of thermal elements;

a temperature-sensitive element positioned in the vicinity of said thermal head to measure a temperature thereof, said temperature-sensitive element changing its resistance with a temperature variation;

a reference resistor having a reference resistance corresponding to an average resistance value of said temperature-sensitive element;

switching means for selecting one of said temperature-sensitive element and said reference resistor;

control means for generating a start pulse signal to initiate a measurement of the temperature of said thermal head;

pulse generating means, coupled to said switching means and said control means, for separately generating a first one-shot pulse and a second one-shot pulse in response to said start pulse signal supplied from said control means, said first one-shot pulse having a first pulse width indicative of said reference resistance and said second one-shot pulse having a second pulse width dependent on the resistance of said selectively connected temperature-sensitive element;

pulse width measuring means, connected to said pulse generating means, for measuring said first pulse width and said second pulse width, said first pulse width being obtained when said switching means selects said reference resistor, and said second pulse width being obtained when said switching means selects said temperature-sensitive element;

temperature signal generating means for generating a temperature signal indicative of the temperature of said thermal head from said first and second pulse widths supplied from said pulse width measuring means so that an error contained in said second pulse width is canceled by said first pulse width; and

driving means for generating a driving signal to be supplied to said plurality of thermal elements from said temperature signal.



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**5,046,860**

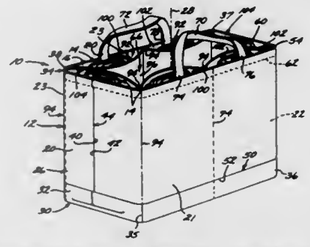
**REUSABLE SHOPPING BAG ASSEMBLY**

**Timothy P. Brennan, Van Nuys, Calif., assignor to New Hero, Incorporated, No. Hollywood, Calif.**

**Filed Aug. 2, 1990, Ser. No. 561,808**

**Int. Cl.[5] B65D** *30/22*

**U.S. Cl. 383—38** **59 Claims**



1. A reusable shopping bag assembly comprising:

a primary bag having a flexible base and a flexible side wall forming a closed surface defining an axially extending tube having first and second ends and opposite interior and exterior surfaces, the base being secured to the side wall at the first end to close the first end of the tube with the second end being open and forming a mouth, a carrying handle secured to the side wall at the mouth and a plurality of elongated compartments secured to the side wall, each compartment having a length that is substantially equal to an axial length of the side wall between the first and second ends and having sufficient capacity to store at least one auxiliary bag; and

a plurality of auxiliary bags that are substantially equal in size and shape to the primary bag, each auxiliary bag having a carrying handle and being stored in one of the elongated compartments for subsequent removal and filling with shopping items

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**5,046,861**

**VERTICALLY ORIENTED DRAWER SLIDE**

**Carl R. Tarver, Phoenix, Ariz., assignor to Siemens Transmission Systems, Inc., Phoenix, Ariz.**

**Filed Dec. 5, 1989, Ser. No. 446,259**

**Int. Cl.[5] A47B** *88/00*

**U.S. Cl. 384—20** **21 Claims**

1. A drawer slide for suspending and supporting a drawer from a drawer holder comprising:

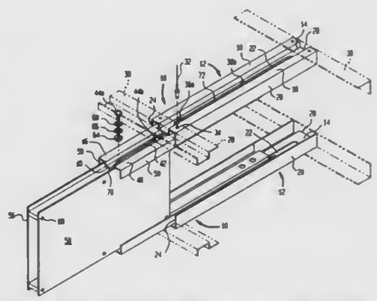
(a) a guide bar rigidly affixed to said drawer holder and having a slot therein;

(B) primary suspension means passing through said slot upon which a drawer load may be attached, said drawer load hanging from and below said primary suspension means where said primary suspension means passes through said slot, said primary suspension means being slidable within said slot;

(C) a slide bar having a slot therein;

(D) additional suspension means; wherein

(E) said primary suspension means attach to said slide bar and said additional suspension means pass through said slide bar slot and attach to said drawer, said drawer load



hanging from and below said additional suspension means where said additional suspension means passes through said slide bar slot, and said additional suspension means are slidable within said slide bar slot.

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**5,046,862**

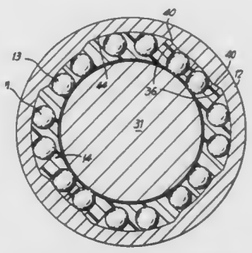
**LINEAR MOTION BALL BEARING**

**Alison Ng, Fairfield, Conn., assignor to Thomson Industries, Inc., Port Washington, N.Y.**

**Filed Nov. 22, 1989, Ser. No. 440,973**

**Int. Cl.[5] F16C** *29/06*

**U.S. Cl. 384—43** **17 Claims**



1. Linear motion ball bearing for providing relative linear motion in combination with a shaft, which comprises a generally cylindrical outer sleeve having an axially elongated opening extending therethrough, an axially elongated generally tubular shaped ball retainer positioned within said sleeve opening and defining a plurality of endless ball loops therein extending generally in the axial direction of said ball retainer, said ball retainer having an axial opening defined by an inner surface dimensioned for reception of a corresponding working support shaft and an outer surface, said ball loops spaced generally circumferentially apart about said ball retainer and each containing a plurality of balls, each loop having a first ball duct for a row of loaded balls and a second ball duct for a row of unloaded balls, each said first ball duct being open through the inner and outer surfaces of said cage such that said loaded balls engage said sleeve and the outer surface of said working shaft for load transmission therebetween, each said ball loop being arranged with said first ball duct next adjacent said first ball duct in the adjacent ball loop along one axially extending side and said second ball duct therein adjacent said second ball duct in the next adjacent ball loop along the other axially extending side, said sleeve defining a land opposite each pair of adjacent first ball ducts, each said land extending sufficiently radially inward and being of sufficient circumferential dimension to

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support said loaded balls of adjacent pairs of said first ball ducts and having a contoured relatively smooth surface for accommodating the loaded balls positioned within said corresponding opposed pair of respective first ball ducts of respectively adjacent ball loops, each relatively smooth ball support surface being connected to the inner surface portion of said outer housing by a ramped surface on at least two end portions to thereby accommodate and support ball movement between said loaded and unloaded ball ducts, a transversely extending ramped surface on each end portion of each land, each ramped surface forming an acute angle with the inner surface of said housing and extending from each land to said inner surface, each land further being surrounded on each side by a ramped surface extending from said arcuate surface to said inner wall of said housing and each loaded and unloaded ball duct being connected by an arcuate ball duct having a ball support surface comprising an arcuate ball path said ball path being defined by an arcuate ball support surface comprising at least three continuous curved surfaces which support said balls such that the center of the ball approximately defines a locus comprised of three correspondingly continuous curves approximately as follows:

(a) a first curve defined by the intersection closest to said land and of a first imaginary control cylinder of diameter at least approximately one ball diameter and its central axis extending generally perpendicular to the chord of each land end, and a second imaginary control cylinder of diameter approximately one ball diameter and having its central axis tangential to the loaded ball surface of each land and generally orthogonal to the central axis of said outer sleeve;

(b) a second curve defined by the intersection of a conical surface concentric with said transversely extending end ramp and closest thereto and spaced orthogonally inward therefrom approximately ½ ball diameter, and said first mentioned imaginary control cylinder; and

(c) a third curve defined by the intersection closest to said land of a cylindrical surface concentric with the inner surface of said housing and spaced radially inward therefrom approximately ½ ball diameter, and said first mentioned imaginary control cylinder.

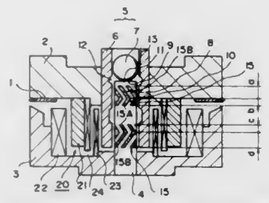
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**5,046,863**

## DYNAMIC PRESSURE BEARING DEVICE

**Ikunori Sakatani; Takeyuki Yoshiba, both of Fujisawa, and Katushiko Tanaka, Yamato, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 7, 1990, Ser. No. 610,000**
**Claims priority, application Japan, Nov. 7, 1989, 1-288993**
**Int. Cl.[5] F16C *21/00***
**U.S. Cl. 384—101** **1 Claim**



1. A dynamic pressure bearing device comprising: a housing having a sleeve, a thrust receiver secured to one end of the sleeve, a shaft fit into the sleeve, the sleeve having cylindrical radial bearing surfaces formed on its inner diametrical surface at two axially spaced apart positions, the thrust receiver having a thrust bearing surface, the shaft having a radial receiving surface opposed to the radial bearing surface and a thrust receiving surface opposed to the thrust bearing surface, lubricant pits disposed near the thrust bearing surface, an air escape aperture disposed in the housing for communicating the lubricant pits with external atmosphere, at least one of the radial bearing surface and the radial receiving surface having herringbone-shaped grooves formed thereon including inner spiral groove segments each disposed on the side between the radial bearing surfaces at the two positions and outer spiral groove segments each disposed in a direction different from that of the inner groove segments on the axially outer side, wherein

each of the outer groove segments has a longer axial length than that for each of the inner groove segments, and the difference of the axial length between each of the outer groove segments and each of the inner groove segments in the herringbone-shaped grooves disposed on the side opposite to the thrust receiving surface is greater than that difference of the axial length between each of the outer groove segments and each of the inner groove segments in the herringbone-shaped grooves disposed on the side of the thrust receiving surface.

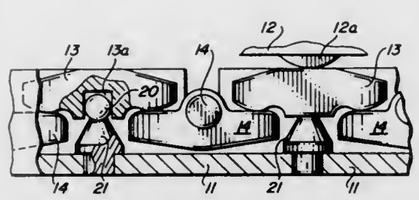
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**5,046,864**

## TILTING PAD THRUST BEARING ASSEMBLIES

**C. William Boller, 1380 Gordon Dr. S., Naples, Fla. 33940**

**Filed Feb. 8, 1991, Ser. No. 652,667**
**Int. Cl.[5] F16C *17/06***
**U.S. Cl. 384—308** **9 Claims**



1. An equalizing tilting pad thrust bearing assembly comprising

a plurality of similar arcuate shaped tilting pads each having flat upper and lower faces and on its lower face a spherically curved contact surface,

a retaining ring designed to house within said ring a plurality of upper and lower equalizing links and to support the tilting pads,

a plurality of upper equalizing links, and

an equal number of lower equalizing links,

the upper and lower equalizing links lying in an endless overlapping arrangement within the retaining ring, each upper link touching at contact points two lower links,

each lower equalizing link being pivotally mounted on the retaining ring by cylindrical members lying perpendicular to the axis of the ring,

each upper equalizing link being pivotally mounted on a spherical ball supported by the retaining ring,

the contact points between adjacent upper and lower equalizing links and the pivot axes of adjacent links lying in a common plane when the equalizing links are in a position of zero pivoting angle, and

the contact points between adjacent tilting pads and upper equalizing links are the spherically curved contact surfaces of the tilting pads.

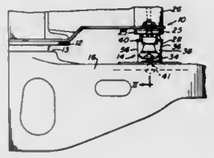


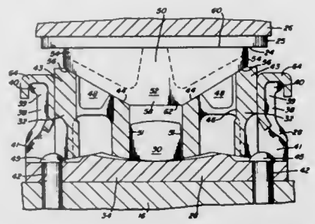
**5,046,865**

## SIDE BEARING

**Bruce Gatnarek, Glenshaw, Pa., assignor to A. Stucki Company, Pittsburgh, Pa.**

**Continuation of Ser. No. 110,531, Oct. 16, 1987, abandoned, which is a continuation of Ser. No. 944,654, Dec. 22, 1986, abandoned. This application Sep. 11, 1989, Ser. No. 405,416**
**Int. Cl.[5] F16C *25/04***
**U.S. Cl. 384—423** **24 Claims**





1. A side bearing assembly for a railway freight car comprising: a rigid channel member having upstanding side and end portions which define an upwardly open cavity therebetween;

elastomeric elements located within said cavity inwardly adjacent said end portions, respectively, to define a space therebetween within said channel member;

said elastomeric elements including upper end portions which extend upwardly above the uppermost portions of said side and end portions;

a rigid unitary member extending between and supported by said upper end portions of said elastomeric elements;

said rigid unitary member having an upper surface adapted to frictionally engage the wear surface of a side bearing wear plate such as is carried by a freight car body;

and at least said upper end portions of said elastomeric elements being deformable within a range of applied compressive forces, such as are applied to said elastomeric elements when said upper surface is in frictional engagement with such a wear surface, to permit relative movement between said rigid unitary member and said channel member throughout said range of applied compressive forces.

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**5,046,866**

## MULTI FRICTION SIDE BEARING FOR A RAILCAR TRUCK

**Harry W. Mulcahy, Griffith, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.**

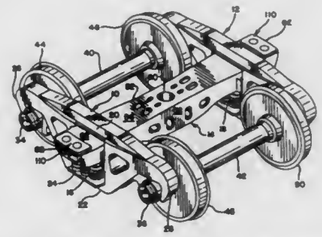
**Filed Sep. 14, 1990, Ser. No. 582,422**
**Int. Cl.[5] F16C *17/04***
**U.S. Cl. 384—423** **11 Claims**

1. A friction bearing for use between a vehicle body and a truck supporting said body, said bearing comprising:

a major friction body having a flat first friction face;

a cavity in said major friction body; and

a secondary friction body having a flat secondary friction face seated in said cavity, said first and said secondary friction faces being parallel and said secondary friction face being movable between positions spaced from and coplanar with said first friction face.



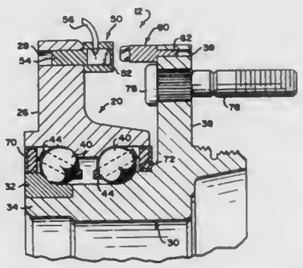
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**5,046,867**

## BEARING ASSEMBLY SPEED SENSOR

**James A. Hilby, Watertown, Conn.; Denis Alff, and Christian Hajzler, both of Annecy, France, assignors to The Torrington Company, Torrington, Conn.**

**Continuation of Ser. No. 422,189, Oct. 16, 1989, abandoned. This application Aug. 29, 1990, Ser. No. 576,105**
**Int. Cl.[5] F16C *19/00*; G01P *3/487***
**U.S. Cl. 384—448** **8 Claims**



1. A wheel bearing assembly comprising:

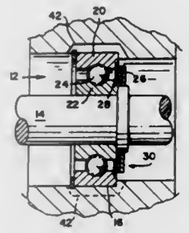
a first race having an integral first flange projecting radially outwardly, said first race being stationary and having an outer surface, said first flange having an aperture;

a second race having a wheel hub mounting flange projecting radially outwardly, said second race being rotatable relative to said first race, and said wheel hub mounting flange having an outer surface, said wheel hub mounting flange having at least two axially-oriented encoder apertures;

an encoder comprising an annular ring having alternate North and South poles magnetized thereon, said encoder having at least two axially-oriented protrusions for engaging said wheel hub mounting flange axially-oriented encoder apertures; and

a sensor assembly comprising a mounting structure having a Hall-effect detector whereby said mounting structure engages said first flange aperture, and said sensor assembly being aligned with said encoder for providing an output signal proportional to the rotational speed of said second race relative to said first race.

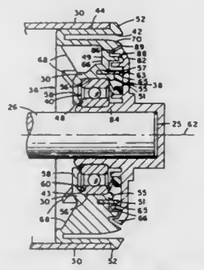
5,046,868
**BEARING WIPER SEAL**
Gregory P. Albert, Waverly, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Continuation of Ser. No. 266,657, Nov. 3, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 512,563
Int. Cl.[5] F16C *33/76*
U.S. Cl. 384—477 14 Claims



1. A bearing having rolling elements, inner and outer races, a shield, and a sealing device axially outward of said shield and said inner race, said sealing device comprising:
an annular housing comprising a ring having a radially inner and a radially outer flange, both flanges extending axially from the ring to define an annular channel;
an annular wiper element disposed in the channel so as to axially extend beyond both flanges; and
means for positioning the sealing device axially adjacent an interface between the bearing inner race and shield so that said sealing device rotates with said inner race and said wiper element is in light surface contact with said bearing shield.

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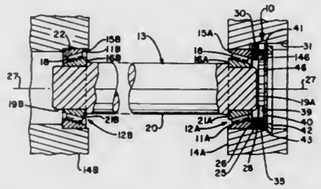
5,046,869
**CONVEYOR BEARING ASSEMBLY**
Clark A. Roberts, and Ian Smith, both of Maryville, Tenn., assignors to Wyko Incorporated, Greenback, Tenn.
Continuation-in-part of Ser. No. 311,604, Feb. 16, 1989. This application Jul. 3, 1990, Ser. No. 547,916
Int. Cl.[5] F16C *43/04, 13/00*; B65G *39/10*
U.S. Cl. 384—537 10 Claims



1. A bearing assembly for rotatably supporting a roller tube of a conveyor about a fixed shaft comprising:
a housing defining a central opening arrangeable about a fixed shaft and a periphery about which a conveyor roller tube is positionable for rotation with the housing about the fixed shaft;
an end cover having a disc portion positioned adjacent one side of the housing and a shaft-receiving hub portion joined to the disc portion and positionable about the shaft in a stationary condition therewith; and
a bearing positioned within the central opening of the housing and about the shaft for permitting rotation of the housing relative to the shaft and end cover; and
the housing including a body encircling the bearing and defining a shoulder surface for abutting one face of the bearing and further including a plurality of finger members joined to the housing body so as to be spaced about the central opening, each of the finger members including a major portion which extends from the housing body and a tab joined to the end of the major portion opposite the housing body, each tab providing a tab surface for abutting the other face of the bearing opposite said one face, the bearing being positioned between said shoulder surface and said tab surfaces so that the shoulder surface and tab surfaces are positioned in abutting relationship with a corresponding face of the bearing and so that the axial movement of the bearing relative to and through the housing central opening is limited by the shoulder surface and tab surfaces;
the tabs of the finger members adapted to resiliently flex radially outwardly relative to the housing body when the bearing is moved into the central opening to accommodate the insertion of the bearing into the central opening during assembly and so that upon positioning said one face of the bearing in abutting relationship with said shoulder surface, the memory of the finger members returns the tabs radially inwardly relative to the housing body so that the tab surface of each tab is moved into abutting relationship with said other face of the bearing.

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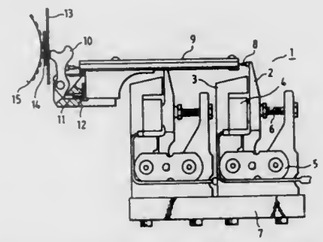
5,046,870
**END PLAY AND PRELOAD ADJUSTING ASSEMBLY FOR TAPERED BEARINGS**
James P. Ordo, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 2, 1990, Ser. No. 562,494
Int. Cl.[5] F16C *23/06*
U.S. Cl. 384—563 11 Claims



1. In combination with at least one bearing assembly supported within a housing means, an adjusting assembly, said adjusting assembly comprising: first and second ring means; means operative between said first ring means and the housing means to preclude rotation of said first ring means but to permit axial translation thereof; said second ring means being angularly rotatable with respect to said first ring means; a latch plate disposed in proximity to said second ring means; means operative between said latch plate and the housing to preclude rotation of said latch plate; means to retain said first ring means and said second ring means as well as said latch plate operatively disposed with respect to each other and said housing; said first and second ring means having opposed, interacting ramp surfaces such that angular rotation of said second ring means effects axial translation of said first ring means; vernier locking means incrementally interactive between said latch plate and said second ring means to secure said second ring means at selected increments of angular rotation.



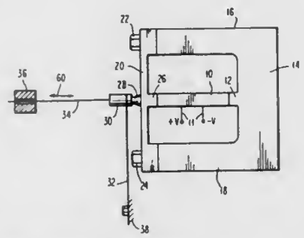
5,046,871
**ACTUATOR FOR PRINT HAMMER**
Seiichi Saitou; Masao Miyasaka, and Nobuhiko Itoh, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed May 24, 1989, Ser. No. 356,148
Claims priority, application Japan, May 27, 1988, 63-70729[U]
Int. Cl.[5] B41J *2/27*
U.S. Cl. 400—124 11 Claims



1. An actuator for actuating a print hammer, comprising: a yoke made of a magnetic material; and electromagnetic coil mounted on said yoke; and an armature rotatably supported on said yoke comprising a plurality of laminated sheets of a press-stamped magnetic material bonded together with one another, and an insulating material and adhesive means for attenuating vibrations resulting from an impact produced when said armature strikes said yoke such that said vibrations are not transmitted to an adjoining actuator, said adhesive means being coated on abutting surfaces of said sheets.

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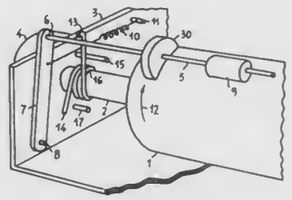
5,046,872
**PRINTER ACTUATED BY PIEZOELECTRICALLY GENERATED SHOCK WAVE**
Paul S. H. Chang, Briarcliff Manor, and Han C. Wang, Chappaqua, both of N.Y., assignors to IBM Corporation, Yorktown, N.Y.
Continuation of Ser. No. 264,535, Oct. 31, 1988, abandoned. This application Feb. 13, 1990, Ser. No. 481,649
Int. Cl.[5] B41J *9/26, 2/295*
U.S. Cl. 400—157.1 14 Claims



1. An impact printer comprising:
actuator means for generating a shock wave in a predetermined direction;
print hammer means; and
solid wave guide means interposed between said actuator means and said print hammer means for both restraining said actuator means from movement in said predetermined direction and for transmitting said shock wave to said print hammer means, said solid waveguide means including a solid waveguide and frame means for positioning said solid wave guide against said actuator means to maintain said actuator means in compression, whereby said print hammer means is moved to a print position by said transmitted shock wave.

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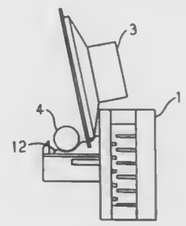
5,046,873
**AUTOMATIC PAPER BAIL ACTUATOR**
Carlo Fare, Via Dante 116, 20090 Limito, Italy
Filed May 8, 1990, Ser. No. 520,583
Claims priority, application Italy, Jun. 14, 1989, 20866 A/89
Int. Cl.[5] B41J *13/20*
U.S. Cl. 400—639.1 4 Claims



1. An automatic paper bail actuator for a printer having a frame and a driving shaft mounted thereon, at least one paper feeding roller coupled to said driving shaft, a bail rod having pressure rollers mounted thereon and cooperating with said feeding roller for guiding the movement of a printing support downstream of a printing line, said actuator comprising:
a first helicoidal spring having coils wound on said shaft and having an inner diameter not exceeding the diameter of said shaft so that a rotation of said shaft normally causes a corresponding rotation of said coil,
said spring having a first and a second ending arm,
a first stop member mounted on said frame, interfering with said first ending arm and causing the release of said spring coils when said shaft rotates in a first direction such as to cause a forward feeding of said printing support,
a second stop member mounted on said frame, interfering with said second ending arm and causing the release of said spring coils when said shaft rotates in the reverse direction opposite to said first direction, said first and second stop members being located on said frame so as to allow a predetermined rotation of said coil in both said directions, owing to rotation of said shaft,
said first ending arm acting on said bail to cause the opening of said bail when said shaft rotates in said reverse direction and acting on said bail to enable its closing when said shaft rotates in said first direction.

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5,046,874
**IMPACT PRINTER PRINT HEAD WITH ACTIVE SOUND PRESSURE ATTENUATION MEANS**
James S. St. Clair, 765 Westwood Dr., Apt. 4B, Clayton, Mo. 63105
Filed Mar. 13, 1990, Ser. No. 492,820
Int. Cl.[5] B41J *29/08*; H03B *29/00*
U.S. Cl. 400—689 5 Claims



3. A method for reducing the noise generated by a print head

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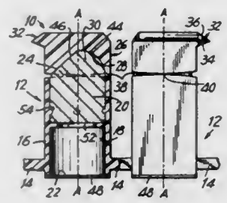
the method comprising providing a microphone for receiving noise generated by the print head in the vicinity of the print head by means of said microphone, modifying the output of the microphone to generate a cancellation signal, and transmitting said cancellation signal by means of a speaker located in the proximity of said print head.

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**5,046,875**
**IN SITU MOLDED PRODUCT SAMPLER WITH TILT-OFF CAP**

Albert B. Skolnik, New York, N.Y., assignor to Liz Claiborne, Inc., New York, N.Y.

Filed Apr. 27, 1990, Ser. No. 515,723
Int. Cl.[5] B65D *85/24*
U.S. Cl. 401—49 21 Claims



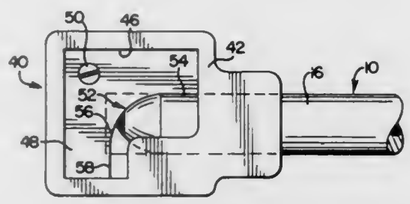
1. A product sampler, comprising:
(a) a tubular body bounding an interior at least partly filled with a portion of a moldable product sample; and
(b) a tilt-off cap removably mounted on the body and bounding an internal mold cavity in communication with the interior of the body, said mold cavity being filled with, and shaping, a shaped portion of the product sample which is exposed for sampling upon removal of the cap from the body, said cap having a laterally-offset handle extending past one side of the body and against which manual forces are exerted for cap removal.

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**5,046,876**
**SAFETY TIPPED PENCIL AND SHARPENER THEREFOR**

Robert Boraca, 2130 Walnut, Park Ridge, Ill. 60068

Filed Aug. 24, 1990, Ser. No. 574,368
Int. Cl.[5] B43K *29/06;* B43L *23/00*
U.S. Cl. 401—50 20 Claims

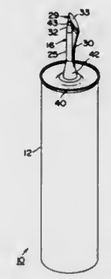


1. In a pencil having a generally elongated, cylindrical configuration of a particular diameter with a central axis and a central core of writing material surrounded by a sheath of sharpenable material, the improvement comprising a safety tip having a central writing area and comprising a curved, circular surface which, in longitudinal cross section through said central axis, is defined by two circles intersecting at said area, each circle having an identical radius in the range from greater than three-quarters the diameter of the pencil to less than the diameter of the pencil, each circle having a center horizontally offset beyond said central axis at a location greater than one-quarter and less than one-half of the diameter of the pencil.

**5,046,877**
**COATING DISPENSING CARTRIDGE AND SPOUT THEREFOR**

William J. Longo, 35865 Timber Ridge La., Willoughby, Ohio 44094

Continuation of Ser. No. 120,992, Nov. 16, 1987, Pat. No. 4,872,778. This application Sep. 18, 1989, Ser. No. 408,601
The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.
Int. Cl.[5] B05C *5/02*
U.S. Cl. 401—266 15 Claims



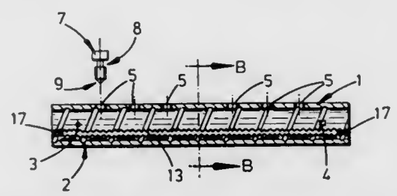
8. In a spout for dispensing a flowable material from a container, the spout having a passage for the flowable material extending from an inlet opening at one end and an orifice at its opposite end which is inclined at an angle to said spout, the improvement comprising:
a single guide means extending transversely from one end of said spout, the entire surface contacting end of said guide means being flat and coplanar with said angled orifice, whereby said guide surface is the primary support for the spout and container during the application of said flowable material to a surface.

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**5,046,878**
**REINFORCING BAR COUPLING SYSTEM**

Brian W. Young, Altrincham, England, assignor to Metal-Bond (Technology) Limited, Stockport, United Kingdom

Filed Jan. 11, 1990, Ser. No. 463,457
Claims priority, application European Pat. Off., Jun. 5, 1989, 89305638; United Kingdom, Jun. 5, 1989, 8912911; Australia, Jun. 15, 1989, 36388/99; Canada, Jun. 19, 1989, 603272
Int. Cl.[5] B25G *3/00;* F16D *1/00*
U.S. Cl. 403—13 24 Claims



1. A coupling fitting for making joints in reinforcing bars or wires for structural concrete, comprising a sleeve-like device having means for locating it over and about portions of said bars or wires adjacent said desired joint with clearance to said bar or wire portions, wherein the means for locating comprises, for each portion, engagers at radial spacings relative to axes of bars or wires to be joined, one of which engagers for each portion is positively adjustable at emplacement through the side wall of the device, and the other engagers comprise radially spaced longitudinal ribs profiled to key into the bars or wire portions, said profiling comprising teeth-like ridges and valleys alternatively spaced along the length of the rib and wherein at least the teeth-like ridges have a hardness greater than that of the bars or wire portions.

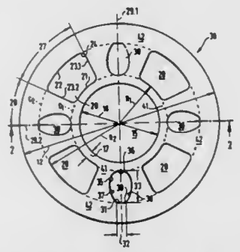


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**5,046,879**
**PERFORATED CONNECTING DISK FOR SCAFFOLDING ELEMENTS**

Ruth Langer nee Layher, IM Weinberg 13, D-7129, Gueglingen (Baden-Wuettermberg), Fed. Rep. of Germany

Filed Mar. 26, 1990, Ser. No. 498,540
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1989, 3909809
Int. Cl.[5] E04G *7/00*
U.S. Cl. 403—49 8 Claims



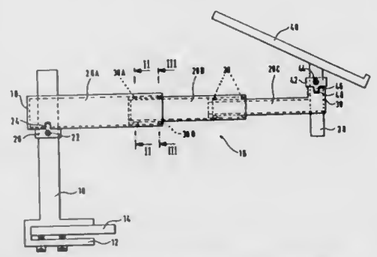
1. A perforated disk for accommodating connecting devices for scaffolding elements comprising a plurality of first hole means for accommodating fastening wedges, and a plurality of second hole means smaller than said first hole means for accommodating fastening wedges, said plurality of second hole means each including a substantially flat wedge contact surface provided at an outer circumference thereof and adapted to be disposed in a vertical direction in an installation position of the perforated disk, wherein a contour of each of the plurality of small hole means, with the exception of the wedge contact surface, is formed as a continuous curve symmetrical with respect to a radius passing through a mid point of the wedge contact surface.

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**5,046,880**
**TELESCOPIC ADJUSTABLE SUPPORT**

Helmut Steinhilber, Sonnenbergstrasse 40, CH-6052 Hergisil, Switzerland

Filed Nov. 28, 1989, Ser. No. 441,915
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1988, 3840893
Int. Cl.[5] F16B *1/00*
U.S. Cl. 403—109 4 Claims



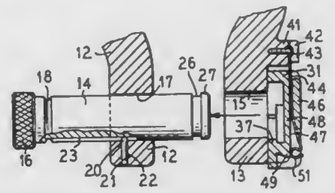
1. A telescopically adjustable support comprising:
a first arm member,
a second arm member telescopically positioned in said first arm member, and
means for locking said second arm member against telescopic movement in said first arm member when the arm members are out of substantial alignment and for permitting telescopic movement when said arm members are substantially in alignment, said means comprising a wedge surface on one said arm member engageable by the other said arm member when said arm members are out of substantial alignment.

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**5,046,881**
**LOCKABLE PIN AND CLEVIS**

William E. Swager, P.O. Box 750, Fremont, Ind. 46737

Filed Feb. 1, 1991, Ser. No. 649,748
Int. Cl.[5] F16C *11/06*
U.S. Cl. 403—154 5 Claims



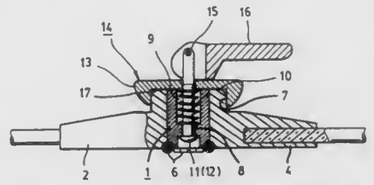
1. A safety locking device comprising, a clevis with two legs each of which is formed with aligned openings, a pin with an enlarged head on one end receivable through said aligned openings, a first transverse groove formed adjacent the second end of said pin, a slide member slidably mounted on one leg of said clevis and formed with an opening with a first portion large enough to allow said pin to extend therethrough and a second portion which is small enough to engage said pin in said first groove to lock it so that said pin can be locked when said slide member is in a first position and so that said pin can be unlocked when said slide member is in a second position, and a locking member with one end attached to said one leg of said clevis and having a second end detachably connected to said slide member to prevent it from moving relative to said clevis.

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**5,046,882**
**TENT FRAME FOLDING DEVICE**

Dong-Soo Ju, Seoul, Rep. of Korea, assignor to Bae Jin Corporation, Seoul, Rep. of Korea

Filed Jan. 8, 1990, Ser. No. 462,057
Claims priority, application Rep. of Korea, Sep. 27, 1989, 89-14046; Nov. 20, 1989, 89-17118
Int. Cl.[5] F16B *7/04;* E04H *15/44*
U.S. Cl. 403—170 2 Claims



1. A tent frame folding device for a dome shaped tent of the kind in which tent fabric supporting arms are extended radially outwardly from a central support when the tent frame is unfolded and are swung to positions in which said arms are aligned in parallel with the central support when the tent is folded, said tent frame folding device comprising,
central support means for providing a central support of associated tent fabric supporting arms,
said central support means having a polygonal outer periphery, as viewed in plan, and having a plurality of planar

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side faces each providing a wide area for supporting engagement with a vertical face of an associated tent fabric supporting arm when the tent frame is unfolded,

frame connecting arm means for supporting ends of tent fabric supporting arms,

said frame connecting arm means comprising an individual frame connecting arm member associated with a respective planar side face of said central support means,

each frame connecting arm member having a vertical step and a vertical face on the back side of the vertical step for engagement with a respective side face of the central support means when the tent frame is unfolded,

each vertical step having a front surface for engagement with a related surface of a locking cap when the tent frame is unfolded,

hinge means for permitting pivoting of the frame connecting arm members on the central support means,

said hinge means including a separate hinge for each frame connecting arm member and located at the lower edge of the connecting arm member so that the vertical face of the frame connecting arm member can be swung into and out of planar contact with a related planar side face of the central support means,

securing pin means mounted for limited axial movement within the central support means and having an upper tip projecting above the central support means,

locking cap means mounted on the upper tip of the securing pin means for axial movement into and out of a locking position with respect to the vertical steps of the frame connecting arm members,

said locking cap means having an inner periphery, as viewed in bottom plan, which provides a particular inner surface for locking engagement with a front surface of a related frame connecting arm member when the locking cap means are moved into the locking position,

spring biasing means for moving the locking cap means axially outwardly on the securing pin means to an unlock position in which the locking cap means are disengaged from the frame connecting arm members,

locking lever means for moving the locking cap means axially inwardly on the securing pin means against the force of the spring biasing means and into said locking position,

said locking lever means including a lever which is pivotally connected to the upper tip of the securing pin means and an eccentric surface which is engagable with the locking cap means for clamping the locking cap means in the locking position when the lever is moved to a locking angle and for releasing the locking cap means to the unlock position when the lever is moved to an unlock angle, and

wherein the interengaged surfaces of the central support means, frame connecting arm means and locking cap means are effective to unload the hinge means in said locking position to minimize possible breakage of the hinge means and any resulting undesired folding of the tent frame.

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**5,046,883**

**CONNECTORS FOR SPACE FRAME STRUCTURES**

**Yehoshua B. Ezra, Rehov Rupin 14, Kfar Saba, Israel**

**Filed Dec. 13, 1989, Ser. No. 450,193**

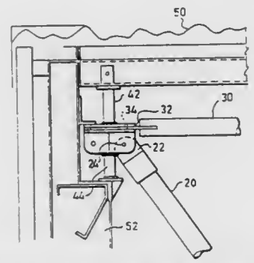
**Int. Cl.[5] F16B** *9/00*

**U.S. Cl. 403—171** **11 Claims**

1. A node-connector for a space frame structure comprising:

a flat base plate divided into a plurality of equal sections by a corresponding plurality of double-wall partitions joined to the flat base plate and to each other at the center of the flat base plate and extending perpendicularly to the flat base plate;

each of said double-wall partitions including two parallel walls spaced from each other and each formed with a single opening, the single opening of each wall in each double-wall partition being aligned with the single opening in the other wall of the double-wall partition for pivotably mounting one structural member of a first group of structural members in the space between the two walls of the respective partition;




said plurality of sections of said flat base plate being located in a common plane and each section being further formed with an opening therethrough perpendicular to said common plane for pivotably mounting one structural member of a second group of structural members.

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**5,046,884**

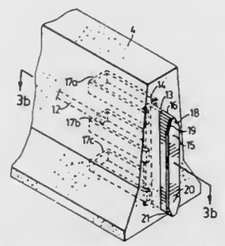
**ROADWAY TRAFFIC BARRIERS**

**Marino Girotti, 26 Seapark Drive, St. Catharines, Ontario, Canada L2M 6S6**

**Filed Jan. 17, 1989, Ser. No. 296,956**

**Int. Cl.[5] E01F** *13/00, 15/00*

**U.S. Cl. 404—6** **7 Claims**




1. A roadway barrier element comprising a cast concrete body of substantially prismatic form having substantially flat upper, lower and end surfaces and locking means at each said end surface, said locking means at one of said end surfaces comprising a female member in the form of a metallic trough embedded in said concrete body extending from said upper surface to said lower surface and open at each end, said locking means at the other of said end surfaces comprising a male member of "T" shaped cross-section wherein the width of the crossbar of the "T" is "W", the height of the vertical leg of the "T" is "d" and the thickness of the vertical leg of the "T" is "t" formed from a section of steel I beam with one flange and a portion of the web embedded in the concrete body and the other flange protruding from the surface of said other end and extending from a point adjacent said upper surface to a point adjacent said lower surface wherein said trough has inwardly turned outer edges which lie substantially in the plane of said end surface and define a slot extending substantially from said lower surface to said upper surface, said trough having an internal width slightly greater than "w", said slot having a width slightly greater than "t", and said trough having an internal dimension from the slot to the inner surface of the trough slightly greater than "d".



**5,046,885**

**HINGED BARRICADE WITH LIMITING BOLT**

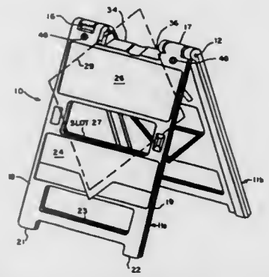
**Kurt W. Thurston, 475 Hill St., Reno, Nev. 89501**

**Continuation-in-part of Ser. No. 470,394, Jan. 5, 1990, Pat. No. 5,009,541, which is a continuation-in-part of Ser. No. 326,615, Mar. 21, 1989, abandoned, and a continuation of Ser. No. 383,298, Jul. 7, 1989, Pat. No. 5,003,912. This application May 18, 1990, Ser. No. 526,226**

**The portion of the term of this patent subsequent to Apr. 23, 2008, has been disclaimed.**

**Int. Cl.[5] E01F** *9/00*

**U.S. Cl. 404—10** **4 Claims**




1. A plastic barricade constructed from two substantially similar frame units each having a planar outside face and which are one piece, hollow, and integrally molded, such units being hinged together to pivot around a common axis of rotation, each of said frame units having left and right legs, the improvement comprising:

hinge means at the top of each leg, each of said frame units including at said left leg a cylindrical male boss and at said right leg a C-shaped female socket for coupling onto said male boss and freely pivoting thereon said hinge means normally allowing said two frame units to freely pivot open or unfold to an angle substantially greater than a predetermined angle used when placing said barricade in a freestanding position;

means for maintaining said barricade at said predetermined angle of said unfolded freestanding position, including for each frame unit a pair of recesses in said planar outside face in each of said legs below said hinge means each said recess having an aperture in its rear wall for accepting an elongated fastener having limiting means on both ends for abutting against the rear walls of said recesses when said barricade is unfolded to its predetermined angle;

both said C-shaped socket and said wall at the rear of said recess below said socket, which includes a said aperture, being compression molded to form a solid resistance against downward forces on an unfolded barricade tending to both break said C-shaped socket and rip said fastener out of said recesses.

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**5,046,886**

**UNIVERSAL STACKABLE MANHOLE SHIELD**

**David J. Muir, Farmington Hills, and James J. Mason, New Hudson, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.**

**Filed Jun. 25, 1990, Ser. No. 542,954**

**Int. Cl.[5] E02D** *29/14*

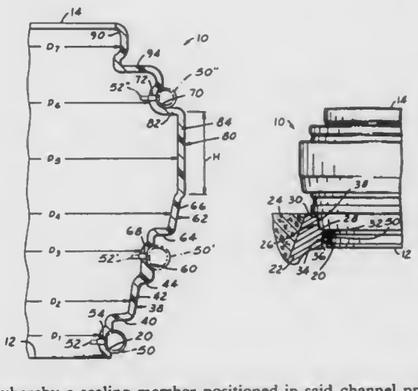
**U.S. Cl. 404—25** **36 Claims**

1. A shield device for protecting and sealing a utility opening having an annular radially extending ridge therein, said shield comprising:

a hollow cylindrical body member having a first annular edge at one end;

a first annular channel portion in said body member adjacent said first edge, said first edge and said first channel being dimensioned to fit within said annular ridge of said opening;

a radially outwardly extending annular wall member adjacent said first channel and positioned substantially perpendicular thereto, said wall member positioned to rest on said annular ridge;




whereby a sealing member positioned in said channel provides a seal between said shield and the under side of said ridge, and also assists in holding said shield in said manhole opening.

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**5,046,887**

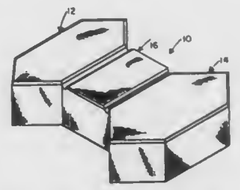
**GUTTERED PAVING BLOCKS**

**John D. Fontana, 21 Pine Ridge Dr., Smithtown, N.Y. 11787, and William Emery, Jr., 27 Fry Blvd., Patchogue, N.Y. 11772**

**Filed Aug. 6, 1990, Ser. No. 563,045**

**Int. Cl.[5] E01C** *5/00*

**U.S. Cl. 404—34** **4 Claims**




1. A paving block for covering a surface by interlocking with other paving blocks each identical to said paving block, said block being a solid body comprising:

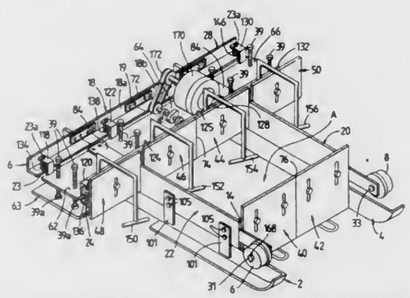
a. a pair of identical head portions each of which has a pair of parallel opposite sides the length of which is equal to the distance between said parallel sides, each said head portion closed at each end of said parallel sides by straight edges coming together to a point at right angles to each other; and

b. a waist portion of square shape joining said head portions, one parallel side of each head portion forming one side of said waist portion, the two head portions being on opposite sides of said waist portion whereby the only way said

paving block can interlock fully with any other identical paving block is where a parallel side of a head portion is nestled against one side of a waist portion of an adjacent paving block and the straight edges adjacent said parallel side rest against straight edges of the adjacent block, said head and waist portions forming a surface on opposite sides of said body being narrower across said waist portion than the lengths of said head portions measured from the points at opposite ends where said straight edges come together, all edges along one surface are chamfered including chamfers along said head and waist portions adjacent each other and gutters formed between the head and waist chamfers, said gutters extending below the bottom edges of the chamfers.

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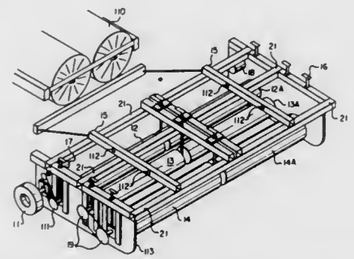
**5,046,888**
**MATERIAL SPREADER**
**John C. King, 3746 1st West, Birmiogham, Ala. 35207**
**Filed Mar. 24, 1987, Ser. No. 29,696**
**Int. Cl.[5] E01C** *19/18, 19/38, 19/22, 11/24*
**U.S. Cl. 404—75** **1 Claim**



1. An apparatus for finishing paving material comprising:
a frame having four sides defining an opening for dispensing paving material,
said sides having means for changing the lengths;
skid means, for supporting said frame on a attached to the underside of two opposing sides of the frame and extending beyond the ends of said two opposing sides, said two opposing sides including means for detachably fastening a hopper;
roller means attached to two corners of said sides adjacent one end of said skid means ends; one of said sides between said skid means, having a first vertically adjustable screed means and means for attaching a cable to move said apparatus; the side opposite the one said side between said skid means, extends beyond said two opposing sides and including a second vertically adjustable screed means;
plate means disposed between said side opposite the one said side and the other of said two opposing sides ends, one end of said plate means resiliently attached to said side opposite the one said side, said plate means having a plurality of submergible-type vibrating means fixed to the upper surface of said plate means, said submergible-type vibrating means extending from said plate means top into said dispensing opening to contact paving material, said plate means other end resiliently attached to a support means, said support means fixed to said two opposing sides other ends, said two opposing sides other ends including roller means attached adjacent thereto;
adjustable float pan means resiliently attached beneath said plate means and extending between said side opposite the one said side and said two opposing sides other ends; and
vibrator means attached to the upper surface of said plate means to vibrate said adjustable float pan means;
wherein said plate means resilient attachments minimize vibration to the frame of said apparatus.

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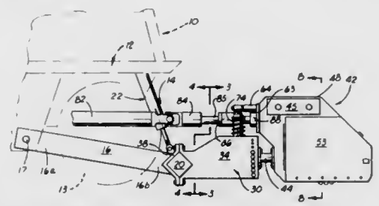
**5,046,889**
**ROLLING SCREED SPREADER BOX**
**Carl L. Sterner, Jr., 3860 Nord Rd., Bakersfield, Calif. 93312-9216**
**Filed Dec. 5, 1989, Ser. No. 446,558**
**Int. Cl.[5] E01C** *19/28*
**U.S. Cl. 404—103** **10 Claims**



1. A spreading device for applying a cold mixed asphaltic concrete paving material comprising:
(a) a fixed or extendable frame spreader box;
(b) an auger attached within said frame and powered for lateral distribution of a paving mixture within said spreader box;
(c) an adjustable screed roll for screeding or spreading the paving mixture to a desired depth of spread of said paving mixture;
(d) an adjustable compression roll for compacting the paving mixture;
(e) conveyance means on each side of said spreader box;
(f) adjustment means at the ends and in the middle of said auger, said screed roll, and said compression roll to adjust the depth of spread of said paving mixture; and
(g) a rotational power transmission means connected between said compression roll and said screed roll.

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**5,046,890**
**ROAD SURFACE TREATING APPARATUS**
**Wayne E. Dickson, Tecumseh, Okla., assignor to Dickson Industries, Inc., Tecumseh, Okla.**
**Filed Jul. 2, 1990, Ser. No. 548,284**
**Int. Cl.[5] E02B** *07/20;* **E21C** *47/00*
**U.S. Cl. 404—90** **5 Claims**

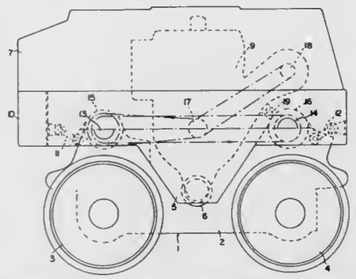


1. A road surface treating apparatus comprising:
a framework;
a pair of arms each having a forward end and a rear end and each pivotally connected at its rear end to said framework for pivotation about a horizontal, substantially transversely extending axis and projecting forwardly from said point of pivotal connection to the forward end of the respective arm;
a transverse tool bar extending substantially horizontally and transversely with respect to the direction of movement of said framework, said transverse tool bar being mounted on the forward ends of said arms and extending transversely there across;
a tool-supporting frame subassembly detachably and adjustably mounted on said tool bar;
a rocker shaft extending forward from, and normal to, said transversely extending frame plate;
a drum housing freely pivotally mounted on the forward end of said rocker shaft and on the opposite side of said frame subassembly from said tool bar for free pivotation about a fore-and-aft horizontal axis to thereby facilitate free floating, rocking movement of said drum housing in response to road anomalies traversed by said apparatus;
a generally cylindrical cutter drum subassembly rotatably mounted in said drum housing for rotation about a substantially horizontal, transversely extending axis, said cutter drum subassembly further including:
a plurality of circumferentially spaced rows of cutter elements mounted on the outer periphery of said cylindrical cutter drum subassembly, said rows of cutter elements extending substantially parallel to each other and over a major portion of the width of said generally cylindrical cutter drum subassembly;
a pair of horizontally spaced shock absorber units each having a first end connected to a point on said drum housing, with said points of connection of said first ends of said shock absorber units to said drum housing being on opposite sides of said horizontal pivotal axis of said drum housing on said tool-supporting frame, each of said shock absorber units further having a second end connected to a point on said tool-supporting frame, so that each of said shock absorber units extends one of said first-mentioned points on said drum housing and one of said last-mentioned point on said tool-supporting frame;
a prime mover mounted on said framework; and
a power train connected between said prime mover and said generally cylindrical cutter drum subassembly for driving said cutter drum subassembly in rotation.



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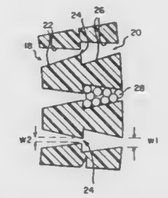
**5,046,891**
**VIBRATOR ROLLER FOR SOIL COMPACTION**
**Gülertan Vural, Emmelshausen, Fed. Rep. of Germany, assignor to BOMAG GmbH, Boppard, Fed. Rep. of Germany**
**Filed Feb. 27, 1990, Ser. No. 485,903**
**Claims priority, application Fed. Rep. of Germany, Mar. 1, 1989, 3906392**
**Int. Cl.[5] E01C** *19/28, 19/38*
**U.S. Cl. 404—117** **26 Claims**



1. A vibratory roller for soil compaction which comprises an undercarriage (1) having a pair of front roller drums 3*a*, 3*b*) and a pair of rear roller drums (4) secured thereto and disposed one after the other in a direction of travel, front and rear imbalance generators (13, 14) connected with said roller drums and said undercarriage for acting on said roller drums, said front and rear imbalance generators being in the form of rotating weights that revolve with a phase difference of 180°, which subject the roller drums and the undercarriage to a vibrational motion, a superstructure (7) supported on said undercarriage and which includes a drive motor, control elements and operative equipment, said superstructure (7) is supported by the undercarriage (1) via elastic resilient pads, whereby at least one supporting resilient pad (*6a*, *6b*) positioned between said front and rear rollers is in a position of a minimum vibration of the undercarriage (1) which is between the front and rear rollers, and said at least one resilient pad supports a main weight of the superstructure (7).

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**5,046,892**
**APERTURED PIPE SEGMENT**
**Antonius B. Kothmann, 4 Haarhof St., Somerset West, 7130 Cape Province, South Africa**
**Filed May 31, 1989, Ser. No. 359,398**
**Claims priority, application South Africa, Jun. 7, 1988, 88/4049**
**Int. Cl.[5] E02B** *11/00*
**U.S. Cl. 405—43** **4 Claims**



1. An apertured pipe segment having a pipe wall and apertures in the pipe wall for the ingress of water into the pipe segment, the apertures each being formed by a longitudinally extending outer slot on an outside portion of the pipe wall and a longitudinal extending inner slot defined by opposed slot walls which diverge from the bottom of the outer slot inwardly on an inside portion of the pipe segment, the outer slot being in flow communication with the inner slot via a slot mouth at the bottom of the outer slot, which slot mouth is narrower than the smallest transverse dimension of the outer slot, each inner slot extending, across its entire width and depth, longitudinally to the extremity of the inside portion at one end of the pipe segment, and each outer slot extending, across its entire width and depth, longitudinally to the extremity of the outside portion at the other end of the pipe segment.

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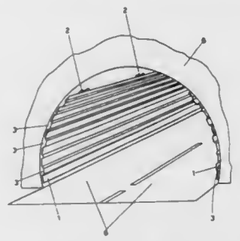
**5,046,893**
**PANEL WITH A FRETTED TRANSVERSAL SECTION, TO BE MOUNTED LONGITUDINALLY AS A COVERING FOR THE INSIDE WALLS OF ROAD TUNNELS**
**Arsenio Borgnini, Via Alcide De Gasperi, 38, Valfabbrica (PG), Italy**
**Filed May 2, 1990, Ser. No. 517,922**
**Claims priority, application Italy, Dec. 29, 1988, 601/88[U]**
**Int. Cl.[5] E21D** *11/00*
**U.S. Cl. 405—151** **7 Claims**

1. A panel for providing a covering for the inside walls of a tunnel, comprising:
at least one sheet having a plurality of parallel longitudinal convex sections formed therein, such that a fretted sheet having a front surface is defined thereby, each convex section including a flat section bounded on opposite sides by respective outwardly sloping side walls, so that an obtuse angle is defined between the flat section and the side walls, each sheet further being flexible, so that the sheet may be adapted to the inclination of the inside walls; and
means for leveling the sheets and for securing the leveled sheets directly to the portions of the inside walls of the tunnel that are to be covered, whereby a covering is provided that is smooth on the front surface even when

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the inside walls of the tunnel are not smooth, and further whereby the front surfaces of various of the sheets applied



in sequence are perfectly aligned so as to be coplanar further creating a continuous regular and smooth front surface.

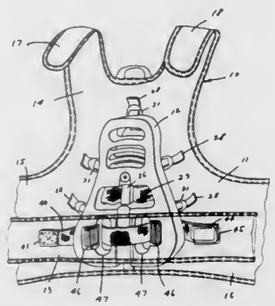
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**5,046,894**

**BUOYANCY COMPENSATOR WITH INTERCHANGEABLE BACKPACK AND COMMERBUND**

**Neil R. Bergstrom, La Mesa, Calif., assignor to Soniform, Inc., El Cajon, Calif.**

**Filed Jul. 12, 1990, Ser. No. 551,909**
**Int. Cl.[5] B63C** *11/30, 11/02*
**U.S. Cl. 405—186** **16 Claims**



1. A buoyancy compensator assembly comprising a vest having an inflatable air cell, a backpack removably attached to the vest, the backpack including means for supporting a breathing tank and an attaching member, and a cummerbund removably attached to the backpack and adapted to encircle the waist of a wearer, the cummerbund including a flexible attaching strap having one end secured to the cummerbund and securing means on the other end of the attaching strap and on the cummerbund, the attaching strap (being threaded through) the attaching member on the backpack and secured to the cummerbund by the securing means.

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**5,046,895**

**ROV SERVICE SYSTEM**

**Benton F. Baugh, 14626 Oak Bend, Houston, Tex. 77079**

**Filed Jan. 8, 1990, Ser. No. 460,262**
**Int. Cl.[5] B63C** *11/00*
**U.S. Cl. 405—188** **20 Claims**

1. A system for the replacement of components in a subsea environment comprising an upper module, a lower module, a tooling package, and module connecting means,

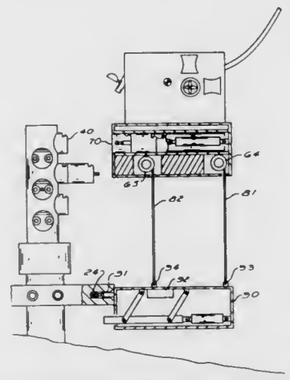
said system having the ability for providing a vertical force and having a net buoyancy, said vertical force exceeding said net buoyancy in a manner as to allow said system to move vertically when subsea or maintaining a constant subsea elevation,

said lower module being negatively buoyant, providing engagement means to a subsea structure,

said upper module being positively buoyant, having a center of buoyancy, supporting said tooling package, and having a front side,

said tooling package having the ability to move from a retracted position adjacent said upper module to an extended position on said front side to engage a device mounted on a subsea structure, the ability to release said device from said subsea structure, the ability to remove said device from said subsea structure,

said module connecting means comprising two or more flexible and extensible members with a first of said flexible and extensible members being at or in front of said center of buoyancy and a second of said flexible and extensible members being behind said center of buoyancy,



such that when said engagement means are engaged with said subsea structure and said first flexible and extensible member is extended to a first length and said second flexible and extensible member is extended to a second length, said upper module has a horizontal trim,

and further such that when said tooling package is extended to the front a first distance said trim is not changed,

and further such that when said device is removed from said subsea structure and the weight of said device is supported by said tooling package at said first position said trim is not changed,

the magnitude of the weight of the device which can be carried without changing said trim being generally proportionate to the magnitude of said net buoyancy of said upper module and to the distance behind said center of buoyancy of said second flexible and extensible member and inversely proportionate to the distance said device is in front of said second flexible and extensible member.

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**5,046,896**

**INFLATABLE BUOYANT NEAR SURFACE RISER DISCONNECT SYSTEM**

**Charles M. Cole, Katy, Tex., assignor to Conoco Inc., Ponca City, Okla.**

**Filed May 30, 1990, Ser. No. 531,180**
**Int. Cl.[5] E21B** *43/013;* **B63B** *35/00*
**U.S. Cl. 405—195** **27 Claims**

1. A riser system, comprising:

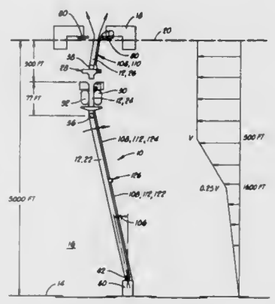
a riser string extending upward from a floor of a body of water, to a floating platform at the surface of said body of water, said riser string including a lower riser portion, an intermediate riser portion, and an upper riser portion;

a releasable connector means, between said intermediate riser portion and said upper riser portion, for permitting said upper riser portion to be selectively disconnected from and reconnected to said intermediate riser portion;

an inflatable bladder means of sufficient buoyancy to support said lower riser portion and said intermediate riser portion;

support means for supporting said inflatable bladder means from said intermediate riser portion so that a buoyant





force of said bladder means is transferred to said intermediate riser portion; and

a first flexible joint means between said lower riser portion and said intermediate riser portion, for permitting said intermediate riser portion and said inflatable bladder means and said support means to float substantially vertically to aid in reconnection of said releasable connector means between said intermediate riser portion and said upper riser portion.

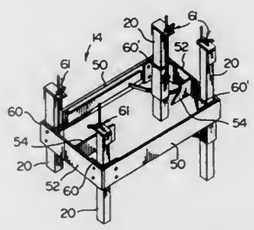
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**5,046,897**

**PLATFORM SUPPORT SYSTEM**

**Kenneth B. Ray, 87 Java Street, Ottawa, Ontario K1Y 3L5, Canada**

**Filed Sep. 20, 1990, Ser. No. 585,632**
**Claims priority, application Canada, Sep. 29, 1989, 614996**
**Int. Cl.[5] E02B** *17/08*
**U.S. Cl. 405—221** **20 Claims**



1. Apparatus for raising and lowering a platform having wooden leg support means, comprising:

a box girder adapted to move axially about a wooden support leg of a platform, said box girder having means for securement of said girder to material to be used in forming the frame of said platform, said box girder having lug means on an exterior surface thereof;

header means for detachable assembly with the top of a support leg of said platform during raising or lowering of said platform frame to a desired level; and,

screw means for operative association with said header means and said lug means for selectively raising or lowering said girder about said leg relative to said leg support means.

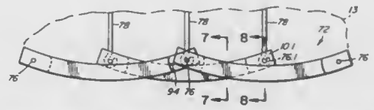
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**5,046,898**

**RETAINING WALL AND BUILDING BLOCK THEREFOR**

**Gary S. McKinney, 4621 River Road, Delta, British Columbia, Canada V4K 1R9**

**Filed Jun. 20, 1990, Ser. No. 540,757**
**Int. Cl.[5] E02D** *3/02*
**U.S. Cl. 405—286** **20 Claims**



1. A building block for a retaining wall, the block comprising:

(a) spaced apart inner and outer faces, and spaced apart generally parallel top and bottom faces, the faces defining a transverse cross-section of the block,

(b) first and second end portions, the end portions being complementary to each other and having respective openings therein positioned to permit adjacent end portions of adjacent blocks to cooperate with each other so that pairs of adjacent openings are alignable with each other, the openings of a particular block being disposed on a straight longitudinal axis of the block,

(c) a clearance means located adjacent the longitudinal axis and adjacent a central portion of the inner face of the block.

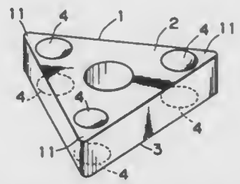
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**5,046,899**

**CUTTING INSERT**

**Masami Nishi, Kyoto, Japan, assignor to Kyocera Corporation, Kyoto, Japan**

**Continuation of Ser. No. 262,601, Oct. 26, 1988, abandoned.**
**This application Feb. 11, 1991, Ser. No. 653,987**
**Claims priority, application Japan, Oct. 30, 1987, 62-276492**
**Int. Cl.[5] B23B** *27/08, 27/16, 2722*
**U.S. Cl. 407—102** **18 Claims**



1. A cutting insert for a cutting tool holder having a supporting surface for supporting the insert, said insert comprising a first substantially flat rake surface which is adapted to face the supporting surface of said cutting tool holder and a second rake surface opposed to said first rake surface, wherein at least said first rake surface has at least one cutting edge and includes at least three upheaved portions for supporting said insert on said supporting surface, each having a maximum height between 0.01 and 0.1 mm relative to the first rake surface and a base width at least 19.9 times its height.

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5,046,900

## HAND DRILLING TOOL FOR DRILLING OUT SPOT WELDS

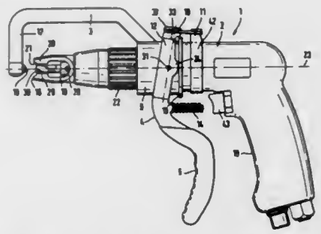
Uwe Helter, Villingen-Schwenningen, and Josef Schill, Bad Dürrheim, both of Fed. Rep. of Germany, assignors to MV Marketing & Vertriebs GmbH Wielaender & Schill, Fed. Rep. of Germany

Filed Aug. 24, 1990, Ser. No. 573,390

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1990, 9003950[U]

Int. Cl.[5] B23B *45/14*

U.S. Cl. 408—84 15 Claims



1. A hand drilling tool for a drilling machine having a drilling axis, in particular for drilling out spot welds, comprising a bracing support means releasably mounted on a body of said drilling machine, said bracing support means being displaceable in the direction of said drilling axis by way of an actuating lever which terminates at one end in a handle, said actuating lever pivotably engaging a fitment sleeve circumscribing said body of said drilling machine, said bracing support means is mounted to said fitment sleeve and is adapted to be axially displaceable with respect to said body of said drilling machine along said drilling axis in response to a pivoting of said actuating lever.

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5,046,901

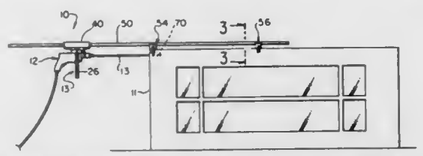
## FLUSH BOLT BORING JIG

Richard Taylor, 2135 W. Jefferson Blvd., Los Angeles, Calif. 90018

Filed Apr. 16, 1990, Ser. No. 509,883

Int. Cl.[5] B23B *45/14*

U.S. Cl. 408—110 8 Claims



1. An apparatus for drilling a bore in the top edge of a door closely parallel to the side edge of the door comprising in combination, a jig and a pair of separate spaced parallel tracks extending parallel to the side edge of the door, a pair of vertically spaced door clamps clamped to the side of the door for holding said tracks to said door, formations on each of said vertically spaced door clamps extending parallel to the side edge of the door and shaped to receive said pair of spaced parallel tracks for holding them in spaced parallel relationship to each other and to the side edge of the door, said jig including a pair of attached spaced parallel slide tubes, said slide tubes spaced apart the same distance as said tracks and mounted over said tracks in concentric relationship with said tracks and in such a way that said slide tubes with said attached jig can be slid over said tracks, a drill clamp mounted in said jig, a drill and a drill bit mounted on said drill clamp whereby said drill is attached to said jig so as the drill moves with the jig along the tracks, the bit of the drill forms a straight bore of desired length which is precisely parallel to the side edge of the door, and means on said jig for adjusting the position of the drill and the drill bit with respect to the bore so the position of the bore in the door can be varied.

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5,046,902

## SPIRAL DRILL

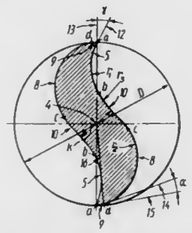
Alexel V. Zubov, ulitsa Shelkovichnaya, 49/63, kv. 96; Vladimir A. Zubkov, ulitsa Perovomaisakaya, 37/45, kv. 25; Anatoly E. Volkov, ulitsa Shelkovichnaya, 212, kv. 51, and Vladimir P. Katusov, ulitsa Shelkovichnaya, 204, kv. 55, all of Saratov, U.S.S.R.

PCT No. PCT/SU88/00204, § 371 Date Jun. 12, 1990, § 102(e) Date Jun. 12, 1990, PCT Pub. No. WO90/04473, PCT Pub. Date May 3, 1990

PCT Filed Oct. 21, 1988, Ser. No. 499,269

Int. Cl.[5] B23B *51/02*

U.S. Cl. 408—230 6 Claims



1. A spiral drill with helical chip flutes (3) inclined to the drill axis (4) at an acute angle (w) and having, each, a leading surface (5) forming, on intersection with the rear drill sharpening surface (6), a major cutting edge (7), a flank surface (8) merging with the guide land (9), and a mating surface (10) between the leading (15) and flank (8) surfaces contacting the drill core K characterized in that the leading (5) and flank (8) surfaces of the helical flutes (3) and their mating surface (10), in a section perpendicular to the drill axis, each has the form of an arc of a respective circle.

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5,046,903

## METHOD AND APPARATUS FOR CONDUCTING OPERATION IN PIPE

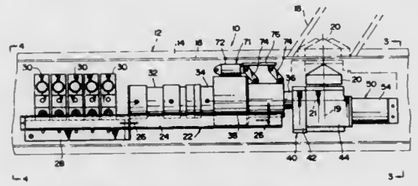
Akito Nagayoshi, Matsudo; Katsuhide Isaka, Yachiyo, and Masahiro Ito, Yokosuka, all of Japan, assignors to Kabushiki Kaisha Iseki Kaihatsu Koki, Tokyo and Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Filed Jan. 27, 1989, Ser. No. 303,561

Claims priority, application Japan, Jan. 27, 1988, 63-14678; Nov. 14, 1988, 63-285789; Nov. 15, 1988, 63-286622

Int. Cl.[5] B23C *3/00*; E03F *3/06*

U.S. Cl. 409—143 16 Claims



1. An apparatus for conducting operations in the interior of a pipe such as cutting off the pipe for boring a hole in the pipe, removing substances attached to the inner surface of the pipe or a protrusion of a branch pipe extending into the pipe, or disposing a plug into the pipe opening of the branch pipe, comprising:

A) a tool having a rotary axis;

B) support means disposed in the interior of said pipe so as to be movable in the axial direction of the pipe;

C) fluid guide means for guiding operating fluid, said guide means including a rod extending in the axial direction of said pipe and a tubular receiving member defining a space to receive the rod, said receiving member being supported by said support means and further provided with a plurality of liquid paths for the operating fluid, said rod being received within said space of said receiving member to be movable in the axial direction thereof and rotatable about its own axis;

D) first drive means for angularly rotating said rod about its own axis with respect to said receiving member and also for moving the rod in the axial direction thereof; and

E) second drive means for supporting said tool and for rotating said tool about its own rotary axis, said second drive means being actuated by said operating fluid which passes through said fluid guide means and being connected to said rod, to be rotated and moved together with the rod by said first drive means; and

wherein said rod has a plurality of recesses disposed in the outer periphery of the rod so as to extend in the peripheral direction and formed spaced apart from each other in the axial direction of said pipe, and has a plurality of holes extending in the axial direction of said pipe, the recesses being respectively communicated with the liquid paths, the holes being respectively communicated with the recesses.



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5,046,904

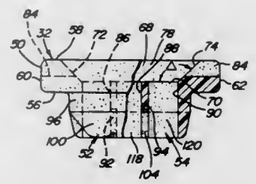
## NUT FOR MOUNTING TRIM TO A MOTOR VEHICLE

Ivanna G. Malinow, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1990, Ser. No. 566,687

Int. Cl.[5] F16B *13/04*

U.S. Cl. 411—15 5 Claims



1. A one-piece molded plastic nut for receiving a screw adapted to retain a trim assembly to a panel having a slot, the plastic nut comprising:

a head having a bottom surface and a top surface with a trench molded into the head and opening onto the top surface, and the trench having a bottom face with a plurality of holes molded in the bottom face of the trench and extending through to the bottom surface of the head for receiving the screw and the trench having a pair of opposing facing planar side walls and a pair of opposing facing planar end walls angled towards the bottom face for guiding the screw towards one of the holes in the bottom face; and

a pair of legs adapted for insertion into the slot in the panel for engaging the panel and retaining the plastic nut to the panel and securely engaging the slot after the screw passes through one of the holes in the head and the screw forms an interference fit between the legs thereby retaining the legs against the panel adjacent to the slot whereby the trim assembly is secured to the panel by the screw which is guided into one of the holes by the planar walls.

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5,046,905

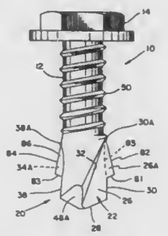
## WINGED DRILL SCREW

Frank Piacenti, Campbellsville, and Steven N. Flinchum, Elkhorn, both of Ky., assignors to Emhart Inc., Towson, Md.

Filed Jul. 6, 1989, Ser. No. 376,325

Int. Cl.[5] F16B *25/00*

U.S. Cl. 411—387 7 Claims



1. A drilling and thread forming fastener for fastening a softer workpiece to a harder workpiece comprising

a threaded shank and

a pilot end,

a plurality of flutes extending longitudinally along said pilot end, each defining a flute surface and a drag surface,

at least one material removing wing extending radially outwardly from and frangibly connected to said pilot end, said wing having

a leading surface defining an angle of between about 1 and 5 degrees to the longitudinal axis of said fastener, said leading surface being continuous with a portion of an associated flute surface,

a trailing convex surface which merges into said pilot end and which with said leading surface defines a tear-drop like crescent shaped rib when said wing is viewed radially,

said surfaces terminating at a lower cutting edge making a relief angle of about 10 to 50 degrees to a plane perpendicular to said longitudinal axis and

said rib tapering radially inwardly from the outermost end of said cutting edge to the location where it mergers into said pilot portion.

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5,046,906

## FORCE APPLICATORS

John W. Bucknell, Unit 5/11 Sevenoaks Street, Taringa, Queensland, 4086, Australia

PCT No. PCT/AU88/00381, § 371 Date May 7, 1990, § 102(e) Date May 7, 1990, PCT Pub. No. WO89/02807, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 29, 1988, Ser. No. 478,009

Claims priority, application Australia, Sep. 29, 1987, PI4642

Int. Cl.[5] F16B *37/08*

U.S. Cl. 411—432 7 Claims

1. A hydraulic nut for applying a load to a threaded tensile member relative to a clamping surface through which the threaded tensile member projects, said hydraulic nut including:

an annular housing having a stepped annular recess extending inwardly from an end face of the annular housing opposite to the clamping surface, the stepped annular recess defining a central bore for the tensile member and forming a cylinder for a piston member, the annular housing having an exterior threaded peripheral locking surface;

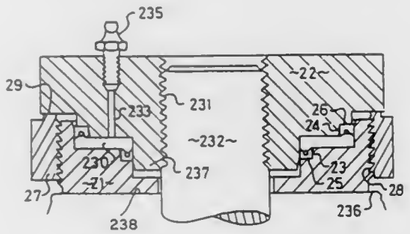
a piston having an axial bore therethrough which is threaded to engage, in use, about the threaded tensile member, said piston being of complementary stepped configuration to said stepped recess of said housing whereby said piston is slidably engaged in said housing, the diameter of said piston being greater than the diameter of said housing so as to provide a peripheral flange radially outwardly of the

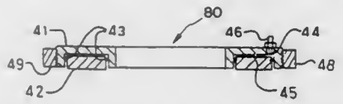
peripheral locking surface of said housing, said flange having a bottom surface which defines a locking face,

sealing means provided between the relatively movable surfaces of said housing and said piston,

a locking collar having an internal thread engageable with the threaded peripheral locking surface of said housing, said locking collar having an upper end surface engageable with said locking face of said piston member when said locking collar is moved upwardly toward said piston following pressure application;

said stepped annular recess of said housing and said stepped piston member having opposed pressure faces which




define therebetween an annular chamber the volume of which depends upon the relative displacement of the piston member relative to the annular housing; and

pressure application means communicating through said piston to said annular chamber whereby pressurized fluid may be applied to and expand said annular chamber to displace said piston relative to the said housing and tension said tensile member,

whereby, said locking collar can be screwed against said locking face of said piston member so that the expanded annular chamber can be maintained, thus maintaining tension in the tensile member when said pressure is released.

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**5,046,907**

## ONE-PIECE ELASTIC RAIL MOUNTING CLIP

**Hans J. von Lange, Stewartstown, Pa., and Oswald Lochschmidt, Bergisch-Gladbach, Fed. Rep. of Germany, assignors to Hans J. Von Lange, Stewartson, Pa.**

**Filed Apr. 23, 1990, Ser. No. 512,918**
**Int. Cl.[5] F16B *15/06*; E01B *9/00, 13/00***
**U.S. Cl. 411—456** **36 Claims**

1. A one-piece spring clip for positively and elastically anchoring a rail relative to a tie plate without using any screws, said tie plate including fastening holes,

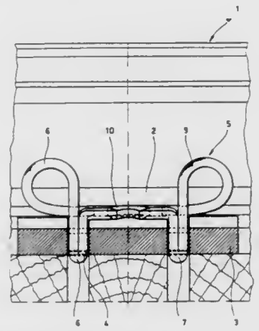
the spring clip being made of bent flat steel,

the spring clip including two shanks for engaging the fastening holes, each shank being followed by a spring loop defining a full circle of approx. 360°,

each shank being defined by a straight rod member and including at a lower end thereof, at least one projection-type anchoring hook projecting above the cross-section of the shank and adapted to engage the tie plate underside, which faces away from the rail, in the area of the fastening hole,

the spring clip including a connecting member between the two spring loops, said connecting member including at least one area of contact, which rests on the rail foot for holding down the rail, and

each shank including at an upper end thereof a projection, which serves as an overload protection means and which is arranged at a distance of approximately 1.5 mm above




the surface of the rail foot in an inserted and tensioned condition of the spring clip.

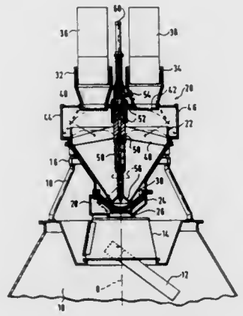
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**5,046,908**

## INSTALLATION FOR CHARGING A SHAFT FURNACE

**Giovanni Cimenti, Fentange, and Emile Lonardi, Bascharage, both of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg**

**Filed Nov. 7, 1989, Ser. No. 432,687**
**Claims priority, application Luxembourg, Nov. 9, 1988, 87379**
**Int. Cl.[5] F27B *11/00***
**U.S. Cl. 414—203** **5 Claims**



1. An apparatus for charging a shaft furnace, said shaft furnace having a furnace head, a drive housing mounted on the furnace head and a distribution chute rotatably suspended from the drive housing, comprising:

a casing mounted on the furnace head, said casing having a cylindrical top portion downwardly extending from a top end and a conical bottom portion extending from the top portion to an open bottom end, said top end having openings for receiving charging material,

a conical hopper rotatably suspended within the casing, said hopper having an open top end for receiving charging material and an open bottom end for discharging the charging material,

means for rotatably suspending the hopper;

transport means for delivering a stream of charging material through the openings in the top end of the casing to the hopper,

flow control means for regulating flow of the stream of charging material from the transport means to the hopper;

a deflecting plate within the hopper, said plate having a closed position for closing the bottom end of the hopper and said plate being movable vertically upwardly from the closed position to define an annular orifice at the bottom end of the hopper;

means for moving the deflecting plate vertically within the hopper;

means for regulating flow of a stream of charging material from the annular orifice.



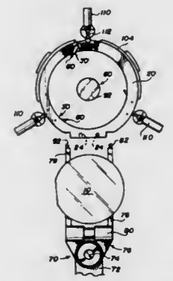
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**5,046,909**

## METHOD AND APPARATUS FOR HANDLING SEMICONDUCTOR WAFERS

**Steven Murdoch, Palo Alto, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.**

**Continuation of Ser. No. 373,734, Jun. 29, 1989, abandoned.**
**This application Dec. 24, 1990, Ser. No. 632,599**
**Int. Cl.[5] B65H *1/62, 5/00***
**U.S. Cl. 414—225** **26 Claims**



18. Apparatus for handling semiconductors wafers used for the production of integrated circuit structures which permits processing of both the top and bottom surfaces of the wafer which comprises:

a) a retaining ring having engagement means thereon to permit said retaining ring to be engaged to transfer said wafer and said retaining ring from one processing station to another to perform one or more processing steps on one or more surfaces of said wafer;

b) means on said retaining ring for engaging the end edges of said wafer leaving both the top and bottom surfaces of said wafer exposed for processing;

c) an inner diameter on said retaining means sufficiently larger than the outer diameter of said wafer to permit equal processing of both sides of said wafer without interference by shadowing from said retaining ring;

(d) storage means for removably storing a plurality of said retaining means in a vertical stack;

(e) a rotatable platform concentrically mounted within said storage means to receive said wafer and rotate it to radially orient said wafer prior to insertion of said wafer into said retaining ring and engagement of said wafer by said retaining ring; and

(f) means connected to said platform for lowering said wafer into a position for engagement with a retaining ring stored in said vertical stack in said storage means.

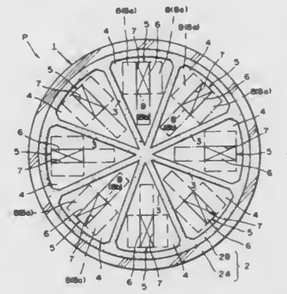
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**5,046,910**

## MAIN BODY STRUCTURE FOR UNDERGROUND PARKING LOT AND UNDERGROUND PARKING LOT USING THE STRUCTURE

**Tomoya Tokuhiro; Teruo Hatano; Koshin Kikuchi, and Shinichi Ozaki, all of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan**

**Filed Mar. 22, 1990, Ser. No. 497,604**
**Claims priority, application Japan, Mar. 23, 1989, 1-71159**
**Int. Cl.[5] E04H *6/12***
**U.S. Cl. 414—261** **7 Claims**



1. An underground parking lot comprising: an outer wall formed in a substantially cylindrical shape for defining a space under ground;

a radial structural body formed within and connected to said outer wall for dividing said space of said outer wall into plural vehicle accommodation spaces; and

vehicle accommodation mechanisms respectively provided in said vehicle accommodation spaces, each vehicle accommodation mechanism including a lift for going up and down with a vehicle loaded thereon, a well for said lift, and plural vehicle receiving stands vertically arrayed close to said lift well.

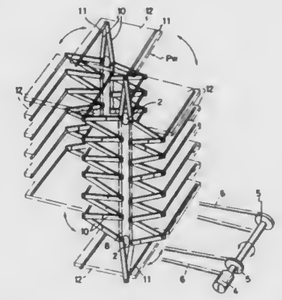
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**5,046,911**

## TRAY SUPPLY APPARATUS

**Naoyuki Ogura, and Takami Aono, both of Hamamatsu, Japan, assignors to Tenryu Technics Co., Ltd., Shizuoka, Japan**

**Filed Feb. 2, 1990, Ser. No. 474,362**
**Claims priority, application Japan, Feb. 3, 1989, 1-11921[U]**
**Int. Cl.[5] H05K *13/02***
**U.S. Cl. 414—331** **6 Claims**



1. A tray supply apparatus for supplying electronic components comprising,

a pair of support means oppositely disposed and offset from each other, each of said support means having an inward side opposite the corresponding inward side of the other

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support means, and each of the support means having upper and lower portions;

two pairs of sprockets, each said pair associated respectively with each of said support means, each said pair of sprockets being rotatably arranged respectively at the upper and lower portions of respective said support means;

a pair of endless transmission means, one of said transmission means at each of said support means, each said transmission means extending between respective said pairs of sprockets to form a drive loop such that said transmission means is movable along a looped orbit in a vertical plane;

two groups of a plurality of arms, each said group of arms having opposite inner and outer ends, each of said arms of a respective said group being pivotally linked end to end in closed geometrical configuration such that the inner ends of consecutive arms of one group are paired and pivotally connected to a corresponding one of said transmission means the outer opposite end of each said arm is paired and pivotally connected to another consecutive arm and extends away from said corresponding transmission means;

two groups of a plurality of shafts, each said group of shafts corresponding to one of said support means, each shaft of a respective said group of shafts having one end pivotally joined to a pair of pivotally connected outer ends of said arms, the opposite end of said shaft having a cantilevered free end and extending in a horizontal direction toward the opposite support means such that said shaft is movable with one and only one of said transmission means, each shaft of the other said group of shafts having one end pivotally joined to a pair of pivotally connected outer ends of said arms in the other said group of arms, the opposite ends of said shafts in the other said group of shafts having cantilevered free ends and extending in a direction opposite the first direction toward the corresponding opposite support means such that the shaft of the second said group of shafts is movable only with the other of said transmission means;

a plurality of tray pallets each of which is supported by one shaft from each of said group of shafts,

drive means for rotatably driving said pairs of sprockets synchronously such that said tray pallets are maintained in a predetermined posture, and each of said tray pallets is moved intermittently along said orbit of said endless transmission means between an uppermost position of said looped orbit and a lowermost position of said looped orbit;

a plurality of trays mounted respectively on said tray pallets and accommodating a plurality of electronic components therein; and,

article withdrawal means positioned above said uppermost position of said looped orbit for withdrawing electronic components from one of said trays which is stopped at said uppermost position.

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**5,046,912**

**CAR DUMPER**

**John Bostrom, Glen Dale, and Eugene A. Annis, Baltimore, both of Md., assignors to Rail Engineering, Inc., Baltimore, Md.**

**Filed Dec. 23, 1988, Ser. No. 289,140**

**Int. Cl.[5] B65G** *67/48*

**U.S. Cl. 414—358** **31 Claims**

3. Apparatus for dumping top-unloading railcars comprising:

A. a car-receiving cradle, rollable between a generally upright starting position for receiving a loaded car and a dumping position in which the cradle has been sufficiently inverted for dumping the contents of a car, and including

1. a longitudinal axis,

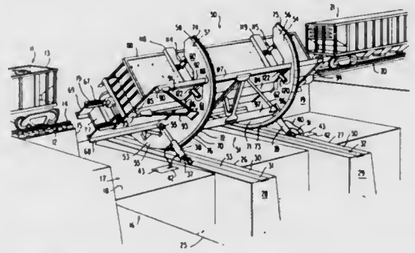
2. rocker members with arcuate peripheries,

3. car rails mounted within said rocker members for supporting a loaded car on said cradle, and

4. a combined center of gravity of the car, of its load and of said cradle located relative to the peripheries of said rocker members for causing said cradle,

a. with a loaded car thereon, to lower its center of gravity while moving from said starting position in a prior portion of its dumping motion comprising an angular interval in the range of about 70 to about 110 degrees and to continue beyond said interval to said dumping position in a subsequent portion of its dumping motion, and

b. with an emptied car thereon, to lower its center of gravity in a prior portion of its return motion from said dumping position and, while passing through



said angular interval to said starting position, to elevate its center of gravity in a subsequent portion of said return motion;

B. cradle track running laterally of said longitudinal axis beneath and supportively engaging said rocker members for rolling and lateral displacement of said cradle along said cradle track between said starting and car dumping positions; and

C. at least one fluid actuated cylinder connected with said cradle for applying fluid under pressure for moving said cradle beyond said interval during its car-dumping motion and within said interval during its return motion.

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**5,046,913**

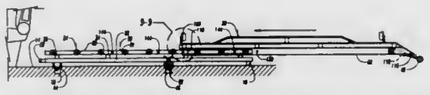
**QUICK INSTALL AND REMOVE SLIDABLE CARRYING TABLE FOR VEHICLES**

**Robert F. Domek, R.R. 2, and Douglas J. Metz, 1608 Pleasant St., both of Emmetsburg, Iowa 50536**

**Filed Feb. 8, 1990, Ser. No. 476,899**

**Int. Cl.[5] B60P** *3/00*

**U.S. Cl. 414—522** **5 Claims**



1. An easy to install and remove slidable carrying table for vehicles comprising:

a unitary table means having a generally planar upper carrying surface;

a unitary base frame means removably securable to a vehicle floor;

a connection means for providing slidable movement of the table means with respect to the base frame means; and

wheel means operatively connected to at least one end of the table means to allow rolling transport of the table means, the wheel means being retractable from a first extended position to a second retracted position and comprising a tubular longitudinal member having at one end a transverse axle to the longitudinal axis of the tubular member onto which a rotatable wheel is attached, and having a pin means rigidly connected to the tubular member and extending transversely from the longitudinal axis, a sleeve means mounted to the table means slidably receiving the tubular member and including a slot in its surface, the slot defining stop portions for the first and second positions of the wheel means, the slot allowing locking of the wheel means in the first and second positions and rotation of the tubular member around the longitudinal axis to rotate the wheel to a retracted second position.



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**5,046,914**

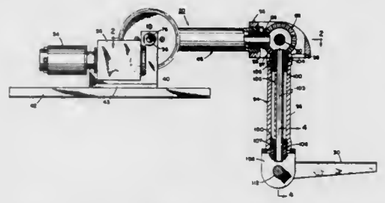
**PARALLEL LIFTING DEVICE**

**John M. Holland, Shawsville, and Kenneth F. Kennedy, Roanoke, both of Va., assignors to Cybermation, Inc., Roanoke, Va.**

**Continuation of Ser. No. 218,094, Jul. 12, 1988, abandoned. This application Oct. 23, 1990, Ser. No. 609,016**

**Int. Cl.[5] B66C** *1/00*

**U.S. Cl. 414—706** **15 Claims**



1. A lifting device (**20**) for attachment to a base (**43**) for maintaining a load supported thereby at a fixed orientation relative to the base comprising:

A) a first shaft (**56**) fixedly mounted to a base;

B) a first gear (**78**) fixedly attached to the shaft;

C) a first yoke (**58**) rotatably mounted to the shaft;

D) a first arm assembly (**26**) including:

1) a first arm (**72**) attached at one end to the first yoke,

2) a second shaft (**82**) rotatably mounted to the first arm,

3) a second gear (**80**) mounted to a first end of the second shaft and meshed with the first gear so as to rotate the second shaft about its axis when the first arm is angularly displaced about the first gear, and

4) a third gear (**86**) mounted at the second end of the second shaft;

E) a second yoke (**92**) fixedly attached to the second end of the first arm;

F) a fourth gear (**88**) rotatably mounted to the second yoke, the fourth gear meshed with the third gear mounted at the second end of the second shaft;

G) a second arm assembly (**94**) including;

1) a second arm (**96**) having a longitudinal axis and being movably attached at one end to the second yoke for free pivotal movement relative to the second yoke and the first arm under the influence of gravity thereby permitting the longitudinal axis of the second arm to maintain a vertical orientation, the second arm being pivoted relative to the first arm solely by the influence of gravity,

2) a third shaft (**102**) rotatably mounted to the second arm,

3) a fifth gear (**104**) mounted to a first end of the third shaft and meshed with the fourth gear, and

4) a sixth gear (**106**) mounted at the second end of the third shaft;

H) a third yoke (**108**) attached to the second end of the second arm;

I) a seventh gear (**110**) rotatably mounted to the third yoke, the seventh gear meshed with the sixth gear mounted at the second end of the third shaft;

J) a platform (**30**) for supporting a load;

K) means (**112, 114, 115, 116**) for interconnecting the platform to the seventh gear; and

L) means (**34, 36, 50, 52**) for angularly rotating the first yoke and thus the first arm about the first shaft mounted to the base;

whereby angular movement of the first arm assembly imparts equal angular movement to the platform with respect to the second arm assembly so that the platform maintains a fixed orientation to the base.

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**5,046,915**

**ROTATIONAL DRIVING APPARATUS WITH FRICTIONAL ENGAGEMENT AND ROBOT USING THE SAME**

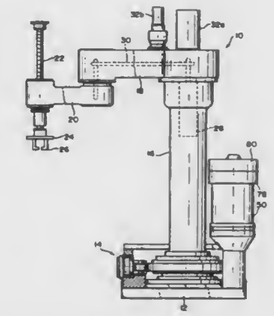
**Yusaku Azuma, Yokohama; Takeo Tanita, Kawasaki; Toshihiro Yamamoto, Yokohama; Shozo Kasai, Kawasaki; Masateru Yasuhara, Kawasaki, and Yasuhiro Sawada, Chofer, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 262,309, Oct. 25, 1988, Pat. No. 4,951,517. This application Jun. 21, 1990, Ser. No. 541,924**

**Claims priority, application Japan, Oct. 28, 1987, 62-270236; Sep. 16, 1988, 63-120462**

**Int. Cl.[5] B25J** *18/00, 19/02;* **F16H** *13/14*

**U.S. Cl. 414—744.5** **7 Claims**



1. A robot comprising:

a base;

a shaft member planted on said base;

a horizontal arm being rotatable about a central axis of said shaft;

an operating member attached to said horizontal arm;

driving means for rotating said shaft member, said driving means including a driving source, and a driving roller connected to said driving source;

a rotating member which is connected to said shaft member and is in rolling contact with said driving roller;

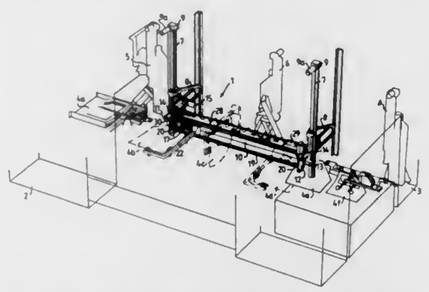
pressing means for pressing said rotating member and driving roller against each other, said pressing means including a pressing roller and a pressing member; and

housing means for coupling said rotating member, said driving roller and said pressing means, said housing means including a driving housing for rotatably supporting said driving roller, a pressing housing for rotatably supporting said pressing roller and a connecting member for connecting said driving housing and pressing housing with each other, said driving housing and pressing housing being arranged so that said driving roller and pressing roller are opposed so as to position the rotating axis of said rotating member at a center therebetween, and said connecting member defining the set positions of said driving housing and pressing housing thereby maintaining the pressing condition of said driving and pressing rollers against the rotating member.

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5,046,916
## HANDLING APPARATUS
Leif Sörensen, Olofstöm, Sweden, assignor to AB Volvo, Gothenburg, Sweden
PCT No. PCT/SE88/00472, § 371 Date Jan. 29, 1990, § 102(e) Date Jan. 29, 1990, PCT Pub. No. WO89/02348, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 16, 1988, Ser. No. 460,183
Claims priority, application Sweden, Sep. 21, 1987, 8703629
Int. Cl.[5] B65G *35/00*
U.S. Cl. 414—751 4 Claims



1. In apparatus for transporting and handling piece goods (4), comprising a stand; a transport rail (10) carried by said stand; a trolley (17) which can be moved along the rail (10) by means of a separate drive means (19); and a gripping device (22) which is pivotally mounted on the trolley and adapted to hold said piece goods (4); the improvement comprising a rotatably journalled guide shaft (28) of non-round cross-section which extends substantially the length of and parailel with the transport rail (10); a follower (30, 31) which is rotatably arranged on the trolley (17) and connected to the guide shaft (28) so as to be slideable therealong but torsionally rigid in a radial direction; means (29) to rotate said guide shaft (28); and an angular rotation transmission means (23–27, 40) converting rotation of said guide shaft (28) to swinging movement of said gripping device (22).

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5,046,917
## APPARATUS FOR FORMING STACKS OF ACCUMULATOR PLATES
Helmut Frey, Ferlach, Austria, assignor to Akkumulatorenfabrik Dr. Leopold Jungfer, Feistritz im Rosental, Austria
Filed May 30, 1990, Ser. No. 530,609
Claims priority, application Austria, Jun. 7, 1989, 1401/89
Int. Cl.[5] B65G *57/04, 57/08*
U.S. Cl. 414—789.5 9 Claims

1. An apparatus for assembling a stack of a predetermined number of sets of accumulator plates, comprising:

a plurality of magazine means each storing, in a substantially upright orientation, a different kind of accumulator plate of said set;

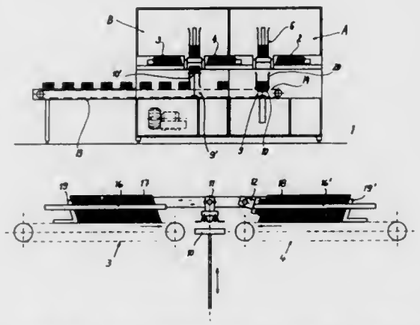
transfer means adapted for receiving, in a first plane, said predetermined number of sets thereon;

stationary means associated with said transfer means in said first plane for precisely aligning said sets in superposition;

means for sequentially feeding one plate at a time from its upright orientation in each magazine to a substantially level orientation on said transfer means for assembling said stack thereon;

conveyor means adapted for removing, in a second plane, said stack from said transfer means; and

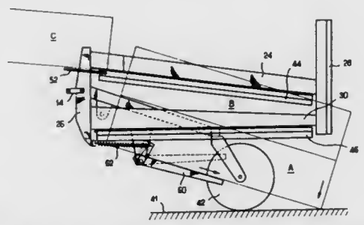
means for initially moving said transfer means relative to said aligning means from said first plane in increments substantially equal to each set of plates received thereon and for thereafter moving said transfer means to position



said stack in said second plane for removal by said conveyor means.

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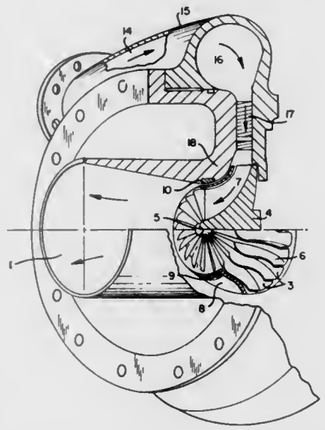
5,046,918
## DEVICE FOR GROUPING BALES OF FODDER
Marc A. Berlivet, La Chapelle Hermier; Jean J. H. Barreteau, St-Gilles Croix De Vie, and Michel H. Mathis, Challans, all of France, assignors to Hesston Braud, France
Filed Mar. 2, 1990, Ser. No. 487,663
Claims priority, application France, Mar. 3, 1989, 89 02831
Int. Cl.[5] B65G *57/08, 57/32*
U.S. Cl. 414—789.7 7 Claims



1. A device for grouping parallelepipedic bales of fodder produced by a bale press, comprising a chassis having a forward and rear end and adapted to be drawn by the bale press, said chassis being supported on at least two wheels and provided with a drawbar on the forward end thereof, wherein the chassis includes a first, upper and a second, lower pair of retractable lateral slides, the forward end of the first, upper pair of said slides being placed at a level substantially corresponding to the level of the output plane of the bale press, and the forward end of the second, lower pair of said slides being placed below the forward end of the first, upper pair of slides at a distance therefrom approximately corresponding to the thickness of a bale, so as to define an inner space of said chassis and wherein the slides of the upper pair of slides are inclined downward from the forward end to the rear end of the chassis.



5,046,919
## HIGH EFFICIENCY TURBOEXPANDER
James B. Wulf, Williamsville, N.Y., assignor to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.
Continuation of Ser. No. 380,531, Jul. 17, 1989, abandoned. This application Jul. 27, 1990, Ser. No. 560,003
Int. Cl.[5] F01D *1/00*
U.S. Cl. 415—1 9 Claims



1. A method for operating a turboexpander having a rotatable assembly comprising a shaft, an impeller hub mounted on the shaft, and a plurality of blades on the impeller hub to form a plurality of fluid flow paths, each fluid flow path defined by the impeller hub surface and two adjacent blades, said method comprising:

(A) passing fluid into a fluid flow path at the design point of the turboexpander at an angle directed toward the leading edge of the trailing blade of the two adjacent blades forming the fluid flow path wherein the angle is within the range of from about −10 to −40 degrees wherein the negative sign of the angle denotes the direction from orthogonal opposite to that in which the rotatable assembly rotates; and

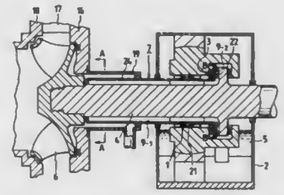
(B) passing the fluid through the fluid flow path while maintaining the pressure normal to the means streamline of the fluid in the meridional plane between the impeller surface and the shroud surface substantially constant.

7. A turboexpander having a rotatable assembly comprising a shaft, an impeller hub mounted on the shaft, and a plurality of blades on the impeller hub to form a plurality of fluid flow channels, each fluid flow channel defined by the impeller hub surface and two adjacent blades, characterized by:

(A) means to provide fluid into a fluid flow channel at the design point of the turboexpander at an angle directed toward the leading edge of the trailing blade of the two adjacent blades forming the fluid flow channel wherein the angle is within the range of from about −10 to −40 degrees wherein the negative sign of the angle denotes the direction from orthogonal opposite to that in which the rotatable assembly rotates; and

(B) the impeller hub and the two adjacent blade surfaces forming the fluid flow channel being contoured so that as a fluid element moves through the fluid flow channel along the mean streamline, the sum of the forces on the element normal to the streamline in the meridional plane is about zero.

5,046,920
## BEARING COOLING SYSTEM IN HORIZONTAL SHAFT WATER TURBINE GENERATOR
Izumi Higashi, and Akio Adachi, both of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Feb. 20, 1990, Ser. No. 482,054
Claims priority, application Japan, Feb. 23, 1989, 1-43557; Mar. 9, 1989, 1-57527; Jul. 6, 1989, 1-174686
Int. Cl.[5] F01D *25/08*
U.S. Cl. 415—111 12 Claims



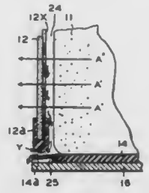
1. A bearing cooling system for a water turbine having a rotatable shaft connected at one end to a movable blade portion and supported by a journal bearing and a thrust bearing having a collar, axially spaced from the movable blade portion, the system comprising:

a first container surrounding and spaced from the rotatable shaft, said first container extending axially from a predetermined engaging position adjacent the one end of the shaft to the journal and thrust bearings, the thrust bearing engaging the outer surface of the first container, the shaft and thrust bearing and inner surface of the container defining walls of a sealed first chamber surrounding a portion of the rotatable shaft and communicating with the journal and thrust bearings, said first chamber adapted to contain a fluid for absorbing heat generated by the journal and thrust bearings; and

a second container spaced from and surrounding a portion of the first container adjacent the one end of the shaft, said second container and said first container defining a second chamber for receiving and containing flowing water from the turbine for cooling the fluid in the first chamber.

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5,046,921
## MOISTURE-REMOVAL DEVICE FOR A COMPRESSED AIR SYSTEM
Hideo Tamamori, Kobe, Japan, assignor to Nippon Air Brake Co., Ltd., Kobe, Japan
Filed Jun. 22, 1990, Ser. No. 542,291
Claims priority, application Japan, Jul. 4, 1989, 1-79021[U]
Int. Cl.[5] F03B *11/08*
U.S. Cl. 415—121.2 11 Claims



1. A moisture-removal device for use in a compressed air system including an air compressor for supplying air to a main reservoir via a regeneration reservoir comprising:

(a) a main body having a chamber, a first port via which said chamber is connected to said air compressor and a second port via which said chamber is connected to said regeneration reservoir;

(b) a filter assembly fixed in said chamber between said

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compressor and said regeneration reservoir, said filter assembly comprising:

(i) a first filter formed of adsorbent particles;

(ii) a second filter surrounding said first filter in spaced-apart relationship therewith to form a cavity therebetween;

(iii) upper and lower plate members between which said first and second filters are clamped; and

(iv) seal means between said second filter and at least said lower plate member for interrupting fluid pressure communication between said cavity and said chamber; and

(c) said seal means including differential pressure responsive valve means for establishing fluid pressure communication between said cavity and said chamber when said chamber is vented to atmosphere.

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**5,046,922**

## POLYMERIC CASING FOR FLUID MACHINES AND PUMPS

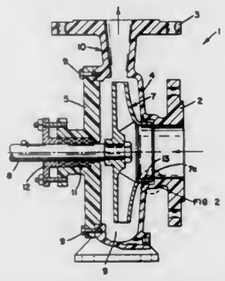
**Toshio Nakamura; Yoshimi Soeda; Shuichi Mitsuhori, and Kazuo Toubo, all of Yokohama, Japan, assignors to Nippon Zeen Co., Ltd. and Ebara Corporation, both of Tokyo, Japan**

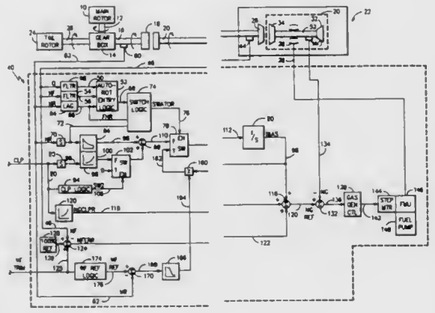
**Filed Dec. 21, 1989, Ser. No. 454,249**

**Claims priority, application Japan, Dec. 26, 1988, 63-328738**

**Int. Cl.[5] F01D** *11/00, 25/00*

**U.S. Cl. 415—172.1** **18 Claims**





**16.** A structural member devoid of reinforcing material for a fluid machine comprising a polymeric material which is molded to a desired configuration by polymerizing a reaction solution in a mold, said reaction solution comprising at least one norbornene-type monomer, a metathesis catalyst system and 3 to 12% by weight of an elastomer, said member has a heat distortion temperature of over 120° C., elongation at break of 15 to 80%, and a flexural modulus of elasticity of 170 kg/mm$^2$ or above.

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**5,046,923**

## HELICOPTER AUTOROTATION DETECTION AND RECOVERY

**Douglas A. Parsons, Enfield, and Mark A. Johnston, Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Oct. 2, 1989, Ser. No. 416,176**

**Int. Cl.[5] F01B** *25/00;* **F16D** *23/00;* **B60K** *41/00*

**U.S. Cl. 416—30** **17 Claims**

**1.** A control for a helicopter gas turbine engine having a free turbine with an output shaft for driving a rotor mechanically coupled thereto and having a gas generator for driving the free turbine, comprising:

rotor speed means, for providing a rotor speed signal indicative of the actual rotary speed of the rotor;

gas generator speed means, for providing an actual gas generator speed signal indicative of the actual rotary speed of the gas generator;

engine control means, for providing an autorotation signal indicative of the mechanical coupling state between the rotor and the free turbine output shaft, for providing, in response to said rotor speed signal, a rotor deceleration signal indicative of the deceleration of said rotor, for providing a desired gas generator speed rate of change signal indicative of a desired gas generator speed rate of change during a recovery from autorotation, for providing a desired gas generator speed signal indicative of a desired gas generator speed, and for providing a fuel command signal in response to said actual gas generator speed signal and said desired gas generator speed signal; and

fuel metering means, for metering fuel to the gas generator at a flow rate determined in response to said fuel command signal; characterized by:

said engine control means comprising means for integrating said desired gas generator speed rate of change signal in response to said autorotation signal being indicative of the rotor being mechanically decoupled from the free turbine output shaft, for providing an integrated recovery signal indicative thereof, and for providing said desired gas generator speed signal with a fuel increasing component as a function of said integrated recovery signal and in the presence of said autorotation signal being indicative of the rotor being mechanically decoupled from the free turbine output shaft and continuing until said rotor deceleration signal is nearly zero.



**5,046,924**

## PROCESS AND CIRCUIT ARRANGEMENT FOR CONTROLLING A CONSUMER DRIVEN BY AN INTERNAL COMBUSTION ENGINE

**Jürgen Gras, Bietigheim-Bissingen, and Jan-Tian Tjoa, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

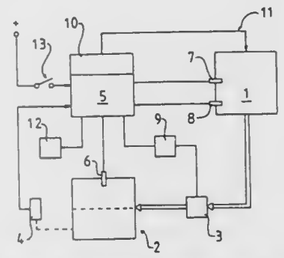
**PCT No. PCT/DE89/00531, § 371 Date Apr. 12, 1990, § 102(e) Date Apr. 12, 1990, PCT Pub. No. WO90/02664, PCT Pub. Date Mar. 22, 1990**

**PCT Filed Aug. 16, 1989, Ser. No. 477,887**

**Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 3829635**

**Int. Cl.[5] F04B** *49/08*

**U.S. Cl. 417—15** **11 Claims**



**1.** A method for controlling a consumer which can be decoupled and coupled to an internal combustion engine so as to be driven thereby, the method comprising the steps of:

determining the anticipated load which the consumer will place on the engine before coupling the consumer to the engine;

increasing the power output of the engine so as to adapt said power output to the determined anticipated load; and,

after the power of the engine has been adapted to said anticipated load, coupling the consumer to the engine.

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**5,046,925**

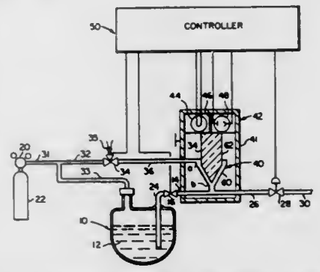
## GAS PISTON LIQUID FLOW CONTROLLER

**Robert E. Fletcher, Vista, Calif., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**

**Continuation-in-part of Ser. No. 452,901, Dec. 19, 1989, abandoned. This application Jan. 8, 1991, Ser. No. 638,714**

**Int. Cl.[5] F04F** *1/06*

**U.S. Cl. 417—138** **6 Claims**




**1.** A gas piston flow controller comprising in combination:

(a) a closed chamber having a known volume;

(b) first means to controllably introduce pressurized gas into said chamber;

(c) second means to controllably introduce liquid into said chamber;

(d) third means to controllably withdraw a stream of said liquid for delivery to a point of use;

(e) means to detect predetermined upper and lower levels of liquid retained in said chamber; and

(f) a controller adapted to control said first, second and third means so that when said means to detect said levels detects said liquid at said upper level, said second means shuts off flow of said stream of liquid to said chamber, when said means to detect said level detects said liquid at said lower level, said first means shuts off flow of said pressurized gas to said chamber while said second means opens to reestablish flow of said liquid to said chamber and said controller permits flow through said third means only when liquid is present in said chamber and wherein said first, second and third means are controlled positive shut-off valves.

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**5,046,926**

## CONTROL DEVICE FOR A VARIABLE DISPLACEMENT HYDROSTATIC MACHINE

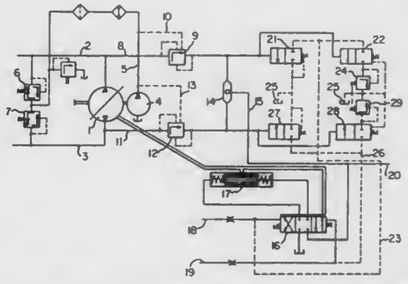
**Horst Deininger, Hoerstein/Alzenau; Gustav Kleineisel, Mainaschaff, and Rudolf Richter, Hoesbach, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jul. 30, 1990, Ser. No. 559,298**

**Claims priority, application Fed. Rep. of Germany, Jul. 31, 1989, 3925297**

**Int. Cl.[5] F04B** *49/08*

**U.S. Cl. 417—216** **15 Claims**



**1.** A control device including a closed fluid circuit adapted to be connected to a variable displacement hydrostatic machine, two delivery lines in said circuit for connection to a hydrostatic machine, a main pump connected to said delivery lines, a stroke-volume regulator in said circuit responsive to an actuating pressure for controlling the operation of a variable displacement hydrostatic machine, a booster pump in said circuit, a feed pressure line in said circuit connecting said booster pump to said delivery lines, actuating pressure lines in said circuit adapted to connect a variable displacement hydrostatic machine to said stroke-volume regulator whereby the fluid pressure in said circuit is the actuating pressure for said stroke-volume regulator if sufficient pressure is provided by a variable displacement hydrostatic machine connected to said circuit and said booster pump increases the actuating pressure supplied to said stroke-volume regulator if insufficient pressure supplied is provided by a variable displacement hydrostatic machine connected in said circuit, a proportioning pressure regulator located in each of said actuating-pressure lines, whereby each of said proportioning pressure regulators supplies an outlet pressure to adjust said stroke-volume regulator to reduce the delivery pressure to a hydrostatic machine connected to said circuit.

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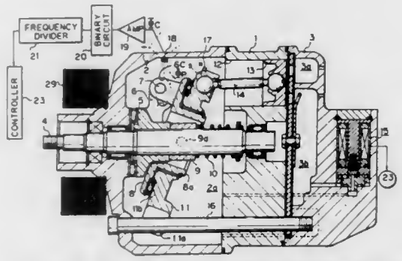


5,046,927

## WOBBLE PLATE TYPE VARIABLE CAPACITY COMPRESSOR WITH A CAPACITY DETECTOR

Junichi Ohno; Chuichi Kawamura, and Kazuya Kimura, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed May 3, 1990, Ser. No. 518,655
Claims priority, application Japan, May 10, 1989, 1-116592
Int. Cl.[5] F04B *1/26, 1/12*
U.S. Cl. 417—222 S 4 Claims




1. A variable capacity wobble plate type compressor including:

an outer casing having a crankcase provided with an interior for receiving a drive and a wobble plate therein, a cylinder block provided with cylinder bores in which compressing pistons reciprocate, and a rear head provided with a suction chamber for a refrigerant gas before compression and a discharge chamber for the refrigerant gas after compression, the crankcase, the cylinder block, and the rear head being axially sealingly combined together to form the outer casing;

an axially extending steel drive shaft rotatably supported by the outer casing and driven by an external drive source via a solenoid-operated clutch mounted on an end of the outer casing;

a magnetic material support member mounted on the drive shaft to be rotated with the drive shaft and provided with an arm portion radially projected from the support member in the crankcase interior;

a rotatable drive plate pivoted on the arm portion of the magnetic material support member and capable of changing an angle of inclination between an erect position substantially vertical to an axis of the drive shaft and a given inclined position, the drive plate supporting a non-rotatable wobble plate supported thereon to cause a wobbling of the wobble plate to thereby reciprocate the pistons at piston strokes varying in response to a change in a pressure in the crankcase interior; and

a capacity detecting means which comprises:

a permanent magnet attached to a portion of an outer periphery of the wobble plate;

a magnetic sensor fixedly attached to the crankcase of the outer casing at a position suitable for sensing an approach and departure of the permanent magnet, the magnetic sensor being capable of generating electric signals indicating the approach and departure of the permanent magnet;

a binary circuit electrically connected to the magnetic sensor, for converting the electric signals of the magnetic sensor into electric binary signals; and

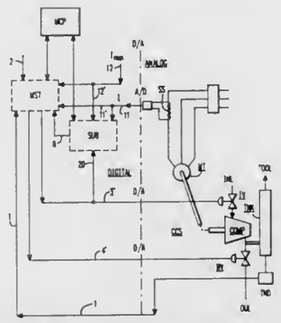
an arrangement wherein a magnetic flux delivered from the permanent magnet flows in a direction opposite to that of a magnetic flux leaking from the solenoid-operated clutch through the drive shaft, the support member, and the arm portion of the support member when the permanent magnet attached to said wobble plate is close to the magnetic sensor.

5,046,928

## LONG TERM COMPRESSOR CONTROL APPARATUS

Clyde O. Peterson, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 26, 1989, Ser. No. 457,046
Int. Cl.[5] F04B *49/08*
U.S. Cl. 417—282 3 Claims




1. In a system for controlling a compressor, driven by a constant speed electrical motor, for admitting fluid into a tank under pressure therein, for use by a pressure responsive tool, including: an inlet valve for admitting fluid through the compressor, a bypass valve for relieving fluid pressure of said tank at an outlet thereof; a master-controller responsive to a signal representative of a tank pressure differential relative to a pressure setpoint signal representative of an assigned reference tank pressure, the master-controller being operative in relation to said tank pressure differential in one of two selected modes, for applying a valve positioning signal for modulating the inlet valve in a first of said modes and for modulating the bypass valve in a second of said modes; means being provided for deriving a signal representative of the motor operative current; and means being provided for comparing said motor current signal with a reference signal characterizing a minimum motor current corresponding to an assigned minimum compressor fluid flow for generating an error signal and for selecting one of said first and second modes according to the sign of said error signal; the combination of:

means for deriving an IV valve positioning signal representative of the IV valve present position;

a subcontroller means responsive to said error signal for generating a corrective signal and for applying said corrective signal to said IV valve positioning signal for modulating the IV valve;

said subcontroller means being enabled when the master-controller is in the second mode;

whereby said subcontroller means maintains said assigned minimum compressor fluid flow when the master-controller is operating in the second mode.

5,046,929

## SEAL COMPRESSOR

Shlomo Novotny, Hudson, Mass.; Mark Kushnir, Rehhovot, and Ran Yaron, Tel-Aviv, both of Israel, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 11, 1989, Ser. No. 336,059
Claims priority, application Israel, Apr. 27, 1988, 86201
Int. Cl.[5] F04B *39/04*
U.S. Cl. 417—439 9 Claims

7. A compressor comprising:

a housing defining a working volume having first, second and third variable volume portions,

a compression cylinder in said housing;

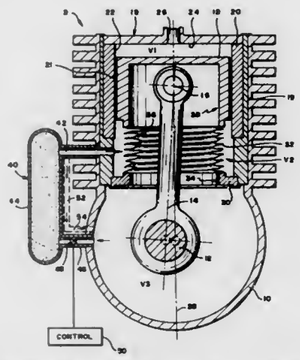
a piston within said cylinder and forming a dynamic seal therewith,



a portion of said compression cylinder above said piston and dynamic seal defining said first volume portion of said working volume and a portion of said working volume surrounding said piston below said dynamic seal comprising said second volume portion;

a crankshaft driven by a power source and connected to drive said piston, said crankshaft being located in said third volume portion of said working volume;

bellows means sealing said second volume portion from said third volume portion;




means defining a bypass gas flow path extending between the second working volume portion surrounding said piston and the third working volume portion surrounding said crankshaft, to prevent a buildup across said bellows means of a differential fluid pressure caused by motion of said piston; and

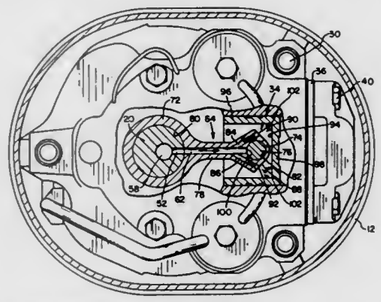
filtering means preventing transport along said flow path of contaminant particles from said working volume portion surrounding said crankshaft to said working volume portion surrounding said piston.

5,046,930

## CONNECTING ROD COOLING AND LUBRICATION

Robert A. Lindstrom, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 18, 1990, Ser. No. 467,001
Int. Cl.[5] F04B *39/06, 39/02*
U.S. Cl. 417—366 12 Claims



1. A compressor comprising:

a housing;

a crankcase disposed within said housing, said crankcase including a cylinder;

a crankshaft rotatably disposed within said crankcase, said crankshaft including an axial bore and an eccentric portion, said eccentric portion having a passage in fluid communication with said axial bore;

a piston including a crown portion and a sidewall portion each having an inner surface;

a wrist pin operably coupled to said piston and said connecting rod;

circulation means for circulating lubricant through said axial bore and said passage; and

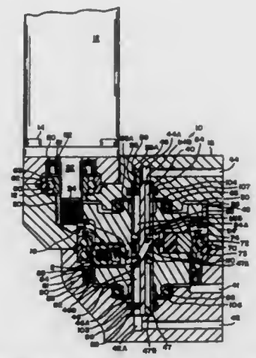
a connecting rod having a crankshaft end portion disposed about said eccentric portion of said crankshaft, a piston end portion having said wrist pin received therein, an intermediate portion extending between an interconnecting said crankshaft and piston end portions, a central lubricating passage extending axially through said intermediate portion to provide fluid communication between said crankshaft and piston end portions and having an opening communicating with said crankshaft passage, and at least two branched lubricating passages branching from said central passage and extending through said piston end portion of said connecting rod closely adjacent said wrist pin and said branching occurring at a position between said wrist pin and the crankshaft end portion of said connecting rod, said central passage being in fluid communication with said wrist pin to directly lubricate said wrist pin, and said branched passages having exit openings on said piston end portion oriented to spray lubricant on a non-bearing inner surface of said piston, whereby circulation of lubricant through said branched passages and out said exit openings indirectly cools said wrist pin by drawing heat away therefrom, and directly cools said piston by spraying lubricant thereon.

5,046,931

## RADIAL GEAR DRIVEN PISTON PUMP

Dean E. Runkle, LaPorte, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 9, 1990, Ser. No. 549,838
Int. Cl.[5] F04B *19/02*
U.S. Cl. 417—463 15 Claims



1. A radial Piston pump for transmitting fluid therethrough, said pump comprising a pintle having longitudinal supply and discharge channels therein, intake and exhaust ports disposed within said pump for communication with said channels in the pintle, a rotor having a central opening disposed about said pintle and carrying radial piston means, the radial piston means disposed within a piston cavity communicating with the central opening of the rotor which receives said pintle, the piston means comPrising an annular-shaped piston cap having a central opening at one radial side, an elastomeric piston sealing ring having a longitudinal extension received seatingly within said central opening of the piston cap, the sealing ring having a central opening communicating with one end of the ring and

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extending within said longitudinal extension, and resilient means disposed within said cavity and extending between one end of said cavity and an end of said longitudinal extension to bias said piston sealing ring and piston cap radially outwardly away from said pintle, the piston sealing ring effecting a seal with an area of said cavity located radially inwardly of said piston cap, so that reciprocal movement of said piston means as said rotor rotates varies the volume of said piston cavity such that fluid drawn in through said intake port and supply channel is carried rotatably by said cavity and discharged through said discharge channel and exhaust port.

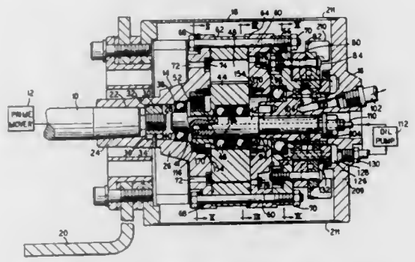
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**5,046,932**

## ROTARY EPITROCHOIDAL COMPRESSOR

**Ralph M. Hoffmann, Eden Prairie, Minn., assignor to Compression Technologies, Inc., Eden Prairie, Minn.**

**Filed Nov. 17, 1989, Ser. No. 437,889**
**Int. Cl.[5] F04C** *18/10, 29/08*
**U.S. Cl. 418—14** **13 Claims**



1. A rotary device, comprising:
a power transmitting shaft extending along a first axis;
a stationary housing;
a rotatable housing portion connected directly to said power transmitting shaft and rotationally mounted on said stationary housing for rotation about said first axis, portions of said rotatable housing forming a rotor chamber, said rotatable housing portion including a ring gear;
a rotor mounted in said rotor chamber and rotationally movable in said rotor chamber about a second axis distinct from said first axis but parallel thereto; and
a single offset shaft mounted in said stationary housing and fixed with respect to said stationary housing, said single offset shaft having a first portion coaxial with said first axis and a second portion coaxial with said second axis, said rotor being mounted for rotation on said second portion of said single offset shaft and said rotatable housing being mounted for rotation on said first portion of said single offset shaft, said first portion of said single offset shaft being a free end.

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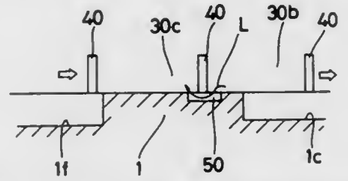
**5,046,933**

## VANE PUMP WITH PRESSURE LEAKING GROOVE TO REDUCE PULSATIONS

**Kyosuke Haga, Anjo; Tsuneo Tanaka, Okazaki; Makoto Kawahara, Okazaki, and Tatsuya Yamamoto, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan**

**Filed Dec. 13, 1989, Ser. No. 450,081**
**Claims priority, application Japan, Dec. 21, 1988, 63-320412; Sep. 26, 1989, 1-249887**
**Int. Cl.[5] F04C** *2/344*
**U.S. Cl. 418—78** **6 Claims**

1. A vane pump for pumping fluid, comprising;
a pump housing assembly;
a cam ring received within said pump housing assembly and formed with an internal cam surface therein, each end surface of said cam ring respectively contacting with a pair of flat surfaces formed within said pump housing assembly;
a rotor disposed within said cam ring and formed with equiangularly spaced plural vane supporting slots;
a drive shaft rottabnly disposed within said pump housing assembly for rotating said rotor;
a plurality of vanes respectively disposed within said vane supporting slots of said rotor, said vanes being radially extensible from said rotor for moving along said internal cam surface when said rotor is rotated, said vanes defining plural pump sectors between said cam ring and said rotor, together with said cam ring, said rotor, and said pair of flat surfaces of said pump housing assembly;
an intake port formed at one of said flat surfaces of said pump housing assembly for leading fluid into said pump sections at a predetermined location;
an exhaust port formed at one of said flat surfaces of said pump housing assembly for taking out fluid pressurized in




said sectors at a location difference from that of said intake port;
at least one pressure leaking groove formed at at least one of said flat surfaces at a location between said intake port and aid exhaust port, the location of said pressure leaking groove being chosen so as to form a passage together with a side edge of one of said vanes located between said exhaust port and said intake party, and the length of said pressure leaking groove being chosen not to reach said exhaust sort or said intake port, so that fluid in a pump sector communicating with said exhaust port starts leaking to an adjacent pump sector communicating with said intake port through said passage, whenever the rotational angle of said rotor approaches to one of rotational angles whereat the instantaneous pressure of fluid in said exhaust port is to reach a maximum pressure, and stops leaking before said one of said vanes reaches said exhaust port or intake port.

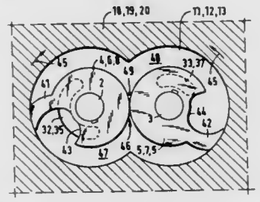
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**5,046,934**

## TWIN SHAFT VACUUM PUMP WITH PURGE GAS INLET

**Hanns-Peter Berges, Cologne, Fed. Rep. of Germany, assignor to Leybold Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Feb. 20, 1990, Ser. No. 481,853**
**Int. Cl.[5] F04C** *29/00, 23/00*
**U.S. Cl. 418—97** **5 Claims**



1. A twin-shaft vacuum pump comprising the following:
a rotor pair mounted for rotation in a pump chamber together by at least one chamber wall, said rotor pair together with said at least one chamber wall defining a suction side and a delivery side of said pump chamber;
a flushing gas outlet orifice, adapted for connection to a flushing gas delivery line, disposed within said pump chamber at said delivery side of said pump;
wherein said pump comprises at least one lateral shield in which said orifice is disposed; and
wherein said rotor pair defines a gap seal between individual rotors, and said orifice is immediately adjacent said gap seal.



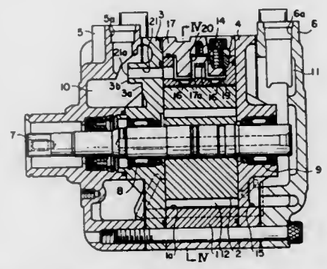
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**5,046,935**

## COMPRESSOR WITH REDUCED VIBRATIONS

**Masahiro Iio; Mitsuya Ono, and Katsumi Sakamoto, all of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Filed Feb. 27, 1990, Ser. No. 486,000**
**Claims priority, application Japan, Mar. 29, 1989, 1-77300**
**Int. Cl.[5] F04C** *29/00*
**U.S. Cl. 417—312** **7 Claims**



1. In a vane compressor including a cam ring, a rotor rotatably received in said cam ring, said rotor having at least one vane slit formed therein, at least one vane each slidably fitted in an associated one of said at least one vane slit, front and rear side blocks closing respective end openings of said cam ring, said front side block having an end face remote from said cam ring, said rotor and said front and rear side blocks defining therebetween at least one compression space for compressing a refrigerant, at least one communication chamber into which said refrigerant is discharged from said compression space, a discharge pressure chamber, and at least one communication passage communicating said communication chamber with said discharge pressure chamber for feeding said refrigerant from said communication chamber into said discharge pressure chamber,
the improvement wherein:
a projection is formed integrally on said end face on said front side block;
said communication passage is formed in said front side block and extends through said projection; and
said communication passage having a diameter and a length, the length of said communication passage being larger than the diameter of said communication passage.

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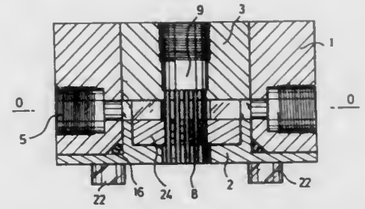
**5,046,936**

## DRAW PLATE FOR THE PRODUCTION OF MEMBRANES OF AN ORGANIC MATERIAL

**Daniel Bourdiol, Pont du Casse, and Franck Saux, Villeneuve-Tolosane, both of France, assignors to Societe Lyonnaise des Eaux, S.A., Paris, France**

**Filed Dec. 22, 1989, Ser. No. 456,093**
**Claims priority, application France, Dec. 22, 1988, 88 17372**
**Int. Cl.[5] B29C** *47/26*
**U.S. Cl. 425—72.1** **11 Claims**

1. An extrusion plate for the production of membranes of an organic material having at least one longitudinal passageway, and comprising:
an annular body (1) having a cavity (2) of a generally cylindrical shape and provided with at least one fluid passageway (5) opening radially in said cavity,
an upper insert body (3) comprising:
at least one upper portion (3*b*) of an external cross-section conjugate with that of the cavity (2) of the body (1) so as to be insertable by force fit into said cavity,
at least one hollow needle (8) extending into an extension of said insert,
means defining a longitudinal passageway (9) traversing said insert (3) for feeding a centering fluid and communicating with said at least one needle (8),



a lower insert body (4) having an external shape conjugate with that of said cavity (2) and insertable by force fit into said cavity, said lower insert having a bore (6) adapted to define about the needles (8) an extrusion chamber (6*b*) of a cross-section conjugate with that of the membrane to be produced,
the lower insert (4) and the upper insert (3) having opposing faces (4*a*, 3*a*) in abutting contact,
each fluid conduit (5) being arranged in the annular body (1) in such a manner as to open at the level of the opposing faces (3*a*, 4*a*) of the lower insert (4) and upper insert (3),
means defining a fluid passage (7; 23, 26*a*) arranged on said opposing faces, in continuity with each of the fluid conduits (5) for establishing fluid communication with the extrusion chamber (6*b*).

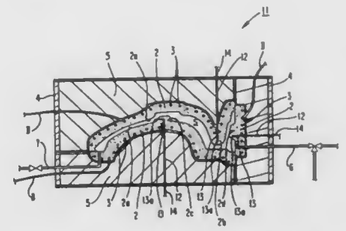
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**5,046,937**

## SLIP-CASTING MOLDS

**Takeshi Ito, Nagoya; Kazushige Murata, Tokoname, and Kuniyoshi Kohmura, Nagoya, all of Japan, assignors to Inax Corporation, Japan**

**Filed Jul. 17, 1989, Ser. No. 381,050**
**Claims priority, application Japan, Jul. 19, 1988, 63-95503[U]**
**Int. Cl.[5] B28B** *1/26*
**U.S. Cl. 425—85** **15 Claims**



1. A mold for casting a slip into a desired shape comprising,
a plurality of mold parts assembled together to define an enclosed mold cavity having a shape corresponding to said desired shape, each of said plurality of mold parts including a porous body forming a filter layer for removing water from a volume of said slip in said mold cavity,

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a plurality of fluid-flow conduits disposed in said filter layer, and a housing member for retaining said porous body, said filter layer having a filter surface in communication with said mold cavity, the filter surface of at least one of said mold parts having a predetermined shape including protruding portions and said housing members defining a housing for said mold upon assembly of said plurality of mold parts,

a fluid-flow duct for connecting said plurality of fluid-flow conduits with the exterior of said housing,

a slip supply duct communicating between a source of said slip and said mold cavity,

said plurality of fluid-flow conduits including a combination of porous ropes arranged in said filter layer and blind holes extending from said housing into said filter layer to within said protruding portions, wherein said combination of porous ropes and blind holes provides said filter layer with substantially uniform fluid-flow properties.

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**5,046,938**

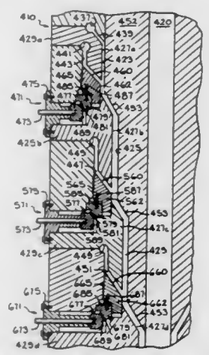
## IMPROVED MULTIPLE LAYER DIE HEAD WITH ADJUSTABLE GAPS

**Michael Hirschberger, Sylvania, Ohio, assignor to Hoover Universal, Inc., Plymouth, Mich.**

**Continuation-in-part of Ser. No. 430,525, Nov. 1, 1989, abandoned. This application May 25, 1990, Ser. No. 528,536**

**Int. Cl.[5] B29C** *47/06, 47/92*

**U.S. Cl. 425—133.1** **15 Claims**



1. A die head for producing a tubular body of multiple resin layers, comprising:

a die body having a longitudinal axis, a plurality of resin inlets for receiving a plurality of molten resins and a annular outlet orifice at one axial end of said die head through which a tubular body of multiple resin layers is extruded;

means within said body forming concentric annular passages to provide annular flow streams of each of said plurality of molten resins, said flow streams being separate from one another and flowing from said inlets toward said outlet orifice;

means for merging said separate concentric flow streams of said resins into a single flow stream having multiple concentric layers of said resins, said merged flow stream flowing through said outlet orifice to form said tubular body; and

means for varying the thickness of at least one of said annular passages to uniformly increase or decrease the thickness of said at least one of said annular passages about the entire circumference of said at least one of said annular passages at a downstream end of said at least one of said annular passages immediately upstream of where the resin flow stream in said at least one of said annular passages merges with another of said resin flow streams whereby the proportional thickness of at least one of said multiple concentric layers of resin within said merged flow stream is increased or decreased relative to the thickness of the other resin layers in said merged flow stream.

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**5,046,939**

## INJECTION MOLDING MACHINE HAVING AN INJECTION MOLD FOR PRODUCING PLASTIC PARTS FROM CHEMICAL MATERIALS

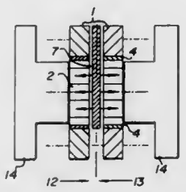
**Hans-Heinrich Kaaden, Bad Aibling, Fed. Rep. of Germany, assignor to Stübbe GmbH, Starnberg, Fed. Rep. of Germany**

**Filed Dec. 4, 1989, Ser. No. 446,464**

**Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711389; PCT Int'l Appl., Apr. 5, 1988, PCT/DE88/00217; Apr. 5, 1988, PCT/DE88/00218**

**Int. Cl.[5] B29C** *45/03, 45/26*

**U.S. Cl. 425—195** **12 Claims**



1. Injection molding machine for producing plastic parts from chemical materials, comprising a mold mounting plate divided into two parts in a direction transverse to a closing direction of said parts, a quick-acting clamping device holding said parts together with a closing force, guide spars on which at least one of said parts is laterally movable after releasing said clamping device, a melt guide system disposed between said parts, adapters disposed in a cassette holder opening formed in at least one of said parts, mold halves in the form of cassette plates having surfaces facing said melt guide system, at least one of said cassette plates being disposed on said adapters in said opening formed in said at least one part, and means disposed on said surface of said at least one cassette plate facing said melt guide system for transferring the closing force.

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**5,046,940**

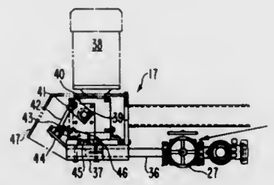
## APPARATUS FOR DIVIDING AND CUTTING DOUGH

**Donald L. Cummings, Mechanicsville, Va., assignor to Automated Machinery Systems, Inc., Richmond, Va.**

**Division of Ser. No. 367,618, Jun. 19, 1989, Pat. No. 4,948,611. This application Mar. 30, 1990, Ser. No. 501,738**

**Int. Cl.[5] A23P** *1/12*

**U.S. Cl. 425—239** **9 Claims**



7. Apparatus for dividing a mass of dough-like material simultaneously into a plurality of smaller volumes of uniform weight comprising:

a conduit for dispensing a flow of dough-like material of uniform density under pressure;

a manifold assembly having an inlet connected to said conduit and a plurality of divider conduits for dividing said flow of dough-like material into a plurality of equally divided smaller flows of dough-like material;



adjustable throttling weir type diaphragm valves connected to each of said divider conduits for minor adjustment of each of said smaller flows so all will flow at the same rate;

an outlet for each of said throttling valves;

a plurality of extruder conduits each connected at one end to said valve outlets and having at the other end an extruder opening for extruding the dough-like material; and

a cut-off assembly arranged to cut-off simultaneously the dough-like material being extruded from each of said extruder conduits into a plurality of pieces of uniform weight.

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**5,046,941**

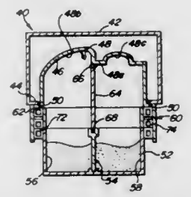
## APPARATUS FOR MOLDING MULTICOLOR THIN WALL PLASTIC SHELL

**Bruce A. Batchelder, Barrington, and John D. Gray, New Durham, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.**

**Filed Oct. 13, 1989, Ser. No. 420,942**

**Int. Cl.[5] B29C** *41/04, 41/22*

**U.S. Cl. 425—435** **2 Claims**



1. Apparatus for molding a thin-walled plastic shell from plastisol in apparatus including a heated mold member and a powder box for storing the plastisol for distribution against the heated mold member the improvement comprising:

said mold member having a mold surface divided into first and second casting segments separated by a raised rib therebetween;

said powder box including an internal chamber and a first divider means carried by said powder box for movement therewith for separating said internal chamber into at least two sections having plastisol therein of a selected color combination, said powder box having an open end for distributing plastisol from said at least two sections; and

a carrier framework located between said mold member and said powder box removably mounted on both said mold member and said powder box to from a passage for flow of plastisol from said powder box to said mold member; said carrier framework including sealing means for perfecting a seal between said mold member and said powder box when said mold member, said carrier framework and said powder box are connected together;

said carrier framework being separable from said mold member and dedicated for use solely with a powder box having a selected color combination;

second divider means carried by said carrier framework and engageable with said first divider means for forming at least two chambers for passage of plastisol from said at least two sections of said powder box; and

mold surface sealing means for perfecting a seal between said second divider means and said raised rib of said mold surface.

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**5,046,942**

## INJECTION MOLDING NOZZLE HAVING TAPERED HEATING ELEMENT ADJACENT THE BORE

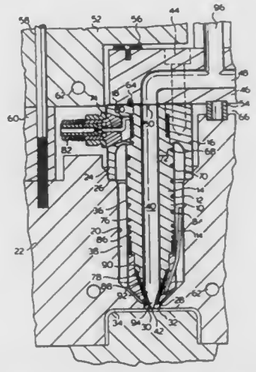
**Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1**

**Filed Dec. 31, 1990, Ser. No. 635,989**

**Claims priority, application Canada, Nov. 19, 1990, 2030286**

**Int. Cl.[5] B29C** *45/22*

**U.S. Cl. 425—549** **1 Claim**



1. In an elongated injection molding nozzle with a rear end and a forward end, formed by a forwardly extending central nose portion, the nozzle having a melt channel extending through the nose portion of the nozzle to form a gate adjacent the forward end, the nozzle having an integral electrically insulated heating element, the heating element having a rear portion extending to a terminal and a central portion extending helically around the melt channel, the improvement wherein;

the heating element has a forward portion with a generally uniform rectangular cross section, the forward portion of the heating element having a plurality of adjacent coils which form a forwardly inwardly tapered inner surface, the forward portion of the heating element being integrally mounted in the nozzle whereby at least part of the inner surface forms an inwardly tapered portion of the melt channel adjacent the gate.

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**5,046,943**

## AIR THROTTLE CONTROL FOR A TWO-STAGE BLOWER BURNER

**Rudolf Mubeim, Oberwil, and Robert Von Euw, Luzern, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland**

**Filed May 2, 1988, Ser. No. 189,424**

**Claims priority, application Switzerland, May 6, 1987, 01733/87**

**Int. Cl.[5] F23N** *1/02, 3/08*

**U.S. Cl. 431—62** **2 Claims**

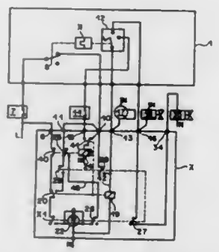
1. A control unit for a blower burner capable of operating in a first burner step with a lower level of fuel consumption and in a second burner step with a higher level of fuel consumption, said control unit comprising

a drive for an air throttle capable of running in a first direction from closed to open and in a second direction from open to closed, said air throttle drive having a first operating position for the first burner step and a second operating position for the second burner step,

switch means operable under control of said drive for being activated by said drive before said first burner step when said drive is running in said first direction and before said air throttle drive passes the first operating position for the first burner step,

first, latch-free relay means for being excited upon activation of said switch means before said first burner step when said drive is running in said first direction and before said drive passes the first operating position for the first burner step, and

second relay means operable under control of said first latch-free relay means for causing said drive to switch from said first direction to said second direction after a delay period following the excitation of said firs latch-free relay means and for enabling said drive to continue operation in said first direction during said delay so that said drive passes said first operating position before said drive switches from said first direction to said second direction.



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**5,046,944**

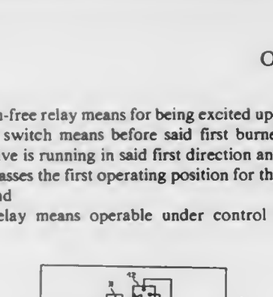
**INFRA-RED GENERATION**

**Thomas M. Smith, 1415 Golf Rd., Cinnaminson, N.J.**

**Division of Ser. No. 12,732, Feb. 9, 1987, abandoned, and a continuation-in-part of Ser. No. 771,722, Sep. 3, 1985, and a continuation-in-part of Ser. No. 831,795, Feb. 19, 1986, Pat. No. 4,722,681, and a continuation-in-part of Ser. No. 592,793, Mar. 23, 1984, Pat. No. 4,654,000. This application Mar. 28, 1989, Ser. No. 329,551**

**Int. Cl.[5] F24D *14/12***

**U.S. Cl. 431—328** **6 Claims**



1. In an infra-red generator having a ceramic fiber mat covering a principal combustion mixture plenum from which a combustion mixture is passed through the thickness of the mat to emerge from a surface on which the mixture burns to heat to incandescence the fibers on that surface, the improvement according to which the combustion mixture plenum has a partition vane extending adjacent one of its edges to form a small pilot conbustion compartment isolated from the principal plenum, said compartment having its own combustion mixture supply inlet separate from that for the principal plenum, the supply inlet being connected as a pilot supply and igniting means fitted adjacent the outer surface of the mat over the pilot compartment to ignite the combustion mixture emerging from that compartment.

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**5,046,945**

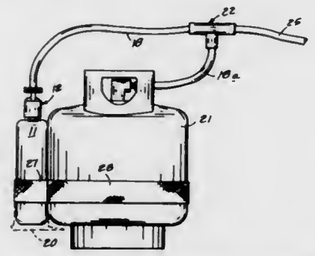
**RESERVE FLAMMABLE GAS CONTAINER APPARATUS**

**Kevin J. McGowan, 475 Ashley Dr., Loganville, Ga. 30249**

**Filed May 29, 1990, Ser. No. 529,533**

**Int. Cl.[5] A44B *1/04***

**U.S. Cl. 431—344** **1 Claim**



1. A reserve flammable gas container apparatus comprising, in combination,

a first flammable gas container defined by a first diameter, the gas container including an upper externally threaded end, and

a coupling head including a first internally threaded socket threadedly receiving the upper threaded terminal end of the first gas container therewithin, and the first threaded socket including an orthogonally and integrally mounted coupling head supply conduit in fluid communication with the first internally threaded socket and defined by a predetermined length to extend beyond the first container, and

a second internally threaded socket in alignment and in fluid communication with the coupling head supply conduit, and

the second internally threaded socket threadedly receiving a first appliance conduit therewithin to direct flammable gas from the first gas container to a gas appliance, and

wherein the coupling head includes a manually manipulable valve handle to selectively limit gas flow from the first gas container to the coupling head supply conduit, and

further including a second gas container, the second gas container defined by a second diameter substantially greater than that defined by the first diameter, and the second gas container including a second appliance conduit in fluid communication with the second gas container, and a "T" shaped junction, the "T" shaped junction including a first conduit and second conduit, the first conduit receiving the second appliance conduit and the second conduit receiving the first appliance conduit, and a main appliance conduit in fluid communication with the "T" shaped junction, wherein the first appliance conduit, the second appliance conduit and the main appliance conduit are in sealed integrally secured association with the "T" shaped junction, and

further including a junction strap, the junction strap including a first flexible strap and a second flexible strap secured together, and the first gas container is secured only within said first flexible strap, and the second gas container is secured only within the second flexible strap to secure the first and second gas container together in a side-by-side relationship, and

wherein the first flexible strap is defined by a first length and the second flexible strap is defined by second length, and the first length is substantially less than that of the second length, and

wherein the first and second flexible straps are secured together medially of each of the respective first and second length of each respective first and second flexible strap at a connection line formed on each rear surface of each respective first and second flexible strap medially of each first and second flexible strap, and

wherein the first flexible strap includes a first and second hook and loop fastener patch formed adjacent a respective first and second terminal end of the first flexible strap, and the first hook and loop fastener patches formed on an interior surface of the first flexible strap adjacent the first terminal end of the first junction strap, and the second hook and loop fastener patch is mounted to an exterior surface of the first flexible strap adjacent the second terminal end of the first flexible strap, and the second flexible strap includes a respective second flexible strap first and second terminal end, wherein the first terminal end includes a second strap first hook and loop fastener patch formed on an interior surface of the second flexible strap adjacent the first terminal end of the second flexible strap, and a second flexible strap second hook and loop fastener patch formed adjacent the second flexible strap second terminal end on an exterior surface of the second flexible strap, wherein the respective first and second hook and loop fastener patches of each respective first and second flexible strap permit selective securement and association of the first and second gas container within the respective first and second flexible strap.



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**5,046,946**

**PROCESS FOR FIRING CERAMIC SHAPED BODIES AND A TUNNEL KILN USED THEREFOR**

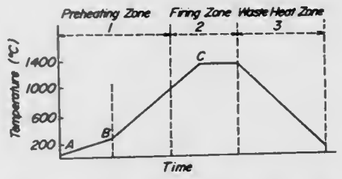
**Keiji Yasuda, Aichi; Koji Ogura, Chiryu, and Kazuhiro Miyahara, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan**

**Continuation of Ser. No. 330,906, Mar. 31, 1989, abandoned. This application Jul. 23, 1990, Ser. No. 555,796**

**Claims priority, application Japan, Mar. 31, 1988, 63-76455**

**Int. Cl.[5] F27D *3/00*; F27B *9/12, 9/00*; B32B *3/12***

**U.S. Cl. 432—11** **2 Claims**




1. A method of firing cordierite ceramic honeycomb shaped bodies to produce substantially crack-free sintered bodies, the method sequentially comprising the following steps:

heating said bodies at a first heating rate between room temperature and a decomposition temperature of a shaping aid contained in said bodies; and

heating said bodies at a second heating rate between said decomposition temperature and a sintering temperature, said first heating rate being less than said second heating rate;

wherein said bodies are heated at a constantly changing temperature between said room temperature and said sintering temperature.

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**5,046,947**

**IMAGE FIXING APPARATUS**

**Michiaki Endoh, and Hironobu Saito, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 26, 1989, Ser. No. 343,388**

**Claims priority, application Japan, Apr. 28, 1988, 63-106765**

**Int. Cl.[5] F27B *9/28***

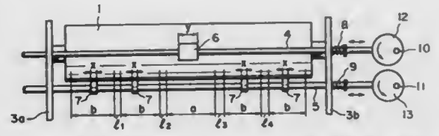
**U.S. Cl. 432—60** **8 Claims**

1. A fixing apparatus, comprising:

a rotatable member contactable to a material carrying a toner image to fix the toner image thereon said rotatable member being heated by a heating source;

temperature detecting means, contactable to a surface of said rotatable member to detect the temperature of the surface of said rotatable member, said temperature detecting means being reciprocable in a direction of a generating line of said rotatable member;

a separating member, contactable to the surface of said rotatable member, to separate the toner carrying material from said rotatable member, said separating member being reciprocable in the direction of the generating line of said rotatable member;



wherein the difference between the reciprocating range of said temperature detecting means and the width of contact of said temperature detecting means with said rotatable member is larger than the width of contact of said temperature detecting means with said rotatable member, wherein the difference between the reciprocating range of said separating member and the width of contact of said separating member with said rotatable member is larger than the width of contact of said separating member with said rotatable member, and wherein the reciprocation ranges of said temperature detecting means and said separating member do not overlap in the direction of the generating line.

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**5,046,948**

**ORTHODONTIC COIL SPRING**

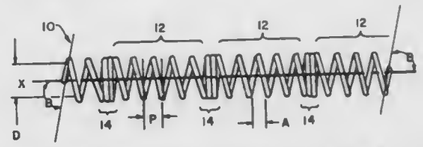
**Fujio Miura, Sakae, Japan, assignor to GAC International, Inc., Central Islip, N.Y.**

**Filed Mar. 29, 1990, Ser. No. 501,603**

**Claims priority, application Japan, May 29, 1989, 1-60964[U]**

**Int. Cl.[5] A61C *3/00***

**U.S. Cl. 433—21** **19 Claims**



1. An open orthodontic coil spring for imparting forces to orthodontic appliances mounted to a patient's teeth, said spring comprising:

a shape-memory alloy wire exhibiting superelastic properties wound into a coil, said coil defining at least one open coil section between the free ends thereof, said open coil section defining predetermined spaces between the turns thereof, the free ends of said coil being tightly wound substantially without any spacing between the turns thereof, said free ends of said coil thus being adapted to substantially engage orthodontic appliances to impart the forces of said spring thereto for moving a patient's teeth.

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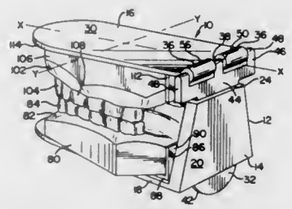


5,046,949

## ARTICULAR SUPPORT SYSTEM FOR DENTAL MODELS

Terry A. Richardson, St.Charles, Ill., assignor to C. J. Star Enterprises, Inc., St. Charles, Ill.

Filed Sep. 27, 1990, Ser. No. 588,755
Int. Cl.[5] A61C *11/02*
U.S. Cl. 433—57 11 Claims



8. A system of support for a set of dental models of a patient's upper and lower teeth with at least one said model being a working model, said system comprising:

a fixture having a base portion,

an upper portion having an inner plate disposed in slot means of said base portion, said inner plate and said slot means allowing longitudinal and lateral position adjustability of said upper portion,

an outer plate connected to said inner plate by hinge means providing said outer plate with positional stability during model movement, and

a holding bracket for said working model of said dental model set, said holding bracket having a U-like shape defined by a center web connecting spaced apart end walls formed with inward facing locking tabs forming locking tab-indentation connection means with said working model fitted between said holding bracket end walls, said holding bracket with said working model freely located and attached to said base portion or said upper portion outer plate depending upon which said model is said working model, said attachment occurring upon teeth of said models being in bite registration and said connection means facilitating release of said working model from said holding bracket and promoting reliable restoration of said working model to its previous position in said holding bracket.

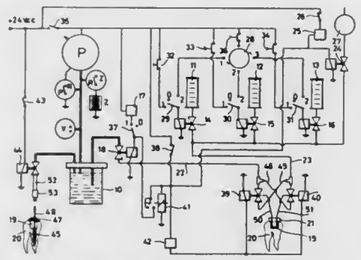
5,046,950

## APPARATUS AND METHOD FOR CARRYING OUT DEVITALIZATIONS AND ROOT CANAL TREATMENTS IN TEETH, AND FOR SEALING THE TREATED TEETH

Osvaldo Favonio, Ornago, Italy, assignor to FARO Fabbrica Apparecchiature Razionali Odontoiatriche S.p.A., Milan, Italy

Filed Oct. 4, 1990, Ser. No. 592,741
Claims priority, application Italy, Oct. 4, 1989, 21915 A/89; Dec. 20, 1989, 22764 A/89
Int. Cl.[5] A61G *5/02*
U.S. Cl. 433—81 14 Claims

1. Apparatus for carrying out devitalizations and root canal treatments in teeth, of the type in which liquid chemical treatment substances are fed into the pulp chamber and root canals of the tooth, characterized in that it comprises, in combination: sealing means for tightly sealing said pulp chamber, a tightly sealed vessel, means for putting said vessel under controlled vacuum, first selective connection means between said vessel and said pulp chamber, a plurality of atmospheric pressure containers suitable for containing respective liquids for the treatment of the pulp chamber and of the root canals, second selective connection means between said plurality of containers and said pulp chamber, and third selective connection means between said pulp chamber and atmosphere, so that the pulp chamber and the root canals can be firstly put under vacuum and then treated in succession with said treatment liquids at atmospheric pressure, which liquids are drawn into



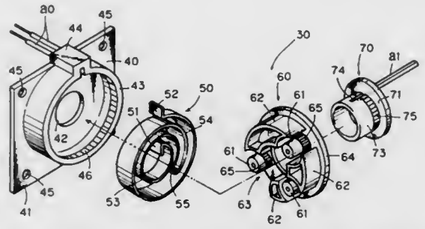
said vessel under controlled vacuum, flowing through said pulp chamber and the relevant root canals.

5,046,951

## WIRING APPARATUS FOR MAKING AN ELECTRICAL CONNECTION BETWEEN A STEERING WHEEL AND A STEERING COLUMN OF A MOTOR VEHICLE

Hiroshi Suzuki, Ikeda, Japan, assignor to Daihatsu Motor Co., Ltd., Ikeda, Japan

Filed May 22, 1990, Ser. No. 526,995
Claims priority, application Japan, Jun. 15, 1989, 1-153238
Int. Cl.[5] H01R *35/02*
U.S. Cl. 439—15 8 Claims



1. A wiring apparatus for making an electrical connection between a steering wheel and a steering column for a motor vehicle having a steering shaft, which mounts said steering wheel to its upper end, said steering shaft being housed rotatably in said steering column, said wiring apparatus including:

a first case fixed to said steering column, wherein said steering shaft extends into a central part of said first case;

a second case fixed to said steering wheel, wherein said steering shaft extends into a central part of said second case, a ring-shaped housing space being formed between said first case and said second case;

a flexible wiring member having one end fixed to said first case and another opposite end fixed to said second case, said wiring member including a first region extending from said one end, said first region being wound in one circumferential direction in said housing space, said wiring member including a second region extending from said another opposite end, said second region being wound in another opposite circumferential direction in said housing space, said wiring member including a folded part making a connection between said first region and said second region, said flexible wiring member being housed in said housing space;

a loosening preventive member having at least one roller being disposed between said first region and said second region of said flexible wiring member; and

means independent of said flexible wiring member for driving said roller circumferentially in said housing space by a relative rotation of said first and second cases.

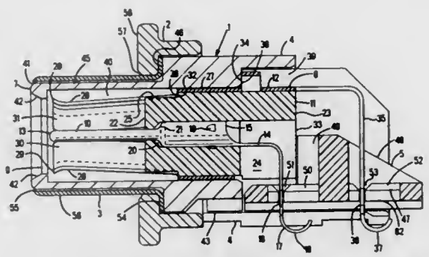


5,046,952

## RIGHT ANGLE CONNECTOR FOR MOUNTING TO PRINTED CIRCUIT BOARD

Thomas S. Coben, Middletown, and John R. Shuey, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 8, 1990, Ser. No. 534,918
Int. Cl.[5] H01R *9/05, 9/09*
U.S. Cl. 439—63 11 Claims



1. An electrical connector assembly for mounting on a printed circuit board having a ground, said assembly having terminals for interconnecting with traces on the printed circuit board, and comprising; a housing having a mounting face and a mating face perpendicular thereto, said housing having contact passages extending rearwardly from said mating face to said mounting face, said housing being characterized by shaped apertures with slots imposed into opposing edges of said shaped apertures at said mounting face; and a plurality of receptacle contacts adapted to be received within respective contact passages, each receptacle contact comprising:

an electrically conductive shell adapted to be received within respective contact passage;

a dielectric insert having a center bore and adapted to be received and secured within said conductive shell; and

a signal carrying contact pressed into the bore of said insert and comprising a finger-shaped mating section and a compliant clip section with arc-shaped solder terminal for interconnection with a respective trace on the printed circuit board, the opposing edges of each clip section being received within a respective slot to permit transverse movement of each clip section away from the circuit board to compress each arc-shaped solder terminal into interconnection with the respective trace while maintaining each clip section in relative position within each slot.

5,046,953

## METHOD AND APPARATUS FOR MOUNTING AN INTEGRATED CIRCUIT ON A PRINTED CIRCUIT BOARD

Robert W. Sbreeve, Corvallis, Oreg.; Michael D. Dobbs; Lucy E. Burris, both of Vancouver, Wash.; Robert B. Freund, Owego, N.Y., and Ronald W. Keil, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

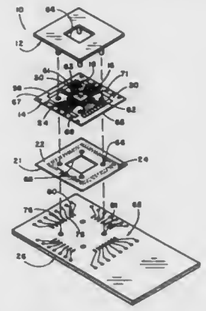
Filed May 25, 1990, Ser. No. 529,069
Int. Cl.[5] H01R *9/09;* H05K *3/34*
U.S. Cl. 439—66 25 Claims

1. A method of preparing a plurality of TAB segments for mounting on a printed circuit board, said TAB segments being formed sequentially on an elongated tape and each having a plurality of conductive leads formed thereon, said method comprising the steps of:

for each TAB segment providing a sheet of nonconductive material having a plurality of conductive elements mounted thereon so that each element protrudes from both sides of said sheet; and

mounting such a sheet on each TAB segment so that said conductive elements are opposite said TAB segments leads.

9. Apparatus for creating an electrical connection between a TAB segment having a plurality of conductive leads formed thereon and a printed circuit board also having a plurality of conductive leads formed thereon, said apparatus comprising:



a sheet of nonconductive material having a plurality of conductive elements mounted thereon so that each element protrudes from both sides of said sheet;

encapsulant for mounting said sheet on said TAB segment; and

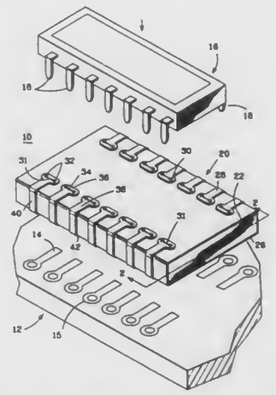
means for compressing the conductive elements between a TAB segment lead and a circuit board lead.

5,046,954

## PLANAR ELECTRICAL CONNECTOR

George R. Schmedding, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 31, 1991, Ser. No. 648,718
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—70 11 Claims



1. An electrical connector for pluggably connecting the leads of electrical/electronic component comprising:

a body having a plurality of cavities arranged in a pattern complementary to the pattern of leads of a component and each of said cavities having a lead receiving entrance and having a cross sectional profile shaped and dimensioned in a selected manner associated with a particular cross sec-

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tional shape and dimension of a given said component lead, said cavity having a greater length than said component lead as inserted within said cavity;

a thin film of insulating material having a series of slits, one for each cavity, said slit being aligned with said corresponding cavity;

a plurality of conductive traces defined on said film corresponding to the number of component leads, each trace including a contact area substantially larger in dimension than a said entrance of a corresponding cavity to overlie said entrance and extend transversely beyond the periphery thereof,

each contact area including a slit therein extending transversely to the axis of insertion of the lead through a given slit in said film into a said cavity entrance, each said slit concluding at each end thereof in an enlarged hole to define in said contact area a plurality of short contact arms having contact surfaces engagable by a said lead and operable to be deflected into said cavity entrance upon said lead being inserted into said cavity through said film slit, the peripheral edges of said cavity entrance serving to press said contact arms into engagement with the said lead to provide a low-resistance, stable electrical and mechanical interface therewith.

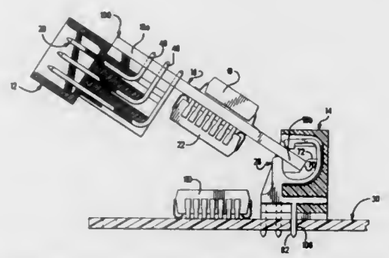
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**5,046,955**

## ACTIVE CONNECTOR ASSEMBLY

**Billy E. Olsson, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jan. 9, 1990, Ser. No. 462,263**
**Int. Cl.[5] H01B** *9/09*
**U.S. Cl. 439—74** **5 Claims**



1. An active connector assembly mountable to a circuit board and including a plurality of circuits concluding in a respective plurality of first contact sections defining a first contact array and engageable with corresponding contact means of corresponding electrical circuits of the board when mounted, and further concluding in a connector matable with a corresponding connector, for interconnecting the corresponding connector and the circuit board, the active connector assembly comprising:

a receptacle housing having secured therein a like plurality of first contact elements including respective said first contact sections at least exposed along a mounting face of said receptacle, said receptacle housing including a second face substantially orthogonal to said mounting face, said second face defining a card edge receiving cavity extending thereinto with second contact sections of said first contact elements exposed within said cavity, said second contact sections being C-shaped with openings facing said second face and coaligned to define an array adapted to receive a card edge into said openings for electrically connecting said second contact sections with respective conductive pads along said first edge of said circuit card;

a second connector including a plurality of second contact elements contained therewithin, said second connector including mounting means along a mounting face thereof enabling disconnectable fastening to the circuit board, and said second contact elements having third contact sections exposed along a mating face thereof for mating with corresponding contact means of a mating connector, said second contact elements extending to fourth contact sections exposed along a third face thereof; and

a circuit card to interconnect said receptacle connector and said second connector and including an array of first circuits extending from conductive pads on at least one major surface along a first edge of said circuit card to an intermediate region and an array of second circuits extending to said intermediate region from a connector-proximate region remote from said first edge, said conductive pads being arrayed to become electrically connected with said C-shaped second contact sections of said receptacle upon insertion of said first edge thereinto, said circuit card being secured to said second connector at said connector-proximate region with said second circuits electrically connected to said fourth contact sections of said second contact elements of said second connector, and said circuit card being adapted to receive at least one electronic component mounted thereon at said intermediate region to electrically connect said first and second circuits for acting on electrical signals passing between said first and second circuits,

whereby circuits between the mating connector and the circuit board are modifiable by an easily replaceable electronic component not mounted directly on the circuit board, by said electronic component being removably securable to said circuit card and said circuit card being removably securable to said circuit board upon unfastening of said second connector from said circuit board.

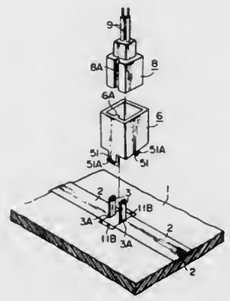
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**5,046,956**

## ELECTRICAL CONNECTOR DEVICE

**Tsunesuke Takano, Tokyo, Japan, assignor to Kabushiki Kaisha T AN T, Tokyo, Japan**

**Filed May 21, 1990, Ser. No. 525,716**
**Claims priority, application Japan, May 30, 1989, 1-63118[U]; May 30, 1989, 1-63119[U]**
**Int. Cl.[5] H01R** *9/09*
**U.S. Cl. 439—78** **5 Claims**



1. An electrical connector device comprising:

a base member made of an electrically insulating plastics material;

at least one pair of opposingly oriented elongated narrow conductor plates each having a base portion embedded within one surface of said electrically insulating base so as to be coextensive with said one base surface, each said base portion of said conductor plates terminating in an upwardly bent end portion so as to provide an upwardly projecting electrically conductive strip, wherein said conductive strips of said conductor plates are in opposed relationship to one another;

a tubular insulating member having a bottom surface provided with apertures for receiving said conductor strips, said tubular insulating member also having resilient tabs capable of engaging with lower edges of said insulating base; and

a male engaging member having female connector members adapted to fit on said conductor strips; wherein

the embedded base portions of said conductor strips are forcibly clamped between said bottom surface of said tubular insulating member around said apertures and the surface of said insulating base.



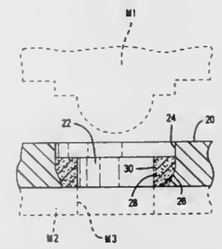
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**5,046,957**

## SOLDER PLATE ASSEMBLY AND METHOD

**Wayne L. Millhimes, Hersbey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jun. 25, 1990, Ser. No. 543,244**
**Int. Cl.[5] H01R** *4/02*
**U.S. Cl. 439—83** **10 Claims**



1. A solder plate assembly for use with connectors having terminal pins projecting therefrom in a given pattern which are required to be soldered to circuits in a circuit board, said assembly comprising:

a thin flat plate of plastic dielectric material having a temperature characteristic so as to maintain mechanical integrity in the presence of molten solder, said plate including a series of apertures formed therein in said given pattern, each said aperture adapted to receive a terminal pin inserted therethrough, each said aperture including an inwardly projecting surface; and

a solder ring fitted within the said aperture and engaging said projecting surface, said projecting surface being beveled from a larger diameter upper portion to a smaller diameter lower portion with said projecting surface retaining said solder ring in said aperture, said ring having an interior diameter slightly larger than the exterior diameter of a said terminal pin to facilitate easy insertion therein whereby

upon inserting said terminal pins into corresponding apertures of said circuit board and apply sufficient heat to reflow said solder ring, said solder flows down into said circuit board aperture to mechanically and electrically join said terminal pin to said circuit board.

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**5,046,958**

## WELDING GROUND CLAMP

**Ronald Brown, 4929 Gair Avenue, Terrace, B. C., CN V8G-2K1, Canada**

**Filed Dec. 7, 1990, Ser. No. 623,559**
**Int. Cl.[5] H01R** *4/66*
**U.S. Cl. 439—92** **7 Claims**

1. A ground clamp for use with welding apparatus, comprising:

A) a workpiece engaging clamp frame which includes

1) a first leg which includes

(a) a handle section having a rear end and a central longitudinal axis,

(b) a neck section,

(c) a U-shaped workpiece engaging section extending from said neck section and having a first arm connected to said neck section and extending at an angle thereto, a bight section connected to said first arm and extending essentially parallel to said handle central longitudinal axis, a second arm connected to said bight section and having a workpiece engaging end, and

2) a second leg which includes

(a) a handle section having a rear end,

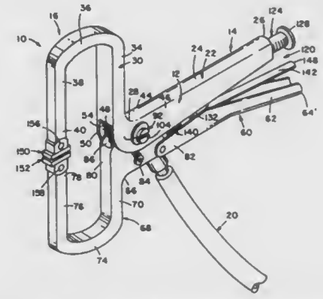
(b) a neck section which engages said first leg handle section neck,

(c) a U-shaped workpiece engaging section extending from said second leg neck section and having a first arm connected to said second leg neck section and extending away from said first leg first arm, a bight section connected to said second leg first arm and extending essentially parallel to said central longitudinal axis, a second arm connected to said second leg bight section and extending toward said first leg second arm and having a workpiece engaging end which is located adjacent to said first leg workpiece engaging end when said clamp frame is closed;

B) pivot means connecting said first leg neck section to said second leg neck section and permitting said first and second legs to pivot thereabout to move said workpiece engaging ends toward and away from each other, said pivot means including

(1) a threaded brass bushing,

(2) a threaded brass fastener attached to said bushing and attaching said first leg to said and establishing an electrical connection of said first and second legs to each other and to said workpiece engaging ends,



C) an electrical ground cable connected to said threaded brass fastener, said pivot means establishing an electrical connection between said electrical ground cable and said first leg workpiece engaging end that is essentially identical in electrical resistance value to the electrical connection between said electrical ground cable and said second leg workpiece engaging end;

D) a handle lock assembly which includes

(1) a screw thread on said first leg adjacent to said first leg rear end,

(2) a threaded locking element threadably engaged with said screw thread to move toward and away from said pivot means, said threaded locking element having a head on one end and a arcuate knob on another end,

(3) a locking arm pivotally mounted at one end thereof on said second leg and having a second end with a concave knob receiving area defined thereon, said arcuate knob engaging said knob receiving area to move said first and second leg handles apart when said threaded locking element is moved toward said pivot means,

(4) a spring connected at one end thereof to said first leg and at another end thereof to said second leg and biasing said first leg handle towards said second leg handle,

(5) a release lever pivotally connected to said locking arm and having one end thereof in abutting contact with said second leg and being oriented to force said locking arm

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knob receiving area away from contact with said arcuate knob when rotated toward said first leg handle; and

E) a workpiece engaging contact plate on each of said workpiece engaging ends.

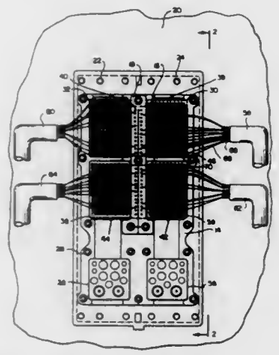
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**5,046,959**

## CONNECTOR ASSEMBLY

**Dan E. Robbins, Glendale; Charles G. Kozlowski, Cave Creek, and Archie L. Epperson, Phoenix, all of Ariz., assignors to Honeywell, Inc., Minneapolis, Minn.**

**Filed Nov. 1, 1990, Ser. No. 607,944**
**Int. Cl.[5] H01R** *4/66*
**U.S. Cl. 439—92** **5 Claims**



1. A connector assembly comprising:

a signal post receptacle subassembly;

a ground post receptacle subassembly; and

support plate means supporting the signal post receptacle subassembly and supporting the ground post receptacle subassembly; wherein

the signal post receptacle subassembly includes:

an electrical insulation board supported by the support plate means;

a plurality of signal posts supported by and extending through the electrical insulation board; and

each of the plurality of signal posts having a first upper end portion on which a signal wire can be wrapped and having a second lower end portion;

the first upper end portion being disposed adjacent to a first upper side of the electrical insulation board and the second lower end portion being disposed adjacent to a second lower side of the electrical insulation board, and wherein the ground post receptacle subassembly includes:

a ground post plate mounted on the support plate means;

a plurality of ground posts;

each ground post having a cantilever end portion on which a ground wire can be wrapped and a base end portion; and

each base end portion being fixedly connected to the ground post plate; and including

at least one wire unit having a signal wire and having a ground wire; wherein

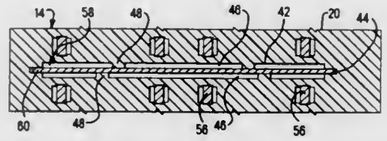
the ground wire has an insulated portion and has a bare portion, the bare portion being wrapped around a respective ground post cantilever end portion forming a region of strain relief and forming an electrical conduction path through the ground wire and the ground post.

**5,046,960**

## HIGH DENSITY CONNECTOR SYSTEM

**James L. Fedder, Etters, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Dec. 20, 1990, Ser. No. 630,716**
**Int. Cl.[5] H01R** *13/658*
**U.S. Cl. 439—108** **10 Claims**



1. A system for establishing an array of ground connections between first and second mating connectors of a connector assembly requiring impedance control, each of said first and second connectors of said assembly including:

a dielectric housing:

a multi-row array of signal contact members disposed in columns in said housing, each said signal contact member being secured in a respective passageway thereof;

a multi-row array of ground contact members disposed in said housing between said columns of signal contact members and between said rows of signal contact members, each of said ground contact members having at least a body section secured in a respective profiled slot, said slot having a width selected to be greater than the thickness of said ground body section; and

means for maintaining said respective ground body sections centered within said respective otherwise wider slot to define air reservoirs of a controlled width on both sides of each said ground contact member, whereby

the signal contact members may be closely spaced in the connector in a manner necessarily reducing the amount of dielectric housing structure between adjacent signal contact members in a row thereof, and the connector impedance assuredly controlled by precisely defined air reservoirs on each side of each ground contact member.

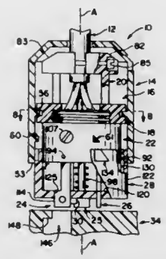
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**5,046,961**

## POSITIVE LOCKING ELECTRICAL PLUG

**Ernest G. Hoffman, Middlefield, Conn., assignor to Hubbell Incorporated, Orange, Conn.**

**Filed Nov. 26, 1990, Ser. No. 617,820**
**Int. Cl.[5] H01R** *13/625*
**U.S. Cl. 439—141** **24 Claims**



1. A male electrical connector, the combination comprising:

a tubular cover having a first open end adapted to receive an electrical cable, and a second open end;

an insulating plug body adapted to receive the electrical cable, and having a plurality of conductive blades extending therefrom, said blades being shaped and dimensioned for insertion into and translation in slots formed in a mating female connector as said plug body is moved axially and angularly, respectively, relative to the female connector;

first means, coupled to said cover and plug body, for coupling said plug body in said cover for limited relative angular movement;

a plate having a plurality of openings, each of said openings slidably receiving one of said blades therein;

second means, coupled to said plate and plug body, for slidably coupling said plate and plug body between first and second axially displaced positions;

locking means, coupled to and extending from said plate and receivable in at least one of the slots in the female connector once said blades are inserted into and translated in a first angular direction in the slots, for resisting relative angular translation of said plate and the female connector in a second angular direction opposite said first angular direction; and

unlocking means, coupled to said cover and plate, for removing said locking means from said at least one of the slots, and thereby allowing relative angular translation of said plate and the female connector in said second angular direction,

said unlocking means being actuated via angular movement of said cover relative to said plate and plug body in said second angular direction.



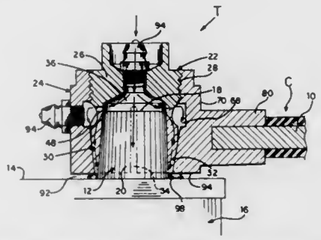
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**5,046,962**

## CABLE TERMINAL ASSEMBLY

**Bobby D. Sloan, 3-Bear Canyon Dr., and Kenneth R. Vaught, Jr., 129 April Point North, both of Montgomery, Tex. 77356**

**Filed Apr. 17, 1990, Ser. No. 509,781**
**Int. Cl.[5] H01R** *4/70*
**U.S. Cl. 439—202** **2 Claims**



1. In a cable terminal assembly for attachment to a battery post having a top wall the improvement comprising:

a one-piece outer member having upper and lower portions and including a cavity in said lower portion bounded by an inside surface, said upper portion provided with a through bore axially aligned with said cavity and said outer member having an outside surface,

a one-piece inner member insertable within said outer member and having upper and lower portions, said inner member lower portion including a skirt having an inside surface surrounding a central post cavity normally defining a configuration adapted to encompass said battery post, said skirt provided with an outside surface and having a plurality of longitudinally extending slots therethrough, said inner member including an upper area defining an upper chamber communicating with said central post cavity and disposed above said battery post top wall when said inner member skirt encompasses said battery post,

said slots each having an upper portion communicating with said inner member upper chamber.

mating threads on said outer and inner member upper portions connecting said inner member to said outer member when said inner member is threadably inserted within said outer member and operable to axially displace said inner member downwardly relative said outer member as said inner member skirt inside surface surrounds said battery post and said skirt outer surface engages said outer member inside surface,

fixed integral wrench engaging means on said inner and outer member upper portions permitting actuation of said inner and outer member upper portion mating threads,

said outer member inside surface and said inner member skirt outer surface each containing cooperating downward and inward tapers,

said cooperating tapers on said inner and outer member lower portions operable to radially and inwardly displace said inner member skirt as said mating threads are actuated to axially displace said inner member downwardly relative said outer member,

said inner and outer members defining a circular passageway therebetween, said circular passageway encircling said inner member in a plane radially adjacent said slot upper portions,

a passage through each of said inner and outer members providing communication from without said assembly respectively to said upper chamber or said circular passageway,

each said passage containing a grease fitting valve,

each said grease fitting valve permitting pressure injection of a fluid protective substance therein and thence through one of said upper chamber or said circular passageway, respectively, and thence into said slots,

said fluid protective substance thus coating said battery post contained within said assembly, and

means connecting an electrical cable to said outer member outside surface, whereby

actuation of said mating threads achieves a fixed attachment of said assembly and its connected electrical cable to said battery post.

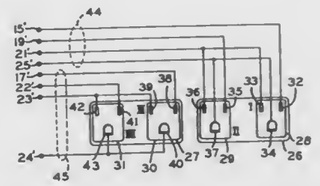
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**5,046,963**

## ELECTRICAL POWER DISTRIBUTION SYSTEM

**Steven M. Kelly, Box 139, Cromwell, Ind. 46732**

**Filed Oct. 1, 1990, Ser. No. 591,245**
**Int. Cl.[5] H01R** *25/06, 25/16*
**U.S. Cl. 439—211** **13 Claims**

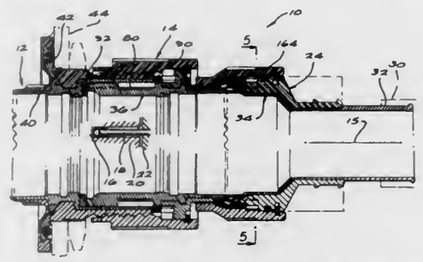


1. An improved multiwire branch circuit power distribution system for connection to an AC power source having a grounded neutral terminal and a plurality of live multiwire branch circuit terminals, said system comprising a first duplex outlet having first and second receptacles, a second duplex outlet having third and fourth receptacles, a first conductor means for connecting a first contact in said first receptacle to a first of said live multiwire branch circuit terminals, a second conductor means for connecting a first contact in said second receptacle to a second of said live multiwire branch circuit terminals, a third conductor means for connecting second contacts in said first and second receptacles to said neutral terminal, a fourth conductor means for connecting a first contact in said third receptacle to a third of said live multiwire branch circuit terminals, a fifth conductor means for connecting a first contact in said fourth receptacle to a third of said live multiwire branch circuit terminals and a sixth conductor means for connecting second contacts in said third and fourth receptacles to said neutral terminal.

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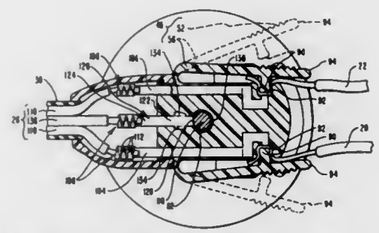


5,046,964
**HYBRID CONNECTOR**
David E. Welsh, Tustin; Piyapote Pisalyaput, Irvine, and William C. Gore, San Bernardino, all of Calif., assignors to ITT Corporation, New York, N.Y.
Filed Oct. 10, 1989, Ser. No. 419,406
Int. Cl.[5] H01R *13/52*
U.S. Cl. 439—271 10 Claims



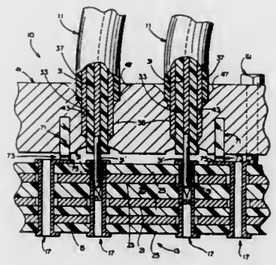
1. In an electrical connector system that includes a plug connector with a front end that can be received in the front end of a receptacle connector so they and their contacts are mated, and wherein each connector has a plastic-metal hybrid construction and includes a metal insert and a plastic shell lying about the metal insert, the improvement wherein:
said receptacle connector has a front edge and said receptacle plastic shell and metal insert both extend to said front edge with the front edges of said shell and insert being substantially even with each other;
said plug connector includes a ring-shaped elastomeric seal positioned to be compressed by the front edges of both said shell and insert as said receptacle is fully inserted, whereby to seal any possible space between said shell and insert.

5,046,965
**DISPOSABLE ELECTRICAL CONNECTOR FOR FETAL SCALP ELECTRODE**
Jon N. Neese; William D. Wallace, both of Salt Lake City, and Christopher A. Cutler, Centerville, all of Utah, assignors to Utah Medical Products, Inc., Utah
Filed May 4, 1990, Ser. No. 518,809
Int. Cl.[5] H01R *13/62*
U.S. Cl. 439—372 33 Claims



1. An electrical connector for use during labor to couple signals from leads of insulated conductors of a fetal scalp electrode to a cable connected to an electrical signal monitor, said connector comprising:
a. a connector body;
b. lead retention means molded as an integral part of said connector body for releasably securing with a snap fit the leads of said insulated conductor of the fetal scalp electrode to said connector body; and
c. conductive means embedded within said connector body for electrically coupling the leads of the fetal scalp electrode through said connector body to the cable when the leads are secured by said lead retention means to said connector body said conductive means comprising:
(i). a lead contact located at said lead retention means for electrically engaging a lead of the fetal scalp electrode secured thereby to said connector body;
(ii). a signal conductor contact site located exterior of said connector body for electrically engaging a signal carrying conductor of the cable;
(iii). an insulated electrically conductive pathway extending from said lead contact through said connector body to said signal conductor contact site; and
(iv). means for effecting electrical reference coupling of a reference conductor of the cable with the body of the patient.

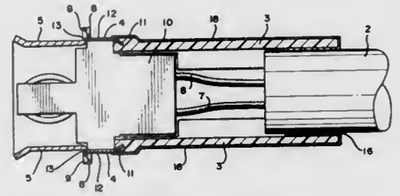
5,046,966
**COAXIAL CABLE CONNECTOR ASSEMBLY**
Keith A. Snyder, and Paul E. Winkler, both of Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 5, 1990, Ser. No. 593,843
Int. Cl.[5] H01R *17/18*
U.S. Cl. 439—579 16 Claims



1. A connector assembly for electrically connecting a plurality of coaxial cables to a circuit board including an electrical ground, at least one electrically conductive segment on a surface thereof and a plurality of conductive holes as part thereof, said assembly comprising:
a common housing for being removably positioned adjacent said circuit board and including a plurality of apertures spacedly positioned therein in a high density arrangement, a plurality of said coaxial cables, each of said cables positioned within a respective one of said apertures and including a pin conductor therein for being positioned within a respective one of said conductive holes within said circuit board when said common housing is positioned adjacent said circuit board and a shielding member for electrically shielding said pin conductor; and
grounding means located on or forming part of said common housing for providing an electrical connection between said shielding members of said coaxial cables and said electrical ground of said circuit board only when said common housing is positioned adjacent said circuit board, said grounding means including at least one spring contact located on a surface of said common housing or projecting therefrom at a location separate from and substantially adjacent at least one of said apertures having said coaxial cables therein, said spring contact electrically coupled to said shielding members and engaging said conductive segment on said surface of said circuit board in a resilient manner to provide said electrical connection between said shielding members and said electrical ground when said common housing is positioned adjacent said circuit board.

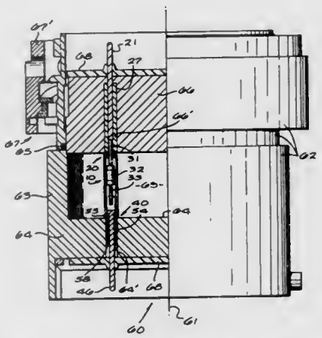


5,046,967
**ELECTRICAL CONNECTOR SHELL INCLUDING PLASTIC AND METAL PORTIONS, AND METHOD OF ASSEMBLY**
Joseph Majernik, Endicott, N.Y., and Lonnie Fisher, Hallstead, Pa., assignors to Amphenol Interconnect Products Corporation, Endicott, N.Y.
Filed Mar. 5, 1990, Ser. No. 488,943
Int. Cl.[5] H01R *9/03*
U.S. Cl. 439—610 14 Claims



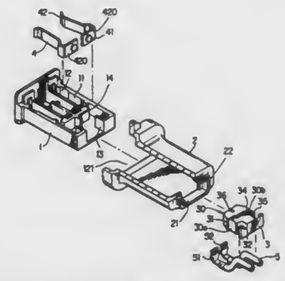
1. An electrical connector shell, comprising:
a plastic shell portion; a first metal shell portion; and a second metal shell portion, wherein a plastic-to-metal interface portion of said first metal shell portion is insert-molded into a plastic-to-metal interface portion of said plastic shell portion to form a composite metal and plastic interface portion, a second portion of said first metal shell portion being free of plastic, wherein said first and second metal shell portions are joined together at a metal-to-metal interface and wherein said electrical connector shell further comprises shielding means for electrically shielding said plastic shell portion, said shielding means including a metal coating on said plastic shell portion.

5,046,968
**ELECTRICAL CONNECTOR CONTACT HAVING AN ELECTRICAL COMPONENT DISPOSED IN A CENTRAL INTERNAL CAVITY**
Robert Baur, Los Angeles; Neal Castleman, Malibu, and Haw-Chan Tan, Culver City, all of Calif., assignors to Tri-Star Incorporated, El Segundo, Calif.
Filed Sep. 28, 1989, Ser. No. 413,988
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 49 Claims



1. A contact for an electrical connector, comprising:
a generally cylindrical body;
a cavity that is substantially central, with respect to the radial dimensions of the body, said cavity being defined within and extending axially within the body;
at at least one axial end of the cavity, a contact structure integral with or secured to the body;
an electrical signal path formed along the body and continuing in the contact structure;
an electrical ground path formed at the outside of the contact;
an electrical component disposed within the cavity and having a pair of electrical leads;
first means electrically connecting a first one of the leads to the ground path; and
second means electrically connecting a second one of the leads to the signal path.

5,046,969
**SOCKET SET**
Nan W. Liao, No. 18, Zee Jou Road, Hsinchu, Taiwan
Filed Jul. 24, 1990, Ser. No. 556,393
Int. Cl.[5] H01R *13/506*
U.S. Cl. 439—686 1 Claim



1. A socket set comprising:
(a) a socket having a pair of chambers each of which has a concavity, a partition provided at a rear end of said chambers, a pair of conductors disposed in said chambers, wherein each conductor has a first end that engages said concavity and a secoond end that has a protrusion, said socket further including a pair of stops provided at said rear end of each of said chambers;
(b) a shell having a first opening adapted to receive said socket, a second opening adapted to receive a connector, and a pair of flanges provided at said second opening;
(c) said connector having a forward end divided into two bases by a gap, a pair of curved channels, each extending from opposite sides of said connector to a respective base, a first pair of hooks adapted to engage said stops of said socket, and a second pair of hooks adapted to engage said flanges of said shell, said paris of hooks located on the sides of said connector and adapted to prevent said connector from being removed from said second opening;
(d) a pair of wires disposed in said channels of said connector and combined with a pair of flanged spades having inclined tongues said pair of flanged spades respectively positioned on said two bases at the forward end of said connector;
(e) siad inclined tongues being in engagement with said protrusions of said conductors.

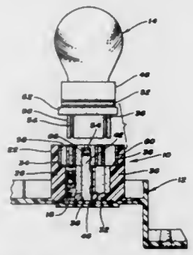
5,046,970
**LAMP SOCKET ASSEMBLY**
Marie T. Brodner, Indianapolis; Jon T. Gale, Anderson, both of Ind.; Donald C. Paul, Downers Grove, and Joseph A. Bettini, Naperville, both of Ill., assignors to General Motors Corporation, Detroit, Mich. and Tricon Industries, Inc., Downers Grove, Ill.
Filed Sep. 15, 1989, Ser. No. 407,982
Int. Cl.[5] H01R *13/00*
U.S. Cl. 439—699 3 Claims

1. A lamp socket assembly having a tubular portion adapted to be integrally molded with a ground terminal and a feed

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terminal for electrical engagement with the terminals of a snap-in wedge-type lamp bulb, said wedge-type lamp bulb having a rectangular base integrally formed with an enlarged guide section and a terminal retainer section for supporting said terminals of said wedge-type lamp bulb, said ground terminal and said feed terminal each being formed with a lead connector, said tubular portion being made of a plastic material and having a pair of opposed end walls each of which is formed with a slot for receiving one end of said enlarged guide



section for permitting said terminal retainer to be inserted into said tubular portion for causing electrical contact with said ground terminal and said feed terminal, a bottom wall interconnecting said end walls of said tubular portion, an opening formed in said bottom wall, an insert having a pair of spring arms attached to a support plate and adapted to be inserted into said opening for engaging said enlarged guide section and thereby serving to releasably retain said wedge-type lamp bulb within said tubular portion, and means for rigidly securing said support plate to said tubular portion.

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**5,046,971**

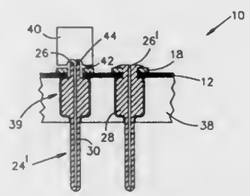
**TERMINAL PINS FOR FLEXIBLE CIRCUITS**

**Murray A. Ruggiero, East Haven; Kin S. Chang, Meriden; George A. Anderson, Old Lyme, and Robert T. Brooker, Watertown, all of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Continuation of Ser. No. 284,622, Dec. 14, 1988, abandoned. This application Jul. 30, 1990, Ser. No. 561,222**

**Int. Cl.[5] H01R** *9/09, 9/16*

**U.S. Cl. 439—741** **8 Claims**



1. A cylindrical electrically conductive pin formed by the steps of drawing a tube through a die followed by machining on a lathe, comprising:

a pin head;

an insertion end; and

a shoulder disposed between said pin head and said insertion end;

said terminal pin having a relatively uniform diameter axial passageway forming a blind hole sealed at said insertion end extending from said pin head through at least a portion of said insertion end; and

said pin head having a first diameter, said passageway having a second diameter of from about 0.005 to about 0.010 inches and said should having a third diameter wherein said second diameter is less than the difference between said third diameter and said second diameter.

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**5,046,972**

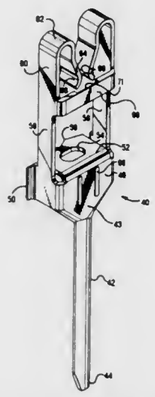
**LOW INSERTION FORCE CONNECTOR AND CONTACT**

**Raymond V. Pass, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Jul. 11, 1990, Ser. No. 551,115**

**Int. Cl.[5] H01R** *13/42*

**U.S. Cl. 439—751** **1 Claim**



1. An electrical socket connector for interconnecting an electronic package to a circuit board, comprising:

a housing having cavities therein which communicate with apertures opening on one surface and further which open on an opposite surface; and

conductive terminals positioned in respective said cavities and having a post portion extending outwardly through said opening on said opposite surface for insertion into a circuit board and further having a base portion at an upper end of said post portion, said base portion defined by a wall having parallel arms extending laterally from each side and a flange extending lateral from a third side, said parallel arms being provided with cavity wall engaging projections projecting outwardly from and normally to free ends thereof, said flange having a serrated free edge for biting into another cavity wall, said terminals further having parallel spring arms attached to and extending outwardly from an edge of respective said parallel arm, said spring arms having free ends bent back in to face said flange and to cooperatively form a socket for receiving a pin on an electronic package.

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**5,046,973**

**BOAT PROPELLER**

**Kurt Waldhauser, Hans-Friz-Weg 28, Graz, Austria A-8010**

**PCT No. PCT/AT87/00056, § 371 Date Apr. 5, 1989, § 102(e) Date Apr. 5, 1989, PCT Pub. No. WO88/02719, PCT Pub. Date Apr. 21, 1988**

**PCT Filed Oct. 9, 1987, Ser. No. 353,654**

**Claims priority, application Austria, Oct. 9, 1986, 2684/86**

**Int. Cl.[5] B63H** *3/00*

**U.S. Cl. 440—50** **8 Claims**

1. A high speed ship propeller comprising:

a propeller shaft having a longitudinal axis;

a central bearing and centering block coupled to said propeller shaft for common rotation therewith and having a first conical bearing surface and a threaded bore;

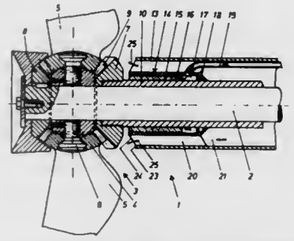
at least two propeller blades, each of said propeller blades having



(i) a socket means having a second conical bearing surface engageable with said first conical bearing surface for bearing said propeller blade on said central bearing and centering block;

(ii) wherein said socket means has a rounded outer surface such that a periphery of said outer surface is disposed nearer said propeller shaft than is a center portion of said rounded outer surface and wherein said rounded outer surface is substantially exposed to a fluid surrounding said propeller blade;

(iii) a first cogging;



(iv) a threaded bolt to couple said propeller blade to said central bearing and centering block and extending perpendicularly to said longitudinal axis of said propeller shaft, penetrating through said second conical surface, and threaded into said threaded bore of said central bearing and centering block, wherein a shoulder of each of said threaded bolts is flush with the rounded outer surface of said socket means; and

a drive means having a second cogging engageable with said first cogging of said propeller blade, for swivelling said propeller blade around a longitudinal axis of said bolt and wherein said longitudinal axis of said bolt is perpendicular to said longitudinal axis of said propeller shaft.

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**5,046,974**

**ANCILLARY FILLER FOR STEERABLE OUTBOARD MOTOR**

**William J. Griffin, Jr., and William J. Griffin, III, both of 7161 Hwy. 95 South, Sandpoint, Id. 83864**

**Filed Jul. 11, 1990, Ser. No. 551,630**

**Int. Cl.[5] B63H** *25/00*

**U.S. Cl. 440—63** **3 Claims**



1. An ancillary tiller for use with outboard motors for small boats that provide means for steerage by pivoting a vertical shaft relative to a boat, comprising, in combination:

motor mounting structure providing means for releasable mounting on the vertical shaft of an outboard motor, said motor mounting structure having a stub mounting shaft extending therefrom with means for releasably interconnecting a first arm thereto;

a first arm having a first inner end releasably interconnected to the stub mounting shaft of the motor mounting structure and extending a spaced distance therefrom;

articulating linkage including a spherical ball carried by the second outer end of the first arm and a socket movably carried by said ball, said socket defining a spherically shaped chamber comprising more than a diametrical half of a sphere substantially the same size as the ball to allow sliding motion of the ball in the chamber, and said socket further including

band type adjustable fastening means structurally carried by and extending about the equatorial portion of the socket to resiliently deform the equatorial portion of the socket to cause frictional fastening of the ball therein, and

a structurally interconnected fastening sleeve extending from the outer surface thereof; and a second arm releasably interconnected with the fastening sleeve of the socket and extending a spaced distance therefrom.

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**5,046,975**

**DEVICE WITH CAVITATIONAL EFFECT FOR PROPELLERS OF WATERCRAFT WITH A PLANING OR SEMIPLANING KEEL**

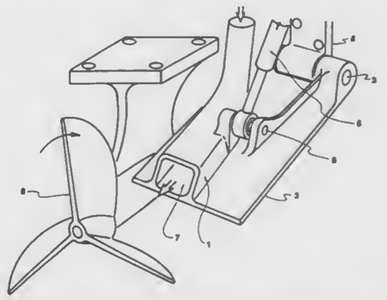
**Fabio Buzzi, Via Per Lecco 1, 22048 Oggiono (Prov. of Como), Italy**

**Filed Apr. 5, 1989, Ser. No. 333,541**

**Claims priority, application Italy, Apr. 5, 1988, 20092 A/88**

**Int. Cl.[5] B63H** *1/18*

**U.S. Cl. 440—66** **7 Claims**



1. A device with cavitational effect for propellers used for the propulsion of watercraft with a planing or semiplaning keel, the propellers having blades and the device comprising a readily movable air flow duct which enables air withdrawn from above the hull water line to directly reach a front part of the propeller, said duct having an outlet which is positionally adjustable relative to the propeller such that the point at which the air reaches the propeller is positionally adjusted along the diameter of said propeller from at least a central portion of the diameter of the propeller to a position beyond tips of the blades of the propeller.

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**5,046,976**

**COWLING AND AIR INTAKE DUCT FOR OUTBOARD MOTOR**

**Seiji Kobayashi, and Masaharu Miyazaki, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Jan. 11, 1990, Ser. No. 463,394**

**Claims priority, application Japan, Jan. 12, 1989, 1-3773**

**Int. Cl.[5] B63H** *21/24*

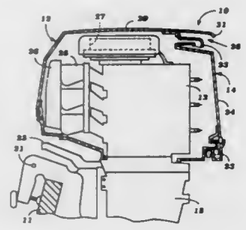
**U.S. Cl. 440—77** **7 Claims**

1. A cowling and air inlet device for the powerhead of an outboard motor having an internal combustion engine including an induction system, comprising air inlet means for inducting air from the atmosphere formed in an upper rear surface of said cowling, air intake means having an air intake opening and mounted within said air inlet means for supplying air to said induction system, and a cover secured to said cowling for covering said air intake means and for forming a top surface of

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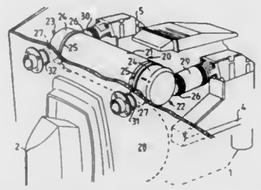
said air inlet means to cooperate in defining a flow path for air into said air inlet means, and wherein the air intake opening is



downwardly facing so as to prevent any water adhering on the underside of said cover from falling into the air intake opening.

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**5,046,977**
**EXHAUST MUFFLER FOR MARINE ENGINES**
**Christian Rodskier, Torslanda, Sweden, assignor to AB Volvo Penta, Goteborg, Sweden**
**Filed Dec. 15, 1989, Ser. No. 455,506**
**Claims priority, application Sweden, Jan. 4, 1989, 8900025**
**Int. Cl.[5] B63H *21/32***
**U.S. Cl. 440—89** **11 Claims**

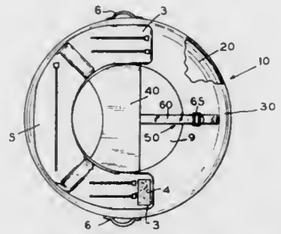


1. Exhaust muffler for marine engines comprising a container with an inlet and an outlet for exhaust and cooling water, and with flow diverting means disposed between the inlet and outlet, the container (**20**) being arranged to be mounted with its longitudinal axis horizontal and transverse to the longitudinal axis of the engine, said inlet (**26**) being disposed adjacent one end of the container, the mixture of exhaust gas and water entering the muffler at least essentially horizontally and perpendicular to the longitudinal axis of the container, said flow diverting means (**50, 51**) diverting the mixture horizontally in one longitudinal direction of the container and then back in the opposite longitudinal direction of the container and then upwards and then downwards before reaching the outlet, the outlet being disposed adjacent the same said one end of the container as the inlet.

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**5,046,978**
**FLOAT TUBE WITH ADJUSTABLE SLING SEAT**
**Larry L. Howerton, 2607 McKinney, Boise, Id. 83704**
**Filed Jul. 26, 1990, Ser. No. 558,756**
**Int. Cl.[5] B63C *9/08***
**U.S. Cl. 441—131** **7 Claims**

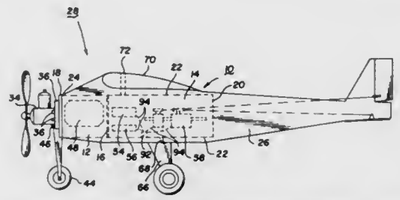
1. A float tube device comprising:
a flexible buoyant tubular member, substantially annular in form and defining a central opening;
a flexible fabric annular cover member encasing said tubular member;
a lateral band of flexible material affixed to opposing portions of said cover member across the central opening; said band of flexible material having a length in excess of the distance between said opposing portions to define a seat with sling; and



adjustable belt means across the width of said seat and connected to and between said seat and said cover for selectively adjusting the sling of said seat.

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**5,046,979**
**CHASSIS MODULE FOR MODEL AIRPLANE CONSTRUCTION**
**Lawrence H. Ragan, 1307 Chesterton Dr., Richardson, Tex. 75080, and George S. Barker, 10827 Alladin, Dallas, Tex. 75229**
**Continuation of Ser. No. 345,686, May 1, 1989, abandoned. This application Apr. 16, 1990, Ser. No. 509,730**
**Int. Cl.[5] A63H *27/00, 30/04*; B64D *27/00***
**U.S. Cl. 446—57** **10 Claims**



1. For use in a model airplane having a fuselage and control means for selectively positioning movable flight control surfaces, a longitudinally removable module comprising:
(a) a support body adapted to be removably mounted longitudinally within a forward opening in the fuselage of the model airplane;
(b) a radio receiver mounted on said support body;
(c) servo means controlled by said radio receiver mounted on said support body and adapted for interconnection with the control means for selectively positioning movable flight control surfaces of the model airplane;
(d) battery means mounted on said support body and operatively interconnected to supply electrical power to said servo means and said radio receiver;
(e) an engine and means for mounting the engine on said support body and a fuel container mounted on said support body for supplying fuel to said engine; and
(f) second servo means mounted on said support body operatively interconnected with a throttle control means for said engine controlled by said radio receiver.

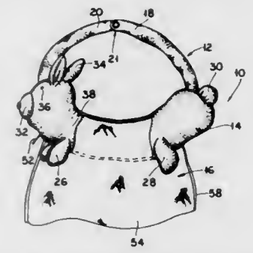
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**5,046,980**
**TOY DEVICE WITH PULL-OUT BIB**
**Woon S. Tai, North Point, Hong Kong, and Rita Raiffe, Edison, N.J., assignors to Gund, Inc., Edison, N.J.**
**Filed Feb. 27, 1990, Ser. No. 485,742**
**Int. Cl.[5] A63H *3/00, 33/00*; A41B *13/10***
**U.S. Cl. 446—73** **27 Claims**

1. A playmate and protector combination for an infant or child comprising:



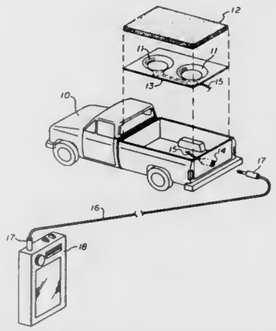
a soft toy having an interior;
a handle for carrying the soft toy;
said handle sized and intended for fitting around the neck of an infant or child; and
a sheet of material located within said soft toy having a portion thereof fixed to the interior of the soft toy, the soft



toy having an opening and the sheet being selectively extendable through the toy opening outwardly therefrom such that said sheet is adapted to be located substantially over at least a substantial portion of the infant or child's torso when said handle is fitted around the neck of the infant or child.

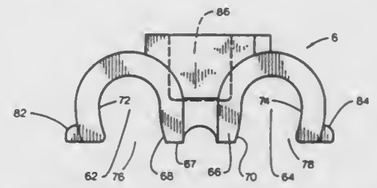
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**5,046,981**
**TOY VEHICLE WITH REMOTELY DRIVEN SPEAKER AND PLURAL BODIES**
**Kenneth A. Roddy, 15322 E. Ritter Cir., Houston, Tex. 77071**
**Filed Mar. 19, 1990, Ser. No. 495,843**
**Int. Cl.[5] A63H *5/00, 17/00, 17/34, 3/33***
**U.S. Cl. 446—81** **10 Claims**



1. A toy vehicle having a remotely driven sound system releasably connectable to a sound source for reproducing sounds through the vehicle sound system comprising;
a toy vehicle having a body,
one or more small loudspeakers housed within said vehicle body and substantially hidden from view,
an audio jack on said vehicle body coupled with said loudspeakers to releasably connect said loudspeakers to a remote radio or tape player, whereby
said toy vehicle when connected to the remote radio or tape player will reproduce actual radio transmissions or prerecorded audio tapes to closely simulate the radio or tape player of an actual vehicle and allow the selection of various types of music or recorded sounds to be reproduced on the vehicle sound system.

**5,046,982**
**CONSTRUCTION APPARATUS**
**Harry Erickson, Vancouver, Canada, assignor to Arlington-Hews, Inc., Vancouver, Canada**
**Continuation of Ser. No. 212,142, Jun. 13, 1988, Pat. No. 4,911,672, which is a continuation of Ser. No. 841,207, Mar. 19, 1986, abandoned, which is a continuation of Ser. No. 723,542, Apr. 15, 1985, abandoned. This application Oct. 20, 1989, Ser. No. 424,103**
**The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.**
**Int. Cl.[5] A63H *33/00***
**U.S. Cl. 446—112** **10 Claims**



1. A connector for connecting first and second spaced parallel cylindrical rods of construction toys or models, the connector comprising:
a central portion having an outer end and first and second tapered sides tapering towards said outer end; and first and second curved outer walls extending outwardly from opposite sides of said central portion, said first and second curved outer walls being curved inwards towards said first and second tapered sides respectively to from first and second U-shaped recesses between said first and second curved outer walls respectively and said central portion, said first and second U-shaped recesses each including an opening having a predetermined width adjacent said outer end of said central portion, said first and second tapered sides extending a distance less than said predetermined width of said respective openings, said first and second recesses having partially circular inner portions to receive the respective first and second cylindrical rods therein, and said recesses having outer portions with said outer walls being concavely curved sufficiently to form a narrowed opening between respective said outer walls and respective said tapered sides to releasably retain the respective rods in the respective recess, the first tapered side of the central portion being inclined sufficiently to provide clearance to receive the first rod therein with negligible deflection of the rod as the connector rotates about the second rod which journals the connector in the inner portion of the second recess, the narrowed portion of the first recess having a dimension slightly less than the diameter of the inner portion of the first recess so that the first outer wall deflects as the first rod enters the first recess, and vice versa.

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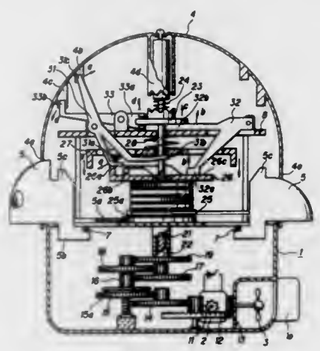
**5,046,983**
**TOY HAVING ROTATABLE COVER AND PROTRUDING PIECES**
**Toshio Suzuki, Tokyo, Japan, assignor to K.K. Toy Box, Tokyo, Japan**
**Filed Oct. 16, 1990, Ser. No. 598,524**
**Claims priority, application Japan, Dec. 11, 1989, 1-319037**
**Int. Cl.[5] A63H *23/10, 13/00***
**U.S. Cl. 446—158** **20 Claims**

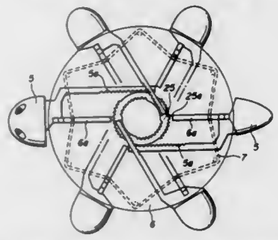
1. A motorized toy comprising:
a body incorporating a drive source, a propelling unit driven by said drive source, a main shaft rotated by receiving transmission of driving force from said drive source via gears, and an auxiliary shaft;

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a cover member formed with a plurality of notches in its outer periphery and mounted above said body;
protruding pieces, inserted into said notches of said cover member, having imparted thereon elastic forces acting in outer directions of said body; and
means for holding and releasing said protruding pieces from said cover;
wherein said protruding pieces are accommodated in the interior of said cover member by interlocking with rota-



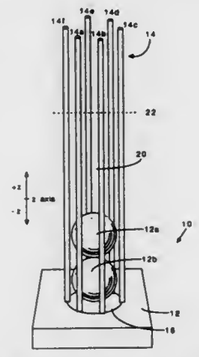


tion of said main shaft, and wherein rotation of said auxiliary shaft is transferred to said cover member through a lever, during a period in which said protruding pieces are accommodated within said cover member, to cause said cover member to rotate a predetermined number of times, and said protruding pieces revert to an initial protruding state by releasing said protruding pieces from being accommodated within said cover member after said cover member has finished rotating said predetermined number of times.

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**5,046,984**
**BOUNCING BALL LAUNCHER**
**David A. Cane, 4 Deacon La., Sudbury, Mass. 01778**
**Filed Apr. 11, 1990, Ser. No. 507,998**
**Int. Cl.[5] A63H** *29/08, 33/00, 29/00;* **G09B** *23/08*
**U.S. Cl. 446—168** **20 Claims**

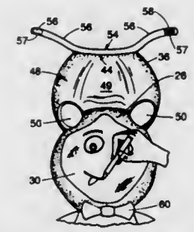
1. An amusement apparatus for use in a force field applied in a first direction along a first axis, said apparatus comprising
a plurality of bounce means for substantially identical acceleration along said first axis under application of said force field,
guide means for substantially constraining said plurality of bounce means to movement substantially in a line lying parallel to said first axis, wherein said bounce means positioned furthest along said line in a second direction which is opposite said first direction is termed a "top" bounce means, and wherein said bounce means positioned furthest along said line in said first direction is termed a "bottom" bounce means,
base means, positioned adjacent said guide means at a first end thereof, for reversing a direction of motion said of at least said bottom bounce means,
activation means coupled to said guide means for enabling translation of said bounce means to a position spaced-apart from said first end in said second direction,
wherein upon positioning said bounce means substantially



adjacent one another at said spaced-apart position and releasing them for acceleration in said force field in said first direction towards said base means, at least said top bounce means rebounds in said second direction with a velocity of greater magnitude then that of a greatest velocity achieved during said acceleration in said first direction.

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**5,046,985**
**DOLL WITH A FACE FLAP OVERLYING A MARKABLE FACE PLATE**
**Roscoe Cearfoss, 805 Camino La Posada, Camarillo, Calif. 93010**
**Filed Dec. 19, 1990, Ser. No. 630,237**
**Int. Cl.[5] A63H** *3/12, 3/00, 3/02;* **B43L** *1/00*
**U.S. Cl. 446—321** **6 Claims**

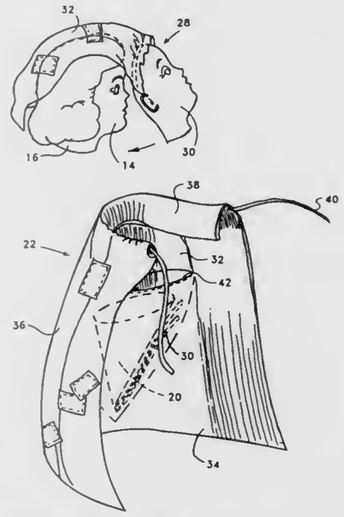


1. In a doll having a head with a top region, a lower region, a back side and a front side with said front side including a blank drawing medium; and,
wherein said front side with said blank drawing medium is surface prepared to eraseably receive markings from a child's markers from the group of crayons, pencils, and felt tip pens,
a flap constructed of flexible material removably overlying said medium having an outerside displaying a face design, said flap having an upper portion attached to said top region and a lower portion having a releasable attachment means for releasably securing said flap to said lower region, said flap being movable from a down position over said medium to a back position over said back side, said releasable attachment means being connectable to said lower region when said flap is in either the down position or the back position.



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**5,046,986**
**DOLL AND COSTUME CONSTRUCTION**
**Patrick J. Wood, and Mary F. Wood, both of 404 Maxwell Dr., Pittsburgh, Pa. 15236**
**Filed Aug. 28, 1990, Ser. No. 574,467**
**Int. Cl.[5] A63H** *3/12, 33/00;* **A41D** *3/08, 11/00*
**U.S. Cl. 446—321** **7 Claims**

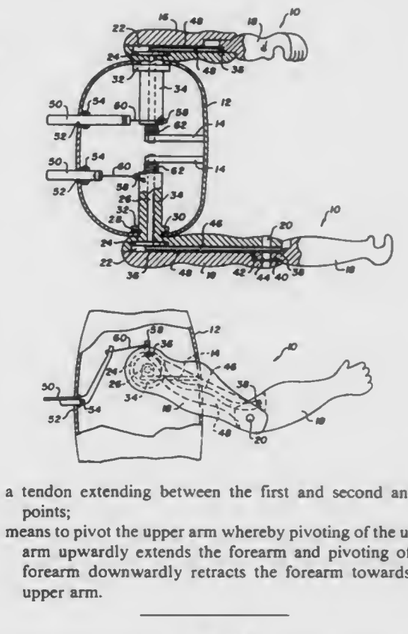


1. A multiple character doll comprising,
a doll body including a supporting torso with a head portion connected thereto, said head portion having a face,
a loose fitting garment draped around said torso, said loose fitting garment having one surface styled for presentation as a first doll character and an opposite surface styled for presentation as a second doll character,
a face mask for positioning over said face to change the character of the doll from said first character to said second character,
means for securing said face mask to said loose fitting garment to position said face mask over said doll face to disguise said doll face when the doll is presented as said second character, and
storage means on said loose fitting garment for receiving said face mask concealed from view to convert the doll from said second character to said first character.

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**5,046,987**
**TOY BOXER ARMS**
**Simeon Djordjevic, 2339 Guilford, Abbotsford, British Columbia, Canada V2S 4Z3**
**Filed Sep. 5, 1989, Ser. No. 403,274**
**Int. Cl.[5] A63H** *13/02*
**U.S. Cl. 446—336** **7 Claims**

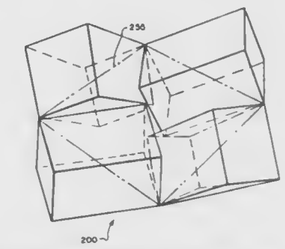
1. An arm for a doll having a torso with a mounting for the arm fixed in the torso, the arm having an upper arm and a forearm pivotally attached to each other at an elbow having a pivotal axis, the improvement comprising:
the upper arm being pivotally received on the mounting and able to pivot in a shoulder opening in the torso about a pivotal axis, the upper arm being provided with a channel to engage the edge of the shoulder opening in the torso;
a first anchor point on the upper arm, offset from the pivotal axis of the upper arm;
a second anchor point adjacent the elbow offset from the elbow pivotal axis and mounted on the forearm;



a tendon extending between the first and second anchor points;
means to pivot the upper arm whereby pivoting of the upper arm upwardly extends the forearm and pivoting of the forearm downwardly retracts the forearm towards the upper arm.

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**5,046,988**
**LINKED POLYHEDRA WITH CORNER CONNECTOR**
**Herbert G. Bennett, 195 E. 31st St., Brooklyn, N.Y. 11226**
**Filed Nov. 13, 1989, Ser. No. 435,239**
**Int. Cl.[5] A63H** *33/00, 33/08;* **A63F** *9/08*
**U.S. Cl. 446—487** **35 Claims**



1. A transformable combination including a first set of polyhedrons comprising:
a plurality of polyhedrons including at least first and second polyhedrons each having a top face edges, a bottom face and a plurality of concave sides; and
means for connecting adjacent corners of each of said polyhedrons in a manner which allows rotation of the faces, edges, and sides of one polyhedron relative to an adjacent polyhedron, wherein said polyhedron has no more than one additional connection to any other polyhedron in the

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set and said means for connecting connecting said first and a last polyhedron thereby creating a closed set.

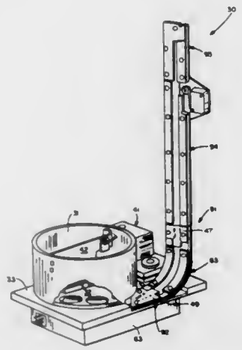
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5,046,989

## COIN STORAGE AND DISPENSING APPARATUS

Jack D. Dass, Santa Clara, Calif., assignor to Jack Dass and Charles F. Popham, both of Carson City, Nev.

Continuation of Ser. No. 192,534, Aug. 18, 1988, abandoned.
This application Dec. 5, 1989, Ser. No. 449,285
Int. Cl.[5] G07D 9/04
U.S. Cl. 453—17 26 Claims



1. A coin storage and dispensing apparatus comprising:
a coin hopper assembly including a coin bowl mounted on a hopper base and a rotatable coin disk having a plurality of coin pockets therein, said hopper base provided with a coin gutter for receiving coins from said plurality of coin pockets, and said rotatable coin disk operatively engaged with a drive means for rotation;
a coin track assembly having a coin channel therein sized to permit passage of a single layer of coins in edge-to-edge relationship, said coin track assembly including a generally horizontal portion and a generally vertical portion joined by a curved intermediate portion, and a coin exit slot in proximity to a terminal end of said generally vertical portion; and
a coin mixer assembly having at least two diametrically opposed upper arms mounted on the inner surface of said coin bowl and at least two flexible fingers in proximity to the upper surface of said coin disk.

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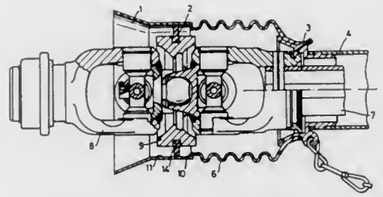
5,046,990

## FIXED GUARD FOR ROTATING JOINTS

Felix Mikeska, Siegburg, and Hans-Jürgen Langen, Frechen, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Aug. 22, 1990, Ser. No. 571,776
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1989, 3927588
Int. Cl.[5] F16C 1/26
U.S. Cl. 464—175 4 Claims

1. A device for protecting a wide angle joint associated with a driveshaft for driving agricultural implements or the like, the device comprising:
a smooth and hollow protective guard at least partially covering the joint;
a sliding ring mounted on the joint inside said hollow guard so that the hollow gaurd clears the joint by a distance relative to a diameter of the sliding ring, the hollow guard having an axial inward end formed with a flexible convoluted tube, the hollow guard having a cylindrical inside surface by means of which the hollow guard is displaceably supported upon the sliding ring, and the hollow guard further having an inwardly oriented contact edge at



a transition to the convoluted tube, which edge is formed so as to be contactable by the sliding ring.

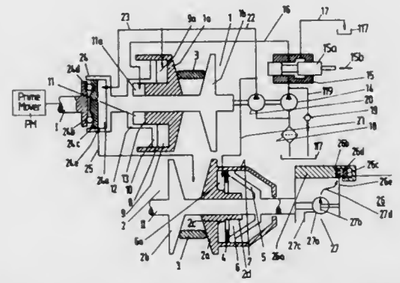
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5,046,991

## CONTINUOUSLY VARIABLE SPEED TRANSMISSION

Oswald Friedmann, Lichtenau, Fed. Rep. of Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Nov. 21, 1990, Ser. No. 616,356
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1989, 3938593; Dec. 7, 1989, 3940460
Int. Cl.[5] F16H 63/00
U.S. Cl. 474—18 17 Claims




1. A continuously variable speed transmission, comprising rotary input and output members; first and second sheaves respectively provided on said input and output members, each of said sheaves comprising a first flange affixed to and a second flange movable axially of the respective member; an endless flexible element trained over said sheaves; a first fluid-operated circuit having means for transmitting torque to one of said members; a second fluid-operated circuit having first and second means for moving the second flanges of said first and second sheaves, respectively; a first pump having means for supplying fluid to said first circuit; a second pump having means for supplying fluid to said second circuit; and additional means for moving at least one of said second flanges toward the respective first flange in response to a rise of pressure of fluid which is supplied by said second pump.



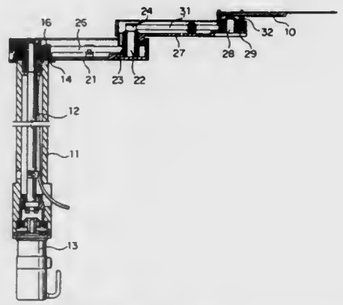
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5,046,992

## ROBOT ARM CAPABLE OF THREE-DIMENSIONALLY MOVING A ROBOT ARM MEMBER

Tadamoto Tamai, Tokyo, and Keiji Okada, Ehime, both of Japan, assignors to Sumitomo Eaton Nova Corporation, Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,524
Claims priority, application Japan, Nov. 14, 1989, 1-296330
Int. Cl.[5] F16H 7/00
U.S. Cl. 474—84 6 Claims



1. A robot arm comprising:
a main post which has a hollow space therein, an upper end, and a lower end;
a rotatable axle which has first and second ends adjacent to said upper and said lower ends of said main post, respectively, and which is extended along said main post within said hollow space;
a first motor coupled to said second end of the rotatable axle and adjacent to said lower end of the main post for rotating said rotatable axle;
a first gear which has a first predetermined number of teeth and which is fixed to said first end of the main post;
a first arm unit which has an inner and an outer end and which is fixed to the inner end of said first axle to be extended from said first end of the first axle;
a first fixed axle which is fixed to said outer end of the first arm unit and which stands upright from said outer end of the first arm unit;
a second gear which has a second predetermined number of teeth and which is rotatably supported on said first fixed axle;
a first power transmission element coupled to said first and said second gears;
a second arm unit which has first and second end portions adjacent to and farther from said first arm unit, respectively, and which is fixed to said second gear at said first end portion to be substantially horizontally extended from said first end portion;
a third gear which has the second predetermined number of teeth and which is fixed to said first fixed axle with said third gear placed within said second arm unit;
a second fixed axle which is fixed to said second end portion of the second arm unit and which stands upright from said second end portion of the second arm unit;
a fourth gear which has a third predetermined number of teeth and which is rotatably supported on said second fixed axle with said fourth gear located within said second arm unit;
a second power transmission element coupled to said third and said fourth gears;
a chuck arm which is fixed to said fourth gear and which is substantially horizontally extended from said second arm unit;
a housing for accommodating said main post along with said first motor;
a second motor which has an output axis and which is fixed to an inside wall of said housing;
a frame member placed within said housing and connected to said output axis of the second motor for rotating said main port; and
an elevating member fixed to said frame member and said main post for selectively moving said main post downwards and upwards.

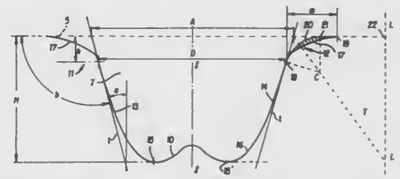
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5,046,993

## TOOTH BELT AND MEANS OF TRANSMISSION RELATED THERETO

Vincenzo Macchiarulo, Pescara, and Tommaso Di Giacomo, Bari, both of Italy, assignors to Pirelli Trasmissioni Industriali S.p.A., Milan, Italy

Filed Nov. 9, 1989, Ser. No. 433,789
Claims priority, application Italy, Nov. 11, 1988, 22584 A/88
Int. Cl.[5] F16G 1/28
U.S. Cl. 474—205 16 Claims



1. A flexible toothed belt comprising a body delimited by two faces, a plurality of teeth projecting from at least one of said faces, a plurality of grooves alternating with said teeth, traction-resistant members incorporated in said body in the longitudinal direction of the belt and in proximity to the teeth, at least one layer of covering on the teeth, each groove being delimited when the belt is stretched by a base line located on the face from which the teeth project and symmetrical with respect to a central line (L-L), each tooth being symmetrical with respect to a central axis (I-I) and formed of a head, two roots and two extended flanks starting from the head, each root comprising a curvilinear segment whose ends, first and second, are located at the end of the flank and on the base line of the groove respectively, each tooth having a tangent (t) at the point of intersection between root and flank forming an angle of predetermined value (b) with the groove base line, said belt being characterized in that said first end of the curvilinear root segment coincides with a first terminal point of a circular arc tangent to the flank and to the base line with center of curvature (C) on the bisectrix (T) of said predetermined angle (b) and said second end of the curvilinear segment being located between a second terminal point of said arc and a point of intersection of the central line (L-L) of the groove and the base of the groove and at most is located on said point of intersection on the base of the groove.

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5,046,994

## VEHICLE TRANSMISSION ASSEMBLY

Toshiyuki Hasegawa, Ashiya; Shigenori Sakigawa, Itami, and Ryota Ohashi, Sakai, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Nov. 1, 1990, Ser. No. 607,864
Claims priority, application Japan, Nov. 20, 1989, 1-301197
Int. Cl.[5] F16H 37/08
U.S. Cl. 475—83 8 Claims

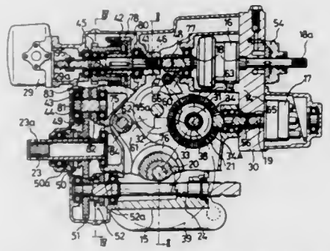
1. A vehicle transmission assembly comprising a hydrostatic transmission, which includes a hydraulic pump having a pump shaft and a hydraulic motor having a motor shaft, and a mechanical transmission mechanism disposed within a transmission casing for transmitting vehicle-driving power to left and right rear wheel axles which are supported by said transmission casing, said motor shaft being connected drivingly to said

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rear wheel axles through said mechanical transmission mechanism, at least one of a rear-PTO shaft and mid-PTO shaft for taking-off auxiliary implement-driving power being supported by said transmission casing and connected drivenly to said pump shaft, characterized in:

that a plate member (**30**) is fixedly secured to a front of said transmission casing (**15**), said hydraulic pump (**16**) being mounted on a rear surface of said plate member and disposed at an upper portion within said transmission casing such that an input end (**18***a*) of said pump shaft (**18**) extends forwardly of said plate member, and said hydraulic motor (**17**) being mounted on a front surface of said plate member at a level lower than said level of said hydraulic pump such that said motor shaft (**19**) extends rearwardly from said motor;



that said mechanical transmission mechanism (**21**) is disposed at a level lower than said level of said hydraulic pump (**16**) and is fashioned to include plural transmission shafts (**31**, **32**, **33**) all of which extend leftwards and rightwards of said transmission casing (**15**), said mechanical transmission mechanism being connected to said motor shaft (**19**) through a bevel gearing (**34**); and

that a drive shaft (**41**) is disposed within said transmission casing (**15**) rearwardly of said hydraulic pump (**16**) and co-axially with said pump shaft (**18**), said pump shaft extending rearwardly from said hydraulic pump and being coupled to said drive shaft, and said drive shaft being connected drivingly to said one PTO shaft (**23**; **24**) through a PTO-clutch (**42**) mounted on said drive shaft and through a gear train (**43**; **143**; **243**) which is disposed at a rear end portion within said transmission casing.

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**5,046,995**

**STEPLESSLY VARIABLE POWER TRANSMISSION**

**Oliver J. Russell, 3560 Altamont Rd., Birmingham, Ala. 35213**

**Continuation-in-part of Ser. No. 356,443, May 24, 1989, abandoned, which is a continuation-in-part of Ser. No. 288,947, Dec. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,186, May 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 782,530, Sep. 30, 1985, abandoned. This application Jun. 11, 1990, Ser. No. 536,188**

**Int. Cl.[5] F16H** *1/28, 1/32*

U.S. Cl. 475—170 **21 Claims**

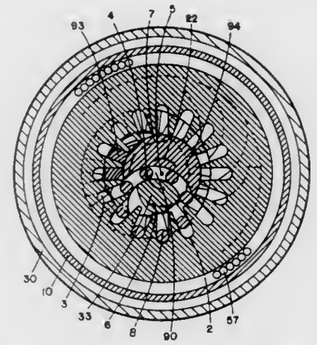
1. A steplessly variable power transmission, comprising:

a input driving means, including a first gearing means, having a plurality of teeth, in rotation, around an axis, and

a means to guide said teeth, on a plurality of paths, that includes a plurality of straight paths, as related to

an output driving second gearing means and a plurality of curved paths, as related to;

a housing, and said curved paths, being selectively and steplessly changed by said means to guide said teeth, and the stepless changing of the curved paths, steplessly varies an



input to output ratio, thereby providing a steplessly variable power transmission.

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**5,046,996**

**PLANETARY FRICTION DRIVE**

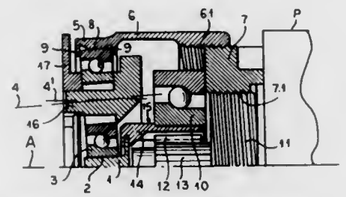
**Eduard Horvath, Vienna, Austria, assignor to Otto Bock Orthopadische Industrie Besitz-Und Werwaltungs-KG, Duderstadt, Fed. Rep. of Germany**

**Filed Jul. 18, 1989, Ser. No. 381,605**

**Claims priority, application Austria, Jul. 18, 1988, A 1843/88**

**Int. Cl.[5] F16H** *13/06, 13/10*

U.S. Cl. 475—197 **12 Claims**



1. A planetary friction-wheel drive, comprising:

a drive shaft rotatable about a first axis, said shaft being provided with a portion having a frustoconical surface coaxial with the drive shaft and rotatable therewith;

an annular support formed with a stationary surface spacedly surrounding said frustoconical surface and being coaxial with said shaft;

a plurality of planet wheels received between said surfaces and frictionally rolling thereon, said planet wheels having central bores extending along respective bore axes inclined to said first axis and respective cylindrical peripheries respectively coaxial with said bores;

a planet-carrier plate having entraining pins loosely traversing said bores, said pins extending along respective second axes parallel to one another and to said first axis and being rotatably entrained by said planet wheels upon rotation of said shaft and rolling of said peripheries on said surfaces, said planet-carrier plate forming an output of the drive; and

means for relatively adjusting said surfaces along said first axis of said shaft and for securing said surfaces in an axially adjusted position, said planet wheels being in contact with said frustoconical surface over entire lengths of respective generatrices of the cylindrical peripheries of said planet wheels.



**5,046,997**

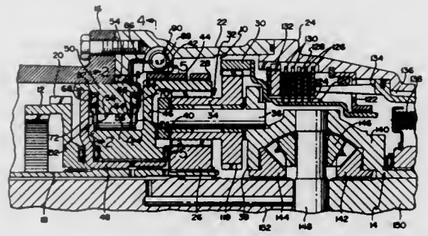
**TWO-STAGE FINAL DRIVE**

**Erkki A. Kolvunen, Livonia, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 24, 1990, Ser. No. 571,813**

**Int. Cl.[5] F16H** *1/44*

U.S. Cl. 475—221 **6 Claims**



1. A two stage final drive connected between an input shaft and two output shafts comprising: a first gear assembly having an input member drivingly connected with said input shaft, an output member, a first reaction member and a second reaction member; a second gear assembly having an input member drivingly connected with said output member of said first gear assembly and differential gear means drivingly connected with said output shafts; selectively engageable control means for establishing said first reaction member as a bi-directional reaction in said first gear assembly during one phase of operation and as a unidirectional reaction during another phase of operation; and selectively engageable friction means for selectively establishing said second reaction member as a bi-directional reaction during said other phase of operation.

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**5,046,998**

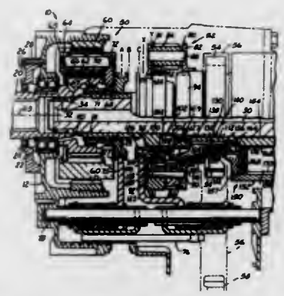
**TWO-WHEEL DRIVE MODE FOR FULL-TIME TRANSFER CASE**

**Barry L. Frost, DeWitt, N.Y., assignor to New Venture Gear, Inc., Troy, Mich.**

**Filed Nov. 16, 1989, Ser. No. 437,066**

**Int. Cl.[5] F16H** *37/08*

U.S. Cl. 475—221 **2 Claims**



1. A vehicle transfer case having an input adapted to be rotatably driven about a central axis by an engine and also having first and second outputs that rotatively drive first and second axles, respectively, the transfer case comprising:

a casing;

an input shaft rotatably supported by said casing along the central axis and adapted to be rotatively driven by the input, said input shaft having a front end and an aft end, said front end thereof being disposed adjacent the input of the transfer case;

an input sun gear of a forward planetary gear set connected to said input shaft to rotate therewith;

a central shaft rotatably supported by said housing along the central axis, said central shaft having a front end and an aft end, said front end thereof being disposed adjacent said aft end of said input shaft and said aft end thereof constituting the first output of the transfer case;

a forward quill sleeve concentrically surrounding said central shaft for relative rotation therewith and having first external spline means formed thereon;

a range clutch collar concentrically surrounding a forward portion of said forward quill sleeve and having internal spline means slidably engaging said first external spline means of said forward quill sleeve such that said range clutch collar being adapted to selectively connect said input shaft to said forward quill sleeve via said forward planetary gear set;

said forward planetary gear set being rotatively driven by said input sun gear and having a first operating range where the planetary operation thereof about the central axis provides driving of said central shaft, and therewith, said first output with speed reduction, said first planetary gear set having a second operating range where no driving of said central shaft is provided, said forward planetary gear having a third operating range where driving of said central shaft is provided with no speed reduction from planetary operation of said forward planetary gear set;

an aft dual planetary differential gear set disposed coaxially in a concentric manner about said central shaft, said aft differential gear set comprising a dual planetary carrier including forward and aft longitudinally spaced interconnected carrier rings rotatable about the central axis, said forward carrier ring having a central internally splined bore concentrically disposed about said central shaft and an aft portion of said forward quill sleeve, forward and aft sun gears concentrically disposed about said central shaft, said aft sun gear having its teeth at a first uniform radius with said forward sun gear having its teeth at a first uniform radius a predetermined distance greater than said aft sun gear teeth radius, first and second sets of pinion gears having identical uniform diameters rotatably supported on first and second, respective, sets of pins disposed parallel to the central axis, said first and second sets of pins journalled between said carrier forward and aft rings at first and second radial distances, respectively, outward from the central axis, wherein said first radial distance is a predetermined distance greater than said second radial distance, said first and second sets of pinion gears disposed in paired relationship such that each said first set pinion gear teeth meshingly engage a corresponding second set pinion gear teeth, the improvement wherein;

said aft portion of said forward quill sleeve having a radial hub portion formed with second external spline means adapted for slidably engaging said forward carrier member internal splines;

an aft quill sleeve concentrically surrounding said central shaft for relative rotation therewith and having its front end separated a predetermined axial distance by a spacer ring from said forward sleeve aft end, said spacer ring concentrically fixed to said central shaft for rotation therewith and having external spline means alignable with said forward quill sleeve second spline means, said aft quill shaft front end formed with external splines alignable with said spacer ring external spline means;

means for shifting said aft planetary gear set carrier and its forward sun gear axially relative to said forward quill shaft, said spacer ring and said aft quill sleeve between a forward two-wheel drive operating mode and a rearward full-time four-wheel drive operating modes;

said shifting means adapted to cause said forward carrier member internal splines to meshingly engage said second spline means on said forward quill sleeve in said four-wheel drive mode, and wherein said forward carrier mem-

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ber internal splines are disengaged from said forward quill sleeve second spline means in said two-wheel drive mode;
said differential gear set forward sun gear having internal splines of predetermined axial length such that they slidably engage said external spline means on both said spacer ring and said radial hub portion of said forward quill sleeve in said two-wheel drive operating mode, and said forward sun gear internal splines slidably engaging both said spacer ring external spline means and said aft quill sleeve forward end external splines in said full-time four-wheel drive operating mode;
said aft sun gear of said aft differential gear set having a rearwardly extending flange concentrically surrounding a forward portion of said aft quill sleeve, said aft sun gear flange formed with external splines engaging an internally splined axial bore of a drive sprocket concentrically surrounding a portion of said flange, chain means connecting said drive sprocket with an offset output shaft constituting the second output of the transfer case;
a resistive clutch comprising an inner housing, defined by an aft end portion of said aft quill sleeve, and an outer housing rotatable relative to said inner housing, said outer housing secured to said aft sun gear flange and being rotatable therewith, whereby with said transfer case aft planetary differential gear st in said full-time four-wheel drive operating mode said resistive clutch is operative to modify torque division between said central shaft and said offset shaft in response to variations in respective rotation speeds of said central shaft and said offset shaft; and
whereby with said transfer case aft planetary differential gear set in said two-wheel drive operating mode said resistive clutch is disconnected from said central output shaft for obviating a driving connection between said outer and inner housings.

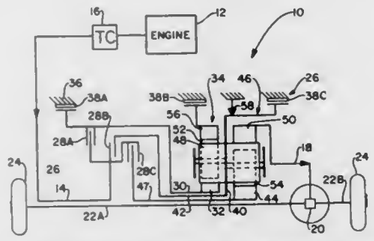
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**5,046,999**

## 5-SPEED, COMPOUND, EPICYCLIC TRANSMISSION HAVING A PAIR OF PLANETARY GEAR SETS

**Tyng Liu, Taipei, Taiwan, and John D. Malloy, Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 5, 1990, Ser. No. 593,420**
**Int. Cl.[5] F16H *3/58***
**U.S. Cl. 475—281** **10 Claims**




1. A five speed epicyclic transmission assembly comprising: a housing an input means and an output means; a pair of axially spaced sun gears rotatably mounted in said housing; a pair of axially spaced ring gears rotatably mounted in said housing and being axially aligned with and encircling respective ones said sun gear; one said ring gear operatively secured to said output means; a carrier rotatably mounted in said housing; a plurality of pinions supported from said carrier for rotation independently of said carrier and for translation when said carrier is rotated; said pinions being grouped in at least pairs, said grouped pinions being meshingly engaged; at least one pinion engaging each said ring gear and one of said pinions being disposed in direct meshing relation with the sun gear and the ring gear axially spaced therefrom; at least one pinion engaging each said sun gear; at least six torque transfer devices; said torque transfer devices including at least two input clutch means selectively to connect said input means with at least one of said sun gears and said carrier; and, said torque transfer devices also including at least two reaction brake means selectively to ground at least said carrier and one sun gear to said housing.

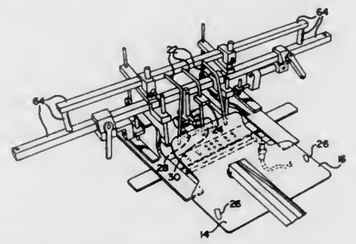
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**5,047,000**

## ATTACHMENT FOR FORMING ENVELOPES

**Robert Lester, Chicago, Ill., assignor to Outlook Envelope Company, Huntley, Ill.**

**Filed Nov. 27, 1989, Ser. No. 441,363**
**Int. Cl.[5] B31B *21/36, 21/62***
**U.S. Cl. 493—231** **9 Claims**




1. In an envelope blank forming machine having means for forming the outline of an envelope blank before folding and means for feeding said envelope blank through said envelope blank forming machine, the invention being an apparatus that is removably attached to said envelope blank forming machine, said apparatus being used to form envelopes from said envelope, blanks said blanks including a leading edge, side flaps, a rear portion, and a front portion, and said apparatus comprising:
a. adhesive application means for applying adhesive on one side of said side flaps of said envelope blank;
b. a buckle bar for urging said leading edge of said envelope upwardly;
c. means for folding said rear portion to a position overlying said front portion;
d. means for folding said side flaps over said rear portion;
e. roller means for pressing the adhesive-covered side of said side flaps onto said rear portion to form an envelope; and
f. a cross-bar frame being removably attached to the envelope blank forming machine, wherein said adhesive application means, said buckle bar, said means for folding said rear portion, said means for folding said side flaps and said roller means are attached to said removable cross-bar frame.

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**5,047,001**

## METHOD FOR CONSTRUCTING A REVERSIBLE DUFFLE BAG

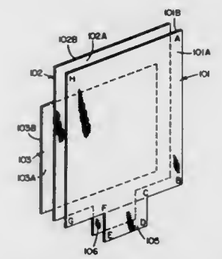
**James E. Willis, 4615 N. 22nd St., #104, Phoenix, Ariz. 85016**

**Continuation of Ser. No. 387,226, Jul. 28, 1989, abandoned, which is a division of Ser. No. 191,428, May 9, 1988, abandoned. This application Aug. 28, 1990, Ser. No. 574,515**
**Int. Cl.[5] B31B *49/04***
**U.S. Cl. 493—267** **7 Claims**

1. A method of making a soft duffle bag for use as a pillow and receptacle comprising:
(a) providing a unitary first and unitary second panel of moisture-resistant material, each panel being generally rectangular and of equal dimensional size and having a top edge, a bottom edge and opposite side edges;
(b) providing a unitary third panel of a softer material, said third panel being generally rectangular having a top edge, bottom edge and opposite side edges with the side edges being shorter than the side edges of the said first and second panels;



(c) positioning said first, second and third panels with the first and second panels in flatwise engagement and the second and third panels in flatwise engagement with the side and bottom edges of all said panels in substantial alignment and the top edges of said first and second panels in substantial alignment;
(d) sewing said first, second and third panels flatwise together along said side edges and joining said panels together at their said bottom edges while leaving the said aligned top edges of said first and second panels unsewn to form a bag with a closed bottom end and an open top end at the said unsewn top edges of said first and second panels; and,
(e) reversing said first and second panels by turning said bag inside out through the said open top end thereof whereby




said first and third panels are adjacent one another forming a bag having one side consisting of said unitary first panel of moisture-resistant material and an obverse side consisting of said unitary third panel of softer material layered against the inside surface of said unitary second panel of moisture-resistant material wherein said first and second panels each have a flap projecting from the central regions of and of substantial shorter length than the bottom edges thereof and having a bottom edge portion and opposite side edge portions and wherein said flaps of said first and second panels are sewn together along their respective said bottom edge portions and their said side edge portions sewn to the said bottom edges of the same respective one of said panels at each side of said flaps to form a bottom for the bag.

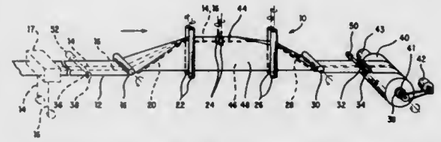
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**5,047,002**

## APPARATUS AND METHOD FOR MAKING Z-FOLDED ZIPPERED FILM

**Larry M. Zieke, Midland, Mich., and James C. Pawloski, Bourbonnais, Ill., assignors to Zip-Pak, Inc., Northbrook, Ill.**

**Filed Sep. 27, 1990, Ser. No. 589,178**
**Int. Cl.[5] B65H *18/00***
**U.S. Cl. 493—394** **16 Claims**




1. A method for making rolls of Z-folded closed zipper, open web film comprising the steps of:
providing an open web of flexible material having at least one male and at least one female zipper element thereon in spaced relationship;
folding said web, bringing said male and female zipper elements into opposing relationship with mating ones thereof;
interlocking said opposing male and female zipper elements, defining a folded lip in the portion of said web between said male and female zipper elements and further defining first and second web panels in remaining portions of said web;
urging said folded lip to fold against one of said web panels;
unfolding said folded web to position said first and second web panels and said folded lip in substantially parallel planes; and
winding said web into a roll.

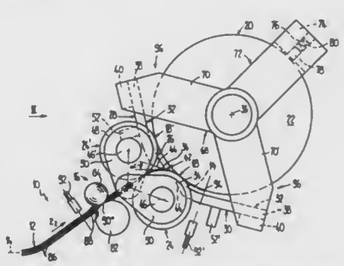
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**5,047,003**

## APPARATUS FOR ZIGZAG FOLDING A PAPER WEB

**Werner Schmidlin, Frick, and Edwin Straub, Oftringen, both of Switzerland, assignors to Faltex AG, Wohlen, Switzerland**

**Filed Jan. 12, 1990, Ser. No. 464,454**
**Claims priority, application Switzerland, Jan. 25, 1989, 00223/89**
**Int. Cl.[5] B65H *45/101, 45/20***
**U.S. Cl. 493—413** **12 Claims**




1. Apparatus for the zigzag folding of a paper web, comprising:
a) a feed for the paper web;
b) a return stop arranged at the downstream end of said paper web feed;
c) two folding nips downstream of said paper web feed arranged on opposing sides of the plane of the paper web feed and formed by
a rotatable surface adapted to be driven alternately in one direction and then the other, and
two folding rollers, each being arranged in association with a respective folding nip, and rotatable surface and said two folding rollers cooperatively defining a build-up space therebetween,
d) means for rotating said surface alternately in one direction and then the other; and
e) two spaced apart guide members, each being associated with a respective folding nip, disposed upstream of and proximate to the rotatable surface, said guide members being adapted for displacement in the direction of rotation for the rotatable surface to an end position immediately following reversal of direction of the rotatable surface; and;
f) means for displacing said guide members in the direction of rotation of said surface from a first end position outside the build-up space into a second end position inside the build-up space immediately following the respective reversal of the driving direction of the rotatable surface, said guide members being spaced from said nips in the second position; and
g) a slit-shaped guide passage for the paper web leading to the respective folding nip and formed between the guide member positioned to the rear in the direction of rotation of the rotatable surface and the folding roller positioned to the front in the direction of rotation of the rotatable surface.

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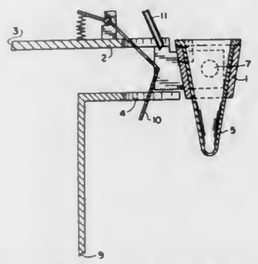


5,047,004

## AUTOMATIC DECANTING CENTRIFUGE

John R. Wells, 4372 Keystone Ave., Culver City, Calif. 90232

Filed Feb. 7, 1990, Ser. No. 476,981
Int. Cl.[5] B04B *5/02, 11/00*
U.S. Cl. 494—17 15 Claims



1. An improved centrifuge of a type having a rotor with a swinging bucket pivotable into an elevated position in the presence of a centrifugal force and pivotable into a rest position in the absence of the centrifugal force,

wherein the improvement comprises:

a lock activable and de-activable in the presence of the centrifugal force,

said lock, when activated, for sustaining the swinging bucket in the elevated position in the absence of the centrifugal force and

said lock, when de-activated, for allowing the swinging bucket to pivot into the rest position in the absence of the centrifugal force.

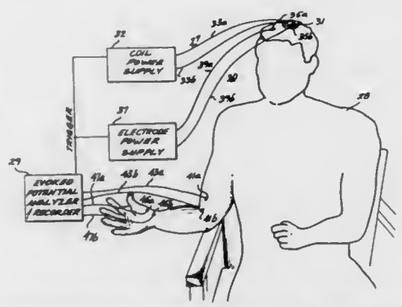
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5,047,005

## METHOD AND APPARATUS FOR MAGNETICALLY STIMULATING NEURONS

John A. Cadwell, Kennewick, Wash., assignor to Cadwell Industries, Inc., Kennwick, Wash.

Division of Ser. No. 8,210, Jan. 28, 1987, Pat. No. 4,940,453.
This application Jul. 5, 1990, Ser. No. 548,025
Int. Cl.[5] A61B *15/05*
U.S. Cl. 600—13 36 Claims




1. Apparatus for stimulating the neural pathways of an organism, such as the human body, to create an evoked potential by depolarizing neurons forming part of the neural pathway to be stimulated, said apparatus comprising:

(a) a stimulator coil; and

(b) electric circuit means connected to said stimulator coil for creating a sinusoidal current flow in said stimulator coil that causes said coil to generate a magnetic field that creates a neuron depolarizing electric field in the body of an organism when said coil is placed on the surface of said organism, said electric circuit means including:

(1) a power supply for supplying capacitor charging power;

(2) a power switch connected across the output of said power supply;

(3) a storage capacitor circuit having one end connected to one side of the power switch; and,

(4) connecting means for connecting said stimulator coil between the other side of said storage capacitor circuit and the other side of said power switch such that said stimulator coil and said storage capacitor circuit form a series circuit and for connecting said series circuit in parallel with said power switch across the output of said power supply.

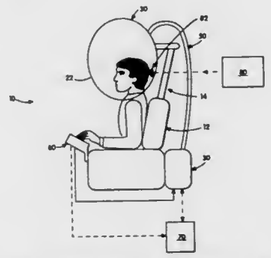
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5,047,006

## PERSONAL INTEGRATING SPHERE SYSTEM

Howard Brandston, 141 W. 24th St., New York, N.Y. 10011, and Aran Safir, 3 Ellsworth Ave., Cambridge, Mass. 02139

Filed Nov. 6, 1989, Ser. No. 432,782
Int. Cl.[5] A61G *10/100, 10/02;* A61M *21/100;* A61B *1/06;* A61N *00/00*
U.S. Cl. 600—21 17 Claims



1. A personal integrating sphere system for beneficially affecting the mental and physical health of a user, comprising:

illuminator means for generating at least one illuminating light beam of predetermined hue, saturation, brightness, and duration;

integrating sphere means having an internal configuration for diffusely reflecting and re-reflecting said at least one illuminating light beam to integrate said at least one illuminating light beam to provide a uniform, featureless illuminated field of view of substantially uniform intensity within said integrating sphere means, said internal configuration of said integrating sphere means being configured to accommodate at least the head of the user internally within said integrating sphere means in such manner that the user visually experiences said uniform, featureless illuminated field of view of substantially uniform intensity; and

coupler means for optically coupling said at least one illuminating light beam from said illuminator means to said integrating sphere means wherein said at least one illuminating light beam is initially injected onto said internal configuration of said integrating sphere means outside the visual field of the user.

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5,047,007

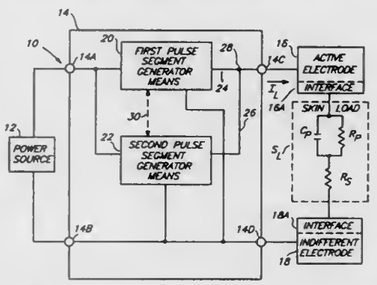
## METHOD AND APPARATUS FOR PULSED IONTOPHORETIC DRUG DELIVERY

Larry A. McNichols, Coon Rapids, and Gary A. Lattin, Forest Lake, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 22, 1989, Ser. No. 456,013
Int. Cl.[5] A61N *1/30*
U.S. Cl. 604—20 16 Claims

1. In a method of pulsed iontophoretic drug therapy, of the type wherein periodic electrical pulses are generated and applied to drive an active electrode and an indifferent electrode of an iontophoresis device in contact with the skin of a living body to deliver drug therethrough, an improvement comprising:

generating a train of said periodic pulses at a predetermined frequency, each pulse thereof extending over a first interval of time which defines a predetermined pulse width of said pulse, each pulse thereof being separated from a subsequent pulse by a second interval of time which defines a pulse interval which immediately follows said pulse width, the summation of said pulse width and immediately following pulse interval comprising a cycle period which is the reciprocal of said frequency, wherein each pulse has waveform characteristics, comprising:




a first pulse segment extending over a predetermined first portion of said pulse width and having a predetermined first average current amplitude; and

a second pulse segment extending over a subsequent second portion comprising the remainder of said pulse width and having a predetermined second average current amplitude;

wherein said first average current amplitude is greater than said second average current amplitude and said second average current amplitude is greater than an average current amplitude during the pulse interval; and

wherein said first portion comprises not more than 50% of said pulse width.

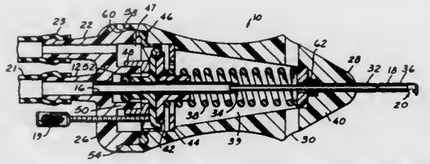
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5,047,008

## VITRECTOMY PROBE

Eugene de Juan, Jr., Durham, N.C.; Gerald S. Gahn; John J. Weidenbenner, both of Manchester, Mo., and Dyson Hickingbotham, Bahama, N.C., assignors to Storz Instrument Company, St. Louis, Mo.

Filed Oct. 27, 1989, Ser. No. 428,125
Int. Cl.[5] A61B *17/20*
U.S. Cl. 604—22 26 Claims



1. A microsurgical cutting device for cutting and removing fibrous gel, said device having a housing, a substantially hollow outer needle having an outward end with an aperture therein, a hollow tubular member having a cutting blade disposed within said outer needle an actuation means, and a suction means, said device comprising:

said housing containing a spring compartment and containing means for communicating with said actuation means, said spring compartment containing a compression spring acting against said actuation means;

said outer needle extending outwardly from said housing and containing said hollow tubular member reciprocable within said outer needle, said hollow tubular member communicating with said suction means a said cutting blade extending toward said apertured end of said outer needle;

said inner tubular member being reciprocable within said outer needle between a first open position and a second cutting position wherein said cutting blade slides across said apertured end of said outer needle, said actuation means tending to force said inner tubular member and cutting blade toward said second position and said compression spring tending to restore said inner tubular member and cutting blade to said first position;

adjustment means for adjusting the location of said inner tubular member when in said first open position;

tubular outlet port attached to said inner tubular member and communicating with said suction means;

tubular vacuum fitting extending outwardly from said housing and communicating with said vacuum means, said tubular vacuum fitting being isolated from the reciprocal motion of said tubular output port and said inner tubular member;

vacuum hose coupled to said suction means and attached to said tubular vacuum fitting; and

said outer needle having at said outward end, a protrusion for facilitating the entry of said fibrous gel into said aperture.

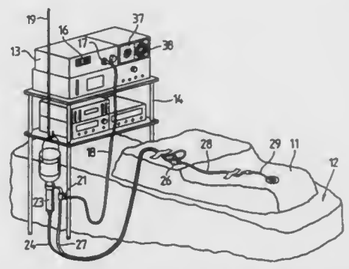
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5,047,009

## METHOD AND APPARATUS FOR OCULAR PERFUSION

Robert E. Morris; Clark D. Witherspoon, both of Birmingham, and William E. Goggans, Jr., Pinson, all of Ala., assignors to Vitreoretinal Development, Inc., Birmingham, Ala.

Continuation-in-part of Ser. No. 99,533, Sep. 22, 1987, Pat. No. 4,813,927, and a continuation of Ser. No. 197,567, May 23, 1988, Pat. No. 4,900,301. This application Feb. 12, 1990, Ser. No. 483,161
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—23 27 Claims



1. An apparatus for controlling intraocular pressure during closed wound intraocular surgery, using a source of continuous pressurized gas at a controlled variable gas pressure, a liquid infusate reservoir having a limited volume for maintaining liquid infusate in the reservoir under pressure with a volume of gas, and an ocular surgical infusion instrument, comprising:

(a) a first conduit for conveying pressurized gas from the source of continuous pressurized gas to the liquid infusate reservoir;

(b) a second conduit for conveying liquid infusate from the reservoir to the ocular surgical infusion instrument;

(c) a third conduit for conveying pressurized gas from the

source of continuous pressurized gas to the ocular surgical infusion instrument; and

(d) an infusate selector valving means for selectively connecting either said second or third conduit to the ocular surgical infusion instrument such that when said second conduit is connected to the surgical infusion instrument, pressurized gas from the source of continuous pressurized gas is prevented from being conveyed to the infusion instrument, and when said third conduit is connected to the surgical infusion instrument, liquid infusate from the liquid infusate reservoir is prevented from being conveyed to the infusion instrument;

thereby permitting accurate and rapid control of infusion pressure during intraocular surgery and permitting rapid conversion between liquid and gas infusion during such surgery.

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**5,047,010**

## EQUIPMENT FOR THE CONTROLLED INSUFFLATION OF A FLUID INTO A BODY CAVITY

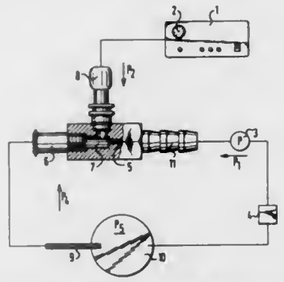
**Felix Ams, Kämpfelbach, and Manfred Baier, Bretten, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Knittlingen, Fed. Rep. of Germany**

**Filed Mar. 14, 1990, Ser. No. 493,522**

**Claims priority, application Fed. Rep. of Germany, Apr. 17, 1989, 3912541**

**Int. Cl.[5] A61M *37/00***

**U.S. Cl. 604—26** **7 Claims**



1. Equipment for the controlled insufflation of a fluid into a body cavity by way of a probe inserted thereinto; the equipment comprising:

a supply device for delivering said fluid to said probe and being connected to said probe by means of a first fluid circuit the supply device having means for setting a nominal fluid pressure value for the body cavity and means for measuring and indicating the actual value of the fluid pressure in the body cavity;

a circulating pump having an inlet side connected to a filter for connection to the body cavity, for drawing off fluid therefrom by way of the filter and a delivery side connected to the probe by way of a second fluid circuit for returning filtered fluid to the body cavity, said first and second fluid circuits having a common portion extending to said probe and in which, when the pump is in operation, there is generated retroactive dynamic pressure acting upon said measuring means; and

means for deriving from the delivery flow of the circulating pump a partial vacuum for acting retroactively upon said measuring means and being of a value to compensate for said dynamic pressure independently of the delivery flow of the circulating pump.

**5,047,011**

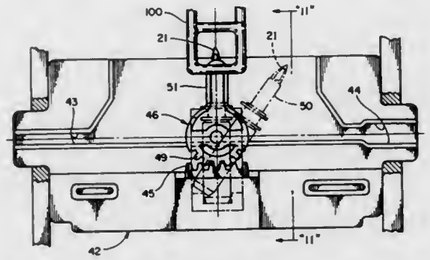
## PIERCING PIN TRANSFER DEVICE FOR CONTINUOUS AMBULATORY PERITONEAL DIALYSIS

**Lois L. Caron, and William L. Rudzena, both of McHenry, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Filed Feb. 20, 1990, Ser. No. 483,496**

**Int. Cl.[5] A61M *5/00***

**U.S. Cl. 604—29** **6 Claims**



4. In a fully automated solution exchange, dialysis apparatus having a housing, a pair of port mounts disposed in axial alignment on opposite sides of said housing and adapted to receive the clamped ports of dialysis solution containers, an ultraviolet bulb in said housing, and a hollow, seal piercing spike connectable by flexible tubing to a dialysis patient, the improvement which comprises a transfer mechanism for automatically moving said spike from a container of used dialysis solution received in one of said port mounts into a dwell position adjacent said ultraviolet bulb for irradiation sterilization of said spike and then into seal piercing engagement with a container of fresh dialysis solution received i.. the other one of said port mounts to minimize the potential of touch contamination for said spike;

said transfer mechanism comprising a track member in said housing which extends between said pair of aligned port mounts, a motor-driven rotatable drive screw disposed parallel to said track member, upstanding cam guideways provided at the opposite ends of said track member adjacent each of said port mounts, a rack formation of gear teeth formed on said track member approximately midway between the ends of said track member, a drive block mounted on said drive screw for movement lengthwise of said drive screw during rotation thereof, a vertically disposed shaft extending through said drive block and being rotatable relative thereto, a cradle for said hollow seal-piercing spike secured to the upper end of said vertically disposed shaft, and a control member secured to the lower end of said vertically disposed shaft and disposed on said track member and having both a cam follower confined by said guideways at opposite ends of said track member and a gear formation engageable with said rack formation whereby during movement of said drive block from one end of said drive screw to the opposite end thereof said control member and said spike cradle are moved successively in a linear direction away from one of said port mounts, then rotated 180 degrees past said ultraviolet lamp, and then moved in a linear direction toward the other port mount, with a spike mounted in said cradle being automatically withdrawn from a container of used dialysis solution, sterilized by said ultraviolet bulb, and then piercingly engaged with a container of fresh dialysis solution.



**5,047,012**

## MOTORIZED SYRINGE WITH MULTIPLE PORT MANIFOLD

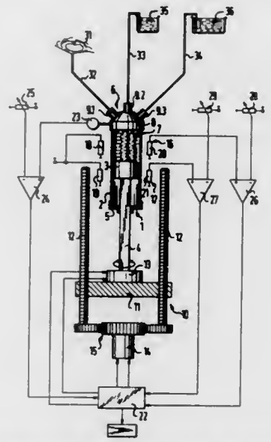
**Ulrich Leuschner, Frankfurt am Main; Felix Ams, Kämpfelbach, and Klaus Müller, Knittlingen-Frendenstein, all of Fed. Rep. of Germany, assignors to Richard Wolf, GmbH, Fed. Rep. of Germany**

**Filed Jan. 12, 1990, Ser. No. 464,019**

**Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 3902943**

**Int. Cl.[5] A61M *1/00***

**U.S. Cl. 604—32** **5 Claims**



1. An apparatus for dissolving concretions in a hollow organ of a body, said apparatus comprising means for introducing liquid solvent into a hollow organ, for withdrawing from the organ a fluid comprising the solvent, secretions from said organ and a sludge formed by the dissolving of a concretion by the solvent, for separating the solvent from the secretions and sludge, and for reintroducing a separate solvent back into the organ, said means including a piston pump having a pressure chamber for introducing said solvent and for drawing off said fluid, said pressure chamber forming a trap for accomplishing a gravitational separation of the secretion and sludge from the solvent, said piston pump including an elongated, cylindrical tube element receiving a piston and being mounted in a vertical direction, means for closing an upper end of the tube element, said means for closing cooperating with the piston to define the pressure chamber and having a distribution head having a plurality of connecting channels individually connecting said pressure chamber to selected lines, a first drive means for moving the piston along an axis of said tube element, sensor means for monitoring the maximum permissible level of said secretions in said chamber and for monitoring the flow pressure of the solvent as it is being introduced into said hollow organ, and control logic means being connected to operate the first drive means in accordance to a sequence program wherein fluid is introduced into the hollow organ, then after a predetermined time the piston is actuated to withdraw the fluid from the organ back into the tube element where it is held to enable separation of the solvent from the other portions of the fluid due to a gravitational separation, and then actuating said piston to reintroduce the solvent back into the hollow organ, said control logic means receiving signals emitted by the sensor means to stop the drive means in response to the flow pressure exceeding a predetermined value and to stop introduction of a solvent once the maximum permissible level of secretions is detected in said chamber.

**5,047,013**

## VARICOSE VEIN PROBE WITH HOLLOW CURVED SPIRAL TIP

**Sonja Roesdeutscher, Dortmund, Fed. Rep. of Germany, assignor to Astra Meditec AB, Molndal, Fed. Rep. of Germany**

**Filed Sep. 8, 1989, Ser. No. 404,589**

**Claims priority, application Fed. Rep. of Germany, Sep. 10, 1988, 3830909**

**Int. Cl.[5] A61M *25/00***

**U.S. Cl. 604—53** **8 Claims**



1. A probe for treating varicose veins, comprising a flexible plastic tube having a circular cross section with a tip portion at least a part of which is curbed in a spiral and having a closed rounded front end thereon, which can be guided through varicose veins at its front end, and wherein the circular cross-section is within at least a portion of said spiral, the tube being at least as long as the vein to be treated, wherein said probe has at least one lateral opening in the spiral of said tip portion and removed from said front end, and an inner cavity of said tube forming a flow connection from a joining piece at a rear end of said tube to said lateral opening in said tip portion for injection of a sclerosing agent.

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**5,047,014**

## MEDICAL PUMP DEVICE

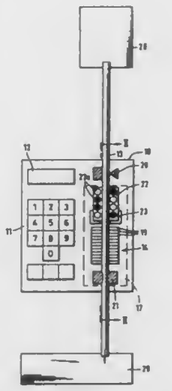
**Wolfgang Mosebach, Dagobertshausen; Rolf Heitmeier, Baunatal, and Reinhard Knuth, Melsungen, all of Fed. Rep. of Germany, assignors to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany**

**Filed Mar. 20, 1990, Ser. No. 496,342**

**Claims priority, application Fed. Rep. of Germany, Apr. 15, 1989, 3912405**

**Int. Cl.[5] A61M *31/00***

**U.S. Cl. 604—67** **7 Claims**



1. A medical pump device comprising:

a hose having a delivery volume,

a hose pump having a drive controlled by signals in dependence on a set delivery rate,

a housing configured to receive the hose,

a coding associated with the hose, the coding containing information about the delivery volume of the hose,

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reading means for reading the coding associated with the hose, and

control means in communication with the reading means for controlling the drive in response to the coding associated with the hose.

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**5,047,015**

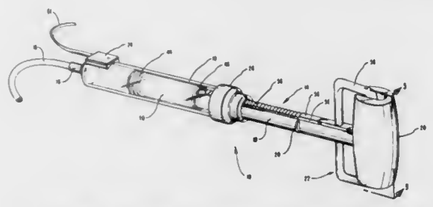
## LOCKING SYRINGE

**Jerrold L. Foote; Darla R. Gill; Fred P. Lampropoulos, all of Salt Lake City, and William Padilla, Bennion, all of Utah, assignors to Merit Medical Systems, Inc., Salt Lake City, Utah**

**Continuation-in-part of Ser. No. 325,561, Mar. 17, 1989. This application Nov. 13, 1989, Ser. No. 434,460**

**Int. Cl.[5] A61M *29/00***

U.S. Cl. 604—99 **85 Claims**



1. A locking syringe for holding a syringe plunger in a selected position against a pressure created within a syringe barrel by sliding movement of the plunger to the selected position within the barrel, the syringe comprising:

a barrel having internal restricting means;

a plunger for disposition at least partially within said barrel, said barrel receiving said plunger in reciprocating, sliding engagement, said plunger comprising:

external restricting means situated along at least a portion of the longitudinal axis of said plunger and corresponding to said internal restricting means such that said external restricting means is capable of engaging said internal restricting means thereby restricting the reciprocating, sliding engagement of said plunger within said barrel;

a triggering means for actuating engagement and disengagement of said external restricting means with said internal restricting means by selective retraction of said external restricting means situated along said portion of the longitudinal axis of said plunger, whereby the sliding engagement of said plunger within said barrel is restricted if said external restricting means and said internal restricting means maintain a position of engagement, and said plunger is free to reciprocate slidably within said barrel if said external restricting means is retracted so as to maintain a position of disengagement relative to said internal restricting means; and

means for increasing the force with which said external restricting means engages said internal restricting means in proportion to the pressure within said barrel exerted on said plunger.

**5,047,016**

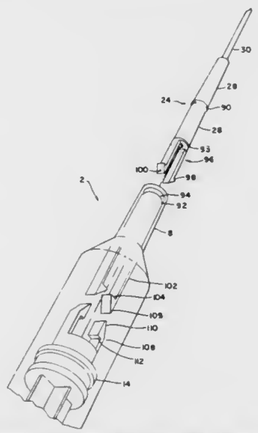
## FLUID PASSING APPARATUS WITH MEANS FOR COVERING THE SAME

**Stuart M. Dolgin, 95 Belvedere Dr., Syosset, N.Y. 11791, and Philip Torbet, Brookville, N.Y., assignors to Stuart M. Dolgin, Syosset, N.Y.**

**Division of Ser. No. 241,352, Sep. 7, 1988, Pat. No. 4,898,589, which is a continuation-in-part of Ser. No. 166,046, Mar. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 135,581, Dec. 21, 1987, abandoned. This application Dec. 5, 1989, Ser. No. 446,213**

**Int. Cl.[5] A61M *5/31, 5/315***

U.S. Cl. 604—110 **21 Claims**



1. Apparatus for passing a fluid into or out of a warm-blooded animal or tissue thereof comprising:

(a) a body having an interior surface defining a cavity adapted to contain said fluid;

(b) a plunger movable axially within the body and comprising a head section having an outer surface in communication with the interior surface of the body to thereby form said cavity and a stem connected at one end to the head section;

(c) a needle assembly having a longitudinal axis and being in flow communication with the cavity of the body and comprising a housing having opposed ends and a longitudinally extending chamber between said ends, needle means permanently affixed to one of said ends, and means for securing the needle assembly to the body outside of the cavity through the other of said ends when the needle assembly is in operative use for passing said fluid;

(d) a first detent means axially extending into the cavity and connected to the end of the needle assembly remote from the needle means, said first detent means comprising two spaced apart detents each having a tapered end remote from the end connected to the needle assembly and a radially extending ledge; and

(e) a second detent means connected to the head section of the plunger and adapted to engage the first detent means upon an inward stroke of the plunger and to retract the needle assembly into the cavity of the body upon an outward stroke of the plunger, said second detent means comprising at least one detent having a tapered end remote from the end connected to the head section of the plunger and a radially extending ledge that is adapted to be mounted upon the ledge of the first detent means when the first and second detent means engage each other on the inward stroke of the plunger.



**5,047,017**

## SYRINGE

**Marc Koska, Turnbridge Wells, United Kingdom, assignor to Agven Medical Corporation Limited, London, England**

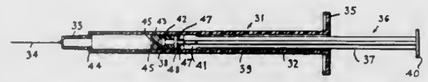
**PCT No. PCT/GB88/00490, § 371 Date Dec. 21, 1989, § 102(e) Date Dec. 21, 1989, PCT Pub. No. WO88/10127, PCT Pub. Date Dec. 29, 1988**

**PCT Filed Jun. 24, 1988, Ser. No. 438,456**

**Claims priority, application United Kingdom, Jun. 25, 1987, 8714923; Jan. 29, 1988, 8801992**

**Int. Cl.[5] A61M *5/00***

U.S. Cl. 604—110 **20 Claims**



1. A one use only syringe comprising a barrel and a plunger in slidable and sealing engagement with the inner wall of the barrel, the barrel having projection means and the plunge having breakable means, characterized in that the projection means project from an inner wall of the barrel and into a path of movement of the plunger stopper and in that the breakable means is integral in a one-piece portion of the plunger and constitutes a breakable connection in the one-piece portion between at least one part of the plunger rod and the plunger stopper the arrangement being such that during either one of advance and withdrawl of the plunger, engagement of the plunger with the projection means causes the breakable connection to break and thus the plunger stopper to break away from the said at least one part of the plunger rod.

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**5,047,018**

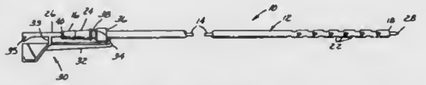
## CATHETER AND STYLET ASSEMBLY HAVING DUAL POSITION STYLET

**Eric L. Gay; Sheila J. Hanson, and William G. O'Neill, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Aug. 14, 1989, Ser. No. 393,212**

**Int. Cl.[5] A61M *5/178***

U.S. Cl. 604—164 **15 Claims**



1. A catheter assembly comprising:

an elongate catheter having proximal and distal ends, and a lumen open at the proximal and distal ends of the catheter;

connecting means adjacent the proximal end of the catheter adapted for connecting the catheter to an extracorporeal support system or the like;

a stiff-flexible stylet slidably receivable in the lumen of the catheter for providing rigidity to the catheter to facilitate introduction of the catheter into a chamber of a heart or other organ, the stylet having proximal and distal ends, and a length relative to the catheter sufficient to permit the distal end of the stylet to extend outwardly from the distal end of the catheter when the stylet is received in the catheter; and

dual positioning means generally adjacent the proximal ends of the stylet and catheter for releasably locking the stylet to the catheter in either of two positions, consisting of a first position wherein the distal end of the stylet extends outwardly from the distal end of the catheter, and a second position wherein the distal end of the stylet is received in the lumen of the catheter;

the dual positioning means comprising a latching member mounted on the stylet adjacent the proximal end thereof, the latching member having a latching portion biased from an unlatched position toward a latching position for releasably securing the stylet in the first and second positions, and first and second latch-receiving means along the catheter for receiving the latching portion to secure the stylet in the first and second positions.

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**5,047,019**

## DEVICE FOR THE SAFE REMOVAL AND DISPOSAL OF SHARPS FROM MEDICAL TOOLS

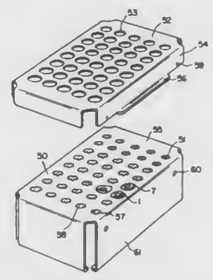
**Brian F. Sincock, Dernancourt, Australia, assignor to Ausmedics Pty. Ltd., Port Lincoln, Australia**

**Continuation-in-part of Ser. No. 265,707, Nov. 1, 1988, Pat. No. 4,973,315, and a continuation-in-part of Ser. No. 497,638, Mar. 23, 1990. This application May 22, 1990, Ser. No. 528,963**

**Claims priority, application Australia, Nov. 11, 1987, PI5348; Oct. 26, 1989, PH7069**

**Int. Cl.[5] A61M *5/32***

U.S. Cl. 604—192 **21 Claims**



1. An apparatus for supporting a plurality of sheaths for receiving and holding medical sharps, each sheath comprising a tubular portion closed at a lower end and open at an upper end and further having a flange around said upper end, said apparatus comprising:

holding means comprising a planar surface with a plurality of apertures therein, each aperture having a configuration to receive and support one of said sheaths toward an upper end of the sheath; and

cover means for covering the planar surface of the holding means, said cover means comprising a planar surface with a plurality of apertures therein, each said aperture having a configuration to prevent passage of said flange therethrough, said plurality of apertures in the cover means arranged to substantially correspond to an arrangement of the apertures in the holding means.

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**5,047,020**

## IONIC HEPARIN COATING

**Li-Chien Hsu, Mission Viejo, Calif., assignor to Baxter International Inc., Deerfield, Ill.**

**Continuation-in-part of Ser. No. 97,295, Sep. 14, 1987, Pat. No. 4,871,357. This application Jul. 31, 1989, Ser. No. 387,728**

**The portion of the term of this patent subsequent to Oct. 3, 2006, has been disclaimed.**

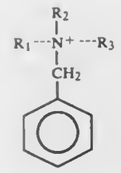
**Int. Cl.[5] A61M *5/32***

U.S. Cl. 604—266 **32 Claims**

1. A blood contacting medical article comprising:

a. a substrate surface; and

b. an anti-thrombogenic surface coating of a complex of heparin and at least 50% by weight of a cationic trialkylbenzyl ammonium salt having the following formula:



wherein $R_1$ is an alkyl group having from about 14 to about 22 carbons;

$R_2$ is an alkyl group having from about 1 to about five carbons; and

$R_3$ is an alkyl group having from about 1 to about five carbons.

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**5,047,021**

## MALE LUER LOCK MEDICAL FITTING

David S. Utterberg, 1080 Chestnut St., Apt. 4A, San Francisco, Calif. 94109

Continuation of Ser. No. 400,827, Aug. 29, 1989, abandoned. This application Dec. 13, 1990, Ser. No. 627,889

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—283 10 Claims




1. A male luer lock, capable of connecting with a female luer lock having a tapered socket and lock lugs, comprising:

a tapered nozzle proportioned to serve as a male luer;

a threaded locking ring having a distal end and rotatably carried about said tapered nozzle in substantially coaxial manner, said locking ring being capable of limited, longitudinal movement along said nozzle between first and second positions in which the distal end of said nozzle extends farther beyond the distal end of the locking ring in the second position than in the first position; nozzle carrying a locking ridge extending radially outwardly therefrom; longitudinally-extending, radially depressible flange means carried on said locking ring and positioned to normally radially overlap the locking ridge in the second position; said flange means being depressible when the locking ring is in said first position to engage the locking ridge, the longitudinal extent of the threads of said locking ring being greater than the maximum longitudinal spacing between said radially depressible flange means and said locking ridge in said first position, whereby rotation of said locking ring relative to lock lugs of a female luer lock engaging said locking ring threads can cause retraction of both said locking ring and tapered nozzle away from said lugs.

**5,047,022**

## DEODORANT BEDDING

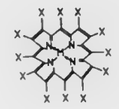
Kaoru Hasebe, 471, Komiya, Harima-cho; Naoki Minamide, 455-1, Komiya, Harima-cho; Seigo Higaki, 386, Honjo, Harima-cho, all of Kako-gun, Hyogo 675-01; Hirohusa Shirai, 2496, Nagase, Maruko-cho, Chiisagata-gun, Nagano 386-04, and Kouichi Hukamachi, 18-5, Chuo, 5-chome, Ueda-shi, Nagano 386, all of Japan

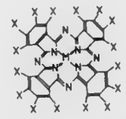
Continuation-in-part of Ser. No. 144,035, Aug. 7, 1987, abandoned. This application Jan. 26, 1990, Ser. No. 470,796

Claims priority, application Japan, Dec. 24, 1985, 60-289267

Int. Cl.[5] A61F *13/15, 13/20*

U.S. Cl. 604—359 4 Claims





1. A deodorant bedding comprising wadding and tick, said wadding comprising a mixture consisting of (1) about 35% by weight of a rayon staple fiber having a swelling rate of about 240% and which contains about 2% by weight of iron phthalocyanine polycarboxylate, (2) about 35% by weight of a rayon staple fiber having a swelling rate of about 240% and which contains about 2% to about 5% by weight of a compound selected from the group consisting of copper acetate, cobalt sulfate, and ferrous acetate, and (3) about 30% by weight of a polyester fiber.

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**5,047,023**

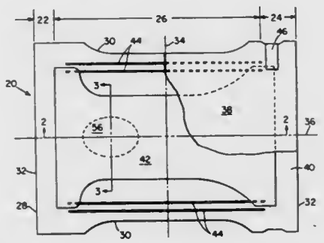
## ABSORBENT MEMBERS HAVING LOW DENSITY AND BASIS WEIGHT ACQUISITION ZONES

Charles J. Berg, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 512,626, Apr. 11, 1990, abandoned, which is a continuation of Ser. No. 147,375, Jan. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 887,584, Jul. 18, 1986, Pat. No. 4,834,735. This application Feb. 11, 1991, Ser. No. 656,101

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—368 26 Claims




1. An absorbent member having a back section and a front section contiguous with said back section, said front section having an end region and a deposition region contiguous with said end region and said back section so that said deposition region is positioned between said end region and said back section, the absorbent member comprising:

a storage zone positioned in at least said deposition region of the absorbent member; and

an acquisition zone positioned in at least said deposition region of the absorbent member, said acquisition zone having a lower average density and a lower average basis weight per unit area than said storage zone, said storage zone at least partially laterally surrounding the perimeter of said acquisition zone so as to be in liquid communication with at least a portion of the lateral area of said acquisition zone; and

a mixture of hydrophilic fibrous material and discrete particles of absorbent gelling material, said particles of absorbent gelling material having a mass median particle size ranging from about 400 microns to about 1680 microns.



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**5,047,024**

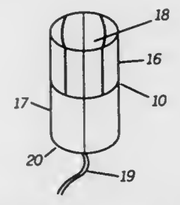
## TAMPON CONSTRUCTION

Jacob A. Glassman, 1680 Michigan Ave., Miami Beach, Fla. 33139

Continuation-in-part of Ser. No. 400,449, Aug. 30, 1989, abandoned. This application Jan. 2, 1990, Ser. No. 455,789

Int. Cl.[5] A61F *13/50*

U.S. Cl. 604—380 16 Claims




1. A method of manufacturing a tampon adapted for absorbing menstrual fluids and being placed within a vaginal canal comprising the steps of

folding a top portion of a rectangularly-shaped piece of absorbing material over a horizontal line and down along a side thereof

folding said once-folded rectangularly-shaped piece of material along a vertical line such that the resulting shape comprises a twice-folded piece of material having double the thickness at the top thereof compared to the bottom thereof

applying pressure to said twice-folded piece of material to form said piece of material into a solid, cylindrical shape.

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**5,047,025**

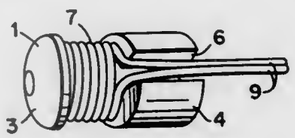
## THERMAL ATHERECTOMY DEVICE

James M. Taylor, Mountain View, Calif., and David F. Wirt, Prescott, Wis., assignors to Metcal, Inc., Menlo Park, Calif. and Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 12, 1990, Ser. No. 464,399

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—31 10 Claims




1. A thermal atherectomy device comprising

a tip of high mu material having a round head and elongated cylinder of smaller diameter than said head extending axially therefrom,

an axially slotted collar secured to said cylinder remote from said head,

a coil of wire wound about said cylinder between said head and said collar and having its end sections extending through said slot in said collar,

a smooth coating of low heat conductive material covering said coil, and

means for connecting said coil of wire to a high frequency source of alternating current.

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**5,047,026**

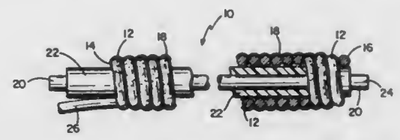
## ELECTROSURGICAL IMPLEMENT FOR TUNNELING THROUGH TISSUE

Mark A. Rydell, Golden Valley, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.

Continuation of Ser. No. 414,449, Sep. 29, 1989, abandoned. This application Jul. 2, 1990, Ser. No. 546,871

Int. Cl.[5] A61B *17/36*

U.S. Cl. 606—48 8 Claims




1. An electrosurgical instrument for tunneling through a tissue body comprising:

(a) a relatively thin, flexible conductive core wire of a predetermined diameter having a proximal end and a distal end;

(b) a continuous layer of insulating material adhered to said core wire except for an exposed portion at said proximal and distal ends, said layer being sufficiently thin and pliable so as not to impair the flexibility of said core wire;

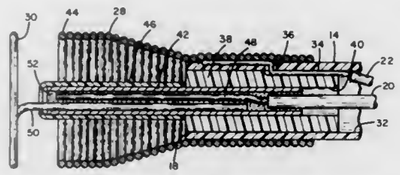
(c) a helical coil of conductive wire of a predetermined length wrapped onto said layer of insulating material and extending over substantially the entire length thereof with adjacent convolutions of said helical coil abutting one another, said helical coil having a proximal end and a distal end and a coating of insulation on the exterior surface of said coil except for a predetermined number of convolutions at said distal end thereof, said exposed portion at said distal end of said core wire flush with or extending beyond said distal end of said coil and spaced therefrom by a predetermined gap, said gap free of electrical insulation, said coil wrapped about said core wire exhibiting a predetermined flexibility sufficient to allow same to be routed through a tortuous path within the lumen of a hollow body organ, said core wire being immovable longitudinally relative to said helical coil and the surface area of said exposed portion of said core wire being substantially less than the surface area of said predetermined number of convolutions; and

(d) terminal means connected to said exposed portion of said proximal end portion of said core wire and to said proximal end of said coil for receiving a voltage therebetween sufficient to create a spark discharge between said exposed portion of said distal end of said core wire and said predetermined number of convolutions to effect tunneling through said tissue body.

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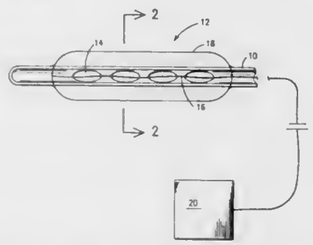
5,047,027
## TUMOR RESECTOR
Mark A. Rydell, Golden Valley, Minn., assignor to Everest Medical Corporation, Minneapolis, Minn.
Filed Apr. 20, 1990, Ser. No. 511,776
Int. Cl.[5] A61B *17/39*
U.S. Cl. 606—48 9 Claims



1. A bipolar electrosurgical instrument comprising:
(a) an elongated, flexible plastic tube having a proximal end, a distal end and at least one lumen extending rom said proximal end to said distal end;
(b) a first wire conductor having a proximal end and extending through said lumen of said plastic the from said proximal end of said tube and beyond said distal end of said tube;
(c) a second wire conductor having a proximal end extending through said lumen of said plastic tube in insulated relation to said first wire conductor;
(d) a first electrode including a conductive helical spring member having proximal and distal ends, the proximal end of said spring member being secured to the exterior of said plastic tube and extending distally beyond said distal end of said plastic tube;
(e) means for connecting said second wire conductor to said conductive helical spring member;
(f) a second electrode including a conductive wire hoop projecting distally beyond the distal end of said helical spring member to form a gap therebetween, the plane of said hoop being perpendicular to the longitudinal axis of said plastic tube; and
(g) means for connecting said first wire conductor to said second electrode.

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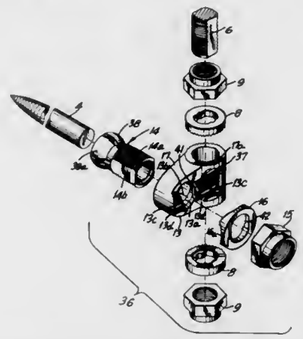
5,047,028
## METHOD FOR INDUCING THROMBOSIS IN BLOOD VESSELS
Quinghua Qian, Schittenhelmstrafe 12, 2300 Kiel 1, Fed. Rep. of Germany
Filed May 3, 1990, Ser. No. 518,163
Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915636
Int. Cl.[5] A61B *17/36*
U.S. Cl. 606—49 13 Claims



1. Method for creating a thrombosis in a blood vessel located directly under the surface of a body cavity which is difficult to reach comprising
inserting a deflated balloon containing a cylindrical tube into the body cavity, the tube having openings to the balloon, inflating the balloon by introducing an electrically conductive fluid into the tube, the balloon having an exterior wall semi-permeable to the fluid, contacting a conductive wire to the conductive fluid to provide a connection to an electrode outside the body and initiating an electric current between the balloon and the electrode located outside the body cavity.

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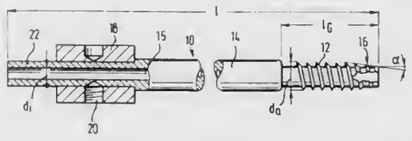
5,047,029
## CLAMP AND SYSTEM FOR INTERNAL FIXATION
Max Aebi, Bern, and Robert Mathys, Jr., Bettlach, both of Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.
Filed Apr. 5, 1989, Ser. No. 333,307
Claims priority, application Switzerland, Jun. 10, 1988, 2233/88
Int. Cl.[5] A61B *17/58*
U.S. Cl. 606—61 11 Claims



2. A coupling for use in osteosynthesis to connect a Schanz type screw with a support rod, said coupling compressing a housing having a cylindrical sleeve for receiving a support rod and clamp means for receiving and retaining a Schanz type screw, said clamp means comprising:
a conically shaped eye in said housing having an axis transverse to the axis of said sleeve
a compressible tubular collet, positioned in said housing and adapted to receive a Schanz type screw,
means for drawing said collet axially into said eye to compress said collet and thus to cause said collet to grasp said Schanz type screw, and
means for preventing rotation of said collet about the axis as it is drawn into the eye.

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5,047,030
## SUCTION DRAINAGE-BONE SCREW
Klaus Draenert, Gabriel-Max-Str. 3, DE-8000 München 90, Fed. Rep. of Germany
Continuation of Ser. No. 272,749, filed as PCT EP88/00122 Feb. 19, 1988, published as WO88/06023 Aug. 25, 1988, abandoned. This application Jun. 20, 1990, Ser. No. 541,099
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705541
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—65 10 Claims



1. A bone screw to be firmly anchored in bone in an essentially vacuum-tight manner, the bone screw comprising:
a threaded portion at a front end of the bone screw, the threaded portion having a core diameter;
a tubular member connected to the threaded portion, the tubular member having a diameter greater than the core diameter of the threaded portion;
a sleeve portion provided at a rear end of the tubular member opposite the threaded portion, the sleeve portion adapted to be engaged by a handle;
a connection piece for a connecting a vacuum line to the tubular member, the connection piece being provided at the rear end of the tubular member adjacent the sleeve portion; and
a longitudinal bore through the length of the bone screw.



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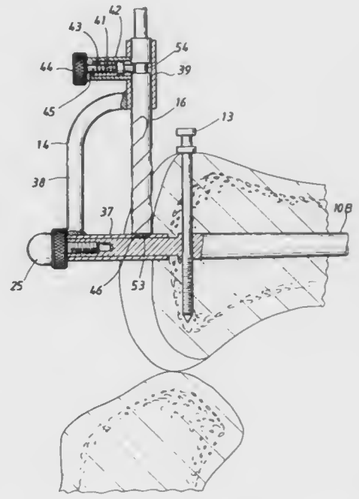
5,047,031
## IN SITU CALCIUM PHOSPHATE MINERALS METHOD
Brent R. Constantz, Woodside, Calif., assignor to Norian Corporation, Mountain View, Calif.
Continuation-in-part of Ser. No. 183,770, Apr. 20, 1988, Pat. No. 4,880,610. This application May 30, 1989, Ser. No. 358,716
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] C01F *11/02*
U.S. Cl. 606—77 14 Claims

1. A method for making calcium phosphate minerals comprising:
combining phosphoric acid, substantially free of uncombined water, a calcium source, neutralizing anions including at least one of carbonate, phosphate and hydroxide in an amount sufficient to substantially neutralise said phosphoric acid and water in an amount to provide a kneadable mixture;
agitating the mixture to produce a substantially uniform mixture; and
allowing the substantially uniform mixture to set and become annealed to a hard workable structure.

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5,047,032
## METHOD AND APPARATUS FOR CUTTING JOINT SURFACES
Roger Jellicoe, Stafford, Australia, assignor to Richards Medical Company, Memphis, Tenn.
Filed Oct. 20, 1988, Ser. No. 260,259
Claims priority, application Australia, Oct. 21, 1987, PI 4991
Int. Cl.[5] A61B *17/56*
U.S. Cl. 606—83 7 Claims

1. Surgical instrumentation for use in cutting bones to a pre-determined depth on one or both sides of a joint, comprising:
(a) a rod adapted for insertion into, and rigid positioning within, the medullary canal of the bone to be cut;
(b) a depth limiting means to control the extent to which the rod may be inserted into the medullary canal of the bone to be cut;
(c) a first guide frame means adapted for connection to the rod and including a hole extending diametrically therethrough for guiding a drill to form a hole transversely of the bone to be cut;
(d) a locking means including an elongated member adapted to extend through the hole in the bone and through a hole in the rod for locking the rod into a desired position within the bone;
(e) a second guide frame means for positioning and guiding a bone cutting or drilling implement in a desired position relative to the bone;
(f) the rod including a proximal end capable of sequentially and removably receiving the first and second guide frame means;
(g) a guide frame rotational locking means capable of holding the first and second guide frame means against rotation relative to the rod at a fixed axial location;
(h) a guide frame axial locking means capable of allowing the second guide frame means to rotate relative to the rod at a fixed axial location; and



(i) means for connecting the first and second guide frame means to the proximal end of the rod.

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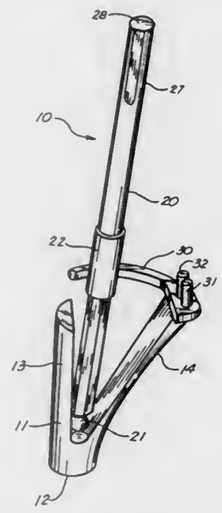
5,047,033
## MILL AND GUIDE APPARATUS FOR PREPARATION OF A HIP PROSTHESIS
Thomas W. Fallin, Memphis, Tenn., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.
Continuation-in-part of Ser. No. 308,205, Feb. 8, 1989, Pat. No. 4,995,883. This application Feb. 7, 1990, Ser. No. 476,172
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—87 14 Claims

1. A guide apparatus for preparing the femur of a patient with a mill to receive a femoral hip prosthesis comprising:
a) a guide body having a lower end base adapted to extend into the intermedullary canal of the femur, and an upper end portion comprised of at least one strut;
b) the lower end of the base having receptacle means for holding one end of a spinning mill;
c) a curved transverse guide rail having connection means thereon for forming a connection with the upper end of

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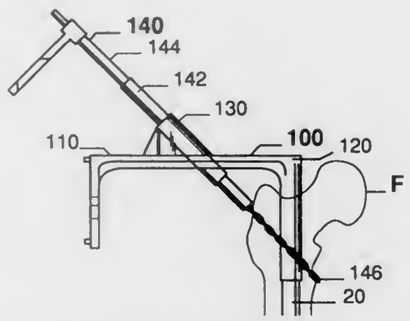


the guide body, the rail having a curved surface that is adapted to guide the mill during preparation of the intermedullary canal of the patient's femur for receiving a hip prosthesis.




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**5,047,034**
**INTRAMEDULLARY ROD SCREW GUIDE**
Gary W. Sohngen, Los Angeles, Calif., assignor to ACE Orthopedic Manufacturing, Los Angeles, Calif.
Filed May 29, 1990, Ser. No. 529,529
Int. Cl.[5] A61F *5/04*
U.S. Cl. 606—87 2 Claims




1. An intramedullary rod installation assembly for use in the installation of an intramedullary rod, comprising:
an intramedullary rod having a proximal end and a distal end, a plurality of bone screw passages therethrough proximate the proximal end and a plurality of bone screw passages therethrough proximate the distal end thereof;
an external support assembly comprising locator means for guiding the installation of a bone screw through an aperture in an intramedullary rod proximate the proximal end thereof, the locator means comprising an external channel support member formed of rigid metal, the channel support member comprising a web portion and flange portions, the web portion having formed therein a plurality of connector screw apertures spaced generally along the center of the web and x-ray alignment means for targeting the bone screws in alignment with the bone screw passages in the proximal end of the intramedullary rod; and
an intramedullary rod screw guide comprising;
an attachment plate portion comprising means for affixing the intramedullary rod screw guide to an external support assembly, said attachment plate portion being generally planar and, in use, extending generally parallel to and spaced from the intramedullary rod being installed;
a laterally extending spacer plate portion having a proximal end and a distal end, the proximal end being secured to the attachment plate portion and extending generally perpendicular thereto;
intramedullary rod attachment means proximate the distal end of the spacer plate; and
guide means secured to the spacer plate intermediate the proximal and distal ends thereof, said guide means comprising;
a guide boss secured to the spacer plate having formed therethrough a cylindrical guide passage having a central axis extending at a non-perpendicular angle relative to the spacer plate for receiving bone drill means and bone screw insertion means;
connecter screws extending through the connector screw apertures securing the attachment plate portion to the external support assembly; and
means securing the intramedullary rod attachment means to the distal end of the intramedullary rod;
the intramedullary rod screw guide, intramedullary rod, and locator means being constructed and configured so as to permit the guided insertion of drill means and bone screw insertion means through the guide passage in alignment with the bone screw passage in the intramedullary rod.

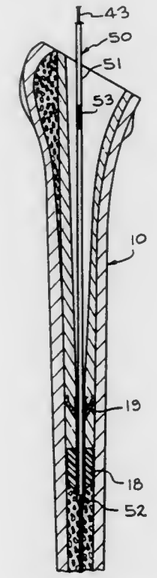
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**5,047,035**
**SYSTEM FOR PERFORMING HIP PROSTHESIS REVISION SURGERY**
W. E. Michael Mikhail, 4203 Shamley Green, Toledo, Ohio 43623, and James J. Elting, 35 Academy St., Oneonta, N.Y. 13620
Filed Aug. 10, 1990, Ser. No. 565,149
Int. Cl.[5] A61F *2/36, 5/04*
U.S. Cl. 606—93 12 Claims

1. A method of performing revision surgery to replace a hip prosthesis having a stem portion previously implanted in a cement mantle in the medullary canal of a femur comprising the steps of:
(a) removing the original prosthesis including the stem portion thereof;
(b) inserting in said medullary canal a trial prosthesis having a stem extending from a distal end to a proximal end, said stem having a size and configuration similar to that of the original prosthesis, said trial prosthesis having a passageway extending longitudinally throughout the length of said stem from said distal end to said proximal end;
(c) inserting an elongated drill bit into said passageway and, using said trial prosthesis passageway as a guide, drilling a pilot passageway through any remaining implanted cement and into said medullary canal;
(d) inserting one end of a guide wire into said pilot passageway;
(e) removing said trial prosthesis from said medullary canal while leaving said guide wire positioned therein; and

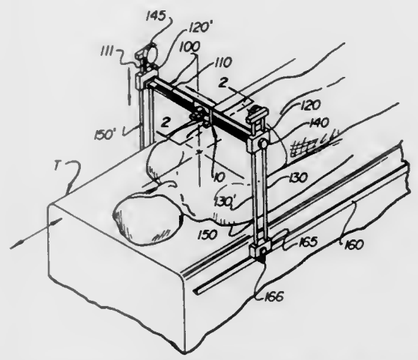


(f) positioning a cannulated reamer over said guide wire and, using said guide wire as a guide, rotating said cannulated reamer to enlarge said pilot passageway into a new cavity for receving new cement and a new hip prosthesis.




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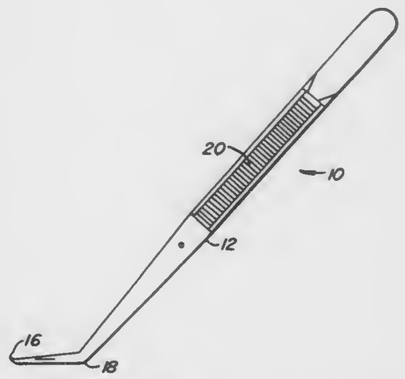
**5,047,036**
**STEREOTACTIC DEVICE**
Panos G. Koutrouvelis, 1201 Ballantrae La., McLean, Va. 22101
Filed Nov. 17, 1989, Ser. No. 437,605
Int. Cl.[5] A61B *19/00*
U.S. Cl. 606—130 17 Claims




1. A stereotactic device for allowing a user to accurately introduce a medical device through a sterile field into a body at a preselected angle comprising:
a. a base having an upper surface exposed when the stereotactic device is in use and a lower surface for placement on the body into which the medical device is to be introduced, said base having an opening therein, through which the part of the medical device to be placed within the body can pass unobstructed.
b. a leg normal to the base, affixed thereto and having a radial slot therein;
c. a carrier for the medical device comprising:
i. a radial portion which rides within the radial slot;
ii. retaining means for retaining the medical device in a fixed radial position relative to the arc defined by the radial slot and downwardly through the opening in the base; and,
iii. means for locking said carrier at a fixed position on the arcute pathway formed by the slot;
d. markings on said leg along said radial slot for placement of the retaining means at a preselected point along said radial slot whereby the medical device retained thereby can be extended downwardly through the opening and into the body at a preselected angle; and
e. markings on the base of said device for orienting said base, said base having opposing edges contiguous with the upper surface thereof and normal to the leg which edges are beveled and slope downwardly and outward from the surface of the base, said markings on said base comprising markings on said beveled edges.

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**5,047,037**
**SUTURE REMOVING INSTRUMENT**
Robert T. Brandfield, 30 Beechwood, Oakland, Calif. 94618
Filed Jan. 12, 1989, Ser. No. 464,092
Int. Cl.[5] A61B *17/28*
U.S. Cl. 606—138 3 Claims




1. A forceps comprising:
a pair of elongate, planar arms coupled together at a first end and tapering towards a second end of each arm;
a pair of scored surfaces on the inside of said arms at said second ends;
a blade having a limited length compared to said forceps and extending from the inside of a first one of said arms, near said second end, toward a second one of said arms;
an anvil surface on the inside of said second arm opposite said blade, said anvil surface being shaped to provide even contact with said blade when said arms are fully compressed;

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said arms being formed to provide a compressible spring action so that said second ends of said arms are separated with no compression force being applied, said scored surfaces contact each other without said blade contacting said anvil surface with a first amount of compression force applied to the outside of said arms, and said blade contacting said anvil surface with a second amount of compression force applied to the outside of said arms, said second compression force being greater than said first compression force; and

an inwardly extending peg coupled to the inside surface of one of said arms, and a hole matching the diameter of said peg positioned in the other of said arms opposite said peg, so that said peg will extend into said hole during compression of said arms together to provide a guiding action for said arms on compression.

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**5,047,038**

**AUTOMATIC HEMOSTATIC CLIP APPLIER**

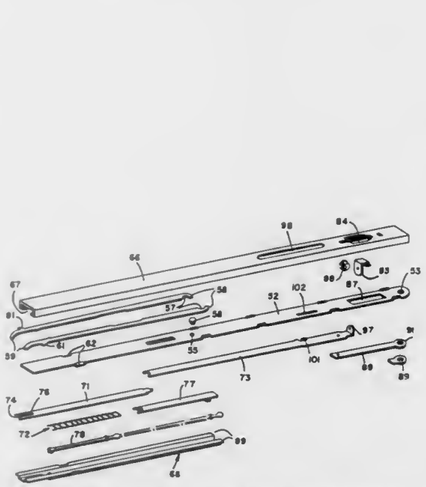
**Rudolph Peters, Oakland; Ronald Peters, Danville, and William Taylor, Oakland, all of Calif., assignors to Edward Weck Incorporated, Research Triangle Park, N.C.**

**Division of Ser. No. 750,158, Jul. 1, 1985, Pat. No. 4,712,549. This application Dec. 28, 1987, Ser. No. 138,553**

**The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.**

**Int. Cl.[5] A61B *17/12***

**U.S. Cl. 606—139** **8 Claims**



1. A tool for storing, dispensing, and applying a plurality of hemostatic clips in serial fashion, comprising;

a tool housing;

magazine means for storing a plurality of hemostatic clips in column fashion;

dispensing means for selectively removing and dispensing the endmost hemostatic clip from one end of said column in serial, sequential fashion;

jaw means for retaining and crimping a hemostatic clip;

feed blade means for translating reciprocally and engaging and transferring the endmost, dispensed clip from the column of hemostatic clips in said magazine means to said jaw means,

shuttle block means disposed to translate linearly and reciprocally in said tool housing to sequentially operate said feed blade means, jaw means, and dispensing means, whereby initial translation of said shuttle block means in a first direction initially withdraws said feed blade means from said jaw means, further translation of said shuttle block means in said first direction closes said jaw means to crimp a hemostatic clip disposed in said jaw means, thereafter translation of said shuttle block means in a second direction initially opens said jaw means and thereafter advances said feed blade means into said jaw means and transfers another hemostatic clip to said jaw means.

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**5,047,039**

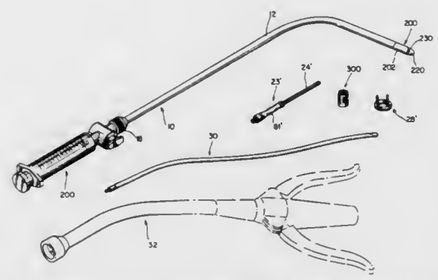
**METHOD AND APPARATUS FOR EFFECTING DORSAL VEIN LIGATION AND TUBULAR ANASTOMOSIS AND LAPAROSCOPIC PROSTATECTOMY**

**Odis L. Avant, 4703 89th St., Lubbock, Tex. 79423, and Duane A. Crawford, Lubbock, Tex., assignors to Odis Lynn Avant, Lubbock, Tex.**

**Filed Sep. 14, 1990, Ser. No. 582,635**

**Int. Cl.[5] A61B *17/00*; A61M *29/00***

**U.S. Cl. 606—148** **21 Claims**



1. Apparatus for effecting ligation of a vein adjacent a hollow, tube-like body member, comprising:

a hollow bullet-shaped sound dimensioned to be inserted in and through a tube-like body member and having a hollow, cylindrical body and a rounded-end tip, said body having an interior wall and a longitudinal axis and said tip having an elongated transverse slot therein; and

first and second spaced-apart, substantially linear needle guide means positioned on said interior wall for longitudinally guiding first and second needles, respectively, from inside said hollow sound out through said transverse slot.

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**5,047,040**

**ATHERECTOMY DEVICE AND METHOD**

**John B. Simpson, Woodside; Richard L. Mueller, Mountain View; Peter S. Brown, Los Altos Hills, and James R. Kermode, Costa Mesa, all of Calif., assignors to Devices for Vascular Intervention, Inc., Redwood City, Calif.**

**Continuation-in-part of Ser. No. 117,072, Nov. 5, 1987, abandoned. This application Feb. 16, 1989, Ser. No. 312,108**

**Int. Cl.[5] A61B *17/32***

**U.S. Cl. 606—159** **19 Claims**

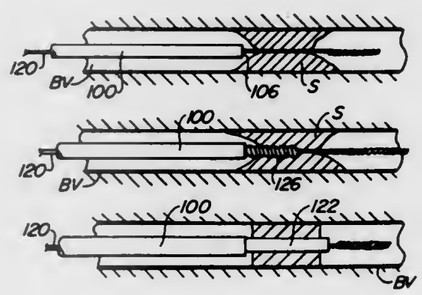
1. An atherectomy device comprising:

a flexible tubular member having proximal and distal ends and a central lumen extending therebetween;

a flexible drive member rotatably disposed in the central lumen of the flexible tubular member;



a collection chamber having an open distal end, said collection chamber being detachable secured to and isolated from the distal end of the flexible tubular member, whereby stenosis is not received in the flexible tubular member and the collection chamber can be removed to allow cleaning; and



a helical blade having a blade tip and a shank attached to a distal end of the flexible drive member, said blade being disposed so that the blade tip can extend distally through the open distal end of the collection chamber while the blade shank remains within the collection chamber, whereby stenosis may be severed and translated proximally into the collection chamber through the open distal end by rotating the blade.

(c) a centering segment secured to said cable means adjacent to said rear end of the cutting head for centering the



cutting head and for preventing it from engaging side branches of the vein.

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**5,047,042**

**CERVICAL CONIZATION METHOD AND INSTRUMENT**

**Ravinder Jerath, 2100 Central Ave., Augusta, Ga. 30909**

**Filed Feb. 9, 1990, Ser. No. 477,548**

**Int. Cl.[5] A61B *17/32***

**U.S. Cl. 606—167** **9 Claims**

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**5,047,041**

**SURGICAL APPARATUS FOR THE EXCISION OF VEIN VALVES IN SITU**

**Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403**

**Continuation of Ser. No. 397,640, Aug. 22, 1989, abandoned, which is a continuation of Ser. No. 212,772, Jun. 29, 1988, abandoned. This application Mar. 23, 1990, Ser. No. 497,840**

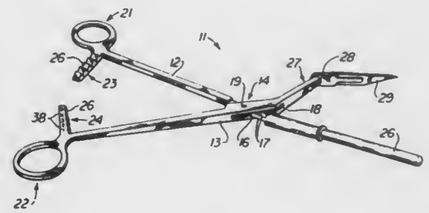
**Int. Cl.[5] A61B *17/32***

**U.S. Cl. 606—159** **2 Claims**

1. A device for cutting venous valve leaflets, comprising:

(a) a cylindrical cutting head having a front end and a hollow rear end, said rear end having rearwardly projecting, inwardly tapered, guide teeth separating several self-locating cutting grooves adapted to engage and sever the valve leaflets;

(b) cable means secured to the cutting head and extending from said hollow rear end for permitting insertion and withdrawal of the cutting head within a vein, said guide teeth causing the cutting grooves properly to engage and sever the valve leaflets as the cutting head moves past the valve leaflets during its withdrawal from the vein; and



1. A surgical instrument for excising a cone shaped tissue sample with said surgical instrument comprising:

a frame;

an elongated probe mounted at one end to said frame and extending therefrom;

a cutter; and

securing means on said frame for securing said cutter thereto with the cutter forming an acute cutting angle relative to said elongated probe, said cutting angle having its apex adjacent to the distal end of said probe;

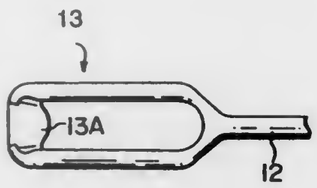
VOL 1130 ISS 2 SE 10 1991 UMI



said frame including first and second elongated arms pivotally attached together intermediate their ends for scissor-like relative motion of said arms, said elongated probe being mounted to one end of said first arm and said securing means being mounted to the corresponding end of said second arm.

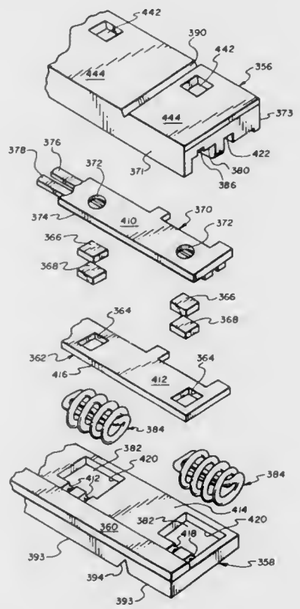
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**5,047,043**
**RESECTING DEVICE FOR LIVING ORGANISM TISSUE UTILIZING ULTRASONIC VIBRATIONS**
**Tetsumaru Kubota; Tatsuo Nagasaki; Koji Taguchi; Hiroyoshi Fujimori; Akio Nakada; Syuichi Takayama; Daisaku Negoro; Toshiki Terayama; Hiroyuki Kusunoki; Shinji Hatta; Hitoshi Karasawa; Masaaki Hayashi; Tadao Hagino, and Akihiro Taguchi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**
**Continuation of Ser. No. 233,988, Aug. 15, 1988, abandoned, which is a continuation of Ser. No. 20,445, Mar. 2, 1987, abandoned. This application Dec. 7, 1989, Ser. No. 449,101**
**Claims priority, application Japan, Mar. 11, 1986, 61-53219; Mar. 17, 1986, 61-58603**
**Int. Cl.[5] A61B *17/32***
**U.S. Cl. 606—169** **5 Claims**




1. A medical resecting device comprising:
ultrasonic vibration generating means for generating ultrasonic vibrations;
a horn coupled to said ultrasonic vibration generating means, said horn having a front portion;
probe means, coupled to said front portion of said horn, for transmitting ultrasonic vibrations generated by said ultrasonic vibration generating means, said probe means including a rod-like shaft portion and a distal end portion, said distal end portion extending from a tip end of said rod-like shaft portion and including two prongs spaced from each other and extending from said tip end of the rod-like shaft portion, and a resecting blade connected between said prongs, at least a cutting end portion of the resecting blade being at an acute angle with respect to a longitudinal axis of said rod-like shaft portion, said angle being in a given plane and said resecting blade being wider than, in a plane perpendicular to said given plane and parallel to the longitudinal axis, said rod-like shaft portion, said cutting end portion of the resecting blade terminating in an arc-shaped, convex edge facing generally along said longitudinal axis; and
power source means for supplying a drive voltage to said ultrasonic vibration generating means;
wherein said probe means has a crank-shaped portion formed between said rod-like shaft portion and said distal end portion, so that the probe means at the tip end of said rod-like shaft portion is bent with the crank-shaped portion in one direction, and said resecting blade is directed in the opposite direction.

**5,047,044**
**MEDICAL DROPLET WHOLE BLOOD AND LIKE MONITORING**
**Roger E. Smith, Bountiful; Mark E. Astill, Centerville; Jay L. Smith, Ogden, and Gale H. Thorne, Bountiful, all of Utah, assignors to Thorne, Smith, Astill Technologies, Inc., Ogden, Utah**
**Division of Ser. No. 256,678, Oct. 12, 1988. This application Feb. 23, 1990, Ser. No. 484,154**
**Int. Cl.[5] A61B *17/32***
**U.S. Cl. 606—182** **18 Claims**



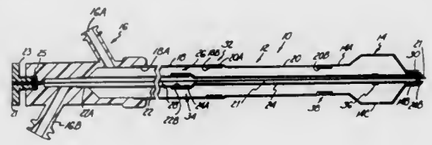

1. Multiple lancet structure comprising:
instrument means;
packet means associated with the instrument means and comprising a plurality of closely associated individually usable and disposable finger piercing elements for respective sequential acquisition of blood droplets, biasing means associated with each finger piercing element by which the associated finger piercing element when in a ready to use position in the instrument means is displaced to penetrate a fingertip or other patient site and thereafter retracted.

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**5,047,045**
**MULTI-SECTION COAXIAL ANGIOPLASTY CATHETER**
**Michelle M. Arney, and Matthew M. Burns, both of Minneapolis, Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.**
**Continuation-in-part of Ser. No. 337,319, Apr. 13, 1989, abandoned. This application Nov. 13, 1989, Ser. No. 433,712**
**Int. Cl.[5] A61M *25/00***
**U.S. Cl. 606—194** **23 Claims**

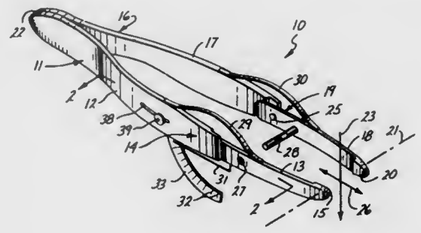
1. A dilatation catheter comprising:
an inner tube including a proximal inner tube section formed from a thin wall polymer tube and a distal inner tube section formed from a thin wall polymer tube connected together at an inner tube bonding region and having a guide wire lumen extending therethrough, with the distal inner tube section being more flexible than the proximal inner tube section;
an outer tube positioned over the inner tube to define an inflation lumen between the inner tube and the outer tube, the outer tube having a proximal outer tube section formed from a thin wall metal tube and a distal outer tube section formed from a thin wall polymer tube connected together at an outer tube bonding region which is spaced distally from the inner tube bonding region, with the distal outer tube section being more flexible than the proximal outer tube section; and
a balloon having a proximal portion connected to a distal end of the distal outer tube section and having a distal portion connected to a distal end of the distal inner tube section.





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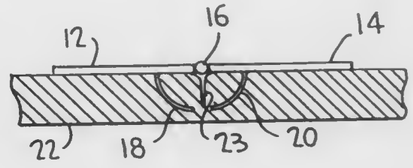
**5,047,046**
**SURGICAL FORCEPS**
**Rodger D. Bodoia, 11341 17th NE, Seattle, Wash. 98125**
**Filed Jul. 13, 1988, Ser. No. 217,830**
**Int. Cl.[5] A61B *17/50***
**U.S. Cl. 606—205** **18 Claims**




1. A forceps comprising:
a first elongated arm having a first proximal section and a first distal section, the first distal section having a first tip;
a second elongated arm having a second proximal section and a second distal section, the second distal section having a second tip;
means for interconnecting the first and second arms with the first and second tips being movable along a path to grip an object;
said first and second arms when gripping the object being usable to apply a component of force to the object that is generally perpendicular to said path;
a first joint for coupling the first proximal section to the first distal section so that the component of force with a magnitude up to a predetermined level can be transmitted from the first distal section to the first proximal section; and
the first joint including break-away means responsive to the component of force exceeding said predetermined level for quickly and automatically reducing the magnitude of the component of force that can be transmitted by the first joint to a magnitude less than the predetermined level.

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**5,047,047**
**WOUND CLOSING DEVICE**
**InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131**
**Continuation-in-part of Ser. No. 262,980, Oct. 26, 1988, Pat. No. 4,924,866. This application Apr. 13, 1990, Ser. No. 508,593**
**Int. Cl.[5] A61B *17/00***
**U.S. Cl. 606—216** **43 Claims**




1. A wound closing device comprising
a first arm having an inner end and an outer end and carrying at least one skin-engaging member extending from said first arm at a position between said inner and outer ends and having a free end for penetrating the skin;
a second arm having an inner end and an outer end and carrying at least one skin-engaging member extending from said second arm at a position between said inner and outer ends and having a free end for penetrating the skin;

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means interconnecting said inner ends of said first and second arms for allowing angular movement thereof relative to each other between an open position where said free ends of said first and second arm skin-engaging members are spaced from each other to span a wound and a closed position where said free ends of said first and second arm skin-engaging members are moved toward each other to penetrate the skin surrounding the wound; and

means angularly urging said first and second arms about said interconnecting means toward said closed position whereby said free ends of said first and second arm skin-engaging members are urged toward each other when said skin-engaging members penetrate the skin to facilitate healing of the wound.

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**5,047,048**

## CRYSTALLINE COPOLYMERS OF P-DIOXANONE AND ε-CAPROLACTONE

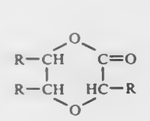
**Rao S. Bezwada, Whitehouse Station; Shalaby W. Shalaby, Lebanon, and Mo Erneta, Princeton Junction, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.**

**Filed Jan. 30, 1990, Ser. No. 472,134**

**Int. Cl.[5] A61B** *17/00;* **C08G** *63/00*

**U.S. Cl. 606—231** **14 Claims**

1. A crystalline copolymer of a monomer represented by the formula:



wherein each R is independently hydrogen or methyl; and from about 5 to about 40 weight percent ε-caprolactone.

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**5,047,049**

## SELF ORIENTING INSTRUMENT HANDLE

**Diane L. Salai, 3809 Dunraven Rd., Richmond, Va. 23236**

**Continuation of Ser. No. 356,761, May 24, 1989, abandoned. This application Nov. 15, 1990, Ser. No. 614,691**

**Int. Cl.[5] A61B** *17/00*

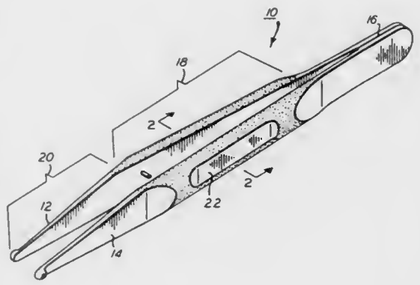
**U.S. Cl. 606—205** **12 Claims**

1. An improved hand held medical instrument comprising:

an instrument tip having a preferred orientation, and rotatable to at least one other orientation;

an instrument handle connected to the instrument tip and adapted to be held in the hand of the user, said handle comprising at least one substantially rounded elongated gripping portion for facilitating rotation of said instrument to orient the instrument tip;

a plurality of elongated longitudinally extending flat and curved gripping surfaces alternating in a radial direction around a circumference of the gripping portion and extending longitudinally over at least a substantial portion of the length of the gripping portion of the handle, the flat and curved gripping surfaces being engageable by the hand of the user while the instrument is held in a comfortable working position for providing a generally cylindrical gripping portion for ease of manipulation and flat locating positions within the cylindrical portions for orienting said instrument in said preferred orientation by touch alone.



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**5,047,050**

## INTERNAL PROSTHESIS WITH RADIOPAQUE ANNULAR PORTIONS

**Alberto Arpesani, Piazza S. Angelo 1, I-20121 Milano, Italy**

**PCT No. PCT/EP88/00115, § 371 Date Oct. 14, 1988, § 102(e) Date Oct. 14, 1988, PCT Pub. No. WO88/06026, PCT Pub. Date Aug. 25, 1988**

**Continuation of Ser. No. 272,747, Oct. 14, 1988, abandoned. This PCT application Feb. 17, 1988, Ser. No. 596,409**

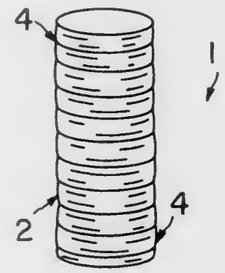
**Claims priority, application Italy, Feb. 17, 1987, 19405 A/87**

**Int. Cl.[5] A61F** *2/06*

**U.S. Cl. 623—1** **8 Claims**

1. A prosthetic device for vascular surgery, comprising a substantially tubular body including plastic material and tolerated by the human body, wherein said tubular body has free ends for attaching to at least one artery, and wherein said tubular body has radiopaque annular portions which are continuous over the entire surface of said tubular body and spaced equidistant along said tubular body for detection of said tubular body by X-rays wherein the radiopaque annular portions do not alter the functional properties or special nature of the prosthetic device.





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**5,047,051**

## INTRAOCULAR LENS WITH HAPTIC ANCHOR PLATE

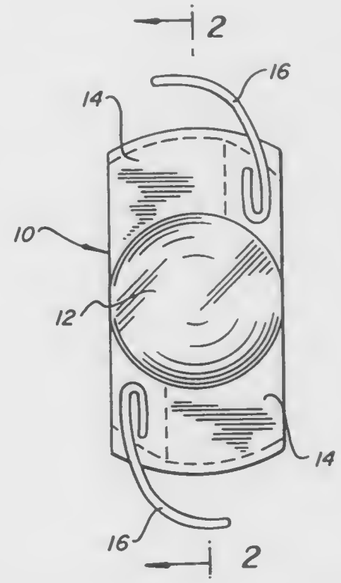
**J. Stuart Cumming, 1211 W. La Palma, Suite 201, Anaheim, Calif. 92801**

**Filed Apr. 27, 1990, Ser. No. 515,189**

**Int. Cl.[5] A61F** *2/16*

**U.S. Cl. 623—6** **16 Claims**

8. An intraocular lens comprising: an optic portion; a haptic anchor plate extending radially outwardly from said optic portion at diametrically opposite ends thereof and attached thereto, said haptic anchor plate having a length corresponding to the transverse dimension of the capsular bag of the eye of the recipient into which the lens is intended to be inserted to hold the lens in said capsular bag, and said haptic plate being sufficiently rigid to resist deformation when fibrosis of the capsular bag occurs; and a pair arcuate resilient haptic members attached to said anchor plate at opposite ends thereof to be compressed down adjacent to the end edges of the haptic anchor plate when the lens is positioned in the capsular bag of the eye of the recipient, and to spring outwardly from the ends of the haptic anchor plate when the lens is positioned in the sulcus of the eye of the recipient for positioning said intraocular lens in said sulcus.



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**5,047,052**

## ANTERIOR CHAMBER INTRAOCULAR LENS WITH FOUR POINT FIXATION

**Seymour Dubroff, 3806 Thornapple, Chevy Chase, Md. 20815**

**Filed Nov. 6, 1987, Ser. No. 117,268**

**Int. Cl.[5] A61F** *2/16*

**U.S. Cl. 623—6** **7 Claims**

1. An intraocular lens for implant in the anterior chamber of an eye comprising

a lens body having a configuration to define first and second opposed end peripheral edges, first and second opposed side peripheral edges connecting said first and second end peripheral edges and a longitudinal axis extending centrally through said first and second end peripheral edges, said first and second end peripheral edges being curved, and said first and second side peripheral edges being curved, the radius of curvature of said first and second end peripheral edges being less than the radius of curvature of said first and second side peripheral edges;

a first fixation member connected with said first side peripheral edge including a continuously curving proximal leg extending toward and beyond said first end peripheral edge and toward said longitudinal axis, a continuously curving junction portion connected with said proximal leg, and a continuously curving distal leg connected with said junction portion to extend in a direction substantially transverse to and away from said longitudinal axis to terminate at a footplate adapted to be received in the angle of intersection of the cornea and the iris in the anterior chamber of an eye;

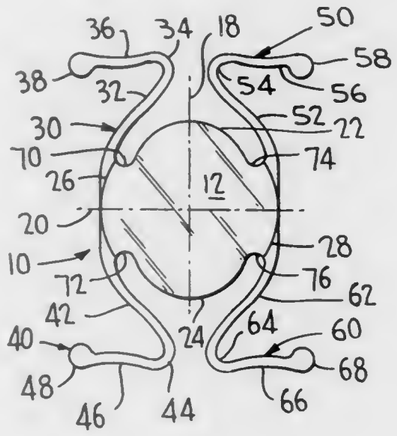
a second fixation member connected with said first side peripheral edge including a continuously curving proxi-

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mal leg extending toward and beyond said second end peripheral edge and toward said longitudinal axis, a continuously curving junction portion connected with said proximal leg, and a continuously curving distal leg connected with said junction portion to extend in a direction substantially transverse to and away from said longitudinal axis to terminate at a footplate adapted to be received in the angle of intersection of the cornea and the iris in the anterior chamber of an eye,

a third fixation member connected with said second side peripheral edge including a continuously curving proximal leg extending toward and beyond said first end peripheral edge and toward said longitudinal axis, a continuously curving junction portion connected with said proximal leg, and a continuously curving distal leg connected with said junction portion to extend in a direction substantially transverse to and away from said longitudinal axis to terminate at a footplate adapted to be received in the angle of intersection of the cornea and the iris in the anterior chamber of an eye; and




a fourth fixation member connected with said second side peripheral edge including a continuously curving proximal leg extending toward and beyond said second end peripheral edge and toward said longitudinal axis, a continuously curving junction portion connected with said proximal leg, and a continuously curving distal leg connected with said junction portion to extend in a direction substantially transverse to and away from said longitudinal axis to terminate at a footplate adapted to be received in the angle of intersection of the cornea and the iris in the anterior chamber of an eye,

said junction portions of said first and third fixation members being disposed in laterally aligned spaced relation on opposite sides of said longitudinal axis at distances from said first end peripheral edge less than the distances of said footplates of said first and third fixation members from said first end peripheral edge and said junction portions of said second and fourth fixation members being disposed in laterally aligned spaced relation on opposite sides of said longitudinal axis at distances from said second end peripheral edge less than the distances of said footplates of said second and fourth fixation members from said second end peripheral edge, and

said lens body and said fixation members being integrally made of on piece of plastic material with said fixation members having continuous curving configurations throughout the lengths thereof to flex along the full lengths in response to forces axially applied to said footplates.

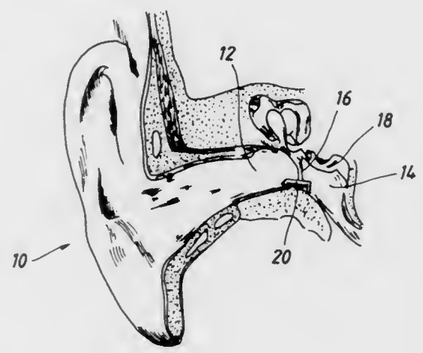
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**5,047,053**

**PERMANENT MIDDLE EAR VENT TUBE AND METHOD OF INSERTION**

**Anthony F. Jahn, Tenafly, N.J., assignor to Smith & Nephew Richards Inc., Memphis, Tenn.**

**Filed Feb. 27, 1990, Ser. No. 485,642**
**Int. Cl.[5] A61F** *2/18*
**U.S. Cl. 623—10** **12 Claims**




1. A permanent ear ventilation tube adapted to provide ventilation between the middle ear and the outer ear, comprising:

an elongated base portion and a flange formed of a non-compressible and biocompatible material;

said elongated base portion terminating at opposite ends and having a longitudinal opening extending therebetween;

said flange eccentrically connected at one end of said elongated base portion wherein the ventilation tube, in its implanted position, has the flange resting on the surface defining the middle ear cavity and the elongated base portion extending into the outer ear cavity.

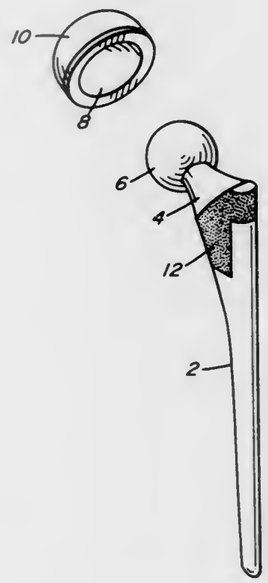


**5,047,054**

**TRIAZINE RESIN COATED PROSTHETIC IMPLANTS**

**Kandasamy Vijayan, Memphis; Larry H. Strait, Jr., Cordova, and Russell D. Jamison, Germantown, all of Tenn., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.**

**Filed Oct. 17, 1990, Ser. No. 599,299**
**Int. Cl.[5] A61F** *2/28*
**U.S. Cl. 623—16** **16 Claims**




1. A method of forming a coating on a prosthetic implant, comprising:

(i) coating at least a portion of the surface of a prosthetic implant with a coating composition comprising a bismaleimide-triazine resin and a biocompatible plasticizer; and

(ii) at least partially curing the bismaleimide-triazine resin.

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**5,047,055**

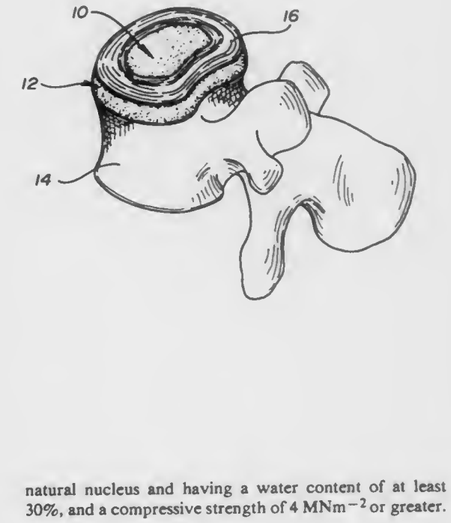
**HYDROGEL INTERVERTEBRAL DISC NUCLEUS**

**Qi-Bin Bao, Livingston, and Paul A. Higham, Ringwood, both of N.J., assignors to Pfizer Hospital Products Group, Inc., New York, N.Y.**

**Filed Dec. 21, 1990, Ser. No. 633,711**
**Int. Cl.[5] A61F** *2/44*
**U.S. Cl. 623—17** **10 Claims**

1. A prosthetic nucleus for implanting in the disc space after the removal of the degenerated or damaged nucleus of an intervertebral disc comprising:

a biologically compatible hydrogel material having when fully hydrated a size and shape generally conforming to a




natural nucleus and having a water content of at least 30%, and a compressive strength of 4 $MNm^{-2}$ or greater.

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**5,047,056**

**CANINE HIP PROSTHESIS**

**Robert V. Kenna, Hobe Sound, Fla., assignor to Pfizer, Inc., New York, N.Y.**

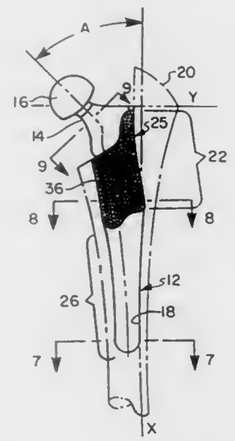
**Filed Feb. 16, 1990, Ser. No. 481,017**
**Int. Cl.[5] A61F** *2/30*
**U.S. Cl. 623—18** **27 Claims**

1. A canine femoral hip prosthesis for insertion into the intramedullary cavity of a canine femur, comprising a stem with an anterior face, a posterior face, a lateral face and a medial face, and having a proximal portion and a substantially longer distal portion, the stem transitioning from a nearly circular cross-section in the distal portion to a non-circular cross-section in the proximal portion with the stem in the proximal portion being substantially thicker on the medial face than on the lateral face, said stem having a slight posterior bow and further exhibiting a three-dimensional compound curvature defined by a transitional series of curves having different radii and orientations, said transitional series of curves match-

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ing the interior contour of the canine femur and thereby providing a glove-like fit between the stem and intramedullary



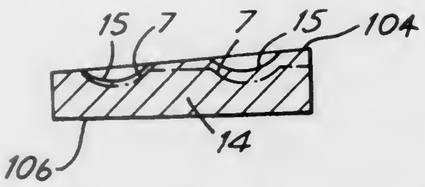

cavity and positive resistance to rotation of the stem within the cavity.

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**5,047,057**
**TIBIAL COMPONENT FOR A REPLACEMENT KNEE PROSTHESIS**

Peter Lawes, Pfizer Inc., 235 E. 42nd St., New York, N.Y. 10017-5755

Continuation of Ser. No. 384,720, Jul. 25, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 622,294
Claims priority, application United Kingdom, Jul. 27, 1988, 8817908
Int. Cl.[5] A61F *2/38*
U.S. Cl. 623—20 10 Claims




1. A surgically implantable knee joint prosthesis for the replacement of the articulation surfaces of a proximal tibia comprising:

a base plate having an upper surface and a lower surface adapted to be permanently fixed to a surgically prepared superior surface of the proximal tibia, said base plate bisected by a medial-lateral plane (M-L) and an anterior-posterior (A-P) plane;

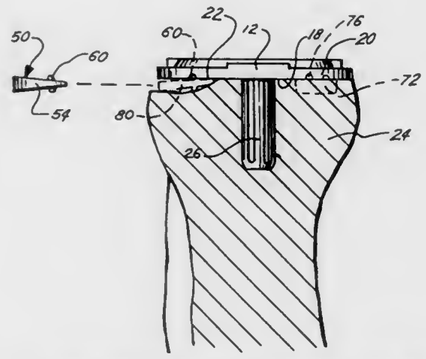
an articulation insert fixedly attached to said upper surface of said base plate, said insert having a superior surface having at least one depression having a central axis therethrough and configured to receive a corresponding condyle present on a distal femur, a vertical plane containing said axis of said depression extending along said insert being non-coplanar with respect to said anterior-posterior (A-P) plane and a medial-lateral (M-L) plane extending through the base plate.

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**5,047,058**
**SYSTEM OF INSERTS FOR THE TIBIAL COMPONENT OF A KNEE PROSTHESIS**

Jeffrey G. Roberts, Palm Harbor, Fla.; James A. Rand, Rochester, Minn.; Thomas Buford, III, Germantown, Tenn., and Jennifer J. Lackey, Memphis, Tenn., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn. and Mayo Foundation for Medical Education & Research, Olmsted County, Minn.

Continuation of Ser. No. 179,428, Apr. 8, 1988, abandoned. This application Apr. 23, 1990, Ser. No. 512,833
Int. Cl.[5] A61F *2/38, 2/30*
U.S. Cl. 623—20 15 Claims




1. A spacer system adapted to be inserted between an inferior contact surface of a prosthesis and adjacent bone, comprising:

a) a component of a bone prosthesis including an inferior contact surface adapted to engage adjacent bone under normal bone conditions; and

b) a spacer adapted to fill a void between at least a portion of said contact surface and adjacent bone, including a first surface to engage the prosthesis and a second surface to engage adjacent bone;

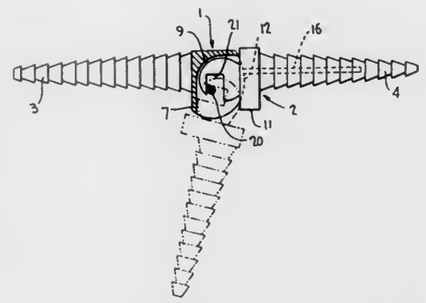
c) the first surface of the spacer and contact surface of the prosthesis including a plurality of cooperating projections and receiving portions sized and shaped so the projections can register with the receiving portions in a plurality of locations so the spacer can be located at a selected one of a plurality of locations on the inferior contact surface of the prosthesis.



**5,047,059**
**PROSTHESIS FOR METACARPOPEALANGEAL OR INTERPHALANGEAL ARTICULATION OF THE FINGERS**

Philippe Saffar, 23 Boulevard d'Argenson, 92299 Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 249,332, Sep. 26, 1988, abandoned. This application Nov. 22, 1989, Ser. No. 440,123
Claims priority, application France, Sep. 28, 1987, 87 13370
Int. Cl.[5] A61F *2/42*
U.S. Cl. 623—21 13 Claims

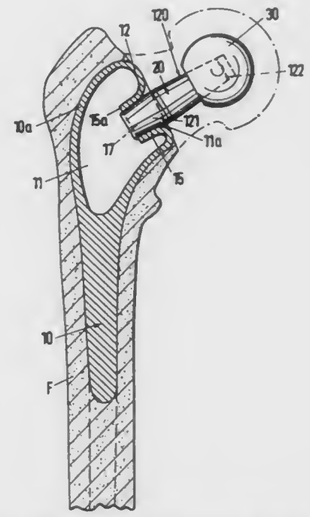



1. A metacarpophalangeal or interphalangeal prosthesis comprising a proximal component and a distal component with each having a first end and a second end, with said second ends being joined together so that said components constitute a bone-like joint; each of said first ends of said proximal component and said distal component being a stem constructed and arranged for implantation into a medullary canal of a bone; said second end of said proximal component being a socket containing an opening, said opening being present on the palmar side and in a side of said socket in the sagittal plane not attached to said stem; and said second end of said distal component being a head constructed and arranged for insertion into said socket, said head being rotatable in said socket substantially in said sagittal plane in such a manner that each of said proximal and distal components are movable relative to each other between an extended position wherein said components are substantially aligned and a predetermined angular position on said palmar side, wherein the improvement comprises a pin fixed inside said socket transverse to said sagittal plane, and said head being in the form of a hook, with said hook being positioned around said pin in such a manner as to (a) prevent said proximal and said distal components from being unjoined when said distal component is subjected to a postero-anterior force which is substantially perpendicular to the axis of said stem of said distal component, and (b) allowing joining or unjoining of said second ends of said proximal and distal components by moving said distal component to a position on said palmar side which is substantially perpendicular to the axis of said stem of said proximal component.

**5,047,060**
**FEMORAL BONE-HIP JOINT ENDOPROSTHESIS**

Ernst J. Henssge; Wolfgang Köller; Pavel Dufek, all of Lübeck, and Jorg Scholz, Berlin, all of Fed. Rep. of Germany, assignors to S+G Implants GmbH

Filed Oct. 3, 1990, Ser. No. 592,222
Claims priority, application European Pat. Off., Oct. 4, 1989, 89118369.1
Int. Cl.[5] A61F *2/36, 2/32*
U.S. Cl. 623—23 2 Claims




1. Femoral bone-hip joint endoprosthesis with an anatomically shaped shank (**10**) tapering conically in the direction of one of its ends and with an articular spheroid (**30**) secured to the same for an articular fossa (**40**), characterized in that, in the upper end (**10***a*) of the shank (**10**) facing the articular spheroid, a cavity (**11**) is constructed, and in that the circumferential rim (**12**) delimiting the upper cavity aperture (**11***a*), while forming a collar-like and tubular retaining stud (**15**), is inserted into the cavity (**11**), while the retaining stud (**15**) possesses an internal cavity (**17**) which tapers conically toward its free end (**15***a*) and an oval internal cross-section (**16**) for accommodating a double cone plug connection (**20**), the double cone (**120**) of which, at least within the area of the retaining stud (**15**), is provided with a cross-sectional configuration that corresponds to the internal cross-sectional configuration of the latter.

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**5,047,061**
**PROSTHESIS HOLDER**

Byron L. Brown, 2315 Hendricks, Fort Smith, Ark. 72903

Filed Jan. 20, 1989, Ser. No. 300,345
Int. Cl.[5] A61F *2/32, 5/04*
U.S. Cl. 623—23 3 Claims

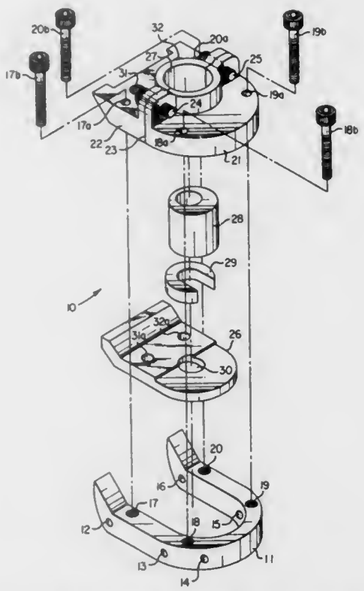
1. Apparatus for positioning and temporarily holding a femoral stem prosthesis within a prepared canal of a femur while said prosthesis is being affixed within said prepared canal, said prosthesis having a removable head, a neck and stem, said apparatus comprising:

a. base guide means for attachment to said femur adjacent the proximal end thereof;

b. holding means being a hollow sleeve having wall-defining inner and outer surfaces, said inner surface being configured for mated fitting on said neck of the prosthesis, said

holding means having a radial aperature extending through said wall between said outer and inner surfaces, said radial aperture being adapted for receiving a fastening member therein for fastening said holding means to the neck; and

c. ceiling means for attachment to said base means, said ceiling means including retaining means for cooperatively



engaging said holding means for positioning and temporarily retaining said holding means in a predetermined position with respect to the ceiling means, thereby to position and retain the prosthesis stem in a predetermined position while said prosthesis is being affixed within the prepared canal, said retaining means comprising a fastening screw.

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**5,047,062**

**FEMORAL STEM-TYPE PROSTHESIS**

**Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006, and Frederick F. Buechel, 76 Crest Dr., South Orange, N.J. 07079**

**Continuation of Ser. No. 825,985, Feb. 4, 1986, abandoned, which is a division of Ser. No. 574,037, Jan. 26, 1984, abandoned. This application Dec. 29, 1989, Ser. No. 458,595**

**Int. Cl.[5] A61F** *2/32*

U.S. Cl. 623—23 **8 Claims**

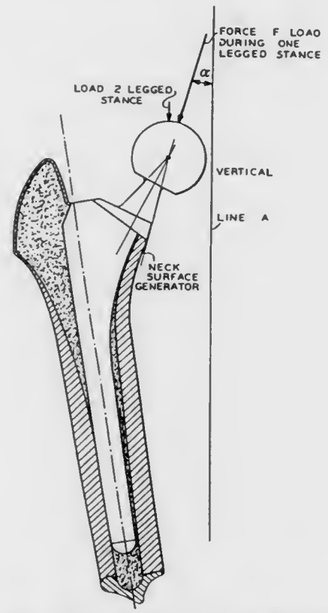
1. A femoral prosthesis for replacing a natural femoral neck and a natural femoral head of a femur, said femur having a medullary cavity, said prosthesis comprising:

an elongated stem for placement in the medullary cavity of the femur, said stem having a longitudinal axis;

a collar disposed at a proximal portion of the stem, said collar extending outwardly from said stem to define an inferior bearing surface and to define a medial edge;

a neck extending from said stem and said collar and inclined between 25°–35° medially from the stem; and

a head extending from a portion of the neck remote from said collar, said head defining a truncated sphere terminating at a truncation edge, wherein at least three points on said truncation edge define a truncation plane adjacent said neck, said head having a spherical radius r, a spherical center and a distance c measured perpendicularly between the truncation plane and the spherical center, the ratio c/r being greater than 0.7, and wherein substantially all of the neck is disposed laterally of a radially aligned line passing from the spherical center of the head to the medial edge of




the collar, whereby the ratio c/r and the alignment of the neck relative to the stem and to the radius extending to the medial edge of the collar enhances the range of articulation of said femur and the resistance of the prosthesis to bending stress and dislocation.

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**5,047,063**

**ADJUSTMENT DEVICE FOR ARTIFICIAL LIMBS**

**Sen-Jung Chen, No. 236, Sec. 3, Ho-Ping West Road, Taipei, Taiwan**

**Filed Nov. 30, 1990, Ser. No. 620,203**

**Int. Cl.[5] A61F** *2/62*

U.S. Cl. 623—38 **4 Claims**

1. An adjustment device for artificial limbs, comprising:

a hollow cylindrical member having an open upper section and an open bottom end;

a plate member disposed on and covering said open bottom end, said plate member having a central through opening;

a coupling member received in said hollow cylindrical member, said coupling member having a top plate portion to cover said central through opening, and a downwardly extending post portion projecting from said top plate portion and having a diameter smaller than said central through opening, said post portion extending through said central through opening of said plate member, said hollow cylindrical member being laterally movable to adjust the position of said post portion in said central through opening;

a sleeve member having an annular plate portion abutting the bottom surface of said plate member, and a hollow guide portion extending downward from said annular plate portion, said hollow guide portion having a downwardly tapered convex surface, said post portion extending into said sleeve member;

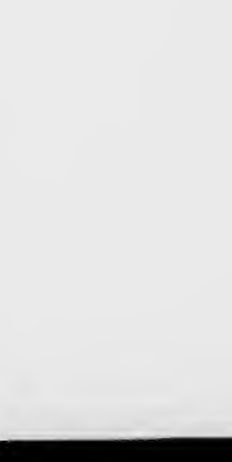
a mounting member having a cylindrical portion with an upper surface provided with a concave recess, said hollow guide portion being tiltably received in said concave recess so as to guide said post portion in an inclined position relative to a vertical axis of said mounting member;

a first adjusting and locking means to adjustably lock said post portion against said hollow cylindrical member in the desired lateral position, said first adjusting and locking means preventing the rotation of said hollow cylindrical member relative to said post portion; and

a second adjusting and locking means to adjustably lock said post portion against said mounting member in the desired inclined position;

one of said hollow cylindrical member and said mounting member being adapted for connection with an artificial limb joint; the other of said hollow cylindrical member and said mounting member being adapted for connection with an artificial limb;

whereby, the lateral position of said post portion in said through opening and the inclination of said post portion relative to the vertical axis of said mounting member can be adjusted to correspondingly adjust the center of gravity of the artificial limb incorporating said adjustment device to match the body equilibrium of a user.



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5,047,064

## METHOD AND COMPOSITION FOR THE ALKALI TREATMENT OF CELLULOSIC SUBSTRATES

Angelo Rizzardi, Matthews, N.C., assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 57,455, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 726,630, Apr. 24, 1985, abandoned, which is a continuation-in-part of Ser. No. 546,859, Oct. 31, 1983, abandoned. This application Aug. 14, 1989, Ser. No. 393,345

Int. Cl.[5] D06M *11/38*

U.S. Cl. 8—125 53 Claims

1. A method for the alkali treatment of a 100 percent cotton or cotton-polyester blend substrate which comprises applying to said substrate an aqueous alkali liquor having a temperature of above 45° F. and containing potassium hydroxide and an alkali metal silicate, said potassium hydroxide being present in an amount in the range 120 to 400 g/l sufficient to improve the dyeability of the substrate and being the sole alkali metal hydroxide present.

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5,047,065

## AQUEOUS FINISHING AGENT AND PROCESS FOR A SOFT HAND, WATER AND OIL REPELLENT TREATMENT FOR FIBROUS MATERIALS: PERFLUORO-ALIPHATIC AGENT, POLYETHYLENE AND MODIFIED HYDROGEN-ALKYL-POLYSILOXANE

Hans-Burkhardt Vogel, Augsburg; Franz Mosch, Gessertshausen; Erich K. Rossler, Stadtbergen-Leitershofen; Michael A. Bernheim, Aystetten, all of Fed. Rep. of Germany; Johan E. De Witte, Borgerhout, and Rudolf J. Dams, Zwijndrecht, both of Belgium, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 259,875, Oct. 19, 1988, abandoned. This application May 15, 1990, Ser. No. 523,174

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737753

Int. Cl.[5] C08L *23/06, 83/04;* D06M *13/36, 15/57*

U.S. Cl. 8—115.6 12 Claims

1. Aqueous finishing agent for fibrous materials comprising:

A) 25 to 65% by weight, based on the weight of the finishing agent, of an aqueous dispersion of a fluoroaliphatic group-bearing water and oil repellent compound selected from perfluoroaliphatic group-bearing polyurethanes, perfluoroaliphatic group-bearing N-methylol condensation products, perfluoroaliphatic group-bearing polycarbodiimides, perfluoroaliphatic group-bearing polymer or copolymer, perfluoroaliphatic group-bearing guanidines, perfluoroaliphatic group-bearing allophanates, perfluoroaliphatic group-bearing biurets, or combinations thereof, said compound comprising 30 to 55% by weight of said dispersion said dispersion containing at least 5% by weight fluorine,

B) 10 to 35% by weight, based on the weight of the finishing agent, of an aqueous dispersion of an emulsified oxidized polyethylene with a density at 20° C. of at least 0.92 $g/cm^3$ and an acid number of at least 5, said emulsifiable polyethylene comprising 20 to 35% of said dispersion, and

C) 25 to 40% by weight, based on the weight of the finishing agent, of a fluorine-free aqueous dispersion of a soft-hand extender selected from the group consisting of an H-functional $C_{8-18}$-alkyl-methyl-polysiloxane, an H- and epoxy-functional $C_{8-18}$-alkyl-methyl-polysiloxane, an H-functional $C_{8-18}$-alkyl-methyl-polysiloxane containing additional aryl groups, and H- and epoxy-functional $C_{8-18}$-alkyl-methyl-polysiloxane containing additional aryl groups, or a combination thereof, said polysiloxane comprising 25 to 40% of said dispersion.

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5,047,066

## DYE COMPOSITION FOR KERATINOUS FIBERS CONTAINING A 2-SUBSTITUTED 4-AMINOPHENOL COMPOUND AS A DEVELOPER, AND A COUPLING SUBSTANCE

Tsutomu Mano, Saitama; Jiro Kawase, Funabashi; Daisuke Misu, Wakayama, and Michio Obayashi, Toyonaka, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 5, 1989, Ser. No. 361,330

Claims priority, application Japan, Jun. 8, 1988, 63-141412

Int. Cl.[5] A61K *7/13*

U.S. Cl. 8—421 6 Claims

1. A dye composition for keratinous fibers, comprising a developer and a coupling substance, wherein the developer is 5-aminosalicylic acid or the methyl ester thereof or both, and the coupling agent is selected from the group consisting of 1-naphthol, 1,5-dihydroxynaphthalene, 1,7-dihydroxynaphthalene and 1,7-dihydroxylnaphthalene-2-carboxylic acid.

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5,047,067

## REACTIVE DYESTUFF COMPOSITION FOR CELLULOSE FIBERS: REACTIVE DYES WITH SIMILAR HUE BUT DIFFERENT REACTIVE GROUPS AND SUBSTANTIVITIES

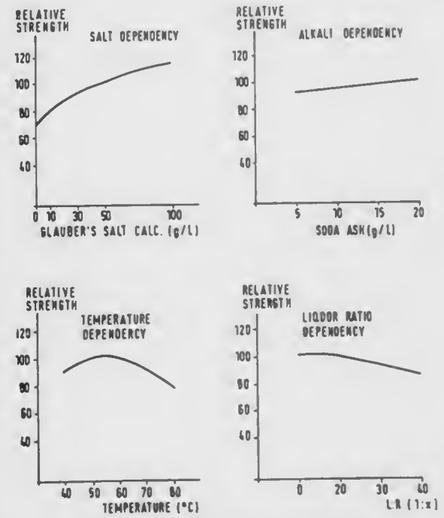
Koichi Miyazaki, Osaka, and Hachiro Hirooka, Hyogo, both of Japan, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 23, 1988, Ser. No. 275,778

Claims priority, application Japan, Nov. 27, 1987, 62-297707

Int. Cl.[5] C09B *62/50, 67/22;* D06P *3/66, 1/38*

U.S. Cl. 8—549 2 Claims

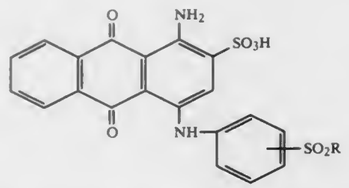



1. A reactive dyestuff composition comprising:

a bromamic acid-condensed reactive dyestuff of the following formula (I):

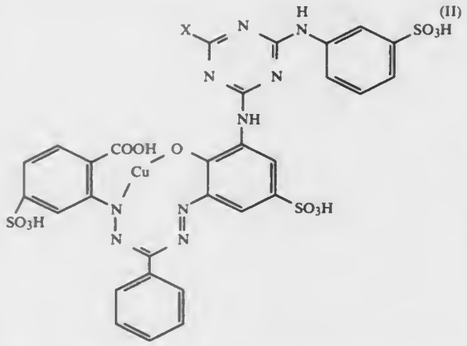
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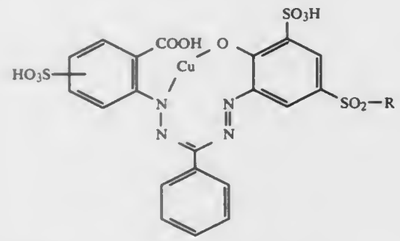
(I)

a copper-formazane reactive dyestuff of the formula (II):



(II)

and a copper-formazane reactive dyestuff of the formula (III):



(III)

wherein:

R is $-CH_2CH_2OSO_3M$, or $CH=CH_2$;

M is a hydrogen atom, an alkali metal, an alkaline earth metal, or a quarternary amine; and

X is a chlorine atom or fluorine atom, and the ratio of the reactive dyestuffs of the formulae (I), (II), and (III) is in the range of 3 to 7:6 to 2:1.

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**5,047,068**

**PROCESS OF ASSEMBLING A CELL**

**David P. Stoklosa, Webster, N.Y., assignor to Eveready Battery Company, Inc., St. Louis, Mo.**

**Filed Oct. 2, 1989, Ser. No. 415,915**

**Int. Cl.[5] H01M** *6/00*

**U.S. Cl. 29—623.2** **7 Claims**

1. A method of making a cell comprising the following steps:

providing a metal container for the cell and for forming a first electrical terminal;

forming a first cell electrode within and in contact with said container;

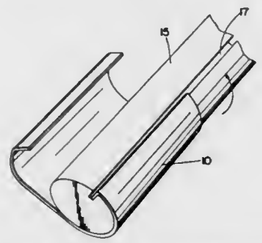
providing a separator for electrically insulating said first cell electrode;

forming a substantially rectangular sheet of spring material having opposed edges bent in the same direction into a compressed longitudinally split cylindrical shape;

wrapping a sheet of electrode material over said sheet of compressed spring material;

inserting said electrode material wrapped spring into the area of said container bounded by said separator;

releasing said spring to enable said spring to press said electrode material against said separator;



attaching a contact to said electrode material and to a cover for said container to form a second terminal for said battery;

adding an electrolyte solution to said container; and

closing said container with said cover to form a complete cell.

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**5,047,069**

**ANTIOXIDANTS FOR LIQUID HYDROCARBONS**

**Jerry J. Weers, Ballwin, and Thomas V. Bagwell, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.**

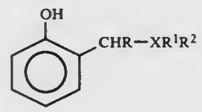
**Continuation of Ser. No. 386,337, Jul. 27, 1989, abandoned. This application Oct. 22, 1990, Ser. No. 601,151**

**Int. Cl.[5] C10L** *5/00*

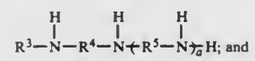
**U.S. Cl. 44—334** **23 Claims**

1. The polymeric reaction product of

(a) an ortho-substituted phenol of the formula



(b) a polyamine of the formula



(c) a $C_1$ to $C_6$ aldehyde;

wherein X is N or S; R is H or a $C_1$ to $C_5$ alkyl moiety; $R^1$ and $R^2$ are each independently $C_5$ to $C_{18}$ alkyl or cycloalkyl moieties which may optionally contain a hetero atom, only one of $R^1$ and $R^2$ being present if X is S, or may be combined to form a 5 or 6 membered ring; $R^3$ is a $C_8$ to $C_{50}$ alkyl moiety which may optionally contain one or more ether linkages; $R^4$ and $R^5$ are each independently $C_2$ to $C_6$ alkylene moieties; and a is 0 or 1.



**5,047,070**

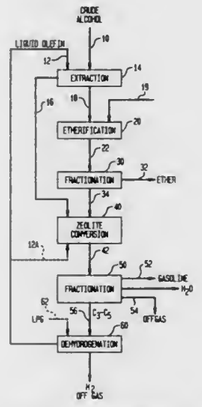
**INTEGRATED PROCESS FOR PRODUCTION OF GASOLINE AND ETHER FROM ALCOHOL WITH FEEDSTOCK EXTRACTION**

**Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Continuation-in-part of Ser. No. 308,072, Feb. 9, 1989, Pat. No. 5,009,859, which is a continuation-in-part of Ser. No. 179,725, Apr. 11, 1988, Pat. No. 4,827,045. This application May 30, 1989, Ser. No. 358,097**

**Int. Cl.[5] C10L** *5/00*

**U.S. Cl. 44—446** **7 Claims**




1. A continuous process for converting crude methanol to methyl tertiary-alkyl ethers and gasoline comprising the steps of:

(a) contacting a crude methanolic feedstock containing a minor amount of water with a liquid olefinic hydrocarbon extraction solvent stream rich in $C_4+$ iso-alkene hydrocarbon under extraction conditions favorable to selective extraction of the methanol, thereby providing a non-aqueous organic extract liquid stream rich in methanol and an aqueous raffinate stream containing unextracted methanol;

(b) charging liquid hydrocarbon extractant and extracted methanol substantially free of water to a first etherification catalytic reaction zone for contact with acid etherification catalyst under etherification process conditions for converting methanol and iso-alkene hydrocarbon to predominantly methyl tertiary-alkyl ether;

(c) fractionating the etherification effluent from step (b) to recover an overhead stream containing unreacted methanol and light olefinic hydrocarbon and to recover liquid product containing methyl tertiary-alkyl ether;

(d) catalytically converting aqueous raffinate from step (a) in contact with medium pore acid zeolite catalyst in a second methanol-to-gasoline reaction zone concurrently with catalytic upgrading of unreacted methanol and olefin in the overhead stream from step (c) to provide predominantly liquid $C_6+$ hydrocarbon product along with $C_3$-$C_5$ alkane intermediate product, water, and light gas;

(e) separating water and light gas from step (d) to recover $C_3$-$C_5$ alkane-rich intermediate and $C_6+$ hydrocarbon product;

(f) dehydrogenating at least a fraction of alkane intermediate from step (e) to provide an olefinic hydrocarbon liquid rich in iso-alkenes; and

(g) recycling olefinic liquid from step (f) to step (a) as extraction solvent liquid for dewatering methanol feedstock.

**5,047,072**

**ULTRAVIOLET AIR ENHANCEMENT AND LASER PLUME EVACUATION METHOD AND SYSTEM**

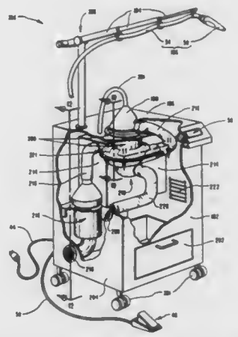
**Thomas J. Wertz, The Woodlands; Gerald D. Abell, Spring, both of Tex., and Russell W. Todd, Silver Spring, Md., assignors to Surgical Laser Products, Inc., The Woodlands, Tex.**

**Continuation-in-part of Ser. No. 269,629, Nov. 10, 1988, Pat. No. 4,986,839. This application Mar. 19, 1990, Ser. No. 495,569**

**The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.**

**Int. Cl.[5] B01D** *46/00*

**U.S. Cl. 55—1** **49 Claims**



46.. A method for the efficient removal of contaminants in a laser plume produced at a surgical site, said method comprising the steps:

(a) aspirating the laser plume from the surgical site;

(b) removing liquid contaminants from the laser plume;

(c) filtering substantially all particulate contaminants and the odor from the laser plume;

(d) sterilizing the laser plume to kill substantially all biologically active material; and

(e) expelling the treated laser plume into the atmosphere.

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**5,047,073**

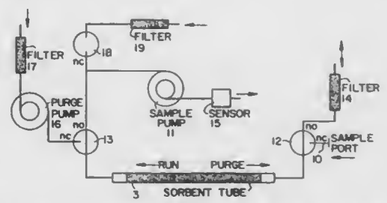
**SORPTION SEPARATION APPARATUS AND METHODS**

**Joseph R. Stetter, and William R. Penrose, both of Naperville, Ill., assignors to Transducer Research, Inc., Naperville, Ill.**

**Filed Feb. 27, 1990, Ser. No. 485,478**

**Int. Cl.[5] B01D** *15/03*

**U.S. Cl. 55—18** **27 Claims**




1. A method of selectively detecting an analyte in a gaseous mixture by a chemical sensor comprising the steps of

(a) pumping ambient air through a chemical filter so as to purify the air from those constituents to which said sensor is responsive,

(b) pumping the purified air through a sorbent-containing tube and through said sensor,

(c) drawing a portion of said gaseous mixture into a sample port,

(d) flushing said portion with purified air from the sample

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port into said sorbent tube, through an inlet end of the tube,

(e) directing analyte-containing eluent from the sorbent tube into said sensor, and

(f) preventing at least one other mixture component to which said sensor is responsive from reaching the sensor, said sorbent having a different retentivity for the analyte than for another component of the gaseous mixture to which the sensor is responsive.

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**5,047,074**

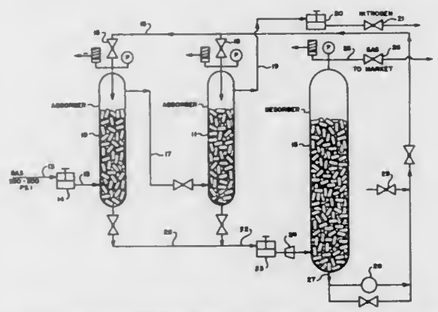
## PURGING OF NITROGEN FROM NATURAL GAS

**Douglas MacGregor, P.O. Box 7025, Salt Lake City, Utah 84107, and Page P. Blakemore, Sr., 4735 Naniloa Dr., Salt Lake City, Utah 84117**

**Continuation-in-part of Ser. No. 301,396, Jan. 25, 1989, abandoned. This application Dec. 4, 1989, Ser. No. 445,789**

**Int. Cl.[5] B01D** *19/00*

**U.S. Cl. 55—48** **11 Claims**



1. A process for separating one or more of the group of light hydrocarbons containing from one to five carbon atoms in each molecule from nitrogen in a stream of gas containing same, comprising passing such a stream of gas through an absorbtion column at substantially ambient temperature, or below and elevated pressure in intimate contact with an absorbent comprised primarily of a poly alpha olefin, for preferentially absorbing said group of light hydrocarbons with respect to the nitrogen in said gas; passing the non-absorbed gas comprised predominantly of nitrogen out of said absorption colum to waste or to recovery for use or for future processing; passing the resulting rich absorbent containing the absorbed light hydrocarbons into a desorber means operating at substantially ambient temperature but at a pressure lower than that of the absorber means, thus effecting desorption of at least some of the light hydrocarbons; and separately recovering the desorbed light hydrocatbons and the resultant lean absorbent from the desorber.

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**5,047,075**

## DUST BUSTER FILTER FOR A VACUUM CLEANER

**Ming-Huei Lin, 2F3R, No. 14, Ching Chung St., Tainan, Taiwan**

**Filed Jun. 2, 1989, Ser. No. 360,460**

**Int. Cl.[5] B01D** *46/00*

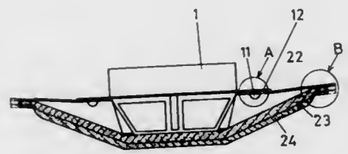
**U.S. Cl. 55—382** **1 Claim**

1. A dust buster filter for a vacuum cleaner comprising:

a filter body made up of three layers of unwoven cloth of different thickness, said three layers of unwoven cloth sandwitching a plastic rectangular ring between the edges of every two neighboring layers, said three layers of unwoven cloth and said two plastic rings being fused together by means of a super-sonic fusing machine, the upper layer of unwoven cloth provided with four holes properly spaced apart to correspond with and fitted into by four cylindrical protrusions on the back surface of the rim of a dirt entrance;

a dirt entrance being provided with a circumferential flat rim around its central opening, said rim being provided with four cylindrical protrusions to correspond with and fit into the four holes in the upper layer of unwoven cloth; and

said upper layer of unwoven cloth and said rim of the dirt



entrance being joined firmly with each other with hot melted glue, and said four protrusions on said rim fitting into and glued with said four holes in said upper layer of unwoven cloth by means of hot melted glue such that dirt entrance may be firmly and unseparably joined with said upper layer of unwoven cloth.

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**5,047,076**

## METHOD OF FABRICATING OPTICAL FIBRES BY SOLUTION-DOPING

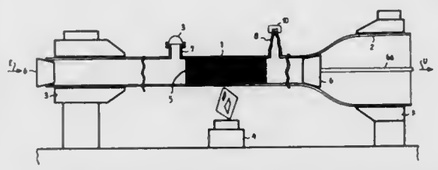
**Livio Cognolato, Baldissero, and Angelantonio Gnazzo, Alessandria, both of Italy, assignors to SIP - Societa Italiana per L-Esercizio Delle Telecomunicazioni P.A., Turin, Italy**

**Filed Dec. 4, 1989, Ser. No. 445,382**

**Claims priority, application Italy, Dec. 7, 1988, 68096 A/88; Aug. 24, 1989, 67715 A/89**

**Int. Cl.[5] C03C** *25/02*

**U.S. Cl. 65—3.12** **17 Claims**



1. A method of doping a core of a silica-based fiber preform, comprising depositing a soot layer, which will form said core of said silica-based optical fiber preform, inside a reaction tube supported by a lathe, and connected to at least one deposition reactant inlet conduit and at least one exhaust conduit, and then impregnating the deposited core soot layer contained inside said reaction tube supported by said lathe with a solution of a precursor of at least a first dopant which raises the refractive index of said layer without giving rise to a central dip of said index, said solution of a precursor of said first dopant being a solution in an anhydrous organic solvent, wherein after said layer deposition,

(a) the reaction tube is disconnected from the at least one deposition reactant inlet conduit as well as from the at least one exhaust conduit for the deposition reaction volatile products;

(b) at least a reaction product exhaust end of the reaction tube is sealed in a sealing operation, while an inert and anhydrous gas flow is maintained in said reaction tube during the sealing operation;

(c) said solution is introduced into the reaction tube, without removing the tube from the lathe so that the solution covers the whole surface of the deposited layer and impregnation of the deposited layer occurs; and

(d) once impregnation is over, the solution is caused to slowly flow out, at a uniform rate, from the reaction tube, which reaction tube is still mounted on the lathe.

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**5,047,077**

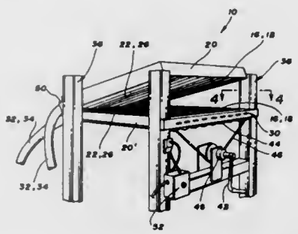
## COMBINATION HEATER QUENCH

**Harold A. McMaster, Woodville, and Robert G. McMaster, Elmore, both of Ohio, assignors to Glasstech, Inc., Perrysburg, Ohio**

**Filed May 24, 1990, Ser. No. 528,253**

**Int. Cl.[5] C03B** *27/04*

**U.S. Cl. 65—349** **16 Claims**



1. A glass sheet tampering system comprising: spaced and opposed plenums; said plenums including quench tubes having integral burners; each said quench tube being defined by complementary inner and outer generally U-shaped tubes; said tubes fitting one inside the other forming a passageway therebetween for communicating combustible gases; said outer U-shaped tube including recesses fabricated along its inside edge whereby a generally slot-shaped opening defining said burner is established along an edge of said quench tube; a top plate having quench openings therein fitting atop the inside U-shaped tube forming a passageway therein for communicating quench air; a conveyor for conveying a glass sheet to be tempered in a direction of conveyance between said plenums; a gas supply means for supplying a pre-mix of combustible gas to said burners for flow through the slot-shaped openings and combustion to heat the glass sheet between the plenums; and an air supply means for subsequently supplying quenching air to the arrays of openings in the quench tubes to tamper the heated glass sheet.

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**5,047,078**

## METHOD AND COMPOSITIONS FOR INCREASING PLANT GROWTH

**Jasbir S. Gill, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.**

**Filed May 2, 1985, Ser. No. 729,838**

**Int. Cl.[5] C05G** *3/00;* **C05B** *21/00*

**U.S. Cl. 71—11** **6 Claims**

1. A method of enhancing the efficacy of a phosphate fertilizer, comprising adding to said fertilizer an effective amount of a scale inhibiting compound selected from the group consisting of: hydroxy ethylidene diphosphonic acid, copolymers ofa crylic acid and 2-acrylamido-2-methylpropyl sulfonic acid, copolymers of acrylic acid and 2-methacrylamido-2-methylpropyl sulfonic acid, copolymers of methacrylic acid 2-acrylamido-2-methylpropyl sulfonic acie, copolymers of methacrylic acid 2-methacrylamido-2-methylpropyl sulfonic acid, copolymers of acrylic acid and hydroxy alkyl acrylate, copolymers of methacrylic acid and hydroxy alkyl acrylate, copolymers of acrylic acid and maleic acid or maleic anhydride and copolymers of methacrylic acid and maleic acid or maleic anhydride.

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**5,047,079**

## METHOD OF PREPARATION AND USE OF SOLID, PHYTOACTIVE COMPOSITIONS

**Roger Djafar, Corte Madera, and Alan H. Benke, El Cerrito, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.**

**Continuation of Ser. No. 897,240, Aug. 18, 1986, abandoned. This application Jul. 18, 1988, Ser. No. 233,257**

**Int. Cl.[5] A01N** *57/20*

**U.S. Cl. 71—86** **10 Claims**

1. A method for the preparation of a solid, substantially non-hygroscopic and non-deliquescent phytoactive composition comprising:

(a) admixing an amine salt of a N-phosphonomethyl-N-carboxylmethyl compound with a molten surfactant, the lower limit on the temperature of the mixture being the melting point of said surfactant and the upper limit being the temperature at which said amine salt of said N-phosphonomethyl-N-carboxylmethyl compound will decompose, the surfactant being solid at ambient temperatures wherein the ratio of N-phosphonomethyl-N-carboxylmethyl compound to surfactant, by weight, is from about 10:1 to about 1:10; and

(b) cooling said mixture to a temperature below the melting point of the surfactant to form a composition comprising said surfactant and said amine salt of N-phosphonomethyl-N-carboxylmethyl compound interdispersed in the matrix thereof and which is solid at ambient temperatures.

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**5,047,080**

## HERBICIDAL COMPOSITION

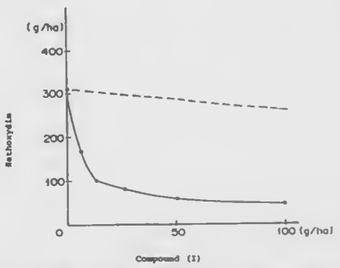
**Ryo Yoshida, Misawa; Yoshiro Mano, Shiga, and Hideyuki Shibata, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan**

**Filed Sep. 14, 1989, Ser. No. 407,104**

**Claims priority, application Japan, Oct. 5, 1988, 63-252771**

**Int. Cl.[5] A01N** *43/38, 35/01, 37/10*

**U.S. Cl. 71—96** **6 Claims**




1. A herbicidal composition which comprises as the active ingredients (a) 2-[7-fluoro-3,4-dihydro-3-oxo-4-(2-propynyl)-2H-1,4-benzoxazine-6-yl]-4,5,6,7-tetrahydro-1H-isoindole-1,3(2H)-dione and (b) at least one of 2-[1-(ethoxyimino)butyl]-5-[2-(ethylthio)propyl]-3-hydroxy-2-cyclohexen-1-one (sethoxydim) and methyl 4-hydroxy-6,6-dimethyl-2-oxo-3-[1-(2 propenyloxy)imino]butyl]-3-cyclo-hexene-1-carboxylate (alloxydim), and an inert carrier or diluent, wherein sethoxydim is present in the herbicidal composition such that the weight proportion of component (a) and sethoxydim is from 1:0.2 to 1:40, and wherein alloxydim is present in the herbicidal composition such that the weight proportion of component (a) and alloxydim is from 1:0.4 to 1:80.

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5,047,081

## METHOD OF DECARBURIZING HIGH CHROMIUM MOLTEN METAL

Haruyoshi Tanabe; Masahiro Kawakami; Kenji Takahashi; Katsuhiro Iwasaki, and Shigeru Inoue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

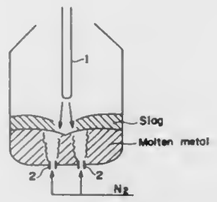
PCT No. PCT/JP88/00909, § 371 Date Apr. 5, 1989, § 102(e) Date Apr. 5, 1989, PCT Pub. No. WO89/02479, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 9, 1988, Ser. No. 320,270

Claims priority, application Japan, Sep. 9, 1987, 62-224048; Sep. 17, 1987, 62-231042; Nov. 13, 1987, 62-285444; Dec. 26, 1987, 62-330979

Int. Cl.[5] C21C *7/10*

U.S. Cl. 75—555 29 Claims




1. A method of decarburizing Cr molten metal, comprising the steps of

blowing, into a Cr molten metal supported in a container having a bottom blowing tuyere and a top blowing lance, a decarburizing $O_2$ diluted with an inert gas from said top lance; and

blowing, into said Cr molten metal, an inert gas in an amount ranging from 1 to 5 $Nm^3$/molten metal ton-min from said bottom blowing tuyere so as to agitate the Cr molten metal.

5,047,082

## METHOD FOR SMELTING REDUCTION OF NI ORE

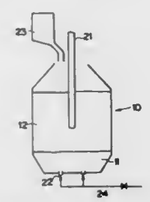
Haruyoshi Tanabe; Katsuhiro Iwasaki; Masahiro Kawakami; Chihiro Taki, and Toshio Takaoka, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Jan. 2, 1990, Ser. No. 460,238

Claims priority, application Japan, Mar. 9, 1989, 1-057179

Int. Cl.[5] C22B *23/00*

U.S. Cl. 75—629 11 Claims




1. A method for a smelting reduction of Ni ore, comprising:

providing a molten metal comprising iron in a converter smelting reduction furnace;

charging a Ni ore and a carbonaceous material into said converter smelting reduction furnace, said furnace having at least one bottom-blow tuyere and a top-blow, lance;

blowing oxygen gas from said top-blow lance and blowing a stirring gas from said bottom-blow tuyere into said furnace thereby reducing the Ni ore and forming Ni in said molten metal and forming slag; and

discharging slag so that a relation represented by a formula

$$Vo > 0.4Ws + 1.0$$

is satisfied, wherein Vo is a specific volume of said smelting reduction furnace in $m^3$ per ton of said molten metal containing Ni and Ws is a specific weight of tons of slag per ton of molten metal.

5,047,083

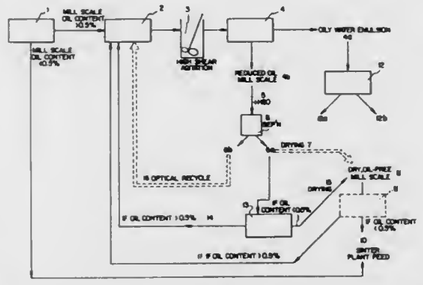
## PROCESS FOR DE-OILING MILL SCALE

Natalie R. Blake, Lisle, and Kristine S. Siefert, Crete, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jun. 15, 1989, Ser. No. 366,703

Int. Cl.[5] C22B *7/00*

U.S. Cl. 75—711 16 Claims




1. A process for de-oiling oily mill scale which consists essentially of

(a) collecting oily mill scale and analyzing for oil content; and then

(b) slurrying a portion of oily mill scale containing more than 0.5 weight percent in oil in water to achieve an aqueous mill scale slurry having at least 25 weight percent solids content; and then

(c) high shear agitating the aqueous mill scale slurry to form a reduced oil mill scale suspension in an oily water emulsion; and then

(d) phase separating the reduced oil mill scale from the oily water emulsion forming a reduced oil mill scale and oily water emulsion; and then

(e) fresh water rinsing the reduced oil mill scale to form an oil-free mill scale and a waste wash water; and then

(f) recycling the waste wash water to form at least a portion of the aqueous mill scale slurry of step b; and then

(g) repeating steps (a) through (f) until the oil-free mill scale contains less than 0.5 weight percent oil; and then

(h) drying the oil-free mill scale for use to form sinter plant feed in the steel making process.

5,047,084

## MICROEMULSION INK JET INK COMPOSITION

Miller Robert J., Burlingame, and Young S. You, Los Altos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 23, 1990, Ser. No. 468,551

Int. Cl.[5] C09D *11/00, 11/06*

U.S. Cl. 106—27 15 Claims

1. A thermal ink jet ink composition comprising:

a. a vehicle phase that is immiscible with water, having at least twelve carbon atoms per molecule and having a colorant dispersed therein,

b. an aqueous phase,

c. a surfactant,

d. one of said vehicle phase and said aqueous phase being a continuous phase,

e. the other of said vehicle phase and said aqueous phase being a discontinuous phase,

f. said continuous phase and discontinuous phase constituting a microemulsion.



5,047,085

## METHOD OF MAKING STRENGTHENED CELLULAR CONCRETE COMPOSITIONS CONTAINING ALPHA,BETA-UNSATURATED DICARBOXYLIC ACID

Mikio Hihara, and Nobuhisa Suzuki, both of Fuji, Japan, assignors to Nissel Plan, Inc., Fuji, Japan

Division of Ser. No. 234,951, Aug. 22, 1988. This application Sep. 25, 1990, Ser. No. 587,729

Claims priority, application Japan, May 25, 1988, 63-127852; May 25, 1988, 63-127853

Int. Cl.[5] C04B *7/02*

U.S. Cl. 106—677 7 Claims

1. A process for making a cellular concrete composition having improved mechanical strength, consisting essentially of the steps of preparing a cement paste consisting essentially of a hydraulic cement and water, mixing the cement paste with a bubbled frother solution containing at least one alpha, beta-unsaturated dicarboxylic acid, and casting the mixture into a form to solidity.

5,047,086

## CEMENT COMPOSITION FOR EXTRUSION

Kazuhisa Hayakawa; Tohru Chiba, and Shin-Ichiro Nakamura, all of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1989, Ser. No. 344,600

Claims priority, application Japan, May 6, 1988, 63-109961

Int. Cl.[5] C04B *16/02, 16/06*

U.S. Cl. 106—731 6 Claims

1. A cement composition for extrusion, consisting of 60–75 wt % cement mortar including about 50 wt % of cements and 16–21 wt % of aggregates, 3–15 wt % crushed pulp fiber and 0.2–1 wt % of at least one member selected from the group consisting of alkylcellulose and hydroxyalkylalkylcellulose in a 2% aqueous solution having a viscosity of 80,000 cps or more at 20° C.

5,047,087

## CEMENTIFEROUS COMPOSITION AND ADDITIVES FOR USE IN SUCH COMPOSITIONS

Peter G. Montague, Dunchurch; Peter Bainbridge, Northants, and John T. Hoarty, Golborne, all of United Kingdom, assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation of Ser. No. 847,983, Apr. 3, 1986, abandoned. This applicatioo May 4, 1989, Ser. No. 348,847

Int. Cl.[5] C04B *7/02*

U.S. Cl. 106—810 11 Claims

1. A cementiferous additive composition comprising as the sole plasticizing additive, 0.01 to 2.5% by weight (solids) of a water soluble copolymer or soluble salt thereof having a molecular weight of 1,000 to 15,000 consisting essentially of:

i) about 33 to 95 mole % of an ethylenically polymerizable carboxylic acid and

ii) from 67 to 5 mole % of an alkyl ($C_1$ to $C_8$) ester of an ethylenically polymerizable carboxylic acid.

5,047,088

## METHOD FOR CRYSTALLIZATION OF FRUCTOSE

Gin C. Liaw; James M. Gaddy, both of Decatur, Ill.; Frank M. Mallee, Sudbury, Mass., and Steven J. Reust, Lafayette, Ind., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jun. 30, 1989, Ser. No. 374,172

Int. Cl.[5] C13F *1/02*

U.S. Cl. 127—60 4 Claims

1. A batch method for producing crystalline fructose from an aqueous solution comprised of fructose comprising:

crystallizing fructose from a solution of fructose to produce a first massecuite of crystalline fructose product and mother liquor,

separating a major portion of said first massecuite from a minor portion of said first massecuite,

mixing said minor portion of said first massecuite with i) a first dry crystalline fructose seed having a mean particle size smaller than said crystalline fructose product in said massecuite and ii) a solution of fructose at a first elevated temperature, to yield a first crystallizing mixture,

lowering the temperature of said first crystallizing mixture to crystallize fructose from said solution and produce a second massecuite of crystalline fructose product and mother liquor,

separating a major portion of said second massecuite from a minor portion of said second massecuite,

mixing said minor portion of said second massecuite with i) a second dry crystalline fructose seed having a mean particle size smaller than said crystalline fructose product in said second massecuite and ii) a solution of fructose at a first elevated temperature to yield a second crystallizing mixture, and

classifying said crystalline fructose of said major portion of said second massecuite into two or more product cuts, each product cut having a mean particle size within a predetermined range, said predetermined range being different for each product cut.

5,047,089

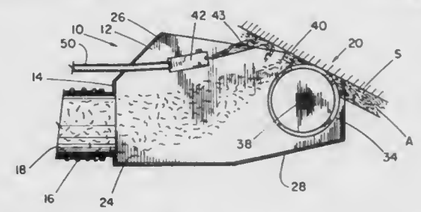
## DEVICE AND METHOD FOR REMOVING ASBESTOS-CONTAINING MATERIAL FROM A SURFACE

Jerrel Grant, 5915 Flintrock, #403, Houston, Tex. 77040

Filed Apr. 26, 1989, Ser. No. 344,127

Int. Cl.[5] B08B *1/00, 3/04, 13/00*

U.S. Cl. 134—21 18 Claims




1. A device for removing and cleaning relatively softer material from a relatively harder surface, comprising:

a housing having an open face for moving in a longitudinal path along a surface having a soft material layer deposited thereon, said face including a leading edge spaced from said surface to clear said soft material layer;

means associated with said open face for making a plurality of substantially continuous parallel longitudinal incisions in said soft material layer as said open face is moved in said path along said surface;

means associated with said open face for scraping said soft material layer between said incisions from said surface to remove the bulk of said soft material therefrom;

means associated with said housing for washing said scraped surface to remove residual soft material therefrom; and

means associated with said housing for aspirating said removed soft material into a collection receptacle.

5,047,090

## SEMICONDUCTOR DEVICE

Yutaka Hayashi, Tsukuba; Shigeaki Tomonari, Kadoma; Jun Sakai, and Keizi Kakite, both of Kadoma, all of Japan, assignors to Agency of Industrial Science & Technology, Ibaragi and Matsushita Electric Works, Ltd., Osaka, both of, Japan

Filed Feb. 14, 1990, Ser. No. 480,203

Claims priority, application Japan, Feb. 23, 1989, 1-44123

Int. Cl.[5] H01L *31/06*

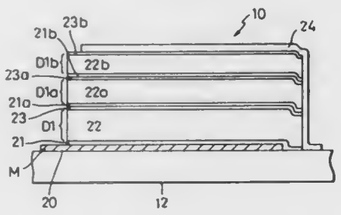
U.S. Cl. 136—249 10 Claims

1. A thin film semiconductor photoelectric light to electricity conversion device which comprises a plurality of laminated

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photoelectric conversion elements each including a said semiconductor thin film having the relationship $L \leqq 1/\alpha(\lambda)$ when




incident light is of a wavelength $\lambda$, the semiconductor thin film has a light absorption coefficient $\alpha(\lambda)$ and a carrier collection length L.

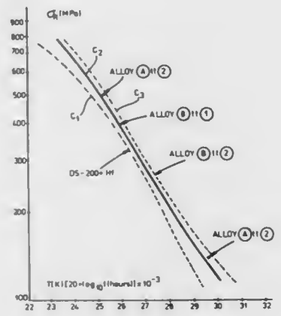
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**5,047,091**

## NICKEL BASED MONOCRYSTALLINE SUPERALLOY, METHOD OF HEAT TREATING SAID ALLOY, AND PARTS MADE THEREFROM

**Tasadduq Khan, Jouy en Josas, and Pierre Caron, Les Ulis, both of France, assignors to Office National d'Etudes et de Recherche Aerospatiales, Chatillon, France**

**Continuation of Ser. No. 363,285, Mar. 29, 1982, abandoned. This application Aug. 10, 1989, Ser. No. 393,033**
**Claims priority, application France, Apr. 3, 1981, 81 06782**
**Int. Cl.[5] C22F *1/10***
**U.S. Cl. 148—3** **17 Claims**




1. A monocrystalline super alloy with a nickel based matrix having a gamma-prime phase with a grain size of 5000 Å aligned along a well defined crystaliographic direction, and particularly intended to the manufacture of turbine blades, wherein the composition, by weight, of the alloy consists essentially of:

| | |
|---|---|
| Al | 5.4 to 6.2% |
| Co | 4 to 7% |
| Cr | 6 to 9% |
| Mo | 0 to 2.5% |
| Ta | 5.5 to 8% |
| Ti | 0 to 1% |
| W | 7 to 9% |

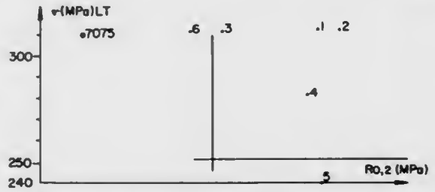
less than 80 ppm carbon, 50 ppm boron and 100 ppm zirconium Ni balance to 100%.

**5,047,092**

## ALUMINIUM BASED ALLOY WITH A HIGH YOUNG'S MODULUS AND HIGH MECHANICAL, STRENGTH

**Jean-Francois Faure, Voiron, France, assignor to Pechiney Recherche, Courbevoie, France**

**Filed Apr. 4, 1990, Ser. No. 503,903**
**Claims priority, application France, Apr. 5, 1989, 89 04700**
**Int. Cl.[5] C22C *21/10***
**U.S. Cl. 148—11.5 A** **3 Claims**




1. A spray deposited, hot worked, aluminum-based alloy, consisting essentially of, by weight:
5.5–8.45% Zn;
2–3.5% Mg;
0.5–2.5% Cu;
0.1–0.5% Zr;
0.3–0.6% Cr;
0.3–1.1% Mn;
up to 0.5% Fe;
up to 0.5% Si;
other elements <0.05% each, up to 0.15% total; and remainder Al,
said alloy having the mechanical properties:
$E \geqq 74$ GPa
$R_{0.2}$ (longitudinal dir.) ≧530 MPa
KIC (longitudinal dir.) ≧20 MPa $\sqrt{m}$
Resistance to corrosion under tension (30 days, short transverse dir.) ≧250 MPa.

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**5,047,093**

## HEAT TREATMENT OF ALLOY 718 FOR IMPROVED STRESS CORROSION CRACKING RESISTANCE

**William L. Kimmerle, Canton, and Marie T. Miglin, North Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Jun. 9, 1989, Ser. No. 364,759**
**Int. Cl.[5] C21D *1/19***
**U.S. Cl. 148—162** **4 Claims**

1. A method for increasing intergranular stress corrosion cracking resistance of Alloy 718 in water reactor environments comprising the steps of:
annealing the alloy at about 1093° C. (2000° F.) for about one hour;
cooling the alloy at about 56° C. (132.8° F.) per hour to about 718° C. (1325° F.);
aging the alloy at about 718° C. (1325° F.) for about four hours;
cooling the alloy at about 56° C. (132.8° F.) per hour to about 621° C. (1150° F.);
aging the alloy at 621° C. (1150° F.) for about sixteen hours;
cooling the alloy to room temperature; and
employing structural members fabricated from the alloy in a water reactor environment.

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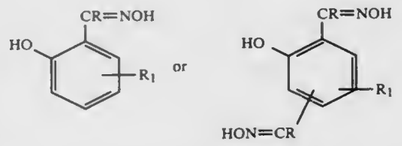
**5,047,094**

## ANTI CORROSION METAL COMPLEX COMPOSITIONS

**Bernard Tury, Prestwich; Glyn R. John, Lowton, and Noreen L. Thomas, Upton, all of England, assignors to Imperial Chemical Industrials, PLC, Hertfordshire, England**

**Division of Ser. No. 117,330, Dec. 18, 1987, abandoned, which is a division of Ser. No. 21,521, Feb. 26, 1989, Pat. No. 4,725,320, which is a continuation of Ser. No. 876,007, Jun. 19, 1986, abandoned. This application Apr. 20, 1989, Ser. No. 340,782**
**Claims priority, application United Kingdom, Jun. 19, 1985, 8515561**
**The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.**
**Int. Cl.[5] C23C *22/48***
**U.S. Cl. 148—248** **8 Claims**

1. A process which comprises contacting a surface of a metal I with a hydroxy oxime of a metal II wherein the hydroxy oxime has the structure:




where
R is hydrogen, a hydrocarbon or a substituted hydrocarbon substituent;
$R_1$ is a hydrocarbon or a substituted hydrocarbon wherein the hydrocarbon group contains 7 to 22 carbon atoms;
metal II being selected such that metal I is capable of displacing metal II ions from the hydroxy oxime complex.

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**5,047,095**

## PROCESS FOR SIMULTANEOUS SMOOTHING, CLEANING, AND SURFACE PROTECTION OF METAL OBJECTS

**Juergen Geke; Hermann Drosdziok, both of Duesseldorf, and Herbert Wievelhoff, Heiligenhaus, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany**

**Filed Jan. 13, 1989, Ser. No. 297,445**
**Claims priority, application Fed. Rep. of Germany, Jan. 14, 1988, 3800834**
**Int. Cl.[5] C23C *22/47, 22/08***
**U.S. Cl. 148—259** **4 Claims**

1. In a process for mass finishing metal workpieces, the improvement wherein the workpieces are in contact for a period of from about 10 to about 60 minutes during the mass finishing with an aqueous solution having a pH value of about 1 to about 6 and consisting essentially of water and:
(a) from about 0.2 to about 10 weight % of materials selected from the group consisting of orthophosphoric acid, condensed phosphoric acids, and water soluble salts of orthophosphoric and condensed phosphoric acids;
(b) from about 0.01 to about 1 weight % of materials selected from the group of tartaric acid, citric acid, and mixtures thereof;
(c) from about 0.005 to about 2 weight % of surfactant, of which at least about 50 weight % of the total amount of surfactant is non-ionic; and
(d) from about 0.001 to about 0.02 weight % of a corrosion inhibitor selected from the group consisting of alkali metal molybdates, benzotriazole, tolyl triazole, benzthiazole, and mixtures of any of these materials; and, optionally
(e) from about 0.01 to about 0.2 weight % of a water hardness stabilizer.

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**5,047,096**

## FERRITIC-MARTENSITIC STAINLESS STEEL ALLOY WITH DEFORMATION-INDUCED MARTENSITIC PHASE

**Hans F. Eriksson, Sandviken, and Hakan F. R. Holmberg, Gävle, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden**

**Filed Oct. 14, 1988, Ser. No. 257,830**
**Claims priority, application Sweden, Oct. 26, 1987, 8704155**
**Int. Cl.[5] C22C *38/58***
**U.S. Cl. 148—325** **10 Claims**

1. A duplex stainless steel alloy with high strength and good ductility in which the microstructure after cooling from high temperature contains ferrite and metastable austenite, said mestastable austenite being capable of being transformed into martensite during subsequent cold-working, which alloy consists essentially of, in percent by weight:

| | |
|---|---|
| C: | max 0.1% |
| Si: | 0.1–1.5% |
| Mn: | above about 2% to max 5% |
| Cr: | 17% to below 21% |
| Ni: | 2–5% |
| Mo: | max 2.0% |
| N: | max 0.2%, |

in which the alloying elements are adjusted such that the following conditions are fulfilled: the ferrite content is from 5–45 volume % and the numerical value for austenite stability versus martensite formation, $S_m$, expressed as $S_m = 462(\%\ C + \%\ N) + 9.2\%\ Si + 8.1\%\ Mn + 13.7\%\ Cr + 34\%\ Ni$ is in the range $475 < S_m < 600$.

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**5,047,097**

## STRUCTURALLY-STRONG SOLID PROPELLANTS

**David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Mar. 13, 1980, Ser. No. 129,043**
**Int. Cl.[5] C06B *45/10***
**U.S. Cl. 149—19.4** **2 Claims**

1. A structurally-strong solid propellant composition comprising a cured intimate mixture of a highly functional hydroxyl-terminated polybutadiene binder of up to about 25 weight percent of said composition; an aluminum metal fuel of up to about 20 weight percent of said composition; an oxidizer of ammonium perchlorate of up to about 80 weight percent of said composition; and a diisocyanate crosslinking agent in an amount from about 0.3 to about 0.8 weight percent of said composition, said diisocyante crosslinking agent being a compound selected from the group of compounds consisting of the diisocyanates having the formula ONC—(R)$_x$—NCO, wherein R equals $CH_2$ and X equals an integer from 25 through 45, said diisocyanate crosslinking agent having a coiled configuration with an increased chain length of methylene groups between the cure sites of said highly functional hydroxyl-terminated polybutadiene binder to contribute to increased elongation properties of said structurally-strong solid propellant composition as a result of said coiled configuration tendency to uncoil when said binder is stressed and the tendency to coil when said stress is relaxed, and said highly functional hydroxyl-terminated polybutadiene providing an increase in the number of crosslink sites for said diisocyanate crosslinking agent having said coiled configuration to contribute to increased tensile strength properties of said structurally-strong solid propellant composition.

VOL 1130 ISS 2 SE 10 1991 UMI



5,047,098

## LIQUID PROPELLANT

Wolfram Witt, Duesseldorf, and Karlheinz Reinelt, Hermannsburg, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 606,671, Mar. 5, 1984, abandoned. This application Oct. 28, 1986, Ser. No. 925,520

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1983, 33077312

Int. Cl.[5] C06B *25/36*

U.S. Cl. 149—89 9 Claims

1. An improved liquid propellant for producing propellant gases in a gun barrel weapon, wherein the basic starting substance of the liquid propellant consists essentially of a monergolic or non-hypergolic liquid propellant of at least one aliphatic composition selected from the groups of nitrated alkanes which consists of nitromethane, nitroethane, nitropropane, and/or a nitrate of the alkanes of methane, ethane, and propane, and includes at least one inhibitor for adjusting the propellant gas pressure and burning time of the liquid propellant which consists of univalent alcohol selected from the group of methanol, ethanol, propanol, or ethylene glycol, the improvement comprising that said liquid propellant includes a gas-pressure-throttling additive, and

said additive is selected from the group consisting of 1, 4 dihydroxybenene, copper (II)-acetylacetonate, 4-tert.-butyl-1,2-dihydroxybenzene, tetrabutyl tin and tertiary butylperbenzoate.

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5,047,099

## MULCH MATERIAL AND METHOD OF MAKING THE SAME

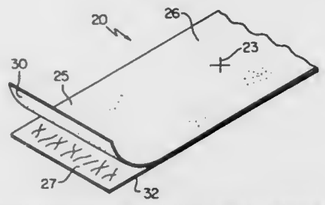
Edward N. Caldwell, Knoxville, Tenn., assignor to Dalen Products, Inc., Knoxville, Tenn.

Division of Ser. No. 231,723, Aug. 12, 1988, Pat. No. 4,910,052. This application Aug. 29, 1989, Ser. No. 400,463

The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.

Int. Cl.[5] B31B *1/60*

U.S. Cl. 156—60 4 Claims




1. In a method of making a sheet of mulch material comprising the steps of providing a sheet of polymeric material having openings passing therethrough and opposed sides one of which is to face the ground on which said sheet of mulch material is to be disposed, and providing a sheet of fabric material to be coextensive with and be secured to said one side of said sheet of polymeric material, the improvement comprising the steps of forming each said opening of said sheet of polymeric material to have a diameter no larger than approximately 0.05 of a millimeter in length and said sheet of fabric material to have a plurality of fiber means bonded together and defining spaces between adjacent fiber means so that each said space is no larger than approximately 0.045 of a millimeter in length whereby at least four fiber means completely overlap each of the largest said openings of said sheet of polymeric material to tend to prevent plant growth through said openings, said step of providing said sheet of fabric material comprising the steps of forming said sheet of fabric material of polymeric material, and heat bonding said sheet of fabric material to said one side of said sheet of polymeric material.

5,047,100

## CURCUMIN IN THE DETECTION AND WARNING OF CYANIDE ADULTERATED FOOD PRODUCTS

Susan Raymond, Palos Hills; Michael J. Greenberg, Northbrook, and Firoz Rajani, Wheaton, all of Ill., assignors to Northwestern Chemical Co., West Chicago, Ill.

Continuation-in-part of Ser. No. 157,918, Feb. 19, 1988. This application Jul. 18, 1989, Ser. No. 382,155

Int. Cl.[5] B32B *33/00*

U.S. Cl. 156—64 27 Claims

1. A method of incorporating a curcumin based cyanide detection system into metallised food packaging comprising the steps of:

providing a transfer agent;

providing a water permeable food packaging material transparent to red-orange light;

depositing on the transfer agent a film of metal particles;

providing an adhesive;

mixing with the adhesive an amount of curcumin sufficient to cause at least a portion of the packaging material to manifest a change from its original color to a red-orange color when the curcumin is in the presence of cyanide;

laminating the packaging material and the metallised transfer agent together with the adhesive disposed between, the lamination being performed before the adhesive is cured so that the metal particles are embedded in the adhesive;

curing the adhesive; and

separating the transfer agent from the packaging material, whereupon the packaging material is provided with a film containing curcumin and metallic particles whereby at least a portion of the packaging material manifests a color change in the presence of cyanide.

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5,047,101

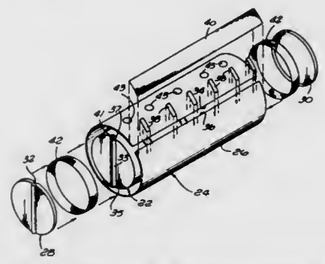
## METHOD FOR FABRICATING AN UNDERGROUND STORAGE TANK ASSEMBLY

Jared A. Trussler, 1225 Northridge, Santa Barbara, Calif. 93105

Continuation-in-part of Ser. No. 99,546, Sep. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 35,412, Apr. 6, 1987, abandoned. This application Apr. 6, 1989, Ser. No. 334,676

Int. Cl.[5] B65B *7/00*; B32B *31/00*; B29C *65/00*; B44C *1/22*

U.S. Cl. 156—69 67 Claims




1. A method for forming an underground fluid storage tank assembly, comprising the steps of:

(a) providing a steel primary fluid storage tank having an outer, peripheral surface;

(b) providing a secondary fluid storage container being formed of curable plastic material and having a substantially smooth inner surface; and

(c) tightly securing said secondary fluid storage container about the outer, peripheral surface of said primary fluid storage tank, the interstitial spaces formed between the outer surface of said primary container and the inner surface of said secondary container permitting the desired migration of fluid therethrough to allow the detection of any fluid leaking through the primary tank or secondary container.



5,047,102

## ADHESION OF SUCTION CUP MOUNTED DEVICES ON A POROUS WALL

William W. Emery, Berkeley Heights, N.J., assignor to Better Sleep Manufacturing Co., Berkeley Heights, N.J.

Filed Oct. 11, 1989, Ser. No. 419,684

Int. Cl.[5] E04B *2/00*

U.S. Cl. 156—71 5 Claims

1. A method for improving the load-carrying capacity of a wall-mounted device supported on a porous wall by suction cups which comprises adhesively applying to the portion of said wall upon which said suction cups are to be mounted a smooth, non-porous patch and then mounting said suction cup upon said patch.

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5,047,103

## METHOD FOR MAKING FLOCK APPLIQUE AND TRANSFERS

Louis B. Abrams, St. Louis, Mo., and Gerhard A. Arzberger, Appleton, Wis., assignors to High Voltage Graphics, Inc., St. Louis, Mo.

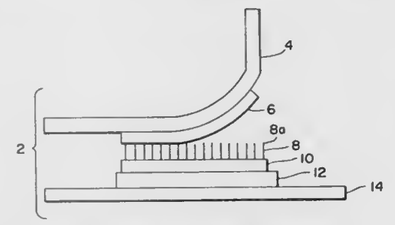
Continuation-in-part of Ser. No. 88,292, Aug. 24, 1987, Pat. No. 4,810,549. This application Feb. 14, 1989, Ser. No. 309,850

Claims priority, application PCT Int'l Appl., Aug. 24, 1988, PCT/US88/02828

The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.

Int. Cl.[5] B05B *5/02*

U.S. Cl. 156—72 40 Claims




1. A method of making an applique comprising:

a) coating a release sheet with a release adhesive;

b) flocking flock through an open section of a barrier into said release adhesive to result in at least two patterns of flock arranged to form a predetermined design adhered to said release sheet.

c) applying a binding adhesive to free ends of said flock;

d) transferring at least one said predetermined design of flock to a substrate material; and

e) affixing said substrate material with said predetermined design of flock to an article.

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5,047,104

## PROFILES OF COMPOSITE FIBROUS MATERIALS

Lothar Preis, and Rolf Förster, both of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

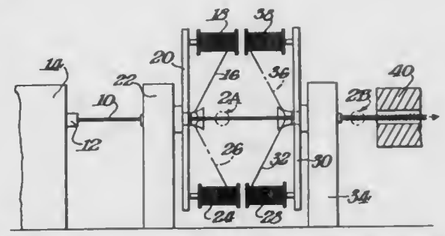
Continuation of Ser. No. 485,302, Feb. 15, 1983, abandoned, which is a continuation of Ser. No. 83,593, Oct. 11, 1979, abandoned, which is a continuation of Ser. No. 929,924, Aug. 1, 1978, abandoned. This application Sep. 22, 1986, Ser. No. 909,603

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735538

Int. Cl.[5] B32B *31/12, 35/00*

U.S. Cl. 156—86 11 Claims

1. A process for the production of unidirectionally reinforced bars of circular cross-section from composite fibre materials selected from glass fibres and carbon fibres, comprising the steps of impregnating strands of fibre materials with liquid reaction resins, disposing the impregnated strands in a predetermined preliminary profile, wrapping the disposed impregnated strands in a liquid condition before they harden with unimpregnated strands of shrinkable materials selected from polyamides or polyester fibres or monofils in drawn (stretched) and/or preoriented and/or textured form and which are so selected that the shrinking forces are active,




before the reaction resin reaches its gel-phase, and simultaneously shrinking the unimpregnated strands to embed the strands in the resin and hardening the wrapped material in a hardening zone until the resin is completely cured without using a mold and without using further resin impregnation sections and a resin-rich surface is obtained without the need for additional shaping.

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5,047,105

## PROCESS FOR FORMING THE BOTTOM OF A SACHET OF FLEXIBLE SYNTHETIC MATERIAL AND DEVICE FOR CARRYING OUT THE PROCESS

Michel Cazes, Vittel, France, assignor to Societe Generale Des Faux Minerals De Vittel, Vittel, France

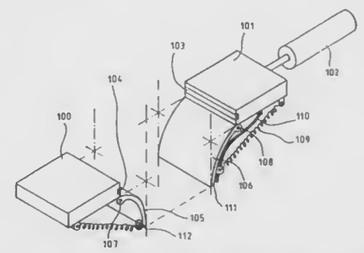
PCT No. PCT/FR88/00070, § 371 Date Oct. 19, 1988, § 102(e) Date Oct. 19, 1988, PCT Pub. No. WO88/06125, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 9, 1988, Ser. No. 286,987

Claims priority, application France, Feb. 19, 1987, 87 02436

Int. Cl.[5] A63B *39/00*; B32B *31/20*

U.S. Cl. 156—146 14 Claims




1. A process for forming a lug in a sachet formed of a flexible synthetic material which contains a liquid, comprising the steps of:

disposing a lug-forming portion of a sachet between first and second opposing welding jaws, the first welding jaw including a convex-shaped cheek piece rotatably articulated thereon, and a counter-abutment surface extending from the second welding jaw, whereby the cheek piece yieldably protrudes from the first welding jaw toward the counter-abutment surface;

moving the welding jaws in relation to one another so that the lug-forming portion of the sachet is engaged between the cheek piece and the counter-abutment surface;

advancing the welding jaws toward each other so that the liquid in the portion of the sachet between the first cheek-piece and the counter-abutment surface is progressively

displaced upwards by the urging of the lug-forming portion between the cheek piece and the counter-abutment surface;

expelling the liquid contained in the lug-forming portion of the sachet by the progressively upward displacement of the cheek piece; and

forming a weld in said portion of the sachet when the opposing jaws come together, forming the lug in the sachet.

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**5,047,106**

## METHOD FOR FABRICATING A FLEXBEAM OF A HELICOPTER ROTOR BLADE

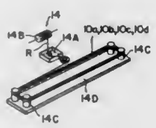
**Tadahiro Matsumoto, and Kiyoshi Nishikawa, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

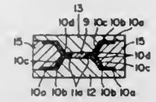
**Division of Ser. No. 294,259, Jan. 5, 1989, Pat. No. 4,892,461. This application Oct. 16, 1989, Ser. No. 422,222**

**Claims priority, application Japan, Jan. 8, 1988, 63-1831**

**Int. Cl.[5] B29C *43/20, 53/56***

**U.S. Cl. 156—169** **2 Claims**





1. A method for fabricating a flexbeam of a helicopter rotor blade, said flexbeam comprising a mast mounting and flapping part connecting to a mast of a helicopter, a feathering and lead-lag motion part connected to an outer end of said mast mounting and flapping part, and a rotor blade mounting part connected to another end of said feathering and lead-lag motion part, opposite to said outer end, for installing said helicopter rotor blade at a pair of bushes provided in a distal end of said rotor blade mounting part, said method comprising:

placing between upper and lower mold halves a preliminarily cured central member of elongated plate shape made of a pre-preg composite material;

placing between said upper and lower mold halves two pairs of the bushes at the two longitudinal end portions of the central member;

preparing loops of roving of half-cured composite material of different length;

laying said loops of different lengths along each longitudinal side of said center member such that said loops are laminated in order of length along cavity portions of Y-shaped cross section between the upper and lower mold halves while encircling two bushes which face longitudinally each other;

setting side mold halves on respective outside of said loops laminated at said laying step, each mold half having a shape corresponding to each cavity portion of Y-shaped cross section; and

molding said central member and said loops within said upper and lower mold halves and said side mold halves to form an integral flexbeam with ribs of Y-shaped cross section.

**5,047,107**

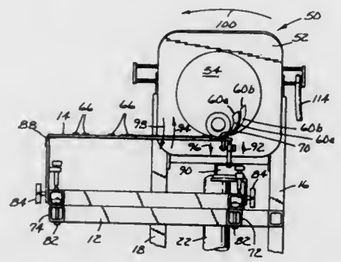
## METHOD AND APPARATUS FOR APPLYING A REFLECTIVE SLEEVE TO A TRAFFIC CONE

**Louis F. Keller, New Brighton; James P. McAuley, Shoreview, and Heinrich F. Stenemann, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Jun. 27, 1989, Ser. No. 371,919**

**Int. Cl.[5] B65C *3/00***

**U.S. Cl. 156—184** **20 Claims**



1. Apparatus for applying a reflective sleeve having spaced end edges to a traffic cone, comprising:

(a) a frame;

(b) a mandrel having a longitudinal axis mounted on said frame for receiving the traffic cone and including means for securing the traffic cone on said mandrel;

(c) a platform mounted on said frame for supporting the reflective sleeve with a pressure sensitive adhesive surface of the reflective sleeve exposed;

(d) mandrel motive means mounted on said frame and connected to said mandrel for shifting said mandrel with the traffic cone secured thereon between a first position and a second position when said mandrel motive means is activated, wherein in said second position said longitudinal axis remains stationary with respect to said frame, so that a tangent line of the traffic cone nearest to said platform is parallel to and spaced from an end edge of the sleeve;

(e) means mounted on said frame for shifting said platform between a first position to a second position with said mandrel in said second position to place the pressure sensitive adhesive surface of the adhesive sleeve along said end edge thereof in contact with the traffic cone at the nearest tangent line; and

(f) means mounted on said frame for rotating said mandrel about said longitudinal axis to wind the sleeve onto the traffic cone.

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**5,047,108**

## TIRE BUILDING DRUM FOR FABRICATING HIGH PROFILE TYPE TIRE CARCASSES

**Mark S. Byerley, Greenback, Tenn., assignor to WYKO, Inc., Greenback, Tenn.**

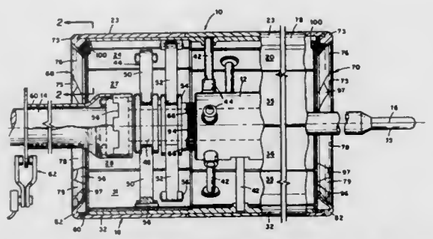
**Filed Mar. 9, 1990, Ser. No. 491,353**

**Int. Cl.[5] B29D *30/24***

**U.S. Cl. 156—417** **18 Claims**

1. A collapsible tire building drum comprising segmented sleeve means rotatable about an axis of rotation, an elongated cylindrical drum means circumferentially disposed about said sleeve means and comprising a plurality of elongated axially extending drum segments, collapsible means coupled to each of said drum segments and to said sleeve means for collapsing said drum segments toward said axis or expanding said drum segments away from said axis to define the cylindrical drum means, and bead seating ring means supported by opposite longitudinal ends of said drum segments and projecting radially inwardly from the drum segments toward said axis, said ring means each comprising a plurality of curved ring segments disposed in a contiguous end-to-end relationship to one another and with at least one ring segment having an end portion thereof pivotably attached thereto for defining recess means therein of a size sufficient for receiving an outer end portion of a drum segment and its supported ring segment disposed adjacent to said at least one ring segment during the





collapsing of said drum segments toward said axis, said supported ring segment having receptacle means therein for receiving the pivotably attached end portion of said at least one ring segment during the collapsing of said drum segments towards said axis.

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**5,047,109**

## APPARATUS FOR PRODUCTION OF BIAS FABRICS

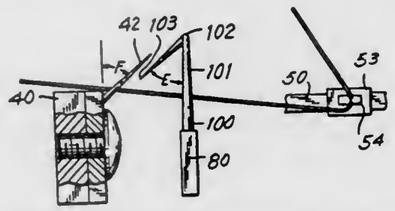
**Ronald G. Krueger, Sparks, Nev., assignor to JB Group, Inc., Greenwich, Conn.**

**Division of Ser. No. 922,344, Oct. 23, 1986, Pat. No. 4,877,470. This application Oct. 26, 1989, Ser. No. 427,445**

**The portion of the term of this patent subsequent to Dec. 3, 2002, has been disclaimed.**

**Int. Cl.[5] D04B *23/00*; D04H *3/00***

**U.S. Cl. 156—440** **11 Claims**



1. An apparatus for forming a bias-laid non-woven fabric including:

a. a pair of parallel conveyors, said conveyors being parallel to the long axis of a bias-laid, non-woven fabric to be formed, and lying at the extremities of the short axis of said fabric, said conveyors being provided with a first plurality of equally spaced needles, said first plurality of needles facing away from said fabric to be formed;

b. at least two yarn carriers, each said carrier having a plurality of openings, each said opening being provided so as to accommodate a single yarn to be laid in the traversing of said yarn carrier from one conveyor to the other conveyor, the mounting for said yarn carrier providing for travel of said yarn carrier to a point beyond the needles formed on said conveyors;

c. first means to drive said conveyor mechanisms;

d. second means to drive said yarn carriers;

e. a pair of rake means for each said yarn carrier, a first rake means being placed beyond said one conveyor within the limit of travel of said yarn carrier and a second rake means placed beyond said other conveyor in association with the end of travel of said yarn carrier, each said rake means being provided with a second plurality of equally spaced needles, said second plurality of needles facing towards said fabric to be formed;

f. means to move said rake system in a first direction parallel with the direction of said associated conveyor and then in a second direction opposite to the direction of movement of said conveyor, when the direction of the yarns carried by said associated yarn carrier is essentially the same as the direction of movement of said conveyor, and means to move said rake means in a direction opposite the direction of movement of said conveyor for all other yarn carriers; and

g. means for bonding the formed, bias-laid, non-woven fabric.

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**5,047,110**

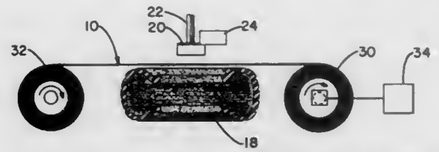
## APPARATUS FOR POSTCURE MARKING AND DECORATING TIRES

**Lynn A. Bryant, Canton; Joseph H. Tazewell, and Durward T. Roberts, Jr., both of Akron, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio**

**Filed Apr. 18, 1989, Ser. No. 339,835**

**Int. Cl.[5] B32B *31/00***

**U.S. Cl. 156—540** **18 Claims**



1. Apparatus for imparting notable markings on a cured tire, comprising:

a laminate having a carrier sheet which receives a transfer layer thereon, said transfer layer comprising a thermoplastic elastomer material selected from the group of rubber and polymer, hydrogenated styrene-butadiene-styrene block copolymers, hydrogenated styrene-isoprene-styrene block copolymers, silicones, butyl, brombutyl, chlorobutyl, and urethanes; and

a die operative for engaging said carrier sheet and urging said transfer layer into contacting engagement with the cured tire.

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**5,047,111**

## METHOD OF FORMING A METAL SILICIDE FILM

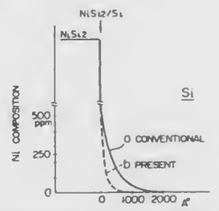
**Akitoshi Ishizaka, Kokubunji; Yasuhiro Shiraki, Hino, and Takashi Ohshima, Kokubunji, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan**

**Continuation of Ser. No. 838,714, Mar. 12, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 110,580**

**Claims priority, application Japan, Mar. 16, 1985, 60-51603; Nov. 9, 1985, 60-249961**

**Int. Cl.[5] C30B *1/10***

**U.S. Cl. 156—603** **8 Claims**



1. A method of forming a nickel silicide film comprising the steps of:

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forming a multi-layered laminate structure comprising a nickel film layer and a silicon film layer which layers are alternately and separately formed on a single crystal silicon substrate, the forming temperature of said nickel film layer and that of said silicon film layer being in a range of 25° C. to 200° C., a thickness of each of said film layers being in the range of 30 to 300 Å, an overall atomic number ratio of said silicon to said nickel being in the range of 1.8 to 2.0; and

heating said multi-layered laminate structure so that alternate silicon film layers and nickel film layers in said multi-layered laminate structure change into monocrystalline nickel silicide, the heating temperature of said multi-layered laminate structure being in the range of 350 to 750° C.; and said monocrystalline nickel silicide being formed on said silicon substrate without intrusion of nickel silicide into said silicon substrate.

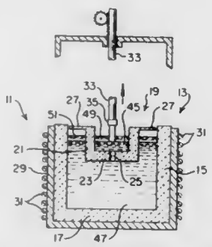
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**5,047,112**

## METHOD FOR PREPARING HOMOGENEOUS SINGLE CRYSTAL TERNARY III-V ALLOYS

**Theodore F. Ciszek, Evergreen, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Aug. 14, 1990, Ser. No. 566,930**
**Int. Cl.[5] C30B** *29/00*
**U.S. Cl. 156—607** **16 Claims**



1. A method for producing homogeneous, single-crystal ternary III-V alloys, comprising:

a) providing a first low-contamination risk crucible for holding a first supply of ternary III-V molten alloy, and a smaller low contamination risk second crucible for holding a relatively smaller quantity of ternary III-V molten alloy; said smaller crucible being adapted for floating placement within said first crucible on said molten alloy and having a bottom wall with a channel of predetermined size to allow flow of molten alloy from said first crucible therethrough;

b) placing in said first crucible a homogeneous quantity of ternary III-V molten alloy having a composition equal to a composition of the crystal to be produced;

c) placing in said smaller crucible a quantity of molten ternary III-V alloy of a homogenous pseudo-binary liquidus composition differing from the composition of the crystal to be produced, and which will solidify into the composition of the crystal to be produced, and floating said smaller crucible on the molten contents of said first crucible;

d) maintaining the contents of said smaller crucible at a predetermined temperature differential lower than the temperature of the contents of said first crucible; and

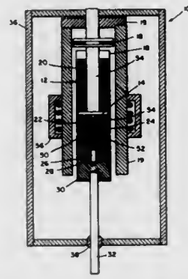
e) drawing out of said smaller crucible a single crystal of a desired homogeneous composition, while melt from said first crucible flows into said channel of said smaller crucible at a rate that corresponds to a rate of growth of said crystal.

**5,047,113**

## METHOD FOR DIRECTIONAL SOLIDIFICATION OF SINGLE CRYSTALS

**Aleksandar Ostrogorsky, 560 Riverside Dr., Apt. #16C, New York, N.Y. 10027**

**Filed Aug. 23, 1989, Ser. No. 397,741**
**Int. Cl.[5] C30B** *11/02*
**U.S. Cl. 156—616.1** **38 Claims**



1. A method for crystal growth by directional solidification comprising:

providing a melt having a chemical composition of a desired single crystal in a container;

heating said material with an axial heat flow source submerged within said melt;

further providing a heat-sink for removal of heat as said single crystal grows; and

mechanically displacing said axial heat flow source with respect to said material to cause said crystal to grow.

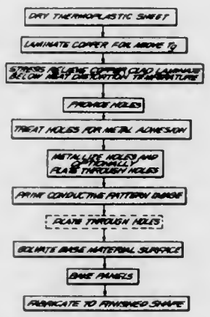
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**5,047,114**

## PROCESS FOR THE PRODUCTION OF METAL CLAD THERMOPLASTIC BASE MATERIALS AND PRINTED CIRCUITS ON THERMOPLASTIC BASE MATERIALS

**David C. Frisch, Baldwin, and Wilhelm Weber, Hicksville, both of N.Y., assignors to AMP-AKZO Corporation, Newark, Del.**

**Continuation of Ser. No. 80,244, Jul. 27, 1987, abandoned, which is a continuation of Ser. No. 703,942, Feb. 21, 1985, abandoned, which is a cootinuation-in-part of Ser. No. 667,884, Nov. 2, 1984, abandoned. This application Feb. 21, 1989, Ser. No. 314,250**
**Int. Cl.[5] B32B** *31/20, 31/26*
**U.S. Cl. 156—630** **6 Claims**




1. A process for the production of a metal clad thermoplastic polymer substrate comprising the steps of:

in a first step providing a thermoplastic polymer film or sheet having an absorbed volatiles content below about 0.1% by weight, said volatiles having boiling below about 245° C., by heating sad film or sheet between 100 and 165° C. for at least 30 minutes;

providing a copper metal foil or sheet, the thermoplastic film or sheet having a thickness below about 0.7 mm and the ratio of the thickness of the metal foil to the thermoplastic film is 0.03 or below;

in a subsequent step superimposing said metal foil on said thermoplastic polymer film or sheet; and

consolidating the assembly so produced by applying pressure to the assembly, at a temperature between about 2° C. and about 45° C. above the glass transition temperature (Tg) of the thermoplastic polymer, for a time period sufficient to firmly laminate the metal foil or sheet to the thermoplastic polymer film or sheet forming a metal clad thermoplastic base which is flat and of substantially uniform thickness.



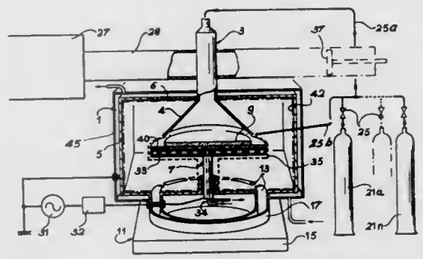
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**5,047,115**

## PROCESS FOR ETCHING BY GAS PLASMA

**Barbara Charlet, Meylan, and Louise Peccoud, Claix, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**PCT No. PCT/FR88/00272, § 371 Date Nov. 15, 1989, § 102(e) Date Nov. 15, 1989, PCT Pub. No. WO88/09830, PCT Pub. Date Dec. 15, 1988**
**PCT Filed May 31, 1988, Ser. No. 439,392**
**Claims priority, application France, Jun. 1, 1987, 87 07631**
**Int. Cl.[5] H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*
**U.S. Cl. 156—643** **13 Claims**



1. In a process for etching a substrate with the aid of a gas plasma produced either by ultra-high frequency waves, or by radio-frequency waves and ultra-high frequency waves, the improvement comprising that the gaseous medium used for forming the plasma comprises at least one non-carbon-containing fluorinating gas, at least one rare gas and at least one non-carbon-containing oxidizing gas.

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**5,047,116**

## METHOD FOR PRODUCING LIQUID TRANSFER ARTICLES

**Pierre Luthi, Mornex, France, and Christian Hidber, Thonex, Switzerland, assignors to Union Carbide Coatings Service Technology Corporation, Danbury, Conn.**

**Filed May 31, 1989, Ser. No. 359,166**
**Int. Cl.[5] B05D** *3/06, 5/00;* **B44C** *1/22*
**U.S. Cl. 156—643** **17 Claims**

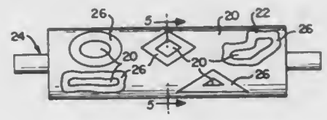
1. A method for producing a liquid transfer article for use in transferring a liquid to another surface comprising the steps of:

(a) coating an article with at least one layer of a coating material selected from the group consisting of refractory oxides and metallic carbides;

(b) patterning over the coated surface a removable mask material which is opaque to a laser beam comprising pulses of radiation of a selected energy level;

(c) directing said laser beam of uniform pulses of radiation with each pulse of radiation being from 0.0001 to 0.4 joule for a duration of 10 to 300 microseconds, onto the surface of the article so that the plurality of pulses of radiation produce in the area of the coated surface not covered by the mask material a pattern of uniform wells adapted for receiving liquid; and

(d) removing the mask material from the coated article.



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**5,047,117**

## METHOD OF FORMING A NARROW SELF-ALIGNED, ANNULAR OPENING IN A MASKING LAYER

**Martin C. Roberts, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**

**Filed Sep. 26, 1990, Ser. No. 588,639**
**Int. Cl.[5] H01L** *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
**U.S. Cl. 156—643** **22 Claims**



1. A process for creating an etch mask having an annular opening, said annular opening having a width that is less than the resolution limit of the employed photolithographic process, said process for creating comprising the following sequence of steps;

(a) creation of a mask island on substrate, said island perimeter defining the inner perimeter of the annular opening;

(b) blanket deposition of a spacer layer over the substrate and said island, the spacer layer being etchable with a significant degree of selectivity over said island, the spacer layer having a given thickness which substantially corresponds to a desired width of the annular opening;

(c) blanket deposition of a protective layer over the spacer layer, the protective layer and the spacer layer being distinctly etchable with respect to each other;

(d) planarization of the protective layer to a level at or below the top of the spacer layer to expose a portion of the spacer layer, the spacer layer at a distance from the island greater than said given thickness remaining covered by the protective layer; and

(e) etching the exposed spacer layer to create said annular opening in said etch mask, said annular opening having an inner perimeter self aligned to the island perimeter and having an outer perimeter self aligned to the remaining protective layer and covered spacer layer, said annular ring having said desired width, and said etching exposing the substrate adjacent to the annular ring, the exposed substrate equal to said desired width.

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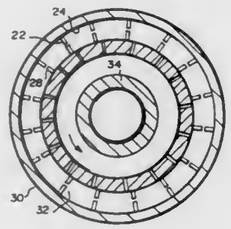


5,047,118

## METHOD FOR DECREASING ENERGY CONSUMPTION DURING REFINING OF FIBER MATERIAL AT A REDUCED GRINDING FREQUENCY WHILE MAINTAINING CAPACITY

Johan Gullichsen, Sjundea, Finland, assignor to Kamyr AB, Karlstad, Sweden

Continuation-in-part of Ser. No. 8,667, Jan. 30, 1987, abandoned, and Ser. No. 37,005, Apr. 10, 1987, Pat. No. 4,754,935. This application Jul. 6, 1987, Ser. No. 70,212
Int. Cl.[5] D21C *1/12*
U.S. Cl. 162—23 17 Claims




1. A method of refining cellulosic fibrous material utilizing juxtaposed relatively movable grinding surfaces defining a grinding zone between them, with a material inlet to the grinding zone and a material outlet from the grinding zone, comprising the steps of:

(a) grinding the material between the grinding surfaces so that the majority of power dissipation of the refiner takes place at a grinding frequency of about 200–2,000 Hz, and

(b) retaining the material within the grinding zone a retention time of at least about one second.

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5,047,119

## METHOD OF STABILIZING WHITE LIQUOR FLOW IN THE CAUSTICIZING OF GREEN LIQUOR FROM A KRAFT PAPER PLANT

Bimal K. Khandelwal, Pensacola, Fla., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 11, 1989, Ser. No. 406,278
Int. Cl.[5] D21C *11/04*
U.S. Cl. 162—30.11 3 Claims

1. In a method for causticizing a green liquor stream from a kraft paper plant by contacting said green liquor with lime to form white liquor and clarifying said white liquor by removal of lime mud in a clarifier, the improvement which comprises removing the lime mud from said clarifier at a set point flow rate based on the green liquor flow rate of the paper plant; measuring fluctuations in the amount of sodium carbonate in the green liquor and fluctuations in the amount of calcium hydroxide in the lime feed; adjusting the lime mud flow rate by up to ∓10% from the set point in accordance with the amount of sodium carbonate in the green liquor and the amount of calcium hydroxide in the lime feed for achieving a substantially uniform lime mud density, whereby variations in the operation of the clarifier and variations in the lime mud flow rate both are controlled.

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5,047,120

## METHOD FOR MANUFACTURE OF LIGHTWEIGHT FROTHED MINERAL WOOL PANEL

David G. Izard, Wauconda, and Mark H. Englert, Buffalo Grove, both of Ill., assignors to USG Interiors, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 218,415, Jul. 11, 1988, abandoned. This application May 11, 1989, Ser. No. 352,324
Int. Cl.[5] D21H *3/00*
U.S. Cl. 162—101 11 Claims

1. A method of manufacturing a lightweight structural mineral panel on a moving foraminous support wire comprising:

A. Forming a dilute fiber furnish in water of mineral fiber and organic resin latex binder;

B. Mixing said furnish and a small amount of cationic amine-based surfactant frothing aid that contains at least one long chain aliphatic radical of $C_8$–$C_{22}$ carbon atoms effective to form a transitory froth of air bubbles;

C. Depositing the froth on a water flooded section of the support wire;

D. After a brief interval of time sufficient for the froth to mature into a mass of bubbles of about 1/64–1/16 inch diameter, applying a vacuum pressure differential to the froth equivalent to from about 4 to about 20 inches of mercury to burst the bubbles and strip water from the wet mass;

E. Stripping additional water from the wet mass by applying a pressure differential to the wet mass equivalent to about 5–20 inches of water; and

F. Drying the wet mass by passing air through the wet mass at a rate of about 50–350 cubic feet per minute per square foot of the surface of the mass at which the air is directed.

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5,047,121

## HIGH GRADE POLYETHYLENE PAPER

Gurvinder P. S. Kochar, Midlothian, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 20, 1990, Ser. No. 585,448
Int. Cl.[5] D21H *13/14*
U.S. Cl. 162—146 11 Claims

1. A process for preparing a synthetic paper containing at least 97% polyethylene, on conventional continuous wet-lay, paper-making equipment, comprising the steps of:

(a) preparing a pulp furnish comprising:

(i) 97–99.5% polyethylene fibrids having an average length of between 0.7 to 1.0 mm, a defect level of between 0 to 6%, a birefrigence of at least 0.030 and a coarseness of between 0.15 to 0.222 mg/m; and

(ii) 0.5–3.0% polyvinyl alcohol fibers;

(b) depositing the furnish on the screen of a paper-making machine to form a waterleaf sheet;

(c) drying the resulting waterleaf sheet on heated drying cans wherein the drying cans have a drying profile such that an initial drying phase is provided at a temperature of between 200° to 270° F. to melt the polyvinyl alcohol fibers and a second drying phase is provided at a temperature between 190° to 240° F. to control stretch and elongation of the fibers; and

(d) thermally bonding the dried fibers at a temperature between 250°–315° F. to provide a Frazier porosity of at least 4 ft3/min./ft2.

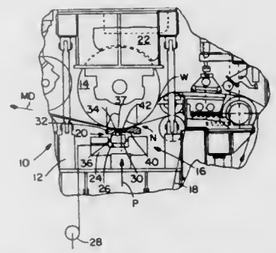


5,047,122

## METHOD FOR HEATED EXTENDED NIP PRESSING

Jere W. Crouse; Jeffrey H. Pulkowski, and Roy J. Porter, all of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 370,933, Jun. 23, 1989, Pat. No. 4,973,384. This application Sep. 7, 1990, Ser. No. 579,745
The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.
Int. Cl.[5] D21F *3/06*
U.S. Cl. 162—206 1 Claim




1. In a heated extended nip press apparatus, a method for pressing water from a formed web, the method comprising the steps of:

rotatably supporting a backing roll relative to a press frame;

heating the backing roll by means of a heater disposed closely adjacent to the backing roll;

moving a press means connected to the press frame relative to the backing roll, the press means cooperating with the backing roll for defining therebetween an extended nip for the passage therethrough of the web;

extending an endless looped blanket through the extended nip such that the web is disposed between the blanket and the backing roll;

applying a pressure to the press means for moving the press means relative to the backing roll;

selectively changing pressures applied to the blanket along a machine direction;

connecting a bore defined by a press member to a source of hydraulic pressure;

moving a piston sealingly and slidably cooperating with the bore such that when the bore is selectively connected to the source of hydraulic pressure, the piston moves relative to the backing roll; and

connecting the piston with a shoe such that the shoe slidably cooperates with the blanket, the shoe being a hydrodynamic shoe which is pivotally connected to the piston, the shoe defining a plurality of cross-machine directional recesses, the recesses selectively cooperating with the piston so that the shoe is permitted to pivot about the piston and so that the shoe is structured and arranged to be selectively positioned in a machine direction relative to the piston by means of the recesses to optimize the web properties and to inhibit delamination of the pressed web.

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5,047,123

## APPARATUS FOR CLARIFYING LIQUIDS

Kostas S. Arvanitakis, Orland Park, Ill., assignor to Hydro-Tek, Inc., Mokena, Ill.

Filed Jun. 9, 1989, Ser. No. 364,330
Int. Cl.[5] B01D *1/00, 3/00*
U.S. Cl. 202—170 14 Claims

1. A liquid clarification system comprising:

a still including a cylindrical tank having end walls at opposite ends thereof, said tank having an inlet through which unclarified liquid having suspended solids is introduced,

means for heating said tank to a temperature in excess of the boiling temperature of the introduced liquid for vaporizing the liquid while leaving said solids within the tank,

condensing means for receiving vapors from liquid from within the tank and for condensing said vapors to liquid form,

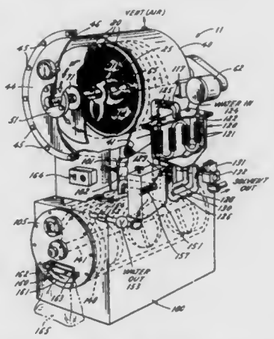
helical blade means operable upon rotation in one rotary direction for moving the contents within the tank in one axial direction and forcing the contents against an end wall at one end,

said helical blade means being operable upon rotation in an opposite rotary direction for moving the contents within the tank in an opposite axial direction and forcing said contents against an end wall at the other end of said tank,

means for alternately rotating said helical blade means in said one direction for moving the contents in said tank in said one axial direction and forcing said contents against the end wall at said one end and then rotating said helical blade means in an opposite rotary direction for moving the contents within the tank in the opposite axial direction and forcing the contents against the end wall at the other end of the tank for enhancing heating and vaporization of the liquid and drying and mixing of the remaining solids,

said heating means including a steam jacket about an outer cylindrical surface of said tank, and means for supplying low-pressure and temperature steam to said steam jacket when the liquid content within the tank exceeds a predetermined level, and means for supplying higher pressure and temperature steam to said steam jacket when the liquid content within said tank is reduced below said predetermined level.

3. A liquid clarification system comprising:



a still including a cylindrical tank having end walls at opposite ends thereof, said tank having an inlet through which unclarified liquids in the form of solvent and water having suspended solids is introduced,

means for heating said tank to a temperature in excess of the boiling temperatures of the introduced liquids for vaporizing a substantial portion of the liquids while leaving said solids within the tank,

condensing means located outside said tank for receiving vapors from liquids within the tank and for condensing said vapors to liquid form,

means for receiving condensed liquids from said condensing means and for separating condensed water from condensed liquid solvent,

helical blade means operable upon rotation in one rotary direction for moving the contents within the tank in one axial direction and forcing the contents against an end wall at one end of said tank,

said helical blade means being operable upon rotation in an opposite rotary direction for moving the contents within the tank in an opposite axial direction and forcing said contents against an end wall at the other end of said tank,

means for alternately rotating said helical blade means in said one direction for moving the contents in said tank in said one axial direction and forcing said contents against

the end wall at said one end and then rotating said helical blade means in an opposite rotary direction for moving the contents within the tank in the opposite axial direction and forcing the contents against the end wall at the other end of the tank for enhancing heating and vaporization of the liquid and drying and mixing of the remaining solids, and means for directing water from said separating means into said tank after said substantial portion of liquids have been vaporized and removed from the tank for creating steam within the tank to enhance further vaporization and removal of solvent remaining in the solids with in the tank.

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**5,047,124**

## APPARATUS FOR FEEDING GAS INTO A SALINE SOLUTION

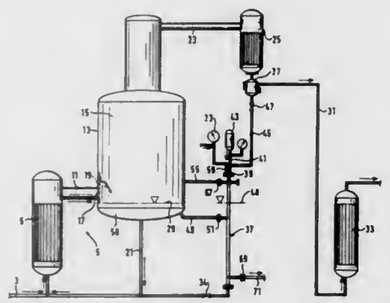
**Karlheinz Haberland, Bruchsal, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany**

**Filed Jul. 26, 1989, Ser. No. 385,107**

**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 3825856**

**Int. Cl.[5] B01D** *1/00, 3/42*

**U.S. Cl. 202—181** **3 Claims**



1. Apparatus for feeding gas in a natural circulation distillation assembly wherein a circulating concentrated saline solution having a predetermined heat content and a distillate are formed, the apparatus comprising:

an enclosure defining an interior;

a gas supply means;

a bubbling-in gas pipe disposed in said enclosure and being connected to said gas supply means for receiving gas therein;

a distillate supply vessel for receiving the distillate from the distillation assembly;

said bubbling-in gas pipe being further connected to said distillate supply vessel for receiving a flow of distillate therein;

conduit means interconnecting said enclosure and said distillation assembly for passing a portion of the concentrated saline solution into said interior of said enclosure thereby transferring the heat of said portion to the gas and distillate in said gas pipe and causing the gas in the gas pipe to become saturated with said distillate; and,

said bubbling-in gas pipe having an opening and being mounted in said enclosure so as to extend down into said portion of said concentrated saline solution for bubbling the saturated gas through said opening and into said portion whereby a formation of crystals at said opening is prevented because of the saturated condition of the gas.

3. Apparatus for feeding gas in a natural circulation distillation assembly wherein a circulating concentrated saline solution having a predetermined heat content and a distillate are formed, the distillation assembly including a vessel defining a vapor chamber for receiving the vapor evaporated from the saline solution supplied to the distillation assemlby, the apparatus comprising:

an enclosure defining an interior and communicating with the distillation assembly for receiving a portion of the concentrated saline solution;

an air supply means;

a bubbling-in air pipe connected to said air supply means for receiving air therein;

a distillate supply vessel for receiving the distillate from the distillation assembly;

said bubbling-in air pipe being also connected to said distillate supply vessel for receiving a flow of distillate therein so as to permit moisture to be transferred from the distillate to the air travelling in said air pipe;

said bubbling-in air pipe being mounted in said measuring housing so as to extend down into said portion of said concentrated saline solution for bubbling air into said portion and for transferring heat from said portion to the air and the distillate flowing in the air pipe; and,

means for connecting said enclosure to the vapor chamber so as to cause a liquid level of said portion of the concentrated saline solution in said enclosure to define a first region of said interior above said level wherein the air and distillate flowing in said pipe are heated by the vapor from said vapor chamber and to define a second region of said interior below said level wherein the air and distillate flowing in said pipe are further heated by said portion of said concentrated saline solution.

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**5,047,125**

## FRACTIONATING COLUMN CONTROL APPARATUS AND METHODS

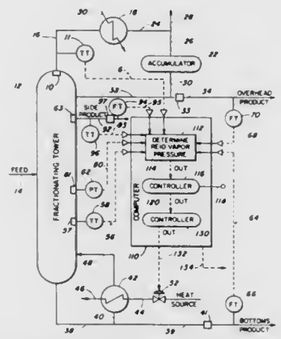
**Patricia A. Meier; W. Jeff Meier, botb of Ponca City, Okla., and Brent J. Woodland, Billings, Mont., assignors to Conoco Inc., Ponca City, Okla.**

**Continuation-in-part of Ser. No. 155,787, Feb. 16, 1988, Pat. No. 4,889,660. This application Aug. 25, 1989, Ser. No. 397,201**

**The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.**

**Int. Cl.[5] B01D** *3/14, 3/42*

**U.S. Cl. 203—2** **7 Claims**



1. A method of separating different products from a multicomponent hydrocarbon stream whereby said stream is fed into a fractionating column, heat is provided to said column and said stream is fractionated into an overhead product stream and a bottoms product stream, wherein the improvement comprises controlling the Reid Vapor Pressure and quality of said overhead product stream comprising:

establishing a first signal representative of the temperature of said overhead product stream;

establishing a second signal representative of the vapor pressure of said overhead product stream;



establishing a third signal representative of the rate of flow of said overhead product stream;

establishing a fourth signal representative of the rate of flow of said bottoms product stream;

establishing a fifth signal representative of the actual Reid Vapor Pressure of said overhead product stream in response to said first, second, third and fourth signals without an analysis of said overhead product stream based on the following relationships:

Reid Vapor Pressure $= A + B\,(X^E - C(Y)) + D/Z$ wherein:

X equals the temperature of said overhead product stream as represented by said first signal;

Y equals the vapor pressure of said overhead product stream as represented by said second signal;

Z equals the rate of flow of said bottoms product stream as represented by said fourth signal divided by the rate of flow of said overhead product stream as represented by said third signal; and

A, B, C, D and E are equal fitted constants;

establishing a sixth signal representative of the desired Reid Vapor Pressure of said overhead product stream;

comparing said fifth signal and said sixth signal and establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

adjusting the amount of heat provided to said fractionating column in response to said seventh signal to maintain the actual Reid Vapor Pressure of said overhead product stream substantially equal to the desired Reid Vapor Pressure of said overhead product stream.

3. Apparatus for separating a mixture of hydrocarbons into discrete products, comprising:

a fractionating column;

means for providing heat to said fractionating column;

means for feeding a stream of said mixture of hydrocarbons to said fractionating column whereby said stream is fractionated into an overhead product stream and a bottoms product stream; and

means for controlling the Reid Vapor Pressure of said overhead product stream, including:

means for establishing a first signal representative of the actual temperature of said overhead product stream;

means for establishing a second signal representative of the actual vapor pressure of said overhead product stream;

means for establishing a third signal representative of the actual rate of flow of said overhead product stream;

means for establishing a fourth signal representative of the actual rate of flow of said bottoms product stream;

means for establishing a fifth signal representative of the actual Reid Vapor Pressure of said overhead product stream in response to said first, second, third and fourth signals without an analysis of said overhead product stream based on the following relationships:

Reid Vapor Pressure $= A + B\,(X^E - C(Y)) + D/Z$ wherein:

X equals the temperature of said overhead product stream as represented by said first signal;

Y equals the vapor pressure of said overhead product stream as represented by said second signal;

Z equals the rate of flow of said bottoms product stream as represented by said fourth signal divided by the rate of flow of said overhead product stream as represented by said third signal; and

A, B, C, D and E are equal fitted constants;

means for establishing a sixth signal representative of the desired Reid Vapor Pressure of said overhead product stream;

means for comparing said fifth signal and said sixth signal and for establishing a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

means responsive to said seventh signal for varying the rate at which heat is provided to said fractionating column to maintain said actual Reid Vapor Pressure of said overhead product stream substantially equal to said desired Reid Vapor Pressure of said overhead product stream.

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**5,047,126**

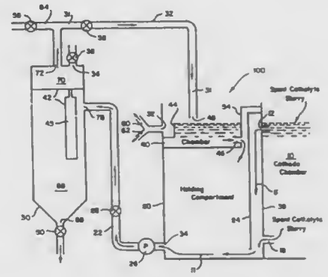
## METHOD FOR RECOVERING METAL FROM WASTE STREAM

**Bernard Greenberg, 269 Clinton Ave., Brooklyn, N.Y. 11205**

**Division of Ser. No. 340,604, Apr. 19, 1989, Pat. No. 4,948,489. This application May 23, 1990, Ser. No. 530,933**

**Int. Cl.[5] C02F** *1/461, 1/62*

**U.S. Cl. 204—151** **9 Claims**



1. A method for recovering metal from a waste stream to render the waste stream suitable for discharge comprising the steps of:

passing a waste stream comprised of heavy metal salts in dilute solution into a cathode chamber of an anion exchange membrane delineated electrolytic cell, wherein said metals are selected from the group having a standard reduction potential more negative than that of hydrogen in the electromotive force series and the heavy metal ion concentration of said solution is less than about 10,000 parts per million of dissolved material;

subjecting said waste stream to high current density electrolysis at up to about 25 volts to enhance the controlled regular formation of a noncompressible metal hydrous oxide crystalline precipitate in said cathode chamber;

separating said precipitate from said waste stream; and

splitting the clarified liquid waste stream so that a portion of the clarified liquid waste stream is discharged and a portion is returned downstream for commingling with the metal ion-containing waste stream for further treatment.

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**5,047,127**

## OZONE GENERATING METHOD

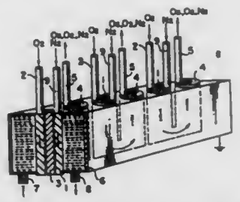
**Isao Tottori; Masazumi Matsuura, and Atsuhiro Fujii, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed Jul. 31, 1990, Ser. No. 560,878**

**Claims priority, application Japan, Nov. 15, 1989, 1-294926**

**Int. Cl.[5] C01B** *13/10*

**U.S. Cl. 204—176** **2 Claims**



1. A method of increasing the quantity of ozone generated by a silent discharge in high purity oxygen comprising:

mixing nitrogen with oxygen having a purity exceeding 99.95% in a ratio of nitrogen to oxygen in a range from 0.0002 to 0.02;

introducing the mixture of nitrogen and oxygen into an ozone generating apparatus; and

producing a silent discharge in the mixture to generate ozone whereby the quantity of ozone generated is increased over the quantity generated when the ratio of nitrogen to high purity oxygen in the mixture is less than 0.0002 or greater than 0.02.

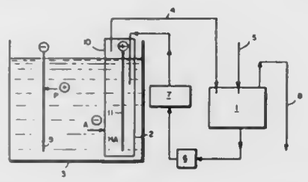
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**5,047,128**

## ELECTRODIALYSIS CELL FOR REMOVAL OF EXCESS ELECTROLYTES FORMED DURING ELECTRODEPOSITION OF PHOTORESISTS COATINGS

**Robert E. Hawkins, Northboro, and Richard L. Harrison, Milford, both of Mass., assignors to Shipley Company Inc., Newton, Mass.**

**Filed Jan. 2, 1990, Ser. No. 459,535**
**Int. Cl.[5] B01K *5/02*; B01D *13/02***
**U.S. Cl. 204—180.8** **22 Claims**



1. A method for controlling build-up of excess electrolyte in an electrodeposition bath containing a photoresist formulation while electrodepositing said photoresist on a substrate, said method comprising the steps of providing an electrodialysis cell within said bath to remove excess electrolyte; continuously circulating said electrolyte from said electrodialysis cell through an external tank containing electrolyte, through an in-line conductivity probe external to said bath, and back to said electrodialysis cell; and mixing said electrolyte with water in said external tank as necessary to lower conductivity in response to the reading from said in-line conductivity probe.

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**5,047,129**

## UNIT FOR THE TREATMENT OF ELECTROPHORETIC STRIPS

**Pietro Nardo, Viale Buffoli, 21, 20095 Cusano Milanino (Milano), Italy**

**Filed Jan. 2, 1990, Ser. No. 459,689**
**Claims priority, application Italy, Jan. 16, 1989, 19099 A/89**
**Int. Cl.[5] G01N *27/26***
**U.S. Cl. 204—182.8** **19 Claims**

1. A unit for the treatment of electrophoretic strips mounted on a frame characterized in that it comprises, in combination:

at least one pair of basins for receiving said frames; and,

a feed, forced circulation and emptying circuit comprising:

as many treatment liquid tanks as there are different treatment liquids;

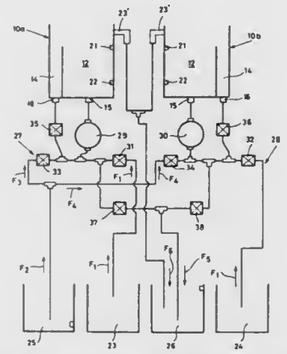
a single rinsing tank containing a rinsing liquid;

a single discharge tank for discharging the treatment liquids; and,

at least one pair of pumps, each of said pumps being connected to an associated one of said basins, each of said pumps also being connected by an associated treatment draw line to one of said treatment liquid tanks for drawing a treatment liquid from its tank into its associated basin, each of said pumps also being connected by a rinse draw line to said single rinsing tank in order to alternatively draw the rinsing liquid into said basins;

a discharge line from each of said basins to said single discharge tank;

a solenoid valve provided on each of said liquid treatment lines, said rinse line, and said discharge line for permitting a forced circulation of the rinsing liquid in each basin, both basins also being connected for discharging the treatment liquids into the same discharge tank both



through an overflow conduit, and by means of said pumps along said discharge line controlled by solenoid valves.

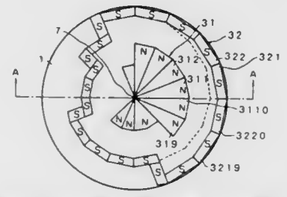
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**5,047,130**

## METHOD AND APPARATUS FOR MAGNETRON DISCHARGE TYPE SPUTTERING

**Yasuhiko Akao, and Takehiro Sakurai, both of Fuchi, Japan, assignors to Anelva Corporation, Tokyo, Japan**

**Filed Oct. 11, 1989, Ser. No. 420,043**
**Claims priority, application Japan, Oct. 17, 1988, 63-260991**
**Int. Cl.[5] C23C *14/35***
**U.S. Cl. 204—192.12** **19 Claims**



13. A method for sputtering a flat circular target using plasma generated by a magnetron discharge type cathode, comprising;

applying a magnetic field to said flat circular target by magnetic poles disposed in back of said flat circular target,

rotating the magnetic field provided on the front surface of said flat circular target by said magnetic field application, and

arranging said magnetic poles and the strength of said magnetic field such that, when said magnetic field is rotated, there are n plasma groups on a j-th circle of a radius $r_j$ from the center of rotation of the rotating magnetic field and m plasma groups on the $j+1$ th circle of a radius $r_{j+1}$ from the center of rotation of the rotating magnetic field, and an erosion rate $D_{rj}$(Å/min) of various parts of said flat circular target on the j-th circle of radius $r_j$ and that said target erodes at an erosion rate $D_{rj+1}$ (Å/min) for parts of said flat circular target on the $j+1$ th circle of radius $r_{j+1}$ in accordance with the equations, respectively:

$$D_{rj} = \sum_{i=1}^{n} \frac{R_{rji}\theta_{rji}}{2\pi} = \frac{1}{2\pi} \sum_{i=1}^{n} \frac{R_{rji}L_{rji}}{r_j}$$

and



-continued

$$D_{rj+1} = \sum_{k=1}^{m} \frac{R_{rj+1k}\theta_{rj+1k}}{2\pi} = \frac{1}{2\pi} \sum_{k=1}^{m} R_{rj+1k} \frac{L_{rj+1k}}{r_{j+1}}$$

where i, j, and k are each positive integers,

where $R_{rji}$ and $R_{rj+1k}$ (Å/min) are the erosion rates under a stationary magnetic field provided by the i-th plasma group that is found on the j-th circle of the radius $r_j$, and that provided by the k th plasma group that is found on the $j+1$ th circle of the radius $r_{j+1}$, respectively, and which erosion rates increase according to the increase of magnetic field strength, and

where $\theta_{rji}$ and $\theta_{rj+1k}$ are the ratio of the arc length $L_{rji}$ of the i-th plasma to distance $r_j$ from the center of rotation, and the ratio of the arc length $L_{rj+1k}$ of the i-th plasma to a distance $r_{j+1}$ from the center of rotation, respectively, and

wherein $D_{rj} > D_{rj+1}$ where the radius $r_j$ of the j-th circle is larger than the radius $r_{j+1}$ of the $j+1$-th circle ($r_j > r_{j+1}$).

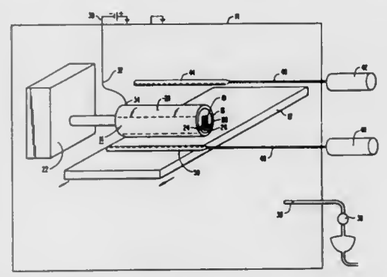
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**5,047,131**

## METHOD FOR COATING SUBSTRATES WITH SILICON BASED COMPOUNDS

**Jesse D. Wolfe, San Ramon; Carolynn Boehmler, Vacaville, both of Calif., and James J. Hofmann, Northfield, Minn., assignors to The BOC Group, Inc., Murray Hill, N.J.**

**Filed Nov. 8, 1989, Ser. No. 433,690**
**Int. Cl.[5] C23C *14/14***
**U.S. Cl. 204—192.23** **13 Claims**



1. A method of depositing a thin film of silicon based compound on a substrate within an evacuated chamber, said method comprising the steps of:

(a) providing an elongated, cylindrical tubular member carrying a silicon sputtering material on an outer surface thereof;

(b) establishing within said tubular member a magnetic field to provide an erosion zone on the sputtering material extending substantially the entire length of the tubular member and circumferentially along a relatively narrow region thereof;

(c) causing a reactive gas to flow into said vacuum chamber;

(d) causing an inert gas to flow into said vacuum chamber;

(e) rotating said tubular member about its longitudinal axis to bring different portions of the sputtering material into sputtering position opposite the magnetic field;

(f) applying d.c. potential to the cylindrical member to cause sputtering; and

(g) positioning said substrate opposite said erosion zone, whereby a thin film of a silicon based compound is deposited on the substrate.

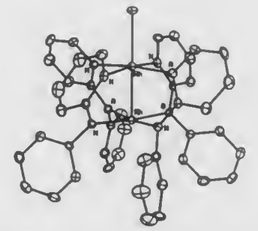
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**5,047,132**

## APPARATUS FOR CATALYTICALLY REDUCING DIOXYGEN USING DIRHODIUM COMPLEXES

**John L. Bear, and Chao-Liang Yao, both of Houston, Tex., assignors to University of Houston, Houston, Tex.**

**Division of Ser. No. 258,849, Oct. 17, 1988, Pat. No. 4,909,911.**
**This application Feb. 20, 1990, Ser. No. 482,253**
**Int. Cl.[5] C25B *11/08***
**U.S. Cl. 204—242** **2 Claims**



1. An apparatus for reducing oxygen in solution comprising an electrode containing a dirhodium complex of the formula $Rh_2(L)_4$ wherein L is a ligand containing 2 donor atoms selected from the group consisting of N, S, P and O provided that not more than one of the donor atoms in each ligand is O and means for applying an electric potential.

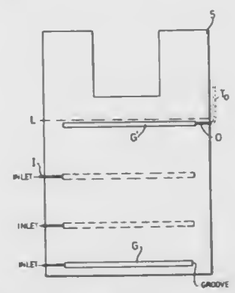
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**5,047,133**

## GAS ELECTRODE ASSEMBLY FOR USE IN ELECTROCHEMICAL CELLS AND METHOD

**Robert J. Allen, Saugus, Mass., assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation of Ser. No. 315,936, Feb. 27, 1989, abandoned.**
**This application Jun. 28, 1990, Ser. No. 545,761**
**Int. Cl.[5] C25B *11/02*; C25C *7/00***
**U.S. Cl. 204—258** **13 Claims**



1. A gas-diffusion electrode assembly for use in an aqueous electrolyte solution, comprising:

an electronically conductive support formed from a solid metal with a generally rectangular flat continuous surface and edges bounding said surface, said support being formed with:

a generally rectilinear narrow supply groove extending along and close to one of said edges and opening at said surface,

a supply passage opening through another of said edges into one end of said supply groove,

a generally rectilinear narrow discharge groove extending along and close to an edge of said support opposite said one of said edges and opening at said surface, and

an outlet opening at an edge of said support and communi-

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cating with one end of said discharge groove for discharging gas entering said discharge groove,

said supply and discharge grooves having open areas at said surface collectively constituting a small fraction of a continuous area of said surface between said grooves, said grooves being each of a constant width which is substantially less than a spacing between grooves of said support;

an electrocatalytic gas-carrying and gas-diffusing electronically conductive sheet juxtaposed with said surface and substantially coextensive therewith;

an electrically conductive adhesive bonding said sheet to said surface over substantially all of said continuous area and between and around said grooves so that said supply groove opens into and communicates directly with said electrocatalytic gas-carrying electronically conductive sheet and said discharge groove receives gas to be discharged therefrom;

means for introducing a gas into said supply passage and said supply groove for diffusion through said sheet in a plane thereof parallel to said surface substantially throughout said web, a gas-confining coating of an aqueous polymeric hydrogel membrane on a surface of said electrocatalytic gas-carrying electronically conductive sheet opposite that bonded to said support by said electrically conductive adhesive,

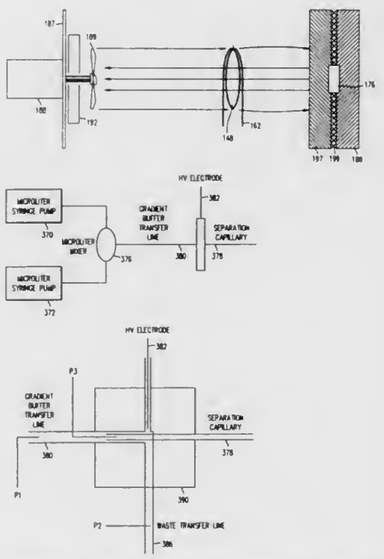
said sheet having a thickness of substantially 1 mm to 3 mm,

said membrane having a thickness of the order of that of said sheet, said adhesive is a layer thinner than said sheet,

said support having a thickness of substantially 0.3 cm, and

said grooves collectively having areas opening at said surface of said support of between 0.1 and 1.0 percent of an area of said surface of said support.

means for controlling a temperature of the separation capillary by observing the electrical resistance of the separation capillary as a result of the voltage provided by the voltage source.




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**5,047,134**

**BUFFER GRADIENT AND TEMPERATURE GRADIENT CAPILLARY ELECTROPHORESIS**

Scot R. Weinberger, Reno, Nev., and Ernst Gassmann, Hoffstetten, Switzerland, assignors to Linear Instruments, Reno, Nev.

Filed Jan. 25, 1990, Ser. No. 470,019
Int. Cl.[5] G01N *27/26;* B01D *57/02*
U.S. Cl. 204—299 R 2 Claims

1. A gradient electrophoresis apparatus comprising:

a first reservoir for holding a first liquid;

a second reservoir for holding a second liquid;

a mixer connected to the first and second reservoirs for mixing the first and second liquids;

a bifurcated separation capillary electrically connected to a voltage source and connected to the mixer for separating into two portions the mixed first and second liquids under the influence of an electric field generated in the capillary by the voltage source; and

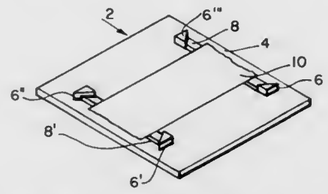
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**5,047,135**

**ELECTROPHORESIS APPARATUS**

Erik Nieman, 201 Monticchio, 251 Jacob Mare Street, Pretoria, South Africa

Filed Mar. 22, 1989, Ser. No. 327,269
Claims priority, application South Africa, Mar. 22, 1988, 88/2019
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—299 R 52 Claims




1. A multi-gel slab gel for use in gel electrophoresis comprising a plurality of wafer-like layers of gel, said layers having thicknesses in the range of about 0.1 to 8 mm and being separated by one more divider webs.



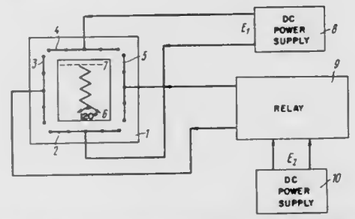
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**5,047,136**

**APPARATUS FOR ELECTROPHORETIC SEPARATION OF HIGH-MOLECULAR DNAS IN A GEL**

David R. Beritashvili, ulitsa D. Ulyanova, 4, korpus 1, kv. 33; Lev V. Karklit, ulitsa Bolotnikovskaya, 38, korpus 5, kv. 2, and Evgeny N. Tverdokhlebov, ulitsa Dnepropetrovskaya, 31, kv. 207, all of Moscow, U.S.S.R.

PCT No. PCT/SU88/00241, § 371 Date Oct. 2, 1989, § 102(e) Date Oct. 2, 1989, PCT Pub. No. WO89/07261, PCT Pub. Date Aug. 10, 1989
PCT Filed Nov. 25, 1988, Ser. No. 423,453
Claims priority, application U.S.S.R., Feb. 2, 1988, 4365904
Int. Cl.[5] B65D *85/18, 75/00*
U.S. Cl. 204—299 R 2 Claims




1. An apparatus for electrophoretic separation of high molecular weight DNA in a gel, comprising a rectangular electrophoresis chamber having a gel unit therein positioned along the sides thereof, four identical groups of equidistant positioned electrodes, a main power supply, a supplemental power supply and a switch having one subtending pair of said electrode groups connected to the output of the switch, and the input of the switch connected to the output of the supplementary power supply, and the other subtending pair of said electrode groups connected to the output of the main power supply.

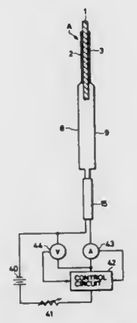
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**5,047,137**

**SOLID ELECTROLYTE AIR/FUEL RATIO SENSOR WITH VOLTAGE CONTROL**

Tetsusyo Yamada; Takao Kojima; Hiroyuki Ishiguro, and Yoshibide Kami, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Oct. 6, 1986, Ser. No. 915,839
Claims priority, application Japan, Oct. 5, 1985, 60-222059
Int. Cl.[5] G01N *27/26*
U.S. Cl. 204—425 7 Claims



1. A blackening-free air/fuel ratio sensor, comprising:

means for defining a closed space;

separating means, including at lest one aperture, for separating, except through said aperature, said closed space from an atmosphere to be measured;

an oxygen pump contained within said separating means adjacent said closed space, said pump comprising a pair of porous electrodes and a layer of oxygenion conductive solid electrolyte sandwiched therebetween;

means for sensing a level of oxygen in said closed space;

a power supply unit for feeding electrical power to said electrodes of said oxygen pump;

means for sensing a voltage, impressed on said oxygen pump by said power supply unit, as information predictive of blackening of said electrolyte; and

means for controlling said power supply unit, in response to said impressed voltage exceeding a predetermined voltage level, to avoid said blackening.

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**5,047,139**

**CATALYST FOR MID-BARREL HYDROCRACKING AND PROCESS USING SAME**

Frank P. Gortsema, Pleasantville; Regis J. Pellet, Croton on the Hudson; Albert R. Springer, Mt. Vernon, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation of Ser. No. 130,559, Dec. 8, 1987, abandoned. This application Dec. 20, 1989, Ser. No. 453,879
Int. Cl.[5] C10G *47/20*
U.S. Cl. 208—111 8 Claims

1. A hydrocracking process for the production of mid-distillate product from heavy feedstocks boiling above 700° F. comprising treating said heavy feedstock at hydrocracking reaction conditions and in the presence of a hydrocracking catalyst comprising a selectively extracted LZ-10 zeolite wherein the LZ-10 zeolite has been selectively extracted to increase its initial $SiO_2/Al_2O_3$ molar ratio of about 5.0 to a higher value within the range of 7.0 to 60.0.

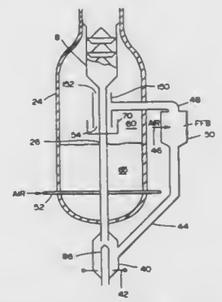
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**5,047,140**

**PROCESS AND APPARATUS FOR MULTI-STAGE REGENERATION OF CATALYST IN A BUBBLING BED CATALYST REGENERATOR AND SIDE MOUNTED FAST FLUIDIZED BED REGENERATOR**

Hartley Owen, Belle Mead, N.J., and Paul H. Schipper, Wilmington, Del., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Apr. 27, 1990, Ser. No. 515,943
Int. Cl.[5] C10G *11/00, 35/10;* B01J *20/34*
U.S. Cl. 208—113 7 Claims



1. A process for the fluidized catalytic cracking of a heavy feed to lighter more valuable products by mixing, in the base of a riser reactor, a heavy crackable feed with a source of hot regenerated catalytic cracking catalyst withdrawn from a catalyst regenerator, and cracking said feed in said riser reactor to produce catalytically cracked products and spent catalyst which are discharged from the top of the riser into a catalyst disengaging zone wherein cracked products are separated from spent catalyst, spent catalyst is discharged from said disengaging zone into a catalyst stripper contiguous with and beneath said disengaging zone and wherein said spent catalyst is contacted with a stripping gas to produce stripped catalyst,

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and said stripped catalyst is collected in a vertical standpipe beneath the stripping zone and then discharged from said standpipe into a catalyst regeneration zone contiguous with and beneath said stripping zone, and said regeneration zone comprises a single dense phase bubbling fluidized bed of catalyst to which an oxygen containing regeneration gas is added and from which hot regenerated catalyst is withdrawn and recycled to said riser reactor, characterized by:

discharging said stripped catalyst from said catalyst standpipe into a closed spent catalyst transfer vessel which is at least partially below said bubbling dense bed;

adding a fluidizing gas to said transfer vessel in an amount sufficient to fluidize the spent catalyst and transfer said spent catalyst via a transfer line into a coke combustor pod at an elevation above said transfer vessel and to a side of said regenerator vessel;

adding oxygen or an oxygen containing gas to said coke combustor vessel in an amount sufficient to provide a superficial vapor velocity which will maintain a majority of the catalyst therein in a state of turbulent or fast fluidization;

transferring catalyst and flue gas from said coke combustor into a transfer line connective with said dilute phase region within said regenerator vessel containing said bubbling fluidized bed; and

discharging and separating catalyst and flue gas from said transfer line in a disengaging means which directs separated catalyst from said transfer line down into said bubbling fluidized bed.

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**5,047,141**

**LARGER PORE MOLECULAR SIEVES OF CONTROLLED ACTIVITY**

**Pochen Chu, Voorhees, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.**

**Division of Ser. No. 257,607, Oct. 14, 1988, Pat. No. 4,912,073, which is a continuation-in-part of Ser. No. 179,592, Oct. 7, 1987, abandoned, which is a continuation of Ser. No. 829,677, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 631,430, Jul. 16, 1984, abandoned. This application Jan. 16, 1990, Ser. No. 465,840**

**Int. Cl.[5] C10G *1/00***

**U.S. Cl. 208—120** **17 Claims**

1. A process for effecting catalytic conversion of an organic charge which comprises contacting said charge under catalytic conversion conditions with a catalyst comprising a catalytically effective amount of the product produced by contacting a high silica content molecular sieve selected from the group consisting of crystalline zeolite, pillared clay and silicoaluminophosphate, characterized by a Constraint Index of less than about 2.5 and containing from about 0.1 wt. % to about 2.5 wt. % framework boron, with an aqueous solution of the salt of a metal selected from the group consisting of those of Groups IB, IIB, IVB and VIII of the Periodic Table of Elements, said contacting being under conditions effective to remove boron from said crystalline molecular sieve; and

converting said contacted crystalline molecular sieve to the hydrogen form.

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**5,047,142**

**CATALYST COMPOSITION AND METHOD FOR HYDROPROCESSING PETROLEUM FEEDSTOCKS**

**David E. Sherwood, Jr.; Burton H. Bartley; Laurence D. Neff, and Pei-Shing E. Dai, all of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Filed May 13, 1988, Ser. No. 194,379**

**The portion of the term of this patent subsequent to Jul. 17, 2007, has been disclaimed.**

**Int. Cl.[5] C10G *17/00, 45/00***

**U.S. Cl. 208—251 H** **10 Claims**

1. A method for the hydroprocessing of a sulfur and metal-containing hydrocarbon feed which comprises contacting said feed with hydrogen and a catalyst in a manner such that the catalyst is maintained at isothermal conditions and is exposed to a uniform quality of feed, where said catalyst has a composition comprising 1.0–5.0 weight percent of an oxide of nickel or cobalt and 10.0–25.0 weight percent of an oxide of molybdenum, all supported on a porous alumina support in such a manner that the molybdenum gradient of the catalyst has a value of less than 6.0, 15–30% of the nickel or cobalt is in an acid extractable form, and said catalyst is further characterized by having a total surface area of 150–210 $m^2/g$, a total pore volume of 0.50–0.75 cc/g, and a pore size distribution such that pores having diameters of less than 100A constitute less than 25.0%, pores having diameters of 100–160A constitute 70.0–85.0% and pores having diameters of greater than 250A constitute 1.0–15.0% of the total pore volume of said catalyst.

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**5,047,143**

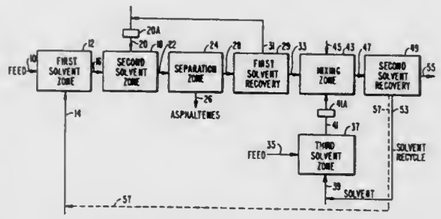
**METHOD FOR CONVERTING LOWER GRADE UINTAITE TO HIGHER GRADE MATERIALS**

**Robert M. Carlson, Irvine, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Continuation of Ser. No. 47,846, May 8, 1987, abandoned. This application Mar. 10, 1989, Ser. No. 323,034**

**Int. Cl.[5] C10G *1/04***

**U.S. Cl. 208—428** **9 Claims**




1. A method for upgrading uintaite to produce an upgraded uintaite product, comprising:

(a) dissolving uintaite feed in a medium polarity solvent to produce a first mixture;

(b) mixing said first mixture with a nonpolar saturated hydrocarbon solvent at a volume ratio of said first mixture to said nonpolar saturated hydrocarbon solvent to produce a second mixture comprising alight phase and a solid phase;

(c) separating said solid phase containing residual asphaltenes from said second mixture to produce a light phase product; and

(d) heating the light phase product of step (c) to recover said medium polarity solvent and said nonpolar saturated hydrocarbon solvent to produce an upgraded uintaite product having a lower meltpoint than the starting uintaite;

wherein the relative proportion of said medium polarity solvent containing dissolved uintaite feed and said nonpolar solvent in said second mixture of step (b) is selected so that the meltpoint of said upgraded uintaite product of step (d) is about 30° C. to about 170° F. lower than the meltpoint of the unitaite feed.



**5,047,144**

**PROCESS FOR THE SEPARATION OF MINERALS BY FLOTATION**

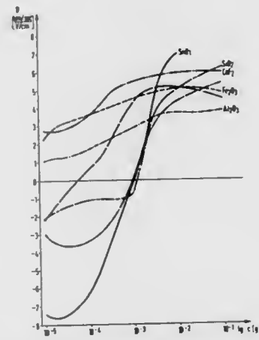
**Bohnslav Dobiaš, Regensburg; Horst Michaud, and Josef Seeholzer, both of Trostberg, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany**

**Continuation of Ser. No. 170,060, Mar. 15, 1988, abandoned, which is a continuation of Ser. No. 866,239, May 21, 1986, abandoned. This application Sep. 26, 1989, Ser. No. 412,596**

**Claims priority, application Fed. Rep. of Germany, May 22, 1985, 3518279; May 7, 1986, 3615385**

**Int. Cl.[5] B03D *1/14***

**U.S. Cl. 209—166** **15 Claims**



1. In a process for the separation of minerals by flotation, the improvement comprising performing the flotation in the presence of a selecting agent which is an activator and in the presence of a tenside, wherein:

the selecting agent is miscible with water, has a pH of from 2 to 6 in aqueous solution, and is a cation-act rive condensation product formed by the condensation of (a) an dicyandiamide, (b) a formaldehyde, and (c) one of an amine, ammonium salt and an acid;

and the inside is an anion-active tenside having a member of the group of alkyl sulphonates, alkyl sulphates, arylsulphones and alkylaryl sulphonates.

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**5,047,145**

**WET PROCESS FOR FLY ASH BENEFICIATION**

**Jiann-Yang Hwang, Houghton, Mich., assignor to Board of Control of Michigan Technological University, Houghton, Mich.**

**Filed May 24, 1990, Ser. No. 528,817**

**Int. Cl.[5] B03B *5/30, 9/04, 1/02***

**U.S. Cl. 209—166** **20 Claims**

1. A wet process for fly ash beneficiation comprising the steps of:

a) mixing a fly ash material having cenospheres with a dispersant and water to form a primary slurry from about 5 to about 35 percent by weight fly ash material;

b) allowing the primary slurry to settle and removing the cenospheres floating in the primary slurry for separating and collecting the cenospheres having a density below about 1.0 g/cc from the primary slurry to form a secondary slurry;

c) adding a constituent soluble in the water to form a water solution between 1.0 g/cc and about 1.6 g/cc and allowing particles of the fly ash material with a density between 1.0 g/cc and about 1.6 g/cc to float in the secondary slurry and thereafter removing and collecting these particles from the secondary slurry to form a tertiary slurry;

d) separating and collecting magnetic materials from the tertiary slurry by imposing a magnetic field from about 100 gauss to about 10 kilogauss and removing the magnetic materials to form a fourth slurry;

e) adding from about 0.5 to about 10 pounds of an oil having a carbon chain greater than octane per ton of fly ash material and a frothing agent to the fourth slurry, whereby the oil will coat remaining unburned carbon in the fourth slurry to form hydrophobic carbon particles;

f) introducing air into the fourth slurry to carry the hydrophobic carbon particles to a frothy layer; and

g) removing and collecting the hydrophobic carbon particles from the frothy layer; and

h) collecting from the carbon depleted slurry the remaining fly ash material by filtering the carbon depleted slurry.

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**5,047,146**

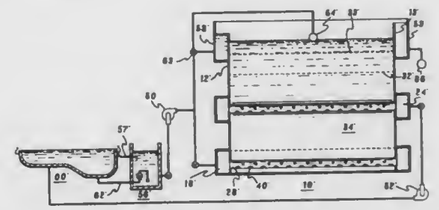
**BIDIRECTIONAL FLOW VACUUM FILTER FOR A SWIMMING POOL HAVING INFLUENT AND EFFLUENT CONDUITS AS STRUCTURAL MEMBERS**

**Dirk Bastenhof, Veenendaal, Netherlands, assignor to Aquatic Amusement Associates, Ltd., Cohoes, N.Y.**

**Filed Feb. 23, 1990, Ser. No. 484,559**

**Int. Cl.[5] B01D *35/02*; E04H *4/12***

**U.S. Cl. 210—97** **10 Claims**



7. A bi-flow filter for filtering fluids comprised of:

a sealed enclosure having a bottom and upstanding side walls, said enclosure being partially filled with filtering media capable of containing fluid having a level;

lower influent means for introducing fluid to the filter near the bottom of the media;

effluent means for collecting filtered fluid at the midlevel of the media;

upper influent means for introducing fluid above the media;

means operatively connected to the upper influent means for terminating the flow of fluid therein in response to the fluid level rising to a first predetermined level above the media; and

a discharge trough positioned to receive fluid from the fluid level rising above a second predetermined level above said first level.

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**5,047,147**

**SINGLE-NEEDLE ARTIFICIAL KIDNEYS**

**Jacques Chevallet, Serezin du Rhone, and Olivier Roy, Annemasse, both of France, assignors to Hospal Industrie, Cedex, France**

**Continuation of Ser. No. 672,666, Nov. 19, 1984, abandoned. This application Nov. 23, 1988, Ser. No. 276,091**

**Int. Cl.[5] B01D *61/32***

**U.S. Cl. 210—101** **9 Claims**

1. An artificial kidney comprising an extracorporeal blood circuit including:

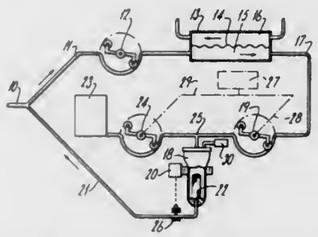
(a) a blood treatment apparatus having a selectively permeable membrane;

(b) a single needle connectable to a patient's arterial-venous network;

(c) a first pump having an inlet port connected to said needle and an outlet port connected to said blood treatment apparatus;

(d) a second pump having an inlet port connected to said

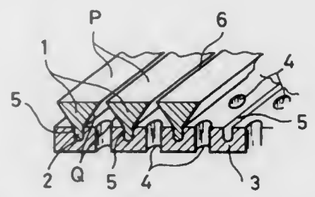
blood treatment apparatus and an outlet port connected to said needle;
(e) first and second actuating means for causing the operation of said first and second pumps, respectively;
(f) at least one reservoir for at least one solution to be introduced into said extracorporeal blood circuit;
(g) at least one perfusion pump having an inlet port con-



nected to said reservoir and an outlet port connected to said extracorporeal blood circuit;
(h) third actuating means for causing the operation of said perfusion pump; and
(i) means connecting said third actuating means with one of the first and second actuating means, whereby the operation of the perfusion is synchronized with one of said first and second pumps.

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**5,047,148**
**RETAINED WIRE FILTER ELEMENT**
**Koichi Arai, c/o Arai Corp., 1390-1, Kurami Samukawa, Koza, Kanagawa, Japan**
**Filed Apr. 24, 1990, Ser. No. 513,638**
**Int. Cl.[5] B01D *29/05***
**U.S. Cl. 210—498** **15 Claims**

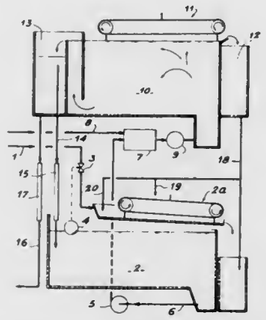



1. A filter element including, in combination:
a) a plurality of filter wire members each having a definite cross-section and a retaining portion;
b) a plate member having a plurality of apertures formed therein, and having a plurality of longitudinal grooves formed in the top surface thereof; and
c) a plurality of longitudinal filtering slits formed by said plurality of filter wire members being retained in said longitudinal grooves by said retaining portions thereof.

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**5,047,149**
**APPARATUS FOR THE CLARIFICATION OF LIQUIDS, SUCH AS NOTABLY WATER, FRUIT JUICES, GRAPE MUST OR SIMILAR**
**Patrick Vion, Houilles, France, assignor to Degremont, Rueil-Malmaison, France**
**Filed May 31, 1990, Ser. No. 531,445**
**Claims priority, application France, Jun. 1, 1989, 89 07259**
**Int. Cl.[5] B03D *1/14***
**U.S. Cl. 210—513** **6 Claims**

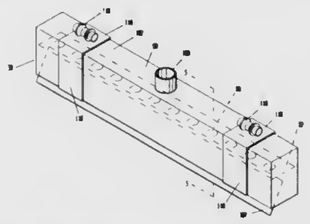
1. Apparatus for clarifying a liquid which contains suspended solids, said apparatus comprising:
(a) tank means for containing said liquid;
(b) inlet conduit means in fluid communication with said tank means for feeding said liquid from an external source into said tank means;
(c) pretreatment means in fluid communication with said tank means, said pretreatment means being located at an elevation greater than that of said tank means for providing a gravity flow of liquid and suspended solids from said pretreatment means to said tank means;
(d) flotation means for separating suspended solids from said liquid, said flotation means having clarified liquid outlet means and suspended solids outlet means, said flotation means being positioned at an elevation greater than said pretreatment means and said tank means for providing a



gravity flow of suspended solids to said pretreatment means and clarified liquid to said tank means;
(e) tank outlet conduit means for providing fluid communication between said tank means and said flotation means;
(f) pump means for transferring liquid between said flotation means through said tank outlet conduit means;
(g) first recycle conduit means for providing fluid communication between said clarified liquid outlet means of said flotation means and said tank means for recycling liquid; and,
(h) second recycle conduit means for providing fluid communication between said suspended solids outlet means of said flotation means and said pretreatment means for recycling solids.

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**5,047,150**
**SETTLED SOLIDS REMOVAL MECHANISM**
**James Mitchell, 749 Hillcrest Ave., El Segundo, Calif. 90245**
**Filed Mar. 5, 1990, Ser. No. 487,875**
**Int. Cl.[5] B01D *17/025***
**U.S. Cl. 210—525** **8 Claims**

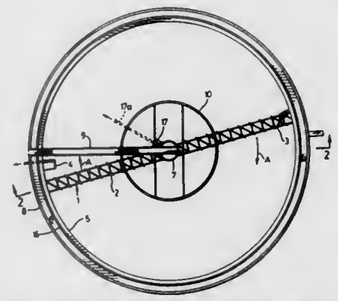


1. A solids collection device for removing settled solids from the bottom surfaces of liquid-containing tanks which comprises·
(a) at lease one bottom surface travelling collector comprising a collector housing which extends transversely across said bottom surface with an open undersurface and a coextensive orifice plate located at an intermediate vertical position in said collector housing to subdivide said housing into an upper vacuum chamber and a lower collection chamber, a wiper blade pivotally supported on the undersurface of said orifice plate and extending downwardly below the lower edges of said housing;
(b) travelling motive means comprising a motor means and mechanical linking means connected to said travelling collector to move said collector in a longitudinal direction along the bottom surface of said tank; and
(c) direction reversing means operatively connected to said motor means to reverse direction of said motor means and thereby reverse the travel of said travelling collector means, whereby said collector means is oscillated across a preselected area of said bottom surface of said tank, with said wiper blade pivotally moving between wiping positions at the trailing edge of said collector.



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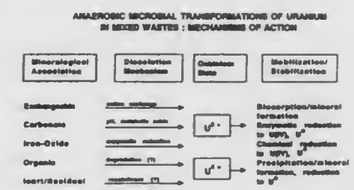
**5,047,151**
**SCUM SKIMMING SYSTEM FOR CIRCULAR SEDIMENTATION AND THICKENING TANKS**
**Jan O. Brandkvist, 176 Sherwood Ave., Toronto. Ontario, Canada M4P 2A8**
**Filed Jun. 13, 1990, Ser. No. 538,059**
**Int. Cl.[5] B01D *21/06***
**U.S. Cl. 210—525** **21 Claims**



1. A scum skimming device for use in a waste treatment system having a sedimentation tank, said tank being an enclosure defined by a bottom and a surrounding cylindrical wall, said tank having a central waste liquid inlet pipe having inlet ports, and having an outer outlet weir to maintain the waste liquid level in said tank substantially constant, the scum skimming device comprising:
a scum skimming blade which is biased into a position partly above and partly below the liquid surface and which sweeps the surface of the tank, said blade being supported from a bottom sludge rake by articulated support posts;
a generally helical blade extending radially to the tank periphery, and being positioned with a portion of the helical blade below the waste liquid level when the tank is in use;
a drive means for rotating said generally helical blade
and a trough partially enclosing said helical blade, said trough being open along one side at about the liquid level to allow floating scum to enter the trough and encounter the helical blade
said scum skimming blade directing said scum through said trough opening and into contact with said helical blade, said helical blade being rotated by said drive unit, said rotation tending to keep said scum in said trough while moving said scum lengthwise along said trough and elevating said scum above said liquid surface and permitting said waste liquid to drain back into said tank to separate said scum from said liquid and move said scum to a discharge point outside said tank.

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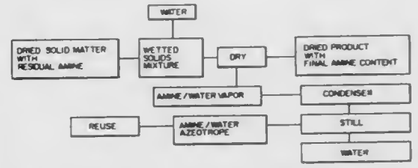
**5,047,152**
**MICROBIAL STABILIZATION AND MASS REDUCTION OF WASTES CONTAINING RADIONUCLIDES AND TOXIC METALS**
**Arokiasamy J. Francis, Middle Island; Cleveland J. Dodge, Wading River, and Jeffrey B. Gillow, Valley Cottage, all of N.Y., assignors to Associated Universities, Inc., Washington, D.C.**
**Filed Nov. 5, 1990, Ser. No. 608,829**
**Int. Cl.[5] C02F *3/34***
**U.S. Cl. 210—611** **8 Claims**




1. A process for reducing the mass of wastes containing radionuclides and/or toxic metals which comprises treating such wastes under anaerobic conditions at elevated temperatures with an aqueous bacterial culture containing Clostridium sp. BFGl and supplemental sources of metabolizable carbon and nitrogen.

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**5,047,153**
**METHOD FOR REMOVING AMINE FROM SOLIDS**
**James C. Nowak, Kent, and Mark K. Tose, Maple Valley, both of Wash., assignors to Resources Conservation Company, Bellevue, Wash.**
**Filed Oct. 31, 1989, Ser. No. 430,768**
**Int. Cl.[5] B01D *17/05***
**U.S. Cl. 210—634** **48 Claims**




1. In a process for dewatering a sludge containing solid matter and water including the steps of:
admixing said sludge with a secondary or tertiary amine to form a mixture, said amine having the general formula

$$\begin{array}{l} R_1 \\ | \\ N-R_2 \\ | \\ R_3 \end{array}$$

wherein
$R_1$ is hydrogen or alkyl,
$R_2$ and $R_3$ are alkyl radicals having from one to six carbon atoms or alkenyl radicals having from two to six carbon atoms, and
the total number of carbon atoms in the molecule being in the range of from three to seven, inclusive, said amine having an inverse critical solution temperature in a two phase system with water,
maintaining the temperature of said mixture below the inverse critical solution temperature of said amine to yield a single phase liquid containing said amine and water and a solid phase containing at least a portion of said solid mat-

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ter which is insoluble in said single phase liquid and separating said solid phase from said single phase liquid, and

drying said separated solid phase to yield a dried solid matter, said dried solid matter containing a residual amount of said amine ranging from about 0.01% to about 1.0% by weight of said dried solid matter.

the improvement comprising:

admixing said dried solid matter with an effective amount of liquid water to form a wetted solids mixture, wherein said effective amount of liquid water ranges from about 2% to about 200% by weight of said dried solid matter; and

drying said wetted solids mixture to produce a dried product with a final amine content less than the residual amine content of said dried solid matter.

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**5,047,154**

## METHOD AND APPARATUS FOR ENHANCING THE FLUX RATE OF CROSS-FLOW FILTRATION SYSTEMS

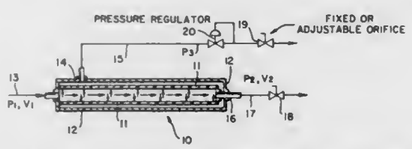
**Daniel L. Comstock, Corvallis, and Robert D. Hagen, Dallas, both of Oreg., assignors to C.P.C. Engineering Company, Sturbridge, Mass.**

**Continuation of Ser. No. 474,817, Mar. 10, 1983, abandoned. This application Sep. 21, 1987, Ser. No. 99,622**

**The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.**

**Int. Cl.[5] B01D** *61/22*

**U.S. Cl. 210—636** **18 Claims**




11. A method of increasing the time-averaged cross-flow filtration flux of a liquid through a porous microfiltration filter medium over the period of a filtration run, comprising the steps of:

a) flowing the liquid transversely through the microfiltration filter medium by establishing a pressure differential across the microfiltration filter medium;

b) cleaning the surface of the microfiltration filter medium prior to commencement of the filtration run by flowing a cleaning solution laterally over said surface while simultaneously temporarily eliminating said pressure differential across the microfiltration filter medium; and

c) commencing the filtration run by gradually increasing the flow rate of the filtrate from essentially extended period of time to substantially prevent the intrusion of the particles of material being filtered out of the liquid into the microfiltration filter medium per se.

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**5,047,156**

## OIL RECOVERY VESSEL AND METHOD UTILIZING ADJUSTABLE WEIR

**John L. Sullivan, Rossmoor, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Jul. 17, 1989, Ser. No. 381,216**

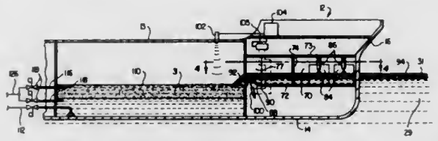
**Int. Cl.[5] E02B** *15/04*

**U.S. Cl. 210—744** **25 Claims**

20. A method for recovering relatively large quantities of oil or a similar pollutant disposed on the surface of a body of water comprising the steps of:

providing a large oil recovery vessel having a hull, a bow, a stern and a plurality of compartments formed in said hull and comprising at least one of each of a primary oil separation tank, a secondary oil separation tank, and an oil storage tank, means forming an opening in said hull and in flow communication with means forming a sluiceway, and an adjustable height weir interposed in said sluiceway between said opening in said hull and said primary separation tank for controlling the flow of oil covered water to said primary separation tank;

maneuvering said vessel at a draft sufficient to ingest oil covered seawater through said opening into said sluiceway and adjusting the height of said weir so as to skim oil from said seawater for flow into said primary separation



tank and maintaining a quantity of oil and seawater in said primary separation tank sufficient to allow substantial gravity separation of oil from water taken in through said opening;

removing oil and water from said primary separation tank; and

maintaining a substantially constant level of liquid in said primary separation tank.

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**5,047,157**

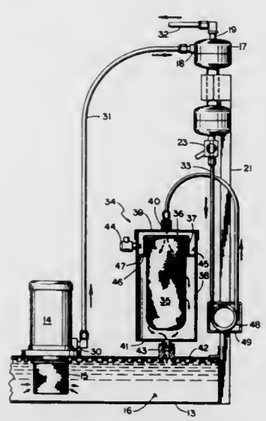
## COOLANT FILTRATION

**James R. Hoffman, and Michael A. Ward, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed May 25, 1990, Ser. No. 529,018**

**Int. Cl.[5] B01D** *35/027, 21/26;* **B04C** *11/00*

**U.S. Cl. 210—787** **2 Claims**




2. In a machine having a coolant supply system including a coolant tank and a centrifugal separator having an inlet port, an outlet port and a flushing port for removing particulates, a method for draining the flushing port, comprising the following steps:

providing a flexible tubular conduit of predetermined diameter and length;

looping a substantial portion of said flexible tubular conduit through a plurality of turns to create a compact coiled form;

storing said compact coiled form in a bracket means;

connecting a filtration basket means in fluid communication with said coolant tank;

connecting one end of said flexible tubular conduit to said flushing port, and the other end of said flexible tubular conduit to said filtration basket means;



continuously directing flushed coolant and particulates through said flexible tubular conduit, from said flushing port to said filtration basket means, while said inlet port of said coolant separator is being supplied with coolant;

accumulating particulates in said filtration basket means by straining said flushed coolant; and

draining strained coolant from said filtration basket means into said coolant tank.

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**5,047,158**

## OLEFINIC HYDROCARBON MODIFICATION WITH SULFUR IMIDES

**Stanley J. Brois, Westfield, N.J., assignor to Exxon Chemical Patents Inc., Linden, N.J.**

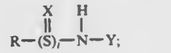
**Continuation of Ser. No. 243,863, Sep. 13, 1988, Pat. No. 4,867,753, which is a division of Ser. No. 36,015, Apr. 8, 1987, Pat. No. 4,772,406. This application Aug. 10, 1989, Ser. No. 392,009**

**The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.**

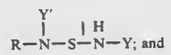
**Int. Cl.[5] C10M** *141/08, 157/06*

**U.S. Cl. 252—47.5** **12 Claims**

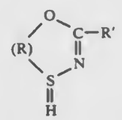
1. A composition of matter comprising at least one hydrocarbon adduct represented by a compound having a formula selected from the group consisting of:



(I)

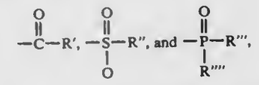


(II)



(III)

wherein R comprises a hydrocarbyl substituent having at least 18 carbon atoms and having present within its structure at least one constituent selected from the group consisting of hydrocarbyloxy, oxa, nitro, alkyl thioether, thio, carbohydrocarbyloxy, sulfonyl, and sulfinyl; X═is selected from the group consisting of O═, S═and Y'—N═; i is an integer selected from the group consisting of 0 and 1; wherein Y and Y' are independently selected from the group consisting of



wherein R' is selected from the group consisting of hydrocarbyl and hydrocarbyloxy, R'' comprises a hydrocarbyl substituent, and R''' and R'''' are independently selected from hydrocarbyloxy, and wherein each of R', R'', R''' and R'''' comprise from about 1 to 20 carbon atoms.

12. A lubricating oil composition comprising base oil and from 2 to 80 wt. % of the adduct according to any one of claims 1, 2, 3, 4, 5, 7, 8, 9, 10 or 11.

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**5,047,159**

## LUBRICANT COMPOSITIONS HAVING IMPROVED ANTI-DEPOSITION PROPERTIES COMPRISING A POLYALKYLENE OXIDE-MODIFIED SILICONE OIL

**Eugene R. Zebler, West Chester, Ohio, assignor to Henkel Corporation, Ambler, Pa.**

**Filed Aug. 24, 1989, Ser. No. 398,196**

**Int. Cl.[5] C10M** *155/02*

**U.S. Cl. 252—49.6** **26 Claims**

1. A lubricant composition having improved anti-deposition characteristics even at temperatures of about 343° C. comprising:

(1) a basestock selected from the group consisting of

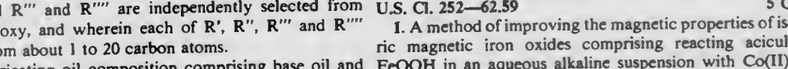
(a) at least one fluid synthetic ester;

(b) at least one fluid polyolefin;

(c) at least one petroleum-derived lubricant fluid; and

(d) mixtures thereof; and

(2) a polyalkylene oxide-modified silicone oil of the general formula



wherein EO is ethyleneoxy, PO is 1,2-propyleneoxy; Z is either hydrogen or a lower alkyl radical of up to about 5 carbons, $x \geq 0$, $y \geq 1$, and m and n are integers, the sum of m+n being at least 1, said silicone oil having a molecular weight in the range of from about 200 to about 5000 g/mole and being present in the lubricant composition in an amount effective to improve said anti-deposition characteristics of said lubricant composition.

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**5,047,160**

## POLYANHYDRIDE MODIFIED ADDUCTS OR REACTANTS AND OLEAGINOUS COMPOSITIONS CONTAINING SAME

**Jacob Emert, Brooklyn, N.Y.; Robert D. Lundberg, Bridgewater, and Antonio Gutierrez, Mercerville, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.**

**Continuation-in-part of Ser. No. 161,919, Feb. 29, 1988. This application Dec. 29, 1988, Ser. No. 291,745**

**Int. Cl.[5] C10M** *133/00*

**U.S. Cl. 252—51.5 A** **46 Claims**

1. An oil soluble dispersant additive useful in lubricating oils comprising the reaction product of:

(i) at least one intermediate adduct comprised of the reaction products of

(a) at least one polyanhydride, and

(b) at least one polyamine; and

(ii) at least one aldehyde and at least one reaction product of long chain hydrocarbyl substituted $C_3$–$C_{10}$ monocarboxylic or $C_4$–$C_{10}$ dicarboxylic acid or anhydride and amine-substituted hydroxy aromatic compound.

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**5,047,161**

## PREPARATION OF ISOMETRIC COBALT- AND TITANIUM-CONTAINING MAGNETIC IRON OXIDES

**Werner Steck, 4 Auerstrasse; Hartmut Hibst, 215 Sternstrasse, both of, 6700 Ludwigshafen, and Helmut Jakusch, 6 c Lorscher Ring, 6710 Frankenthal, all of Fed. Rep. of Germany**

**Continuation of Ser. No. 856,959, Apr. 29, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 183,425**

**Claims priority, application Fed. Rep. of Germany, Apr. 30, 1985, 3515517**

**Int. Cl.[5] C04B** *35/00;* **C01G** *49/06*

**U.S. Cl. 252—62.59** **5 Claims**

1. A method of improving the magnetic properties of isometric magnetic iron oxides comprising reacting acicular γ-FeOOH in an aqueous alkaline suspension with Co(II) ions, Ti(IV) ions and Fe(II) ions under inert gas at a pH higher than 8 and at from 35° C. to the boiling point of the suspension to

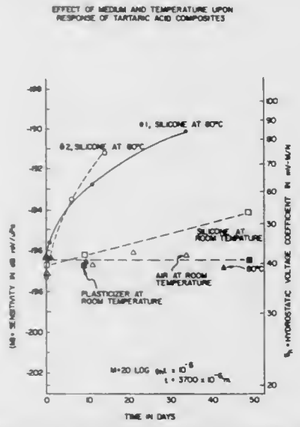
produce isometric cobalt- and titanium-containing magnetic iron oxide which contains from 2 to 8% by weight of cobalt(II) ions and from 0.5 to 6% by weight of titanium(IV) ions.

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**5,047,162**
**PIEZOELECTRIC COMPOSITE MATERIALS AND METHOD OF MAKING**

**William P. Krug, Hoffman Estates, Ill., and Meredith A. Aronson, Drexel Hill, Pa., assignors to Martin Marietta Corporation, Bethesda, Md.**

**Division of Ser. No. 868,856, May 30, 1986, abandoned. This application Jun. 26, 1989, Ser. No. 372,141**
**Int. Cl.[5] C04B *35/00*; H01B *1/00***
**U.S. Cl. 252—62.9** **18 Claims**




7. A composite piezoelectric material including a polymer matrix of a first mass, made from a prepolymer and up to 60% wt. % plasticizer, in which is dispersed at least 20 percent by weight of a plurality of piezoelectric particles selected from the group consisting of tartaric acid, mono-saccharides, disaccharides and carboxylic salts, each of said particles having a size of 1 to 300 microns, and which is poled and cured to polymerization, the improvement comprising:

the composite having the plasticizer essentially removed in an amount of 20–25 wt. % of the composite by reacting the polymer with silicone fluid, such that the polymer matrix is reduced to a second, lesser mass and the composite exhibits a hydrostatic piezoelectric response which is substantially stable over time and a high hydrosotatic voltage constant.

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**5,047,163**
**ACTIVATION OF BLEACH PRECURSORS WITH SULFONIMINES**

**David J. Batal, Secaucus, N.J., and Stephen A. Madison, Valley Cottage, N.Y., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Filed Mar. 16, 1990, Ser. No. 494,632**
**Int. Cl.[5] C11D *7/54, 7/18*; D06L *3/02***
**U.S. Cl. 252—102** **38 Claims**

1. A bleaching composition comprising:

(i) from about 1 to about 60% by weight of a peroxygen compound;

(ii) from about 0.05 to about 10% of an oxygen transfer agent whose structure is:

$$R^1R^2C{=}NSO_2R^3$$

wherein:

$R^1$ may be a substituted or unsubstituted radical selected from the grouping consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl and cycloalkyl radicals;

$R^2$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, $R^1C{=}NSO_2R^3$, nitro, halo, cyano, alkoxy, keto, carboxylic and carboalkoxy radicals;

$R^3$ may be a substituted or unsubstituted radical selected from the group consisting of phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, nitro, halo, and cyano radicals;

$R^{12}$ with $R^2$ and $R^2$ with $R^3$ may respectively together form a cycloalkyl, heterocyclic, and aromatic ring system; and

(iii) from about 0.1 to about 40% of a bleach precursor that reacts with peroxide anion and forms therewith a peracid or perimidic acid.

31. A method for bleaching a stained substrate, said method comprising contacting said stained substrate in an aqueous medium with a peroxygen compound, a bleach precursor and with an oxygen transfer agent whose structure is:

$$R^1R^2C{=}NSO_2R^3$$

wherein:

$R^1$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl and cycloalkyl radicals;

$R^2$ may be a substituted or unsubstituted radical selected from the group consisting of hydrogen, phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, $R^1C{=}NSO_2R^3$, nitro, halo, cyano, alkoxy, keto, carboxylic and carboalkoxy radicals;

$R^3$ may be a substituted or unsubstituted radical selected from the group consisting of phenyl, aryl, heterocyclic ring, alkyl, cycloalkyl, nitro, halo, and cyano radicals;

$R^1$ with $R^2$ and $R^2$ with $R^3$ may respectively together form a cycloalkyl, heterocyclic, and aromatic ring system; and said peroxygen compound to oxygen transfer agent being present in a molar ratio ranging from about 1500:1 to about 1:2, and said bleach precursor to oxygen transfer agent being present in a molar ratio ranging from about 250:1 to about 1:20.

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**5,047,164**
**CLEANING/DISINFECTING PROCESS AND COMPOSITION**

**Michael P. Corby, Ravenshead, England, assignor to Diversey Corporation, Ontario, Canada**

**Continuation of Ser. No. 796,849, Nov. 12, 1985, Pat. No. 4,822,513. This application Jan. 3, 1989, Ser. No. 293,013**
**Claims priority, application United Kingdom, Dec. 12, 1984, 8428564**
**The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.**
**Int. Cl.[5] C11D *3/43***
**U.S. Cl. 252—106** **11 Claims**

1. A process for preparing an acid-based cleaning/disinfecting composition containing a stable interhalogen, $ICl_2$—, said process comprising the in situ preparation of $ICl_2$— by:

i) reacting in solution a source of I— with a source of Cl— in the presence of up to 95 percent by weight of solution of an acid selected from the group consisting of nitric acid, phosphoric acid, hydrochloric acid, sulfonic acid, sulfuric acid and mixtures thereof, to produce up to 25 percent by weight of solution of stabilized $ICl_2$— in an acid medium which is not appreciably oxidized by the interhalogen.



**5,047,165**
**FINE FABRIC LAUNDRY DETERGENT WITH SUGAR ESTERS AS SOFTENING AND WHITENING AGENTS**

**Regis Lysy, Olne, and Marie-Helene Fraikin, Hermee, both of Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.**

**Filed Jan. 25, 1989, Ser. No. 302,168**
**Int. Cl.[5] C11D *1/831, 9/32***
**U.S. Cl. 252—121** **20 Claims**

1. A non-bleaching fine fabric detergent composition comprising:

a detersively effective amount of a surfactant mixture of anionic and nonionic surfactants, said mixture having a ratio of anionic surfactant to nonionic surfactant of from 9:1 to 0.1:1, by weight;

a detergent building effective amount of at least one builder salt; and

a softening and whitening effective amount of a sugar ester containing at least one fatty acid chain having at least 10 carbon atoms.

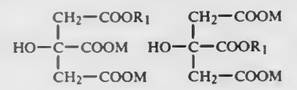
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**5,047,166**
**SKIN TREATMENT COMPOSITION CONTAINING MONOESTER OF CITRIC ACID**

**Ira Weil, New York, N.Y., assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Division of Ser. No. 24,233, Mar. 10, 1987. This application Jul. 7, 1989, Ser. No. 376,451**
**Int. Cl.[5] C11D *9/06, 15/04, 1/08*; C07C *69/74***
**U.S. Cl. 252—132** **21 Claims**

1. A skin treatment composition comprising from about 1% to about 35% by weight of a dication salt of a monoester of citric acid having one of the following formulae:



(I) (II)

where $R_1$ has the structure of a moiety derived from $R_1$—OH, which alcohol is selected from the group consisting of alcohols of the formula:

$$R_2{-}A(O{-}R_3)_x{-}OH \quad \text{(III)}$$

or

$$R_2{-}(O{-}R_3)_x{-}OH \quad \text{(IV)}$$

where $R_2$ is a hydrocarbon chain having 10 to 18 carbon atoms, A is an aryl group, $R_3$ is an alkyl chain having 2 to 4 carbon atoms and x is an integer from 1 to 7; each M is a cation selected from the group consisting of the alkali metals, the alkaline earth metals, ammonium, substituted ammonium and a mixture thereof; and a physiologically acceptable carrier for said monoester.

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**5,047,167**
**CLEAR VISCOELASTIC DETERGENT GEL COMPOSITIONS CONTAINING ALKYL POLYGLYCOSIDES**

**Peter L. Steyn, West Orange, and Robert Corring, Rockaway Township, Morris County, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Filed Dec. 30, 1987, Ser. No. 139,355**
**Int. Cl.[5] C11D *3/37, 3/12, 3/22, 17/00***
**U.S. Cl. 252—160** **3 Claims**

1. An aqueous cleaning composition in gel form having a viscosity on a Haake Rotovisco RV-100 Vicsometer at 25° C. under 5 $sec^{-1}$ shear of from about 1,000 to 20,000 cps and under 21 $sec^{-1}$ shear of from about 200 to 5,000 cps, a pH range from 11 to 13, a steady state viscoelastic deformation compliance $J_e^*$ value greater than 0.01, and a light transmittance not lower than 10% through a sample 2 cm thick, said composition comprising:

(i) from 0.1 to 10% of a thickener that is a crosslinked polycarboxylic polymer;

(ii) from 0.01 to 2% of alumina; and

(iii) from 0.01 to 20% of an alkyl polyglycoside.

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**5,047,168**
**SUGAR ETHERS AS BLEACH STABLE DETERGENCY BOOSTERS**

**Guy Broze, Grace-Hollogne, and Jean-Paul Delvenne, Tillff, both of Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.**

**Filed Jan. 21, 1988, Ser. No. 146,514**
**The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.**
**Int. Cl.[5] C11D *3/22, 3/395***
**U.S. Cl. 252—174.17** **19 Claims**

12. A non-aqueous heavy duty laundry composition comprising by weight about 10 to about 60% of a suspension of insoluble particles of builder salt, an effective amount of a bleaching agent, an effective amount of a bleach activator and, about 4 to 15% as a detergency booster, a sugar ether containing at least one long chain alkyl group dispersed in about 30% to 70% of weight liquid nonionic surfactant.

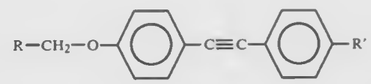
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**5,047,169**
**TOLANE COMPOUND**

**Toshihiro Shibata, and Norio Kurosawa, both of Saitama, Japan, assignors to Adeka Argus Chemical Co., Ltd., Tokyo, Japan**

**Filed Aug. 21, 1989, Ser. No. 397,036**
**Claims priority, application Japan, Sep. 16, 1988, 63-232997; Feb. 3, 1989, 1-26373**
**Int. Cl.[5] C09K *19/06*; C07C *41/00***
**U.S. Cl. 252—299.6** **6 Claims**

1. A tolane compound represented by the following general formula (I):



(I)

wherein R represents an alkynyl or an alkadienyl group having 3 to 18 carbon atoms, and R' represents an alkyl or an alkoxy group having 1 to 18 carbon atoms.

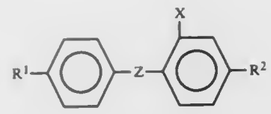
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**5,047,170**
**ANISOTROPIC COMPOUNDS HAVING NEMATIC PHASE AND LIQUID CRYSTAL MIXTURES**

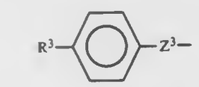
**Tuong Huynh-ba, Pully, and Maged A. Osman, Zürich, both of Switzerland, assignors to Merck Patent GmbH, Darmstadt, Fed. Rep. of Germany**

**Continuation of Ser. No. 758,792, Jul. 24, 1905, Pat. No. 4,808,333, which is a continuation-in-part of Ser. No. 457,567, Jan. 13, 1983, abandoned. This application Dec. 23, 1988, Ser. No. 289,046**
**Claims priority, application Switzerland, Jan. 14, 1982, 198/82-0; Jan. 19, 1982, 292/82-3; May 4, 1982, 2725/82-7**
**Int. Cl.[5] C09K *19/34, 19/00***
**U.S. Cl. 252—299.6** **6 Claims**

1. A liquid crystal composition containing at least one anisotropic compound having the formula



wherein
Z is selected from the group consisting of a single bond and a $—CH_2CH_2—$ group,
X is selected from the group consisting of fluorine and chlorine,
$R^1$ and $R^2$ are selected from the group consisting of $C_1$-$C_{12}$-alkyl, $C_1$-$C_{12}$-alkoxy and cyclic groups of the formula



(13)

wherein $R^3$ is selected from the group consisting of $C_1$-$C_{12}$-alkyl, $C_1$-$C_{12}$-alkoxy, and $Z^3$ is selected from the group consisting of a single bond and a $—CH_2CH_2—$ group, with the provisos that
(A) at least one of Z and $Z^3$ is a $—CH_2CH_2—$ group; and
(B) at least one of $R^1$ and $R^2$ is of the formula (13).

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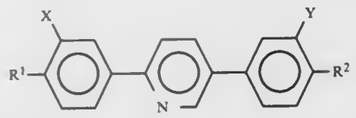
**5,047,171**

## OPTICALLY ACTIVE-2,5-DIPHENYLPYRIDINE

**Kouji Ohno; Shinichi Saito, and Hiromichi Inoue, all of Kanagawa, Japan, assignors to Chisso Corporation, Ohsaka, Japan**

**Filed Sep. 1, 1988, Ser. No. 240,584**
**Claims priority, application Japan, Sep. 3, 1987, 62-220824**
**Int. Cl.[5] C09K** *19/34;* **C07D** *211/70, 211/72*
**U.S. Cl. 252—299.61** **14 Claims**

1. An optically active 2,5-diphenylpyridine expressed by the formula

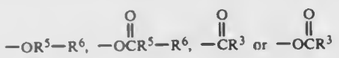


(I)

wherein one of $R^1$ and $R^2$ represents an alkyl group or an alkoxy group, each of 4 to 10 carbon atoms, and the other thereof represents an optically active group selected from the group consisting of



$R^5$ represents an optically active alkylene group of 2 to 12 carbon atoms;
$R^6$ represents an alkoxy group, an alkanoyl group, an alkanoyloxy group, an alkoxycarbonyl group or an alkoxycarbonyloxy group, each of 1 to 12 carbon atoms; and
$R^9$ represents a group expressed by



wherein
$R^5$ and $R^6$ are as defined above; and $R^3$ represents an optically active alkyl group of 4 to 15 carbons having a methyl or ethyl branch
X represents hydrogen or halogen; and
Y represents hydrogen.

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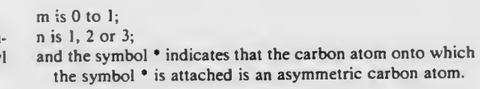
**5,047,172**

## W-SUBSTITUTED, OPTICALLY ACTIVE ALKANOL ESTER DERIVATIVES

**Shinichi Saito; Takashi Inukai; Hiromichi Inoue; Kazutoshi Miyazawa; Kouji Ohno, all of Yokohamashi, and Makoto Ushioda, Kawasakishi, all of Japan, assignors to Chisso Corporation, Osakafu, Japan**

**Continuation-in-part of Ser. No. 59,117, Jun. 3, 1987, abandoned, and a continuation-in-part of Ser. No. 83,830, Aug. 11, 1987, abandoned. This application Sep. 19, 1989, Ser. No. 409,093**
**Claims priority, application Japan, Jun. 9, 1986, 61-133269; Aug. 12, 1986, 61-189127; Mar. 23, 1987, 62-68629**
**Int. Cl.[5] C09K** *19/12, 19/10, 19/8*
**U.S. Cl. 252—299.61** **29 Claims**

1. A compound expressed by the formula



(I)

wherein
$R^1$ represents an alkyl group or alkoxy group each of 1 to 12 carbon atoms;
$R^2$ represents a linear or methyl-branched alkyl group of 1 to 15 carbon atoms;



m is 0 to 1;
n is 1, 2 or 3;
and the symbol • indicates that the carbon atom onto which the symbol • is attached is an asymmetric carbon atom.



**5,047,173**

## METHOD OF REDUCING THE POWDER WEIGHT OF EUROPIUM ACTIVATED STRONTIUM TETRABORATE PHOSPHOR

**Anthony F. Kasenga; Joseph J. Lenox, both of Towanda, and James J. Colson, Jr., Wyalusing, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Mar. 8, 1991, Ser. No. 666,303**
**Int. Cl.[5] C09K** *11/63*
**U.S. Cl. 252—301.4 R** **1 Claim**

1. A method of reducing the powder weight of $SrB_4O_7$:Eu phosphor without loss of brightness comprising the steps of: milling said phosphor; blending the milled phosphor with $EuF_3$ and $H_3BO_3$ in a ratio of one mole $SrB_4O_7$:Eu to 0.003 moles $EuF_3$ to 0.012 moles $H_3BO_3$; firing the blend at 1675° F. in an atmosphere of about 4% hydrogen - 96% nitrogen; milling the fired blend in water containing $Sr(OH)_2.8H_2O$; and then washing and drying the phosphor.

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**5,047,174**

## PRODUCTION OF STABLE METAL OXIDE SOLS

**Fawzy G. Sherif, Stony Point, N.Y., assignor to Akzo America Inc., New York, N.Y.**

**Filed Nov. 21, 1988, Ser. No. 273,768**
**Int. Cl.[5] B01J** *13/00;* **G01G** *23/04, 25/02*
**U.S. Cl. 252—309** **6 Claims**

1. A process for forming stable metal oxide sols which comprises adding water to a Group IIA, Group IIIA, or transition metal alkoxide solution to cause hydrolysis of the alkoxide to form the corresponding metal oxide solids, separating the metal oxide solids from the water in contact therewith to prevent agglomeration of the solids, and redispersing the metal oxide in anhydrous alcohol for a time effective to form a stable sol.

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**5,047,175**

## SALT COMPOSITION AND EXPLOSIVES USING SAME

**John W. Forsberg, Mentor, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio**

**Division of Ser. No. 137,301, Dec. 23, 1987, Pat. No. 4,828,633. This application Nov. 1, 1988, Ser. No. 265,877**
**Int. Cl.[5] B01F** *17/16, 17/36;* **C07C** *69/40*
**U.S. Cl. 252—356** **59 Claims**

1. A composition comprising:
(A) at least one salt moiety derived from (A)(I) at least one high-molecular weight polycarobyxlic acylating agent, said acylating agent (A)(I) having at least one hydrocarbyl substituent having an average of from about 20 to about 500 carbon atoms, and (A)(II) one or more members selected from the group consisting of ammonia, at least one amine, at least one alkali or alkaline earth metal, and at least one alkali or alkaline earth metal compound;
(B) at least one salt moiety derived from (B)(I) at least one low-molecular weight polycarboxylic acylating agent, said acylating agent (B)(I) optionally having at least one hydrocarbyl substituent having an average of up to about 18 carbon atoms, and (B)(II) one or more members selected from the group consisting of ammonia, at least one amine, at least one alkali or alkaline earth metal, and at least one alkali or alkaline earth metal compound;
said moieties (A) and (B) being coupled together by (C) at least one compound having one or more functions selected from the group consisting of (i) two or more primary amino groups, (ii) two or more secondary amino groups, (iii) at least one primary amino group and at least one secondary amino group, (iv) at least two hydroxyl groups and (v) at least one primary or secondary amino group and at least one hydroxyl group.

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**5,047,176**

## INCOMBUSTIBLE AZEOTROPIC LIKE SOLVENT COMPOSITIONS

**Kohji Tamura, Kawanishi; Yukio Omure, Takatsuki; Satoshi Ide, Osaka; Naoyoshi Hanatani, and Toshimasa Fukuzawa, both of Settsu, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan**

**Filed Dec. 23, 1988, Ser. No. 288,897**
**Claims priority, application Japan, Dec. 26, 1987, 62-330892**
**Int. Cl.[5] C11D** *7/50;* **B01F** *1/00*
**U.S. Cl. 252—364** **1 Claim**

1. A solvent composition consisting essentially of 87 to 92 parts by weight of 1, 1, 2-trichloro- 1, 2, 2-trifluoroethane and 8 to 13 parts by weight of a hydrocarbon mixture, the hydrocarbon mixture contains cyclopentane in an amount of not less than 50% by weight and 2-methylpentane in an amount of not less than 5% by weight, the solvent composition is incombustible and exhibits azeotropic-like properties and the boiling point range of the solvent composition is between 45°–48° C.

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**5,047,177**

## CONDITIONING SHAMPOO COMPOSITIONS CONTAINING CATIONIC GUM DERIVATIVE AND POLYAMINE CONDENSATION PRODUCT AS SOLE CONDITIONING AGENTS

**Joseph Varco, Fairfield, Conn., assignor to Clairol Incorporated, New York, N.Y.**

**Filed Apr. 30, 1990, Ser. No. 516,406**
**Int. Cl.[5] A61K** *7/075;* **C11D** *1/65, 3/30, 3/37*
**U.S. Cl. 252—548** **10 Claims**

1. A conditioning shampoo composition consisting essentially of by weight of the composition (a) from about 1 to about 50% of an anionic surfactant; (b) from about 0.1 to about 3% of a cationic derivative of a polygalactomannan gum, (c) from about 0.5 to about 3% of a readily water-soluble polycondensation product obtained by reacting a water-soluble polyamine containing reactive amino groups and having 4 to 6 carbons with an ether of a poly $C_2$-$C_3$ alkylene glycol having terminal halohydrin or hydroxyl groups followed by reaction with (i) a halohydrin, (ii) an epoxide having more than one epoxide group, (iii) a bifunctional reaction product obtained by reaction of (i) or (ii) with a reactant selected from glycols, diglycols, polyalkylene glycol and glycerin, and (iv) the addition product of said amine and said ether, said component (c) having terminal fatty aliphatic residues, and (d) from 44 to 98.8% water, the components (b) and (c) being essentially the sole hair conditioning components present in the composition.

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**5,047,178**

## NICKEL/ALUMINA CATALYST, ITS PREPARATION AND USE

**Keshab L. Ganguli, Bleiswijk; Peter Nootenboom, Oud-Beyerland, and Cornelis K. Lok, Rockanje, all of Netherlands, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands**

**Continuation of Ser. No. 304,002, Jan. 30, 1989, abandoned, which is a continuation of Ser. No. 947,855, Dec. 30, 1986, abandoned, which is a division of Ser. No. 747,440, Jun. 21, 1985, Pat. No. 4,657,889. This application Jun. 27, 1990, Ser. No. 544,017**
**Claims priority, application Netherlands, Jun. 21, 1984, 8401965**
**Int. Cl.[5] C07C** *51/36, 67/303, 209/48*
**U.S. Cl. 260—409** **1 Claim**

1. A process for the catalytic hydrogenation of a compound selected from the group consisting of unsaturated oils, fats, fatty acids and fatty acid nitrile derivatives which comprises utilizing, as the catalyst at a temperature of 80°–250° C., a nickel alumina catalyst which includes 75%–90% by weight of nickel and wherein the atomic ratio of nickel/aluminum is between 10 and 2, the active nickel surface area is between 90 and 150 $m^2/g$ nickel, the average pore size, depending on the

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above atomic ratio, is between 4 and 20 nanometers and the nickel crystallites have an average diameter between 1 and 5 nanometers.

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5,047,179

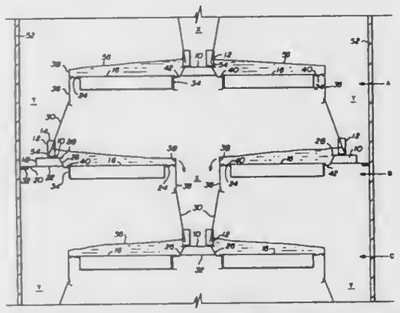
## DISTILLATION TRAY

James O. Nye, Friendswood, Tex., assignor to Nye Trays, Inc., Friendswood, Tex.

Division of Ser. No. 233,769, Aug. 19, 1988, abandoned. This application Feb. 25, 1991, Ser. No. 660,521

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—114.1 15 Claims



1. A downcomer for use in a distillation column comprising: a generally downward extending inclined plate, which describes at least one surface enclosing a space having a downwardly decreasing volume, said inclined plate being positioned along a seal pan and spaced slightly thereabove, said seal pan being secured to a tray within said distillation column and positioned entirely above said tray, and a perforated plate positioned adjacent to and extending downward from and along said seal pan.

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5,047,180

## PROCESS FOR MAKING CELLULOSE ESTER MICROPARTICLES

Thomas L. Steiner, Charlotte; Kenneth A. Domeshek, Matthews; William Stitt, Pineville; Jesse L. Riley, and Lance J. Deutsch, both of Charlotte, all of N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 77,274, Jul. 24, 1987, abandoned, and a continuation-in-part of Ser. No. 77,275, Jul. 24, 1987, abandoned, and a continuation-in-part of Ser. No. 281,587, Dec. 9, 1988, abandoned, and a continuation-in-part of Ser. No. 88,914, Aug. 24, 1987, abandoned, and a continuation-in-part of Ser. No. 168,799, Mar. 16, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,275

Int. Cl.[5] C08B *3/06*

U.S. Cl. 264—5 23 Claims

1. A process for producing cellulose ester microspheres comprising the steps of:

(a) dissolving a cellulose ester in a liquid comprising a solvent for the cellulose ester and a non-solvent for the cellulose ester, thereby forming a dope;

(b) spheronizing the dope, thereby forming droplets of the dope;

(c) droping the droplets for a finite amount of time; and

(d) precipitating the droplets in a precipitant.

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5,047,181

## FORMING OF COMPLEX HIGH PERFORMANCE CERAMIC AND METALLIC SHAPES

Mark A. Occhionero, Milford; Bruce E. Novich, Lexington, and Cathryn A. Sundback, Harvard, all of Mass., assignors to Ceramics Process Systems Corporation, Milford, Mass.

Continuation of Ser. No. 427,769, Oct. 26, 1989, abandoned, which is a continuation-in-part of Ser. No. 412,108, Sep. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 180,092, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 125,643, Nov. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 36,085, Apr. 9, 1987, abandoned. This application Feb. 25, 1991, Ser. No. 659,480

Int. Cl.[5] B22F *1/00*; C04B *35/64*

U.S. Cl. 264—28 13 Claims

1. A process for producing a sintered ceramic or metallic article, comprising:

a. providing a stable, pourable suspension consisting essentially of at least about 35 vol % solid ceramic particles or metallic particles or combinations thereof and a vehicle composed of a dispersant selected from the group consisting of acrylate-based polymeric polyelectrolytes and polyethylene imines, at least one cryoprotectant, and the remainder water;

b. shaping the suspension in a closed mold at a pressure of less than about 200 psi;

c. chilling the mold temperature to less than the freezing point of the vehicle;

d. solidifying the shaped suspension by rapidly freezing the shaped suspension;

e. freeze drying the solidified shape below the freezing point of the vehicle without the formation of a continuous liquid phase; and

f. firing the dried shape.

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5,047,182

## COMPLEX CERAMIC AND METALLIC SHAPED BY LOW PRESSURE FORMING AND SUBLIMATIVE DRYING

Cathryn A. Sundback, Harvard; Bruce E. Novich, Lexington, both of Mass.; Angelica E. Karas, New Brunswick, N.J., and Richard W. Adams, Marlborough, Mass., assignors to Ceramics Process Systems Corporation, Milford, Mass.

Continuation of Ser. No. 412,108, Sep. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 180,092, Apr. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 36,085, Apr. 9, 1987, abandoned, and a continuation-in-part of Ser. No. 125,643, Nov. 25, 1987, abandoned. This application Mar. 7, 1991, Ser. No. 668,679

Int. Cl.[5] C04B *41/92*

U.S. Cl. 264—28 16 Claims

1. A process for forming an article comprising:

(a) providing a well-dispersed pourable slurry consisting essentially of at least about 35% by volume of inorganic sinterable particles, a non-aqueous vehicle having a volume change on freezing of not more than 10% by volume, and a dispersant selected from the group consisting of acrylic acid based polymeric polyelectrolytes, phosphate ethers, and combinations thereof;

(b) providing a closed mold of a desired geometry;

(c) injecting the slurry into the closed mold at a pressure of less than about 100 psi;

(d) decreasing the temperature of the mold to below the freezing point of the vehicle for a time sufficient to freeze the vehicle and to result in a solidified piece;

(e) drying the solidified piece by sublimation under conditions below the vapor pressure of the vehicle and below the melting point of the vehicle and without the formation of a continuous liquid phase effective to produce a green piece; and

(f) sintering the green piece to produce a densified article.



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5,047,183

## METHOD OF INJECTION MOLDING ARTICLES OF THERMOPLASTIC MATERIALS

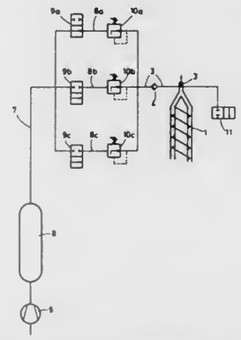
Helmut Eckardt, Meinerzhagen, and Jürgen Ehritt, Hilchenbach-Müsen, both of Fed. Rep. of Germany, assignors to Battenfeld GmbH, Meinerzhagen, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 255,715

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734164

Int. Cl.[5] B29C *45/76*; B29D *22/00*

U.S. Cl. 264—40.3 12 Claims



1. In a method of injection molding an article of thermoplastic material, the method including initially forcing molten thermoplastic material into a mold cavity of an injection mold in an amount sufficient for forming the article, the mold cavity having a surface, subsequently forcing a single flowable medium into the injection mold and thermoplastic material with a pressure which distributes the thermoplastic material uniformly over the surface of the mold cavity so as to form a hollow body, such that the thermoplastic material defines a surface, cooling the hollow body in the injection mold while maintaining the pressure of the medium therein, and releasing the pressure of the medium from the hollow body and removing the molded article from the injection mold, the improvement comprising conducting the flowable medium from a pressure reservoir into the mold cavity and to the surface of the thermoplastic material distributed over the surface of the mold cavity, preventing the flowable medium from flowing back out of the mold cavity and controlling the pressure of the medium existing within the injection mold and acting on the surface of the thermoplastic material distributed over the surface of the mold cavity at least temporarily until the thermoplastic material has cooled wherein the pressure of the medium is controlled from a lowest pressure level to a highest pressure level and then to a middle pressure level before the pressure of the medium is released from the hollow body.

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5,047,184

## PROCESS AND VACUUM MOLD FOR THE MANUFACTURE OF A TEXTILE COVERED CUSHION

Ralf Busch, Ketsch, and Volker Onnenberg, Drabenderhoehe, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

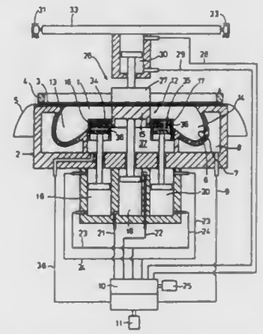
Filed Jun. 23, 1988, Ser. No. 210,696

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1987, 3722321

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.6 6 Claims

1. In a process for the manufacture of a cushion provided with a textile cover by back foaming, wherein (i) the cover is placed on the edge of a vacuum molding part at least partly containing a mold cavity and is stretched before a vacuum is applied to the mold cavity, (ii) the cover is sucked into position, (iii) a foamable reaction mixture is then applied to the back of the cover and (iv) when the reaction mixture has set to form the foam core, the cushion is removed from the mold, the improvement wherein prior to the application of the vacuum to the mold cavity, the cover is brought into contact with at



least one moveable section of the wall of the mold cavity as it is positioned over the mold cavity, the cover is fixed to this section and the section together with the cover fixed thereto is then moved into the molding position.

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5,047,185

## METHOD OF PRODUCING MOLDINGS

Rudolf Engel, Michael-Steinherr-Str. 17, D-8904 Friedberg, Fed. Rep. of Germany

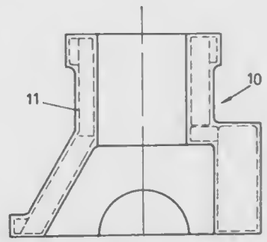
PCT No. PCT/EP88/01111, § 371 Date Jul. 5, 1989, § 102(e) Date Jul. 5, 1989, PCT Pub. No. WO89/05222, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 7, 1988, Ser. No. 381,668

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1987, 3741689

Int. Cl.[5] C04B *35/76*

U.S. Cl. 264—60 22 Claims




1. A method for producing a molding in the form of a composite body, comprising the steps of:

embedding a reinforcement in a ceramic material, said reinforcement having a strength which is greater than the strength of the ceramic material which comprises a rigid, three-dimensional supporting skeleton which is connected to reinforced fiber mats having, at least partially, carbon fibers with a structure which is pervious to the ceramic material and has a geometry which is adaptable to the geometry of the ceramic material;

anchoring and mounting said supporting skeleton into a mold cavity;

shooting the ceramic material, in a pulverulent condition, into the mold cavity by abruptly placing the mold cavity under vacuum; and,

firing the ceramic material.

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5,047,186

## PROCESS FOR PRODUCING SILICON NITRIDE BASED ARTICLES OF HIGH FRACTURE TOUGHNESS AND STRENGTH

Marvin Huckabee, Marlboro; Sergej-Tomislav Buljan, Acton, and Jeffrey T. Neil, Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1989, Ser. No. 458,122
Int. Cl.[5] C04B *35/58*
U.S. Cl. 264—62 11 Claims

1. A process for producing a silicon nitride-based article of improved fracture toughness and strength comprising the step of:

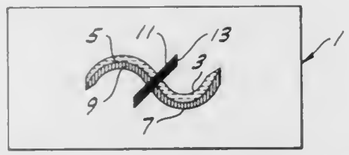
densifying to at least about 98 percent of theoretical density a mixture comprising (a) a silicon nitride powder blend consisting essentially of about 10–30 percent by weight of a first silicon nitride powder of an average particle size of about 0.2 μm and a surface area of about 8–12 $m^2/g$, and about 70–90 percent by weight of a second silicon nitride powder of an average particle size of about 0.4–0.6 μm and a surface area of about 2–4 $m^2/g$; (b) an effective amount of a suitable oxide densification aid; and (c) about 10–50 percent by volume, based on the volume of said densified article, of refractory whiskers or fibers having an aspect ratio of about 3–150 and having an equivalent diameter selected to produce in said densified article an equivalent diameter ratio of said whiskers or fibers to grains of silicon nitride of greater than 1.0.

5,047,187

## METHOD OF MAKING ORNAMENTAL PRE-CAST TERRAZZO PANELS WITH INTEGRAL INLAY DESIGN

Christopher T. Banus, Fairfield, Iowa, assignor to The Granitech Corporation, Fairfield, Iowa

Filed May 1, 1989, Ser. No. 345,480
Int. Cl.[5] B28B *1/08;* B29C *39/12;* B44C *3/10*
U.S. Cl. 264—71 8 Claims




1. A process for preparing a pre-cast terrazzo panel having detailed, multicolor designs therein constituted by background and inlay designs of different colors and wherein the inlay and background colors are integral with no surface difference between the inlay and background comprising the steps of:

(a) providing a pre-cast unpolished terrazzo panel with a first background color;

(b) cutting out an inlay pattern or design in said terrazzo panel, through the complete thickness of said panel, to create a silhouette cut-out panel;

(c) placing said cut-out panel in a mold and releasably affixing face of said cut-out panel to a surface of said mold, pouring a blend of a second color comprising a binder and aggregate into said cut-out such that said blend contacts said mold surface, vibrating said blend to settle said blend, and curing said blend to create a cured inlay of said second color in said panel, wherein said blend when poured into said cut-out is prevented from working its way between said mold surface and said face of said cut-out panel due to said face of said cut-out panel being releasably affixed to said surface of said mold.

(d) releasing said panel containing said cured inlay from said mold; and

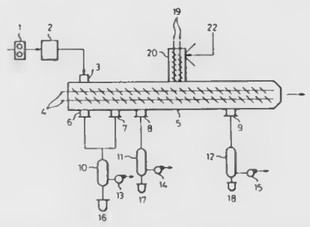
(e) polishing said face of said panel to produce a terrazzo panel having a plurality of different colors therein with said inlay color being integral with said background color and without said different colors being separated from each other by divider strips.

5,047,188

## PROCESS FOR PREPARATION OF MODIFIED METHACRYLIC RESIN MOLDING MATERIAL

Kazuya Okada; Masahiro Taniguchi; Yasunori Shimomura; Hidemi Tanaka, all of Toyama, and Tsutomu Matsui, Nakashinkawa, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Jun. 21, 1989, Ser. No. 369,017
Claims priority, application Japan, Jun. 25, 1988, 63-156022
Int. Cl.[5] B29B *7/84*
U.S. Cl. 264—101 5 Claims




1. A process for the preparation of a modified methacrylic resin molding material in which volatile components are removed from a methacrylic polymer composition and the methacrylic polymer composition is mixed with a modifying polymer, which comprises:

extruding said methacrylic polymer composition through a volatile component-removing extruder equipped with a plurality of vent zones from a first vent zone to a final vent zone, whereby the volatile components of unreacted monomer, solvent and by-product are vented from the extruder, and equipped with a screw type feeder modifying polymer supply means arranged between the final vent zone and the vent zone adjacent the final vent zone; and

feeding modifying polymer into said extruder by means of said screw-type feeder and mixing said modifying polymer with said methacrylic polymer as the material continuously flows through said extruder, the venting of volatile components occurring through all vent zones and occurring as a mixture of polymer material is continuously extruded and said modifying polymer being at least one member selected from the group consisting of (i) a multistage polymer obtained by graft-polymerizing a vinyl monomer to an acrylic rubber, (ii) a polymer obtained by graft-polymerizing a vinyl monomer to a homopolymer or copolymer of butadiene as a rubber source, (iii) a quadripolymer comprising methyl methacrylate as the main component and styrene, α-methylstyrene and maleic anhydride as comonmer components, (iv) a terpolymer comprising methyl methacrylate as the main component and α-methylstyrene and cyclohexylmaleimide as comonomer components, (v) a methyl methacrylate/cyclohexylmaleimide copolymer, and (vi) a methyl methacrylate/N-phenylmaleimide copolymer.

5,047,189

## PROCESS FOR PREPARING PARTIALLY DISSOLVABLE AND SPLITTABLE CONJUGATED MICROFIBER

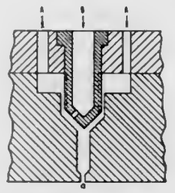
Chen-Ling Lin, Taipei, Taiwan, assignor to Nan Ya Plastics Corporation, Taipei, Taiwan

Filed Mar. 29, 1990, Ser. No. 500,961
Int. Cl.[5] D01D *5/26, 5/36*
U.S. Cl. 264—103 3 Claims

1. A process for preparing a conjugated polymer microfilament comprising a polyamide central portion surrounded by a polyester portion, where in a cross-section of the conjugated microfilament the polyamide forms a matrix comprising a plurality of orange-wedge shaped islands all slightly connected at a common center and separated and surrounded by the polyester, the number of polyamide orange-wedge shaped islands being in the range 3 to 12 so that upon an outermost surrounding portion of said polyester being dissolved the remaining polyester and polyamide can be split into 3 to 12 sections of polyester and 3 to 12 sections of polyamide for a corresponding total of 6 to 24 split conjugated filaments of polyester and polyamide, the process comprising the steps of:

separately melting and metering respective flows of said polyester and said polyamide;

extruding said metered flows of melted polyester and polyamide through a conjugated spinneret with the polyester separating the orange-wedge shaped polyamide islands all slighty connected to a common center and separating said islands and surrounding the polyamide, the conjugated fiber being extruded at a temperature at the range 270° to 300° C., a dynamic viscosity during said extrusion being in



the range 2000 to 3500 poises for said polyester and in the range 800 to 2500 poises for the polyamide, a take-up speed for the conjugated extruded fiber being in the range 500 to 4000 m/min, and

passing the undrawn conjugated yarn obtained from the conjugated spinneret through a belt-nip twister with a draw ratio in the range 1.5 to 4.5, at a speed in the range 300 to 600 m/min, at a drawing temperature in the range 100° to 180° C.,

said nip twister having a twist level in the range 3000 to 4000 T/M, a belt cross angle in the range 110° to 130°, a ratio of belt speed/yarn speed between 1.62 and 2.2, a second feed roller of said nip twister having an overfeed in the range 1.5 to 2.5%, and a third feed roller of said nip twister having an overfeed in the range 2.0 to 3.5%,

the conjugated textured yarn thus obtained having a titer in the range 300 to 450 d and a filament count in the range 12 to 128, with the titer per filament in the range 0.01 to 0.5 d and a sub-resolving ratio=(weight of unsplit yarn−−weight of split yarn upon dissolving of an outermost portion of polyester)/(weight of unsplit yarn) being in the range 0.1 to 0.4.

5,047,190

## DIFFERENTIAL SCREW THREAD PRESS FOR PREPARATION OF DISCS FOR SPECTROSCOPIC ANALYSIS

Thomas A. Jenks, Box 114, Elbridge, N.Y. 13060

Filed Jun. 22, 1990, Ser. No. 542,444
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—109 10 Claims

1. A screw thread press for forming sample discs for spectrographic analysis which comprises:

a frame member having opposed sides and ends and having an opening through the center thereof;

a first threaded hole in one side of said frame member extending to said center opening;

a second threaded hole formed in the opposite side of said frame member in axial alignment with said first threaded hole and extending to said center opening;



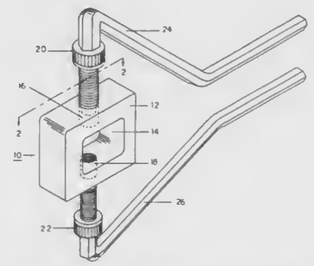
first and second anvil screw members rotatably mounted in said first and second threaded holes;

means for holding said anvil screw members stationary when said frame member is rotated about said anvil screw members; and

means for causing said anvil screws to come together when said frame member is rotated about said anvil screws.

9. In a screw thread press for forming sample discs for spectrographic analysis, the method of forming smooth surface discs which comprises:

providing a vise having therein a pair of spaced apart axially aligned threaded holes having different thread pitches;




positioning a first threaded anvil screw in one of said holes;

placing a quantity of material to be compacted on the end of said first anvil screw positioned in said frame;

positioning a second anvil screw in said other hole with the end thereof in close juxtaposition to the material on the end of said first anvil screw;

holding said first and second anvil screws stationary;

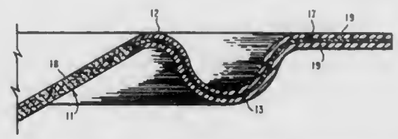
rotating said frame about said anvil screws to cause them to come together so as to compact the material to be compacted into a solid disc having smooth flat surfaces without any relative rotary motion marks.

5,047,191

## METHOD FOR MANUFACTURING LOUDSPEAKER DIAPHRAGM

Neal L. Baitcher, Fort Wayne, and Robert M. Brennan, Columbia City, both of Ind., assignors to Fibre Form Corporation, Columbia City, Ind.

Division of Ser. No. 787,306, Oct. 15, 1985, Pat. No. 4,646,874.
This application Jul. 30, 1986, Ser. No. 892,066
Int. Cl.[5] B29C *67/00*
U.S. Cl. 264—112 1 Claim




1. A method for constructing a one-piece high compliance loudspeaker diaphragm, comprising the steps of:

a) accreting fibers to form a loudspeaker diaphragm, including a cone body and an annular flange-substrate extending outwardly therefrom, in a controlled manner such that the flange-substrate is formed thinner and at a lesser density per unit area than the cone body, the flange-substrate having insufficient tensile strength of itself to withstand acoustic operation at low frequencies and high power;

b) forming a supporting flange on the loudspeaker diaphragm by permeating the flange-substrate with a liquid elastomer having a sufficient tensile strength, sufficient compliance and in a sufficient amount that when cured,

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the tensile strength of the supporting flange is primarily attributable to the elastomer and the supporting flange is sufficiently compliant and of sufficient tensile strength to withstand acoustical operation at low frequencies and high power; and

c) curing the elastomer.

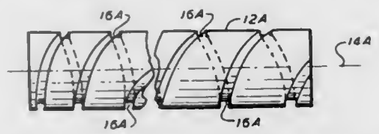
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**5,047,192**

## PROCESS OF MANUFACTURING A CRYOGENIC REGENERATOR

**John R. Purcell, and Raymond E. Sarwinski, both of San Diego, Calif., assignors to CDC Partners, San Diego, Calif.**

**Division of Ser. No. 258,504, Oct. 17, 1988, Pat. No. 4,866,943.**
**This application Jul. 10, 1989, Ser. No. 377,314**
**Int. Cl.[5] B29C** *41/12, 41/42, 41/48*
**U.S. Cl. 264—139** **4 Claims**




1. Process of manufacturing a cryogenic regenerator including a plurality of channels for conducting a working fluid, comprising the steps of:

providing a cylindrical forming member having a longitudinal axis and a plurality of peripheral slots displaced axially and oriented substantially parallel to said longitudinal axis or having a continuous spiral peripheral slot of sufficiently small pitch such that the convolutions thereof are oriented substantially parallel to said longitudinal axis;

providing epoxy which is relatively flexible upon hardening, loading said epoxy with thermally conductive material for enhancing the radial thermal conductivity of said cryogenic regenerator, and applying said epoxy to the periphery of said cylindrical forming member to fill said plurality of slots or said spiral peripheral slot with said epoxy and to form a radial layer of said epoxy of a generally first radial thickness;

allowing said epoxy to harden and thereafter reducing the radial thickness of said peripheral layer of hardened epoxy to a second smaller radial thickness;

splitting said hardened relatively flexible epoxy radially and parallel to said axis and thereafter removing said epoxy from said cylindrical forming member to provide a relatively flexible base layer from said epoxy formerly residing on the periphery of said cylindrical forming member and to provide a plurality of substantially parallel corrugations from epoxy formerly residing in said plurality of slots or said spiral peripheral slot, said corrugations extending outwardly from a bottom of said base layer; and

rolling said relatively flexible base layer into a generally cylindrical spiral having an axis with said corrugations extending parallel to said axis of said cylindrical spiral and with said corrugations extending radially inwardly and engaging a top of said base layer to cause said base layer and said corrugations to cooperatively form said plurality of channels.

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**5,047,193**

## METHOD AND APPARATUS FOR MAKING HONEYCOMB STRUCTURES

**Isaac Rinkewich, 48-22 Garden View Ter., Hightstown, N.J. 08520**

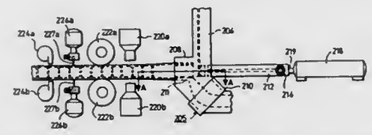
**Continuation-in-part of Ser. No. 25,052, Mar. 12, 1987, abandoned. This application Feb. 24, 1988, Ser. No. 160,000**
**Int. Cl.[5] B29C** *47/90*
**U.S. Cl. 264—155** **15 Claims**

1. A method of making a honeycomb structure including a honeycomb core and facing layers on its opposite sides, comprising:

feeding to an extrusion head a plurality of preformed core elements in alignment with each other transversely of the extrusion head with a space between each pair of adjacent core elements;

and extruding material over the opposite sides of said core elements and in the spaces between said core elements to produce a honeycomb structure having transversely-extending ribs defined by said core elements, and longitudinally-extending ribs defined by the material extruded in said spaces between the core elements.

10. Apparatus for making a honeycomb structure including



a honeycomb core having a facing layer on its opposite faces, comprising:

an extrusion head elongated in the transverse direction;

feeder means for feeding to said extrusion head a plurality of core elements in alignment with each other transversely of the extrusion head with a space between each pair of adjacent core elements;

and means for extruding through said extrusion head material over the opposite sides of said core elements and in the spaces between said core elements to produce a honeycomb structure having transversely-extending ribs defined by said core elements, and longitudinally-extending ribs defined by the material extruded in said spaces between the core elements.

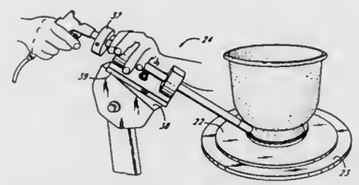
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**5,047,194**

## METHOD OF MAKING A POTTERY BOWL WITH INTEGRAL CATCH TRAY

**William J. Roufs, Whittier, Calif., and Kenneth A. Fait, 26392 Via Conchita, Mission Viejo, Calif. 92691, assignors to Kenneth A. Fait, Mission Viejo, Calif.**

**Filed Sep. 14, 1990, Ser. No. 583,032**
**Int. Cl.[5] A01G** *9/02;* **B28B** *1/02, 1/29, 11/08*
**U.S. Cl. 264—155** **6 Claims**



1. A process for forming a pottery bowl and catch tray wherein said pottery bowl and catch tray are integral including the steps of placing a portion of clay into a first mold half having the shape of the exterior of said pottery bowl, slowly forcing a second mold half into said first mold half by way of a ram press, said second mold half having the shape of the interior of said pottery bowl thereby forming a greenware bowl, and parting said first and second mold halves and removing said greenware bowl, wherein the improvement comprises;

forming a thickened sidewall at the bottom of said greenware bowl during said forcing of said second mold half into said first mold half;

placing the said greenware bowl with said thickened sidewall onto a bat on a potter's wheel and turning said bat and said greenware bowl; and



slowly moving a shaping tool including a tip at an angle from the horizontal so that said tip contacts said thickened sidewall and penetrates into said thickened sidewall at said bottom of said greenware bowl thereby forming said thickened sidewall into said integral catch tray, said integral catch tray including air upwardly extending catch tray wall and a catch tray rim.

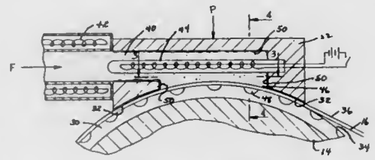
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**5,047,195**

## METHOD OF MAKING A MOLDED ARTICLE

**George B. Moertel, Rd. #3, Conneautville, Pa. 16406**

**Filed Sep. 15, 1988, Ser. No. 244,329**
**Int. Cl.[5] B29D** *5/00*
**U.S. Cl. 264—166** **10 Claims**



1. A method of continuously molding articles, comprising the steps of:

continuously moving the outer peripheral portion of a forming mold having a continuous channel with a plurality of spaced apart openings thereto, said channel extending the length of said mold in a first endless path defined by the outer peripheral portion;

continuously moving a band-like molding member in a second endless path;

continuously engaging a portion of the band-like molding member and the outer peripheral portion of the forming mold as they pass together through a region of engagement to form a continuously moving open-ended molding cavity;

continuously injecting hardenable material through a group of said openings and into said molding cavity adjacent an initial section of engagement of said band-like molding member and said forming mold;

intermixing hardenable material injected through foremost openings of said group of openings located closest to said initial section of engagement to flow toward said open end of said cavity where the speed of said mold and said band-like member maintains said injected hardenable material within said molding cavity in advance of said openings;

compacting said hardenable material injected through said foremost openings by hardenable material injected through other openings of said group of openings as said previously injected hardenable material moves past said group of openings within said cavity;

progressively hardening said hardenable material in the continuously moving molding cavity to form an article in solid form;

continuously disengaging the band-like molding member from the outer continuous peripheral portion of the forming mold during their movement away from the region of engagement; and,

removing the article during the disengaging step.

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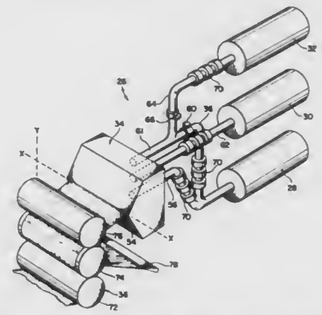
**5,047,196**

## METHOD FOR FORMING CO-EXTRUDED ADHESIVE TAPES

**Leo Zuckerberg, and Enrique Torres, both of Houston, Tex., assignors to Tek-Rap, Inc., Tex.**

**Filed Jun. 29, 1989, Ser. No. 347,930**
**Int. Cl.[5] B29C** *47/06*
**U.S. Cl. 264—171** **15 Claims**

1. A method of forming a continuous sheet of adhesive tape comprising the steps of continuously and simultaneously co-extruding first, second, and third pressurized substantially uniformly dispersed molten streams through a co-extrusion die, said first stream comprising between approximately 20% and 60% by weight of an elastomeric based adhesive polymer, between approximately 0% and 55% by weight of fillers, between approximately 8% and 40% by weight of tackifiers, between approximately 0% and 6% by weight of processing aids, between approximately 0% and 60% by weight of reinforcing materials and between approximately 0% and 15% by weight of protective materials, said second pressurized stream comprising between approximately 25% and 90% by weight of a flexible thermoplastic and between approximately 5% and 80% by weight of an elastomerically compatible coupling agent, said third pressurized stream comprising either between approximately 80% and 100% by weight of a molten flexible thermoplastic or a mixture comprising between approximately



20% and 60% by weight of an elastomeric based adhesive polymer, between approximately 0% and 55% by weight of fillers, between approximately 8% and 40% by weight of tackifiers, between approximately 0% and 6% by weight of processing aids, between approximately 0% and 60% by weight of reinforcing materials and between approximately 0% and 15% by weight of protective materials, the compatibility of said coupling agent with both said thermoplastic and said adhesive polymer being greater than the compatibility of said thermoplastic with said adhesive polymer, material from said first, second and third streams merging in the interior of said die so that the material from said second stream is interposed between the material from said first and third streams, material from said first, second and third streams passing outwardly from said co-extrusion die as a continuous tape sheet of first, second and third intimately fused layers of material from said first, second and third streams, respectively.

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**5,047,197**

## CELLULOSE DERIVATIVE SPINNING SOLUTIONS HAVING IMPROVED PROCESSABILITY AND PROCESS

**Ingemar Uneback, Odsmal; Lars-Erik Noord, and Margreth Strandberg, both of Stenungsund, all of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden**

**Filed Nov. 19, 1985, Ser. No. 799,516**
**Claims priority, application Sweden, Nov. 19, 1984, 84058007**
**Int. Cl.[5] D01F** *2/08, 2/24*
**U.S. Cl. 264—193** **18 Claims**

1. A cellulose derivative spinning solution having an improved flow rate at comparable cellulose derivative content and pressure drop across the spinning nozzle, and a higher cellulose derivative content at comparable flow rate, comprising a cellulose derivative in solution in a spinning solution solvent therefor, and a polyethylene glycol having an average molecular weight within the range from about 2 to about 4 million, in an amount to improve flow rate at comparable cellulose derivative content and increase cellulose derivative content at comparable flow rate.

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10. A process for spinning a cellulose derivative into elongated forms through a spinning nozzle, which comprises spinning a cellulose derivative in solution in a cellulose spinning solvent in the presence of added polyethylene glycol having an average molecular weight within the range from about 2 to about 4 million in an amount to improve flow rate of the spinning solution through the spinning nozzle at comparable cellulose derivative content and pressure drop across the nozzle, or an increased cellulose derivative content at a comparable flow rate.

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5,047,198

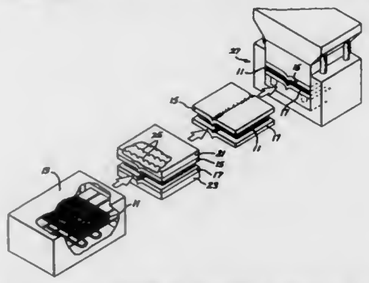
## COMPRESSION MOLDING OF COMPOSITE PARTS ON HOT MOLD SURFACES WITH A SHORT CYCLE TIME

**Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Continuation of Ser. No. 361,464, Jun. 5, 1989, abandoned, which is a continuation of Ser. No. 176,114, Mar. 30, 1988, abandoned. This application Aug. 17, 1990, Ser. No. 569,048**

**Int. Cl.[5] B29C** *43/04, 43/52, 43/34*

**U.S. Cl. 264—257** **5 Claims**



1. A method of compression molding a reinforced thermoplastic sheet to obtain a part with a desired surface finish in a short cycle time, comprising the steps of:

placing the composite sheet between nondeformable mold inserts having a thickness of one sixteenth to one quarter of an inch and having the desired contour of the part to be molded;

conduction heating the composite sheet and mold inserts above the temperature at which the thermoplastic material in the composite sheet becomes molten;

transporting the composite sheet between the mold inserts to a mold cooled to a temperature lower than that at which the thermoplastic sheet solidifies;

placing the mold inserts and composite sheet in the mold;

closing the mold, the composite sheet and inserts having been heated sufficiently and the inserts having sufficient mass to allow the thermoplastic resin to flow and fill the mold inserts during mold closing;

allowing the molded composite sheet to cool;

opening the mold and removing the molded composite sheet and the mold inserts and

separating the molded composite sheet from the mold inserts.

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5,047,199

## GASKET FOR AND METHOD OF CASTING POLYMER PLATES

**Jean-Paul Leca, Mantes La Jolie, and Jean-Yves Barbin, Etrepagny, both of France, assignors to Norsolor, France**

**PCT No. PCT/FR88/00049, § 371 Date Nov. 25, 1988, § 102(e) Date Nov. 25, 1988, PCT Pub. No. WO88/05718, PCT Pub. Date Aug. 11, 1988**

**PCT Filed Jan. 28, 1988, Ser. No. 265,847**

**Claims priority, application France, Jan. 29, 1987, 87 01049**

**Int. Cl.[5] B29C** *33/00, 39/40*

**U.S. Cl. 264—316** **10 Claims**

1. A gasket for fabricating methyl methacrylate polymer plates by casting comprising a core of plasticized poly(vinyl chloride), said core being sheathed by a thin layer of thermoplastic polymer selected from the group consisting of propylene polymers and saturated polyesters, said thermoplastic polymer being capable of keeping its elasticity at temperatures ranging from 20° to 120° C. and having a melting or softening point higher than about 115° C.

10. A process for fabricating polymer plates by casting, comprising introducing a methylmethacrylate prepolymer or a mixture of unsaturated monomers, whose principal constituent is methyl methacrylate, or said unsaturated monomer or monomers themselves into a mold comprised of two parallel plates separated by a gasket, and bringing the mold to a temperature sufficient to complete or carry out the polymerization, wherein said gasket comprises a core of plasticized poly(vinyl chloride), said core being sheathed by a thin layer of thermoplastic polymer selected from the group consisting of propylene polymers and saturated polyesters, said thermoplastic polymer being capable of keeping its elasticity at temperatures ranging from 20° to 120° C. and having a melting or softening point higher than about 115° C.

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5,047,200

## METHOD OF MAKING A FIRE HOSE

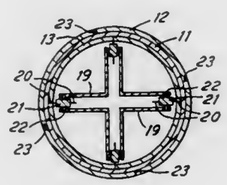
**Robert M. Harcourt, King City, Canada, assignor to Angus Fire Armour Limited, Lancaster, England**

**Continuation-in-part of Ser. No. 51,581, May 20, 1987, abandoned. This application May 1, 1989, Ser. No. 345,711**

**Claims priority, application United Kingdom, May 30, 1986, 8613233**

**Int. Cl.[5] B29C** *35/04, 47/06*

**U.S. Cl. 264—514** **7 Claims**



1. A method of making a fire hose of uniform cross-section along its length, comprising the steps of:

providing a tubular fabric reinforcing jacket made from synthetic textile yarns and having highly crimped weft threads;

forming a tube by extruding onto the internal and external surfaces of said tubular fabric reinforcing jacket a lining and covering of rubber or curable elastomeric material;

providing a tubular restraining sheath or mould of substantially the same uniform internal diameter as the external diameter of said tube;

curing said tube while said highly crimped weft threads are in a substantially untensioned condition by confining said tube in said tubular restraining sheath or mould and applying heat and pressure within said tube, pressing said tube into tight engagement with said sheath or mould, said sheath or mould substantially preventing radial expansion of said tube; and

removing said tube from said sheath or mould after said step of substantially untensioned curing, thereby forming a water-swellable fire hose.



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5,047,201

## SEAL FOR A VESSEL CONNECTION OF A HOT PIPELINE

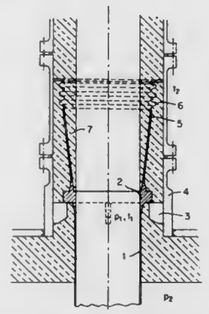
**Rainer Schmidt; Helmut David, and Ernst Malik, all of Oberhausen, Fed. Rep. of Germany, assignors to MAN Gutehoffnungshütte AG, Oberhausen, Fed. Rep. of Germany**

**Filed Jul. 11, 1989, Ser. No. 378,082**

**Claims priority, application Fed. Rep. of Germany, Jul. 14, 1988, 3823810**

**Int. Cl.[5] G21C** *13/00;* **F16L** *5/00*

**U.S. Cl. 376—204** **4 Claims**



1. A nonremovable seal for a hot pipeline extending through a nozzle in a container comprising: a hot pipeline having a wall with a first temperature and extending through a nozzle in a container having a wall with a second temperature, said first temperature being substantially higher than said second temperature, said hot pipeline having an interior first pressure to be sealed off from a second pressure in said container; brackets connected to said nozzle; said hot pipeline having a flange resting on said brackets, said hot pipeline with said flange being able to expand freely radially; a pipe member connected to said flange and having a temperature at the flange equal substantially to said first temperature; said pipe member having an upper end with a temperature substantially equal to said second temperature; insulation around said pipe member; said pipe member and said insulation having a length to enable said pipe member to withstand the difference between said first pressure and said second pressure and the difference between said first temperature and said second temperature; compensator means having one end connected to said pipe member and having another end connected to said nozzle for compensating against axial expansion of said pipe member, said compensator being subjected to the difference between said first pressure and said second pressure.

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5,047,202

**Patent Not Issued For This Number**

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5,047,203

## PURIFIER FOR NUCLEAR REACTOR COOLING WATER AND METHOD OF PURIFICATION

**Shigeo Miyata, and Akira Okada, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co., Ltd., Kagawa, Japan**

**Filed Sep. 19, 1990, Ser. No. 584,624**

**Claims priority, application Japan, Sep. 21, 1990, 1-245544**

**Int. Cl.[5] G21C** *19/30*

**U.S. Cl. 376—310** **6 Claims**

1. A purifier for nuclear reactor cooling water, which contains, as an active ingredient,

a titanium oxide-based solid solution of the formula (1)

$$(Ti_{1-x}Al_x)O_2 \quad (1)$$

wherein x is defined by $0<x<0.5$, and/or

an aluminum oxide-based solid solution of the formula (2)

$$(Al_{1-y}Ti_y)_2O_3 \quad (2)$$

wherein y is defined by $0<y<0.5$.

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5,047,204

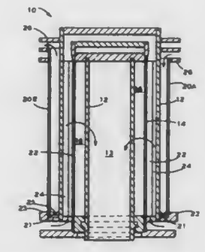
## NUCLEAR FUEL ELEMENT FOR A PARTICLE BED REACTOR

**Matthew W. Ales, Amherst, and John D. Malloy, III, Lynchburg, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Nov. 21, 1990, Ser. No. 616,951**

**Int. Cl.[5] G21C** *3/30*

**U.S. Cl. 376—430** **6 Claims**



1. A nuclear fuel element for a particle bed reactor, comprising:

a. an inner porous cylinder;

b. an outer porous cylinder connected at either end to and concentric with said inner porous cylinder, defining an annulus therebetween;

c. a fuel particle bed in said annulus between said inner and outer porous cylinders;

d. a plurality of fins extending radially outward from said outer porous cylinder;

e. a nonporous cylinder concentric with and positioned around said outer porous cylinder, defining an annulus therebetween;

f. a plurality of flexible fins extending radially inward from said nonporous cylinder and in contact with said fins on said outer porous cylinder; and

g. a plurality of heat removal tubes attached to the outer surface of said nonporous cylinder.

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5,047,205

## METHOD AND ASSEMBLY FOR PRODUCING EXTRUDED PERMANENT MAGNET ARTICLES

**Vijay K. Chandhok, Pittsburgh; Robert F. Krause, Murrysville; Bao-Min Ma, Pittsburgh, all of Pa., and John J. DuPlessis, Elizabethtown, Ky., assignors to Crucible Materials Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 122,351, Nov. 18, 1987, abandoned. This application Apr. 14, 1989, Ser. No. 338,447**

**Int. Cl.[5] B22F** *7/00*

**U.S. Cl. 419—8** **20 Claims**

1. A method for producing a compacted fully dense permanent magnet, said method comprising:

providing a particle charge of a permanent magnet alloy composition from which said article is to be made;

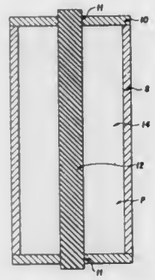
placing said charge in a cylindrical container having a generally axially positioned core with said charge surrounding said core within said container; and

heating said container and charge to an elevated temperature

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and extruding said container and charge to simultaneously compact said charge to form a substantially fully dense permanent magnet article having substantially identical



magnet properties along two orthogonal directions perpendicular to the extrusion direction to achieve a fiber texture.

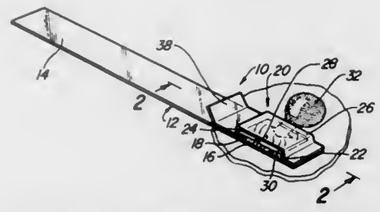
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**5,047,206**

**REAGENT TEST STRIP**

**Mitchell P. Dombrowski, Grosse Point Farms, Mich., assignor to Wayne State University, Detroit, Mich.**

**Filed Mar. 11, 1987, Ser. No. 24,573**
**Int. Cl.[5] G01N *31/22***
**U.S. Cl. 422—56** **25 Claims**



1. A reagent test strip (**10,10'**) comprising a support medium (**12,12'**) including a handle portion (**14,14'**) and a reagent support portion (**16,16'**); an insoluble reagent (**18,18'**) fixedly adhered to said reagent support portion (**16,16'**) defining a reagent surface (**19,19'**) capable of quantitatively changing reflectance in the presence of a reactant to be quantitatively determined; and a cover (**20,20'**) mounted on said support medium (**12,12'**) and only over said reagent (**18,18'**), said cover (**20,20'**) defining capillary chamber means (**28,28'**) having two open ends (**30,30'**) and a predetermined volume only over said reagent surface (**19,19'**) for drawing a predetermined amount of liquid (**32,32'**) into said capillary chamber means (**28,28'**) and only over said reagent surface (**19,19'**) to quantitatively react all of the liquid with said reagent (**18,18'**) and quantitatively change the reflectance of the reagent surface, said cover (**20,20'**) being the only structure over said reagent surface (**19,19'**) and being spaced thereover only sufficiently to establish said predetermined volume for acting as a capillary.

17. A method of making a reagent test strip (**10,10'**) including the steps of: cutting a predetermined length of a support medium (**12**); embossing a first depression (**50**) at a predetermined distance proximate to one end (**52**) of the support medium (**12**) and a second depression (**54**) between the first depression and the end (**52**) of the support medium (**12**); fixedly adhering an insoluble reagent (**18**) on the support medium (**12**) at a distance from the first depression (**50**) that is equal to the distance of the second depression (**54**) from the first depression (**50**) in the opposite direction; folding over the support medium at the first depression (**50**) so that the second depression (**50**) forms a covered chamber (**28**) directly over the reagent (**18**) with two open sides; and adhering the folded over portion to the support medium (**12**).

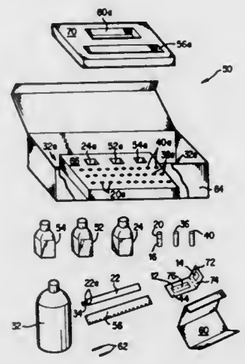
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**5,047,207**

**KIT FOR DIAGNOSING PLANT DISEASES**

**Richard K. Lankow, Cinnaminson; Sally A. Miller, Pennsauken; G. David Grothaus, Delran; Frank P. Petersen, Beverly, all of N.J.; Dennis R. Stocker, Yardley, Pa.; Stephanie L. Papa, Merchantville, N.J.; James Donovan, Levittown, and Douglas Malik, Pittsburgh, both of Pa., assignors to Agri-Diagnostics Associates, Cinnaminson, N.J.**

**Filed May 20, 1986, Ser. No. 865,379**
**Int. Cl.[5] G01N *1/02***
**U.S. Cl. 422—58** **5 Claims**



1. Apparatus for extracting and collecting sap from a plant sample, comprising:
a support backing; and
a first and second extraction pad releasably connected to the support backing, which first and second extraction pad are: (a) configured separately on the support backing in a non-overlying fashion relative to one another, such that the undersurface of each extraction pad is fully in contact with the support backing and (b) made of an abrasive material capable of effectively disrupting the physical integrity of a plant sample rubbed therebetween; and which first extraction pad is made of a material capable of collecting sap from the plant sample so disrupted and then capable of releasing said sample of sap for testing.

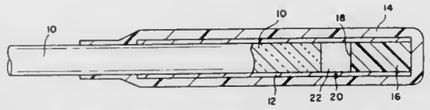
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**5,047,208**

**BLOOD GAS MONITORING SENSORS**

**Jeffrey A. Schweitzer, St. Anthony, and Keith J. Proctor, Lino Lakes, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.**

**Filed Feb. 23, 1989, Ser. No. 314,615**
**Int. Cl.[5] G01N *21/27***
**U.S. Cl. 422—58** **14 Claims**



12. Colorimetric sensor for measurement of the amount of a chemical constituent dissolved in a fluid, comprising:
a chamber containing a colorimetric dye means for changing light absorption characteristics in response to changes in the amount of said chemical constituent, said chamber comprising a tubular semipermeable membrane having a proximal end and a distal end and containing said colorimetric dye means;
fiber optic means having a proximal end and a distal end for delivering light from the light source to said chamber and for carrying light reflected from said chamber to a means for monitoring light intensity, the distal end of said fiber optic means located within said tubular membrane and sealed to said tubular membrane, the distal end of said fiber optic means exposed to said colorimetric dye means; and
a plug of reflective adhesive, located within the distal end of said tubular membrane and sealing to the distal end of said tubular membrane, and located distal to said colorimetric dye means.



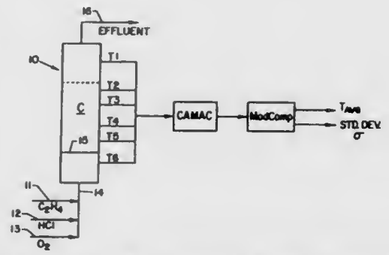
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**5,047,209**

**CONTROL SYSTEM FOR THE QUANTIFICATION OF THE QUALITY OF FLUIDIZATION USING A THERMOCOUPLE**

**John P. Lenczyk, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Division of Ser. No. 848,102, Apr. 4, 1986, Pat. No. 4,740,643.**
**This application Feb. 16, 1988, Ser. No. 156,515**
**Int. Cl.[5] C07C *17/156;* G01N *31/10;* G05D *7/00***
**U.S. Cl. 422—62** **2 Claims**




1. In a fluid-bed reactor operating at elevated temperature and containing a finely divided catalyst which catalyzes a reaction of gaseous reactants which reaction changes the viscosity of said catalyst at operating conditions as a function of the ratio of said reactants, the improvement comprising, at least one thermocouple means, located at a preselected location within said bed, including a sheath having a diameter no greater than 0.5 inch and adapted to measure fluctuations in the range from about 0.1° F. to about 0.5° F., of the temperature at said location a plurality of times each minute; a means of converting analog temperature signal to a digital signal; means for computing an average temperature at said location during a predetermined period of time; means for quantifying the quality of fluidization of said catalyst by computing the standard deviation of temperature at said location said predetermined period of time; and, means for controlling the ratio of said reactants to lower said standard deviation below a preselected numerical value to increase the quality of fluidization of said catalyst.

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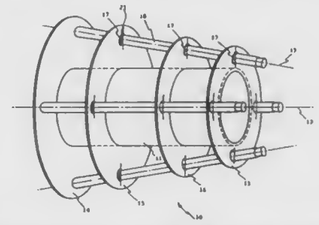
**5,047,210**

**DEVICE FOR PRESENTING RECEPTACLES**

**François Melet, Osny, France, assignor to Melet Schloesing Laboratories, Osny, France**

**Filed Dec. 12, 1988, Ser. No. 288,609**
**Claims priority, application France, Dec. 4, 1987, 87 17297**
**Int. Cl.[5] B01L *9/00;* A47F *5/02***
**U.S. Cl. 422—64** **14 Claims**

1. A device for presentation of receptacles, and especially of assay tubes each containing a sample of liquid to be analyzed, said device comprising a cylindrical rotatable drum having a core and at least two circular crowns which are integral with the core, and one crown being disposed at each end of the drum, at least two of the crowns having the same number of receptacle receiving means selected from the group consisting of perforations and cavities distributed all around the respective crown and adapted to receive the receptacles containing the samples, the receptacle receiving means of the crowns



being disposed in such a way that an axis of each receptacle when received in the receptacle receiving means is inclined at an acute angle less than 45° relative to an axis of rotation of the drum, wherein, the axis of rotation of the drum is maintained horizontal during the presentation of the receptacles with a view to the transfer, after homogenization, of all or part of their contents into an automatic analyzer.

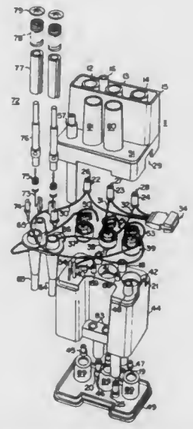
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**5,047,211**

**DISPOSABLE BLOOD HANDLING CASSETTE DEVICE FOR MEASURING HAEMOSTASIS**

**Thomas E. Sloane, Jr., West Redding, and Joseph W. Blake, III, Norwalk, both of Conn., assignors to Xylum Corporation, Scarsdale, N.Y.**

**Filed Aug. 18, 1989, Ser. No. 395,843**
**Int. Cl.[5] G01N *11/04, 11/08, 33/49***
**U.S. Cl. 422—73** **18 Claims**



1. A device for measuring haemostasis properties of a blood sample comprising:
a blood sample reservoir for receiving a blood sample through an inlet, and for receiving a displacing material forcing said blood sample through an outlet;
a blood sample tube connected to said outlet and connected to a collection chamber for receiving displaced blood; and,
a punching station located along said blood sample tube for punching a hole in said tube, whereby blood exits said hole, simulating bleeding, said punching station including

a drain tube having a top end centered with respect to said hole collecting said exiting blood, said drain tube being tapered from said top end to a narrower discharge end connected to a compartment of said collection chamber, said narrow end permitting detection of blood droplets formed from said simulated bleeding.

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5,047,212

## INSTRUMENT FOR MEASUREMENT OF THE ORGANIC CARBON CONTENT OF WATER

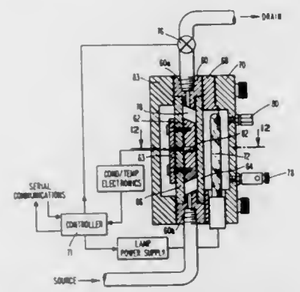
**Frederick K. Blades, Boulder, and Richard D. Godec, Erie, both of Colo., assignors to Anatel Corporation, Boulder, Colo.**

**Continuation of Ser. No. 938,634, Feb. 9, 1987, abandoned, which is a continuation of Ser. No. 635,551, Aug. 2, 1984, Pat. No. 4,666,860, which is a continuation-in-part of Ser. No. 569,678, Jan. 10, 1984, Pat. No. 4,626,413. This application Nov. 7, 1988, Ser. No. 270,451**

**The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.**

**Int. Cl.[5] G01N** *31/12*

**U.S. Cl. 422—82.02** **17 Claims**




1. An apparatus for the measurement of total organic carbon contained in a sample of deionized water, comprising:

a sample cell for containing a sample of deionized water;

a source of ultraviolet radiation of a frequency which promotes oxidation of organic carbon compounds disposed such that radiation from said source is incident on said sample cell;

a pair of electrodes in said cell;

means for monitoring the electrical conductivity between said electrodes;

means for measuring the temperature of water in the cell; and

means for correcting the monitored conductivity as a function of the measured temperature;

wherein the exposure of a sample of water containing organic carbon compounds to ultraviolet radiation and the monitoring of the consequent change of electrical conductivity of the sample both take place in said sample cell.

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5,047,213

## BIOLOGICAL SENSORS

**Martin F. Finlan, Aylesbury, and Richard P. Harvey, Amersham, both of England, assignors to Amersham International PLC, Little Chalfont, England**

**Filed Jan. 18, 1989, Ser. No. 299,564**

**Claims priority, application United Kingdom, Jan. 27, 1988, 8801807**

**Int. Cl.[5] G01N** *21/00, 21/55*

**U.S. Cl. 422—82.11** **15 Claims**

1. A sensor for use in biological, biochemical or chemical testing, said sensor comprising:

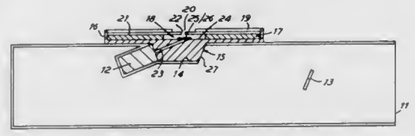
an optical waveguide having an input end and an output end and along which radiation may propagate by means of internal reflections off its internal surfaces,

a source of electromagnetic radiation whose output is applied to the input end of said optical waveguide, and

wherein said output end of the optical waveguide is cut off at an angle to its axis to provide a sloping end face,

wherein said radiation is input to the waveguide as a focussed beam so that the beam is incident at said end face as a spread of angles, and

wherein the angle of the sloping end face is such as to (1) cause the incident beam to be totally internally reflected at said face, and (2) cause the thus-reflected beam to be incident on the wall of the waveguide at an angle sufficiently great for it to exit from the waveguide without being subject to further internal reflection,



means for monitoring the radiation from said source which is internally reflected at said face,

a layer of metallic material applied to said sloping face,

a layer of sensitive material applied to the metallic layer, and

means for introducing onto the sensitive layer so as to react therewith a sample to be analyzed,

the arrangement being such that the aforesaid spread of radiation incident at said face of the optical waveguide is such as to include that angle at which surface plasmon resonance occurs, and allows the changing characteristics of the resonance to be monitored, which characteristics, as detected by said monitoring means, are dependent upon the reaction between the sample and the sensitive layer.

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5,047,214

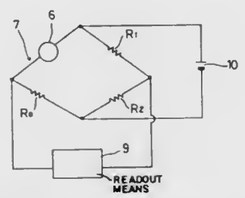
## SMELL SENSING ELEMENT AND SMELL SENSING DEVICE

**Kiyoshi Fukui, Osaka; Tesshi Shigemori, Nishinomiya, and Katsuo Ehara, Tokyo, all of Japan, assignors to New Cosmos Electric Co., Ltd., Osaka, Japan**

**Filed Mar. 8, 1989, Ser. No. 320,602**

**Int. Cl.[5] G01N** *27/12*

**U.S. Cl. 422—98** **11 Claims**




11. A smell sensing device, comprising:

a power source;

a casing having an inlet opening and an outlet opening and a passage extending between the openings;

a smell sensing element disposed in said passage for sensing the presence of an odorous gas by changing its resistance value through absorption of said gas; and

readout means for displaying an output of the smell sensing element, said smell sensing element comprising:

a conductor portion and a semiconductor portion comprised primarily of $SnO_2$ and said first and second components carried by said $SnO_2$ wherein

said first component is of at least one selected from the group consisting of oxides of alkaline earth metals; and

said second component is of at least one selected from the group consisting of oxides of Sc, Y, Ti, Zr, Hf, Th, Al, Ga and lanthanoids.



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5,047,215

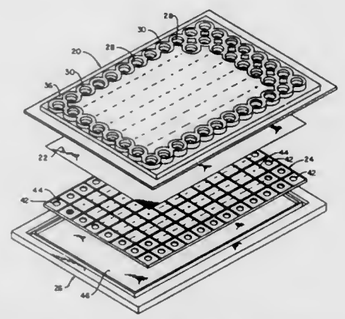
## MULTIWELL TEST PLATE

**Roy Manns, Belmont, Mass., assignor to Polyfiltronics, Inc., Rockland, Mass.**

**Division of Ser. No. 745,877, Jun. 18, 1985, Pat. No. 4,948,442. This application May 30, 1990, Ser. No. 530,913**

**Int. Cl.[5] C12M** *1/12, 1/20*

**U.S. Cl. 422—101** **8 Claims**



1. Filtration apparatus comprising, in combination:

a substantially flat, thermoplastic culture tray having at least one well therein extending between open ends on opposite flat surfaces of said tray;

a substantially flat, thermoplastic harvester tray having at least one opening therethrough, said harvester tray being disposed with respect to said culture tray so that each said opening is adjacent and registered with each said well;

filtration means extending across each said opening; and

barrier means formed as a fluid-impervious wall circumscribing and joining together the peripheries of each registered well and opening, said wall being formed of the thermoplastic material of said trays.

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5,047,216

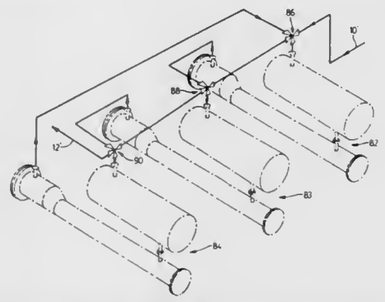
## APPARATUS FOR RECOVERING ELEMENTAL SULPHUR

**David W. McDougall, Calgary, Canada, assignor to Delta Projects Inc., Calgary, Canada**

**Filed Feb. 22, 1988, Ser. No. 158,527**

**Int. Cl.[5] C01B** *17/04*

**U.S. Cl. 422—160** **4 Claims**



1. Apparatus for recovering elemental sulphur by the subdewpoint Claus process, comprising:

at least two Claus catalytic converter and condenser sets, each set comprising a converter containing a catalyst and a condenser, each set having an inlet connection to the converter and an outlet connection from the condenser;

in association with each said converter and condenser set, a respective two-position four-way switching valve having two inlets and two outlets and providing two mutually isolated flow paths between said switching valve inlets and outlets, each said valve being switchable between a first position in which each inlet is connected to a defined one of said outlets, and a second position in which the connections between the inlets and outlets are reversed;

inlet means for a hydrogen sulphide-containing gas stream from which elemental sulphur is to be recovered, said stream being at a consistently high temperature sufficient to vapourize sulphur condensed on said catalysts, for re-generation of the catalysts, said inlet means being coupled with a first inlet of a first one of said switching valves, a first outlet of a second one of said switching valves communicating with exhaust means; and,

piping coupling said converter and condenser sets and valves so that said first valve can be set to deliver gas selectively through either one of its outlets to the inlet connection of a selected one of said converter and condenser sets, the converter catalyst of which is to be regenerated by said high temperature gas stream, while the second valve can be set to receive gas selectively through either of its inlets from the outlet connection of either of the converter and condenser sets, and to deliver gas through said first outlet of said second switching valve to said exhaust means or through the other of its outlets to the second inlet of said first valve;

whereby, with each said valve set to a respective defined one of said first and second positions, said gas stream is delivered to a first one of the converter and condenser sets for regenerating the catalyst in the converter and is subsequently delivered to a second said set for recovery of elemental sulphur, and with each said valve set to the other position, gas circulation through the said converter and condenser set is reversed with no stagnant gas being allowed to accumulate within the apparatus.

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5,047,217

## REACTOR WITH INTERNAL HEAT CONTROL BY HOLLOW HEAT EXCHANGER PLATES

**Quang Dang Vu, Neuilly; Roland Huin, Montesson, and Jean-Paul Euzen, Dardilly, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed Dec. 22, 1988, Ser. No. 288,365**

**Claims priority, application France, Dec. 23, 1987, 87 18204**

**Int. Cl.[5] B01J** *8/02;* **F28D** *9/00*

**U.S. Cl. 422—200** **23 Claims**

1. An apparatus comprising a substantially cylindrical reactor having a substantially circular cross section, a central axis, an upper part, and a lower part, and said reactor is in fluid communication with, a first duct for the introduction of a heat-carrying fluid, a second duct for removal of heat-carrying fluid, at least one duct for introduction of a charge into said reactor and at least one duct for removal of reaction effluent from said reactor, further comprising:

a) a central distributor manifold, whose longitudinal axis corresponds to the axis of said reactor, which is situated in the upper part of the reactor and is in fluid communication with said first duct,

b) a plurality of distributor manifolds, each having an axis perpendicular to the axis of said reactor, said plurality of distributor manifolds being individually in fluid communication with said central distributor manifold,

c) a central receiver manifold, whose longitudinal axis corresponds to the axis of said reactor, which is situated in the lower part of said reactor and is in fluid communication with said second duct,

d) a plurality of receiver manifolds, each having an axis perpendicular to the axis of said reactor, said plurality of

receiver manifolds being individually in fluid communication with said central receiver manifold,

e) a plurality of hollow plates, continuous and elongate, for the flow of heat-carrying fluid, each of said plates com-



prising an inlet means in fluid communication with one of said distributor manifolds and an outlet means in fluid communication with one of said receiver manifolds and each of said plates being disposed radially with respect to the axis of said reactor.

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**5,047,218**

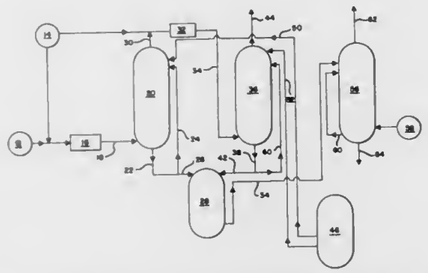
**SWEETENING OF SULFUR-CONTAINING GASES USING OZONE**

**Pedro C. Ortega, Los Teques; Dino V. Brunasso, Anzoategui, and Luis M. Cabrera V., Los Teques Edo. Hiranda, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela**

**Filed Dec. 30, 1988, Ser. No. 292,234**

**Int. Cl.**[5] **C01B** *17/16, 31/20, 17/00;* **C01C** *1/24*

**U.S. Cl. 423—224** **19 Claims**



1. A process for removing hydrogen sulfide from a gas stream containing such compound which comprises the steps of:

commingling said gas stream with ozone in an amount sufficient to oxidize in gaseous in gaseous phase at least a portion of the hydrogen sulfide present to a sulfur oxide and to produce a sulfur oxide-enriched gas stream; and

contacting the sulfur oxide-enriched gas stream with an aqueous liquid scrubbing composition for a time period sufficient to decrease sulfur oxide concentration in said sulfur oxide-enriched gas stream and to increase sulfate ion concentration in the scrubbing composition and thereafter recorvering a sulfate-containing compound from said scrubbing composition.

**5,047,219**

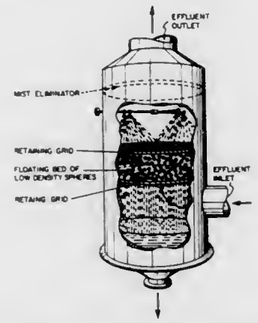
**HYBRID PROCESS FOR NITROGEN OXIDES REDUCTION**

**W. Robert Epperly, New Canaan, and Barry N. Sprague, Bethlehem, both of Conn., assignors to Fuel Tech, Inc., Rowayton, Conn.**

**Filed Aug. 18, 1989, Ser. No. 395,810**

**Int. Cl.**[5] **C01B** *21/00*

**U.S. Cl. 423—235** **15 Claims**




1. A process for reducing the nitrogen oxide concentration in the effluent from the combustion of a carbonaceous fuel, the process comprising:

a) introducing into the effluent a first treatment agent comprising a nitrogenous composition selected from the group consisting of urea, ammonia, hexamethylenetetramine, ammonium salts of organic acids, 5- or 6-membered heterocyclic hydrocarbons having at least one cyclic nitrogen, hydroxy amino hydrocarbons, $NH_4$-lignosulfonate, furfurylamine, tetrahydrofurylamine, hexamethylenediamine, barbituric acid, guanidine, guanidine carbonate, biguanidine, guanylurea sulfate, melamine, dicyandiamide, biuret, 1,1'-azobisformamide, methylol urea, methylol urea-urea condensation product, dimethylol urea, methyl urea, dimethyl urea, calcium cyanamide, and mixtures thereof under conditions effective to reduce the nitrogen oxides concentration and ensure the presence of ammonia in the effluent;

b) introducing into the effluent a second treatment agent comprising an oxygenated hydrocarbon at an effluent temperature of about 500° F. to about 1600° F. under conditions effective to oxidize nitric oxide in the effluent to nitrogen dioxide and ensure the presence of ammonia at a weight ratio of ammonia to nitrogen dioxide of about 1:5 to about 5:1, and

c) contacting the effluent with an aqueous scrubbing solution having a pH of 12 or lower under conditions effective to cause nitrogen dioxide to be absorbed therein.

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**5,047,220**

**CATALYTIC DENITRIFICATION CONTROL PROCESS AND SYSTEM FOR COMBUSTION FLUE GASES**

**John Polcer, Brookside, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.**

**Filed Mar. 27, 1989, Ser. No. 329,143**

**Int. Cl.**[5] **B01J** *8/00;* **C01B** *21/00;* **G01N** *21/00*

**U.S. Cl. 423—239** **11 Claims**

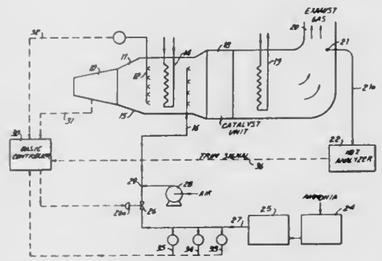
1. A process for controlling the catalytic denitrification of flue gases by ammonia addition to the flue gas, said process comprising:

(a) withdrawing from a combustion process a flue gas stream containing at least about 20 volume parts $NO_x$ per million of flue gas, and controllably adding ammonia gas to said flue gas stream;

(b) passing the flue gas and ammonia mixture through a catalytic denitrification unit containing a denitrification catalyst material and reducing the $NO_x$ concentration in the flue gas;

(c) obtaining a control signal based on process parameter signals including the volume flow rate of said flue gas, and determining the quantity of ammonia initially added to the flue gas so that it is less than the amount theoretically required to reduce all of the $NO_x$ in the flue gas;






(d) obtaining a trim signal based on comparing the $NO_x$ concentration measured in the flue gas downstream of the catalytic dentrification unit and a desired $NO_x$ concentration; and

(e) providing additional ammonia injection based on the trim signal by adjusting the ammonia addition flow rate as needed to provide the desired reduced $NO_x$ concentration in the flue gas being emitted to the atmosphere and to avoid excess ammonia injection and system oscillation.

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**5,047,221**

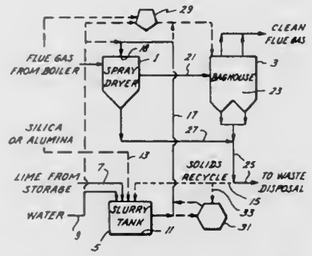
**PROCESSES FOR REMOVING SULFUR FROM SULFUR-CONTAINING GASES**

**Wojciech Jozewicz, Chapel Hill; John C. S. Chang, Cary; Charles B. Sedman, Hillsborough; Theodore G. Brna, Cary, all of N.C., and Gary T. Rochelle, Austin, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.**

**Continuation of Ser. No. 163,864, Mar. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 928,537, Nov. 7, 1986, Pat. No. 4,804,521, and Ser. No. 930,171, Nov. 10, 1986, abandoned. This application Jan. 22, 1990, Ser. No. 469,804 The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.**

**Int. Cl.**[5] **G01B** *17/00;* **B01J** *8/00*

**U.S. Cl. 423—242** **18 Claims**




1. A process for reducing the level of sulfur dioxide in a sulfur dioxide-containing gas, comprising the steps of:

(a) preparing an aqueous slurry comprising a calcium alkali together with a calcium-reactive silica or alumina which are present in amounts sufficient to allow for the formation of a sulfur dioxide-absorbing component which includes a calcium silicate or calcium aluminate;

(b) heating the slurry to a temperature between about 120° and 180° C. to facilitate in the formation of the sulfur dioxide-absorbing component;

(c) contacting the gas with the slurry in a manner sufficient to allow for the absorption of sulfur dioxide by the absorbing component; and

(d) separating the absorbing component in the form of spent solids from the gas.

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**5,047,222**

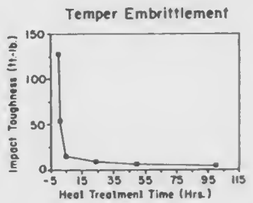
**PROCESS FOR REMOVING SULFUR FROM SULFUR-CONTAINING GASES: HIGH CALCIUM FLY-ASH**

**Gary T. Rochelle, Austin, Tex., and John C. S. Chang, Cary, N.C., assignors to Board of Regents, The University of Texas System, Austin, Tex.**

**Continuation of Ser. No. 156,856, Feb. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 939,171, Nov. 10, 1986, abandoned, and Ser. No. 928,337, Nov. 17, 1986, Pat. No. 4,804,521. This application Dec. 8, 1989, Ser. No. 449,089 The portion of this patent subsequent to Feb. 14, 2006, has been disclaimed.**

**Int. Cl.**[5] **B01J** *8/00;* **C01B** *17/00*

**U.S. Cl. 423—242** **18 Claims**




1. A process for reducing the level of sulfur dioxide in a sulfur dioxide-containing gas, comprising the steps of:

(a) preparing an aqueous slurry comprising a calcium alkali together with a calcium-reactive silica or alumina, the calcium alkali and calcium-reactive silica or alumina being introduced into the slurry in a form consisting essentially of a high clacium fly ash, which are present in amounts sufficient to allow for the formation of a sulfur dioxide-absorbing component which includes a calcium silicate or calcium aluminate;

(b) heating the slurry to a temperature between about 50° and 200° C. for between about 0.1 and about 24 hours to faciliate in the formation of the sulfur dioxide-absorbing component;

(c) contacting the gas with the slurry in a manner sufficient to allow for the absorption of sulfur dioxide by the absorbing component; and

(d) separating the absorbing component in the form of spent solids from the gas.

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**5,047,223**

**SEPARATION OF PHOSPHORIC ACID FROM AQUEOUS SOLUTIONS OF THIAMINE PHOSPHATES**

**Wolfgang Schul, Ludwigshafen, and Joachim Paust, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Feb. 9, 1990, Ser. No. 477,476**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906633**

**Int. Cl.**[5] **C01B** *25/16;* **C07D** *239/02, 415/00*

**U.S. Cl. 423—321 S** **5 Claims**

1. A process for separating phosphoric acid from aqueous solutions of thiamine phosphates which are obtained in the phosphorylation of thiamine, with or without subsequent partial hydrolysis, wherein the phosphoric acid is converted with a virtually water-insoluble or only slightly water-soluble ter-

tiary amine selected from the group consisting of an aliphatic or aliphatic-cycloaliphatic tertiary amine of 8 to 40 carbon atoms and an aliphatic-araliphatic tertiary amine of 9 to 36 carbon atoms into the corresponding salt and the latter is extracted with a virtually water-immiscible or only slightly water-miscible solvent of moderate polarity selected from the group consistin of an aliphatic or cycloaliphatic alcohol of 4 to 8 carbon atoms, an ether of 4 to 12 carbon atoms, a ketone of 5 to 8 carbons atoms and a hydrocarbon of 6 to 10 carbon atoms.

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**5,047,224**

## METHOD FOR TREATING ORGANIC WASTE MATERIAL AND AN OXIDATION CATALYST/COCATALYST COMPOSITION USEFUL THEREFOR

**Patrick M. Dhooge, Corrales, N. Mex., assignor to Delphi Research, Inc., Albuquerque, N. Mex.**

**Continuation-in-part of Ser. No. 253,232, Oct. 4, 1988, Pat. No. 4,925,540. This application Aug. 18, 1989, Ser. No. 395,649**

**Int. Cl.[5] C01B** *31/20*

**U.S. Cl. 423—437** **21 Claims**

1. A catalyst composition which comprises, in combination:
a) organics oxidation catalyst iron (III)/iron (II),
b) iron (II) oxidation catalyst copper (II)/copper (I), and
c) homogeneous cocatalyst.

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**5,047,225**

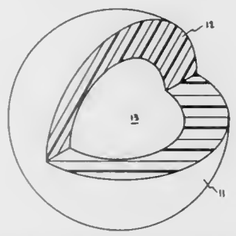
## LOW DENSITY CARBONIZED COMPOSITE FOAMS

**Fung-Ming Kong, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Division of Ser. No. 447,478, Dec. 7, 1989, Pat. No. 4,992,254. This application Mar. 14, 1990, Ser. No. 493,534**

**Int. Cl.[5] D01F** *9/12*; **G21C** *15/00, 13/00*

**U.S. Cl. 423—447.2** **7 Claims**




1. A low density carbonized polystyrene-resorcinol-formaldehyde composite foam prepared by a process comprising:
(A) preparing an inverse emulsion of a styrene monomer in water:
(B) polymerizing said styrene monomer to produce a foam;
(C) filling said foam with an aqueous resorcinol-formaldehyde solution in an amount sufficent to substantially occupy the cells of said foam;
(D) curing said resorcinol-formaldehyde in said solution to form a gel; and
(E) heating said resorcinol-formaldehyde gel filled polystyrene foam to a temperature sufficient to carbonize said foam, whereby a foam having a density less than about 50 $mg/cm^3$ and interlinked cells of a diameter no greater than about 1 $\mu m$ is produced.

**5,047,226**

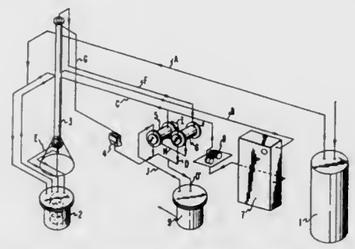
## PROCESS FOR THE REMOVAL OF ARSENIC IN THE MANUFACTURE OF HYDROFLUORIC ACID

**Raul B. Schon, Colonia Granada, Mexico, assignor to Fluorex, S.A. DE C.V., Mexico**

**Continuation of Ser. No. 282,649, Dec. 12, 1988, abandoned. This application Dec. 12, 1989, Ser. No. 449,446**

**Int. Cl.[5] C01B** *7/19*

**U.S. Cl. 423—484** **4 Claims**



1. A process for purifying hydrofluoric acid which comprises the following steps: input of distilled hydrofluoric acid, which contains arsenic, into a reactor and cooling to a temperature below room temperature; oxidation while stirring of the arsenic contained in the hydrofluoric acid in the form of arsenic trifluoride using potassium permanganate as the oxidation agent in the presence of a stoichiometric surplus of potassium ions coming from potassium bifluoride, wherein first the potassium bifluoride and then the potassium permanganate are added to cause the oxidation reaction, in order to obtain the heptafluoride of arsenic and potassium; halting the cooling of the reaction mixture while continuing the stirring for a period of from 1 to 24 hours, permitting the mixture to remain quiescent to permit deposition; and finally distilling the hydrofluoric acid at a temperature below reflux conditions, whereupon the heptafluoride of arsenic and potassium formed during the oxidation reaction is removed from the hydrofluoric acid.

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**5,047,227**

## NOVEL AND IMPROVED ANTIBODIES FOR SITE SPECIFIC ATTACHMENT OF COMPOUNDS

**John D. Rodwell, Yardley; Thomas J. McKearn, New Hope, both of Pa., and Cynthia G. Long, Skillman, N.J., assignors to Cytogen Corporation, Princeton, N.J.**

**Continuation of Ser. No. 153,175, Feb. 8, 1988, abandoned. This application Feb. 4, 1991, Ser. No. 650,363**

**Int. Cl.[5] A61K** *49/02, 39/44*

**U.S. Cl. 424—1.1** **16 Claims**

1. A method for treating a cellular disorder, comprising: administering to an animal or a human a therapeutically effective amount of an aqueous soluble antibody-compound conjugate which comprises a compound attached via a covalent bond to an oxidized carbohydrate moiety of a high-mannose containing antibody or antibody fragment, in which the oxidized carbohydrate moiety is not part of nor directly involved with the antigen binding site of the antibody or antibody fragment, to form an antibody-compound conjugate being characterized by substantially the same immunospecificity as the unconjugated antibody or antibody fragment and which is immunoreactive with and immunospecific for a target site associated with the cellular disorder and substantially non-immunoreactive with and non-immunospecific for tissue not associated with the cellular disorder.



**5,047,228**

## NONIONIC 5-C-SUBSTITUTED 2,4,6-TRIIODOISOPHTHALIC ACID DERIVATIVES

**Heinz Gries; Heinrich Pfeiffer; Ulrich Speck, and Wolfgang Mutzel, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

**Continuation of Ser. No. 60,278, Jun. 10, 1987, abandoned, which is a continuation of Ser. No. 855,557, Apr. 25, 1986, abandoned, which is a continuation of Ser. No. 655,669, Sep. 28, 1984, abandoned, which is a continuation of Ser. No. 223,619, Jan. 9, 1981, abandoned. This application Mar. 2, 1989, Ser. No. 318,454**

**Claims priority, application Fed. Rep. of Germany, Jan. 11, 1980, 3001292**

**Int. Cl.[5] A61K** *49/04*

**U.S. Cl. 424—5** **15 Claims**

1. 2,4,6-Triiodobenzene-1,3,5-tricarboxylic acid tris(2,3-dihydroxypropyl-N-methylamide).
2. 2,4,6-Triiodobenzene-1,3,5-tricarboxylic acid tris[bis(2-hydroxyethyl)]triamide.
3. 5-N-Methylcarbamoyl-2,4,6-triiodiosophthalic acid bis(2,3-dihydroxy-1-hydroxymethylpropyl)diamide.

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**5,047,229**

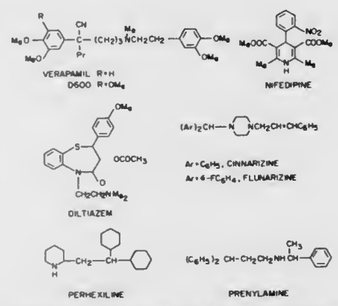
## TREATMENT OF CARDIOVASCULAR AND CEREBRAL TOXICITY USING CALCIUM MODULATORS

**Gabriel G. Nahas, Englewood, N.J., and Renaud Trouve, Maisons Alfort, France, assignors to Miles, Inc., Elkhart, Ind.**

**Filed Dec. 17, 1986, Ser. No. 943,639**

**Int. Cl.[5] A61K** *49/00*

**U.S. Cl. 424—10** **12 Claims**




1. A method for treating cardiovascular toxicity induced by a tricyclic antidepressant that induces a toxic effect by altering the normal interaction of neurotransmitters with the calcium ion metabolism of myocardial cells, comprising administering to a host intoxicated with the toxic material a compound which inhibits constriction of arteries in vitro in the presence of a neurotransmitter in an amount effective to treat the toxicity.

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**5,047,230**

## AEROSOL COMPOSITION COMPRISING NITROGLYCERIN AS ACTIVE INGREDIENT

**Margit Nagy; József Kenderfi; Frigyes Görgényi; Margit Csörgo; Lidia Fedina, all of Budapest; Antal Mosonyi; Sándor Vajas, both of Körmend, and Attila Mándi, Budapest, all of Hungary, assignors to EGIS Gyogyszergyar, Budapest, Hungary**

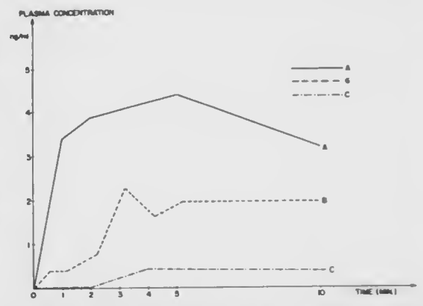
**Filed Jul. 7, 1989, Ser. No. 376,678**

**Claims priority, application Hungary, Jul. 8, 1988, 3585/88**

**Int. Cl.[5] A61L** *9/04*

**U.S. Cl. 424—45** **13 Claims**

1. An aerosol composition free of propellant gas which comprises
0.1 to 4% oy weight of nitroglycerin,
51 to 90% by weight of a $C_{2-4}$ aliphatic alcohol (component A), and
10 to 49% by weight of a polyalkyleneglycol containing 2 or 3 carbon atoms in the alkylene moiety (component $B_1$)




and/or a $C_{2-8}$ alcohol containing two or three hydroxyl groups (component $B_2$)
optionally together with one or more pharmaceutically acceptable carriers and/or diluents.

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**5,047,231**

## RAW HIDE CONTAINING AN INORGANIC PYROPHOSPHATE

**Henry C. Spanier, West Milford; Lorna C. Staples, Teaneck, and Felice Scaglione, Hasbrouck Heights, all of N.J., assignors to Nabisco Brands, Inc., Parisppany, N.J.**

**Filed May 30, 1989, Ser. No. 358,175**

**The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.**

**Int. Cl.[5] A61K** *7/16*

**U.S. Cl. 424—57** **5 Claims**

1. Process for the prevention of tartar accumulation on the teeth of a dentulous dog, comprising chewing or eating by the dog of a tarter inhibiting amount of raw hide which contains an effective antitartar amount of at least one alkali metal inorganic pyrophosphate, the amount of said at least one alkali metal inorganic pyrophosphate being sufficient to deliver from about 0.1 to about 5 weight percent, based on the total weight of the raw hide containing at least one alkali metal inorganic pyrophosphate, of $P_2O_7$ said at least one alkali metal inorganic pyrophosphate being water soluble, the raw hide containing at least one alkali metal inorganic pyrophosphate being slightly acid to near neutral, and the raw hide containing at least one alkali metal inorganic pyrophosphate being chewable, tough and flexible.

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**5,047,232**

## NON-AQUEOUS WATERPROOF OIL-BASED COMPOSITIONS AND METHOD OF PREPARING SAME

**Carl Kaplan, Memphis, Tenn., assignor to Schering-Plough Healthcare Products, Inc., Memphis, Tenn.**

**Filed Sep. 29, 1986, Ser. No. 913,172**

**Int. Cl.[5] A61K** *7/42, 7/44, 7/48, 9/07*

**U.S. Cl. 424—59** **12 Claims**

1. A non-aqueous waterproof oil-based topical sunscreen composition comprising about 1 to about 5 weight percent of one or more water-in-oil emulsifiers having an HLB value of about 1 to about 7, at least one cosmetic emollient, and a sunscreening effective amount of a sunscreening agent.

VOL 1130 ISS 2 SE 10 1991 UMI



5,047,233

## HAIR-WAVING PROCESS

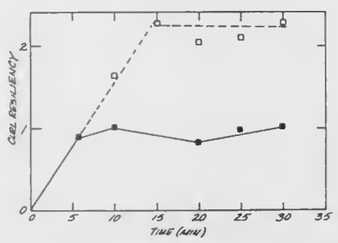
Roger A. Mathews, Newbury Park; Edward R. Moore, Canoga Park, and David W. Cannell, Los Angeles, all of Calif., assignors to Redken Laboratories, Inc., Canoga Park, Calif.

Continuation of Ser. No. 767,500, Aug. 20, 1985, Pat. No. 4,840,791, which is a continuation of Ser. No. 577,169, Feb. 6, 1984, abandoned. This application Apr. 25, 1989, Ser. No. 343,003

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[5] A61K *7/09;* A45D *7/04*

U.S. Cl. 424—72 6 Claims




1. In a process for the permanent waving of hair in which washed hair wound on a mandrel is subjected to the action of at least one mercaptan reducing agent capable of cystine cleavage and contained in a reactive waving solution applied to achieve cystine cleavage, and the step of applying an oxidizing agent to the hair after rinsing the hair, to reform the cystine bonds, the improvement which comprises:

(a) allowing the applied reactive solution to remain in contact with the hair for a time sufficient to achieve substantially maximum cystine bond cleavage and prior to rinsing the hair;

(b) blotting the mandrel-wound hair to remove reactive waving solution from the hair leaving a remainder to maintain the level of cleaved cystine bonds; then

(c) applying to the hair containing the remainder of reactive waving solution a protein-flow solution and allowing the applied protein-flow solution to contact the hair for a period of time sufficient to induce protein flow in the hair to a desired curl configuration followed by rinsing of the hair and application of the oxidizing agent to reestablish the cystine bonds to fix the curl, said protein-flow solution being an aqueous solution having a pH from about 2 to about 10 and comprising an aqueous solution of at least one protein-flow agent selected from the group consisting of a salt of a polyvalent ion selected from Mg++ and Ca++ and present in an amount up to solution saturation, a water-soluble hydroxyorganic compound containing up to about 4 carbon atoms and at least one hydroxyl group present in a concentration of from about 2 to about 2.0 percent by weight of solution and mixtures thereof.

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5,047,234

## AIR FRESHENER COMPOSITION

Lyndel D. Dickerson, Centerville; John A. Ferguson, and Donald Cashman, both of Cincinnati, all of Ohio, assignors to Drackett Company, Cincinnati, Ohio

Filed Aug. 23, 1989, Ser. No. 397,806

Int. Cl.[5] A61L *9/015, 9/04, 9/12*

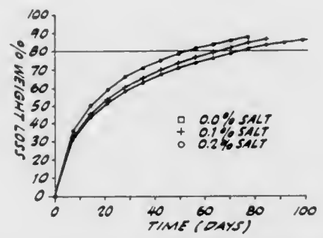
U.S. Cl. 424—76.2 18 Claims

1. An aqueous air freshener composition consisting essentially of:

(a) about 1 to about 20 wt. % of a fragrance component,

(b) about 2 to about 15 wt. % of an emulsifier,

(c) about 0.01 to about 0.5 wt. % of at least one weight loss inhibitor which is an alkali metal or alkaline earth metal halide, sulfate, nirate, carbonate, bicarbonate or phosphate, and




(d) about 3 to about 15 wt. % of a monohydric alcohol having 2 to about 12 carbon atoms.

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5,047,235

## PHARMACEUTICAL PREPARATIONS HAVING AN ANTIHYPERTENSIVE AND CARDIOPROTECTIVE EFFECT

Klaus Lossnitzer, Bad Kissingen; Karl-Friedrich Ober, Darmstadt; Gerhard Giebenhain, Muhltal; Gerhard Zeiss, Gross-Gerau, and Karl-Dieter Volger, Bickenbach, all of Fed. Rep. of Germany, assignors to Rohm-Pharma GmbH, Weiterstadt, Fed. Rep. of Germany

Continuation of Ser. No. 860,235, May 6, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 251,921

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517820

Int. Cl.[5] A61K *31/79, 31/54*

U.S. Cl. 424—80 10 Claims

1. A composition, comprising:

(i) α-isopropyl-α-[(N-methyl-N-homoveratryl)-γ-aminopropyl]-3,4-dimethoxyphenyl-acetonitrile, or a pharmacologically acceptable salt thereof;

(ii) 2,4,7-triamino-6-phenylpteridine, or a pharmacologically acceptable salt thereof; and

(iii) 6-chloro-3,4-dihydro-7-sulfamoyl-2H-1,2,4-benzothiadiazine-1,1-dioxide, or a pharmacologically acceptable salt thereof;

wherein (i), (ii) and (iii) are present together in a weight ratio of about 16:5:2.5.

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5,047,236

## METHOD OF TREATING STROKE

Robert L. Hunter, Tucker, Ga., assignor to Emory University, Atlanta, Ga.

Continuation of Ser. No. 403,017, Sep. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 303,791, Jan. 30, 1989, abandoned, which is a division of Ser. No. 45,459, May 7, 1987, Pat. No. 4,801,452, which is a continuation-in-part of Ser. No. 43,888, Apr. 29, 1987, which is a continuation of Ser. No. 863,582, May 15, 1986, abandoned. This application May 11, 1990, Ser. No. 522,297

Int. Cl.[5] L61K *31/475*

U.S. Cl. 424—83 9 Claims

1. A method for treating stroke in a human or animal comprising the step of injecting into the human or animal with the stroke a solution with an effective concentration of a surface-active copolymer with the following general formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein a is an integer such that the hydrophobe represented by $(C_3H_6O)$ has a molecular weight of between approximately 950 to 4000, and b is an integer such that the hydrophile portion represented by $(C_2H_4O)$ constitutes between approximately 50% to 90% by weight of the copolymer.



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5,047,237

## ATTENUATED PSEUDORABIES VIRUS HAVING A DELETION OF AT LEAST A PORTION OF A GENE ENCODING AN ANTIGENIC, NONESSENTIAL PROTEIN, VACCINE CONTAINING SAME AND METHODS OF IDENTIFYING ANIMALS VACCINATED WITH THE VACCINE

Mark D. Cochran, Carlsbad, Calif., assignor to PruTech Research and Development Partnership, San Jose, Calif.

Continuation of Ser. No. 887,140, Jul. 17, 1986, which is a continuation-in-part of Ser. No. 773,430, Sep. 6, 1985, Pat. No. 4,877,737, and a continuation-in-part of Ser. No. 823,102, Jan. 27, 1986. This application May 11, 1988, Ser. No. 192,866

Int. Cl.[5] A61K *39/245;* G01N *33/543;* C12N *15/38, 15/86*

U.S. Cl. 424—89 7 Claims

1. A vaccine which comprises an effective immunizing amount of an attenuated pseudorabies virus designated S-PRV-013 (ATCC Accession No. VR 2120) and a suitable carrier.

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5,047,238

## ADJUVANTS FOR VACCINES

William M. Acree; Bobby Edwards, both of Fort Dodge, Iowa, and John W. Black, Milton, Tenn., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 821,193, Jan. 22, 1986, abandoned, which is a division of Ser. No. 618,638, Jun. 7, 1984, Pat. No. 4,567,042, which is a continuation-in-part of Ser. No. 504,434, Jun. 15, 1983, Pat. No. 4,567,043. This application Mar. 24, 1988, Ser. No. 173,202

Int. Cl.[5] A61K *37/00, 31/74*

U.S. Cl. 424—89 15 Claims

1. A veterinary vaccine composition comprising viral antigen, a pharmaceutically acceptable carrier, and added to the antigen, an adjuvant which is at least one member selected from the group consisting of linear ethylene maleic anhydride copolymer and an uncoalesced acrylic copolymer.

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5,047,239

## BIOLOGICAL CONTROL OF FRUIT ROT

P. Lawrence Pusey, Warner Robins, Ga., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 98,167, Sep. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 797,538, Nov. 13, 1985, Pat. No. 4,764,371, which is a continuation-in-part of Ser. No. 606,069, May 1, 1984, abandoned. This application Aug. 11, 1989, Ser. No. 393,010

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.[5] C12N *1/20*

U.S. Cl. 424—93 5 Claims

1. A method of inhibiting brown rot on peaches comprising applying *Bacillus subtilis* B-3 to preharvest peaches in an amount to effectively inhibit said brown rot.

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5,047,240

## METHOD FOR PRODUCING A PROTEOLYTIC COMPLEX STIMULATING THE ACTIVITY OF THE PANCREAS AND ITS APPLICATION IN ZOOTECHNY

Michel Hooreman, 10, rue du Delta, F-75009 Paris, France

PCT No. PCT/FR87/00233, § 371 Date Apr. 18, 1988, § 102(e) Date Apr. 18, 1988, PCT Pub. No. WO87/07905, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 19, 1987, Ser. No. 187,540

Int. Cl.[5] A61K *37/54;* C12N *9/52;* A23K *1/165*

U.S. Cl. 424—94.63 11 Claims

1. A process for producing an enzymatic complex by fermentation of a strain of *Streptomyces fradiae* which consists in keeping the pH value within the range of from 7.0 to 7.5 during the culture by adding an inorganic acid or organic acid solution, separating the broth from the mycelium by filtration with a clarifying agent, and fractionating the resulting filtrate by ultrafiltration with a membrane having a cutting threshold corresponding to a molecular weight within the range of from 2,000 to 12,000 and finally atomizing this enzymatic mixture to obtain a proteolytic complex consisting essentially of proteases of type II, III, and IV, in which at least 40% of the proteolytic activity is afforded by protease of type II, and in which the proteases of type III and IV each give at the most 30% of the total proteolytic activity.

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5,047,241

## TRIS-KRINGLE PLASMINOGEN ACTIVATOR WITH NOVEL K2 INSERT

Paul P. Hung, Bryn Mawr; Narender K. Kalyan, Phoenixville, and Shawguang L. Lee, Villanova, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 884,835, Jul. 11, 1986, Pat. No. 4,916,071. This application Dec. 31, 1987, Ser. No. 140,068

Int. Cl.[5] A61K *37/547;* C12N *9/64*

U.S. Cl. 424—94.64 6 Claims

1. A tris-kringle tissue plasminogen activator comprising the amino acid sequence of human t-PA modified in by insertion of K between amino acids 91 and 92 of human t-PA which K is K2 or K2 modified at position 186 by Ala substitution for Ser to prevent glycosylation, where K2 is the second kringle of human t-PA.

6. A pharmaceutical composition comprising a blood clot disrupting amount of a tris-kringle tissue plasminogen activator comprising the amino acid sequence of human t-PA modified by insertion of K between amino acids 91 and 92 of human t-PA in which K is K2 or K2 modified at position 186 by Ala substitution for Ser to prevent glycosylation, where K2 is the second kringle of human t-PA and a pharmaceutically acceptable carrier.

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5,047,242

## AZADIRACHTIN DERIVATIVE INSECTICIDES

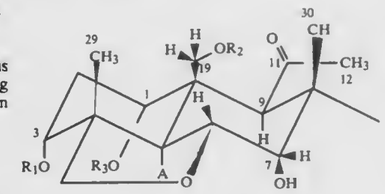
James A. Klocke, Salt Lake City, Utah; S. Mark Lee, Elkgrove, Calif., and Ronald B. Yamasaki, Salt Lake City, Utah, assignors to Native Plant Institute ("NPI"), Salt Lake City, Utah

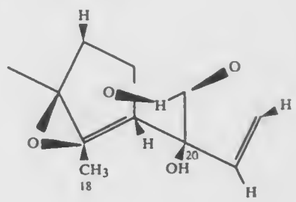
Continuation-in-part of Ser. No. 21,807, Mar. 4, 1987. This application Oct. 13, 1987, Ser. No. 72,892

Int. Cl.[5] A01N *65/00, 43/16, 25/00;* A61K *35/78*

U.S. Cl. 424—195.1 26 Claims

1. A substantially pure compound of the formula



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wherein $R_1$ is H or acetyl, $R_3$ is H or acetyl and $R_3$ is a lipophilic group.

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5,047,243
**CARRIER GRANULES CONTAINING LIQUID ACTIVE COMPOUNDS**

**Elmar Aotfang, Monheim; Dimitrios Kerimis, Cologne, and Rolf-Jürgen Singer, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 5, 1990, Ser. No. 461,208**
**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1989, 3901273**
**Int. Cl.[5] A01N** *25/34*
**U.S. Cl. 424—408** **10 Claims**

1. Carrier granules having an average particle diameter from 0.1 to 3 mm and containing liquid active compounds by weight comprising approximately
   a) 50 to 99.5% of carrier granules having a nonabsorptive surface,
   b) 0.1 to 20% of at least one liquid phosphoric acid derivative as active compound, and
   c) 0.1 to 4% of at least one adhesive based on polyurethane as a binder, optionally mixed with a further adhesive selected from the group consisting of polyvinyl acetate, polyvinylpyrrolidine, polyvinyl alcohol, copolymers of vinyl acetate/di-n-butyl maleate, acrylic acid ester, vinyl acetate/ethylene, vinyl acetate/ethylene/vinyl chloride, vinyl acetate/acrylic acid ester, vinyl acetate/vinyl ester and styrene/acrylic acid ester.

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5,047,244
**MUCOADHESIVE CARRIER FOR DELIVERY OF THERAPEUTICAL AGENT**

**Dilip R. Sanvordeker, Irvine, and Sau-Hung S. Leung, Corona, both of Calif., assignors to Watson Laboratories, Inc., Corona, Calif.**

**Filed Jun. 3, 1988, Ser. No. 202,662**
**Int. Cl.[5] A61F** *13/00;* **A61K** *9/26*
**U.S. Cl. 424—435** **11 Claims**

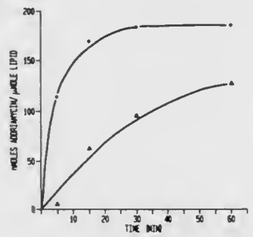



1. A therapeutic dosage form comprising an anhydrous but hydratable monolithic polymer matrix that contains amorphous fumed silica as well as a therapeutic agent and defines a mucoadhesive face, and a water-insoluble barrier layer secured to said polymer matrix and defining a non-adhesive face; said therapeutic agent being dehydroepiandrosterone, said polymer being polyethylene glycol having a number average molecular weight of about 4,000, and the weight ratio of dehydroepiandrosterone to said polyethylene glycol being about 1:4, respectively.

5,047,245
**NOVEL COMPOSITION FOR TARGETING, STORING AND LOADING OF LIPOSOMES**

**Marcel B. Bally; Helen Loughrey, and Pieter R. Gullis, all of Vancouver, Canada, assignors to The Liposome Company, Inc., Princeton, N.J.**

**Division of Ser. No. 941,913, Dec. 15, 1986, Pat. No. 4,805,172, which is a continuation-in-part of Ser. No. 811,037, Dec. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 749,161, Jun. 26, 1985, abandoned, and a continuation-in-part of Ser. No. 759,419, Jul. 26, 1985, Pat. No. 4,880,635. This application Aug. 28, 1989, Ser. No. 399,642**
**Int. Cl.[5] A61K** *37/22;* **B01J** *13/02*
**U.S. Cl. 424—450** **5 Claims**



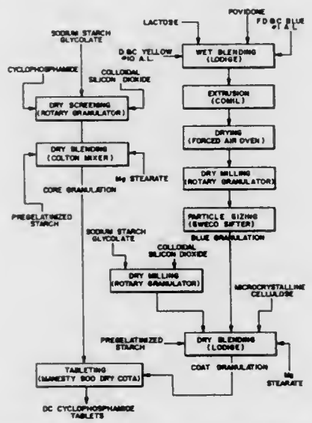

1. A method for loading a streptavidin-coupled liposome with an ionizable bioactive agent, said liposome being surrounded by an external aqueous medium, comprising the steps of:
   (a) producing a transmembrane potential with an orientation which will load the ionizable bioactive agent into the liposome; and
   (b) admixing the ionizable bioactive agent with the liposome in the external aqueous medium.

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5,047,246
**DIRECT COMPRESSION CYCLOPHOSPHAMIDE TABLET**

**Claude E. Gallian, Newburgh, and Charles Williams, Evansville, both of Ind., assignors to Bristol-Myers Company, New York, N.Y.**

**Filed Sep. 9, 1988, Ser. No. 242,849**
**Int. Cl.[5] A61K** *9/30*
**U.S. Cl. 424—464** **14 Claims**




1. A directly compressible pharmaceutical composition



comprising cyclophosphamide and a partially or fully pregelatinized starch.

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5,047,247
**DISPERSIBLE TABLETS OF DIHYDROERGOTOXINE METHANESULFONATE AND OF ACID ADDITION SALTS THEREOF**

**Jenny Milovac; Mateja Kovacic, both of Ljubljana; Zdravko Kopitar, Menges; Janja Urbancic-Smerkolj; Andrej Lenardic, both of Ljubljana; Mirjan Zorz, Grosuplje; Bojan Kofler, Skofja Loka; Angela Vene-Mozina; Vida Nikolic, both of Ljubljana; Marija Lampret, Sentvid pri Sticni, and Breda Meden, Ljubljana, all of Yugoslavia, assignors to LEK, Yugoslavia**

**Filed Sep. 26, 1989, Ser. No. 412,740**
**Claims priority, application Yugoslavia, Sep. 30, 1988, P 1839/88**
**Int. Cl.[5] A61K** *9/20, 9/14, 9/50*
**U.S. Cl. 424—465** **11 Claims**

1. A water-dispersible tablet of dihydroergotoxine methanesulfonate comprising
   0.1 to 4% (w/w) of dihydroergotoxine methanesulfonate as an active ingredient,
   one or more disintegrating agents in an amount from 4 to 60% (w/w) selected from the group consisting of starch, modified starch, formaldehyde casein product, microcrystalline cellulose, cross-linked carboxymethyl cellulose, and cross-linked polyvinyl pyrrolidone,
   an organic acid in an amount of from 0.8 to 10% (w/w) selected from the group consisting of citric acid, tartaric acid and malic acid, and
   0.2 to 2% by weight of butyl hydroxyanisole, as the antioxidizing agent.

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5,047,248
**FORMULATION FOR PREPARING SUSTAINED RELEASE DRUGS FOR ORAL ADMINISTRATION**

**Massimo Calanchi; Leonardo Gentilini; Luigi Mapelli, and Marco Meroni, all of Milan, Italy, assignors to Eurand Italia S.p.A., Milan, Italy**

**Continuation of Ser. No. 114,658, filed as PCT EP87/00124 on Mar. 3, 1987, published as WO87/05212 on Sep. 11, 1987, abandoned. This application Feb. 8, 1989, Ser. No. 308,120**
**Claims priority, application Italy, Mar. 7, 1986, 19675 A/86**
**Int. Cl.[5] A61K** *9/22, 9/52*
**U.S. Cl. 424—485** **9 Claims**

1. Formulation for preparing solid dosage forms having a regular and sustained release, characterized by consisting essentially of an effective amount of a pharmaceutically active substance and 10–80 weight percent of a matrix, being a homogeneous mixture of substances imparting a retard effect, said matrix consisting essentially of 31–100 weight percent of xanthan gum, said pharmaceutically active substance being intimately admixed into said matrix.

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5,047,249
**COMPOSITIONS AND METHODS FOR TREATING SKIN CONDITIONS AND PROMOTING WOUND HEALING**

**John Rothman, Lebanon, N.J., and Philip A. Band, Brooklyn, N.Y., assignors to John Morris Co., Inc., South Plainfield, N.J.**

**Continuation-in-part of Ser. No. 223,167, Jul. 22, 1988, abandoned. This application Mar. 3, 1989, Ser. No. 319,402**
**Int. Cl.[5] A61K** *37/12, 35/14, 35/16*
**U.S. Cl. 424—543** **34 Claims**

1. A method for treating abnormal or damaged conditions of the epithelium, including skin, and ungual tissue comprising applying to the affected area a composition comprising:
   a). about 0.01 to about 12% by weight of a protein containing sufficient cysteinyl groups to covalently bind said protein to said tissue;
   b). about 0.1 to about 15% by weight of a reducing agent capable of reducing cystine to cysteine in said protein;
   c). about 0.001 to about 4.0% by weight of an oxidizing agent capable of oxidizing cysteine to cystine; and
   d). about 81.0% to about 99.889% by weight of at least one component selected from the group consisting of water, acids, bases, buffering agents, emulsifying agents, thickeners, solvents, preservatives, coloring agents and perfuming agents.

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5,047,250
**PROCESS FOR THE PREPARATION OF NEW YEASTS AS FOOD COMPOUNDS FOR FRY**

**Jean-Paul Prieels, Brussels, and Lea Tirtiaux, Bierges, both of Belgium, assignors to Oleofina, S.A., Brussels, Belgium**

**Filed Jun. 18, 1986, Ser. No. 875,143**
**Claims priority, application Luxembourg, Jun. 20, 1985, 85967**
**Int. Cl.[5] A23K** *1/06*
**U.S. Cl. 426—2** **7 Claims**

1. A method of feeding any of fry, shellfish, and mollusks comprising directly feeding to any of said fry, shell fish, and mollusks a dried yeast feed containing active yeast and fish oil, the amount of fish oil not exceeding 20% by weight of dry matter of the dried yeast, said dried yeast formed by homogenizing a mixture of active yeast, water, and fish oil to form a stable emulsion and then drying the resulting emulsion to remove water therefrom and thereby obtaining said dried yeast feed containing said active yeast and said fish oil in a quantity effective to enhance the nutritive value of said dried yeast feed to the fry, shell fish, and mollusks.

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5,047,251
**STABLE PEPPERMINT OIL HAVING REDUCED PULEGONE CONTENT AND METHOD OF PRODUCING THE SAME**

**Jeffrey S. Spencer, Kalamazoo, Mich., assignor to A. M. Todd Company, Kalamazoo, Mich.**

**Division of Ser. No. 234,028, Aug. 18, 1988, Pat. No. 4,861,616. This application May 9, 1989, Ser. No. 349,580**
**Int. Cl.[5] A23L** *1/22;* **C11B** *9/02*
**U.S. Cl. 426—3** **10 Claims**

1. Peppermint oil characterized by a menthofuran content and a pulegone content which is less than 0.5% by weight, and additionally characterized by improved stability against menthofuran oxidation breakdown compared to peppermint oil having a higher pulegone content and also characterized by having increased methone and menthol levels when compared with a peppermint oil having a higher pulegone content.

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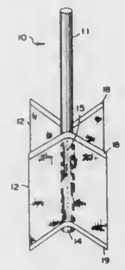
5,047,252
**BEVERAGE INFUSION DEVICE AND METHOD**

**Richard T. Liu, Worthington; Alva D. Oren, Hilliard; Dean F. Rushmore, Marysville, and Donald L. Wetherilt, Powell, all of Ohio, assignors to Nestec S.A., Vevey, Switzerland**

**Continuation-in-part of Ser. No. 313,420, Feb. 22, 1989, abandoned. This application Apr. 17, 1989, Ser. No. 339,447**
**Int. Cl.[5] B65B** *29/04*
**U.S. Cl. 426—79** **13 Claims**

1. A beverage infusion device capable of being inserted in a beverage cup for preparing an individual cup of an infusible beverage which comprises
   a rotatable rigid or semi-rigid shaft dimensioned and configured to be hand held and rotated between the thumb and forefinger of a user and having a length greater than the height of the beverage cup, and
   at least two porous rectangular pouches containing a measured quantity of an infusible beverage material, each of said pouches having a pair of opposing side panels sealed together around the periphery and along the vertical midline of said panels to divide each pouch into a pair of sealed compartments, with the beverage material being distributed substantially equally among the compartments, said pouched being secured to the shaft adjacent a lower

end thereof along the sealed vertical midline of the pouches and spaced equidistant around the periphery of the shaft such that the side panels of the pouches extend radially outwardly from the shaft, said pouches being



dimensioned to fit within a beverage cup and to be freely rotatable therein, the upper end of said shaft, being free of said pouches, extends out of said cup sufficient to be held and rotated by hand when said lower end and said pouches are fully enclosed in said cup.

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**5,047,253**

**MULTILAYER FILM TUBE FOR COOK-IN MEAT ADHESION AND METHOD OF MAKING**

**Roger L. Juhl, Countryside, and Jeffrey M. Schuetz, Woodridge, both of Ill., assignors to Viskase Corporation, Chicago, Ill.**

**Continuation-in-part of Ser. No. 252,409, Oct. 3, 1988, Pat. No. 4,915,963, which is a continuation of Ser. No. 126,336, Nov. 30, 1987, Pat. No. 4,784,863. This application Mar. 5, 1990, Ser. No. 489,393**

**Int. Cl.[5] A22C** *13/00*; **B65B** *55/00*

**U.S. Cl. 426—113** **51 Claims**

1. In a flexible tube formed of multilayer film of at least three layers comprising an inner layer, an oxygen barrier layer with its inner side adhered to the outer side of said inner layer and an outer layer with its inner side adhered to the outer side of said barrier layer, the improvement comprising an inner layer formed of a blend comprising thermoplastic polymer and starch particles substantially uniformly distributed through said inner layer such that the starch at the inside surface of said inner layer is present in quantity of at least about 4 grams/1000 ft.$^2$ inside surface and also present in quantity and particle size so that a portion of said starch particles are proximate said inside surface in visually protruding but not physically penetrating relationship so that said inside surface is randomly uneven, at least said inside surface being oxidized.

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**5,047,254**

**PROCESS FOR THE RECOVERY OF EDIBLE OIL FROM CEREAL PRODUCTS**

**Tung-Ching Lee, 26 Higgins Dr., Kingston, R.I.**

**Continuation of Ser. No. 302,344, Sep. 15, 1981, abandoned, which is a continuation of Ser. No. 97,602, Nov. 26, 1979, abandoned. This application Mar. 14, 1986, Ser. No. 841,009**

**Int. Cl.[5] G11B** *1/04*

**U.S. Cl. 426—417** **8 Claims**

1. A process for the recovery of edible oil from rice bran which comprises

1) subjecting said rice bran simultaneously to a temperature in the range 100°-200° C. and a pressure of at least 500 psi from 5 to 20 seconds in the absence of added moisture so as to produce a pelletized product and

2) subjecting said pelletized product to solvent extraction and separating the miscella formed from the bran.

**5,047,255**

**ACTIVATING MATERIAL COMPOSED MAINLY OF ANIMAL BONE, FLOCCULATING AGENT COMPOSED MAINLY OF THE MATERIAL AND PROCESSES FOR PREPARATION THEREOF**

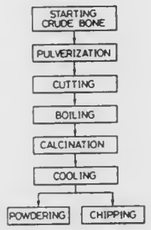
**Sanai Fujita, No. 2256-13 Kitatokorozawa-cho, Tokorozawa-shi, Saitama-ken, Japan**

**Filed Nov. 25, 1988, Ser. No. 276,265**

**Claims priority, application Japan, Apr. 28, 1988, 63-105579; Apr. 28, 1988, 63-105580**

**Int. Cl.[5] C04B** *33/32*

**U.S. Cl. 426—418** **24 Claims**




1. A method of preserving food comprising the steps of:

calcining animal bone to have a water content of less than about 6 percent by weight;

beneficiating said calcined animal bone to a size between about 20 mesh to about 200 mesh; and

disposing the beneficiated calcined animal bone at least adjacent to food to be preserves.

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**5,047,256**

**FLAVORING WITH ALKYL (3-METHYLTHIO)-BUTYRATES**

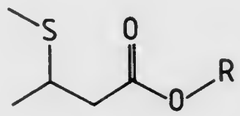
**Arnold Bruijnje; Theo Heideman, both of Huizen, and Hans J. Wille, Bussum, all of Netherlands, assignors to Naarden International N.V., Huizerstraatweg, Netherlands**

**Continuation of Ser. No. 310,953, Feb. 15, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,704**

**Claims priority, application Netherlands, Feb. 26, 1988, 8800502**

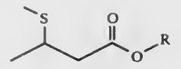
**Int. Cl.[5] A23L** *1/235*

**U.S. Cl. 426—535** **7 Claims**



1. Flavor composition having a fresh red fruit flavor character which comprises an alkyl (3-methylthio)-butyrate having the formula:





in which R is an alkyl group having 4 or 5 carbon atoms.

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**5,047,257**

**SPROUT-DAMAGED WHEAT FLOUR CONTAINING BARLEY ALPHA-AMYLASE INHIBITOR**

**Urszula Zawistowska, Winnipeg Manitoba, Canada, assignor to ABI Biotechnology, Inc., Winnipeg, Canada**

**Division of Ser. No. 207,669, Jun. 16, 1988, Pat. No. 4,910,297. This application Jan. 8, 1990, Ser. No. 461,990**

**Claims priority, application Canada, Jun. 29, 1987, 540780**

**Int. Cl.[5] A21D** *8/04*

**U.S. Cl. 426—622** **9 Claims**

1. A wheat flour composition comprising sprout-damaged wheat flour in admixture with an amount of barley alpha-amylase inhibitor effective to suppress the excessive activity of alpha-amylase II, said inhibitor having the following physical and chemical characteristics:

it is a salt soluble protein with a molecular weight of about 21,000 and isoelectric point at pH 7.2;

it inhibits wheat alpha-amylase II and subtilisin (alkaline protease from Bacillus subtilis); and

it does not inhibit the human serine protease trypsin and chymotrypsin.

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**5,047,258**

**AQUEOUS SPRAY-COATING PROCESS**

**Raymond J. Belanger, Rensselaer; Gregg Stetsko, Bethlehem, and Shrikant N. Pagay, Guilderland, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Continuation of Ser. No. 380,048, Jul. 14, 1989, abandoned. This application Dec. 4, 1990, Ser. No. 622,293**

**Int. Cl.[5] A61K** *9/32*

**U.S. Cl. 427—3** **18 Claims**

1. A method of preventing pharmaceutical dosage forms from adhering during spray coating, comprising: spraying said pharmaceutical dosage forms in the absence of glidant with a mixture consisting essentially of a one to one copolymer of ethyl acrylate and methacrylic acid and a plasticizer in air having an inlet dew point below about 10° C. and an inlet temperature between about 35° C. and about 60° C.

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**5,047,259**

**ACRYLIC COPOLYMER FLOW CONTROL AGENTS**

**Doris Oberkobusch, Duesseldorf; Wolfgang Gress, Wuppertal-Elberfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany**

**Filed Aug. 25, 1989, Ser. No. 399,664**

**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828876**

**Int. Cl.[5] B05D** *1/04, 1/06, 5/00, 3/02*

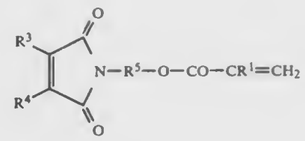
**U.S. Cl. 427—27** **26 Claims**

1. A powder coating process comprising the steps of:

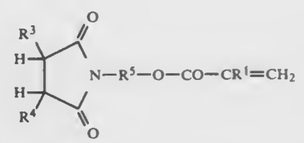
(1) applying a powder coating composition comprising a thermoplastic or thermosetting resin and from about 0.1% to about 2.0% by weight of a flow control agent to a metal substrate, wherein said flow control agent is a copolymer comprising units of: (A) an acrylate of the formula (I)



wherein $R^1$ is a hydrogen atom or a methyl group and $OR^2$ is the residue of a $C_{16-34}$ fatty alcohol, and an N-containing olefin selected from the group consisting of: (B) a compound of the formula (II) or (VI)

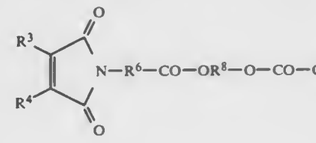


(II)

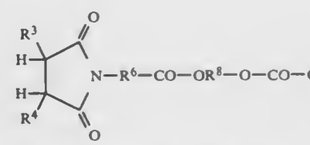


(VI)

wherein $R^3$ and $R^4$ are together or separately hydrogen or $C_{1-4}$ alkyl groups or when taken together are ring fragments of an unsubstituted or a $C_{1-4}$-alkyl-substituted $C_5$ or $C_6$ ring, $R^5$ is a linear or branched $C_{1-12}$ alkylene group, $—CH_2—CH_2—O—CH_2—CH_2—$, $—CH_2—CH_2—NH—CH_2—CH_2—$, or a $C_{1-4}$-alkylene-substituted phenylene group and $R^1$ is as defined above; (C) a compound of the formula (III) or (VII)



(III)

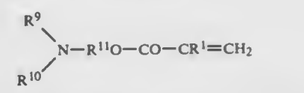


(VII)

wherein $R^1$, $R^3$ and $R^4$ are as defined above, $R^6$ is a phenylene group or an alkylene group corresponding to the formula

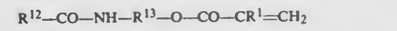


wherein $R^7$ is a hydrogen atom or a straight chain or branched $C_{1-11}$ alkyl radical and $R^8$ is a $C_{2-10}$ alkylene group; (D) a compound of the formula (IV)



(IV)

wherein $R^1$ is as defined above, $R^9$ is a phenyl or benzyl group, $R^{10}$ is a $C_{1-16}$ alkyl group and $R^{11}$ is a $C_{2-6}$ alkylene group, or $R^9$ and $R^{10}$ are $C_{1-16}$ alkyl groups and $R^{11}$ is a phenylene group; or (E)j a compound of the formula (V)



wherein $R^{12}$ is a $C_{7-33}$ alkyl group and $R^{13}$ is a $C_{2-4}$ alkylene group and $R^1$ is as defined above wherein the molar ratio of (A) to (B), (C), (D), or (E) is equal to from about 1.0:0.5 to about 1.0:10.0 and (2) heating the coated substrate to a temperature sufficient to fuse said powder coating composition.

3. The process of claim 1 wherein said powder coating composition is applied electrostatically.

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5,047,260

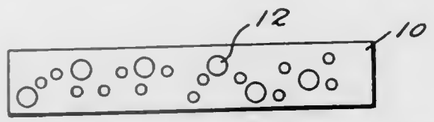
## METHOD FOR PRODUCING A SHIELDED PLASTIC ENCLOSURE TO HOUSE ELECTRONIC EQUIPMENT

David Durand, Portsmouth, R.I., assignor to Key-Tech, Inc., Cranston, R.I.

Division of Ser. No. 365,712, Jun. 14, 1989, Pat. No. 4,960,614, which is a continuation-in-part of Ser. No. 11,975, Feb. 6, 1987, Pat. No. 4,863,757. This application Jan. 3, 1990, Ser. No. 472,168

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—54.1 5 Claims




1. A method of fabricating a shielded plastic enclosure for housing electronic equipment, comprising the steps of:

applying a layer to at least one interior surface of said enclosure of a shielding composition comprising a suspension of silver-coated magnetite particles in a U.V. curable resin, said shielding composition being applied in an amount sufficient such that the resulting layer of said shielding composition has a thickness to effectively shield against electromagnetic interference, radio frequency interference or electrostatic discharge; and

effecting U.V. radiation cure of the said U.V. curable resin by exposing said shielding composition to a U.V. source having an output in the region between 360 nm and 420 nm for a time sufficient to cure said U.V. curable resin.

5,047,261

## PROCESS FOR THE MANUFACTURE OF COATINGS BY RADIOCROSSLINKING

Khalil Moussa, Hattiesburg, Miss.; Christian Decker, Rixheim, France; Jean-Claude Brosse, Connerre, France; Sammy Chevalier, Paris, France, and Denis Couvert, Etampes, France, assignors to Societe Nationale des Pourdres et Explosifs, Paris, France

Filed Jun. 19, 1990, Ser. No. 540,374

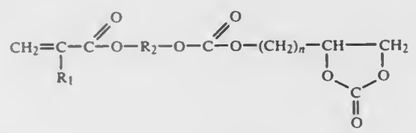
Claims priority, application France, Jun. 29, 1989, 89 08651

Int. Cl.[5] C08F *24/00, 224/00;* B05D *3/06*

U.S. Cl. 427—54.1 10 Claims

1. Process for the manufacture of coatings by radiocrosslinking, characterized in that the procedure is according to the following successive stages:

a) A radiocrosslinkable composition (C) is produced by mixing at least one (meth)acrylic compound (A) with a reactive diluent system comprising at least one mono(-meth)acrylic carbonate (B) corresponding to the general formula (I):



in which:

$R_1$ denotes hydrogen or the methyl group,

$R_2$ denotes an alkylene ether or alkylene chain, optionally substituted by at least one methyl or ethyl group, which has a total number of carbon atoms of between 2 and 6, preferably an alkylene chain of formula $(CH_2)_m$, m being an integer such that $2 \leqq m \leqq 6$,

n denotes an integer such that $1 \leqq n \leqq 6$,

b) the radiocrosslinkable composition (C) is applied onto a substrate,

c) the composition (C) thus applied is radiocrosslinked.

5,047,262

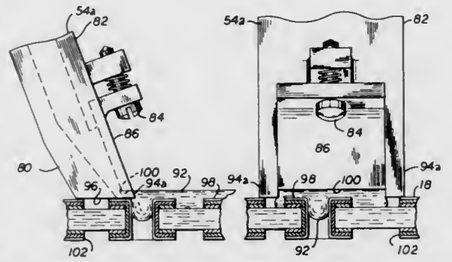
## APPARATUS AND METHOD FOR SELECTIVELY COATING PRINTED CIRCUIT PANELS

John H. deVries, St. Petersburg, and Walter K. McCall, Belleair Beach, both of Fla., assignors to Automate-Tech, St. Petersburg, Fla.

Continuation-in-part of Ser. No. 131,962, Dec. 11, 1987, abandoned, and a continuation-in-part of Ser. No. 221,265, Jul. 19, 1988, abandoned. This application Aug. 16, 1990, Ser. No. 568,072

Int. Cl.[5] C23C *26/00*

U.S. Cl. 427—96 15 Claims




8. Method of selectively masking circuit portions of a printed circuit panel having connector tabs comprising:

(a) feeding a circuit panel between a pair of grippers in a vertical position;

(b) aligning the vertical height of the circuit panel for passage through a series of treatment stations to clean the circuit portion of the circuit panel;

(c) coating the circuit portion of the circuit panel on each side with a controlled volume flow of a liquid coating solution by at least one wiper on each side movable in a vertical plane in response to a signal, the wipers having a first fixed edge in contact with the panel surface to be coated and a second adjustable edge forming a slot with the first fixed edge, the second edge spaced apart from the panel surface to be coated, the liquid polymer flowing from the wiper between the first and second edge, the first edge and second edge of the wiper having a pair of continguous end guards defining a first and second side, the panel being coated with a defined strip of polymer while moving past the wipers; and thereafter

(d) curing the coating solution to form a polymer.

5,047,263

## FIBER-REINFORCED THERMOPLASTIC POLYMER COMPOSITE AND PROCESS FOR PREPARATION THEREOF

Michel Glemet, Serquigny, France, assignor to Atochem, Courbevoie, France

Filed Mar. 19, 1986, Ser. No. 841,194

Claims priority, application France, Mar. 24, 1985, 85 04374

Int. Cl.[5] B05D *1/36;* D02G *3/00*

U.S. Cl. 427—203 7 Claims

1. A process for the manufacture of a fiber-reinforced thermoplastic polymer composite comprising wetting said fiber reinforcement with a thermoplastic polymer resulting from the polyaddition of a polyamide oligomer carrying functional groups with a reaction partner or a thermoplastic polymer that is a sequenced poly(ether-amide) copolymer, applying a polyamide over said thermoplastic polymer, and heat curing the thus-formed assembly to form a unitary composite.



5,047,264

## METHOD OF DYNAMICALLY BALANCING CERAMIC TURBINE WHEELS

Barry S. Draskovich, Mesa, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 26, 1989, Ser. No. 357,577

Int. Cl.[5] B05D *3/12, 5/00*

U.S. Cl. 427—277 7 Claims

1. A method of balancing a silicon-containing ceramic wheel for use in a gas turbine engine comprising the steps of:

predetermining the location and amount of additional mass needed to balance said wheel;

preparing a mixture of fine ceramic powder and sodium silicate solution, said fine ceramic powder having substantially the same composition as the surface of said ceramic wheel;

applying a thin layer of said mixture to the wheel at said predetermined location;

allowing said mixture to solidify;

applying sufficient additional layers of said mixture to add about said predetermined amount of additional mass to the wheel; and

curing said mixture before using said wheel in a gas turbine engine.

5,047,265

## METHOD OF FLAME-SPRAYING OF POWDERED MATERIALS AND FLAME-SPRAYING APPARATUS FOR CARRYING OUT THAT METHOD

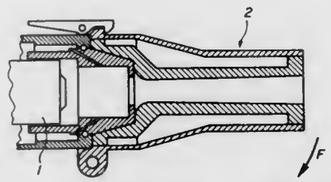
Wolfgang Simm, Ecublens, and Hans-Theo Steine, Chavannes, both of Fed. Rep. of Germany, assignors to Castolin S.A., Switzerland

Filed Apr. 24, 1989, Ser. No. 342,341

Claims priority, application Switzerland, Apr. 28, 1988, 1599/88

Int. Cl.[5] B05B *1/24*

U.S. Cl. 427—423 6 Claims




1. A method of flame-spraying of powdered materials for producing surface layers on substrates by means of an autogeneous flame-spraying apparatus in which a mixture of a combustion gas and an oxidation gas is produced and ignited at the outlet from a burner nozzle, and in which the powdered spraying material is conveyed by means of a carrier gas to said burner nozzle and, at the outlet thereof, is introduced in the flame of the flame spraying apparatus, according to which method the working parameters of the flame-spraying apparatus are chosen so that the energy constant $P_E$ of the particles of the spraying material is comprised between 0.1 and 0.2 s/m, said constant being defined by the ratio of the percentage of the kinetic energy $E_k$ of the particles at the impact of the particles on the substrate surface, to the flame speed $F_v$ measured in m/s, the output speed of the particles of spraying material at the burner nozzle when the flame is burning being less than 30 m/s and the grain size of the spraying material being chosen as a function of the flame speed within a continuously narrowing range comprised between 150 and 37 μm at $F_v = 90$ m/s and between 63 and 5 μm at $F_v = 300$ m/s.

5,047,266

## PROCESS FOR PRODUCING SYNTHETIC FIBER AND VEGETABLE FIBER BY FIBROIN PROTEIN WITH EGG WHITE AND ACRYLIC RESIN

Shigesaburo Mizushima, No. 98-11, Notobeshimo, Rokuseimachi, Kashima-gun, Ishikawa-ken, and Shigemi Mizushima, No. 81-17, 3-chome, Akayama-cho, Koshigaya-shi, Saitama-ken, both of Japan, assignors to Shigesaburo Mizushima, Ishkawa; Shigemi Mizushima, Saitama and Mizushima Silk Industries Co., Ltd., Ishikawa, all of, Japan

Filed Mar. 27, 1990, Ser. No. 500,255

Claims priority, application Japan, Apr. 17, 1989, 1-96937

Int. Cl.[5] B05D *3/04*

U.S. Cl. 427—338 3 Claims



1. A process for producing a synthetic fiber and vegetable fiber by use of fibroin protein, which comprises adsorbing a solution containing egg-white and acrylic resin onto a synthetic fiber yarn or vegetable fiber yarn and drying the resulting fiber, adsorbing fibroin protein onto said synthetic fiber yarn or vegetable yarn, fixing said fibroin protein on said synthetic fiber yarn or vegetable fiber yarn by converting said fibroin protein and egg-white, which were adsorbed in synthetic fiber yarn or vegetable fiber yarn, to an insoluble state.

5,047,267

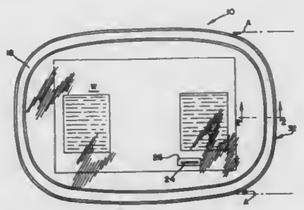
## PROTECTIVE SERVING MAT

Terese A. Pantaleo, 7854 Redondo La., Orland Park, Ill. 60462, and Donald E. Perrin, 255 N. 6th St., Clinton, Iowa 52732

Filed Jun. 13, 1989, Ser. No. 365,836

Int. Cl.[5] B32B *3/20*

U.S. Cl. 428—13 8 Claims



1. A protective serving mat comprising:

a first sheet and a second sheet superimposed on each other and interconnected to define a first chamber for holding a liquid;

said first sheet being substantially transparent so that a content of said chamber in said liquid is visible through said first sheet;

an opening in said first chamber adapted to allow repeated access to said first chamber so that a user can interchangeably add a desired content to said first chamber;

closure means removably attached to said opening for sealing and resealing said opening; and,

a second, separate chamber disposed adjacent said first chamber, said second chamber being visible through said first chamber.

VOL 1130 ISS 2 SE 10 1991 UMI

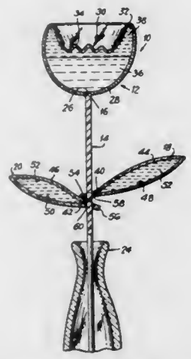


5,047,268

## LIQUID-FILLED DECORATIVE STEMMED ARTIFICIAL FLOWERS

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Mar. 9, 1990, Ser. No. 491,212
Int. Cl.[5] A41G *1/00*
U.S. Cl. 428—24 17 Claims



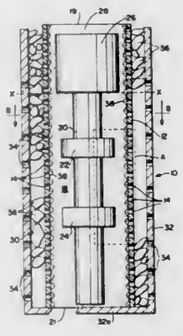
1. A decorative, stemmed, artificial flower, comprising:
a flower-shaped head having an inlet and light-transmissive wall portions bounding an interior;
a colored liquid introduced via the inlet into the interior of the head for sealed containment therein, said colored liquid being visible through the wall portions of the head; and
an elongated stem having one end connected to the head, for supporting and displaying the head and the liquid sealingly contained therein.

5,047,269

## ASSEMBLY FOR MAKING CERAMIC COMPOSITE STRUCTURES AND METHOD OF USING THE SAME

Marc S. Newkirk, Newark, and H. Daniel Lesher, Wilmington, both of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Division of Ser. No. 3,102, Jan. 14, 1987, Pat. No. 4,832,892.
This application Jan. 18, 1989, Ser. No. 298,647
Int. Cl.[5] E06B *3/26*
U.S. Cl. 428—34.4 19 Claims



1. An assembly for use in making a self-supporting ceramic composite structure comprising a filler and a polycrystalline ceramic matrix embedding said filler, said ceramic matrix comprising an oxidation reaction product of a parent metal with an oxidant, said assembly comprising:
(a) a segmented container;
(b) a permeable mass of filler disposed within said container; and
(c) a body of parent metal disposed in contact with said mass of filler, said segmented container comprising at least one segment having a coefficient of thermal expansion greater than a coefficient of thermal expansion of said mass of filler, said at least one segment being dimensioned and configured to define at least one expansion joint which accommodates thermal expansion of said at least one segment by circumferential expansion thereof, thereby inhibiting radial expansion of said segmented container so as to reduce volumetric expansion of said container.

5,047,270

## COATED RESIN MOLDED-ARTICLE

Shigeo Mori, Tokyo; Atsunori Yaguchi, and Masahiro Kitayama, both of Sodegaura, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Filed Sep. 14, 1988, Ser. No. 244,216
Claims priority, application Japan, Sep. 14, 1987, 62-230485; Sep. 14, 1987, 62-230486; May 13, 1988, 63-114738; Jun. 9, 1988, 63-142617; Jun. 9, 1988, 63-142618; Jun. 9, 1988, 63-142619; Jun. 9, 1988, 63-142637; Jun. 9, 1988, 63-142638; Jun. 9, 1988, 63-142639; Jun. 22, 1988, 63-154020
Int. Cl.[5] B32B *27/36;* B65D *53/00;* C08J *9/10*
U.S. Cl. 428—35.2 8 Claims

1. A coated resin molded-article which comprises a polyester resin substrate and an adherent coating thereon which consists essentially of a curable phosphazene compound represented by the formula

$$-[NP(X)_p(Y)_q]_n- \quad (1)$$

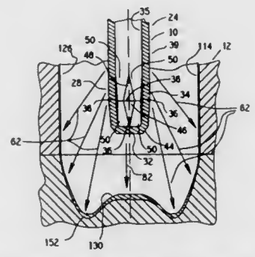
wherein X and Y denote a polymerizable-curable group or non-polymerizable-curable group, which are identical or different, at least one of them being a polymerizable-curable group; p and q each denote a numeral of at least 0, their sum being 2; and n is an integer of 3 to 12.

5,047,271

## APPARATUS AND PROCESS RELATING TO A PREFORM AND A CONTAINER WITH GEODESIC REINFORCEMENT

Frederick J. Feddersen, Londonderry, and Jizu J. Cheng, Manchester, both of N.H., assignors to FMT Holdings, Inc., Londonderry, N.H.

Filed Jun. 21, 1990, Ser. No. 541,719
The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.
Int. Cl.[5] B65D *1/02, 23/00*
U.S. Cl. 428—36.92 13 Claims



1. A plastic preform for forming blow molded plastic bottles which comprises: a neck portion defining an opening; a tubular sidewall portion depending therefrom; and an integral base structure depending from the tubular sidewall portion to a closed end; said preform having an outside wall face and an inside wall face, with at least one of the inside wall face and the outside wall face of the base structure having integrally formed thereon a plurality of filets, extending longitudinally of the preform to define a reinforcement of varying thickness spaced from the closed end and circumscribing the base structure, wherein said filets decrease progressively in width and radial thickness at least from said reinforcing ring toward said closed end, the preform being capable of forming a blow molded plastic container with a bottom portion having a reinforcement of circumferential alterations in wall thickness with a regularly undulating cross-section along said circumference.

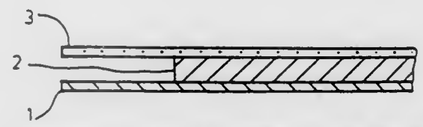


5,047,272

## TRANSPARENT LAMINATES

Tillmann Hassel, Cologne, and Hanns-Peter Müller, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,941
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842966
Int. Cl.[5] G02B *5/30;* B32B *17/10, 27/40, 27/32*
U.S. Cl. 428—40 12 Claims



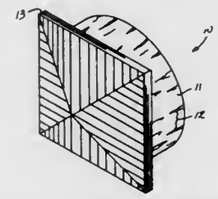
1. A laminate comprising a transparent polymer having a high content of hydroxyl groups as the core layer and an adhesive layer applied to one or both sides which is tack-free under normal conditions, and which can each accept an outer layer, wherein in said laminates as adhesive layers, a thermoplastic polyurethane-urea is used which has a substantially linear molecular structure with exclusively aliphatically or cycloaliphatically bonded urethane and urea segments and a content of urea groups —NH—CO—NH— of 1 to 20% by weight and a content of carboxyl groups —COOH bonded directly with the main chain of the molecule in lateral positions, of 0.001 to 10% by weight, all relative to the total weight of the polyurethane-polyurea.

5,047,273

## PLUG STRUCTURE

Julie C. Ernst-Cox, and Mark F. Cox, both of 70 Lake Major Rd., Dartmouth, N.S., Canada B2W 3X7

Filed Nov. 20, 1989, Ser. No. 439,142
Int. Cl.[5] B65D *39/00*
U.S. Cl. 428—63 4 Claims



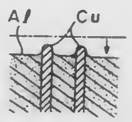
1. A cellular plug structure for securement within a bore comprising,
a cylindrical base member defined by a predetermined diameter and an axis, and
a cap member orthogonally and fixedly secured to an upper end of said base member, said cap member defined by a predetermined width greater than said predetermined diameter, and
the base member defined by a cellular grain structure parallel to said axis, and
wherein the cap member is defined by a multi-faceted planar surface configuration, and
wherein the base member includes a series of annular compression grooves directed radially and interiorly of said base member, and
wherein the compression grooves are spaced at equal intervals about the base member and extend interiorly of the base member a distance substantially equal to one-fourth of said predetermined diameter, and
wherein the compression grooves are defined by a predetermined height extending below said upper end of said base member, but greater than one-half of a predetermined axial length of said base member, and
wherein the compression grooves are of a generally triangular, cross-sectional configuration, wherein each triangular groove is defined by an apex positioned interiorly of said base member, and
wherein the compression grooves are filled with an adhesive therewithin for subsequent extrusion of said adhesive from said compression grooves into contact with said bore for fixedly securing said plug structure within said bore.

5,047,274

## ANNODIZED ALUMINUM SUBSTRATE FOR A MAGNETIC RECORDING DISK IN WHICH PORES ARE FILLED WITH A NON MAGNETIC MATERIAL AND THE SURFACE POLISHED AND ETCHED

Noboru Tsuya, 3-13-11, Hachimanyama, Setagaya-Ku, Tokyo; Tadao Tokushima, 1-18-1, Izumi, and Toshiro Takahashi, 350-29, Ose-cho, both of, Hamamatsui-shi, Shizuoka-ken, all of Japan

Filed Jul. 13, 1988, Ser. No. 218,202
Claims priority, application Japan, Sep. 28, 1987, 62-243074
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—64 2 Claims




1. A substrate for a magnetic disk, comprising an anodized aluminum layer having pores packed with a non-magnetic material having a different etching rate from that of the anodized aluminum layer and subjecting to polishing and etching treatment to form a finely roughened surface having a depth in the range of 50 to 5,000 Å due to the difference in the etching rate of the anodized aluminum layer and said non-magnetic material.

5,047,275

## SPRAY DRIED PHENOL-FORMALDEHYDE RESIN COMPOSITIONS

Shui-Tung Chiu, Coquitlam, Canada, assignor to Borden, Inc., Columbus, Ohio

Division of Ser. No. 532,439, Jun. 4, 1990, which is a division of Ser. No. 385,571, Jul. 26, 1989, Pat. No. 4,950,433. This application Jan. 16, 1991, Ser. No. 642,018
Int. Cl.[5] B32B *5/12;* C09T *161/10*
U.S. Cl. 428—106 13 Claims

1. A waferboard or oriented strandboard comprising wafers or strands bound together by having applied thereto a curable powdered phenol-aldehyde resole resin prepared by spray drying an aqueous phenol-aldehyde resole resin containing a water soluble oxo boron compound in an amount sufficient to

VOL 1130 ISS 2 SE 10 1991 UMI



improve the spray dryability of the resin and subsequently curing said applied resin under heat and pressure.

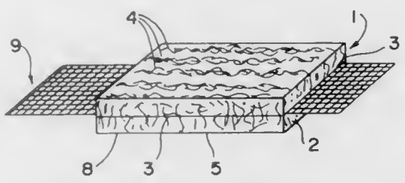
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5,047,276

## MULTILAYERED TEXTILE COMPLEX BASED ON FIBROUS WEBS HAVING DIFFERENT CHARACTERISTICS

Gilbert F. Chomarat, Les Gets, and Andrë Fourezon, Le Cheylard, both of France, assignors to Etablissements les Fils D'Auguste Chomarat et Cie, France

Filed Oct. 19, 1988, Ser. No. 259,698
Claims priority, application France, Nov. 3, 1987, 87 15461
Int. Cl.[5] B32B *5/12*
U.S. Cl. 428—110 4 Claims




1. A multiplayer textile complex comprising:
a first web of non-brittle flexible synthetic fibers selected from the group consisting of polyester, polyamide and polypropylene; and
a second web of rigid and brittle mineral fibers selected from the group consisting of glass and asbestos;
wherein said first web and said second web are connected to each other by a minor another of the synthetic fibers of said first web implanted within the mineral fibers of said second web without protruding through an outside surface of said second web.

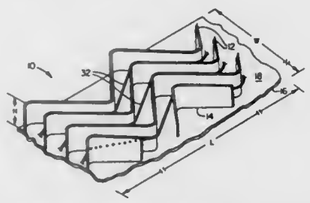
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5,047,277

## NESTED HONEYCOMB STRUCTURES AND PRODUCTION METHOD

Bernard P. Kunz, Albuquerque, N. Mex., assignor to Core Craft Technologies, Inc., Albuquerque, N. Mex.

Filed Jul. 10, 1989, Ser. No. 377,728
Int. Cl.[5] B32B *3/12*
U.S. Cl. 428—116 11 Claims




1. A fiberglass structure, comprising:
at least two corrugated strips positioned in a face-to-face manner and spaced between their ends, wherein peaks and valleys of each said strip extend into peaks and valleys of adjacent strips, wherein said strips, between said peaks and valleys, have a substantially straight line forward slope and a substantially straight line reverse slope; and
a relatively thin skin comprising a fibrous material into which one edge of each of said strips is embedded, wherein said embeddedness improves the shear strength of the structure.

5,047,278

## POLYESTER FILM AND MAGNETIC RECORDING MEDIUM

Masaaki Ono, Mishima; Takao Izasa, Moriyama, and Kazuo Okabe, Mishima, all of Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP88/00444, § 371 Date Jan. 6, 1988, § 102(e) Date Jan. 6, 1988, PCT Pub. No. WO88/08437, PCT Pub. Date Nov. 3, 1988
PCT Filed May 2, 1988, Ser. No. 296,053
Filed Jan. 6, 1989, Ser. No. 296,053
Claims priority, application Japan, May 1, 1987, 62-106305
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—141 19 Claims

1. A polyester film for forming thereon a ferromagnetic metal thin film for a magnetic recording medium, which is composed of a polyester prepared by using a germanium compound as the polymerization catalyst, wherein the Young's modulus $E_{MD}$ in the machine direction thereof and the Young's modulus $E_{TD}$ in the transverse direction thereof satisfy the requirements of $E_{MD} \geqq 350$ kg/mm$^2$, $E_{TD} \geqq 350$ kg/mm$^2$ and $E_{MD} \times E_{TD} \geqq 250{,}000$ kg$^2$/mm$^4$, the refractive index $n_{ZD}$ in the thickness direction thereof satisfies the requirement of $1.480 \leqq n_{ZD} \leqq 1.492$, and the maximum roughness Rt of one surface of the film is not larger than 100 nm and the maximum roughness Rt of the other surface of the film is in the range of from 30 to 150 nm.

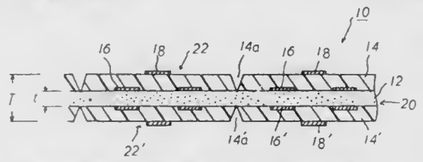
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5,047,279

## MULTILAYER PRINTED CIRCUIT BOARD

Yoshihiro Nasu, Hikone, and Kazuyuki Mitsuhashi, Shiga, both of Japan, assignors to Shin-Kobe Electric Machinery Company, Ltd., Tokyo, Japan

Filed Nov. 8, 1989, Ser. No. 433,132
Claims priority, application Japan, Jan. 26, 1989, 1-17261
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—156 6 Claims




1. A multilayer printed circuit board comprising:
a laminate of at least one insulated layer of only glass fiber nonwoven cloth impregnated with thermosetting resin and insulated layers of glass fiber woven cloth impregnated with thermosetting resin;
said laminate having cutting grooves formed therein so that only glass fiber nonwoven cloth layer remains uncut whereby the multilayer printed circuit board can be divided at said uncut glass fiber nonwoven cloth layer along said cutting grooves into a plurality of printed circuit board portions which can be mounted having a practical size; and
the thickness of said uncut glass fiber nonwoven layer being so set as to be equal to at least one-fourth of the entire thickness of the multilayer printed circuit board.

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5,047,280

## HIGH DENSITY CORRUGATED WAFER BOARD PANEL PRODUCT

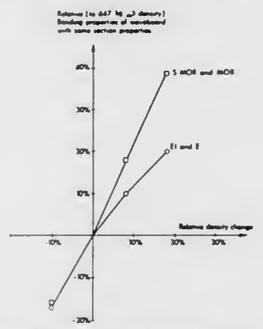
Lars Bach, Edmonton, Canada, assignor to Alberta Research Council, Edmonton, Canada

Filed Jan. 3, 1989, Ser. No. 293,073
Int. Cl.[5] B32B *3/28*; E04C *2/32*
U.S. Cl. 428—182 1 Claim

1. A corrugated wafer board formed of binder-coated wafers which have been subjected to heating and compression which is characterized by having a density ranging from between



about 700 kg/m$^3$ to 900 kg/m$^3$, said density throughout said board being substantially uniform, and wherein the panel mass per unit area is substantially equal to a corrugated wafer board of normal density, whereby the bending strength is increased




and the bending stiffness remains substantially equal to a wafer board of normal density and the amplitude of said board ranges from about 3 mm to 100 mm (0.125" to 4").

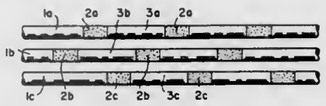
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5,047,281

## FIBER REINFORCED COMPOSITE MATERIAL AND METHOD FOR PRODUCING FIBERS FOR SUCH MATERIAL

Wolfgang Betz, Gauting; Werner Huether, Karlsfeld, and Herbert Merz, Munich, all of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 623,553, Jun. 22, 1984, abandoned. This application Dec. 24, 1986, Ser. No. 946,649
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323855
Int. Cl.[5] B32B *3/00, 15/04, 17/06*
U.S. Cl. 428—201 19 Claims




1. A fiber reinforced composite material, comprising fibers and a matrix material in which said fibers are embedded, each of said fibers having along its length first surface ring zones around the respective fiber with a first given adhesiveness or bonding ability and second surface ring zones around the respective fiber with a second adhesiveness or bonding ability lower than said given adhesiveness for providing different bonding abilities between the fiber surface and the embedding matrix material at said first and second surface ring zones along the length of said fibers, said second surface ring zones being interspersed between said first surface ring zones along the length of the respective fiber for providing a crack stop characteristic at an interface between the fibers and said embedding matrix material at said second surface ring zones.

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5,047,282

## TRANSLUCENT AND VARIEGATED DECORATIVE LAMINATE HAVING AN EFFECT OF DEPTH

Jesus L. Mier, Las Arenas, Spain, assignor to Formica Corporation, Wayne, N.J.

Filed Nov. 16, 1987, Ser. No. 120,975
Claims priority, application Spain, Nov. 18, 1986, 8603067
Int. Cl.[5] B32B *21/08, 27/04*
U.S. Cl. 428—204 11 Claims

1. A translucent and variegated decorative laminate having a visual three dimensional effect of depth, wherein said laminate comprises (1) a core of a plurality of translucent resin impregnated absorbent and transparent paper sheets, (2) two or more translucent resin impregnated decorative sheets with printed variegation therein to obtain the desired decorative




effect, (3) at least two or more translucent resin impregnated translucent intermediate sheets inserted between said decorative sheets, and (4) a translucent resin impregnated surface sheet.

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5,047,283

## ELECTRICALLY CONDUCTIVE ARTICLE

Dennis D. Leatherman, Pittsburgh, Pa.; Kee V. Sin, Mira Mesa, Calif., and James A. Russell, Atlanta, Ga., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 20, 1989, Ser. No. 409,853
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—209 42 Claims

1. An electrically conductive article comprising:
(a) at least one sheet of microporous material having generally opposing sides, said microporous material on a coating-free, printing ink-free, impregnant-free and pre-bonding basis comprising:
(1) a matrix consisting essentially of substantially water insoluble thermoplastic organic polymer,
(2) finely divided substantially water-insoluble filler particles, of which at least about 50 percent by weight are siliceous particles, said filler particles being distributed throughout said matrix and constituting from about 50 to about 90 percent by weight of said microporous material,
(3) a network of interconnecting pores communicating substantially throughout said microporous material, said pores constituting at least about 35 percent by volume of said microporous material; and
(b) electrically conductive coating or electrically conductive printing ink on at least a portion of at least one of said sides.

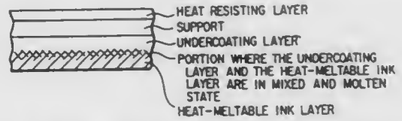
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5,047,284

## THERMAL TRANSFER RECORDING SHEET

Kiyoshi Shibuya; Toshihiko Matsushita, both of Tokyo, and Sadao Morishita, Ushiku, all of Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,130
Claims priority, application Japan, Apr. 15, 1988, 63-93163
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—216 4 Claims

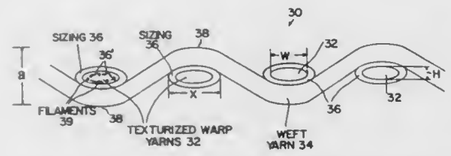



1. A thermal transfer recording sheet which comprises a support, an undercoating layer comprising a heat-meltable olefin resin, and a heat-meltable ink layer laminated in succession on one side of said support, wherein the thickness of the undercoating layer is 0.5 to 5 μm, and wherein the heat meltable ink layer has a thickness of 1 to 15 μm, the difference in melting point of the under-coating layer and that of the heat-

meltable ink layer being 20 C. or less, and wherein the application of the heat-meltable ink layer to the undercoating layer results in said layers being mixed with each other in the vicinity of the interface therebetween after being coated on the support.

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5,047,285
FABRIC, PRESSURE SENSITIVE TAPE
Edward S. Ward, Lugoff, S.C., assignor to Hermitage Industries, Inc., Camden, S.C.
Filed Jun. 30, 1989, Ser. No. 374,527
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—229 20 Claims




1. A fabric comprising a warp yarn cooperating with a weft yarn, wherein the warp yarn is ribbonized out of round as viewed in a section across its longitudinal axis and only the warp yarn carries a non-hardening agglutinating sizing which is only so tacky as to cause the warp yarn to adhere nominally to the weft yarn where the warp and weft yarns intersect in the fabric.

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5,047,286
PRINTING SHEETS
Yoshiaki Kaburaki; Junichi Morimoto; Katumitu Tamura, and Koichi Tomita, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Tokyo, Japan
Filed Jul. 25, 1989, Ser. No. 385,226
Int. Cl.[5] B32B *27/32, 27/00;* B41M *1/30*
U.S. Cl. 428—246 6 Claims

1. A printing sheet comprising
(a) a support,
(b) a surface layer provided on at least one side surface of said support, said surface layer containing at least one polymeric compound selected from the group consisting of n-butyl (meth) acrylate based polymers, phenyl (meth-)acrylate based homopolymer and copolymers, benzyl (meth)acrylate based homopolymers and copolymers, and a non-polymeric compound selected from the group consisting of cinnamic acid, and cinnamic acid derivatives, and
(c) said surface layer having at least one member selected from the group consisting of manganese, cobalt, and lead and compounds thereof.

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5,047,287
DIAPHRAGM
Noriyuki Horiuchi, and Hiroyuki Kobayashi, both of Nishikasugai, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Dec. 27, 1988, Ser. No. 290,321
Claims priority, application Japan, Dec. 27, 1987, 62-331407
Int. Cl.[5] B32B *7/12, 27/08, 31/12, 31/20, 33/00*
U.S. Cl. 428—248 9 Claims

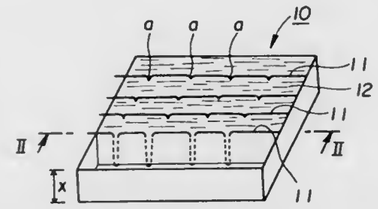
1. A diaphragm which comprises
a) a base fabric;
b) at least one fluororubber layer bonded to said base fabric, and
c) an adhesive including an acrylonitrile-butadiene rubber or acrylonitrile-isoprene rubber having an amino group to adhere said base fabric to said fluororubber layer,
wherein said adhesive further includes an isocyanate-type adhesive.

5,047,288
NONWOVEN FABRIC COMPRISING SINGLE FILAMENTS AND FILAMENT BUNDLES THAT YIELD IMPROVED IMPACT RESISTANT MOLDED ARTICLES
Hideki Hoshiro, Takatuki; Hironao Funabiki, Suita; Kenji Saimen, Okayama; Toshihide Ohigashi, Nara, and Hiroshi Sugishima, Okayama, all of Japan, assignors to Kuraray Company Limited, Kurashiki, Japan
Filed Mar. 28, 1990, Ser. No. 501,868
Claims priority, application Japan, Mar. 31, 1989, 1-82112
Int. Cl.[5] B32B *27/04;* D04H *1/00, 3/00*
U.S. Cl. 428—290 4 Claims

1. A nonwoven fabric comprising a synthetic organic fiber for reinforcement of resinous molded articles, comprising a multiplicity of synthetic organic filaments (A) having a fineness of 1 to 50 deniers and a length of 5 to 200 mm and a multiplicity of strands (B) comprising a plurality of said filaments laid parallel with each other, the ratio by weight of (A) to [(A)+(B)] being 0 to 50%, the ratio by weight of the total weight of strands (B') having a total fineness of not more than 300 deniers and (A) to [(A)+(B)] being 20 to 80% and the ratio by weight of strands (B'') having a total fineness ob 500 to 5,000 to [(A)+(B)] being 5 to 20%, and said single filaments (A) and said strands (B) being bonded with one another with a non-fiber binder in an amount of 1 to 20% by weight based on the total weight of [(A)+(B)], wherein said fiber has a single-filament strength of 80 to 500 kg/mm$^2$.

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5,047,289
HEAT RESISTANT ALUMINA FIBER MAT
Noriyuki Arano, and Michiyo Tsuchiya, both of Oumimachi, Japan, assignors to Denki Kagku Kogyu Kabushiki, Tokyo, Japan
Continuation of Ser. No. 137,427, Dec. 23, 1987, abandoned.
This application Jan. 9, 1990, Ser. No. 463,010
Claims priority, application Japan, Dec. 27, 1986, 61-309069
Int. Cl.[5] B32B *5/06*
U.S. Cl. 428—221 14 Claims




1. A heat-resistant sintered alumina fiber mat comprising an accumulated mass of alumina staple fibers and continuous alumina filaments, said accumulated mass being sewn with said continuous alumina filaments, the staple alumina fibers and continuous alumina filaments being adhered to and reacted with each other, said continuous alumina filaments being reinforced by said reinforcing material before being sintered.

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5,047,290
MAGNETIC RECORDING MEDIUM
Mikio Kisbimoto, and Shin'ichi Kitahata, both of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed Sep. 28, 1988, Ser. No. 250,409
Claims priority, application Japan, Oct. 1, 1987, 62-249361
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—323 4 Claims

1. A magnetic recording medium which comprises a substrate and a magnetic layer comprising a binder, a hexagonal system barium ferrite powder of the formula:

$$BaO.n[Fe_{2-(a+b+c+d)}Co_aNi_bZn_cTi_dO_{3+e}] \quad (I)$$



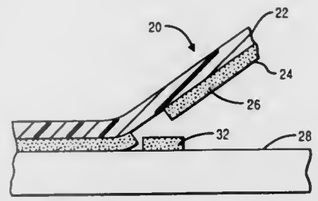
wherein n is a number of 5.5 to 6.0, a through d are each a number of 0.01 to 0.2 and satisfy the equation:

$$(a+b+c)/d=1 \text{ to } 10$$

and e is a number of −0.3 to 0.01, having a coercive force of from 200 to 2000 Oe, and an average diameter of its platelet plane of between 0.02 to 0.05 microns, and a non-magnetic particulate powder having a Mohs' hardness of not less than 7 in an amount of from 1 to 30% by weight based on the weight of said ferrite powder.

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5,047,291
MAGNETIC THERMAL TRANSFER RIBBON
Shashi G. Talvalkar, Kettering; Marion E. McCreight, Dayton, and Thomas J. Obringer, Vandalia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Jul. 10, 1989, Ser. No. 377,656
Int. Cl.[5] B41M *5/26*
U.S. Cl. 428—329 6 Claims




1. A thermal transfer ribbon comprising a substrate and a thermal sensitive coating which is formed from a mixture consisting essentially of a saturated, fatty alcohol transfer agent, a water base latex adhesive, a polyvinyl acetate resin, an intensifying azine dye, a tetrafluoroethylene polymer, and magnetic iron oxide, the mixture being dispersed in a solvent solution.

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5,047,292
PITCH-BASED CARBON FIBER AND PROCESS FOR PREPARATION THEREOF
Jiro Sadanobu; Akihiro Ohba, both of Iwakuni, and Tsutomu Nakamura, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan
Filed Dec. 7, 1988, Ser. No. 281,245
Claims priority, application Japan, Jun. 10, 1988, 63-141670
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—367 6 Claims

1. A pitch-based carbon fiber having a microstructure consisting of strip-like structural units extended in the longitudinal direction of the fiber, wherein the fractal dimension D of the arrangement of the strip-like structural units in the cross-section of the fiber has a fractal structure satisfying the requirement of the following formula (2) relatively to the observation scale r satisfying the requirement of the following formula (1) with respect to the cross-section of the fiber:

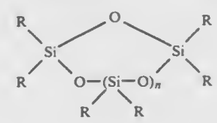
$$E/2.5>r>E/25 \quad (1)$$

$$2.0>D>1.05 \quad (2)$$

wherein E in the formula (1) stands for a smallest principal radius of gyration of cross-sectioned area of the fiber.

5,047,293
FIXED DRESSINGS WITH GREATLY REDUCED FOAMING
Bernhard Jansen, Cologne; Hanns-Peter Müller, Bergisch-Gladbach, and Roland Richter, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed May 11, 1990, Ser. No. 522,294
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1989, 3918177
Int. Cl.[5] B32B *17/04;* C08G *9/00;* A61F *5/04*
U.S. Cl. 428—423.1 6 Claims

1. A fixed dressing comprising a polyisocyanate composition on a flexible backing material, the polyisocyanate composition consisting essentially of:
a) at least one organic polyisocyanate,
b) at least one catalyst and
c) at least one compound of the formula




(I)

in which R represents methyl, ethyl or propyl and $1 \leqq n \leqq 4$.

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5,047,294
USE OF POLYURETHANE RESINS FOR AQUEOUS FILLER COMPOSITIONS
Michael Schwab, Mainz-Kostheim, and Gerd Walz, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany
Filed Aug. 18, 1989, Ser. No. 396,964
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828157
Int. Cl.[5] B32B *27/00;* B05D *3/02*
U.S. Cl. 428—432.1 14 Claims

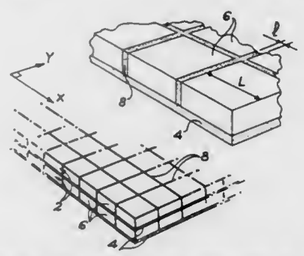
1. A process for the preparation of filler coatings on substrates, wherein an aqueous filler composition is prepared by admixing water-dispersible polymer as binder and, optionally, other polymeric binders, crosslinking agents and customary additives, the water-dispersible polymer being a polyurethane resin which contains building blocks derived from
(A) polyisocyanates,
(B) polyols having an average molecular weight $M_n$ of at least 400,
(C) low-molecular polyols if desired and,
(D) compounds containing at least two groups reactive toward isocyanate groups and at least one group capable of forming anions,
(E) compounds which are monofuctional or contain active hydrogen of variable reactivity, these building blocks being always positioned at the chain end of the polyurethane resin and optionally
(F) compounds which are other than (B), (C) and (E) and contain at least two groups reactive toward NCO groups.

13. A substrate coated by the filler composition according to claim 1.

5,047,295
## CONCRETE ROOF TILE
Bernhard Dotzauer, Maxdorf; Rolf Dersch, Frankenthal; Johannes Vinke, Neustadt; Harutyun Hanciogullari, Birkenau; Manfred Schwartz, Ludwigshafen, and Volkmar Berg, Graben, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Jan. 8, 1990, Ser. No. 461,916
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1989, 3901073
Int. Cl.[5] B32B *27/00*
U.S. Cl. 428—500 2 Claims

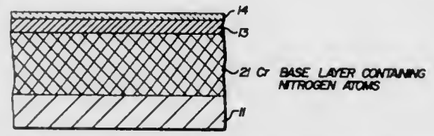
1. A concrete roof tile coated on at least one of its surfaces with an unfilled- or aggregate- or pigment-filled film of a crosslinked copolymer containing the following monomer units in copolymerized form:
(a) from 0.03 to 2% by weight of tin in the form of units of at least one organotin compound having one or more polymerizable C=C bonds,
(b) from 0.5 to 5% by weight of units of at least one compound from the group consisting of acrylic acid, methacrylic acid, acrylamide, methacrylamide and/or vinylsulfonic acid,
(c) from 0.1 to 5% by weight of units of carbonyl-containing monomers crosslinked with dihydrazides of aliphatic dicarboxylic acids of from 2 to 10 carbon atoms, and
(d) the difference to 100% by weight of units of at least two monomers selected from the group consisting of the acrylic and methacrylic esters of $C_1$–$C_8$-alkanols and styrene in such an amount and in such mixing ratios that the copolymer has a glass transition temperature of from −15° to +10° C. prior to crosslinking.

5,047,296
## COMPOSITE MAGNETIC MATERIAL AND ITS PRODUCTION PROCESS
Bernard Miltenberger, Labrede, and Jean M. Sajer, Lanton, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France
Filed Sep. 8, 1988, Ser. No. 241,584
Claims priority, application France, Sep. 18, 1987, 87 12971
Int. Cl.[5] G11B *5/66*
U.S. Cl. 428—694 11 Claims



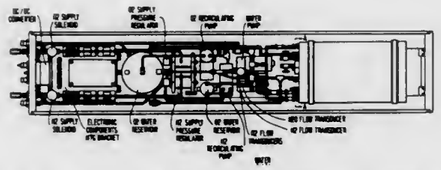
1. Composite magnetic material, comprising an alternation of magnetic material films (2) and electrically insulating materials (4), each magnetic material film (2) being formed by several magnetic blocks (6) separated from one another by electrically insulating joints (8, 8*a*), the total volume Vp occupied by the blocks and the total volume Vj occupied by the joints and the insulating films being such that the ratio Vp/Vj varies from 10 to 50.

5,047,297
## MAGNETIC RECORDING MEDIUM AND MANUFACTURING METHOD THEREOF
Hiroaki Wakamatsu, Yokohama; Yoshihiro Mitobe, Nagano, and Katsumi Kiuchi, Ebina, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jul. 7, 1988, Ser. No. 219,696
Claims priority, application Japan, Jul. 9, 1987, 62-172219
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—694 17 Claims




1. A magnetic recording medium comprising a non-magnetic substrate, a Cr base layer formed on said substrate, and a magnetic film of a Co alloy formed on said base layer, said Cr base layer having a continuous surface and containing a noise-reducing amount, comprising at least 1 atom %, of nitrogen atoms substantially uniformly distributed therein.

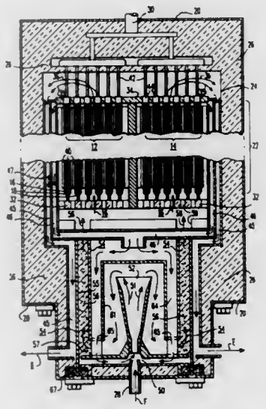
5,047,298
## CLOSED LOOP REACTANT/PRODUCT MANAGEMENT SYSTEM FOR ELECTROCHEMICAL GALVANIC ENERGY DEVICES
John H. Perry, Jr., Riviera Beach; Abraham Person, Palm Beach Shores; Steven M. Misiaszek, Tequesta, and Donald P. Alessi, Jr., Lake Park, all of Fla., assignors to Perry Oceanographics, Inc., Riviera Beach, Fla.
Filed Nov. 13, 1990, Ser. No. 612,350
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—17 9 Claims



1. A closed loop reactant/product management system for electrochemical galvanic energy devices, the system comprising:
(a) a modular package comprising a plurality of galvanic cells, two internal gas flow conduit means for independently carrying each of two gaseous reactants, which form a liquid product within the galvanic cells, and an internal liquid flow conduit means for independently carrying a cooling liquid to the galvanic cells, the cooling liquid being derived from the liquid product;
(b) first and second gas supply connecting means each designed to provide make-up gaseous reactants, respectively, to the system;
(c) indirect heat exchanger means in fluid flow connection with the internal liquid flow conduit means;
(d) first and second liquid-gas separator means and first and second liquid reservoir means, the respective separator means and reservoir means being in open fluid flow connection, each of the reservoir means being designed to provide a liquid-free, gas-filled space in an upper portion thereof and to maintain liquid in the lower portion, the first reservoir means being in pressure-tight fluid flow connection with the heat exchanger means and with the respective internal liquid flow passage, each of the first and second reservoir means being in pressure-tight fluid flow connection with the respective first and second gas supply connecting means, and the first and second liquid-gas separator means being in pressure tight fluid flow connection with the respective gas flow conduit means; and
(f) gas repressurization means between each of the gas flow conduit means and the respective liquid-gas separator means, designed to increase the pressure of gas from the internal gas flow conduit means.

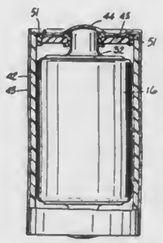


5,047,299
## ELECTROCHEMICAL CELL APPARATUS HAVING AN INTEGRATED REFORMER-MIXER NOZZLE-MIXER DIFFUSER
Larry A. Shockling, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 25, 1990, Ser. No. 559,111
Int. Cl.[5] H01M *8/12*
U.S. Cl. 429—20 12 Claims



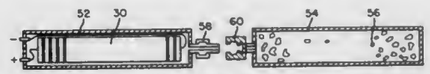
1. An electrochemical apparatus comprising:
(1) fresh gaseous feed fuel inlet,
(2) gaseous feed oxidant inlet,
(3) gaseous spent fuel recirculation channel,
(4) separate hot combusted exhaust gas exit channel,
(5) a generator chamber containing a plurality of electrochemical cells, and
(6) a reforming chamber, where the reforming chamber has a top close to the generator chamber, and a bottom close to the fresh gaseous feed fuel inlet, and contains:
(a) an outer portion containing reforming material, which outer portion connects to the generator chamber,
(b) an inner portion containing a mixer-diffuser within a shell barrier, which inner portion connects to the outer portion at the bottom of the reforming chamber, and
(c) a middle portion between the inner and outer portions, connected to the gaseous spent fuel recirculation channel at the top of the reforming chamber and feeding into the mixer-diffuser at the bottom of the reforming chamber, where the mixer-diffuser is within the reforming chamber, a mixer nozzle is near the bottom of the reforming chamber, which mixer nozzle is connected to the fresh gaseous feed fuel inlet, and where the mixer nozzle also feeds into the mixer-diffuser at the bottom of the reforming chamber.

5,047,300
## ULTRA-THIN PLATE ELECTROCHEMICAL CELL
Tristan E. Juergens, Loveland, Colo., assignor to Bolder Battery, Inc., Black Hawk, Colo.
Filed Jun. 14, 1989, Ser. No. 366,867
Int. Cl.[5] H01M *2/22, 4/64*
U.S. Cl. 429—94 4 Claims



3. A rechargeable electrochemical cell comprising:
porous positive and negative plates, each having major faces and formed of an ultra-thin non-perforate film of metal partially coated with a layer of electrochemically active paste;
porous, compressible separator interposed between said positive and negative plates to define, in combination, a cell unit, having first and second horizontal edges;
a container encapsulating said cell unit;
liquid electrolyte within said container;
said cell unit is spirally wound about a central axis and held tightly in a tubular configuration;
on the first horizontal edge of said cell unit said negative plate extends beyond the edge of said separator, the separator extends beyond the edge of said positive plate and said negative film is not coated with said paste in the portion extending beyond said separator;
on the second horizontal edge of said cell unit, said positive plate extends beyond the edge of said separator, the separator extends beyond the edge of said negative plate, and said positive film is not coated with said paste in the portion extending beyond said separator;
negative and positive terminal connectors, said negative connector adjacent to said first horizontal edge of said cell unit said positive connector adjacent to said second horizontal edge of said cell unit;
said terminal connectors are conductive cones containing a plurality of oblong radial apertures; and
said connectors are secured to the portion of said plates extending beyond said separator, such portion bending radially inward.

5,047,301
## HIGH TEMPERATURE BATTERY AND SYSTEM UTILIZING SAME
Otto J. Adlhart, Fair Lawn, and Timothy D. Meyer, Wyckoff, both of N.J., assignors to Ergenics Power Systems, Inc., Ringwood, N.J.
Continuation of Ser. No. 332,463, Mar. 31, 1989, abandoned.
This application Dec. 3, 1990, Ser. No. 622,216
Int. Cl.[5] H01M *12/04, 6/30*
U.S. Cl. 429—101 10 Claims



1. An energizing system organizable in a cylindrical configu-

VOL 1130 ISS 2 SE 10 1991 UMI



ration, for use at a temperature in a range from 0° to +200° C. and under severe vibrational conditions, the system comprising in combination:

a first cylindrical vessel containing a battery which includes a cell of laminated construction comprising a solid oxidant cathode, an electrolyte element in electrical contact with said cathode, a catalyst in electrical contact with said electrolyte element, and an electrically conductive electrolyte impermeable separator sheet in electrical contact with said catalyst and providing an anode for said cell;

a second cylindrical vessel in the form of a metal container provided with a metal hydride bed in which hydrogen is reversible stored;

and piping means connecting said first vessel to said second vessel so that battery can be exposed to hydrogen gas to generate a voltage by consuming said hydrogen and solid oxidant thereof.

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**5,047,302**

## GALVANIC CELL WITH A POLYMER ELECTRODE

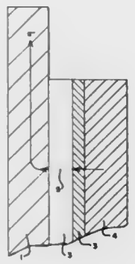
**Rainer Bittihn, Kelkheim; Friedrich Woeffler, Schmitten, and Georg Ely, Glashütten, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany**

**Continuation of Ser. No. 799,946, Nov. 20, 1985. This application Aug. 10, 1987, Ser. No. 85,271**

**Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443455; May 28, 1985, 3519090**

**Int. Cl.[5] H01M *4/60***

**U.S. Cl. 429—213** **19 Claims**



1. A galvanic cell having at least one electrode with an active material comprised of a conductive organic polymer compound of polyconjugated structure doped with cations or anions, and which comprises an aluminum substrate covered with a natural oxide film and an electron-conducting coating covering the natural oxide film, wherein the polymer compound is formed from the corresponding starting monomer by electrochemical deposition on the electron-conducting coating of the aluminum substrate.

**5,047,303**

**Patent Not Issued For This Number**

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**5,047,304**

## ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

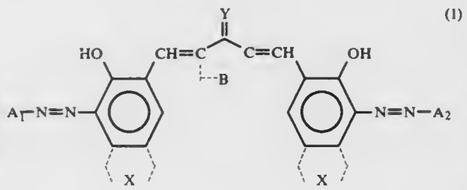
**Hajime Miyazaki; Hideyuki Takai; Shintetsu Go, and Kazushi Iuchi, all of Yokohama, Japan, assignors to Canon Kabusbiki Kaisha, Tokyo, Japan**

**Filed Oct. 18, 1989, Ser. No. 423,230**

**Int. Cl.[5] G03G *5/06***

**U.S. Cl. 430—73** **7 Claims**

1. An electrophotographic photosensitive member having a photosensitive layer on an electroconductive support, comprising an azo pigment represented by the general formular (1) as a charge-generating substance in the photosensitive layer



(1)

wherein $A_1$ and $A_2$ are respectively an aromatic radical or an heterocyclic radical which may be linked through a linking radical; B is a radical necessary for forming together with the carbon atoms a five-membered, six-membered, or seven-membered ring which may be condensed with an aromatic ring; X is a radical condensing with the aromatic ring to form a polycyclic aromatic or heterocyclic ring; Y is oxygen, sulfur, dicyanomethylene, or cyanomethylene.

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**5,047,305**

## ELECTROSTATIC-IMAGE DEVELOPING POLYESTER TONER WITH RELEASE AGENT

**Masafumi Uchida; Jiro Takahashi; Hiroyuki Takagiwa; Akitoshi Matsubara, and Toshiko Yajima, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan**

**Filed Feb. 9, 1989, Ser. No. 308,406**

**Int. Cl.[5] G03G *9/087, 9/097***

**U.S. Cl. 430—110** **14 Claims**

1. An electrostatic image developing toner containing a polyester prepared by condensation polymerization of a monomer composition consisting essentially of:

Component (1): an at least trivalent aromatic carboxylic acid,

Component (2): an aromatic dicarboxylic acid, and

Component (3): an aliphatic dialcohol,

and a releasing agent having a range of penetration, wherein the total of an acid value (AV) and a hydroxyl value (OHV) of said polyester is not less than 30 and not more than 80, and the ratio of OHV/AV is not more than 5.0.



**5,047,306**

## HUMIDITY TOLERANT CHARGE DIRECTOR COMPOSITIONS

**Yaacov Almog, Rehovot, Israel, assignor to Spectrum Sciences B. V., Rotterdam, Netherlands**

**Filed May 19, 1989, Ser. No. 354,121**

**Int. Cl.[5] G03G *9/13***

**U.S. Cl. 430—115** **37 Claims**

1. A liquid developer including:

a non-polar, organic, carrier liquid;

pigmented toner particles; and

a charge director material comprising a zwitterionic charge director compound and an ionic charge director compound each being conjugated to a polymer which is insoluble in said liquid.

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**5,047,307**

## TONER FOR USE IN COMPOSITIONS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES, METHOD OF MAKING THE SAME, AND LIQUID COMPOSITION USING THE IMPROVED TONER

**Benzion Landa, Edmonton; Peretz Ben-Auraham; Joseph Hall, both of Rehovot, Israel, and George A. Gibson, Endwell, N.Y., assignors to Savin Corporation, Stamford, Conn.**

**Continuation of Ser. No. 287,840, Dec. 21, 1988, abandoned, which is a division of Ser. No. 157,122, Feb. 10, 1988, Pat. No. 4,794,651, which is a continuation of Ser. No. 45,168, Apr. 24, 1987, abandoned, which is a continuation of Ser. No. 679,906, Dec. 10, 1984, abandoned, which is a continuation-in-part of Ser. No. 242,242, Sep. 9, 1988, abandoned. This application Aug. 16, 1989, Ser. No. 394,141**

**Int. Cl.[5] G03G *9/13***

**U.S. Cl. 430—137** **18 Claims**



1. A method of producing toner particles adapted for electrophoretic movement through a nonpolar liquid comprising the steps of plasticizing at a temperature in the range of about 65° C. and 100° C. a thermoplastic polymer with a nonpolar liquid having an electrical volume resistivity in excess of about $10^9$ ohm centimeters and a dielectric constant below about 3.0 to form a sponge, shredding said sponge into pieces, adding more nonpolar liquid, wet-grinding the pieces into particles, and continuing the grinding step to pull the particles apart to form fibers extending therefrom.

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**5,047,308**

## PROCESS FOR PREPARING PHOTO- AND HEAT-SENSITIVE RECORDING MATERIAL

**Toshimasa Usami, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jun. 21, 1988, Ser. No. 209,382**

**Claims priority, application Japan, Jun. 22, 1987, 62-155212**

**Int. Cl.[5] G03C *1/74, 1/52;* B41M *5/18***

**U.S. Cl. 430—138** **2 Claims**

1. A process to prepare a photo- and heat-sensitive recording material excellent in fixability consisting essentially of a support having on one side thereon at least one photo- and heat-sensitive layer having a haze % of less than 30 containing a photo-decomposable diazo compound and a coupler, said coupler being a compound which forms color by coupling with the diazo compound, comprising microencapsulating either the diazo compound or the coupler wherein the component to be microencapsulated is present in a concentration of 0.2 wt% or more, dissolving the remainder component into a high boiling point organic solvent slightly soluble or insoluble in water, dispersing the resulting solution containing the remainder component in an aqueous solution to form an emulsified dispersion having an oil size diameter of less than 7 microns and an oil phase/aqueous phase weight ratio of from 0.02 to 0.6, mixing the thus obtained microcapsule solution and emulsified dispersion, coating the resultant mixture on one side of the support, then drying the coat.

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**5,047,309**

## PHOTOSENSITIVE DIAZONIUM RECORDING MATERIAL WITH SULFUR COMPOUND CONTAINING UNDERCOAT LAYER

**Akinobu Koike, and Keiji Akiyama, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan**

**Filed Jun. 6, 1989, Ser. No. 362,255**

**Claims priority, application Japan, Jun. 7, 1988, 63-139678**

**Int. Cl.[5] G03C *1/52, 1/76***

**U.S. Cl. 430—159** **15 Claims**

1. A photosensitive recording material comprising:

(a) an aluminum substrate having a hydrophilic surface,

(b) an undercoating layer coated directly onto the surface of said substrate, said undercoating layer comprising at least one compound selected from the group consisting of 2-mercaptobenzoic acid, mercaptosuccinic acid, 4-mercaptobenzenesulfonic acid and thiodiglycolic acid, said at least one compound being included in an amount required to sufficiently improve developing property in a developing process after imagewise expose to light, and

(c) a photosensitive layer comprising an admixture of a diazonium compound in an amount required to sufficiently make the photosensitive layer photosensitive and a high molecular weight binder compound which is insoluble in water and soluble in an aqueous alkaline solution in an amount of 5–95% by weight based on the total photosensitive layer.

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**5,047,310**

## PHOTOGRAPHIC PROCESS OF HEATING DURING DEVELOPMENT AFTER IMAGE EXPOSURE WITH A CONDUCTIVE LAYER CONTAINING CARBON BLACK

**Hiroyuki Ozaki; Hideki Naito; Satoru Sawada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 809,671, Dec. 16, 1985, abandoned. This application Dec. 16, 1986, Ser. No. 942,958**

**Claims priority, application Japan, Dec. 19, 1984, 59-268032**

**Int. Cl.[5] G03C *5/54***

**U.S. Cl. 430—203** **13 Claims**

1. A process for forming an image in a photographic material containing a support having provided thereon (a) a photographic layer in the form of a heat developable light-sensitive layer or an image receiving layer and (b) at least one electrically conductive layer, comprising, after image-wise exposing the heat developable light-sensitive layer:

electrically energizing the conductive layer to generate sufficient heat to (1) raise the temperature of said photographic layer to a temperature which heat develops the light-sensitive layer, or (2) raise the temperature of said photographic layer to a temperature which heat develops the light-sensitive layer and transfers a mobile dye resulting from the heat development of the light-sensitive layer

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to an image receiving layer, or (3) transfer a mobile dye resulting from heat development of the light-sensitive layer to an image-receiving layer, wherein the electrically conductive layer comprises carbon black having a dibutyl phthalate absorption capability of at least 150 cc/100 g and a hydrophilic binder.

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**5,047,311**

## PANCHROMATIC SILVER HALIDE PHOTOGRAPHIC ELEMENT

**Kazunaka Endo; Kyonosuke Yammamoto; Eiji Kanada, and Shigeyoshi Suzuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Ltd., Tokyo, Japan**

**Continuation of Ser. No. 738,473, May 28, 1985, abandoned. This application Feb. 24, 1987, Ser. No. 18,722**

**Claims priority, application Japan, May 29, 1984, 59-109281; Jun. 26, 1984, 59-132278**

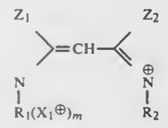
**Int. Cl.[5] G03C** *5/54*

**U.S. Cl. 430—204** **7 Claims**

1. A method of printing comprising printing with lithographic printing plates which have been prepared by employing a silver complex diffusion transfer process which comprises

(i) subjecting to blue, green, red and amber exposure four panchromatic light-sensitive materials which comprise a support and, provided thereon, a silver halide emulsion layer and a surface physical development nuclei layer, said emulsion layer comprising at least 70 mole % of silver chloride and being optically sensitized to blue, green and red spectral regions, and said emulsion containing

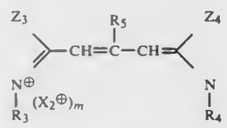
(a) at least one of the blue-sensitizing dyes represented by the general formula (I):



[I]

wherein $Z_1$ represents a group of atoms necessary for completing benzothiazole nucleus, benzoxazole nucleus, or benzoselenazole nucleus having a substituent at position 5 and/or 6; $Z_2$ represents a group of atoms necessary for completing a naphthothiazole nucleus, naphthoselenazole nucleus, or naphthoxazole nucleus, provided that $Z_1$ and $Z_2$ do not simultaneously form a benzoxazole nucleus and naphthosazole nucleus, respectively; $R_1$ and $R_2$ represent each a substituted or unsubstituted aliphatic group, at least one of $R_1$ and $R_2$ representing an aliphatic group having a sulfo group; $X_1$ represents a cation; and m represents 0 and 1;

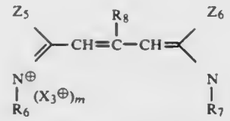
(b) at least one of the sensitizing dye represented by the following general formula (II):



[II]

wherein $Z_3$ and $Z_4$ represent groups of atoms necessary to complete benzoxazole nucleus or naphthoxazole nucleus; $R_3$ and $R_4$ represent each a substituted or unsubstituted aliphatic or aromatic group, at lest one of $R_3$ and $R_4$ being a group having a sulfo group; $R_5$ represents a hydrogen atom, alkyl group, aryl group, or aralkyl group; $X_2$ represents a cation; and m represent 0 or 1; and

(c) at least one of the sensitizing dye represented by the following general formula (III):



[III]

wherein $Z_5$ and $Z_6$ each represents a group of atoms necessary to complete a benzothiazole nucleus, benzoselenazole nucleus, naphthothiazole nucleus, or naphthoselenazole nucleus; $R_6$ and $R_7$ represent each an unsubstituted or substituted aliphatic group or aromatic group, at least one of $R_6$ and $R_7$ being a group having a sulfo group; $R_8$ represents a hydrogen atom, an alkyl group, aryl group, or aralkyl group; $X_3$ represents a cation; and m represents 0 or 1; as green- and red-sensitizing dyes; and

(ii) diffusion transfer developing the exposed material in the presence of a silver halide solvent;

to obtain yellow, magneta, cyan and black plates; and

(iii) printing using blue, green, red and black ink on the printing plates prepared by subjecting the four panchromatic light-sensitive materials to blue, green, red and amber light exposures, respectively.

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**5,047,312**

## SILICON NAPHTHALOCYANINES WITH UNSATURATED LIGANDS AND OPTICAL RECORDING MEDIUM

**Bernhard Albert, Maxdorf; Peter Neumann, and Sibylle Brosius, both of Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Aug. 22, 1989, Ser. No. 396,678**

**Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830041**

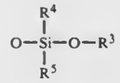
**Int. Cl.[5] G11B** *7/24;* **C07D** *487/22*

**U.S. Cl. 430—270** **8 Claims**

3. An optical recording medium comprising a base and a radiation-sensitive layer, wherein the radiation-sensitive layer contains a silicon naphthalocyanine of formula I:



wherein Nc is a radical of a naphthalocyanine system which may be substituted by $C_1$–$C_{12}$-alkyl, $C_1$–$C_{12}$-alkoxy, unsubstituted or $C_1$–$C_4$-alkyl-substituted $C_6$–$C_{12}$-aryl, or by phenyl-$C_1$–$C_6$-alkyl where the phenyl nucleus may be substituted, and $R^1$ and $R^2$ are identical or different and each is independently of the other a radical of the formula:



where $R^3$ is a radical which has from 2 to 20 carbon atoms and contains from 1 to 5 double bonds, from 1 to 3 triple bonds, or combinations thereof and which may further contain form 1 to 4 phenyl nuclei or from 1 to 3 saturated or unsaturated isocyclic 5-, 6- or 7-membered rings or which may be interrupted by from 1 to 5 oxygen atoms, $R^4$ and $R^5$ are identical or different and each is independently of the other $C_1$–$C_{20}$-alkyl, $C_1$–$C_{20}$-alkoxy or the radical $(O)_nR^3$, wherein n is 0 or 1 and $R^3$ is as defined above, or $R^1$ i $C_1$–$C_{20}$-alkyl.



**5,047,313**

## PHOTOSENSITIVE SEMI-AQUEOUS DEVELOPABLE COPPER CONDUCTOR COMPOSITION

**William J. Nebe, Wilmington, Del., and James J. Osborne, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 21, 1989, Ser. No. 396,492**

**The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.**

**Int. Cl.[5] G03F** *7/027, 7/033*

**U.S. Cl. 430—281** **7 Claims**

1. In a semi-aqueous developable photosensitive copper conductor composition which is fireable in a substantially nonoxidizing atmosphere comprising an admixture of:

(a) finely divided particles of copper solids having a surface area-to-weight ratio of no greater than 20 $m^2/g$ and at least 80 percent by weight of the particles having a size of 0.5–10 $\mu m$ and

(b) finely divided particles of an inorganic binder having a glass transition temperature in the range of from 550° to 825° C., a surface area-to-weight ratio of no greater than 10 $m^2/g$ and at least 90 wt. percent by weight of the particles having a size of 1–10 $\mu m$, the weight ratio of (b) to (a) being in a range from 0.0001 to 0.25, dispersed in an organic vehicle comprising

(c) an organic polymeric binder,

(d) a photoinitiation system,

(e) photohardenable monomer,

(f) an organic medium

wherein the improvement comprises the organic polymeric binder is a copolymer or interpolymer comprising (1) a non-acidic comonomer comprising a $C_1$–$C_{10}$ alkyl acrylate or $C_1$–$C_{10}$ alkyl methacrylate, and (2) an acidic comonomer comprising an ethylenically unsaturated carboxylic acid, with the proviso that all acidic comonomers comprise from 5 to less than 15 weight percent of the polymer, wherein the organic polymeric binder has a molecular weight no greater than 100,000 and wherein the composition upon imagewise exposure to actinic radiation is developable in an aqueous solution containing 0.63 percent by weight sodium borate and 8.7 percent by weight butyl cellusolve.

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**5,047,314**

## SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

**Nobuo Sakai, and Tsumoru Hirano, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

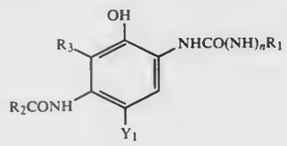
**Filed Jan. 9, 1989, Ser. No. 294,453**

**Claims priority, application Japan, Jan. 8, 1988, 63-1250**

**Int. Cl.[5] G03C** *1/08, 1/46, 7/34*

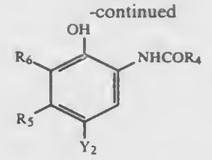
**U.S. Cl. 430—505** **41 Claims**

1. A silver halide color photographic material comprising a support having thereon a cyan coupler-containing layer, a magenta coupler-containing layer and a yellow coupler-containing layer, wherein the cyan coupler-containing layer contains a dispersion of oleophilic fine particles which is obtained by emulsifying or dispersing a solution containing (a) at least one cyan coupler represented by the general formula (I) and/or (II) described below, (b) at least one compound represented by the general formula (III) described below, (c) at least one water-insoluble and organic solvent-soluble homopolymer or copolymer, and (d) an organic solvent having a boiling point of not less than 160° C.,



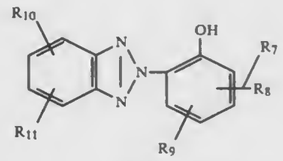
(I)

-continued



(II)

wherein $R_1$, $R_2$, and $R_4$ each represents a substituted or unsubstituted aliphatic group, a substituted or unsubstituted aromatic group or a substituted or unsubstituted heterocyclic group, $R_3$, $R_5$ and $R_6$ each represents a hydrogen atom, a halogen atom, an aliphatic group, an aromatic group or an acylamino group, and $R_3$ may represent a non-metallic atomic group necessary to form a nitrogen-containing 5-membered or 6-membered ring together with $R_2$, $Y_1$ and $Y_2$ each represents a hydrogen atom or a group capable of being released upon a coupling reaction with an oxidation product of a developing agent, and n represents 0 or 1,



(III)

wherein $R_7$, $R_8$, $R_9$, $R_{10}$ and $R_{11}$, which may be the same or different, each represents a hydrogen atom, a halogen atom, a nitro group, a hydroxy group, an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an acyloxy group, an aryloxy group, an alkylthio group, an arylthio group, a mono- or di-alkylamino group, an acylamino group or a 5-membered or 6-membered heterocyclic group containing an oxygen atom or a nitrogen atom, and $R_{10}$ and $R_{11}$ may combine with each other to form a 5-membered or 6-membered aromatic ring.

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**5,047,315**

## SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

**Masakazu Morigaki, and Osamu Takahashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Sep. 12, 1988, Ser. No. 243,391**

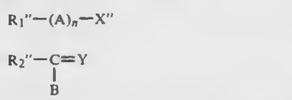
**Claims priority, application Japan, Sep. 11, 1987, 62-228033**

**Int. Cl.[5] G03C** *1/34, 1/38*

**U.S. Cl. 430—544** **19 Claims**

1. A silver halide color photographic material comprising a support having provided thereon a photographic layer, wherein the photographic material contains:

at least one compound (a) selected from (i) a compound represented by formula (IV) or (V) capable of chemically bonding with an aromatic amine developing agent, which remains after color development processing, to produce a chemically inert and substantially colorless compound or (ii) a compound represented by formula (VI) capable of chemically bonding with an oxidation product of an aromatic amine developing agent, which remains after color development processing, to produce a chemically inert and substantially colorless compound:



(IV)

(V)

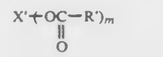
wherein $R_1''$ and $R_2''$ each represents an aliphatic group, an aromatic group or heterocyclic group; X'' represents a

releasing group capable of being eliminated upon reaction with an aromatic amine developing agent; A represents a group capable of reacting with an aromatic amine developing agent to form a chemical bond; n represents 1 or 0; B represents a hydrogen atom, an aliphatic group, an aromatic group, a heterocyclic group, an acyl group or a sulfonyl group; and Y represents a group which accelerates addition of an aromatic amine developing group to a compound of formula (V); $R_1$" and X", or Y and $R_2$", or Y and B may be bound to each other to form a cyclic structure; the compounds represented by Formulae (IV) and (V) are compounds which have a secondary rate constant of reaction with p-anisidine, $K_2$ (80° C.), of 1.0 liter/mol/sec to $1\times10^{-5}$ liter/mol/sec,

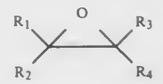
J—Z (VI)

wherein J represents an aliphatic group, aromatic group, or heterocyclic group; and Z represents a nucleophilic group or a group capable of being decomposed in a light-sensitive material to release a nucleophilic group, provided that Z is a group derived from a nucleophilic functional group having a Pearson's nucleophilic $nCH_3I$ value of 5 or more, and

at least one compound (b) represented by the following Formulae (II) or (III):



(II)



(III)

wherein X' represents a divalent to hexavalent polyvalent group; n and m each represents an integer of 2 to 6; R' represents an aliphatic group or an aromatic group, provided that R' existing in the same molecule may be the same or different from each other; $R_1$, $R_2$, $R_3$ and $R_4$, which may be the same or different, each represents a hydrogen atom, an aliphatic group, an aromatic group, an aliphatic oxycarbonyl group, an aromatic oxycarbonyl group or a carbamoyl group, provided that the sum of the carbon atoms contained in $R_1$, $R_2$, $R_3$ and $R_4$ is 8 or more, and at least one combination of $R_1$ and $R_2$, $R_3$ and $R_4$ or $R_1$ and $R_3$ may be bound to each other to form a 5- to 7-membered ring, said compound (a) and compound (b) being incorporated in the same layer or different layers.

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**5,047,316**

**SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL**

**Tsumoru Hirano, and Kiyoshi Nakajyo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan**

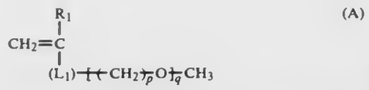
**Filed Jan. 9, 1990, Ser. No. 462,559**

**Claims priority, application Japan, Jan. 10, 1989, 1-3470**

**Int. Cl.[5] G03C *1/04, 7/34***

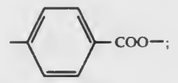
**U.S. Cl. 430—545** **22 Claims**

1. A silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer obtained by coating a mixture containing (i) a dispersion comprising a cyan dye forming coupler dissolved in a high boiling point solvent; (ii) a silver halide emulsion; and (iii) an aqueous polymer latex solution, said aqueous polymer latex solution comprising from 70 to 100% by weight of monomer units of a monomer represented by the following general formula (A):

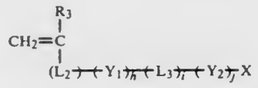


(A)

wherein $R_1$ represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; $L_1$ represents —CONH— or



p represents an integer of from 1 to 4; q represents an integer of from 1 to 30; and up to 30% by weight of monomer units of a monomer represented by the following general formula (B):



(B)

wherein $R_2$ represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms; $L_2$ represents —COO— or —CONH— or a phenylene group; $L_3$ represents —OCO—, —COO—, —NHCO— or —CONH—; $Y_1$ and $Y_2$ each represents a straight chain or branched chain alkylene group having from 1 to 12 carbon atoms; and h, i and j each represent 0 or 1, when j is 0, X represents a hydrogen atom or an alkali metal atoms and when j is 1, X represents —COOH—, —$SO_3$H, —OPO(OH)$_2$ or a metal salt thereof.

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**5,047,317**

**SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL**

**Shigeru Shibayama; Shunichi Aida; Toshio Aizu, and Shunji Takada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 308,224, Feb. 9, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 593,592**

**Claims priority, application Japan, Feb. 9, 1988, 63-28444; Mar. 28, 1988, 63-74251**

**Int. Cl.[5] G03C *1/34***

**U.S. Cl. 430—564** **11 Claims**

1. A method for imparting storage stability to a high-sensitivity silver halide photographic light-sensitive material comprising determining the potassium content of each ingredient to be included in the photosensitive material and selecting and combining ingredients such that the potassium level of the final photographic light-sensitive material does not exceed 1 part potassium per 1000 parts silver by weight.

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**5,047,318**

**IMIDAZOLE LEUCO DYE COMPOSITION CONTAINING 4'-HYDROXYACETANILIDE, DIAGNOSTIC KIT AND METHOD USING SAME**

**Brian A. Snyder, Rochester; Harold C. Warren, III, Rush, both of N.Y., and Gregory J. McClune, Portage, Mich., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 13, 1988, Ser. No. 206,258**

**Int. Cl.[5] G01N *33/53, 33/543*; C12Q *1/34, 1/28***

**U.S. Cl. 435—5** **8 Claims**

1. A method for the determination of a ligand, said method comprising:

A. contacting a sample of a biological specimen suspected of containing a ligand with:



a specific binding species which is a receptor for said ligand,

and the same or different specific binding species which is labeled with peroxidase, said labeled species being reactive with either said ligand or a receptor for said ligand,

to form a peroxidase-labeled reaction product of said ligand with said specific binding species which is captured on a microporous membrane, and

B. after the formation and capture of said peroxidase-labeled reaction product, and in the presence of a substrate for peroxidase, determining said labeled reaction product by contacting said reaction product on said membrane with an aqueous dye-providing composition which is substantially free of peroxidase or a peroxidase-labeled specific binding species, said composition comprising an imidazole leuco dye, 4'-hydroxyacetanilide which is present in an amount of from about 0.5 to about 2.5 mmolar, and a water-soluble or -dispersible polymer selected from the group consisting of vinylpyrrolidone polymers, acrylamide polymers, acrylic and methacrylic acid polymers, polyethylene glycols and polyamines as a determination of said ligand.

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**5,047,319**

**Patent Not Issued For This Number**

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**5,047,320**

**Patent Not Issued For This Number**

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**5,047,321**

**METHOD FOR ANALYSIS OF CELLULAR COMPONENTS OF A FLUID**

**Michael R. Loken, Los Altos, and Leon W. M. M. Terstappen, Palo Alto, both of Calif., assignors to Becton Dickinson & Co., Franklin Lakes, N.J.**

**Filed Jun. 15, 1988, Ser. No. 207,099**

**Int. Cl.[5] C12Q *1/68*; G01N *33/577***

**U.S. Cl. 435—6** **16 Claims**

1. A method for multi-parameter analysis of cells in a body fluid wherein said method comprises the steps of:

1) taking a fluid sample from an individual;

2) adding two fluorescent nucleic acid dyes to said sample wherein one dye will differentially label DNA and wherein the other dye will differentially label RNA, and further wherein each dye has a fluorescent peak emission spectra different from the other;

3) adding a fluorescently labelled cell surface marker to said sample, wherein said marker recognizes an antigen that is differentially expressed on said cells in said fluid sample and wherein said fluorescent label has a peak emission spectra different from said fluorescent dyes; and

4) analyzing said cells in said sample in an instrument capable of detecting and recording three channels of fluorescence and two channels of light scattering for each of the cells in said sample.

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**5,047,322**

**USE OF DRY ANALYTICAL ELEMENTS TO DETERMINE ANALYTES**

**Robert E. Emmons, Victor; Linda A. Mauck; John C. Mauck, both of Rochester, all of N.Y.; TaiWing Wu, Toronto, Canada; Royden N. Rand, Pittsford, N.Y., and Angelo P. Andrese, West Chester, Pa., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation-in-part of Ser. No. 68,767, Jun. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 811,031, Dec. 19, 1985, abandoned. This application Sep. 30, 1988, Ser. No. 251,494**

**Int. Cl.[5] C12Q *1/68*; G01N *33/561***

**U.S. Cl. 435—6** **28 Claims**

1. A method for determining an analyte, said method comprising the steps of:

A. forming a temporary laminate by overlaying a plate adapted for electrically induced migration and containing a plurality of analytes which have been electrically separated from one another, with a dry, transparent analytical element containing a water-insoluble binder material having pre-dispersed therein a reactive component which will react with at least one of said analytes to form a non-diffusible, detectable species solely in said element, and

B. removing said analytical element from said plate and detecting said detectable species in said analytical element.

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**5,047,323**

**METHOD FOR DETECTING HUMAN KININOGEN USING MONOCLONAL ANTIBODIES THERETO**

**Robert W. Colman, and Alvin H. Schmaier, both of Philadelphia, Pa., assignors to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.**

**Division of Ser. No. 821,367, Jan. 27, 1986, Pat. No. 4,908,431. This application Oct. 30, 1989, Ser. No. 429,262**

**Int. Cl.[5] G01N *33/53, 33/543***

**U.S. Cl. 435—7.21** **5 Claims**

1. A method for determining the level of human kininogen in a specimen comprising contacting the specimen with a monoclonal antibody which binds to an antigenic determinant of human kininogen, and measuring the human kininogen bound by said antibody by an assay means, which antigenic determinant is characterized by binding to monoclonal antibody produced by hybridoma ATCC #HB-8963 or ATCC #HB-8964.

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**5,047,324**

**SUBSTANTIALLY PURE ENZYME-ANTIBODY CONJUGATE PREPARATIONS**

**Robert A. Fredrickson, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.**

**Continuation-in-part of Ser. No. 939,640, Dec. 9, 1986, abandoned. This application Sep. 16, 1987, Ser. No. 95,621**

**Int. Cl.[5] G01N *33/535, 33/563***

**U.S. Cl. 435—7.9** **5 Claims**

1. A method for obtaining a substantially pure preparation of a conjugate comprising a single β-D-galactosidase molecule covalently coupled to a predetermined number of a monovalent antibody fragment selected from the group consisting of Fab and Fab', said method comprising the steps of:

(a) applying to a polyacrylamide gel electrophoretic support matrix a reaction mixture from the coupling of β-D-galactosidase with the monovalent antibody fragment, said reaction mixture comprising, as separately migratable species, at least free β-D-galactosidase and a population of β-D-galactosidase conjugates comprising one or more molecules of β-D-galactosidase covalently coupled to one or more of said monovalent antibody fragment;

(b) electrophoretically separating said free β-D-galactosidase and β-D-galactosidase conjugates into distinct concentration zones on said support matrix;

(c) staining the support matrix with a chromogenic β-D-

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galactosidase substrate to visualize bands containing the enzyme,

(d) cutting and removing the gel band containing a desired β-D-galactosidase conjugate wherein greater than about 99% of β-D-galactosidase present in the preparation in such band is covalently coupled to the antibody fragment, and

(e) eluting a substantially pure preparation of the desired β-D-galactosidase conjugate from the gel band removed in step (d).

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**5,047,325**

## WASH SOLUTION CONTAINING A CATIONIC SURFACTANT AND ITS USE IN CHLAMYDIAL AND GONOCOCCAL DETERMINATIONS

**Allan D. Pronovost, San Diego, and James H. Gilbert, Oakland, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 7, 1988, Ser. No. 255,924**

**Int. Cl.[5] C12Q *1/00, 1/28;* G01N *33/53***

**U.S. Cl. 435—7.36** **15 Claims**

1. A method for the determination of chlamydial or gonococcal organisms comprising:

A. contacting chlamydial or gonococcal antigen extracted from a specimen suspected of containing chlamydial or gonococcal organisms, respectively, with an antibody to said antigen so as to form an immunological complex of said antigen and antibody,

B. prior to, simultaneously with or subsequent to said complex formation, insolubilizing either or both of said antigen or antibody on a solid support so as to form a bound immunological complex,

C. separating uncomplexed materials from said bound immunological complex by washing said complex with a wash solution having a pH of from about 7 to about 12 and at least about 0.1 weight percent of one or more cationic surfactants, and

D. determining the presence of said bound complex as an indication of the amount of chlamydial or gonococcal organisms in said specimen.

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**5,047,326**

## IMMUNMOLOGICAL REAGENT COMPOSITION AND ITS USE IN THE DETERMINATION OF CHLAMYDIAL OR GONOCOCCAL ANTIGENS

**Allan D. Pronovost, San Diego, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 7, 1988, Ser. No. 255,925**

**Int. Cl.[5] C12Q *1/00;* G01N *33/53***

**U.S. Cl. 435—7.36** **20 Claims**

1. An immunological reagent composition useful for the determination of a chlamydial or gonococcal antigen comprising:

a. an antibody to a chlamydial or gonococcal antigen, or an antibody to said chlamydial or gonococcal antibody,

b. a nonimmunological blocking protein having a pI of from about 4 to about 7, and

c. an amphoteric surfactant present in an amount of at least about 0.001 weight %.

**5,047,327**

## TIME-STABLE LIQUID CHOLESTEROL ASSAY COMPOSITIONS

**Karen R. Caris, Camarillo, Calif., and Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010, assignors to Ivan E. Modrovich, Camarillo, Calif.**

**Continuation of Ser. No. 110,091, Oct. 14, 1987, abandoned, which is a continuation of Ser. No. 868,892, May 27, 1986, abandoned, which is a continuation of Ser. No. 590,220, Mar. 16, 1984, abandoned, which is a continuation of Ser. No. 364,899, Apr. 2, 1982, abandoned. This application Jan. 3, 1989, Ser. No. 294,896**

**Int. Cl.[5] C12Q *1/60***

**U.S. Cl. 435—11** **16 Claims**

1. A stable cholesterol assay composition which consists essentially of a polyhydroxy compound free aqueous solution of:

(a) at least one acidic compound selected from the group consisting of a bile acid and a salt of a bile acid, the total of said acidic compound being present in a positive amount of up to about 5 mM;

(b) a nonionic surfactant present in a concentration of from about 0.15 to about 1.5 percent volume by volume;

(c) a buffer in a concentration of from 0 to about 65 mM;

(d) cholesterol oxidase in a concentration of at least about 0.02 KIU/l,

(e) microbial cholesterol esterase in a concentration of at least about 0.07 KIU/l; and

(f) a chromogen system for determining of hydrogen peroxide; said cholesterol assay solution having a pH of from about 5.5 to about 8.5 a stability of at least 3 days at 41° C. and an essay completion time within 10 minutes at 37° C.

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**5,047,328**

## METHOD FOR DETERMINATION OF THE TYPE AND SEVERITY OF PERIODONTAL DISEASE STATES

**Donald A. Chambers, Evanston, Ill., and Thomas E. Schindler, San Diego, Calif., assignors to The Board of Trustees of the University of Illinois, Urbana, Ill.**

**Filed Oct. 26, 1988, Ser. No. 262,995**

**Int. Cl.[5] C12Q *1/52, 1/48***

**U.S. Cl. 435—16** **7 Claims**

1. A method for determining the severity and type of periodontal disease in mammals comprising the steps of

(1) sampling crevicular fluid for a selected brief period of time,

(2) assaying the crevicular fluid sample so collected to determine the total quantity of aspartate aminotransferase present, and

(3) correlating the total quantity of aspartate aminotransferase present in said crevicular fluid sample with a standard for the selected period of time indicative of the severity and type of periodontal disease.

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**5,047,329**

## METHOD FOR THE MEASUREMENT OF CREATINE OR CREATININE AND REAGENTS FOR THESE MEASUREMENTS

**Masaru Suzuki, Kashiwa, Japan, assignor to Noda Institute for Scientific Research, Noda, Japan**

**Filed Jan. 5, 1988, Ser. No. 141,043**

**Claims priority, application Japan, Jan. 23, 1987, 62-13645**

**Int. Cl.[5] C12Q *1/34***

**U.S. Cl. 435—18** **8 Claims**

1. A method for measuring creatine in a sample comprising: decomposing N-ethylglycine present in the sample enzymatically with sarcosine oxidase of which Km value (Michaelis constant) to N-ethylglycine at pH 8, 37° C. is 20 mM or below and thereafter determining creatine by reacting the decomposed sample with creatine amidinohydrolase and sarcosine oxidase N of which Km value (Michaelis constant) to N-ethylglycine at pH 8, 37° C. is 50 mM or above as obtained by culturing Bacillus sp. NS-129 (FERM BP-671) and measuring final reaction products as a measure of creatine present in the sample.



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**5,047,330**

## COMPOUND LABELLED BY THE ACETYL CHOLINESTERASE OF *ELECTROPHORUS ELECTRICUS,* ITS PREPARATION PROCESS AND ITS USE AS A TRACER OR MARKER IN ENZYMOIMMUNOLOGICAL DETERMINATIONS

**Jacques Grassi, Charenton le Pont, and Philippe Pradelles, Longjumeau, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Continuation of Ser. No. 636,613, Aug. 1, 1984, abandoned. This application Jan. 6, 1988, Ser. No. 142,247**

**Claims priority, application France, Aug. 17, 1983, 83 13389**

**Int. Cl.[5] C12Q *1/46***

**U.S. Cl. 435—20** **21 Claims**

1. A compound, comprising:

(i) a molecule component which is at least one member selected from the group consisting of antigens, haptens and antibodies; and

(ii) an enzyme component, wherein said enzyme is molecular form $A_{12}$, $A_8$ or $G_4$, or an aggregate of these forms, of acetyl cholinesterase obtained from *Electrophorus electricus;*

wherein said molecule component and said enzyme component are bonded to each other via a covalent bond or a reversible bond, and wherein said compound is usable as an enzymoimmunologic tracer or marker.

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**5,047,331**

## METHOD AND DEVICE FOR BACTERIAL TESTING

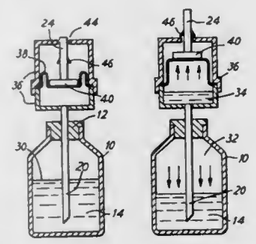
**Derwent Swaine, Winchester; Eric Y. Bridson, Camberley, and Deepak Sawhney, Basingstoke, all of England, assignors to Oxoid Limited, England**

**Continuation of Ser. No. 574,700, Jan. 27, 1984, abandoned. This application Oct. 19, 1987, Ser. No. 110,587**

**Claims priority, application United Kingdom, Feb. 14, 1983, 8303096**

**Int. Cl.[5] C12Q *1/02, 1/04;* C12M *1/24***

**U.S. Cl. 435—29** **12 Claims**



1. A culture test process for culturing a number of samples possibly containing bacteria and identifying any samples among said number which do contain bacteria, by indicating the production of gas during growth of cultures corresponding to said bacteria-containing samples, said process comprising:

(a) introducing each of said samples possibly containing bacteria into a respective sterile liquid growth medium in a first container of a respective culture test device, the medium being such that it generates gas if bacterial growth occurs;

(b) providing in each said first container a gaseous head space above said liquid medium and a closure for said first container above said head space which is gas tight except for an exit path for liquid via a narrow tube, said tube having a first opening below the surface of said liquid medium in said first container and leading upwards to a respective second, upper liquid container, each said upper liquid container being located above said first container and having a transparent wall for indicating visually the presence of liquid in said upper container, said second, upper liquid container being provided with at least one of a flexible wall for increasing a volume of the interior thereof and means for venting gas from the interior thereof in response to a pressure change in the interior

said first container having a gaseous head space above said liquid medium and a closure for said first container which is gas tight except for an exit path via a narrow tube;

said narrow tube opening below the surface of said liquid medium and leading upwards to a second and upper liquid container;

said upper liquid container having a transparent wall for indicating visually the presence of said liquid in said upper liquid container;

said upper liquid container being provided with at least one of a flexible wall for increasing a volume of the interior thereof and means for venting gas from the interior thereof in response to a pressure change in the interior thereof so that liquid can enter said upper liquid container via said narrow tube in response to gas production in said first container with minimal change in interior pressure of said second container;

whereby in use of the device in the event of growth of a bacterial culture in said liquid medium and gas production by said culture, pressure develops in said gaseous head space and drives part of said culture upwards into said upper liquid thereof so that fluid can enter said upper liquid container through said tube in response to gas production in said first container with minimal change in interior pressure of said second container;

(c) incubating said culture test devices together to culture said respective sample in each said device, whereby in the event of bacterial growth and consequent gas production in any of said devices, pressure develops in a corresponding one of said gaseous head spaces and drives part of said respective liquid culture upwards into said respective upper liquid container, thereby to provide visual indication of said gas production in said respective device, thereby to identify the corresponding sample as positive for bacteria.

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**5,047,332**

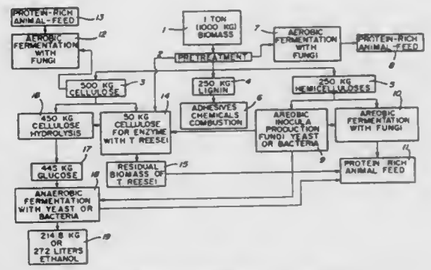
## INTEGRATED PROCESS FOR THE PRODUCTION OF FOOD, FEED AND FUEL FROM BIOMASS

**Devinder S. Chahal, Laval, Canada, assignor to Institut Armand-Frappier-Univ. of Quebec, Laval, Canada**

**Filed Sep. 3, 1986, Ser. No. 903,467**

**Int. Cl.[5] A23K *1/00;* C12P *39/00, 19/02, 21/00***

**U.S. Cl. 435—42** **14 Claims**




1. Process for treating biomass which comprises:

(a) pretreating said biomass to enable it to be fractionated into cellulose, lignin and hemicellulose;

(b) separating pretreated biomass into said celulose lignin and hemicellulose;

(c) producing inocula of *Chaetomium cellulolyticum IAF*-101 (NRRL 18756), Aspergillus sp. IAF-201 (NRRL 18758), Penicillum sp. IAF-603 (NRRL 18759), *Trichoderma reesei* QMY-1 (NRRL 18760), Saccharomyces spp., Kluyveromyces spp., and Zymononas spp. by growing same on hemicellulose fraction obtained by separation from pretreated biomass;

(d) inoculating another hemicellulose fraction obtained by separation from pretreated biomass with an inoculum selected from the group consisting of inocula of *Chaetomium cellulolyticum* IAF-101 (NRRL 18756), Aspergillus sp. IAF-201 (NRRL 18758) and Penicillm sp. IAF-603 (NRRL 18759) under aerobic fermentation conditions effective to produce protein-rich animal feed;

(e) providing a fraction of pretreated biomass not subjected to separating step (b) and inoculating same with an inoculum of *Chaetomium cellulolyticum IAF*-101 (NRRL 18756), Aspergillus sp. IAF-201 (NRRL 18758) or Penicillum sp. IAF-603 (NRRL 18759) under aerobic fermentation conditions effective to product protein-rich animal feed;

(f) inoculating a cellulose fraction obtained by separation from pretreated biomass with an inoculum selected from the group consisting of inocula of *Chaetomium cellulolyticum* IAF-101 (NRRL 18756), Aspergillus sp. IAF-201 (NRRL 18758) and Penicillum sp. IAF-603 (NRRL 18759) under aerobic fermentation conditions effective to produce protein-rich animal feed;

(g) fermenting a fraction of pretreated biomass not subjected to separating step (b) or fractionated cellulose under aerobic conditions with *Trichoderma reesei* QMY-1 (NRRL 18760) to give a cellulase-system, hydrolyzing a cellulose fraction obtained in step (d) with said cellulose system to give glucose, and fermenting said glucose with an inoculum selected from said inocula of yeasts and bacteria to give ethanol.

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**5,047,333**

**METHOD FOR THE PREPARATION OF NATURAL HUMAN GROWTH HORMONE IN PURE FORM**

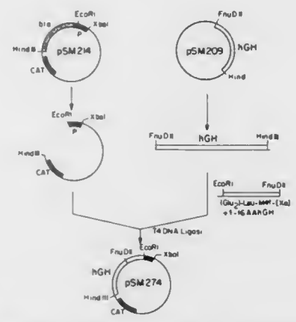
**Guido Grandi, Segrate; Elisabetta Franchi, Milan; Federico Maisano, Lodi, and Silvia Astrua Testori, Milan, all of Italy, assignors to Eniricerche S.p.A., Milan, Italy**

**Filed Dec. 22, 1988, Ser. No. 288,358**

**Claims priority, application Italy, Dec. 22, 1987, 23148 A/87**

**Int. Cl.**[5] **C12P** *21/06, 21/02;* **C12N** *15/18;* **C07K** *13/00*

**U.S. Cl. 435—68.1** **5 Claims**




1. A method for the preparation of a substantially pure protein having the sequence of naturally occurring human growth hormone comprising the steps of:

(A) transforming *Bacillus subtilis* cells with a hybrid plasmid comprising a gene encoding a precursor of human growth hormone, wherein said precursor of human growth hormone contains, at the N-terminal of naturally occurring human growth hormone, the following amino acid sequence:

$(aa)_n$-Idle-Glu-Gly-Arg-

wherein:
$(aa)_n$ is

Met-Glu-Glu-Leu-Met;

wherein Ile-Glu-Gly-Arg- is the tetrapeptide recognized by Factor Xa;

(B) culturing the resulting transformed cells of step (A) such that they synthesize said precursor of human growth hormone;

(C) lysing the resulting cultured transformed cells of step (B) and recovering the supernatant liquid containing said precursor of human growth hormone;

(D) purifying the resulting precursor of human growth hormone from the resulting supernatant liquid of step (C) by chromatography;

(E) hydrolyzing the resulting precursor of human growth hormone of step (D) by treatment with Factor Xa to produce a protein having the sequence of naturally occurring human growth hormone; and

(F) purifying the resulting protein having the sequence of naturally occurring human growth hormone of step (E) from the resulting hydrolysis mixture by chromatography so as to obtain said substantially pure protein having the sequence of naturally occurring human growth hormone.

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**5,047,334**

**NOVEL PROKARYOTIC EXPRESSION AND SECRETION SYSTEM**

**Joan Petro, Cambridge; Jennifer Jackson, Reading, and Scott Putney, Arlington, all of Mass., assignors to Repligen Corporation, Cambridge, Mass.**

**Filed Jun. 30, 1987, Ser. No. 68,471**

**Int. Cl.**[5] **C12N** *15/31, 15/70, 15/03;* **C12P** *21/00, 21/02*

**U.S. Cl. 435—69.1** **16 Claims**

1. A DNA sequence which is capable of enhancing the expression or secretion of a protein in a prokaryotic host wherein said DNA sequence is selected from the group consisting of:

(A)

```
CCCGGGGATC  GGATTTACTG  AAAATACCAT
                                50
TAAAAAATAT  CTACAATGCA  CTAACATCCA
GACAGTGACG  GTGCCTGTTC  CTGCGAAGTT
               100
TTTACGTGCT  TCAAATGTAC  CGACTGGATT
                                150
GCTTAATGAA  ATGATTGCTT  ATCTCAACTC
GGAAGAACGC  ATCAATCATA  ATTTTTCAGA
                        200
ACTTTTGCTT  TTTTCTTGCC  TGTCTATTTT
TGCCGCATGC  AAAGGTTTCA  TTACACTATT
               250
AACTAACGGT  GTGCTATCCG  TTTCTGGGAA
                                300
AGTGAGAAAT  ATTGTCAACA  TGAAGCCGGC
GCACCCATGG  AAGCTGAAAG  ATATTTGTGA
                        350
CTGCCTGTAC  ATCAGTGAAA  GCCTGTTGAA
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GAAAAAACTT  AAGCAAGAGC  AAACGACATT
               400
CTCACAGATT  CTTTTAGATG  CAAGAATGCA
                        450
GCACGCAAAA  AATTTGATAC  GCGTAGAAGG
TTCAGTCAAT  AAAATTGCCG  AACAATGTGG
               500
TTATGCCAGT  ACATCTTATT  TTATTTATGC
GTTCCGCAAA  CATTTCGGCA  ACAGTCCGAA
               550
GAGAGTTTCT  AAGGAGTACC  GTTGTCAAAG
                        600
TCACACGGGT  ATGAATACGG  GCAACACGAT
GAATGCTTTA  GCTATTTGAT  TATTTGCTAA
               650
CGAGTAGTCA  ACCACACACG  CTGCGTAAGA
ATTAAATGGG  GCAGCCATTC  CCTGCCCCGC
               700
GTTGTTTTTA  GGCGATATAT  TTATTGAAAT
                        750
AAATAAGTGA  CATCCATCAC  ATATTTATGC
ACTTGCATAA  CCTGTTGCAT  GATTATTTAT
               800
GATCTCAATT  CTGCATTTTG  TCAGTAAAAT
GCAATAATTT  ATTAAATATC  AATAAATTAG
               850
TTGTTTATCG  GCGAGAAATT  ACTTAATAGA
                        900
ACAGAAAGTA  ATGTCAACGC  TTTATGGACT
GTTTTTTCCC  TTTTTTTAGC  TAAATCTGCT
               950
ATCTCTTTAT  GTGACTAACT  TCACTTACAT
CCACTTATTT  CTCTTCGTAA  AATTACTTTG
               1000
GAATTAAGTA  CAATAAGAAG  AGGAACATTT
                        1050
ATGAAGTCTG  CATTAAAGAA  AAGTGTCGTA
AGTACCTCGA  TATCTTTGAT  ACTGGCATCT
               1100
GGTATGGCTG  CATTTGCTGC  TCATGCGGCA
GATGATGTAA  AGCTGAAAGC  AACCAAAACA
               1150
AACGTTGCTT  TCTCAGACTT  TACGCCGACA
                        1200
GAATACAGTA  CCAAAGGAAA  GCCAAATATT
ATCGTACTGA  CCATGGATGA  TCTTGGTTAT
               1250
GGACAACTTC  CTTTGATAA   GGGATCTTTT
GACCCAAAAA  CAATGGAAAA  TCGTGAAGTT
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               1300
GTCGATACCT  ACAAAATAGG  GATAGATAAA
                        1350
GCCATTGAAG  CTGCACAAAA  ATCAACGCCG
ACGCTCCTTT  CATTAATGGA  TGAAGGCGTA
               1400
CGTTTTACTA  ACGGCTATGT  GGCACACGGT
GTTTCCGGCC  CCTCCCGCGC  CGCAATAATG
               1450
ACCGGTCGAG  CTCCCGCCCG  CTTTGGTGTC
                        1500
TATTCCAATA  CCGATGCTCA  GGATGGTATT
CCGCTAACAG  AAACTTTCTT  GCCTGAATTA
               1550
TTCCAGAATC  ATGGTTATTA  CACTGCAGCA
GTAGGTAAAT  GGCACTTGTC  AAAAATCAGT
               1600
AATGTGCCGG  TACCGGAAGA  TAAACAAACG
                        1650
CGTGACTATC  ATGACAACTT  CACCACATTT
TCTGCGGAAG  AATGGCAACC  TCAAAACCGT
               1700
GGCTTTGATT  ACTTTATGGG  ATTCCACGCT
GCAGGAACGG  CATATTACAA  CTCCCTTCAC
               1750
TGTTCAAAAA  TCGTGAACGT  GTCCCGCAAA
               1773
GGT;
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(B)

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                CAT     GATTATTTAT
               800
GATCTCAATT  CTGCATTTTG  TCAGTAAAAT
GCAATAATTT  ATTAAATATC  AATAAATTAG
               850
TTGTTTATCG  GCGAGAAATT  ACTTAATAGA
                        900
ACAGAAAGTA  ATGTCAACGC  TTTATGGACT
GTTTTTTCCC  TTTTTTTAGC  TAAATCTGCT
               950
ATCTCTTTAT  GTGACTAACT  TCACTTACAT
CCACTTATTT  CTCTTCGTAA  AATTACTTTG
               1000
GAATTAAGTA  CAATAAGAAG  AGGAACATTT
                        1050
ATGAAGTCTG  CATTAAAGAA  AAGTGTCGTA
AGTACCTCGA  TATCTTTGAT  ACTGGCATCT
               1100
GGTATGGCTG  CATTTGCTGC  TCATG;
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(C)

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ATGAAGTCTG
          1050
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| | | |
|---|---|---|
| CATTAAAGAA | AAGTGTCGTA | AGTACCTCGA |
| TATCTTTGAT | ACTGGCATCT | GGTATGGCTG |
| CATTTGCT; | | |

(D) DNA sequences wherein the non-coding region (nucleotides 1 through 1020 inclusive) of (D) is identical to the non-coding region of (A), said non-coding region of (A) consisting of nucleotides 1through 1020 inclusive of (A), and the coding region (nucleotides 1021 through 1773 inclusive) of (D) is any sequence that codes for the same amino acid sequence encoded by the coding region of (A), said coding region of (A) consisting of nucleotides 1021 through 1773 inclusive;

(E) DNA sequences wherein the non-coding region (nucleotides 768 through 1020 inclusive) of (E) is identical to the non-coding region of (B), said non-coding region of (B) consisting of nucleotides 768 through 1020 inclusive of (B), and the coding region (nucleotides 1021 through 1105 inclusive of (E) is any sequence that codes for the same amino acid sequence encoded by the coding region of (B), said coding region of (B) consisting of nucleotides 1021 through 1105 inclusive; and

(F) DNA sequences encoding the same amino acid sequence encoded by the coding region of (C), said coding region of (C) consisting of nucleotides 1021 through 1098 inclusive.

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**5,047,335**

**PROCESS FOR CONTROLLING INTRACELLULAR GLYCOSYLATION OF PROTEINS**

**James Paulson, Sherman Oaks; Eryn Ujita-Lee, Redondo Beach, and Jasminder Weinstein, Culver City, all of Calif., assignors to The Regents of the University of Calif., Berkeley, Calif.**

**Filed Dec. 21, 1988, Ser. No. 288,618**
**Int. Cl.[5] C12N** *15/00, 15/56, 15/79*
**U.S. Cl. 435—69.1** **16 Claims**

1. A process for altering the glycosylation of a protein produced by a eukaryotic cell, said process comprising the steps of:

introducing into said eukaryotic cell at least one gene which is capable of expressing at least one enzyme which is selected from the group consisting of glycosyltransferase, fucosyltransferases, galactosyltransferases, β-acetylgalactosaminyltransferases, N-acetylglycosaminyltransferases and sulfotransferases; and

expressing a sufficient amount of at least one of said enzymes in said eukaryotic cell to thereby alter the glycosylation of said protein in said eukaryotic cell.

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**5,047,336**

**DNA SEQUENCES, RECOMBINANT DNA MOLECULES AND PROCESSES FOR PRODUCING MULLERIAN INHIBITING SUBSTANCE-LIKE POLYPEPTIDES**

**Richard L. Cate, Brookline, and Patricia K. Donahoe, Weston, both of Mass., assignors to Biogen, Inc., Cambridge and The General Hospital Corporation, Boston, both of, Mass.**

**Filed Oct. 30, 1985, Ser. No. 792,880**
**Int. Cl.[5] C12N** *1/21, 1/16, 15/10, 5/16, 15/70, 15/74, 15/79*
**U.S. Cl. 435—69.4** **15 Claims**

Bovine tryptic peptides used for making oligonucleotide probes

Peak # T105-106:

LeuAspLeuValProPheProGlnPro

Peak # T81:

LeuAlaLeuAspProGlyAlaLeuAlaGlyPheProGlnGlyGlnVal

11. The host according to claim **10**, wherein said animal cells are selected from the group consisting of COS cells, CHO cells, mouse cells, swine cells and human tissue cells in culture.

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**5,047,337**

**CERAMIDE-GLYCANASE**

**Su-Chen Li, and Yu-Teh Li, both of Tulane University Medical Center 1430 Tulane Ave., New Orleans, La. 70112**

**Filed Oct. 23, 1987, Ser. No. 113,024**
**Int. Cl.[5] C12P** *19/04, 7/64, 13/02;* **C12N** *9/24*
**U.S. Cl. 435—101** **38 Claims**

7. A ceramide-glycanase enzyme which functions to hydrolyze the glycosidic linkage of a glycolipid to yield an intact oligosaccharide and a lipid, and which is essentially free of exoglycosidase.

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**5,047,338**

**POLYESTER ANTIBIOTIC PREPARATION**

**Guido M. Miescher, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Northbrook, Ill.**

**Filed May 29, 1986, Ser. No. 868,014**
**Int. Cl.[5] C12P** *17/16, 17/18;* **C12N** *1/38;* **C07D** *407/00*
**U.S. Cl. 435—118** **21 Claims**

1. A method for producing a polyether antibiotic material comprising:

(a) forming discrete polyether antibiotic-containing agglomerates which are separable from an aqueous medium by producing a polyether antibiotic through cultivation of a polyether antibiotic-producing microorganism in a generally aqueous nutrient-containing fermentation broth under conditions wherein at the end of fermentation, a lipid is present in the broth in a sufficient amount to form discrete agglomerates with polyether antibiotic in the fermentation broth, which agglomerates are separable from the fermentation broth; and

(b) separating the agglomerates from the broth.

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**5,047,339**

**RECOVERY OF POLYETHER ANTIBIOTIC MATERIAL**

**Vikram P. Mehrotra, Terre Haute, Ind., assignor to International Minerals & Chemical Corp, Northbrook, Ill.**

**Filed Apr. 21, 1986, Ser. No. 854,106**
**Int. Cl.[5] C12P** *17/16, 17/18;* **C12N** *1/38;* **C07D** *407/00*
**U.S. Cl. 435—118** **12 Claims**

1. A method for recovering a polyether antibiotic material comprising:

(a) mixing an aqueous medium having lipid droplets dispersed therein to cause the droplets to collide with each other and coalesce to form agglomerates which are separable from the medium, the lipid droplets comprising polyether antibiotic and a lipid material capable of adsorbing on said polyether antibiotic without degrading said polyether antibiotic; and

(b) separating the agglomerates from the medium.

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**5,047,340**

**LAC+ SACCHAROMYCES CEREVISIAE**

**Robert C. Dickson, Lexington, Ky., and Kotikanyadanam K. Sreekrishna, Bartlesville, Okla., assignors to The University of Kentucky Research Foundation, Lexington, Ky.**

**Continuation of Ser. No. 741,213, Jun. 5, 1985, abandoned. This application Oct. 18, 1988, Ser. No. 260,124**
**Int. Cl.[5] C12P** *21/00, 21/02;* **C12N** *5/00*
**U.S. Cl. 435—161** **18 Claims**

18. A method for converting lactose contained in whey into ethanol, which comprises

treating whey with a Lac+ Saccharomyces yeast strain having β-galactosidase activity, said strain having been transformed by insertion of a vector carrying a Lac 12 Kluyveromyces permease yeast gene which confers on the strain the ability to utilize lactose as its sole carbon source when cultured under appropriate lactose utilization conditions.

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**5,047,341**

**Patent Not Issued For This Number**

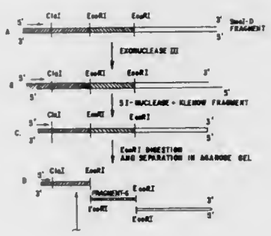
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**5,047,342**

**CLONING AND EXPRESSION OF T5 DNA POLYMERASE**

**Deb K. Chatterjee, Gaithersburg, Md., assignor to Life Technologies, Inc., Gaithersburg, Md.**

**Filed Aug. 10, 1989, Ser. No. 391,930**
**Int. Cl.[5] C12N** *9/12, 1/20;* **C07H** *15/12, 19/06*
**U.S. Cl. 435—194** **20 Claims**




1. An isolated recombinant DNA molecule comprising

(a) a structural gene encoding a protein, wherein said protein has a T5 DNA polymerase activity,

(b) a promoter, wherein said promoter and said structural gene are in such position and orientation with respect to each other that said structural gene may be expressed in a cell under control of said promoter, and

(c) an origin of replication capable of maintaining the promoter/structural gene/origin of replication combination in a cell.

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**5,047,343**

**MICROTUBER PROPAGATION OF POTATOES**

**Peter J. Joyce, and Brent H. McCown, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.**

**Filed Apr. 29, 1988, Ser. No. 187,748**
**Int. Cl.[5] C12N** *5/04;* **A01H** *4/00*
**U.S. Cl. 435—240.45** **19 Claims**

1. A method of inducing tuber formation at a rate of more than two microtubers from a single potato microtuber explant comprising:

(a) culturing a potato microtuber in vitro so that a shoot is formed therefrom;

(b) inducing a microtuber-shoot complex formation containing multiple independently-growing shoot axes by culturing the microtuber in a medium sufficiently low in calcium so as to induce shoot-tip necrosis on the shoot growing from the microtuber;

(c) placing the microtuber-shoot complex in a growth medium under conditions suitable for increasing the length of the shoot axes and creating a root structure for the shoot axes; and

(d) placing the microtuber shoot complex under conditions for encouraging the tuberization of the shoots so that multiple microtubers are formed on the independently-growing shoots.

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**5,047,344**

**INDUCTION OF SETTLEMENT AND METAMORPHOSIS IN *CRASSOSTREA VIRGINICA* BY MELANIN-SYNTHESIZING BACTERIA AND AMMONIA, AND METABOLIC PRODUCTS OF SAID BACTERIA**

**Ronald M. Weiner, Rockville; Rita R. Colwell, Bethesda; Dale B. Bonar, Gambrills, all of Md.; Steven L. Coon, Falls Church, Va., and Marianne Walsh, Crofton, Md., assignors to Research Corporation Techniques, Inc., Tucson, Ariz.**

**Continuation-in-part of Ser. No. 567,023, Dec. 30, 1983. This application Apr. 25, 1988, Ser. No. 185,647**
**Int. Cl.[5] A01K** *61/00;* **C12N** *1/00;* **C12P** *1/04, 13/22*
**U.S. Cl. 435—252.1** **15 Claims**

1. A method for inducing the settlement and metamorphosis of *Crassastrea viginica* larvae comprising exposing said larvae in an aqueous medium to melanin-synthesizing bacteria of the genus Alteromonas for a time and under conditions sufficient to induce the settlement and metamorphosis of said oyster larvae.

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**5,047,345**

**COMPOSITION FOR ISOLATING AND PURIFYING NUCLEIC ACID AND IMPROVED METHOD USING SAME**

**David A. DeBonville, Cambridge, and Gerard E. Riedel, Concord, both of Mass., assignors to Genetics Institute, Cambridge, Mass.**

**Filed Jun. 2, 1989, Ser. No. 360,276**
**Claims priority, application PCT Int'l Appl., May 22, 1989, PCT/US89/02234**
**The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.**
**Int. Cl.[5] C12N** *1/08, 1/06;* **C12Q** *1/68;* **C07H** *15/12*
**U.S. Cl. 435—270** **18 Claims**

1. A stable single phase aqueous composition useful in isolating nucleic acids from cell or virus cultures, comprising:

about 1 to 3.5M acetate salt solution;

about 4 to 11.2M acetic acid;

about 1 to 40% by volume phenol; and

about 1 to 40% by volume chloroform.

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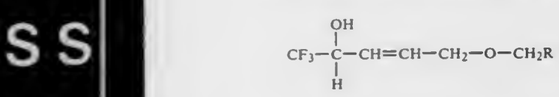


## 5,047,346
## OPTICALLY ACTIVE 3-(2-TRIFLUORO-1-HYDROXYETHYL)PROPENYL BENZYL ETHER, DERIVATIVES THEREOF, METHOD FOR PREPARING THE SAME AND USE THEREOF FOR LIQUID CRYSTAL COMPOUND

Tomoya Kitazume, Tokyo; Takashi Yamazaki, Kanagawa, and Hitoshi Iwatsubo, Tokyo, all of Japan, assignors to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo, Japan

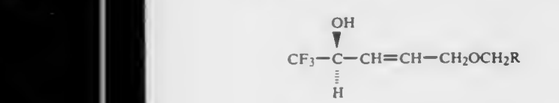
Continuation-in-part of Ser. No. 271,744, Nov. 15, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,421
Claims priority, application Japan, Nov. 20, 1987, 62-292181; Nov. 20, 1987, 62-292182; Nov. 20, 1987, 62-292183
Int. Cl.[5] C12P 7/22
U.S. Cl. 435—280 1 Claim

1. A method for optical resolution of optically active alcohol which comprises esterifying alcohol of the formula



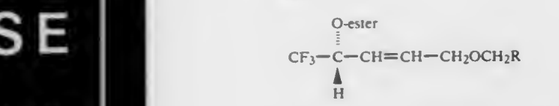
(III)

wherein R stands for a substituted or not substituted phenyl group and asymmetrically hydrolyzing the ester by use of lipase or esterase until



(R)-(VI)

and



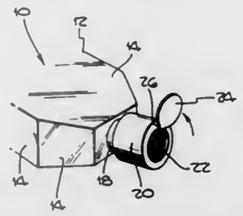
(S)-(VII)

where R stands for a substituted or not substituted phenyl group are obtained.

## 5,047,347
## GAS PERMEABLE CULTURE FLASK AND METHOD FOR CULTURING MAMMALIAN CELLS

Martin J. Cline, 441 Alma Real Dr., Pacific Palisades, Calif. 90272

Filed Aug. 17, 1987, Ser. No. 86,075
Int. Cl.[5] C12M 1/24
U.S. Cl. 435—296 9 Claims



1. A gas permeable culture flask adapted for use in growing cell cultures in incubators having controlled atmospheres with selected levels of one or more gases, said flask comprising:

a flask having a unitary body including gas impermeable walls with a surface area defining a culturing zone having an atmosphere containing one or more gases;

a neck connected to said flask body having an opening for introducing mammalian cells and culture fluids into said culturing zone to form a cell culture within said culturing zone;

a gas permeable insert located in said flask wall defining a gas permeable opening through which said gases from the atmosphere in said incubator can communicate with the gases in the atmosphere in said flask to thereby allow equilibration between the two atmospheres while the flask is in said incubator to form an equilibrated atmosphere in said flash which is substantially equivalent to the atmosphere in said incubator having said selected levels of one or more of said gases, said selected levels of gases being chosen to provide the desired growth of said cell culture, said gas permeable insert being made from material having a sufficiently large pore size to allow passage of said gases therethrough while having a sufficiently small pore size to prevent microorganisms from passing therethrough;

means associated with said flask for selectively occluding said gas permeable insert, said occluding means being movable repeatedly between an open position when said flask is placed within said incubator to allow exchange of gases through said gas permeable insert and a closed position when said flask is removed form said incubator atmosphere to prevent the escape of gases from said culturing zone through said gas permeable insert to thereby increase the amount of time said flask may be left outside said incubator atmosphere while still maintaining the desired selected levels of gases within the atmosphere of said flask;

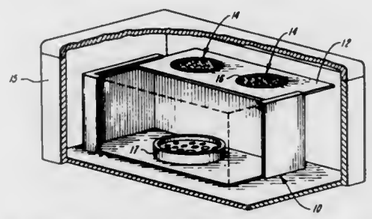
a cap for covering said opening in said neck; and

means for removably mounting said cap to said neck whereby said cap may be removed from said neck when said cells and culturing fluids are to be introduced into or removed from said culturing zone.

## 5,047,348
## APPARATUS FOR HOUSING RADIOACTIVE ITEMS DURING INCUBATION

Margaret C. Stinson, N. Billerica, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 335,836, Apr. 10, 1989. This application Sep. 27, 1989, Ser. No. 413,163
The portion of the term of this patent subsequent to Dec. 25, 2007, has been disclaimed.
Int. Cl.[5] C12M 1/12, 1/22
U.S. Cl. 435—311 6 Claims



1. An apparatus for housing radio-labelled items during incubation thereof, comprising:

a substantially square or rectangular container for housing cultures of radio-labelled cells disposed in cell culture containers, said container having a lid which selectively seals an opening in the container, said openings having an area substantially equal to that of a side of the container opposite the opening;

at least one filter-retaining vent opening disposed in the container means;

a filter cartridge means for securely fitting within the vent opening of the container such that gas exiting the container passes through the filter cartridge means and for entrapping radioactive compounds contained in gases exiting said container; and an activated charcoal, radiation-absorbing filter material housed within the filter cartridge means.

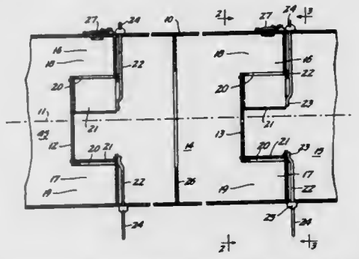
5. The apparatus of claim 1 wherein the filter cartridge means is disposed within a vent opening in the lid of the container means.



## 5,047,349
## MULTI-COMPARTMENT ROTATING DRUM APPARATUS FOR THE FERMENTATION OF NATURAL ORGANIC MATERIAL

Eric W. Eweson, deceased, late of Far Hills, N.J. by Dorothy D. Eweson , assignor to Bedminster Bioconversion Corporation, Cherry Hill, N.J.

Continuation of Ser. No. 917,241, Oct. 7, 1986, abandoned, which is a continuation of Ser. No. 551,364, Nov. 14, 1983, abandoned. This application Aug. 8, 1989, Ser. No. 391,736
Int. Cl.[5] C12M 1/10
U.S. Cl. 435—312 17 Claims



13. Apparatus for the fermentation of natural organic material by treating with successive groups of aerobic microorganisms which comprises a digester drum mounted for rotation about its longitudinal axis and divided by transverse partitions into compartments for retention of successive groups of microorganisms, each of said partitions having the shape of a circular area truncated by parallel chordal lines; an entry at one end of said drum for introducing the material, a discharge port at the opposite end of said drum for discharging of treated material, said axis of said drum being inclined from the horizontal so as to position said entry at a higher elevation than said discharge port; transfer buckets associated with each of said partitions, each of said transfer buckets having an inlet for receiving material from a compartment and a discharge opening for transferring material between compartments; the inlet being defined by one of the chordal lines and wall portions of the digester subtended by said one chordal line; means for forcing air into said digester drum to cause the air to move through said drum from the lower elevation to the higher elevation end thereof; valve means associated with the discharge opening of each of said transfer buckets for selectively transferring material between compartments and linkage means associated with said valve means, a portion of said linkage means extending through the wall of said drain for providing an external visual aid to indicate the proper closing and opening of said valve means; and means disposed in each of said compartments for retaining in the compartment a quantity of material to serve as an inoculant for inoculating material entering the compartment.

## 5,047,350
## MATERIAL AND METHOD FOR OXYGEN SENSING

Steven C. Switalski; Hsue-Yang Liu; Paul B. Merkel, all of Rochester, and Bradley K. Coltrain, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

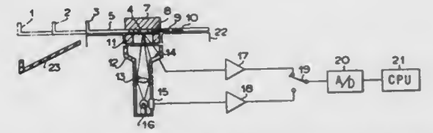
Filed Jan. 19, 1989, Ser. No. 300,105
Int. Cl.[5] G01N 21/64
U.S. Cl. 436—136 11 Claims

11. A sensor comprising a luminescent material which luminesces when excited by visible or ultraviolet light and whose lifetime or intensity of illumination is quenchable by oxygen, said luminescent material being incorporated within a membrane consisting essentially of a silicic acid heteropolycondensate having silane units with the formula RSi≡ wherein the unsatisfied valences of said units are interconnected by oxygen and wherein R is a substituted or unsubstituted alkyl or aryl group.

## 5,047,351
## OPTICAL END-POINT TYPE ANALYTICAL METHOD

Hajime Makiuchi; Yuzo Iwata; Kikuo Hirai, and Kenji Murabayashi, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 91,985, Sep. 1, 1987, abandoned. This application May 10, 1989, Ser. No. 351,315
Claims priority, application Japan, Sep. 1, 1986, 61-205604
Int. Cl.[5] G01N 21/78
U.S. Cl. 436—169 2 Claims




1. A method of analyzing the concentration of an analyte using the end-point method and plural predetermined calibration curves showing the variation of the optical density or emission intensity with analyte concentrations at various predetermined time intervals by observing the variation in optical density or emission intensity of a sample occurring due to the reaction of the analyte, which comprises:

(a) measuring the optical density or emission intensity due to the reaction of the analyte at least once at a predetermined time interval after the beginning of the reaction;

(b) if the optical density or emission intensity obtained at the first measurement is smaller than a predetermined critical value ($TH_1$), selecting a predetermined calibration curve showing the variation of the optical density or emission intensity with analyte concentrations at various predetermined time intervals for a reaction time corresponding to said first measurement, and discontinuing the measurement,

(c) if the optical density or emission intensity obtained at the first measurement is not smaller than a predetermined critical value ($TH_1$), continuing the reaction further until an optical density or emission intensity smaller than $TH_1$ wherein $_1$ is at least 2 and $TH_1$ is greater than $TH_{1-1}$ for each time interval $T_1$ is obtained, then selecting a predetermined calibration curve showing the variation of optical density or emission intensity with analyte concentration at the predetermined time interval for a reaction time corresponding to the measurement where the optical density or emission intensity smaller than $TH_1$ is obtained for the first time, and discontinuing the measurement, and

(d) determining the amount of the analyte using said selected calibration curve.

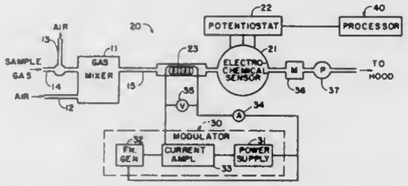
## 5,047,352
## SELECTIVE CHEMICAL DETECTION BY ENERGY MODULATION OF SENSORS

Joseph R. Stetter, Naperville, Ill., and Takaaki Otagawa, Solon, Ohio, assignors to Arch Development Corporation, Argonne, Ill.

Continuation of Ser. No. 736,196, May 20, 1985, abandoned. This application Jan. 23, 1989, Ser. No. 300,206
Int. Cl.[5] G01N 1/22
U.S. Cl. 436—181 5 Claims

1. A method for identifying an unknown component of a gas sample comprising the steps of passing the gas sample through

a single sensing unit containing a separate modulator component and a filament operatively connected to the modulator component, modulating the temperature of the filament to produce a modulated reactive response in the unknown component of the gas sample, passing the modulated reacted gas sample into a separate electrochemical cell to produce a modulated sensor signal of the unknown component in the gas sam-




ple, converting the modulated sensor signal of the unknown component to a concentration independent value, comparing the concentration independent value of the modulated sensor signal of the unknown component with those of known responses for various components previously stored within the memory of a computer to determine the presence or absence of the unknown components having known responses previously stored.

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**5,047,353**

## PROCESS FOR PREPARING REAGENT FOR MEASURING ENDOTOXIN

**Masakazu Tsuchiya, Itami, and Shuji Matuura, Kawanishi, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan**

**Filed Mar. 15, 1989, Ser. No. 323,719**
**Claims priority, application Japan, Mar. 16, 1988, 63-62142**
**Int. Cl.[5] G01N *33/579***
**U.S. Cl. 436—502** **8 Claims**

1. A process for preparing a reagent for measuring endotoxin which comprises

contacting an extracted solution of horseshoe crab hemocyte lysate with at least one treating agent selected from the group consisting of (a) a water-insoluble polysaccharide containing $\beta$-1,3-glucosidic linkage, (b) a water-insoluble polysaccharide derivative containing $\beta$-1,3-glucosidic linkage, (c) a polysaccharide containing $\beta$-1,3-glucosidic linkage and being fixed on a water-insoluble carrier, and (d) a polysaccharide derivative containing $\beta$-1,3-glucosidic linkage and being fixed on a water-insoluble carrier.

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**5,047,354**

## THROMBOXANE $B_2$ ASSAY FOR CORONARY ARTERY THROMBOSIS

**Marie L. Foegh, and Peter W. Ramwell, both of 1356 Kirby Rd., McLean, Va. 22101**

**Filed Oct. 30, 1987, Ser. No. 114,924**
**Int. Cl.[5] G01N *33/536, 33/53, 30/00***
**U.S. Cl. 436—536** **5 Claims**

1. A method for detecting coronary artery thrombosis before a myocardial infarction in a patient comprising:

(a) obtaining a sample from a patient susceptible to having coronary artery thrombosis;

(b) determining levels of thromboxane $B_2$ ($TXB_2$) or a metabolite of $TXB_2$ or thromboxane $A_2$ ($TXA_2$) in said sample; and

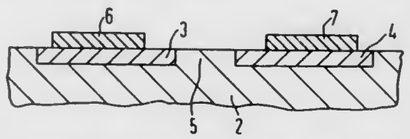
(c) diagnosing a coronary artery thrombosis based upon comparison of the levels of $TXB_2$ or a metabolite of $TXB_2$ or $TXA_2$ in said sample with normal levels, wherein an elevated level is diagnostic of an impending infarction.

**5,047,355**

## SEMICONDUCTOR DIODE AND METHOD FOR MAKING IT

**Jakob Huber, Beyharting, and Ewald Pettenpaul, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. 170,614, Mar. 11, 1988, abandoned, which is a continuation of Ser. No. 637,189, Aug. 2, 1984, abandoned. This application Sep. 12, 1989, Ser. No. 406,826**
**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334167**
**Int. Cl.[5] H01L *21/04***
**U.S. Cl. 437—15** **2 Claims**




1. In a process for making a protective device in a semiconductor substrate having at least a semi-insulating surface region for protecting at least one semiconductor device located in the substrate and subject to potentially harmful voltages, the process comprising the steps of:

epitaxially applying a doped semiconductor layer on the entire surface region;

structuring the semiconductor layer photolithographically to form two doped regions separated by a third region wherein the semiconductor layer is fully removed to expose the semi-insulating surface in the third region;

depositing ohmic contacts on the two regions;

alloying the ohmic contacts;

passivating the surface region; and

connecting the ohmic contacts to the one semiconductor device for dissipating the harmful voltages.

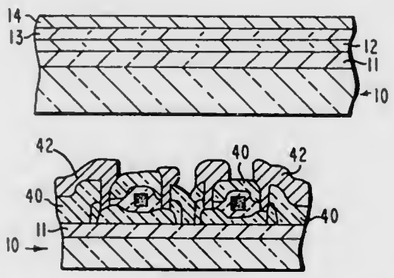
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**5,047,356**

## HIGH SPEED SILICON-ON-INSULATOR DEVICE AND PROCESS OF FABRICATING SAME

**Mei Li, Mission Viejo; Chen-Chi P. Chang, Newport Beach, and Maw-Rong Chin, Huntington Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Feb. 16, 1990, Ser. No. 481,032**
**Int. Cl.[5] H01L *21/86***
**U.S. Cl. 437—21** **18 Claims**




1. A method of fabricating a silicon-on-insulator integrated circuit wafer, comprising the steps of:

providing an insulating semiconductor substrate comprising a silicon layer disposed on a buried oxide layer;

forming an oxide layer on the silicon layer;

depositing a nitride layer on the oxide layer;

forming an oversized polysilicon mask on the nitride layer, said mask having exposed regions for forming gates and



covered regions for forming sources and drains, and etching the exposed nitride regions to expose the underlying oxide layer;

oxidizing the silicon layer to form a field oxide layer that thins the underlying silicon layer, wherein the regions for forming gates are thinner than the regions for forming sources and drains; removing the nitride and field oxide layers;

forming a relatively thin layer of oxide on the thinned silicon layer;

masking a portion of the surface of the wafer and implating ions of a first conductivity type into the unmasked portion of the silicon layer to form P-well locations, adjusting the doping concentration and profile to minimize edge and back-channel leakages;

masking the previously implanted portion of the surface of the wafer and implanting ions of a second conductivity type into the unmasked portion of the silicon layer to form N-well locations, adjusting the doping concentration and profile to minimize edge and back-channel leakages;

removing the thin layer of oxide, depositing photoresist to form an active area mask on the surface, and etching the implanted silicon layer to form active areas;

forming a gate oxide layer on the active areas;

depositing a layer of polysilicon over the surface of the wafer and depositing phosphorous ions into the layer of polysilicon;

forming a polysilicon mask over the layer of polysilicon and etching it to form polysilicon gates;

forming an N+ photoresist mask above the N-well locations and implanting phosphorous ions into the unmasked portion of the surface;

forming a P+ photoresist mask above the P-well locations and implanting boron ions into the unmasked portion of the surface;

disposing a phosphoro-borosilicate glass layer over the surface of the wafer and reflowing it at a predetermined temperature for a predetermined time;

masking the phosphoro-borosilicate glass layer and etching it to provide contact locations; and

depositing an electrically conductive layer on the surface and etching it to provide contact locations that provide electrical connection between the wafer and external devices.

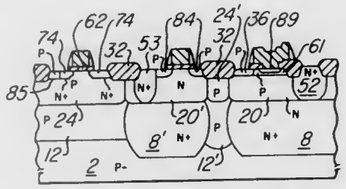
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**5,047,357**

## METHOD FOR FORMING EMITTERS IN A BICMOS PROCESS

**Robert H. Eklund, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Feb. 3, 1989, Ser. No. 306,439**
**Int. Cl.[5] H01L *21/328, 21/225***
**U.S. Cl. 437—31** **28 Claims**




10. A method for forming bipolar and field effect transistors at a surface of a semiconductor body, comprising:

forming a collector region of a first conductivity type in said body;

forming a base region disposed within said collector region at a first location of said surface, said base region of a second conductivity type;

forming a first well of said first conductivity type at a second location of said surface;

forming a gate dielectric over said first well;

forming a semiconductor layer in contact with said base region and overlying said gate dielectric, said semiconductor layer doped with first and second dopants of said first conductivity type, said first dopant having a relatively high diffusivity relative to said second dopant;

removing selected portions of said semiconductor layer to define an emitter electrode in contact with said base region and a gate electrode overlying said well;

doping portions of said first well near said gate electrode with dopant of said second conductivity type; and

heating said semiconductor body to diffuse said first dopant from said semiconductor layer into said base region to form an emitter region.

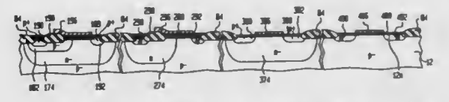
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**5,047,358**

## PROCESS FOR FORMING HIGH AND LOW VOLTAGE CMOS TRANSISTORS ON A SINGLE INTEGRATED CIRCUIT CHIP

**Walter K. Kosiak; Douglas R. Schnabel; Jonathan D. Mann; Jack D. Parrish, and Paul R. Rowlands, III, all of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.**

**Filed Mar. 17, 1989, Ser. No. 324,869**
**Int. Cl.[5] H01L *21/265***
**U.S. Cl. 437—34** **5 Claims**



1. A process for forming in a common substrate of one conductivity type low voltage transistors of the one type conductivity type and of the opposite conductivity type and of the opposite conductivity type in which the high voltage transistors of both types are of the lightly-doped drain type, which include lightly doped drain extension areas, and the transistors of the one conductivity type are formed in wells of the opposite conductivity type characterized in that:

the lightly doped drain extension area of the opposite conductivity type of each of said high voltage transistors of the opposite conductivity type is formed as a well in common with the forming of the wells of the opposite conductivity type for the transistors of the one conductivity type;

the lightly doped drain extension area of the one conductivity type of each of said high voltage transistors of the one conductivity type is formed by separate implantation of the one conductivity type into its well of opposite conductivity type;

the drain extension area of the one conductivity type of each of said high voltage transistors of the one conductivity type are driven into the substrate during field oxidation of the substrate; and

a thicker gate oxide layer is selectively formed in each of said high voltage transistors by growing a first oxide layer both where the gate of the high voltage transistor and the gate of each of the low voltage transistors are to be provided, removing the first oxide layer selectively where the gate of the low voltage transistor is to be formed, and then growing a second oxide layer where the first oxide layer was removed while simultaneously thickening the first oxide layer where the gate of the high voltage transistor is to be formed.

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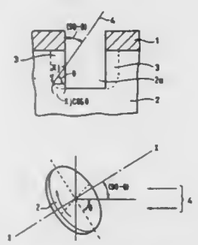


**5,047,359**

## METHOD OF IMPLANTING INTO THE SIDEWALL OF A TRENCH BY ROTATING THE WAFER

**Masao Nagatomo, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 93,529, Aug. 17, 1987, abandoned. This application Apr. 26, 1989, Ser. No. 342,673**
**Claims priority, application Japan, Dec. 17, 1985, 60-284686**
**Int. Cl.[5] H01L *21/266***
**U.S. Cl. 437—35** **3 Claims**



1. A method of manufacturing a semiconductor device having portions at which impurity ions are implanted, comprising the steps of:
forming a trench of a predetermined depth and width in a substrate surface of a wafer, for forming an impurity ion implantation region therein at a surface of a side wall of the trench;
forming an ion implantation mask of a predetermined thickness on said substrate surface of said wafer except for said trench;
mounting said wafer for rotation thereof about a rotation axis, such that an acute angle $(90-\theta)$, where $\theta$ is within the range 45° to 90°, formed between side wall surface of said trench and a direction of impurity ion implantation is determined according to the relationship tan $(90-\theta)$ (said width of said trench)/(sum of said ion implantation mask thickness+said depth of said trench);
forming said thin ion implantation region, by rotating said mounted wafer about said rotation axis at an angular velocity depending on an implantation current of said impurity ions and implanting the impurity ions to said inner surface of said side wall of said trench while said wafer is being rotated.

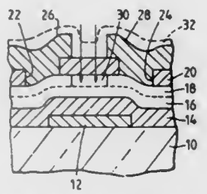
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**5,047,360**

## METHOD OF MANUFACTURE THIN FILM TRANSISTORS

**Keith H. Nicholas, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 8, 1989, Ser. No. 390,850**
**Claims priority, application United Kingdom, Sep. 30, 1988, 8822960**
**Int. Cl.[5] H01L *21/336***
**U.S. Cl. 437—40** **5 Claims**



1. A method of fabricating a TFT comprising the steps of
(a) forming a gate electrode on a substrate;
(b) forming a multi-layer structure over said gate electrode on said substrate, said multi-layer structure including in superimposed relationship:
a gate insulator layer,
an intrinsic semiconductor layer providing a channel region,
a doped semiconductor layer extending over said channel region, and
a passivating layer;
(c) forming windows in said passivating layer to expose respective underlying areas of said doped semiconductor layer, said windows being above said doped semiconductor layer at respective sides of said gate electrode;
(d) depositing contact material into said windows to form source and drain contacts, and
(e) implanting further dopants into said doped semiconductor layer through said passivating material by using said contact material in said windows as a mask, said further dopants converting said doped semiconductor layer between said contact material into a high resistance region, said high resistance region being above said gate electrode.

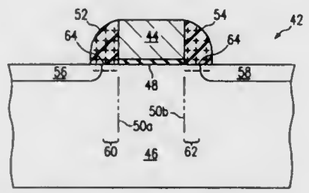
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**5,047,361**

## NMOS TRANSISTOR HAVING INVERSION LAYER SOURCE/DRAIN CONTACTS

**Mishel Matloubian, Emeryville, Calif., and Cheng-Eng D. Chen, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 375,169, Jun. 30, 1990, Pat. No. 4,994,869. This application Jul. 6, 1990, Ser. No. 549,507**
**Int. Cl.[5] H01L *21/265***
**U.S. Cl. 437—40** **16 Claims**



1. A method of forming a transistor comprising:
forming a gate conductor adjacent a semiconductor substrate defining first and second gate edges within the semiconductor substrate;
forming a sidewall spacer adjacent the side of the gate conductor and the surface of the semiconductor substrate; and
forming positive charges which are trapped within the sidewall spacer such that a negative charge layer is formed opposite the sidewall spacer, said step of forming positive charges trapped within the sidewall spacer comprising exposing the sidewall spacer to radiation.

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**5,047,362**

## METHOD OF MAKING LARGE-SCALE EPROM MEMORY WITH A CHECKER BOARD PATTERN AND AN IMPROVED COUPLING FACTOR

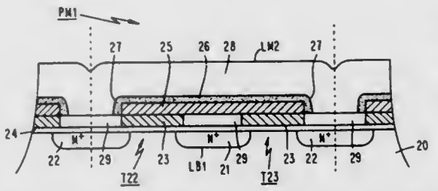
**Albert Bergemont, La Tronche, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France**

**Filed Aug. 11, 1989, Ser. No. 392,699**
**Claims priority, application France, Aug. 11, 1988, 88 10964**
**Int. Cl.[5] H01L *21/70***
**U.S. Cl. 437—52** **3 Claims**

1. A method for manufacturing a memory comprising floating gate MOS transistors arranged according to rows and columns on a substrate of a first conductivity type, each memory point of the memory comprising a pair of transistors arranged according to a row, said method comprising the following steps:



depositing and etching a first polysilicon layer on the substrate to form, according to columns, strips in which the floating gates (23) of the transistors will be formed,
implanting a dopant of a second conductivity type in the substrate by using the first polysilicon layer as a mask to form alternate drawing (21) and source (22) columns of said transistors,
forming isolation strips (2*a*) between the stripes of the first polysilicon layer,
depositing a second polysilicon layer (25) and isolating its upper surfaces (26),



etching the second polysilicon layer (25) to cover, according to columns, the pairs of adjacent stripes from which will be formed the transistor floating gates of a transistor pair,
isolating the lateral surfaces (27) of the second polysilicon layer,
depositing a third polysilicon layer (28),
etching by a same mask, according to rows, the three polysilicon layers,
forming an isolating layer, and
establishing contacts with remaining stripes of the third polysilicon level (word lines), with the drain columns (bit lines) and with the source columns.

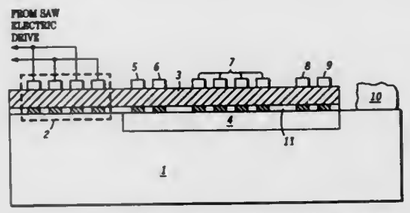
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**5,047,363**

## METHOD AND APPARATUS FOR REDUCING HETEROSTRUCTURE ACOUSTIC CHARGE TRANSPORT DEVICE SAW DRIVE POWER REQUIREMENTS

**Fred S. Hickernell, Phoenix; Frederick Cho, Scottsdale, and Frederick M. Fliegel, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Division of Ser. No. 577,180, Sep. 4, 1990. This application Nov. 26, 1990, Ser. No. 618,207**
**Int. Cl.[5] H01L *21/70, 21/18***
**U.S. Cl. 437—53** **5 Claims**



1. A method for increasing the charge carrying capacity of a heterostructure acoustic charge transport device, comprising the steps of:
providing a semiconductor substrate having a surface;
fabricating an interdigital metallic surface acoustic wave transducer along said surface of said semiconductor substrate;
providing a channel including epitaxial layers of semiconductor material along said surface of said semiconductor substrate;
depositing a thin-film layer of piezoelectric material along said channel of said semiconductor substrate said thin-layer of dielectric material being more strongly dielectric than said semiconductor substrate;
providing electric charge to said channel of said substrate; and
transporting said electric charge through said channel.

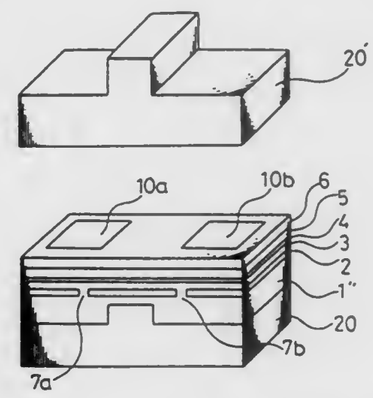
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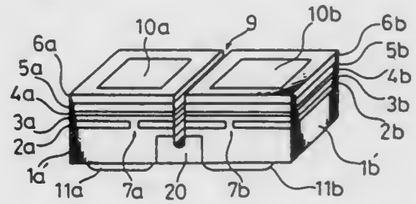
**5,047,364**

## METHOD FOR MAKING A MULTI-POINT EMISSION TYPE SEMICONDUCTOR LASER DEVICE

**Ryo Hattori, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Division of Ser. No. 347,259, May 4, 1989, Pat. No. 4,916,710. This application Mar. 8, 1990, Ser. No. 490,309**
**Claims priority, application Japan, Jun. 27, 1988, 63-158608**
**Int. Cl.[5] H01L *21/20, 21/265***
**U.S. Cl. 437—129** **8 Claims**





1. A method of making a multi-point light emission type semiconductor laser device comprising:
producing at least one protrusion on an electrically insulating or semi-insulating semiconductor substrate;
depositing a semi-conductor layer on said substrate to bury said protrusion;
depositing a semiconductor laser structure including multiple light emission points, each of said light emission points being separated from adjacent light emission points by a said protrusion;
removing a portion of said insulating or semi-insulating semiconductor substrate from the substrate side without removing said protrusion to expose the surface of said semiconductor layer; and
forming a groove which separates the respective light emission points extending into said protrusion from the side of the device opposite the substrate.

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**5,047,365**

## METHOD FOR MANUFACTURING A HETEROSTRUCTURE TRANSISTOR HAVING A GERMANIUM LAYER ON GALLIUM ARSENIDE USING MOLECULAR BEAM EPITAXIAL GROWTH

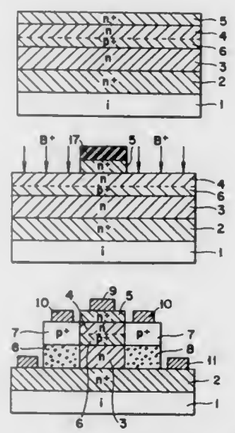
**Masafumi Kawanaka; Jun'ichi Sone, and Tooru Kimura, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Mar. 27, 1989, Ser. No. 328,672**

**Claims priority, application Japan, Mar. 25, 1988, 63-72336; Nov. 30, 1988, 63-304387**

**Int. Cl.[5] H01L *21/20***

**U.S. Cl. 437—132** **6 Claims**



1. A method for manufacturing a heterostructure bipolar transistor comprising the steps of (1) forming on a substrate an N-type gallium arsenide layer serving as an emitter region by molecular beam epitaxial growth; (2) holding said gallium arsenide layer in a high vacuum at a first temperature causing arsenic atoms on a surface of said gallium arsenide layer to evaporate from said surface, and (3) forming a germanium layer serving as a collector region on said gallium arsenide layer at a second temperature lower than said first temperature to form simultaneously a P-type germanium region serving as a base region at the interface of said gallium arsenide layer and said germanium layer by diffusing of gallium atoms from said gallium arsenide layer.

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**5,047,366**

## METHOD OF DIFFUSING SILICON INTO COMPOUND SEMICONDUCTORS AND COMPOUND SEMICONDUCTOR DEVICES

**Takashi Murakami, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed Oct. 28, 1988, Ser. No. 264,142**

**Claims priority, application Japan, Nov. 4, 1987, 62-278530**

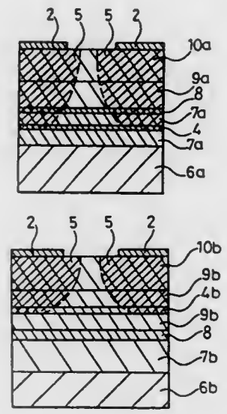
**Int. Cl.[5] H01L *21/225***

**U.S. Cl. 437—160** **12 Claims**

1. A method of diffusing silicon into a compound semiconductor comprising:

forming a silicon diffusion limiting layer in the body of a compound semiconductor having a surface remote from said layer, said layer having a slower silicon diffusion rate than said semiconductor;

disposing a silicon film at each of two spaced apart regions on said surface; and



diffusing silicon into said semiconductor from said film at an elevated temperature for sufficient time so that the diffusing silicon penetrates into but not through said layer.

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**5,047,367**

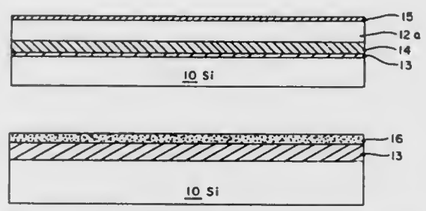
## PROCESS FOR FORMATION OF A SELF ALIGNED TITANIUM NITRIDE/COBALT SILICIDE BILAYER

**Chin-Shih Wei, Fremont; David B. Fraser, Danville, and Venkatesan Murali, San Jose, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 8, 1990, Ser. No. 535,423**

**Int. Cl.[5] H01L *21/44***

**U.S. Cl. 437—200** **37 Claims**



24. A process for forming a fill for contact areas on a silicon substrate comprising the steps of:

conformally depositing on said silicon substrate a first layer comprising a refractory metal;

conformally depositing on said first layer a second layer comprising a near-noble metal;

performing an anneal on said silicon substrate in a nitrogen containing gas selected from the group consisting of nitrogen and ammonia to form a near-noble metal silicide layer disposed above said contact areas on said silicon substrate and a refractory metal nitride layer disposed above said near-noble metal silicide layer;

performing a first etch of said near-noble metal layer from all regions except said contact areas;

etching said refractory metal layer from all regions except said contact areas;

selectively depositing a third layer comprising silicon in said contact areas to form said fill comprising a self aligned silicide layer, a self aligned refractory metal nitride layer and a selective silicon layer.



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**5,047,368**

## METHOD OF MANUFACTURING A THICK-FILM CIRCUIT ARRANGEMENT

**Wolfgang E. Schnitker, Krefeld; Michael P. J. Nover, Essen, and Kay Appel, Monchengladbach, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.**

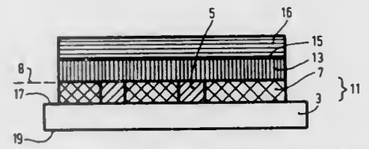
**Division of Ser. No. 208,853, Jun. 14, 1988, Pat. No. 4,839,775.**

**This application Apr. 3, 1989, Ser. No. 333,161**

**Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602960**

**Int. Cl.[5] H01L *21/56***

**U.S. Cl. 437—213** **13 Claims**



1. A method of manufacturing a thick-film circuit arrangement comprising the steps of

forming at least one thick-film conductor arrangement of conductor paths and integrated circuits on a first surface of a ceramic substrate,

filling intermediate spaces between said conductor paths and integrated circuits with a sintered non-conducting paste of a thick-film glass material, said thick-film conductor arrangement and said sintered non-conducting paste extending to substantially the same height above said ceramic substrate to form a first planar surface,

forming at least one layer of a thick-film anti-access material on said first planar surface over said thick-film conductor arrangement and said sintered non-conducting paste, and

providing observation impeding inclusions in said thick-film anti-access material to prevent optical recognition of said thick-film conductor arrangement.

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**5,047,369**

## FABRICATION OF SEMICONDUCTOR DEVICES USING PHOSPHOSILICATE GLASSES

**Debra A. Fleming, Lake Hiawatha; David W. Johnson, Jr., Pluckemin; Shobha Singh, Summit; LeGrand G. VanUltert, Morristown, and George J. Zydzik, Columbia, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed May 1, 1989, Ser. No. 345,924**

**Int. Cl.[5] C03C *3/00;* H01L *21/02***

**U.S. Cl. 437—240** **41 Claims**

1. A process for fabricating a semiconductor device, which comprises depositing by a particle beam deposition a phosphosilicate glass target material on at least a portion of a semiconductor surface so that said at least a portion of said surface is covered with a contacting phosphosilicate glass region comprising from 1 to 15 mole percent $P_2O_5$, wherein said glass material is prepared by a procedure comprising the steps of

a) forming a gel by mixing together fumed silica, aqueous solution of reagent grade phosphoric acid and water, and permitting said sol to gel, said silica having surface area within a range of from 50 to 400 $m^2/g$ and is added in an amount sufficient to form a sol containing from 20 to 55 weight percent silica,

b) drying said gel at ambient atmosphere and temperature conditions for a period of up to 14 days,

c) dehydrating the dried gel by heating at a rate of from 250 to 350 degrees per hour to a temperature within a range of from 500 to 700 degrees C., and maintaining at said temperature for a period of from 10 minutes to three hours,

d) sintering the dehydrated gel into glass by heating the gel at a rate of from 100 to 180 degrees C. per hour from said dehydrating temperature to a desired peak temperature within a range of from 600 to 1200 degrees C., and

e) cooling the sintered glass, preferably upon reaching said peak temperature,

said dehydrating and sintering stages being conducted in a flowing atmosphere comprising an inert gas.

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**5,047,370**

## METHOD FOR PRODUCING COMPOUND SEMICONDUCTOR SINGLE CRYSTAL SUBSTRATES

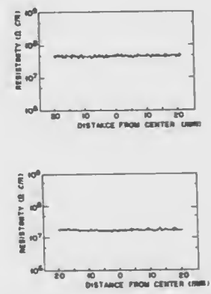
**Hiromasa Yamamoto; Masayuki Mori, and Osamu Oda, all of Toda, Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 429,778, Oct. 30, 1989, abandoned. This application Jul. 3, 1990, Ser. No. 547,915**

**Claims priority, application Japan, Oct. 31, 1988, 63-276630; Jan. 15, 1989, 1-153481**

**Int. Cl.[5] H01L *21/324***

**U.S. Cl. 437—248** **19 Claims**



1. A method for producing compound semiconductor single crystal substrates comprising:

a first annealing step including installing wafers of a grown compound semiconductor single crystal into an evacuated and sealed quartz ampoule and subjecting the wafers to a first heat-treatment at a temperature higher than 1100° C. and lower than the melting point of the single crystal for at least 30 minutes;

a first cooling step, for gradually cooling the heat-treated wafers to room temperature at a cooling rate from 1° to 30° C./min;

etching the cooled wafers;

a second annealing step including subjecting the etched wafers to a second heat-treatment at temperatures between 750° C. and 1100° C. for at least 20 minutes in a non-oxidizing atmosphere; and

a second cooling step, for cooling the heat-treated wafers gradually to room temperature.

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**5,047,371**

## GLASS/CERAMIC SEALING SYSTEM

**Satyam C. Cherukuri, Northford, Conn., assignor to Olin Corporation, New Haven, Conn.**

**Filed Sep. 2, 1988, Ser. No. 239,891**

**The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.**

**Int. Cl.[5] C03C *8/02, 10/04, 2/118, 3/078***

**U.S. Cl. 501—21** **10 Claims**

1. A sealing glass having a coefficient of thermal expansion of from about 160 to $180\times10^{-7}$/° C. capable of ceramization, consisting essentially of:

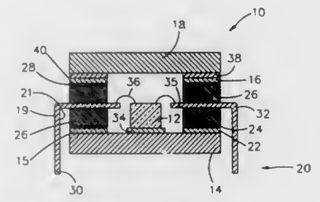
from about 40 to about 50 molar percent $SiO_2$;

from about 10 to about 20 molar percent BaO;

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from about 6 to about 9 molar percent $Li_2O$;
from about 18 to about 22 molar percent $K_2O$;
from about 0.1 molar percent to about 5 molar percent of a nucleating agent;
up to about 15 molar percent ZnO;




up to about 6 molar percent PbO;
up to about 5 molar percent $Al_2O_3$; and
up to about 10 molar percent of an additive selected from the group consisting of $B_2O_3$, CaO, NiO, $TiO_2$, SrO and combinations thereof.

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**5,047,372**
**ALLOYED POWDER AND METHOD OF PREPARING SAME**

**Lien Parrish, Cross Lanes, W. Va., and Lionel C. Montgomery, Bay Village, Ohio, assignors to Ucar Carbon Technology Corporation, Danbury, Conn.**

**Filed Dec. 29, 1988, Ser. No. 291,605**
**Int. Cl.[5] C04B** *35/56, 35/58*
**U.S. Cl. 501—87** **11 Claims**

1. A method for preparing an alloyed refractory powder composed of a multiplicity of individual particles each of which consists essentially of an alloy of two or more carbothermic reaction products of elemental oxides and carbon, which method comprises:
(a) blending carbon with at least a first and second elemental oxide each of which is selected from a separate oxide of the group of elements consisting of: boron, titanium, zirconium, chromium, molybdenum, tungsten, niobium, tantalum, iron, nickel, cobalt, vanadium, hafnium, silicon, uranium and thorium;
(b) heating the blend from step (a) to a temperature sufficient to form a carbothermic reaction mixture composed of a first and second reaction product of said first and second elemental oxide and carbon with said first and second reaction product forming an alloy; and
(c) comminuting the alloy of step (b) to form a powder of individual alloyed particles.

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**5,047,373**
**CERAMIC MATERIALS EXHIBITING PSEUDO-PLASTICITY AT ROOM TEMPERATURE**

**Thomas D. Ketcham, Big Flats, N.Y., assignor to Corning Incorporated, Corning, N.Y.**

**Filed Mar. 24, 1989, Ser. No. 328,532**
**The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.**
**Int. Cl.[5] C04B** *35/48*
**U.S. Cl. 501—103** **35 Claims**

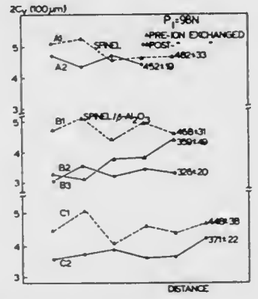
1. A ceramic alloy exhibiting pseudo-plasticity through the presence of transformation bands and with the substantial absence of microcracking consisting essentially, expressed in terms of mole percent on the oxide basis, of
(A) 82–99% of at least one member selected from the group consisting of $ZrO_2$, $HfO_2$, and $ZrO_2$-$HfO_2$ solid solution;
(B) 0.5–10% of at least one stabilizer oxide in the indicated proportions selected from the group consisting of 0–3.5% $Y_2O_3$, 0–3.5% $Sc_2O_3$, 0–3.5% $RE_2O_3$, 0–10% $CeO_2$, 0–10% $TiO_2$, 0–10% $SnO_2$, 0–10% CaO, and 0–10% MgO; and
(C) 0.5–8% of a toughening agent in the indicated proportion selected from the group consisting of 0–8% $YNbO_4$, 0–8% $YTaO_4$, 0–8% $YVO_4$, 0–8% $RENbO_4$, 0–8% $RETaO_4$, 0–8% $REVO_4$, 0–8% $MgWO_4$, 0–8% $MgMoO_4$, 0–8% $CaWO_4$, 0–8% $CaMoO_4$, and 0–8% $SnO_2$.

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**5,047,374**
**SURFACE STRENGTHENED COMPOSITE CERAMIC MATERIAL**

**Patrick S. Nicholson, Ancaster, Canada; Fred F. Lange, Santa Barbara, Calif., and Thomas Troczynski, Ancaster, Canada, assignors to McMaster University, Hamilton, Canada**

**Filed Apr. 27, 1988, Ser. No. 186,998**
**Int. Cl.[5] C04B** *35/10*
**U.S. Cl. 501—127** **9 Claims**




1. A surface-strengthened composite ceramic material comprising a ceramic matrix, a refractory phase disbursed at least in and close to the surface of said matrix, said refractory phase comprising beta-alumina particles in the range of 10% to 30% by volume of the ceramic material, in which larger cations producing a larger molar volume replace sufficient smaller cations in beta-alumina particles in and close to the surface of the composite ceramic material to cause compressive surface stresses which increase the surface strength of the composite ceramic material, said smaller cations having been replaced by the larger cations after firing of the composite ceramic material.

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**5,047,375**
**METHOD FOR PRODUCING HIGH OPACIFYING KAOLIN PIGMENT**

**Weyman Dunaway, Sandersville, and Ralph E. Turner, Tennille, both of Ga., assignors to ECC America Inc., Atlanta, Ga.**

**Filed Dec. 22, 1988, Ser. No. 288,681**
**Int. Cl.[5] C04B** *33/00;* **C09C** *1/36*
**U.S. Cl. 106—439** **12 Claims**

1. A method of producing a high opacifying pigment which comprises subjecting an iron-stained titania-containing kaolin to froth flotation, recovering froth "rejects" comprising kaolin enriched in said iron-stained titania, said enriched kaolin enriched in said iron-stained titania, said enriched kaolin containing said titania in the amount of above 2weight percent to about 15 weight percent, dewatering and drying said froth "rejects", and calcining said "rejects" having above 2 to about 15 weight % titania at a temperature in the range of about 1500° to about 2200° F.



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**5,047,376**
**CURING COMBINATION FOR CATIONICALLY POLYMERIZABLE MATERIALS**

**Dieter Baumann, Möhlin; Kurt Meier, Binningen; Werner Margotte, Lupsingen, and Beat Müller, Marly, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jul. 27, 1989, Ser. No. 386,526**
**Claims priority, application Switzerland, Aug. 4, 1988, 2959/88**
**Int. Cl.[5] G03C** *1/68*
**U.S. Cl. 502—5** **18 Claims**

1. A composition of matter obtainable by
A) dissolving or dispersing a component i) in a component ii), component i) being a compound of the formula I

$$[(R^1)(R^2Fe^{II})_a]^{+na}na\ X^- \quad (I)$$

and component ii) being selected from the group consisting of a polycarboxylic acid, an anhydride based on a polycarboxylic acid, or a polyisocyanate, in which, in formula I, $R^1$ is a $\pi$-arene, $R^2$ is a $\pi$-arene or an anion of a $\pi$-arene, a and n, independently of one another, are 1 or 2, and X is an anion $[LQ_m]^-$ or an anion of an unfluorinated, partially fluorinated or perfluorinated aliphatic, cycloaliphatic, aromatic or araliphatic carboxylic acid or sulfonic acid, in which L is selected from the group consisting of B, P, As, Sb and Bi, Q is a halogen atom and m corresponds to the valency of L increased by one, and
B) activating said solution or dispersion containing components i) and ii) by irradiation with actinic radiation or by heating, so that component i) is virtually no longer detectable in said solution or dispersion.

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**5,047,377**
**PROCESS FOR THE PURIFICATION AND RECOVERY OF THE CONTAMINATED SOLUTION OF THE CATALYST PRODUCED ON CARBONYLATION OF METHANOL AND/OR METHYL ACETATE AND/OR DIMETHYL ETHER**

**Heinz Erpenbach, Cologne; Eitel Goedicke, Bergheim; Winfried Lork, Erftstadt, and Heribert Tetzlaff, Frankfurt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 465,807, Jan. 12, 1990, abandoned. This application Aug. 6, 1990, Ser. No. 563,396**
**Claims priority, application Fed. Rep. of Germany, Jan. 28, 1989, 3902515**
**Int. Cl.[5] B01J** *38/68, 31/40;* **C07C** *67/36, 51/12*
**U.S. Cl. 502—24** **5 Claims**

1. A process for the purification and recovery of a contaminated catalyst solution produced during carbonylation of at least one substance selected from methanol, methyl acetate and dimethyl ether, the contaminated catalyst solution consisting essentially of 1 to 10 % by mass of carbonyl complexes of rhodium, 35 to 80% by mass of quaternary heterocyclic aromatic nitrogen compounds or quaternary organo-phosphorus compounds as organic promoters, or 35 to 80% by mass of alkali metal salts or compounds of carbonyl-forming base metals as inorganic promoters, 0.5 to 10 % by mass of undistillable organic impurities and 20to 50% by mass of acetic acid, acetic anhydride and ethylidene diacetate the process comprising removing the organic impurities together with the acetic acid, acetic anhydride and ethylidene diacetate from the contaminated catalyst solution by extraction at pressures from 35 to 450bar and temperatures from 0 to 120° C. with 0.5 to 80parts by weight of liquefied or supercritical 9as selected from the group consisting of carton dioxide sulfur hexafluoride dinitrogen monoxide, fluorohydrocarbon, chlorofluorohydrocarbons, bromofluorohydrocarbons, bromochlorofluorohydrocarbons, saturated or unsaturated $C_2$- to $C_4$-hydrocarbons, ammonia or mixtures thereof per part by weight of contaminated catalyst solution, and separating the phase of the liquefied or supercritical gas from the purified promoter-containing catalyst solution, separating the phase of the liquefied or supercritical gas by flash vaporization, re-employing the recovered gas for extraction, separating acetic acid, acetic anhydride end ethylidene diacetate from the component which remains liquid and combining it with the purified catalyst complex so as to obtain fresh catalyst solution containing at least 99.90% of the rhodium contained in the original contaminated catalyst solution, and purging the organic impurities which remain as the residue when the phase of the liquefied or supercritical gas is separated.

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**5,047,378**
**EXHAUST GAS-PURIFYING CATALYST AND PROCESS FOR PURIFYING EXHAUST GASES**

**Yasuyoshi Kato; Nobue Teshima; Kunihiko Konishi, and Toshiaki Matsuda, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 17, 1989, Ser. No. 422,697**
**Claims priority, application Japan, Oct. 18, 1988, 63-262029**
**Int. Cl.[5] B01J** *29/06*
**U.S. Cl. 502—74** **4 Claims**

1. An exhaust gas-purifying catalyst for reducing nitrogen oxides and oxidizing carbon monoxide, comprising:
a first component including copper and/or cobalt supported by zirconium oxide or titanium oxide, an atomic ratio of said copper and/or cobalt to said zirconium oxide or titanium oxide being in the range of 20/80 to 1/99; and
a second component including a copper-substituted type zeolite, a proportion by weight of said first component to said second component being in the range of 5/95 to 50/50.

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**5,047,379**
**COCONDENSATION OF METAL OXIDES IN ORGANIC SOLVENTS FOR DEPOSITION ON SOLID SUPPORTS**

**Elmer C. Alyea, 115 Cork Street West, Guelph, Ontario, Canada N1H 2X6; Kevin F. Brown, 52 Shadybrook Crescent, Guelph, Ontario, Canada N1G 3G5, and Keith J. Fisher, 21 Lychgate Avenue, Stourbridge, West Midlands DY9 OTS, England**

**Continuation-in-part of Ser. No. 217,010, Jul. 8, 1988, abandoned. This application Oct. 26, 1989, Ser. No. 387,705**
**Int. Cl.[5] B01J** *21/04, 23/22, 23/28, 29/08*
**U.S. Cl. 502—79** **29 Claims**

1. A process for preparing metal oxide catalysts having one or more metal oxide species bound to or entrapped on a solid phase support which comprises:
vaporizing a metal oxide or two or more metal oxides;
cocondensing said metal oxide or two or more different metal oxides with a suitable organic liquid solvent which is capable of solvating said metal oxide or metal oxides;
dissolving said metal oxide or metal oxides in said solvent to form a solvated complex in said liquid solvent;
contacting said solvated complex with a solid phase support material so as to cause binding or entrapment of said solvated metal oxide specie or metal oxide species to said solid support; and
removing excess liquid solvent or solution.

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**5,047,380**
**CERAMIC MATERIALS, METHOD OF PREPARING THE SAME AND HYDROGENATION AND OXIDATION PROCESSES USING THE SAME**

**James M. Tour; Shekar L. Pendalwar, and Joel P. Cooper, all of Columbia, S.C., assignors to University of South Carolina, Columbia, S.C.**

**Filed Mar. 23, 1990, Ser. No. 498,802**
**Int. Cl.[5] B01J** *31/12*
**U.S. Cl. 502—158** **23 Claims**

1. A compound comprising a polysiloxane matrix material containing a homogeneous dispersion of metal particles, wherein the polysiloxane matrix material is uncalcinated and substantially all of the metal is in the zero oxidation state.

12. A method of preparing an uncalcinated polysiloxane

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matrix material containing a homogeneous dispersion of metal particles in the zero oxidation state, which comprises mixing a siloxane compound having Si-H groups with a metal salt in an aqueous solution; wherein the siloxane compound is polymerized into a polysiloxane matrix, the metal is reduced to the zero oxidation state, and particles of the metal are homogeneously dispersed within the polysiloxane matrix

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**5,047,381**
**LAMINATED SUBSTRATE FOR CATALYTIC COMBUSTOR REACTOR BED**

**Kenneth W. Beebe, Galway, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Nov. 21, 1988, Ser. No. 273,537**
**Int. Cl.[5] B01J** *21/04, 21/06, 23/12, 23/40*
**U.S. Cl. 502—304** **10 Claims**

1. A laminated catalyst element, comprising:
a metal support substrate;
a catalytically active noble metal oxidation resistant layer selected from the group consisting of plantinum, palladium, rhodium, iridium, osmium and ruthenium, provided over said metal support substrate for preventing high temperature oxidation of said metal support substrate;
a metal oxide coating, selected from the group consisting of alumina, zirconia and thoria, provided over said noble metal oxidation resistant layer; and
a combustion catalyst selected from the group consisting of platinum, palladium, rhodium, iridium, chromium oxides, iron oxides, cobalt oxides, lanthanum oxides, terbium-cerium-thorium, ruthenium, osmium, nickel oxides, magnesium oxides and copper oxides, said combustion catalyst being provided on said metal oxide coating, and wherein
said noble metal oxidation resistant layer provides a secondary source of combustion catalyst due to said catalytic activity thereof.

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**5,047,382**
**METHOD FOR MAKING IRON OXIDE CATALYST**

**Thomas P. Rudy, Saratoga, and Forrest R. Goodson, San Jose, both of Calif., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 12, 1988, Ser. No. 283,117**
**Int. Cl.[5] B01J** *23/74*
**U.S. Cl. 502—338** **14 Claims**

1. A method for making ferric oxide particles comprising:
a. diluting a gaseous iron-containing compound with an oxygen-containing gas at a temperature such that the rate of oxidation is negligible, said iron-containing compound
(i) capable of being vaporized below about 500° C.; and
(ii) capable of forming ferric oxide when reacted with oxygen-containing atmosphere at temperatures below about 500° C.; and
b. oxidizing said diluted gaseous iron-containing compound in an oxygen-containing environment wherein ferric oxide particles are formed, suspended in the oxygen-containing environment.

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**5,047,383**
**HEAT-SENSITIVE RECORDING MATERIAL WITH A SUBSTRATE COMPRISING A FOAMED POLYESTER RESIN FILM CONTAINING MINUTE CAVITIES**

**Hiroo Hayashi; Katsuhiko Ishida, both of Takatsuki, and Toshimitsu Arikawa, Ibaraki, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Mar. 19, 1990, Ser. No. 496,203**
**Claims priority, application Japan, Mar. 17, 1989, 1-66683**
**Int. Cl.[5] B41M** *5/40*
**U.S. Cl. 503—200** **4 Claims**

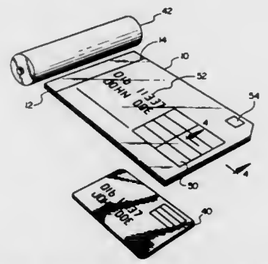
1. An improved heat-sensitive recording material of the type having a substrate and a heat-sensitive recording layer formed on said substrate, said heat-sensitive recording layer containing a color former and a color developer to color said color former upon contact by heating, characterized in that said substrate comprises an adiabatic foamed polyester resin film containing minute cavities with an apparent specific gravity in the range of 0.9 to 1.2.

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**5,047,384**
**CARBONLESS MULTIPLE PLY CREDIT CARD TRANSACTION FORM**

**Joseph A. McCormick, Manhattan, Ill., assignor to General Credit Forms, Inc., Earth City, Mo.**

**Filed Jul. 7, 1989, Ser. No. 376,590**
**Int. Cl.[5] B41M** *5/132*
**U.S. Cl. 503—226** **29 Claims**



1. A carbonless, multiple ply business form having a plurality of transaction slips or plies providing multiple copies of a transaction when said form is imprinted by an imprinting machine using a card having an embossed surface, by an impact printer or by a hand held stylus, said form comprising:
at least a first substantially translucent ply having an upper surface and a lower surface in a stacked relationship to a second ply having an upper surface and a lower surface,
said lower surface of said translucent ply comprising a first layer of a first colorless, chemically reactive positive image producing agent in contact with said upper surface of said second ply,
said upper surface of said second ply comprising a second layer of a second colorless, chemically reactive positive image producing agent,
said first and second chemically reactive image producing agents being adapted to react with each other upon application of sufficient imprinting pressure to said form whereby, said agents contact each other and react under said pressure to provide visible, positive images on said lower surface of said translucent ply and on said upper surface of said second ply; and,
said visible, positive image on said lower surface of said translucent ply being readable through said upper layer of said translucent ply.

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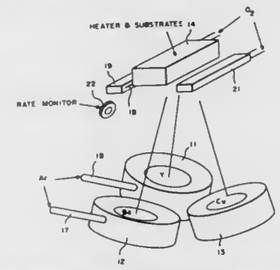
**5,047,385**
**METHOD OF FORMING SUPERCONDUCTING $YBA_2CU_3O_{7-x}$ THIN FILMS WITH CONTROLLED CRYSTAL ORIENTATION**

**Malcolm R. Beasley, Palo Alto, Calif.; Kookrin Char, Seoul, Rep. of Korea; Theodore H. Geballe, Woodside; Robert H. Hammond, Los Altos, Calif.; Aharon Kapitulnik, Palo Alto, Calif.; Andy Kent, Chene, Switzerland; Michio Naito, Tokyo, Japan, and Byungdu Oh, Seoul, Rep. of Korea, assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.**

**Filed Jul. 20, 1988, Ser. No. 221,726**
**Int. Cl.[5] C23C** *14/34;* **B05D** *3/06, 5/12*
**U.S. Cl. 505—1** **12 Claims**

1. The method of growing a thin film of nominally $YBa_2Cu_3O_{7-x}$ composition with selected crystal orientation which comprises the steps of depositing material by sputtering simultaneously from Y, Ba and Cu sources on the surface of a substrate, introducing oxygen at said surface during deposition, controlling are richer or poorer than the 1:2:3 stoichiometry





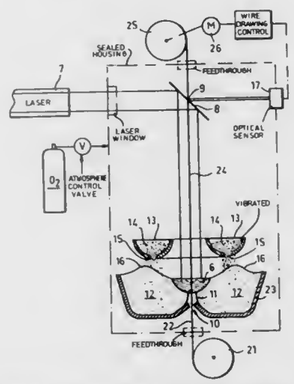

within a few atom percent and followed by annealing to selectively grow an a-axis or a c-axis oriented film of $YBa_2Cu_3O_{7-x}$.

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**5,047,386**
**APPARATUS FOR CONTINUOUS MANUFACTURE OF HIGH TEMPERATURE SUPERCONDUCTING WIRES FROM MOLTEN SUPERCONDUCTING OXIDES**

**Aharon Z. Hed, Nashua, N.H., assignor to Troy Investments Inc., Nashua, N.H.**

**Filed Dec. 29, 1988, Ser. No. 291,681**
**Int. Cl.[5] B05C** *3/15, 11/10;* **H01B** *13/16, 12/06*
**U.S. Cl. 505—1** **4 Claims**



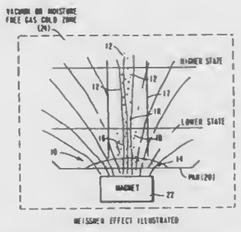

1. An apparatus for making a composite high-temperature-superconducting wire, comprising a refractory core having a melting point above a melt temperature of a superconducting oxide ceramic having a critical temperature $T_c$ above 23°K and a layer of said superconducting oxide ceramic on said core, said apparatus comprising:
means forming a controlled-atmosphere chamber;
a vessel received in said chamber and formed with an opening at a bottom thereof, said vessel receiving an annular mass of said superconducting oxide ceramic in solid form surrounding a passage traversing said mass and extending upwardly from said opening;
means for forming a melt of said superconductive oxide ceramic in a small pool in said mass above said passage and at a temperature slightly above a melting point of said superconducting oxide ceramic;
means for drawing said refractory core through said opening, said passage and said melt in succession and depositing said melt on said core, said pool being in contact only with said mass, said core and said atmosphere;
means in said chamber above said pool for cooling said melt deposited on said core by radiation and convection while maintaining a substantially radially symmetrical thermal gradient in the region of the cooling melt deposited on said core so that said layer of superconducting ceramic is formed with radially directed growth of columnar grains of said superconducting ceramic;
means for controlling an atmosphere within said chamber; and
energy-supply means for maintaining said superconductive oxide molten in said pool, said energy-supply means including means for generating a beam of electromagnetic energy which is trained on said pool, said beam being a laser beam, said energy-supply means including a mirror formed with an orifice traversed by the core coated with said layer of said superconducting ceramic and oriented at an angle of substantially 45° to an incident portion of said beam from said source for directing said beam along said core onto said pool.

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**5,047,387**
**METHOD FOR THE SELECTING SUPERCONDUCTING POWDERS**

**Inna G. Talmy, Silver Spring; Curtis A. Martin, Germantown, and Kurt P. Scharnhorst, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 19, 1988, Ser. No. 145,172**
**Int. Cl.[5] H01L** *39/00*
**U.S. Cl. 505—1** **14 Claims**




MEISSNER EFFECT ILLUSTRATED

1. A process for beneficiation of superconducting material in particulate form wherein some particles are more superconducting than others, comprising:
generating a strong vertically directed magnetic field above a source;
reducing the temperature of the superconducting material to at least a critical temperature ($T_c$) thereof;
introducing the material into the magnetic field and maintaining the material within said field oriented so that the superconducting particles are levitated therein above the source at elevation states depending upon their respective superconductivity to enable separation of particles at selected elevation states from the mixture.

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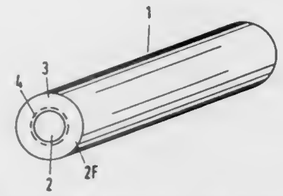
**5,047,388**
**SUPERCONDUCTOR AND METHOD FOR ITS PRODUCTION**

**Franz-Josef Rohr, Absteinach, and Andreas Reich, Heidelberg, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany**

**Filed Dec. 27, 1988, Ser. No. 290,520**
**Claims priority, application Fed. Rep. of Germany, Dec. 24, 1987, 3744145**
**Int. Cl.[5] H01L** *39/12;* **C04B** *35/48;* **C23C** *4/10;* **H01B** *12/00*
**U.S. Cl. 505—1** **1 Claim**

1. A method for producing a superconductor which comprises applying a layer of superconducting oxide ceramic material to a supporting substrate with an intermediate layer coating which coating is formed by the steps of forming a suspension of $La_{1-x}M_xCrO_3$ in which M is selected from the group

consisting of magnesium, calcium, strontium, and barium, and wherein the chromium component can be replaced entirely or in part by iron, nickel, cobalt, or manganese;




applying said suspension by the steps of immersion, electrophoresis, spraying, or painting onto the surface of a substrate to be coated, and then durably bonding the suspension to the substrate by sintering at substantially 950° C. to form said coated substrate layer.

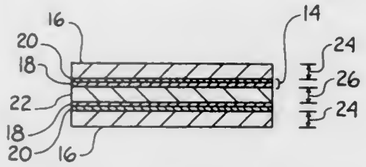
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**5,047,389**

## SUBSTRATE FOR CERAMIC SUPERCONDUCTOR

**Lawrence D. Woolf, Carlsbad; Frederick H. Elsner, Cardiff, and William A. Raggio, Del Mar, all of Calif., assignors to General Atomics, San Diego, Calif.**

**Filed Oct. 31, 1988, Ser. No. 265,827**
**Int. Cl.[5] B32B *3/00***
**U.S. Cl. 505—1** **14 Claims**




1. A structure for supporting a ceramic superconducting material having oxygen and copper constituents, which comprises:

a metallic substrate having an oxide former constituent; and

an oxide layer formed by said oxide former on the surface of said substrate to substantially inhibit interdiffusion between said substrate and said ceramic superconducting material when said ceramic material is bonded to said substrate, wherein said oxide former is a material selected from the group consisting of aluminum (Al), silicon (Si), manganese (Mn), magnesium (Mg), zirconium (Zr), and combinations thereof.

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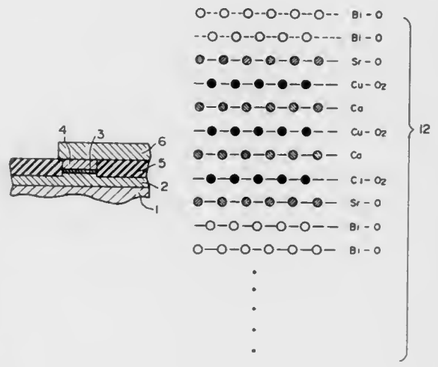
**5,047,390**

## JOSEPHSON DEVICES AND PROCESS FOR MANUFACTURING THE SAME

**Hidetaka Higashino, Matsubara; Koichi Mizuno, Nara; Hideaki Adachi, Neyagawa; Kentaro Setsune, Sakai; Akira Enokihara, Nara; Shinichiro Hatta, Hirakata; Kiyotaka Wasa, Nara; Shigemi Kohiki, Osaka, and Tomoaki Matsushima, Soraku, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Sep. 27, 1989, Ser. No. 413,174**
**Claims priority, application Japan, Oct. 3, 1988, 63-249206; Nov. 17, 1988, 63-291219; Nov. 21, 1988, 63-293859; Jan. 12, 1989, 1-005208; Jan. 31, 1989, 1-021402; Mar. 10, 1989, 1-058324**
**Int. Cl.[5] H01B *12/00*; H01L *39/12, 39/22*; B05D *5/12***
**U.S. Cl. 505—1** **4 Claims**

1. A Josephson device, comprising a junction formed by forming the first layer-shaped oxide superconductor thin film including a plurality of Cu-O layers on a substrate, a barrier layer thereon and the second layer-shaped oxide superconductor thin film on the barrier layer wherein a material of said barrier layer is a Bi oxide type layer-shaped compound.



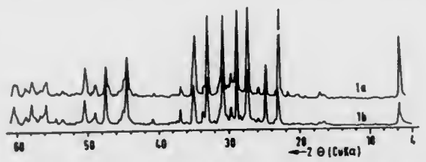

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**5,047,391**

## PROCESS FOR PRODUCING A HIGH-TEMPERATURE SUPERCONDUCTOR AND ALSO SHAPED BODIES COMPOSED THEREOF

**Joachim Bock, and Eberhard Preisler, both of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Aug. 18, 1989, Ser. No. 395,609**
**Claims priority, application Fed. Rep. of Germany, Sep. 3, 1988, 3830092**
**Int. Cl.[5] C01G *29/00*; C04B *35/60***
**U.S. Cl. 505—1** **9 Claims**




1. A process for producing a high-temperature superconductor of the composition $Bi_2(Sr,Ca)_3Cu_2O_{8+z}$, the ratio of strontium to calcium being (5 to 2) : 1 and x having a value between 0 and 2, which comprises vigorously mixing compounds of bismuth, strontium, calcium and copper selected from the group comprising oxides and carbonates in a stoichiometric ratio, heating the mixture at temperatures of 870° to 1100° C. until a homogeneous melt is obtained, casting the melt in molds and allowing it to solidify in them without quenching, annealing the cast bodies removed from the molds for 6 to 30 hours at 780 to 850° C., and treating the annealed cast bodies for at least 6 hours at temperatures from 600 to 830° C. in an oxygen atmosphere.

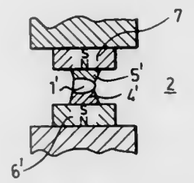


**5,047,392**

## DIAMAGNETIC COLLOIDS BASED SEALS

**Aharon Z. Hed, Nashua, N.H., assignor to Troy Investments Inc., Nashua, N.H.**

**Filed Mar. 21, 1989, Ser. No. 334,582**
**Int. Cl.[5] F16C *33/74***
**U.S. Cl. 505—1** **12 Claims**




1. A seal assembly comprising:

two juxtaposed surfaces defining a space between them;

a diamagnetic colloid received in said space and comprising superconductor particles dispersed in a liquid; and

magnetic-field applying means for localizing said diamagnetic colloid in said space substantially at loci of minima of a magnetic field generated by said magnetic-field applying means.

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**5,047,393**

**Patent Not Issued For This Number**

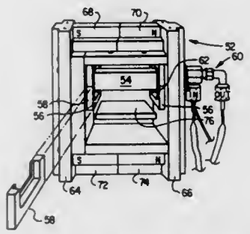
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**5,047,394**

## SPUTTERING METHOD

**John C. Wolfe; Yat-lung R. Chau, both of Houston, and Wongsik S. Ho, Stafford, all of Tex., assignors to University of Houston System, Houston, Tex.**

**Filed Sep. 12, 1989, Ser. No. 406,071**
**Int. Cl.[5] H01L *39/24***
**U.S. Cl. 505—1** **1 Claim**




1. A method of depositing a compound film on a flat substrate, said flat substrate having a face, said method comprising the steps of:

providing a cylindrical magnetron sputtering system having a flattened cathode with a flattened target mounted on at least one surface thereof, said flattened target also having a surface;

positioning said face of said substrate parallel to and in the immediate vicinity of said surface of said flattened target;

applying a magnetic field parallel to said surface of said flattened target; and

causing uniform erosion of said target by sputtering thereof;

wherein said step of causing uniform sputtering erosion of said target material comprises the steps of employing high temperature superconductor target material and operating the sputtering system at high pressure.

**5,047,395**

## REDUCTION OF OXYRADICAL DAMAGE IN BIOMEDICAL APPLICATIONS

**Tai-Wing Wu, Toronto, Canada, assignor to Nagase Co., Ltd., Osaka, Japan**

**Filed Jul. 17, 1990, Ser. No. 554,197**
**Int. Cl.[5] A61K *37/00, 31/40***
**U.S. Cl. 514—2** **20 Claims**

1. A composition useful as an antioxidant and cytoprotective agent in treating blood in a mammal in vivo to scavenge oxidative free radicals therefrom, said composition comprising an effective amount of a bilirubin attached covalently to a peptide chain of at least 6 amino acid residues and including the sequence Lys-Gln-Arg, in association with a physiologically acceptable adjuvant therefor.

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**5,047,396**

## INTRAVENOUS PHARMACEUTICAL COMPOSITION AND PROCESS FOR PREPARING THE SAME

**Erno Orbán; Tibor Balogh; Lajos Ila; Gábor Ambrus; Antónia Jekkel; Sándor Elek; Éva Tomori; István Elekes; Éva T. Sarudy; Imre Moravcsik, all of Budapest, and Lajos Siklósi, Gödöllo, all of Hungary, assignors to Biogal Gyogyszergyar, Debrecen, Hungary**

**Filed Jul. 21, 1989, Ser. No. 383,024**
**Claims priority, application Hungary, Jul. 21, 1988, 3796/88**
**Int. Cl.[5] A61K *37/02*; C07K *7/64***
**U.S. Cl. 514—11** **7 Claims**

1. Intravenous pharmaceutical composition comprising cyclosporin as active ingredient which comprises

a) 1 part by mass of one or more cyclosporins,

b) 8 to 13 parts by mass of a monoester of a saturated hydroxylated fatty acid formed with polyethylene glycol or the mixture of said monoesters,

c) 4 to 10 parts by mass of one or more intravenously administerable mono- or polyvalent alcohols.

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**5,047,397**

## LINEAR ANALOGS OF ATRIAL NATRIURETIC PEPTIDES

**Robert M. Scarborough, Hayward; John A. Lewicki, Los Gatos, and Lorin K. Johnson, Pleasanton, all of Calif., assignors to California Biotechnology Inc., Mountain View, Calif.**

**Continuation-in-part of Ser. No. 237,299, Aug. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 138,893, Dec. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 921,360, Oct. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 904,091, Sep. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 868,312, May 28, 1986, Pat. No. 4,757,048, which is a continuation-in-part of Ser. No. 795,220, Nov. 5, 1985, abandoned, Ser. No. 168,661, Mar. 16, 1988, Pat. No. 4,804,650, Continuation of Ser. No. 921,360, , and a continuation-in-part of Ser. No. 904,091, , Ser. No. 868,312, , and a continuation-in-part of Ser. No. 795,220,. This application Dec. 16, 1988, Ser. No. 285,916**
**Int. Cl.[5] C07K *7/06, 7/08, 7/10*; A61K *37/02***
**U.S. Cl. 514—12** **20 Claims**

1. A linear peptide compound having natriuretic, diuretic and/or vasodilator activity in mammals, which has the formula:

$$Z_1Z_2\text{-}AA_8\text{-}AA_9\text{-}AA_{10}\text{-}AA_{11}\text{-}AA_{12}\text{-}Z_3 \quad (1)$$

wherein:

each of $AA_8$ and $AA_{11}$ is, independently, a basic/noncyclic; neutral/nonpolar/small; or neutral/polar/large/-nonaromatic amino acid residue; and $AA_8$ can also be a neutral nonpolar/large/nonaromatic amino acid residue;

$AA_9$ is a neutral/nonpolar/large/nonaromatic amino acid residue in the D or L configuration;

$AA_{10}$ is an acidic amino acid residue;

$AA_{12}$ is a neutral/nonpolar/large/nonaromatic amino acid

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residue in the D or L configuration or a covalent bond; and

wherein $Z_1$ is a peptide of from 1 to 125 amino acids having as its carboxy-terminal residue a hydrophobic amino acid residue, or the des$NH_2$ form thereof, or is a hydrophobic aliphatic, aromatic, or mixed aliphatic/aromatic organic group of from 6 to 20 carbon atoms;

$Z_2$ is a spacer group capable of providing a spaced dimension of 4.5–15 angstroms between $AA_8$ and the hydrophobic moiety of $Z_1$;

$Z_3$ is (OH), $NH_2$, NHR' or NR'R" wherein R' or R" are each independently straight or branched chain alkyl of 1–10 carbon atoms wherein 1 or 2 carbons may be replaced by O, N, or S; or is a peptide of 1–20 amino acid residues, or an amide or alkyl amide thereof; but when $AA_{12}$ is a covalent bond, $Z_3$ cannot be (OH), $NH_2$ or a peptide; and

wherein one or more of the amide linkages between adjacent amino acid residues may optionally be replaced by a linkage selected from the group consisting of $—CH_2NH—$, $—CH_2S—$, $—CH_2CH_2—$, $—CH=CH—$, $—COCH_2—$, $—CH(OH)CH_2—$ and $—CH_2SO—$,

with the proviso that if $AA_8$-$AA_{12}$ is R-M-D-R-I, and $Z_3$ is G-A-Q-S-G-L-G, $Z_1Z_2$ cannot be F-G-G; and

with the additional proviso that if $AA_8$-$AA_{12}$ is R-I-D-R-I, and $Z_3$ is G-A-Q-S-G-L-G-C-N-S-F-R, $Z_1Z_2$ cannot be F-F-G.

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**5,047,398**

## DDAVP ANTIDIURETIC AND METHOD THEREFOR

**Helmer Hagstam, Malmo, Sweden, and Hans Vilhardt, Espergarde, Denmark, assignors to Ferring B.V., Haarlen, Netherlands**

**Continuation of Ser. No. 705,701, Feb. 26, 1985, abandoned, which is a continuation of Ser. No. 613,779, May 24, 1984. This application Dec. 17, 1985, Ser. No. 809,937**

**Claims priority, application Sweden, Nov. 18, 1983, 8306367**

**Int. Cl.[5] A61K** *37/34*

**U.S. Cl. 514—15** **11 Claims**

1. An antidiuretic composition for humans comprising a gastrointestinally absorbable, antidiuretically effective, amount of 1-deamino-8-D-arginine vasopressin and a pharmaceutically acceptable carrier in solid oral dosage form for absorption in the gastrointestinal tract of said humans.

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**5,047,399**

## HYDROPHOBIC PSEUDO-PEPTIDES

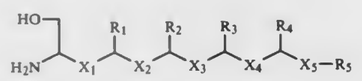
**Laura S. Lehman, New YOrk, N.Y., and Michael F. Czarniecki, Westfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.**

**Filed Jul. 13, 1988, Ser. No. 218,402**

**Int. Cl.[5] A61K** *37/02;* **C07K** *7/06*

**U.S. Cl. 514—17** **15 Claims**

1. A compound represented by the formula

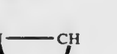


wherein $R_1$ is lower alkyl or $—CH_2CONR_6R_7$;

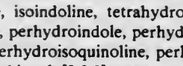
$R_2$, $R_3$, $R_4$ and $R_5$ are independently lower alkyl, cycloalkyl lower alkyl, aryl lower alkyl, heteroaryl lower alkyl, aryl lower alkoxy, substituted aryl lower alkyl, wherein the aryl portion is substituted with 1–3 substituents independently selected from lower alkyl, hydroxy, lower alkoxy and halogeno, substituted heteroaryl lower alkyl wherein the substituents on the heteroaryl portion are as defined for aryl lower alkyl, substituted cycloalkyl lower alkyl wherein the substituents on the cycloalkyl portion are as defined for aryl lower alkyl, and substituted aryl lower alkoxy wherein the substituents are as defined for aryl lower alkyl;

$R_6$ and $R_7$ are independently hydrogen or lower alkyl;

$X_1$, $X_2$, $X_3$, $X_4$ and $X_5$ are independently



cis or trans $—CH_8=CR_9—$, $—CHR_8CHR_9—$, $—CN_2NR_8—$,



provided that when $R^4$ is methyl, $X_4$ is not —CONH—;

$R_8$ and $R_9$ are independently hydrogen or lower alkyl; and the pharmaceutically acceptable salts thereof.

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**5,047,400**

## TRIPEPTIDE COMPOUNDS HAVING A NITROGENOUS POLYCYCLIC STRUCTURE

**Michel Vincent, Bagneux; Georges Remond, Versailles; Bernard Portevin, Elancourt, and Claude Cudennec, La Celle St-Cloud, all of France, assignors to Adir et Cie, Neuilly-sur-Seine, France**

**Filed Jun. 16, 1988, Ser. No. 207,710**

**Claims priority, application France, Jun. 16, 1987, 87 08350**

**Int. Cl.[5] A61K** *31/40;* **C07D** *221/02, 217/00, 209/46*

**U.S. Cl. 514—18** **13 Claims**

1. A compound selected from those of the formula:



(I)

in which:

X denotes either an oxygen atom, or two hydrogen atoms;

Y denotes either a hydrogen atom, or a hydroxyl group;

or

Y denotes an amino group on condition that X denotes two hydrogen atoms;

R denotes a hydrogen atom, or a straight- or branched-chain alkyl group having 1 to 6 carbon atoms, optionally substituted with one or more hydroxy, amino, mercapto, methylthio or carboxy groups, or an aryl group;

Lys and Arg denote, respectively, lysyl and arginyl residues engaged in peptide bonds,



denotes a bicyclic structure selected from the group consisting of indoline, isoindoline, tetrahydroquinoline, tetrahydroisoquinoline, perhydroindole, perhydroisoindole, perhydroquinoline, perhydroisoquinoline, perhydrocyclopenta[b-]pyrrole, 2-azabicyclo[2.2.2]octane, and 2-azabicyclo-[2.2.1]heptane; their enantiomers, epimers and diastereoisomers, as well as their addition salts with a pharmaceutically-acceptable acid or base.

13. A method for treating a living animal body afflicted with an infectious condition susceptible thereto, comprising the step of administering to the said living animal an amount of a compound of claim 1 which is effective for alleviation of the said condition.



**5,047,401**

## USE OF DIPEPTIDE ALKYL ESTERS TO TREAT GVHD

**Peter E. Lipsky, and Dwain L. Thiele, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.**

**Continuation of Ser. No. 774,051, Sep. 5, 1985, Pat. No. 4,752,602. This application Mar. 15, 1988, Ser. No. 168,177**

**Int. Cl.[5] A61K** *37/02*

**U.S. Cl. 514—19** **6 Claims**

1. A method of treating a patient for bone marrow graft versus host disease, comprising the step of contacting bone marrow cells to be grafted into said patient with an alkyl ester of a dipeptide, said alkyl dipeptide ester comprising an amount sufficient to substantially deactivate natural killer cells or cytotoxic T-lymphocytes, said dipeptide alkyl esters consisting essentially of the L-amino acids leucine, phenylalanine, valine, isoleucine, alanine, proline, glycine, or aspartic acid beta-methyl ester, individually or in combination.

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**5,047,402**

## CYCLIC AMIDES AS MEDICAMENTS

**Victor G. Matassa, Chadds Ford, Pa., assignor to ICI Americas Inc., Wilmington, Del.**

**Continuation-in-part of Ser. No. 180,875, Apr. 13, 1988, abandoned. This application Apr. 12, 1989, Ser. No. 337,193**

**Int. Cl.[5] A61K** *31/55;* **C07D** *225/00, 401/00, 209/18*

**U.S. Cl. 514—212** **14 Claims**

1. A compound of formula I, formula set out hereinabove, wherein:

the group $>Z—Y—X<$ is selected from a group consisting of:

(a) $>C=CR^a—N<$ and

(b) $>N—CR^a=C$,

in which ">" indicates two separate bonds;

the radicals $R^a$ and $R^b$ are together selected from a group consisting of

(i) $R^a$ and $R^b$ are each hydrogen,

(ii) $R^a$ is chloro and $R^b$ is hydrogen,

(iii) $R^a$ is bromo and $R^b$ is hydrogen and

(iv) $R^a$ and $R^b$ are each chloro;

Q is oxygen or sulfur;

the groups $R^1$ and $R^9$ are each independently selected from a group consisting of hydrogen, (1–6C)-alkyl which may contain a double or triple bond,(3–6C)cycloalkyl and (3–6C)cycloalkyl(1–4C)alkyl wherein a cycloalkyl group or the cycloalkyl portion of a cycloalkylalkyl group may contain a double bond and may bear 1 or 2 (1–3C)alkyl groups;

$R^3$ is hydrogen or (1–3C)alkyl;

the values of m and n are independently selected from a group of integers consisting of 1, 2 and 3;

$R^{11}$ is selected from a group consisting of hydrogen, (1–4C-)alkoxy, (1–2C)alkyl and hydroxy;

$R^{12}$ is selected from a group consisting of (6–12C)aryl, heteroaryl, and (6–12C)aryl(1–4C)alkyl, in any of which the aromatic or heteroaromatic moiety may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy, trifluoromethyl and amino;

or a salt thereof.

12. A method of antagonizing the action of at least one type of leukotriene in a mammal requiring such treatment comprising administering to said mammal an effective amount of a compound of claim 1.

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**5,047,403**

## METHOD FOR THE REDUCTION OF HEAT DISTRESS INDUCED NICARBAZIN TOXICITY IN FOWL

**Robert G. Teeter, 4814 Country Club Ct., Stillwater, Okla. 74074**

**Filed Aug. 21, 1989, Ser. No. 396,194**

**Int. Cl.[5] A61K** *31/54, 31/505*

**U.S. Cl. 514—224.8** **17 Claims**

1. A method for treating heat distress in poultry induced by the administration of nicarbazin to such poultry during periods of high ambient temperature and/or relative humidity which comprises administering an effective amount of phenothiazine, or a salt thereof, to such poultry during such periods of nicarbazin administration.

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**5,047,404**

## CHEMICAL COMPOUNDS

**William J. Coates; Sean T. Flynn, and Derek A. Rawlings, all of Hertfordshire, England, assignors to Smith Kline & French Laboratories, Ltd., Welwyn Garden City, England**

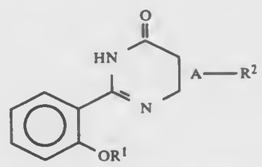
**Filed Jun. 13, 1989, Ser. No. 365,469**

**Claims priority, application United Kingdom, Jun. 16, 1988, 8814350; Jun. 16, 1988, 8814351; Jun. 16, 1988, 8814353**

**Int. Cl.[5] A61K** *31/44;* **C07D** *475/02, 487/04*

**U.S. Cl. 514—243** **19 Claims**

1. A compound of the formula (1):

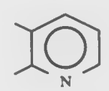


(1)

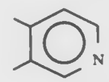
or a pharmaceutically acceptable salt thereof, wherein



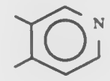
is a ring of sub-formula (a), (b), (c), (d), (e), (f) or (g):



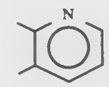
(a)



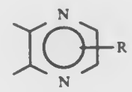
(b)



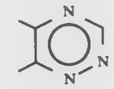
(c)



(d)



(e)



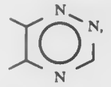
(f)

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(g)



$R^1$ is $C_{1-6}$alkyl, $C_{2-6}$alkenyl, $C_{3-5}$cycloalkyl$C_{1-6}$alkyl, or $C_{1-6}$alkyl substituted by 1 to 6 fluoro groups;

$R^2$ is $C_{1-6}$alkylthio, $C_{1-6}$alkylsulphonyl, $C_{1-6}$alkoxy, hydroxy, hydrogen, hydrazino, $C_{1-6}$alkyl, phenyl, —NHCOR$^3$ wherein $R^3$ is hydrogen or $C_{1-6}$alkyl, or —$NR^4R^5$, wherein $R^4$ and $R^5$ together with the nitrogen atom to which they are attached form a pyrrolidino, piperidino, hexahydroazepino, morpholino or piperazino ring, or $R^4$ and $R^5$ are independently hydrogen, $C_{3-5}$cycloalkyl or $C_{1-6}$alkyl which is optionally substituted by —$CF_3$, phenyl, —$S(O)_nC_{1-6}$alkyl wherein n is 0, 1 or 2, —$OR^6$, —$CO_2R^7$ or —$NR^8R^9$ wherein $R^6$ to $R^9$ are independently hydrogen or $C_{1-6}$alkyl, provided that the carbon atom adjacent to the nitrogen atom is not substituted by said —$S(O)_nC_{1-6}$alkyl, —$OR^6$ or —$NR^8R^9$ groups; and

R is hydrogen and can also be hydroxy when $R^2$ is hydroxy.

19. A method of combatting allergic disease in a host in need thereof by administration of a non-toxic but effective amount of a compound according to claim 1.

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**5,047,405**

**ANTIAMNESIC USE OF PTERIDINE DERIVATIVES**

**Federico Gennari, Truccazzano, Italy, assignor to Bioresearch S.p.A., Milan, Italy**

**Continuation of Ser. No. 182,726, Apr. 18, 1988, abandoned. This application Feb. 27, 1990, Ser. No. 488,438**

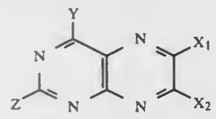
**Claims priority, application Italy, May 14, 1987, 20516 A/87**

**Int. Cl.**[5] **C07D** *57/28;* **A61K** *31/505*

**U.S. Cl. 514—249** **4 Claims**

1. A therapeutic process for treating memory and vigilance disturbance nature cognitive pathologies including Alzheimer-type senile dementia, multiinfarctual dementia, metabolic encephalopathies, Korsakoff's syndrome, and the consequences of the abuse of anxiolytic and neuroleptic therapies, said process comprising

administering to a patient in need thereof a therapeutically effective amount of a pteridine of the formula



wherein Y and Z can be the same or different and are H, OH, or $NH_2$ and $X_1$ and $X_2$ can be the same or different and are OH, $C_1$–$C_4$ alkyl, phenyl, hydroxymethyl, or carboxyl.

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**5,047,406**

**SUBSTITUTED CYCLOHEXANOLS AS CENTRAL NERVOUS SYSTEM AGENTS**

**Bradley W. Caprathe, Redford; Juan C. Jaen, Plymouth; Sarah J. Smith, and Lawrence D. Wise, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.**

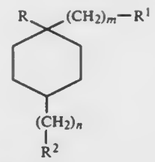
**Continuation-in-part of Ser. No. 446,901, Dec. 6, 1989, Pat. No. 4,957,921. This application May 2, 1990, Ser. No. 517,913**

**Int. Cl.**[5] **C07D** *403/04, 403/14, 405/04, 409/04, 401/04, 417/04;* **A61K** *31/495, 31/445, 30/435*

**U.S. Cl. 514—252** **7 Claims**

1. A compound of Formula I

I



wherein

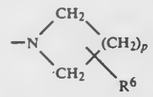
R is —$OR^3$, wherein $R^3$ is hydrogen, lower alkyl, cycloalkyl of from three- to seven-member saturated hydrocarbon ring, cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms, phenyl lower alkyl, phenyl lower alkyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, lower alkanoyl, phenylcarbonyl, phenylcarbonyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, or phenyl lower alkanoyl, phenyl lower alkanoyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy and trifluoromethyl,



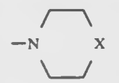
wherein $R^4$ and $R^5$ are each independently hydrogen, lower alkyl, cycloalkyl of from three- to seven-member saturated hydrocarbon ring, cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms, phenyl, phenyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, 2-, 3-, or 4-pyridinyl, 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl, 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl, 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienyl, 2- or 3-thienyl substituted by lower alkyl or halogen, 2- or 3-furanyl, 2- or 3-furanyl substituted by lower alkyl or halogen, 2-, 4-, or 5, thiazolyl, 2-, 4-, or 5-thiazolyl substituted by lower alkyl or halogen, phenyl lower alkyl, phenyl lower alkyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, 2-, 3-, or 4-pyridinyl lower alkyl, 2-3-, or 4-pyridinyl lower alkyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl lower alkyl, 2-, 4-, or 5-pyrimidinyl lower alkyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl lower alkyl, 2-pyrazinyl lower alkyl substituted by lower alkyl, lower alkoxy or halogen, 2- or 3-thienyl lower alkyl, 2- or 3-thienyl lower alkyl substituted by lower alkyl or halogen, 2- or 3-furanyl lower alkyl, 2- or 3-furanyl lower alkyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl lower alkyl, 2-, 4-, or 5-thiazolyl lower alkyl substituted by lower alkyl or halogen, lower alkyanoyl, cycloalkanoyl, cycloalkylalkanoyl, phenyl lower alkanoyl, phenyl lower alkanoyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy and trifluoromethyl, 2-, 3-, or 4-pyridinyl lower alkanoyl, 2-, 3-, or 4-pyridinyl lower alkanoyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl lower alkanoyl, 2-, 4-, or 5-pyrimidinyl lower alkanoyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl lower alkanoyl, 2-pyrazinyl lower alkanoyl substituted by lower alkyl, lower alkoxy or halogen, 2- or



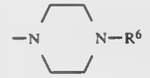
3-thienyl lower alkanoyl, 2- or 3-thienyl lower alkanoyl substituted by lower alkyl or halogen, 2- or 3-furanyl lower alkanoyl, 2- or 3furanyl lower alkanoyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl lower alkanoyl, 2-, 4-, or 5-thiazolyl lower alkanoyl substituted by lower alkyl or halogen, phenylcarbonyl, phenylcarbonyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, 2-, 3-, or 4-pyridinylcarbonyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinylcarbonyl, 2-, 4-, or 5-pyrimidinylcarbonyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinylcarbonyl, 2-pyrazinylcarbonyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienylcarbonyl, 2- or 3-thienylcarbonyl substituted by lower alkyl or halogen, 2- or 3-furanylcarbonyl, 2- or 3-furanylcarbonyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolylcarbonyl, 2-, 4-, or 5-thiazolylcarbonyl substituted by lower alkyl or halogen, or $R^4$ and $R^5$ are taken together with the nitrogen atom to which they are attached to form a ring denoted by



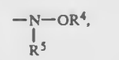
wherein p is zero or an integer from 1 to 4 and $R^6$ is hydrogen, lower alkyl, cycloalkyl of from three- to seven-member saturated hydrocarbon ring, cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms,



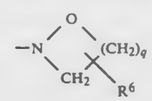
wherein X is oxygen or sulfur or



wherein $R^6$ is as defined above, or



wherein $R^4$ and $R^5$ are each independently hydrogen, lower alkyl, cycloalkyl of from three- to seven-member saturated hydrocarbon ring, cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms, phenyl, phenyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, phenyl lower alkyl, phenyl lower alkyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, lower alkanoyl, phenyl lower alkanoyl, phenyl lower alkanoyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy and trifluoromethyl, phenylcarbonyl, phenylcarbonyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, or $R^4$ and $R^5$ are taken together with the oxygen and nitrogen atoms to which they are attached to form a ring denoted by



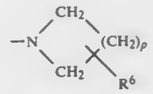
wherein q is an integer from 2 to 3 and $R^6$ is as defined above;

m is zero or an integer from 1 to 2;

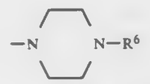
$R^1$ is hydrogen; or when R is —$OR^3$ wherein $R^3$ is cycloalkyl of from three- to seven-member saturated hydrocarbon ring or cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms,



wherein $R^4$ and $R^5$ are each independently cycloalkyl of from three- to seven-member saturated hydrocarbon ring, cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms, 2-, 3-, or 4-pyridinyl, 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl, 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl, 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienyl, 2- or 3-thienyl substituted by lower alkyl or halogen, 2- or 3- furanyl, 2- or 3-furanyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl, 2-, 4-, or 5-thiazolyl substituted by lower alkyl or halogen, 2-, 3-, or 4-pyridinyl lower alkyl, 2-, 3-, or 4-pyridinyl lower alkyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl lower alkyl, 2-, 4-, or 5-pyrimidinyl lower alkyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl lower alkyl, 2-pyrazinyl lower alkyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienyl lower alkyl, 2- or 3-thienyl lower alkyl substituted by lower alkyl or halogen, 2- or 3-furanyl lower alkyl, 2- or 3-furanyl lower alkyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl lower alkyl, 2-, 4-, or 5-thiazolyl lower alkyl substituted by lower alkyl or halogen, cycloalkanoyl, cycloalkylalkanoyl, 2-, 3-, or 4-pyridinyl lower alkanoyl, 2-, 3-, or 4-pyridinyl lower alkanoyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl lower alkanoyl, 2-, 4-, or 5-pyrimidinyl lower alkanoyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl lower alkanoyl, 2-pyrazinyl lower alkanoyl substituted by lower alkyl, lower alkoxy or halogen, 2- or 3-thienyl lower alkanoyl, 2- or 3-thienyl lower alkanoyl substituted by lower alkyl or halogen, 2- or 3-furanyl lower alkanoyl, 2- or 3-furanyl lower alkanoyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl lower alkanoyl, 2-, 4-, or 5-thiazolyl lower alkanoyl substituted by lower alkyl or halogen, 2-, 3-, or 4-pyridinylcarbonyl, 2-, 3-, or 4-pyridinylcarbonyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinylcarbonyl, 2-, 4-, or 5-pyrimidinylcarbonyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinylcarbonyl, 2-pyrazinylcarbonyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienylcarbonyl, 2- or 3-thienylcarbonyl substituted by lower alkyl or halogen, 2- or 3-furanylcarbonyl, 2- or 3-furanylcarbonyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolylcarbonyl, 2-, 4-, or 5-thiazolylcarbonyl substituted by lower alkyl or halogen, or $R^4$ and $R^5$ are taken together with the nitrogen atom to which they are attached to form a ring denoted by



wherein p is zero or an integer from 1 to 4 and $R^6$ is cycloalkyl of from three- to seven-member saturated hydrocarbon ring, cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from on- to six-carbon atoms, or



wherein $R^6$ is as defined above, or



wherein $R^4$ and $R^5$ are each independently cycloalkyl of from three- to seven-member saturated hydrocarbon ring or cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms, or $R^4$ and $R^5$ are taken together with the oxygen and nitrogen atoms to which they are attached to form a ring denoted by

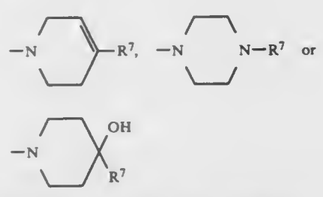


wherein q is an integer from 2 to 3 and $R^6$ is cycloalkyl of from three- to seven-member saturated hydrocarbon ring, or cycloalkylalkyl wherein the cycloalkyl group is as defined above and the attached alkyl group is from one- to six-carbon atoms

$R^1$ is additionally phenyl, phenyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl, 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-, pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen, 2- or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen, 2- or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, 2-, 4, or 5-thiazolyl or 2-, 4-, or 5-thiazolyl substituted by lower alkyl or halogen;

n is zero or an integer from 1to 4;

$R^2$ is



wherein $R^7$ is phenyl, phenyl substituted by one to four substituents selected from the group consisting of lower alkyl, lower alkoxy, lower thioalkoxy, halogen and trifluoromethyl. 2-, 3-, or 4-pyridinyl or 2-, 3-, or 4-pyridinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, 4-, or 5-pyrimidinyl or 2-, 4-, or 5-pyrimidinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-pyrazinyl or 2-pyrazinyl substituted by lower alkyl, lower alkoxy, or halogen, 2-, or 3-thienyl or 2- or 3-thienyl substituted by lower alkyl or halogen, 2- or 3-furanyl or 2- or 3-furanyl substituted by lower alkyl or halogen, 2-, 4-, or 5-thiazolyl or 2-, 4-, or 5-thiazolyl substituted by lower alkyl or halogen; and the corresponding cis and trans isomers thereof; or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating schizophrenia comprising administering to a host suffering therefrom a therapeutic effective amount of a compound according to claim 1 in unit dosage form.

6. A method of treating depression comprising administering to a host suffering therefrom a therapeutic effective amount of a compound according to claim 1 in unit dosage form.

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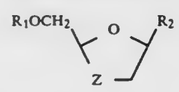
**5,047,407**

## 2-SUBSTITUTED-5-SUBSTITUTED-1,3-OXATHIOLANES WITH ANTIVIRAL PROPERTIES

**Bernard Belleau, Westmount, and Nghe Nguyen-Ba, Brossard, both of Canada, assignors to IAF BioChem International, Inc., Montreal, Canada**

**Filed Feb. 8, 1989, Ser. No. 308,101**
**Int. Cl.[5] A61K** *31/505;* **C07D** *411/04*
**U.S. Cl. 514—274** **13 Claims**

1. A 1,3-oxathiolane of formula (A), the geometric and optical isomers thereof, and mixtures of those isomers:



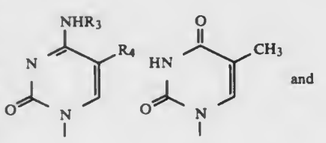
(A)

wherein:

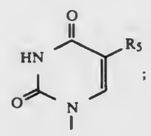
Z is selected from the group consisting of sulfur, sulfoxide, and sulfone;

$R_1$ is selected from the group consisting of hydrogen and an acyl group having 1 to 16 carbon atoms;

$R_2$ is a heterocyclic radical selected from the group consisting of:



and



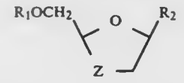
;

$R_3$ and $R_4$ are independently selected from the group consisting of hydrogen and $C_{1-6}$ alkyl groups;

$R_5$ is selected from the group of hydrogen, $C_{1-6}$ alkyl, bromine, chlorine, fluorine, and iodine; and

X and Y are independently selected from the group consisting of bromine, chlorine, fluorine, iodine, amino and hydroxyl groups.

6. A method for treating human immunodeficiency virus infections in animals and humans, characterized by administering an antiviral effective amount of a compound of a 1,3-oxathiolane of Formula (A), the geometric and optical isomers thereof, and mixtures of those isomers:



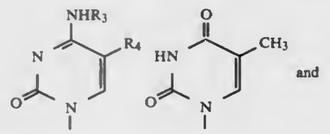
(A)

wherein:

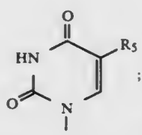
Z is selected from the group consisting of sulfur, sulfoxide and sulfone;

$R_1$ is selected from the group consisting of hydrogen and an acyl group having 1 to 16 carbon atoms;

$R_2$ is a heterocyclic radical selected from the group consisting of:



and



;

$R_3$ and $R_4$ are independently selected from the group consisting of hydrogen and $C_{1-6}$ alkyl groups;

$R_5$ is selected from the group of hydrogen, $C_{1-6}$ alkyl, bromine, chlorine, fluorine, and iodine; and

X and Y are independently selected from the group consisting of bromine, chlorine, fluorine, iodine, amino and hydroxyl groups.

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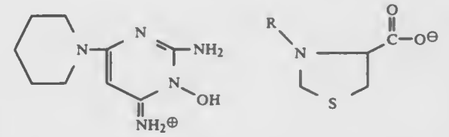
**5,047,409**

## COMPOUNDS FOR COSMETIC-DERMATOLOGICAL USE AND RELEVANT COMPOSITIONS

**Michele G. Di Schiena, and Vittoria Orrù, both of Trezzano sul Naviglio, Italy, assignors to Serono OTC S.A., Switzerland**

**Filed May 21, 1986, Ser. No. 866,069**
**Claims priority, application Italy, May 22, 1985, 20837 A/85**
**Int. Cl.[5] C07D** *239/48;* **A61K** *31/505*
**U.S. Cl. 514—275** **10 Claims**

1. A salt of a thiazolidine-4-carboxylic acid with 6-piperidino-2,4-diaminopyrimidine-3-oxide of the formula



wherein R is hydrogen, formyl, acetyl, trifluoroacetyl, propionyl, butyryl, hexanoyl, pivaloyl, caproyl, lauroyl, stearoyl, phthaloyl, benzoyl, 3,4,5-trimethoxybenzoyl, cyclopentacarbonyl, 4-aminobenzoyl, 2,3- or 4-chlorobenzoyl, 2,3,4-methylbenzoyl, glycyl, alanyl, valyl, lysyl, aspartyl, histidyl, cysteyl, malonyl, succinyl, malyl, maleyl, fumaryl, glutaryl, adipyl, cyclohexam-1,4-dicarboxyl, camphoryl, endobicyclo (2.2.2) ott-5-en-2,3-dicarboxyl, phthalyl, terephthalyl, isophthalyl, methyl, ethyl, n-propyl, i-propyl, n-butyl, sec-butyl, t-butyl, n-pentyl, neopentyl, n-hexyl, cyclohexyl, cyclopentyl, 4-methylcyclohexyl, t-butyloxycarbonyl, ethyloxycarbonyl, benzyloxycarbonyl, 2,2,2-trichloro-ethyloxycarbonyl and aryl or halo, OH, $OCH_2$, $OCH_3$, $NH_2$, $NO_2$, $CH_3$, or $CF_3$ substituted aryl in which said aryl radical is phenyl, benzyl or tolyl.

5. A composition for topical use in trichology comprising 0.1 to 10% by weight of a salt of claim 1 and a topical vehicle therefor.

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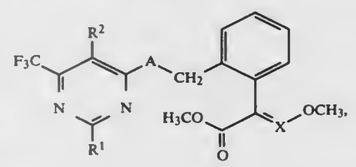
**5,047,408**

## PEST CONTROL WITH PYRIMIDINES

**Franz Schuetz, Ludwigshafen; Siegbert Brand, Weinheim; Jochen Wild, Deidesheim; Thomas Kuekenhoener, Frankenthal; Peter Hofmeister, Neustadt, and Christoph Kuenast, Otterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jul. 12, 1990, Ser. No. 551,471**
**Claims priority, application Fed. Rep. of Germany, Jul. 13, 1989, 3923068**
**Int. Cl.[5] A01N** *43/54*
**U.S. Cl. 514—274** **2 Claims**

1. A method for combating insects and mite pests which comprises applying to the pests or their infested habitat a pesticidally effective amount of a pyrimidine of formula I



I

wherein

$R^1$ is $C_1$–$C_6$-alkyl, $C_3$–$C_6$-cycloalkyl, $C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio, or aryl which is unsubstituted or mono- or poly-substituted by $C_1$–$C_6$-alkyl, $C_1$–$C_4$-alkoxy or halogen,

$R^2$ is halogen or hydrogen;

A is oxygen or sulfur and

X is CH or N,

or a plant-tolerated acid addition salt or metal complex thereof.

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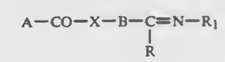
**5,047,410**

## INDOLYL DERIVATIVES AND THEIR USE AS 5-$HT_3$, RECEPTOR ANTAGONISTS

**Arturo Donetti, Milan; Marco Turconi, Voghera; Massimo Nicola, Pavia, and Rosamaria Micheletti, Milan, all of Italy, assignors to Istituto De Angeli S.p.A., Milan, Italy**

**Filed Jul. 12, 1989, Ser. No. 378,958**
**Claims priority, application Italy, Jul. 12, 1988, 21330 A/88**
**Int. Cl.[5] A61K** *31/165, 31/235, 31/275, 31/38, 31/405, 31/44, 31/18;* **C07D** *221/22, 215/38;* **C07C** *233/64*
**U.S. Cl. 514—299** **8 Claims**

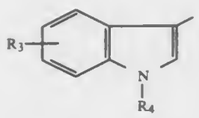
1. Compound of general formula (I)



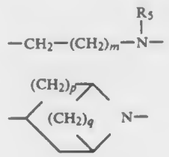
(I)

wherein

A is



wherein
$R_3$ is H, halogen, $C_{1-6}$ alkoxy
$R_4$ is H, $C_{1-6}$ alkyl
X is —O— or —NH—
B is a group selected from



wherein
m is 1, 2
p is 0, 1, 2,
q is 0, 1, 2, 3
$R_5$ is H, $C_{1-6}$ alkyl
R is H, $C_{1-6}$ alkyl optionally substituted by halogen, $NR_6R_7$ in which $R_6$ is H, $C_{1-6}$ alkyl, $NO_2$, CN and $R_7$ is H, $C_{1-6}$ alkyl;
$R_1$ is H, $C_{1-6}$ alkyl optionally substituted by halogen, CN, or tautomers thereof, optical isomers thereof and acid addition salts thereof.

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**5,047,411**

## BENZAZOLE COMPOUNDS AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

**Hisashi Takasugi, Osaka; Yousuke Katsura, Toyonaka; Yoshikazu Inoue, Amagasaki; Shigetaka Nishino, Osaka, and Takao Takaya, Kawanishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

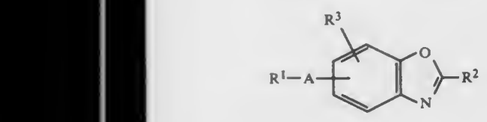
**Filed Aug. 23, 1989, Ser. No. 397,669**

**Claims priority, application United Kingdom, Aug. 25, 1988, 8820231**

**Int. Cl.[5] C07D** *413/06;* **A61K** *31/44, 31/42*

**U.S. Cl. 514—300** **4 Claims**

1. A compound of the formula:



wherein
$R^1$ is pyridyl, imidazopyridyl or tetrahydroimidazopyridyl, each of which may be substituted with substituent(s) selected from the group consisting of amino; amino substituted with alkanoyl or diaminomethylene; hydroxy; hydroxy substituted with alkanoyl or lower alkyl; carboxy; alkanoyl; halogen; lower alkyl; and lower alkyl substituted with phenol, hydroxy, halogen, lower alkoxy, amino, lower alkylamino piperidino or azido,
$R^2$ is amino or amino substituted with a substituent selected from the group consisting of lower alkyl, lower alkenyl, amidino, lower alkylamino(lower)alkylidene and alkanoyl,
$R^3$ is hydrogen and
A is lower alkylene, or a pharmaceutically acceptable salt thereof.

4. A method for the treatment of ulcer in a human being or animal comprising administering an effective amount of a compound of claim 1 or a pharmaceutically acceptable salt thereof.

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**5,047,412**

## ALKENE DERIVATIVES

**George R. Brown, Winslow, and Michael J. Smithers, Macclesfeild, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England**

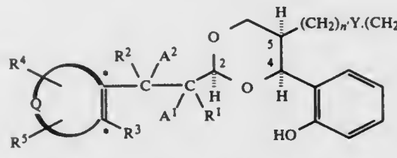
**Division of Ser. No. 861,335, May 9, 1986, Pat. No. 4,824,858. This application Feb. 1, 1989, Ser. No. 304,718**

**Claims priority, application United Kingdom, May 10, 1985, 8511896; Dec. 30, 1985, 8531893**

**Int. Cl.[5] A61K** *31/335, 31/34;* **C07D** *319/06, 257/04*

**U.S. Cl. 514—307** **8 Claims**

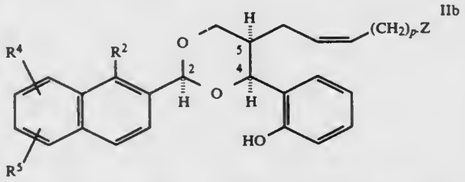
1. A [2,4,5-cis]-dioxane of the formula I:



I

wherein $A^1$ and $A^2$ form a direct link; $R^2$ is hydrogen or (1–4C) alkyl; $R^3$ together with $R^1$ forms vinylene; $R^4$ and $R^5$ are independently selected from hydrogen, halogeno, (1–4C)alkyl, (1–4C)alkoxy, nitro, cyano, trifluoromethyl, hydroxy, (1–4C-)alkanoylamino and (2–4C)alkanoyloxy, or $R^4$ and $R^5$ together form (1–4C)alkylenedioxy attached to adjacent carbon atoms in Q when the latter completes a benzene ring; Y is vinylene; n is 1; m is 2; Q, in conjunction with its adjoining carbon atoms, completes a benzene or pyridine ring; and Z is carboxy, 1(H)-tetrazol-5yl, or a group of the formula $—CO.NH.SO_2R^6$ wherein $R^6$ is (1–6C)alkyl, benzyl or phenyl, the latter two of which are unsubstituted or bear a halogeno, (1–4C)alkyl, (1–4C)alkoxy, nitro, cyano or trifluoromethyl substituent, or a pharmaceutically acceptable salt thereof.

3. A naphthyl compound of the formula IIb



IIb

wherein $R^2$ is hydrogen or (1–4C)alkyl; $R^4$ and $R^5$ are independently selected from hydrogen, halogeno, (1–4C)alkyl, (1–4C-)alkoxy, hydroxy, nitro, cyano and trifluoromethyl, or $R^4$ and $R^5$ together form methylenedioxy; p is 2; and Z is carboxy, 1(H)-tetrazol-5-yl or a group of the formula $—CO.NH.SO_2R^6$ wherein $R^6$ is (1–6C)alkyl, benzyl or phenyl, the latter two of which are unsubstituted or bear a halogeno, (1–4C)alkyl, (1–4C)alkoxy, nitro, cyano or trifluoromethyl substituent; or a pharmaceutically acceptable salt thereof.

7. A method of antagonizing one or more of the actions of thromboxane $A_2$ in a warm-blooded animal requiring such treatment which comprises administering to the said animal an effective amount of a compound of formula I or IIb, or a pharmaceutically acceptable salt thereof, as defined in claim 3 or 1.

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**5,047,413**

## PHARMACEUTICAL COMPOSITIONS CONTAINING ACYLATED BENZILIC ACID DERIVATIVES

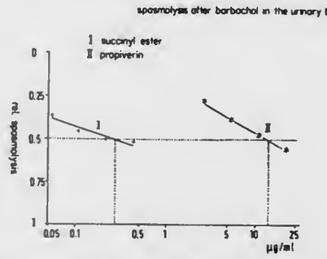
**Eckhart Pein, Northeim; Helmut Ritter, Wuppertal, and Reinhard Laven, Salzgitter, all of Fed. Rep. of Germany, assignors to Schaper & Bruemmer GmbH & Co., KG, Salzgitter, Fed. Rep. of Germany**

**Division of Ser. No. 285,171, Dec. 16, 1988, Pat. No. 4,933,459. This application Mar. 19, 1990, Ser. No. 495,122**

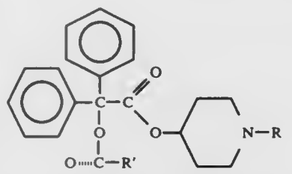
**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1987, 3742580**

**Int. Cl.[5] A61K** *31/445;* **C07D** *211/36*

**U.S. Cl. 514—327** **9 Claims**




1. A pharmaceutical composition comprising:
(A) a therapeutically effective amount of an N-alkyl-4-piperidyl α,α-diphenyl-α-acyloxyacetates having the formula



(1)

wherein R is H, $CH_3$, $C_2H_7$; R' is H, $NH_2$, phenyl, carboxyphenyl, ($C_1$–$C_6$)alkyl, hydroxy($C_1$–$C_6$)alkyl, methoxy, ethoxy, methoxymethyl, ethoxymethyl, amino($C_1$–$C_6$)alkyl which can be substituted in the alkyl radical by one or more of an $—NH_2$, —COOH or $—SCH_3$ group, N-acetylamino($C_1$–$C_6$)alkyl, or a group having the formula

$—CH=CH—COOR''$ or $—(CH_2)_n—COOR''$

where n is an integer from 0 to 8; and R'' is H, $CH_3$, $C_2H_5$, $C_3H_7$, or a pharmacologically acceptable cation; or a salt thereof with a pharmacologically acceptable acid; and
(B) a pharmaceutically acceptable vehicle.

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**5,047,414**

## 2-(AMINOALKYLTHIO)METHYL-1,4-DIHYDROPYRIDINE, A METHOD FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

**Carmelo A. Gandolfi; Marco Frigerio; Silvano Spinelli; Odoardo Tofanetti, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy**

**Continuation of Ser. No. 299,992, filed as PCT EP87/00335 on Jun. 25, 1987, published as WO88/00187 on Jan. 14, 1988, abandoned.**

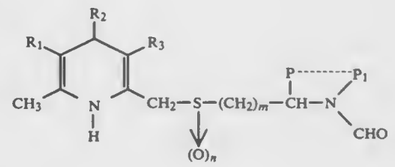
**This application Dec. 21, 1990, Ser. No. 638,131**

**Claims priority, application Italy, Jun. 27, 1986, 20965A/86**

**Int. Cl.[5] A61K** *31/435, 31/335, 31/40;* **C07D** *211/68, 211/80, 213/02, 211/80, 213/02*

**U.S. Cl. 514—338** **10 Claims**

1. Compounds of formula I



wherein:
$R_1$ represents:
a $COCH_3$, $COC_6H_5$, CN or $NO_2$ group;
a COORa group, wherein Ra represent hydrogen, $C_1$–$C_6$ straight or branched alkyl, optionally bearing at least one substituent selected from the group consisting of $C_1$–$C_6$ alkoxy groups and secondary amino groups of formula $—NR_4R_5$ wherein $R_4$ and $R_5$, that may be the same or different, represent $C_1$–$C_6$ alkyl, phenyl, benzyl or, taken together with the nitrogen atom, form a five or six membered ring;
$R_2$ is a phenyl ring unsubstituted or substituted with at least one substituent selected from the group consisting of $C_1$–$C_6$ alkyl, halogen, nitro, cyano, $C_1$–$C_6$ alkoxycarbonyl, $C_1$–$C_6$ alkylthio, $C_1$–$C_6$ alkylsulfinyl; pentafluorophenyl; α- or β-naphthyl; a five- or six-membered heterocyclic ring; α-benzo (2,3-b)-1,4-dioxan-α-yl; α-benzofuroxanyl;
$R_3$ represents a COORa group wherein Ra is as above defined;
P is selected from the group consisting of hydrogen, $—(CH_2)_p—W$ and $C_1$–$C_8$ linear or branched alkyl;
N-$P_1$ is the residue of a primary or secondary amino group wherein $P_1$ is selected from the group consisting of hydrogen, $C_1$–$C_6$ lower linear or branched alkyl group and $—(CH_2)_p—W$;
P, taken together with $P_t$ and the nitrogen atom to which $P_1$ is linked, may form a pyrrolidine or a piperidine ring;
W is selected from the group consisting of hydroxymethyl, formyloxymethyl, $CO_2R$ wherein R is hydrogen or $C_1$–$C_4$ lower alkyl, CN, 4-imidazolyl, $C_3$–$C_7$ cycloalkyl ring, phenyl ring optionally constituted by at least one substituent selected from the group consisting of halogens and $C_1$–$C_3$-alkoxy groups;
m is an integer from 1 to 3;
n is zero or an integer from 1 to 2;
p is zero or an integer from 1 to 3, their salts, enantiomers, diastereoisomers or mixtures thereof.

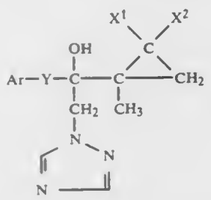
VOL 1130 ISS 2 SE 10 1991 UMI

### 5,047,415
### 2,2-DIHALOGENOCYCLOPROPYL-HYDROXY-ETHYL-TRIAZOLES

Udo Kraatz, Leverkusen; Graham Holmwood, Wupertal; Karl-Rudolf Gassen, Odenthal; Stefan Dutzmann, Duesseldorf, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 12, 1989, Ser. No. 378,730
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824435
The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.
Int. Cl.[5] A01N *43/653;* C07D *249/08*
U.S. Cl. 514—383 7 Claims

1. A 2,2-dihalogenocyclopropyl-hydroxyethyl-triazole of the formula



(I)

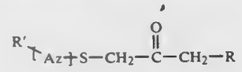
in which
Ar represents phenyl which can be mono- or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, trifluoromethoxy and methoximinomethyl,
$X^1$ represents fluorine or chlorine,
$X^2$ represents fluorine or chlorine and
Y represents the groups $—OCH_2—$, $—SCH_2—$, $—CH_2CH_2—$ or —CH=CH—, where the hetero atom is linked to the aryl radical when Y represents $—OCH_2—$.

### 5,047,416
### TRIAZOLE COMPOUNDS AND THEIR USE AS TRANSGLUTAMINASE INHIBITORS

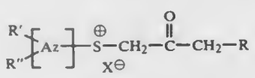
David C. Remy, North Wales; John J. Baldwin, Gwyneed Valley; David A. Claremon, Audubon, and Stella W. King, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 31, 1989, Ser. No. 386,645
Int. Cl.[5] C07D *249/12, 249/16;* A61K *31/41*
U.S. Cl. 514—384 14 Claims

1. An azole compound selected from the group consisting of:
(A) an azole represented by the formula



or its acid addition salt,
wherein said acid addition salt is a salt formed by the addition of an acid selected from the group consisting of hydrochloric, hydrobromic, hydroiodic, phosphoric, sulfuric, trifluoroacetic, trichloroacetic, oxalic, maleic, pyruvic, malonic, succinic, citric, mandelic, benzoic, cinnamic, methanesulfonic, ethanesulfonic, and trifluoromethanesulfonic acids; and
(B) an azolium salt represented by the formula



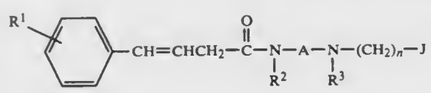
wherein Az is a triazole nucleus,
R' and R'' independently are lower alkyl from 1 to 5 carbon atoms, phenyl; substituted phenyl containing from 1 to 3 substituents selected from lower alkyl, lower alkoxy, halo and hydroxy; benzyl, phenylethyl,
R is hydrogen, lower alkyl from 1 to 5 carbon atoms, cycloalkyl from 3 to 7 carbon atoms, phenyl or substituted phenyl containing from 1 to 3 substituents selected from lower alkyl, lower alkoxy, halo and hydroxy; and
X is a negative radical of a pharmaceutically acceptable salt;
wherein said negative radical is derived from an acid selected from the group consisting of hydrochloric, hydrobromic, hydroiodic, phosphoric, sulfuric, trifluoroacetic, trichloroacetic, oxalic, maleic, pyruvic, malonic, succinic, citric, mandelic, benzoic, cinnamic, methanesulfonic, ethanesulfonic, and trifluoromethanesulfonic acids.

### 5,047,417
### BUTENOIC OR PROPENOIC ACID DERIVATIVES

Norio Minami; Fumihiro Ozaki; Keiji Ishibashi; Yasuhiro Kabasawa; Megumi Ikemori; Toshiaki Ogawa, and Takanori Kawamura, all of Ibaraki, Japan, assignors to Eisai Co. Ltd., Tokyo, Japan

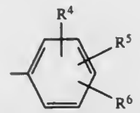
Filed May 19, 1989, Ser. No. 354,306
Claims priority, application Japan, Jun. 1, 1988, 63-134892
Int. Cl.[5] A61K *31/335, 31/34, 31/38, 31/40, 31/415, 31/44;* C07D *403/06, 233/66, 233/54, 213/63, 213/70, 319/14*
U.S. Cl. 514—397 12 Claims

1. A butenoic or propenoic acid derivative having the formula (I)



(I)

wherein $R^1$ is an imidazolyl group, $R^2$ and $R^3$ each are hydrogen, a lower alkyl, a cycloalkyl or an allyl group, A is an alkylene group having 1 to 6 carbon atoms, wherein said alkylene may have a lower alkyl, a lower alkoxy or hydroxy attached thereto, J is a phenyl having substituents $R^4$, $R^5$ and $R^6$:



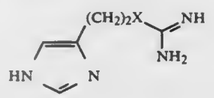
wherein $R^4$, $R^5$ and $R^6$ each are hydrogen, a halogen atom, a lower alkyl, a lower alkoxy, hydroxy, nitro, cyano, trifluromethyl, an alkylsulfonyloxy, $—NR^7R^8$ wherein $R^7$ and $R^8$ being hydrogen or a lower alkyl, or an alkanoylamino, or two of $R^4$, $R^5$ and $R^6$ may form an alkylenedioxy together with two adjacent carbon atoms on the phenyl, or $R^4$, $R^5$ and $R^6$ may form a 5- to 7-membered carbocyclic ring together with the $—(CH_2)—$, and n is an integer of from 1 to 6, or a pharmacologically acceptable salt thereof.

### 5,047,418
### METHOD OF STIMULATING HISTAMINE $H_3$-RECEPTORS

William Howson, Welwyn, United Kingdom, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Filed Jul. 20, 1990, Ser. No. 556,921
Claims priority, application United Kingdom, Jul. 25, 1989, 8916947
Int. Cl.[5] A61K *31/415, 9/70*
U.S. Cl. 514—400 2 Claims

1. A method of stimulating histamine $H_3$-receptors in a patient in need thereof which comprises administering a patient an effective amount to stimulate said receptors of a compound of the formula (1):



(1)

or a pharmaceutically acceptable salt thereof
wherein X is $CH_2$ or S.



### 5,047,419
### PHOTODYNAMIC THERAPY OF GLIOMA OR MAMMARY CARCINOMA USING SELENO- OR TELLUROPYRYLIUM SALTS

Michael R. Detty, Rochester, N.Y., and Stephen K. Powers, Chapel Hill, N.C., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 24, 1988, Ser. No. 261,288
Int. Cl.[5] A61K *31/095, 31/35, 31/56*
U.S. Cl. 514—432 10 Claims

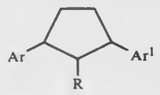
1. A composition effective for increasing the survival time of animals affected with glioma or mammary carcinoma cells, comprising a therapeutically effective amount of a seleno- or a telluropyrylium dye having a singlet oxygen quantum efficiency of at least 0.005, when exposed in an air-saturated solution to light of wavelengths between about 650 to 1000 nm with an energy sufficient to produce a phototherapeutic effect; and a pharmaceutically acceptable carrier.

### 5,047,420
### 1,3-DIARYL CYCLOPENTANES AND DERIVATIVES THEREOF AS PAF ANTAGONISTS

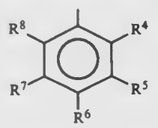
Donald W. Graham, Mountainside; Tesfaye Biftu, Parlin; John C. Chabala, Westfield, all of N.J.; Michael N. Chang, Newtown, Pa.; Yuan-Ching P. Chiang, Piscataway, N.J.; Kathryn L. Thompson, Westfield, N.J., and Shu S. Yang, Bridgewater, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 88,320, Aug. 24, 1987, abandoned, and Ser. No. 898,966, Aug. 21, 1986, abandoned.
This application Aug. 21, 1989, Ser. No. 396,489
Int. Cl.[5] A61K *31/27, 31/165;* C07C *271/36, 321/28*
U.S. Cl. 514—484 8 Claims

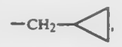
1. A compound of formula:



wherein
R is $—(O)_m(CH_2)_n—(CO)NR^3R^2$, wherein m is 0 or 1; n is an integer from 0 to 6; and
$R^2$ and $R^3$ are each independently H, $C_{1-8}$ alkyl, $C_{3-8}$ cycloalkyl, phenyl $C_{1-3}$ alkyl or $C_{1-4}$ perhaloalkyl; and
Ar and $Ar^1$ are each independently: phenyl or substituted phenyl of formula



wherein $R_4$–$R_8$ independently represents H, $R^2$; YO— wherein Y is $C_{1-6}$alkenyl, $C_{1-6}$alkynyl,



$—CH_2OR^2$, $—CH_2C_{4-8}$cycloalkyl, $CH_2CH(OH)—CH_2OH$; $R^2S—$; $R^2SO—$; $R^2SO_2—$; $CF_3O—$; $CF_3S—$; $CF_3SO—$; $CF_3SO_2—$; $CH_3OCH_2O—$; $R^2R^3N—$; halo;
with the proviso that Ar and $Ar^1$ are not simultaneously the same and that at least one of $R_4$–$R_8$ contains a sulfur.

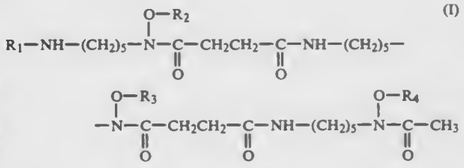
5. A pharmaceutical composition for treating a disease or a disorder mediated by PAF comprising a pharmaceutical carrier and a therapeutically effective amount of a compound according to claim 1.

### 5,047,421
### ORALLY EFFECTIVE ION CHELATORS

Donald E. Green, Sunnyvale, Calif., assignor to Oral-D, Boston, Mass.

Continuation of Ser. No. 574,482, Jan. 26, 1984, Pat. No. 4,684,482. This application Jul. 31, 1987, Ser. No. 80,482
The portion of the term of this patent subsequent to Jun. 9, 2004, has been disclaimed.
Int. Cl.[5] A61K *31/215*
U.S. Cl. 514—507 5 Claims

1. A pharmaceutical composition for treating a trivalent metal overload condition or disease in a human being which composition comprises a therapeutically effective amount of a compound of formula I:



(I)

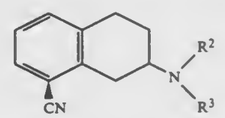
wherein $R_1$ is acetyl and $R_2$, $R_3$ and $R_4$ are each n-octanoyl.

### 5,047,422
### 8-SUBSTITUTED 2-AMINOTETRALINS

Bodo Junge, Wuppertal; Bernd Richter, Bergisch Gladbach; Thomas Glaser, Roesrath; Jörg Traber, Lohmar, all of Fed. Rep. of Germany, and George S. Allen, Nashville, Tenn., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 354,950, May 22, 1989, Pat. No. 4,968,679, which is a division of Ser. No. 132,372, Dec. 15, 1987, Pat. No. 4,873,262. This application Jul. 13, 1990, Ser. No. 553,294
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643899; Jun. 15, 1987, 3719924
Int. Cl.[5] A61K *31/275;* C07C *255/52*
U.S. Cl. 514—510 7 Claims

I. An 8-substituted 2-aminotetralin of the formula



in which
$R^2$ represents hydrogen or alkyl, and
$R^3$ represents alkyl.
or a salt thereof.

7. A method of treating a disorder of the central nervous system, the cardiovascular system or the intestinal tract com-

prising administering to a patient suffering therefrom an amount effective therefor of a compound or salt thereof according to claim 1.

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5,047,423
## PESTICIDAL COMPOSITIONS

Barry A. Richardson, Winchester; Timothy R. G. Cox, Bishops Waltham, and Stuart W. Carter, Berkhamsted, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

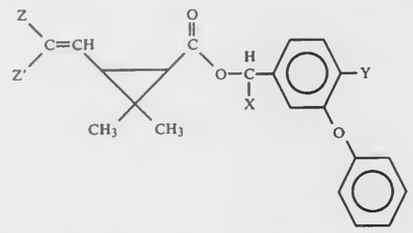
Continuation of Ser. No. 654,315, Sep. 25, 1984, abandoned. This application Sep. 12, 1989, Ser. No. 406,191

Claims priority, application United Kingdom, Sep. 29, 1983, 8326173; May 31, 1984, 8413916

Int. Cl.[5] A01N *37/34, 53/00, 31/08*

U.S. Cl. 514—521 6 Claims

1. A composition for the treatment of timber, the composition comprising creosote and a compound of formula I:



(I)

wherein Z and $Z^1$ are the same or different and each is selected from halo, halophenyl and haloalkyl, X is selected from hydrogen and a cyano group, and Y is selected from hydrogen and a fluorine atom, the range of the compound of formula I to creosote being 0.001:99.999 to 99.99:0.01.

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5,047,424
## ENVIRONMENTALLY SAFE INSECTICIDE

George S. Puritch, Saanichton, and Gregory S. Salloum, Victoria, both of Canada, assignors to Safer, Inc., Newton, Mass.

Filed Oct. 3, 1988, Ser. No. 252,786

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] A01N *53/00;* A61K *31/215*

U.S. Cl. 514—521 15 Claims

1. An environmentally safe insecticidal composition, consisting essentially of:

a solution of alkali metal salts of monocarboxylic acids, the solution comprising a predominant amount of the alkali metal salts of oleic acid and a lesser amount of the alkali metal salts of linoleic acid;

a solvent for said pyrethroid compound comprising a low molecular weight alcohol; and

a pyrethroid compound,

wherein the ratio of the solution of monocarboxylic acid salts to the pyrethroid compound is at least about 2:1.

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5,047,425
## AMINE DERIVATIVES HAVING CARDIOVASCULAR ACTIVITY

Cesare Casagrande, Arese; Francesco Santangelo, and Luisa Calabi, both of Milan, all of Italy, assignors to Simes Societa Italiana Medicinali & Sintetici SpA, Vicenza, Italy

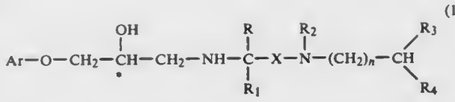
Filed Nov. 30, 1988, Ser. No. 278,205

Claims priority, application Italy, Dec. 1, 1987, 22824 A/87

Int. Cl.[5] A61K *31/275, 31/235, 31/24, 31/19, 31/435, 31/495;* C07C *255/03, 321/00, 233/00;* C07D *241/04*

U.S. Cl. 514—522 5 Claims

1. A compound of the formula



(I)

wherein

Ar is a cyclic or bicyclic aromatic system optionally substituted by one or more substituents selected from the group consisting of halogen, hyroxy, $C_1$–$C_5$ alkyl, $C_2$–$C_5$ alkenyl, $C_1$–$C_5$ alkoxy, $C_1$–$C_3$ alkylthio, $C_2$–$C_5$ alkenyloxy, or alkoxy-alkyl having from 1 to 5 carbon atoms both in the alkyl and in the alkoxyl portion, phenoxy or phenylalkoxy group, aminocarbonylalkyl group having from 1 to 3 carbon atoms in the alkyl portion, cyano, carboxy, aminocarbonyl or amino group, piperazinyl, piperidinyl, and morpholinyl groups;

R and $R_1$, equal to or different from one another, are hydrogen or $C_1$–$C_3$ alkyl;

X is a $(CH_2)_pY$ group wherein Y is a methylene group or a carbonyl group and p is an integer selected from among 0, 1 and 2;

$R_2$ is hydrogen or $C_1$–$C_3$ alkyl;

n is an integer selected among 0, 1 and 2;

$R_3$ and $R_4$, equal to or different from one another, are phenyl optionally substituted by one or more halogen, $C_1$–$C_3$ alkyl, $C_1$–$C_3$ alkoxy, nitro, alkylthio, alkylsulfinyl and alkylsulfonyl groups, having from 1 to 3 carbon atoms in the alkyl portion;

and their salts with pharmaceutically acceptable acids or bases.

5. A pharmaceutical composition containing a therapeutically effective amount of a compound according to claim 1 together with one or more pharmaceutically acceptable excipients.

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5,047,426
## FUNGICIDAL COMPOSITIONS

Paul H. Briner, Canterbury, England, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

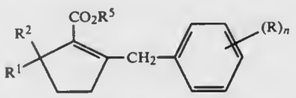
Filed Aug. 23, 1989, Ser. No. 397,756

Claims priority, application United Kingdom, Aug. 31, 1988, 8820597; Aug. 31, 1988, 8820598; Aug. 31, 1988, 8820599; Aug. 31, 1988, 8820600; Aug. 31, 1988, 8820601; Aug. 31, 1988, 8820602

Int. Cl.[5] A61K *31/215;* C07C *69/74, 61/20*

U.S. Cl. 514—530 6 Claims

3. A fungicidal composition which comprises a carrier and, as active ingredient, a compound of the formula



(I)

in which n represents an integer from 0 to 5; each R represents a halogen atom, nitro, cyano, hydroxyl, $C_{1-12}$ alkyl, $C_{1-12}$ haloalkyl, alkoxy, haloalkoxy, amino, $C_{1-12}$ alkylamino, $C_{1-12}$ dialkylamino, alkoxycarbonyl, carboxyl, alkanoyl, $C_{1-12}$ alkylthio, $C_{1-12}$ alkylsulphinyl, $C_{1-12}$ alkylsulphonyl, carbamoyl, $C_{1-12}$ alkylamido, $C_{3-8}$ cycloalkyl or phenyl group; $R^1$ and $R^2$ independently represent a hydrogen atom or an $C_{1-12}$ alkyl group; and $R^5$ represents a hydrogen atom or an $C_{1-12}$ alkyl or $C_{1-12}$ cycloalkyl group.

4. A fungicidal composition which comprises a carrier and, as active ingredient, a compound of the formula



5,047,427
## TREATMENT FOR SECONDARY DIABETES EFFECTS

Joseph R. Williamson, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Filed Oct. 31, 1988, Ser. No. 264,589

Int. Cl.[5] H61K *31/19*

U.S. Cl. 514—557 5 Claims

1. A method to ameliorate or reduce vascular albumin leakage induced by diabetes in diabetic subjects, which method comprises administering to said diabetic subjects pyruvic acid or its pharmaceutically acceptable salts in an amount effective to ameliorate or reduce said vascular albumin leakage.

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5,047,428
## EXPECTORANT COMPRISING HYDROXYALKYLCYSTEINE DERIVATIVE

Yoshikuni Itoh; Hiroyuki Mizuno, both of Tomisato; Chikako Kiyohara, Narashino; Susumu Sato, Shisui, and Tatsuhiko Katori, Tone, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1989, Ser. No. 365,368

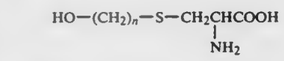
Claims priority, application Japan, Jun. 16, 1988, 63-148653

The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.

Int. Cl.[5] A01N *31/02, 33/08*

U.S. Cl. 514—562 6 Claims

1. A method of inducing expectoration, comprising administering to a patient in need thereof, an effective amount of a hydroxyalkylcysteine of the following formula (I),



(I)

wherein n is an integer of 1–4.

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5,047,429
## TREATMENT OF OEDEMA

Piers C. G. Nye, Oxford, Great Britain, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 18, 1989, Ser. No. 339,763

Claims priority, application United Kingdom, Apr. 19, 1988, 8809205

Int. Cl.[5] A61K *31/175*

U.S. Cl. 514—592 6 Claims

1. A method of treating pulmonary oedema in a patient comprising administering to said patient an oedemous-fluid-removing effective amount, a sulphonylurea compound or a pharmaceutically acceptable salt thereof.

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5,047,430
## AMIDE COMPOUNDS, THEIR PRODUCTION AND USE

Giichi Goto, Osaka, and Terumi Nakajima, Tokyo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

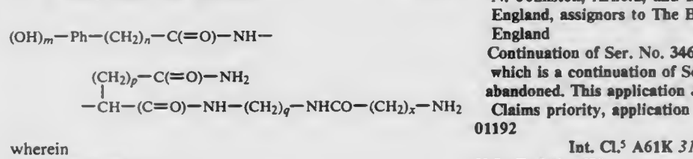
Filed Apr. 25, 1989, Ser. No. 342,965

Claims priority, application Japan, Apr. 26, 1988, 63-105080

Int. Cl.[5] A01N *37/18;* A61K *31/16*

U.S. Cl. 514—616 7 Claims

1. A compound of the formula



wherein

m is an integer of 1 to 3;

n is an integer of 1 or 2;

p is an integer of 1 or 2;

q is an integer of 1 to 6;

x is an integer of 2 to 6;

Ph is phenylene

or a pharmaceutically acceptable salt thereof.

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5,047,431
## 1,1,2-TRIPHENYLBUT-1-ENE DERIVATIVES

Helmut Schickaneder, Poing; Roland Löser, Feldafing, and Helmut Grill, Vaterstetten, all of Fed. Rep. of Germany, assignors to Klinge Pharma GmbH & Co., Munich, Fed. Rep. of Germany

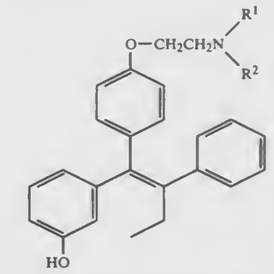
Continuation of Ser. No. 930,015, Nov. 5, 1986, abandoned, which is a continuation of Ser. No. 800,356, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 328,723, Dec. 8, 1981, abandoned. This application May 14, 1990, Ser. No. 523,266

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046719

Int. Cl.[5] A61K *31/135;* C07C *217/20*

U.S. Cl. 514—648 17 Claims

1. A compound of the formula I



(I)

having the E configuraiton wherein $R^1$ and $R^2$ may be the same or different, provided that, when $R^1$ and $R^2$ are the same, each of them is a methyl or ethyl radical, and when $R^1$ and $R^2$ are different, one of them is hydrogen and the other is a methyl or ethyl radical; or a non-toxic, pharmaceutically acceptable salt thereof.

12. A method for elicting an anti-estrogenic response in a mammal which comprises administering to said mammal an anti-estrogenically effective amount of a compound or salt as claimed in claim 1.

13. A method of treating a mammal having a mammary tumor which comprises administering to said mammal a mammary tumor-inhibiting effective amount of a compound or salt as claimed in claim 1.

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5,047,432
## ARYLCYCLOBUTYLMETHYLAMINE THERAPEUTIC AGENTS

John R. Housley, Breaston; James E. Jeffery, Chilwell; David N. Johnston, Arnold, and Bruce J. Sargent, Carlton, all of England, assignors to The Boots Company Plc, Nottingham, England

Continuation of Ser. No. 346,252, May 1, 1989, abandoned, which is a continuation of Ser. No. 818,547, Jan. 13, 1986, abandoned. This application Jun. 20, 1990, Ser. No. 541,174

Claims priority, application United Kingdom, Jan. 17, 1985, 01192

Int. Cl.[5] A61K *31/135;* C07C *211/08*

U.S. Cl. 514—650 15 Claims

1. A compound of the formula I



or a pharmaceutically acceptable salt thereof wherein one or both of $R_1$ and $R_2$ are H, cyclohexyl or an alkyl moiety of 1 to 4 carbon atoms unsubstituted or substituted by morpholino or the group $—NR_1R_2$ is morpholino or piperidino, $R_3$ is phenyl, naphthyl or phenyl substituted by 1 to 3 substituents selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, methyl, methoxy, methylthio and phenyl and $R_4$ is selected from the group consisting of 3-hydroxypropyl, 2-hydroxy-1,2-dimethylpropyl, 4-hydroxybutyl, 4-hydroxypentyl, 6-hydroxyhexyl, 6-hydroxyheptyl, a group of the formula II

$$—C(OH)R_6R_7 \qquad II$$

wherein $R_6$ is H, methyl or ethyl and $R_7$ is methyl, ethyl, propyl, isopropyl, isobutyl or pentenyl and a group of the formula III

$$—CH_2C(OH)R_8R_9 \qquad III$$

wherein $R_8$ is H, methyl, ethyl, propyl or isopropyl and $R_9$ is methyl, ethyl, propyl, isopropyl, isobutyl, tert-butyl, cyclopropyl, trifluoromethyl, 1-methylthioethyl, methoxymethyl, ethoxymethyl, 2-methoxyethyl, 2-ethoxyethyl or morpholinomethyl.

2. A compound according to claim 1 wherein $—NR_1R_2$ is amino, N-methylamino, N,N-dimethylamino, N,N-diethylamino, N-butyl-N-methylamino, N-methyl-N-(2-morpholinoethyl)amino, N-cyclohexyl-N-methylamino, piperidino or morpholino.

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**5,047,433**

## N-ALKYL DERIVATIVES OF 2-AMINO-6,7-DIMETHOXY TETRALINE AND PHARMACEUTICAL COMPOSITIONS HAVING ANTIHYPERTENSIVE ACTIVITY CONTAINING SAME

**Mauro Marzi; Maria O. Tinti; Romano Di Fabio, and Domenico Misiti, all of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy**

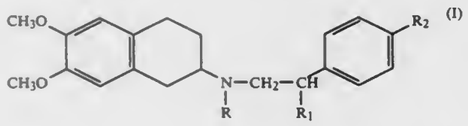
**Filed Dec. 21, 1987, Ser. No. 135,335**

**Claims priority, application Italy, Dec. 23, 1986, 48779 A/86**

**Int. Cl.[5] A61K** *31/135;* **C07C** *211/60, 215/70*

**U.S. Cl. 514—653** **20 Claims**

1. Compound having general formula (I)



(I)

wherein:

R is selected from hydrogen, ethyl, n-propyl and methyl cyclopropyl;

$R_1$ is selected from hydrogen, hydroxy and $—OR_3$ wherein $R_3$ is selected from methyl, ethyl and n-propyl; and

$R_2$ is selected from hydrogen, methyl, hydroxy, trifluoromethyl, fluoro and methoxy.

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**5,047,434**

## METHOD FOR WEIGHT GAIN-INCREASING OF FODDER UTILIZATION OF PIGS, CATTLE OR POULTRY

**Ferenc Simon; Károly Magyar; Attila Nagy; Lajos Fekete; László Puskás; Pál Fekete; István Simonyi; János Egri, and Katalin Zukovics née Sümeg, all of Budapest, Hungary, assignors to Egis Gyogyszergyar, Budapest, Hungary**

**Filed Jul. 5, 1989, Ser. No. 375,507**

**Claims priority, application Hungary, Jul. 5, 1988, 3487/88**

**Int. Cl.[5] A61K** *31/135*

**U.S. Cl. 514—653** **4 Claims**

1. A method for increasing the weight gain and improving the fodder utilization of pigs, cattle or poultry, which comprises: introducing into the stomach of the animal as the active agent a physiologically effective amount of 1-(3,5-dihydroxyphenyl)-2-(tertiary butylamino)-ethanol or a physiologically acceptable acid addition salt thereof.

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**5,047,435**

## ANTIVIRAL COMPOSITIONS CONTAINING AROMATIC POLYCYCLIC DIONES AND METHOD FOR TREATING RETROVIRUS INFECTIONS

**David Lavie, Rehovot, Israel; Daniel Meruelo, Scarborough; Gad Lavie, New York, both of N.Y.; Michel Revel, Rehovot, Israel; Vincent Vande Velde, Boncelles, Belgium, and Dalia Rotman, Rehovot, Israel, assignors to New York University, New York, N.Y. and Yeda Research and Development Company, Ltd., Rehovot, Israel**

**Continuation-in-part of Ser. No. 84,008, Aug. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 82,700, Aug. 7, 1987, Pat. No. 4,898,891. This application Mar. 27, 1989, Ser. No. 328,767**

**Claims priority, application Israel, Aug. 8, 1986, 79661**

**Int. Cl.[5] A61K** *31/015, 45/08;* **A61L** *2/18, 15/00*

**U.S. Cl. 514—732** **30 Claims**

1. A method for treating a mammal afflicted with a disease caused by a retrovirus which comprises administering to said mammal an effective anti-retroviral amount of a compound selected from the group consisting of hypericin, pseudohypericin, a pharmaceutically-acceptable salt of hypericin or pseudohypericin, and mixtures thereof.

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**5,047,436**

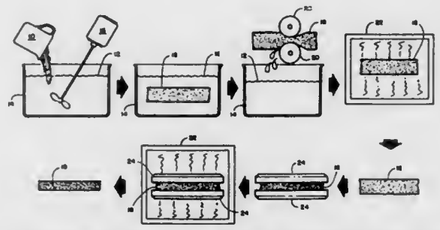
## METHOD OF IMPROVING FOAM FIRE RESISTANCE THROUGH THE INTRODUCTION OF INORGANIC PARTICLES THEREINTO

**Francis U. Hill, and Lola E. Crosswhite, both of San Diego, Calif., assignors to Sorrento Engineering Corporation, National City, Calif.**

**Division of Ser. No. 448,540, Dec. 11, 1989, Pat. No. 4,962,132, which is a continuation-in-part of Ser. No. 373,900, Jun. 30, 1989, Pat. No. 4,935,452. This application Feb. 12, 1990, Ser. No. 478,824**

**Int. Cl.[5] C08J** *9/40*

**U.S. Cl. 521—53** **9 Claims**



1. The method of improving the flame resistance of open-cell polyimide foam products which comprises the steps of:



adding very finely divided non-metallic inorganic particles which are gel forming and insoluble in water and polar organic liquids, to water or a highly polar organic liquid to form a gel;

placing an open-cell synthetic resin foam product in said gel;

manipulating said foam product in said gel by rolling said foam to alternately compress and release said foam whereby gel is caused to substantially fill all open cells;

removing said foam product; and

drying said foam product;

whereby said inorganic particles remain dispersed throughout said cells.

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**5,047,437**

## POROUS POLYACRYLONITRILE BEADS AND PROCESS FOR THEIR PRODUCTION

**Michael T. Cooke, New York, N.Y., and Laura J. Hiscock, Norwalk, Conn., assignors to American Cyanamid**

**Filed Nov. 23, 1988, Ser. No. 275,317**

**Int. Cl.[5] C08J** *9/28*

**U.S. Cl. 521—56** **27 Claims**

1. A substantially skinless highly porous bead comprising a homopolymer or copolymer of an acrylonitrile, said bead being substantially non-swellable in water, being substantially isotropic, having pores of not substantially greater than about 5 microns in diameter and a pore volume not substantially less than about 1.5 ml/g.

18. A process for the preparation of isotropic porous polymer beads, said process comprising

(i) heating and mixing an acrylonitrile homopolymer or copolymer with a mixture comprising a solvent and a non-solvent for the polymer to form a homogeneous solution:

(ii) breaking the homogeneous solution into droplets;

(iii) cooling the droplets, optionally in the presence of an inert liquid, to bring about phase separation and solidification of the polymer in the droplets;

(iv) separating the droplets from any inert liquid and the solvent-non-solvent mixture to produce isotropic porous beads.

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**5,047,438**

## POROUS RIGID RESINS AND PROCESS OF PREPARATION

**Binyamin Feibush, State College, Pa., and Nai-Hong Li, Baltimore, Md., assignors to Supelco, Inc., Bellefonte, Pa.**

**Filed Sep. 26, 1988, Ser. No. 249,762**

**Int. Cl.[5] C08J** *9/26*

**U.S. Cl. 521—61** **18 Claims**



160μ

1. A process for preparing porous, rigid resin particles which comprises (a) contacting porous inorganic template particles with a reaction mixture comprising monoethylenically unsaturated monomers, polyethylenically unsaturated monomers and a polymerization initiator in a liquid medium, the volume of the reaction mixture being approximately equal to the pore volume of the inorganic particles, said monomers and initiator being phase separable from the reaction medium and extractable into the pores of the inorganic particles, (b) polymerizing the monomers in the pores of the template particles to form crosslinked copolymers, and (c) removing the inorganic particles from the copolymer, whereby the isolated copolymer particles mirror the size, surface area and porosity of the template particles.

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**5,047,439**

## EXPANDABLE POWDER COATING COMPOSITION, METHOD OF COATING A SUBSTRATE WITH HEAT-INSULATING FOAM AND COMPOSITE MATERIAL OBTAINED THEREBY

**Katuya Sano, Chiryu; Takeshi Hasegawa, Nagoya; Kiyoshi Kittaka, Okazaki; Atushi Sakuraoka, Toyohashi; Katsuji Kitagawa, Kasukabe; Tetsuo Miyake, Kitakatsushika, and Kazutomo Moriguchi, Soka, all of Japan, assignors to Somar Corporation, Japan**

**Filed Dec. 2, 1988, Ser. No. 279,057**

**Claims priority, application Japan, Dec. 3, 1987, 62-307108; Mar. 15, 1988, 63-060845; Aug. 3, 1988, 63-193632; Aug. 3, 1988, 63-193633**

**Int. Cl.[5] C08J** *9/06*

**U.S. Cl. 521—78** **26 Claims**

1. An expandable, hydroxyl group-containing powder coating composition comprising:

(a) a thermoplastic resin containing a hydroxyl group-containing polymer;

(b) a cross-linking agent containing a polyisocyanate compound which is capable of reacting with the hydroxyl groups of said polymer at a temperature higher than the melting point of said thermoplastic resin to crosslink said polymer and which is solid at room temperature, the relative amounts of hydroxyl groups in the composition and said polyisocyanate compound providing a ratio of equivalents of the isocyanate group per equivalent of the hydroxyl groups in the composition of less than 1; and

(c) a blowing agent capable of decomposing and generating a gas when heated to a temperature higher than the melting point of said thermoplastic resin.

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**5,047,440**

## ACTIVATOR CONCENTRATE FOR CHEMICAL BLOWING AGENT COMPOSITIONS

**Claude F. Wilson, Jr., Cincinnati, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio**

**Filed Jul. 17, 1989, Ser. No. 380,979**

**Int. Cl.[5] C08J** *9/06, 9/08*

**U.S. Cl. 521—88** **28 Claims**

1. An activator concentrate useful in combination with a primary chemical blowing agent in foaming molten polymer resin, said concentrate being in the form of pellets and comprising an activator and a metal soap dispersed in a carrier resin, said metal soap being present in an effective amount to disperse said activator in said molten carrier resin, and each of said metal soap and said carrier resin being molten or soluble in said molten polymer resin at foaming conditions, wherein said carrier resin has a melt temperature below the decomposition temperature of said activator.

VOL 1130 ISS 2 SE 10 1991 UMI

5,047,441

## RIGID POLYURETHANE FOAMS PREPARED FROM POLYVINYL ACETATE/ALLYL ALCOHOL POLYOLS, AND PROCESS FOR MAKING SAME

Eric J. Lind, Schaumburg, Ill.; Manfred L. Genz, Dearborn; Michele L. Lee, River Rouge, and Thomas B. Lee, Southgate, all of Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Aug. 10, 1989, Ser. No. 392,257

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—137 27 Claims

1. A process for preparing polyurethane foams comprising reacting:

an isocyanate, and

an active hydrogen containing component comprising a polyvinyl acetate/allyl alcohol random copolymer, in the presence of a catalyst and a blowing agent.

5,047,442

## PHOTOPOLYMERIZABLE COMPOSITION BASED ON A VINYL COMPOUND, A SULFUR-CONTAINING COMPOUND AND AN ALPHA-DIKETONE

Isao Sasaki, Hiroshima, and Nobuhiro Mukai, Ohtake, both of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Division of Ser. No. 765,925, Aug. 15, 1985, Pat. No. 4,777,190. This application Aug. 2, 1988, Ser. No. 227,606

Claims priority, application Japan, May 13, 1985, 60-99545; May 14, 1985, 60-100478

Int. Cl.[5] C08F *2/50, 4/40, 18/16, 20/20*

U.S. Cl. 522—27 15 Claims

1. A photopolymerizable composition comprising:

a vinylic monomer;

a mixture of photoinitiators consisting of:

(a) a polysulfide represented by the following formula:

$$R_4—(S)_n—S—R_4$$

where, n is an integer of from 0 to 10 and $R_4$ is a saturated $C_{1\text{-}20}$ alkyl group, a phenyl or benzyl group, each of which may be either unsubstituted or substituted with a carboxylic acid group at any position, and

(b) camphorquinone, wherein the said mixture of photoinitiators is added in an amount of from $10^{-5}$% by weight to 30% by weight based on the vinylic monomer.

5,047,443

## HOTMELT CONTACT ADHESIVES WHICH CAN BE CROSSLINKED WITH ULTRAVIOLET RADIATION IN THE PRESENCE OF OXYGEN

Gerd Rehmer, Bobenheim-Roxheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 18, 1989, Ser. No. 353,460

Claims priority, application Fed. Rep. of Germany, May 21, 1988, 3817452

Int. Cl.[5] C08F *2/46, 24/00;* C08G *3/00;* C08J *3/28*

U.S. Cl. 522—46 5 Claims

1. A hotmelt contact adhesive which is crosslinkable with ultraviolet radiation in the air and is based on

(A) copolymers which have a K value of from 8 to 60 and are prepared by solution copolymerization of

(a) from 0.1 to 20%, based on the weight of the copolymers, of tetrahydrofurfur-2-yl (meth)acrylate and/or N-2-tetrahydrofurfuryl (meth)acrylamide and/or alkoxyalkyl (meth)acrylates and/or N-alkoxyalkyl (meth)acrylamides,

(b) from 44 to 99.9%, based on the weight of the copolymers, of monoolefinically unsaturated acyclic unsubstituted monocarboxylates of 3 to 12 carbon atoms, up to 20% by weight of which may be replaced by vinyl ethers of 3 to 20 carbon atoms, styrene, α-methylstyrene, vinyl chloride, vinylidene chloride and/or acrylonitrile,

(c) from 0 to 30%, based on the weight of the copolymers, of monoolefinically unsaturated compounds of 4 to 25 carbon atoms having one or more ester, carboxamide or carboximide groups, one of which is adjacent to the olefinic double bond, and having 1 to 3 carboxyl groups, and

(d) from 0 to 6%, based on the weight of the copolymers, of α,β-monoolefinically unsaturated mono- and/or di-carboxylic acids of 3 to 6 carbon atoms and/or their anhydrides

at from 70° to 150° C. in the presence of from 0.25 to 10% by weight, based on the monomers, of a ketone peroxide as a polymerization initiator and from 15 to 200% by weight, based on the monomers, of inert solvents, and removal of the solvents during or after the polymerization, and

(B) from 0.01 to 10% by weight, based on the sum of the components (A) and (B), of benzophenone and/or benzophenone derivatives.

5,047,444

## FLUORESCENT DEGREE OF CURE MONITORS

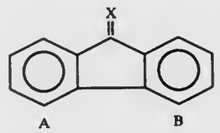
Robert J. DeVoe; Katherine A. Brown-Wensley, and George V. D. Tiers, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 31, 1989, Ser. No. 359,108

Int. Cl.[5] C08F *12/32, 265/04, 212/32;* C08G *77/04*

U.S. Cl. 522—99 22 Claims

1. A curable composition consisting essentially of at least one of a) a hydride curable silicone comprising an ethylenically unsaturated siloxane and a polyhydrosiloxane, b) an ethylenically unsaturated compound selected from the group consisting of acrylates and methacrylates, unsaturated amides, and vinyl compounds, and c) a cationically polymerizable monomer which is different from component b) and is selected from the group consisting of 1,2-, 1,3-, and 1,4-cyclic ethers, vinyl ethers, N-vinyl compounds, ethylenically unsaturated hydrocarbons, cyclic formals, and cyclic organosiloxanes; and dibenzofulvene or derivative therof as a latent uvaphore which is capable of reacting during curing to form a uvaphore, said dibenzofulvene or derivative thereof having the formula




I

wherein X is $CR^1R^2$ or $NR^1$, wherein $R^1$ and $R^2$ each independently is a hydrogen atom, or an alkyl, aryl, alkenyl, aralkenyl, alkynyl, aralkynyl, alkaryl, or aralkyl group, or $R^1$ and $R^2$ together are a cycloaliphatic group of ring size 3 to 12 atoms, all of which can include up to 50 carbon atoms and 0 to 30 heteroatoms selected from the group consisting of unitary N, Si, S and nonperoxidic O; and wherein aromatic groups designated A and B together or each independently contain up to two ring nitrogen atoms, and together or independently are a single or fused aromatic ring system having 1 to 4 rings.

5,047,445

## ELECTROCONDUCTIVE POLYMERIC MATERIAL

Akira Nishizawa, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 20, 1989, Ser. No. 368,715

Claims priority, application Japan, Jun. 20, 1988, 63-151922

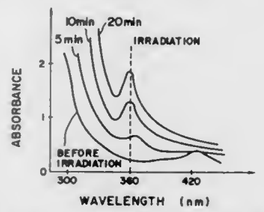
Int. Cl.[5] C08J *3/28*

U.S. Cl. 522—114 18 Claims

1. An electroconductive polymeric material comprising: a dispersion of dicyclopentadienyl iron with no chemical reaction in a resin selected from the group consisting of vinyl chloride resin having (—$CH_2$—CHCl—) structure in the molecular chain and vinylidene chloride resin having (—CH-



$_2$—$CCl_2$—) structure in the molecular chain, said resin being dissolved in an organic solvent which has evaporated, and said




resin being irradiated with light having ultraviolet rays, so that when redissolved in said solvent the polymeric material becomes non-electroconductive.

5,047,446

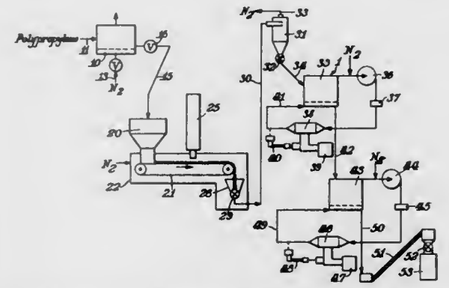
## THERMAL TREATMENT OF IRRADIATED PROPYLENE POLYMER MATERIAL

Anthony J. DeNicola, Jr., Newark, Del., assignor to Himont Incorporated, Wilmington, Del.

Filed Jul. 22, 1988, Ser. No. 223,136

Int. Cl.[5] C08J *3/28;* C08F *110/06*

U.S. Cl. 522—157 12 Claims




1. In a method of making high-molecular-weight, long-chain branched propylene polymer material from linear semi-crystalline normally solid propylene polymer material in an environment in which an active-oxygen concentration of less than about 15% by volume is maintained, which method includes the steps of irradiating said linear polymer material with high-energy ionizing radiation and thermally deactivating residual free radicals in the irradiated polymer material, the improvement comprising heating the irradiated polymer material at a temperature in the range of about from 40° C. to 110° C. for at least about 10 minutes prior to deactivating residual free radicals.

5,047,447

## MEDIUM INCORPORATING MELANIN AS AN ABSORBING PIGMENT FOR PROTECTION AGAINST ELECTROMAGNETIC RADIATION

James M. Gallas, San Antonio, Tex., assignor to Photoprotective Technologies Incorporated, San Antonio, Tex.

Continuation-in-part of Ser. No. 105,632, Oct. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 739,556, May 30, 1985, Pat. No. 4,698,374, which is a continuation-in-part of Ser. No. 618,745, Jun. 8, 1984, abandoned, said Ser. No. 105,632, is a continuation-in-part of Ser. No. 88,029, Aug. 18, 1987, abandoned, which is a continuation of Ser. No. 837,852, Mar. 6, 1986, abandoned, which is a continuation of Ser. No. 739,756, May 30, 1985, abandoned, which is a continuation of Ser. No. 618,745, Jun. 8, 1984, abandoned. This application Dec. 20, 1989, Ser. No. 453,023

The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.

Int. Cl.[5] C08J *3/00*

U.S. Cl. 523—106 25 Claims

1. An apparatus for absorbing radiation emitted from natural or artificial sources, comprising:

a solid material or a material being in its solid state; and

melanin being connected with the material, the material and the melanin being transparent.

5,047,448

## ANTIMICROBIAL-SHAPED ARTICLE AND A PROCESS FOR PRODUCING THE SAME

Kazuhiko Tanaka; Kiyoshi Hirakawa, both of Kurashiki; Kiyoshi Takisawa, Kurita; Takao Akagi, and Masao Kawamoto, both of Kurashiki, all of Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

Filed Mar. 31, 1989, Ser. No. 331,350

Claims priority, application Japan, Sep. 27, 1988, 63-243618

Int. Cl.[5] C08L *77/00, 67/02*

U.S. Cl. 523—122 9 Claims

1. An antimicrobial fiber having high durability, which comprises a thermoplastic polymer having a melting point of at least 200° C. and which incorporates therein a disperse mixture of:

(A) fine particles of at least one member selected from the group consisting of metallic copper and metallic zinc and compounds of the foregoing having an average particle diameter of not more than 5 μm;

(B) fine particles of at least one member selected from the group consisting of metallic aluminum, metallic silver, metallic iron and metallic zinc and compounds of the foregoing and excluding (A), said fine particles having an average particle diameter of not more than 5 μm; and

(C) a liquid polyester having a melting point of not higher than 10° C. and a viscosity at 25° C. of at least 10 poises, the contents of said (A), (B) and (C) in said fiber satisfying the following formulas (1) through (4):

(1) (A)+(B)=0.1 to 10% by weight based on the weight of said fiber;

(2) (C)=0.1 to 10% by weight based on the weight of said fiber;

(3) ((A)+(B)): (C)=5:95 to 80:20 by weight, and

(4) (A):(B)=1:99 to 99:1 by weight.

5,047,449

## FIRE PROTECTION MATERIAL

Nicole Pastureau, Eysines, France, assignor to Aerospatiale Society National Industrielle, Paris, France

Filed Jun. 15, 1989, Ser. No. 366,388

Claims priority, application France, Jun. 16, 1988, 88 08085

Int. Cl.[5] C08K *3/38*

U.S. Cl. 523—179 5 Claims

1. Fire protection material employing simultaneously the two phenomena of intumescence and endothermicity to obtain

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optimal protection characteristics maintaining the element to be protected at a temperature below or about 150° C. when it is subjected to thermal attack corresponding to a flame temperature of 700° to 1,000° C. for a duration of at least one hour for a thickness of the material between 10 and 20 mm, essentially characterized in that it is a flexible material comprising:

a binder which is a silicone elastomer in a proportion of 30 to 35 % by weight;

a reinforcing charge which is a metal oxide compatible with said silicone elastomer in a proportion of 17 to 23% by weight;

an active charge of borax ($Na_2B_4O_7,10H_2O$) in a proportion of 38 to 45% by weight; and

an insulative charge of mica or vermiculite in a proportion of 5 to 10% by weight,

these proportions being relative to the total weight of said material.

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5,047,450

## POLYETHYLENE TEREPHTHALATE MOLDING RESIN BLENDS

Charles R. Wilder, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 177,731, Apr. 5, 1988, abandoned. This application Mar. 23, 1989, Ser. No. 327,888

Int. Cl.[5] C08K *7/14, 3/40*

U.S. Cl. 523—435 17 Claims

1. A molding resin blend which has a high after-molding flow rate, which crystallizes rapidly after being injection molded, and which has engineering resin performance characteristics, said blend comprising on a 100 weight percent total blend basis:

(a) from about 30 to about 75 weight percent of polyethylene terephthalate having an inherent viscosity of at least about 0.25;

(b) from about 25 to about 65 weight percent of glass fibers having an average cross-sectional thickness in the range from about 7 to about 15 microns and an average length in the range from about 2 to about 8 millimeters;

(c) from about 0.5 to about 7 weight percent of a polyester having a number average molecular weight in the range from about 7,500 to about 20,000 and which is a condensation product of a dialkanoic acid containing from about 8 to 12 carbon atoms per molecule and a dialkanol containing from 2 to about 5 carbon atoms per moleucle;

(d) from about 0.1 to about 7 weight percent of a metal salt of an ionic hydrocarbon copolymer of an alpha-olefin containing from 2 to about 5 carbon atoms per molecule and an alpha, beta-ethylenically unsaturated carboxylic acid containing from about 3 to about 5 carbon atoms per molecule in which copolymer the carboxyl groups have been at least partially neutralized with cations of said metal, said copolymer having a number average molecular weight in excess of about 3,000 prior to neutralization, said metal being selected from the group consisting of sodium and potassium;

(e) from about 0.1 to about 1 weight percent of an antioxidant; and

(f) from 0 to about 3 weight percent of a polyethylene having a number average molecular weight in the range from about 500 to about 10,000.

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5,047,451

## WELDING CORROSION INHIBITING COATING

L. Donald Barrett, Cleveland Heights, Ohio; Dale R. Hahn, Union Lake, Mich.; Peter E. Pelloski, Ferndale, Mich., and Richard W. Ziegler, Troy, Mich., assignors to Depor Industries, Inc., Birmingham, Mich.

Continuation of Ser. No. 69,287, Jul. 1, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,029

Int. Cl.[5] C08K *3/08;* C09D *5/10, 163/00*

U.S. Cl. 523—442 14 Claims

1. A corrosion resistant liquid coating composition for application to and curing on a steel substrate to a dry film and being electric resistance weldable after curing, comprising: a finely divided metal selected from the group consisting of aluminum, stainless steel and alloys and blends thereof, and having an average particle size not greater than about 60 microns and a maximum individual particle size not greater than about 100 microns; a resin system at least 50% by weight consisting essentially of primary bonding resin; a weldability agent consisting essentially of a quantity of finely divided nickel equal to at least 15% by weight of all solids of the composition; the quantity of said resin system being about 10% to 525% by weight of said finely divided metal and nickel; a vehicle comprising an active organic solvent compatible with said resin system and dissolving said primary bonding resin into a liquid solution, and said vehicle being of sufficient total quantity for the composition to have a viscosity in the range of 20 to 280 seconds in a Ford No. 4 cup, said coating composition having essentially no zinc therein, said finely divided metal and nickel being suspended and disbursed in said liquid resin and said resin system being curable to a dry film tenaciously adhered to a steel substrate with said finely divided metal an nickel dispersed therein by heating a thin wet film of said coating composition to a temperature not greater than about 500° F. to provide such a dry film coating which is electric resistance weldable after curing and protects the metal substrate, form corrosion after being welded and is highly resistant to petrol chemicals and a neutral salt spray.

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5,047,452

## BINDER AND BINDER-BASED SIZE FOR MINERAL FIBERS

Bernard Gicquel, Saint-Brice Sous Foret, France, assignor to Saint Gobain Recherche, Aubervilliers Cedex, France

Filed Oct. 27, 1989, Ser. No. 427,377

Claims priority, application France, Oct. 27, 1988, 88 14008

Int. Cl.[5] C08L *63/00*

U.S. Cl. 523—443 6 Claims

1. In a size for the preparation of insulating glass mats consisting essentially of an epoxy resin, an amino hardening agent and, as additives, 0.1 to 20% of silane, 0 to 15% of a mineral oil, the improvement wherein said epoxy resin is a condensation product of epichlorohydrin and bisphenol A having a polymerization index n of less than 1 and the equivalent molar mass of the hardening agent is less than 100 g.

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5,047,453

## PROCESS FOR PREPARING MOLDINGS BY COMPACTING AND SIMULTANEOUSLY BONDING FIBROUS MATERIAL

Walter Vöst, Bobingen, and Heinz Schmelzer, Rümmelsheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1985, Ser. No. 730,384

Claims priority, application Fed. Rep. of Germany, May 4, 1984, 3416473

Int. Cl.[5] C08L *3/00*

U.S. Cl. 523—447 20 Claims

1. A process for preparing a molding which comprises mixing a) a fibrous material with b) a pulverulent mixture of a hot-melt adhesive based on copolymer of:

1) vinyl ester,

2) a carboxamide selected from the group consisting of an amide of acrylic acid, an amide of methacrylic acid, an N-methylol compound of either or a mixture of any of the preceding and

3) at least one further vinyl monomer,

c) a solid epoxy resin and d) a curing agent for the epoxy resin, and heating the mixture under pressure in a mold to a temperature at which the hot-melt adhesive becomes liquid and the epoxy resin reacts with its curing agent.



5,047,454

## WATERBORNE PIGMENTED ACRYLIC HYDROSOL COATING COMPOSITION

Richard A. Cowles, Perrysburg, Ohio; Nick Georgalas, Chappaqua, N.Y., and Shailesh C. Shah, Paramus, N.J., assignors to BASF Corporation, Clifton, N.J.

Division of Ser. No. 10,452, Feb. 3, 1987. This application Oct. 14, 1988, Ser. No. 257,633

Int. Cl.[5] C08K *5/00;* C09D *5/02;* C08L *33/02*

U.S. Cl. 523—500 1 Claim

1. A waterborne pigmented coating composition comprising one or a combination or mixture of substantially uniformly dispersed acrylic hydrosol particles and an aqueous soluble salt of a thermosettable polymer comprising a polyester polymer having acid functionality, the aqueous soluble salt having a volatile substituent, and a liquid constituent comprising a mixture of water and organic solvents, the organic solvents functioning as coalescing agents for the film forming constituents whereby the resulting composition is substantially free of surfactants and emulsifiers.

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5,047,455

## THICKENED MOLDING COMPOSITIONS

Anton Hesse, Weinheim; Jan Holoch, Leimen, and Roland Peter, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,395

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1987, 3731067

Int. Cl.[5] C08L *67/06*

U.S. Cl. 523—508 19 Claims

1. A thickened, uncrosslinked molding composition which has a long shelf life at 23° C. and can be cured at above 50° C. and contains

A a liquid reactive system which can be polymerized by means of free radicals,

B 1 to 80% by weight, based on A, of an isocyanate-containing thickener,

C 0.01 to 5% by weight, based on A, of a polymerization initiator which decomposes at above 50° C., and, if desired,

D an additive selected from the group consisting of reinforcing fibers, fillers, polymerization inhibitors, polyfunctional hydroxyl compounds, lubricants, paraffins, flame retardants, metal oxides, thickening accelerators, curing accelerators and mixtures thereof,

wherein the thickener is a combination of

B1 0.001 to 0.5 amine equivalent based on 100 g of A + B1, of an aminobenzoic acid derivative, and

B2 0.001 to 1.5 isocyanate equivalents, based on one equivalent of all the NCO-reactive groups present in the molding composition, of an isocyanate.

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5,047,456

## THERMALLY REVERSIBLE SUPERABSORBENT POLYMERS

Fidelis C. Onwumere, Norcross; Sharon L. Greene, Alpharetta, both of Ga., and Shirley H. Wright, Greenville, S.C., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 21, 1989, Ser. No. 341,519

Int. Cl.[5] C08J *89/00;* C08K *11/00;* C08G *18/81, 18/10*

U.S. Cl. 524—13 34 Claims

1. A superabsorbent polymer adapted for use in melt processes, said polymer having a thermally reversible bond which is adapted to evanesce at an elevated temperature and revert to a thermally reversible bond upon cooling to ambient temperature so that said polymer is adapted, upon being heated to said elevated temperature, to dissociate into melt processable polymer fragments and, upon being cooled from said elevated temperature to ambient temperature, to re-associate.

5,047,457

## ACRYLATE POLYMER MODIFIED ASPHALT COMPOSITIONS

William A. Higgins, Gates Mills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 24,188, Mar. 10, 1987, Pat. No. 4,833,184. This application Jan. 25, 1989, Ser. No. 302,538

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

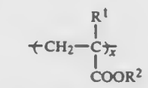
Int. Cl.[5] C08L *95/00*

U.S. Cl. 524—60 15 Claims

1. A modified asphalt composition comprising

(A) asphalt, and

(B) about 0.01 to about 10 percent by weight of at least one hydrocarbon-soluble acrylate polymer containing units of the formula



wherein $R^1$ is a lower alkyl group containing form 1 to about 4 carbon atoms, $R^2$ is a mixture of alkyl groups containing from about 4 to about 20 carbon atoms, and x is an integer providing a weight average molecular weight (Mw) to the acrylate polymer of about 100,000 to 700,000.

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5,047,458

## MELAMINE SALTS OF ALKYL ACID PHOSPHATES AS FLAME RETARDANTS FOR POLYMERS

Richard F. Grossman, Shelton, and Francis W. McKane, Jr., Bridgeport, both of Conn., assignors to Synthetic Products Company, Cleveland, Ohio

Division of Ser. No. 226,866, Aug. 1, 1988, Pat. No. 4,927,929. This application Mar. 13, 1990, Ser. No. 492,945

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[5] C08K *5/3492*

U.S. Cl. 524—100 4 Claims

1. A flame retardant composition for a synthetic polymer comprising a melamine salt of an alkyl acid phosphate where the alkyl group is $C_1$ to about $C_{20}$.

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5,047,459

## FLAMEPROOF COMPOSITIONS OF POLYCONDENSATION PRODUCTS

Günther Walde, Flein, Fed. Rep. of Germany, assignor to L. Brüggemann Komm.-GES., Heilbronn, Fed. Rep. of Germany

Filed Jan. 3, 1989, Ser. No. 292,999

Int. Cl.[5] C08K *5/3492*

U.S. Cl. 524—100 10 Claims

1. A self-extinguishing thermoplastic composition comprising a polycondensate selected from the group consisting of thermoplastically processable polyamides, thermoplastically processable polyesters and a mixture thereof and a flame retardant which comprises a mixture of melamine with at least one adduct of ε-caprolactam and hexamethylene diisocyanate in a molar ratio of 0.2 to 0.5 mole of hexamethylene diisocyanate to 1 mole of ε-caprolactam, wherein the proportion of the adduct, based on the mixture of the melamine and adduct, amounts to 5–25% by weight of the flame retardant.

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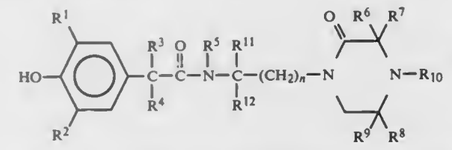
5,047,460

## STABILIZED POLYPROPYLENE FIBERS PIGMENTED WITH RED 144

George Kletecka, Fairview Park, and John Ta-Yuan Lai, Broadview Heights, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Filed May 16, 1989, Ser. No. 352,519
Int. Cl.[5] C08K *5/34*
U.S. Cl. 524—100 4 Claims

1. A method for imparting improved discoloration resistance to fibers of polypropylene homopolymer, or copolymers of propylene with a minor amount of ethylene, which method comprises incorporating into a melt from which said fibers are drawn, no more than a melt-stabilizing quantity of a secondary stabilizer, and an effective amount, sufficient to color the fibers bright red but less than 2 phr, of Red 144 azo condensation pigment so as to produce Red 144-pigmented fibers, and an effective amount, sufficient to attenuate degradation of said Red 144-pigmented fibers when exposed to sunlight, of a N-(substituted)-1-(piperazine-2-one alkyl)-α-(3,5-dialkyl-4-hydroxyphenyl)-α,α-substituted acetamide ("3,5-DHPZNA") having a disubstituted alpha carbon atom, said 3,5-DHPZNA having the structure



wherein, $R^1$, $R^2$ and $R^5$ each represent hydrogen, $C_1$–$C_{12}$ alkyl, phenyl, naphthyl, $C_4$–$C_{12}$ cycloalkyl, and, alkylsubstituted cycloalkyl, phenyl and naphthyl, each alkyl substituent being $C_1$–$C_8$, and at least one of $R^1$ and $R^2$ is t-$C_4$–$C_{12}$ alkyl;

$R^3$ and $R^4$ independently represent $C_1$–$C_{18}$ alkyl, and $C_5$–$C_{12}$ cycloalkyl, phenyl and naphthyl, and, alkyl-substituted cycloalkyl, phenyl and naphthyl, each alkyl substituent being $C_1$–$C_8$, and, when together cyclized, $R^3$ with $R^4$ may represent $C_4$–$C_{12}$ cycloalkyl, and $C_1$–$C_8$ alkyl-substituted cycloalkyl;

$R^6$, $R^7$, $R^8$ and $R^9$ each represent $C_1$–$C_{12}$ alkyl, or, when together cyclized, $R^6$ with $R^7$, and $R^8$ with $R^9$, may represent $C_4$–$C_{12}$ cycloalkyl, and $C_1$–$C_8$ alkyl-substituted cycloalkyl;

$R^{10}$ is selected from the group consisting of hydrogen, $C_1$–$C_8$ alkyl and



wherein $R^{13}$ represents hydrogen, $C_1$–$C_{18}$ alkyl or allenyl, phenyl or naphthyl;

$R^{11}$ and $R^{12}$ independently represent hydrogen and $C_1$–$C_{18}$ alkyl; and,

n is an integer in the range from 1 to about 8.

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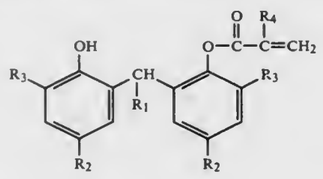
5,047,461

## BUTADIENE POLYMER COMPOSITION CONTAINING PHENOLIC COMPOUND AND SULPHUR-CONTAINING COMPOUND

Takeshi Takata, Nishinomiya; Shinichi Yachigo, Toyonaka; Manji Sasaki, Ibaraki; Kikumitsu Inoue, Nishinomiya, and Shinya Tanaka, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 23, 1988, Ser. No. 288,992
Claims priority, application Japan, Dec. 28, 1987, 62-332109
Int. Cl.[5] C08K *5/36*
U.S. Cl. 524—291 15 Claims

1. A method for stabilizing a butadiene polymer which comprises incorporating into the butadiene polymer a phenolic compound represented by the formula (I):



(I)

wherein

$R_1$ is an alkyl having 1 to 4 carbon atoms,

$R_2$ and $R_3$ are each independently a group represented by $-C(CH_3)_2-R'$ in which R' is an alkyl having 1 to 5 carbon atoms or phenyl, and

$R_4$ is hydrogen or methyl,

and a sulfur-containing compound represented by the formula (II):

$$(R_5-S-CH_2CH_2COOCH_2)_xC \quad \text{(II)}$$

wherein $R_5$ is an alkyl having 4 to 20 carbon atoms, whereby the butadiene polymer is prevented from thermally deteriorating and discoloring in the absence of oxygen as well as from thermally and oxidatively deteriorating in the presence of oxygen.

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5,047,462

## SOLID COATING COMPOSITION FOR TEXTILE FLOOR COVERINGS

Helmut Kehr, Schermbeck; Adolf Kuehnle, Marl; Heinrich Leppek, Gelsenkirchen-Buer, and Matthias Schleinzer, Dorsten, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 248,952
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732532
Int. Cl.[5] C08K *3/30, 3/26, 3/34*
U.S. Cl. 524—423 5 Claims

1. A solid coating composition suitable for a textile floor covering, and containing a combination of a filler and a polyolefin-based thermoplastic binder, wherein said thermoplastic binder comprises, as a major component, 65 to 99 wt.% of an atactic polyolefin or a low crystallinity olefin copolymer, and, as a minor component, 1 to 20 wt.% of an isotactic polyolefin which is grafted with an unsaturated organic acid or an unsaturated organic acid anhydride and up to 15 wt% of non-functionalizede isotactic polypropylene and wherein said filler, which is at least one member selected from the group consisting of limestone, barite, and mica, is present in an amount of from 50 to 85 wt%.

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5,047,463

## CAST CEILING TILES CONTAINING LATEXES AS BINDERS

William H. Keskey, and Kenneth R. Meath, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 146,947, Jan. 22, 1988, Pat. No. 4,861,822.
This application Mar. 2, 1989, Ser. No. 318,093
Int. Cl.[5] C08K *3/34, 3/26;* C08L *39/00*
U.S. Cl. 524—426 16 Claims

1. A cast ceiling tile which comprises a molded and dried mixture, the mixture before drying comprising:

(a) water;

(b) mineral wool;

(c) an alkali-swellable latex comprising:

(i) a $C_3$–$C_8$ α,β-ethylenically unsaturated carboxylic acid monomer in an amount from about 15 to about 60 weight percent based on the weight of the monomers in the copolymer;

(ii) at least one of a copolymerizable nonionic vinyl monomer in an amount from about 45 to about 30 weight percent based on the weight of the monomers in the copolymer; and

(iii) an additional late feed of nonionic vinyl monomer in an amount from about 10 to about 40 weight percent based on the weight of the monomers in the copolymer; and

(d) filler, wherein the mixture before drying is formed by blending the mineral wool with a premixture of water, latex, and filler, said premixture having a sharp yield point when measured with a recording Brookfield Viscometer.

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5,047,464

## BIOERODIBLE THERMOSET ELASTOMERS

Stefano A. Pogany, and Gaylen M. Zentner, both of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 20, 1989, Ser. No. 409,908
Int. Cl.[5] C08F *8/00*
U.S. Cl. 524—500 6 Claims

1. A bioerodible, thermoset, covalently cross-linked poly(ortho ester) elastomer synthesized by the reaction of a diketene acetal with (i) a polymeric polyol having a hydroxy functionality of at least two and (ii) 0–50% by weight of monomeric polyol, based on the total weight of (i) and (ii), having a hydroxy functionality of at least three.

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5,047,465

## IMPACT MODIFIED POLYPHENYLENE SULFIDE

Andrew B. Auerbach, Livingston, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jul. 7, 1989, Ser. No. 376,525
Int. Cl.[5] C08L *77/02*
U.S. Cl. 524—504 27 Claims

1. An impact resistant polyarylene sulfide composition comprising polyarylene sulfide and an impact strength improving amount of a functionalized selectively hydrogenated block copolymer of the formula $B_n(AB)_oA_p$ where n=0 or 1, o=1–50, o=0 or 1, each A is predominantly a polymerized monoalkenyl aromatic or vinyl arene hydrocarbon block and each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block, to which block copolymer has been grafted at least one graftable functional molecule selected from the group consisting of an electrophilic graftable molecule containing a carboxyl functional group and an electrophile, wherein said electrophile is carbon dioxide, wherein substantially all of said electrophilic graftable molecules or electrophiles are grafted to the block copolymer in the monoalkenyl aromatic or vinyl arene block and said carboxyl functional groups are carboxylic acids, their salts or esters.

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5,047,466

## AMINO RESIN SOLUTIONS HAVING LOW ELECTRICAL CONDUCTIVITY

Gerd Busse, Mutterstadt; Jakob Decher, Bobenheim-Roxheim; Wolfgang Eisele, Ludwigshafen; Edgar Haeussler, Boehl-Iggelheim, and Otto Wittmann, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 476,760
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905913
Int. Cl.[5] C08L *61/32*
U.S. Cl. 524—597 6 Claims

1. An amino resin solution having an electrical conductivity of <100 μS/cm for impregnating paper, obtainable by

A) methylolation of melamine with aqueous formaldehyde in a molar ratio of from 1:2 to 1:5 in the presence of a tertiary organic amine at a pH of from 7 to 12,

B) etherification with a molar excess, based on the methylol groups, of a $C_1$–$C_4$-alcohol in the presence of an unsubstituted or substituted organic dicarboxylic acid and/or polycarboxylic acid at a pH of from 3 to 6,

C) neutralization of the reaction mixture with an inorganic base and removal of the volatile components by distillation, except for a water content of and <10% by weight, based on the reaction mixture,

D) addition of a $C_1$–$C_4$-alcohol to give a solids content of from 40 to 90% by weight, based on the amino resin solution, and removal of insoluble components by filtration.

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5,047,467

## PROCESS FOR PRODUCING GRAFTED ALKYD RESIN

Masahide Amemoto; Hikaru Watanabe, both of Osaka, and Akio Shoji, Kishiwada, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 104,950, Oct. 6, 1987, abandoned. This application Aug. 2, 1989, Ser. No. 388,739
Claims priority, application Japan, Oct. 8, 1986, 61-238014; Mar. 12, 1987, 62-55318
Int. Cl.[5] C08F *283/01*
U.S. Cl. 525—7.3 10 Claims

1. A process for improving the pigment dispersibility of an alkyd resin useful as a vehicle for paint, said process comprising:

producing a grafted alkyd resin by graft-copolymerizing an alkyd resin having a site of unsaturation capable of being graf copolymerized, with 0.01 to 5.0% by weight of at least one vinyl monomer selected from the group consisting of nitrogen-containing vinyl monomers and phosphorus-containing vinyl monomers and not more than 5.0% by weight of at least one vinyl monomer other than said nitrogen- and phosphorous-containing vinyl monomers whereby grafting occurs at said sites of unsaturation and the dispersibility of pigments for paint in said graft-modified alkyd resin is improved as compared to the dispersibility of said pigments in the alkyd resin before graft-copolymerization.

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5,047,468

## PROCESS FOR THE IN SITU BLENDING OF POLYMERS

Kiu H. Lee, South Charleston, W. Va.; Frederick J. Karol, Belle Mead, N.J., and Sari B. Samuels, North Woodmere, N.Y., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Nov. 16, 1988, Ser. No. 271,639
Int. Cl.[5] C08F *297/08;* C08L *23/20, 23/08*
U.S. Cl. 525—53 5 Claims

1. A process for the in situ blending of polymers wherein a higher density ethylene copolymer matrix is prepared in a high melt index reactor and a lower density ethylene copolymer is then incorporated into the ethylene copolymer matrix in a low melt index reactor comprising continuously contacting, under polymerization conditions, a mixture of ethylene and one alpha-olefin having 4 or 6 carbon atoms with a catalyst in two fluidized bed reactors connected in series, said catalyst comprising:

(i) a silica supported complex consisting essentially of magnesium, titanium, halogen, an electron donor, and at least one activator compound having the formula $AlR'_eX'_fH_g$ wherein X' is Cl or OR'''; R'' and R''' are saturated aliphatic hydrocarbon radicals having 1 to 14 carbon atoms and are the same or different; f is 0 to 1.5; g is 0 or 1; and e+f+g=3; and

(ii) a hydrocarbyl aluminum cocatalyst,

the polymerization conditions being such that an ethylene copolymer matrix having a melt index in the range of about 122 to about 600 grams per 10 minutes is formed in the high melt index reactor and a lower density ethylene copolymer having a melt index in the range of about 0.1 to about 1 gram per 10 minutes is formed in the low melt index reactor, each copolymer having a density of about

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0.860 to about 0.965 gram per cubic centimeter and a melt flow ratio in the range of about 22 to about 70, and being admixed with active catalyst, with the provisos that:

(a) the mixture of ethylene copolymer matrix and active catalyst formed in the high melt index reactor is transferred to the low melt index reactor;

(b) other than the active catalyst referred to in proviso (a) and the cocatalyst referred to in proviso (e), no additional catalyst is introduced into the low melt index reactor;

(c) in the high melt index reactor:

(1) the alpha-olefin is present in a ratio of about 0.1 to about 3.5 moles of alpha-olefin per mole of ethylene; and

(2) hydrogen is present in a ratio of about 0.5 to about 2 moles of hydrogen per mole of combined ethylene and alpha-olefin;

(d) in the low melt index reactor:

(1) the alpha-olefin is present in a ratio of about 0.1 to about 3.5 moles of alpha-olefin per mole of ethylene; and

(2) hydrogen is present in a ratio of about 0.01 to about 0.3 mole of hydrogen per mole of combined ethylene and alpha-olefin; and

(e) additional hydrocarbyl aluminum cocatalyst is introduced into the low melt index reactor in an amount sufficient to restore the level of activity of the catalyst transferred from the high melt index reactor to about the initial level of activity in the high melt index reactor.

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5,047,469

## NOVEL POLYVINYL ALCOHOL AND PROCESS FOR PRODUCING POLYVINYL ALCOHOL BY HYDROLYSIS CATALYZED BY ACIDS

**Takanori Kitamura, Kurashiki; Yuuji Takenouchi, Okayama, and Kunio Abe, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan**

**Filed Feb. 9, 1989, Ser. No. 307,949**

**Claims priority, application Japan, Feb. 10, 1988, 63-29308; Dec. 13, 1988, 63-315506**

**Int. Cl.[5] C08F** *16/06*

**U.S. Cl. 525—56** **14 Claims**

1. A polyvinyl alcohol having a saponification degree of 70 to 98 mol % and a block character, $\eta$, of at least 0.55 and satisfying the following formula (1):

$$Y \geqq -0.86X + 85 \quad (1)$$

wherein X represents the saponification degree (mol %) and Y represents the percentage by weight of the methanol-soluble substances in said polyvinyl alcohol (wt %).

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5,047,470

## HIGH IMPACT BLENDS OF COPOLYETHER-ESTER ELASTOMERS, RUBBER GRAFT POLYMERS AND STYRENE-ACRYLONITRILE RIGID POLYMERS

**David Whalen, Washington, and Oliver P. Creecy, Elizabeth, both of W. Va., assignors to General Electric Company, Parkersburg, W. Va.**

**Filed Jul. 28, 1989, Ser. No. 386,087**

**Int. Cl.[5] C08L** *67/02, 35/06, 51/04*

**U.S. Cl. 525—64** **13 Claims**

1. A thermoplastic polymer composition, comprising

(a) from about 40 to about 80 weight percent of a thermoplastic copolyether-ester elastomer;

(b) from about 5 to about 50 weight percent of a rubber graft polymer comprising from about 50 to about 85 weight percent of a rubbery polymer substrate and from about 15 to about 50 weight percent of a grafting copolymer grafted to the rubbery polymer substrate, said grafting copolymer being formed from about 60 to about 95 weight percent of at least one monomer selected from the group consisting of styrene, $\alpha$-methyl styrene, halogen-substituted styrene and methyl methacrylate and from about 5 to about 40 weight percent of at least one different monomer selected from the group consisting of acrylonitrile, methyl methacrylate, maleic anhydride, maleimide, N-phenyl maleimide and acrylamide; and

(c) from about 5 to about 50 weight percent of a rigid polymer formed from (i) at least about 50 weight percent of one or more monomers selected from the group consisting of styrene, $\alpha$-methyl styrene and halogen-substituted styrene, (ii) at least 20 percent acrylonitrile, and (iii) N-phenyl maleimide.

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5,047,471

## TOUGHENED POLYOXYMETHYLENE AND SHAPED ARTICLES PRODUCED THEREFROM

**Karlheinz Burg; Harald Cherdron, both of Wiesbaden; Friedrich Kloos, Mainz, and Helmut Schlaf, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Division of Ser. No. 715,871, Mar. 25, 1985, abandoned. This application May 20, 1988, Ser. No. 196,432**

**Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984; Feb. 18, 1985, 3505524**

**Int. Cl.[5] C08L** *61/02*

**U.S. Cl. 525—66** **16 Claims**

1. A mixture comprised of polyoxymethylene (component A), 5-50% by weight, relative to the total mixture of A) and B), of a rubber-elastic graft copolymer (component B), a polymeric third component (component C) in an amount of 10 to 95% by weight, relative to the sum of B) and C), wherein the graft copolymer is present in the polyoxymethylene in a state of fine distribution and is comprised of particles which have been formed from a rubber-elastic, single-phase core and a hard graft shell, said shell comprising a plurality of layers and wherein the component C together with the component B forms a two-phase system B/C, or with increasing amounts of the component B which is then increasingly located in the core of the two-phase system, and the two-phase system is present in a state of fine distribution in the polyoxymethylene.

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5,047,472

## POLYPHENYLENE ETHER OR POLYPHENYLENE ETHER/POLYSTYRENE WITH POLYORGANOSILOXANE/POLYVINYL-BASED GRAFT POLYMER MODIFIERS

**Muhanad A. Alsamarraie, Clifton Park; William R. Haaf, Voorheesville, both of N.Y.; Warren J. Peascoe, West Stockbridge, and I-Chung W. Wang, Williamstown, both of Mass., assignors to General Electric Company, Selkirk, N.Y.**

**Filed Nov. 14, 1988, Ser. No. 271,249**

**Int. Cl.[5] C08L** *61/04*

**U.S. Cl. 525—68** **44 Claims**

1. A composition comprising a polyphenylene ether resin (A) or a mixture (A-1) comprising (i) a polyphenylene ether resin and (ii) a polystyrene resin wherein said polyphenylene ether resin (i) comprises at least 35 parts by weight based upon 100 parts by weight of (i) and (ii) combined; and

an effective impact strength, weld line strength, flame resistance, surface appearance, moldability or flowability modifying amount of a multi-stage polyorganosiloxane/-polyvinyl-based graft polymer composition (B) comprising

(a) as a first stage, a substrate selected from

(i) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer and at least one vinyl polymer;

(ii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which are derived from a cross-linking agent or agents;

(iii) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and units which serve as a graft-linking agent or agents;

(iv) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, units which are derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; or

(v) a polymeric co-homopolymerized substrate comprised of, in combination, an organosiloxane polymer, at least one vinyl-based polymer, and a mixture of any of units which are derived from across-linking agent or agents, units which serve as a graft-linking agent or agents, or units derived from a cross-linking agent or agents and units from the same or different agent or agents which serve as a graft-linking agent or agents; and

(b) at least one subsequent stage or stages graft polymerized in the presence of any previous stage and which is comprised of a vinyl-based polymer.



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5,047,473

## FLEXIBLE POLYMER MIXTURES

**Karl-Erwin Piejko, Gladbach; Christian Lindner; Hans-Eberhard Braese, both of Koeln; Rolf Kubens, Odenthal, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany**

**Filed Dec. 12, 1988, Ser. No. 283,537**

**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743489**

**Int. Cl.[5] C08L** *31/02, 33/08, 51/04*

**U.S. Cl. 525—71** **4 Claims**

1. A soft, flexible polymer mixture comprising

a) 30–70 parts by weight of a graft polymer of a mixture of 25–40 parts by weight of acrylonitrile and 75–60 parts by weight of styrene, $\alpha$-methylstyrene, alkylmethacrylate or mixtures thereof on particulate, cross-linked alkylacrylate rubbers having an average particle diameter ($d_{50}$) of from 0.1 to 0.8 $\mu$m with a total rubber content of 20 to 55% by weight, prepared with a graft yield greater than 25% by weight,

b) 60–5 parts by weight of a graft polymer of

(b1) methyl methacrylate, in combination with up to 30% by weight of styrene, acrylonitrile, alkyl acrylate, or mixtures thereof

b2) a mixture of 20 to 40% by weight of acrylonitrile and 80 to 60% by weight of styrene, $\alpha$-methylstyrene, alkylmethacrylate or mixtures thereof

on a particulate, cross-linked alkylacrylate rubber having an average particle diameter ($d_{50}$) of from 0.1 to 0.8 $\mu$m with a total rubber content of 65 to 90% by weight, and

c) 10–40 parts by weight of a partially cross-linked, rubber-like copolymer of 5–40% by weight of acrylonitrile, styrene, alkyl methacrylate or mixtures thereof and 95–60% by weight of alkyl acrylate having a gel content of from 20 to 99% by weight and a swelling index greater than 10, determined in dimethylformamide at 23° C.

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5,047,474

## POLYMERIC MODIFIER COMPOSITIONS

**Ismail S. Rabinovich, Holland, and Eugene C. Szamborski, Richboro, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Aug. 3, 1989, Ser. No. 389,011**

**Int. Cl.[5] C08G** *63/48, 63/91;* **C08L** *51/04, 53/00*

**U.S. Cl. 525—71** **19 Claims**

1. A polymer composition of an acrylate core/shell polymer and a butadiene core/shell polymer, comprising

from about 50 to about 95 weight percent of a first acrylate core/shell polymer having an alkyl acrylate core and a shell of alkyl methacrylate, and

from about 5 to about 50 weight percent of a second core/-shell polymer having

a core of a polymer containing butadiene,

a first outer stage of a polymer selected from the group of styrenic polymers, styrenic/methacrylate polymers, and alkyl methacrylate polymers, and

a second outer stage of a polymer selected from the group of styrenic polymers, styrenic/methacrylate polymers, and alkyl methacrylate polymers.

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5,047,475

## DELUSTERED THERMOPLASTIC RESIN COMPOSITION WITH GOOD IMPACT RESISTANCE

**Takuya Ogawa, Nagoya; Masatoshi Iwamoto, Aichi; Kazumasa Chiba, and Kazuhisa Yano, both of Nagoya, all of Japan, assignors to Toray Industries, Inc., Japan**

**Filed Aug. 3, 1989, Ser. No. 389,165**

**Claims priority, application Japan, Aug. 3, 1988, 63-194244; Apr. 4, 1989, 1-86334; Apr. 4, 1989, 1-86335**

**Int. Cl.[5] C08L** *51/04, 55/02*

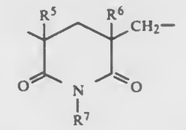
**U.S. Cl. 525—73** **10 Claims**

1. A resin composition comprising, based on 100 parts by weight of the following components (A) through (D),

(A) from 1 to 98 parts by weight of a graft copolymer obtained by graft-polymerizing (a) from 5 to 80% by weight of a rubbery polymer and (b) from 95 to 20% by weight of a monomer mixture consisting of from 40 to 90% by weight of an aromatic vinyl compound, from 60 to 10% by weight of a vinyl cyanide compound and from 0 to 50% by weight of another ethylenically unsaturated compound copolymerizable therewith,

(B) from 1 to 40 parts by weight of at least one modified copolymer selected from the group consisting of ($B_1$) a modified vinyl copolymer obtained by polymerizing (a) from 40 to 90% by weight of an aromatic vinyl compound, (b) from 60 to 10% by weight of a vinyl cyanide compound, (c) from 0.01 to 10% by weight of an ethylenically unsaturated monomer having at least one member selected from the group consisting of an epoxy group, a carboxyl group and an amino group, and (d) from 0 to 40% by weight of another ethylenically unsaturated compound, and ($B_2$) a modified olefinic copolymer obtained by copolymerizing (e) from 50 to 95% by weight of at least one olefin selected from the group consisting of ethylene and propylene, (f) from 0.1 to 20% by weight of an ethylenically unsaturated monomer having at least one member selected from the group consisting of an epoxy group, a carboxyl group and an amino group, and (g) from 0 to 40% by weight of another ethylenically unsaturated compound copolymerizable therewith,

(C) from 1 to 60 parts by weight of an imidized acrylic resin which is a polymer containing cyclic imide units represented by the following formula (VI):



(VI)

wherein $R^5$, $R^6$, and $R^7$ each represent a hydrogen atom or a substituted or unsubstituted alkyl or aryl group having 1 to 20 carbon atoms, and

(D) from 0 to 90 parts by weight of a vinyl copolymer obtained by polymerizing (a) from 40 to 90% by weight of an aromatic vinyl compound, (b) from 60 to 10% by weight of a vinyl cyanide compound and (c) from 0 to 40% by weight of another ethylenically unsaturated compound copolymerizable therewith, wherein the content of the rubbery polymer (a) in the graft copolymer (A) is 5 to 40% by weight based on the total weight of the resin composition.

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**5,047,476**

## PROCESS FOR CROSSLINKING HYDROLYZABLE COPOLYMERS

**Michael J. Keogh, Bridgewater, N.J., assignor to Union Carbide Chemicals and Plastics Company Inc., Danbury, Conn.**

**Filed May 12, 1989, Ser. No. 351,073**
**Int. Cl.[5] C08F *8/00***
**U.S. Cl. 525—106** **24 Claims**

1. A process for crosslinking comprising the following steps:

(a) admixing, in a processing zone, a copolymer containing at least one hydrolyzable silane moiety; a dihydrocarbyltin oxide; and

(i) a carboxylic acid;

(ii) a compound bearing at least one carboxylate moiety, which is capable of forming a carboxylic acid when subjected to heat and/or moisture; or

(iii) mixtures thereof, with the proviso that:

(A) in the event that component (ii) is present, the conditions in the processing zone are such that the carboxylate moiety forms a carboxylic acid;

(B) the residence time of the mixture in the processing zone is sufficient to at least partially complete the processing of the copolymer, but of sufficient brevity to substantially avoid a reaction of the carboxylic acid with the dihydrocarbyltin oxide; and

(b) passing the mixture from step (a) into a crosslinking zone under such reaction conditions that the carboxylic acid reacts with the dihydrocarbyltin oxide to form dihydrocarbyltin carboxylate, said crosslinking zone having a moisture content sufficient to crosslink the hydrolyzable copolymer in the presence of the dihydrocarbyltin carboxylate.

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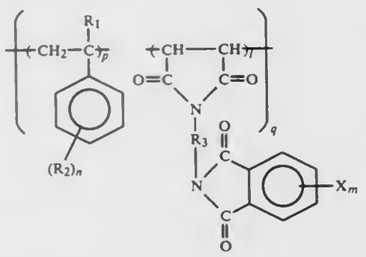
**5,047,477**

## METHOD OF PRODUCING IMIDE BOND-CONTAINING RESINS AND FLAME RETARDANTS COMPRISING SAID RESINS

**Akira Taniuchi, and Koichi Niwa, both of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan**

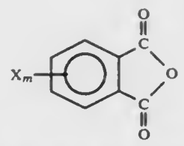
**Filed Apr. 12, 1989, Ser. No. 336,973**
**Claims priority, application Japan, Apr. 21, 1988, 63-98938**
**The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.**
**Int. Cl.[5] C08F *8/30, 12/08***
**U.S. Cl. 525—123** **3 Claims**

1. A method of producing imide bond-containing resins of the general formula (4)



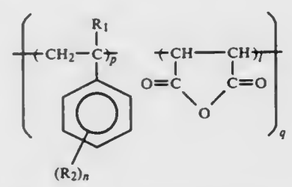
(4)

wherein $R_1$ is H or $CH_3$, $R_2$ is H, Cl, Br, F or $CH_3$, $R_3$ is an aliphatic, aromatic or alicyclic hydrocarbon group, X is Br, Cl or F, l is equal to 1, m is an integer of 1 to 4, n is an integer of 1 to 5, p is an integer of 1 to 4 and q is a number equal to 1 to 100, which comprises reacting a halogenated phthalic anhydride of the general formula (1)



(1)

wherein X and m are as defined above, a copolymer of the general formula (2)



(2)

wherein $R_1$, $R_2$, p, n, l and q are as defined above, and a diisocyanate compound of the general formula (3)

$$R_3—(NCO)_2 \quad (3)$$

wherein $R_3$is as defined above, in an inert solvent in the presence of a tertiary amine as a catalyst.

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**5,047,478**

## THERMOPLASTIC RESIN COMPOSITION

**Tadayuki Ohmae; Yoshiki Toyoshima; Kentaro Mashita; Noboru Yamaguchi, all of Chiba; Toshio Kawakita, Osaka, and Jinsho Nambu, Chiba, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 90,473, Aug. 28, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 394,165**
**Claims priority, application Japan, Aug. 28, 1986, 61-202581**
**Int. Cl.[5] C08L *77/00***
**U.S. Cl. 525—183** **4 Claims**

1. A thermoplastic elastomer composition having a flexural modulus as defined in ASTM D790 of from 500 to 15,000 kg/cm$^2$, which is obtained by:

melt kneading a mixture comprising: p2 (A) from 20 to 58 parts by weight of a polyamide resin and

(B) from 42 to 80 parts by weight of an ethylene copolymer comprising:

(a) from 40 to 90% by weight of an ethylene unit,

(b) from 5–60% by weight of an $\alpha,\beta$-unsaturated carboxylic acid alkyl ester unit, and

(c) from 0.3 to 10% by weight of a maleic anhydride unit; and

further melt kneading said mixture with

(C) from 0.01 to 20 parts by weight, based on 100 parts by weight of the sum of the polyamide resin (A) and the ethylene copolymer (B), of a compound selected from a group consisting of an aliphatic diamine carbamate, an aliphatic polyamine, an alicyclic polyamine, and an aromatic amine.



**5,047,479**

## THERMOPLASTIC RESIN COMPOSITION

**Tadayuki Ohmae; Yoshiki Toyoshima; Kentaro Mashita, and Jinsho Nambu, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 155,781, Feb. 16, 1988, abandoned. This application Aug. 21, 1989, Ser. No. 396,786**
**Claims priority, application Japan, Feb. 16, 1987, 62-32781**
**Int. Cl.[5] C08L *77/00***
**U.S. Cl. 525—183** **3 Claims**

1. An impact resistant polyamide resin composition obtained by:

melt kneading a mixture comprising:

(A) from 60 to 97 parts by weight of a polyamide resin, and

(B) from 3 to 40 parts by weight of an ethylene copolymer comprising:

(a) from 40 to 90% by weight of an ethylene unit,

(b) from 5–60% by weight of an $\alpha,\beta$-unsaturated carboxylic acid alkyl ester unit, and

(c) from 0.3 to 10% by weight of a maleic anhydride unit; and melt kneading said mixture with

(C) from 0.01 to 20 parts by weight, based on 100 parts by weight of the sum of the polyamide resin (A) and the ethylene copolymer (B), of compound containing at least two amino groups per molecule selected from a group consisting of an aliphatic diamine carbamate, an aliphatic polyamine, an alicyclic polyamine, and an aromatic aminel.

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**5,047,480**

## THERMOPLASTIC MOLDING COMPOSITIONS

**Edgar Leitz; Ulrich Jansen, both of Dormagen, Fed. Rep. of Germany; Hans-Jürgen Kress, Pittsburgh, Pa.; Horst Peters, Leverkusen, Fed. Rep. of Germany; Jochen Schoeps, Krefeld, Fed. Rep. of Germany, and Leo Morbitzer, Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Dec. 10, 1987, Ser. No. 131,091**
**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642645**
**Int. Cl.[5] C08L *35/00***
**U.S. Cl. 525—207** **4 Claims**

1. Thermoplastic molding compositions containing

a. from 1 to 99 parts by weight of a thermoplastic copolymer of

from 40 to 70 parts by weight methyl methacrylate, from 20 to 50 parts by weight $\alpha$-methyl styrene and from 5 to 15 parts by weight acrylonitrile,

b. from 1 to 99 parts by weight of a statistical thermoplastic copolymer of

from 70 to 95 parts by weight styrene and from 5 to 30 parts by weight maleic acid anhydride.

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**5,047,481**

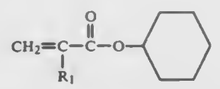
## COMPATIBLE POLYMER BLENDS

**Werner Siol, Darmstadt, and Ulrich Terbrack, Reinheim, both of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany**

**Division of Ser. No. 96,472, Sep. 15, 1987, Pat. No. 4,898,912. This application May 23, 1989, Ser. No. 355,497**
**Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632369**
**Int. Cl.[5] C08L *45/00, 33/06***
**U.S. Cl. 525—216** **16 Claims**

1. A polymer composition, consisting essentially of:

(i) 40–99 wt. % of a miscible two component polymer blend, containing 0.1–99.9 wt. % of a first polymer comprising 90–100 wt. % styrene monomer units, and 99.9–0.1 wt. % of a second polymer comprising 10–100 wt. % of monomer units having formula (I):



(I)

wherein $R_1$ is hydrogen or methyl; and

(ii) 60-1 wt. % of a third polymer, wherein said third polymer is chemically different from said first polymer and said second polymer, and wherein said third polymer is non-miscible with said first polymer, said second polymer and said polymer blend.

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**5,047,482**

## CABLE INSULATION BASED ON ETHYLENE POLYMERS HAVING HIGH RESISTANCE TO THE FORMATION OF WATER TREES

**Johannes Schlag; Ernst Koehnlein; Peter Bauer, all of Ludwigshafen, and Ludwig Koessler, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Mar. 5, 1987, Ser. No. 22,216**
**Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607756**
**Int. Cl.[5] C08L *23/06, 23/08, 23/26, 33/04***
**U.S. Cl. 525—221** **3 Claims**

1. A cable insulation having high resistance to the formation or growth of water trees and high aging resistance and consisting of a low density polyethylene (I) and from 2 to 10% by weight, based on the low density polyethylene, of an ethylene polymer (II) which differs from (I) and conventional additives in the usual amounts, wherein the ethylene polymer (II) is a terpolymer having a melt flow index of from 1.0 to 30 g/10 min, measured at 190° C. and under a load of 2.16 kp according to DIN 53,735, and consisting of

(a) 100 mole parts of copolymerized ethylene;

(b) 1 to 5.5 mole parts of a copolymerized $C_1$–$C_8$-alkyl ester of a $C_3$–$C_6$-alkenecarboxylic acid; and

(c) 1 to 3.2 mole parts of a copolymerized $C_3$–$C_6$-alkenecarboxylic acid.

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**5,047,483**

## PNEUMATIC TIRE WITH TREAD OF STYRENE, ISOPRENE, BUTADIENE RUBBER

**Adel F. Halasa, Bath, Ohio; Jean Bergh, Vianden, Luxembourg, and Fernand A. J. Fourgon, Bastogne, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Jun. 29, 1988, Ser. No. 213,019**
**Int. Cl.[5] C08L *9/06***
**U.S. Cl. 525—237** **9 Claims**

1. A pneumatic tire having an outer circumferential tread were said tread is a sulfur cured rubber composition comprised of, based on 100 parts by weight rubber (phr), (A) about 10 to about 90 parts by weight of a styrene, isoprene, butadiene terpolymer rubber (SIBR), and (B) about 70 to about 30 weight percent of at least one of cis 1,4-polyiosprene rubber and cis 1,4-polybutadiene rubber wherein said SIBR rubber is comprised of (1) about 10 to about 35 weight percent bound styrene, (2) about 30 to about 50 weight percent bound isoprene and (3) about 30 to about 40 weight percent bound butadiene and is characterized by having a single glass transition temperature (Tg) which is in the range of about −10° C. to about −40° C. and, further, the said bound butadiene structure contains about 30 to about 40 percent 1,2-vinyl units, the said bound isoprene structure contains about 10 to about 30 percent 3,4 units, and the sum of the percent 1,2-vinyl units of the bound butadiene and the percent 3,4 units of the bound isoprene is in the range of about 40 to about 70 percent.

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5,047,484

## TAPERED BLOCK COPOLYMERS

Lu H. Tung, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 24, 1989, Ser. No. 440,850
Int. Cl.[5] C08F 8/04
U.S. Cl. 525—314 13 Claims

1. A hydrogenated, tapered, block copolymer corresponding to the formula $AB(BA)_n$ wherein A is a block of a monovinylidene aromatic monomer and B is a partially or fully hydrogenated block of a conjugated diene, and n is a number from 0 to 6, said block copolymer being further characterized in that at least one of the junctions between an A block and a B block is tapered such that the total amount of isolated, polymerized monovinylidene aromatic units in the polymer is from 30 to 75 percent, said block copolymer having a melt index from 1 to 40.

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5,047,485

## PROCESS FOR MAKING A PROPYLENE POLYMER WITH FREE-END LONG CHAIN BRANCHING AND USE THEREOF

Anthony J. DeNicola, Jr., New Castle County, Del., assignor to HIMONT Incorporated, Wilmington, Del.

Filed Feb. 21, 1989, Ser. No. 313,274
Int. Cl.[5] C08F 8/50
U.S. Cl. 525—387 22 Claims

1. A process for making normally solid,gel-free, propylene polymer material with a branching index of less than 1 and with a strain hardening elongational viscosity from normally solid, amorphous to predominantly crystalline propylene polymer material without strain hardening elongational viscosity, which comprises:

(1) mixing a low decomposition temperature peroxide with a linear propylene polymer material, which material is at room temperature to 120° C., in a mixing vessel in the substantial absence of atmospheric oxygen or its equivalent,

(2) heating or maintaining the resulting mixture in the substantial absence of atmospheric oxygen or its equivalent at room temperature to 120° C. for a period of time sufficient for decomposition of the peroxide, for a substantial amount of fragmentation of the linear propylene polymer material to occur, and for a significant amount of long chain branches to form, but insufficient to cause gelation of the propylene polymer material;

(3) treating the propylene polymer material in the substantial absence of atmospheric oxygen or its equivalent to deactivate substantially all the free radicals present in said propylene polymer material.

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5,047,486

## INTEGRATED PROCESS FOR THE PREPARATION OF POLYCARBONATE AND/OR POLYARYLATE BLOCK COPOLYMERS WITH POLY(ARYL ETHERS)

Selvaraj Savariar, Somerset, N.J., assignor to Amoco Corporation, Chicago, Ill.

Filed Apr. 3, 1989, Ser. No. 332,881
Int. Cl.[5] C08G 81/00, 64/18, 63/672
U.S. Cl. 525—394 2 Claims

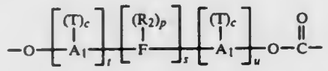
1. A process for the preparation of block copolymers selected from the group consisting of (a) $(AB)_m$; (b) ABA; (c) BAB; (d) and combinations thereof, wherein A is a poly(aryl ether) block, and B is a poly(arylatecarbonate) block; the molecular eweights of the blocks A and B individually being at least 500; m is an integer and is one or greater; which process comprises the steps of

(a) the reaction of a hydroxy-terminated poly(aryl ether) with a high molecular weight poly(arylate-carbonate) to yield a block copolymer; followed by

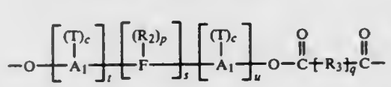
(b) the coupling of the material obtained in step (a) under poly(aryl ether) forming conditions via the hydroxy/activated halobenzenoid compound, or the hydroxy/activated nitrobenzenoid compound nucleophilic polycondensation process;

wherein said poly(arylate-carbonate) comprises at least two of the following four recurring units in its linear chain

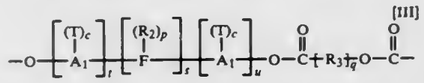
[I]



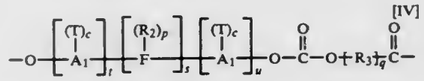
[II]



[III]



[IV]



wherein $A_1$ and $R_3$ are divalent aromatic radicals which may be the same or different; F is selected from the group of alkylene, cycloalkylene, alkylidene and cycloalkylidene; $R_2$ is hydrogen, alkyl, cycloalkyl or aryl; T is halogen, nitro, $R_2$ or $OR_2$; c is any whole number from and including zero through the number of positions available on A for substitution; p is any whole number from and including zero through the number of positions available on F for substitution; q is a whole number equal to at least one; s is zero or one; t is a whole number equal to at least one; and u is any whole number including zero.

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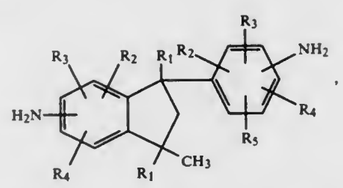
5,047,487

## COMPOSITIONS OF POLY(IMIDES) HAVING PHENYLINDANE DIAMINES AND/OR DIANHYDRIDE MOIETIES IN THE POLY(IMIDE) BACKBONE

Rafael Camargo, Foster City; Frank Mercer, Belmont, and Tai C. Cheng, Mountain View, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 9,317, Jan. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 815,343, Dec. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 688,783, Jan. 4, 1985, abandoned. This application Apr. 10, 1989, Ser. No. 336,587
Int. Cl.[5] C08L 79/08, 67/03, 69/00, 71/12
U.S. Cl. 525—432 12 Claims

1. A composition comprising a blend of (1) a poly(imide) having phenylindane diamine or phenylindane dianhydride moieties in its backbone, said polyimide being made by the reduction of a diamine monomer (i) selected from the group consisting of

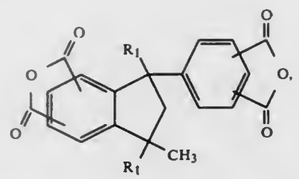


4,4'-diaminobenzophenone, 4,4'methylenebis(o-chloroaniline), m-phenylenediamine, p-phenylenediamine, 4,4'-methylenedianiline, 4,4'-oxydianiline, 4,4'-sulfonyldianiline, and 4,4'-isopropylidenedianiline, where $R_1$ is hydrogen or an alkyl group having from 1 to 5 carbon atoms,



and $R_2$, $R_3$, $R_4$, and $R_5$ are independently hydrogen, halogen, or lower alkyl having 1 to 4 carbon atoms;

and a dianhydride monomer (ii) selected from the group consisting of



1,4,5,8-naphthalene tetracarboxylic dianhydride, 3,3',4,4'-benzophenonetetracarboxylic acid dianhydride, pyromellitic dianhydride, 4,4'-isopropylidenediphthalic anhydride, 4,4'-oxydiphthalic anhydride, 4,4'-methylenediphthalic anhydride, and 4,4'-sulfonyldiphthalic anhydride, where $R_1$ is as hereinabove defined;

provided that at least one of said diamine monomer (i) or dianhydride monomer (ii) contains a phenylindane moiety; and (II) a polymeric component which is a poly(ether imide) free of phenylindane moieties in its backbone.

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5,047,488

## SUSPENDED EMULSION POLYMERIZATION OF VINYL MONOMERS

Pierre Nogues, and Francois Erard, both of Bernay, France, assignors to Atochem, Puteaux, France

Filed Mar. 17, 1988, Ser. No. 169,585
Claims priority, application France, Mar. 17, 1987, 87 03636
Int. Cl.[5] C08F 2/32, 14/06
U.S. Cl. 526—65 26 Claims

1. A process for the preparation of a polymer insoluble in its monomeric constituents, comprising suspended emulsion polymerizing at least one olefinic monomer, said at least one monomer having dispersed therein finely divided droplets of an aqueous solution of at least one component of a polymerization initiating system, and wherein the amount of water in said aqueous solution constitutes at least 19% by weight of said at least one monomer.

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5,047,489

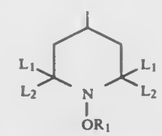
## ETHYLENICALLY UNSATURATED COMPOUNDS CONTAINING 1-HYDROCARBYLOXY-2,2,6,6-TETRAMETHYLPIPERIDINE MOIETIES, AND POLYMERS, COPOLYMERS AND STABILIZED COMPOSITIONS

Ramanathan Ravichandran, Nanuet, N.Y.; Peter J. Schirmann, Fairfield, and Andrew Mar, Norwalk, both of Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 479,912, Feb. 14, 1990, Pat. No. 4,983,737, which is a continuation-in-part of Ser. No. 326,705, Mar. 21, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 605,636
Int. Cl.[5] C08F 26/06
U.S. Cl. 526—263 9 Claims

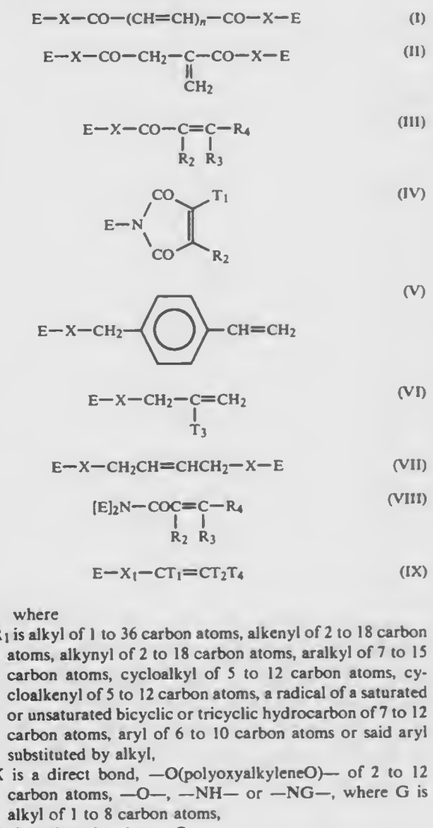
1. A polymer or copolymer which comprises the polymerization product of

(a) 1 to 100% by weight, based on the total polymer or copolymer, of at least one ethylenically unsaturated, polymerizable monomer containing a hindered amine moiety substituted on the 1-N atom with a hydrocarbyloxy group, said moiety having the formula E



(E)

where $L_1$ and $L_2$ are independently alkyl of 1 to 4 carbon atoms, or $L_1$ and $L_2$ together are pentamethylene, and $R_1$ is hydrocarbyl, and said monomer is selected from the group consisting of formulas I-IX

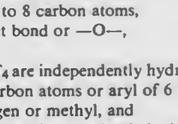


(I) $E-X-CO-(CH=CH)_n-CO-X-E$

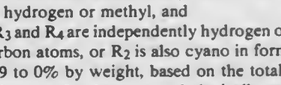
(II) $E-X-CO-CH_2-C(=CH_2)-CO-X-E$

(III) $E-X-CO-C(R_2)=C(R_3)-R_4$

(IV)



(V)



(VI) $E-X-CH_2-C(T_3)=CH_2$

(VII) $E-X-CH_2CH=CHCH_2-X-E$

(VIII) $[E]_2N-COC(R_2)=C(R_3)-R_4$

(IX) $E-X_1-CT_1=CT_2T_4$

where

$R_1$ is alkyl of 1 to 36 carbon atoms, alkenyl of 2 to 18 carbon atoms, alkynyl of 2 to 18 carbon atoms, aralkyl of 7 to 15 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, cycloalkenyl of 5 to 12 carbon atoms, a radical of a saturated or unsaturated bicyclic or tricyclic hydrocarbon of 7 to 12 carbon atoms, aryl of 6 to 10 carbon atoms or said aryl substituted by alkyl,

X is a direct bond, —O(polyoxyalkyleneO)— of 2 to 12 carbon atoms, —O—, —NH— or —NG—, where G is alkyl of 1 to 8 carbon atoms,

$X_1$ is a direct bond or —O—,

n is 1 or 2,

$T_1$, $T_2$ and $T_4$ are independently hydrogen, halogen, alkyl of 1 to 18 carbon atoms or aryl of 6 to 10 carbon atoms,

$T_3$ is hydrogen or methyl, and

$R_2$, $R_3$ and $R_4$ are independently hydrogen or alkyl of 1 to 12 carbon atoms, or $R_2$ is also cyano in formula III; and

(b) 99 to 0% by weight, based on the total polymer or copolymer, of at least one ethylenically unsaturated, polymerizable monomer having no group of formula E present and selected from the group consisting of the esters and amides of acrylic and methacrylic acid, the itaconates, the citraconates, styrene, the vinyl pyridines, divinylbenzene, acrylonitrile, methacrylonitrile, N-vinyl-2-pyrrolidone, N-vinylcarbazole, maleimides, vinyl sulfonate, vinyl phos-

phonates, alpha-olefins, isoprene, butadiene, vinyl esters, vinyl ethers and halogenated olefins.

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**5,047,490**

## HIGH MOLECULAR WEIGHT COPOLYMERS OF MALEIC ANHYDRIDE AND METHYL VINYL ETHER

**Zvi Peliah, Savyion, Israel; Istvan Potencsik, Mannheim, Fed. Rep. of Germany; Werner Kopp, Harthausen, Fed. Rep. of Germany, and Ernst Urmann, Ludwigshafen, Fed. Rep. of Germany, assignors to Giulini Chemie GmbH, Ludwigshafen, Fed. Rep. of Germany**

**Continuation of Ser. No. 180,079, Apr. 11, 1988, abandoned. This application Jul. 14, 1989, Ser. No. 382,064**

**Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712265**

**Int. Cl.[5] C08F *34/02***

**U.S. Cl. 526—271** **10 Claims**

1. A process of manufacturing powdered copolymers of maleic anhydride and methyl vinyl ether in a single reaction vessel, essentially consisting of the steps of:

preparing a reaction mixture by mixing maleic anhydride with an excess of methyl vinyl ether, said excess being in a range from about 3 to about 20 mol methyl vinyl ether per mol maleic anhydride and adding a radical initiator in a quantity of from about 0.001 to about 1 weight % with respect to the maleic anhydride;

initiating a polymerization reaction by heating said reaction mixture in said reaction vessel to a decomposition temperature of the radical initiator, initiating said polymerization reaction at said decomposition temperature in the reaction vessel with intensive stirring and in the absence of other solvents;

heating said reaction mixture in said reaction vessel to a reaction temperature at least 5° C. higher than said decomposition temperature to complete said polymerization reaction and maintaining said reaction temperature by external cooling;

evaporating excess methyl vinyl ether after reaction of maleic anhydride; and

collecting a powdered copolymer of maleic anhydride and methyl vinyl ether, said copolymer having a mole ratio of maleic anhydride:methyl vinyl ether of about 1:1 and having a specific viscosity in a range from about 2 to about 5.

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**5,047,491**

## POLYORGANOSILOXANE COMPOUNDS

**Takahiro Saho; Yoshinori Akutsu; Takaharu Nakano, and Nobumasa Ohtake, all of Yokohama, Japan, assignors to Chisso Corporation, Japan**

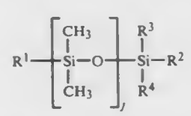
**Filed Aug. 1, 1989, Ser. No. 388,076**

**Claims priority, application Japan, Aug. 1, 1988, 63-192316**

**Int. Cl.[5] C08G *77/06***

**U.S. Cl. 528—15** **24 Claims**

1. A polyorganosiloxane compound represented by the following general formula (I):



(I)

in which

j is an integer from 2 to 2,000;

$R^1$ is a pentafluorophenyl group or a linear or branched fluoroalkyl group as represented by the following general formula (II):



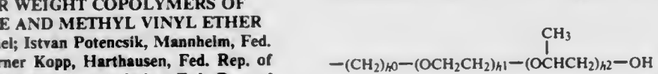
(II)

wherein

a is an integer from 3 to 18; and

b is 0 or an integer of 2a

$R^2$ is 3-(m-hydroxyphenyl)propyl group, 3-(o-hydroxyphenyl)propyl group, 3-(p-hydroxyphenyl)propyl group, a substituent as represented by the general formula (III):



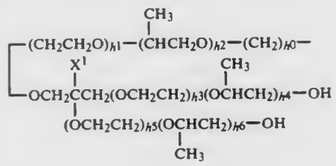
(III)

wherein

$h^o$ is an integer from 1 to 6; and

$h^1$ and $h^2$ are independently each 0 or an integer from 1 to 20,

a substituent as represented by the following general formula (IV):



(IV)

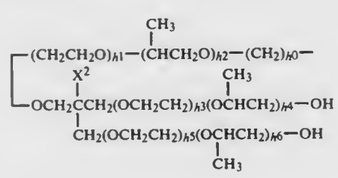
wherein

$X^1$ is a hydrogen atom, methyl group or ethyl group;

$h^3$, $h^4$, $h^5$ and $h^6$ are independently 0 or an integer from 1 to 20; and

$h^0$, $h^1$ and $h^2$ have the same meanings as above, or

a substituent as represented by the following general formula (V):



(V)

wherein

$X^2$ is a hydrogen atom, methyl group or ethyl group; and $h^1$, $h^2$, $h^3$, $h^4$, $h^5$ and $h^6$ have the same meanings as above; and

$R^3$ and $R^4$ are independently each an alkyl group having from 1 to four carbon atoms or a phenyl group.

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**5,047,492**

## ORGANOOLIGOSILSESQUIOXANES

**Richard Weidner; Norbert Zeller; Bernward Deubzer, and Volker Frey, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany**

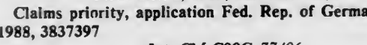
**Filed Oct. 2, 1989, Ser. No. 416,073**

**Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837397**

**Int. Cl.[5] C08G *77/06***

**U.S. Cl. 528—15** **12 Claims**

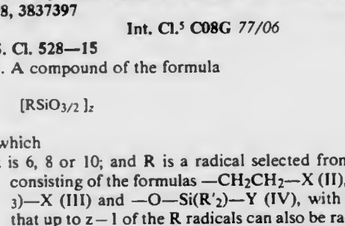
1. A compound of the formula



(I)

in which

z is 6, 8 or 10; and R is a radical selected from the group consisting of the formulas $—CH_2CH_2—X$ (II), —CH(CH-3)—X (III) and —O—Si(R'2)—Y (IV), with the proviso that up to z—1 of the R radicals can also be radicals of the formula —O—SiR'3, in which X is a radical selected from the group consisting of a monovalent radical and one-half of a divalent radical selected from the group consisting of the formulas



(V)

(VI)

(VII)

(XV)

(VIII)

R' is selected from the group consisting of $C_1$- to $C_6$-alkyl, $C_1$- to $C_6$-alkoxy and phenyl radicals;

R'' is selected from the group consisting of $C_1$- to $C_{18}$-alkyl radicals, and $C_1$-to $C_{18}$-alkyl radicals which are substituted by radicals selected from the group consisting of the formulas (V) and (VI);

R''' is selected from the group consisting of divalent $C_1$- to $C_{18}$-hydrocarbon radicals, radicals of the formula $—(R'_2SiO)_n—$; and mixtures thereof;

Z is selected from the group consisting of a halogen atom, $—NH_2$ radical, N-piperidinyl, N-piperazinyl, N-morpholinyl radical, a $C_1$- to $C_6$—N-monoalkylamino and a $C_1$- to $C_6$dialkylamino radical;

Y is selected from the group consisting of a hydrogen atom, a $C_2$- to $C_{10}$-hydrocarbon radical, a halogenated $C_2$- to $C_{10}$-hydrocarbon radical and a radical selected from the group consisting of formula (II) and (III); and n is an integer having a value of at least 1.

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**5,047,493**

## CATIONIC PAINT BINDERS BASED ON POLYETHER URETHANES AND PROCESS FOR PREPARATION THEREOF

**Rudolf Schipfer; Wolfgang Daimer, and Gerhard Schmölzer, all of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria**

**Division of Ser. No. 266,561, Nov. 3, 1988, Pat. No. 4,939,226. This application Jul. 2, 1990, Ser. No. 546,934**

**Claims priority, application Austria, Nov. 3, 1987, 2882/87**

**Int. Cl.[5] C08G *18/18, 18/08, 18/80***

**U.S. Cl. 528—45** **2 Claims**

1. Process for preparing cationic paint binders comprising the steps of (1) providing a polyhydroxyplyether containing primary hydroxyl groups; (2) reacting said polyhydroxypolyether with a diisocyanate having NCO-groups with different reactivities, said reaction being carried out at a temperature of from about 30 to 80° C. to selectively react said primary hydroxyl groups with one of the NCO-groups of said diisocyanate in the presence of 0.02 to 0.1 mole percent of 1,4-diazabicyclo-2,2,2-octane as catalyst; (3) reacting at a temperature of 20 to 80° C. the remaining NCO-group of said diisocyanate with primary or secondary aliphatic amines; and (4) reacting the primary and secondary hydroxyl groups present on the reaction product of (3) at least partially with a half-blocked diisocyannate, the components and proportions thereof being controlled so that a binder prooduced by the process will have a basicity which will permit said binder to be diluted with water after protonation.

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**5,047,494**

## CASTABLE POLYURETHANE ELASTOMERS CHAIN EXTENDED WITH 2,3-BIS(HYDROXYMETHYL)BICYCLO[2,2,1]HEPTANE

**I. Sioun Lin, Mickleton, N.J.; Stanley J. Gromelski, Jr., Dover, Del.; Kou-Chang Liu, Wayne, and Suzanne B. Nelsen, Mountain Lakes, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.**

**Filed Aug. 17, 1989, Ser. No. 394,908**

**Int. Cl.[5] C08G *18/32***

**U.S. Cl. 528—74** **5 Claims**

1. A castable polyurethane elastomer comprising the polymerization reaction product of a polyurethane prepolymer and 2,3-bis (hydroxymethyl) bicyclo [2,2,1] heptane.

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**5,047,495**

## POLYURETHANE FOR FLEXIBLE FUEL CONTAINERS

**Edmond G. Kolycheck, Lorain, Ohio, assignor to The G. F. Goodrich Company, Akron, Ohio**

**Filed Aug. 28, 1989, Ser. No. 399,645**

**Int. Cl.[5] C08G *18/38***

**U.S. Cl. 528—76** **14 Claims**

1. A high molecular weight, thermoplastic polyurethane characteristically resistant to aliphatic hydrocarbon fuels, said polyurethane adapted for use as an aliphatic hydrocarbon fuel barrier in the construction of flexible fuel containers, the polyurethane comprising:

a thermoplastic polyurethane having an average molecular weight from about 60,000 to 500,000 comprising a hydroxyl terminated ethylene ether oligomer intermediate having an average molecular weight from about 500 to 5,000 reacted with a non-hindered diisocyanate and an aliphatic extender glycol to produce said thermoplastic polyurethane, said oligomer intermediate being selected from (a) a hydroxyl terminated diethylene glycol-aliphatic linear polyester, or (b) a polyethylene glycol;

wherein said hydroxyl terminated diethylene glycol-aliphatic linear polyester (a) is produced by esterifying a diethylene glycol with an aliphatic dicarboxylic acid having from 4 to 10 carbon atoms;

wherein said polyethylene glycol (b) consists of repeating ethylene ether units n wherein n is from about 11 to about 115,

wherein said non-hindered diisocyanate is an aromatic or cyclic aliphatic diisocyanate and,

wherein said extender glycol consists of an aliphatic non-ether glycol having from 2 to 6 carbon atoms and containing only primary alcohol groups.

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**5,047,496**

## PROCESS FOR THE PREPARATION OF AROMATIC POLYETHERSULPHONES

**Thomas Eckel, Dormagen; Karl Fuhr, Krefeld, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany**

**Filed Jun. 13, 1989, Ser. No. 365,304**

**Claims priority, application Fed. Rep. of Germany, Jun. 22, 1988, 3820959**

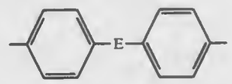
**Int. Cl.[5] C08G *8/02, 8/26, 75/23***

**U.S. Cl. 528—171** **3 Claims**

1. Process for the preparation of high molecular weight aromatic polyethersulphones consisting essentially of recurrent units of formula

—O—Z—O—W—

wherein —Z— denotes a divalent mononuclear or multinuclear aromatic group containing 6 to 30 carbon atoms, and W denotes

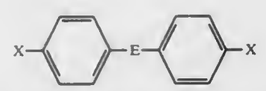


wherein E is an electron accepting sulphone, carbonyl, vinyl, sulphoxide or azo group, and wherein both —Z— and —W— are attached to the ether oxygen atom by aromatic carbon atoms by means of covalent bonds and at least one of Z or W provides a sulphone group between aromatic carbon atoms,

said process comprising reacting equimolar quantities of diphenols of the formula

HO—Z—OH

and dihalogen aryls of the formula



wherein X is halogen, in the presence of 1 to 1.2 mol of alkali metal carbonate per mol of diphenol and in the presence of cyclic N-alkylated acid amide solvent with a boiling point in the range of 180° to 250° C., and wherein water formed in the reaction is completely removed azeotropically as a cyclic N-alkylated acid amide/water mixture at temperatures from 5° to 20° Centigrade below the boiling point of the cyclic N-alkylated acid amide solvent without an additional azeotropic former.

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**5,047,497**

## WATER-IN-OIL EMULSION PROCESS FOR PRODUCING AN AROMATIC POLYCARBONATE

**Mitsuhiko Tamura, and Isao Akihara, both of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan**

**Filed Apr. 9, 1990, Ser. No. 506,093**
**Claims priority, application Japan, Dec. 27, 1989, 1-338993**
**Int. Cl.[5] C08G *64/20***
**U.S. Cl. 528—199** **25 Claims**

1. A process for producing an aromatic polycarbonate which comprises the steps of:

a low molecular weight polycarbonate oligomer having chloroformate groups by subjecting an aqueous alkali solution of a compound having two phenolic hydroxyl groups and phosgene to reaction in an organic solvent, and

polymerizing the oligomer in a water-in-oil emulsified state in the presence of an alkali and a tertiary amine, the tertiary amine being added into the water-in-oil emulsion after the average diameter of the liquid droplets of dispersed water phase in the water-in-oil emulsion is reduced to not more than 10 μm.

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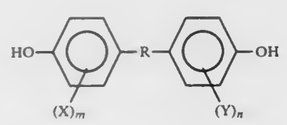
**5,047,498**

## FLAME-RESISTANT POLYCARBONATE CONTAINING UNITS FROM HALOGENATED TRIPHENYL COMPOUNDS

**Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine S.p.A., Palermo, Italy**

**Filed Jun. 12, 1989, Ser. No. 365,958**
**Claims priority, application Italy, Jul. 8, 1988, 21283 A/88**
**Int. Cl.[5] C08G *64/14***
**U.S. Cl. 528—202** **7 Claims**

1. A thermoplastic branched polycarbonate of high molecular weight possessing flame-resistant properties, wherein said polycarbonate contains carbonate units, units derived from a dihydroxyaromatic compound of formula:



(I)

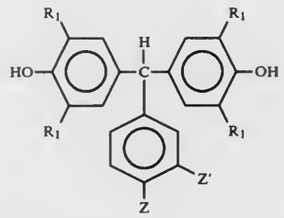
wherein:

R a substituted or non-substituted linear or branched $C_1$–$C_5$ alkylene radical, or a group chosen from O, S, $SO_2$, or CO; or R is a single bond;

X and Y, are the same or different and are H or $CH_3$;

m and n are the same or different and are whole numbers from 1 to 4,

units derived from a halogenated triphenyl compound of the formula:



(II)

where:

$R_1$ is hydrogen or a linear or branched $C_1$–$C_5$ alkyl radical;

Z is chlorine or bromine; and

Z′ is hydrogen chlorine or bromine, and units derived from a polyfunctional organic branching agent, and processing at least three equal or different functional groups chose from OH, COOH, COCl, or $SO_2Cl$ groups.

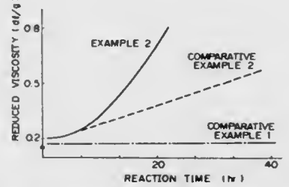
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**5,047,499**

## PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYAMIDE-IMIDE RESIN

**Toichi Sakata, Katsuta; Kenji Hattori, and Yoshiyuki Mukoyama, both of Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan**

**Filed Feb. 15, 1989, Ser. No. 310,642**
**Int. Cl.[5] C08G *60/08, 69/26, 60/42***
**U.S. Cl. 528—313** **35 Claims**




1. A process for producing high molecular weight polyamide-imide resin having a reduced viscosity of 0.3 dl/g or above by reacting (I) a trimellitic acid derivative selected from the group consisting of trimellitic acid anhydride and an ester of trimellitic acid or trimellitic acid anhydride with an alcohol and (II) an aromatic diamine, in the presence of a polar solvent and dehydration catalyst, which process comprises the two reaction stages:

(a) a first reaction stage which comprises reacting the trimellitic acid derivative (I) and the aromatic diamine (II) in the presence of a polar solvent in the presence of a first dehydration catalyst selected from the group consisting of boric acid, boric anhydride, phosphoric acid, pyrophosphoric acids, metaphosphoric acids, ethylmethaphosphoric acid, polyphosphoric acid, phosphorus pentoxide, and phosphoric pentachloride at a temperature ranging from about 195° C. to about 205° C. until a polyamide-imide resin having a reduced viscosity of 0.2 to 0.5 dl/g as measured at a concentration of 0.5 g/dl in dimethylformamide at 30° C. is produced; and

(b) a second reaction stage which comprises adding a phosphorous triester as a second dehydration catalyst to the reaction mixture resulting from the first reaction stage and further reacting the reaction mixture at a temperature ranging from about 180° C. to about 190° C. until a high molecular weight polyamide-imide resin having a reduced viscosity of 0.3 dl/g or above as measured at a concentration of 0.5 g/dl in dimethylformamide at 30° C. is produced; the first dehydration catalyst being used in an amount of 0.5 to 20% by weight on the basis of the total of the trimellitic acid derivative (I) and the aromatic diamine (II), and the phosphorus triester as a second dehydration catalyst being used in an amount of 0.1 to 50% by weight on the basis of the total of the trimellitic acid derivative (I) and the aromatic diamine (II).



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**5,047,500**

## AROMATIC POLYAMIDE FIBER FREE OF CRYSTAL DEFECT LAYERS PERPENDICULAR TO THE FIBER AXIS

**Ho J. Park, Seoul; Moo S. Rhim; Hak M. Kim, both of Kumi; Du H. Kim, Deagu; Seog C. Yoo, Chunceon; Sang H. Kim, Seoul; Sa N. B. Park, Gumi; Ink S. Han, Kyungsan; John T. Park, and Si M. Kim, both of Daegu, all of Rep. of Korea, assignors to Kolon Industries, Inc., Rep. of Korea**

**Division of Ser. No. 24,173, Mar. 10, 1987, Pat. No. 4,876,040.**
**This application Oct. 23, 1989, Ser. No. 396,065**
**Claims priority, application Rep. of Korea, May 15, 1986, 86-3826; May 15, 1986, 86-3827; Jul. 23, 1986, 86-5983; Jul. 23, 1986, 86-5984**
**Int. Cl.[5] C08G *69/46***
**U.S. Cl. 528—348** **4 Claims**

1. A fiber product comprising one or more fibers of aromatic polyamide polymer having a microscopic structure of an extended molecular chain, free of crystal defect layers perpendicular to the fiber axis, a high inherent viscosity of at least 3.0, and a high tensile strength of at least 15 g/d, said inherent viscosity being determined at 30° C. using a concentration of 0.5 grams of said polymer in 100 ml of concentrated sulfuric acid.

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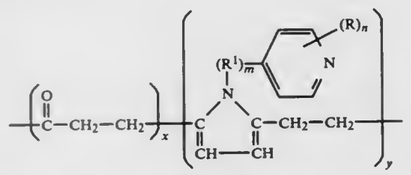
**5,047,501**

## PYRIDINE DERIVATIVES

**Pui K. Wong, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.**

**Continuation of Ser. No. 138,768, Dec. 29, 1987, abandoned. This application Aug. 14, 1989, Ser. No. 394,310**
**Int. Cl.[5] C08G *67/02*; C07D *401/06***
**U.S. Cl. 528—392** **16 Claims**

10. A polymeric polypyridine product consisting essentially of x number of carbonyl-containing groups and y number of pyridine-substituted pyrrole groups, said product having the following formula



wherein $R^1$ is a lower alkylene bridging group of up to 4 carbon atoms, m is zero or 1, R independently is an alkyl group of up to 10 carbon atoms, n is zero, 1 or 2, x is an integer of 1 or greater, y is an integer of 5 or greater and the ratio of y:x is at least 5.

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**5,047,502**

## GASTRIN RELEASING PEPTIDE ANTAGONIST

**Allen I. Oliff, Gwynedd Valley, Pa.; David C. Heimbrook, Ringoes, N.J.; Mark W. Riemen, Doylestown, Pa., and Victor M. Garsky, Blue Bell, Pa., assignors to Merck and Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 111,755, Oct. 23, 1987, abandoned. This application Aug. 3, 1989, Ser. No. 389,093**
**Int. Cl.[5] C07K *7/08; A61K 37/00***
**U.S. Cl. 530—329** **15 Claims**

1. A peptide having the amino acid sequence

His Trp Ala Val Gly Leu—$NH_2$,
Ac-His Trp Ala Val Gly Leu—$NH_2$,
Ac-His Trp Ala Val Gly Leu—$NHR^1$ or
Ac-His Trp Ala Val Gly Leu—$OR^1$

wherein $R^1$ is benzyl, a straight or branched chain alkyl group of from 1 to 5 carbon atoms, or a phenyl group, either of which is optionally substituted by alkyl of from 1 to 3 carbon atoms, hydroxy, alkoxy of from 1 to 3 carbon atoms, $NH_2$, halogen, trifluoromethyl or nitro.

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**5,047,503**

## THROMBIN-BINDING SUBSTANCE AND PROCESS FOR ITS PREPARATION

**Nobuo Aoki, Tokyo; Shigeru Kimura, Higashiyamato, and Masami Shiratsuchi, Musashimurayama, all of Japan, assignors to Kowa Company, Ltd., Nagoya, Japan**

**Filed Jul. 10, 1987, Ser. No. 72,051**
**Claims priority, application Japan, Jul. 15, 1986, 61-166084; Jul. 22, 1986, 61-172626**
**The portion of the term of this patent subsequent to May 3, 2007, has been disclaimed.**
**Int. Cl.[5] C07K *3/22, 3/20, 3/28, 15/06***
**U.S. Cl. 530—350** **8 Claims**

1. A thrombin binding substance prepared by a process comprising:

successively subjecting human urine to ion exchange chromatography, affinity chromatography employing a column with a thrombin-bound carrier, gel filtration, and molecular weight fractionation, said thrombin-binding substance having the following characteristics:

(a) molecular weight:
46,500±6,000 in reduced condition by SDS PAGE
39,000±10,000 in unreduced condition by SDS PAGE

(b) isoelectric point: pH 5.0–5.3

(c) affinity: strong affinity to thrombin

(d) activity:
(1) capable of promoting the thrombin catalyzed activation of protein C
(2) prolongs clotting time; and

(e) stability; stable to denaturing agents (urea an sodium dodecylsulfate).

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**5,047,504**

## METHOD FOR PURIFYING GRANULOCYTE-MACROPHAGE COLONY STIMULATING FACTOR

**Thomas C. Boone, Newbury Park, Calif., assignor to Amgen, Inc., Thousand Oaks, Calif.**

**Continuation of Ser. No. 43,331, Apr. 28, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 312,294**
**Int. Cl.[5] C07K *3/28***
**U.S. Cl. 530—351** **13 Claims**

1. A process for isolating and purifying GM-CSF from a GM-CSF producing microorganism comprising:

1) lysing the microorganism and separating insoluble material containing GM-CSF from soluble proteinaceous material;

2) solubilizing the GM-CSF present in the insoluble material;

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3) oxidizing the GM-CSF in the presence of a reducing agent;
4) selectively separating correctly folded GM-CSF from incorrectly folded GM-CSF by precipitating the incorrectly folded GM-CSF and retaining correctly folded GM-CSF in solution;
5) recovering purified GM-CSF from the solution.

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**5,047,505**

## HIGH LEVEL EXPRESSION IN E. COLI OF SOLUBLE MATURE HIL-1BETA AND DERIVATIVES WITH ALTERED BIOLOGICAL ACTIVITY

**James J. Huang, Wallingford, Pa., assignor to Du Pont Merck Pharmaceutical Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 6,870, Jan. 27, 1987, abandoned. This application Dec. 18, 1987, Ser. No. 132,185**
**Int. Cl.[5] C07K** *15/06, 13/00*
**U.S. Cl. 530—351** **1 Claim**

1. Derivative of mature hIL-1$\beta$ having amino acid substitutions at the first appearing contiguous Ala-Pro in the mature protein and having enhanced biological activity in comparison to native and *E. coli*-expressed mature-hIL-1$\beta$, wherein the substitutions are Thr and Met for Ala and Pro, respectively.

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**5,047,506**

## METHOD FOR THE PURIFICATION OF FACTOR XIII BY AFFINITY CHROMATOGRAPHY

**Hartmut Löbermann, Schallstadt; Jürgen Römisch, Marburg, and Werner Stüber, Lahntal, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg-/Lahn, Fed. Rep. of Germany**

**Filed Mar. 9, 1989, Ser. No. 321,133**
**Claims priority, application Fed. Rep. of Germany, Mar. 11, 1988, 3808048**
**Int. Cl.[5] C07K** *3/18, 3/28, 15/06*
**U.S. Cl. 530—381** **14 Claims**

1. A method for the purification of the "a" subunit of factor XIII by affinity chromatography, which comprises:
alkylating a solution containing the "a" subunit of factor XIII in the absence of $Ca^{2+}$ and $Mg^{2+}$;
reversibly binding the "a" subunit of factor XIII to a carrier matrix suitable for disulfide exchange reactions in the presence of at least one of $Ca^{2+}$ and $Mg^{2+}$; and
removing the "a" subunit of factor XIII from the carrier matrix by reaction with a reducing agent.

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**5,047,507**

## NOVEL MONOCLONAL ANTIBODIES WITH SPECIFICITY AND HIGH AFFINITY FOR HUMAN CARCINOEMBRYONIC ANTIGEN

**Franz Buchegger, Chexbres, and Jean-Pierre Mach, Lausanne, both of Switzerland, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.**

**Filed Jan. 4, 1989, Ser. No. 293,467**
**Claims priority, application United Kingdom, Jan. 5, 1988, 8800078**
**Int. Cl.[5] C07K** *15/28;* **C12P** *21/08;* **C12N** *5/20;* **A61K** *43/00*
**U.S. Cl. 530—387** **9 Claims**

1. A monoclonal antibody specific for human carcinoembryonic antigen, and derivatives thereof selected from the group consisting of antigen-binding fragments, conjugates with enzymes, fluorescent markers, metal chelates, cytotoxic or cytostatic substances, avidin, biotin, radioactively labelled antibodies and radioactively labelled fragments, characterized in that said antibody and derivatives thereof recognize epitopes of human carcinoembryonic antigen not present on non-specific cross-reacting antigen $NCA_{55}$ or $NCA_{95}$, biliary glycoprotein or granulocytes, and bind to human carcinoembryonic antigen with an affinity of at least $1.3\times10^{10}$ to $1.9\times10^{10}$ liters/mol and having the designation MAb CE25.

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**5,047,508**

## MONOCLONAL ANTIBODY TO MHS-5; A NEW PROBE FOR SEXUAL ASSAULT ANALYSIS

**John C. Herr; Mark Sigman, and William M. Sutherland, all of Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.**

**Continuation-in-part of Ser. No. 741,601, Jun. 5, 1985, Pat. No. 4,741,998. This application Apr. 21, 1987, Ser. No. 42,193**
**Int. Cl.[5] A61K** *39/395;* **C12N** *5/20*
**U.S. Cl. 530—387** **2 Claims**

1. A monoclonal antibody which specifically binds to a seminal vesicle specific antigen, SVSA, wherein SVSA is secreted by principal cells of the seminal vesicle epithelium, and wherein further the antibody is MHS-5.

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**5,047,509**

## ABNORMALLY GLYCOSYLATED VARIANTS OF $A_2$ MACROGLOBULIN

**Bruno Silvestrini, Rome, Italy, and Yan Cheng, Staten Island, N.Y., assignors to Aziende Chimiche Riunite, Rome, Italy**

**Filed Feb. 15, 1989, Ser. No. 311,650**
**Claims priority, application European Pat. Off., Jan. 20, 1989, 89101000.1**
**Int. Cl.[5] C07K** *15/00*
**U.S. Cl. 530—392** **2 Claims**

1. An isolated abnormally glycosylated variant of the protein, $a_2$-macroglobulin, wherein the amount of glycosylation is greater than the glycosylation of $a_2$-macroglobulin occurring in patients without autoimmune disease.

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**5,047,510**

## METHOD OF PURIFICATION OF TRANSFORMING GROWTH FACTOR-BETA

**James L. Cone, Germantown, Md., and Joseph E. DeLarco, Chesterfield, Mo., assignors to Ostuka Pharmaceutical Co. Ltd., Tokyo, Japan**

**Continuation of Ser. No. 141,382, Jan. 7, 1988, abandoned. This application Oct. 11, 1989, Ser. No. 420,704**
**Int. Cl.[5] C07K** *3/02, 3/22, 3/28*
**U.S. Cl. 530—399** **10 Claims**

1. A method for purifying TGF-$\beta$ consisting essentially of:
(1) acid-ethanol extracting platelets:
(2) carrying out cation-exchange separation on the resulting extract of step (1) and isolating the fraction(s) containing TGF-$\beta$ activity: and
(3) carrying out hydrophobic separation on the fraction(s) containing TGF-$\beta$ activity of step (2) and isolating the fraction(s) containing TGF-$\beta$ activity, so as to obtain TGF-$\beta$ purified to homogeneity as determined by SDS-polyacrylamide gel electrophoresis.

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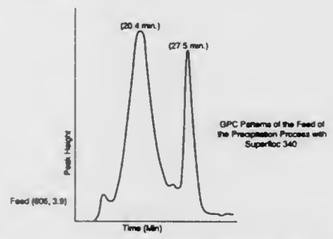
**5,047,511**

## METHOD FOR RECOVERING RECOMBINANT PROTEINS

**Vikram P. Mehrotra, Terre Haute, Ind., assignor to Pitman-Moore, Inc., Lake Forest, Ill.**

**Filed Aug. 28, 1989, Ser. No. 399,021**
**Int. Cl.[5] C07K** *15/14, 15/06, 3/24*
**U.S. Cl. 530—399** **14 Claims**

1. A method for recovering a recombinant somatotropin from a protein solution containing high molecular weight contaminating proteins, those proteins having a molecular weight greater than about 1.5 times the molecular weight of the recombinant somatotropin, and the recombinant somatotropin, comprising:
directly adding to the solution in amounts sufficient to selectively precipitate the high molecular weight contaminating proteins a flocculant with (a) contains a pendant quaternary ammonium group to impart positive charge to the flocculant, (b) is soluble in water, (c) is stable from about pH 4–12, (d) is stable at from about 0°–60° C., and (e) is a polymer having a molecular weight of from about 100,000 to 12 million daltons;




separating the precipitate from the solution; and
recovering the recombinant somatotropin from the solution.

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**5,047,512**

## IMMOBILIZED CYCLOPHILIN AND METHODS OF USING SUCH

**Robert E. Handschumacher, 97 Great Harbor Rd., Guilford, Conn. 06437; Matthew W. Harding, 206 Goffe Ter., New Haven, Conn. 06511, and David W. Speicher, 91 Fawn Dr., Cheshire, Conn. 06410**

**Division of Ser. No. 730,776, May 3, 1985, Pat. No. 4,722,999. This application Jun. 23, 1987, Ser. No. 65,395**
**Int. Cl.[5] C07K** *17/12;* **G01N** *33/566, 33/53*
**U.S. Cl. 530—402** **15 Claims**

1. Cyclophilin, a homogeneous cytosolic binding protein having a specific binding activity above 50 ug cyclosporin A per mg of protein bound and a molecular weight of about 17,600 daltons, immobilized on a support.

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**5,047,513**

## METAL CHELATE RESINS

**Heinz Döbeli, Ziefen, and Frich Hochuli, Arisdorf, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**Continuation of Ser. No. 396,718, Aug. 22, 1989, abandoned, which is a division of Ser. No. 72,452, Jul. 14, 1987, Pat. No. 4,877,830. This application Oct. 15, 1990, Ser. No. 596,634**
**Int. Cl.[5] A23J** *1/00;* **C07K** *3/00, 13/00, 15/00*
**U.S. Cl. 530—412** **2 Claims**

1. A method for the purification of proteins comprising subjecting said proteins to affinity chromatography on a metal chelate resin of the formula:

Carrier
matrix-spacer-NH—$(CH_2)x$—CH(COOH-)—$N(CH_2COO^-)_2Ni^{2+}$

wherein X=2–4.

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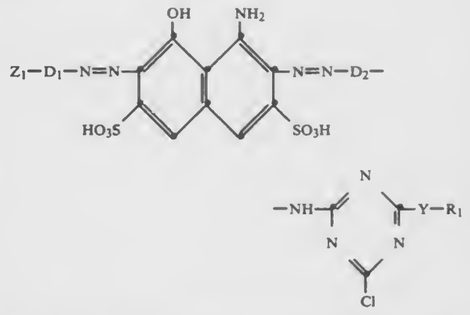
**5,047,514**

## BIREACTIVE PRIMARY DISAZO DYES CONTAINING 1-AMINO-8-HYDROXYNAPHTHALENE-3,6 DISULFONIC ACID AS COUPLING COMPONENT

**Peter Scheibli, Bottmingen, and Karl Seitz, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 898,797, Aug. 20, 1986, Pat. No. 4,713,082, which is a continuation of Ser. No. 771,127, Aug. 30, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 116,963**
**Claims priority, application Switzerland, Aug. 30, 1984, 4154/84-3**
**Int. Cl.[5] C09B** *62/08, 62/085;* **D06P** *1/382, 3/66*
**U.S. Cl. 534—637** **3 Claims**

1. A reactive dye of the formula




in which $D_1$ *and* $D_2$ are each phenylene unsubstituted or substituted by sulfo, $Z_1$ is vinylsulfonyl, $\beta$-chloroethylsulfonyl, $\beta$-sulfatoethylsulfonyl, $\beta$-acetoxyethylsulfonyl or $\beta$-chloroethylsulfonylbutyrylamino, Y is sulfur, and $R_1$ is $C_1$–$C_4$-alkyl or $C_1$–$C_4$-alkoxy-$C_1$–$C_4$-alyl.

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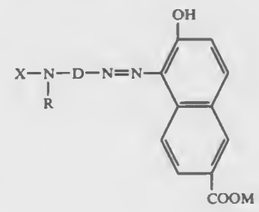
**5,047,515**

## WATER-SOLUBLE CONTAINING A FIBER-REACTIVE TRIAZINE RADICAL AND 6-CARBOXY-2-NAPHTHOL AS COUPLING COMPONENT, SUITABLE AS DYES

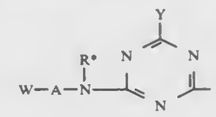
**Hartmut Springer, Königstein/Taunus, and Kurt Hussong, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Continuation of Ser. No. 461,700, Jan. 8, 1990, abandoned, which is a continuation of Ser. No. 295,892, Jan. 11, 1989, abandoned. This application May 21, 1990, Ser. No. 526,173**
**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1988, 3800690**
**Int. Cl.[5] C09B** *62/085, 62/51;* **D06P** *1/38*
**U.S. Cl. 534—638** **7 Claims**

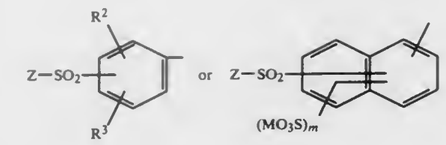
1. A monoazo compound of the formula




where
D is para- or meta-phenylene, each substituted by sulfo,
R is hydrogen,
M is hydrogen or alkali metal,
X is a group of the formula




where
Y is chlorine,
R° is hydrogen,
A is a direct bond and
W is a group of the formula



or



where
$R^2$ is hydrogen,
$R^3$ is hydrogen,
Z denotes vinyl or is ethyl which is substituted in the $\beta$-position by a substituent which can be eliminated by alkali to form a vinyl group,
M is the number zero, 1 or 2 (in the case of m being zero, this group denoting hydrogen) and
M has the above mentioned meaning.

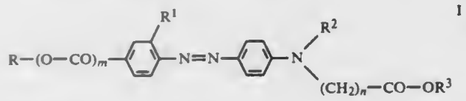
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**5,047,516**
**AZO COMPOU7ND SUITABLE FOR USE IN NON-LINEAR OPTICS**

**Simon Allen, Cheadle Hulme, and Paul F. Gordon, Rochdale, both of England, assignors to Imperial Chemical Industries PLC, London, England**

Filed May 5, 1988, Ser. No. 190,672
Claims priority, application United Kingdom, May 5, 1987, 8710572; Jnl. 24, 1987, 8717594
Int. Cl.[5] C09B *29/01, 29/085;* G02F *1/13*
U.S. Cl. 534—649 7 Claims

1. An azo compound of the formula:



wherein
R is a non-hydrophilic aliphatic or cycloaliphatic group containing from 8 to 40 carbon atoms;
m is 0 or 1;
$R^1$ is $NO_2$, CN or $COOR^2$;
$R^2$ is H or $C_{1-4}$-alkyl;
n is from 1 to 4 and
$R^3$ is H, a metal or a group containing a tetravalent N atom wherein the N atom is attached directly to the O atom.

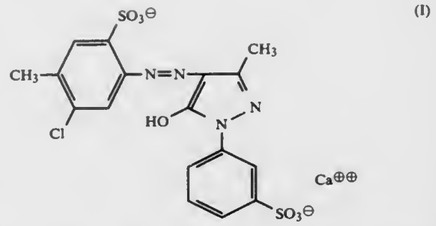
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**5,047,517**
**LAKED PYRAZOLONE AZO PIGMENT, PROCESS FOR ITS PREPARATION AND ITS USE**

**Walter Deucker, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

Filed Sep. 28, 1989, Ser. No. 413,853
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833226
Int. Cl.[5] C09B *63/00;* D06P *1/44, 3/79*
U.S. Cl. 534—784 4 Claims

1. A water-insoluble monoazo compound of the formula (I)



(I)

2. A colorant for the pigmenting of natural and synthetic materials comprising the monoazo compound of claim 1.

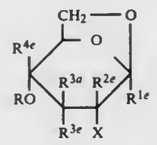
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**5,047,518**
**1,6-ANHYDRO-$\beta$-HEXOPYRANOSE DERIVATIVES AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS**

**Richard H. Furneaux, Wilton; Ronald F. Henzell, Hamilton, and Peter C. Tyler, Northland, all of New Zealand, assignors to Her Majesty the Queen in right of New Zealand, Wellington, New Zealand**

Continuation of Ser. No. 729, Jan. 6, 1987, abandoned. This application Apr. 10, 1990, Ser. No. 507,305
Claims priority, application New Zealand, Jan. 8, 1986, 214774
Int. Cl.[5] C07H *3/10;* A01N *43/00*
U.S. Cl. 536—4.1 22 Claims

1. Herbicidal and/or plant growth regulatory compositions comprising, together with a carrier and/or surface-active agent, an effective amount of at least one herbicidal and/or plant growth regulatory active agent selected from compounds of formula (I)



(I)

in which R represents a substituted or unsubstituted aralkyl group,
X represents an O-, N- or S-linked organic group, a substituted or unsubstituted hydrocarbyl group, a halogen atom, a hydroxy, amino, alkoxyamino, nitro, cyano, azido, sulpho or phospho group,
$R^{1e}$ represents a hydrogen atom or a substituted or unsubstituted hydrocarbyl group, or a formyl group;
$R^{2e}$ represents a hydrogen atom, a hydroxy group or a substituted or unsubstituted hydrocarbyl or O-linked hydrocarbyl group or, together with the group X, $R^{2e}$ may represent a ketonic oxygen atom —O— or a group of formula $—CH_2O—$;
$R^{3a}$ represents a hydrogen atom, a hydroxy group or a substituted or unsubstituted alkoxy, alkenyloxy, aralkoxy or $C_{1-4}$ hydrocarbyl group;
$R^{3e}$ represents a hydrogen atom, a hydroxy group or a substituted or unsubstituted hydrocarbyl or O-linked hydrocarbyl group; and
$R^{4e}$ represents a hydrogen atom or a substituted or unsubstituted hydrocarbyl group, and enantiomers and salts thereof.



**5,047,519**
**ALKYNYLAMINO-NUCLEOTIDES**

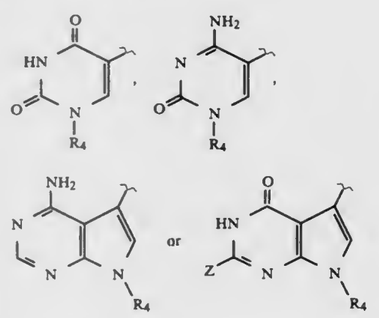
**Frank W. Hobbs, Jr., and Anthony J. Cocuzza, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

Continuation-in-part of Ser. No. 881,372, Jul. 2, 1986, abandoned. This application Jun. 12, 1987, Ser. No. 57,565
Int. Cl.[5] C07H *1/00*
U.S. Cl. 536—23 12 Claims

6. A labeled alkynylamino-nucleotide having the structure:

$$Nuc—C{\equiv}C—R_1—NR_2R_3$$

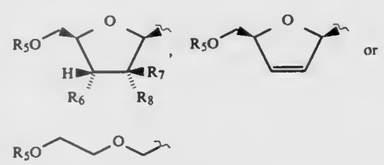
wherein
$R_1$ is a diradical moiety of 1–20 atoms.
$R_2$ is H, $C_1$–$C_4$ alkyl or a protecting group, and
Nuc is $R_4$-Het having the structure



or



Z is H or $NH_2$, and
$R_4$ is



or



wherein
$R_5$ is H, $PO_3H_2$, $P_2O_6H_3$, $P_3O_9H_4$ or
(i) when $R_7$=$R_8$=H, then $R_6$=H, OH, R, $N_3$ or $NH_2$; or
(ii) when $R_7$=H and $R_8$=OH, then $R_6$=H or OH; or
(iii) when $R_7$=OH and $R_8$=H, then $R_6$=OH,
and $R_{R3}$ is a reporter group.

9. A process of preparing 7-(3-amino-1-propynyl)2′,3′-dideoxyguanosine 5′-triphosphate comprising the steps of:
(A) reacting 6-methoxy-2-methylthio-7-deazapurine with 1-chloro-2-deoxy-3,5-di-O-p-toluoyl-α-D-ribofuranose in presence of sodium hydride;
(B) hydrolyzing the ester product 9 of step (A) under basic condition to diol 10;
(C) protecting the 5-OH position in diol 10 with a trityl group;
(D) removing the 3-OH group by reducing an intermediate thionocarbonate with a tin hydride reducing agent;
(E) treating the dideoxydeazapurine 12 resulting from step (D) with N-iodosuccinimide to form the 7-iodo derivative 13;
(F) reacting compound 13 with sodium thiocresolate in hexamethylphosphoramide to form the 7-deazapurin-6-one 14;
(G) treating compound 14 successively with meta-chloroperoxybenzoic acid and ammonia to obtain the 7-deazaguanosine 15;
(H) coupling N-propargyltrifluoroacetamide to the deprotected 7-iodo compound 16 to obtain 7-(3-trifluoroacetamido-1-propynyl)-2′,3′-dideoxy-7-deazaguanosine; and
(I) reacting the product of step (H) sequentially with phosphorous oxychloride and pyrophosphate to convert it to the 5′-triphosphate followed by deprotection.

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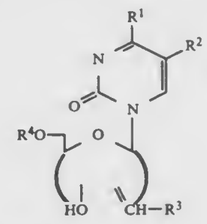
**5,047,520**
**2′-ALKYLIDENEPYRIMIDINE NUCLEOSIDE DERIVATIVES, PROCESS FOR PRODUCTION THEREOF, AND USES THEREOF**

**Akira Matsuda; Tohru Ueda; Kenji Takenuki, all of Sapporo, and Haruhiko Machida, Choshi, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Chiba, Japan**

PCT No. PCT/JP88/00278, § 371 Date Nov. 18, 1988, § 102(e) Date Nov. 18, 1988, PCT Pub. No. WO88/07049, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 17, 1988, Ser. No. 295,948
Claims priority, application Japan, Mar. 19, 1987, 62-65405; Jan. 30, 1988, 63-20032
Int. Cl.[5] A01N *43/04;* A61K *31/70;* C07H *17/02, 15/12*
U.S. Cl. 536—23 11 Claims

1. A 2′-alkylidenepyrimidine nucleoside derivative represented by formula:

[I]



wherein $R^1$ is an amino or hydroxy group, $R^2$ is a hydrogen or halogen atom or a lower alkyl group of 1 to 8 carbon atoms, $R^3$ is a hydrogen atom or a lower alkyl group of 1 to 8 carbon atoms, and $R^4$ is a hydrogen atom or a phosphate moiety, or a salt thereof.

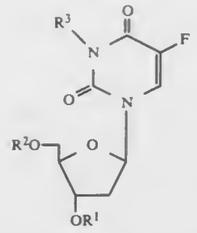
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**5,047,521**
**5-FLUOROURACIL DERIVATIVES**

**Setsuro Fujii, Kyoto; Mitsuru Hirohashi, Otsu; Yoshihito Yamamoto, Otsu, and Yutaka Kojima, Otsu, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan**

PCT No. PCT/JP87/00275, § 371 Date Feb. 9, 1988, § 102(e) Date Feb. 9, 1988
PCT Filed Apr. 30, 1987, Ser. No. 150,407
Claims priority, application Japan, Apr. 30, 1986, 61-101285; Feb. 27, 1987, 62-45754
Int. Cl.[5] C07H *19/00*
U.S. Cl. 536—23 26 Claims

1. A compound the formula



wherein $R^1$ and $R^2$ are each a hydrogen atom, acyl group, phenyl-$C_1$- $C_6$ alkyl group having a group $R^xOCO$—on the phenyl ring, or a group —$(A)_nB$, and wherein at least one of $R^1$ and $R^2$ is a group —$(A)_nB$ wherein n is 1, $R^3$ is a hydrogen atom or an acyl group, with the proviso that when $R^1$ is a hydrogen atom or acyl group, $R^2$ is not a hydrogen atom or acyl group, the acyl group represented by $R^1$, $R^2$ and $R^3$ being one selected from the class consisting of:

(a) $C_1$-$C_6$ alkanoyl groups,

(b) benzoyl groups optionally having 1 to 3 substituents selected from the class consisting of $C_1$-$C_6$ alkyl group, $C_1$-$C_6$ alkoxy group and halogen atom,

(c) phenoxycarbonyl group, and

(d) pyridyloxycarbonyl arylenecarbonyl groups represented by the formula



wherein $R^x$ is a pyridyl group optionally having 1 to 4 substituents selected from the class consisting of hydroxyl group, oxo group, halogen atom, amino group, carboxyl group, cyano group, nitro group, carbamoyl group, ($C_1$-$C_6$ alkyl)carbamoyl group, carboxy-($C_1$- $C_6$ alkyl)-carbamoyl group, ($C_1$-$C_6$ alkoxy)carbonyl-($C_1C_6$ alkyl)-carbamoyl group, phenylcarbamoyl group optionally having on the phenyl ring 1 to 3 substituents selected from halogen atom, $C_1$-$C_6$ alkyl group and $C_1$-$C_6$ alkoxy group, $C_1$-$C_6$ alkyl group, $C_2$-$C_6$ alkenyl group, ($C_1$-$C_6$ alkoxy)-carbonyl group, tetrahydrofuranyl group, tetrahydropyranyl group, $C_1$-$C_6$ alkoxy-$C_1$-$C_6$ alkyl group, phenyl-$C_1$-$C_6$ alkoxy-$C_1$-$C_6$ alkyl group, $C_1$-$C_6$ alkylthio-$C_1$-$C_6$ alkyl group, $C_1$-$C_6$ alkanoyloxy group, benzoyloxy group optionally having 1 to 3 substituents selected from halogen atom, $C_1$-$C_6$ alkyl group and $C_1$-$C_6$ alkoxy group, and phenoxycarbonyloxy group, Y being a phenylene group, naphthalene group, pyridinediyl group, pyrazinediyl group, furandiyl group or 4-pyridon-1-$C_1$-$C_6$ alkyl-diyl group, the pyridyl group represented by $R^x$ in the phenyl $C_1$-$C_6$ alkyl group with a group $R^xOCO$— on the phenyl ring being the same as the group $R^x$ described above under the item (d), A in the group —$(A)_nB$ being a $C_1$-$C_6$ alkylene group, and B in said group being a heterocyclic group such that 1 to 3 substituents may be attached to the heterocyclic ring, the substituents being selected from the class consisting of hydroxyl group, cyano group, halogen atom, $C_1$-$C_6$ alky group, $C_1$-$C_6$ alkoxy group, phenyl group, $C_1$-$C_6$ alkoxy group having 1 or 2 phenyl groups optionally substituted with $C_1$-$C_6$ alkoxy group or halogen atom on the phenyl ring, phenoxy group optionally substituted with halogen atom or $C_1$- $C_6$ alkoxy group on the phenyl ring, nitro group, oxo group, benzoyloxy group, ($C_1$-$C_6$ alkoxy)carbonyl group, $C_1$-$C_6$ alkanoyloxy group, phenyl-$C_1$-$C_6$ alkylthio group and a group of $R^xOCO$— wherein $R^x$ is as defined above, the heterocyclic ring being selected from the class consisting of pyridine, pyrimidine, pyrazine, pyridazine, 1,3,5-triazine, tetrazole, 1,2,4-thiadiazole, 1,2,4-thiadiazole, 1,2,3-thiadiazole, thiazole, isothiazole, pyrrole, 1,4-dioxine, 1,3-dioxine, 1,2-dioxine, quinoline, isoquinoline, 1,5-naphthyridine, 1,6-naphthyridine, 1,7-naphthyridine, 1,8-naphthyridine, benzofuran, benzothiazole, quinoxaline, quinazoline, cinnoline, phthalazine, $\beta$-naphthoquinone and benzo-(f)-quinoline, and n being 0 or 1.

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**5,047,522**

**ISOLATED REPETITIVE DNA OF PROTOZOAN PARASITES**

**Nadia Nogueira, Princeton, N.J., and Paul Lizardi, New York, N.Y., assignors to Rockefeller University, New York, N.Y.**

**Division of Ser. No. 38,959, Apr. 16, 1987, Pat. No. 4,801,530, which is a continuation of Ser. No. 584,646, Feb. 29, 1984, abandoned, which is a continuation-in-part of Ser. No. 522,811, Aug. 12, 1983, abandoned. This application Jul. 11, 1988, Ser. No. 217,381**

**Int. Cl.[5] C07H** *15/12, 17/00*

**U.S. Cl. 536—27** **6 Claims**




1. Isolated *T. cruzi* DNA which is repeated more than once in the organism and

(a) has nucleotide sequence

5'-CTCTTGCCCACACGGGTGCTGCACTCGGCTGA
TCGTTTTCGAGCGGCTGCTGCATCACACGTTG
TCGTCCAAATTTTTGTTTCCGATTGTGAATGGTG
GCAATCGGAAACACTCTCTGTCAATATCTGTT
TGCGTGTTCACACACTGGACACCAAACAACCCTGA
ACTATCCGCTGCTTGGAGGAATTTCGCGAG-3'

or

(b) the nucleotide sequence complementary to it or its double stranded form.

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**5,047,523**

**NUCLEIC ACID PROBE FOR DETECTION OF NEISSERIA GONORRHOEA**

**Derek Woods, Flemington; M. Jane Madonna, Middlesex, both of N.J., and Linda S. Mulcahy, Yardley, Pa., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.**

**Filed Aug. 2, 1988, Ser. No. 227,526**

**Int. Cl.[5] C07H** *15/12;* **C12Q** *1/68, 1/70;* **C12N** *11/02*

**U.S. Cl. 536—27** **16 Claims**

1. A nucleic acid probe, consisting essentially of at least one nucleotide sequence having a length of from 30 to 600 bases selected from the group consisting of

5'...AGCTTTTTGGCGCTGCGTCCGGCTAACT-
GATATCTGCATGGAGGCAACCGGC AGTTAT-
TATGAAGAAGTTGCCGACTACTTCGCGCAG-
TATTACAGCGTTTACGT AGTGAACCCGCT-
GAAAATAAGCAAGTATGCAGAAAGCAGGTT-
CAAGCGAACCAAA ACAGACAAACAGGATG-
CAAAAGCTGATAGCGCTCAG-
TATTGCCGGTCGCGGAAAGA AAGCGAGCTT-
GTAAAGAGGCAGAAGCTACGGACACGAG-
CAATACAGGCTTTTACGG ATGACGCCAGC-
TAACGCGTCAATCAAAGCGTAGCGCTGCAT-
GAAACGTCTACAGGC TAAGATAG...3' and



5'..ATTCCCGGGGATCGTAATCTCCGCCTTTCT-
TATGTACGTGATACGCAATAAC GGCGAGTT-
TACGCATCAATGCTGCGATGATGACTTTTT-
TAGGCTTCTTCTTTT CTTCCAGTCTTGCTAT-
GAAGTCGGGAAATGCCCTTATGCGGTATG-
CGACATGGCCGG CATAAACAAGACGGCGC-
GTAATTTCCTGTTGCCAAACTTGGT-
CAGTTTGCCTTTTCC CCTTACGCTTGTCCC-
GGATTGACTTTTTGTTGCGGGCTTAAGCTG-
CGAACGCTGCAA ATTTGTTTGATGTTT-
CAAATTTCGAAGATGTTAGATGATGAAACAC-
TAGCTGCGTC ATTCTGCTATGCGGTATGTT-
CAGAGCTCAGCTCTGACGTAGCTTCG...3'; said probe capable of hybridizing with Neisseria gonorrhoea chromosomal DNA.

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**5,047,524**

**AUTOMATED SYSTEM FOR POLYNUCLEOTIDE SYNTHESIS AND PURIFICATION**

**William A. Andrus, San Francisco; Christie D. McCollum, Foster City, and Gerald Zon, San Carlos, all of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.**

**Filed Dec. 21, 1988, Ser. No. 287,890**

**Int. Cl.[5] C07H** *21/02, 21/04*

**U.S. Cl. 536—27** **10 Claims**

1. A method for synthesizing a polynucleotide of a predetermined sequence, the method comprising the steps of:

(a) providing a nonswellable porous polystyrene support, remaining substantially mechanically rigid during synthesis;

(b) providing a 5'-tritylated protected nucleoside, the 5'-tritylated protected nucleoside being attached to the nonswellable porous polystyrene support, such that the 5'-tritylated protected nucleoside forms a protected correct-sequence chain;

(c) detritylating the correct-sequence chain to free a 5'-hydroxyl;

(d) reacting with the 5'-hydroxyl of the correct-sequence chain a 5'-tritylated protected nucleoside monomer selected from the group consisting of 5'-tritylated protected nucleoside-3'-phosphoramidite and 5'-tritylated protected nucleoside-3'-hydrogen phosphonate to form either a protected correct-sequence chain or a failure sequence, the failure sequence having a 5'-hydroxyl;

(e) repeating steps (c) and (d) until the polynucleotide of the predetermined sequence is obtained;

(f) cleaving the polynucleotide from the nonswellable porous polystyrene support to form a cleavage mixture, the cleavage mixture containing tritylated polynucleotide and untritylated failure sequences; and

(g) purifying the polynucleotide by exposing the cleavage mixture to a hydrophobic adsorbent, washing the hydrophobic adsorbent to preferentially remove untritylated failure sequences, detritylating the 5'-hydroxyl of the tritylated polynucleotide, and eluting the untritylated polynucleotide from the hydrophobic adsorbent.

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**5,047,525**

**9-HALOPROSTAGLANDIN CLATHRATES AND THEIR USE AS MEDICINES**

**Bernd Radüchel; Werner Skuballa; Olaf Loge, and Johann-Wilbelm Tack, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**

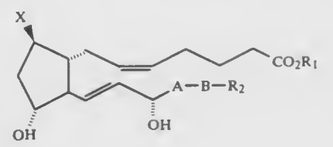
**Continuation of Ser. No. 349,374, May 8, 1989, abandoned, which is a continuation of Ser. No. 205,966, Jun. 13, 1988, abandoned, which is a continuation of Ser. No. 931,590, filed as PCT DE86/00039 on Feb. 4, 1986, abandoned. This application Jul. 6, 1990, Ser. No. 549,045**

**Claims priority, application Fed. Rep. of Germany, Feb. 4, 1985, 3504044**

**Int. Cl.[5] C08B** *37/16;* **A01N** *43/04*

**U.S. Cl. 536—103** **9 Claims**

1. A pharmaceutical preparation comprising as the active component a $\beta$-cyclodextrin clathrate of a prostaglandin of the formula




wherein

$R_1$ is hydrogen or alkyl of up to 10 carbon atoms,

$R_2$ is alkyl, cycloalkyl, or optionally substituted phenyl,

A and B jointly mean a direct bond or

A means alkylene of up to 10 carbon atoms and

B means an oxygen atom, a direct bond, or a —C≡C—bond, and

X means a chlorine or fluorine atom,

and a pharmaceutically acceptable excipient.

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**5,047,526**

**DEHYDROGENATIVE SILYLATION PROCESS OF ORGANIC COMPOUNDS HAVING ACTIVE HYDROGEN**

**Keiji Yamamoto, Yokohama, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Japan**

**Filed Jun. 22, 1989, Ser. No. 369,964**

**Claims priority, application Japan, Jun. 29, 1988, 63-162173**

**Int. Cl.[5] C07F** *7/08, 7/18, 7/10;* **C07D** *205/00*

**U.S. Cl. 540—200** **18 Claims**

1. A silylation process which comprises reacting tert-butyldimethylsilane of the formula, $(CH_3)_3CSiH(CH_3)_2$, and an organic compound containing an active hydrogen reactive with the t-butyldimethylsilane, the reaction being carried out at a temperature of from 20° C. to 200° C., optionally in the presence of a dehydrogenative silylation catalyst.

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**5,047,527**

**PROCESS FOR THE PREPARATION OF MONOFUNCTIONALIZED CYCLIC TETRAMINES**

**Henri Handel, Brest; Jean-Jacques Yaouanc, Locmaria-Plouzane; Ayoub F. Zegzouti, Brest; Denis Malouala, Brest; Hervé des Abbayes, Brest; Jean-Claude Clement, Coat-Meal; Hélène Bernard, Plouguerneau, and Guénaëlle Le Gall, Fouesnant, all of France, assignors to Centre National de la Recherche Scientifique (CNRS), Paris, France**

**Filed Mar. 19, 1990, Ser. No. 495,045**

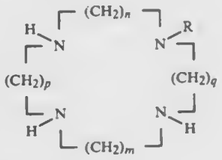
**Claims priority, application France, Mar. 20, 1989, 89 03600**

**Int. Cl.[5] C07D** *257/02*

**U.S. Cl. 540—474** **12 Claims**

1. Process for the preparation of monofunctionalized cyclic tetramines of formula I

(1)




in which:

m=n=p=q=2, or

m=n=2 ; p=q=3, or

m=2 ; n=p=q=3, or

n=2 ; m=p=q=3, or

m=n=p=q=3, or

m=n=3 ; p=q=4, and

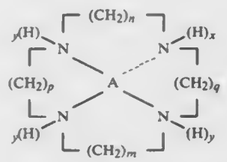
R denotes a saturated or unsaturated, especially polymeriz-

VOL 1130 ISS 2 SE 10 1991 UMI



able, substituted or unsubstituted alkyl radical, comprising the steps of:

preparing a triprotected tetraazacycloalkane compound, of formula II



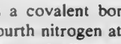
(II)

in which

x and y denote, independently of each other, 1 or 0,

at least three of the four nitrogen atoms are bonded, via covalent bonds, with A, where A is selected from the group consisting of a Boron atom, P(O) group, P(+) group and a metal carbonyl group M(CO), with M being Cr, Mo or W, and

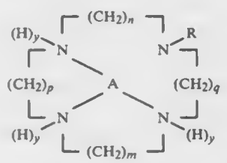
the broken line denotes a covalent bond which may be formed between the fourth nitrogen atom and A; in that the triprotected tetraazacycloalkane compound of formula III



(III)

in which:

R has the meaning given in connection with formula I, and X denotes a halogen or a tosylate radical, to obtain a triprotected and monofunctionalized tetraazacycloalkane compound of formula IV



(IV)

and in that A is removed from the compound of formula IV to obtain the corresponding compound of formula I.

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**5,047,528**

## PROCESS OF SYNTHESIS OF VINBLASTINE AND VINCRISTINE

**James P. Kutney, Vancouver; Lewis S. L. Choi, Bunaby, both of Canada; Jun Nakano, Moriyama; Hiroki Tsukamoto, Kariya, both of Japan; Camille A. Boulet, Medicine Hat, Canada, and Michael McHugh, Glasgow, Scotland, assignors to University of Bristish Columbia, Vancouver, Canada**

**Continuation-in-part of Ser. No. 11,810, Feb. 6, 1987, abandoned. This application Aug. 2, 1988, Ser. No. 228,821**

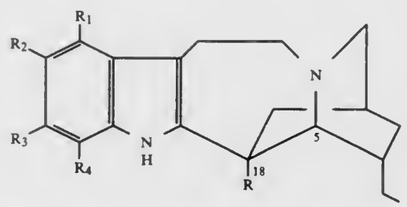
**Claims priority, application Canada, Jan. 22, 1987, 527897; Aug. 6, 1987, 543832**

**Int. Cl.[5] C07D *519/04***

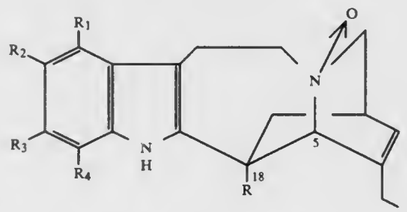
**U.S. Cl. 540—478** **39 Claims**

1. A process for the production of dimer alkaloid compounds comprising the steps of:

(a) oxidizing an indole unit having a bridge nitrogen and being represented by the following formula:



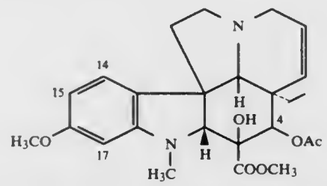
wherein R represents hydrogen or COO-alkyl and $R_1$, $R_2$, $R_3$ and $R_4$ independently represent H, OH, O-alkyl, OCO-alkyl, alkyl or aryl groups, said oxidation being carried out in the cold, at a temperature from about −77° C. to about +40° C, thereby oxidizing the bridge nitrogen of said indole unit and forming an N-oxide derivative as represented by the following formula:



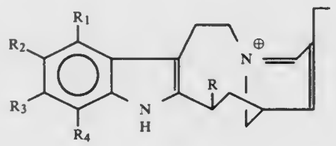
wherein $R_1$, $R_2$, $R_3$, and $R_4$ are the same as above, and without isolating said derivative;

(b) treating said N-oxide derivative in the presence at least of one member selected from of the group consisting of acetic anhydride, halogenated acetic anhydride, and acetyl chloride, to effect a Polonovski-type fragmentation reaction;

(c) without isolating the product of step (b), stereoscopically coupling said product of step (b) with a dihydroindole unit represented by the formula:

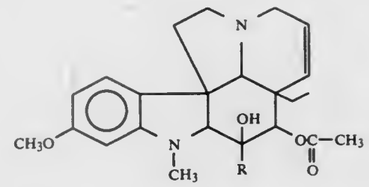


said coupling being conducted in the presence of at least one member selected from the group consisting of acetic anhydride, halogenated acetic anhydride, and acetyl chloride at a low temperature of about −70° to about +40° C., under inert conditions, to form a first iminium intermediate, represented by the formula:



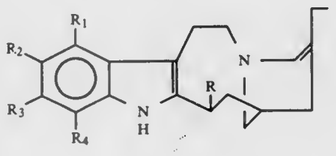


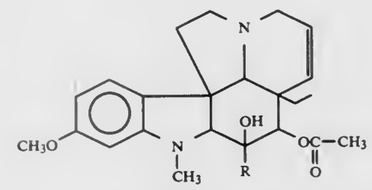
-continued



wherein R═$COOCH_3$ and $R_1$, $R_2$, $R_3$, and $R_4$ are the same as defined above;

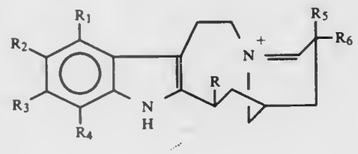
(d) reducing said first iminium intermediate by reaction with a 1,4-dihydropyridine compound, thereby forming an enamine intermediate, represented by the following formula:

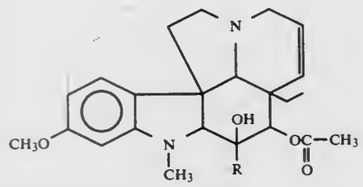




wherein R═COOCH, and $R_1$, $R_2$, $R_3$, and $R_4$ are the same as defined in step (c);

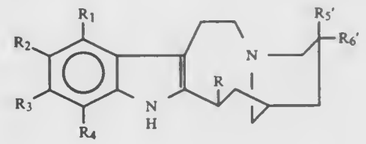
(e) transforming said enamine intermediate obtained in step (d) by oxidation under controlled aeration conditions to a second iminium intermediate, as represented by the following formula:

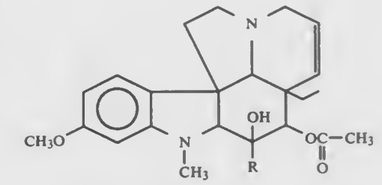




wherein R═$COOCH_3$ and $R_1$, $R_2$, $R_3$, and $R_4$ are the same as defined in step (c), $R_5$ is OOH or $C_2H_5$ and $R_6$ is OOH or $C_2H_5$, with the proviso that $R_5$ and $R_6$ cannot be the same; and

(f) reducing the second iminium intermediate obtained in step (e) to form said dimer alkaloid compounds, represented by the formula:





wherein R, $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ are the same as defined in step(e) and R'5 and R'6 are OH or $C_2H_5$, with the proviso that R'5 and R'6 cannot be the same.

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**5,047,529**

## PHENYLSULFONES AND CYCLIZATION PRODUCTS THEREOF

**Manfred Patsch, Wachenheim; Klaus Pandl, and Martin Fischer, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

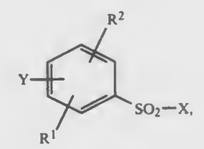
**Filed Mar. 13, 1990, Ser. No. 492,837**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3911975**

**Int. Cl.[5] C07D *279/16***

**U.S. Cl. 544—52** **2 Claims**

1. A phenylsulfone of formula I



(I)

in which

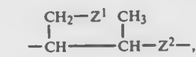
$R^1$ is hydrogen, halogen, $C_1$–$C_4$-alkyl, nitro, hydroxysulfonyl, carboxyl, the radical $—NR^3R^4$,

in which $R^3$ and $R^4$ are the same or different and denote hydrogen, $C_1$–$C_4$-alkyl or $C_2$–$C_4$-alkyl substituted by hydroxy, $C_1$–$C_4$-alkanoyloxy, $C_1$–$C_4$-alkoxy, hydroxysulfonyl, chlorine or bromine,

or the radical $S(O)_nR^5$,

in which n is ) or 2 and $R^5$ denotes $C_1$–$C_4$-alkyl or $C_2$–$C_4$-alkyl substituted by hydroxy, chlorine, bromine, $C_1$–$C_4$-alkoxy, hydroxysulfonyl or sulfato,

with $R^2$ in the ortho-position relative to the group $SO_2$—X, $R^2$ and X together denote the radical



in which

$Z^1$ is hydroxy, chlorine, $C_1$–$C_4$-alkanoyloxy, $C_1$–$C_4$-alkylsulfonyloxy, phenysulfonyloxy, o- or p-tolylsulfonyloxy or sulfato and

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$Z^2$ is imino or $C_1$–$C_4$-alkylimino optionally substituted by hydroxy, 2-hydroxyethylthio or 2-hydroxyethylsulfonyl, and

Y denotes amino, $C_1$–$C_4$-alkanoylamino or nitro.

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**5,047,530**

## ARYLENEDIAMINE SUBSTITUTED TRIAZINES

**Edward L. Wheeler, Watertown; Franklin H. Barrows, Naugatuck; Robert J. Franko, Beacon Falls, and Wadim Batorewicz, New Haven, all of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.**

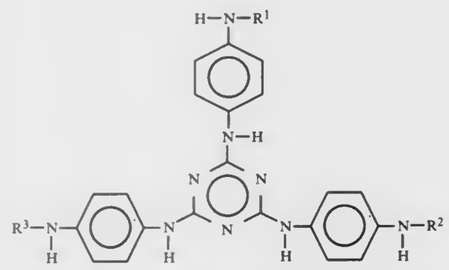
**Division of Ser. No. 90,298, Aug. 28, 1987, Pat. No. 4,794,135. This application Oct. 5, 1988, Ser. No. 254,005**

**The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.**

**Int. Cl.[5] C07D** *251/70*

**U.S. Cl. 544—197** **13 Claims**

1. A compound of the general formula:



(I)

in which $R^1$, $R^2$ and $R^3$ are radicals independently selected from a $C_3$–$C_{18}$ branched or linear alkyl, or a $C_3$–$C_{12}$ cycloalkyl or a $C_3$–$C_{12}$ cycloalkyl substituted with one or more $C_1$–$C_{12}$ alkyl groups.

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**5,047,531**

## PIPERIDINE-TRIAZINE COMPOUNDS FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

**Giuseppe Cantatore, Bitonto, and Graziano Vignali, Sasso Marconi, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

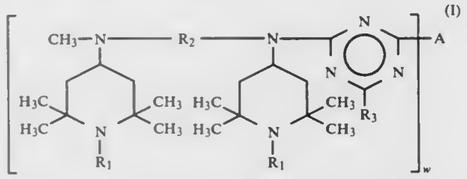
**Filed Aug. 2, 1989, Ser. No. 389,152**

**Claims priority, application Italy, Aug. 4, 1988, 21644 A/88**

**Int. Cl.[5] C07D** *251/50, 251/70;* **C08K** *5/34;* **C08L** *25/06*

**U.S. Cl. 544—198** **8 Claims**

1. A compound of formula I

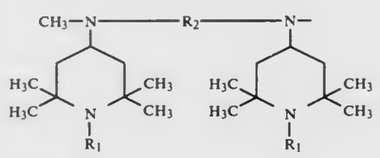


(I)

in which $R_1$ is hydrogen, $C_1$–$C_8$alkyl, 0°, OH, NO, $CH_2CN$, $C_1$–$C_{18}$alkoxy, $C_5$–$C_{12}$cycloalkoxy, $C_3$–$C_6$alkenyl, $C_7$–$C_9$phenylalkyl which is unsubstituted or mono, di-or tri-substituted on the phenyl by $C_1$–$C_4$alkyl, $C_1$–$C_8$-acyl or $C_2$–$C_4$alkyl substituted in the 2-, 3- or 4-position by OH;

$R_2$ is $C_2$–$C_{12}$alkylene;

$R_3$ is a group of formula II

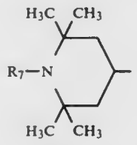


(II)

with $R_1$ and $R_2$ being as defined above, or $R_3$ is a group —$OR_4$, —$SR_4$ or



in which $R_4$ is $C_1$–$C_{18}$alkyl, $C_5$–$C_{12}$cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by $C_1$–$C_4$alkyl, $C_3$–$C_1$.$_8$alkenyl, phenyl which is unsubstituted or mono, di- or tri-substituted by $C_1$–$C_4$alkyl, $C_7$–$C_9$-phenylalkyl which is unsubstituted or mono, di- or tri-substituted on the phenyl by $C_1$–$C_4$alkyl, or a group of the formula (III)



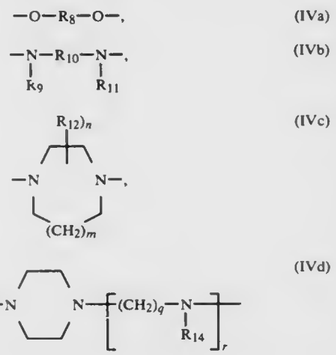
(III)

where $R_7$ has any of the meanings given for $R_1$;

$R_5$ and $R_6$ which can be identical or different are hydrogen, $C_1$–$C_{18}$alkyl, $C_5$–$C_{12}$cycloalkyl which is unsubstituted or mono, di- or tri-substituted by $C_1$–$C_4$alkyl, $C_7$–$C_9$-phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by $C_1$–$C_4$alkyl, $C_2$–$C_4$alkyl substituted in the 2-, 3- or 4-position by OH, by $C_1$–$C_8$alkoxy or by di-($C_1$–$C_4$alkyl)-amino, $C_3$–$C_{18}$-alkenyl, tetrahydrofurfuryl or a group of the formula (III), or $R_5$ and $R_6$, together with the nitrogen atom to which they are linked, form part of a 5-membered to 7-membered heterocyclic ring which is 1 -pyrrolidyl, 1-piperidyl, 4-morpholinyl, 4-methyl-1-piperazinyl, 1-hexahydroazepinyl, 5,57-trimethyl-1-homopiperazinyl or 4,5,5,7-tetramethyl-1-homopiperazinyl; and

w is an integer from 2 to 6; and when w is 2,

A is one of the groups of the formula (IVa)–(IVd)



(IVa)

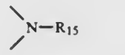
(IVb)

(IVc)

(IVd)

in which $R_8$ is $C_2$–$C_{12}$alkylene, cyclohexylene, cyclohexylenedimethylene, methylenedicyclohexylene, ($C_2$–$C_6$alkylidene)-dicyclohexylene, phenylene, ($C_2$–$C_6$alkylidene)-diphenylene, xylylene or $C_4$–$C_{12}$alkylene interrupted by 1, 2 or 3 oxygen atoms; $R_9$ and $R_{11}$ which can be identical or different are hydrogen, $C_1$–$C_{18}$alkyl, $C_5$–$C_{12}$cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by $C_1$–$C_4$alkyl, $C_7$–$C_9$-phenylalkyl which is unsubstituted or mono-, di- or tri-substituted on the phenyl by $C_1$–$C_4$-alkyl, or a group of the formula (III); $R_{10}$ is as defined above for $R_8$ or $C_4$–$C_{12}$alkylene interrupted by 1 or 2 groups





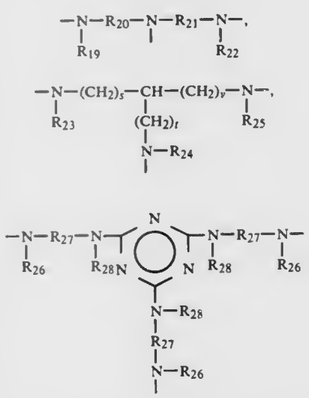
where $R_{15}$ has any of the meanings given above for $R_9$ and $R_{11}$, or is one of the groups of the formula (Va)–Vd)



where $R_{16}$ is hydrogen, $C_1$–$C_{18}$alkyl, $C_5$–$C_{12}$cycloalkyl which is unsubstituted or mono, di- or tri-substituted by $C_1$–$C_4$alkyl, $C_2$–$C_{18}$alkenyl, phenyl which is unsubstituted or mono-, di- or tri-substituted by $C_1$–$C_4$-alkyl or an OH group or mixture thereof, $C_7$–$C_9$phenylalkyl which is unsubstituted or mono-, di-or tri-substituted on the phenyl by $C_1$–$C_4$alkyl or an OH group or mixture thereof;

$R_{17}$ is $C_1$–$C_{18}$alkyl, $C_5$–$C_{12}$cycloalkyl which is unsubstituted or mono-, di- or tri-substitutedc by $C_1$–$C_4$alkyl, $C_3$–$C_1$.$_8$alkenyl or a group of the formula (III); $R_{18}$ is $C_1$–$C_{18}$alkyl or phenyl which is unsubstituted or mono-, di- or tri-substituted by $C_1$–$C_4$alkyl; m is zero or 1; $R_{12}$ is hydrogen or methyl; n is zero, 1, 2, 3 or 4; $R_{13}$ and $R_{14}$ which are identical or different are as defined above for $R_9$ and $R_{11}$; p and q which can be identical or different are integers from 2 to 6; and r is zero or 1;

when w is 3, A is one of the groups of the formula (VIa)–(-VIc)

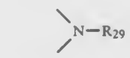


(VIa)

(VIb)

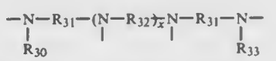
(VIc)

in which $R_{19}$, $R_{22}$, $R_{23}$, $R_{24}$, $R_{25}$, $R_{26}$ and $R_{28}$ which can be identical or different are as defined above for $R_9$ and $R_{11}$; $R_{20}$ and $R_{21}$ which can be identical or different are $C_2$–$C_{12}$alkylene or $C_4$–$C_{12}$alkylene interrupted by a group



with $R_{29}$ being defined as above for $R_{15}$; s and v which can be identical or different are integers from 2 to 6; t is zero or 1; and $R_{27}$ is $C_2$–$C_{12}$alkylene, and

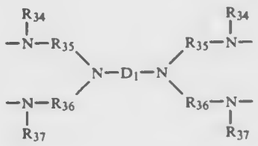
when w is 4,5 or 6, A is additionally a group of the formula (VII)



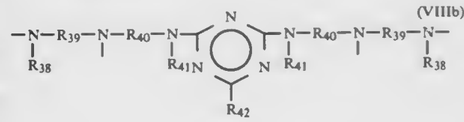
(VII)

in which $R_{30}$ and $R_{33}$ which can be identical or different are as defined above for $R_9$ and $R_{11}$; $R_{31}$ and $R_{32}$ which can be identical or different are $C_2$–$C_{12}$alkylene; and xi is 1, 2 or 3, and,

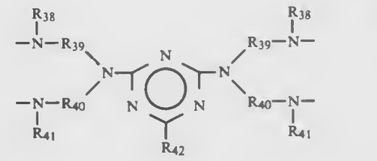
when w is 4, A is also one of the groups of the formula (VIIIa)–(VIIIc)



(VIIIa)

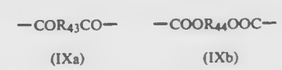


(VIIIb)



(VIIIc)

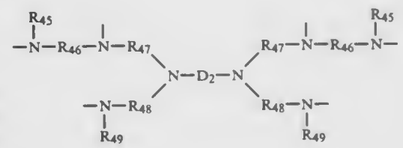
in which $R_{34}$, $R_{37}$, $R_{38}$ and $R_{41}$ which can be identical or different are as defined above for $R_9$ and $R_{11}$; $R_{35}$, $R_{36}$, $R_{39}$ and $R_{40}$ which can be identical or different are $C_2$–$C_{12}$alkylene; $D_1$ is $C_2$–$C_{12}$alkylene, 2-hydroxytrimethylene, —$CH_2CO$—, xylylene or one of the groups of the formula (IXa) or (IXb)



(IXa) (IXb)

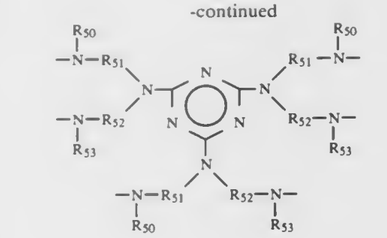
in which $R_{43}$ is a direct bond, $C_1$–$C_{12}$alkylene, cyclohexylene or phenylene; $R_{44}$ is as defined above for $R_8$; and $R_{42}$ is as defined above for $R_3$; and

when w is 6, A is also one of the groups of the formula (Xa)–(Xc)

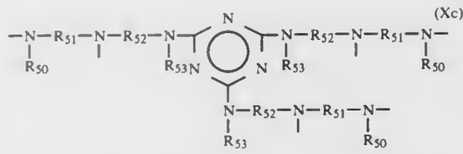


(Xa)

-continued



(Xb)



(Xc)

in which $R_{45}$, $R_{49}$, $R_{50}$ and $R_{53}$ which can be identical or different are as defined above for $R_9$ and $R_{11}$; $R_{46}$, $R_{47}$, $R_{48}$, $R_{51}$ and $R_{52}$ which can be identical or different are $C_2$-$C_{12}$alkylene; and

$D_2$ is as defined above for $D_1$.

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**5,047,532**

**ISOLATION AND ELUCIDATION OF CEPHALOSTATINS 5 AND 6**

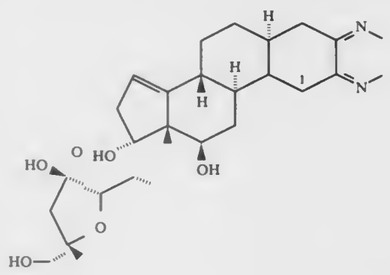
**George R. Pettit, Paradise Valley, and Yoshiaki Kamano, Tempe, both of Ariz., assignors to Arizona Board of Regents, acting on behalf of Arizona State University, Tempe, Ariz.**

**Filed Jul. 28, 1989, Ser. No. 386,427**

**Int. Cl.[5] C07D *491/22*; A61K *31/495***

**U.S. Cl. 544—230** **3 Claims**

1. Compounds in substantially pure form denominated Cephalostatins having the structural formula:



wherein R = —$CH_3$ or —H.

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**5,047,533**

**ACYCLIC PURINE PHOSPHONATE NUCLEOTIDE ANALOGS**

**Reist, Elmer J., Menlo Park, and Priscilla A. Sturm, Mountain View, both of Calif., assignors to SRI International, Menlo Park, Calif.**

**Continuation of Ser. No. 5,421, Jan. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 828,231, Feb. 10, 1986, abandoned, which is a continuation-in-part of Ser. No. 497,720, May 24, 1983, abandoned. This application Jan. 22, 1990, Ser. No. 469,791**

**Int. Cl.[5] A61K *31/675*; C07F *9/6561***

**U.S. Cl. 544—244** **5 Claims**

1. The compound which is 9(3'-phosphono-1'-propyloxymethyl) guanine.

5. The compound which is 9(3'-phosphono-1'-hydroxymethyl-1'-propyloxymethyl)guanine.

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**5,047,534**

**SELECTIVE ADENOSINE RECEPTOR AGENTS**

**Norton P. Peet, Cincinnati, and Nelson L. Lentz, West Chester, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

**Filed Mar. 26, 1990, Ser. No. 499,111**

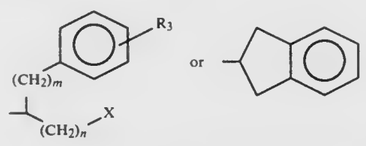
**Int. Cl.[5] A61K *31/52*; C07D *473/12***

**U.S. Cl. 544—267** **18 Claims**

1. A compound according to the structure:



including the (R) and (S) enantiomers and racemic mixtures thereof, and the pharmaceutically acceptable salts thereof, wherein $R_1$ and $R_2$ are each independently $C_1$-$C_4$)lower alkyl or ($C_2$-$C_4$)lower alkenyl, Z is:



$R_3$ is ($C_1$-$C_3$)lower alkyl, nitro, amino, hydroxy, fluoro, bromo or chloro, m is zero or an integer from 1 to 4, n is an integer from 1 to 4, and X is H or OH.

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**5,047,535**

**N-HETEROCYCLIC AMPHIPHILIC AMIDES**

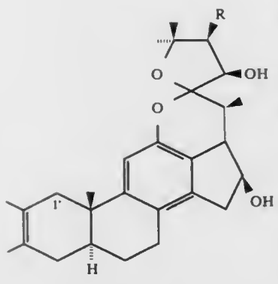
**Meir Lahav; Leslie Leiserowitz, both of Rehovot; Jacob Sagiv, Ness Ziona; Ronit Popovitz-Biro, Rehovot, all of Israel; Karlheinz Hill, Bad Berneck, Fed. Rep. of Germany, and Ehud Landau, Rehovot, Israel, assignors to Yeda Research and Development Company Limited, Rehovot, Israel**

**Filed Aug. 5, 1987, Ser. No. 81,769**

**Claims priority, application Israel, Aug. 5, 1986, 79624**

**Int. Cl.[5] C07F *9/06, 9/28*; C07D *249/12, 233/54***

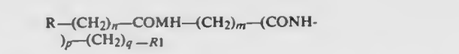
**U.S. Cl. 546—22** **1 Claim**



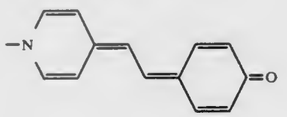
wherein R = H or $CH_3$.

1. Amphiphilic molecules suited for the production of Z-type Langmuir-Blodgett multilayer films of the formula:

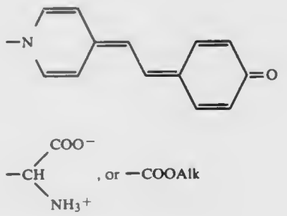




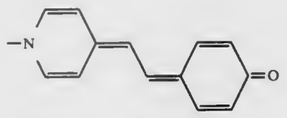
where R designates —$CH_3$, —$CH_2$Hal, —CH=CH—$\phi$, —N—=—$NO_2$, or



where $R_1$ designates —CH, —OOOH, —$NH_2$, —$OONH_2$, —$PO_3$=,



wherein at least one of R and $R_1$ is



where Hal designates a halogen atom, Alk designates an alkali metal atom and where the sum of n,m and q is 14 and p is zero or one and where there may be more than 2 alkyl-amido entities.

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**5,047,536**

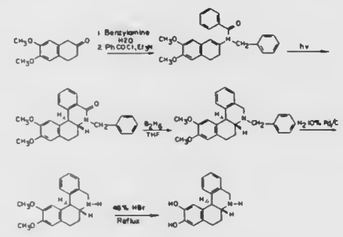
**HEXAHYDROBENZO(A)PHENANTHRIDINE COMPOUNDS**

**David E. Nichols, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.**

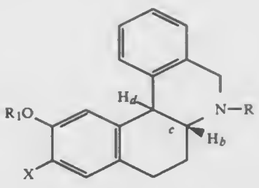
**Filed Mar. 17, 1989, Ser. No. 325,140**

**Int. Cl.[5] C07D *215/58***

**U.S. Cl. 546—61** **5 Claims**



1. A compound of the formula



wherein $H_a$ and $H_b$ are trans across ring fusion bond c;

R is hydrogen or $C_1$-$C_4$ alkyl;

$R_1$ is hydrogen, benzoyl or pivaloyl;

X is hydrogen, chloro, bromo, iodo or a group of the formula —$OR_2$ wherein $R_2$ is hydrogen, benzoyl or pivaloyl, provided that when X is a group of the formula $OR_2$, the groups $R_1$ and $R_2$ can be taken together to form a group of the formula —$CH_2$—.

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**5,047,537**

**SEPARATION OF ISOMERS OF FURO (3,4-c) PYRIDINE DERIVATIVES**

**Andre Esanu, Paris, France, and Charles Eck, Shrewsbury, Mass., assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France**

**PCT No. PCT/FR90/00228, § 371 Date Oct. 18, 1990, § 102(e) Date Oct. 18, 1990**

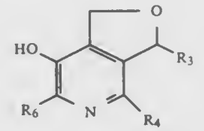
**PCT Filed Apr. 2, 1990, Ser. No. 598,653**

**Claims priority, application United Kingdom, Apr. 3, 1989, 8907480**

**Int. Cl.[5] C07D *491/48***

**U.S. Cl. 546—116** **5 Claims**

1. A method for the separation of stereoisomers of 7-hydroxy-furo[3,4-c]pyridine derivatives of the formula



wherein $R_3$ represents a hydrogen atom, a straight chain saturated hydrocarbon group having from 1 to 5 carbon atoms or unsaturated hydrocarbon group having from 2 to 5 carbon atoms, a heterocyclic group having up to 6 ring atoms, a phenyl group, a phenylalkyl or phenylalkenyl group, said groups being optionally substituted by one or more chlorine or fluorine atoms, trifluoromethyl groups, alkyl groups having from 1 to 5 carbon atoms, alkoxy groups having from 1 to 5 carbon atoms, alkylthio groups having from 1 to 5 carbon atoms, dialkylamino groups in which each alkyl group has from 1 to 5 carbon atoms, dialkylaminoalkoxy groups in which each of the two alkyl groups and the alkoxy group has from 1 to 5 carbon atoms or $\alpha$ or $\beta$-alkoxy-N-pyrrolidinyl groups in which the alkoxy group has from 1 to 5 carbon atoms; $R_4$ represents a hydrogen or chlorine atom and $R_6$ represents a lower saturated or unsaturated hydrocarbon group up to $C_5$, optionally substituted by a hydroxy radical, by a amino rest $N(R)_2$ wherein R stands for hydrogen or a lower alkyl up to $C_3$, which comprises:

reacting a fully O-acetylated monosaccharide halogenide with a racemate of the selected 7-hydroxy-furo[3,4-c] pyridine derivative to form the (+) and (−) (O-acetylated monosaccharide) (furo[3,4-c]pyridine 7-yl derivative) ethers, then

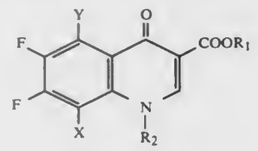
separating the (+) and the (−) ethers by selective crystallization, in a hydroalcoholic medium, either of the acety-

lated forms or of the corresponding desacetylated forms and, finally,
working up each of the separated derivatives, optionally hydrolysing the ester function, and
breaking the ether bond between monosaccharide and furo[3,4-c] pyridine derivative.

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**5,047,538**
**QUINOLINECARBOXYLIC ACID ANTIBACTERIAL AGENTS**
**John M. Domagala, Canton; Mark J. Suto, and William R. Turner, both of Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.**
**Filed Apr. 12, 1990, Ser. No. 508,886**
**Int. Cl.[5] C07D *215/233, 401/04***
**U.S. Cl. 546—156** **5 Claims**

1. A compound of the formula

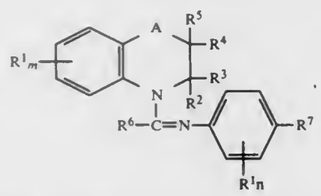


wherein
X is alkenyl from two to ten carbon atoms, alkynyl from two to eight carbon atoms, cycloalkyl from three to six carbon atoms or cycloalkyl substituted by alkyl from one to four carbon atoms;
Y is hydrogen, fluoro or amino;
$R_1$ is hydrogen, alkyl of from one to six carbon atoms or a pharmaceutically acceptable cation, and
$R_2$ is alkyl of from one to four carbon atoms, vinyl, haloalkyl or hydroxyalkyl of from one to four carbon atoms, cycloalkyl of from three to six carbon atoms, phenyl or phenyl substituted by one or more halogen atoms.

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**5,047,539**
**HETEROCYCLIC AMIDINE DERIVATIVES**
**Peter Spang, Ingbert; Peter Neumann, Mannheim, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**
**Filed Apr. 19, 1990, Ser. No. 511,302**
**Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916494**
**Int. Cl.[5] C07D *219/08, 209/82***
**U.S. Cl. 546—164** **2 Claims**

1. Heterocyclic amidine derivatives of the general formula I



(I)

in which the variables
$R^1$ are the same or different and denote hydrogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, hydroxyl or chlorine,
$R^2$ to $R^5$ denote hydrogen or $C_1$–$C_4$-alkyl and $R^3$ and $R^4$ can together form a five-membered or six-membered ring,
$R^6$ denotes hydrogen or $C_1$–$C_8$-alkyl,
$R^7$ denotes cyano or —$COOR^8$, —$COR^8$, —$CONHR^8$ or —$CONR^8_2$, in which
$R^8$ is a straight-chain or branched-chain $C_1$–$C_{12}$-alkyl group which may be interrupted by oxygen atoms, a cyclopentyl or cyclohexyl group or a phenylalkyl group having from 1 to 3 carbon atoms in the alkyl moiety,
A is a chemical bond or a methylene group which may additionally carry one or two $C_1$–$C_4$-alkyl radicals, and
m and n are each 1 or 2.

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**5,047,540**
**LIPID DERIVATIVES**
**Susumu Kamata; Tatsuo Tsuri, both of Hyogo; Nobuhiro Haga; Takeaki Matsui, both of Osaka; Morio Kishi; Kimio Takahashi, both of Kyoto; Sanji Hagashita, Nara, and Kaoru Seno, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan**
**Filed Nov. 29, 1988, Ser. No. 284,590**
**Claims priority, application Japan, Dec. 17, 1987, 62-320238**
**Int. Cl.[5] C07D *403/06, 215/10***
**U.S. Cl. 546—172** **19 Claims**

1. A compound represented by the formula:

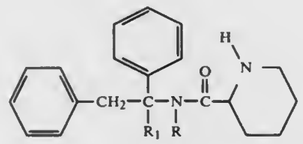


wherein $R_1$ is alkyl or alkylcarbamoyl; $R_2$ is lower alkyloxy, lower alkylcarbamoyloxy, lower alkylcarbonylamino, lower alkyloxycarbonylamino, lower alkylureido, lower alkyloxymethyl, lower alkylcarbonylmethyl, cyanomethyl, a 5-membered heterocyclic group, or a 5-membered heterocyclyloxy group, wherein one or more N, O or S heteroatoms are present; $R_2$ hydrogen $)_m$— wherein m is an integer of 1 to 5; $R_3$, $R_4$, and $R_5$ taken together with the adjacent nitrogen atom form quinolinio or isoquinolinio which are unsubstituted or substituted by a member selected from the group consisting of lower alkyl, carboxyl, lower alyloxycarbonyl, hydroxy, lower alkyloxy, acyloxy, lower alkylamino, amino, carbamoyl and ureido; $R_6$ is hydrogen or lower alkylcarbonyl; $X^-$ is a pharmaceutically acceptable anion; Y is oxygen or sulfur; and n is an integer of 1 to 10.

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**5,047,541**
**2-AZACYCLOCARBOXAMIDE DERIVATIVES**
**Ronald C. Griffith, Pittsford, N.Y., assignor to Fisons Corporation, Rochester, N.Y.**
**Continuation-in-part of Ser. No. 11,981, Feb. 6, 1987, abandoned. This application Jun. 14, 1989, Ser. No. 366,070**
**Int. Cl.[5] C07D *211/32***
**U.S. Cl. 546—225** **2 Claims**

1. A compound of the formula

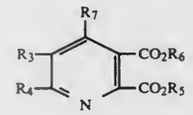


wherein R and $R_1$ are independently selected from hydrogen and methyl.



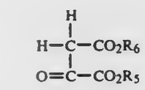
**5,047,542**
**PROCESS FOR PREPARING PYRIDINE CARBOXYLIC ACID ESTERS**
**B. Franklin Gupton, Virginia Beach; James H. Rea, Portsmouth, both of Va.; Werner H. Mueller, Corpus Christi, Tex., and John Saukaitis, East Greenwich, R.I., assignors to Hoechst Celanese Corporation, Somerville, N.J.**
**Filed Jul. 1, 1988, Ser. No. 214,549**
**Int. Cl.[5] C07D *213/55***
**U.S. Cl. 546—250** **15 Claims**

1. A method for the preparation of substituted and disubstituted pyridine-2-3-dicarboxylates of formula I:



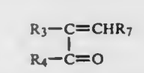
(I)

wherein $R_3$ is hydrogen, halogen, $C_1$–$C_6$ straight or branched alkyl, alkenyl, phenyl, or substituted-phenyl; $R_4$ and $R_7$ are each hydrogen, $C_1$–$C_6$ straight or branched alkyl, alkenyl, phenyl, or substituted-phenyl; and $R_5$ and $R_6$ are each $C_1$–$C_4$ alkyl; comprising reacting a $\beta$-ketoester of formula II:



(II)

wherein $R_5$ and $R_6$ are defined above with an $\alpha,\beta$-unsaturated aldehyde or ketone of formula III:



(III)

wherein $R_3$, $R_4$ and $R_7$ are as described in formula I in the presence of at least 1 molar equivalent of an ammonium salt in a solvent at a temperature range of ambient temperature to the boiling point of the solvent until the reaction is essentially complete.

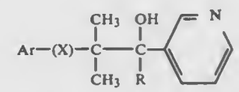
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**5,047,543**
**1,4-DIHYDROPYRIDINE DERIVATIVES**
**Toshihisa Ogawa; Tomomi Ota; Shuichi Sato, all of Ageo; Takemi Sunaga, Tokyo; Yoshiaki Watanabe, Kodaira, and Katsuo Hatayama, Omiya, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan**
**Filed Nov. 17, 1989, Ser. No. 437,636**
**Claims priority, application Japan, Nov. 24, 1988, 63-296861**
**Int. Cl.[5] C07D *213/42***
**U.S. Cl. 546—321** **1 Claim**

1. A 2,6-Dimethyl-4-(3-nitrophenyl)-1,4-dihydropyridine-3,5-dicarboxylic acid 3-(2-nicotinoylaminoethyl) ester 5-(3-nitrooxypropyl ester and pharmaceutically acceptable salts thereof.

**5,047,544**
**PESTICIDAL SUBSTITUTED PYRIDINE DERIVATIVES**
**Hans-Ludwig Elbe, Wuppertal; Wilhelm Brandes, Leichlingen; Stefan Dutzmann, Duesseldorf, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Continuation of Ser. No. 226,162, Jul. 29, 1988, abandoned. This application Dec. 26, 1989, Ser. No. 456,599**
**Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725967; May 7, 1988, 3815700**
**The portion of the term of this patent subsequent to Jul. 3, 2008, has been disclaimed.**
**Int. Cl.[5] A01N *43/40*; C07D *213/30, 213/34***
**U.S. Cl. 514—277** **9 Claims**

1. A substituted pyridine derivative of the formula



(I)

in which
Ar stands for phenyl which is monosubstituted by a substituent selected from the group consisting of cyano, nitro, methylthio, ethylthio, trifluoromethylthio, difluoromethylthio, fluoromethylthio, difluorochloromethylthio, dichlorofluoromethylthio, difluoroethylthio, difluorobromomethylthio, trichloromethylthio, trifluoroethylhio, tetrafluoroethylthio, pentafluoroethylthio, trifluorochloroethylthio, trifluorodichloroethylthio, pentachloroethylthio, methylsulphinyl, trifluoromethylsulphinyl, dichlorofluoromethylsulphinyl, difluorochloromethylsulphinyl, fluoromethylsulphinyl, difluoromethylsulphinyl, methylsulphonyl, trifluoromethylsulphonyl, dichlorofluoromethylsulphonyl, dichlorochloromethylsulphonyl, fluoromethylsulphonyl, difluoromethylsulphonyl, methoxycarbonyl, ethoxycarbonyl, methoximinomethyl, ethoximinomethyl, methoximinoethyl, ethoximinoethyl, and phenyl or phenoxy which are in each case optionally monosubstituted, disubstituted or trisubstituted by fluorine or chlorine or by phenylalkyl or pohenylalkyloxy with 1 to 4 carbon atoms in straight-chain or branched alkyl or alkoxy part or cycloalkyl with 3 to 6 carbon atoms or by alkyl with 1 to 8 carbon atoms straight-chain or branched; or for phenyl which is mono- to trisubstituted identically or differently by fluorine, chlorine, bromine, methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, methoxy, ethoxy, n- or i-propoxy, trifluoromethyl, dichlorofluoromethyl, difluorochloromethyl, difluorobromomethyl, trichloromethyl, fluoromethyl, difluoromethyl, trifluoroethyl, tetrafluoroethyl, trifluorochloroethyl, pentafluoroethyl, methylthio, ethylthio, trifluoromethoxy, difluoromethoxy, fluoromethoxy, dichlorofluoromethoxy, difluorochloromethoxy, difluorobromomethoxy, trichloromethoxy, trifluoroethoxy, tetrafluoroethoxy, pentafluoroethoxy, trifluorochloroethoxy, trifluorodichloroethoxy, difluorotrichloroethoxy, or pentachloroethoxy, or stands for $\alpha$-naphthyl or $\beta$-naphthyl which are optionally substituted by bromine;
X is selected from the group consisting of O, S, SO and $SO_2$, and
R stands for methyl, ethyl, n- or i-propyl, n-, i-, s- or t-butyl, allyl, propargyl, methoxymethyl, methylthiomethyl, cyclopropyl, chlorophenoxymethyl or chlorophenylthiomethyl,
or a plant-compatible acid or metal salt addition product thereof.

8. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound or addition product according to claim 1.

**5,047,545**

## 2-ALKOXYCARBONYL-4-(4-PYRIDYL)CYCLOHEXANONES AND PROCESS FOR PREPARING THEM

**Nobuyuki Fukazawa, and Hiroyuki Yamashita, both of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Continuation of Ser. No. 23,104, Mar. 3, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,179**

**Int. Cl.[5] C07D *217/26***

**U.S. Cl. 546—342** **2 Claims**

1. 2-Methoxycarbonyl-4-(4-pyridyl)cyclohexanone.

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**5,047,546**

## OXAZOLIDINES CONTAINING SILANE GROUPS

**Giovanni Parrinello, Duisburg, Belgium; Rolf Mülhaupt, Marly, Switzerland, and Hubert Simon, Mulbouse, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation of Ser. No. 457,453, Dec. 27, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 612,737**

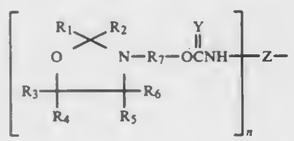
**Claims priority, application Switzerland, Dec. 29, 1988, 4845/88**

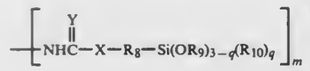
**Int. Cl.[5] C07F *7/18***

**U.S. Cl. 548—110** **13 Claims**

1. A compound of the general formula I

(I)





wherein

$R_1$ is hydrogen, $C_1$-$C_{12}$alkyl, $C_5$-$C_7$cycloalkyl, phenyl or benzyl,

$R_2$ is hydrogen or $C_1$-$C_4$alkyl, or

$R_1$ and $R_2$, together with the linking carbon atom, form a 5- or 6-membered ring, and

$R_3$, $R_4$, $R_5$ and $R_6$ are identical or different and are hydrogen, $C_1$-$C_{12}$alkyl, phenyl or phenyl substituted by 1 to 3 members selected from the group consisting of $C_1$-$C_4$alkyl, halogen or $C_1$-$C_4$alkoxy or are a group of formula $-CH_2OR_{11}$, where $R_{11}$ is $C_1$-$C_{12}$alkyl, phenyl or phenyl substituted by 1 to 3 members selected from the group consisting of $C_1$-$C_4$alkyl, halogen or $C_1$-$C_4$alkoxy, or are —C(O)—$R_{12}$, and $R_{12}$ is $C_1$-$C_{12}$alkyl,

$R_7$ is $C_1$-$C_4$alkylene, $R_8$ is $C_1$-$C_8$alkylene, $R_9$ is $C_1$-$C_4$alkyl, or two radicals $R_9$ together are $C_1$-$C_4$alkylene, and $R_{10}$ is $C_1$-$C_4$alkyl or phenyl,

q is a value from 0 to 2,

X is —S— or —NH—,

Y is O or S, and

Z is an organic radical which is derived from a polyisocyanate or a polyisothiocyanate containing at least three NCO or NCS groups respectively,

n is a value $\geq 1$ and m is a value $\geq 1$, with the proviso that $n+m \geq 3$.

**5,047,548**

## 3-ARYL-3-HYDROXY-4-(1H-1,2,4-TRIAZOL-1-YL)BUTYRAMIDE AND DERIVATIVES AS ANTIFUNGAL AGENTS

**Kenneth Richardson, Birchington, and Geoffrey E. Gymer, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 808,390, Nov. 29, 1985, abandoned, which is a continuation of Ser. No. 535,973, Sep. 26, 1983, abandoned. This application Jan. 27, 1988, Ser. No. 149,031**

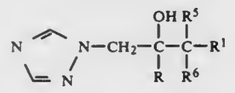
**Claims priority, application United Kingdom, Sep. 30, 1982, 8227978; Feb. 2, 1983, 8302888**

**Int. Cl.[5] C07D *249/08***

**U.S. Cl. 548—267.6** **13 Claims**

1. A compound of the formula

(I)



or a pharmaceutically acceptable acid addition salt thereof, wherein

R is 2,4-dichlorophenyl, 2,4-difluorophenyl or 4-chlorophenyl;

$R^1$ is $-CONR^2R^3$ where either

(a) $R^2$ is H or $C_1$-$C_4$alkyl, and $R^3$ is H, $C_1$-$C_4$alkyl, $-CH_2CF_3$, carbamoylmethyl, allyl, 2-(methylthio)ethyl, 2-(methylsulfinyl)ethyl, 2-(methylsulfonyl)ethyl, 4-chlorophenylmethyl or 4-chlorophenylethyl; and $R^5$ and $R^6$ are each H or $CH_3$.

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**5,047,549**

## DERIVATIVES OF PRAVASTATIN FOR INHIBITING CHOLESTEROL BIOSYNTHESIS

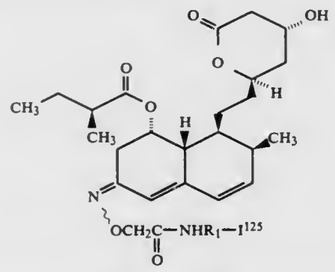
**Richard A. DiPietro, North Brunswick; Jan-I Tu, Kendall Park, and Noor Z. Turabi, Dayton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Division of Ser. No. 171,092, Mar. 21, 1988, Pat. No. 4,857,522. This application Apr. 17, 1989, Ser. No. 338,816**

**Int. Cl.[5] C07D *405/12***

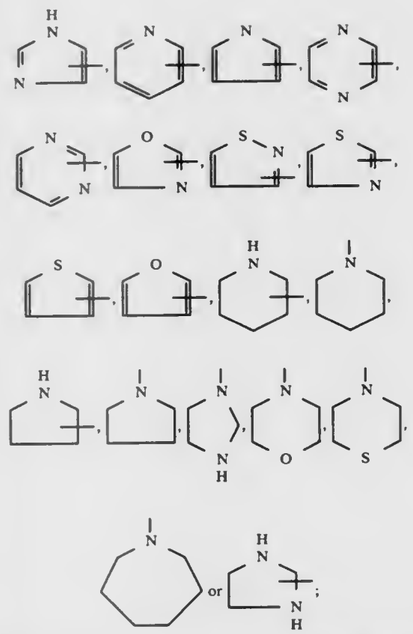
**U.S. Cl. 548—336** **3 Claims**

1. A radiolabelled compound for use in the radioimmunoassay of pravastatin, said compound having the structure



wherein $R_1$ is lower alkyl, aryl, arylalkyl or heterocyclic alkyl wherein the term "heterocyclic alkyl" refers to a 5, 6- or 7-membered ring containing 1- or 2-hetero atoms which are N, O and/or S, which ring is attached to an alkyl, said heterocyclic being





the term "aryl" by itself or as part of an arylalkyl group refers to a substituted or unsubstituted monocyclic or bicyclic aromatic hydrocarbon group containing from 6 to 10 carbons in the ring; and the term "lower alkyl" and "alkyl" by itself or as part of another group is substituted or unsubstituted and contains 1 to 12 carbons in the normal chain, wherein the substituent on the lower alkyl or alkyl group is a halo-substituent, $CF_3$, an alkoxy substituent, an aryl substituent, an alkyl-aryl substituent, a haloaryl substituent, a cycloalkyl substituent, an alkylcycloalkyl substituent, hydroxy, an alkylamino substituent, an alkanoylamino substituent, a cyano substituent, a thiol substituent or an alkylthio substituent, and wherein the substituent on the monocyclic or bicyclic aromatic hydrocarbon group is 1 2 or 3 lower alkyl groups, 1, 2 or 3 halogens (Cl, Br or F), 1, 2 or 3 lower alkoxy groups, 1, 2 or 3 hydroxy groups, 1, 2 or 3 phenyl groups, 1, 2 or 3 alkanoyloxy groups, 1, 2 or 3 benzoyloxy groups, 1, 2 or 3 haloalkyl groups, 1, 2 or 3 halophenyl groups, 1, 2 or 3 allyl groups, 1, 2 or 3 cycloalkylalkyl groups, 1, 2 or 3 adamantylalkyl groups, 1, 2 or 3 alkylamino groups, 1, 2 or 3 alkanoylamino groups, 1, 2 or arylcarbonylamino groups, 1, 2 or 3 amino groups, 1, 2 or 3 nitro groups, 1, 2 or 3 cyano groups, 1, 2 or 3 thiol groups, and/or 1, 2 or 3 alkylthio groups.

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**5,047,550**

## 3-CYANO-5-HYDROXY-1-ARYLPYRAZOLES

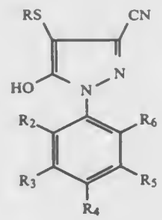
**Themistocles D. J. D'Silva, Chappel Hill; Gail S. Powell, Raleigh; Philip R. Timmons, Durham, all of N.C., and Richard G. Pennicard, Dagenham, England, assignors to Rhone-Poulenc AG Co., Research Triangle Park, N.C.**

**Division of Ser. No. 317,722, Mar. 2, 1989, Pat. No. 4,918,085. This application Jan. 25, 1990, Ser. No. 470,172**

**Int. Cl.[5] C07 *231/28***

**U.S. Cl. 548—365** **4 Claims**

1. A compound of formula 14



14

wherein:

R is selected from unsubstituted $C_1$ to $C_4$ alkyl or $C_1$ to $C_4$ alkyl substituted by one or more halogen atoms, which are the same or different, up to full substitution;

$R_2$, $R_3$, $R_5$, and $R_6$ are individually a hydrogen atom or a halogen atom;

$R_4$ is selected from a halogen atom or a $C_1$ to $C_4$ straight chain or branched chain alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl group, which group is unsubstituted or substituted by one or more halogen atoms which are the same or different.

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**5,047,551**

## PREPARATION OF 4-CHLOROPYRAZOLES

**Ulf Baus, Dossenheim, and Wolfgang Reuther, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

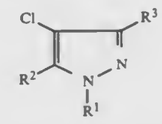
**Filed Oct. 30, 1989, Ser. No. 429,783**

**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1988, 3840342**

**Int. Cl.[5] C07D *231/14***

**U.S. Cl. 548—375** **12 Claims**

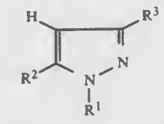
1. A process for preparing a 4-chloropyrazole of the formula



I

where $R^1$, $R^2$ and $R^3$ are each independently of the others hydrogen or a substituent which is inert under the reaction conditions and selected from the group consisting of $C_1$-$C_8$-alkyl and halosubstituted $C_1$-$C_4$-alkyl, which process comprises:

reacting a pyrazole of the formula



II

where $R^1$, $R^2$ and $R^3$ are each as defined above, in a solvent medium with 0.95–10 equivalents of hypochloric acid, or a salt thereof, while excluding any carboxylic acid in an amount more than about 0.5% by weight, calculated as acetic acid and based on the weight of the reaction mixture; and

isolating the product I.

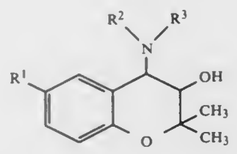
5,047,552

## PROCESS FOR PREPARING BENZOPYRAN DERIVATIVES

Dominick A. Quagliato, and Leslie G. Humber, both of No. Brunswick, N.J., assignors to American Home Products Corporation, New York, N.Y.

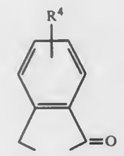
Division of Ser. No. 210,970, Jun. 24, 1988, Pat. No. 4,925,839, which is a continuation-in-part of Ser. No. 146,875, Jan. 22, 1988, abandoned. This application Feb. 7, 1990, Ser. No. 477,015
Claims priority, application Canada, Oct. 27, 1987, 550349
Int. Cl.[5] C07D *405/04*
U.S. Cl. 548—454 1 Claim

1. A process for the preparation of a compound of formula

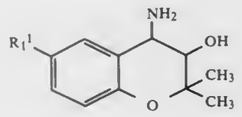


(I)

wherein $R^1$ is trifluoromethoxy or $\beta$, $\beta$, $\beta$-trifluoroethoxy; $R^2$ and $R^3$ are joined together to form

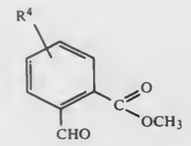


wherein $R^4$ is selected from the group consisting of hydrogen, alkoxy containing 1 to 5 carbon atoms, amino or mono- or disubstituted alkyl amino wherein said alkyl groups contain 1 to 5 carbon atoms which comprises the reaction of a compound of formula (II)



(II)

wherein $R_1{}^1$ is $R^1$ as defined above or a group or atom convertible thereto, with a compound of formula



wherein $R^4$ is selected from the group consisting of hydrogen, alkoxy containing 1 to 5 carbon atoms, amino or mono- or disubstituted alkyl amino wherein said alkyl groups contain 1 to 5 carbon atoms in the presence of zinc chloride-sodium cyanoborohydride; and optionally forming a pharmaceutically acceptable salt or solvate.

5,047,553

## TETRAFLUORO-N-PHENYLPHTHALIMIDE

Deanne M. Nowak, Depew, and Henry C. Lin, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Dallas, Tex.

Filed Feb. 27, 1989, Ser. No. 315,746
Int. Cl.[5] C07D *209/48;* C07C *63/00;* A61K *31/40*
U.S. Cl. 548—476 1 Claim

1. Tetrafluoro-N-phenylphthalimide.

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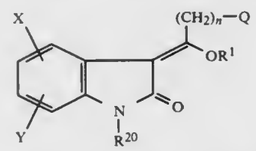
5,047,554

## 3-SUBSTITUTED-2-OXINDOLE DERIVATIVES

Frederick J. Ehrgott, Norwich; Carl J. Goddard, Groton, and Gary R. Schulte, Stonington, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 340,113, Apr. 18, 1989, abandoned. This application Jan. 31, 1990, Ser. No. 473,266
Int. Cl.[5] C07D *209/34*
U.S. Cl. 548—486 1 Claim

1. A process for preparing compounds of the formula

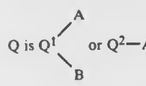


wherein X is H, F, Cl, Br, $(C_1$–$C_6)$alkyl, $(C_3$–$C_8)$cycloalkyl, $NO_2$, $CF_3$, CN, SH, $S(O)_mR^3$, $OR^4$, $COR^4$ or $CONR^4R^5$;

Y is H, F, Cl, Br, $(C_1$–$C_6)$alkyl, $(C_3$–$C_8)$cycloalkyl, $NO_2$, $CF_3$, CN, SH, $S(O)_tR^{17}$, $OR^{18}$ or $CONR^{18}R^{19}$;

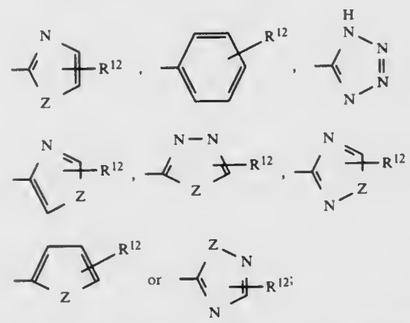
$R^1$ is H;

$R^{20}$ is $COR^6$, $CONR^7R^8$, phenyl or mono- or disubstituted phenyl wherein the substituent or substituents are each Cl, F, Br, $(C_1$–$C_6)$alkyl, $(C_1$–$C_6)$ alkoxy or $CF_3$;



Q is $Q^1$ or $Q^2$—$A^1$;

A is H, F, Cl, Br, I, $CF_3$, $OR^9$, $S(O)_pR^{10}$, $COOR^{11}$, $CONR^9R^{11}$, CN, $NO_2$, $COR^{10}$, $CH_2OR^{11}$, $OCOR^{10}$, $NR^9R^{11}$, $N(R^9)COR^{11}$, $SO_2NR^9R^{11}$,



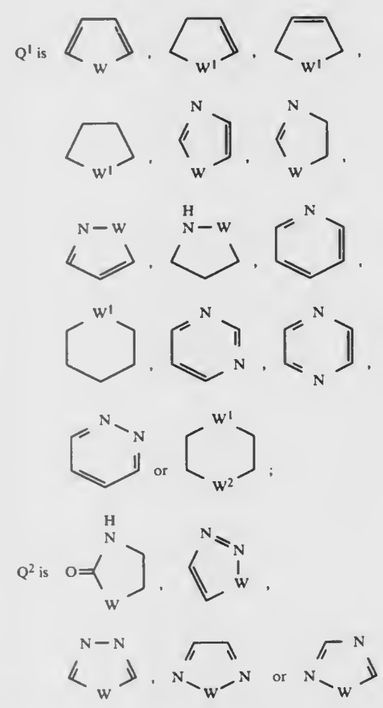
B is H, F, Cl, Br, I, $CF_3$, $OR^{13}$, $S(O)_rR^{14}$, $COOR^{15}$, $CONR^{13}R^{15}$, CN, $NO_2$, $COR^{14}$, $CH_2OR^{15}$, $OCOR^{14}$, $NR^{13}R^{15}$, $N(R^{13})COR^{15}$ or $SO_2NR^{13}R^{15}$;

provided that A and B cannot both be H, or A and B are taken together, bonded to the same ring carbon of $Q^1$ and



equal oxo, or when A is not H, B is as defined above or $(C_1$–$C_4)$alkyl;

$A^1$ is F, Cl, Br, I, $CF_3$, $OR^9$, $S(O)_pR^{10}$, $COOR^{11}$, $CONR^9R^{11}$, CN, $NO_2$, $COR^{10}$, $CH_2OR^{11}$, $OCOR^{10}$, $NR^9R^{11}$, $N(R^9)COR^{11}$ or $SO_2NR^9R^{11}$;



m, n, p, q and t are each zero, one or two;

W and Z are each O, S or $NR^{11}$;

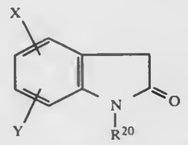
$W^1$ and $W^2$ are each O, S or $NR^{10}$ provided that when one of $W^1$ and $W^2$ is O, S or the other is O or S;

$R^3$, $R^6$, $R^{10}$, $R^{14}$ and $R^{17}$ are each $(C_1$–$C_6)$alkyl or phenyl; $R^5$, $R^8$, $R^{11}$, $R^{15}$ and $R^{19}$ are each H, $(C_1$–$C_6)$alkyl or phenyl; $R^4$, $R^7$, $R^9$, $R^{13}$ and are each H or $(C_1$–$C_6)$alkyl; and $R^{12}$ is H, F, Cl, Br, $CF_3$ or $(C_1$–$C_6)$alkyl;

which comprises reacting a compound of the formula

$$Q—(CH_2)_nCOOH,$$

wherein Q and n are as defined above, with a molar excess of 1,1'-carbonyldiimidazole in a reaction inert solvent under an inert atmosphere and reacting the product thereof with a substituted 2-oxindole of the formula



wherein X, Y and $R^{20}$ are as defined above, in the presence of a basic agent at about 0°–50° C. in a reaction inert solvent under an inert atmosphere.

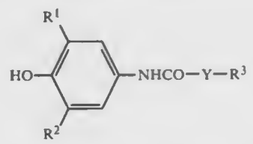
5,047,555

## 4-AMINOPHENOL DERIVATIVES AND PROCESSES FOR PREPARING THE SAME

Hirozumi Inoue, Tokyo; Kei Tsuzurahara, Omiya; Katsuo Ikezawa, Urawa, and Tomofumi Uchida, Habikino, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Dec. 4, 1989, Ser. No. 445,059
Claims priority, application Japan, Dec. 13, 1988, 63-314792; Dec. 26, 1988, 63-330643; Dec. 26, 1988, 63-330644
Int. Cl.[5] C07D *207/33, 333/38, 235/38*
U.S. Cl. 548—537 11 Claims

1. A 4-aminophenol derivative of the formula:



(wherein $R^1$ and $R^2$ each represent a lower alkyl group, Y represents a single bonding arm, a lower alkylene group or a lower alkenylene group, $R^3$ represents a thienyl group or pyrrolyl group which may be also substituted with a lower alkyl group; benzothienyl group, indolyl group; or a phenyl group which is substituted with 1 to 2 groups selected from a lower alkoxy group and a lower alkanoyloxy group; or Y-$R^3$ represents integrally an alkyl group with 6 to 9 carbon atoms; or a hydrocarbon group with 5 to 14 carbon atoms having 2 or 3 double bonds) or a pharmacologically acceptable salt thereof.

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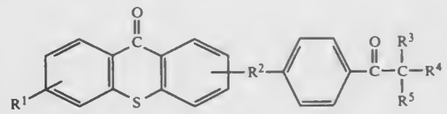
5,047,556

## PHOTOINITIATORS HAVING A COMBINED STRUCTURE

Manfred Köhler, Dormstadt, and Jörg Ohngemach, Reinheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Aug. 8, 1989, Ser. No. 390,940
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1988, 3826947
Int. Cl.[5] C07D *335/10*
U.S. Cl. 549—27 6 Claims

1. A compound of the formula



in which

$R^1$ is hydrogen, halogen, $C_{1\text{-}6}$-alkoxy, $C_{1\text{-}6}$alkylthio, or $NO_2$;

$R_2$ is $COO$-$(CH_2)_m$-X or X-$(CH_2)_m$-Y-$CO$-$(CH_2)_n$-X, where X is O or S, Y is O or NH, m is a number from 2 to 10 and n is a number from 1 to 10;

$R^3$, $R^4$, independently of one another, are each H, $C_{1\text{-}12}$-alkyl, $C_{2\text{-}12}$-alkenyl or together $C_{2\text{-}6}$-alkylene;

$R^5$ is $OR^6$, $SO_2R^7$ or $OSO_2R^7$;

$R^6$ is H, $C_{1\text{-}6}$alkyl or $C_{1\text{-}6}$-alkanoyl; and

$R^7$ is $C_{1\text{-}6}$alkyl or phenyl or benzyl which is unsubstituted or in each case substituted by halogen, $C_{1\text{-}6}$-alkyl or $C_{1\text{-}6}$-alkoxy.

VOL 1130 ISS 2 SE 10 1991 UMI



**5,047,557**

## COMPLEXES HAVING OPTICALLY ACTIVE LIGANDS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Andreas Hafner, Frenkendorf; Rudolf Duthaler, Bettingen, and Guido Bold, Gipf-Oberfrick, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

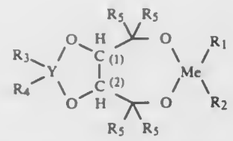
Filed Feb. 16, 1990, Ser. No. 481,416

Claims priority, application Switzerland, Mar. 8, 1989, 867/89; Sep. 28, 1989, 3511/89

Int. Cl.[5] C07F *00/00*

U.S. Cl. 549—206 18 Claims

1. A compound of the formula I



(1)

in which Me is tetravalent titanium, zirconium or hafnium, $R_1$ is linear or branched $C_1$-$C_{18}$alkyl, $C_2$-$C_{12}$alkenyl, $C_2$-$C_{12}$alkynyl or $C_3$-$C_8$cycloalkyl or $C_3$-$C_8$cycloalkenyl each of which is unsubstituted or substituted by $C_1$-$C_4$alkyl, or is $C_6$-$C_{12}$aryl, $C_7$-$C_{16}$alkaryl, $C_7$-$C_{16}$aralkyl, $C_8$-$C_{16}$alkaralkyl, $C_8$-$C_{16}$aralkenyl, $C_9$-$C_{16}$alkaralkenyl, $C_8$-$C_{16}$aralkynyl or $C_9$-$C_{16}$alkaralynyl each of which is unsubstituted or monosubstituted or polysubstituted by $(C_6H_5)_2P$—, $(R_6O)_2P(O)$—, $(R_6)_3Si$—, $(R_6)_3SiO$—, $R_6SO_2$—, -S-$C_2$-$C_4$alkylene-S- or -O-$C_2$-$C_4$alkylene-O- in which $R_6$ is phenyl, benzyl or $C_1$-$C_8$alkyl, cyano, F, nitro, $C_1$-$C_{12}$alkylthio, $C_1$-$C_{12}$alkoxy, —$NR_{18}R_{19}$ wherein $R_{18}$ and $R_{19}$ are $C_1$-$C_{12}$alkyl, cyclopentyl, cyclohexyl, phenyl, benzyl, or $(R_6)_3Si$—, or $R_{18}$ and $R_{19}$ together are $C_3$-$C_6$alkylene, 3-oxapentylene or -Si$(R_6)_2C_2$-$C_3$alkylene-Si$(R_6)_2$- or $COR_7$ in which $R_7$ is the radical of a monohydric alcohol; or $R_1$ is a radical of a $C_2$-$C_{20}$enol, $C_2$-$C_{20}$enamine or $C_2$-$C_{20}$enhydrazine which is linked via the O atom or N atom; $R_2$ is cyclopentadienyl or indenyl each of which is unsubstituted or substituted by $C_1$-$C_6$alkyl, $C_2$-$C_6$alkenyl, $C_1$-$C_6$alkoxy, $C_5$-$C_6$cycloalkyl, $C_6$-$C_{12}$aryl, $C_7$-$C_{13}$aralkyl, tri-$C_1$-$C_6$alkoxysilyl, tri-$C_1$-$C_6$alkylsilyl, $R_6SO_2$— or halogen, Y is C, Si or —Si—O—$SiR_3R_4$—, $R_3$ and $R_4$ independently of one another are H, linear or branched $C_1$-$C_{18}$alkyl or $C_2$-$C_{12}$alkenyl or $C_5$-$C_6$cycloalkyl or $C_5$-$C_6$cycloalkenyl each of which is unsubstituted or substituted by $C_1$-$C_4$alkyl, or are phenyl, naphthyl, benzyl, $C_1$-$C_6$alkylphenyl or $C_1$-$C_6$alkylbenzyl, or $R_3$ and $R_4$ together are $C_nH_{2n}$— in which n is 3 to 7 and which is unsubstituted or sustituted by —CN, —F, —Cl, —Br, nitro, $C_1$-$C_{12}$alkylthio or $C_1$-$C_{12}$alkoxy, R is $C_6$-$C_{10}$aryl, $C_5$- or $C_6$-heteroaryl which contains a single heteroatom which is selected from the group comprising O, S and N, or $R_5$ is benzyl, naphthylmethyl or $C_5$-$C_6$heteroarylmethyl which contains a single heteroatom which is selected from the group comprising O, S and N which is unsubstituted or substituted by $C_1$-$C_{12}$alkyl, $C_1$-$C_{12}$alkoxy, $C_1$-$C_{12}$alkylthio, cyano, —$NR_{18}R_{19}$, —$CONR_{18}R_{19}$, fluorine, $C_6$-$C_{10}$aryl, $R_6SO_2$—, $C_1$-$C_{12}$alkoxymethyl, $C_1$-$C_{12}$alkylthiomethyl, —$CH_2NR_{18}R_{19}$ or —$CH_2CONR_{18}R_{19}$ wherein $R_{18}$ and $R_{19}$ are as defined above, or $R_5$ is $C_1$-$C_{12}$alkyl, $C_2$-$C_{12}$alkenyl, $C_2$-$C_{12}$alkynyl, $C_3$-$C_8$cycloalkyl or $C_3$-$C_8$cycloalkenyl, and C(1) and C(2) are chiral atoms, predominantly in the form of enantiomers or diastereomers.

**5,047,558**

## PROCESS FOR THE PREPARATION OF A DIOXANE ADDUCT OF 2-HYDROXYNAPHTHALENE-6-CARBOXYLIC ACID

Helmold von Plessen, Königstein/Taunus, and Siegbert Rittner, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 349,579, May 9, 1989, Pat. No. 4,925,959.

This application Feb. 14, 1990, Ser. No. 480,080

Int. Cl.[5] G07D *319/12*

U.S. Cl. 549—377 4 Claims

1. A process for the preparation of an adduct from 2-hydroxynaphthalene-6-carboxylic acid and 1,4-dioxane, wherein 2-hydroxynaphthalene-6-carboxylic acid is dissolved in 1,4-dioxane or a mixture thereof with water or with an organic solvent and then allowed to crystallize.

**5,047,559**

## NOVEL FLUORINATED LASER DYES

Peter R. Hammond, Livermore, Calif., and James F. Feeman, Wyomissing, Pa., assignors to United States Department of Energy, Washington, D.C.

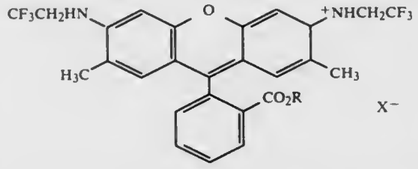
Division of Ser. No. 524,899, May 18, 1990, Pat. No. 4,992,560.

This application Jan. 22, 1991, Ser. No. 643,607

Int. Cl.[5] C07D *311/88*

U.S. Cl. 549—227 4 Claims

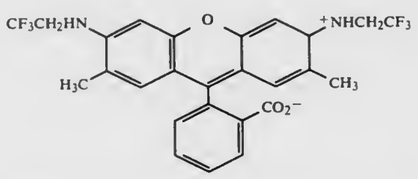
1. A method of preparing a compound of the formula III



wherein R is linear or branched alkyl containing 1-10 carbon atoms and $X^{\ominus}$ is an anion, comprising the steps of

(a) reacting substantially equimolar amounts of 2,2,2-trifluoroethyl-1-tosylate and 3-amino-4-methylphenol and acidifying the reaction product thereof to form N-monoalkylated 3-amino-4-methylphenol;

(b) purifying and drying at least a portion of said N-monoalkylated phenol from step (a) and condensing said N-monoalkylated phenol sequentially with phthalic anhydride and phosphoric acid to form a compound of the formula



(c) treating the product of step (b) with a compound of the formula ROH in the presence of an acid to form a compound of the formula III.



**5,047,560**

## PROCESS FOR PRODUCING HIGHLY PURE 3,3',4,4'-BIPHENYLTETRACARBOXYLIC ACID OR DIANHYDRIDE THEREOF

Fusaji Shoji, Yokohama; Nobuo Aoki, Gunma; Jun Kurita; Tsuyoshi Aoyama, both of Shibukawa; Toshiyuki Kiriyu, Gunma, and Yoshinori Matsuzaki, Yokohama, all of Japan, assignors to Hitachi, Ltd.; Japan Carlit Co., Ltd. and Kanto Koatsu, all of Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 490,917

Claims priority, application Japan, Oct. 6, 1989, 1-260026

Int. Cl.[5] C07D *307/77;* C07C *63/331*

U.S. Cl. 549—241 7 Claims

1. A process for producing highly pure 3,3',4,4'-biphenyltetracarboxylic acid, which comprises heating crude 3,3',4,4'-biphenyltetracarboxylic acid in the form of fine powder at 160° C.-260° C. to produce 3,3', 4,4'-biphenyltetracarboxylic dianhydride, treating the resulting 3,3',4,4'-biphenyltetracarboxylic dianhydride with hot water to separate impurities by dissolution, and filtering the resulting 3,3',4,4'-biphenyltetracarboxylic acid.

**5,047,561**

## PROCESS FOR PRODUCING A LACTONE

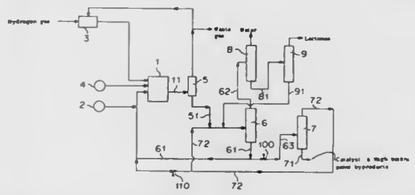
Chihiro Miyazawa; Kazunari Takahashi; Hiroshi Kameo; Shinji Isogai, all of Kurashiki, and Masayuki Otake, Yokohama, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Sep. 14, 1990, Ser. No. 582,158

Claims priority, application Japan, Sep. 27, 1989, 1-249346; Oct. 4, 1989, 1-257960; Oct. 24, 1989, 1-274999; Aug. 3, 1990, 2-206400

Int. Cl.[5] C07D *307/33*

U.S. Cl. 549—325 9 Claims



1. A process for producing a lactone by reacting in a hydrogenation reaction zone a dicarboxylic acid, a dicarboxylic acid anhydride and/or a dicarboxylic acid ester with hydrogen in a liquid phase using a solvent in the presence of a catalyst comprising ruthenium and an organic phosphine, which process comprises the following steps (1) to (6)

(1) a first step of recovering the liquid phase from the hydrogenation reaction zone,

(2) a second step of distilling the liquid phase in a first distillation column to obtain a first distillate and a first residue,

(3) a third step of recycling, the first residue to the hydrogenation reaction zone,

(4) a fourth step of distilling a part of the first residue in a second distillation column to obtain a second distillate and a second residue,

(5) a fifth step of recycling the second distillate to the hydrogenation reaction zone or the first distillation column, and

(6) a sixth step of recovering a lactone from the first distillate.

**5,047,562**

**Patent Not Issued For This Number**

**5,047,563**

## CHIRAL CROWN ETHERS

James B. Denton, and Kin-Fai Yip, both of Elkhart, Ind., assignors to Miles Inc., Elkhart, Ind.

Filed Sep. 10, 1987, Ser. No. 95,012

Int. Cl.[5] C07D *323/00*

U.S. Cl. 549—353 16 Claims

1. A composition comprising an ionophore selected from optically active isomers of bis (12-crown-4 methyl) dialkyl malonates, wherein one alkyl group is methyl and the second alkyl group has from 4 to 20 carbon atoms.

**5,047,564**

## FLUORINE-CONTAINING VITAMIN $D_2$ DERIVATIVES

Yoshiro Kobayashi, Tokyo; Takeo Taguchi, Hachioji, and Nobuo Ikekawa, Musashino, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

Filed Feb. 3, 1988, Ser. No. 151,931

Claims priority, application Japan, Feb. 10, 1987, 62-29423

Int. Cl.[5] C07J *9/00*

U.S. Cl. 552—653 1 Claim

1. (24ξ)-28,28,28-trifluoro-25-hydroxyvitamin $D_2$.

**5,047,565**

## MONONUCLEAR AND MULTINUCLEAR PHOSPHIDO, ARSENIDO, AND STIBIDO COMPLEXES OF ALUMINUM, GALLIUM AND INDIUM

Richard A. Jones; Alan H. Cowley, and John G. Ekerdt, all of Austin, Tex., assignors to Board of Regents, the University of Texas System, Austin, Tex.

Filed Oct. 14, 1987, Ser. No. 108,834

Int. Cl.[5] C07F *5/00, 9/50, 9/70, 9/90*

U.S. Cl. 556—19 9 Claims

1. A compound having the formula:

$$\{R_2M(ER'R'')\}n$$

wherein

M is gallium,

E is antimony,

R is chloride, R' and R'' are t-butyl; and n is 2

wherein M and E are bound by direct sigma bonding.

**5,047,566**

## COLORLESS FERRIC ALKYLPHOSPHATES

David R. Whitcomb, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 896,766, Aug. 14, 1986, abandoned. This application Jul. 7, 1987, Ser. No. 73,890

Int. Cl.[5] C07F *9/141, 15/02*

U.S. Cl. 556—24 11 Claims

1. A colorless iron compound substantially free of carboxylate capable of reacting with a chelate to give a colored iron complex, said iron compound being selected from those represented by the general formulae

$$Fe[OOP(OR)_2]_3.X$$

$$Fe[OOP(OR)_2]_3$$

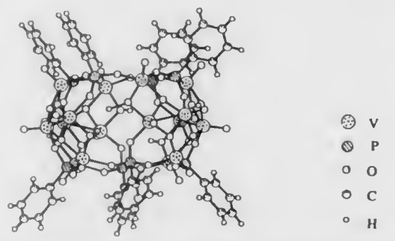
where each R is independently chosen from branched chain alkyl group whose main chain has from 3 to 18 carbon atoms, and X is an anion different from phosphate and wherein compounds of the second formula are insoluble in cyclohexane.

5,047,567

## HETEROPOLYOXO VANADIUM COMPOUNDS CONTAINING MOLECULAR ANIONS AND THEIR STRUCTURE

Guohe Huan, Washington, and Allan J. Jacobson, Princeton, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Sep. 17, 1990, Ser. No. 583,406
Int. Cl.[5] C07F 9/00, 9/02, 9/70
U.S. Cl. 556—42 13 Claims




1. A composition of matter comprising heteropolyoxo vanadium compounds of the general formula:

$$(R'_4N)_xH_y(VO_b)_a(RQO_3)\cdot nH_2O$$

wherein $(VO_b)_a(RQO_3)$ is a molecular anion; R and R′ selected from the group consisting of substituted or unsubstituted monovalent organic groups and mixtures thereof; Q is a phosphorus or arsenic atom; n is zero or a positive number; a is from about 1.0 to about 3.0; b is from about 1.0 to about 2.0; x and y are such that $(x+y)$ equals $(2ab+2)-ma$ where m is the oxidation state of the vanadium ranging from about 3.5 to about 5.0, and where $(x+y)$ and x cannot equal zero.

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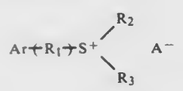
5,047,568

## SULFONIUM SALTS AND USE AND PREPARATION THEREOF

Raymond W. Angelo, Endwell; Jeffrey D. Gelorme, Binghamton; Joseph P. Kuczynski, Apalachin; William H. Lawrence, Greene, all of N.Y.; Socrates P. Pappas, Fargo, N. Dak., and Logan L. Simpson, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 18, 1988, Ser. No. 272,965
Int. Cl.[5] C07C 381/12; C08G 59/68, 59/72
U.S. Cl. 556—64 12 Claims

1. A compound having the formula:



wherein Ar is a fused aromatic radical selected from the group of anthracyl, peryl, and pyryl; $R_1$ is a divalent bridge selected from the group of alkylene and alkenylene, alkylene and alkenylene chains broken with an oxygen atom; and substituted derivatives thereof having a hydroxyl group pendant from the chain; each $R_2$ and $R_3$, individually, is selected from the group of alkyl, aryl, alkaryl, aralkyl, and substituted aryl, provided that not more than one of $R_2$ and $R_3$ is alkyl; and $A^-$ is a non-nucleophilic anion.

5,047,569

## METHOD OF PRODUCING POLYSILANE COMPOUNDS

Bruce C. Berris, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 3, 1990, Ser. No. 548,483
Int. Cl.[5] C07F 7/08
U.S. Cl. 556—430 15 Claims

1. A method for polymerizing a monomeric or oligomeric silane precursor material to produce a polysilane compound comprising polymerizing said monomeric or polymeric silane precursor material in the presence of an effective amount of a diphosphorous nickel chloride catalyst for producing an average molecular weight of about 500 or more for said polysilane compound.

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5,047,570

## PREPARATION OF 2-CYANO-3-AMINOACRYLONITRILE DERIVATIVES

Schefczik: Ernst, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 10, 1989, Ser. No. 308,617
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804394
Int. Cl.[5] C07C 253/30
U.S. Cl. 558—375 4 Claims

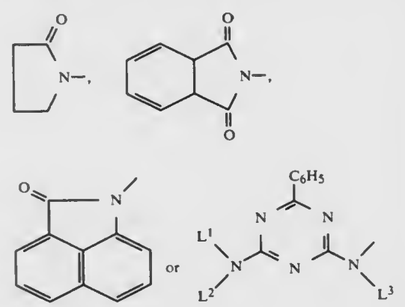
1. A process for preparing a 2-cyano-3-aminoacrylonitrile derivative of the formula I



(I)

where R is selected from the group consisting of substituted $C_1$–$C_{10}$-alkyl, styryl or $C_1$–$C_4$-dialkylamino substituted styryl, phenyl or substituted phenyl and aromatic heterocyclyl, and wherein;

(a) the alkyl substituents are selected from the group consisting of $C_1$–$C_4$ alkoxy, phenoxy, phenyl or substituted phenyl having a group selected from $C_1$–$C_4$ alkyl, nitro, halogen and hydroxyl, $C_1$–$C_4$ alkoxy, $C_1$–$C_4$-monoalkyl, dialkyl carbamoyl, pyrrolidinocarbonyl, piperidinocarbonyl, morpholinocarbonyl, piperazinocarbonyl, N-($C_1$–$C_4$-alkyl)piperazinocarbonyl, phenylthio, phenylsulfonyl, anilino, $C_1$–$C_4$-alkanoylamino, benzoylamino, N-($C_1$–$C_4$-alkyl)-N-($C_1$–$C_4$-alkanoyl)-amino, N-($C_5$–$C_7$-cycloalkyl)-N-($C_1$–$C_4$-alkanoly)-amino, N-($C_1$–$C_4$-alkyl)-N-benzoylamino, N-phenyl-N-benzoylamino, phenylsulfamino, N-($C_1$–$C_4$-alkyl)-phenylsuflonylamino, N-phenyl-N-phenylsulfonylamino, N,N′-($C_1$–$C_4$-dialkyl)ureido, N-phenyl-N′-($C_1$–$C_4$-alkyl)ureido, N,N′-diphenylureido, 4,5-dichloropyridazin-1-yl, and a radical taken from the formulas consisting of:



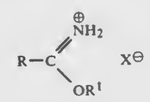


wherein $L^1$, $L^2$ and $L^3$ are identical or different, and each is independent of the others, are hydrogen or $C_1$–$C_4$-alkyl; (b) the phenyl substituents are selected from the group consisting of $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, hydroxyl, phenoxy, phenylthio, phenylsulfonyl, $C_1$–$C_4$-alkoxycarbonyl, $C_1$–$C_4$-hydroxyalkyl, $C_4$-hydroxyalkyl, $C_1$–$C_4$-haloalkyl, $C_1$–$C_4$-(pyrrolidino)-, -(piperidino)-, -(morpholino)-, -(piperazino)-, -[N-($C_1$–$C_4$-alkyl)-piperazino]-alkyl, $C_1$–$C_4$-phenylalkoxy, $C_1$–$C_4$-dialkylsulfamoyl and $C_1$–$C_4$-alkanoylamino;

(c) said aromatic heterocyclyl is selected from the group consisting of pyridinyl, $C_1$–$C_4$-alkyl substituted pyridinyl, thienyl and $C_1$–$C_4$ alkyl substituted thienyl; which comprises treating a nitrile of the formula II

R—CN (II)

where R is as defined above, in an organic diluent at from 0° to 30° C. with a $C_1$–$C_6$ alkanol in the presence of a hydrogen halide and reacting the resulting iminoester hydrohalide of the formula III



where R is as defined above, $R^1$ is $C_1$–$C_6$-alkyl and X is a halide ion, with or without intermediary isolation, with malodinitrile in an inert organic solvent at from 20 to 100° C. in the presence of a base selected from the group consisting of sodium carbonate, potassium carbonate, sodium bicarbonate, potassium bicarbonate, triethylamine, tripropylamine, triisopropylamine, tributylamine, N,N-dimethylaniline, N,N-diethylaniline, sodium methoxide and sodium ethoxide.

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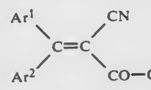
5,047,571

## PROCESS FOR THE PREPARATION OF 2-CYANO-3,3-DIARYLACRYLATES

Peter Spang, Ingbert, and Peter Neumann, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

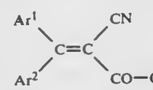
Filed Apr. 13, 1990, Ser. No. 508,689
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914382
Int. Cl.[5] C07C 253/30
U.S. Cl. 558—402 4 Claims

1. A process for the preparation of a 2-cyano-3,3-diarylacrylate of the general formula I



(I)

in which $Ar^1$ and $Ar^2$ each denote phenyl and R is an aliphatic radical of from 3 to 30 carbon atoms, wherein a 2-cyano-3,3-diarylacrylate of the general formula II



(II)

in which $R^1$ stands for methyl or ethyl, is reacted with an alcohol of formula III

R—OH (III)

in the presence of a basic catalyst, selected from the group of basic alkali metal salts and alkaline earth salts, alkaline earth oxides and basic zeolites, at a temperature of from 90° to 180° C., with continuous removal of the resulting alcohol R′—OH, wherein the continuous removal of the alcohol R′OH is effected with a stream of inert gas.

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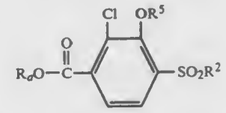
5,047,572

## TRISUBSTITUTED BENZOIC ACID INTERMEDIATES

William J. Michaely, El Cerrito, and Jeff K. Curtis, Berkeley, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 386,648, Jul. 31, 1989, Pat. No. 5,001,256, which is a division of Ser. No. 273,391, Nov. 18, 1988, abandoned. This application Dec. 10, 1990, Ser. No. 624,932
Int. Cl.[5] C07C 317/14
U.S. Cl. 560—11 2 Claims

1. A compound of the structural formula



wherein $R_a$ is $C_1$–$C_4$ alkyl, $R^5$ is $—CH_2CH_2OCH_3$ or $—CH_2CH_2OC_2H_5$; and $R^2$ is $C_1$–$C_4$ alkyl.

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5,047,573

## PROCESS FOR THE PRODUCTION OF PEPTIDES USING DIACYLAMINES

Hans Bradaczek, Bergengruenstrasse 47, D-100 Berlin 38, Fed. Rep. of Germany; Wojciech Gruszecki, and Maria Gruszecki, both of Berlepschstrasse 132, D-100 Berlin 37, Fed. Rep. of Germany

PCT No. PCT/DE87/00088, § 371 Date Dec. 7, 1987, § 102(e) Date Dec. 7, 1987, PCT Pub. No. WO87/05292, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 27, 1987, Ser. No. 123,157
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3608083
Int. Cl.[5] C07C 205/00, 261/00; C07K 1/00
U.S. Cl. 560—21 4 Claims

3. N-(2-chlorbenzoyl)-N-(N′tert.-butyloxycarbonyl-L-alanin anilide.

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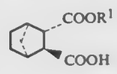
5,047,574

## CERTAIN OPTICALLY ACTIVE MONO ESTERS OF DICARBOXYLIC ACIDS

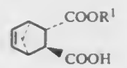
Mitsuaki Ohtani, Nara, and Takaharu Matsuura, Hyogo, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Dec. 12, 1989, Ser. No. 448,867
Claims priority, application Japan, Dec. 14, 1988, 63-315729
Int. Cl.[5] C07C 69/74
U.S. Cl. 560—120 1 Claim

1. An optically active mono-ester selected from the group consisting of a (1R,2S,3S,4S)-3-carboxy-bicyclo[2,2,1]heptane-2-carboxylic acid ester of the formula:



or a (1S,2S,3S,4R)-3-carboxy-bicyclo[2,2,1]hept-5-ene-2-carboxylic acid ester of the formula:



wherein $R^1$ is alkyl which may be substituted by alkoxy, halogen, amino, amino derivative, or nitro or $R^1$ is alkenyl, aryl or aralkyl, each of which may be substituted by alkyl, alkoxy, halogen, amino, amino derivative or nitro, or enantiomer of said carboxylic acid esters of the aforementioned formulae.

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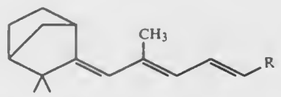
**5,047,575**

## NORBORNENE CARBOXYLIC ACIDS AND ESTERS

**Guy Solladie, Strasbourg; Serge Forestier, Claye-Souilly, and Gérard Lang, St-Gratien, all of France, assignors to L'Oreal, Paris, France**

**Filed Oct. 14, 1988, Ser. No. 258,132**
**Claims priority, application France, Oct. 16, 1987, 87 14298**
**Int. Cl.[5] C07C *69/74, 35/20***
**U.S. Cl. 560—120** **7 Claims**

1. A compound having the formula



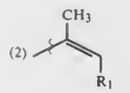
(I)

or a corresponding salt thereof, wherein R represents



(II)

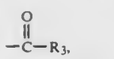
or



(III)

wherein

$R_1$ represents a radical selected from the group consisting of oxazolinyl, —C≡N, —$CH_2$—O—$R_2$ and



$R_2$ represents hydrogen, $C_1$–$C_6$ alkyl, cyclopentyl, cyclohexyl, tetrahydropyrannyl, $C_7$–$C_9$ aralkyl unsubstituted or substituted with one or more $C_1$–$C_6$ alkoxy groups, a radical of the formula



wherein R', R'' and R''' each independently, represents linear or branched $C_1$–$C_6$ alkyl or aryl unsubstituted or substituted by $C_1$–$C_4$ alkyl,

$R_3$ represents hydrogen, —$OR_4$

wherein $R_4$ represents hydrogen or $C_1$–$C_6$ alkyl.

**5,047,576**

## POLYMERIZABLE VINYL COMPOUND HAVING POLYTHIOETHER SKELETON

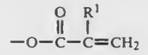
**Yoichiro Takenosita, and Haruo Yoshida, both of Oita, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 23, 1988, Ser. No. 172,178**
**Claims priority, application Japan, Mar. 25, 1987, 62-69147; Mar. 26, 1987, 62-70471**
**Int. Cl.[5] C07C *321/12***
**U.S. Cl. 560—125** **6 Claims**

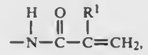
1. A polymerizable vinyl compound having a polythioether skeleton, which is prepared by addition-reaction (1) a polyene compound represented by the following general formula (I):

$$A\text{-}X_m \quad (I)$$

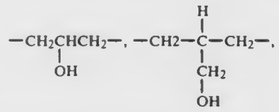
wherein X stands for (a)

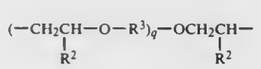


or (b)

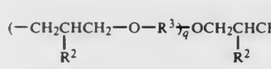


A stands for a polyvalent aliphatic or alicyclic hydrocarbon residue, or





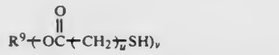
or



$R^1$ stands for H or $CH_3$, $R^2$ stands for H, an aliphatic hydrocarbon residue or OH, $R^3$ stands for an aliphatic or alicyclic hydrocarbon residue which may contain a halogen atom, and m and q are integers of m ≧ 2 and q ≧ 1, with (2) at least one polythiol compound selected from the group consisting of those which are represented by the following general formulae (II) and (IV):

$$R^4\text{—SH})_r \quad (II)$$

wherein $R^4$ stands for an organic group consisting of an aliphatic or alicyclic hydrocarbon, and r is an integer of from 2 to 4,



(IV)

wherein $R^9$ stands for a substituted or unsubstituted aliphatic polyhydric alcohol residue having 2 to 20 carbon atoms, which may have an OH group, u is an integer of 1 or 2, and v is an integer of form 2 to 4,

in the presence of a basic catalyst under such a condition that the ratio of the total number of vinyl groups in the polyene compound to the total number of thiol groups in the polythiol compound is at least 2; the terminal groups of said polymerizable vinyl compound being X.



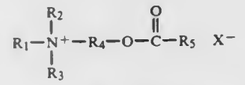
**5,047,577**

## QUATERNARY AMMONIUM COMPOUNDS

**Kim R. Smith; Joe D. Sauer, and James E. Borland, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.**

**Continuation of Ser. No. 782,353, Oct. 1, 1985, Pat. No. 4,883,917. This application Aug. 8, 1986, Ser. No. 894,938**
**Int. Cl.[5] C07C *67/02***
**U.S. Cl. 560—253** **21 Claims**

1. A quaternary ammonium laundry bleach activator having the formula



wherein $R_1$ and $R_2$ are alkyls containing 8–20 carbon atoms, $R_3$ is methyl, $R_4$ is —$(CH_2CH_2)$—, $R_5$ is an alkyl containing 1–20 carbon atoms and X is a monovalent anion.

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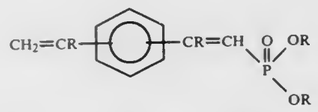
**5,047,578**

## NOVEL PHOSPHONIC ACID COMPOUNDS AND METHOD OF PREPARATION

**Gerald K. McEwen, Ashland, Va., and Donald L. Schmidt, Midland, Mich., assignors tn The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 82,758, Aug. 7, 1987, Pat. No. 4,758,384. This application Apr. 20, 1988, Ser. No. 183,853**
**Int. Cl.[5] C07F *9/38, 9/40***
**U.S. Cl. 562—8** **3 Claims**

1. A compound which corresponds to the formula



wherein R is independently in each occurrence hydrogen or $C_{1-12}$ alkyl.

2. The compound of claim 1 wherein R is in each occurrence hydrogen.

3. The compound of claim 2 which is (2-(4-ethenylphenyl)ethenyl)-phosphonic acid.

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**5,047,579**

## PROCESS FOR PRODUCING N-PHOSPHONOMETHYLGLYCINE

**Jozef G. Glowka; Kai K. Lau, both of New South Wales, Australia; Henryk Krawczyk, Orzeszkowej, Poland, and Donald L. Fields, Jr., Manchester, Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Jun. 25, 1990, Ser. No. 543,002**
**Claims priority, application Australia, Jan. 26, 1990, PJ8339**
**Int. Cl.[5] C07F *9/38***
**U.S. Cl. 562—17** **16 Claims**

1. In a process for producing N-phosphonomethylglycine by the oxidation of N-phosphonomethyliminodiacetic acid with a peroxide to form an intermediate N-phosphonomethyliminodiacetic acid-N-oxide, the improvement which comprises:

adding a catalytic amount of a metabisulfite compound in the presence of a catalytic amount of water-soluble molybdenum compound to convert the intermediate to N-phosphonomethylglycine.

**5,047,580**

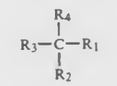
## PROCESS FOR THE SEPARATION OF SULFURIC ACID FROM AQUEOUS MIXTURES OF PARAFFIN-SULFONIC ACIDS

**Lucio Faggian, San Donato Milanese; Enrico Borgarello, Turin; Cosimo Franco, Locri, and Gerardo Carrillo, San Donato Milanese, all of Italy, assignors to Eniricerche S.p.A., Milan and Enichem Augusta S.p.A., Palermo, both of, Italy**

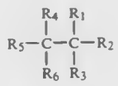
**Continuation of Ser. No. 136,559, Dec. 22, 1987, abandoned. This application Mar. 22, 1990, Ser. No. 498,443**
**Claims priority, application Italy, Dec. 23, 1986, 22815 A/86**
**Int. Cl.[5] B01D *3/10;* C07C *303/42***
**U.S. Cl. 562—33** **13 Claims**

1. A process for the separation of sulfuric acid from an aqueous mixture, thereof with ($C_{12}$–$C_{18}$)-paraffin-sulfonic acids, comprising the steps of:

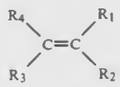
(a) mixing said aqueous mixture, at a temperature within the range from 10° to 80° C., with one or more halogenated solvent(s) selected from the group consisting of methane, ethane and ethylene halogenated derivatives of the general formulas of (1), (2) or (3):



(1)



(2)



(3)

wherein at least one of $R_1$, $R_2$, $R_3$, $R_4$, $R_5$ and $R_6$ is a halogen, and the remaining R's are hydrogen, to form a two phase mixture, wherein said two phase mixture consists of an aqueous phase constituted by $H_2SO_4$ and $H_2O$ and a residual phase containing paraffin-sulfonic acids,

(b) mixing said residual phase with sulfuric acid to form a residual refined phase containing paraffin-sulfonic acids and a second phase, wherein said second phase is constituted by sulfuric acid in water, and

(c) recovering paraffin-sulfonic acids by submitting said residual refined phase to a treatment of separation of the halogenated solvent or of the halogenated solvents used.

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**5,047,581**

## ISOLATION OF CIS-ISOMERS FROM ISOMERIC MIXTURES OF CIS/TRANSCYCLOPROPANECARBOXYLATES

**Raymond M. Palmere, West Orange, and Thomas E. Guralski, Trenton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed Aug. 25, 1989, Ser. No. 398,674**
**Int. Cl.[5] C07C *51/347, 51/42***
**U.S. Cl. 562—506** **12 Claims**

1. A process for preparing a product substantially enriched in the cia isomers of 3-(2-halo-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylic acid from isomeric mixtures of cis- and trans-3-(2,2-dihalo-3,3,3-trifluoropropyl)-2,2-dimethylcyclopropanecarboxylic acid esters which comprises contacting said isomeric mixture with an excess of base in a solvent at elevated temperatures, to hydrolyze the ester, dehydrohalogenate the side chain and selectively convert the unsaturated side chain of the trans cyclopropane carboxylic acid to an acetyl byproduct acidifying the resulting product mixture to a pH of about 7.2 to 7.4, and recovering cis-3-(2-halo-3,3,3-tri-

VOL 1130 ISS 2 SE 10 1991 UMI

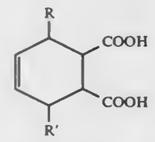


fluoro-1-propenyl)-2,2-dimethylpropanecarboxylic acid, wherein halo is chloro or bromo.

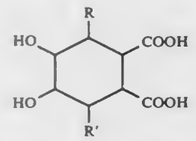
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**5,047,582**
**PROCESS FOR THE OXIDATION OF A TETRAHYDROPHTHALIC ACID**
**David L. Brotherton, and Kwok W. Fung, both of Easley, S.C., assignors to Ortec, Inc., Easley, S.C.**
**Filed Oct. 2, 1989, Ser. No. 415,890**
**Int. Cl.[5] C07C *51/285***
**U.S. Cl. 562—508** **20 Claims**

1. A process for oxidation of a tetrahydro compound of the formula



wherein R and R' independently are H, alkyl, aryl or halo, to a glycol of the formula



comprising treating the tetrahydro compound with hydrogen peroxide under reflux conditions at a temperature above about 50° C. to 100° C. in the absence of a catalyst.

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**5,047,583**
**PRODUCTION OF CARBOXYLIC ACIDS**
**Peter S. Williams, Hull, England, assignor to BP Chemicals Limited, London, England**
**Filed Jul. 13, 1984, Ser. No. 630,656**
**Claims priority, application United Kingdom, Jul. 15, 1983, 8319184**
**Int. Cl.[5] C07C *51/353, 53/122, 53/08***
**U.S. Cl. 562—606** **22 Claims**

1. In a process for the preparation of a carboxylic acid of the formula $RCO_2H$ from an ester of formic acid of the formula $HCO_2R$, where R is a $C_1$ to $C_{10}$ aliphatic hydrocarbyl radical, which process comprises reacting the formic acid ester at elevated temperature and superatmospheric pressure with a halide promoter and an iridium catalyst selected from the group consisting of $[Ir(Cyclooctadiene)Cl]_2$, $HIr-CO[P(C_6H_5)_3]_3$, $Na_2IrCl_6{\cdot}XH_2O$, $ClIrCO(PEt_3)_2$, $UrBr_3{\cdot}XH_2$), $IrCl_3{\cdot}XH_2O$, $Ir13{\cdot}XH_2O$, $Na_3IrNO_2O$, $[(C_5H_5)_2Ir]NO_3$, $Ir_4-(CO)_{12}$, $IrH_3[P(C_6H_5)_3]_3$, 1,2,3-$py_3IrCl_3$, trans$[Ir\ py_4Cl_2]Cl$, $(C_8H_{12})_2IrSnClhd$ 3, and iridium metal, where X indicates differing degrees of hydration and varies from 0 to 12, the improvement which comprises carrying out the reaction in the presence of a strong acid comprising a sulphonic acid.

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**5,047,584**
**PROCESS FOR THE PREPARATION OF PENTAHALOETHOXY BENZOYL HALIDE COMPOUNDS**
**James J. Maul, Grand Island, N.Y., and Byron R. Cotter, Northvale, N.J., assignors to Occidental Chemical Corp., Grand Island, N.Y.**
**Filed Dec. 9, 1985, Ser. No. 806,915**
**Int. Cl.[5] C07C *51/60***
**U.S. Cl. 562—852** **8 Claims**

1. A process for the preparation of pentahaloethoxy benzoyl halide compounds comprising the steps of:
(a) chlorinating p-cresyl trifluoroacetate to form p-α,α-dichloro-β-,β-,β-trifluoroethoxy benzotrichloride; and
(b) (1) fluorinating the p-α,α-dichloro-β-,β-,β-tri-fluoroethoxy benzotrichloride to form p-pentafluoroethoxy benzotrifluoride and (2) hydrolyzing the p-pentafluoroethoxy benzotrifluoride to form p-pentafluoroethoxy benzoyl fluoride.

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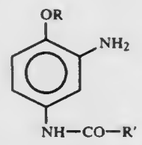
**5,047,585**
**PROCESS FOR RACEMIZING AN OPTICALLY ACTIVE N-BENZYLIDENE AMINO-ACID AMIDE**
**Wilhelmus H. J. Boesten, Sittard; Hans E. Schoemaker, Urmond, and Bernardus H. N. Dassen, Heerlen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands**
**Division of Ser. No. 850,157, Apr. 10, 1986, Pat. No. 4,847,412.**
**This application Apr. 3, 1989, Ser. No. 332,576**
**Claims priority, application Netherlands, Apr. 12, 1985, 8501093**
**Int. Cl.[5] C07C *231/06***
**U.S. Cl. 564—124** **1 Claim**

1. A process for the preparation of DL-amino-acid amide from the corresponding DL-aminonitrile in the presence of water and a water-miscible ketone and at least 0.05 mole of strong base per liter solution while in the same step incorporating the racemization of a corresponding optically active N-benzylidene amino-acid amide.

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**5,047,586**
**PROCESS FOR THE PREPARATION OF 4-ACYLAMINO-2-AMINOALKOXYBENZENES**
**Hartmut Heise, Bad Soden am Taunus, and Manfred Hintzmann, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**
**Continuation of Ser. No. 308,883, Feb. 9, 1989. This application Aug. 22, 1990, Ser. No. 571,505**
**Claims priority, application Fed. Rep. of Germany, Feb. 13, 1988, 3804621**
**Int. Cl.[5] C07C *231/02, 209/36***
**U.S. Cl. 564—144** **8 Claims**

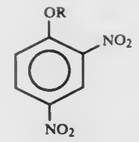
1. A process for the preparation of 4-acylamino-2-aminoalkoxybenzenes of the formula (I)



(I)

in which R denotes an alkyl-$C_1$–$C_6$- or alkoxy-$C_1$–$C_4$-alkylene-$C_1$–$C_4$ group and R' denotes a methyl or ethyl group, which comprises pumping a solution or suspension of a 2,4-dinitroalkoxybenzene of the formula (2)





in which R has the above mentioned meaning, in a butyl acetate into a stirred suspension of a nickel catalyst on a kieselguhr carrier in butyl acetate, which has been initially introduced into an autoclave, at a hydrogen pressure of about 5 to about 50 bar, and a temperature of about 60° to about 120° C., at a rate which corresponds to the rate of the hydrogenation of 2,4-dinitroalkoxybenzene to 2,4-diaminoalkoxybenzene, dehydrating the reduction solution by azeotropic distillation, after the hydrogenation is completed, and acylating the resulting 2,4-diaminoalkoxybenzene with about 0.90 to about 0.99 mole of the anhydride of an alkylmonocarboxylic acid having 2 to 3 carbon atoms, relative to 1 mole of 2,4-diaminoalkoxybenzene, at temperatures of about −5° to about +15° C.

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**5,047,587**
**PROCESS FOR PURIFYING OXALIC ACID DIAMIDE**
**Loreno Lorenzoni, Porto Torres; Giuseppe Messina, Alghero, and Vittorio Bruzzi, Milan, all of Italy, assignors to Enichem Anic S.p.A., Palermo, Italy**
**Filed Dec. 8, 1987, Ser. No. 129,843**
**Claims priority, application Italy, Dec. 11, 1986, 22638 A/86**
**Int. Cl.[5] C07B *63/00*; C07C *103/4***
**U.S. Cl. 564—160** **13 Claims**

1. A process for removing copper form copper-containing oxamide comprising contacting said oxamide at least once with an effective amount of an aqueous solution of a complexing agent for copper comprising an ammonium salt of an organic or inorganic acid, wherein said copper and said complexing agent form a water-soluble copper complex, the process taking place at a pH form 2 to 8 and at a temperature from 40° to 150° C.

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**5,047,588**
**SURFACE ACTIVE POLYCARBODIIMIDES AND THEIR DISPERSIONS**
**James W. Taylor, S. Charleston, W. Va., assignor to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.**
**Division of Ser. No. 845,982, Mar. 31, 1986, Pat. No. 4,820,863.**
**This application Jan. 30, 1989, Ser. No. 303,231**
**The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.**
**Int. Cl.[5] C07C *267/00***
**U.S. Cl. 564—252** **11 Claims**

1. A carboxyl-reactive surface-active polycarbodiimide of the formula

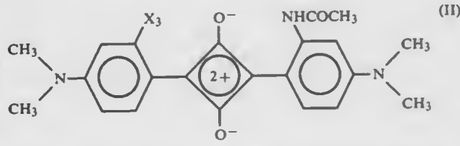
R—X—R'

wherein R is a residue of a hydrophobic organic compound containing at least two carbodiimide groups; R' is a residue of an organic compound having a hydrophilic segment and at least one functional group capable of reacting with a carbodiimide group; and X is a group formed by the reaction of a said carbodiimide group with a said functional group.

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**5,047,589**
**ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING SQUARYLIUM COMPOUND**
**Yutaka Akasaki; Akihiko Tokida; Kaoru Torikoshi; Tooru Ishii; Hidemi Suto, and Akira Imai, all of Kanagawa, Japan, assignors to Fuji Xerox Co. Ltd., Tokyo, Japan**
**Filed Dec. 2, 1988, Ser. No. 278,917**
**Claims priority, application Japan, Dec. 4, 1987, 62-305855; Dec. 4, 1987, 62-305862; Dec. 4, 1987, 62-305863; Dec. 4, 1987, 62-305864; Dec. 4, 1987, 62-305865; Dec. 4, 1987, 62-305866**
**Int. Cl.[5] C07C *211/00***
**U.S. Cl. 564—307** **1 Claim**

1. A squarylium compound represented by formula (II)



(II)

wherein $X_3$ is a hydrogen atom, a methyl group, a fluorine atom, or a hydroxy group.

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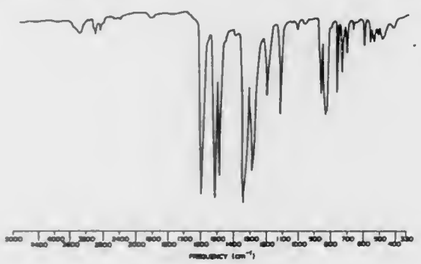


5,047,590

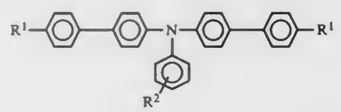
## DINITRO COMPOUNDS, DIAMINO COMPOUNDS AND TRIAMINE COMPOUNDS AND PREPARATION METHODS THEREOF

Tomoyuki Shimada, Numazu; Masaomi Sasaki, Susono, and Tamotsu Aruga, Mishima, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 29, 1990, Ser. No. 530,166
Claims priority, application Japan, May 31, 1989, 1-140107; May 31, 1989, 1-140108
Int. Cl.[5] C07C *211/54*
U.S. Cl. 564—309 10 Claims



1. A compound having formula (I):



(I)

wherein $R^1$ is a nitro group, an amino group or a diphenylamino group which may have a substituent; and $R^2$ is hydrogen or an alkyl group having 1 to 6 carbon atoms.

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5,047,591

## SINGLE-STAGE PROCESS FOR PRODUCING BIS-(AMINO-NITROPHENYL)-METHANE

Werner Stegmann, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 142,241, Jan. 4, 1988, abandoned, which is a continuation of Ser. No. 20,243, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 789,253, Oct. 18, 1985, abandoned. This application Sep. 6, 1988, Ser. No. 241,828
Claims priority, application Switzerland, Oct. 30, 1984, 5181/84
Int. Cl.[5] C07C *209/78*
U.S. Cl. 564—331 2 Claims

1. A process for producing bis-(4-amino-3-nitrophenyl)-methane in one stage, which process comprises

condensing in a 2:1 molar ratio o-nitroaniline with formaldehyde firstly in water at a temperature of between 20° and 40° C. in the presence of sulfuric acid, wherein for each 1 part of o-nitroaniline, 3–4 parts by weight of water and 1.7–2.2 parts by weight of 92–94% sulfuric acid are present, and

subsequently rearranging the formed methylene-bis-(o-nitroaniline) by heating of the reaction mixture at a temperature of between 90° and 100° C.

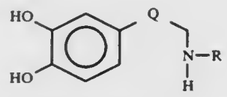
5,047,592

## SELECTIVE HYDROGENOLYSIS PROCESS

Joel F. Carpenter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 21, 1989, Ser. No. 396,346
Int. Cl.[5] C07C *209/68, 209/78*
U.S. Cl. 564—374 14 Claims

1. A process which comprises subjecting one or more compounds of the formula



(II)

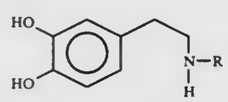
where Q is either a carbonyl group



or a hydroxymethylene group



and R is a hydrogen atom or a hydrocarbyl group, to hydrogenolysis in an aqueous, acidic reaction medium at a temperature of about 20° to about 100° C. and a pressure up to about 100 psi using hydrogen and a metal hydrogenolysis catalyst such that there is produced a compound of the formula



(I)

wherein R is a hydrogen atom or a hydrocarbyl group.

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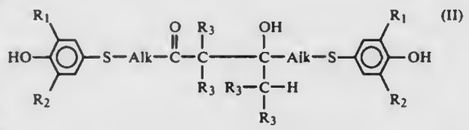
5,047,593

## LIPOXYGENASE INHIBITING COMPOUNDS

Richard A. Mueller, Glencoe, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 196,927, May 20, 1988, which is a continuation of Ser. No. 736,887, May 20, 1985, abandoned. This application Jun. 2, 1989, Ser. No. 360,953
Int. Cl.[5] C07C *321/26;* C07B *323/09, 323/20*
U.S. Cl. 568—43 8 Claims

1. A compound of the formula:



(II)

wherein $R_1$ and $R_2$ are the same or different members of the group consisting of 1,1-dimethyethyl, halo, phenyl or substituted phenyl wherein the substituents are selected from the group consisting of halo, hydroxy, lower alkyl and lower alkoxy; Alk is $C_1$–$C_6$ alkylene, $R_3$ is hydrogen or lower alkyl; with the limitation that $R_1$ each must be the same and $R_2$ each must be the same.

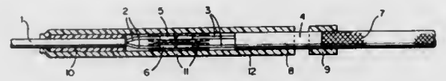


5,047,594

## NUCLEAR QUALIFIED IN-CONTAINMENT ELECTRICAL CONNECTORS AND METHOD OF CONNECTING ELECTRICAL CONDUCTORS

J. G. Powell, Clifton Park, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 9, 1990, Ser. No. 549,982
Int. Cl.[5] H02G *15/08;* H01R *4/00*
U.S. Cl. 174—88 R 6 Claims



1. A method of making a nuclear qualified electrical connection between electrical conductors comprising:

stripping the ends of an insulated instrument wire to expose two electrical conductors extending therefrom;

providing a watertight electrical cable comprised of sealing material around and between electrical conductors thereof;

stripping an end of said watertight cable to expose two electrical conductor lead wires extending from said end of the cable;

positioning a length of a first heat shrinkable tubing onto each of said cable lead wires;

positioning a length of a second heat shrinkable tubing on the end of said instrument wire adjacent the stripped end thereof;

positioning a length of an outer third heat shrinkable tubing on said watertight cable having a length sufficient to cover an end portion of said insulated wire adjacent said conductors therefrom and the end portion of said cable adjacent said cable lead wires;

providing two butt spliced connectors; .

inserting the ends of each of said instrument conductors into an end of a respective one of said butt splice connectors;

inserting said ends of said cable lead wires into opposite ends of respective ones of said butt spliced connectors;

crimping each of said butt splice connectors to electrically and structurally connect said respective ends of said lead wires together;

positioning said first heat shrinkable tubing on each of said cable lead wires over a portion of said cable lead wires and said respective butt spliced connector;

heating said first and second heat shrinkable tubing to shrink said first and second tubing onto the respective parts covered thereby;

positioning said outer third heat shrinkable tubing so that it extends over the ends of said cable and instrument wire; and

heating said outer third heat shrinkable tubing to shrink said outer third heat shrinkable tubing onto said respective ends of said instrument wire and cable and onto said butt splice connectors therebetween.

3. A nuclear qualified in-containment electrical connection comprising:

an insulated, sheathed instrument lead having electrical conductors therein, the ends of said electrical conductors extending from one end of said instrument lead to provide two exposed lead wires extending from said instrument lead;

a watertight cable having electrical conducting wires therein and sealing material around and between said electrical conductors so that said cable is watertight under a differential pressure, said conducting wires extending from one end of said cable to provide two instrument lead wires therefrom;

two butt splice connectors each connecting the ends of respective ones of said lead wires from said instrument lead and said cable;

a length of a first heat shrinkable plastic tubing positioned over each butt splice connector and an adjacent portion of a respective lead wire from said cable, said tubing being heat shrunk into position;

a length of a second heat shrinkable plastic tubing on the end portion of said instrument lead adjacent said lead wires therefrom, said heat shrinkable tubing being heat shrunk onto said instrument lead; and

a length of outer an outer third heat shrinkable plastic tubing extending over said end portion of said instrument lead and said heat shrinkable tubing thereon and over said butt spliced connectors and a portion of said cable adjacent said cable lead lines, said outer third heat shrinkable tubing being heat shrunk into sealing position on said instrument lead and said cable.

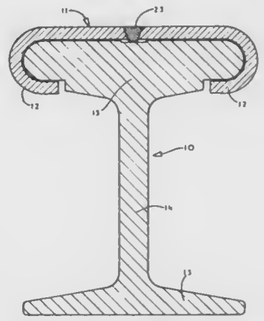
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5,047,595

## CONDUCTOR RAILS

David J. Hartland, Taunton, England, assignor to Willis Bricknell & Co., Limited, Chard, England

Filed May 17, 1990, Ser. No. 527,048
Claims priority, application United Kingdom, May 20, 1989, 8911676
Int. Cl.[5] E01B *5/08*
U.S. Cl. 191—22 DM 13 Claims



1. A method of manufacturing a conductor rail comprising a main body and a wear-resisting facing layer, said main body having an upwardly presented surface, said method including forming the facing layer as at least two portions and welding said at least two portions together when disposed in contact with the main body in such manner as to obtain a mechanical interlocking engagement of the thus formed facing layer with the main body.

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5,047,596

## MULTI-WAY CHANGE-OVER ROTARY AND SLIDE SWITCH

Nobuo Ebishi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1990, Ser. No. 506,976
Claims priority, application Japan, Jun. 12, 1989, 1-67337[U]
Int. Cl.[5] H01H *9/00, 15/00, 25/00*
U.S. Cl. 200—4 4 Claims

1. A multi-way change-over switch, comprising:

a manually operable lever having first and second ends, said lever including a planar protrusion positioned intermediate said first and second ends;

a rotary slider including electrically conducting contacts, said rotary slider supporting said manually operable lever for rocking motion thereon, and said rotary slider further including a flange portion comprising a plurality of sides, wherein each side of said flange portion acts as a fulcrum

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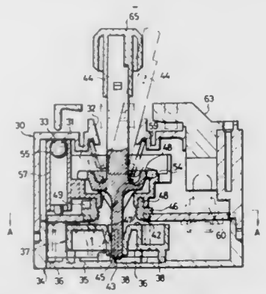


with said planar protrusion of said manually operable lever, whereby rotation of said manually operable lever also rotates said rotary slider;

a printed circuit board having a plurality of contacts on first and second sides of said printed circuit board and a through hole which allows passage of said manually operable lever, said printed circuit board supporting said rotary slider on said first side;

a cover which supports said printed circuit board; and

a slide switch mechanism disposed between said printed circuit board and said cover, said slide switch mechanism



including electrically conductive contacts supported in operative relationship with contacts on said second side of said printed circuit board, said slide switch mechanism further including means coupling said slide switch mechanism to said manually operable lever;

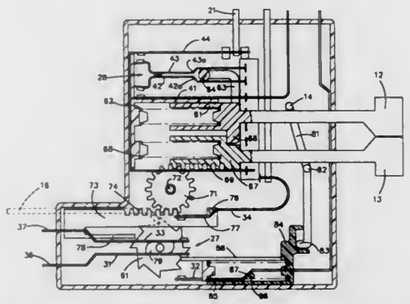
wherein rotation of said manually operable lever rotates said rotary slider over one group of said plurality of contacts on said first side of said circuit board and rocking of said manually operable lever slides said slide switch mechanism over another group of said plurality of contacts on said second side of said circuit board.

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**5,047,597**
**VACUUM CLEANER SWITCH**

**John J. Jailor, North Ridgeville, Ohio, assignor to The Scott Fetzer Company, Westlake, Ohio**

**Division of Ser. No. 203,430, Jun. 7, 1988, Pat. No. 4,905,343. This application Jan. 17, 1990, Ser. No. 466,668**
**Int. Cl.[5] H01H *9/00*; A47L *9/28***
**U.S. Cl. 200—5 B** **9 Claims**



1. A control switch for an electrical appliance having a removable accessory, said switch comprising:

a) an electrical switch assembly defining a switch input and a switch output and an interruptable electric current path between said switch input and said switch output, said switch output being electrically coupled to an electrically actuatable component of said appliance;

b) said switch input being adapted for connection to an external source of electric power;

c) said switch assembly further comprising:

i) a first contact assembly including a first contact movable between an enabled position and a disabled position;

ii) an ON/OFF contact assembly including an ON/OFF contact movable between an ON position and an OFF position, said contacts being relatively positioned such that they make contact only when said first contact is in its said enabled position and said ON/OFF contact is in said ON position;

iii) said contact assemblies comprising conductive means coupling said first and said ON/OFF contacts to interrupt said current path between said switch input and said switch output when said contacts are not in contact with one another, and for completing said interruptable current path when said contacts are in contact with one another;

iv) an ON/OFF switch and associated first linkage for moving said ON/OFF contact between said ON and said OFF positions;

v) structure for biasing said first contact toward said disabled position; and,

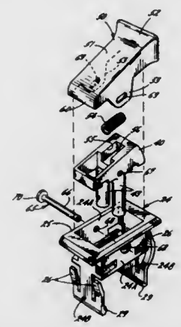
vi) second linkage responsive to engagement of said removable accessory with said appliance for moving said first contact to said enabled position.

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**5,047,598**
**SAFETY ROCKER WITH IMPROVED ACTUATOR MOUNTING**

**Thomas F. Osika, Valparaiso, and John A. Stuhlmacher, Crown Point, both of Ind., assignors to McGill Manufacturing Company, Inc., Valparaiso, Ind.**

**Continuation-in-part of Ser. No. 114,129, Oct. 28, 1987, Pat. No. 4,870,230. This application Sep. 1, 1989, Ser. No. 402,907**
**The portion of the term of this patent subsequent to Sep. 26, 2006, has been disclaimed.**
**Int. Cl.[5] H01H *3/20***
**U.S. Cl. 200—43.16** **3 Claims**



1. A safety switch comprising a hollow body having a pair of laterally spaced sides and having a switch contact, a switch actuator, means mounting said switch actuator within said body and between said sides for pivoting said actuator relative to said body between first and second switch contact positions, said means comprising aligned holes formed through said actuator and the sides of said body and further comprising a rivet extending through said holes, a latch having a pair of laterally spaced ears straddling said actuator and located within said body adjacent the sides thereof, elongated slots formed through said ears, said slots receiving said rivet and coacting with said rivet to mount said latch for pivotal movement with said actuator between said first and second positions



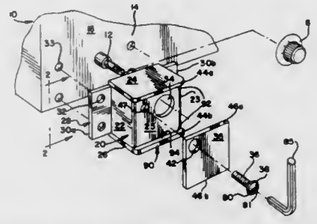
and also to mount said latch for sliding movement relative to said actuator between latched and unlatched positions, said latch positively engaging said body when said latch is in said latched position and said actuator is in said first position and acting to prevent movement of said actuator to said second position, said latch releasing said body when said latch is moved to said unlatched position thereby to enable movement of said actuator to said second position, and means biasing said latch toward said latched position.

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**5,047,599**
**LOCKING HOUSING FOR A SWITCH**

**Donald A. Giolli, 538 W. Westmere Rd., Des Plains, Ill. 60016**

**Filed Mar. 23, 1990, Ser. No. 498,267**
**Int. Cl.[5] H01H *9/28***
**U.S. Cl. 200—43.022** **19 Claims**



1. A locking closure for a rotary switch member comprising:

a closure casing adapted to receive and cover the rotary switch member, the casing having a plurality of exterior walls which define a compartment which encloses said rotary switch member, said casing also having a base portion adapted to mount said casing on a surface proximate to said rotary switch member, said casing further having a switch member access opening disposed in a casing exterior wall in alignment with and proximate to said rotary switch member, the switch member access opening providing limited access to said rotary switch member;

means for covering said switch member access opening in the form of a cover plate, the cover plate being disposed over said switch member access opening and preventing access to said rotary switch member;

means for securing said cover plate to said casing in a secure position over said opening, said securing means releasably engaging a portion of said casing; and

means retaining said cover plate on said casing exterior wall in a covering position over said opening, the retaining means including at least one extension of said casing which interferingly engages said cover plate and prevents the movement thereof relative to said casing exterior wall.

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**5,047,600**
**KNOB SWITCH DEVICE**

**Nobuyuki Enari, and Hiroyasu Ito, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

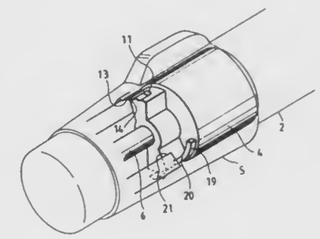
**Filed Mar. 5, 1990, Ser. No. 488,142**
**Claims priority, application Japan, Mar. 14, 1989, 1-28678[U]**
**Int. Cl.[5] H01H *9/00, 3/02***
**U.S. Cl. 200—61.54** **7 Claims**

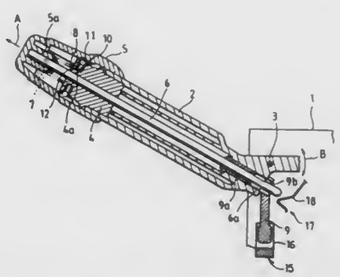
1. A knob switch device having a body, an operating knob mounted on said body to be rotatable about and axially movable along a rotational axis of said operating knob, a first switch operated by rotation of said operating knob, and a second switch operated by axial movement of said operating knob,

said device comprising:

a guiding member on one of said body and said operating knob, said guiding member having an inclined surface to provide a ramp sloping at an angle with respect to the direction of axial movement of said knob,

a guided member on the other of said operating knob and said body, said guided member being in contact with said





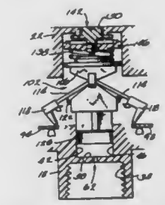
inclined surface so that when said operating knob is depressed to move in the axial direction to operate said second switch, said operating knob also rotates to operate said first switch.

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**5,047,601**
**PRESSURE RESPONSIVE SWITCH WITH CUP SHAPED ACTUATING MEMBER**

**Stanley H. Edwards, Jr., Raleigh; Dwight D. Edwards, Asheville; James B. Warren, Arden, and Jackie C. Sullivan, Wendell, all of N.C., assignors to Square D Company, Palatine, Ill.**

**Filed Jan. 25, 1990, Ser. No. 470,026**
**Int. Cl.[5] H01H *35/24***
**U.S. Cl. 200—81 R** **30 Claims**



1. A pressure responsive switch apparatus comprising

a housing including a wall defining a passageway having an end adapted to communicate with a source of fluid under pressure,

a switch supported by said housing,

an actuator which is movably supported by said housing and which includes an end located in said passageway,

means for actuating said switch in response to movement of said actuator, and

means detached from said actuator and located within said passageway and between said actuator and said end of said passageway for sealingly engaging said wall in response to

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pressure from the fluid source and for moving said actuator away from said end of said passageway in response to pressure from the fluid source.

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**5,047,602**

## PRESSURE-SENSITIVE MAT-FORM ELECTRIC SWITCHING ELEMENT

**Karel Lipka, Weiningen, Switzerland, assignor to G. Bopp & Co. AG, Zurich, Switzerland**

**Filed May 10, 1990, Ser. No. 521,669**

**Claims priority, application Fed. Rep. of Germany, May 17, 1989, 3915989**

**Int. Cl.[5] H01H** *35/00, 3/02*

**U.S. Cl. 200—86 R** **12 Claims**




1. A pressure-sensitive mat-form electric switching element comprising:

a flat electrode;

a flexible movable electrode which can be brought into contact with said flat electrode by applying pressure against an elastic resetting force;

said flexible movable electrode being formed by a compressible contact-mesh composed of conducting and non-conducting wires and lying on said flat electrode;

said conducting wires, which are extending in the first direction of weaving, being arranged essentially in a plane; and

said non-conducting wires, which are extending in the other direction of weaving, being bent around said conducting wires and keeping said conducting wires at some distance from said flat electrode;

so that when said flexible contact-mesh is compressed said conducting wires are flexiblely deformed, whereby the wave crests formed on said conducting wires are reaching the surface of said contact-mesh and are contacting there said flat electrode.

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**5,047,603**

## ELECTRICAL CONTACT STRUCTURES SPECIFICALLY SUITED FOR LOW POWER CIRCUITS

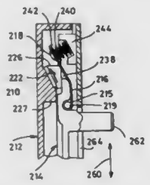
**Franco P. Pardini, Milan, Italy, assignor to CGE Compagnia Generale Elettromeccanica S.p.A., Milan, Italy**

**Filed Jun. 27, 1989, Ser. No. 371,932**

**Claims priority, application Italy, Jun. 27, 1988, 21108 A/88**

**Int. Cl.[5] H01H** *1/60*

**U.S. Cl. 200—253** **3 Claims**




1. Electric contact mechanism, particularly for use in low power circuits of double-interruption type, comprising:

insulating frame means;

at least one pair of fixed contacts having flat contact surfaces and provided on said frame means;

at least one pair of movable contacts having flat contact surfaces and cooperating with said fixed contacts to open or close a circuit;

at least one electrically conductive bridge carrying said movable contacts;

slider means for reciprocally moving said conductive bridge in a first direction to move said movable contacts into and out from engagement with said fixed contacts;

spring means acting on said conductive bridge to press said movable contacts against said fixed contacts in an engaged position thereof, said spring means being positioned such that they are excluded from a current flow therethrough to avoid a possible annealing thereof due to overheating;

said movable contacts being positioned on said conductive bridge so that when said movable contacts engage said fixed contacts, said movable contacts continue to move along said fixed contacts in a second direction, inclined to said first direction, in order to rub against said fixed contacts, thereby cleaning contact surfaces of said fixed and movable contacts;

said conductive bridge being a U-shaped strap, said slider means including an elongated slider movable within said frame means, said frame means having support brackets provided with fixed arms carrying said fixed contacts, said U-shaped strap having legs carrying at external ends thereof hinges, said slider having pins fastened thereto, said hinges being adapted to pivot about said pins, said spring means abutting at one end thereof against said conductive bridge and at another end thereof against protrusions carried by said slider so that no electric current can flow through said spring means.

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**5,047,604**

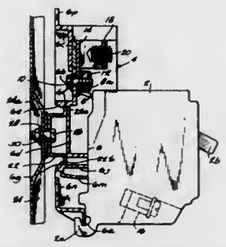
## ADAPTER PROVIDING UNITARY MOUNTING CAPABILITY FOR STANDARD CIRCUIT BREAKER

**William E. Grass, Whitefish Bay, and Robert J. Clarey, Brookfield, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Mar. 27, 1990, Ser. No. 499,137**

**Int. Cl.[5] H02B** *1/10;* **H01R** *9/16*

**U.S. Cl. 200—294** **17 Claims**



1. In combination with a circuit breaker having a terminal adapted to be connected to bus structure of a distribution panelboard and a hook adapted to engage a mounting rail of said distribution panelboard, an adapter connecting said circuit breaker for use with electrical control apparatus not having said bus structure, said adapter comprising:

a base adapted to be mounted to support structure of said apparatus, said base comprising means defining opposed slots for receiving opposite edges of a mounting member, said circuit breaker being removably mounted to said base;

an electrical conductor carried by said base having first terminal means cooperably connected to said circuit breaker terminal and second terminal means comprising a wiring lug; and

a flange structurally cooperable with said circuit breaker hook securing said circuit breaker to said adapter in collaboration with said cooperably connected circuit breaker terminal and said first terminal means.



**5,047,605**

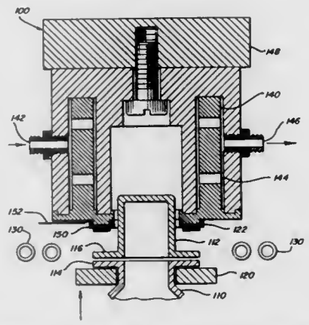
## INDUCTION WELDING APPARATUS AND METHOD

**John E. Ogden, Libertyville, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.**

**Filed May 10, 1989, Ser. No. 350,063**

**Int. Cl.[5] H05B** *6/06*

**U.S. Cl. 219—10.41** **12 Claims**




1. A method of heating a part of thermoplastic material comprising

the steps of:

positioning a die made of a material that is heated in response to high frequency electromagnetic radiation in thermal contact with the part;

exposing said die to high frequency electromagnetic radiation to effect heating of the die and of the part in said thermal contact therewith;

continuously cooling the heated die while it is in thermal contact with the heated part to cool both the heated die and the heated part in thermal contact therewith; and

simultaneously exposing said die to sufficient electromagnetic radiation to effect said heating of said die and the part.

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**5,047,606**

## METHOD AND DEVICE FOR CALCULATING AN OFFSET DIRECTION AND A TILT DIRECTION OF THE WIRE ELECTRODE OF A WIRE ELECTRO-DISCHARGE MACHINING APPARATUS

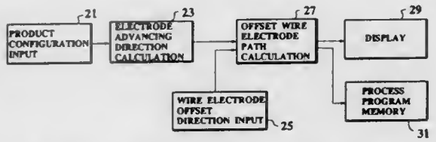
**Jiro Hiramine, Kawasaki, Japan, assignor to Amada Wasino Co., Ltd., Japan**

**Filed Aug. 14, 1990, Ser. No. 567,156**

**Claims priority, application Japan, Aug. 15, 1989, 1-209550**

**Int. Cl.[5] B23H** *7/06*

**U.S. Cl. 219—69.12** **4 Claims**




1. A method for calculating an offset direction of a wire electrode of wire electro-discharge machining apparatus, comprising the steps of:

inputting offset information in terms of whether the wire electrode should be offset on the inner side or on the outer side of the theoretical position thereof with respect to the closed perimeter of a product to be produced; and

calculating, on the basis of said offset information and an advancing direction of the wire electrode, the offset direction of the wire electrode as to whether the wire electrode should be offset on the right side or on the left side of the theoretical position thereof with respect to the advancing direction of the wire electrode.

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**5,047,607**

## WIRE-CUTTING ELECTRIC DISCHARGE MACHINE WITH WIRE SECTIONING DEVICE FOR WIRE DISPOSAL

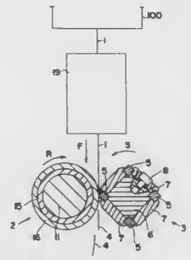
**Jean-Paul Briffod, Lucinges, France, assignor to Charmilles Technologies S.A., Meyrin, Switzerland**

**Continuation of Ser. No. 319,885, Mar. 2, 1989, abandoned, which is a division of Ser. No. 149,859, Jan. 29, 1988, abandoned. This application Dec. 26, 1990, Ser. No. 632,619**

**Claims priority, application Switzerland, Jan. 30, 1987, 339/87**

**Int. Cl.[5] B23H** *7/02;* **B23D** *25/12*

**U.S. Cl. 219—69.12** **24 Claims**




1. A combination for providing numerous cut sections of an EDM machining wire, comprising:

an EDM machine apparatus;

an electrode wire evacuated by said EDM machining apparatus at a linear speed; and

means for sectioning said evacuated wire into numerous cut sections, comprising:

rotating hub having an axis of rotation;

a rotating core having an axis of rotation parallel to the axis of rotation of said hub;

an anvil disposed about and rotating with said hub;

a tool disposed about and rotating with said core;

at least one blade borne on said tool having a cutting edge disposed parallel to the axes of rotation of said hub and said core; and

means for radially elastically mounting at least one of said anvil and said tool to a respective one of said hub and said core comprising a radially elastic support rotting with said respective one of said hub and said core, surrounding said axis of rotation of said respective one of said hub and said core;

wherein said wire is located so as to translate between said anvil and said tool; and

wherein said at least one of said anvil and said tool possesses a low moment of inertia, thereby both lessening the effect of acceleration experienced during impact of said blade against said anvil and improving the longevity of said sectioning means.

**5,047,608**

## METHOD AND APPARATUS FOR RESISTANCE WELDING WHEREIN THE ELECTRODE AXIS IS INCLUDED WITH RESPECT TO THE ELECTRODE FORCING AXIS

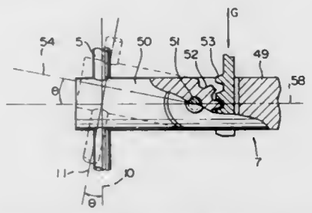
**Yasuo Takahashi; Tohru Saito; Masashi Ichikawa; Tadayuki Otani, and Kunihiro Hayashida, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Feb. 21, 1990, Ser. No. 482,796**

**Claims priority, application Japan, Feb. 23, 1989, 1-41606; Mar. 9, 1989, 1-54991; Mar. 18, 1989, 1-64951; Jul. 26, 1989, 1-192904; Jan. 12, 1990, 2-3517**

**Int. Cl.[5] B23K** *11/10*

**U.S. Cl. 219—91.2** **16 Claims**



1. A method of resistance welding with electrode tip faces of a pair of opposing electrodes placed in contact with surfaces of workpieces, said method comprising inclining both or one of the center axis of a pair of opposing electrodes with respect to an electrode forcing axis and placing the electrode tip face on the surface of workpiece and welding said workpieces; then tilting the electrode center axis with respect to the electrode forcing axis and forming a next electrode tip face for welding, and placing said electrode tip face on the surface of workpiece and thereafter welding said workpieces; thereby the welding of a preselected number of welds being carried out with the electrode tip placed in contact with the workpiece surface by intermittently tilting the electrode about the electrode center axis and forming a new contact face of the electrode tip.

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**5,047,609**

## CROSSED DOT BAR GRAPH DISPLAY FOR INDICATION OF POSITION OF A LIGHT BEAM, AND AN IMPROVED LASER SYSTEM WITH ACTIVE LASER CAVITY ALIGNMENT USING SAME

**John P. Ekstrand, Palo Alto, Calif., assignor to Spectra-Physics, San Jose, Calif.**

**Filed Jan. 5, 1990, Ser. No. 461,359**

**Int. Cl.[5] B23K** *26/02*

**U.S. Cl. 219—121.78** **13 Claims**

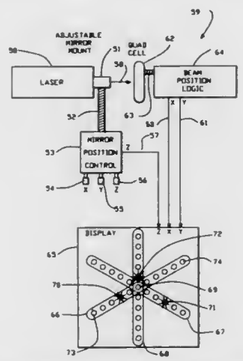
1. An apparatus for displaying information concerning position of a light beam; comprising:

detector means, having a face with a reference point, for generating a first signal indicating position of a light beam incident on the face in a first dimension relative to the reference point, and a second signal indicating position of the light beam incident on the face in a second dimension relative to the reference point;

display means, connected to the detector means, for displaying information concerning position of the beam in response to the first and second signals, including

a first set of indicating means, mounted in a linear array, each of the indicating means in the first set for indicating a respective position in the first dimension of the beam relative to the reference point, and

a second set of indicating means, mounted in a linear array, each of the indicating means in the second set for indicating a respective position in the second dimension of the beam relative to the reference point, wherein the first and second sets intersect in one member and the respective position indicated by the one member is the



reference point in the first dimension or the second dimension.

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**5,047,610**

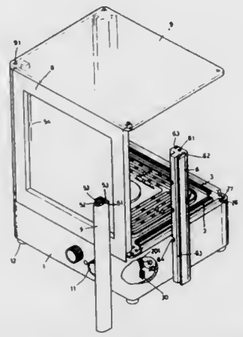
## BUILT-UP TYPE ELECTRIC HEAT-CONVECTION STOVE

**Kwei T. Chang, No. 14, Lane 54, Luong Chuan St., Panchiao, Taipei Hsien, Taiwan**

**Filed Jun. 4, 1990, Ser. No. 532,540**

**Int. Cl.[5] A21B** *1/26;* **F27B** *1/00*

**U.S. Cl. 219—400** **1 Claim**



1. An electric heat-convection stove, comprising:

a base;

a heat-convection mechanism comprised of a motor vertically fastened inside said base, a first fan for heat radiation and a second fan for output of a heat current respectively driven by said motor to rotate, a pan mounted on the top of said base and set between said first and second fans, a heating coil mounted on said pan covered with a protective cap, and a perforated tray mounted on the top of said pan and covering over said protective cap, said perforated tray comprising a recessed portion surrounded by a plurality of channels, said channels defining therebetween a plurality of rails having a plurality of vent holes thereon for heat current output, said recessed portion comprising a circular raised portion at the center said circular raised portion having a plurality of vent holes thereon for heat current input, said pan comprising a plurality of raised portions and round holes on the four corners thereof; and

a hood mounted on said base and defining therein a roasting chamber, said roast chamber being comprised of four zinc alloy posts having each a plurality of recessed holes and raised portions at the two opposite ends thereof corresponding to the raised portions and recessed holes on said pan for fastening, a front panel, three side boards and a top cover, and a plurality of silicone rubber for sealing the gap between said side boards and said top cover and the gap between said side boards and said pan, said front panel, side boards and top cover being made of transparent, reinforcing glass material, said front panel comprising two unitary side bolts and two sliding stays at the lower ends of the two opposite sides thereof and respectively fastened in said base.



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**5,047,611**

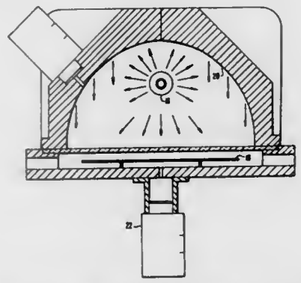
## METHOD FOR SELECTIVELY CURING A FILM ON A SUBSTRATE

**Timothy J. Stultz, San Jose, Calif., assignor to Peak Systems, Inc., Fremont, Calif.**

**Filed Mar. 23, 1990, Ser. No. 499,913**

**Int. Cl.[5] F27B** *5/14;* **F27D** *11/02*

**U.S. Cl. 219—405** **5 Claims**



1. A method for selectively heating a film on a substrate, comprising the steps of:

selecting said substrate and said film to have different light absorption characteristics;

illuminating said film and substrate with a source of light having a peak wavelength that will be substantially absorbed by said substrate and substantially not absorbed by said film.

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**5,047,612**

## APPARATUS AND METHOD FOR CONTROLLING POWDER DEPOSITION IN A PLASMA SPRAY PROCESS

**Sudhir D. Savkar, and Robert D. Lillquist, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 5, 1990, Ser. No. 475,471**

**Int. Cl.[5] B23K** *9/00*

**U.S. Cl. 219—121.47** **30 Claims**

1. Apparatus for controlling a powder deposit pattern in a plasma spray process comprising:

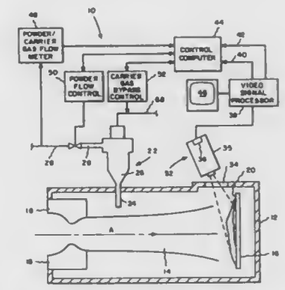
means for generating a plasma plume;

means for injecting a powder comprising a plurality of particles into said plasma plume, said powder being entrained in a carrier gas;

target means having a deposit surface facing said plasma plume for receiving thereon a deposit of said powder transported by said plasma plume;

sensor means for generating an image representative of a temperature distribution of said powder deposited on said target means, said sensor means further having means for identifying a location of an impact point of said powder upon said target means; and

control means responsive to said sensor means for selectively adjusting a carrier gas flow rate in said powder



injecting means to selectively move said location of said powder impact point on said target.

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**5,047,613**

## ARRANGEMENT FOR DISPENSING BANK NOTES AND GOODS

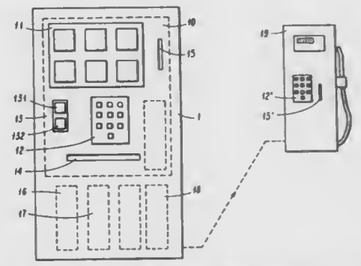
**Hans B. A. Swegen, Farsta, and Jan Westlund, Åkersberga, both of Sweden, assignors to Inter Innovation AB, Stockholm, Sweden**

**Filed Mar. 23, 1989, Ser. No. 327,612**

**Claims priority, application Sweden, Apr. 8, 1988, 8801296**

**Int. Cl.[5] G06F** *15/30*

**U.S. Cl. 235—379** **15 Claims**



1. An arrangement for dispensing bank notes form a store of bank notes to a customer-accessible receipt opening, comprising:

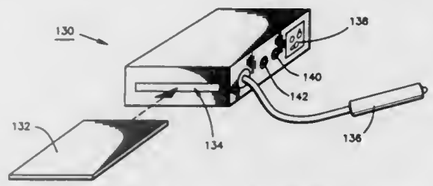
a card reader (**15**);

a first keyboard (**11**) intended for insertion of the number of bank notes or the sum required; and a second keyboard (**12**) for the insertion of an individual code; CHARACTERIZED IN THAT the card reader (**15**), the first keyboard (**11**), the second keyboard (**12**) and the requisite control electronics are incorporated in a customer-operated panel (**10**) which is common to a cash dispenser (**1**) and to a goods vending machine (**19**), and in that the control panel includes a third keyboard (**13**) having at least two buttons (**131, 132**), a first button (**131**) being intended for activating the process for dispensing bank notes and the other button (**132**) being intended for initiating the process for the purchase of goods; the control panel being intended for activating a process for the dispensing of bank notes and/or a process for the purchase of goods in response to the manner of manipulation of the control panel (**10**) by the customer.

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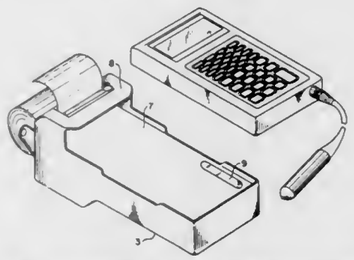


5,047,614
**METHOD AND APPARATUS FOR COMPUTER-AIDED SHOPPING**
James S. Bianco, 217 Brainard Rd., Enfield, Conn. 06082
Continuation-in-part of Ser. No. 300,352, Jan. 23, 1989, abandoned. This application Aug. 8, 1989, Ser. No. 391,733
Int. Cl.[5] G06F *15/24, 15/26*
U.S. Cl. 235—385 17 Claims



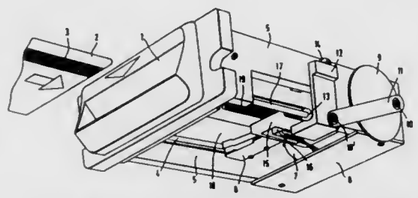

1. Apparatus to aid shopping by a consumer, comprising:
(a) bar code reading means to read, at a location remote from a store, information representing items desired by said consumer;
(b) portable memory means to receive and retain said information; and
(c) terminal means located at said store to read said portable memory means, after temporary physical attachment of said portable memory means to said terminal means, to compile a list of said items and to provide said list to said consumer.

5,047,615
**BAR CODE PRINTING OR READING APPARATUS**
Mituo Fukumoto; Tokuya Kondo, both of Takarazuka; Takuji Yasumoto, Moriguchi; Syunji Tanaka, Osaka, and Mikio Kitashiro, Nishinomiya, all of Japan, assignors to Furuno Electric Co., Limited, Nishinomiya, Japan
Continuation of Ser. No. 196,681, May 20, 1988, abandoned. This application Oct. 1, 1990, Ser. No. 593,479
Claims priority, application Japan, May 20, 1987, 62-75824; May 20, 1987, 62-75825; May 20, 1987, 62-75826
Int. Cl.[5] G06K *7/10, 7/01*
U.S. Cl. 235—432 20 Claims



1. A bar code printing or reading apparatus comprising:
a portable terminal including,
a first face with keys,
a bar code reader connected thereto,
first electric power supply means for powering said portable terminal, and
wireless transmitting means for transmitting bar code information, located on a second face of said portable terminal which is substantially parallel and opposite to said first face; and
a hand held bar code printer including,
a recessed portion for receiving and supporting said portable terminal on an upper face thereof,
said upper face including wireless receiving means for receiving said bar code information,
printing means for recording signals representative of said bar code information on a recording medium, and
second electric power supply means for powering said hand held bar code printer.

5,047,616
**READING DEVICE FOR READING NON-STATIONARY DATA STORAGE MEANS**
Klaus Maresch, Bahnstrasse 34, 8035 Stockdorf, and Michael Maresch, Schellingstrasse 93, D-8000 Munchen 2, both of Fed. Rep. of Germany
PCT No. PCT/EP89/00131, § 371 Date Nov. 15, 1989, § 102(e) Date Nov. 15, 1989, PCT Pub. No. WO89/07802, PCT Pub. Date Aug. 24, 1989
PCT Filed Feb. 13, 1989, Ser. No. 435,426
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1988, 3804340
Int. Cl.[5] G06K *7/06*
U.S. Cl. 235—435 8 Claims



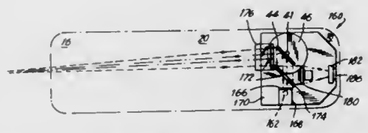
1. A reading device for reading data automatically from a non-stationary data storage means (2,3), comprising a reading head (16) having a reading area inside the reading device, guide means for enabling insertion of the non-stationary data storage means into the reading area from outside the reading device along a guide path to enable reading of data from the storage means with the reading head, and further including
stationary test data storage means (19), fixedly and immovably mounted inside the reading device and wherein said test data storage means is of a type corresponding to the non-stationary data storage means (2,3) and wherein said test data storage means is constantly present within the reading area of the reading head (16) for reading test data during the absence of non-stationary data storage means inserted into the reading area.

5,047,617
**NARROW-BODIED, SINGLE- AND TWIN-WINDOWED PORTABLE LASER SCANNING HEAD FOR READING BAR CODE SYMBOLS**
Howard M. Shepard, Great River; Edward D. Barkan, South Setauket, and Jerome Swartz, Stonybrook, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Division of Ser. No. 272,545, Nov. 17, 1988, which is a division of Ser. No. 148,555, Jan. 26, 1988, Pat. No. 4,845,350, which is a division of Ser. No. 883,923, Jul. 10, 1986, Pat. No. 4,758,717, which is a division of Ser. No. 519,523, Aug. 1, 1983, Pat. No. 4,673,805, which is a division of Ser. No. 342,231, Jan. 25, 1982, Pat. No. 4,409,470. This application Apr. 2, 1990, Ser. No. 503,329
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] G06K *7/10*
U.S. Cl. 235—467 26 Claims

1. In a scanning system for reading symbols, a lightweight, small volume hand-held laser scanning head contained within a housing configured to be held in one hand during scanning, comprising:
(a) a laser diode source supported within the housing, and operative for emitting a laser beam along a first optical path;

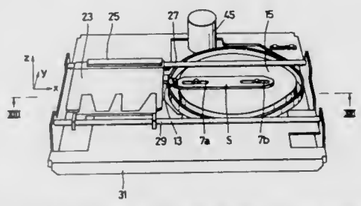


(b) a sensor supported within the housing and defining a field of view along a second optical path;
(c) a movably supported optical scanner including only a single light-reflective element positioned in both optical paths for receiving both the laser beam from the source and the field of view from the sensor and providing them to the symbol such that the laser beam is at least in part within the field of view at the symbol;
(d) a driving mechanism supported within the housing and operative for moving the single light-reflective element



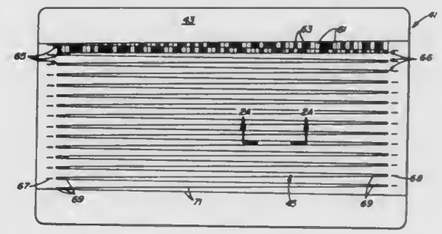
relative to the symbol to thereby repetitively scan the field of view and the laser beam across the respective symbol;
(e) said sensor being operative, during scanning, for detecting laser light of variable intensity reflected off the respective symbol, and for generating an electrical signal which is indicative of the detected intensity of the reflected laser light; and
(f) a signal processor in the housing for processing the electrical signal to generate therefrom data descriptive of the respective symbol being read.

5,047,618
**LINEAR OSCILLATORY MOTION DEVICE FOR OPTICAL CARD READ/WRITE APPARATUS**
Koichi Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 23, 1989, Ser. No. 327,789
Claims priority, application Japan, Mar. 30, 1988, 63-77083; Sep. 26, 1988, 63-238820
Int. Cl.[5] G06K *13/00;* F16H *21/20*
U.S. Cl. 235—415 35 Claims



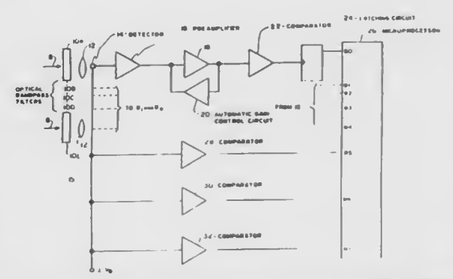

17. An optical card read/write apparatus with a linear oscillatory motion device for driving an object into a linear oscillatory motion, comprising:
optical head means for reading from and writing in data on an optical card;
a motor which rotates at a constant angular velocity in one direction;
crank means with variable stroke, having means for holding the optical card at one end, for converting rotations of the motor into linear oscillatory motion of the optical card; and
guiding cam means for controlling the stroke of the crank means according to a shape of said guiding cam means defined such that in at least one part of the linear oscillatory motion of the optical card an acceleration of the optical card changes continuously.

5,047,619
**HIGH DENSITY DATA TRACK LAYOUT FOR STORAGE MEDIA**
Larry S. Zurbrick, San Jose, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.
Filed Jul. 18, 1989, Ser. No. 381,560
Int. Cl.[5] G06K *7/10;* G11B *7/007*
U.S. Cl. 235—488 20 Claims



1. A data storage medium comprising,
a sheet of data storage material having a plurality of tracks, each track having a plurality of data bits therein, each track having a starting point and an end point at opposite ends thereof, each track having a width that continually increases from said starting point to said end point, adjacent tracks having said starting points proximate to said end points of each other.

5,047,620
**LASER PULSE RECEIVER FOR DETECTING AND RECORDING WEAK LASER PULSES IN VARIABLE BACKGROUND RADIATION**
L. N. Durvasula, Vienna; William K. Krug, Herndon, and Gary P. Stevenson, Sterling, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Dec. 26, 1989, Ser. No. 457,124
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—208.2 9 Claims



1. A laser pulse receiver system for detecting and recording very weak laser pulses in the presence of variable background radiation, said system comprised of:
a plurality of optical bandpass filters wherein each of said plurality of optical bandpass filters passes only one wavelength of signal pulses of one each of a plurality of selected valid laser sources and blocks all other wavelengths of said selected valid laser sources;
an optics and a detector, said detector positioned on a detector bias line wherein said optics focuses incoming radiation from said plurality of optical bandpass filters including said variable background radiation onto said detector

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wherein said detector produces an output varying electrical current in response to said incoming radiation;
a microprocessor;
a plurality of electrical signal paths and inhibit signal electrical lines for receiving said detector output varying electrical current, wherein each of said plurality of electrical signal paths isolates and passes only one of said selected valid laser source wavelength signal pulses included in said detector output varying electrical current therethrough and wherein said plurality of inhibit signal electrical lines identifies invalid variable background radiation source, wherein separate outputs from each of said plurality of electrical signal paths, and said inhibit signal electrical lines constitute a multibit data word which is passed to said microprocessor for selectively storing and retrieving by said microprocessor to determine the presence of specific valid laser pulses.

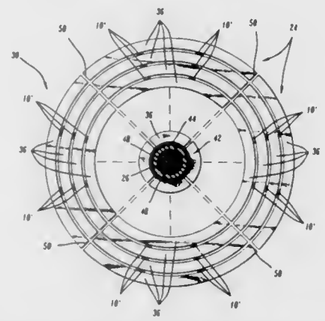
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**5,047,621**

## RADIAL TRANSMISSION LINE FOR WAVEFORM GENERATION AND POWER ACCUMULATION

**Maurice Weiner, Ocean; Lawrence J. Bovino, Eatontown, and Anderson H. Kim, Toms River, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Apr. 25, 1990, Ser. No. 514,467**
**Int. Cl.[5] H01J *40/14***
**U.S. Cl. 250—208.4** **38 Claims**



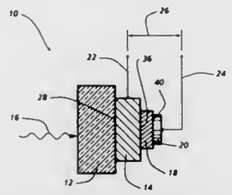
1. A radial transmission line for generating a waveform, comprising:
a common electrode and a segmented electrode separated along an axis, each said electrode having an aperture disposed therethrough along said axis, said segmented electrode having at least two independent sections disposed in radial sequence relative to said axis; and
at least one piece of semiconductor material disposed between each radially adjacent pair of said independent sections to provide an electrically conductive path therebetween when optical radiation is directed upon said pieces of semiconductor material;
the waveform being available from across said electrodes at locations on the periphery of each said aperture therein and being configured in accordance with individual voltages applied between said common electrode and each said independent section, as well as the phasing of optical radiation on said pieces of semiconductor material.

**5,047,622**

## LONG WAVELENGTH INFRARED DETECTOR WITH HETEROJUNCTION

**Tak-Kin Chu, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Division of Ser. No. 539,958, Jun. 18, 1990, Pat. No. 5,012,083.**
**This application Jan. 22, 1991, Ser. No. 645,960**
**Int. Cl.[5] H01J *40/14***
**U.S. Cl. 250—211 J** **10 Claims**



1. A method of detecting radiation by generation of conduction band electrons and valence band holes, comprising the steps of: providing a first semiconducting region having an energy band formed by a conduction band material; providing a second semiconducting region formed by a material establishing a current-resistance drop; generating an electric field extending through said regions with said current-resistance drop; exposing said regions to the radiation being detected to generate said conduction band electrons and the valence band holes; and sensing electrical voltage appearing across said regions as a result of said generation of the conduction band electrons and the valence band holes.

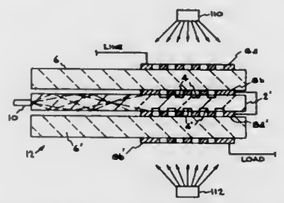
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**5,047,623**

## TRANSPARENT SELECTIVE ILLUMINATION MEANS SUITABLE FOR USE IN OPTICALLY ACTIVATED ELECTRICAL SWITCHES AND OPTICALLY ACTIVATED ELECTRICAL SWITCHES CONSTRUCTED USING SAME

**Russell B. Wilcox, Oakland, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 2, 1990, Ser. No. 473,793**
**Int. Cl.[5] H01J *40/14***
**U.S. Cl. 250—211 R** **37 Claims**



21. An optically activated electrical switch comprising:
(a) at least two stacked photoconductive wafers, each having one or more electrodes formed on both surfaces thereof comprising spaced apart parallel metallic strips on one surface of each wafer staggered from spaced apart parallel metallic strips on the opposite surface of each wafer; and
(b) planar transparent light conducting means in between said photoconductive wafers capable of conducting light to surfaces of said wafers facing planar surfaces of said light conducting means comprising:
(i) light scattering means on portions of one or more surfaces of said planar light conducting means opposite surfaces of said wafers not covered by said electrodes to transmit light from said light conducting means into said photoconductive wafers; and
(ii) reflective means on other surfaces of said planar glass member not containing said light scattering means.



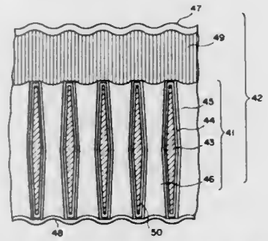
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**5,047,624**

## METHOD OF MANUFACTURING AND X-RAY IMAGE INTENSIFIER

**Hidero Anno, Ootawara, and Katsuhiro Ono, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Division of Ser. No. 444,795, Dec. 1, 1989. This application Oct. 24, 1990, Ser. No. 602,687**
**Claims priority, application Japan, Dec. 2, 1988, 63-305785**
**Int. Cl.[5] H01J *31/50***
**U.S. Cl. 250—213 VT** **1 Claim**



1. A method of manufacturing an X-ray image intensifier, comprising the steps of:
forming a large number of small holes in a substrate composed of photosensitive glass;
forming the substrate into an arcuated shape by hot pressing;
converting the substrate into crystallized glass by a heat treatment; and
obtaining an input phosphor screen by filling the small holes with a fluorescent material.

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**5,047,625**

## OPTICAL SYSTEM OF LASER BEAM READER

**Mitsunori Iima, and Seiich Mori, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 349,679, May 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 266,662, Nov. 3, 1988, abandoned. This application Feb. 2, 1990, Ser. No. 474,645**
**Claims priority, application Japan, Nov. 4, 1987, 62-2789; Jan. 27, 1989, 1-18131**
**Int. Cl.[5] H01J *3/14***
**U.S. Cl. 250—216** **40 Claims**



1. An optical system of a laser beam reader comprising:
a light projecting portion having an optical axis for projecting a laser beam of light along an optical path toward an object;
a condenser lens located in said optical path and having a transmitting portion for permitting the projected beam of light to pass therethrough without changing the direction of the projected beam of light, said condenser lens having a condensing portion for condensing light reflected from the object; and
a light receiving element for detecting the light quantity of a condensed light reflected from the object;
an optical axis of said condenser lens being spaced from said optical axis of said light projecting portion in such a manner that they are generally parallel with each other.

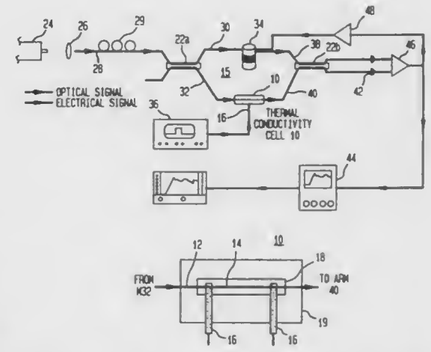
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**5,047,626**

## OPTICAL FIBER SENSOR FOR MEASURING PHYSICAL PROPERTIES OF LIQUIDS

**Lloyd C. Bobb, Warminster; Barbara J. White, Hatboro, and Jon P. Davis, Willow Grove, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 3, 1990, Ser. No. 460,435**
**Int. Cl.[5] H01J *5/16***
**U.S. Cl. 250—227.19** **16 Claims**




1. A method for measuring a physical property of a liquid using a light transmitting optical fiber having an optical path length, comprising the steps of:
(a) disposing a conductive material upon the surface of a region of said light transmitting optical fiber;
(b) disposing at least a portion of said fiber region having said conductive material in said liquid;
(c) applying light energy to a first end of said light transmitting optical fiber;
(d) thermally changing said optical path length in response to electrical energy applied to said conductive material while said fiber is disposed in said liquid;
(e) receiving transmitted light at a second end of a said optical fiber,
(f) determining the change in said optical path length in accordance with said received light; and,
(g) determining said physical property of said liquid in accordance with said thermally changed optical path length.

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**5,047,627**

## CONFIGURATION FIBER-OPTIC BLOOD GAS SENSOR BUNDLE AND METHOD OF MAKING

**Jeffrey B. Yim, Woodinville; Todd W. Hubbard, Seattle; Lori D. Melkerson, Snohomish; Michael A. Sexton, Everett, and Bruce M. Fieggen, Edmonds, all of Wash., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Filed May 18, 1990, Ser. No. 526,185**
**Int. Cl.[5] G01N *33/48*; A61B *5/00***
**U.S. Cl. 250—227.23** **22 Claims**

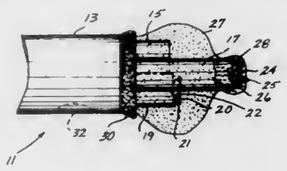
1. A multi-analyte sensor comprising:
(a) a first, a second, and a third optical fiber, each optical fiber having a longitudinal axis and a distal end, the longitudinal axis corresponding to the direction that a light signal propagates through said optical fibers, all of said optical fibers being arranged in a sheath such that their

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longitudinal axes are substantially parallel, said sheath terminating short of the distal ends of the optical fibers, leaving an exposed portion of each optical fiber extending beyond the sheath, only two of the optical fibers being bonded together up to and around their distal ends, the distal ends of the optical fibers forming a mutually supporting array;

(b) a first indicator matrix containing a first indicator molecule, disposed adjacent to said first optical fiber, said first indicator molecule exhibiting a first signal in response to light at a first wavelength to an extent that depends upon a first analyte concentration around the sensor;



(c) a second indicator matrix containing a second indicator molecule, disposed adjacent to said second optical fiber, said second indicator molecule exhibiting a second signal in response to light at a second wavelength to an extent that depends upon a second analyte concentration around the sensor; and

(d) a third indicator matrix containing a third indicator molecule, disposed adjacent said third optical fiber, said third indicator molecule exhibiting a third signal in response to light of a third wavelength to an extent that depends upon a third analyte concentration around the sensor, wherein said mutually supporting array minimizes breakage of any of the optical fibers and indicator matrices due to handling.

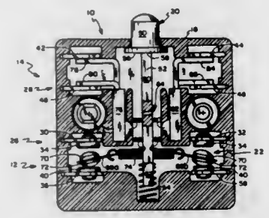
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**5,047,628**

## HYBRID SWITCH WITH SOLID-STATE CONDITION

**Ronald Schmidt, Arlington Hts.; Roy Robertson, and John C. Jones, both of Chicago, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.**

**Filed Mar. 26, 1990, Ser. No. 498,968**
**Int. Cl.[5] G01D *5/34***
**U.S. Cl. 250—229** **21 Claims**



1. A compact solid-state/mechanical hybrid switch, comprising:

housing means;

actuating means disposed within said housing means for movement between a first position and a second position;

return spring means disposed within said housing means and operatively connected to said actuating means for returning said actuating means from said second position to said first position when pressure is removed from said actuating means;

first terminal means disposed within said housing means and including a first pair of oppositely disposed fixed contact members electrically connected within a first electrical circuit, and a second pair of oppositely disposed fixed contact members electrically connected within a second electrical circuit;

solid-state switching means fixedly disposed within said housing means and disposed within said first electrical circuit for producing selective switching between low and high logic levels at second terminal means disposed within said housing means; and

switch butterfly assembly means disposed within said housing means and including a pair of oppositely disposed movable switch contact blade members pivotably mounted upon said actuating means for movement between said first pair of oppositely disposed fixed contact members and said second pair of oppositely disposed fixed contact members, in response to said movement of said actuating means between said first position and said second position, for alternatively controlling said first electrical circuit, electrically connected to said first pair of oppositely disposed fixed contact members, and within which said solid-state switching means is incorporated, and said second electrical circuit electrically connected to said second pair of oppositely disposed fixed contact members.

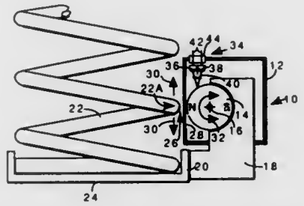
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**5,047,629**

## POSITION AND MOTION DETECTOR WITH MAGNETIC COUPLING AND OPTICAL DETECTION

**Henry E. Geist, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 30, 1990, Ser. No. 502,702**
**Int. Cl.[5] G01D *5/34***
**U.S. Cl. 250—231.1** **9 Claims**



1. A device for detecting motion of one portion of an apparatus with respect to another portion of the apparatus, comprising:

a stator constructed of ferromagnetic material;

a substantially sealed housing enclosing at least a portion of the stator and attached to the another portion of the apparatus by the stator;

a magnet;

an armature of ferromagnetic material enclosed within the substantially sealed housing and magnetically coupled to the one portion of the apparatus by means of a magnetic circuit including the apparatus, the stator, the magnet and the armature, the armature being moveably mounted and responsive to motion of the one portion of the apparatus with respect to the another portion; and

an optical detector including a light emitter and a light sensor forming a light path extending within the substantially sealed housing, the light path further including a portion of the armature designed to change the amount of light in the light path in response to movement of the armature for sensing a change in position of the armature and the one portion of the apparatus with respect to the another portion.

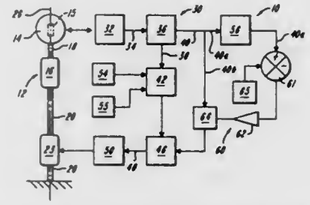


**5,047,630**

## MODIFIED DUAL-MODE RESONANT SCANNING SYSTEM

**Charles L. Confer, 196 Annie Moore Rd., Bolton, Mass. 01740, and Gordon J. Burrer, 5 Wayland Hills Rd., Wayland, Mass. 01778**

**Filed Aug. 22, 1990, Ser. No. 571,281**
**Int. Cl.[5] H01J *3/14, 5/16, 40/14***
**U.S. Cl. 250—235** **6 Claims**



1. A dual-mode resonant scanning system for use in a radiation imaging system, comprising:

high-Q dual-mode resonant mechanical scanning means for simultaneously oscillating at a predetermined third harmonic frequency and near the fundamental frequency of said predetermined third harmonic frequency, said high-Q dual-mode resonant mechanical scanning means being designed and fabricated for self-resonance at said predetermined third harmonic frequency and wherein said high-Q dual-mode resonant mechanical scanning means is mechanically tuned for self-resonant oscillation near the fundamental frequency of said predetermined third harmonic frequency; and

control means associated with said high-Q dual-mode resonant mechanical scanning means for controlling the simultaneous oscillation thereof, said control means including

means for generating an exact fundamental frequency signal based upon a signal having said predetermined third harmonic frequency, and

means for phase locking said exact fundamental frequency signal with said predetermined third harmonic frequency with an appropriate scan amplitude and phase angle therebetween to produce a triangular scan motion for said high-Q dual-mode resonant mechanical scanning means to provide near constant velocity scanning over a predetermined scan angle.

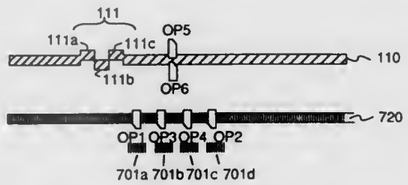
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**5,047,631**

## SELF-REFERENCING START OF PLOT SYSTEM AND METHOD

**Dale C. Frese, San Jose, Calif., assignor to Synergy Computer Graphics Corporation, Sunnyvale, Calif.**

**Filed Dec. 22, 1989, Ser. No. 455,687**
**Int. Cl.[5] H01J *3/14***
**U.S. Cl. 250—237 G** **52 Claims**




1. A three portion mark for use on a print medium to indicate the start of plot of print lines on the print medium, comprising:

a first portion of said mark above a reference line;

a second portion of said mark beneath the reference line directly following in space the first portion; and

a third portion above the reference line, said third portion being spaced from the first portion by the width of the second portion.

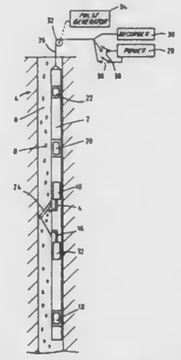
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**5,047,632**

## METHOD FOR DETERMINING DYNAMIC FLOW CHARACTERISTICS OF MULTIPHASE FLOWS

**Andrew Hunt, Royston, England, assignor to Schlumberger Technology Corporation, Houston, Tex.**

**Filed May 16, 1990, Ser. No. 524,246**
**Claims priority, application United Kingdom, May 27, 1989, 8912256**
**Int. Cl.[5] G01F *1/74;* G01V *5/04***
**U.S. Cl. 250—302** **10 Claims**



1. A method for determining a volumetric flow rate for a continuous phase of a multiphase flow circulating in a pipe, said flow being composed of at least a dispersed phase and the continuous phase, the method comprising the steps of:

discharging or activating a fluid-miscible tracer into the flow at a chosen first location in the pipe for mixing, or activating, at least a portion of the tracer with the continuous phase therein;

measuring the tracer concentration at least a chosen second location in the pipe with a detector as a function of time t so as to obtain at least one series of tracer-concentration data versus time;

fitting a relationship S(t) to the series of data so as to derive the values of the velocity U of the continuous phase and/or the dispersion coefficient k of the tracer in the continuous phase; and

measuring the volume fraction $y_1$ of the continuous phase in the pipe and determining the volumetric flow rate $Q_1$ of the continuous phase in accordance with the relationship

$$Q_1 = UAy_1$$

wherein A is the flowing area.

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5,047,633

## IMAGING APPARATUS AND METHOD

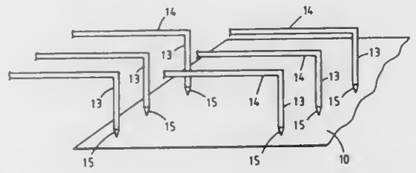
Martin F. Finlan, Aylesbury, and Ian A. McKay, Chalfont St. Giles, both of England, assignors to Amersham International plc, Buckinghamshire, England

Filed May 3, 1990, Ser. No. 518,543

Claims priority, application United Kingdom, May 8, 1989, 8910566

Int. Cl.[5] H01J *37/00*

U.S. Cl. 250—306 18 Claims



1. A method for the high resolution imaging of macromolecules and interactions involving macromolecules, said method comprising placing a molecule under test on a surface, said surface being notionally subdivided into a plurality of individual areas, scanning said surface at high resolution by means of scanning tunnelling and/or atomic force microscope apparatus incorporating a plurality of fine probes each associated with one of said areas, said scanning comprising scanning each of said probes across its individual area, detecting movement of each of said probes in a direction transverse to the surface due to undulations in the surface, and displaying the resultant of said scanning so that the topography of the surface can be ascertained.

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5,047,634

## METHOD AND DEVICE TO MEASURE THE CONCENTRATION OF THE VARIOUS ISOTOPES OF RADON IN A GASEOUS ATMOSPHERE

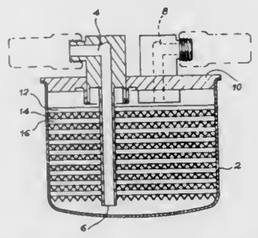
Michel Guelin, Briis Sous Forges; Jacqueline Le Gac, Le Mesnil St Denis, and Jean Charuau, Les Ulis, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 25, 1990, Ser. No. 528,941

Claims priority, application France, May 30, 1989, 89 07109

Int. Cl.[5] G01T *7/02*

U.S. Cl. 250—255 7 Claims



1. Method to measure the concentration in a gaseous atmosphere of the isotopes of radon, including $Rn^{222}$, $Rn^{220}$ and $Rn^{219}$, wherein it consists of collecting and homogeneously distributing in a closed sampling space containing a sample of this atmosphere the solid daughter products of these isotopes and of carrying out outside this space a spectrometry of the $\gamma$ ray radiations they emit.

5,047,635

## DOWN-HOLE PROBE ASSEMBLIES

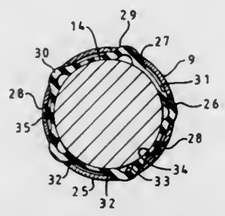
Peter A. Leaney, Cheltenham, and Keith Lathan, Gloucester, both of United Kingdom, assignors to Baroid Technology, Inc., Houston, Tex.

Filed Dec. 4, 1990, Ser. No. 621,798

Claims priority, application United Kingdom, Dec. 6, 1989, 8927619

Int. Cl.[5] G01V *5/04*

U.S. Cl. 250—256 10 Claims



1. A downhole probe assembly for use in conditions of high vibration or shock, comprising a vibration-sensitive inner unit having a cylindrical outer surface, an outer casing having a cylindrical inner surface within which the inner unit is accommodated, and an intermediate vibration-damping composite sleeve extending between said inner and outer surfaces and having two coaxial sleeve parts fitting one within the other and consisting of an apertured sleeve part made of relatively rigid material and a further sleeve part made of relatively resilient material having portions which extend through apertures in the apertured sleeve part, whereby portions of the further sleeve part engage said inner surface and further portions of the further sleeve part engage said outer surface so as to support the inner unit within the outer casing in such a manner as to isolate the inner unit from substantial external vibration and shock.

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5,047,636

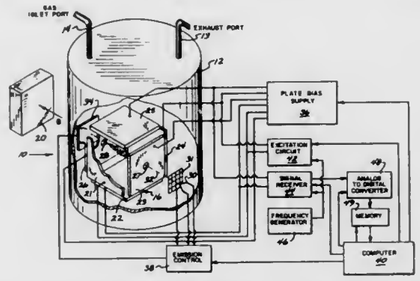
## LINEAR PREDICTION ION CYCLOTRON RESONANCE SPECTROMETRY APPARATUS AND METHOD

Thomas C. Farrar; Jeffrey F. Loo; Mark D. Krahling, and John W. Elling, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 8, 1990, Ser. No. 462,161

Int. Cl.[5] B01D *59/44;* H01J *49/00*

U.S. Cl. 250—291 18 Claims



1. An ion cyclotron resonance mass spectrometer comprising:

a closed chamber for receiving a gaseous sample to be analyzed;

an ion trapping cell formed by a plurality of electrode plates within said chamber;

means for producing K groups of ions within said ion trapping cell, where K is a positive integer and each group being defined by a different ion mass-to-charge ratio;

means for generating a magnetic field along a given direction through said ion trapping cell to cause the ions to orbit at angular frequencies dependent on the mass-to-charge ratio of individual ions;

means for producing a static electric field within said ion trapping cell which in conjunction with the magnetic field confines within said ion trapping cell substantially all ions of a given charge polarity that are formed by said means for producing ions;

means for creating a time-varying electric field within said ion trapping cell and orthogonal to the given direction of the magnetic field, to excite ions having mass-to-change ratios within a predetermined range;

means for detecting a time domain electrical signal produced in said ion trapping cell by the orbiting excited ions;

means for sampling the electrical signal detected by said means for detecting to produce N digital samples of that signal during a sampling period which is less than $1/\Delta f$, where $\Delta f$ is the smallest separation between resonant frequencies of the ions; and

means for transforming the samples of the time domain electrical signal into a frequency domain signal data by linear prediction using a linear least-squares procedure, the resultant frequency domain signal data comprising K coefficients $a_1 - a_K$ in which each coefficient represents the abundance of excited ions in one of the K groups of ions having a different mass-to-charge ratio.



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5,047,637

## ATOMIC PROBE TYPE MICROSCOPE APPARATUS

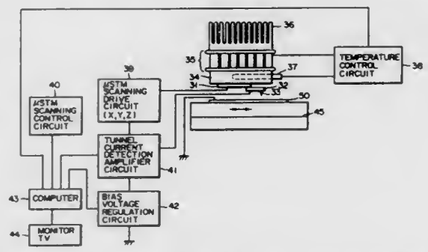
Akitoshi Toda, Kunitachi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 17, 1990, Ser. No. 525,076

Claims priority, application Japan, May 29, 1989, 1-135013

Int. Cl.[5] H01J *37/252*

U.S. Cl. 250—306 9 Claims




1. An atomic probe microscope apparatus for investigating a surface structure of a specimen, comprising:

a specimen on which the specimen is located;

a probe for scanning a surface of the specimen;

detecting means for receiving a signal from the probe;

means for two- or three-dimensionally changing a relative positional relation between the specimen and the probe; and

temperature control means comprising at least one of a probe temperature control means and a specimen temperature control means for achieving temperature control independently of the detecting means wherein said probe temperature control means and said specimen temperature control means control only the temperature of the probe or specimen, respectively.

5,047,638

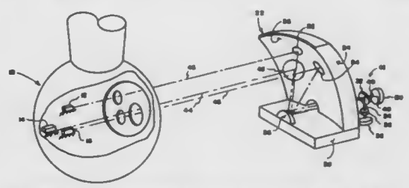
## PASSIVE BORESIGHTING SYSTEM

Jeffery A. Cameron, 2808 Montrose Dr. SW., Decatur, Ala. 35601, and Deborah L. Fraley, 119 Steele Dr., Madison, Ala. 35758

Filed Jun. 28, 1989, Ser. No. 372,678

Int. Cl.[5] G01B *11/26, 11/27;* G02B *23/06*

U.S. Cl. 250—330 17 Claims



1. A passive boresighting system including a laser for boresighting a plurality of components to a target, said plurality of components including at least a thermal imager and an optical system operable in the visible portion of the electromagnetic spectrum, said boresighting system comprising:

support means for supporting said laser and said plurality of components;

a target arranged in spaced relation with said plurality of components and disposed for impingement by the output laser beam from said laser, said target disposed for energization by said laser beam to emit a point source of radiation at a predetermined wavelength;

a collimator disposed intermediate said target and said plurality of components, said target positioned at the geometric focal point of said collimating means;

visible source generator means disposed between said collimating means and said target for converting a portion of the output laser beam of said laser into visible radiation; and

means for redirecting said visible radiation back through said collimating means for superimposed relation with said point source of radiation from said target.

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5,047,639

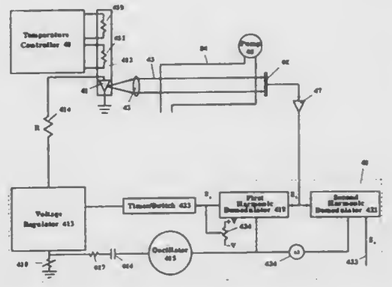
## CONCENTRATION DETECTOR

Jacob Y. Wong, 4589 Camino Molinero, Santa Barbara, Calif. 93110

Filed Dec. 22, 1989, Ser. No. 455,072

Int. Cl.[5] G01N *21/39;* G01J *3/00*

U.S. Cl. 250—341 5 Claims




1. A concentration detector comprising:

a single chamber, only, for containment of a sample chemical, the concentration of which is to be measured;

a first optical detector that produces a signal $S_1$ indicative of an intensity of light incident thereon;

a tunable source of substantially monochromatic light of a

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wavelength λ, said substantially monochromatic light being directed through said single chamber onto said first optical detector;

means, coupled to said first optical detector and to said tunable source of light and responsive to the measured intensity of light incident on said first optical detector, for locking the wavelength λ to an absorption peak of said sample chemical;

means, coupled to said first optical detector, for producing an output signal indicative of the intensity of light incident on said first optical detector;

whereby, by use of only a single chamber for containment of a sample that is used both for adjustment of the wavelength of the light to an absorption peak of the sample and for measuring the amount of absorption of this sample, a simpler, more compact, less expensive, high sensitivity concentration detector is produced than in devices in which additional chambers or sensing means or both are included to provide these two functions of adjusting the wavelength and of measuring an amount of absorption of said light in passing through said chamber and sample.

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**5,047,640**

## WEB INSPECTING METHOD

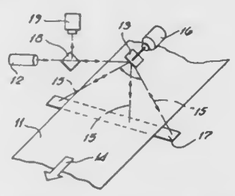
**David Brunnschweiler, Balderstone Lodge, Commons Lane, Balderstone, Blackburn, Lancs.; Neil R. Henderson, 2 Southcliffe, Great Harwood, Lancashire, BB2 7PP, both of England BB6 7PP , and David W. Swift, 8 Bryntiron Avenue, Prestatyn, Clwyd, LL19 9PB, Wales**

**Filed Jan. 19, 1990, Ser. No. 467,177**

**Claims priority, application United Kingdom, Jan. 19, 1989, 8901192; Jan. 28, 1989, 8901921**

**Int. Cl.[5] G01N** *21/89*

**U.S. Cl. 250—341** **6 Claims**



1. A method of inspecting travelling web material subject to ambient light which comprises

a) emitting light from a light source,

b) modulating the emitted light into alternating on and off pulses,

c) traversing the modulated light back and forth from edge to edge across the web transverse to its direction of travel, so that it travels along a first path which passes through the web to emerge therefrom with a reduced intensity,

d) measuring the intensity of the sum of the emitted light beam passing through the web plus ambient light during the on pulses and measuring the intensity of ambient light alone during the off pulses to yield a measurement of the intensity of the emitted light alone passing through the web during the on pulses independent of ambient light, and

e) measuring the intensity and variations thereof of the emitted light travelling along a second path the same length and through the same atmosphere as the first path, but not passing through the web during some of the on pulses and comparing the same to said yielded measurements of the intensity and variations thereof of the emitted light alone passing through the web during the on pulses in order to monitor web properties irrespective of variations in intensity of light emitted from the light source.

**5,047,641**

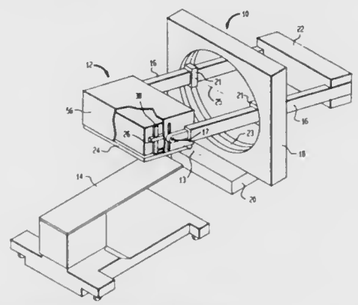
## SCINTILLATION CAMERA WITH AUTOMATICALLY COUNTERBALANCED GANTRY

**Nicolaas C. Besseling, Schaumburg; Albrecht H. Enders, Chicago; George J. Hanz, Bloomingdale; Hendrik Koopmans, Schaumburg, and David A. Yunder, Cicero, all of Ill., assignors to Siemens Gammasonics, Inc., Hoffman Estates, Ill.**

**Filed Mar. 14, 1990, Ser. No. 493,566**

**Int. Cl.[5] G01T** *1/166*

**U.S. Cl. 250—363.08** **14 Claims**



1. A scintillation camera, comprising:

a gantry;

a detector secured to the gantry;

means for detachably securing a collimator to the detector;

means for counterbalancing the gantry;

means for identifying a collimator which has been secured to the detector; and

control means operatively connected to said counterbalancing means and said identifying means and causing said counterbalancing means to be automatically adjusted so as to appropriately counterbalance the gantry in accordance with the collimator which has been secured to the detector.

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**5,047,642**

## RADIOLUMINESCENT SCREEN WITH AN IMPROVED QUALITY FACTOR AND SPATIAL RESOLUTION FOR X OR GAMMA PHOTON IMAGING

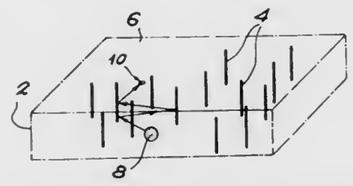
**Gaëtan Pleyber, Domene, and Philippe Gerard, Saint Ismier, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Oct. 11, 1990, Ser. No. 595,955**

**Claims priority, application France, Oct. 12, 1989, 89 13352**

**Int. Cl.[5] G01T** *1/202*

**U.S. Cl. 250—368** **7 Claims**



1. Radioluminescent screen with an improved quality factor and spatial resolution for X or gamma photon imaging having a transparent plate (2) made from a scintillating material cooperating with an image sensor (16) transforming the light photons produced in the scintillating plate (2) by X or gamma photons into currents supplying a video system, characterized in that the scintillating plate (2) has in its volume light deflecting lines (4) distributed in a direction perpendicular to the plane of the plate, in accordance with spacings equal to or smaller than those of the image points brought to the format of said plate.



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**5,047,643**

## RADIATION IMAGE READ-OUT APPARATUS

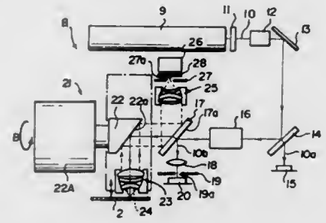
**Nobuhiko Ogura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. 409,543, Sep. 19, 1989, abandoned. This application Mar. 8, 1991, Ser. No. 667,357**

**Claims priority, application Japan, Sep. 19, 1988, 63-233987**

**Int. Cl.[5] G03B** *42/00*

**U.S. Cl. 250—327.2** **5 Claims**



1. A radiation image read-out apparatus wherein a stimulable phosphor sheet carrying a radiation image stored thereon is scanned with stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during exposure to radiation, and the emitted light is photoelectrically detected in order to read out the radiation image,

the radiation image read-out apparatus comprising:

i) a sheet holding means for holding said stimulable phosphor sheet thereon in a cylindrical surface form,

ii) a stimulating ray source for producing said stimulating rays,

iii) a semi-transparent mirror which is provided in an optical path of said stimulating rays and which transmits one of said stimulating rays and said light emitted by said stimulable phosphor sheet and reflects the other thereof,

iv) a spinner provided with:

a) a deflection mirror which reflects said stimulating rays coming from said semi-transparent mirror toward said stimulable phosphor sheet, said reflection being effected on the center axis of said cylindrical surface, and

b) a condensing lens which is positioned in the optical path of said stimulating rays reflected by said deflection mirror in order to converge said stimulating rays as a collimated light on said stimulable phosphor sheet, and which has substantially equal focal lengths with respect to said stimulating rays and said light emitted by said stimulable phosphor sheet, wherein the focal length with respect to said stimulating rays is defined by placing said stimulable phosphor sheet at a position where the collimated light having a wavelength equal to that of said stimulating rays is condensed, and wherein the focal length with respect to said light emitted by said stimulable phosphor sheet is defined by condensing the emitted light at a focal point of the emitted light,

said spinner rotating said deflection mirror and said condensing lens together coaxially with respect to said center axis, thereby to scan said stimulating rays in a main scanning direction on said stimulable phosphor sheet,

v) a sub-scanning means for moving said sheet holding means with respect to said spinner in parallel with said center axis,

vi) a detection lens provided in an optical path of said light emitted by said stimulable phosphor sheet, which light has passed through said condensing lens and comes from said semi-transparent mirror, in order to converge said emitted light,

vii) an aperture plate which is provided at a position where said emitted light is converged by said detection lens, and which an aperture of a size allowing only said emitted light after being thus converged to pass therethrough, and

viii) a photodetector provided at the rear of said aperture plate.

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**5,047,644**

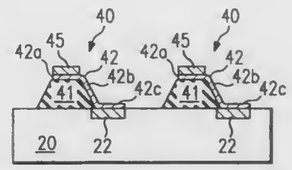
## POLYIMIDE THERMAL ISOLATION MESA FOR A THERMAL IMAGING SYSTEM

**Edward G. Meissner, Dallas; Robert A. Owen, Rowlett, and Mary E. Cronin, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jul. 31, 1989, Ser. No. 387,918**

**Int. Cl.[5] G01J** *5/06*

**U.S. Cl. 250—332** **14 Claims**



1. A thermal imaging system including an array of thermally insulating mesa structures, comprising:

an array of thermal sensors, each for providing a sensor signal output representative of the amount of thermal radiation incident to the sensor;

a circuit substrate having disposed on a substantially planar surface an array of signal contact pads for receiving the sensor signal outputs from the array of thermal sensors;

an array of mesa structures, formed of a thermally insulating polymer material, projecting from the substantially planar surface of said circuit substrate, at least one being disposed adjacent each signal contact pad; and

for each mesa structure disposed adjacent a signal contact pad, a contoured mesa conductor, extending from the top of the mesa down the sidewalls to cover the adjacent area of said circuit substrate including said corresponding signal contact pad, for providing a signal path between the top of said mesa structure and a respective contact pad;

said thermal sensor array being disposed over said circuit substrate in contact with said array of thermally insulating mesa structures such that, for each thermal sensor, the sensor signal output is coupled through a respective mesa conductor to the associated contact pad.

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**5,047,645**

## THIN FILM INFRARED LASER DETECTOR AND MONITOR

**Arshavir A. Gundjian, Montreal, and Massoud Badaye, Gloucester, both of Canada, assignors to The Royal Institution for the Advancement of Learning, Montreal, Canada**

**Filed Jul. 7, 1989, Ser. No. 376,741**

**Int. Cl.[5] G01J** *5/20;* **G01S** *5/22*

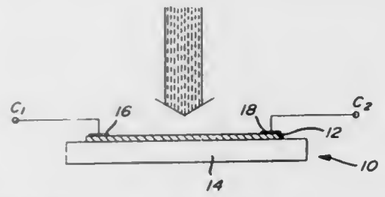
**U.S. Cl. 250—370.01** **21 Claims**

1. A method of detecting pulsed laser radiation comprising directing laser radiation in pulse form into a thin film of semiconductor material of non-centrosymmetric lattice structure having a substantial crystallographic texture, said thin film having a thickness of 1 to 50 μm, inducing by optical rectification an electric current within said thin film responsive to the pulse form radiation, conducting said electric current from said

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film through a pair of electrical contact elements in direct ohmic contact with said thin films, developing an electrical




signal responsive to said electric current, and determining said electrical signal as a measure of characteristics of the radiation.

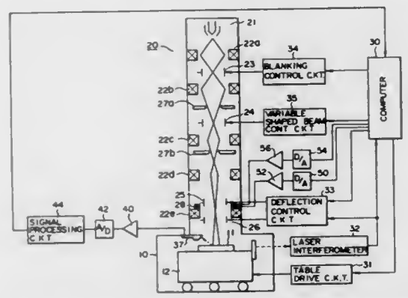
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**5,047,646**

## METHOD OF CORRECTING ASTIGMATISM OF VARIABLE SHAPED BEAM

**Kiyoshi Hattori, Tokyo; Shuichi Tamamushi; Eiji Nishimura, both of Kawasaki; Naotaka Ikeda, Fujisawa, and Hirotsugu Wada, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Aug. 20, 1990, Ser. No. 570,024**
**Claims priority, application Japan, Sep. 21, 1989, 1-243313**
**Int. Cl.[5] H01J** *37/30, 37/304*
**U.S. Cl. 250—396 R** **19 Claims**




1. A method of correcting astigmatism of a variable shaped beam, which uses a charged beam lithographic apparatus having first and second shaping apertures, a deflector for generating the shaped beam by an optical superposition, a focus correction coil for adjusting a focus of the shaped beam, and astigmatism correction coils for correcting the astigmatism of the shaped beam,

the method comprising the steps of:

adjusting the focus of the shaped beam by using said focus correction coil; and

correcting the astigmatism of the shaped beam by using said astigmatism correction coils, the step of correcting the astigmatism of the shaped beam including the substeps of

measuring first edge resolutions of the shaped beam in an arbitrary first direction and a second direction perpendicular to the first direction, and correcting first astigmatism in the first and second directions on the basis of the first edge resolutions, and

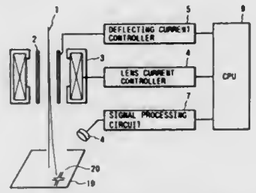
measuring second edge resolutions in a third direction oblique to the first direction and a fourth direction perpendicular to the third direction, and correcting second astigmatism in the third and fourth directions on the basis of the second edge resolutions.

**5,047,647**

## ELECTRON BEAM LITHOGRAPHY APPARATUS

**Hiroyuki Itoh, Kodaira, and Kenichi Hirane, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Instrument Engineering Co., Ibaraki, both of, Japan**

**Filed Sep. 14, 1990, Ser. No. 582,083**
**Claims priority, application Japan, Sep. 28, 1989, 1-250479**
**Int. Cl.[5] H01J** *37/153*
**U.S. Cl. 250—491.1** **8 Claims**




1. An electron beam lithography apparatus comprising:

an electron lens for focusing an electron beam on to a specimen;

a means for controlling current of the electron lens;

a deflector for deflecting the electron beam;

a means for controlling the deflector; a detector for detecting a reflective electron from marks relating the specimen when the deflector deflects the electron beam so as to scan the marks;

a signal processing circuit for obtaining position signals of the marks by processing an output of the detector; and

a means for memorizing high order polynomial equation and calculating a correcting value of the deflector controlling means based on the high order polynomial equations, wherein coefficient of the first order term is calculated from the position signals of the marks in a short cycle and other coefficients of the high order polynomial equation are calculated from the position signals in a longer cycle than said short cycle.

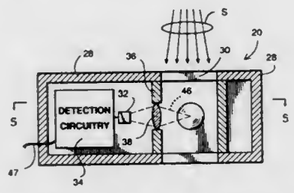
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**5,047,648**

## METHOD AND APPARATUS FOR DETECTING PARTICLES IN ION IMPLANTATION MACHINES

**Boris Fishkin, San Jose, and Michael Current, Mountain View, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.**

**Continuation of Ser. No. 513,329, Apr. 20, 1990, abandoned. This application Nov. 26, 1990, Ser. No. 618,019**
**Int. Cl.[5] H01J** *37/244*
**U.S. Cl. 250—492.2** **12 Claims**




1. A method for detecting particles in an ion implantation machine comprising the steps of:

exposing a substrate positioned within a vacuum chamber to an ion beam by rotating said substrate within a plane of rotation past an ion beam aperture, where the impingement of said ion beam on said substrate dislodges free particles; and

disposing particle sensing means within said vacuum chamber substantially within said plane of rotation to detect a portion of said free particles.

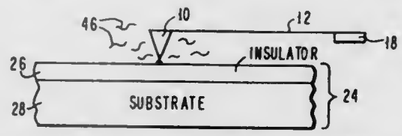


**5,047,649**

## METHOD AND APPARATUS FOR WRITING OR ETCHING NARROW LINEWIDTH PATTERNS ON INSULATING MATERIALS

**Rodney T. Hodgson, Ossining; Jackson E. Stanland, Waccabuc, and Oliver C. Wells, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 9, 1990, Ser. No. 594,269**
**Int. Cl.[5] H01J** *37/317*
**U.S. Cl. 250—492.2** **20 Claims**




1. A method for producing fine linewidth patterns on an insulating substrate, comprising the steps of:

bringing to close proximity an insulating substrate and a pointed tip, said pointed tip being connected to a spring-like cantilever and electrically connected to a voltage source,

applying a voltage of said pointed tip to emit electrons therefrom, said electrons traveling to said insulator and affecting molecules at the surface or within said insulator, there being no highly conducting return path for said electrons through said insulating substrate, and

moving said pointed tip and said substrate relative to one another to scan said tip across said substrate to thereby expose different areas of the substrate surface to said electrons.

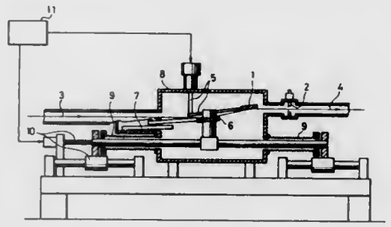
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**5,047,650**

## MONOCHROMETER

**Tatsuo Harada, Fuchu; Masaaki Ito, Hachioji, and Toshiaki Kita, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**PCT No. PCT/JP84/00545, § 371 Date Jul. 17, 1985, § 102(e) Date Jul. 17, 1985, PCT Pub. No. WO85/02254, PCT Pub. Date May 23, 1985**
**Continuation of Ser. No. 188,642, May 2, 1988, which is a continuation of Ser. No. 70,637, Jul. 6, 1987, which is a continuation of Ser. No. 758,220, Jul. 17, 1985, abandoned. This PCT application Nov. 14, 1984, Ser. No. 639,303**
**Claims priority, application Japan, Nov. 21, 1983, 58-217726**
**Int. Cl.[5] G21K** *1/06*
**U.S. Cl. 250—505.1** **3 Claims**



1. A monochrometer comprising:

a plane diffraction grating having grooves of varied spacing, the spacing among the grooves being continuously changed depending upon the position of grooves, such that the light of a single wavelength emitted from a given point is reflected and diffracted by said plane diffraction grating and is converged at another point on a plane perpendicular to the grooves of said plane diffraction grating; said plane diffraction grating having grooves of varied spacing which continuously change as a function of distance W from a center 0 of said grating in a manner that the groove spacing $\sigma_W$ at a predetermined point P on the surface of the grating at a distance W from the center 0 of said grating satisfies the following relation:

$$\frac{m\lambda}{\sigma_W} = \sin\left(\tan^{-1}\frac{r_1\sin\alpha - W}{r_1\cos\alpha}\right) + \sin\left(\tan^{-1}\frac{r_2\sin\beta - W}{r_2\cos\beta}\right)$$

so that said plane grating enables m-th diffracted light of wavelength $\lambda$ emitted from said incident slit at a distance $r_1$ and angle $\alpha$ from the center 0 to be converted at said exit slit at a distance $r_2$ and an angle $\beta$ from the center 0 without aberration;

a plane mirror for directing a light beam to said plane diffraction grating;

an incident slit for introducing the light beam; a fixed exit slit for directly taking out a light beam which is reflected and diffracted by said plane diffraction grating;

first means for turning said plane diffraction grating about an axis of rotation including the grooves thereof by a given angle; and

second means for moving said plane mirror and for arbitrarily changing the angle of deviation of a spectrometer which sees said incident slit on said exit slit from the axis of rotation of said plane diffraction grating on a plane perpendicular to the axis of rotation of said plane diffraction grating; and

control means for controlling said first and second means so that a given single wavelength component is taken, through said exit slit, out of the light beam which has passed through said incident slit and which is reflected and diffracted by said plane diffraction grating, by changing the angle of deviation of said spectrometer and the rotational angle of said plane diffraction grating while maintaining constant the distance between the axis of rotation of said plane diffraction grating and said incident light and maintaining constant the distance between the axis of rotation of said plane diffraction grating and said exit slit.

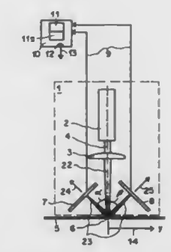
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**5,047,651**

## ARRANGEMENT FOR MEASURING A DEVIATION FROM ITS LINE OF A MOVABLE WEB OF FOIL

**Michael Wessner, Baar, and Daniel Holliger, Stelnhausen, both of Switzerland, assignors to Landis & Gyr Betriebs AG, Zug, Switzerland**

**Filed Mar. 27, 1990, Ser. No. 499,949**
**Claims priority, application Switzerland, Apr. 12, 1989, 1381/89**
**Int. Cl.[5] G01N** *21/86*
**U.S. Cl. 250—548** **12 Claims**



1. An arrangement for measuring the deviation of a marking track of a web of foil from a central position, the arrangement comprising:

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a tracking sensor including a light source and an optical receiver arranged on the same side of the web, said light source having an optical means for illuminating said marking track with a spot of predetermined size, said optical receiver having two photosensitive detectors for producing respective sensed signals in response to light received from the illuminated spot, and wherein said tracking sensor and said web of foil are movable relative to each other; and

a measuring apparatus connected to said photosensitive detectors and including a computing unit for converting said sensed signals from said photosensitive detectors into a difference signal indicative of the deviation of the marking track;

wherein said marking track comprises two mutually parallel diffraction grating tracks differing in diffraction-optical characteristics, and wherein each of said photosensitive detectors is arranged so as to receive light diffracted at a predetermined order of diffraction from a respective one of said two diffraction grating tracks when said illuminated spot is coincident with the respective diffraction grating track.

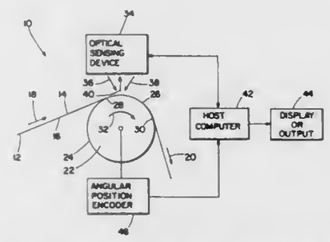
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**5,047,652**

## SYSTEM FOR ON-LINE MEASUREMENT OF COLOR, OPACITY AND REFLECTANCE OF A TRANSLUCENT MOVING WEB

**Khaim Lisnyansky, Chester, and Martin A. Hubbe, New Windsor, both of N.Y., assignors to International Paper Company, Tuxedo Park, N.Y.**

**Filed Apr. 16, 1990, Ser. No. 509,589**
**Int. Cl.[5] G01N** *21/86, 21/89*
**U.S. Cl. 250—571** **24 Claims**




1. An on-line system for optically measuring at least one characteristic of a web having front and back surfaces and moving with a velocity, said system comprising:

a backing roll having a surface which comprises at least one optical standard, said roll positioned such that a circumferential portion of said surface contacts the back web surface where said at least one characteristic is to be measured, the web curving around said circumferential portion, and said roll rotating with a circumferential velocity that substantially equals the web velocity; and

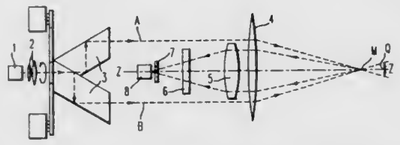
an optical sensing device positioned adjacent said circumferential portion of said roll surface so as to view the front web surface backed by said at least one optical standard for measuring said at least one web characteristic.

**5,047,653**

## DEVICE ON BOARD A MOVING VEHICLE TO OBTAIN SIGNALS REPRESENTATIVE OF THE RELATIVE SPEED OF THE VEHICLE WITH RESPECT TO AN AMBIENT FLUID

**James Garcia, Bondy, and Gérard Beigbeder, Paris, both of France, assignors to Thomson-CSF, Puteaux, France**

**Filed Jun. 25, 1990, Ser. No. 543,081**
**Claims priority, application France, Jun. 30, 1989, 89 08808**
**Int. Cl.[5] G01P** *3/36;* **G01B** *9/02*
**U.S. Cl. 250—574** **19 Claims**



1. A device for obtaining signals representative of a relative speed of a vehicle with respect to an ambient fluid comprising:

at least one fringe anemometer, positioned on board the vehicle, and having:

a radiant energy emitting source for emitting a radiant energy beam,

measuring volume forming means for forming the radiant energy beam into a measuring volume having at least an interference fringe and a measuring axis,

a photodetector for receiving light reflected from the measuring volume and for generating output signals representative thereof, and

an optical filter having a bandpass substantially at an emission frequency of the radiant energy beam of the radiant energy emitting source, the optical filter being position along an optical path extending between the measuring volume and the photodetector; and

orienting means for orienting the measuring axis of the measuring volume of the at least one laser anemometer in at least two different directions so that the photodetector generates signals representative of light reflected from the measuring volume for the at least two different directions.

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**5,047,654**

## SOLAR POWERED ELECTRICITY MINE SYSTEM

**Edwin Newman, 10331 Lindley Ave., #113, Northridge, Calif. 91326**

**Filed Feb. 5, 1990, Ser. No. 475,370**
**Int. Cl.[5] H02K** *7/18*
**U.S. Cl. 290—52** **13 Claims**

1. A system for the conversion of solar thermal power to electrical energy, comprising in combination:

(a) a multiplicity of heliostat fields for receiving and concentrating incident solar flux;

(b) a multiplicity of flux receiving prisms which are each mounted on heliostat field towers, one for each heliostat field;

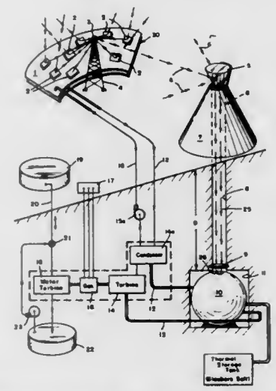
(c) a central mirror for receiving the solar flux transmitted to it by said prisms; said central mirror being mounted on top of an artificial or natural hill above the opening of a vertical mine shaft;

(d) a vertical mine shaft, approximately 5 meters in diameter and extending from the top of said hill to a depth of approximately 100 meters below the local ground surface; said mine shaft providing an insulating enclosure for downward transmission of said solar flux from said central mirror;

(e) a boiler, mounted in an enclosure at the bottom of said mine shaft and having its receiving aperture located at its top center, coinciding with the center of said mine shaft; said boiler for producing superheated steam from injected water by transferring thermal heat from the received solar flux to said injected water;

(f) a glass lens, made of a suitable material such as silica glass and mounted across said mine shaft at its bottom, separating said boiler from said mine shaft;

(g) means for converting said superheated steam input from said boiler, to electrical power output and exhaust water;



said means being located below the ground, near to said boiler in order to minimize thermal losses;

(h) means for cooling said exhaust water and returning it for use by said boiler; and

(i) an auxiliary drive system means, providing a renewable alternate energy source for operation during night hours or periods of high electrical load.



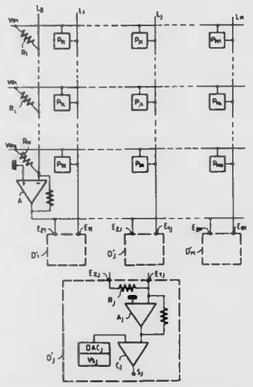
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**5,047,655**

## PROGRAMMABLE ANALOG NEURAL NETWORK

**Emmanuel Chambost, Limours, and Francois Vallet, Montigny Le Bretonneux, both of France, assignors to Thomson - CSF, Puteaux, France**

**Filed Mar. 1, 1990, Ser. No. 486,965**
**Int. Cl.[5] G06F** *7/00*
**U.S. Cl. 307—201** **5 Claims**



1. Programmable analogue neural network, of the type with a Cartesian matrix with N inputs and M outputs, comprising: a first addition circuit connected to the N inputs, said matrix further comprising N lines and M columns, the N.M synapses each being constituted by a logic gate, the M columns each being connected to a column addition circuit, another input of each of these column addition circuits being connected to the output of said first addition circuit and still another input of each of these column addition circuits being connected to a circuit producing an adjustable voltage.

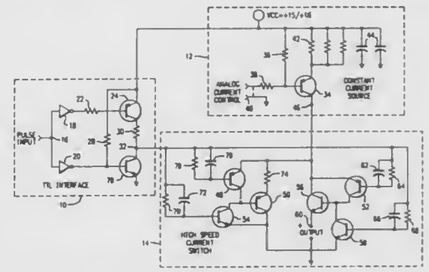
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**5,047,656**

## CONTINUOUS DUTY CIRCUITRY FOR HIGH SPEED SWITCHING OF CURRENT FROM A CONSTANT CURRENT SOURCE

**Louis R. Witt, III, Towson, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jul. 19, 1990, Ser. No. 555,340**
**Int. Cl.[5] H03K** *19/0175, 17/60, 19/094*
**U.S. Cl. 307—255** **21 Claims**




1. A high speed switching circuit for controlling transmission to a load of a current flow generated by a current source, comprising:

first and second transistor switching means each having a power input, a power output, and at least one control input, wherein the power input of each switching means is connected to the current flow generated by the current source, and the power outputs of the first and second transistor switching means connected to a load and a dummy load, respectively, and

control means connected to at least one control input of each switching means for generating first and second control signals, wherein the switching means are responsive to the control signals to change their conductive states in complementary fashion to alternately steer said current flow to said load and said dummy load, respectively.

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**5,047,657**

## INTEGRATED CIRCUIT COMPRISING A SIGNAL LEVEL CONVERTER

**Evert Seevinck; Jan Dikken, and Hans-Jürgen O. Schumacher, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sep. 1, 1989, Ser. No. 402,002**
**Claims priority, application Netherlands, May 10, 1989, 8901170**
**Int. Cl.[5] H03K** *5/00, 19/094*
**U.S. Cl. 307—264** **16 Claims**

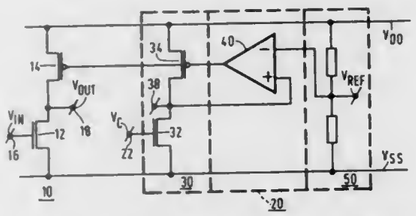
1. An integrated converter circuit for transforming, under the control of a control voltage, an input signal voltage having a first and a second extreme value on an input terminal into an output signal voltage having a third and a fourth extreme value on an output terminal, comprising:

a buffer which comprises a current path which includes a current channel of a driver transistor connected to a first power supply terminal, and a controllable load connected to a second power supply terminal, the input terminal being coupled to a control electrode of the driver transistor, the output terminal being coupled to a current path between the load and the driver transistor;

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a control circuit for controlling the load under the control of both the control voltage and a reference voltage so that the output signal voltage is substantially equal to the reference voltage if the input signal voltage is substantially equal to the control voltage, and




a capacitance connected between a control terminal of the load and the input terminal whereby the load and the drive transistor are controllable in a mutually opposed manner.

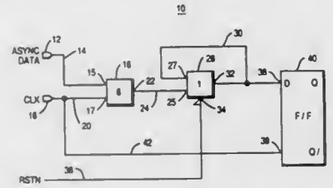
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**5,047,658**

## HIGH FREQUENCY ASYNCHRONOUS DATA SYNCHRONIZER

**Eugene L. Shrock, Castle Rock, and William K. Petty, Colorado Springs, both of Colo., assignors to NCR Corporation, Dayton, Ohio**

**Filed Jun. 1, 1990, Ser. No. 532,005**
**Int. Cl.[5] H03K** *3/286, 3/289*
**U.S. Cl. 307—269** **16 Claims**




1. A synchronizer for synchronizing an input data signal with a clock signal, comprising:

means for providing a binary product at an output thereof, said binary product means having a first input connected to said input data signal and a second input connected to said clock signal;

means for providing a binary sum at an output thereof, said binary sum means having a first input connected to said output of said binary product means and a second input connected to said output of said binary sum means thereby providing positive feedback; and

sampling means for sampling and holding said output of said binary sum means;

said sampling means having a sample input connected to said output of said binary sum means, and a clock input connected to said clock signal and responsive to a transition of said clock signal from a binary LOW to a binary HIGH to sample and hold the binary state of said sample input during such transition;

whereby said binary product means outputs a binary LOW if said input data signal is a binary LOW at the same time that said clock signal is a binary HIGH, and a binary HIGH if said clock signal and said input data signal are HIGH concurrently, and if the output of the binary product means is a binary HIGH, the binary sum means latches-up to a binary HIGH condition that is sampled as the clock signal subsequently transitions from a binary LOW to a binary HIGH.

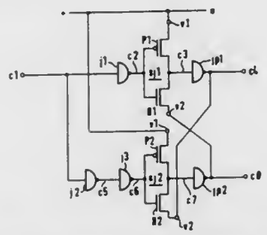
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**5,047,659**

## NON-OVERLAPPING TWO-PHASE CLOCK GENERATOR UTILIZING FLOATING INVERTERS

**Manfred F. Ullrich, Denzlingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany**

**Filed Sep. 4, 1990, Ser. No. 576,814**
**Claims priority, application European Pat. Off., Sep. 22, 1989, 89117551.5**
**Int. Cl.[5] H03K** *5/13*
**U.S. Cl. 307—269** **3 Claims**




1. A two-phase-clock generator which generates a first clock and a nonoverlapping second clock from an input clock by utilizing gate delays, comprising:

a first floating inverter and a second floating inverter each having an input, an output, a first supply terminal and a second supply terminal, said input of said first logic gate and said input of said second logic gate being coupled to said input clock in antiphase, and said first supply terminals of each of said first and second floating inverters connected to a supply voltage;

a first output buffer having an input coupled to said output of said first floating inverter and having an output that provides said first clock, said output further being provided as feedback to said second supply terminal of said second floating inverter; and

a second output buffer having an input coupled to said output of said second floating inverter and having an output that provides said nonoverlapping second clock, said output further being provides as feedback to said second supply terminal of said first floating inverter.

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**5,047,660**

## HIGH VOLTAGE HIGH SPEED CCD CLOCK DRIVER

**Ram Kannegundla, Rochester, and Win-Chyi Chang, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 6, 1989, Ser. No. 432,020**
**Int. Cl.[5] H03K** *5/01, 17/687*
**U.S. Cl. 307—270** **5 Claims**

1. A clock drive circuit for charging a CCD capacitive load in response to a clock signal of a predetermined voltage amplitude, said clock drive circuit comprising:

an input terminal for receiving said clock signal;

an output terminal for supplying current to said capacitive load;

a first voltage terminal for receiving a first voltage;

a second voltage terminal for receiving a second voltage greater than said first voltage;

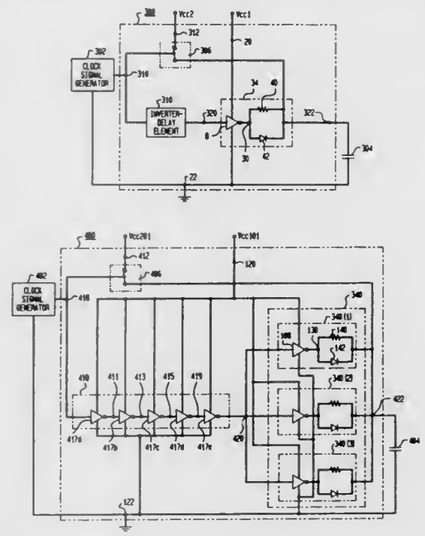
a first charging path selectively connected between said first voltage terminal and said output terminal under the control of said clock signal; and

a second charging path having a substantially higher impedance than said first charging path selectively connected between said second voltage terminal and said output terminal under the control of said clock signal;

both of said charging paths operating together to charge said capacitive load to said first voltage level and said second



charging path operating substantially alone to charge said capacitive load from said first voltage level to said second




voltage level greater than said first voltage level greater than said first voltage level.

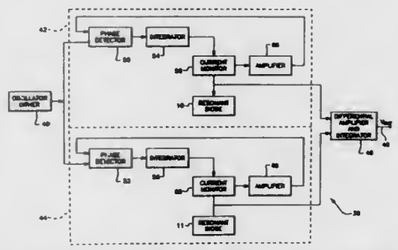
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**5,047,661**

## SUPERLATTICE PRECISION VOLTAGE REFERENCE

**Dale P. Berndt, Plymouth, and Andrzej Peczalski, Brooklyn Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Division of Ser. No. 251,596, Sep. 30, 1988, Pat. No. 4,905,056. This application Jan. 16, 1990, Ser. No. 433,067**
**Int. Cl.[5] H03K** *3/01;* **H01L** *27/12*
**U.S. Cl. 307—296.6** **4 Claims**




1. A superlattice precision voltage reference comprising:

a first superlattice resonant tunneling diode having a peak current flow at a specific voltage.

a second superlattice resonant tunneling diode having a peak current flow at a specific voltage; and

support electronics means, connected to said first and second resonant tunneling diodes, for tracking the peak current flows of said first and second resonant tunneling diodes and for providing a precision voltage reference output.

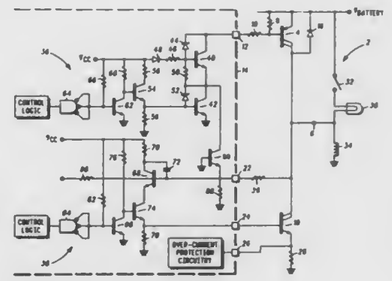
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**5,047,662**

## INDUCTIVE LOAD DRIVING CIRCUIT WITH INDUCTIVELY INDUCED VOLTAGE COMPENSATING MEANS

**Arthur J. Edwards, Hoffmann Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 28, 1989, Ser. No. 399,147**
**Int. Cl.[5] H03K** *5/00*
**U.S. Cl. 307—296.4** **9 Claims**




1. A driver circuit comprising:

an output node;

first transistor means for driving a substantially inductive load connected to the output node, the first transistor means having a first current electrode coupled to the output node, a second current electrode for connection to a voltage source coupled to a first control and having a control electrode;

second transistor means for driving a first substantially non-inductive load connected to the output node, the second transistor means having a first current electrode coupled to the output node, a second current electrode for connection to a reference potential and having a control electrode coupled to a second control node; and

compensating means, coupled to the control electrode of the first transistor, for sensing an inductively-induced voltage at the output node when the first transistor means is disabled to cease driving the substantially inductive load and for re-enabling the first transistor means in response thereto to dissipate the inductively-induced voltage at the output node so as to protect the second transistor means.

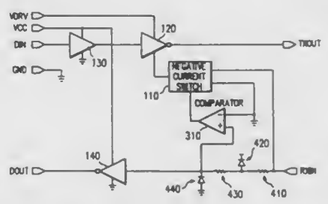
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**5,047,663**

## LOW-POWER COMPARATOR WHICH TOLERATES HIGH-SLEW-RATE INCOMING SIGNALS AND DERIVING POWER FROM THE INCOMING SIGNALS

**Robert D. Lee, Denton, and Gary V. Zanders, Dallas, both of Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.**

**Filed Jul. 28, 1989, Ser. No. 386,823**
**Int. Cl.[5] H03K** *3/01, 19/092*
**U.S. Cl. 307—296.1** **18 Claims**




1. An integrated circuit, comprising:

at least one contact pad for signal input, at least one contact

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pad for signal output, and at least one contact pad for receiving a power supply voltage;

a comparator which compares the voltage of said signal input contact pad to ground, and provides a control signal output indicating whether the potential of said signal input pad is less than ground by at least a predetermined amount;

one or more switching devices

which are directly connected to said input contact pad, without any substantial intervening resistor,

and which are controlled, in accordance with the output of said comparator, to selectively connect said input contact pad to a local ground line within the integrated circuit;

at least one MOS diode, comprising an insulated-gate field-effect transistor having a source coupled to ground, a drain coupled to said local ground line, and a gate coupled to said drain thereof;

whereby said MOS diode prevents sharp transients from pulling the potential of said local ground line near the potential of said power supply voltage.

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**5,047,664**

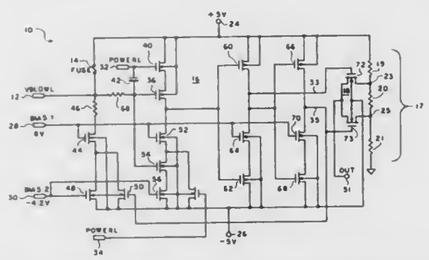
## TRIMMING CIRCUIT

**Miki Moyal, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.**

**Filed Jul. 21, 1989, Ser. No. 383,918**

**Int. Cl.[5] H03K** *3/26, 3/335*

**U.S. Cl. 307—303** **16 Claims**



1. A trimming circuit for adjusting a value of a circuit parameter from a first level to a second level and deciding whether the second level should be permanent, said trimming circuit comprising:

an input;

output means for providing said circuit parameter value;

a current switching means coupled to said input, said current switching means being convertible from a first state to a permanent second state by the application at said input of a first input condition; and

circuit means coupled to said input, said current switching means, and to said output means, for causing said output means to adjust said circuit parameter from said first level permanently to said second level in response to said current switching means being converted from said first state to said permanent second state, said circuit means also being responsive to the application at said input of a second input condition for causing said output means to nonpermanently adjust said circuit parameter from said first level to said second level only while said second input condition is applied at said input.

**5,047,665**

## LOW NOISE, LOW OFFSET, HIGH SPEED CMOS DIFFERENTIAL AMPLIFIER

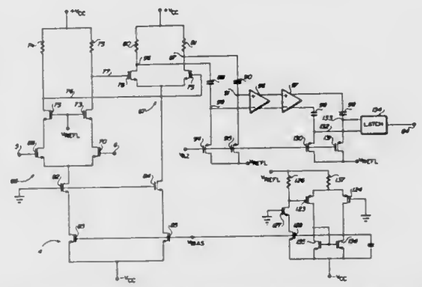
**Tony D. Miller, Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.**

**Division of Ser. No. 308,150, Feb. 8, 1989, Pat. No. 4,940,981.**

**This application Jun. 15, 1990, Ser. No. 538,974**

**Int. Cl.[5] H03K** *5/22;* **H03F** *3/45*

**U.S. Cl. 307—355** **4 Claims**



1. A field effect transistor differential amplifier having first and second input terminals and first and second output terminals, comprising in combination:

(a) a first stage including first and second input field effect transistors, first and second cascode field effect transistors, a first current source field effect transistor, and first and second load devices, the first current source field effect transistor having a drain coupled to a source of each of the first and second input field effect transistors, the first input field effect transistor having its gate coupled to the first input terminal and a drain coupled to a source of the first cascode field effect transistor, the first cascode field effect transistor having a gate connected to a first reference voltage conductor and a drain coupled by a first conductor to a first terminal of the first load, device, a second terminal of the first load device being coupled to a first supply voltage conductor, the second input field effect transistor having a gate coupled to the second input terminal and a drain coupled to a source of the second cascode field effect transistor, the second cascode field effect transistor having a drain coupled by a second conductor to a first terminal of the second load device and a gate coupled to the gate of the first cascode transistor, a second terminal of the second load device being coupled to the first supply voltage conductor;

(b) a second state including third and fourth input field effect transistors having gates coupled to the first and second conductors, respectively, a second current source field effect transistor, and third and fourth load devices, the second, current source field effect transistor having a gate and source coupled to a gate and source, respectively, of the first current source field effect transistor, and a drain coupled to a source of each of the third and fourth input field effect transistors, the third input field effect transistor having a drain coupled by a third conductor to a first terminal of the third load device, the third load device having a second terminal coupled to the first supply voltage conductor, a drain of the fourth input field effect transistor being coupled by a fourth conductor to a first terminal of the fourth load device, a second terminal of the fourth load device being coupled to the first supply voltage conductor;

(c) a first capacitor having a first terminal coupled to the third conductor and a second terminal coupled to a fifth conductor, and a second capacitor having a first terminal coupled to the fourth conductor and a second terminal coupled to a sixth conductor;

(d) a first auto-zeroing field effect transistor having a source coupled to the fifth conductor, a gate coupled to receive an auto-zeroing control signal, and a drain coupled to a second reference voltage conductor, and a second auto-zeroing field effect transistor having a source coupled to the sixth conductor, a gate coupled to receive the auto-zeroing control signal, and a drain coupled to the second reference voltage conductor;

(e) a third cascode field effect transistor having a source coupled to the drain of the first current source transistor, a gate coupled to a third reference voltage conductor, and a drain coupled to the sources of the first and second input field effect transistors;

(f) a fourth cascode field effect transistor having a source coupled to the drain of the second current mirror field effect transistor, and a drain coupled to the sources of the third and fourth input field effect transistors;

wherein the fifth and sixth conductors are connected to the inputs of a third stage similar to the second stage, and a pair of complementary output conductors of the third stage are coupled to inputs of a fourth stage similar to the second stage, the fourth stage having a pair of complementary output conductors connected to first terminals of third and fourth capacitors, respectively, the field effect transistor differential amplifier including third and fourth auto-zeroing field effect transistors having source electrodes connected to second terminals of the third and fourth auto-zeroing capacitors, respectively, the third and fourth auto-zeroing field effect transistors having gate electrodes coupled to receive the auto-zeroing control signal and each having a drain coupled to the second reference voltage conductor, the second terminals of the third and fourth capacitors being coupled to a pair of differential inputs of a field effect transistor latch, whereby the field effect transistor differential amplifier in combination with the field effect transistor latch form a comparator.



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**5,047,666**

## FAST SAMPLE AND HOLD CIRCUIT CONFIGURATION

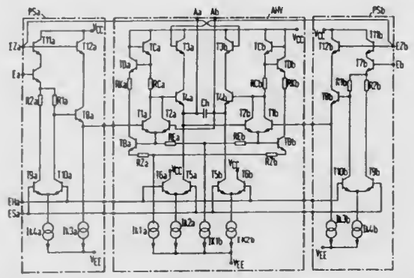
**Berthold Astegher, Klagenfurt; Alexander Lechner, Faak/See, and Hermann Jessner, Villach, all of Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Apr. 24, 1990, Ser. No. 513,910**

**Claims priority, application European Pat. Off., Apr. 24, 1989, 89107375.1**

**Int. Cl.[5] G11C** *27/02*

**U.S. Cl. 307—353** **11 Claims**



1. Circuit configuration, comprising: a symmetrically constructed sample and hold amplifier including first, second, third and fourth transistors each having a collector, an emitter and a control terminal, the collectors of said first and said third transistors being interconnected to form a first output terminal, the collectors of said second and said fourth transistors being interconnected to form a second output terminal, a first collector resistor connected between said first output terminal and a first supply potential, a second collector resistor connected between said second output terminal and the first supply potential, said first output terminal being connected to the control terminal of said fourth transistor, said second output terminal being connected to the control terminal of said third transistor, a hold capacitor connected between said first and second output terminals, the emitter of said first transistor being directly connected to the emitter of said third transistor, the emitter of said second transistor being directly connected to the emitter of said fourth transistor, at least one resistor connected between the emitters of said first and third transistors and the emitters of said second and fourth transistors, and at least one constant current impressing means connecting the emitters of said first and third transistors and the emitters of said second and fourth transistors to each other and to a second supply potential; a first switchable level shifter having an input in the form of a first signal input terminal for receiving a given signal, and an output being connected to the control terminal of said first transistor for supplying a differential output signal; and a second switchable level shifter having an input in the form of a second signal input terminal for receiving a signal complementary to the given signal, and an output being connected to the control terminal of said second transistor for supplying a differential output signal; said level shifters each having a switching state; the input and output signals of each of said switchable level shifters having a different constant direct voltage difference as a function of said switching state of said level shifters.

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**5,047,667**

## VOLTAGE DIFFERENCE DETECTOR

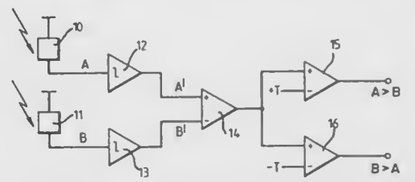
**James B. Howie, Edinburgh, Scotland, assignor to GEC Ferranti Defence Systems Limited, Stanmore, England**

**Filed Jan. 19, 1990, Ser. No. 467,563**

**Claims priority, application United Kingdom, Jan. 21, 1989, 8901332**

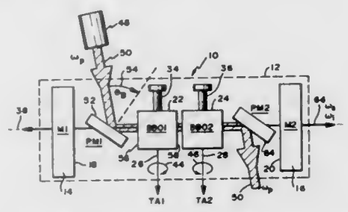
**Int. Cl.[5] H03K** *5/24*

**U.S. Cl. 307—355** **5 Claims**



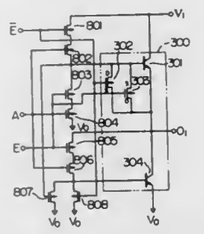
1. An electrical detector circuit arranged to detect which of a plurality of simultaneous varying input signals has a dominant maximum amplitude, the input signals being expected to have a wide dynamic range of amplitudes relative to whichever of said input signals has the dominant maximum amplitude and differing from one another only in amplitude, which detector circuit includes a separate limiting amplifier associated with each input signal and arranged to provide an output signal having an amplitude limited, when saturation of the amplifier occurs, to a value less than the said dominant maximum amplitude, and comparison means for comparing each said output signal with a variable comparing signal which differs from each input signal only in amplitude, said comparison means providing at least one output indicative of which of the simultaneous input signals has the dominant maximum amplitude.

5,047,668
**OPTICAL WALKOFF COMPENSATION IN CRITICALLY PHASE-MATCHED THREE-WAVE FREQUENCY CONVERSION SYSTEMS**
Walter R. Bosenberg, Monmouth Junction, N.J., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.
Filed Jun. 26, 1990, Ser. No. 543,419
Int. Cl.[5] H03F 7/00
U.S. Cl. 359—330 17 Claims



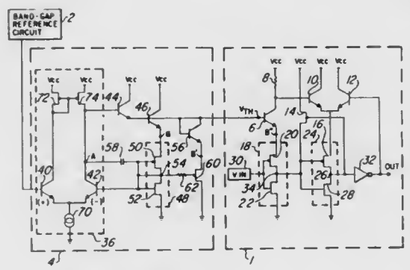
1. A walkoff compensated optical frequency conversion system comprising:
first and second nonlinear optical crystals each having a corresponding optical axis;
first and second mounting means mounting said first and second crystals, respectively, in alignment with each other along a common axis, each said crystal being mounted with its respective optical axis at an angle Θ with respect to said common axis, said crystals being oppositely disposed with respect to said common axis to provide an angle 2Θ between the optical axes of the first and second crystals; and
means directing a beam of light along said common axis and through said first and second crystals.

5,047,669
**TRISTATE CIRCUIT USING BIPOLAR TRANSISTOR AND CMOS TRANSISTOR**
Masahiro Iwamura; Kozaburo Kurita, both of Hitachi; Hideo Maejima, Hitachi; Tetsuo Nakano, Ome, and Atsuo Hotta, Higashiyamato, all of Japan, assignor to Hitachi, Ltd, Tokyo, Japan
Filed Mar. 3, 1989, Ser. No. 318,689
Claims priority, application Japan, Mar. 7, 1988, 63-51494
Int. Cl.[5] H03K 17/16
U.S. Cl. 307—446 23 Claims



1. A tri-state switching circuit having an active state in which an output terminal of the circuit is responsive to an input to the circuit and a quiescent state in which the output terminal is floating, comprising:
a bipolar transistor having a collector, a base coupled to the input and an emitter;
a first-conductivity type MOS transistor having drain and source connected to the base and emitter, respectively, of said bipolar transistor and a gate receiving a first control signal which controls selectively ON and OFF of said first-conductivity type MOS transistor;
a second-conductivity type MOS transistor having source and drain connected to the base and emitter, respectively, of said bipolar transistor and a gate receiving a second control signal which controls selectively ON and OFF of said second-conductivity type MOS transistor; and
control signal generating means for generating the first and second control signals selected so as to set both said first-conductivity type MOS transistor and said second-conductivity type MOS transistor at ON condition thereby causing the emitter and base of said bipolar transistor to be substantially at the same potential when said bipolar transistor is in the quiescent state.

5,047,670
**BICMOS TTL INPUT BUFFER**
Hiep V. Tran, Carrollton, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 427,150, Oct. 25, 1989, abandoned, which is a continuation of Ser. No. 198,276, May 25, 1988, Pat. No. 4,902,915. This application Sep. 6, 1990, Ser. No. 587,482
The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.
Int. Cl.[5] H03K 17/04
U.S. Cl. 307—475 3 Claims



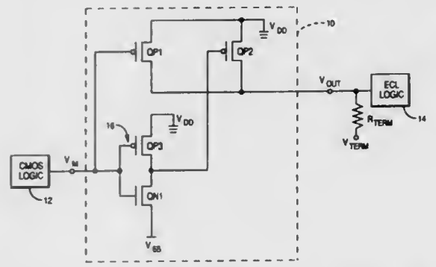
1. A circuit comprising:
an operational amplifier;
a threshold inverter coupled to said operational amplifier;
a first stage inverter;
a control circuit coupling said threshold inverter to said first stage inverter, whereby said first stage inverter receives a selected voltage, controlled by said control circuit, from said threshold inverter; and
a second stage inverter coupled to said first stage inverter.

5,047,671
**CMOS TO ECL CONVERTER**
Mukesh B. Suthar, Sunnyvale, and Thao T. Tonnu, Lemon Grove, both of Calif., assignors to NCR Corporation, Dayton, Ohio
Filed Oct. 13, 1988, Ser. No. 257,242
Int. Cl.[5] H03K 19/12
U.S. Cl. 307—451 8 Claims

1. A converter circuit for converting a first set of logic signals into a second set of logic signals, comprising:
an input for being connected to a source of the first set of logic signals;
an output for being connected to a circuit using the second set of logic signals;
a power terminal connected for receiving a power signal;
a first transistor having first, second and control terminals; and
a second transistor having first, second and control terminals;
said first transistor and said second transistor connected in parallel, with the first terminal of each connected to said power terminal and with the second terminal of each connected to said output terminal;

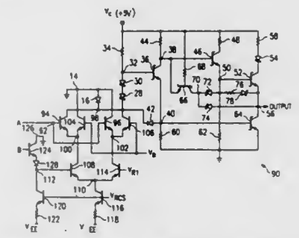


the circuit at said output terminal having a resistance associated therewith forming a voltage divider with said parallel-connected first and second transistors;
said first transistor and said second transistor having their respective control terminals connected so that said first transistor is enabled in response to a first level signal in the



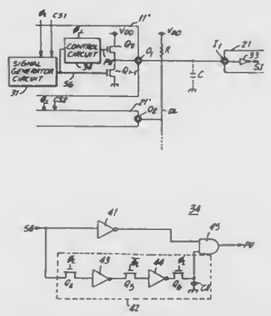
first set of logic signals and said second transistor is enabled in response to second level signal in the first set of logic signals; and
said first transistor when enabled having a different resistance between its first terminal and its second terminal than the resistance of said second transistor between its first and second terminals.

5,047,672
**ECL/TTL CONVERSION CIRCUIT AND TRANSLATION PROGRAMMABLE ARRAY LOGIC**
Rohit L. Bhuva, Plano, Tex.; Walter C. Bonneau, Jr., Peoria, Ariz.; Robert L. Gruebel, Plano, Tex.; Robert A. Helmick, Allen, Tex., and Allen Y. Chen, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Mar. 31, 1989, Ser. No. 332,257
Int. Cl.[5] H03K 19/0175, 19/20, 17/16; G06F 7/38
U.S. Cl. 307—475 18 Claims



1. A circuit for converting an ECL signal to TTL signal, comprising:
an ECL input for receiving a binary ECL signal, said ECL signal consisting of a sequence of portions at a high ECL voltage level and portions at a low ECL voltage level;
a TTL high supply voltage input;
a TTL low supply voltage input;
an output, said circuit producing a high TTL voltage level referenced to the level of said TTL high supply voltage on said output in response to a preselected one of said high and low ECL voltage levels on said ECL input, said circuit producing a low TTL voltage level referenced to the level of said TTL low supply voltage on said output in response to receiving the other of said high and low ECL voltage levels on said ECL input; and
a polarity switch operable to receive a polarity signal having a high and low values for reversibly preselecting said one of said high and low ECL voltage levels and said other of said high and low ECL voltage levels.

5,047,673
**HIGH SPEED OUTPUT STRUCTURE SUITABLE FOR WIRED-OR STRUCTURE**
Hiroaki Kaneko, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 2, 1990, Ser. No. 474,284
Claims priority, application Japan, Feb. 3, 1989, 1-24857
Int. Cl.[5] H03K 19/02, 19/096
U.S. Cl. 307—480 8 Claims

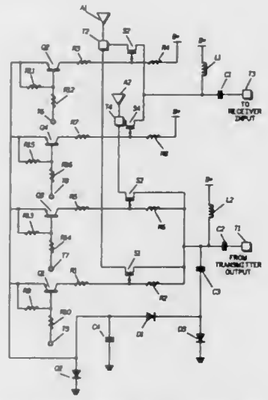


1. An output circuit comprising a first voltage terminal receiving a first voltage, a second voltage terminal receiving a second voltage, a clock terminal receiving a clock signal, an output transistor having a current path connected between an output terminal and said second voltage terminal and a control terminal, a signal generating circuit coupled to said clock terminal for operatively supplying said control terminal of said output transistor with one of a first level rendering said output transistor conductive and a second level rendering said output transistor non-conductive in synchronism with said clock signal, a switch circuit having a current path connected between said output terminal and said first voltage terminal, and a control circuit coupled to said signal generating circuit for controlling said switch circuit, said control circuit temporarily rendering said switch circuit conductive during a cycle period of said clock signal when the level at said control terminal of said output transistor changes from said first level to said second level.

5,047,674
**GALLIUM ARSENIDE ANTENNA SWITCH HAVING VOLTAGE MULTIPLIER BIAS CIRCUIT**
Edward T. Clark, Plantation, and Enrique Ferrer, Miami, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Continuation-in-part of Ser. No. 258,933, Oct. 17, 1988, abandoned.
This application May 2, 1990, Ser. No. 517,899
Int. Cl.[5] H01P 1/15
U.S. Cl. 307—570 8 Claims

1. A switch for coupling at least one terminal to a plurality of terminals, conprising in combination:
first bias voltage means of multiplying the voltage of a signal at a first terminal of said switch, and for converting said signal to a first bias voltage:
second bias voltage means for providing a second bias voltage in the absence of said at said first terminal;
first signal switching means for coupling said first terminal to a second terminal of said switch;
second signal switching means for coupling said second terminal to a third terminal of said switch;
first bias switching means for coupling said first bias voltage

to said first signal switching means in response to first control signal; and



second bias switching means for coupling said second bias voltage to said second signal switching means in response to a second control signal.

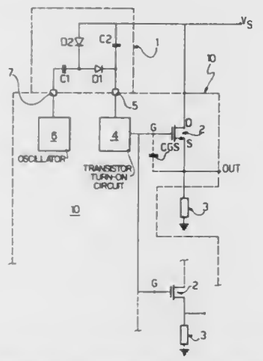
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**5,047,675**

**CIRCUIT DEVICE, MADE UP OF A REDUCED NUMBER OF COMPONENTS, FOR SIMULTANEOUSLY TURNING ON A PLURALITY OF POWER TRANSISTORS**

**Sandro Cerato, Vercelli; Antonella Baiocchi, Pavia, and Angelo Alzati, Milan, all of Italy, assignors to SGS-Thomson Microelectronics S.r.L., Milan, Italy**

**Filed Oct. 23, 1989, Ser. No. 425,423**
**Claims priority, application Italy, Nov. 7, 1988, 22533 A/88**
**Int. Cl.[5] H03K** *17/687, 19/01*
**U.S. Cl. 307—578** **6 Claims**



5. The combination of a plurality of power transistors having input terminals, an oscillator having an output, a turn-on circuit having a bootstrap input and out output connected to the transistor input terminals, and a circuit device, made up on reduced number of components, for simultaneously turning on said power transistors and connected between the output of said oscillator and the bootstrap input of said turn-on circuit, said oscillator and turn-on circuit and power transistors being incorporated into an integrated circuit, characterized in that said circuit device comprises:

a first diode,

a first capacitor having one end connected to said oscillator output and its other end connected in series with said first diode to said bootstrap input of the turn-on circuit,

a second capacitor connected between said bootstrap input of the turn-on circuit and the high side pole of a voltage supply, and

a second diode connected between the junction of the first capacitor and the first diode, and directly to said high side voltage supply pole.

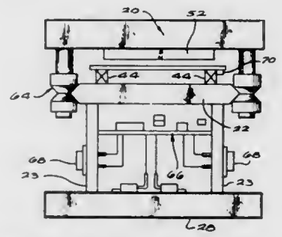
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**5,047,676**

**BRUSHLESS LINEAR ACTUATOR WITH SENSOR-ACTIVATED COILS**

**Yoshiaki Ichikawa, Chula Vista, Calif., assignor to Hitachi Metals, Ltd., Tokyo, Japan**

**Filed Apr. 2, 1990, Ser. No. 503,299**
**Int. Cl.[5] H02K** *41/025;* **B60L** *13/02;* **G05B** *11/58*
**U.S. Cl. 310—12** **18 Claims**



1. A brushless dc linear actuator comprising:

a guide rail extending in a longitudinal direction;

at least one moving member, each of which is movable along the guide rail in the longitudinal direction and includes a plurality of permanent magnets;

electromagnetic drive means for driving the moving member forward and backward along the rail, said drive means including at least one series of electromagnetic coils secured to the guide rail and distributed longitudinally along the guide rail with a predetermined pitch; and

Hall-effect means, secured to the guide rail and including one Hall-effect element adjacent to each coil, for brushless, non-impulsive, gradual energization and shut-off of active ones of the coils within a predetermined distance of the permanent magnets of the moving member.

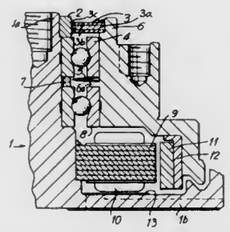
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**5,047,677**

**ALUMINUM DISK MOTOR HAVING THERMAL COMPENSATION AND MAGNETIC SEALING**

**Sadayoshi Mineta, and Koichi Katakura, both of Komagane, Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano, Japan**

**Filed Dec. 7, 1989, Ser. No. 447,224**
**Claims priority, application Japan, Dec. 9, 1988, 63-160091**
**Int. Cl.[5] H02K** *5/02;* **G11B** *33/14*
**U.S. Cl. 310—67 R** **3 Claims**



1. In a motor for driving an aluminum magnetic disk in which a rotational center of said magnetic disk is a fixed shaft, said motor having a frame, a shaft formed integral with the frame, an armature mounted on the shaft, a bearing provided on the opposite end of said shaft with respect to said frame, a hub to which a magnetic disk mounted around the shaft is securable, the improvement comprising that said frame, said shaft and said hub are formed of aluminum so that changes in temperature will not adversely affect motor performances due to differences in thermal expansion of these motor parts and that a magnetic sealing arrangement is provided including a magnetic sealing material arranged in the vicinity of said bearing on the shaft end opposite of said frame, a magnetic material being provided opposed to said magnetic sealing material in a radial direction of said hub, and a magnetic fluid arranged between said magnetic sealing material and said magnetic material.



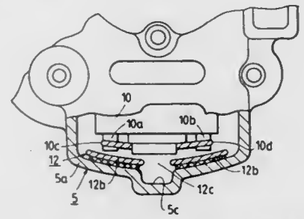
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**5,047,678**

**GENERATOR FOR VEHICLE**

**Hitoshi Ogawa, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan**

**Filed Aug. 25, 1988, Ser. No. 236,472**
**Int. Cl.[5] H02K** *5/10, 11/00*
**U.S. Cl. 310—88** **6 Claims**



1. In a vehicle generator comprising a bracket, a shaft rotatably supported by said bracket, a rotor fixed to said shaft, fans fixed to said rotor, a stator disposed at an outer circumference of said rotor and fixed to said bracket, a brush holder attached to a bottom surface of said bracket, said brush holder having first and second terminals and first and second pigtails on respective opposed sides thereof and a partition plate attached to said brush holder and composed of an axial portion and a radial portion between said bracket and said brush holder, the improvement wherein a single opening portion is formed in said axial portion of said partition plate at a central portion thereof between said first and second terminals and said first and second pigtails.

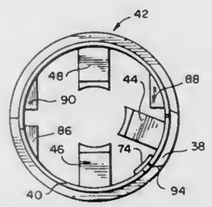
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**5,047,679**

**CASING FOR A SMALL MOTOR ASSEMBLY**

**Edward J. Baader, 232 Stephen La., and Joseph E. Baader, 333 Holiday Dr., both of Springfield, Ohio 45505**

**Filed Aug. 30, 1990, Ser. No. 575,023**
**Int. Cl.[5] H02K** *5/00*
**U.S. Cl. 310—89** **6 Claims**



1. A snap-fitted assembly of motor casing sides adapted for use as a dynamoelectric brush holder assembly of the type having a commutator, said brush holder assembly supporting electric brush assemblies contacting the commutator comprising:

a) a first semi-circular motor casing side adapted for snap-fitting with second and third motor casing sides, said first semi-circular motor casing side further including:

i) top and bottom peripherally extending inner flanges;

ii) a peripherally extending tapered end tab, extending at one end from a top flange of said first semi-circular motor casing side so as to be complementally engagable with a corresponding end tab extending from a bottom of a second motor casing side;

iii) a radially extending brush housing having an open radially extending slide in its side so as to support a compression spring and brush assembly in contact with the commutator; and

iv) a medial locking hook and slot defined at an other end of said top flange;

b) a second semi-circular motor casing side adapted for snap-fitting with said first semi-circular motor casing side and a third semi-circular motor casing side, further including:

i) top and bottom axially extending inner flanges;

ii) peripherally extending tapered end tabs extending from both ends of the bottom axially extending inner flange so as to be complementally engagable with end tabs peripherally extending from top flange ends of said first semi-circular motor casing and said third semi-circular motor casing side; and

iii) a radially extending brush housing having an open, radially extending slide in its side so as to support a compression spring and brush assembly in contact with the commutator; and

c) a third semi-circular motor casing side snap-fitted to open ends of said first semi-circular motor casing side and said second semi-circular motor casing side, and further including:

i) top and bottom axially extending flanges;

ii) peripherally extending tapered end tab defined at one end of the top axially flange so as to be complementally engagable with an adjacent end tab, defined on the bottom axially extending flange of said second semi-circular motor casing side and a medially extending tab defined at the other end of said top axially extending flange so as to be complementally engagable with said medial locking hook and slot in said first semi-circular motor casing side; and

iii) a radially extending brush housing having an open radially extending slide in its side so as to support a compression spring and brush assembly in contact with the commutator.

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**5,047,680**

**ROTATING ELECTRICAL MACHINE**

**Vilmos Török, Lidingö , Sweden, assignor to Astra-Tech AB, Stockholm, Sweden**

**PCT No. PCT/SE88/00645, § 371 Date Jun. 5, 1990, § 102(e) Date Jun. 5, 1990, PCT Pub. No. WO89/05540, PCT Pub. Date Jun. 15, 1989**
**PCT Filed Nov. 25, 1988, Ser. No. 476,471**
**Claims priority, application Sweden, Dec. 9, 1987, 8704913**
**Int. Cl.[5] H02K** *16/00, 21/12, 21/26*
**U.S. Cl. 310—156** **9 Claims**

1. A rotary electric machine comprising

inner and outer coaxial parts which are relatively rotatable about an axis of rotation, each of said inner and outer coaxial parts including a ferromagnetic core, and a substantially cylindrical air gap separating the cores,

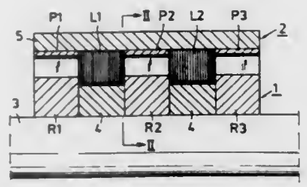
at least three rings of magnet poles of alternating polarities on said ferromagnetic core of one of said inner and outer coaxial parts, said rings of magnet poles being coaxial with said axis of rotation and axially spaced-apart on the cir-

cumferential side of said core that faces said air gap, all of said rings of magnet poles having the same number of magnet poles,

at least three rings of circumferentially spaced-apart teeth on the circumferential side of said ferromagnetic core of the other of said inner and outer coaxial parts that faces said air gap,

each of said rings of teeth being coaxial with said axis of rotation and positioned opposite to an associated one of said rings of magnet poles to form therewith a cooperating pair of rings,

the number of teeth of each said ring of teeth being half the number of magnet poles of each said ring of magnet poles,




the relative angular position of said ring of teeth and said ring of magnet poles of each said cooperating pair of rings in any relative angular position of said inner and outer coaxial parts being angularly offset from the relative angular position of the rings of the other cooperating pairs of rings by one-third of the angular extent of one pair of adjacent magnet poles of each of said rings of magnet poles,

and a pair of coil windings carried on one of said inner and outer coaxial parts, said windings being coaxial with said axis of rotation and each of said windings being positioned between adjacent ones of said cooperating pair of rings on said inner and outer coaxial parts.

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**5,047,681**

**CONSTANT POWER SYNCHRONOUS MOTOR WITH MICROPROCESSOR CONTROL**

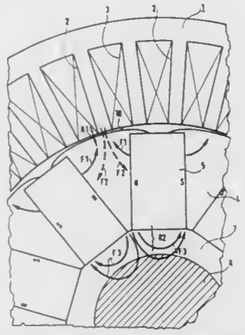
**Gabriel Gaillard, Dijon; André Régis, Talant, and Patrick Fage, Fontaine les Dijon, all of France, assignors to GEC Alsthom SA, Paris, France**

**Filed Jan. 11, 1990, Ser. No. 463,732**

**Claims priority, application France, Jan. 11, 1989, 89 00264; Oct. 2, 1989, 89 12843**

**Int. Cl.[5] H02K** *21/12*

**U.S. Cl. 310—156** **4 Claims**



1. A control system for operating a synchronous motor at constant power, said synchronous motor comprising magnets of the fluxconcentration type, the motor comprising a rotor provided with magnets positioned radially within the rotor having an azimuthal magnetization direction, and wherein the value (R2) of the reluctance to the flux of the magnets of a connection part (7) adjacent to the shaft (6) of the motor lies between 10 times and 20 times the reluctance of an air gap (10) of the motor, said system comprising a pick-up (C) measuring the position of its rotor, and a power-varying circuit (VP) operating as a current generator, and said power-varying circuit (VP) being controlled by a programmed microprocessor (MP) receiving information specifying the desired speed for the motor (M), information representative of the difference between the current speed and the desired speed for the motor, information from said pick-up relating to the position of the rotor of the motor, and stored information in order to enable the system to cause a zero phase difference between the current I delivered by the power-varying circuit and the potential difference U across the terminals of the motor windings, thereby minimizing the installed power required of the power-varying circuit in order to run the synchronous motor and powervarying circuit at constant power.

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**5,047,682**

**PERMANENT MAGNET EXCITED ELECTRIC MOTOR**

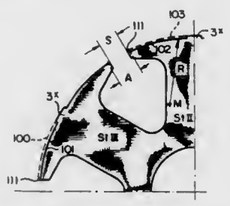
**Martin Burgbacher, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany**

**Continuation of Ser. No. 140,976, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 2,957, Jan. 12, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,937**

**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1986, 3600737**

**Int. Cl.[5] H02K** *1/22*

**U.S. Cl. 310—361** **22 Claims**




1. An electromagnetic direct current motor excited by permanent magnets comprising

a laminated core having radially extending slots with slot openings at a coaxial surface of the core, the coaxial surface being cylindrical;

at least one winding forming electromagnetic poles defined in sectors between the slots,

a plurality of radially thin, annular permanent magnets arranged in alternating polarities in the general form of a ring with a gap separating each polarity, the faces of the electromagnetic poles facing the faces of the permanent magnets and being separated by an air gap defined therebetween, one of the electromagnetic poles as an entity or the permanent magnets as an entity being the stator and the other the rotor;

no more than one raised portion on each of the electromagnetic pole surfaces extending radially into the air gap, the circumferential width of the raised portion being small compared to the electromagnetic pole pitch such that the electromagnetic pole pitch is many times the circumferential width of the raised portion; and

the raised portions being located circumferentially on the surface of the laminated core such that the distance measured in the direction of rotor rotation from the center of a core slot defined between any given pair of electromagnetic poles to the center of a raised portion on the electromagnetic pole adjacent the given pair is equal to n times the permanent magnet pole pitch, n being a whole number.



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**5,047,683**

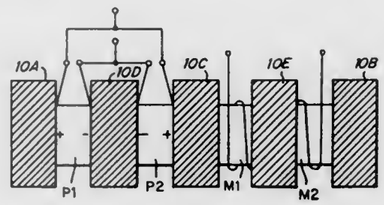
**HYBRID TRANSDUCER**

**John L. Butler, Marshfield, Mass., and Arthur Clark, Adelphi, Md., assignors to Image Acoustics, Inc., North Marshfield, Mass.**

**Filed May 9, 1990, Ser. No. 521,111**

**Int. Cl.[5] H01L** *41/08*

**U.S. Cl. 310—334** **64 Claims**




1. A transducer including means for combining acoustical energy and electrical energy and comprising; a first element having magnetostrictive properties and associated wiring, a second element having piezoelectric properties and associated wiring, means for combining both said elements into a unitary transducer device, a plurality of mass loads, and means securing the mass loads to the transducer device so as to reduce the wave speed and provide operation at a reduced frequency, wherein said first element comprises two segments and said second element comprises two segments and furthermore including at least five mass loads.

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**5,047,684**

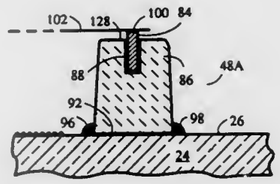
**MASK SUPPORT STRUCTURE FOR TENSION MASK COLOR CATHODE RAY TUBES**

**Raymond G. Capek, Elmhurst; Lawrence W. Dougherty, Sleepy Hollow, and Andrew S. Parry, Wildwood, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Aug. 13, 1990, Ser. No. 566,721**

**Int. Cl.[5] H01J** *29/07*

**U.S. Cl. 313—407** **15 Claims**




1. A tension mask color cathode ray tube including a glass faceplate having on its inner surface a centrally disposed, rectangular screening area, and on opposed sides thereof, a shadow mask support structure having mask-receiving member embedded therein, the body of said mask support structure wrapping substantially around said mask-receiving member such that said mask-receiving member protrudes from said mask support structure in a direction which is not parallel to the plane of force applied by a tension mask attached to said mask-receiving means, whereby the bond of said mask-receiving member and said mask support structures does not lie in such plane of force applied by a mask, the body strength of said mask support structure, rather than the shear strength of said bond, providing the primary resistance to such mask-applied force.

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**5,047,685**

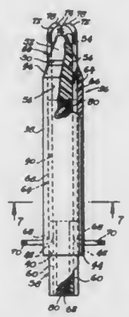
**ELECTRODE STRUCTURE FOR LITHOTRIPTER**

**Christopher Nowacki, 1552 Chickamauga, Long Grove, Ill. 60047, and Mark T. Horbal, 2 South 530 Iroquois Courts West, Warrenville, Ill. 60555**

**Filed Sep. 11, 1989, Ser. No. 405,425**

**Int. Cl.[5] H01T** *13/02;* **A61H** *1/00*

**U.S. Cl. 313—141** **12 Claims**



1. Electrode structure as for a lithotripter comprising first and second cylinders of insulating material, the first cylinder fitting inside the second cylinder, said first and second cylinders having confronting cylindrical surfaces, means securing said first cylinder in said second cylinder and said first cylinder having a pair of elongated straight channel means opening laterally to said confronting surfaces, and a pair of electrodes each having an elongated runner received in a respective channel means, each having an integral terminal portion extending from said second cylinder adjacent on end thereof for engagement with electrical connections, and each electrode having an extending tip integral with a respective electrode runner and extending beyond the other end of said second cylinder and turned toward the longitudinal axis of said second cylinder, the electrode tips being in spaced, confronting disposition to one another.

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**5,047,686**

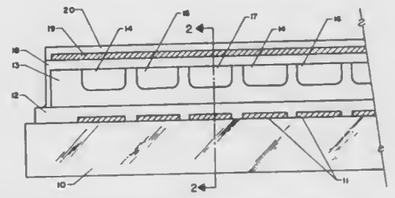
**SINGLE LAYER MULTI-COLOR LUMINESCENT DISPLAY**

**James B. Robertson, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Dec. 31, 1987, Ser. No. 140,185**

**Int. Cl.[5] H05B** *33/14*

**U.S. Cl. 313—503** **2 Claims**




1. A multi-color luminescent surface comprising:
an insulator substrate; and

a single layer of host material formed of ZnS and having a smooth top surface on said substrate, said single layer of host material including impurities formed of Mg, TbF3, and Mn hosted therein in selected areas forming a pattern of blue, green and red phosphors of ZnS:Mg, ZnS:$TbF_3$, and ZnS:Mn:$TbF_3$, respectively within said single layer of ZnS host material; and

an insulating layer over said smooth top surface of said single layer of ZnS host material.

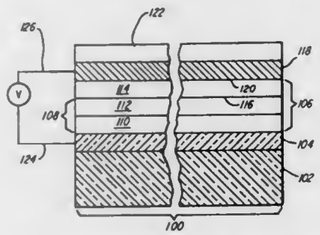
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5,047,687

## ORGANIC ELECTROLUMINESCENT DEVICE WITH STABILIZED CATHODE

Steven A. VanSlyke, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1990, Ser. No. 557,848
Int. Cl.[5] H05B *33/26;* B32B *15/04*
U.S. Cl. 313—503 14 Claims




1. An organic electroluminescent device comprising in sequence, a support, an anode, an organic electroluminescent medium, and a cathode,

characterized in that

said cathode is comprised of a layer consisting essentially of a plurality of metals other than alkali metals, at least one of said metals having a work function of less than 4 eV, and,

overlying said cathode, a protective layer comprised of a mixture of

at least one organic component of said organic electroluminescent medium and

at least one metal having a work function in the range of from 4.0 to 4.5 eV capable of being oxidized in the presence of ambient moisture.

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5,047,688

## AUTOMOBILE INTERIOR LIGHT CONTROL SYSTEM

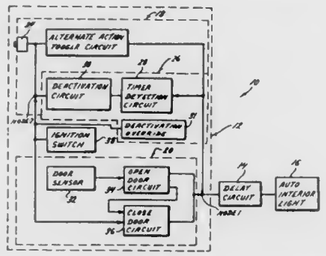
Ralph W. Alten, Arnold, Mo., assignor to Siegel-Robert, Inc., St. Louis, Mo.

Filed Jun. 11, 1990, Ser. No. 536,308
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 315—84 50 Claims

1. A lighting system for controlling an interior electrical light of an automobile, comprising:

a generating means for generating an electrical signal for turning on or off the automobile interior light; and,

a delay means electrically connected to said interior light and responsive to said generating means, so that the light level of the interior light rises transiently to a maximum level when said generating means is activated to create an electrical signal to turn on the interior light, and so that the light level of the interior light decays transiently to a minimum light level when said generating means is activated to create an electrical signal to turn off the interior light.



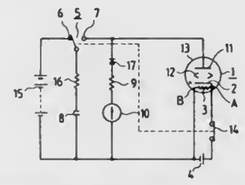

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5,047,689

## GAS DISCHARGE TUBE, INDIRECTLY HEATED CATHODE FOR USE THEREIN AND DRIVE CIRCUIT THEREFOR

Koji Kawai, and Yuji Shimazu, both of Shizuoka, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Feb. 21, 1990, Ser. No. 483,767
Claims priority, application Japan, Feb. 21, 1989, 1-41000
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—94 5 Claims




1. In a gas discharge tube comprising an indirectly heated cathode structure including a hot cathode into which a heater is incorporated, the improvement wherein during discharging said heater is supplied with a discharge current so as to generate Joule heat which is used as a heat source for said hot cathode.

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5,047,690

## INVERTER POWER SUPPLY AND BALLAST CIRCUIT

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 787,692, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 644,155, Aug. 27, 1984, abandoned, which is a continuation of Ser. No. 555,426, Jan. 23, 1983, abandoned, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned. This application Oct. 29, 1990, Ser. No. 604,252
Int. Cl.[5] H05B *41/29*
U.S. Cl. 315—224 20 Claims

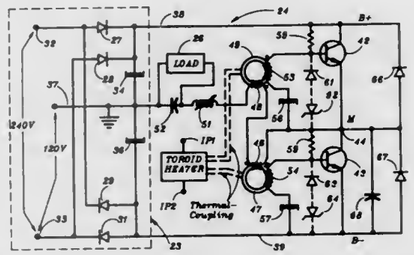
1. An arrangement comprising:

power input terminals across which is provided an ordinary AC power line voltage;

rectifier means connected with the power input termnials; the rectifier means having; (i) a center terminal, (ii) a positive terminal, and (iii) a negative terminal; the center terminal being connected, substantially wihtout any intervening impedance, with one of the power input terminals; the rectifier means being operative to provide a DC voltage between the negative terminal and the positive termina; the magnitude of this DC voltage being substantially constant and approximately equal to that of the peak-to-peak magnitude of the AC power line voltage;

inverter means conneced with: (i) the center terminal, (ii) the negative terminal, and (iii) the positive terminal; the inverter means being operative to provide a squarewave voltage at an inverter output; the squarewave voltage having an absolute peak-to-peak magnitude substantially equal to that of the AC power line voltage;






an L-C voltage connected with the inverter output; the L-C circuit having a tank inductor and a tank capacitor; the L-C circuit being naturally resonant at or near the fundamental frequency of the squarewave voltage; and

fluorescent lamp effectively connected in parallel with the tank capacitor, thereby to receive a lamp current.

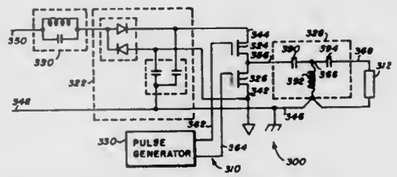
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5,047,691

## HIGH-PASS T-NETWORKS WITH INTEGRAL TRANSFORMER FOR GASEOUS DISCHARGE LAMPS

Ronald A. Lesea, Redwood City, and John B. Sampson, Morgan Hill, both of Calif., assignors to GTE Products Corporation, Danvers, Mass.

Filed Nov. 29, 1989, Ser. No. 443,588
Int. Cl.[5] H05B *37/00*
U.S. Cl. 315—244 6 Claims




1. A lighting system comprising in combination:

a high-frequency AC power source (310);

a load (312) including at least one gaseous discharge lamp; and

a current-limiting network (328) including,

first capacitor means (390),

second capacitor means (394), said first and said second capacitor means and said load being coupled in series across said high-frequency AC power source, and

inductor means (392) coupled in series with said first capacitor means across said high-frequency AC power source and coupled in series with said second capacitor means across said load.

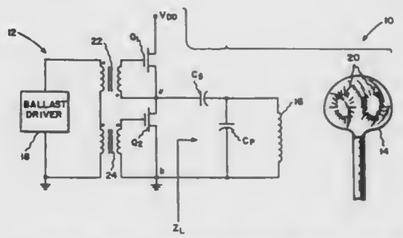
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5,047,692

## INTEGRATED TUNING CAPACITOR NETWORK AND HEAT SINK FOR AN ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP BALLAST

Joseph C. Borowiec, and Sayed-Amr A. El-Hamamsy, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 30, 1990, Ser. No. 472,144
Int. Cl.[5] H05B *41/16*
U.S. Cl. 315—248 11 Claims




1. A ballast for an electrodeless high intensity discharge lamp of the type having an excitation coil situated about an arc tube for exciting a plasma discharge therein upon application of a radio frequency signal to said excitation coil, said ballast comprising:

first and second switching devices connected in series in a half-bridge configuration with a junction therebetween;

ballast drive means coupled to said first and second switching devices, said ballast drive means being adapted to be coupled to an RF power supply for alternately driving said first and second switching devices; and

resonant circuit means coupled to said first and second switching devices at the junction therebetween, said resonant circuit means comprising said excitation coil, a first capacitor in parallel combination with said excitation coil, and a second capacitor connected in series with said parallel combination, said first and second capacitors each comprising a first and second metal plate with a dielectric material therebetween, said first metal plate being common to said first and second capacitors so as to comprise one of the metal plates of each of said first and second capacitors, and at least a portion of said second metal plate of each of said first and second capacitors overlapping each other so as to minimize any parasitic inductance therebetween;

said first and second capacitors together comprising impedance matching means for matching the ballast load impedance to maximize efficiency, the capacitance of said first capacitor being optimized for matching the ballast load resistance, and the capacitance of said second capacitor being optimized for matching the ballast load angle.

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5,047,693

## STARTING AID FOR AN ELECTRODELESS HIGH INTENSITY DISCHARGE LAMP

Victor D. Roberts, Burnt Hills; Sayed-Amr A. El-Hamamsy, and Robert J. Thomas, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 23, 1990, Ser. No. 527,502
Int. Cl.[5] H05B *41/24*
U.S. Cl. 315—248 24 Claims

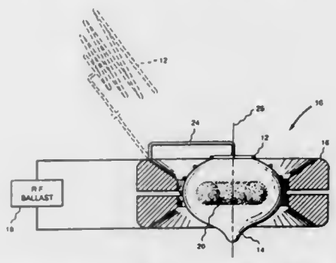
1. A starting aid for an electrodeless high intensity discharge lamp which includes an excitation coil situated about an arc tube for exciting an arc discharge in an ionizable fill contained in said arc tube, said starting aid comprising:

a spiral starting electrode having a plurality of turns for which, at least during initiation of the arc discharge in said arc tube, at least two of said turns substantially conform to the shape of said arc tube, and at least one of said turns is

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positioned adjacent to the portion of said arc tube nearest the arc discharge to be initiated and is oriented so as to provide a capacitive starting current in said arc tube that




flows in substantially the same location as the arc discharge; and

means for coupling a radio frequency signal to said spiral starting electrode.

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**5,047,694**

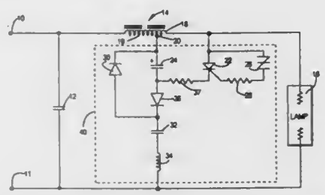
**LAMP STARTING CIRCUIT**

**Joe A. Nuckolls, and Isaac L. Flory, IV, both of Blacksburg, Va., assignors to Hubbell Incorporated, Orange, Conn.**

**Filed Jun. 30, 1989, Ser. No. 374,068**

**Int. Cl.[5] H05B *41/14***

**U.S. Cl. 315—290** **4 Claims**




1. A starting, operating and hot restarting circuit for a high pressure sodium lamp comprising the combination of

first and second terminals connectable to an AC source;

connector means connectable to an HPS lamp;

an inductive ballast connected to said first terminal and to one of said connector means so that, in use, said ballast is in series with a lamp connected to said connector means across said AC source, said ballast including

first and second winding portions and a tap at the junction of said portions, said second portion being connected to said first terminal and having a significantly larger number of windings than said first portion;

a semiconductor switch having a controllable conductive path connected at one end to said ballast so that said first portion is between said one end and said tap;

a storage capacitor connected between the other end of said conductive path and said tap;

a voltage-sensitive breakdown device connected to said switch, said breakdown device having a breakdown voltage significantly greater than the amplitude of said AC source, said breakdown device being responsive to the voltage across said storage capacitor so that when the voltage across said storage capacitor exceeds the breakdown voltage of said breakdown device, said device conducts and said switch becomes conductive, causing current flow through said first portion of said ballast, inducing high voltage in said second portion which is applied to said lamp connector means to start a lamp connected thereto;

a charging circuit connected between said tap and said second terminal, said charging circuit including a first diode, a pumping capacitor and a choke in series with each other and a second diode connected between said storage and pumping capacitors,

said diodes being oppositely poled so that said pumping capacitor is charged during one-half of each AC cycle and said storage capacitor is charged during the other half of each cycle to a voltage higher than the half cycle amplitude of said source by an amount proportional to the charge on said pumping capacitor, the voltage on said storage capacitor increasing during each cycle until said breakdown device conducts.

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**5,047,695**

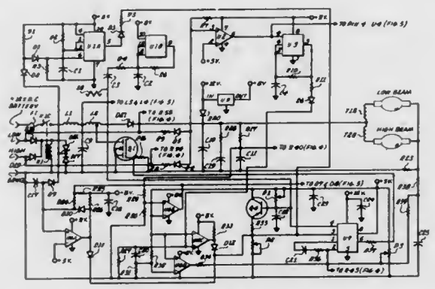
**DIRECT CURRENT (DC) ACOUSTIC OPERATION OF XENON-METAL HALIDE LAMPS USING HIGH-FREQUENCY RIPPLE**

**Gary R. Allen, Chesterland; Joseph M. Allison, Euclid; John M. Davenport, Lyndhurst, and Richard L. Hansler, Pepper Pike, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 20, 1990, Ser. No. 482,387**

**Int. Cl.[5] H04B *41/00, 37/00***

**U.S. Cl. 315—291** **17 Claims**



1. A method of operating a gas discharge light source having selected ingredients therein comprising the steps of:

(A) applying across a pair of electrodes of said gas discharge light source a starting voltage having a relatively high amplitude and a relatively short duration;

(B) continuing the application of said starting voltage until said discharge light source attains initial ionization;

(C) applying across said pair of electrodes, a run current of a direct current (DC) type;

(D) selecting a level and a center frequency for a ripple current signal; and

(E) imposing said ripple current signal having such selected level and center frequency onto said DC run current.

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**5,047,696**

**POWER-LIMITED CEILING LIGHTING SYSTEM**

**Ole K. Nilssen, Caesar Dr., Rte. 5, Barrington, Ill. 60010**

**Continuation of Ser. No. 703,027, Feb. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 450,187, Dec. 16, 1982, abandoned. This application Oct. 23, 1989, Ser. No. 425,436**

**The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.**

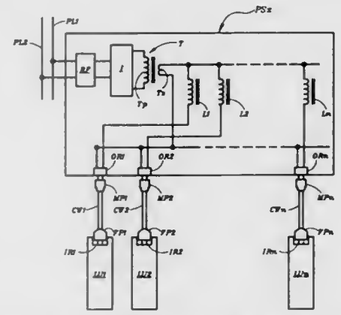
**Int. Cl.[5] H05B *37/00, 41/00***

**U.S. Cl. 315—312** **20 Claims**

1. A power conditioner for use in a lighting system and operable to power a plurality of luminaires used for providing general illumination in spaces used for human occupancy, said power conditioner being operable to connect with an ordinary electric utility power line, said power line being capable of providing a maximum available Volt-Ampere output so large as to be considered unsafe from a fire-initiation viewpoint, a maximum available Volt-Ampere output higher than about 100 Volt-Ampere normally being considered unsafe from a fire initiation viewpoint, said power conditioner comprising:

a plurality of pairs of power output terminals, each one of these pairs of power output terminals being: i) operable to connect with and to power one of said luminaires, and ii) limited separately and individually to provide electrical output that may be as high as, but is limited to be not higher than, the maximum Volt-Ampere output that under





normally encountered circumstances may be considered safe from a fire-initiation viewpoint,

such that, substantially regardless of the load presented to any given pair of power output terminals, the maximum Volt-Ampere output available form this given pair of power output terminals is limited by means internal of the power conditioner to be no higher than the maximum available Volt-Ampere output considered safe from a fire initiation viewpoint.

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**5,047,697**

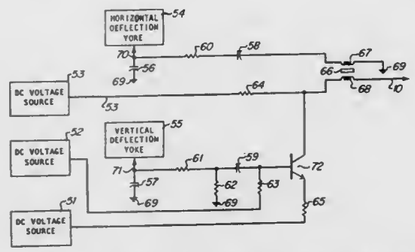
**DUAL AXIS DYNAMIC FOCUS OF AN ELECTRON BEAM IN A DISPLAY MONITOR**

**Stephen E. Horvath, Roseville, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Jun. 26, 1989, Ser. No. 371,875**

**Int. Cl.[5] G09G *1/04;* H01J *29/58***

**U.S. Cl. 315—382** **5 Claims**




1. In a display monitor, a circuit for generating a focal voltage used to vary focal length of an electron beam in a cathode ray tube, the circuit utilizing horizontal current placed on a horizontal deflection yoke of the cathode ray tube and vertical current placed on a vertical deflection yoke of the cathode ray tube, the circuit comprising:

horizontal capacitance means, coupled to the horizontal deflection yoke, for receiving a portion of the horizontal current;

vertical capacitance means, coupled to the vertical deflection yoke, for receiving a portion of the vertical current;

first amplifying means, coupled to the vertical capacitance means, for amplifying a voltage signal across the vertical capacitance means to produce a first amplified voltage, the first amplifying means including a transistor having a base, an emitter and a collector, the emitter being coupled through a first resistor to a first DC bias voltage, the collector being coupled through a second resistor to a second DC bias voltage, and the base being coupled through a coupling capacitor and through a voltage divider to the vertical capacitance means and being coupled through a third resistor to a third DC bias voltage;

second amplifying means, coupled to the horizontal capacitance means, for amplifying a voltage signal across the horizontal capacitance means for producing a second amplified voltage; and,

summing means, coupled to the the collector of the transistor and to the second amplifying means, for summing the first amplified voltage and the second amplified voltage to produce the focal voltage.

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**5,047,698**

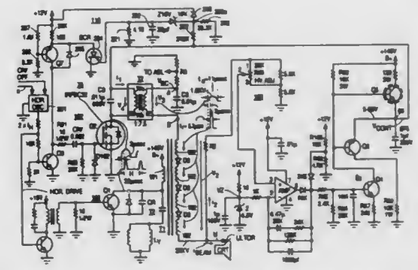
**HIGH VOLTAGE SHUTDOWN CIRCUIT**

**Ronald E. Fernsler, and Kevin M. Williams, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Mar. 14, 1991, Ser. No. 669,553**

**Int. Cl.[5] H01J *29/70***

**U.S. Cl. 315—411** **19 Claims**



1. A high voltage power supply of a video apparatus, comprising:

a source of an input signal at a first frequency;

a first flyback resonant circuit including a deflection winding;

first switching means responsive to said input signal and coupled to said first flyback resonant circuit for generating a resonant, first flyback pulse voltage at a frequency that is related to said first frequency that is developed across as high voltage winding of a flyback transformer;

a second flyback resonant circuit;

second switching means responsive to said input signal and coupled to said second flyback resonant circuit for generating a resonant, second flyback pulse voltage at a frequency that is related to said first frequency, said second flyback pulse voltage being combined with said first flyback pulse voltage to produce a high voltage pulse that is coupled to an electrode of a cathode ray tube;

a control circuit coupled to said second flyback pulse voltage generating means for controlling said second flyback pulse voltage in a manner that varies said high voltage pulse; and

a first protection circuit responsive to said controlled second flyback pulse voltage and coupled to said second flyback pulse voltage generating means for disabling the generation of said second flyback pulse voltage when said second flyback pulse voltage is outside a normal operation range.

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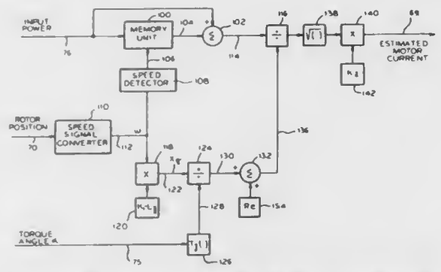


5,047,699

## VSCF START SYSTEM MOTOR CURRENT ESTIMATOR

Gregory 1. Rozman, and Vijay K. Maddali, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 26, 1989, Ser. No. 371,078
Int. Cl.[5] H02P 7/06
U.S. Cl. 318—254 16 Claims




1. A current estimator for a motor having a rotor and a stator having a stator coil which is energized from a source of power for imparting rotation to the rotor, comprising:

first sensing means for sensing the speed of rotational movement of the rotor;

second sensing means for sensing the power drawn by the stator coil from the source of power;

means for determining motor torque angle; and

means coupled to said first and second sensing means and said determining means for calculating an estimation of the current through the stator coil responsive to said rotor speed, said power drawn by the stator coil, and said torque angle.

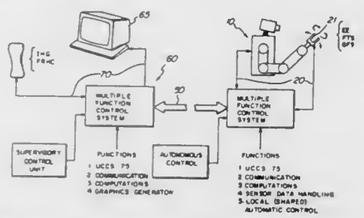
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5,047,700

## UNIVERSAL COMPUTER CONTROL SYSTEM FOR MOTORS

Zoltan F. Szakaly, Tujunga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 23, 1988, Ser. No. 172,105
Int. Cl.[5] G05B 19/42
U.S. Cl. 318—568.1 33 Claims




1. A universal computer control system for controlling and sensing the operating parameters of a plurality of motors that are software-controllable, said system having a command processor with a read/write memory address signal cycle, which command processor is dedicated to controlling said plurality of motors in accordance with a software program system itself, and said system comprising:

at least one controller card and a plurality of software-controllable motors which are connected to said controller card;

a signal user-accessible command processor connected to said controller card by a first digital bus;

a user-accessible code generator located in said command processor and responsive to user-initated inputs in order to control and/or sense the plurality of motors by said single command processor in accordance with digital signals sent to or from said controller card by said signal command processor;

digital storage means at said controller card accessible by read/write signals from said single command processor over said first digital bus, for storing at an address associated with each of said motors, user-initated software command written by said code generator, which software commands individually control or sense the operational status of any one of the plurality of motors connected to said controller card;

sensor circuits at each of said motors for delivering to said controller card, digital signals stored at the motor's address at said controller card, which signals are indicative of the operating status of each of said motors to be controlled by said card; and

address means at said controller card accessible by said command processor over said first digital bus during the command processor's read/write memory cycle for transferring digital signals, indicative of said user-desired control and/or each individual motor's operational status, from said digital storage means at said controller card to said command processor.

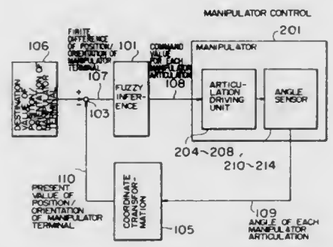
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5,047,701

## MANIPULATOR

Shinichi Takarada, Yokohama, and Satoshi Mohri, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1990, Ser. No. 536,801
Claims priority, application Japan, Jun. 12, 1989, 1-146569
Int. Cl.[5] G05B 19/42
U.S. Cl. 318—568.1 16 Claims




1. A manipulator system having a plurality of articulations, comprising:

destination coordinate means for giving a destination coordinate value of the position and orientation of the terminal of a manipulator;

present coordinate means for giving a present coordinate value of the position and orientation of the terminal of said manipulator;

finite difference generating means connected to said destination coordinate means and said present coordinate means for generating finite differences between said destination coordinate value and said present coordinate value; and

fuzzy inference means connected to said finite difference generating means for executing a fuzzy inference of said finite differences data for at least one of said plurality of articulations.

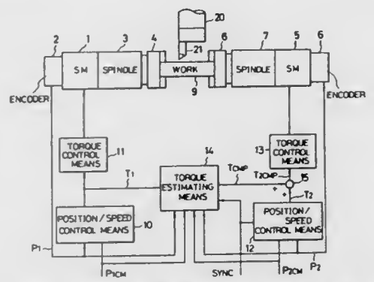


5,047,702

## SYNCHRONOUS CONTROL METHOD AND APPARATUS THEREFOR

Yoshimaro Hanaki, and Masayuki Nashiki, both of Aichi, Japan, assignors to Kabushiki Kaisha Okuma Tekkosho, Aichi, Japan

Filed Apr. 25, 1990, Ser. No. 513,818
Claims priority, application Japan, Apr. 27, 1989, 1-108468
Int. Cl.[5] G06F 15/46
U.S. Cl. 318—625 6 Claims




1. A method of synchronously controlling first and second spindles which are rotatably provided and opposed to each other in an opposed spindle lathe when a work is held between the first and second spindles, the method comprising the steps of: respectively driving the first and second spindles by first and second servo motors using respectivc first and second driving apparatuses controlling one of the rotational position and speed of the first spindle by the first servo motor, and generating and applying a torque command, for torque control, to said second driving apparatus for said second servo motor the torque command generated in accordance with another torque command applied to the first driving apparatus for the first servo motor.

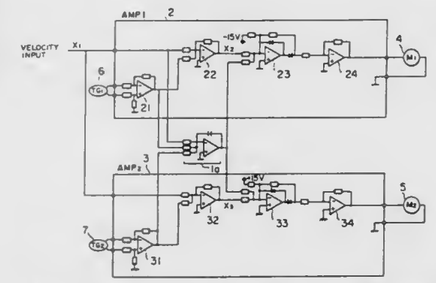
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5,047,703

## MOTOR DRIVING DEVICE

Koji Akamatsu, c/o Nagoya Seisakusho of Mitsubishi Denki Kabushiki Kaisha, 1-14, Yada Minami 5-chome, Higashi-ku,, Nagoya City, Aichi Prefecture, Japan

Filed Oct. 25, 1989, Ser. No. 426,560
Claims priority, application Japan, Oct. 28, 1988, 63-272147
Int. Cl.[5] G05B 11/01
U.S. Cl. 318—630 1 Claim




1. A motor driving device wherein two motors are held in engagement with an identical spindle through respective torque transmission mechanisms, and wherein each of the motors has a driving amplifier for generating a torque in a direction reverse to that of a torque of the other motor; comprising an integration circuit which integrates with respect to time a difference signal between an angel command value of said spindle and a rotational angle feedback value thereof, and which applies its integral output to the driving amplifiers in common, wherein the rotational angle feedback value of said spindle consists of a sum signal between velocity feedback signals of said two motors.

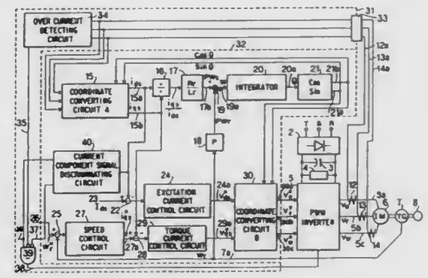
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5,047,704

## MOTOR CONTROL APPARATUS AND MOTOR CONTROLLING METHOD

Satomi Yamauchi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1990, Ser. No. 545,180
Claims priority, application Japan, Oct. 23, 1989, 1-273667
Int. Cl.[5] H02P 5/402
U.S. Cl. 318—801 5 Claims




1. A motor control apparatus, comprising:

an inverter for outputting a.c. power for driving a motor;

current detector means for detecting a current of said motor;

conversion means for converting the current detected by said current detector means into an excitation current component and a torque current component;

control means for controlling operation of said inverter by comparing said excitation current component and said torque current component with an excitation current command value and a torque current command value, respectively, and developing a voltage command for said inverter;

current component discriminating means for discriminating whether at least one of said excitation current component and said torque current component is less than or equal to a predetermined value, and outputting an alarm signal if at least one of said excitation current component and said torque current component is less than or equal to said predetermined value upon expiration of a predetermined time period after inputting of an operation signal for starting operation of said inverter; and

stopping means for halting operation of said inverter in response to said alarm signal.

5. A method of controlling operation of a motor, comprising the steps of:

a) determining the existence of an error flange and outputting an alarm signal for disabling an inverter if the error flag exists;

b) determining the application of an operation signal if said error flag does not exist;

c) clearing a counter in the absence of said operation signal;

d) driving a motor with a.c. power from said inverter upon application of said operation signal;

e) comparing an excitation current of the motor with a predetermined value;

f) incrementing said counter if said excitation current is less than or equal to said predetermined value, and resetting said counter if said excitation current is greater than said predetermined value;

g) comparing the contents of said counter with a predetermined count value upon incrementing said counter;

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h) generating said error flag if the contents of said counter exceed said predetermined count value; and

i) returning to step a).

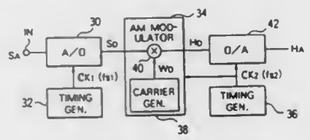
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5,047,705

## DIGITAL AMPLITUDE MODULATION APPARATUS

Takahiko Kishi, Tokyo, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed Jun. 6, 1990, Ser. No. 533,852
Claims priority, application Japan, Jun. 8, 1989, 1-146479
Int. Cl.[5] H03C *1/52, 1/60*
U.S. Cl. 332—151 4 Claims




1. A digital amplitude modulation apparatus comprising:

means (**30**, **32**) for generating a series of digital modulation signals ($S_D$) in a rate of $f_{s1}$; and

means (**34**, **36**, **50**) for digitally amplitude-modulating said digital modulating signal ($S_D$) with a digital carrier ($W_D$) of a rate of $f_c$ in a processing rate of $f_{s2}$ to produce a digital amplitude-modulated signal ($G_D$),

wherein the equations $2\times f_{s1}=f_{s2}$ and $f_c=(n/4)\times f_{s2}$ are satisfied, where n is a positive odd number (1, 3, 5, . . .).

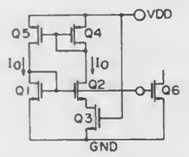
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5,047,706

## CONSTANT CURRENT-CONSTANT VOLTAGE CIRCUIT

Koichiro Ishibashi, Tokyo; Katsuro Sasaki, Fuchu, and Katsubiro Shimobigashi, Musashimurayama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 5, 1990, Ser. No. 577,512
Claims priority, application Japan, Sep. 8, 1989, 1-231569
Int. Cl.[5] G05F *3/24*
U.S. Cl. 323—313 4 Claims




1. A constant current-constant voltage circuit comprising:

first and second MOSFETs having gates connected together;

a third MOSFET having a drain-source path connected to a source of said second MOSFET;

a current mirror circuit having an input connected to a drain of said second MOSFET and an output connected to a drain of said first MOSFET;

the gate of said first MOSFET being connected to the drain thereof;

a gate of said third MOSFET being connected to a predetermined operation potential point to make said third MOSFET operate in a linear region; and

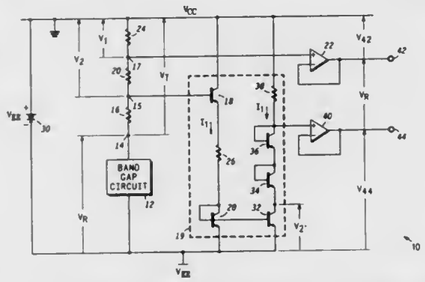
a first coefficient ($W_3L_2/L_3W_2$) depending upon channel lengths ($L_2$, $L_3$) and channel widths ($W_2$, $W_3$) of said second and third MOSFETs being set at a value not larger than a predetermined value.

5,047,707

## VOLTAGE REGULATOR AND METHOD FOR SUBMICRON CMOS CIRCUITS

Robert P. Dixon, Chandler, and Walter C. Seelbach, Fountain Hills, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 19, 1990, Ser. No. 615,684
Int. Cl.[5] G05F *3/16*
U.S. Cl. 323—314 8 Claims




1. A circuit having first and second supply voltage rails, comprising:

a bandgap circuit coupled between a circuit node and the second supply voltage rail for providing a predetermined reference voltage across said bandgap circuit, said predetermined reference voltage being substantially independent of temperature and power supply variation;

resistive means coupled between the first supply voltage rail and said circuit node for providing voltages which are referenced with respect to the first supply voltage rail at respective first and second outputs;

level translator means having an input coupled to said second output of said resistive means for translating said voltage appearing at said second output of said resistive means to a voltage at an output of said level translator means, said voltage at said output of said level translator means being referenced with respect to said second supply voltage rail;

a first operational amplifier coupled to said first output of said resistive means for transferring said voltage appearing at said first output of said resistive means to a first terminal, said first operational amplifier being capable of sourcing current; and

a second operational amplifier coupled to said output of said level translator means for transferring said voltage appearing at said output of said level translator means to a second terminal wherein a voltage developed between said first and second terminals is substantially equal to said predetermined reference voltage of said bandgap circuit, said second operational amplifier being capable of sinking current.

8. A method for providing a regulated voltage that is positioned between first and second power supply rails, the method comprising the steps of:

generating a predetermined reference voltage that is substantially independent of temperature and power supply variation;

generating first and second voltages that are referenced with respect to the first power supply rail;

translating said second voltage to a third voltage, said third voltage being referenced with respect to the second power supply rail; and

transferring said first and third voltages respectively to first and second terminals wherein a voltage developed between said first and second terminal is substantially equal to said predetermined reference voltage.

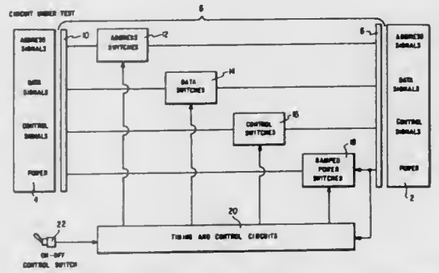


5,047,708

## APPARATUS FOR TESTING CIRCUIT BOARDS

Robert L. Kondner, Jr., 409A E. Preston St., Baltimore, Md. 21202

Filed Dec. 23, 1988, Ser. No. 290,268
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—73.1 20 Claims




1. Apparatus comprising electronic equipment, a circuit board for testing and being designed to be used with said electronic equipment in the normal operation of said electronic equipment, and switch means connected between said electronic equipment and said circuit board for permitting said circuit board to be tested by removable connection with said electronic equipment, wherein removal or installation of a said circuit board connected directly to said electronic equipment during said normal operation will prevent maintenance of integrity of the circuit board, said switch means comprising means for removably receiving said circuit board and means for selectively transmitting power or bus signals between said electronic equipment and said circuit board in a predetermined sequence for allowing said circuit board to be installed or removed while said electronic equipment remains activated while maintaining the integrity of said circuit board, whereby said circuit board may be installed or removed without inactivating said electronic equipment.

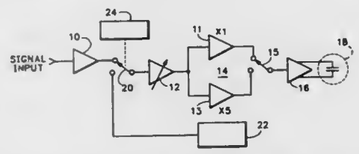
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5,047,709

## CALIBRATED VOLTAGE CURSORS

Davorin Fundak, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 16, 1990, Ser. No. 465,859
Int. Cl.[5] G01R *35/00*
U.S. Cl. 324—121 R 2 Claims




1. An apparatus for providing calibrated cursors on a display together with an input signal comprising:

an input signal path for receiving and processing the input signal;

means for displaying the output of the input signal path on the display; and

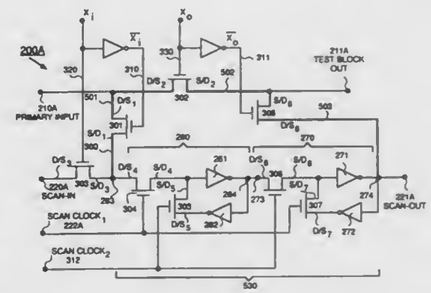
means for injecting a cursor signal into the input signal path prior to any gain stage in the input signal path.

5,047,710

## SYSTEM FOR SCAN TESTING OF LOGIC CIRCUIT NETWORKS

John E. Mahoney, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Division of Ser. No. 106,750, Oct. 10, 1987, Pat. No. 4,855,669.
This application Jul. 26, 1989, Ser. No. 385,856
Int. Cl.[5] G01R *31/28*
U.S. Cl. 324—158 R 10 Claims




1. A semiconductor device comprising:

flip-flop means, having an input terminal and an output terminal, for storing digital information; and

test block means, having a primary input terminal coupled to said output terminal of the flip-flop means, a primary output terminal coupled to said input terminal of the flip-flop means, a scan-in terminal for receiving digital signals from a serial scan path and a scan-out terminal for outputting digital signals to the serial scan path;

wherein the test block means includes first switching means for selectively and a synchronously coupling said primary input terminal to said primary output terminal to thereby form a breakable feedback path for a synchronously conducting signals from the output terminal of the flip-flop means to the input terminal of the flip-flop means, the first switching means being switchable among signal conducting and signal blocking states, and the first switching means being structured such that the integrity of one or more major components therein, responsible for allowing signals to pass through the first switching means, may be verified while the first switching means is in a signal blocking state; and

switch control means operatively coupled to the first switching means for selectively breaking open said breakable feedback path.

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5,047,711

## WAFER-LEVEL BURN-IN TESTING OF INTEGRATED CIRCUITS

William H. Smith, Poway, and Chau-Shiong Chen, San Diego, both of Calif., assignors to Silicon Connections Corporation, San Diego, Calif.

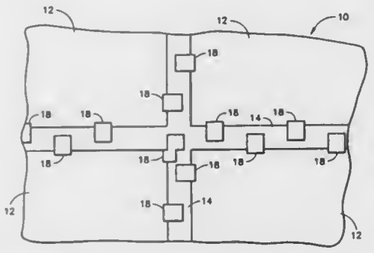
Filed Aug. 23, 1989, Ser. No. 397,768
Int. Cl.[5] G01R *1/00, 31/02*
U.S. Cl. 324—158 R 9 Claims

1. A wafer containing an array of integrated circuit dice, wherein the dice are separated by scribe lanes in which the wafer may be cut to dice the wafer into individual die; and wherein individual integrated circuits of the array include

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contact pads that extend from only said individual integrated circuit into the scribe lanes for use during burn-in



testing of the integrated circuits while they are contained in the wafer.

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**5,047,712**

**CIRCUIT FOR INVERTING THE LATTER HALF OF PATTERN OUTPUT FROM DEVICE UNDER TEST**

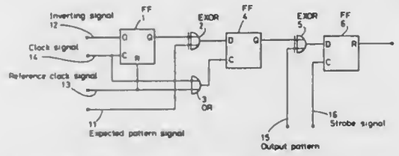
**Jou Koyama, Tokyo, Japan, assignor to Ando Electric Co., Ltd., Tokyo, Japan**

**Filed Aug. 23, 1990, Ser. No. 571,961**

**Claims priority, application Japan, Aug. 31, 1989, 1-226225**

**Int. Cl.[5] G01R** *31/28*

**U.S. Cl. 324—158 R** **2 Claims**



1. A circuit for inverting the latter half of an expected pattern for a device to be tested with regard to operation thereof, comprising:

a first flip-flop having a first input terminal supplied with an inverting signal for controlling inversion of an expected pattern, a second input terminal supplied with a reference clock signal for determining the period of said expected pattern and a third input terminal supplied with a clock signal synchronized with transitions in an output pattern of a device to be tested as to whether it operates as desired or not;

an exclusive-OR circuit having inputs supplied with the output of said first flip-flop and said expected pattern, respectively;

an OR circuit having inputs supplied with said reference clock signal and said clock signal, respectively; and

a second flip-flop having a first input terminal supplied with the output of said exclusive-OR circuit and a third input terminal supplied with the output of said OR circuit.

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**5,047,713**

**METHOD AND APPARATUS FOR MEASURING A DEEP IMPURITY LEVEL OF A SEMICONDUCTOR CRYSTAL**

**Yoshio Kirino, and Tateo Kusama, both of Tokyo, Japan, assignors to Semitex Co., Ltd. and Toshiba Ceramics Co., Ltd., both of Tokyo, Japan**

**Filed Nov. 14, 1990, Ser. No. 612,926**

**Claims priority, application Japan, Aug. 9, 1990, 2-211122**

**Int. Cl.[5] G01R** *31/26*

**U.S. Cl. 324—158 R** **10 Claims**

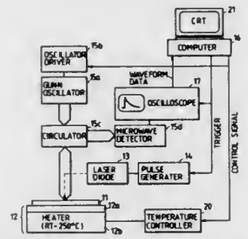
1. An apparatus for measuring a deep impurity level in a semiconductor specimen, comprising:

stage means for holding the specimen, and for changing a temperature of the specimen within a predetermined range;

beam source means for irradiating the specimen with an energy beam to generate minority carriers in it;

probe means for detecting, in a non-contact manner, a signal reflecting a temporal change in concentration of the minority carriers;

means for producing a signal decay curve on the basis of the detection signal from the probe means;



memory means for storing a plurality of the signal decay curves obtained at the respective temperatures of the specimen; and

computing means for controlling the beam source means, and the probe means and/or the decay curve producing means so that they operate in a synchronized manner, and for determining the impurity level by performing an Arrhenius' plot on the basis of the plurality of the signal decay curves and the corresponding temperatures.

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**5,047,714**

**PRINTED CIRCUIT BOARD AND A METHOD OF RECOGNIZING THE POSITION OF SURFACE MOUNTED PARTS**

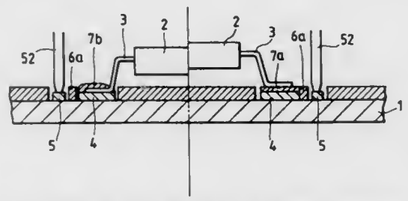
**Yutaka Maeno, Yotsukaido; Seiji Hashiguchi, Narashino; Keiichi Hasegawa, Yotsukaido; Masaaki Hachiya, Narashino, and Shingo Ueyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 10, 1989, Ser. No. 349,655**

**Claims priority, application Japan, May 11, 1988, 63-112403**

**Int. Cl.[5] G01R** *31/00, 1/06*

**U.S. Cl. 324—158 R** **20 Claims**



11. A printed circuit board having a surface, comprising:

a first row comprising a plurality of conductors for connecting leads of an integrated circuit, and corresponding first position detecting patterns each for detecting at least a position of one of said first row lead connecting conductors, and said first position detecting patterns being formed at predetermined positions along a longitudinal direction of said lead connecting conductor patterns adjacent at least both ends of said first row, said first row being formed in a direction perpendicular to said longitudinal direction of said lead connecting conductor patterns; and

a second row comprising a plurality of conductors and corresponding second position detecting patterns each for detecting at least a position of one of said second row lead connecting conductors, and said second position detecting patterns being formed on said surface of said printed circuit board arranged substantially similarly to said first row, said second row being spaced apart by a predetermined interval from said first row, and being positioned parallel or perpendicular thereto.



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**5,047,715**

**ELECTROMAGNETIC DEVICE FOR POSITION MEASUREMENT HAVING MULTIPLE COILS WITH EQUAL AREA OF TURN CROSS-SECTION**

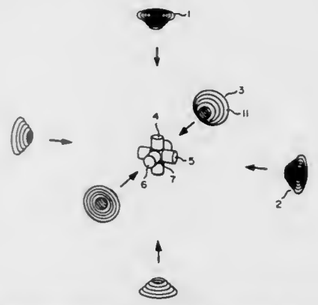
**Jürgen Morgenstern, Im Heidewinkel 33, 4000 Düsseldorf 12, Fed. Rep. of Germany**

**Filed Dec. 22, 1988, Ser. No. 288,247**

**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1987, 3743500**

**Int. Cl.[5] G01B** *7/14;* **H01F** *5/00, 27/28*

**U.S. Cl. 324—207.17** **10 Claims**



1. In an electromagnetic device for position measurement including at least one alternating voltage generator for the transmitter, at least one receiver, an inductive probe for transmission, and an inductive probe for reception, at least the probe for transmission having at least two coils with intersecting winding axes, the improvement wherein:

said probes have a plurality of intersecting winding axes;

the turn diameters of said at least two coils are greater when the distance from the center of the probe is greater than when the distance from the center of the probe is smaller;

the turns of said at least two coils have an identical area of cross-section; and

the number of layers of turns of said at least two coils is reduced as the distance of the coils from the center of the probe is increased.

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**5,047,716**

**MOVEMENT DETECTOR EMPLOYING CONSTANT CURRENT DRIVE**

**Takashi Katagiri, Nagano, Japan, assignor to K.K. Sankyo Seiki Seisakusho, Nagano, Japan**

**Filed Feb. 21, 1989, Ser. No. 312,157**

**Claims priority, application Japan, Feb. 19, 1988, 63-21060; Feb. 19, 1988, 63-36912**

**Int. Cl.[5] G01B** *7/14*

**U.S. Cl. 324—207.21** **11 Claims**

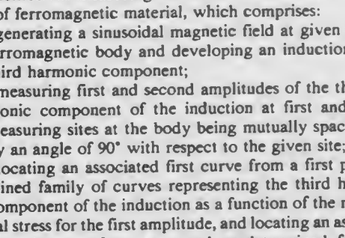
1. A magnetic detector comprising:

a magnetic recording medium magnetized with a repetitive signal having a predetermined wavelength λ:

a magnetic resistance element comprising 2m magnetic resistance strips which are arranged at intervals of $(n-\frac{1}{4})\lambda$(where m and n are natural numbers), wherein said strips are connected in series with one another, said magnetic resistance element being held to face said magnetic recording medium;

a DC source connected to interconnected ends of at least a preselected pair of two adjacent ones of said strips;

first and second constant current sources connected to ends of other ones of said strips;



means for producing an output signal as a difference between voltages at said ends of other ones of said strips.

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**5,047,717**

**METHOD AND APPARATUS FOR MEASURING INTERNAL MECHANICAL STRESS OF A FERROMAGNETIC BODY BY DETERMINING THE THIRD HARMONIC OF THE INDUCTION**

**Gerhard Hofer, Röttenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Dec. 4, 1989, Ser. No. 446,469**

**Claims priority, application European Pat. Off., Dec. 7, 1988, 88 120 460.6**

**Int. Cl.[5] G01B** *7/24;* **G01R** *33/18*

**U.S. Cl. 324—209** **6 Claims**



1. Method for measuring the mechanical internal stress of a body of ferromagnetic material, which comprises:

(a) generating a sinusoidal magnetic field at given site of a ferromagnetic body and developing an induction with a third harmonic component;

(b) measuring first and second amplitudes of the third harmonic component of the induction at first and second measuring sites at the body being mutually spaced apart by an angle of 90° with respect to the given site;

(c) locating an associated first curve from a first predetermined family of curves representing the third harmonic component of the induction as a function of the mechanical stress for the first amplitude, and locating an associated second curve from a second predetermined family of curves representing the third harmonic component of the induction as a function of the mechanical stress for the second amplitude;

(d) determining a point of intersection of the first and the second curves; and

(e) defining a given direction by a connecting line passing through the given site of the sinusoidal magnetic field and through the first measuring site, and determining the abscissa value of the point of intersection beginning at a predetermined abscissa value as a measured value for the

magnitude of the mechanical internal stress in the given direction.

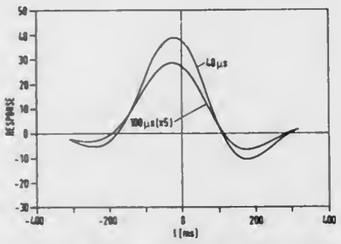
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**5,047,718**

## IMPROVING THE DISCRIMINATION OF AN IMPULSE TECHNIQUE METAL DETECTOR BY CORRELATING RESPONSES INSIDE AND OUTSIDE OF A CUT-OFF PEAK AREA

**Kari T. J. Aittoniemi, and Ari T. Järvi, both of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland**

**Filed Jan. 30, 1990, Ser. No. 472,582**
**Claims priority, application Finland, Jan. 31, 1989, 890463**
**Int. Cl.[5] G01R *33/00, 33/12;* G01V *3/11;* G08B *13/24***
**U.S. Cl. 324—239** **6 Claims**




1. A method for detecting metal objects and for improving discrimination in a pulse operated metal detector comprising measuring at least two different responses in metal objects passing through the metal detector, wherein at least one of the responses is measured inside a cut-off peak area of a generated pulse of the metal detector, and at least one response is measured outside the cut-off peak area, including examining the correlation of the responses within a given period of time in the metal detector, and forming at least one distinctive parameter on the basis of the correlation of said responses in order to determine the nature of objects that caused the response.

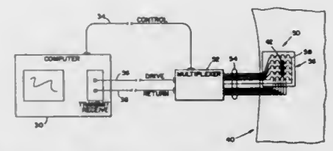
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**5,047,719**

## FLEXIBLE COIL ASSEMBLY FOR REFLECTANCE-MODE NONDESTRUCTIVE EDDY-CURRENT EXAMINATION

**Duane Johnson, San Mateo, and Yehuda Krampfner, Pleasanton, both of Calif., assignors to The Failure Group, Inc., Menlo Park, Calif.**

**Filed May 25, 1990, Ser. No. 528,753**
**Int. Cl.[5] G01N *27/82;* G01R *33/12;* H01F *21/02***
**U.S. Cl. 324—242** **26 Claims**




1. A flexible coil assembly for non-destructive eddy-current examination of electrically conductive members, comprising:
a flexible planar substrate;
a first array of driver coils disposed on one side of said flexible substrate, said first array comprising a plurality of parallel columns of pairs of coils connected in series to one another, each of said parallel columns of pairs of coils comprising parallel outgoing and return lines, each line consisting of a plurality of series-connected coils, the lines having terminal and opposite ends, the terminal ends of said lines being connected to means for controllably connecting said columns to a source of excitation energy and the opposite ends of said lines being connected to one another, whereby current flows in opposite directions in the outgoing and return lines of each column; and
a second array of detector coils disposed on the opposite side of said flexible substrate, said second array comprising a plurality of parallel rows of coils connected in series to one another, said rows extending in a direction other than parallel to said columns, each of said parallel rows of pairs of coils comprising parallel outgoing and return lines, each consisting of a plurality of series-connected coils, the lines having terminal and opposite ends, the terminal ends of said outgoing and return lines being connected to means for controllably connecting said rows to means for processing signals detected by one or more of the coils of the corresponding row, and the opposite ends of said lines being connected to one another, whereby current flows in opposite directions in the outgoing and return lines of each row.

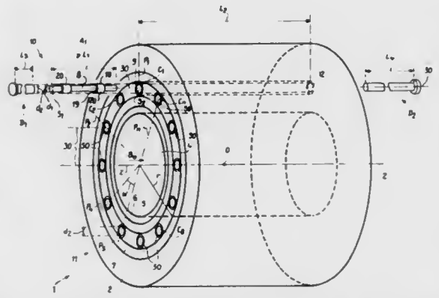
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**5,047,720**

## CORRECTION DEVICE USING MAGNETIC ELEMENTS FOR CORRECTING UNHOMOGENEITIES OF THE MAGNETIC FIELD IN A MAGNET

**Aubert Guy, Grenoble, France, assignor to Centre National De La Recherche Scientifique, Paris, France**

**PCT No. PCT/FR87/00512, § 371 Date Aug. 2, 1989, § 102(e) Date Aug. 2, 1989, PCT Pub. No. WO88/05167, PCT Pub. Date Jul. 14, 1988**
**PCT Filed Dec. 23, 1987, Ser. No. 432,762**
**Claims priority, application France, Dec. 30, 1986, 8618358**
**Int. Cl.[5] G01R *33/20***
**U.S. Cl. 324—320** **17 Claims**



1. A device for the correction of non-homogeneities of a magnetic field ($B_O$) in a magnet, comprising at least one magnetic element, the length and cross section of which are defined according to the correction to be made, said magnetic element being contained in a first opening formed in a support located in the vicinity of the field to be corrected, characterized in that the opening is formed in the support by a location reserved during the construction of the support, the opening having a length and a cross section greater than, respectively, the maximum length and the maximum cross section of the magnetic element, and in that it further comprises means disposed in said opening to keep the longitudinal axis of the magnetic element substantially identical with the longitudinal axis of the opening.

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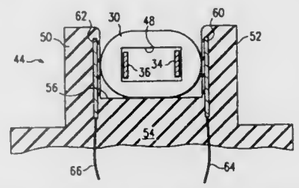
**5,047,721**

## FAULTY LAMP TESTER

**Earl T. Farley, 3213 22nd St., Lubbock, Tex. 79410**

**Filed Aug. 6, 1990, Ser. No. 562,743**
**Int. Cl.[5] G01R *31/22***
**U.S. Cl. 324—414** **6 Claims**

1. An apparatus for testing for faulty lights in a string of lights, each light having a light socket with at least first and second contacts provided therein, the first and second contacts being disposed substantially parallel and spaced a predetermined distance apart and operable to place an AC signal across the electrodes of a light bulb which is supported in the socket, the apparatus comprising:
a first capacitive plate;
a second capacitive plate;




a support member for supporting said first and second capacitive plates in a substantially parallel relationship and at a distance greater than that between the first and second contacts, said support having a cavity formed between said first and second capacitive plates for receiving the socket; and
a detector circuit for detecting a voltage difference between said first and second capacitive plates.

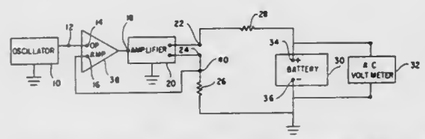
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**5,047,722**

## APPARATUS FOR MEASURING INTERNAL RESISTANCE OF WET CELL STORAGE BATTERIES HAVING NON-REMOVABLE CELL CAPS

**John W. Wurst, Far Hills; Stephen A. Garron, Elizabeth, and Allan M. Dob, Clifton, all of N.J., assignors to SSMC Inc., Edison, N.J.**

**Filed Apr. 17, 1989, Ser. No. 338,688**
**Int. Cl.[5] G01N *27/26***
**U.S. Cl. 324—430** **5 Claims**




1. Apparatus for measuring the total internal resistance of a multicell battery having spaced apart positive and negative terminals comprising:
first transistor means having an input circuit and an output circuit and having mutually exclusive conductive and non-conductive electric states;
second resistance means connected in series with the output circuit of said first means to form a network, said network being connected between said positive and negative terminals;
an operational amplifier having an output circuit connected to the input circuit of the first means and first and second input circuits, the first input circuit of the amplifier being connected to said network at a point connected to both of the first and second means; and
third means including an oscillator to apply an alternating voltage to the second input circuit of the amplifier, the alternating voltage changing polarity on alternate half cycles, the first means being in the conductive state when the alternating voltage is of one polarity and being in the non-conductive state when the alternating voltage is of the other polarity, said network conducting no current when the first means is in the non-conductive state and conducting a current of constant value when the first means is in the conductive state, the voltage appearing between the positive and negative terminals as a result of the current flow in the network being monotonically related to the internal resistance of the battery.

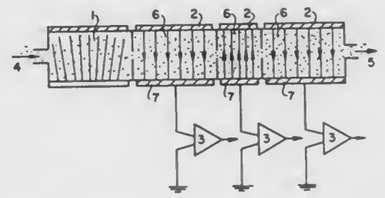
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**5,047,723**

## METHOD FOR DETECTION OF FOREIGN MATTER CONTENTS IN GASES

**Pertti Puumalainen, Päivärinteentie 3, 70300 Kuopio, Finland**

**PCT No. PCT/FI87/00075, § 371 Date Dec. 1, 1988, § 102(e) Date Dec. 1, 1988, PCT Pub. No. WO87/07720, PCT Pub. Date Dec. 17, 1987**
**PCT Filed Jun. 1, 1987, Ser. No. 286,063**
**Claims priority, application Finland, Jun. 3, 1986, 862349**
**Int. Cl.[5] G01N *27/62***
**U.S. Cl. 324—464** **4 Claims**



1. A method for detecting foreign matter in gases, comprising the steps of:
ionizing the gas containing foreign matter in an ionization zone,
passing the ionized gas containing foreign matter through a plurality of chambers, each with different electric fields,
measuring field currents passing transversely through two or more of said chambers, and
obtaining corresponding signals, wherein amounts and relationships of said signals provide an analysis of the foreign matter in the gases.

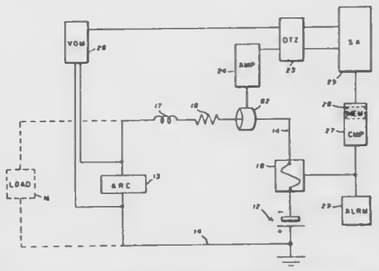
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**5,047,724**

## POWER CABLE ARCING FAULT DETECTION SYSTEM

**Jeffrey Boksiner, Randolph, and Michael Parente, Florham Park, both of N.J., assignors to Bell Communications Research, Inc., N.J.**

**Filed Dec. 19, 1989, Ser. No. 452,968**
**Int. Cl.[5] G01R *31/02***
**U.S. Cl. 324—520** **13 Claims**




1. A method of detecting the occurrence of an arcing event in an electrical circuit which comprises:
a) establishing a template of threshold frequency domain power values encompassing at least a portion of a reference frequency domain spectrum of measurements of an electrical parameter in such a circuit during an arcing event;



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b) continually obtaining test measurements of said electrical parameter in said electrical circuit;
c) deriving frequency domain test spectra of said test measurements;
d) comparing said frequency domain test spectra with said threshold template; and
e) providing an arc detection signal when one or more of said frequency domain test spectra deviates beyond said template.

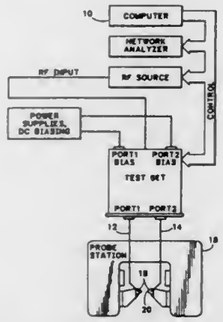
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**5,047,725**

## VERIFICATION AND CORRECTION METHOD FOR AN ERROR MODEL FOR A MEASUREMENT NETWORK

**Eric W. Strid, and Andrew C. Davidson, both of Portland, Oreg., assignors to Cascade Microtech, Inc., Beaverton, Oreg.**

**Filed Nov. 28, 1989, Ser. No. 443,213**
**Int. Cl.[5] G01R *27/04***
**U.S. Cl. 324—601** **18 Claims**




1. A method for correcting a multi-port error model having N error factors, where N is a predetermined integer, said N error factors being determined from at least N measurement taken with calibration standards in a multi-port measurement network, said method comprising the steps of:
(a) measuring a network parameter of said multi-port measurement network including a verification standard having a known network parameter to obtain a verification measurement;
(b) de-embedding said verification measurement using said N error factors;
(c) comparing said de-embedded verification measurement with said known network parameter to obtain a modeling error; and
(d) systematically altering at least one of said N error factors to obtain new error factors such that a new de-embedded verification measurement using said new error factors reduces said modeling error.

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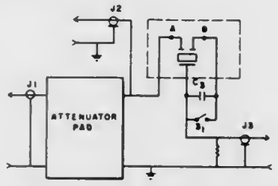
**5,047,726**

## METHOD AND APPARATUS FOR IMPLEMENTING FOUR-FREQUENCY MEASURING PROCESS FOR COUPLED-DUAL RESONATOR CRYSTALS USING BOTH RESONATOR PORTS

**Gerald Roberts, Lynchburg; Samual Toliver, Rustburg, and John U. Daniels, Jr., Lynchberg, all of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.**

**Filed Feb. 16, 1990, Ser. No. 480,774**
**Int. Cl.[5] G01R *29/22***
**U.S. Cl. 324—727** **15 Claims**

1. A method of accurately measuring selected parameters of coupled-dual resonator crystals having a piezoelectric plate, a first input/output electrode on said plate, a common electrode on said plate, and a second input/output electrode on said plate, said method comprising the steps of:
applying a band of frequencies to said first input/output electrode relative to a reference point with the second input/output and the common electrodes open-circuited or connected with a capacitor;
determining the frequencies that cause the maximum voltages to appear at the common electrode relative to said reference point;




applying a band of frequencies to said second input/output electrode relative to said reference point with the first input/output electrode and the common electrode short-circuited; and
determining the frequencies that cause the maximum voltages to appear at the common electrode relative to the reference point.

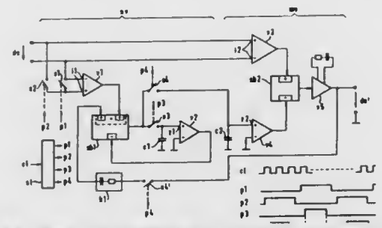
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**5,047,727**

## OFFSET-VOLTAGE-BALANCING OPERATIONAL AMPLIFIER

**Ulrich Theus, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany**

**Filed Sep. 14, 1990, Ser. No. 583,267**
**Claims priority, application European Pat. Off., Sep. 20, 1989, 89117361**
**Int. Cl.[5] H03F *1/02, 3/16***
**U.S. Cl. 330—9** **12 Claims**



1. An offset-voltage-balancing operational amplifier for a pair of difference input signals, comprising
an auxiliary amplifier having an auto-zero input, a difference input that receives said pair of difference input signals, and an output;
a first switch that selectively short-circuits said difference input of said auxiliary amplifier;
a second switch that selectively connects at least one of said pair of difference input signals to said difference input of said auxiliary amplifier, and selectively disconnects said at least one of said pair of difference input signals from said difference input of said auxiliary amplifier when said first switch short-circuits said difference input;
a main amplifier having a difference input that receives said pair of difference signals, an auto-zero input, and an output;
a third switch having an input connected to said output of said auxiliary amplifier, and having an output;
a first storage capacitor connected to said output of said third switch, said first storage capacitor being selectively coupled to said output of said auxiliary amplifier to be charged thereby, said first storage capacitor connected to said auto-zero input of said auxiliary amplifier to apply a voltage thereto;
a fourth switch having an input connected to said output of said auxiliary amplifier and having an output
a second storage capacitor connected to said output of said fourth switch, said second storage capacitor being selectively coupled to said output of said auxiliary amplifier to be charged thereby, said second storage capacitor connected to said auto-zero input of said main amplifier to apply a voltage thereto; and
a controller that provides respective first, second, third and fourth control signals to control said first, second, third and fourth switches, respectively, said control signals defining a first measurement interval in which said first switch short-circuits said difference inputs of said auxiliary amplifier, and a nonoverlapping second measurement interval in which said second switch provides said one of said pair of difference signals to said difference input of said auxiliary amplifier;
wherein:
said auxiliary amplifier comprises:
a first amplifier having a first predetermined sensitivity, said first amplifier having a difference input that forms said difference input of said auxiliary amplifier, and having an output;
a second amplifier having a second predetermined sensitivity, said second amplifier having an input that forms said auto-zero input of said auxiliary amplifier, and having an output, said second sensitivity of said second amplifier being less than said first sensitivity of said first amplifier; and
a first subtracter having a minuend input connected to said output of said first amplifier, having a subtrahend input connected to said output of said second amplifier, and having an output, said output forming said output of said auxiliary amplifier; and
said main amplifier having a third predetermined sensitivity, said third amplifier having a difference input that forms the difference input of said main amplifier, and having an output;
a fourth amplifier having a fourth predetermined sensitivity, said fourth sensitivity less than said third sensitivity, said fourth amplifier having a fourth difference input that forms the auto-zero input of said main amplifier, and having an output;
a second subtracter having a minuend input connected to said output of said third amplifier, having a subtrahend input connected to said output of said fourth amplifier, and having an output; and
a fifth amplifier having an input and an output, said input connected to said output of said second subtracter, said fifth amplifier having a high open-loop gain, said output of said fifth amplifier forming said output of said main amplifier.

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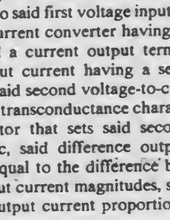
**5,047,728**

## AMPLIFIER HAVING A LOW NOISE ACTIVE GAAS MESFET LOAD

**Robert J. Bayruns, Middlesex, N.J., assignor to Anadigics, Warren, N.J.**

**Filed Jul. 18, 1990, Ser. No. 554,802**
**Int. Cl.[5] H03F *3/16***
**U.S. Cl. 330—277** **15 Claims**

1. An amplifier comprising:
a first field effect transistor having first, second and third contacts including gate, drain and source terminals, respectively;
a signal input terminal connected to said gate terminal of said first field effect transistor;
a signal output terminal connected to said drain terminal of said first field effect transistor;
an inductor connected to the drain terminal of said first field effect transistor;
an active load connected in series with said inductor, said active load including a second field effect transistor having a gate terminal connected to said signal output terminal, a source terminal connected in series with its said inductor and a drain terminal; and,



a DC voltage source connected to said drain terminal of said second field effect transistor.

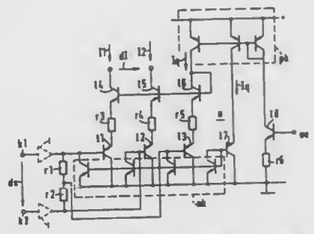
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**5,047,729**

## TRANSCONDUCTANCE AMPLIFIER

**Ulrich Theus, Gundelfingen, Fed. Rep. of Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany**

**Filed Nov. 19, 1990, Ser. No. 615,550**
**Claims priority, application European Pat. Off., Dec. 1, 1989, 89122203.6**
**Int. Cl.[5] H03F *3/45***
**U.S. Cl. 330—252** **10 Claims**



1. A transconductance amplifier that provides a difference output current in response to a difference input voltage applied between first and second voltage input terminals, comprising:
a first voltage-to-current converter having an input terminal coupled to said first voltage input terminal, said first voltage-to-current converter having a reference-potential terminal and having a current output terminal that provides a first output current having a first output current magnitude, said first voltage-to-current converter having a first transconductance characteristic and having a first resistor that sets said first transconductance characteristic;
a second voltage-to-current converter having an input terminal coupled to said first voltage input terminal, said second voltage-to-current converter having a reference-potential terminal and a current output terminal that provides a second output current having a second output current magnitude, said second voltage-to-current converter having a second transconductance characteristic and having a second resistor that sets said second transconductance characteristic, said difference output current having a magnitude equal to the difference between said first and second output current magnitudes, said magnitude of said difference output current proportional to said difference input voltage;
a resistive voltage divider coupled between said first and second voltage input terminals, said resistive voltage divider having an output tap;
a constant current source that provides a quiescent constant current; and

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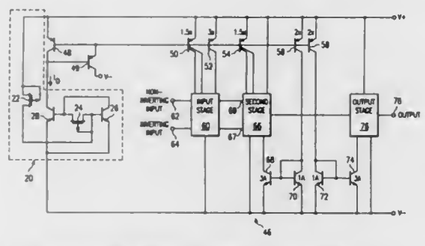
a third voltage-to-current converter having an input terminal coupled to said output tap of said resistive voltage divider, having a reference-potential terminal, and having a current terminal connected to said constant current source, said third voltage-to-current converter having a third transconductance characteristic and having a third resistor that sets said third transconductance characteristic, said reference-potential terminal of said third voltage-to-current converter connected to said reference-potential terminals of said first and second voltage-to-current converters so that said first, second and third reference-potential terminals are at a common reference potential determined by said third voltage-to-current converter.

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**5,047,730**
**OPERATIONAL AMPLIFIER HAVING STABLE BIAS CURRENT PROVIDING MEANS**

**Felicia M. James, Carrollton, Tex., and Peter J. Andrews, Raunds, England, assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Division of Ser. No. 330,402, Mar. 29, 1989, Pat. No. 4,975,632. This application Sep. 12, 1990, Ser. No. 581,335**
**Int. Cl.[5] H03F *3/45***
**U.S. Cl. 330—256** **6 Claims**

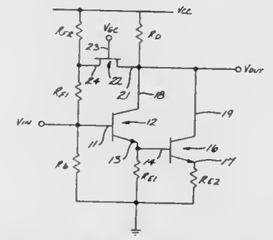


1. An operational amplifier circuit, comprising:
a bias current supply circuit, comprising:
an initial current source, an initial current output by said initial current source varying in magnitude due to effects of variance inducing factors;
a current mirror circuit coupled to said initial current source and responsive to said initial current and outputting a bias current; and
an active resistive element within said current mirror circuit comprising a transistor, said transistor responsive to said initial current and the variance inducing factors and operable to counteract the variance of said initial current and thus minimize variance in said bias current;
a second current mirror circuit coupled to said bias current supply circuit and responsive to said bias current to supply current to a plurality of stages within the operational amplifier circuit;
an input stage coupled to said second current mirror circuit operable to receive an input signal to be amplified by the operational amplifier circuit;
an amplification stage coupled to said second current mirror circuit and said input stage, said amplification stage operable to amplify a signal transmitted from said input stage; and
an output stage coupled to said second current mirror circuit and said amplification stage, said output stage operable to output an amplified signal transmitted from said amplification stage.

**5,047,731**
**VARIABLE GAIN WIDEBAND BIPOLAR MONOLITHIC AMPLIFIER**

**Donald M. Lee, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed Sep. 5, 1990, Ser. No. 577,873**
**Int. Cl.[5] H03G *3/12***
**U.S. Cl. 330—282** **20 Claims**



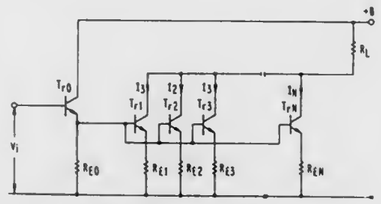
1. A monolithic bipolar variable gain amplifier formed by a discrete bipolar process comprising:
a first transistor and a second transistor connected together in a Darlington configuration on a single chip and having an input and an output;
a resistive shunt feedback loop connected between the output and the input to control the gain of the amplifier; and
means on the same chip as the transistors for actively varying the impedance of the shunt feedback loop thereby varying the gain of the amplifier.

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**5,047,732**
**WIDE BAND AMPLIFIER**

**Minoru Tanaami, and Michiko Naito, both of Tokorozawa, Japan, assignors to Kabushiki Kaisha ENU ESU, Japan**

**PCT No. PCT/JP89/00805, § 371 Date Apr. 3, 1990, § 102(e) Date Apr. 3, 1990, PCT Pub. No. WO90/01831, PCT Pub. Date Feb. 22, 1990**
**PCT Filed Aug. 7, 1989, Ser. No. 465,253**
**Claims priority, application Japan, Aug. 8, 1988, 63-196149**
**Int. Cl.[5] H03F *3/68***
**U.S. Cl. 330—295** **5 Claims**



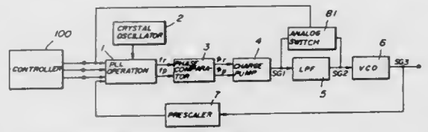
1. A wide-band amplifier comprising:
a plurality of parallel connected transistors, each transistor including an emitter, base, and collector;
input means for receiving an input signal and applying said input signal to respective bases of said plurality of transistors, said input means including a transistor having a base receiving said input signal, a collector receiving a high power supply potential, and an emitter connected to a source of a low power supply potential through an emitter resistor, a driving signal supplied to the bases of said plurality of parallel connected transistors from said emitter of said input means transistor; and
output means for receiving respective output currents from the respective collectors of said plurality of transistors and providing said output current as an output signal.



**5,047,733**
**PLL SYNTHESIZER PROVIDING RAPID FREQUENCY CHANGEOVER**

**Kazuyuki Nonaka; Takehiro Akiyama, and Kouzi Takekawa, all of Kasugai, Japan, assignors to Fujitsu Limited, Kawasaki and Fujitsu VLSI Limited, Kasugai, both of, Japan**

**Filed Dec. 21, 1989, Ser. No. 454,589**
**Claims priority, application Japan, Dec. 28, 1988, 63-332371**
**Int. Cl.[5] H03L *7/093***
**U.S. Cl. 331—14** **17 Claims**



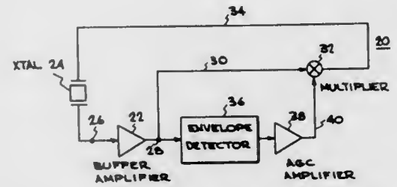
1. A PLL synthesizer comprising:
a voltage-controlled oscillator generating an output signal having a frequency based on a first signal supplied thereto;
PLL controlling means for generating a second signal based on said output signal and a set frequency changeable in response to a strobe signal supplied from an external circuit;
lowpass filter means, having an input terminal and an output terminal, for filtering said second signal supplied through said input terminal to thereby generate said first signal supplied to said voltage-controlled oscillator through said output terminal; and
switch means, coupled between said input and output terminals of said lowpass filter means, for receiving an external signal in synchronism with said strobe signal and for supplying said second signal directly to said voltage-controlled oscillator during a predetermined time in response to said external signal, so that said second signal is supplied directly to said voltage-controlled oscillator in synchronism with the beginning of a change of the set frequency instructed by said strobe signal.

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**5,047,734**
**LINEAR CRYSTAL OSCILLATOR WITH AMPLITUDE CONTROL AND CROSSTALK CANCELLATION**

**Gerald R. Newell, Alamo; Michael W. Nootbaar, Benicia, and Pradeep Bhardwaj, Concord, all of Calif., assignors to New SD, Inc., San Francisco, Calif.**

**Filed May 30, 1990, Ser. No. 530,640**
**Int. Cl.[5] H03B *1/04, 5/32;* H04B *15/00***
**U.S. Cl. 331—46** **16 Claims**



1. A circuit compensating for the shunt capacitance of a frequency selective crystal element which is in series with a buffer amplifier having input and output terminals in a series-feedback oscillator circuit comprising:
a differential amplifier having an input terminal coupled to the output terminal of said buffer amplifier, said differential amplifier providing a noninverted signal at a noninverting signal output terminal and providing an inverted signal at an inverting signal output terminal;
said crystal element having first and second terminals and having a shunt capacitance between said two terminals, said crystal element having its first terminal coupled to the noninverting output terminal of the differential amplifier and having its second terminal coupled to the input terminal of said buffer amplifier to form said series feedback crystal oscillator circuit;
a compensating capacitor having first and second terminals, said compensating capacitor having its first terminal coupled to the inverting signal output terminal of said differential amplifier and having its second terminal coupled to the input terminals of said buffer amplifier such that the compensating capacitor passes a compensating signal, which is substantially equal in magnitude and opposite in phase to the signal passing through the shunt capacitance of the crystal element, to the input terminal of the buffer amplifier to thereby cancel the effect of the signal passing through the shunt capacitance of the crystal element.

6. A circuit for reducing an interfering crosstalk signal coupled from a first crystal oscillator circuit to a second crystal oscillator circuit, comprising:
means for providing a crosstalk cancellation signal from the first crystal oscillator circuit, said crosstalk cancellation signal being oppositely phased with respect to the interfering crosstalk signal;
means for coupling said crosstalk cancellation signal into the second crystal oscillator circuit to cancel said interfering signal.

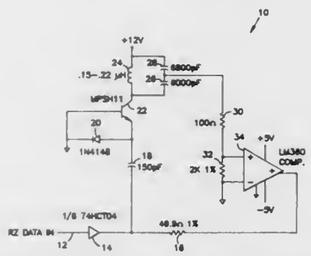
9. A system for automatic cancelling of a crosstalk interference signal which is generated in a source circuit and which is coupled through a stray coupling impedance to interfere with a crosstalk-sensitive circuit, comprising:
means for injecting a crosstalk tracer signal into said source circuit, said crosstalk tracer signal having a frequency which does not interfere with operation of said crosstalk-sensitive circuit,
crosstalk-cancellation means for coupling an inverted tracer signal from an output terminal of said source circuit to said crosstalk-sensitive circuit, said crosstalk cancellation means including:
an inverter circuit coupled to the output terminal of said source circuit;
amplitude-control means for controlling the amplitude of said inverted tracer signal in response to an inverted-tracer control signal;
means for coupling said inverted tracer signal to an input terminal of said crosstalk-sensitive circuit so that said tracer signal coupled to said crosstalk-sensitive circuit is summed with the oppositely-phased inverted tracer signal to provide a residual tracer signal, which results from imperfect cancellation of said tracer signal and said inverted tracer signal;
means for detecting the amplitude of said residual tracer signal and for generating said inverted-tracer control signal;
wherein said amplitude-control means is controlled by said inverted-tracer control signal to minimize the amplitude of said residual tracer signal so that said crosstalk-cancellation means provides a path for a signal, which is approximately equal in amplitude and opposite in phase to said crosstalk interference signal, to said crosstalk-sensitive circuit to thereby provide for automatic cancellation of said crosstalk interference signal.

14. In a linear oscillator: an amplifier and a frequency determining element connected in a loop to form an oscillator for producing an output signal of predetermined frequency, means responsive to the output signal for providing a control signal corresponding to the amplitude of the output signal, and means for linearly multiplying the output signal by the control signal to maintain the amplitude of the output signal at a substantially constant level.

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**5,047,735**
**RZ CLOCK RECOVERY CIRCUIT WITH POSITIVE-FEEDBACK**
**Reuben W. Meline, Crystal, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.**
**Filed Oct. 5, 1990, Ser. No. 593,692**
**Int. Cl.[5] H03B *5/12*; H03L *7/24***
**U.S. Cl. 331—117 R** **7 Claims**



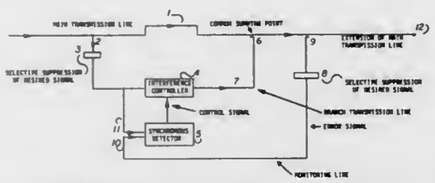

1. A tuned-tank clock recovery circuit for RZ data comprising:

tuned-tank oscillator means, including input means, for receiving an RZ data input stream, recovering the RZ clock signal, and providing a digital clock signal output; and

said oscillator means including positive feedback means for feeding the recovered clock signal back to its input means to provide a self-regenerating clock recover circuit.

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**5,047,736**
**SELECTIVE INTERFERENCE REDUCTION IN TRANSMISSION LINES**
**Rabindra N. Ghose, Los Angeles, Calif., assignor to Technology Research International, Inc., Calabasas, Calif.**
**Filed Sep. 10, 1990, Ser. No. 580,146**
**Int. Cl.[5] H04B *7/28*; H03B *29/00***
**U.S. Cl. 333—12** **12 Claims**




1. An apparatus for selectively reducing an interference in a transmission line carrying said interference and a desired signal without substantially affecting the desired signal comprising:

(a) means for sampling said interference almost exclusively from a sampling point at the transmission line such that the sampled signal does not contain any substantial desired signal;

(b) an interference controller having an input and output port and a control port, capable of adjusting the amplitude and time delay of the sampled interference flowing therethrough from the input port to the output port of said interference controller and reversing the polarity with respect to the input interference, with said input port connected to said sampling point;

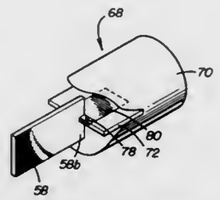
(c) means for introducing the adjusted interference from the output port of the interference controller at a coupling point of said transmission line where the coupling point follows said sampling point with respect to the direction of said desired signal flow, so as to sum, at said coupling point, the interference already existing at the transmission and said adjusted interference;

(d) means for monitoring almost exclusively said sum of the interferences at a monitoring point of the transmission line that follows said coupling point, said sum of interferences being substantially free of any desired signal;

(e) means for a closed-loop control to drive said monitored sum of interferences toward a minimum by using said summed interferences from said monitoring point to adjust the amplitude and time delay of the interference through said control port of the interference controller until said adjusted interference becomes equal in amplitude and 180° out-of-phase with respect to the interference already existing at the transmission line at said coupling point.

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**5,047,737**
**DIRECTIONAL COUPLER AND TERMINATION FOR STRIPLINE AND COAXIAL CONDUCTORS**
**William W. Oldfield, Redwood City, Calif., assignor to Wiltron Company, Morgan Hill, Calif.**
**Division of Ser. No. 176,100, Mar. 31, 1988, abandoned. This application Oct. 25, 1988, Ser. No. 262,473**
**Int. Cl.[5] H01P *1/26***
**U.S. Cl. 333—22 R** **11 Claims**



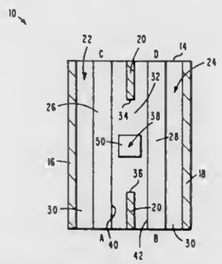

6. A termination for a stripline conductor having a terminal end and having a slot in the terminal end of the stripline conductor comprising:

first and second planar ground planes; and

a planar resistive element provided between said planar ground planes and inserted in said slot in said stripline conductor, for electrically interconnecting said stripline conductor and said ground planes, said termination supporting said stripline conductor.

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**5,047,738**
**RIDGED WAVEGUIDE HYBRID**
**Harry Wong, Monterey Park, and Mon N. Wong, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**
**Filed Oct. 9, 1990, Ser. No. 594,499**
**Int. Cl.[5] H01P *5/18***
**U.S. Cl. 333—113** **11 Claims**




1. A waveguide hybrid, comprising:

a generally rectangular open-ended, hollow superstructure defined by a pair of parallel, opposed, conductive, narrow walls, and a pair of parallel, conductive, opposed, broad walls, joined together along their longitudinal edges;



an intermediate, conductive, narrow wall joining said pair of broad walls along the longitudinal centerline thereof, thereby bifurcating said superstructure into first and second generally rectangular waveguides, with said first waveguide having first and second ports disposed, respectively, at opposite ends thereof, and said second waveguide having first and second ports disposed, respectively, at opposite ends thereof;

a first ridge provided on the interior surface of a first one of said broad walls along the longitudinal centerline of said first waveguide;

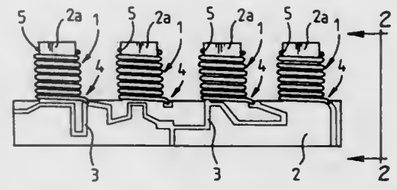
a second ridge provided on the interior surface of said first one of said broad walls along the longitudinal centerline of said second waveguide;

an opening provided in a central portion of said intermediate narrow wall; and,

a capacitive button provided on the interior surface of said first one of said broad walls within said opening.

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**5,047,739**
**TRANSMISSION LINE RESONATOR**
**Lauri Kuokkanen, Kempele, Finland, assignor to LK-Products Oy, Kempele, Finland**
**PCT No. PCT/FI88/00163, § 371 Date Jun. 12, 1990, § 102(e) Date Jun. 12, 1990, PCT Pub. No. WO89/05046, PCT Pub. Date Jun. 1, 1989**
**PCT Filed Oct. 7, 1988, Ser. No. 377,854**
**Claims priority, application Finland, Nov. 20, 1987, 875142**
**Int. Cl.[5] H01P *7/00, 1/20***
**U.S. Cl. 333—219** **6 Claims**




1. A resonator structure comprising a helix resonator (1) wound of metal wire into a cylindrical coil and supported by a plate (2) of insulating material disposed therewithin, characterized in that at least a part of the insulating plate (2) comprises an electrical circuit formed by strip lines (3), and that the helix resonator (1) is electrically connected to said circuit.

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**5,047,740**
**MICROWAVE SWITCH**
**Robert E. Alman, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Jun. 12, 1990, Ser. No. 536,813**
**Int. Cl.[5] H01H *53/00***
**U.S. Cl. 335—4** **24 Claims**

1. A mechanical switch comprising:

a housing;

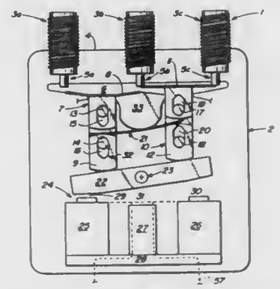
electrical connectors mounted with their ends extending into the housing;

a first jumper supported at one end of a first slider, the first slider being movable between a closed position at which two connector ends are electrically connected by the first jumper and an isolated position at which the two connector ends are not electrically connected by the first jumper;

a second jumper supported at one end of a second slider, the second slider being movable between a closed position at which two others of the connector ends are electrically connected by the second jumper and an isolated position at which the two other connector ends are not electrically connected together by the second jumper;

spring means for moving the second slider to its isolated position when the first slider is moved to its closed position and for moving the first slider to its isolated position when the second slider is moved to its closed position;

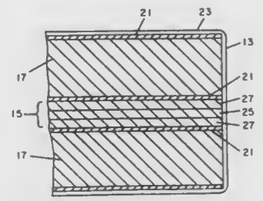
an armature pivotally supported about a pivot axis such that the first end of the armature drives the first slider into its closed position and a second end of the armature drives the second slider into its closed position; and



magnetic drive means for rotating the armature such that a first end of the armature drives the first slider into its closed position when the armature is rotated in one direction and a second end of the armature drives the second slider into its closed position when the armature is rotated in an opposite direction.

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**5,047,741**
**EPOXY-IMPREGNATED SUPERCONDUCTIVE TAPE COILS**
**Evangelos T. Laskaris, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**
**Filed Aug. 17, 1989, Ser. No. 395,635**
**Int. Cl.[5] H01F *7/22***
**U.S. Cl. 335—216** **12 Claims**




1. A superconductive tape coil comprising:

a superconductive foil;

a first and second foil of current conducting material soldered symmetrically about said superconductive foil forming a superconductive tape, said tape wound in helical layers forming a coil; adjacent turns of tape electrically insulated from one another;

a strip of electrically conductive foil situated between layers of tape and electrically insulated therefrom, said strip of conductive foil enclosing the inner layers of tape, the ends of said strip joined together to form an electrically conductive loop; and

epoxy resin impregnating said coil.

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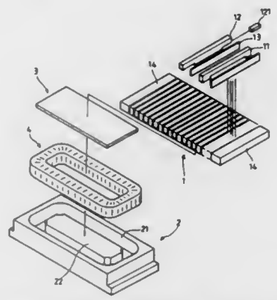


5,047,742

## STRUCTURE OF ELECTROMAGNETIC WORK HOLDER

P. J. Hsu, No. 5, Alley 1, Lane 250, Min Chuan East Road, Taipei, Taiwan

Filed Feb. 21, 1991, Ser. No. 658,619
Int. Cl.[5] H01F 7/20
U.S. Cl. 335—289 1 Claim



1. A structure of electromagnetic sucker comprising a sucker, a base, an intermediate plate and a solenoid, in which the sucker is composed of a plurality of convex and concave rectangular iron sheets separated by non-magnetic copper alloy and connected together with pressure plates at two lateral sides, the convex rectangular iron sheet is adhered with a pad at the bottom of each lateral side, the base an O-shaped recession for holding of the solenoid, and has a core in the middle, the intermediate plate is a magnetic square plate placed above the core, and the sucker is secured to the top of the base in a manner that the convex iron sheet keeps contact with the intermediate plate and the concave iron sheet has two lateral sides to keep contact with the base to form a magnetic field with attraction force; and characterized by the tight assembly of the sucker by means of welding at high temperature.

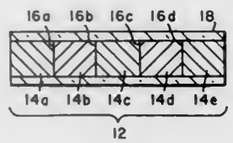
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5,047,743

## INTEGRATED MAGNETIC ELEMENT

Stanley P. Scesney, P.O. Box 101, Camarillo, Calif. 93010

Continuation-in-part of Ser. No. 146,843, Jan. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 799,260, Nov. 18, 1985, abandoned. This application Mar. 28, 1989, Ser. No. 329,686
Int. Cl.[5] H01F 7/02
U.S. Cl. 335—302 3 Claims




1. An integrated magnetic element comprising a plurality of hard and soft magnetic elements of dissimilar permeability; said magnetic elements being initially fused together and subsequent to said fusing being subjected to a singular magnetomotive force defining a resulting energy product for each of said magnetic elements of substantially equal magnitude, each with respect to the other; said plurality of magnetic elements arranged such that there is wide dispersion between the permeabilities of a first and a last of said magnetic elements, and having iron as one of said plurality of magnetic elements; said iron being proximate to one end of said integrated magnetic element, and wherein said integrated magnetic element is binder-free and durable enough to withstand mechanical and thermal forces of reworking said integrated magnetic element.

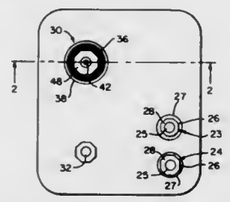
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5,047,744

## HIGH VOLTAGE FLUID FILLED TRANSFORMER

Ralph M. Francis, Jr., and John C. Mastopietro, both of Racine, Wis., assignors to Plasma Technics, Inc., Racine, Wis.

Filed Jan. 23, 1990, Ser. No. 468,545
Int. Cl.[5] H01F 27/10
U.S. Cl. 336—58 6 Claims




1. A transformer for producing a high voltage in an electrostatic apparatus comprising:

a hermetically sealed housing having an internal cavity;

a coil assembly within the internal cavity said housing and having a primary coil and a secondary coil wound about a magnetically conductive core;

a first electrical terminal including an elongated electrical insulator hermetically sealed across a hole in said housing and having with a first aperture extending longitudinally therethrough, a means for making electrical connection extending outward from one end of the electrical insulator and hermetically sealed thereto with a second aperture extending therethrough and communicating with the first aperture in the electrical insulator, and means for sealing the second aperture, said secondary coil being connected to the means for making electrical connection;

a plurality of other electrical terminals which extend from said housing and to which the primary and secondary coils are connected; and

thermally conductive fluid entirely filling the cavity which is not filled by said coil assembly so that there is substantially no gas within the cavity.

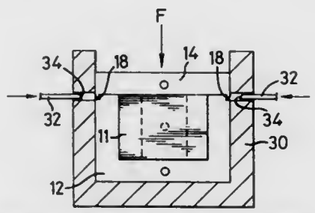
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5,047,745

## LAMINATIONS

George W. Marriott, and Trevor Hirst, both of Wiltshire, United Kingdom, assignors to Linton and Hirst Limited, Swindon, England

Filed Jul. 26, 1989, Ser. No. 385,853
Claims priority, application United Kingdom, Jul. 27, 1988, 8817875.1; Dec. 30, 1988, 8830408.4
Int. Cl.[5] H02K 1/06; H01F 27/26
U.S. Cl. 310—217 24 Claims




1. A lamination assembly for an electromagnetic device comprising first and second packs of complementary laminations that fit together, said first pack of laminations including at least one external face with a dovetail formation therein, and said second pack of laminations including at least one deformable projection thereon, each lamination in said second pack of laminations having a first major surface lying in a plane and each projection thereof being of substantially rectangular cross-sectional configuration in a plane parallel to the plane of the respective lamination in said second pack of laminations each interfitting with and engaging with one said dovetail formation, and each said deformable projection being bent inwardly toward each respective said dovetail formation and permanently engaging said dovetail formation and thereby permanently locking said first and second packs of laminations together, with each said projection having an exterior surface which is inclined to the respective external face.



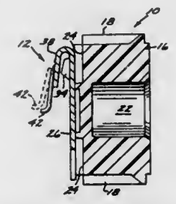
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5,047,746

## POTENTIOMETER WIPER ASSEMBLY

Stephen R. Stilwell, Riverside, and Ronald L. Froebe, Rubidoux, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed May 24, 1990, Ser. No. 529,981
Int. Cl.[5] H01C 10/32
U.S. Cl. 338—162 20 Claims




1. A wiper assembly for a potentiometer, wherein the potentiometer has a carrier for carrying the wiper assembly along a resistive element, the wiper assembly comprising:

a substantially planar, solid metal plate adapted for attachment to the carrier;

a strip of metal formed integrally with the plate and bent back over itself out of the plane of the plate to form a cantilevered spring arm having a free end;

an array of resilient, conductive wires, each of the wires having first and second ends, the first end of each of the wires being attached to the free end of the spring arm, so that the wires are arranged in a parallel, side-by-side relationship, each of the wires thereby forming a resilient, cantilevered wiper finger, extending beyond the free end of the spring arm.

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5,047,747

## COMBINATION BACK-UP LIGHT AND SOUND EMITTING DEVICE FOR TRUCKS AND OTHER AUTOMOTIVE VEHICLES

Mark Gottlieb, Annandale, Va., assignor to Designtech International, Inc, Springfield, Va.

Filed Jul. 25, 1990, Ser. No. 557,711
Int. Cl.[5] B60Q 1/26
U.S. Cl. 340—463 3 Claims

1. A combination back-up light and sound emitting device for a truck, comprising:

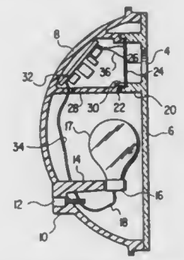
a reflector having means for mechanical and electrical connection to a vehicle;

a light transmitting cover mounted to said reflector to form a housing therewith;

a light emitting device mounted in said housing and electrically connected to said means for electrical connection to a vehicle; and

a sound emitting device electrically connected to said means for electrical connection to a vehicle,

whereby both said light emitting device and said sound emitting device are simultaneously electrically connected




to a vehicle by said means for electrical connection to a vehicle.

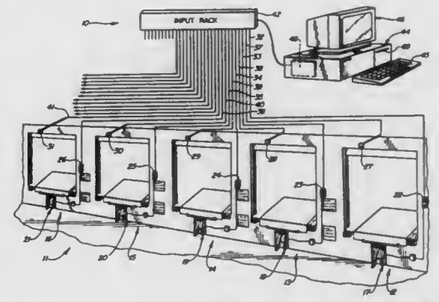
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5,047,748

## DOCK MONITORING SYSTEM

Glen Trickle, Racine, Wis., assignor to Rite-Hite Corporation, Milwaukee, Wis.

Filed Apr. 21, 1989, Ser. No. 341,531
Int. Cl.[5] E05B 41/00
U.S. Cl. 340—542 16 Claims




1. A remote monitoring system for continually monitoring a truck docking facility which includes a plurality of truck loading/unloading positions and locking means operable at each position for restraining a truck against movement during loading/unloading operations, said monitoring system comprising: lock condition sensing means for substantially continually developing locked and unlocked signals respectively corresponding to locked and unlocked conditions of said locking means at each of said truck loading/unloading positions; data processing means; keyboard means coupled to said data processing means for control of operation thereof; a monitor coupled to said data processing means and including a display screen; and dedicated coupling means for coupling said data processing means to said lock condition sensing means, said data processing means being operable to continually process signals from said lock condition sensing means and to display on said screen a plurality of types of data including current lock condition data which shows the current status of each of said lock condition sensing means and load time data showing the time of development of each locked signal.

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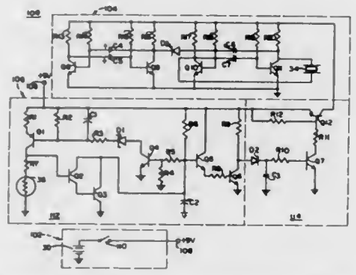


**5,047,749**

## PASSIVE REMOTE PHOTOELECTRIC SURVEILLANCE ALARM WITH TELESCOPIC OPTICS

**Marc H. Segan, Great Barrington, Mass.; Michael R. Newsome, Jersey City, and Steven M. Cohen, Hoboken, both of N.J., assignors to Tyco Industries, Inc., Mt. Laurel, N.J.**

**Filed Apr. 3, 1990, Ser. No. 505,122**
**Int. Cl.[5] G08B *13/18***
**U.S. Cl. 340—555** **14 Claims**



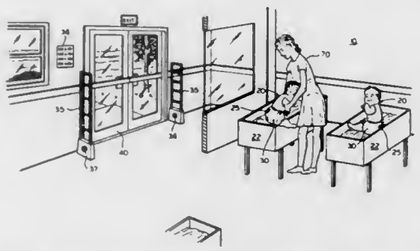
1. A passive remote photoelectric surveillance alarm comprising:
a power supply;
indicator means for generating a discernible alarm indication when powered by the power supply;
photosensitive switch means between the power supply and the indicator means, the photosensitive switch means switching between nonconducting and conducting states for powering the indicator means with the power supply at least in response to non-naturally occurring changes in intensity of ambient visible light impinging upon a photoresponsive element of the switch means and the photosensitive switch means automatically self-adjusting for preventing the powering of the indicator means in response to naturally occurring changes in the intensity of the ambient visible light impinging upon the photoresponsive element; and
telescope means for concentrating visible light on the photoresponsive element.

**5,047,750**

## NON-INTRUSIVE INFANT SECURITY SYSTEM

**Larry F. Hector, 303 W. North St., Hinsdale, Ill. 60521**

**Filed Mar. 9, 1990, Ser. No. 491,105**
**Int. Cl.[5] G08B *23/00***
**U.S. Cl. 340—573** **21 Claims**



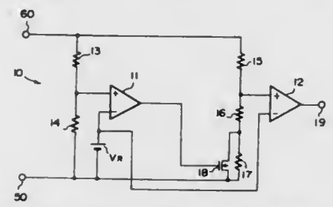
1. A surreptitious security system for infants comprising:
tuned coil means inconspicuously affixed to the diaper of an infant;
detector means for detecting when said tuned coil means affixed to the infant is in physical proximity to said detector means; and
alarm means for indicating when said detector means has detected said tuned coil means.

**5,047,751**

## POWER SUPPLY VOLTAGE MONITORING CIRCUIT

**Tadahiko Miura, and Takahashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Jan. 31, 1990, Ser. No. 473,280**
**Claims priority, application Japan, Feb. 3, 1989, 1-24861**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—661** **8 Claims**



1. A power supply voltage monitoring circuit for use in a semiconductor circuit used with at least two power supply systems having different supply voltages and which is operable by switching high and low power supply voltages, said monitoring circuit comprising:
a first power supply line to which a supply voltage to be monitored is supplied;
a second power supply line;
a reference voltage source connected at one side thereof to said second power supply line;
a first comparing means connected to another side of said reference voltage source and receiving a supply voltage from said first power supply line, said first comparing means having a threshold value at a supply voltage being an intermediate voltage between said high and low power supply voltages and comparing a supply voltage received from said first power supply line with a reference voltage;
a second comparing means connected to said another side of said reference voltage source and to said first power supply line, respectively, and comparing a voltage received therein with the reference voltage supplied thereto from said reference voltage source; and
a switching means disposed between said first comparing means and said second comparing means and changing in response to an output from said first comparing means the voltage compared by said second comparing means,
whereby an alarm signal indicating as to whether the supply voltage is normal or abnormal is obtained at an output of said second comparing means.

**5,047,752**

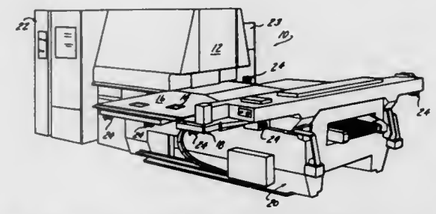
## SAFETY SYSTEM FOR A MACHINE TOOL

**Gerard J. Schorn, Southampton, Pa., assignor to Murata Wiedemann, Inc., King of Prussia, Pa.**

**Filed Nov. 14, 1989, Ser. No. 436,420**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—680** **7 Claims**

1. A safety system for a machine tool of the type including a machining head and a table mounted adjacent said machining head for powered movement through a path extending along a region of said machine tool, towards and away from said machining head, and fixed structure adjacent said machining head, said table and fixed structure having sides projecting laterally to the side of said machining head to create pinch areas in which the leading side of the table moves towards said machining head, and a safety system for conditionally shutting down said machine tool upon intrusion of a person into said pinch areas, including means stopping said powered movement of said table, said safety system characterized by ultrasonic transmitter means periodically transmitting an ultrasonic pulse from said leading side of said table into said pinch area, ultrasonic receiver means for receiving echo signals from objects in the pinch area, and safety circuit means for triggering a machine tool shutdown including stopping said powered movement of said table upon receiving an echo signal from an object within an accurately predetermined range from said leading side of said table, said predetermined range being a small proportion of the extent of said powered movement of said table





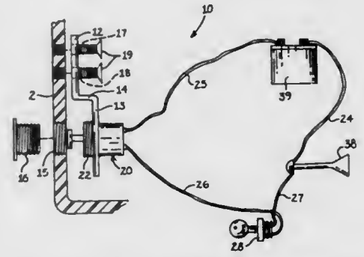
along said path towards and away from said fixed structure, said safety circuit means including timer means creating an interval of limited duration only during which interval an echo signal from a transmitted pulse will produce a machine shut down, whereby said safety circuit means is not responsive to echo signals from objects outside of said range to create a shifting safety zone substantially less than the extent of movement of said table along said path, and whereby entry of a person into portions of said pinch areas which are out of said safety zone does not result in a machine tool shut down.

**5,047,753**

## DRAIN PLUG POSITION INDICATOR APPARATUS

**David B. Birchfield, 1205 E. 55th St., Odessa, Tex. 79762**

**Filed May 29, 1990, Ser. No. 529,561**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—686** **6 Claims**



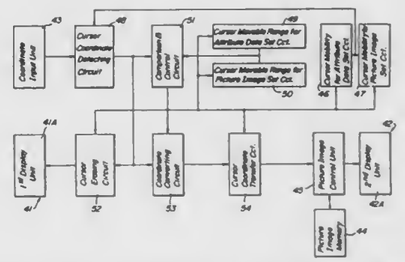
1. A drain plug warning apparatus in combination with a boat transom, the boat transom including a vertical wall including a rear vertical wall interior surface, and a drain plug aperture positioned therethrough positioned adjacent a floor interior surface of a floor associated with a boat, wherein the apparatus comprises:
a support plate mounted to the rear vertical wall interior surface of the transom, wherein the support plate includes a first switch, the first switch including a housing and a reciprocating member mounted in the housing wherein the reciprocating member is in a forward second position extended from the housing in the absence of drain plug and in a retracted first position directed interiorly of the housing in the presence of the drain plug directed through the drain plug aperture;
an alarm member in electrical communication with the first switch;
a battery in electrical communication with the first switch and the alarm member wherein the alarm member is actuated upon the reciprocating member extended to the forward second position; and
the support plate including an upper planar web parallel to a lower planar web, with a transverse web orthogonally oriented between the upper planar web and the lower planar web, wherein the transverse web is integrally secured to a lower terminal edge of the upper planar web and to an upper terminal edge of the lower planar web, and the lower planar web includes a threaded aperture threadedly receiving the first switch, and the first switch including a threaded forward end, the threaded forward end reciprocatably received within the threaded aperture to permit adjustment of the first switch relative to the lower planar web.

**5,047,754**

## DISPLAY APPARATUS FOR DISPLAYING A POSITION INDICATING MARK OVER A PLURALITY OF DISPLAY SCREENS

**Yuichiro Akatsuka; Akira Matsueda, and Takefumi Sakurada, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jan. 10, 1989, Ser. No. 296,372**
**Claims priority, application Japan, Sep. 27, 1985, 60-212638; May 14, 1986, 61-108622; May 14, 1986, 61-109756**
**Int. Cl.[5] G09G *5/08***
**U.S. Cl. 340—709** **6 Claims**



1. An apparatus for displaying a position indicating mark over a plurality of display screens, comprising:
first and second display units each having a display screen, said display screens of said first and second display units each having different dimensions;
a coordinate input unit including a mouse, for entering coordinates of a current position of a position indicating mark displayed on a display screen; and
a signal processing unit coupled with said display units and coordinate input unit for selecting automatically among said first and second display units a selected display unit which effects a display on the basis of said coordinates entered by said coordinate input unit and for displaying the position indicating mark on the selected display unit; said signal processing unit comprising:
first means for setting a first ratio of movement of the position indicating mark on the first display unit relative to movement of the mouse;
second means for setting a first range over which the position indicating mark is movable on the first display unit;
third means for setting a second ratio of movement of the position indicating mark on the second display unit relative to movement of the mouse; and
fourth means for setting a second range over which the position indicating mark is movable on the second display unit; whereby when the position indicating mark is displayed on the display screen of the first display unit, said first and second setting means are used, while when

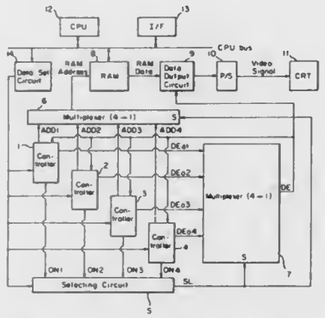
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the position indicating mark is displayed on the display screen, of the second display unit, said third and fourth setting means are used.

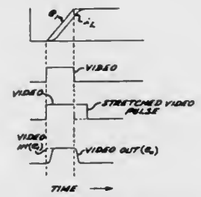
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5,047,755
IMAGE INFORMATION DISPLAY APPARATUS
Toshiya Morita; Hiroshi Kamada, both of Yamatokoriyama, and Sumio Kita, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 213,602, Jun. 30, 1988, abandoned. This application Jun. 22, 1990, Ser. No. 541,461
Claims priority, application Japan, Jul. 3, 1987, 62-167247
Int. Cl.[5] G09G 5/14
U.S. Cl. 340—721 4 Claims




1. An image information display apparatus for displaying image information on a CRT having a plurality of rectangular display regions comprising:
central processing means for inputting and outputting the image information and controlling the apparatus;
a memory for storing and outputting the image information under control of said central processing means;
a plurality of address producing means corresponding in number to the plurality of rectangular display regions for developing active signals indicating whether or not the scanning position of the CRT is within one of the plurality of rectangular display regions and address signals addressing the memory for the image information at the one rectangular region determined to have the scanning position of the CRT therein, each of said plurality of address producing means including,
a first register for storing a first parameter indicative of a horizontal coordinate position on the CRT for one of the plurality of rectangular display regions,
a second register for storing a second parameter indicative of a vertical coordinate position of the CRT for said one rectangular display region,
a third register for storing a third parameter indicative of the horizontal width of said one rectangular display region, and
a fourth register for storing a fourth parameter indicative of the vertical width of said one rectangular display region;
data set means for developing a priority signal for said plurality of address producing means in response to an input from said central processing means; and
address deciding means for selecting an effective address signal from among said plurality of address producing means in response to said priority order signal and the active signals outputted from said address producing means, so that the image information is sequentially read from the memory corresponding to said effective address signal from the address deciding means for displaying the plurality of rectangular display regions on the CRT.

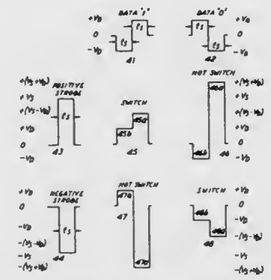
5,047,756
VIDEO COMPENSATION APPARATUS FOR STROKE MODE CRT DISPLAYS
Ted W. Berwin, Playa del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 22, 1989, Ser. No. 369,984
Int. Cl.[5] G09G 1/04, 1/10
U.S. Cl. 340—723 8 Claims




1. A stroke mode CRT display including a controller for generating X and Y channel signals for controlling the X and Y deflection amplifiers of the CRT, and a Z channel control signal for controlling the CRT beam brightness, wherein the respective X amplifier and deflection coil circuitry and the Y amplifier and deflection coil circuitry are characterized by a known transfer function characteristic, the improvement comprising a Z channel compensation circuit characterized by the same transfer function characteristic as that of the respective X and Y amplifier circuitry, whereby the X, Y and Z signals are properly temporally related to each other wherein said compensation circuit comprises a resistor ($R_t$)-capacitor ($C_t$)-inductor ($L_t$) circuit, and wherein the circuit element values R, C and L are selected so that the transfer function of the compensation circuit substantially matches that of said deflection amplifier and coil.

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5,047,757
METHOD OF ADDRESSING A FERROELECTRIC LIQUID CRYSTAL DISPLAY
Matthew F. Bone, Bishop'Stortford; Ian Coulson, Maidenhead; Johnathan R. Hughes, St. John's; Peter W. Ross, Stanstead; Frances C. Saunders, Suckley, and Paul W. H. Surguy, Uxbridge, all of England, assignors to STC plc; The Secretary of State for Defence and Thorn EMI, London, England
Filed Sep. 2, 1988, Ser. No. 239,994
Claims priority, application United Kingdom, Sep. 4, 1987, 8720856
Int. Cl.[5] G09G 3/36, 3/00
U.S. Cl. 340—784 7 Claims

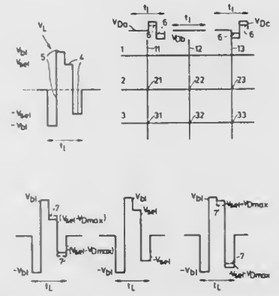



1. A method of addressing a matrix-array type liquid crystal cell with a ferroelectric liquid crystal layer having a plurality of pixels defined by areas of overlap between members of a first set of electrodes on one side of the liquid crystal layer and members of a second set of electrodes on the other side of the liquid crystal layer, each of said pixels having a first and second state and a response time for switching between said first and second state which depends on the voltage across the liquid crystal layer, said response time showing a minimum at a particular voltage; the method including the step of applying a strobe waveform to a selected member of said first set of electrodes, which strobe waveform comprises a strobe pulse of voltage magnitude $V_s$, while a data waveform is applied to each member of said second set of electrodes, said data waveform being charge-balanced and bipolar and comprising data pulses of voltage magnitude $V_D$, wherein a waveform for switching a pixel defined by said selected member comprises a switching pulse of voltage magnitude, $(V_s - V_D)$, and given duration, and a waveform for not switching a pixel defined by said selected member comprises a non-switching pulse of voltage magnitude, $(V_s + V_D)$, which magnitude is greater than said given voltage magnitude of said switching pulse and a duration less than said given duration of said switching pulse.



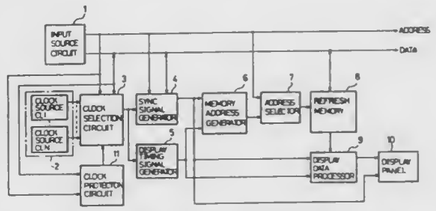
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5,047,758
METHOD OF DRIVING A PASSIVE FERRO-ELECTRIC LIQUID CRYSTAL DISPLAY DEVICE
Wilbert J. A. M. Hartmann, and Karel E. Kuijk, both of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 280,418, Dec. 6, 1988, abandoned. This application Nov. 9, 1990, Ser. No. 614,044
Claims priority, application Netherlands, Dec. 16, 1987, 8703040
Int. Cl.[5] G09G 3/36
U.S. Cl. 340—784 18 Claims



1. A method of driving a display device comprising a ferroelectric liquid crystalline medium between two supporting plates, the first plate comprising a system of row electrodes and the second plate comprising a system of column electrodes defining at least one display element at the area of the crossings of row and column electrodes, said display element reaching a desired transmission state from an extreme transmission state during selection, characterized in that during selection by a bipolar selection signal, said display element reaches the desired transmission state from the extreme transmission state via drive voltages comprising said bipolar selection signal and a bipolar auxiliary signal each comprising a plurality of sub-signals on the row electrodes and data voltages on the column electrodes, which data voltages are bipolar, said desired transmission state being reached dependent on the data voltages which are substantially simultaneously presented and change polarity approximately simultaneously with said bipolar selection signal which is presented to the row electrode at least for a part of a line period.

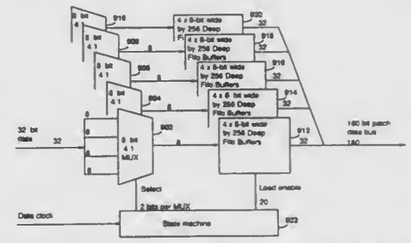
5,047,759
IMAGE DISPLAY SYSTEM
Hideharu Takebe, Hyogo, and Tomoaki Makino, Kanagawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 11, 1989, Ser. No. 336,940
Claims priority, application Japan, Apr. 22, 1988, 63-101114
Int. Cl.[5] G09G 1/02
U.S. Cl. 340—789 4 Claims




1. An image display system for displaying data at one of a plurality of display resolutions, a corresponding clock signal being selected to display the data at the one resolution, comprising:
a clock selection circuit receiving clock signals from a plurality of clock sources for selecting a clock signal in response to an active allow-inhibit signal;
a sync signal generator receiving said selected clock signal from said clock selection circuit for generating sync signals in response to said selected clock signal;
a timing signal generator receiving said selected clock signal for generating various timing signals for processing the display data;
refresh memory for storing pixel data;
display data processor for converting said pixel data read out from said refresh memory to said display data in response to said timing signals;
a display medium having a fixed display resolution and receiving said display data and sync signals for forming a display pattern; and
clock selection control means for generating said allow/inhibit signal in response to an address signal, a write-enable signal and a control signal.

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5,047,760
CROSSBAR CONVERTER
Neil F. Trevett, Kingston upon Thames, United Kingdom, and Malcolm E. Wilson, Bridport, England, assignors to DuPont Pixel Systems Limited, Weybridge, England
Filed Jan. 13, 1989, Ser. No. 297,002
Claims priority, application United Kingdom, Mar. 23, 1988, 8806872; Mar. 23, 1988, 8806875; Mar. 23, 1988, 8806878
Int. Cl.[5] G09G 5/00
U.S. Cl. 340—799 9 Claims




1. A method for converting 32 bit (four byte) parallel data words of raster formatted pixel data consisting of a predeter-

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mined number of bytes, into a 160 bit, 2 dimensional patch format having an X dimension equal to five, one byte pixels and a Y dimension equal to four, one byte pixels comprising the steps of:

(A) storing each consecutive byte within a first horizontal scan line of the parallel data words of raster formatted pixel data into a first group of five fifo buffers, so that every group of five consecutive bytes is stored at a progressively deeper level into the fifos;

(B) storing each consecutive byte within a second horizontal scan line of the parallel data words of raster formatted pixel data into a second group of five fifo buffers, so that every group of five consecutive bytes is stored at a progressively deeper level into the fifos;

(C) storing each consecutive byte within a third horizontal scan line of the parallel data words of raster formatted pixel data into a third group of five fifo buffers, so that every group of five consecutive bytes is stored at a progressively deeper level into the fifos;

(D) storing each consecutive byte within a fourth horizontal scan line of the parallel data words of raster formatted pixel data into a fourth group of five fifo buffers, so that every group of five consecutive bytes is stored at a progressively deeper level into the fifos; and

(E) accessing the pixel data within the four groups of five fifo buffers in parallel, first in first out fashion whereby the pixel data stored within the fifo buffers is accessed as consecutive patches across the horizontal scan direction of a display monitor.

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**5,047,761**
**POINTER ILLUMINATED INSTRUMENT**

**Gerhard Sell, Schwalbach/Ts., Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Dec. 8, 1989, Ser. No. 447,925**
**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904657**
**Int. Cl.[5] G01D *11/28;* F21V *21/00***
**U.S. Cl. 340—815.1** **6 Claims**



1. A pointer instrument comprising

a dial, a pointer moveable about the dial for providing an indication thereon, and a light guide for illuminating the dial with light from a source of light, a surface of the light guide enclosing the light source and facing the dial for directing light from the source of light toward the dial;

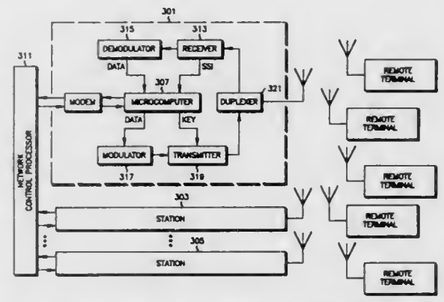
a measurement mechanism including electronic components and a shaft, the shaft passing through the light guide for operating the pointer for providing the indication on the dial; and wherein

at least one surface of the light guide, facing away from the dial, serves as a support for the electronic components.

**5,047,762**
**METHOD AND APPARATUS FOR INCREASING CO-CHANNEL UTILIZATION IN A MULTI-STATION DATA COMMUNICATIONS NETWORK WITH OVERLAPPING COVERAGE**

**Eugene J. Bruckert, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Dec. 6, 1989, Ser. No. 446,828**
**Int. Cl.[5] H04B *7/00***
**U.S. Cl. 340—825.06** **22 Claims**




1. A method of increasing co-channel utilization in a digital radio communications system having at least two fixed stations each transmitting into and receiving from a geographic radio coverage area on the same duplex radio channel, the geographic radio coverage area of one fixed station overlapping at least a portion of the geographic radio coverage area of a second fixed station, and a plurality of remote terminals having the capability of receiving from and transmitting to at least one of the at least two fixed stations, the method comprising the steps of:

transmitting a station identification from a first one of the at least two fixed stations;

receiving said station identification at one of the plurality of remote terminals;

transmitting a message including said received station identification from said one of the plurality of remote terminals from the portion of the geographic radio coverage areas which overlap;

receiving said message including said received station identification at a second one of the at least two fixed stations;

transmitting an inhibit signal from said second one of the at least two fixed stations in response to said message reception, whereby at least a second of the plurality of remote terminals is prevented from transmitting;

determining a signal strength level of said received message at said second one of the at least two fixed stations; and

transmitting from said second one of the at least two fixed stations a no-inhibit signal when said signal strength is less than a first predetermined value.

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**5,047,763**
**SELECTIVE CALL SYSTEM WITH MESSAGE REBROADCASTING OVER ANOTHER SELECTIVE CALL SYSTEM**

**William J. Kuznicki, Coral Springs, and Robert J. Schwendeman, Pompano Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Nov. 30, 1989, Ser. No. 444,489**
**Int. Cl.[5] G08B *7/00;* H04Q *7/00;* H04M *11/02;* H04B *7/15***
**U.S. Cl. 340—825.44** **23 Claims**

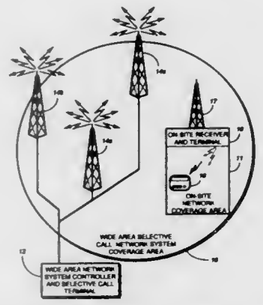
1. A selective call system having a first selective call service and a second selective call service, comprising:

first RF transmission means for transmitting messages in the first selective call service;



a first plurality of selective call receivers for receiving said messages transmitted by said first selective call service;

receiving means for receiving said messages transmitted by said first RF transmission means; and



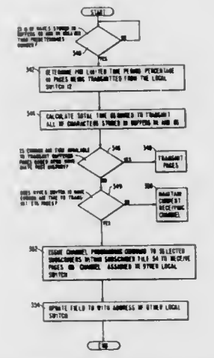

second RF transmission means coupled to said receiving means for retransmitting selected ones of said messages over the second selective call service.

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**5,047,764**
**PAGING SYSTEM WITH DYNAMICALLY PROGRAMMABLE RECEPTION FREQUENCIES**

**Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Jr., Chicago, Ill., assignors to Telefind Corporation, Coral Gables, Fla.**

**Continuation-in-part of Ser. No. 158,931, Feb. 22, 1988, Pat. No. 4,881,073. This application Oct. 31, 1989, Ser. No. 429,615**
**Int. Cl.[5] H04Q *7/00***
**U.S. Cl. 340—825.440** **50 Claims**



1. A method of transmitting an information transmission to an information receiver in an information transmission network including a plurality of connected information transmission systems with information transmissions being transmitted between the systems with a plurality of the information transmission systems including a service and a transmitter with the information transmissions being on at least one channel selected from a plurality of channels on which information transmission may be broadcast to the information receivers in the network and occurring only in one direction from the transmitter to the information receiver comprising:

(a) programming the information receiver by at least one RF transmission transmitted by a broadcast of a RF carrier on at least one first channel from a transmitter of one of the information transmission systems to the information receiver to receive information transmissions on at least one second channel to be broadcast by at least one other information transmission system which has been determined prior to initiation of the broadcast on the at least one first channel of the at least one second channel, an area containing the at least one other information transmission system has been stored by the one information transmission system in response to information that the information receiver is to be transported from broadcast range of the one information transmission system into an area which contains the at least one other information transmission system broadcasting on the at least one second channel and the broadcast of the RF carrier on the at least one first channel to program the information receiver to receive transmissions on the at least one second channel has been terminated to stop all communication with the information receiver on any channel prior to initiation of a broadcast on the at least one second channel to the information receiver from the at least one other information transmission system;

(b) transporting the information receiver from broadcast range of the transmitter of the one information system, which broadcast the RF carrier causing the information receiver to be programmed to receive information transmissions on the at least one second channel, to broadcast range of the transmitter of the at least one other information transmission system where an information transmission is to be received on the at least one second channel; and

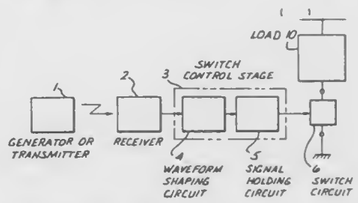
(c) transmitting an information transmission from the one information transmission system to the transmitter of the at least one other information transmission system and transmitting the information transmission from the transmitter of at least one other information transmission system on the at least one programmed second channel to the information receiver.

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**5,047,765**
**REMOTE CONTROLLED SWITCH**

**Mitsuo Munekata, Tokyo, Japan, assignor to Toshio Hayashi, Torrance, Calif.**

**Continuation of Ser. No. 142,134, Jan. 7, 1988, Pat. No. 4,935,733. This application Jun. 18, 1990, Ser. No. 539,911**
**The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.**
**Int. Cl.[5] H04Q *9/16***
**U.S. Cl. 340—825.51** **8 Claims**




1. A remote control signal receiver for use with infrared remote control transmitters of the type adapted to emit a pulse coded control signal characterized by a cyclic pulse sequence including a repeating custom pulse code and a variable code-bearing signal portion normally intended for activating a code-responsive receiver associated with a first device such as a remote controlled television set or the like, comprising:

load switching means for controlling operation of a second device;

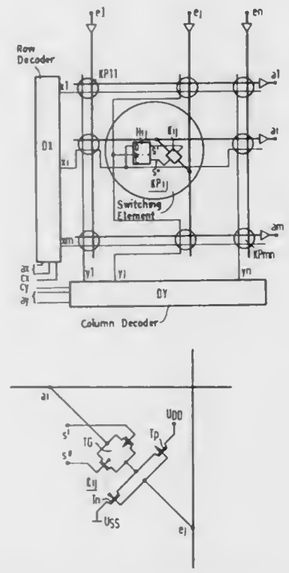
detector means for converting said infrared signal to a corresponding electrical pulse coded signal;

circuit means interconnecting said detector means and said switching means responsive to said custom pulse code but nonresponsive to said variable portion for actuating said

load switching means irrespective of the code content of said cyclic pulse sequence.

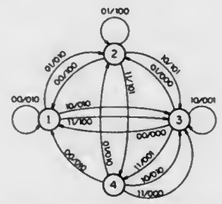
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**5,047,766**
**BROAD BAND SIGNAL SWITCHING MATRIX**
**Ruediger Hofmann, Gilching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**
**Continuation of Ser. No. 918,477, Oct. 14, 1986, abandoned. This application Dec. 15, 1988, Ser. No. 285,303**
**Claims priority, application Fed. Rep. of Germany, Oct. 22, 1985, 3537562**
Int. Cl.[5] H04Q *3/52*
U.S. Cl. 340—825.850 **1 Claim**




1. A broadband switching matrix comprising:
a plurality of row lines;
a plurality of column lines;
a plurality of select lines respectively associated with said row and column lines;
said row and column lines intersecting to form a plurality of crosspoints; and
at each crosspoint, a holding memory cell having inputs connected to select lines for the crosspoint, a complementary metal-oxide-semiconductor inverter and a complementary metal-oxide-semiconductor transfer gate having a controlled conductive path connected in series in the path connecting the row and column lines present at the crosspoint, the inverter having an output connected to the conductive path input of the transfer gate, and said transfer gate having control signal inputs connected to and controllable by said holding memory cell in response to signals on said select lines.

**5,047,767**
**APPARATUS UTILIZING A FOUR STATE ENCODER FOR ENCODING AND DECODING A SLIDING BLOCK (1,7) CODE**
**Anthony D. Weathers, San Diego, and Robert D. Swanson, Del Mar, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed May 21, 1990, Ser. No. 526,929**
Int. Cl.[5] H03M *7/00*
U.S. Cl. 341—59 **2 Claims**




1. An encoder/decoder system for encoding and decoding a run length limited code in accordance with the rule specifying a minimum of one and a maximum of seven 0's between adjacent ones, with a coding rate of $\frac{2}{3}$, said encoder/ decoder system comprising:
a. an encoder comprising means for receiving 2 input data bits,
b. storage means for storing 2 present encoder state defining bits, said 2 present encoder state defining bits being derived from the immediately preceding encoding operation, and
c. first logic circuit means for logically combining said 2 input data bits and said 2 present encoder state defining bits to produce 3 encoded output bits in accordance with said run length limited rules and to produce 2 next encoder state defining bits for storage in said storage means, in accordance with the following table:

| INPUT BITS | | 00 | 01 | 10 | 11 |
|---|---|---|---|---|---|
| PRESENT STATE | 1 | 1,010 | 2,010 | 3,010 | 3,100 |
| | 2 | 1,100 | 2,100 | 3,101 | 4,101 |
| | 3 | 1,000 | 2,000 | 3,001 | 4,001 |
| | 4 | 1,010 | 2,010 | 3,010 | 3,000 |

LEGEND
State: 1=00, 2=01, 3=10, 4=11 Leftmost bit=MSB
Input Bits: 00, 01, 10, 11 Leftmost bit=MSB
Table Entry: W,XYZ
W=Next State
XYZ= 3 Output Bits; X=MSB

d. a decoder comprising a second logic circuit for decoding encoded bits, said second logic circuit having an output of 2 decoded bits for each of 3 of said encoded bits presented to said decoder in groups 3, in accordance with the following Boolean expressions:

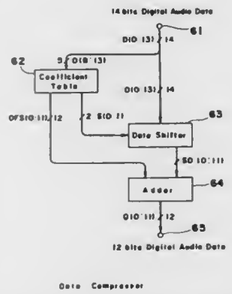
$$I_1 = 00x + 01x + 1xx + 20x + 21x + 40x + 41x + 5xx$$
$$I_2 = 042 + 044 + 045 + 05x + 101 + 100 + 242 + 244 + 245 + 25x + 40x + 41x + 422 + 444 + 445 + 45x + 500 + 501 + 52x + 12x + 00x + 01x$$

LEGEND
$I_1$ = *MSB* of decoded two bits
$I_2$ = *LSB* of decoded two bits

Equation terms: ABC; Octal representation of 9 bits presented to said decoder in groups of 3, A=first group of 3 presented, B=second group of 3 presented, C=third group of 3 presented, x=don't care.



**5,047,768**
**DATA COMPANDING METHOD AND DATA COMPRESSOR/EXPANDER**
**Susumu Yamaguchi, Moriguchi, and Tetsuo Ishiwata, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Apr. 26, 1990, Ser. No. 514,835**
**Claims priority, application Japan, Apr. 27, 1989, 1-108853; Nov. 14, 1989, 1-295856**
Int. Cl.[5] H03M *7/50*
U.S. Cl. 341—95 **8 Claims**

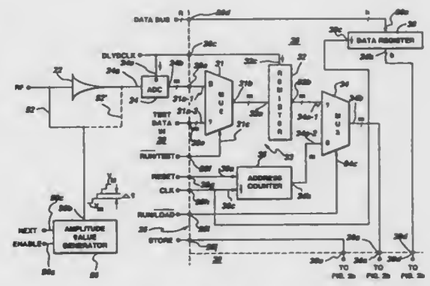



1. A data compressor for converting a 14-bit input signal to a 12-bit output signal, the 14-bit input having bits D13, D12, . . . ,D1, D0, and having a numberical value range of −8192 to +8191 in decimal notation, said data compressor comprising:
a coefficient lookup table for receiving the five most significant bits D13 through D9 of the 14-bit input signal, and for outputting in accordance with a value of the thus received five most significant bits an offset value and a bit shift value;
a data shifter for receiving the 14-bit input signal and the bit shift value output by said coefficient lookup table, and for conducting a bit shift operation on the 14-bit input signal in accordance with said bit shift value, and for outputting a thus bit shifted signal; and,
an adder receiving and adding the offset value output by said coefficient table and the bit shifted signal output by said data shifter, the thus added result being output as the 12-bit output signal.

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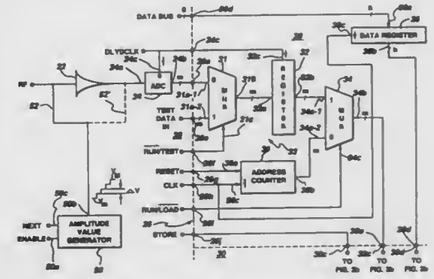
**5,047,769**
**METHODS OF CORRECTING DATA CONVERSION/TRANSFER ERRORS IN A VIBRATORY ENERGY IMAGING SYSTEM UTILIZING A PLURALITY OF CHANNELS**
**William E. Engeler, Scotia; Matthew O'Donnell, Schenectady; John J. Bloomer, Schenactady, and John T. Pedicone, Schenactady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**
**Filed May 3, 1990, Ser. No. 518,596**
Int. Cl.[5] H03M *1/06*
U.S. Cl. 341—118 **8 Claims**

1. A method of correcting errors in at least a selected one of a plurality N of channels of a vibratory energy imaging system, each of said channels concurrently carrying a separate, respective signal, comprising the steps of:
(a) providing an addressable memory means having a plurality L of individually-addressable locations, each for storage of a digital data word;
(b) storing in each of the L locations of the memory means a digital data word having a value selected to impart to a transfer function for said one of said N channels a desired functional relationship that is error-free;
(c) converting an analog input signal in said one channel into a digital data signal in a manner causing potential error to be present in the desired relationship; and
(d) addressing, response to each digital data output signal from the converting means, a preselected corresponding memory means location from which to output a stored digital data word, for subsequent use in said one channel, such that the outputted stored digital data word is independent of any error present in said desired relationship.




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**5,047,770**
**APPARATUS FOR TESTING DATA CONVERSION/TRANSFER FUNCTIONS IN A VIBRATORY ENERGY IMAGING SYSTEM**
**William E. Engeler, Scotia; Matthew O'Donnell, Schenectady; John J. Bloomer, Schenectady, and John T. Pedicone, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**
**Filed May 3, 1990, Ser. No. 518,595**
Int. Cl.[5] H03M *1/10*
U.S. Cl. 341—120 **7 Claims**



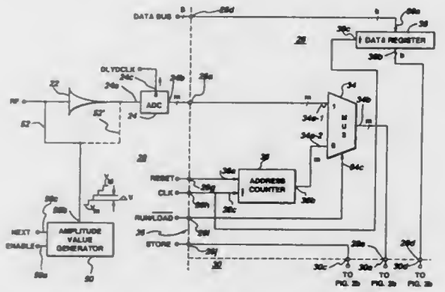

1. Apparatus for testing a data conversion/transfer function in at least one of a plurality N of channels of a vibratory energy imaging system, each of said channels being implemented by an addressable memory having a plurality $L=2^m$ locations, where m is the number of bits in an address data word addressing any one of said L locations, each of said L locations being capable of storing an input data word of b bits therein, said apparatus comprising:
means for providing an input data word for storage in said addressable memory;
means for providing a selected test data word to address a predetermined one of the L locations of the addressable memory, said test data word corresponding to the address of the location at which said input data word is being stored; and
a register for temporarily storing the selected test data word prior to application to said addressable memory;
whereby said test data word can initiate readout of said input data word from said addressable memory.

5,047,771

## APPARATUS FOR IMPLEMENTATION OF DESIRED INPUT/OUTPUT FUNCTION IN AN ELECTRONIC SYSTEM HAVING A PLURALITY OF CHANNELS

William E. Engeler, Scotia; Matthew O'Donnell, Schenectady; John J. Bloomer, Schenectady, and John T. Pedicone, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 3, 1990, Ser. No. 518,600
Int. Cl.[5] H03M 1/12
U.S. Cl. 341—140 9 Claims



1. Apparatus for implementing a desired input/output function in each channel of a multiple channel electronic system, said each channel comprising:

means for nonlinearly converting an analog input signal, having a present amplitude falling in one of a plurality of increments into which a full range of input signals is divided, into a digital output signal;

an addressable memory means, having a plurality L of individually-addressable locations, each for storage of a digital data word;

means for storing in each of the L locations of the memory means a digital data word having a value selected to impart a transfer function of a desired output signal value to said channel; and

means for addressing, responsive to each digital data output signal from the converting means, a corresponding memory means location from which to output a stored digital data word.

5,047,772

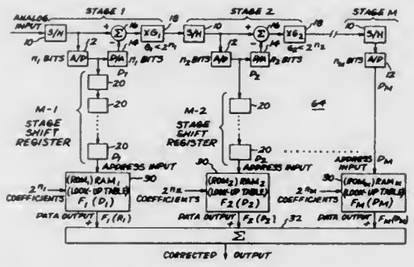
## DIGITAL ERROR CORRECTION SYSTEM FOR SUBRANGING ANALOG-TO-DIGITAL CONVERTERS

David B. Ribner, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 4, 1990, Ser. No. 533,263
Int. Cl.[5] H03M 1/44, 1/10
U.S. Cl. 341—156 22 Claims

1. A multi-stage pipelined subranging analog-to-digital converter, comprising:

a plurality of cascade-coupled conversion stages, each of said stages including first means responsive to an analog input signal for generating a binary conversion signal corresponding to the nearest guantized level below that of the analog input signal, second means responsive to said binary conversion signal for generating a quantized analog signal corresponding tot he nearest quantized level below that of the analog input signal, third means for subtracting the quantized analog signal from the analog input signal to generate a residual analog signal for application to the next conversion stage, and a look-up table for generating a compensated binary signal selected by said binary conversion signal, said look-up table being coupled to the output of said first means by circuit means in the final stage of said converter and by delay means introducing incrementally larger delays in each successive earlier stage, respectively; and



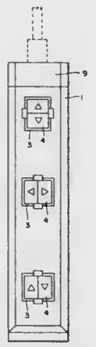
means for combining said compensated binary signals from said look-up tables into a binary output signal.

5,047,773

## PROCEDURE FOR THE GENERATION OF CONTROL SIGNALS IN A PUSH BUTTON BOX, AND A PUSH BUTTON BOX DESIGNED FOR IMPLEMENTING THE PROCEDURE

Juha Seitsonen, Hangonkyla, and Olavi Jussila, Hyvinkaa, both of Finland, assignors to Kone Oy, Helsinki, Finland

Filed Dec. 22, 1989, Ser. No. 454,996
Claims priority, application Finland, Dec. 22, 1988, 885938
Int. Cl.[5] G08C 19/12; H01H 21/24; B66C 13/40
U.S. Cl. 341—176 19 Claims



1. A method for the generation of control signals in a push bottom box and transmission of said signals for control of a machine, which method comprises:

detecting through a partition, a change in position of at least one push button element in relation to at least one detection element by non-contacting means;

generating a control signal proportional to the detected change in position of said at least one push button; and transmitting said generated control signal to said machine.

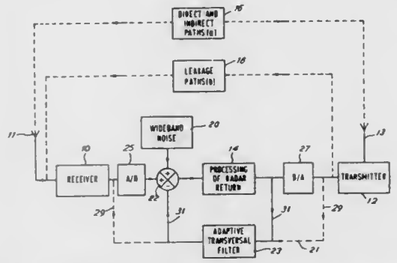


5,047,774

## RADIO FREQUENCY TRANSMISSION AND RECEPTION SYSTEM

Ian D. Kimber, Bracknell, and Stephen J. Roome, West Drayton, both of England, assignors to Thorn EMI plc, London, England

Filed Oct. 25, 1989, Ser. No. 426,283
Claims priority, application United Kingdom, Oct. 25, 1988, 8824968
Int. Cl.[5] G01S 7/38, 7/40
U.S. Cl. 342—15 6 Claims



1. A radio frequency transmission and reception system comprising a transmitter for transmission of radio frequency signals in the form of pulses, the pulses having at least one pulse duration,

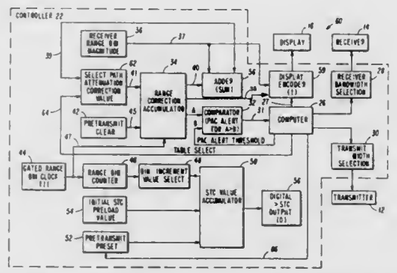
and of relatively wideband signals during periods between pulses of the radio frequency signals, a receiver for receiving radio frequency signals in the form of pulses and having at least one pulse duration, and a feedback circuit for combining output signals from the receiver with signals for transmission by the transmitter, the feedback circuit including means to adaptively modify wideband signals in the signals for transmission over a time period having a duration substantially in excess of the pulse duration of the pulses of the signals received by the receiver for rendering the receiver substantially insensitive to received signals received thereby directly and or indirectly from the transmitter.

5,047,775

## AUTOMATIC RANGE ADJUSTABLE WEATHER RADAR SYSTEM

Orville J. Alitz, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 27, 1990, Ser. No. 589,865
Int. Cl.[5] G01S 7/34
U.S. Cl. 342—26 20 Claims



1. In a weather radar system having a pulse transmitter, a receiver, means for compensating for path attenuation and means for detecting when the path attenuation is excessive and beyond the capability of the compensating means to correct display errors caused by the excessive path attenuation, the improvement being an automatic range adjuster, comprising:

means for selectively altering the width of the pulses generated by the pulse transmitter; and

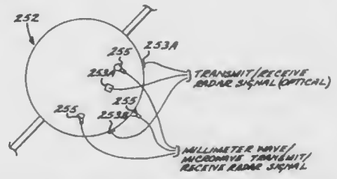
means for automatically controlling the selective width altering means to alter the pulse width of the transmitter pulses in response to the excessive path attenuation means.

5,047,776

## MULTIBEAM OPTICAL AND ELECTROMAGNETIC HEMISPHERICAL/SPHERICAL SENSOR

Howard Baller, Marina Del Rey, Calif., Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 27, 1990, Ser. No. 545,313
Int. Cl.[5] G01S 13/86; H01Q 15/08
U.S. Cl. 342—52 29 Claims



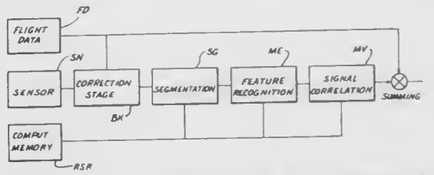
1. A lens comprising a plurality of concentric dielectric shells of aerogel material, arranged around a center sphere of material characterized by a refractive index of approximately $\sqrt{2}$, and wherein said lens has an outer radium $r_o$, and the radius of each shell is characterized by a typical radium value r, the respective refractive index value of each shell being an approximation to the formula $(2-(r/r_o)^2)^{\frac{1}{2}}$, said lens characterized in that planar electromagnetic wave fronts incident on said lens from a distant source are imaged at a focus point on the lens surface at the end of the diameter of the lens in the direction of the incoming wave front and that the lens provides electro-optical and radio frequency operation.

5,047,777

## LINEAR METHOD OF NAVIGATION

Walter Metzdorff, Friedrichshafen; Peter Lux, Langenargen, and Max Eibert, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier Luftfahrt gmbH, Fed. Rep. of Germany

Filed May 14, 1990, Ser. No. 523,131
Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915633
Int. Cl.[5] G01S 13/89; G06F 15/50
U.S. Cl. 342—64 6 Claims



1. Navigational method for aircraft under utilization of a sensor, a signal processing stage and a reference stage, including using the sensor to measure and determine at a high data resolution representing an elevational profile of overflight by linearly scanning across a flight path, the improvement comprising;

segmentizing the measuring data by detecting elevational scanning data patterns to persist over certain lengths of scanning and by detecting boundaries of these data pattern, different elevational patterns differ by changes in

average elevation and by degrees of elevational variations about such average elevation; and

by detecting specifically coordinate values in the these boundaries as indication for length values wherein the average elevation pattern remains uniform, the boundaries constituting patterns of segmentation of the measuring data;

identifying and classifying the segments in accordance with variables pertaining to and identifying different persistent at uniform patterns, in that different patterns in elevational data persisting for certain lengths of scanning, are bounded by said boundaries, so that together with the patterns of such boundaries there result identification of elevational patterns as persisting between pairs of boundaries; and

ascertaining the position of the craft vis-a-vis reference data by comparing boundary patterns for identifying elevational pattern features are concerned with corresponding boundary patterns of reference information.

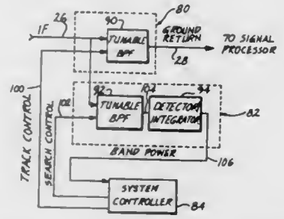
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**5,047,778**

## FMCW RADAR RANGE TRACKER AND METHOD

**David H. Cofield, and John A. Moren, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Oct. 11, 1990, Ser. No. 596,865**
**Int. Cl.[5] G01S *13/34, 13/70***
**U.S. Cl. 342—97** **10 Claims**




7. A method for producing a ground return signal in an FMCW radar system, the radar system comprising means for producing an IF signal having frequencies within a range extent band, the IF signal including a ground return component having frequencies in a ground return band within the range extent band, the method comprising:

bandpass filtering the IF signal using a first bandpass filter to produce the ground return signal, the first bandpass filter having a first passband having a first passband center frequency and a first passband width, and means for adjusting the first passband center frequency in accordance with a track control signal;

bandpass filtering the IF signal using a second bandpass filter to produce a band power signal, the second bandpass filter having a second passband having a second passband center frequency and a second passband width, and means for adjusting the second passband center frequency in accordance with a search control signal;

varying the search control signal such that the second bandpass filter scans frequencies within the range extent band;

storing samples of the band power signal;

processing the stored samples to identify the ground return band; and

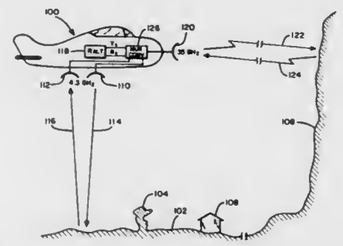
varying the track control signal so as to vary the first passband center frequency such that the first passband tracks the ground return band.

**5,047,779**

## AIRCRAFT RADAR ALTIMETER WITH MULTIPLE TARGET TRACKING CAPABILITY

**James R. Hager, Crystal, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Aug. 28, 1990, Ser. No. 574,586**
**Int. Cl.[5] G01S *13/18***
**U.S. Cl. 342—120** **8 Claims**




1. A radar altimeter multiple target tracking system comprising:

(a) means for repeatedly transmitting pulses of electromagnetic energy at a predetermined power level from an aircraft towards the earth's surface;

(b) means for receiving return pulse signals from said surface and from objects extending upward from said surface;

(c) closed-loop tracking means including a range gate coupled to said receiving means for determining from the time interval between transmitted pulses and the position of said range gate when overlapping the leading edge of the corresponding return pulse signals from said earth's surface the altitude of said aircraft relative to said earth's surface;

(d) means for periodically interrupting said closed-loop tracking means and storing said altitude and power level information in a memory while searching for returns from said objects, if any;

(e) means for resuming operation of said closed-loop tracking means for tracking said return signal from said object and determining from the time interval between transmitted pulses and the position of said range gate when overlapping the leading edge of the corresponding return pulse signals from said object the altitude of said aircraft relative to said object;

(f) means for storing the altitude and power level information relative to said object in said memory; and

(g) means for alternately reading out the contents of said memory means to said tracking means whereby tracking of said return pulse signals from the earth's surface and said object are interleaved and resumed from an altitude and at a power level value stored in said memory.

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**5,047,780**

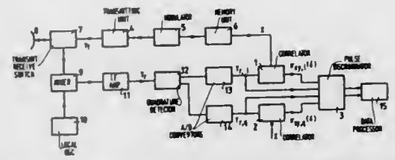
## PULSE RADAR APPARATUS AND PULSE DISCRIMINATION CIRCUIT SUITABLE FOR INCORPORATION IN A PULSE RADAR APPARATUS

**Jan A. Dijkstra, Almelo, Netherlands, assignor to Hollandse Signaalapparaten B.V., Hengelo, Netherlands**

**Filed Jul. 12, 1990, Ser. No. 553,023**
**Claims priority, application Netherlands, Jul. 14, 1989, 8901826**
**Int. Cl.[5] G01S *13/08***
**U.S. Cl. 342—145** **15 Claims**

1. A pulse radar apparatus comprising a transmitting and receiving unit for the generation and transmission of a modulated radar transmitter pulse $Y_t$, for the reception of a signal $Y_r$ and the correlation of the signal $Y_r$ with a replica X of the emitted transmitter pulse $Y_t$ to obtain an in time $\delta$ compressed correlation signal $\sigma_{xy}(\delta)$, characterised in that the transmitting and receiving unit includes a pulse discriminator to, on the basis of at least one amplitude $|Y_r|$ of the received signal $Y_r$





and at least one amplitude $|\sigma_{xy}(\delta)|$, of the correlation signal $\sigma_{xy}(\delta)$, generate a signal P as a function of the extent of the modulation information contained in the received signal $Y_r$.

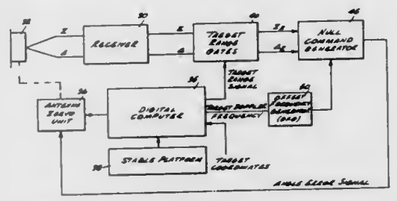
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**5,047,781**

## RADAR SENSING GENERATOR IN A MONOPULSE RADAR SYSTEM

**William M. Bleakney, Sherman Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Jun. 5, 1968, Ser. No. 736,932**
**Int. Cl.[5] G01S *13/00***
**U.S. Cl. 342—149** **16 Claims**




1. A radar receiving system comprising:

monopulse radar receiving means, including a monopulse antenna and a monopulse receiver for producing, in substantiallygain-matched sum and difference channels, a plurality of doppler frequency signals representing energy reflected from a target area;

means, including computing means, for deriving a doppler frequency representative of a target within said target area; and

error signal generating means to which are supplied said signals in said sum and difference channels and said doppler frequency signal, including a bandpass filter in each of said channels, each said bandpass filter having a frequency band width substantially as wide as the doppler freuqency subtended between the 3 db points on the antenna sum pattern of said antenna, for producing an error signal proportional to the difference between the target direction represented by said computed target doppler frequency and the direction of the antenna monopulse null, said error signal generating means including means for differentiating said sum channel signals, and means for subtracting said differentiated signals from said difference channel signals.

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**5,047,782**

## SYSTEM AND METHOD FOR SIMULATING TARGETS FOR A RADAR RECEIVER UTILIZING AN OPTICAL LINK

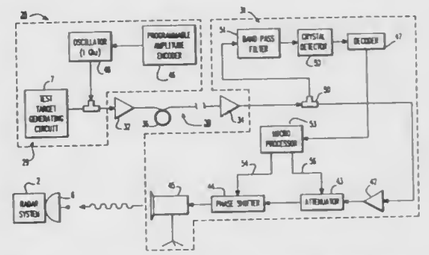
**Stanley Y. Lew, Parsippany, N.J., and Donald J. Grone, Reisterstown, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jun. 4, 1990, Ser. No. 532,835**
**Int. Cl.[5] G01S *7/40***
**U.S. Cl. 342—169** **24 Claims**

1. A system for simulating targets for a radar system having both a radar transmitter including oscillator circuits for both generating radar pulses and a receiver for receiving the reflections of said pulses comprising:

a test target generator means having an input slaved to the output of the oscillator circuits of the radar transmitter for generating a target simulating signal;

an antenna means for emitting the target simulating signal back to the radar receiver, said antenna means being located at least $2D^2/L$ from the radar receiver, where D is the diameter of the radar receiver and L is the wavelength of the target simulating signal and




an optical transmission link for transmitting the target simulating signal from the test target generator means to the antenna means including first and second transducers for converting the carrier of the target generating signal from a radio frequency carrier to an optical frequency and back again to a radio frequency carrier, and a fiber optic cable means for transmitting the optical carrier from said first transducer to said second transducer in an efficient and secure manner.

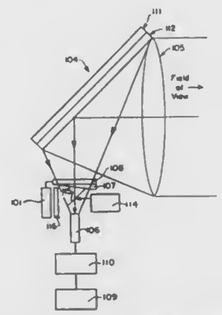
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**5,047,783**

## MILLIMETER-WAVE IMAGING SYSTEM

**G. Richard Hugenin, South Deerfield, Mass., assignor to Millitech Corporation, South Deerfield, Mass.**

**Continuation-in-part of Ser. No. 117,600, Nov. 6, 1987, Pat. No. 4,910,523, and a continuation-in-part of Ser. No. 194,774, May 17, 1988, and a continuation-in-part of Ser. No. 286,210, Dec. 19, 1988. This application Mar. 19, 1990, Ser. No. 495,879**
**Int. Cl.[5] G01S *13/89*; H01L *27/146*; G02B *26/10*; G01J *5/50***
**U.S. Cl. 342—179** **36 Claims**




1. A millimeter-wave imaging system, comprising:

an array of detector elements, each element generating a signal responsive to detected millimeter wave radiation, said elements being spaced apart a distance $\Delta X$;

means for imaging millimeter-wave radiation from a field of view onto said array;

means mounted in the path of radiation from the imaging means to the array of detector elements for redirecting

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radiation incident thereon so as to shift the point at which such radiation is incident on the detector array in a first direction a distance that is less than $\Delta X$;

means for rotating the redirecting means in the path of radiation so as to rotate the first direction in which the radiation is shifted; and

means for forming an image from the signals generated by the detector elements that is responsive to radiation received from the field of view wherein each pixel of the image is responsive to radiation detected by a particular element of the array from the portion of its field of view corresponding to a particular angle of orientation of said redirecting means.

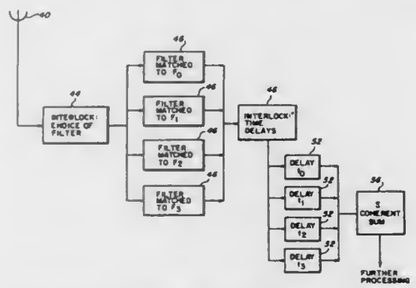
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**5,047,784**

## ZERO CROSS-CORRELATION COMPLEMENTARY RADAR WAVEFORM SIGNAL PROCESSOR FOR AMBIGUOUS RANGE RADARS

**Karl R. Gerlach, Dunkirk, Md., and Frank F. Kretschmer, Jr., Sarasota, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 30, 1991, Ser. No. 647,946**
**Int. Cl.[5] G01S *13/30***
**U.S. Cl. 342—201** **2 Claims**




1. A method of ranging comprising steps for:

transmitting a sequence of coded pulses $F_1, F_2, \ldots, F_{(N-1)}, F_0, F_1, \ldots, F_{N-1}$, each of said coded pulses $F_n$, n=0, 1, 2 . . . , N−1, being coded in accordance with the (n+1)th row of a matrix of dimension NxN given as follows:

$$\begin{bmatrix} d_0\lambda^0 W_N^{(0)(0).M} & d_1\lambda^0 W_N^{(1)(0).M} & \ldots \\ d_0\lambda^1 W_N^{(0)(1).M} & d_1\lambda^1 W_N^{(1)(1).M} & \ldots \\ . & & \ldots \\ . & & \ldots \\ . & & \ldots \\ d_0\lambda^{(N-1)} W_N^{(0)(N-1).M} & d_1\lambda^{(N-1)} W_N^{(1)(N-1).M} & \ldots \\ d_{N-1}\lambda^0 W_N^{(N-1)(0).M} \\ d_{N-1}\lambda^0 W_N^{(N-1)(1).M} \\ . \\ . \\ . \\ d_{N-1}\lambda^0 W_N^{(N-1)(N-1).M} \end{bmatrix}$$

each of said coded pulses being spaced from adjacent ones of said coded pulses by time intervals $t_0, t_1, \ldots, t_{N-1}$, each $F_n$ being followed immediately by a corresponding $t_n$, the last N of said time intervals being denominated detection intervals;

selecting an integer c from the set whose members are: 0, 1, 2, . . . , N−1;

detecting returns of said coded pulses during each of said detection intervals;

passing said returns detected in each said detection interval through a corresponding filter matched to one of said coded pulses $F_n$, n=(N+j−c) mod N, j=0, 1, 2, . . . , N−1;

coherently summing the outputs of said filters generated during said detection intervals.

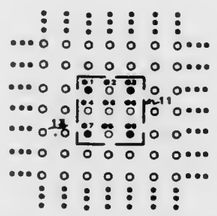
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**5,047,785**

## SPLIT-PHASE TECHNIQUE FOR ELIMINATING PATTERN NULLS FROM A DISCRETE GUARD ANTENNA ARRAY

**Michael D. Julian, Playa Del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed May 31, 1990, Ser. No. 531,185**
**Int. Cl.[5] H01Q *3/22***
**U.S. Cl. 342—372** **17 Claims**



1. A guard for an active antenna array, said array comprising a plurality of antenna elements, said guard comprising:

a selected subarray of the elements of said antenna array, the elements of said selected subarray being allocated to first and second guard subarrays, each of the first and second guard subarrays having a physical center, each element of each of said first and second guard subarrays further having a phase and a weight associated therewith, the weight being selected for application to the signal received by the respective element, the weights associated with the elements of the first guard subarray being selected to exhibit quadrant symmetry with respect to one another, the weights of the second guard subarray being selected to exhibit quadrant symmetry with respect to one another; and

means for establishing a 90-degree phase difference between the phase of the received signal at the physical center of said first guard subarray and the phase of the received signal at the physical center of said second guard subarray.

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**5,047,786**

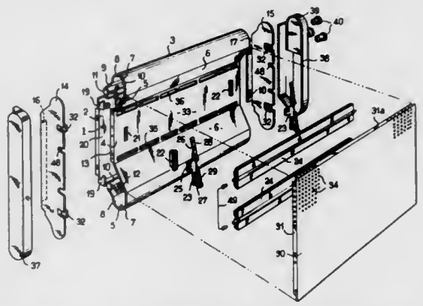
## ELECTRIC HEATING APPARATUS UTILIZING DUAL CHAMBERS FOR HEATING BY CONVECTION

**Pierre Levy, Rueil Malmaison, France, assignor to Airelec Industries, Cedex, France**

**Filed Jan. 31, 1990, Ser. No. 473,070**
**Claims priority, application France, Feb. 14, 1989, 89 01897**
**Int. Cl.[5] F24H *3/00***
**U.S. Cl. 392—370** **12 Claims**

1. Electric heating apparatus comprising at least one electrical heating resistor (**24**) arranged in a body (**1**) of sheet metal provided with an air inlet in its lower part and an air outlet in its upper part, characterized in that the body (**1**) is formed by a double-walled hollow element in the form of a trough (**2, 3**), provided with end walls (**14, 15**) and at least one opening (**12**) for the entry of fresh air and defining a first space (**20**) for the admission of air, in that the electrical resistor (**24**) is mounted on the concave part of the double-walled element in the form of a trough (**2, 3**) on the exterior of the latter, a perforated panel (**30**) being arranged on the said concave wall and defining with the latter a second space (**33**) for the heating of the air by convection and for the direct radiation of the heat by the





resistor through the perforations in the perforated panel, at least one opening (**35, 36**) being made in the said hollow element (**2, 3**) in order to put the first and second spaces (**20, 33**) in communication and at least one passage (**31c**) for the discharge of hot air being provided between the hollow element (**2, 3**) and a lateral edge of the perforated panel (**30**).

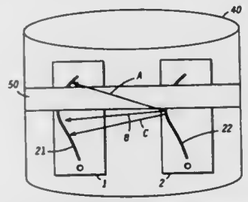
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**5,047,787**

## COUPLING CANCELLATION FOR ANTENNA ARRAYS

**Shawn W. Hogberg, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed May 1, 1989, Ser. No. 345,319**
**Int. Cl.[5] H01Q *1/52***
**U.S. Cl. 343—841** **22 Claims**




1. Apparatus for cancellation of RF coupling between antennas of an array, said apparatus comprising:

shroud means having an axis;

receiving antenna means connected to said shroud means and said receiving antenna means having an axis;

transmitting antenna means connected to said shroud means and said transmitting antenna means having an axis, said axes of said shroud means, receiving antenna means and said transmitting antenna means being substantially parallel, said transmitting antenna means being located in proximity to said receiving antenna means whereby first RF coupling is present between said transmitting antenna means and said receiving antenna means; and

dielectric means positioned across said axis of said receiving antenna means and said axis of said transmitting antenna means whereby second RF coupling is induced between said receiving and transmitting antenna means, said first and second RF couplings being approximately 180 degrees out of phase and substantially equal in magnitude substantially cancelling each other.

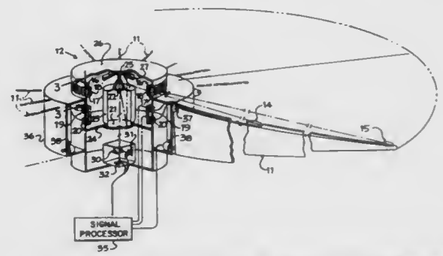
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**5,047,788**

## FIGURE CONTROL SYSTEM FOR A FLEXIBLE ANTENNA

**Calvin W. Gillard, Palo Alto, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.**

**Filed Oct. 5, 1989, Ser. No. 417,604**
**Int. Cl.[5] H01Q *15/20***
**U.S. Cl. 343—915** **10 Claims**




1. An apparatus for controlling the figure of a flexible antenna, said apparatus comprising:

a) a framework for supporting said flexible antenna, said framework comprising a plurality of support members independently movable with respect to each other;

b) means attached to said plurality of support members for generating a corresponding plurality of optical signals;

c) means responsive to said plurality of optical signals for indicating precise locations of said support members, and concomitantly for determining an actual figure for said flexible antenna during a specified time interval; and

d) means responsive to said actual figure for generating electrical signals to actuate mechanical means for moving said support members independently of each other so as to change said actual figure of said flexible antenna as determined for said specified time interval into conformity with a specified figure.

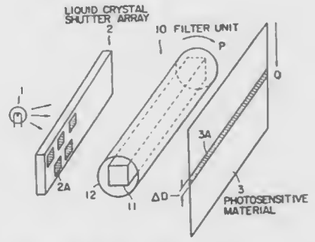
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**5,047,789**

## METHOD FOR DRIVING AND CONTROLLING LIQUID CRYSTAL AND DEVICE THEREFOR

**Toshikiyo Kanayama, Kaisei, and Kenichi Morimoto, Osaka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 14,041, Feb. 12, 1987, Pat. No. 4,939,529. This application Mar. 16, 1990, Ser. No. 503,158**
**Claims priority, application Japan, Feb. 20, 1986, 61-35784**
**Int. Cl.[5] G01D *9/42*; G02F *1/13***
**U.S. Cl. 346—108** **2 Claims**




1. A liquid crystal drive/control method for driving and controlling a liquid crystal shutter array in order to record an image at adjusted gradation, the liquid crystal shutter array including at least one liquid crystal cell line having a plurality of liquid crystal cells, said method comprising the steps of:

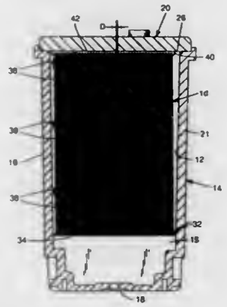
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transmitting light through the liquid crystal shutter array to expose a photosensitive material;
providing a filter device having colors R, G and B interposed between the liquid crystal shutter array and the photosensitive material, the filter device including a cylindrical filter plate and a Selfoc lens array which is internally located at a center of the cylindrical filter plate;
rotating the filter device so as to transmit R, G and B color lights for recording a color image;
dividing a gradation density data corresponding to one liquid crystal cell line according to a gradation density dividing level unit;
converting the thus divided gradation density data into binary data for each dividing level unit;
storing the binary data in a register; and
reading the binary data in parallel from the register and driving the liquid crystal shutter array according to the thus read binary data;
wherein gradation control and drive for each liquid crystal cell line is based on the binary data obtained from the gradation density data.

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**5,047,790**
**CONTROLLED CAPILLARY INK CONTAINMENT FOR INK-JET PENS**
**Bruce Cowger, and John H. Dion, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Jan. 12, 1990, Ser. No. 464,500**
**Int. Cl.[5] B41J** *2/175*
**U.S. Cl. 346—140 R** **3 Claims**



1. A containment apparatus comprising:
a reservoir for storing liquid, the reservoir including a liquid-permeable part;
an array of spaced apart capillary sheets disposed within the reservoir and arranged to provide capillarity sufficient to prevent liquid in the reservoir from permeating through the liquid-permeable part; and
a screen disposed between the capillary sheets and the liquid-permeable part, the screen providing capillarity that is greater in magnitude than the capillarity provided by the capillary sheets for holding liquid within the screen after liquid is removed from between the capillary sheets.

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**5,047,791**
**ELECTROSTATIC COLOR PRINTING APPARATUS**
**Fereidoon S. Jamzadeh, Fairport; Kevin M. Johnson, Rochester, and Robert E. Zeman, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Jun. 4, 1990, Ser. No. 532,832**
**Int. Cl.[5] G03G** *15/01*
**U.S. Cl. 346—157** **14 Claims**

1. Color printing apparatus, comprising:
an image drum rotatable through an endless path,
means for forming a series of large electrostatic images on said image drum as it moves through said path, each large image of said series of images representing a color separation of a multicolor image and each large image being made up of an array of smaller images, said array having at least one boundary between smaller images that runs in a generally cross-track direction,
means for applying toners of different colors to said series of large electrostatic images to create a series of different color toner images corresponding to said electrostatic images,
means for transferring said series of toner images in registration to a single receiving sheet to create a multicolor

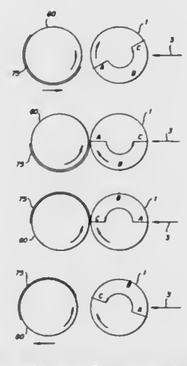
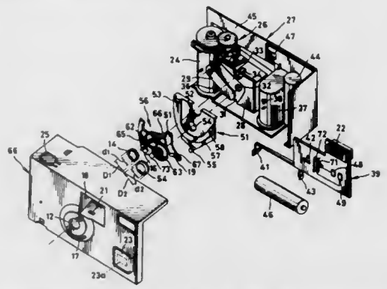


image thereon, said transfer means including a transfer roller for holding a receiving sheet on its periphery and positioned to bring said receiving sheet into contact with said drum as said roller rotates said receiving sheet repeatedly through transfer relation with said drum, contact between said receiving sheet and said drum causing at least one discontinuity in the rotation of said drum, and
said image forming means including means for incrementally forming said electrostatic image as said drum rotates past said image forming means, said image forming means being positioned to form said cross-track boundary between smaller images when said discontinuity in the rotation of said drum occurs.

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**5,047,792**
**CAMERA**
**Seiji Asano; Junichi Takagi, and Takaji Kono, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Oct. 15, 1990, Ser. No. 597,764**
**Claims priority, application Japan, Oct. 16, 1989, 1-268529; Nov. 15, 1989, 1-296566**
**Int. Cl.[5] G03B** *3/00, 13/12, 15/05*
**U.S. Cl. 354—149.11** **16 Claims**

1. A camera comprising:
a first taking lens;
a second taking lens having a longer focal length and a different diameter than said first taking lens;
a lens holder holding said first and second taking lenses, said lens holder being formed with two different sized apertures that register with said first and second taking lenses and being movable in a plane perpendicular to the photographic light path; and

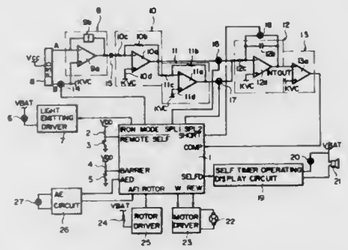


lens changeover means for moving said lens holder between two positions so as selectively to place either of said taking lenses in the photographic light path.



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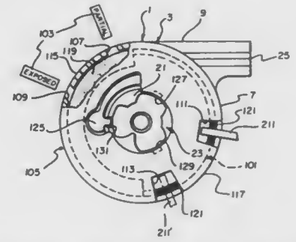
**5,047,793**
**AUTOMATIC RANGE FINDER CAMERA SYSTEM WITH A REMOTE CONTROL FUNCTION**
**Yasuhiko Shiomi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 500,098, Mar. 21, 1990, abandoned, which is a continuation of Ser. No. 420,735, Oct. 12, 1989, abandoned, which is a continuation of Ser. No. 259,412, Oct. 18, 1988, abandoned, which is a continuation of Ser. No. 188,068, Apr. 27, 1988, abandoned, which is a continuation of Ser. No. 945,896, Dec. 24, 1986, abandoned. This application Jun. 12, 1990, Ser. No. 537,144**
**Claims priority, application Japan, Dec. 26, 1985, 60-296664; Dec. 26, 1985, 60-296665; Dec. 26, 1985, 60-296666**
**Int. Cl.[5] G03B** *9/64, 17/38, 17/40*
**U.S. Cl. 354—238.1** **66 Claims**



1. A camera comprising:
distance measuring means for automatically and repeatedly measuring the distance to an object;
discriminating means for comparing the measured results with one another to discriminate a change, and for providing an activation signal when the change exceeds a predetermined amount; and
exposure control means for performing an exposure operation in response to said activation signal.

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**5,047,794**
**FILM CASSETTE WITH LOCK-OUT MEANS FOR PREVENTING LOAD OF EXPOSED FILM**
**Daniel M. Pagano, Henrietta; Stephen H. Miller, Rochester, and Thomas D. Jensen, Himrod, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Jul. 31, 1990, Ser. No. 565,769**
**Int. Cl.[5] G03B** *17/26, 17/36*
**U.S. Cl. 354—275** **4 Claims**



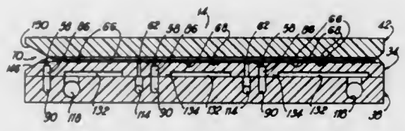
1. A film cassette comprising a film spool supported inside a lighttight cassette shell for rotation to thrust a filmstrip coiled about said spool to the exterior of said shell whether said filmstrip is unexposed or is only partly exposed, and a film exposure status indicator supported for rotation relative to said shell from an unexposed position to respective partly exposed and fully exposed positions for providing visible indications that said filmstrip is only partly exposed or is substantially exposed, is characterized in that:
said status indicator includes integral lock-out means capable of being detected for the purpose of preventing insertion of said film cassette into various cameras intended to be used with the film cassette;
a cap for covering said lock-out means to prevent the lock-out means from being detected includes respective window-like means for revealing the lock-out means when said status indicator is in its partly exposed and fully exposed positions, to permit said film cassette to be used with a relatively simple camera intended to receive the film cassette only with fresh unexposed film and a more complex camera intended to receive the film cassette with unexposed or partly exposed film; and
said spool is supported for rotation to return said filmstrip to the interior of said shell, and said status indicator is fixed to said spool for rotation simultaneously with the spool to move said lock-out means initially to one of said window-like means and then to another of said window-like means when the spool is rotated to return the filmstrip to the interior of said shell.

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**5,047,795**
**SLOTTED PROCESSING APPARATUS AND METHOD**
**John B. Keable, Knoxville, Tenn., and Steve Bostic, Atlanta, Ga., assignors to Delphi Technology, Inc., Atlanta, Ga.**
**Continuation-in-part of Ser. No. 442,193, Nov. 28, 1989, which is a continuation-in-part of Ser. No. 330,112, Mar. 29, 1989. This application Nov. 28, 1989, Ser. No. 442,252**
**Int. Cl.[5] G03D** *3/02, 3/08*
**U.S. Cl. 354—320** **26 Claims**

1. An apparatus for processing a photographic emulsion comprising:
a. means for delivering a photographic processing chemical through an opening for contact with the emulsion;
b. a sink having an edge at least partially defined by the

opening and in which photographic processing chemical may puddle; and



c. at least one rib positioned within the sink for agitating and removing at least a portion of the photographic processing chemical from the emulsion.

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**5,047,796**

**AUTOMATIC FOCUSING DEVICE FOR CAMERA**

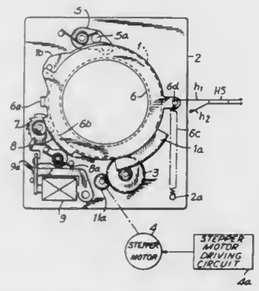
**Sigeru Tagami; Nobuo Shinozaki, and Kazuo Akimoto, all of Chiba, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 375,756, Jul. 5, 1989, abandoned. This application Jul. 31, 1990, Ser. No. 560,262**

**Claims priority, application Japan, Jul. 4, 1988, 63-166397**

**Int. Cl.[5] G03B** *9/08, 13/36*

**U.S. Cl. 354—400** **12 Claims**



1. An automatic focusing device for a camera having a lens, said device comprising:

means providing a camera release signal;

camera lens focusing means for adjusting the focus of the lens;

motor lens for driving said camera lens focusing means to adjust the focus of the lens during a focusing operation and for subsequently controlling the performance of an exposure operation;

operation start means for providing a start signal confirming the start of the focusing operation by said camera lens focusing means between the time of said camera release signal and the next occurring exposure operation; and

motor drive means responsive to a camera release signal for controlling said motor means to start a sequence of a focusing operation and a subsequent exposure operation and for inhibiting said exposure operation in the absence of a start signal from said operation start means following said last mentioned camera release signal.

**5,047,797**

**IMAGE RECORDING APPARATUS CAPABLE OF ADJUSTING A DENSITY OF AN IMAGE REPRODUCED ON A RECORDING MEDIUM**

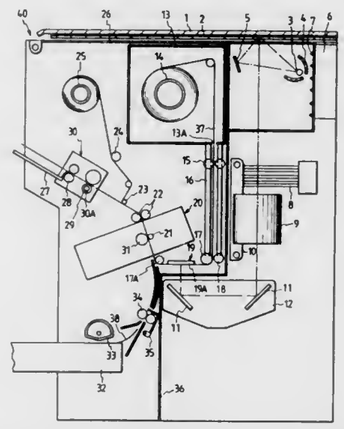
**Kenji Sakakibara, Ichinomiya; Michitoshi Akao, Nagoya; Yukichi Sawaki, Gifu, and Tokunori Katoh, Ichinomiya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan**

**Filed Mar. 24, 1989, Ser. No. 328,318**

**Claims priority, application Japan, Mar. 25, 1988, 63-72864**

**Int. Cl.[5] G03B** *27/32*

**U.S. Cl. 355—27** **18 Claims**



1. An image recording apparatus for recording an image of an original on a photosensitive recording medium, a density of said image recorded on said recording medium being changed depending upon an amount of light applied to said recording medium, said apparatus comprising:

an original support member for supporting said original;

a light source for emitting a light toward said original supported on said original support member;

a first drive signal generating means for generating a first drive signal;

a first driving means responsive to said first drive signal for driving at least one of said original support member and said light source to move relative to each other at a first speed corresponding to said first drive signal, said image of said original being scanned at said first speed by said light emitted from said light source, an image bearing light bearing said image of said original being provided as a result of the scanning;

a second drive signal generating means for generating a second drive signal;

a second driving means responsive to said second drive signal for moving said recording medium at a second speed corresponding to said second drive signal, said second drive speed being in coincidence with the first drive speed;

an optical means for receiving and applying said image bearing light onto said recording medium to record said image of said original thereon;

a density means for setting a density of said image to be reproduced on said recording medium and providing an image density instruction signal;

a control means for controlling said first drive signal generating means in accordance with said image density instruction signal, whereby said density of said image to be recorded on said recording medium is controlled by the change of the scanning speed.



**5,047,798**

**THERMAL FIXING UNIT HAVING GAS PURIFICATION MEANS**

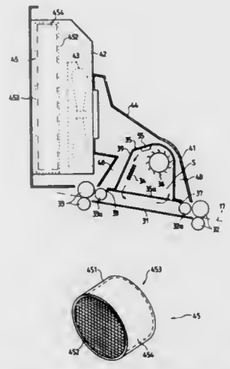
**Takemi Yamamoto; Osamu Takagi, both of Nagoya; Yumio Matsumoto, Kasugai; Yasuo Kimura, Ichinomiya, and Takashi Nakata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Dec. 13, 1989, Ser. No. 449,818**

**Claims priority, application Japan, Dec. 16, 1988, 63-318874; Dec. 19, 1988, 63-321337; Jan. 30, 1989, 1-20510; Jan. 31, 1989, 1-23047**

**Int. Cl.[5] G03B** *27/52*

**U.S. Cl. 355—27** **15 Claims**



1. A thermal fixing unit for thermal fixing an output image recorded on an image recording medium, the image recording medium including a developer sheet comprising a base substrate and a developer material coated thereover, the output image being formed by a chromogenic reaction between the developer material and a chromogenic material selectively formed on a separate photosensitive sheet, the thermal fixing unit comprising:

a main frame provided with a sheet inlet and a sheet outlet and defining a sheet path therebetween;

a transferring means disposed within the main frame for transferring the developer sheet along the sheet path;

a heating means disposed within the main frame for heating the developer sheet transferred along the sheet path, the developer sheet releasing gaseous component upon heating, the heating means having a plurality of operational modes and further comprising a heater for heating air within the main frame and a hot air circulating fan for circulating the hot air provided by the heater, the hot air being applied to the developer sheet; and

gas purification means connected to the main frame for removing the gaseous component, said gas purification means being hermetically connected to the main frame.

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**5,047,799**

**IMAGE FORMING APPARATUS HAVING A PHOTOSENSITVE RECORDING MEDIUM REWINDING FUNCTION**

**Takashi Nakata, and Tatsuya Shindo, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Oct. 24, 1990, Ser. No. 602,790**

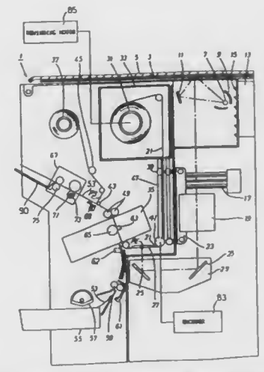
**Claims priority, application Japan, Nov. 25, 1989, 1-306249**

**Int. Cl.[5] G03B** *27/32, 27/52*

**U.S. Cl. 355—27** **20 Claims**

1. An image forming apparatus which forms a latent image on an elongated photosensitive recording medium using light which carries image information, and forms the image on a recording sheet by bringing the recording sheet in contact with the photosensitive recording medium on which the latent image has been formed, said apparatus comprising:

a detecting means for detecting a separation between the photosensitive recording medium and the recording sheet; and



a rewinding means for rewinding the photosensitive recording medium a predetermined amount in response to the detection of the separation by said detecting means.

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**5,047,800**

**IMAGE RECORDING APPARATUS**

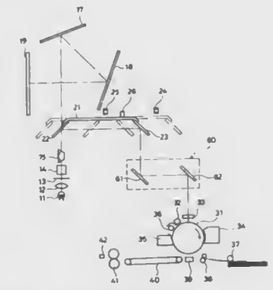
**Fumio Fukumoto, Yamato; Osami Kato, Ebina; Hideaki Hirasawa, Sagamihara, and Tsutomu Tsukamoto, Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 13, 1990, Ser. No. 581,686**

**Claims priority, application Japan, Sep. 14, 1989, 1-236891; Dec. 6, 1989, 1-315199**

**Int. Cl.[5] G03B** *13/28*

**U.S. Cl. 355—45** **19 Claims**



1. An image recording apparatus comprising:

image forming means for reproducing an image on an original onto a recording medium;

transporting means for transporting said recording medium to said image forming means at a predetermined timing;

projecting means for projecting said image on said original onto said image forming means;

detecting means for detecting a position of said image to be projected onto said image forming means;

shifting means for shifting an optical axis of said image to be projected in a direction orthogonal to a transporting direction of said recording medium; and

controlling means responsive to a result of the detection by

said detecting means for operating said shifting means so that said image may be formed at a predetermined position on said recording medium and for controlling said transporting means so that a timing to transport said recording medium may be altered.

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5,047,801

## COLOR IMAGE FORMING APPARATUS HAVING THE DEVELOPING MEANS AND CLEANING MEANS FORMED AS A DETACHABLE UNIT

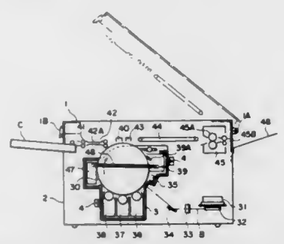
Satoshi Haneda; Masakazu Fukuchi; Hisashi Shoji; Shunji Matsuo, and Shizuo Morita, all of Hachloji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 1, 1989, Ser. No. 444,570

Claims priority, application Japan, Dec. 6, 1988, 63-308148; Dec. 12, 1988, 63-314360

Int. Cl.[5] G03G *15/00, 15/01*

U.S. Cl. 355—200 7 Claims



3. An electrostatic image forming apparatus for forming a color image comprising;

an image retainer for carrying said color image,

a charging means for charging a surface of said image retainer,

a means for forming a latent image on the charged surface of said image retainer, wherein said latent image forming means forms said latent image under said image retainer,

a plurality of developing means for developing said latent image to form a toner image, wherein said developing means are positioned adjacent to each other on a side of said image retainer,

a transfer sheet conveyance means for conveying a transfer sheet to a transfer means,

said transfer means for transferring said toner image onto said transfer sheet,

wherein said transfer sheet conveyance means and said transfer means are movably located on the upper side of said image retainer, a top frame part of said electrostatic image forming apparatus, comprising said transfer sheet conveyance means and said transfer means, being adapted to be opened, and

a cleaning means for cleaning residual toner from the surface of said image retainer,

wherein said image retainer, said cleaning means and said developing means, are formed as a unit and said unit is detachable from said electrostatic image forming apparatus.

5,047,802

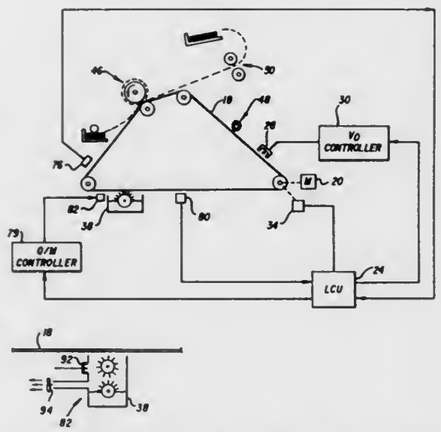
## PROCESS CONTROL OF ELECTROSTATOGRAPHIC MACHINE BY ADJUSTING CHARGE-TO-MASS RATIO OF TONER IN RESPONSE TO TONED DENSITY OF DEVELOPED IMAGE

Lawrence J. Donivan, and Joseph F. Laukaitis, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,948

Int. Cl.[5] G03G *21/00, 15/08*

U.S. Cl. 355—208 12 Claims






1. In an electrostatographic reproduction machine having means for developing an electrostatic latent image with charged toner particles, the improvement comprising:

means for producing a signal having a value characteristic of the toned density of the developed image; and

means responsive to said signal for adjusting the charge-to-mass ratio of the toner, wherein said signal adjusting means includes (1) a source of ions and (2) means for directing the ions to the toner particles.

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5,047,803

## IMAGE FORMING APPARATUS WITH DETACHABLY MOUNTABLE PROCESS CARTRIDGE

Masanohu Kanoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,539

Claims priority, application Japan, Mar. 2, 1988, 63-047637; Mar. 2, 1988, 63-047638

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—211 25 Claims

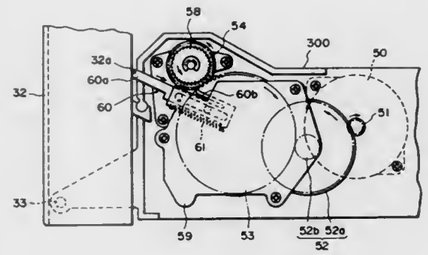
1. An image forming apparatus, comprising:

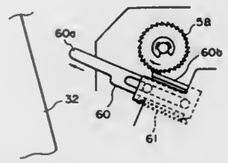
means for detachably supporting a process cartridge, said process cartridge containing a movable image bearing member, at least one process means for forming an image on the image bearing member and driven means for receiving a driving force from said image forming apparatus;

driving means engageable with the driven means of the process cartridge to drive the driven means;



an openable and closable member forming a part of a casing of said image forming apparatus; and




applying means for applying to said driving means a force for urging the process cartridge in response to opening said openable and closable member.

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5,047,804

## IMAGE FORMING APPARATUS HAVING A TONER REPLENISHMENT CONTROL SYSTEM

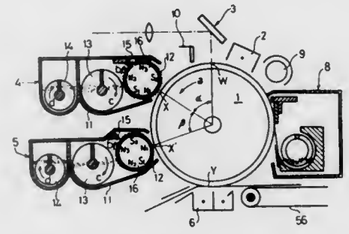
Masaru Komura, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

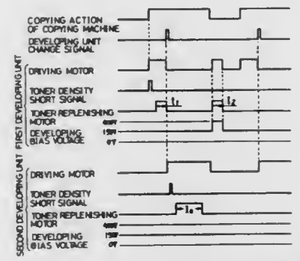
Filed Jul. 26, 1988, Ser. No. 224,155

Claims priority, application Japan, Jul. 27, 1987, 62-188366; Jul. 27, 1987, 62-188367

Int. Cl.[5] G03G *21/00*

U.S. Cl. 355—246 5 Claims






1. An image forming apparatus provided with a plurality of developing means for developing an image of an original in a plurality of colors by sequentially actuating a plurality of the developing means, comprising:

a plurality of developer replenishing means each of which corresponds to one of a plurality of the developing means and replenishes developer to each corresponding developing means;

detecting means for detecting a shortage of developer in each of the developing means;

first control means, responsive to the detecting means, for actuating one of the developer replenishing means corresponding to the developing means in operation, said first control means continuing the actuating of said one of the developer replenishing means even after said corresponding developing means ceases operation; and

second control means for actuating the developing means receiving developer replenishment when the developing means ceased operation in response to said first control means for a predetermined time after the development of the image of original is completed.

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5,047,805

## DEVELOPING DEVICE HAVING A SPACE FOR RECEIVING AND INCREASING PRESSURE OF TONER RECEIVED THEREIN

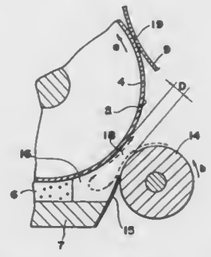
Tateki Oka; Naoki Toyoshi, both of Toyohashi; Hiroshi Goto, Toyokawa; Hirofumi Hasegawa, Hatano, and Kenji Miyashita, Aichi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1990, Ser. No. 552,536

Claims priority, application Japan, Jul. 17, 1989, 1-185267

Int. Cl.[5] G03G *15/09*

U.S. Cl. 355—253 16 Claims



1. A developing device comprising:

a rotatable toner carrying member for transporting toner to a rotatable member;

a rotatable toner supplying member facing to said toner carrying member with a predetermined distance therebetween for supplying toner to the surface of said toner carrying member;

a scrape member contacting with said toner supplying member for scraping the toner from the surface of said toner supplying member; and

a seal member facing said toner carrying member wherein said toner carrying member, toner supplying member, seal member and scrape member constitute a space for storing the toner therein so that the toner is supplied therefrom onto said toner carrying member due to increased pressure from the toner stored in said space.

VOL 1130 ISS 2 SE 10 1991 UMI

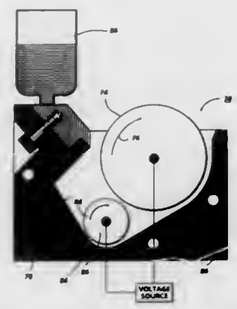


5,047,806

## METERLESS SINGLE COMPONENT DEVELOPMENT

Grace T. Brewington, and John F. Knapp, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1990, Ser. No. 537,660
Int. Cl.[5] G03G *15/06*
U.S. Cl. 355—259 20 Claims



1. An apparatus for developing a latent image recorded on an image receiving member, including:

a housing defining a chamber storing a supply of electrostatically charged marking particles therein with the marking particles having a charge distribution;

means, disposed at least partially in the chamber of said housing, for transporting marking particles closely adjacent to the latent image recorded on the image receiving member;

means, disposed in the chamber of said housing and spaced from said transporting means, for moving the charged marking particles in the chamber of said housing; and

means for applying an electrical bias between said moving means and said transporting means to attract charged marking particles of the same polarity from said moving means to said transporting means with the marking particles attracted to said tranporting means having a selected charge distribution with the range of the selected charge distribution being less than the range of the charge distribution of the marking particles in the chamber of said housing.

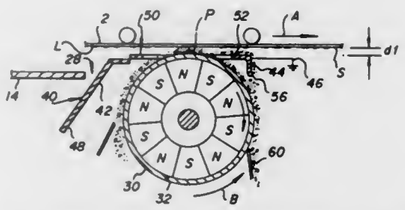
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5,047,807

## DEVELOPMENT APPARATUS HAVING A PLATE SCAVENGING DEVICE

Satyan R. Kalyandurg, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 15, 1990, Ser. No. 597,135
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—269 7 Claims



1. A scavenging device for use in a magnetic development apparatus of an electrostatographic copier or printer employing a multiple component developer material including charged toner and charged carrier particles, to recapture or scavenge charged magnetic carrier particles undesirably transferred to the image-bearing surface of such copier or printer during toner image development, the scavenging device comprising:

(a) a first non-magnetic plate for stationary mounting between the image-bearing surface and the magnetic development roller of the development apparatus, said first plate having a first portion and a second portion, and said second portion including a development aperture for allowing the charged toner particles to transfer from the development roller to the image-bearing surface, and a flat and substantially wide surface area for picking up or recapturing, unwanted charged carrier particles also transferring to the image-bearing surface;

(b) a second non-magnetic plate connected to said first plate for guiding the movement of recaptured particles away from said flat pickup surface area; and

(c) means for electrically biasing said first and second plates to a polarity opposite to that of the charged carrier particles.

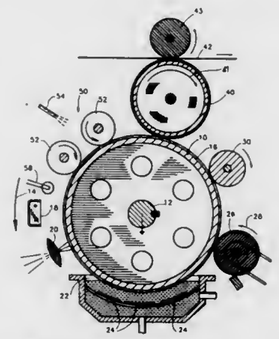
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5,047,808

## IMAGE TRANSFER APPARATUS INCLUDING A COMPLIANT TRANSFER MEMBER

Benzion Landa, Edmonton, Canada; Itzhak Ashkenazi, Rehovot, Israel; Jan Van Mil, Ramat Gan, Israel; Hanna Pinhas, Holon, Israel, and Ishaiau Lior, Nes Ziona, Israel, assignors to Spectrum Sciences B.V., Wassenaar, Netherlands

Continuation-in-part of Ser. No. 306,065, Feb. 6, 1989. This application Aug. 14, 1989, Ser. No. 393,649
Int. Cl.[5] G03G *15/14*
U.S. Cl. 355—277 15 Claims



1. An imaging system comprising:

an image bearing surface;

an intermediate transfer member operative for transfer of liquid toner images from said image bearing surface to a substrate;

means for providing first transfer engagement between said intermediate transfer member and said image bearing surface for transfer of a liquid toner image from said image bearing surface to said intermediate transfer member at a first pressure, producing deformation of the intermediate transfer member to a first deformation degree; and

means for providing second transfer engagement between said intermediate transfer member and said substrate for transfer of said liquid toner image from said intermediate transfer member to said substrate at a second pressure, producing deformation of the intermediate transfer member to a second deformation degree;

wherein the second pressure exceeds the first pressure by a first multiple and the second deformation degree exceeds the first deformation degree by a second multiple, substantially less than said first multiple.

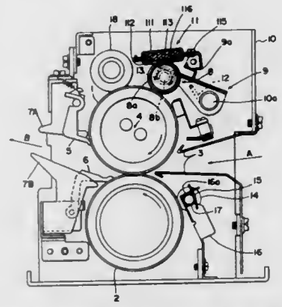


5,047,809

## FIXING APPARATUS WITH OIL SUPPLY APPARATUS

Akihiro Owada, and Yoshikazu Ikunami, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 25, 1989, Ser. No. 301,287
Claims priority, application Japan, Jan. 26, 1988, 63-16542; Jan. 26, 1988, 63-16543; Mar. 9, 1988, 63-56707
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—284 8 Claims



2. In a fixing apparatus wherein a toner image is formed on a transfer medium by passing the transfer medium between a heat roller and a press roller, each of the rollers rotating while in pressure contact with each other, comprising:

an oil application roller having a layer of heat-resistant fibers impregnated with a first oil having a dynamic viscosity of $\nu 1$; and

oil supply means including a fiber member impregnated with a second oil having a dynamic viscosity of $\nu 2$, wherein $\nu 2$ is in the range of 1000 cst to 10,000 cst, the oil-impregnated fiber member being pressed against the oil application roller for transferring oil to the oil application roller, wherein the amount of oil applied to the transfer medium is in the range of $3.5\times10^{-2}$mg/100cm$^2$ to 0.11mg/100cm$^2$ and the ratio of dynamic viscosities of the first and second oils is in the range of:

$\nu 2{:}\nu 1 = 1{:}3$ to 30.

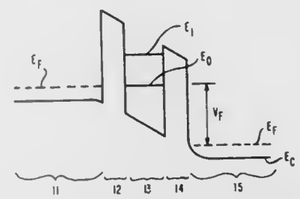
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5,047,810

## OPTICALLY CONTROLLED RESONANT TUNNELING ELECTRONIC DEVICES

Daniel S. Chemla, Rumson; David A. B. Miller, Fair Haven, and Stephan Schmitt-Rink, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 9, 1989, Ser. No. 294,225
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—4 16 Claims



1. An optoelectronic device having active and inactive states of operation, said active state corresponding to conduction by resonant tunneling of carriers, said optoelectronic device including at least one double barrier quantum well semiconductor heterostructure wherein said resonant tunneling occurs through both barriers of each said double barrier quantum well semiconductor heterostructure into and out of the lowest quasi-confined eigenstate of the quantum well, means for applying an electrical potential to said at least one double barrier quantum well semiconductor heterostructure, means for applying a signal to said at least one double barrier quantum well semiconductor heterostructure to control the state of operation of said optoelectronic device, said signal applying means including a source of an optical signal having a mean photon energy less than a bandgap energy of said at least one double barrier quantum well semiconductor heterostructure and sufficient to cause a desired shift $\delta E_o$ for a quasi-confined eigenstate in a quantum well of the at least one double barrier quantum well semiconductor heterostructure, where the desired shift is,

$$\delta E_o = \frac{2|\mu_{cv}\xi_\nu|^2}{(E_o - h\nu)} \quad \frac{|\phi(r=0)|^2}{N_s}$$

where $\mu_{cv}$ is an interband transition matrix element; $\xi_\nu$ is an optical field at frequency $\nu$; $E_0$ is an energy of said lowest quasi-confined eigenstate in the quantum well; $h\nu$ is the mean photon energy of the optical signal; $|\phi(r=0)|^2$ is the square of an envelope function of an exciton for $r=0$; and $N_s$ is the saturation density.

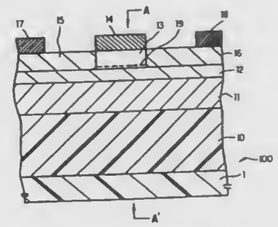
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5,047,811

## FIELD EFFECT TRANSISTOR WITH CHANNEL FORMED ON HOMOJUNCTION INTERFACE

Shinji Miyano, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 16, 1988, Ser. No. 271,786
Claims priority, application Japan, Nov. 18, 1987, 62-289479
Int. Cl.[5] H01L *29/48, 29/56, 29/64, 29/161*
U.S. Cl. 357—15 21 Claims



1. A field-effect transistor comprising: a first semiconductor layer doped with impurities of one-conduction type;

a second semiconductor layer on said first semiconductor layer, said second semiconductor layer doped with impurities of a reverse-conduction type;

a third semiconductor layer on said second semiconductor layer, the third semiconductor layer including semiconductor materials of the same conduction type as those of said second semiconductor layer, said third semiconductor layer having an impurity concentration lower than that of said second semiconductor layer;

a control gate on said third semicontrol layer;

source and drain regions formed on both sides of said control gate; and

a channel formed in said third semiconductor layer by a potential well at an interface portion between said second semiconductor layer and said third semiconductor layer.

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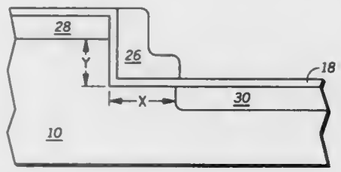


5,047,812

## INSULATED GATE FIELD EFFECT DEVICE

James R. Pfiester, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1989, Ser. No. 315,668
Int. Cl.[5] H01L *29/10, 29/78, 27/01, 29/00*
U.S. Cl. 357—23.4 7 Claims



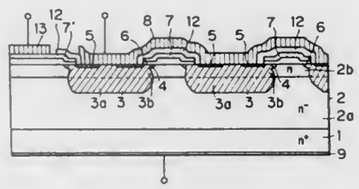

1. An insulated gate field effect device comprising:
a semiconductor substrate having a first surface;
a recess in said first surface, the bottom of said recess defining a second surface, and a wall of said recess extending from said first surface to said second surface;
a first transistor formed in said substrate and comprising a source region formed at said first surface;
a drain region comprising a first heavily doped region formed at said second surface and spaced apart from said wall;
a channel region defined along said wall and said second surface between said drain region and said source region;
a gate insulator overlying said channel region; and a gate electrode overlying said gate insulator and portions of second surface and said wall.

5,047,813

## SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Masana Harada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 207,196, Jun. 16, 1988, abandoned. This application Dec. 28, 1989, Ser. No. 455,775
Claims priority, application Japan, Aug. 19, 1987, 62-206857
Int. Cl.[5] H01L *29/10*
U.S. Cl. 357—23.4 11 Claims



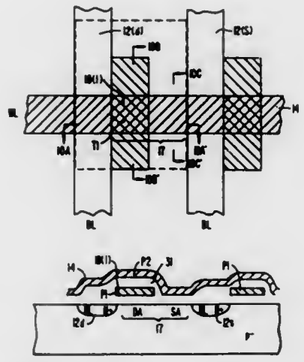

1. A semiconductor device comprising:
a first semiconductor layer of a first conductivity type formed on a surface of said first semiconductor layer;
a third semiconductor layer of a second conductivity type formed on a surface of said second semiconductor layer, said third semiconductor layer being higher in impurity concentration than said second semiconductor layer;
a well region of the first conductivity type formed in at least said third semiconductor layer;
a semiconductor region of the second conductivity type formed in a surface of said well region separately from said third semiconductor layer;
an insulation film formed on the surface of said well region between said semiconductor region and said third semiconductor layer;
a control electrode formed on a surface of said insulation film;
a first electrode formed on said semiconductor region and said well region; and
a second electrode formed on a back surface of said first semiconductor layer.

5,047,814

## E²PROM CELL INCLUDING ISOLATED CONTROL DIFFUSION

Emanuel Hazani, 1210 Sesame Dr., Sunnyvale, Calif. 94087

Continuation-in-part of Ser. No. 152,702, Feb. 5, 1988, Pat. No. 4,845,538. This application Mar. 22, 1989, Ser. No. 327,663
Int. Cl.[5] H01L *28/78, 27/04;* G11C *11/40*
U.S. Cl. 357—23.5 5 Claims




1. An E²PROM memory cell formed in an array of cells, with the cell including first and second regions of a first conductivity type formed along the surface of a doped bulk semiconductor substrate of a second conductivity type, with a polysilicon control electrode overlying the substrate, and with the region of the substrate disposed between the first and second regions and underlying the control electrode forming a channel region, with the channel region consisting of a drain area disposed adjacent to the first region and a source area disposed adjacent to the second region, and with the first region, channel region, control electrode, and second region forming the drain, channel, gate, and source of a first MOS transistor, and where the cell is programmed or erased by applying bias voltages to first and second regions and the control electrode, said memory cell comprising:
a programmable polysilicon floating gate electrode disposed only over the drain area of the channel region and under the control electrode and having a coupling edge disposed alongside said first region to capacitively couple said floating gate to the first region and bulk semiconductor substrate so that the drain area is inverted but the source area is not inverted when the first region is charged to a programming voltage;
an first insulating layer disposed between the floating gate and first region of sufficient thickness to prevent the tunnelling of electrons between the floating gate and first region when biasing voltages are applied to the first region and the control electrode to program the cell; and
a second insulating layer separating the floating gate and the control electrode sufficiently thin to allow electrons to tunnel between the control electrode and the floating gate when biasing voltages are applied to the first region and control electrode to program the cell.

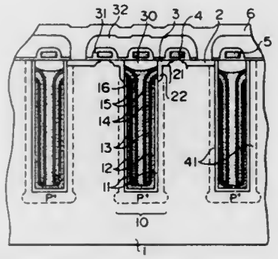


5,047,815

## SEMICONDUCTOR MEMORY DEVICE HAVING A TRENCH-STACKED CAPACITOR

Mitsuo Yasubira, Ikeda; Takatoshi Yasui, Higashiosaka; Kazuhiro Matsuyama, Neyagawa; Hideyuki Iwata, Hirakata, and Masanori Fukumoto, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 14, 1989, Ser. No. 394,123
Claims priority, application Japan, Aug. 18, 1988, 63-205141; Dec. 13, 1988, 63-314037
Int. Cl.[5] H01L *29/68*
U.S. Cl. 357—23.6 4 Claims



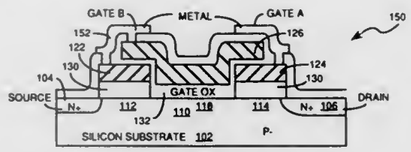

4. A semiconductor memory device comprising:
a semiconductor substrate having a plurality of trenches formed therein;
an insulating film formed on a bottom and a sidewall of at least one of said trenches;
a first cell plate electrode provided in said one of said trenches;
a first capacitor insulating film formed on said first cell plate electrode;
a storage electrode formed on said first capacitor insulating film, said storage electrode being connected with a source area of a switching transistor of a unit cell of said memory device;
a second capacitor insulating film formed on said storage electrode; and
a second cell plate electrode formed on said second capacitor insulating film, said first and second cell plate electrodes being connected with each other and supplied with a given bias voltage from an external circuit.

5,047,816

## SELF-ALIGNED DUAL-GATE TRANSISTOR

Yongbum P. Cuevas, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Aug. 21, 1990, Ser. No. 570,942
Int. Cl.[5] H01L *29/78, 29/68, 29/92*
U.S. Cl. 357—23.14 2 Claims



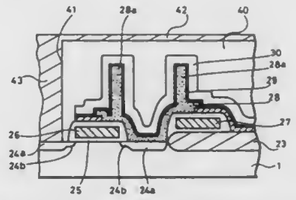

1. A semiconductor transistor comprising:
an MOS transistor device formed in a semiconductor substrate of one type and having a source and drain of the opposite type, a channel area between said source and drain, a first gate overlying a first portion of said channel area abutting said source, a second gate overlying a second portion of said channel area abutting said drain, and a third gate overlying a third portion of said channel area which is between said first and second portions of said channel area, said third gate partially overlying said first and second gates; said third gate connected to said first gate so that said first and third gates together form a single gate of said MOS transistor device.

5,047,817

## STACKED CAPACITOR FOR SEMICONDUCTOR MEMORY DEVICE

Wataru Wakamiya; Yoshinori Tanaka; Takahisa Eimori; Hiroji Ozaki; Hiroshi Kimura, and Shinichi Satoh, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1989, Ser. No. 364,033
Claims priority, application Japan, Jun. 10, 1988, 63-144311; Mar. 30, 1989, 1-83171
Int. Cl.[5] H01L *29/68, 29/78*
U.S. Cl. 357—23.6 14 Claims




1. A capacitor of a semiconductor memory device, comprising:
a semiconductor substrate having a conductive region on a major surface thereof,
an insulating layer formed on a major surface of said semiconductor substrate, a gate electrode of said memory device being formed above said major surface through a portion of said insulating layer,
a first electrode layer formed extending on a major surface of said insulating layer and on said conductive region;
a dielectric layer covering a surface of said first electrode layer, and
a second electrode layer formed on a surface of said dielectric layer,
characterized in that a lower surface of a portion of said first electrode layer in contact with an upper surface of said insulating layer has a step-shaped transition, viewed along a section passing through a central portion of said first electrode layer, formed above and overlapping said gate electrode.

5,047,818

## SEMICONDUCTOR MEMORY DEVICE HAVING BURIED STRUCTURE TO SUPPRESS SOFT ERRORS

Katsuhiro Tsukamoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

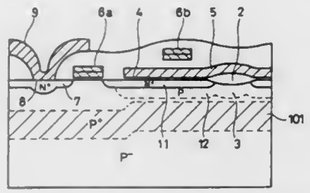
Continuation of Ser. No. 146,686, Jan. 20, 1988, abandoned. This application Feb. 28, 1991, Ser. No. 662,989
Claims priority, application Japan, Feb. 19, 1987, 62-37482
Int. Cl.[5] H01L *27/68, 29/92, 27/02*
U.S. Cl. 357—23.6 14 Claims

1. A semiconductor memory device comprising:
a semiconductor substrate of a certain conductivity type having a main surface, with said substrate having a prescribed impurity concentration for said certain conductivity type;
a charge storage capacitor and a write/read transistor having a gate formed on said main surface; and
a continuous buried layer formed in said substrate having an impurity concentration higher than that in said substrate for said certain conductivity type, wherein said buried

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layer is formed at a first depth beneath the capacitor and at a second depth greater than the first depth beneath said



transistor gate, said continuous buried layer being vertically separated from said capacitor and said transistor.

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**5,047,819**

## AMORPHOUS-SILICON THIN FILM TRANSISTOR ARRAY SUBSTRATE

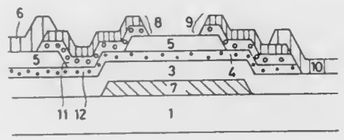
**Sakae Tanaka, and Yoshiaki Watanabe, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 306,372, Feb. 3, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 551,688**

**Claims priority, application Japan, Feb. 26, 1988, 63-43576**

**Int. Cl.[5] H01L** *45/00, 27/12, 27/01, 23/48*

**U.S. Cl. 357—23.7** **4 Claims**



1. In a reverse staggered amorphous silicon thin film transistor array substrate including an array of amorphous silicon thin film transistors having source and gate electrodes, gate wirings connected to the gate electrodes of said amorphous silicon thin film transistors, a gate insulating layer deposited on said gate wirings and gate electrodes, source wirings extending in a given direction, having a given width and arranged to cross said gate wirings to define a plurality of cross overs, an amorphous silicon layer deposited on said gate insulating layer at said cross overs, a protective insulation layer deposited on said amorphous silicon layer at said cross overs and having a greater width than said given width, said source wiring being deposited on said protective insulation layer at said cross overs, said source wirings being connected to the source electrodes of said amorphous silicon thin film transistors at locations spaced from said cross overs, said source wiring being of a different material than said source electrodes, said substrate comprising an amorphous-silicon thin film transistor array substrate, the improvement wherein said amorphous silicon layer is deposited on said gate insulating layer at said locations, said protective insulation layer is deposited on said amorphous silicon layer at said locations, said source electrode is formed on said protective insulation layer at said locations, said source wiring is formed on said source electrode at said locations, whereby said protective insulation layer and amorphous silicon layer extend from said cross overs in the direction of said source wiring at least as far as said source electrodes, whereby level changes in said source wiring adjacent said cross overs are minimized.

**5,047,820**

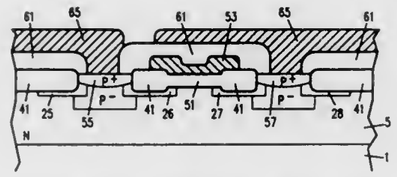
## SEMI SELF-ALIGNED HIGH VOLTAGE P CHANNEL FET

**Martin E. Garnett, Los Gatos, Calif., assignor to Micrel, Inc., Sunnyvale, Calif.**

**Continuation of Ser. No. 244,207, Sep. 14, 1988, abandoned. This application May 11, 1990, Ser. No. 523,289**

**Int. Cl.[5] H01L** *29/10, 29/68, 29/06*

**U.S. Cl. 357—23.8** **7 Claims**



1. A semi self-aligned semiconductor device comprising:
- a semiconductor body of a first conductivity type and having a principal surface;
- a source region of a second conductivity type opposite the first conductivity type formed in the semiconductor body and extending to the principal surface of the semiconductor body;
- a drain region of the second conductivity type formed in the semiconductor body spaced apart from the source region and extending to the principal surface of the semiconductor body;
- a first deep well region of the second conductivity type formed in the semiconductor body surrounding the source region and having a doping level different than that of the source region;
- a second deep well region of the second conductivity type formed in the semiconductor body surrounding the drain region and having a doping level different than that of the drain region;
- a first field region of the second conductivity type formed in the semiconductor body having a doping level different than that of the source region and surrounding the source region at the principal surface and extending laterally beyond the first deep well region;
- a second field region of the second conductivity type formed in the semiconductor body having a doping level different than that of the drain region and surrounding the drain region of the principal surface and extending laterally beyond the second deep well region;
- a first field oxide region overlying the first field region;
- a second field oxide region overlying the second field region and spaced apart from the first field oxide region;
- only a single conductive gate layer overlying the principal surface and extending over said first and second field oxide regions; and
- a channel region having an effective length defined by a distance between the first and second field regions.

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**5,047,821**

## TRANSFERRED ELECTRON III-V SEMICONDUCTOR PHOTOCATHODE

**Kenneth A. Costello, Palo Alto; William E. Spicer, Stanford, and Verle W. Aebi, Menlo Park, all of Calif., assignors to Intevac, Inc., Santa Clara, Calif.**

**Filed Mar. 15, 1990, Ser. No. 494,044**

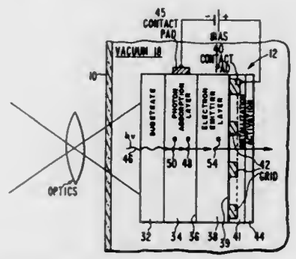
**Int. Cl.[5] H01L** *27/14, 31/00, 29/161, 45/00*

**U.S. Cl. 357—30** **19 Claims**

1. A transferred electron III-V semiconductor photocathode comprising:
- a p-type III-V semiconductor layer, for emitting electrons in response to a photon flux input;



- a grid mesh formed over the exposed surface of the p-type III-V semiconductor layer;
- an activation layer formed on the remaining exposed surface



of the semiconductor layer lowering the work function of the semiconductor layer;
- a Schottky barrier formed between the activation layer and the semiconductor layer.

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**5,047,822**

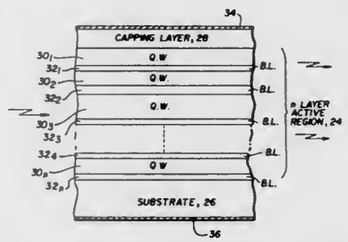
## ELECTRO-OPTIC QUANTUM WELL DEVICE

**John W. Little, Jr., Wheaton, and Richard P. Leavitt, Silver Spring, both of Md., assignors to Martin Marietta Corporation, Bethesda, Md.**

**Filed Mar. 24, 1988, Ser. No. 172,518**

**Int. Cl.[5] H01L** *27/14, 31/00*

**U.S. Cl. 357—30** **9 Claims**



1. A semiconductor device for modifying optical transmission comprising:
- a substrate;
- a multilayered semiconductor quantum well structure located on said substrate and including a plurality of pairs of quantum well layers of mutually difference widths separated from each other by a respective semiconductor barrier layer;
- an outer capping layer on said semiconductor structure, said quantum well structure being located intermediate said substrate and capping layer thereby;
- means for applying an electric potential across said electric field across said quantum well structure which when applied generates an electric field across said quantum well layers and operates to bring the electron sub-band energies of said quantum well layers of different widths into and out of resonance, thereby allowing excitons in the wells to undergo resonant field ionization, wherein electrons tunnel back and forth between said wells causing an alteration of the coefficient of light absorption of wavelengths in the region of the excitonic absorption feature; and
- means for directing optical energy from and external source to said plurality of pairs of quantum layers substantially parallel to the interfaces between contiguous layers of said semiconductor structure whereby light transmitted through said structure will undergo a phase shift due to resonant field ionization of quantum confined excitons.

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**5,047,823**

## CIRCUIT STRUCTURE HAVING A LATERAL BIPOLAR TRANSISTOR AND ITS METHOD OF MANUFACTURE

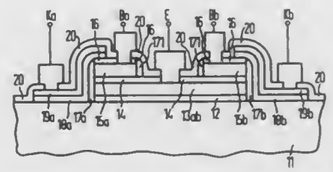
**Ludwig Treitinger, and Emmerich Bertagnolli, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Apr. 16, 1990, Ser. No. 509,308**

**Claims priority, application European Pat. Off., May 11, 1989, 89108511.0**

**Int. Cl.[5] H01L** *21/265*

**U.S. Cl. 357—34** **26 Claims**



1. A circuit structure including at least one bipolar transistor which comprises a base, an emitter and a collector, said circuit structure comprising:
- a silicon substrate including a substrate surface;
- a first insulating layer disposed on a first portion of said substrate surface;
- an $n^+$-doped silicon emitter layer disposed on said first insulating layer, and an emitter terminal disposed on said $n^+$-doped silicon emitter layer, said emitter layer including a sidewall extending perpendicular to said substrate surface;
- a second insulating layer disposed on said $n^+$-doped silicon emitter layer;
- a p-doped silicon base layer covering said sidewall of said $n^+$-doped silicon emitter layer and extending perpendicular to said substrate surface, said base layer constituting the base of the at least one bipolar transistor;
- a highly-doped silicon base terminal layer disposed on a portion of said second insulating layer electrically contacting said p-doped silicon base layer and constituting a base terminal;
- an n-doped silicon collector layer disposed on a second portion of said substrate surface and constituting the collector of the at least one bipolar transistor;
- a collector terminal disposed on said further n-doped silicon collector layer;
- a passivation layer covering the at least one transistor and comprising a plurality of holes therethrough respectively extending to said collector terminal, said emitter terminal and said base terminal; and
- a plurality of electrical contacts each comprising metal filling the respective hole and in electrical contact with the area of the respective terminal exposed by the respective hole.

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**5,047,824**

## REVERSE CONDUCTING GATE TURN-OFF THYRISTOR

**Futoshi Tokunoh, and Katsumi Sato, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 27, 1989, Ser. No. 343,587**

**Claims priority, application Japan, Jan. 31, 1989, 1-21673**

**Int. Cl.[5] H01L** *29/74, 29/747*

**U.S. Cl. 357—38** **11 Claims**

1. A reverse conducting gate turn-off thyristor, comprising:
- a first conductivity type first semiconductor layer having a first conductivity and first and second major surfaces;

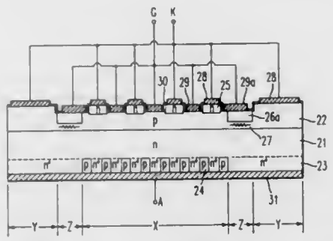
VOL 1130 ISS 2 SE 10 1991 UMI



a second conductivity type second semiconductor layer formed on said first major surface of said first semiconductor layer and having a second conductivity different from said first conductivity;

a separating layer formed in said second semiconductor layer from a surface thereof to a predetermined depth of said second semiconductor layer for electrically separating said second semiconductor layer into first and second regions, said separating layer being positioned between said first and second regions and comprising one of an insulation material and a high resistance material:

a second conductivity type third semiconductor layer formed on a portion of said second major surface of said first semiconductor layer adjacent to said first region of said second semiconductor layer;




a first conductivity type fourth semiconductor layer formed on said first region of said second semiconductor layer;

a first electrode formed both on said third semiconductor layer and a portion of said second major surface of said first semiconductor layer adjacent to said second region of said second semiconductor layer;

a second electrode formed both on said fourth semiconductor layer and said second region of said second semiconductor layer; and

a third electrode formed both on said first region of said second semiconductor layer and said separating layer, said third electrode being formed directly on said separating layer.

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**5,047,825**

**SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A DECODER PORTION OF COMPLEMENTARY MISFETS EMPLOYING MULTI-LEVEL CONDUCTING LAYER AND A MEMORY CELL PORTION**

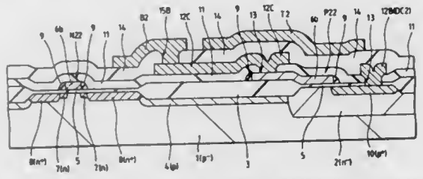
**Kazuo Yasaka, Kodaia; Yntaka Shinagawa, Iruma, and Toru Miyamoto, Fuchuu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering, Ltd., both of Tokyo, Japan**

**Division of Ser. No. 361,347, Jun. 5, 1989, Pat. No. 4,916,162. This application Feb. 27, 1990, Ser. No. 485,598**

**Claims priority, application Japan, Jun. 9, 1988, 63-142724**

**Int. Cl.[5] H01L** *27/02, 27/10, 23/48*

**U.S. Cl. 357—42** **27 Claims**



1. A semiconductor device having a decoder circuit for a memory, said semiconductor device comprising:

a semiconductor substrate;

an address line having a pair of complementary address signal lines which are disposed over said semiconductor substrate;

a cell which includes a decoder circuit for a memory and which is comprised of a first MISFET of a first conductivity type and a second MISFET of a second conductivity type, said cell being formed on said semiconductor substrate; and

a conductor layer which is connected to gate electrodes of said first and second MISFETs and which is extended so as to underlie a region where said pair of complementary address signal lines are respectively to be formed, wherein said conductor layer is electrically connected to one of said complementary address signal lines.

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**5,047,826**

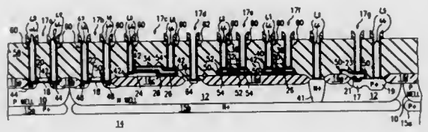
**GIGAOHM LOAD RESISTOR FOR BICMOS PROCESS**

**Stephen A. Keller, Sugarland, and Rajiv R. Shah, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Jun. 30, 1989, Ser. No. 375,080**

**Int. Cl.[5] H01L** *27/02, 29/68, 29/78, 29/04*

**U.S. Cl. 357—42** **4 Claims**



1. A BiCMOS integrated circuit including a highly resistive load, comprising:

a semiconductor substrate;

a first doped region formed in said substance, defining the base of a bipolar transistor;

a first conductive layer overlying said substrate, a first portion of said first conductive layer defining the gate of a PMOS transistor, a second portion of said first conductive layer defining the gate of an NMOS transistor, a third portion of said first conductive layer overlying said first doped region and defining the emitter of the bipolar transistor and a fourth portion of the first conductive layer defining the first plate of a capacitor;

a dielectric layer formed over said first plate of said capacitor;

a resistive amorphous silicon layer having a first portion formed over said dielectric layer to form a second plate of the capacitor and a second portion formed over the substrate to form a resistor body;

second doped regions formed in said substrate adjacent said PMOS gate and said NMOS gate, said doped regions operable as source and drain regions for the NMOS and PMOS transistors;

a third region formed in said second plate;

fourth doped regions formed in said second portion of said amorphous silicon layer to form the head regions of the resistor; and

a fifth doped region formed in said substrate adjacent said first doped region, said fifth doped region defining the collector of the bipolar transistor.



**5,047,827**

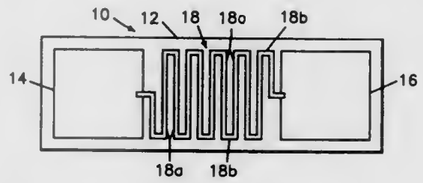
**INTEGRATED CIRCUIT RESISTOR FABRICATION USING FOCUSED ION BEAM**

**William M. Clark, Jr., Thousand Oaks; Gary M. Atkinson, Santa Monica; Wing Y. Lum, San Diego, and James R. Herring, San Marcos, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 20, 1990, Ser. No. 569,690**

**Int. Cl.[5] H01L** *27/02, 27/10;* **H01C** *3/10, 7/22*

**U.S. Cl. 357—51** **20 Claims**




1. An integrated circuit resistor, comprising:

a substrate; and

a doped region formed in and having a lower electrical sheet resistance than the substrate, the doped region having a boustrophedonic shape and including at least one section formed by implantation with a focused ion beam, said at least one section including substantially the entire doped region, the length of the doped region being substantially between 10 and 100 times the width of the boustrophedonic shape thereof.

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**5,047,828**

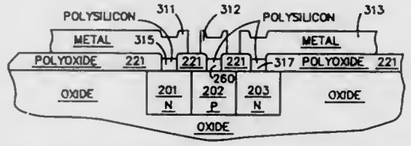
**PNP TYPE LATERAL TRANSISTOR WITH MINIMAL SUBSTRATE OPERATION INTERFERENCE**

**Sidney I. Soclof, San Gabriel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Continuation-in-part of Ser. No. 698,217, Jan. 31, 1985, abandoned, which is a division of Ser. No. 558,072, Dec. 5, 1983, Pat. No. 4,580,331, which is a continuation-in-part of Ser. No. 279,482, Jul. 1, 1981, abandoned. This application Jun. 24, 1987, Ser. No. 66,663**

**Int. Cl.[5] H01L** *29/72, 29/06*

**U.S. Cl. 357—55** **5 Claims**




1. An array of sub-micron dimensioned PNP-type lateral transistors formed in a substrate doped N-type, each comprising in combination:

spaced apart slots in the substrate through selected sides of which N+-type doping is received into the adjacent substrate and driven in followed by P or P+ doping driven in through opposed sides;

said spaced apart slots comprising spaced apart pairs of slots orthogonally related to further pairs of slots with each pair of slots and each further pair of slots bounding a portion of the substrate comprising a region between said opposed sides;

said slots filled with field oxide and surrounding each said region where a transistor will be formed;

said P+ doping on the inner sides of said spaced apart slots within said regions comprising an emitter and a collector electrode area;

said N+ doping and the N substrate in said region between the P+ doping comprising a graded base electrode area;

electrical contacts on each P+ electrode area and on the graded N+N electrode area; and,

each contact measuring down to 0.7 micron across.

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**5,047,829**

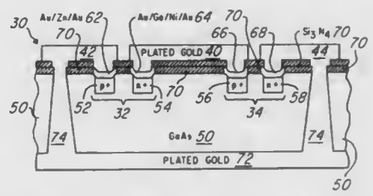
**MONOLITHIC P-I-N DIODE LIMITER**

**David J. Seymour, Plano; David D. Heston, Dallas, and Randall E. Lehmann, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Oct. 30, 1986, Ser. No. 924,948**

**Int. Cl.[5] H01L** *29/12*

**U.S. Cl. 357—58** **2 Claims**




1. A distributed diode limiter, comprising:

(a) first and second conductors on a surface of a semiconductor substrate, said conductors forming a planar transmission line on said surface with said second conductor grounded;

(b) a first region in said semiconductor substrate at said surface and along and electrically contacting said first conductor, said first region doped a first conductivity type; and

(c) a second region in said semiconductor substrate at said surface and along and electrically contacting said second conductor, said second region doped a second conductivity type opposite said first type, said first region and said second region separated by an undoped region to form a first distributed p-i-n diode.

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**5,047,830**

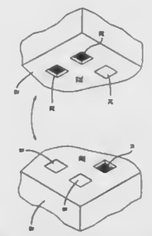
**FIELD EMITTER ARRAY INTEGRATED CIRCUIT CHIP INTERCONNECTION**

**Dimitry G. Grabbe, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed May 22, 1990, Ser. No. 526,877**

**Int. Cl.[5] H01L** *23/48, 29/44, 29/52*

**U.S. Cl. 357—68** **7 Claims**



1. An assembly for providing a separable electrical path between an area on one substrate and an area on another substrate, comprising:

a first substrate (10) having a first planar surface (20);

a planar film (18) of conductive material covering a first predetermined area of said first planar surface (20);

a second substrate (12) having a second planar surface (22), said second substrate being formed with a second prede-

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termined area (28) recessed from said second planar surface, said recessed area having a floor, and a plurality of tapered projections (32) extending from said floor toward but not beyond said second planar surface, the distal ends of said projections lying substantially along a plane parallel to and spaced from said second planar surface; and

means (34, 38, 40, 44, 46) for separably securing said first substrate to said second substrate with said first and second planar surfaces being in parallel superposed relationship and said first and second areas in registration one with the other.

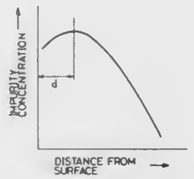
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**5,047,831**

**REDUCED RESISTANCE CONTACT REGION FOR SEMICONDUCTOR DEVICE**

**Toshiharu Katayama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 1, 1989, Ser. No. 444,358**
**Claims priority, application Japan, Dec. 5, 1988, 63-308082**
**Int. Cl.[5] H01L** *23/48, 29/40, 29/44, 29/52*
**U.S. Cl. 357—68** **6 Claims**




1. A semiconductor device, comprising:

a substrate having a major surface;

an impurity region formed in the major surface of said substrate, an impurity concentration profile of said impurity region having a single peak impurity concentration value spaced a predetermined distance from the major surface of said substrate and decreasing monotonically therefrom as a function of distance from the major surface of said substrate;

a recess formed in the major surface of said substrate to a depth corresponding to said peak impurity concentration value to provide a contact region of said substrate; and

a conducting layer having a lower surface bound by end surfaces, said conducting layer being formed on said substrate and in contact with said contact region, the lower surface of said conducting layer coinciding with a region of said impurity region displaced from the major surface of said substrate and corresponding to said single peak inpurity concentration, opposite end surfaces of said conducting layer being formed at right angles to said lower surface.

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**5,047,832**

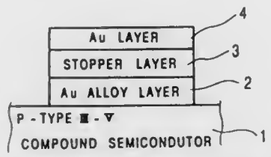
**ELECTRODE STRUCTURE FOR III-V COMPOUND SEMICONDUCTOR ELEMENT AND METHOD OF MANUFACTURING THE SAME**

**Ichiro Tonai, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan**

**Filed Mar. 8, 1990, Ser. No. 489,801**
**Claims priority, application Japan, Mar. 10, 1989, 1-59400**
**Int. Cl.[5] H01L** *23/48*
**U.S. Cl. 357—71** **25 Claims**

1. An electrode structure for a p-type III-V compound semiconductor element, comprising:

an Au alloy layer formed on a p-type III-V compound semiconductor, said Au alloy layer containing at least one of Zn, Cd, Mg, and Be in addition to Au,




a stopper layer formed directly onto said Au alloy layer, said stopper layer consisting essentially of Ti or Cr, and

an Au layer formed directly onto said stopper layer.

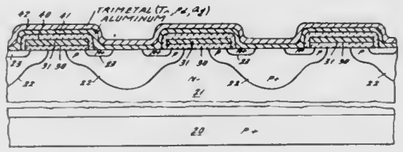
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**5,047,833**

**SOLDERABLE FRONT METAL CONTACT FOR MOS DEVICES**

**Herbert J. Gould, Sherman Oaks, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.**

**Filed Oct. 17, 1990, Ser. No. 599,148**
**Int. Cl.[5] H01L** *23/54*
**U.S. Cl. 357—71** **9 Claims**




1. A MOSGATE structure having a solderable front metal contact; said MOSGATE structure comprising a thin flat chip of silicon having a front surface and a back surface, a first main contact pad on said front surface, a control contact pad on said front surface and spaced from and insulated from said first main contact pad, and a solderable second main contact area extending across the full surface of said back surface; said main contact pad area disposed atop a plurality of spaced junctions in the front surface of said thin flat chip of silicon which define at least a portion of said MOSFET structure, a solderable mass on said contact pad for receiving a main power lead by soldering to said main contact pad, and an amorphous silicon coating on said front surface to define a high voltage termination for said chip; said main contact pad being exposed through a window in said amorphous silicon coating; said amorphous silicon coating being non-wettable by solder and acting as a dam for containing solder on said main contact pad area.

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**5,047,834**

**HIGH STRENGTH LOW STRESS ENCAPSULATION OF INTERCONNECTED SEMICONDUCTOR DEVICES**

**Caroline A. Kovac, Ridgefield, Conn., and Ismail C. Noyan, Peekskill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

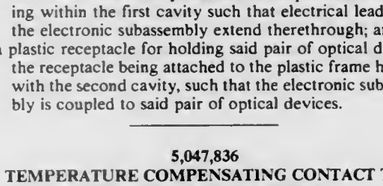
**Continuation of Ser. No. 368,740, Jun. 20, 1989, abandoned. This application Aug. 27, 1990, Ser. No. 574,393**
**Int. Cl.[5] H01L** *23/28, 23/48*
**U.S. Cl. 357—72** **5 Claims**

1. An electronic assembly comprising:

a semiconductor device having a surface area with electrical contact locations, said semiconductor device being of a material taken from the group of Si and GaAs,

at least one external electrical connecting member having an inner and outer end, each said inner end being bonded to a contact location on said semiconductor device,

a quantity of epoxy immobilization material positioned exclusively in the immediate vicinity of each connecting member bond at each contact location, the remaining portion of said surface area of said device being free of epoxy and,



a layer of silicone encapsulating material covering the entirety of said epoxy free surface area and extending over said epoxy material.



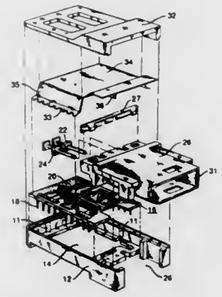
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**5,047,835**

**LIGHTWAVE PACKAGING FOR PAIRS OF OPTICAL DEVICES**

**Peter C. Chang, Allentown, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Dec. 26, 1989, Ser. No. 457,135**
**Int. Cl.[5] H01L** *23/02, 33/00, 31/16;* **G02B** *6/30*
**U.S. Cl. 357—74** **20 Claims**



1. A lightwave communication package comprising:

a pair of semiconductor optical devices;

a plastic frame housing including a first cavity and a second cavity;

an electronic subassembly, including active semiconductor devices for operation of said pair of optical devices, the electronic subassembly attached to the plastic frame housing within the first cavity such that electrical leads from the electronic subassembly extend therethrough; and

a plastic receptacle for holding said pair of optical devices, the receptacle being attached to the plastic frame housing with the second cavity, such that the electronic subassembly is coupled to said pair of optical devices.

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**5,047,836**

**TEMPERATURE COMPENSATING CONTACT TO AVOID MISREGISTRATION**

**Futoshi Tokunoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 278,469, Dec. 1, 1988, abandoned. This application Oct. 2, 1990, Ser. No. 593,383**
**Claims priority, application Japan, Dec. 3, 1987, 62-308055**
**Int. Cl.[5] H01L** *23/42, 23/44, 23/46, 23/02*
**U.S. Cl. 357—79** **5 Claims**

1. A semiconductor device comprising:

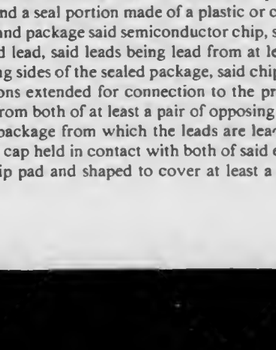
semiconductor element having first and second electrodes respectively on first and second regions of one surface of said semiconductor element;

a temperature compensator provided with a through hole in a region corresponding to said second electrode, said temperature compensator having a first surface arranged to face a surface of said first electrode;

a first external electrode having a cavity defined in a region corresponding to said second electrode and having one surface arranged to face a second surface of said temperature compensator;

a second external electrode arranged in a space region defined by said through hole and said cavity to face a surface of said second electrode;

an insulator interposed between the outer side surface of said second external electrode and the inner side surface of said cavity and between the outer side surface of said second external electrode and the inner side surface of said through hole to locate said second external electrode in



prescribed positional relation to said first external electrode and said temperature compensator, wherein said insulator is formed by a substantially cylindrical elastic member which is C-shaped in section and has an outer diameter larger than the inner diameter of said cavity of said first external electrode and larger than the inner diameter of said through hole of said temperature compensator in order to form a friction fit; and

pressure connection means for applying pressure to said semiconductor element and said first external electrode to pressure-connect junction surfaces between said first electrode and said temperature compensator, between said temperature compensator and said first external electrode and between said second electrode and said second external electrode, respectively.

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**5,047,837**

**SEMICONDUCTOR DEVICE WITH HEAT TRANSFER CAP**

**Makoto Kitano, Niibari; Takahiro Daikoku, Ushiku; Sueo Kawai, Nishiibaraki; Ichio Shimizu, Sawa; Kazuo Yamazaki, Isesaki; Asao Nishimura, Ushiku; Hideo Miura, and Akihiro Yaguchi, both of Niihari, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

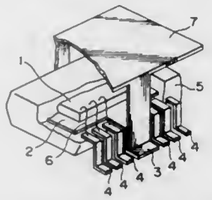
**Filed Aug. 3, 1989, Ser. No. 388,943**
**Claims priority, application Japan, Aug. 15, 1988, 63-201844**
**Int. Cl.[5] H01L** *23/02*
**U.S. Cl. 357—81** **4 Claims**

1. A semiconductor device comprising:

a semiconductor package including a semiconductor chip, a chip pad on which said semiconductor chip is mounted, leads, and a seal portion made of a plastic or ceramic so as to seal and package said semiconductor chip, said chip pad and said lead, said leads being lead from at least a pair of opposing sides of the sealed package, said chip pad having extensions extended for connection to the printed circuit board from both of at least a pair of opposing sides of said sealed package from which the leads are lead; and

a metallic cap held in contact with both of said extensions of said chip pad and shaped to cover at least a portion of a

surface of said sealed package opposite to a surface facing said printed circuit board, and



wherein said cap and said extensions of said chip pad are provided with mating projections and recesses for locating them with respect to each other.

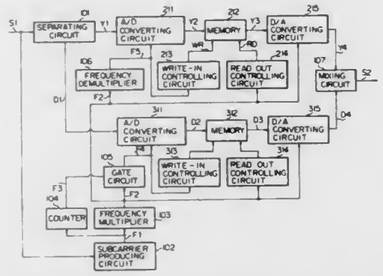
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**5,047,839**

## IMAGE SQUEEZING CIRCUIT FOR SQUEEZING ORDINARY-SIZED IMAGE INTO SMALLER AREA

**Akira Sawada, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Oct. 30, 1989, Ser. No. 429,142**
**Claims priority, application Japan, Oct. 31, 1988, 63-276464**
**Int. Cl.[5] H04N** *5/45, 9/74, 9/76*
**U.S. Cl. 358—22** **7 Claims**



1. An image squeezing circuit for producing an output color image carrying signal used to reproduce an image 1/m the size of an ordinary-sized image, m being an integer equal to or greater than 2, the output color image carrying signal being produced from an input color image carrying signal used to reproduce the ordinary-sized image, which image squeezing circuit comprises:

(a) means responsive to the input color image carrying signal for producing a color subcarrier signal;

(b) first sampling means for sampling a chrominance component of the input color image carrying signal every m cycles of the color subcarrier signal and at a rate which is n times the frequency of the color subcarrier signal to produce a sampled chrominance signal, n being an integer equal to or greater than 3;

(c) second sampling means for sampling a luminance component of the input color image carrying signal at a rate which is n/m times the frequency of the color subcarrier signal to produce a sampled luminance signal; and

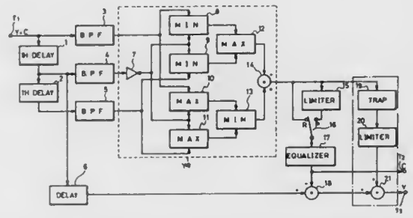
(d) output signal means responsive to the sampled chrominance signal and the sampled luminance signal for producing a reduced color image carrying signal which is 1/m the size of the input color image carrying signal.

**5,047,840**

## LUMINANCE SIGNAL/CHROMINANCE SIGNAL SEPARATING CIRCUIT AND A NOISE REDUCTION CIRCUIT USING A 3 LINE LOGICAL COMB FILTER

**Shigeru Miki, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan**

**Filed Jun. 25, 1990, Ser. No. 543,009**
**Claims priority, application Japan, Jun. 26, 1989, 1-163111**
**Int. Cl.[5] H04N** *9/78*
**U.S. Cl. 358—31** **8 Claims**



1. A luminance signal/chrominance signal separating circuit comprising:

means ($T_1$) for providing a color video signal including a luminance signal and a chrominance signal,

logical comb filter means for separating said color video signal into said luminance signal and said chrominance signal, wherein said logical comb filter means comprises:

a first bandpass filter means (3) for extracting the signal components of the chrominance signal band from said color video signal,

a first 1H delay means (1) for delaying said color video signal by 1 horizontal period,

a second bandpass filter means (4) for extracting the signal components of the chrominance signal band from the output of said first 1H delay means,

a second 1H delay means (2) for delaying the output of said first 1H delay means by 1 horizontal period,

a third bandpass filter means (5) for extracting the signal components of the chrominance signal band from the output of said second 1H delay means,

vertical correlator means (VR) for providing a signal including at least said chrominance signal in response to the outputs of said first, second, and third bandpass filter means, and

subtraction means (18) for subtracting the output of said vertical correlator means from the output of said first 1H delay means,

trapping means (19) for trapping the signal components of the chrominance signal band from the output of said vertical correlator means,

limiting means (20) for limiting the amplitude of the output of said trapping means, and

addition means (21) for adding the output of said limiting means to the output of said subtraction means to provide the result thereof as said luminance signal.

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**5,047,841**

## ENCODER FOR TELEVISION SIGNALS

**Roger N. Robinson, 3 Montpellier Court, St. Leonards Road, Windor, Berkshire, United Kingdom**

**Filed Oct. 28, 1988, Ser. No. 264,217**
**Int. Cl.[5] H04N** *11/12, 9/78*
**U.S. Cl. 358—31** **7 Claims**

1. An encoder for encoding color video signals into a composite color video signal, comprising:

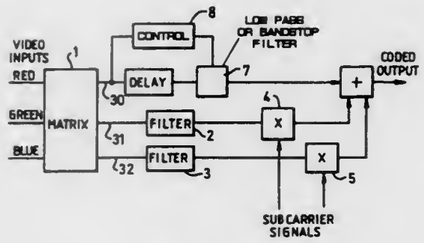
means for producing a luminance signal,

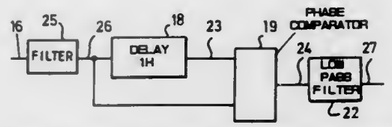
means for producing a chrominance signal by modulating a subcarrier;



a first filter for attenuating components of the luminance signal at or adjacent the frequency of the sub-carrier;

a control means for controlling said first filter, said control means comprising a second filter for passing luminance signal components around the sub-carrier frequency, first





means for delaying the output from said second filter and a phase comparator for comparing the output from said second filter and the output from said first delay means; and

means for combining the output of the first filter with the chrominance signal.

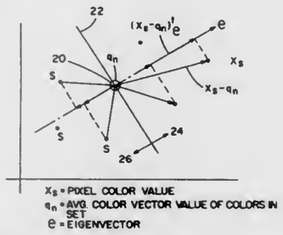
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**5,047,842**

## COLOR IMAGE DISPLAY WITH A LIMITED PALETTE SIZE

**Charles A. Bouman, Jr., West Lafayette, Ind., and Michael T. Orchard, Princeton, N.J., assignors to The Trustees of Princeton University, Princeton, N.J.**

**Filed Nov. 3, 1989, Ser. No. 431,487**
**Int. Cl.[5] B04N** *1/46*
**U.S. Cl. 358—75** **12 Claims**



$x_s$ = PIXEL COLOR VALUE
$q_n$ = AVG. COLOR VECTOR VALUE OF COLORS IN SET
e = EIGENVECTOR

12. A method for creating from a digitized color image, a tree structured partitioning of all pixels in the image into M disjoint sets, with the pixels in each set having similar color values, said method comprising the steps of:

a. Separating and assigning all pixels in the image into disjoint sets so as to minimize the differences between the respective pixel color values in each set;

b. selecting one of the sets created in step (a) which has the greatest variation of color values of assigned pixels, and separating and assigning all pixels in the selected set into new disjoint sets, so as to minimize the differences between the respective color values in each set;

c. continuing said selecting, separating and assigning actions, as defined in (b), for sets until a total of M disjoint sets have been derived; and

d. assigning to all pixels in a set, a mean color value calculated form all pixel colors in the set.

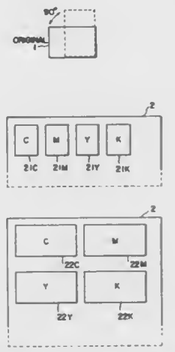
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**5,047,843**

## IMAGE READING METHOD

**Tadashi Miyakawa, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jul. 11, 1989, Ser. No. 378,099**
**Claims priority, application Japan, Jul. 13, 1988, 63-174150**
**Int. Cl.[5] H04N** *1/46*
**U.S. Cl. 358—75** **9 Claims**



1. An image reading method for printing an original image on a photosensitive material where an original image disposed on a planar surface is read by main scannings in a first direction and auxiliary scannings of lines in a second direction and the read image is outputted on a photosensitive material by exposure of an output image thereon, the method comprising the steps of:

inputting said original image, disposed on a planar surface, in a first orientation;

determining whether a scanning of said original image on said planar surface is preferred in said first orientation or a second orientation different from said first orientation according to the size of said output image and the size of said photosensitive material;

if said second orientation is preferred, rotating said planar surface having said original image disposed thereon so that said original image is in said second orientation; and

reading said original image after said determining step and any rotation, if necessary.

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**5,047,844**

## COLOR IMAGE PROCESSING APPARATUS

**Yoshinori Ikeda, Tokyo; Tetsuya Ohnishi, and Masatomo Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 22, 1989, Ser. No. 327,098**
**Claims priority, application Japan, Mar. 24, 1988, 63-069979**
**Int. Cl.[5] H04N** *1/46*
**U.S. Cl. 358—80** **18 Claims**

1. A color image processing apparatus comprising:

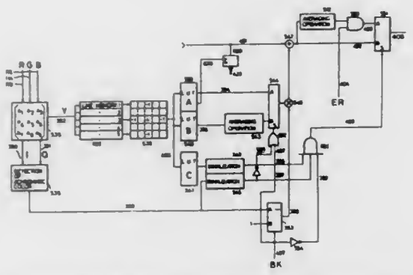
(a) discriminating means for discriminating an achromatic and line image portion within an image;

(b) reducing means for reducing a chromatic color compo-

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nent within an area near said achromatic and line image portion discriminated by said discriminating means; and



(c) suppressing means for suppressing a chromatic color component reduced by said reducing means.

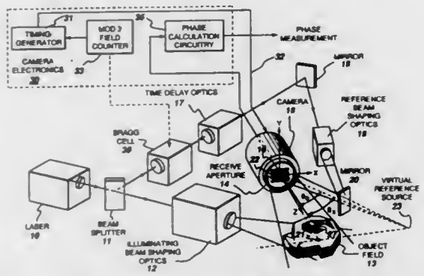
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**5,047,845**

**CHARGE-TRANSFER-DEVICE PLANAR ARRAY FOR DETECTING COHERENT-LIGHT PHASE**

**Harold W. Tomlinson, Scotia, and Gerald J. Michon, Waterford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 9, 1990, Ser. No. 594,507**
**Int. Cl.[5] H04N *13/00***
**U.S. Cl. 358—90** **13 Claims**



1. A solid state imager for sensing shifts in the phase of a hologram fringe pattern, said solid state imager comprising:
a bulk substrate of a semiconductor material of a first conductivity type, said bulk substrate having a first surface;
an epitaxial layer of a semiconductor material of a second conductivity type, said epitaxial layer having a first surface forming a semiconductive junction with the first surface of said bulk sustrate and having a second surface opposed to its first surface, said second conductivity type being opposite to said first conductivity type;
a layer of electrically insulating material having a first surface disposed against the second surface of said epitaxial layer and having a second surface opposed to its first surface;
electrodes of electrically conductive material disposed within said layer of electrically insulating material, said electrodes being essentially planar and parallel to the first surface of said bulk substrate;
means for making electrical connections to said electrodes via paths of electrically conductive material disposed within said layer of electrically insulating material;
a layer of optically opaque mask material disposed against the second surface of said layer of electrically insulating material and provided with windows therethrough arranged at regular intervals in parallel rows evenly spaced apart, said layer of electrically insulating material being thin enough in the vicinity of said windows for light to pass therethrough;
a plurality of photosensors disposed in a sensor plane along the second surface of said epitaxial layer, in spatial registration with the windows in said opaque mask, for generating respective electrical responses to impinging light;
an improvement wherein said electrodes of electrically conductive material and said means for making electrical connections to said electrodes are configured to provide
a first plurality of multiplier-free processors, each associated with a respective successive pair of adjacent photosensors occurring in a first spatial phasing along each of said rows, each of said first plurality of multiplier-free processors being located in said epitaxial layer near the second surface thereof in propinquity with its associated pair of adjacent photosensors so as to be shielded by said opaque mask from impinging light, said first plurality of multiplier-free processors for parallelly generating respective electrical responses descriptive of partial pixel by pixel correlations on successive fields of the responses of its associated pair of adjacent photosensors, said successive fields being identified by respective ones of consecutive ordinal numbers alternately odd and even; and
means for combining the electrical responses of said first plurality of multiplier-free processors to generate an electrical output signal from said imager.

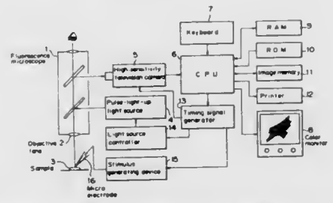
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**5,047,846**

**IMAGE PROCESSING EQUIPMENT WITH LIGHT SOURCE SYNCHRONIZED TO BLANKING INTERVAL OF VIDEO CAMERA**

**Shigeru Uchiyama, Hamamatsu; Hideji Fujiwake, Kyoto; Iwayo Nakagawa; Masahiko Hirano, both of Hamamatsu; Yoshinori Mizuguchi, Hamamatsu; Hideshi Oishi, Hamamatsu, and Norikazu Sugiyama, Hamamatsu, all of Japan, assignors to Hamamatsu Photonics K.K., Japan**

**Filed Aug. 20, 1990, Ser. No. 570,249**
**Claims priority, application Japan, Aug. 25, 1989, 1-219780**
**Int. Cl.[5] H04N *7/18, 5/335***
**U.S. Cl. 358—93** **3 Claims**



1. An image processing equipment for measuring a change in a condition of a sample over time using a high-sensitivity television camera, said image processing equipment comprising:
a pulse-light-up light source for emitting a pulse excitation light during a blanking period of said high-sensitivity television camera;
a stimulus generating device for imparting a stimulus to the sample at a time preceding the time at which the light is emitted from said pulse-light-up light source; and
a timing signal generator for supplying timing signals to said high-sensitivity television camera, pulse-light-up source and stimulus generating device.

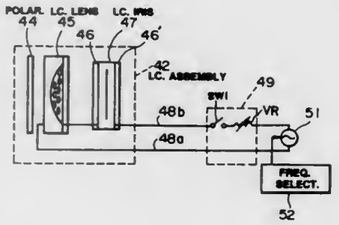


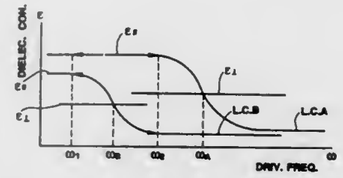
**5,047,847**

**ENDOSCOPE USING LIQUID CRYSTAL DEVICES DIFFERENT IN THE RESPONSE FREQUENCY IN THE IMAGE FORMING OPTICAL SYSTEM**

**Akitoshi Toda, Kunitachi; Hisanari Shimazu, Akishima; Akira Takano, Oume; Hirofumi Miyanaga, Hachioji; Susumu Takahashi, Kunitachi; Yoshinao Ohaki, Hachioji, and Yoshisada Aoki, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Aug. 21, 1989, Ser. No. 396,159**
**Claims priority, application Japan, Oct. 19, 1988, 63-263377**
**Int. Cl.[5] H04N *7/18;* A61B *1/04***
**U.S. Cl. 358—98** **20 Claims**





16. An imaging apparatus comprising:
an image forming optical system for forming an optical image of an object to be imaged;
an image receiving means arranged in a focal plane of said image forming optical system;
a liquid crystal assembly forming at least a part of said image forming optical system, said liquid crystal assembly formed of a plurality of liquid crystals showing a refractive index anisotropy for an incident light depending on molecule orientation and each liquid crystal having a different response frequency to driving signals for controlling said molecule orientation;
two signals lines for feeding said driving signals to said liquid crystal assembly;
a signal generating means for selectively outputting said driving signals different, at least, in frequency to said liquid crystal assembly through said signal lines; and
a control means for varying optical characteristics of said liquid crystal assembly by switching at least the frequency of the driving signals output from said signal generating means.

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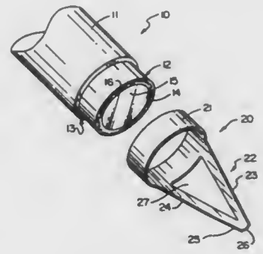
**5,047,848**

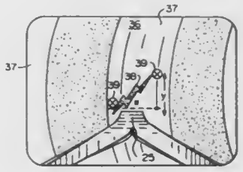
**ELASTOMERIC GAGE FOR BORESCOPE**

**Allan I. Krauter, Syracuse, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.**

**Filed Jul. 16, 1990, Ser. No. 552,574**
**Int. Cl.[5] H04N *7/18***
**U.S. Cl. 358—100** **14 Claims**

1. Gage for measuring size and distance of a target object viewed in a borescope probe which has a viewing head at a distal tip of a tubular probe member, the gage comprising a ring fitting removably over said distal tip and a resiliently





flexible ear projecting axially from said ring a predetermined distance distal of said viewing head.

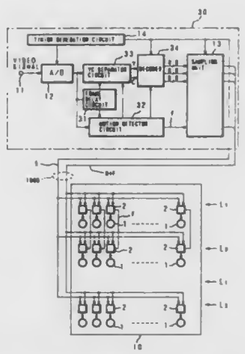
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**5,047,849**

**IMAGE DISPLAY APPARATUS WITH IMAGE TURBULENCE SUPPRESSION**

**Zenichiro Hara, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 18, 1990, Ser. No. 510,575**
**Claims priority, application Japan, Apr. 19, 1989, 1-97287**
**Int. Cl.[5] H04N *7/18***
**U.S. Cl. 358—105** **8 Claims**



1. An image display apparatus comprising:
display modules connected with a bus, each display module having a display part with pixels disposed in matrix form, means for driving each pixel based on a corresponding pixel data, a memory part corresponding to said display part, and means for converting the contents of said memory part to a brightness of a pixel of the display part corresponding thereto; and
a signal generating means supplying image information organized in a plurality of fields to each of said display module via said bus,

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said signal generating means detecting motion of the image information, appending a flag indicating the presence/absence of motion to each pixel data and transmitting the data to said display module,

said display module, when updating image information in one field, driving a pixel allocated to another field with a pixel data according to the presence/absence of motion as indicated by the flag of an adjacent pixel allocated to said one field, said pixel data being derived from the pixel data of said adjacent pixel allocated to said one field if the flag shows presence of motion, and being said pixel's own pixel data from a preceding field if the flag shows absence of motion.

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**5,047,850**

## DETECTOR FOR DETECTING VECTOR INDICATING MOTION OF IMAGE

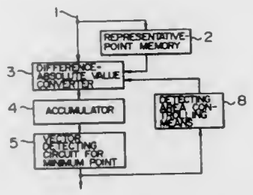
**Hirofumi Ishii, Moriguchi, and Atsushi Morima, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Mar. 1, 1990, Ser. No. 486,912**

**Claims priority, application Japan, Mar. 3, 1989, 1-052286; Mar. 14, 1989, 1-061780**

**Int. Cl.[5] H04N** *7/18, 7/12*

**U.S. Cl. 358—105** **14 Claims**




1. An image-motion vector detector for detecting a vector indicating the motion of an image, comprising:

means for deriving correlative values of image data between an input TV signal of a current field and that of a previous field in a correlative value determination area for detecting a motion vector and to detect an optimum point of said correlative values as an image-motion vector;

means for predicting an area for a motion vector of a current field based on motion vectors obtained before the current field; and

means for changing said correlative value determination area for detecting a motion vector based on an output of said predicting means,

wherein said predicting means comprises means for deriving a predicted motion vector of the current field by time-sequence signal processing of the motion vectors obtained before the current field and means for checking a frequency component of a change with time of the motion vectors obtained before the current field and controlling the time-series signal processing performed by said means for deriving said predicted motion vector based on the checking result.

**5,047,851**

## PROCESS AND DEVICE FOR DETECTING AND EVALUATING SURFACE CRACKS IN WORKPIECES

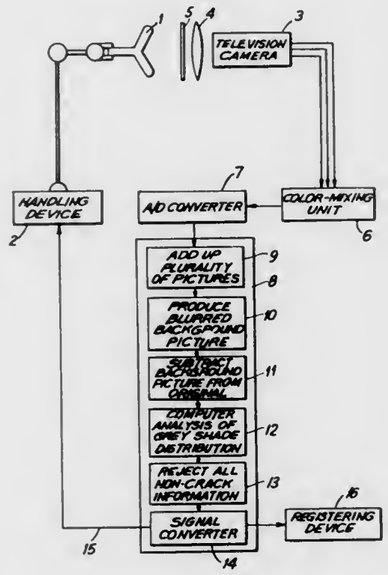
**Kurt Sauerwein, Erkrath; Hans P. Busse, Wuppertal; Rainer Link, Kerpen-Horrem; Helmut Wiacker, Hilden; Christian Stapf; Rüdiger Schulz, both of Wuppertal; Ekhard Stolzenberg, Wülfrath; Kurt Disselhorst, Solingen; Herbert Burghoff, Wermelskirchen; Karl Kirchesch, Düsseldorf, all of Fed. Rep. of Germany; James D. Lean, London; Laurence F. Topping, Romford, both of Great Britain, and Wolfgang Zindler, Dormagen, Fed. Rep. of Germany, assignors to Isotopen-Technik Dr. Sauerwein GmbH and Ford Werke AG, both of Köln-Niehl, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 249,356, Sep. 23, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 485,133**

**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731947**

**Int. Cl.[5] H04N** *7/18*

**U.S. Cl. 358—101** **9 Claims**




1. A device for detecting and evaluating surface cracks in workpieces, comprising:

workpiece handling means for holding a workpiece;

a color television camera provided so as to view the workpiece held in the handling means, the camera having an optical filter adapted to light emanating from a crack representation agent, the camera producing a picture output including the colors red, green and blue;

a color-mixing unit connected to the camera output for mixing the colors and producing a corresponding output;

an analog-digital signal converter provided as to convert the output of the color-mixing unit;

a digital picture processing unit having a picture store, the processing unit being provided so as to receive the converted output; and

a computer unit arranged so as to prepare and evaluate digital picture levels and having a control output connected to the workpiece handling device.



**5,047,852**

## ADAPTIVE TRANSFORM ENCODER FOR DIGITAL IMAGE SIGNAL IN RECORDING/REPRODUCING APPARATUS

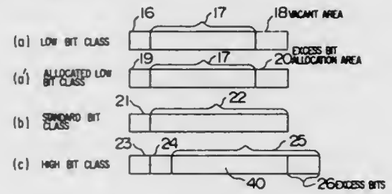
**Hiroyuki Hanyu, Katsuta; Nobukazu Doi, Hachioji; Seiichi Mita, Kanagawa; Morishi Izumita, Inagi, and Yoshizumi Eto, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 5, 1989, Ser. No. 375,727**

**Claims priority, application Japan, Jul. 22, 1988, 63-181901**

**Int. Cl.[5] H04N** *7/12, 7/04, 5/95*

**U.S. Cl. 358—133** **8 Claims**




1. An adaptive transform encoder for processing continuous digital signals for each fixed block, comprising:

means for orthogonal-transforming one block of digital input signals;

means for calculating an activity index of the orthogonal-transformed block;

means for comparing the activity index of the block with a predetermined reference and for classifying the block to a standard bit class having a predetermined number of bits when the activity index of the block is equal to the reference, classifying the block to at least one low bit class having a smaller number of bits than the predetermined number of bits of the standard bit class when the activity index of the block is smaller than the reference, and for classifying the block to at least one high bit class having a larger number of bits than the predetermined number of bits of the standard bit class when the activity index of the block is larger than the reference;

means for quantizing the input signal of the block with the number of bits designated by the bit class;

means for selecting a block of the low bit class from the quantized blocks;

allocation means for adding to the selected block of the low bit class data having more bits than the number of bits of the standard bit class of the block of the quantized high bit class to make the number of bits of the block of the low bit class and the number of bits of the block of the high bit class apparently equal to the number of bits of the block of the standard bit class; and

means for encoding the quantized block signal.

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**5,047,853**

## METHOD FOR COMPRESSSING AND DECOMPRESSING COLOR VIDEO DATA THAT USES LUMINANCE PARTITIONING

**Eric M. Hoffert, San Francisco, Calif., and Lee S. Mighdoll, Chagrin Falls, Ohio, assignors to Apple Computer, Inc., Cupertino, Calif.**

**Continuation-in-part of Ser. No. 495,428, Mar. 16, 1990. This application Mar. 19, 1990, Ser. No. 495,331**

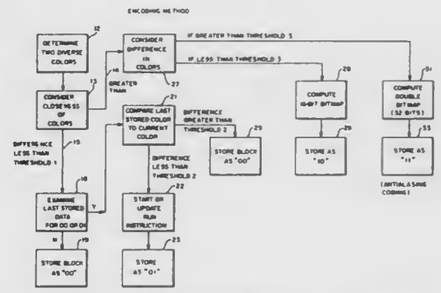
**Int. Cl.[5] H04N** *7/12*

**U.S. Cl. 358—133** **12 Claims**

1. In a compression method for compressing digital color video pixel data which uses luminance values for determining compressed color data where fewer colors are used to represent the compressed data than are found in the data presented for compression, an improvement comprising the steps of:

determining if the video pixel data presented for compression has duochrominance and isoluminance which are not within predetermined limits of duochrominance and isoluminance; and

representing said video data presented for compression by a




method which is substantially independent of relying on luminance values for determining colors used to represent the compressed data, when said duochrominance and isoluminance are not within said predetermined limits.

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**5,047,854**

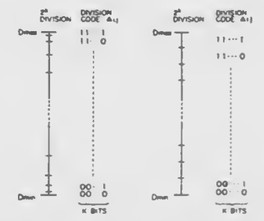
## IMAGE INFORMATION TRANSMISSION SYSTEM TRANSMITTING MAXIMUM AND MINIMUM VALUE DATA

**Yoshitsugu Iwabuchi, Atsugi, and Hisashi Ishikawa, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 28, 1989, Ser. No. 386,105**

**Int. Cl.[5] H04N** *7/12*

**U.S. Cl. 358—135** **9 Claims**




1. A method of transmitting image information, one frame of which is constituted by a plurality of pixel data, comprising:

(A) a first step of dividing the plurality of pixel data corresponding to the one-frame image information into a plurality of pixel blocks each having a predetermined number of pixel data as a unit pixel block;

(B) a second step of detecting maximum and minimum values represented by pixel data within each pixel block in units of pixel blocks divided in the first step, and outputting maximum value data representing the detected maximum value and minimum value data representing the detected minimum value;

(C) a third step of selecting one of a plurality of different quantization characteristics which have the same quantization bit number and different characteristics, in accordance with a difference between the maximum and minimum values of each pixel block detected in the second step, quantizing a level region between the maximum and minimum values to obtain a plurality of regions on the basis of the selected quantization characteristic, and outputting position data representing a correspondence between each pixel data within each pixel block and one of

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the plurality of divided regions in correspondence with the pixel data within each pixel block; and

(D) a fourth step of transmitting as unit block data the maximum and minimum value data output in units of pixel blocks in the second step and the position data output in correspondence with the pixel data within each pixel block in the third step.

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**5,047,855**

**PICTURE PICK-UP OR DISPLAY DEVICE FOR SUCCESSIVE SCANNING IN OPPOSING DIRECTION INCLUDES A CIRCUIT FOR ASSURING VERTICAL SYMMETRY OF THE VIDEO SIGNAL BEING DISPLAYED**

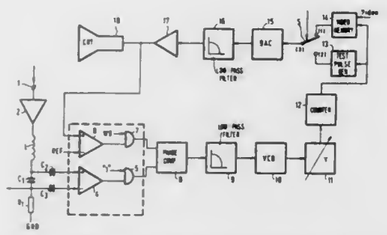
**Carlos C. R. Correa, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 22, 1990, Ser. No. 604,732**

**Claims priority, application Netherlands, Nov. 29, 1989, 8902939**

**Int. Cl.[5] H04N** *5/04*

**U.S. Cl. 358—139** **8 Claims**



1. A picture pick-up or display device for picking up a scene or for displaying a scene image, said device, comprising a line deflection circuit for generating a symmetrical line deflection current through a line deflection coil, a video signal processing circuit having a memory for storing video information and for alternately generating and supplying the video information of a line in one direction and of the subsequent line in the opposite direction, and a clock oscillator for generating a clock signal for reading the video information from the memory, the clock oscillator being incorporated in a control loop which further comprises a counter for counting pulses of the clock signal, and a phase comparison stage and measuring means for receiving a first signal from the line deflection circuit and a second signal from a signal generator which is also incorporated in the control loop for supplying the second signal at measuring instants, the control loop being adapted to cause the first and the second signal to occur substantially simultaneously at the measuring instants, characterized in that the measuring means comprise a maximum value detector for applying the first signal to the phase comparison stage substantially at the instant when the line deflection current has a maximum value, each measuring instant substantially coinciding with one count of the counter during the line blanking interval.

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**5,047,856**

**METHOD AND APPARATUS FOR SHARPENING TELEVISION PICTURES WHILE REDUCING INCIDENTAL NOISE**

**William G. Miller, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.**

**Filed May 8, 1990, Ser. No. 520,693**

**Int. Cl.[5] H04N** *5/14, 5/208*

**U.S. Cl. 358—166** **6 Claims**

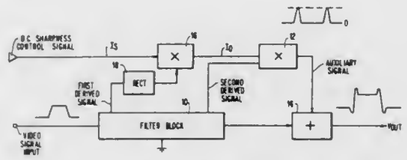
1. A method for reducing the transition times in a video signal, comprising the steps of

a) providing a first signal having a relatively constant amplitude;

b) deriving a first derived signal from said video signal;

c) shaping said first derived signal to derive a first shaped signal;

d) deriving a second derived signal from said video signal;



e) modulating said first signal with said first shaped signal so as to generate a modulated first signal;

f) multiplying said second derived signal with said modulated first signal so as to generate a second signal; and

g) adding said second signal in phase with said video signal so as to produce a video output signal having reduced transition times as compared to said video signal.

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**5,047,857**

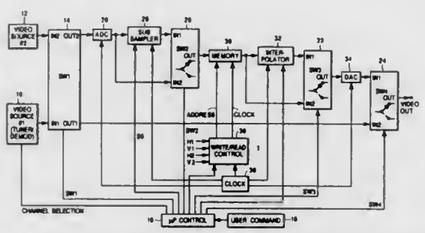
**TELEVISION SYSTEM WITH ZOOM CAPABILITY FOR AT LEAST ONE INSET PICTURE**

**David J. Duffield, and David L. McNeely, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.**

**Filed Apr. 20, 1989, Ser. No. 340,832**

**Int. Cl.[5] H04N** *5/262*

**U.S. Cl. 358—183** **25 Claims**



1. A method of operating a television system to provide an "instant-replay" feature, comprising the steps of:

compressing successive fields of a television signal;

storing successive ones of said compressed fields in respective sectors of a memory device;

retrieving ones of said stored compressed fields from said memory sectors in a repetitive sequence; and

expanding ones of said retrieved compressed fields in said repetitive sequence to produce a sequence of television fields.



**5,047,858**

**MULTIPLE IMAGE PROCESSING AND DISPLAY SYSTEM**

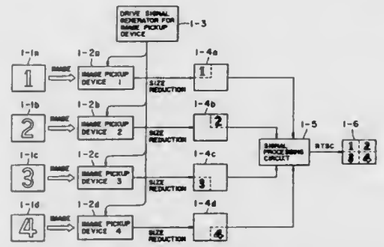
**Izumi Almonoya, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 30, 1989, Ser. No. 330,614**

**Claims priority, application Japan, Mar. 31, 1988, 63-80026**

**Int. Cl.[5] H04N** *5/45*

**U.S. Cl. 358—183** **8 Claims**



1. A method of displaying sub-frame images for a television system wherein image pickup signals are read out from a plurality of image pickup devices using vertical direction signal readout means and horizontal direction signal readout means, and a plurality of images picked up with the plurality of image pickup devices are reduced in size by processing the image pickup signals to display the reduced images on the screen of a single television monitor at the same time, comprising the steps of:

reading out said image signals of a predetermined number n of lines at the same time by using said vertical direction signal readout means, where n is a number larger than or equal to 1;

reading said image signals at a high speed within a period of one m-th of an effective horizontal scan period, by using said horizontal direction signal readout means, where m is a number larger than or equal to 1; and

determining the start timings for reading said image pickup signals from each of said image pickup devices in the vertical and horizontal directions, by using timing determining means, depending upon at which position on said display screen each said image picked up with each said image pickup device is to be displayed.

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**5,047,859**

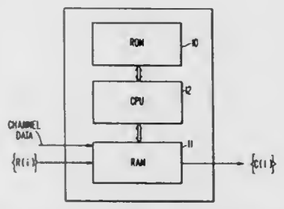
**METHOD AND APPARATUS FOR COMMUNICATION CHANNEL IDENTIFICATION AND SIGNAL RESTORATION**

**David Koo, Briarcliff Manor, N.Y., assignor to North American Philips Corporation, New York, N.Y.**

**Filed Oct. 9, 1990, Ser. No. 595,112**

**Int. Cl.[5] H04N** *7/08*

**U.S. Cl. 358—187** **14 Claims**



1. A method of communication channel identification, comprising:

transmitting a test signal T over a communication channel to be identified;

receiving a signal R which is the test signal T after it has passed through the communication channel; and

calculating a sequence of channel values

$$\left\{ C(p) = \sum_{q=1}^{Q} T^{-1}(p,q)R(q) \right\}$$

where $T^{-1}(p, q)$ is the (p, q)th element of the inverse of the test signal evolution matrix

$$[T(m,i)] = \begin{bmatrix} T(1) & 0 & 0 & 0 & \dots \\ T(2) & T(1) & 0 & 0 & \dots \\ T(3) & T(2) & T(1) & 0 & \dots \\ T(4) & T(3) & T(2) & T(1) & \dots \\ . & & & & \\ . & & & & \\ . & & & & \end{bmatrix}$$

{T(i)} is a sequence of values of the transmitted test signal and {R(i)} is a sequence of values of the received test signal.

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**5,047,860**

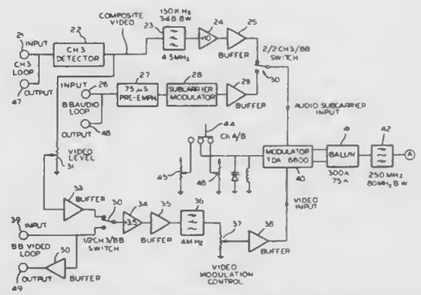
**WIRELESS AUDIO AND VIDEO SIGNAL TRANSMITTER AND RECEIVER SYSTEM APPARATUS**

**Gary Rogalski, 14310 68th Ave., Surrey, 2H5**

**Filed Jun. 1, 1990, Ser. No. 537,482**

**Int. Cl.[5] H04N** *7/04, 5/60, 5/38*

**U.S. Cl. 358—198** **21 Claims**



1. A wireless audio and video signal transmitter and receiver system capable of accepting both external baseband audio and video signal inputs and an external modulated audio/video signal input modulated at a particular television channel, wherein the transmitter transmits an audio/video signal to one or more remote receivers which regenerate the original audio/video signal providing both baseband audio and video signal outputs as well as a modulated audio/video signal output at said particular television channel, said wireless audio/video signal transmitter and receiver system comprising:

transmitter means for connection to audio/video signal sources and are capable of accepting said external modulated audio/video signal input as well as said external baseband audio and video signal inputs, said transmitter means including:

modulated audio/video signal input means for permitting an external audio/video modulated signal to be connected to said transmitter means, said modulated audio/video signal input means serving to convert said external modulated audio/video signal into a first inter-

nal baseband video signal and a first internal audio subcarrier signal corresponding to said external modulated audio/video signal input;

baseband audio signal input means for permitting an external baseband audio signal to be connected to said transmitter means, said baseband audio signal input means serving to convert said external baseband audio signal into a second internal audio subcarrier signal;

baseband video signal input means for permitting an external baseband video signal source to be connected to said transmitter means, said baseband video signal input means providing as an output a second internal baseband video signal;

video/RF switch means operably and electrically connected to said modulated audio/video signal input means, said baseband audio signal input means and said baseband video signal input means, said video/RF switch means serving to permit the selection between said first internal audio subcarrier signal and said second internal audio subcarrier signal, and said first internal baseband video signal and said second internal baseband video signal, thus providing for the alternative selection by the user between said external modulated audio/video signal input and said external baseband audio/video signal input in a manner which obviates the need for the use of an RF switch; said video/RF switch means providing an audio subcarrier audio signal output and a baseband video signal output;

video filter means operably and electrically connected to said baseband video signal output of said video/RF switch means providing a filtered video signal output;

AM modulator means electrically connected to said audio subcarrier signal output of said video/RF switch means and said filtered video signal output of said video filter means, said AM modulator means serving to AM modulate both said filtered video signal output and audio subcarrier signal output towards converting said signal outputs to a modulated IF frequency signal;

up converter means electrically connected to said AM modulator means for converting said modulated IF frequency signal to an RF frequency signal;

RF amplifier means electrically connected to said up converter means for amplifying said RF frequency signal;

transmitter antenna means electrically connected to said RF amplifier means for transmitting said amplified RF signal;

one or more receiver means capable of providing an external modulated audio/video signal output as well as external baseband audio signal and baseband video signal outputs, said one or more receiver means each including:

receiver antenna means for receiving said amplified RF signal transmitted by said transmitter means;

receiver front end means electrically connected to said receiver antenna means for amplifying and filtering said received RF signal;

down converter means electrically connected to said receiver antenna means, said down converter means serving to convert said received RF signal to an IF signal having a frequency corresponding to the carrier frequency for said modulated IF frequency signal;

receiver filter means electrically connected to said down converter means providing a filtered IF signal output;

modulated audio/video signal output means electrically connected to said receiver filter means for providing a modulated audio/video signal output on said particular television channel;

modulated audio/video signal demodulator means electrically connected to said receiver filter means, said modulated audio/video signal demodulator means serving to provide a composite audio and video output signal;

baseband audio signal output means, electrically connected to said modulated audio/video signal demodulator means, for providing a baseband audio signal output; and

baseband video signal output means, electrically connected to said modulated audio/video signal demodulator means, for providing a baseband video signal output;

whereby said wireless audio/video signal transmitter and receiver system permits the wireless transmission and remote reception of audio/video signals from a signal source such as a VCR to a reception device such as a television monitor.

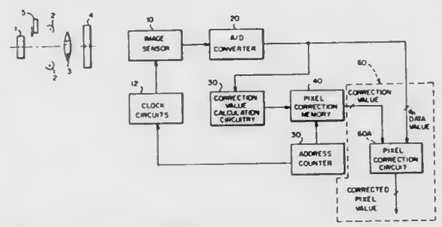
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**5,047,861**

## METHOD AND APPARATUS FOR PIXEL NON-UNIFORMITY CORRECTION

**James S. Houchin, and Kenneth A. Parulski, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jul. 31, 1990, Ser. No. 561,437**
**Int. Cl.[5] H04N** *5/335*
**U.S. Cl. 358—213.15** **12 Claims**




1. An apparatus for correcting a plurality of picture element values from an image sensing array using at least two correction signals comprising:

means for forming an image data signal from a plurality of picture element values;

means for forming at least two correction signals from at least two correction values for each picture element of said image sensing array;

first lookup table means having at least one input for receiving at least one correction signal and at least one additional input for receiving said image data signal for performing a first function on each picture element value of said image data signal in accordance with the value of one of the correction signals corresponding to said picture element of said image sensing array; and

second lookup table means having at least one input for receiving at least one correction signal and at least one additional input for receiving said image data signal for sequentially performing a second function on each picture element value that has had the first function applied so as to provide a plurality of corrected picture element values.

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**5,047,862**

## SOLID-STATE IMAGER

**Eric G. Stevens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 12, 1989, Ser. No. 420,857**
**Int. Cl.[5] H04N** *3/14, 5/335;* **H01L** *29/78*
**U.S. Cl. 358—213.29** **12 Claims**

1. A solid-state imager comprising:

a substrate of a semiconductor material of one conductivity type having a major surface;

a plurality of photodetectors in the substrate at said major surface;

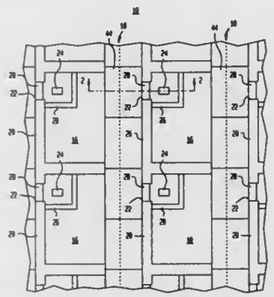
a separate shift register in said substrate at said major surface and extending between pairs of the photodetectors;

means for selectively transferring charge carriers from each photodetector to an adjacent shift register;



a drain in said substrate at said major surface contiguous to each photodetector and one of said shift registers;

barrier means between each of the drains and its contiguous photodetector;



barrier means between each of the drains and its contiguous shift register; and

means for selectively transferring charge carriers from each of the photodetectors into and across its adjacent shift register to the drain contiguous to the shift register.

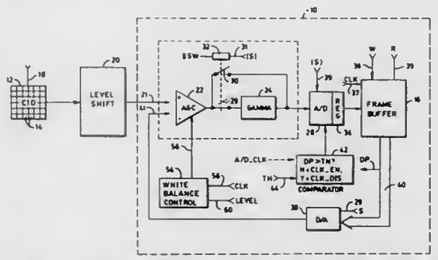
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**5,047,863**

## DEFECT CORRECTION APPARATUS FOR SOLID STATE IMAGING DEVICES INCLUDING INOPERATIVE PIXEL DETECTION

**David D. Pape, Framingham, and Wanda T. Reiss, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed May 24, 1990, Ser. No. 528,123**
**Int. Cl.[5] H04N** *3/14*
**U.S. Cl. 358—213.16** **8 Claims**




1. A defect correction apparatus for a solid state imaging device having an array of pixels for producing image scene pixel data when exposed to scene light comprising:

a frame buffer having memory locations corresponding to the pixels of the imaging device and being responsive for storing values of shuttered dark pixel data for each pixel in the corresponding memory locations prior to exposure of the image device to scene light;

register means responsively coupled to the imaging device and having an output coupled to the frame buffer for sequentially clocking dark pixel data into the frame buffer for storage and for subsequently clocking selected image pixel data into the corresponding frame buffer locations for replacing the dark pixel data with image pixel data of the scene; wherein the register means includes and analog-to-digital (A/D) converter for producing digital outputs in response to analog inputs representative of pixel data from corresponding elements of the imaging device;

a comparator having an output operatively coupled to the register means and being responsively coupled to the register means and being responsively coupled to the frame buffer for producing either an enable output for enabling the register means when the dark pixel data is less than a selected threshold indicative of an operative pixel or an inhibit output for inhibiting the register means when the dark pixel data is greater than the threshold indicative of an inoperative pixel, such that, the dark pixel data for a particular location is replaced in the buffer by image pixel data for a corresponding pixel when the pixel is operative an dark pixel data for such location is replaced by image pixel data from an operative pixel immediately prior to the defective pixel when the pixel is inoperative and means for adjusting the analog input to the A/D converter in accordance with the value of dark pixel data in the buffer for the corresponding element.

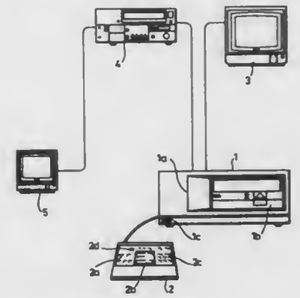
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**5,047,864**

## COLORS VIDEO PRINTER WITH MONITOR FOR DISPLAYING MIXED VIDEO SIGNALS AND CHARACTER MESSAGES INDICATING PRINTER OPERATING CONDITIONS

**Shogo Fujito, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jun. 29, 1989, Ser. No. 373,242**
**Claims priority, application Japan, Jun. 29, 1988, 63-161801**
**Int. Cl.[5] H04N** *1/23*
**U.S. Cl. 358—296** **14 Claims**



1. A printing apparatus comprising:

(a) key means for selecting a function of said printing apparatus;

(b) printing means for printing a video signal on a recording medium, wherein a peripheral video apparatus connected to said printing apparatus and supplies said video signal to said printing apparatus;

(c) memory means for storing said video signal which is supplied from said video apparatus;

(d) control means for generating a message character corresponding to said function selected by said key means and for generating a display signal formed by mixing said video signal and said message character;

(e) a control circuit for controlling a peripheral display apparatus which is supplied with said display signal and which is connected to said printing apparatus; and

(f) said control means supplies the mixed signal comprising said video signal and said message character to said control circuit and supplies said video signal to said printing means.

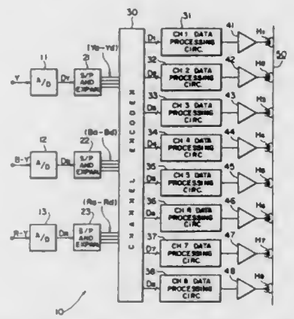
VOL 1130 ISS 2 SE 10 1991 UMI



5,047,865
## SYSTEM FOR TRANSMITTING A DIGITAL VIDEO SIGNAL

Takao Inoue, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,844
Claims priority, application Japan, Dec. 17, 1987, 62-319921
Int. Cl.[5] H04N 9/80
U.S. Cl. 358—310 7 Claims



1. A method of transmitting digital video data signals comprised of digital luminance data signals and first and second digital chrominance data signals, said method comprising the steps of:

dividing said digital luminance data signals into a plurality of sets thereof each consisting of two successive digital luminance data signals;

dividing said first digital chrominance data signals into a plurality of sets thereof, each of said sets of first digital chrominance data signals consisting of two successive first digital chrominance data signals;

dividing said second digital chrominance data signals into a plurality of sets thereof, each of said sets of second digital chrominance data signals consisting of two successive second digital chrominance data signals;

distributing said sets of digital luminance data signals, said sets of first digital chrominance data signals and said sets of second digital chrominance data signals into a plurality of transmission channels in such a manner that each said set of digital luminance data signals is interleaved between a set of said first digital chrominance data signals and a set of said second digital chrominance data signals in each of said transmission channels; and

inverting one of said two successive data signals in each of said sets of digital luminance data signals and in each of said sets of first and second digital chrominance data signals for obtaining the complement of said one of the two successive data signals in each set which has been inverted and thereby substantially minimizing any DC component in each of said transmission channels.

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5,047,866
## COMB FILTER TYPE LUMINANCE/CHROMINANCE SIGNAL SEPARATION CIRCUIT

Katsuyuki Watanabe; Tomomitsu Kuroyanagi, both of Katsuta; Atsushi Yoshioka; Michio Masuda, both of Yokohama, and Toshiro Aizawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1989, Ser. No. 323,841
Claims priority, application Japan, Mar. 16, 1988, 63-60335
Int. Cl.[5] H04N 9/80, 9/78
U.S. Cl. 358—329 3 Claims

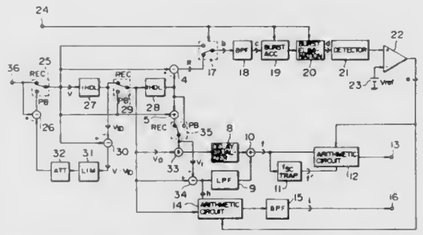
1. A separation circuit of a comb filter type for use in a video tape recorder and for separating a composite color signal V composed of a luminance signal Y and a chrominance signal C, which are multiplexed through two-frequency interleaving, into said luminance signal Y and said chrominance signal C, said separation circuit comprising:

a delay circuit including a pair of first and second delay elements each for giving said composite color signal V a propagation delay time equal to one horizontal scanning period, and said first and second delay elements being connected in series to each other in a recording mode so that said composite color signal V is applied to one end of the series connection of said first and second delay elements and delayed output signals $V_{2D}$ and $V_{1D}$ are obtained from the other end of said series connection and a connection point between said first and second delay elements, respectively;

a first arithmetic operation circuit for receiving said color composite signal V and said delayed output signals $V_{1D}$ and $V_{2D}$ from said delay circuit, and for calculating an output signal $Y=\frac{1}{2}(V_{1D})+\frac{1}{4}(V+V_{2D})$ corresponding to said luminance signal Y and another output signal $C=\frac{1}{2}((V_{1D})-\frac{1}{4}(V+V_{2D})$ corresponding to said chrominance signal C so as to output said output signals Y and C;

a second arithmetic operation circuit for receiving said color composite signal V and said delayed output signal $V_{2D}$ from said delay circuit, and for calculating a difference signal $(V-V_{2D})$ so as to output said difference signal;

detection means for extracting a frequency component of a chrominance signal band from said difference signal from said second arithmetic operation circuit and for comparing the level of said frequency component with a reference value to thereby obtain a signal $k(0<k<1)$ indicating non-correlation between said composite color signal V and said delayed output signal $V_{2D}$;



filter means for removing a component of said chrominance signal band from said output signal Y of said first arithmetic operation circuit to thereby obtain an output signal Y' including no component of said chrominance signal band;

a third arithmetic operation circuit for receiving said output signal Y of said first arithmetic operation circuit, said output signal Y' of said filter means and said signal k indicating non-correlation between said composite color signal V and said delayed output signal $V_{2D}$ and for caculating $(1-k)Y+kY')$ so as to output the result of calculation as a luminance signal;

a fourth arithmetic operation circuit for receiving said delayed output signal $V_{1D}$ of said delay circuit, said output signal C of said first arithmetic operation circuit and said signal k indicating non-correlation, and for calculating $(1k)C+kV_{1D}$ so as to output the result of calculating as a chrominance signal;

a noise reduction filter including said first delay element and a feedback circuit which feeds back the output of said first delay element to the input so as to reduce common phase background noise in signals between adjacent horizontal scanning lines in a playback mode; and

a fifth arithmetic operation circuit which receives the composite color signal V and said output signal $V_{1D}$ to calculate $Y=\frac{1}{2}(V+V_{1D})$ and output the signal Y, where said second delay element receives the output of said noise reduction filter, in the playback mode, to thereby obtain an output luminance signal including no component of said chrominance signal band.

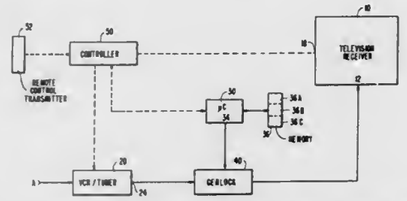


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5,047,867
## INTERFACE FOR A TV-VCR SYSTEM

Hugo J. Strubbe, Yorktown Heights, N.Y., and Donald R. Gentner, Palo Alto, Calif., assignors to North American Philips Corporation, New York, N.Y.

Filed Jun. 8, 1989, Ser. No. 363,569
Int. Cl.[5] H04N 5/76
U.S. Cl. 358—335 13 Claims



1. A system for integrating the operation and control of a television receiver and a video cassette recorder, said television receiver being capable of receiving and displaying various television broadcast channels as well as other video signals, and said video cassette recorder being capable of recording programs at least from said broadcast channels and reproducing programs previously recorded on tapes and outputting said programs as video signals, an output of said video cassette recorder being coupled to said television receiver, said system comprising:

means for enabling a user to control said system and thereby operate said television receiver and/or said video cassette recorder, and to enter information concerning said user's favorite broadcast programs and various particular broadcast programs into said system, said information including the program name, broadcast channel, starting time, length, repeat pattern in the case of favorite broadcast programs, and whether the user wants the program recorded;

first storing means for storing said favorite broadcast program information and said various particular broadcast program information, said information being stored in the form of program description pages and a menu page;

second storing means for storing information concerning programs on a tape currently loaded in said video cassette recorder, said information being stored in the form of program description pages and a menu page;

third storing means for storing information concerning programs on other tapes of said user, said information being stored in the form of menu pages;

means coupled to said video cassette recorder for operating the recording and reproducing functions thereof in response to said information stored in said first and second storing means and said enabling means;

output means coupled to said first, second and third storing means for applying to said television receiver an output of said system including said favorite broadcast program information, the program information of said current tape, and the program information of said other tapes, said output means outputting said program description pages and said menu pages as additional channels included in a television channel ring; and

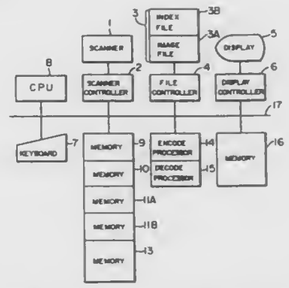
means coupled to said television receiver for switching said television receiver to selectively receive said broadcast channels, said video cassette recorder output and said system output.

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5,047,868
## IMAGE DATA PROCESSING METHOD FOR SELECTIVE PARTIAL IMAGE DISPLAY

Haruo Takeda, Kawasaki, and Kuniaki Tabata, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,752
Claims priority, application Japan, Sep. 12, 1986, 61-213885; Feb. 4, 1987, 62-22307
Int. Cl.[5] H04N 5/76
U.S. Cl. 358—335 14 Claims



13. A display system for successively displaying a plurality of pages of retrieved images on a display screen, comprising:

a first file means for storing a plurality of image data records, each including one page of compressed image data compressed by data encoding of original image data;

a second file means for storing a plurality of code data for retrieving ones of said image data records and a plurality of position data each related to one of said code data so as to selectively access a one of said plurality of image data records specified by said one code data;

means for designating by a user a display region in one page of an image to be displayed on the display screen and a retrieval condition for retrieving image data records;

means for sequentially selectively reading out whole image data blocks of respective retrieved image data records from the first file means according to the positional data related to retrieved code data which match with said retrieval condition if the user has designated a full size as said display region, and for sequentially selectively reading out partial image data blocks of respective retrieved image data records from the first file according to said positional data related to said retrieved code data if the user has designated a partial area of the page as said display region; and,

converting means for successively converting by data decoding the image data blocks read out from said first file means to image data having a form of the original image data to display a part or whole of original images on the display screen one after another.

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5,047,869
## RECORDING DEVICE FOR ELECTRONIC STILL CAMERA

Harumi Aoki, and Nobuya Sakai, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 268,303
Claims priority, application Japan, Nov. 6, 1987, 62-280720
Int. Cl.[5] H04N 5/76, 5/781
U.S. Cl. 358—341 4 Claims

1. A recording device for an electronic still camera, comprising:

control means;

recording drive means controlled by said control means to move a recording head by a predetermined track pitch;

a video/audio change-over switch controlled by said control

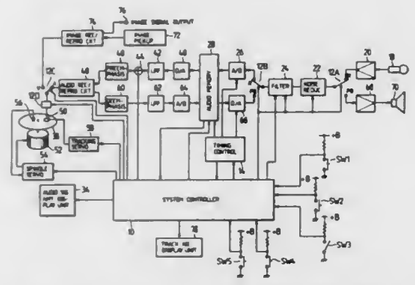
VOL 1130 ISS 2 SE 10 1991 UMI



means to selectively supply a video signal or time-compressed audio signal to said recording head so that video signals and compressed audio signals are recorded on a memory disc with said recording head;

a video signal recording switch for inputting a video signal recording instruction; and

an audio signal recording switch for inputting an audio signal recording instruction,



said control means, in response to said video signal recording instruction, operating to record a video signal on a first track, and, in response to said audio signal recording instruction, operating to record a time-compressed audio signal on a track which is removed by a one-track pitch in one direction from said first track, said video signal and audio signal being recorded on said memory disc alternately.

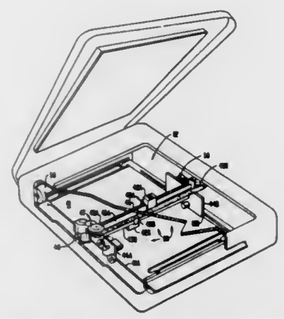
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**5,047,870**

**COMBINED SCANNING/REPRODUCING HEAD**

**Andrew Filo, Cupertino, Calif., assignor to Optum Corporation, Cupertino, Calif.**

**Filed Mar. 17, 1988, Ser. No. 169,791**
**Int. Cl.[5] H04N** *1/04*
**U.S. Cl. 358—472** **24 Claims**



1. A system for reproducing on a medium an image of an illuminated object, said system comprising:

means for detecting reflected illumination from said object by scanning in a first plane, said means generating signals responsive to the detected illumination,

means for processing signals from said detecting means, wherein said signal processing means includes means for increasing the resolution of said detecting means, and

means associated with said detecting means and responsive to said processing means, for reproducing images in a second, non-coplanar, plane fixed with respect to said first plane on said medium,

whereby said reproducing means creates said image on said medium by the scanning of said detecting means, and whereby,

said reproducing means creates said image as said detecting means scans said object thus requiring no storage of the signal generated by said detecting means.

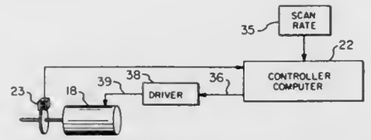
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**5,047,871**

**DIRECTION SCALING METHOD AND APPARATUS FOR IMAGE SCANNING RESOLUTION CONTROL**

**Gerald L. Meyer, Loveland, and David W. Boyd, Greeley, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Filed May 23, 1989, Ser. No. 356,027**
**Int. Cl.[5] H04N** *1/04, 1/10*
**U.S. Cl. 358—486** **7 Claims**




1. Apparatus for scaling image data sensed from a planar media which contains the image using a scanner head having an array of elements each capable of detecting the level of light reflected from the media image with the elements retained in the scanner head in a generally elongated liner configuration and an actuator for producing relative movement of a line of scanning light with respect to the media image plane so that light from a source illuminating the media image is reflected into the array elements comprising

means generating a signal reflecting a predetermined pixel sampling density,

enabling means having an input and including means responsive to signals present at said enabling means input for enabling the relative movement producing actuator to cause relative motion of the line of scanning light with respect to the media image plane at a rate corresponding to signals present to said enabling means input, and

means coupling said generating means signal to said enabling means input for causing said relative movement producing actuator to establish relative movement between the media image and the line of scanning light at a rate correlated to a predetermined pixel density.

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**5,047,872**

**FAST AND SLOW PLAYBACK METHOD AND APPARATUS FOR DATA RECORDED ON MAGNETIC TAPE**

**Jürgen Heitmann, Alsbach-Hähnlein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Feb. 16, 1989, Ser. No. 311,939**
**Claims priority, application Fed. Rep. of Germany, Feb. 22, 1988, 3805436**
**Int. Cl.[5] H04N** *5/78;* **G11B** *21/02*
**U.S. Cl. 360—10.2** **10 Claims**

1. Method of reproducing data signals with a magnetic recording and reproducing apparatus having a rotary device around which a magnetic tape is would in a helical loop, with normal playback magnetic heads (P1, P2) mounted on a periphery of said rotary device and auxiliary playback magnetic heads (AP1, AP2) mounted also on the periphery of said rotary device for scanning tracks of a magnetic tape before they reach said normal playback heads and therefore having track positions relative to said tape which are respectively different from track positions of said normal playback heads,

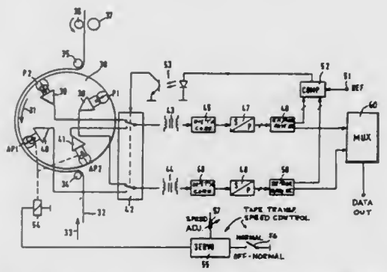
comprising the steps of:



changing a tape transport speed for reproducing data signals recorded on a tape from a speed equal to tape speed at which said signals were recorded to a different tape speed with respect to the tape speed at which said signals were recorded;

simultaneously shifting all said auxiliary playback magnetic heads relative to the track positions of said normal playback magnetic heads by an axial displacement of half a track width of said auxiliary playback magnetic heads during a tape transport speed change from said tape speed at which said signals were recorded to said different tape speed;

reproducing said data signals by said normal playback heads and said auxiliary playback magnetic heads;




measuring error rates of each of the reproduced data signals;

providing a predetermine error rate corresponding to said apparatus;

comparing the measured error rates with said predetermined error rate;

selecting only those reproduced data signals whose respective error rates are lower than the predetermined error rate for further data signal processing; and

simultaneously shifting all said auxiliary playback magnetic heads back to their original positions with respect to said normal playback magnetic heads during a corresponding tape transport speed change from said different tape speed to said tape speed at which said signals were recorded.

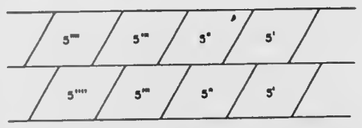
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**5,047,873**

**SPLIT SWIPE TAPE RECORDING**

**Dale O. Ballinger, Lakewood, and Daniel Soo, Sedalia, both of Colo., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Dec. 4, 1989, Ser. No. 445,588**
**Int. Cl.[5] G11B** *5/02*
**U.S. Cl. 360—22** **17 Claims**




1. A method of recording data onto tape which may move longitudinally at any of a plurality of speeds by means of recording/reproducing apparatus of the type employing a rotary scanner having at least two heads spaced from one another around the circle in which they travel, comprising the steps of:

storing sequences of D data bytes where D is an integer;

dividing each of said sequences of D data bytes into W partial sequences of D/W data bytes each;

selecting a head for recording a subtrack which forms part of a recorded track across the tape, said track being formed of W subtracks and containing D data bytes, each subtrack containing D/W data bytes, said subtracks being located on the tape so as to maximize overlap of individual subtracks with the location of the track which would have been recorded at full tape speed by a single head, the selection being based on tape speed and rotary scanner speed.

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**5,047,874**

**TECHNIQUE FOR CERTIFYING DISK RECORDING SURFACE**

**Ruben Yomtoubian, Saratoga, Calif., assignor to Unisys Corp., Detroit, Mich.**

**Filed Mar. 31, 1989, Ser. No. 332,637**
**Int. Cl.[5] G11B** *5/02*
**U.S. Cl. 360—25** **11 Claims**

| | Test | Sites | Criteria | Designation |
|---|---|---|---|---|
| STEP I | Analog | all | MB up to 85%;EB at 35% -> "Defect"<br>MB up to 70%;EB at 25% -> "Suspect" | |
| STEP II | Brief Digital | only "Suspects" from STEP I | MB up to 55% ----------> "Verified Defect"<br>"passing Suspects" -> "Secondary Suspects" | |
| STEP III | Full, Extensive Digital | only "Secondary" Suspects | MB -- (nominal) ----------> "Verified Defects"<br>(EB -- nominal) "passing?" ----------> Released (assume acceptable) | |

1. A method of designating recording defect areas on recording surface portions of a magnetic recording disk, this method comprising:

STEP 1: establish first failure criteria for a missing bit, namely FIRST CRITERIA, and for extra bits, namely SECOND CRITERIA, and impress one or several analog signal patterns on all recording sites of said disk surface portions, read them, erase them and then re-read them, then designate as Fail-sites all recording sites that do not pass any said criteria and record such in memory means;

STEP 2: next establish alternate digital criteria and digitally write, once, on all said recording sites except said Fair-sites, with worst-case patterns, and read-out thereafter, designating as Fail-sites recording sites that do not pass said digital criteria and do not yield a prescribed nominal read-out amplitude;

STEP 3: then establish final full digital criteria and digitally write and read, repeatedly, on all recording sites except those designated FAIL, with several varied worst-case patterns, designating as FAIL those recording sites that do not pass said final full digital criteria and recording such in said memory means; said FAIL-designated sites being made available for the user of the disk.

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**5,047,875**

**RECORDING SYSTEM WHICH CAN RECORD SIGNALS FROM TWO FIELDS FOR THE COMPOSITION OF ONE PICTURE**

**Susumu Kozuki, Tokyo; Nobuo Tezuka, Kawasaki, and Makoto Masunaga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

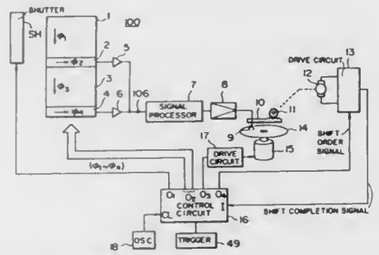
**Continuation of Ser. No. 273,679, Nov. 21, 1988, abandoned, which is a continuation of Ser. No. 511,180, Jul. 6, 1983, abandoned. This application Sep. 20, 1990, Ser. No. 587,639**
**Claims priority, application Japan, Jul. 7, 1982, 57-119064**
**Int. Cl.[5] H04N** *5/76*
**U.S. Cl. 360—35.1** **20 Claims**

1. A still video recording apparatus comprising:

means for converting an optical image into a frame video signal which consists of two field video signals which are formed simultaneously and for sequentially outputting said two field video signals one by one;

means for recording said two field video signals on a me-

dium, said recording means recording each of said field video signals in a different location of said medium, respectively, after a predetermined operation which is performed before the recording operation;




means for detecting completion of said predetermined operation of said recording means and for generating a detection signal; and

control means for controlling the outputting operation of said converting and outputting means in response to said detecting signal.

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**5,047,876**

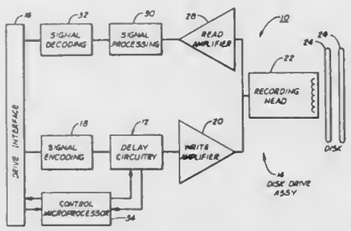
**ADAPTIVE PREWRITE COMPENSATION APPARATUS**

**Stephen R. Genheimer, Mustang, and Steven V. Holsinger, Oklahoma City, both of Okla., assignors to Seagate Technology Inc., Scotts Valley, Calif.**

**Filed Mar. 3, 1989, Ser. No. 319,251**

**Int. Cl.[5] G11B *5/09***

**U.S. Cl. 360—46** **6 Claims**




1. An adaptive prewrite compensation apparatus for writing data on a magnetic medium, the apparatus comprising:

data supply means for introducing a serial data pattern into the apparatus;

data storage means for storing the data pattern;

encoding means for encoding the data pattern;

write delay determination means for determining a write delay value;

application means for applying the write delay value to the data pattern; and

writing means for writing the data pattern with the applied write delay value so that when the data pattern is read back, bits of the read data pattern will have the same temporal spacing as bits of the pattern as received from the data supply means;

wherein the writing means employs a code decoder and a disk drive assembly containing at least one disk; wherein the data supply means employs a code encoder, a timing clock, and a disk drive interface suitable for manually entering data patterns into the adaptive prewrite compensation apparatus; wherein the data storage means employs a shift register; wherein the decoding means is a plurality of subpattern recognizers; wherein the write delay determination means employs a plurality of delay selectors, one for each subpattern recognizer; and wherein the write delay determination means further employs a subtractor.

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**5,047,877**

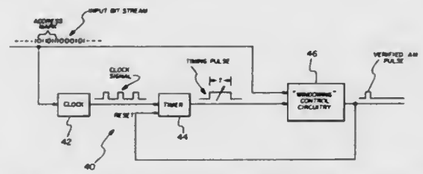
**WINDOWING METHOD OF AND APPARATUS FOR ADDRESS MARK DETECTION**

**Kenneth E. Herting, Rush, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 9, 1989, Ser. No. 363,800**

**Int. Cl.[5] G11B *5/09*; H03D *3/24***

**U.S. Cl. 360—51** **7 Claims**




3. Apparatus for preventing false detection of any of a plurality of N address marks arranged, respectively, at predetermined locations in a stream of information-bearing bits played back from a record storage medium, said apparatus comprising:

a) timer means, synchronized with the binary bit stream, for defining a series of N sequential non-overlapping intervals each of which encompasses a particular time when one of the series of N address marks is expected to occur within the bit stream;

b) a decoder, responsive to said timer means, for signaling which one of the series of N address marks is expected to occur in each of the intervals defined by said timer means; and

c) validation circuitry, responsive to the bit stream, said timer means and said decoder, for determining sequentially whether each address mark expected to occur in the bit stream actually occurs in the bit stream within the corresponding time interval defined by said timer means.

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**5,047,878**

**SCREEN ENCORE METHOD FOR A VTR**

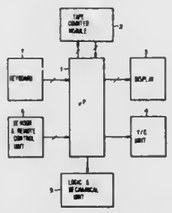
**Jong-Sam Woo, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea**

**Filed Sep. 25, 1989, Ser. No. 412,004**

**Claims priority, application Rep. of Korea, Dec. 8, 1988, 1988-16326**

**Int. Cl.[5] G11B *15/18***

**U.S. Cl. 360—69** **3 Claims**



1. A screen encore method in a video tape recorder including a microcomputer and counter module means, said method comprising:

a first step which initializes all ports and the content of a ram at a power-on-reset, sets the initial values, controls interrupts, and at the same time, checks an option port to determine a rewind picture search or rewind mode;



a second step which checks the presence of an encore key input and then processes an encore key function;

a third step which checks the mode, and, if the present mode accompanies a mechanism operation, controls the mechanism operation; and

a fourth step which switches the mode and checks the sensor and emergency to stabilize the system.

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**5,047,879**

**MULTI-CHANNEL REPRODUCING APPARATUS WITH SEARCHING FOR PROGRAMS**

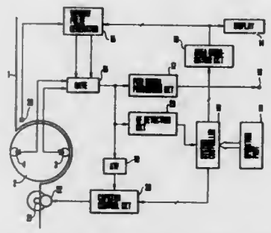
**Tsutomu Fukatsu; Taizou Hori; Toshiyuki Masui, all of Kanagawa; Takashi Kobayashi, Tokyo; Tetsuya Wakui, Chiba, and Koji Takahashi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 944,578, Dec. 22, 1986, Pat. No. 4,853,803. This application May 18, 1989, Ser. No. 339,121**

**Claims priority, application Japan, Dec. 27, 1985, 60-292537; Dec. 27, 1985, 60-292538; May 5, 1986, 61-102128; May 15, 1986, 61-109688**

**Int. Cl.[5] G11B *15/22, 27/22***

**U.S. Cl. 360—72.1** **10 Claims**



1. An apparatus for reproducing information signals from a tape-shaped record bearing medium on which a plurality of channels of information signals and subordinate signals are recorded, each channel of information signals comprising one or more programs, comprising:

(a) reproducing means for reproducing an information signal of a selected channel among the plurality of channels and the subordinate signals of all of the plurality of channels from said tape-shaped record bearing medium;

(b) moving means for moving said tape-shaped record bearing medium in the longitudinal direction thereof;

(c) detection means for detecting leader parts of all programs of the information signals of the plurality of channels by using the subordinate signals reproduced by said reproducing means; and

(d) mode changing means for changing the apparatus alternately between a first mode in which the information signals are reproduced by said reproducing means and said tape-shaped record bearing medium is moved by said moving means at a predetermined speed and second mode in which said reproducing means does not reproduce the information signals and said moving means moves said medium at a speed faster than said predetermined speed, in response to outputs of said detection means.

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**5,047,880**

**MAGNETIC DISK PACK WITH A SERVO RECORDING SURFACE**

**Yoshitaka Ohno, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed May 1, 1989, Ser. No. 345,169**

**Claims priority, application Japan, Dec. 5, 1988, 63-308109**

**Int. Cl.[5] G11B *5/09***

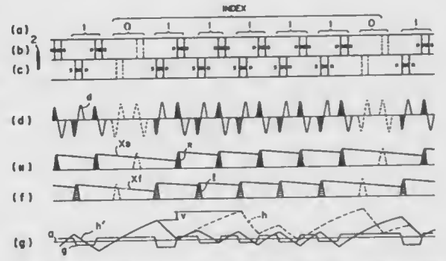
**U.S. Cl. 360—78.14** **3 Claims**

1. A magnetic disk device comprising:

a magnetic disk having a servo recording surface for generating a position signal via a servo head of an information processing apparatus, the position signal having variations centered around a level corresponding to a radial position of the servo head, the servo head changing position relatively along a circumferential direction of the servo recording surface as said magnetic disk rotates between odd and even numbered servo tracks formed thereon, said servo recording surface including:

concentric odd numbered tracks along which dibits of a first polarity are formed at a fixed circumferential spacing;

concentric even numbered tracks alternating with said odd number tracks in a radial direction of the servo recording surface, dibits of a second polarity opposite to the first polarity being formed on the even numbered tracks at the same fixed circumferential spacing as on the odd numbered tracks, the dibits on the even numbered tracks being circumferentially displaced with respect to the dibits on




the odd numbered tracks by half said circumferential spacing between the dibits on the odd and even numbered tracks; and

an index portion formed at a predetermined circumferential position of said odd and even numbered tracks to mark the circumferential position, said index portion including a pattern of missing pairs of succeeding dibits on adjacent pairs of odd and even numbered tracks, wherein at least three non-missing pairs of succeeding dibits on adjacent pairs of odd and even numbered tracks are interposed between a missing pair of dibits and a next missing pair of dibits on adjacent pairs of odd and even numbered tracks;

wherein the position signal deviates from the level responsive to a missing pair of dibits, and the deviation from the level is reduced responsive to the at least three non-missing pairs of succeeding dibits between the missing pair of dibits and the next missing pair of dibits.

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**5,047,881**

**RECORDING AND/OR REPRODUCING APPARATUS**

**Tsukasa Uehara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 449,301, Dec. 5, 1989, abandoned, which is a continuation of Ser. No. 243,205, Sep. 9, 1988, abandoned, which is a continuation of Ser. No. 107,860, Oct. 7, 1987, abandoned, which is a continuation of Ser. No. 648,700, Sep. 7, 1984, abandoned. This application Dec. 5, 1990, Ser. No. 622,363**

**Claims priority, application Japan, Sep. 12, 1983, 58-142035[U]**

**Int. Cl.[5] G11B *17/035, 5/82***

**U.S. Cl. 360—99.05** **39 Claims**

1. A recording and/or reproducing apparatus using a disc-shaped record bearing medium, comprising:

(A) head means for recording signals on and/or reproducing recorded signals from the medium;

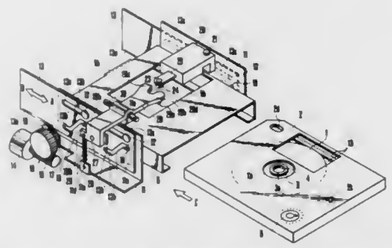
(B) rotating means engageable with the medium for rotating said medium relative to said head means;

(C) detecting means for detecting the rotation of said medium at a position near and opposite to a center portion of the medium on the rotating means; and

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(D) pressing means for pressing said center portion of the medium relative to said rotating means to exactly mount the medium on the rotating means, and for releasing the pressing operation after the mounting of said medium on the rotating means, said pressing means having a portion



formed to avoid said detecting means and being provided opposite to said center portion of the medium and separately from said detecting means so that said pressing means does not interfere with the detecting means during the pressing and releasing operation of said pressing means.

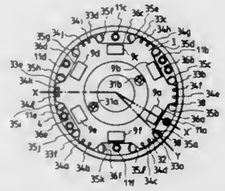
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**5,047,882**

## ROTARY HEAD CYLINDER FOR VIDEO TAPE RECORDER

**Hiroyoshi Kawai, Katsuta; Tsutomu Masumoto, Toukai; Yoshio Manabe, Hitachi; Tsunenori Iwama, Naka, and Shinji Ozaki, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 25, 1990, Ser. No. 528,761**
**Claims priority, application Japan, May 26, 1989, 1-131321**
**Int. Cl.[5] G11B *5/53, 21/18, 21/24***
**U.S. Cl. 360—107** **4 Claims**



1. A rotary head cylinder assembly including a lower cylinder for guiding travel of a magnetic tape, an upper cylinder rotatably mounted on said lower cylinder and provided with magnetic heads and height adjusting screws for said magnetic heads, and a circuit board fixedly mounted on said upper cylinder and supporting thereon amplifiers in positions in close proximity to said magnetic heads, characterized in that:

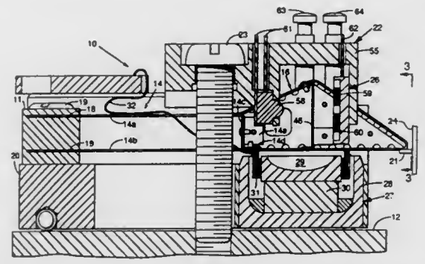
said circuit board is provided with notched portions at the outer periphery thereof in positions coinciding with the positions of said height adjusting screw of said magnetic heads on said upper cylinder.

**5,047,883**

## PANTOGRAPH HEAD MOUNT HAVING DOUBLE LEAVES INTEGRAL WITH A RIGID TIP STRUCTURE

**William N. Aldrich, Redwood City, and Sidney D. Miller, Mountain View, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.**

**Filed Feb. 7, 1990, Ser. No. 477,268**
**Int. Cl.[5] G11B *5/56***
**U.S. Cl. 360—109** **17 Claims**



1. A pantographic mount for moving a magnetic transducing head transversely across a magnetic tape, comprising:

a support base;

a rigid tip structure carrying said magnetic head in a normal relationship to said tape;

a pair of elongated spring arm leaves of different natural frequencies of vibration, each having an inboard end portion thereof solidly mounted on said support base and an outboard end portion thereof solidly integral with said rigid tip structure, said leaves being arranged in parallel with length and width dimensions of each spring arm leaf being parallel, respectively, to the length and width dimensions of the other spring arm leaf, so as to define said mount as a flexible pantograph maintaining said head in said normal relationship to said tape when said rigid tip structure is displaced in directions orthogonal to said length and width dimensions of said spring arm leaves;

wherein each of said spring arm leaves is formed of a material having predetermined flexibility characteristics, and each of said leaves has a structural configuration that is different from the structural configuration of the other leaf with the structural configuration of each leaf selected to cooperate with said flexibility characteristics of the leaf to cause the portion thereof adjacent said rigid tip structure to deflect in the same displacement direction and to the same displacement dimension as the portion of the other leaf adjacent said rigid tip structure, whereby the natural frequency of vibration of each leaf is different from that of the other leaf;

wherein each of said spring leaves has a reticulated structural configuration of solid portions defining a plurality of openings through the thickness of the leaf so as to reduce the inertia of the leaf during flexing movement, while maintaining a predetermined resistance of the leaf to torsional distortion about a length axis thereof, wherein said openings are arranged in a first reticulated structural configuration for one of said leaves, and in a second reticulated structural configuration for the other leaf, said first and second configurations being substantially incongruent, so as to avoid beating resonances between the two leaves during operation;

said rigid tip structure being proportioned and formed with a box-like construction characterized by selected width, height and length dimensions for providing optimum torsional stability of said mount and particularly of said spring arm leaves integral with said rigid tip structure thereof; and

electromagnetic means mounted for acting upon said rigid tip structure to deflect said head and the outboard portions of said spring arm leaves in said directions orthogonal to said length and width dimensions of said leaves, so as to move said magnetic head transversely while maintaining said normal attitude of said head with respect to said tape.

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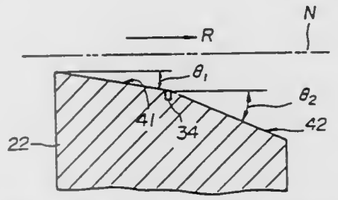


**5,047,884**

## MAGNETIC HEAD HAVING A CONTROL PORTION FOR GENERATING NEGATIVE PRESSURE

**Kenji Negishi; Daisuke Mitsuhashi, both of Tokyo; Yoshiaki Kato; Akira Takimoto, both of Kanagawa, and Noboru Kawasaki, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jan. 5, 1990, Ser. No. 461,508**
**Claims priority, application Japan, Jan. 17, 1989, 1-5918; Mar. 24, 1989, 1-70349; Jun. 9, 1989, 1-145445**
**Int. Cl.[5] G11B *5/187, 15/60***
**U.S. Cl. 360—122** **13 Claims**



1. A magnetic head, having an opposing surface for location in a radial direction opposite a recording surface of a magnetic disc which defines a free rotary plane when rotated in a rotational direction, and a magnetic gap formed on said opposing surface, said head comprising:

a control portion formed on said opposing surface for generating a negative pressure between said control portion and said magnetic disc as said magnetic disc rotates, thereby attracting said magnetic disc towards said magnetic gap, wherein said control portion comprises first and second inclined surfaces inclined to gradually become more distant from said free rotary plane of said magnetic disc towards a downstream side with respect to the rotational direction of said magnetic disc, said first and second inclined surfaces having different angles of inclination relative to said free rotary plane.

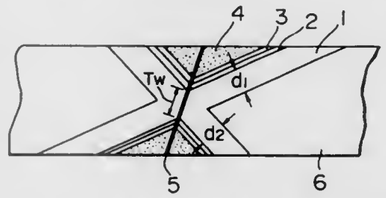
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**5,047,885**

## MAGNETIC HEAD FORMED OF THIN METAL FILM INCLUDING A CHEVRON SHAPE

**Hideo Zama, Katsuta; Hitoshi Idegami, Ibaraki; Yosio Manabe, Hitachi, and Kenkichi Inada, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 10, 1988, Ser. No. 269,608**
**Claims priority, application Japan, Nov. 13, 1987, 62-285605**
**Int. Cl.[5] G11B *5/147***
**U.S. Cl. 360—126** **6 Claims**



1. A magnetic head formed of a thin metal film in which a metal magnetic film in the form of a chevron is formed on a substrate, wherein two half cores of said magnetic head are formed and in each half core the apex portion of said chevron-shaped metal magnetic film is flattened, said two half cores being integrated in such a manner as to face each other with a gap member placed therebetween, said magnetic head having a track width not greater than twice the average thickness d of thicknesses $d_1$, $d_2$, wherein $d_1$ and $d_2$ represent the thickness of said metal magnetic film provided on both sides of said apex portion, respectively, wherein $d_1$ and $d_2$ are not substantially equal to each other such that $d_2/d_1 \neq 1$ and the following formula is met:

$$0.74 \leqq d_2/d_1 \leqq t.35.$$

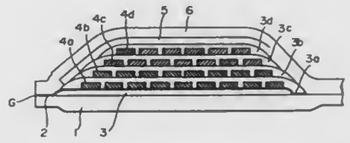
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**5,047,886**

## THIN-FILM MAGNETIC HEAD

**Atsushi Toyoda, and Shuichi Sawada, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan**

**Filed Mar. 19, 1990, Ser. No. 495,711**
**Claims priority, application Japan, Mar. 20, 1989, 1-68611**
**Int. Cl.[5] G11B *5/31, 5/23***
**U.S. Cl. 360—126** **2 Claims**



1. A thin-film magnetic head including an edge portion comprising:

(a) a lower core;

(b) a first insulating layer partially coating said lower core;

(c) a gap layer which coats said first insulating layer;

(d) a plurality of coil conductor layers each of which is spirally formed, said plurality of coil conductor layers being sequentially piled up on said gap layer;

(e) a plurality of insulating layers which respectively coat said plurality of coil conductor layers, wherein at least one of said plurality of insulating layers partially coats said gap layer; and

(f) an upper core which coats said plurality of insulating layers,

wherein said edge portion is formed by an uncoated portion of said lower core which is not coated by said first insulating layer, and corresponding parts of said gap layer and said upper core.

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**5,047,887**

## METHOD AND APPARATUS FOR CLEANING THE TAPE HEAD AND TAPE PATH OF A VIDEO CASSETTE RECORDER USING A WETTED CLEANING TAPE

**Ernest D. Boshek, San Jose, Calif., assignor to Tandy Corporation, Ft. Worth, Tex.**

**Filed Dec. 28, 1989, Ser. No. 457,986**
**Int. Cl.[5] G11B *5/41***
**U.S. Cl. 360—128** **21 Claims**

1. Apparatus for cleaning portions of a video cassette recorder, the recorder including a scanner, means for receiving a tape cassette, a device for drawing tape out of a cassette, received in the means for receiving, and for contacting the tape with at least a portion of the scanner and means for providing lengthwise movement of the tape, the apparatus comprising:

a housing;

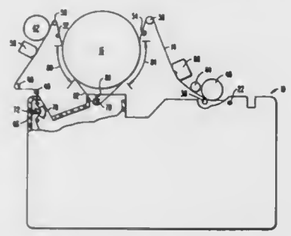
a feed reel and a takeup reel rotatably mounted in said housing;

a cleaning tape extending between said feed reel and said

takeup reel, and configured, by the recorder to engage the scanner when said housing is inserted in the recorder;

a first means, mounted in said housing, for storing fluid and applying the fluid to at last a first portion of said tape;

a second means, mounted in said housing, for storing fluid



and applying the fluid to at least a second portion of said tape spaced from said first portion;

each of said first means and said second means also being a means for wetting at least a portion of said tape during a time when said tape is moving past said first means and second means, respectively.

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**5,047,888**

## MAGNETIC SHEET CONTROL MEMBER

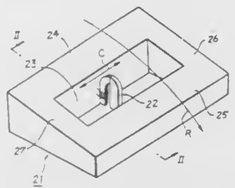
**Daisuke Mitsuhashi; Shigeru Ando, and Nishiyama Tomoyuki, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Dec. 27, 1989, Ser. No. 457,917**

**Claims priority, application Japan, Dec. 27, 1988, 63-327947; Dec. 28, 1988, 63-328939; Dec. 28, 1988, 63-328940; Jun. 9, 1989, 1-145443**

**Int. Cl.[5] G11B** *15/60*

**U.S. Cl. 360—130.34** **12 Claims**



1. A magnetic sheet control member, used in a recording and reproduction device for magnetic recording and reproduction using a magnetic head in sliding contact with a flexible magnetic sheet rotating about a center point and defining in a radial direction from the center point a free rotary surface plane, to deflect said magnetic sheet from said free rotary surface plane into close contact with said magnetic head by a negative pressure, said control member having a slot disposed at a center portion thereof, said magnetic head being inserted in said slot, comprising:

a body having an upstream-side inclined surface and a downstream-side inclined surface disposed, respectively, at an upstream side and a downstream side with respect to the rotational direction of said magnetic sheet, said inclined surfaces being inclined to become more distant from the free rotary surface plane of said magnetic sheet towards their downstream side, and stabilizing surfaces disposed respectively at an outer side and an inner side of said body with respect to the radial direction of said magnetic sheet to connect said upstream-side inclined surface and said downstream-side inclined surface to form said slot.

**5,047,889**

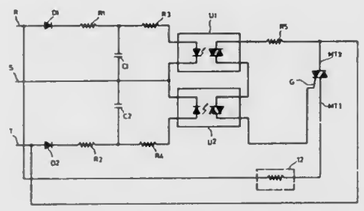
## ELECTROMAGNETIC SWITCH WITH UNDERVOLTAGE AND PHASE FAILURE PROTECTION

**Shu-Chin Chen, No. 30, Aly. 3, Ln. 469, Shan-Ting Sec., Chung-Feng Road, Tao-Yuan Hsien, Taiwan**

**Filed Jan. 8, 1991, Ser. No. 638,840**

**Int. Cl.[5] H02H** *3/24*

**U.S. Cl. 361—92** **1 Claim**



1. A protective device for preventing electrical load from undervoltage and phase failure condition in a three-phase power supply system by controlling actuating coil of an electromagnetic switch to cut off three-phase power source to the load, which comprises:

a rectifier means having three terminals connected to the three phase line of the three-phase AC power source for providing a DC power source;

a voltage dropping means for dropping the DC power source from the rectifier means into a lower DC voltage;

a filter circuit for filtering the DC voltage from the voltage dropping means into a well-filtered DC voltage;

a current limiting circuit for limiting the current flow of the filter circuit; a photo coupling circuit connected to the current limiting circuit, which having a first photo coupler and a second photo coupler connected in series; and

a large current control switch having a control gate controlled by the photo coupling circuit, a first main terminal and second main terminal, in which the first main terminal and the second main terminal are connected in series with the actuated coil of the electromagnetic switch and then connected across the any two phase lines of the three-phase power source while the control gate is controlled by the photo coupling circuit so that when the fault condition caused by undervoltage and phase failure of the three-phase power source is happen, the large current control switch cut the load off the three-phase power source.

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**5,047,890**

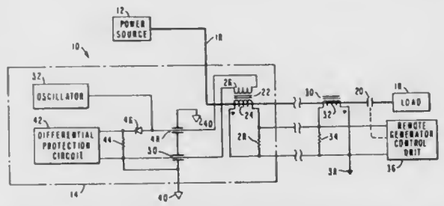
## DIFFERENTIAL CURRENT PROTECTION CIRCUITS

**Leland L. Kessler, American Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Mar. 12, 1990, Ser. No. 491,764**

**Int. Cl.[5] H02H** *3/28*

**U.S. Cl. 361—93** **7 Claims**




1. A differential protection circuit comprising:

a first current transformer having a first winding inductively coupled to a power conductor at a first location;

a second current transformer having a first winding inductively coupled to said power conductor at a second location spaced from said first location;

said first windings of said first and second current transformers being electrically connected in a loop in series with each other in a bucking arrangement;

a first resistor electrically connected in parallel with said first windings of said first and second current transformers;

a first control means for disabling an electric circuit in response to a first voltage signal across said first resistor;

a second winding on said first current transformer; and

a second control means for disabling said electric circuit in response to a second voltage signal across said second winding.



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**5,047,891**

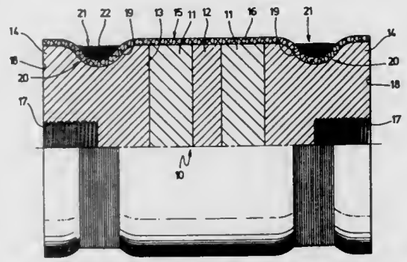
## SURGE ARRESTER CORE

**Walter N. Nedriga, Savannah, Ga., assignor to IDSI Products of Georgia, Savannah, Ga.**

**Filed Jul. 18, 1990, Ser. No. 554,703**

**Int. Cl.[5] H02H** *9/04*

**U.S. Cl. 361—117** **11 Claims**



6. In a surge arrester core comprising a series array of nonlinear resistor units stacked in face-to-face contact between inner end faces of a pair of terminal end pieces and enclosed within and bonded to the inner surface of a circumscribing jacket of rigid reinforced plastic material, the improvement wherein:

said plastic reinforced material comprises a plastic impregnated, bi-directional weave fabric woven of bi-directionally oriented strands of which the strands of one of said bi-directional orientations have greater tensile strength than the strands of the other of said bi-directional orientations,

said bi-directional weave fabric strands of greater tensile strength being arranged longitudinally of said jacket,

said terminal end pieces each have a groove depression extending circumferentially of the periphery of said terminal end piece and

a constrictive band compressively circumscribing an area of said jacket overlying each said terminal end piece groove depression.

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**5,047,892**

## APPARATUS FOR REMOVING STATIC ELECTRICITY FROM CHARGED ARTICLES EXISTING IN CLEAN SPACE

**Soichiro Sakata; Takanori Yoshida, both of Kanagawa, and Takao Okada, Tokyo, all of Japan, assignors to Takasago Thermal Engineering Co., Ltd., Tokyo, Japan**

**Filed Oct. 13, 1989, Ser. No. 427,682**

**Claims priority, application Japan, Mar. 7, 1989, 64-52867**

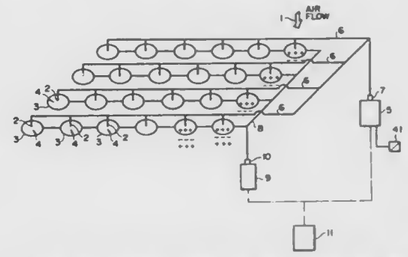
**Int. Cl.[5] H05F** *3/04*

**U.S. Cl. 361—231** **15 Claims**

1. An apparatus for removing static electricity from charged articles existing in a clean space comprising an AC ionizer having a plurality of needle-like emitters disposed in a flow of filtered clean air, wherein an AC high voltage is applied to said emitters to effect corona discharge for ionizing air, whereby a flow of thus ionized air is supplied onto said charged articles to neutralize static electricity thereon, said apparatus characterized in that:

a discharge end of each of said needle-like emitters is coated with a dielectric ceramic material;

each of said emitters is disposed with its discharge end spaced apart by a predetermined distance from a grid-like




or loop-like opposite conductor, each emitter and associated opposite conductor forming a discharge pair;

a plurality of such discharge pairs are arranged in a two dimensional expanse in a direction transversing a flow direction of said flow filtered clean air;

each opposite conductor of said discharge pairs is connected to a DC voltage source; and

there is provided a means for adjusting a DC voltage applied to each opposite conductor from said DC voltage source.

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**5,047,893**

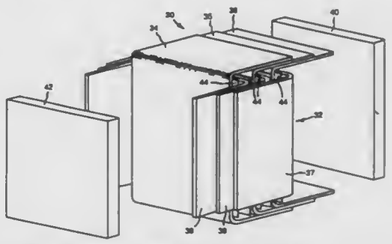
## HIGH-FREQUENCY CAPACITOR

**George A. Farrall, Rexford, and Joseph C. Borowiec, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 24, 1990, Ser. No. 586,927**

**Int. Cl.[5] H02B** *1/18;* **H05K** *7/20;* **H05B** *37/00;* **H01G** *4/08*

**U.S. Cl. 361—377** **22 Claims**



1. A high-frequency capacitor, comprising:

a first conductive member including a plurality of substantially U-shaped metal plates disposed substantially parallel to each other, said first conductive member further including a first terminal plate disposed between the ends thereof;

a second conductive member including a plurality of substantially U-shaped metal plates disposed substantially parallel to each other and interleaved with the metal plates of said first conductive member, said second conductive member further including a second terminal plate disposed between the ends thereof; and

a dielectric material disposed between the adjacent metal plates of said first and second conductive members.

VOL 1130 ISS 2 SE 10 1991 UMI

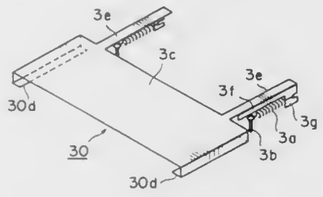


5,047,894

## IC CARD WITH SHUTTER HAVING L-SHAPED FLANGES ENCLOSING THE SIDES OF AN ELECTRODE TERMINAL BOARD

Shigeo Onoda, and Hajime Maeda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,933
Int. Cl.[5] H05K *5/00*; H01R *13/447*; G06K *19/00, 19/04*
U.S. Cl. 361—395 6 Claims




1. An IC card for connection to an external device comprising:
an IC card including at least one electronic part;
electrical connection means disposed on said IC card for electrically connecting said electronic part to an external device;
a sliding shutter having a main surface and including opposed first and second edges, and L-shaped flanges extending from said first and second edges for selectively covering said electrical connection means; and
L-shaped grooves in said IC card receiving said L-shaped flanges of said shutter, said grooves extending in the direction of sliding of said shutter.

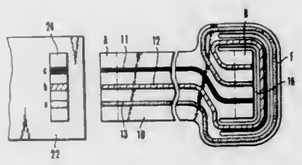
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5,047,895

## FLEXIBLE PRINTED CIRCUIT BOARD

Takahide Sasaki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 4, 1989, Ser. No. 293,411
Claims priority, application Japan, Jan. 26, 1988, 63-8331[U]
Int. Cl.[5] H05K *1/00*
U.S. Cl. 361—398 5 Claims




1. A flexible printed circuit board permitting electric connections with other electrical parts, comprising:
a plurality of electrode portions;
a plurality of conductive patterns for electrically connecting said plurality of electrode portions to each other;
a slit provided around and adjacent to at least one electrode portion of said plurality of electrode portions; and
a detour portion separated by said slit from said at least one electrode portion located adjacent to said slit, said detour portion being provided to allow at least one of said plurality of conductive patterns to detour and cause an order of arrangement of said conductive patterns of said at least one electrode portion located adjacent to said slit to differ from an order of arrangement of said conductive patterns of other corresponding electrode portions.

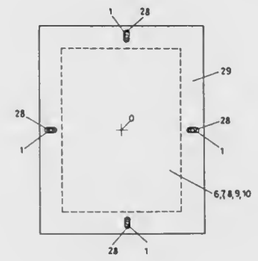
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5,047,896

## ASSEMBLY OF MULTI-LAYER CIRCUIT BOARDS SECURED BY PLASTIC RIVETS

Harry Zust, Erlenbach, Switzerland, assignor to Fela Planungs Ag, Baden-Dattwil, Switzerland

Filed Nov. 8, 1989, Ser. No. 433,575
Claims priority, application Switzerland, Nov. 11, 1988, 04190/88
Int. Cl.[5] H05K *1/00*
U.S. Cl. 361—412 3 Claims




1. A multi-layer assembly comprising a plurality of planar circuit layer stacked in registry and defining a series of elongated, aligned holes having parallel sides about the periphery thereof, and a plurality of sliding bodies each formed of a thermoplastic material and having a flange at one end and a second end, each of said bodies further having a central bore therethrough having its axis extending between said ends and two opposed planar sliding surfaces parallel to said axis and parallel to each other, each of said sliding bodies being inserted into one of said elongated each sliding body being dimensioned to be tightly fitting within said elongated hole with said sliding surfaces being aligned parallel to the parallel sides of said elongated hole, the second end of the sliding body projecting beyond said stacked elements, said second end being expandable into a collar whereby the stacked planar elements are retained together and are slidable in a longitudinal direction about the sliding body.



5,047,897

**Patent Not Issued For This Number**

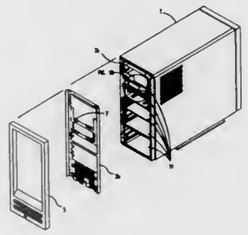
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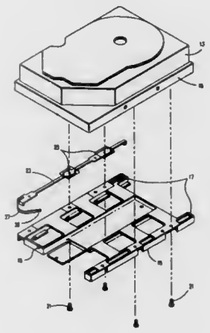
5,047,898

## DEFLECTABLE CONTACT FOR PROVIDING POSITIVE SURFACE CONTACT FOR SHIELDING ELECTROMAGNETIC INTERFERENCE

Kevin K. Cooke, Delray Beach; John R. Dewitt, Boca Raton, and Paul J. Galinis, Boynton Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1989, Ser. No. 435,913
Int. Cl.[5] H05K *9/00, 7/02*
U.S. Cl. 361—424 10 Claims





1. In a personal computer assembly including a housing having an electromagnetic interference shield panel mountable on one surface thereon adjacent a front surface of at least one electronic device mounted on a movable support, the improvement comprising:
said shield panel having a first contact spaced from said support and said electronic device;
said support being a base having an upper surface and a lower surface, said upper surface having said electronic device mounted thereon;
and a grounding connector mounted on said support and providing a low resistivity grounding path between said electronic device and said shield, said grounding connector comprising conductive means and a second contact;
said conductive means being mounted on said support between said upper surface of said base and said electronic device, said conductive means being mechanically and electrically connected to a ground connection of said electronic device; and
said second contact extending from said base into grounding electrical engagement with said first contact, said second contact being connected to said conductive means, and said second contact being deflectable and deformable by said first contact between a first position and a second position, for providing a line contact with said first contact when in said first position, and for providing a low resistivity surface contact in which said second contact is deformed against said first contact to provide greater contact surface area than said line contact when deflected into said second position by pressure exerted thereon by said first contact and said electromagnetic interference shield panel, when said personal computer assembly is fully assembled, to provide enhanced shielding against electromagnetic interference.

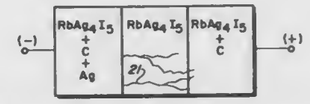
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5,047,899

## SOLID ELECTROLYTE CAPACITOR AND METHOD OF MAKING

John F. Bruder, Phoenix, Ariz., assignor to Quadri Electronics Corporation, Chandler, Ariz.

Filed Aug. 3, 1990, Ser. No. 562,234
Int. Cl.[5] H01G *9/00*
U.S. Cl. 361—502 26 Claims




3. A capacitor structure for storing backup energy, comprising in combination:
(a) a layer of solid electrolyte material composed of $RbAg_4I_5$;
(b) a layer of anode material composed of carbon and $RbAg_4I_5$ and adjoining a first surface of the electrolyte material, and a layer of cathode material also composed of carbon and $RbAg_4I_5$ and adjoining a second surface of the electrolyte material parallel to the first surface;
(c) means for charging the capacitor structure to produce a voltage of 0.50 volts to 0.66 volts between tbe anode material and the cathode material, to thereby cause storage of charge in a double layer mode and also in a pseudocapacitance mode and to cause silver to deposit in the anode.

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5,047,900

## ELECTRONIC FLASH APPARATUS

Anthony DiRisio, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

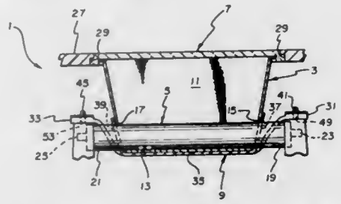
Filed Jan. 7, 1991, Ser. No. 637,851
Int. Cl.[5] G03B *15/02*
U.S. Cl. 362—16 3 Claims

1. An electronic flash assembly comprising (a) a concave shaped reflector housing having an open front, a closed rear, and a pair of opposite side openings, (b) a flash lens covering the open front of said reflector housing, (c) a flash tube positioned in said reflector housing with respective end portions protruding outward from said side openings of the reflector housing to loosely support said flash tube, and (d) an elastomeric strap having a pair of opposite end portions, an intermediate portion extending over the exterior of said reflector housing at its closed rear, and respective openings located

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between the end portions and intermediate portion of said strap which receive the end portions of said flash tube to allow the strap to secure the tube and the housing relative to one another, is characterized in that:



fixed means holds said flash lens and engages said elastomeric strap at its end portions for inducing the strap to yieldably bias said reflector housing firmly against the lens.

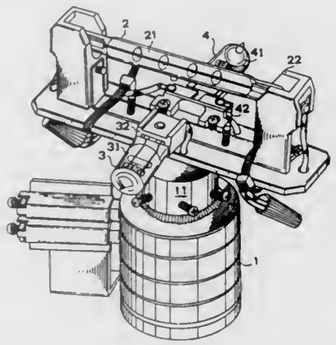
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**5,047,901**

## STRUCTURE OF ROTARY LAMP FOR VARIABLE STAGE ILLUMINATION

**Yu-Chuan Lin, 1F, No. 103, San Yang Road, San Chung, Taipei, Taiwan**

**Filed Jun. 1, 1990, Ser. No. 531,896**
**Int. Cl.[5] F21V *21/30***
**U.S. Cl. 362—35** **1 Claim**



1. A rotary lamp for stage lighting control comprising

a seat having a revolving shaft controlled to rotate at a constant speed in a horizontal plane,

an elongated lamp included an elongated lamp tube mounted on a lamp holder, said lamp holder being connected and secured to said seat, whereby said lamp holder rotates when the shaft rotates,

two short lamps, each including a short lamp tube mounted on a respective lamp holder, said two short lamps being mounted on respective opposite sides of said elongated lamp, and at right angles thereto, whereby said short lamps rotate when said shaft rotates,

a single four-step control switch controllable to selectably switch on said elongated long lamp, one or both of said short lamps, and all of said lamps, and being electrically connected with said elongated lamp, and with said two short lamps for respectively controlling the operation of said elongated lamp and said two short lamps,

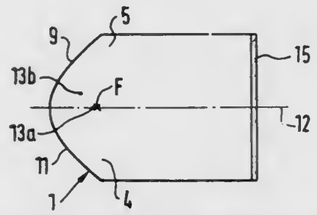
said lamps being supplied with a voltage of 12 volts derived from a single mains supply, said elongated lamp being designed to have a current of 5 Amperes pass therethrough, said short lamps being designed to have a current of 3 Amperes pass therethrough.

**5,047,902**

## HEADLAMP FOR POWER VEHICLE

**Rainer Neumann, Stuttgart, and Gerhard Lindae, Leonberg-Eltingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 23, 1990, Ser. No. 572,619**
**Claims priority, application Fed. Rep. of Germany, Oct. 7, 1989, 3933540**
**Int. Cl.[5] F21M *3/22***
**U.S. Cl. 362—61** **11 Claims**



1. A headlamp for power vehicles, comprising a reflector; a light source arranged in said reflector, said light source and said reflector being movable relative to one another so that in one position the light source is located close to a focal point of said reflector and in another position it is spaced from said focal point both along an optical axis and also vertically relative to the optical axis of said reflector to produce different light distributions so that in said one position said light source is located on said optical axis of said reflector and in said other position said light source is vertically spaced from said optical axis of said reflector and locations of a dark-bright limit in light distributions in said both positions are substantially the same.

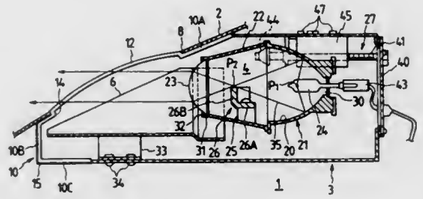
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**5,047,903**

## AERODYNAMIC VEHICLE HEADLAMP

**Masataka Choji, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Dec. 1, 1989, Ser. No. 444,233**
**Claims priority, application Japan, Dec. 15, 1988, 63-314938**
**Int. Cl.[5] B60Q *1/00***
**U.S. Cl. 362—61** **18 Claims**



1. A vehicle headlamp, comprising:

a lamp housing;

a reflector mounted in said lamp housing;

a projecting lens provided in front of said reflector near a light gathering region of said reflector; and

a transparent lens cover sloping forward disposed in front of said projecting lens, said transparent lens cover lying across an optical axis of said reflector and covering a front opening of said lamp housing, said lens cover having an upper surface portion sloping along an inner surface of a vehicle body; a curved portion corresponding in area to an effective light distribution region defined by said projecting lens; and annular wall extending from said upper surface portion of said lens cover so as to reinforce said lens cover, said curved portion being integral with and surrounded by said annular wall, and said annular wall



extending through an opening in said vehicle body; a front surface portion extending substantially vertically from a front edge of said upper surface portion; and a lower surface portion extending horizontally rearward from a lower edge of said front surface portion.

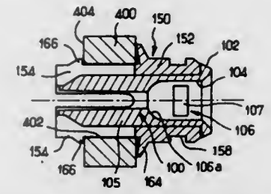
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**5,047,904**

## CAPSULE, IN PARTICULAR FOR MOUNTING THE HEAD OF AN ANGLE-ADJUSTMENT ON A REFLECTOR OF A MOTOR VEHICLE HEADLIGHT

**Didier Vraux, Noisy-Le-Sec, France, assignor to Valeo Vision, Bobigny Cedex, France**

**Filed Nov. 30, 1990, Ser. No. 621,045**
**Claims priority, application France, Dec. 1, 1989, 89 15894**
**Int. Cl.[5] B60Q *1/06***
**U.S. Cl. 362—66** **10 Claims**



1. A capsule, in particular for mounting the head of an angle-adjustment screw on a reflector of a motor vehicle headlight, the capsule being of the type comprising, in the vicinity of a first end, means for receiving the head, and in the vicinity of a second end, fixing means for fixing the capsule to a mount fixed to the reflector, wherein the capsule comprises a first portion including a housing for the head, and a second portion including the fixing means for fixing the capsule to the reflector, wherein said fixing means comprise flexible means suitable for entering into latching engagement with said mount, and wherein said first portion of the capsule is capable of sliding relative to the second portion to a locking position in which it bears against the flexible means, preventing them from moving out from their latching engagement with the mount.

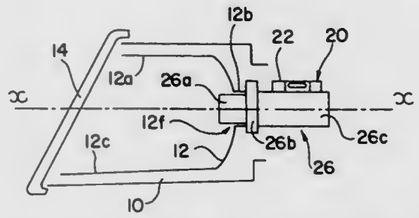
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**5,047,905**

## MOTOR VEHICLE HEADLIGHT INCLUDING AN INDICATOR DEVICE FOR INDICATING THE ELEVATION DIRECTION OF ITS REFLECTOR

**Patrice Collot, Pantin, and Jean-Marie Brel, Claye-Souilly, both of France, assignors to Valeo Vision, Bobigny Cedex, France**

**Filed Feb. 19, 1991, Ser. No. 657,441**
**Claims priority, application France, Feb. 20, 1990, 90 02027**
**Int. Cl.[5] F21M *3/18***
**U.S. Cl. 362—66** **2 Claims**



1. A motor vehicle headlight comprising a light source, a reflector, a housing, and a front glass, and also comprising an indicator device for indicating the elevation direction of the reflector, the indicator device being of the type comprising a spirit level mounted on said reflector in a plane which is essentially vertical and parallel to the optical axis defined by said reflector, and the spirit level occupying a predetermined angular relationship with said optical axis, wherein the spirit level is mounted on a support suitable for being removably and temporarily installed in a lamp hole provided in the reflector, said support replacing the lamp.

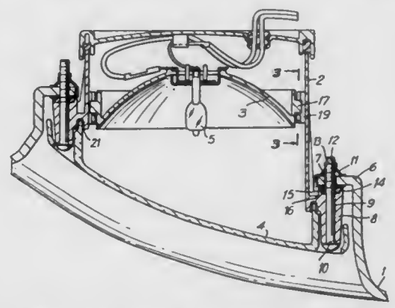
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**5,047,906**

## LAMP FOR VEHICLE

**Walter K. Weber, Grand Rapids, Mich., assignor to KB Lighting Inc., Kentwood, Mich.**

**Filed Mar. 16, 1990, Ser. No. 495,463**
**Int. Cl.[5] B60Q *1/00***
**U.S. Cl. 362—80** **8 Claims**



1. A lamp for a vehicle, comprising a lens; a reflector; a supporting casing supporting said lens and said reflector; a housing; means for compensating manufacturing tolerances and dampening vibrations and including an elastic element arranged between said supporting casing and said housing; and means for turnably mounting said reflector on said supporting casing, said mounting means including a receiving block provided on said supporting casing, and a projection provided on said reflector and turnably received in said receiving block.

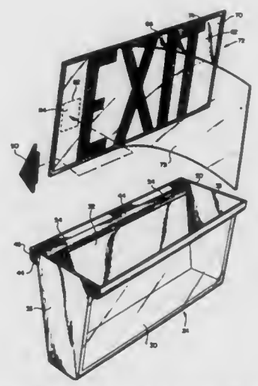
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**5,047,907**

## LEGEND DISPLAYING LIGHT FIXTURE WITH ENHANCED STRENGTH AND STRUCTURAL STABILITY

**James W. Hawkins, Skokie, Ill., assignor to Kenall Manufacturing Co., Gurnee, Ill.**

**Filed Jun. 11, 1990, Ser. No. 536,195**
**Int. Cl.[5] F21V *3/04***
**U.S. Cl. 362—311** **5 Claims**




1. In a legend-displaying electrical fixture including a frame-

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less, unitary housing of plastic composition, and illumination means, said housing been devoid of metallic framing elements and having a light-pervious principal wall of transparent plastics material presented for viewing a legend therethrough, a fixture-housed, legend-imprinted panel means displaying said legend for viewing through said wall, said light-pervious panel means being essentially co-continuous with said wall,

fastening means for securing said legend-imprinted panel means within said housing to overlie said light-pervious wall in substantially contiguous abutment with a surface of said wall disposed interiorly of said housing,

the improvement wherein said housing defines a unitary structure of plastics composition devoid of auxiliary framing elements, wherein said panel means is a thin, flexible sheet of plastics composition, and wherein said fastening means comprises adhesive means in the form of a predeposited, film-like web of substantially uniform thickness overlying and circumscribing said panel means in a perimetric marginal band thereabout for securely bonding said panel means to said wall on an inner face thereof,

physically generated, etched, band-like border means formed integrally on said light transmitting wall along perimetric margins thereof for visually and unobtrusively shielding said band of adhesive from view and for aesthetically enhancing the appearance of said unitary housing of said fixture, and

wherein said panel means is characterized by limited, controlled rigidity coupled with a high degree of flexibility.

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**5,047,908**

## LIGHTING FITTINGS

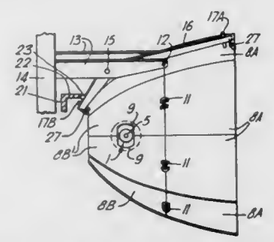
**Angus B. Dixon, Oldham, and Wilfred A. Price, Stanmore, both of Great Britain, assignors to Osram Limited, England**

**Continuation of Ser. No. 527,274, May 23, 1990. This application Nov. 28, 1990, Ser. No. 619,030**

**Claims priority, application United Kingdom, Jun. 6, 1989, 8912941**

**Int. Cl.[5] F21V *7/00***

**U.S. Cl. 362—346** **3 Claims**



1. A lighting fitting for use with an electric lamp having a relatively compact high intensity light source, comprising: a reflector having a longitudinal axis and extending forwardly of the lamp, said reflector including a plurality of separate segments disposed around the lamp and pivotable about respective axes which are tangential to a circle centered on the longitudinal axis of the reflector, each segment having at least two separate sections disposed end to end or partially overlapping in the direction of the longitudinal axis, said at least two separate sections being operatively coupled to means for pivoting said at least two separate sections simultaneously but through different angles.

**5,047,909**

## POWER CONVERSION APPARATUS WITH HARMONIC FILTRATION

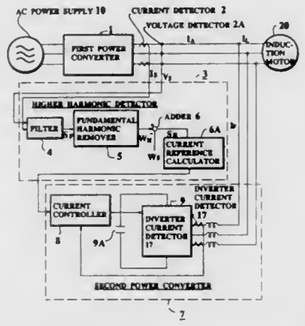
**Hiromi Hosoda, Tokyo, Japan, assignor to Kabusbiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation-in-part of Ser. No. 449,336, Dec. 11, 1989, abandoned, which is a continuation of Ser. No. 247,602, Sep. 22, 1988, abandoned. This application Oct. 29, 1990, Ser. No. 604,477**

**Claims priority, application Japan, Sep. 28, 1987, 62-240809**

**Int. Cl.[5] H02M *1/12, 1/14***

**U.S. Cl. 363—40** **13 Claims**




1. A power conversion apparatus with harmonic filtration, comprising:

first power converter means for converting an input power from a power supply into an output power;

detector means, connected to an output side of the first power converter means, for detecting an output current and an output voltage of the first power converter means;

higher harmonic detector means, connected to the detector means, for detecting a higher harmonic component on a basis of the output current and the output voltage, and for producing current reference signal corresponding to the detected higher harmonic component; and

second power converter means for producing an inverse of the detected higher harmonic component according to the current reference signal, and combining the produced inverse of the higher harmonic component with the output current of the first power converter means such that the higher harmonic component in the output current of the first power converter means is cancelled by the inverse of the higher harmonic component.

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**5,047,910**

## IDEAL SINUSOIDAL VOLTAGE WAVEFORM SYNTHESIS CONTROL SYSTEM

**Alexander Levran, Los Angeles, and Anurag Chandra, Los Alamitos, both of Calif., assignors to Teledyne Inet, Torrance, Calif.**

**Filed Jul. 9, 1990, Ser. No. 550,189**

**Int. Cl.[5] H02M *7/48***

**U.S. Cl. 363—41** **5 Claims**

1. In combination:

(a) an AC power inverter means comprising a plurality of solid-state switching means connected in a plurality of inverter bridges to produce polyphase AC output power, and switch driver circuits;

(b) a filter and sense means to sense said inverter output line voltage waveforms and filter current waveforms;

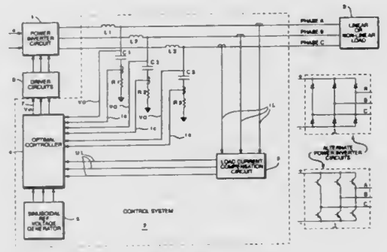
(c) means for sensing load currents in said AC power inverter output lines;

(d) means for load current compensation for processing said sensed load currents in accordance with the formula $U_L = R\, i_L + L\, di/dt$, where UL=load current compensation signal, R=line resistance, L=inserted line inductance, $i_L$=sensed load current, di/dt=change in load current per unit time;

(e) means for generating a sinewave voltage reference; and

(f) an optimal controller means, including digitial circuits and memory storage means arranged and connected to operate on the incoming signals from said filter and sense means, from said load current compensation means and from said means for generating a sinewave voltage reference, to produce a sequence of signals Vin for optimal switching of said inverter switching means in accordance with the formula: $Vin = U + U_L$, where





$U_L$=load current compensation signal,

$U = -P1b1 - P2b2$,

where P1, P2 are Lagrange scaling factors derived from signal feedback parameters, and modified by the sinewave voltage reference,

where b1, b2 are matrix values determined by selected values of line inductance and line and sense filter resistance; said sequence of signals Vin, when connected to said switch driver circuits, causing said inverter switch means to turn on and off in a sequence producing and inverter optimum sinusoidal voltage waveform output.

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**5,047,911**

## DEVICE FOR A UNIPOLARLY OPERATED ELECTRICAL CIRCUIT COMPONENT

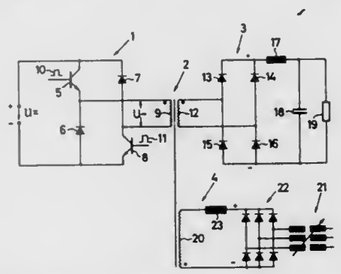
**Wolfgang Sperzel, Gelnhausen-Hailer; Horst Landwehr, Hanau; Johann Sturmer, Freigericht; Friedrich-Werner Thomas, Gelnhausen, and Guido Hubertus, Hochheim, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany**

**Filed Jul. 22, 1988, Ser. No. 223,035**

**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724649**

**Int. Cl.[5] H02H *7/122***

**U.S. Cl. 363—56** **16 Claims**



1. An apparatus for transforming a first dc voltage into a second dc voltage, comprising:

an input for receipt of a first dc voltage;

means, coupled to said input, for producing unipolar pulses from said first dc voltage;

a transformer, said transformer having a primary winding coupled to said producing means for receipt of said unipolar pulses, and a secondary winding,

said transformer generating a first magnetic flux in response to said unipolar pulses;

an output coupled to said secondary winding for output of a second dc voltage; and

means, coupled to said transformer and responsive to a current flowing in response to said unipolar pulses, for generating a second magnetic flux and superimposing said second magnetic flux upon said first magnetic flux,

said superimposed magnetic fluxes providing a total magnetic flux that is varied.

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**5,047,912**

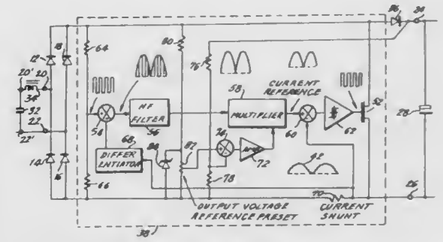
## FOUR-TERMINAL UNITY POWER FACTOR ELECTRONIC RECTIFIER

**Brian R. Pelly, Palos Verdes Estates, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.**

**Filed Mar. 9, 1990, Ser. No. 580,101**

**Int. Cl.[5] H02M *7/06***

**U.S. Cl. 363—89** **13 Claims**




1. An electronic power rectifier, comprising:

a self-contained electronic power rectifier module having first and second user-accessible input terminals suited for being coupled to an AC input voltage filtering circuit and first and second user-accessible output terminals, said electronic power rectifier module lacking terminals dedicated for connection thereto of filtering circuit means;

a rectifier bridge within said module and coupled to said first and second input terminals; and

control means in said module for controlling the current drawn via said first and second input terminals in a manner which is effective to cause said module to draw power from said input terminals at substantially unity power factor.

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**5,047,913**

## METHOD FOR CONTROLLING A POWER CONVERTER USING AN AUXILIARY RESONANT COMMUTATION CIRCUIT

**Rik W. A. A. De Doncker, and James P. F. Lyons, both of Niskayuna, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Sep. 17, 1990, Ser. No. 583,910**

**Int. Cl.[5] H02M *7/521***

**U.S. Cl. 363—95** **8 Claims**

1. A method for controlling a power converter of the type including an inverter having at least one phase, said inverter having at least two series-coupled main switching devices per phase, said series-coupled main switching devices being coupled to positive and negative rails of a dc supply, the junction between said main switching devices being coupled to a load, said main switching devices each having a snubber capacitor coupled in parallel therewith and an antiparallel diode coupled thereacross, said power converter further including a pair of series-coupled bus-splitting capacitors coupled between said

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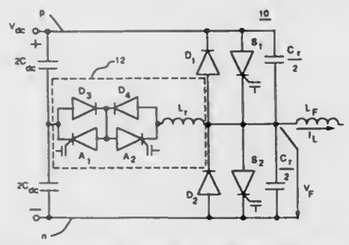


positive and negative rails of said dc supply, said power converter further including an auxiliary resonant commutation circuit coupled between the junction joining said main switching devices and the junction joining said bus-splitting capacitors, said auxiliary resonant commutation circuit comprising a pair of antiparallel-coupled auxiliary switching devices coupled in series with a resonant circuit, said resonant circuit including an inductor and said snubber capacitors, said method comprising commutating load current between one of said main switching devices and the opposing one of said antiparallel diodes coupled across the other one of said main switching devices, when commutation is initiated with load current in said opposing one of said antiparallel diodes, by:

(a) applying a forcing potential of substantially one-half the dc supply voltage across said inductor by turning on one of said auxiliary switching devices;

(b) allowing current in said inductor to increase to the load current level and displace the load current flowing through said opposing one of said antiparallel diodes;

(c) turning on said other one of said main switching devices



so as to enable the current through said inductor to increase to a predetermined boost current threshold above the load current level;

(d) turning off said other one of said main switching devices when current therethrough reaches said predetermined boost current threshold, thereby allowing said resonant circuit to resonate from the voltage level of one of said rails of said dc supply to the voltage level of the opposite rail thereof;

(e) clamping the output voltage of the respective inverter phase to the voltage level of the opposite rail of said dc supply by forward biasing the other one of said antiparallel diodes;

(f) turning on said one of said main switching devices when the voltage thereacross is substantially zero;

(g) allowing the current through said inductor to decrease to substantially zero; and ( (h) turning off said one of said auxiliary switching devices when the current therethrough is substantially zero;

whereby the load current flows through said one of said main switching devices.

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**5,047,914**

**CURRENT CONTROLLED INVERTER**

**John J. Dhyanchand, and Vietson M. Nguyen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Nov. 21, 1989, Ser. No. 439,685**

**Int. Cl.[5] H02M** *7/5387*

**U.S. Cl. 363—98** **20 Claims**

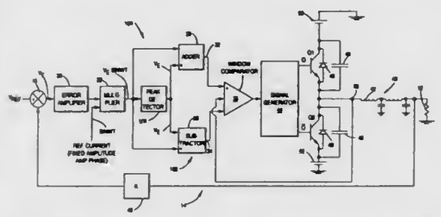
1. An inverter for producing an AC output potential from a filter containing an inductance through which current flows to a load comprising:

first and second switches coupled in series between a pair of DC reference potentials with each switch having a conductive and a non-conductive state controlled by control signals applied to control terminals of the switch;

first and second freewheeling diodes coupled in parallel respectively between first and second terminals of the first and second switches;

a current sensor producing a load current signal proportional to current flowing through the inductance to the load; and

a controller, responsive to an error signal proportional to a difference between an output voltage produced by the inverter applied to the load and a signal proportional to a



desired regulated output voltage of the inverter, a current reference signal varying at a frequency equal to the AC output potential and the load current signal, for producing the control signals applied to the switches which turn on the switches only when current is flowing in the freewheeling diode in parallel with the switch being turned on.

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**5,047,915**

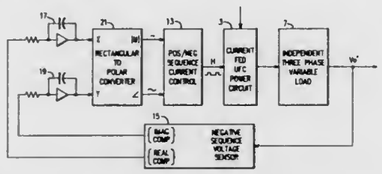
**UNRESTRICTED FREQUENCY CONVERTER FOR UNBALANCED LOADS**

**Goeffrey M. Smith, Reisterstown, Md.; Thomas H. Putman, Penn Hills Township, Allegheny County, Pa.; Eric J. Stacey, Penn Hills Township, Allegheny County, Pa., and Laszlo Gyugyi, Penn Hills Township, Allegheny County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jun. 26, 1990, Ser. No. 543,984**

**Int. Cl.[5] H02M** *5/257*

**U.S. Cl. 363—161** **8 Claims**



1. A current fed unrestricted frequency converter for supplying multiphase current of one frequency to a multiphase unbalanced voltage source type load from a multiphase current source having another frequency while maintaining balanced voltages on said multiphase unbalanced voltage source type load, said converter comprising:

an array of switches connecting each phase of said multiphase current source to each phase of said multiphase unbalanced voltage source type load;

sensing means sensing a negative sequence component of voltage in said multiphase unbalanced voltage source type load;

control means responsive to said sensing means operating said switches to gate portions of each phase of said multiphase current to said multiphase unbalanced voltage source type load in a repetitive pattern which reduces said negative sequence voltage component in said load to substantially zero; and

means connected to said multiphase unbalanced voltage source type load to substantially eliminate any zero sequence voltage in said multiphase unbalanced voltage source type load.



**5,047,916**

**METHOD AND APPARATUS OF FREE SPACE ENUMERATION FOR COLLISION AVOIDANCE**

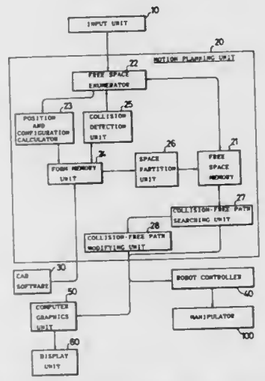
**Koichi Kondo, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 24, 1989, Ser. No. 328,682**

**Claims priority, application Japan, Mar. 25, 1988, 63-69832; Mar. 25, 1988, 63-69833; Jul. 21, 1988, 63-180304**

**Int. Cl.[5] G06F** *15/20*

**U.S. Cl. 364—167.01** **80 Claims**



1. An apparatus for collision-free path determination using free space enumeration, in which configurations of a physical object and surrounding physical obstacles are represented by a configuration space defined in terms of degrees of freedom of the object, the configuration space being divided up into a multiplicity of cells defined in terms of intervals in the degrees of freedom, in which a path of the object between a given initial point in the configuration space from which the path starts and a given final point in the configuration space at which the path ends is to be determined, the apparatus comprising:

means for enumerating a continuous free space between the initial point and the final point in which the path can be located, including:

means for selecting cells which satisfy a prescribed condition, between the initial point and the final point, by simultaneously using a plurality of strategies for selecting the cells; and

means for checking an occurrence of a collision between the object and the surrounding obstacles in the selected cells;

means for determining a collision-free path in the free space joining the initial point and the final point; and

means for controlling a position of the physical object with respect to the physical obstacle according to the determined collision-free path.

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**5,047,917**

**APPARATUS FOR INTRASYSTEM COMMUNICATIONS WITHIN A BINARY N-CUBE INCLUDING BUFFER LOCK BIT**

**William C. Athas, Sandy, Utah; Reese Faucette, Pasadena, and Charles L. Seitz, San Luis Rey, both of Calif., assignors to The California Institute of Technology, Pasadena, Calif.**

**Continuation of Ser. No. 754,828, Jul. 12, 1985, abandoned. This application Jan. 31, 1989, Ser. No. 303,977**

**Int. Cl.[5] G06F** *15/16*

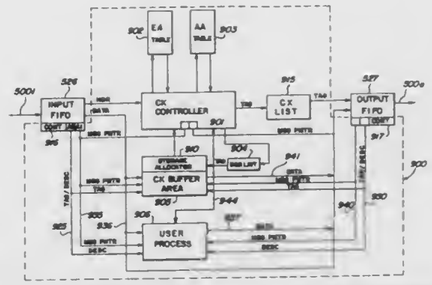
**U.S. Cl. 364—200** **7 Claims**

1. In a computer system of the binary n-cube type wherein a plurality of computing nodes are interconnected by point-to-point, bidirectional, asynchronous communications channels for the transmission of messages between user process programs executing in ones of the computing nodes, the improved communication system for the prevention of system blockout comprising:

a) input means at each of the computing nodes connected for receiving messages input to the computing node from communication input channels connected thereto, said input mans including input buffer means for interfacing with said communication input channels connected thereto and for initially receiving said messages;

b) output means at each of the computing nodes connected for transmitting messages output from the computing node to communication output channels connected thereto, said output means including output buffer means for interfacing with said communication output channels connected thereto and for holding said messages prior to and during transmission thereof;

c) kernel program means at each of the computing nodes for acting as an interface between the user process programs



executing in the computing node and said input and output means and for exclusively controlling the receiving and transmitting of messages into and out of the computing node;

d) means for allowing the user process programs to pass control to said kernel program means in order to request the sending and receiving of messages on their behalf by said kernel program means; and

e) a lock bit associated with each said output buffer means which lock bit has conditions of locked and unlocked which are sensible by the user process programs and set by said kernel program means to a locked condition when a message is placed in said output buffer and set by said kernel program means to an unlocked condition when a message therein has been transferred out of said output buffer means so that said output buffer means is available to receive a new message.

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**5,047,918**

**FILE MANAGEMENT SYSTEM**

**Mayer D. Schwartz, and Norman M. Delisle, both of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.**

**Continuation of Ser. No. 815,430, Dec. 31, 1985, abandoned. This application Dec. 19, 1988, Ser. No. 289,395**

**Int. Cl.[5] G06F** *1/00*

**U.S. Cl. 364—200** **4 Claims**

1. A method for a computer for storing successive versions of successively changed data files stored in a computer accessed data storage device and for searching for a group of said versions, the method comprising the steps of:

creating and storing a version history record when the content of one of said data files undergoes a change, the version history record comprising a set of instructions for recreating a version of the content of said one data file existing immediately prior to the change by inserting data into and deleting data from said one data file existing immediately following the change, one such version history record being created and stored each time a data file

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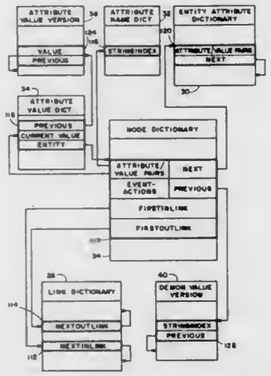


is changed such that a version history record is associated with each successive version of the data file;

assigning to each version history record and storing a time parameter value established according to the time the version associated with the version history record was first stored as the content of a data file;

storing node records, each of said node records being associated with a corresponding one of said version history records and comprising first data indicating at least one file attribute parameter and second data indicating a value for said at least one file attribute parameter, said file attribute parameter value representing an attribute of a content of a data file recreated by the set of instructions comprising the associated version history record; and

searching for a group of said version history records in response to an input command identifying a particular file




attribute parameter value and a first particular time, wherein each version history record of said group comprises the set of instructions recreating a data file as it existed as of said first particular time and is associated with a node record and wherein the step of searching comprises the substeps of:

reading data comprising the stored node records;

identifying from the node record data read a first subset of version history records associated with node records indicating said particular file attribute parameter value,

reading stored time parameter values assigned to version history records to determine a second subset of version history records comprising instructions recreating a data file as it existed as of said first particular time, and

identifying said group of version history records as all version history records included in both said first and second subsets.

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**5,047,919**

**METHOD AND APPARATUS FOR MONITORING SOFTWARE EXECUTION IN A PARALLEL MULTIPROCESSOR COMPUTER SYSTEM**

**Thomas L. Sterling, Crofton, Md., and Donald J. Becker, Palm Bay, Fla., assignors to Harris Corporation, Melbourne, Fla.**

**Continuation-in-part of Ser. No. 848,013, Apr. 3, 1986, abandoned. This application Jul. 14, 1989, Ser. No. 382,063**

**Int. Cl.[5] G06F *11/30***

**U.S. Cl. 364—200** **15 Claims**

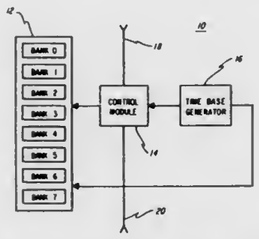
1. A software monitor for monitoring the execution of software on a parallel multiprocessor computer system, wherein each processor operates as a central processor, and wherein the software running on at least one processor is segregated into a plurality of mutually exclusive segments by a user before execution, and wherein marker statements are inserted into the software to delimit the segments, and wherein the computer system executes the software, including the marker statements, said software monitor comprising:

time-base generator means for providing clock pulses, wherein each clock pulse is representative of a predetermined unit of time;

controller means responsive to the marker statements;

a number of storage banks equal to the number of processors in the computer system;

wherein each storage bank is subdivided into a predetermined number of segment sub-banks, wherein said predetermined number is equal to or greater than the number of segments;




wherein each segment sub-bank is further subdivided into a plurality of storage locations;

wherein one of said plurality of storage locations stores a value representing the time the respective processor spends executing the identified segment;

wherein said controller means detects a marker statement designating the beginning of an identified segment;

wherein said controller means detects a marker statement identifying the end of said identified segment;

wherein the contents of the respective storage location is updated in response to the number of clock pulses occurring during execution of the identified segment.

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**5,047,920**

**HIERARCHAL SYSTEM FOR REDUCING MEMORY ACCESS TIME TO PLURAL EQUAL SIZED MEMORIES BY SIMULTANEOUSLY ADDRESSING AND ACCESSING MEMORY**

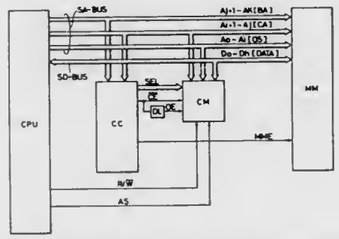
**Tsuneo Funabashi, Tokyo, Japan, assignor to Hitachi, Ltd., Toyko, Japan**

**Division of Ser. No. 15,030, Feb. 17, 1987, abandoned. This application May 2, 1989, Ser. No. 346,242**

**Claims priority, application Japan, Feb. 21, 1986, 61-35104**

**Int. Cl.[5] G06F *12/08***

**U.S. Cl. 364—200** **3 Claims**




1. A hierarchal memory system for use with a computer processor, said memory system comprising:

first memory means having a plurality of equal sized groups of memory blocks for storing information, each memory block of said first memory means identified by a memory address including a group portion identifying the group of which the memory block is a part and a block portion identifying the position of the memory block within its group, each memory block of said first memory means responsive to simultaneous receipt of a memory address signal indicative of the memory address of such memory block and a first control signal for outputting information stored in such memory block;

second memory means having a first plurality of memory blocks, equal in number to the number of groups of memory blocks in said first memory means, each memory block of said first plurality of memory blocks storing the information stored in a uniquely associated memory block in said first memory means, each of said uniquely associated memory blocks being from a different one of said groups of memory blocks in said first memory means, each memory block of said first plurality of memory blocks identified by an address corresponding with the group portion of the memory addresses of the memory blocks of the associated different one of said groups of memory blocks in said first memory means, each memory block of said first plurality of memory blocks responsive to receipt of a memory address signal having a group portion corresponding with the address of such memory block for outputting information stored in such memory block;

third memory means having a second plurality of memory blocks, equal in number to the number of groups of memory blocks in said first memory means, each memory block of said second plurality of memory blocks identified by an address corresponding with the address of an associated memory block of said first plurality of memory blocks and storing the block portion of the memory block address of the memory block in said first memory means that is storing the same information as is stored in said associated one of said first plurality of memory blocks;

first control means responsive to receipt of a memory address from a computer processor for assuming alternatively a first state or a second state, said first control means assuming the first state when the received memory address block portion is different from the block portion stored in the third memory means memory block identified by the group portion of the received memory address and assuming the second state when the received memory address block portion is the same as the block portion stored in the third memory means block identified by the group portion of the received memory address;

first signal generating means responsive to said first control means being in its first state for applying a first control signal to said first memory means to cause said first memory means to ouput the information stored in the first memory means memory block identified by the received memory address;

second signal generating means responsive to said first control means being in its second state for generating a second control signal;

an output terminal; and

second control means coupled to said second memory means and responsive to the second control signal for applying to said output terminal the information output from said second memory means;

whereby, upon receipt of a data request from the computer processor, said second memory means outputs information to said second control means while said first control means is assuming one of its states so that the desired information is more rapidly available for output when said first control means assumes its second state, thereby reducing memory access time.



**5,047,921**

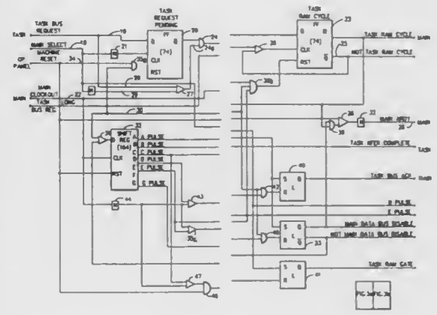
**ASYNCHRONOUS MICROPROCESSOR RANDOM ACCESS MEMORY ARBITRATION CONTROLLER**

**Harold B. Kinter, Binghamton, and Gerald R. Westcott, Newark Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 31, 1989, Ser. No. 304,777**

**Int. Cl.[5] G06F *15/16***

**U.S. Cl. 364—200** **20 Claims**



13. A controller for a printer apparatus having its functions stored in memory means common to a plurality of asynchronous microprocessor means, at least one of which is equipped with a "not ready" mode of interruption, said controller comprising:

means for connecting and disconnecting each of said plurality of asynchronous microprocessor means with said common memory means for a predetermined limited period of time;

clock means connected with said common memory means for timing an internal operating cycle for said common memory means;

first circuit means for giving priority to one of said asynchronous microprocessor means when there is contention for access to said common memory means;

second circuit means, responsive to a predetermined signal, for initiating an adjustment in the internal timing of an asynchronous microprocessor means contending for access to said common memory means to bring it into synchronism with said internal operating cycle of said clock means; and

means to interrupt said connection means whenever there is

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contention for access to said common memory means after one predetermined, limited, period of time;

whereby each of said plurality of asynchronous microprocessor means alternates for one of said predetermined, limited periods of time for accessing said common memory means.

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5,047,922

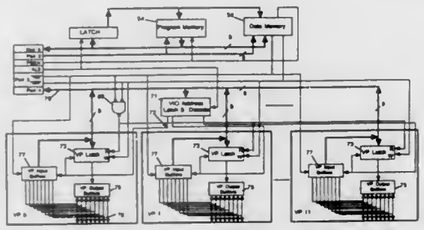
## VIRTUAL I/O

Shekhar Borkar, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 150,740, Feb. 1, 1988, abandoned. This application Jul. 27, 1990, Ser. No. 559,976

Int. Cl.[5] G06F *13/00*

U.S. Cl. 364—200 5 Claims



1. A microprocessor system including a microprocessor formed as a single integrated circuit, having bus means (**15**) for transferring data to and from internal registers, timing and control means (**21**) for controlling input and output operations, said system comprising:

a plurality of input/output port means (**27, 27', 29, 29', 31, 31', 35, 35'**) onboard said microprocessor for receiving and sending data and control signals to and from devices external to the microprocessor, each of said port means including a port latch (**27, 29, 31, 35**) coupled to said bus means (**15**), a port driver (**27', 29', 31' 35'**) coupled to said port latch and input/output pins coupled to said port driver, said input/output pins for coupling said microprocessor to devices external to the microprocessor;

control means (**85**) onboard said microprocessor and coupled to a predetermined one of said plurality of port means for generating control signals for use by said timing and control means (**21**) to modify the timing of the execution of predetermined instructions performed by said microprocessor;

transfer means (**81, 82, 83**) onboard said microprocessor coupled to said bus means, said predetermined one of said port means and said control means (**85**) for transferring data to and from said bus means (**15**) and said predetermined one of said port means;

a plurality of virtual port means (**73, 77, 75, 78**) for coupling to said input/output pins of said predetermined one of said port means, each of said virtual port means for coupling to a device external to said microprocessor; and

virtual address decoder means (**71**) for coupling to said input/output pins of said predetermined one of said port means and each of said virtual port means for decoding data on said input/output pins for selecting which one of said plurality of virtual port means is to transfer data to or receive data from said input/output pins.

5,047,923

## MODULARLY STRUCTURED DIGITAL COMMUNICATION SYSTEM FOR INTERCONNECTING TERMINAL EQUIPMENT AND PUBLIC NETWORKS

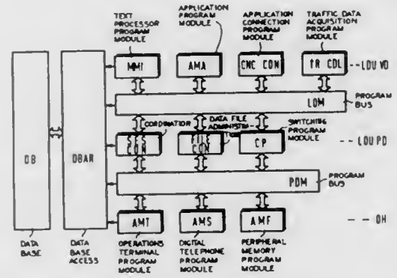
Siegfried Elstner, Eichenau, and Klaus Kuhlmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 19, 1988, Ser. No. 233,827

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1987, 3727954; Jun. 13, 1988, 3820072

Int. Cl.[5] G06F *3/16, 13/42;* H04L *12/50;* H04M *7/00*

U.S. Cl. 364—200 31 Claims




1. A modularly structured digital communications system for connecting terminal equipment to one another and to, public networks, which contained:

a central system computer having a system data base and at least one multi-tasking operating system, comprising:

means for the administration of a line technology task structure having operating technique apparatus program modules for interfacing with types of terminal equipment for generating logical operating technology status messages from inputs receive from at least one of the terminal equipment and operating technology terminal equipment and for outputting setting data for the terminal equipment and/or operating technology terminal equipment that are acquired from logical bperating technology status messages associated with apparatus type, and

means for administering an operations-oriented coordination task structure hierarchically equivalent to a switching technology task structure and having a coordination program module for the control of the operations-oriented information and data flow, said coordination program module being hierarchically lower-ranking than a coordination task organization program, and

means for administering an operations-oriented application task structure having at least one application program module for executing application-oriented functions, such as initialization, maintenance, and remote control technology, said at least one application program module being hierarchically lower-ranking than an application task organization program,

whereby at least one part of the program modules is individually accessible to the data base via defined data base access routines,

the multi-tasking operating system having a program bus structure having a first transmission protocol, that is a virtual terminal protocol, defined independently of the type of communication services and terminal equipment for status messages transmitted between the line technology task structure and the coordination task structure and having a second transmission protocol, that is a virtual application protocol, likewise defined independently of the communications services and the type of terminal equipment which provides compact data arrangement that is at least approximately free of control characters for status messages transmitted inside the application task structure and between the latter and the coordination task structure, and

a text processor program module for converting status messages in one of the two transmission protocols into status messages in the other transmission protocol;

the operating technique apparatus program modules operatively connected to at least one of the program bus structure, the terminal equipment and the operating technology terminal equipment;

the coordination program module operatively connected to at least the program bus structure;

the at least one application program module operatively connected to at least the program bus structure; and

the text processor program module operatively connected to at least the program bus structure.



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5,047,924

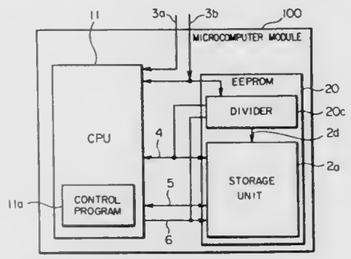
## MICROCOMPUTER

Shuzo Fujioka; Toshiyuki Matsubara; Atsuo Yamaguchi; Kenichi Takahira; Shigeru Furuta, and Takesi Inoue, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 2, 1988, Ser. No. 279,029

Int. Cl.[5] G06F *1/04*

U.S. Cl. 364—200 2 Claims




1. A microcomputer comprising:

a divider which divides a clock signal originating from outside the microcomputer and changes the frequency of the clock signal to a desired frequency thereby creating a synchronizing signal;

a storage unit connected to said divider having a memory cell array and a control circuit which writes data in the memory cell array responsive to the synchronizing signal from said divider;

a CPU connected to said divider and said storage unit which includes a control program that sets the dividing ratio of the divider;

said divider having:

a write time setting register which receives a dividing ratio from a CPU;

a first counter adapted to receive a clock signal from outside of the microcomputer; and

a second counter serially connected with said first counter and adapted to receive a carry output from said first counter as a clock signal;

said first and second counters being constructed to receive the dividing ratio from said write time setting register and to divide the clock signal according to the dividing ratio set in said first and second counters.

5,047,925

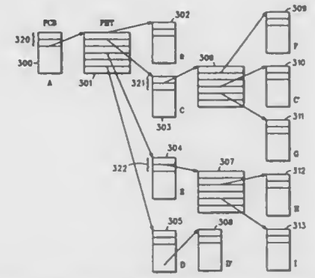
## LOGICAL RING IN A VIRTUAL SINGLE MACHINE

Andrew I. Kun; Frank C. Kolnick, both of Willowdale, Canada, and Bruce M. Mansfield, Kent, Wash., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 730,923, May 6, 1985, abandoned. This application Apr. 15, 1988, Ser. No. 183,469

Int. Cl.[5] G06F *15/16*

U.S. Cl. 364—200 13 Claims




1. A method of communicating between processes in a data processing system comprising a plurality of processes grouped into one or more contexts, said method comprising the steps of:

(a) providing each context with a table identifying the location of each of its constituent processes;

(b) generating a request by a first process in one of said contexts to send a message to any process within said one context having the identical name as said first process, the location of said identically-named process within said context being unknown to said first process;

(c) searching the table of said one context to determine whether any other identically-named process is located within said one context; and

(d) if said one context contains any identically-named process, sending said message to said identically-named process.

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5,047,926

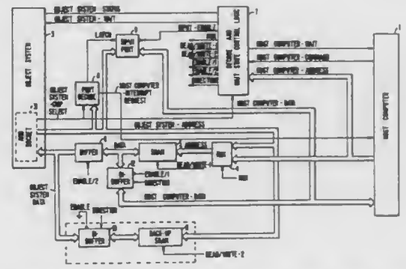
## DEVELOPMENT AND DEBUG TOOL FOR MICROCOMPUTERS

Ruey-Shen Kuo, PanChiao; Chun-Lin G. Chen, and Ray-Yuan R. Lan, both of Taipei, all of Taiwan, assignors to Acer Incorporated, Taipei, Taiwan

Filed Mar. 15, 1989, Ser. No. 324,269

Int. Cl.[5] G06F *11/00*

U.S. Cl. 364—200 9 Claims



1. Apparatus for debugging an object system, said object system having at least a processing unit and a register, said object system having a ROM socket and providing a chip select signal, an object system address bus, and an object system data bus through said ROM socket, and said apparatus

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being connected to a host computer for bidirectional data transmission through a host computer data bus when addressed by a host computer address bus, said host computer including a debugging program for debugging said object system, and said apparatus being connected to said object system through said ROM socket, comprising:

decoder/wait state control logic means connecting with said host computer to receive address information therefrom, said control logic means being responsive to a plurality of command signals from said host computer and providing a wait signal to said host computer, said control logic means further connecting with said object system to receive said chip select signal and a status signal from said object system and providing a wait signal to said object system, said control logic means further providing an input-enable, a MUX, a read/write-1, an enable/1, an enable/2, and a direction signal;

an object system bus connecting with said object system at said ROM socket, said object system bus including said object system data and address bus;

multiplexer means connecting with said host computer to receive said host computer address information and connected to said object system address bus, said multiplexer means being responsive to said mux signal for providing an address signal derived from one of said host computer address information and information carried by said object system address bus;

port decoder means receiving said object system address bus and responsive to said chip select signal, and providing a host computer interrupt request signal to the host computer and a latch signal;

a host computer bus connecting with said host computer said host computer bus including said host computer data bus and address bus;

input port means connected to receive said object system address bus and said host computer data bus and being responsive to said latch signal and said input-enable signal for transferring data on said object system address bus to said host computer data bus;

SRAM means connected to receive said debugging program and at least a control instruction sent from the host computer through the host computer data bus, said SRAM being addressed by the address signal from the multiplexer means in response to said read/write-1 signal from said control logic means; and

first bidirectional buffer means, second buffer means, and a data bus means interconnecting said SRAM means, first bidirectional buffer means, and second buffer means, wherein:

said first bidirectional buffer means is connected to said host computer data bus and is responsive to said direction and enable/1 signals to enable data flow to and from said host computer;

said second buffer means is connected to said object system data bus and is responsive to said enable/2 signal to enable communication to said object system; and

the processing unit of the object system executing the debugging program and control instructions stored in the SRAM.

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**5,047,927**

## MEMORY MANAGEMENT IN PACKET DATA MODE SYSTEMS

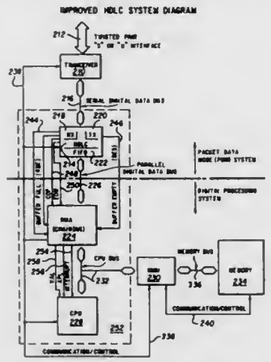
**Richard G. Sowell, Sam Jose, and Robert Pieters, Diamond Springs, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Oct. 28, 1988, Ser. No. 263,715**
**Int. Cl.[5] G06F** *13/28*
**U.S. Cl. 364—200** **14 Claims**

1. A memory management system for a Packet Data Mode System including a Direct Memory Access DMA controller coupled to a memory, the management system of the type for extracting and sending a message from the memory storage or receiving and storing the message to the memory storage the system comprising:

a. means for receiving a message coupled to the DMA controller, wherein the message includes a Control/Address Field (CAF) and may include a Data Field (DF);

b. storage means for generating a change of field signal




coupled to the DMA controller for signifying an end of the first received of the CAF or DF;

c. storage means for generating an end of message signal coupled to the DMA controller for signifying that the entire message has been received;

d. said DMA controller storing the CAF and DF at separate addressable locations in the memory.

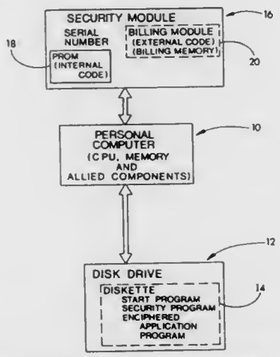
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**5,047,928**

## BILLING SYSTEM FOR COMPUTER SOFTWARE

**John D. Wiedemer, 930 W. Forest Dr., Houston, Tex. 77079**

**Continuation-in-part of Ser. No. 922,689, Oct. 24, 1986, Pat. No. 4,796,181. This application Jan. 3, 1989, Ser. No. 292,927**
**The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.**
**Int. Cl.[5] H04L** *9/00*
**U.S. Cl. 364—406** **5 Claims**




1. A billing system for billing users on a usage basis for an enciphered application software program for a computer comprising:

a hardware security module attached to the computer, the security module carrying therein a fixed computer-readable numeric internal code and also carrying a billing module interface;

a billing module electrically connected to the security module and electrically connecting to the billing module interface therein, the billing module having fixed and alterable memory therein with a fixed computer-readable numeric external code in the fixed memory and billing information stored in the alterable memory, and

a storage medium for the computer carrying an enciphered application program thereon and also carrying thereon security program means for (1) causing the computer to read the internal code and the external code, (2) using the internal and external codes to generate a decipher key which is used in a predetermined algorithm to decipher the application program for use by the user, and (3) writing usage billing information in the alterable memory in the billing module.



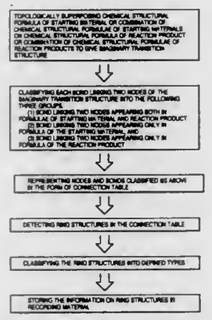
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**5,047,929**

## METHOD FOR PROCESSING INFORMATION ON CHEMICAL REACTIONS

**Shinsaku Fujita, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 903,720, Sep. 5, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 236,261**
**Claims priority, application Japan, Sep. 9, 1985, 60-199920**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—497** **12 Claims**




1. A method of storing information for an organic chemical reaction in which a reaction of at least one starting material to give at least one reaction product is involved; which comprises the steps:

(a) topologically superposing a chemical structural formula of the starting material or a combination of chemical structural formulae of the starting materials on a chemical structural formula of the reaction product or a combination of chemical structural formulae of the reaction products to give an imaginary transition structure;

(b) classifying each bond linking two nodes of the imaginary transition structure into the following three groups; (1) bond linking two nodes appearing both in the formulae of the starting material and the reaction product, (2) bond linking two nodes appearing only in the formula of the starting material, and (3) bond linking two nodes appearing only in the formula of the reaction product;

(c) representing nodes and bonds classified in step (b) in the form of a connection table;

(d) detecting ring structures in the connection table;

(e) classifying the ring structures into any type of the following five groups; (I) ring structure which contains one bond of (2) and does not contain the bond of (3), (II) ring structure which contains two or more bonds of (2) and does not contain the bond of (3); (III) ring structure which does not contain the bond of (2) and contains one bond of (3); (IV) ring structure which does not contain the bond of (2) and contains two or more bonds of (3); and (V) ring structure which contains one bond of (2) and one bond of (3); and

(f) storing the classified ring structures in a recording material.

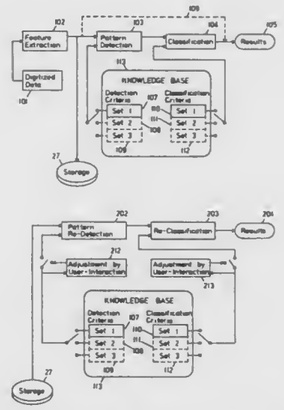
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**5,047,930**

## METHOD AND SYSTEM FOR ANALYSIS OF LONG TERM PHYSIOLOGICAL POLYGRAPHIC RECORDINGS

**Wim L. J. Martens, Eindhoven, Netherlands, and Jaap I. Kap, Madison, Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.**

**Filed Jun. 26, 1987, Ser. No. 67,765**
**Int. Cl.[5] A61B** *5/04*
**U.S. Cl. 364—413.04** **37 Claims**




1. A method of analyzing physiological signals obtained from physiological sensor on a subject, comprising the steps of:

(a) receiving the time varying physiological signals from the sensors on the subject;

(b) digitizing the physiological signals to provide digital physiological signal data;

(c) storing the digitized physiological signal data in correlation with time and making such data available for later retrieval;

(d) analyzing the physiological signal data on a real time basis to detect patterns therein indicating fluctuations in physiological function;

(e) displaying to an operator the results of the analysis on a real time basis as the data is being received from the subject;

(f) after completion of the taking of physiological data from the subject, displaying to the operator the final results of the analysis based on all the data taken;

(g) re-analyzing the physiological data stored for long term retrieval after specification by the operator of new criteria determining fluctuations is physiological function;

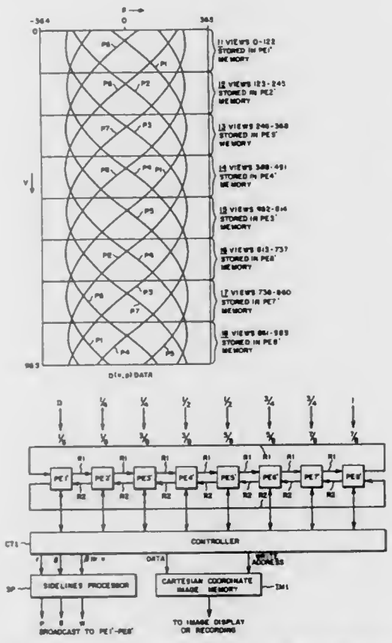
wherein the step of analyzing data on a real time basis and the step of re-analyzing the stored data each includes the steps of extracting significant features from the background nonsignificant features of the time varying data, comparing the extracted features with respect to model patterns to categorize the extracted features, and classifying a particular time epoch within which such categorized patterns are found into a class depending on which class has criteria which most closely match the categorized patterns for the particular time epoch.

**5,047,931**

## PARALLEL COMPUTATION OF FAN-BEAM BACK-PROJECTION RECONSTRUCTION ALGORITHM IN COMPUTED TOMOGRAPHY

Wen-Tai Lin, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 30, 1989, Ser. No. 358,300
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.21 16 Claims



1. A method for computing, in parallel, density functions for m image picture elements in accordance with the fan-beam back-projection reconstruction algorithm for computed tomography, for use before an image memory for storing said density functions and for use after a tomographic scanner having a fan beam energy source and opposing arcuate strip of detectors both exhibiting relative rotation in equal angular increments during a succession of scanning views, V in number, around a point of origin, said method comprising the steps of:

storing the detector responses of each of the successive scanning views after pre-convolution processing and convolution with a filter kernel;

selecting said m image picture elements to describe points in scanned space being equidistant from said point of origin and having integral coordinates inasfar as addressing said image memory during its writing where density functions is concerned;

successively calculating weights for correcting for fan beam divergence, which each weight is associated in common with each of said m selected image picture elements in a respective one of the V views thereof, the order of said calculating establishing scanning paths through the stored detector responses for accumulating density functions for each of said m selected image picture elements wherein the angle between the ray sum passing through each of those selected image elements and the central ray of the fan beam during their respective views is the same in all m cases;

determining by interpolation from the stored detector responses after pre-convolution processing and convolution with a filter kernel the density functions of each of said m selected elements, progressing over their respective scanning paths through the stored detector responses and calculating their like-valued interpolation coefficients in common; and

accumulating the products of said weights with the density functions for each of m selected image picture elements progressing over their respective scanning paths through the stored detector responses.

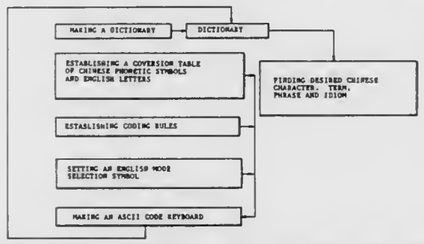
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**5,047,932**

## METHOD FOR CODING THE INPUT OF CHINESE CHARACTERS FROM KEYBOARD ACCORDING TO THE FIRST PHONETIC SYMBOLS AND TONES THEREOF

Kou-Chang Hsieh, Boulder, Colo., assignor to Talent Laboratory, Inc., Boulder, Colo.

Filed Dec. 29, 1988, Ser. No. 291,731
Int. Cl.[5] B41J *5/30*; G06F *15/38*
U.S. Cl. 364—419 4 Claims



1. A method for coding input of Chinese characters based upon the characters' phonetic sounds comprising the steps of:

(1) making a dictionary including:

an instruction code index section including a plurality of memory addresses, a plurality of machine codes respectively contained in memory locations of said memory addresses of said instruction code index section, and a plurality of instruction codes corresponding to said machine codes, and

an input/output conversion section including a plurality of memory addresses, a plurality of machine codes respectively contained in memory locations of said memory addresses of said conversion section, and a plurality of input/output conversion instruction codes and Chinese characters;

(2) establishing a conversion table which converts each Chinese phonetic representation symbols to a predetermined English letter in accordance with phonetic similarities therebetween;

(3) establishing coding rules for coding Chinese characters as follows:

(i) when a Chinese phrase to be output has three or more characters, its input/output conversion instruction code includes a set of English letters phonetically resembling the first phonetic representation symbols of each Chinese character, wherein said English letters are arranged in the same order as said corresponding Chinese characters,

(ii) when a Chinese phrase to be output has two characters, its input/output conversion instruction code includes two English letters phonetically resembling the respective first phonetic representation symbols of these Chinese characters, and two numerals designating respective tones of these Chinese characters, wherein said English letters and said numerals are arranged in a predetermined order,

(iii) when a single Chinese character is to be output, its input/output conversion instruction code includes an English letter phonetically resembling the first phonetic representation symbol of this Chinese character, and a numeral designating tone of this Chinese character, wherein said English letter and said numeral are arranged in a predetermined order,

(4) setting a mode selection symbol as a first symbol of instruction codes for English letter mode, said mode selection symbol being an English letter which is not present in said conversion table mentioned in step (2); and

(5) making an ASCII code keyboard which has a plurality of English alphabet keys, some of said English alphabet keys being respectively marked with a corresponding Chinese phonetic symbol according to said conversion table mentioned in step (2), whereby, when any key on said keyboard is pressed, an ASCII code signal is generated and output.



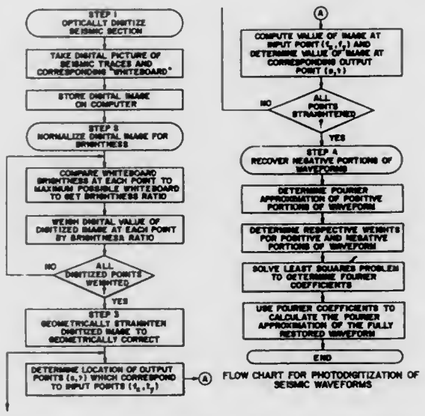
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**5,047,933**

## FULL WAVE FORM RESTORATION OF OPTICALLY DIGITIZED SEISMIC TRACES

Yoichi Harita, and James C. Schatzman, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 160,962, Feb. 26, 1988, abandoned.
This application Jan. 26, 1990, Ser. No. 471,047
Int. Cl.[5] G01V *1/28, 1/34*
U.S. Cl. 364—421 4 Claims



1. A method for photodigitizing wave forms contained on a seismic section, comprising:

a. optically digitizing said wave forms on said seismic section to produce a digitized image;

b. normalizing said digitized image to produce a normalized digitized image;

c. geometrically straightening said digitized image to produce a geometrically corrected digitized image; and

d. recovering the negative portions of said wave forms on said seismic section to produce a fully restored wave form of said digitized image.

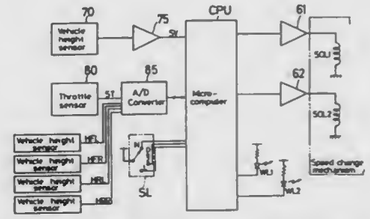
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**5,047,934**

## CONTROLLING DEVICE FOR AUTOMATIC SPEED CHANGE MECHANISM

Yoshitami Saito, Aichi, Japan, assignor to Aisin Seiki K.K., Aichi, Japan

Filed Mar. 30, 1989, Ser. No. 330,832
Claims priority, application Japan, Mar. 30, 1988, 63-77479
Int. Cl.[5] B60K *41/18*; G05D *17/02*
U.S. Cl. 364—424.1 6 Claims



1. A controlling device for an automatic speed change mechanism of an automobile comprising:

a speed change mechanism installed between a driving output shaft and a driving source disposed in an automobile and having speed change means for selecting speed change steps for converting into a plurality of reduction ratios the ratios between the input shaft and the output shaft;

an automobile speed detecting means for emitting electric signals in response to the speed of the automobile;

a throttle detection means for emitting electric signals in response to an increase of power of said driving source;

at least one automatic load response automobile height detecting means for emitting electric signals analogous to the distance between a road surface and a body of the automobile; and

an electronic controlling means connected to said speed change mechanism, said speed detecting means, said throttle detecting means and said height detecting means, said electronic controlling means having a plurality of predetermined speed change programs indicating the relationship between the automobile speed detected by said automobile speed detecting means, the increase of the driving power detected by said throttle detecting means and the speed change steps whereby said electronic controlling means is operative, based on a selected speed change program to control the speed change means of said speed change mechanism and is operative to select a different speed change program in response to a variation of the automobile height detected by said height detection means.

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**5,047,935**

## AUTOMATIC TRANSMISSION CONTROL APPARATUS, HAVING MEANS FOR DETERMINING THE COMPLETION OF A SHIFT

Yuji Kashihara, Toyota, Japan, assignor to Toyota Jishoda Kabushiki Kaisha, Japan

Filed Sep. 8, 1989, Ser. No. 404,753
Claims priority, application Japan, Sep. 22, 1988, 63-238439
Int. Cl.[5] B60K *41/10, 41/18*; G06F *15/20*
U.S. Cl. 364—424.1 7 Claims

1. An apparatus including an automatic transmission disposed in a power transmitting system for a motor vehicle, having an input shaft, an output shaft, a first transmission mechanism, a second transmission mechanism, and a rotary member associated with the input shaft, and means for controlling the automatic transmission, said controlling means comprising:

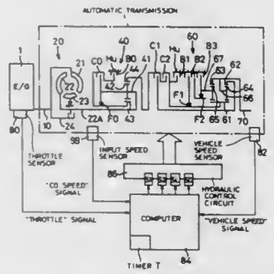
means for producing first and second shifting commands;

first testing means for testing for the presence of a first

shifting command to effect a first shifting operation of said automatic transmission which requires a shifting action of only one of said first and second transmission mechanisms;

first determining means, operable when said first testing means positively tests for the presence of said first shifting command, for effecting a first determination based on a rotating speed of said rotary member, that said first shifting operation is complete;

second testing means for testing the presence of a second shifting command to effect a second shifting operation of




said automatic transmission which requires shifting actions of both of said first and second transmission mechanisms; and

second determining means, operable when said second testing means positively tests for the presence of said second shifting command, for effecting a second determination based on said rotating speed of said rotary member that the shifting action of said second transmission mechanism is completed, and a third determination that said second shifting operation is completed at a predetermined time interval after said second determination.

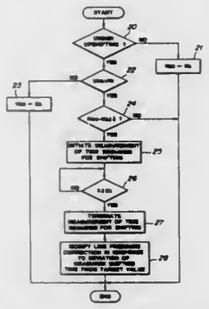
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**5,047,936**

**GEAR SHIFT CONTROL FOR POWER TRAIN**

**Shigeru Ishii, Atsugi, and Shigeki Shimanaka, Hadano, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Jul. 27, 1989, Ser. No. 385,867**
**Claims priority, application Japan, Jul. 28, 1988, 63-186978**
**Int. Cl.[5] B60K *41/10***
**U.S. Cl. 364—424.1** **4 Claims**




1. In a gear shift control apparatus for a power train including a prime motor, a torque converter, and an automatic transmission to which a prime motor output torque is transmitted through the torque converter, the automatic transmission being subjected to a gear shift operation from a gear position with a first gear ratio to another gear position with a second gear ratio the apparatus comprising:

prime motor output speed sensor means for detecting an output speed of the prime motor and for generating a prime motor output speed signal which is indicative of said prime motor output speed detected;

transmission output speed sensor means for detecting an output speed of the automatic transmission and for generating a transmission output speed signal which is indicative of said transmission output speed detected; and

means for multiplying said automatic transmission output speed signal by the gear ratio of another gear position established after the gear shift operation to obtain a pseudo transmission input speed, for calculating a ratio of said pseudo transmission input speed to said prime motor output speed detected to obtain a torque converter pseudo speed ratio, for generating a torque converter pseudo speed ratio signal which is indicative of said torque converter pseudo speed ratio obtained, and for determining that the gear shift operation is completed when said torque converter pseudo speed ratio signal reaches a predetermined value.

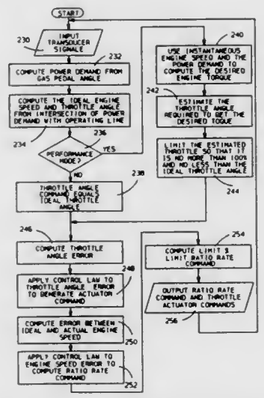
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**5,047,937**

**ENGINE CVT CONTROL SYSTEM**

**Hamid Vahabzadeh, Rochester, and Samuel M. Linzell, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Jun. 1, 1990, Ser. No. 531,676**
**Int. Cl.[5] B60K *41/18***
**U.S. Cl. 364—424.1** **5 Claims**




1. In a CVT control system, for a vehicle drivetrain with an engine having various engine speeds, including ratio control means having an input element positionable in response to a control signal to establish various speed ratios between input and output shafts of the CVT and various ratio rates of the CVT and controller means developing the control signal for positioning the input element in response to operator demand, the improvement wherein the controller means (1) develops a command indicative of a desired engine speed in response to operator power demand, (2) compares the command to a measure of the actual engine speed, (3) develops the control signal in a manner determined as a function of the comparison, and (4) applies the control signal to the input element, affecting a direct control of the ratio rate and hence engine speed, in response to the operator demand.

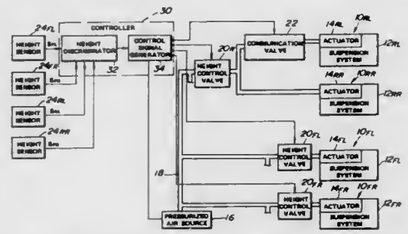


**5,047,938**

**HEIGHT CONTROL SYSTEM IN AUTOMOTIVE SUSPENSION SYSTEM WITH HUNTING PREVENTIVE FEATURE**

**Masatsugu Yokote, Yokohama; Hideo Ito, Zushi, and Kenji Kawagoe, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Dec. 18, 1987, Ser. No. 135,110**
**Claims priority, application Japan, Dec. 19, 1986, 61-303159**
**Int. Cl.[5] B60G *17/10***
**U.S. Cl. 364—424.05** **15 Claims**




15. A height control system for an automotive vehicle, comprising:

first, second and third suspension systems respectively provided at first, second and third mutually spaced portions of a vehicle body for suspending a vehicular body relative to corresponding first, second and third vehicular wheels;

first, second and third variable pressure actuators filled with pressurized working fluid and associated with each of said first, second and third suspension systems, for adjusting relative distance between said vehicle body and said vehicular wheel at corresponding first, second and third portions;

a pressure supply passage network including a pressurized working fluid source, for adjusting pressure of said working fluid in said first, second and third actuators for adjusting the relative distance between said vehicular body and said vehicular wheel at corresponding first, second and third portions;

a first and second pressure control valve means disposed within said pressure supply passage network, said first pressure control valve means being disposed between said first actuator and said pressure supply passage network for selectively establishing and blocking fluid communication therebetween, and said second pressure control valve means being disposed between said second and third actuators and said pressure supply passage network for selectively establishing and blocking fluid communication therebetween;

a communication passage means provided downstream of said second pressure control valve means and connecting said second and third actuators;

a communication control valve disposed within said communication passage means for selectively establishing and blocking fluid communication between said third actuator and said communication passage means;

means for monitoring vehicular height at said first, second and third portions of the vehicle and operating said communication control valve to open for establishing fluid communication between said third actuator and said communication passage means when the height level of one of said first, second and third portions is out of a predetermined target height range and to close said communication control valve while all of the height levels at first, second and third portions are within said predetermined target height range; and

means for controlling said pressure supply system and said first and second pressure control valve means for adjusting height level of the portions of the vehicle body to maintain the height level at the corresponding portion of the vehicle within said predetermined target range.

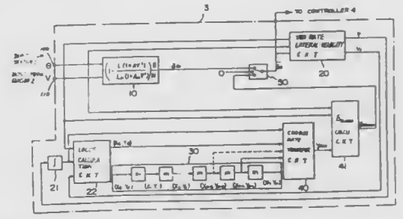
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**5,047,939**

**REAR WHEEL STEERING ANGLE CONTROL SYSTEM FOR VEHICLE**

**Ken Ito, and Kazutaka Adachi, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Japan**

**Filed Sep. 7, 1989, Ser. No. 407,463**
**Claims priority, application Japan, Sep. 8, 1988, 63-225825**
**Int. Cl.[5] B62D *7/14***
**U.S. Cl. 364—424.05** **22 Claims**




15. A system for controlling a rear wheel steering angle for a vehicle comprising:

first means for sensing vehicle speed to provide a signal indicative thereof;

second means for sensing an actual steered angle of front wheels of the vehicle to provide a signal indicative thereof;

third means for determining a first rear wheel steering angle required for turning within a given target turning circle as a function of the vehicle speed and the actual steered angle of the front wheel sensed by said first and second means and providing a signal indicative thereof;

fourth means for providing a first locus defined along a path of a first specific point on the front end of the vehicle based on the signals from, the first locus including a longitudinal line extending between the first specific point and a second specific point on the rear end of the vehicle as part of the first locus at the time the system starts;

fifth means for determining a second rear wheel steering angle resulting in the second specific point intersecting the first locus at a point where a line extending between center points of the rear wheels intersects the first locus and providing a signal indicative thereof;

sixth means for selecting the smaller of the absolute values of the first and second rear wheel steering angles to provide a rear wheel target steering angle to cause the second locus to be positioned inside the first locus with respect to the center of the vehicle turning circle; and

seventh means for controlling the rear wheel actual steering angle based on said rear wheel target steering angle.

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**5,047,940**

**POWER TRAIN CONTROL APPARATUS FOR A VEHICLE**

**Toru Onaka; Toshiaki Tsuyama; Kazutoshi Nobumoto; Fumio Kageyama; Akira Sone, and Makoto Teshima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jun. 7, 1989, Ser. No. 362,869**
**Claims priority, application Japan, Jun. 7, 1988, 63-141249; Jan. 25, 1989, 1-15553**
**Int. Cl.[5] B60T *8/58;* B60K *13/02***
**U.S. Cl. 364—426.02** **24 Claims**

1. A power train control apparatus for a vehicle comprising a combination of one or more microprocessors having a memory with programs stored therein for carrying out power train

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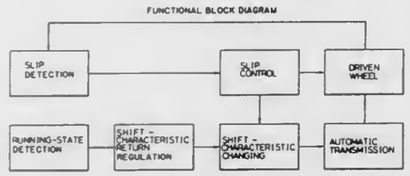


control functions and associated apparatus adapted to transmit output of an engine to a driven wheel through an automatic transmission for shifting speed stages based on a given shift characteristic, said combination comprising:

a slip detecting means for detecting a slip value of the driven wheel on pavement;

a slip control means for controlling the degree of slippage by reducing torque to be applied to the driven wheel in response to output from said slip detecting means when a degree of slippage is large enough to be reduced by slip control;

a shift-characteristics changing means for changing said given shift characteristic, said shift characteristic comprising a first shift characteristic and a second shift characteristic, in a manner such that said first shift characteristic is used at the time of ordinary running when no slip control is carried out by said slip control means and said second shift characteristic is used when slip control is carried out by said slip control means;




a running-state detecting means for detecting a given preset vehicle running state; and

a regulation means for regulating return of said second shift characteristic to said first shift characteristic when said given preset running state is detected by said running-state detecting means as slip control by said slip control means terminates.

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**5,047,941**

**WHEEL ACCELERATION SLIP CONTROL DEVICE**

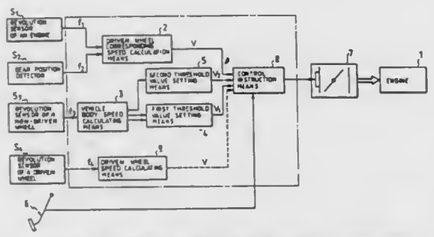
**Hirokazu Seki, Saitama, Japan, assignor to Akebono Brake Industry Co. Ltd., Tokyo and Akebono Research and Development Centre Ltd., Hanyu, both of, Japan**

**Continuation of Ser. No. 201,402, Jun. 2, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 617,389**

**Claims priority, application Japan, Jun. 4, 1987, 62-138994**

**Int. Cl.[5] B60K** *31/00*

**U.S. Cl. 364—426.03** **5 Claims**



1. A wheel acceleration slip control device comprising:

threshold value setting means for setting a first threshold value above a vehicle body speed and a second threshold value above said vehicle body speed larger than said first threshold value;

driven wheel corresponding speed calculating means for calculating a driven wheel corresponding speed from an engine speed; and

control instruction means for controlling a throttle within a degree of opening specified for said throttle by an operator to (1) close the degree of opening of said throttle when said driven wheel corresponding speed is greater than said second threshold value and increasing, (2) open the degree of opening of said throttle when said driven wheel corresponding speed is (a) greater than said second threshold value and decreasing and (b) less than said first threshold value, and (3)

hold the degree of opening of said throttle when said driven wheel corresponding speed is between said first threshold value and said second threshold value.

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**5,047,942**

**AIRPLANE TAKEOFF AND LANDING PERFORMANCE MONITORING SYSTEM**

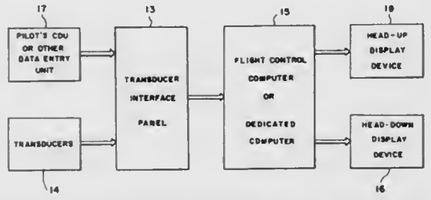
**David B. Middleton, Yorktown; Raghavachari Srivatsan, Newport News, and Lee H. Person, Jr., Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Continuation-in-part of Ser. No. 82,766, Aug. 6, 1987, Pat. No. 4,843,554. This application May 11, 1988, Ser. No. 192,562**

**The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.**

**Int. Cl.[5] G06F** *15/50*

**U.S. Cl. 364—427** **34 Claims**




1. In an airplane takeoff and landing performance monitoring system including a display for graphically and continuously depicting the position of an airplane on a runway from and during takeoff relative to where particular events are predicted to occur, the improvement comprising:

transducer means for continuously sensing ambient conditions and airplane loading and acceleration information and generating information signals representative thereof;

computer means responsive to said information signals for generating an acceleration history curve and predicting future airplane performance from and during takeoff and landing based on said acceleration history curve and said information signals; and

head-up display means responsive to signals from said computer means for depicting the position of said airplane on the runway and for depicting the predicted location on the runway where said airplane will achieve any particular speed.

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**5,047,943**

**SYSTEM AND METHOD FOR DETECTING ENGINE REVOLUTION SPEED, IDENTIFYING ENGINE CYLINDER, AND CONTROLLING ENGINE OPERATION ACCORDING TO DETECTED ENGINE REVOLUTION SPEED AND IDENTIFIED CYLINDER**

**Toshio Takahata; Masahiro Hisatomi, and Yoshihiro Okada, all of Kanagawa, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Nov. 22, 1989, Ser. No. 440,559**

**Claims priority, application Japan, Nov. 22, 1988, 63-295251; Nov. 22, 1988, 63-295252; Dec. 22, 1988, 63-325102**

**Int. Cl.[5] G06F** *15/48, 15/50;* **F02P** *5/00*

**U.S. Cl. 364—431.03** **15 Claims**

1. An apparatus for a multi-cylinder, four-cycle, spark-ignited engine, comprising:

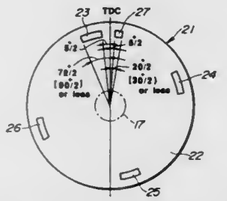
a) first means comprising:



a rotor plate which rotates in synchronization with a rotation of an engine crankshaft;

a plurality of first slits whose number corresponds to the number of cylinders, said first slits being equally spaced along a circumferential direction of the rotor plate, and each slit forming a first predetermined degree of arc along the circumferential direction, the first predetermined degree of arc being equal among the first slits; and

a second slit formed between two of the first slits, said second slit having a second predetermined degree of arc along the circumferential direction, which is smaller than the first predetermined arc,




wherein the first slits and the second slit being aligned on the same radial length from a center of rotation of the rotor plate, the first means outputting a pulse train signal having a first level change derived from each of the first slits and corresponding to a first crank angular position within a range of a first predetermined degree before a top dead center TDC in a compression stroke and having a second level change derived from the second slit and corresponding to a second angular position within a range of a second predetermined degree after the top dead center in the compression stroke; and

b) second means for controlling at least one of a fuel supply quantity control to the engine and ignition timing control on the basis of the first and second signals outputted by the first means.

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**5,047,944**

**VEHICLE CONTROL APPARATUS INCLUDING ABNORMALITY DETECTION**

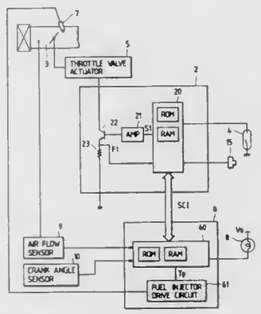
**Hideaki Ishikawa, Katsuta; Taiji Hasegawa, Nakaminato, and Osamu Abe, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Ibaraki, both of, Japan**

**Filed Jun. 29, 1989, Ser. No. 372,829**

**Claims priority, application Japan, Jul. 7, 1988, 63-170013**

**Int. Cl.[5] B60K** *31/02;* **G06F** *11/20*

**U.S. Cl. 364—431.11** **11 Claims**




1. A control apparatus for controlling a vehicle having a plurality of devices which operate to carry out different functions, respectively, through control applied thereto, said control apparatus comprising:

a plurality of unit controllers for controlling said devices respectively, at least one of said unit controllers having a self-diagnosis function and including means for outputting a signal representing a judgement result of self diagnosis when an abnormality is detected in an operation of said one unit controller;

data transfer means for allowing said one unit controller to transfer the signal representing a result of self diagnosis to at least one other unit controller; and

means provided in said other unit controller for changing, in response to said signal representing a result of self diagnosis from said one unit controller, a control mode of said other unit controller to a predetermined control mode in which safety will be ensured in the operation of said vehicle.

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**5,047,945**

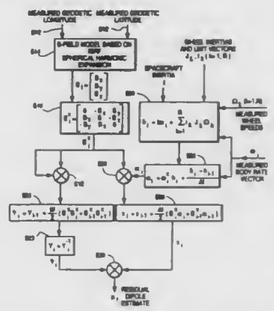
**RESIDUAL MAGNETIC DIPOLE CANCELLATION SYSTEM FOR SATELLITES**

**Michael A. Paluszek, Lawrenceville, N.J., assignor to General Electric Company, East Windsor, N.J.**

**Filed Aug. 9, 1990, Ser. No. 564,994**

**Int. Cl.[5] B64G** *1/10*

**U.S. Cl. 364—434** **15 Claims**




1. A method for rendering a spacecraft substantially free of perturbations of attitude and position attributable to magnetic fields of a heavenly body about which it orbits, said method comprising the steps of:

measuring the spacecraft momentum over a portion of an orbit of said spacecraft about said heavenly body by the use of electrical instruments, to produce momentum-related electrical signals;

measuring the body rate of said spacecraft over said portion of said orbit by the use of electrical instruments, to produce body-rate-related electrical signals;

accessing information from an electronic memory, which information relates to the historic magnitude of the magnetic field of said heavenly body in said portion of said orbit;

estimating the magnitude and direction of the magnetic dipole of said spacecraft by means of a computer, from at least said momentum-related and body-rate-related signals and said accessed information, to form electrical signals representing an estimate of said magnetic dipole; and

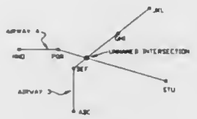
automatically passing current through coils associated with said spacecraft in response to said electrical signals representing an estimate for tending to cancel said perturbations.

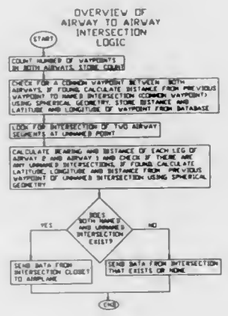
5,047,946

## AIRCRAFT NAVIGATIONAL SYSTEM AND METHOD FOR GUIDING AN AIRCRAFT ALONG INTERSECTING AIRWAYS

Ethmer W. King, Albuquerque, N. Mex.; Siamak H. Ghaffari, Santa Barbara, Calif., and David S. Yotsuuye, Renton, Wash., assignors to The Boeing Company, Inc., Seattle, Wash.

Filed Sep. 21, 1989, Ser. No. 410,316
Int. Cl.[5] G06F *15/50*
U.S. Cl. 364—448 29 Claims




26. A method to provide flight path information for an aircraft to travel along a first airway comprising a plurality of first segments to a point of intersection with a second airway comprising a plurality of second segments, and then to travel along said second airway, said system comprising:

a. providing to a flight path information input means information designating said first airway as a first path of travel and a departure location on said first airway and information designating said second airway as a second path of travel and a destination location on said second airway;

b. providing said information to a navigational computer means comprising a memory which contains information of identification and locations of waypoints on said first and second airways;

c. operating an identifying and calculating means of said navigational computer means to:

i. ascertain whether any waypoint is positioned on both of said first and second airways so as to constitute a common waypoint which is a named point of intersection;

ii. if said named point of intersection exists, then compute a distance from a previous waypoint on said first airway to said named point of intersection;

iii. ascertain existence of an unnamed point of intersection of said first and second airways which is not located on said common waypoint;

iv. if said unnamed point of intersection exists, compute location of said unnamed point of intersection and calculating a distance from a previous waypoint on said first airway to said unnamed point of intersection;

v. ascertain whether both said named and unnamed points of intersection exist or whether only one of said named and unnamed points of intersection exists, and in the event that both of said named and unnamed points of intersection exist, selecting that point of intersection which is closest to said previous waypoint on said first airway, and if only one of said named and unnamed points of intersection exists, selecting that point of intersection which does exist;

vi. incorporate the selected point of intersection in a flight plan which comprises a first flight path portion along said first airway to the selected point of intersection, and a second flight path portion from said selected point of intersection along said second segment;

d. operating output flight control means to provide flight path guidance data for said first flight path portion and said second flight path portion.

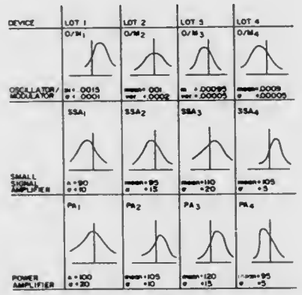
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5,047,947

## METHOD OF MODELING THE ASSEMBLY OF PRODUCTS TO INCREASE PRODUCTION YIELD

Joseph W. Stump, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 25, 1990, Ser. No. 557,697
Int. Cl.[5] G06F *15/46*
U.S. Cl. 364—468 5 Claims




1. A method of assembling a product assembled from a plurality of components, with the components being available from multiple manufacturing lots, to increase the yield of products having acceptable performance characteristics, comprising:

a. testing significant performance parameters of components of each manufacturing lot of each major component used in the assembly of the product to establish the statistical characteristics of the significant performance parameters of each manufacturing lot of each major component used in the assembly of the product;

b. evaluating the statistically probable performance of the product assembled with different combinations of components form different manufacturing lots to assess the performance sensitivity of the product to different combinations of components from different manufacturing lots;

c. selecting the combinations of components from different manufacturing lots to achieve the highest yield of products with acceptable performance characteristics; and

d. assembling products from the selected combination of components from different manufacturing lots to achieve the highest yield of products with acceptable performance characteristics.

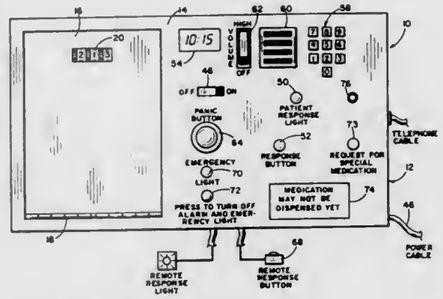


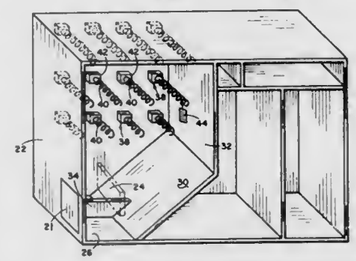
5,047,948

## MEDICATION DISPENSING SYSTEM

Joseph D. Turner, 11613 South 101 East Ave., Bixby, Okla. 74008

Filed Apr. 25, 1989, Ser. No. 342,753
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—479 12 Claims



1. A medication dispensing system, comprising:

a securable medication cabinet containing:

a plurality of medication dispensing components wherein each dispensing component comprises:

dispensing means for holding a medication package and dispensing the package upon actuation comprises a rotatable coil member interiorly of the cabinet upon which a medication package is placed,

a receptacle in the bottom of the cabinet to receive a medication package as it is dispensed,

a door in a side wall to permit access by a patient to a medication package in the receptacle, and

a stop secured to the interior of the cabinet to limit the opening of the door so that the patient may not reach farther into the cabinet to obtain unauthorized medication, and

programmable logic controller means for:

accepting prescription data,

accepting and evaluating patient physical data,

interfacing with medication dispensing components to select a dispensing component in response to patient prescription data and patient physical data,

interfacing with display components to indicate visually a response by patient to a signal entered, and

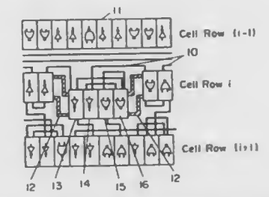
interfacing with a peripheral system adaptable to respond to a reaction of the patient.

5,047,949

## STANDARD CELL LSI LAYOUT METHOD

Ryuichi Yamaguchi, Hirakata, and Atsushi Yamamoto, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 204,526, Jun. 9, 1988, abandoned. This application Jun. 6, 1990, Ser. No. 534,358
Claims priority, application Japan, Jun. 10, 1987, 62-144650
Int. Cl.[5] G06F *15/60*
U.S. Cl. 364—491 2 Claims




1. In a standard cell LSI comprising functional circuits formed by placing a plurality of cell rows consisting of a plurality of standard cells and by routing said standard cells, a standard cell LSI layout method comprising the steps of:

deciding a global routing path which connects signal pins of said standard cells; and

determining the routing density from said global routing path in routing channels between cell rows; and

bending said cell rows in a zigzag lien by shifting one or more of said standard cells in a direction of a more dispersed routing area from a more congested routing area in order to avoid congested routing area between said cell rows; and

shifting at least one cell row in order to eliminate wiring area containing no wiring between said cell rows, which is produced as a result of bending of cell rows; and

connecting said signal pins of said standard cells by generating routing patterns.

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5,047,950

## METHOD AND AN APPARATUS FOR MEASURING THE FLOW IN OSCILLATING DISPLACEMENT PUMPS

Horst Fritsch, Leonberg, and Josef Benken, Weil der Stadt, both of Fed. Rep. of Germany, assignors to LEWA Herbert Ott GmbH & Co., Fed. Rep. of Germany

Continuation of Ser. No. 203,289, Jun. 6, 1988, abandoned, which is a continuation of Ser. No. 946,965, Dec. 29, 1986, abandoned. This application Jun. 2, 1989, Ser. No. 343,073
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1985, 354618
Int. Cl.[5] G01L *23/00*
U.S. Cl. 364—510 7 Claims

1. An oscillating pump for pumping a fluid, said pump comprising a piston plunger disposed within a piston cylinder, said piston plunger being adapted to move within said piston cylinder between front and back dead points, said piston plunger being further adapted to act on a chamber whereby, in a forward stroke said piston feeds fluid from said chamber, fluid being drawn into said chamber by suction of a vacuum caused by a backstoke of said piston plunger, said oscillating pump further comprising;

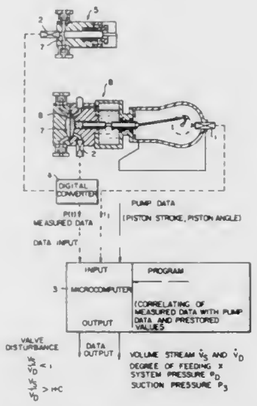
pressure sensors for measuring a pressure response in said piston cylinder,

means for determining a time $t_2$ at which a positive pressure surge associated with said suction occurs, and times at



VOL 1130 ISS 2 SE 10 1991 UMI

which said piston reaches said back dead point $t_1$, and said front dead point $t_3$, and




means for calculating a volume flow of said pump based upon the determined times, using the kinematic equation of said piston.

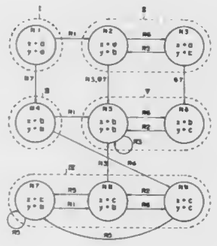
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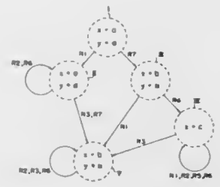
**5,047,951**

**INFERENCE PROCESSOR USING META KNOWLEDGE**

**Kenji Ono, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 10, 1989, Ser. No. 349,830**
**Claims priority, application Japan, May 12, 1988, 63-115341**
**Int. Cl.[5] G06F** *15/00*
**U.S. Cl. 364—513** **5 Claims**





1. An inference processor comprising:
rule storage means for storing production rules formed of pairs of condition part and conclusion part;
meta knowledge generating means for obtaining a directed-graph matrix formed of production rules satisfying transition conditions between all combinations of states of variables included in the production rules stored in said rule storage means, decomposing the directed-graph matrix into strongly-connected components, and obtaining conditions of variables of respective strongly-connected components and production rules satisfying transition conditions between the respective strongly-connected components as meta knowledge; and
interpreter means for obtaining a general direction of inference on the basis of the meta knowledge obtained in said meta knowledge generating means, and executing inference processing by executing a production rule stored in said rule storage means on the basis of the direction.

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**5,047,952**

**COMMUNICATION SYSTEM FOR DEAF, DEAF-BLIND, OR NON-VOCAL INDIVIDUALS USING INSTRUMENTED GLOVE**

**James P. Kramer, Stanford; Peter Lindener, E. Palo Alto, and William R. George, Palo Alto, all of Calif., assignors to The Board of Trustee of the Leland Stanford Junior University, Stanford, Calif.**

**Filed Oct. 14, 1988, Ser. No. 258,204**
**Int. Cl.[5] G10L** *5/00*
**U.S. Cl. 364—513.5** **25 Claims**

1. An instrumented glove for use in a man-machine interface comprising a cover material configured to fit on the hand of a wearer, a plurality of variable resistance strain gage means supported by said cover material and positioned to flex with movement of the hand, said cover material including guiding pockets in which said strain gage means are supported, said strain gage means comprising strain gage responsive means mounted on a flexible support material, and means electrically connected to said plurality of strain gage means for transmitting changes in resistance of said plurality of strain gage means to circuitry of the machine system.

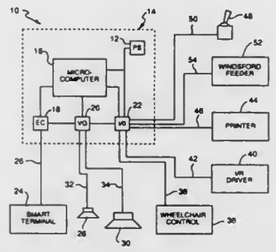
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**5,047,953**

**AUGMENTIVE COMMUNICATIONS SYSTEM AND METHOD**

**John M. Smallwood, and William A. Custer, both of Northville, Mich., assignors to Detroit Institute of Children, Detroit, Mich.**

**Filed Jul. 31, 1989, Ser. No. 387,961**
**Int. Cl.[5] G10L** *5/00*
**U.S. Cl. 364—513.5** **14 Claims**
**MICROFICHE APPENDIX INCLUDED**
**(2 Microfiche, 159 Pages)**




1. In a programmable system for enabling a user to generate sentences from a set of stored words and phrases by actuating a single switch in response to choices presented to said user, a method of generating said sentences in said system comprising the steps of:
storing in said programmable system at least one set of numbered instructions executable by said system which defines said choices and their order of presentation, said set of instructions including individually numbered instructions, each having a first line number for identification, a command symbol, at least one word to be presented to said user as one of said choices, and at least one second line number for indicating which individual instruction to execute next;
executing said instructions in said system by:
(a) locating a first individual instruction to be executed from the set of instructions;
(b) determining if there is more than one second line number in the instruction to be executed;
(c) when there is no more than one second line number in the instruction to be executed, executing the function defined by the command symbol of the instruction to be executed, and proceeding to the individual instruction indicated by the second line number designated in the instruction to be executed;
(d) when there is more than one second line number in the instruction to be executed, presenting a word in an individual instruction indicated by the first such second line number to said user;
(e) determining if said single switch has been actuated within a predetermined interval of time after said word is presented to said user;
(f) when said switch is actuated within said-predetermined interval of time, executing a function defined by a command symbol in the individual instruction indicated by the first such second line in the instruction to be executed, and proceeding to the next second line number designated in the instruction to be executed;
(g) when said switch is not activated within said predetermined interval of time, presenting to said user a word in another individual instruction indicated by the next second line number in the instruction to be executed; and
(h) repeating steps (e), (f), and (g) for each successive second line number listed in the instruction to be executed.



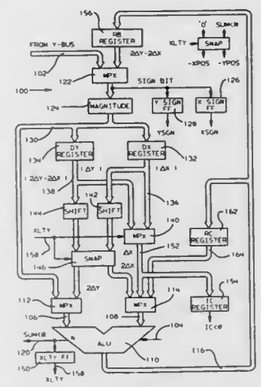
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**5,047,954**

**GRAPHICS VECTOR GENERATOR SETUP TECHNIQUE**

**James Corona, Kingston, and Terence W. Lindgren, Rosendale, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 820,763, Jan. 17, 1986, abandoned. This application Oct. 17, 1989, Ser. No. 425,494**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—518** **15 Claims**




1. In a Bresenham vector generator for generating a pixel approximation of a vector ($\Delta X$, $\Delta Y$), said generator having an arithmetic logic unit (ALU) and first and second registers, apparatus for generating an initial error term ($2\Delta Y - \Delta X$) and a correction term ($2\Delta Y - 2\Delta X$) comprising means for generating the quantities $\Delta X$, $2\Delta X$ and $2\Delta Y$, where $\Delta X$ and $\Delta Y$ are the components of said vector along predetermined axes, means for supplying said quantities $2\Delta Y$ and $2\Delta X$ to said ALU on a first clock cycle to obtain said correction term ($2\Delta Y - 2\Delta X$), means for storing said correction term in said first register, means for supplying said quantities $2\Delta Y$ and $\Delta X$ to said ALU on a second clock cycle to obtain an initial error term ($2\Delta Y - \Delta X$), means for storing said initial error term in said second register, and means operable on each subsequent clock cycle for supplying the error term stored in said second register to said ALU as a first input, selectively supplying the quantity $2\Delta Y$ or the correction term stored in said first register as a second input in accordance with the sign of the current error term stored in said second register, and storing the result in said second register.

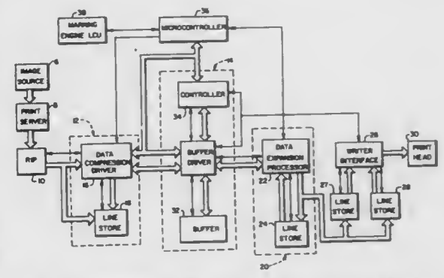
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**5,047,955**

**ELECTRONIC COLLATION**

**Gary W. Shope, Rochester, and Russell L. Godsbalk, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 19, 1987, Ser. No. 63,882**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—519** **6 Claims**




1. In an electronic printer of the type wherein a desired plurality of collated sets of multi-page documents may be produced from image data received as character code signals to be applied to a raster image processor for conversion to a rasterized video data stream for printing, the improvement being:
means, sequentially following the raster image processor, for electronically storing in rasterized form the image data of a multi-page document; and
electronic collation means for presenting the stored image data for printing in the proper sequence, as often as is needed to produce the desired number of collated document sets, whereby a plurality of electronically collated, multi-page sets can be printed without re-rasterization.

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**5,047,956**

**INFORMATION PROCESSING DEVICE HAVING A FUNCTION OF DESIGNATING A PRINTING-START POSITION**

**Akira Hirami, and Fumibiro Inoue, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 19, 1989, Ser. No. 382,235**
**Claims priority, application Japan, Jul. 22, 1988, 63-184293**
**Int. Cl.[5] G06K** *15/00*
**U.S. Cl. 364—519** **3 Claims**

1. An information processing device operable for printing labels, arranged in rows and columns on a sheet, from a user-specifiable print-start position, comprising:
input means for inputting data including multiple-line address data to be printed and position start data designating

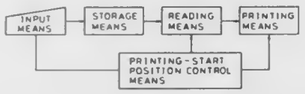
the label position on the sheet, by row and column, at which label printing is to begin;

data storage means for storing the data inputted from said input means;

position information storage means for storing position information of the labels which are arranged in rows and columns on the sheet;

printing means operable for printing the address data on the labels;

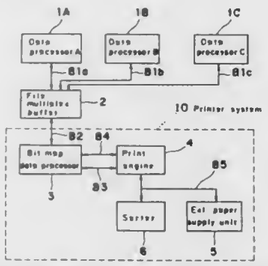
printing start position control means for calculating, based upon the position start data inputted from said input means and the position information stored in said position information storage means, the print-start position on the sheet at which printing is to begin so as to print the multiple-line address data on the sheet-arranged labels beginning with the row-and-column identified label designated by the position start data; and




control means for reading the address data and position start data from said storage means and for causing said printing means to operatively print the address data, in accordance with the position start data calculated by said printing start position control means, sequentially on the labels affixed to the sheet from the label position designated by the row-and-column position start data inputted from said input means.

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**5,047,957**
**PRINTER CONTROLLER**
**Yoshikazu Ikenoue, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed Oct. 19, 1989, Ser. No. 424,526**
**Claims priority, application Japan, Oct. 21, 1988, 63-266758; Oct. 21, 1988, 63-266759; Oct. 21, 1988, 63-266760; Oct. 21, 1988, 63-266761; Nov. 12, 1988, 63-286358; Nov. 12, 1988, 63-286359**
**Int. Cl.[5] G06K** *15/00*
**U.S. Cl. 364—519** **8 Claims**




1. Printer controller for controlling a printer responsive to a host machine or a terminal, comprising:

receiver means for receiving data sent from said host machine or terminal, said data including an identification code for identifying individual users;

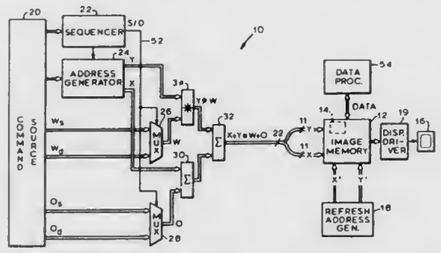
font memory means for storing font data indicating respective patterns of characters of at least one set in a memory area corresponding to the identification code received;

selection means for selecting one of memory areas corresponding to the identification code received; and

print control means for controlling printing action using font data stored in the memory area selected by said selection means.

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**5,047,958**
**LINEAR ADDRESS CONVERSION**
**Todd R. Comins, North Chelmsford, and Willem A. H. Engelse, Townsend, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**
**Filed Jun. 15, 1989, Ser. No. 366,859**
**Int. Cl.[5] G06F** *12/10, 3/14;* **G09G** *1/02*
**U.S. Cl. 364—521** **8 Claims**




1. A display system comprising:

A. an on-screen memory containing a two-dimensional array of memory locations for storing image data representing the values of image pixels;

B. display means for repetitively scanning the contents of the on-screen memory and generating a visual display of the image that they represent;

C. an off-screen memory containing a two-dimensional array of memory locations for storing image data representing the values of image pixels;

D. an address circuit comprising:

i. means for receiving input signals that represent (a) as an off-screen-segment offset value, the position of an off-screen segment of the off-screen memory, the off-screen segment having a beginning location, (b) a location in a corresponding on-screen segment of the on-screen memory as x and y components of the address of the location, (c) the width of the on-screen segment, (d) an on-screen-segment offset value, and (e) the width of the off-screen memory;

ii. a first multiplexer, including two input ports, for receiving at one input port the signals representing the width of the on-screen segment, for receiving at its other input port the signals representing the width of the off-screen memory, and for selectively forwarding as a first multiplexer output the signals received at one of its input ports;

iii. a multiplier for multiplying the y component of the width that the first multiplexer output represents and generating as the product signal a signal representative of the resultant product;

iv. a second multiplexer, including two input ports, for receiving at one input port the signals representing the off-screen-segment offset value, for receiving at its other input port signals representing the on-screen-segment offset values, and for selectively forwarding as a second multiplexer output the signals received at one of its input ports;

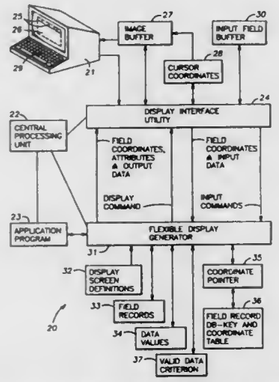
v. addition means for adding the product, the x component, and the offset value that the second multiplexer output represents and generating as the address signal a signal representing the resultant sum; and

vi. means for applying the address signal to the off-screen memory and to the on-screen memory; and

E. access means for reading from and writing to the on-screen-memory and off-screen-memory locations that the address signal represents.



**5,047,959**
**FLEXIBLE DATA DISPLAY**
**Timothy T. Phillips, Edgewood; Deborah C. Cummings, Villa Hills; Emily S. Divita, Erlanger, all of Ky., and Steve M. Bryan, Cincinnati, Ohio, assignors to Square D Company, Palatine, Ill.**
**Filed Sep. 13, 1988, Ser. No. 244,052**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—521** **24 Claims**




1. A method of operating a data processing system for building a series of display screens such that content and format of said display screens is readily adapted for a specific application in response to suer input and data base format changes; said data processing system including a data display terminal, said data display terminal including means for displaying alphanumeric characters at specified screen coordinates and means for enabling a user to enter alphanumeric data; a central processing unit; and a memory; an application program stored in said memory and executed by said central processing unit, and a data base stored in said memory; said data base including a plurality of definitions of field of alphanumeric characters to be displayed by said display terminal, some of said fields being defined as output only fields and others of said fields being defined as updatable fields, and definitions of sequences of said fields including a definition of a respective sequence of said fields for each one of said display screens, wherein each one of said display screens is displayed by simultaneously displaying the respective sequence of said fields for said each one of said display screens; said method comprising successively displaying said display screens by successively performing, for each one of said display screens, the steps of:

(a) reading said data base to obtain the definition of the respective sequence of said fields to be displayed simultaneously by said display terminal as said each one of said display screens;

(b) reading said data base to obtain said definitions of said fields of alphanumeric characters to be displayed simultaneously to obtain information about said fields of alphanumeric characters to be displayed simultaneously;

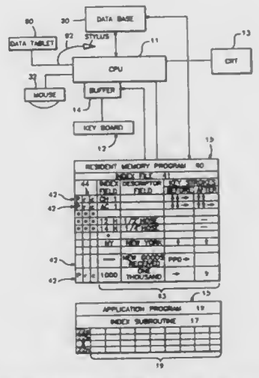
(c) computing respective screen coordinates for said fields of alphanumeric characters to be displayed simultaneously in response to said respective sequence of said fields of alphanumeric characters to be displayed simultaneously and said information about said fields of alphanumeric characters to be displayed simultaneously;

(d) transmitting said respective screen coordinates of said fields of alphanumeric characters to be displayed simultaneously along with said information about said fields of alphanumeric characters to be displayed simultaneously to said means for displaying to thereby simultaneously display said fields of alphanumeric characters to be displayed simultaneously; and

(e) displaying alphanumeric data entered by said user in selected ones of said fields defined as updatable and preventing alphanumeric data entered by said user from being displayed in said fields defined as output only fields.

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**5,047,960**
**APPARATUS AND METHOD TO AUTOMATE DATA ENTRY INTO AN APPLICATION PROGRAM**
**Scott K. Sloan, 9444 Saw Tooth Way, San Diego, Calif. 92129**
**Filed Jan. 4, 1989, Ser. No. 293,311**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—523** **35 Claims**




1. In a computer system, apparatus for automatically inputting desired data into an application program by extracting the desired data from a data source in the computer system and printing it out from the computer system in a visible format comprising:

means for storing said data source as an index list of predefined strings in a memory area of said computer system;

means for converting said data source into said visible format as a visible listing of items with each item in said listing of items corresponding to a predefined string in said index list wherein said visible listing of items is separate from said computer system;

means for selecting one of said items in said visible listing, and identifying a corresponding predefined string in said index list; and

means for inputting the corresponding string into a specified application program.

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**5,047,961**
**AUTOMATIC BATTERY MONITORING SYSTEM**
**Bent P. Simonsen, 27 Starfish Ct., Newport Beach, Calif. 92663**
**Continuation-in-part of Ser. No. 199,684, May 31, 1988, abandoned. This application Jan. 17, 1990, Ser. No. 446,023**
**Int. Cl.[5] G08B** *21/00;* **H02J** *7/04*
**U.S. Cl. 364—550** **8 Claims**

1. A battery monitoring system to detect and record conditions of a rechargeable battery utilized in a stand-by mode, in an emergency power discharging mode and in a charging mode, which comprises:

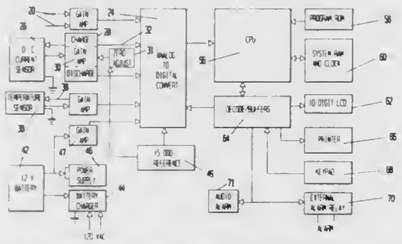
a) detection means including battery voltage detection means; battery current detection means; clock means; and ambient battery temperature detection means;

b) computer means receiving detection signals from each of said detection means during said stand-by, charging and discharging modes, and operative to provide output signals of:

(1) instantaneous battery voltage and current;

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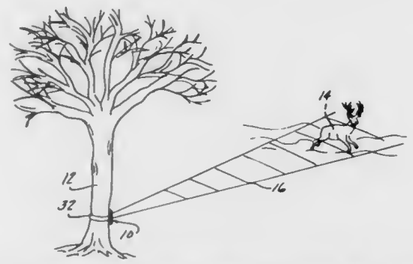
(2) date and time of said instantaneous signals of battery voltage and current; and
(3) battery temperature;
c) summation means operatively associated with said computer means to prepare and provide output total use signals for each of the following:
(4) total accumulated number of discharge uses;
(5) total accumulated number of discharge uses lasting over a first predetermined time period;
(6) total of lapsed minutes of discharge uses; and
(7) total accumulated battery discharge power;



d) incipient battery failure detection means including:
(8) storage means to receive a preset end voltage selected by the user and representing the minimal permissible voltage for useful operation;
(9) comparator means receiving the detected instantaneous battery voltage during discharge; and
(10) alarm means to indicate a deteriorated battery condition when said instantaneous battery voltage decreases below said preset end voltage; and
e) recording means to record said detection signals and said total use signals.

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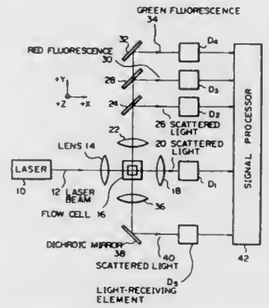
**5,047,962**
**EVENT OCCURRENCE TIME AND FREQUENCY DETECTION AND RECORDING APPARATUS**
**John Cornish, 32819 Jefferson, St. Clair Shores, Mich. 48082**
**Filed Jun. 6, 1988, Ser. No. 202,498**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—550** **4 Claims**



1. An apparatus for detecting and recording the time and frequency of the presence of an animal at a surveillance site comprising:
a weatherproof housing;
an electric power source mounted in the housing for supplying electric power to the apparatus;
a central processing means mounted in the housing and operating a control program;
infrared sensor means, mounted in the housing and having a field of view in the form of a planar pie-shaped sector extending radially outward from the housing and input to the central processing means, for sensing the presence of an animal at the surveillance site within the entire field of view of the sensor means;
memory means, mounted in the housing and coupled to the central processing means, for data and control program storage;
a clock mounted in the housing and coupled to the central processing means, the clock providing continuous clock pulses;
display means, mounted in the housing and coupled to the central processing means, for displaying the date, time and number of separate presences of an animal sensed by the sensor means in a predetermined time period; and
the central processing means being responsive to the control program and to the input of start date and start time data from the input means for storing the start date and start time data in the memory means, and responsive to the presence of an animal sensed by the sensor means to store in the memory means the data and time of the detected presence of an animal and responsive to the input means for recalling from the memory means and sucessively outputting to the display means for visual display the data and time of the detected presence of an animal at the surveillance site;
wherein said central processing means establishes sucessive time periods, each having a predetermined time interval, starting from the initial start date and start time of detecting and recording and said central processing means includes means responsive only the presence of an animal sensed by the sensor means for storing in the memory means the date and start time of only the time period in which at least one animal was detected.

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**5,047,963**
**PARTICLE ANALYZING APPARATUS AND METHOD FOR DETERMINING NUCLEAR SHIFT INDEX**
**Tokihiro Kosaka, Hyogo, Japan, assignor to TOA Medical Electronics Co., Ltd., Kobe, Japan**
**Filed Sep. 1, 1989, Ser. No. 401,983**
**Claims priority, application Japan, Sep. 30, 1988, 63-246539**
**Int. Cl.[5] G06F** *15/42;* **G01N** *15/02*
**U.S. Cl. 364—555** **5 Claims**



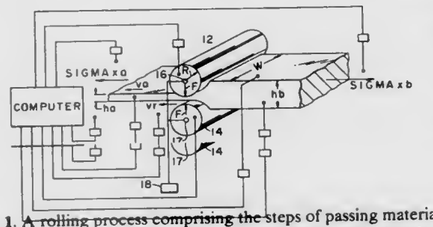

1. A particle analyzing apparatus for determining a nuclear shift index of a particle, the apparatus forming a detecting zone by irradiating a zone, in which particles flow substantially in single file, with a laser beam in a direction perpendicular to the direction of particle flow, and detecting at one or a plurality of locations, an optical change produced in the detecting zone when particles pass through the detecting zone one at a time, thereby obtaining one or plural types of signals with respect to a single particle, said apparatus comprising:
a laser beam irradiating zone for performing irradiation with said laser beam formed to be narrower than a diameter of a particle nucleus in the direction of particle flow and wider than the diameter of the particle nucleus in a direction perpendicular to the particle flow, and detecting



scattered light emitted by the particle nucleus, thereby obtaining a particle signal;
first characteristic quantity extracting means for extracting high-frequency components contained in the particle signal, in order to determine a degree of complexity of the particle nucleus;
second characteristic quantity extracting means for extracting a magnitude of a difference between the particle signal and a signal obtained by flipping over said particle signal in terms of time, in order to determine a degree of symmetry of said particle nucleus; and
means for determining the nuclear shift index from said first and said second characteristic quantity extracting means.

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**5,047,964**
**MATERIAL DEFORMATION PROCESSES**
**Lawrence A. Lalli, Franklin Township, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**
**Continuation-in-part of Ser. No. 683,005, Dec. 18, 1984, abandoned. This application May 4, 1990, Ser. No. 519,032**
**Int. Cl.[5] B21B** *37/00*
**U.S. Cl. 364—557** **27 Claims**

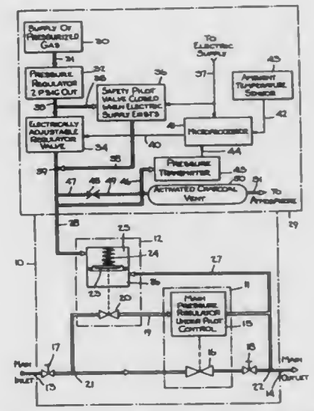



1. A rolling process comprising the steps of passing material between rolls for decreasing thickness of the material by plastic deformation and determining friction and material temperature by measuring mechanical parameters of the step of passing and calculating friction and temperature from the mechanical parameters, the calculated temperature being a temperature for the region undergoing plastic deformation, the calculated friction being friction between roll face and material.

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**5,047,965**
**MICROPROCESSOR CONTROLLED GAS PRESSURE REGULATOR**
**Robert J. Zlokovitz, 20 Villanova La., Dix Hills, N.Y. 11746**
**Continuation-in-part of Ser. No. 293,647, Jan. 5, 1989, abandoned. This application May 15, 1990, Ser. No. 523,723**
**Int. Cl.[5] G06F** *15/46*
**U.S. Cl. 364—558** **17 Claims**

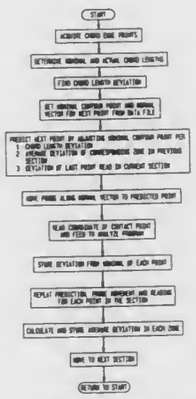
1. A pressure regulating arrangement for a gas distribution system comprising in combination, means responsive to the pressure of a controlling gas for controlling the pressure of a gas entering a supply distribution network, means for supplying pressurized gas, electrically controllable means interconnecting said pressurized gas supplying means and said pressure controlling means for applying to the latter means controlling gas under pressure for determining said pressure of gas entering said distribution network, and a microprocessor for storing historical downstream pressure drop data coupled to said



electrically controllable means for applying controlling signals to the latter means.

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**5,047,966**
**AIRFOIL MEASUREMENT METHOD**
**Kevin H. Crow, Lima; Melvin L. Morris, Spencerville, both of Ohio; William F. Derouchie, Southfield, and Dan W. Prevost, Livonia, both of Mich., assignors to Airfoil Textron Inc., Lima, Ohio**
**Filed May 22, 1989, Ser. No. 354,727**
**Int. Cl.[5] G01B** *5/20*
**U.S. Cl. 364—560** **1 Claim**



1. The method of measuring an airfoil comprising the steps of:
activating a control program for controlling the movement of a measuring machine probe,
supplying nominal coordinates of the airfoil to be measured to the control program,
moving the probe to the nominal coordinates under program control,
acquiring data points on the airfoil corresponding to the nominal coordinates,
measuring the airfoil by mathematically reconstructing at least certain portions of the airfoil by interpolation utiliz-

ing the data points and determining dimensions from the certain portions,

and wherein the control program further compensates for deviations between the nominal and actual coordinate points for movement of the probe and acquisition of data points by the further steps of:

determining the length of a nominal chord from the nominal coordinates,

for each airfoil section, acquiring data points sufficient to define an actual airfoil chord and calculating the difference of length between the actual airfoil chord and the nominal chord,

predicting the position of other data points to be measured from the nominal coordinates and the calculated difference of length, and

substituting the predicted data points for the nominal coordinates for the movement of the probe, whereby the efficiency and accuracy of probe movement is enhanced.

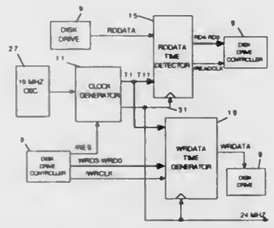
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**5,047,967**

## DIGITAL FRONT END FOR TIME MEASUREMENT AND GENERATION OF ELECTRICAL SIGNALS

**Wendell Sander, Los Gatos, and Brian Sander, Boulder Creek, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed Jul. 19, 1989, Ser. No. 382,171**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—569** **27 Claims**




1. An integrated circuit frontend for coupling to an integrated circuit hard disk drive controller, a central processing unit having a system clock, and a disk drive, said frontend generating timing signals for use by said disk controller using digital circuitry and write pulses for use by said disk drive to write data, and receiving read pulses generated by said disk drive representing read data, said frontend comprising:

(a) clock generator means for converting a system clock signal generated by said system clock having a first frequency into a reference clock signal having a second frequency;

(b) read data time detector means coupled to said clock generator means, said disk drive controller and said disk drive for receiving said read pulses and generating a relative read value output to said disk drive controller, said relative read value representing the location of a particular read pulse relative to said reference clock signal;

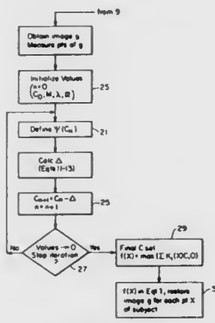
(c) write data time generator means coupled to said clock generator, said disk drive controller and said disk drive for receiving a relative write value generated by said disk drive controller which represents the location of a particular write pulse relative to said reference clock signal and generating said write pulses output to said disk drive based upon said relative write value.

**5,047,968**

## ITERATIVE IMAGE RESTORATION DEVICE

**Walter A. Carrington, and Kevin E. Fogarty, both of Worcester, Mass., assignors to University of Massachusetts Medical Center, Worcester, Mass.**

**Continuation of Ser. No. 164,137, Mar. 4, 1988, abandoned. This application Mar. 20, 1990, Ser. No. 512,504**
**Int. Cl.[5] G06F** *15/332;* **G06K** *9/40*
**U.S. Cl. 364—574** **16 Claims**




1. An image restoration device comprising:

an optical viewing member for providing a view of a subject, the optical viewing member responding to each point of the subject according to a response function to provide a viewed image of the subject;

a data processor for receiving from the optical viewing member and storing a series of viewed images of the subject as viewed through the optical viewing member;

computer processing means coupled to the data processor for responding to the viewed images and restoring the viewed images to substantially noiseless, undistorted images, the computer processing means restoring each viewed image by iteratively determining for each point in a viewed image a factor which minimizes noise and distortion at that point, the factor being iteratively determined, according to a formulation of a mathematical definition of the factor, by performance of transform calculations including a mathematical division operation in a transform domain of functions which include the response function of the optical viewing member to determine the factor, transforms of the response function being denominators in the division operation, the division operation enabling avoidance of performance of a matrix inversion operation, and with the determined factors for the points of a viewed image the computer processing means minimizing noise and distortion at each point of the image such that a substantially noiseless, undistorted image is formed; and

display means coupled to the computer processing means for providing a view of the substantially noiseless, undistorted images in a non-transform domain.

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**5,047,969**

## GENERAL NETWORK MODELING AND SYNTHESIS

**Edwin A. Sloane, Los Altos, Calif., assignor to Schlumberger Technologies, Limited, Farnborough, England**

**Filed Dec. 15, 1988, Ser. No. 283,447**
**Int. Cl.[5] G06G** *7/14*
**U.S. Cl. 364—578** **2 Claims**

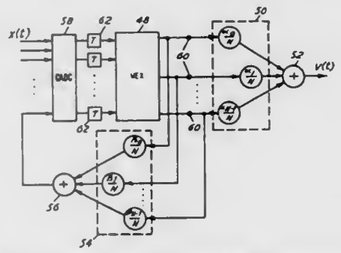
1. A modeling cell for modeling the input/output behavior of a reference network or system having an n-bit binary input channel, for receiving a sequence of unique n-bit state input vectors, and having at least one output channel, comprising:

(a) time delay means coupled to each bit of said state input vector, each said time delay being independently assignable, thus forming a delayed state vector, of n-bits;



(b) expansion means coupled to said time delay means for producing a unique $2^n$ state binary expansion vector from each said unique delayed state vector, each said state binary expansion vector being linearly independent;

(c) one or more numerical look up tables, coupled to receive a $2^n$ state binary expansion vector, for transforming said $2^n$ state binary expansion vector to a $2^n$ state weighted




expansion vector, each weight having independently assignable values related to the behavior of the reference network or system;

(d) one or more digital adders, each coupled to one of said weighing means forming the sum of the individual weights of said weighted expansion vector, each said sum being an output signal corresponding to an output of the referenced network or system.

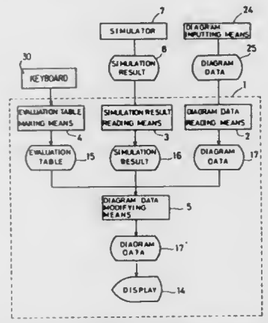
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**5,047,970**

## APPARATUS FOR DISPLAYING SIMULATION RESULT

**Satoko Kamakura, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed May 31, 1989, Ser. No. 359,329**
**Claims priority, application Japan, Feb. 8, 1989, 1-28886**
**Int. Cl.[5] G06F** *15/60, 15/72*
**U.S. Cl. 364—578** **7 Claims**




1. An apparatus for displaying a simulation result of an electric circuit, comprising:

(a) means for inputting diagram data expressing a diagrammatic structure of an object circuit as a combination of unit elements, wherein electronic elements and branches of signal lines interconnecting said electronic elements in said object circuit are regarded as said unit elements,

(b) means for inputting simulation data expressing a simulation result of said object circuit said simulation data including components which indicate respective electric states of said unit elements in simulation,

(c) means for inputting and holding evaluation data which express a criterion required for evaluating said respective electric states of said unit elements, said criterion being variable by varing said evaluation data,

(d) means for receiving said diagram data, said simulation data and said evaluation data from the means (a), (b) and (c), respectively, and for evaluating said respective electric states according to said criterion to generate an image data expressing a circuit diagram of said object circuit in which said unit elements are colored according to a result of evaluation of said respective electric states, and

(e) means for receiving said image data from the means (d) to display said circuit diagram in colors.

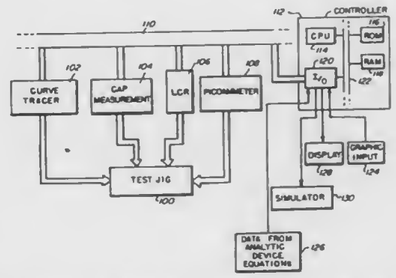
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**5,047,971**

## CIRCUIT SIMULATION

**Lawrence B. Horwitz, Danville, Calif., assignor to Intergraph Corporation, Huntsville, Ala.**

**Continuation of Ser. No. 65,454, Jun. 23, 1987, abandoned. This application Aug. 15, 1989, Ser. No. 394,232**
**Int. Cl.[5] G06G** *7/62, 7/48;* **G01R** *31/28*
**U.S. Cl. 364—578** **24 Claims**




1. A method of simulating operation of a circuit having a plurality of circuit components, at least one of which is an active component, comprising the steps of:

loading characterizing data having been previously actually measured for an actual sample of each individual one of said circuit components, including said at least one active component, in a memory connected to processing means;

loading into said memory data specifying interconnections of said circuit components, including said at least one active component, to form said circuit being simulated; and

causing said processing means to accept said data from both said loading steps and mathematically analyzing the operation of said circuit established in said interconnections loading step to determine operation of said circuit formed by the cooperation of said components, whose characterizing data was loaded said characterizing data loading step, as interconnected in a manner specified in said interconnections loading step by mathematically analyzing interactions of said circuit components.

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**5,047,972**

## DIGITAL SIGNAL PROCESSOR WITH MEMORY HAVING DATA SHIFT FUNCTION

**Hirobumi Wada, Ohme, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Division of Ser. No. 184,242, Apr. 21, 1988, Pat. No. 4,959,815. This application Mar. 23, 1990, Ser. No. 498,332**
**Claims priority, application Japan, Apr. 24, 1987, 62-99778**
**Int. Cl.[5] G06F** *15/31*
**U.S. Cl. 364—724.16** **9 Claims**

1. A digital signal processor having a digital filter including a delay means for delay signal processing, said delay means comprising:

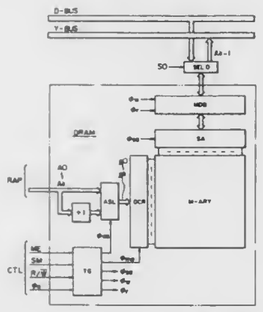
a first memory means for storing first data;

a second memory means for storing second data;

a data line coupled to said first and second memory means

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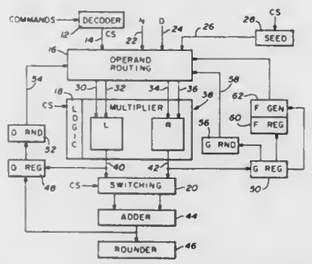
and providing said first data to said second memory means;
a first selecting line coupled to said first memory means;
a second selecting line coupled to said second memory means;
selecting means, coupled to said first and second selecting lines, for providing first and second selection signals to said first and second selecting lines; and,



amplifier means, coupled to said data line, for reading said first data during a first time period in which said selecting means provides said first selecting signal to said first selecting line
and for writing said first data into said second memory means during a second time period in which said selecting means provides said second selecting signal to said second selecting line, wherein said first time period overlaps said second time period.

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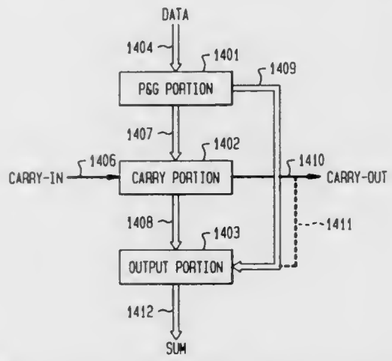
**5,047,973**
**HIGH SPEED NUMERICAL PROCESSOR FOR PERFORMING A PLURALITY OF NUMERIC FUNCTIONS**
**Donald E. Steiss, Richardson; Maria B. Hipona, Dallas, and Henry M. Darley, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Apr. 26, 1989, Ser. No. 343,465**
**Int. Cl.[5] G06F** *7/52, 7/38*
**U.S. Cl. 364—754** **14 Claims**



1. A processor for performing a plurality of arithmetic functions comprising:
multiplier circuitry for calculating the product of two or more numbers;
logic circuitry for reconfiguring said multiplier into a first array and a second array wherein said first and second arrays calculate products;
operand routing circuitry for directing one set of numbers to said first array and another set of numbers to said second array;
registers for directing said products to said operand routing circuitry a predetermined number of iterations;
adder circuitry for combining said products after said predetermined number of iterations to produce a result.

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**5,047,974**
**CELL BASED ADDER WITH TREE STRUCTURED CARRY, INVERTING LOGIC AND BALANCED LOADING**
**William R. Young, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.**
**Filed Nov. 24, 1987, Ser. No. 124,807**
**The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.**
**Int. Cl.[5] G06F** *7/50*
**U.S. Cl. 364—784** **37 Claims**



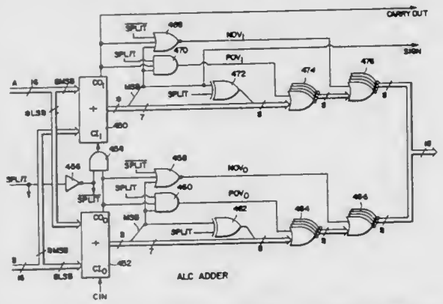

10. An x-bit adder cell through which an n(x)-bit adder having a tree-structured carry is configured by interconnecting n repeats of said x-bit cell structure, said cell comprising:
first means for receiving x-bit input signals and generating therefrom propagate (P) and generate (G) term signals associated with said x-bits; and
second means for receiving said propagate and generate term signals from said first means and a carry signal (CBAR) and producing therefrom x-bit sum signals (S), said second means including a carry propagation circuit formed of a plurality of gate circuits and inverter circuits interconnected with one another to form a carry tree structure.

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**5,047,975**
**DUAL MODE ADDER CIRCUITRY WITH OVERFLOW DETECTION AND SUBSTITUTION ENABLED FOR A PARTICULAR MODE**
**Michael F. Patti, Plainsboro; Nicola J. Fedele, Kingston, both of N.J.; Kevin Harney, Brooklyn, N.Y., and Allen H. Simon, Belle Mead, N.J., assignors to Intel Corporation, Santa Clara, Calif.**
**Filed Nov. 16, 1987, Ser. No. 121,022**
**Int. Cl.[5] G06F** *7/50*
**U.S. Cl. 364—786** **7 Claims**

5. Circuitry comprising:
a dual adder having first and second binary summing means;
said first binary summing means having first and second input ports, an output port and a carry output terminal, for summing first and second N-bit values applied to the respective first and second input ports to generate an N-bit sum at said output port and a carry-out signal at said carry output terminal, where N is a positive integer;
said second binary summing means having first and second input ports, a carry input terminal and an output port, for summing a carry-in signal, applied to said carry input terminal, and first and second R-bit values, applied to said respective first and second input ports of said second binary summing means, to generate an R-bit sum at the output port of said second binary summing means, where R is a positive integer;
coupling circuitry coupled to the carry output terminal of said first summing means and responsive to a control signal, said control signal having first and second values which correspond to applying said carry-out signal and a null-signal, respectively, to said carry input terminal;
circuitry for providing add-with-saturate responsive to said control signal and coupled to said adder for detecting



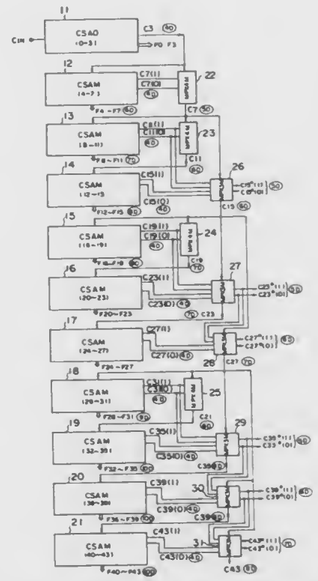



when a sum provided by said adder is outside of a predetermined range of values and, upon so detecting, substituting a predetermined value within said predetermined range of values for the sum provided by the adder to provide add-with-saturate in accordance with said control signal; and
said coupling circuitry being configured to operate in a first mode as an N+R bit adder when the control line has said first value and to operate in a second mode as a separate N-bit adder and separate R-bit adder when the control signal has said second value and said add-with-saturate is active only when said coupling circuit is in one of said first and second modes and inactive when said coupling circuit is in the other of said first and second modes.

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**5,047,976**
**LOGIC CIRCUIT HAVING CARRY SELECT ADDERS**
**Gensuke Goto, Ebina, and Hajime Kubosawa, Machida, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**
**Continuation of Ser. No. 329,241, Mar. 27, 1989**
**This application Feb. 22, 1991, Ser. No. 658,467**
**Int. Cl.[5] G06F** *7/50*
**U.S. Cl. 364—788** **21 Claims**

1. An operation circuit for M-bit parallel full addition, comprising:
N partitioned adders provided for every n bits (n<M; N≧M/n), each generating a pair of provisional carry signals $C_{ns\text{-}1}(1)$ and $C_{ns\text{-}1}(0)$ and real sum signals Fj each having n bits (n(s−1)≦j≦n2−1) related to the s-th (1≦s≦N) partitioned adder, said paired provisional carry signals being calculated supposing a first case where a carry signal (carry-out) of a lower-order bit ((n(s−1)−1)th bit) is "1" and a second case where the carry signal of said lower-order bit is "0"; and
means for generating a real carry signal $C_{ns\text{-}1}$ (carry-out of the (ns−1)th bit) and a pair of provisional carry signals $C^*_{ns\text{-}1}(1)$ and $C^*_{ns\text{-}1}(0)$, said means for generating comprising:
a plurality of first means for selecting one of provisional carry signals $C_{ns\text{-}1}(1)$ and $C_{ns\text{-}1}(0)$ supplied from an s-th partitioned adder, depending on the value of the real carry signal $C_{n(s\text{-}1)\text{-}1}$ supplied from said (s−1)th partitioned adder being "1" or "0", respectively, said selected one of said provisional carry signals being the real carry signal $C_{ns\text{-}1}$ to be propagated from said s-th partitioned adder;
a plurality of second means for generating a pair of provisional carry signals $C^*_{ns\text{-}1}(1)$ and $C^*_{ns\text{-}1}(0)$ by selecting either one of said provisional carry signals $C_{ns\text{-}1}(1)$ and $C_{ns\text{-}1}(0)$, depending on the provisional carry signals $C^*_{n(s\text{-}1)\text{-}1}(1)$ and $C^*_{n(s\text{-}1)\text{-}1}(0)$ propagated from said second means relating to the (n(s−1)−1)th bit, or depending upon said provisional carry signals $C_{n(s\text{-}1)\text{-}1}(1)$ and $C_{n(s\text{-}1)\text{-}1}(0)$ propagated from said (s−1)th partitioned adder, $C_{ns\text{-}1}(1)$ or $C_{ns\text{-}1}(0)$ being selected as $C^*_{ns\text{-}1}(1)$ depending on the value of $C^*_{n(s\text{-}1)\text{-}1}(1)$ or $C_{n(s\text{-}1)\text{-}1}(1)$ being "1" or "0" respectively, and $C_{ns\text{-}1}(1)$ or $C_{ns\text{-}1}(0)$ being selected as $C^*_{ns\text{-}1}(0)$ depending upon the value of $C^*_{n(s\text{-}1)\text{-}1}(0)$ or $C_{n(s\text{-}1)\text{-}1}(0)$ being "1" or "0", respectively; and
a plurality of third means, used alternately with said first



means in combination with said second means, for generating said real carry signal $C_{ns\text{-}1}$ by selecting $C^*_{ns\text{-}1}(1)$ or $C^*_{ns\text{-}1}(0)$ generated by said second means and related to said (ns−1)th bit, if said real carry signal $C_{ms\text{-}1}$ (0<m<n) propagated from one of said first and third means relating to said lower-order bit ((ms−1)th bit) is "1" or "0", respectively; and
said first means relating to said (ns−1)th bit and l pairs (0<l<N) of said second and third means relating to a (n(s+1)−1)th, (n(s+2)−1)th, . . . , and (n(s+l)−1)th bit, generating (l+1) real carry signals $C_{ns\text{-}1}$, $C_{n(s+1)-1}$, $C_{n(s+2)-1}$, . . . , and $C_{n(s+l)-1}$ at the same time depending on the real carry signal $C_{n(s\text{-}1)\text{-}1}$ relating to the (n(s−1)−1)th bit, $C_{ns\text{-}1}(1)$, $C^*_{n(s+1)-1}(1)$, $C^*_{n(s+2)-1}(1)$, . . . , and $C^*_{n(s+l)-1}(1)$ are selected as the respective real carry signals if $C_{n(s-1)-1}$ is "1", and $C_{ns\text{-}1}(0)$, $C^*_{n(s+1)-1}(0)$, $C^*_{n(s+2)-1}(0)$, . . . , and $C^*_{n(s+l)-1}(0)$ are selected as respective real carry signals when $C_{n(s-1)-1}$ is "0".

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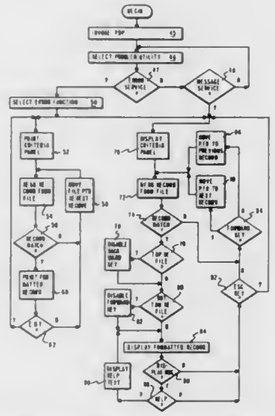


5,047,977

## METHODS OF GENERATING AND RETRIEVING ERROR AND TASK MESSAGE RECORDS WITHIN A MULTITASKING COMPUTER SYSTEM

Reginal R. Hill, Pflugerville, and Richard J. Hrabik, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 179,178, Apr. 8, 1988, abandoned. This application May 29, 1990, Ser. No. 529,672
Int. Cl.[5] G06F *11/34, 15/40*
U.S. Cl. 364—900 5 Claims



1. In a multitasking computer system, a method of generating and retrieving error log records in said computer system, said method comprises the steps of:

operating a determination program to detect errors in the execution of a first task activated by a user of the multitasking computer system while the user interacts with a second task;

storing detected first task errors as records accessible by parameter reference through error log services;

enabling through a peripheral of said computer system an error log service;

entering a set of service type and time parameters into said system, which parameters can be associated with a record stored therein;

having said computer system retrieve a record which matches selected entered parameters; and

displaying to said user by operation of a selected utility program in said computer system said retrieved records in a predetermined format, specific criteria within said entered set of parameters and any data associated with said retrieved record.

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5,047,978

## BLOCH LINE MEMORY DEVICE

Youji Maruyama, Iruma; Tadashi Ikeda, Tsukui, and Ryo Suzuki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 7, 1989, Ser. No. 362,646
Claims priority, application Japan, Jun. 17, 1988, 63-148007
Int. Cl.[5] G11C *19/08*
U.S. Cl. 365—29 14 Claims

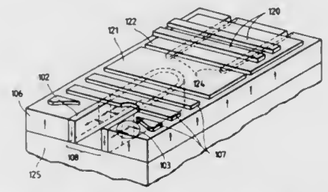
9. A bloch line memory comprising:

information means using Bloch lines formed in the magnetic wall around a stripe domain having an end portion thereof formed in a magnetic film as an information carrier;

information write means for generating said Bloch lines in said information memory means; and

information read means for reading out the information of said information memory means;

said information read means including means for turning the direction of the wall magnetization at the end portion of



said stripe domain when chopping of said stripe domain to a predetermined direction by moving said Bloch line existing at the end portion of said stripe domain in a predetermined direction.

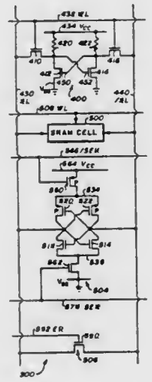
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5,047,979

## HIGH DENSITY SRAM CIRCUIT WITH RATIO INDEPENDENT MEMORY CELLS

Wingyu Leung, Cupertino, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Jun. 15, 1990, Ser. No. 538,998
Int. Cl.[5] G11C *13/00*
U.S. Cl. 365—154 10 Claims



6. A static, random access memory circuit comprising in combination:

a first bit linc (730);

a second bit line (740);

a memory cell (700) including,

a word line (732),

a first resistor (720),

a second resistor (722),

a first transistor (710) having a gate connected to said memory cell word line (732) and a channel having a first end connected to said first bit line (730) and a second end,

a second transistor (716) having a gate connected to said memory cell word line (732) and a channel having a first end connected to said second bit line (730) and a second end,

a third transistor (712) having a gate connected to said memory cell second transistor (716) channel second end and a channel connected between said memory cell first transistor (710) channel second end and a circuit ground potential, and



a fourth transistor (714) having a gate connected to said memory cell first transistor (710) channel second end and a channel connected between said memory cell second transistor (716) channel second end and the circuit ground potential; and

a fifth transistor (720) having a gate connected to said memory cell second transistor (716) channel second end and a channel connected from said memory cell first transistor (710) channel second end to (734) a power supply potential, and

a sixth transistor (722) having a gate connected to said memory cell first transistor (710) channel second end and a channel connected from said memory cell second transistor (716) channel second end to (734) the power supply potential a regenerative sense amplifier (804) including,

a regenerative sense amplifier first line (834),

a regenerative sense amplifier second line (836),

a first transistor (812) having a gate connected to said second bit line (440) and a channel connected between said first bit line (430) and said regenerative sense amplifier second line (836),

a second transistor (814) having a gate connected to said first bit line (430) and a channel connected between said second bit line (440) and said regenerative sense amplifier second line (836),

a third transistor (820) having a gate connected to said second bit line (440) and a channel connected between said regenerative sense amplifier first line (834) and said first bit line (430), and

a fourth transistor (822) having a gate connected to said first bit line (430) and a channel connected between said regenerative sense amplifier first line (834) and said second bit line (440).

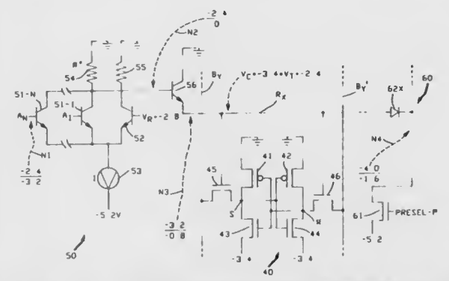
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5,047,980

## BICMOS MEMORY HAVING MEMORY CELLS CONNECTED DIRECTLY TO ADDRESS DECODERS

Rimon Shookhtim, La Jolla; Lo-Shan Lee, San Diego, and Babak Mansoorian, La Jolla, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 17, 1990, Ser. No. 569,673
Int. Cl.[5] G11C *11/36, 11/407*
U.S. Cl. 365—177 12 Claims



1. A digital memory of the type which includes a row of memory cells and a row addressing circuit for the row; said row addressing circuit including a) an input node for receiving an ECL address, b) a first bipolar transistor which passes current to a first voltage supply when the row is deselected by said address, c) a second bipolar transistor which passes current to said first voltage supply when the row is selected by said address, and d) a third bipolar transistor having a base coupled to the collector of one of said first and second transistors; wherein said memory also includes:

a second voltage supply whose voltage is smaller in magnitude then the first supply's voltage;

field effect transistors in each cell which are cross-coupled between ground and said second voltage supply forming set and reset nodes that switch to and above the second supply's voltage;

an N-channel field effect transistor in each cell having a source connected to one of said nodes, and a gate connected via a row line directly to the emitter of said third bipolar transistor;

a discharging means coupled to said row line, for discharging said gate below said second supply's voltage plus a threshold voltage for said N-channel transistor in response to a control signal; and,

a charging means coupled to the collectors of said first, second, and third bipolar transistors for charging said gate above the second supply voltage plus said threshold voltage in response to said ECL address.

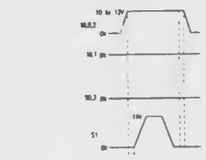
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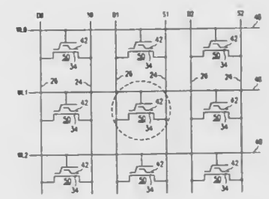
5,047,981

## BIT AND BLOCK ERASING OF AN ELECTRICALLY ERASABLE AND PROGRAMMABLE READ-ONLY MEMORY ARRAY

Manzur Gill, Rosharon; Sung-Wei Lin; Iano D'Arrigo, both of Houston, and David McElroy, Rosenberg, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 219,529, Jul. 15, 1988, abandoned. This application Jun. 30, 1989, Ser. No. 374,113
Int. Cl.[5] G11C *16/04*
U.S. Cl. 365—185 11 Claims





1. A method for erasing a block of electrically erasable and programmable read-only memory cells in a semiconductor array of rows and columns of such cells, each column of memory cells having an elongate semiconductor source bit line spaced apart from an elongate semiconductor drain bit line, the source bit lines and drain bit lines being formed at an angle to the rows of memory cells, comprising the steps of:

preselecting first and second erasing voltages such that the second erasing voltage is substantially more positive than the first erasing voltage;

preselecting a third voltage such that the second erasing voltage is substantially more positive than the third voltages;

placing the first erasing voltage on each of a plurality of word line conductors formed to be spaced apart and over respective rows of memory cells, each word line conductor insulatively disposed adjacent, for each cell in the respective row, a floating gate conductor thereof; p1

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placing the second erasing voltage on a selected one of the source bit lines, an insulative programming window for each cell in a respective column of memory cells spacing the floating gate conductor of that cell from the source bit line of the respective column of memory cells;

placing the third voltage on the remaining unselected ones of the source bit lines;

allowing the drain bit line of each column of memory cells to float;

in response to said steps of placing the first and second erasing voltages and allowing the drain bit line of each column of memory cells to float, drawing electrons from each programmed floating gate conductor in the column of memory cells associated with the selected source bit line to the selected source bit line to thereby erase previously programmed floating gate conductors in that column of memory cells; and

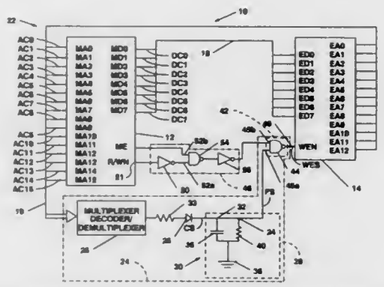
in response to said steps of placing the first erasing voltage, placing the third voltage, and allowing the drain bit line of each column of memory cells to float, generating an electric potential between the remaining unselected source bit lines and the floating gate conductors associated therewith that is insufficient to erase the floating gate conductors in the columns of memory cells associated with the unselected source bit lines.

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## 5,047,982
## WRITE PROTECTION METHOD AND APPARATUS FOR AN EEPROM

**Vernon R. Smith, and Alan L. Stahl, both of Peoria, Ill., assignors to Caterpillar, Inc., Peoria, Ill.**

**Filed Apr. 12, 1990, Ser. No. 567,809**
**Int. Cl.[5] G11C** *16/00, 7/00;* **G06F** *12/14*
**U.S. Cl. 365—185** **14 Claims**



1. An apparatus for controllably programming a nonvolatile electrically erasable programmable read only memory (EEPROM), said EEPROM being of the type which requires a write-enable signal during programming, comprising:

a microprocessor adapted to repeatedly produce a pseudo address signal at a preselected frequency, said pseudo address signal corresponding to an unused memory address code;

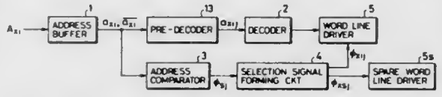
second means for receiving said pseudo address signal and delivering a write-enable signal to said EEPROM in response to receiving said pseudo address signal a preselected number of times; and

third means for delivering an address signal and a corresponding data signal to said EEPROM while said write-enable signal is produced, said address signal being indicative of an address location in said EEPROM and said data signal corresponding to the data to be stored in said EEPROM address location.

## 5,047,983
## SEMICONDUCTOR STORAGE DEVICE WITH REDUNDANCY ARRANGEMENT

**Hidetoshi Iwai, Fucyu, and Kazuyuki Miyazawa, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 707,630, Aug. 20, 1985. This application Sep. 20, 1990, Ser. No. 586,399**
**Claims priority, application Japan, Sep. 26, 1984, 59-199556**
**Int. Cl.[5] G11C** *7/00, 11/413*
**U.S. Cl. 365—200** **13 Claims**



1. A semiconductor storage device comprises:

a memory array;

a first circuit receiving an input address signal;

a second circuit made to respond to an output signal of said first circuit and forming an address signal to be supplied to an address decoder;

said address decoder being coupled to said memory array, and decoding said address signal formed by said second circuit so as to form a selection signal to be supplied to said memory array;

a spare memory;

an address comparator circuit receiving an output signal of said first circuit, wherein said address comparator circuit includes store means for storing a defective address signal and means for comparing the defective address signal stored in said storage means with the output signal of said first circuit; and

a selection signal forming circuit made to respond to an output signal of said address comparator circuit and forming a selection signal for said spare memory,

wherein said first circuit is formed of an address buffer circuit, and

further wherein said second circuit is formed of a predecoder decoding the address signal supplied from said address buffer circuit, and forming, based on this signal, a decoded signal to be supplied to said address decoder.

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## 5,047,984
## INTERNAL SYNCHRONOUS STATIC RAM

**Junji Monden, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed May 9, 1990, Ser. No. 520,943**
**Claims priority, application Japan, May 9, 1989, 1-116308**
**Int. Cl.[5] G11C** *7/00, 11/4*
**U.S. Cl. 365—203** **2 Claims**

1. An internal synchronous SRAM comprising:

an address transition detector connected to receive an address signal for generating an internal synchronous signal in response to transition of the address signal;

a control pulse generator connected to receive the internal synchronous signal and operating to generate a pull-down control signal and a bit line precharge signal in response to the internal synchronous signal, the pull-down control signal having a predetermined pulse width and having a tailing edge before a rising of a word line selecting signal, and the bit line precharge signal having a leading edge substantially concurrent with a leading edge of the pull-down control signal and a tailing edge after the tailing edge of the pull-down control signal but before the rising of the word line selecting signal;

an SRAM cell array having a number of SRAM cells arranged in the form of a matrix, a plurality of word lines and a plurality of pairs of bit lines, one SRAM cell being located at each intersection between each word line and each pair of bit lines, each of the word lines being connected to receive a corresponding word line select signal;

a precharge circuit connected to all the bit lines and a voltage supply voltage and for precharging the bit lines in response to the bit line precharge signal during an active period of the bit line precharge signal;

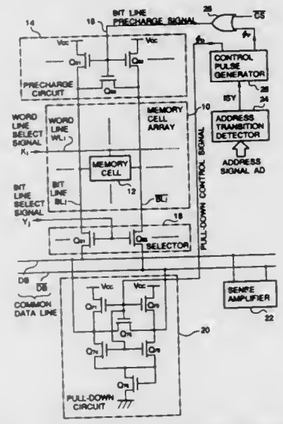
a selector connected to all the bit lines and receiving a bit line select signal for connecting only a selected pair of bit lines to a pair of common data lines;

a pull-down circuit connected to the pair of common data lines and for pulling down the common data lines in response to the pull-down control signal during an active period of the pull-down control signal; and

a sense amplifier connected to the common data lines for amplifying a data signal appearing on the common data lines,

whereby the bit lines are precharged at substantially the same time as the common data lines are pulled down, and continuously precharged after completion of the pull-down of the common data lines, and the precharge of the bit lines is completed before the rising of the word line select signal.



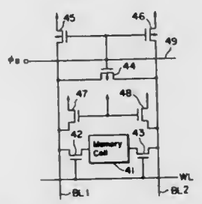


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## 5,047,985
## STATIC RANDOM ACCESS MEMORY DEVICE HAVING A HIGH SPEED READ-OUT AND PRECHARGING ARRANGEMENT

**Fumio Miyaji, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Division of Ser. No. 312,865, Feb. 17, 1989. This application Jan. 2, 1991, Ser. No. 636,578**
**Claims priority, application Japan, Feb. 19, 1988, 63-36711; Feb. 19, 1988, 63-36712; Feb. 20, 1988, 63-37908**
**Int. Cl.[5] G11C** *13/00*
**U.S. Cl. 365—203** **4 Claims**



1. A semiconductor memory device where in a plurality of memory cells are provided between a pair of bit lines, and are controlled via a word line and a precharging line, wherein the memory device comprises for each memory cell:

a pair of access transistors each formed from a MOS transistor of a first conductivity type channel, the memory cell being connected in series between the pair of access transistors between the pair of bit lines, each access transistor being connected to be selectively controlled by the word line;

a pair of MOS transistors of the first conductivity type channel each connected at the gate and drain thereof to an external voltage supply and at the source thereof to a separate one of the bit lines to act as first variable loads; and

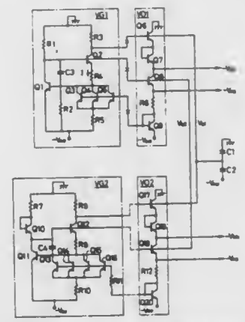
a pair of MOS transistors of a second conductivity type channel each connected at its source to the external voltage supply and at its drain to a separate one of the bit lines to individually terminate the bit line for performing a precharging operation before selection of the word line.

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## 5,047,986
## SEMICONDUCTOR MEMORY

**Kazuhisa Miyamoto; Shuuichi Miyaoka, both of Ohme, and Masanori Odaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 184,661, Apr. 21, 1988, Pat. No. 4,899,314. This application Jan. 30, 1990, Ser. No. 472,637**
**Claims priority, application Japan, Apr. 24, 1987, 62-99775**
**Int. Cl.[5] G11C** *11/34*
**U.S. Cl. 365—226** **10 Claims**



1. A semiconductor integrated circuit device comprising:

a first generate circuit for generating at an output thereof a first reference level;

a second generate circuit for generating at an output thereof a second reference level that is different from the first reference level;

a first output circuit for providing at an output thereof a first reference voltage;

a second output circuit coupled to said first output circuit and for providing at an output thereof a second reference voltage which is substantially identical with said first reference voltage;

a first compare circuit having a first input to which a first input signal is to be supplied and a second input coupled to receive said first reference voltage for comparing said first reference voltage with said first input signal;

a second compare circuit having a first input to which a second input signal is to be supplied and a second input coupled to receive said second reference and for comparing said second reference voltage with said second input signal; and

means for coupling one of the outputs of said first and second generate circuits to said first and second output circuits,

wherein values of the first and second reference voltages

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provided from the first and second output circuits when the first and second output circuits are coupled to the first generate circuit are different from values of the first and second reference voltages provided from the first and second output circuits when the first and second output circuits are coupled to the second generate circuit.

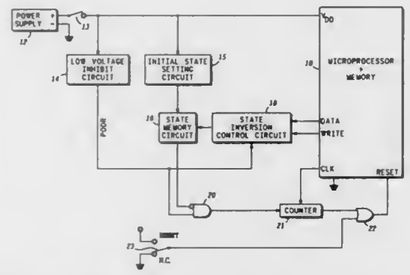
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**5,047,987**

## LOW VOLTAGE INHIBIT CONTROL APPARATUS

**Masahiro Kosuge, Kawasaki, Japan, assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Nov. 17, 1989, Ser. No. 438,901**
**Claims priority, application Japan, Nov. 21, 1988, 63-292509**
**Int. Cl.[5] G06F *11/30, 13/12***
**U.S. Cl. 365—228** **8 Claims**




1. In conjuction with a microprocessor system having a power supply, low voltage inhibit control apparatus comprising:

a low voltage inhibit circuit coupled to the power supply for sensing when the power supply output becomes below a predetermined voltage and supplying a power down reset signal in response thereto; and

control circuitry coupled so as to receive the power down reset signal from said low voltage inhibit circuit and further coupled so as to receive a first instruction signal from the microprocessor system, for preventing the received power down reset signals from being supplied to the microprocessor system in response to receiving the first instruction signal and allowing the received power down reset signals to be supplied to the microprocessor system when lacking the first instruction signal.

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**5,047,988**

## DISPOSABLE IC MEMORY CARD HAVING AN EMBEDDED BATTERY

**Masaharu Mizuta, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed Dec. 5, 1988, Ser. No. 279,723**
**Claims priority, application Japan, Jun. 17, 1988, 63-148154**
**Int. Cl.[5] G11C *5/14***
**U.S. Cl. 365—229** **7 Claims**

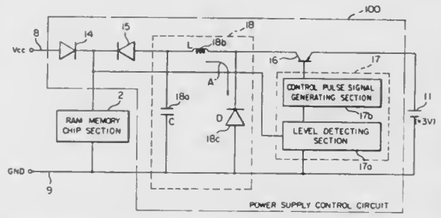
1. A disposable IC (integrated circuit) memory card having an internal powe source for data backup comprising:

a memory chip section for storing data and having a power input temrinal and a ground terminal, the ground terminal being connected to a common ground;

a battery having a first terminal and a second terminal, embedded in said disposable IC card, and producing an output voltage at the first terminal relative to the second terminal higher than a predetermined holding voltage required to be applied to the power input terminal of said memory chip section to retain stored data in said IC card;

an LC (inductance-capacitance) circuit including a capacitor having a first terminal connected to the common ground and a second terminal connected to the power input terminal of said memory chip section through a diode for supplying a voltage to said memory chip section, an inductor having first and second terminals, the first terminal of the inductor being connected to the second terminal of said capacitor, and a diode having a cathode conencted to the second temrinal of said inductor and an anode connected to the common ground;

a switching circuit connected between the first terminal of said battery and the second terminal of said inductor for selectively connecting and disconnecting the first terminal of said battery and the second terminal of said inductor; and




a level-detection/control circuit for detecting the potential difference between the common ground and the power input terminal of said memory chip section and for controlling said switching circuit to alternately connect and disconnect the first termnial of said battery and the second terminal of said inductor so that the potential difference is not less than the predetermined holding voltage wherein said switching circuit intermittently supplies electrical power to said LC circuit from said battery.

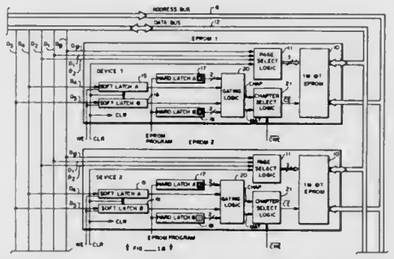
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**5,047,989**

## CHAPTER MODE SELECTION APPARATUS FOR MOS MEMORY

**George R. Canepa; Mark Bauer, and Phil Kliza, all of Folsom, Calif., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Mar. 10, 1989, Ser. No. 321,909**
**Int. Cl.[5] G11C *8/00*; G06F *12/06***
**U.S. Cl. 365—238.5** **36 Claims**




1. In an integrated circuit memory having n address lines accessing more than $2^n$ address locations, an apparatus for providing an alternative addressing mode to access memory locations in excess of that which is capable of being accessed by said n address lines, comprising:

first latching means coupled to receive at least one bit;

program means;

second latching means for storing at least one comparison bit, said second latching means coupled to said program means, said at least one comparison bit accessed from said program means;

comparison means coupled to receive a value of said at least one bit and for generating a comparison of it to a value of said at least one comparison bit and generating an output indicative of said comparison; and

select means coupled to receive said output from said comparison means and for generating an enabling signal for enabling said memory if said comparison results in a match.



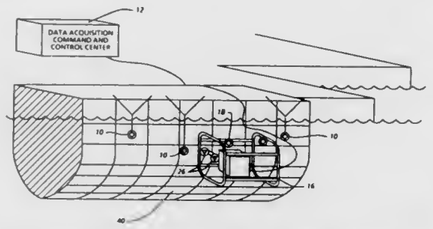
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**5,047,990**

## UNDERWATER ACOUSTIC DATA ACQUISITION SYSTEM

**Adamandios G. Gafos, Baltimore; Donald Maxwell; Frank S. Halliwell, both of Annapolis; Dana C. Lynn, Severna Park, and Christopher N. Sears, Shady Side, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 1, 1990, Ser. No. 516,576**
**Int. Cl.[5] G01S *15/00***
**U.S. Cl. 367—6** **8 Claims**




1. A method of making computer based underwater acoustic data measurements with a free swimming remotely operated vehicle comprising the steps of:

a. ascertaining and mapping the three dimensional surface features of a marine structure with a solid modeler computer aided design means;

b. deploying an underwater baseline acoustic net at said marine structure in accordance with said mapping of marine structure;

c. deploying said remotely operated vehicle and performing background noise calibration with an underwater acoustic transducer array;

d. performing a preplanned underwater acoustic data measurement survey of said marine structure; and

e. performing analysis of said measurements and storing said information in a data storage system.

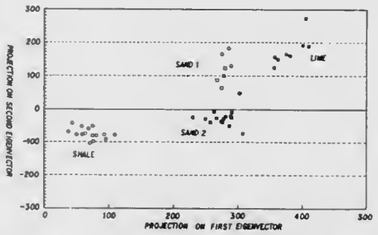
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**5,047,991**

## LITHOLOGY IDENTIFICATION USING SONIC DATA

**Kai Hsu, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.**

**Division of Ser. No. 345,510, Apr. 28, 1989, Pat. No. 4,951,266.**
**This application May 21, 1990, Ser. No. 526,419**
**Int. Cl.[5] G01V *1/30, 1/40***
**U.S. Cl. 367—25** **20 Claims**




1. A method of identifying lithology of a formation traversed by a borehole from which sonic data was acquired, the sonic data comprising a data set of m waveforms, each of the waveforms including a formation wave component digitized into n samples, said formation wave component comprising at least direct wave components, said lithology identification method comprising the steps of:

for a plurality of m waveforms characterizing the n samples of each formation wave component as a vector, thereby obtaining a plurality of formation wave component vectors;

obtaining a first eigenvector based on said formation wave component vectors;

selecting a first formation wave component vector of said plurality of formation wave component vectors;

calculating a projection of said first wave component vector on said first eigenvector; and

identifying the lithology of the formation through which the wave component characterized by said first formation wave component vector passed based on said projection of said first wave component vector on said first eigenvector.

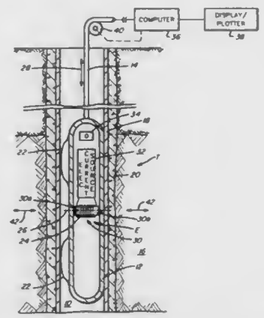
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**5,047,992**

## ELECTROMAGNETICALLY INDUCED ACOUSTIC WELL LOGGING

**Donald L. Howlett, Kingwood, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Filed Jun. 29, 1990, Ser. No. 546,605**
**Int. Cl.[5] G01V *1/40, 1/143***
**U.S. Cl. 367—31** **25 Claims**




1. A method of acoustic well logging to investigate subsurface formations adjacent a cased well borehole, comprising the steps of:

emitting electromagnetic energy from an electromagnetic source in the cased well borehole;

displacing the well borehole casing with the emitted electromagnetic energy to form acoustic waves which travel through the subsurface formations; and

sensing the acoustic waves after their travel through the subsurface formations at a transducer spaced from the electromagnetic source.

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**5,047,993**

## DETECTION AND CLASSIFICATION FOR MULTI-BEAM SONAR SYSTEMS

**Robert Halley, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 8, 1965, Ser. No. 463,474**
**Int. Cl.[5] G01S *15/00***
**U.S. Cl. 367—105** **4 Claims**

1. In combination in a detection and a classification system for multiple beam signals;

an array of uniformly spaced transducers;

beam forming means for so combining the signals of said transducers as to simultaneously generate, in a predeter-

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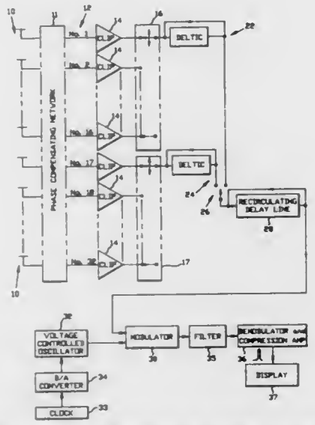


mined number of separate circuits, beam signals received from different discrete directions;

a first recirculating delay line time compression storage unit having storage capacity sufficient to receive and simultaneously contain digital information definitive of all of said beam signals;

a sampling switch for successively feeding digital samples of each of the separate beam signals into said storage unit;

a second recirculating delay line time compression storage unit having a storage capacity sufficient to receive the signal from one beam only;




a sampling switch for successively feeding the digital signals of a beam, one beam at a time, from said first storage unit to said second storage unit;

a sweep frequency oscillator, a modulator, the input circuits of the modulator being coupled, respectively, to the output of said oscillator and to the output of said second delay line, bandpass filter connected to the output of said modulator, and a display device coupled to the output of said filter for displaying the frequencies at the output of said filter.

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**5,047,994**

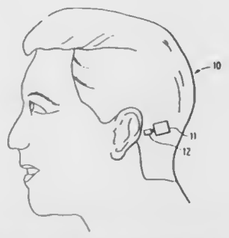
**SUPERSONIC BONE CONDUCTION HEARING AID AND METHOD**

**Martin L. Lenhardt, Hayes; Alex M. Clarke, and William Regelson, both of Richmond, all of Va., assignors to Center for Innovative Technology, Herndon, Va.**

**Division of Ser. No. 358,616, May 30, 1989, Pat. No. 4,982,434. This application Nov. 2, 1990, Ser. No. 608,429**

**Int. Cl.[5] G01S** *15/02*

**U.S. Cl. 367—116** **1 Claim**




1. A supersonic hearing aid for echo location comprising:

a source of supersonic sound for radiating to objects to be detected;

two microphones adapted to be spaced apart for receiving said radiated supersonic sound waves when they are reflected from objects to be detected and converting said sounds to electrical signals;

an amplifier for said electrical signals; and

two transducers for converting said amplified supersonic electrical signals to supersonic vibration signals for connecting said supersonic vibration signals to the human sensory system on both the left side and right side of the head to assist in echo location.

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**5,047,995**

**DETECTION OF MOVING OBJECTS**

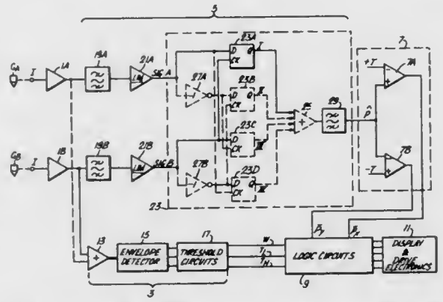
**Howard J. Wells, Worcestershire, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Filed Dec. 19, 1980, Ser. No. 222,404**

**Claims priority, application United Kingdom, Jan. 17, 1980, 8001463**

**Int. Cl.[5] G01S** *3/80*

**U.S. Cl. 367—125** **12 Claims**




1. A system for the detection of moving objects, the system comprising:

a phase-sensitive circuit, responsive to two electrical input signals, for deriving a phase-sense signal that distinguishes a phase lead and a phase lag between these input signals;

an amplitude-sensitive circuit, responsive to at least one of the two electrical input signals, for comparing the peak amplitude of at least this one input signal against a first amplitude threshold of magnitude predetermined so to distinguish between electrical signals, that are characteristic of at least one class of moving object, from other electrical signals, and for deriving a first amplitude-threshold signal that is dependent on the outcome of this first comparison; and

a processing circuit connected to both the phase-sensitive circuit to receive the phase-sense signal, and the amplitude-sensitive circuit to receive the amplitude-threshold signal, for providing an output signal indicating the detection of a moving object if, while said first amplitude threshold is exceeded, the phase-sense signal changes corresponding to a change in signal phase-sense, namely a change from a phase lead to a phase lag, or a change from a phase lag to a phase lead, between the two electrical input signals.



**5,047,996**

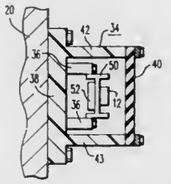
**SONAR TRANSDUCER**

**Ronald E. Armiger, Millersville, and Joyce M. Mang, Arnold, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Nov. 22, 1989, Ser. No. 440,139**

**Int. Cl.[5] H04R** *1/02*

**U.S. Cl. 367—154** **8 Claims**




1. An underwater transducer comprising:

a) an elongated mounting member;

b) a plurality of transducer modules, each including at least a transducer active element for acoustic energy transfer with the water environment;

c) said modules being affixed to said mounting member along the length thereof;

d) a housing including a back wall;

e) means for connecting the mid portion of said mounting member to said housing such that said mounting member stands off from said back wall and is cantilevered on both sides of said mid portion;

f) means for excluding the surrounding water medium from gaining entry to the interior of said housing; and

g) means for mounting said housing to a host structure.

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**5,047,997**

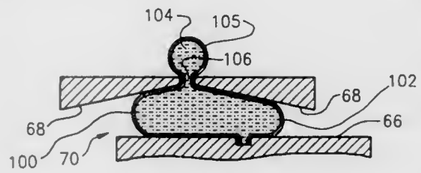
**SONAR PROJECTOR WITH LIQUID MASS LOADING FOR OPERATION AT LOWER FREQUENCY**

**Gerard K. Forsberg, Lauderdale Lakes, Fla., assignor to Argotec, Inc., Ft. Lauderdale, Fla.**

**Division of Ser. No. 395,981, Aug. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 263,729, Oct. 28, 1988, abandoned, which is a continuation of Ser. No. 86,696, Aug. 17, 1987, abandoned. This application Jul. 19, 1990, Ser. No. 554,401**

**Int. Cl.[5] G01V** *1/38*

**U.S. Cl. 367—191** **7 Claims**




1. A seal assembly interposed between a pair of concentric cylindrical members movable relative to each other comprising:

a pair of concentric cylindrical surfaces formed, respectively, on each of said movable members axially coextensive and radially spaced apart to define a cylindrical space therebetween, said opposed cylindrical surfaces being arranged to be displaced relative to each other axially in opposed directions from a neutral position;

a seal member affixed to both said movable members arranged within said space between said concentric surfaces, said seal member being formed of flexible nonresilient material defining a sealed enclosed volume having a liquid medium enclosed therein;

said concentric surfaces being configured to reduce the volume enclosed by said seal member therebetween when said surfaces are displaced axially relative to each other in said opposed directions while being maintained in concentric relationship;

said sealed volume including reservoir means for receiving liquid therein when said concentric surfaces are axially displaced from said neutral position and for returning said received liquid under pressure to said sealed volume when said opposed surfaces are returned to said neutral position after movement in either of said opposed directions.

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**5,047,998**

**TIMEPIECE WITH MOBILE DECORATIONS**

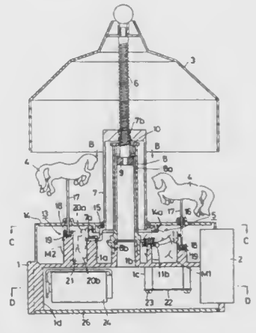
**Junichi Aizawa; Shoichiro Kumazawa, and Tomohiro Wada, all of Tokyo, Japan, assignors to Seikosha Co., Ltd., Japan**

**Filed Jul. 31, 1989, Ser. No. 387,625**

**Claims priority, application Japan, Jul. 29, 1988, 63-189863**

**Int. Cl.[5] G04B** *21/02, 19/06;* **G04C** *23/00*

**U.S. Cl. 368—75** **20 Claims**



1. A timepiece with mobile decorations comprising: a roof disposed over a case body having a timepiece unit built therein; driving means for driving said roof between raised and lowered positions while turning the same in response to a signal from the said timepiece unit; and mobile decorations disposed inside of said roof when said roof is in the lowered position to operate and become visible from the outside when said roof is in the raised position.

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**5,047,999**

**OPTICAL RECORD CARRIER READER CALCULATING TRACK PITCH AND WRITE VELOCITY FOR LOCATING READ POINT**

**Meine J. P. van der Meulen, Oss, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 15, 1988, Ser. No. 232,401**

**Claims priority, application Netherlands, Aug. 17, 1987, 8701925**

**Int. Cl.[5] G11B** *7/085*

**U.S. Cl. 369—32** **2 Claims**

1. An apparatus for reproducing information recorded at a given write velocity in substantially concentrical tracks on an optically readable record carrier, the information including an address code as a measure of radial position on the record carrier, said apparatus comprising:

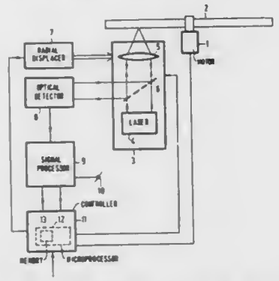
an optical read device for directing a light beam towards the record carrier, the light beam being modulated by the information;

a detector for producing a signal modulated in response to the modulated light beam;

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a signal processor for deriving an output signal and for deriving address codes from the signal of the detector;
radial displacement means for displacing the light beam in a radial direction across the record carrier, and
controlling means for at least controlling the radial displacement means for displacing a position of the light beam having a known address code to a second position of the light beam having a second address code by displacing the



light beam across a plurality of tracks dependent on the second address code and the known address code, the write velocity and the track pitch, the controlling means having calculating means for calculating the track pitch and the write velocity of the record carrier using address codes obtained from the record carrier after displacement of the light beam from the first position with the known address code successively across a first and a second number of tracks.

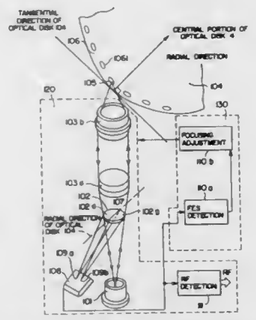
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**5,048,000**

**OPTICAL INFORMATION READING APPARATUS COMPRISING A DIFFRACTION GRATING MEMBER HAVING FIRST AND SECOND PORTIONS**

**Shigeki Tsujl, and Hikaru Nishihara, both of Hiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 7, 1989, Ser. No. 334,563**
**Claims priority, application Japan, Apr. 7, 1988, 63-86707**
**Int. Cl.[5] G01J *1/20*; G11B *7/00***
**U.S. Cl. 369—44.12** **3 Claims**



1. An optical information reading apparatus, comprising:
a light source for producing a laser beam irradiating a rotating recording media provided with a pit train having a long axis along a circumferential direction;
optical means for converging the laser beam from said light source on said rotating recording media;
a diffraction grating member for emitting light converged in at least two directions upon receipt of light reflected by said rotating recording media, said diffraction grating member having first and second portions divided by a boundary line wherein said boundary line being aligned parallel to the radial direction of said rotating recording media; and
detecting means comprising at least two pairs of photosensitive detectors respectively receiving said light emitted in at least two directions from said diffraction grating member for determining whether said optical means is properly positioned for focusing said light onto said recording media,
each of said pairs of photosensitive detectors having a dividing line formed along the direction of the light emitted from said diffraction grating member,
the direction in which each of said diffraction grating member faces said photosensitive detectors in said detecting means selected to be a direction parallel to the radial direction of said rotating recording media.

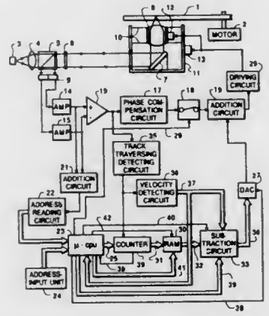
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**5,048,001**

**LOAD CORRECTION METHOD FOR AN INFORMATION RETRIEVAL APPARATUS**

**Mitsuro Moriya, Neyagawa; Masayuki Shibano, Izumisano; Hiroyuki Yamaguchi; Shinichi Yamada, both of Hirakata, and Katsuya Watanabe, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Apr. 4, 1990, Ser. No. 504,289**
**Claims priority, application Japan, Apr. 7, 1989, 1-88866**
**Int. Cl.[5] G11B *21/08*, *7/085***
**U.S. Cl. 369—44.32** **10 Claims**



1. A load correction method for compensating a variation of a load against a movement of an optical head actuator in an information retrieval apparatus which retrieves information from a recording carrier on which information is recorded on a plurality of information tracks formed on the recording carrier by using an optical head which forms a light spot on the recording carrier, the information retrieval apparatus being operable in a velocity control mode in which the optical head actuator drives the optical head so as to move the light spot in a direction traversing the tracks to reach a desired track while measuring a velocity of the light spot traversing the tracks, comparing a measured velocity signal indicative of the measured velocity of the light spot with a reference velocity signal, and controlling the optical head actuator so that a difference between the measured velocity signal and the reference velocity signal becomes zero to thereby move the light spot at a velocity corresponding to the reference velocity signal, said method comprising the steps of:
(1) setting a value of the reference velocity signal to a standard value by which the light spot moves at a predetermined velocity in the velocity control mode when the load against the optical head actuator is a standard load;
(2) operating information retrieval apparatus in the velocity control mode while measuring the velocity of said light spot, comparing the measured velocity with the predetermined velocity, and when the measured velocity is not equal to the predetermined velocity, increasing or decreasing the value of the reference velocity signal by a predetermined value;
(3) repeating said step (2) until the measured velocity becomes substantially equal to the predetermined velocity;
(4) calculating, as a load correction value indicative of a difference between an actual load and the standard load, a difference between the value of the reference velocity signal after completing said step (3) and the standard value of the reference velocity signal; and
(5) correcting the reference velocity signal based on the standard value and the load correction value to obtain a new reference velocity signal by which the light spot moves at the predetermined velocity in the velocity control mode under a presence of the actual load against the optical head actuator.



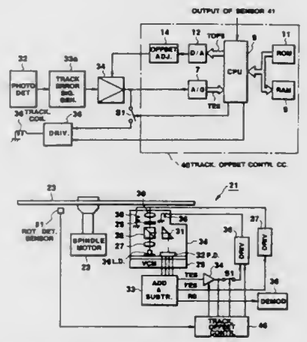
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**5,048,002**

**PHOTODISC APPARATUS WITH MEANS FOR CANCELING OFFSET OF TRACKING SERVO LOOP**

**Yuji Horie, and Shoji Yoshikawa, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Apr. 26, 1990, Ser. No. 515,009**
**Claims priority, application Japan, Apr. 27, 1989, 1-108033**
**Int. Cl.[5] G11B *7/095***
**U.S. Cl. 369—44.35** **16 Claims**



1. A tracking servo system comprising:
beam generating means for generating a light beam for recording or reproduction of information in and from an optical recording medium having information recording tracks;
an objective lens for applying said light beam to said optical recording medium;
lens actuator means for driving said objective lens in a direction to cross said tracks in response to an input signal;
a photosensing means for receiving the light beam reflected from said optical recording medium;
tracking error signal generating means for generating, from the output of said photosensing means, a tracking error signal indicative of the offset of a beam spot formed by said light beam on said optical recording medium from an object track;
variable level means for changing an output level of said tracking error signal by shifting the level of said tracking error signal and for outputting an adjusted tracking error signal;
drive signal generating means for generating a drive signal which causes said lens actuator means to drive said objective lens in a direction to cross said track; said drive signal generating means being connected to supply said drive signal to said lens actuator means;
switching means having an ON condition and an OFF condition for connecting the output from said variable level means to said lens actuator means when said switching means is in said ON condition, so as to operate as a tracking servo to cause said beam spot to trace an object track; said switching means being connected such that, in said OFF condition, said output from said variable level means is disconnected from said lens actuator means;
control means for receiving the output of said tracking error signal generating means, for determining an offset adjustment amount and producing an offset adjustment signal representing said offset adjustment amount, and for generating a drive signal to said lens actuator means so as to selectively cause said lens actuation means to drive said objective lens in a direction to cross a track, said control means including:
(a) mean value detection means which, when said switching means is in said OFF condition, receives said tracking error signal and detects a mean value of said tracking error signal;
(b) standard range output means for outputting a standard range which is used as a reference for determination as to whether an offset exists in said tracking error signal; and
(c) offset control means for controlling an amount of a level shift which is to be effected by said variable level means, said offset control means supplying said offset adjustment signal to said variable level means so as to cause said mean value to fall within said standard range.

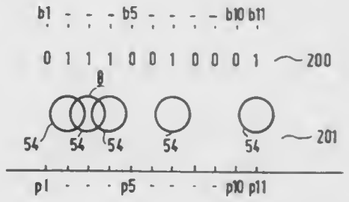
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**5,048,003**

**METHOD OF AND DEVICE FOR RECORDING INFORMATION, RECORD CARRIER, DEVICE FOR READING THE RECORDED INFORMATION, AND ENCODING AND DECODING CIRCUIT FOR USE IN THE RECORDING AND READ DEVICE**

**Constant P. M. J. Baggen; Cornelis M. J. Van Uijen, and Erik W. Gaal, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 494,873, Feb. 8, 1990, abandoned, which is a continuation of Ser. No. 190,723, May 5, 1988, abandoned. This application Jan. 30, 1991, Ser. No. 651,094**
**Claims priority, application Netherlands, Dec. 3, 1987, 8702905**
**Int. Cl.[5] G11B *5/76*, *5/09***
**U.S. Cl. 369—59** **16 Claims**




1. A method of optically recording information on an optical record carrier, in which an information signal is converted into a code signal comprising code words constituting bits, the number of successive bits of a fist logic value being at least equal to P and groups of at least P bits of a first logic value within each code word being separated by at least Q successive bits of a second logic value, P being an integer greater than or equal to 1 and Q being an integer greater than P, the method forming a pattern of recording marks corresponding to the code signal on the record carrier, the recording marks representing the bits of the first logic value, the number of bits of the first logic value is code-word dependent, and the number of successive bits of the first logic value is not constant for all of the code words.

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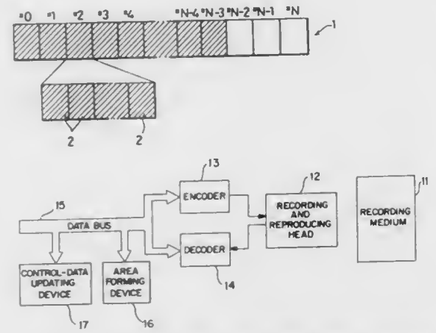


5,048,004

## OPTICAL RECORDING MEDIUM RECORDING AND REPRODUCING DEVICE

Toshihisa Deguchi; Takeshi Yamaguchi, both of Nara; Shigemi Maeda, Yamatokoriyama; Takashi Iwaki, Nara; Tsuneo Fujiwara, and Shigeo Terashima, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 19, 1989, Ser. No. 340,454
Claims priority, application Japan, Apr. 20, 1988, 63-97491
Int. Cl.[5] G11B *27/36*
U.S. Cl. 369—54 16 Claims




13. A method for recording new control data on an optical recording medium, comprising the steps of:

(a) forming a control data recording area having a plurality of recording blocks on the optical recording medium, each recording block having a distinct address;

(b) setting a pointer to an initial address value;

(c) determining if the recording block corresponding to the address value of the pointer has no control data recorded therein;

(d) incrementing the address value of the pointer if said step (c) determines that the recording block has control data recorded therein;

(e) repeating said steps (c) and (d) until said step (c) determines that the recording block has no control data recorded therein; and

(f) recording new control data in the recording block corresponding to the address value of the pointer when said step (c) makes an affirmative determination.

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5,048,005

## SPINDLE CLAMP HAVING A UNITARY LOCK MEMBER

Donald L. Ekhoff, 2600 Day Rd., Gilroy, Calif. 95020

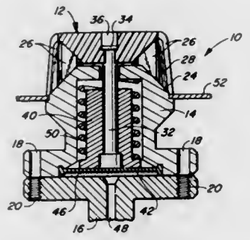
Filed Oct. 10, 1989, Ser. No. 419,039
Int. Cl.[5] G11B *23/00, 25/00*
U.S. Cl. 369—270 20 Claims

1. A spindle clamp for removably supporting a disk having a central aperture comprising,

a hub having a rotational axis and a disk-seating surface for supporting a disk perpendicular to said rotational axis, said hub having an inclined surface on a first side of said disk-seating surface, said inclined surface being inclined axially outwardly with approach to said disk-seating surface,

a lock member having an axis generally coinciding with said rotational axis, said lock member having an axially-depending portion in contact with said inclined surface of said hub, said axially-depending portion having a free end, said free end being a terminus of said lock member, said axially-depending portion made of an elastically bendable material, said lock member having a relaxed, disk-releasing position wherein the radial extent of said free end is less than the radial extent of the central aperture of a disk, and

means operatively coupled to said lock member for displacing along said rotational axis said lock member relative to said inclined surface and for selectively pressing said free




end onto a disk to be supported on said disk-seating surface, displacement from said disk-releasing position towards said disk-seating surface causing radial expansion of said lock member at said free end to provide a disk-clamping position wherein said radial extent of the lock member exceeds the radial extent of said central aperture.

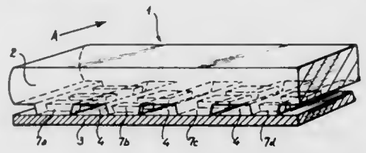
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5,048,006

## OPTICAL INFORMATION CARRIER HAVING INTERCONNECTED BUFFER SPACES FOR MAINTAINING ITS FLAT SHAPE

Joseph M. E. Beaujean, Grubbenvorst, Netherlands, assignor to Docdata, N.V., Venlo, Netherlands

Division of Ser. No. 253,396, Oct. 3, 1988, which is a continuation of Ser. No. 852,039, filed as PCT NL85/00024 on Jun. 24, 1985 published as WO86/00459 on Jan. 16, 1986, abandoned. This application Jul. 3, 1989, Ser. No. 374,998
Claims priority, application Netherlands, Jun. 22, 1984, 8401996
Int. Cl.[5] G11B *7/24*
U.S. Cl. 369—275.001 6 Claims




1. An optical information carrier comprising an optically transparent layer (2) and a reflective layer (3) provided adjacent to each other, wherein at the interface between said layers an optically readable information structure is provided in said optically transparent layer (2), said information structure containing alternate areas with such different properties that a scanning light beam is modulated in correspondence with information present in said structure, and wherein in the optically transparent layer (2) multiple gas-filled buffer spaces are provided at positions distributed over the interface between said layers, said buffer spaces being formed by multiple cavities formed in the optically transparent layer (2) adjacent to the reflective layer (3) and extending into areas intermediate between tracks of the information structure, said buffer spaces being directly mutually interconnected by passageways existing within the information tracks, so as to provide pressure and vapor equalization between adjacent buffer spaces of the optical information carrier, wherein the information structure comprises circular, radially or spirally extending information tracks onto a circular optically transparent layer of said optically transparent layer, and the buffer spaces are provided by respective circular, radially or spirally extending cavities and within the information tracks provided in the optically transparent layer.



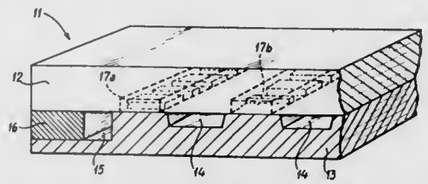
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5,048,007

## OPTICAL INFORMATION CARRIER HAVING INTERCONNECTED BUFFER SPACES FOR MAINTAINING ITS FLAT SHAPE

Joseph M. E. Beaujean, Grubbenvorst, Netherlands, assignor to Docdata, N.V., Venlo, Netherlands

Division of Ser. No. 253,396, Oct. 3, 1988, abandoned, which is a continuation of Ser No. 852,039, filed as PCT NL85/00024 on Jun. 22, 1985, published WO86/00459 on Jan. 16, 1986, abandoned. This application Dec. 15, 1989, Ser. No. 451,628
Claims priority, application Netherlands, Jun. 22, 1984, 8401996
Int. Cl.[5] G11B *7/24*
U.S. Cl. 369—275.1 12 Claims




I. An optical information carrier comprising an optically transparent layer (12) and a reflective layer (13) provided adjacent to each other, wherein at the interface between said layers an optically readable information structure is provided in said optically transparent layer (12), said information structure containing alternate areas with such different properties that a scanning light beam is modulated in correspondence with the information present in said structure, and wherein the reflective layer multiple gas-filled buffer spaces are provided at positions distributed over the interface between said optically transparent and reflective layers, said buffer spaces being directly mutually interconnected by passages existing within the information tracks, so as to provide pressure and vapor equalization between adjacent buffer spaces of the optical information carrier, wherein the information structure comprises circular, radially or spirally extending information tracks onto a circular optically transparent layer of said optically transparent layer, and the buffer spaces are provided by respective circular, radially or spirally extending cavities and within the information tracks provided in the optically transparent layer.

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5,048,008

## DISK CARTRIDGE

Shuji Haruna, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

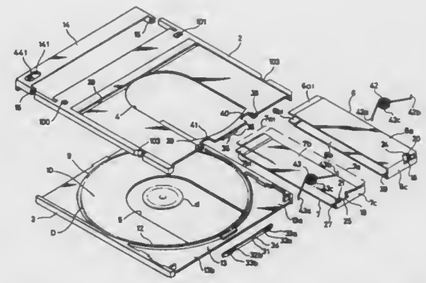
Filed Mar. 7, 1989, Ser. No. 320,286
Claims priority, application Japan, Mar. 11, 1988, 63-57970; Jun. 30, 1988, 63-86810[U]
Int. Cl.[5] G11B *23/033*
U.S. Cl. 369—291 10 Claims

1. A disk cartridge comprising:

a) a disk cartridge-body for accommodating therein a freely rotatable disk-shaped record medium on which an information signal can be recorded;

b) an openable and closable member for opening and closing an opening portion which is formed on the disk cartridge-body to exchange the disk-shaped record medium; and

c) a write-protecting mechanism formed on the openable and closable member to determine whether or not the information signal can be recorded on the disk-shaped



record medium and being arranged so as not to disengage from the openable and closable member.

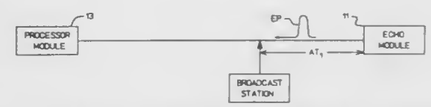
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5,048,009

## BROADCAST STATION LOCATOR FOR A LOCAL AREA NETWORK

Michael Conrad, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 28, 1989, Ser. No. 317,185
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—17 25 Claims




1. Apparatus for determining the position of each of a plurality of transmitter-receiver stations that are connected to and communicate with each other on a bus topology cable network of such stations by broadcasting and receiving packets on the cable, where if a packet is transmitted or received by a station, the station does not broadcast a packet during an interframe time interval of predetermined length $\Delta t_{gap}$ that immediately follows transmission or receipt of the preceding packet, the apparatus comprising:

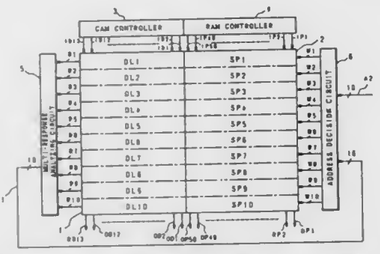
an echo module, positioned at a first end of a cable, to receive a broadcast packet, to determine whether a pulse in the packet is the last pulse received before an interframe time interval and whether at least a predetermined number of broadcast packets have been received, and if both these conditions are satisfied to broadcast an echo pulse on the cable network after a predetermined time delay $\Delta t_d$ where $\Delta t_d << \Delta t_{gap}$; and

a processor module, positioned at a second end of the cable, to receive a broadcast packet, to determine the time $t_1$ at which the broadcast packet arrives at the processor module, to receive an echo pulse signal, to determine the time $t_2$ at which the echo pulse arrives at the processor module, and to determine the time interval $\Delta T_1$ required for a signal to travel from the broadcasting station to the echo module by the relation $\Delta T_1 = (t_2 - t_1 - \Delta t_{dp})/2$, where $\Delta t_{dp}$ is a net time delay associated with signal processing in the processor module.

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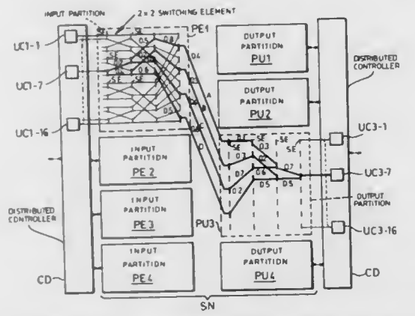
5,048,010
**COMMUNICATION CONTROL PROCESSOR**
Takeo Nakabayashi, and hirohisa Machida, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 16, 1989, Ser. No. 421,872
Claims priority, application Japan, Nov. 11, 1988, 63-285971
Int. Cl.[5] H04Q *11/00*
U.S. Cl. 370—58.2 10 Claims




1. A communication control processor comprising:
multiplex communication means for simultaneously creating a plurality of data links on one transmission line by setting an identifier for each data link;
a CAM for storing each said identifier;
means for retrieving the CAM by said identifier;
a first memory for storing parameters related to said data links; and
a second memory for storing addresses of said first memory in which parameters related to each data link specified by each said identifier are stored in a particular address to be accessed as a result of retrieval of the CAM according to said identifier.

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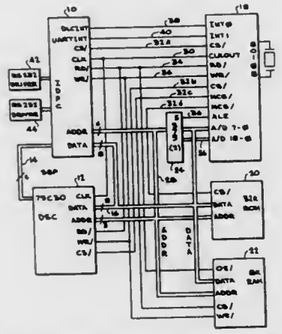
5,048,011
**ROUTING METHOD FOR FAST PACKET SWITCHING SYSTEMS**
Riccardo Melen, Turin, Italy, assignor to CSELT - Centro Studi E Laboratori Telecomunicazioni S.p.a., Turin, Italy
Filed Apr. 14, 1989, Ser. No. 338,958
Claims priority, application Italy, May 24, 1988, 67474 A/88
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—60 6 Claims




1. A method of routing packets through an interconnection network of a fast packet switching system, in which a number of alternative connection paths between any input and any output of the interconnection network is available and the interconnection network is associated with a distributed control structure composed of a plurality of processing units which manage routing at a virtual call level, comprising the steps of:
storing at at least some of said processing units, each associated with a group of network inputs and at least some of said processing units each associated with a group of network outputs, bandwidth occupancy data of interstage links which can be reached from the inputs of said group and are included between said inputs and a stage where separate interstage links are allotted to all alternative paths or respectively bandwidth occupancy data of the interstage links leading to the outputs of said group and included between said stage and the outputs of said group;
updating said data whenever a new call is routed;
evaluating when a virtual call is to be routed by the processing units associated with the input or respectively the output involved in the connection, on the basis of the updated condition of bandwidth occupancy and of the bandwidth requirements of the new call, a cost function of the connection along the portion of each possible routing path included between the input and the stage where separate interstage links are allotted to all alternative paths or respectively for a portion of each routing path included between said stage and the respective output;
combining the results of the evaluations carried out by said units together in one of said units, thereby determining a global cost function of the individual connection paths; and
forwarding the calls on the path which presents the minimum global cost function.

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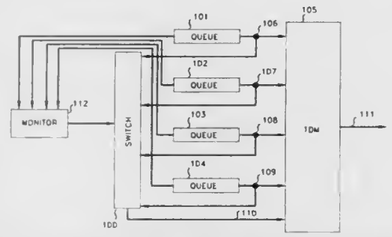
5,048,012
**DATA LINK CONTROLLER WITH FLEXIBLE MULTIPLEXER**
Dale E. Gulick, and Terry G. Lawell, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 35,683, Apr. 3, 1987, abandoned. This application Feb. 14, 1989, Ser. No. 311,411
Int. Cl.[5] H04J *3/04*
U.S. Cl. 370—77 4 Claims



1. A bidirectional data communication port adaptable for use with a data link controller for controlling data communications with a station, the data communications port comprising transmitting means for transmitting outbound data to said station and receiving means for receiving inbound data from said station;
said transmitting means including time slot multiplexer means for selectively establishing time-relations for said outbound data in response to a plurality of first clock signals; and
said receiving means including a time segment demultiplexer means for selectively establishing time-correspondences for said inbound data in response to a plurality of second clock signals.



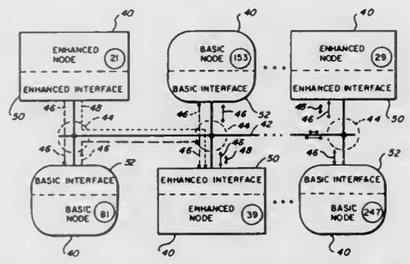
5,048,013
**TRANSMISSION CONGESTION CONTROL METHOD AND APPARATUS**
Kai Y. Eng, Eatontown; Richard D. Gitlin, Little Silver, and Mark J. Karol, Fair Haven, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Apr. 6, 1990, Ser. No. 505,796
Int. Cl.[5] H04J *3/16*
U.S. Cl. 370—79 9 Claims




4. Apparatus for generating a plurality of N communications channels, the apparatus being adapted for connection to a communications link, comprising:
a plurality of at most N−1 queues;
means for sequentially polling said queues and for outputting data from each queue on an associated separate one of said N communications channels during such time when said queue is polled, thereby leaving at least one remaining communications channel;
means for monitoring each of said queues to determine at least one of said queues which has the most data stored therein relative to the other queues; and
means for switching data from said at least one queue which has the most data stored therein to said means for sequentially polling and for outputting, thereby causing data from said at least one queue which has the most data stored therein to be output on said at least one remaining channel.

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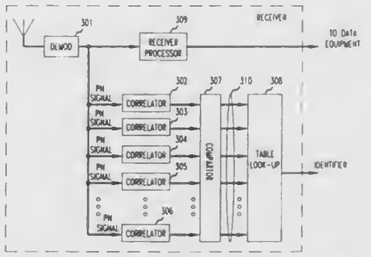
5,048,014
**DYNAMIC NETWORK RECONFIGURATION TECHNIQUE FOR DIRECTED-TOKEN EXPANDED-ADDRESS LAN**
Michael A. Fischer, San Antonio, Tex., assignor to Datapoint Corporation, San Antonio, Tex.
Continuation of Ser. No. 292,467, Dec. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 270,641, Nov. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 270,804, Nov. 14, 1988, abandoned. This application Jul. 24, 1990, Ser. No. 560,002
Int. Cl.[5] H04J *3/14*
U.S. Cl. 370—85.5 54 Claims




1. A directed token local area network (LAN), comprising:
a plurality of at least three nodes, each node having a unique address or ID, at least one of the nodes being a basic node, all basic nodes having IDs which fall within a basic range of permissible IDs, at least one of the nodes being an enhanced node, each enhanced node having an ID which falls within an enhanced range of permissible IDs or within the basic range, all of the IDs in the enhanced range being greater than those permitted in the basic range, at least one of the enhanced nodes having an ID in the enhanced range; and
reconfiguration means associated with all of the nodes and operative for passing tokens to locate the next active node and to establish automatically all of the active nodes in a token loop according to the IDs of the nodes to enable all of the active nodes to receive tokens during normal LAN operation, said reconfiguration means executing a standard reconfiguration sequence for locating and establishing all of the active nodes with IDs in the basic range in a sequence in a basic segment of the token loop, said reconfiguration means also executing an enhanced reconfiguration sequence for locating and establishing all of the active nodes with IDs in the enhanced range in a sequence in an enhanced segment of the token loop, the basic and enhanced segments defining the token loop, and the execution of the enhanced reconfiguration sequence commencing with the first enhanced node to receive the token in conjunction with execution of the basic reconfiguration sequence.

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5,048,015
**INTERFERENCE SOURCE IDENTIFICATION**
Yossi Zilberfarb, Elberon, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 14, 1990, Ser. No. 538,367
Int. Cl.[5] H04J *3/12*
U.S. Cl. 370—110.4 16 Claims




1. A receiver for receiving a desired transmitted signal, from among a plurality of transmitted signals, each of the transmitted signals comprising a data signal and a superimposed identification signal, each identification signal having a predetermined amplitude, the receiver comprising:
means for comparing the amplitude of the identification signal of the desired transmitted signal to an amplitude of an identification signal of at least one other transmitted signal from the plurality transmitted signals; and
means for causing an alarm condition when said means for comparing indicates that said amplitude of said identification signal from said at least one other transmitted signal is greater than a predetermined fraction of said amplitude of said identification signal of said desired transmitted signal.

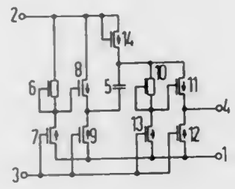
VOL 1130 ISS 2 SE 10 1991 UMI



**5,048,016**
**CIRCUIT CONFIGURATION FOR INCREASING THE OUTPUT VOLTAGE OF AN ELECTRONIC SWITCHING STAGE**

**Ralf Schwendt, Düsseldorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Sep. 7, 1990, Ser. No. 579,046**
**Claims priority, application European Pat. Off., Sep. 7, 1989, 89116559.9**
**Int. Cl.[5] H03K** *19/096, 17/60*
**U.S. Cl. 307—570** **6 Claims**



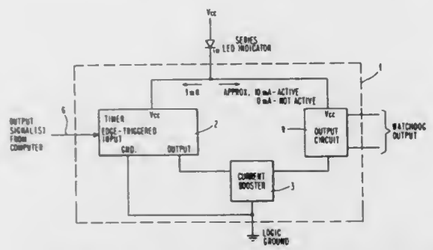
1. Circuit configuration, comprising a node point, a first electronic reversing switch having an output being coupled to a first operating potential during a first switching phase and to a second operating potential during a second switching phase; a second electronic reversing switch having an output being coupled to the first operating potential during the first switching phase and to said node point during the second switching phase; a diode connected in the conducting direction between the second operating potential and said node point; and a capacitor connected between the output of said first electronic reversing switch and said nod point.

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**5,048,017**
**WATCHDOG TIMER**

**Brian H. Breneman, 150 W. Beaver St., Hellam, Pa. 17406**

**Filed Dec. 29, 1988, Ser. No. 291,500**
**Int. Cl.[5] G06F** *11/32*
**U.S. Cl. 371—16.3** **7 Claims**

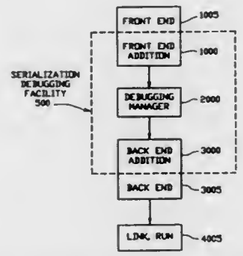


1. A watchdog timer for monitoring computer controlled systems, whereby the said watchdog timer requires a supply current less than that required to light an LED when the output is in an inactive state and requires a supply current equal to that required to light an LED when the output is in an active state, the improvement wherein all said supply current flows through a series connected LED and comprising:
(a) an edge-triggered input for detecting state changing signals from a computer control system, and;
(b) a timer which is reset by said detected state changes and further providing an output which indicates when said timer has timed out.

**5,048,018**
**DEBUGGING PARALLEL PROGRAMS BY SERIALIZATION**

**David Bernstein, Bronx, and Kimming So, Armonk, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 29, 1989, Ser. No. 373,953**
**Int. Cl.[5] G06F** *11/00*
**U.S. Cl. 371—19** **12 Claims**



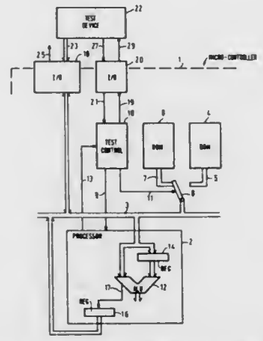

1. A method of serializing sections of a parallel program, comprising the steps of:
a) locating sections of said program that may be executed concurrently;
b) displaying information representative of said sections and their interrelationships;
c) selecting at least one of said sections for serialization, responsive to the displayed information;
d) generating object code for the program providing for serial execution of said selected sections.

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**5,048,019**
**METHOD OF TESTING A READ-ONLY MEMORY AND DEVICE FOR PERFORMING THE METHOD**

**Hans-Gerd Albertsen, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 15, 1989, Ser. No. 366,571**
**Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 38207281**
**Int. Cl.[5] G06F** *11/00;* **G11C** *29/00*
**U.S. Cl. 371—21.1** **14 Claims**



1. A method for testing the contents of a read-only memory in an integrated circuit, the method comprising the steps of:
(a) switching a processor of the integrated circuit to a test mode, which processor is controlled by contents of the read-only memory;
(b) activating a test program stored in the processor to control the processor rather than the contents;
(c) receiving externally supplied test data at the processor via external connections of the integrated circuit;
(d) under control of the test program,
(i) successively reading the contents;
(ii) comparing the contents and the externally supplied test data in an arithmetic unit of the processor;
(iii) supplying an error message in response to a negative comparison result;
(iv) storing any error message in a storage register of the processor;
(v) only outputting any stored error message after the end of the test program, via an external connection of the integrated circuit which is also a data connection during normal operation of the processor,
whereby the contents are tested without the contents being either supplied or accessible externally to the integrated circuit.

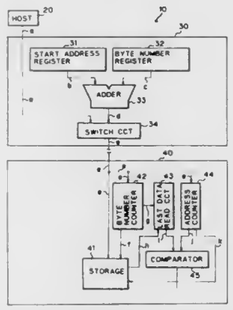


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**5,048,020**
**ELECTRONIC DISK SUBSYSTEM**

**Kazumichi Miki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jul. 25, 1990, Ser. No. 557,080**
**Claims priority, application Japan, Jul. 25, 1989, 1-192167**
**Int. Cl.[5] G06F** *11/00*
**U.S. Cl. 371—21.2** **5 Claims**



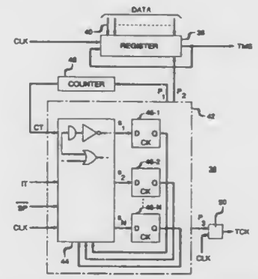

1. An electronic disk subsystem, comprising:
an electronic disk control unit connected to a host by an upper-layer bus; and
an electronic disk unit connected to said electronic disk control unit by a lower-layer bus;
said electronic disk control unit comprising start address register means for storing a start address for data transfer which is inputted from said upper layer bus at a beginning of a transfer of write data,
byte number register means for storing a number bytes of data to be transferred which is inputted from said upper-layer bus at said beginning of said transfer of said write data,
adder means for adding a content of said start address register means and a content of said byte number register means when data to be transferred from said electronic disk control unit to electronic disk unit are exhausted, and
switching means for selectively feeding either one of an output of said adder means and an output of said host to said lower-layer bus;
said electronic disk unit comprising
storage means for storing an output of said switching means as data,
byte number counter means for storing said number of bytes of data to be transferred which is inputted from said upper-layer bus via said electronic disk unit at said beginning of said transfer of said write data and being decremented by a number of transferred bytes every time said data is transferred,
last data reading means for reading last data which is a write data transfer end address out of said storage means,
address counter means for storing said start address inputted from said upper-layer bus via said electronic disk control unit at said beginning of said transfer of said write data and incremented by said number of transferred bytes every time said data is transferred, and
comparator means for comparing said last data read out by said last data reading means and a content of said address counter means;
said switching means feeding, when data to be transferred from said electronic disk control unit to said electronic disk unit are exhausted subsequent to said output of said host, said output of said adder means to said storage means as last data;
said last data reading means reading said last data out of said storage means when said byte number counter means is decremented to zero;
said comparator means comparing said last data and said content of said address counter means.

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**5,048,021**
**METHOD AND APPARATUS FOR GENERATING CONTROL SIGNALS**

**Najmi T. Jarwala, Plainsboro; Paul W. Rutkowski, Morris Plains, both of N.J., and Chi W. Yau, Holland, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Aug. 28, 1989, Ser. No. 399,132**
**Int. Cl.[5] H04B** *17/00*
**U.S. Cl. 371—22.3** **12 Claims**




1. A method for generating selected bit sequences of a control signal for controlling a controller comprising the steps of:
loading a multi-bit control macro of a particular type into a register having its shift output coupled to its shift input;
identifying the type of macro loaded in the register;
shifting out the bits of the control macro to a controller in a sequence established in accordance with the macro's identity; while
simultaneously shifting back into the register each bit which is shifted out.

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**5,048,022**
**MEMORY DEVICE WITH TRANSFER OF ECC SIGNALS ON TIME DIVISION MULTIPLEXED BIDIRECTIONAL LINES**

**Thomas D. Bissett, Derry, N.H.; Norbert H. Riegelhaupt, Framingham, and Mitch Berkson, Brighton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Aug. 1, 1989, Ser. No. 388,323**
**Int. Cl.[5] G06F** *11/10*
**U.S. Cl. 371—40.1** **3 Claims**

1. A memory for storing data in a computer system, wherein the computer system includes a memory controller means for writing or reading data during a memory transfer cycle, and a

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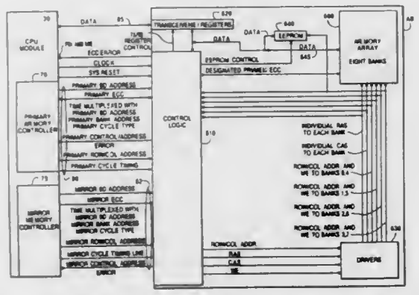


memory interface bus for coupling the memory to the memory controller means, wherein the memory interface bus includes a plurality of bidirectional data lines, a plurality of time division multiplexed bidirectional lines, and a cycle timing line for providing cycle timing signals to the memory, and wherein the memory comprises:

memory array means including a plurality of addressable storage locations, for storing data and ECC signals;

sequencer means, coupled to the cycle timing line, for generating a plurality of sequence timing signals in accordance with a clock signal and the cycle timing signals;

data buffer means, coupled to the plurality of bidirectional data lines, to the memory array means, and to the sequencer means, for transferring data between the bidirectional data lines and the memory array means, when enabled by the sequence timing signals during the memory transfer cycle;



control buffer means, coupled to the plurality to time division multiplexed bidirectional lines, to the memory array, and to the sequencer means,

for transferring address signals, provided on the time division multiplexed bidirectional lines by the memory controller means, from the time division multiplexed bidirectional lines to the memory array means, to access the addressable storage locations in the memory array means specified by the address signals, when enabled by sequence timing signals at the beginning of the memory transfer cycle; and

for transferring ECC signals, between the time division multiplexed bidirectional lines and the memory array means, at times when data is transferred between the bidirectional data lines and the memory array means, when enabled by sequence timing signals after the beginning of the memory transfer cycle.

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**5,048,023**

**ASYMMETRIC SOFT-ERROR RESISTANT MEMORY**

**Martin G. Buehler, La Canada, and Marvin Perlman, Granada Hills, both of Calif., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.**

**Filed Feb. 16, 1989, Ser. No. 311,024**

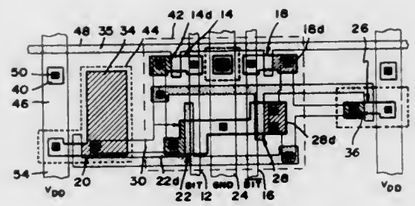
**Int. Cl.[5] G11C *29/00*; H03M *13/00***

**U.S. Cl. 371—40.1** **3 Claims**

1. A memory apparatus comprising:

a memory which includes a plurality of binary memory cells, each memory cell including first and second regions that each can change the binary state of the cell when struck by ionizing radiation at a time when the region is at a predetermined voltage, and wherein said first region of each cell is a plurality of times larger than said second region;

encoder means for storing a codeword in each of a predetermined group of said memory cells, with each codeword having a plurality of bits that can each have first and second states, and with the codewords being based on an asymmetric error correcting code which enables the correction of any single error in a codeword wherein a bit has erroneously changed from a first state to a second state;



each binary cell being in said first state when said first region is at said predetermined voltage.

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**5,048,024**

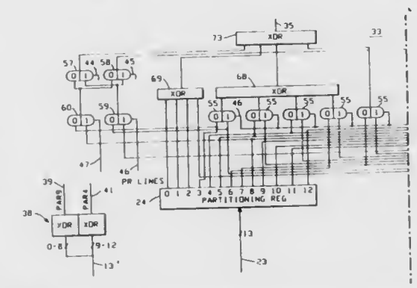
**PARTITIONED PARITY CHECK AND REGENERATION CIRCUIT**

**Gary R. Robeck, Albertville, and Joseba M. Desubijana, Minneapolis, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.**

**Filed Sep. 6, 1989, Ser. No. 403,638**

**Int. Cl.[5] G06F *11/10***

**U.S. Cl. 371—49.1** **8 Claims**



1. A partitioned parity check and regeneration circuit, comprising:

an input data word comprising a plurality of bytes, each said byte comprising plural data bits and a parity bit,

partitioning register means comprising buffer registers for storing selected data bits from said input data word to provide a subset input data word of fewer data bits than said input data word,

parity register means containing a plurality of parity bits associated with each said subset input data word, and

input logic means for generating said parity bits,

said input logic means having all of the inputs of said input data word, and

having an error detecting output and a parity bit output for loading said parity register means.

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**5,048,025**

**SUPERCONDUCTING FREE ELECTRON LASER**

**Yasuhiko Takemura, Atsugi, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan**

**Continuation-in-part of Ser. No. 287,069, Dec. 21, 1988, Pat. No. 4,971,945. This application Jan. 26, 1990, Ser. No. 470,733**

**Claims priority, application Japan, Dec. 21, 1987, 62-321391**

**Int. Cl.[5] H01S *3/00***

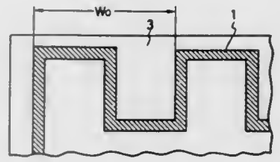
**U.S. Cl. 372—2** **5 Claims**

1. A free electron laser comprising:



accelerator means for emitting an electron beam in a predetermined first direction;

at least one coil disposed adjacent to and substantially in parallel with said first predetermined direction so that, in response to passage of electric current through said coil, each turn of the coil produces a magnetic field which is substantially perpendicular to said first predetermined direction and which is opposite in direction to the direction of the magnetic field produced by an adjacent turn of the coil;



a power source for supplying said electric current to said coil;

a plurality of superconductors respectively corresponding to at least some of the turns of the coil and so disposed with respect to said some turns that each superconductor is subjected to the magnetic field of its associated turn of the coil and captures and maintains therein the magnetic field of its associated turn of the coil whereby an electromagnetic wave is generated in response to the electron beam passing through the magnetic fields maintained by said plurality of superconductors.

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**5,048,026**

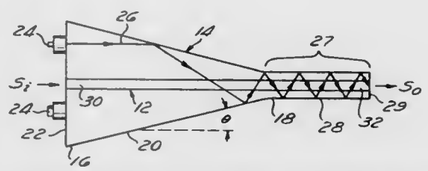
**FIBER OPTIC AMPLIFIER**

**Herbert J. Shaw, Stanford, and Michel J. F. Digonnet, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.**

**Continuation of Ser. No. 537,796, Sep. 30, 1983. This application May 4, 1988, Ser. No. 191,770**

**Int. Cl.[5] H01S *3/30***

**U.S. Cl. 372—6** **26 Claims**



1. A fiber optic device for producing coherent light, comprising:

an optical fiber, for guiding an optical signal, said fiber comprising a laser material;

a jacket, surrounding at least a portion of said optical fiber, to provide a cladding for said optical fiber which has a refractive index selected to cause said optical signal to be guided within said optical fiber, said jacket comprising:

a first end having an end face for receiving pump light;

a second fiber sized end, having a diameter which is small compared to said first end; and

a transition portion, between said first and second ends; and means for preferentially introducing collimated pump light into said end face at a location which is offset from said optical fiber to nonuniformly illuminate said end face to preferentially excite high order modes in said jacket, said transition portion of said jacket configured to focus said pump light at said second end, said focused pump light refracting from said jacket into said fiber to cause inversion of the electronic population of said laser material to cause emission of photons from said laser material.

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**5,048,027**

**HYBRID LASER**

**John L. Hughes, Melbourne, and Barry L. Hudson, Lower Templestowe, both of Australia, assignors to Austral Asian Lasers Pty. Ltd., Melbourne, Australia**

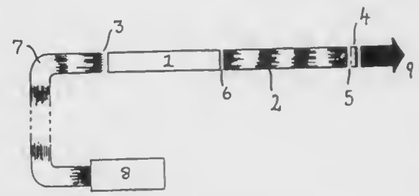
**PCT No. PCT/AU89/00259, § 371 Date Mar. 9, 1990, § 102(e) Date Mar. 9, 1990, PCT Pub. No. WO89/12923, PCT Pub. Date Dec. 28, 1989**

**PCT Filed Jun. 16, 1989, Ser. No. 490,657**

**Claims priority, application Australia, Jun. 16, 1988, PI8814**

**Int. Cl.[5] H01S *3/08***

**U.S. Cl. 372—18** **8 Claims**



1. A scaleable laser system comprising:

a laser resonator,

a first laser resonator end mirror arranged and constructed to fully reflect at a lasing wavelength and to fully transmit at a laser pump wavelength,

a second laser resonator end mirror arranged and constructed to partially transmit at a lasing wavelength and fully reflect at a laser pump wavelength,

a laser medium,

a first optically polished end face of said laser medium disposed adjacent said first resonator end mirror,

a first bundle of single mode optical fibers having a first optical fiber end and a second optical fiber end,

said first and said second optical fiber ends being optically polished and index matched to said laser medium and said laser resonator,

a second optically polished end face of said laser medium disposed opposite said first end face, said second end face being index matched to said first bundle of single mode optical fibers,

a second fiber bundle coupled to an outside face of said first end mirror, said second fiber bundle arranged and constructed to convey light from a remotely cited power supply to said laser medium,

whereby said laser resonator is phase locked and optically coupled by the index matching of said first fiber bundle and laser medium to said resonator mirrors.

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**5,048,028**

**ACHROMATIC-TYPE LASER SCANNING OPTICAL SYSTEM**

**Jun Makino, and Jun Koide, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 28, 1989, Ser. No. 458,545**

**Claims priority, application Japan, Jan. 9, 1989, 1-002258; Aug. 4, 1989, 1-202386; Nov. 13, 1989, 1-294192**

**Int. Cl.[5] H01S *3/10***

**U.S. Cl. 372—24** **10 Claims**

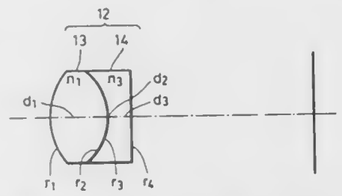
1. An achromatic scanning optical apparatus for scanning a predetermined plane, said scanning optical apparatus comprising:

a laser source for generating a laser beam having a predetermined wavelength;

an optical arrangement comprising a first optical system and a second optical system, said optical arrangement for scanning the predetermined plane;

said first optical system for converging a beam of light generated by said laser source into a converged light beam;

deflecting means for deflecting the light beam converged by said first optical system to said second optical system;




said second optical system for focusing the light beam deflected by said deflecting means onto the predetermined plane at a focus position for scanning the predetermined plane; and

correcting means for correcting any change in the focus position of the light beam on the predetermined plane caused by wavelength variations of the laser beam from said laser source through the entire optical arrangement.

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**5,048,029**

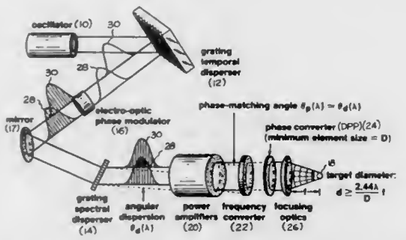
**SYSTEM FOR OBTAINING SMOOTH LASER BEAMS WHERE INTENSITY VARIATIONS ARE REDUCED BY SPECTRAL DISPERSION OF THE LASER LIGHT (SSD)**

**Stanley Skupsky; Terrance J. Kessler; Robert W. Short; Stephen Craxton, all of Rochester; Samuel A. Letzring, Honeoye Falls, and John Soures, Pittsford, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.**

**Filed Jul. 24, 1990, Ser. No. 557,273**

**Int. Cl.[5] H01S *3/13***

**U.S. Cl. 372—26** **20 Claims**




1. A system for smoothing intensity variations in a laser beam by spectral dispersion of the beam which comPrises means for generating a laser beam, means for phase modulating said beam to provide a phase modulated beam, means for angularly dispersing said phase modulated beam to provide an angularly and spectrally dispersed beam having a plurality of frequencies, and means in the path of said dispersed beam for combining portions of said beam of different frequencies to provide an output beam smoothed in intensity variation.

**5,048,030**

**LIGHT AMPLIFYING DEVICE**

**Hiroyuki Hiiro, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

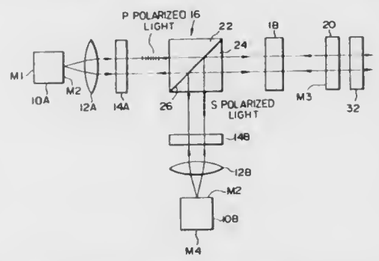
**Continuation of Ser. No. 458,254, Dec. 28, 1989, abandoned.**

**This application Mar. 14, 1991, Ser. No. 668,332**

**Claims priority, application Japan, Dec. 28, 1988, 63-333125**

**Int. Cl.[5] H01S *3/14***

**U.S. Cl. 372—68** **19 Claims**




1. A light amplifying device, comprising:

an optical resonator constituted by first and second reflective mirrors and a common reflective mirror, disposed in optically opposite relation to each other, said common reflective mirror having reflectivity smaller than reflectivities of said first and second reflective mirrors;

optical path changing means comprising one of a polarized beam splitter and a polarizing prism disposed between said first and second reflective mirrors and said common mirror for making the laser beams incoming from a side of said common reflective mirror emerge in a direction toward at least one of said first and second reflective mirrors corresponding to either direction of an orthogonal polarizing plane, and for making laser beams incoming from the sides of said first and second reflective mirrors incident on said common mirror;

first and second amplifying media disposed in optical paths of the laser beams between said first and second reflective mirrors and said optical path changing means, respectively, for amplifying the laser beams through the process of stimulated emission; and

an optical element, disposed between said common reflective mirror and said optical path changing means, for rotating the polarizing plane of the laser beam transmitted to said optical element both after outcoming from said optical path changing means and after being reflected by said common reflective mirror, by a predetermined angle with respect to the polarizing plane of the laser beam coming into the optical element after coming out of said optical path changing means, so as to cause at least a part of the laser beam coming out of one of said amplifying media to enter the other of said amplifying media; whereby laser beams emitted from said amplifying media are summed coherently to provide a high-energy laser beam in a single polarized state.

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**5,048,031**

**LASER WITH ACTIVELY STABILIZED ETALON FOR SINGLE FREQUENCY OPERATION**

**Tracy F. Thonn, Sunnyvale, Calif., assignor to Coherent, Inc., Palo Alto, Calif.**

**Filed Apr. 23, 1990, Ser. No. 512,846**

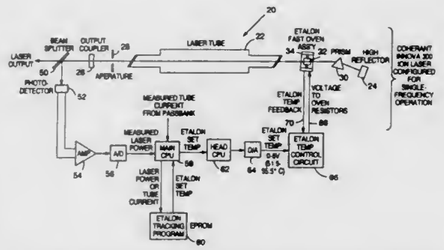
**Int. Cl.[5] H01S *3/106***

**U.S. Cl. 372—33** **16 Claims**

1. A method of operating a laser, said laser having a resonator with a temperature tunable etalon mounted therein for single frequency operation comprising the steps of:

monitoring an output parameter of the laser that is indicative of variations in the alignment of the peak of the transmission frequency curve of the etalon with the frequency of the selected longitudinal mode of the laser, said variations arising from the drift in the frequency of the selected longitudinal mode caused by changes in the length of the resonator; and






varying the temperature of the etalon based on the monitored output parameter so that the peak of the transmission frequency curve of the etalon tracks the mode in the laser.

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**5,048,032**

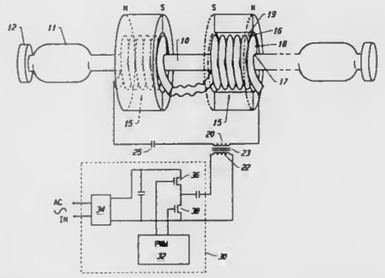
**AIR COOLED RF INDUCTION EXCITED ION LASER**

**John P. Ekstrand, Palo Alto; John P. Goldsborough, Los Altos, and David L. Wright, Redwood City, all of Calif., assignors to Spectra-Physics, San Jose, Calif.**

**Filed Jul. 18, 1990, Ser. No. 554,785**

**Int. Cl.[5] H01S *3/04***

**U.S. Cl. 372—34** **24 Claims**




1. An ion laser comprising:

a resonant cavity including an output coupler and a laser bore, said resonant cavity containing an active medium; and

means for exciting said active medium to induce laser gain in said resonant cavity, said means for exciting including

power supply means for generating a radio frequency (RF) output, and

means for coupling said RF output to said active medium and for dissipating heat associated with said laser bore during the excitation of said active medium.

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**5,048,033**

**METHOD AND APPARATUS FOR CONTROLLING THE POWER SUPPLY OF A LASER OPERATING IN A PULSE MODE**

**Joel A. Donahue, Brookfield, Mass., and Alan M. Neech, Yorkshire, England, assignors to Coherent, Inc., Palo Alto, Calif.**

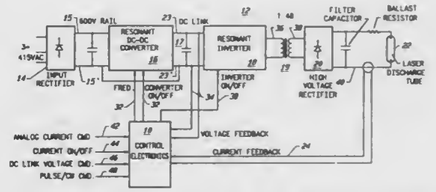
**Filed Sep. 4, 1990, Ser. No. 577,875**

**Int. Cl.[5] H01S *3/00***

**U.S. Cl. 372—38** **18 Claims**

1. In a power supply of the type for supplying an output current to a gaseous discharge apparatus in a continuous mode or in a pulse mode, wherein said power supply having: converting means for receiving a first direct current signal and for converting said first direct current signal into a second direct current signal, energy storage means for receiving said second direct current signal and for storing the electrical energy of said second direct current signal, inverting means for receiving the voltage from said energy storage means and for inverting the voltage received to produce a first alternating current signal, wherein the improvement comprising:

means for detecting said output current supplied to said gaseous discharge apparatus;




means for detecting the voltage from said energy storage means;

means for receiving a first signal, representative of the desired output current;

means for receiving a second signal, representative of the desired voltage from the energy storage means;

means for receiving a third signal, representative of the on and off state of operation of said inverting means; and

electronic control means for receiving said output current detected, said voltage detected, and said first, second and third signals to control said converting means and said inverting means.

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**5,048,034**

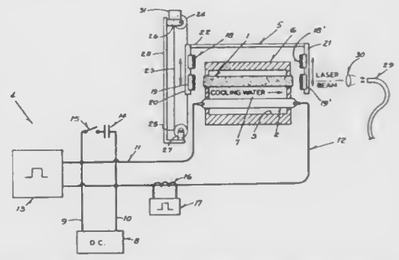
**LONG WAVELENGTH NDYAG LASER**

**John Tulip, Edmonton, Canada, assignor to Carl Zeiss Stiftung, Fed. Rep. of Germany**

**Filed Nov. 20, 1986, Ser. No. 933,103**

**Int. Cl.[5] H01S *3/16***

**U.S. Cl. 372—41** **23 Claims**




1. A long wavelength neodymium laser, comprising:

a housing including a reflective hollow optical cavity;

a laser rod mounted in said optical cavity, said laser rod composed of a crystalline or glass host structure having neodymium doping;

a pump lamp mounted in said optical cavity adjacent to said laser rod, said pump lamp providing a source of light for transfer to said laser rod;

drive means including circuit means for driving said pump lamp to produce intermittent pulses of light from said pump lamp; and

wavelength selective resonator means for providing maximum reflection at about 1.44 μm wavelength and mini-

VOL 1130 ISS 2 SE 10 1991 UMI

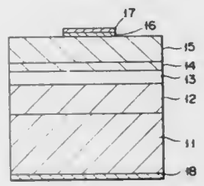
VOL 1130 ISS 2 SE 10 1991 UMI



mum reflection at other wavelengths to allow laser oscillation at about 1.44 μm.

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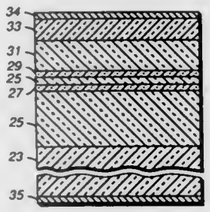
5,048,035
SEMICONDUCTOR LIGHT EMITTING DEVICE
Hideto Sugawara, Tokyo; Masayuki Ishikawa, Nishimine; Yoshihiro Kokubun, Yokohama; Yukie Nishikawa, Narashino, and Shigeya Naritsuka, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 29, 1990, Ser. No. 530,120
Claims priority, application Japan, May 31, 1989, 1-138869; Aug. 31, 1989, 1-225641; Nov. 29, 1989, 1-310247
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 14 Claims




1. In a semiconductor light emitting device comprising:
a compound semiconductor substrate of a first conductivity type;
an InGaAlP layer formed on said substrate and having a light emitting region;
a GaAlAs layer of a second conductivity type formed on said InGaAlP layer and having a larger band gap than that of said InGaAlP layer; and
an electrode formed on a part of said GaAlAs layer,
wherein light is emitted from a surface at the electrode side except for said electrode.

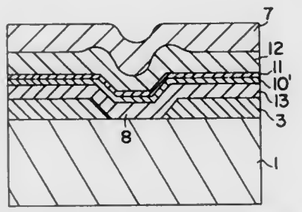
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5,048,036
HETEROSTRUCTURE LASER WITH LATTICE MISMATCH
Donald R. Scifres; David F. Welch, both of San Jose; John Endriz, Belmont, all of Calif., and William Streifer, deceased, late of Palo Alto, Calif. by Shirley Streifer, Executrix , assignors to Spectra Diode Laboratories, Inc., San Jose, Calif.
Continuation-in-part of Ser. No. 408,675, Sep. 18, 1989, Pat. No. 4,984,242. This application Jan. 4, 1991, Ser. No. 638,358
Int. Cl.[5] H01S *3/19*; H01L *33/00*
U.S. Cl. 372—45 37 Claims




1. In a semiconductor laser, a structure comprising,
a substrate, and
a multilayer semiconductor heterostructure disposed on said substrate, said heterostructure including an active region of at least one layer, at least one cladding layer of said heterostructure having a composition with a substantially different lattice constant than said active region.

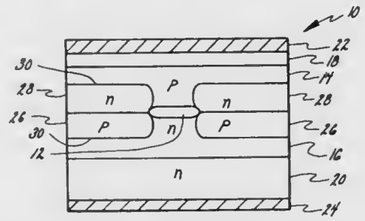
5,048,037
SEMICONDUCTOR LASER DEVICE
Satoshi Arimoto, and Toshitaka Aoyagi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Jul. 18, 1990, Ser. No. 553,579
Claims priority, application Japan, Oct. 13, 1989, 1-267333
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—45 15 Claims




1. A self-aligned bent active layer semiconductor laser for emitting visible light comprising:
a semiconductor substrate of a first conductivity type;
a semiconductor current blocking layer of a second conductivity type opposite the first conductivity type disposed on said substrate including a central stripe-shaped groove exposing the substrate;
a lower cladding layer of the first conductivity type and an active layer comprising GaInP successively disposed on said current blocking layer and in said stripe-shaped groove, said lower cladding layer comprising a first cladding layer comprising AlGaAs disposed on said current blocking layer and in said stripe-shaped groove on said substrate and a second cladding layer comprising AlGaInP sufficiently thin to avoid inferior growth thereon of said GaInP active layer; and
a third semiconductor cladding layer of the second conductivity type disposed on said active layer.

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5,048,038
ION-IMPLANTED PLANAR-BURIED-HETEROSTRUCTURE DIODE LASER
Thomas M. Brennan, Albuquerque; Burrell E. Hammons, Tijeras; David R. Myers, and Gregory A. Vawter, both of Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 25, 1990, Ser. No. 469,996
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 10 Claims

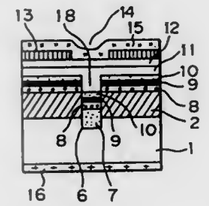



1. A semiconductor laser device comprising:
(a) an optical resonant cavity;
(b) a optical waveguide layer of a high refractive index;
(c) an upper optical waveguide cladding layer having a low refractive index and a first type of electrical conductivity, said upper cladding layer above said optical waveguide layer of high refractive index;
(d) a lower optical waveguide cladding layer having a low refractive index and a second type of electrical conductivity, said lower cladding layer below said optical waveguide layer of high refractive index;
(e) an active region coincident with said optical waveguide layer of high refractive index for conversion of injected current into light, said active region confined vertically by said lower and upper cladding layers;
(f) electrode means for applying current to said device; and
(g) reversed-biased junctions laterally adjacent to and in the plane of the active region for constraining current to flow through said active region.



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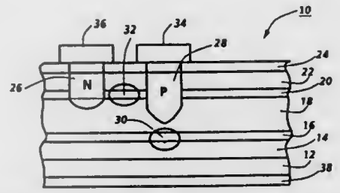
5,048,039
LASER DIODE
Takashi Tsubota, and Yoji Hosoi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Japan
Filed Mar. 26, 1990, Ser. No. 500,186
Claims priority, application Japan, Mar. 30, 1989, 1-76489
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—46 12 Claims




1. A laser diode comprising:
a substrate;
a first blocking layer located on said substrate, and having a stripe-like groove;
a lower cladding layer and a second blocking layer disposed alternately in said groove for forming an alternate combination thereof;
an active layer located in said groove and located above said first blocking layer outside said groove;
an upper cladding layer;
a first electrode located above said upper cladding layer; and
a second electrode located below said substrate;
said active layer being disposed between said alternate combination and said upper cladding layer in said groove.

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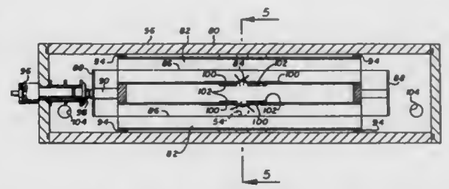
5,048,040
MULTIPLE WAVELENGTH P-N JUNCTION SEMICONDUCTOR LASER WITH SEPARATED WAVEGUIDES
Thomas L. Paoli, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 8, 1990, Ser. No. 490,799
Int. Cl.[5] H01S *3/19*
U.S. Cl. 372—50 22 Claims




1. In a multiple wavelength semiconductor laser comprising a plurality of semiconductor layers deposited on a substrate, two of said semiconductor layers, each being an active layer for providing light wave generation and propagation under lasing conditions, each of said active layers being active at a different wavelength,
at least one of said semiconductor layers being between said two active layers, and
two disordered regions of opposing conductivity types extending through one of said active layers to said at least one semiconductor layer between said active layers, such that forward-biasing the first of said disordering regions with respect to said substrate causes a portion of said active layer between said first disordered region and said substrate to lase at a first wavelength, forward-biasing said first disordered region with respect to the second of said disordered regions causes a portion of said active layer between said disordered regions to lase at a second wavelength, and forward-biasing said first disordering region with respect to said substrate and with respect to said second disordered region causes a portion of said active layer between said first disordered region and said substrate to lase at said first wavelength and a portion of said active layer between said disordered regions to lase at said second wavelength.

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5,048,041
COMPACT EXCIMER LASER
Robert P. Akins; Donald G. Larson, both of San Diego; Uday K. Sengupta, Del Mar, and Richard L. Sandstrom, Encinitas, all of Calif., assignors to Cymer Laser Technologies, San Diego, Calif.
Division of Ser. No. 144,799, Jan. 15, 1988. This application Jul. 10, 1990, Ser. No. 550,389
Int. Cl.[5] H01S *3/22*
U.S. Cl. 372—57 5 Claims




1. A compact excimer laser, including
a housing structure having a plurality of walls forming an internal laser cavity,
a gas located within the laser cavity and with the gas capable of lasing action,
a pair of spaced electrodes located within the laser cavity and forming an electrical discharge area between the electrodes for stimulating gas within the discharge area to lasing action in accordance with an electrical discharge between the electrodes,
one of the pair of electrodes located along a central position within the cavity and grounded to the housing structure,
the other of the pair of electrodes located adjacent to one of the walls of the housing structure and with the other electrode mounted on a main insulator member, the main insulator member formed of ceramic material, and
the one wall of the housing including inwardly extending wall portions to form an integral spacer and central position support for the main insulator from the one wall on one side of the main insulator.

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5,048,042

## CATALYTIC METHOD FOR INHIBITING DEPOSIT FORMATION IN METHANE RAMAN CELLS

Thomas P. Moser, Redondo Beach, and Donald R. Dewhirst, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 19, 1990, Ser. No. 615,118
Int. Cl.[5] H01S 3/22
U.S. Cl. 372—59 15 Claims

1. A method for inhibiting the formation of deposits on the inside surface of the window of a Raman cell comprising methane as the scattering medium wherein said methane is exposed to arcing conditions, said method comprising providing within said Raman cell a catalytic composite comprising palladium on a titania substrate whereby said catalytic composite promotes the hydrogenation of radicals formed during said arcing and thereby inhibits the reaction of said radicals to form said deposits.

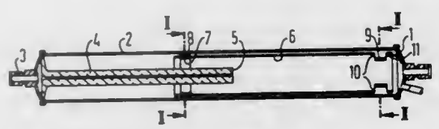
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5,048,043

## GAS LASER

Wolfgang Welsch, Baldham; Hans Krueger, Munich; Klemens Huebner, Ottobrunn, and Rudolf Haeusler, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

Filed Aug. 6, 1990, Ser. No. 564,739
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932256
Int. Cl.[5] H01S 3/03
U.S. Cl. 372—65 10 Claims




1. A gas laser tube structure, comprising:
a housing tube having respective first and second end pieces at opposite ends thereof, each of the end pieces having mounting means for an optical element;
the first end piece having positioned thereat a capillary as a discharge channel which projects into the housing tube;
a cylindrical cathode in the housing tube which surrounds an end of the capillary, said cathode having an end face termination and a beam passage opening at said second end piece, and said cathode being connected to said second end piece; and
spring means for axially displaceably supporting and centering and end of the cathode opposite end face termination relative to a wall of the housing tube such that when the second end piece is joined in a glass soldering process at the end of the housing tube with the housing tube aligned in its soldering position, an intrinsic weight of the end piece with the attached cathode is sufficient to overcome a friction between the spring means and the housing wall thereby allowing the end piece to be displaced axially relative to the housing tube axis during the glass soldering process and permitting the cathode to shift to its final position after the housing is closed by the end piece.

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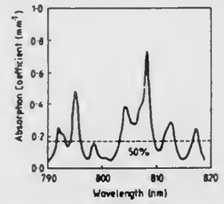
5,048,044

## OPTICALLY PUMPED LASERS

Clive L. M. Ireland, Warwickshire, United Kingdom, assignor to Lumonics, Ltd., Rugby, United Kingdom

Filed Dec. 11, 1989, Ser. No. 448,123
Claims priority, application United Kingdom, Dec. 22, 1988, 8829875
Int. Cl.[5] H01S 3/06
U.S. Cl. 372—66 7 Claims

1. An optically pumped laser comprising an optical cavity having an optical axis, a solid laser member located in the optical cavity and formed at least partly from active material, the laser member having two end surfaces which intersect the optical axis and at least one side surface extending between the end surfaces, pumping light providing means including at least one array of laser diodes for providing pumping light and arranged so that the pumping light passes into the laser member through at least one side surface thereof, and means for deflecting the pumping light so that pumping light initially travelling from the pumping light providing means towards the laser member in a direction normal to the optical axis is deflected and caused to make at least one pass across the laser member in a direction having a component along the optical axis.



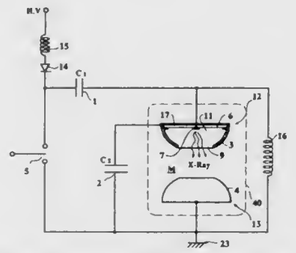

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5,048,045

## AUTOMATIC PREIONIZATION PULSE LASER

Etsuo Noda, Fujisawa; Setsuo Suzuki, Yokohama, and Osami Morimiya, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1990, Ser. No. 494,218
Claims priority, application Japan, Mar. 22, 1989, 1-67685
Int. Cl.[5] H01S 3/097
U.S. Cl. 372—86 20 Claims




1. An automatic preionization pulse laser system, comprising:
a first electrode and a second electrode located to define a discharge region therebetween;
means for providing a laser medium in said discharge region;
a first capacitance connected between said electrodes;
a second capacitance connected between said electrodes;
means for accumulating an electric charge on said first capacitance; and
means for discharging said electric charge accumulated on said first capacitance and transferring said electric charge to said first electrode;
said first electrode comprising
a vacuum chamber, and
substrate means located in said vacuum chamber and connected between said first and second capacitances to provide for transfer of said electric charge from said first capacitance to said second capacitance, said substrate means being responsive to said transfer for producing a large voltage sliding discharge to generate X-rays for preionizing said laser medium;



said second capacitance, upon said transfer of said electric charge thereto, discharging said electric charge across said electrodes to excite said laser medium to produce radiation for lasing.

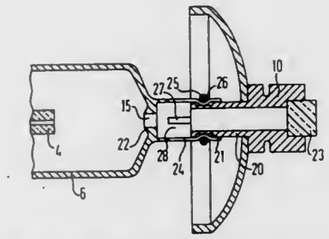
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5,048,046

## CATHODE AND CATHODE MOUNT FOR A GAS LASER

Wolfgang Welsch, Baldham; Hans Krueger, Munich; Klemens Huebner, Ottobrunn, and Rudolf Haeusler, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich

Filed Aug. 6, 1990, Ser. No. 564,736
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932254
Int. Cl.[5] H01S 3/097
U.S. Cl. 372—87 14 Claims




1. A gas laser tube structure, comprising:
a housing tube having first and second end pieces at opposite ends thereof terminating said housing tube;
the second end piece having a mounting means attached thereto for attachment of an optical element, said mounting means having a bore;
a capillary as a discharge channel adjacent said first end piece and positioned in said housing tube;
a substantially cylindrical cathode in the housing tube, said cathode surrounding an end of the capillary within the housing tube, and said cathode having a tube termination spaced in an axial direction from an end face of the capillary, said tube termination having a beam passage opening;
said mounting means having an extension projecting into an interior of the housing tube;
said cathode having a retaining tube extending from a region of the tube termination in a direction facing away from the capillary end face and towards said mounting means, and means for connecting said cathode retaining tube to said extension and for supporting said cathode retaining tube by said extension; and
said beam passage opening of said tube termination being smaller than said bore of said mounting means and said beam passage opening of the tube termination being positioned between said mounting means and said capillary end face so that plasma passing through the beam passage opening during operation is kept away from walls of the bore.

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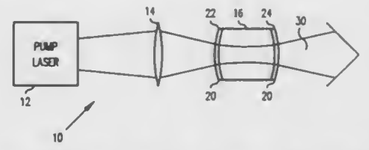
5,048,047

## PASSIVE ABSORPTIVE RESONATOR LASER SYSTEM AND METHOD

William J. Kozlovsky, and William P. Risk, both of Mountain View, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1990, Ser. No. 582,286
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—92 14 Claims

1. A laser system comprising:
a means for generating pump light at a first frequency;
a laser material in optical communication with said means for generating pump light, said laser material being disposed in an optical resonator, thereby causing said laser material to lase and produce laser light at a second frequency; and
said optical resonator having reflective surfaces which produce reflectivities such that resonance is established in said resonator at approximately said first frequency and approximately said second frequency, thereby providing a more efficient absorption of said pump light.



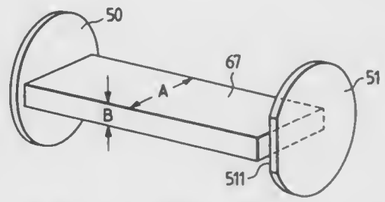

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5,048,048

## GAS LASER DEVICE

Junichi Nishimae; Kenji Yoshizawa, and Masakazu Taki, all of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 564,517
Claims priority, application Japan, Aug. 11, 1989, 1-206978; Jan. 10, 1990, 2-2859; Jan. 12, 1990, 2-3550
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—95 6 Claims




1. A gas laser device, comprising:
a discharge space in which a laser gas is excited by electric discharge, said discharge space being in the form of a slab whose section perpendicular to a laser optical axis has a longer side and a shorter side; and
laser resonator mirrors disposed at both ends of said discharge space, respectively, said laser resonant mirrors constituting a negative branch unstable resonator in a first dimension of said longer side of said section of said discharge space,
wherein an output laser beam is obtained at one end of said longer side of said section of said discharge space.

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5,048,049

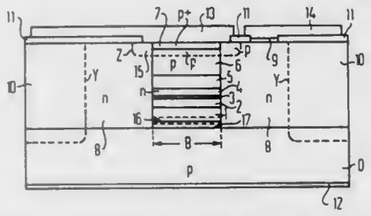
## TURNABLE DISTRIBUTED FEEDBACK-LASER

Markus C. Amann, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 408,560, Sep. 18, 1989, abandoned. This application Dec. 18, 1990, Ser. No. 629,017
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1988, 3832240
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—96 20 Claims

1. A tunable distributive feedback of semiconductor material formed on a substrate which is doped for electrical conduction of a first conductivity type, comprising a strip-shaped sequence of semiconductor layers grown one upon another and comprising an active layer for generating emission, a tuning layer formed of a material which has a different energy band gap between the valency band and the conduction band from the material of said active layer, and a central layer doped for a

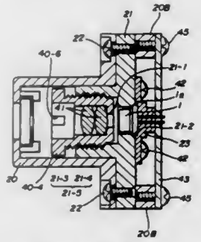
conductivity type opposite to the conductivity type of said substrate and formed between said active layer and said tuning layer, comprising further a grating created by a boundary surface between two layer with different refractive indexes,



and lateral regions joining said strip-shaped layer sequence laterally and being doped for the same conductivity type as said central layer and having lateral dimensions so as to provide efficient lateral limitation of the current path.

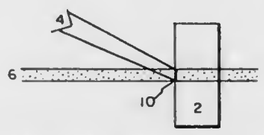
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**5,048,050**
**SEMICONDUCTOR LASER APPARATUS**
**Takeshi Komurasaki, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**
**Continuation of Ser. No. 291,128, Dec. 28, 1988, abandoned. This application Feb. 27, 1990, Ser. No. 485,825**
**Claims priority, application Japan, Jan. 8, 1988, 63-2160**
**Int. Cl.[5] H01S** *3/08*
**U.S. Cl. 372—101** **10 Claims**



1. A semiconductor laser apparatus comprising:
a fitting member having a first opening and a second opening which are connected to each other and are concentric with each other, said first opening serving as a semiconductor laser fitting portion and said second opening serving as a collimator lens fitting portion;
a semiconductor laser fitted into said first opening; and
a collimator lens and a lens holder in which said collimator lens is accommodated, said lens holder being fitted into said second opening;
wherein:
said lens holder has through holes in opposed walls thereof and a male screw thread formed around a peripheral surface thereof, and said second opening has a female screw thread formed at an inner surface thereof,
said lens holder has a press-fitting portion formed at an end portion of said lens holder located on the side of said first opening and formed on a surface of said lens holder which is the same as the surface at which said male screw thread is formed, and
said lens holder is inserted into said second opening by the engagement of said male and female screw threads and is positioned therein by press-fitting said press-fitting portion of said lens holder into said second opening of said fitting member, thereby eliminating a need for manual alignment of optical axes and manual focus adjustment.

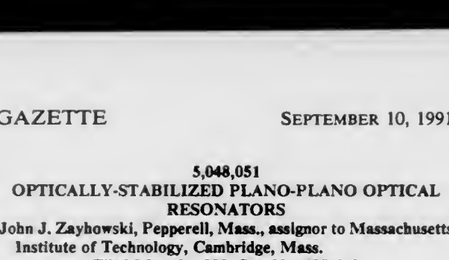
**5,048,051**
**OPTICALLY-STABILIZED PLANO-PLANO OPTICAL RESONATORS**
**John J. Zayhowski, Pepperell, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**
**Filed Mar. 2, 1990, Ser. No. 487,612**
**Int. Cl.[5] H01S** *3/08*
**U.S. Cl. 372—101** **26 Claims**



1. A controllable lens for refracting light comprising:
an optical lensing element formed of a material which transmits the light and which has temperature-dependent optical properties, and
control light source means for illuminating the lensing element with control light, said control light having a spatial intensity distribution across a surface of the lensing element to cause nonuniform heating in the lensing element, thereby causing a nonuniform change in the optical properties of the lensing element,
whereby the lensing element functions as a controllable lens which controllably refracts the light.

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**5,048,052**
**SPREAD SPECTRUM COMMUNICATION DEVICE**
**Masahiro Hamatsu; Shoichi Minagawa, and Masaharu Mori, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan**
**Filed Feb. 2, 1990, Ser. No. 475,185**
**Claims priority, application Japan, Feb. 7, 1989, 1-29538**
**Int. Cl.[5] H04L** *27/30*
**U.S. Cl. 375—1** **18 Claims**



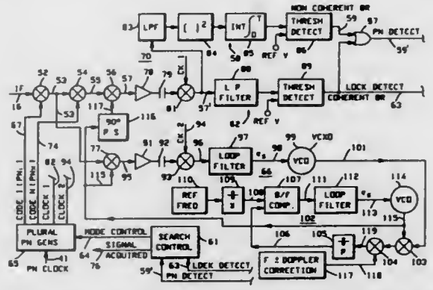

1. A spread spectrum communication device comprising:
a transmitter which includes:
spread-modulating means including a plurality of pseudo-noise code generators outputting different code patterns and a gate which, in response to information data, selects and outputs one of said code patterns from a respective one of said pseudo-noise code generators, said transmitter transmitting a spread signal which has a carrier frequency and includes said selected code pattern; and
a receiver which includes:
a reference pseudo-noise code generator generating a reference pseudo-noise code which is asynchronous to said carrier frequency and said selected code pattern from said transmitter and which is inverted in time with respect to the code pattern of one of said pseudo-noise code generators of said transmitter;
a surface acoustic wave convolver to which is applied said reference pseudo-noise code and the spread signal from said transmitter,
a waveform shaper which shapes a waveform of a correlation peak train outputted by said convolver; and



demodulator means for reproducing said information data in response to pulses of the shaped waveform from said waveform shaper.

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**5,048,053**
**DETECTING AND TRACKING CIRCUIT FOR COMPONENT PN CODES**
**Vaughn L. Mower, Bountiful, and John W. Zscheile, Jr., Farmington, both of Utah, assignors to Unisys Corporation, Blue Bell, Pa.**
**Filed Nov. 20, 1989, Ser. No. 439,133**
**Int. Cl.[5] H04L** *27/30*
**U.S. Cl. 375—1** **19 Claims**

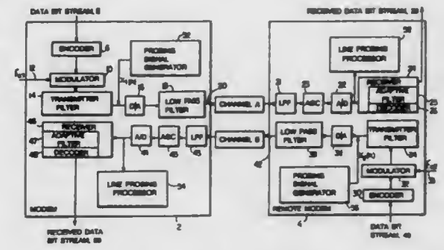



1. A detection and tracking circuit for fast acquisition of a PN composite code composed of PN component codes, comprising:
a first correlator/mixer having an input coupled to receive a signal containing a down converted PN composite code,
a PN generator having a first PN, component code output and a second component code $PN_X$ output for producing $PN_2$ to $PN_N$ component codes,
said $PN_1$ code output being coupled to said first correlator/-mixer for producing a data modulated IF carrier signal output, coupled to an input of second correlator/mixer and to a coherent carrier tracking loop,
said second correlator/mixer having an input coupled to said $PN_X$ output from said PN generator and an output coupled to a down converter/mixer which provides a baseband data bearing signal output,
said baseband data bearing signal output being coupled to a noncoherent detection branch and to a coherent lock detection branch,
said noncoherent detection branch providing means for detecting the alignment of said first $PN_1$ component code with said PN composite code to be acquired, and
said coherent lock detection branch providing means for coherently detecting alignment of said $PN_2$ to $PN_N$ component codes with said PN composite code.

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**5,048,054**
**LINE PROBING MODEM**
**Vedat M. Eyuboglu, Boston, and Ping Dong, Norwood, both of Mass., assignors to Codex Corporation, Mansfield, Mass.**
**Filed May 12, 1989, Ser. No. 351,199**
**Int. Cl.[5] H04B** *7/10*
**U.S. Cl. 375—8** **71 Claims**

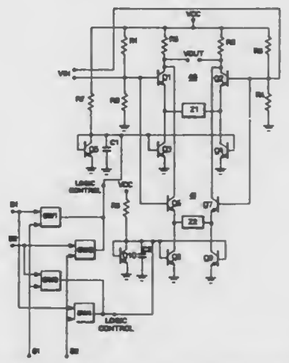
1. A modem for receiving data sent from a remote device over a communication channel by using a single carrier modulated signal, the modem comprising:
a. a receiver for receiving the modulated signal and for receiving a line probing signal sent by the remote device over the channel, the receiver being capable of receiving the modulated signal over any one of a plurality of frequency bands, said line probing signal simultaneously stimulating more than one of said plurality of frequency bands;
b. a line probing processor for measuring characteristics of the channel based upon the received line probing signal; and




c. a selector for selecting one of the plurality of frequency bands, said selection being based upon the measured characteristics of the channel, said selected frequency band to be used for receiving the modulated signal from the remote device.

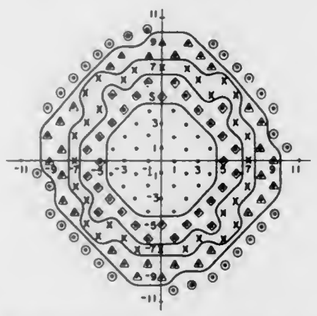
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**5,048,055**
**MULTI-DATA RATE SELECTABLE EQUALIZER**
**John L. Creigh; Jerry Dagher, both of Raleigh, and James W. Sylivant, Apex, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**
**Filed Feb. 26, 1990, Ser. No. 485,206**
**Int. Cl.[5] H04B** *3/14*
**U.S. Cl. 375—11** **5 Claims**



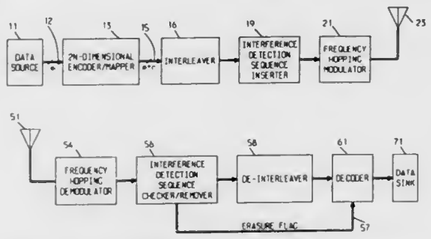

1. An equalizer circuit for selectively equalizing a transmission media used for selectively conveying signals at one of more than one data rate comprising:
a plurality of equalizers adapted for connection to said transmission media and each arranged to equalize the transmission media for signals at a different one of said more than one different data rates;
each said equalizer including a controllable means having a first state in which the equalizer is operative and a second state in which the equalizer is inoperative; and,
means for selectively controlling a single controllable means to the first state and the remaining controllable means to the second state whereby the transmission media is equalized by the equalizer associated with the controllable means controlled to the first state.

5,048,056
**METHOD AND APPARATUS FOR MAPPING AN EIGHT DIMENSIONAL CONSTELLATION OF A CONVOLUTIONALLY CODED COMMUNICATION SYSTEM**
Yuri Goldstein, Southbury, Conn., assignor to General Data-Comm, Inc., Middlebury, Conn.
Filed Jun. 8, 1990, Ser. No. 535,329
Int. Cl.[5] H04L *5/12*; H03M *7/00*
U.S. Cl. 375—39 12 Claims



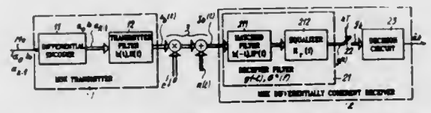
11. An apparatus for transmitting a system of 28 information bits by sending corresponding signals over a channel in 4 signaling slots, comprising:
(a) means for encoding at least some of the 28 information bits that appear during a block of said four signaling slots by adding one redundant bit, to form a set of 29 signal point selection bits for said block;
(b) means for selecting, for said set of 29 signal point selection bits, an 8D signal point drawn from an 8D constellation for said block, said 8D signal point selected for a particular said block being dependent on the 8D signal point selected for at least one other said block, said means for selecting being connected to be responsive to said means for encoding,
wherein said means for selecting includes a mapping means for establishing a correspondence between each possible combination of said 29 signal point selection bits and the coordinates of the 8D signal points in said 8D constellation,
wherein said means for encoding and said means for selecting define a dividing of said 8constellation into five hundred twelve 8D groupings out of a possible six hundred twenty-five 8D groupings, each 8D grouping having at most $32^4$ points, each 8D grouping being a concatenation of four 2D groups, one from each of four 2D constellations, such that said 8D constellation is a subset of a concatenation of said four 2D constellations,
wherein each 2D group is comprised of thirty-two 2D points of its respective 2D constellation, and each said 2D constellation is divided into five 2D groups, each 2D group having a substantially different average energy relative to the others,
wherein said means for encoding and said means for selecting further define a dividing of each of said five hundred twelve 8D groupings into four subgroups of at most eight points, three of the subgroups representing ninety, one hundred eighty, and two hundred seventy degree rotations of the first subgroup; and
(c) means for modulating at least one carrier for transmission over said channel in accordance with the coordinates represented by each selected said 8D signal point, said means for modulating being connected to be responsive to said means for encoding.

5,048,057
**WIRELESS LOCAL AREA NETWORK**
Adel A. M. Saleh, Holmdel, and Lee-Fang Wei, Lincroft, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jan. 2, 1990, Ser. No. 459,880
Int. Cl.[5] H04B *7/02*; H04L *1/02*
U.S. Cl. 375—40 14 Claims




1. Apparatus comprising
means responsive to a stream of input data for generating a sequence of coded modulation signal points representing that data, said coded modulation signal points being generated from a code having built-in diversity,
means for transmitting the coded modulation signal points to a receiver, with at least the coded modulation signal points which provide said diversity being transmitted using respective different frequencies,
means for detecting ones of the coded modulation signal points received by the receiver that are likely to have been subject to strong interference, and
means for performing soft decision decoding responsive to the received values of said ones of the coded modulation signal points, other than said detected ones of the coded modulation signal points likely to have been subject to strong interference, to form decisions as to the values of the transmitted coded modulation signal points.

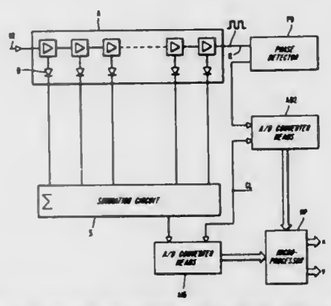
5,048,058
**MSK MODULATION AND DIFFERENTIALLY COHERENT DETECTION TRANSMISSION SYSTEM**
Ghassan K. Kaleh, 46, rue Barrault, 75634 Paris Cedex 13, France
Filed Feb. 17, 1989, Ser. No. 318,051
Claims priority, application France, Feb. 19, 1988, 88 02016
Int. Cl.[5] H04L *27/10*
U.S. Cl. 375—47 32 Claims



1. A minimum shift key (MSK) continuous phase modulation transmission system comprising differentially coherent type MSK transmitting equipment and differentially coherent type MSK receiving equipment which are connected through a transmission medium,
said transmitting equipment comprising means for encoding a message having an ordered string of K symbols successively derived with a predetermined periodicity, T, into an ordered coded string of K differentially coded symbols, where K is an integer greater than one, the encoder deriving an MSK continuous phase signal modulated by a waveform having a string of impulses carrying said ordered coded string,
said receiving equipment including: filter means matched with the waveform of the impulses of said impulse string, and means cascaded with said filter means for suppressing intersymbol interference inherent to said MSK type continuous phase signal from samples of a string of received impulses.

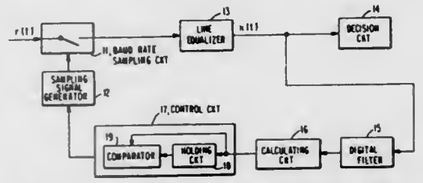


5,048,059
**LOG-POLAR SIGNAL PROCESSING**
Paul W. Dent, Stehag, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Sep. 18, 1989, Ser. No. 408,379
Claims priority, application Sweden, Sep. 19, 1988, 8803313
Int. Cl.[5] H04B *1/10*
U.S. Cl. 375—94 11 Claims



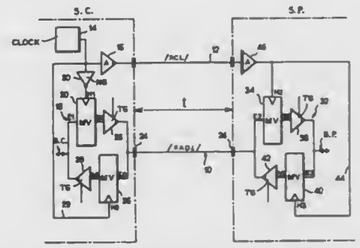
4. An apparatus for processing radio signals that vary over a wide dynamic range, which comprises:
means for amplifying the radio signals in a plurality of serial stages;
means for detecting the output of each amplified stage;
means for summing the detected outputs of said detecting means in order to provide a signal proportional to the logarithm of the amplitudes of the radio signals;
means for generating signals proportional to the phase of the radio signals from the output of the last stage of said amplifying means; and
processing means for processing the signals proportional to the logarithm of the amplitudes and the signals proportional to the phase of the radio signals, in order to provide restored digital signals representative of the radio signals.

5,048,060
**DIGITAL SIGNAL RECEIVING CIRCUIT WITH MEANS FOR CONTROLLING A BAUD RATE SAMPLING PHASE BY A POWER OF SAMPLED SIGNALS**
Masanobu Arai; Masaru Yamaguchi, both of Tokyo, and Takenori Ogata, Miyagi, all of Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Nov. 16, 1988, Ser. No. 271,979
Claims priority, application Japan, Nov. 16, 1987, 62-288940
Int. Cl.[5] H04B *3/04*; H04L *7/02*
U.S. Cl. 375—106 9 Claims




1. A receiving circuit for use in a transmission system of a digital signal at a transmission baud rate, said receiving circuit comprising:
a baud rate sampling circuit for sampling said digital signal as a received signal by a sampling signal having a sampling rate equal to said transmission baud rate to produce a series of sampled signals;
calculating means, operatively connected to said baud rate sampling circuit, for calculating at least one element of an autocorrelation function of said series of sampled signals as a power of said series of sampled signals; and
sampling control means responsive to said power for controlling a sampling phase of said sampling signal so that said power is maximized.

5,048,061
**METHOD FOR TRANSMITTING INFORMATION OVER A BIDIRECTIONAL LINK, AND APPARATUS FOR PERFORMING THE METHOD**
Maurice Hubert, Versailles, France, assignor to Bull S.A., France
Filed Aug. 29, 1989, Ser. No. 400,136
Claims priority, application France, Aug. 31, 1988, 88 11389
Int. Cl.[5] H04L *7/04*
U.S. Cl. 375—111 37 Claims




1. A method of transmitting data in the form of electrical signals, over a bidirectional link including a central station (S. C.) and a peripheral station (S. P.) connected to th central station by a bidirectional transmission bus (10), said central station (S. C.) being provided with a clock (14) furnishing a synchronizing clock signal having a leading edge and a falling edge to said peripheral station (S. P.), the method being characterized in that the central station (S. C.) transmits at one edge of the clock signal and receives at the other edge of the clock signal and in that the peripheral station (S. P.) transmits and receives at said other edge of the clock signal such that the synchronization is preformed in a biphase mode upon transmission from the central station (S. C.) and in a monophase mode upon transmission from the peripheral station (S. P.).

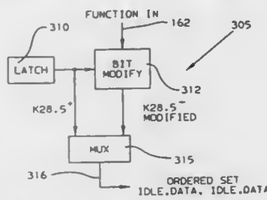
5,048,062
**TRANSMITTING COMMANDS OVER A SERIAL LINK**
Thomas A. Gregg, Highland, and Leon Skarshinski, Red Hook, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.
Filed Oct. 30, 1989, Ser. No. 429,268
Int. Cl.[5] H04L *7/00*
U.S. Cl. 375—114 22 Claims

1. Apparatus for generating commands in a system wherein multi-bit characters are continuously sent from a sender to a receiver to acquire character synchronization, said apparatus comprising:
register means for providing a multi-bit idle character;
bit modifying means connected to said register means for changing selected bits of said multi-bit idle character for forming a command character which is a modification of said multi-bit idle character; and

VOL 1130 ISS 2 SE 10 1991 UMI



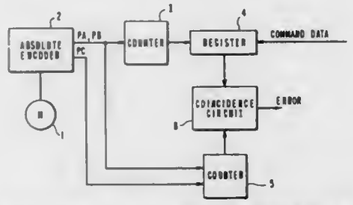
multiplexing means for forming an ordered set of characters, said ordered set having said multi-bit idle character as a




first character and said command character as a second character.

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**5,048,063**
**MACHINE POSITION DETECTING APPARATUS**
**Shinichi Isobe, Oshino, and Yoshiaki Ikeda, Hachioji, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan**
**PCT No. PCT/JP89/00323, § 371 Date Sep. 29, 1989, § 102(e) Date Sep. 29, 1989, PCT Pub. No. WO89/09112, PCT Pub. Date Oct. 5, 1989**
**PCT Filed Mar. 28, 1989, Ser. No. 423,459**
**Claims priority, application Japan, Mar. 28, 1988, 63-73650**
**Int. Cl.[5] G06K** *11/00;* **H03K** *21/02;* **G05B** *11/06*
**U.S. Cl. 377—17** **5 Claims**

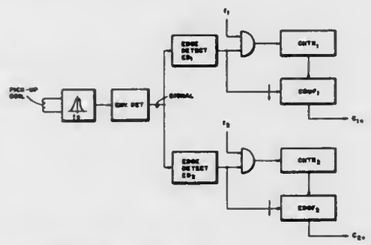



1. A machine position error detecting apparatus for outputting an error signal based on a rotational position signal and a one-revolution signal output from an absolute position detector circuit attached to a movable element and based on a movable element move command, comprising:
position memory means for reading the absolute position detector circuit and storing an absolute position when power is introduced and for subsequently reading and storing the movable element move command;
counting means for counting and storing a count corresponding to an amount of shift indicated by the absolute position detector circuit based on said rotational position signal and the one-revolution signal; and
collating means for providing the error signal based on comparing the amount of shift with the absolute position.

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**5,048,064**
**VITAL RATE DECODER**
**David B. Rutherford, Rochester, N.Y., assignor to General Signal Corporation, Stamford, Conn.**
**Filed Nov. 4, 1988, Ser. No. 267,214**
**Int. Cl.[5] H03K** *21/02;* **B61L** *29/00*
**U.S. Cl. 377—20** **7 Claims**

1. A vital rate decoder for use in a vital processing system to provide automatic train protection, comprising;
a pickup coil for picking up external signals;
means connected to said pickup coil, including two channels, for period and duty cycle measurement respectively of the pulse resulting from demodulation of said signals, each of said channels having an output;
a counter in each of said channels;
tolerance accumulation rate decoding means connected to said channel outputs, the maximum amount of tolerance accumulated, and the minimum time required to accumulate it, being functions of the rate code selected;
said tolerance accumulation rate decoding means including:
(a) means for extracting duty cycle information as well as period length in both of said channels, duty cycle information being accumulated by allowing the counter of one channel to count during the positive portion of the



incoming signal, while the other channel is incrementing the counter therein during the entire period of the incoming signal; and
(b) means for determining the validity of the period and duty cycle counts received on the even and odd cycles with respect to the allowed range of values specified for each rate code.

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**5,048,065**
**METHOD AND CIRCUIT FOR CONTROLLING THE FREQUENCY OF AN ELECTRONIC INVERTER**
**Leland L. Kessler, American; David A. Fox, and Kevin M. Jones, both of Shawnee, all of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**
**Filed Mar. 12, 1990, Ser. No. 491,924**
**Int. Cl.[5] H03B** *19/00*
**U.S. Cl. 377—47** **7 Claims**

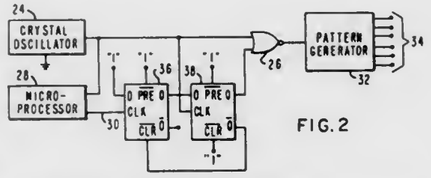
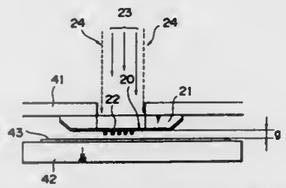



FIG. 2

1. A frequency control circuit comprising:
means for producing a clock signal having a plurality of voltage pulses which occur at a first frequency;
means for producing a control signal having a plurality of voltage pulses which occur at a frequency lower than said first frequency, and for changing the frequency of said voltage pulses in said control signal at the end of each of a plurality of time intervals; and
means for combining said clock signal with said control signal after each of said time intervals, such that one of said voltage pulses in said clock signal is deleted for each of said voltage pulses in said control signal, thereby producing a modified clock signal.



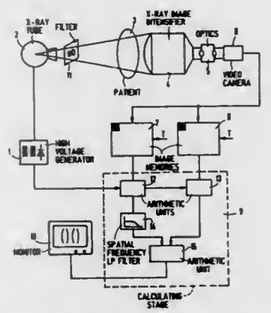
**5,048,066**
**X-RAY EXPOSURE PROCESS FOR PREVENTING ELECTROSTATIC ATTRACTION OR CONTACT OF X-RAY MASKS**
**Yasuaki Fukuda, Hadano, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 290,641, Dec. 27, 1989, abandoned. This application Dec. 10, 1990, Ser. No. 624,521**
**Claims priority, application Japan, Dec. 29, 1987, 62-335225**
**Int. Cl.[5] G21K** *5/00*
**U.S. Cl. 378—34** **23 Claims**




1. An X-ray exposure process comprising the steps of:
arranging an X-ray mask adjacent to and spaced from a wafer having an X-ray sensitive membrane thereon, the mask including a support frame and a support membrane held thereon which is X-ray transmissive and has an electrical resistivity of 10 Ω. cm. or less, and an X-ray absorber provided in a pattern form on the surface of the support membrane;
irradiating the wafer having the X-ray sensitive member thereon with X-rays through the X-ray mask; and
cancelling the potential difference between the X-ray mask and the wafer.

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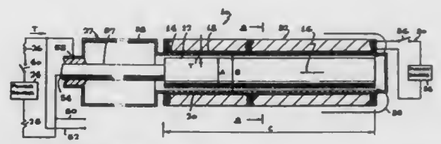
**5,048,067**
**X-RAY DIAGNOSTICS INSTALLATION**
**Heinz Horbaschek, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany**
**Filed Jul. 27, 1990, Ser. No. 558,469**
**Claims priority, application European Pat. Off., Aug. 3, 1989, 89114380.2**
**Int. Cl.[5] H05G** *1/64*
**U.S. Cl. 378—99** **9 Claims**




1. An x-ray diagnostics installation comprising:
an x-ray source fed by a high voltage generator for generating an x-ray beam;
an x-ray image intensifier video chain including first memory means for storing video signals of an x-ray image without a subject present in the x-ray beam and second memory means for storing video signals of an x-ray image with a subject disposed in the x-ray beam;
filter means for filtering said x-ray beam; and
calculating means connected to said first and second memories and to said high voltage generator for calculating, with said means for filtering present in the x-ray beam, actual attenuation values of an x-ray exposure which would be obtained without the means for filtering present in the x-ray beam.

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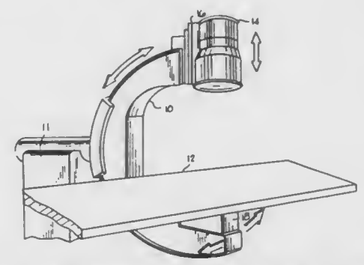
**5,048,068**
**MAGNETICALLY OPERATED PULSER**
**Peter J. Turchi, 6503 Masefield St., Worthington, Ohio 43085**
**Filed Nov. 16, 1989, Ser. No. 437,396**
**The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.**
**Int. Cl.[5] H01J** *35/06*
**U.S. Cl. 378—121** **8 Claims**



1. A pulser comprising:
a diode having first and second electrodes that form electrode surfaces facing each other, said surfaces being spaced to form a gap between them;
a circuit coupled to said electrodes and constructed to pass a voltage across said electrodes;
means for rapidly establishing an intense magnetic field in said gap, in a direction which is substantially parallel to said electrode surfaces, so as to rapidly increase the impedance between said electrodes.

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**5,048,069**
**DUAL-SLIDE SUPPORT MECHANISM FOR X-RAY SYSTEM COMPONENTS**
**Bernard W. Siczek, Boulder, Colo., assignor to Fischer Imaging Corporation, Denver, Colo.**
**Filed Mar. 14, 1990, Ser. No. 493,243**
**Int. Cl.[5] H05G** *1/02*
**U.S. Cl. 378—197** **4 Claims**




1. An X-ray imaging system mechanism for providing support and bi-directional linear travel for a component of an X-ray imaging system, the mechanism comprising:
C-shaped arm means, supported by a frame, and adapted for both arcuate and rotational motion with respect to said frame;
a housing, fixedly attached to one end of said C-shaped arm means;
primary slide means, coupled to said housing for linear travel with respect to said housing, said primary slide means including first and second roller means positioned at opposite ends of said primary slide means;
a single motor, coupled to said housing, for bi-directionally

driving said primary slide means over a primary range of linear travel;

secondary slide means, coupled in sliding engagement with said primary slide means, said secondary slide means supporting said component of the X-ray imaging system; and

belt means, routed over said first and second roller means of said primary slide means, said belt means being fixedly attached to said housing adjacent an outer face of said primary slide means and also being fixedly attached to said secondary slide means adjacent an inner face of said primary slide means, said belt means being operative, in response to incremental travel in a selected direction of said primary slide means initiated by said single motor, for causing simultaneous incremental travel of said secondary slide means in the selected direction, said simultaneous incremental travel of said secondary slide means being double the incremental travel of said primary slide means.

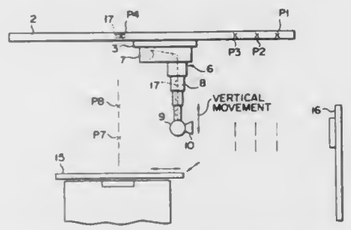
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**5,048,070**

## X-RAY TUBE SUPPORT APPARATUS

**Tomio Maehama, and Kiyoaki Inoue, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 12, 1989, Ser. No. 448,914**
**Claims priority, application Japan, Dec. 13, 1988, 63-314295**
**Int. Cl.[5] H05G** *1/02, 1/64*
**U.S. Cl. 378—197** **11 Claims**




1. An X-ray tube support apparatus comprising:

X-ray tube supporting means for supporting an X-ray tube to be vertically extendible;

guiding means, having moving paths which allow movement in two-dimensional directions parallel to a ceiling surface, for supporting said X-ray tube supporting means, and guiding said X-ray tube to a central position of one horizontally movable photographing table;

a plurality of position detecting means, arranged in a vertical moving path of said X-ray tube supporting means, and the two-dimensional moving paths to the central position of said photographing table, for detecting current positions of said X-ray tube supporting means in accordance with vertical and two-dimensional movements thereof;

a plurality of fixing means, arranged in the two-dimensional moving paths of said guiding means and the vertical moving path of said X-ray tube supporting means, for fixing the position of said X-ray tube supporting means; and

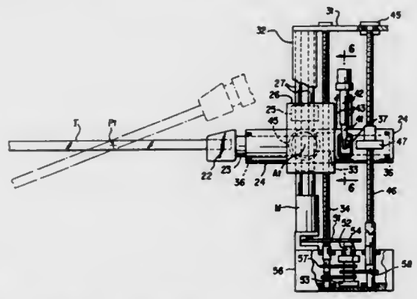
determining means for storing position data corresponding to the central position of said photographing table and a set distance from a focal point of said X-ray tube to an X-ray photographing system, comparing the position data with a position detecting signal of the position detected by said each position detection means, and outputting a lock instruction to the corresponding one of said fixing means when it is determined that the position data coincides with the position detection signal, thus locking said X-ray tube supporting means.

**5,048,071**

## X-RAY PATIENT EXAMINATION TABLE SUPPORT SYSTEM WITH ROTATING AND TILTING MEANS

**Kip P. Van Steenburg, Sudbury, Mass., assignor to John K. Grady, Littleton, Mass.**

**Division of Ser. No. 797,633, Nov. 13, 1985, Pat. No. 4,912,754.**
**This application Mar. 22, 1990, Ser. No. 497,232**
**Int. Cl.[5] A61B** *6/04*
**U.S. Cl. 378—209** **3 Claims**



1. Apparatus for supporting a patient during medical procedures comprising:

a base with an upright standard;

a patient table having a longitudinal and a transverse axis;

a table support on the standard, the support including a single shaft extending from the support to the patient table, and the shaft constituting a sole, cantilever support for the table;

first rotational means on the support rotationally mounting one end of the shaft so as to tilt the table about a first axis;

and second rotational means on the support for rotating the table about a second axis at right angles to the first axis, so that the table can be tilted about its transverse axis and canted about its longitudinal axis;

the shaft extending from the standard to one end of the table a substantial distance sufficient to leave the supported end of the table unobstructed to medical personnel.

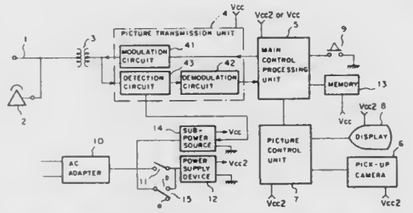
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**5,048,072**

## STILL PICTURE TRANSMISSION DEVICE

**Yoshinori Yasuda, Gumma, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation-in-part of Ser. No. 307,472, Feb. 8, 1989, abandoned. This application Aug. 7, 1990, Ser. No. 563,899**
**Claims priority, application Japan, Feb. 17, 1988, 63-034324**
**Int. Cl.[5] H04N** *7/12, 7/14*
**U.S. Cl. 379—53** **5 Claims**




1. A still picture transmission device, comprising:

a picture transmission unit having a detection circuit for detecting a tone signal transmitted by a caller over a telephone circuit connected to said device immediately before transmission of still picture data and generating a detection signal in response to the detection of said tone signal;

a memory for temporarily storing said still picture data;

a main control processing unit for controlling storage of still picture data in said memory;

a sub-power source, connected to a main power source, for continuously providing power to said picture transmission unit and said memory;

a switchable power supply device for supplying power to said main control processing unit; and

switching means, responsive to said detection signal, for switching power to said power supply device from said main power source to automatically enable said still picture data to be received into said memory.

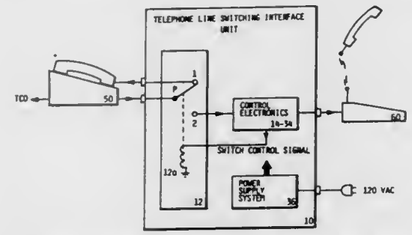
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**5,048,073**

## TELEPHONE LINE SWITCHING INTERFACE UNIT

**Isaac Weiser, and Margaret A. Weiser, both of 4760 Corbin, Tarzana, Calif. 91356**

**Filed Feb. 20, 1990, Ser. No. 481,519**
**Int. Cl.[5] H04M** *11/00, 3/42, 1/64*
**U.S. Cl. 379—63** **27 Claims**




1. A telephone line switching interface unit that allows a remotely located telephone accessory unit to automatically receive a telephone signal first received at a remotely located telephone set, said interface unit comprising:

a telephone signal switching means having a pole that selectively makes contact between a first contact and a second contact where the pole is connected to the base unit of said telephone set, the first contact is connected to the handset of said telephone set and the second contact is connected, via control electronics means, in said interface unit to said telephone accessory unit, where the contact position of said switching means is controlled by said telephone accessory unit such that when the telephone accessory unit is "on hook", said switching means is deenergized with the pole of said switching means connected to the first contact allowing said telephone set to operate in its normal mode and when the telephone accessory unit is "off hook", a switch control signal is produced by said control electronics means that energizes said switching means causing the pole to move to the second contact which disconnects the handset from the base unit of said telephone set and allows the telephone signal from the telephone central office to bypass the handset of said telephone set and be automatically routed and received by said telephone accessory unit; said control electronics means including telephone characteristic compensation switch means for compensating for various models of telephone sets and wiring configurations, said telephone characteristic compensation switch means having an input from said telephone signal switching means and further having first and second outputs; a first isolation matching transformer having an input from said first output of said telephone characteristic compensation switch means and having an output; a second isolation/matching transformer having an input connected to said second output of said telephone characteristic compensation switch means and having an output; a first gain-selection variable resistance having an input connected to said output of said first isolation/matching transformer, and having an output; and a second gain-selection variable resistance having an input connected to said output of said second isolation/-matching transformer, and having an output.

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**5,048,074**

## ELECTRONIC APPARATUS FOR "HANDS OFF" CONTROL OF A VOICE MAIL SYSTEM

**William P. Dugdale, 4450 E. 56th St., Indianapolis, Ind. 46220**

**Filed Jul. 31, 1989, Ser. No. 388,011**
**Int. Cl.[5] H04M** *1/00, 3/50*
**U.S. Cl. 379—67** **13 Claims**




3. A method for hands off control of a voice mail system by a user comprising the steps of:

(1) electronically connecting voice mail system function signal generating means for generating voice mail system control signals corresponding to voice mail system functions to a voice mail system means via a telephone network system;

(2) electronically connecting (a) hands off pedal means having a plurality of pedals and electrical pedal switches, each of said plurality of pedals operable to enable a corresponding electrical pedal switch, to (b) said voice mail system function signal generating means so that the actuation of any of said electrical pedal switches causes said voice mail system function signal generating means to generate a particular voice mail system control signal corresponding to both said particular electrical pedal switch activated and corresponding to a particular voice mail system function;

(3) choosing a voice mail system function desired by said user;

(4) activating the pedal corresponding to the voice mail system function desired by the user by pressing said pedal; and

(5) manually processing oral mail from said voice mail system while repeatedly performing steps 3 and 4.



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5,048,075

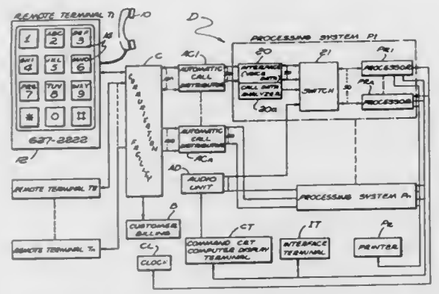
## TELEPHONIC-INTERFACE STATISTICAL ANALYSIS SYSTEM

Ronald A. Katz, Los Angeles, Calif., assignor to First Data Resources Inc., Omaha, Nebr.

Continuation of Ser. No. 342,506, Apr. 24, 1989, abandoned, which is a continuation of Ser. No. 194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned. This application Jul. 18, 1990, Ser. No. 555,111

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—92 11 Claims



1. A statistical analysis control system for use with a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility includes DNIS capability to provide digital identification data indicating a called number, said control system comprising:

voice generator structure for actuating said terminal apparatus as to provide vocal operating instructions to an individual caller;

function unit structure for processing data supplied by individual callers at said terminals in accordance with a plurality of distinctly different operating process formats, at least one of said formats of said function unit structure including means for actuating said voice generator structure to cue an individual caller, means for storing digital data provided by an individual caller using said digital input means, means for addressing said means for storing digital identification data and key test means for qualifying individual callers for processing in accordance with said select format; and

caller selection structure controlled by said digital identification data of DNIS capability, for coupling a caller at a terminal selectively to said function unit structure for processing data in accordance with a select operating process format.

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5,048,076

## CONTROL APPARATUS FOR AN AUTOMATED TELEPHONE ATTENDANT

David L. Maurer, 151 Park Ave., Randolph, N.J. 07869; Evan H. Sohn, 197 Maple St., Englewood, N.J. 07631, and Robert D. Entwisle, 18 Fern Ave., Wharton, N.J. 07885

Filed Jan. 16, 1990, Ser. No. 464,869

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—94 30 Claims

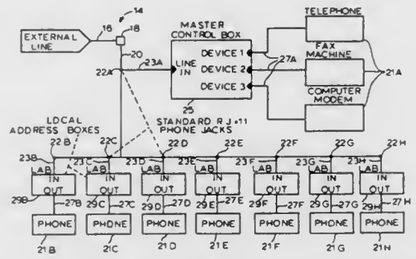
1. Telephone switching apparatus for coupling an external telephone line to a particular telephone device out of a plurality of telephone devices connected in, respectively, a plurality of internal telephone lines branching from said external telephone line comprising:

switch means in each of said internal telephone lines for selectively blocking passage of signals between said external telephone line and said plurality of telephone devices;

control means in one of the internal telephone lines for

(a) detecting a ring signal on said external telephone line,

(b) responding to identification signals on the external telephone line to identify said particular telephone device, and



(c) generating a ringback signal and a selection signal which is unique to the particular telephone device;

(d) providing said ringback and selection signals to said external telephone line and all of the plurality of internal telephone lines; and

means in said internal telephone lines coupled to said switch means and responsive to said selection signal for generating a switching signal, said switch means being responsive to the switching signal for passing signals between said external telephone line and said particular telephone device through said switch means.

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5,048,077

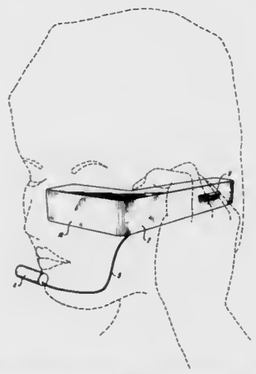
## TELEPHONE HANDSET WITH FULL-PAGE VISUAL DISPLAY

Benjamin A. Wells, Newton, and E. Allen Becker, Brookline, both of Mass., assignors to Reflection Technology, Inc., Waltham, Mass.

Filed Jul. 25, 1988, Ser. No. 223,552

Int. Cl.[5] H04M *11/00;* H04N *1/42*

U.S. Cl. 379—96 18 Claims



18. In a telephone handset for connection to a telephone line, said telephone handset having means for receiving voice signals from said telephone line, means for transmitting said voice signals to said telephone line and means for receiving non-voice data from said telephone line, the improvement comprising means responsive to said non-voice data for generating a magnified, virtual image of visual display capable of displaying at least approximately 1,920 characters of text simultaneously.



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5,048,078

## SYSTEM FOR COMMUNICATION OVER A TELEPHONE LINE BETWEEN A FACSIMILE APPARATUS AND A COMPUTER

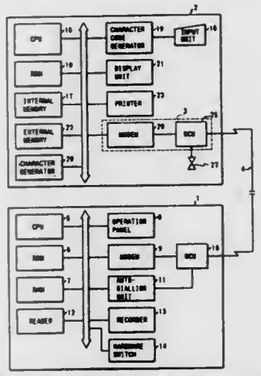
Mitsuo Satomi, Kyoto, and Masahiro Utsumi, Joyo, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 26, 1989, Ser. No. 372,873

Claims priority, application Japan, Jul. 1, 1988, 63-164213

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—100 15 Claims



15. A facsimile communication method for communication over a telephone line between a host computer having an input device and a facsimile unit operable in accordance with a plurality of selectively alterable operating parameters which are stored in a storage device within the facsimile unit, the method comprising the steps of:

connecting the host computer to the facsimile unit through the telephone line; and

reading the plurality of selectively alterable operating parameters of the facsimile unit over the telephone line with the host computer; and

altering at least one operating parameter of the facsimile unit over the telephone line with the input device of the host computer.

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5,048,079

## SMDR TRANSLATOR

Craig J. Harrington, McKinney; Brian W. Johnson, Lucas; Michael S. Miller, Garland, and Ronald E. Souder, Arlington, all of Tex., assignors to Intelilcall, Inc., Carrollton, Tex.

Filed Aug. 10, 1990, Ser. No. 565,954

Int. Cl.[5] H04M *15/16, 15/28, 15/32*

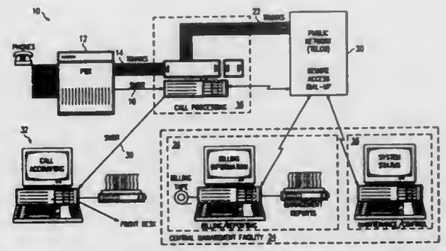
U.S. Cl. 379—112 18 Claims

1. A data processing system used in conjunction with a PBX system operable to output SMDR data records for calls placed through the PBX system and a call processing system coupled to the PBX system and operable to generate call records for calls placed through the call processing system, the data processing system comprising:

circuitry for receiving the SMDR data records from the PBX system;

circuitry for receiving the call records from the call processing system;

circuitry for matching a particular SMDR data record and a particular call record associated with a particular call placed through the PBX system and the call processing system; and



circuitry for creating a combined data record associated with said particular call comprising selected data from said particular call record and said particular SMDR data record.

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5,048,080

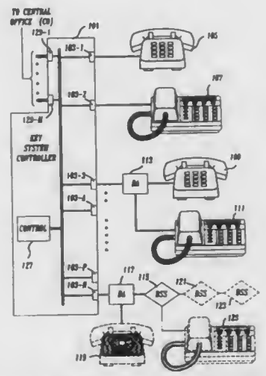
## CONTROL AND INTERFACE APPARATUS FOR TELEPHONE SYSTEMS

John F. Bell, Howell; David F. Jones, Middletown, both of N.J.; Farid Khalili, Great Neck, N.Y.; Walter G. Kotzavitch, Freehold, N.J.; Thong V. Lau, Eatontown, N.J., and Manhar R. Mahida, Princeton Junction, N.J., assignors to AT&T Bell Laboratories, Murray Hill, Pa.

Filed Jan. 29, 1990, Ser. No. 546,322

Int. Cl.[5] H04M *1/72*

U.S. Cl. 379—165 23 Claims



1. Apparatus in at least one station port interface of a switching system control unit adapted for controlling a plurality of remote station units over an at least one conductor pair comprising:

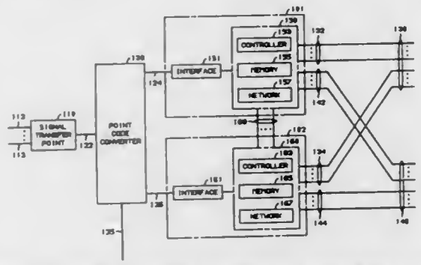
means for supplying all signals required to operate and control an at least one TR device regardless of whether a key set is also bridged onto said station port; and

means for supplying directly all signals required to operate and control at least one key set regardless of whether a TR device is also bridged onto said station port.

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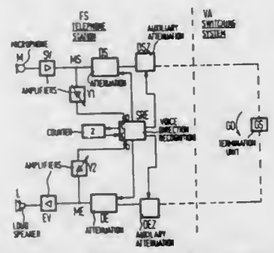


5,048,081
ARRANGEMENT FOR ROUTING PACKETIZED MESSAGES
George W. Gavaras, West Long Branch, N.J.; Albert S. Loots, Naperville, Ill., and Praful B. Shanghavi, Edison, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Dec. 28, 1989, Ser. No. 458,070
Int. Cl.[5] H04M 7/06; H04Q 3/78, 11/04
U.S. Cl. 379—221 25 Claims



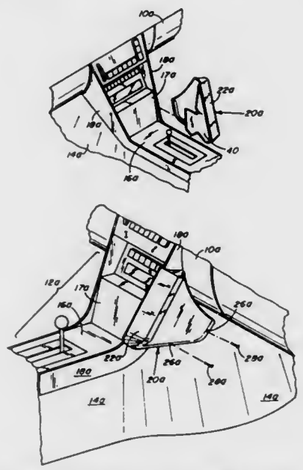
25. In a system comprising a plurality of cooperating nodes interconnected by a message transfer network, wherein the nodes communicate via messages including destination address information and indicia identifying functions to be executed, the method of substituting a new node for a selected node of the network on a real time basis, comprising the steps of:
recording indicia defining functions of the selected node assigned for execution by the new node;
intercepting a message from another node of the network addressed to the selected node; and
selectively applying the intercepted message to the new node when the function defined in a message is a function assigned to the new node.

5,048,082
VOICE DIRECTION RECOGNITION IN A DIGITAL TELEPHONE STATION
Wolfgang Krafft, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Feb. 15, 1990, Ser. No. 480,234
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908282
Int. Cl.[5] H04M 1/60
U.S. Cl. 379—389 3 Claims



1. A method for controlling a voice-controlled voice direction recognition unit in a digital telephone station, the voice direction recognition unit controlling a variable attenuation element in a transmission channel and a variable attenuation element in a reception channel of the digital telephone station in an inversely proportional attenuation ratio, a termination unit in an appertaining switching system connecting the telephone station to another digital telephone station, to an analog telephone station or to a forwarding system, and control voltages for the voice direction recognition unit respectively taken from a measuring point in the transmission channel and from a measuring point in the reception channel, comprising the steps of: reporting from the voice direction recognition unit every switching occurrence of voice direction to a counter unit; calculating in the counter unit the switching occurrences per time unit; and outputting from the counter unit a control signal to the voice direction recognition unit for an upward transgression of a predetermined number of switching occurrences per time unit, said control signal causing at least the value of attenuation in the reception channel to be increased.

5,048,083
AUTOMOTIVE TELEPHONE MOUNTING DEVICE
Richard Dunchock, 34032 Selva, Unit 96, Laguna Niguel, Calif. 92677
Filed Jan. 26, 1990, Ser. No. 470,723
Int. Cl.[5] H04M 1/00; B62D 43/00; B60R 7/00, 11/02
U.S. Cl. 379—454 7 Claims

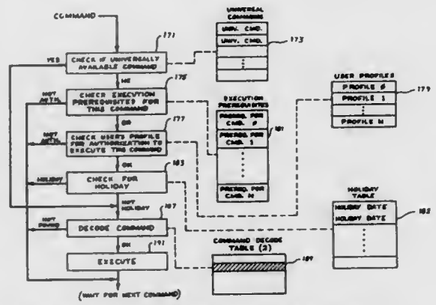


1. A telephone mounting device which is attachable alongside an automobile center console, without causing destruction of any portion of the console, wherein the center console has at least one vertical sidewall, said device comprising:
a housing sized and configured for mounting against the center console and for supporting a telephone thereon; and
a console-engaging member extending from a first portion of said housing to engage the housing to said center console;
said housing having a second portion engageable to the automobile, beneath said center console, to hold the housing against said console;
said console-engaging member having a member sized and configured to slip inboard of said vertical sidewall in such manner as to at least partially support said housing in an operative position next to said vertical sidewall and to substantially prevent said housing from being pulled laterally away from said console.

5,048,084
Patent Not Issued For This Number

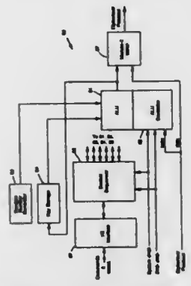


5,048,085
TRANSACTION SYSTEM SECURITY METHOD AND APPARATUS
Dennis G. Abraham, Concord; Steven G. Aden, Charlotte; Todd W. Arnold, Charlotte; Steven W. Neckyfarow, Charlotte, and William S. Rohland, Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 6, 1989, Ser. No. 418,068
Int. Cl.[5] H04K 1/00
U.S. Cl. 380—23 68 Claims



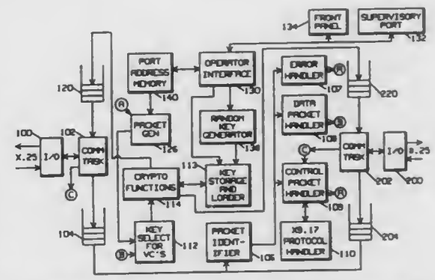
1. A security device comprising: a data processor:
memory connected to said processor;
data input and output means connected to said processor;
secure session establishing means programmed into said security device for controlling said processor to establish a secure session with another device:
an authorization profile stored in said memory, said profile defining the authority of a user of said security device to cause said processor to execute programmed commands:
transfer means for transferring at least part of said authorization profile from said security device to said another device for controlling said another device in accordance with said authority of said user defined in said authorization profile.

5,048,086
ENCRYPTION SYSTEM BASED ON CHAOS THEORY
Mark E. Bianco, Diamond Bar, Calif., and Dana A. Reed, Castle Rock, Colo., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jul. 16, 1990, Ser. No. 553,030
Int. Cl.[5] H04L 9/28
U.S. Cl. 380—28 14 Claims



1. A cryptographic system comprising:
a random number generator;
a memory for storing one or more cryptographic keys;
an arithmetic means coupled to the random number generator and memory for iterating a predetermined logistic difference equation having the form $x_{n+1}=\mu x_n(1-x_n)$, where $\mu$ is a cryptographic key, $x_n$ is a random number generated by the random number generator, and $x_{n+1}$ is an iterated result generated by succesively calculating $x_{n+1}$ in the above equation a selected number of successive times. to thereby generate a sequence of encrypting iterates, and for converting the sequence of encrypting iterates into binary form;
adder means coupled to the arithmetic means for summing the encrypting iterates with digital data to thereby generate encrypted data; and
controller means for controlling the operation of and transfer of data between the random number generator, the memory, the arithmetic means, and the adder means.

5,048,087
KEY MANAGEMENT FOR ENCRYPTED PACKET BASED NETWORKS
Nick G. Trbovich, Pembroke Pines, and Thomas D. Campbell, Coral Springs, both of Fla., assignors to Racal Data Communications Inc., Sunrise, Fla.
Division of Ser. No. 305,672, Feb. 3, 1989, Pat. No. 4,965,804.
This application Oct. 16, 1990, Ser. No. 601,159
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—43 2 Claims



1. In a packet switched network, a method for changing keys used for encrypted switched virtual circuit communication between a first *Data Terminal Equipment* (*DTE*) and a second DTE, said first and second DTE having an associated first and second encryption device, comprising the steps of:
issuing a call request packet from said first DTE to said second DTE;
intercepting said call request packet at said first encryption device and substituting a call request for a key management center;
transferring a key from said key management center to said first DTE;
balancing counters at a link associated with said first DTE and first encryption device using a dummy packet in order to make frame send and receive sequence numbers equal and packet send and receive sequence numbers equal;
establishing a channel between said first and second data encrypters; and
transferring a key from said first data encrypter to said second encrypter.

5,048,088
LINEAR PREDICTIVE SPEECH ANALYSIS-SYNTHESIS APPARATUS
Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Mar. 28, 1989, Ser. No. 329,725
Claims priority, application Japan, Mar. 28, 1988, 63-75024
Int. Cl.[5] G10L 7/02, 7/00
U.S. Cl. 381—38 8 Claims
1. A linear predictive speech analysis-synthesis apparatus

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having an analysis part receiving an input speech signal and a synthesis part producing a synthesized speech signal,

said analysis part comprising:

means for receiving said input speech signal;

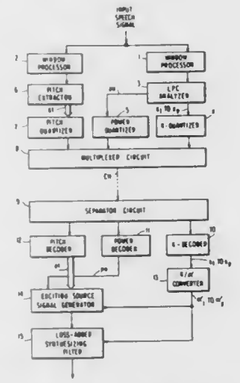
means responsive to said input speech signal for extracting first parameters corresponding to linear predictive coefficients;

means responsive to said input speech signal for extracting a second parameter corresponding to pitch information;

means responsive to said input speech signal for extracting a third parameter corresponding to power information; and

means for transmitting said first parameters, second parameter and third parameter,

said synthesis part comprising:



means for receiving said first parameters, second parameter and third parameter from said analysis part;

means responsive to said first parameters, second parameter and third parameter for generating an exciting source signal, said exciting source signal generating means having a first transfer function, said first transfer function being used to generate said exciting source signal; and

means responsive to said first parameters for synthesizing said synthesized speech signal by filtering said exciting source signal by a second transfer function, said second transfer function being defined by said first parameters and by a damping factor, wherein the product of said first and second transfer functions corresponds to a spectral envelope characteristic of said input speech signal.

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**5,048,089**

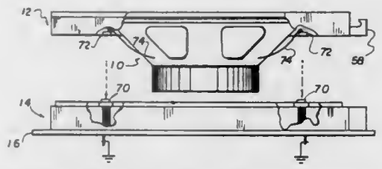
**PORTABLE, REMOVABLY ATTACHED SPEAKER ASSEMBLY**

**Patrick G. Moore, 2539 S. Bayshore Dr., Apt. 118, Miami, Fla. 33133**

**Filed Nov. 27, 1989, Ser. No. 441,327**

**Int. Cl.[5] H04R** *1/02, 25/00;* **H04B** *1/00*

**U.S. Cl. 381—87** **17 Claims**



1. A removably attached speaker assembly comprising:

a) a mounting assembly secured to a support deck and disposed and configured to support a speaker structure thereon,

b) a plurality of attachment posts secured to said mounting assembly and extending outwardly therefrom,

c) a base secured to said speaker structure and including a locking mechanism movably mounted thereon and structured for selective disposition between a locked and a non-locked position relative to said posts,

d) said locking mechanism comprising bracket means selectively positionable into and out of locking engagement with said posts to respectively define said locked and said unlocked positions, handle means connected to said bracket means in driving engagement therewith for selectively positioning said bracket means into and out of locking engagement with said plurality of posts,

e) said handle means structured to support said assembly when disengaged from said mounting assembly to facilitate carrying thereof, and

f) electrical connecting means for interconnecting said mounting assembly and said base and electrically attach to a source of electrical power for supplying electrical current to the speaker structure.

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**5,048,090**

**HEARING AID WITH TRANSMITTER AND MICROPHONE HOUSING PARTS**

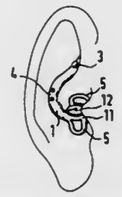
**Wolfgang Geers, Dortmund, Fed. Rep. of Germany, assignor to Horgeraete Geers GmbH & Co. KG, Dortmund, Fed. Rep. of Germany**

**Filed Nov. 13, 1989, Ser. No. 434,147**

**Claims priority, application Fed. Rep. of Germany, Nov. 11, 1988, 8814162[U]**

**Int. Cl.[5] H04R** *25/00*

**U.S. Cl. 381—68.6** **10 Claims**



1. Hearing aid comprising a transmitter housing part to be received in the auditory canal of the ear, a microphone housing part to be positioned in the auricle, a unit accessible for manual operation integrated into the microphone housing part for loudness level regulation, the microphone housing part being formed as a plastic hook adaptable individually to the curve of the concha to extend substantially along the antitragus region of the ear, a microphone being arranged in an end region of the plastic hook remote from the transmitter housing part so that the microphone is positioned in an upper part of the ear in the cymba fold thereof.

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**5,048,091**

**TALKER SPEECH LEVEL CONTROL CIRCUIT FOR TELEPHONE TRANSMITTER BY PIEZOELECTRIC CONVERSION**

**Yasuji Sato, Hachioji, and Takeshi Horiuchi, Hino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 5, 1989, Ser. No. 375,604**

**Claims priority, application Japan, Jul. 5, 1988, 63-167443**

**Int. Cl.[5] H03G** *3/00*

**U.S. Cl. 381—107** **3 Claims**

1. A talker speech level control circuit for controlling the level of an electric signal converted from a talker speech, comprising:



an acoustic-electric conversion element for converting an acoustic input signal into an electric signal;

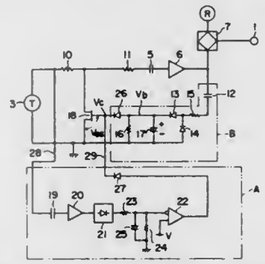
means for transmitting the electric signal output from said conversion element to a communication line;

an amplifier provided in said transmission means for amplifying the electric signal outputted from said conversion element;

means for attenuating the electric signal applied to said amplifier in response to both a first compression control signal and a second compression control signal;

a first compression control means which detects that the level of the electric signal outputted from said conversion element is in a first region lower than an ordinary speech signal region for outputting the first compression control signal to said attenuating means; and

a second compression control means for detecting if the level of the electric signal outputted from said conversion



element is in a second region higher than the ordinary speech signal region for outputting the second compression control signal to said attenuating means, the second compression control means including a first time-constant circuit determining a transition time required when the level of the electric signal is shifted from the ordinary speech region to the second region, and a second time-constant circuit determining a transition time required when the level of the electric signal is shifted from said second region to the ordinary speech signal region, and the time constant of said first time-constant circuit is smaller than that of said second time-constant circuit, so that the losing of a high-level initial portion or an ending portion of a word of the talker speech is avoided;

whereby the level of noises transmitted to the communication line is suppressed by carrying out compression to the electric signal in either of the first and second regions.

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**5,048,092**

**ELECTROACOUSTIC TRANSDUCER APPARATUS**

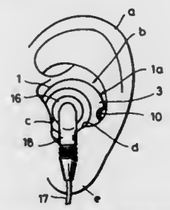
**Makoto Yamagishi, Tokyo, and Satoshi Matui, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Dec. 4, 1989, Ser. No. 445,429**

**Claims priority, application Japan, Dec. 12, 1988, 63-161025[U]**

**Int. Cl.[5] H04R** *25/00*

**U.S. Cl. 381—187** **3 Claims**



1. An electroacoustic transducer apparatus comprising:

(a) a housing formed so as to be accommodated within a concave portion of a cavum concha between tragus and antitragus of an auricle, the housing having a front side and a rear side and being supported by the tragus and anntitragus when accommodated within the concave portion of the auricle;

(b) an electroacoustic transducer element incorporated within the housing; and

(c) an elastic ring member attached to an outer peripheral portion of the housing, wherein an air passage portion is formed through the ring member so as to equalize the pressure on both the front side and rear side of the housing, wherein the ring member increases inn its annular width in one direction so that the center a position of its inner periphery and the center position of its outer periphery are displaced from each other.

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**5,048,093**

**DEFECT COUNTING METHOD AND APPARATUS**

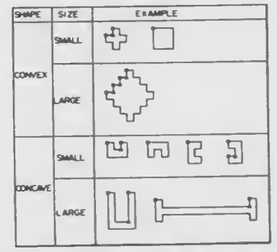
**Hiroaki Kimura; Masaki Fuse, and Masatoshi Toda, all of Kawasaki, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan**

**Filed Apr. 11, 1990, Ser. No. 507,492**

**Claims priority, application Japan, Apr. 13, 1989, 1-93667**

**Int. Cl.[5] G06K** *9/46*

**U.S. Cl. 382—8** **14 Claims**




1. A defect counting method for measuring the number of defect areas contained in binary image date comprising the steps of:

i) scanning the binary image date;

ii) inputting into a memory values of a first pixel and second pixels close to the first pixel from among the binary image data;

iii) identifying a projection or a corner of a defect area from said values of the first and second pixels;

iv) incrementing, in a counter, a number of the defect areas when each projection is identified;

v) decrementing, in the counter, the number of the defect areas when each corner is identified; and

vi) repeating said steps i) to v) selecting each pixel constituting the binary image as said first pixel.

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**5,048,094**

**METHOD AND APPARATUS FOR CHECKING PATTERN**

**Yoshiyuki Aoyama; Takahiro Nakano, both of Fugisawa, and Osamu Kanasashi, Ebina, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 24, 1989, Ser. No. 426,574**

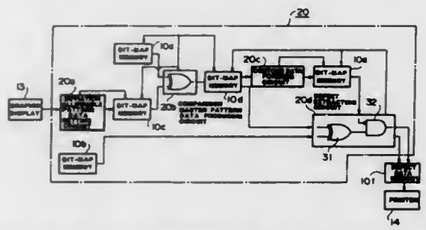
**Claims priority, application Japan, Nov. 29, 1988, 63-301866**

**Int. Cl.[5] G06K** *9/00*

**U.S. Cl. 382—8** **12 Claims**

1. In a method for checking a pattern wherein an object under check having a pattern to be checked formed thereon is scanned two-dimensionally relative to an imaging device to obtain check pattern data, and the check pattern data is compared with previously stored master pattern data to check for a defect in the pattern to be checked, the improvement comprising the steps of: dividing check pattern data for each one

scanning line from the imaging device into a plurality of pixel groups and storing the check pattern data in a memory means; calculating an inclination of the pattern to be checked by comparing the store check pattern data with the master pattern data; matching the check pattern data and the master pattern



data with each other by changing the order of reading of one of the check pattern data and the master pattern data in accordance with the inclination of the pattern data to be checked; and comparing the check pattern data with the master pattern data.

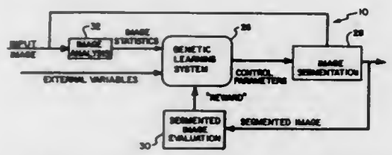
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**5,048,095**

**ADAPTIVE IMAGE SEGMENTATION SYSTEM**

**Bir Bhanu, New Brigton; Sungkee Lee, St. Paul, and John C. Ming, Coon Rapids, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Mar. 30, 1990, Ser. No. 502,603**
**Int. Cl.[5] G06K 9/34**
**U.S. Cl. 382—9** **8 Claims**



1. An adaptive image segmentation system comprising:
an image analyzer;
a genetic learning system connected to said image analyzer;
an image segmenter connected to said genetic learning system; and
segmented image evaluator connected to said image segmenter and to said genetic learning system.

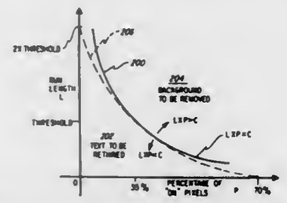
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**5,048,096**

**BI-TONAL IMAGE NON-TEXT MATTER REMOVAL WITH RUN LENGTH AND CONNECTED COMPONENT ANALYSIS**

**Louis J. Beato, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 1, 1989, Ser. No. 444,355**
**Int. Cl.[5] G06K 9/46, 9/34, 9/40, 9/66**
**U.S. Cl. 382—9** **29 Claims**



1. A system for removing non-text, graphical or background information from a digitized image of pixels organized by rows and columns, said image including text characters, said system comprising:
means for computing the length of each run of contiguous ones of said pixels characterized by a first value and for computing the proportion of pixels characterized by said first value in the corresponding one of said rows or said columns in which said run resides; and
run length removal means for removing from said image each run for which the combination of both said length and said proportion exceed predetermined criteria indicative of non-text information wherein said means for removing comprises means for defining a curve in a plane having first and second axes for said length and said proportion respectively, whereby said length and said proportion specify a location in said plane corresponding to the value of said proportion and the value of said length, respectively, wherein said means for removal removes said run if said location is not bounded between said curve and said axes.

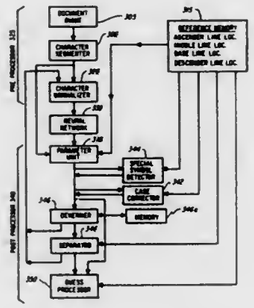
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**5,048,097**

**OPTICAL CHARACTER RECOGNITION NEURAL NETWORK SYSTEM FOR MACHINE-PRINTED CHARACTERS**

**Roger S. Gaborski, Pittsford; Louis J. Beato, Rochester; Lori L. Barski, Pittsford; Hin-Leong Tan, Rochester; Andrew M. Assad, N. Chill, and Dawn L. Dutton, Buffalo, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 2, 1990, Ser. No. 474,587**
**Int. Cl.[5] G06K 9/62, 9/34**
**U.S. Cl. 382—14** **36 Claims**



21. In an optical character recognition system comprising a neural network trained to recognize a character image on the basis of a predetermined set of symbols, said neural network having an input and an output at which each character image transmitted to said input is given an individual score for each one of said symbols in said set, a method for performing optical character recognition, comprising:
a pre-processing step comprising designating plural contiguous "on" pixels in a document image as a separate object and segmenting said object from said document image as an individual character image and transmitting the normalized version of said character image to said neural network input;



a post-processing step comprising sensing whenever the output of said neural network meets at leas one of a predetermined set of neural network output conditions and correcting the output of said neural network in response to said sensing step, wherein said predetermined set of neural network output conditions includes a condition that the highest score at said neural network output corresponds to one of a predetermined set of symbols whose character image upon being normalized by said preprocessor is indistinguishable by said neural network from an other symbol.

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**5,048,098**

**Patent Not Issued For This Number**

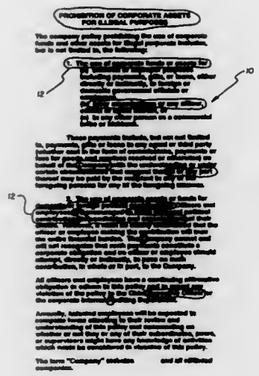
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**5,048,099**

**POLYGON-BASED METHOD FOR AUTOMATIC EXTRACTION OF SELECTED TEXT IN A DIGITIZED DOCUMENT**

**Yongchun Lee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 21, 1990, Ser. No. 526,425**
**Int. Cl.[5] G06K 9/48**
**U.S. Cl. 382—22** **4 Claims**



1. A method of extracting marked text regions defined by hand drawn closed curves on a paper document, comprising the steps of:
raster scanning said document;
generating as the document is being scanned, a bit map representation of the document such that whenever a transition is detected, contour vectorization is used including contour pixel tracing and piecewise linear approximation to convert the bit map representation into a collection of closed polygons formed by a series of vectors;
separating the collection of polygons into inner and outer groups of contours, and the separation criteria for said groups is made by the summing the cross products given by the equation:

$$R = \sum_{i=2}^{n-2} (X_i - X_1)(Y_{i+1} - Y_1) - (X_{i+1} - X_1)(Y_i - Y_1);$$

sorting all of the inner and outer contours according to location in their respective groups;
determining segmentation points by substrating the lower coordinate ($LY_i$) from the upper coordinate ($UY_{i+1}$) and obtaining a positive value in eacb group of sorted contours such that overlapping contours are geometrically related to one another;
establishing polygon blocks for all polygons having a geometrical relationship in the horizontal direction;
use contour linking to examine the geometrical relationships of the coordinates of both the outer and inner contours of polygons to determine if they are geometrically overlapping;
scanning the list of linked polygons to locate external inner contours of polygons; and
extracting the inner contours of polygons formed by said hand drawn closed curves from said bit map representative document using the angular sum of the centerpoint of an outer countour.

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**5,048,100**

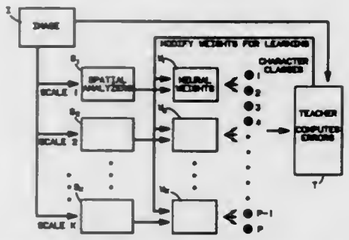
**SELF ORGANIZING NEURAL NETWORK METHOD AND SYSTEM FOR GENERAL CLASSIFICATION OF PATTERNS**

**Michael Kuperstein, 40 Longwood Ave., Brookline, Mass. 02146**

**Filed Dec. 15, 1988, Ser. No. 284,975**
**Int. Cl.[5] G06K 9/66**
**U.S. Cl. 382—36** **24 Claims**

1. A method of classifying a pattern into one of a plurality of pattern classes, comprising the steps of:
converting the pattern to be classified into an image comprising at least one spatial distribution of intensity amplitudes relative to a spatial window on the pattern;
convolving the image with a plurality of different convolution kernels;
averaging convolutions of the image across spatial sectors within the spatial window;
transforming the averaged convolutions of the image with a distribution of weights for each of the plurality of pattern

classes into computed correlations for each of the plurality of pattern classes; and



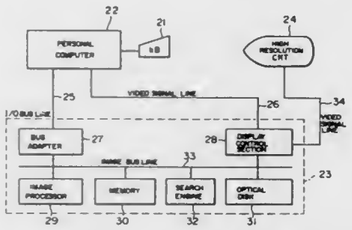

determining a single pattern class of the plurality of pattern classes from the computed correlations, whereby the pattern is classified in said single pattern class.

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**5,048,101**
**ELECTRONIC FILING DEVICE**

**Yasuo Kurosu, Yokohama; Koichi Okazawa, Tokyo; Yoshihiro Yokoyama; Hiroaki Aotsu, both of Yokohama, and Hidefumi Masuzaki, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 186,162, Apr. 26, 1988, abandoned. This application Sep. 25, 1989, Ser. No. 411,268**
**Claims priority, application Japan, Apr., 1987, 62/107599**
**Int. Cl.[5] G06K *9/36***
**U.S. Cl. 382—41** **22 Claims**



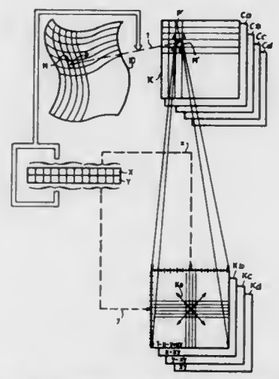

1. An electronic filing device comprising:
an electronic computer provided with a data port for sending and receiving commands and data as well as a video port for outputting video signals; and
an image processing device connected to said electronic computer through said data port and said video port, which includes
storing means for storing image data,
searching means for searching said image data stored in said storing means to obtain image data responding to said commands and data from said electronic computer and for obtaining searched image data,
converting means for converting video signals asynchronously provided from said electronic computer through said video port into digital video signals in synchronous with said image processing device,
storage means for storing said digital video signals converted by said converting means,
synthesizing means connected to said storage means and said searching means for enlarging an image represented by said digital video signals stored in said storage means in response to said data from said electronic computer and synthesizing said digital video signals of said enlarged image and said searched image data obtained by said searching means, and
displaying means for displaying a synthesized image of an enlarged image enlarged by said synthesizing means and a searched image data obtained by said searching means.

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**5,048,102**
**MULTIPLE INTERPOLATION PROCESS FOR IMAGE CORRECTION**

**Michel Tararine, Sceaux, and Bernard Thevenin, Saint Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Sep. 14, 1988, Ser. No. 244,715**
**Claims priority, application France, Sep. 16, 1987, 87 12814**
**Int. Cl.[5] G06K *9/36***
**U.S. Cl. 382—41** **7 Claims**



1. A process for the multiple interpolation of the value of a point P in an elementary mesh A,B,C,D having Cartesian coordinate axes and at least four nodes, from scintillation data produced by a gamma camera and representing an image constituted by picture elements, in order to correct distortions of said image, said process comprising the steps of
determining an interpolation fineness to be obtained,
precalculating the interpolation contributions relative to all the locations in the mesh for the given fineness and as a function of the coordinates of the said locations in said mesh,
attributing to the point P as the interpolated value, the result of an algebraic composition of the contributions relative to the coordinates of the point and weighting coefficients Ca,Cb,Cc,Cd of the mesh nodes, that composition being of the form $Ka \cdot Ca(x,y) + Kb \cdot Cb(x,y) + Kc \cdot Cc(x,y) + Kd \cdot Cd(x,y)$, being stored and determining therefrom the displacement value of said point P,
outputting a corrected image.

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**5,048,103**
**METHOD FOR THE AUTOMATIC RESETTING OF IMAGES**

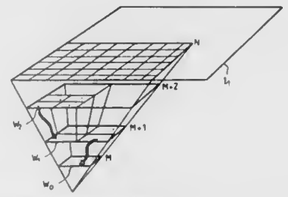
**Vincent Leclerc, Paris, and Jean Lienard, Clamart, both of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France**

**Filed Mar. 16, 1990, Ser. No. 494,395**
**Claims priority, application France, Mar. 29, 1989, 89 04085**
**Int. Cl.[5] G06K *9/32*; H04N *5/32***
**U.S. Cl. 382—44** **8 Claims**

1. A method for the automatic resetting of images wherein a resetting is done of a second image, called a mask image, distorted with respect to a first image, called a reference image, each image having points and being defined as a collection of addresses of these points, each address being associated with a gray level, said method including the following steps:



a selection is made, preferably in the first image, of a set of landmarks;
a search is made for the correspondents of these landmarks in the second image;
an estimation is made of the shifts undergone by the selected landmarks of the first image with respect to the corresponding searched-for landmarks of the second image;
one of the images, preferably the second image, is restored by correcting the position or the gray level of the points of this image in taking into account the shifts of the landmarks located in the neighborhood of these points;
wherein, to make the selection,
an assigning is done, to points of the first image, of a computed magnitude or of computed magnitudes characteristic of the solidity and of the homogenity of distribution of points of this image liable to act as landmarks;
a sorting-out is done of the landmarks to be chosen as a function of the meeting of a criterion by a combination of the magnitudes at these points;



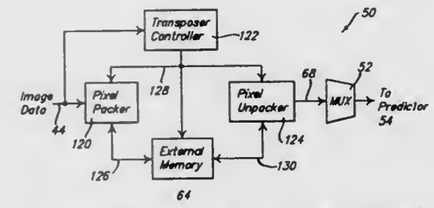
wherein, to do the sorting out,
a computation is made, at these points, of at least one of the following five magnitudes:
*$X_1$: the difference, preferably standardized, between the two images in the means of the gray levels, these means being computed in each of the two images on a population of points contained in windows framing considered superimposable points;
*$X_2$: the standard deviation of the gray levels of a population of points located in a window framing, in the first image, a landmark to be characterized;
*$X_3$: the useful value of Moravec for the points, to be characterized, of the first image;
*$X_4$: the standardized value of the gray level gradient, computer on a landmark to be characterized in the first image;
*$X_5$: the value (a) of the damping coefficient of the self-correlation function modelized by an exponential function, at the position of the landmark to be characterized.

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**5,048,104**
**METHOD AND APPARATUS FOR TRANSPOSING IMAGE DATA**

**Robert D'Aoust, Detroit; Debora Y. Grosse, Ann Arbor, and Stephen R. Krebs, Ypsilanti Township, Washtenau County, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.**

**Filed Oct. 10, 1989, Ser. No. 419,778**
**Int. Cl.[5] G06K *9/36***
**U.S. Cl. 382—46** **13 Claims**



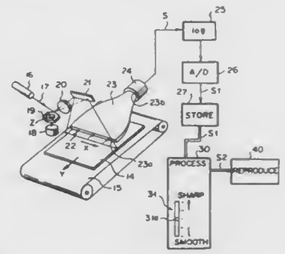

1. A data transposer which receives image data having a plurality of pixels associated therewith, said plurality of pixels being arranged in a plurality of columns, each of said columns being uniquely associated with a single vertical scan of said image and having a plurality of rows associated therewith, each of said rows within said columns having a unique one of said plurality of pixels of said image contained therein, each of said columns further including at least one overscan pixel at at least a first end of said column, said data transposer comprising:
pixel packer means, coupled to said image data, for sequentially storing portions of said image data and for outputting said stored portions therefrom;
first memory means, coupled to said pixel packer means, for receiving said output of said pixel packer means;
controller means, coupled to said pixel packer means and to said memory means for causing said pixel packer means to sequentially store and output every portion of said image data and for causing said first memory means to store said received columns of pixels, and for causing the pixels contained in the same rows of each of said columns of said stored image data to be output from said first memory means, said controller means further comprising stripping means, coupled to said pixel packer means, for deleting any overscan pixels present in said columns prior to causing said pixel packer means to store the image data in said first memory means.

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**5,048,105**
**METHOD AND APPARATUS FOR ENLARGING OR REDUCING IMAGES**

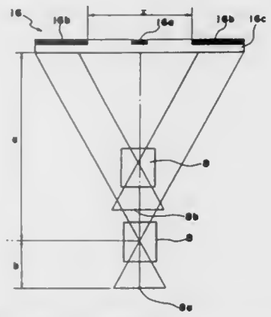
**Yuuma Adachi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd, Kanagawa, Japan**

**Filed Apr. 19, 1990, Ser. No. 511,134**
**Claims priority, application Japan, Apr. 20, 1989, 64-101343**
**Int. Cl.[5] G06K *9/36***
**U.S. Cl. 382—47** **6 Claims**




1. An image enlarging or reducing method wherein, from a series of primary image signal components of an image signal representing an image, secondary image signal components, which correspond to an enlarged image or a reduced image of said image, the number of which is different from the number of the primary image signal components, are obtained from predetermined interpolating operation formulas, wherein the improvement comprises the steps of:
i) calculating values of coefficients in said predetermined interpolating operation of formulas, said calculated values corresponding to a desired sharpness of an enlarged image or a reduced image, said calculated values varying according to desired sharpness, yet said values corresponding to the degree to which said image is enlarged or reduced by said predetermined interpolating operation formula, and said values having a coinciding scale of enlargement or a coinciding scale of reduction, but having different sharpness, and
ii) obtaining secondary image signal components from said predetermined interpolating operation formulas in which said coefficients are set to the calculated values.

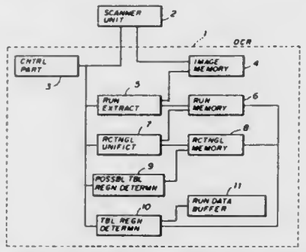
5,048,106
## IMAGE READER
Akio Nakajima, and Hirofumi Hasegawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 242,539, Sep. 9, 1988, abandoned. This application Nov. 26, 1990, Ser. No. 618,027
Claims priority, application Japan, Sep. 9, 1987, 62-227483
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—47 7 Claims



1. An image reader, comprising:
a scanning optical means for scanning an image of a document with a slit;
an image sensor;
a projection lens having an optical axis for projecting the scanned image onto the image sensor;
first means for moving the image sensor in the optical axis of the projection lens;
second means for moving the projection lens in the optical axis of the projection lens;
a platen glass plate on which a document to be read is placed;
a pattern element having a predetermined pattern thereon, said pattern element arranged near the top portion of the platen glass plate;
means for inputting a designated magnification;
control means for changing the magnification from a standard magnification to the designated magnification, said control means including means for automatically controlling said first and second moving means so as to vary the magnification in accordance with the designated magnification;
said control means further including means for determining the center position of a document image after the magnification is varied form a standard magnification to the designated magnification based on outputs form said image sensor of images of the predetermined pattern of said pattern element, said images being projected onto said image sensor at the designated magnification by said projection lens; and
output means for outputting image data by referring to the center position of the document image which has been determined by said determining means.

5,048,107
## TABLE REGION IDENTIFICATION METHOD
Michiyoshi Tachikawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan
Filed Jun. 5, 1990, Ser. No. 533,346
Claims priority, application Japan, Jun. 6, 1989, 1-143456
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—48 6 Claims

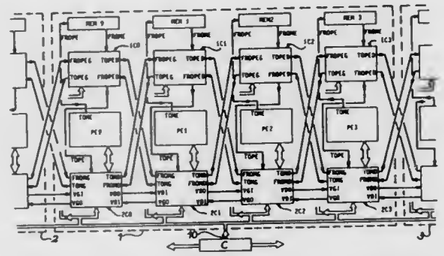
1. A method of locating and identifying a table region within an input image data of an original, said method comprising the steps of:
reading the input image data of the original to store the input image data in an image data memory;
extracting first sets of runs of successively read black picture elements from each line of the input image data stored in the image data memory to store the first sets of the runs in a run memory, each said first set of the runs stored in the run memory including coordinate values of a starting point and an end point of each said run;
unifying adjacent runs among the first sets of the runs stored in the run memory into first rectangles, coordinate values of each of said first rectangles being stored in a rectangle memory;
extracting a second rectangle rom among the first rectangles stored in the rectangle memory, said second rectangle having a width greater than a prescribed width and a height greater than a prescribed height;
unifying second sets of runs of successive black picture




elements from each line within said second rectangle to extract ruled lines, each of said second sets of the runs having a length greater than a prescribed length, coordinate values of a starting point and an end point of each said ruled line being stored in a run data buffer;
counting the number of the ruled lines thus extracted from said second sets of the runs stored in the run data buffer within said second rectangle; and
making a decision on whether the counted number of the ruled lines is greater than a prescribed number, thus making a determination that said second rectangle makes up the table region in the input image data stored in the image data memory;
the determination that the second rectangle makes up the table region within the original being made based on the number of the ruled lines within the second rectangle thus extracted from the input image data of the original which is stored in the image data memory.

5,048,108
## DATA PROCESSING DEVICE WITH PROCESSORS ARRANGED IN A LOOPED LINE CONFIGURATION USING HELICOIDAL ADDRESSING FOR PROCESSING DATA RELATING TO PIXELS
Jean-Luc Basille, Ramonville; Hassane Es-Safi, Muret; Jean-Yves Latil, Lacroix Falgarde, and Didier Juvin, Paris, all of France, assignors to Commissariat, a l'Energie Atomique, Paris and ADERMIP (Association pour le Development de l'Enseignement de l'Economic et et des Recherches de Midi Pyrenees, Toulouse, both of, France
Filed Nov. 15, 1988, Ser. No. 271,741
Claims priority, application France, Nov. 16, 1987, 87 15785
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—49 3 Claims

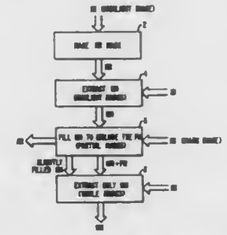
1. A device for processing data relating to pixels marked by lines and by columns comprising means for memorizing data, and means for processing data relating to each of these pixels according to data relating to each of the pixels situated at least in the immediate environment of the processed pixel so as to process the data relating to pixels situated inside windows each having at least nine pixels, wherein the processing means comprise at least one group of four identical processors marked from the row j=0 to the row j=3 so as to process the pixels situated on successive lines and respectively belonging to the same predetermined column, the memorization means comprising at least four memories marked from at least the row j=0 to the row j=3 and respectively connected to the processors, the data relating to the pixels of the predetermined lines and columns being registered in these memories according to a "helicoidal" addressing, the processing means also comprising connection means marked from at least the row i=0 to the row i=3 so as to connect each processor to its memory and so as to interconnect each processor with each adjacent processor of the group so that the processors are interconnected according to their successive rows in a looped configuration, the connection means also being connected to a control unit for sequencing the addressing and processing operations carried out by the processors,
wherein each processor is connected directly to its memory so as to enter data in this memory, the connection means comprising for each processor a first switching circuit and a second switching circuit, each connected to a sequencing unit, each first switching circuit being also connected to the memory and processor, each second switching circuit being connected to the processor, said first switching circuit of each processor being connected to the second switching circuits of two adjacent processors by means of bidirectional lines, and the second switching circuit of each processor being connected to the second



switching circuits of two adjacent processors by means of bidirectional lines, the first and second switching circuits of each row J processor between at least j=0 and j=3 comprising:
a)—means for transmitting data read in the memory of the processor to this processor;
b)—means for transmitting data supplied by the processor to the memory of this processor;
c)—means for transmitting data read in the memory of a row J processor to a row J+1 processor;
d)—means for transmitting data read in the memory of a row J processor to a row J-1 processor;
e)—means for transmitting data supplied by a row J processor to a row J+1 processor;
f)—means for transmitting data supplied by a row J processor to a row J−1 processor;
g)—means for transmitting the data of the memory of a row J processor to a row J+2 processor;
h)—means for transmitting the data of the memory of a row J processor to a row J−2 processor;
i)—means for transmitting the data of a row J processor to a row J+2 processor;
j)—means for transmitting the data of a row J processor to a row J−2 processor;
k)—means for transmitting the data of a row J processor to a row J+3 processor; and
l)—means for transmitting the data of a row J processor to a row J−3 processor.

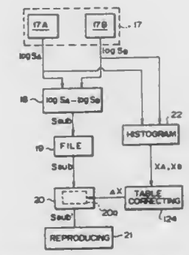


5,048,109
## DETECTION OF HIGHLIGHTED REGIONS
Dan S. Bloomberg, Palo Alto; Henry W. Sang, Jr., Cupertino, and Lakshmi Dasari, Palo Alto, all of Calif., assignors to Xerox Corporation, Rochester, N.Y.
Filed Dec. 8, 1989, Ser. No. 447,985
Int. Cl.[5] G06K 9/38, 9/34
U.S. Cl. 382—50 68 Claims



1. A method for processing a first image in a digital computer to identify a location of highlight regions in said first image, said first image comprising mark regions having a first grayscale, a highlighted portion of said marks at least partially surrounded by said highlight regions, said highlight regions having a second grayscale, comprising the steps of:
a) inputting a grayscale image of said first image;
b) identifying a location of said portion of said marks in said first image using said grayscale image, said step of identifying a location further comprising the step of converting said highlight regions to substantially solid regions, said substantially solid regions corresponding to said highlight regions; and
c) using said substantially solid regions in combination with an image comprising at least marks of said first image to extract a second image, said second image comprising said highlighted portion of said marks.

5,048,110
## METHOD AND APPARATUS FOR AUTOMATICALLY CORRECTING SUBTRACTION IMAGE DENSITY
Nobuyoshi Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 9,117, Jan. 29, 1987, abandoned, which is a continuation of Ser. No. 717,972, Mar. 29, 1985, abandoned. This application Feb. 27, 1989, Ser. No. 318,465
Claims priority, application Japan, Mar. 30, 1984, 59-63042; Mar. 30, 1984, 59-63043; Mar. 30, 1984, 59-63044; Apr. 27, 1984, 59-85723
Int. Cl.[5] G06K 9/40
U.S. Cl. 382—54 4 Claims




1. In temporal subtraction processing for radiation images including the steps of exposing two or more stimulable phosphor sheets respectively to radiation passing through an object injected with contrast media into a specific structure and radia-

tion passing through said object without injection of contrast media to thereby store radiation images of said object in said stimulable phosphor sheets, the image information from said specific structure being different between radiation images, scanning said stimulable phosphor sheets by stimulating rays which cause said stimulable phosphor sheets to emit light in proportion to the stored radiation energy, photoelectrically detecting and converting the amounts of emitted light into digital image signals, obtaining a difference signal for forming an image of said specific structure by carrying out subtraction processing of said digital signals between corresponding picture elements of said radiation difference signal on the basis of a predetermined gradation conversion table,

a method of automatically correcting the density of a subtraction image, which comprises the steps of:

obtaining a histogram of said difference signal, calculating a signal corresponding to a maximum frequency point of said histogram from said histogram, calculating the difference Δ x between a standard background density of a subtraction image formed by said difference signal and said signal corresponding to a maximum frequency point of said histogram, and carrying out correction by adding said difference Δ x to said difference signal prior to said image gradation processing.

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**5,048,111**

**HYBRID SUBBAND-BASED HIERARCHICAL STORAGE AND DISPLAY METHOD FOR HIGH RESOLUTION DIGITAL IMAGES IN A MULTIUSE ENVIRONMENT**

**Paul W. Jones, Churchville, and Paul W. Melnychuck, W. Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 6, 1989, Ser. No. 432,293**
**Int. Cl.[5] G06K** *9/00*
**U.S. Cl. 382—56** **24 Claims**

7. A hierarchical storage method comprising the steps of:

a) forming a digital representation of an image;

b) decomposing said digital representation into multiple subband images, each comprised of a band of spatial frequencies, at one or more resolution levels ranging from the lowest spatial frequency subband to the highest defined by the digital representation of a);

c) further decomposing the lowest frequency subband of b) into a plurality of lower resolution images by;

iteratively lowpass filtering and subsampling the subband to create a plurality of lower resolution images;

encoding and storing the lower resolution images; and

encoding and storing the remaining subbands of step b).

12. A hierarchical storage method comprising the steps of:

a) forming a digital representation of an image;

b) decomposing said digital representation into multiple subband images, each comprised of a band of spatial frequencies at one or more resolution levels, ranging from the lowest spatial frequency subband to the highest defined by the digital representation of a);

c) further decomposing the lowest frequency subband of b) into a one or more lower resolution images by iteratively lowpass filtering and subsampling the subband;

d) encoding and storing the lowest resolution image of c);

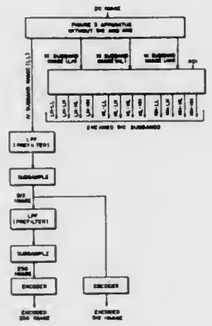
e) further decomposing the remaining lower resolution images of c) according to the following steps:

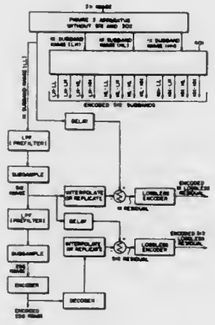
1. decoding the lowest resolution image of d);

2. interpolating or replicating said image to the dimensions of the next higher resolution level to form a prediction image;

3. subtracting said prediction image from the next higher resolution image formed in c) to create a residual image;

4. losslessly encoding and storing said residual image; and





5. iterating steps 2, 3, and 4 for each remaining image in c) to create a hierarchy of losslessly encoded residual images.

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**5,048,112**

**DATA DECOMPRESSION SYSTEM AND METHOD**

**James F. Alves, Calabasas, and Jerry A. Burman, Westlake Village, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Apr. 25, 1990, Ser. No. 514,779**
**Int. Cl.[5] G06K** *9/36*
**U.S. Cl. 382—56** **23 Claims**

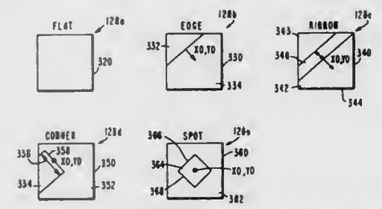
15. A method of data decompressing an image, said method comprising the steps of:

storing a plurality of icons related to a data compressed image in a memory, each icon having predetermined attributes associated therewith and representative of image content of a block of pixels and including an attribute representative of a principal axis angle of a feature in said block of pixels;

accessing each icon of the plurality of icons stored in the memory;



generating a decompressed block of pixels in response to each of the plurality of accessed icons; and




combining the decompressed blocks of pixels to form a decompressed image.

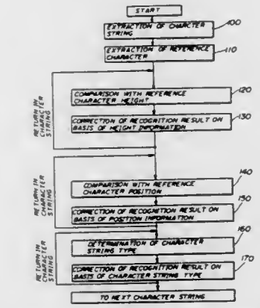
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**5,048,113**

**CHARACTER RECOGNITION POST-PROCESSING METHOD**

**Hideaki Yamagata, Yokohama; Keiji Kojima, Kawasaki, and Tatsuhiko Hashimoto, Sagamihara, all of Japan, assignors to Ricoh Company, Ltd., Japan**

**Filed Feb. 21, 1990, Ser. No. 483,023**
**Claims priority, application Japan, Feb. 23, 1989, 1-43983; Feb. 28, 1989, 1-48338; Jan. 11, 1990, 2-3950**
**Int. Cl.[5] G06K** *9/03*
**U.S. Cl. 382—57** **25 Claims**




18. A character recognition post-processing method to be performed after recognition of characters written in a document, the method comprising:

(a) extracting a first reference character serving as a reference with respect to correction of the recognition results from a predetermined character string obtained by recognizing characters in the document, said first reference character having a substantially constant relative height without regard to the fonts which can be used in documents;

(b) comparing a height of said first reference character and a height of each of other characters in said character string; and

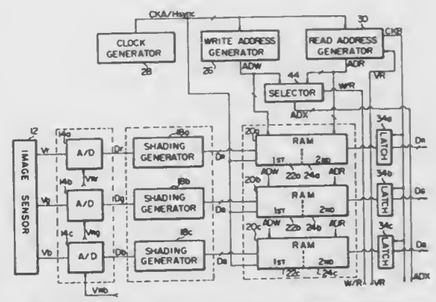
(c) correcting the recognition results of characters other than said first reference character and in said character string based on results obtained in said step (b).

**5,048,114**

**IMAGE READING AND PROCESSING APPARATUS RESPONSIVE TO ATTRIBUTES FOR DESIGNATING COPYING CONDITIONS**

**Shigeru Moriya, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Jan. 12, 1989, Ser. No. 296,798**
**Claims priority, application Japan, Jan. 14, 1988, 63-7281; Mar. 3, 1988, 63-50946; Mar. 3, 1988, 63-50947**
**Int. Cl.[5] G06K** *9/20*
**U.S. Cl. 382—61** **14 Claims**




1. An image reading and processing apparatus comprising:

(a) image data generating means which is operative to optically scan an original image-carrying medium along a predetermined path in a line-by-line manner and, during each cycle of line scanning, generate image data from a line of pixels on the scanned image-carrying medium,

(b) means for generating a first address signal and a second address signal,

(c) image data memory means for storing the image data for each line of pixels on the scanned image-carrying medium, the image data memory means being responsive to said first address signal for outputting the image data stored therein,

(d) an attribute data storage memory having a plurality of addressable memory spaces respectively corresponding to a plurality of small areas into which the entire region of the image-carrying medium can be divided, each of said memory spaces having stored therein attribute data designating the conditions inwhich the image on said image-carrying medium is to be reproduced, said attribute data storage memory being responsive to said second address signal for outputting the attribute data corresponding to the second address signal,

(e) data processing means for processing the image data output from said image data memory, the data processing means being operative to process the image data on the basis of the attribute data output from said attribute data storage memory,

(f) means for generating a magnification/reduction-ratio signal indicative of a magnification/reduction ratio at which an image on an image-carrying medium is to be reproduced,

(g) first timing regulating means responsive to said magnification/reduction-ratio signal for regulating the timings at which said first address signal is to be generated,

(h) second timing regulating means responsive to said magnification/reduction-ratio signal for regulating the timings at which said second address signal is to be generated, and

(i) control means for controlling each of said first and second timing regulating means.

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**5,048,115**

## SPEED CONTROL UNIT FOR DIRECT CURRENT ELECTRIC MOTOR WITH INTRINSIC FEED-BACK

**Gianfranco Venturino, Milan, Italy, assignor to GSE Di Venturino Gianfranco, Milan, Italy**

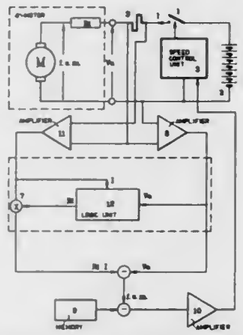
PCT No. PCT/IT87/00073, § 371 Date Feb. 23, 1989, § 102(e) Date Feb. 23, 1989, PCT Pub. No. WO88/00771, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 20, 1987, Ser. No. 313,975

Claims priority, application Italy, Jul. 21, 1986, 21195 A/86

Int. Cl.[5] H02P *5/00*

U.S. Cl. 388—815 9 Claims



1. Speed control process for direct current motor fed by a d.c. voltage power source according to which e.m.f.=V−Ri is calculated as the difference between a terminal voltage Va and a voltage drop at a reference resistor through which an armature current flows, then this value is used as a velocity feedback signal for motor regulation, said process comprising cyclically measuring said terminal voltage Va at two successive close instants t1 and t2 during which armature resistance and the motor e.m.f. can be considered constant, and storing these terminal voltage values $Va_{t1}$, $Va_{t2}$ in a memory, then using these terminal voltage values to determine an actual armature resistance during the interval t1—t2, then multiplying this value to obtain an instant current, and subtracting the result from the terminal voltage Va and only thereafter using the resulting e.m.f. as a velocity feedback signal for the velocity feedback circuit.

**5,048,116**

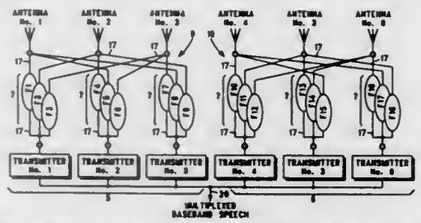
## SIGNAL ROUTING SYSTEM

**Dennis R. Schaeffer, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

Filed May 24, 1989, Ser. No. 356,160

Int. Cl.[5] H04M *11/00*

U.S. Cl. 455—33 14 Claims



6. A signal routing system for dynamically switching frequencies among a plurality of antennas of a cell, each antenna radiating into a different sector of the cell, the system comprising:

a) a plurality of signal transmission sources for generating a plurality of signals;

b) a plurality of communication paths, coupled to the plurality of signal transmission sources, for conducting the plurality of signals; and

c) a plurality of frequency responsive means, each frequency responsive means coupled to a different communication path, for allowing a first signal of the plurality of signals to be supported by a particular communication path only when the first signal is of a predetermined frequency.

**5,048,117**

## RADIO TELEPHONE APPARATUS

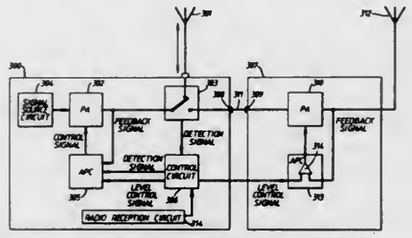
**Hideki Aisaka, and Buntarou Sawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Japan**

Filed Feb. 28, 1989, Ser. No. 316,913

Claims priority, application Japan, Feb. 29, 1988, 63-46062

Int. Cl.[5] H04B *1/04, 1/16*

U.S. Cl. 455—89 9 Claims



1. A portable radio telephone apparatus capable of being selectively connected to an adaptor unit for transmitting a radio frequency signals at a certain power level responsive to a level control signal, said radio telephone apparatus comprising:

amplifying means for amplifying said radio frequency signal by an amplification factor;

radiating means for radiating said amplified radio frequency signal;

an operator actuatable switch coupled to an output of said amplifying means and selectively coupled to said radiating means and said adaptor unit for selectively applying the output signals of said amplifying means to either of said radiating means or said adaptor unit;

control means coupled to said amplifying means and to said operator actuatable switch and responsive to said level control signal for controlling said amplifying means so that said amplification factor of said amplifying means is fixed to a predetermined level when said operator actuatable switch means is in a first state and so that said amplification factor of said amplifying means is variable in response to said level control signal when said operator actuatable switch is in a second state, wherein said radiating means comprises an antenna capable of being extended and said operator actuatable switch is activated in cooperation with the extension of said antenna.

**5,048,118**

## COMBINATION DUAL LOOP ANTENNA AND BEZEL WITH DETACHABLE LENS CAP

**Dwight D. Brooks, Boynton Beach, and John J. Parkes, Lantana, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

Filed Jul. 10, 1989, Ser. No. 377,645

Int. Cl.[5] H04B *1/08;* H01Q *1/22*

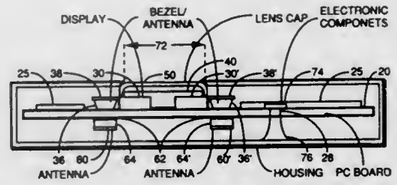
U.S. Cl. 455—156 11 Claims

1. An electronic device having a housing with a viewing slot, the electronic device comprising:



a printed circuit board mounted within said housing and secured to said housing;

an antenna within said housing and physically coupled to said printed circuit board; and



means for displaying information, said means mounted within said housing and viewable through said viewing slot, said means secured to said printed circuit board by said antenna.

**5,048,119**

## BROADCAST RECEIVER FOR RADIO OR TELEVISION SIGNALS WITH STORAGE AND INTERCHANGE OF PRESET STATIONS

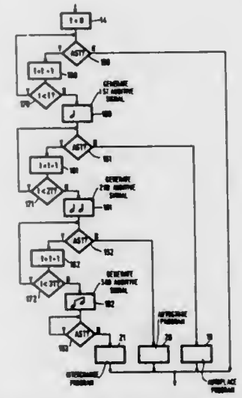
**Derk J. C. Wassink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

Filed May 5, 1989, Ser. No. 348,233

Claims priority, application Netherlands, Feb. 22, 1989, 8900430

Int. Cl.[5] H04B *17/02*

U.S. Cl. 455—161 4 Claims



1. A broadcast receiver for radio or television signals, comprising:

a tuning circuit for tuning the receiver to a broadcast transmitter in response to an applied tuning value representing said broadcast transmitter;

a storage medium for storing a plurality of tuning values, each tuning value representing a pre-programmed broadcast transmitter;

an operating panel having a plurality of means for generating selection commands corresponding, respectively, to said plurality of tuning values, and means for generating a storage command; and

a control circuit having means for applying a tuning value of the storage medium corresponding to a selected one of said selection commands generating means to the tuning circuit, and further having means for searching a plurality of locally receivable broadcast transmitters and storing their respective tuning values in said storage medium in response to said storage command, wherein said operating panel further comprises means for generating an interchange command, and the control circuit further comprises means for interchanging a first tuning value in said storage medium selected by a first of said selection commands generating means and a second tuning value in said storage medium selected by a second of said selection commands generating means in response to said interchange command, whereby said first selection commands generating means then corresponds to said second tuning value and said second selection commands generating means corresponds to said first tuning value.

**5,048,120**

## ARRANGEMENT FOR THE GENERATION OF AN FSK-MODULATED OPTICAL SIGNAL HAVING TWO POLARIZATION STATES THAT ARE ORTHOGONAL TO ONE ANOTHER FROM AN FSK-MODULATED OPTICAL TRANSMITTED SIGNAL

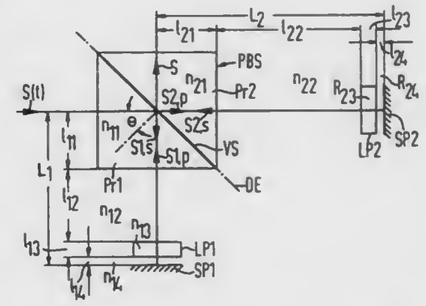
**Alfred Ebberg, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

Filed Jul. 30, 1990, Ser. No. 560,039

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1989, 3928403

Int. Cl.[5] H04B *10/00*

U.S. Cl. 455—616 9 Claims



8. A system for generation of a FSK-modulated optical signal having first and second polarization states which are orthogonal to each other from a FSK-modulated optical transmitted signal for polarization independent optical super heterodyne reception of the FSK-modulated optical transmitted signal, comprising:

polarizing beam splitter means for dividing the transmitted signal into first and second orthogonal polarized signal components;

first and second reflector and polarization modification means for reflecting the respective first or second signal component back on itself back towards the polarizing beam splitter means and for changing an original polarization state of the respective signal component into a polarization state orthogonal thereto;

a first optical path length between the polarizing beam splitter means and the first reflector and polarization modification means allocated to the first signal component and a second optical path length between the polarizing beam splitter means and the second reflector means allocated to the second signal component being selected different from one another such that an amount of said difference equals $c/4\ \Delta f$, where c is the light velocity and $\Delta f$ is an optical frequency deviation contained in the FSK-modulated transmitted signal; and

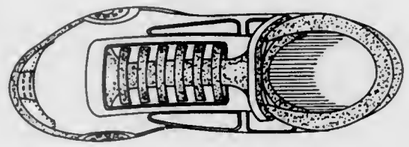
a polarization preserving fiber being introduced between at least one of the first and second reflector and polarization modification means and the polarizing beam splitter means.

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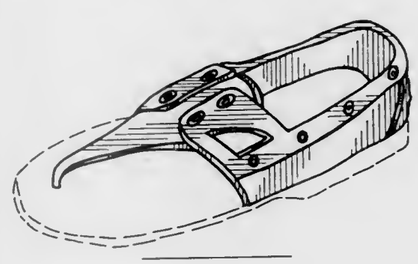
# DESIGNS

SEPTEMBER 10, 1991

319,718
SNEAKER OR SIMILAR ARTICLE
Frank A. Del Vecchio, Jr., 65 Riverside Dr., Trumbull, Conn. 06611, and Richard A. Mansfield, 1601 Sand Dollar Ct., Kurre Beach, N.C. 28449
Division of Ser. No. 78,182, Jul. 27, 1987, Pat. No. Des. 307,507.
This application Mar. 2, 1990, Ser. No. 487,243
Term of patent 14 years
U.S. Cl. D2—273



319,719
SANDAL UPPER
Robert B. Fox, Mashpee, Mass., assignor to Atlantic Thermoplastics Co., Inc., Blackstone, Mass.
Filed Jul. 27, 1988, Ser. No. 224,790
Term of patent 14 years
U.S. Cl. D2—314



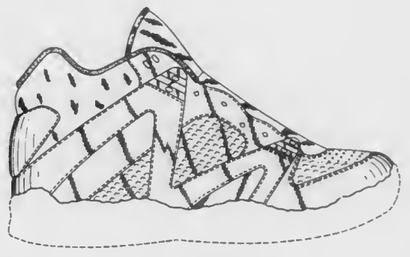
319,720
SIDEWALL ELEMENT OF A SHOE
Lawrence Selbiger, Portland, Oreg., assignor to Avia Group International Inc., Portland, Oreg.
Filed Jun. 22, 1989, Ser. No. 370,300
Term of patent 14 years
U.S. Cl. D2—314



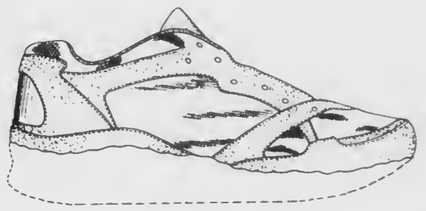
319,721
SHOE UPPER
Larry M. Clark, Simi Valley, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Aug. 22, 1990, Ser. No. 571,423
Term of patent 14 years
U.S. Cl. D2—314



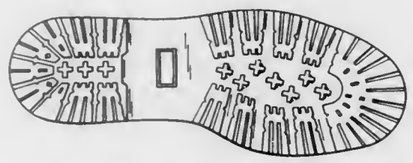
319,722
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.
Filed Nov. 27, 1990, Ser. No. 618,832
Term of patent 14 years
U.S. Cl. D2—314



319,723
SHOE UPPER
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.
Filed Dec. 7, 1990, Ser. No. 624,668
Term of patent 14 years
U.S. Cl. D2—314



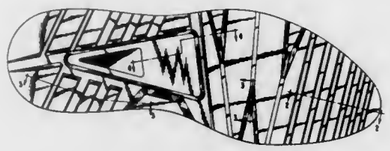
319,724
SHOE SOLE
James E. Issler, Westport, Conn., assignor to H. H. Brown Shoe Company, Inc., New York, N.Y.
Filed Jan. 17, 1989, Ser. No. 297,023
Term of patent 14 years
U.S. Cl. D2—320



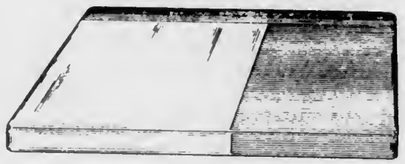
319,725
OUTSOLE
Ric Claveria, Loma Linda, Calif., assignor to L.A. Gear, Inc., Los Angeles, Calif.
Filed Apr. 5, 1990, Ser. No. 505,003
Term of patent 14 years
U.S. Cl. D2—320



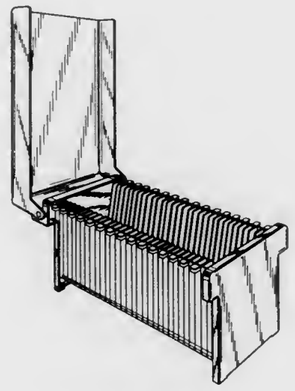
319,726
SHOE OUTSOLE BOTTOM
Robert J. Lucas, Lake Oswego, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 15, 1990, Ser. No. 538,499
Term of patent 14 years
U.S. Cl. D2—320



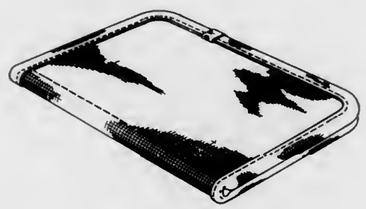
319,727
MICRO-FLOPPY DISK CASE
Katsuichi Kitada, Tokyo, Japan, assignor to Shin-Shin Shokai Co., Ltd., Tokyo, Japan
Filed Sep. 7, 1988, Ser. No. 241,141
Term of patent 14 years
U.S. Cl. D3—35



319,728
DISKETTE STORAGE CONTAINER
Arthur Kohler, Mentor, Ohio, assignor to Chagrin Plastic Methods, Inc., Mentor, Ohio
Filed Nov. 2, 1988, Ser. No. 266,367
Term of patent 14 years
U.S. Cl. D3—35

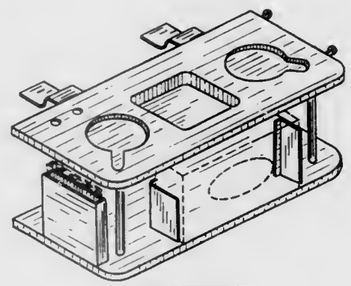


319,729
PORTFOLIO
Randy A. Kogutt, Dallas, Tex.
Filed Jan. 21, 1988, Ser. No. 146,360
Term of patent 14 years
U.S. Cl. D3—56

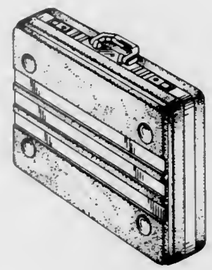




319,730
MULTI-PURPOSE HOLDER FOR ATTACHMENT TO THE DASHBOARD OF AN AUTOMOBILE
William D. E. Steenson, P.O. Box 3187, Leesburg, Va. 22075
Filed Feb. 21, 1989, Ser. No. 313,148
Term of patent 14 years
U.S. Cl. D3—40



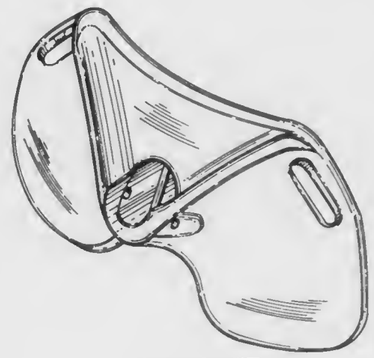
319,731
CARRYING CASE
Donald R. Reynolds, Jr., Wake County, N.C., and Thomas J. Chipley, Fauguier County, Va., assignors to Southern Case, Inc., Raleigh, N.C.
Filed Dec. 19, 1988, Ser. No. 286,502
Term of patent 14 years
U.S. Cl. D3—76



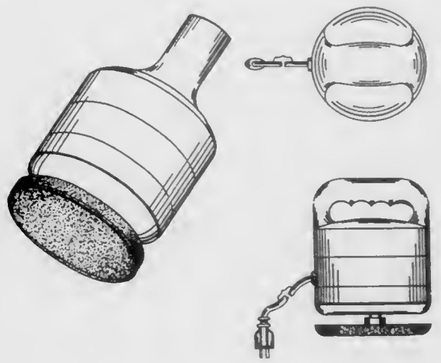
319,732
COSMETOLOGIST'S ROD BELT
Vergina R. Gumbs, 2912 Kelly St., Hayward, Calif. 94541
Filed Apr. 29, 1988, Ser. No. 187,875
Term of patent 14 years
U.S. Cl. D3—100



319,733
FISHING ROD HOLDER
Dennis Braid, 8046 Oso Ave., Canoga Park, Calif. 91306
Filed Mar. 23, 1987, Ser. No. 29,406
Term of patent 14 years
U.S. Cl. D3—104



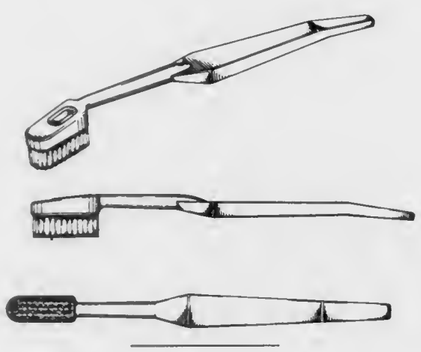
319,734
ROTARY SCRUBBER
Irving Townsend, 11910 Mayfield Ave., Los Angeles, Calif. 90049
Filed Mar. 20, 1989, Ser. No. 325,467
Term of patent 14 years
U.S. Cl. D4—102



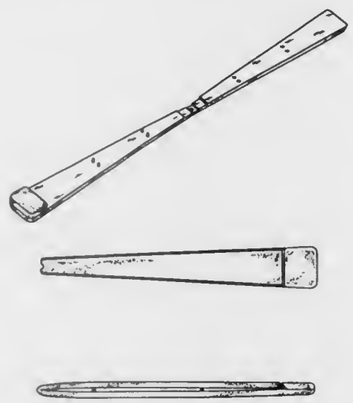
VOL 1130 ISS 2 SE 10 1991 UMI



319,735
TOOTHBRUSH
Milton Hodosh; Steven H. Hodosh, and Alex J. Hodosh, all of 243 Elmwood Ave., Providence, R.I. 02907
Filed May 23, 1989, Ser. No. 356,529
Term of patent 14 years
U.S. Cl. D4—104



319,736
BRUSH HANDLE
Lars-Erik Thuresson, Vasagatan 12, and Per-Gunnar Thuresson, Tulpangatan 10, both of S-742 00 Östhammar, Sweden
Filed Jul. 13, 1988, Ser. No. 218,925
Claims priority, application Sweden, Feb. 2, 1988, 88-0213
Term of patent 14 years
U.S. Cl. D4—138



319,737
CAP HOLDER
Robert C. Hasslocher, San Antonio, Tex., assignor to Veva B. Hasslocher, San Antonio, Tex.
Filed May 19, 1989, Ser. No. 354,683
Term of patent 14 years
U.S. Cl. D6—315



319,738
CAP HOLDER
Robert C. Hasslocher, San Antonio, Tex., assignor to Veva B. Hasslocher, San Antonio, Tex.
Filed May 19, 1989, Ser. No. 354,690
Term of patent 14 years
U.S. Cl. D6—316

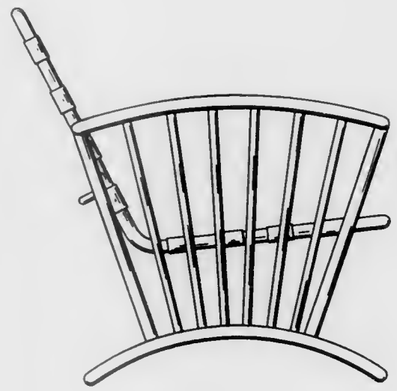


319,739
ARMCHAIR
Tetsuya Narita, Funabashi, Japan, assignor to Okamura Corporation, Kanagawa, Japan
Filed Mar. 22, 1988, Ser. No. 147,919
Term of patent 14 years
U.S. Cl. D6—366





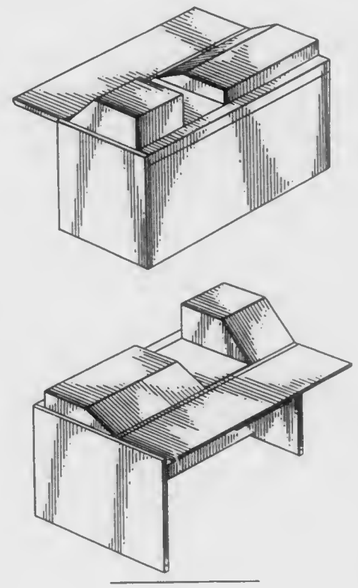
319,740
CHAIR
Steve C. Hess, Birmingham, Ala., assignor to Winston Furniture Co., Inc., Birmingham, Ala.
Filed Jun. 15, 1987, Ser. No. 61,389
Term of patent 14 years
U.S. Cl. D6—370



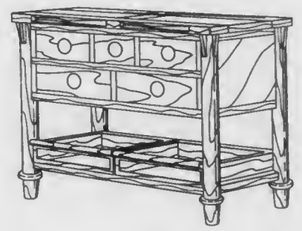
319,741
HOLDER FOR COMPACT DISKS
Keith V. Sylvester, San Diego, Calif., assignor to Stratagene, La Jolla, Calif.
Filed Sep. 9, 1988, Ser. No. 242,468
Term of patent 14 years
U.S. Cl. D6—407



319,742
TRADING DESK
Wijtse Rodenburg, Rosmalen, Netherlands, assignor to Ahrend Groep N.V., Amsterdam, Netherlands
Filed May 5, 1988, Ser. No. 190,932
Term of patent 14 years
U.S. Cl. D6—426



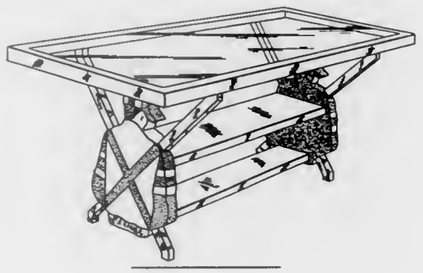
319,743
BUTCHER BLOCK TABLE WITH STORAGE OR THE LIKE
Jonathan Grey, Midhurst, England, assignor to Smallbone Plc, Berkshire, England
Filed Dec. 18, 1987, Ser. No. 134,526
Claims priority, application United Kingdom, Jun. 19, 1987, 1042968
Term of patent 14 years
U.S. Cl. D6—436



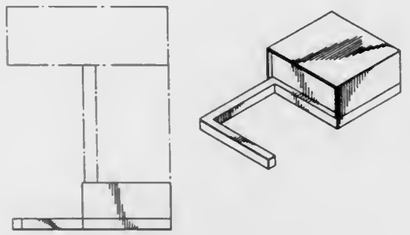
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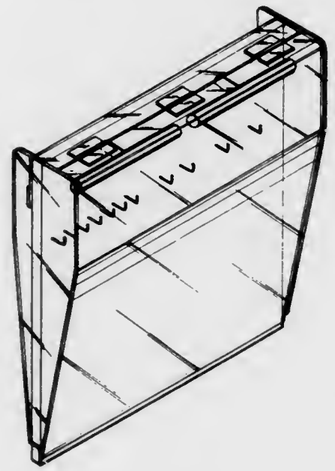
319,744
TABLE
Maria Luisa Monti Riffeser, Bologna, Italy, assignor to Monrif S.R.L., Milan, Italy
Filed Jun. 3, 1988, Ser. No. 202,916
Claims priority, application Int'l Pat. Institute, Apr. 5, 1988, DM/010662
Term of patent 14 years
U.S. Cl. D6—452



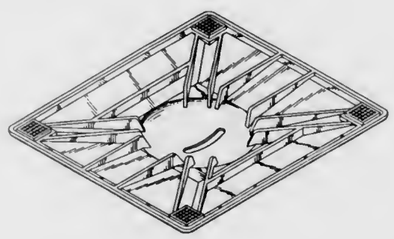
319,745
COFFEE BREWER SUPPORT STAND
Frank D. Williams, Laplace, La., assignor to Wm. B. Reily & Company, Inc., New Orleans, La.
Filed Nov. 28, 1988, Ser. No. 276,555
Term of patent 14 years
U.S. Cl. D6—464



319,746
JEWELRY DISPLAY CASE
Robert I. Rubin, University City, Mo., assignor to Jewelry Works, Inc., Maryland Heights, Mo.
Filed May 18, 1988, Ser. No. 194,557
Term of patent 14 years
U.S. Cl. D6—470



319,747
ROTATABLE TOP FOR AN ELECTRONIC EQUIPMENT SUPPORT STAND
John E. Bales, and Douglas L. Johnston, both of Portland, Oreg., assignors to Comtek Industries, Inc., Portland, Oreg.
Filed Apr. 6, 1988, Ser. No. 178,082
Term of patent 14 years
U.S. Cl. D6—495

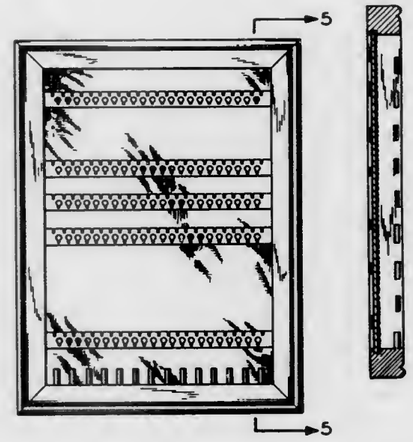




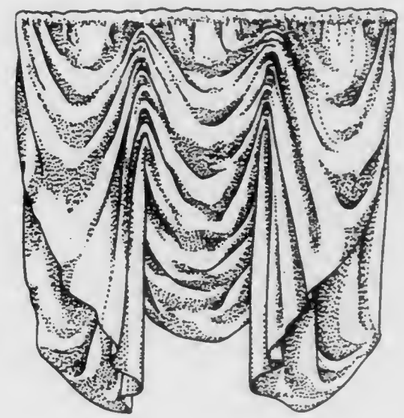
319,748
SHAMPOO BOTTLE HOLDER
Rik Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Dec. 11, 1989, Ser. No. 448,596
Term of patent 14 years
U.S. Cl. D6—524



319,749
JEWELRY STORAGE RACK
Sandra L. McPherson, 2024 Lankestar Pl., Yukon, Okla. 73099
Filed Aug. 10, 1989, Ser. No. 392,243
Term of patent 14 years
U.S. Cl. D6—571




319,750
CURTAIN
Virginia G. Scarpelos, 10 Freeman Ave., Boston, Mass. 02132
Filed Feb. 23, 1989, Ser. No. 313,811
Term of patent 14 years
U.S. Cl. D6—575



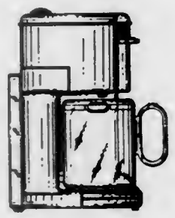
319,751
PILLOW TO SPACE LEGS
Gene A. Hoff, Box 56455 Deep Run Rd., Martins Ferry, Ohio 43935
Filed Jan. 3, 1989, Ser. No. 292,743
Term of patent 14 years
U.S. Cl. D6—601

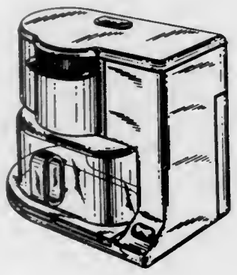


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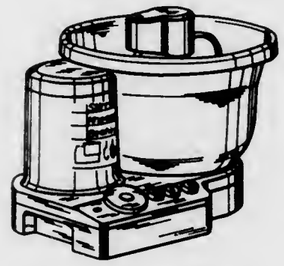


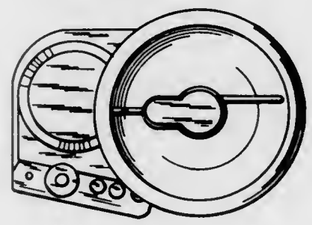
319,752
COMBINED COFFEE MAKER AND CARAFE
Duane D. Adams, Deep River, and Masao Tsuji, Old Lyme, both of Conn., assignors to North American Philips Corp., New York, N.Y.
Division of Ser. No. 212,858, Jun. 29, 1988. This application Dec. 27, 1990, Ser. No. 634,367
Term of patent 14 years
U.S. Cl. D7—309





319,754
FOOD MIXER
Rudolf Maass, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Jan. 11, 1989, Ser. No. 295,981
Term of patent 14 years
U.S. Cl. D7—379

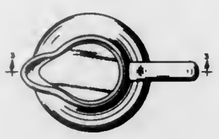


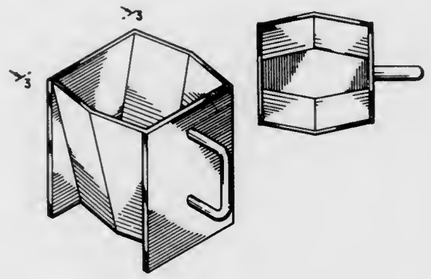


319,755
BEVERAGE MUG
David W. Guy, 1008 S. First St., Pinckneyville, Ill. 62274
Filed Feb. 16, 1989, Ser. No. 311,580
Term of patent 14 years
U.S. Cl. D7—536

319,753
CREAM PITCHER OR SIMILAR ARTICLE
Steve A. Unger, Manilus, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 10, 1989, Ser. No. 321,544
Term of patent 14 years
U.S. Cl. D7—319

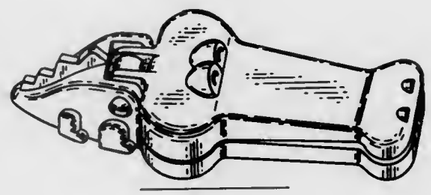








319,756
ALLIGATOR NUTCRACKER
Mineo Kimura, Tokyo, Japan, assignor to Shoei Foods, U.S.A., Inc., Portland, Oreg.
Filed Mar. 13, 1989, Ser. No. 322,070
Term of patent 14 years
U.S. Cl. D7—680



319,757
SNOW SHOVEL
Dale W. Nelson, 75 E. 600 North, Orem, Utah 84057
Filed Mar. 23, 1990, Ser. No. 498,364
Term of patent 14 years
U.S. Cl. D8—10



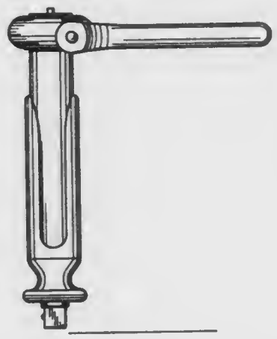
319,758
TOOL FOR OPENING A COMPUTER
Edward L. Hames, Peterborough, N.H., assignor to Curtis Manufacturing Company, Inc., Jaffrey, N.H.
Filed Oct. 14, 1988, Ser. No. 258,322
Term of patent 14 years
U.S. Cl. D8—14



319,759
TOOL FOR USE IN PLUGGING A CYLINDRICAL PIPE
Timothy H. Bookont, 1625 Shepherd Rd., Chattanooga, Tenn. 37421
Filed Apr. 25, 1988, Ser. No. 185,809
Term of patent 14 years
U.S. Cl. D8—21



319,760
RATCHET DRIVER TOOL
John M. Justice, Rte. 3, Box 174, Greenbrier, Tenn. 37073
Filed Dec. 23, 1988, Ser. No. 288,811
Term of patent 14 years
U.S. Cl. D8—25



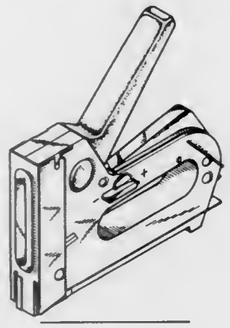
319,761
GAS BURNING TOOL
Sadao Yoshinaga, Chiba, Japan, assignor to Prince Industrial Development Co., Ltd., Japan
Filed Dec. 26, 1989, Ser. No. 456,277
Claims priority, application Japan, Jun. 27, 1989, 1-23753
Term of patent 14 years
U.S. Cl. D8—30



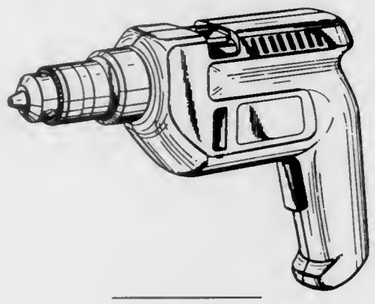
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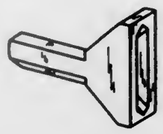
319,762
STAPLER
William H. Chi, No. 17, Lane 29, Ta Te St., Taichung City, Taiwan
Filed Dec. 11, 1989, Ser. No. 448,456
Term of patent 14 years
U.S. Cl. D8—49



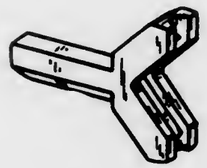
319,763
POWER DRILL
Ulrich Reiferscheid, Ravensburg, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 21, 1989, Ser. No. 312,964
Claims priority, application United Kingdom, Aug. 31, 1988, 1053303
Term of patent 14 years
U.S. Cl. D8—68



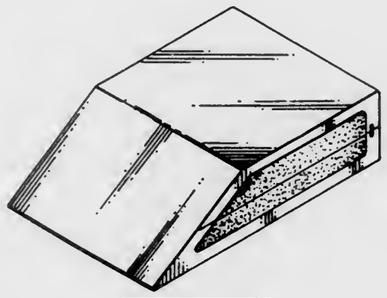
319,764
CUP HOOK DRIVER
Wilfred M. McCord, Jr., Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.
Filed Sep. 26, 1988, Ser. No. 249,432
Term of patent 14 years
U.S. Cl. D8—70



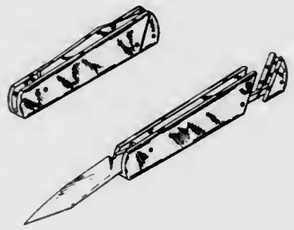
319,765
V-SHAPED CUP HOOK DRIVER
Wilfred M. McCord, Jr., Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.
Filed Sep. 26, 1988, Ser. No. 249,433
Term of patent 14 years
U.S. Cl. D8—70



319,766
SANDING BLOCK
Robert D. Erickson, Rte. 113 A, P.O. Box 10, Tamworth, N.H. 03886
Filed Oct. 25, 1988, Ser. No. 262,506
Term of patent 14 years
U.S. Cl. D8—94

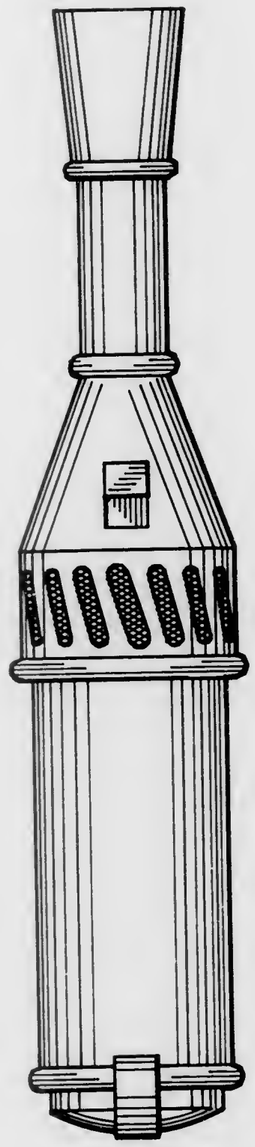


319,767
KNIFE
Jim W. Sargent, 1403 Chisholm Rd., Florence, Ala. 35630
Filed Apr. 14, 1989, Ser. No. 338,128
Term of patent 14 years
U.S. Cl. D8—99





319,768
CORDLESS HOT AIR GUN
Brad T. Smith, 1731 Limestone Rd., Wilmington, Del. 19804
Filed Nov. 3, 1988, Ser. No. 266,623
Term of patent 14 years
U.S. Cl. D8—29.1



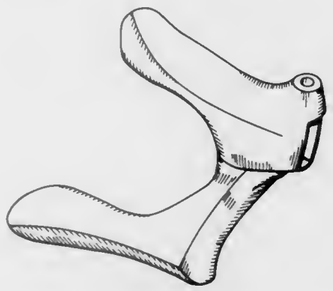
319,769
COMBINED DOOR HANDLE AND DEADBOLT UNIT
Paul D. Fleming, Glendale, and Nandor Gajer, Woodland Hills, both of Calif., assignors to W & F Manufacturing, Inc., Glendale, Calif.
Filed Apr. 3, 1989, Ser. No. 332,096
Term of patent 14 years
U.S. Cl. D8—301



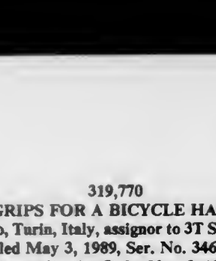
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319,770
SET OF GRIPS FOR A BICYCLE HANDLE BAR
Lucio Borromeo, Turin, Italy, assignor to 3T S.p.A., Turin, Italy
Filed May 3, 1989, Ser. No. 346,866
Claims priority, application Italy, Nov. 3, 1988, 53504 [U]/88
Term of patent 14 years
U.S. Cl. D8—303



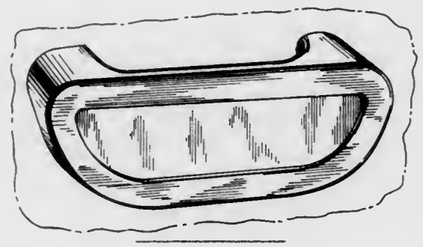
319,771
HANDLE
Mary J. Reid, and David J. O'Connell, both of Sheboygan, Wis., assignors to Jacob Delafon, Paris, France
Filed Nov. 6, 1989, Ser. No. 433,085
Term of patent 14 years
U.S. Cl. D8—312



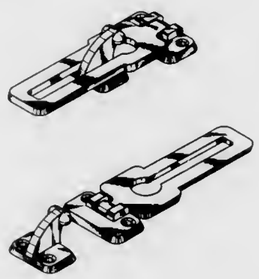
319,772
SLIDING PATIO DOOR HANDLE
Duane L. Mosch, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.
Filed Jun. 20, 1988, Ser. No. 209,042
The portion of the term of this patent subsequent to Sep. 6, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—319



319,773
HANDLE
Maurice Y. Magnin, Par Bornel, France, and Mary J. Reid, Sheboygan, Wis., assignors to Jacob Delafon, Paris, France
Filed Oct. 31, 1989, Ser. No. 429,907
Term of patent 14 years
U.S. Cl. D8—319

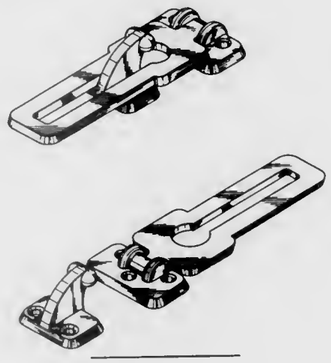


319,774
DOOR GUARD
Walter J. MacFarlane, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Apr. 28, 1989, Ser. No. 345,714
The portion of the term of this patent subsequent to Sep. 10, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—331

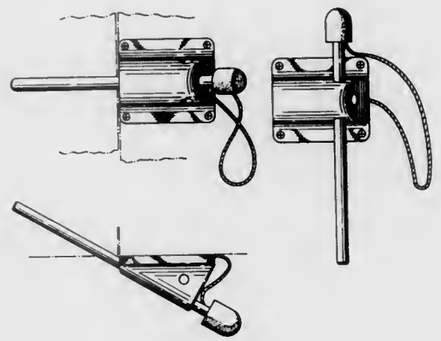




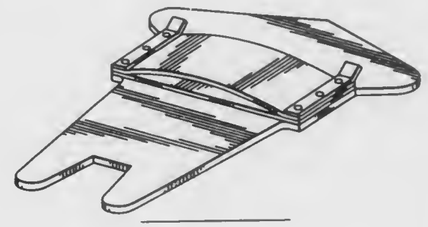
319,775
DOOR GUARD
Walter J. MacFarlane, Kensington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Jul. 17, 1989, Ser. No. 381,013
The portion of the term of this patent subsequent to Sep. 10, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—331



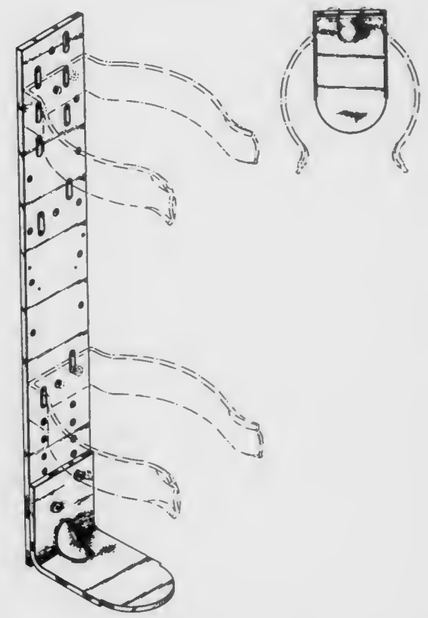
319,776
DOOR LOCK
Lindy R. Barrett, 304 SW. 20th St., and Van A. Jacobs, Rte. 2, Box 270A, both of Bentonville, Ark. 72712
Filed Oct. 11, 1989, Ser. No. 419,838
Term of patent 14 years
U.S. Cl. D8—340



319,777
ANCHOR HOLDER
Gerald M. Granger, 3203 Hermosa Dr., Youngstown, Ohio 44511
Filed May 31, 1988, Ser. No. 200,184
Term of patent 14 years
U.S. Cl. D8—373



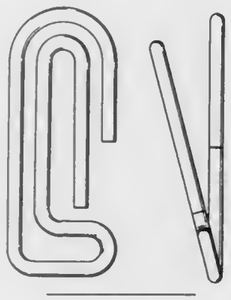
319,778
VERTICAL SUPPORT BRACE BRACKET PANEL FOR HOLDING TUBULAR OBJECTS
Theodore Ziaylek, Jr., 140 Riverview Dr., Yardley, Pa. 19067
Filed Jun. 1, 1989, Ser. No. 360,170
Term of patent 14 years
U.S. Cl. D8—373



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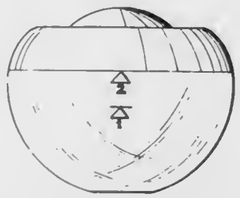
319,779
DOOR STOP OR SIMILAR ARTICLE
Lawrence M. Lunn, 6125 U.S. Hwy. 31, South, Indianapolis, Ind. 46227
Filed Feb. 3, 1989, Ser. No. 305,491
Term of patent 14 years
U.S. Cl. D8—402



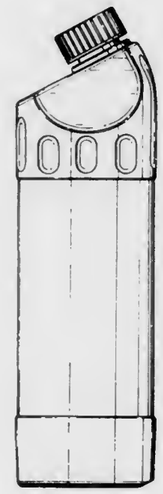
319,780
POUCH
Timo Laaki, Tarhiaisentie 12, 37800 Toijala, Finland
Filed Jun. 10, 1988, Ser. No. 204,782
Claims priority, application Finland, Dec. 10, 1987, 1075/87
Term of patent 14 years
U.S. Cl. D9—305



319,781
LIQUID DETERGENT DISPENSER OR SIMILAR ARTICLE
Hans Halm, Herne, and Herbert Buecheler, Erkrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany
Filed Jan. 19, 1989, Ser. No. 299,846
Claims priority, application World Int. Prop. O., Jul. 19, 1988, DMA/000808
Term of patent 14 years
U.S. Cl. D9—353



319,782
COMBINED BOTTLE AND CAP
Ulrich Reif, Dusseldorf, Fed. Rep. of Germany, assignor to Lever Brothers Company, Division of Conopco Inc., New York, N.Y.
Filed Sep. 5, 1989, Ser. No. 403,229
Claims priority, application United Kingdom, Mar. 13, 1989, 1057823
Term of patent 14 years
U.S. Cl. D9—373

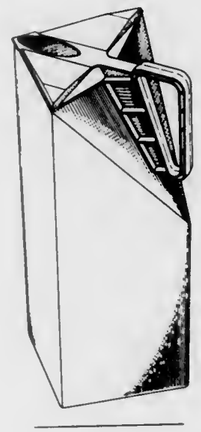


319,783
DESIGN FOR A WICKER CONTAINER
Barbara A. Grimm, 555 Victoria Road, Hong Kong, Hong Kor
Filed Dec. 9, 1988, Ser. No. 281,695
Term of patent 14 years
U.S. Cl. D9—414





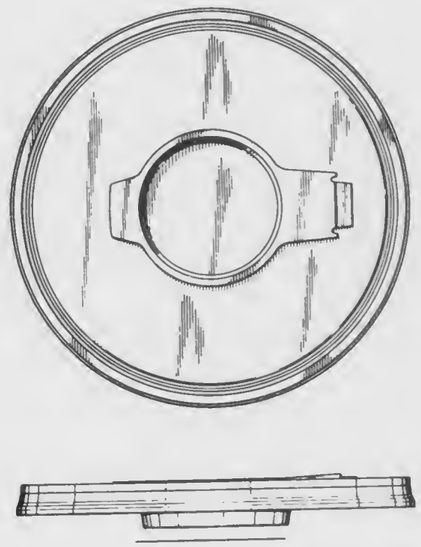
319,784
PACKAGING CONTAINER
Per Nylander, Jönköping, Sweden, assignor to Roby Teknik AB, Lund, Sweden
Division of Ser. No. 143,614, Jan. 13, 1988. This application Nov. 26, 1990, Ser. No. 618,098
Claims priority, application Sweden, Jul. 13, 1987, 871584; Jul. 13, 1987, 871585; Jul. 13, 1987, 871586; Jul. 13, 1987, 871587; Jul. 13, 1987, 871588; Jul. 13, 1987, 871590; Jul. 13, 1987, 871591; Jul. 13, 1987, 871592; Jul. 13, 1987, 871593; Jul. 15, 1989, 871589
Term of patent 14 years
U.S. Cl. D9—417



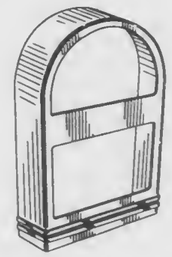
319,785
BOX BASE
John D. Kilmartin, III, Providence, R.I., assignor to International Packaging Corporation, Pawtucket, R.I.
Filed Mar. 20, 1989, Ser. No. 326,528
Term of patent 14 years
U.S. Cl. D9—423



319,786
LID FOR A CONTAINER
Adrian P. Rayner, Malmesbury, England, assignor to CMB Foodcan plc, Worcester, England
Filed Dec. 15, 1989, Ser. No. 451,358
Claims priority, application United Kingdom, Jun. 15, 1989, 1060216
Term of patent 14 years
U.S. Cl. D9—449



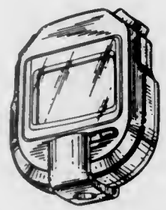
319,787
APPLIANCE HOUSING
Dominic LeVita, Roselle, Ill., assignor to Geminii Display Ltd., Elk Grove Village, Ill.
Filed Apr. 18, 1988, Ser. No. 182,770
Term of patent 14 years
U.S. Cl. D10—1



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319,788
STOPWATCH
Naoto Fukazawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Sep. 23, 1988, Ser. No. 248,410
Claims priority, application Japan, Apr. 18, 1988, 63-15679
Term of patent 14 years
U.S. Cl. D10—30



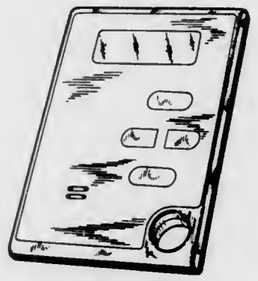
319,789
WRIST WATCH CASE
Tetsuo Okaya, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 11, 1988, Ser. No. 255,295
Claims priority, application Japan, Apr. 12, 1988, 63-14845
Term of patent 14 years
U.S. Cl. D10—30



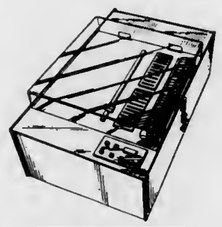
319,790
WRISTWATCH
Eddy Burgener, Moutier, Switzerland, assignor to Roventa-Henex SA, Bienne, Switzerland
Filed Jul. 13, 1988, Ser. No. 218,073
Claims priority, application World Int. Prop. O., Jan. 19, 1988, DM/010096
Term of patent 14 years
U.S. Cl. D10—32



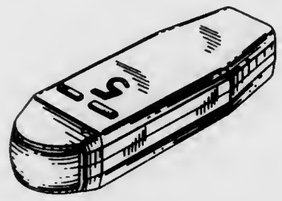
319,791
ELECTRONIC METRONOME
Hiroshi Saito, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Dec. 8, 1988, Ser. No. 282,345
Claims priority, application Japan, Jul. 8, 1988, 63-27286
Term of patent 14 years
U.S. Cl. D10—43



319,792
AUTOMATIC OPTICAL FIBER ALIGNMENT INSTRUMENT
Olivier Rickli, La Chaux-des-Fonds, and Jose Piffaretti, Saint-Blaise, both of Switzerland, assignors to CABLOPTIC S.A., Switzerland
Filed Oct. 18, 1988, Ser. No. 259,112
Claims priority, application Hague, Apr. 18, 1988, 010767
Term of patent 14 years
U.S. Cl. D10—46



319,793
ULTRASONIC PROBE
Patrick Dubut, Valbonne, France, assignor to CGR Ultrasonic, Villenoy les Meaux, France
Continuation of Ser. No. 53,420, May 22, 1987, Pat. No. Des. 316,376. This application Jan. 7, 1991, Ser. No. 638,420
Claims priority, application France, Nov. 25, 1986, 86 6228
Term of patent 14 years
U.S. Cl. D10—60



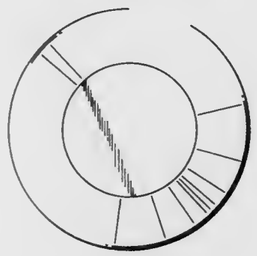


319,794
PIPE WRAP TEMPLATE
James A. Elkins, P.O. Box 2324, Brownwood, Tex. 76804, assignor to James A. Elkins, Brownwood, Tex.
Filed Oct. 23, 1989, Ser. No. 425,595
Term of patent 14 years
U.S. Cl. D10—64

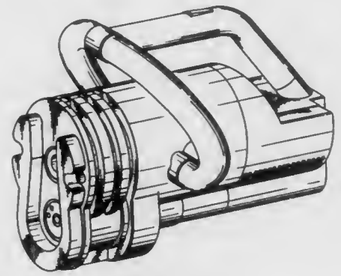




319,795
SKID MEMBER FOR CALIPER GAUGE OF CONTACTING TYPE
Michael K. Norton, Los Gatos, Calif., assignor to Measurex Corporation, Cupertino, Calif.
Filed May 1, 1989, Ser. No. 345,645
Term of patent 14 years
U.S. Cl. D10—73



319,796
AIR SAMPLING GUN FOR COLLECTION OF VAPORS
James B. McGown, Attleboro; Edward E. A. Bromberg, Peabody; David H. Fine, Sudbury; A. Lindsay Carroll, Jr., Cohasset; Michel D. Arney, Roslindale, and Lynn Noble, Lexington, all of Mass., assignors to Thermedics Inc., Woburn, Mass.
Filed Jan. 3, 1989, Ser. No. 293,142
Term of patent 14 years
U.S. Cl. D10—81



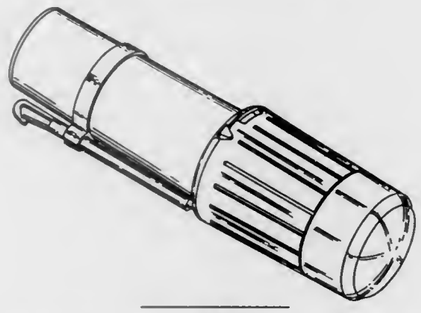
319,797
SCALE
Donald A. Bergman, Roscoe, and Robert A. O'Neil, Glen Ellyn, both of Ill., assignors to Newell Co., Freeport, Ill.
Filed Jan. 12, 1989, Ser. No. 296,572
Term of patent 14 years
U.S. Cl. D10—92



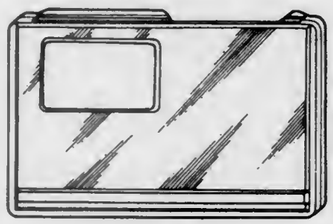
319,798
FIRE DETECTOR
Hisashi Hatano, Tokyo, Japan, assignor to Nittan Company Limited, Tokyo, Japan
Filed Jun. 6, 1988, Ser. No. 203,029
Term of patent 14 years
U.S. Cl. D10—106



319,799
TRANSMITTER BUOY
Thomas R. Krishan, Newtown Square; Peter W. Bressler; Eric A. Schneider, both of Philadelphia; Fernando M. Guidone, Exton; Albert C. Paulovitz, Kennett Square, and William M. Gorman, Springfield, all of Pa., assignors to Litton Systems, Inc., Springfield, Pa.
Filed Aug. 7, 1989, Ser. No. 390,336
Term of patent 14 years
U.S. Cl. D10—107



319,800
COMBINATION PROTECTIVE CASE AND STAND FOR AN ELECTRONIC TIMEKEEPING DEVICE
Ryo Murata, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Apr. 20, 1987, Ser. No. 40,579
Claims priority, application Japan, Dec. 25, 1986, 51972
Term of patent 14 years
U.S. Cl. D10—128



319,801
EARRING
Paolo Bulgari, Rome, Italy, assignor to Partecipazioni Bulgari S.p.A., Rome, Italy
Division of Ser. No. 218,032, Jul. 13, 1988, Pat. No. Des. 314,526. This application Nov. 15, 1990, Ser. No. 613,297
Claims priority, application Int'l Pat. Institute, Jan. 14, 1988, DM/01 0065
Term of patent 14 years
U.S. Cl. D11—42



D319,802
Patent Not Issued For This Number

319,803
TABLETOP NOVELTY
Joe Traner, 203 W. Ave San Antonio, San Clemente, Calif. 92672
Filed Aug. 21, 1989, Ser. No. 396,455
Term of patent 14 years
U.S. Cl. D11—157



319,804
COMBINED ZIPPER PULL, BAG TAG, LCD CLOCK, KEYRING AND THERMOMETER
Edward R. Johnson, and Robert P. Miller, both of P.O. Box 961, Ligonier, Pa. 15658
Filed May 12, 1989, Ser. No. 350,837
Term of patent 14 years
U.S. Cl. D11—221

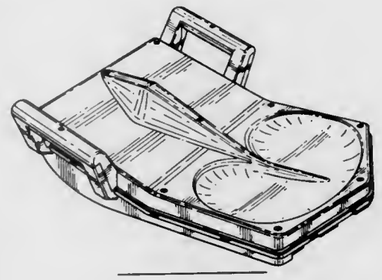


319,805
AIRCRAFT
Gerald A. Wiegert, 400 N. Marine Ave., Wilmington, Calif. 90744
Filed May 13, 1988, Ser. No. 193,999
Term of patent 14 years
U.S. Cl. D12—333

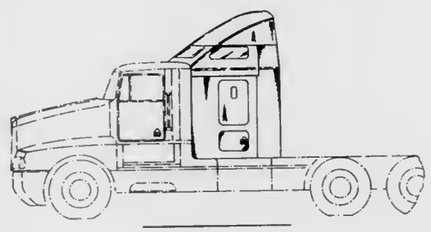




319,806
SNOW SLED
August Schmid, Schwerzenbach, Switzerland, assignor to A. G. Schmid AG, Schwerzenbach, Switzerland
Filed Nov. 3, 1989, Ser. No. 431,860
Term of patent 14 years
U.S. Cl. D12—11



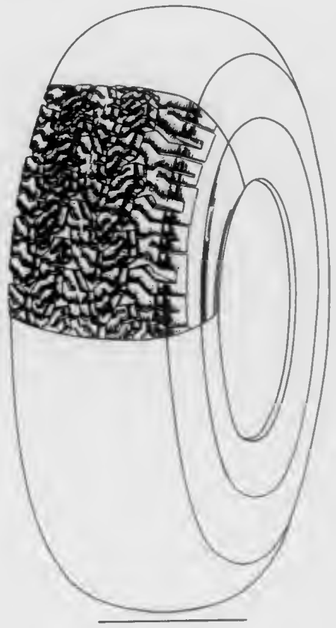
319,807
TRUCK SLEEPER UNIT
Wayne K. Simons, Kent; Donald A. Richardson, Renton, and Roy L. Meryman, Bellevue, all of Wash., assignors to Paccar Inc., Bellevue, Wash.
Division of Ser. No. 374,645, Jun. 30, 1989, abandoned. This application Mar. 15, 1990, Ser. No. 493,908
Term of patent 14 years
U.S. Cl. D12—96



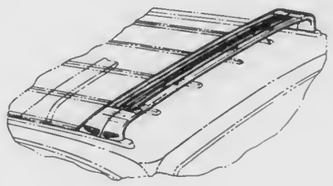
319,808
BICYCLE CRANK
Gary B. Cook, 26871 Avendida Domingo, Mission Viejo, Calif. 92691
Filed Oct. 23, 1989, Ser. No. 426,391
Term of patent 14 years
U.S. Cl. D12—123



319,809
TIRE
Miroslav Manestar, Norton, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio
Filed Apr. 17, 1989, Ser. No. 339,425
Term of patent 14 years
U.S. Cl. D12—147



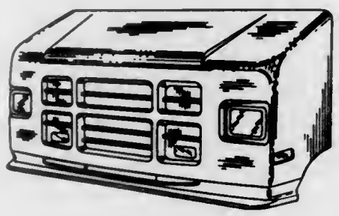
319,810
ADJUSTABLE LUGGAGE CARRIER CROSS RAILS WITH LOCKING WRENCH
Craig Stapleton, and Curtis J. Morlin, both of Port Huron, Mich., assignors to Huron/St. Clair Incorporated, Port Huron, Mich.
Filed May 3, 1988, Ser. No. 192,401
Term of patent 14 years
U.S. Cl. D12—157



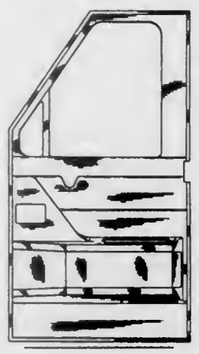
VOL 1130 ISS 2 SE 10 1991 UMI



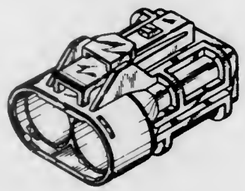
319,811
COMBINED HOOD, LIGHTS AND GRILL UNIT FOR A VAN
George J. Tisten, Elkhart, Ind., assignor to Holiday Rambler Corporation, Wakarusa, Ind.
Filed Apr. 7, 1989, Ser. No. 334,994
Term of patent 14 years
U.S. Cl. D12—164



319,812
VEHICLE INTERIOR DOOR PANEL
George J. Tisten, Elkhart, and Donald J. Wilson, Granger, both of Ind., assignors to Holiday Rambler Corporation, Wakarusa, Ind.
Filed Apr. 11, 1989, Ser. No. 336,311
Term of patent 14 years
U.S. Cl. D12—195

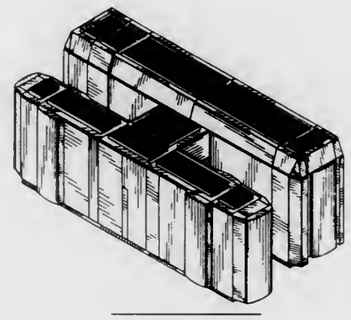


319,813
HOUSING FOR AN ELECTRICAL CONNECTOR
Seiji Kozono, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Aug. 2, 1989, Ser. No. 388,555
Claims priority, application Japan, Feb. 8, 1989, 1-4141
Term of patent 14 years
U.S. Cl. D13—133



319,814
SEMI-CONDUCTOR SUBSTRATE WITH CONDUCTING PATTERN
Terutomi Hasegawa, Ogaki, and Nobumichi Goto, Seki, both of Japan, assignors to Ibiden Co., Ltd., Ogaki, Japan
Filed Apr. 13, 1988, Ser. No. 181,262
The portion of the term of this patent subsequent to Jul. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—182

319,815
ELECTRONIC COMPUTER
Kazuo Maruyama; Shinji Mine, and Tetsuya Nagata, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 5, 1989, Ser. No. 417,753
Claims priority, applicatioo Japan, Apr. 6, 1989, 1-12904
Term of patent 14 years
U.S. Cl. D14—102



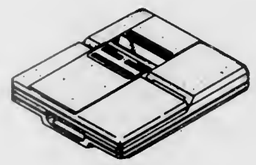
319,816
FLOOR STANDING CABINET FOR DATA COMMUNICATIONS EQUIPMENT
Charles E. Albert, Jr., and John J. Yagoda, both of Willowick, Ohio, assignors to Elsag International B.V., Amsterdam, Netherlands
Filed Nov. 13, 1989, Ser. No. 436,390
The portion of the term of this patent subsequent to Aug. 20, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—102



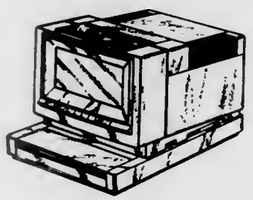


319,817
LAP-TOP COMPUTER
Ching-Chung Lin, P.B. Box 16-450, Taipei, Taiwan
Filed Jun. 6, 1989, Ser. No. 362,297
Term of patent 14 years
U.S. Cl. D14—106

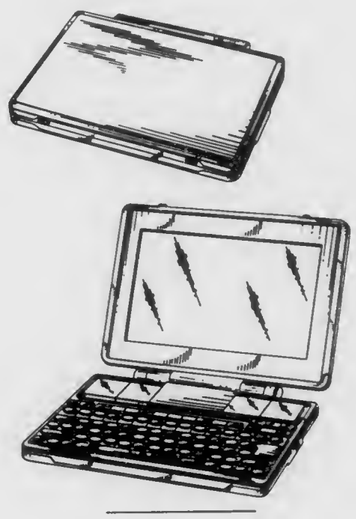




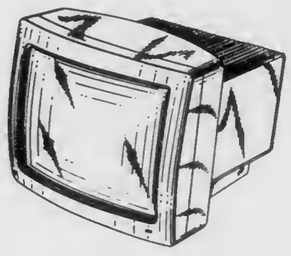
319,818
INFORMATION STORAGE AND RETRIEVAL UNIT
Takashi Yomo, Kawasaki, and Tatsuo Kojima, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 14, 1989, Ser. No. 393,269
Claims priority, application Japan, Feb. 16, 1989, 1-5913
Term of patent 14 years
U.S. Cl. D14—106



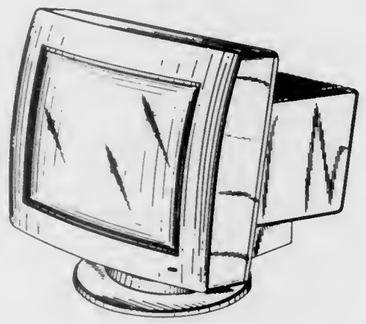
319,819
COMPUTER
Mitsuro Kawaguchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 28, 1989, Ser. No. 442,368
Claims priority, application Japan, May 30, 1989, 1-19777
Term of patent 14 years
U.S. Cl. D14—106



319,820
COMPUTER DISPLAY
Noritaka Uchibori; Mitsuro Kawaguchi, both of Nagano, and Mitsuru Iseki, Aichi, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 16, 1989, Ser. No. 438,363
Claims priority, application Japan, May 16, 1989, 1-17661
Term of patent 14 years
U.S. Cl. D14—113



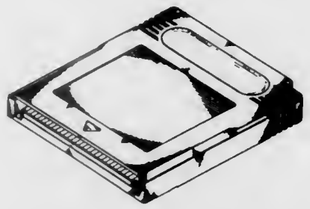
319,821
COMPUTER DISPLAY
Mitsuro Kawaguchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 16, 1989, Ser. No. 438,364
Claims priority, application Japan, May 16, 1989, 1-17659
Term of patent 14 years
U.S. Cl. D14—113



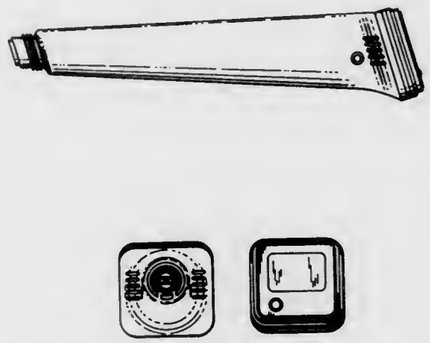
319,822
COMPUTER KEYBOARD HOLDER
Jamie T. Troke, R.R. #1 , Carrying Place, Ontario, Canada K0K 1L0
Filed Jan. 23, 1989, Ser. No. 299,818
Claims priority, application Canada, Jul. 21, 1988, 21-07-88-9
Term of patent 14 years
U.S. Cl. D14—114



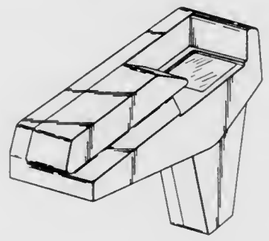
319,823
CARTRIDGE FOR HAND-HELD ELECTRONIC GAME
Shin Kojo, Kyoto, Japan, assignor to Nintendo Co., Ltd., Japan
Filed Jul. 5, 1989, Ser. No. 376,283
Claims priority, application Japan, Jan. 6, 1989, 1-200
Term of patent 14 years
U.S. Cl. D14—114



319,824
PORTABLE OPTICAL SCANNER
Martin P. Riddiford, London, England, assignor to Price/-Stern/Sloan Publishers, Inc., Los Angeles, Calif.
Filed Aug. 6, 1987, Ser. No. 83,058
Claims priority, application United Kingdom, Feb. 6, 1987, 1039802
Term of patent 14 years
U.S. Cl. D14—116

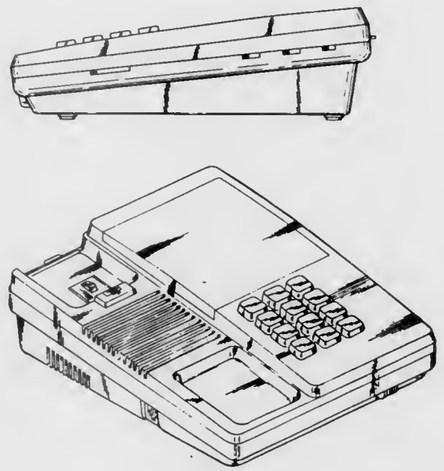


319,825
CREDIT CARD READER
Rodger J. Andrew, Winborne, England, assignor to Landis & Gyr Communications (U.K.) Ltd., England
Filed Apr. 6, 1989, Ser. No. 334,014
Claims priority, application United Kingdom, Oct. 7, 1988, 1054123
Term of patent 14 years
U.S. Cl. D14—116

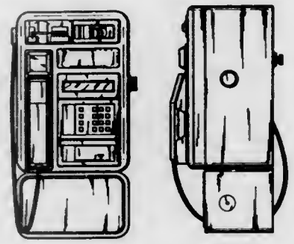




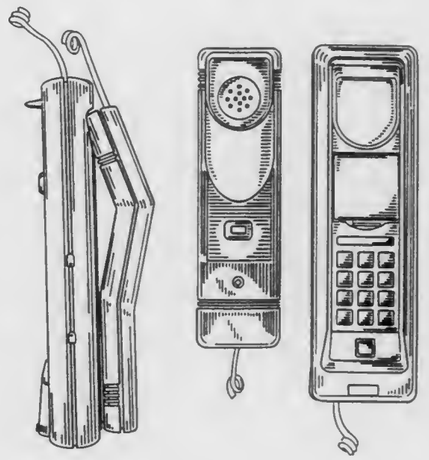
319,826
TELEPHONE BASE
Hok L. Hung, Unit 13, 13/F., Thriving Industrial Centre, 26-38 Sha Tsui Road, Tsuen Wan, Kowloon, Hong Kong
Filed Dec. 11, 1990, Ser. No. 625,976
Term of patent 14 years
U.S. Cl. D14—142



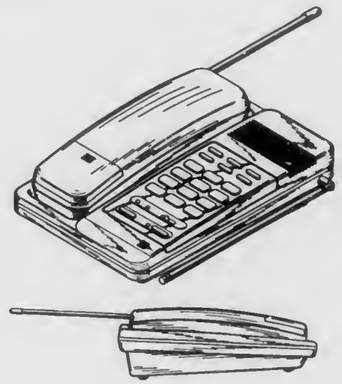
319,827
MODULAR PUBLIC TELEPHONE
Francisco Ibanez Palomeque, and Jose M. Garcia Morales, both of Madrid, Spain, assignors to Telefonica De Espana, S.A., Spain
Filed Apr. 25, 1990, Ser. No. 514,361
Term of patent 14 years
U.S. Cl. D14—146



319,828
TELEPHONE SET
Ernst Thomke, Grenchen, Switzerland, assignor to Swatch AG, Bienne, Switzerland
Filed Dec. 27, 1989, Ser. No. 457,535
Claims priority, application Hague, Jul. 7, 1989, DM/014017
Term of patent 14 years
U.S. Cl. D14—150



319,829
WIRELESS TELEPHONE SET
Richard Wu, Taipei, Taiwan, assignor to Kingtel Telecommunications Corp., Taipei, Taiwan
Filed Dec. 4, 1990, Ser. No. 622,098
Term of patent 14 years
U.S. Cl. D14—151

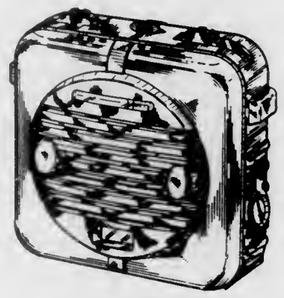


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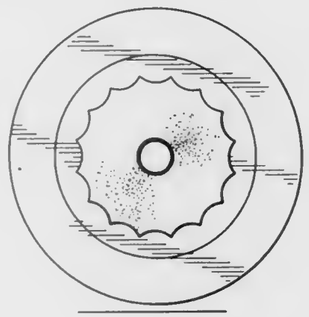
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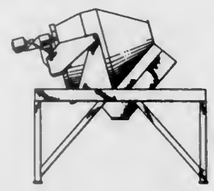
319,830
PORTABLE RADIO RECEIVER
Hiroyuki Miyai, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Aug. 21, 1989, Ser. No. 396,466
Claims priority, application Japan, Feb. 20, 1989, 1-6159
Term of patent 14 years
U.S. Cl. D14—195



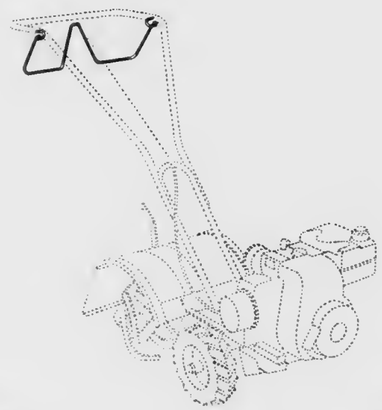
319,831
PHONOGRAPH TURNTABLE COVER
James E. Dessi, P.O. Box 612232, North Miami, Fla. 33261
Filed Sep. 2, 1988, Ser. No. 239,962
Term of patent 14 years
U.S. Cl. D14—261



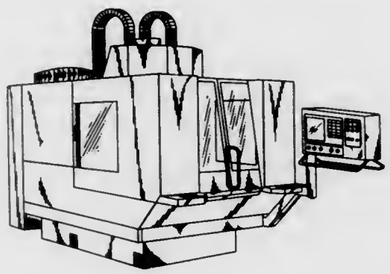
319,832
CONCRETE MIXER
Robert H. Ross, P.O. Box 70, Brownwood, Tex. 76804
Filed Nov. 24, 1989, Ser. No. 440,753
Term of patent 14 years
U.S. Cl. D15—19



319,833
BAIL FOR A ROTARY POWER TILLER OR THE LIKE
Albert C. Johnston, Troy, N.Y., assignor to Garden Way Incorporated, Troy, N.Y.
Filed Apr. 3, 1989, Ser. No. 332,754
Term of patent 14 years
U.S. Cl. D15—28

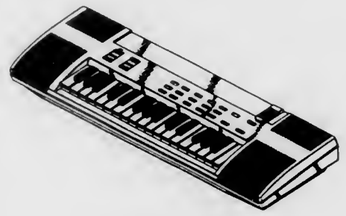


319,834
MACHINE TOOL HOUSING
Eugen Rütschle, Mühlheim, Fed. Rep. of Germany, assignor to Chiron-Werke GmbH & Co. KG, Tuttlingen, Fed. Rep. of Germany
Continuation of Ser. No. 193,949, May 13, 1988, abandoned.
This application Oct. 30, 1990, Ser. No. 609,044
Term of patent 14 years
U.S. Cl. D15—131

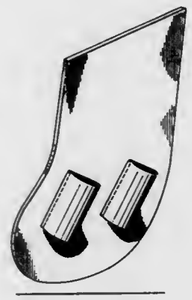




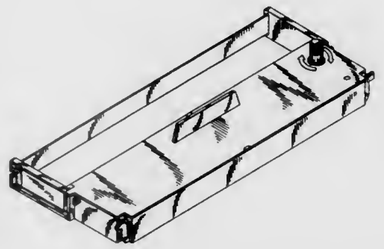
319,835
ELECTRONIC MUSIC KEYBOARD
Yoshitaka Naito, Obome, Japan, assignor to Casio Computer Co. Ltd., Tokyo, Japan
Filed Dec. 5, 1988, Ser. No. 280,514
Term of patent 14 years
U.S. Cl. D17—1



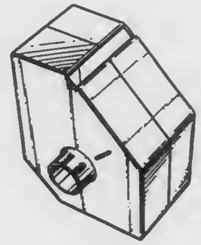
319,836
DRUMSTICK HOLDER
Thomas J. Clouse, 1399 10th St. NW., Apt. 203, New Brighton, Minn. 55112, and Boyd R. Perttu, 10130 Hwy. 65 NE., Blaine, Minn. 55434
Filed Jun. 7, 1989, Ser. No. 362,592
Term of patent 14 years
U.S. Cl. D17—22



319,837
RIBBON CASSETTE
Mutsune Urawa, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Dec. 6, 1989, Ser. No. 446,967
Claims priority, application Japan, Jun. 26, 1989, 1-023539
Term of patent 14 years
U.S. Cl. D18—12



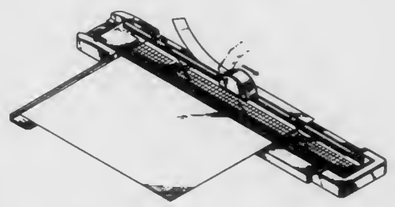
319,838
RIBBON CARTRIDGE FOR LETTERING SYSTEM
Michael P. Kassner, Circle Pines, and George F. Schwoboda, Minneapolis, both of Minn., assignors to Varitronic Systems, Inc., Minneapolis, Minn.
Filed Aug. 8, 1988, Ser. No. 229,855
Term of patent 14 years
U.S. Cl. D18—22



319,839
SINHALESE FONT
Sisira Ranasinghe, 2002 Beechmont Dr., Fort Wayne, Ind. 46825
Filed Sep. 7, 1988, Ser. No. 241,549
Term of patent 14 years
U.S. Cl. D18—25



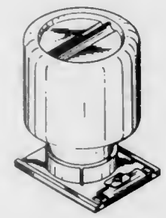
319,840
PAPER CUTTER
Minoru Hatsumi, Tokyo, and Yasuhiko Nakamura, Abiko, both of Japan, assignors to Maruzen Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 27, 1990, Ser. No. 544,857
Claims priority, application Japan, Jan. 8, 1990, 2-406
Term of patent 14 years
U.S. Cl. D18—34



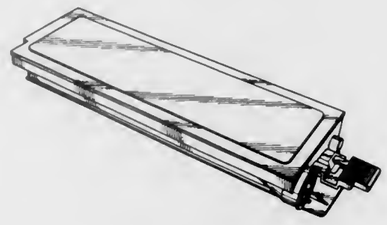
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319,841
TONER CARTRIDGE
Hideo Fukuda, Katano; Mikio Ido, Sakai, and Naoki Motobayashi, Tondabayashi, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan
Filed Jun. 27, 1989, Ser. No. 372,785
Claims priority, application Japan, Feb. 27, 1989, 1-7244; Apr. 28, 1989, 1-16129
Term of patent 14 years
U.S. Cl. D18—43



319,842
TONER CARTRIDGE FOR A PRINTER
Tetsuo Tanda, c/o Tokyo Yoga Office of Kyocera Corporation, of No. 14-9, 2-Chome, Tamagawadai, Setagaya-Ku, Tokyo, Japan
Filed Oct. 27, 1989, Ser. No. 427,809
Claims priority, application Japan, Apr. 28, 1989, 1-16299
Term of patent 14 years
U.S. Cl. D18—43



319,843
COMBINATION GREETING CARD AND GIFT-HOLDING CONTAINER
Ernest L. Thornell, Rte. 2, Box 14, Hermann, Mo. 65041
Filed Dec. 30, 1988, Ser. No. 291,990
Term of patent 14 years
U.S. Cl. D19—2



319,844
BALL POINT PEN
Gerald Grötsch, Fürth, and Friedrich Heger, Feucht, both of Fed. Rep. of Germany, assignors to J.S. Staedtler GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Mar. 13, 1989, Ser. No. 322,769
Term of patent 14 years
U.S. Cl. D19—48



319,845
MECHANICAL PEN
Gerald Grötsch, Fürth, and Friedrich Heger, Feucht, both of Fed. Rep. of Germany, assignors to J.S. Staedtler GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Mar. 13, 1989, Ser. No. 322,770
Term of patent 14 years
U.S. Cl. D19—48

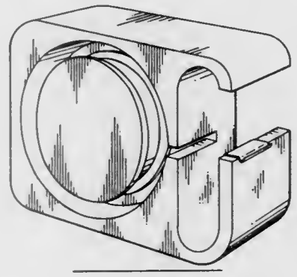


319,846
ERASER
Jerrilyn C. Kiyokane, Seal Beach, Calif., assignor to Namkung Promotions, Inc., Costa Mesa, Calif.
Filed Nov. 7, 1988, Ser. No. 267,769
Term of patent 14 years
U.S. Cl. D19—53

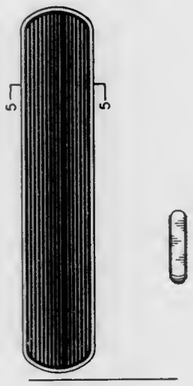




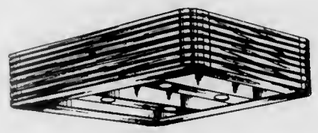
319,847
TAPE DISPENSER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Jan. 13, 1989, Ser. No. 296,245
Term of patent 14 years
U.S. Cl. D19—69



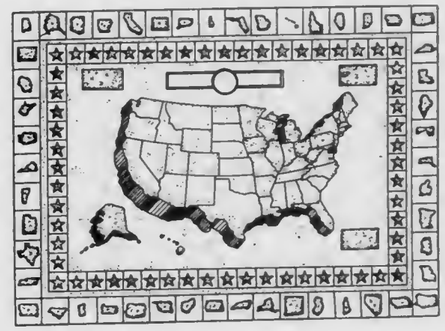
319,848
SIGN
James Hofman, Lake Bluff, Ill., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Feb. 23, 1989, Ser. No. 312,814
Term of patent 14 years
U.S. Cl. D20—10



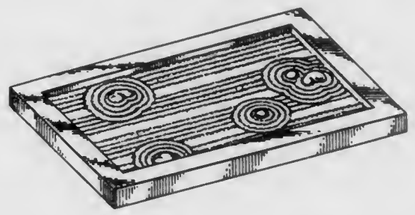

319,849
COMBINED HEADER AND SIGN SUPPORT HOUSING FOR A DISPLAY STAND
David C. F. Stoddard, and James D. Robertson, both of Atlanta, Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Oct. 16, 1989, Ser. No. 421,914
Term of patent 14 years
U.S. Cl. D20—19



319,850
GAME BOARD
Francisco J. Diaz, 9 Leonard Ct., Rockville, Md. 20850
Filed May 2, 1989, Ser. No. 346,602
Term of patent 14 years
U.S. Cl. D21—31



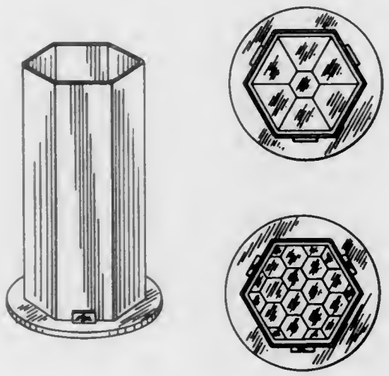
319,851
TOY ROCK AND SAND GARDEN
Peter J. Hartwell, 16 Old Army Rd., Bernardsville, N.J. 07924
Filed Apr. 25, 1989, Ser. No. 343,132
Term of patent 14 years
U.S. Cl. D21—59



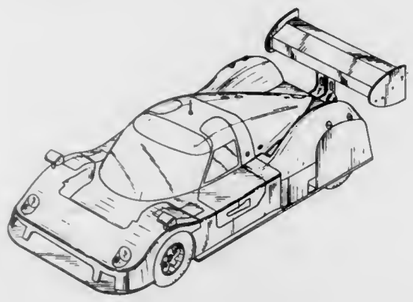
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319,852
KALEIDOSCOPE
Gerald R. Sorensen, Elgin, and Marvin G. Kuhlman, Des Plaines, both of Ill., assignors to National Creative Merchandising Corp., Arlington Heights, Ill.
Filed Feb. 14, 1989, Ser. No. 310,849
Term of patent 14 years
U.S. Cl. D21—60



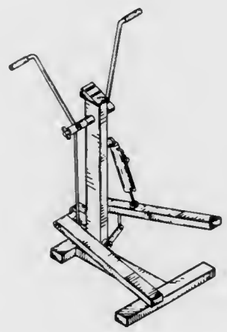
319,853
MODEL RACING CAR
Anthony J. Southgate, Northampton, United Kingdom, assignor to Jaguar Cars Limited, Warwickshire, United Kingdom
Filed Jul. 31, 1989, Ser. No. 387,106
Claims priority, application United Kingdom, Feb. 1, 1989, 1056794
Term of patent 14 years
U.S. Cl. D21—137



319,854
PATELLA EXERCISER
John O. Geary, 11547 Coolidge Pl., Los Angeles, Calif. 90066
Filed Sep. 23, 1988, Ser. No. 248,480
Term of patent 14 years
U.S. Cl. D21—191




319,855
PHYSICAL EXERCISER
John W. Bull, 2502 Wedgewood Ct., Olympia, Wash. 98501
Continuation-in-part of Ser. No. 181,302, Apr. 13, 1988, Pat. No. 4,830,362. This application Apr. 19, 1988, Ser. No. 183,184
Term of patent 14 years
U.S. Cl. D21—195

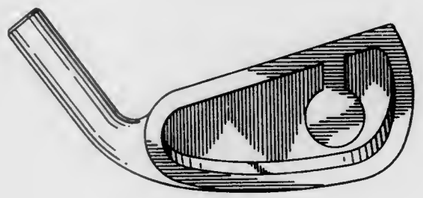




319,856
GOLF CLUB PUTTER
James A. Wennemar, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.
Filed Feb. 17, 1987, Ser. No. 15,002
Term of patent 14 years
U.S. Cl. D21—215

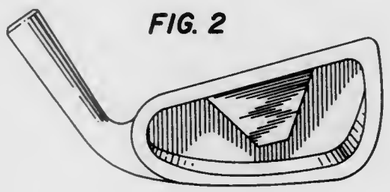


319,857
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Dec. 28, 1988, Ser. No. 290,899
Term of patent 14 years
U.S. Cl. D21—220



319,858
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Dec. 28, 1988, Ser. No. 290,902
Term of patent 14 years
U.S. Cl. D21—220

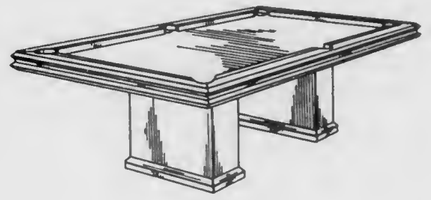
FIG. 2



319,859
TENNIS NET BASE SUPPORT OR SIMILAR ARTICLE
John W. Cutrone, 17-17 3rd Ave. N. #9, Lake Worth, Fla. 33460
Filed Apr. 26, 1988, Ser. No. 186,215
Term of patent 14 years
U.S. Cl. D21—221



319,860
BILLIARD TABLE
Horst Ascher, Steinbrecherstrasse 22, 3300 Braunschweig, Fed. Rep. of Germany
Filed Aug. 29, 1988, Ser. No. 237,877
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 1431
Term of patent 14 years
U.S. Cl. D21—232



319,861
BILLIARD TABLE
Donald S. Brostoski, and Susan M. Brostoski, both of Calabassas, Calif., assignors to Golden West Billiard Supply, Inc., Canoga Park, Calif.
Filed Jul. 5, 1989, Ser. No. 375,622
Term of patent 14 years
U.S. Cl. D21—232



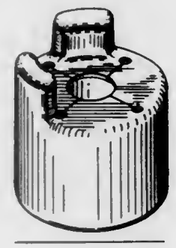
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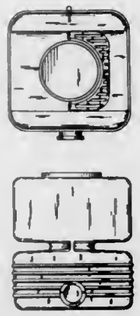
319,862
GREEN MARKERS
Torgny L. O. Lahger, Brobyvägen 8, 289 00 Knislinge, Sweden
Filed Nov. 26, 1986, Ser. No. 935,546
Claims priority, application Sweden, May 30, 1986, 86-1309
Term of patent 14 years
U.S. Cl. D21—234



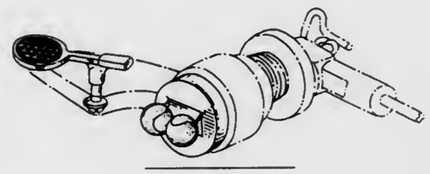
319,863
RETAINER CAP FOR FISHING ROD HOLDER
Reginald O. Oak, 290 Somerset Ave., Fairfield, Conn. 06430, and William J. Preinsberger, P.O. Box 1731, Darien, Conn. 06820
Filed Jan. 3, 1989, Ser. No. 293,476
Term of patent 14 years
U.S. Cl. D22—147



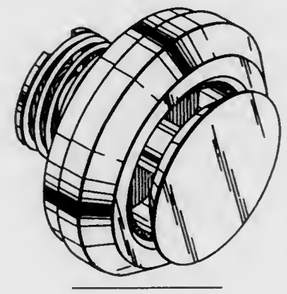
319,864
COMBINED REFRIGERATOR JUG AND WATER FILTER
Francois Geneve; Luc Heiligenstein, and Stephen Melamed, all of Chicago, Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Aug. 11, 1989, Ser. No. 393,305
Term of patent 14 years
U.S. Cl. D23—209



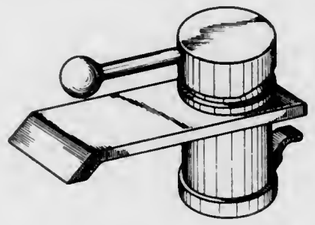
319,865
ORNAMENTS FOR FLUSH HANDLES
Ronald P. Hardman, 1046 W. Tropicana Ct., Ontario, Calif. 91762
Filed Feb. 27, 1989, Ser. No. 315,772
Term of patent 14 years
U.S. Cl. D23—251



319,866
VACUUM BREAKER VALVE
Ronald J. Rogers, Fredericksburg, Iowa, assignor to Vacu-Purg, Inc., Fredericksburg, Iowa
Filed Jun. 20, 1988, Ser. No. 210,106
Term of patent 14 years
U.S. Cl. D23—235

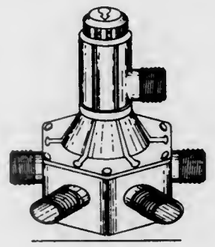


319,867
FAUCET
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Sep. 29, 1989, Ser. No. 415,113
Claims priority, application World Int. Prop. O., Apr. 10, 1989, DM/013310
Term of patent 14 years
U.S. Cl. D23—238

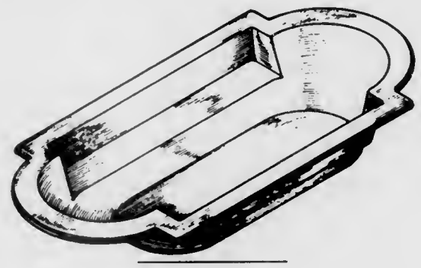




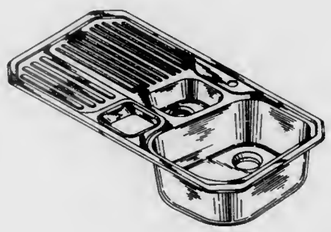
319,868
MULTI-OUTLET SEQUENCER VALVE
Paul Robinson, Woodville, Australia, assignor to Sabco Limited, Australia
Filed Dec. 9, 1988, Ser. No. 282,287
Claims priority, application Australia, Jul. 27, 1988, 2485
Term of patent 14 years
U.S. Cl. D23—246



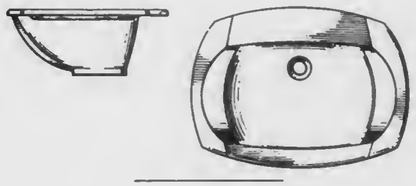
319,869
BATH TUB
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Jun. 16, 1989, Ser. No. 367,101
Claims priority, application Int'l Pat. Institute, Jan. 3, 1989, DM/012526
Term of patent 14 years
U.S. Cl. D23—280



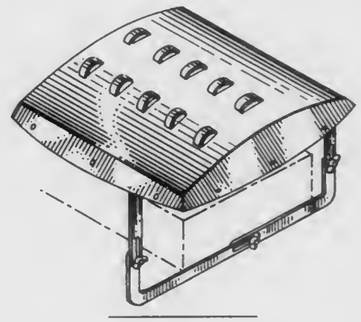
319,870
SINK
Klaus W. Göcke, Detmold, and Manfred Mück, Kürnbach, both of Fed. Rep. of Germany, assignors to Blanco GmbH & Co. KG, Oberderdingen, Fed. Rep. of Germany
Filed Dec. 28, 1988, Ser. No. 290,893
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 10 AR 88/88
Term of patent 14 years
U.S. Cl. D23—287



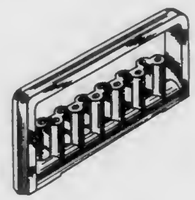
319,871
LAVATORY
Rik Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Dec. 11, 1989, Ser. No. 448,592
Term of patent 14 years
U.S. Cl. D23—294



319,872
SUN SHADE FOR A WINDOW AIR CONDITIONER
Frankie Holt, 1820 Marshall St., Columbia, S.C. 29203
Filed May 14, 1990, Ser. No. 522,849
Term of patent 14 years
U.S. Cl. D23—354



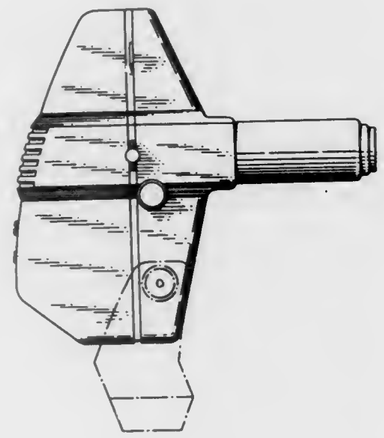
319,873
DENTAL BURR HOLDER
Melvin R. Rouse, 1056 Serpentine La., Pleasanton, Calif. 94566
Filed Feb. 17, 1989, Ser. No. 312,565
Term of patent 14 years
U.S. Cl. D24—147



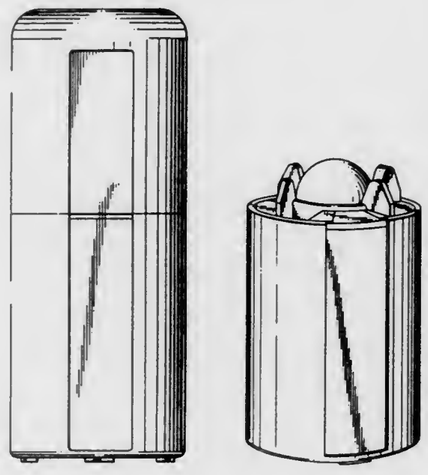
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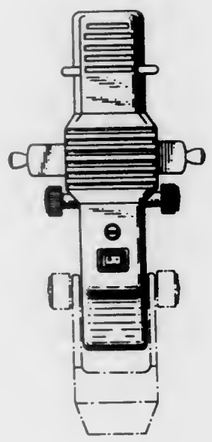


319,874
OPHTHALMIC PROJECTOR
Werner Höelbl, Vienna, Austria, assignor to Cambridge Instruments Inc., Buffalo, N.Y.
Filed Sep. 19, 1988, Ser. No. 245,547
Term of patent 14 years
U.S. Cl. D24—150



319,875
TOOTHBRUSH SANITIZING CAPSULE
A. Wayne Lackey, 8090 Twin Lake Dr., Boca Raton, Fla. 33496, and Joseph F. Bello, 7763 Villa Nova Dr., Boca Raton, Fla. 33433
Filed Jun. 20, 1988, Ser. No. 208,567
Term of patent 14 years
U.S. Cl. D24—217





319,876
BLOOD PRESSURE GAUGE
Kenichi Kida, Tokyo, and Hideo Hata, Fuji, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 10, 1989, Ser. No. 309,712
Claims priority, application Japan, Mar. 9, 1988, 63-9298
Term of patent 14 years
U.S. Cl. D24—165





319,877
GYNECOLOGICAL FORCEPS
Terry O'Neal-Cox, Roselle Park, N.J., assignor to R. Martin Oliveras, Newark, N.J., a part interest
Filed Jan. 12, 1989, Ser. No. 296,197
Term of patent 14 years
U.S. Cl. D24—143



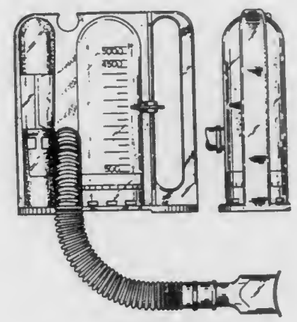
319,878
NASAL INSERT FOR ABSORBING MUCUS AND THE LIKE
Bruce K. Holland, 2323 N. Woodlawn, #719, Wichita, Kans. 67220
Filed Jul. 14, 1988, Ser. No. 218,602
Term of patent 14 years
U.S. Cl. D24—106



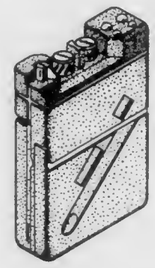
319,879
SINGLE SAMPLE PROCESSOR SYRINGE FOR SOLID PHASE EXTRACTION TUBES
George D. Wachob, State College, and Brian R. Lowery, Julian, both of Pa., assignors to Supelco, Inc., Bellefonte, Pa.
Filed Dec. 16, 1987, Ser. No. 133,694
Term of patent 14 years
U.S. Cl. D24—108



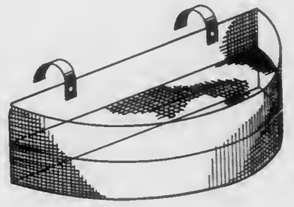
319,880
BREATHING EXERCISER
Laszlo Tapolcai, Stamford, Conn., assignor to Sherwood Medical Company, St. Louis, Mo.
Filed Nov. 8, 1988, Ser. No. 269,099
Term of patent 14 years
U.S. Cl. D24—164



319,881
TRANSCUTANEOUS ELECTRICAL NERVE STIMULATOR
David Zuppan, New Brighton, and Zosim Ioffe, St. Paul, both of Minn., assignors to Empi, Inc., St. Paul, Minn.
Filed Mar. 2, 1989, Ser. No. 317,789
Term of patent 14 years
U.S. Cl. D24—214



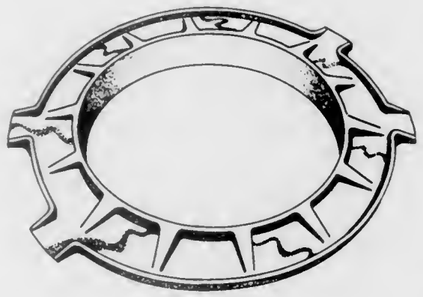
319,882
TODDLER'S POOL TRAINING PLATFORM
Margo D. Scott, 249 Newton Hill Rd., Box 185, Northfield, Conn. 06778
Filed Jul. 23, 1987, Ser. No. 76,934
Term of patent 14 years
U.S. Cl. D25—2



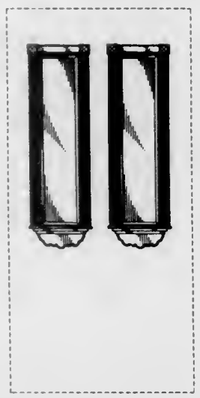
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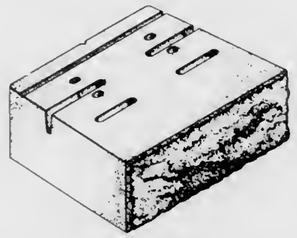
319,883
RING FOR A MANHOLE COVER
Martin C. Pettesch, Roselle, and Robert O. Andreasen, Bridgewater, both of N.J., assignors to Universal Valve Company, Inc., Elizabeth, N.J.
Filed Oct. 12, 1988, Ser. No. 257,029
Term of patent 14 years
U.S. Cl. D25—36



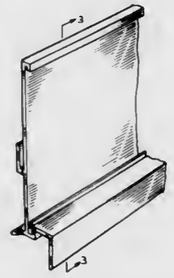
319,884
DOOR PANEL
Roger C. Hall, Jasper, Tex., assignor to Visador Company, Jasper, Tex.
Filed Oct. 24, 1988, Ser. No. 261,058
Term of patent 14 years
U.S. Cl. D25—48



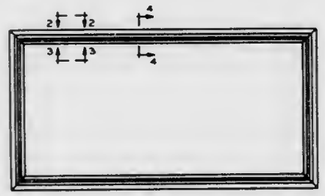
319,885
RETAINING WALL BLOCK
Peter J. Blomquist, and Michael E. Woolford, both of Lake Elmo, Minn., assignors to Kiltie Corporation, North St. Paul, Minn.
Continuation of Ser. No. 239,976, Sep. 2, 1988, abandoned. This application Nov. 30, 1990, Ser. No. 620,306
Term of patent 14 years
U.S. Cl. D25—118



319,886
CARD HOLDER EXTRUSION
Roger F. Simpson, Malvern, and Barry W. Crone, Balwyn, both of Australia, assignors to Design Synergy Pty. Ltd., Albert Park, Australia
Filed Oct. 17, 1988, Ser. No. 258,984
Claims priority, application Australia, Apr. 19, 1988, 1295/88
Term of patent 14 years
U.S. Cl. D25—119

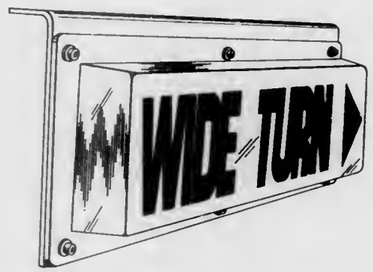


319,887
ADJUSTABLE WIDTH COPYING FOR SWIMMING POOLS
Richard H. Lewis, 3144 Nisbet, Pinckney, Mich. 48169
Filed Mar. 28, 1989, Ser. No. 329,487
Term of patent 14 years
U.S. Cl. D25—119

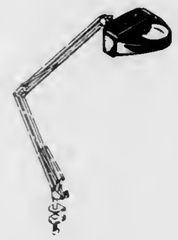




319,888
AUXILIARY ILLUMINATED TURN SIGNAL FOR SEMI-TRAILERS
Wesley P. Brandon, Palestine, Tex., assignor to Safety Signals, Inc., Jacksonville, Tex.
Filed Jan. 24, 1989, Ser. No. 301,272
Term of patent 14 years
U.S. Cl. D26—31




319,889
LAMP SHADE WITH MAGNIFYING GLASS
James Lu, 6F1.-3, No. 512, Sec. 4, Chunghsiao E. Rd., Taipei, Taiwan
Filed Jan. 17, 1989, Ser. No. 297,342
Term of patent 14 years
U.S. Cl. D26—51



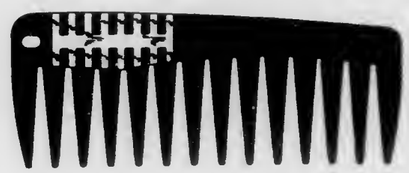
319,890
LANTERN
Barbara J. Stork, Lancaster, Pa., assignor to Donsco, Inc., Wrightsville, Pa.
Filed Mar. 17, 1989, Ser. No. 326,210
Term of patent 14 years
U.S. Cl. D26—41



319,891
OUTDOOR LIGHT FIXTURE
Robert D. Giese, Kenosha, Wis., assignor to Intermatic Incorporated, Spring Grove, Ill.
Filed Jul. 28, 1989, Ser. No. 387,102
Term of patent 14 years
U.S. Cl. D26—67



319,892
COMB
Francis G. Caron, Strasbourg, France, assignor to CELLULOID S.A., Selestat, France
Filed Mar. 6, 1989, Ser. No. 318,949
Claims priority, application France, Sep. 5, 1988, 885508
Term of patent 14 years
U.S. Cl. D28—21



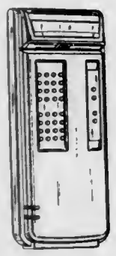
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319,893
RAZOR HANDLE
Alan K. Pittaway, High Wycombe, England, assignor to Wilkinson Sword Limited, Bucks, England
Filed Mar. 24, 1989, Ser. No. 328,138
Claims priority, application United Kingdom, Sep. 30, 1988, 1053947
Term of patent 14 years
U.S. Cl. D28—48



319,894
DRY SHAVER
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Oct. 10, 1989, Ser. No. 418,452
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 8902755
Term of patent 14 years
U.S. Cl. D28—49



319,895
DRY SHAVER
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Oct. 10, 1989, Ser. No. 418,453
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1989, 8902755
Term of patent 14 years
U.S. Cl. D28—49



319,896
COMBINED DRY SHAVER WITH CHARGING STAND THEREFOR
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany
Filed Oct. 11, 1989, Ser. No. 419,696
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 8902808
Term of patent 14 years
U.S. Cl. D28—49





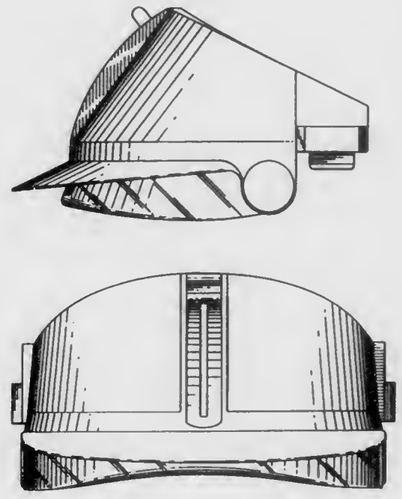
319,897
CREAM MAKE-UP CONTAINER
Karena Bakic, Varese, Italy, assignor to Cosmede Anstalt, Liechtenstein
Filed Mar. 30, 1988, Ser. No. 175,128
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1987, URA1501/87
Term of patent 14 years
U.S. Cl. D28—82



319,898
OXYGEN TANK CASE
Joseph T. Whitworth, Kalispell, Mont., assignor to G. B. Communications, Inc., Kalispell, Mont.
Filed Oct. 11, 1988, Ser. No. 256,372
Term of patent 14 years
U.S. Cl. D29—7



319,899
VISOR ATTACHMENT FOR SAFETY HELMETS
Martin Pernicka, Montreal, Canada, assignor to Institut de Recherche en Santé et an Sécurité do Travail do Quebec, Montreal, Canada
Filed May 30, 1989, Ser. No. 363,942
Term of patent 14 years
U.S. Cl. D29—16



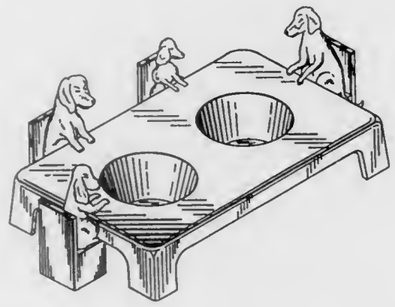
319,900
GLOVE FOR DIVERS
Terry S. Steele, Jupiter, Fla., assignor to Wenoka SeaStyle, West Palm Beach, Fla.
Filed Feb. 13, 1989, Ser. No. 309,549
Term of patent 14 years
U.S. Cl. D29—22

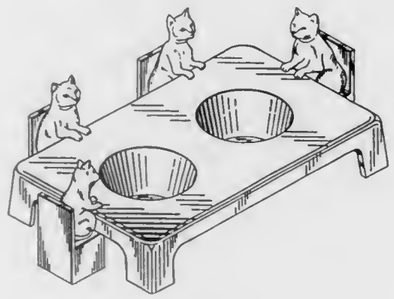


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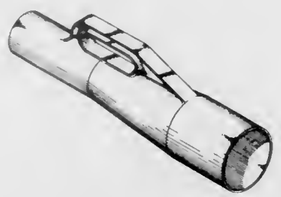


319,901
ANIMAL FEEDING TABLE
Gerald Steiner, 2033 Virginia Ave. South, St. Louis Park, Minn. 55426
Division of Ser. No. 219,178, Jul. 15, 1988, Pat. No. Des. 315,594. This application Aug. 23, 1990, Ser. No. 571,444
Term of patent 14 years
U.S. Cl. D30—131





319,902
HANDLE ATTACHMENT FOR GARDENER'S AIR BLOWER
Raymone E. Russell, P.O. Box 282, Grenada, Calif. 96038
Filed Oct. 10, 1989, Ser. No. 421,571
Term of patent 14 years
U.S. Cl. D32—15



319,903
STOCKING HOLDER
Edward L. Barner, 10880 Wilshire Blvd., Los Angeles, Calif. 90024
Filed Aug. 5, 1988, Ser. No. 228,969
Term of patent 14 years
U.S. Cl. D32—61





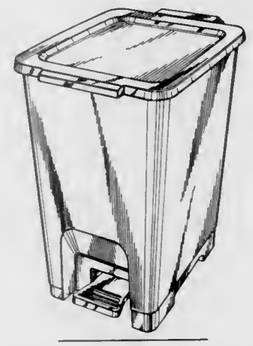




319,904
CONTAINER FOR RECYCLING
Andrew M. Cozzi, 161 Camden St., Roselle Park, N.J. 07204, and Jesse L. Colodner, 22 Walter St., Pearl River, N.Y. 10965
Filed Aug. 25, 1988, Ser. No. 236,140
Term of patent 14 years
U.S. Cl. D34—1



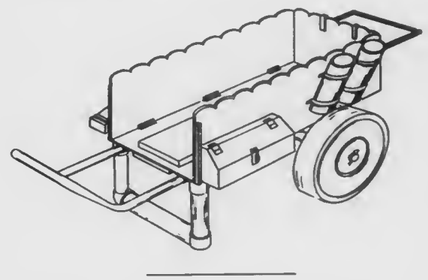
319,905
STEP-ON WASTEBASKET
Eric Hotchkiss, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jan. 13, 1989, Ser. No. 296,762
Term of patent 14 years
U.S. Cl. D34—9



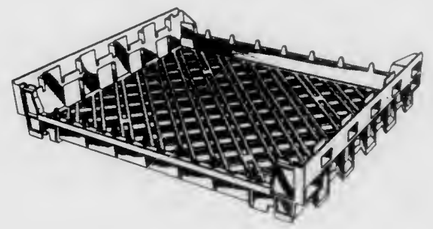
319,906
SHOPPING CART WITH SEAT
Takehiko Takahashi; Kinji Adachi, and Tomihiro Kaneko, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Mar. 21, 1989, Ser. No. 327,176
Term of patent 14 years
U.S. Cl. D34—19



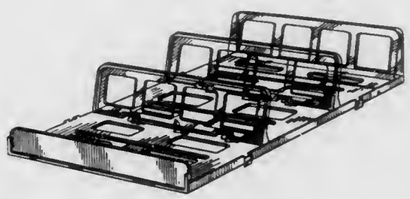
319,907
FISHERMAN'S CART
Alton V. Fountain, 101 Kilarny Rd., Wilmington, N.C. 28409
Filed Oct. 2, 1989, Ser. No. 415,530
Term of patent 14 years
U.S. Cl. D34—26



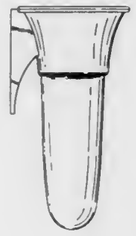
319,908
BAKERY TRAY
Edward L. Stahl, Lee's Summit, Mo., assignor to Piper Industries of Texas, Inc., Orlando, Fla.
Filed Apr. 12, 1989, Ser. No. 337,165
Term of patent 14 years
U.S. Cl. D34—40



319,909
COLLAPSIBLE FOOD DISPLAY TRAY
James M. Snediker, Glenview, Ill., and Daniel J. Oelschlaeger, Oak Creek, Wis., assignors to Chicago Show Printing Co., Morton Grove, Ill.
Filed Jan. 19, 1990, Ser. No. 467,764
Term of patent 14 years
U.S. Cl. D34—40



**319,910**
**MAUSOLEUM VASE**
David N. Hepburn, and Robert E. Hepburn, both of Glendale, Calif., assignors to Triple H Company, Glendale, Calif.
Filed Jul. 17, 1990, Ser. No. 553,682
Term of patent 14 years
U.S. Cl. D99—5



**319,911**
**COIN CASE**
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company Ltd., Tokyo, Japan
Filed Aug. 5, 1988, Ser. No. 229,541
Term of patent 14 years
U.S. Cl. D99—37



# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 10TH DAY OF SEPTEMBER, 1991

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Abbiss, John B.; Smart, Anthony E.; and Woodward, Roger P., to Titan Corporation, The. Improvements in a system for determining atmospheric data relating to the movements of an airborne vehicle. 5,046,840, Cl. 356-28.000.

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Abraham, Dennis G.; Aden, Steven G.; Arnold, Todd W.; Neckyfarow, Steven W.; and Rohland, William S., to International Business Machines Corporation. Transaction system security method and apparatus. 5,048,085, Cl. 380-23.000.

Abrams, Louis B.; and Arzberger, Gerhard A., to High Voltage Graphics, Inc. Method for making flock applique and transfers. 5,047,103, Cl. 156-72.000.

ACE Orthopedic Manufacturing: *See—*
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Adachi, Yuuma, to Fuji Photo Film Co., Ltd. Method and apparatus for enlarging or reducing images. 5,048,105, Cl. 382-47.000.

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Adkins, Wayman L. Asbestos bulk extractor and method therefor. 5,046,301, Cl. 53-435.000.

Adlhart, Otto J.; and Meyer, Timothy D., to Ergenics Power Systems, Inc. High temperature battery and system utilizing same. 5,047,301, Cl. 429-101.000.

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Aebi, Max; and Mathys, Robert, Jr., to Synthes (U.S.A.). Clamp and system for internal fixation. 5,047,029, Cl. 606-61.000.

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Aisaka, Hideki; and Sawa, Buntarou, to Kabushiki Kaisha Toshiba. Radio telephone apparatus. 5,048,117, Cl. 455-89.000.

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Aitken, John; and Oria, Victorio L., to Mecano-Tech, Inc.; and Explosivos Tecnologios Argentino S.A. Adiabatically induced ignition of combustible materials. 5,046,567, Cl. 175-4.600.

Aittoniemi, Kari T. J.; and Jarvi, Ari T., to Outokumpu Oy. Improving the discrimination of an impulse technique metal detector by correlating responses inside and outside of a cut-off peak area. 5,047,718, Cl. 324-239.000.

Aizawa, Junichi; Kumazawa, Shoichiro; and Wada, Tomohiro, to Seikosha Co., Ltd. Timepiece with mobile decorations. 5,047,998, Cl. 368-75.000.

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Ando, Shigeru: *See—*
Mitsuhashi, Daisuke; Ando, Shigeru; and Nishiyama Tomoyuki, 5,047,888, Cl. 360-130.340.
Andoh, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonaka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, to Asahi Kogaku Kogyo K.K. Apparatus for correcting scanning beams on basis of tilting of surface segments of polygonal mirror used in scanning pattern drawing apparatus. 5,046,796, Cl. 359-216.000.
Andrese, Angelo P.: *See—*
Emmons, Robert E.; Mauck, Linda A.; Mauck, John C.; Wu, TaiWing; Rand, Royden N.; and Andrese, Angelo P., 5,047,322, Cl. 435-6.000.
Andrews, Peter J.: *See—*
James, Felicia M.; and Andrews, Peter J., 5,047,730, Cl. 330-256.000.
Andros, Andrew A.; and Campana, Thomas J., Jr., to Telefind Corporation. Paging system with dynamically programmable reception frequencies. 5,047,764, Cl. 340-825.440.
Andrus, William A.; McCollum, Christie D.; and Zon, Gerald, to Applied Biosystems, Inc. Automated system for polynucleotide synthesis and purification. 5,047,524, Cl. 536-27.000.
Anelva Corporation: *See—*
Akao, Yasuhiko; and Sakurai, Takehiro, 5,047,130, Cl. 204-192.120.
Angelo, Raymond W.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; Lawrence, William H.; Pappas, Socrates P.; and Simpson, Logan L., to International Business Machines Corporation. Sulfonium salts and use and preparation thereof. 5,047,568, Cl. 556-64.000.
Angus Fire Armour Limited: *See—*
Harcourt, Robert M., 5,047,200, Cl. 264-514.000.
Annis, Eugene A.: *See—*
Bostrom, John; and Annis, Eugene A., 5,046,912, Cl. 414-358.000.
Anno, Hidero; and Ono, Katsuhiro, to Kabushiki Kaisha Toshiba. Method of manufacturing and X-ray image intensifier. 5,047,624, Cl. 250-213.0VT.
Anreiter, Alois, to Linsinger Maschinenbau GmbH. Method for manufacturing stators, in particular extended stators, for pumps or motors with eccentric shafts. 5,046,244, Cl. 29-888.020.
Antfang, Elmar; Kerimis, Dimitrios; and Singer, Rolf-Jurgen, to Bayer Aktiengesellschaft. Carrier granules containing liquid active compounds. 5,047,243, Cl. 424-408.000.
Antonious, Anthony J. Iron type golf club head with improved perimeter weight configuration. 5,046,733, Cl. 273-77.00A.
Antoon, John M. Exercising device. 5,046,722, Cl. 272-63.000.
Aoki, Harumi; and Sakai, Nobuya, to Asahi Kogaku Kogyo K.K. Recording device for electronic still camera. 5,047,869, Cl. 358-341.000.
Aoki, Nobuo; Kimura, Shigeru; and Shiratsuchi, Masami, to Kowa Company, Ltd. Thrombin-binding substance and process for its preparation. 5,047,503, Cl. 530-350.000.
Aoki, Nobuo: *See—*
Shoji, Fusaji; Aoki, Nobuo; Kurita, Jun; Aoyama, Tsuyoshi; Kiriyu, Toshiyuki; and Matsuzaki, Yoshinori, 5,047,560, Cl. 549-241.000.
Aoki, Yoshisada: *See—*
Toda, Akitoshi; Shimazu, Hisanari; Takano, Akira; Miyanaga, Hirofumi; Takahashi, Susumu; Ohaki, Yoshinao; and Aoki, Yoshisada, 5,047,847, Cl. 358-98.000.
Aono, Takami: *See—*
Ogura, Naoyuki; and Aono, Takami, 5,046,911, Cl. 414-331.000.
Aotsu, Hiroaki: *See—*
Kurosu, Yasuo; Okazawa, Koichi; Yokoyama, Yoshihiro; Aotsu, Hiroaki; and Masuzaki, Hidefumi, 5,048,101, Cl. 382-41.000.
Aoyagi, Toshitaka: *See—*
Arimoto, Satoshi; and Aoyagi, Toshitaka, 5,048,037, Cl. 372-45.000.
Aoyama, Tsuyoshi: *See—*
Shoji, Fusaji; Aoki, Nobuo; Kurita, Jun; Aoyama, Tsuyoshi; Kiriyu, Toshiyuki; and Matsuzaki, Yoshinori, 5,047,560, Cl. 549-241.000.
Aoyama, Yoshiyuki; Nakano, Takahiro; and Kanasashi, Osamu, to Nippon Seiko Kabushiki Kaisha. Method and apparatus for checking pattern. 5,048,094, Cl. 382-8.000.
Appel, Kay: *See—*
Schnitker, Wolfgang E.; Nover, Michael P. J.; and Appel, Kay, 5,047,368, Cl. 437-213.000.
Apple Computer, Inc.: *See—*
Hoffert, Eric M., 5,047,853, Cl. 358-133.000.
Sander, Wendell; and Sander, Brian, 5,047,967, Cl. 364-569.000.
Applied Biosystems, Inc.: *See—*
Andrus, William A.; McCollum, Christie D.; and Zon, Gerald, 5,047,524, Cl. 536-27.000.
Applied Materials, Inc.: *See—*
Fishkin, Boris; and Current, Michael, 5,047,648, Cl. 250-492.200.
Murdoch, Steven, 5,046,909, Cl. 414-225.000.
Aquatic Amusement Associates, Ltd.: *See—*
Bastenhof, Dirk, 5,047,146, Cl. 210-97.000.
Araghi, Mehdi N.: *See—*
Ritter, Joachim A.; Araghi, Mehdi N.; and Kramer, Charles J., 5,046,794, Cl. 359-18.000.
Arai, Koichi. Retained wire filter element. 5,047,148, Cl. 210-498.000.
Arai, Masanobu; Yamaguchi, Masaru; and Ogata, Takenori, to NEC Corporation. Digital signal receiving circuit with means for controlling a baud rate sampling phase by a power of sampled signals. 5,048,060, Cl. 375-106.000.
Arai, Yasunori: *See—*
Nagase, Makoto; Asami, Kuniaki; Kobayashi, Shuichi; Arai, Yasunori; Ito, Kazuo; and Oka, Motohiro, 5,046,507, Cl. 128-745.000.
Arano, Noriyuki; and Tsuchiya, Michiyo, to Denki Kagku Kogyu Kabushiki. Heat resistant alumina fiber mat. 5,047,289, Cl. 428-221.000.
Arch Development Corporation: *See—*
Stetter, Joseph R.; and Otagawa, Takaaki, 5,047,352, Cl. 436-181.000.
Argotec, Inc.: *See—*
Willard, Bernard; and Forsberg, Gerard K., 5,047,997, Cl. 367-191.000.
Arii, Kazuyoshi: *See—*
Tsuda, Akira; and Arii, Kazuyoshi, 5,046,312, Cl. 60-493.000.
Arikawa, Toshimitsu: *See—*
Hayashi, Hiroo; Ishida, Katsuhiko; and Arikawa, Toshimitsu, 5,047,383, Cl. 503-200.000.
Arimoto, Satoshi; and Aoyagi, Toshitaka, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 5,048,037, Cl. 372-45.000.
Arizona Board of Regents, acting on behalf of Arizona State University: *See—*
Pettit, George R.; and Kamano, Yoshiaki, 5,047,532, Cl. 544-230.000.
ARK, Inc.: *See—*
Clapp, Timothy G.; and Cole, William R., Jr., 5,046,712, Cl. 271-65.000.
Arlington-Hews, Inc.: *See—*
Erickson, Harry, 5,046,982, Cl. 446-112.000.
Armiger, Ronald E.; and Mang, Joyce M., to Westinghouse Electric Corp. Sonar transducer. 5,047,996, Cl. 367-154.000.
Arney, Michelle M.; and Burns, Matthew M., to Scimed Life Systems, Inc. Multi-section coaxial angioplasty catheter. 5,047,045, Cl. 606-194.000.
Arnold, Herbert; Horbelt, Michael; Jautelat, Rudiger; Werner, Peter; Mezger, Manfred; and Plapp, Gunther, to Robert Bosch GmbH. System for setting the throttle flap angle for an internal combustion engine. 5,046,467, Cl. 123-339.000.
Arnold, Todd W.: *See—*
Abraham, Dennis G.; Aden, Steven G.; Arnold, Todd W.; Neckyfarow, Steven W.; and Rohland, William S., 5,048,085, Cl. 380-23.000.
Aronson, Meredith A.: *See—*
Krug, William P.; and Aronson, Meredith A., 5,047,162, Cl. 252-62.900.
Arpesani, Alberto. Internal prosthesis with radiopaque annular portions. 5,047,050, Cl. 623-1.000.

Aruga, Tamotsu: *See—*
Shimada, Tomoyuki; Sasaki, Masaomi; and Aruga, Tamotsu, 5,047,590, Cl. 564-309.000.
Arvanitakis, Kostas S., to Hydro-Tek, Inc. Apparatus for clarifying liquids. 5,047,123, Cl. 202-170.000.
Arzberger, Gerhard A.: *See—*
Abrams, Louis B.; and Arzberger, Gerhard A., 5,047,103, Cl. 156-72.000.
Asahi Kogaku Kabushiki Kaisha: *See—*
Takahashi, Nagashige; and Ouchi, Teruo, 5,046,351, Cl. 72-478.000.
Asahi Kogaku Kogyo K.K.: *See—*
Andoh, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonaka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,046,796, Cl. 359-216.000.
Aoki, Harumi; and Sakai, Nobuya, 5,047,869, Cl. 358-341.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Iima, Mitsunori; and Mori, Seiich, 5,047,625, Cl. 250-216.000.
Morimoto, Akira; and Iizuka, Takashi, 5,046,795, Cl. 359-206.000.
Asahi Trading Co., Ltd.: *See—*
Hakui, Tamotsu, 5,046,438, Cl. 112-222.000.
Asai, Kohtaro: *See—*
Murakami, Tokumichi; Ito, Atsushi; and Asai, Kohtaro, 5,047,838, Cl. 358-13.000.
Asakura, Tsutou: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,046,828, Cl. 359-72.000.
Asami, Kuniaki: *See—*
Nagase, Makoto; Asami, Kuniaki; Kobayashi, Shuichi; Arai, Yasunori; Ito, Kazuo; and Oka, Motohiro, 5,046,507, Cl. 128-745.000.
Asano, Seiji; Takagi, Junichi; and Kono, Takaji, to Fuji Photo Film Co., Ltd. Camera. 5,047,792, Cl. 354-149.110.
Asano, Yasuo: *See—*
Yanagi, Tooru; and Asano, Yasuo, 5,046,812, Cl. 385-96.000.
Asari, Logan R.: *See—*
Ray, James C.; and Asari, Logan R., 5,046,846, Cl. 356-326.000.
Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Throttle control apparatus for an internal combustion engine. 5,046,575, Cl. 180-178.000.
Asea Brown Boveri Aktiengesellschaft: *See—*
Rohr, Franz-Josef; and Reich, Andreas, 5,047,388, Cl. 505-1.000.
Ashcroft, Richard N.; and Jennings, John J. Animal enclosure apparatus, and methods of constructing and utilizing same. 5,046,457, Cl. 119-168.000.
Ashida, Yasuhiro: *See—*
Kimura, Mayumi; Ashida, Yasuhiro; and Ito, Masami, 5,046,754, Cl. 280-707.000.
Ashkenazi, Itzhak: *See—*
Landa, Benzion; Ashkenazi, Itzhak; Van Mil, Jan; Pinhas, Hanna; and Lior, Ishaiau, 5,047,808, Cl. 355-277.000.
ASSA AB: *See—*
Urby, Lars, 5,046,342, Cl. 70-337.000.
Assad, Andrew M.: *See—*
Gaborski, Roger S.; Beato, Louis J.; Barski, Lori L.; Tan, Hin-Leong; Assad, Andrew M.; and Dutton, Dawn L., 5,048,097, Cl. 382-14.000.
Associated Universities, Inc.: *See—*
Francis, Arokiasamy J.; Dodge, Cleveland J.; and Gillow, Jeffrey B., 5,047,152, Cl. 210-611.000.
Astegher, Berthold; Lechner, Alexander; and Jessner, Hermann, to Siemens Aktiengesellschaft. Fast sample and hold circuit configuration. 5,047,666, Cl. 307-353.000.
Astill, Mark E.: *See—*
Smith, Roger E.; Astill, Mark E.; Smith, Jay L.; and Thorne, Gale H., 5,047,044, Cl. 606-182.000.
Astra Meditec AB: *See—*
Rossdeutscher, Sonja, 5,047,013, Cl. 604-53.000.
Astra-Tech AB: *See—*
Torok, Vilmos, 5,047,680, Cl. 310-156.000.
Astrua Testori, Silvia: *See—*
Grandi, Guido; Franchi, Elisabetta; Maisano, Federico; and Astrua Testori, Silvia, 5,047,333, Cl. 435-68.100.
AT&T Bell Laboratories: *See—*
Bell, John F.; Jones, David F.; Khalili, Farid; Kutzavitch, Walter G.; Luu, Thong V.; and Mahida, Manhar R., 5,048,080, Cl. 379-165.000.
Blyler, Lee L., Jr.; Chandross, Edwin A.; Cohen, Leonard G.; and Manzione, Louis T., 5,046,800, Cl. 350-96.120.
Chang, Peter C., 5,047,835, Cl. 357-74.000.
Chemla, Daniel S.; Miller, David A. B.; and Schmitt-Rink, Stephan, 5,047,810, Cl. 357-4.000.
Eng, Kai Y.; Gitlin, Richard D.; and Karol, Mark J., 5,048,013, Cl. 370-79.000.
Fleming, Debra A.; Johnson, David W., Jr.; Singh, Shobha; VanUitert, LeGrand G.; and Zydzik, George J., 5,047,369, Cl. 437-240.000.
Gavaras, George W.; Loots, Albert S.; and Shanghavi, Praful B., 5,048,081, Cl. 379-221.000.
Jarwala, Najmi T.; Rutkowski, Paul W.; and Yau, Chi W., 5,048,021, Cl. 371-22.300.
Morris, John R., 5,046,658, Cl. 228-206.000.
Saleh, Adel A. M.; and Wei, Lee-Fang, 5,048,057, Cl. 375-40.000.
Zilberfarb, Yossi, 5,048,015, Cl. 370-110.400.
Athas, William C.; Faucette, Reese; and Seitz, Charles L., to California Institute of Technology, The. Apparatus for intrasystem communications within a binary n-cube including buffer lock bit. 5,047,917, Cl. 364-200.000.
Atkinson, Gary M.: *See—*
Clark, William M., Jr.; Atkinson, Gary M.; Lum, Wing Y.; and Herring, James R., 5,047,827, Cl. 357-51.000.
Atlantic Richfield Company: *See—*
Sullivan, John L., 5,047,156, Cl. 210-744.000.
Atlas Copco MCT AB: *See—*
Emanuelsson, Kaj B. I.; and Hartwig, Carl S. M., 5,046,783, Cl. 299-31.000.
Atochem: *See—*
Glemet, Michel, 5,047,263, Cl. 427-203.000.
Nogues, Pierre; and Erard, Francois, 5,047,488, Cl. 526-65.000.
Atsugi Unisia Corporation: *See—*
Komatsu, Koichi, 5,046,572, Cl. 180-140.000.
Auerbach, Andrew B., to Hoechst Celanese Corporation. Impact modified polyphenylene sulfide. 5,047,465, Cl. 524-504.000.
Auergesellschaft GmbH: *See—*
Hunnebeck, Volker, 5,046,198, Cl. 2-440.000.
Ausmedics Pty. Ltd.: *See—*
Sincock, Brian F., 5,047,019, Cl. 604-192.000.
Austral Asian Lasers Pty. Ltd.: *See—*
Hughes, John L.; and Hudson, Barry L., 5,048,027, Cl. 372-18.000.
Austria Metall Aktiengesellschaft: *See—*
Garnweidner, Peter; and Ublacker, Peter, 5,046,777, Cl. 296-189.000.
Autio, Jukka, to Valmet Paper Machinery Inc. Multi-cylinder dryer with twin-wire draw and web transfer between the cylinder groups. 5,046,266, Cl. 34-120.000.
Automate-Tech: *See—*
deVries, John H.; and McCall, Walter K., 5,047,262, Cl. 427-96.000.
Automated Machinery Systems, Inc.: *See—*
Cummings, Donald L., 5,046,940, Cl. 425-239.000.
Avant, Odis L.; and Crawford, Duane A., to Odis Lynn Avant. Method and apparatus for effecting dorsal vein ligation and tubular anastomosis and laparoscopic prostatectomy. 5,047,039, Cl. 606-148.000.
Ayers, Ray R., to Shell Oil Company. Steel-fiberglass float. 5,046,443, Cl. 114-244.000.
Ayuta, Masanori: *See—*
Hiratsuka, Katsuo; Yazaki, Imao; Nakayama, Koichi; and Ayuta, Masanori, 5,046,437, Cl. 112-110.000.
Ayuta, Tokuichi; and Ohtsuki, Kazuhiro, to Daiichi Denshi Kogyo Kabushiki Kaisha. Cutter for optical fibers. 5,046,252, Cl. 30-258.000.
Aziende Chimiche Riunite: *See—*
Silvestrini, Bruno; and Cheng, Yan, 5,047,509, Cl. 530-392.000.
Azuma, Yusaku; Tanita, Takeo; Yammamoto, Toshihiro; Kasai, Shozo; Yasuhara, Masateru; and Sawada, Yasuhiro, to Canon Kabushiki Kaisha. Rotational driving apparatus with frictional engagement and robot using the same. 5,046,915, Cl. 414-744.500.
B. Braun Melsungen AG: *See—*
Mosebach, Wolfgang; Heitmeier, Rolf; and Knuth, Reinhard, 5,047,014, Cl. 604-67.000.
B. F. Goodrich Company, The: *See—*
Kletecka, George; and Lai, John Ta-Yuan, 5,047,460, Cl. 524-100.000.
Lenczyk, John P., 5,047,209, Cl. 422-62.000.
Baader, Edward J.; and Baader, Joseph E. Casing for a small motor assembly. 5,047,679, Cl. 310-89.000.
Baader, Joseph E.: *See—*
Baader, Edward J.; and Baader, Joseph E., 5,047,679, Cl. 310-89.000.
Babcock-Hitachi Kabushiki Kaisha: *See—*
Kato, Yasuyoshi; Teshima, Nobue; Konishi, Kunihiko; and Matsuda, Toshiaki, 5,047,378, Cl. 502-74.000.
Babcock & Wilcox Company, The: *See—*
Ales, Matthew W.; and Malloy, John D., III, 5,047,204, Cl. 376-430.000.
Kimmerle, William L.; and Miglin, Marie T., 5,047,093, Cl. 148-162.000.
Bach, Lars, to Alberta Research Council. High density corrugated wafer board panel product. 5,047,280, Cl. 428-182.000.
Badaye, Massoud: *See—*
Gundjian, Arshavir A.; and Badaye, Massoud, 5,047,645, Cl. 250-370.010.
Bae Jin Corporation: *See—*
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Baggen, Constant P. M. J.; Van Uijen, Cornelis M. J.; and Gaal, Erik W., to U.S. Philips Corporation. Method of and device for recording information, record carrier, device for reading the recorded information, and encoding and decoding circuit for use in the recording and read device. 5,048,003, Cl. 369-59.000.
Bagwell, Thomas V.: *See—*
Weers, Jerry J.; and Bagwell, Thomas V., 5,047,069, Cl. 44-334.000.
Baier, Manfred: *See—*
Ams, Felix; Baier, Manfred; and Schafer, Roland, 5,046,510, Cl. 128-771.000.
Ams, Felix; and Baier, Manfred, 5,047,010, Cl. 604-26.000.
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Baiocchi, Antonella: *See—*
Cerato, Sandro; Baiocchi, Antonella; and Alzati, Angelo, 5,047,675, Cl. 307-578.000.



Baitcher, Neal L.; and Brennan, Robert M., to Fibre Form Corporation. Method for manufacturing loudspeaker diaphragm. 5,047,191, Cl. 264-112.000.
Baker, Gerald S., to Cooper Industries, Inc. Shaft locking or manual operating apparatus. 5,046,376, Cl. 74-424.8VA.
Baldwin, John J.: *See—*
Remy, David C.; Baldwin, John J.; Claremon, David A.; and King, Stella W., 5,047,416, Cl. 514-384.000.
Baller, Howard. Multibeam optical and electromagnetic hemispherical/spherical sensor. 5,047,776, Cl. 342-52.000.
Ballinger, Dale O.; and Soo, Daniel, to Honeywell Inc. Split swipe tape recording. 5,047,873, Cl. 360-22.000.
Bally, Marcel B.; Loughrey, Helen; and Gullis, Pieter R., to Liposome Company, Inc., The. Novel composition for targeting, storing and loading of liposomes. 5,047,245, Cl. 424-450.000.
Balmer, Oskar: *See—*
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Balogh, Tibor: *See—*
Orban, Erno; Balogh, Tibor; Ila, Lajos; Ambrus, Gabor; Jekkel, Antonia; Elek, Sandor; Tomori, Eva; Elekes, Istvan; Sarudy, Eva T.; Moravcsik, Imre; and Siklosi, Lajos, 5,047,396, Cl. 514-11.000.
Band, Philip A.: *See—*
Rothman, John; and Band, Philip A., 5,047,249, Cl. 424-543.000.
Bannister, Ray L.; Close, Frederick C.; and Loeber, Peter J., to Pitney Bowes Inc. Anti-jamming gear arrangement. 5,046,378, Cl. 74-435.000.
Banus, Christopher T., to Granitech Corporation, The. Method of making ornamental pre-cast terrazzo panels with integral inlay design. 5,047,187, Cl. 264-71.000.
Bao, Qi-Bin; and Higham, Paul A., to Pfizer Hospital Products Group, Inc. Hydrogel intervertebral disc nucleus. 5,047,055, Cl. 623-17.000.
Barabino, William A. Portemonnaie assembly. 5,046,620, Cl. 206-581.000.
Baranchugov, Vladimir A.: *See—*
Leikin, Vladimir Z.; Neradov, Viktor P.; Dianov, Ivan M.; Luzin, Pavel M.; Gorbunov, Evgeny D.; Gerasimov, Vladimir; and Baranchugov, Vladimir A., 5,046,670, Cl. 241-194.000.
Barber, Michael, to CTS Corporation. Molded ball/seal. 5,046,701, Cl. 251-129.020.
Barbin, Jean-Yves: *See—*
Leca, Jean-Paul; and Barbin, Jean-Yves, 5,047,199, Cl. 264-316.000.
Barkan, Edward D.: *See—*
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Barker, George S.: *See—*
Ragan, Lawrence H.; and Barker, George S., 5,046,979, Cl. 446-57.000.
Barker, Philip C.: *See—*
Serikow, Victor M.; and Barker, Philip C., 5,046,191, Cl. 2-2.000.
Barnes, Josh T., to Lexalite Corporation. Signal reflector and optical system. 5,046,818, Cl. 359-527.000.
Baroid Technology, Inc.: *See—*
Leaney, Peter A.; and Lathan, Keith, 5,047,635, Cl. 250-256.000.
Baroux, Bruno: *See—*
Carla, Francis; Baroux, Bruno; Fraisse, Jacques; and Signoret, Jacques, 5,046,686, Cl. 244-118.500.
Barradas, George. Hair curling iron. 5,046,516, Cl. 132-232.000.
Barreteau, Jean J. H.: *See—*
Berlivet, Marc A.; Barreteau, Jean J. H.; and Mathis, Michel H., 5,046,918, Cl. 414-789.700.
Barrett, L. Donald; Hahn, Dale R.; Pelloski, Peter E.; and Ziegler, Richard W., to Depor Industries, Inc. Welding corrosion inhibiting coating. 5,047,451, Cl. 523-442.000.
Barrows, Franklin H.: *See—*
Wheeler, Edward L.; Barrows, Franklin H.; Franko, Robert J.; and Batorewicz, Wadim, 5,047,530, Cl. 544-197.000.
Barski, Lori L.: *See—*
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Barton, James I. Ear plug assembly for hearing aid. 5,046,580, Cl. 181-135.000.
Barton, Richard: *See—*
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Basar, Ronald J.: *See—*
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BASF Aktiengesellschaft: *See—*
Albert, Bernhard; Neumann, Peter; and Brosius, Sibylle, 5,047,312, Cl. 430-270.000.
Baus, Ulf; and Reuther, Wolfgang, 5,047,551, Cl. 548-375.000.
Busse, Gerd; Decher, Jakob; Eisele, Wolfgang; Haeussler, Edgar; and Wittmann, Otto, 5,047,466, Cl. 524-597.000.
Dotzauer, Bernhard; Dersch, Rolf; Vinke, Johannes; Hanciogullari, Harutyun; Schwartz, Manfred; and Berg, Volkmar, 5,047,295, Cl. 428-500.000.
Hemel, Ralf; and Linhart, Friedrich, 5,046,853, Cl. 356-440.000.
Hesse, Anton; Holoch, Jan; and Peter, Roland, 5,047,455, Cl. 523-508.000.
Patsch, Manfred; Pandl, Klaus; and Fischer, Martin, 5,047,529, Cl. 544-52.000.
Rehmer, Gerd, 5,047,443, Cl. 522-46.000.
Schefczik: Ernst, 5,047,570, Cl. 558-375.000.
Schlag, Johannes; Koehnlein, Ernst; Bauer, Peter; and Koessler, Ludwig, 5,047,482, Cl. 525-221.000.
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Horbaschek, Heinz, to Siemens Aktiengesellschaft. X-ray diagnostics installation. 5,048,067, Cl. 378-99.000.

Horbelt, Michael: *See*—
Arnold, Herbert; Horbelt, Michael; Jautelat, Rudiger; Werner, Peter; Mezger, Manfred; and Plapp, Gunther, 5,046,467, Cl. 123-339.000.

Horgeraete Geers GmbH & Co. KG: *See*—
Geers, Wolfgang, 5,048,090, Cl. 381-68.600.

Horhota, George. Lock core service valve. 5,046,523, Cl. 137-385.000.

Hori, Taizou: *See*—
Fukatsu, Tsutomu; Hori, Taizou; Masui, Toshiyuki; Kobayashi, Takashi; Wakui, Tetsuya; and Takahashi, Koji, 5,047,879, Cl. 360-72.100.

Horie, Yuji; and Yoshikawa, Shoji, to Olympus Optical Co., Ltd. Photodisc apparatus with means for canceling offset of tracking servo loop. 5,048,002, Cl. 369-44.350.

Horiuchi, Noriyuki; and Kobayashi, Hiroyuki, to Toyoda Gosei Co., Ltd. Diaphragm. 5,047,287, Cl. 428-248.000.

Horiuchi, Takeshi: *See*—
Sato, Yasuji; and Horiuchi, Takeshi, 5,048,091, Cl. 381-107.000.

Horvath, Eduard, to Otto Bock Orthopadische Industrie Besitz-und Werwaltungs-KG. Planetary friction drive. 5,046,996, Cl. 475-197.000.

Horvath, Stephen E., to Hewlett-Packard Company. Dual axis dynamic focus of an electron beam in a display monitor. 5,047,697, Cl. 315-382.000.

Horwitz, Lawrence B., to Intergraph Corporation. Circuit simulation. 5,047,971, Cl. 364-578.000.

Hoshino Gakki Co., Ltd.: *See*—
Hoshino, Yoshihiro, 5,046,700, Cl. 248-638.000.





Hoshino, Yoshihiro, to Hoshino Gakki Co., Ltd. Drum mount for securing clamp. 5,046,700, Cl. 248-638.000.

Hoshiro, Hideki; Funabiki, Hironao; Saimen, Kenji; Ohigashi, Toshihide; and Sugishima, Hiroshi, to Kuraray Company Limited. Nonwoven fabric comprising single filaments and filament bundles that yield improved impact resistant molded articles. 5,047,288, Cl. 428-290.000.

Hoshizaki Denki Kabushiki Kaisha: *See*—
Maruyama, Fumio; Nagata, Osamu; Suyama, Tomio; Takeda, Yukimasa; Kamino, Hiroaki; and Suyama, Koji, 5,046,517, Cl. 134-95.000.

Hoshizaki Electric Co., Ltd.: *See*—
Yoshida, Akiyoshi; Tosaki, Junichi; and Wakatuki, Yuji, 5,046,328, Cl. 62-248.000.

Hoshizawa, Sei: *See*—
Taneda, Yukinori; Hoshizawa, Sei; Nagayama, Katsuya; and Matsuura, Tatsukichi, 5,046,235, Cl. 29-606.000.

Hoslet, Rene : *See*—
Schneider, Bernard; and Hoslet, Rene , 5,046,630, Cl. 215-321.000.

Hosoda, Hiromi, to Kabushiki Kaisha Toshiba. Power conversion apparatus with harmonic filtration. 5,047,909, Cl. 363-40.000.

Hosoi, Yoji: *See*—
Tsubota, Takashi; and Hosoi, Yoji, 5,048,039, Cl. 372-46.000.

Hospal Industrie: *See*—
Chevallet, Jacques; and Roy, Olivier, 5,047,147, Cl. 210-101.000.

Hotta, Atsuo: *See*—
Iwamura, Masahiro; Kurita, Kozaburo; Maejima, Hideo; Nakano, Tetsuo; and Hotta, Atsuo, 5,047,669, Cl. 307-446.000.

Houchin, James S.; and Parulski, Kenneth A., to Eastman Kodak Company. Method and apparatus for pixel non-uniformity correction. 5,047,861, Cl. 358-213.150.

Housley, John R.; Jeffery, James E.; Johnston, David N.; and Sargent, Bruce J., to Boots Company Plc, The. Arylcyclobutylmethylamine therapeutic agents. 5,047,432, Cl. 514-650.000.

Howard, Richard E.: *See*—
Denker, John S.; Howard, Richard E.; Jackel, Lawrence D.; and LeCun, Yann, 5,048,098, Cl. 382-15.000.

Howerton, Larry L. Float tube with adjustable sling seat. 5,046,978, Cl. 441-131.000.

Howie, James B., to GEC Ferranti Defence Systems Limited. Voltage difference detector. 5,047,667, Cl. 307-355.000.

Howk, Richard A.: *See*—
Weetman, Ronald J.; and Howk, Richard A., 5,046,245, Cl. 29-889.700.

Howlett, Donald L., to Texaco Inc. Electromagnetically induced acoustic well logging. 5,047,992, Cl. 367-31.000.

Howlett, Ian C. Sail rig and staysail system. 5,046,440, Cl. 114-102.000.

Howson, William, to Smith Kline & French Laboratories Limited. Method of stimulating histamine $H_3$-receptors. 5,047,418, Cl. 514-400.000.

Hrabik, Richard J.: *See*—
Hill, Reginal R.; and Hrabik, Richard J., 5,047,977, Cl. 364-900.000.

Hsieh, Kou-Chang, to Talent Laboratory, Inc. Method for coding the input of Chinese characters from keyboard according to the first phonetic symbols and tones thereof. 5,047,932, Cl. 364-419.000.

Hsu, Jack J.: *See*—
Huang, Wann-Sheng; and Hsu, Jack J., 5,046,561, Cl. 166-273.000.

Hsu, Kai, to Schlumberger Technology Corporation. Lithology identification using sonic data. 5,047,991, Cl. 367-25.000.

Hsu, Li-Chien, to Baxter International Inc. Ionic heparin coating. 5,047,020, Cl. 604-266.000.

Hsu, P. J. Structure of electromagnetic work holder. 5,047,742, Cl. 335-289.000.

Huan, Guohe; and Jacobson, Allan J., to Exxon Research & Engineering Company. Heteropolyoxo vanadium compounds containing molecular anions and their structure. 5,047,567, Cl. 556-42.000.

Huang, Chi C. Pipe cutting device. 5,046,250, Cl. 30-92.000.

Huang, James J., to Du Pont Merck Pharmaceutical Company. High level expression in e. *coli* of soluble mature HIL-1beta and derivatives with altered biological activity. 5,047,505, Cl. 530-351.000.

Huang, Wann-Sheng; and Hsu, Jack J., to Texaco Inc. Application of multiphase generation process in a $CO_2$ flood for high temperature reservoirs. 5,046,561, Cl. 166-273.000.

Hubbard, Todd W.: *See*—
Yim, Jeffrey B.; Hubbard, Todd W.; Melkerson, Lori D.; Sexton, Michael A.; and Fieggen, Bruce M., 5,047,627, Cl. 250-227.230.

Hubbe, Martin A.: *See*—
Lisnyansky, Khaim; and Hubbe, Martin A., 5,047,652, Cl. 250-571.000.

Hubbell, Clarence C.: *See*—
Gregor, John S.; Hubbell, Clarence C.; and Lichtensteiger, Susan K., 5,046,413, Cl. 101-93.010.

Hubbell Incorporated: *See*—
Hoffman, Ernest G., 5,046,961, Cl. 439-141.000.
Nuckolls, Joe A.; and Flory, Isaac L., IV, 5,047,694, Cl. 315-290.000.

Huber, Jakob; and Pettenpaul, Ewald, to Siemens Aktiengesellschaft. Semiconductor diode and method for making it. 5,047,355, Cl. 437-15.000.

Hubert, Maurice, to Bull S.A. Method for transmitting information over a bidirectional link, and apparatus for performing the method. 5,048,061, Cl. 375-111.000.

Hubertus, Guido: *See*—
Sperzel, Wolfgang; Landwehr, Horst; Sturmer, Johann; Thomas, Friedrich-Werner; and Hubertus, Guido, 5,047,911, Cl. 363-56.000.

Hubner Gummi-und Kunststoff GmbH: *See*—
Jungblut, Ernst D.; Knopf, Werner; and Rotter, Gerald, 5,046,428, Cl. 102-469.000.

Huckabee, Marvin; Buljan, Sergej-Tomislav; and Neil, Jeffrey T., to GTE Laboratories Incorporated. Process for producing silicon nitride based articles of high fracture toughness and strength. 5,047,186, Cl. 264-62.000.

Hudson, Barry L.: *See*—
Hughes, John L.; and Hudson, Barry L., 5,048,027, Cl. 372-18.000.

Huebner, Klemens: *See*—
Welsch, Wolfgang; Krueger, Hans; Huebner, Klemens; and Haeusler, Rudolf, 5,048,043, Cl. 372-65.000.
Welsch, Wolfgang; Krueger, Hans; Huebner, Klemens; and Haeusler, Rudolf, 5,048,046, Cl. 372-87.000.

Huels Aktiengesellschaft: *See*—
Kehr, Helmut; Kuehnle, Adolf; Leppek, Heinrich; and Schleinzer, Matthias, 5,047,462, Cl. 524-423.000.

Huether, Werner: *See*—
Betz, Wolfgang; Huether, Werner; and Merz, Herbert, 5,047,281, Cl. 428-201.000.

Hugenin, G. Richard, to Millitech Corporation. Millimeter-wave imaging system. 5,047,783, Cl. 342-179.000.

Hughes Aircraft Company: *See*—
Alves, James F.; and Burman, Jerry A., 5,048,112, Cl. 382-56.000.
Berwin, Ted W., 5,047,756, Cl. 340-723.000.
Bianco, Mark E.; and Reed, Dana A., 5,048,086, Cl. 380-28.000.
Bleakney, William M., 5,047,781, Cl. 342-149.000.
Clark, William M., Jr.; Atkinson, Gary M.; Lum, Wing Y.; and Herring, James R., 5,047,827, Cl. 357-51.000.
Julian, Michael D., 5,047,785, Cl. 342-372.000.
Li, Mei; Chang, Chen-Chi P.; and Chin, Maw-Rong, 5,047,356, Cl. 437-21.000.
Moser, Thomas P.; and Dewhirst, Donald R., 5,048,042, Cl. 372-59.000.
Pepper, David M., 5,046,824, Cl. 359-72.000.
Wong, Harry; and Wong, Mon N., 5,047,738, Cl. 333-113.000.

Hughes, John H. Spring-loaded teeth for comminuter rolls. 5,046,671, Cl. 241-294.000.

Hughes, John L.; and Hudson, Barry L., to Austral Asian Lasers Pty. Ltd. Hybrid laser. 5,048,027, Cl. 372-18.000.

Hughes, Johnathan R.: *See*—
Bone, Matthew F.; Coulson, Ian; Hughes, Johnathan R.; Ross, Peter W.; Saunders, Frances C.; and Surguy, Paul W. H., 5,047,757, Cl. 340-784.000.

Huhnke, Beverley M. Water-saving tank construction, attachment and method for flush toilets. 5,046,202, Cl. 4-415.000.

Huin, Roland: *See*—
Dang Vu, Quang; Huin, Roland; and Euzen, Jean-Paul, 5,047,217, Cl. 422-200.000.

Hukamachi, Kouichi: *See*—
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Hultzsch, Guenter; Idstein, Hermann; and Nies, Reinhard, to Hoechst Aktiengesellschaft. Method and apparatus for continuously drying boards coated on both sides. 5,046,264, Cl. 34-4.000.

Humber, Leslie G.: *See*—
Quagliato, Dominick A.; and Humber, Leslie G., 5,047,552, Cl. 548-454.000.

Hummel, Kurt M.: *See*—
Runkel, Walter; Hummel, Kurt M.; and Schulte, Rudolf, 5,046,755, Cl. 280-708.000.

Hung, Paul P.; Kalyan, Narender K.; and Lee, Shawguang L., to American Home Products Corporation. Tris-Kringle plasminogen activator with novel K2 insert. 5,047,241, Cl. 424-94.640.

Hunnebeck, Volker, to Auergesellschaft GmbH. Gas goggles. 5,046,198, Cl. 2-440.000.

Hunt, Andrew, to Schlumberger Technology Corporation. Method for determining dynamic flow characteristics of multiphase flows. 5,047,632, Cl. 250-302.000.

Hunter, Robert L.; and Duncan, Alexander, to Emory University. Method of treating stroke. 5,047,236, Cl. 424-83.000.

Hurlburt, Joseph C., to Ford New Holland, Inc. Method of mounting an implement to a prime mover. 5,046,230, Cl. 29-426.100.

Hurlburt, Joseph C., to Ford New Holland, Inc. Steering mechanism for tractors. 5,046,577, Cl. 180-266.000.

Hurliman, Russell J.: *See*—
Becicka, Kenneth F.; Chamberlain, Neal C.; Reed, Thomas R.; Hurliman, Russell J.; and Daneshjoo, Bahman, 5,046,303, Cl. 53-540.000.

Hussong, Kurt: *See*—
Springer, Hartmut; and Hussong, Kurt, 5,047,515, Cl. 534-638.000.

Huynh-ba, Tuong; and Osman, Maged A., to Merck Patent GmbH. Anisotropic compounds having nematic phase and liquid crystal mixtures. 5,047,170, Cl. 252-299.600.

Hwang, Edward Y.; and Doyle, John R., to Westinghouse Electric Corp. Turbine power plant automatic control system. 5,046,318, Cl. 60-646.000.

Hwang, Feng-Lin. Mini-package structure of rubbish bags. 5,046,619, Cl. 206-554.000.

Hwang, Jiann-Yang, to Michigan Technological University, Board of Control of. Wet process for fly ash beneficiation. 5,047,145, Cl. 209-166.000.

Hwang, Nag-Hyo, to SamSung Electronics Co., Ltd. Paper feeder for a copying machine. 5,046,714, Cl. 271-162.000.

Hydro-Tek, Inc.: *See*—
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Hyldig, Poul E.: *See—*
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IAF BioChem International, Inc.: *See—*
Belleau, Bernard; and Nguyen-Ba, Nghe, 5,047,407, Cl. 514-274.000.
Ichikawa, Hiroyuki: *See—*
Kuwana, Kazutaka; Okamoto, Kuniaki; Yoshida, Tsuyoshi; Ichikawa, Hiroyuki; Kamikado, Masaru; Nakanishi, Nobuyasu; Sugitani, Tatsuo; and Sakai, Kazunori, 5,046,787, Cl. 303-103.000.
Ichikawa, Masashi: *See—*
Takahashi, Yasuo; Saito, Tohru; Ichikawa, Masashi; Otani, Tadayuki; and Hayashida, Kunihiro, 5,047,608, Cl. 219-91.200.
Ichikawa, Yoshiaki, to Hitachi Metals, Ltd. Brushless linear actuator with sensor-activated coils. 5,047,676, Cl. 310-12.000.
Ichinose, Hisao; and Takeda, Yoshimitsu, to Nissan Motor Co., Ltd. Sunroof structure for automotive vehicle. 5,046,779, Cl. 296-216.000.
ICI Americas Inc.: *See—*
Djafar, Roger; and Benke, Alan H., 5,047,079, Cl. 71-86.000.
Matassa, Victor G., 5,047,402, Cl. 514-212.000.
Michaely, William J.; and Curtis, Jeff K., 5,047,572, Cl. 560-11.000.
Ide, Satoshi: *See—*
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Idegami, Hitoshi: *See—*
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Idemitsu Petrochemical Company Limited: *See—*
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IDSI Products of Georgia: *See—*
Nedriga, Walter N., 5,047,891, Cl. 361-117.000.
Idstein, Hermann: *See—*
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IDX, Inc.: *See—*
Juds, Scott; Halsey, Johnny H.; and Halsey, James H., 5,046,841, Cl. 356-71.000.
Iima, Mitsunori; and Mori, Seiich, to Asahi Kogaku Kogyo Kabushiki Kaisha. Optical system of laser beam reader. 5,047,625, Cl. 250-216.000.
Iio, Masahiro; Ono, Mitsuya; and Sakamoto, Katsumi, to Diesel Kiki Co., Ltd. Compressor with reduced vibrations. 5,046,935, Cl. 417-312.000.
Iizuka, Masao: *See—*
Ishit, Koji; Iizuka, Masao; Tagami, Jun; Yamada, Toshikazu; Sasaki, Katsuyasu; and Ikeda, Yoshiki, 5,046,290, Cl. 52-1.000.
Iizuka, Nobuo, to Seiko Instruments, Inc. Dynamic viscoelasticity measurement apparatus with output signal offset correction. 5,046,367, Cl. 73-789.000.
Iizuka, Takashi: *See—*
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Ikeda, Makoto: *See—*
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Ikeda, Naotaka: *See—*
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Ikeda, Tadashi: *See—*
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Ikeda, Yasushi: *See—*
Andoh, Hiroaki; Ohshima, Michio; Matsui, Yuji; Okuyama, Takashi; Yoshimura, Toshitaka; Yamaguchi, Hidetaka; Ikeda, Yasushi; Nonaka, Jun; Miyoshi, Tamihiro; Kakimoto, Mitsuo; Iwama, Masatoshi; Morita, Hideyuki; Tachihara, Satoru; Morimoto, Akira; and Ohwaki, Akira, 5,046,796, Cl. 359-216.000.
Ikeda, Yoshiaki: *See—*
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Ikeda, Yoshiki: *See—*
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Ikeda, Yoshinori; Ohnishi, Tetsuya; and Shimizu, Masatomo, to Canon Kabushiki Kaisha. Color image processing apparatus. 5,047,844, Cl. 358-80.000.
Ikekawa, Nobuo: *See—*
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Ikemori, Megumi: *See—*
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Ikenoue, Yoshikazu, to Minolta Camera Kabushiki Kaisha. Printer controller. 5,047,957, Cl. 364-519.000.
Ikeuchi, Hiroshi; and Ohnishi, Norio, to H. Ikeuchi & Co., Ltd. Two-fluid nozzle. 5,046,668, Cl. 239-432.000.
Ikezawa, Katsuo: *See—*
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Ikuma, Akira: *See—*
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Illinois Tool Works, Inc.: *See—*
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Ilyashenko, Alexei A.: *See—*
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Image Acoustics, Inc.: *See—*
Butler, John L.; and Clark, Arthur, 5,047,683, Cl. 310-334.000.
Imai, Akira: *See—*
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Imamura, Hiroyuki, to Jatco Corporation. Shift control system for automatic power transmission. 5,046,384, Cl. 74-866.000.
Imperial Chemical Industrials, PLC: *See—*
Tury, Bernard; John, Glyn R.; and Thomas, Noreen L., 5,047,094, Cl. 148-248.000.
Imperial Chemical Industries PLC: *See—*
Allen, Simon; and Gordon, Paul F., 5,047,516, Cl. 534-649.000.
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Inada, Kenkichi: *See—*
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Inax Corporation: *See—*
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Ingersoll-Rand Company: *See—*
Albert, Gregory P., 5,046,868, Cl. 384-477.000.
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Inkster, Kevin R.: *See—*
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Inland Container Corporation: *See—*
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Saito, Shinichi; Inukai, Takashi; Inoue, Hiromichi; Miyazawa, Kazutoshi; Ohno, Kouji; and Ushioda, Makoto, 5,047,172, Cl. 252-299.610.
Inoue, Hirozumi; Tsuzurahara, Kei; Ikezawa, Katsuo; and Uchida, Tomofumi, to Tanabe Seiyaku Co., Ltd. 4-aminophenol derivatives and processes for preparing the same. 5,047,555, Cl. 548-537.000.
Inoue, Kikumitsu: *See—*
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Inoue, Kiyoaki: *See—*
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Inoue, Shigeru: *See—*
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Inoue, Takao, to Sony Corporation. System for transmitting a digital video signal. 5,047,865, Cl. 358-310.000.
Inoue, Takesi: *See—*
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Inoue, Yoshikazu: *See—*
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Inslee, Donald W.: *See—*
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Inslee, Glenn E.; Inslee, Donald W.; Inslee, Theophilus D.; and Inslee, Phillip D. Fish farm and hydroponic greenhouse. 5,046,451, Cl. 119-3.000.
Inslee, Phillip D.: *See—*
Inslee, Glenn E.; Inslee, Donald W.; Inslee, Theophilus D.; and Inslee, Phillip D., 5,046,451, Cl. 119-3.000.
Inslee, Theophilus D.: *See—*
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Institut Armand-Frappier-Univ. of Quebec: *See—*
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Institut Francais du Petrole: *See—*
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Institute of Textile Technology: *See—*
Moussalli, Francis S., 5,046,673, Cl. 242-18.00R.



Integrated Device Technology, Inc.: *See—*
Leung, Wingyu, 5,047,979, Cl. 365-154.000.
Intel Corporation: *See—*
Borkar, Shekhar, 5,047,922, Cl. 364-200.000.
Canepa, George R.; Bauer, Mark; and Kliza, Phil, 5,047,989, Cl. 365-238.500.
Patti, Michael F.; Fedele, Nicola J.; Harney, Kevin; and Simon, Allen H., 5,047,975, Cl. 364-786.000.
Wei, Chin-Shih; Fraser, David B.; and Murali, Venkatesan, 5,047,367, Cl. 437-200.000.
Intellicall, Inc.: *See—*
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Inter Innovation AB: *See—*
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Intergraph Corporation: *See—*
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Jungblut, Ernst D.; Knopf, Werner; and Rotter, Gerald, to Hubner Gummi-und Kunststoff GmbH. Shell for a propellant charge. 5,046,428, Cl. 102-469.000.

Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., to Bayer Aktiengesellschaft. 8-substituted 2-aminotetralins. 5,047,422, Cl. 514-510.000.

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Keogh, Michael J., to Union Carbide Chemicals and Plastics Company Inc. Process for crosslinking hydrolyzable copolymers. 5,047,476, Cl. 525-106.000.

Keon, Richard; and Morris, Luther. Cutter for preparing an insulation batt for installation. 5,046,392, Cl. 83-862.000.

Kerbaugh, Steven M. Spherical edge locator for machining. 5,046,262, Cl. 33-644.000.

Keren, Eliezer, to Rotlex Optics Ltd. Method and apparatus for measuring the three-dimensional orientation of a body in space. 5,046,843, Cl. 356-152.000.

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Kessler, Leland L., to Westinghouse Electric Corp. Differential current protection circuits. 5,047,890, Cl. 361-93.000.

Kessler, Leland L.; Fox, David A.; and Jones, Kevin M., to Westinghouse Electric Corp. Method and circuit for controlling the frequency of an electronic inverter. 5,048,065, Cl. 377-47.000.

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Khan, Tasadduq; and Caron, Pierre, to Office National d'Etudes et de Recherche Aerospatiales. Nickel based monocrystalline superalloy, method of heat treating said alloy, and parts made therefrom. 5,047,091, Cl. 148-3.000.

Khandelwal, Bimal K., to Champion International Corporation. Method of stabilizing white liquor flow in the causticizing of green liquor from a kraft paper plant. 5,047,119, Cl. 162-30.110.

Kidder, John S.; and Montgomery, Derek, to CST Coldswitch Holdings Inc. Single fibre control switches. 5,046,806, Cl. 385-16.000.

Kikuchi, Koshin: *See*—
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Kilgore, Bruce J.; and Shorten, Martyn R., to Nike, Inc.; and Nike International Ltd. Athletic shoe with pronation control device. 5,046,267, Cl. 36-114.000.

Kim, Anderson H.: *See*—
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Kim, Du H.: *See*—
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Kim, Sang H.: *See*—
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Kimmerle, William L.; and Miglin, Marie T., to Babcock & Wilcox Company, The. Heat treatment of Alloy 718 for improved stress corrosion cracking resistance. 5,047,093, Cl. 148-162.000.

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Kirino, Yoshio; and Kusama, Tateo, to Semitex Co., Ltd.; and Toshiba Ceramics Co., Ltd. Method and apparatus for measuring a deep impurity level of a semiconductor crystal. 5,047,713, Cl. 324-158.00R.

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Kolycheck, Edmond G., to G. F. Goodrich Company, The. Polyurethane for flexible fuel containers. 5,047,495, Cl. 528-76.000.

Komatsu, Koichi, to Atsugi Unisia Corporation. Steering control system for vehicle. 5,046,572, Cl. 180-140.000.

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Komurasaki, Takeshi, to Ricoh Company, Ltd. Semiconductor laser apparatus. 5,048,050, Cl. 372-101.000.

Kondner, Robert L., Jr. Apparatus for testing circuit boards. 5,047,708, Cl. 324-73.100.

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Koutrouvelis, Panos G. Stereotactic device. 5,047,036, Cl. 606-130.000.

Kovac, Caroline A.; and Noyan, Ismail C., to International Business Machines Corporation. High strength low stress encapsulation of interconnected semiconductor devices. 5,047,834, Cl. 357-72.000.

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Pierret, Hubert; Pierret, Gabriel L.; Pierret, Maurice J.; and Pierret, Jean-Marie M., 5,046,220, Cl. 19-0.600.

Pierret, Maurice J.: *See—*
Pierret, Hubert; Pierret, Gabriel L.; Pierret, Maurice J.; and Pierret, Jean-Marie M., 5,046,220, Cl. 19-0.600.

Pieters, Robert: *See—*
Sowell, Richard G.; and Pieters, Robert, 5,047,927, Cl. 364-200.000.

Pinhas, Hanna: *See—*
Landa, Benzion; Ashkenazi, Itzhak; Van Mil, Jan; Pinhas, Hanna; and Lior, Ishaiau, 5,047,808, Cl. 355-277.000.

Pirelli Trasmissioni Industriali S.p.A.: *See—*
Macchiarulo, Vincenzo; and Di Giacomo, Tommaso, 5,046,993, Cl. 474-205.000.

Pisalyaput, Piyapote: *See—*
Welsh, David E.; Pisalyaput, Piyapote; and Gore, William C., 5,046,964, Cl. 439-271.000.

Pitman-Moore, Inc.: *See—*
Mehrotra, Vikram P., 5,047,511, Cl. 530-399.000.

Pitney Bowes Inc.: *See—*
Bannister, Ray L.; Close, Frederick C.; and Loeber, Peter J., 5,046,378, Cl. 74-435.000.

Pittman, Loyal V.: *See—*
Havemann, Robert K.; and Pittman, Loyal V., 5,046,326, Cl. 62-180.000.

Plapp, Gunther: *See—*
Arnold, Herbert; Horbelt, Michael; Jautelat, Rudiger; Werner, Peter; Mezger, Manfred; and Plapp, Gunther, 5,046,467, Cl. 123-339.000.

Plasma Technics, Inc.: *See—*
Francis, Ralph M., Jr.; and Mastopietro, John C., 5,047,744, Cl. 336-58.000.

Platt, William J., to National Rolling Mills, Inc. Perimeter clip. 5,046,294, Cl. 52-489.000.

Pleyber, Gaetan; and Gerard, Philippe, to Commissariat a l'Energie Atomique. Radioluminescent screen with an improved quality factor and spatial resolution for X or gamma photon imaging. 5,047,642, Cl. 250-368.000.

Pogany, Stefano A.; and Zentner, Gaylen M., to Merck & Co., Inc. Bioerodible thermoset elastomers. 5,047,464, Cl. 524-500.000.

Polaroid Corporation: *See—*
—Pape, David D.; and Reiss, Wanda T., 5,047,863, Cl. 358-213.160.

Polcer, John, to Foster Wheeler Energy Corporation. Catalytic denitrification control process and system for combustion flue gases. 5,047,220, Cl. 423-239.000.

Polyfiltronics, Inc.: *See—*
Manns, Roy, 5,047,215, Cl. 422-101.000.

Pool, Peter J., to EEV Limited. Method of fabricating imaging apparatus. 5,047,303, Cl. 430-22.000.

Popham, Charles F.: *See—*
Dass, Jack D., 5,046,989, Cl. 453-17.000.

Popovitz-Biro, Ronit: *See—*
Lahav, Meir; Leiserowitz, Leslie; Sagiv, Jacob; Popovitz-Biro, Ronit; Hill, Karlheinz; and Landau, Ehud, 5,047,535, Cl. 546-22.000.

Porter, Roy J.: *See—*
Crouse, Jere W.; Pulkowski, Jeffrey H.; and Porter, Roy J., 5,047,122, Cl 162-206.000.

Porter, William: *See—*
Kor, Bouko J.; and Porter, William, 5,046,665, Cl. 239-71.000.

Portevin, Bernard: *See—*
Vincent, Michel; Remond, Georges; Portevin, Bernard; and Cudennec, Claude, 5,047,400, Cl. 514-18.000.

Potencsik, Istvan: *See—*
Pehlah, Zvi; Potencsik, Istvan; Kopp, Werner; and Urmann, Ernst, 5,047,490, Cl. 526-271.000.

Poulsen, Thomas E. High velocity fire fighting nozzle. 5,046,564, Cl. 169-47.000.

Powell, Douglas H., to Ames Company, Inc. Differential loading fluid check valve. 5,046,525, Cl. 137-512.000.

Powell, Gail S.: *See—*
D'Silva, Themistocles D. J.; Powell, Gail S.; Timmons, Philip R.; and Pennicard, Richard G., 5,047,550, Cl. 548-365.000.

Powell, J. G., to United States of America, Energy. Nuclear qualified in-containment electrical connectors and method of connecting electrical conductors. 5,047,594, Cl. 174-88.00R.

Powers, Stephen K.: *See—*
Detty, Michael R.; and Powers, Stephen K., 5,047,419, Cl. 514-432.000.

Pozzobon, Alessandro, to Nordica S.p.A. Device for adjusting the flexibility in a ski boot. 5,046,269, Cl. 36-120.000.

PPG Industries, Inc.: *See—*
Betts, Ronald E.; and Deetz, David W., 5,046,496, Cl. 128-635.000.
Leatherman, Dennis D.; Sin, Kee V.; and Russell, James A., 5,047,283, Cl. 428-209.000.

Pradelles, Philippe: *See—*
Grassi, Jacques; and Pradelles, Philippe, 5,047,330, Cl. 435-20.000.

Prat, Roberto E., to Texipat, S. A. Automatic repair of broken warp threads in weaving machines. 5,046,535, Cl. 139-351.000.

Pratt, John D., to Textron, Inc. Blind fastener for composite materials. 5,046,348, Cl. 72-356.000.

PRB Industries, Inc.: *See—*
McFarlin, George P.; and Savage, Chester, 5,046,634, Cl. 220-465.000.

Precision Fukuhara Works, Ltd.: *See—*
Sawazaki, Masatoshi; and Ueda, Hiroyuki, 5,046,333, Cl. 66-140.00R.

Preis, Lothar; and Forster, Rolf, to Bayer Aktiengesellschaft. Profiles of composite fibrous materials. 5,047,104, Cl. 156-86.000.

Preisler, Eberhard: *See—*
Bock, Joachim; and Preisler, Eberhard, 5,047,391, Cl. 505-1.000.

Prevost, Dan W.: *See—*
Crow, Kevin H.; Morris, Melvin L.; Derouchie, William F.; and Prevost, Dan W., 5,047,966, Cl. 364-560.000.

Price, Wilfred A.: *See—*
Dixon, Angus B.; and Price, Wilfred A., 5,047,908, Cl. 362-346.000.

Price, William F.: *See—*
Breezer, Harlon W.; and Price, William F., 5,046,434, Cl. 108-51.100.

Prieels, Jean-Paul; and Tirtiaux, Lea, to Oleofina, S.A. Process for the preparation of new yeasts as food compounds for fry. 5,047,250, Cl. 426-2.000.

Priest, William L.: *See—*
Compeau, David E.; Manuel, Mark; Priest, William L.; Rogers, Lloyd W., Jr.; and Nicholas, Mark D., 5,046,283, Cl. 49-138.000.

Princeton University, The Trustees of: *See—*
Bouman, Charles A., Jr.; and Orchard, Michael T., 5,047,842, Cl. 358-75.000.

Procter & Gamble Company, The: *See—*
Berg, Charles J., 5,047,023, Cl. 604-368.000.

Proctor, Keith J.: *See—*
Schweitzer, Jeffrey A.; and Proctor, Keith J., 5,047,208, Cl. 422-58.000.

Prohaska, Hans: *See—*
Baungarter, Peter; Egner-Walter, Bruno; Prohaska, Hans; Schmid, Eckhardt; and Teutsch, Melitta, 5,046,216, Cl. 15-250.290.

Pronovost, Allan D.; and Gilbert, James H., to Eastman Kodak Company. Wash solution containing a cationic surfactant and its use in chlamydial and gonococcal determinations. 5,047,325, Cl. 435-7.360.

Pronovost, Allan D., to Eastman Kodak Company. Immunmological reagent composition and its use in the determination of chlamydial or gonococcal antigens. 5,047,326, Cl. 435-7.360.

Protect A Pet, Inc.: *See—*
Heyman, Barbara C.; Inman, William J.; and Kraft, Scott A., 5,046,456, Cl. 119-106.000.

Protectair Limited: *See—*
Young, David E.; and Davis, Kenneth P., 5,046,490, Cl. 128-87.00B.

Proto, George R.; and Colligan, Francis D., to United States Surgical Corporation. Apparatus for attaching surgical suture components. 5,046,350, Cl. 72-416.000.

Prufrex-Elektro-Apparatebau Inh. Helga Muller, geb./Dutschke: *See—*
Erhard, Werner, 5,046,468, Cl. 123-414.000.

PruTech Research and Development Partnership: *See—*
Cochran, Mark D., 5,047,237, Cl. 424-89.000.

Pulkowski, Jeffrey H.: *See—*
Crouse, Jere W.; Pulkowski, Jeffrey H.; and Porter, Roy J., 5,047,122, Cl. 162-206.000.

Pupic, Nicola: *See—*
Sondergeld, Werner; Cappel, Bert; Schniggenfittig, Gunter; Pupic, Nicola; Gensheimer, Valentin; and Hartung, Georg, 5,046,420, Cl. 101-350.000.

Purcell, John R.; and Sarwinski, Raymond E., to CDC Partners. Process of manafacturing a cyrogenic regenerator. 5,047,192, Cl. 264-139.000.

Purcell, Robert J. Blade and linkage mechanism with downdraft control. 5,046,565, Cl. 172-239.000.

Purdue Research Foundation: *See—*
Nichols, David E., 5,047,536, Cl. 546-61.000.

Puritch, George S.; and Salloum, Gregory S., to Safer, Inc. Environmentally safe insecticide. 5,047,424, Cl. 514-521.000.



Pusey, P. Lawrence, to United States of America, Agriculture. Biological control of fruit rot. 5,047,239, Cl. 424-93.000.

Puskas, Laszlo : *See—*
Simon, Ferenc; Magyar, Karoly; Nagy, Attila; Fekete, Lajos; Puskas, Laszlo ; Fekete, Pal; Simonyi, Istvan; Egri, Janos; and Zukovics nee Sumeg, Katalin, 5,047,434, Cl. 514-653.000.

Putman, Thomas H.: *See—*
Smith, Goeffrey M.; Putman, Thomas H.; Stacey, Eric J.; and Gyugyi, Laszlo, 5,047,915, Cl. 363-161.000.

Putney, Scott: *See—*
Petro, Joan; Jackson, Jennifer; and Putney, Scott, 5,047,334, Cl. 435-69.100.

Puumalainen, Pertti. Method for detection of foreign matter contents in gases. 5,047,723, Cl. 324-464.000.

Qian, Quinghua. Method for inducing thrombosis in blood vessels. 5,047,028, Cl. 606-49.000.

Quadri Electronics Corporation: *See—*
Bruder, John F., 5,047,899, Cl. 361-502.000.

Quagliato, Dominick A.; and Humber, Leslie G., to American Home Products Corporation. Process for preparing benzopyran derivatives. 5,047,552, Cl. 548-454.000.

Quantum Chemical Corporation: *See—*
Wilson, Claude F., Jr., 5,047,440, Cl. 521-88.000.

R. P. Scherer Corporation: *See—*
Wood, Anthony J. G., 5,046,618, Cl. 206-532.000.

Rabinovich, Ismail S.; and Szamborski, Eugene C., to Rohm and Haas Company. Polymeric modifier compositions. 5,047,474, Cl. 525-71.000.

Rabo, Jule A.: *See—*
Gortsema, Frank P.; Pellet, Regis J.; Springer, Albert R.; and Rabo, Jule A., 5,047,139, Cl. 208-111.000.

Racal Data Communications Inc.: *See—*
Trbovich, Nick G.; and Campbell, Thomas D., 5,048,087, Cl. 380-43.000.

Raduechel, Bernd; Suballa, Werner; Loge, Olaf; and Tack, Johann-Wilhelm, to Schering Aktiengesellschaft. 9-haloprostaglandin clathrates and their use as medicines. 5,047,525, Cl. 536-103.000.

Rafferty, Scott; Batchelder, Bruce; and Dupuis, Mark, to Davidson Textron Inc. Multi-cutter self-piercing cover assembly for airbag. 5,046,758, Cl. 280-732.000.

Ragan, Lawrence H.; and Barker, George S. Chassis module for model airplane construction. 5,046,979, Cl. 446-57.000.

Raggio, William A.: *See—*
Woolf, Lawrence D.; Elsner, Frederick H.; and Raggio, William A., 5,047,389, Cl. 505-1.000.

Raiffe, Rita: *See—*
Tai, Woon S.; and Raiffe, Rita, 5,046,980, Cl. 446-73.000.

Rail Engineering, Inc.: *See—*
Bostrom, John; and Annis, Eugene A., 5,046,912, Cl. 414-358.000.

Rajani, Firoz: *See—*
Raymond, Susan; Greenberg, Michael J.; and Rajani, Firoz, 5,047,100, Cl. 156-64.000.

Ramwell, Peter W.: *See—*
Foegh, Marie L.; and Ramwell, Peter W., 5,047,354, Cl. 436-536.000.

Rand, James A.: *See—*
Roberts, Jeffrey G.; Rand, James A.; Buford, Thomas, III; and Lackey, Jennifer J., 5,047,058, Cl. 623-20.000.

Rand, Royden N.: *See—*
Emmons, Robert E.; Mauck, Linda A.; Mauck, John C.; Wu, TaiWing; Rand, Royden N.; and Andrese, Angelo P., 5,047,322, Cl. 435-6.000.

Ravichandran, Ramanathan; Schirmann, Peter J.; and Mar, Andrew, to Ciba-Geigy Corporation. Ethylenically unsaturated compounds containing 1-hydrocarbyloxy-2,2,6,6-tetramethylpiperidine moieties, and polymers, copolymers and stabilized compositions. 5,047,489, Cl. 526-263.000.

Rawlings, Derek A.: *See—*
Coates, William J.; Flynn, Sean T.; and Rawlings, Derek A., 5,047,404, Cl. 514-243.000.

Ray, Edward A.: *See—*
Bengel, Thomas G.; Ray, Edward A.; Miller, Phillip E.; Bauer, Frank I.; and Sejvar, James, 5,046,289, Cl. 51-411.000.

Ray, James C.; and Asari, Logan R., to Lubrizol Corporation, The. Method and apparatus for spectroscopic comparison of compositions. 5,046,846, Cl. 356-326.000.

Ray, Kenneth B. Platform support system. 5,046,897, Cl. 405-221.000.

Raychem Corporation: *See—*
—Camargo, Rafael; Mercer, Frank; and Cheng, Tai C., 5,047,487, Cl. 525-432.000.

Raymond, Susan; Greenberg, Michael J.; and Rajani, Firoz, to Northwestern Chemical Co. Curcumin in the detection and warning of cyanide adulterated food products. 5,047,100, Cl. 156-64.000.

Raytheon Company: *See—*
Clawson, Lawrence G., 5,046,478, Cl. 126-110.00R.
Ferguson, Christopher; and Adamski, Joseph R., 5,046,336, Cl. 68-17.00R.

Rea, James H.: *See—*
Gupton, B. Franklin; Rea, James H.; Mueller, Werner H.; and Saukaitis, John, 5,047,542, Cl. 546-250.000.

Reames, Eddie J.: *See—*
Shepard, Spencer H.; Lloyd, Phillip D.; Reames, Eddie J.; Freudenthal, Jon P.; and Partington, Albert J., 5,046,246, Cl. 29-889.210.

Redken Laboratories, Inc.: *See—*
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., 5,047,233, Cl. 424-72.000.

Reed, Dana A.: *See—*
Bianco, Mark E.; and Reed, Dana A., 5,048,086, Cl. 380-28.000.

Reed, Ronald L.: *See—*
Teletzke, Gary F.; and Reed, Ronald L., 5,046,560, Cl. 166-272.000.

Reed, Thomas R.: *See—*
Becicka, Kenneth F.; Chamberlain, Neal C.; Reed, Thomas R.; Hurliman, Russell J.; and Daneshjoo, Bahman, 5,046,303, Cl. 53-540.000.

Reese, Wayne S.: *See—*
Walker, Steve A.; and Reese, Wayne S., 5,046,327, Cl. 62-244.000.

Reflection Technology, Inc.: *See—*
Wells, Benjamin A.; and Becker, E. Allen, 5,048,077, Cl. 379-96.000.

Regelson, William: *See—*
Lenhardt, Martin L.; Clarke, Alex M.; and Regelson, William, 5,047,994, Cl. 367-116.000.

Regis, Andre : *See—*
Gaillard, Gabriel; Regis, Andre ; and Fage, Patrick, 5,047,681, Cl. 310-156.000.

Rehmer, Gerd, to BASF Aktiengesellschaft. Hotmelt contact adhesives which can be crosslinked with ultraviolet radiation in the presence of oxygen. 5,047,443, Cl. 522-46.000.

Reich, Andreas: *See—*
Rohr, Franz-Josef; and Reich, Andreas, 5,047,388, Cl. 505-1.000.

Reichow, James R., to Dynasound Organizer, Inc. Ergonomic handle for game controller. 5,046,739, Cl. 273-148.00B.

Reinelt, Karlheinz: *See—*
Witt, Wolfram; and Reinelt, Karlheinz, 5,047,098, Cl. 149-89.000.

Reiss, Wanda T.: *See—*
Pape, David D.; and Reiss, Wanda T., 5,047,863, Cl. 358-213.160.

Reist, Elmer J.; and Sturm, Priscilla A., to SRI International. Acyclic purine phosphonate nucleotide analogs. 5,047,533, Cl. 544-244.000.

Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; Portevin, Bernard; and Cudennec, Claude, 5,047,400, Cl. 514-18.000.

Remy, David C.; Baldwin, John J.; Claremon, David A.; and King, Stella W., to Merck & Co., Inc. Triazole compounds and their use as transglutaminase inhibitors. 5,047,416, Cl. 514-384.000.

Repligen Corporation: *See—*
Petro, Joan; Jackson, Jennifer; and Putney, Scott, 5,047,334, Cl. 435-69.100.

Research Corporation Techniques, Inc.: *See—*
Weiner, Ronald M.; Colwell, Rita R.; Bonar, Dale B.; Coon, Steven L.; and Walsh, Marianne, 5,047,344, Cl. 435-252.100.

Research Corporation Technologies, Inc.: *See—*
Buchegger, Franz; and Mach, Jean-Pierre, 5,047,507, Cl. 530-387.000.

Resources Conservation Company: *See—*
Nowak, James C.; and Tose, Mark K., 5,047,153, Cl. 210-634.000.

Reust, Steven J.: *See—*
Liaw, Gin C.; Gaddy, James M.; Mallee, Frank M.; and Reust, Steven J., 5,047,088, Cl. 127-60.000.

Reuther, Wolfgang: *See—*
Baus, Ulf; and Reuther, Wolfgang, 5,047,551, Cl. 548-375.000.

Revel, Michel: *See—*
Lavie, David; Meruelo, Daniel; Lavie, Gad; Revel, Michel; Vande Velde, Vincent; and Rotman, Dalia, 5,047,435, Cl. 514-732.000.

Reynolds Consumer Products, Inc.: *See—*
Custer, Richard G.; Kosiorek, Richard R.; and Kolosso, Michael P., 5,046,300, Cl. 53-412.000.

Rheinmetall GmbH: *See—*
Skowasch, Gerhard; and Hoffmann, Wolfgang, 5,046,424, Cl. 102-226.000.
Witt, Wolfram; and Reinelt, Karlheinz, 5,047,098, Cl. 149-89.000.

Rhim, Moo S.: *See—*
Park, Ho J.; Rhim, Moo S.; Kim, Hak M.; Kim, Du H.; Yoo, Seog C.; Kim, Sang H.; Park, Sa N. B.; Han, Ink S.; Park, John T.; and Kim, Si M., 5,047,500, Cl. 528-348.000.

Rhode, Siegfried: *See—*
Entenmann, Robert; Kugler, Karl-Heinz; Rhode, Siegfried; Rothaar, Ulrich; Stengel, Bernhard; Torno, Oskar; Unland, Stefan; and Philipp, Matthias, 5,046,470, Cl. 123-481.000.

Rhone-Poulenc AG Co.: *See—*
D'Silva, Themistocles D. J.; Powell, Gail S.; Timmons, Philip R.; and Pennicard, Richard G., 5,047,550, Cl. 548-365.000.

Riba, Gunther. Tunnel finisher with air rollers. 5,046,335, Cl. 68-5.00C.

Ribner, David B., to General Electric Company. Digital error correction system for subranging analog-to-digital converters. 5,047,772, Cl. 341-156.000.

Ricard, Claude F. Processes and devices for mechanically crimping terminals on conducting wires. 5,046,241, Cl. 29-863.000.

Richard Wolf GmbH: *See—*
Ams, Felix; Baier, Manfred; and Schafer, Roland, 5,046,510, Cl. 128-771.000.
Ams, Felix; and Baier, Manfred, 5,047,010, Cl. 604-26.000.
Diener, Jorg, 5,046,845, Cl. 356-241.000.
Lehmann, Helmut; and Karst, Siegfried, 5,046,816, Cl. 385-117.000.
Leuschner, Ulrich; Ams, Felix; and Muller, Klaus, 5,047,012, Cl. 604-32.000.
Steiner, Rudolf; and Xiao-Meng, Liu, 5,046,810, Cl. 385-38.000.

Richards Medical Company: *See—*
Jellicoe, Roger, 5,047,032, Cl. 606-83.000.

Richardson, Barry A.; Cox, Timothy R. G.; and Carter, Stuart W., to Burroughs Wellcome Co. Pesticidal compositions. 5,047,423, Cl. 514-521.000.
Richardson, Kenneth; and Gymer, Geoffrey E., to Pfizer Inc. 3-aryl-3-hydroxy-4-(1H-1,2,4-triazol-1-yl)butyramide and derivatives as antifungal agents. 5,047,548, Cl. 548-267.600.
Richardson, Terry A., to C. J. Star Enterprises, Inc. Articular support system for dental models. 5,046,949, Cl. 433-57.000.
Richter, Bernd: *See*—
Junge, Bodo; Richter, Bernd; Glaser, Thomas; Traber, Jorg; and Allen, George S., 5,047,422, Cl. 514-510.000.
Richter, Roland: *See*—
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Richter, Rudolf: *See*—
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Ricoh Company, Ltd.: *See*—
Komurasaki, Takeshi, 5,048,050, Cl. 372-101.000.
Shimada, Tomoyuki; Sasaki, Masaomi; and Aruga, Tamotsu, 5,047,590, Cl. 564-309.000.
Tachikawa, Michiyoshi, 5,048,107, Cl. 382-48.000.
Yamagata, Hideaki; Kojima, Keiji; and Hashimoto, Tatsuhiko, 5,048,113, Cl. 382-57.000.
Yamaguchi, Shingo, 5,046,859, Cl. 374-185.000.
Riedel, Gerard E.: *See*—
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Riedhammer, Josef, to Linde Aktiengesellschaft. Axial piston machine with swash plate construction. 5,046,403, Cl. 92-57.000.
Riegelhaupt, Norbert H.: *See*—
Bissett, Thomas D.; Riegelhaupt, Norbert H.; and Berkson, Mitch, 5,048,022, Cl. 371-40.100.
Riemen, Mark W.: *See*—
Oliff, Allen I.; Heimbrook, David C.; Riemen, Mark W.; and Garsky, Victor M., 5,047,502, Cl. 530-329.000.
Rieter Machine Works, Ltd.: *See*—
Graf, Felix, 5,046,225, Cl. 28-246.000.
Riggs, Arthur D.: *See*—
Pande, Hema; Riggs, Arthur D.; Zaia, John A.; and Clark, Brian R., 5,047,320, Cl. 435-5.000.
Riley, Jesse L.: *See*—
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Rimage Corporation: *See*—
Skubic, Robert L.; and Lee, John S., 5,046,305, Cl. 53-572.000.
Rimbey, Ronald P.; and Paulik, Rita M., to General Motors Corporation. Door latch coupling arrangement. 5,046,769, Cl. 292-216.000.
Rinkewich, Isaac. Method and apparatus for making honeycomb structures. 5,047,193, Cl. 264-155.000.
Risberg, Mark A.: *See*—
Steinhardt, Michael D.; Risberg, Mark A.; and Bloemer, John M., 5,046,201, Cl. 4-354.000.
Risk, William P.: *See*—
Kozlovsky, William J.; and Risk, William P., 5,048,047, Cl. 372-92.000.
Rite-Hite Corporation: *See*—
Trickle, Glen, 5,047,748, Cl. 340-542.000.
Ritter, Helmut: *See*—
Pein, Eckhart; Ritter, Helmut; and Laven, Reinhard, 5,047,413, Cl. 514-327.000.
Ritter, Joachim A.; Araghi, Mehdi N.; and Kramer, Charles J., to Holotek Ltd. Hologon scanner system. 5,046,794, Cl. 359-18.000.
Rittner, Siegbert: *See*—
von Plessen, Helmold; and Rittner, Siegbert, 5,047,558, Cl. 549-377.000.
Rizzardi, Angelo. to Sandoz Ltd. Method and composition for the alkali treatment of cellulosic substrates. 5,047,064, Cl. 8-125.000.
Ro, Abraham E. Clothes washer and dry cleaner. 5,046,337, Cl. 68-18.00F.
Robbins, Dan E.; Kozlowski, Charles G.; and Epperson, Archie L., to Honeywell, Inc. Connector assembly. 5,046,959, Cl. 439-92.000.
Robeck, Gary R.; and Desubijana, Joseba M., to Unisys Corporation. Partitioned parity check and regeneration circuit. 5,048,024, Cl. 371-49.100.
Robert Bosch GmbH: *See*—
Arnold, Herbert; Horbelt, Michael; Jautelat, Rudiger; Werner, Peter; Mezger, Manfred; and Plapp, Gunther, 5,046,467, Cl. 123-339.000.
Gmelin, Karl, 5,046,469, Cl. 123-470.000.
Gras, Jurgen; and Tjoa, Jan-Tian, 5,046,924, Cl. 417-15.000.
Heitmann, Jurgen, 5,047,872, Cl. 360-10.200.
Linder, Ernst, 5,046,472, Cl. 123-533.000.
Neumann, Rainer; and Lindae, Gerhard, 5,047,902, Cl. 362-61.000.
Schmid, Werner, 5,046,471, Cl. 123-509.000.
Robert Krups Stiftung & Co. KG.: *See*—
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RobertBosch GmbH: *See*—
Entenmann, Robert; Kugler, Karl-Heinz; Rhode, Siegfried; Rothaar, Ulrich; Stengel, Bernhard; Torno, Oskar; Unland, Stefan; and Philipp, Matthias, 5,046,470, Cl. 123-481.000.
Roberts, Clark A.; and Smith, Ian, to Wyko Incorporated. Conveyor bearing assembly. 5,046,869, Cl. 384-537.000.
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Sherwood, David E., Jr.; Bartley, Burton H.; Neff, Laurence D.; and Dai, Pei-Shing E., to Texaco Inc. Catalyst composition and method for hydroprocessing petroleum feedstocks. 5,047,142, Cl. 208-251.00H.

Shibano, Masayuki: *See—*
Moriya, Mitsuro; Shibano, Masayuki; Yamaguchi, Hiroyuki; Yamada, Shinichi; and Watanabe, Katsuya, 5,048,001, Cl. 369-44.320.

Shibata, Hideyuki: *See—*
Yoshida, Ryo; Mano, Yoshiro; and Shibata, Hideyuki, 5,047,080, Cl. 71-96.000.

Shibata, Toshihiro; and Kurosawa, Norio, to Adeka Argus Chemical Co., Ltd. Tolane compound. 5,047,169, Cl. 252-299.600.

Shibayama, Shigeru; Aida, Shunichi; Aizu, Toshio; and Takada, Shunji, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 5,047,317, Cl. 430-564.000.

Shibuya, Kiyoshi; Matsushita, Toshihiko; and Morishita, Sadao, to Mitsubishi Paper Mills Limited. Thermal transfer recording sheet. 5,047,284, Cl. 428-216.000.

Shibuya Kogyo Co., Ltd.: *See—*
Hamano, Itirou, 5,046,599, Cl. 198-481.100.

Shigematsu, Masayuki: *See—*
Fukuma, Masumi; and Shigematsu, Masayuki, 5,046,804, Cl. 385-43.000.

Shigemori, Tesshi: *See—*
Fukui, Kiyoshi; Shigemori, Tesshi; and Ehara, Katsuo, 5,047,214, Cl. 422-98.000.

Shimada, Tomoyuki; Sasaki, Masaomi; and Aruga, Tamotsu, to Ricoh Company, Ltd. Dinitro compounds, diamino compounds and triamino compounds and preparation methods thereof. 5,047,590, Cl. 564-309.000.

Shimanaka, Shigeki: *See—*
Ishii, Shigeru; and Shimanaka, Shigeki, 5,047,936, Cl. 364-424.100.

Shimaoka, Makoto: *See—*
Yagiu, Yasutoshi; Kumazawa, Tetsuo; Shimaoka, Makoto; and Aiki, Kunio, 5,046,798, Cl. 350-96.200.

Shimazu, Hisanari: *See—*
Toda, Akitoshi; Shimazu, Hisanari; Takano, Akira; Miyanaga, Hirofumi; Takahashi, Susumu; Ohaki, Yoshinao; and Aoki, Yoshisada, 5,047,847, Cl. 358-98.000.

Shimazu, Yuji: *See—*
Kawai, Koji; and Shimazu, Yuji, 5,047,689, Cl. 315-94.000.

Shimizu Construction Co., Ltd.: *See—*
Tokuhiro, Tomoya; Hatano, Teruo; Kikuchi, Koshin; and Ozaki, Shinichi, 5,046,910, Cl. 414-261.000.

Shimizu, Ichio: *See—*
Kitano, Makoto; Daikoku, Takahiro; Kawai, Sueo; Shimizu, Ichio; Yamazaki, Kazuo; Nishimura, Asao; Miura, Hideo; and Yaguchi, Akihiro, 5,047,837, Cl. 357-81.000.

Shimizu, Isao: *See—*
Saekusa, Shozo; Katoh, Seiichi; Ikuma, Akira; Saito, Hiroshi; and Shimizu, Isao, 5,046,820, Cl. 359-814.000.

Shimizu, Masatomo: *See—*
Ikeda, Yoshinori; Ohnishi, Tetsuya; and Shimizu, Masatomo, 5,047,844, Cl. 358-80.000.

Shimizu, Shigemi, to Sanden Corporation. Wobble plate compressor with a rotation prevention mechanism. 5,046,401, Cl. 92-12.200.

Shimizu, Yasuhiro, to Toshin Technical Co., Ltd. Self cleaning liquid circulator. 5,046,410, Cl. 99-455.000.

Shimohigashi, Katsuhiro: *See—*
Ishibashi, Koichiro; Sasaki, Katsuro; and Shimohigashi, Katsuhiro, 5,047,706, Cl. 323-313.000.

Shimomura, Yasunori: *See—*
Okada, Kazuya; Taniguchi, Masahiro; Shimomura, Yasunori; Tanaka, Hidemi; and Matsui, Tsutomu, 5,047,188, Cl. 264-101.000.

Shimomura, Yoshimasa: *See—*
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,046,764, Cl. 285-166.000.

Shimoyama, Jun: *See—*
Takahashi, Noriyuki; Shimoyama, Jun; Kasai, Eiji; and Miki, Akitoshi, 5,046,495, Cl. 128-399.000.

Shin Caterpillar Mitsubishi Ltd.: *See—*
Yoshino, Kazunori, 5,046,309, Cl. 60-445.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Hayakawa, Kazuhisa; Chiba, Tohru; and Nakamura, Shin-Ichiro, 5,047,086, Cl. 106-731.000.
Yamamoto, Keiji, 5,047,526, Cl. 540-200.000.

Shin-Kobe Electric Machinery Company, Ltd.: *See—*
Nasu, Yoshihiro; and Mitsuhashi, Kazuyuki, 5,047,279, Cl. 428-156.000.

Shinagawa, Yutaka: *See—*
Yasaka, Kazuo; Shinagawa, Yutaka; and Miyamoto, Toru, 5,047,825, Cl. 357-42.000.

Shindo, Tatsuye: *See—*
Nakata, Takashi; and Shindo, Tatsuya, 5,047,799, Cl. 355-27.000.

Shine, Paul R., to Boeing Company, The. Cowling interlock system. 5,046,689, Cl. 244-129.400.

Shinko Electric Co., Ltd.: *See—*
Yoshizaki, Tsukasa, 5,046,234, Cl. 29-596.000.

Shinmoto, Takahiko, to Ryobi Ltd. Ink removing system for an offset printing machine. 5,046,422, Cl. 101-425.000.

Shinonaga, Hirohiko: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Shinonaga, Hirohiko; Asakura, Tsutou; Furuya, Masato; and Tai, Hiromichi, 5,046,828, Cl. 359-72.000.

Shinozaki, Nobuo: *See—*
Tagami, Sigeru; Shinozaki, Nobuo; and Akimoto, Kazuo, 5,047,796, Cl. 354-400.000.

Shiomi, Yasuhiko, to Canon Kabushiki Kaisha. Automatic range finder camera system with a remote control function. 5,047,793, Cl. 354-238.100.

Shionogi & Co., Ltd.: *See—*
Kamata, Susumu; Tsuri, Tatsuo; Haga, Nobuhiro; Matsui, Takeaki; Kishi, Morio; Takahashi, Kimio; Hagashita, Sanji; and Seno, Kaoru, 5,047,540, Cl. 546-172.000.
Ohtani, Mitsuaki; and Matsuura, Takaharu, 5,047,574, Cl. 560-120.000.

Shipley Company Inc.: *See—*
Hawkins, Robert E.; and Harrison, Richard L., 5,047,128, Cl. 204-180.800.

Shirai, Hirohusa: *See—*
Hasebe, Kaoru; Minamide, Naoki; Higaki, Seigo; Shirai, Hirohusa; and Hukamachi, Kouichi, 5,047,022, Cl. 604-359.000.

Shiraki, Yasuhiro: *See—*
Ishizaka, Akitoshi; Shiraki, Yasuhiro; and Ohshima, Takashi, 5,047,111, Cl. 156-603.000.

Shiratsuchi, Masami: *See—*
Aoki, Nobuo; Kimura, Shigeru; and Shiratsuchi, Masami, 5,047,503, Cl. 530-350.000.

Shockling, Larry A., to Westinghouse Electric Corp. Electrochemical cell apparatus having an integrated reformer-mixer nozzle-mixer diffuser. 5,047,299, Cl. 429-20.000.

Shoda, Isao. Machine tool. 5,046,233, Cl. 29-568.000.

Shoji, Akio: *See—*
Amemoto, Masahide; Watanabe, Hikaru; and Shoji, Akio, 5,047,467, Cl. 525-7.300.

Shoji, Fusaji; Aoki, Nobuo; Kurita, Jun; Aoyama, Tsuyoshi; Kiriyu, Toshiyuki; and Matsuzaki, Yoshinori, to Hitachi, Ltd.; Japan Carlit Co., Ltd.; and Kanto Koatsu. Process for producing highly pure 3,3',4,4'-biphenyltetracarboxylic acid or dianhydride thereof. 5,047,560, Cl. 549-241.000.

Shoji, Hisashi: *See—*
Haneda, Satoshi; Fukuchi, Masakazu; Shoji, Hisashi; Matsuo, Shunji; and Morita, Shizuo, 5,047,801, Cl. 355-200.000.

Shookhtim, Rimon; Lee, Lo-Shan; and Mansoorian, Babak, to Unisys Corporation. BiCMOS memory having memory cells connected directly to address decoders. 5,047,980, Cl. 365-177.000.

Shope, Gary W.; and Godshalk, Russell L., to Eastman Kodak Company. Electronic collation. 5,047,955, Cl. 364-519.000.

Short, Robert W.: *See—*
Skupsky, Stanley; Kessler, Terrance J.; Short, Robert W.; Craxton, Stephen; Letzring, Samuel A.; and Soures, John, 5,048,029, Cl. 372-26.000.

Shorten, Martyn R.: *See—*
Kilgore, Bruce J.; and Shorten, Martyn R., 5,046,267, Cl. 36-114.000.

Showa Denko Kabushiki Kaisha: *See—*
Takenosita, Yoichiro; and Yoshida, Haruo, 5,047,576, Cl. 560-125.000.

Showa Shell Sekiyu K.K.: *See—*
Mori, Kahoru; Yamada, Yuichiro; Yamamoto, Norio; Tokunaga, Masao; Kawamura, Ichiro; Suzuki, Yoshiichi; Hagiwara, Takashi; Aihara, Yoshihiko; Yamakawa, Noriko; and Sakuma, Shigenori, 5,046,823, Cl. 359-56.000.

Showa Shell Sekiyu Kabushiki Kaisha: *See—*
Kitazume, Tomoya; Yamazaki, Takashi; and Iwatsubo, Hitoshi, 5,047,346, Cl. 435-280.000.

Showa Yakuhin Kako Co., Ltd.: *See—*
Nagase, Makoto; Asami, Kuniaki; Kobayashi, Shuichi; Arai, Yasunori; Ito, Kazuo; and Oka, Motohiro, 5,046,507, Cl. 128-745.000.

Shreeve, Robert W.; Dobbs, Michael D.; Burris, Lucy E.; Freund, Robert B.; and Keil, Ronald W., to Hewlett-Packard Company. Method and apparatus for mounting an integrated circuit on a printed circuit board. 5,046,953, Cl. 439-66.000.

Shrock, Eugene L.; and Petty, William K., to NCR Corporation. High frequency asynchronous data synchronizer. 5,047,658, Cl. 307-269.000.

Shuey, John R.: *See—*
Cohen, Thomas S.; and Shuey, John R., 5,046,952, Cl. 439-63.000.

Siczek, Bernard W., to Fischer Imaging Corporation. Dual-slide support mechanism for X-ray system components. 5,048,069, Cl. 378-197.000.

Siefert, Kristine S.: *See—*
Blake, Natalie R.; and Siefert, Kristine S., 5,047,083, Cl. 75-711.000.

Siegel-Robert, Inc.: *See—*
Alten, Ralph W., 5,047,688, Cl. 315-84.000.

Siemens Aktiengesellachaft: *See—*
Hofer, Gerhard, 5,047,717, Cl. 324-209.000.

Siemens Aktiengesellschaft: *See—*
Amann, Markus C., 5,048,049, Cl. 372-96.000.
Astegher, Berthold; Lechner, Alexander; and Jessner, Hermann, 5,047,666, Cl. 307-353.000.
Ebberg, Alfred, 5,048,120, Cl. 455-616.000.
Elstner, Siegfried; and Kuhlmann, Klaus, 5,047,923, Cl. 364-200.000.
Hofmann, Ruediger, 5,047,766, Cl. 340-825.850.
Horbaschek, Heinz, 5,048,067, Cl. 378-99.000.
Huber, Jakob; and Pettenpaul, Ewald, 5,047,355, Cl. 437-15.000.
Krafft, Wolfgang, 5,048,082, Cl. 379-389.000.
Schaefer, Willi, 5,046,708, Cl. 269-322.000.
Schwendt, Ralf, 5,048,016, Cl. 307-570.000.
Stein, Karl-Ulrich, 5,046,809, Cl. 350-96.170.
Treitinger, Ludwig; and Bertagnolli, Emmerich, 5,047,823, Cl. 357-34.000.
Welsch, Wolfgang; Krueger, Hans; Huebner, Klemens; and Haeusler, Rudolf, 5,048,043, Cl. 372-65.000.
Welsch, Wolfgang; Krueger, Hans; Huebner, Klemens; and Haeusler, Rudolf, 5,048,046, Cl. 372-87.000.

Siemens Gammasonics, Inc.: *See—*
Besseling, Nicolaas C.; Enders, Albrecht H.; Hanz, George J.; Koopmans, Hendrik; and Yunder, David A., 5,047,641, Cl. 250-363.080.

Siemens Transmission Systems, Inc.: *See—*
Tarver, Carl R., 5,046,861, Cl. 384-20.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Marzi, Mauro; Tinti, Maria O.; Di Fabio, Romano; and Misiti, Domenico, 5,047,433, Cl. 514-653.000.

Sigman, Mark: *See—*
Herr, John C.; Sigman, Mark; and Sutherland, William M., 5,047,508, Cl. 530-387.000.

Signoret, Jacques: *See—*
Carla, Francis; Baroux, Bruno; Fraisse, Jacques; and Signoret, Jacques, 5,046,686, Cl. 244-118.500.

Siklosi, Lajos: *See—*
Orban, Erno; Balogh, Tibor; Ila, Lajos; Ambrus, Gabor; Jekkel, Antonia; Elek, Sandor; Tomori, Éva; Elekes, Istvan; Sarudy, Eva T.; Moravcsik, Imre; and Siklosi, Lajos, 5,047,396, Cl. 514-11.000.

Silicon Connections Corporation: *See—*
Smith, William H.; and Chen, Chau-Shiong, 5,047,711, Cl. 324-158.00R.

Silvatrim Associates: *See—*
Shanok, Victor; Shanok, Jesse P.; and Limansky, Joseph, 5,046,652, Cl. 224-326.000.

Silvestrini, Bruno; and Cheng, Yan, to Aziende Chimiche Riunite. Abnormally glycosylated variants of $a_2$ macroglobulin. 5,047,509, Cl. 530-392.000.

Silvia, Denis A.: *See—*
Gibbons, Gould, Jr.; and Silvia, Denis A., 5,046,425, Cl. 102-293.000.

Simes Societa Italiana Medicinali & Sintetici SpA: *See—*
Casagrande, Cesare; Santangelo, Francesco; and Calabi, Luisa, 5,047,425, Cl. 514-522.000.

Simm, Wolfgang; and Steine, Hans-Theo, to Castolin S.A. Method of flame-spraying of powdered materials and flame-spraying apparatus for carrying out that method. 5,047,265, Cl. 427-423.000.

Simon, Allen H.: *See—*
Patti, Michael F.; Fedele, Nicola J.; Harney, Kevin; and Simon, Allen H., 5,047,975, Cl. 364-786.000.

Simon, Ferenc; Magyar, Karoly; Nagy, Attila; Fekete, Lajos; Puskas, Laszlo ; Fekete, Pal; Simonyi, Istvan; Egri, Janos; and Zukovics nee Sumeg, Katalin, to Egis Gyogyszergyar. Method for weight gain-increasing of fodder utilization of pigs, cattle or poultry. 5,047,434, Cl. 514-653.000.

Simon, Hubert: *See—*
Parrinello, Giovanni; Mulhaupt, Rolf; and Simon, Hubert, 5,047,546, Cl. 548-110.000.

Simon, Jerome H. Tapered optical waveguides for uniform energy (light) distribution including energy bridging. 5,046,805, Cl. 385-31.000.

Simonsen, Bent P. Automatic battery monitoring system. 5,047,961, Cl. 364-550.000.

Simonyi, Istvan: *See—*
Simon, Ferenc; Magyar, Karoly; Nagy, Attila; Fekete, Lajos; Puskas, Laszlo ; Fekete, Pal; Simonyi, Istvan; Egri, Janos; and Zukovics nee Sumeg, Katalin, 5,047,434, Cl. 514-653.000.

Simpson, Daniel L.: *See—*
Kumley, Marvin A.; Simpson, Daniel L.; Swanson, Kurt W.; and Beck, Bryan L., 5,046,365, Cl. 73-708.000.

Simpson, George D., Jr.; and Simpson, George D., Sr. Boat having a composite v-shaped foam block bottom structure. 5,046,445, Cl. 114-357.000.

Simpson, George D., Sr.: *See—*
Simpson, George D., Jr.; and Simpson, George D., Sr., 5,046,445, Cl. 114-357.000.

Simpson, John B.; Mueller, Richard L.; Brown, Peter S.; and Kermode, James R., to Devices for Vascular Intervention, Inc. Atherectomy device and method. 5,047,040, Cl. 606-159.000.

Simpson, Logan L.: *See—*
Angelo, Raymond W.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; Lawrence, William H.; Pappas, Socrates P.; and Simpson, Logan L., 5,047,568, Cl. 556-64.000.

Sin, Kee V.: *See—*
Leatherman, Dennis D.; Sin, Kee V.; and Russell, James A., 5,047,283, Cl. 428-209.000.

Sincock, Brian F., to Ausmedics Pty. Ltd. Device for the safe removal and disposal of sharps from medical tools. 5,047,019, Cl. 604-192.000.

Singer Medical Products, Inc.: *See—*
Singer, Theodore, 5,046,506, Cl. 128-741.000.

Singer, Rolf-Jurgen: *See—*
Antfang, Elmar; Kerimis, Dimitrios; and Singer, Rolf-Jurgen, 5,047,243, Cl. 424-408.000.

Singer, Theodore, to Singer Medical Products, Inc. Molded needle with adhesive. 5,046,506, Cl. 128-741.000.

Singh, Shobha: *See—*
Fleming, Debra A.; Johnson, David W., Jr.; Singh, Shobha; VanUitert, LeGrand G.; and Zydzik, George J., 5,047,369, Cl. 437-240.000.

Siol, Werner; and Terbrack, Ulrich, to Rohm GmbH Chemische Fabrik. Compatible polymer blends. 5,047,481, Cl. 525-216.000.

SIP - Societa Italiana per L-Esercizio Delle Telecommunicazioni P.A.: *See—*
Cognolato, Livio; and Gnazzo, Angelantonio, 5,047,076, Cl. 65-3.120.

Sippican Corporation, The: *See—*
Layport, John L., 5,046,359, Cl. 73-170.00A.

Skarshinski, Leon: *See—*
Gregg, Thomas A.; and Skarshinski, Leon, 5,048,062, Cl. 375-114.000.

Skinner, Steven L.: *See—*
Boyd, Charles L.; Skinner, Steven L.; and Werner, Kurt L., 5,046,369, Cl. 73-861.030.

Skolnik, Albert B., to Liz Claiborne, Inc. In situ molded product sampler with tilt-off cap. 5,046,875, Cl. 401-49.000.

Skouson, John D.: *See—*
Swann, Timothy A.; and Skouson, John D., 5,046,429, Cl. 102-530.000.

Skowasch, Gerhard; and Hoffmann, Wolfgang, to Rheinmetall GmbH. Fuze for a bomblet projectile. 5,046,424, Cl. 102-226.000.

Skubic, Robert L.; and Lee, John S., to Rimage Corporation. Sleever module for disk packaging unit. 5,046,305, Cl. 53-572.000.

Skupsky, Stanley; Kessler, Terrance J.; Short, Robert W.; Craxton, Stephen; Letzring, Samuel A.; and Soures, John, to University of Rochester, The. System for obtaining smooth laser beams where intensity variations are reduced by spectral dispersion of the laser light (SSD). 5,048,029, Cl. 372-26.000.

SKW Trostberg Aktiengesellschaft: *See—*
Dobias, Bohnslav; Michaud, Horst; and Seeholzer, Josef, 5,047,144, Cl. 209-166.000.

Slater, Daniel. Scale-platform massager apparatus. 5,046,485, Cl. 128-33.000.

Sloan, Bobby D.; and Vaught, Kenneth R., Jr. Cable terminal assembly. 5,046,962, Cl. 439-202.000.

Sloan, Scott K. Apparatus and method to automate data entry into an application program. 5,047,960, Cl. 364-523.000.

Sloane, Edwin A., to Schlumberger Technologies, Limited. General network modeling and synthesis. 5,047,969, Cl. 364-578.000.

Sloane, Thomas E., Jr.; and Blake, Joseph W., III, to Xylum Corporation. Disposable blood handling cassette device for measuring haemostasis. 5,047,211, Cl. 422-73.000.

Smalley, Alfred E.; and Gundlach, Joseph C., to Smalley Mfg. Co.; and Acraloc Corp. Inertial conveyor system. 5,046,602, Cl. 198-750.000.

Smalley Mfg. Co.: *See—*
Smalley, Alfred E.; and Gundlach, Joseph C., 5,046,602, Cl. 198-750.000.

Smallwood, John M.; and Custer, William A., to Detroit Institute of Children. Augmentive communications system and method. 5,047,953, Cl. 364-513.500.

Smart, Anthony E.: *See—*
Abbiss, John B.; Smart, Anthony E.; and Woodward, Roger P., 5,046,840, Cl. 356-28.000.

Smith, Franklin R.: *See—*
Butterfield, Roger P.; Smith, Franklin R.; and Dembosky, Stanley K., 5,046,460, Cl. 123-90.150.

Smith, George R.: *See—*
Metzger, John R.; and Smith, George R., 5,046,857, Cl. 374-135.000.



Smith, Goeffrey M.; Putman, Thomas H.; Stacey, Eric J.; and Gyugyi, Laszlo, to Westinghouse Electric Corp. Unrestricted frequency converter for unbalanced loads. 5,047,915, Cl. 363-161.000.

Smith, Ian: *See—*
Roberts, Clark A.; and Smith, Ian, 5,046,869, Cl. 384-537.000.

Smith, Jack E.: *See—*
Fratini, Albert V., Jr.; and Smith, Jack E., 5,046,285, Cl. 49-477.000.

Smith, James E.: *See—*
Stiller, Alfred H.; and Smith, James E., 5,046,459, Cl. 123-55.00R.

Smith, Jay L.: *See—*
Smith, Roger E.; Astill, Mark E.; Smith, Jay L.; and Thorne, Gale H., 5,047,044, Cl. 606-182.000.

Smith, Kim R.; Sauer, Joe D.; and Borland, James E., to Ethyl Corporation. Quaternary ammonium compounds. 5,047,577, Cl. 560-253.000.

Smith Kline & French Laboratories, Ltd.: *See—*
Coates, William J.; Flynn, Sean T.; and Rawlings, Derek A., 5,047,404, Cl. 514-243.000.
Howson, William, 5,047,418, Cl. 514-400.000.

Smith, Lloyd H., to Texas A&M University System, The. Modular tray accumulator system. 5,046,597, Cl. 198-347.400.

Smith, Michael G.: *See—*
Johnston, Jeffery S.; Smith, Michael G.; and Karpinski, Mark, 5,046,786, Cl. 303-7.000.

Smith, Murray A.; and Lichfield, Mark W. Carrying case for fishing rod and reel. 5,046,279, Cl. 43-26.000.

Smith & Nephew Richards Inc.: *See—*
Fallin, Thomas W., 5,047,033, Cl. 606-87.000.
Jahn, Anthony F., 5,047,053, Cl. 623-10.000.
Roberts, Jeffrey G.; Rand, James A.; Buford, Thomas, III; and Lackey, Jennifer J., 5,047,058, Cl. 623-20.000.
Vijayan, Kandasamy; Strait, Larry H., Jr.; and Jamison, Russell D., 5,047,054, Cl. 623-16.000.

Smith, Roger E.; Astill, Mark E.; Smith, Jay L.; and Thorne, Gale H., to Thorne, Smith, Astill Technologies, Inc. Medical droplet whole blood and like monitoring. 5,047,044, Cl. 606-182.000.

Smith, Sarah J.: *See—*
Carprathe, Bradley W.; Jaen, Juan C.; Smith, Sarah J.; and Wise, Lawrence D., 5,047,406, Cl. 514-252.000.

Smith, Thomas M. Infra-red generation. 5,046,944, Cl. 431-328.000.

Smith, Vernon R.; and Stahl, Alan L., to Caterpillar, Inc. Write protection method and apparatus for an EEPROM. 5,047,982, Cl. 365-185.000.

Smith, William H.; and Chen, Chau-Shiong, to Silicon Connections Corporation. Wafer-level burn-in testing of integrated circuits. 5,047,711, Cl. 324-158.00R.

Smithers, Michael J.: *See—*
Brown, George R.; and Smithers, Michael J., 5,047,412, Cl. 514-307.000.

Snyder, Brian A.; Warren, Harold C., III; and McClune, Gregory J., to Eastman Kodak Company. Imidazole leuco dye composition containing 4'-hydroxyacetanilide, diagnostic kit and method using same. 5,047,318, Cl. 435-5.000.

Snyder, John R.: *See—*
Marcum, Howard W., Jr.; Snyder, John R.; and Stebens, Robert E., 5,046,775, Cl. 296-39.200.

Snyder, Keith A.; and Winkler, Paul E., to International Business Machines Corporation. Coaxial cable connector assembly. 5,046,966, Cl. 439-579.000.

So, Kimming: *See—*
Bernstein, David; and So, Kimming, 5,048,018, Cl. 371-19.000.

Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.): *See—*
Esanu, Andre; and Eck, Charles, 5,047,537, Cl. 546-116.000.

Societe d'Exploitation des Machines Dubuit: *See—*
Dubuit, Jean-Louis; Rouly, Eric; and Douville, Jean-Pierre, 5,046,412, Cl. 101-39.000.

Societe Generale des Faux Minerals de Vittel: *See—*
Cazes, Michel, 5,047,105, Cl. 156-146.000.

Societe Lyonnaise des Eaux, S.A.: *See—*
Bourdiol, Daniel; and Saux, Franck, 5,046,936, Cl. 425-72.100.

Societe Nationale des Pourdres et Explosifs: *See—*
Moussa, Khalil; Decker, Christian; Brosse, Jean-Claude; Chevalier, Sammy; and Couvert, Denis, 5,047,261, Cl. 427-54.100.

Soclof, Sidney I., to Rockwell International Corporation. PNP type lateral transistor with minimal substrate operation interference. 5,047,828, Cl. 357-55.000.

Soeda, Yoshimi: *See—*
Nakamura, Toshio; Soeda, Yoshimi; Mitsuhori, Shuichi; and Toubo, Kazuo, 5,046,922, Cl. 415-172.100.

Sofanou, S.A.: *See—*
Lomberty, M. Marc; and Rougeot, M. Gabriel, 5,046,766, Cl. 285-419.000.

Sohn, Evan H.: *See—*
Maurer, David L.; Sohn, Evan H.; and Entwisle, Robert D., 5,048,076, Cl. 379-94.000.

Sohngen, Gary W., to ACE Orthopedic Manufacturing. Intramedullary rod screw guide. 5,047,034, Cl. 606-87.000.

Solladie, Guy; Forestier, Serge; and Lang, Gerard, to L'Oreal. Norbornene carboxylic acids and esters. 5,047,575, Cl. 560-120.000.

Somar Corporation: *See—*
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Joyce, Peter J.; and McCown, Brent H., 5,047,343, Cl. 435-240.450.
Wise, Lawrence D.: *See—*
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Witherspoon, Clark D.: *See—*
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Witt, Louis R., III, to Westinghouse Electric Corp. Continuous duty circuitry for high speed switching of current from a constant current source. 5,047,656, Cl. 307-255.000.
Witt, Wolfram; and Reinelt, Karlheinz, to Rheinmetall GmbH. Liquid propellant. 5,047,098, Cl. 149-89.000.
Wittmann, Otto: *See—*
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Woeffler, Friedrich: *See—*
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Wogoman, Steven S.: *See—*
Decker, Lloyd B.; Gulliver, Barron J.; and Wogoman, Steven S., 5,046,780, Cl. 297-302.000.
Wolf, Michael T.; Yokajty, Joseph E.; and Bush, Bradley S., to Eastman Kodak Company. Film thrusting cassette. 5,046,679, Cl. 242-71.100.
Wolf, Raymond D., to Fluoroware, Inc. Seamless pressure vessel with recessed indentation. 5,046,638, Cl. 220-679.000.
Wolfe, Jesse D.; Boehmler, Carolynn; and Hofmann, James J., to BOC Group, Inc., The. Method for coating substrates with silicon based compounds. 5,047,131, Cl. 204-192.230.
Wolfe, John C.; Chau, Yat-lung R.; and Ho, Wong-sik S., to University of Houston System. Sputtering method. 5,047,394, Cl. 505-1.000.
Wolkovitch, Julian. Airplane with braced wings and pivoting propulsion devices. 5,046,684, Cl. 244-7.00A.
Wong, Harry; and Wong, Mon N., to Hughes Aircraft Company. Ridged waveguide hybrid. 5,047,738, Cl. 333-113.000.
Wong, Jacob Y. Concentration detector. 5,047,639, Cl. 250-341.000.
Wong, Mon N.: *See—*
Wong, Harry; and Wong, Mon N., 5,047,738, Cl. 333-113.000.
Wong, Pui K., to Shell Oil Company. Pyridine derivatives. 5,047,501, Cl. 528-392.000.
Woo, Jong-Sam, to SamSung Electronics Co., Ltd. Screen encore method for a VTR. 5,047,878, Cl. 360-69.000.
Wood, Anthony J. G., to R. P. Scherer Corporation. Child-resistant blister pack. 5,046,618, Cl. 206-532.000.
Wood, David E.: *See—*
Wallace, Arthur W.; Sorwick, Jack R.; Pearce, Thomas; Clements, Philip E.; and Wood, David E., 5,046,669, Cl. 241-23.000.
Wood, Mary F.: *See—*
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Wood, Michael: *See—*
Hamano, Junichi; Wood, Michael; Dunlap, Lee; and Wilson, Terry, 5,046,735, Cl. 273-85.0CP.
Wood, Norman S. Umbrella holder. 5,046,622, Cl. 211-63.000.
Wood, Patrick J.; and Wood, Mary F. Doll and costume construction. 5,046,986, Cl. 446-321.000.
Woodland, Brent J.: *See—*
Meier, Patricia A.; Meier, W. Jeff; and Woodland, Brent J., 5,047,125, Cl. 203-2.000.
Woods, Derek; Madonna, M. Jane; and Mulcahy, Linda S., to Ortho Diagnostic Systems Inc. Nucleic acid probe for detection of neisseria gonorrhoea. 5,047,523, Cl. 536-27.000.
Woods, Quentin T., to Boeing Company, The. Wing major assembly jig. 5,046,688, Cl. 244-123.000.
Woodward, Roger P.: *See—*
Abbiss, John B.; Smart, Anthony E.; and Woodward, Roger P., 5,046,840, Cl. 356-28.000.
Woolf, Lawrence D.; Elsner, Frederick H.; and Raggio, William A., to General Atomics. Substrate for ceramic superconductor. 5,047,389, Cl. 505-1.000.
Worden, David F.: *See—*
Weinerman, Lee S.; Worden, David F.; Lauterbach, Norman; and Farmer, Wilton T., Jr., 5,046,340, Cl. 70-208.000.
Worgotter: *See—*
Theurer, Josef; Hansmann, Johann; and Worgotter, 5,046,270, Cl. 37-104.000.
Worp, Nicholas J., to Motorola, Inc. Liquid crystal display backlighting apparatus having combined optical diffuser and shock dampening properties. 5,046,829, Cl. 359-49.000.
Worsley, Clifford R., to Goetze AG. Assembling device for valve actuating components of internal-combustion engines. 5,046,463, Cl. 123-90.670.
Wrap-A-Round Limited: *See—*
Drury, David J.; and Drury, Norman, 5,046,296, Cl. 53-211.000.
Wright, David L.: *See—*
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Wright, Shirley H.: *See—*
Onwumere, Fidelis C.; Greene, Sharon L.; and Wright, Shirley H., 5,047,456, Cl. 524-13.000.
Wu, Tai-Wing, to Nagase Co., Ltd. Reduction of oxyradical damage in biomedical applications. 5,047,395, Cl. 514-2.000.
Wu, TaiWing: *See—*
Emmons, Robert E.; Mauck, Linda A.; Mauck, John C.; Wu, TaiWing; Rand, Royden N.; and Andrese, Angelo P., 5,047,322, Cl. 435-6.000.
Wulf, James B., to Union Carbide Industrial Gases Technology Corporation. High efficiency turboexpander. 5,046,919, Cl. 415-1.000.
Wulf, Rudolf; Binder, Burkhard; and Hieronimus, Beatrix, to Deutsche Forschuhgsanstalt fur Luft-und Raumfahrt F.V. Deformable wall. 5,046,358, Cl. 73-147.000.
Wurst, John W.; Garron, Stephen A.; and Dob, Allan M., to SSMC Inc. Apparatus for measuring internal resistance of wet cell storage batteries having non-removable cell caps. 5,047,722, Cl. 324-430.000.
WYKO, Inc.: *See—*
Byerley, Mark S., 5,047,108, Cl. 156-417.000.
Roberts, Clark A.; and Smith, Ian, 5,046,869, Cl. 384-537.000.
Xenidis, Phil. Tremolo arm and attachment means for an electric guitar. 5,046,393, Cl. 84-313.000.
Xerox Corporation: *See—*
Beer, Ted A.; and Williams, Geoffrey C., 5,046,678, Cl. 242-71.800.
Bloomberg, Dan S.; Sang, Henry W., Jr.; and Dasari, Lakshmi, 5,048,109, Cl. 382-50.000.
Brewington, Grace T.; and Knapp, John F., 5,047,806, Cl. 355-259.000.
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Xiao-Meng, Liu: *See—*
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Yachigo, Shinichi: *See—*
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Yagiu, Yasutoshi; Kumazawa, Tetsuo; Shimaoka, Makoto; and Aiki, Kunio, to Hitachi, Ltd. Semiconductor light emitting device and apparatus using the same. 5,046,798, Cl. 350-96.200.
Yaguchi, Akihiro: *See—*
Kitano, Makoto; Daikoku, Takahiro; Kawai, Sueo; Shimizu, Ichio; Yamazaki, Kazuo; Nishimura, Asao; Miura, Hideo; and Yaguchi, Akihiro, 5,047,837, Cl. 357-81.000.
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Yajima, Toshiko: *See—*
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Yamada, Shinichi: *See—*
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Yamada, Tetsusyo; Kojima, Takao; Ishiguro, Hiroyuki; and Kami, Yoshihide, to NGK Spark Plug Co., Ltd. Solid electrolyte air/fuel ratio sensor with voltage control. 5,047,137, Cl. 204-425.000.
Yamada, Toshikazu: *See—*
Ishit, Koji; Iizuka, Masao; Tagami, Jun; Yamada, Toshikazu; Sasaki, Katsuyasu; and Ikeda, Yoshiki, 5,046,290, Cl. 52-1.000.
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Yamagata, Hideaki; Kojima, Keiji; and Hashimoto, Tatsuhiko, to Ricoh Company, Ltd. Character recognition post-processing method. 5,048,113, Cl. 382-57.000.
Yamagishi, Makoto; and Matui, Satoshi, to Sony Corporation. Electro-acoustic transducer apparatus. 5,048,092, Cl. 381-187.000.
Yamaguchi, Atsuo: *See—*
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Yamaguchi, Hidetaka: *See—*
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Yamaguchi, Ryuichi; and Yamamoto, Atsushi, to Matsushita Electric Industrial Co., Ltd. Standard cell LSI layout method. 5,047,949, Cl. 364-491.000.
Yamaguchi, Shingo, to Ricoh Company, Ltd. Temperature measuring device and thermal head device having the same. 5,046,859, Cl. 374-185.000.
Yamaguchi, Susumu; and Ishiwata, Tetsuo, to Matsushita Electric Industrial Co., Ltd. Data companding method and data compressor-/expander. 5,047,768, Cl. 341-95.000.

Yamaguchi, Takeshi: *See—*
Deguchi, Toshihisa; Yamaguchi, Takeshi; Maeda, Shigemi; Iwaki, Takashi; Fujiwara, Tsuneo; and Terashima, Shigeo, 5,048,004, Cl. 369-54.000.

Yamaha Corporation: *See—*
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Yamamoto, Atsushi: *See—*
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Yamamoto, Hiromasa; Mori, Masayuki; and Oda, Osamu, to Nippon Mining Co., Ltd. Method for producing compound semiconductor single crystal substrates. 5,047,370, Cl. 437-248.000.

Yamamoto, Keiji, to Shin-Etsu Chemical Co., Ltd. Dehydrogenative silylation process of organic compounds having active hydrogen. 5,047,526, Cl. 540-200.000.

Yamamoto, Norio: *See—*
Mori, Kahoru; Yamada, Yuichiro; Yamamoto, Norio; Tokunaga, Masao; Kawamura, Ichiro; Suzuki, Yoshiichi; Hagiwara, Takashi; Aihara, Yoshihiko; Yamakawa, Noriko; and Sakuma, Shigenori, 5,046,823, Cl. 359-56.000.

Yamamoto, Osamu; and Yoshida, Toshihiko, to Sharp Kabushiki Kaisha. Light wavelength converter. 5,046,802, Cl. 359-328.000.

Yamamoto, Takashi: *See—*
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Yamamoto, Takemi; Takagi, Osamu; Matsumoto, Yumio; Kimura, Yasuo; and Nakata, Takashi, to Brother Kogyo Kabushiki Kaisha. Thermal fixing unit having gas purification means. 5,047,798, Cl. 355-27.000.

Yamamoto, Tatsuya: *See—*
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Yamamoto, Yoshihito: *See—*
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Yamashita, Hiroyuki: *See—*
Fukazawa, Nobuyuki; and Yamashita, Hiroyuki, 5,047,545, Cl. 546-342.000.

Yamauchi, Satomi, to Mitsubishi Denki Kabushiki Kaisha. Motor control apparatus and motor controlling method. 5,047,704, Cl. 318-801.000.

Yamazaki, Kazuo: *See—*
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Yamazaki, Nobuto; Terakado, Yoshimitsu; Ohashi, Yuji; and Hayashi, Hijiri, to Kabushiki Kaisha Shinkawa. Ultrasonic wire bonding apparatus. 5,046,654, Cl. 228-1.100.

Yamazaki, Shunpei; and Sato, Masahiko, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal electro-optical device having micro-domains. 5,046,831, Cl. 359-76.000.

Yamazaki, Takashi: *See—*
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Yammamoto, Kyonosuke: *See—*
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Yammamoto, Toshihiro: *See—*
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Yanagi, Tooru; and Asano, Yasuo, to Sumitomo Electric Industries Ltd. Apparatus and method for joining coated optical fibers by fusion. 5,046,812, Cl. 385-96.000.

Yancey, William E. Baseball pitchers practice target. 5,046,729, Cl. 273-26.00A.

Yang, Shu S.: *See—*
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Yano, Kazuhisa: *See—*
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Yaouanc, Jean-Jacques: *See—*
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Yaron, Ran: *See—*
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Yasaka, Kazuo; Shinagawa, Yutaka; and Miyamoto, Toru, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering, Ltd. Semiconductor integrated circuit device having a decoder portion of complementary misfets employing multi-level conducting layer and a memory cell portion. 5,047,825, Cl. 357-42.000.

Yasuda, Hiroshi: *See—*
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,046,764, Cl. 285-166.000.

Yasuda, Keiji; Ogura, Koji; and Miyahara, Kazuhiro, to NGK Insulators, Ltd. Process for firing ceramic shaped bodies and a tunnel kiln used therefor. 5,046,946, Cl. 432-11.000.

Yasuda, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Still picture transmission device. 5,048,072, Cl. 379-53.000.

Yasuhara, Masateru: *See—*
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Yasuhira, Mitsuo; Yasui, Takatoshi; Matsuyama, Kazuhiro; Iwata, Hideyuki; and Fukumoto, Masanori, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory device having a trench-stacked capacitor. 5,047,815, Cl. 357-23.600.

Yasui, Takatoshi: *See—*
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Lavie, David; Meruelo, Daniel; Lavie, Gad; Revel, Michel; Vande Velde, Vincent; and Rotman, Dalia, 5,047,435, Cl. 514-732.000.

Yi, Chong S. Rotary internal combustion engine. 5,046,465, Cl. 123-248.000.

Yim, Jeffrey B.; Hubbard, Todd W.; Melkerson, Lori D.; Sexton, Michael A.; and Fieggen, Bruce M., to Abbott Laboratories. Configuration fiber-optic blood gas sensor bundle and method of making. 5,047,627, Cl. 250-227.230.

Yip, Kin-Fai: *See—*
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Yokajty, Joseph E.: *See—*
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Yokote, Masatsugu; Ito, Hideo; and Kawagoe, Kenji, to Nissan Motor Co., Ltd. Height control system in automotive suspension system with hunting preventive feature. 5,047,938, Cl. 364-424.050.

Yokoyama, Takeshi: *See—*
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Yokoyama, Yoshihiro: *See—*
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Yomtoubian, Ruben, to Unisys Corp. Technique for certifying disk recording surface. 5,047,874, Cl. 360-25.000.

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Yoo, Young S.; and Salmon, John K., to Otis Elevator Company. Elevator occupant load weighing sensor mounting assembly. 5,046,584, Cl. 187-1.00R.

Yoon, InBae. Wound closing device. 5,047,047, Cl. 606-216.000.

York Marine Products: *See—*
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Yoshiba, Takeyuki: *See—*
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Yoshida, Akiyoshi; Tosaki, Junichi; and Wakatuki, Yuji, to Hoshizaki Electric Co., Ltd. Refrigeration apparatus with article preserving and displaying chamber. 5,046,328, Cl. 62-248.000.

Yoshida, Haruo: *See—*
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Yoshida Kogyo K. K.: *See—*
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Yoshida, Ryo; Mano, Yoshiro; and Shibata, Hideyuki, to Sumitomo Chemical Company, Ltd. Herbicidal composition. 5,047,080, Cl. 71-96.000.

Yoshida, Takanori: *See—*
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Yoshida, Toshihiko: *See—*
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Yoshida, Toshiyasu, to Jatco Corporation. Oil level monitoring device for automotive automatic power transmission. 5,046,263, Cl. 33-722.000.

Yoshida, Tsuyoshi: *See—*
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Yoshimura, Toshitaka: *See—*
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Yoshino, Kazunori, to Shin Caterpillar Mitsubishi Ltd. Energy regenerative circuit in a hydraulic apparatus. 5,046,309, Cl. 60-445.000.

Yoshinuma, Mikio: *See—*
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Yoshioka, Atsushi: *See—*
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Yoshizaki, Tsukasa, to Shinko Electric Co., Ltd. Method of manufacturing a core unit for a linear probe motor. 5,046,234, Cl. 29-596.000.

Yoshizawa, Kenji: *See—*
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Yotsuuye, David S.: *See—*
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You, Young S.: *See—*
Miller Robert J.; and You, Young S., 5,047,084, Cl. 106-27.000.

Young, Brian W., to Metal-Bond (Technology) Limited. Reinforcing bar coupling system. 5,046,878, Cl. 403-13.000.

Young, David E.; and Davis, Kenneth P., to Protectair Limited. Orthopaedic brace and motion control mechanism therefor. 5,046,490, Cl. 128-87.00B.

Young, Roland D.: *See—*
Cathcart, John C., Sr.; Coke, John, Jr.; Young, Roland D.; and Cathcart, Eugene K., Sr., 5,046,642, Cl. 222-153.000.

Young, William R., to Harris Corporation. Cell based adder with tree structured carry, inverting logic and balanced loading. 5,047,974, Cl. 364-784.000.

Yumoto, Toshiyuki: *See—*
Nakayama, Hiroshi; Takeda, Tomokazu; Yumoto, Toshiyuki; Kitada, Mitsuo; Ohta, Shoji; and Chosa, Masatoshi, 5,046,578, Cl. 180-291.000.

Yunder, David A.: *See—*
Besseling, Nicolaas C.; Enders, Albrecht H.; Hanz, George J.; Koopmans, Hendrik; and Yunder, David A., 5,047,641, Cl. 250-363.080.

Zabka, Britton. Holographic printer. 5,046,792, Cl. 359-26.000.

Zabrowski, Geoffrey P.; and Blohm, Robert L., to Briggs & Stratton Corp. Starter motor construction. 5,046,373, Cl. 74-7.00R.

Zaia, John A.: *See—*
Pande, Hema; Riggs, Arthur D.; Zaia, John A.; and Clark, Brian R., 5,047,320, Cl. 435-5.000.

Zama, Hideo; Idegami, Hitoshi; Manabe, Yosio; and Inada, Kenkichi, to Hitachi, Ltd. Magnetic head formed of thin metal film including a chevron shape. 5,047,885, Cl. 360-126.000.

Zander, Richard A.: *See—*
Crumb, Donald A.; Dillon, William F., Jr.; Gaiser, Robert F.; and Zander, Richard A., 5,046,313, Cl. 60-535.000.

Zanders, Gary V.: *See—*
Lee, Robert D.; and Zanders, Gary V., 5,047,663, Cl. 307-296.100.

Zawistowska, Urszula, to ABI Biotechnology, Inc. Sprout-damaged wheat flour containing barley alpha-amylase inhibitor. 5,047,257, Cl. 426-622.000.

Zayarny, Sergei L.; Notkin, Vladimir S.; and Ilyashenko, Alexei A., to Kaluzhskoe Proizvodstvennoe Obiedinenie Putevykh Mashin I Gidrapriuodok "Kalugaputmash" . Tamping mechanism of tie-tamping outfit. 5,046,430, Cl. 104-12.000.

Zayhowski, John J., to Massachusetts Institute of Technology. Optically-stabilized plano-plano optical resonators. 5,048,051, Cl. 372-101.000.

Zegzouti, Ayoub F.: *See—*
Handel, Henri; Yaouanc, Jean-Jacques; Zegzouti, Ayoub F.; Malouala, Denis; des Abbayes, Herve ; Clement, Jean-Claude; Bernard, Helene; and Le Gall, Guenaelle, 5,047,527, Cl. 540-474.000.

Zehler, Eugene R., to Henkel Corporation. Lubricant compositions having improved anti-deposition properties comprising a polyalkylene oxide-modified silicone oil. 5,047,159, Cl. 252-49.600.

Zeiss, Gerhard: *See—*
Lossnitzer, Klaus; Ober, Karl-Friedrich; Giebenhain, Gerhard; Zeiss, Gerhard; and Volger, Karl-Dieter, 5,047,235, Cl. 424-80.000.

Zelinski, George. Bowling ball. 5,046,731, Cl. 273-63.00E.

Zeller, Norbert: *See—*
Weidner, Richard; Zeller, Norbert; Deubzer, Bernward; and Frey, Volker, 5,047,492, Cl. 528-15.000.

Zeman, Robert E.: *See—*
Jamzadeh, Fereidoon S.; Johnson, Kevin M.; and Zeman, Robert E., 5,047,791, Cl. 346-157.000.

Zenith Electronics Corporation: *See—*
Capek, Raymond G.; Dougherty, Lawrence W.; and Parry, Andrew S., 5,047,684, Cl. 313-407.000.

Zenoni, Pietro, to L.G.L. Electronics S.p.A. Device for counting turns unwinding from weft feeders. 5,046,536, Cl. 139-452.000.

Zentner, Gaylen M.: *See—*
Pogany, Stefano A.; and Zentner, Gaylen M., 5,047,464, Cl. 524-500.000.

Ziegler, Richard W.: *See—*
Barrett, L. Donald; Hahn, Dale R.; Pelloski, Peter E.; and Ziegler, Richard W., 5,047,451, Cl. 523-442.000.

Zieke, Larry M.; and Pawloski, James C., to Zip-Pak, Inc. Apparatus and method for making Z-folded zippered film. 5,047,002, Cl. 493-394.000.

Zieve, Peter B. Power supply for electromagnetic proof load tester and dent remover. 5,046,345, Cl. 72-56.000.

Zilberfarb, Yossi, to AT&T Bell Laboratories. Interference source identification. 5,048,015, Cl. 370-110.400.

Zindler, Wolfgang: *See—*
Sauerwein, Kurt; Busse, Hans P.; Link, Rainer; Wiacker, Helmut; Stapf, Christian; Schulz, Rudiger; Stolzenberg, Ekhard; Disselhorst, Kurt; Burghoff, Herbert; Kirchesch, Karl; Lean, James D.; Topping, Laurence F.; and Zindler, Wolfgang, 5,047,851, Cl. 358-101.000.

Zip-Pak, Inc.: *See—*
Zieke, Larry M.; and Pawloski, James C., 5,047,002, Cl. 493-394.000.

Zlokovitz, Robert J. Microprocessor controlled gas pressure regulator. 5,047,965, Cl. 364-558.000.

Znoyek, Gerald: *See—*
Kolschbach, Veit M.; Lachmann, Dieter E.; and Znoyek, Gerald, 5,046,674, Cl. 242-54.00R.

Zoltner, John D., to Xerox Corporation. Rotary ink stamp for a copier/printer apparatus. 5,046,419, Cl. 101-235.000.

Zon, Gerald: *See—*
Andrus, William A.; McCollum, Christie D.; and Zon, Gerald, 5,047,524, Cl. 536-27.000.

Zorz, Mirjan: *See—*
Milovac, Jenny; Kovacic, Mateja; Kopitar, Zdravko; Urbancic-Smerkolj, Janja; Lenardic, Andrej; Zorz, Mirjan; Kofler, Bojan; Vene-Mozina, Angela; Nikolic, Vida; Lampret, Marija; and Meden, Breda, 5,047,247, Cl. 424-465.000.

Zscheile, John W., Jr.: *See—*
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Zubkov, Vladimir A.: *See—*
Zubov, Alexei V.; Zubkov, Vladimir A.; Volkov, Anatoly E.; and Katusov, Vladimir P., 5,046,902, Cl. 408-230.000.

Zubov, Alexei V.; Zubkov, Vladimir A.; Volkov, Anatoly E.; and Katusov, Vladimir P. Spiral drill. 5,046,902, Cl. 408-230.000.

Zuckerberg, Leo; and Torres, Enrique, to Tek-Rap, Inc. Method for forming co-extruded adhesive tapes. 5,047,196, Cl. 264-171.000.

Zukovics nee Sumeg, Katalin: *See—*
Simon, Ferenc; Magyar, Karoly; Nagy, Attila; Fekete, Lajos; Puskas, Laszlo ; Fekete, Pal; Simonyi, Istvan; Egri, Janos; and Zukovics nee Sumeg, Katalin, 5,047,434, Cl. 514-653.000.

Zurbrick, Larry S., to Drexler Technology Corporation. High density data track layout for storage media. 5,047,619, Cl. 235-488.000.

Zust, Harry, to Fela Planungs AG. Assembly of multi-layer circuit boards secured by plastic rivets. 5,047,896, Cl. 361-412.000.

Zydzik, George J.: *See—*
Fleming, Debra A.; Johnson, David W., Jr.; Singh, Shobha; VanUitert, LeGrand G.; and Zydzik, George J., 5,047,369, Cl. 437-240.000.

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# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF SEPTEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Andre, Robert; and LeMert, Alfred J., to Selmer Company, L.P., The. Drum hoop. Re. 33,685, Cl. 84-413.000.

Fujitsu Limited: *See—*
Tsukui, Setsuo, Re. 33,688, Cl. 235-379.000.

Greer, J. Rex, to Pony Pack, Inc. Auxiliary air conditioning, heating and engine warming system for trucks. Re. 33,687, Cl. 165-43.000.

LeMert, Alfred J.: *See—*
Andre, Robert; and LeMert, Alfred J., Re. 33,685, Cl. 84-413.000.

Medical Implements, Inc.: *See—*
Parrish, James M., Re. 33,686, Cl. 128-771.000.

Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Objective lens system for endoscopes. Re. 33,689, Cl. 359-708.000.

Olympus Optical Co., Ltd.: *See—*
Nishioka, Kimihiko, Re. 33,689, Cl. 359-708.000.

Parrish, James M., to Medical Implements, Inc. Urine specimen collectors and method of detecting spurious urine specimens. Re. 33,686, Cl. 128-771.000.

Pony Pack, Inc.: *See—*
Greer, J. Rex, Re. 33,687, Cl. 165-43.000.

Selmer Company, L.P., The: *See—*
Andre, Robert; and LeMert, Alfred J., Re. 33,685, Cl. 84-413.000.

Tsukui, Setsuo, to Fujitsu Limited. Automatic transaction machine. Re. 33,688, Cl. 235-379.000.

# LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Adams, Alfred A., to Group Lotus plc. Mould for moulding an article. B1 4,767,308, 9-10-91, Cl. 425-405.100.

Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., to Halomet, Inc. Process for making ferrite spherical particulate toner core from raw fly ash. B1 4,698,289, 9-10-91, Cl. 430-106.600.

Bachman, William R.: *See—*
Joshi, Yatindra M.; Bachman, William R.; and Jain, Nemichand B., B1 4,808,413, Cl. 424-458.000.

Donaldson Company, Inc.: *See—*
Engel, Donald F.; and Gieseke, Steven S., B1 4,720,292, Cl. 55-337.000.

E. R. Squibb & Sons, Inc.: *See—*
Joshi, Yatindra M.; Bachman, William R.; and Jain, Nemichand B., B1 4,808,413, Cl. 424-458.000.

Earl, Geoffrey H.: *See—*
Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., B1 4,698,289, Cl. 430-106.600.

Engel, Donald F.; and Gieseke, Steven S., to Donaldson Company, Inc. Cylindrical air filter with lightweight housing and radially directed seal. B1 4,720,292, 9-10-91, Cl. 55-337.000.

Gieseke, Steven S.: *See—*
Engel, Donald F.; and Gieseke, Steven S., B1 4,720,292, Cl. 55-337.000.

Graves, George A., Jr.; and Kumar, Binod, to University of Dayton. Bioabsorbable glass fibers for use in the reinforcement of bioabsorbable polymers for bone fixation devices and artificial ligaments. B1 4,604,097, 9-10-91, Cl. 623-11.000.

Group Lotus plc: *See—*
Adams, Alfred A., B1 4,767,308, Cl. 425-405.100.

Halomet, Inc.: *See—*
Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., B1 4,698,289, Cl. 430-106.600.

Jain, Nemichand B.: *See—*
Joshi, Yatindra M.; Bachman, William R.; and Jain, Nemichand B., B1 4,808,413, Cl. 424-458.000.

Joshi, Yatindra M.; Bachman, William R.; and Jain, Nemichand B., to E. R. Squibb & Sons, Inc. Pharmaceutical compositions in the form of beadlets and method. B1 4,808,413, 9-10-91, Cl. 424-458.000.

Kumar, Binod: *See—*
Graves, George A., Jr.; and Kumar, Binod, B1 4,604,097, Cl. 623-11.000.

Meyerson, Steven C., to Republic Bank. Bonded panel interlock device. B1 4,769,963, 9-10-91, Cl. 52-309.900.

Republic Bank: *See—*
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Trunko, David W.: *See—*
Aldrich, Robert G.; Earl, Geoffrey H.; and Trunko, David W., B1 4,698,289, Cl. 430-106.600.

University of Dayton: *See—*
Graves, George A., Jr.; and Kumar, Binod, B1 4,604,097, Cl. 623-11.000.

# LIST OF DESIGN PATENTEES

A. G. Schmid AG: *See—*
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Adachi, Kinji: *See—*
Takahashi, Takehiko; Adachi, Kinji; and Kaneko, Tomihiro, 319,906, Cl. D34-19.000.

Adams, Duane D.; and Tsuji, Masao, to North American Philips Corp. Combined coffee maker and carafe. 319,752, 9-10-91, Cl. D7-309.000.

Ahrend Groep N.V.: *See—*
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Albert, Charles E., Jr.; and Yagoda, John J., to Elsag International B.V. Floor standing cabinet for data communications equipment. 319,816, 9-10-91, Cl. D14-102.000.

Andreasen, Robert O.: *See—*
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Andrew, Rodger J., to Landis & Gyr Communications (U.K.) Ltd. Credit card reader. 319,825, 9-10-91, Cl. D14-116.000.

Antonious, Anthony J. Iron type golf club head. 319,857, 9-10-91, Cl. D21-220.000.

Antonious, Anthony J. Iron type golf club head. 319,858, 9-10-91, Cl. D21-220.000.

Arney, Michel D.: *See—*
McGown, James B.; Bromberg, Edward E. A.; Fine, David H.; Carroll, A. Lindsay, Jr.; Arney, Michel D.; and Noble, Lynn, 319,796, Cl. D10-81.000.

Ascher, Horst. Billiard table. 319,860, 9-10-91, Cl. D21-232.000.

Associated Mills Inc.: *See—*
Geneve, Francois; Heiligenstein, Luc; and Melamed, Stephen, 319,864, Cl. D23-209.000.

Atlantic Thermoplastics Co., Inc.: *See—*
Fox, Robert B., 319,719, Cl. D2-314.000.

Avia Group International Inc.: *See—*
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Bakic, Karena, to Cosmede Anstalt. Cream make-up container. 319,897, 9-10-91, Cl. D28-82.000.





Bales, John E.; and Johnston, Douglas L., to Comtek Industries, Inc. Rotatable top for an electronic equipment support stand. 319,747, 9-10-91, Cl. D6-495.000.

Barner, Edward L. Stocking holder. 319,903, 9-10-91, Cl. D32-61.000.

Barrett, Lindy R.; and Jacobs, Van A. Door lock. 319,776, 9-10-91, Cl. D8-340.000.

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Bergman, Donald A.; and O'Neil, Robert A., to Newell Co. Scale. 319,797, 9-10-91, Cl. D10-92.000.

Black & Decker Inc.: *See—*
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Blanco GmbH & Co. KG: *See—*
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Blomquist, Peter J.; and Woolford, Michael E., to Kiltie Corporation. Retaining wall block. 319,885, 9-10-91, Cl. D25-118.000.

Bookout, Timothy H. Tool for use in plugging a cylindrical pipe. 319,759, 9-10-91, Cl. D8-21.000.

Borromeo, Lucio, to 3T S.p.A. Set of grips for a bicycle handle bar. 319,770, 9-10-91, Cl. D8-303.000.

Braid, Dennis. Fishing rod holder. 319,733, 9-10-91, Cl. D3-104.000.

Brandon, Wesley P., to Safety Signals, Inc. Auxiliary illuminated turn signal for semi-trailers. 319,888, 9-10-91, Cl. D26-31.000.

Braun Aktiengesellschaft: *See—*
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Ullmann, Roland, 319,896, Cl. D28-49.000.

Bressler, Peter W.: *See—*
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Brostoski, Susan M.: *See—*
Brostoski, Donald S.; and Brostoski, Susan M., 319,861, Cl. D21-232.000.

Buecheler, Herbert: *See—*
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Bulgari, Paolo, to Partecipazioni Bulgari S.p.A. Earring. 319,801, 9-10-91, Cl. D11-42.000.

Bull, John W. Physical exerciser. 319,855, 9-10-91, Cl. D21-195.000.

Burgener, Eddy, to Roventa-Henex SA. Wristwatch. 319,790, 9-10-91, Cl. D10-32.000.

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Canon Kabushiki Kaisha: *See—*
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CGR Ultrasonic: *See—*
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Chagrin Plastic Methods, Inc.: *See—*
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Chiron-Werke GmbH & Co. KG: *See—*
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Comtek Industries, Inc.: *See—*
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Cook, Gary B. Bicycle crank. 319,808, 9-10-91, Cl. D12-123.000.

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Reid, Mary J.; and O'Connell, David J., 319,771, Cl. D8-312.000.

Delepine, Jean-Claude. Faucet. 319,867, 9-10-91, Cl. D23-238.000.

Delepine, Jean-Claude. Bath tub. 319,869, 9-10-91, Cl. D23-280.000.

Del Vecchio, Frank A., Jr.; and Mansfield, Richard A. Sneaker or similar article. 319,718, 9-10-91, Cl. D2-273.000.

Design Synergy Pty. Ltd.: *See—*
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Dessi, James E. Phonograph turntable cover. 319,831, 9-10-91, Cl. D14-261.000.

Diaz, Francisco J. Game board. 319,850, 9-10-91, Cl. D21-31.000.

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Fleming, Paul D.; and Gajer, Nandor, to W & F Manufacturing, Inc. Combined door handle and deadbolt unit. 319,769, 9-10-91, Cl. D8-301.000.

Fountain, Alton V. Fisherman's cart. 319,907, 9-10-91, Cl. D34-26.000.

Fox, Robert B., to Atlantic Thermoplastics Co., Inc. Sandal upper. 319,719, 9-10-91, Cl. D2-314.000.

Fukazawa, Naoto, to Seiko Epson Corporation. Stopwatch. 319,788, 9-10-91, Cl. D10-30.000.

Fukuda, Hideo; Ido, Mikio; and Motobayashi, Naoki, to Mita Industrial Co., Ltd. Toner cartridge. 319,841, 9-10-91, Cl. D18-43.000.

G. B. Communications, Inc.: *See—*
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Gajer, Nandor: *See—*
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Geary, John O. Patella exerciser. 319,854, 9-10-91, Cl. D21-191.000.

Geminii Display Ltd.: *See—*
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Geneve, Francois; Heiligenstein, Luc; and Melamed, Stephen, to Associated Mills Inc. Combined refrigerator jug and water filter. 319,864, 9-10-91, Cl. D23-209.000.

Giese, Robert D., to Intermatic Incorporated. Outdoor light fixture. 319,891, 9-10-91, Cl. D26-67.000.

Gocke, Klaus W.; and Muck, Manfred, to Blanco GmbH & Co. KG. Sink. 319,870, 9-10-91, Cl. D23-287.000.

Golden West Billiard Supply, Inc.: *See—*
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Granger, Gerald M. Anchor holder. 319,777, 9-10-91, Cl. D8-373.000.

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Grey, Jonathan, to Smallbone Plc. Butcher block table with storage or the like. 319,743, 9-10-91, Cl. D6-436.000.

Grimm, Barbara A. Design for a wicker container. 319,783, 9-10-91, Cl. D9-414.000.

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273 5,046,561
293 5,046,562
297 5,046,563

**CLASS 169**

47 5,046,564

**CLASS 172**

71 5,046,346
239 5,046,565

**CLASS 173**

162.002 5,046,566

**CLASS 174**

88 R 5,047,594

**CLASS 175**

4.6 5,046,567
21 5,046,568

**CLASS 177**

30 5,046,569
145 5,046,570

**CLASS 180**

65.1 5,046,571
140 5,046,572
143 5,046,573
5,046,574
178 5,046,575
233 5,046,576
266 5,046,577
291 5,046,578
340 5,046,579

**CLASS 181**

135 5,046,580
152 5,046,581

**CLASS 182**

127 5,046,582

**CLASS 184**

6.4 5,046,583

**CLASS 187**

1 R 5,046,584
9 E 5,046,585
17 5,046,586

**CLASS 188**

32 5,046,587
41 5,046,588
72.3 5,046,589

**CLASS 191**

22 DM 5,047,595

**CLASS 192**

3.29 5,046,591
3.58 5,046,592
18 A 5,046,593
84 C 5,046,594
85 AA 5,046,595
106.1 5,046,596

**CLASS 198**

347.4 5,046,597
465.1 5,046,598
481.1 5,046,599
697 5,046,600
731 5,046,601
750 5,046,602
812 5,046,603

**CLASS 200**

4 5,047,596
5 B 5,047,597
43.022 5,047,599
43.16 5,047,598
61.54 5,047,600
81 R 5,047,601
86 R 5,047,602
253 5,047,603
294 5,047,604

**CLASS 202**

170 5,047,123
181 5,047,124

**CLASS 203**

2 5,047,125

**CLASS 204**

151 5,047,126
176 5,047,127
180.8 5,047,128
182.8 5,047,129
192.12 5,047,130
192.23 5,047,131
242 5,047,132
258 5,047,133
299 R 5,047,134
5,047,135
5,047,136
425 5,047,137

**CLASS 206**

0.5 5,046,604
5.1 5,046,605
37 5,046,606
44.12 5,046,607
209 5,046,608
232 5,046,609
330 5,046,610
339 5,046,611
365 5,046,612
366 5,046,613
5,046,614
454 5,046,615
467 5,046,616
507 5,046,617
532 5,046,618
554 5,046,619
581 5,046,620
627 5,046,621

**CLASS 208**

111 5,047,139
113 5,047,140
120 5,047,141
251 H 5,047,142
428 5,047,143

**CLASS 209**

166 5,047,144
5,047,145

**CLASS 210**

97 5,047,146
101 5,047,147
498 5,047,148
513 5,047,149
525 5,047,150
5,047,151
611 5,047,152
634 5,047,153
636 5,047,154
744 5,047,156
787 5,047,157

**CLASS 211**

63 5,046,622
65 5,046,623
70.6 5,046,624
5,046,625
131 5,046,626

**CLASS 215**

31 5,046,627
100 R 5,046,628
221 5,046,629
321 5,046,630

**CLASS 219**

10.41 5,047,605
69.12 5,047,606
5,047,607
91.2 5,047,608
121.47 5,047,612
121.78 5,047,609
400 5,047,610
405 5,047,611

**CLASS 220**

85 R 5,046,631
276 5,046,632
407 5,046,633
465 5,046,634
524 5,046,635
571 5,046,636
610 5,046,637
679 5,046,638

**CLASS 221**

127 5,046,639
213 5,046,640
253 5,046,641

**CLASS 222**

153 5,046,642
161 5,046,643
321 5,046,644
394 5,046,645
541 5,046,646
594 5,046,647
638 5,046,648

**CLASS 223**

95 5,046,649
113 5,046,650

**CLASS 224**

155 5,046,651
326 5,046,652

**CLASS 227**

130 5,046,653

**CLASS 228**

1.1 5,046,654
9 5,046,655
123 5,046,656
5,046,657
206 5,046,658

**CLASS 229**

2.500 5,046,659
4.5 5,046,660
92.1 5,046,661
157 5,046,662

**CLASS 235**

379 Re.33,688
5,047,613
5,047,614
385 5,047,618
415 5,047,615
432 5,047,616
435 5,047,617
467 5,047,619
488

**CLASS 237**

12.3 C 5,046,663

**CLASS 239**

71 5,046,665
73 5,046,666
124 5,046,667
432 5,046,668
661 5,046,664

**CLASS 241**

23 5,046,669
194 5,046,670
294 5,046,671
296 5,046,672

**CLASS 242**

18 R 5,046,673
54 R 5,046,674
56 R 5,046,675
56.2 5,046,676
71.1 5,046,677
5,046,679
5,046,680
5,046,681
5,046,682
71.8 5,046,678
199 5,046,683

**CLASS 244**

7 A 5,046,684
23 C 5,046,685
118.5 5,046,686
122 AG 5,046,687
123 5,046,688
129.4 5,046,689
137.1 5,046,690
158 R 5,046,691

**CLASS 248**

48.2 5,046,692
159 5,046,693
188.2 5,046,694
230 5,046,695
309.1 5,046,696
394 5,046,697
430 5,046,698
533 5,046,699
638 5,046,700

**CLASS 250**

208.2 5,047,620
208.4 5,047,621
211 J 5,047,622
211 R 5,047,623
213 VT 5,047,624
216 5,047,625
227.19 5,047,626
227.23 5,047,627
229 5,047,628
231.1 5,047,629
235 5,047,630
237 G 5,047,631
255 5,047,634
256 5,047,635
291 5,047,636
302 5,047,632
306 5,047,633
5,047,637
327.2 5,047,643
330 5,047,638
332 5,047,644
341 5,047,639
5,047,640
363.08 5,047,641
368 5,047,642
370.01 5,047,645
396 R 5,047,646
491.1 5,047,647
492.2 5,047,648
5,047,649
505.1 5,047,650
548 5,047,651
571 5,047,652
574 5,047,653

**CLASS 251**

129.02 5,046,701
129.04 5,046,702
368 5,046,703

**CLASS 252**

47.5 5,047,158
49.6 5,047,159
51.5 A 5,047,160
62.59 5,047,161
62.9 5,047,162
102 5,047,163
106 5,047,164
121 5,047,165
132 5,047,166
160 5,047,167
174.17 5,047,168
299.6 5,047,169
5,047,170
299.61 5,047,171
5,047,172
301.4 R 5,047,173
309 5,047,174
356 5,047,175
364 5,047,176
548 5,047,177

**CLASS 254**

348 5,046,704

**CLASS 256**

36 5,046,705

**CLASS 260**

409 5,047,178

**CLASS 261**

114.1 5,047,179

**CLASS 264**

5 5,047,180
28 5,047,181
5,047,182
40.3 5,047,183
46.6 5,047,184
60 5,047,185
62 5,047,186
71 5,047,187
101 5,047,188
103 5,047,189
109 5,047,190
112 5,047,191
139 5,047,192
155 5,047,193
5,047,194
166 5,047,195
171 5,047,196
193 5,047,197
257 5,047,198
316 5,047,199
514 5,047,200

**CLASS 269**

32 5,046,706
309 5,046,707
322 5,046,708

**CLASS 270**

30 5,046,709
37 5,046,710

**CLASS 271**

11 5,046,711
65 5,046,712
149 5,046,713
162 5,046,714
164 5,046,715
214 5,046,716
219 5,046,717

**CLASS 272**

6 5,046,719
19 5,046,720
36 5,046,721
63 5,046,722
73 5,046,723
78 5,046,724
118 5,046,725
141 5,046,726
5,046,727

**CLASS 273**

18 5,046,728
26 A 5,046,729
33 5,046,730
63 E 5,046,731
73 J 5,046,732
77 A 5,046,733
85 B 5,046,734
85 CP 5,046,735
85 G 5,046,736
139 5,046,737
143 R 5,046,738
148 B 5,046,739
164 5,046,740
195 A 5,046,741
232 5,046,742
247 5,046,743
421 5,046,744

**CLASS 277**

1 5,046,718
212 FB 5,046,745

**CLASS 280**

11.22 5,046,746
11.28 5,046,747
47.34 5,046,748
79.5 5,046,749
87.021 5,046,750
607 5,046,751
678 5,046,752
699 5,046,753
707 5,046,754
708 5,046,755
718 5,046,756
731 5,046,757
732 5,046,758
743 5,046,759

**CLASS 281**

45 5,046,760

**CLASS 285**

7 5,046,761
38 5,046,762
81 5,046,763
166 5,046,764
197 5,046,765
419 5,046,766

**CLASS 290**

52 5,047,654

**CLASS 292**

34 5,046,767
68 5,046,768
216 5,046,769
218 5,046,770
336.3 5,046,771
336.5 5,046,772

**CLASS 294**

100 5,046,773

**CLASS 296**

38 5,046,774
39.2 5,046,775
97.22 5,046,776
5,046,777
202 5,046,778
216 5,046,779

**CLASS 297**

302 5,046,780
338 5,046,781
349 5,046,782

**CLASS 299**

31 5,046,783

**CLASS 301**

37 PB 5,046,784
52 5,046,785

**CLASS 303**

7 5,046,786
103 5,046,787
116 5,046,788

**CLASS 307**

201 5,047,655
255 5,047,656
264 5,047,657
269 5,047,658
5,047,659
270 5,047,660
296.1 5,047,663
296.4 5,047,662
296.6 5,047,661
303 5,047,664
353 5,047,666
355 5,047,665
5,047,667
446 5,047,669
451 5,047,671
475 5,047,670
5,047,672
480 5,047,673
570 5,047,674
5,048,016
578 5,047,675

**CLASS 310**

12 5,047,676
67 R 5,047,677
88 5,047,678
89 5,047,679
156 5,047,680
5,047,681
217 5,047,745
334 5,047,683
361 5,047,682

**CLASS 312**

108 5,046,789
250 5,046,790
265.1 5,046,791

**CLASS 313**

141 5,047,685
407 5,047,684
503 5,047,686
5,047,687

**CLASS 315**

84 5,047,688
94 5,047,689
224 5,047,690
244 5,047,691
248 5,047,692
5,047,693
290 5,047,694
291 5,047,695
312 5,047,696
382 5,047,697
411 5,047,698

**CLASS 318**

254 5,047,699
568.1 5,047,700
5,047,701
625 5,047,702
630 5,047,703
801 5,047,704

**CLASS 323**

313 5,047,706
314 5,047,707

**CLASS 324**

73.1 5,047,708
121 R 5,047,709
158 R 5,047,710
5,047,711
5,047,712
5,047,713
5,047,714
207.17 5,047,715
207.21 5,047,716
209 5,047,717
239 5,047,718
242 5,047,719
320 5,047,720
414 5,047,721
430 5,047,722
464 5,047,723
520 5,047,724
601 5,047,725
727 5,047,726

**CLASS 330**

9 5,047,727
252 5,047,729
256 5,047,730
277 5,047,728
282 5,047,731
295 5,047,732

**CLASS 331**

14 5,047,733
46 5,047,734
117 R 5,047,735

**CLASS 332**

151 5,047,705

**CLASS 333**

12 5,047,736
22 R 5,047,737
113 5,047,738
219 5,047,739

**CLASS 335**

4 5,047,740
216 5,047,741
289 5,047,742
302 5,047,743

**CLASS 336**

58 5,047,744



**CLASS 338**

162 5,047,746

**CLASS 340**

463 5,047,747
542 5,047,748
555 5,047,749
573 5,047,750
661 5,047,751
680 5,047,752
686 5,047,753
709 5,047,754
721 5,047,755
723 5,047,756
784 5,047,757
5,047,758
789 5,047,759
799 5,047,760
815.1 5,047,761
825.06 5,047,762
825.44 5,047,763
825.440 5,047,764
825.51 5,047,765
825.850 5,047,766

**CLASS 341**

59 5,047,767
95 5,047,768
118 5,047,769
120 5,047,770
140 5,047,771
156 5,047,772
176 5,047,773

**CLASS 342**

15 5,047,774
26 5,047,775
52 5,047,776
64 5,047,777
97 5,047,778
120 5,047,779
145 5,047,780
149 5,047,781
169 5,047,782
179 5,047,783
201 5,047,784
372 5,047,785

**CLASS 343**

841 5,047,787
915 5,047,788

**CLASS 346**

108 5,047,789
140 R 5,047,790
157 5,047,791

**CLASS 350**

6.8 5,046,797
96.12 5,046,800
96.16 5,046,807
96.17 5,046,809
96.20 5,046,798
96.21 5,046,813
96.23 5,046,814
5,046,815
336 5,046,825
339 D 5,046,826
520 5,046,834

**CLASS 351**

206 5,046,835
219 5,046,836

**CLASS 353**

82 5,046,837
101 5,046,838

**CLASS 354**

149.11 5,047,792
238.1 5,047,793
275 5,047,794
320 5,047,795
400 5,047,796

**CLASS 355**

27 5,047,797
5,047,798
5,047,799
45 5,047,800
200 5,047,801
208 5,047,802
211 5,047,803
246 5,047,804
253 5,047,805
259 5,047,806
269 5,047,807
277 5,047,808
284 5,047,809

**CLASS 356**

5 5,046,839
28 5,046,840
71 5,046,841
136 5,046,842
152 5,046,843
238 5,046,844
241 5,046,845
326 5,046,846
338 5,046,847
345 5,046,848
357 5,046,849
367 5,046,850
375 5,046,851
398 5,046,852
440 5,046,853
5,046,854

**CLASS 357**

4 5,047,810
15 5,047,811
23.14 5,047,816
23.4 5,047,812
5,047,813
23.5 5,047,814
23.6 5,047,815
5,047,817
5,047,818
23.7 5,047,819
23.8 5,047,820
30 5,047,821
5,047,822
34 5,047,823
38 5,047,824
42 5,047,825
5,047,826
51 5,047,827
55 5,047,828
58 5,047,829
68 5,047,830
5,047,831
71 5,047,832
5,047,833
72 5,047,834
74 5,047,835
79 5,047,836
81 5,047,837

**CLASS 358**

13 5,047,838
22 5,047,839
31 5,047,840
5,047,841
75 5,047,842
5,047,843
80 5,047,844
90 5,047,845
93 5,047,846
98 5,047,847
100 5,047,848
101 5,047,851
105 5,047,849
5,047,850
133 5,047,852
5,047,853
135 5,047,854
139 5,047,855
166 5,047,856
183 5,047,857
5,047,858
187 5,047,859
198 5,047,860
213.15 5,047,861
213.16 5,047,863
213.29 5,047,862
296 5,047,864
310 5,047,865
329 5,047,866
335 5,047,867
5,047,868
341 5,047,869
472 5,047,870
486 5,047,871

**CLASS 359**

12 5,046,793
18 5,046,794
26 5,046,792
49 5,046,829
54 5,046,827
56 5,046,823
72 5,046,824
5,046,828
75 5,046,822
76 5,046,831
90 5,046,830
206 5,046,795
216 5,046,796
305 5,046,832
328 5,046,802
5,046,817
330 5,047,668
527 5,046,818
654 5,046,833
708 Re.33,689
814 5,046,819
5,046,820
823 5,046,821

**CLASS 360**

10.2 5,047,872
22 5,047,873
25 5,047,874
35.1 5,047,875
46 5,047,876
51 5,047,877
69 5,047,878
72.1 5,047,879
78.14 5,047,880
99.05 5,047,881
107 5,047,882
109 5,047,883
122 5,047,884
126 5,047,885
5,047,886
128 5,047,887
130.34 5,047,888

**CLASS 361**

92 5,047,889
93 5,047,890
117 5,047,891
231 5,047,892
377 5,047,893
395 5,047,894
398 5,047,895
412 5,047,896
414 5,047,897
424 5,047,898
502 5,047,899

**CLASS 362**

16 5,047,900
35 5,047,901
61 5,047,902
5,047,903
66 5,047,904
5,047,905
80 5,047,906
311 5,047,907
346 5,047,908

**CLASS 363**

40 5,047,909
41 5,047,910
56 5,047,911
89 5,047,912
95 5,047,913
98 5,047,914
161 5,047,915

**CLASS 364**

167.01 5,047,916
200 5,047,917
5,047,918
5,047,919
5,047,920
5,047,921
5,047,922
5,047,923
5,047,924
5,047,925
5,047,926
406 5,047,927
413.04 5,047,928
413.21 5,047,930
419 5,047,931
421 5,047,932
424.05 5,047,933
5,047,938
5,047,939
424.1 5,047,934
5,047,935
5,047,936
5,047,937
426.02 5,047,940
426.03 5,047,941
427 5,047,942
431.03 5,047,943
431.11 5,047,944
434 5,047,945
448 5,047,946
468 5,047,947
479 5,047,948
491 5,047,949
497 5,047,929
510 5,047,950
513 5,047,951
513.5 5,047,952
5,047,953
518 5,047,954
519 5,047,955
5,047,956
521 5,047,957
5,047,958
5,047,959
523 5,047,960
550 5,047,961
5,047,962
555 5,047,963
557 5,047,964
558 5,047,965
560 5,047,966
569 5,047,967
574 5,047,968
578 5,047,969
5,047,970
724.16 5,047,971
754 5,047,972
784 5,047,973
5,047,974
786 5,047,975
788 5,047,976
900 5,047,977

**CLASS 365**

29 5,047,978
154 5,047,979
177 5,047,980
185 5,047,981
5,047,982
200 5,047,983
203 5,047,984
5,047,985
5,047,986
228 5,047,987
229 5,047,988
238.5 5,047,989

**CLASS 366**

137 5,046,855
291 5,046,856

**CLASS 367**

6 5,047,990
25 5,047,991
31 5,047,992
105 5,047,993
116 5,047,994
125 5,047,995
154 5,047,996
191 5,047,997

**CLASS 368**

75 5,047,998

**CLASS 369**

32 5,047,999
44.12 5,048,000
44.32 5,048,001
44.35 5,048,002
54 5,048,004
59 5,048,003
270 5,048,005
275.001 5,048,006
275.1 5,048,007
291 5,048,008

**CLASS 370**

17 5,048,009
58.2 5,048,010
60 5,048,011
77 5,048,012
79 5,048,013
85.5 5,048,014
110.4 5,048,015

**CLASS 371**

16.3 5,048,017
19 5,048,018
21.1 5,048,019
21.2 5,048,020
22.3 5,048,021
40.1 5,048,022
5,048,023
49.1 5,048,024

**CLASS 372**

2 5,048,025
6 5,048,026
18 5,048,027
24 5,048,028
26 5,048,029
33 5,048,031
34 5,048,032
38 5,048,033
41 5,048,034
45 5,048,035
5,048,036
5,048,037
46 5,048,038
5,048,039
30 5,048,040
57 5,048,041
59 5,048,042
65 5,048,043
66 5,048,044
68 5,048,030
86 5,048,045
87 5,048,046
92 5,048,047
95 5,048,048
96 5,048,049
101 5,048,050
5,048,051

**CLASS 374**

135 5,046,857
179 5,046,858
185 5,046,859

**CLASS 375**

1 5,048,052
5,048,053
8 5,048,054
11 5,048,055
39 5,048,056
40 5,048,057
47 5,048,058
94 5,048,059
106 5,048,060
111 5,048,061
114 5,048,062

**CLASS 376**

204 5,047,201
310 5,047,203
430 5,047,204

**CLASS 377**

17 5,048,063
20 5,048,064
47 5,048,065

**CLASS 378**

34 5,048,066
99 5,048,067
121 5,048,068
197 5,048,069
5,048,070
209 5,048,071

**CLASS 379**

53 5,048,072
63 5,048,073
67 5,048,074
92 5,048,075
94 5,048,076
96 5,048,077
100 5,048,078
112 5,048,079
165 5,048,080
221 5,048,081
389 5,048,082
454 5,048,083

**CLASS 380**

23 5,048,085
28 5,048,086
43 5,048,087

**CLASS 381**

38 5,048,088
68.6 5,048,090
87 5,048,089
107 5,048,091
187 5,048,092

**CLASS 382**

8 5,048,093
5,048,094
9 5,048,095
5,048,096
14 5,048,097
15 5,048,098
22 5,048,099
36 5,048,100
41 5,048,101
5,048,102
44 5,048,103
46 5,048,104
47 5,048,105
5,048,106
48 5,048,107
49 5,048,108
50 5,048,109
54 5,048,110
56 5,048,111
5,048,112
57 5,048,113
61 5,048,114

**CLASS 383**

38 5,046,860

**CLASS 384**

20 5,046,861
43 5,046,862
101 5,046,863
308 5,046,864
423 5,046,865
5,046,866
448 5,046,867
477 5,046,868
537 5,046,869
563 5,046,870

**CLASS 385**

13 5,046,808
15 5,046,811
16 5,046,806
31 5,046,805
38 5,046,810
43 5,046,804
96 5,046,812
117 5,046,816
122 5,046,803
130 5,046,801

**CLASS 388**

815 5,048,115

**CLASS 392**

370 5,047,786

**CLASS 400**

124 5,046,871
157.1 5,046,872
639.1 5,046,873
689 5,046,874

**CLASS 401**

49 5,046,875
50 5,046,876
266 5,046,877

**CLASS 403**

13 5,046,878
49 5,046,879
109 5,046,880
154 5,046,881
170 5,046,882
171 5,046,883

**CLASS 404**

6 5,046,884
10 5,046,885
25 5,046,886
34 5,046,887
75 5,046,888
90 5,046,890
103 5,046,889
117 5,046,891

**CLASS 405**

43 5,046,892
151 5,046,893
186 5,046,894
188 5,046,895
195 5,046,896
221 5,046,897
286 5,046,898

**CLASS 407**

102 5,046,899

**CLASS 408**

84 5,046,900
110 5,046,901
230 5,046,902

**CLASS 409**

143 5,046,903

**CLASS 411**

15 5,046,904
387 5,046,905
432 5,046,906
456 5,046,907

**CLASS 414**

203 5,046,908
225 5,046,909
261 5,046,910
331 5,046,911
358 5,046,912
522 5,046,913
706 5,046,914
744.5 5,046,915
751 5,046,916
789.5 5,046,917
789.7 5,046,918

**CLASS 415**

1 5,046,919
111 5,046,920
121.2 5,046,921
172.1 5,046,922

**CLASS 416**

30 5,046,923

**CLASS 417**

15 5,046,924
138 5,046,925
216 5,046,926
222 S 5,046,927
282 5,046,928
312 5,046,935
366 5,046,930
439 5,046,929
463 5,046,931

**CLASS 418**

14 5,046,932
78 5,046,933
97 5,046,934

**CLASS 419**

8 5,047,205

**CLASS 422**

56 5,047,206
58 5,047,207
5,047,208
62 5,047,209
64 5,047,210
73 5,047,211
82.02 5,047,212
82.11 5,047,213
98 5,047,214
101 5,047,215
160 5,047,216
200 5,047,217

**CLASS 423**

| | |
|---|---|
| 224 | 5,047,218 |
| 235 | 5,047,219 |
| 239 | 5,047,220 |
| 242 | 5,047,221 |
| | 5,047,222 |
| 321 S | 5,047,223 |
| 437 | 5,047,224 |
| 447.2 | 5,047,225 |
| 484 | 5,047,226 |

**CLASS 424**

| | |
|---|---|
| 1.1 | 5,047,227 |
| 5 | 5,047,228 |
| 10 | 5,047,229 |
| 45 | 5,047,230 |
| 57 | 5,047,231 |
| 59 | 5,047,232 |
| 72 | 5,047,233 |
| 76.2 | 5,047,234 |
| 80 | 5,047,235 |
| 83 | 5,047,236 |
| 89 | 5,047,237 |
| | 5,047,238 |
| 93 | 5,047,239 |
| 94.63 | 5,047,240 |
| 94.64 | 5,047,241 |
| 195.1 | 5,047,242 |
| 408 | 5,047,243 |
| 435 | 5,047,244 |
| 450 | 5,047,245 |
| 458 | B1 4,808,413 |
| 464 | 5,047,246 |
| 465 | 5,047,247 |
| 485 | 5,047,248 |
| 543 | 5,047,249 |

**CLASS 425**

| | |
|---|---|
| 72.1 | 5,046,936 |
| 85 | 5,046,937 |
| 133.1 | 5,046,938 |
| 195 | 5,046,939 |
| 239 | 5,046,940 |
| 405.1 | B1 4,767,308 |
| 435 | 5,046,941 |
| 549 | 5,046,942 |

**CLASS 426**

| | |
|---|---|
| 2 | 5,047,250 |
| 3 | 5,047,251 |
| 79 | 5,047,252 |
| 113 | 5,047,253 |
| 417 | 5,047,254 |
| 418 | 5,047,255 |
| 535 | 5,047,256 |
| 622 | 5,047,257 |

**CLASS 427**

| | |
|---|---|
| 3 | 5,047,258 |
| 27 | 5,047,259 |
| 54.1 | 5,047,260 |
| | 5,047,261 |
| 96 | 5,047,262 |
| 203 | 5,047,263 |
| 277 | 5,047,264 |
| 338 | 5,047,266 |
| 423 | 5,047,265 |

**CLASS 428**

| | |
|---|---|
| 13 | 5,047,267 |
| 24 | 5,047,268 |
| 34.4 | 5,047,269 |
| 35.2 | 5,047,270 |
| 36.92 | 5,047,271 |
| 40 | 5,047,272 |
| 63 | 5,047,273 |
| 64 | 5,047,274 |
| 106 | 5,047,275 |
| 110 | 5,047,276 |
| 116 | 5,047,277 |
| 141 | 5,047,278 |
| 156 | 5,047,279 |
| 182 | 5,047,280 |
| 201 | 5,047,281 |
| 204 | 5,047,282 |
| 209 | 5,047,283 |
| 216 | 5,047,284 |
| 221 | 5,047,289 |
| 229 | 5,047,285 |
| 246 | 5,047,286 |
| 248 | 5,047,287 |
| 290 | 5,047,288 |
| 323 | 5,047,290 |
| 329 | 5,047,291 |
| 367 | 5,047,292 |
| 423.1 | 5,047,293 |
| 432.1 | 5,047,294 |
| 500 | 5,047,295 |
| 694 | 5,047,296 |
| | 5,047,297 |

**CLASS 429**

| | |
|---|---|
| 17 | 5,047,298 |
| 20 | 5,047,299 |
| 94 | 5,047,300 |
| 101 | 5,047,301 |
| 213 | 5,047,302 |

**CLASS 430**

| | |
|---|---|
| 22 | 5,047,303 |
| 73 | 5,047,304 |
| 106.6 | B1 4,698,289 |
| 110 | 5,047,305 |
| 115 | 5,047,306 |
| 137 | 5,047,307 |
| 138 | 5,047,308 |
| 159 | 5,047,309 |
| 203 | 5,047,310 |
| 204 | 5,047,311 |
| 270 | 5,047,312 |
| 281 | 5,047,313 |
| 505 | 5,047,314 |
| 544 | 5,047,315 |
| 545 | 5,047,316 |
| 564 | 5,047,317 |

**CLASS 431**

| | |
|---|---|
| 62 | 5,046,943 |
| 328 | 5,046,944 |
| 344 | 5,046,945 |

**CLASS 432**

| | |
|---|---|
| 11 | 5,046,946 |
| 60 | 5,046,947 |

**CLASS 433**

| | |
|---|---|
| 21 | 5,046,948 |
| 57 | 5,046,949 |
| 81 | 5,046,950 |

**CLASS 435**

| | |
|---|---|
| 5 | 5,047,318 |
| | 5,047,320 |
| 6 | 5,047,321 |
| | 5,047,322 |
| 7.21 | 5,047,323 |
| 7.36 | 5,047,325 |
| | 5,047,326 |
| 7.9 | 5,047,324 |
| 11 | 5,047,327 |
| 16 | 5,047,328 |
| 18 | 5,047,329 |
| 20 | 5,047,330 |
| 29 | 5,047,331 |
| 42 | 5,047,332 |
| 68.1 | 5,047,333 |
| 69.1 | 5,047,334 |
| | 5,047,335 |
| 69.4 | 5,047,336 |
| 101 | 5,047,337 |
| 118 | 5,047,338 |
| | 5,047,339 |
| 161 | 5,047,340 |
| 172.3 | 5,047,341 |
| 194 | 5,047,342 |
| 240.45 | 5,047,343 |
| 252.1 | 5,047,344 |
| 270 | 5,047,345 |
| 280 | 5,047,346 |
| 296 | 5,047,347 |
| 311 | 5,047,348 |
| 312 | 5,047,349 |

**CLASS 436**

| | |
|---|---|
| 136 | 5,047,350 |
| 169 | 5,047,351 |
| 181 | 5,047,352 |
| 502 | 5,047,353 |
| 536 | 5,047,354 |

**CLASS 437**

| | |
|---|---|
| 15 | 5,047,355 |
| 21 | 5,047,356 |
| 31 | 5,047,357 |
| 34 | 5,047,358 |
| 35 | 5,047,359 |
| 40 | 5,047,360 |
| | 5,047,361 |
| 52 | 5,047,362 |
| 53 | 5,047,363 |
| 129 | 5,047,364 |
| 132 | 5,047,365 |
| 160 | 5,047,366 |
| 200 | 5,047,367 |
| 213 | 5,047,368 |
| 240 | 5,047,369 |
| 248 | 5,047,370 |

**CLASS 439**

| | |
|---|---|
| 15 | 5,046,951 |
| 63 | 5,046,952 |
| 66 | 5,046,953 |
| 70 | 5,046,954 |
| 74 | 5,046,955 |
| 78 | 5,046,956 |
| 83 | 5,046,957 |
| 92 | 5,046,958 |
| | 5,046,959 |
| 108 | 5,046,960 |
| 141 | 5,046,961 |
| 202 | 5,046,962 |
| 211 | 5,046,963 |
| 271 | 5,046,964 |
| 372 | 5,046,965 |
| 579 | 5,046,966 |
| 610 | 5,046,967 |
| 620 | 5,046,968 |
| 686 | 5,046,969 |
| 699 | 5,046,970 |
| 741 | 5,046,971 |
| 751 | 5,046,972 |

**CLASS 440**

| | |
|---|---|
| 50 | 5,046,973 |
| 63 | 5,046,974 |
| 66 | 5,046,975 |
| 77 | 5,046,976 |
| 89 | 5,046,977 |

**CLASS 441**

| | |
|---|---|
| 131 | 5,046,978 |

**CLASS 446**

| | |
|---|---|
| 57 | 5,046,979 |
| 73 | 5,046,980 |
| 81 | 5,046,981 |
| 112 | 5,046,982 |
| 158 | 5,046,983 |
| 168 | 5,046,984 |
| 321 | 5,046,985 |
| | 5,046,986 |
| 336 | 5,046,987 |
| 487 | 5,046,988 |

**CLASS 452**

| | |
|---|---|
| 30 | 5,046,219 |

**CLASS 453**

| | |
|---|---|
| 17 | 5,046,989 |

**CLASS 455**

| | |
|---|---|
| 33 | 5,048,116 |
| 89 | 5,048,117 |
| 156 | 5,048,118 |
| 161 | 5,048,119 |
| 616 | 5,048,120 |

**CLASS 464**

| | |
|---|---|
| 175 | 5,046,990 |

**CLASS 474**

| | |
|---|---|
| 18 | 5,046,991 |
| 84 | 5,046,992 |
| 205 | 5,046,993 |

**CLASS 475**

| | |
|---|---|
| 83 | 5,046,994 |
| 170 | 5,046,995 |
| 197 | 5,046,996 |
| 221 | 5,046,997 |
| | 5,046,998 |
| 281 | 5,046,999 |

**CLASS 493**

| | |
|---|---|
| 231 | 5,047,000 |
| 267 | 5,047,001 |
| 394 | 5,047,002 |
| 413 | 5,047,003 |

**CLASS 494**

| | |
|---|---|
| 17 | 5,047,004 |

**CLASS 501**

| | |
|---|---|
| 21 | 5,047,371 |
| 87 | 5,047,372 |
| 103 | 5,047,373 |
| 127 | 5,047,374 |

**CLASS 502**

| | |
|---|---|
| 5 | 5,047,376 |
| 24 | 5,047,377 |
| 74 | 5,047,378 |
| 79 | 5,047,379 |
| 158 | 5,047,380 |
| 304 | 5,047,381 |
| 338 | 5,047,382 |

**CLASS 503**

| | |
|---|---|
| 200 | 5,047,383 |
| 226 | 5,047,384 |

**CLASS 505**

| | |
|---|---|
| 1 | 5,047,385 |
| | 5,047,386 |
| | 5,047,387 |
| | 5,047,388 |
| | 5,047,389 |
| | 5,047,390 |
| | 5,047,391 |
| | 5,047,392 |
| | 5,047,394 |

**CLASS 514**

| | |
|---|---|
| 2 | 5,047,395 |
| 11 | 5,047,396 |
| 12 | 5,047,397 |
| 15 | 5,047,398 |
| 17 | 5,047,399 |
| 18 | 5,047,400 |
| 19 | 5,047,401 |
| 212 | 5,047,402 |
| 224.8 | 5,047,403 |
| 243 | 5,047,404 |
| 249 | 5,047,405 |
| 252 | 5,047,406 |
| 274 | 5,047,407 |
| | 5,047,408 |
| 275 | 5,047,409 |
| 277 | 5,047,544 |
| 299 | 5,047,410 |
| 300 | 5,047,411 |
| 307 | 5,047,412 |
| 327 | 5,047,413 |
| 338 | 5,047,414 |
| 383 | 5,047,415 |
| 384 | 5,047,416 |
| 397 | 5,047,417 |
| 400 | 5,047,418 |
| 432 | 5,047,419 |
| 484 | 5,047,420 |
| 507 | 5,047,421 |
| 510 | 5,047,422 |
| 521 | 5,047,423 |
| | 5,047,424 |
| 522 | 5,047,425 |
| 530 | 5,047,426 |
| 557 | 5,047,427 |
| 562 | 5,047,428 |
| 592 | 5,047,429 |
| 616 | 5,047,430 |
| 648 | 5,047,431 |
| 650 | 5,047,432 |
| 653 | 5,047,433 |
| | 5,047,434 |
| 732 | 5,047,435 |

**CLASS 521**

| | |
|---|---|
| 53 | 5,047,436 |
| 56 | 5,047,437 |
| 61 | 5,047,438 |
| 78 | 5,047,439 |
| 88 | 5,047,440 |
| 137 | 5,047,441 |

**CLASS 522**

| | |
|---|---|
| 27 | 5,047,442 |
| 46 | 5,047,443 |
| 99 | 5,047,444 |
| 114 | 5,047,445 |
| 157 | 5,047,446 |

**CLASS 523**

| | |
|---|---|
| 106 | 5,047,447 |
| 122 | 5,047,448 |
| 179 | 5,047,449 |
| 435 | 5,047,450 |
| 442 | 5,047,451 |
| 443 | 5,047,452 |
| 447 | 5,047,453 |
| 500 | 5,047,454 |
| 508 | 5,047,455 |

**CLASS 524**

| | |
|---|---|
| 13 | 5,047,456 |
| 60 | 5,047,457 |
| 100 | 5,047,458 |
| | 5,047,459 |
| | 5,047,460 |
| 291 | 5,047,461 |
| 423 | 5,047,462 |
| 426 | 5,047,463 |
| 500 | 5,047,464 |
| 504 | 5,047,465 |
| 597 | 5,047,466 |

**CLASS 525**

| | |
|---|---|
| 7.3 | 5,047,467 |
| 53 | 5,047,468 |
| 56 | 5,047,469 |
| 64 | 5,047,470 |
| 66 | 5,047,471 |
| 68 | 5,047,472 |
| 71 | 5,047,473 |
| | 5,047,474 |
| 73 | 5,047,475 |
| 106 | 5,047,476 |
| 123 | 5,047,477 |
| 183 | 5,047,478 |
| | 5,047,479 |
| 207 | 5,047,480 |
| 216 | 5,047,481 |
| 221 | 5,047,482 |
| 237 | 5,047,483 |
| 314 | 5,047,484 |
| 387 | 5,047,485 |
| 394 | 5,047,486 |
| 432 | 5,047,487 |

**CLASS 526**

| | |
|---|---|
| 65 | 5,047,488 |
| 263 | 5,047,489 |
| 271 | 5,047,490 |

**CLASS 528**

| | |
|---|---|
| 15 | 5,047,491 |
| | 5,047,492 |
| 45 | 5,047,493 |
| 74 | 5,047,494 |
| 76 | 5,047,495 |
| 171 | 5,047,496 |
| 199 | 5,047,497 |
| 202 | 5,047,498 |
| 313 | 5,047,499 |
| 348 | 5,047,500 |
| 392 | 5,047,501 |

**CLASS 530**

| | |
|---|---|
| 230 | 5,046,258 |
| 329 | 5,047,502 |
| 350 | 5,047,503 |
| 351 | 5,047,504 |
| | 5,047,505 |
| 381 | 5,047,506 |
| 387 | 5,047,507 |
| | 5,047,508 |
| 392 | 5,047,509 |
| 399 | 5,047,510 |
| | 5,047,511 |
| 402 | 5,047,512 |
| 412 | 5,047,513 |

**CLASS 534**

| | |
|---|---|
| 637 | 5,047,514 |
| 638 | 5,047,515 |
| 649 | 5,047,516 |
| 784 | 5,047,517 |

**CLASS 536**

| | |
|---|---|
| 4.1 | 5,047,518 |
| 23 | 5,047,519 |
| | 5,047,520 |
| | 5,047,521 |
| 27 | 5,047,522 |
| | 5,047,523 |
| | 5,047,524 |
| 103 | 5,047,525 |

**CLASS 540**

| | |
|---|---|
| 200 | 5,047,526 |
| 474 | 5,047,527 |
| 478 | 5,047,528 |

**CLASS 544**

| | |
|---|---|
| 52 | 5,047,529 |
| 197 | 5,047,530 |
| 198 | 5,047,531 |
| 230 | 5,047,532 |
| 244 | 5,047,533 |
| 267 | 5,047,534 |

**CLASS 546**

| | |
|---|---|
| 22 | 5,047,535 |
| 61 | 5,047,536 |
| 116 | 5,047,537 |
| 156 | 5,047,538 |
| 164 | 5,047,539 |
| 172 | 5,047,540 |
| 225 | 5,047,541 |
| 250 | 5,047,542 |
| 321 | 5,047,543 |
| 342 | 5,047,545 |

**CLASS 548**

| | |
|---|---|
| 110 | 5,047,546 |
| 267.6 | 5,047,548 |
| 336 | 5,047,549 |
| 365 | 5,047,550 |
| 375 | 5,047,551 |
| 454 | 5,047,552 |
| 476 | 5,047,553 |
| 486 | 5,047,554 |
| 537 | 5,047,555 |

**CLASS 549**

| | |
|---|---|
| 27 | 5,047,556 |
| 206 | 5,047,557 |
| 227 | 5,047,559 |
| 241 | 5,047,560 |
| 325 | 5,047,561 |
| 353 | 5,047,563 |
| 377 | 5,047,558 |

**CLASS 552**

| | |
|---|---|
| 653 | 5,047,564 |

**CLASS 556**

| | |
|---|---|
| 19 | 5,047,565 |
| 24 | 5,047,566 |
| 42 | 5,047,567 |
| 64 | 5,047,568 |
| 430 | 5,047,569 |

**CLASS 558**

| | |
|---|---|
| 375 | 5,047,570 |
| 402 | 5,047,571 |

**CLASS 560**

| | |
|---|---|
| 11 | 5,047,572 |
| 21 | 5,047,573 |
| 120 | 5,047,574 |
| | 5,047,575 |
| 125 | 5,047,576 |
| 253 | 5,047,577 |

**CLASS 562**

| | |
|---|---|
| 8 | 5,047,578 |
| 17 | 5,047,579 |
| 33 | 5,047,580 |
| 506 | 5,047,581 |
| 508 | 5,047,582 |
| 606 | 5,047,583 |
| 852 | 5,047,584 |

**CLASS 564**

| | |
|---|---|
| 124 | 5,047,585 |
| 144 | 5,047,586 |
| 160 | 5,047,587 |
| 252 | 5,047,588 |
| 307 | 5,047,589 |
| 309 | 5,047,590 |
| 331 | 5,047,591 |
| 374 | 5,047,592 |

**CLASS 568**

| | |
|---|---|
| 43 | 5,047,593 |

**CLASS 600**

| | |
|---|---|
| 13 | 5,047,005 |
| 21 | 5,047,006 |

**CLASS 604**

| | |
|---|---|
| 20 | 5,047,007 |
| 22 | 5,047,008 |
| 23 | 5,047,009 |
| 26 | 5,047,010 |
| 29 | 5,047,011 |
| 32 | 5,047,012 |
| 53 | 5,047,013 |
| 67 | 5,047,014 |
| 99 | 5,047,015 |
| 110 | 5,047,016 |
| | 5,047,017 |
| 164 | 5,047,018 |
| 192 | 5,047,019 |
| 266 | 5,047,020 |
| 283 | 5,047,021 |
| 359 | 5,047,022 |
| 368 | 5,047,023 |
| 380 | 5,047,024 |

**CLASS 606**

| | |
|---|---|
| 31 | 5,047,025 |
| 48 | 5,047,026 |
| | 5,047,027 |
| 49 | 5,047,028 |
| 61 | 5,047,029 |
| 65 | 5,047,030 |
| 77 | 5,047,031 |
| 83 | 5,047,032 |
| 87 | 5,047,033 |
| | 5,047,034 |
| 93 | 5,047,035 |
| 130 | 5,047,036 |
| 138 | 5,047,037 |
| 139 | 5,047,038 |
| 148 | 5,047,039 |
| 159 | 5,047,040 |
| | 5,047,041 |
| 167 | 5,047,042 |
| 169 | 5,047,043 |
| 182 | 5,047,044 |
| 194 | 5,047,045 |
| 205 | 5,047,046 |
| | 5,047,049 |
| 216 | 5,047,047 |
| 231 | 5,047,048 |

**CLASS 623**

| | |
|---|---|
| 1 | 5,047,050 |
| 6 | 5,047,051 |
| | 5,047,052 |
| 10 | 5,047,053 |
| 11 | B1 4,604,097 |
| 16 | 5,047,054 |
| 17 | 5,047,055 |
| 18 | 5,047,056 |
| 20 | 5,047,057 |
| | 5,047,058 |
| 21 | 5,047,059 |
| 23 | 5,047,060 |
| | 5,047,061 |
| | 5,047,062 |
| 38 | 5,047,063 |



| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 273 | 319,718 | | 601 | 319,751 | | 414 | 319,783 | | | 319,816 | D20— | 10 | 319,848 |
| | 314 | 319,719 | D7— | 309 | 319,752 | | 417 | 319,784 | | 106 | 319,817 | | 19 | 319,849 |
| | | 319,720 | | 319 | 319,753 | | 423 | 319,785 | | | 319,818 | D21— | 31 | 319,850 |
| | | 319,721 | | 379 | 319,754 | | 449 | 319,786 | | | 319,819 | | 59 | 319,851 |
| | | 319,722 | | 536 | 319,755 | D10— | 1 | 319,787 | | 113 | 319,820 | | 60 | 319,852 |
| | | 319,723 | | 680 | 319,756 | | 30 | 319,788 | | | 319,821 | | 137 | 319,853 |
| | 320 | 319,724 | D8— | 10 | 319,757 | | | 319,789 | | 114 | 319,822 | | 191 | 319,854 |
| | | 319,725 | | 14 | 319,758 | | 32 | 319,790 | | | 319,823 | | 195 | 319,855 |
| | | 319,726 | | 21 | 319,759 | | 43 | 319,791 | | 116 | 319,824 | | 215 | 319,856 |
| D3— | 35 | 319,727 | | 25 | 319,760 | | 46 | 319,792 | | | 319,825 | | 220 | 319,857 |
| | | 319,728 | | 29.1 | 319,768 | | 60 | 319,793 | | 142 | 319,826 | | | 319,858 |
| | 40 | 319,730 | | 30 | 319,761 | | 64 | 319,794 | | 146 | 319,827 | | 221 | 319,859 |
| | 56 | 319,729 | | 49 | 319,762 | | 73 | 319,795 | | 150 | 319,828 | | 232 | 319,860 |
| | 76 | 319,731 | | 68 | 319,763 | | 81 | 319,796 | | 151 | 319,829 | | | 319,861 |
| | 100 | 319,732 | | 70 | 319,764 | | 92 | 319,797 | | 195 | 319,830 | | 234 | 319,862 |
| | 104 | 319,733 | | | 319,765 | | 106 | 319,798 | | 261 | 319,831 | D22— | 147 | 319,863 |
| D4— | 102 | 319,734 | | 94 | 319,766 | | 107 | 319,799 | D15— | 19 | 319,832 | D23— | 209 | 319,864 |
| | 104 | 319,735 | | 99 | 319,767 | | 128 | 319,800 | | 28 | 319,833 | | 235 | 319,866 |
| | 138 | 319,736 | | 301 | 319,769 | D11— | 42 | 319,801 | | 131 | 319,834 | | 238 | 319,867 |
| D6— | 315 | 319,737 | | 303 | 319,770 | | 157 | 319,803 | D17— | 1 | 319,835 | | 246 | 319,868 |
| | 316 | 319,738 | | 312 | 319,771 | | 221 | 319,804 | | 22 | 319,836 | | 251 | 319,865 |
| | 366 | 319,739 | | 319 | 319,772 | D12— | 11 | 319,806 | D18— | 12 | 319,837 | | 280 | 319,869 |
| | 370 | 319,740 | | | 319,773 | | 96 | 319,807 | | 22 | 319,838 | | 287 | 319,870 |
| | 407 | 319,741 | | 331 | 319,774 | | 123 | 319,808 | | 25 | 319,839 | | 294 | 319,871 |
| | 426 | 319,742 | | | 319,775 | | 147 | 319,809 | | 34 | 319,840 | | 354 | 319,872 |
| | 436 | 319,743 | | 340 | 319,776 | | 157 | 319,810 | | 43 | 319,841 | D24— | 106 | 319,878 |
| | 452 | 319,744 | | 373 | 319,777 | | 164 | 319,811 | | | 319,842 | | 108 | 319,879 |
| | 464 | 319,745 | | | 319,778 | | 195 | 319,812 | D19— | 2 | 319,843 | | 143 | 319,877 |
| | 470 | 319,746 | | 402 | 319,779 | | 333 | 319,805 | | 48 | 319,844 | | 147 | 319,873 |
| | 495 | 319,747 | D9— | 305 | 319,780 | D13— | 133 | 319,813 | | | 319,845 | | 150 | 319,874 |
| | 524 | 319,748 | | 353 | 319,781 | | 182 | 319,814 | | 53 | 319,846 | | 164 | 319,880 |
| | 571 | 319,749 | | 373 | 319,782 | D14— | 102 | 319,815 | | 69 | 319,847 | | 165 | 319,876 |
| | 575 | 319,750 | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | 214 | 319,881 |
| | | | | | | | | | | | | | 217 | 319,875 |
| | | | | | | | | | | | | | 36 | 319,883 |
| | | | | | | | | | | | | | 48 | 319,884 |
| | | | | | | | | | | | | | 118 | 319,885 |
| | | | | | | | | | | | | | 119 | 319,886 |
| | | | | | | | | | | | | | | 319,887 |
| | | | | | | | | | | | | | | 319,888 |
| | | | | | | | | | | | | | 41 | 319,890 |
| | | | | | | | | | | | | | 51 | 319,889 |
| | | | | | | | | | | | | | 67 | 319,891 |
| | | | | | | | | | | | | D28— | 21 | 319,892 |
| | | | | | | | | | | | | | 48 | 319,893 |
| | | | | | | | | | | | | | 49 | 319,894 |
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| | | | | | | | | | | | | | 82 | 319,897 |
| | | | | | | | | | | | | D29— | 7 | 319,898 |
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| | | | | | | | | | | | | | 22 | 319,900 |
| | | | | | | | | | | | | D30— | 131 | 319,901 |
| | | | | | | | | | | | | D32— | 15 | 319,902 |
| | | | | | | | | | | | | | 61 | 319,903 |
| | | | | | | | | | | | | D34— | 1 | 319,904 |
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| | | | | | | | | | | | | D99— | 5 | 319,910 |
| | | | | | | | | | | | | | 37 | 319,911 |

## CLASSIFICATION OF PLANTS

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| P.— | 47 | 7,644 | | 68 | 7,645 | | | 7,646 | | | 7,647 | | | 7,648 | | | 7,649 |

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# GEOGRAPHICAL INDEX
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| | 5,046,446 | 5,046,525 | 5,047,084 | 5,047,737 | 5,048,112 | 5,046,449 |
| | 5,046,588 | 5,046,526 | 5,047,101 | 5,047,738 | 08 : 5,046,374 | 5,046,600 |
| | 5,046,888 | 5,046,528 | 5,047,131 | 5,047,740 | 5,046,395 | 5,046,648 |
| | 5,046,995 | 5,046,529 | 5,047,143 | 5,047,743 | 5,046,669 | 5,046,675 |
| | 5,047,009 | 5,046,568 | 5,047,150 | 5,047,746 | 5,046,730 | 5,046,725 |
| | 5,047,097 | 5,046,580 | 5,047,156 | 5,047,756 | 5,047,112 | 5,046,829 |
| | 5,047,638 | 5,046,582 | 5,047,192 | 5,047,767 | 5,047,212 | 5,046,864 |
| 04 : | 5,046,195 | 5,046,609 | 5,047,194 | 5,047,776 | 5,047,300 | 5,047,024 |
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| | 5,046,744 | 5,046,657 | 5,047,327 | 5,047,828 | 5,046,516 | 5,047,974 |
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5,047,154
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5,047,918
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44 : 5,046,753
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45 : Re.33,685
5,046,371
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5,047,380
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5,047,928
5,047,973
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5,048,012
5,048,014
5,048,079
49 : 5,046,279

5,046,965
5,047,015
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5,047,074
5,047,242
5,047,917
5,048,053
51 : Re.33,686
5,046,206
5,046,239
5,046,673
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5,047,036
5,047,049

5,047,121
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53 : 5,046,202
5,046,231

5,046,276
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54 : 5,046,265
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5,047,372
5,047,468
5,047,470
5,047,588
55 : 5,046,201
5,046,272
5,046,300
5,046,361
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5,046,373
5,046,434
5,046,458
5,046,488
5,046,596
5,046,683
5,047,122
5,047,343
5,047,604
5,047,636
5,047,744
5,047,748
56 : 5,046,404
5,046,455

## DESIGN PATENTS

01 : 319,740
319,767
05 : 319,776
06 : 319,721
319,725
319,732
319,733
319,734
319,741
319,748
319,769
319,795
319,803
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319,808
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319,865
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319,724
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319,775
319,863
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319,882
10 : 319,768
12 : 319,831
319,859
319,875
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13 : 319,849

17 : 319,755
319,787
319,797
319,848
319,852
319,856
319,864
319,909
18 : 319,779
319,811
319,812
319,839
19 : 319,866
20 : 319,878
21 : 319,764
319,765
22 : 319,745
24 : 319,850
319,857
319,858

25 : 319,719
319,750
319,796
26 : 319,810
319,887
27 : 319,772
319,836
319,838
319,881
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319,901
29 : 319,746
319,843
319,908
30 : 319,898
33 : 319,758
319,766
34 : 319,851
319,877
319,883

319,904
319,753
319,833
37 : 319,731
319,907
39 : 319,728
319,751
319,777
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319,816
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40 : 319,749
41 : 319,720
319,722
319,723
319,726
319,747
319,778
319,799
319,804

319,879
319,890
44 : 319,735
319,785
45 : 319,872
47 : 319,759
319,760
48 : 319,729
319,737
319,738
319,794
319,832
319,884
319,888
49 : 319,757
51 : 319,730
53 : 319,807
55 : 319,771
319,891

## PLANT PATENTS

06 : 7,645
7,646
7,647
7,648
7,649

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Harry F. Manbeck, Jr., *Commissioner*

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# OFFICIAL GAZETTE

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PATENTS

September 17, 1991



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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees ( in U.S. dollars) is as follows:

| | |
|---|---|
| Transmittal fee: | 170.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 550.00 |
| —Corresponding prior U.S. national application filed | 380.00 |
| —Supplemental search fee, per additional invention | 150.00 |
| European Patent Office as ISA | 1320.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —Search fee paid to USPTO as ISA | 400.00 |
| —Additional examination fee, per additional invention | 130.00 |
| —ISA not the USPTO | 600.00 |
| —Additional examination fee, per additional invention | 200.00 |
| International fees | |
| Basic fee | 490.00 |
| Basic Supplemental fee (for each page over 30) | 10.00 |
| Designation fee per country or region for the first 10 national or regional offices | 119.00 |
| Designation fee for 11th and subsequent designations | No Charge |
| Handling fee | 150.00 |

U.S. National Stage fees

| | Small Entity | Regular |
|---|---|---|
| USPTO was IPEA | 165.00 | 330.00 |
| USPTO was ISA but not IPEA | 185.00 | 370.00 |
| USPTO was neither ISA nor IPEA | 250.00 | 500.00 |
| USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4) | 25.00 | 50.00 |
| —For each independent claim in excess of 3 | 18.00 | 36.00 |
| —For each claim in excess of 20 | 6.00 | 12.00 |
| —For each application containing a multiple dependent claim | 60.00 | 120.00 |
| —Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1) | 60.00 | 120.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) | 30.00 | 30.00 |

June 27, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks.*

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### Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 13, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,769,854 through 4,771,476
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 11, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,470,155 through 4,471,494
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:





37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

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### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED JULY 7, 1991*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| Re.32,228 | 06/750,139 | 8/19/86 |
| (4,391,898) | (06/277,866) | (7/05/83) |
| 4,390,997 | 06/225,656 | 7/05/83 |
| 4,391,000 | 06/356,397 | 7/05/83 |
| 4,391,007 | 06/222,415 | 7/05/83 |
| 4,391,010 | 06/293,864 | 7/05/83 |
| 4,391,016 | 06/302,135 | 7/05/83 |
| 4,391,017 | 06/335,178 | 7/05/83 |
| 4,391,020 | 06/270,213 | 7/05/83 |
| 4,391,023 | 06/226,474 | 7/05/83 |
| 4,391,024 | 06/247,148 | 7/05/83 |
| 4,391,026 | 06/245,689 | 7/05/83 |
| 4,391,027 | 06/270,602 | 7/05/83 |
| 4,391,032 | 06/282,706 | 7/05/83 |
| 4,391,048 | 06/217,037 | 7/05/83 |
| 4,391,049 | 06/229,949 | 7/05/83 |
| 4,391,052 | 06/333,727 | 7/05/83 |
| 4,391,053 | 06/268,773 | 7/05/83 |
| 4,391,056 | 06/219,433 | 7/05/83 |
| 4,391,057 | 06/219,432 | 7/05/83 |
| 4,391,060 | 06/294,894 | 7/05/83 |
| 4,391,073 | 06/215,692 | 7/05/83 |
| 4,391,076 | 06/253,495 | 7/05/83 |
| 4,391,085 | 06/319,698 | 7/05/83 |
| 4,391,095 | 06/279,913 | 7/05/83 |
| 4,391,110 | 06/288,189 | 7/05/83 |
| 4,391,111 | 06/273,137 | 7/05/83 |
| 4,391,117 | 06/300,325 | 7/05/83 |
| 4,391,118 | 06/261,071 | 7/05/83 |
| 4,391,134 | 06/241,832 | 7/05/83 |
| 4,391,136 | 06/274,857 | 7/05/83 |
| 4,391,139 | 06/351,827 | 7/05/83 |
| 4,391,143 | 06/268,424 | 7/05/83 |
| 4,391,145 | 06/248,620 | 7/05/83 |
| 4,391,153 | 06/337,044 | 7/05/83 |
| 4,391,173 | 06/324,449 | 7/06/83 |
| 4,391,177 | 06/390,293 | 7/05/83 |
| 4,391,188 | 06/231,021 | 7/05/83 |
| 4,391,217 | 06/323,426 | 7/05/83 |
| 4,391,219 | 06/283,643 | 7/05/83 |
| 4,391,225 | 06/350,052 | 7/05/83 |
| 4,391,229 | 06/220,739 | 7/05/83 |
| 4,391,238 | 06/247,745 | 7/05/83 |
| 4,391,258 | 06/238,654 | 7/05/83 |
| 4,391,262 | 06/313,358 | 7/05/83 |
| 4,391,263 | 06/245,355 | 7/05/83 |
| 4,391,265 | 06/228,181 | 7/05/83 |
| 4,391,266 | 06/224,431 | 7/05/83 |
| 4,391,273 | 06/288,264 | 7/05/83 |
| 4,391,279 | 06/329,646 | 7/05/83 |
| 4,391,289 | 06/264,578 | 7/05/83 |
| 4,391,298 | 06/221,738 | 7/05/83 |
| 4,391,304 | 06/254,881 | 7/05/83 |
| 4,391,310 | 06/304,358 | 7/05/83 |
| 4,391,312 | 06/268,783 | 7/05/83 |
| 4,391,316 | 06/302,770 | 7/05/83 |
| 4,391,319 | 06/278,719 | 7/05/83 |
| 4,391,323 | 06/223,097 | 7/05/83 |
| 4,391,340 | 06/231,399 | 7/05/83 |
| 4,391,354 | 06/250,025 | 7/05/83 |
| 4,391,356 | 06/361,809 | 7/05/83 |
| 4,391,361 | 06/270,629 | 7/05/83 |
| 4,391,364 | 06/235,396 | 7/05/83 |
| 4,391,367 | 06/258,876 | 7/05/83 |
| 4,391,369 | 06/298,063 | 7/05/83 |
| 4,391,387 | 06/278,741 | 7/05/83 |
| 4,391,389 | 06/245,392 | 7/05/83 |
| 4,391,390 | 06/226,894 | 7/05/83 |
| 4,391,396 | 06/228,132 | 7/05/83 |
| 4,391,397 | 06/277,153 | 7/05/83 |
| 4,391,399 | 06/305,492 | 7/05/83 |
| 4,391,403 | 06/253,822 | 7/05/83 |
| 4,391,404 | 06/292,622 | 7/05/83 |
| 4,391,423 | 06/248,745 | 7/05/83 |
| 4,391,425 | 06/267,791 | 7/05/83 |
| 4,391,426 | 06/337,260 | 7/05/83 |
| 4,391,430 | 06/264,146 | 7/05/83 |
| 4,391,435 | 06/236,295 | 7/05/83 |
| 4,391,440 | 06/232,955 | 7/05/83 |
| 4,391,441 | 06/314,173 | 7/05/83 |
| 4,391,442 | 06/345,024 | 7/05/83 |
| 4,391,450 | 06/412,709 | 7/05/83 |
| 4,391,467 | 06/253,125 | 7/05/83 |
| 4,391,469 | 06/313,010 | 7/05/83 |

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,391,470 | 06/241,483 | 7/05/83 |
| 4,391,499 | 06/356,235 | 7/05/83 |
| 4,391,507 | 06/240,658 | 7/05/83 |
| 4,391,514 | 06/234,224 | 7/05/83 |
| 4,391,518 | 06/224,232 | 7/05/83 |
| 4,391,531 | 06/218,136 | 7/05/83 |
| 4,391,533 | 06/349,167 | 7/05/83 |
| 4,391,536 | 06/298,307 | 7/05/83 |
| 4,391,540 | 06/249,483 | 7/05/83 |
| 4,391,552 | 06/295,893 | 7/05/83 |
| 4,391,562 | 06/261,734 | 7/05/83 |
| 4,391,591 | 06/321,980 | 7/05/83 |
| 4,391,597 | 06/400,528 | 7/05/83 |
| 4,391,607 | 06/276,863 | 7/05/83 |
| 4,391,609 | 06/315,587 | 7/05/83 |
| 4,391,620 | 06/235,137 | 7/05/83 |
| 4,391,621 | 06/246,551 | 7/05/83 |
| 4,391,624 | 06/269,228 | 7/05/83 |
| 4,391,628 | 06/346,359 | 7/05/83 |
| 4,391,636 | 06/331,163 | 7/05/83 |
| 4,391,651 | 06/311,709 | 7/05/83 |
| 4,391,668 | 06/256,665 | 7/05/83 |
| 4,391,674 | 06/270,529 | 7/05/83 |
| 4,391,682 | 06/228,796 | 7/05/83 |
| 4,391,684 | 06/279,782 | 7/05/83 |
| 4,391,685 | 06/238,430 | 7/05/83 |
| 4,391,686 | 06/302,884 | 7/05/83 |
| 4,391,688 | 06/269,743 | 7/05/83 |
| 4,391,706 | 06/341,074 | 7/05/83 |
| 4,391,715 | 06/292,404 | 7/05/83 |
| 4,391,717 | 06/375,534 | 7/05/83 |
| 4,391,718 | 06/292,867 | 7/05/83 |
| 4,391,733 | 06/297,274 | 7/05/83 |
| 4,391,734 | 06/297,275 | 7/05/83 |
| 4,391,743 | 06/325,648 | 7/05/83 |
| 4,391,745 | 06/283,816 | 7/05/83 |
| 4,391,747 | 06/348,473 | 7/05/83 |
| 4,391,748 | 06/258,847 | 7/05/83 |
| 4,391,753 | 06/225,189 | 7/05/83 |
| 4,391,757 | 06/325,512 | 7/05/83 |
| 4,391,759 | 06/247,368 | 7/05/83 |
| 4,391,760 | 06/221,642 | 7/05/83 |
| 4,391,768 | 06/246,888 | 7/05/83 |
| 4,391,775 | 06/328,015 | 7/05/83 |
| 4,391,782 | 06/221,556 | 7/05/83 |
| 4,391,783 | 06/356,023 | 7/05/83 |
| 4,391,784 | 06/293,850 | 7/05/83 |
| 4,391,790 | 06/306,061 | 7/05/83 |
| 4,391,791 | 06/347,229 | 7/05/83 |
| 4,391,803 | 06/375,749 | 7/05/83 |
| 4,391,804 | 06/358,533 | 7/05/83 |
| 4,391,811 | 06/307,777 | 7/05/83 |
| 4,391,812 | 06/361,233 | 7/05/83 |
| 4,391,813 | 06/257,039 | 7/05/83 |
| 4,391,816 | 06/321,304 | 7/05/83 |
| 4,391,819 | 06/283,104 | 7/05/83 |
| 4,391,823 | 06/285,241 | 7/05/83 |
| 4,391,838 | 06/320,860 | 7/05/83 |
| 4,391,839 | 06/247,645 | 7/05/83 |
| 4,391,865 | 06/308,626 | 7/05/83 |
| 4,391,873 | 06/340,623 | 7/05/83 |
| 4,391,883 | 06/306,575 | 7/05/83 |
| 4,391,887 | 06/292,362 | 7/05/83 |
| 4,391,899 | 06/296,197 | 7/05/83 |
| 4,391,913 | 06/388,214 | 7/05/83 |
| 4,391,925 | 06/391,812 | 7/05/83 |
| 4,391,926 | 06/254,686 | 7/05/83 |
| 4,391,929 | 06/408,670 | 7/05/83 |
| 4,391,931 | 06/291,852 | 7/05/83 |
| 4,391,939 | 06/255,029 | 7/05/83 |
| 4,391,942 | 06/366,084 | 7/05/83 |
| 4,391,945 | 06/251,789 | 7/05/83 |
| 4,391,958 | 06/322,204 | 7/05/83 |
| 4,391,967 | 06/427,017 | 7/05/83 |
| 4,391,971 | 06/334,769 | 7/05/83 |
| 4,391,974 | 06/220,286 | 7/05/83 |
| 4,391,975 | 06/356,236 | 7/05/83 |
| 4,391,990 | 06/319,354 | 7/05/83 |
| 4,391,996 | 06/321,644 | 7/05/83 |
| 4,392,006 | 06/293,280 | 7/05/83 |
| 4,392,027 | 06/277,650 | 7/05/83 |
| 4,392,028 | 06/232,164 | 7/05/83 |
| 4,392,035 | 06/270,056 | 7/05/83 |
| 4,392,042 | 06/237,677 | 7/05/83 |
| 4,392,044 | 06/251,767 | 7/05/83 |
| 4,392,046 | 06/247,867 | 7/05/83 |
| 4,392,047 | 06/231,464 | 7/05/83 |
| 4,392,048 | 06/314,513 | 7/05/83 |
| 4,392,049 | 06/286,382 | 7/05/83 |
| 4,392,050 | 06/255,660 | 7/05/83 |
| 4,392,052 | 06/250,898 | 7/05/83 |
| 4,392,061 | 06/353,104 | 7/05/83 |
| 4,392,064 | 06/228,087 | 7/05/83 |
| 4,392,065 | 06/275,004 | 7/05/83 |
| 4,392,084 | 06/243,292 | 7/05/83 |
| 4,392,089 | 06/285,205 | 7/05/83 |
| 4,392,098 | 06/311,842 | 7/05/83 |
| 4,392,115 | 06/253,268 | 7/05/83 |
| 4,392,122 | 06/277,399 | 7/05/83 |
| 4,392,129 | 06/248,230 | 7/05/83 |
| 4,392,134 | 06/263,186 | 7/05/83 |
| 4,392,136 | 06/288,927 | 7/05/83 |
| 4,392,138 | 06/222,421 | 7/05/83 |
| 4,392,143 | 06/288,632 | 7/05/83 |
| 4,392,147 | 06/279,160 | 7/05/83 |
| 4,392,165 | 06/248,808 | 7/05/83 |
| 4,392,169 | 06/265,867 | 7/05/83 |
| 4,392,171 | 06/299,763 | 7/05/83 |
| 4,392,190 | 06/222,951 | 7/05/83 |
| 4,392,192 | 06/373,129 | 7/05/83 |
| 4,392,194 | 06/237,817 | 7/05/83 |
| 4,392,219 | 06/252,593 | 7/05/83 |
| 4,392,225 | 06/234,725 | 7/05/83 |
| 4,392,232 | 06/306,490 | 7/05/83 |
| 4,392,236 | 06/243,820 | 7/05/83 |
| 4,392,239 | 06/391,709 | 7/05/83 |
| 4,392,244 | 06/217,375 | 7/05/83 |
| 4,392,249 | 06/247,268 | 7/05/83 |
| 4,677,699 | 06/886,569 | 7/07/87 |
| 4,677,704 | 06/854,481 | 7/07/87 |
| 4,677,708 | 06/824,520 | 7/07/87 |
| 4,677,719 | 06/831,354 | 7/07/87 |
| 4,677,728 | 06/822,598 | 7/07/87 |
| 4,677,729 | 06/816,120 | 7/07/87 |
| 4,677,731 | 06/733,867 | 7/07/87 |
| 4,677,732 | 06/803,468 | 7/07/87 |
| 4,677,733 | 06/860,865 | 7/07/87 |
| 4,677,746 | 06/810,005 | 7/07/87 |
| 4,677,747 | 06/839,169 | 7/07/87 |
| 4,677,751 | 06/655,815 | 7/07/87 |
| 4,677,752 | 06/852,992 | 7/07/87 |
| 4,677,764 | 06/700,133 | 7/07/87 |
| 4,677,765 | 06/834,365 | 7/07/87 |
| 4,677,774 | 06/799,533 | 7/07/87 |
| 4,677,775 | 06/873,965 | 7/07/87 |
| 4,677,776 | 06/753,274 | 7/07/87 |
| 4,677,780 | 06/798,954 | 7/07/87 |
| 4,677,782 | 06/747,354 | 7/07/87 |
| 4,677,784 | 06/842,273 | 7/07/87 |
| 4,677,786 | 06/873,796 | 7/07/78 |
| 4,677,787 | 06/661,108 | 7/07/87 |
| 4,677,789 | 06/825,258 | 7/07/87 |
| 4,677,793 | 06/823,248 | 7/07/87 |
| 4,677,806 | 06/848,175 | 7/07/87 |
| 4,677,812 | 06/897,381 | 7/07/87 |
| 4,677,814 | 06/618,821 | 7/07/87 |
| 4,677,815 | 06/836,748 | 7/07/87 |
| 4,677,827 | 06/704,679 | 7/07/87 |
| 4,677,833 | 06/861,929 | 7/07/87 |
| 4,677,845 | 06/804,612 | 7/07/87 |
| 4,677,850 | 06/843,922 | 7/07/87 |
| 4,677,859 | 06/757,469 | 7/07/87 |
| 4,677,860 | 06/833,906 | 7/07/87 |
| 4,677,862 | 06/912,156 | 7/07/87 |
| 4,677,870 | 06/781,484 | 7/07/87 |
| 4,677,877 | 06/771,445 | 7/07/87 |



| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,677,881 | 06/859,040 | 7/07/87 |
| 4,677,883 | 06/872,121 | 7/07/87 |
| 4,677,884 | 06/720,170 | 7/07/87 |
| 4,677,887 | 06/794,479 | 7/07/87 |
| 4,677,893 | 06/748,172 | 7/07/87 |
| 4,677,899 | 06/832,634 | 7/07/87 |
| 4,677,903 | 06/759,205 | 7/07/87 |
| 4,677,905 | 06/812,815 | 7/07/87 |
| 4,677,915 | 06/624,043 | 7/07/87 |
| 4,677,918 | 06/768,805 | 7/07/87 |
| 4,677,923 | 06/888,783 | 7/07/87 |
| 4,677,929 | 06/834,405 | 7/07/87 |
| 4,677,930 | 06/937,450 | 7/07/87 |
| 4,677,935 | 06/749,288 | 7/07/87 |
| 4,677,936 | 06/865,558 | 7/07/87 |
| 4,677,949 | 06/767,114 | 7/07/87 |
| 4,677,950 | 06/818,595 | 7/07/87 |
| 4,677,951 | 06/804,195 | 7/07/87 |
| 4,677,957 | 06/825,906 | 7/07/87 |
| 4,677,959 | 06/865,394 | 7/07/87 |
| 4,677,961 | 06/797,037 | 7/07/87 |
| 4,677,962 | 06/853,088 | 7/07/87 |
| 4,677,970 | 06/764,833 | 7/07/87 |
| 4,677,984 | 06/653,460 | 7/07/87 |
| 4,677,992 | 06/828,028 | 7/07/87 |
| 4,678,001 | 06/828,136 | 7/07/87 |
| 4,678,008 | 06/904,365 | 7/07/87 |
| 4,678,010 | 06/704,521 | 7/07/87 |
| 4,678,011 | 06/816,885 | 7/07/87 |
| 4,678,016 | 06/902,788 | 7/07/87 |
| 4,678,018 | 06/826,599 | 7/07/87 |
| 4,678,020 | 06/809,258 | 7/07/87 |
| 4,678,025 | 06/817,810 | 7/07/87 |
| 4,678,039 | 06/824,171 | 7/07/87 |
| 4,678,059 | 06/867,049 | 7/07/87 |
| 4,678,061 | 06/826,687 | 7/07/87 |
| 4,678,065 | 06/799,576 | 7/07/87 |
| 4,678,076 | 06/787,430 | 7/07/87 |
| 4,678,082 | 06/884,244 | 7/07/87 |
| 4,678,083 | 06/891,454 | 7/07/87 |
| 4,678,093 | 06/811,102 | 7/07/87 |
| 4,678,095 | 06/858,685 | 7/07/87 |
| 4,678,101 | 06/759,073 | 7/07/87 |
| 4,678,104 | 06/670,618 | 7/07/87 |
| 4,678,109 | 06/795,343 | 7/07/87 |
| 4,678,113 | 06/827,397 | 7/07/87 |
| 4,678,115 | 06/723,629 | 7/07/87 |
| 4,678,116 | 06/857,189 | 7/07/87 |
| 4,678,119 | 06/765,049 | 7/07/87 |
| 4,689,125 | 06/764,938 | 7/07/87 |
| 4,678,132 | 06/930,244 | 7/07/87 |
| 4,678,136 | 06/874,470 | 7/07/87 |
| 4,678,141 | 06/892,452 | 7/07/87 |
| 4,678,148 | 06/789,475 | 7/07/87 |
| 4,678,150 | 06/915,978 | 7/07/87 |
| 4,678,154 | 06/856,593 | 7/07/87 |
| 4,678,155 | 06/941,201 | 7/07/87 |
| 4,678,157 | 06/645,802 | 7/07/87 |
| 4,678,165 | 06/860,242 | 7/07,87 |
| 4,678,166 | 06/855,852 | 7/07/87 |
| 4,678,169 | 06/882,182 | 7/07/87 |
| 4,678,185 | 06/820,538 | 7/07/87 |
| 4,678,191 | 06/784,584 | 7/07/87 |
| 4,678,192 | 06/815,541 | 7/07/87 |
| 4,678,201 | 06/635,278 | 7/07/87 |
| 4,678,205 | 06/740,480 | 7/07/87 |
| 4,678,206 | 06/898,901 | 7/07/87 |
| 4,678,209 | 06/789,681 | 7/07/87 |
| 4,678,211 | 06/760,472 | 7/07/87 |
| 4,678,212 | 06/835,649 | 7/07/87 |
| 4,678,218 | 06/871,375 | 7/07/87 |
| 4,678,219 | 06/863,059 | 7/07/87 |
| 4,678,220 | 06/830,211 | 7/07/87 |
| 4,678,221 | 06/804,525 | 7/07/87 |
| 4,678,222 | 06/869,577 | 7/07/87 |
| 4,678,224 | 06/730,413 | 7/07/87 |
| 4,678,238 | 06/840,155 | 7/07/87 |
| 4,678,239 | 06/779,267 | 7/07/87 |
| 4,678,243 | 06/800,570 | 7/07/87 |
| 4,678,251 | 06/827,945 | 7/07/87 |
| 4,678,262 | 06/918,191 | 7/07/87 |
| 4,678,265 | 06/613,265 | 7/07/87 |
| 4,678,268 | 06/663,547 | 7/07/87 |
| 4,678,269 | 06/807,329 | 7/07/87 |
| 4,678,272 | 06/347,013 | 7/07/87 |
| 4,678,277 | 06/655,024 | 7/07/87 |
| 4,678,281 | 06/716,218 | 7/07/87 |
| 4,678,283 | 06/647,210 | 7/07/87 |
| 4,678,292 | 06/625,025 | 7/07/87 |
| 4,678,296 | 06/667,374 | 7/07/87 |
| 4,678,307 | 06/787,284 | 7/07/87 |
| 4,678,308 | 06/832,938 | 7/07/87 |
| 4,678,309 | 06/832,939 | 7/07/87 |
| 4,678,329 | 06/789,280 | 7/07/87 |
| 4,678,330 | 06/729,022 | 7/07/87 |
| 4,678,340 | 06/794,964 | 7/07/87 |
| 4,678,342 | 06/769,426 | 7/07/87 |
| 4,678,356 | 06/751,690 | 7/07/87 |
| 4,678,360 | 06/891,243 | 7/07/87 |
| 4,678,368 | 06/884,648 | 7/07/87 |
| 4,678,375 | 06/586,128 | 7/07/87 |
| 4,678,377 | 06/725,248 | 7/07/87 |
| 4,678,381 | 06/575,170 | 7/07/87 |
| 4,678,385 | 06/863,067 | 7/07/87 |
| 4,678,387 | 06/707,494 | 7/07/87 |
| 4,678,390 | 06/844,455 | 7/07/87 |
| 4,678,391 | 06/807,751 | 7/07/87 |
| 4,678,393 | 06/834,114 | 7/07/87 |
| 4,678,394 | 06/760,542 | 7/07/87 |
| 4,678,396 | 06/716,146 | 7/07/87 |
| 4,678,403 | 06/761,532 | 7/07/87 |
| 4,678,412 | 06/833,511 | 7/07/87 |
| 4,678,413 | 06/821,485 | 7/07/87 |
| 4,678,414 | 06/938,833 | 7/07/87 |
| 4,678,419 | 06/835,160 | 7/07/87 |
| 4,678,422 | 06/797,228 | 7/07/87 |
| 4,678,430 | 06/859,363 | 7/07/87 |
| 4,678,433 | 06/814,324 | 7/07/87 |
| 4,678,438 | 06/924,398 | 7/07/87 |
| 4,678,444 | 06/832,389 | 7/07/87 |
| 4,678,445 | 06/806,423 | 7/07/87 |
| 4,678,450 | 06/618,316 | 7/07/87 |
| 4,678,451 | 06/789,817 | 7/07/87 |
| 4,678,454 | 06/879,530 | 7/07/87 |
| 4,678,469 | 06/921,222 | 7/07/87 |
| 4,678,473 | 06/903,173 | 7/07/87 |
| 4,678,474 | 06/844,809 | 7/07/87 |
| 4,678,485 | 06/823,076 | 7/07/87 |
| 4,678,487 | 06/733,972 | 7/07/87 |
| 4,678,490 | 06/791,000 | 7/07/87 |
| 4,678,501 | 06/817,177 | 7/07/87 |
| 4,678,503 | 06/407,464 | 7/07/87 |
| 4,678,511 | 06/772,942 | 7/07/87 |
| 4,678,520 | 06/698,216 | 7/07/87 |
| 4,678,525 | 06/729,119 | 7/07/87 |
| 4,678,538 | 06/853,906 | 7/07/87 |
| 4,678,540 | 06/872,073 | 7/07/87 |
| 4,678,543 | 06/572,662 | 7/07/87 |
| 4,678,544 | 06/834,687 | 7/07/87 |
| 4,678,546 | 06/716,803 | 7/07/87 |
| 4,678,548 | 06/887,637 | 7/07/87 |
| 4,678,551 | 06/786,023 | 7/07/87 |
| 4,678,554 | 06/825,055 | 7/07/87 |
| 4,678,555 | 06/754,005 | 7/07/87 |
| 4,678,564 | 06/798,610 | 7/07/87 |
| 4,678,572 | 06/921,334 | 7/07/87 |
| 4,678,574 | 06/804,349 | 7/07/87 |
| 4,678,582 | 06/822,125 | 7/07/87 |
| 4,678,583 | 06/873,364 | 7/07/87 |
| 4,678,605 | 06/820,281 | 7/07/87 |
| 4,678,609 | 06/795,542 | 7/07/87 |
| 4,678,615 | 06/888,860 | 7/07/87 |
| 4,678,646 | 06/815,200 | 7/07/87 |
| 4,678,647 | 06/861,985 | 7/07/87 |
| 4,678,657 | 06/742,770 | 7/07/87 |
| 4,678,705 | 06/751,675 | 7/07/87 |

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VOL 1130 ISS 3 SE 17 1991 UMI



| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,678,729 | 06/871,867 | 7/07/87 |
| 4,678,740 | 06/728,330 | 7/07/87 |
| 4,678,742 | 06/733,331 | 7/07/87 |
| 4,678,758 | 06/668,724 | 7/07/87 |
| 4,678,761 | 06/792,479 | 7/07/87 |
| 4,678,762 | 06/787,240 | 7/07/87 |
| 4,678,776 | 06/806,159 | 7/07/87 |
| 4,678,777 | 06/762,979 | 7/07/87 |
| 4,678,782 | 06/679,574 | 7/07/87 |
| 4,678,788 | 06/821,992 | 7/07/87 |
| 4,678,791 | 06/731,426 | 7/07/87 |
| 4,678,792 | 06/706,579 | 7/07/87 |
| 4,678,797 | 06/733,449 | 7/07/87 |
| 4,678,804 | 06/783,300 | 7/07/87 |
| 4,678,810 | 06/833,015 | 7/07/87 |
| 4,678,811 | 06/788,285 | 7/07/87 |
| 4,678,823 | 06/869,553 | 7/07/87 |
| 4,678,832 | 06/667,069 | 7/07/87 |
| 4,678,849 | 06/831,687 | 7/07/87 |
| 4,678,853 | 06/818,489 | 7/07/87 |
| 4,678,874 | 06/847,960 | 7/07/87 |
| 4,678,875 | 06/796,648 | 7/07/87 |
| 4,678,894 | 06/724,389 | 7/07/87 |
| 4,678,903 | 06/822,340 | 7/07/87 |
| 4,678,909 | 06/810,324 | 7/07/87 |
| 4,678,912 | 06/537,311 | 7/07/87 |
| 4,678,918 | 06/776,329 | 7/07/87 |
| 4,678,923 | 06/841,479 | 7/07/87 |
| 4,678,924 | 06/751,431 | 7/07/87 |
| 4,678,925 | 06/818,330 | 7/07/87 |
| 4,678,952 | 06/765,867 | 7/07/87 |
| 4,678,958 | 06/737,260 | 7/07/87 |
| 4,678,959 | 06/791,676 | 7/07/87 |
| 4,678,965 | 06/793,885 | 7/07/87 |
| 4,678,972 | 06/908,730 | 7/07/87 |
| 4,678,974 | 06/865,902 | 7/07/87 |
| 4,678,986 | 06/856,449 | 7/07/87 |
| 4,678,995 | 06/680,866 | 7/07/87 |
| 4,679,007 | 06/736,215 | 7/07/87 |
| 4,679,014 | 06/819,304 | 7/07/87 |
| 4,679,017 | 06/841,166 | 7/07/87 |
| 4,679,024 | 06/781,266 | 7/07/87 |
| 4,679,028 | 06/846,385 | 7/07/87 |
| 4,679,031 | 06/770,752 | 7/07/87 |
| 4,679,033 | 06/840,851 | 7/07/87 |
| 4,679,037 | 06/809,320 | 7/07/87 |
| 4,679,049 | 06/795,962 | 7/07/87 |
| 4,679,058 | 06/732,179 | 7/07/87 |
| 4,679,100 | 06/769,905 | 7/07/87 |
| 4,679,105 | 06/695,084 | 7/07/87 |
| 4,679,108 | 06/463,290 | 7/07/87 |
| 4,679,114 | 06/849,790 | 7/07/87 |
| 4,679,118 | 06/890,890 | 7/07/87 |
| 4,679,123 | 06/838,178 | 7/07/87 |
| 4,679,130 | 06/870,379 | 7/07/87 |
| 4,679,133 | 06/870,378 | 7/07/87 |
| 4,679,139 | 06/605,788 | 7/07/87 |
| 4,679,149 | 06/707,569 | 7/07/87 |
| 4,679,158 | 06/714,710 | 7/07/87 |
| 4,679,183 | 06/761,833 | 7/07/87 |
| 4,679,197 | 06/711,237 | 7/07/87 |
| 4,679,202 | 06/747,242 | 7/07/87 |
| 4,679,223 | 06/726,895 | 7/07/87 |
| 4,679,231 | 06/771,285 | 7/07/87 |
| 4,679,233 | 06/771,097 | 7/07/87 |
| 4,679,234 | 06/849,700 | 7/07/87 |
| 4,679,236 | 06/684,918 | 7/07/87 |
| 4,679,237 | 06/761,730 | 7/07/87 |
| 4,679,238 | 06/727,371 | 7/07/87 |
| 4,679,242 | 06/661,926 | 7/07/87 |
| 4,679,250 | 06/692,394 | 7/07/87 |

## NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

| Patent No. | Serial No. | Patent Date | Application Filing Date | Delayed Payment Acceptance Date |
|---|---|---|---|---|
| 4,308,416 | 06/217,495 | 12/29/81 | 12/17/80 | 6/27/91 |
| 4,348,546 | 06/310,793 | 9/07/82 | 10/31/81 | 8/01/91 |
| 4,609,917 | 06/652,326 | 9/02/86 | 9/19/84 | 7/18/91 |

### Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

**4,424,250**, Re. S. N. 07/741,211, Filed July 30, 1991, Cl. 428, TEXTILE PANEL, Ronald W. Adams, Owner of Record: *Gates Formed Fibre Inc., Auburn, Me.*, Attorney or Agent: H. W. Oberg, Ex. Gp.: 154

**4,680,353**, Re. S. N. 07/737,825, Filed July 26, 1991, Cl. 526, PROCESS FOR PRODUCTION OF SYTRENE POLYMERS, Nobuhide Ishihara, et. al., Owner of Record: *Idemitsu Kosan Co., Ltd., Tokyo, Japan*, Attorney or Agent: Marshall J. Chick, Ex. Gp.: 155

**4,729,831**, Re. S. N. 07/740,581, Filed Aug. 5, 1991, Cl. 210/631, METHOD FOR PREVENTING THE BULKING OF ACTIVATED SLUDGE, Kiyohura Monsanto, Owner of Record: *Mitsubishi Kasei Polytec Co., Tokyo, Japan*, Attorney or Agent: Norman F. Oblon, Ex. Gp.: 136

**4,821,142**, Re. S. N. 07/683,199, Filed Apr. 10, 1991, Cl. 361/395, CERAMIC MULTILAYER CIRCUIT BOARD AND SEMICONDUCTOR MODULE, Nobuyuki Ushifusa, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Alan E. Schiavelli, Ex. Gp.: 214

**4,854,469**, Re. S. N. 07/741,602, Filed Aug. 7, 1991, Cl. 220/086, POLLUTION CONTROL APPARATUS FOR MARINE FUEL TANKS, Thomas S. Hargest, Owner of Record: *Inventor*, Attorney or Agent: James M. Bagarazzi, Ex. Gp.: 241

**4,855,823**, Re. S. N. 07/742,852, Filed Aug. 8, 1991, Cl. 358/008, IMAGING ASSEMBLY AND MOUNTING FOR SURVEILLANCE VIEWING UNDER REMOTE CONTROL, Kenneth E. Struhs, et. al., Owner of Record: *Applied Engineering Co., Salt Lake City, Utah*, Attorney or Agent: Kent S. Burningham, Ex. Gp.: 262

**4,861,261**, Re. S. N. 07/741,763, Filed Aug. 7, 1991, Cl. 431/001, METHOD OF OPERATING A GAS-INFRARED RADIATOR, AND THE GAS-INFRARED RADIATOR, Kurt Krieger, Owner of Record: *Inventor*, Attorney or Agent: Louis Weinstein, Ex. Gp.: 346



**4,862,240**, Re. S. N. 07/744,514, Filed Aug. 13, 1991, Cl. 357/042, COMPLEMENTARY SEMICONDUCTOR DEVICE, Atsuo Watanabe, et. al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: William I. Solomon, Ex. Gp.: 258

**4,884,478** Re. S. N. 07/742,886, Filed Aug. 9, 1991, Cl. 081/59.1, SCREW TOOL, Karl Lieser, Owner of Record: *Wera Werk Herman Werner GmdH & Co., Kurzerter Strasse, Fed. Rep. of Germany*, Attorney or Agent: Martin A. Farber, Ex. Gp.: 323

**4,959,713** Re. S. N. 07/744,372, Filed Aug. 13, 1991, Cl. 358/108, HOME AUTOMATION SYSTEM, Noriaki Morotomi, et. al., Owner of Record: *Matsushita Electric Industrial Co., Ltd., Kadoma-Shi, Japan*, Attorney or Agent: Henry M. Zykorie, Ex. Gp.: 262

**5,009,301**, Re. S. N. 07/740,782, Filed Aug. 6, 1991, Cl. 192/106.2, CLUTCH DAMPER ASSEMBLY, Wayne L. Spitler, Owner of Record: *General Motors Corp., Detroit, Mich.*, Attorney or Agent: Ronald F. Scherer, Ex. Gp.: 352

### Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**4,959,120**, Reexam. No. 90/002,404, Requested Aug. 19, 1991, Cl. 156/651, DEMATERIALIZATION OF METAL FILMS, David Wilson, Owner of Record: *Golden Valley Microwave Foods, Inc., Minneapolis, Minn.*, Attorney or Agent: Paul A. Welter, Merchant, Gould, Smith, Edell, et. al., Minneapolis, Minn., Ex. Gp.: 134, Requester: Beckett Industries, Inc., Oakville, Ontario, Canada

**4,996,835**, Reexam. No. 90/002,403, Requested Aug. 16, 1991, Cl. 059/080, FINE JEWELRY ROPE CHAIN, David Rozenwasser, Owner of Record: *David Rozenwasser, Savion, Isreal*, Attorney or Agent: Helgott & Karas, New York, N.Y., Ex. Gp.: 321, Requester: Oroamerica, Inc., Burbank, Calif.

**5,006,583** Reexam. No. 90/002,401, Requested Aug. 16, 1991, Cl. 514/646, ALKYLAMINO AND ALKYLAMINO ALKYL DIARYLKETONES, R. Richard L. Hamer, et. al., Owner of Record: *Hoechst-Roussel Pharmeceuticals, Inc., Somerville, N.J.*, Attorney or Agent: Raymond R. Wittekind, Hoechst Celanese Corp., Somerville, N.J., Ex. Gp.: 129, Requester: Hoechst-Roussel Pharmeceuticals, Inc., Somerville, N.J.

### Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

MBA International, Inc., Fort Wayne, Ind., Reg. No. 1,385,106, for the mark "PROFITWATCH", Canc. No. 19,127.

Central Welding Supply Co., Inc., South Houston, Tex., Reg. No. 939,379, for the mark "HPG", Canc. No. 19,542.

Dial-A-Story, Inc., Chicago, Ill., Reg. No. 909,310, for the mark "DIAL-A-STORY", Canc. No. 19,554.

Furniture Leasing of America, Inc., Allston, Mass., Reg. No. 1,010,149 for the mark "THE APARTMENT FINDER", Canc. No. 19,677.

M & L Distribution Co., Inc., Fairfield, N.J., Reg. No. 1,447,682, for the mark "MICHELE", Canc. No. 19,686.

EFP Inns, Inc., Atlanta, Ga., Reg. No. 1,399,894, for the mark "CORVETTE'S AN ENTERTAINMENT ESTABLISHMENT" and design, Canc. No. 19,713.

JEAN BROWN
*Administrator of the Trademark Trial and Appeal Board*
For JEFFREY M. SAMUELS
*Assistant Commissioner for Trademarks*

### Errata

"All reference to Patent No. 5,013,651 to Elizabeth A. Wang of Carlisle, Mass. for `DNA SEQUENCES ENCODING OSTEOINDOCTIVE PRODUCTS' appearing in the *Official Gazette* of May 7, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,030,700 to Main Chang of Houston, Tex. for `METHOD FOR PREVENTING GAS PHASE REACTOR FOULING DURING ALPHA-OLEFIN POLYMERIZATIONS' appearing in the *Official Gazette* of July 9, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,035,501 to Howard J. Preston of Calif. for `AUTOMATIC FOCUSING SYSTEM FOR USE WITH A MOTION PICTURE CAMERA' appearing in the *Official Gazette* of July 30, 1991 should be deleted since no patent was granted."

"All reference to Patent No. 5,035,751 to Makoto Nagashima, et. al. of Japan for `CLEANING METHOD FOR SEMICONDUCTOR WAFER PROCESSING APPARATUS' appearing in the *Official Gazette* of July 30, 1991 should be deleted since no patent was granted."

### Department of Commerce Patent and Trademark Office [Docket No. 910235-1173]

*Agency:* Patent and Trademark Office, Commerce.
*Action:* Notice.

### Notice of Termination of Status of International Depository Authority under Budapest Treaty

*Summary:* Notice is hereby given that In Vitro International, Inc.'s status as an international depository is terminated effective Sept. 25, 1991.
*Address:* Questions should be submitted to H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231.
*For Further Information Contact:* H. Dieter Hoinkes, Office of Legislation and International Affairs, (703) 557-3065.
*Supplementary Information:* Since Nov. 30, 1983, In Vitro International, Inc. (IVI) of Linthicum, Maryland, has been rec-

ognized as an international depository authority under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. The Patent and Trademark Office has received a letter from Dr. Rex A. D'Agostino, President of IVI, dated May 24, 1991, stating that IVI can no longer continue to perform its functions as an international depository authority under the Budapest Treaty.

By letter dated June 25, 1991, the Patent and Trademark Office has notified the Director General of the World Intellectual Property Organization that "the United States withdraws its declaration of assurances made on behalf of IVI on Sept. 9, 1983". As a consequence, the termination of the status of IVI as an international depository authority takes effect on Sept. 25, 1991.

All deposits stored with IVI under the Budapest Treaty were transferred on June 20, 1991, to a substitute authority, which is the American Type Culture Collection (ATCC), 12301 Parklawn Dr., Rockville, Md., 20852, (Telephone No. (301) 881-2600). All mail or other communications addressed to IVI regarding those deposits, including all files and other relevant information, have also been transferred to ATCC. In its capacity as a substitute authority, ATCC has agreed to store all deposits transferred from IVI for an initial period of not less than three months from July 5, 1991, the date of first notice in the Federal Register of IVI's termination as an international depository authority. Patent owners and applicants who wish to preserve their date of original deposit must contact ATCC by Oct. 5, 1991, to make arrangements to pay ATCC's fee for continued maintenance and storage of their deposits past the initial storage period. ATCC will not accept responsibility for continued storage of deposits in respect of which depositors have failed to make appropriate arrangements by Oct. 5, 1991.

For further information, contact H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231; telephone (703) 557-3065.

July 10, 1991 HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks*

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**Registration to Practice**

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Final aproval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before Nov. 1, 1991.

Askin, Laramie E., 3801 Great Neck Ct., Alexandria, Va. 22309
Brown, Edward A., 2000 S. Eads St., #223, Arlington, Va. 22202
Shideler, Blynn L., 424 Perrymont Rd., Pittsburgh, Pa. 15237

Aug. 22, 1991 CAMERON WEIFFENBACH, *Director*
*Office of Enrollment and Discipline*

# PATENT NOTICES

**Certificates of Correction For Week of September 17, 1991**

| | | | |
|---|---|---|---|
| D. 308,222 | 4,904,410 | 4,926,483 | 4,937,332 |
| D. 308,294 | 4,906,051 | 4,926,704 | 4,937,373 |
| Re. 33,214 | 4,908,561 | 4,926,728 | 4,937,473 |
| Re. 33,233 | 4,908,837 | 4,927,177 | 4,937,581 |
| 4,766,158 | 4,910,027 | 4,927,184 | 4,937,590 |
| 4,788,141 | 4,910,277 | 4,927,603 | 4,937,862 |
| 4,793,067 | 4,910,675 | 4,928,144 | 4,937,936 |
| 4,814,177 | 4,910,724 | 4,928,146 | 4,938,412 |
| 4,816,529 | 4,911,646 | 4,928,287 | 4,938,465 |
| 4,816,554 | 4,912,416 | 4,928,473 | 4,938,496 |
| 4,819,799 | 4,913,418 | 4,928,525 | 4,938,803 |
| 4,821,137 | 4,913,955 | 4,928,600 | 4,939,681 |
| 4,823,162 | 4,914,110 | 4,928,653 | 4,939,732 |
| 4,838,182 | 4,914,144 | 4,928,877 | 4,939,740 |
| 4,839,699 | 4,914,525 | 4,929,785 | 4,939,780 |
| 4,843,225 | 4,914,579 | 4,929,918 | 4,939,795 |
| 4,852,692 | 4,914,677 | 4,931,380 | 4,939,798 |
| 4,853,214 | 4,914,778 | 4,931,396 | 4,939,866 |
| 4,853,378 | 4,914,868 | 4,931,524 | 4,939,877 |
| 4,855,780 | 4,915,318 | 4,931,526 | 4,939,962 |
| 4,859,040 | 4,915,683 | 4,931,778 | 4,939,996 |
| 4,861,120 | 4,915,934 | 4,931,816 | 4,939,998 |
| 4,867,903 | 4,916,031 | 4,931,823 | 4,939,999 |
| 4,868,729 | 4,916,111 | 4,932,278 | 4,940,730 |
| 4,870,503 | 4,916,858 | 4,932,881 | 4,940,810 |
| 4,875,545 | 4,917,496 | 4,933,234 | 4,940,829 |
| 4,876,128 | 4,917,578 | 4,933,406 | 4,941,099 |
| 4,878,365 | 4,917,704 | 4,933,546 | 4,941,309 |
| 4,878,505 | 4,917,841 | 4,934,204 | 4,941,324 |
| 4,880,751 | 4,918,444 | 4,934,227 | 4,941,609 |
| 4,881,223 | 4,918,554 | 4,934,532 | 4,941,895 |
| 4,882,288 | 4,918,771 | 4,934,565 | 4,942,334 |
| 4,883,614 | 4,919,252 | 4,934,814 | 4,942,716 |
| 4,884,070 | 4,919,504 | 4,935,052 | 4,942,978 |
| 4,884,852 | 4,919,582 | 4,935,062 | 4,943,941 |
| 4,886,974 | 4,919,640 | 4,935,141 | 4,944,128 |
| 4,887,164 | 4,919,646 | 4,935,404 | 4,944,844 |
| 4,891,939 | 4,919,671 | 4,935,405 | 4,946,970 |
| 4,895,745 | 4,919,830 | 4,935,541 | 4,977,094 |
| 4,896,553 | 4,921,696 | 4,935,555 | 5,006,654 |
| 4,897,080 | 4,921,873 | 4,935,939 | 5,009,141 |
| 4,899,142 | 4,922,811 | 4,936,114 | 5,012,514 |
| 4,900,135 | 4,923,035 | 4,936,244 | 5,016,338 |
| 4,901,237 | 4,923,295 | 4,936,564 | 5,018,395 |
| 4,902,708 | 4,925,089 | 4,936,727 | 5,018,742 |
| 4,904,085 | 4,925,179 | 4,937,182 | 5,019,634 |
| 4,904,340 | 4,925,802 | 4,937,282 | |

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**Disclaimers**

4,856,308—*Charles R. Johnson*, Hudson, Ohio, AUTOMOBILE STEERING LOCK. Patent dated Aug. 15, 1989. Disclaimer filed July 1, 1991, by the assignee, James E. Winner, Jr.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

---

4,866,602—*John C. Hall* Redmond, Wash. POWER SUPPLY FOR A COMPUTER PERIPHERAL DEVICE WHICH POSITIONS A CURSOR ON A COMPUTER DISPLAY. Patent dated Sept. 12, 1989. Disclaimer filed July 8, 1991, by the assignee, Microsoft Corp.

Hereby enters this disclaimer to claim 15 of said patent.

---

4,973,086—*Donald D. Donnelly; Nora J. Donnelly*, both of Dallas, Tex. RECORDS MANAGEMENT APPARATUS FOR CONSTRUCTING AND MAINTAINING A FILE FOLDER-BASED DOCUMENT FILING AND RETRIEVAL SYSTEM. Patent dated Nov. 27, 1990. Disclaimer filed June 27, 1991, by the inventors.

The term of this patent subsequent to Nov. 27, 2007, has been disclaimed.

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5,006,081—*Eugene F. Counsel*, Clearwater, Fla.; *Walter M. Werner*, Dowington, Pa. ELECTRICAL WIRE CONNECTOR. Patent dated Apr. 9, 1991. Disclaimer filed May 10, 1991, by the assignee, AMP Inc.

Hereby enters this disclaimer to claim 1 of said patent.

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**Disclaimer and Dedication**

4,860,341—*Robert F. D'Avello*, Hoffman Estates; *Francis P. Tobolski, Jr.*, Algonquin; *Joseph L. Kowalski*, Fox River Grove, all of Ill. RADIOTELEPHONE CREDIT CARD CALL APPROVAL SYNCHRONIZATION. Patent dated Aug. 22, 1989. Disclaimer filed June 17, 1991, by the assignee, Motorola, Inc.

Hereby disclaims and dedicates to the public all claims of said patent.



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| ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director | 308-1235 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director | 308-0651 |
| HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director | 308-2351 |
| BIOTECHNOLOGY, GROUP 180—EDWARD E. KUBASIEWICZ, Director | 308-0196 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—D. G. KELLY, Director | 308-1782 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—ROBERT E. GARRETT, Director | 308-0511 |
| INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—GERALD GOLDBERG, Director | 308-0754 |
| PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—CARLTON CROYLE Director | 308-0771 |
| ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—JOSEPH J. ROLLA, Director. | 308-0956 |
| COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP— 260 B. R. GRAY, Director | 308-0962 |
| DESIGN, GROUP 290—ROBERT E. GARRETT, Director | 308-0511 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—F. R. SCHMIDT, Director | 308-1113 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Director | 308-1148 |
| MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director | 308-0858 |
| SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—JOHN KITTLE, Director | 308-0861 |
| GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director | 308-0651 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during August 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,827,085 to 3,832,735 inclusive
Plant Patents ..... 3,581 to 3,603

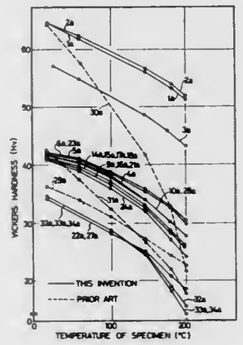
VOL 1130 ISS 3 SE 17 1991 UMI

# REEXAMINATIONS

SEPTEMBER 17, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 4,278,740 (1556th)**
**ALUMINUM-TIN BASE BEARING ALLOY AND COMPOSITE**
**Tamotsu Nara, Toyota, and Soji Kamiya, Nishio, both of Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan**
**Reexamination Request No. 90/002,257, Jan. 23, 1991.**
**Reexamination Certificate for Patent No. 4,278,740, issued Jul. 14, 1981, Ser. No. 47,336, Jun. 11, 1979.**
**Claims priority, application Japan, Jul. 11, 1978, 53/84232; Jul. 11, 1978, 53/84233**
**Int. Cl.[5] B32B** *15/04*
**U.S. Cl. 428—653**




AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–20** is confirmed.

**1**. An Al-Sn base, bearing alloy, consisting essentially of: from 3.5 to 35 wt. % of Sn; from 0.1 to 1.0 wt. % of Cr; from 1 to 10 wt. %, in total, of one or more additive elements selected from the group consisting of Si, Mn, Sb, Ti, Ni and Fe; and the balance is Al.

**5**. A bearing material which is made by applying said bearing alloy as claimed in claim **1** to a backing steel sheet by pressure welding.

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**B1 4,446,715 (1557th)**
**TRANSDUCER CALIBRATION SYSTEM**
**Wilber H. Bailey, Leucadia, Calif., assignor to Camino Laboratories, Inc.**
**Reexamination Request No. 90/002,106, Aug. 9, 1990.**
**Reexamination Certificate for Patent No. 4,446,715, issued May 8, 1984, Ser. No. 385,492, Jun. 7, 1982.**
**Int. Cl.[5] G01D** *21/00;* **G01K** *15/00;* **G01L** *27/00*
**U.S. Cl. 73—1 R**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **7** is confirmed.

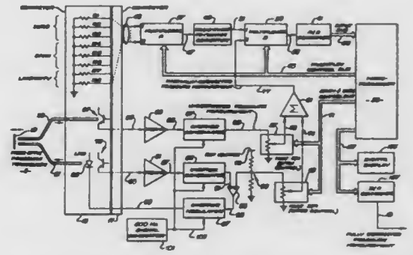
Claims **1–3**, **5**, **6**, **8–12** and **14–17** are determined to be patentable as amended.

Claims **4** and **13** dependent on an amended claim, are determined to be patentable.

New claims **18–56** are added and determined to be patentable.

**1**. A system for selectively measuring one of a plurality of separate physical variables, comprising:

a plurality of transducer means, each adapted to monitor a separate physical variable and produce a signal indicative thereof, the signal differing from a desired relationship with the physical variable in a predetermined fashion;

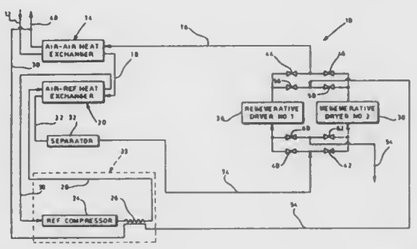


a plurality of *passive* characterizing means, each associated with a separate transducer means and *each* characterizing *with at least one passive indicator* the difference between the signal produced by [the] *its respective* transducer means and the desired relationship with the physical variable; and

a single correcting means, responsive to any selected one of the individual transducer means and its associated characterizing means, for adjusting the transducer means signal in a prescribed fashion, to produce a corrected measurement of the corresponding physical variable.

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**B1 4,761,968 (1558th)**
**HIGH EFFICIENCY AIR DRIVING SYSTEM**
**Sanjiv K. Basseen, Anderson County, and Richard A. Harlan, Morgan County, both of Tenn., assignors to Pioneer Air Systems, Inc.**
**Reexamination Request No. 90/002,007, Apr. 25, 1990.**
**Reexamination Certificate for Patent No. 4,761,968, issued Aug. 9, 1988, Ser. No. 108,105, Oct. 13, 1987.**
**Int. Cl.[5] F25D** *23/00*
**U.S. Cl. 62—271**



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AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3–7, and 10–17 are cancelled.

Claims 2, 9 and 18 are determined to be patentable as amended.

Claims 8 and 19 dependent on an amended claim are determined to be patentable.

New claims 21 and 22 are added and determined to be patentable.

[1. An improved drying system for removing moisture from air and like gases used in pneumatic systems to produce a product gas having a dew point of −40 to about −100 degrees Fehrenheit, which comprises:

a heat exchange means having an inlet for receiving inlet gas from said pneumatic systems, and an outlet, for cooling said inlet gas to produce an outlet gas having a dew point of about 35 to 40 degrees F., said heat exchange means having a refrigerant flowing therein;

a refrigerant system connected to said heat exchange means for supplying said refrigerant to said heat exchanger means, said refrigerant system having at least a compressor;

a moisture separator means connected to said outlet of said heat exchanger means for removing condensed moisture contained in said cooled outlet gas;

a moisture sorption means having at least one bed of moisture removal material, said sorption means having an inlet connected to said separator to receive gas having said condensed moisture removed, and an outlet for the removal of dried gas; and

a purge system for selectively removing moisture from said bed of moisture removal material, said purge system including a withdrawl line to obtain a purge gas from said outlet of said moisture sorption means, a heat exchanger in said withdrawl line proximate said compressor said refrigerant system to heat said purge gas, and a means of selectively applying said purge gas from said heat exchanger to said bed for said selected removal of moisture from said bed.]

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**B1 4,798,465 (1559th)**

**PARTICLE SIZE DETECTION DEVICE HAVING HIGH SENSITIVITY IN HIGH MOLECULAR SCATTERING ENVIRONMENT**

**Robert G. Knollenberg, Boulder, Colo., assignor to Particle Measuring Systems, Inc.**

**Reexamination Request No. 90/002,102, Aug. 6, 1990.**
**Reexamination Certificate for Patent No. 4,798,465, issued Jan. 17, 1989, Ser. No. 851,477, Apr. 14, 1986.**
**Int. Cl.[5] G01N** *15/02, 21/00*
**U.S. Cl. 356—336**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 12–20 is confirmed.

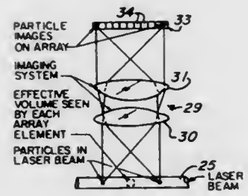
Claims 1, 3, 6 are determined to be patentable as amended.

Claims 2–5, 7–11, dependent on an amended claim, are determined to be patentable.

1. A particle size detection device capable of operation with high sensitivity in a high molecular scattering environment, said device comprising:

first means for enabling a mixture of gas and particles to be passed through a predetermined sensing region such that a high molecular scattering background is present at said sensing region *that includes noise due to background light from molecular scattering exceeding light scattered by particles to be detected at said sensing region;*

second means for illuminating said sensing region so that particles in said sensing region cause light scattering; and




detecting and processing means for receiving light scattered at said sensing region, said detecting and processing means being configured to reduce *said* noise due to background light from molecular scattering occurring within said sensing region to a level that enables detection and processing of light scattered by particles within said sensing region having a diameter of at least as small as 0.1 micron and larger, said detecting and processing means providing an electrical signal output indicative of the presence of such particles sensed in said sensing region.

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**B1 Des. 286,524 (1555th)**

**ANTI SKID CHAIN UNIT FOR VEHICLE TIRE**

**Ragnar Härdmark, Linköping, Sweden, assignor to Onspot AB, Linköping, Sweden**

**Reexamination Request No. 90/002,236, Dec. 18, 1990.**
**Reexamination Certificate for Patent No. Des. 286,524, issued Nov. 4, 1986, Ser. No. 630,412, Jul. 13, 1984.**
**Claims priority, application Sweden, Jan. 17, 1984, 840132**
**U.S. Cl. D12—154**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The single claim is cancelled.

[The ornamental design for an anti skid chain unit for vehicle tires, as shown and described.]



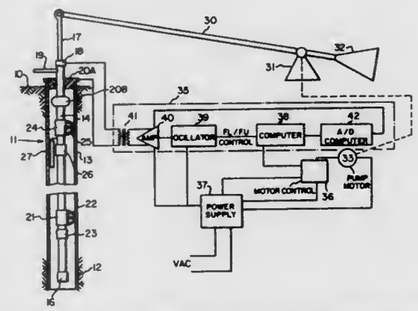
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

**Re. 33,690**

**LEVEL SENSOR**

**Harold P. Adams, Jr., Oil City; Andrew B. Maitland, Cranberry; David R. Hill, Oil City, all of Pa.; William E. Banton, Derry, N.H.; Lee M. Richey, Franklin, and David C. Taylor, Slippery Rock, both of Pa., assignors to Oil Well Automation, Inc., Seneca, Pa.**

**Original No. 4,747,451, dated May 31, 1988, Ser. No. 82,840, Aug. 6, 1987. Application for reissue Apr. 5, 1990, Ser. No. 505,346**
**Int. Cl.[5] E21B** *43/00, 47/06;* **F04B** *49/06*
**U.S. Cl. 166—53** **19 Claims**




*18. A system for controlling production in an oil well having an electrically conductive casing at electrical ground potential, an electrically conductive tubing within the casing, means for activating a pump at the lower end of the tubing comprising:*

*means for electrically isolating the tubing from ground potential so that the casing and tubing form a coaxial electrical conduit;*

*level sensing means mounted upon the outer surface of the tubing with means for establishing an electrical ground to the adjacent casing;*

*control means for transmitting electrical signals down the oil well, said signals powering the sensing means, and for turning off or on the means for activating the pump according to the level sensed by the level sensing means; and*

*said tubing comprising an electrically insulating tubing section just below the sensing means.*

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**Re. 33,691**

**PIEZOELECTRIC CERAMIC SWITCHING DEVICES AND SYSTEMS AND METHOD OF MAKING THE SAME**

**John D. Harnden, Jr., Schenectady, and William P. Kornrumpf, Albany, both of N.Y., assignors to General Electric Company, Fort Wayne, Ind.**

**Original No. 4,670,682, dated Jun. 2, 1987, Ser. No. 685,109, Dec. 21, 1984. Application for reissue Jun. 1, 1989, Ser. No. 361,843**
**Int. Cl.[5] H01L** *41/08*
**U.S. Cl. 310—332** **102 Claims**

*45. A switching device operable as a normally-open three-position switch comprising:*

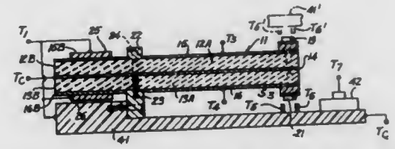
*at least one movable piezoelectric bender member having two planar piezoelectric plate elements secured in sandwich fashion on opposite sides of at least one central conductive surface;*

*an outer conductive surface extending at least over a movable bender portion of said bender member and secured to each of said plate elements so that said outer conductive surfaces are insulated from each other and said central conductive surface by said plate elements, each said outer conductive surface having at least one movable contact means operatively secured thereto;*

*clamping means for clamping a non-bending portion of said bender member located adjacent to and mechanically supporting said bender portion in a cantilever manner;*

*said non-bending portion disposed under said clamping means remaining non-movable and being electrically isolated from said conductive surfaces;*

*a first fixed contact secured adjacent one planar side of said bender portion for contact with said movable contact means when one of said plate elements is energized, and a second fixed contact secured adjacent the other planar side of said bender portion for contact with said movable contact means when the other of said plate elements is energized; and*




*switch energization circuit means operatively associated with said bender member for selectively applying a direct current potential to a selected one of said plate elements on said bender portion, each successive energization of said respective plate elements having the same polarity so that no depolarization of said plate elements occurs during successive energizations of said plate elements;*

*whereby sufficient energization of one of said plate elements causes movement of said bender portion toward said first fixed contact for contacting said first fixed contact, and sufficient energization of said other plate element and sufficient deenergization of said first plate element causes movement of said bender portion toward said second fixed contact for contacting said second fixed contact, and upon deenergization of both of said plates, said bender member is positioned so that both of said fixed contacts are open.*

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**Re. 33,692**

**FAULT DIAGNOSIS SYSTEM FOR ELECTRONIC DEVICE ON AUTOMOBILES**

**Shigeaki Hirano, and Hirotoshi Maekawa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Original No. 4,901,025, dated Feb. 13, 1990, Ser. No. 84,841, Aug. 13, 1987. Application for reissue Nov. 5, 1990, Ser. No. 608,734**
**Claims priority, application Japan, Aug. 18, 1986, 61-193120**
**Int. Cl.[5] G01R** *31/00*
**U.S. Cl. 324—537** **2 Claims**

1. A fault diagnosis system for an automobile comprising:

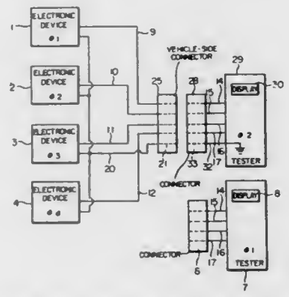
at least one automotive electronic device mounted on an automobile which performs a fault diagnosis on the automobile, the electronic device having a signal line for outputting signals representing results of the fault diagnosis according to either one of a plurality of output signaling schemes and having a control line for inputting a signal selecting the output signal scheme;

a vehicle-side connector connected to the signal line and the control line;

a first tester adapted to a first one of the plurality of output signaling schemes and having a display for displaying results of the fault diagnosis transmitted from said elec-

tronic device in accordance with the first output signaling scheme, the first tester having a first tester-side connector which can be connected to said vehicle-side connector for linking the signal [lines] *line* and the control line between said electronic device and said first tester, the first tester providing a first signal for designating the first output signaling scheme to said control line; and

a second tester adapted to a second one of the plurality of output signaling schemes and having a display for displaying results of the fault diagnosis transmitted from said




electronic device in accordance with the second output signaling scheme, the second tester having a second tester-side connector which can be connected to said vehicle-side connector for linking the signal [lines] *line* and the control line between said electronic device and said second tester, the second tester providing a second signal for designating the second output signaling scheme to said control line;

wherein either one of said tester-side connectors of said testers can be selectively connected to said vehicle-side connector.

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**Re. 33,693**

**DEVICE USING ORDERED SEMICONDUCTOR ALLOY**

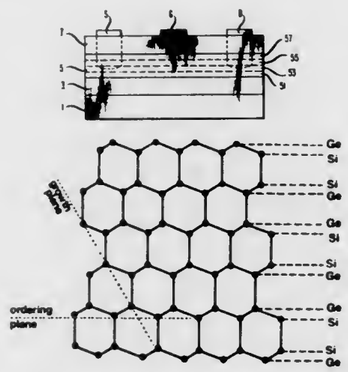
**John C. Bean, New Providence, and Abbas Ourmazd, Colts Neck, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Original No. 4,661,829, dated Apr. 28, 1987, Ser. No. 741,636, Jun. 5, 1985. Continuation of Ser. No. 343,757, Apr. 26, 1989, abandoned. Application for reissue Jun. 8, 1990, Ser. No. 536,059**

**Int. Cl.[5] H01L *29/163***

**U.S. Cl. 357—30** **13 Claims**

*13. A semiconductor device comprising at least one strained epitaxial semiconductor alloy layer having a composition which comprises ordered $Ge_xSi_{1-x}$, the atoms of said ordered $Ge_xSi_{1-x}$*




*layer being characterized by long-range periodicity of the constituent species in the lattice.*

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**Re. 33,694**

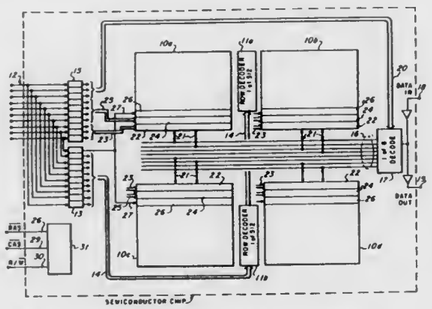
**DYNAMIC MEMORY ARRAY WITH SEGMENTED BIT LINES**

**David J. McElroy, Rosenberg, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Original No. 4,658,377, dated Apr. 14, 1987, Ser. No. 634,898, Jul. 26, 1984. Application for reissue Jul. 19, 1988, Ser. No. 221,568**

**Int. Cl.[5] G11C *11/40***

**U.S. Cl. 365—149** **31 Claims**




1. A semiconductor memory device comprising:

an array of rows and columns of memory cells, each cell including [an access] *a* transistor having a gate connected to one of a plurality of parallel word lines extending along said rows of cells, each cell including storage means coupled to a source-to-drain path of said [access] transistor,

a plurality of bit lines extending along said columns of cells' perpendicular to *and vertically spaced from* said word lines,

a plurality of bit line segments for each of said bit lines, said segments being [separate] *at least partially formed at a level vertically spaced* from said bit lines and extending parallel to said bit lines, the source-to-drain paths of said [access] transistors being connected to said segments, and a plurality of control means, a separate one of said control means being connected between each of said segments and a corresponding one of said bit lines for selectively connecting said segments to a bit line in response to an address.

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**Re. 33,695**

**DISC CASE**

**Mikio Ogusu, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan**

**Original No. 4,669,078, dated May 26, 1987, Ser. No. 751,731, Jul. 3, 1985. Application for reissue Sep. 8, 1988, Ser. No. 242,443**

**Claims priority, application Japan, Jul. 4, 1984, 59-101162[U]; Sep. 11, 1984, 59-137561[U]; Sep. 11, 1984, 59-137562[U]**

**Int. Cl.[5] B65D *85/30*; G11B *23/04***

**U.S. Cl. 369—291** **16 Claims**

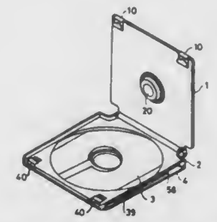
1. A disc case for receiving a disc on which information data are recorded and for supporting said disc rotatably in said disc case, said disc case being able to be set into a reproducing apparatus with said disc received in said disc case and receiving said disc releasably, wherein said disc case comprises:

a first case member having a disc receiving area on its central portion;

a second case member associated with said first case member to be able to open and close said disc receiving area; and

locking means having two locking members, a first locking member which is formed integrally on one of said first and second case members and a second locking member which is formed integrally on the other of said first and second case members and locks said first and second case members in a closed state with said disc receiving area closed in cooperation with said first locking member,

said second locking member having integrally an operating



part which release the locking of said first and second case members when operated, said first locking member including a surface portion means which limits movement of said operating part to thereby reduce movement of said second locking member when said opening part is operated to release the locking of said first and second case members.

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# PLANT PATENTS

## GRANTED SEPTEMBER 17, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

### 7,650
### ROSE PLANT JACMISS

**William A. Warriner, Tustin, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.**

**Filed Apr. 23, 1990, Ser. No. 513,492**
**Int. Cl.[5] A01H** *5/00*
**U.S. Cl. Plt.—9** **1 Claim**

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its distinctive compact spreading habit of growth, disease resistant glossy foliage, attractive flower form and light pink color, and its high, nearly constant production of flowers.

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### 7,651
### NAVEL ORANGE TREE NAMED 'ROHDE SUMMER NAVEL'

**Peter W. McLaren, Victoria, Australia, assignor to Harkhill Farm, Victoria, Australia**

**Filed Mar. 2, 1990, Ser. No. 487,890**
**Int. Cl.[5] A01H** *5/00*
**U.S. Cl. Plt.—45** **1 Claim**

1. A new and distinct variety of navel orange tree substantially as shown and described, characterized particularly as to novelty by a relatively late maturing fruit in comparison with other known late navel varieties.

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### 7,652
### ILEX PLANT-MESGOLG VARIETY

**Kathleen K. Meserve, Vero Beach, Fla., assignor to The Conard-Pyle Company, West Grove, Pa.**

**Filed Apr. 3, 1990, Ser. No. 508,709**
**Int. Cl.[5] A01H** *5/00*
**U.S. Cl. Plt.—65** **1 Claim**

1. A new and distinct variety of *Ilex*×*meserveae,* substantially as illustrated and described, characterized particularly as to novelty by the unique combination of:

(a) a vigorous densely branched growth habit which assumes a pyramidal configuration,
(b) bears deep green foliage having a very glossy upper surface,
(c) bears pistillate flowers in abundance mostly during the first half of May when grown in Southern Pennsylvania,
(d) forms in profusion berries which when mature exhibit an attractive lemon-yellow coloration, and
(e) exhibits a cold tolerance substantially the same as that of *Ilex*×*meserveae* Blue Princess (U.S. Plant Pat. No. 3,675).

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### 7,653
### ZANTEDESCHIA PLANT 'APRICOT GLOW'

**Richmond E. Harrison, Palmerston North, New Zealand, assignor to Manukau Horticulture Limited, Auckland, New Zealand**

**Filed Oct. 2, 1989, Ser. No. 415,860**
**Int. Cl.[5] A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct variety of Zantedeschia plant, said plant being a seedling resulting from a controlled cross between *Zantedeschia elliottiana* and *Zantedeschia rehmannii,* substantially as described and illustrated.

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### 7,654
### CHRYSANTHEMUM PLANT NAMED WHITE SPLENDOR

**Earl T. May, Los Osos, Calif., assignor to May Floral Company, Inc., Los Osos, Calif.**

**Filed Jul. 25, 1990, Ser. No. 556,992**
**Int. Cl.[5] A01H** *5/00*
**U.S. Cl. Plt.—74** **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named White Splendor, substantially as herein shown and described, which exhibits pure white ray florets in combination with other characteristics which are substantially identical to those of the Splendor cultivar (U.S. Plant Pat. No. 5,225).

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# PATENTS

## GRANTED SEP. 17, 1991

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 301-083 | 5,048,185 |
| 100-090 | 5,048,428 |
| 181-272 | 5,048,636 |
| 222-189 | 5,048,750 |
| 249-219 | 5,048,781 |
| 359-202 | 5,048,904 |
| 385-040 | 5,048,906 |
| 385-002 | 5,048,907 |
| 385-039 | 5,048,908 |
| 385-027 | 5,048,909 |
| 385-017 | 5,048,910 |
| 385-033 | 5,048,911 |
| 385-023 | 5,048,912 |
| 385-037 | 5,048,913 |
| 385-053 | 5,048,914 |
| 385-086 | 5,048,915 |
| 385-071 | 5,048,916 |
| 385-078 | 5,048,917 |
| 385-086 | 5,048,918 |
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| 385-055 | 5,048,920 |
| 385-069 | 5,048,921 |
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| 359-569 | 5,048,925 |
| 359-487 | 5,048,926 |
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| 359-058 | 5,048,930 |
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| 359-056 | 5,048,934 |
| 359-056 | 5,048,935 |
| 385-007 | 5,048,936 |
| 359-301 | 5,048,937 |
| 359-652 | 5,048,938 |
| 359-683 | 5,048,939 |
| 359-708 | 5,048,940 |

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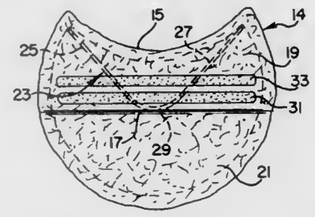
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| 359-368 | 5,048,941 |
| 359-513 | 5,048,942 |
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| 156-252 | 5,049,431 |
| 439-325 | 5,049,511 |
| 525-149 | 5,049,606 |
| 514-226 | 5,049,669 |
| 392-412 | 5,049,725 |
| 359-332 | 5,049,762 |
| 359-135 | 5,050,164 |
| 359-180 | 5,050,239 |

# PATENTS

GRANTED SEPTEMBER 17, 1991

## GENERAL AND MECHANICAL

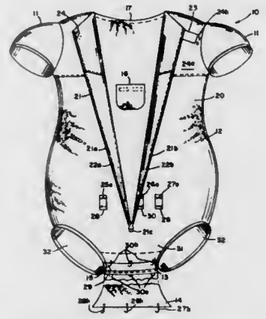
**5,048,121**
**SYSTEM FOR BOTTLE FEEDING AN INFANT**
**John Kordecki, 515 Olive St., Hoffman Estates, Ill. 60194**
**Division of Ser. No. 382,475, Jul. 17, 1989. This application Apr. 9, 1990, Ser. No. 507,251**
**Int. Cl.[5] A41B** *13/00, 13/10;* **A41D** *11/00*
**U.S. Cl. 2—49 R** **7 Claims**




1. A bib comprising:
a substrate having at least two layers superimposed on and attached to each other, the substrate being generally flat with opposed side surfaces and a generally circular periphery,
a portion of the periphery of the substrate being recessed in an arcuate shape to fit only around a front portion of a wearer's neck generally under the chin;
an elongated rigid member formable to the contours of the wearer generally encompassing said recessed arcuate portion disposed between and being fully contained within the layers of the substrate; and,
a pressure sensitive adhesive disposed on one side surface of the substrate for adhering the substrate to a wearer.

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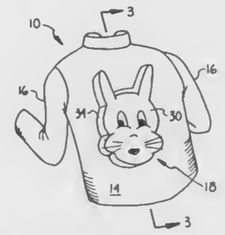
**5,048,122**
**GARMENT FOR SHIELDING LINES CONNECTED TO A PATIENT**
**Deborah G. Prieur, 327 Asbury St., Hamilton, Mass. 01982**
**Continuation of Ser. No. 297,086, Jan. 13, 1989, abandoned. This application Jun. 4, 1990, Ser. No. 532,339**
**Int. Cl.[5] A41D** *13/00, 11/00*
**U.S. Cl. 2—69** **12 Claims**



1. A garment to be worn by a person with a catheter and catheter line or the like implanted at an implant site, said garment comprising:
A. close-fitting garment body means with an inside surface for covering a portion of the person including the implant site,
B. pocket forming means having a loose edge and having other edges mounted to said garment body means on said inside surface adjacent the implant site for forming with said garment body means a pocket with an opening along said loose edge facing and proximate the implant site for storing a portion of the catheter line or the like therein,
C. first partial closure means attached to said pocket forming means along substantially all said loose edge and second partial closure means attached to said garment body means opposite to said first partial closure means for releasable attachment thereto, said first and second partial closure means having a gap therethrough into said pocket and partially closing said opening around said gap to retain the catheter line or the like in said pocket means while allowing the catheter line limited motion relative to said garment through said gap in said partial closure means, and
D. garment closure means affixed to said garment body means for facilitating the removal and donning of the garment, said closure means being offset from the site of said pocket means.

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**5,048,123**
**GARMENT WITH 3-DIMENSIONAL INFLATABLE DESIGN**
**Demetrius A. Monson, 535 S. Mesa Hills Dr., #1618, El Paso, Tex. 79912**
**Filed Oct. 3, 1990, Ser. No. 590,457**
**Int. Cl.[5] A41D** *1/02*
**U.S. Cl. 2—69** **26 Claims**




1. A novelty garment comprising:
a jacket constructed of lightweight pliable material, said jacket having a connectable set of front panels, a rear panel attached to said front panels and a plurality of sleeves;
an opening in said rear panel of said jacket, said opening having a peripheral edge;
an air pocket comprising an outer panel and a side panel secured about a perimeter of said outer panel, said side panel also secured about the edge of said opening, said side panel comprising at least one segment of material, said air pocket secured substantially about an entire periphery of said air pocket to the edge of said opening so that said air pocket is in substantially continuous engagement with said rear panel, wherein the pocket is self-inflatable when the wearer is in motion or when said jacket is worn in windy conditions; and
a design imprinted on said outer panel, the perimeter of said outer panel corresponding to an outer edge of said design.

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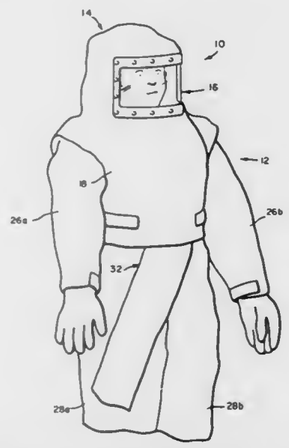


5,048,124

## EASY ACCESS PROTECTIVE COVERALLS

Milton A. Lewis, Jr., Richmond, Va.; Jeffrey S. Mason, Covington, Ind.; Carson B. Swinford, Danville, Ill., and Timothy R. Wiseman, Sr., Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1989, Ser. No. 414,484
Int. Cl.[5] A41D *13/00*; A62B *17/00*
U.S. Cl. 2—79 6 Claims



1. Protective coveralls providing protection to a wearer of the coveralls in a hazardous environment comprising:

a one-piece main suit with arm and leg portions connected to a torso portion having shoulder areas and a neck opening;

a head covering including a viewing lens and downwardly-draping hood for covering the head of the wearer and extending downwardly at least over the neck opening of said main suit in use, said head covering being detachable from said main suit;

a slit-like opening extending downwardly from the neck opening adjacent the uppermost area of one shoulder area diagonally across the front of said torso portion to a position adjacent the upper area of the opposite leg portion;

a zipper for closing said slit-like opening;

an elongate flap attached to said main suit along and adjacent to the zipper at one side of said opening, said flap having a length at least as long as said slit-like opening and a width sufficient to cover the zipper and provide an overlapping portion which overlaps the main suit on the opposite side of the opening;

complementary hook and loop fastening tapes having a width at least 2 cm wide on the underside of said overlapping portion of said flap and on a corresponding location on the exterior of said main suit for securing said flap to said suit covering said zipper, said hook and loop fastening tapes being generally continuous and extending substantially the entire length of said flap;

an unattached extension of said elongate flap which overlaps further over said opposite side of said opening, said unattached extension being unattached from said main suit along at least a predominant portion of its length whereby said unattached extension provides a hand grip to assist in gripping said flap to detach said complementary hook and loop fastening tapes securing said flap to said suit; and

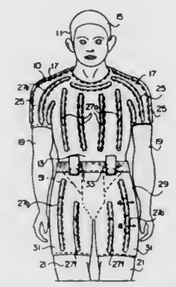
an over-the-shoulder extension of the uppermost area of said flap which extends past and over the uppermost area of said shoulder area of said main suit.

5,048,125

## ATHLETIC SPORTSWEAR

Joseph Libertini, and Deborah A. Libertini, both of 618 Country Club La., Havertown, Pa. 19083

Filed Jan. 25, 1990, Ser. No. 470,129
Int. Cl.[5] A41D *13/02*; A63B *21/00*
U.S. Cl. 2—79 4 Claims



1. An article of apparel for use as athletic sportswear made of a stretchable material and sized to cover at least a portion of the musculoskeletal frame of the wearer said article comprising at least two layers of fabric attached together to form the shape of said article, said layers being provided with a plurality of elongated pockets between said layers extending longitudinally along a portion of the length of said article, said pockets being spaced apart at a predetermined distance and enclosing particulate material of sufficient density to substantially increase the weight of said article, said pockets being of relatively small cross section to permit flexibility, said pockets including pocket divider means dividing each of said pockets into a plurality of pocket segments such that said particulate material is prevented from freely passing between said pocket segments, whereby said article provides equal distribution of the weight of said particulate material about said musculoskeletal frame.

5,048,126

## PROTECTIVE APPAREL

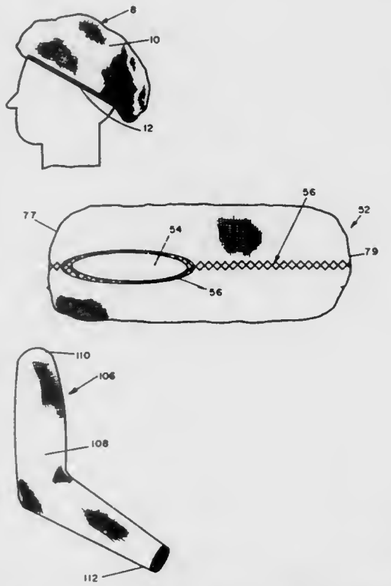
James G. McLaughlin, 4103 Kenwood Dr., Huntsville, Ala. 35810

Filed Oct. 2, 1989, Ser. No. 415,658
Int. Cl.[5] A41D *13/08*; A42B *1/00*; A43B *3/16*
U.S. Cl. 2—125 5 Claims

2. A protective sleeve having first and second spaced arm receiving openings into which the arm of an individual is inserted, said sleeve disposed for being worn on said arm comprising:

a pair of similar elongated sections of material having spaced elongated side edge surfaces and spaced end edge surfaces, said side edge surfaces disposed in heat sealed relation along the length thereof, said first of said arm receiving openings defining the shoulder portion of said sleeve and said second of said arm receiving openings defining the wrist portion of said sleeve, said end edge surfaces having an elastic band glued therein around the periphery said openings, the peripheral edge surfaces of said arm receiving openings being disposed for folded relation responsive to receiving said elastic band in said glued relation in said folded edges whereby said peripheral edge surfaces of said arm receiving openings are retained in said folded relation solely as a result of said glued relation.



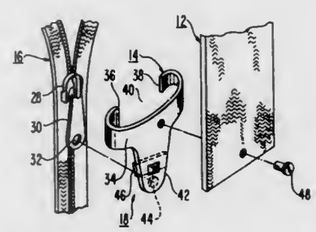


5,048,127

## INTERCHANGEABLE PRE-TIED NECKTIE

Philip S. Yang, Palos Verdes, Calif., assignor to Viscount USA, Inc., Paramount, Calif.

Filed Nov. 8, 1990, Ser. No. 610,746
Int. Cl.[5] A41D *25/02, 25/08*
U.S. Cl. 2—149 8 Claims



1. A necktie comprising:

a knot support;

an outer tie secured to said knot support and being positionable about said knot support to provide a knot;

an inner tie releasably secured to said knot support comprising an upper loop to be worn about the neck of a wearer, an adjusting means positioned on said inner tie, and a tie end adjacent to said upper loop, said adjusting means including a grasping means having an aperture therein; and

a securing means for releasably securing said inner tie to said knot support including a stud positioned on the rear surface of said knot support and a protruding securing means also positioned on a rear surface of said knot support;

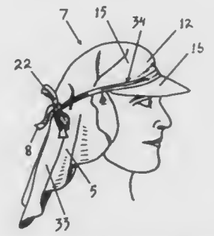
wherein said grasping means is located within said protruding securing means and said stud is positioned within said aperture of said grasping means when said inner tie is secured to said knot support.

5,048,128

## PROTECTIVE HEADWEAR

John C. Watson, Jr., P.O. Box 9241, Calabasas, Calif. 91372

Filed Mar. 11, 1991, Ser. No. 674,875
Int. Cl.[5] A42B *1/04*
U.S. Cl. 2—204 1 Claim



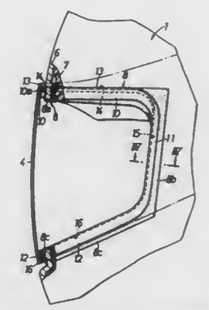
1. A unisex protective headcovering, comprising a fabric kerchief portion, a visor portion, and a tying ribbon portion designed to protect the wearer's head, eyes, neck, ears and part of the back and shoulder area from the harmful effects of the sun with the option to be worn wet to provide evaporative cooling for the wearer, and said fabric kerchief portion being a substantially rectangular form designed to drape downward at the back of the wearer's head; a visor portion whose rear edge is concave, made of suitably rigid material; and a ribbon portion whose middle region is affixed to one edge of said rectangular portion and also affixed to said visor portion along concave rear edge of visor and whose ends are of sufficient length to be drawn back to the rear of the wearer's head and knotted to secure the head covering in place.

5,048,129

## HELMET FOR RIDING VEHICLE

Eitaro Kamata, Tokyo, Japan, assignor to Shoei Kako Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1990, Ser. No. 627,457
Claims priority, application Japan, Aug. 22, 1990, 2-87798[U]
Int. Cl.[5] A42B *1/08*
U.S. Cl. 2—424 4 Claims



1. A helmet for riding a vehicle comprising: a cap body with a shield plate, means for vertically turnably supporting rail shield plate on left and right side surfaces of said cap body to

open and close a window formed in a front surface of the cap body, and a seal lip being formed continuously from an edge member attached to a peripheral edge of the window for tightly contacting with an inner surface of the shield plate in a closed position thereof, wherein

said seal lip includes an upper seal lip portion having a tip end directed downward, said upper seal lip portion being formed continuously from an upper side portion of the edge member along an upper edge of the window and being provided at an upper surface of a base portion of said upper seal lip portion with an upper drain groove which extends along the upper edge of the window.

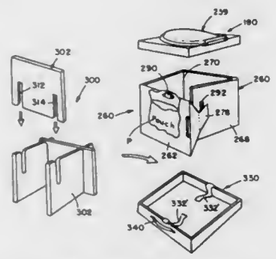
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**5,048,130**

## PORTABLE, KNOCKDOWN TOILET KIT

**Charles J. Brotman, 8103 Kenewick Ave., Takoma Park, Md. 20912, and Mark Gottlieb, 3495 Pence Ct., Annandale, Va. 22003**

**Filed Jul. 18, 1990, Ser. No. 553,638**
**Int. Cl.[5] A47K *11/04***
**U.S. Cl. 4—483** **10 Claims**



1. A portable, knockdown toilet comprising:

A) a monolithic top unit which includes

(1) a planar central section having an opening defined therethrough,

(2) front and rear flanges depending from said central section,

(3) two side flanges depending from said central section,

(4) said top unit flanges cooperating with each other to define a top unit perimeter;

B) a monolithic bottom unit which includes

(1) a planar central section,

(2) front and rear flanges connected to said central section,

(3) two side flanges connected to said central section,

(4) said bottom unit flanges cooperating with each other to define a bottom unit perimeter which is essentially equal in size to said top unit perimeter, and

(5) a handle mounting means on one of said bottom unit flanges,

(6) a handle attached to said handle mounting means,

(7) a securing strap means attached to said bottom unit;

C) a monolithic midunit which includes

(1) four essentially identical sections defined by folding said midunit along foldlines to define two outer sections and two inner sections, each of which includes

(a) a rectangular perimeter having a top edge, a bottom edge, a first side edge and a second side edge,

(b) a tab extending from a foldline on said first side edge of one of said outer sections,

(2) a slot defined in the other of said outer sections for receiving said tab;

D) a waste collection bag removably securable within said opening;

E) an insert unit for supporting said top unit and located within said midunit, said insert including four essentially identical monolithic rectangular panels, with each panel including a two blind-ended slots defined therein near an edge of said panel said panels being connected together by slidably connecting each panel in respective slots to form a rectangular configuration;

F) whereby when said toilet is in a knockdown position said top unit flanges being located to contact said bottom unit flanges for forming a kit, said top unit cooperating with said bottom unit to define a carrying case, said carrying case being sized to contain said midunit sections and said insert unit panels, as well as said waste collection bag in a kit form.

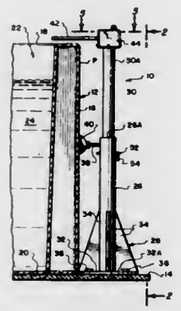
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**5,048,131**

## ADJUSTABLE ASSIST STAND FOR AN ELEVATED SPA

**Gordon R. Stephen, 4331 Stonewood Ct., Santa Maria, Calif. 93455**

**Filed Sep. 24, 1990, Ser. No. 587,212**
**Int. Cl.[5] A47K *3/00, 3/12***
**U.S. Cl. 4—559** **18 Claims**



1. A user assist stand for use with an above-floor level spa, said assist stand comprising:

(a) an elongated main hollow tubular member having an open top end;

(b) means for securing said main member to a floor and extending upright adjacent an exterior side of a sidewall of a spa;

(c) an elongated auxiliary extension member slidably interfitting in telescoping relation within said main member through said open top end thereof such that an upper portion of said auxiliary member is disposed upwardly from said main member;

(d) hand grip means for assisting a user to enter or leave the spa; a swivel lock mechanism for mounting said hand grip to said upper portion of said auxiliary member wherein said hand grip means lockingly swivels from a horizontal position to a vertical position; and

(e) a release lock mechanism operable for securing said auxiliary member to said main member to position said upper portion of said auxiliary member and said hand grip means mounted thereon at a desired elevation above said main member and relative to an upper edge of the spa sidewall, said release lock mechanism also being operable for releasing said auxiliary member from securement to said main member to permit slidable movement of said auxiliary member relative to said main member and thereby adjustment of the elevation of said upper portion of said auxiliary member and said hand grip means thereon relative to the main member and the spa sidewall.

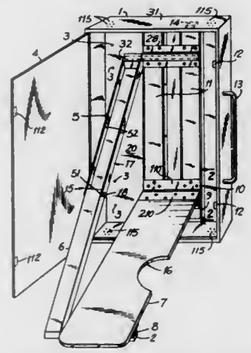


**5,048,132**

## BATH/SHOWER SEAT ASSEMBLY AND ENCLOSURE

**Phyllis Rizzo, 67-27 Eliot Ave., Middle Village, N.Y. 11379**

**Filed Jan. 30, 1990, Ser. No. 472,126**
**Int. Cl.[5] A47K *3/12***
**U.S. Cl. 4—578** **8 Claims**



1. A folding bath seat assembly, which can be mounted on the side wall of a bathtub, comprising:

a) a wall mountable enclosure;

b) a hinge, one part of which is attached to a lower portion of the wall mountable enclosure;

c) an elongated seat member having upper and lower major surfaces, one end portion of which is attached to the other part of the hinge, so designed as to fold between an open position substantially perpendicular to the enclosure and a closed position substantially parallel to and adjacent to the enclosure, the hinge being secured to the upper major surface;

d) an elongated foldable seat support means pivotably attached at a first end to the other end portion of the seat member, and pivotably attached at a second end to an upper portion of the wall mounting enclosure, the seat support means and the seat member being so juxtaposed with respect to the enclosure, such that in the closed position of the seat member, the seat member and the seat support means are wholly within the enclosure;

e) an angle bracket support member rigidly secured to the lower major surface of the seat member opposite the hinge connection location and so designed as to abut the wall mounting enclosure when the seat member is in the open position.

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**5,048,133**

## STRETCHER

**Tadashi Iura, 172-4, Befu-cho; Yukio Yokohata, 185-1, Befu-cho, both of Matsuyama-shi, Ehime 791, and Hisashi Terao, 640-1, Mori, Iyo-shi, Ehime 799-31, all of Japan**

**Filed Jun. 6, 1988, Ser. No. 202,627**
**Claims priority, application Japan, Jun. 18, 1987, 62-153115**
**Int. Cl.[5] A61G *7/10***
**U.S. Cl. 5—81 B** **7 Claims**

6. A wheeled stretcher for transferring a person to and from a bed comprising:

a truck;

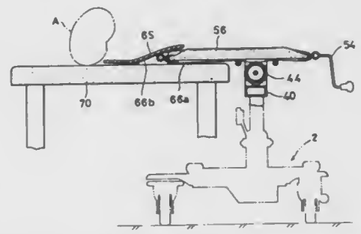
a lifting device, the height of said lifting device being positionable to go under a bed, said lifting device being located at a position off center of a longitudinal centerline of said truck, and having a narrow width;

a bed frame positioned above approximately the center of said truck, and supported and lifted by said lifting device;

a bed mat positioned onto said bed frame;

a transfer sheet positioned atop said mat which can be moved in a lateral direction relative to said bed frame, said transfer sheet being made of a plate form material which can be bent freely in either a longitudinal direction or lateral direction relative to a longitudinal centerline of said bed frame; and

at least one pair of belts, one end of each belt of said pair of



belts being connected at one end to said transfer sheet and at the other end, in opposite directions of rotation, to a take up drum mounted between the longitudinal sides of said bed frame for moving said transfer sheet to and beyond opposite lateral sides of said bed frame as said take-up drum is rotated in opposite directions.

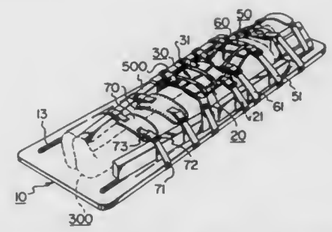
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**5,048,134**

## RESTRAINING DEVICE

**Wayne R. Dennill, and Richard E. Vollo, both of 935 Todd Road, Kamloops, Canada V2C 5A9**

**Filed Apr. 20, 1990, Ser. No. 511,682**
**Claims priority, application Canada, Apr. 21, 1989, 597479**
**Int. Cl.[5] A61G *1/00, 1/044***
**U.S. Cl. 5—82 R** **20 Claims**

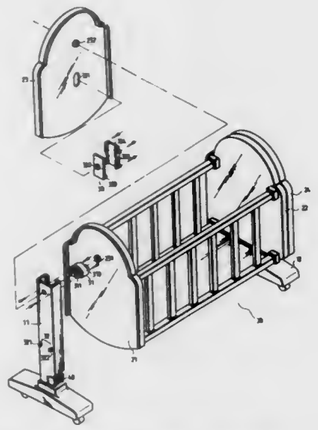


1. A restraining device for immobilizing a preselected portion of a prostrate human body (**300**) when disposed on a body support platform (**10**) having accompanying attachment locations (**11**), said device comprising first (**20,50**) and second (**30,60**) panel sections for placement over said body portion, quick coupling and release means (**100***a*, **100***b*, **200***a*, **200***b*) on said first and second panel sections for detachably interconnecting said panel sections together in overlapping and variably adjustable relationship, and side attachment means (**21, 22,31,32,51,52,61,62**) extending from each of said first and second panel sections for securing said panel sections to said attachment locations, said first (**20,50**) and second (**30,60**) panel sections each including at least one adjustable variable length strap extending outwardly therefrom providing said side attachment means and wherein said panel sections (**20,30**) overlap one another in a direction across said body.

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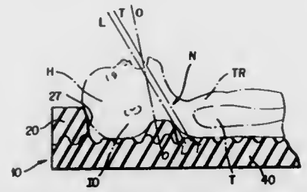


**5,048,135**
## SWINGING ASSEMBLY FOR CRIBS
Chin Y. Chen, 9-1, Lane 161, Hsing An Road Sec. 1, Taichung, Taiwan
Filed Jan. 23, 1991, Ser. No. 644,452
Int. Cl.[5] A47D *9/02*
U.S. Cl. 5—109 2 Claims



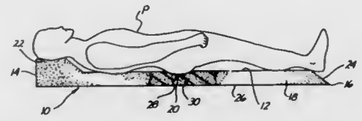
1. A swinging assembly for cribs comprising:
a crib with two opposite inner frames disposed at two opposite sides of said crib;
two corresponding outer frames matching said two opposite inner frames respectively;
two lateral braces supporting said two inner frames respectively;
each of said lateral brace disposed between each of said corresponding inner frame and outer frame respectively;
a bearing disposed between said inner frame and said lateral brace;
said bearing connected to an upper portion of said lateral brace and an inner periphery of said inner frame;
at least a protrusion stopper disposed on an outer periphery of said lateral brace;
a switching apparatus disposed between said lateral brace and said outer frame;
said switching apparatus having an outer positioning seat and an inner positioning seat;
said inner positioning seat abutting an outer periphery of said lateral brace;
said outer positioning seat having a knob passing through a slot in a center of said outer frame;
said inner positioning seat enclosed by said outer positioning seat;
said outer positioning seat having a flange in a lower end of said outer positioning seat to be stopped by said protrusion stopper;
an electrical apparatus installed in a lower interior of said lateral brace;
said electrical apparatus having a silicon controlled rectifier, at least a diode, and a transformer;
a non-magnetic partition extending downwardly from said inner frame to face said electrical apparatus;
a magnetic device disposed at a bottom of said crib to face said partition;
said magnetic device having two permanent magnets positioned by a securing seat;
a corrugated plate disposed under said crib to position said securing seat securely.

**5,048,136**
## INFANT SUPPORT
Michael D. Popitz, Newton, Mass., assignor to Brigham & Women's Hospital, Boston, Mass.
Filed Oct. 3, 1990, Ser. No. 593,651
Int. Cl.[5] A47C *16/00*
U.S. Cl. 5—431 31 Claims




1. An apparatus for supporting the head, neck, and body of an infant for airway management comprising:
a head-receiving opening formed within said apparatus and a head-supporting surface within said head-receiving opening;
a body-receiving opening formed within said apparatus and a body-supporting surface within said body-receiving opening;
a neck support defined between said head-receiving opening and said body-receiving opening, said neck support dimensioned to support the neck of said infant in an extended position, said neck support formed of a material having a density greater than that of said head-supporting surface;
wherein when said head, neck and body of said infant are supported on said apparatus, the axes of the head and neck of said infant are automatically aligned for airway management.

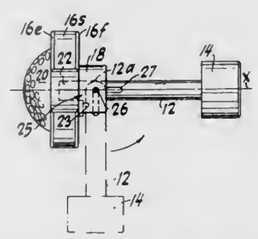
**5,048,137**
## EDGE-SHEAR REDUCTION IN BODY SUPPORT FOAM PADS
John E. Rogers, P.O. Box 1437, Blue Jay, Calif. 92317
Filed Aug. 20, 1990, Ser. No. 570,220
Int. Cl.[5] A47C *27/14*
U.S. Cl. 5—464 12 Claims




12. A body support pad of resilient material having a top surface for supporting a human body, a single cavity in a coccygeal supporting region of said pad for partially admitting a protuberant anatomical portion of a human body supported thereon for relieving pressure on said anatomical portion of the human body, said cavity having a rim at said top surface, the interior of said cavity being shaped and configured for defining a zone of graded pressure exerted against said human body by an uncut continuous area of said top surface adjacent to said rim thereby to relieve shear stress on the body at said rim, said graded pressure diminishing with proximity to said rim.

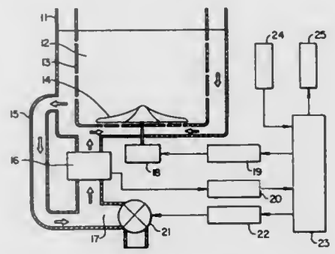


**5,048,138**
## SHOE SPIKE WRENCH AND CLEANING TOOL
Herbert L. Everroad, Scottsdale, Ariz., assignor to Foot-Joy, Inc., Brockton, Mass.
Continuation of Ser. No. 379,409, Jul. 13, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 600,561
Int. Cl.[5] B25F *1/00*
U.S. Cl. 7—138 2 Claims




1. A combination shoe wrench and cleaning tool comprising
a. a handle having a hand grippable surface generated around an axis;
b. an elongated shaft hingedly engaged to the head for positioning along such axis for operation and perpendicular to the axis for compact storage;
c. a head on the shaft carrying wrench prongs;
d. a hollow in the shaft to hold and store a cleaning element; and
e. a cap frictionally engageable with the head, such cap having a hole to permit the cleaning element to protrude.

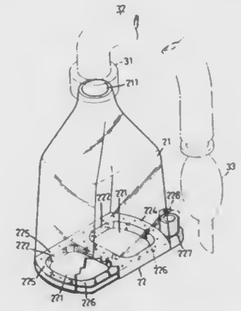
**5,048,139**
## WASHING MACHINE WITH A TURBIDIMETER AND METHOD OF OPERATING SAME
Takatomo Matsumi, Fujiidera; Kazutoshi Takimoto, Yao, and Koji Kikuchi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 40,751, Apr. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 782,022, Oct. 23, 1985, abandoned. This application Jul. 16, 1990, Ser. No. 552,705
Claims priority, application Japan, Jan. 8, 1985, 60-1834; Jan. 8, 1985, 60-1835; Jan. 8, 1985, 60-1837; Jan. 8, 1985, 60-1838; Jan. 9, 1985, 60-2795; Jan. 9, 1985, 60-2799; Feb. 5, 1985, 60-21500
Int. Cl.[5] D06F *33/02, 39/00*
U.S. Cl. 8—158 13 Claims




1. A washing machine, comprising:
a tank for storing cleaning water;
a pulsator disposed inside the tank for agitating the cleaning water;
a motor for driving the pulsator, which motor is in mechanical connection with the pulsator;
a turbidimeter for measuring turbidity of the cleaning water;
a motor-controlling means for alternately effecting a strong flow operation whereby the pulsator undergoes a first reciprocating motion and a flow operation whereby said pulsator undergoes a second reciprocating motion which is weaker than the first reciprocating motion; and
a sensor-controlling means for causing the turbidimeter to measure cleaning water turbidity in a predetermined time period occurring between the beginning of the second reciprocating motion and the beginning of the first reciprocating motion.

12. A method of operating a washing machine having a turbidimeter for measuring turbidity of cleaning water in said washing machine, said method comprising the steps of:
continuously monitoring the temporal rate of change in turbidity of said cleaning water;
identifying a point in time when the turbidity level measured by said turbidimeter stops dropping after a washing or rinsing cycle of said washing machine is started;
storing as an initial value the turbidity level measured by said turbidimeter at said point in time; and
terminating said cycle when a temporal rate of the turbidity decreases lower than a predetermined rate and the difference between the initial value and the turbidity is smaller than a predetermined value.

**5,048,140**
## CLEANING DEVICE FOR FISH TANK
Hans Wu, No. 78, Chung-Shan Wu St., Tainan City, Taiwan
Filed Feb. 12, 1991, Ser. No. 653,368
Int. Cl.[5] E04H *3/20*
U.S. Cl. 15—1.7 2 Claims

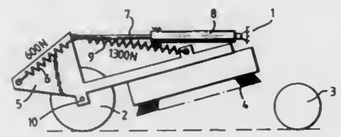



1. A cleaning device for fish tank comprising:
a hood with a bottom open end and a constricted top open end;
a suction pipe connected to said top open end of said hood; and
a closed hollow casing for receiving water therein connected to said bottom open end to close the same, said hollow casing having an opening formed therethrough to communicate the interior and exterior of said hood, and a wall defining said opening, said wall being provided with a plurality of spraying holes, said casing having a top face provided with a plurality of spraying holes, a hollow housing extending beyond said bottom open end and having an interior space communicating with the interior of said casing, said hollow housing having a water inlet.

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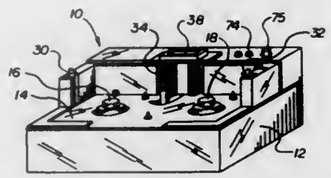
**5,048,141**
**FLOOR-CLEANING MACHINE WITH IMPROVED BRUSH PRESSURE CONTROL**
**Karl Hüppi, Brunnenstrasse 1B, CH-9542 Munchwilen, Switzerland**
**Filed Apr. 3, 1990, Ser. No. 503,607**
**Claims priority, application United Kingdom, Apr. 3, 1989, 8907481**
**Int. Cl.[5] A47L** *11/162*
**U.S. Cl. 15—49.1** **3 Claims**




1. Automatic floor-cleaning and floor-treating machine comprising:
a machine body having wheels supporting the same with respect to a floor;
a frame pivotally mounted to said machine body so as to be pivotable about a pivot axis;
at least one rotating brush mounted to a first lateral side of said frame with respect to said pivot axis;
a first spring means having first and second ends, said first end of said first spring means being coupled to said frame on a second lateral side of the frame with respect to said pivot axis;
a motor coupled to said second end of said first spring means, said motor being mounted to said machine body so as to selectively displace said second end of said first spring means with respect to said pivot axis; and
a second spring means having first and second ends, said first end of said second spring means being coupled to said second end of said first spring means and said second end of said second spring means being mounted to said frame on the same lateral side thereof as said at least one rotating brush.

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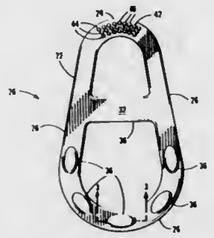
**5,048,142**
**ELECTROMAGNETIC TAPE CLEANER**
**George Stone, 315 W. Main, Pierce, Nebr. 68767**
**Filed Apr. 16, 1990, Ser. No. 509,303**
**Int. Cl.[5] B08B** *11/02*
**U.S. Cl. 15—97.1** **11 Claims**




1. An apparatus for cleaning electromagnetic tape wound onto dual reels of a tape cartridge, comprising
a housing,
a pair of spindles rotatably supported on said housing at positions for receiving respective reels of an electomagnetic tape cartridge thereon, power means drivingly connected to at least one of said spindles for causing the tape to be transferred from one reel to the other,
a first soft absorbent pad supported on said housing for wiping engagement with one side of a tape in a cartridge received on said spindles,
a cleaner post carrier supported on said housing for movement between a cleaning position adjacent said first pad and a loading position spaced further from said first pad,
a cleaner post having opposite first and second cleaner surfaces and being removably and reversably mounted on said carrier such that one of said cleaner surfaces faces said first pad,
a second soft absorbent pad on said first and second cleaner surfaces of said post whereby a tape on a cartridge on said spindle is sandwiched between said first and second pads upon movement of said carrier to the cleaning position thereof,
a cleaning fluid reservoir on said housing,
a liquid cleaning fluid in said reservoir, and
fluid communication means between said reservoir and at least said first pad whereby said first pad is soaked with fluid from said reservoir for cleaning a tape advanced between said pads by said power means.

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**5,048,143**
**TEETHING BRUSH**
**David T. Carroll, 105 Military Rd., Rothchild, Wis. 54474**
**Filed Oct. 23, 1990, Ser. No. 602,170**
**Int. Cl.[5] A46B** *15/00*; **A61J** *17/00*
**U.S. Cl. 15—110** **10 Claims**




9. A combination child's toothbrush and infant teething ring comprising:
a) a body in the shape of a closed ring having a narrow first portion dimensioned to fit within a child's opened mouth, a second portion wider than a child's opened mouth so as to prevent the body from being inserted fully into a child's mouth and two spaced angled side members extending between and connecting the first and second portions, wherein the body has an upper surface defining a plane and a lower surface;
b) a plurality of upstanding bristles extending from the plane of the upper surface in spaced rows along the first portion of the body wherein the rows are evenly spaced from the perimeter of the first body portion, said bristles and first portion defining a brush head; and
c) a plurality of protrusions extending from the upper surface of the second portion of the body to form teething bumps for biting engagement with the child's teeth and gums.

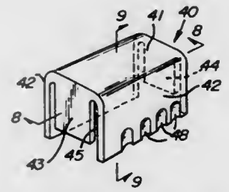
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**5,048,144**
**REMOVABLE COVER SYSTEM FOR TOOTHBRUSHES**
**Edward A. Andrews, 1475 Ravine View Ct., Bloomfield Hills, Mich. 48013**
**Filed Sep. 21, 1990, Ser. No. 586,565**
**Int. Cl.[5] A46B** *9/04*, *17/04*
**U.S. Cl. 15—184** **7 Claims**

1. A removable cover system for a toothbrush having an elongated handle with a flattened bristle portion having a rear end and a forward end with side edges, with an elongated hand grip portion integral with and extending from the forward end of the bristle portion, and the bristle portion having an upper face which numerous bristles are mounted so as to extend upwardly from said upper face, comprising:



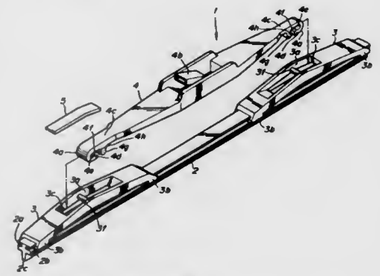
a thin wall, elongated cover member made of a springy plastic material formed in a generally U-shaped cross-section shape with a base and integral depending legs;
the lower, free edge portions of the legs normally being located on the opposite side edges of the brush bristle portion and being formed with integral, engagement portions which are shaped to frictionally engage against their adjacent bristle portion edges and resiliently press against them, for holding the cap upon the bristle portion so that the cap extends over, and covers, the bristles and said leg




engagement portions being formed by a bowed in cross-section strip formed integral with the lower free edge portions of each of the legs and including integral flaps formed on each of the opposite ends of the cover member, with the flaps being still and extending from the cap base towards the brush bristle portion for covering the opposite ends of the bristles mounted upon the bristle portion, and a gap between the side edges of said flaps and each of their adjacent cap legs so that the legs may resiliently flex independently of the flaps.

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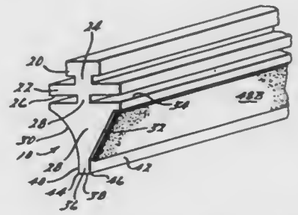
**5,048,145**
**WIPER BLADE WITH IMPROVED LEVER TO YOKE CONNECTOR**
**Tuyoshi Takahashi, and Yukinori Uchida, both of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Kanagawa, Japan**
**Continuation of Ser. No. 380,358, Jul. 17, 1989, abandoned. This application Nov. 16, 1990, Ser. No. 614,523**
**Claims priority, application Japan, Jul. 19, 1988, 63-95297[U]**
**Int. Cl.[5] B60S** *1/04*, *1/38*
**U.S. Cl. 15—250.42** **1 Claim**




1. A wiper blade comprising:
a blade rubber adapted to be disposed in contact with a curved surface to be wiped;
a pair of yokes attached to said blade rubber with each yoke provided with a lever-fitting part; and
a lever provided with a pair of U-shaped yoke-fitting parts at opposite ends of the lever for engaging said lever-fitting parts of said yokes respectively and having connecting means for connecting said lever to a wiper arm;
each of said U-shaped parts defining a hooking hole with an opening which opens towards the opposite hooking hole;
each of said lever-fitting parts being equipped with a lever-setting shaft bridging said lever-fitting part;
said U-shaped yoke-fitting parts each having an engaging part extending toward each other with each engaging part having a projection defining said opening to said hooking hole in which one of said lever-setting shafts is rotatably engaged; and
said lever being provided adjacent each yoke-fitting part with a protrusion extending downward and spaced from an end of said engaging part adjacent thereto for restricting the disengagement of said lever-setting shaft from the engaging part of said U-shaped yoke-fitting part.

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**5,048,146**
**WIPER BLADE**
**Adrian Cavenago, R.R. #2, Harrow, Ontario, Canada N0R 1G0**
**Continuation-in-part of Ser. No. 439,820, Nov. 21, 1989. This application Nov. 28, 1990, Ser. No. 617,516**
**Claims priority, application Taiwan, Jan. 23, 1990, 79100524**
**Int. Cl.[5] B60S** *1/38*
**U.S. Cl. 15—250.36** **58 Claims**

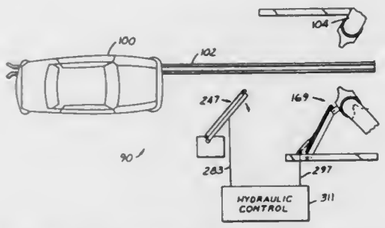



1. An elastomeric windshield wiper blade comprising when in an unstressed state:
(a) an elongated mounting portion of standard configuration adapted to be mounted to a conventional windshield wiper blade holding frame;
(b) an elongated base portion of generally rectangular cross-section being integrally connected to said mounting portion and having a relatively flat surface on the opposite side thereof from said mounting portion;
(c) an elongated relatively narrow transversely flexible connecting portion being integrally connected to said base portion and extending generally along the middle of said flat surface;
(d) an elongated body portion of generally triangularly shaped cross-section having one apex thereof adapted to be generally pointed towards the windshield, said apex being disposed between first and second elongated faces of said body portion with a third elongated face of said body portion being integrally connected to said connecting portion and adapted to be disposed generally parallel to said flat surface on said base portion;
(e) an elongated generally rectangular squeegee portion integrally connected to said body portion along said apex, said squeegee portion having an elongated free end surface generally parallel to said third face and generally parallel wiping surfaces extending therefrom toward said body portion, the intersection of said end surface end said wiping surfaces defining first and second wiping edges, said first wiping edge being adapted to wipe the windshield when said wiper blade is moved in one direction thereacross and said second wiping edge being adapted to wipe the windshield when said wiper is moved in the opposite direction,
said first face being generally concave in cross-sectional configuration,
said second face being generally flat in cross-sectional configuration; and
(f) a scrubbing surface on said second face comprising a

plurality of short relatively stiff projections which do not engage the windshield surface when said wiper blade is moved across said windshield in the direction said scrubbing surface is facing and said squeegee portion does not encounter foreign matter on the windshield but which do rub on the window to scrub foreign matter therefrom when said wiper blade is moved across the windshield in the direction said scrubbing surface is facing and said squeegee portion encounters foreign matter on the windshield, the resultant increased friction between said squeegee portion and the window causing said squeegee portion in the area of said foreign matter to fold over further than normally to bring said scrubbing surface into action in the area of said foreign matter to remove same from the windshield.

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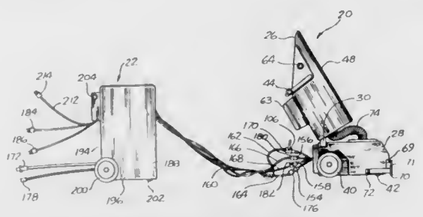
**5,048,147**
**SIDE NOZZLE TRACER SYSTEM**
**James A. Belanger; Robert J. Wentworth, both of Northville, and Graham J. Astley, Novi, all of Mich., assignors to Belanger, Inc., Northville, Mich.**
**Division of Ser. No. 385,031, Jul. 26, 1989, Pat. No. 4,977,689. This application Oct. 30, 1990, Ser. No. 605,810**
**Int. Cl.[5] A47L** *5/00*
**U.S. Cl. 15—319** **13 Claims**




10. A method of accurately positioning an accessory within a vehicle wash system to reflect the actual width of a particular vehicle, including the steps of:
(A) positioning an automatic means for determining the exact width of a vehicle in a position such that it can determine the width of a particular vehicle;
(B) determining the exact width of a particular vehicle;
(C) communicating a signal being a reflection of the exact width to a means for positioning the accessory; and
(D) moving the accessory to one of a plurality of positions depending on the exact width of the vehicle.

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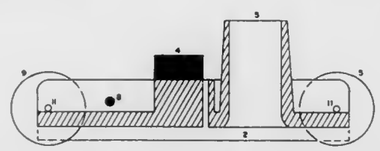
**5,048,148**
**CARPET CLEANING APPARATUS**
**Robert Gleadall, 38818-15 Avenue, Edmonton, Alberta, Canada T6L 2M4**
**Filed May 23, 1989, Ser. No. 356,276**
**Int. Cl.[5] A47L** *5/34*
**U.S. Cl. 15—321** **5 Claims**




1. A carpet cleaning apparatus, comprising:
a. a housing having a lower surface and an interior cavity;
b. means for moving the housing along a carpet secured adjacent to the lower surface of the housing;
c. a water supply conduit secured to the housing, the conduit having a first end whereby the conduit may be coupled to a water supply and a second end with spray jets whereby fluids may be discharged onto a carpet;
d. a discharge tank secured within the interior cavity of the housing, the discharge tank having two suction ports, and two fluid inlets;
e. two suction conduits, each suction conduit having a first end communicating with one of the fluid inlets of the discharge tank and a second end disposed adjacent the lower surface of the housing; and
f. two suction motors secured in the interior cavity of the housing spaced from and positioned above the discharge tank, each of the suction motors communicating with one of the suction inlets of the discharge tank through a length of vacuum hose such that a vacuum is created within the discharge tank and the suction conduits by the cumulative suction force of the two suction motors thereby drawing fluids from the surface of a carpet via the suction conduits into the fluid inlets of the discharge tank.

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**5,048,149**
**VAC-BRUSH**
**Leslie A. Heinen, Jr., 4510 Briardale, San Antonio, Tex. 78217**
**Filed Jun. 27, 1989, Ser. No. 372,437**
**Int. Cl.[5] F04H** *3/20*
**U.S. Cl. 15—328** **4 Claims**




1. A cleaning device for use as an aid in cleaning hard, smooth surfaces; said cleaning device consisting of:
a two piece horizontal plate supported by front and rear wheels in normal, vacuum only mode, and a continuous width front brush and rear wheels in a combined vacuuming/brushing mode;
said two piece plate consisting of:
a rear plate having a suction stack for attachment to a vacuum hose, a pole yoke for connection to a pole handle, wheels for rear support, and means for pivotal attachment of a front plate;
a front plate having a continuous brush attached to one side for use in the vacuum/brush mode, and front support wheels on the opposite side for use in the vacuum only mode.

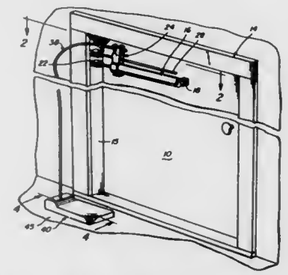
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**5,048,150**
**DOOR HOLDER**
**Phillip Guerin, Lawrence, Mass., assignor to Professional Engineering Company Incorporated, Lawrence, Mass.**
**Filed Jan. 29, 1990, Ser. No. 471,558**
**Int. Cl.[5] E05F** *5/00*
**U.S. Cl. 16—49** **24 Claims**

1. A door holder for attachment to a door comprising:
a holding means including means secured to the door and means secured to a stationary structure adjacent to said door,
said holding means including an actuable clamping means, engaging said means secured to a stationary structure, having a first released position in which the door is freely openable and closable and a second holding position in which the door is held open,



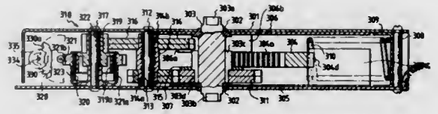
said clamping means having means for clamping said means secured to a stationary structure only in one direction of relative movement therebetween to hold the door but enable further opening thereof; and



foot-operated actuating means remote from said clamping means to move said clamping means from its first released position to its second holding position.

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**5,048,151**
**MECHANICAL DOOR CHECK**
**Makoto Orii; Katsuhiko Hayashi, and Teruaki Imai, all of Nagano, Japan, assignors to K.K. Sankyo Seiki Seisakusho, Nagano, Japan**
**Continuation-in-part of Ser. No. 216,476, Jul. 8, 1988, abandoned. This application Sep. 6, 1989, Ser. No. 403,525**
**Claims priority, application Japan, Sep. 6, 1988, 62-223304**
**Int. Cl.[5] E05F** *3/00*
**U.S. Cl. 16—64** **19 Claims**



1. A door check for closing a door, comprising:
a first pivot pin rotatable in response to the opening and closing of said door;
a slider adapted to be linearly moved by the rotations of said pivot pin and to rotate said pivot pin during the closing of said door;
a first coil spring for biasing said slider in a door closing direction;
a worm;
a gear train connected to said worm at a final stage thereof for speeding up the rotations of said worm relative to the rotation of said pivot pin;
brake means for applying a braking force to said worm; and
a one-way transmission clutch for operating said brake means in said door closing direction,
said one-way transmission clutch comprising a second coil spring disposed in the gear train, to attendantly provide a door check which is substantially noiseless during opening and closing of said door.

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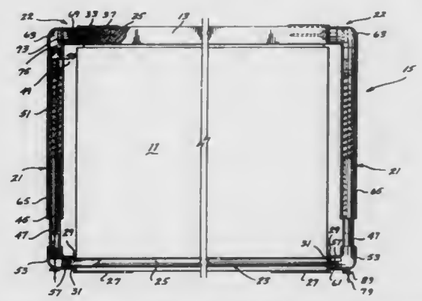
**5,048,152**
**UMBRELLA HANDLE**
**Martin Gray, Sheffield, United Kingdom, assignor to Hoyland Fox Limited, Sheffield, England**
**Filed Jan. 22, 1990, Ser. No. 468,001**
**Claims priority, application United Kingdom, Jan. 24, 1989, 8901472**
**Int. Cl.[5] A47B** *95/02*
**U.S. Cl. 16—110 R** **9 Claims**




1. An umbrella handle into which a shaft can be inserted, the handle having a sleeve-shaped integral axial extension on the shaft side for receiving a tip-cup to be slidably mounted thereon, wherein the axial stop along the extension has an abutment formed in one piece with the axial extension for preventing the tip-cup from sliding off the extension after assembly of the handle to the shaft, and wherein said extension is radially elastically compressible so as to allow the tip-cup to pass over the abutment and onto the extension prior to the assembly of the handle to the shaft.

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**5,048,153**
**SPA COVER LIFT MECHANISM**
**Michael R. Wall, Gig Harbor, and James W. Campbell, Tacoma, both of Wash., assignors to Starlite Leisure Products, Inc., Snohomish, Wash.**
**Filed Feb. 14, 1990, Ser. No. 480,093**
**Int. Cl.[5] E05D** *11/00*
**U.S. Cl. 16—223** **10 Claims**



1. A lift mechanism for a spa or hot tub cover comprising:
(a) a pair of compressible struts;
(b) an upper hinge mechanism for attaching one end of each of said compressible struts to a spa or hot tub cover on opposite sides thereof; and
(c) a lower hinge mechanism for affixing the other ends of said compressible struts to locations adjacent one edge of the base of a spa or hot tub, said lower hinge mechanism comprising:
(1) plate means for affixing said other ends of said compressible struts to a location adjacent one edge of the base of a spa or hot tub:
(2) a torque tube:
(3) rotation means for rotatably affixing said torque tube to said plate means; and

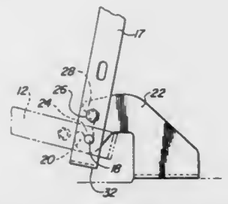
VOL 1130 ISS 3 SE 17 1991 UMI



(4) attachment means for attaching the other ends of said compressible struts to opposite ends of the torque tube.

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**5,048,154**
**HOOD HINGE**
James A. Swartzendruber, West Bend, Wis., assignor to Deere & Company, Moline, Ill.
Filed Jul. 9, 1990, Ser. No. 549,887
Int. Cl.[5] E05D *7/10*
U.S. Cl. 16—267 7 Claims



I. A hinge for removably securing a hood to a powered vehicle, said hood having open, partially open and closed positions, comprising:

rod means rigidly fixed to the hood, said rod means defining a single axis about which the hood pivots when shifting between positions;

a protruding member fixed to the hood;

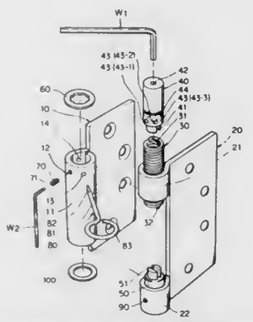
a mounting member fixed to the powered vehicle for mounting the hood to the vehicle, said mounting member including

a hooked portion for pivotally carrying the rod means and blocking horizontal shifting of the rod means, said hooked portion having an opening through which the rod means passes to remove the hood from the vehicle when the hood is in the partially open position, and

a finger portion for blocking the upward movement of the protruding member to prevent the rod means from passing through the opening of the hooked portion when the hood is in the closed position.

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**5,048,155**
**SET SCREW FIXING DEVICE FOR SPRING HINGE**
Kyu B. Hwang, Daeku, Rep. of Korea, assignor to Hyundae Precision Co., Ltd., Daeku, Rep. of Korea
Filed Sep. 11, 1989, Ser. No. 405,537
Int. Cl.[5] E05F *1/08*
U.S. Cl. 16—301 1 Claim



1. A spring hinge including a pintle connected to a torsion spring and including a hinge knuckle adapted to be turned by the pintle and spring when the pintle is fixed to the hinge knuckle, the improvement wherein:

said pintle is in the shape of a cylinder with an outer wall centered about a central axis of rotation and has a plurality of pintle holes, each pintle hole extending radially from the outer wall into the pintle along a pintle hole axis, said pintle hole axis extending radially through and normal to said central axis, the pintle hole axis for one or more of said pintle holes offset from the pintle hole axis for one or more other of said pintle holes by a pintle hole offset angle,

said hinge knuckle has an inner knuckle wall forming a cylindrical opening for receiving the pintle such that the pintle is constrained, when not fixed, to rotate within the hinge knuckle about the central axis, said hinge knuckle having a plurality of knuckle holes extending through said knuckle wall, each said knuckle hole oriented along a knuckle hole axis extending radially from and normal to said central axis, the knuckle hole axis for one or more of said knuckle holes offset from the knuckle hole axis for one or more other of said knuckle holes by a knuckle hole offset angle, said pintle hole offset angle equal to said knuckle hole offset angle whereby two or more pintle holes oriented along two or more pintle hole axes are concurrently alignable respectively with two or more knuckle holes oriented along two or more knuckle hole axes,

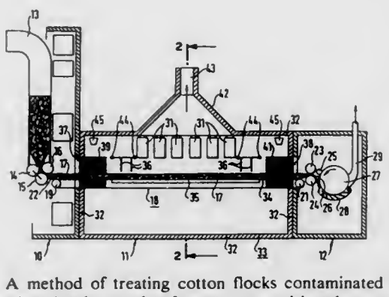
first fixing means for insertion through a first knuckle hole into a first pintle hole to initially fix the alignment of the pintle relative to the hinge knuckle, said first pintle hole extending completely through said pintle,

said hinge knuckle having another knuckle hole extending through said knuckle wall, oriented along the knuckle hole axis for said first knuckle hole, and located on the opposite side of said central axis from said first hole, whereby said first fixing means is insertable in a straight line through said first knuckle hole, said first pintle hole and said another knuckle hole,

second fixing means for insertion through a second knuckle hole into a second pintle hole, when the pintle is initially fixed by said first fixing means, to finally fix the alignment of the pintle relative to the hinge knuckle.

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**5,048,156**
**METHOD OF TREATING COTTON CONTAMINATED WITH HONEYDEW**
Rene Waeber; Fritz Knabenhans, and Othmar Bachmann, all of Winterthur, Switzerland, assignors to Maschinenfabrik Rieter, AG, Winterthur, Switzerland
Filed May 31, 1989, Ser. No. 359,495
Claims priority, application Switzerland, Jun. 3, 1988, 02121/88
Int. Cl.[5] D01G *9/00, 37/00*
U.S. Cl. 19—66 CC 11 Claims



1. A method of treating cotton flocks contaminated with honeydew, by the supply of energy, comprising the steps of:

compressing arriving honeydew contaminated cotton flocks and thereby forming a honeydew contaminated cotton flock web;

depositing the honeydew contaminated cotton flock web on a conveyor belt;

moving the honeydew contaminated cotton flock web on said conveyor belt into a microwave oven structured as a tunnel;

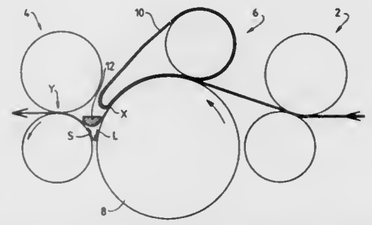
heating the honeydew contaminated cotton flock web on said conveyor belt in said microwave oven by means of microwave energy; and

during said step of heating said honeydew contaminated cotton flock web by means of microwave energy on said conveyor belt in said microwave oven, heating said honeydew by means of said microwave energy and thereby converting said honeydew into a substantially non-sticky material.



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**5,048,157**
**DRAFTING ARRANGEMENT FOR SPINNING MACHINES**
Rudolf Wehrli, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Jul. 10, 1989, Ser. No. 377,541
Claims priority, application Switzerland, Jul. 15, 1988, 02723/88
Int. Cl.[5] D01H *5/72*
U.S. Cl. 19—288 18 Claims



1. A drafting arrangement for reducing the thickness of a fiber structure delivered to a spinning stage of a spinning machine for producing relatively fine yarns comprising

a first operative unit having a pair of rollers defining a converging space for guiding a continuous length of fiber therebetween;

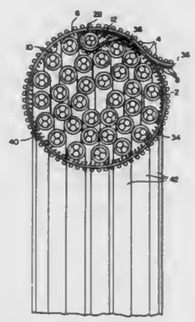
a second operative unit adjacent said first unit, said second unit including a large friction roller and an endless apron partly embracing said roller to cooperate therewith to deliver a length of fiber to said first unit; and

a guide element interposed between said units for guiding a length of fiber therebetween, said guide element being disposed in a converging gap between said roller of said second unit and one roller of said first unit to deflect the length of fiber over said element and between said units.

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**5,048,158**
**KEEPER FOR COILED ITEMS**
Robert Koerner, 1130 E. 3d St., Coal City, Ill. 60416
Filed Jan. 12, 1990, Ser. No. 464,072
Int. Cl.[5] A44B *18/00*
U.S. Cl. 24—16 R 7 Claims

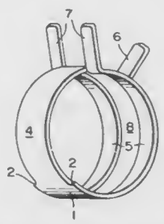
1. A keeper, comprising a single elongated flat flexible strap member extending in a single band between a first free end and a second free end having interlocking means to form a first interlockable loop and an interlock made by manipulating said elongated flexible strap member in an interlocking maneuver and releasable interconnecting means to make a second releasably interconnectable loop by a loop forming maneuver and a releasable interconnection simultaneously made with and by said same loop forming maneuver, wherein said interlocking means includes a longitudinally extending slot and a laterally extending notch spaced apart from said longitudinally extending slot a pre-determined distance, a portion of said flexible member extending through said longitudinally extending slot said pre-determined distance to form said first interlockable loop, said laterally extending notch at such point extending



laterally of said longitudinal slot whereby opposite edge portions of said lateraly extending notch bear against corresponding portions of said flexible member adjacent said longitudinal slot to thereby provide an interlock to hold and lock said first interlockable loop in place until said interlocking means is uniocked.

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**5,048,159**
**HOSE CLAMP**
Jan-Olof Johansson, and Evert Karlsson, both of Anderstorp, Sweden, assignors to Anderstorps Werkstads Aktiebolag, Anderstorp,
Filed Nov. 12, 1987, Ser. No. 119,700
Int. Cl.[5] F16L *33/02*
U.S. Cl. 24—20 R 4 Claims

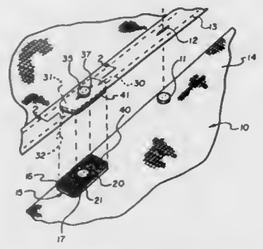


1. In a cylindrical hose clamp having a rectangular and uniformly thick resilient plate, a first gripping lug protruding centrally from one side of the plate and two second gripping lugs protruding from the opposite side of the plate at opposite sides of the first lug respectively, the lugs having ends, each of which defines a radially protruding tongue to use when expanding the clamp, the tongue of the first lug being adapted to engage and travel along a track defined between said second lugs, the improvement that said three lugs are broader adjacent the rectangular plate than at the ends, the lugs each have junction with the plate and taper from the junction to their respective ends, and the periphral extension of each lug is greater than the peripheral extension of the plate.

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5,048,160
**BUTTON REPLACEMENT DEVICE**
Lewis S. Goodrich, and Wanda L. Goodrich, both of P.O. Box 598, Driggs, Id. 83422
Filed Apr. 9, 1990, Ser. No. 506,099
Int. Cl.[5] A44B *18/00*
U.S. Cl. 24—306 6 Claims

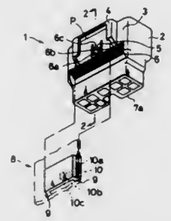


1. A device for converting a button/button hole attachment combination existing in juxtaposed positions on respective first and second pieces of material to be temporarily joined together to a pressure contact system, said device comprising:
1. a first sheet of flexible material having an exposed side and an attachment side, said attachment side including attachment means for enabling permanent fixation of the first sheet to the first piece of material to be joined in an overlapping position with a button location of the first piece of material;
2. a second sheet of flexible material having an exposed side and an attachment side, said attachment side including attachment means for enabling permanent fixation of the second sheet to the second piece of material to be joined in overlapping configuration with a button hole located in the second piece of material;
3. at least one button coupled to the attachment side of the second sheet, said button coupled to the attachment side of the second sheet, said button being configured and colored to complement other buttons on the second piece of material;
4. the respective exposed sides of the first and second sheets of material including hook/loop attachment means capable of being joined on contact and separated by merely pulling the respective pieces of material apart; and
said first sheet of material further includes a button hole configured in size to receive a button of the button/button hole combination, thereby facilitating proper positioning of the first sheet of flexible material by inserting the button of the button/button hole combination through the button hole of the first sheet of material to correctly align the first sheet of material with the second sheet of material which is to be positioned on the second piece of material by inserting the button coupled to the second sheet of material through the button hole of the second piece of fabric.

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5,048,161
**CONNECTOR WITH LOCK ONTO PANEL**
Hiroshi Watanabe; Naoto Taguchi, and Katsuaki Terada, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed May 21, 1990, Ser. No. 526,013
Claims priority, application Japan, May 25, 1989, 1-59674[U]; Jul. 17, 1989, 1-83023[U]
Int. Cl.[5] F16B *13/00*
U.S. Cl. 24—704.1 7 Claims

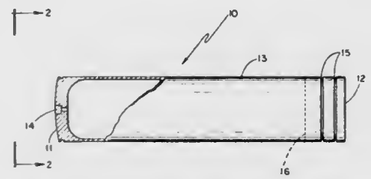
1. A connector capable of mounting and locking onto a mounting panel, comprising:
a housing having a wall;
a sliding means provided on said wall and capable of slidingly fitting on a guide means provided on a mounting panel onto which said connector is to be mounted; and
a flexible engagement member formed in a portion of said wall by cutting a part of said wall, said member having an engagement projection capable of engaging with an engagement projection provided on said mounting panel, said member being deformed and having its position changed toward the inside of said housing when said engagement projections are brought into engagement with each other;



wherein said sliding means comprises a substantially U-shaped sliding rail integrally projecting from the outer surface of said wall of said housing in such a manner as to surround edges of a portion of said wall; and
wherein said flexible engagement member is formed by cutting a substantially U-shaped slit around a central portion of said wall, said member having a distal end positioned adjacent the ends of the U-shape slit.

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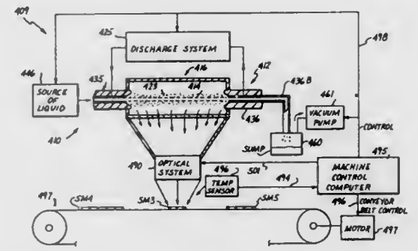
5,048,162
**MANUFACTURING THIN WALL STEEL CARTRIDGE CASES**
Stanley R. Nelson, Minneapolis, Minn., assignor to Alliant Techsystems Inc., Minnetonka, Minn.
Filed Nov. 13, 1990, Ser. No. 612,532
Int. Cl.[5] B21D *51/54*
U.S. Cl. 29—1.2 24 Claims



1. A method of manufacturing high strength, high precision thin-walled cartridge cases from a metal of interest selected from low alloy steels comprising the steps of:
extruding a closed-end cartridge case blank from a billet of the metal of interest;
austenitizing the formed cartridge case blank at a temperature in an approximate range of 1525° F. to 1575° F.;
subjecting the austenitized cartridge blank to an interrupted quench at a temperature in an approximate range of 600° F. to 750° F.;
freezing the quenched case at a temperature of about −100° F.;
tempering the case blank at a temperature at or above 700° F.



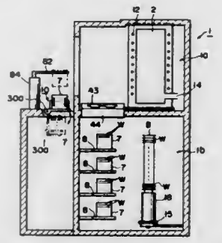
5,048,163
**SYSTEM FOR PROCESSING SEMICONDUCTOR MATERIALS**
John F. Asmus, 8239 Sugarman Dr., La Jolla, Calif. 92037, and Ralph H. Lovberg, 4744 Panorama Dr., San Diego, Calif. 92116
Continuation-in-part of Ser. No. 129,152, Dec. 7, 1987, Pat. No. 4,889,605. This application May 4, 1989, Ser. No. 347,423
Int. Cl.[5] C23C *14/00*
U.S. Cl. 29—25.01 24 Claims




1. A system for treating the surface of a semiconductor material to vary its conductivity properties, which comprises:
plasma pinch means for establishing an incoherent ultraviolet light of sufficient high intensity to cause the conductivity properties of substantially the entire planar surface of the semiconductor material to be varied uniformly;
said plasma pinch means including a pair of spaced apart combination liquid emitter and electrode means and combination liquid receptor and electrode means for directing a liquid therebetween, and electrical discharge means coupled electrically to said liquid receptor means for causing a plasma pinch to be formed and maintained to generate said light;
means for directing said ultraviolet light toward the surface of the semiconductor material for heating the surface thereof;
means for pulsating said ultraviolet light repetitively at a rate of at least once per second to cause the conductivity properties of the semiconductor material to be varied in response thereto; and
means for terminating said heating of the treated semiconductor surface.

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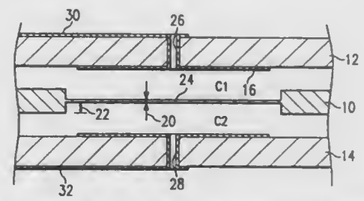
5,048,164
**VERTICAL HEAT-TREATMENT APPARATUS HAVING BOAT TRANSFER MECHANISM**
Yoshiyuki Harima, Zushi, Japan, assignor to Tokyo Electron Sagami Limited, Kanagawa, Japan
Filed Aug. 8, 1990, Ser. No. 564,318
Claims priority, application Japan, Aug. 11, 1989, 1-209220
Int. Cl.[5] H01L *21/68*; F27D *3/00, 5/00*
U.S. Cl. 29—25.01 17 Claims



1. A vertical heat treatment apparatus for housing and heat-treating a boat carrying wafers horizontally in a reaction tube, comprising:
a lid member provided at a lower portion of the reaction tube for closing and opening the reaction tube, the lid member supporting the boat to be treated;
a drive means for vertically moving the lid member between an upper position where the reaction tube is closed by the lid member, and a lower position where the boat is transferred onto and out of the lid member;
a transfer means provided in a space under the reaction tube and exclusively used for the reaction tube, the transfer means transferring the wafers between the boat positioned vertically and wafer carriers positioned near the transfer means; and
an arm provided in the space under the reaction tube and exclusively used for the reaction tube, the arm being swingable on a horizontal plane and having a support portion for supporting the boat vertically; wherein
the transfer means transfers the wafers into and out of the boat at a first position located on the swing orbit of the support portion of the arm, the boat is transferred onto and out of the lid member at a second position located directly below the reaction tube and on the swing orbit of the support portion of the arm, and the boat is transferred between the first and second positions by swinging the arm.

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5,048,165
**METHOD FOR CONTROLLING THE SENSITIVITY AND LINEARITY OF CAPACITIVE TRANSDUCER SYSTEMS**
Robert M. Cadwell, Sunnyvale, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 304,344, Jan. 30, 1989, and a continuation-in-part of Ser. No. 304,359, Jan. 30, 1989, and a continuation-in-part of Ser. No. 462,448, Jan. 18, 1990. This application Jan. 26, 1990, Ser. No. 471,205
Int. Cl.[5] H01G *5/16*
U.S. Cl. 29—25.41 38 Claims




1. A method for controlling nonlinearities in a transducer having a movable member responsive to an input stimulus and in which nonlinearities of a first type degrade performance of the transducer, comprising the step of introducing into the transducer during manufacture thereof a nonlinearity of a second type defined by a stiffness which changes with an input, said nonlinearity being introduced into a constraining member attached to the movable member so as to offset the linearities of the first type and thereby control the overall nonlinearity of the transducer.

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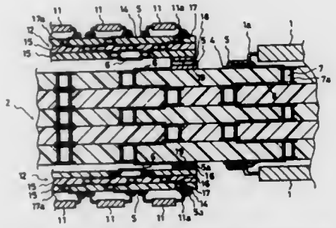


**5,048,166**

## METHOD OF MAKING RIGID-FLEXIBLE MULTILAYER BOARD SYSTEM

Chiharu Wakamatsu, Kanagawa, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Division of Ser. No. 234,080, Aug. 19, 1988. This application Apr. 6, 1990, Ser. No. 505,573
Claims priority, application Japan, Aug. 28, 1987, 62-214508
Int. Cl.[5] H05K *3/36*
U.S. Cl. 29—830 1 Claim



1. A method of making a rigid-flexible multilayer board system, which comprises the steps of:
applying a first solder having a first melting point to at least two part mounting lands of a flexible multilayer printed circuit board;
attaching at least two lead pins of a first electronic part to said part mounting lands;
subjecting said flexible multilayer printed circuit board with said electronic part to a first temperature which is higher than said first melting point whereby said electronic part is secured to said flexible multilayer printed circuit board;
applying a second solder having a second melting point to at least two part mounting lands and two board mounting lands of a rigid multilayer printed circuit board;
attaching at least two lead pins of a second electronic part to said part mounting lands of said rigid printed circuit board and two board mounting lands of said flexible multilayer printed circuit board to said board mounting lands of said rigid multilayer printed circuit board; and
subjecting said rigid multilayer printed circuit board with said flexible multilayer printed circuit board and said first and second electronic parts to a second temperature which is lower than said first melting point but higher than said second melting point, whereby said flexible multilayer printed circuit board and said second electronic part are secured to said rigid multilayer printed circuit board.

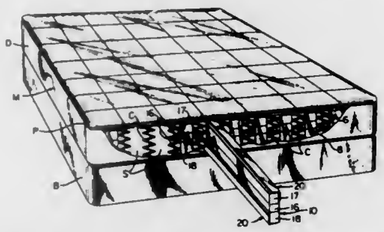
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**5,048,167**

## METHOD FOR RESTORING USED MATTRESSES

James R. Heffley, and James R. Heffley, Jr., both of 11495 W. 77th Dr., Arvada, Colo. 80005

Filed Mar. 13, 1989, Ser. No. 321,917
Int. Cl.[5] B68G *7/00*
U.S. Cl. 29—91.1 12 Claims



1. A method for restoring used mattresses of the type having spaces between rows of spring coils enclosed in a mattress cover comprising the steps of:
removing one end of said cover to expose said coils;
providing a block of material for filling each space between adjacent rows of coils, said block of material having limited resiliency and substantially corresponding to the length and cross-sectional size of each said space;
inserting each said block of material lengthwise into each said space from the one exposed end of said mattress; and
reclosing said mattress cover along the one end of said mattress.

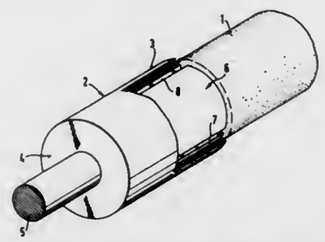
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**5,048,168**

## CERAMIC TRANSPORT SHAFT WITH METAL END CAP, PARTICULARLY FOR GLASS MELTING FURNACES, WITH HEAT EXPANSION COMPENSATION

Luc Vanaschen, Eupen, Belgium; Hans-Werner Kuster, Aachen, Fed. Rep. of Germany; Hubert Havenith, Würselen, Fed. Rep. of Germany, and Gerhard Schubert, Herzogenrath, Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Jul. 17, 1990, Ser. No. 553,372
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1989, 3924277
Int. Cl.[5] B21B *31/08*
U.S. Cl. 29—118 6 Claims



1. A ceramic transport shaft for a furnace, comprising:
a ceramic shaft member;
a metal end cap into which an end of said shaft member is fitted with an annular gap between said shaft member and said end cap; and
a metal sleeve filling said gap, said sleeve having at least one axial slot,
wherein the linear thermal expansion coefficient of said sleeve is greater than that of said end cap, and wherein said shaft member, said end cap and said sleeve have such linear thermal coefficients of expansion, and the wall of said sleeve has such a radial thickness, that a change in the radial size of said gap due to thermal expansion of said shaft member and said end cap is at least equalled by a change in the radial thickness of said sleeve wall.

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**5,048,169**

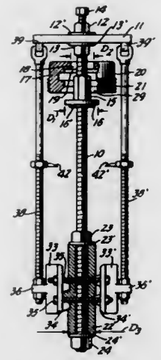
## HOSE-REPAIR TOOL

Antonio Beggiato, 810 Charlotte Ter., Ridgefield, N.J. 07657

Filed Jul. 9, 1990, Ser. No. 549,770
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—235 16 Claims

1. A hose-repair tool for use in assembly or disassembly of a hose-coupling element with respect to an end of a length of flexible hose, wherein the coupling element comprises an elongate tubular tail having a straight bore of substantially the nominal inside diameter of the hose, said tubular tail having an outwardly flanged coupling formation at one end, said tool comprising an elongate threaded rod and a transverse body member to the central region of which one end of said rod is mounted for rotation and is restrained against axial displacement, a rigid annular anvil member having a bore in running clearance with said rod and having an outer diameter in running clearance with the bore of the coupling element, two like tie rods connected at one end to diametrically opposed points of suspension from said body member and extending like distances substantially parallel to said threaded rod, a hose clamp comprising separate arcuate halves each of which halves is connected to the other end of one of said rods, whereby said anvil and threaded rod may be axially inserted via the bore of the coupling element and into the hose beyond the end of the tail of the coupling element, further whereby the separable





halves of said clamp may engage the hose over diametrically opposite arcs backed by said anvil, thus deriving clamped engagement of said body member to the hose at longitudinal offset from said coupling element, and means including a jacking element in threaded engagement to said threaded rod and adapted for axially driving engagement with the flanged formation of the coupling element, whereby depending upon the direction of relative rotation of said threaded rod and jacking element, the coupling element will be subjected to axial-displacement force in the direction of separating or of assembling the coupling element with respect to the hose.

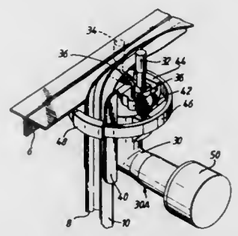
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**5,048,170**

## APPARATUS FOR FITTING FLEXIBLE STRIPS

Jürgen Küppers, Mönchengladbach, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Oct. 22, 1990, Ser. No. 601,339
Claims priority, application United Kingdom, Nov. 22, 1989, 8926348
Int. Cl.[5] B23P *21/00*; B23Q *15/00*
U.S. Cl. 29—235 13 Claims



1. A tool for fitting a length of channel-shaped strip into a mounting flange or the like, comprising
an open mouth guide channel mounted on the tool and shaped and sized to receive the strip slidably,
retaining means for holding the strip in the guide channel by permitting its sliding therein and comprising a keeper slidable between a free position clear of the guide channel and a retaining position in which it bridges across the mouth of the guide channel, and
two rotatable rollers rotatable about parallel axes and carried by the tool and positioned to engage opposite sides of the strip for pressing the strip onto the flange at a position adjacent to but spaced from the end of the guide channel so that the strip slides through the guide channel as the tool moves along the flange and presses the strip thereon.

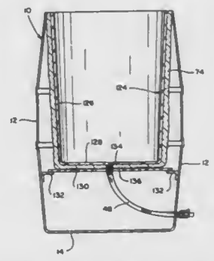
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**5,048,171**

## METHOD FOR CONVERTING BARREL TYPE UNITS INTO FREE STANDING MERCHANDISING DISPLAYS FOR HOLDING CHILLED PRODUCTS

Christopher C. Bidwell, Berkely Lake, Ga., and Dewalt W. Fowler, Manchester, Mo., assignors to Paul Flum Ideas, Inc., St. Louis, Mo.

Division of Ser. No. 434,095, Nov. 8, 1989, Pat. No. 4,982,840. This application Mar. 2, 1990, Ser. No. 499,994
Int. Cl.[5] B21K *21/16*
U.S. Cl. 29—401.1 22 Claims



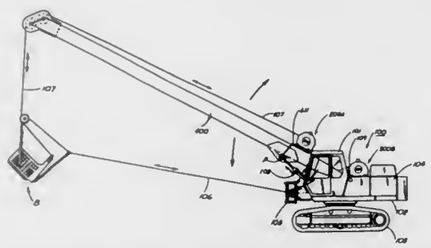
1. A method of converting a barrel type unit into a display assembly for holding products, said barrel unit including annular wall means and opposed top and bottom end portions, the top end portion of said barrel unit being open and including an upper edge, said method comprising:
(a) providing a container member for holding products positioned therein, said container member having an upper end portion of a predetermined size and shape,
(b) providing support means for supporting said container member within said barrel unit, said support means being engageable with or attachable to said barrel unit at a particular location thereon,
(c) determining the particular location on said barrel unit at which to engage or attach said support means for supporting said container member within said barrel unit when said container member is positioned therewithin,
(d) configuring said barrel unit for engagement with or attachment to said support means at said predetermined location,
(e) engaging or attaching said support means to said barrel unit at said predetermined location, and
(f) inserting said container member into the open end portion of said barrel unit and positioning and locating the same therewithin such that said container member is supported by said support means in a relatively stable position within said barrel unit.

5,048,172

## METHOD FOR CONVERTING A "BACKHOE" TO A "CRANE" USING A "TRUE FREE FALL" HYDRAULIC WINCH SYSTEM

Richard L. Gravenhorst, River Ridge, La., assignor to Reco Crane Company, Inc., New Orleans, La.

Division of Ser. No. 944,421, Dec. 19, 1986, Pat. No. 4,950,125.
This application Feb. 28, 1990, Ser. No. 486,891
Int. Cl.[5] B21K *21/16*
U.S. Cl. 29—401.1 3 Claims



1. A method of converting a backhoe vehicle to crane-like operation, which backhoe vehicle includes a backhoe mounting area with a front boom pivot and a front end having upper and lower portions to which a standard backhoe type boom having a forward end and a distal end is pivotally connected and at least one boom hoist hydraulic cylinder having upper and lower ends, whose lower end is connected to the front, lower portion of the backhoe vehicle and whose upper end is connected to the standard backhoe type boom, comprising the following steps:

(a) dismounting the standard backhoe type boom from the backhoe mounting area of the backhoe vehicle;

(b) mounting a crane-like boom, having an intermediate portion and a foot, to said backhoe mounting area of said backhoe vehicle, connecting the foot of the boom to the front boom pivot of the backhoe vehicle and the intermediate portion of the crane-like boom to the upper end of the hoist boom hydraulic cylinder;

(c) providing at least one hydraulically driven winching system on the backhoe vehicle and crane-like boom combination, which winching system further comprises—

a hoist winch drum on which a hoist cable is wound;

a hoist winch drum base upon which said hoist winch drum is mounted, said drum base and drum being mounted in such a configuration as to allow said drum to rotate with respect to said base, with said base and said boom having a fixed, constant, longitudinal separation distance during winch operation;

hydraulic motor means connected to said drum for directly driving and alternately rotating said drum to wind up and play out said hoist cable, depending upon the direction of rotation, under the control of the backhoe operator, said motor having a neutral disposition in which no significant drag is placed on said drum when said drum is rotated, allowing said drum to be free wheeling with respect to said motor; said motor and said drum forming the operative elements of a winch system; and

supplemental braking system means associated with said hoist cable for selectively retarding the movement of the cable, said supplemental braking system means being independent of said hydraulic motor means and under the control of the operator when said drum is free wheeling with respect to said hydraulic motor;

(d) running a hoist cable from said hoist winch drum along and over said crane-like boom and suspending a crane-type work implement off the distal end of said boom; and

(e) placing said hydraulic motor means in a neutral position and allowing the crane-type work implement to free fall under the control of the backhoe operator in regular, repetitive operations of the converted backhoe.

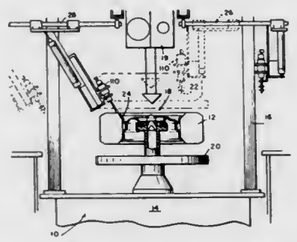
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5,048,173

## AUTOMATIC WEIGHT APPLICATION MACHINE

William H. Miller, McCordsville, Ind., assignor to Ransburg Corporation, Indianapolis, Ind.

PCT No. PCT/US88/00936, § 371 Date Apr. 24, 1989, § 102(e) Date Apr. 24, 1989, PCT Pub. No. WO88/07909, PCT Pub. Date Oct. 20, 1988
Continuation of Ser. No. 39,586, Apr. 16, 1987, abandoned. This PCT application Mar. 24, 1988, Ser. No. 435,483
Int. Cl.[5] B23P *11/02, 21/00*
U.S. Cl. 29—450 14 Claims



1. A method for automatically applying a balance correcting weight-and-clip assembly to a vehicle wheel-and-tire assembly, the method comprising the steps of: providing a weight-and-clip assembly including a ferromagnetic clip to which a balance-correcting weight is attached; conveying a wheel-and-tire assembly to which the balance-correcting weight is to be applied to a weight application station; orienting the wheel-and-tire assembly properly to receive at the correct location the balance-correcting weight; moving a hammer from a storage orientation out of operating position permitting conveying of the wheel-and-tire assembly to and from the weight application station and then to a use orientation in operating position adjacent the wheel-and-tire assembly to which balance correcting weight is to be applied, the hammer comprising a jaw having a contour conforming to the shape of the clip, a shank portion, the shank portion and the jaw being provided with ferromagnetic material, and an electrically conductive coil surrounding the shank portion; energizing the coil, thereby capturing the weight and clip assembly in the jaw; then driving the hammer through operating cycles, thereby hammering the weight and clip assembly onto the wheel and tire assembly; and then conveying the wheel-and-tire assembly to which a balance correcting weight has been applied away from the weight application station.

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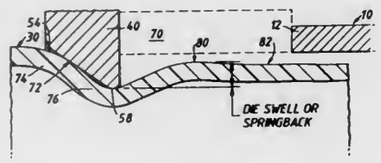
5,048,174

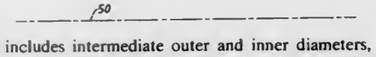
## METHOD AND APPARATUS FOR LINING A BURIED PIPE WITH A POLYMER LINING

Brian E. McGuire, Shaw, England, assignor to British Gas plc, London, England

Continuation of Ser. No. 349,074, May 9, 1989, abandoned. This application Apr. 12, 1990, Ser. No. 508,529
Claims priority, application United Kingdom, May 9, 1988, 8810891; May 9, 1988, 8810892; May 9, 1988, 8810893; May 9, 1988, 8810894; May 9, 1988, 8810897; Aug. 11, 1988, 8819063
Int. Cl.[5] F16L *55/18*
U.S. Cl. 29—451 16 Claims

1. A method of lining a pipe comprising the steps of pulling a polymer liner through a die without application of heat to the liner other than any generated by the passage of the liner through the die, or of heat used to restore that lost owing to cold weather, said die having a circular opening, having a central, longitudinal die axis and comprising an inner entry wall, an inner throat portion and an inner exit wall symmetrical about said axis wherein the entry wall decreases in diameter towards said throat portion and the exit wall increases in diameter away from the throat portion, and said pulling of the liner through the die comprises using a pulling force which does not cause yielding of the liner and which reduces the diameter of the liner with longitudinal extension of the liner, such that the liner has, before entering said throat portion, a first portion which is convex as viewed from outside the liner and which includes maximum outer and inner diameters, such that the liner has, in passing through said throat portion, a second portion which is concave as viewed from outside the liner and which includes minimum outer and inner diameters, and such that the liner has, after leaving said throat portion, a third portion which is convex as viewed from outside the liner and





which includes intermediate outer and inner diameters, said intermediate outer diameter being less than the inner diameter of said pipe, the difference between said intermediate outer diameter and said minimum outer diameter being the result of die swell which occurs after the liner emerges from said die, and the liner with said die swell entering, with clearance, into the pipe, said pulling force being such that said die swell of the liner is partially restrained after the emergence thereof from said throat portion, and said method further comprising pulling the liner through the pipe, and removing the pulling load thereby causing the liner to revert, without the use of heat or pressure to a larger diameter which is substantially equal to said maximum outer diameter or which is such that the outer surface of the liner is prevented from enlarging further owing to contact with the inner surface of the pipe.

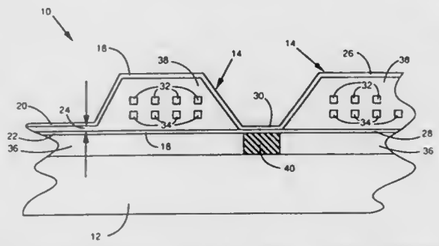
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5,048,175

## METHOD FOR GROUNDING POLE STRUCTURES IN THIN FILM MAGNETIC HEADS

Mark Jursich, Prior Lake, and Scott D. Dobbins, Edina, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 319,144, Mar. 3, 1989, Pat. No. 4,972,286.
This application Aug. 27, 1990, Ser. No. 557,131
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 8 Claims



1. In a method of forming a thin film magnetic read/write head having a thin film magnetic core and a substrate, an improvement comprising:

depositing a conductive stud upon the substrate wherein the conductive stud is formed separately from the substrate;

depositing a separating layer upon the substrate and the conductive stud following depositing the conductive stud;

removing a portion of the separating layer until a portion of the conductive stud is exposed; and

forming the core separately from the conductive stud by depositing a first magnetic layer at least partly on the separating layer and the exposed conductive stud whereby the conductive stud is sandwiched between the substrate and the core and is in electrical contact with the substrate and the core.

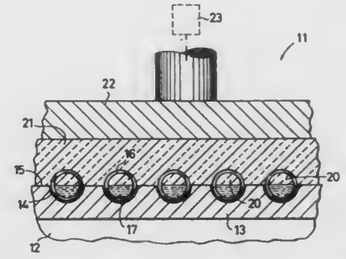
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5,048,176

## METHOD OF MAKING A RADIANT HEATER

Leonhard Doerner, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 385,008
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1988, 3828192
Int. Cl.[5] H05B *3/00*
U.S. Cl. 29—611 12 Claims



1. A method for producing radiant heaters having an insulator comprising insulating material and at least one heating coil partly embedded therein, wherein a cross-sectional area of an interior space of said at least one heating coil comprises two portions, a first portion being filled with a filling material able to be brought into said interior space, a second of said portions being left free from filling material, subsequent to filling said first portion said insulating material is applied in such a way that it fills the second portion of said interior space of said at least one heating coil, said filling material being subsequently removed from the first portion.

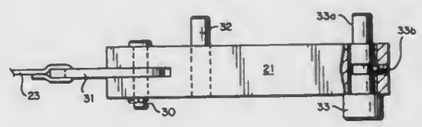
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5,048,177

## GENERATOR ROTOR SLOT WEDGE TOOL

Richard J. Keck, and Dennis R. Ulery, both of Saratoga, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 557,725, Jul. 26, 1990. This application Nov. 8, 1990, Ser. No. 610,579
Int. Cl.[5] H02K *15/10*
U.S. Cl. 29—734 9 Claims



1. A tool for use in an apparatus for inserting or removing coil slot wedges into or from the coil slots of a cylindrical body, said tool comprising:

an elongated body;

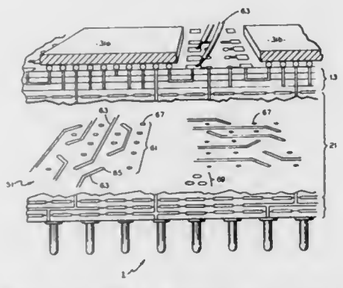
VOL 1130 ISS 3 SE 17 1991 UMI



a connecting means at one end of said elongated body for connecting it to a high strength flexible pulling medium;
said elongated body including at least one protruding dowel means, said dowel means being of a size and shape for engaging an opening in said coil slot wedges;
said body including additional means for attaching said elongated body to a coil slot wedge.

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**5,048,178**
**ALIGNMENT—REGISTRATION TOOL FOR FABRICATING MULTI-LAYER ELECTRONIC PACKAGES**
**Perminder S. Bindra, South Salem, N.Y.; Peter J. Lueck, Leonberg, Fed. Rep. of Germany, and Eberhard H. Naegele, Johnson City, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.**
**Filed Oct. 23, 1990, Ser. No. 602,554**
**Int. Cl.[5] H05K** *3/36;* **B23P** *21/00*
**U.S. Cl. 29—830** **25 Claims**



1. A method of forming a multilayer microelectronic circuit package comprising the steps of:
providing a first layer thereof having features thereon in proximity to an optical system adapted for imaging a surface of the layer;
imaging features on the surface of the first layer with said optical system;
generating targets through said optical system with respect to selected ones of said features;
storing the targets generated from the selected features of the layer;
placing a next layer of the circuit package into proximity with the optical system;
moving the said next layer until selected features thereof coincide with the stored targets generated from the surface features of the first layer through the optical system; and
placing the said next layer atop the first layer.
23. An optical alignment apparatus for aligning and laminating layers of a multilayer microelectronic circuit package comprising:
carrier plate means for carrying individual layers of the multilayer microelectronic circuit package;
optical system means for (i) imaging selected features of individual layers, (ii) generating targets with respect to said selected features, (iii) storing optical target features generated from surface features of a prior layer, and (iv) superimposing said generated targets over selected features of subsequent layers of said multilayer microelectronic circuit packages;
means for moving said layer on said carrier plate means into proximity to the optical system;
means for picking up the first layer and bringing the first layer into closer proximity to the optical system;
means for positioning said optical system with respect to said features on the surface of the first layer to thereby allow the optical system to image selected features of the first layer;
means for lowering imaged layer and passing the imaged layer to a bottom retaining means;
means for moving a next layer until selected features thereof coincide with the targets generated through the optical system; and
means for lowering the said layer and placing the said layer atop the first layer.

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**5,048,179**
**IC CHIP MOUNTING METHOD**
**Masahiro Shindo; Toshikazu Yoshimizu, both of Toyonaka; Kenichi Kurihara, Yohohama; Shunpei Tamaki, Takarazuka; Toshio Kawakami, Suita; Yukio Kadowaki, and Shoji Matsumoto, both of Minoo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**
**Division of Ser. No. 53,264, May 22, 1987, abandoned. This application Feb. 14, 1990, Ser. No. 480,013**
**Claims priority, application Japan, May 23, 1986, 61-119944; May 23, 1986, 61-119942; Sep. 25, 1986, 61-227395**
**Int. Cl.[5] H05K** *3/34*
**U.S. Cl. 29—840** **17 Claims**



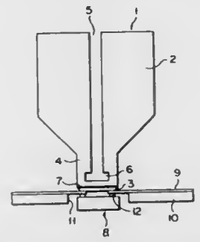

1. A method for manufacturing an IC card, comprising the steps of:
providing a metal plate of a desired shape, said metal plate having a first surface;
forming at least one hole through said plate;
locating an IC chip inside of said hole and filling a gap between said hole and said IC chip to fix said IC chip in location, said IC chip having a second surface on which at least one contact pad is formed;
forming an electrically insulating layer covering said first and second surfaces;
forming a hole in said insulating layer at desired location thereof and extending therethrough;
forming a metal layer on said insulating layer at least at a location above said IC chip; and
patterning said metal layer to define an interconnection pattern which is in electrical connection to said contact pad of said IC chip.

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**5,048,180**
**METHOD OF BONDING A SEMICONDUCTOR DEVICE WITH A SUBSTRATE**
**Takayoshi Tanaka, Sayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**
**Filed Mar. 7, 1990, Ser. No. 490,049**
**Claims priority, application Japan, Mar. 14, 1989, 1-59810**
**Int. Cl.[5] H05K** *3/34;* **B23P** *19/00*
**U.S. Cl. 29—840** **6 Claims**

1. A method of making an integrated circuit chip unit, comprising the steps of:
providing a carrier tape which comprises an insulating tape having a device hole and a plurality of leads, each of which leads is mounted on said insulating tape and has one end projecting inside of said device hole;
providing an integrated circuit chip having a plurality of bump electrodes;
aligning said one ends of said leads with said bump electrodes of said integrated circuit chip; and
thermocompressing said one ends of said leads to said bump electrodes by a heater head including a heater conductive portion having a slit at a middle and an interconnection crossing over said slit at only one end of said heater conductive portion, and a bonding tip portion formed on said interconnection of said heater conductive portion;
said heater conductive portion, including said interconnection, being made of either one of molybdenum and tungsten for generating bonding heat by undergoing high frequency electric current;
said bonding tip portion having a higher resistivity, higher thermal conductivity and lower coefficient of thermal expansion than those of said heater conductive portion.
4. A bonding apparatus for electrically bonding a first contact to a second contact, comprising:
heat conductor means for generating bonding heat by undergoing a high frequency electric current and having a slit at

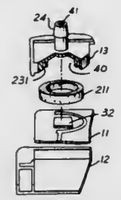





a middle and an interconnection crossed over at only one end of said slit;
said heat conductor means, including said interconnection, being made of one of the materials selected from molybdenum and tungsten with respect to characteristics of resistivity, thermal conductivity and coefficient of thermal expansion; and
bonding tip means formed on said interconnection of said heat conductor means for thermocompressing the first contact to the second contact and having a higher resistivity, higher thermal conductivity and lower coefficient of thermal expansion than those of said heat conductor means.

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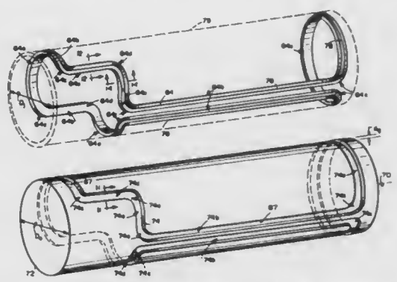
**5,048,181**
**METHOD FOR MAKING THICK FILM CIRCUIT HOUSING ASSEMBLY DESIGN**
**Duane M. Grider, Eagan, Minn., assignor to Ford Motor Company, Dearborn, Mich.**
**Division of Ser. No. 245,496, Sep. 19, 1988. This application Nov. 19, 1990, Ser. No. 615,526**
**Int. Cl.[5] H05K** *3/39*
**U.S. Cl. 29—840** **6 Claims**




1. A method of fabricating a thick film integrated circuit assembly with a circuit board, a pressure sensor, and an electrical terminal including the steps of:
forming a housing with a cavity for receiving the pressure sensor;
positioning a sealing ring around the pressure sensor on the thick film circuit board;
positioning the housing on the thick film circuit board so the sealing ring is adjacent the periphery of the cavity;
positioning the housing on the thick film circuit board so the sealing ring is adjacent the periphery of the cavity;
positioning a base plate adjacent the side of the thick film circuit board opposite from the housing; and
applying a coupling force between the base plate and the housing so that the housing presses on the sealing ring and forms a pressure seal between the housing and the thick film circuit board.

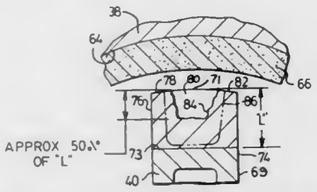
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**5,048,182**
**METHODS FOR FABRICATING PATTERN ROLLS**
**Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630**
**Division of Ser. No. 250,684, Sep. 29, 1988, Pat. No. 4,938,677, which is a continuation-in-part of Ser. No. 17,603, Feb. 24, 1987, abandoned, and Ser. No. 158,622, Feb. 22, 1988, abandoned. This application May 1, 1990, Ser. No. 517,197**
**Int. Cl.[5] A01B** *29/00*
**U.S. Cl. 29—895.21** **19 Claims**



1. A method of fabricating a pattern roll which is adapted to form first and second beveled peripheral edge portions of substantially constant geometry on an article by passing a preform of the article between the pattern roll and a platen surface, said method comprising the steps of:
(a) forming at least one continuous recessed groove of a depth dimension $d_g$ in a cylindrical surface of a base roll having a predetermined outside diameter $D_o$, the groove having a number of circumferentially extending sections and a number of longitudinally extending sections joined to one another such that the groove formed in the cylindrical surface of the roll, when projected onto a planar surface, has a geometric configuration which establishes a peripheral outline of said article;
(b) forming, from a rigid cylindrical sleeve having an internal diameter $D_i$ less than said diameter $D_o$ of said base roll and a radial thickness $t_c$ greater than said groove depth $d_g$, a number of unitarily joined circumferential and longitudinal rib segments by removing unwanted portions of said cylindrical sleeve so that said number of unitarily joined circumferential and longitudinal rib segments remain;
(c) forming beveled surfaces on said circumferential and longitudinal rib segments such that said beveled surfaces of said circumferential rib segments are formed at an angle $A_1$, while said beveled surfaces of said longitudinal segments are formed at an angle $A_2$ greater than angle $A_1$; and
(d) rigidly positioning said circumferential and longitudinal rib segments in respective circumferential and longitudinal grooved sections, whereby said first and second beveled peripheral edge portions of substantially constant geometry may be formed by said circumferential and longitudinal rig segments, respectively.

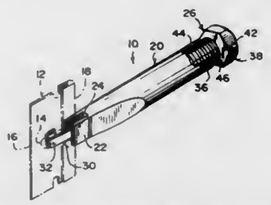
5,048,183
**METHOD OF MAKING AND REPAIRING TURBINE BLADES**
John N. Cang, San Diego; Joseph R. Gast, Alpine; John J. Hensley, and Christian M. Waldhelm, both of San Diego, all of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.
Continuation of Ser. No. 377,495, Jul. 10, 1989, abandoned, which is a division of Ser. No. 236,874, Aug. 26, 1988, abandoned. This application Nov. 8, 1990, Ser. No. 609,033
Int. Cl.[5] B21K *3/04*
U.S. Cl. 29—889.1 17 Claims




1. A method of making a turbine blade having a metallic body being of a predetermined strength sufficient to resist structural deformation and an outer tip formed on the metallic body comprising the steps of:
(a) forming the outer tip on an outer extremity of the metallic body by a weld layered puddling build-up of a repetitive series of passes using a filler rod comprised of a material having a predetermined strength less than that of the metallic body and being resistant to high temperature, oxidation, corrosion, sulfidation and thermal fatigue at operating temperatures; and
(b) machining the outer tip to a preestablished profile after forming of the outer tip on the metallic body.

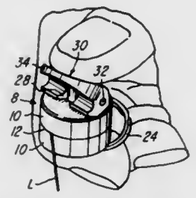
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5,048,184
**SLOT BLADE HOLDER**
Clarence E. Saxton, 4522 Orchard Ave., San Diego, Calif. 19107
Filed Nov. 13, 1990, Ser. No. 611,840
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—169 6 Claims




1. A slot blade holder for a standard single edge razor blade having a central aperture, a front cutting edge and a rear flange, said holder comprising:
a) a hollow tubular handle having its forward end flattened with a slot therethrough to receive transversely the rear flange of the razor blade; and
b) means for securing the rear flange of the razor blade at the central aperture within the slot of the forward end of said handle, so that the front cutting edge of the razor blade is in a position to remove various materials from flat surfaces and cut materials when used in conjunction with a straight edge or the like,
c) a safety shield which slides over the cutting edge of the razor blade to cover the cutting edge when said holder is not being used and placed in storage.

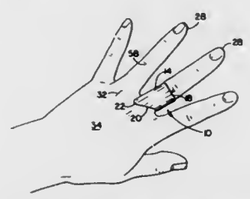
5,048,185
**HAND ACTUATED NIPPERS**
Larry A. Laymaster, 819 Factory Rd., Beavercreek, Ohio 45385
Filed Aug. 30, 1990, Ser. No. 574,761
Int. Cl.[5] B26B *17/00*
U.S. Cl. 30—183 13 Claims




1. A hand actuated cutting tool adapted for cutting a flexible line or other article, comprising a set of opposing cutting dies each having a center portion, at least one of said dies having means forming a peripherally extending sharp cutting edge and the other said die having an opposing cutting surface, a center pin connecting said center portions of said dies and providing for relative axial movement of said cutting dies between a retracted open position defining a gap between said cutting edge and said cutting surface and a closed position with said cutting edge engaging said cutting surface, said pin also supporting said dies for rotation for selecting portions of said cutting edge and said cutting surface, means including at least one spring member disposed between said dies and surrounding said center pin for biasing said dies to said retracted position, and means connected to said pin for moving said dies from said open position to said closed position for cutting the article inserted between selected portions of said cutting edge and said cutting surface.

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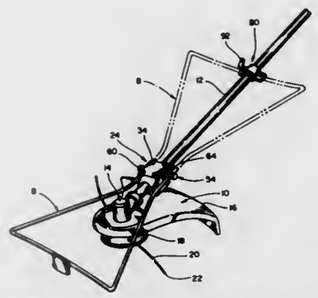
5,048,186
**SHEAR GUARD**
George L. Lamb, and Frances A. Lamb, both of 570 Encina Dr., El Dorado Hills, Calif. 95630
Continuation-in-part of Ser. No. 273,900, Nov. 21, 1988, abandoned. This application Mar. 15, 1991, Ser. No. 670,476
Int. Cl.[5] D26B *13/00*
U.S. Cl. 30—233 9 Claims




1. A guard for protecting a finger from the blades of a pair of shears, said guard comprising a band of rigid yet formable planar material disposed in a ring-like configuration, said band having opposed wide and narrow ends with a gap therebetween adjustable to comfort around said finger, said band further including a front edge oriented transverse to said finger's axis and generally perpendicular to said wide and narrow ends, and a rear edge angled between said wide and narrow ends so as to permit said wide end to protect a knuckle of a finger where it joins a hand, and so as to permit said narrow end to cover a fleshy pad beneath said finger.



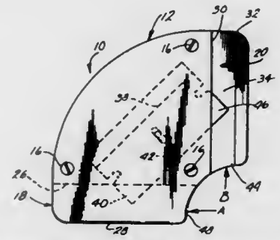
5,048,187
**WHIP TYPE WEED CUTTER**
Patrick J. Ryan, 840 W. Moreland Dr., No. 11, Vernon Hills, Ill. 60061
Filed Oct. 9, 1990, Ser. No. 595,181
Int. Cl.[5] B26B *7/00*
U.S. Cl. 30—276 20 Claims




1. A cutter attachment for a mono-filament type trimmer implement including a trimmer support shaft and a cutter in the form of a rotatable mono-filament used for lawn trimming mounted at a free end thereof comprising a base secured to said trimmer support shaft above said cutter, an elongated swingable rod shaped guard having a closed guard end and a pair of free ends positioned in adjacency to said base, and attachment means joining said free ends of said guard to said base enabling said elongated swingable rod shaped guard to be swung from a "storage position" where said closed end of the guard rests on and overlies said shaft rearwardly behind said cutter to a "guard position" where said closed guard end extends forwardly beyond said cutter for protecting shrubs, trees and the like from the rotatable mono-filament on said cutter.

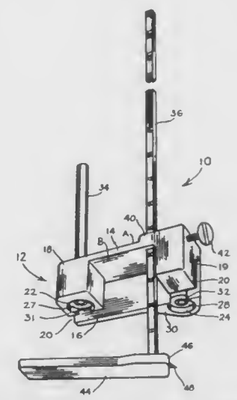
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5,048,188
**RABBET CUTTING TOOL**
Douglas F. Wolff, P.O. Box 106, Ceresco, Mich. 49033-0106
Filed Sep. 13, 1990, Ser. No. 582,678
Int. Cl.[5] B26B *29/00*; B26D *3/00, 1/00*
U.S. Cl. 30—288 8 Claims




1. A blade holder for a rabbeting tool used in cutting a rabbet in a board material, said tool comprising a body for holding and guiding a cutting blade, said body having a first cutting slot into which a portion of the blade extends used for cutting the edge of the board material and a second cutting slot into which another portion of the blade extends used for cutting the face of the board material near an edge, the edge cut and the face cut intersecting so that a notch is cut into the edge of said board material for making a rabbet joint.

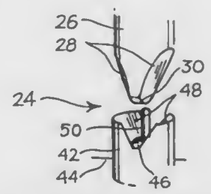
5,048,189
**WALLBOARD CUTTER**
Harold O. Aurness, 5808 Knox Ave. No., Brooklyn Center, Minn. 55430, and Sidney K. Legg, 3943 Lyndale Ave. N., Minneapolis, Minn. 55412
Filed Mar. 7, 1990, Ser. No. 489,516
Int. Cl.[5] B26B *29/06*
U.S. Cl. 30—293 7 Claims




1. A cutting unit for cutting or scoring wallboard of various thicknesses comprising members forming a channel having first and second ends with a first wall formed of first and second column members, one at each end of the channel, a planar second wall opposite the first wall with a planar floor between a first roller member in the second wall at the first end flush to the channel with a second roller flush to the channel in the first column member at the second end of the channel; with the channel floor also extending laterally between the first and second columns to provide for a sliding measure rod to extend through at 90° to an outer edge of the floor extension near the second column and secured by a wing screw, a rotatable handle with a cutting blade mounted transversely to a zero end of the measure rod; a pulling handle extending upward from the first column member, whereby the unit can be pulled along the edge of the wallboard with the score or cut controlled by hand.

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5,048,190
**RECTANGULAR HOLE CUTTER**
Harold O. Aurness, 5808 Knox Ave. No., Brooklyn Center, Minn. 55430, and Sidney K. Legg, 3943 Lyndale Ave. No., Minneapolis, Minn. 55412
Filed Mar. 21, 1988, Ser. No. 170,904
Int. Cl.[5] G26B *3/00*
U.S. Cl. 30—299 8 Claims




1. A unit utilizing an outside power source for cutting rectangular holes in light-weight construction material such as wallboard comprising a two-member cam action means within a housing with a rectangular first base plate which describes

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the size and shape of the holes to be cut, with the base plate having a top side and a bottom side; a rectangular second base plate with a top side and a bottom side and having the same perimeter dimensions as the first base plate with the top side centered in spaced relation symmetrically to the bottom side of the first base plate; a female member of the cam action means centered immoveably on the top of the second base plate; a male member of the cam action means centered rotatably in the housing of the first base plate with a stem extending from a top end to an outside power source; with the female member of the cam action means having a special top end configuration and slideably centered in a hole centered through the first base plate to engage the male cam member, also having a special end configuration, to cooperatively create a pumping action when the power source is engaged; stabilizing means from spring constrained stabilizer posts extending up from corners of the second base plate slideably through the first base plate to return the base plates to their original spaced relationship during the induced action of the male cam member; several alternate separately attachable cutting blade sets to saw same size rectangular holes in different kinds of material, each set having a rectangular (third) base plate of a configuration common to all cutting set base plates and attachable to the bottom of the second base plate immoveably thereto; with saw blades of a distinct shape and kind for each set of blades attached rotatably to each perimeter side of the third base plate, with a common means for connecting the center overlapping blade corners rotatably and slideable vertically from the third base plate to the first base plate to facilitate the sawing action of the blades; a handle for hand guidance of the unit.

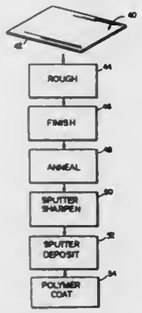
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**5,048,191**

## RAZOR BLADE TECHNOLOGY

Steve S. Hahn, Wellesley Hills, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 535,741, Jun. 8, 1990, abandoned. This application Oct. 16, 1990, Ser. No. 599,267
Int. Cl.[5] B26B *21/54*
U.S. Cl. 30—346.54 31 Claims




1. A process for forming a razor blade comprising the steps of

providing a ceramic substrate,

mechanically abrading said ceramic substrate in a sequence of rough-honing and finish-honing steps with diamond abrasive materials to form a sharpened edge thereon with facets that have an included angle of less than thirty degrees and a tip radius of less than twelve hundred angstroms; and

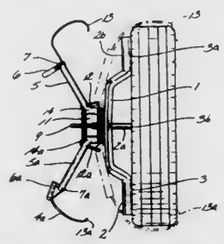
sputter-sharpened said edge to form a cutting edge defined by supplemental facets that are less than one micrometer in width and have an included angle greater than forty degrees.

**5,048,192**

## WHEEL POSITION GAUGING DEVICE

Luis N. Pascoal, Rua Edmundo Navarro de Andrade 1700, Campinas, SP, CEP 13100, Brazil

Filed Apr. 30, 1990, Ser. No. 517,586
Claims priority, application Brazil, Sep. 30, 1989, 8904352
Int. Cl.[5] G01B *5/255*
U.S. Cl. 33—203.18 10 Claims



1. A wheel position measuring device for use with a wheel position measuring projector, comprising:

(a) support means for contacting one side of a tire, and for mounting a wheel position measuring projector at a predetermined location with respect to the tire; and

(b) gripping means having a plurality of arms for holding the support means in contact with the tire by gripping the other side of the tire, and means for connecting the gripping means to the support means so as to bias the arms and thus the gripping means substantially toward a center of the tire to hole the support means in contact with the one side of the tire.

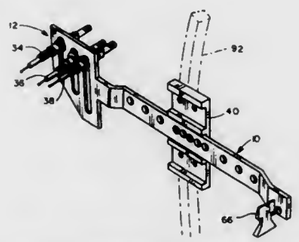
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**5,048,193**

## ARCHERY BOW SIGHT

Rodney D. Hacquet, P.O. Box 141, Newport, Ind. 47966

Filed Jun. 23, 1989, Ser. No. 372,431
Int. Cl.[5] F41G *1/46*
U.S. Cl. 33—265 9 Claims



1. A bow sight for an archery bow, which bow is operable to propel arrows, said bow sight comprising:

a sight bar with a front end and a back end;

means for securing said sight bar to said bow intermediate the ends of the sight bar;

a front sight having a wind pin mounting bracket with at least one slot, which front sight is mounted on said sight bar front end forwardly of said bow;

a plurality of wind pins, at least one wind pin positioned in each of said slots, which pins are adjustable to match the trajectory of arrows at fixed distances;

a rear sight mounted on said sight bar back end rearwardly of said bow;

said rear sight having an upper edge, a lower edge and a center of gravity;

a sighting notch positioned at said rear sight upper edge, a pivot shaft bore between said upper edge and said center of gravity;

said sight bar having a longitudinal axis, a front surface, and a mounting port at said back end, which mounting port is perpendicular to said inner surface and said longitudinal axis;

a rear sight pivot shaft extending through said mounting port and having said rear sight pivotally mounted on said pivot shaft in said shaft bore;

means for locking said pivot shaft and rear sight in said mounting port;

said rear sight pivotable to maintain, as the bow is inclined relative to a horizontal plane, alignment with at least one of said front sight wind pins for a more consistent arrow trajectory at a predetermined distance.



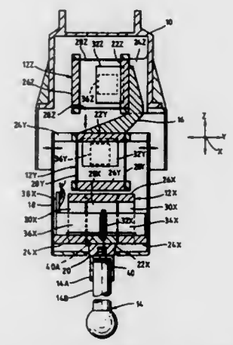
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**5,048,194**

## POSITION SENSING PROBE

David R. McMurtry, Wotton-Under-Edge, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom

PCT No. PCT/GB88/01069, § 371 Date Aug. 1, 1989, § 102(e) Date Aug. 1, 1989, PCT Pub. No. WO89/05435, PCT Pub. Date Jun. 15, 1989
PCT Filed Dec. 5, 1988, Ser. No. 382,655
Claims priority, application United Kingdom, Dec. 5, 1987, 8728500
Int. Cl.[5] G01B *5/20, 7/28*
U.S. Cl. 33—558 10 Claims



1. A position sensing probe for use in position determining apparatus, comprising:

a fixed part for mounting in the position determining apparatus, whereby the apparatus can move the probe relative to a workpiece surface;

a movable part, having means for contacting the workpiece surface;

support means for supporting the movable part on the fixed part so as to permit deflection of the movable part relative to the fixed part;

means for measuring the amount of said deflection of the movable part relative to the fixed part, and providing an output in accordance therewith; and

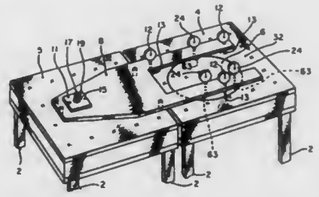
trigger means, independent of said deflection measuring means, for providing a trigger signal when said contacting means contacts the workpiece surface.

**5,048,195**

## APPARATUS AND METHOD FOR ALIGNMENT OF ADJACENT SURFACES

Mark A. Leonov, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 6, 1990, Ser. No. 563,560
Int. Cl.[5] G01B *5/24, 3/28*
U.S. Cl. 33—645 8 Claims



1. An apparatus for aligning adjacent surfaces for coplanarity and angle comprising:

(A) a base plate;

(B) a plurality of support legs coupled to the base plate;

(C) a plurality of depth gauges coupled to the base plate;

(D) an angle plate coupled to the base plate, wherein the angle plate has an inclined surface that slopes towards the plurality of depth gauges, and wherein the inclined surface has a predetermined angle; and

(E) leveling means coupled to the inclined surface.

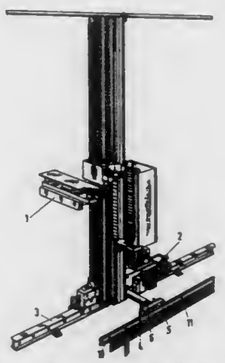
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**5,048,196**

## POSITION SENSING ARRANGEMENT IN A WORKING DEVICE

Alfred Bernd, Herdecke; Anton Münzebrock, Dortmund; Heinz Pfannkuche, Bochum; Uwe Schulte, and Roland Staggl, both of Wetter, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 342,455
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3813897
Int. Cl.[5] G01B *5/04, 3/12*
U.S. Cl. 33—734 19 Claims



1. In a guided working device (1) including drive means (2) operable for selectively moving the working device along a travel path, the improvement comprising:

a control rail (11) extending along the path;

a measuring carriage (5) connected to the working device (1) for movement therewith along the path, said measuring carriage being disposed in at least closely proximate relation to said control rail (11);

a measuring band (10) carried on said control rail (11);

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a measuring wheel (7) rotatably disposed on said measuring carriage (5) so that, as the working device operably moves along the travel path, said measuring wheel rotates on and relative to said measuring band (10) whereby said rotations of the measuring wheel provide a precise measure of the movement of the measuring carriage and working device along the travel path;

means (6) comprising an angle transmitter for sensing said rotations of the measuring wheel; and

a travel rail (3) extending along the travel path and on which the guided working device (1) is movable, said control rail (11) being arranged substantially parallel to said travel rail (3).

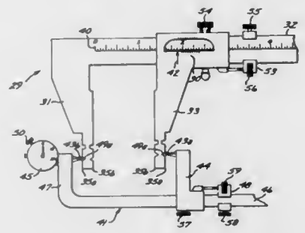
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**5,048,197**

## APPARATUS AND METHOD FOR MEASURING PITCH DIAMETER

**Gunnar Anderson, 12750 Caravel, Cerritos, Calif. 90701**

**Filed Feb. 17, 1989, Ser. No. 311,773**
**Int. Cl.[5] G01B *3/40, 344***
**U.S. Cl. 33—829** **7 Claims**



1. A system for measuring pitch diameter of a selected threaded member having threading with one of a plurality of thread forms, and a predetermined thread depth and thread lead, comprising:

a precision gauge having (1) a pair of variably separable jaws each with a reference surface thereon, (2) a means of indicating the precise absolute separation of the separable jaws' reference surface, and (3) a single thread profile notch for at least one of said plurality of thread forms formed in each reference surface, each said profile notch corresponding in shape to said selected threaded member's thread form and to one half its predetermined thread depth, said thread profile notch formed in one of said pair of jaws being laterally offset with respect to said thread profile notch formed in the other of said jaws a predetermined dimension, said predetermined dimension corresponding to one half a thread lead dimension of said selected threaded member; and

a transfer tool having a pair of variably separable jaws, each with a ball-point type contact surface affixed thereto, said ball-point type contact surfaces being conformed for receipt within (1) said thread profile notches of said precision gauge, and (2) said threaded member's threading, said variably separable jaws of said transfer tool being configured such that said ball-point type contact surfaces engage said threaded member's threading at substantially diametrically opposed locations, and a means for locking a particular separation of said transfer tool's jaws in place.

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**5,048,198**

## SHUTTER SYSTEM FOR SHIELDING A COATED SUBSTRATE DURING A RADIATION-CURING PROCESS

**Joseph T. Burgio, Jr., 705 Jennings St., Bethlehem, Pa. 18016**

**Filed Nov. 20, 1989, Ser. No. 439,549**
**Int. Cl.[5] F26B *3/28***
**U.S. Cl. 34—4** **26 Claims**

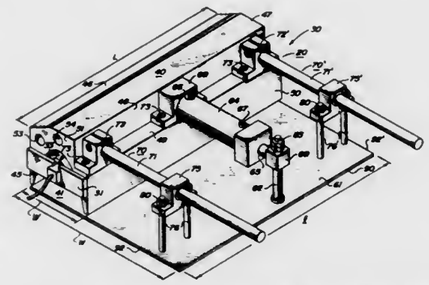
1. A shutter system for use with a reflector block means having a high-temperature lamp mounted within a cavity thereof for curing a coating on a substrate moving adjacent said reflector block means, comprising:

(A) cylinder means having:

(i) a piston rod extending therefrom;

(B) cantilevered shutter means having:

(i) an inner portion; and



(ii) an outer portion connected with said cylinder means piston rod;

whereby reciprocal movement of said piston rod moves the inner portion of said shutter means to a position between said reflector block means and said substrate when movement thereof is interrupted and away therefrom when said substrate is moving.

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**5,048,199**

## DEWATERING COMPOSITION

**Robert Cole, Roanoke, Va., assignor to Wen-Don Corporation, Roanoke, Va.**

**Division of Ser. No. 293,914, Jan. 6, 1989. This application Oct. 30, 1990, Ser. No. 605,450**
**Int. Cl.[5] F26B *3/00***
**U.S. Cl. 34—9** **5 Claims**

1. A method for dewatering wet ores, comprising the step of bringing the wet ore into contact with a dewatering composition consisting essentially of about 5 to 40 weight percent of a sulfosuccinate, about 5 to 40 weight percent of a non-ionic surfactant, and an effective amount of a silicone foam control agent.

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**5,048,200**

## PROCESS AND APPARATUS FOR DEHUMIDIFYING WET AIR

**Rolf Ryham, Princeton, N.J., assignor to Ahsltromforetagen Svenska AB, Norrkoping, Sweden**

**Filed Jun. 19, 1990, Ser. No. 540,083**
**Int. Cl.[5] F26B *3/00***
**U.S. Cl. 34—32** **8 Claims**

1. A process for dehumidifying wet air generated in a paper making machine comprising the steps of:

a) removing said wet air from said paper making machine by suction;

b) contacting said wet air in an absorber with circulating absorption liquid comprising an aqueous hygroscopic salt solution to form diluted absorption liquid;

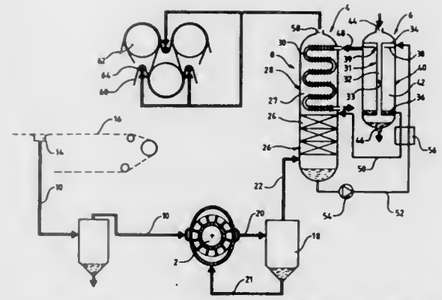
c) heating at least a portion of said absorption liquid to its boiling point by indirect heat exchange with a heating fluid in an evaporator to form concentrated absorption liquid and water vapor;

d) condensing said water vapor produced by heating said absorption liquid by indirect heat exchange with a cooling fluid in a condenser;

e) passing said air through said absorber and utilizing said air as said cooling fluid in said condenser thereby heating and further drying said air;



f) recirculating said concentrated absorption liquid to said absorber; and



g) further utilizing said dried heated air as drying air in a drying section of said paper machine.

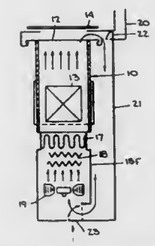
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**5,048,201**

## LAMINAR FLOW SYSTEM FOR DRYING PARTS

**Howard M. Layton, New Fairfield, Conn., assignor to Interlab, Inc., Danbury, Conn.**

**Filed Jul. 13, 1990, Ser. No. 552,165**
**Int. Cl.[5] F26B *21/06***
**U.S. Cl. 34—77** **9 Claims**



1. A system for drying parts which in the course of their processing are rendered wet with a solvent or other liquid which if not removed will impair the quality of the parts, said system comprising:

(a) an open-ended drying chamber having a generally rectangular cross section, one rectangular end thereof defining a gas inlet and the other end a gas outlet;

(b) a work zone disposed within the chamber intermediate the side walls thereof for supporting the parts to be dried;

(c) a pressure chamber coupled to said gas inlet of the drying chamber and provided with a gas input port;

(d) a low-pressure drop, box-like submicron particle filter unit of the Hepa type provided with an accordion-folded continuous sheet of non-woven fibers having high strength, said unit having an entry face and an exit face and being disposed in said pressure chamber with its exit face fully covering the rectangular gas inlet to the drying chamber; and

(e) means to feed a gas at a relatively low pressure appropriate to the low-pressure drop of the filter unit into the input port of the pressure chamber and to elevate the temperature of the gas to a level promoting rapid evaporation of said liquid, said filter unit being capable of operating at said elevated temperature, said gas filling the pressure chamber and exerting a substantially uniform, distributed pressure on the entry face of the unit whereby the gas at an elevated temperature emerges as a laminar stream from the exit face of the unit and flows from the inlet to the outlet of the drying chamber to effect substantially uniform drying of the parts in the work zone.

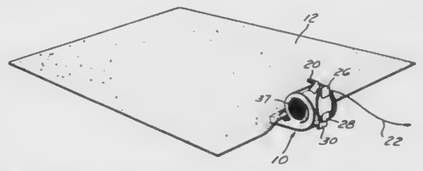
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**5,048,202**

## CARPET DRYER

**William K. Shero, 30961 Steeplechase, San Juan Capistrano, Calif. 92675**

**Filed Apr. 6, 1990, Ser. No. 505,928**
**Int. Cl.[5] F26B *13/00***
**U.S. Cl. 34—151** **17 Claims**



10. A portable device for drying carpet comprising:

a housing;

an air blower disposed within said housing; and

means for maintaining an edge of said carpet at an elevation above at least a portion of said housing during a drying process.

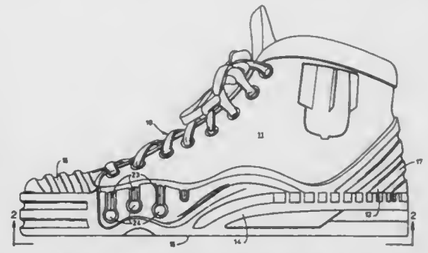
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**5,048,203**

## ATHLETIC SHOE WITH AN ENHANCED MECHANICAL ADVANTAGE

**Robert J. Kling, 3416 Woodford Rd., Cincinnati, Ohio 45213**

**Filed Apr. 5, 1990, Ser. No. 504,865**
**Int. Cl.[5] A43B *5/00, 13/14***
**U.S. Cl. 36—32 R** **8 Claims**



1. An athletic shoe constructed for comfort and to give a mechanical advantage to its user, said shoe comprising:

(a) an upper member; and

(b) a sole member connected to the upper member, said sole member characterized in having (i) a substantially flat bottom surface throughout its length, (ii) a lateral inwardly concave channel in the bottom surface extending substantially across the metatarsal area of the user's foot, (iii) a set of longitudinally running inwardly concave channels in the sole's bottom surface extending from near the lateral channel to near the sole member's forward extremity, and (iv) a plurality of vertically extending grooves in both walls of the sole member extending from about the head of the metatarsal area to about the base of the metatarsal area of the user wherein each of the vertically extending grooves further has a round indentation at the lower end of the indentation to induce a substantially equal dissipation of stress vectors resulting from a compression of the sole member during use.

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5,048,204

## SECURING AND ADJUSTER DEVICE, PARTICULARLY FOR SKI BOOTS

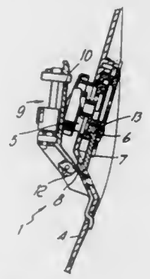
Maurizio Tacchetto, Noventa Padovano; Claudio Zorzi, Silea; Giuseppe De Bortoli, Montebelluna; Alessandro Pozzobon, Paderno Di Ponzano Veneto, and Renato Serafin, Vedelago, all of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Jul. 10, 1989, Ser. No. 378,341

Claims priority, application Italy, Jul. 22, 1988, 82572 A/88; Jan. 20, 1989, 82503 A/88

Int. Cl.[5] A43C *11/00*

U.S. Cl. 36—50 8 Claims



1. Securing and adjustment device particularly for ski boots, comprising;

first tensioning means defining at least a first cable tensioning position and a first cable release position.

at least one first cable connected to said first tensioning means,

locking means releasably engaging said first tensioning means for locking said first tensioning means in said first cable tensioning position.

second tensioning means defining at least a second cable tensioning position and a second cable release position,

at least one second cable connected to said second tensioning means, and

release means for converting movement of said second tensioning means into movement of said locking means,

wherein said release means disengage said locking means from said first tensioning means upon moving said second tensioning means to said second cable release position, thereby simultaneously causing said first tensioning means to assume said first cable release position.

wherein said first tensioning means comprise at least one cable winding device, said cable winding device having at least one toothed crown, said second tensioning means comprising at least one lever, said locking means comprising at least one tooth, said tooth releasably engaging said toothed crown said release means comprising at least one rod, said rod being connected to said tooth, said lever being engageable with said rod for disengaging said tooth from said toothed crown.

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5,048,206

## COMBINED SNOW SHOVELING DEVICE AND CART

Warren S. Jones, 1011 Woodmere Dr., Indianapolis, Ind. 46260

Filed Apr. 13, 1990, Ser. No. 508,975

Int. Cl.[5] E01H *5/02*

U.S. Cl. 37—265 19 Claims

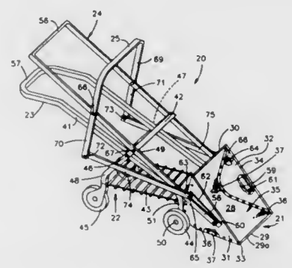
1. A manually powered utility device for removing snow from a surface, said device comprising:

collection means designed and arranged for manually variable and selectable orientation relative to said surface and arranged for scooping snow from a surface and temporarily holding the collected snow;

a support frame arranged with a plurality of wheels disposed across said surface;

a manually operable first lever pivotally attached at a first location to said collection means and at a second location to said support frame such that movement of said frame across said surface results in movement of said collection means, said second location of attachment to said support frame providing a fulcrum for said first lever; and

a second lever manually operable independently of said first lever and pivotally attached to said first lever, said second



lever being pivotally attached to said collection means and arranged to selectively change the orientation of said collection means relative to said surface by manually controlled rotation of said collection means to anyone of a plurality of different orientations relative to said surface about an axis of rotation passing through said first location.

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5,048,207

## ADJUSTABLE DISCHARGE WING PLOW

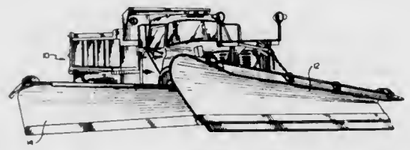
Jan H. Verseef, Clayton, N.Y., assignor to Frink America, Inc., Clayton, N.Y.

Filed Mar. 13, 1990, Ser. No. 492,961

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[5] E01H *5/06*

U.S. Cl. 37—281 9 Claims



5. In a snow plow of the type having a main plow and one or more wing plows, each wing plow having a main frame and an elongated scraper blade means mounted on said main frame, an arcuate moldboard comprising in combination;

a first arcuate moldboard mounted on top of a portion of said blade means;

a second arcuate moldboard having a flexible sheet portion mounted on top of said blade means adjacent said first moldboard;

said first and second moldboards combining to extend along the entire length of said scraper blade means; and

actuating means for selectively adjusting the curvature of said flexible sheet portion of said second moldboard.

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5,048,208

## CD CASE CLIP HANDLER

Eli Tatz, 134 W. 58th St., New York, N.Y. 10019

Continuation-in-part of Ser. No. 334,158, Apr. 6, 1989, abandoned. This application Oct. 12, 1989, Ser. No. 420,754

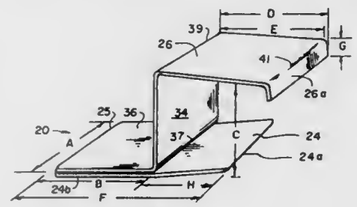
Int. Cl.[5] G09F *3/00*

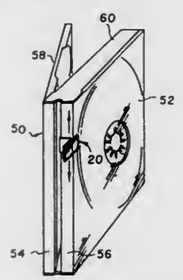
U.S. Cl. 40—312 7 Claims

1. A clip for use in combination with a CD case having a first



housing part with a rear ridge having a substantially rectangular cross-section, a top surface, a bottom surface, a rear surface and a front surface, the CD case also have a second housing part hinged to the ridge of the first housing part, the clip comprising a one-piece member made of a single piece of metal strip material and having: a planar bottom plate (**24**) with a leading edge (**24***a*) for engagement with the bottom surface of the ridge; a planar top plate (**26**) spaced from said bottom plate, said top plate having a leading edge for engagement with the top surface of the ridge; a planar connecting plate (**34**) connected between said top and bottom plate at a location spaced from said leading edge; a planar tap plate (**36**) connected at a first bend (**25**) to said bottom plate and connected to said connecting plate at a second bend (**37**), said bottom plate having a planar projection (**24***b*) extending under, adjacent and parallel to said tab plate, said tap plate and projecting extending rearwardly of said leading edges for extending rearwardly of the rear surface of the ridge, said connecting plate being connected to said top plate at a third bend (**39**); and a planar angled flange (**26***a*) connected at a fourth bend (**41**) to said leading edge of said top plate for extending toward said bottom plate and engaging the front surface of the ridge to retain the clip on the ridge; said bottom plate having a portion carrying said leading edge (**24***a*) of said bottom plate and extending forwardly of said second bend (**37**), said top plate (**26**) extending at a small angle inwardly toward said portion of said bottom plate and said portion of said bottom plate being shorter than said top plate.





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5,048,209

## APPARATUS FOR CYCLIC REARRANGEMENT OF A SHEET STACK

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland and Licinvest AG, Chur, Switzerland

PCT No. PCT/EP89/00363, § 371 Date Nov. 30, 1989, § 102(e) Date Nov. 30, 1989, PCT Pub. No. WO89/09947, PCT Pub. Date Apr. 4, 1989

PCT filed Apr.4, 1989, Ser. No. 444,137

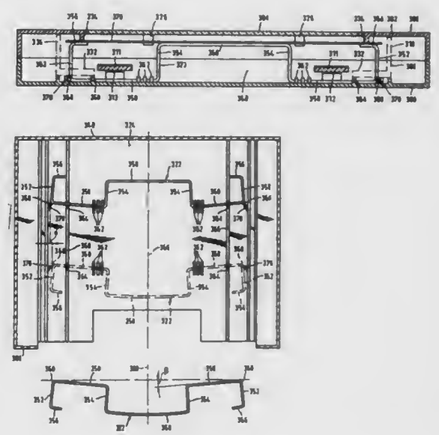
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1988, 3811750

Int. Cl.[5] G09F *11/30*

U.S. Cl. 40—511 40 Claims

1. An apparatus for cyclic rearrangement of a stack of substantially rectangular sheets of nominally identical thickness, comprising

a first frame member and a second frame member, one of said frame members having a display window, said frame members being reciprocable relative to one another between an inner end position and an outer end position, and means for removing an individual sheet from a first end of an inserted sheet stack through a removal gap upon withdrawal of said frame members and for returning said removed individual sheet to the second stack end through a return gap upon the frame members being pushed together, said means including at least one transfer system for guiding said individual sheet from said removal gap to said return gap, said transfer system comprising at least one pivotable element mounted in said first frame member and engaging said individual sheet at its side facing away



from said return gap, said pivotable element being subjected to spring bias and pivotable about an axis extending substantially transverse to the reciprocation direction, said transfer system further comprising a control element provided on said second frame member so as to control the pivoting movement of said at least one pivotable element, said first frame member having at least two bearings for said at least one pivotable element, said bearings defining slightly misaligned pivot axes, and said at least one pivotable element including a bracket formed from a length of wire to define shaft portions mounted in said bearings whereby said bracket is elastically deformed so as to produce said spring bias.

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5,048,210

## DEVICE FOR ILLUMINATING RESIDENCE INFORMATION

Stephen Taylor, Tallmadge, and Philip Ross, Kent, both of Ohio, assignors to Adjusta-Post Manufacturing Co., Norton, Ohio

Filed Feb. 5, 1990, Ser. No. 475,678

Int. Cl.[5] G09F *13/04*

U.S. Cl. 40—575 11 Claims

1. A device for illuminating residence information comprising:

a housing of molded, rigid material having an essentially elongated and inverted "U" shape in longitudinal cross section and having an outer surface further comprising a top section, two end walls and being open on a bottom and two sides;

at least one cross-arm support affixed to the top outer section of said housing and having an opening cut therein;

a means for illuminating said device mounted on the inner surface of said housing;

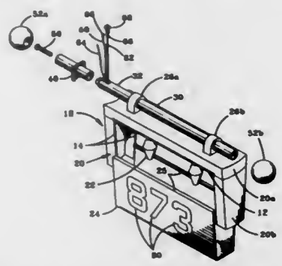
VOL 1130 ISS 3 SE 17 1991 UMI



a means for connecting said illuminating means to a source of energy;

a lens comprising at least one molded, non-opaque material and having a modified "U" shape in transverse cross-section, said lens being removably mounted onto said housing; and

a means for mounting said device onto a vertical support structure having a cross-arm hole essentially perpendicular to a longitudinal axis of said structure, said mounting means comprising an elongated tubular cross-arm, said

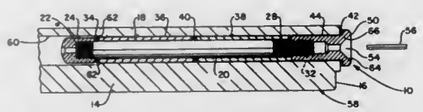


cross-arm having a first and a second end and a plug partially inserted in said first end and a mounting stud being substantially tubular and having a first and a second end and a flange on its outer surface,

wherein said cross-arm engages the aperture of each said cross-arm support and said cross-arm and said mounting stud are inserted into said cross-arm hole in said vertical structure from opposite sides and urged into engagement with one another such that said plug is contained within said mounting stud and retained there by a fastening means.

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**5,048,211**
**SAFETY LOCK FOR FIREARMS**
**Norbert Hepp, 3871 Foskett Rd., Medina, Ohio 44256**
**Filed Nov. 1, 1990, Ser. No. 607,809**
**Int. Cl.[5] F41A** *17/44*
**U.S. Cl. 42—70.11** **18 Claims**



16. A safety device for securing a firearm, comprising:

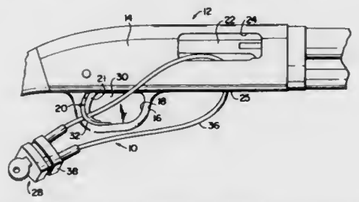
a rod, threaded at a first end thereof and having a plug fixed to a second end thereof, said plug being received in a firing chamber of the firearm;

a sleeve slidingly received upon said rod;

a first expandable ring received upon said rod and engaging a shoulder of the firing chamber, and

a head threadedly received upon said second end of said rod, threaded movement of said head and rod urging said sleeve into compressing engagement with said expandable ring between said sleeve and said plug, deforming said ring into radial contacting engagement with a bore of the firearm.

**5,048,212**
**FIREARM LOCK ASSEMBLY**
**Alan I. Mossberg, St. Petersburg, Fla., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.**
**Filed Jul. 31, 1990, Ser. No. 560,572**
**Int. Cl.[5] F41A** *17/32, 17/46*
**U.S. Cl. 42—70.11** **6 Claims**



1. Lock assembly for a firearm having a receiver, a breech bolt supported for movement between open and closed positions within the receiver, at least two ports defined by the receiver and communicating with the interior thereof when the breech bolt is in an open position, a trigger guard depending from the receiver and cooperating therewith to define a laterally disposed trigger opening, and a trigger supported within the receiver and having an operating part exposed within the trigger opening and moveable relative to the trigger guard between inactive and firing positions, said lock assembly comprising breech bolt locking means for locking said breech bolt in an open position and trigger locking means for providing a closure for the trigger opening and maintaining the trigger in its inactive position including a unitary trigger locking element having a sidewall portion for positioning laterally adjacent an associated side of the trigger guard and an integral wing portion projecting from said sidewall portion for positioning between the trigger operating part and an associated portion of the trigger guard when the trigger is in its inactive position to substantially fill the space between the trigger operating part and the associated portion of the trigger guard, said wing portion projecting through and beyond the trigger guard when said lock assembly is in its lock condition, said wing portion having an aperture for receiving an associated part of the breech bolt locking means therethrough to secure said trigger locking element to the trigger guard, whereby the trigger is secured in its inactive position and the breech bolt is secured in an inactive position when the lock assembly is in locked condition.

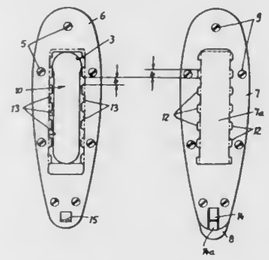
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**5,048,213**
**CLOSURE ARRANGEMENT FOR A GUNSTOCK STORAGE SPACE**
**Blenk Gerhard, Schimmelreiterweg 15, 8965 Wertach, Fed. Rep. of Germany**
**Filed Oct. 17, 1990, Ser. No. 599,301**
**Claims priority, application Fed. Rep. of Germany, Nov. 28, 1989, 8913997[U]**
**Int. Cl.[5] F41C** *23/22*
**U.S. Cl. 42—71.01** **4 Claims**

1. Closure arrangement for a gunstock storage space, with a holding plate which can be attached to the butt plate and which comprises an essentially rectangular access opening through which a storage recess provided in the butt is accessible, with a closure plate which can be latched on the holding plate and which in the latched position closes the access opening, and with a stock cap preferably made of soft rubber which is connected to the closure plate, characterised in that the holding plate (6) is provided with undercut portions (11) at two opposed longitudinal edges of the access opening (10) and that the closure plate (7) is provided with an essentially rectangular attachment (7a) engaging in the access opening (10) and comprising at its longitudinal edges projections (12) which can be inserted under the undercut portions (11) and engage behind



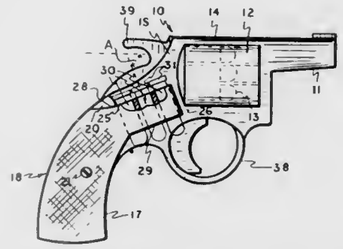
the undercut portions (11) in the latched position of the closure plate (7), such that the closure plate (7) together with the stock



cap (8) attached thereto can be completely removed from the butt (1).

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**5,048,214**
**REVOLVER GRIP WITH CARTRIDGE STORAGE**
**Robert B. Cohen, 151-35 84th St., #2C, Howard Beach, N.Y. 11414**
**Filed Feb. 25, 1991, Ser. No. 660,782**
**Int. Cl.[5] F41C** *23/10*
**U.S. Cl. 42—72.02** **6 Claims**



1. A cartridge-holding grip panel adapted to be mounted upon a revolver having:

a) a cylinder that rotatively holds a plurality of ammunition cartridges for sequential alignment with a breech of the barrel, and

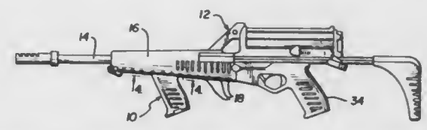
b) a handle portion rearwardly and downwardly disposed from said cylinder and adapted to be embraced by paired grip panels having mounting apertures which permit bolted engagement with the handle portion,

said cartridge-holding grip panel adapted to serve as one of said paired grip panels and comprising: a) an integral structure bounded by inner and outer surfaces, upper and lower extremities and front and rear side edges, and b) a cartridge-receiving portion associated with said upper extremity and having substantially parallel top and bottom surfaces and a plurality of parallel circular cylindrical bores of equal diameter communicating between said top and bottom surfaces, each of said bores adapted to secure a spare cartridge by frictional force.

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**5,048,215**
**FRONT GRIP FOR A FIREARM**
**James C. Davis, Bakersfield, Calif., assignor to Calico Light Weapon Systems, Bakersfield, Calif.**
**Filed Aug. 30, 1990, Ser. No. 575,438**
**Int. Cl.[5] F41C** *23/16, 23/22*
**U.S. Cl. 42—72** **6 Claims**

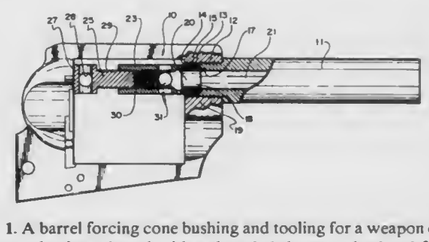
1. A removable optional front grip for a gun, said gun having a barrel and a barrel shroud, said barrel shroud being formed with a row of regularly spaced openings along it's bottom extending longitudinally of said gun, the improvement of said grip comprising a top wall, a plurality lug means on said top wall, one of said lug means having a manually operable locking portion, the spacing of said plurality of lug means matching the regular spacing of said row of openings in said barrel shroud, whereby said front grip may be removably and optionally mounted on said barrel shroud with the use of a plurality of



said barrel shroud openings equal in number to said plurality of lug means, and said plurality of lug means being less than the number of said openings in said row of barrel shroud openings, whereby said grip may be mounted at any one of several different positions on said barrel shroud to accommodate different arm lengths of users of said gun.

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**5,048,216**
**BARREL FORCING CONE BUSHING AND TOOLING**
**Richard J. Casull, P.O. Box 243, Freedom, Wyo. 83120**
**Filed May 14, 1990, Ser. No. 522,666**
**Int. Cl.[5] F41A** *21/00*
**U.S. Cl. 42—76.01** **7 Claims**



1. A barrel forcing cone bushing and tooling for a weapon of a type having a barrel with a threaded throat or lead end for turning in a tapped barrel-receiving bore of the weapon frame, the improvement comprising, an annular bushing having a cylindrical shape with a smooth central opening therethrough for coaxial alignment to a bore of said barrel and is externally threaded; and means for turning said bushing into a tapped barrel-receiving bore of the weapon frame into engagement with a throat or lead end of the barrel that consists of a coupling means formed around a cylinder side end of said bushing and a turning tool means having a coupling means to couple to said bushing coupling means and means for turning said turning tool means to turn also said bushing.

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**5,048,217**
**OVERLAPPING COVER FOR GUNS WITH EXTENDED MAGAZINES**
**Michael D. Easter, 840 J St., Penrose, Colo. 81240**
**Filed Oct. 12, 1990, Ser. No. 597,862**
**Int. Cl.[5] F41A** *35/02*
**U.S. Cl. 42—96** **5 Claims**

1. A protective covering apparatus for guns using an extended magazine positioned beneath the receiver area comprising:

(a) a single flexible cover unit made from a sheet of flexible material including a pouch portion connected to two flap portions and being of sufficient size and shape to enclose the magazine, receiver and trigger of a gun when placed in a closed covering position;

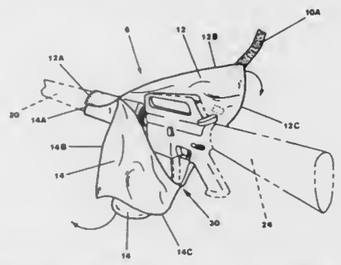
(b) said pouch portion having a mitten-like shape providing

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a cavity therewithin of a size and shape such as to receive the entire extending portion of the gun's magazine;

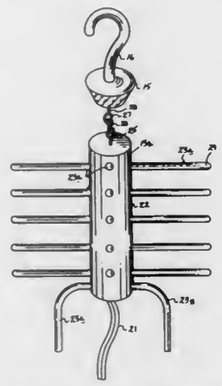
(c) attachment means for attaching the front edge of said flap portions to the hand guard area of a gun whereby the front edges of said flap portions overlap each other and attach said cover unit to the gun when said cover unit is in an open non-covering position; and also fixedly holding the front edges of said flap portions when said cover unit is in a closed covering position whereat the receiver, magazine and trigger of the gun are completely covered; and



(d) attachment means associated with rear edge of said flap portion means for securing and sealing about the butt stock and pistol grip area of the gun whereby said pouch means envelopes the gun's magazine and said flap portion means are overlapped one over another over the top and down the side of the gun's receiver causing one side edge of said flap portions to be positioned along each side of the gun's receiver.

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**5,048,218**
**GAME LURING DEVICE**
**Edwin Stewart, Rte. 6, Box 147, Winchester, Va. 22601**
**Filed Sep. 18, 1990, Ser. No. 585,018**
**Int. Cl.[5] A01M *31/06***
**U.S. Cl. 43—1** **3 Claims**



1. A game luring device comprising in combination,

an elongate longitudinally aligned container defining an open upper end including a cavity defined within the container,

and

an elongate axially aligned fibrous wick core defined by a predetermined porosity is telescopingly mounted within the container,

and

the fibrous wick core includes a rigid wire spine coaxially mounted relative to the fibrous wick core and includes a plug mounted to an upper end of the wire spine,

and

a support hook that is coaxially and orthogonally mounted to an upper surface of the plug above the fibrous wick core,

and

wherein a predetermined quantity of the game luring liquid is contained within the container, and the wick core includes an elongate flexible wick leg coaxially mounted to and extending downwardly of the fibrous wick core into the game luring liquid,

and

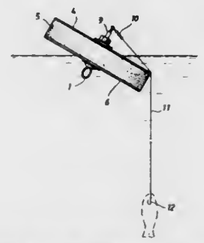
wherein the container includes an opaque upper body portion formed about a major surface of the container and a transparent lower body portion to permit visual observation of available game luring liquid within the container,

and

wherein the wick core is defined as an elongate cylindrical fibrous body and includes a matrix of radially projecting legs mounted orthogonally relative to an exterior surface of the fibrous wick core and defined by a further predetermined porosity greater than the predetermined porosity of the fibrous wick core.

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**5,048,219**
**FREE FLOATING FISH CATCHING DEVICE**
**George Georgescu, 1301 Ann St., Humble, Tex. 77338**
**Continuation-in-part of Ser. No. 436,313, Nov. 13, 1989. This application Apr. 19, 1990, Ser. No. 510,955**
**Int. Cl.[5] A01K *61/00***
**U.S. Cl. 43—4** **8 Claims**



1. A free floating fish catching device, comprising:

(a) a large dimensional generally flat float structure forming substantially a flat top surface having an outer edge and forming a bottom surface;

(b) top and bottom wear resistant plate members respectively engaging said top and bottom surfaces of said float structure and cooperating with said float structure to form said outer edge, said bottom plate member forming a surface having a desired attention attracting appearance;

(c) washer members engaging said top and bottom plate members;

(d) a connector bolt being fixed to said float and extending through the central portion of said top and bottom plate members and through said washer members and having a free end projecting upwardly from the central portion of said top surface;

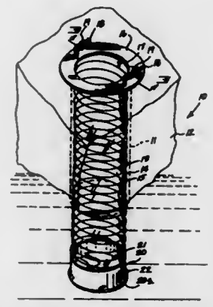
(e) a nut member being threadedly received by said connector bolt and securing said connector bolt, said top and bottom plate members and said washer members in movable relation with said float structure; and

(f) swivel means being secured to said free end of said connector bolt and adapted to receive a hook supporting leader such that said leader extends along said top surface to said outer edge and extends downwardly from said outer edge into the water, whereby the force applied by a fish to said leader is induced downwardly on said outer edge thus causing said float structure to become inverted and expose said bottom surface as an indication that a fish has been caught, said substantially flat top surface forming a water brake to restrain fish movement of said free floating fish catching device and quickly tire the fish.



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**5,048,220**
**ICE FISHING TRAP**
**Dennis L. Harris, 2722 E. 11th St., Cheyenne, Wyo. 82001**
**Filed Sep. 18, 1990, Ser. No. 585,016**
**Int. Cl.[5] A01K *61/00***
**U.S. Cl. 43—4** **6 Claims**



1. An ice fishing apparatus for positioning through an elongate opening within an ice sheet, wherein the apparatus comprises,

an elongate cylindrical body, the cylindrical body including an upper terminal end and a lower terminal end, wherein the cylindrical body is coaxially aligned and wherein a rigid annular ring is fixedly mounted coaxially to the upper terminal end, and

a rigid cylindrical tubular base is coaxially and integrally mounted to the lower terminal end, and

trap means mounted within the cylindrical base for securement of a fish directed through the cylindrical base when the cylindrical body is positioned within the elongate opening, and

wherein the cylindrical body includes an elongate reinforcing helical wire coaxially directed through the cylindrical body coaxially aligned about the cylindrical body, and a flexible covering sheet fixedly mounted to the helical wire, wherein the helical wire is flexible and permits extension and retraction of the cylindrical body to accommodate the elongate opening, and

wherein the covering sheet is transparent, and

wherein the cylindrical base is rigid and wherein the trap means includes a trap door member, the trap door member mounted adjacent a cylindrical base lower terminal end, and the cylindrical base lower terminal end flared outwardly to provide an enhanced support for apparatus during storage.

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**5,048,221**
**CATCH AND RELEASE TRAP**
**Vincent J. Kunkel, 19075 East Shore Dr., Kimball, Minn. 55353**
**Filed Jan. 3, 1990, Ser. No. 460,358**
**Int. Cl.[5] A01K *97/14***
**U.S. Cl. 43—6** **15 Claims**

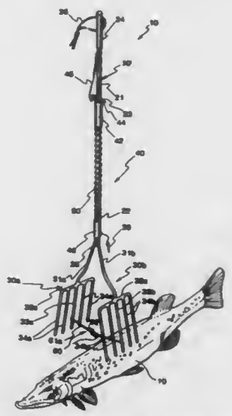
15. An apparatus for releasibly grasping objects, comprising:

an elongated handle having first and second ends;

a pair of grasping hands, each hand having a stem end pivotally connected to the first end of the handle and a grasping end;

closer force means operably connected to the handle and the grasping hands for selectively exerting a force tending to bring together the grasping ends of the grasping hands, said closer force means comprising a closer sleeve surrounding the stem ends of the grasping hands and resilient means for urging the closer sleeve to move along the stem ends of the grasping hands in the direction of the grasping ends; and

trigger means operably connected to the grasping hands for selectively opposing the force means and holding the grasping ends of the grasping hands apart, said trigger means comprising a first trigger link pivotally connected to one of said grasping hands and positionable to have a free end extend generally perpendicular to said one grasping hand and toward the other grasping hand and a second trigger link pivotally connected to said other grasping hand and positionable to have a free end extend generally perpendicular to said other grasping hand and toward said one grasping hand, the free ends of said first and second trigger links being engagable to form an overcenter trip mechanism that resists the closer force means until tripped, said trigger means being responsive to contact with an object located between the grasping ends of the grasping hands to cease selectively opposing the force means and to permit the grasping ends to pivot rapidly toward each other.



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**5,048,222**
**CRAB CATCHER**
**Robert P. Correll, P.O. Box 57, Benedict Ave., Benedict, Md. 20612**
**Filed Aug. 31, 1990, Ser. No. 575,669**
**Int. Cl.[5] A01K *73/00, 74/00***
**U.S. Cl. 43—9.1** **14 Claims**

1. An aquatic animal catcher for mounting to a boat under and adjacent to the surface of the water next to the boat, comprising:

an elongated mesh basket having an open end, said open end facing in the direction of motion of the boat;

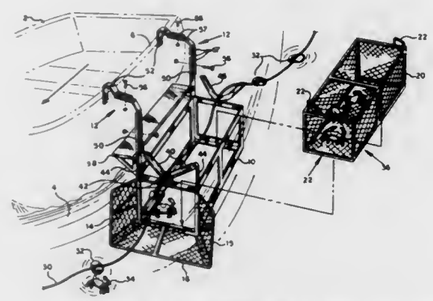
a frame for mounting said basket to the boat, said frame adapted to removably hold said basket in position; and

means for guiding a baited line along a path above said open end as the boat moves, whereby

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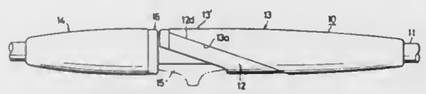


aquatic animals feeding on the baited line may be swept into said open end of said basket and held therein by the motion of the boat and said basket may be lifted away from said frame when full.



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5,048,223
FISHING ROD
Shigeru Yamamoto, and Masaru Akiba, both of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Tokyo, Japan
Continuation of Ser. No. 463,861, Jan. 5, 1990, abandoned, which is a continuation of Ser. No. 264,086, Oct. 28, 1988, abandoned. This application Oct. 12, 1990, Ser. No. 595,775
Claims priority, application Japan, Oct. 31, 1987, 62-167195; Sep. 22, 1988, 63-124978; Oct. 17, 1988, 63-135158
Int. Cl.[5] A01K *87/06*
U.S. Cl. 43—22 5 Claims

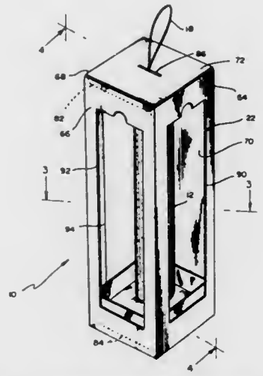


1. A fishing rod comprising:
a rod stem member subject to bending upon catching of a fish;
a spinning reel mounting member secured to an outer periphery of said rod stem member for engaging to reel leg fixing portion at a lower side of the rod stem member; and
at least two grip members likewise secured to the outer periphery of said rod stem member, one end of a first grip member being bonded to one end of said spinning reel mounting member and forming a bonding surface which extends from behind a spinning reel mounted on a bottom surface of said rod obliquely upwardly and forward towards a rod tip to a position above said spinning reel and adjacent to a second, forwardly positioned grip member, said bonding surfaces being exposed to exfoliative stresses upon bending, said bonding surfaces being oblique relative to the axis of said rod stem member, whereby to disperse the exfoliative stresses without damage upon bending.

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5,048,224
INSECT TRAP
Steven Frisch, Brooklyn, N.Y., assignor to Atlantic Paste & Glue Co., Inc., Brooklyn, N.Y.
Filed May 11, 1990, Ser. No. 522,265
Int. Cl.[5] A01M *1/14*
U.S. Cl. 43—114 33 Claims

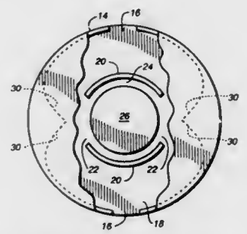
1. An insect trap comprising
an elongated member having a first end, a second end and an outer surface,
a non-drying adhesive layer disposed on said outer surface, at least one end cap mounted on one end of said elongated member,



a container enclosing said elongated member and said end cap, with said container comprising a plurality of panel portions, and with at least one of said panel portions comprising a removable perforated portion.

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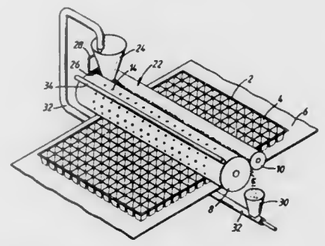
5,048,225
INSECT FEEDING STATION
Eugene Brandli, Issaquah, Wash., assignor to The Clorox Company, Oakland, Calif.
Continuation of Ser. No. 180,718, Apr. 4, 1988, Pat. No. 4,894,947, which is a continuation of Ser. No. 681,079, Dec. 12, 1984, abandoned, which is a continuation of Ser. No. 406,671, Aug. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 251,684, Apr. 6, 1981, abandoned. This application Jun. 8, 1989, Ser. No. 363,324
The portion of the term of this patent subsequent to Jan. 14, 2003, has been disclaimed.
Int. Cl.[5] A01M *1/20*
U.S. Cl. 43—131 1 Claim



1. An insect feeding station for administering poison to insects, said feeding station comprising a base portion and a cover secured thereto, said base portion comprising a floor, an outer wall having a plurality of openings, an inner wall spaced apart from said outer wall and having a plurality of openings, said inner wall openings being offset in a horizontal plane from said outer wall openings, said inner wall forming an inner feeding compartment containing a solid poisoned bait positioned substantially at the center of said floor, and means on the interior of said outer wall for guiding insects toward said openings in said inner wall.



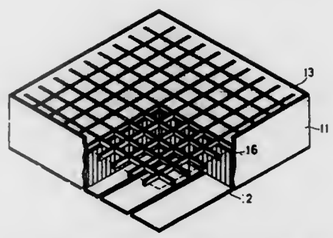
5,048,226
APPARTUS FOR SELECTING AND DISCHARGING SEEDS
Thomas W. Hamilton, Stoke Poges, United Kingdom, assignor to T W Hamilton Design Limited, United Kingdom
Continuation of Ser. No. 174,247, Mar. 28, 1988. This application Feb. 28, 1990, Ser. No. 486,439
Claims priority, application United Kingdom, Apr. 11, 1987, 8708734
The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.
Int. Cl.[5] A01G *1/04*
U.S. Cl. 47—1.01 10 Claims



1. A seeding machine comprising:
first and second movable surfaces, making contact along a common axis and thereafter separating to define a seed trough;
means for moving the surfaces away from the common axis to cause any seeds in the trough to tumble continuously, one of said surfaces defining a plurality of openings;
a source of pressure difference; and
means coupling said openings to said source of pressure difference to enable an individual seed to be attracted to each opening and to allow said one surface to carry the individual seeds to a location for discharge.

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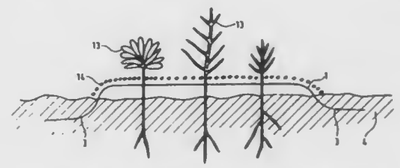
5,048,227
METHOD OF CULTIVATING *AGARICUS BLAZEI* MUSHROOM
Junya Okubo, 1-1-3 Koganemachi, Kokurakita-ku, Kitakyushu-shi, Fukuoka; Kazukuni Kuramoto, 2-8-9 Tamachi, Yahatanishi-ku, Kitakyusbu-shi, Fukuoka, and Shinji Ohkubo, 2-5-5-103 Yokoyama, Sagamihara-shi, Kanagawa, all of Japan
Filed May 4, 1989, Ser. No. 347,747
Claims priority, application Japan, May 5, 1988, 63-109137; Dec. 23, 1988, 63-223695
Int. Cl.[5] A01G *1/04*
U.S. Cl. 47—1.1 12 Claims



1. In a method of producing fruit bodies of an edible mushroom comprising the steps of inoculating in a plurality of locations with a spawn of *Agaricus blazei* onto a compost bed, allowing the spawn to run on the compost bed, and then casing the compost bed with casing soil, thereby causing the fruit bodies to be produced, the improvement wherein said casing covers the surface of the compost bed, and at least one obstacle is buried underneath the top surface of said casing soil and placed at a position of a spawn aggregation layer of the *Agaricus blazei* which is formed above the surface of said compost bed in said casing soil.

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5,048,228
COMPOSITE AGROTEXTILE AND ITS APPLICATIONS
Jean L. Neveu, and Philippe Gregoire, both of Colmar, France, assignors to Holzstoff Holding S.A., Basel, Switzerland
Filed Jul. 6, 1989, Ser. No. 376,027
Claims priority, application France, Jul. 7, 1988, 88 09240
Int. Cl.[5] A01G *7/00*
U.S. Cl. 47—9 12 Claims



1. A composite agrotextile, comprising an elementary porous sheet which is permeable to air and water having a woven, knitted or nonwoven structure and a substantially rectangular shape with a direction of elongation, said elementary porous sheet having side strips joined thereto at least along said direction of elongation, said side strips being produced from a flexible and smooth sheet of plastic of closed structure having greater elasticity than said elementary porous sheet.

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5,048,229
TREE TRUNK PROTECTOR
Van-De R. Campbell, 1330 NW. 56th Ave., Lauderhill, Fla. 33313
Filed Oct. 28, 1988, Ser. No. 246,876
Int. Cl.[5] A01G *17/12*
U.S. Cl. 47—24 3 Claims



1. A tree protector comprising at least two middle piece members each having an upper edge, a lower edge, a pair of parallal side edges and thickness adapted to enclose the trunk of a tree in order to protect the same from damage, and a series of at least four locking devices, each locking device having a channel-like cross-section of a width adapted to receive side members and having a length adapted to enclose a portion of said tree, at least two of said locking devices adapted to rest on a ground or earth surface about said tree and to receive said members in mutually locking-staggered relationship about said tree, and at least two of said locking devices adapted to engage the upper edge of said members in mutually locking staggered-relationship.

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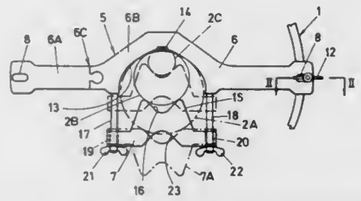


5,048,230

## SUPPORT FOR CHRISTMAS TREE OR ANALOGOUS ELEMENTS

Félicien Bernardy, Rue de Grendel 4, 6702 Attert, Belgium

PCT No. PCT/BE88/00020, § 371 Date Jan. 27, 1989, § 102(e) Date Jan. 27, 1989, PCT Pub. No. WO88/09638, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 1, 1988, Ser. No. 320,099
Claims priority, application Belgium, Jun. 2, 1987, 8700612
Int. Cl.[5] A47G *33/12*
U.S. Cl. 47—40.5 19 Claims



1. A stand device for a plant having a large diameter trunk which comprises

a receptacle in which said trunk can be inserted and which has a bottom and an upwardly-extending side that defines a peripheral upper edge. and

a support means for supporting said trunk in position within the receptacle, said support means including

an elongated first retaining element which has first and second fastening means for connection to two spaced-apart locations on the peripheral upper edge of said side of said receptacle, and

a second retaining element which has attachment means for adjustably attaching said second retaining element to said first retaining element in order to clamp said trunk therebetween,

said first retaining element defining a recessed first support zone for a trunk and said second retaining element including a protruding portion which defines a recessed second support zone for a trunk, said protruding portion being extendable into said recessed first support zone of said first retaining element but never contacting said first retaining element.

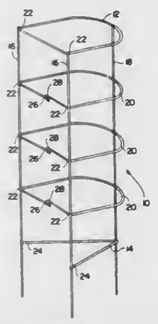
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5,048,231

## PLANT SUPPORT CONSTRUCTED FOR COMPACT NESTING

Dwight C. Brown, 1516 N. Nicholas St., Arlington, Va. 22205

Filed Aug. 1, 1990, Ser. No. 561,469
Int. Cl.[5] A01G *17/06*
U.S. Cl. 47—45 20 Claims



1. A plant support, comprising:

at least three vertical supports each having a top portion and a lower portion acting as a stake for insertion into the ground;

a continuous top horizontal support having a substantially fixed shape connected to said top portions of said vertical supports; and

at least one discontinuous horizontal support having an open side and connected to said vertical supports, said discontinuous horizontal support being located below said top horizontal support providing an assembly with an open side and sufficient space to allow side loading and compact nesting of a plurality of plant supports when not in use.

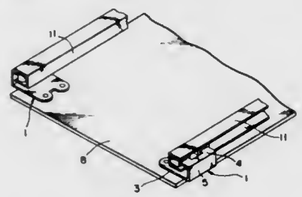
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5,048,232

## SLIDER FOR DOOR WINDOWS OF VEHICLES AND METHODS OF MANUFACTURING THE SAME

Tokio Miyagawa, Yokohama; Yasukazu Nomura, Nirasaki, and Tsuji Hitoshi, Utsunomiya, all of Japan, assignors to Mitsui Kinzoku Kogya Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1990, Ser. No. 553,293
Claims priority, application Japan, Jul. 22, 1989, 1-189678
Int. Cl.[5] E05D *15/16;* E05F *11/38*
U.S. Cl. 49—440 1 Claim



1. A slider for door windows of vehicles, comprising a metal slide base comprising a base frame fixed to a door window glass, a sub-frame parallel with said base frame spaced at a predetermined distance from the base frame and having at least one mounting member, a side frame connecting end portions of the base frame the sub-frame; and slide pieces of a synthetic resin having at their inner end sections bifurcated portions with inserted rubber rods molded on said mounting members by using metal molds arranged with reference to said base frame; said bifurcated portions being slidably engaged with a guide rail fixed to an inner portion of a door.

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5,048,233

## REFRIGERATOR DOOR AND METHOD OF MANUFACTURING SAME

Edward D. Gidseg, Manhasset, and Jan Ganik, Fresh Meadows, both of N.Y., assignors to Northland Corporation, Greenville, Mich.

Continuation of Ser. No. 45,647, May 1, 1987, abandoned. This application Aug. 29, 1990, Ser. No. 576,145
Int. Cl.[5] E06B *3/00*
U.S. Cl. 49—501 17 Claims

1. A door for at least partially obstructing an opening in cabinet means of the type wherein the temperature inside the cabinet is normally different from the outside temperature, which comprises:

a plurality of frame members of predetermined configuration, each said frame member having a first section in thermal contact with the inside of the cabinet means and a second section in thermal contact with the outside of the cabinet means;

means to prevent thermal conductivity at least between portions of said first and second sections;

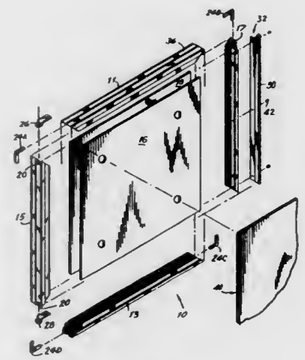
means to attach each of said frame members to an adjacent member so as to form a rectangular frame of predetermined dimensions;

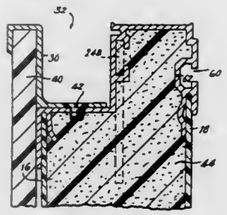
front and rear panel members configured and adapted for insertion into said frame members so as to be retained in parallel spaced relation;

means to mount said plurality of frame members upon a structural member such as cabinet means, each of said mounting means being respectively attached to opposed frame members; and

thermal insulation medium positioned within the door interior space defined between said frame members and said front and rear panel members;







said means to prevent thermal conductivity comprising a continuous slot formed in each of said frame sections disposed between said first and second sections and including a generally U-shaped wall extending across said slot and inwardly toward said door interior space, said wall having a continuous cut formed therein, wherein said first sections and said rear panels are maintained in assembled relationship with the door by adhesion to said thermal insulation medium.

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5,048,234

## ENERGY ABSORBING MODULAR DOOR

Ian V. Lau, Troy, and Jeffrey A. Welch, St. Clair Shores, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

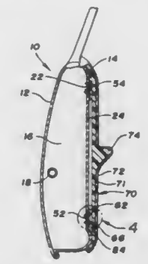
Filed Dec. 24, 1990, Ser. No. 633,629
Int. Cl.[5] B60J *5/04*
U.S. Cl. 49—502 4 Claims

1. A vehicle door comprising:

a door inner panel and door outer panel attached together to form a door hingedly mounted on the vehicle body, said inner panel having an opening therein,

a module panel having door components mounted thereon and adapted for mounting in the inner panel within the opening of the inner panel,

and a plurality of energy absorbing means extending between the module panel and the door inner panel to effectively mount the module panel on the door and enable



energy absorbing movement of the module panel relative to the door upon impact of the occupant against the door.

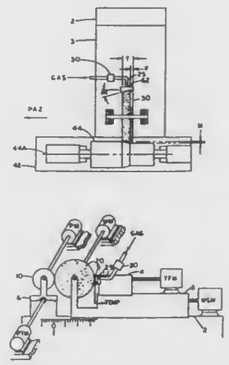
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5,048,235

## PREDICTIVE HIGH WHEEL SPEED GRINDING SYSTEM

Roderick L. Smith, 2012 Greenfield La., Rockford, Ill. 61107

Filed Nov. 15, 1988, Ser. No. 271,721
Int. Cl.[5] B24B *53/00*
U.S. Cl. 51—5 D 4 Claims



1. In a grinding machine, the combination comprising a resin bonded grinding wheel mounted from rotation about its axis and means for rotationally driving the wheel, said wheel having a face engageable with a workpiece for producing grinding action; a truing element having an operative surface conforming to the desired shape of the wheel face in a direction parallel to the wheel axis; means for thermally insulating the truing element from the machine support to minimize heat flow from the truing element to the machine support; and means for relatively feeding the wheel face into relative rubbing contact with the operative surface of said truing element while heating the wheel face with heat from a source in addition to the normal friction between the wheel face and the truing element to weaken the resin binder sufficiently to release the worn grit material of the wheel and expose fresh grit material.

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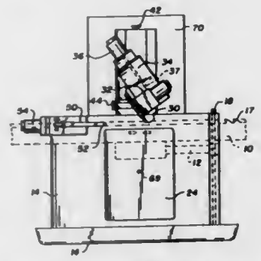


5,048,236

## SAW BLADE TOOTH GRINDER FOR SAWS

Christopher C. Williams, Port Moody, Canada, assignor to Williams & White Machine Shop, Burnaby, Canada

Filed Nov. 29, 1989, Ser. No. 443,423
Int. Cl.[5] B24B *3/36*
U.S. Cl. 51—77 BS 7 Claims



1. An apparatus for grinding saw teeth on a blade, comprising:

saw blade mounting means,

saw blade indexing means for indexing a saw tooth to move in a first plane on the mounting means, the saw blade indexing means operated by a first servo motor,

a grinding head having means to grind a saw tooth,

grinding head travel means to move the grinding head in a second plane, the second plane being at an angle of about 35° from the perpendicular of the first plane, the grinding head travel means operated by a second servo motor,

control means, wherein said servo motors are simultaneously actuated by a programmed computer, for controlling movement of the saw blade in the first plane, and at the same time controlling movement of the grinding head in the second plane such that the blade and the grinding head are moved simultaneously during grinding of a curved portion of the saw tooth to ensure a predetermined curved saw tooth profile is ground.

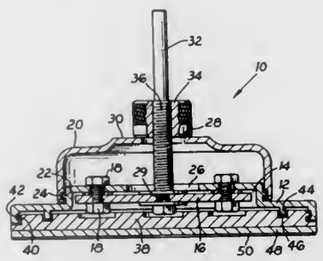
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5,048,237

## ATTACHMENT FOR A POWER TOOL

Julien J. L. Lankry, Hillcrest, Brookdale Road, Gatley, Cheadle, Cheshire, SK7 2NW, England

Filed Apr. 27, 1990, Ser. No. 516,124
Claims priority, application United Kingdom, Nov. 28, 1989, 8926883
Int. Cl.[5] B24B *45/00*
U.S. Cl. 51—168 9 Claims



1. An attachment for a power tool comprising a drive shaft, a disc extending transversely to the drive shaft, said disc being adapted to receive at least one of an abrasive or buffering element and said drive shaft being laterally angularly movable relative to the disc, and locking means selectively operable to hold the disc substantially rigidly with respect to the drive shaft, characterised by flexible membrane means intermediate and linking the disc and drive shaft and susceptible to the action of the locking means in controlling relative lateral angular movement therebetween, said locking means being operable to move said shaft to a position withdrawn relative to the abrasive or buffering element, in such position the shaft and disc being held rigidly with respect to each other.

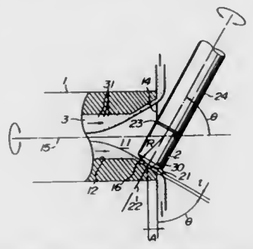
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5,048,238

## NON-CONTACT MACHINING OF SPHERICAL SURFACE

Mitsuakira Ikeda, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jul. 11, 1990, Ser. No. 550,987
Claims priority, application Japan, Jul. 11, 1989, 1-178584
Int. Cl.[5] B24B *11/00, 57/02*
U.S. Cl. 51—317 13 Claims



1. A method of machining a spherical surface of a workpiece with a tubular jig which is rotatable about a first axis, a first end, a second end opposite to said first end, and a through passage extending along said axis from said first end to said second end, the passage having an inlet at the first end and an outlet at the second end, the outlet having a tapered surface spreading outwardly at a peripheral edge thereof, said method comprising the steps of:

rotating the tubular jig about said first axis;

rotating the workpiece about a second axis which is inclined a predetermined angle with respect to said first axis;

supplying a fluid lubricant-coolant which contains suspended abrasive particles from said inlet through said passage toward said outlet, so that a highly packed flowing layer of abrasive particles is produced on and along said tapered surface under centrifugal forces generated by the rotation of said tubular jig; and

pressing the spherical surface of the workpiece against said flowing layer of abrasive particles while said tubular jig and said workpiece are being rotated about said first and second axis, respectively,

wherein said spherical surface of the workpiece has a radius of curvature R which is expressed by:

$$R = \frac{1}{2\sin^2\theta}(C\sin\theta - 2A\cos\theta) - t$$

where $\theta$ is the angle of the tapered surface with respect to a plane which extends perpendicularly to said first axis, C is the outside diameter of the tapered surface, A is the distance from an outer edge of the tapered surface to the position where the workpiece is machined, and t is the thickness of the abrasive particle layer.

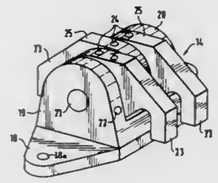


5,048,239

## APPARATUS FOR MOUNTING A DECOMPRESSION WALL PANEL IN AN AIRCRAFT OR SPACECRAFT

Wolfhard Filitz; Robert Finkbeiner, and Harald Knothe, all c/o Deutsche Airbus GmbH, Patent Dept., P.O. Box 107845, D 2800 Bremen 1, Fed. Rep. of Germany

Filed Jun. 22, 1990, Ser. No. 542,923
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1989, 3922025
Int. Cl.[5] E05C *9/02*
U.S. Cl. 52—1 10 Claims



1. An apparatus for mounting a decompression wall panel to a wall for normally closing a hole in said wall, comprising locking means for releasably securing said panel to a frame surrounding said hole with a first frame flange bearing against said wall and a second frame flange bearing against said panel, said locking means comprising a lock body securable to said frame on a side opposite said frame flanges, at least one first locking lever tiltable in one direction for holding said first frame flange against said wall, at least one second locking lever tiltable in the opposite direction for holding said panel against said second frame flange, journal means secured to said lock body for tiltably mounting said first and second locking levers to said lock body, and shearing means for securing said first and second locking levers against rotation relative to said lock body to prevent tilting of said locking levers about said journal means under normal operating conditions, said shearing means shearing in response to a predetermined pressure difference across said wall panel for permitting movement of said wall panel in any one of two opposite directions.

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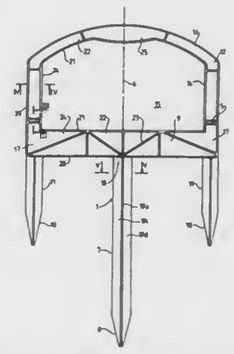
5,048,240

## REMOVABLE COMPONENT FOR FASTENING AN ELEMENT TO BE FASTENED TO THE GROUND AND METHOD FOR IMPLEMENTATION THEREOF

Pascal Dupre, Ablis, and Guy Lavo, Bonneval, both of France, assignors to Societe a Responsabilitee Limitee DL System, France

Filed Jun. 5, 1990, Ser. No. 533,336
Claims priority, application France, Jun. 5, 1989, 89 07405
Int. Cl.[5] E04D *1/34*
U.S. Cl. 52—4 38 Claims

1. A component for removably fastening a sheet-like element to the ground, said component having means for clamping the sheet-like element against the ground including a guard, an elongated principal peg having one end rigidly connected to the guard and the other end being free for passing through the sheet-like element and embedment in the ground, an elongated secondary peg being rigidly connected to said guard and extending parallel to said principal peg, said secondary peg having a free end for embedment in the ground, and a handle rigidly connected to one of said guard and principal peg and extending from said guard on a side opposite said pegs so that when the component is embedded in the ground to fasten a sheet-like element thereto, said handle is permanently visible and accessible above the ground and element.



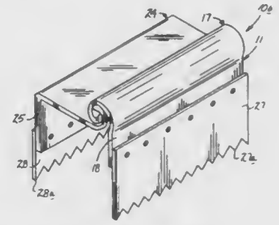
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5,048,241

## LAWN EDGING APPARATUS

Justin J. Gavin, Jr., c/o Cabin 1 820 Water St., Prairie du Sac, Wis. 53578

Filed Feb. 5, 1990, Ser. No. 475,224
Int. Cl.[5] E02D *2/00*; A01G *1/00*
U.S. Cl. 52—102 1 Claim



1. A lawn edging apparatus comprising,

a first shield means for piercing securement into an underlying ground surface, and

a second shield means for overlying the ground surface, and

the first and second shield means each including a respective first and second free edge, and

each first and second shield means further including a respective first and second edge means for pivotal securement together for permitting pivotment of the first shield means relative to the second shield means, and

wherein the first shield means includes a first planar wall member, the first planar wall member terminating in the first free edge at one end and in the first edge means at the other end, the first free edge and the first edge means aligned parallel relative to one another and the first edge means of a generally "J" shaped configuration, and the second shield means including a second planar wall member terminating in the second free edge at one end and in the second edge means at the other end, wherein the second edge means is of a generally "J" shaped configuration, the second edge means slidably receivable within the first edge means longitudinally thereof, and

wherein the first edge means defines a first arcuate interior surface to complementarily receive an exterior surface of the second edge means, and

wherein the first edge means and the second edge means are

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continuous throughout and coextensive with the respective first and second planar wall member respectively, and

wherein the second planar wall member includes a third planar wall member mounted integrally and orthogonaly relative to the first planar wall member remote from the second edge means, and

wherein the first shield means and the second shield means are formed of a semi-rigid polymeric material, and

wherein the third planar wall member includes a second serrated plate mounted coextensively to a lowermost end thereof defined by a second length, and wherein the first planar wall member includes a first serrated plate mounted coextensively therewith, wherein the first serrated plate is defined by a first length, wherein the first length is greater than the second length.

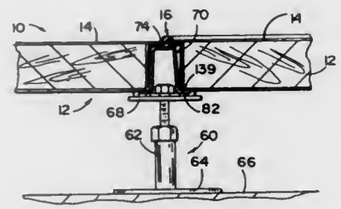
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**5,048,242**

## ACCESS FLOOR SYSTEM WITH HEMMED EDGE PANEL

**Steven D. Cline, Hastings, Mich., assignor to C-Tec, Inc., Grand Rapids, Mich.**

**Filed Apr. 4, 1990, Ser. No. 504,291**
**Int. Cl.[5] E04B *5/57***
**U.S. Cl. 52—126.6** **15 Claims**




1. An access floor system, comprising:

a plurality of floor panels, each panel including a pan having a bottom, a sidewall, and a generally horizontally extending peripheral flange joined to said sidewall;

a top plate juxtaposed on said pan, said top plate including a peripheral portion which is configured to extend around and under said flange of said sidewall pan to define a hemmed edge;

a plurality of support pedestal assemblies, each assembly including a support plate configured to support said floor panels at their corners; and

a plurality of elongated trim pieces positioned on the hemmed edge, each of said trim pieces being generally U-shaped in cross section and each including an upper leg, a base and a lower leg, said legs being joined to said base with each leg including a free end, and wherein the free end of said lower leg defines an upstanding portion dimensioned to snap over and capture said hemmed edge.

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**5,048,243**

## EARTHQUAKE RESTRAINT MECHANISM

**John D. Ward, 3640 Cincinnati, Rocklin, Calif. 95677**

**Continuation-in-part of Ser. No. 167,062, Mar. 11, 1988, abandoned. This application Oct. 17, 1988, Ser. No. 258,359**
**Int. Cl.[5] E04B *1/98***
**U.S. Cl. 52—167 R** **9 Claims**

1. An earthquake restraint mechanism, for use with buildings of the type having structural members, the structural members including a plurality of wall panels, the wall panels having first surfaces, second surfaces, side edges and upper edges, the wall panels being mounted with the side edges of wall panels adjacent other wall panels, comprising:

a restrainer assembly coupling a first of the wall panels to an adjacent, second wall panel, the restrainer assembly including:

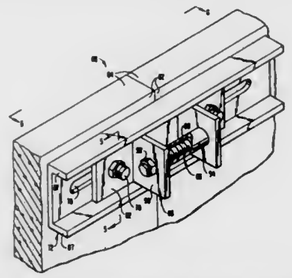
a first restrainer mount secured to the first wall panel and a second restrainer mount secured to the second wall panel;

a restrainer coupling the first and second restrainer mounts;

at least one of the restrainer and restrainer mounts including panel to panel shock absorbing structure;

first and second alignment plates positioned against the first and second surfaces of the first and second wall panels, the first and second alignment plates including through holes;

fastening elements passing through the through holes in the



first and second alignment plates and passing through the first and second wall panels;

the first and second restrainer mounts secured to the first alignment plate by the fastening elements, the fastening elements and alignment plates adapted to permit movement of the wall panels in a plane defined by the wall panels but to inhibit other movement of the wall panels;

whereby the restrainer assembly helps keep the first wall panel and the second wall panel from falling down after the building has been subjected to an external force.

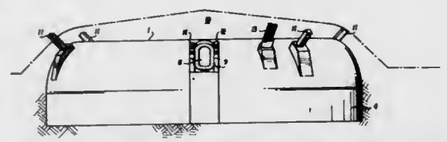
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**5,048,244**

## UNDERGROUND SHOCK-RESISTANT STRUCTURE

**Marcel M. Barbier, Herndon, Va., assignor to Marcel M. Barbier, Inc., Herndon, Va.**

**Filed Jun. 7, 1990, Ser. No. 536,388**
**Int. Cl.[5] E02D *29/00*; E04H *9/12***
**U.S. Cl. 52—169.6** **13 Claims**



1. An underground shock-resistant, substantially annular structure comprising:

a) a vaulted roof having a substantially annular configuration as viewed from above having inner and outer edges and a generally elliptical configuration as viewed in cross-section, the inner and outer edges of said roof extending downwardly and having inner and outer substantially ring configurations, respectively, as viewed from above; and

b) a base member having a substantially annular configuration as viewed from above and having inner and outer edges, said inner and outer edges of said base member joining said inner and outer edges, respectively, of said vaulted roof;

c) the external surface of said elliptical vaulted roof having a continuous convex configuration with a slowly varying radius of curvature;

d) whereby overpressures and shockwaves striking the external surface of said vaulted roof are deflected by said surface.

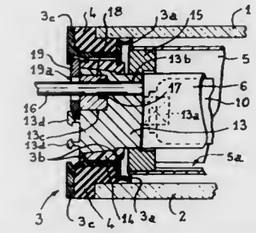


**5,048,245**

## DOUBLE-GLAZING INSULATING PANEL

**René Bresson, Gray, and Guy Grossard, Chargey, both of France, assignors to S I M U, Gray, France**

**Filed Oct. 10, 1990, Ser. No. 594,952**
**Claims priority, application France, Oct. 20, 1989, 89 14092**
**Int. Cl.[5] E06B *7/12***
**U.S. Cl. 52—171** **11 Claims**




1. In a double-glazing insulating panel having two panes sealed to a frame so as to create a space therebetween and wherein the frame includes upper and side walls the improvement comprising, a cradle element mounted in the spaces within the panel adjacent the upper wall, a rotatable drum having first and second end portions, a screen supported by said drum, an elongated slot in said cradle element through which said screen extends, a drive mechanism mounted within said drum, first mounting means for rotatably supporting said first end of said drum within said cradle element, means for drivingly connecting said drive mechanism to said drum, an opening in one of the side walls of the frame, said opening being axially aligned with said drum, said drive mechanism being selectively axially slidable relative to said drum through said opening, a stopper assembly removably mounted in sealing relationship within said opening, and said second end of said drum being supported within the panel by said stopper assembly.

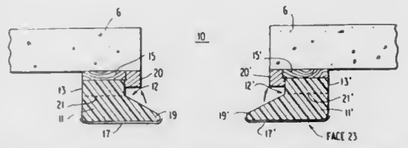
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**5,048,246**

## WEDGE SEAL FOR LOADING DOCK SHELTER

**Vince P. Sullivan, Columbia, Md., assignor to Serco Corporation, Ontario, Canada**

**Continuation of Ser. No. 412,377, Sep. 26, 1989, abandoned. This application Aug. 21, 1990, Ser. No. 569,600**
**Int. Cl.[5] E04H *9/14, 14/00***
**U.S. Cl. 52—173 DS** **16 Claims**




1. A seal usable at a loading dock opening to seal an opening adjacent endwalls of the loading dock and a vehicle positioned at the loading dock opening, said seal comprising;

a foam sealing member vertically mountable on each loading dock endwall, each foam sealing member having a first foam portion outwardly projecting from an endwall, a second foam portion projecting outward from said first portion having an elongated tapered flexible pad extending in a direction toward said opening, each foam sealing member having a recess where said first and second portions meet, said recess defined by a vertical surface of the elongated tapered flexible pad and an adjoining vertical surface of said first portion projecting from said sidewall, said vertical surfaces forming an obtuse angle between them, wherein as said vehicle moves to said loading dock, said elongated tapered flexible pad of each foam sealing member engages the rear of said vehicle and deflects without substantial bulging deformation of said foam sealing member into the door opening to create a seal between said vehicle and the loading dock opening; and

means to mount said foam sealing members to said endwalls.

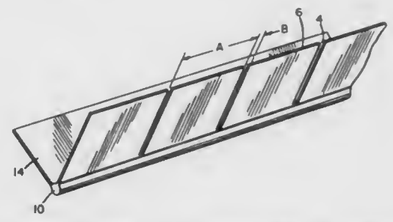
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**5,048,247**

## ARCH CORNER BEAD

**Michael D. Weldy, 1320 Dewey Pl., Campo, Calif. 92006**

**Filed Nov. 13, 1989, Ser. No. 436,073**
**Int. Cl.[5] B32B *3/26, 1/04***
**U.S. Cl. 52—255** **20 Claims**




1. A beaded drywall corner strip suitable for reinforcing corners of arches, comprising:

an elongated "L" shaped plastic strip having two flat legs, said legs joined forming an acute inside angle;

a substantially cylindrical solid bead formed in continuum with said legs at the junction of said angle;

one of said legs containing a plurality of spaced kerfs, said kerfs providing a means for the strip to follow curves without buckling, tearing or overlapping; and

the outside surface of said legs having surface means to adhere to joint compound.

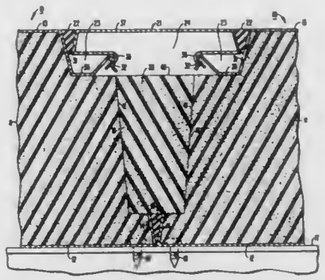
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**5,048,248**

## NON-DIRECTIONAL COMPOSITE FOAM PANEL SIDE JOINT

**Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237**

**Continuation-in-part of Ser. No. 336,739, Apr. 12, 1989. This application Jun. 20, 1989, Ser. No. 370,133**
**Int. Cl.[5] E04C *1/00***
**U.S. Cl. 52—309.9** **21 Claims**



1. A building panel assembly comprising panel members, said members comprising an outer metal facing sheet forming an exterior panel surface, an inner metal facing sheet forming an interior panel surface, and a structural foam core, said inner metal facing sheet being characterized as having a width of specific dimension defined by two parallel edges, said outer metal facing sheet being also characterized as having a width defined by two parallel edges which is less than the width of said inner metal facing sheet, said structural foam core being

characterized as having substantially parallel top and bottom surfaces adhesively connected to said outer metal and inner metal facing sheets and being further characterized wherein said top surface is of a width substantially coincident with the width of said outer metal facing sheet and said bottom surface is of a width substantially coincident with the width of said inner metal facing sheet such that said structural foam core possesses sloping side walls and wherein said panel members abut approximately at the parallel edges of adjacent inner metal facing sheets, a foam plug having a top surface and sloping side walls frictionally engaging the sloping side walls of the structural foam cores of adjacent panel members and an exterior joint cover covering over the top surface of said foam plug and contacting said outer metal facing sheets of adjacent panel members.

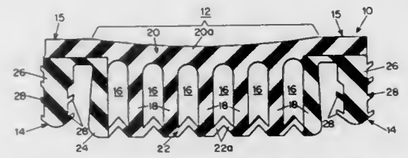
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**5,048,249**

## GASKET FOR FLUSH EXPANSION JOINT COVER

**Thomas A. Shreiner, Muncy, and Paul Moulton, Williamsport, both of Pa., assignors to Construction Specialties, Inc., Cranford, N.J.**

**Filed Dec. 26, 1990, Ser. No. 634,013**
**Int. Cl.[5] E04B *1/62*; E01C *11/04***
**U.S. Cl. 52—403** **4 Claims**




1. A gasket for a longitudinally elongated expansion joint cover, comprising:

a longitudinally elongated central body portion; and

two longitudinally elongated side portions, one at either transverse edge of the central body portion,

said central body portion and said side portions being composed of co-extruded thermoplastic rubber of different hardnesses, the hardness of the central body portion being less than the hardness of the side portions, so that the central body portion is sufficiently flexible to accommodate movement of the expansion joint cover and the side portions are sufficiently rigid to resist displacement of the gasket from engagement with members of the expansion joint cover,

said central body portion including a multiplicity of longitudinally elongated side-by-side hollow cells defined in cross section by transversely spaced apart generally vertical walls and vertically spaced apart generally transverse walls interconnecting the respective top and bottom edges of adjacent vertical walls, the bottom wall of each cell having upwardly converging angularly related segments adapted to fold into the space within the cell upon transverse compression of the central body portion,

said generally transverse upper wall of said central body portion having, at least when said central body portion in the relaxed state, a slightly concave upper surface,

each of said side portions being generally U-shaped in transverse cross section and opening downwardly, with a upper closed end thereof having a generally flat upper surface which is generally flush with the adjacent upper surface of said central body portion,

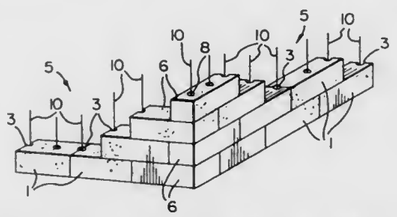
a transversely inner leg of each side portion forming a transversely outer vertical wall of the adjacent, cell of the central body portion and a transversely outer leg of each side portion being adapted to engage with a longitudinally elongated, upwardly opening groove in the expansion joint cover to retain the gasket in place on the cover.

**5,048,250**

## BUILDING BLOCK

**Anthony J. P. Elias, P.O. Box 398, Minto, New Brunswick E0E 1J0, Canada**

**Filed Apr. 2, 1990, Ser. No. 502,854**
**Int. Cl.[5] E04B *1/04, 2/42***
**U.S. Cl. 52—437** **4 Claims**




1. A building block for use in a self-supporting wall comprising substantially rectangular parallelepipedic body means, said body means including a mixture of three parts by weight cement and two parts by weight wood fiber; and vertically extending, semicylindrical groove means in at least one end of said body means for forming a cylindrical concrete receiving passage with opposed corresponding groove means in a horizontally aligned similar block, whereby a plurality of blocks can be used to form a wall reinforced by concrete columns filling aligned vertical passages in the blocks.

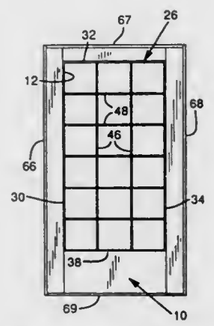
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**5,048,251**

## DIVIDED LIGHT DOOR

**Terry A. Turner, Prineville, Oreg., assignor to Tru-Line Manufacturing, Redmond, Oreg.**

**Filed Feb. 26, 1990, Ser. No. 484,279**
**Int. Cl.[5] E06B *3/70***
**U.S. Cl. 52—456** **7 Claims**




1. In a door or similar structure that extends generally in a plane:

a lattice frame comprising multiple edge band strips disposed end-to-end and collectively forming a band of material extending about the perimeter of the lattice frame and bounding a generally open area, and multiple elongate inner frame pieces crossed with each other and having ends joined with said band of material, said pieces dividing said open area into multiple panel-receiving openings,

a light-transmitting panel mounted in respective ones of said panel-receiving openings, and

an integrated core panel mounting said lattice frame, said core panel having a frame-receiving opening and said opening snugly receiving the lattice frame, said core panel having horizontal and vertical expanses bounding said frame-receiving opening and said horizontal and vertical expanses merging at corner regions disposed outwardly of corner extremities in said opening, the core panel being made of multiple veneer layers extending generally in the plane of the door and said layers being adhesively secured together, the veneer layers of the core panel at said corner regions including layers which are continuations of a vertical expanse and layers which are continuations of a horizontal expanse and said layers overlapping thus to integrate the core panel at said corner regions.



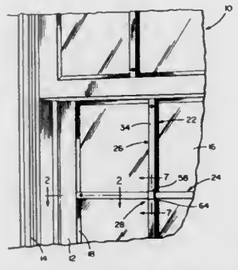
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**5,048,252**

## WINDOW GRID WITH CAM LOCK

**Richard K. Osborn, Lutz, Fla., assignor to Nu-Air Manufacturing Co., Tampa, Fla.**

**Filed Oct. 11, 1990, Ser. No. 596,097**
**Int. Cl.[5] E06B *3/70***
**U.S. Cl. 52—456** **10 Claims**




1. A window grid for converting a single pane window to a window having the appearance characteristics of a multi-pane window, said grid comprising at least one muntin extending between opposed portions of a window sash, means on each end of the muntin for securing the muntin to the window sash, said means on each end of the muntin including a cam lock, said cam lock including a rotatable plate positioned on the inner surface of the muntin and having a rounded beveled edge and an outwardly extending lateral pin connected with the plate and rotatably journaled in the muntin, said pin being eccentrically positioned on the plate to move the beveled edge into and out of engagement with the window sash when the plate is rotated between a locked position in alignment with the muntin to an unlocked position in angular relation to the muntin.

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**5,048,253**

## LOUVER WITH MAXIMUM FREE AREA

**Robert W. Olsen, Washington, N.J., assignor to Construction Specialties, Inc., Cranford, N.J.**

**Filed Jan. 2, 1991, Ser. No. 636,753**
**Int. Cl.[5] E06B *7/08***
**U.S. Cl. 52—473** **1 Claim**

1. A louver having a multiplicity of blades of identical cross section mounted in uniformly spaced relation and in uniform orientations relative to a front plane and a rear plane defined by their front and rear extremities characterized in that each cross section along the length of each blade is located exclusively within a zone defined by:

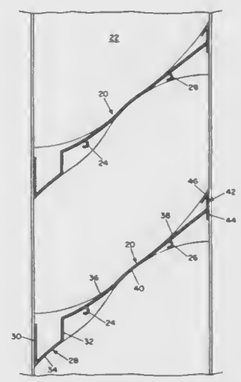
(a) front and rear lines in the front and rear planes, respectively;

(b) first and second points located respectively in parallel upper and lower lines spaced-apart by a selected distance T not less than the blade thickness, oriented obliquely to the front and rear planes at a selected blade slope angle and intersecting the front plane at respective upper and lower front points and the rear plane at respective upper and lower rear points;

(c) a first upper arc tangent to the upper line at the first point, having a radius C equal to the perpendicular distance between the upper line of the zone and the lower line of the zone next above, having its center at the lower front point of the zone next above and intersecting the front line;

(d) a first lower arc tangent to the lower line at the second point, having the same radius C as the upper front arc, having its center at the upper rear point of the zone next below and intersecting the rear line;

(e) a second lower arc tangent to the lower line at the lower front point, having a radius equal to the sum of two times C and T and having its center at the upper rear point of the second zone below;




(f) a second upper arc having a radius equal to the sum of C and T, having its center at the upper rear point of the zone next below and tangent to the upper line at the first point;

(g) a third upper arc having a radius equal the sum of two times C and T, intersecting the rear line at the upper rear point and tangent to the second upper arc; and

(h) a third lower arc having a radius equal to the sum of C and T, intersecting the first and second lower arcs tangentially and having its center coincident with the center of the third upper arc of the zone next below.

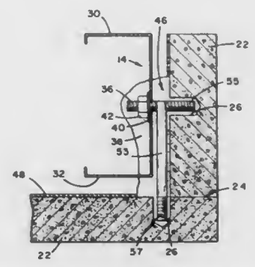
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**5,048,254**

## PREFABRICATED BUILDING PANEL

**Richard A. Merlau, Elkhart Lake, Wis., assignor to Valders Stone and Marble, Inc., Valders, Wis.**

**Filed Oct. 31, 1989, Ser. No. 429,856**
**Int. Cl.[5] E04B *1/41***
**U.S. Cl. 52—475** **11 Claims**




1. An apparatus adapted for connecting a structural frame element to at least first and second stone panel members of the type having depressed bores defined in rear surfaces thereof, comprising:

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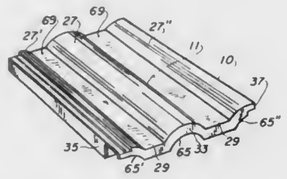
securing means which is adapted for securing to the structural frame element;

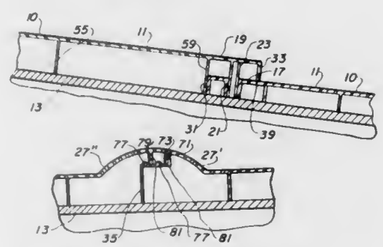
first insertion means connected to said securing means which is adapted for insertion into the depressed bore in a rear surface of a first stone panel member, said first insertion means extending in the same direction as said securing means and including a third anchor pin which is externally threaded; and

second insertion means which is connected to said first insertion means and said securing means and which is adapted for insertion into the depressed bore in a surface of said second stone panel member, whereby said apparatus may rigidly mount said stone panel members to said structural frame element, said second insertion means including a fourth anchor pin which extends in a direction perpendicular to said securing means.

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**5,048,255**
**MOLDED THERMOPLASTIC ROOFING TILE**
**Arthur S. Gonzales, 3113 Half Circle Dr., Norco, Calif. 91760**
**Filed Feb. 12, 1990, Ser. No. 478,926**
**Int. Cl.[5] E04D** *1/30, 1/24*
**U.S. Cl. 52—533** **17 Claims**





1. A plurality of interlocking thermoplastic roof tiles for covering a pitched planar roof surface, each tile comprising:

(a) an elongated thin top wall formed with a plurality of corrugations defining domed ridges the wall having a lateral upper marginal extremity, a lateral lower marginal extremity, a first longitudinal edge and a second longitudinal edge, said upper marginal extremity defining a shelf configured to, when mounted on such roof surface, angle downwardly therealong and away therefrom to form a predetermined angle relative to said roof surface;

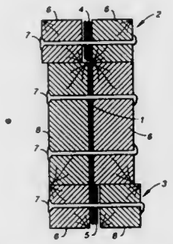
(b) such tile having at said lower marginal extremity a overhang spaced from such roof surface so that each such plurality of tiles will overlap the upwardly facing top wall on the first longitudinal edge, having an elongated upwardly facing pocket defining a trough and on the second longitudinal edge an overhang flange such that laterally adjacent tiles, being complimently configured, permit the flanges and troughs of laterally adjacent tiles to overlie one another, said tile further including;

(c) a support grid under said top wall and formed with a plurality of vertically extending longitudinal, diagonal, and transverse wall segments terminating at extended edges in a common plane with the roof for supporting said top wall from said roof surface and disposed at said predetermined angle relative thereof; and,

(d) said top wall shelf having a plurality of upwardly opening socket means and in said overhang having a plurality of flange means such that the flange means of such plurality of tile may be received complimently in the socket means of longitudinally adjacent tiles when installed on a roof.

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**5,048,256**
**COMPOSITE BEAM**
**Ola O. Thorsnes, Oslo, Norway, assignor to A/S Selvaagbygg, Oslo, Norway**
**Filed Sep. 27, 1989, Ser. No. 413,242**
**Int. Cl.[5] E04C** *3/30*
**U.S. Cl. 52—730** **21 Claims**



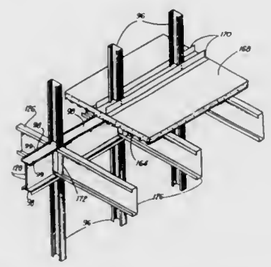
1. A beam comprising:

a web with transverse flanges at its longitudinal edge portions, the web including a single steel plate and the transverse flanges including elements of wood which are attached to the respective edge portions to provide exposed wooden surfaces on at least two sides of the web;

attachment means for attaching the transverse flanges to the longitudinal edge portions of the steel plate, characterized in that the steel plate at the edge portions is bent back.

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**5,048,257**
**CONSTRUCTION SYSTEM FOR DETENTION STRUCTURES AND MULTIPLE STORY BUILDINGS**
**Charles W. Luedtke, 110 Bransford Rd., NE., Atlanta, Ga. 30342**
**Division of Ser. No. 106,542, Oct. 6, 1987, Pat. No. 4,918,897.**
**This application Feb. 16, 1990, Ser. No. 481,438**
**Int. Cl.[5] E04C** *3/16*
**U.S. Cl. 52—747** **4 Claims**



1. A method of providing a continuous cementicious diaphragm floor slab after erection of light metal stud framed partition walls, said partition walls being formed by upper and lower U-shaped track members with opposes vertical legs and spaced apart light metal studs received in said track members, and in which joist receiving tracks are secured between and space said upper and lower track members, said joist receiving tracks having floor joists secured thereto, such that said floor joists are thereby connected to said studs and a decking means is provided over said joists, said method comprising the steps of:

a) attaching a metal angle to said studs on at least one side of said partition walls so that one leg thereof projects radially away from the wall at a predetermined height above said decking means and the other leg projects vertically upward against said light metal studs;

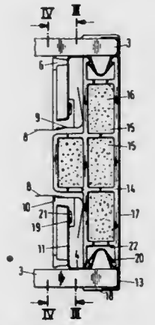
b) pouring a cementicious material over said decking means and over said opposed vertical legs of said lower U-shaped track member to form said cementicious diaphragm slab using said radially projecting angle leg as a screed; and

c) filling the space between said spaced studs and behind the upwardly projecting leg of said metal angle with cementicious material to at least the height of said radially projecting leg to provide a continuous slab through the said partition walls.



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**5,048,258**
**WINDOW HAVING A TENSIONED INSULATION FOIL**
**Paul Grether, Begonienstr. 11-CH-8472, Seuzach, Switzerland**
**Filed Sep. 28, 1989, Ser. No. 414,116**
**Claims priority, application Switzerland, Jul. 26, 1989, 02786/89**
**Int. Cl.[5] E04C** *2/54*
**U.S. Cl. 52—789** **17 Claims**



1. A window comprising

a pair of transparent panes;

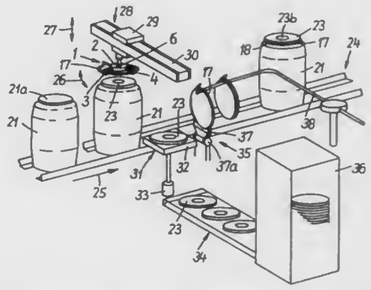
at least one biaxially stretched insulation foil disposed in a plane between said panes;

a plurality of mounting elements on at least one side of said foil, at least one of said elements having an adhesion point secured to said foil in offset relation to said plane of said foil; and

a tension spring element mounted on one of said panes and secured to said mounting elements in stretched relation therebetween said one pane and said mounting elements for biasing said mounting elements relative to said panes to maintain said foil in stretched condition.

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**5,048,259**
**APPARATUS FOR INSTALLING OR REMOVING A LID FROM A STANDARD BARREL**
**Siegfried Cox, Mülheim; Rolf Schwerhoff, Borken, and Ulrich P. Vogt, Essen, all of Fed. Rep. of Germany, assignors to Fried. Krupp GmbH, Essen, Fed. Rep. of Germany**
**Filed Oct. 23, 1990, Ser. No. 601,349**
**Claims priority, application Fed. Rep. of Germany, Oct. 31, 1989, 3936210**
**Int. Cl.[5] B65B** *7/28, 51/04*
**U.S. Cl. 53—132.1** **15 Claims**



1. A manipulating apparatus for selectively closing a standard barrel having a barrel mouth and having externally projecting lip segments around the barrel mouth by positioning at the barrel mouth a lid having an externally disposed lid lip so that an inner side of the lid lip faces an inner side of the lip segments, and by installing a releasable clamping ring which engages an outer side of the lid lip and an outer side of the lip segments to tighten the lid lip toward the lip segments, the clamping ring having a U-shaped cross-section and being provided with a closing means which includes an externally disposed and pivotally connected clamping lever whose movement between an open position and a closed position changes the diameter of the clamping ring, or for selectively opening the barrel by removing the clamping ring and lid, said manipulating apparatus comprising:

a rigid support unit which includes a central carrier having a bottom side and at least three radially oriented support arms extending from the central carrier, the bottom side of the central carrier projecting below the support arms, the support unit having a central axis which passes through the bottom side of the central carrier;

guide unit means for moving the support unit horizontally and vertically and for rotating the support unit about its central axis;

gripper mechanisms movably mounted on the support arms, each gripper mechanism including gripping tongs which are oriented toward the central carrier and including a tong base surface facing the gripper tongs;

advancing units which are mounted on the support arms to displace the gripper mechanisms relative to the respective support arms toward or away from the central carrier;

holding cylinders attached to the support arms and including holding rods which can be extended toward the central carrier; and

a rotating unit mounted on the support unit, the rotating unit including a pivot member which is movable between adjacent support arms about a pivot axis that is parallel to the central axis of the support unit, the pivot member having a carrying portion which extends parallel to the central axis of the support unit,

wherein, in order to close the barrel, the lid is picked up from a supply station by the support unit with the holding rods temporarily extended and transferred to the mouth of the barrel, the lid is pressed onto the barrel by lowering the central carrier, a clamping ring is then picked up by

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the support unit and spread open and, after being transferred to the barrel and being lowered around the lid, the clamping ring is supported on extended holding rods at the height of the lip segments and the lid lip, the clamping ring is pressed against the lip segments and lid lip by the tong base surfaces of the gripper mechanisms mounted on a pair of adjacent support arms while the gripper tongs of the respective gripper mechanisms are open, and the clamping lever is moved toward to its closed position by the pivot member, and

wherein, in order to open the barrel, the pivot mechanism is moved beneath the clamping mechanism, with the support unit turning from time to time, and the pivot mechanism moves the clamping lever into its open position, the clamping ring is pressed against the lip segments and lid lip by the tong base surfaces of the gripper mechanisms mounted on a pair of support arms while the clamping ring rests on extended holding rods, the clamping ring is gripped by the gripping tongs of another gripper mechanism, the clamping ring is spread open by all of the gripper mechanisms and raised in its spread-open state, after the clamping ring is deposited the lid is gripped by the gripping tongs between its lip segments, and the lid is removed from the barrel by the support unit and transferred to a deposit station.

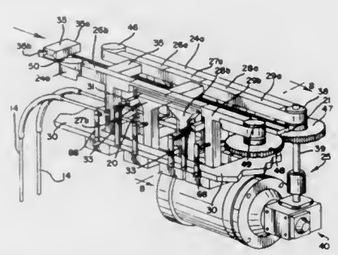
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**5,048,260**

## INDUCTION SEALING MACHINE AND PACKAGE WRAPPER USEFUL THEREWITH

**Susan L. Raymond, Palos Hills, and Kevin M. Fistek, Burbank, both of Ill., assignors to Wm. Wrigley, Jr. Company, Chicago, Ill.**

**Filed Oct. 17, 1989, Ser. No. 422,929**
**Int. Cl.[5] B65B *51/18***
**U.S. Cl. 53—370.8** **9 Claims**



1. Apparatus for sealing opposite sides of a package wherein each side has portions folded upon each other with a thermoplastic material between overlapping folded portions, comprising:

a conveyor for conveying the package along a path of travel with the sides of the package to be sealed facing perpendicular to the path of travel, said conveyor including a pair of counter-rotating belts on opposite sides of said path of travel which contact respective sides of the package to be sealed such that the package is compressed between said belts,

means for inducing a heat-producing eddy current sufficient to cause the thermoplastic material to become flowable and adhere overlapped folded portions together, said means for inducing a heat-producing eddy current including and induction coil having portions located adjacent and on respective sides of said path of travel in opposite relationship to said sides to be sealed such that each said package end to be sealed passes closely by an induction coil portion, and further including an induction sensitive material associated with said package side to be sealed,

means for applying pressure to each of said belts along a portion of said path of travel wherein said thermoplastic material becomes flowable under action from said means for inducing a heat-producing eddy current, to thereby press said overlapped portions together, said means for applying pressure including a first pair of platen members which are not susceptible to said eddy current, said pair of platen members being opposed on respective sides of said path of travel and located between said belt and said induction coil portion on each side of said path of travel, and further including an adjustable biasing means for urging said platen member against said belt to apply a desired pressure on said belt to effect a desired pressure of said belts against said package ends to be sealed,

each said platen member has a head portion having a pressure face which engages said belt and a hollow located behind said face within which said induction coil is received, and a body portion extending from said head portion, with pivot means for mounting said body portion to permit said head portion to freely move toward and away from said belt, said adjustable biasing means further comprising a spring mounted to bias said body portion toward said belt.

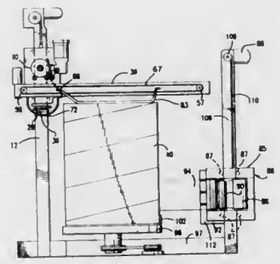
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**5,048,261**

## TOP SHEET DISPENSER FOR A STRETCH WRAPPING APPARATUS

**Patrick R. Lancaster, III; John Fain, and Kenneth J. McDowell, Jr., all of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.**

**Filed Sep. 14, 1989, Ser. No. 407,094**
**Int. Cl.[5] B65B *11/04***
**U.S. Cl. 53—399** **20 Claims**



14. A method of stretch wrapping a load comprising:

dispensing and forwarding a sheet from a roll of sheet material;

receiving, accumulating and containing the dispensed sheet in a container;

drawing the dispensed sheet from the container over the top of a load;

dispensing a web from a web dispenser and stretching the web; and

rotating the load relative to the web dispenser to wrap the web around the sides of the load.

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**5,048,262**

## PROTECTIVE SHEET, PHOTOSENSITIVE SHEET FILM PACKAGING METHOD AND PACKAGE OF PHOTOSENSITIVE SHEET FILM

**Tsunenari Kakuda, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

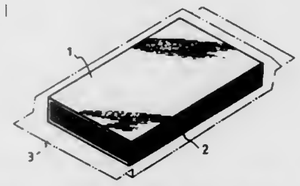
**Continuation of Ser. No. 268,974, Nov. 9, 1988, abandoned. This application Aug. 10, 1990, Ser. No. 565,903**
**Claims priority, application Japan, Nov. 11, 1987, 62-284452**
**Int. Cl.[5] B65B *29/00***
**U.S. Cl. 53—401** **1 Claim**

1. A method of packing a stack of a plurality of photosensitive sheet films, each including a fluorine surfactant, with a protective sheet, comprising the steps of:

providing a stack of a plurality of photosensitive sheet films, each including a fluorine surfactant;

preparing said protective sheet comprised of a low electrification paper material formed of natural pulp paper im-





pregnated with an inorganic salt of alkali metal in an amount of 0.01–40 g/m$^2$, said protective sheet having a weight of 150–700 g/m$^2$ and a water content of 3.5–8.5%;

regulating an ambient temperature of 20°–30° C. and relative humidity to 40–70% RH; and

packing said stack with said protective sheet.

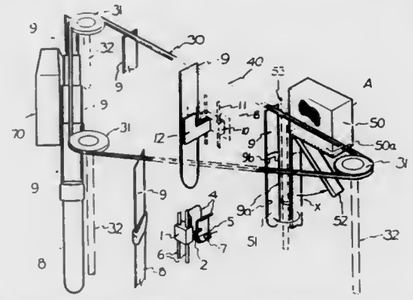
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**5,048,263**

## PROCESS AND APPARATUS FOR FOLDING SOCK CUFFS

**David Lau, Templestowe, Australia, assignor to Pacific Dunlop Limited, Victoria, Australia**

**PCT No. PCT/AU88/00315, § 371 Date Apr. 20, 1990, § 102(e) Date Apr. 20, 1990, PCT Pub. No. WO89/01439, PCT Pub. Date Feb. 23, 1989**
**PCT Filed Aug. 22, 1988, Ser. No. 466,273**
**Claims priority, application Australia, Aug. 21, 1987, PI 3885**
**Int. Cl.[5] B65B *25/20, 63/04***
**U.S. Cl. 53—429** **14 Claims**



1. A process of folding a sock cuff comprising

(a) locating and gripping the open end of a sock on a carriage mounted for reciprocal movement over and along a blade,

(b) moving said carriage over and along said blade so that a substantial portion of said sock covers the blade,

(c) gripping said sock adjacent but below the fold line location of said sock cuff,

(d) tensioning the portion below said fold line by moving the gripped area of said sock axially along the blade away from the free end thereof,

(e) releasing the grip on said open end of said sock,

(f) folding said sock cuff over the gripped area of said sock, and

(g) releasing and removing grip on said fold line adjacent portion.

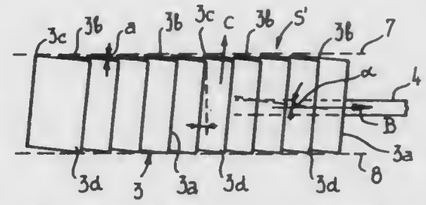
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**5,048,264**

## PROCESS AND APPARATUS FOR THE TEMPORARY STORAGE OF MULTI-SHEETED, FOLDED PRINTING PRODUCTS, SUCH AS NEWSPAPERS, PERIODICALS AND PARTS THEREOF

**Beat Fröhlich, Oberdürnten, Switzerland, assignor to Ferag AG, Switzerland**

**Filed Feb. 12, 1990, Ser. No. 478,557**
**Claims priority, application Switzerland, Feb. 22, 1989, 00640/89**
**Int. Cl.[5] B65B *63/04*; B65H *29/66***
**U.S. Cl. 53—430** **33 Claims**



1. A process for the temporary storage of multi-sheeted, folded printing products, such as newspapers, periodicals and parts thereof, comprising: conveying a series of folded printing products in an imbricated stream together with a winding band in a conveying direction toward a winding core, each printing product overlapping an adjacent printing product in said stream and having a lateral fold edge at a side of said imbricated stream, and winding said imbricated stream of printing products and said band around said winding core, wherein, during said winding, at least some of said printing products have said lateral fold edge slightly offset in relation to the lateral fold edge of an adjacent printing product in a direction which runs transversely to said conveying direction of said printing products.

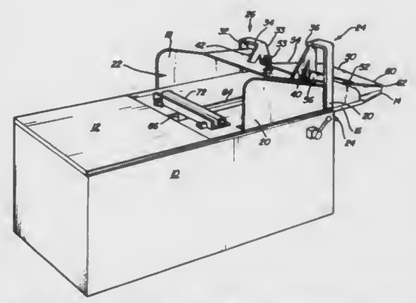
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**5,048,265**

## METHOD AND APPARATUS FOR FILLING CUSHIONS

**David Mintz, West Bloomfield, and Pierre Tremblay, Howell, both of Mich., assignors to Machine Design Systems, Inc., Detroit, Mich.**

**Filed Feb. 20, 1990, Ser. No. 482,361**
**Int. Cl.[5] B65B *63/02***
**U.S. Cl. 53—439** **11 Claims**



1. A cushion cover stuffing machine comprising a platform for supporting a compressible cushion, means for inserting said cushion in a compressed state into a cover forming a substantially complete enclosure for said cushion and having an open end and an opposite closed end, said cover being of a size transversely of its length that is less than the uncompressed size of the cushion to be received therein, comprising means for

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fixedly positioning said cover with its open end directed toward said cushion with said cover in a substantially untensioned state, said fixedly positioning means holding said cover in the latter position, means for positioning said cushion on said platform for movement into said open end of said cover, means for moving said cushion on said platform inwardly of said cover open end in a compressed state towards the opposite closed end of said cover, said fixedly positioning means expanding said cover transversely of its length as said cushion moves therein towards said opposite closed end while said cover remains in a relatively fixed position with respect to said platform, said means for moving said cushion being operative to force said cushion against said closed end of said cover upon further movement of said cushion thereby forcing said cover into contact with said cushion and forcing said cover to move and whereby said cushion moves off said platform and expands within said cover.

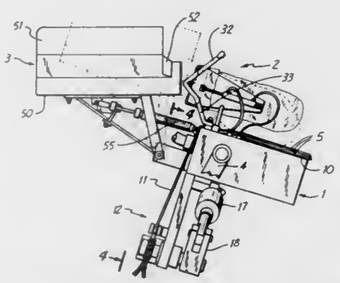
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**5,048,266**

**BAG FILLING APPARATUS**

**Robert A. Wieckowicz, Rice Lake, Wis., assignor to Jerome Foods, Inc., Baron, Wis.**

**Filed Jan. 30, 1990, Ser. No. 472,093**
**Int. Cl.[5] B65B** *43/36, 45/00, 57/02*
**U.S. Cl. 53—469** **19 Claims**



1. A method of filling a bag having an opening therein with a commodity, without contaminating a sealable region of the bag adjacent the opening, comprising the steps of:
forming a cuff in the sealable region of the bag adjacent the opening;
arranging the commodity on a platform adjacent to the cuffed bag, the platform including funnel means defining a funnel-like opening being closely receivable in the cuffed bag opening; and
inserting the funnel means into the bag opening and filling the bag with the commodity.

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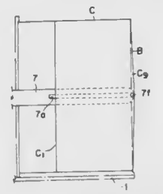
**5,048,267**

**CUTTING AND OPENING METHOD AND DEVICE FOR A RECTANGULAR PACKAGE COVERED WITH PACKAGING MATERIAL**

**Mutsuo Kudo; Paul Traugaardh, and Masaru Gunji, all of Tokyo, Japan, assignors to AB Tetra Pak, Lund, Sweden**

**Filed Sep. 13, 1989, Ser. No. 406,447**
**Claims priority, application Japan, Sep. 13, 1988, 63-229667**
**Int. Cl.[5] B65B** *69/00*
**U.S. Cl. 53—492** **12 Claims**

1. A cutting and opening method for a rectangular package covered with packaging material comprising the steps of:
forming a space between the packaging material and the packaged items;
cutting the packaging material of a rectangular package from one edge to the other on two mutually opposing planes;
cutting the packaging material on said two planes from one of the two edges other than those passing a starting point and a finishing point of the cutting lines to the above-mentioned cutting step;
cutting the packaging material on a plane adjacent to the above-mentioned two planes and having two edges passing the two cutting lines wherein the two cutting lines are connected after forming a space between the packaging material and the packaged items;
opening the packaging material at each area on the three planes where cutting lines are provided; and



inserting a backplate from a cut area made by cutting the packaging material from one edge to the other on each of the two mutually opposing planes, and said packaging material on the planes being cut on a surface of the backplate;
wherein a tip of the backplate inserted from the cut area on each of the two mutually opposing planes protrudes outward to form a space between the packaging material and the packaged items when cutting the plane adjacent to the two mutually opposing planes.

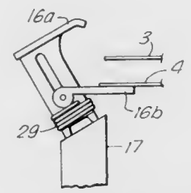
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**5,048,268**

**VACUUM PACKAGING METHOD AND APPARATUS**

**Sandro Brembilla, Arese, and Mario Romani, Passirana di Rho, both of Italy, assignors to W. R. Grace & Co.-Conn., Duncan, S.C.**

**Filed May 17, 1990, Ser. No. 525,502**
**Claims priority, application United Kingdom, Aug. 29, 1989, 8919523**
**Int. Cl.[5] B65B** *47/02, 31/00*
**U.S. Cl. 53—511** **9 Claims**



1. A packaging apparatus comprising means for advancing a first film web along a path including in sequence (i) a loading station at which at least one product is placed on the first film web, (ii) a film covering station including means to supply a second film web which is placed over the first film web and over products(s) having been placed thereon at the loading station, and (iii) a packaging station at which the first and second film webs are sealed together to define a package with the product(s) loaded at the loading station enclosed within the pack; wherein said advancing means comprise: clamping means for gripping the margin s of said first film web and for entraining its advance through said loading station, said film covering station, and said packaging station; and means located at said film covering station for opening the jaws of said clamping means at said film covering station to release the margins of said first film web and to provide space for access of a said second film web to said clamping means; and including means for closing said jaws of the clamping means to hold said second film web in juxtaposition with said first film web by clamping of their margins as the clamping means advance from said film covering station.



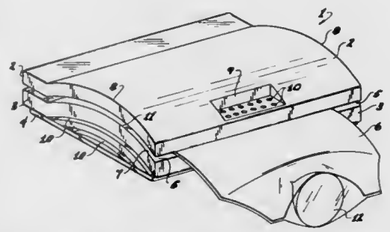
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**5,048,269**

**VACUUM SEALER**

**Frank Deni, 130 Deer Run, Williamsville, N.Y. 14221**

**Filed May 9, 1990, Ser. No. 520,729**
**Int. Cl.[5] B65B** *31/04*
**U.S. Cl. 53—512** **6 Claims**



1. A vacuum sealer comprising in combination a sealer housing, a bag supply compartment for supplying a folded web of bags, a vacuum-generating means and means for sealing and cutting the lead side of the folded web of plastic bags while leaving the end of the bag open, said sealer housing comprising at one first end of said housing a movable lid connected to a bottom housing portion and a sealer entrance located at a second opposite end of said housing, said lid and bottom housing portion when pressed together having activating means that initiates said vacuum-generating means and said means for sealing and cutting plastic bags, said means for sealing and cutting plastic bags all substantially immovably located along said sealer entrance, said means for sealing and cutting plastic bags comprising at lest three wires fixed in said bottom housing portion adjacent to and in substantially parallel positions to each other, at least two of said wires dedicated to forming an airtight seal on said bag, all of at least three wires fixed and located at said sealer entrance and between said at least three wires and said bag supply compartment is an air exhaust nozzle which comprises said vacuum-generating means for said open end of the bag for evacuating said bag after the sealing and cutting operation.

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**5,048,270**

**WRINKLE FREE FILM SPREADER DEVICE FOR FORM, FILL AND SEAL MACHINES**

**Michael J. McMahon, Palatine, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.**

**Filed Jan. 26, 1990, Ser. No. 470,807**
**Int. Cl.[5] B65B** *9/06*
**U.S. Cl. 53—551** **20 Claims**

9. In a form, fill and seal machine including a vertical forming and filling tube having an upper product receiving end portion and a lower product discharge end, a package-making film guiding collar means about said upper end portion of said tube, and film sealing and pull down means below said lower discharge end and functioning to draw package making film through said guide collar means into tubular relation about said tube and to draw the tubular film downwardly below said discharge end and then sealing the tubular film at bag width intervals;
spreader means at said discharge end for laterally stretching the tubularly formed bag making film in a vertical plane to eliminate wrinkle unevenness when the sealing means seals across the film;
said spreader means including an elongate one-piece rod like spreader member with a straight leg extending longitudinally within said tube, said leg further comprising as a fixed extension on a lower end thereof an integral angular spreader finger formation located at the discharge end of said tube within said tubular film and having an outwardly and downwardly slanting part;
an upper end portion of said member having an obliquely upwardly and outwardly extending mounting and actuating formation projecting through a hole in said tube in clearance relation to said guide shoulder means;
supporting means on said tube engaged by said upper end formation; and



actuator means mounted on said tube and operatively controlling said upper end formation for effecting movements of said member and thereby controlling movements of said lower end finger formation between a wrinkle free spreading position of said slanting part relative to said tubular film and a retracted position for permitting relatively free downward movement of said tubular film when said sealing and pull down means pulls the tubular film downwardly.

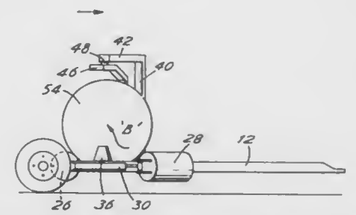
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**5,048,271**

**BALE WRAPPING MACHINE**

**John D. Walton, Newton Lodge, Mickleton, Barnard Castle, Co. Durham, DL 12 OLG, England**

**Filed Oct. 5, 1990, Ser. No. 593,233**
**Int. Cl.[5] B65B** *11/04*
**U.S. Cl. 53—587** **6 Claims**



1. A bale wrapping machine comprising a wheeled frame, a wrapping mechanism mounted on said wheeled frame and adapted to wrap a rotating cylindrical bale carried on the frame in stretchable film material, said wheeled frame being open-fronted and adapted to be located about the bale to be wrapped, at least one roller extending transversely of said frame adjacent the rear thereof, and a pair of semi-rollers one mounted at each side of the frame to be pivotal between an inoperative position extending substantially fore and aft of the frame and an operative position extending transversely of the frame adjacent the open front end thereof, the arrangement

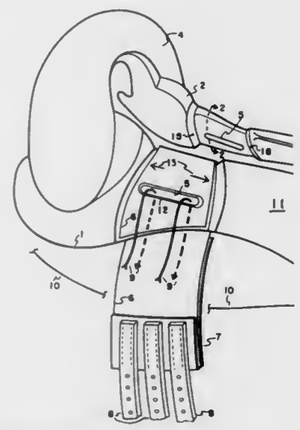
VOL 1130 ISS 3 SE 17 1991 UMI



being such that, with the semi-rollers in their inoperative positions, the frame is located about the bale with the at least one rear roller engaging a region of the circumference of the bale, the semi-rollers then being moved to their operative positions to engage an opposite region of the circumference of the bale and whereby the bale is supported on, for rotation by, the at least one rear roller and the front semi-rollers, the wrapping mechanism being operable to wrap the rotating bale, the semi-rollers, on completion of the wrapping operation, being movable upwardly from their operative positions to displaced positions whereby the wrapped bale is tipped from the machine rearwardly over the at least one rear roller.

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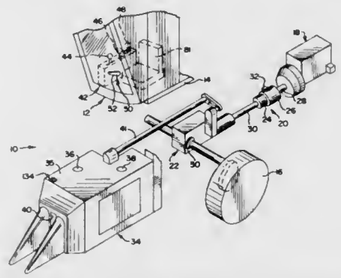
**5,048,272**
**SADDLE RIGGING FOR USE IN SADDLES HAVING RIGID TREES**
**Sharon G. Saare, 1267 Clover Dr., Santa Rosa, Calif. 95401**
**Filed Nov. 20, 1989, Ser. No. 439,437**
**Int. Cl.[5] B68C *1/02***
**U.S. Cl. 54—44** **14 Claims**



**11**. A saddle comprising:
a saddle tree, itself comprising:
a left bar having first and second surfaces;
a right bar, spaced apart from the left bar, and having first and second surfaces;
the first surfaces of the left and right bars generally facing toward each other, and the second surfaces thereof generally facing away from each other; and
there being a slot in the left bar and a slot in the right bar;
a left bar strap looped at approximately the middle thereof around an upper portion of the left bar above the slot therein, and thereafter forming a left bar strap of double thickness proximate the first surface of the left bar and extending therebeyond to a distal end of the left bar strap;
left fastening means, attached to the distal end of the left bar strap, for fastening to one end of rigging that secures the saddle to an equine or the like;
a right bar strap looped at approximately the middle thereof around an upper portion of the right bar above the slot therein, and thereafter forming a right bar strap of double thickness proximate the first surface of the right bar and extending therebeyond to a distal end of the right bar strap;
right fastening means, attached to the distal end of the right bar strap, for fastening to a remaining end of the rigging; and
left and right transition means respectively between the distal ends of the left and right bar straps and the left and right fastening means, each transition means being bent to have first and second parallel portions that wrap around the distal end of the respective bar strap.

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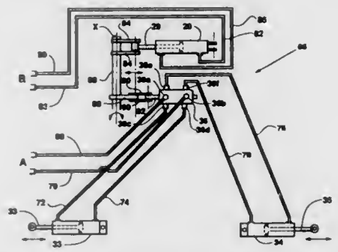
**5,048,273**
**METHOD AND APPARATUS FOR CONTROLLING OPERATION OF AN AGRICULTURAL IMPLEMENT**
**Jesse H. Orsborn, Hinsdale; George M. Butkovich, Lemont; Thomas K. Bessman, Frankfort, and John F. Link, Calumet City, all of Ill., assignors to J. I. Case Company, Racine, Wis.**
**Continuation-in-part of Ser. No. 553,894, Jul. 16, 1990, abandoned. This application Dec. 14, 1990, Ser. No. 628,209**
**Int. Cl.[5] A01D *46/08***
**U.S. Cl. 56—10.2** **17 Claims**



**1**. A control system for an agricultural implement having a mobile frame with an operator station having an operator seat, a harvesting unit mounted on the frame, an engagable implement drive train for driving the implement across a field, an operable drive assembly for enabling operation of the harvesting unit and drive train, operable control means for conditioning said drive assembly to enable operation of said harvesting unit and drive train as a function of the operable control means position, drive control means for selectively operating said drive train in a neutral mode or in a drive mode as a function of the drive control means position, said control system comprising:
first operative means for sensing the presence of the operator in the operator seat and for providing a first signal when the operator is seated and a second signal when the operator is not present in the operator seat;
second operative means for sensing the position of said operable control means and for producing a third signal when said operable control means is positioned to condition said drive assembly to enable operation of said harvesting unit and drive train and a fourth signal when said operable control means is positioned to condition said drive assembly in a neutral mode;
third operative means for sensing the position of said drive control means and for producing a fifth signal when said drive control means is positioned to condition said drive train in a neutral mode and a sixth signal when said drive control means is positioned to condition said drive train in a drive mode; and
logic control means connected and responsive to signals from each of said first, second and third operative means for controlling operation of said operable drive assembly such that when a third signal is received from said second operative means and a sixth signal is received from said third operative means the logic control means enables the operable drive assembly although the operator is away from the operator seat and disables the operable drive assembly from operating at least the harvesting unit when a fifth signal is received from said third operative means indicative of the drive train being shifted into a neutral mode of operation.



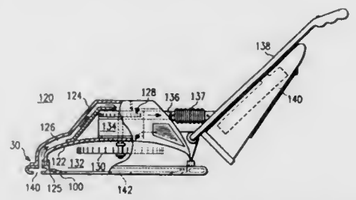
**5,048,274**
**APPARATUS AND METHOD FOR CONTROLLING MULTIPLE FUNCTIONS OF AN AGRICULTURAL IMPLEMENT**
**Richard E. Jennings, Manheim, Pa., assignor to Ford New Holland, Inc., New Holland, Pa.**
**Filed Jun. 15, 1990, Ser. No. 538,612**
**Int. Cl.[5] A01D *37/00*; F01L *33/00***
**U.S. Cl. 56—10.2** **10 Claims**



**10**. A method of controlling multiple functions of an agricultural implement, said method comprising the steps of:
operating a first hydraulic cylinder, which is connected to a first source of hydraulic fluid, in a manner to control a first function of the implement and in a manner to mechanically shift valve means to a position where a second hydraulic cylinder is selectively connected to a second source of hydraulic fluid that is independent from said first source of hydraulic fluid;
operating said second hydraulic cylinder in a manner to control a second function of the implement;
operating said first hydraulic cylinder in a manner to mechanically shift said valve means to another position where a third hydraulic cylinder is selectively connected to said second source of hydraulic fluid; and
operating said third hydraulic cylinder to control a third function of the implement.

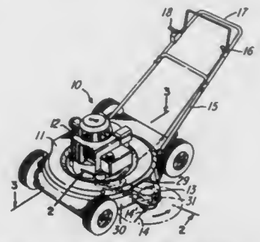
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**5,048,275**
**AIR-FLOATED APPARATUS HAVING STRUCTURAL CHANNEL MEMBER AND PRESSURE SEAL**
**Arthur L. Fassauer, P.O. Box 124, Canyon, Tex. 79015**
**Filed Sep. 7, 1990, Ser. No. 579,048**
**Int. Cl.[5] A01D *53/00***
**U.S. Cl. 56—12.8** **17 Claims**



**1**. In an air-floated apparatus having a deck with an open bottom, a platform enclosing a portion of the open bottom of the deck to define a pressure chamber, and means for pressurizing air in the pressure chamber to float a housing above a support surface, the platform having an opening and the deck having an outer periphery, the improvement comprising:
a structural member supported between the deck and the platform along a predetermined portion of the deck outer periphery, the structural member including an upper wall and a lower wall defining a chamber.

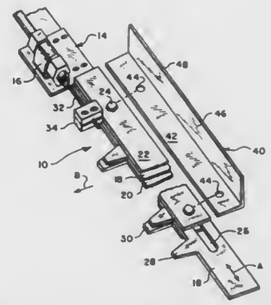
**5,048,276**
**COMNBINED MOWER BLADE FLAIL ASSEMBLY**
**Gary D. Miller, 127 Solar Dr., Tipp City, Ohio 45371**
**Filed Nov. 7, 1990, Ser. No. 610,123**
**Int. Cl.[5] A01D *34/03***
**U.S. Cl. 56—16.9** **10 Claims**



**1**. A combined mower blade flail assembly comprising a mower blade capable of rotating in one direction within a mower deck having an upper interior portion and end portions, a flail assembly capable of flail cord rotation only in a direction opposite from and at a speed faster than that of said mower blade, a drive shaft for said mower blade connected to a drive wheel, a separate drive shaft for said flail assembly capable of independent operative connection to a separate drive disc, and means to operatively connect said mower blade drive wheel to said flail assembly drive disc to cause simultaneous rotation of said flail assembly drive disc with said mower blade drive wheel but in a direction opposite from and at a speed greater than said mower blade drive wheel.

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**5,048,277**
**HEDGE TRIMMER**
**Joseph Trimarco, 565 Cameron Ave., Elmont, N.Y. 11003, and John DeBenedittis, 848 Dogwood Ave., Franklin Sq., N.Y. 11010**
**Filed Aug. 2, 1990, Ser. No. 561,891**
**Int. Cl.[5] A01D *34/13***
**U.S. Cl. 56—236** **11 Claims**



**1**. In a hedge trimmer of the type having a reciprocating blade adapted to cut in a direction transverse to the axis of reciprocation and wherein said reciprocating blade is slidably secured to a coextending support bar superposed over said blade by bolt means extending through said blade, the improvement comprising a deflector comprising a base and a barrier wall, said base being secured to said support bar in proximity to the surface of said support bar so that said barrier wall arrests the movement of the cut hedge material relative to the sweep of the trimmer.

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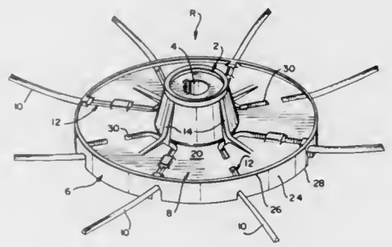


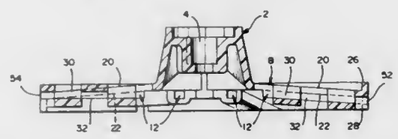
**5,048,278**

## ROTARY CUTTING MEMBER FOR USE WITH LAWN MOWERS AND THE LIKE

Dallas W. Jones, New Hartford, N.Y., and Matthew F. Orr, Shawnee Mission, Kans., assignors to Trim-a-Lawn, Utica, N.Y.

Filed Sep. 18, 1989, Ser. No. 409,004
Int. Cl.[5] A01D *34/73*
U.S. Cl. 56—295 19 Claims





1. An apparatus for holding a plurality of flexible cutting filaments having an angular cross-section for cutting vegetation, said apparatus comprising:

a) a rotary member;

b) said rotary member including a hub;

c) said member including a rim disposed around said hub;

d) said member including means for securing said rim to said hub;

e) said member including means for securing first and second flexible cutting filaments;

f) said filaments securing means including first and second passageways keyed to the cross-section of the cutting filaments and extending through said rim for permitting the filaments to be positioned within respective said first and second passageways at a specific orientation;

g) each of said first and second passageways extending through said rim at different elevations above the ground for permitting the cutting filaments to cut the vegetation at different heights; and

h) one of said first and second passageways extending radially horizontally and the other of said first and second passageways extending radially downwardly away from said hub to said rim.

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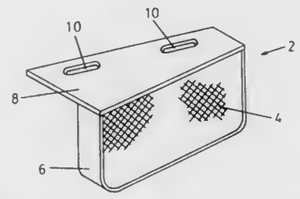
**5,048,279**

## LEAF MULCHER FOR USE WITH A ROTARY BLADE POWER LAWNMOWER

George W. Badawey, 408 Catherine Street, Port Colborne, Ontario, Canada L3K 4L5 , and Theodore M. deRuiter, 19M-41 Brown Street, Wainfleet, Ontario, Canada L0S 1V0

Filed Feb. 7, 1990, Ser. No. 476,593
Int. Cl.[5] A01D *67/00, 75/00*
U.S. Cl. 56—320.2 7 Claims

1. A leaf mulcher for use with a rotary blade power lawnmower having a grass outlet of a defined width for cuttings created by the blade as said mower moves along the ground, said mulcher comprising a screen and support means therefor, with means to mount said screen on said mower on an outside of said outlet so that said screen transverses the entire outlet, but is oriented to provide an opening for some of said cuttings leaving the grass outlet to escape around a side of said screen



without passing through said screen, said mulcher also not closing off said outlet towards said ground.

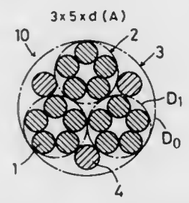
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**5,048,280**

## STEEL COMPOSITE CORD

Kenichi Okamoto, and Hidekazu Nakata, both of Itami, Japan, assignors to Sumimoto Electric Industries, Ltd., Osaka, Japan

Filed Dec. 26, 1989, Ser. No. 456,755
Claims priority, application Japan, Dec. 27, 1988, 63-331032
Int. Cl.[5] D02G *3/02, 3/36*
U.S. Cl. 57—238 4 Claims




1. A high-elongation composite steel cord for reinforcing a rubber product, said steel cord comprising (1) a plurality of strands each made by twisting a plurality of brass-plated steel filaments, and (2) a plurality of organic monofilaments which have been subjected to a resorcinolformaline-latex surface treatment, said organic monofilaments being arranged between and in contact with adjacent strands, said strands and said monofilaments being twisted together to form a twisted strand with a hollow core in its center, the diameter dl of said each organic monofilament and the distance S between the adjacent strands being given by the formula:

$$0.3h \leqq dl \leqq 0.5h \text{ and } 0 \leqq S \leqq 0.85dl$$

wherein

$$h = \frac{2D_1S + S^2 + \left\{ D_0 - (D_0 - D_1)\sin\frac{\pi}{2n}(n-2) \right\}^2}{D_0 + D_1 - (D_0 - D_1)\sin\frac{\pi}{2n}(n-2)}$$

wherein $D_0$ designates the diameter of the steel cord, $D_1$ designates the diameter of each steel strand, n designates the number of steel strands, and S designates the distance between the adjacent strands.

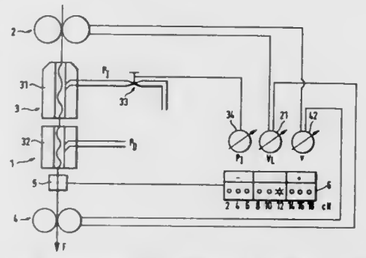


**5,048,281**

## PROCESS AND DEVICE FOR THE ADJUSTMENT OF AN AIR SPINNING DEVICE

Harald Dallmann, Winterthur, Switzerland; Peter Artzt, and Gerhard Egbers, both of Reutlingen, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany

Filed Oct. 20, 1989, Ser. No. 424,397
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1988, 3836481
Int. Cl.[5] D01H *1/115, 13/20*
U.S. Cl. 57—264 8 Claims



1. An air spinning device comprising a plurality of spinning stations for air spinning yarn, at least one of said stations comprising:

(a) a plurality of drafting rollers for drafting textile fiber for forming a spun yarn;

(b) an injection air nozzle for engaging said spun yarn after it emerges from said drafting rollers;

(c) a twister air nozzle for engaging and twisting said spun yarn after it emerges from said injector nozzle;

(d) tension measuring means for detecting and measuring the tension level in said spun yarn after it emerges from said twisting nozzle and for generating a signal corresponding to the tension level detected;

(e) first pressure means for maintaining the air pressure in said twisting nozzle at a constant level selected for the optimal spinning of said spun yarn;

(f) second adjustable pressure means for adjusting the air pressure level in said injector nozzle at a pressure level which is always below the constant pressure level of said twisting nozzle;

(g) draw-off rollers for drawing off said spun yarn emerging from said yarn measuring means; and

(h) control means for receiving signals generated by said tension measuring means and for controlling the air pressure level in said injector nozzle and the speeds of said drafting rollers and said draw-off rollers to maintain the tension level in said yarn at a predetermined level.

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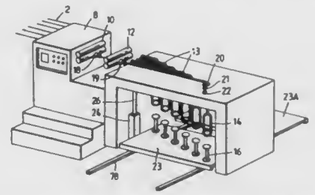
**5,048,282**

## DRAWING MACHINES

Robert J. Hunt, Listurn, and Kenneth F. Crockard, Bangor, both of Northern Ireland, assignors to James Mackie & Sons Limited, Belfast, Northern Ireland

Division of Ser. No. 245,277, Sep. 16, 1988, Pat. No. 4,885,904.
This application Sep. 27, 1989, Ser. No. 413,308
Claims priority, application United Kingdom, Sep. 19, 1987, 8722062
Int. Cl.[5] D01H *9/04*
U.S. Cl. 57—267 3 Claims

1. A drawing machine having a drawing zone for drawing slivers, and a plurality of flyers for winding the slivers on to bobbins, which comprises two bobbin carriages each bearing spindles which can support bobbins for rotation thereon, and means for moving the bobbin carriages, arranged side-by-side, in a direction generally at right angles to the paths of the slivers through the drawing zone, between positions in which at least one bobbin carriage is below the flyers, to enable the slivers to be wound on to the bobbins thereon, while the other bobbin carriage is displaced to one side of the flyers, to enable full bobbins to be doffed and replaced by empty bobbins, the draw-



ing machine further comprising automatic bobbin lifting means arranged on guide supports so as to be moveable from one side of the flyers, from which full bobbins have been doffed, to the other side, on which full bobbins are to be doffed.

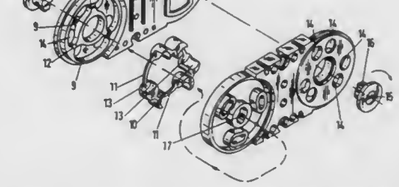
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**5,048,283**

## GUIDE CHAIN FOR GUIDING ENERGY LINES

Werner Moritz, Siegen; Volker Jud, Wilnsdorf, and Willibald Weber, Netphen, all of Fed. Rep. of Germany, assignors to Kabelschlepp Gesellschaft mit beschränkter Haftung, Siegen, Fed. Rep. of Germany

Filed Aug. 3, 1990, Ser. No. 562,634
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928238
Int. Cl.[5] F16G *13/16*
U.S. Cl. 59—78.1 6 Claims



1. A guide or feeder chain or power and supply lines, including chain links that comprises two spaced-apart link members that are disposed parallel to one another and are interconnected by crosspieces, with said chain links having a reciprocal pivot angle that is delimited by abutment inserts, with exposed sides of said chain links covered by cover plates that are secured to said crosspieces, and with end links of said chain being connected, via connectors, on the one hand to a fixed connection and on the other hand to a movable consuming device, said guide or feeder chain further comprising:

at least some of said cross pieces, along a portion thereof disposed between said link members, having an enlarged cross-sectional configuration;

each of said abutment inserts being interconnected to at least one other abutment insert via a stem means that fixedly extends into corresponding notch means of said link members;

a respective curved cover element being telescopically guided on one side of each of said cover plates, with each cover element covering the region of a link pivot axis and extending below an adjacent cover plate;

each of said end links having two ends, one of which is embodied to connect to one of said link members, and the other of which is provided with a pocket to receive variously shaped ones of said connectors; and

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said at least some crosspieces having an asymmetrically widened profile.

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## METHOD OF OPERATING GAS TURBINES WITH REFORMED FUEL

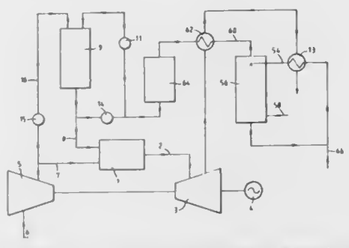
Warwick J. Lywood, Yarm; Jeremy C. B. Hunns, Caldicot, and Peter J. Davidson, Darlington, all of England, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation-in-part of Ser. No. 181,031, Apr. 13, 1988, Pat. No. 4,938,685, which is a continuation-in-part of Ser. No. 52,004, May 20, 1987, Pat. No. 4,788,004. This application Jul. 11, 1989, Ser. No. 378,070

Claims priority, application United Kingdom, May 27, 1986, 8612777; Apr. 13, 1987, 8708776; Jul. 11, 1988, 8816440

Int. Cl.[5] F02C *3/20*

U.S. Cl. 60—39.02 11 Claims



1. A method of operating a gas turbine wherein a compressed mixture of a fuel gas and air is combusted in a turbine combustor with the formation of a flame and the combustion products are let down through a turbine producing shaft power, wherein said fuel gas comprises the product of a stage of catalytic autothermal steam reforming of a light hydrocarbon feedstock having a boiling point at atmospheric pressure below 220° C.,

said catalytic autothermal steam reforming stage comprising reacting a feedstock gas containing the light hydrocarbon feedstock and steam with an amount of air insufficient to cause complete combustion and then passing the resultant hot partially combusted mixture over a catalyst that exhibits steam reforming activity, and

the amount of air fed to the gas turbine combustor, relative to the amount of hydrocarbon fed to the catalytic autothermal steam reforming stage, is greater than the maximum amount of air that enables a flame to be sustained in said combustor if that amount of hydrocarbon were to be fed directly to the combustor.

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5,048,285

## CONTROL SYSTEM FOR GAS TURBINE ENGINES PROVIDING EXTENDED ENGINE LIFE

Thomas P. Schmitt, Tequesta, and Stephen L. Collins, Stuart, both of Fla., assignors to Untied Technologies Corporation, Hartford, Conn.

Filed Mar. 26, 1990, Ser. No. 499,098

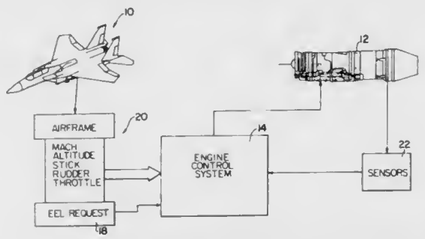
Int. Cl.[5] F02C *9/00*

U.S. Cl. 60—204 13 Claims

1. An apparatus for controlling thrust from an engine in an aircraft, the engine having a compressor affixed to a spool driven by a turbine, a burner for generating hot exhaust gas and a variable area exhaust nozzle, the engine and aircraft having a plurality of sensors for generating signals indicative of parameters, including altitude and air temperatures and pressures external to and internal to the engine at selected locations thereof, said apparatus comprising:

a means for receiving the aircraft and engine parameter signals; as well as command signals, including signals requesting normal or extended engine life mode of engine operation;

scheduling means responsive to said aircraft parameter signals for generating signals corresponding to a normal engine operational mode comprised of selected values of engine pressure ratio (EPR) as a function of total engine airflow that comprise a standard operating line, said scheduling means further selectively generating signals corresponding to an extended engine life (EEL) operational mode wherein said scheduling means computes a total differential of said engine pressure ratio (EPR) with




respect to said total airflow such that a ratio therebetween constitutes a value (M) defining a relationship between engine pressure ratio (EPR) and total airflow (W) corresponding to a value of constant engine thrust and selects values of engine pressure ratio (EPR) as a function of total engine airflow (W) in accordance therewith that comprise an extended engine life (EEL) operating line; and

a control means responsive to said pilot command signals for providing signals to said scheduling means for selecting between said normal and extended engine life (EEL) operating modes.

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5,048,286

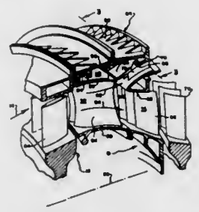
## BYPASS VALVE DOOR

Larry W. Stransky, West Chester; Michael A. Phillips, Cincinnati, and Edward W. Ryan, Mason, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 29, 1990, Ser. No. 546,229

Int. Cl.[5] F02K *3/02*

U.S. Cl. 60—226.3 11 Claims



1. For a bypass valve system for controlling fluid flow in a gas turbine engine having an annular frame including a longitudinal centerline axis, an outer casing, an intermediate casing spaced from said outer casing to define a cavity, said intermediate casing including an annular opening therein, and an inner casing spaced from said intermediate casing to define a first channel for channeling fluid flow; and a flow splitter disposed between said intermediate and inner casings to define with said intermediate casing a second channel being in flow communication with said first channel; a bypass valve door disposable in said annular opening comprising:

an inner surface for facing said fluid, an outer surface, a first end pivotally connectable to said frame, and a second end, said door being positionable in an open position generally parallel to said intermediate casing, and in a closed position generally inclined from said intermediate casing;



said door inner surface facing said splitter in said door open position for allowing substantially unobstructed fluid flow from said first channel to said second channel, and said door closed position disposing said door second end adjacent to said splitter for substantially blocking fluid flow from said first channel to said second channel;

said door inner surface being arcuate relative to said centerline axis for being coextensive with said intermediate casing for providing a smooth boundary of said second flow channel when said door is in said open position;

said door inner surface having a first radius relative to said centerline axis at said door first end and a second radius relative to said centerline axis at said door second end when said door is in said open position, said first and second radii being different; and

a seal seat extending obliquely from said door second end and positionable within said cavity when said door is in said open position and positionable in sealing contact with said splitter when said door is in said closed position.

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5,048,287

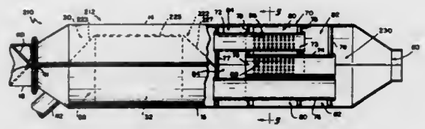
## TUNED EXHAUST PROCESSOR ASSEMBLY

Michael G. Howe; James C. Arthur, and Robert T. Usleman, all of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Continuation of Ser. No. 232,023, Aug. 15, 1988, abandoned. This application Jun. 19, 1990, Ser. No. 541,083

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—288 29 Claims



1. An exhaust processor assembly comprising

a housing formed to include an inlet and an outlet,

a partition positioned within the housing to define first and second flow passages extending through the housing to provide communication between the inlet and the outlet of the housing,

a substrate situated in the first flow passage and configured to collect particulate matter entrained in combustion product introduced into the first flow passage through the inlet, and

a muffler situated in the second flow passage to attenuate noise generated by combustion product passing through the second flow passage toward the outlet, the muffler including a plurality of baffles defining a plurality of muffler chambers and at least one tube configured and positioned to interconnect selected muffler chambers to define means for conducting combustion product introduced into the muffler toward the housing outlet.

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5,048,288

## COMBINED TURBINE STATOR COOLING AND TURBINE TIP CLEARANCE CONTROL

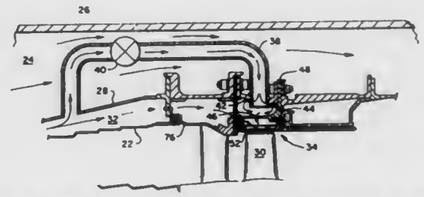
Alan D. Bessette, Palm Beach Gardens; Daniel O. Davies, West Palm Beach, and John L. Shade, Jupiter, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 286,838, Dec. 20, 1988, abandoned. This application Nov. 13, 1990, Ser. No. 644,461

Int. Cl.[5] F02C *7/18*

U.S. Cl. 60—226.1 7 Claims

1. For an aircraft fan jet engine having an engine case, a fan duct surrounding said engine casing and flowing fan discharge air therethrough, a turbine with a plurality of blades each having a tip portion rotatably supported in said engine casing, an outer air seal surrounding said blades and defining a gap between said outer air seal and said tip, first means for cooling said outer air seal by continuously directing a portion of cool engine air obtained from a source to said outer air seal, and second means by-passing said first means leading another portion of said cool engine air also obtained from said source to



said outer air seal and means for throttling or shutting off said other portion of said cool engine air in said second means, whereby said second means for by-passing is rendered partially or totally inoperative permitting said engine casing to influence the growth or said outer air seal.

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5,048,289

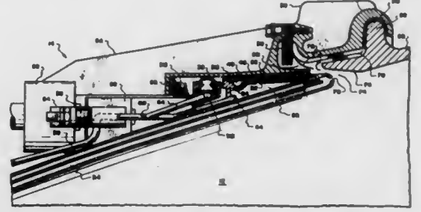
## EXTENDIBLE NOZZLE

William S. Brown, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 15, 1989, Ser. No. 366,901

Int. Cl.[5] F02K *9/84, 1/52*

U.S. Cl. 60—267 5 Claims



1. A thrust nozzle assembly for a rocket engine comprising:

(a) a regeneratively cooled fixed nozzle section attached to a rocket engine;

(b) a heat resistant, radiatively cooled, metallic extendible nozzle section which in a stored position forms a frustoconical sleeve about the fixed nozzle section;

(c) nozzle extending and retracting means for selectively extending the extendible nozzle section to a fully extended position or retracting the extended nozzle to a stored position;

(d) means for effecting a cooled, fluid seal interface and thermally managed environment to maintain an elastic repetitive seal system between the fixed nozzle section and the extendible nozzle when the latter is in an extended functional position;

(e) means for providing cooling fluid to and between interfacing surfaces of the fixed nozzle section and extendible nozzle section;

(f) means for circulating said cooling fluid into contact with said interfacing surfaces of the fixed nozzle and extending nozzle sections, and routing the fluid so as to maintain a replenished cooling fluid in contact with said surfaces;

(g) thermal isolation rings housed within a segment of the extendible nozzle section;

(h) as least one heat dissipating fin structure;

(i) radiative shields;

(j) a radiatively cooled extension to the extendible nozzle section; and

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(k) means for joining the fixed cooled nozzle section and the extendible nozzle section.

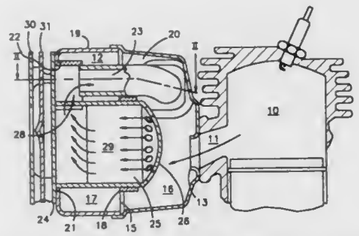
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**5,048,290**

## ARRANGEMENT FOR WASTE GAS PURIFICATION

**Mats R. F. Lavenius, Göteborg; Karl F. Wildt-Persson, Askim, and George N. Fraquhar, Alingsås, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed May 24, 1990, Ser. No. 528,699**
**Claims priority, application Sweden, May 29, 1989, 8901908**
**Int. Cl.[5] F01N** *3/28*
**U.S. Cl. 60—299** **4 Claims**



1. An arrangement for waste gas purification of a combustion engine combined with a waste gas silencer for an engine, comprising: a catalystic element **(29)** placed on a partition wall **(15)** of the silencer, the partition wall dividing the interior of the silencer into two chambers **(16, 17)**, characterized in that the catalytic element and surrounding plates **(24, 25, 26)** for guiding and distributing waste gases form a cassette in the silencer which is provided with openings **(18, 22)** as well as an adjoining surface **(21)** for forming a tight connection to the cassette, a part of the cassette forming a lid **(24)** which fits over an opening **(22)** into the wall **(21)** of the silencer, the wall facing away from the engine, the inside of the lid constituting a fastening member to one end of a sheet steel cylinder **(25)** which projects by its free end into one of said openings **(18)** in said partition wall **(15)**, the free end of the cylinder being covered by a radiation protective and distributing plate **(26)** provided with through passage holes.

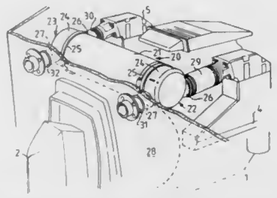
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**5,048,291**

## EXHAUST MUFFLER FOR MARINE ENGINES WITH TWO ROWS OF CYLINDERS

**Christian Rodskier, Torslanda, Sweden, assignor to AB Volvo Penta, Guthenburg, Sweden**

**Filed Nov. 30, 1989, Ser. No. 443,377**
**Claims priority, application Sweden, Dec. 16, 1988, 8804555**
**Int. Cl.[5] F01N** *7/10;* **B63H** *21/32*
**U.S. Cl. 60—323** **9 Claims**



1. Exhaust muffler installation in a boat with at least one engine with two rows of cylinders and a propeller drive coupled to the engine and mounted on the outside of the boat transom, comprising means for collecting exhaust from each said row of cylinders with one exhaust inlet and one exhaust outlet for each row of cylinders, characterized in that said means is formed by an elongated container **(20)**, said container being mounted with its longitudinal axis horizontal and transverse to the rows of cylinders of the engine **(1)** between the rear of the engine and the boat transom **(3)**, and in that an inlet **(26)** and an outlet **(27)** for exhaust from each row of cylinders are disposed at or near each end of the container.

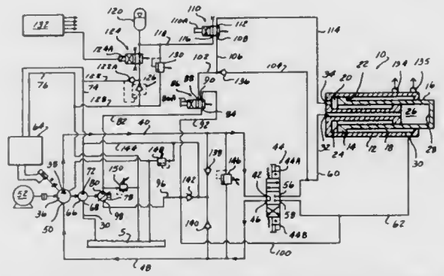
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**5,048,292**

## DUAL PUMP TRAVERSE AND FEED SYSTEM

**Philip A. Kubik, 1527 Lockridge, Bloomfield Hills, Mich. 48013**

**Filed Aug. 2, 1990, Ser. No. 561,878**
**Int. Cl.[5] F15B** *11/02, 1/02*
**U.S. Cl. 60—413** **5 Claims**



1. Hydraulic circuit means for selectively driving a single rod piston operatively disposed in a three chamber hydraulic cylinder in forward and return strokes, said piston having equal areas on its rod end side and its head end side respectively exposed in first and second chambers of said cylinder and a third area on its head end side exposed in the third chamber of said cylinder, said circuit means comprising a main pump connected to said first and second chambers of said cylinder via directional control valve means in a first circuit to drive said piston in a forward traverse stroke when said valve means is in a first position and to drive said piston in a return traverse stroke when said valve means is in a second position, a feed pump having an intake and an outlet, first conduit means connecting said first chamber of said cylinder to said intake of said feed pump, second conduit means connected to said second chamber of said cylinder, first two position valve means 86 operable in a first position to connect said outlet of said feed pump to said second conduit means to drive said piston in a forward feed stroke and operable in a second position to connect said outlet to said first conduit means to enable said feed pump to idle via a second closed loop circuit, accumulator, and second two position valve means operable in a first position to connect said third chamber to said accumulator and operable in a second position to connect said third chamber to said second conduit means.

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**5,048,293**

## PUMP CONTROLLING APPARATUS FOR CONSTRUCTION MACHINE

**Yukio Aoyagi, Ibaraki, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan**

**Filed Dec. 21, 1989, Ser. No. 454,387**
**Claims priority, application Japan, Dec. 29, 1988, 63-333621**
**Int. Cl.[5] E02F** *9/22*
**U.S. Cl. 60—420** **17 Claims**

5. A hydraulic drive controlling apparatus for a construction machine having a plurality of operation means to be manipulated by the machine operator, comprising:

at least one variable displacement type hydraulic pump for pumping hydraulic fluid to a delivery pressure;

a plurality of actuators responsive to respective operation means to be driven with the hydraulic fluid from said hydraulic pump and with respective load pressures;

directional control valves for controlling said plurality of actuators, said directional control valves being driven in accordance with amounts of manipulation of the operation means;

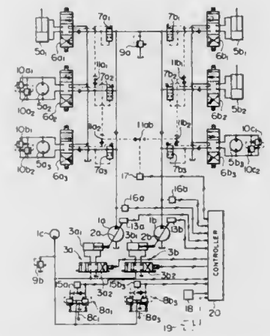
means for detecting the delivery pressure of said hydraulic pump;

means for selecting a maximum load pressure among the load pressures of said plurality of actuators;

first control means for controlling displacement of said hydraulic pump to bring a differential pressure between the delivery pressure and the maximum load pressure to a specified value in one mode of control;

second control means for controlling the displacement of said hydraulic pump to bring the delivery pressure thereof to a predetermined set target pressure value in another mode of control;





first command means for selecting a mode of control of the displacement of said hydraulic pump and outputting a corresponding command signal;

first selection means for selecting one of said first and said second control means for operation in one of the modes depending upon the command signal from said first command means; and

second selection means for judging whether said operation means for a specific one of said actuators is manipulated, for selecting said second control means when said operation means for said specific actuator is manipulated, and for selecting said first control means when said operation means for the other actuators are manipulated.

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**5,048,294**

## SAFETY DEVICE FOR HYDRAULIC CLOSED CIRCUIT

**Morio Oshina, Ibargi; Takashi Kanai, Kashiwa; Masami Ochiai, and Koji Nozaki, both of Ibaragi, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Toyota, Japan**

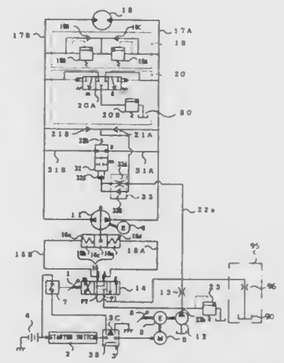
**Division of Ser. No. 276,019, Nov. 25, 1989, abandoned. This application Sep. 6, 1990, Ser. No. 578,350**
**Claims priority, application Japan, Nov. 28, 1987, 62-301258; Nov. 28, 1987, 63-301259; Oct. 17, 1988, 63-260995**
**Int. Cl.[5] F15B** *9/04*
**U.S. Cl. 60—468** **8 Claims**

1. A safety device for a hydraulic closed circuit which includes a variable displacement hydraulic pump driven by a prime mover, a tilting controlling means for controlling a tilt angle of said variable displacement hydraulic pump, and a hydraulic motor having a pair of input/output ports connected in a closed circuit to a pair of input/output ports of said variable displacement hydraulic pump by way of a pair of main pipe lines, said safety device comprising:

a rotation detecting means for detecting a rotational condition of said prime mover;

an opening and closing valve having a first position in which said opening and closing valve disconnects said main pipe lines from each other and a second position in which said opening and closing valve establishes communication between said main pipe lines; and

a change-over controlling means for changing over said opening and closing valve to the second position in response to a detection of stopping of said prime mover and for changing over said opening and closing valve to the first position after lapse of a predetermined delay time after starting of said prime mover.



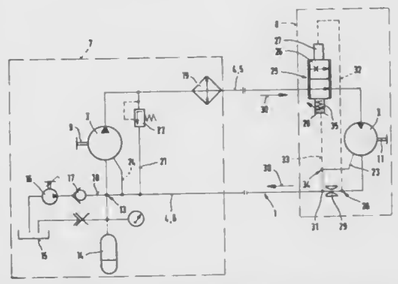
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**5,048,295**

## HYDROSTATIC TRANSMISSION

**Arnulf Höscheler, Ulm, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany**

**Filed Mar. 15, 1989, Ser. No. 324,240**
**Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 3812300**
**Int. Cl.[5] F16D** *31/02*
**U.S. Cl. 60—461** **16 Claims**



1. Hydrostatic transmission comprising a main line for a flow of hydraulic fluid; said main line having low pressure and high pressure flow sections; a pump and a hydraulic motor arranged in said main line; an oil drain line of said hydraulic motor being connected with said low pressure section; a control valve arranged in said main line upstream of the connection of said oil drain line to said low pressure section for controlling the flow of the hydraulic fluid to said hydraulic motor in response to the hydraulic pressure reigning in said main line, said control valve being a throttling valve **(25)** having a passage of adjustable cross-section and two ports respectively connected with said pump **(2)** and said hydraulic motor **(3)**, said control valve reducing the flow of the hydraulic fluid responsive to an increasing pressure or decreasing temperature of the hydraulic fluid; a throttling pressure relief valve **(22)** located in a bypass **(21)** intermediate said high and low pressure sections **(5,6)**, said control valve cooperating with said throttling pressure relief

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valve such that the throttling effect of said pressure relief valve reduces with increasing throttling effected by said control valve; and a valve body (26) of said control valve (25) being acted upon by an increased throttling effect of the hydraulic pressure in the direction of flow upstream of a throttle (29) arranged in said main line (4).

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5,048,296

## ANTI-VIBRATION APPARATUS IN A HYDRAULIC SYSTEM FOR BOOM CYLINDER OF WORKING APPARATUS

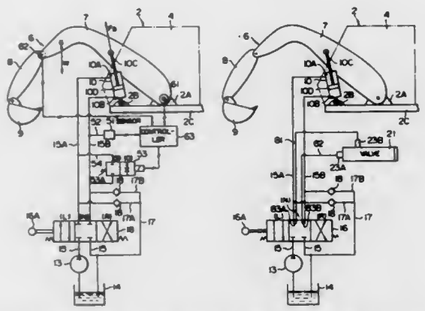
Kazuhiro Sunamura, Ibaraki; Osamu Tomikawa, Tsuchiura, and Toichi Hirata, Ushiku, all of Japan, assignors to Hitachi Construction Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1990, Ser. No. 463,300

Claims priority, application Japan, Jan. 13, 1989, 1-007351; Jan. 13, 1989, 1-007352; Jan. 13, 1989, 1-007353

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—468 20 Claims



1. A hydraulic system for a boom cylinder in a working apparatus which includes a boom mounted pivotally on a body of the working apparatus, comprising:

actuator means for moving said boom up and down, said actuator means including a piston rod connected to said boom and a cylinder defining a rodside hydraulic chamber and a bottom-side hydraulic chamber for extending or retracting said piston rod;

a hydraulic circuit including directional selecting valve means and lines for respectively connecting said rod-side and bottom-side hydraulic chambers with said directional selecting valve means, said directional selecting valve means selectively switching feed of pressurized working fluid to and discharge of the working fluid from with respect to said rod-side and said bottom-side hydraulic chamber; and

means connected to said bottom-side hydraulic chamber of said actuator means through said hydraulic circuit for relieving a pressure in said bottom-side hydraulic chamber to a low-pressure side of said hydraulic circuit when said pressure changes from rise to fall.

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5,048,297

## METHOD AND APPARATUS FOR CONTROLLING THE MOVEMENT OF A FREE, GAS-DRIVEN DISPLACER IN A COOLING ENGINE

Domenico S. Sarcia, 114 Sunset Rd., Carlisle, Mass. 01741, and Richard J. Birch, 35 Elm St., Wellesley, Mass. 02181

Filed Mar. 14, 1990, Ser. No. 493,747

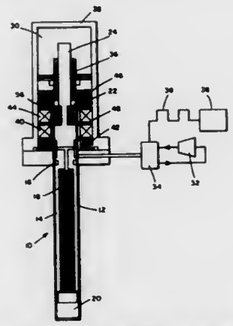
Int. Cl.[5] F02G *1/045;* F25B *9/00*

U.S. Cl. 60—520 23 Claims

1. A method for controlling the movement of a free motion, gas-driven, piston actuated displacer with respect to the top dead center and bottom dead center portions of its cycle and the pressure across the displacer's actuation piston in a cooling engine, said method comprising the steps of:

(1) generating a magnetic snubbing force that acts on the displacer to limit the movement of the displacer beyond top dead center;

(2) generating another magnetic snubbing force that acts on the displacer to limit the movement of the displacer beyond bottom dead center;



(3) generating a magnetic retaining force that acts on the displacer to prevent the displacer from moving towards bottom dead center until a first predetermined pressure differential as established across the displacer's actuation piston; and,

(4) generating a magnetic retaining force that acts on the displacer to prevent the displacer from moving towards top dead center until a second predetermined pressure differential is established across the displacer's actuation piston.

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5,048,298

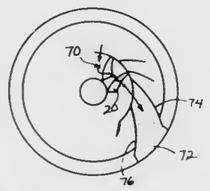
## LOW COST FUEL SYSTEM FOR A GAS TURBINE ENGINE

Colin Rodgers, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 10, 1989, Ser. No. 377,564

Int. Cl.[5] F02C *7/22*

U.S. Cl. 60—726 7 Claims



1. A gas turbine engine comprising:

a rotary compressor rotatable about an axis and having an inlet and an outlet;

an annular combustor;

a turbine wheel mounted for rotation about an axis generally centrally of said combustor and coupled to said compressor to drive the same;

a nozzle interposed between said combustor and said turbine wheel for directing gases of combustion from the combustor against said wheel;

a plenum surrounding said combustor and connected to said outlet;

a low pressure fuel jet at said compressor inlet and directed to spray fuel into said inlet at a location radially displaced from said compressor axis and extending substantially less than peripherally around said inlet; and

directing means within said plenum and having an entrance at said outlet for receiving substantially only a fuel-air mixture from said compressor, the remainder of said plenum also being in fluid communication with said outlet to receive substantially only air therefrom.

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5,048,299

## AIR CONDITIONER FOR AN AUTOMOBILE

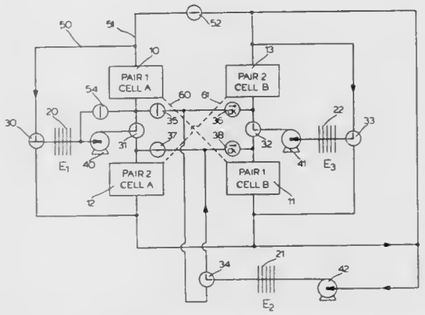
William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382

Continuation-in-part of Ser. No. 426,009, Oct. 24, 1989, Pat. No. 4,939,902. This application Jun. 18, 1990, Ser. No. 539,237

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[5] F17C *11/00*

U.S. Cl. 62—46.2 17 Claims




1. Apparatus for air conditioning an automobile, the automobile having an engine, the apparatus comprising:

a) first and second pairs of hydrogen storage cells, both cells of each pair containing a material capable of forming a hydride,

b) first, second, and third heat exchangers, the first exchanger absorbing heat from the interior of the automobile, the second exchanger continuously rejecting heat to the ambient air outside of the automobile, the third exchanger absorbing heat generated by the engine,

c) a heat transfer fluid that circulates between the hydrogen storage cells and the heat exchangers, and

d) means for routing the flow of heat transfer fluid in accordance with four sequential stages, as follows:

| | First Exchanger | Second Exchanger | Third Exchanger |
|---|---|---|---|
| Stage 1 | First cell of the first pair | Second cell of the first pair, and first cell of the second pair | Second cell of the second pair |
| Stage 2 | | Second cell of the second pair | |
| Stage 3 | First cell of the second pair | Second cell of the second pair, and first cell of the first pair | Second cell of the first pair |
| Stage 4 | | Second cell of the first pair | |

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5,048,300

## MICROTOME COOLING CHAMBER AND METHOD OF ADJUSTING THE COOLING CHAMBER TEMPERATURE

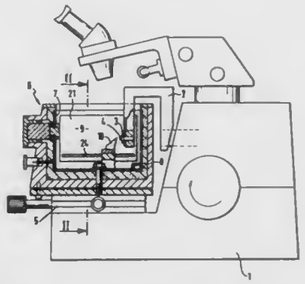
Reinhard Libl, Vienna, Austria, assignor to Reichert-Jung Optische Werke A.G., Vienna, Australia

Filed May 11, 1990, Ser. No. 523,054

Claims priority, application Austria, May 26, 1989, 1270/89; Fed. Rep. of Germany, Apr. 20, 1990, 4012600

Int. Cl.[5] F17C *7/04*

U.S. Cl. 62—48.1 13 Claims



1. A cooling chamber on a microtome comprising an internal space which is observable and accessible from above for accommodating in said space an object holder for holding an object to be processed and a processing tool for the object, with heating resistance means for controlling the temperature of the object holder and the processing tool to a desired value, and further including a supply tank for accommodating a liquid cryogenic agent, and a heater body providing a feed conduit communicating the tank with the cooling chamber space and opening into the cooling chamber space to feed evaporated gaseous cryogenic agent thereto, the heater body being operable to heat the gaseous cryogenic agent as it flows to said cooling chamber space for setting a predetermined temperature of the gas atmosphere in the cooling chamber space.

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5,048,301

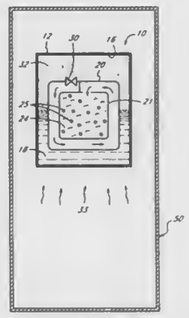
## VACUUM INSULATED SORBENT DRIVEN REFRIGERATION DEVICE

Cullen M. Sabin, San Diego; Dennis A. Thomas, Los Angeles, and Gary V. Steidl, Encinitas, all of Calif., assignors to International Thermal Packaging, Los Angeles, Calif.

Continuation of Ser. No. 293,812, Jan. 5, 1989, abandoned. This application Jun. 13, 1990, Ser. No. 539,330

Int. Cl.[5] F25B *15/00*

U.S. Cl. 62—101 32 Claims

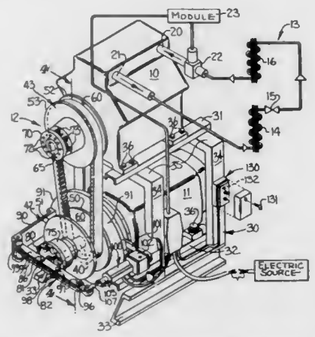


1. A self-contained cooling device comprising:

a liquid that, in operation of the device, evaporates to form a vapor;
a first evacuated chamber containing a sorbent for receiving the vapor;
a second chamber substantially surrounding and thermally enclosing the first chamber, the second chamber adapted to serve both as a conduit for passage of the vapor into the first chamber and as a thermal insulator of the first chamber when the second chamber is substantially evacuated;
a valve to prevent the vapor from flowing into the first chamber until desirable; and
a means for actuating the valve, thereby commencing operation of the device.

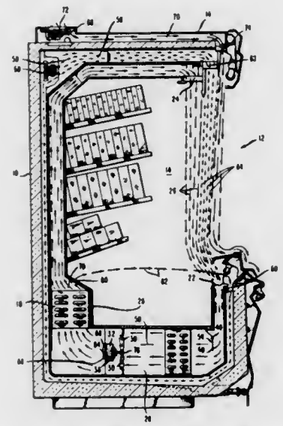
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**5,048,302**
**REFRIGERANT SYSTEM HAVING CONTROLLED VARIABLE SPEED DRIVE FOR COMPRESSOR**
**Thomas K. Hagenlocher, Huelben; Karl-Heinz Linnig, Friedrichshafen, both of Fed. Rep. of Germany; Michael P. Toomey, Charlotte, N.C.; Donald L. Hudson, Matthews, N.C., and David T. Bolen, Charlotte, N.C., assignors to Hudson Associates, Inc., Charlotte, N.C.**
**Filed Feb. 9, 1990, Ser. No. 477,592**
**Int. Cl.[5] F25B *1/00*; F16H *59/00***
**U.S. Cl. 62—228.4** **13 Claims**




**1**. A refrigerant system comprising a compressor with an external shaft, a constant speed motor having an external shaft extending substantially parallel to said compressor shaft at a fixed center distance therefrom, respective variable pitch pulleys having inner and outer pulley components mounted on the ends of the shafts of said motor and compressor, one pulley component of each pulley being axially movable relative to the other pulley component, an endless belt looped around said motor and compressor pulleys for drivingly connecting said motor to said compressor, said looped belt always being under constant tension due to the center distances between said motor and compressor shafts being constant, sensing means for sensing a variance in refrigerant characteristic from a predetermined value at a predetermined location in the refrigerant system, means operatively connected to said one movable pulley component of said motor pulley and being responsive to a sensed variation in the refrigerant characteristic for varying the axial position of said one pulley component of said motor pulley and to in turn vary the axial position of said one pulley component of said compressor so as to vary the pitch of said compressor pulley, said responsive means including a linear actuator having a plurality of incremental movement steps of predetermined values for incrementally moving said movable motor pulley component and incrementally changing the speed of the compressor.

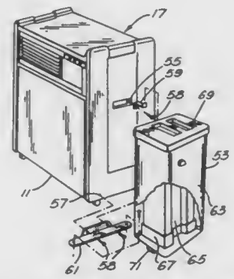
**5,048,303**
**OPEN FRONT REFRIGERATED DISPLAY CASE WITH IMPROVED AMBIENT AIR DEFROST MEANS**
**Bradley J. Campbell, Newtown, and Ronald R. Rosanio, Levittown, both of Pa., assignors to Hill Refrigeration Division of the Jepson Corporation, Trenton, N.J.**
**Filed Jul. 16, 1990, Ser. No. 553,046**
**Int. Cl.[5] A47F *3/04***
**U.S. Cl. 62—256** **19 Claims**



**18**. An open front refrigerated display case with improved ambient air defrost means comprising:
(a) a housing means comprising:
(1) a display compartment area adapted for receiving and retaining articles therein;
(2) an open front area to facilitate placement and removal of articles positioned within said display compartment area;
(b) a primary refrigeration means comprising:
(1) a primary refrigeration duct means extending through said housing means, said primary refrigeration duct means defining a primary inlet below said open front area and a primary outlet above said open front area, said primary refrigeration duct means being adapted to expel refrigerated air from said primary outlet to pass over said open front area and into said primary inlet to form a primary refrigeration curtain thereover;
(2) a primary refrigeration coil means positioned within said primary refrigeration duct means to receive air flowing therethrough for refrigeration thereof, said primary refrigeration coil means being rendered inoperative during defrosting thereof;
(3) a primary fan means positioned within said primary refrigeration duct means to facilitate air flow therethrough, said primary fan means operative to urge air flow through said primary refrigeration duct means from said primary inlet to said primary outlet during refrigeration by said primary refrigeration coil means, said primary fan means operative to urge air flow through said primary refrigeration duct means from said primary outlet means to said primary inlet means during defrosting of said primary refrigeration coil means;
(4) a primary drive means operatively connected with respect to said primary fan means to power operation thereof;
(c) an ambient air defrost means operable to periodically defrost said primary refrigeration coil means as required, said ambient air defrost means including:
(1) an ambient air circulation means for drawing ambient air through said primary refrigeration duct means through said primary refrigeration coil means to facilitate ambient air defrost thereof, said ambient air circulation means comprising said primary fan means;
(2) an ambient air drive means for operatively driving of said ambient air circulation means to facilitate operation thereof, said ambient air drive means comprising said primary drive means;
(3) a one-way ambient air flow restriction means for controlling air flow through said primary refrigeration duct means during ambient air defrost and allowing full air flow through said refrigeration duct means during normal refrigeration mode operation, said one-way ambient air flow restriction means including:
(a) a header member fixedly attached with respect to said primary refrigeration duct means; and
(b) an air damper means mounted pivotally movable with respect to said header member to be movable between a refrigeration mode position and a defrosting mode position, said air damper means operable while in the refrigeration mode position to allow full air flow through said primary refrigeration duct means from said primary inlet to said primary outlet, said air damper means operable while in the defrosting mode to extend across said refrigeration duct means to restrict air flow therethrough, said air damper means defining a plurality air flow apertures therein to facilitate restricted air flow therepast responsive to said air damper means being in the defrosting mode position, said air damper means being operable responsive to being in the defrosting mode position to restrict reverse air flow through said primary refrigeration duct means to approximately 300 feet per minute for defrosting of said primary refrigeration coil means, said air damper means being movable to the defrosting mode position by air flow pressure exerted thereon by ambient defrosting air flow passing in a reverse direction through said primary refrigeration duct means;
(d) a secondary cooling means comprising:
(1) a secondary duct means extending through said housing means, said secondary duct means defining a secondary inlet below said open front area adjacent said primary inlet, said secondary duct means further including a secondary outlet above said open front area adjacent said primary outlet, said secondary refrigeration duct means being adapted to expel air from said secondary outlet to pass over said open front area and into said secondary inlet to form a secondary refrigeration air curtain thereover;
(2) a secondary fan means positioned within said secondary duct means to facilitate air flow therethrough;
(e) an ambient air flow control means comprising:
(1) an ambient duct means extending through said housing means, said ambient duct means defining an ambient inlet positioned within said housing above said open front area and further defining an ambient outlet within said housing above said open front area, said ambient outlet being adapted to expel air therefrom over said open front area to form an ambient air curtain extending thereover;
(2) an ambient fan means positioned within said ambient duct means to facilitate ambient air flow therethrough from said ambient inlet to said ambient outlet; and
(f) a bin area supplemental refrigeration means defining a display bin refrigeration outlet means positioned within said primary refrigeration duct means between said primary refrigeration coil and said primary outlet adjacent said display bin area to facilitate refrigeration thereof, said display bin refrigeration outlet means adapted to expel refrigeration air therefrom across said display bin area into said primary inlet to form a bin refrigeration air curtain extending thereover.



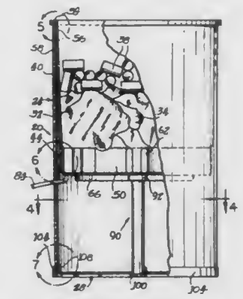
**5,048,304**
**PORTABLE AIR CONDITIONING APPARATUS HAVING LARGE WATER SUPPLYING CAPACITY TO EVAPORATION TYPE CONDENSER THEREIN**
**Tomoyoshi Takeuchi, Mishima, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Continuation of Ser. No. 295,373, Jan. 10, 1989, abandoned. This application Jul. 2, 1990, Ser. No. 546,700**
**Claims priority, application Japan, Feb. 29, 1988, 63-46814**
**Int. Cl.[5] F28D *5/00***
**U.S. Cl. 62—305** **8 Claims**



**1**. A portable air conditioning apparatus comprising:
a movable outer casing having an outer wall for defining an interior space;
air conditioning means disposed in the outer casing for conditioning air flowing into the interior space, the air conditioning means including a condenser cooled by water, a part of the water being subject to evaporation; and
water supply means movably attached to the outer wall of the outer casing outside of the interior space for storing water supplied to the condenser.

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**5,048,305**
**COOLER ASSEMBLY**
**Ronald Taub, 1154 Sheridan Rd., Highland Park, Ill. 60035**
**Filed Aug. 30, 1990, Ser. No. 575,224**
**Int. Cl.[5] F25D *3/08***
**U.S. Cl. 62—372** **24 Claims**



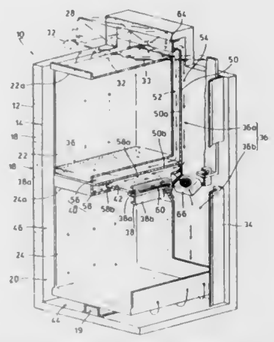
**1**. A cooler for the storage of canned beverages and the like therein, to be retrieved therefrom, said cooler being adapted to use ice as a cooling medium;
said cooler comprising an outer cylindrical housing having an upper rim and a circumambient annular lower edge;
tubular vessel means of self-supporting plastics composition sleeved within said housing for holding beverages to be cooled therewithin;
said vessel means having an integrally formed bottom closure as a floor thereof; and
strut-like spacer means integrally formed with said vessel

means, said spacer means being disposed as an array and having closed upper ends to prevent accumulating of fluid therewithin, said spacer means projecting upwardly of said vessel means for supporting beverage containers thereon, the beverage containers being in an elevated mode and being ice-cooled in said vessel means;

said spacer means delineating therebetween and in combination with a lower annular sector and said bottom closure of said vessel means, sump means for receiving and retaining therein water formed from melting of ice contained in said vessel means.

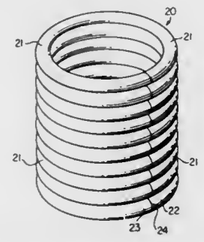
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**5,048,306**
**REFRIGERATOR**
**Yuji Wakatsuki; Shigekazu Kondo; Mitsuyuki Takaoka, and Nobuya Suzuki, all of Toyaoke, Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Aichi, Japan**
**Filed Jun. 19, 1990, Ser. No. 540,352**
**Int. Cl.[5] F25D *17/06***
**U.S. Cl. 62—419** **4 Claims**



1. A refrigerator having a heat-insulating box which has a plurality of opening sections and an heat-insulated door provided at each of said opening sections; a plurality of storage boxes disposed vertically through a prescribed space within said heat-insulating box, and having opening sections open correspondingly to said opening sections; an evaporator disposed on said upper storage box in said heat-insulating box, said refrigerator, comprising: first and second passages which are defined in a space in the interior of said heat-insulating box, said first passage for guiding cold air blown out from said evaporator downwardly, and said second passage for upwardly guiding the cold air that has flowed downwardly in said first passage to return to said evaporator; a partition plate which is disposed within said first passage to divide said passage into a passage which communicates said first passage with said second passage in order to allow the flow of the cold air in contact with said upper storage box, and a passage communicating with said second passage, allowing the cold air to flow into said upper storage box out of contact with said upper storage box; a regulating means which is disposed in a cold air passage from said evaporator, and regulates the flow of said cold air into said passage; and a cold air introducing means disposed in said passage, said cold air introducing means being operated to let a part of the cold air from said evaporator to flow into said passage without being regulated by said regulating means.

**5,048,307**
**CYLINDRICAL COOLING AND INSULATING CONTAINER**
**Gregory M. Baxter, Allen St., #304, Dallas, Tex. 75204, assignor to Gregory M. Baxter, Dallas, Tex.**
**Continuation-in-part of Ser. No. 275,114, Nov. 21, 1988. This application Jun. 21, 1989, Ser. No. 369,299**
**Int. Cl.[5] F25D *3/08***
**U.S. Cl. 62—457.4** **18 Claims**



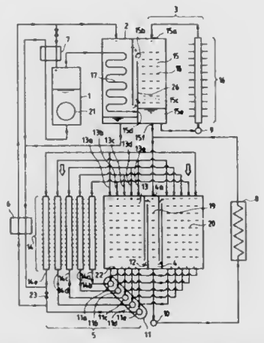
1. A substantially cylindrical, thermally insulated container for a beverage receptacle, comprising:

a plurality of flexible hollow tubes joined edge to edge to form a stack of tubes with first and second open ends, each of said plurality of tubes having a substantially fixed radial dimension;

a plurality of connectors, each having a first end inserted into and bonded with said first open end of a respective one of said plurality of tubes, and a second end inserted into and bonded with said second open end of said respective one of said plurality of tubes, whereby said first and second open ends are connected to form a substantially cylindrical inner surface of said container to accommodate a substantially cylindrical outer surface of a beverage receptacle.

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**5,048,308**
**ABSORPTION REFRIGERATOR**
**Daisuke Hisajima, Kashiwa; Tomihisa Ohuchi, Tsukuba; Seiichiro Sakaguchi; Toshifumi Kunugi, both of Chiyoda, and Michihiko Aizawa, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Jun. 15, 1990, Ser. No. 538,720**
**Claims priority, application Japan, Jun. 16, 1989, 1-152388**
**Int. Cl.[5] F25B *15/00***
**U.S. Cl. 62—476** **8 Claims**

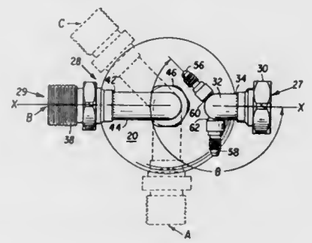


1. An absorption refrigerator including an evaporator, an absorber, a regenerator and a condenser, said absorber includes a vapor absorption portion formed by at least two flow paths through which an absorption solution flows downwardly and absorbs a cooling medium vapor, at least two solution cooling portions separated from and juxtaposed with said vapor absorption portion, and circulation means for circulating said absorption solution absorbing said cooling medium vapor disposed between said solution cooling portions and said vapor absorption portion, and means for causing said absorption solution, supplied from a regenerator and cooled in said first solution cooling portion, to flow down through said first vapor absorption portion so as to absorb the cooling medium vapor evaporated in said evaporator, then leading the absorption solution to said second solution cooling portion through said first solution circulation portion and cooling the absorption solution thereat, causing said absorption solution to again flow down through a flow path of said vapor absorption portion different from the flow path through which the absorption solution has previously flowed down, so as to absorb said cooling medium vapor, and for returning said absorption solution flowing down through said flow path of said vapor absorption portion to said regenerator.



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**5,048,309**
**UNIVERSAL ACCUMULATOR**
**Billy M. Carlisle, Jr., 6415 Jetty, San Antonio, Tex. 78239**
**Continuation of Ser. No. 360,442, Jun. 2, 1989, Pat. No. 4,938,037, which is a continuation of Ser. No. 139,858, Dec. 30, 1987, Pat. No. 4,835,986. This application Jun. 29, 1990, Ser. No. 545,883**
**Int. Cl.[5] F25B *43/00***
**U.S. Cl. 62—503** **6 Claims**



1. An accumulator, comprising:

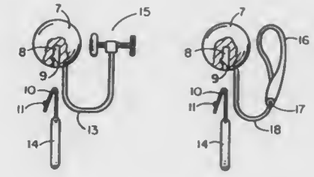
a housing having a top;

first fitting means connected to said top of said housing and in fluid communication with a cavity within said housing, said first fitting means having a first fitting means port;

second fitting means having a second fitting means port, said second fitting means being adapted to be connected to said top of said housing in fluid communication with said cavity within said housing; and

means for adjustably connecting said second fitting means to said housing top so as to permit variable positioning of said second fitting means port relative to said first fitting means port, said means for adjustably connecting said second fitting means to said housing top permitting said second fitting means port and said first fitting means port to remain in substantially the same plane as said second fitting means port is rotated relative to said first fitting means port within the range of approximately fifteen degrees to three hundred forty five degrees, said accumulator thereby being adapted to accommodate a variety of automotive applications.

**5,048,310**
**APPARATUS FOR CHANGEABLE EARRING PENDENTS**
**Yong N. Riley, 626 Fairview Dr., Plymouth, Wis. 53073**
**Filed Jul. 30, 1990, Ser. No. 560,352**
**Int. Cl.[5] A44C *7/00***
**U.S. Cl. 63—13** **2 Claims**



1. Apparatus for changeable earring pendents wherein the improvement comprises:

(a) a screw on ear ring mount comprising an adjustable screw assembly,

(b) a U-shaped connector for joining back and front of an ear connector,

(c) an earring ball on the front of said ear connector,

(d) a slot in said earring ball,

(e) a female opening in said slot,

(f) a V spring insert,

(g) a male stud segment on said V spring insert,

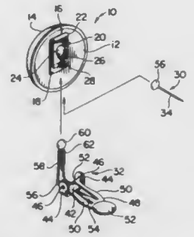
(h) said V spring inserted in said slot,

(i) said male stud segment fitting into said female opening in said slot and

(j) a pendent spring ring suspended from a leg of said V spring.

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**5,048,311**
**CONVERTIBLE JEWELRY ARTICLE**
**John Mastrobuono, 399 Comstock Pkwy., Cranston, R.I. 02921**
**Filed Aug. 17, 1990, Ser. No. 569,851**
**Int. Cl.[5] A44C *7/00***
**U.S. Cl. 63—12** **9 Claims**



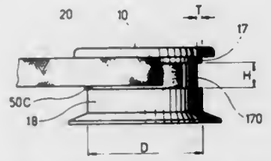
1. A convertible jewelry article for use by a wearer, comprising an ornamental member having a backing to which a holding bracket is secured, said holding bracket having a dome portion the interior of which has a semi-spherical shape, and means for mounting said ornamental member in a position of use on said wearer, said mounting means including a semi-spherical member that is removably received in the semi-spherical shaped interior of the dome portion of said holding bracket in seated relation therewith, a longitudinal slot being formed in said holding bracket and extending into said dome portion and an elongated element that is joined to said semi-spherical member, said element being received in said slot for aiding in removably locking said holding bracket and ornamental member on said mounting means.

5,048,312

## SLIP-PROOF ELASTIC YARN FEEDING RING DEVICE REMOVABLY MOUNTED ON YARN-FEEDING DRUM

Jen-Fu Chen, 220 Berkley St., Saint Lamber, Montreal, Quebec, Canada J4P 3E1

Filed Oct. 27, 1989, Ser. No. 427,513
Int. Cl.[5] B65H *51/06*; D04B *15/48*
U.S. Cl. 66—132 T 8 Claims



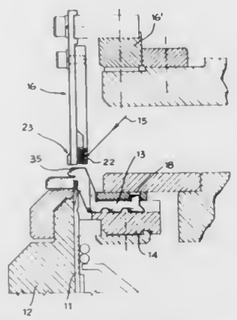

1. An improved yarn-feeding apparatus of the type wherein a yarn-feeding drum is rotatably mounted on a spindle, and wherein fed yarn is guided by a yarn guide movably mounted beside said drum and pressed and fed between an endless yarn-feeding belt and the yarn-feeding drum to be carried by the belt, wherein the improvement comprises:
the circumference of said yarn-feeding drum including a first portion and a second portion, the first portion having a top edge and the second portion having a bottom edge;
a slip-proof elastic yarn-feeding ring device removably mounted in said first portion of the yarn-feeding drum, said elastic ring device having a diameter smaller than that of said first portion of the yarn-feeding drum, whereby when said elastic ring device is extended to fixedly ring said first portion of the circumference of the yarn-feeding drum via its elastic binding force, the ring device thickness and width are consequently reduced.

5,048,313

## CIRCULAR KNITTING MACHINES WITH THREAD GUIDE HAVING SUPPORT CAM FOR YARN

Cesare Vignoni, Brescia, Italy, assignor to Vignoni S.r.l., Gividino, Italy

Filed Jul. 31, 1989, Ser. No. 387,932
Claims priority, application Italy, Aug. 4, 1988, 5200 A/88
Int. Cl.[5] D04B *9/02, 15/48*
U.S. Cl. 66—141 7 Claims



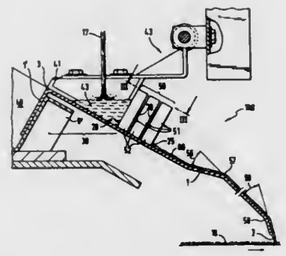

1. A knitting machine, comprising:
a cylinder arrangement with a plurality of needles, each needle having hook and a latch, each needle being displaceable within a rising zone;
sinker means including a plurality of intercalating elements, each intercalating element cooperating with a needle to knit threads and having a normal working face and a nose portion extending above said working face and having a length shorter than said working face and said nose portion defining an interweaving gap, said nose and said working face cooperate for controlling the feeding thread;
lifting and lowering cam means for displacing ones of said plurality of needles;
ingress and egress cam means for individually displacing ones of said plurality of intercalating elements; and,
a plurality of thread feed stations each feed station including a thread guide positioned at a distance above the rising zone of said needles, each thread guide including at least one guide bush positioned facing a radial direction of said cylinder and said thread guide including an inward supporting cam flush with said bush, said inward supporting cam including front bearing means for holding the yarn as it is fed, said front bearing means extending towards the rising zone of said needles substantially in a vertical plane in a direction which is parallel to the circumference of the cylinder.

5,048,314

## APPARATUS FOR APPLYING A TREATMENT FLUID HAVING A FLOW HOMOGENIZING BAFFLE

Alfred Keller, Willich; Julius Kohnen, Tonisvorst, and Wolfgang Kurschatke, Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Filed May 16, 1990, Ser. No. 525,232
Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915843
Int. Cl.[5] D06B *1/02*
U.S. Cl. 68—205 R 4 Claims



1. Apparatus for applying a treatment fluid onto a web of material comprising:
a support structure;
a run-off member having a top side and a bottom side, said run-off member being connected to said support structure in a position allowing a web of material to be treated in the apparatus to pass underneath the bottom side of said run-off member, said run-of member having upper and lower horizontal edges extending transverse to a web to be treated by the apparatus and defining ends of a run-off surface disposed on the top side of the run-off member, said run-off surface having an upper portion and lower portion sloping downwardly such that said lower horizontal edge is situated directly above a web to be treated by the apparatus when such a web passes underneath the run-off member;
means for supplying treatment fluid to the upper portion of the run-off surface over a width corresponding to the width of a web to be treated by the apparatus; and
a flow homogenizing baffle disposed on the top side of the run-off surface between said upper and lower horizontal edges, said baffle extending over the width of the run-off surface in a transverse direction parallel to said upper and lower horizontal edges, said baffle having a uniform field of deflection elements extending outwardly from the top side of the run-off surface each of said deflection elements having an upper transverse face proximal to the upper portion of the run-off surface and a lower transverse face proximal to the lower portion of the run-off surface, the deflection elements being arranged in at least three rows of deflection elements, the deflection elements within each of the rows being spaced from each other by a first small distance to define therebetween longitudinal channels generally perpendicular to the transverse direction, each of the longitudinal channels having an end proximal to the lower portion of the run-off surface, the rows being spaced from each other by a second small distance in the transverse direction to define therebetween transverse channels, the transverse channels being in communication with the longitudinal channels, each row being mutually offset in the transverse direction relative to each other such that the longitudinal channels intersect the transverse channels opposite the transverse faces, the distal ends of the longitudinal channels intersecting the transverse channels such that the angle therebetween is 90° or less whereby treatment fluid flowing down the upper portion of the run-off surface enters the baffle through the longitudinal channels in the row of deflection elements closest to the upper portion of the run-off surface, is deflected several times in the longitudinal and transverse channels, thereby creating turbulence and reducing the velocity of the treatment fluid, exits the baffle through the longitudinal channels in the row of deflection elements closest to the lower portion of the run-off surface, and flows over the lower horizontal edge of the run-off surface in a veil uniform across the width of the run-off surface.

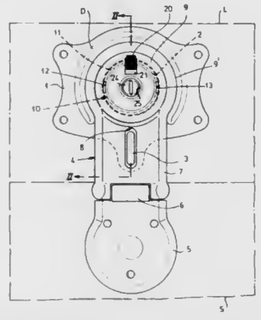


5,048,315

## CLOSURE FOR A LIDDED CONTAINER

Richard J. Rekuc, Pattenburg, N.J., assignor to Sudhaus of America, Inc., Lebanon, N.J.

Filed Sep. 21, 1990, Ser. No. 586,572
Int. Cl.[5] E05B *65/48*
U.S. Cl. 70—12 7 Claims



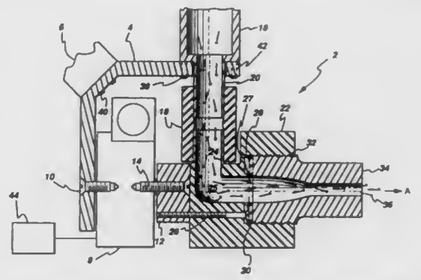
1. A trunk lock, comprising:
a staple plate mounted on a trunk lid and formed with a circularly extending ridge defining a generally circular groove, a staple projecting from said staple plate below said groove, and a circular opening spaced inwardly from said groove and above said staple;
a hasp having a fixed portion mounted fixedly on a body of a trunk formed with said lid and swingable portion connected by a hinge with said fixed portion, said swingable portion having a narrow elongated part connected with said hinge and formed with a slot through which said staple can pass, said swingable portion further having a wide part of generally circular configuration on a free end of said narrow part and fitting into said groove;
a lock assembly on said hasp and including a spring-loaded upwardly movable slide bolt receivable in said opening upon closing of the trunk lock to swing said hasp into an upright position with said wide part fitting into said groove so that said bolt engages behind a margin of said opening, and a key-operated lock mechanism extending into said opening in a closed position of the lock for selectively engaging and locking said slide bolt; and
a finger tab operatively connected to said slide bolt, linearly movable downwardly in a slot formed in said wide part to release said slide bolt from engagement with said staple plate when said slide bolt is not held locked by said mechanism.

5,048,316

## PRESSURE POT SHOT PEENING SYSTEM HAVING A HOLDER

Robert A. Thompson, New York, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 28, 1991, Ser. No. 646,901
Int. Cl.[5] B24C *7/00*
U.S. Cl. 72—19 6 Claims



1. A pressure pot shot peening system which is comprised of:
a supply means for supplying a mass of shot and air to a gun means;
a bracket means having first and second legs;
a sensor means operable to sense a reaction force from operation of said pressure pot peening system said sensor means having first and second sides such that said first side of said sensor means is rigidly attached to said first leg of said bracket means;
a gun means having a nozzle means with said gun means having first and second ends such that said mass of shot and air are conveyed from said first end through said second end and ejected from said nozzle means to create a reaction force parallel to said nozzle means and said gun means and a substantially 90° bend having first and second legs and being located intermediate of said first and second ends of said gun means such that saidfirst leg of said 90° bend is substantially located parallel to said second side of said sensor means and said second leg of said 90° bend is substantially perpendicular to said second side of said sensor means so that substantially the entire reaction force of the mass of shot and air ejected from said nozzle means is sensed by said sensor means and said second leg of said bracket being substantially located at a predetermined distance away from said first end of said gun means.

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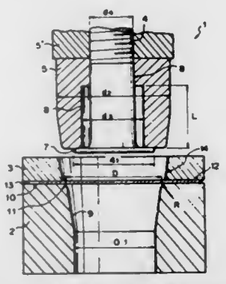


5,048,317

## METHOD OF MANUFACTURING DRAW-FORMED CONTAINER

Kazumi Hirota, Tokyo, and Kikuo Matsuoka, Yokohama, both of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

PCT No. PCT/JP88/00541, § 371 Date Apr. 2, 1990, § 102(e) Date Apr. 2, 1990, PCT Pub. No. WO89/11930, PCT Pub. Date Dec. 14, 1989
PCT Filed Jun. 4, 1988, Ser. No. 465,154
Int. Cl.[5] B21D 22/22
U.S. Cl. 72—347 7 Claims



1. In a method of manufacturing a draw-forming container which comprises using a male mold comprised of a core of a rigid body and a sleeve of an elastic body provided around the rigid body, a female mold having a cavity corresponding to the outside shape of the final container, and a crease presser on the female mold, feeding a coated metal sheet between the crease presser and the female mold, and driving the male mold and the female mold axially so as to mate the male and female molds

an improvement wherein the ratio of a maximum diameter ($d_2$) of the male mold to an inlet diameter (D) of the female mold satisfies the following relation

$$1.2 > d_2/D > 1.03$$

the coated metal sheet has a metal thickness of not more than 0.2 mm, and the male and female molds are such that when they mate each other without the presence of the coated sheet, a load in the axial direction (load on the elastic body) which the female mold undergoes at a bottom dead point is 10 to 60 kg/cm$^2$ of the circumferential area of the female mold.

5,048,318

## INTERMEDIATE DEPOSITING STATION BETWEEN MACHINING STAGES OF A PRESS

Karl Thudium, Wäschenbeuren, and Walter Rieger, Göppingen, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Fed. Rep. of Germany

Filed Sep. 12, 1990, Ser. No. 580,967
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1989, 3931081
Int. Cl.[5] B21D 45/05
U.S. Cl. 72—405 5 Claims

1. A metal forming machine comprising:

a plurality of machining stages for machining sheet metal parts; and

an arrangement for the temporary intermediate depositing and pivoting of individual sheet metal parts during a transfer from one machine stage to a next machining stage of the metal forming machine, said arrangement including:

templates for supporting a sheet metal part from below which are adjustable in height, distance and oblique position relative to another sheet metal part;

a mounting plate displaceable in a first correcting movement in a first horizontal direction with respect to a foundation after pivoting of the sheet metal part from a first position in which the sheet metal part is placed on the templates into a second position in which the sheet metal part is removed from the templates;

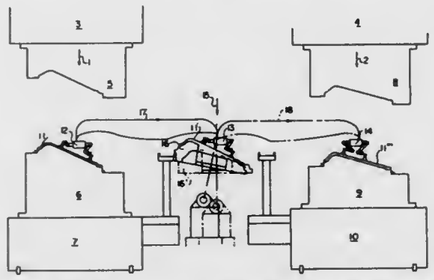
a first adjusting device coupled to the mounting plate and operable to displace said mounting plate horizontally;

a carriage plate coupled to the mounting plate and displaceable in a second horizontal direction that is transverse to the first horizontal direction;

a second adjusting device coupled to the carriage plate and operable to displace said carriage plate horizontally;

a console coupled vertically on said carriage plate;

a third adjusting device coupled to the console and operable to lift and lower said console in a second correcting movement after pivoting of the sheet metal part from the first position in which the sheet metal part is placed on the



templates and the second position in which the sheet metal part is removed from the templates;

a pivot bearing on the console;

a fifth adjusting device pivoted in the pivot bearing and having an output;

a bracket coupled to the fifth adjusting device;

a fourth adjusting device coupled to the fifth adjusting device via said bracket and operable to pivot the fifth adjusting device and thereby pivot the sheet metal part from the first position in which the sheet metal part is placed on the templates to the second position in which the sheet metal part is removed from the templates;

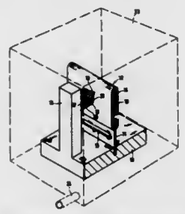
supporting brackets coupling the fifth adjusting device output to the templates, the fifth adjusting device being rotationally drivable in forward and reverse directions.

5,048,319

## METHOD FOR CALIBRATING AN ACCELERATION SENSOR

Dietmar Neuhaus, Duesseldorf, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fur Luft- und Raumfaht e.V., Cologne, Fed. Rep. of Germany

Filed May 22, 1990, Ser. No. 527,097
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917611
Int. Cl.[5] G01P 15/08, 15/13
U.S. Cl. 73—1 D 8 Claims



2. An acceleration sensor for calculating an absolute acceleration based upon excursions of an inertial body at different densities of a medium surrounding the inertial body, the acceleration sensor comprising:

an inertial body attached to an elastic member,

a sensor for detecting the position of the inertial body,

a pressure sealed casing for accommodating the inertial body together with the elastic member and the sensor, means for varying the density of the medium surrounding inertial body

the sensor having a tip directed towards the inertial body, via which tip a tunnel current flows to the inertial body, the tip being movable towards the inertial body, and

a moving means for moving the tip, the moving means being controlled such that the distance between the tip and the inertial body remains constant.

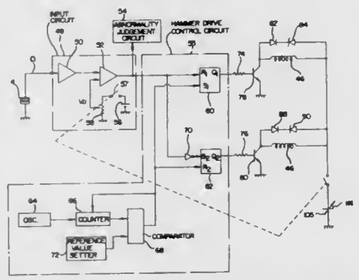


5,048,320

## METHOD AND APPARATUS FOR IMPACT-TYPE INSPECTION OF STRUCTURES

Kunihiro Mitsuhashi; Chihiro Jyomuta; Fujio Oka, all of Tamano, and Hidetoshi Nishikawa, Chiba, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/00092, § 371 Date Nov. 7, 1989, § 102(e) Date Nov. 7, 1989, PCT Pub. No. WO89/07249, PCT Pub. Date Aug. 10, 1989
PCT Filed Feb. 2, 1988, Ser. No. 423,475
Claims priority, application Japan, Aug. 28, 1986, 61-200055; Sep. 17, 1987, 62-231032
Int. Cl.[5] G01N 3/30; G01M 7/00
U.S. Cl. 72—12 9 Claims



1. Apparatus for impact-type inspection of structures, comprising:

a hammer having a hammer head and a sensing means for sensing impact force or deceleration, said hammer head being disposed at a leading end portion of said hammer;

a hammer driving member which includes a hammer driving means for driving said hammer from a return position against an object to be inspected so as to apply a non-destructive impact force to the object to be inspected, and said hammer driving member including a return means for driving said hammer back to said return position; and

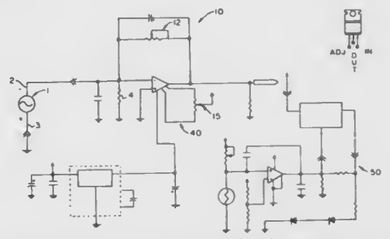
means receiving the output of said sensing means for sequentially actuating said hammer driving means, deactuating said hammer driving means when an output signal is received from said sensing means, and calculating a waveform characteristic of said signal.

5,048,321

## METHOD OF DISCRIMINATING BREATH CONTAMINANTS AND APPARATUS THEREFOR

G. Daniel Chow, Richmond, Calif., assignor to Intoximeters, Inc., St. Louis, Mo.

Filed May 11, 1990, Ser. No. 522,313
Int. Cl.[5] G01N 19/02
U.S. Cl. 73—23.3 7 Claims



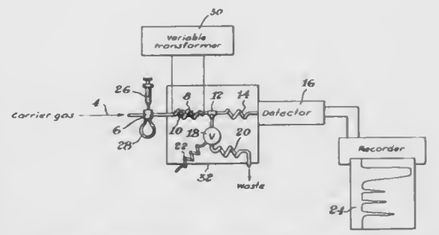
1. A method of discriminating alcohols different from ethanol in breath samples comprising sampling voltages from a fuel cell at a rapid rate to establish a curve rising, upon introduction of standard samples containing a known amount of ethanol without interferants, from an initial base line to a peak; establishing an end point; determining the area under the curve from the introduction of the sample to said end point, and establishing at least two other areas under the curve between the peak and the end point, a peak area, between the peak and a point on the curve relatively near the peak, and a trail area, between the end point and a point nearer the end point than the peak area; introducing a sample containing interferants in the form of alcohols different from ethanol and detecting said interferants by establishing differences between the values calculated based on total areas and the peak and trail areas of curves generated in response to said sample containing said interferants and those of said standard sample containing ethanol alone.

5,048,322

## HEATED COLUMN INLET GAS CHROMATOGRAPHY METHOD AND APPARATUS

Joseph F. Hiller; Terrence McCabe, and Paul L. Morabito, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 5, 1989, Ser. No. 402,327
Int. Cl.[5] G01N 30/30
U.S. Cl. 73—23.41 20 Claims



1. A gas chromatograph suitable for large volume on-column injection comprising a retention gap, an analytical column, and a detector communicating in series and a first means for controlling the temperature of said analytical column, the improvement comprising:

a second means for controlling the temperature of said retention gap whereby said retention gap can be controlled at a

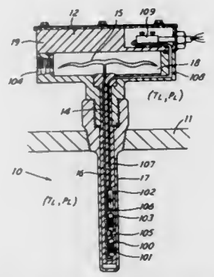
VOL 1130 ISS 3 SE 17 1991 UMI



temperature different than the temperature of the analytical column.

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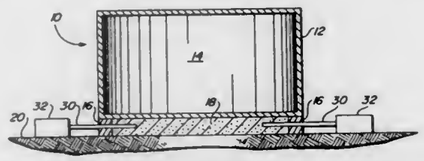
**5,048,323**
**FLUID METERING**
James W. Stansfeld, Hampshire, and David I. H. Atkinson, Surrey, both of England, assignors to Schlumberger Industries Limited, Farnborough, England
Filed Aug. 11, 1988, Ser. No. 231,313
Claims priority, application United Kingdom, Aug. 12, 1987, 8719105
Int. Cl.[5] G01N *9/24*
U.S. Cl. 73—32 A 7 Claims



1. A gas flow correction sensor for sensing a pressure-temperature function of gas flowing in a line for use in correcting the output of a volumetric flow meter connected in the line, the sensor comprising:
a sealed gas-containing chamber having at least a portion thereof in a thermowell entering the line, said chamber including a bellows subjected to line pressure and said portion comprising a capillary tube connected with a sub-chamber, whereby the contained gas will be maintained at line temperature and pressure; and
a vibrating element density sensing means for producing an output signal whose frequency is dependent upon the density of the contained gas, the density sensing means being mounted in said sub-chamber.

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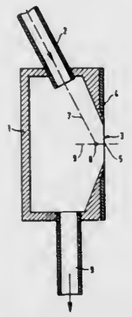
**5,048,324**
**ABOVEGROUND TANK LEAK DETECTION SYSTEM AND METHOD**
Glenn M. Thompson, Tucson, Ariz., assignor to Tracer Research Corporation, Tucson, Ariz.
Filed Jul. 11, 1989, Ser. No. 378,415
Int. Cl.[5] G01N *1/02*
U.S. Cl. 73—40.7 58 Claims



1. An apparatus for detecting a leak from an aboveground fluid storage tank disposed on a backfill material, comprising:
volatile liquid phase tracer means for providing a gas phase detectable component in a fluid leak, a quantity of said volatile liquid phase tracer means being mixed with the fluid in said aboveground fluid storage tank;
a plurality of sample probe members horizontally and radially disposed in the backfill material underneath the aboveground fluid storage tank; and
evacuation means, operably coupled to said plurality of sample probe members, for evacuating gas samples from the backfill material underneath the aboveground fluid storage tank, into and through said at least one of a plurality of sample probe members.

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**5,048,325**
**MEASURING CELL**
Georg C. von Alfthan, Kauniainen, and Antti I. Ahonen, Helsinki, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland
Continuation of Ser. No. 393,543, Aug. 11, 1989, abandoned.
This application Dec. 7, 1990, Ser. No. 627,541
Claims priority, application Finland, Aug. 12, 1988, 883743
Int. Cl.[5] G01N *21/05*
U.S. Cl. 73—61 R 12 Claims



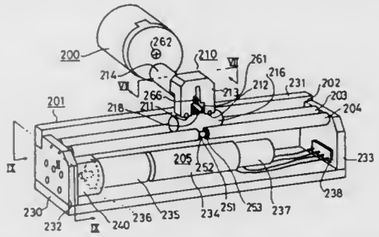
1. A measuring cell for determining the composition of a flowing slurry, the measuring cell comprising:
means defining an inlet passage, the inlet passage having a central axis;
means defining an outlet passage; and
a substantially planar measuring window having a center point, the measuring window being disposed with its plane inclined relative to the central axis of the inlet passage and so that an axis through the center point of the measuring window and perpendicular to the plane of the measuring window approximately intersects the central axis of the inlet passage at a point internal to the measuring cell and spaced apart from the measuring window, whereby slurry entering the measuring cell along said central axis is directed toward the measuring window.

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**5,048,326**
**SURFACE ROUGHNESS MEASURING INSTRUMENT**
Yoichi Toida, Chigasaki, and Chihiro Marumo, Yokohama, both of Japan, assignors to Mitutoyo Corporation, Tokyo, Japan
Filed Nov. 7, 1989, Ser. No. 432,909
Claims priority, application Japan, Nov. 9, 1988, 63-283127
Int. Cl.[5] G01B *21/30, 5/28*
U.S. Cl. 73—105 8 Claims

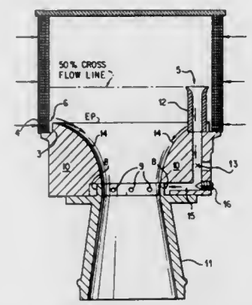
1. A surface roughness measuring instrument characterized by being provided with a rotary drive mechanism which includes two rollers, each roller having an axis, the axes being arranged in parallel to support a sphere placed thereupon for measurement of the surface roughness thereof, and
a rotary drive means which has a rotary drive motor used to drive said two rollers to rotate in identical directions at equal tangential velocities,
in which a holding section for supporting the sphere is formed on one of said two rollers, and
a pair of surfaces which make up the holding section face each other axially along the roller and take the form of partial surfaces of spheres whose centers lie along the axis of rotation of the roller and whose diameters are equal to that of the roller.





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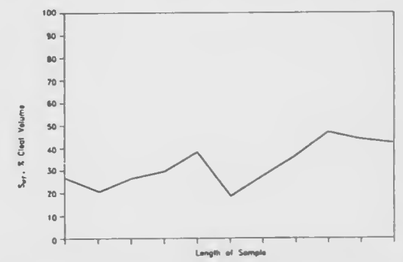
**5,048,327**
**MASS AIR FLOW METER**
Robert K. Atwood, 3450 John R. Rd., Rochester, Mich. 48063
Filed May 17, 1990, Ser. No. 524,581
Int. Cl.[5] G01M *19/00*
U.S. Cl. 73—118.2 18 Claims




1. Improvement in a mass air flow meter for internal combustion engines having a hollow elongated body having a venturi therein, a sample tube associated with said body for receiving a flow of sample air therethrough, the entire air source for an engine being split into a main flow path through the venturi and into a sampling path through the sample tube, an air flow transducer disposed in said sample tube, the flow through the sample tube downstream from said transducer being recombined with the main flow of air through said venturi, said improvement comprising the following structure for improving the flow dynamics of the air flow through the sampling path including expansion of the dynamic range and increase of the signal to noise ratio resulting in improved engine performance, fuel efficiency, and emission control:
(a) said sample tube being tapered in decreasing area in the direction of air flow through the sample tube;
(b) the transducer being disposed near the minimum area of said sample tube;
(c) said sample tube having a length equal to more than 6 times the maximum cross sectional dimension thereof near the transducer;
(d) a collecting chamber downstream from the sample tube for receiving the output flow therefrom;
(e) flow restriction means opening to the minimum throat diameter of said venturi and serving as the outlet of said collecting chamber;
(f) said collecting chamber serving as an accumulator for the outlet flow from said sample tube and having a volume more than twice the volume of the sample tube above said transducer;
(g) the total cross sectional area of said flow restriction means being about half that of the minimum cross sectional area of said sample tube near the transducer so that the pressure drop across said flow restriction means is at least 1.5 times that across the length of the sample tube above said transducer; and
(h) said collecting chamber and said flow restriction means providing a pneumatic equivalent of a low pass R C filter which decouples the high turbulence in the main flow through the venturi, averages same and provides a scaled down profiled flow through the sample tube for measurement by said transducer, said measurements having an accuracy of ±2% of reading error.

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**5,048,328**
**METHOD OF DETERMINING THE POROSITY AND IRREDUCIBLE WATER SATURATION OF A COAL CLEAT SYSTEM**
Rajen Puri, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.
Filed Feb. 24, 1989, Ser. No. 315,007
Int. Cl.[5] E21B *47/00*
U.S. Cl. 73—153 4 Claims




1. A nondestructive method of determining the irreducible water saturation, $S_{wr}$, profile across the length of a core sample of coal, said method comprising the steps of:
Step 1:
(a) applying pressure simulating a formation overburden pressure on a core sample of coal in a hydrostatic core holder;
(b) flowing distilled water or formation brine into and through the pressurized core holder until the sample is saturated with water;
(c) scanning the sample over its length with a linear X-ray device or CAT-scan to obtain a measure of the magnitude of X-ray attenuation of the sample, the values of X-ray intensity being denoted as $I^1$;
Step 2:
(a) flowing a humidified, inert, substantially nonadsorbing gas into and through the core holder until no additional water is displaced from the coal sample by the flowing gas;
(b) scanning the sample over its length with the X-ray device to obtain a measure of the magnitude of X-ray attenuation of the sample, the values of X-ray intensity being denoted as $I^2$;
Step 3:
(a) flowing X-water into and through the pressurized core holder until the sample is saturated with X-water;
(b) scanning the sample over its length with the X-ray device to determine a measure of the magnitude of X-ray attenuation of the sample, the values of X-ray intensity being denoted as $I^3$;
Step 4:
(a) flowing a humidified, inert, substantially nonabsorbing gas into and through the pressurized core holder until no additional X-water is displaced from the coal sample by the flowing gas;

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(b) scanning the sample over its length with the X-ray device to determine a measure of the magnitude of X-ray attenuation of the sample, the values of X-ray intensity being denoted as $I^4$; and

Step 5:

(a) determining the irreducible water saturation, $S_{wr}$ profile in the coal cleat network across the length of the core sample of coal using the following equation:

$$S_{wr} = \frac{\ln (I^2/I^4)}{\ln (I^1/I^3)} .$$

wherein $S_{wr}$, $I^1$, $I^2$, $I^3$, and $I^4$ have the meanings set forth above;

wherein said hydrostatic holder is equipped with injection means for injecting fluids at an upstream end and with discharge means for removing displaced fluid through a downstream end of said holder; and

wherein the X-ray device measures the X-ray attenuation over the same or essentially the same portion of the sample in each of Steps 1–4 above.

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**5,048,329**

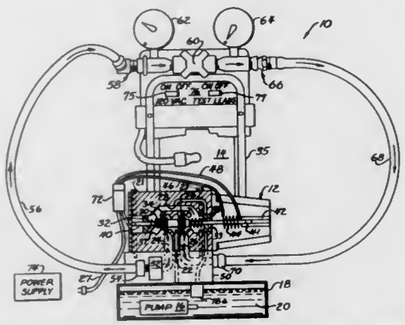
**HYDRAULIC VALVE TEST DEVICE**

**Guiseppe A. Marchini, North Clinton, Iowa, assignor to Commonwealth Edison Company, Chicago, Ill.**

**Filed Aug. 27, 1990, Ser. No. 573,644**

**Int. Cl.[5] G01M *19/00***

**U.S. Cl. 73—168** **12 Claims**




1. Apparatus for testing an electrically energized hydraulic valve, wherein the hydraulic valve is open when energized and closed when de-energized, said apparatus comprising:

a closed hydraulic system coupled to the hydraulic valve and including first and second ports and a pump for maintaining a hydraulic fluid under pressure;

valve means coupling said first and second ports for providing a pressure drop in the hydraulic fluid between said ports;

first and second hydraulic pressure gauges coupled between the first port and said valve means and between said second port and said valve means, respectively, wherein hydraulic fluid flows in a first direction and said first pressure gauge indicates the hydraulic fluid pressure applied to the hydraulic valve when the hydraulic valve is de-energized and said second gauge indicates zero pressure; and

electrical means coupled to the hydraulic valve for energizing the hydraulic valve whereupon the hydraulic fluid flows in a second direction, wherein said first and second directions are opposed and said first pressure gauge indicates zero pressure and said second pressure gauge indicates the hydraulic fluid pressure applied to the hydraulic valve.

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**5,048,330**

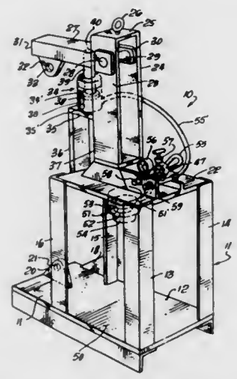
**MATERIALS TESTING MACHINE**

**Gary G. Link, Jr., 5821 Lorelie Ave., and Steve Quinn, 5319 Autry Ave., both of Lakewood, Calif. 90712**

**Filed Feb. 12, 1990, Ser. No. 478,578**

**Int. Cl.[5] G01M *19/00***

**U.S. Cl. 73—168** **3 Claims**



1. A materials testing machine for testing equipment used for lifting or jacking up equipment, said testing machine comprising:

a machine frame having a base and a vertical arm assembly, said machine frame including an equipment attachment point;

a generally horizontal arm having an inner end and an outer end, said generally horizontal arm being pivotally attached at a pivotal attachment point near its inner end to said vertical arm assembly and said generally horizontal arm having an equipment attachment point near its outer end;

a hydraulic cylinder assembly including a cylinder having a base, a piston and a piston rod extending outwardly from said cylinder and a hydraulic hose extending outwardly from said cylinder at a point between said base and said piston, said base of said cylinder assembly being supported on a plate supported by the machine frame and its piston rod being in contact with an intermediate point of said generally horizontal arm between the pivotal attachment point of the generally horizontal arm and the equipment attachment point of said generally horizontal arm;

hydraulic fluid within said hydraulic cylinder and said hydraulic hose; and

at least one pressure gauge connected to said hydraulic hose, said materials testing machine being free from any hydraulic pump and said materials testing machine instead obtaining its motive force from the equipment being tested.

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**5,048,331**

**CONTINUOUS RAINWATER MONITORING SYSTEM**

**Nobuyoshi Hattori, and Takaaki Fukumoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Filed May 1, 1990, Ser. No. 517,314**

**Claims priority, application Japan, Jan. 25, 1990, 2-13638**

**Int. Cl.[5] G01W *1/14***

**U.S. Cl. 73—170 R** **8 Claims**

1. A continuous rainwater monitoring device comprising:

rainfall sensor means for detecting the commencement and the end of each rainfall occurence;

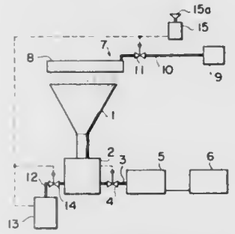
receiver-container means for receiving and collecting rainwater;

rain gauge means for storing the rainwater collected by the receiver-container means and for determining an amount of rainfall by a measurement of the rainwater;

measurement and analysis means for analysing ionic chemical characteristics, including the pH of the rainwater colleted in the rain gauge means;

automatic recording means for automatically recording results of measurements and analyses effected by the measurement and analysis means;

cleaning means for cleaning the interior of said receiver-container means and rain gauge means by means of cleaning water, so as to remove contaminants attached thereto; and



cleaning evaluation means for evaluating the cleanliness of the interiors of the receiver-container means and the rain gauge means, wherein the cleaning evaluation means collects the cleaning water that has been utilized in cleaning the receiver-container means and the rain gauge means, so as to evaluate the state of contamination of said cleaning water, and continues to conduct a cleaning operation until the contamination state of the interiors of said receiver-container means and said rain gauge means falls below a predetermined level.

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**5,048,332**

**FLOW METER FOR MEASURING FLUID FLOW WITH MULTIPLE TEMPERATURE SENSORS**

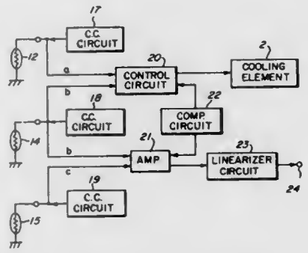
**Kouichi Ishikawa; Hiroshi Mihira; Noriyuki Kimura, and Masao Yamaguchi, all of Kyoto, Japan, assignors to Stec Inc., Kyoto, Japan**

**Division of Ser. No. 337,926, Apr. 14, 1989, Pat. No. 4,947,889. This application Jan. 5, 1990, Ser. No. 461,238**

**Claims priority, application Japan, Nov. 22, 1988, 63-295261**

**Int. Cl.[5] G01F *1/68***

**U.S. Cl. 73—204.16** **6 Claims**




1. A flow meter for measuring fluid flow, comprising:

a conduit adapted to be connected to a source of fluid and permitting fluid to pass therethrough;

means for cooling a portion of the conduit;

a first temperature sensor mounted on a surface of the conduit upstream of the cooling means for providing a signal representative of temperature;

a second temperature sensor mounted on the cooling means for providing a signal representative of temperature;

a third temperature sensor mounted on a surface of the conduit downstream of the cooling means for providing a signal representative of temperature;

means for controlling the cooling means so that a temperature difference between the first temperature sensor and the second temperature sensor is maintained at a predetermined value, and

means for determining flow rate whereby the flow rate of the fluid is determined on the basis of a difference between the temperature signals of the second temperature sensor and the third temperature sensor.

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**5,048,333**

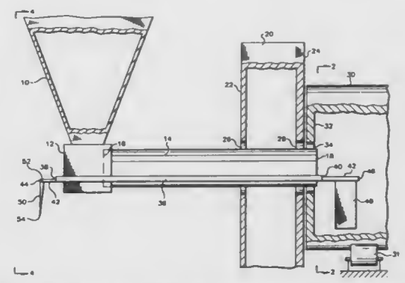
**MATERIAL LEVEL CHECKING APPARATUS FOR USE IN A ROTATING MEMBER**

**Ralph E. Bonnell, Dewey, and Donald R. Engelbert, Copan, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 15, 1990, Ser. No. 597,972**

**Int. Cl.[5] G01F *23/16*; H01H *35/24***

**U.S. Cl. 73—290 R** **19 Claims**



1. An apparatus for measuring the level of material within a rotating vessel having an end wall and a rotational axis comprising:

(a) a rod having a first and second end and having a longitudinal axis parallel to the rotational axis of said vessel wherein said rod is capable of rotation around its longitudinal axis and wherein said rod passes through an end wall of said vessel so that said first end of said rod is on the exterior of said vessel and said second end of said rod is on the interior of said vessel;

(b) a rigid member means fixedly secured to said rod between said second end of said rod and said end wall of said vessel so as to extend radially outwardly from the longitudinal axis of said rod so that said rod lies substantially within the same plane as said rigid member for engaging the surface of material within said rotating vessel and rotating said rod in response thereto; and

(c) an indicator means operatively related to said rod between the first end of said rod and said end wall for providing an indication of rotation of said rod in response to the engagement of the surface of said material by said member means.

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**5,048,334**

**METHOD AND APPARATUS FOR SUBTERRANEAN LIQUID LEVEL MEASUREMENT**

**Duane R. Hampton, Portage; Ross Wagner, Grand Rapids, and James Howell, Kalamazoo, all of Mich., assignors to The Board of Trustees of Western Michigan University, Kalamazoo, Mich.**

**Filed Aug. 22, 1990, Ser. No. 571,319**

**Int. Cl.[5] G01F *23/22***

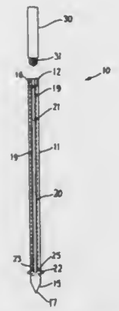
**U.S. Cl. 73—290 R** **14 Claims**

1. An apparatus for measuring the thickness of a layer of a first liquid above an interface formed by the first liquid and a second liquid in an underground formation, said apparatus

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comprising means for detecting said interface and means for indicating the thickness of said first liquid layer comprising an



elongated strip which contains a chemical which undergoes a color change upon contact with said first liquid layer.

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**5,048,335**

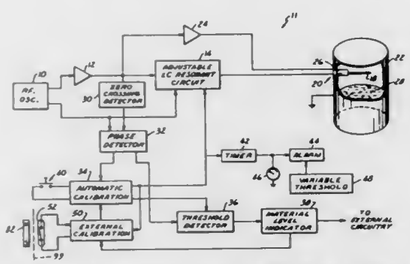
**CAPACITANCE-TYPE MATERIAL LEVEL INDICATOR**

**Norman F. Marsh, Port Huron; John R. Schutt, Lexington, and Bruce W. Campbell, Port Huron, all of Mich., assignors to Bindicator Company, Port Huron, Mich.**

**Filed Oct. 1, 1987, Ser. No. 103,389**

**Int. Cl.[5] G01F *23/26***

**U.S. Cl. 73—304 C** **10 Claims**



1. A system for indicating level of material in a vessel as a function of material capacitance comprising probe means adapted to be coupled to a vessel so as to be responsive to variations in capacitance at the vessel as a function of material level; circuit means coupled to said probe means such that operating characteristics of said circuit means vary as a function capacitance at said probe means; calibration means including means for initiating a calibration operation, means coupled to said circuit means for automatically varying operating characteristics of said circuit means during a said calibration operation, and means responsive to said circuit means during said calibration operation for detecting a predetermined operating characteristic at said circuit means, corresponding to a predetermined material level condition at said vessel, and for terminating said calibration operation when said predetermined operating characteristic is obtained; means responsive to variations in operation characteristics of said circuit means, including said probe means, from said predetermined operating characteristic for indicating level of material in said vessel; and a closed explosion-proof housing enclosing said circuit means, said calibration means and said variations-responsive means;

characterized in that said initiating means comprises flux-responsive switch means positioned within said housing and coupled to said automatically-varying means, and means for selectively directing flux energy onto said flux-responsive switch means from externally of said closed explosion-proof housing through a wall of said housing so as to selectively vary conductive condition at said flux-responsive switch means without opening said closed housing, said system further comprising means coupled to said variations-responsive means for inhibiting operation of said calibration means when material in the vessel is adjacent to said probe means.

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**5,048,336**

**MOISTURE-SENSITIVE DEVICE**

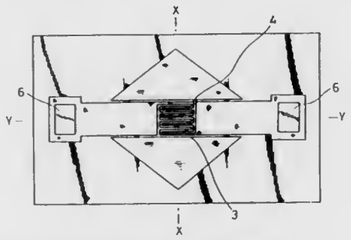
**Takashi Sugihara, Ryugasaki; Kazutaka Uda; Hiroki Tabuchi, both of Nara; Shuji Miyoshi, Yamatokouriyama; Yasuhiko Inami; Nobuo Hashizume, both of Nara, and Hisatoshi Furubayashi, Yamatokouriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 29, 1989, Ser. No. 459,262**

**Claims priority, application Japan, Dec. 29, 1988, 63-332348; Sep. 5, 1989, 1-229873**

**Int. Cl.[5] G01N *27/12***

**U.S. Cl. 73—336.5** **11 Claims**



1. A moisture-sensitive device comprising:

a substrate provided with a pair of recesses;

a pair of belt-like heating elements extending over the recesses and formed adjacent at least one side of openings of the recesses, each of said heating elements comprising a resistive film of platinum or nickel and a heat-resistant insulating film covering the resistive film;

an insulator formed between the substrate and the heating elements;

a container, the inside of which is an atmosphere of a given humidity, the container being formed integral with the substrate and acting to isolate one of the heating elements from an outside atmosphere; and

lead wires for supplying electric current to the heating elements.

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**5,048,337**

**HYPSOMETER HAVING CONTROLLED HEATING, PARTICULARLY FOR USE IN METROLOGICAL RADIO-SONDES**

**Paul W. Ruppert, Wetzikon, Switzerland, assignor to Meteolabor AG, Wetzikon, Switzerland**

**Filed Jun. 7, 1990, Ser. No. 534,427**

**Claims priority, application Fed. Rep. of Germany, Nov. 6, 1989, 3936839**

**Int. Cl.[5] G01L *9/00***

**U.S. Cl. 73—384** **7 Claims**

5. A hypsometer having controlled heating, particularly for use in metrological radio-sondes, comprising:

an open boiling vessel including a vessel flask containing measuring fluid, and a vessel neck attached to said vessel flask;

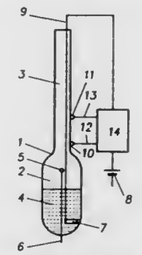
an electrical heating resistor plunging into the measuring fluid and located within said vessel flask;

a temperature sensor measuring the boiling temperature; and

an adaptive control system adjusting the heating capacity to a command value corresponding to the specific boiling temperature involved;



said adaptive control system comprising means for measuring the decrease of temperature in said vessel neck, said measuring means being arranged alongside a measuring section located at the lower end of said vessel neck, thereby using a predetermined temperature difference as



said command value for adjusting the heating capacity, said command value of said temperature difference being about 1 degree C. in order to hold the condensation zone in a stable position closely above said measuring section, independtly of the specific boiling temperature.

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**5,048,338**

**ELECTRONIC BOBWEIGHT ELIMINATOR**

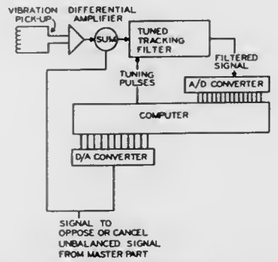
**Gordon E. Hines; Ronald W. Anderson, both of Ann Arbor, and Leonard J. Salenbien, Saline, all of Mich., assignors to Hines Industries, Inc., Ann Arbor, Mich.**

**Continuation-in-part of Ser. No. 340,144, Apr. 17, 1989, Pat. No. 4,938,064. This application Jun. 27, 1990, Ser. No. 544,834**

**The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.**

**Int. Cl.[5] G01M *1/16***

**U.S. Cl. 73—462** **5 Claims**



1. A method for rotationally balancing a workpiece, the end use of which is to carry attached bodies of specified mass in a balanced rotational operation, comprising the steps of:

positioning such workpiece without such attached bodies for rotation;

rotating such workpiece to induce a rotational vibration of such workpiece;

monitoring said rotational vibration of such workpiece and generating an electronic signal representative of said vibration;

processing such electronic signal to determine the amount and location of such rotational unbalance;

generating a second electronic signal representative of any unbalance solely created by the removal of such attached bodies from such workpiece; and,

applying said second electronic signal to said first electronic signal to offset said first electronic signal by the amount of unbalance solely created by such removed bodies, whereby the amount of unbalance signal remaining is solely representative of the inherent rotational unbalance of the workpiece as if such workpiece were operating with such bodies attached, said second electronic signal being applied to said first electronic signal prior to said first electronic signal being processed to determine the amount and location of such rotational unbalance.

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**5,048,339**

**ACCELERATION PICK-UP DEVICE**

**Dietmar Neuhaus, Duesseldorf, Fed. Rep. of Germany, assignor to Deutsdche Forschungsanstalt fur Luft- und Raumfaht e.V., Cologne, Fed. Rep. of Germany**

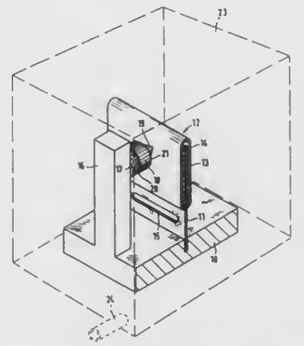
**Filed Oct. 11, 1989, Ser. No. 420,554**

**Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834531**

**The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.**

**Int. Cl.[5] G01P *15/13*; G01V *7/00***

**U.S. Cl. 73—515** **18 Claims**



1. An acceleration pick-up device having a body which is fastened to an elastic member, and a sensor for detecting the position of said inert body, characterized in that, for calibrating an absolute value of acceleration, the mass of the inert body is controllably changed by the addition or the receiving of a foreign medium, wherein the inert body, together with the elastic member and the sensor, is accommodated in a pressure-tight housing and wherein the foreign medium is introduced into said housing.

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**5,048,340**

**SEMI-AUTOMATIC SYSTEM FOR ULTRASONIC MEASUREMENT OF TEXTURE**

**R. Bruce Thompson, and Samuel J. Wormley, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa**

**Continuation of Ser. No. 197,763, May 23, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 485,178**

**Int. Cl.[5] G01N *29/00***

**U.S. Cl. 73—597** **24 Claims**

1. An apparatus for semi-automatic ultrasonic measurement of texture in rolled metal sheet having a rolling direction, wherein the sheet has crystallite structure whose properties can be inferred from the velocities of ultrasonic plate modes, comprising:

at least first ultrasonic transmitting transducer means for exciting ultrasonic energy in the form of a least one selected ultrasonic plate mode in the sheet, the transmitting transducer means including adjustable orientation means for selecting desired propagation directions with respect to the rolling direction of the sheet from a plurality of different propagation directions, the number of plate modes and directions being directly related to the type of crystallite structure of the sheet being analyzed;

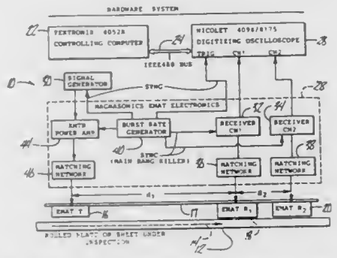
at least and second ultrasonic receiving transducer means for

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receiving the ultrasonic energy in a selected ultrasonic plate mode, each receiving transducer means including adjustment means for selecting desired angular orientation with respect to the sheet;

each receiving transducer means for a particular plate mode positioned at a predetermined fixed distance from one another and from each transmitting transducer means for that plate mode allowing the measurement of both relative and absolute volocities of the ultrasonic energy;



control means for operating each transmitting transducer means to generate the ultrasonic energy and each receiving transducer means for reception of the ultrasonic energy in the appropriate plate mode; and

processing means for timing reception of the ultrasonic energy between any transducer means and for deriving texture characteristics of the sheet from relative and absolute velocity measurements of the ultrasonic energy by obtaining quantitative information defining preferred orientation of grains of the sheet.

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**5,048,341**

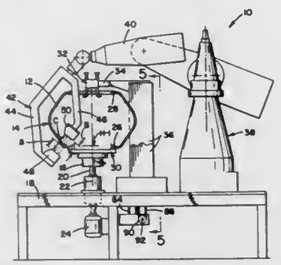
**CONTAINER WALL MEASURING APPARATUS AND METHOD**

**Dennis A. Lundell, Uniontown; Richard B. Nash, Cuyahoga Falls, and James D. Stokes, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Jan. 2, 1990, Ser. No. 459,690**

**Int. Cl.[5] G01N** *29/00*

**U.S. Cl. 73—620** **10 Claims**



1. Apparatus for measuring the thickness of a wall of a round container having at least one open end and a container axis comprising:

(a) turntable means for supporting said round container with said container axis coaxial with an axis of said turntable and including gripping means for holding said container on said turntable means;

(b) guide roller means for placing inside an open end of said container for guiding edges of said container at said open end including a first roller head for positioning on one side of said container and a second roller head for positioning on an opposite side of said container;

(c) frame means having opposing arms with measuring means mounted on said arms and movable into a measuring position between said first roller head and said second roller head;

(d) frame supporting means for moving said frame means to a first circumferential position with said measuring means on opposite sides of a wall of said container at a first height over said turntable means;

(e) means for rotating said turntable means to predetermined circumferential positions at said first height for measuring the distance between said measuring means and said wall to determine the thickness of said wall at said circumferential positions at said first height.

(f) means for moving said frame means to a second height above said turntable means for measuring the distances of said measuring means from said wall to determine the thickness of said wall at said circumferential positions at said second height; and

(g) means for retracting said guide roller means and said frame means from said round container so that said container can be removed from said turntable means.

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**5,048,342**

**MOTOR VEHICLE CONSTRAINING APPARATUS, PARTICULARLY SUITABLE FOR VEHICLE RUNNING SIMULATION BENCHES**

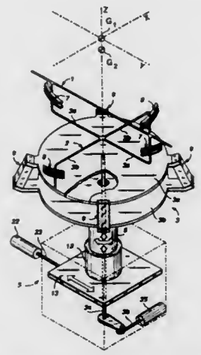
**Alberto Morelli, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy**

**Filed Sep. 26, 1989, Ser. No. 412,653**

**Claims priority, application Italy, Sep. 28, 1988, 67869 A/88**

**Int. Cl.[5] G01N** *29/00*

**U.S. Cl. 73—669** **13 Claims**



1. A motor vehicle constraining apparatus, particularly suitable for vehicle running simulation benches, comprising:

a first rigid element, a second rigid element and a third rigid element joined articulately together by constraint structure to allow the first element to oscillate with respect to the second element about a first substantially fixed axis of virtual oscillation, and to allow the second element to oscillate with respect to the third element about a second substantially fixed axis of virtual oscillation perpendicular to the first axis, the first element being rigidly attached to a vehicle body and the third element being fixed to a support structure interposed between the apparatus and an apparatus base;

wherein the constraint structure comprises a first series of substantially cylindrical guides interposed between the first element and the second element and a second series of substantially cylindrical guides interposed between the second element and the third element and;

wherein the third element comprises a pair of plates;

said apparatus further comprising an assembly of dynamometer cells disposed between said pair of plates and arranged to measure the force components transferred between said plates, said assembly of dynamometer cells comprising four cells disposed such that central elongation axes of said cells form a pyramid configuration.



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**5,048,343**

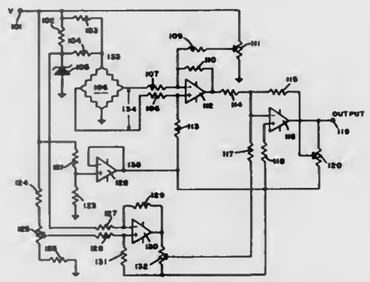
**TEMPERATURE-COMPENSATED STRAIN-GAUGE AMPLIFIER**

**Mohammadreza Oboodi, Livingston, and Devlin M. Gualtieri, Ledgewood, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Filed Apr. 30, 1990, Ser. No. 516,898**

**Int. Cl.[5] G01B** *5/30*

**U.S. Cl. 73—766** **3 Claims**



1. A strain gauge amplifier comprising:

(a) A constant voltage source for providing a constant voltage to said amplifier;

(b) semiconductor means electrically connected to said constant voltage source and comprising a temperature sensor for generating a voltage signal proportional to the absolute temperature in response to minimum current;

(c) circuit means including a strain gauge bridge element connected to said semiconductor means for supplying said voltages, said circuit means cooperating with said temperature sensor to compensate said bridge element and further comprising a plurality of operational amplifiers connected to said strain gauge bridge element and said semiconductor means for combining and amplifying said voltage signal; and

(d) said temperature sensor being proximate to said bridge element and said circuit means including resistance means comprising a plurality of resistors which cooperate with resistance of said bridge element to provide resistive loading at an output of said bridge element and to form a voltage divider network that selects from voltage across said semiconductor means and voltage supplied from said constant voltage source and applies the selected voltage from said semiconductor means as excitation voltage of said bridge element.

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**5,048,344**

**BOREHOLE STRAIN MONITOR FOR SOFT ROCK**

**Gerhard H. Herget, Kanata, and Franz Kapeller, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, Ontario, Canada**

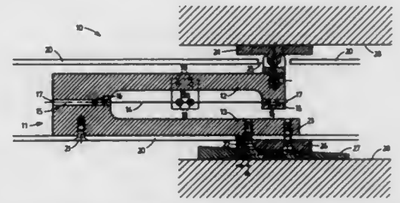
**Filed Oct. 23, 1989, Ser. No. 426,072**

**Claims priority, application Canada, Apr. 7, 1989, 596032**

**Int. Cl.[5] G01B** *7/16*

**U.S. Cl. 73—784** **10 Claims**

1. A strain monitor for use in a rock bore to measure rock deformation comprising: a U-shaped yoke having a pair of parallel spaced arms adapted to be positioned adjacent to inner surfaces of the bore and responsive to movement thereof, a stressed wire extending between the base of the yoke and the end of one of the arms and means measuring the natural frequency of vibration of the wire, thereby to supply a measure of the strain of the rock bore adjacent the end of the arms.



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**5,048,345**

**METHOD OF DETERMINING POSITIONS OF BEADS**

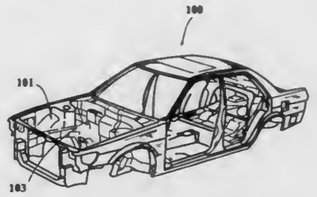
**Ichiro Hagiwara; Masaaki Tsuda, both of Kamakura; Yuichi Kitagawa, Yokosuka, and Tatsuya Futamata, Atsugi, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 2, 1990, Ser. No. 561,998**

**Claims priority, application Japan, Aug. 3, 1989, 1-200264; Sep. 7, 1989, 1-230315**

**Int. Cl.[5] G01N** *3/00*

**U.S. Cl. 73—788** **8 Claims**



1. A method of determining positions of beads on a member to be subjected to a crushing load, comprising the steps of:

obtaining a buckling waveform on the member without any bead;

analyzing the obtained buckling waveform to determine concave portions and convex portions of the buckling waveform; and

determining the positions of the beads in accordance with the concave portions and the convex portions of the buckling waveform.

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**5,048,346**

**METHOD OF ESTIMATING THE THERMAL STRESS OF A HEAT-RESISTANT MEMBER BY TESTING A MODEL OF THE MEMBER MADE OF A DIFFERENT MATERIAL**

**Mitsuru Yano, Okagaki; Hisashi Yasuda; Masatoshi Nakamizo, both of Kitakyusyu; Takashi Hattori, Kanda, and Kenji Itoh, Moka, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan**

**Filed Mar. 29, 1990, Ser. No. 500,952**

**Claims priority, application Japan, Mar. 30, 1989, 1-79842; Feb. 6, 1990, 2-26392**

**Int. Cl.[5] G01B** *5/30;* **G01N** *25/72, 3/60*

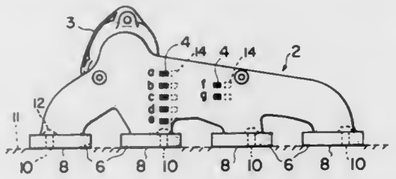
**U.S. Cl. 73—804** **15 Claims**

1. A method of estimating a thermal stress of a heat-resistant member, part or the whole of which is to be heated to a high temperature, comprising heating to heated states a model formed by a high-thermal expansion material and having a shape similar to that of said heat-resistant member while said model is in a restraint state and also in a free state, respectively, said high-temperature expansion material being different from the material of the member being modeled and having a ther-

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mal expansion coefficient greater than that of the material of the member being modeled; measuring the strain of said model at each of a plurality of predetermined positions in said heated states by strain gauges adhered to the predetermined positions



of said model; and calculating a stress at each predetermined position from the difference in measured strain values between said restraint state and said free state, thereby estimating the stress of said heat-resistant member in a heated state.

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**5,048,347**

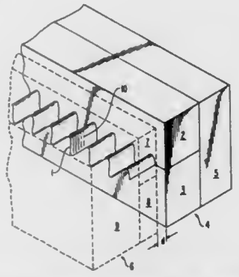
**METHOD FOR TESTING CORRUGATED MEDIUM**

**Jonathan C. Knowles, Toledo, Oreg., assignor to Georgia-Pacific Corporation, Atlanta, Ga.**

**Filed Sep. 7, 1990, Ser. No. 578,823**

**Int. Cl.[5] G01N *3/08***

**U.S. Cl. 73—821** **3 Claims**



1. A process for determining the crush strength of fluted wood fiber-based corrugated media, said process comprising:

a. forming corrugations in a sample of wood fiber-based medium exhibiting a rectangular shape and a pair of short edges and a pair of long edges and having the fibers of said medium running substantially parallel to said long edges;

b. placing the corrugated sample horizontally across a gap of about 0.7 to about 1 mm between a first sample holder and a second sample holder wherein each of the sample holders comprises a corrugated upper jaw in close mating relationship with both a corrugated bottom jaw and the corrugations in said sample;

c. securing said sample in said first holder and said second holder;

d. applying a horizontal crushing force on said sample by forcing one of said sample holders to move relatively toward the other sample holder; and

e. measuring the force required to cause crushing failure in said sample.

**5,048,348**

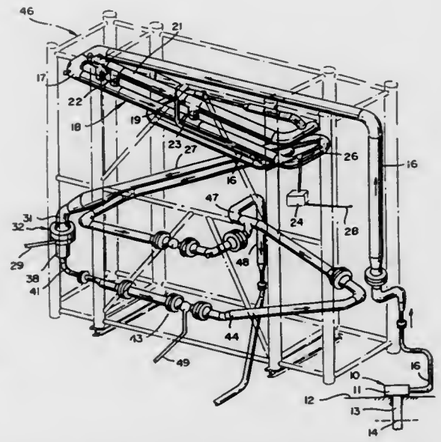
**FLUID FLOW VOLUMETRIC DETERMINATION APPARATUS AND METHOD**

**Michael G. Durrett; Earl L. Dowty, Katy, and Gregory J. Hatton, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.**

**Continuation-in-part of Ser. No. 310,972, Feb. 14, 1989, abandoned. This application Feb. 12, 1990, Ser. No. 478,898**

**Int. Cl.[5] G01F *1/74, 15/08***

**U.S. Cl. 73—861.04** **9 Claims**



1. System for determining the volumetric flow rate of a multi-phase production stream at the well head (11) of a producing well (13) communicated with a subterranean reservoir (14), which holds at least one hydrocarbon liquid, water, and a gaseous component, said system defining a fluid flow path including:

a fluid separator means (18) communicated with said well head (11) to receive a multi-component production stream from said well (13) comprised of said at least one hydrocarbon liquid, water and a gaseous component,

vapor receiving means (21) communicated with said fluid separator means (18) to receive the gaseous component which separates from said multi-component production stream,

monitor means (24) associated with the downstream end of said separator means (18), to monitor the substantially gas-free, production stream, and to provide a first signal indicative of the volumetric relationship between the hydrocarbon liquid and the water content of said stream,

a constraint meter (32) having an inlet (31) communicated with said fluid separator means (18) said constraint meter (32) having a constricted segment (38), and means for determining the pressure differential established by the substantially gas-free liquid stream which flows through said constricted segment (38), for providing a second signal indicative of said pressure differential,

and densitometer means (43) communicated with said constraint meter (32) to receive said substantially gas-free liquid stream therefrom, to provide a third signal indicative of the density of said liquid stream flowing therethrough.



**5,048,349**

**CORIOLIS-TYPE MASS FLOW METER COMPRISING AT LEAST TWO STRAIGHT PARALLEL VIBRATING TUBES**

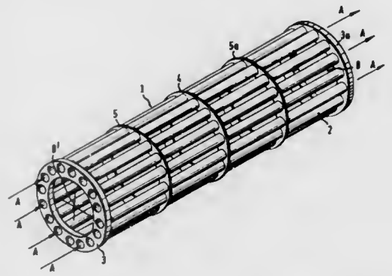
**Christianus J. M. Wolff, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.**

**Filed May 21, 1987, Ser. No. 58,667**

**Claims priority, application United Kingdom, Feb. 21, 1983, 8304783**

**Int. Cl.[5] G01F *1/84***

**U.S. Cl. 73—861.37** **2 Claims**



1. Coriolis-type mass flow meter to be used in a flow line, comprising:

at least two straight flow tubes for having a fluid flow therethrough having their longitudinal axes aligned in a parallel arrangement and having their extreme ends rigidly disposed,

an exciting means disposed adjacent said tubes at about 50 percent of the length of said flow tubes for vibrating said tubes in a direction normal to the flow direction,

means adapted to detect the phase difference occurring between upstream and downstream portions of the flow tubes when said flow tubes are subjected to vibration by said exciting means and located at equal distances from said exciting means, and

means adapted to connect the flow tubes to said flow line, wherein said flow tubes comprise a circular arrangement of said tubes, and wherein the vibration is rotational.

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**5,048,350**

**ELECTROMAGNETIC DRIVER AND SENSOR**

**Yousif A. Hussain, Coulsdon, and Milos J. Machacek, Reigate, both of England, assignors to The Foxboro Company, Foxboro, Mass.**

**Filed Dec. 5, 1989, Ser. No. 446,310**

**Int. Cl.[5] G01F *1/84***

**U.S. Cl. 73—861.38** **25 Claims**

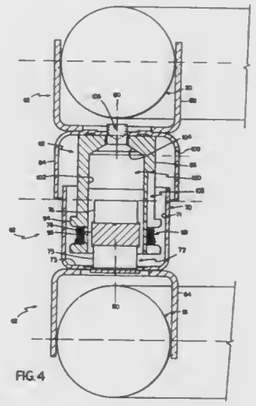
1. A shielded electromechanical device for use in a Coriolis type mass flowmeter for interconverting mechanical energy and electrical energy comprising:

a proximal end and a distal end;

a coil assembly connected to said distal end;

a magnetic assembly connected to said proximal end adapted to interact with said coil assembly; and

a shield assembly surrounding said coil assembly and said magnetic assembly, said shield assembly adapted to reduce the magnetic field exterior to said shield assembly, said shield assembly including a proximal shield attached to said proximal end and a distal shield attached to said distal end,



wherein one of said shields is adapted to fit within and move relative to the other of said shields.

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**5,048,351**

**MASS FLOW SENSOR**

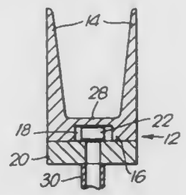
**Andrew N. Dames, London, England, assignor to Schlumberger Industries Limited, Farnborough, Hampshire, England**

**Filed Dec. 21, 1989, Ser. No. 454,248**

**Claims priority, application United Kingdom, Dec. 24, 1988, 8830257**

**Int. Cl.[5] G01F *1/84***

**U.S. Cl. 73—861.38** **12 Claims**



1. A mass flow sensor comprising:

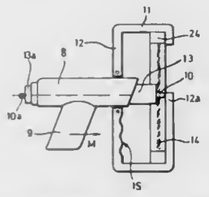
a sensing element comprising a resonantly vibratable structure adapted for immersion in a fluid whose mass flow is to be sensed;

means for exciting resonant vibrations of said structure; and

means for sensing the vibrations at respective points on said structure spaced apart along the direction of flow of the fluid;

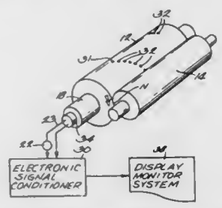
wherein the structure comprises at least one pair of substantially similar vanes, which are elongated in, and generally aligned with, the direction of flow of the fluid, which are coupled together by and project substantially symmetrically from a common yoke, and which are resonantly vibratable substantially perpendicular to the direction of flow of the fluid at a common frequency but in antiphase with each other.

5,048,352
**RACQUET STRING TENSION MEASURING DEVICE**
Felipe Artola Ugarte, Vizcaya, Spain, assignor to Masker, S.A., Bizkaia, Spain
Filed Nov. 16, 1989, Ser. No. 436,884
Claims priority, application Spain, Nov. 22, 1988, 8803577
Int. Cl.[5] G01L *5/04*
U.S. Cl. 73—862.45 3 Claims



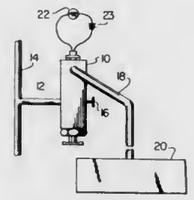
1. A racquet string tension measuring device, said device having a body and comprising in combination:
means for fixing the relative position of said device and said racquet;
means for applying a force to stringing on said racquet and for deflecting said stringing;
means to measure said force;
means for measuring stringing deflection;
a force applicator part of said means for applying a force protruding from said body;
a rod (*4a*) movably mounted on and protruding from said force applicator part (*3a*);
wherein said rod is supported on said means for fixing the relative position of said device and said racquet;
wherein said means for fixing the relative position supports said racquet;
wherein said means for deflection measurement comprises means for measuring relative displacement between said force applicator part and said rod; and
wherein said means for force measurement comprises means for measurement of the relative displacement between said device body and said force applicator part.

5,048,353
**METHOD AND APPARATUS FOR ROLL PROFILE MEASUREMENT**
Edgar J. Justus, deceased, late of Beloit, Wis., and by Katherine J. Clayton, executrix, Warren, R.I., assignors to Beloit Corporation, Beloit, Wis.
Filed Mar. 1, 1990, Ser. No. 486,989
Int. Cl.[5] G01L *1/18, 5/00*
U.S. Cl. 73—862.55 6 Claims



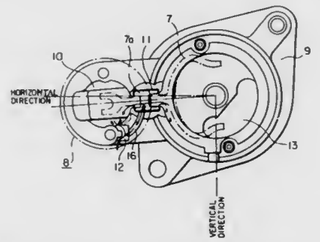

1. Apparatus for producing a reading indicative of non-uniformities in the cross-machine nip pressure profile of two cooperating rolls, comprising, in combination:
first and second rolls with a nip line of contact therebetween;
pressure sensitive means arrayed in the cross-machine direction on the surface of the first roll along a face width thereof and arranged in a uniform spiral for less than 360°, said pressure sensitive means being capable of producing a first signal corresponding to the nip force applied by the mating roll against the pressure sensitive means;
signal conditioning means for receiving the first signal and producing a read-out signal indicative of the nip force at predetermined locations across the surface of the roll as determined by the pressure sensitive means passing through the nip;
display monitoring means for receiving the read-out signal and providing a display of the read-out signals at lateral points across the surface of the roll indicative of the nip pressure profile along the nip line;
the interruption in the first signal produced by a gap in the pressure sensitive means not passing through the nip is utilized by the signal conditioning means to reset the third signals passed to the display monitoring means.

5,048,354
**DEVICE FOR SAMPLING A CIRCULATING FLUID**
James E. Mullis, Sr., and James E. Mullis, Jr., both of Unit #8, 980 Pacific Gate, Mississauga, Ontario, Canada L5T 1Y1
Filed Jan. 11, 1990, Ser. No. 463,503
Int. Cl.[5] G01N *1/20*
U.S. Cl. 73—863.25 9 Claims



1. A device for sampling the contents of a pressurized circulating fluid system comprising:
(a) a housing having a cavity, an inlet to said cavity for receiving fluid from the pressurized circulating fluid system, and an outlet from said cavity;
(b) a filter seated in said cavity and interposed between said inlet and said outlet;
(c) means for sensing the pressure differential between said inlet and said outlet; and
(d) valve means for draining said cavity to obtain fluid for analysis and to facilitate removal of said filter.

5,048,355
**ENGINE STARTER WITH A FRONT BRACKET PROVIDED WITH A DRAINAGE STRUCTURE**
Hirokazu Ueno, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed May 11, 1990, Ser. No. 521,963
Claims priority, application Japan, May 15, 1989, 1-121926
Int. Cl.[5] F02N *15/06*
U.S. Cl. 74—7 A 2 Claims

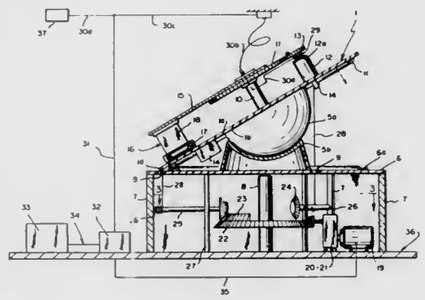



1. A starter device for an automotive internal combustion engine, comprising:



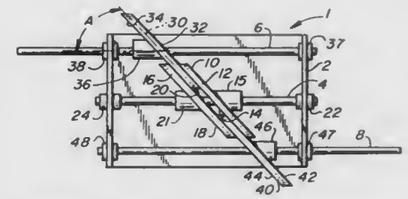
an electric motor portion accommodating an electric motor, and having a horizontally oriented axis;
an output shaft coupled to a rotor shaft of the electric motor;
a pinion assembly axially slidably supported on the output shaft, a pinion of said pinion assembly being adapted to be engaged with a ring gear of the internal combustion engine when translated to a front position thereof;
an electromagnetic switch attached to a side of the electric motor portion, and having a horizontally oriented axis;
a lever rotatably supported on a fulcrum portion thereof, two end portions of the lever engaging with the pinion assembly and a front end of a plunger of the electromagnetic switch, respectively, so as to transmit a movement of the plunger of the electromagnetic switch to the pinion assembly; and
a front bracket (9) secured to a front side of the motor portion to accommodate the output shaft and the pinion assembly, said front bracket including a substantially cup-shaped switch box portion (10) accommodating a front end of the electromagnetic switch and situated horizontally alongside of a portion of the front bracket accommodating the output shaft and the pinion assembly, and a lever box portion (11) accommodating the fulcrum portion of the lever situated between the switch box portion and the portion accommodating the output shaft and the pinion assembly,
wherein a first drainage port (12) communicating an interior of the switch box portion to outside is formed in a lower side of the cup-shaped switch box portion, and a second drainage port (16) is formed in the front bracket which communicates an interior of the lever box portion to an intermediate portion of the first drainage port.

5,048,356
**WOBBLE DEVICE**
Leo Levko, 146 West 79th St., New York, N.Y. 10024
Filed Apr. 23, 1990, Ser. No. 513,120
Int. Cl.[5] F16H *33/10*
U.S. Cl. 74—60 21 Claims



1. A wobble device comprising:
a circular platform;
means for pivoting said platform to achieve a wobbling movement;
a shaft transverse to and positioned in a center of said platform;
a moveable carriage rotatably attached through an arm to said shaft;
roller means for moving said carriage on an upper surface of said platform, said roller means connected to said carriage;
a support frame below said platform; and
a plurality of extension elements evenly distributed around and outwardly directed from said platform.

5,048,357
**TRANSLATION/ROTATION CONVERSION APPARATUS**
Eric O. Siperko, P.O. Box 743, Angwin, Calif. 94508
Filed Sep. 24, 1990, Ser. No. 587,058
Int. Cl.[5] F16H *15/08, 23/00, 21/44*
U.S. Cl. 74—110 18 Claims



1. Translation/rotation conversion apparatus including:
a rotatable follower shaft;
a follower slant mounted on the follower shaft at an oblique angle with respect to the follower shaft,
the follower slant having a first planar face; a rotatable drive shaft disposed parallel to the follower shaft;
a drive slant mounted on the drive shaft at the same oblique angle with respect to the drive shaft as the follower slant is mounted with respect to the follower shaft,
the drive slant having a second planar face; and wherein
the second face is engaged in flat overlapping relationship with the first face and at least one shaft is free to reciprocally translate.

5,048,358
**ROTARY PHASED RADIAL THRUST VARIABLE DRIVE TRANSMISSION**
William B. Shook, Bremen, Ohio, assignor to Thurston, Inc., Columbus, Ohio
Filed Jun. 4, 1990, Ser. No. 533,026
Int. Cl.[5] F16H *29/14*
U.S. Cl. 74—112 24 Claims



1. A rotary phased radial thrust variable drive transmission located between a rotatable input driving member and an output driven member which are mounted for relative rotation on a common axis, including radial thrust linkages carried by one of said members, and a cam unit surrounding said axis and having a selected profile, said thrust linkages carrying cam-followers for engaging said cam profile during relative rotation of said members and thrust means for engaging a mating surface on the other of said members to supply torque thereto so as to result in rotation thereof, and adjustable means for varying the profile of said cam unit.

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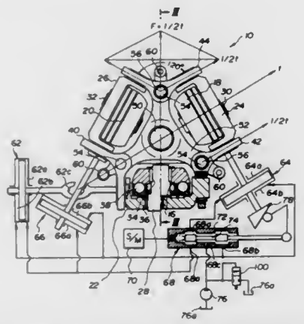


**5,048,359**

## TOROIDAL CONTINUOUSLY VARIABLE TRANSMISSION

Masaki Nakano, Kawasaki, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 15, 1990, Ser. No. 570,277
Claims priority, application Japan, Aug. 15, 1989, 1-210486
Int. Cl.[5] F16H *15/00*
U.S. Cl. 74—190.5 8 Claims



1. In a toroidal continuously variable transmission:
co-axial input and output discs having facing toric surfaces;
at least three circumferentially-spaced friction rollers disposed between and in driving contact with said toric surfaces for transmitting torque between said input and output discs;
roller carriers rotatably supporting said rollers, respectively;
swing links, each of said swing links having two arms, each of said arms being associated with one of said carriers;
means for forming a swivel connection between each of said arms and its associated carrier;
means for forming a slidable connection between each of said arms and its associated carrier; and
control means for controlling said roller carriers.

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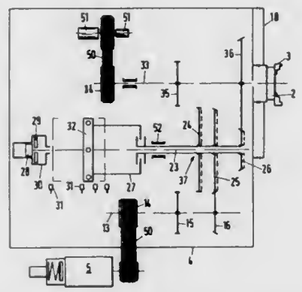
**5,048,360**

## C-AXLE GEARING

Siegfried Kuhn, Dürnau; Werner Mühlich, Süssen; Robert Räder, Göppingen; Otmar Ritz, Wangen; Hermann Schulten, Birenbach, and Manfred Unruh, Göppingen, all of Fed. Rep. of Germany, assignors to Boehringer Werkzeugmaschinen GmbH, Fed. Rep. of Germany

Filed Aug. 1, 1990, Ser. No. 561,144
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1989, 3925601
Int. Cl.[5] F16H *3/22*
U.S. Cl. 74—347 10 Claims

1. A shiftable gearing system for a lathe, the system comprising:
a main spindle for supporting and driving a workpiece, the main spindle including a gear shaft (**33**) and a first slightly conical gear wheel (**36**);
second and third slightly conical gear wheels (**26, 25**);
driving means for driving the gearing system, the driving means including a gear shaft (**13**) and a fourth slightly conical gear wheel (**16**); and
shifting means for shifting the system from a first position, in which the first and second gear wheels engage each other with play and the third and fourth gear wheels engage each other with play, to a second position, in which the first and second gear wheels engage each other without play and the third and fourth gear wheels engage each other without play, and in which the main spindle is



driven by the driving means exclusively through the first, second, third and fourth gear wheels.

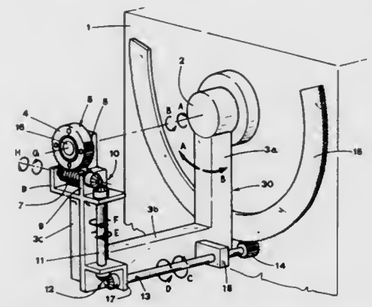
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**5,048,361**

## DEVICE FOR KEEPING THE SPATIAL ATTITUDE OF A MEMBER, CONSTRAINED TO A SWINGING SUPPORT, WITH RESPECT TO A FIXED ELEMENT

Mario Ciucani, Via S. Girolamo, Fermo, Italy

Filed May 4, 1990, Ser. No. 518,792
Claims priority, application Italy, May 10, 1989, 4807/89[U]
Int. Cl.[5] F16H *35/00*
U.S. Cl. 74—380 3 Claims



1. A device for maintaining the spacial attitude of a member with respect to a fixed reference element, comprising:
a first pivot protruding from said reference element and subject to oscillation in both directions about its axis;
a swinging support, said member being connected to said swinging support, said swinging support including a number of consecutive segments connected at one of its ends radially to said first pivot, oscillation of said pivot causing oscillation of said swinging support;
a second pivot fastened to the free end of said swinging support said second pivot having its axis coaxial with said axis of said first pivot, said member being rotatably supported and on said second pivot;
at least a sector of a crown gear fastened to said reference element, said crown gear being fixed concentrically with said first pivot;
transmission means supported by said swinging support, said transmission means having a first end and a second end, said first end toothedly engaging said crown gear;
a worm gear mounted adjacent to said member, said worm gear having a shaft rotatably supported by said swinging support, the second end of said transmission means engaging said worm gear shaft for rotation of said worm gear, at least a portion of said member being circular and centered about said second pivot axis, said portion having teeth engaging said worm gear,
rotation of said swinging support in either direction about the axis of said first pivot causing said worm gear to rotate by way of said transmission means engaging said crown gear, the effect of rotation of said swinging support about said first pivot being effectively cancelled by a counter rotational effect produced by said crown gear, transmission means, worm gear and teeth to fix said member relative to said reference element.



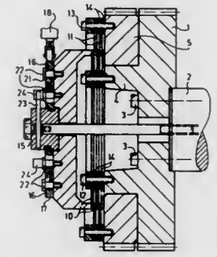
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**5,048,362**

## DEVICE FOR TENSIONALLY CONNECTING A FIXED GEARWHEEL AND AN ADJUSTABLE GEARWHEEL ON A CYLINDER OF A TURNING APPARATUS IN A SHEET-FED ROTARY PRINTING PRESS AND, MORE PARTICULARLY, TO SUCH A DEVICE WHICH IS ELECTRICALLY SAFEGUARDED

Willi Becker, Bammental, and Hans-Peter Hiltwein, Philippsburg, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Fed. Rep. of Germany

Filed Jun. 13, 1989, Ser. No. 365,596
Claims priority, application Fed. Rep. of Germany, Jun. 13, 1988, 3820026
Int. Cl.[5] B41F *21/10, 13/00*
U.S. Cl. 74—439 17 Claims



1. In a sheet-fed rotary printing press, a device for tensionally connected a fixed gearwheel and a gearwheel coaxial with and adjustable in rotational position thereof relative to the fixed gearwheel, comprising an actuatable clamping element and a clamping body for clamping the fixed gearwheel and the adjustable gearwheel together, said clamping element being disposed substantially centrally on said clamping body, said clamping body being braced against one of the gearwheels, and being held with said clamping element on the other of the gearwheels, friction elements carried by the gearwheels as to be mutually overlappingly interengaging in the manner of a multidrive clutch, said clamping body having an annular pressure member radially spaced from said substantially centrally disposed clamping element for bracing said clamping body against the one gearwheel through the intermediary of said friction elements in an overlap region of said friction elements.

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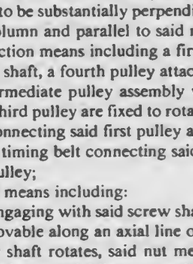
**5,048,363**

## WORM GEAR LUBRICATION RETAINER AND TRANSFER APPARATUS

Frederick R. Hughes, Kernersville, N.C.; Carlton L. Rintz, Lititz, Pa.; Ronald G. Sergeant, Lewisville, and Karl E. Zemlin, Greensboro, both of N.C., assignors to Burle Technologies, Inc., Wilmington, Del.

Filed Sep. 5, 1990, Ser. No. 577,889
Int. Cl.[5] F16H *57/04;* F16N *7/12*
U.S. Cl. 74—467 6 Claims

1. In a worm gear lubricating apparatus of the type which includes at least one lubricant impregnated porous pad attached to the side of a worm gear with each pad located upon the worm gear so that each porous pad wipes the outside of a worm which rotates on a worm shaft and drives the worm gear, the improvement comprising a barrier means located on the worm shaft in proximity to at least one end of the worm,



with the barrier constructed to prevent flow of the lubricant beyond the location of the barrier means.

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**5,048,364**

## MOTOR-OPERATED TILT STEERING DEVICE

Noboru Minamoto; Yoshiyuki Nakamura, and Hironori Kotani, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jun. 28, 1989, Ser. No. 373,370
Claims priority, application Japan, Jul. 14, 1988, 63-93567[U]
Int. Cl.[5] B62D *1/18*
U.S. Cl. 74—493 3 Claims



1. A motor-operated tilt steering device including:
a fixed bracket fixed to the body of a vehicle and supporting a lower steering shaft by means of a lower column;
a tilt bracket pivotally movably attached to said fixed bracket, one end of said tilt bracket supporting by an upper column an upper steering shaft connected to said lower steering shaft by a universal joint;
a tilting electric motor attached to said fixed bracket;
speed reduction means for reducing rotational speed of a shaft of said motor; and
conversion means including a screw shaft for converting rotation of said motor shaft to a pivotal movement of said tilt bracket, said screw shaft being attached to said fixed bracket so as to be substantially perpendicular to an axis of said lower column and parallel to said motor shaft;
said speed reduction means including a first pulley attached to said motor shaft, a fourth pulley attached to said screw shaft, an intermediate pulley assembly wherein a second pulley and a third pulley are fixed to rotate together, a first timing belt connecting said first pulley and second pulley, and a second timing belt connecting said third pulley and said fourth pulley;
said conversion means including:
a nut member engaging with said screw shaft so that said nut member is movable along an axial line of said screw shaft as said screw shaft rotates, said nut member including a fixed shaft having an axial line perpendicular to said axial line of said screw shaft; and
a bearing assembly secured to the outer end of said tilt bracket, said bearing assembly including a large bearing supported by said tilt bracket, an eccentric collar fixed inside said large bearing, and a small bearing fixed on said

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eccentric collar at its eccentric position, said small bearing engaging said fixed shaft provided on said nut member;

whereby said eccentric collar generates a turning point for said tilt bracket relative to said nut member when said nut member is moved as said screw shaft rotates to thereby convert linear movement of said nut member into angular movement of said tilt bracket so that the upper column supported by said tilt bracket is held in a desired angular position.

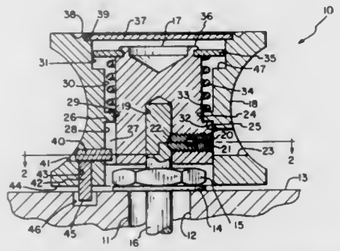
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**5,048,365**

## ORDNANCE ARMING SWITCH KNOB ASSEMBLY

George Webb, Irvington, Ill., assignor to Magnavox Government and Industrial Electronics Company, Fort Wayne, Ind.

Filed Mar. 29, 1990, Ser. No. 501,052
Int. Cl.[5] G05G *1/10;* B25G *3/00*
U.S. Cl. 74—553 10 Claims



1. A knob assembly actuating a rotary switch which is mounted on a stationary base, said switch having a shaft which rotates about an axis extending upwardly from said base for actuation, said knob assembly comprising an arbor, means for securing said arbor to the shaft for rotation with the shaft about the axis, a knob, means for keying said knob to said arbor for limited axial movement relative to said arbor while preventing rotational movement between said knob and said arbor, said knob moving between first and second axial positions relative to said arbor, spring means cooperating with said arbor and said knob for urging said knob from said first position to said second position relative to said arbor, and means for preventing rotation of said knob about the axis when said knob is in said second position and for not interfering with rotation of said knob about the axis when said knob is in said first position, said rotation preventing means including a pin secured to said knob extending in a direction parallel to the axis, said pin engaging a stationary hole in the base when said knob is in said second position and said pin clearing said hole when said knob is in said first position to permit rotation of said knob.

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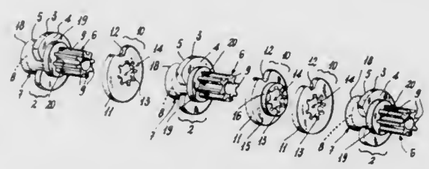
**5,048,366**

## MODULAR CAMSHAFT WITH REMOVABLE CAMS, PARTICULARLY FOR CIRCUIT BREAKERS AND ELECTRICAL CHANGEOVER SWITCHES OR THE LIKE

Marino Spanio, Cusano Milanino, Italy, assignor to Bremas S.p.A., Italy

Filed Mar. 26, 1990, Ser. No. 498,954
Int. Cl.[5] F16H *53/08*
U.S. Cl. 74—567 7 Claims

1. A camshaft comprising at least two modules coupled together, each carrying at least one cam and comprising two cylindrical elements disposed on a same axis and projecting in opposite directions from opposing faces of said cam, a first cylindrical element acting as a hub and a second cylindrical element being hollow and acting as a seat, the seat of one module being arranged to receive the hub of the other module so as to define the camshaft, each hub having integral thereto means which directly contact cooperate with means integral to each seat to by said means alone torsionally lock said two modules together, and further comprising, between two of said cams, at least one annular element spaced from said cams and removably mounted on one of the two cylindrical elements of each module, each said annular element comprising in its outer edge at least one recess so as to act as an additional cam, and



comprising it its inner edge means for torsionally locking it to the cylindrical element on which said annular element is mounted and wherein removal, replacement, or readjustment of each said annular element requires disassembly of said camshaft.

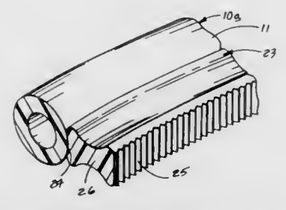
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**5,048,367**

## AUTOMATIC BALANCE APPARATUS

Veryl E. Knowles, 7305 S. Yakima Ave., Tacoma, Wash. 98408

Filed Feb. 26, 1990, Ser. No. 493,831
Int. Cl.[5] F16F *15/22*
U.S. Cl. 74—573 F 1 Claim



1. A vehicular wheel balance apparatus for securement to an annular wheel to provide dynamic balancing of the wheel, wherein the wheel includes a planar web mounting the wheel balance apparatus thereon, wherein the apparatus comprises,

an annular tube of semi-rigid deformable material, the tube including a continuous conduit therewithin, and

a mercury balancing fluid contained within the conduit for effecting dynamic balancing of the wheel during rotation of the wheel, and

the mercury balance contained within the conduit with the balance fluid contained within a predetermined angle of arc within the conduit, and

wherein the predetermined angle of arc is within a range of 20 to 110 degrees, and

wherein the annular tube includes an outer surface diametrically aligned with an inner surface, and an inner web member includes an inner securement means for securement of an inner surface of the planar web, and

wherein the securement means includes an inner securement web and an outer securement web, the inner securement web including an arcuate exterior face adhesively securing the inner surface of the annular tube therewithin, the outer securement web including a series of equally spaced ribs formed thereon, and the annular tube formed about a predetermined axis, and the ribs arranged parallel to and spaced from the axis, and

wherein the outer securement web and the inner securement web are arranged spaced relative to one another, and further including a narrowed central web defined by a width less than that of the outer securement web inner securement web, and wherein the central web is flexible to flexibly secure the outer securement web relative to the inner securement web.

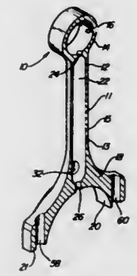


**5,048,368**

## HOLLOW CONNECTING ROD

Robert Mrdjenovich, Brighton, and David A. Yeager, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 31, 1989, Ser. No. 388,101
Int. Cl.[5] G05G *1/00*
U.S. Cl. 74—579 E 3 Claims



1. A connecting rod for use in an engine, comprising:

an elongate tubular shank member with two opposite ends;

a piston connecting member attached to one of the ends, the piston connecting member including a cylindrical surface adapted to cooperate with a piston wrist pin and defining a first passage extending axially with respect to the shank member to the cylindrical surface;

a crankpin connecting member attached to the opposite end of the shank member, the crankpin connecting member including a generally semi-cylindrical surface adapted to cooperate rotatably with a crankpin and defining a second passage extending axially with respect to the shank member to the semi-cylindrical surface;

wherein the elongate tubular shank member, the piston connecting member, and the crankpin connecting member define therebetween a hollow section for producing desired stiffness to weight characteristics in the connecting rod,

the elongate tubular shank member being provided with a central aperture extending transversely therethrough proximate the crankpin connecting member,

a pair of bolt holes extending through the crank pin connecting member for receiving bolts therethrough which attach the crankpin connecting member to the crankpin, and

the elongate tubular shank member being provided with a wall having a minimum thickness of no more than about 2.8 millimeters,

wherein the elongate tubular shank member is generally annular in cross-section throughout most of the length thereof.

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**5,048,369**

## CLIPLESS PEDAL WITH FASTENING MEANS

Chung-I Chen, No. 3, Kung-Chi Rd., Yn-Shih Industry Dist., Ta-Chia Chen, Taichung Hsien, Taiwan

Filed Feb. 28, 1990, Ser. No. 486,547
Int. Cl.[5] G05G *1/14*
U.S. Cl. 74—594.6 9 Claims

1. An improved clipless pedal having a mounting support for fixing to a shoe sole, and a pedal body rotatively mounted to a conventional pedal shaft and comprising retaining means for said mounting support wherein the improvement comprises:

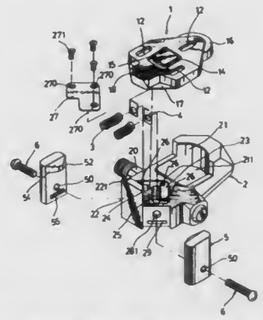
said pedal body has a substantially trapezoidal rear end having a generally flat portion and two inclined sides, a support member fixed to the flat portion and a pair of rear jaw members having means for revertably engaging with said pedal body at the included sides,

said pedal body, said mounting support, said support member and said pair of rear jaw members having surfaces shaped in such a manner to ensure said mounting support is rotatable and can push said rear jaw members to allow a lateral disengagement of said mounting support from said pedal body;

the pedal body further including a substantially V-shaped groove, the two ends of said groove being perpendicular to said included sides of the rear end of said pedal body, said V-shaped groove having two elongated slots formed along its length,

and a first hole formed on each said included side and communicating with said elongated slots,

the rear jaw members further including a second hole aligned with the first hole of the engaged inclined side, and



said means for revertably engaging said rear jaw members including

a pair of screw members, each adapted to pass through said first and second holes so as to be longitudinally disposed inside a respective elongated slot of the V-shaped groove,

a pair of spring members, each longitudinally disposed inside a respective elongated slot and surrounding the length of the screw member therein,

and a pair of bolt members respectively positioned within the two elongated slots to threadably engage the screw member therein and hold the respective spring member in place.

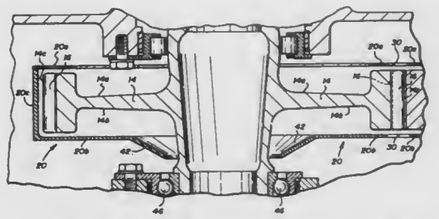
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**5,048,370**

## GEAR SHROUDING SYSTEM

Charles L. Duello, Arlington, Tex., assignor to Bell Helicopter Textron Inc., Fort Worth, Tex.

Filed Oct. 18, 1989, Ser. No. 423,767
Int. Cl.[5] F16H *57/02*
U.S. Cl. 74—606 R 6 Claims



1. A shroud for a high speed gear train including and a plurality of meshing gears, each gear having sides, teeth and an outer diameter, the shroud and comprising:

a pair of side walls disposed opposite the sides of each gear and adjacent to the gear outer diameter;

an end wall disposed generally perpendicularly to said pair of side walls and being disposed parallel to the gear outer

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diameter, such that said shroud side walls and end wall substantially enclose the teeth of each of the plurality of gears within the gear train; and

said end wall including a first port for allowing cooling fluid to be injected onto the gears and a second port for allowing cooling fluid to exit from the shroud.

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**5,048,371**

## CONTINUOUSLY VARIABLE TRANSMISSION PROVIDED WITH A TORQUE CONVERTER

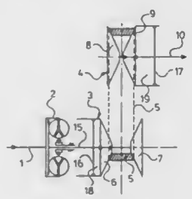
**Emery F. M. Hendriks, NR Heeze, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands**

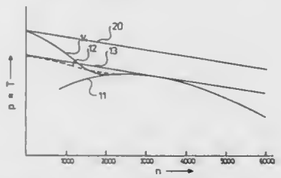
**Continuation of Ser. No. 295,097, Jan. 9, 1989, abandoned. This application Mar. 27, 1990, Ser. No. 501,340**

**Claims priority, application Netherlands, Feb. 2, 1988, 8800246**

**Int. Cl.[5] F16H *47/06***

**U.S. Cl. 74—730.1** **12 Claims**






1. Continuously variable transmission having a maximum torque characteristic and transmitting torque over a full speed range provided with a primary shaft with a primary pulley mounted thereon, a secondary shaft with a secondary pulley mounted thereon, each pulley comprising two conical discs, at least one of the two pulleys being axially movable by means of a hydraulic control cylinder, a driving belt being provided between the secondary pulley and the primary pulley, a hydrodynamic torque-converter with an ingoing shaft having a speed range of about 1000 to about 6000 revolutions per minute and a normal operating speed range between about 2500 and 4000 revolutions per minute, the primary pulley being drivable by the ingoing shaft via the hydrodynamic torque-converter, the torque-converter having a torque characteristic representing the torque delivered thereby whose torque-converting factors are chosen such, that the maximum torque to be transmitted by means of said transmission is lowered in substantial equal amounts over the full speed range concerned resulting in a lowered maximum torque characteristic of said transmission, the lowered maximum torque characteristic substantially matching the torque characteristic of said torque-converter over said full speed range and the converting factor of the torque converter being about 2 at most at a speed range of 1000–2000 revolutions per minute.

**5,048,372**

## TRANSMISSION GEAR POSITION DEPENDENT OUTPUT CONTROL SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

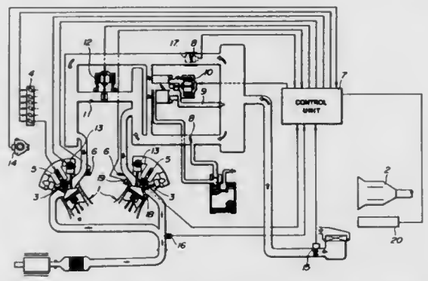
**Tsuyoshi Sodeno; Shozo Nakayama; Kiyomi Kawamizu, all of Kanagawa; Yuji Kato, Tokyo, and Nobutaka Takahashi, Kanagawa, all of Japan, assignors to Nissan Motor Company, Limited, Japan**

**Filed Dec. 11, 1989, Ser. No. 447,128**

**Claims priority, application Japan, Dec. 12, 1988, 63-311883**

**Int. Cl.[5] B60K *41/05***

**U.S. Cl. 74—860** **13 Claims**




1. An output characteristics control system for an internal combustion engine of a vehicle having an automatic transmission for providing engine power to driving wheels of the vehicle, comprising:

means, associated with the automatic power transmission, for detecting a predetermined specific gear position of the automatic transmission for producing a corresponding specific gear position indicative signal;

means for selecting an engine output characteristic on the basis of the detected gear position of said automatic power transmission and generating a corresponding control signal, said engine output characteristic selecting means selecting a first normal output characteristic in the absence of said specific gear position indicative signal and selecting a second limited output characteristic in the presence of said specific gear position indicative signal for producing a control signal representing a selected one of said first and second output characteristics, the second limited output characteristic being lower in magnitude than the first normal output characteristic; and

means, associated with said engine, for adjusting an engine output characteristic thereof according to said control signal.

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**5,048,373**

## CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION

**Takayuki Sumimoto; Shunichi Egawa, and Takahiro Kyohzuka, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Sep. 4, 1990, Ser. No. 577,104**

**Claims priority, application Japan, Sep. 1, 1989, 1-228103**

**Int. Cl.[5] B60K *21/02***

**U.S. Cl. 74—866** **12 Claims**

1. A control apparatus for an automatic transmission having kickdown pressure means for generating kickdown pressure; means for generating governor pressure corresponding to vehicle velocity; means for generating throttle pressure corresponding to engine load; and shift valves to which the kickdown pressure, governor pressure and throttle pressure are applied, wherein the shift valves are changed over in dependence upon an equilibrium relationship among the kickdown, governor and throttle pressures,

the control apparatus comprising:

speed detecting means for detecting transmission speed;

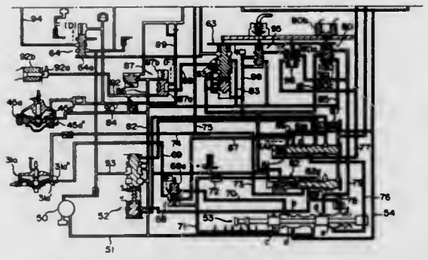


operation detecting means for detecting a kickdown operation performed by a driver;

vehicle velocity detecting means for detecting vehicle velocity; and

control means, receiving outputs from said speed detecting means, said operation detecting means and said vehicle velocity detecting means, for controlling the kickdown pressure means, wherein, when the transmission speed is a relatively lower speed, kickdown operation is detected and vehicle velocity is rising, said control means controls the kickdown pressure means

(a) to apply the kickdown pressure to the shift valves,



while the vehicle velocity is within a first velocity region (Z1 or Z4) on a lower velocity side of a first vehicle velocity ($V_{U2I}$ or $V_{U3I}$) which is less than an engine overrun point ($V_{o1}$ or $V_{o2}$);

(b) not to apply the kickdown pressure to the shift valves, while the vehicle velocity is within a second velocity region (Z2 or Z5) which is set from the first vehicle velocity to a second vehicle velocity which exceeds the engine overrun point ($V_{o1}$ or $V_{o2}$); and

(c) to apply the kickdown pressure to the shift valves, while the vehicle velocity is within a third velocity region (Z3 or Z6) which exceeds the second vehicle velocity.

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**5,048,374**

## VEHICLE SPEED CONTROL SYSTEM FOR MOTOR VEHICLE HAVING AN AUTOMATIC TRANSMISSION CONTROL SYSTEM

**Osamu Miyake, Nishikamo; Nobuyasu Suzumura, Toyota, and Shoji Kawata, Okazaki, all of Japan, assignors to Aisin Seiki Kabusbiki Kaisha, Kariya, Japan**

**Division of Ser. No. 126,901, Nov. 30, 1987, abandoned. This application Sep. 28, 1989, Ser. No. 413,765**

**Claims priority, application Japan, Nov. 29, 1986, 61-285233; Nov. 29, 1986, 61-285234; Nov. 29, 1986, 61-285235; Nov. 29, 1986, 61-285236; Nov. 29, 1986, 61-285237; Nov. 29, 1986, 61-285238**

**Int. Cl.[5] B60K *41/06***

**U.S. Cl. 74—866** **12 Claims**

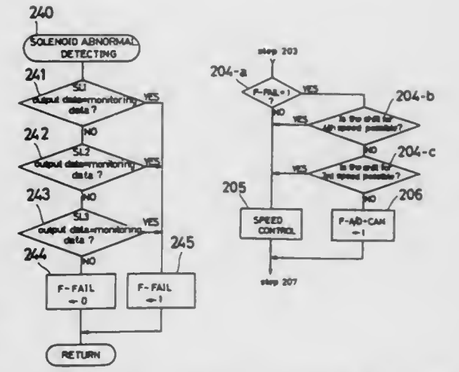
1. A speed control system for a vehicle having an automatic transmission with a plurality of shiftable speed stages, the automatic transmission being capable of shifting from an operating speed stage to another speed stage and capable of maintaining an operating speed stage when in a normal condition as required by a deviation between the actual vehicle velocity and throttle opening, the speed control system, comprising:

velocity setting means operative when activated for controlling the throttle to maintain a set vehicle velocity and deactivated for discontinuing the set vehicle velocity;

transmission control means governed by the set vehicle velocity for either maintaining the operating speed stage or alternatively shifting from the operating speed stage to another required speed stage in accordance with the actual vehicle velocity and the operating speed stage of the automatic transmission;

failure detecting means for detecting the inability of the automatic transmission either to maintain the operating speed stage or alternatively the inability to shift to the required speed stage; and

deactivating means responsive to the failure detecting means for deactivating the velocity setting means in response to




the detection of the inability to maintain the operating speed stage or alternatively detection of the inability to shift from the operating speed stage to another required speed stage.

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**5,048,375**

## METHOD FOR CONSTRUCTING A ROTATING CUTTING TOOL

**Yoshinobu Kobayashi, 2047, Shimotsuruma, Yamato-shi, Kanagawa-ken, 242, Japan**

**Continuation of Ser. No. 404,496, Sep. 8, 1989, abandoned. This application Oct. 16, 1990, Ser. No. 598,814**

**Claims priority, application Japan, Sep. 22, 1988, 63-124412[U]**

**Int. Cl.[5] B21K *5/02*; B23B *51/02***

**U.S. Cl. 76—108.6** **3 Claims**

1. A method for constructing a rotating cutting tool comprising the steps of:

providing a rotating cutting part;

providing a solid monolithic shank which is larger in diameter than the rotating cutting part;

providing a through-aperture in the shank extending from a first end of the shank to a second end of the shank;

heating the shank to expand the shank;

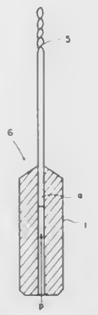
inserting the rotating cutting part into the first end of the through-aperture of the heated shank;

cooling the shank to contract the shank around the rotating cutting part; wherein the rotating cutting part can be removed from the shank and replaced when the rotating cutting part has worn and when the rotating cutting part

VOL 1130 ISS 3 SE 17 1991 UMI

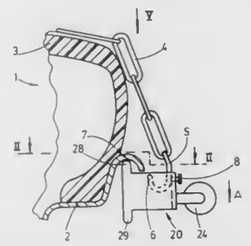


has broken by reheating the shank to expand the shank, and pushing the rotating cutting part out of the shank through-aperture with a rod inserted in the second end of the through-aperture.



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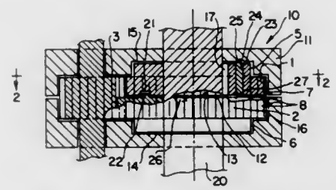
**5,048,376**
**TOOL, MOUNTING MEANS AND RING DEVICE FOR ANTI-SKID CHAINS**
**Odd Faanes, P.O. Box 126, 2001 Lilleström, Norway**
**Filed Feb. 6, 1990, Ser. No. 475,969**
**Claims priority, application Norway, Feb. 13, 1989, 890606; Jun. 28, 1989, 89273**
**Int. Cl.[5] B60C *27/06***
**U.S. Cl. 81—15.8** **7 Claims**



1. A hand tool for applying and removing anti-skid chains to and from vehicle wheels having elastic tires, the tool comprising
an elongate rod having a handle at one end,
a plate at an opposite end of the rod,
a connection between the rod and the plate,
connector means on the plate for connecting the plate to a hook element of a tire chain cross-link, said connector means being positioned closer to the handle than is said connection, and
an abutment element on the plate,
whereby said the abutment element is adapted to engage a rim of said wheel and to act as a fulcrum around which said tool is pivoted to move said hook element of said connected tire chain cross-link, said tool pivoted firstly so as to cause movement of said tire chain cross-link in a direction perpendicular to and inwardly toward a central axis of said wheel so that the position of said hook element is below an edge of said tire rim, said tool is pivoted secondly so as to cause movement of said tire chain cross-link parallel to said axis, said parallel movement being in a direction inwardly toward the tire for chain application and in a direction outwardly away from the tire for chain removal, said tool being pivoted thirdly so as to cause a motion of said hook element of said tire chain cross-link in a direction perpendicular to said axis, a radially outward motion relative to said wheel causing engagement of said hook element with said tire rim for attachment, and a radially inward motion relative to said wheel causing disengagement of said hook element with said tire rim for removal.

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**5,048,377**
**GRIPPING AND ROTATING TONG DEVICE**
**Matti Varis, SF-99300 Muonio, Finland**
**PCT No. PCT/F188/00164, § 371 Date May 30, 1990, § 102(e) Date May 30, 1990, PCT Pub. No. WO89/03470, PCT Pub. Date Apr. 20, 1989**
**PCT Filed Oct. 7, 1988, Ser. No. 469,445**
**Claims priority, application Finland, Oct. 8, 1987, 874439**
**Int. Cl.[5] B25B *17/00***
**U.S. Cl. 81—57.15** **6 Claims**

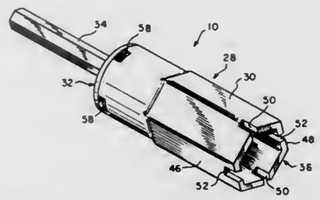


1. A gripping and rotating device for handling rods, comprising:
a movable transfer device;
a housing secured to said movable transfer device; said housing including wall means defining an exterior and an interior; means defining an opening axially through said housing and communicating with said interior; a radial aperture laterally intersecting said opening so that a rod can be taken laterally into said housing through said radial aperture, so as to extend axially from said housing through said opening along a longitudinal axis of said opening;
gripping means disposed in said interior of said housing for gripping a rod when taken laterally into said housing; said gripping means including two axially adjacent rings journalled by respective bearing means in said housing coaxially with said opening for rotation about said longitudinal axis;
each said ring having means defining a respective axial opening therethrough, coaxially with said axial opening through said housing, and means defining a radially opening notch laterally intersecting the respective said axial opening through the respective said ring so that a rod when being taken laterally into said housing can be taken laterally into said rings through the respective said radial notches, so as to extend axially from said rings through the respective axial openings through said rings along said longitudinal axis;
at least one of said rings being peripherally provided with a respective set of cogging centered on said longitudinal axis;
drive gear means journalled in said housing and arranged to be reversibly rotated in driving relation with said set of cogging for reversibly rotating said at least one of said rings about said longitudinal axis;
at least one of said rings having surface means facing the respective said axial opening therethrough and arranged for drivingly engaging said rod when extending through said axial openings, whereby said rod may be rotated about said longitudinal axis by rotating said drive gear means;
interengageable limiting means provided on rings and arranged to provide for a predetermined angular amount of lost motion between said rings upon rotation of said drive gear means in either angular direction, said predetermined angular amount being sufficient to relatively rotate said one of said rings relative to the other of said rings sufficient to cause said radially opening notches through said rings to be shifted between an open condition in which both of these notches overlap one another in effective radial alignment on one side of said longitudinal axis, and a closed condition in which these notches are substantially completely non-overlapping, through rotation of at least one of said rings by a predetermined angular amount.



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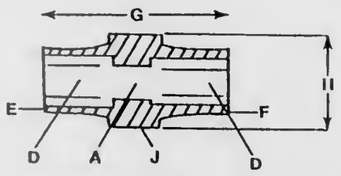
**5,048,378**
**TOOL AND METHOD FOR FAUCET NUT INSTALLATION**
**William F. Nikolas, 10708 Old River School Rd., Downey, Calif. 90241**
**Filed Nov. 13, 1990, Ser. No. 611,824**
**Int. Cl.[5] B25B *13/00***
**U.S. Cl. 81—124.2** **14 Claims**



1. A plumbing tool for installing a faucet nut on a threaded nipple of a faucet assembly comprising: a socket having a blind end and an opposite hexagonal end with an opening large enough to circumscribe said nipple and formed by six walls of equal length and uniform thickness throughout arranged in first, second and third pairs, the walls within each pair being mutually opposing, and wherein said socket is formed with a first set of diametrically opposed radial slots at all demarcations between said walls in said first and second pairs and a second set of diametrically opposed radial slots oriented perpendicular to said first set of slots and bisecting each of said walls in said third pair, and a drive shaft coupled to said blind end of said socket and adapted to fit into the jaws of a chuck of an electric drill.

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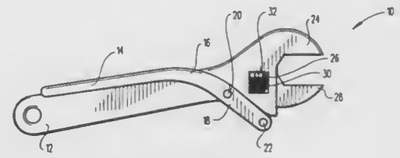
**5,048,379**
**MULTI-FUNCTIONAL DOUBLE-ENDED SOCKET WRENCHES**
**Robert E. Gramera, and David B. Wuchert, both of 704 County Rd. 220, Durango, Colo. 81301**
**Continuation-in-part of Ser. No. 368,040, Jun. 16, 1989, abandoned. This application Mar. 29, 1990, Ser. No. 500,897**
**Int. Cl.[5] B25B *13/00***
**U.S. Cl. 81—124.4** **10 Claims**



1. A double-ended socket type wrench comprising in combination a hollow shell, substantially cylindrical body portion, nut and bolt engaging means formed internally, adjacent each end of said body portion and extending from each end to a point spaced from the central portion of said body portion, including a passageway extending axially for the entire length of said body portion for receiving a bolt of length equal to or greater than said body portion when engaging a nut with said nut engaging means with said central portion of said body portion, comprising an external hexagonal surface drive engaging portion, raised from said body portion, wherein said nut and bolt engaging means and said central portion are in axial alignment with each other.

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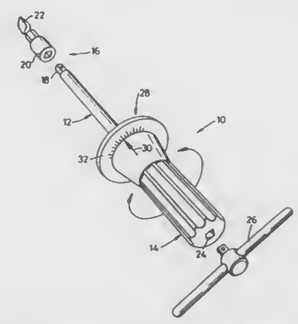
**5,048,380**
**ADJUSTABLE WRENCH**
**Mark A. Caldwell, 872 Apache Trail, Lexington, Ky. 40503**
**Filed Feb. 20, 1990, Ser. No. 481,189**
**Int. Cl.[5] B25B *13/16***
**U.S. Cl. 81—165** **5 Claims**



1. An adjustable wrench, comprising:
an elongated handle;
a first jaw formed at an end of said handle;
a second jaw slidably mounted adjacent said first jaw;
a gear rack secured to said second jaw;
a worm gear rotatably mounted on a shaft, said worm gear constrained against axial movement with respect to said shaft and in mesh with said gear rack;
said shaft mounted in said handle for reciprocal axial linear movement parallel to said gear rack;
and
lever means pivotally secured to said shaft for axially moving said shaft.

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**5,048,381**
**TORQUE-INDICATING SCREWDRIVER**
**David G. Allen, Chiddingfold, and Terence C. Bullen, Guildford, both of England, assignors to MHH Engineering Co., Ltd. of Bramley, Etc., England**
**Filed Apr. 3, 1990, Ser. No. 503,771**
**Claims priority, application United Kingdom, Apr. 21, 1989, 8909169; Oct. 11, 1989, 8922886**
**Int. Cl.[5] B25B *23/159***
**U.S. Cl. 81—477** **6 Claims**



1. A torque-indicating screwdriver comprising a shaft assembly, a handle and fastener coupling, the shaft assembly comprising a torsionally elastic torque transmitter rotationally coupling the handle to the fastener coupling, and a torque indicator, the torque indicator comprising:
first and second torque indicator members, the torque indicator members being mounted on the shaft assembly and

the torque indicator members being movable relative to each other to indicate torque;

a uni-directional rotation transmitter means mounted on the handle, the uni-directional rotation transmitter means engageable with the first member to move the first member with the handle in one rotational direction; and

a latch mounted on the handle, the latch means being movable between a lock position in which it engages the first member and locks the first member to the handle for movement therewith in two rotational directions, and a release position in which the latch means is disengaged from the first member and the first member is unlocked from the handle.

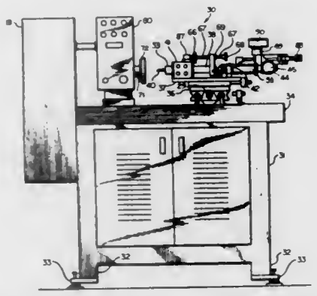
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**5,048,382**

## METHOD FOR MAKING ELASTOMERIC SEALING DEVICE

**Edward P. Mitchell, Bristol, Ind., assignor to Mar Don Corporation, Park Ridge, Ill.**

**Filed Aug. 23, 1989, Ser. No. 397,578**
**Int. Cl.[5] B23B *5/00***
**U.S. Cl. 82—1.11** **19 Claims**



1. A process of producing a plurality of knife cut concentric ring sections into a device having first and second faces and formed of a non metallic pliant material, said ring sections being concentric with an axis of said device and extending parallel with said axis, said process comprising the steps of:

a. mounting said first face of said device in a rotatable chuck means having a rotatable axis;

b. rotating said device about said axis on said chuck means;

c. positioning a knife means substantially perpendicular to the second face of said device at a first radial distance from said axis;

d. moving said knife means parallel with said axis relative to said device whereby said knife means cuts a slit ring into said device while said device is rotated, said knife means moving to a position more closely adjacent said first face;

e. continually rotating said device while said knife means continues to cut into said device;

f. positioning said knife at another radial distance from said axis, and repeating steps d. and e. thereby forming a ring section;

g. positioning said knife at another radial distance from said axis and repeating steps d. and e. to form a second ring section; and,

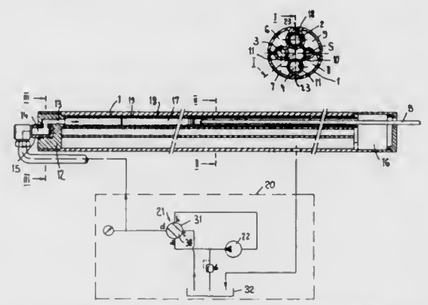
h. dismounting said device from said chuck without removing said ring sections from said device.

**5,048,383**

## GUIDE-BAR DEVICE FOR AUTOMATIC LATHE AND METHOD OF FABRICATION THEREOF

**Markus Geiser, Péry, and Claude Vandevoir, La Neuveville, both of Switzerland, assignors to Sameca SA, Lamboing, Switzerland**

**Filed Jun. 22, 1988, Ser. No. 210,029**
**Claims priority, application European Pat. Off., Jun. 24, 1987, 87810361.3**
**Int. Cl.[5] B23B *13/02***
**U.S. Cl. 82—127** **14 Claims**



1. Guide-bar device for receiving and guiding bar stocks of different diameters and/or profiles to be machined in an automatic lathe, comprising:

a cylindrical body having a length at least equal to the length of bars to be machined with a longitudinal axis running the length thereof;

a plurality of tubular members forming tubular cavities of different diameters for receiving and guiding the bars to be machined, said tubular cavities being arranged in said cylindrical body parallel to the longitudinal axis of said cylindrical body, and said tubular cavities being capable of comprising on their whole length oil distribution channels for dipping said bars to be machined;

said cylindrical body including a peripheral ring connected by reinforcing ribs to each of said tubular members, each of said tubular members being further connected by reinforcing ribs to adjacent tubular members, said reinforcing ribs enhancing the moment of inertia and hence the rigidity and the stability of said cylindrical body;

said cylindrical body including means for angularly positioning which permit in cooperation with fixed external means a precise indexing of said cylindrical body; and

oil distributing means for distributing oil being located at a rear part of said cylindrical body, an il collector located at a front part of said cylindrical body and means permitting a return of the oil to a hydraulic group feeding said device with the oil under pressure in a closed circuit.

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**5,048,384**

## CENTERING DEVICE

**Eric T. Carlen, Roanoke, Va., assignor to Carlen Controls, Inc., Roanoke, Va.**

**Filed Apr. 30, 1990, Ser. No. 515,751**
**Int. Cl.[5] B23B *23/02***
**U.S. Cl. 82—170** **17 Claims**

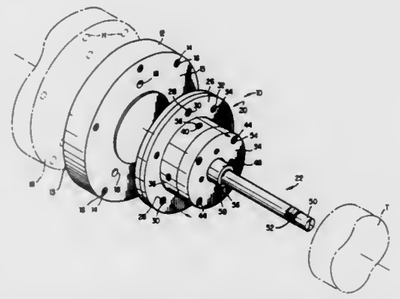
1. A centering device for attaching an indicator to a motor shaft comprising:

a housing including a base for attachment to said motor shaft, and a flange disposed on said base substantially perpendicular thereto;

a mandrel shaft including a base end and a distal end, said base end received within said flange, said distal end including means for receiving an indicator for indicating the rotational output of said motor shaft;



means for adjusting said base end of said mandrel shaft within said flange such that a central axis of said mandrel shaft is in alignment with a central axis of said motor shaft; and



wherein said indicator, when provided on said distal end of said mandrel shaft, provides a true indication of the rotation of said motor shaft.

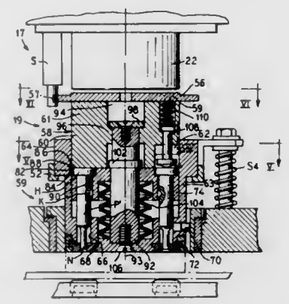
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**5,048,385**

## INDEXABLE MULTI-TOOL FOR PUNCH PRESS

**Richard M. Eckert, Amherest, and Ronald C. Hill, Corfu, both of N.Y., assignors to Strippit, Inc., Akron, N.Y.**

**Filed Dec. 28, 1989, Ser. No. 458,281**
**Int. Cl.[5] B26F *1/08*; B26D *5/02***
**U.S. Cl. 83—34** **24 Claims**



7. A turret punch press comprising the following:

a press frame supporting rotatable upper and lower turrets, each of said turrets including a plurality of sets of circumferentially spaced tool holding stations, each of said sets including an upper station in said upper turret and a corresponding lower station in said lower turret;

at least one of said sets of tool holding stations being an indexing set that is provided with means for rotating tool holders received therein;

a multi-tool holder comprising a punch carrier with a plurality of spaced apart punch-carrying openings therein with punches in said openings, said multi-tool holder being received in the upper station of said at least one indexing set;

a die carrier bearing a plurality of dies corresponding to said punches, said die carrier being received in the lower station of said at least one indexing set below said multi-tool holder, whereby a punch in each of said punch-carrying openings of said punch carrier will mate with a die carried by said die carrier;

said multi-tool holder including a striker body having a striker member, said punch carrier being selectively rotatable with said striker body and movable with respect to said striker body; and

a lock selectively actuable to retain said striker body against movement when said punch carrier of said multi-tool holder is moved by said indexing set.

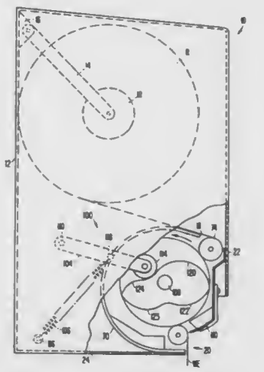
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**5,048,386**

## FEED MECHANISM FOR FLEXIBLE SHEET MATERIAL DISPENSERS

**Raymond F. DeLuca, Stamford, Conn.; Paul W. Jespersen, Houston, Tex., and Holger Rasmussen, Kilchberg, Switzerland, assignors to Georgia-Pacific Corporation, Atlanta, Ga.**

**Filed Oct. 27, 1989, Ser. No. 427,336**
**Int. Cl.[5] A47K *10/36*; B26D *1/56*; B26F *3/02***
**U.S. Cl. 83—37** **15 Claims**



1. A method of dispensing a web of flexible sheet material from a dispenser including a feed roller rotatable through an operating cycle that includes a web cutting segment and a lead feed segment, a cam operably connected to said feed roller, a cam follower operable with said cam, and a drive spring tensionably attached to said cam follower, the method comprising the steps of:

storing energy in said drive spring by rotating said feed roller through that portion of its operating cycle occurring prior to completion of said web cutting segment;

releasing at least a portion of the energy stored in said drive spring to assist rotation of said feed roller in cutting said web during the web cutting segment of said operating cycle;

thereafter storing energy in said drive spring during rotation of said feed roller following completion of said web cutting segment; and

releasing energy stored in the drive spring to assist in rotation of said feed roller during the lead feed segment of said cycle, such that a lead of said flexible sheet material is fed from said dispenser for access by a subsequent user.

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**5,048,387**

## HORIZONTAL PERFORATION FORMING APPARATUS FOR ROTARY PRESS

**Tsutomu Niitsuma, and Shin Ohsawa, both of Ibaraki, Japan, assignors to Komori Corporation, Tokyo, Japan**

**Filed Feb. 23, 1990, Ser. No. 484,065**
**Claims priority, application Japan, Jul. 14, 1989, 1-180600**
**Int. Cl.[5] B26D *1/62***
**U.S. Cl. 83—344** **10 Claims**

2. A horizontal perforation forming apparatus for a rotary press comprising:

a perforation cylinder having a perforation blade extending

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substantially parallel to a longitudinal axis of said perforation cylinder;

a mating cylinder mounted adjacent said perforation cylinder, said mating cylinder having a perforation blade seat extending in an axial direction of said mating cylinder, said perforation blade and perforation blade seat being adapted to cooperate with an oppose each other upon rotation of said perforation and mating cylinders;

drive gear means for driving both said perforation cylinder and mating cylinder, said perforation cylinder and mating cylinder being indirectly geared together so as to provide proper mating of said perforation blade with said perforation blade seat;

interaxial distance adjusting means for adjusting a distance between axes of said perforation and mating cylinders, said interaxial distance adjusting means having first eccentric bearing means rotatably supporting said perforation cylinder and second eccentric bearing means rotatably supporting said mating cylinder, said interaxial distance adjusting means rotating said first and second eccentric bearing means to provide substantially equal adjustment of both said perforation and mating cylinders, said equal adjustment enabling said perforation blade and said perforation blade seat to remain opposing; and

phase adjusting means having a phase adjusting shaft which is axially moved to rotate said perforation cylinder, said perforation cylinder thereby rotating said mating cylinder by said perforation cylinder being indirectly geared with said mating cylinder, said phase adjusting means correcting a phase error created upon said equal adjustment of said distance between axes of said perforation and mating cylinders so as to enable horizontal perforations to be properly located on a web.

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**5,048,388**

**ROTARY KNIFE ASSEMBLY**

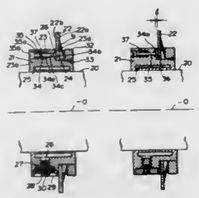
**Tatsunori Kobayashi, and Masayuki Inoue, both of Anpachi, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan**

**Filed Mar. 28, 1990, Ser. No. 500,452**

**Claims priority, application Japan, Mar. 31, 1989, 1-37871[U]**

**Int. Cl.[5] B23D** *19/06*

**U.S. Cl. 83—504** **11 Claims**



1. A rotary knife assembly comprising:

a rotary shaft having an axis of rotation therethrough;

a flange fitted on and securely fixed to said rotary shaft, said flange including a radially-outwardly protruding flange portion having opposite end faces and at least one bore extending axially thereof, and a reduced diameter portion disposed adjacent to said flange portion;

a rotary knife of an annular shape having opposite faces and fitted on said reduced-diameter portion of said flange with one of said opposite faces directed toward one of said opposite end faces of said flange portion;

a resilient member mounted on said flange for urging said rotary knife toward said flange portion; and

shifting means including at least one shifting member having an abutting member of a predetermined thickness and being movably accommodated in said bore of said flange portion so as to shift said rotary knife through a distance equivalent to the thickness of said abutting member in a direction away from said flange portion against the urging force of said resilient member.

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**5,048,389**

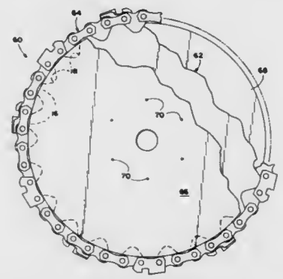
**CIRCULAR SAW BLADE WITH SAW CHAIN PROVIDING CUTTERS**

**Raymond R. Carlton, 3105 SE. Carlton St., Portland, Oreg. 97202**

**Continuation-in-part of Ser. No. 149,398, Jan. 28, 1988, abandoned. This application Dec. 9, 1988, Ser. No. 281,949**

**Int. Cl.[5] B27B** *17/00*

**U.S. Cl. 83—838** **8 Claims**



1. A circular cutting blade comprising:

a circular disc having sprocket teeth circumferentially distributed about the periphery of the disc and gullies circumferentially distributed about the periphery of the disc with the gullies interspersed between the teeth; and

a cutting chain mounted on and extending as a continuous chain circumferentially about the periphery of the disc, said chain having opposed side links interspersed with center links, the center links including links with anchor portions projecting downwardly in the chain and seated within said gullies, said side links including cutter links with cutter portions projecting radial outwardly from the disc, and a pair of side plates secured to said disc with one side plate on one side of the disc and the other side plate on the other side of the disc, the side plates having peripheral margins extending over the gullies and overlapping the anchor portions and peripheral edges underlying the side links.



**5,048,390**

**TONE VISUALIZING APPARATUS**

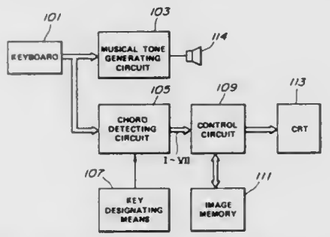
**Takeshi Adachi; Yasushi Kurakake; Hideo Suzuki, and Kotaro Mizuno, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan**

**Filed Sep. 1, 1988, Ser. No. 239,984**

**Claims priority, application Japan, Sep. 3, 1987, 62-133930[U]; Sep. 3, 1987, 62-219248[U]; Sep. 10, 1987, 62-137597[U]; Sep. 10, 1987, 62-137598[U]; Sep. 11, 1987, 62-138321[U]; Oct. 2, 1987, 62-150553[U]**

**Int. Cl.[5] G06K** *15/00;* **A63J** *17/00*

**U.S. Cl. 84—464 R** **47 Claims**




1. A tone visualizing apparatus, comprising:

(a) detecting means for detecting a musical tone parameter of an inputted audio signal;

(b) image display means for displaying an image of an object based on predetermined image information; and

(c) display control means for controlling a sense of distance of said object displayed by said image display means in response to a variation of said musical tone parameter.

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**5,048,391**

**ELECTRONIC MUSICAL INSTRUMENT FOR GENERATING MUSICAL TONES ON THE BASIS OF CHARACTERISTICS OF INPUT WAVEFORM SIGNAL**

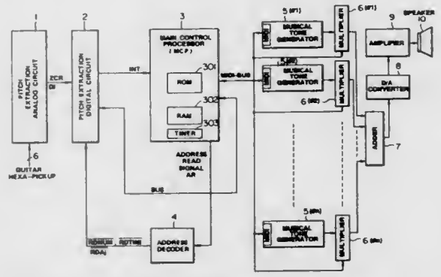
**Shigeru Uchiyama, Sayama, and Katsuhiko Obata, Tachikawa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Jun. 22, 1989, Ser. No. 370,336**

**Claims priority, application Japan, Jun. 27, 1988, 63-158752**

**Int. Cl.[5] G10H** *1/057, 1/18*

**U.S. Cl. 84—654** **9 Claims**



5. An electronic musical instrument, comprising:

envelope extraction means for extracting an envelope signal from an input waveform signal;

means for digitizing said input waveform signal to produce a digital waveform signal;

musical tone generation means for generating a musical tone signal; and

envelope control means coupled to said envelope extraction means and to said musical tone generation means for controlling an envelope of the musical tone signal supplied from the musical tone generation means in accordance with the envelope signal extracted by said envelope extraction means; and

wherein said envelope extraction means comprises:

maximum peak value detection means for detecting a maximum peak value of said digital waveform signal at its leading edge, said digital waveform signal being obtained by said digitizing of said input waveform signal;

effective peak value detection means for sequentially detecting effective peak values of said digital waveform signal after its leading edge; and

envelope signal calculation means including means for sequentially calculating ratios of present effective peak values detected sequentially by said effective peak value detection means to the maximum peak value detected by said maximum peak value detection means; and means for sequentially outputting the calculated ratios as the envelope signal.

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**5,048,392**

**ELEVATING BEARING FOR A LARGE-CALIBER WEAPON ACCOMMODATED IN THE TURRET OF A TANK**

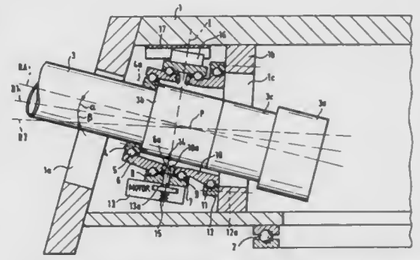
**Gottlieb Ruttgerodt, Kassel, and Heinrich Wolzenburg, Dortmund, both of Fed. Rep. of Germany, assignors to Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany**

**Filed Mar. 5, 1990, Ser. No. 488,588**

**Claims priority, application Fed. Rep. of Germany, Mar. 15, 1989, 3908346**

**Int. Cl.[5] F41G** *5/24*

**U.S. Cl. 89—41.02** **5 Claims**



1. A device for elevating a large-caliber weapon having a tube in a turret of a tank, comprising:

a slanting bearing subassembly inside the turret and comprising a first flange secured non-rotatably to the tube and mounted non-rotatably with respect to the turret, a second flange secured rigidly and non-rotatably to the turret, a first bearing ring mounted at one end on the first flange for rotation about a first axis coincident with an axis of the tube, a second bearing ring mounted at one end on the second flange for rotation about a second axis at a first given angle with respect to the first axis of the tube, means mounting another end of the first and second bearing rings for rotation around an axis at a second given angle to the first axis which is equal to one half of the first given angle; and

at least one mechanism non-rotatably mounted in the turret for rotatably driving said another end of the first and second bearing rings in equal amounts simultaneously in opposite directions.

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5,048,393

## REMOVAL TOOL FOR PROPELLING CHARGE MODULES

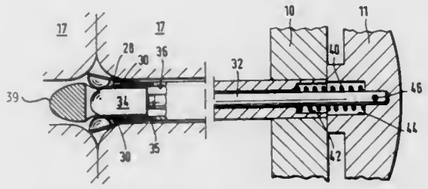
Dieter Grabner, Willich, and Hans-Jürgen Engels, Mülheim, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 589,021

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1989, 3932131

Int. Cl.[5] F41A 9/24

U.S. Cl. 89—45 12 Claims



1. A tool for manual removal of propelling charge modules of the type having a hollow ignition channel from a magazine in which the modules are stored one behind the other with the channels aligned, said tool comprising:

a holding rod of a length and diameter permitting insertion of said holding rod into the hollow ignition channel of a desired number of said charge modules;

a radially oriented depth abutment mounted on said holding rod for axial displacement along said holding rod;

means for fastening said depth abutment at a desired location along said holding rod;

a holding handle fastened to one end of said holding rod; and

a manually actuated clamping means, mounted in said holding rod, for arresting said charge modules disposed around said holding rod to prevent axial movement relative to said depth abutment; and

wherein said clamping means comprises: an actuating plunger disposed in a longitudinal bore of said holding rod for axial movement and fastened, via a fastening means, to an actuating handle at an end which projects from said holding handle, with said actuating plunger including a rod portion and a cap disposed at an end of said rod portion of said actuating plunger opposite to said actuating handle, and with said cap being rounded at its front end and being of a larger diameter than said rod portion of said actuating plunger; and,

means, responsive to axial displacement of said actuating plunger and engagement with said front end of said cap, for gripping an exterior surface of a charge module to cause said arresting.

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5,048,394

## MULTIPLEXED HYDRAULIC CONTROL SYSTEM WITH OSCILLATOR FOR MULTIPLEXER DRIVE

Daniel J. McLevige, Davis, and Donald E. Wernberg, Rockford, both of Ill., assignors to Woodward Governor Company, Rockford, Ill.

Filed Jul. 28, 1989, Ser. No. 387,177

Int. Cl.[5] F15B 9/09

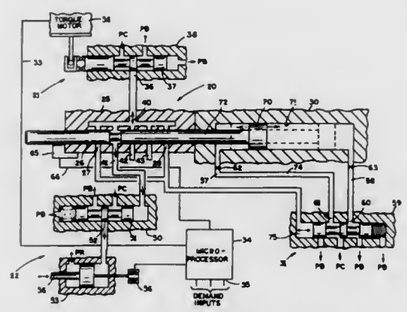
U.S. Cl. 91—361 21 Claims

1. A multiplexed hydraulic control system having a plurality of channels for individually controlling the positions of a plurality of actuators in the respective channels in accordance with a corresponding plurality of electrical control signals, the control system comprising the combination of:

a multiplexer including at least one hydraulic cylinder having an input port and a plurality of output ports, the hydraulic cylinder having reciprocatable operator means therein for individually connecting the input port to individual ones of the output ports;

hydraulic oscillator means associated with the multiplexer for causing an oscillating reciprocating motion of the multiplexer operator means to sequentially connect the input port to the respective output ports as the operator means reciprocates due to said oscillation;

and means coordinated with the position of the multiplexer



operator means for modulating the multiplexer input in accordance with the electrical control signal corresponding to the output port of the channel then connected to the input port, thereby to control the actuators in the respective channels in accordance with the plurality of electrical control signals for the respective channels.

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5,048,395

## CONTROL DEVICE FOR CYLINDER

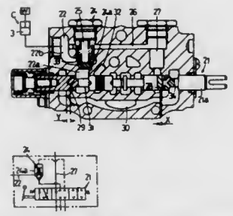
Kazumi Ohshima, Saitama, Japan, assignor to Kayaba Industry Co. Ltd., Japan

Continuation of Ser. No. 214,526, Jul. 1, 1988, abandoned. This application Mar. 26, 1990, Ser. No. 499,031

Claims priority, application Japan, Jul. 7, 1987, 62-104160; Jul. 7, 1987, 62-104161; Oct. 26, 1987, 62-163449; Oct. 26, 1987, 62-163450; Oct. 28, 1987, 62-164810; Dec. 10, 1987, 62-187958

Int. Cl.[5] F15B 11/08, 13/044

U.S. Cl. 91—447 3 Claims



1. A control device for a cylinder comprising:

a housing;

a cylinder port formed in said housing;

an operating check valve provided with a pilot chamber and arranged in said housing on a side of said cylinder port, said operating check valve being adapted to permit only flowing of fluid to the cylinder;

an orifice for communicating said pilot chamber of said operation check valve and said cylinder port with each other;

a spool type valve including spool slidably arranged in said housing;

a through passage formed at said spool of said spool type valve;

a return passage communicated through said through passage with said cylinder port in association with movement of said spool;



a first control port formed in said spool, said first control port being closed at the neutral position of said spool and open to a side of a pilot passage in association with movement of said spool to carry out communication between said pilot passage and said return passage and blocking of the communication; and

a second control port formed in said spool, said second control port being closed at the neutral position of said spool and communicated with said return passage in association with movement of said spool;

said first control port being communicated with said pilot passage prior to opening of said second control port to a side of said return passage and communicating said cylinder port and said return passage with each other through said through passage after said second control port is open to said return passage.

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5,048,396

## BYPASS VALVE

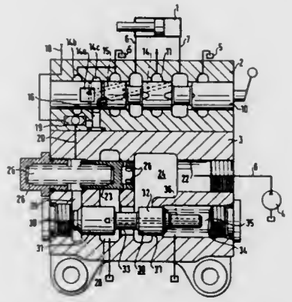
Heinz Torkler, and Werner Peschel, both of Lohr/Main, Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 35,980, Apr. 8, 1987, abandoned. This application Jun. 29, 1988, Ser. No. 213,518

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1986, 3611973

Int. Cl.[5] F15B 13/08, 13/02

U.S. Cl. 91—512 16 Claims



1. Bypass and pressure control valve for a system comprising a load, a pump and at least one directional control valve for directional control of the working fluid from said pump to a load and from the load to a return, said directional control valve having a neutral position in which said pump does not communicate with said load, said bypass and pressure control valve being characterized by a spring-loaded slide piston normally closed with the directional control valve is in said neutral position and displaceable by the pump pressure against the load pressure of the load and the force of a spring into and opened position for regulating a flow path for the pump fluid to a tank when the directional control valve is deflected out of its neutral position and a second piston in parallel flow path with said slide piston for communicating the pump fluid to the tank when the directional control valve is in its neutral position, said connection provided by said second piston being closed when the directional control valve is deflected out of its neutral position into a working position.

5,048,397

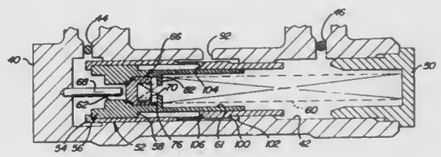
## IN-LINE HYDRAULIC PRESSURE INTENSIFIER

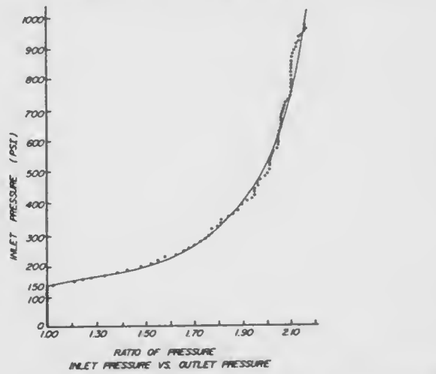
Leo A. Cooney, 459 Washington Rd., Grosse Pointe, Mich. 48230

Continuation-in-part of Ser. No. 329,795, Mar. 28, 1989, Pat. No. 4,976,190. This application Sep. 19, 1990, Ser. No. 585,243

Int. Cl.[5] F15B 11/00

U.S. Cl. 91—535 6 Claims






1. A hydraulic brake pressure intensifying apparatus (10) comprising:

a fluid cylinder (42) extending axially between an inlet end (44) and an outlet end (46);

a first piston (54) slideably disposed in said cylinder (42), said first piston (54) including a first forward end area adjacent said inlet end (44) and a first rearward end area smaller than said first forward end area adjacent said outlet end (46);

a second piston (56) disposed for telescopic sliding movement within said first piston (54), said second piston (56) including a second forward end area adjacent said inlet end (44) and a second rearward end area smaller than said second forward end area adjacent said outlet end (46);

a flow passage (62) communicating hydraulic fluid between said inlet (44) and outlet (46) ends of said cylinder (42);

valve means (66) moveable between open and closed positions for preventing fluid flow through said flow passage (62) when in said closed position;

said first (54) and second (56) pistons having a combined forward end area when said valve means (66) is in said closed position, and said first (54) and second (56) pistons having a combined rearward end area when said valve means (66) is in said closed position;

and characterized by the ratio between said first forward end area and said first rearward end area being between 60 percent and 70 percent of the ratio between said combined forward end area and said combined rearward end area, and the ratio between said combined forward end area and said combined rearward end area being between 80 percent and 90 percent of the ratio between said second forward end area and said second rearward end area.

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**5,048,398**

## SINGLE, LIGHT-WEIGHT AND LOW FRICTION LIGHT-METAL PISTON FOR INTERNAL-COMBUSTION ENGINES

**Horst Pfeiffenberger, Feilbach; Emil Ripberger, Remseck, and Jürgen Ellermann, Winnenden, all of Fed. Rep. of Germany, assignors to Mahle GmbH, Stuttgart, Fed. Rep. of Germany**

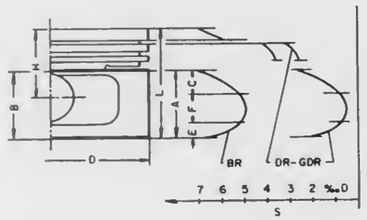
**PCT No. PCT/DE87/00593, § 371 Date Jun. 7, 1989, § 102(e) Date Jun. 7, 1989, PCT Pub. No. WO88/04724, PCT Pub. Date Jun. 30, 1988**

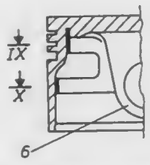
**PCT Filed Dec. 16, 1987, Ser. No. 368,298**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644188**

**Int. Cl.[5] F16J *1/04***

**U.S. Cl. 92—225** **21 Claims**




1. A single, light-weight, low friction, light-metal piston for use in a cylinder having a contact bearing surface of an internal combustion engine, comprising:

said piston having hub bores and piston ring grooves being arranged exclusively above the hub bores wherein

(a) H=(0.25–0.4) D;

(b) A is equal to or greater than B;

(c) T=(0.45–0.8) D;

(d) L=(0.45–0.65) D;

(e) A=(0.3–0.4) D;

(f) C is equal to or greater than 0.1 A;

(g) E is equal to or greater than 0.1 A;

(h) F is equal to or greater than 0.25 A, but lesser than 0.75 A;

(i) said piston having piston outer surfaces on a piston body in direct operational contact with the contact surface of the cylinder of the internal combustion engine or in indirect operational contact therewith via the lubricating film,

said piston outer surfaces lie on a cylindrical surface equipped with an oval-shaped overlay, whereby the larger oval-shaped axis in pressure-counterpressure direction (P-CPD) and the small oval-shaped axis extend in the pin direction;

(j) said piston having pin hubs and expansion adjusting lamellar metal inserts, the cold tolerance in a cylinder material made of iron forming the opposing contact surface lies in the part of the bearing area adjacent to the pressure-counterpressure direction at values between approximately (0.0001–0.0006) D when said expansion-adjusting, lamellar metal inserts engage inside surfaces of the piston body lying between the pin hubs, which inserts prevent piston body expansion in the pressure-counterpressure direction in the piston which is warming up, or between approximately (0.0004–0.0001) D, when such expansion inserts are not present;

(k) said piston ring grooves having annular strips between said grooves, the running tolerances at the annular strips between said piston ring grooves and in the piston area F with the smallest running tolerance opposite the cylinder bearing surface, for the piston under hot running conditions, deviate a maximum of five-fold from each other, in order to provide the piston a synchronous guiding at the annular strips and in the area F of the piston;

wherein

L=maximum piston length;

D=maximum piston diameter;

H=compression height;

A=median piston body height beneath the lowest piston ring groove in a peripheral area having the approximate same piston body height of at least 45 degrees on each of both bearing sides of the piston, said bearing sides being the peripheral area between the piston hubs;

B=maximum piston body height outside the piston body areas with height A;

T=diametrically opposite distance of the radial, external hub bore ends;

C=axial height area at the upper piston body end in the piston body area having the height A, which piston body area is retracted radially and in a cone-shaped manner, at least in a piston body area lying in pressure-counterpressure direction (P-CPD), to form a hydrodynamic lubricating film wedge;

E=axial height area at the lower piston body end in the piston body area having the height A, which piston body area is retracted radially and in a cone-shaped manner, at least in a piston body area lying in pressure-counterpressure direction (P-CPD), to form a hydrodynamic lubricating film wedge; and

F=axial height of an area in the piston body area having the height A lying, at least in pressure-counterpressure (P-CPD) direction, between the piston body areas defined by heights C and E.

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**5,048,399**

## AIR INTAKE FOR AN AUTOMOTIVE AIR CONDITIONING SYSTEM

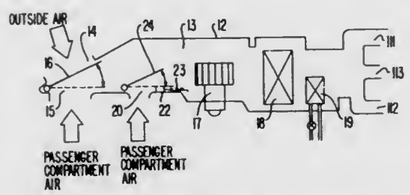
**Fujita Toshihiko, Isesaki, and Nakazawa Takeharu, Tamamura, both of Japan, assignors to Sanden Corporation, Gunma, Japan**

**Continuation of Ser. No. 299,351, Jan. 23, 1989, abandoned. This application May 29, 1990, Ser. No. 529,759**

**Claims priority, application Japan, Jan. 23, 1988, 63-6656[U]**

**Int. Cl.[5] B60H *1/00***

**U.S. Cl. 98—2.01** **9 Claims**




3. An air intake assembly for an air conditioning system which controls the temperature in a passenger compartment of an automobile, said air intake assembly comprising:

a duct which defines an air passage;

blower means disposed in said air passage for blowing air at various speeds through said air passage;

an outside air intake formed in said duct for admitting air from outside said passenger compartment to said duct;

first and second passenger compartment air intakes formed in said duct for admitting air from said passenger compartment to said duct;

first damper means for selectively opening and closing said outside air intake and said first passenger compartment air intake in response to temperature control signals,

second damper means for opening and closing said second passenger compartment air intake in response to the speed of the blown air in said air passage; and

damper control means for selectively controlling said second damper means independently of the speed of the blown air in said air passage.



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**5,048,400**

## PRESSURE COOKER WITH SENSOR

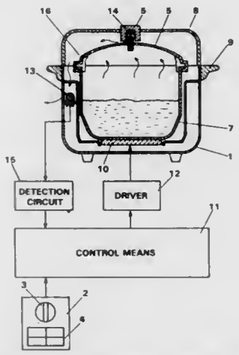
**Shigeki Ueda, Yamatokoriyama; Kaeko Nishimoto, Tenri; Ichiro Hori; Hitoshi Kurita, both of Yamatokoriyama, and Mitsuo Akiyoshi, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Dec. 19, 1990, Ser. No. 629,804**

**Claims priority, application Japan, Dec. 22, 1989, 1-333336; Dec. 26, 1989, 1-337157; Jan. 22, 1990, 2-13157; May 8, 1990, 2-118914**

**Int. Cl.[5] A23L *1/00*; A47J *27/00***

**U.S. Cl. 99—332** **10 Claims**




1. A pressure cooker with sensors comprising:

a pressure cavity which accommodates and seals up food;

a pressure control valve provided in a portion of this pressure cavity;

a heating chamber which accommodates the pressure cavity;

a heating device combined with said heating chamber, said heating device heating the pressure cavity;

a micro-computer which controls an electric power supply to said heating device;

a humidity sensor, or gas sensor, which detects excess vapor discharged from the pressure control valve; and

a timer means which sets a heating time for the period after the prescribed pressure is reached within the pressure cavity,

wherein said micro-computer starts said timer means by detecting only a prescribed amount of excess vapor or gas discharged from said pressure control valve using said humidity sensor or gas sensor.

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**5,048,401**

## BARBECUE APPARATUS AND METHOD OF MAKING THE SAME

**Charles J. Hoover, 51788 Gates Bridge East, Gates, Oreg. 97346**

**Filed Mar. 14, 1990, Ser. No. 493,248**

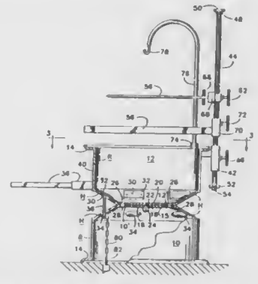
**Int. Cl.[5] A47J *37/04***

**U.S. Cl. 99—339** **13 Claims**

1. A barbecue construction utilizing a pair of conventional dual-type vehicle road wheels each having a circumferential rim member, an outwardly projecting wheel hub member defining a one side of the wheel and an opposite, hollow interior portion of the wheel, a wheel mounting plate member at the outer, terminal end of the hub member, the mounting plate member having a centrally disposed axle bore and a plurality of axle bore-encircling lug bores therethrough, the hub member also including, where provided in a particular wheel construction, wheel hub openings through the projecting dish wall forming the hub member, the barbecue construction comprising:

a) a first wheel of the pair forming a lower, barbecue base member, the wheel arranged for disposition on an underlying ground surface so that its projecting hub member faces upwardly and its opposite, hollow interior side faces downwardly,

b) a second wheel of the pair forming an upper, barbecue firebox member, the wheel disposed for support on the first wheel in inverted condition relative to the first wheel so that the mounting plate member on the hub member of the lower wheel engages the mounting plate member on the hub member of the upper wheel and supports the latter in said inverted condition with its opposite, hollow interior facing upwardly and thereby defining a fuel-receiving firebox therein,



c) wheel hub opening cover means on the upper wheel, the cover means configured to close the hub openings through the dish wall of the hub member to the passage of air therethrough,

d) axle bore cover means engaging at least one of the wheels and configured to close the axle bore to the passage of air therethrough, and

e) wheel retaining means interengaging the upper and lower wheel, the retaining means configured to retain the upper wheel rotatably in position on the lower wheel wherein the lug bores through each mounting plate member may be brought into and out of alignment with each other by rotating the upper wheel relative to the lower wheel, whereby to selectively control the upward passage of air permitted through the lug bores and into the firebox beneath a fire contained therein so that the burn rate of a fire may be controlled as desired.

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**5,048,402**

## APPARATUS FOR KNEADING AND COOKING

**Gilles J. Letournel, Ouistreham, and Vital A. Parise, Douvres, both of France, assignors to Moulinex (Societe Anonyme), Bagnolet, France**

**Filed Dec. 13, 1990, Ser. No. 626,882**

**Claims priority, application France, Dec. 13, 1989, 89 16450**

**Int. Cl.[5] B01F *15/06***

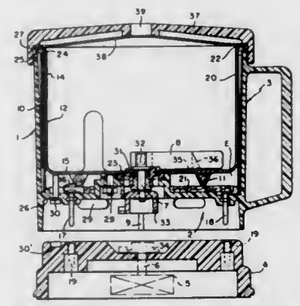
**U.S. Cl. 99—348** **9 Claims**

1. Apparatus for kneading and cooking foodstuffs comprising a working bowl (1) having a bottom (2) and a side wall (3), and mounted removably on a base (4) enclosing a drive mechanism (5) whose output shaft (6) is adapted to couple with a drive shaft (7) which passes through the bottom (2) of the bowl (1) and which is secured for rotation to a working tool (8) provided in said bowl (1), as well as heating means (10, 11) adapted to heat the bowl (1) so as to permit cooking the con-

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tents, wherein the bowl (1) is comprised by a double wall comprising a basin (12) and an enclosure (13) mounted at a small distance from each other, and the heating means (10, 11) are provided in a space (E) between the basin (12) and the enclosure (13) and are divided between a lateral heating element (10) and a bottom heating element (11) so as to heat respectively the side wall (14) and the bottom (15) of said basin (12), the heating means (10, 11) being fed with electric current by means of complementary and detachable electrical connection devices (17, 18, 19) provided respectively on the enclosure (13) and the base (4).



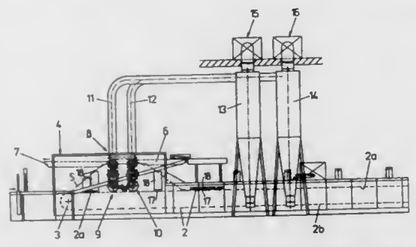
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**5,048,403**

## OVEN FOR ROASTING PIECES OF BAKED WARE

**Franz Haas, Sr., Vienna; Franz Haas, Jr., Leobendorf, and Johann Haas, Klosterneuburg, all of Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria**

**Filed Feb. 12, 1990, Ser. No. 478,261**
**Claims priority, application Austria, Feb. 20, 1989, 379/89**
**Int. Cl.[5] A47J *37/00***
**U.S. Cl. 99—355** **10 Claims**



1. An oven for roasting pieces of edible material, comprising

an endless chain of tongs, which revolves in the oven and comprises an upper course and a lower course extending in upper and lower superimposed planes, respectively,

a transfer station disposed adjacent to the upper plane and in which pieces of edible material which is to be roasted are placed into the tongs of the chain of tongs and pieces of roasted edible material are removed from said tongs, wherein

said chain of tongs comprises hinged tongs adapted to be swung open and shut, and each of which comprises two plates which, in said upper course, constitute a top plate and a bottom plate and serve to heat-treat the pieces of edible material and move in said upper course in an open position through the transfer station and move in a closed position through the remainder of the oven with pieces of edible material held between said plates, and

a transfer apparatus is provided in said transfer station and comprises two sets of rotating vacuum drums, which sets are closely spaced apart and arranged one behind the other in the direction of travel of said upper course and are disposed above the bottom plates of the open tongs in said transfer station and have shells and are adapted to hold the pieces of edible material which is to be roasted and the pieces of roasted edible material on said shells and to transport said pieces of material held on said shells, wherein

the vacuum drums of the two sets of drums rotate at a surface speed which equals the speed of travel of the chain of tongs in the oven,

each of said sets of drums comprises a lowermost vacuum drum having a lower shell portion adjacent to the upper plane, and

each of said lowermost vacuum drums rotates in such a sense that said lower shell portion moves in the same direction as said upper course of said chain of tongs.

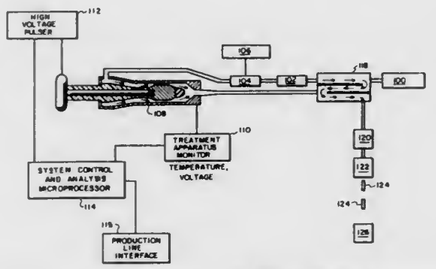
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**5,048,404**

## HIGH PULSED VOLTAGE SYSTEMS FOR EXTENDING THE SHELF LIFE OF PUMPABLE FOOD PRODUCTS

**Andrew H. Bushnell, San Diego; Joseph E. Dunn, Rancho La Costa, and R. Wayne Clark, Del Mar, all of Calif., assignors to Foodco Corporation, San Diego, Calif.**

**Continuation of Ser. No. 527,656, May 16, 1990, abandoned, which is a continuation of Ser. No. 365,082, Jun. 12, 1984, abandoned, which is a continuation-in-part of Ser. No. 51,841, May 18, 1987, Pat. No. 4,838,154, which is a division of Ser. No. 740,004, May 31, 1985, Pat. No. 4,695,472. This application Nov. 2, 1990, Ser. No. 609,080**
**Int. Cl.[5] A23L *3/32***
**U.S. Cl. 99—451** **4 Claims**




1. A pulsed field treatment apparatus for preservation treatment of a pumpable foodstuffs, comprising:

an electric field treatment chamber comprising first electrode means for making electrical contact with the pumpable foodstuff disposed adjacent said first electrode means in said electric field treatment chamber, second electrode means spaced apart from said first electrode means for making electrical contact with the pumpable foodstuff disposed in a high voltage treatment zone between said first electrode means and said second electrode means, and sold dielectric separator means comprising a dielectric nonconductive spacer separating said first electrode means and said second electrode means externally of said electric field treatment chamber and having a minimum surface pathway length between said first electrode means, and said second electrode means of at least twice the minimum distance between said first electrode means and said second electrode means in said electric field treatment chamber;

inlet conduit means for introducing the pumpable foodstuff to be treated into said electric field treatment chamber;

outlet conduit means for discharging the pumpable foodstuff which has passed through said electric field treatment chamber;

means for applying high voltage electrical pulses to said first and second electrode means at a rate of at least about 0.01 pulse per second to provide a pulsed electric field having an electric field strength of at least about 25,000 volts per centimeter between said first and second electrode means through the pumpable foodstuff located therebetween in said high voltage treatment zone; and

means for pumping the pumpable foodstuff through said inlet conduit means at a rate such that all of the pumpable foodstuff is subjected to at least one pulse of the pulsed electric field in transit through said high voltage treatment zone before the pumpable foodstuff is conducted from the electric field treatment chamber through said outlet conduit means.



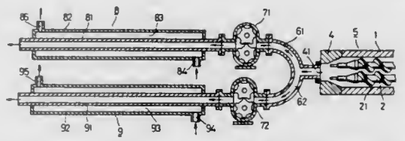
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**5,048,405**

## APPARATUS FOR MANUFACTURING FIBROUS FISH OR SHELLFISH "NERISEIHIN" PRODUCT

**Toshikatsu Takahashi; Isamu Sasaki, both of Tokyo; Takeya Yoshioka, Fukuoka, and Chuji Sarukawa, Tokyo, all of Japan, assignors to Nippon Suisan Kaisha, Ltd., Tokyo, Japan**

**Filed May 16, 1990, Ser. No. 524,115**
**Claims priority, application Japan, Jul. 10, 1989, 1-080971[U]**
**Int. Cl.[5] A22C *11/04*; A23P *1/00***
**U.S. Cl. 99—470** **6 Claims**



1. An apparatus for manufacturing a fibrous neriseihin of fish and shellfish comprising:

a twin screw extruder including two screws rotated in the same direction for kneading, pressurizing and thermally fusing a raw material, consisting mainly of a fish and shellfish material as the raw material is forcibly fed by said screws and for extruding the thermally fused material from an outlet of said extruder;

a plurality of branch tubes having inlets respectively connected to the outlet of said extruder for tentatively collecting and retaining said thermally fused material for a moment;

feed pumps having inlets respectively connected to the outlet of each said branch tube for feeding at a constant rate the material from said extruder while holding the material in the thermally fused state; and

cooling zones having inlets respectively connected to the outlet of each said feed pump for gradually cooling the material continuously fed from each said feed pump in the thermally fused state from an outer periphery of the material.

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**5,048,406**

## DISPOSABLE/REFILLABLE SMOKE CARTRIDGE FOR GAS BARBECUE GRILLS

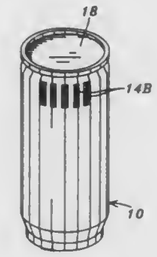
**Joseph R. Cofer, Rte. 3, Box 6075, Sweetwater, Tenn. 37874**

**Filed May 2, 1990, Ser. No. 517,832**
**Int. Cl.[5] A23L *1/01*; A23B *4/04***
**U.S. Cl. 99—482** **20 Claims**

1. A smoke cartridge for containing flavored smoke-emitting material and for flavoring food by subjecting said smoke-emitting material to an externally applied heat-producing means, said cartridge comprising:

an elongated container for containing said smoke-emitting material, said container having a first end portion and a second end portion, and having sidewall means defining a bottom surface portion for being disposed toward said heat-producing means and an oppositely disposed top surface portion, said first end portion of said container including an end wall provided with at least one smoke-emitting opening;

whereby said top surface portion of said sidewall means serves as a grease shielding means for prohibiting grease from dripping into the smoke-emitting opening in said end wall of said container; and




whereby said elongated container can be positioned such that said bottom surface portion proximate said second end portion is heated by said heat-producing means in order to heat said smoke-emitting material within said container to the point of emitting smoke, and such that said first end portion is displaced from said heat producing means so as to reduce the possibility of gases emitted by said smoke-emitting opening being ignited.

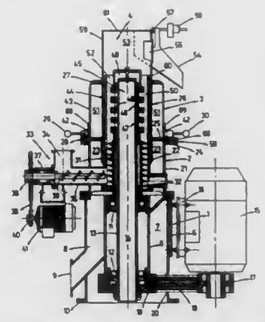
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**5,048,407**

## GRAIN HUSKING AND POLISHING MACHINE

**Felipe Salete-Garces, Av. Ano de Juarez No. 198 Col., Granjas San Antonio 09070 D.F., Mexico**

**Filed Oct. 31, 1990, Ser. No. 606,973**
**Claims priority, application Mexico, Nov. 7, 1989, 18264; Oct. 19, 1990, 22939**
**Int. Cl.[5] B02B *3/00, 3/04, 3/06***
**U.S. Cl. 99—519** **17 Claims**



1. An air-swept grain husking and/or polishing machine which comprises an approximately cylindrical housing longitudinally divided into first, second, third and fourth intercommunicated longitudinal sections, a hollow axle arranged concentrically within said housing and rotatively mounted on bearing means mounted within an isolated chamber concentrically arranged within said first housing section, said hollow axle extending throughout the length of said first, second and third housing sections, rotational driving means attached to the end of said hollow axle outwardly of said isolated chamber, air inlet means connected to the driven end of said hollow axle for permitting a stream of air to be drawn into the hollow space of said hollow axle, grain pressurizing screw conveyor means mounted on said axle within a concentric chamber arranged in said second housing section, grain feed means for feeding a

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continuous mass of grain into said concentric chamber of said second housing section to be picked up by said screw conveyor means, abrasive rotor means mounted on said hollow axle next to said screw conveyor means and within said third housing section, screen means mounted on means for adjusting the eccentricity thereof with respect to said hollow axle and to said rotor means, said screen means comprising a plurality of screen sections spaced by means of a corresponding plurality of alternated abrading sections, said screen means being mounted within said third housing section in confronted relationship with said rotor means, said eccentricity adjusting means comprising an annular plate having a pair of diametrically opposed arms, the free end of one of said arms being pivotally mounted on said housing and the opposite arm thereof being engaged by a plate sidewardly displacing mechanism for moving said arm towards any one of two sideward opposite directions, whereby said screen means mounted on said plate will be moved sidewardly to adjust the eccentricity thereof with respect to said axle and rotor means in order to vary the strength of the abrading action exerted on the grain by said abrasive rotor and said screen means, grain outlet means on the cylindrical wall of said fourth housing section, said outlet means being plugged by a weighted lid, particle laden air outlet means constituted by the annular spaces formed between the outer walls of said third and second housing sections, and said screen means in said third housing section and said concentric chamber in said second section, and particle laden air exhaust chute means arranged within said first housing section and adapted to be connected to air suction means.

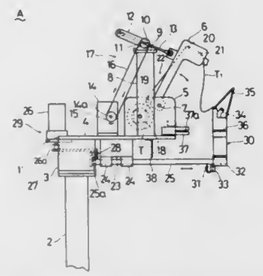
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**5,048,408**

## BUNDLING DEVICE

**Satoru Sakaguchi, and Kohei Tujino, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan**

**Filed Apr. 10, 1990, Ser. No. 506,843**
**Claims priority, application Japan, Apr. 11, 1989, 1-42319**
**Int. Cl.[5] B65B** *27/06, 13/18*
**U.S. Cl. 100—12** **9 Claims**



**1**. A bundling device for bundling articles with a bundling tape, comprising:

a base stand having front and rear ends;

a slide shaft reciprocably mounted to said base stand for movement between an extended position in which it is at a forward location and a retracted position in which it is located rearwardly of said forward location;

a shaft driving means for moving said slide shaft between its extended and retracted positions;

a pressing table detachably mounted to a forward end of said slide shaft, said pressing table including a pinching means for pinching a free end of said bundling tape;

a holding means, mounted to said base stand, for detaching said pressing table from said slide shaft as said slide shaft is moved to its retracted position and for holding said pressing table;

a bundling arm pivotably mounted on said base stand for movement between a standby position in which a free end of said bundling arm is spaced from said pressing table and a bundling position in which said free end of said bundling arm is positioned adjacent said pressing table;

an arm driving means for moving said bundling arm between its standby and bundling positions; and

a tape feed means, mounted to said base stand, for feeding the bundling tape from said free end of said bundling arm.

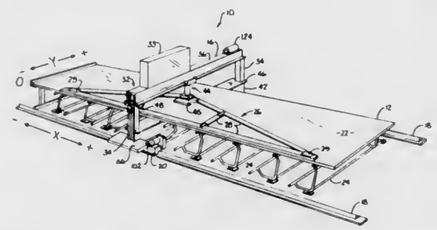
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**5,048,409**

## TRUSS FABRICATION MACHINE WITH JOYSTICK CONTROLS

**Jack A. Schulz, Rte. 1, Box 285, Monett, Mo. 65708**

**Filed Apr. 23, 1990, Ser. No. 512,838**
**Int. Cl.[5] B30B** *15/16, 1/00*
**U.S. Cl. 100—48** **8 Claims**



**1**. In a truss fabricating apparatus having an elongated table for supporting truss elements to be joined by connector plates pressed into place thereon, a gantry spanning the table and movable longitudinally thereof, and at least one press unit mounted on the gantry for movement therealong transversely of the table to successive positions where the press unit may be actuated to engage the connector plates, a control system for the gantry and the press unit comprising: the same;

a reversible drive connected with said press unit for causing the same to move along the gantry and traverse the table;

a joystick control movable in positive and negative X directions corresponding to movement of the gantry longitudinally of the table, and movable in positive and negative Y directions corresponding to movement of the press unit along the gantry transversely of the table;

means responsive to X-direction movement of said control for producing an electrical, gantry control signal representative of the X-direction polarity and displacement of the control;

means responsive to Y-direction movement of said control for producing an electrical, press unit control signal representative of the Y-direction polarity and displacement of the control;

driver means connected with said reversible motor means and said reversible drive for operating the same in response to said gantry and press unit control signals to cause the gantry to move longitudinally of the table in a direction and at a speed governed by said gantry control signal, and to cause the press unit to move transversely of the table in a direction and at a speed governed by said press unit control signal, whereby to shift the press unit to a position for engagement with a connector plate; and

selectively operable means connected with said press unit for actuating the same, whereby the joystick control and selectively operable means enable an operator of the apparatus to guide the press unit to the successive positions required for installation of the truss connector plates.

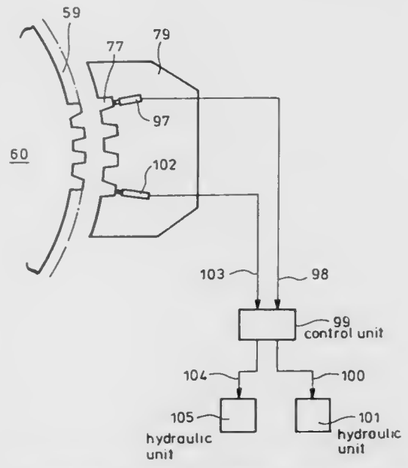


**5,048,410**

## APPARATUS FOR SECURELY CLAMPING A TRANSMISSION SHAFT OF A TRANSFER FEED PRESS DURING ITS SHUTDOWN

**Naoki Teramoto, and Kiyoshi Uneme, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan**

**Filed Mar. 7, 1990, Ser. No. 489,912**
**Claims priority, application Japan, Apr. 5, 1989, 1-86444**
**Int. Cl.[5] B30B** *15/14*
**U.S. Cl. 100—48** **1 Claim**




**1**. An apparatus for securely clamping a transmission shaft of a transfer feed press during its shutdown wherein a drive force from a press drive for vertically moving slides is transmitted through the transmission shaft to feed bars, comprising an externally teeth disk fitted over the transmission shaft and engagement members each having teeth which selectively engage with and disengage from the teeth on said disk;

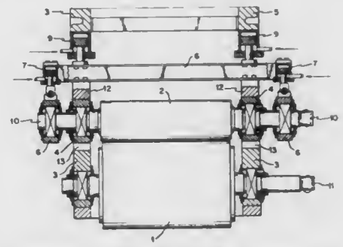
a rotating mechanism which movably supports a pair of said engagement members and displaces them in the peripheral direction of said disk while said members are maintained in an opposed relationship diametrically of said disk, an opening and closing mechanism for supporting said members for their selective movement toward and away from each other, drive means for driving said rotating mechanism and said opening and closing mechanism, position sensor means for at least one of said members for detecting complementary alignment of the teeth on the corresponding member with the teeth of said disk engaged with each other and sending a signal in response to said alignment, proximity sensor means for at least one of said members for detecting engagement of the teeth on the corresponding member with the teeth of said disk and sending a signal in response to said engagement and a control unit adapted to receive said signal from said position sensor means and said signal for said proximity sensor means and to transmit command signals to said drive means in response to said signals from said position and proximity sensor means to control the drive means of said rotating mechanism thereby stopping said drive means when complimentary alignment or engagement of the teeth are detected or by preliminarily receiving a stoppage signal in anticipation of a time period necessary for the complimentary engagement.

**5,048,411**

## CALENDER, IN PARTICULAR FOR THE PRODUCTION OF PACKING SHEETS

**Hermann Siebert, Sontra-Ulfen, Fed. Rep. of Germany, assignor to Paul Troester Maschinenfabrik, Hannover, Fed. Rep. of Germany**

**Filed Apr. 12, 1990, Ser. No. 508,253**
**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1989, 3912303**
**Int. Cl.[5] B30B** *15/34, 3/04*
**U.S. Cl. 100—93 RP** **8 Claims**



**1**. A calender, in particular for the production of packing sheets, comprising two spaced calender stands,

two rotatable calender cylinders comprising a larger diameter cylinder and a smaller diameter cylinder, said cylinders having shafts which extend beyond the ends of the respective cylinders,

first bearings secured in fixed position on said calender stands for rotatably supporting said larger diameter cylinder by its shaft,

second bearings on said calender stands for rotatably supporting said smaller diameter cylinder, by its shaft, said second bearings being slidable on said calender stands for movement of said smaller diameter cylinder toward and away from said larger diameter cylinder, opposite end portions of said shaft of said smaller diameter cylinder extending beyond said second bearings,

third bearings on said extended end portions of said shaft of said smaller diameter cylinder, said third bearings being spaced axially from said second bearings,

a support beam slidable on said calender stands in a direction toward and away from said larger diameter cylinder,

a pair of support members which are slidable in said calender stands respective and connect said second bearings fixedly with said support beam,

means for moving said support beam toward and away from said larger diameter cylinder and thereby moving said smaller diameter cylinder toward and away from said larger diameter cylinder to vary a gap between said cylinders, and

counter-bending means acting between opposite outer end portions of said support beam and said third bearings on said extended end portions of said shaft of said smaller diameter cylinder to counteract bending of said smaller diameter cylinder.

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**5,048,412**

## APPARATUS FOR PROCESSING SEMICONDUCTOR PACKAGES AND THE LIKE

**Hiroshi Murakami, Sparks, Nev., assignor to Y.K.C. Co., Ltd., Japan**

**Filed Apr. 30, 1990, Ser. No. 516,348**
**Claims priority, application Japan, Jan. 25, 1990, 2-13518**
**Int. Cl.[5] B30B** *7/00, 1/26, 15/30*
**U.S. Cl. 100—137** **6 Claims**

**4**. Apparatus for processing semiconductor packages and the like comprising:

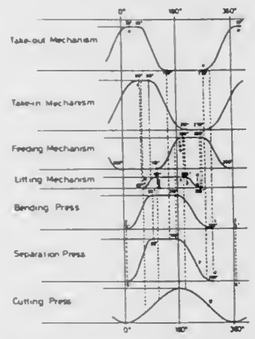
means providing a series of work presses, each press of said

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series being adapted to perform a separate operation on a package sheet;

feeding means for moving package sheets to and from each of said work presses in succession, said feeding means comprising at least one article support movable toward and away from a path extending through said work presses, and at least one article feeding lever reciprocably movable along the direction of said path, said article feeding lever having means for engaging package sheets and indexing said package sheets along said path by movement of the article feeding lever in a forward direction




when said article support is moved toward said path, and said article feeding lever being movable in a reverse direction without reverse movement of said package sheets when said article support is moved away from said path;

first means for operating said work press;

second means for effecting reciprocating movement of said article feeding lever along the direction of said path;

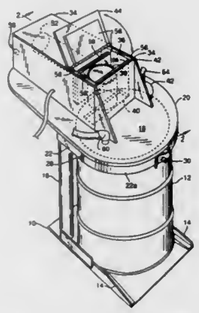
third means for effecting movement of said article support toward and away from said path; and

a common drive shaft;

said first, second and third means all comprising cams arranged on said common drive shaft.

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**5,048,413**
**CAN CRUSHING APPARATUS**
**Fred J. Deiters, 56 Greenridge Ct., Lake Oswego, Oreg. 97035**
**Filed Mar. 29, 1990, Ser. No. 501,604**
**Int. Cl.[5] B30B *9/32***
**U.S. Cl. 100—226** **3 Claims**



1. A can crushing apparatus for use with an open top waste receptacle comprising:

a flat supporting base having front, rear and side portions;

upright guide walls on the sides of said base arranged to guide a waste receptacle therebetween onto the base when the receptacle is moved in from the front of said base;

a horizontal platform supported on said upright standard means having upper and lower surfaces,

said platform having a front portion projecting from said standard means to closely overlie an open top waste receptacle supported on the base;

a depending flange on the flower surface of said platform having an inner surface contour similar to the outer contour of a top portion of a waste receptacle,

said flange having a rear abutment arranged for engagement by a waste receptacle and also having a front releasable connection that allows movement of the waste receptacle into engagement with said rear abutment and removal of the waste receptacle,

and seal means at the lower surface of said platform having sealing engagement with an upper portion of the waste receptacle when the latter is seated on the base whereby to confine toxic material within the waste receptacle,

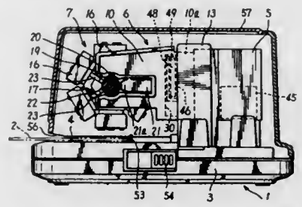
can crushing means on said platform having a compartment arranged to receive cans to be crushed and also having powered plunger means arranged to crush said cans to a reduced size;

and an opening in said platform through which crushed cans can fall into the waste receptacle,

said opening being of a size to restrict cans from falling therethrough before crushing but to allow cans to fall therethrough into the waste receptacle after they are reduced in size by crushing.

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**5,048,414**
**AUTOMATIC STAMPER**
**Hiroyasu Hoshino, Tokyo, Japan, assignor to Elm Industry Co., Ltd., Tokyo, Japan**
**Filed Apr. 27, 1990, Ser. No. 515,702**
**Claims priority, application Japan, Aug. 1, 1989, 1-200081; Oct. 4, 1989, 1-116694**
**Int. Cl.[5] B41J *1/22***
**U.S. Cl. 101—93.18** **14 Claims**



1. An automatic stamper of the type including a printing block having a drum and a plural number of stamp units mounted around the circumference of said drum, said drum having support shafts at opposite ends thereof, a support frame having bearing holes for detachably and rotatably receiving said support shafts, and a base member having a document support surface for setting thereon a document to be imprinted with one of said stamp units and supporting said support frame for vertical movements toward and away from said document support surface, characterized in that said stamper comprises:

stamp support surfaces on the circumference of said drum;

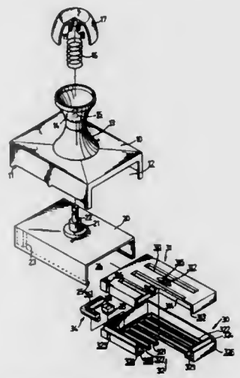
means for detachably mounting said plural number of stamp units on said stamp support surfaces with the longitudinal axis of the respective stamp units disposed parallel with the axis of said drum;

an electric motor having an output shaft for driving said support frame; and

a switch positioned to be closed upon setting a document on said document support surface of said base member, and means responsive to closing of said switch to actuate said motor for one reciprocal movement of said frame toward and away from said document.



**5,048,415**
**STAMP COMBINATION**
**Shiny Shih, No. 77, Lane 101, Nan Yuan St., Tainan, Taiwan**
**Filed May 31, 1990, Ser. No. 531,231**
**Int. Cl.[5] B41J *27/00***
**U.S. Cl. 101—103** **5 Claims**



1. A stamp combination comprising:

a housing which is hollow and which is substantially a rectangular parallelepiped having an open bottom, a stem integrally provided on said housing, a lid provided on top of said stem and slidable vertically relative to said stem, a spring bearing between said stem and said lid for biasing said lid upward relative to said stem;

a holder including a pair of side walls and having a shape similar to said housing, said holder being smaller than said housing so that said holder is receivable in said housing, a rod being vertically disposed in said stem and being connected between said lid and said holder so that said lid, said rod and said holder move in concert, an opening being formed in the front end of said holder, a first flange being longitudinally formed on a lower end of each side wall of said holder and extending inwards of said holder;

a base portion including an upper casing and a lower casing, a plurality of holes being formed in the upper surface of said upper casing, a spongy material being received in said upper casing, ink being added to said spongy material via said holes; a plurality of grooves being formed in the bottom of said lower casing; said upper casing and said lower casing being insertable into said holder through said opening of said holder, and being supported in place by said first flanges of said holder;

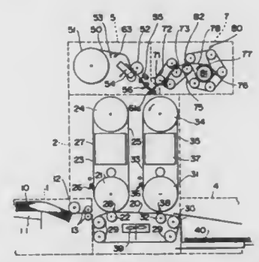
a plurality of blocks each having a letter, a numeral or a symbol printed on an upper surface thereof and having an identical letter, numeral or symbol carved on a lower surface thereof, said blocks being interchangeably disposed and arranged in said grooves, a lower part of said blocks extending beyond said grooves so that a lower surface of each block is lower than a lower surface of said lower casing, said upper surfaces of said blocks contacting said spongy material so as to absorb said ink therefrom, said blocks being easily arrangeable in series in said grooves by referring to said printed letters, numerals or symbols provided on said upper surfaces of said blocks;

said lower surfaces of said blocks being higher than a lower end of said housing when said lid is not pressed downward; and

said holder and said base portion being caused to move downward by said rod so that said lower surfaces of said blocks are caused to move downward beyond said lower end of said housing and so that said carved letters, numerals or symbols provided on said lower surfaces of said blocks contact a surface to be stamped when said lid is pressed downward by a user.

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**5,048,416**
**MULTI-COLOR PRINTING APPARATUS**
**Yutaka Iijima, Komae, Japan, assignor to Duplo Corporation, Komae, Japan**
**Filed Jul. 19, 1990, Ser. No. 554,414**
**Claims priority, application Japan, Jul. 24, 1989, 1-191156**
**Int. Cl.[5] B41F *15/10*; B41L *13/08***
**U.S. Cl. 101—115** **9 Claims**



1. A multi-color printing apparatus comprising:

a plurality of pressure transferring means provided for respective colors, each of which presses printing paper against an original printing stencil to transfer the image thereto;

printing paper supplying means for passing printing paper through the plurality of pressure transferring means;

an original printing stencil supplying device having a stencil supplying section for supplying stencil paper, a thermal head for engraving an image on the stencil paper and a cutter for cutting the engraved stencil paper at a preset length to provide original printing stencils, the original printing stencil supplying device supplying an original printing stencil to the pressure transferring means;

a used printing stencil collecting device for collecting used printing stencils discharged from the pressure transferring means; and

moving means for moving the original printing stencil supplying device and used printing stencil collecting device at the same time as an integral unit between the pressure transferring means, to selectively set the original printing stencil supplying device and used printing stencil collecting device to the position of one of the pressure transferring means.

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**5,048,417**
**COMPACT APPARATUS FOR SCREEN PREPARATION AND PRINTING AND METHOD OF USE**
**Michael A. Everroad, 3312 Sam Rayburn Run, Carrollton, Tex. 75007**
**Filed May 4, 1990, Ser. No. 518,938**
**Int. Cl.[5] B41F *15/12, 15/00***
**U.S. Cl. 101—123** **32 Claims**

1. Compact, multi-function screen printing apparatus comprising:

a first transparent plate member;

support means for horizontally supporting said first plate member;

a housing having an open upper end across which said first plate member extends;

a second translucent plate member supported for movement between a first position permitting access to the upper side surface of said first plate member, and a second position in which said second plate member horizontally overlies said first first plate member in a spaced relationship therewith;

holding means for holding an emulsion film sheet and a film

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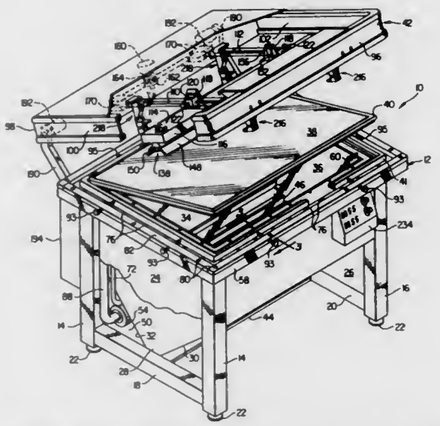
positive sheet positioned in the space between said first plate member and said second plate member in its second position in firm contact with one another;

exposure light means disposed within said housing and selectively operable to expose an emulsion sheet held between said first and second plate members and against a film positive sheet;

backlighting means disposed within said housing and selectively operable to reveal imperfections in the exposed emulsion sheet when it is supported on the upper side surface of said second plate member in said second position thereof, to thereby facilitate correction of the exposed emulsion sheet;

printing arm means carried by said support means for movement between a first position permitting access to the upper side surface of said second plate member in said second position thereof, and a second position in which said printing arm means overlie said second plate member in said second position thereof;

positioning means for operatively positioning a printing screen, with the corrected emulsion sheet thereon, over an imprintable item positioned on the upper side surface of said second plate member in said second position; and



squeege means, operatively supported by said printing arm means for movement relative thereto, for forcing a printing medium downwardly through the printing screen onto the imprintable item,

whereby, with the exception of rinsing the exposed emulsion sheet, all of the steps necessary to carry out a screen printing process may be performed using said apparatus,

said first plate member and said second plate member in said second position thereof defining therebetween an emulsion sheet exposure space operable in conjunction with said exposure light means,

said second plate member in said second position thereof defining a work surface upon which a printing screen incorporating the exposed emulsion sheet may be fabricated,

said second plate member defining a screen checking support surface upon which the fabricated printing screen may be positioned and, utilizing said backlighting means, checked for defects and corrected, and

said second plate member in said second position thereof defining a printing support surface upon which an imprintable item may be positioned, held beneath the corrected printing screen, and imprinted utilizing said squeege means.

**5,048,418**

## FLEXOGRAPHIC PRINTING MACHINE WITH A TEMPERATURE-REGULATED PRINTING-MACHINE FRAME

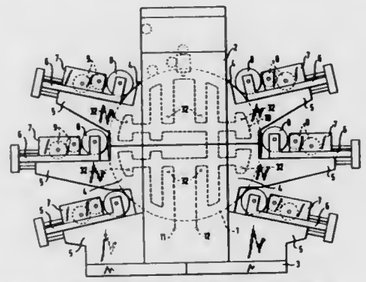
**Christoph Hars; Ottomar Tessmann; Klaus Schirrich, and Bodo Steinmeier, all of Bielefeld, Fed. Rep. of Germany, assignors to Fischer & Krecke, Bielfeld, Fed. Rep. of Germany**

**Continuation of Ser. No. 692,146, Jan. 17, 1985, abandoned. This application Dec. 29, 1986, Ser. No. 946,618**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1984, 3401626**

**Int. Cl.[5] B41F** *5/18, 13/00*

**U.S. Cl. 101—178** **14 Claims**



1. A flexographic printing machine comprising:

an impression cylinder regulated at a constant operating temperature;

at least one flexographic printing unit positioned about the periphery of the impression cylinder;

a double-sided printing machine frame onto which said impression cylinder is mounted comprising at least one printing unit bracket on which said printing unit is mounted; and

means for regulating said frame at a constant temperature to prevent expansion and contraction of the frame during operation of the printing machine to maintain said impression cylinder and said printing unit at constant relative positions.

**5,048,419**

## BOMBLET FUZE

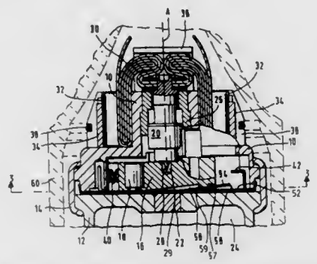
**Gerhard Skowasch, Gelsenkirchen, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany**

**Filed Jul. 30, 1990, Ser. No. 559,346**

**Claims priority, application Fed. Rep. of Germany, Jul. 29, 1989, 3925235**

**Int. Cl.[5] F42B** *12/58;* **F42C** *14/06, 15/184*

**U.S. Cl. 102—226** **11 Claims**



1. In a fuze for an explosive projectile, including: a fuze housing; a first primary firing pin mounted in said housing for axial displacement in the longitudinal direction; a detonation charge carried by a slide disposed in said housing adjacent and below said primary firing pin, said slide being mounted in said housing for displacement transverse to said longitudinal direction of said housing, and to its center longitudinal axis, between a safety position, wherein said detonation charge is not aligned with said firing pin, and an armed position, wherein said detonation charge is aligned with said firing pin; self destruct means provided in said slide, and including an ignition element disposed adjacent an edge of said slide, for causing self destruction of at least said fuze after a given time delay following ignition of said ignition element; and a second firing pin mounted laterally in said fuze housing at a position for causing ignition of said ignition element upon displacement of said slide into said armed position; the improvement wherein said second firing pin is a flat strip of sheet metal in the shape of a pointed wedge disposed in the displacement path of said slide, and is an inwardly bent end portion of an integrated, tongue-like, upwardly bent sheet-metal strip member of a flat sheet metal spring disc disposed in the direct proximity of a lower surface of said slide and extending over the entire cross sectional area of said fuze housing.



**5,048,420**

## LOW ENERGY FUSE

**Michael W. Beck; Malcolm D. Harding, both of Ayrshire, Scotland, and Anthony J. Rowe, Edenvale, South Africa, assignors to Imperial Chemical Industries plc, London, United Kingdom**

**Filed Feb. 22, 1990, Ser. No. 482,947**

**Claims priority, application United Kingdom, Feb. 22, 1989, 8904026**

**Int. Cl.[5] C06C** *5/00*

**U.S. Cl. 102—275.3** **9 Claims**

1. In a shock tube suitable for use in a blasting system for the remote detonation of an explosive after a predetermined delay period, said shock tube being of the type which comprises plastic tubing on the inner surface of which there is provided an adherent particulate coating of a reactive chemical composition containing at least one fuel component and at least one oxidant in intimate admixture that is capable of propagating a combustion signal from one end of said tubing to the other, the improvement wherein the oxidant is barium peroxide ($BaO_2$), the barium peroxide providing oxygen in a supply such as to sustain stable low speed propagation of the signal.

**5,048,421**

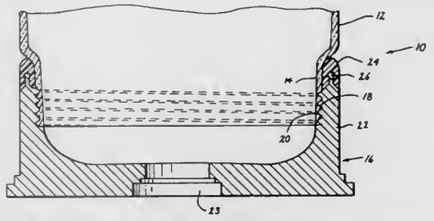
## COMBUSTIBLE CARTRIDGE CASE BASE

**Terry L. Swartout, Seminole, Fla., assignor to Olin Corporation, Cheshire, Conn.**

**Filed Aug. 6, 1990, Ser. No. 562,774**

**Int. Cl.[5] F42B** *5/18*

**U.S. Cl. 102—431** **18 Claims**



1. An ammunition cartridge comprising:

a combustible case having a tubular wall with a threaded open end, said case wall having a uniform density of plastic resin throughout said wall at said end; and

a generally cup shaped head having a tubular peripheral wall provided with threads corresponding to said threaded open end engaged with said threaded end so as to close said end.

**5,048,422**

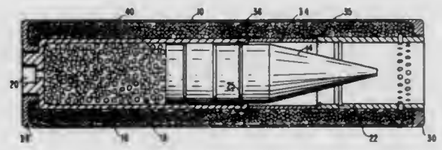
## MAIN PROPELLANT IGNITION LINER FOR CASED TELESCOPED AMMUNITION

**James R. Northrup, and Brian B. Tasson, both of Maple Grove, Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Sep. 10, 1990, Ser. No. 580,391**

**Int. Cl.[5] F42B** *5/045*

**U.S. Cl. 102—434** **12 Claims**



1. A cased telescoped ammunition comprising in combination;

a control tube housing a first propellant and a projectile;

a metering tube forming in combination with said control tube an axial passageway;

an outer casing surrounding said control tube and said metering tube and radially spaced therefrom;

said control tube and said metering tube spaced from one another to form a gap along said axial passageway between said tubes;

a second propellant in the space between said tubes and said outer case;

a liner disposed in said gap in contact with said control tube and said metering tube and separating said second propellant from said passageway; and

said control tube and said metering tube arranged such that ignition of said first propellant forces said projectile along said axial passageway and ignition products of said first propellant ignite said second propellant through said liner as said projectile passes said liner.

**5,048,423**

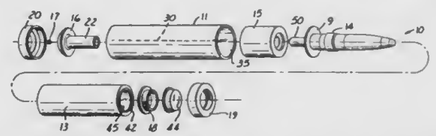
## CARTRIDGE CASE FOR TELESCOPED AMMUNITION ROUND

**Harold E. Garrett, Santa Ana, Calif., assignor to Loral Aerospace Corp., New York, N.Y.**

**Continuation of Ser. No. 290,597, Dec. 27, 1988, abandoned. This application Jul. 6, 1990, Ser. No. 570,833**

**Int. Cl.[5] F42B** *5/045*

**U.S. Cl. 102—434** **4 Claims**



1. A telescoped ammunition round cartridge case comprises a generally tubular case wall and an axially extending elongate score line in said wall having radial depth less than the radial thickness of said wall, said score line being in a radially inside surface of said wall and being defined by two oppositely extending sides which contact each other to form a hairline fracture.

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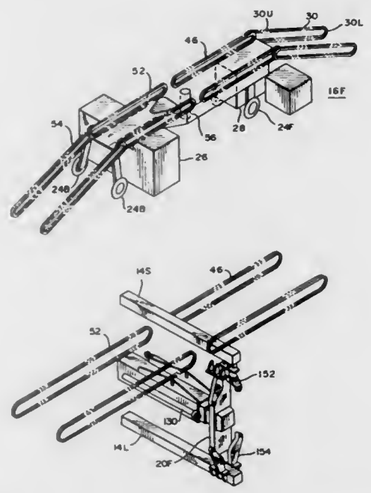


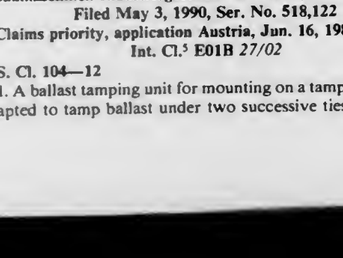
5,048,424

## TIE REPLACER AND METHOD

Harry Madison, Germantown, Tenn., and G. Robert Newman, Fairmont, Minn., assignors to Harsco Corporation, Wormleysburg, Pa.

Filed Apr. 20, 1990, Ser. No. 512,206
Int. Cl.[5] E01B *29/10*
U.S. Cl. 104—9 19 Claims





1. A tie replacement vehicle comprising:
(a) a main frame having a pair of front wheels and a pair of rear wheels;
(b) a first lifting conveyor having a lower end disposable at rail level corresponding to a pair of rails upon which said wheels are supported and an upper end at said main frame, said first lifting conveyor mounted at a first end of said main frame and operable to lift ties from a pair of rails to said main frame;
(c) a first lowering conveyor having a lower end disposable at rail level and an upper end at said main frame, said first lowering conveyor mounted at a second end of said vehicle opposite said first end and operable to lower ties from said main frame to placement on top of the pair of rails;
(d) movement means to selectively move ties over said vehicle from said upper end of said first lifting conveyor to said upper end of said first lowering conveyor; and
(e) a tie inserter supported by a said main frame and including a first tie clamp operable to clamp ties disposed on said vehicle at a location between said upper end of said first lifting conveyor and said upper end of said first lowering conveyor, said tie inserter being operable to insert a new tie under the pair of rails while the new tie is clamped by said first tie clamp.

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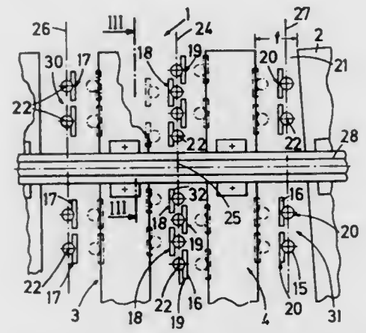
5,048,425

## BALLAST TAMPING UNIT FOR MOUNTING ON A TAMPING MACHINE AND A TAMPING TOOL THEREFOR

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed May 3, 1990, Ser. No. 518,122
Claims priority, application Austria, Jun. 16, 1989, 1477/89
Int. Cl.[5] E01B *27/02*
U.S. Cl. 104—12 15 Claims

1. A ballast tamping unit for mounting on a tamping machine adapted to tamp ballast under two successive ties fastened to two rails of a railroad track, the two ties defining a crib therebetween, the tamping unit comprising
(a) a vertically adjustable tamping tool carrier,
(b) a set of two pairs of opposed vibratory and reciprocable tamping tools mounted on the tamping tool carrier, the pairs of tamping tools being so spaced from each other in the direction of elongation of the track that two adjacent ones of the tamping tools of said pairs may be immersed in the crib between the successive ties and two remote ones of the tamping tools of said pairs may be immersed in respective cribs adjacent the successive ties, each tamping tool comprising



(1) a tamping pick having a substantially straight shaft having a center axis extending between a lower and an upper end,
(2) a tamping jaw at the lower tamping pick shaft end and
(3) a tamping pick holder, the upper end of the tamping pick shaft being detachably mounted in the tamping pick holder,
(4) the two adjacent tamping tools being reciprocable into an end position wherein the center axes and upper ends thereof substantially extend in a vertical plane extending perpendicularly to the direction of elongation of the track, and
(c) drive means connected to the tamping tools for vibrating and reciprocating the tamping tools.

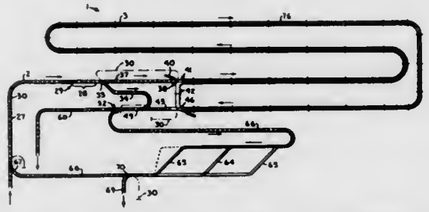
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5,048,426

## INTEGRATED CONVEYOR SYSTEM WITH TRANSFER OF TROLLIES

Harold S. Burt, Kansas City, and Benjamin P. DiFalco, Overland Park, both of Kans., assignors to Mid-West Conveyor Co., Inc., Kansas City, Kans.

Filed Mar. 20, 1990, Ser. No. 496,535
Int. Cl.[5] B61K *3/00*
U.S. Cl. 104—88 5 Claims



1. In an integrated conveyor system wherein a plurality of power and free trolleys of a raised power and free first conveyor ride upon and are transported along a path of the power and free conveyor and further wherein said trolleys drive



associated transferable carriers about the power and free conveyor, the improvement comprising:
(a) a raised loop second conveyor continuously moving at a generally constant speed during operation of the system and cooperating with said first conveyor; said power and free trolleys being supported by, riding on and being transferable between a first overhead track of said first conveyor and a second overhead track of said second conveyor with associated carriers at specific locations therealong such that said transferable trolleys travel along fixed paths associated with said tracks and such that said trolleys and the carriers associated therewith are transportable about said second conveyor for a generally fixed period of time.

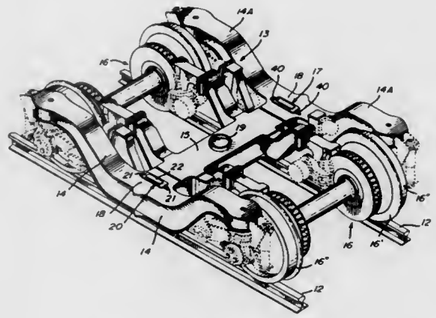
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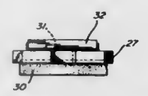
5,048,427

## RAILWAY TRUCK ASSEMBLY WITH SIDE BEARING HEIGHT ADJUSTER

Raymond Dumoulin, Rosemère, Canada, assignor to Bombardier Inc., Boucherville, Canada

Filed Apr. 27, 1990, Ser. No. 515,417
Int. Cl.[5] B61F *5/14*
U.S. Cl. 105—199.3 12 Claims





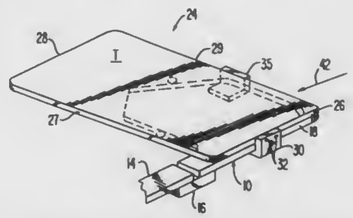
1. A truck assembly for a railway vehicle, said assembly comprising a truck frame defined by opposed side frame sections and a transom section extending transversely between said side frame sections substantially at mid-length thereof, a pair of wheel assemblies supported between opposed ends of said side frame sections, and a truck bolster assembly supported above said transom for supporting a cab thereon, said bolster assembly being retained in position relative to said transom by a central pivot, side bearing height adjusting means including interchangeable bearing elements of different heights; said bearing elements, one at a time, being selectively positioned between said truck frame and said truck bolster assembly and spaced from said central pivot on a respective side thereof, and each said bearing element having a top friction support surface to restrain rotation of said bolster assembly about said central pivot.

5,048,428

## CLIP-ON WORK SURFACE FOR A CHAIR TABLET

Mark C. LaRue, Route 13, Box 975, Leander, Tex. 78641

Filed Jun. 27, 1990, Ser. No. 544,583
Int. Cl.[5] A47B *13/08*
U.S. Cl. 108—90 1 Claim



1. A detachable member for increasing the work surface area of a tablet on a tablet chair, the tablet being of the type having a top surface, a bottom surface and a plurality of side edges, the member comprising the combination of
a substantially rigid, generally planar body positionable for use on top of the tablet, the body having a top work surface with an area significantly greater than the top surface of the tablet and a bottom surface positionable on said top surface of said tablet;
hook means attached to said body for extending under said tablet with said body positioned on top of said tablet and for engaging two side edges and said bottom surface of said tablet;
a first stop member protruding from the bottom surface of said body, said first stop member being spaced from said hook means a sufficient distance to engage a third side edge of said tablet;
means defining a recess in said body extending upwardly from said bottom surface; and
a second stop member protruding from said bottom surface of said body, said second stop member being spaced from said hook means a sufficient distance to engage a fourth side edge of said tablet;
one of said first and second stop members being retractable above said bottom surface of said body to allow attachment and detachment of said body to and from said tablet, said one of said members including a member shaped to be received in said recess and spring means for urging said member toward its protruding position.

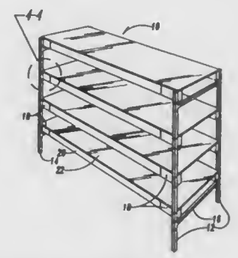
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5,048,429

## UNIVERSAL SHELVING

Dan L. Freiberg, 1311 190th St., State Center, Iowa 50247

Filed Oct. 30, 1989, Ser. No. 428,786
Int. Cl.[5] A47B *9/00*
U.S. Cl. 108—106 11 Claims



1. A shelving structure comprising:
first and second pairs of vertical legs;

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first and second cross braces extending between the first and second pairs of legs, respectively;
means for adjustably securing the cross braces to the legs such that the cross braces are vertically adjustable along the legs;
a first pair of longitudinal braces extending between corresponding legs of the first and second pairs of legs;
bracket means slidably received on each leg for adjustably securing the longitudinal braces to the legs, each bracket means including a C-shaped support member for supporting and receiving a respective end of the longitudinal braces, a collar fixed on the support member and being slidably received on the leg, and a set screw extending through the collar for frictionally engaging the leg so as to hold the bracket and longitudinal brace in position on the leg; and
a shelf supported on the longitudinal braces.

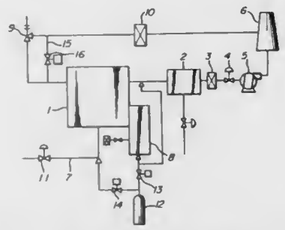
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**5,048,430**

## METHOD OF STOPPING COMBUSTION IN RESTRAINED COMBUSTION FURNACE IN SAFETY AND COMBUSTION STOP SYSTEM THEREFOR

**Hiroaki Kawai, Kasugai, Japan, assignor to NGK Insulators, Ltd., Japan**

**Filed Oct. 16, 1990, Ser. No. 598,192**
**Claims priority, application Japan, Oct. 20, 1989, 1-274536**
**Int. Cl.[5] F23N *5/24***
**U.S. Cl. 110—193** **12 Claims**



1. A method of safely stopping combustion in a restrained combustion furnace in which wastes to be incinerated are gasified and then burnt with an air amount lower than a theoretical combustion air amount, in case of emergency, the method comprising the steps of shutting off a combustion air supply line connected to the furnace, simultaneously feeding inert gas to a lower portion of the furnace and an outlet conduit of waste gas leaving the furnace and stop combustion in the furnace, opening a bypass line connected to an upper portion of the furnace, and flowing gas in the furnace through a filter to a waste gas stack through said bypass line.

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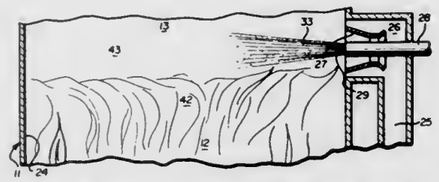
**5,048,431**

## METHOD AND APPARATUS FOR REDUCING SULFUR DIOXIDE CONTENT IN FLUE GASES

**Ronald R. Landreth, Crown Point, and Lee R. Andersen, Griffith, both of Ind., assignors to Inland Steel Company, Chicago, Ill.**

**Continuation of Ser. No. 227,866, Aug. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 144,714, Jan. 14, 1988, which is a continuation of Ser. No. 4,644, Jan. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 885,463, Jul. 14, 1986, abandoned. This application Jul. 5, 1990, Ser. No. 548,183**
**Int. Cl.[5] F23B *7/00***
**U.S. Cl. 110—343** **9 Claims**

1. In a combustion process wherein a sulfur containing fuel is introduced into a first zone of a combustion chamber, and wherein combustion air (a) is introduced into said first zone or (b) is introduced both into said first zone of said chamber downstream of the first zone, to produce downstream-flowing combustion reaction gases containing sulfur dioxide ($SO_2$), and wherein finely divided particles of a material calcineable into lime are inducted through an entry into said second zone in sufficient amount to reduce substantially the $SO_2$ content of said combustions reaction gases, the improvement comprising:
transporting a mixture of said particles and a carrier gas up to a location further from said entry than adjacent thereto, under a s dense phase transport in which the solids to gas ratio is at least about 20 to 1;
said carrier gas being incapable of distributing said particles across said second zone;
and then a adding to said mixture, at said location, an additional gas volume, not employed in said dense phase transport, to introduce said particles into said second zone and to distribute the particles across said second zone;



said additional gas volume being a booster gas introduced directly into said mixture outside said chamber, to dilute said mixture and increase the velocity a with which said particles are transported, so that the particles enter said second zone with sufficient entry velocity to be distributed across said second zone against the urging of combustion gases flowing downstream from said fist zone;
the combined amount of said booster gas and said carrier gas being relatively insignificant compared to the amount of said combustion air introduced into said chamber.

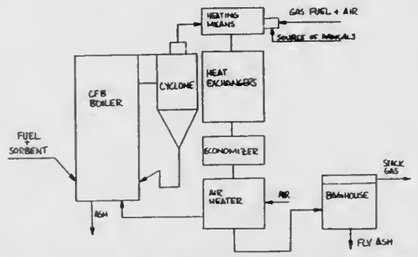
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**5,048,432**

## PROCESS AND APPARATUS FOR THE THERMAL DECOMPOSITION OF NITROUS OXIDE

**John E. Hofmann, Naperville, and William H. Sun, Aurora, both of Ill., assignors to Nalco Fuel Tech, Naperville, Ill.**

**Filed Dec. 27, 1990, Ser. No. 634,402**
**Int. Cl.[5] F23J *11/00, 15/00***
**U.S. Cl. 110—345** **17 Claims**




1. A process for the reduction of nitrous oxide in the effluent from the combustion of a carbonaceous fuel, the process comprising:
a) forming an effluent in a circulating fluidized bed boiler; and
b) raising the temperature of said effluent to a temperature of at least about 1700° F., when said effluent is at a temperature below about 1700° F.

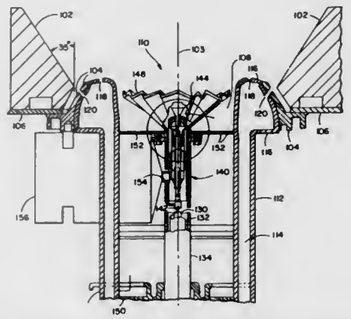


**5,048,433**

## RADIATION ENHANCEMENT IN OIL/COAL BOILERS CONVERTED TO NATURAL GAS

**Alex E. S. Green, Gainesville; Bruce A. S. Green, Micanopy, and John C. Wagner, Gainesville, all of Fla., assignors to University of Florida, Gainesville, Fla.**

**Division of Ser. No. 285,818, Dec. 16, 1988, Pat. No. 4,978,367, which is a continuation-in-part of Ser. No. 176,157, Mar. 31, 1988, abandoned. This application Sep. 12, 1990, Ser. No. 581,303**
**Int. Cl.[5] F23D *1/02***
**U.S. Cl. 110—260** **6 Claims**



1. In a method for use in a furnace converted from combustion of oil or coal to natural gas, the improvement comprising co-firing natural gas in said furnace together with a slurry comprising micronized coal in No. 2 fuel oil to enhance the infrared radiation from the natural gas flame.

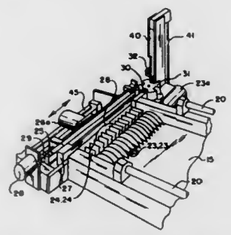
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**5,048,434**

## APPARATUS FOR TRANSPLANTING PLANTS

**Albert J. Forster, 19420 Wooster Rd., Howard, Ohio 43028, and James J. Zeller, 6934 Simmons Church Rd., Centerburg, Ohio 43011**

**Filed Apr. 23, 1990, Ser. No. 513,125**
**Int. Cl.[5] A01C *1/04***
**U.S. Cl. 111—105** **4 Claims**



1. An apparatus for separating and transplanting plants in individual receptacles contained in a porous open cell unitary flat comprising:
a support for said flat,
means for moving said flat intermittently on said support,
means for cutting said flat into individual units, each unit surrounding an individual receptacle,
said means for cutting said flat into individual units comprising a plurality of cutting means to make a first parallel cut in said flat and a second means for cutting said flat at right angles to said first cut so as to separate each unit from the other,
means for inserting said individual units, each containing a plant, into a growing medium in an appropriate receptacle.

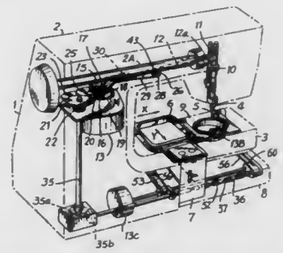
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**5,048,435**

## DEVICE FOR A SEWING MACHINE HAVING A ZIGZAG STITCHING MECHANISM AND AN EMBROIDERING MECHANISM

**Hideaki Takenoya, and Fumiyuki Mishima, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan**

**Filed Nov. 27, 1989, Ser. No. 441,161**
**Int. Cl.[5] D05B *7/00, 3/00***
**U.S. Cl. 112—168** **3 Claims**



1. A switching device for a sewing machine including a frame having an upper part thereof formed as a frame arm and a lower part thereof formed as a frame bed, a drive shaft rotatably supported in the frame arm, a needle bar reciprocating vertically in accordance with rotation of the drive s aft, a needle bar supporter for holding the needle bar and movably supported in the frame arm, a fabric feeding device movably supported within the frame bed, a stepping motor for controlling one of reciprocating movement of the needle bar supporter and movement of the fabric feedin device and having an output shaft, and a transmission rod having a first end thereof connected to one of the needle bar supporter and the fabric feeding device and a second end thereof connected with the stepping motor for transmitting rotational movement of the stepping motor output shaft into each of the reciprocating movement of the needle bar supporter and the movement of the fabric feeding device for zigzag stitching operation, respective; said switching device at a position close to the second end comprising a rotatable disc having a center of rotation and fixedly supported on an out put shaft of the stepping motor; means for movably connecting the second end of the transmission rod with said rotatable disc so that the second end is movable between a first position on said rotatable disc which coincides with the center of rotation of said rotatable disc and a second position on said rotatable disc which is spaced part from the center of rotation of said rotatable disc; a stub projecting from the transmission rod; a stopper for engaging said stub in the first position of the second end of the transmission rod above rotatable disc, said stopper being disengaged from said stub in the second position of the second end of the transmission rod above said rotatable disc; and means for converting the rotational movement of the stepping motor output shaft into movement of an embroidering frame in an arbitrarily chosen X-direction of Y-direction when the first end of the transmission rod is connected with the needle bar supporter and not with the fabric feed mechanism, and when the second end of the transmission rod is in the first position thereof above said rotatable disc during embroidering operation.

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5,048,436

## ROTARY LOOPER FOR A LOCKSTITCH SEWING MACHINE

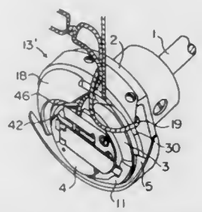
Horst Thiele, Bielefeld, Fed. Rep. of Germany, assignor to Durkopp Adler AG, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,554

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911134

Int. Cl.[5] D05B *57/08, 57/26, 57/14*

U.S. Cl. 112—228 13 Claims



1. A rotary looper for a lockstitch sewing machine for receiving either a coreless thread package or a bobbin wound with thread; said rotary looper comprising:

a looper body which is mounted to be driven by a looper shaft, said looper shaft generally defining an axial direction, said looper body having a looper tip which is operable for gripping and guiding a needle thread loop of said sewing machine;

a lower bobbin-housing part radially within said looper body and having an eccentric hollow for receiving an upper bobbin-housing part;

an upper bobbin-housing part having an inner space which receives said coreless thread package or bobbin; and being mounted in the eccentric hollow of the bobbin-housing lower part;

first and second independent thread-tensioning elements on the upper bobbin-housing part; and path means on said upper bobbin-housing part defining respective thread paths from said inner space within the upper bobbin-housing part, to said first and second thread-tensioning elements.

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5,048,437

## PRESSER DEVICE IN A SEWING MACHINE

Antonio Jimenez, Meyrin, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

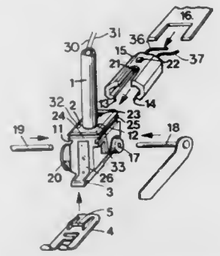
PCT No. PCT/CH88/00212, § 371 Date May 11, 1989, § 102(e) Date May 11, 1989, PCT Pub. No. WO89/05880, PCT Pub. Date Jun. 29, 1989

PCT Filed Nov. 16, 1988, Ser. No. 372,378

Claims priority, application Switzerland, Dec. 22, 1987, 4994/87

Int. Cl.[5] D05B *29/00, 29/12*

U.S. Cl. 112—235 9 Claims



1. Presser device in a sewing machine, comprising a support provided with means for holding and releasing a presser foot, the support being of a general parallelepiped shape and having two parallel grooves that are arranged on two opposing lateral faces of the support, said grooves forming sliding guides for a sewing attachment.

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5,048,438

## SEWING MACHINE BOBBIN THREAD TENSION CONTROL DEVICE

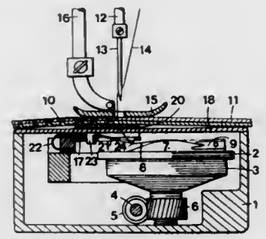
Antonio Jimenez, Meyrin, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed Nov. 21, 1989, Ser. No. 439,468

Claims priority, application Switzerland, Nov. 29, 1988, 4431/88

Int. Cl.[5] D05B *47/00*

U.S. Cl. 112—255 8 Claims



1. Sewing machine comprising a longitudinally reciprocable needle bar, means for securing a needle on this bar, a loop holder for taking hold of an upper thread introduced by the needle and cause said upper thread to pass around a spool having a lower thread thereon so as to form a seam stitch, a transporter mechanism for displacing fabric to be sewn from a completed seam stitch to a following point to be stitched, means for slackening the lower thread prior to the formation of each seam stitch, an element actuated by the transporter mechanism for said fabric to be sewn, so as to relax the lower thread issuing from the spool once during each cycle of the transporter mechanism, the transporter mechanism comprising a vertically movable feed dog, said element being mounted on the feed dog of the transporter mechanism and cooperating with a stationary abutment upon vertical movement of the feed dog to relax the lower thread.

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5,048,439

## COMPUTERIZED SEWING MACHINE

Gérard Tschopp, Geneva; Claude Buchilly, Vevey, and Christian R. Kohli, Thonex, all of Switzerland, assignors to Mefina S.A., Switzerland

Filed Jul. 11, 1990, Ser. No. 550,832

Claims priority, application Switzerland, Jul. 11, 1989, 2580/89

Int. Cl.[5] D05B *3/02*

U.S. Cl. 112—458 4 Claims

1. A computerized sewing machine comprising:

first control means for controlling reciprocal axial movement of a sewing needle for penetrating a material to be sewn and a loop pick-up device for cooperating with the needle for forming a sewing stitch;

second control means for controlling relative displacement of the needle and the material in two orthogonal directions with a specific amplitude in each direction;

at least one electronic memory in which computerized sewing instructions are stored, said instructions corresponding to a plurality of different designs or patterns, said designs or patterns comprising letters and signs belonging to at least two different styles of alphabet, sewing instructions for the letters and signs of each alphabet being embodied in a specific memory bank, the reference address for the beginning of the memory bank for each alphabet being different;

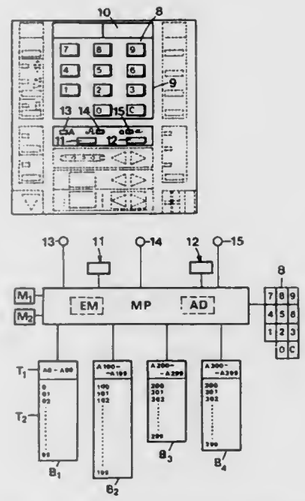
first selection means for selecting the letter or the sign to be sewn;

microprocessor means for reading from said electronic memory sewing instructions corresponding to the design or pattern selected by said first selection means and for controlling the second control means in accordance with said instructions so as to sew the selected design or pattern on said material;

second selection means for selecting the style of alphabet in which the letter or the sign selected with said first selection means is to be sewn;

each memory bank comprising an address section for locating, within the memory bank, instructions for a particular letter or sign, address information being disposed within said address section in a predetermined order, said address information being individual to each letter or sign and identical for each alphabet;

said first selection means comprising a keyboard for selecting a particular letter or signal by inputting a code corresponding to the address information assigned to that letter or sign in the address section of the memory bank of a default alphabet of said alphabets;



said second selection means comprising a memory element containing at least a first value corresponding to the address of the beginning of the memory bank containing data for the letters and signs of the default alphabet, and at least a second value corresponding to the space in the memory element separating the beginning of the memory bank for the default alphabet from the beginning of the memory bank containing data for the letters and signs of the second alphabet style;

indicator means for indicating to the microprocessor the alphabet style selected by said second selection means;

means for forming a composite address value by adding at least said first value to the value of the code selected by the first keyboard selecting means, said composite address identifying the portion of memory containing specific instructions for controlling said second control means so that the design or pattern corresponding to the letter or sign selected and the alphabet style selected is sewn on the material.



5,048,440

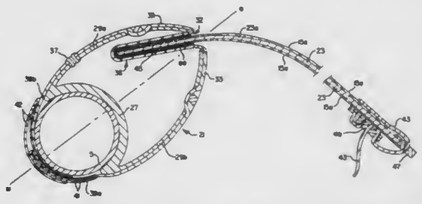
## SAILING APPARATUS

Barry Spanier, Haiku, Hi., assignor to Neil Pryde Limited, Hong Kong

Continuation-in-part of Ser. No. 345,767, May 1, 1989, abandoned. This application May 8, 1989, Ser. No. 348,675

Int. Cl.[5] B63B *35/79*

U.S. Cl. 114—39.2 7 Claims



5. In combination, a sailing apparatus comprising a sail mounted on a mast having a luff pocket which encircles the mast and extends over a substantial part thereof, and at least one batten mounted on the sail and extending towards the mast; and a coupling member comprising an integrally molded body for locating an end of said at least one batten relative to the mast, a batten pocket for said at least one batten extending from a trailing edge of the sail to a forward edge of the said sail adjacent the mast where the luff pocket is discontinued to define a space between said forward edge and said mast, the body being mounted to the mast in said space for movement circumferentially of the mast and being coupled to the batten end.

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5,048,441

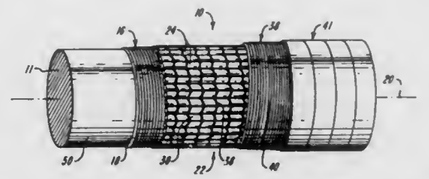
## COMPOSITE SAIL MAST WITH HIGH BENDING STRENGTH

Peter A. Quigley, Cataumet, Mass., assignor to Fiberspar, Inc., W. Wareham, Mass.

Filed Jun. 14, 1989, Ser. No. 366,464

Int. Cl.[5] B63B *15/00;* B31C *00/00;* B29D *22/00;* B32B *5/06*

U.S. Cl. 114—90 5 Claims



1. In a sail mast for a wind-powered sail craft, said mast having means for securing the mast to the sail craft and means for securing a sail to the mast, the improvement comprising a multiple-ply composite structure of fibers and a polymer matrix having

A. at least one inner ply having circumferentially extending fibers disposed in a polymer matrix,

B. at least one intermediate ply having

(i) first axially extending fibers in circumferentially-spaced sets with circumferential gaps between each set of the first fibers,

(ii) second axially extending fibers in circumferentially-spaced sets disposed in said circumferential gaps,

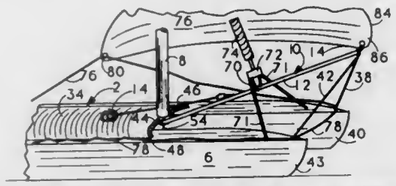
C. helically-oriented fibers interwoven with only one of said sets of first or second axially-extending fibers, and

D. an outer ply having circumferentially extending fibers.

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5,048,442
**SPINNAKER HANDLING DEVICES**
John Hackney, 12420 Kelso Dr., Thonotosassa, Fla. 33592
Filed Jan. 22, 1990, Ser. No. 468,074
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—102 12 Claims



1. In a multihull sailboat comprising a mast, a spinnaker carried forward of said mast and a spinnaker pole for controlling a guy attached to said spinnaker, the improvement which comprises:
said spinnaker pole comprising a fore end, an aft end and a central portion axially connecting said fore end to said aft end,
a cap on said fore end having front and rear surfaces and a bore extending axially through said cap from said front surface to said rear surface,
said guy being reeved through said bore and the fore end of said spinnaker pole to exit said pole through an opening in said central portion and lead aft to said sailboat.
a first line extending from said front surface of said cap for attachment to a first portion of said sailboat,
a second line extending from said front surface of said cap for attachment to a second portion of said sailboat spaced apart from said first portion, and
means for attaching said aft end of said spinnaker pole to said sailboat.

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5,048,443
**SAIL HANDLING SYSTEM**
Thomas G. S. Brown, Box 17, Site 17, RR #4, Armdale, Nova Scotia, Canada B3L 4J4
Filed Apr. 23, 1990, Ser. No. 512,314
Claims priority, application Canada, Apr. 24, 1989, 597525
Int. Cl.[5] B63H *9/04*
U.S. Cl. 114—104 2 Claims



1. A sail handling system adaptable to installation with a sail on a mast, where said sail is hauled up by a halyard running up said mast, passing over the top of said mast, and thence being secured to a head piece at the top of said sail, said system comprising at least one hauldown stacking line, the first end of each said hauldown stacking line being securable to said head piece, the second end of each said hauldown stacking line being routed downwardly and interwoven through a plurality of grommet means installed in said sail in a line extending generally from top to bottom of said sail, whereby said sail may be hauled down the mast and stacked by pulling downwardly on each said hauldown stacking line while controlling release of tension on said halyard.

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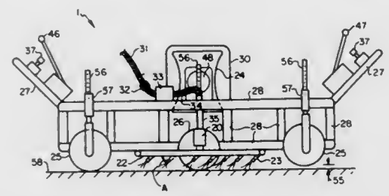
5,048,444
**ADJUSTABLE WHEEL FOR YACHT PEDESTAL STEERER**
John E. Moore, 265 Grandview Dr., Warwick, R.I. 02886
Continuation-in-part of Ser. No. 295,908, Jan. 11, 1989, abandoned. This application Mar. 16, 1990, Ser. No. 494,595
Int. Cl.[5] B63H *25/02*
U.S. Cl. 114—144 R 5 Claims



1. In combination an upright hollow yacht steering pedestal having a column portion, and a base portion affixed to the cockpit deck of a boat, the pedestal column portion having a shaft rotatively mounted in and transverse to the pedestal column, a rudder shaft drive means affixed to the shaft within the pedestal column, said shaft having a swivel joint located outside the column and a wheel mounted at the terminus of the swivel joint.

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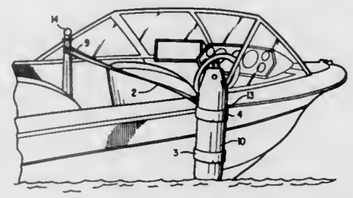
5,048,445
**FLUID JET SYSTEM AND METHOD FOR UNDERWATER MAINTENANCE OF SHIP PERFORMANCE**
Roland N. J. Lever, Jensen Beach, and Ian E. Brown, Ft. Lauderdale, both of Fla., assignors to Cavi-Tech, Inc., Fort Lauderdale, Fla.
Filed Sep. 8, 1989, Ser. No. 404,221
Int. Cl.[5] B63B *59/00*
U.S. Cl. 114—222 38 Claims



1. A hull cleaning and smoothing cart comprising:
main frame body having a top side, a bottom side, a first end and a second end;
a plurality of wheel means mounted to said main frame body so as to extend from said bottom side thereof;
a fluid manifold mounted to said main frame body;
a plurality of high pressure fluid jet nozzles mounted to said manifold, said fluid jet nozzles directing fluid outwardly from said bottom side of said main frame body;
at least one orientable thruster assembly mounted to said main frame body, said thruster assembly having a fluid intake facing in a facing direction of said bottom side of said main frame body and a fluid exhaust facing in a facing direction of said top side;
a plurality of flexible fluid flow lines for respectively fluidly coupling said fluid manifold and each said thruster assembly to at least one source of high pressure fluid remote from said main frame body; and
control means defined on said main frame body for a controlling flow of high pressure fluid to said fluid manifold and to each said thruster assembly and for controlling a tilt angle of each said thruster assembly.
35. A method for maintaining a ship hull comprising:
providing underwater video camera equipment;
periodically surveying the submerged hull of the ship with said video camera equipment controlled by a diver who is in voice communication with an above-water controller;
providing a drawing of the hull of the ship:
recording the condition of various portions of the ship hull on said drawing of the hull of the ship;
determining the decrease in performance attributable to each submerged portion of the hull;
determining whether no maintenance is required, the ship must be dry docked, or interim underwater maintenance would be desireable;
prioritizing areas to be cleaned in accordance with projected improved performance, available time, and cost of cleaning if interim underwater maintenance is indicated;
performing required maintenance on designated areas in said order of priority; and returning the ship to service.

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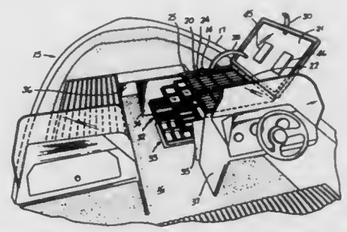
5,048,446
**HARNESS FOR SECURING A FENDER TO A BOAT**
James S. Powell, 6610 Shirley Pond Rd., Harrison, Tenn. 37341
Filed May 26, 1989, Ser. No. 357,480
Int. Cl.[5] B63B *59/02*
U.S. Cl. 114—219 9 Claims



1. An apparatus for protecting a boat which comprises:
a boat fender having an upper half and a lower half;
an elongated strap member having an upper end and a lower end;
adjustable fastening means mounted on the upper end of said elongated member for releasably forming the upper end of said elongated member into a loop, the size of said loop being adjustable to vary the length of said elongated member;
at least a first and a second short strap member which are disposed transversely across the lower end of said elongated member, the distance between said first and second short strap members being such that the first short strap member is positioned at substantially the mid-point of the upper half of said boat fender and the second short strap member is positioned at substantially the mid-point of the lower half of said boat fender, and the upper end of said elongated member extending substantially beyond the point at which said first short strap member is disposed across said elongated member.



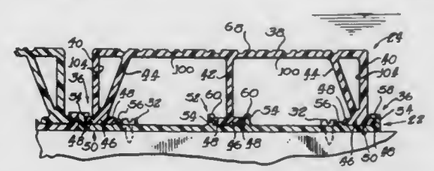
5,048,447
**TOURNAMENT STYLE TACKLE BOX AFFIXED TO BOAT**
Dominic Vicari, Stafford, Va., assignor to Dallas Steele, Jr., Stafford, Va., a part interest
Filed Jul. 16, 1990, Ser. No. 552,490
Int. Cl.[5] A63D *55/00*
U.S. Cl. 114—255 12 Claims



1. A fishing tackle box securely affixed on at least two opposite sides of four substantially vertical sides to a fishing boat at a deck position between a gunwhale and a fisherman standing site, a hinged planar top surface panel on the tackle box horizontally disposed at a height above the deck for alternative service as a seat and fishing platform for supporting a standing fisherman when not opened for use while fishing, and hinging structure disposed near the gunwhale for opening the panel including means for holding it in open position to expose under the hinged panel a substantially horizontally disposed multiple compartment artificial lure tray accessible to a standing fisherman at a comfortable height when standing on said deck position standing site for rapid selection and change of lures.

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5,048,448
**BOAT DOCK STRUCTURE**
Dennis G. Yoder, Nappanee, Ind., assignor to CTB, Inc., Milford, Ind.
Filed Dec. 15, 1989, Ser. No. 452,246
Int. Cl.[5] B63B *35/44*
U.S. Cl. 114—263 18 Claims



1. A dock structure adapted for assembly with a supporting frame, said dock structure comprising: clip means adapted to be fixedly attached to said frame and a plank member adapted to be assembled with said clip means; said clip means having an elongate base portion, and plank receiving means attached to said base portion for engaging and securely retaining said plank member in engagement with said clip means; said plank member having an upper web portion and being formed with at least three flange supporting means extending from said upper web portion, each of said at least three flange supporting means having flange means formed on an end thereof distal said web portion, said flange means cooperatively engaging correspondingly formed plank receiving means for securing said plank member in engagement with said clip means attached to said frame.

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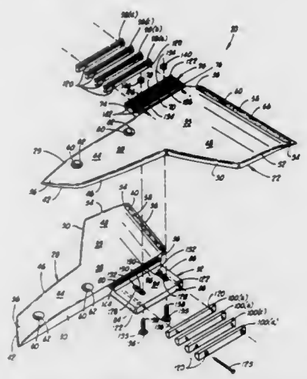


5,048,449

## ADJUSTABLE BOAT STABILIZER

Arthur R. Templeman, Overland Park, Kans., assignor to Marine Dynamics, Inc., Overland Park, Kans.

Continuation-in-part of Ser. No. 210,697, Jun. 23, 1988, Pat. No. D. 308,851. This application Feb. 9, 1990, Ser. No. 478,589
Int. Cl.[5] B63B *1/24*
U.S. Cl. 114—280 14 Claims



1. A boat stabilizer for attachment to the lower drive unit of a boat motor comprising:

a first lifting member having a first interior side wall for positioning adjacent to a first side of said drive unit;

a second lifting member having a second interior side wall for positioning adjacent to a second side of said drive unit; and

said first and second lifting members each including a nose portion having a leading edge, an end portion having a trailing edge and spaced from said nose portion, a longitudinal axis connecting said leading edge of said nose portion to said trailing edge of said end portion and a body portion disposed on said longitudinal axis between said nose portion and said end portion, said body portion including:

a first wing section attached to said nose portion and having an exterior leading edge extending from said leading edge of said nose portion outwardly from said longitudinal axis at a first horizontal angle with respect to said longitudinal axis; and

a second wing section attached to said first wing section and having an exterior leading edge extending from said leading edge of said first wing section outwardly from said longitudinal axis at a second horizontal angle with respect to said longitudinal axis, said second horizontal angle being greater than said first horizontal angle.

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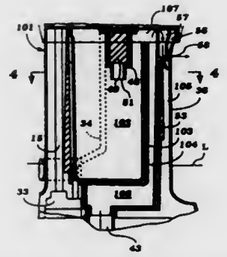
5,048,450

## SEAT LATCH FOR WATERCRAFT

Katsunori Oka, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 13, 1989, Ser. No. 450,608
Claims priority, application Japan, Dec. 14, 1988, 63-317042
Int. Cl.[5] B63B *35/84*
U.S. Cl. 114—363 7 Claims

1. A small watercraft comprised of a hull portion defining a rider's area at the rear of said hull portion, a seat detachably connected to said hull portion in said rider's area and adapted to accommodate a rider seated thereupon, releasable latching means for providing sole means for detachably affixing said seat to said hull portion, a single operating means for completely releasing said latching means and accessible by a rider while seated upon said seat wherein the rider's area and seat



are configured so as to accommodate the rider seated in straddle fashion upon the seat.

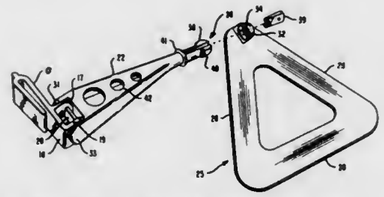
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5,048,451

## VEHICLE CAUTION SIGN

Walter H. Reimers, Ithaca, and Gerald Muirhead, Watkins Glen, both of N.Y., assignors to CHR Industries, Inc., Ithaca, N.Y.

Filed Apr. 2, 1990, Ser. No. 503,519
Int. Cl.[5] B60Q *1/26, 1/34, 1/54;* G09F *7/22*
U.S. Cl. 116—35 A 19 Claims



1. A caution sign for use on a vehicle comprising

means for mounting the sign on the vehicle,

holding means coupled with said mounting means and extending outwardly therefrom,

first pivot means coupling said mounting means and said holding means, and

second pivot means secured to said sign and pivotally coupled with said holding means, said second pivot means comprising a bearing member defining an aperture of inclined shape therethrough, said sign being freely disposed in a generally vertical direction and supported by said bearing member and readily visible when said vehicle is not moving and said sign freely pivoting to a generally horizontal direction and supported by said bearing member when said vehicle is moving at a predetermined speed.

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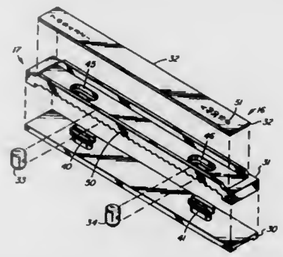
5,048,452

## RACQUET-MOUNTED SCORING DEVICE

Perry S. Haddock, 2618-206th Street, Langley, British Columbia, Canada V3A 4P5, and Wayne M. Fraser, 15388 Columbia Avenue, White Rock, British Columbia, Canada V4B 1J9

Filed Jan. 23, 1990, Ser. No. 468,874
Int. Cl.[5] A63B *71/06;* G09F *9/40*
U.S. Cl. 116—225 15 Claims

1. A scoring device comprising a flexible elongate base member, a flexible elongate track member having score indicating indicia thereon, means for mounting the track member on the base member so that the longitudinal axis of the members are in a alignment and the members being capable of relative movement with respect to each other when the members are flexed about a transverse axis, and at least one score indicator mounted to said track member so as to be selectively movable relative to said track member for indicating a score



according to its position relative to the score indicating indicia on the track member.

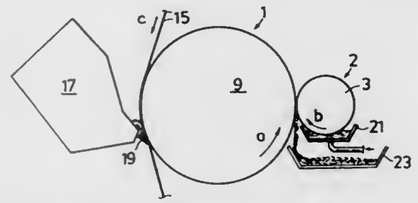
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5,048,453

## COATING DEVICE

Tore Eriksson, Klässbol, Sweden, assignor to BTG Källe Inventing AB, Säffle, Sweden

Filed Sep. 22, 1989, Ser. No. 411,119
Claims priority, application Sweden, Sep. 27, 1988, 8803403
Int. Cl.[5] B05C *1/08*
U.S. Cl. 118—249 17 Claims



1. A coating device for coating a travelling web, comprising at least one backing roll for contacting the web, application means cooperating therewith to supply a coating material to said backing roll, and means for smoothing material supplied to the web, said application means including a self-supporting coating roll, a mantel surface of said coating roll being provided with circumferentially extending, parallel grooves, said mantel surface cooperating with said backing roll to apply said coating material to a surface of said backing roll with metered application before said backing roll contacts the web, said self-supporting coating roll having a length-to-diameter ratio of less than about 25.

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5,048,454

## DEVICE FOR APPLICATION OF GLUE STRIPS

Reinhold Berntsson, Jordal 8775, S-444 00 Stenungsund, Sweden

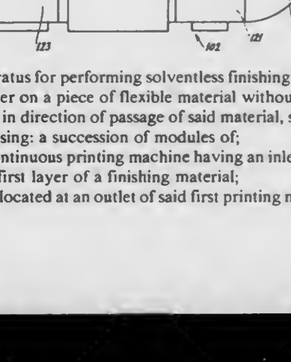
PCT No. PCT/SE88/00541, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO89/03252, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 17, 1988, Ser. No. 469,482
Claims priority, application Sweden, Oct. 16, 1987, 8704038
Int. Cl.[5] B05B *15/02;* B05C *5/02*
U.S. Cl. 118—302 5 Claims

1. A device for application of a glue strip on a movable paper web, the means comprising at least one glue sprayer for spraying glue under pressure, a first and a second diaphragm-magnetic valve, a housing for the two diaphragm-magnetic valves;

first and second inlet chambers leading respectively into the first and second valves; first and second outlet channels leading respectively from the first and second valves;

a first and a second spring loaded rubber diaphragm between the first and second inlet chambers respectively, on the one hand, and the first and second outlet channels, respectively, on the other hand, the first chamber and the first valve being intended for glue and the second chamber and the second valve being intended for a rinsing liquid, the outlet channels being interconnected; and

a common nozzle into which the outlet channels open, the nozzle having a fine outlet opening relatively closely spaced from a paper web;



the first and second magnetic valves having respective first and second pistons, the pistons of the magnetic valves acting upon the respective rubber diaphragms for urging the diaphragms to close the pathways from the first and second inlet chambers to the first and second outlet channels, respectively; each piston having a relatively very short stroke; the device eliminating late dripping at the nozzle and the nozzle being automatically cleaned after each glue application.

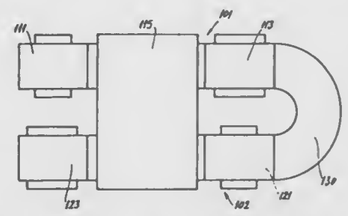
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5,048,455

## PROCESS AND APPARATUS FOR AUTOMATIC FINISHING OF FLEXIBLE MATERIALS, AND PARTICULARLY LEATHERS AND HIDES

Gérard Gavend; Bernard Vitteau, and Bernard Vulliermet, all of Lyons, France, assignors to Centre Technique Cuir Chaussure, Lyons, France

Division of Ser. No. 207,106, Jun. 14, 1988, Pat. No. 4,932,978. This application Nov. 17, 1989, Ser. No. 437,872
Claims priority, application France, Jun. 23, 1987, 87 09163
Int. Cl.[5] B05C *9/08*
U.S. Cl. 118—642 6 Claims



1. Apparatus for performing solventless finishing in a continuous manner on a piece of flexible material without an evaporation step in direction of passage of said material, said apparatus comprising: a succession of modules of;

a first continuous printing machine having an inlet for applying a first layer of a finishing material;

an oven located at an outlet of said first printing machine and

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extending over at least a first passage for curing said first layer;
a first staining or graining machine for satining or graining said first layer;
a bend for reverting said piece with said first layer satined or grained towards said oven;
a second continuous printing machine for applying a second layer of a finishing material on said first layer;
a second passage extended over said oven in reverse direction to said first passage for curing said second layer;
a second satining or graining machine for satining or graining said second layer having an outlet adjacent to the inlet of said first satining or graining machine; and
conveying means for continuously transporting said piece of flexible material from said inlet of said first printing machine to the outlet of said second printing machine.

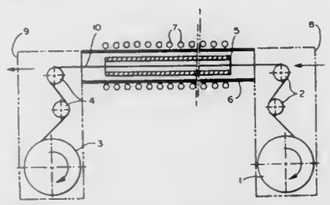
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**5,048,456**

## DEVICE FOR CONTINUOUSLY COATING A CARBON FIBER FABRIC WITH A CARBIDE-BASED PASSIVATING PROTECTIVE LAYER

**Jean Bouix, Lyons; Hervé Mourichoux, Villeurbanne; Christiane F. Vincent, and Henri J. Vincent, both of Lyons, all of France, assignors to Centre National de la Recherche Scientifique, France**

**Filed Mar. 30, 1990, Ser. No. 502,524**
**Claims priority, application France, Apr. 4, 1989, 89 04650**
**Int. Cl.[5] C23C *16/00***
**U.S. Cl. 118—718** **6 Claims**



1. Apparatus for continuously coating carbon filaments of a continuous multi-filament fabric with a carbide-based passivation layer that includes

a reactor means having an elongated hollow inner member formed of a material that will not react with a gas selected from the group of $SiCl_4$—$H_2$, $TiCl_4$—$H_2$, and $BCl_3$—$H_2$, and an elongated hollow outer member surrounding said first member, said outer member being formed of a non-corrosive material that is capable of retaining heat within said reactor means,

flow means for passing a reaction gas in a first direction through said inner member, said reaction gas containing a volatile compound capable of reacting with said carbon filaments to form a carbide passivation layer upon each of said filaments,

first means for supplying a fabric to be passivated,

drive means for drawing said continuous fabric through said inner member under tension in a direction opposite that of said reaction gas, and

second means for receiving fabric from said drive means and storing said fabric,

induction means for heating said inner member and fabric positioned within said inner member to a temperature at which the gas reacts with the filaments of the fabric to form a carbide passivation layer upon each filament.

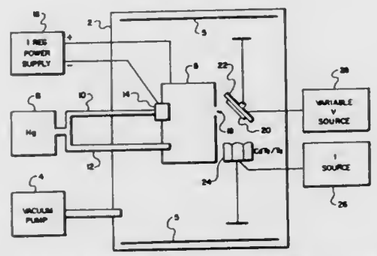
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**5,048,457**

## PLASMA/RADIATION ASSISTED MOLECULAR BEAM EPITAXY METHOD AND APPARATUS

**Julius Hyman, Jr., Los Angeles; John R. Beattie, Westlake Village; Jesse N. Matossian, Woodland Hills; Owen K. Wu, Agoura; Juan F. Lam, Agoura Hills, all of Calif., and Lawrence Anderson, Jackson, Wyo., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Division of Ser. No. 281,309, Jan. 13, 1989, abandoned. This application May 31, 1990, Ser. No. 531,711**
**Int. Cl.[5] C23C *16/00***
**U.S. Cl. 118—723** **11 Claims**




1. Apparatus for epitaxially growing a compound having a plurality of constituent substances upon a substrate, comprising:

a chamber having an opening on one side for the emission of gas from within the chamber,

means for introducing a gas of one of said substances into said chamber,

means for discharging electrons into said chamber to ionize and excite at least some of said gas, the relative amounts of ionization and excitation radiation depending upon the electron discharge voltage and emission current, with excited gas particles spontaneously decaying into neutral particles and excitation radiation,

an anode within said chamber,

means for maintaining said anode at a more positive voltage than said chamber to attract electrons and thereby initiate and sustain said electron discharge,

means for holding a substrate in the path of a gas, ion and radiation plasma emitted through said chamber opening, and

means for forming a flux comprising particles of at least one other substance in said compound and for directing said flux onto the substrate to react with said plasma thereon,

said electron discharge means generating sufficient radiation and said substrate holding means holding the substrate with respect to said chamber opening so that said radiation reaches the substrate with a density sufficient to substantially increase the sticking coefficient of said gas on the substrate, compared to its sticking coefficient in the absence of said radiation.

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**5,048,458**

## METHOD OF BREEDING FISH

**Guido Ebner, Eiken, and Heinz Schürch, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

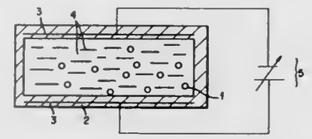
**Filed Jun. 19, 1989, Ser. No. 369,483**
**Int. Cl.[5] A01K *63/00***
**U.S. Cl. 119—3** **17 Claims**

6. A method of inducing desirable and useful properties in fish, which comprises:

a) producing an electrostatic field by means of capacitor plates which are insulated against water acting as dielectric medium and whereby the flow of current is prevented;

b) exposing early development stages of the fish to said electrostatic field under controlled conditions such as to induce lasting useful and desirable properties in the fish; and





c) keeping said early development stages of the fish in said electrostatic field for a period of time suitable for inducing the desirable and useful properties in the fish.

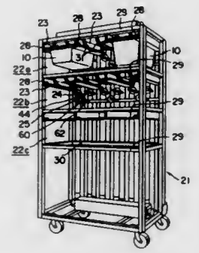
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**5,048,459**

## APPARATUS FOR RAISING EXPERIMENTAL ANIMALS

**Motohiro Niki; Mieko Niki; Etsuko Niki; Misako Niki, all of 2-22-11, Yushima, Bunkyo-Ku, Tokyo-To, Japan, and Kap J. Lee, R.R. #1, Box 123, Grand Forks, N. Dak. 58201**

**Filed Oct. 25, 1990, Ser. No. 603,124**
**Claims priority, application Japan, Oct. 26, 1989, 1-277062**
**Int. Cl.[5] A01K *1/03***
**U.S. Cl. 119—17** **6 Claims**



1. An apparatus for raising experimental animals, comprising:

a cage rack;

cages for confining animals, each of the cages being adapted to be placed in a received position within the cage rack and including a casing, having an open top, and a lid separate from the casing, for closing the open top of the casing, the lid having an upper surface;

sliding means, mounted to the cage rack, for sliding the casing of the cage in a guiding direction to the received position within the cage rack; and

resilient depressing means, mounted to the cage rack, for engaging and resiliently depressing the upper surface of the lid of the cage toward the sliding means for positively holding the lid and the casing against movement.

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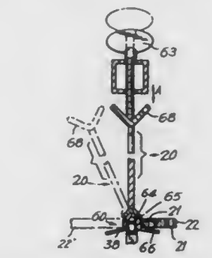
**5,048,460**

## MODULAR ANIMAL KENNEL

**John E. Sheaffer, Havre de Grace, Md., assignor to Lab Products, Inc., Maywood, N.J.**

**Filed Jun. 2, 1989, Ser. No. 360,519**
**Int. Cl.[5] A01K *1/00***
**U.S. Cl. 119—19** **17 Claims**

1. A modular animal kennel comprising a plurality of fixed wall means, defining sides of a modular kennel, a frame mounted to said plurality of wall means, removable wall means for being releasably securably supported within the frame without permanent fastening means, the removable wall defining the kennel enclosure, a floor, floor support means integrally formed on at least one of said wall means and one said frame for supporting said floor therebetween, said floor support means including a formed beam having a convex surface, a first flange extending from a first side of the convex surface and a second flange extending from the opposed side of said convex surface forming a smooth concave transition between said at least one wall means, said removable wall and said floor.



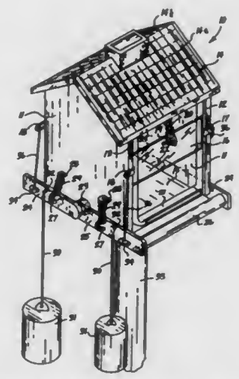
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**5,048,461**

## BIRD FEEDER APPARATUS

**John E. Wessner, 354 Peck St., Melbourne, Fla. 32901**

**Filed Jul. 23, 1990, Ser. No. 559,671**
**Int. Cl.[5] A01K *39/00, 39/022***
**U.S. Cl. 119—52.3** **1 Claim**



1. A bird feeding apparatus comprising, in combination,

a feed structure provided with at least one opening, the feed structure including spaced parallel side walls arranged coextensively relative to one another and including a floor mounted orthogonally relative to and between the side walls, and

a roof mounted to the side walls to overlie the floor, and the side walls including aligned side edges, and

a slide plate mounted reciprocatably and slidably along the side edges, and

the slid plate biased to a first raised position spaced above the floor and the slide plate repositionable to a second lowered position in contact with the floor, and

a perch rod means pivotally mounted relative to the feed structure from a first position in alignment with the floor to a second position spaced below the floor wherein the perch rod means is operatively associated with the slide plate to effect repositioning of the slide plate to the second position when the perch rod means is rotated to a second perch rod position, and

wherein the opening includes a respective right and left rail flange mounted to each aligned side edge of each side wall, wherein the right and left rail flanges are arranged orthogonally relative to each respective side wall, and the

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slide plate includes a respective right and left "U" shaped clip mounted to each respective right and left end of the slide plate, wherein each right and left clip is slidably mounted to each respective right and left rail flange, and

wherein the perch rod means includes a right and left leg, each right and left leg orthogonally and integrally mounted to each opposed end of the perch rod means and extending parallel to each respective side wall of the feed structure, and each right and left leg pivotally mounted relative to the feed structure, and each leg including a cable flange integrally mounted to an exterior surface of each leg, and each cable flange includes a slide plate cable secured at a lower terminal end of each slide plate cable to a respective cable flange of a respective right and left leg, with an upper terminal end of each slide plate cable mounted to a respective right and left "U" shaped clip, and

wherein the slide plate includes a flange plate mounted to an exterior surface of the slide plate, and the flange plate retaining a lower terminal end of a first retraction spring, and an upper terminal end of the first retraction spring mounted to the roof, and

including a support clip mounted to each right and left leg, and a side wall clip mounted to each side wall in alignment above each support clip when the perch rod means is in the first position, and a second retraction spring secured between the side wall clip and the support clip to bias the perch rod means in the first position, and

including a tether line, the tether line mounted to one of the right and left legs at an upper terminal end of the tether line, and a lower end of the tether line selectively secured to one of a plurality of counter-balance weights, and

including a concave trough mounted to the floor between the perch rod means and a forward terminal end of the floor.

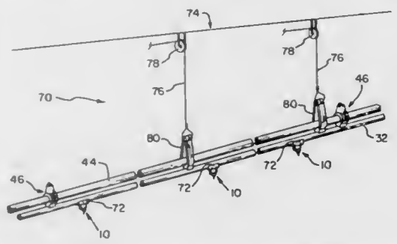
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**5,048,462**

## HANGER FOR WATER SUPPLY SYSTEM AND METHOD OF INSTALLATION

**Robert H. Hostetler, Goshen, Ind., assignor to Avtron Inc., Elkhart, Ind.**

**Filed Oct. 31, 1989, Ser. No. 429,226**
**Int. Cl.[5] A01K** *7/00*
**U.S. Cl. 119—72** **31 Claims**



1. A water supply system for fowl or small animals, comprising:

an elongate ballast member;

a tubular water supply conduit;

connecting means for rigidly attaching said conduit to said ballast member;

a plurality of valve means on said conduit for providing water to the fowl or small animals, said plurality of valve means in fluid communication with said conduit;

suspension means for suspending said ballast member and said conduit, said suspension means having a plurality of flexible lines extending downwardly; and

a plurality of hanger members slidably engaging and suspending said ballast member, each of said hanger members coupled to a corresponding one of said flexible lines so that said suspension means can suspend said ballast member and said conduit, each said hanger including a first and second arm capable of separation to allow said ballast member to pass through, each said hanger further including a latching means for releasably holding said first and second arms together at their upper ends, said latching means including a keeper having a latch portion located at said upper end of said first arm, and a snap edge located at said upper end of said second arm.

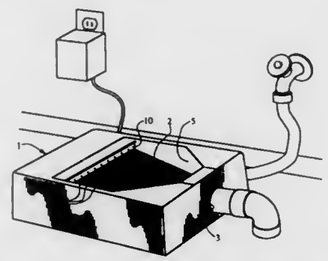
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**5,048,463**

## CONTROL SYSTEM FOR ACCESSORIES USED WITH SMALL ANIMALS AND PETS

**C. Carl Wilson, 2807 Illinois La., Manhattan, Kans. 66502, and Kevin D. Dutton, Morton, Ill., assignors to C. Carl Wilson, Manhattan, Kans.**

**Continuation-in-part of Ser. No. 368,576, Jun. 20, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 598,468**
**Int. Cl.[5] A01K** *1/00*
**U.S. Cl. 119—163** **11 Claims**



1. A control system for accessories used with small animals or pets comprising;

an accessory module with logic control and reset segment;

non-directional passive infrared detectors with accompanying interface circuits to verify the presence of said small animals or pets, said detectors mounted on structural elements associated with said accessory module; and

appropriate electrical connectors for said control system.

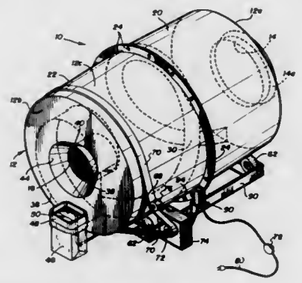
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**5,048,464**

## SELF CLEANING LITTER SYSTEM

**Kirk B. Shirley, 2705 Bay Meadow Cir., Dallas, Tex. 75234**

**Filed Aug. 31, 1990, Ser. No. 575,959**
**Int. Cl.[5] A01K** *1/01*; **B07B** *1/00*
**U.S. Cl. 119—166** **19 Claims**



1. A litter system comprising:

a chamber for containing a quantity of particulate litter, said chamber having a front wall and a rear wall, said front wall thereof including an aperture providing an entry way to said chamber for an animal;



a helical shaped screen disposed within said chamber and extending from adjacent said front wall to adjacent said rear wall for separating the litter from animal waste and for transporting the animal waste through said chamber; and

means for rotating said chamber, such that animal waste is transported through said chamber as said chamber rotates.

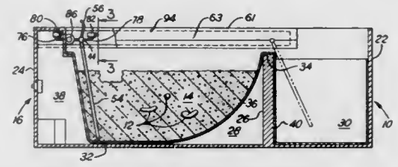
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**5,048,465**

## SELF-CLEANING KITTY LITTER BOX

**Angelo Carlisi, 759 Central Dr., Lake Orion, Mich. 48362**

**Filed Jan. 10, 1991, Ser. No. 639,277**
**Int. Cl.[5] A01K** *1/01*
**U.S. Cl. 119—166** **14 Claims**



1. A self-cleaning kitty litter box comprising:

a housing including an area for holding kitty litter said area having at one end an arcuate upwardly extending portion and a lip;

a rake including a plurality of pivotable tines movable laterally along the housing through the area for holding kitty litter;

means interacting with the rake as it approaches said end so as to rotate the tines along said arcuate upwardly extending portion until the rake passes beyond the area for holding kitty litter as lateral movement of the rake continues; and

dropping means located beyond said arcuate upwardly extending portion of the area for holding kitty litter interacting with the rake so to allow any solid waste collected by the tines as they pass through the area for holding kitty litter to be dropped outside the area for holding kitty litter.

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**5,048,466**

## SUPERCRITICAL PRESSURE BOILER WITH SEPARATOR AND RECIRCULATING PUMP FOR CYCLING SERVICE

**Alexander H. Rudd, deceased, late of Akron, Ohio by Phyllis G. Rudd, executrix , assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Nov. 15, 1990, Ser. No. 613,414**
**Int. Cl.[5] F22D** *7/00*
**U.S. Cl. 122—406.5** **11 Claims**

1. A system for cycling a once-through boiler which reduces thermal shocking of the pressure parts of the boiler upon start-up of the boiler from an idle condition after a brief shutdown, comprising:

a main fluid flow path having an economizer connected in series with a furnace;

a first auxiliary flow path connected to the main fluid flow path downstream of the furnace;

a separator in the first auxiliary flow path for separating fluid taken from the main fluid flow path into steam and water during said start-up of the boiler;

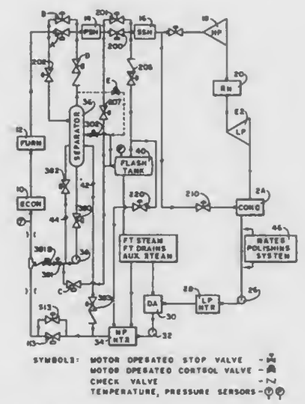
means for discharging steam from the separator into the main fluid flow path;

means for discharging water from the separator to a circulating pump in the first auxiliary flow path;

means for discharging water from the circulating pump into the main fluid flow path upstream of the economizer;

a second auxiliary flow path connected to the main fluid flow path downstream of the means for discharging steam from the separator into the main fluid flow path;

a flash tank in the second auxiliary flow path for separating fluid delivered thereto into steam and water during said start-up of the boiler;




means for discharging steam from the flash tank into the main fluid flow path; and

means for discharging water from the flash tank to heat recovery means in the main fluid flow path.

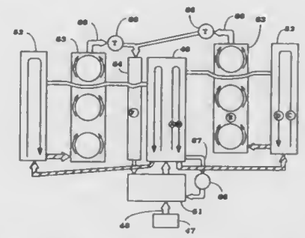
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**5,048,467**

## WATER JACKET ARRANGEMENT FOR MARINE TWO CYCLE INTERNAL COMBUSTION ENGINE

**Akinori Kojima, Shizuoka, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Feb. 16, 1990, Ser. No. 481,978**
**Claims priority, application Japan, Feb. 17, 1989, 1-36109**
**Int. Cl.[5] F02B** *75/18*
**U.S. Cl. 123—41.74** **4 Claims**



1. A cooling arrangement for a liquid cooled two cycle, crankcase compression, internal combustion engine having a cylinder block with a cooling jacket, a cylinder head affixed to said cylinder block and having a cooling jacket, a crankcase, a scavenge passage in said cylinder block for conveying a charge from said crankcase to the combustion chamber thereof, an exhaust port in said cylinder block for delivering exhaust gases from the engine combustion chamber to the atmosphere, and a cooling jacket encircling said exhaust port, and means for circulating liquid coolant first through said exhaust port cooling jacket, then through cylinder head cooling jacket and then through said cylinder block cooling jacket, said cylinder block having an upper cooling jacket and a lower cooling jacket, said upper cooling jacket being spaced from the scavenge passage said means for circulating liquid coolant circulates the liquid coolant through said upper portion of said cylinder block

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cooling jacket before said lower portion of said cylinder block cooling jacket.

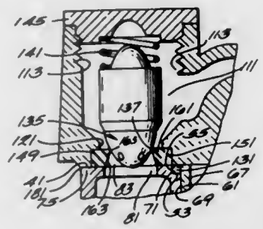
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5,048,468

## MARINE PROPULSION DEVICE WITH CLOSED DECK CYLINDER BLOCK CONSTRUCTION

George L. Broughton, Zion, Ill., and Paul W. Breckenfeld, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 509,609, Apr. 16, 1990, abandoned.
This application Sep. 14, 1990, Ser. No. 583,008
Int. Cl.[5] F02B 75/18
U.S. Cl. 123—41.74 8 Claims



1. An engine comprising a closed deck cylinder block including a cylinder bore having an outer end, a counter bore at said outer end of said cylinder bore, and an outer wall including an outer cylinder head mounting surface extending from said counter bore, a cylinder liner received in said cylinder bore and defining, with said counter bore, a U-shaped annular groove in said cylinder head mounting surface, a cylinder head including a cylinder block mounting surface engaged with said cylinder head mounting surface of said cylinder block, a seal member located in said annular groove and engaged with said cylinder block and said cylinder head, and a plurality of fasteners extending between and tightly securing together said cylinder block and said cylinder head.

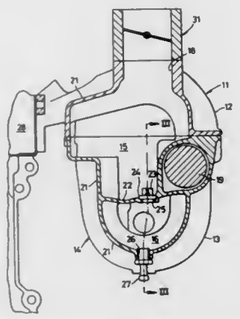
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5,048,469

## INTERNAL COMBUSTION ENGINE INLET MANIFOLD

Richard H. Spray, Studley, England, assignor to Rover Group Limited, United Kingdom

Filed Dec. 7, 1990, Ser. No. 626,619
Claims priority, application United Kingdom, Dec. 12, 1989, 8928044
Int. Cl.[5] F02M 35/10
U.S. Cl. 123—52 MB 6 Claims



1. An internal combustion engine inlet manifold comprising a housing defining a plenum and a vacuum reservoir separated by a common dividing wall, an inlet tract connected to and extending from the plenum for connection to an engine to be supplied with air and an inlet port to connect the plenum to atmosphere through a variable throttle, the reservoir having an outlet port for connection of the reservoir to a device requiring a source of vacuum, and a one way flow valve operable to permit the egress of air from said reservoir when the pressure in the plenum is lower than that subsisting in the reservoir but to prevent the flow of air from the plenum to the reservoir when the pressure in the plenum is higher than that subsisting in the reservoir.

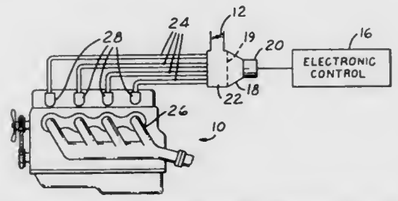
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5,048,470

## ELECTRONICALLY TUNED INTAKE MANIFOLD

Earl R. Geddes, Livonia, and Todd A. Gross, Dearborn Hts., both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1990, Ser. No. 633,734
Int. Cl.[5] F02M 35/10
U.S. Cl. 123—52 MB 25 Claims




1. An electronically controlled intake manifold system for an internal combustion engine, comprising:
- an intake manifold for conveying charge air to each of the cylinders of said engine;
- an electronically driven pressure pulse generator operatively connected with said manifold for the purpose of producing pressure pulses within the manifold at one or more frequencies related to an operating parameter of the engine; and
- a processor using at least one operating parameter of the engine to generate a signal for driving said pressure pulse generator.

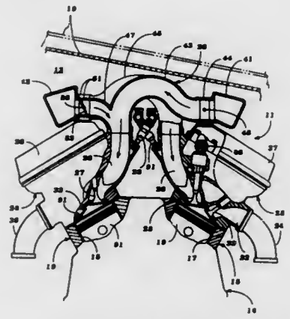
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5,048,471

## INTAKE SYSTEM FOR AUTOMOTIVE ENGINE

Osamu Takii, and Iwao Masumoto, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Continuation of Ser. No. 420,044, Oct. 11, 1989, abandoned.
This application Sep. 18, 1990, Ser. No. 585,283
Claims priority, application Japan, Oct. 12, 1988, 63-256569
Int. Cl.[5] F02M 35/10
U.S. Cl. 123—52 MV 13 Claims



1. An induction system for an internal combustion engine having a pair of angularly disposed cylinder banks each formed with at least one cylinder bore, a pair of cylinder heads each affixed to a respective one of said cylinder banks and closing the cylinder bore thereof, a pair of plenum chambers each lying generally vertically above a respective one of said cylinder heads, intake passages formed in said cylinder heads for supplying each cylinder bore thereof with an intake charge, a series of first intake runners extending from each of said plenum chambers to the intake passages of the adjacent cylinder head, a series of second intake runners extending from each of said plenum chambers to the intake passages of the remotely positioned cylinder head, said first intake runners being substantially shorter than said second intake runners, said first and said second intake runners being arranged in pairs with each of said pairs comprising a first and second runner merging together externally of said plenum chambers to form a common passage and opening communicating with a respective one of said intake passages.



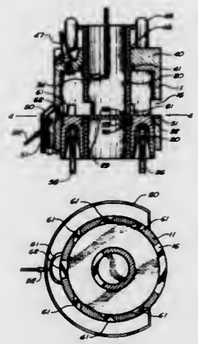
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5,048,472

## TWO STROKE CYCLE INTERNAL COMBUSTION ENGINE

Jiro Takashima, 7203 Schiller, Houston, Tex. 77055

Filed Aug. 3, 1990, Ser. No. 562,881
Int. Cl.[5] F02B 75/20
U.S. Cl. 123—59 AC 9 Claims



1. Two cycle internal combustion engine comprising: a cylinder, a cylinder head with an opening, a piston with an opening, and a sleeve which is axially displaced inside the cylinder extending through the cylinder head opening and the piston opening; said piston being slidably held between the inner wall of the cylinder and the outer wall of the sleeve to form an annular combustion chamber.

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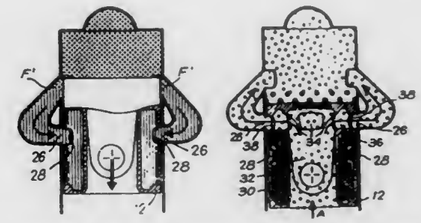
5,048,473

## METHOD AND APPARATUS FOR EQUIPPING A TWO-STROKE ENGINE WHICH IS SELF-SUPERCHARGED BY POST-CHARGING AND IN WHICH AN ADMISSION DUCT PROVIDES PRE-EXHAUST INTO A STORAGE CHAMBER

Rémi Curtil, 7, rue Fortuny 75017, Paris, France

PCT No. PCT/FR88/00155, § 371 Date Dec. 6, 1989, § 102(e) Date Dec. 6, 1989, PCT Pub. No. WO88/08073, PCT Pub. Date Oct. 20, 1988
PCT Filed Mar. 25, 1988, Ser. No. 432,750
Claims priority, application France, Apr. 6, 1987, 87 04757
Int. Cl.[5] F02B 75/02
U.S. Cl. 123—65 A 19 Claims

1. A method for self-supercharging by a post-charging effect with fresh charge, a two-cycle reciprocating piston internal combustion engine having at least one cylinder and piston mounted for reciprocation in the cylinder, comprising the steps of:
- exchanging pressure phases between an intake charge and an exhaust charge through a gas interface existing between said charges and which remains during a subsequent scavenging step, the exchanging occurring within a closed compressor system comprising the combustion chamber having at least one transfer port and at least one exhaust port; and
- partially pre-exhausting the combustion chamber through the transfer port into a transfer duct in communication with said transfer port with said transfer duct leading to a storage chamber located in said piston.



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5,048,474

## VALVE TRAIN FOR AUTOMOTIVE ENGINE

Yutaka Matayoshi, Yokosuka; Shigeru Kamegaya, Tokyo; Shigeru Sakuragi, Yokosuka; Hiroshi Komatsu, Zushi, and Kozaburo Okawa, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 13, 1990, Ser. No. 479,621
Claims priority, application Japan, Feb. 22, 1989, 1-42739; Mar. 1, 1989, 1-49176; Mar. 6, 1989, 1-53263; Mar. 9, 1989, 1-57388
Int. Cl.[5] F01L 1/30
U.S. Cl. 123—90.18 14 Claims

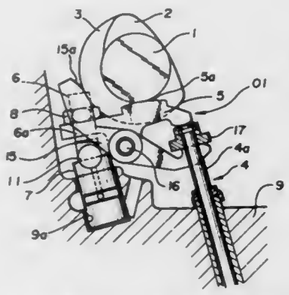
1. A valve train for an internal combustion engine comprising:
- a cam shaft, said cam shaft being operatively connected with a crank shaft of said engine;
- an opening cam, said opening cam being formed so as to have a cam profile which varies along the axis of said cam shaft;
- a closure cam, said closure cam being formed so as to have a cam profile which varies along the axis of said cam shaft;
- axial driving means for driving said cam shaft along its axis;
- an opening rocker arm, said opening rocker arm having formed thereon a valve stem engaging portion for engaging a valve stem of a poppet valve and for exerting a force thereon in an opening direction;
- an opening cam follower, said opening cam follower being formed on said opening rocker arm for direct engagement with said opening cam;
- a closure rocker arm, said closure rocker arm having formed thereon a valve stem engaging portion for engaging said valve stem of said poppet valve and for exerting a force thereon in a valve closing direction;

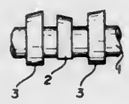
VOL 1130 ISS 3 SE 17 1991 UMI



a closure cam follower, said closure cam follower being formed on said closure rocker arm for direct engagement with said closure arm; and

wherein one of either said opening or closure rocker arms is pivotably connected to the cylinder head and the other of said opening or closure rocker arms is pivotably connected to said one rocker arm so as to be relatively pivotable, said one and the other rocker arms being pivotable at separate and distinct locations.





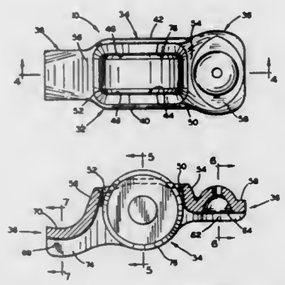
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**5,048,475**

**ROCKER ARM**

Jesse V. Mills, Toledo, Ohio, assignor to Henley Manufacturing Holding Company, Inc., Hampton, N.H.

Filed Jan. 17, 1991, Ser. No. 642,645
Int. Cl.[5] F01L *1/18*
U.S. Cl. 123—90.39 9 Claims



1. A rocker arm of the cam-follower type comprising a one-piece, cold-formed, elongate metal body having an intermediate portion, a first end portion, and a second end portion, said intermediate portion having two substantially parallel side walls, a large, elongate upper opening, and two top walls extending sharply downwardly from ends of said elongate opening, upper edge portions of said parallel side walls near said elongate opening being thinner than lower edge portions thereof and edge portions of said two top walls near said elongate opening being thinner than lower portions thereof, said first end portion having a top wall which is structurally integral with one of said two top walls and two short side walls of arcuate configuration as viewed from below said body, said first end portion top wall having a downwardly-facing recess therein with an opening extending through said first end portion top wall, said arcuate side walls being spaced apart farther than said parallel side walls, said second end portion of said body having a top wall and two side walls with the lower surface of said second end portion top wall being engagable with an upper end of a valve stem, said parallel side walls having aligned holes therein, an axle extending through said holes, and a roller rotatably mounted on said axle and being exposed at said elongate opening for engaging on overhead cam.

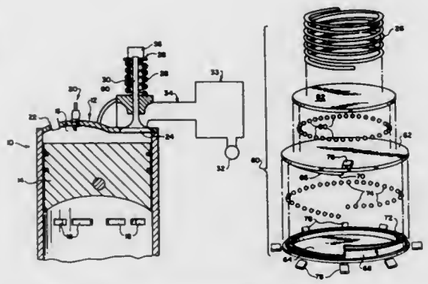
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**5,048,476**

**TWO-CYCLE INTERNAL COMBUSTION ENGINE**

William H. Crouse, 1285 Gulf Shore Blvd., Naples, Fla. 33940

Filed Oct. 11, 1990, Ser. No. 596,012
Int. Cl.[5] F16F *13/00*
U.S. Cl. 123—90.66 15 Claims



1. An internal combustion engine, comprising:

a cylinder;

a piston slidably mounted in said cylinder;

a cylinder head enclosing one end of said cylinder so as to define a combustion chamber within said cylinder between said piston and said cylinder head;

fuel injection means for allowing fuel to enter said combustion chamber;

intake means for allowing air to enter said combustion chamber;

ignition means for igniting a mixture of said fuel and said air in said combustion chamber;

at least one exhaust port for allowing burned exhaust gases to escape said combustion chamber;

said intake means comprising;

an aperture in said cylinder head;

a valve, having an elongated stem, capable of opening and closing said aperture;

an air pump forcing pressurized air into said cylinder through said aperture;

a spring, exerting a force on said valve, in opposition to a force created by said air pump, said valve opening when said pressure in said pressurized air exerts a force on said valve greater than a sum of forces exerted, on said valve, by said spring and a pressure in said cylinder due to motion of said piston; and

tension varying means for varying compression in said spring during a stroke and thus varying said force, exerted by said spring, so as to vary the duration of an open position of said valve during an engine cycle.



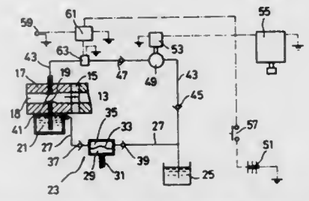
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**5,048,477**

**FUEL SUPPLY SYSTEM FOR AN ENGINE**

Minoru Wada, Nishitamagun; Tetsuo Yamagishi, Musashimurayama, and Isao Morooka, Oume, all of Japan, assignors to Komatsu Zenoah Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00682, § 371 Date May 8, 1989, § 102(e) Date May 8, 1989, PCT Pub. No. WO89/00239, PCT Pub. Date Jan. 12, 1989
PCT Filed Jul. 6, 1988, Ser. No. 330,081
Claims priority, application Japan, Jul. 6, 1987, 62-166862; Jan. 22, 1988, 63-10974; Jan. 22, 1988, 63-10975; Jun. 29, 1988, 63-85027
Int. Cl.[5] F02M *1/10*
U.S. Cl. 123—180 P 4 Claims



1. A fuel supply system for an internal combustion engine having a fuel tank, a combustion chamber defined in an engine cylinder, an intake air passage communicated to the combustion chamber and having a venturi portion, and a crankcase having an inside pressure which changes in response to cranking of the engine, comprising:

a main fuel passage communicating the fuel tank and the intake air passage;

first supply means provided on the main fuel passage for supplying main fuel from the fuel tank to the intake air passage responsive to cranking of the engine, wherein the first supply means comprises a diaphragm device for delivering fuel from the fuel tank into the intake air passage, the diaphragm device communicating with the crankcase so that the main fuel flows into and out of the diaphragm device in response to pressure changes in the crankcase;

a starting fuel passage communicating the fuel tank and the intake air passage, which is separate from the main fuel passage;

second supply means provided on the starting fuel passage for supplying an appropriate amount of starting fuel from the fuel tank into the intake air passage, in addition to the main fuel, in accordance with the temperature of the engine cylinder and upon starting of the engine, wherein the second supply means includes a pump for delivering starting fuel from the fuel tank to the starting fuel passage;

means for detecting the temperature of the engine cylinder; and

valve means provided between the pump and the intake air passage for controlling the starting fuel to be supplied into the intake air passage in accordance with the detected temperature of the cylinder;

wherein the main fuel passage and the starting fuel passage communicate with the venturi portion of the intake air passage so that both the main fuel and the starting fuel are supplied into the intake air passage at the venturi portion.

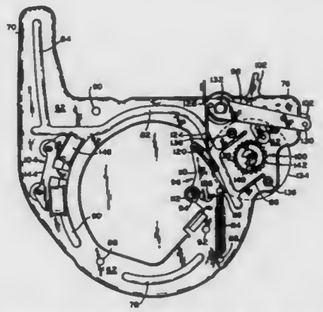
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**5,048,478**

**SINGLE CYLINDER ENGINE HAVING MULTI-FUNCTIONAL BRACKET AND METHOD OF ASSEMBLING SAME**

Kevin G. Bonde, Kiel; Mark T. Holschuh, Fond du lac, and Lee E. Roller, West Bend, all of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 379,485, Jul. 13, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,788
Int. Cl.[5] F02F *7/00*
U.S. Cl. 123—195 A 29 Claims



1. In a single cylinder air-cooled internal combustion engine having a crankcase, a crankshaft and a flywheel mounted thereto, said crankcase forming a bearing housing for said crankshaft, the improvement comprising:

a sheet metal bracket, separate from said crankcase, encircling said crankshaft and attached to the crankcase , said bracket having a plurality of accessory elements mounted thereto, said bracket overhanging said crankcase; and

pilot means attached to said bracket and said crankcase for accurately locating said bracket relative to said crankcase.

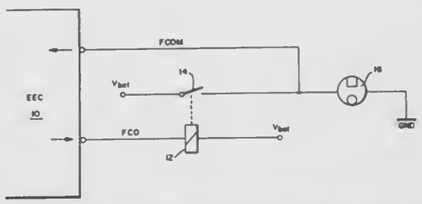
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**5,048,479**

**ELECTRONIC ENGINE CONTROL FOR A MOTOR VEHICLE**

Ralf-Michael Bartke, Bühl, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 3, 1990, Ser. No. 563,093
Claims priority, application European Pat. Off., Aug. 4, 1989, 89114452.9
Int. Cl.[5] F02B *77/00*
U.S. Cl. 123—198 D 9 Claims




1. In a motor vehicle equipped with an internal combustion engine having an electric fuel pump for supplying fuel to the engine, the fuel pump having terminals for receiving electrical energy for operating the pump, a method for testing a safety device provided for switching off the fuel supply to the engine

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when there is a fault condition, said safety device including a switching unit switchable for interrupting the supply of electrical energy to the pump, the method comprising the steps of:

supplying the electrical energy from a power supply to said fuel pump at said terminals across which a voltage is present when said electrical energy is supplied and across which a reaction voltage develops when the electrical energy supplied to said terminals is interrupted;

causing an electronic engine control unit to simulate a fault condition by applying a drive signal to said switching unit for switching said switching unit to interrupt the electrical energy to said terminals; and,

transmitting said reaction voltage to said electronic control unit thereby indicating proper operation of said switching unit or a malfunction of said switching unit when said reaction voltage is not transmitted to said electronic engine control unit in response to said drive signal applied to said switching unit.

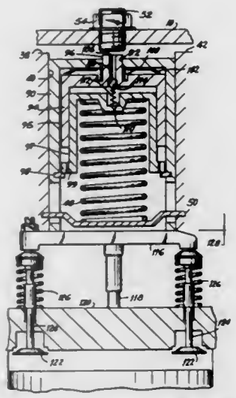
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**5,048,480**

## VARIABLE TIMING PROCESS AND MECHANISM FOR A COMPRESSION RELEASE ENGINE RETARDER

**Robert B. Price, Manchester, Conn., assignor to Jacobs Brake Technology Corporation, Wilmington, Del.**

**Filed Mar. 15, 1990, Ser. No. 493,968**
**Int. Cl.[5] F02D *9/06, 13/04***
**U.S. Cl. 123—321** **20 Claims**



1. In an engine retarding system of a gas compression release type including an internal combustion engine having a pressurized lubricating oil system, intake valve means, exhaust valve means and pushtube means associated with each of said intake valve means and said exhaust valve means, hydraulically actuated slave piston means associated with said exhaust valve means to open said exhaust valve means, adjusting means adapted to limit the travel of said slave piston means, control valve means and solenoid means communicating in series with said pressurized lubricating oil system and said hydraulically actuated slave piston means, master piston means driven from said pushtube means associated with one of said intake and said exhaust valve means and hydraulically interconnected with said slave piston means, the improvement comprising a variable timing means incorporated in said slave piston means and responsive to the hydraulic pressure acting on said slave piston means, said variable timing means comprising an intermediate piston means mounted for reciprocating motion within said slave piston means and having stop means adapted to extend through said slave piston means and abut against said adjusting means when said master piston is in a retracted position, said stop means having a bore formed therethrough, inner piston means mounted for limited reciprocating motion with respect to said intermediate piston means and said slave piston means, a check valve communicating with said bore of said stop means to permit flow of oil through said bore toward said inner piston means, first biasing means adapted to bias said intermediate piston means away from said slave piston means and second biasing means positioned between said slave piston means and said intermediate piston means and responsive to the hydraulic pressure above said slave piston means whereby the extension of said stop means through said slave piston means is proportional to the hydraulic pressure above said slave piston means.

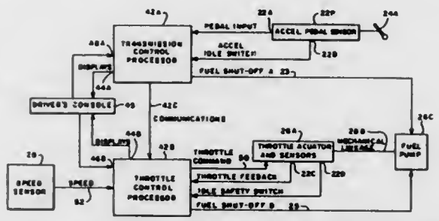
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**5,048,481**

## THROTTLE ACTUATOR SAFETY METHOD FOR AUTOMATED TRANSMISSION

**Kwok W. Chan, Chorley, England; William F. Coté, Windermere, Fla., and Louis E. Miller, Livonia, Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Filed Dec. 15, 1989, Ser. No. 451,392**
**Int. Cl.[5] F02D *41/22***
**U.S. Cl. 123—333** **6 Claims**



1. For use in a vehicle having an accelerator **24A**, a throttle responsive to throttle commands **(50)**, a fuel flow system, and an electronic control system **(10)** in which the functions are divided between a transmission control processor **(42A)** and a throttle control processor **(42B)**, a method for insuring safety, comprising the steps of:

ascertaining whether the processors **(42A, 42B)** are communicating properly **(90)**, and carrying out the remaining steps only if the processors are not communicating properly;

providing **(92)** a throttle command calling for idle;

sensing **(94)** the actual throttle position and providing a throttle position feedback signal **(22C)**;

sensing whether the throttle has returned to idle and providing a throttle idle safety signal **(22D)** accordingly;

stopping the flow of the fuel system **(26C, 96)** if at least one of the throttle position feedback signal **(22C)** and the idle safety signal **(22D)** indicate that the throttle is not at idle position.

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**5,048,482**

## DEVICE FOR CONTROLLING AN OPERATING CHARACTERISTIC OF AN INTERNAL COMBUSTION ENGINE

**Alfred Kratt, Schwieberdingen, and Eberhard Lang, Erligheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**PCT No. PCT/DE89/00532, § 371 Date Apr. 17, 1990, § 102(e) Date Apr. 17, 1990, PCT Pub. No. WO90/02258, PCT Pub. Date Mar. 8, 1990**
**PCT Filed Aug. 16, 1989, Ser. No. 477,882**
**Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828850**
**Int. Cl.[5] F02D *41/12, 41/22, 31/00***
**U.S. Cl. 123—333** **13 Claims**

1. An arrangement for controlling an operating parameter of an internal combustion engine having an air-intake pipe, the arrangement comprising:



actuating means for adjusting the air through-put passing to the engine through said intake pipe with said actuating means being adjustable to correspond to an idle condition of the engine and a drive condition of the engine;

idle-condition detection means for detecting the adjustment of said actuating means corresponding to said idle condition;

control means for controlling the fuel metered to the engine;

drive-condition detection means for detecting a drive condition critical to safety produced by a fault in said actuating means for adjusting the air flow to the engine during idle;

engine speed limiting means operatively connected to said control means and being actuable by said drive-condition detection means for limiting the speed of the engine; and,

said engine speed limiting means being effective in said idle condition and said drive condition and being adapted to emit an engine speed limit value increasing as a function of time as the engine passes from said idle condition to said drive condition.

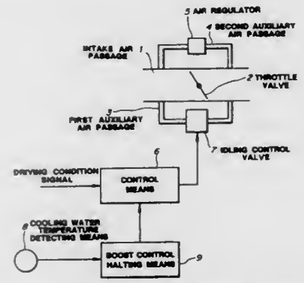
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**5,048,483**

## SYSTEM AND METHOD FOR CONTROLLING ENGINE REVOLUTIONS FOR VEHICULAR INTERNAL COMBUSTION ENGINE

**Shinsuke Nakazawa, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jan. 26, 1990, Ser. No. 470,631**
**Claims priority, application Japan, Jan. 27, 1989, 1-18695**
**Int. Cl.[5] F02M *3/09*; F02D *41/16***
**U.S. Cl. 123—339** **10 Claims**



1. A system for controlling an engine revolution for an internal combustion engine, comprising:

a) an air regulator installed in a first air intake passage bypassing an engine throttle valve and which opens according to an engine warmed-up condition;

b) an idling control valve, installed in a second air passage bypassing the throttle valve, through which an engine idling speed control and boost pressure control are carried out in response to a control signal;

c) first means for detecting a coolant water temperature; and

d) second means for subtracting a part of the control signal corresponding to the opening angle of the idling control valve based on the boost control from the control signal so as to suspend the boost control through the idling control valve when the coolant temperature is below a predetermined value.

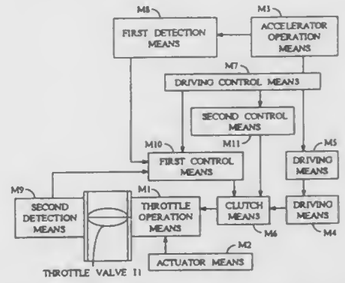
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**5,048,484**

## THROTTLE CONTROLLER

**Tadashi Terazawa, Toyota; Hiroshi Nakashima, Nishio, and Yoshinori Taguchi, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed May 15, 1990, Ser. No. 523,532**
**Claims priority, application Japan, May 29, 1989, 1-135254**
**Int. Cl.[5] F02D *11/10***
**U.S. Cl. 123—361** **4 Claims**



1. In a throttle controller having a throttle operation means for opening and closing a throttle valve, an actuator means for actuating said throttle operation means to close said throttle valve, an accelerator operation mechanism, a driving means for driving said throttle operation means to open and close said throttle valve, a driving source for rotating said driving means, a clutch means for engaging and disengaging said throttle operation means with and from said driving means, and a driving control means for engaging and disengaging said clutch means while controlling said driving source at least in response to accelerator operation of said accelerator operation means, the improvement comprising a first detection means, a second detection means, a first control means and a second control means, said first detection means outputting a signal corresponding to the amount of accelerator operation of said accelerator operation mechanism, said second detection means outputting a signal corresponding to the opening of said throttle valve, said first control means allowing said clutch means to have said driving control means disengage said throttle operation means from said driving means if said output signal from said first detection means indicates that the amount of accelerator operation is less than a predetermined level and if said output signal from said second detection means indicates that the opening of said throttle valve reflecting the accelerator operation at that point is in excess of a predetermined angle, said second control means being provided in parallel with and independent of said first control means and allowing said driving control means to control said clutch means.

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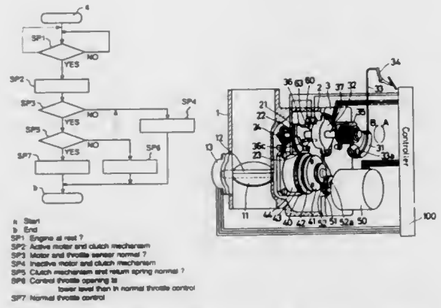


5,048,485

## THROTTLE CONTROL METHOD FOR INTERNAL COMBUSTION ENGINE

Tadashi Terazawa, Toyota; Hiroshi Nakashima, Nishio, and Yoshinori Taguchi, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 29, 1990, Ser. No. 529,610
Claims priority, application Japan, May 29, 1989, 1-135256
Int. Cl.[5] F02D *9/08, 41/02*
U.S. Cl. 123—399 2 Claims




1. A throttle control method for an internal combustion engine wherein a motor is connected through a clutch mechanism to a throttle valve which is constantly biased toward a closed position by a return spring, said motor being controlled in accordance with an output signal from a throttle sensor which detects a predetermined opening of said throttle valve, thereby controlling intake air into said internal combustion engine, and wherein said clutch mechanism is engaged and disengaged in accordance with a running condition of the vehicle and an operating condition of said internal combustion engine, said method comprising detecting an operating condition of said motor, said throttle sensor, said clutch mechanism and said return spring by activating said motor and said clutch mechanism, and deactivating both said motor and said clutch mechanism when an abnormality is detected in at least one of said motor, said throttle sensor, said clutch mechanism and said return spring, inhibiting starting and maintaining said internal combustion engine in an inoperative state when said motor and said clutch mechanism are activated in order to detect an operating condition of said motor, said throttle sensor, said clutch mechanism and said return spring.

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5,048,486

## IGNITION CIRCUIT WITH TIMING CONTROL

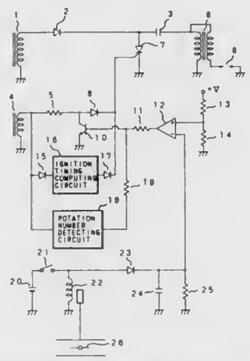
Hiroshi Okuda, Himeji, and Kyoichi Kamoshita, Yoshikawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Tohatsu Corporation, both of Tokyo, Japan

Filed Aug. 2, 1990, Ser. No. 561,749
Claims priority, application Japan, Aug. 3, 1989, 1-203226
Int. Cl.[5] F02P *5/06, 5/14*
U.S. Cl. 123—418 14 Claims

1. An ignition apparatus which determines an ignition timing corresponding to the running state of an internal combustion engine provided with a choke switch, comprising:

advance signal outputting means for outputting an advance signal of the ignition timing during a period when said choke switch is closed and for a predetermined period after said choke switch is opened; and

advancing means for advancing the ignition timing of said internal combustion engine on the basis of said advance signal outputted from said advance signal outputting means.



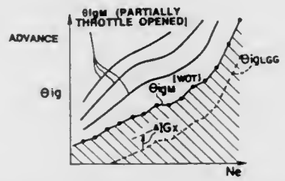

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5,048,487

## IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Sachito Fujimoto, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,458
Claims priority, application Japan, Sep. 12, 1989, 1-107080[U]
Int. Cl.[5] F02P *5/00*
U.S. Cl. 123—418 5 Claims




1. A system for controlling an ignition timing of an internal combustion engine, comprising:

first means for detecting operating condition of the engine;

second means for determining dwell angle of an ignition coil on the basis of the detected engine operating condition;

third means for determining a retard limit on the basis of the detected engine operating condition such that ignition timing of the engine is determined within the retard limit;

fourth means for calculating a ratio of the dwell angle to a prescribed angle and then for comparing the ratio with a reference value;

and

fifth means for changing the retard limit in the advance direction when the ratio is found to exceed the reference value.

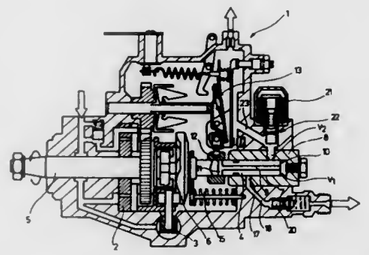


5,048,488

## METHOD AND APPARATUS FOR REDUCING THE RESIDUAL INJECTION FLUID IN AN INJECTION PUMP

Bernhard Bronkal, Koengen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 18, 1990, Ser. No. 629,144
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1990, 4006084
Int. Cl.[5] F02M *41/00*
U.S. Cl. 123—467 9 Claims



1. A method for reducing the amount of residual injection fluid within an injection pump for an internal combustion engine upon shutting off the engine, comprising the following steps:

closing a stop valve on the injection pump to cease the supply of injection fluid to the pump; and

then adjusting an injection timing mechanism to an early position in order to reduce the quantity of residual injection fluid within the pump.

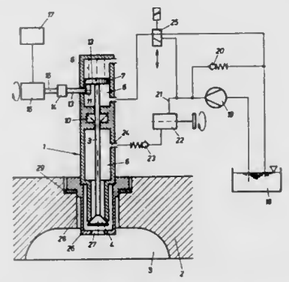
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5,048,489

## HYDRAULICALLY OPERATED VALVE WITH CONTROLLED LIFT

Christof D. Fischer; Diethard Plohberger, and Karl Wojik, all of Graz, Austria, assignors to Avl Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Apr. 11, 1990, Ser. No. 507,453
Claims priority, application Austria, Apr. 12, 1989, A865/89
Int. Cl.[5] F02M *49/02, 53/00, 61/16, 67/04*
U.S. Cl. 123—467 16 Claims



1. A hydraulically operated fuel/gas injection valve for an internal combustion engine with controlled lift, having a valve stem and a stop face fixed on said valve stem, wherein a stop cam is provided which is mechanically driven via a friction clutch and which cooperates with said stop face, maximum valve lift of said injection valve being set by rotating said stop cam through a defined angle, said stop cam being capable of contacting said stop face when said injection valve is in a closed position, and wherein a control unit is provided for control of a cam drive in accordance with an operational state of said internal combustion engine.

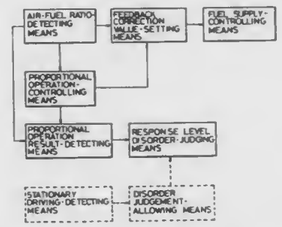
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5,048,490

## METHOD AND APPARATUS FOR DETECTION AND DIAGNOSIS OF AIR-FUEL RATIO IN FUEL SUPPLY CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

Shinpei Nakaniwa, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan

Filed Jun. 14, 1990, Ser. No. 537,630
Claims priority, application Japan, Jun. 16, 1989, 1-152423
Int. Cl.[5] F02D *41/14, 41/22*
U.S. Cl. 123—479 12 Claims




1. A method for the detection and diagnosis of an air-fuel ratio in a fuel supply control systems of an internal combustion engine, which system comprises air-fuel ratio-detecting means for detecting an air-fuel ratio of an air-fuel mixture sucked in the engine based on the concentration of exhaust components in an exhaust gas from the engine and is obstructed so that a fuel supply quantity is feedback-controlled to bring the air-fuel ratio detected by the air-fuel ratio-detecting means close to a target air-fuel ratio, said method comprising performing an operation of proportionally changing a feedback correction value for the feedback control of the fuel supply quantity over a mean value thereof when the air-fuel ratio detected by the air-fuel ratio-detecting means is reversed from the rich level to the lean level relative to the target air-fuel ratio or vice versa, detecting at least one of the time from the point of the start of the proportional changing operation to the point of the start of the change of the air-fuel ratio to the target air-fuel ratio and the ratio of the change of a detection signal of the air-fuel ratio-detecting means during the practice of the operational changing operation, and judging a disorder of the air-fuel ratio-detecting means when at least one of said time and ratio is not substantially equal in both the change directions of the air-fuel ratio.

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5,048,491

## AUTOMOBILE ENGINE CONTROL APPARATUS

Takashi Haiki, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 30, 1990, Ser. No. 574,683
Claims priority, application Japan, Aug. 30, 1989, 1-225935
Int. Cl.[5] F02M *51/00*
U.S. Cl. 123—479 9 Claims

1. An engine control apparatus for an internal combustion engine which has a plurality of cylinders in two groups and an electronic fuel injector provided for each of said cylinders, comprising:

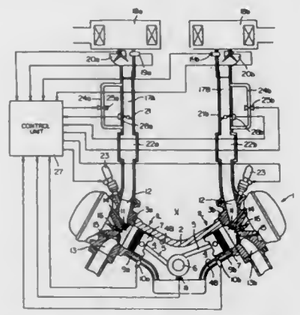
manifold means provided for each group of cylinders;

a pair of air flow meters for sensing an amount of intake air introduced into said internal combustion engine through each of said manifold means to provide a signal representative of said amount of intake air;

control means for providing each of said electronic fuel injectors with an injector control signal, said injector control signal determining the amount of fuel delivered by

said injectors, based on said signal representative of said amount of intake air, so as to deliver a mixture having a correct ratio of air to fuel into each of said groups of cylinders;

fault detecting means for detecting if either one of said air flow meters is at fault; and



control signal adjusting means for adjusting said injector control signal and providing an adjusted control signal;

wherein when said fault detecting means detects that one of said air flow meters is at fault, said adjusted control signal is provided to cylinders in one of said groups associated with said one of said air flow meters based on said signal provided by the other of said air flow meters.

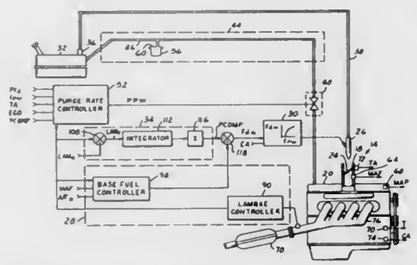
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**5,048,492**

## AIR/FUEL RATIO CONTROL SYSTEM AND METHOD FOR FUEL VAPOR PURGING

**Martin F. Davenport, Plymouth; Daniel V. Orzel, Westland, and Douglas R. Hamburg, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 5, 1990, Ser. No. 622,651**
**Int. Cl.[5] F02M** *25/08*
**U.S. Cl. 123—489** **15 Claims**



1. A control system for a vehicle having a fuel vapor recovery system coupled between a fuel supply system and an intake manifold of an internal combustion engine, comprising:

an exhaust gas oxygen sensor coupled to the engine exhaust providing a rich output indication when engine exhaust gases are richer than a predetermined value and providing a lean output indication when said engine exhaust gases are leaner than said predetermined value;

purging means coupled to the fuel supply system and the fuel vapor recovery system for purging a vapor mixture of fuel vapor and purged air into the engine air/fuel intake; and

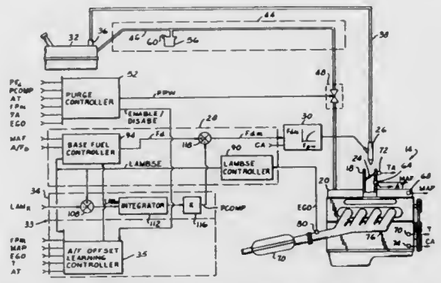
purge control means for increasing flow rate of said purged vapor mixture by a predetermined amount when said exhaust gas oxygen sensor changes from said rich output indication to said lean output indication.

**5,048,493**

## SYSTEM FOR INTERNAL COMBUSTION ENGINE

**Daniel V. Orzel, Westland; Martin F. Davenport, Plymouth, and Douglas R. Hamburg, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 3, 1990, Ser. No. 620,685**
**Int. Cl.[5] F02D** *41/04;* **F02M** *25/08*
**U.S. Cl. 123—489** **13 Claims**



1. A control system for a vehicle having a fuel vapor recovery system coupled between fuel supply system and an intake manifold of an internal combustion engine, comprising:

induction means for inducting a mixture of ambient air and liquid fuel into the air/fuel intake;

purging means coupled to the fuel supply system and the fuel vapor recovery system for periodically purging a vapor mixture of fuel vapor and purged air into the engine air/fuel intake;

adaptive learning means responsive to an air/fuel measurement of engine operation for measuring fuel vapor content in said purged vapor mixture;

feedback means coupled to an exhaust gas oxygen sensor for providing said air/fuel measurement, said feedback means also correcting said liquid fuel inducted into said engine in response to said air/fuel measurement and said fuel vapor content measurement; and

purge control means for stopping said purging when said fuel vapor content measurement is less than a preselected value.

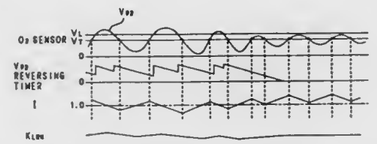
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**5,048,494**

## AIR-FUEL RATIO CONTROLLER

**Takanori Fujimoto, and Yoshiaki Kanno, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed May 31, 1990, Ser. No. 531,429**
**Claims priority, application Japan, May 31, 1989, 1-137954**
**Int. Cl.[5] F02D** *41/14*
**U.S. Cl. 123—489** **3 Claims**



1. An air-fuel ratio controller comprising:

oxygen content detecting means for detecting oxygen content of the engine exhaust gases,

deviation calculating means for calculating deviation between an objective oxygen content value corresponding to an objective air-fuel ratio and the detected value by said oxygen content detecting means,

integrating means for integrating the calculated values by said deviation calculating means,



smoothing means for smoothing the integrated values by said integrating means,

time measuring means,

comparing means for comparing the detected value by said oxygen content detecting means with a predetermined value, and making said time measuring means measure time according to the result of comparison, and

means for stopping said smoothing means when said comparing means does not make said time measuring means measure time during a predetermined period.

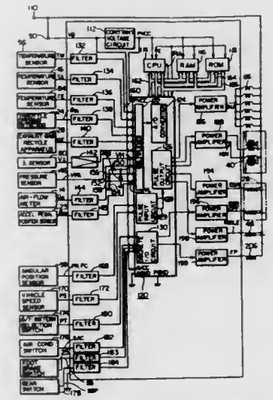
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**5,048,495**

## ELECTRONIC ENGINE CONTROL METHOD AND SYSTEM FOR INTERNAL COMBUSTION ENGINES

**Mikihiko Onari, Kokubunji; Motohisa Funabashi, Sagamihara; Teruji Sekozawa, Kawasaki; Takeshi Atago, Katsuta, and Makoto Shioya, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 420,697, Oct. 11, 1989, Pat. No. 4,996,965, and a continuation of Ser. No. 155,391, Feb. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 46,388, May 6, 1987, Pat. No. 4,853,720, and a continuation of Ser. No. 92,613, Sep. 3, 1987, Pat. No. 4,887,216. This application Jun. 5, 1990, Ser. No. 534,620**
**Claims priority, application Japan, Feb. 18, 1987, 62-33256**
**Int. Cl.[5] F02M** *51/00*
**U.S. Cl. 123—492** **53 Claims**



1. An electronic control method for a vehicle equipped with an internal combustion engine having a plurality of electronic engine control modes, including acceleration control mode, deceleration control mode, idle control mode, and air-to-fuel ratio control mode, comprising the steps of:

measuring the degree of depression of an accelerator and a brake of said vehicle, which is made to effect a change in the operating condition of the vehicle and the engine;

measuring the vehicle operating conditions, including the vehicle speed, engine RPM, engine intake fuel to air ratio, driveline torque and engine coolant temperature;

selecting one engine control mode among said plurality of engine control modes in accordance with said measured degree of said depression and one or more of said measured vehicle operating conditions, including said vehicle speed and engine RPM;

selecting a target among a plurality of target references, including target engine RPM, target air-to-fuel ratio, and target torque, in accordance with said selected engine control mode; and

controlling an operation of actuators, including a fuel injection volume actuator, an ignition timing actuator, and an intake air valve actuator, for controlling said engine in response to the selected target reference.

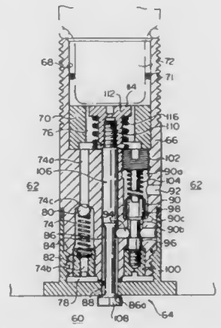
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**5,048,496**

## FUEL INJECTION SYSTEM FOR ENGINE AND METHOD FOR INJECTING FUEL

**Masanori Misumi, Hirosbima, and Michihiko Tabata, Ohtake, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jul. 20, 1990, Ser. No. 554,911**
**Claims priority, application Japan, Jul. 20, 1989, 1-188021**
**Int. Cl.[5] F02D** *9/00;* **F02M** *47/00*
**U.S. Cl. 123—531** **9 Claims**



1. A fuel injection system of an internal combustion engine comprising

air introducing means extending in one direction for introducing auxiliary air under pressure,

annular passage means of a disc-like space extending radially outwardly from the air introducing means and substantially perpendicularly to the air introducing means for introducing fuel for combustion,

annular opening means provided at inner end of the fuel annular passage means for injecting the fuel into the auxiliary air flowing in the air introducing means from position surrounding the auxiliary air flow at a right angle to the flowing direction of the auxiliary air so that the fuel is atomized to be mixed with the auxiliary air.

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**5,048,497**

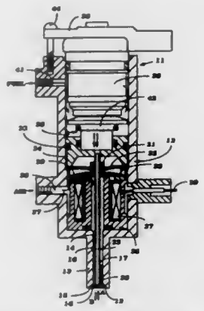
## FUEL INJECTION UNIT

**Hajime Kishida, and Takeo Yoshida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan**

**Filed Feb. 22, 1990, Ser. No. 483,119**
**Claims priority, application Japan, Feb. 22, 1989, 1-42561**
**Int. Cl.[5] F02M** *67/02, 55/00*
**U.S. Cl. 123—533** **14 Claims**

1. A fuel injection unit for injecting fuel and pressurized air to an engine for combustion comprising injection valve means moveable between an opened position and a closed position for controlling the flow of fuel and air to the engine, a source of pressurized air communicating with said injection valve means for discharge to the engine when said injection valve means is open, an intermittently operated fuel injector source of pressurized fuel for sequentially discharging fuel into said fuel injection unit and for discharge of fuel to the engine upon opening of said injection valve means, and control means for

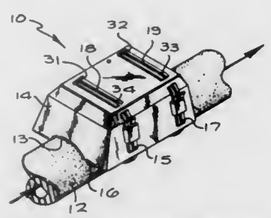
controlling the operation of said injection valve means and of said fuel injector so that fuel is not injected by said fuel injector



until said control means has operated said injection valve means to its open position.

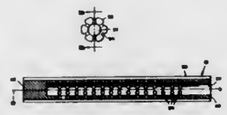
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**5,048,498**
**FUEL LINE CONDITIONING APPARATUS**
**Alan Cardan, 433 E. Lorraine St., Glendale, Calif. 91207**
**Filed Aug. 10, 1990, Ser. No. 565,552**
**Int. Cl.[5] F02B** *75/00*
**U.S. Cl. 123—538** **4 Claims**



1. A fuel conditioning apparatus for an internal combustion engine, said apparatus comprising:
fuel conditioning means for magnetically aligning the molecules of a hydrocarbon fuel mixture passing through a fuel intake of said engine, said conditioning means having a plurality of magnets; and
a housing to maintain said plurality of magnets in rigid position; and
means for affixing said housing to said fuel intake line, said plurality of magnets forming a focused magnetic field, said field polarizing said fuel mixture thereby causing alignment of said molecules;
said plurality of magnets further including a first pair of rectangular magnets stacked in polar alignment, a second pair of rectangular magnets stacked in polar alignment, a first and second disk magnet adjacently placed on said first pair in polar alignment with said first pair, a third and fourth disk magnet adjacently placed on said second pair in polar alignment with said second pair, said first pair positioned adjacent to said second pair with polarity of said first pair and second pair in the identical direction; and
said polarity of said plurality of magnets is of a positive degree of flux.

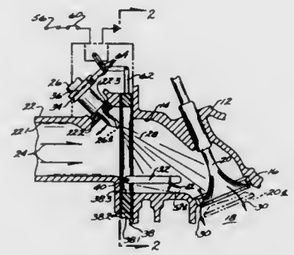
**5,048,499**
**FUEL TREATMENT DEVICE**
**Clark L. Daywalt, 6703 E. 27th St., Tulsa, Okla. 74129**
**Filed Mar. 29, 1990, Ser. No. 502,265**
**Int. Cl.[5] F02M** *27/00*
**U.S. Cl. 123—538** **22 Claims**



1. A fuel treatment device comprising:
an elongated element having an outer surface and a central axis extending between first and second ends in the direction of elongation, said element being made of an alloy containing the following metals: copper, zinc, nickel, lead and tin;
a central bore within said element and extending along the central axis from an inlet opening at the first end of said element to within a short distance of the second end of said element; and
a plurality of passages each extending through said element between the outer surface of the element and the central bore and providing flow communication between the central bore and said outer surface, each said passage having a cross-sectional area that is at least approximately an order of magnitude smaller than the cross-sectional area of the central bore and all the passages together having a cross-sectional area that is at least twice as large as the cross-sectional area of the central bore.

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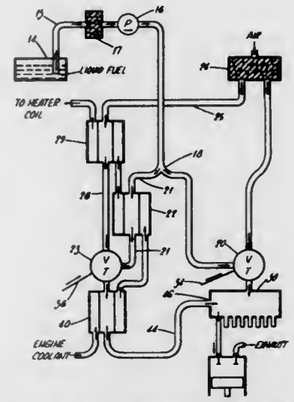
**5,048,500**
**INTERNAL COMBUSTION ENGINE WITH FUEL INJECTORS AND HEATERS**
**Jeffrey A. Curhan, Medway, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Aug. 22, 1990, Ser. No. 570,662**
**Int. Cl.[5] F02G** *5/00*; **F02M** *15/00*
**U.S. Cl. 123—549** **41 Claims**



1. Internal combustion engine comprising an inlet channel leading to a cylinder intake valve opening for furnishing an air-fuel mixture to an engine cylinder through the opening, a fuel injector for directing fuel into the inlet channel to be mixed with air in the channel to form an air-fuel mixture, a heating device arranged in the inlet channel for heating fuel received from the fuel injector, and means regulating the direction of fuel flow from the injector between a first path wherein the fuel is intercepted and heated by the heating device before being furnished to the engine cylinder when the engine is below a predetermined temperature and a second path permitting the fuel to be furnished to the engine cylinder without being intercepted by the heating device when the engine is above a predetermined temperature.



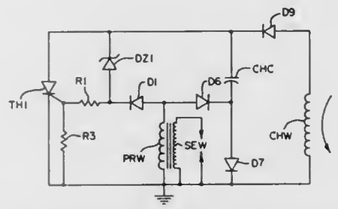
**5,048,501**
**FUEL ECONOMY SYSTEM FOR INTERNAL COMBUSTION ENGINES**
**Dale T. Smith, 604 Clarendon Ct., Troy, Ohio 45373, and C. George Amistadi, R.D. #1, Box 445, Dover, Ohio 44622**
**Filed Mar. 27, 1989, Ser. No. 329,192**
**Int. Cl.[5] F02M** *31/00*
**U.S. Cl. 123—554** **6 Claims**



1. A supplemental (add-on) air and fuel vaporization process and apparatus, for an internal combustion engine comprising, means for mixing air and supplemental fuel, and, supplying said mixture to a chamber that is a heat exchanger that is at least one of internally and externally heated, effecting vaporization of a portion of the supplemental fuel in said heated chamber, and combining the heated, partly vaporized fuel and air mixture with at least one of the conventional air of a fuel injected engine and air and fuel mixture, and supplying the total mixture to the combustion chambers for ignition.

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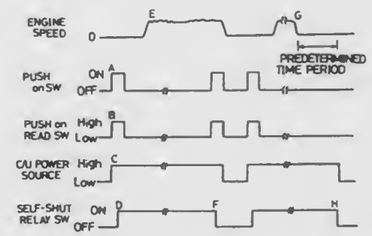
**5,048,502**
**CAPACITIVE-DISCHARGE IGNITION SYSTEM WITH STEP TIMING ADVANCE**
**Richard A. Dykstra, Cedar Grove, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.**
**Filed Sep. 5, 1990, Ser. No. 578,429**
**Int. Cl.[5] F02P** *3/08, 5/04*
**U.S. Cl. 123—602** **16 Claims**



1. An advancing capacitive-discharge ignition system for an internal combustion engine, comprising:
a charge capacitor;
an ignition thyristor in circuit connection with said charge capacitor and having a gate, an anode and a cathode, said charge capacitor discharging through said ignition thyristor;
a charge winding located on a leading pole of a stator, said charge winding generating an alternating charge winding signal having positive and negative voltage signals;
an ignition coil including a primary winding and a secondary winding, said primary winding generating an alternating primary winding voltage signal having a positive voltage signal, a leading negative voltage signal, and a trailing negative voltage signal, said primary winding located on a trailing pole of a stator;
first gate control means for gating on said ignition thyristor at low engine speeds; and
second gate control means for gating on said ignition thyristor at high engine speeds to advance ignition timing.

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**5,048,503**
**AUTOMATIC POWER INTERRUPTING SYSTEM FOR VEHICULAR CONTROL CIRCUIT**
**Kazuo Suzuki, Tokyo, and Yoshiki Yuzuriha, Isesaki, both of Japan, assignors to Fuji Heavy Industries, Ltd., Tokyo and Japan Electronic Control Systems Co., Ltd., Isesaki, both of, Japan**
**Filed Oct. 26, 1990, Ser. No. 603,448**
**Claims priority, application Japan, Jan. 12, 1989, 1-138636**
**Int. Cl.[5] F02P** *11/00*
**U.S. Cl. 123—632** **2 Claims**




1. An automatic power interrupting system for a vehicular control circuit, comprising: a relay switch having a normally open contact connected between a power source and the supply terminal of a control circuit and a relay coil connected with said power source; a normally open control switch connected between said power source and said supply terminal and with the signal input terminal of said control circuit and adapted to be turned on only when an external force is applied thereto; revolution detecting means for detecting the revolutions of an engine; and switching means for turning on said relay switch, when the power is supplied to said control circuit, and off said relay switch after a predetermined time period by measuring the time period after the stop of the engine revolutions on the basis of a detection signal outputted from said revolution detecting means.

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**5,048,504**
**ARCHERY SUPPORT STAND**
**Jimmy D. Ballard, SSR Box 19, Weatherford, Tex. 76086**
**Filed Mar. 15, 1990, Ser. No. 493,639**
**Int. Cl.[5] F41B** *5/00*
**U.S. Cl. 124—86** **3 Claims**

1. An archery support stand for securing a plurality of arrows and an archery bow, comprising in combination,
a table member including an upper surface with spaced parallel sides, with first and second arrow mounting plates for vertically mounting the plurality of arrows thereon, wherein the first and second mounting plates are mounted upon the upper surface of the table member in a spaced relationship relative to one another;
an archery bow clamp means mounted to the upper surface of the table member for securing an upper portion of the archery bow, and a positioning clamp mounted on the upper surface of the table member spaced from the clamp means and in alignment with the clamp means for receiving a lower end of the archery bow, wherein the position-

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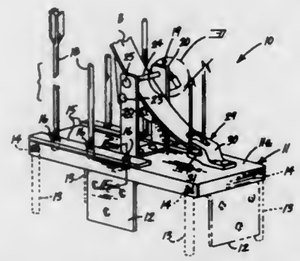


ing clamp includes a plurality of spaced jaws defining a gap therebetween for receiving the lower end of the archery bow;

wherein the first and second arrow mounting plates include plate members formed with a series of tapered bores directed orthogonally downwardly from an upper surface of the first and second plate members, wherein the bores are tapered and extend downwardly including a resilient polymeric liner laminated interiorly of the bores for protecting and securing arrow heads of the arrows therewithin while maintaining the arrows in a vertically aligned relationship relative to one another;

wherein the mounting plates are spaced adjacent the side walls at a forwardmost portion of the upper surface of the table member;

wherein the archery bow clamp means comprises a "U" shaped bracket mounted on the upper surface between the plate members, the bracket including spaced parallel legs, wherein the spaced parallel legs are formed with a first



pair of bores with a single bore directed through each leg of the bracket, and a pivot pin mounted through the bores, wherein the pivot pin includes a support block rotatably mounted on the pivot pin, wherein the pivot block includes an upper arcuate surface for receiving an upper arcuate portion of the archery bow, and the clamp means further including a lock pin spaced above and adjacent the arcuate surface with the lock pin directed through a further pair of bores with a single bore directed through each leg of the bracket in aligned relationship relative to one another, the further bores slidably receiving a lock pin therethrough with the lock pin formed with an enlarged head at one end and a pin aperture through its other free end, the lock pin defined by a predetermined length greater than a length between the legs of the bracket, wherein an aperture of the pin extends exteriorly of the bracket orthogonally relative thereto for receiving a lock member to selectively secure the lock pin relative to the bracket.

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**5,048,505**

**COOKING AND STORING APPARATUS**

**Paul W. Hait, Sun River, Oreg., assignor to Pyromid, Inc., Redmond, Oreg.**

**Filed Mar. 14, 1991, Ser. No. 669,660**

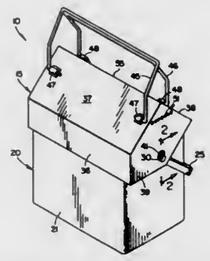
**Int. Cl.[5] F24C *1/16***

**U.S. Cl. 126—9 R** **16 Claims**

1. A portable cooking and storing apparatus comprising:

(a) a storage unit;

(b) a cooking unit disposed on said storage unit to form a portable assembly for transporting; and



(c) latch means between said storage unit and said cooking unit for detachably securing said cooking unit to said storage unit.

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**5,048,506**

**CONTAINER FOR HEATING CANNED FOOD AND CAN MAIN BODY USED THEREFOR**

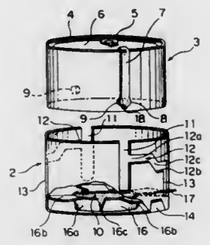
**Yuichi Hayasbi, Soka, Japan, assignor to Koshin Shoji Co., Ltd., Tokyo, Japan**

**Filed Dec. 28, 1990, Ser. No. 635,010**

**Claims priority, application Japan, Oct. 6, 1990, 2-105484[U]**

**Int. Cl.[5] A47G *23/04***

**U.S. Cl. 126—262** **5 Claims**



1. A container for heating canned food comprising a heater casing having a hollow cylindrical member for containing a solid fuel at the bottom and a can main body which can be fit into and pulled out of said heater casing, wherein

said can main body has a lid which can be detached from the can main body along a cut line, one or more of protrusions formed integrally on the side of the can main body and a safety metal stripe having a base end integrally connected to the lid, a top end formed with a recess for covering one of said protrusions, and a portion which is provisionally connected to the side or the protrusion of the can main body and can be released therefrom when said stripe is pulled downward from above, and

said heater casing has one or more of vertical guide grooves for integrally receiving the protrusions on the can main body and the recess of the safety metal stripe covering the protrusion, and one or plurality stages of lateral engaging grooves formed in communication with said vertical groove for engaging the protrusion of said can main body.



**5,048,507**

**ENDOTHERMIC BUILDING**

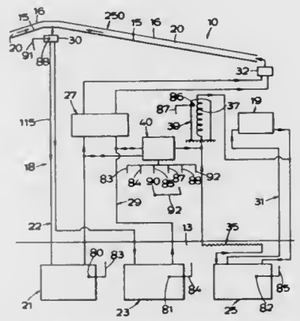
**Alan H. Ridett, 42a High Street, Newport, Isle of Wright, England P030 1SF**

**Filed Feb. 5, 1990, Ser. No. 475,174**

**Claims priority, application United Kingdom, Feb. 7, 1989, 8902662**

**Int. Cl.[5] E04D *13/18***

**U.S. Cl. 126—430** **13 Claims**



1. A building supported by a foundation structure, and provided with:

(a) solar heated heat exchanger means,

(b) heat store means disposed within the foundation structure,

(c) a circulation system including heat pump means.

(d) the system being operable to convey a heat transfer liquid around a plurality of paths, which paths connect the heat exchanger means with the heat store means,

(e) the system constituting primary and secondary circulatory sub-systems,

(f) each sub-system comprising:

(i) a heat store separate from, and maintained at a temperature different from that of, the heat store of the other sub-system,

(ii) conduit means interconnecting the two heat stores with said heat pump means whereby heat can be transferred between the heat stores, by transfer of said heat transfer liquid, from one heat store to the other heat store, and vice versa, and

(iii) control means operable to control said heat transfer between the heat stores.

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**5,048,508**

**ENDOSCOPE HAVING SEALED SHAFT**

**Karl Storz, Auf dem Scbildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany**

**Filed Aug. 13, 1990, Ser. No. 566,580**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942905**

**Int. Cl.[5] A61B *1/00***

**U.S. Cl. 128—4** **4 Claims**

1. An endoscope, comprising:

(a) an endoscope shaft;

(b) a periscope;

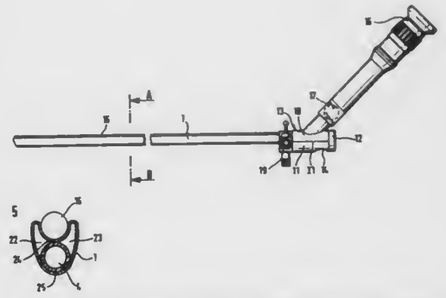
(c) optics removably secured to said endoscope shaft and separable from said endoscope shaft; and

(d) an instrument channel having an apertured cap through which treatment instruments are introduced into said instrument channel under visual control via said optics;

(e) said endoscope shaft having:

(i) a hollow interior;

(ii) a substantially kidney-shaped cross-section with a substantially semicircular upper surface portion for partial external reception of a catheter in said semicircular upper surface; and



(iii) a lower surface within said hollow interior retaining said periscope thereon.

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**5,048,509**

**CERVICAL SUPPORT**

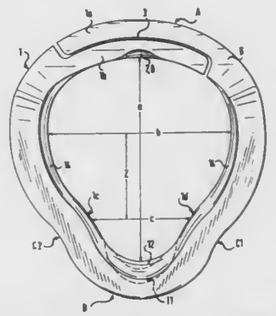
**Jaana Grundei, Lübeck, and Andreas Timmermann, Ekelsdorf, both of Fed. Rep. of Germany, assignors to Adev Gesellschaft fur Entwicklung und Vertrieb von Medizintechnischen Artikeln mbH, Lübeck, Fed. Rep. of Germany**

**Filed Feb. 12, 1990, Ser. No. 478,354**

**Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906233**

**Int. Cl.[5] A61H *1/02*; A61F *5/04***

**U.S. Cl. 128—75** **14 Claims**



1. A cervical support provided by a substantially stable support body of elastic foam material, for encircling the neck of the wearer, the cervical support comprising:

a rearward nape support region having free end pieces which are detachably connectable to each other in overlapping relationship to secure the cervical support about the wearer's neck;

a forward, chin support region opposite to said nape support region and being of smaller height than said nape region; and

two lateral, opposed jaw support regions between said nape region and said chin support region and having upper and lower marginal contours configured to the anatomical

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shape of the chin, and of the wearer's body area proximate to the neck, respectively;

wherein as seen from above the surgical support, the nape support region is of bowed shape and merges on a major transverse axis of said body with said jaw support regions, which are arranged in mirror image, symmetrical, relationship with each other on either side of a longitudinal axis bisecting said nape and chin support regions and extending at right angles to said major transverse axis, each jaw support region defining an arc projecting inwardly of said body proximate to a minor transverse axis thereof parallel to said major transverse axis and being spaced therefrom, said chin support region substantially defining an arc of a circle, and

wherein the length of said major transverse axis is approximately 0.80 to 0.95 of the length of said longitudinal axis, the length of said minor transverse axis being approximately 0.5 to 0.7 of the length of said longitudinal axis.

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**5,048,510**

## INFLATABLE PENILE PROSTHESIS WITH SATELLITE RESERVOIR

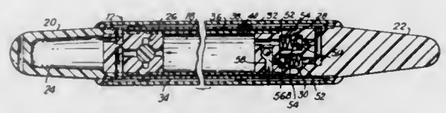
**Sidney F. Hauschild, Hendricks; John C. Hill, Minnetonka, and Dezso K. Levius, Bloomington, all of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.**

**Filed Aug. 29, 1988, Ser. No. 237,926**

**The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.**

**Int. Cl.[5] A61F** *2/26*

**U.S. Cl. 128—79** **7 Claims**



1. An implantable penile prostheses comprising:

1) a generally tubular body implantable within one or each of the corpus cavernosa of the penis to simulate a natural erection; and

2) a fluid reservoir implantable in a patient's body in fluid communication with said tubular body;

said tubular body comprising:

a generally tubular chamber inflatable from a flaccid to an erect state when filled with a fluid substantially to capacity and deflatable from the erect state to the flaccid state when substantially free of fluid, said tubular chamber being in fluid communication with said fluid reservoir through a second passageway which is defined by a conduit extending axially along the length of said tubular body externally of said tubular chamber;

a manually actuatable valve system for controlling fluid flow between said tubular chamber and said fluid reservoir; and

a proximal section and a distal section;

said valve system comprising a first valve for controlling fluid flow from said tubular chamber to said fluid reservoir to attain the flaccid state, and a pump and a second valve to allow an irreversible fluid flow from said fluid reservoir to said tubular chamber to attain the erect state on compressing said pump, said pump located in said distal section and said second valve located in said proximal section, both of said pump and said second valve being in series with said tubular chamber along the length of said tubular body, said pump and said second valve being in fluid communication through a first passageway which is in fluid isolation from said second passageway defined by a conduit extending axially along the length of said tubular body externally of said tubular chamber.

**5,048,511**

## METHOD AND APPARATUS FOR TREATING IMPOTENCE

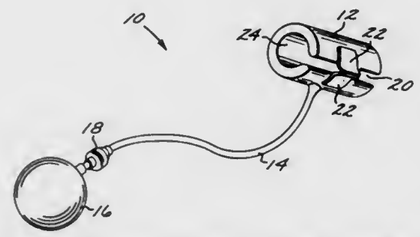
**Robert F. Rosenbluth, Laguna Nigvel, and Brian J. Cox, Lake Forest, both of Calif., assignors to Advanced Surgical Intervention, Inc., San Clemente, Calif.**

**Continuation of Ser. No. 418,286, Oct. 6, 1989, Pat. No. 4,958,630. This application Sep. 25, 1990, Ser. No. 588,090**

**The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.**

**Int. Cl.[5] A61F** *2/26*

**U.S. Cl. 128—79** **24 Claims**



1. A device for treating impotence in a human male patient, comprising:

an inflatable cuff, implantable in the patient so as to receive and engage a portion of a corpus cavernosum of the patient; and

cuff actuation means, implantable in the patient, and operable by the patient, for selectively inflating and deflating the cuff, thereby selectively and reversibly restricting the blood flow through the corpus cavernosum, the cuff actuation means comprising:

a fluid-filled squeeze bulb;

conduit means for providing fluid communication between the bulb and the cuff; and

valving means for allowing the flow of fluid through the conduit means from the bulb to the cuff in response to the collapsing of the bulb due to the application of external pressure thereto, the valving means including a housing defining a fluid flow path between the bulb and the conduit means, and a valve element in the housing, movable between a first position in which the valve element is closed against a valve seat, thereby closing the fluid flow path, and a second position opening the fluid flow path, the valve element being movable from the first position to the second position in response to the pressure-induced collapsing of the bulb;

biasing means in the housing and engageable against the valve element, for biasing the valve element against the valve seat; and

manual valve actuation means, operably associated with the valving means, for selectively moving the valve element from the first position to the second position in response to manual operation, thereby to allow the flow of fluid through the conduit means from the cuff to the bulb, the manual valve actuation means comprising:

means defining a flexible portion of the housing;

a push-button seated in the housing so as to be manually operable, the push-button including a protuberance that is engageable against the flexible portion; and

valve element engagement means disposed on the flexible portion so as to be operably engageable against the valve element to displace the valve element from the valve seat in response to the flexing of the flexible portion when the push-button is operated to engage the protuberance against the flexible portion.



**5,048,512**

## GASTROSTOMY TUBE PROTECTOR AND HIDER

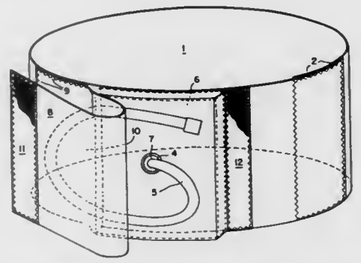
**W. Richard Turner, and Linda T. Turner, both of 1677 S. 1806 W., Heber City, Utah 84032**

**Filed Apr. 16, 1985, Ser. No. 723,919**

**The portion of the term of this patent subsequent to Nov. 17, 2003, has been disclaimed.**

**Int. Cl.[5] A61B** *19/00*

**U.S. Cl. 128—876** **2 Claims**



1. A gastrostomy tube protector and hider comprising

a body band of flexible sheet material having opposite ends and means on said opposite ends for releasably securing said ends together, and a hole therethrough intermediate the ends of the waist band

a pad of resilient foam fixed to the waist band intermediate the opposite ends thereof, said pad having a hole therethrough overlying and aligned with the hole through the waist band;

a flap of flexible material having one side thereof hingedly connected to the waist band at one side of the pad; and

means on an opposite side of the flap and on the waist band at an opposite side of the pad to releasably secure the opposite side of the flap to the waist band, with the flap overlying the resilient pad.

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**5,048,513**

## BANDAGE CONSISTING OF ELASTICATED TEXTILE MATERIAL

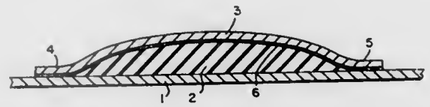
**Holger Reinhardt, Kampen, Fed. Rep. of Germany, assignor to Bauerfeind GmbH & Co., Kempea, Fed. Rep. of Germany**

**Filed Sep. 21, 1989, Ser. No. 410,652**

**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1988, 3832438**

**Int. Cl.[5] C08G** *18/10*

**U.S. Cl. 128—156** **13 Claims**



1. A bandage formed of elastic textile material, said elastic textile material being provided with a cushion covered by an overlay of an elastic textile material and which is secured to the elastic textile material of the bandage by means of border areas which project over the cushion, characterized in that:

the overlay (3) is provided, on the side facing the cushion (2), with an elastic thermoplastic synthetic coating (6), the softening temperature of said coating being less than that of said elastic textile material, said overlay being adhered to the elastic textile material (1) of the bandage in the region of the border areas (4, 5) by heating.

**5,048,514**

## INHALER FOR MEDICAMENTS CONTAINED IN CAPSULES

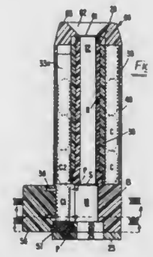
**Luca Ramella, Milan, Italy, assignor to Somova S.p.A., Milan, Italy**

**Filed Jul. 3, 1990, Ser. No. 547,180**

**Claims priority, application Italy, Jul. 7, 1989, 21132 A/89**

**Int. Cl.[5] A61M** *15/00*

**U.S. Cl. 128—203.21** **11 Claims**



1. A device for administering inhalation medicament in a capsule, said device comprising:

an inhalation device main body including a tubular portion having an inhalation passage extending therein, and a base portion defining a chamber therein adapted to accommodate a capsule and communicating with said inhalation passage and the exterior of the main body;

a magazine supported on said main body, the magazine defining a plurality of bores therein adapted to accommodate a plurality of capsules;

a slider slidably mounted to the base portion of said inhalation device main body and defining a capsule seat therein adapted to accommodate a capsule,

said slider being slidable relative to said base portion and to said magazine between a filling position at which said capsule seat is aligned with a respective one of the bores of said magazine and a loading position at which said capsule seat is located in said chamber;

a capsule piercing means for piercing a capsule accommodated in said capsule seat while said slider is located between the filling position and the loading position; and

a mouthpiece located at an end of the tubular portion of said inhalation device main body that is remote from the base portion thereof.

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**5,048,515**

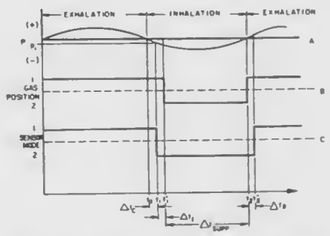
## RESPIRATORY GAS SUPPLY APPARATUS AND METHOD

**David W. Sanso, 701 Harlan-E38, Lakewood, Colo. 80214**

**Filed Nov. 15, 1988, Ser. No. 271,525**

**Int. Cl.[5] A61M** *16/00*

**U.S. Cl. 128—204.26** **34 Claims**




1. A method for supplying supplemental respiratory gas

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through a single hose cannula to an in vivo respiratory system, comprising the steps of:

A. connecting a means for sensing pressure to the cannula hose to measure pressure within the cannula hose;

B. monitoring the pressure within the cannula hose until a time, $t_O$, of an initial occurrence of a pressure less than atmospheric pressure;

C. continuing to monitor the pressure for a predetermined period of time, $\Delta t_c$, until a time $t_1$;

D. determining the magnitude of a pressure, $P_1$, occurring within the cannula hose during the period of time $\Delta t_c$;

E. at time $t_1$, disconnecting the pressure sensing means for the cannula hose;

F. waiting a predetermined period of time $\Delta t_1$, until a time $t_1'$;

G. at time $t_1'$, connecting a source of supplemental gas to the cannula hose to begin a supplemental gas administration interval of providing supplemental gas to the in vivo respiratory system;

H. continuing to provide supplemental gas to the in vivo system for a time interval $\Delta t_{sup}$, based upon the value $P_1$, in accordance with a predetermined relation, until a time $t_2$;

I. at time $t_2$, disconnecting the source of supplemental gas from the cannula hose to end the supplemental gas administration interval;

J. waiting a predetermined period of time $\Delta t_2$ until a time $t_2'$;

K. at a time $t_2'$, reconnecting the pressure sensing means to the cannula hose to again monitor the pressure within the cannula hose; and,

L. successively repeating steps A through K a plurality of times to provide supplemental gas to the in vivo respiratory system on a continuing basis.

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**5,048,516**

## RESPIRATORY MASK

**Stig Söderberg, St. Spelbo, S-680 96 Lesjüfors, Sweden**

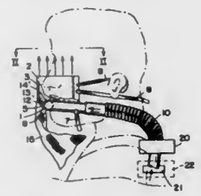
**PCT No. PCT/SE88/00380, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO89/00874, PCT Pub. Date Feb. 9, 1989**

**PCT Filed Jul. 14, 1988, Ser. No. 460,182**

**Claims priority, application Sweden, Jul. 28, 1987, 8702983**

**Int. Cl.[5] A62B** *18/02*

**U.S. Cl. 128—205.25** **12 Claims**



1. A respiratory mask for supplying air from an external air source to a user comprising:

a face shield covering a portion of the user's face, including a substantially vertical front portion covering the user's nose and mouth, first and second side portions having side edges sealingly engaging the user's cheeks, an upper portion having an upper edge, and a bottom portion having a bottom edge;

means for supplying the air to said face shield, including a first air hose extending from the external air source and penetrating one portion of said face shield, and a second air hose connected to said first air hose and having a peripheral surface curved in a substantial U-shape sealingly engaging the user's face proximate and directly below the user's lower lip, and a plurality of nozzle openings in said surface for distributing the air within said face shield, said bottom portion of said face shield being fixed to said peripheral surface of the second air hose to prevent escape of the air from said bottom portion of said face shield.

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**5,048,517**

## RECIRCULATING POSITIVE-PRESSURE RESPIRATOR

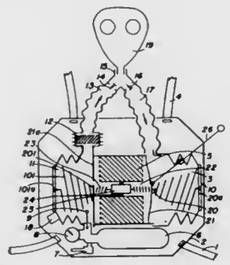
**Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany**

**Filed Jan. 19, 1990, Ser. No. 467,643**

**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 3901581**

**Int. Cl.[5] A62B** *7/10*

**U.S. Cl. 128—205.28** **5 Claims**



1. A respirator for recirculation operation, comprising: a respiratory circuit including an expiration line; an expiration bag connected to said expiration line; internally disposed tension spring in said expiration bag for compressing said expiration bag; an inspiration gas line connected to an oxygen souce; a carbon dioxide binding chemical cartridge and said oxygen source arranged in said respiratory circuit between said inspiration bag and said expiration bag; and, an internally disposed pre-tensioning spring connected to said inspiration bag to compress siad inspiration bag.

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**5,048,518**

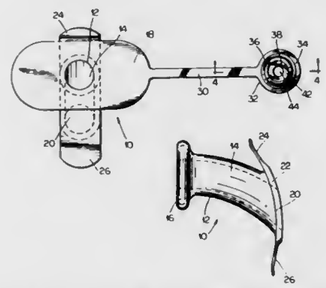
## STOMA STENT SYSTEM

**Isaac Eliachar, Pepper Pike; Dat Nguyen, Lyndhurst, both of Ohio; Charles Lane, Duxbury, and Lewis H. Marten, Quincy, both of Mass., assignors to Hood Laboratories, Pembroke, Mass.**

**Filed Jan. 4, 1990, Ser. No. 460,822**

**Int. Cl.[5] A61M** *16/00;* **A62B** *9/06*

**U.S. Cl. 128—207.14** **18 Claims**



1. A stoma stent system for the treatment of a patient after a tracheostomy comprising:

an elongated open tube for disposition in an incision made between the trachea of a patient and the environment to provide a path for an air flow; and

means for weaning a patient off of said stoma stent comprising modifying means for selectively modifying said air flow by selectively changing the air flow resistance in said tube

said tube having a tube diameter and said modifying means including a plurality of replaceable air restricting members, each member having a hole of a different size with a restriction diameter smaller than said tube diameter, said air flow resistance being modified by placing one of said replaceable air restricting members into said tube, wherein all the air flow passing from the tube passes through said hole.



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**5,048,519**

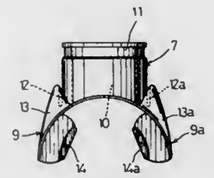
## MOUTHPIECE FOR DIVING

**Masatoshi Kasama, No. 21-404, 1 ban, Hanamigawa, Chiba-shi, Chiba-ken, Japan, and Yoshiaki Masubuchi, 92-10, Issiki, Hayamamachi, Miuragun, Kanagawaken, Japan**

**Filed Nov. 21, 1990, Ser. No. 618,334**

**Int. Cl.[5] A62B** *9/00*

**U.S. Cl. 128—207.14** **4 Claims**



1. A mouthpiece for diving comprising:

a tubular air guide provided with first and second end portions including left and right outside walls, said first end portion forms an engagement portion with which a regulator is engaged, said second end portion extends from said first portion and includes a pair of resilient supporting arm portions flexibly supported contiguously to the left and right outside walls of said second end portion of said tubular air guide upon which the teeth and the lips of a diver are supported when in use, each of said resilient supporting arm portions include stopper portions, said stopper portions including side portions formed between said stopper portions and the left and right outside walls of said first end portion of said sir guide, said stopper portions project along the left and right outside walls of said first end portion with a spacing therebetween, and said resilient supporting arms include means on an inside wall which are grasped by the teeth.

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**5,048,520**

## ULTRASONIC TREATMENT OF ANIMALS

**Robert E. Vago, Northbrook, Ill., assignor to Malmros Holding, Inc., Morton Grove, Ill.**

**Continuation-in-part of Ser. No. 175,936, Mar. 30, 1988, Pat. No. 4,942,868. This application Mar. 10, 1989, Ser. No. 322,128**

**The portion of the term of this patent subsequent to Jul. 24, 2007, has been disclaimed.**

**Int. Cl.[5] A61H** *1/00*

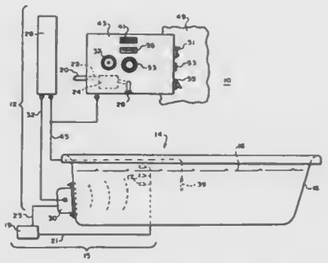
**U.S. Cl. 128—24 A** **24 Claims**

1. A method of treating an animal in a working fluid contained within wall means comprising the steps of:

transmitting ultrasonic vibrations at a power density in excess of 15 watts per square centimeter through the working fluid during a first time period in which no portion of the animal is immersed in said working fluid, whereby sterilization is provided to said working fluid;

immersing a body portion of the animal into the working fluid during a second time period different than the first time period with the portion being in acoustic contact with the fluid; and

applying ultrasonic vibrations through the working fluid to the portion of the body at a frequency in the range of 15 kilohertz to 100 kilohertz and a power density sufficiently



below 15 watts per square centimeter to avoid discomfort to the animal during the second time period.

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**5,048,521**

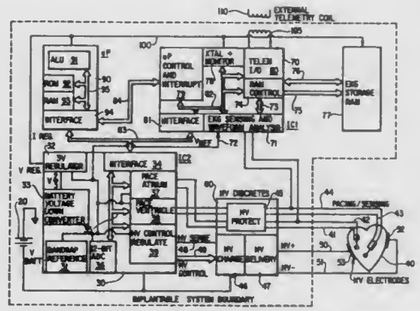
## METHOD FOR COMBINED CARDIAC PACING AND DEFIBRILLATION

**Benjamin Pless; Michael Sweeney, both of Menlo Park; Roger Winkle, Palo Alto, all of Calif., and Anthony Nathan, Bushey Heath, England, assignors to Ventritex, Inc., Sunnyvale, Calif.**

**Division of Ser. No. 362,163, Jun. 19, 1989, Pat. No. 5,007,422. This application Jun. 29, 1990, Ser. No. 546,261**

**Int. Cl.[5] A61N** *1/36*

**U.S. Cl. 128—419 PG** **7 Claims**



1. A method for combined cardiac pacing and defibrillating comprising the steps of:

implanting a DDI pacer/defibrillator having a V-V timer and a V-A timer;

connecting sensing and pacing leads to the atrium and the ventricle;

sensing for P-waves;

sensing for R-waves;

resetting the V-V timer and the V-A timer if an R-wave is sensed;

providing a pacing stimulus to the ventricle if no R-wave is sensed during the V-V time interval;

maintaining the V-V time intervals constant notwithstanding the sensing of a high atrial rate;

inhibiting the pacing stimulus to the ventricle if an R-wave is sensed during the V-V time interval;

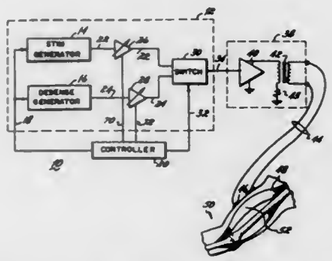
inhibiting a pacing stimulus to the atrium if a P-wave is sensed during the V-A time interval;

if an R-wave is sensed during the V-V time interval, then determining the presence of an arrhythmia; and

providing arrhythmia therapy if an arrhythmia is determined to be present.

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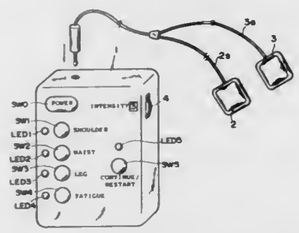
**5,048,522**
**POWER MUSCLE STIMULATOR**
**Steven H. Petrofsky, Dayton, Ohio, assignor to Therapeutic Technologies, Inc., Tampa, Fla.**
**Continuation of Ser. No. 509,565, Apr. 13, 1990, Pat. No. 4,996,987, which is a continuation-in-part of Ser. No. 349,856, May 10, 1989. This application Jan. 2, 1991, Ser. No. 637,606**
**The portion of the term of this patent subsequent to Mar. 5, 2008, has been disclaimed.**
**Int. Cl.[5] A61N *1/00***
**U.S. Cl. 128—421** **19 Claims**




1. A method for electrically stimulating a muscle with reduced pain comprising:
applying a high frequency, low amplitude, continuously varying current to said muscle to densensitize said muscle; and
immediately applying a low frequency, high amplitude, continuously varying current to said muscle to stimulate said muscle, said stimulating current have slope and an amplitude substantially identical to the slope and amplitude of said densensitizing current as said stimulating current begins substantially simultaneously with termination of said densensitizing current.

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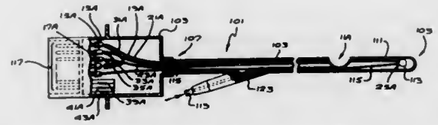
**5,048,523**
**TRANSCUTANEOUS ELECTRIC NERVE STIMULATOR**
**Tsutomu Yamasawa, Osaka; Manabu Yoshimura, Kyoto, and Mamoru Toriu, Saitama, all of Japan, assignors to Omron Corporation, Kyoto and Ito Co., Ltd., Tokyo, both of, Japan**
**Filed Apr. 3, 1990, Ser. No. 503,448**
**Claims priority, application Japan, Apr. 7, 1989, 1-88404**
**Int. Cl.[5] A61N *1/18***
**U.S. Cl. 128—421** **4 Claims**




1. A transcutaneous electric nerve stimulater comprising:
a plurality of curing electrodes;
waveform signal output means for producing continuously at least two types of different waveform signals in a time sequence and for applying the waveform signals to said curing electrodes; and
manual operate means for fixing the waveform signal to be produced from said waveform signal output means to a waveform signal obtained at an operation of said manual operate means, thereby continuously generating the fixed waveform signal.

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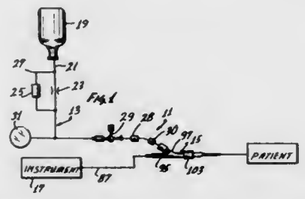
**5,048,524**
**BLOOD PARAMETER MEASUREMENT**
**Wilber H. Bailey, Leucadia, Calif., assignor to Camino Laboratories, Inc., San Diego, Calif.**
**Filed Mar. 3, 1989, Ser. No. 318,779**
**Int. Cl.[5] A61B *5/14***
**U.S. Cl. 128—634** **40 Claims**



1. Apparatus for measuring a parameter of a sample of blood, the apparatus comprising:
means defining a receptacle for insertion into a body to a desired location and for receiving the sample of blood at said location;
generating means for generating bursts of optical energy, each burst characterized by one of a plurality of preselected wavelengths;
guide means for guiding the energy into the sample of blood in the receptacle;
receiving means for receiving the energy after it has passed through the blood in the receptacle;
measuring means for measuring the intensity of each burst of received energy;
a memory having a molecular extinction coefficient and an optical scattering coefficient stored therein; and
computing means, operative to read the memory to obtain the molecular extinction coefficient and the optical scattering coefficient and to compute the desired parameter of the blood according to the measured intensities of the received bursts of energy and according to said coefficients.

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**5,048,525**
**BLOOD PARAMETER MEASUREMENT SYSTEM WITH COMPLIANT ELEMENT**
**Thomas P. Maxwell, Santa Ana, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Continuation-in-part of Ser. No. 328,056, Mar. 23, 1989, Pat. No. 4,934,369, which is a division of Ser. No. 8,937, Jan. 30, 1987, Pat. No. 4,830,013. This application Jun. 18, 1990, Ser. No. 539,602**
**The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.**
**Int. Cl.[5] A61B *5/00***
**U.S. Cl. 128—637** **13 Claims**



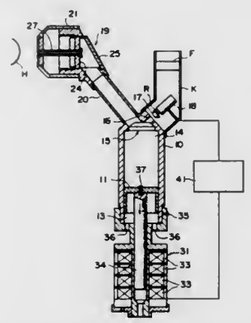

1. An assembly for the measurement of a blood parameter comprising:



first means for withdrawing blood from a patient into the first means;
said first means comprising a catheter adapted to be received in a patient's cardiovascular system and having a lumen for receiving blood from the patient's cardiovascular system;
said first means further comprising means for introducing a fluid into the lumen so as to form a blood-fluid interface in the first means;
said first means being compliant whereby the patient's heartbeats tend to move the interface;
said first means having a first compliance and a second compliance and comprising means for selecting the first compliance or the second compliance, said first and second compliances being different; and
a sensor in communication with the lumen.

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**5,048,526**
**GAS JET SHOOTING DEVICE FOR USE WITH A NON-CONTACT TONOMETER**
**Hideo Tomoda, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Japan**
**Filed Aug. 19, 1988, Ser. No. 234,043**
**Claims priority, application Japan, Aug. 20, 1987, 62-207054; Sep. 1, 1987, 62-216531**
**Int. Cl.[5] A61B *3/16***
**U.S. Cl. 128—648** **13 Claims**

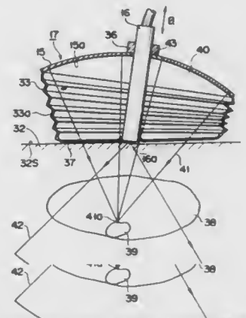


1. A gas jet shooting device for use with a non-contact tonometer, of the type having a cylinder in which air is compressed by a piston arrangement, and a nozzle communicating with said cylinder to allow said compressed air to issue toward an eye examining position when said piston arrangement is in a first position, characterized by:
means for reciprocating the piston arrangement in said cylinder body between the first position and a second position,
suction means for allowing air to flow into said cylinder from a region from said nozzle when said piston arrangement is in the second position,
a solenoid for actuating said suction means, and
means for controlling said means for reciprocating the piston arrangement and said solenoid at predetermined intervals.

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**5,048,527**
**SHOCK WAVE TREATMENT APPARATUS**
**Kiyoshi Okazaki, Takanezawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Nov. 16, 1988, Ser. No. 271,876**
**Claims priority, application Japan, Nov. 16, 1987, 62-290158; Jan. 13, 1988, 63-3829**
**Int. Cl.[5] A61B *17/22***
**U.S. Cl. 128—660.03** **10 Claims**

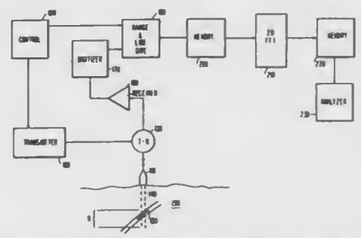
1. A shock wave treatment apparatus comprising:
shock wave generation means for creating a shock wave which converges to a converging point for crushing a to-be-crushed object in a living body said shock wave generation means having a shock wave transmission surface;
pulser means for supplying a pulse signal to said shock wave generation means;
a water tank mounted below the shock wave transmission surface of said shock wave generation means and containing water, said water tank having a bottom surface;
image information collecting means arranged between said transmission surface and said converging point of the shock wave generation means and having an ultrasonic wave transmission/reception surface held in substantially the same plane as the bottom surface of said water tank,



and for collecting tomographic image data of the living body with the ultrasonic wave transmission/reception surface adapted to be set in contact with the surface of the living body; and
image information processing means connected to said image information collecting means for processing the collected image information;
means for displaying said processed image information;
wherein said water tank includes a substantially cylindrical body having a through hole for permitting said image information collecting means to be supported therein and moved in a direction substantially perpendicular to the bottom surface of said water tank.

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**5,048,528**
**ALIAS SUPPRESSION IN PULSED DOPPLER SYSTEMS**
**Laura Superina, Westminster, and Casper W. Barnes, Irvine, both of Calif., assignors to North American Philips Corp., New York, N.Y.**
**Filed Nov. 15, 1990, Ser. No. 614,351**
**Int. Cl.[5] A61B *8/00***
**U.S. Cl. 128—661.09** **10 Claims**




1. A method for suppressing alias terms from the output of a system which processes pulsed wave signals to determine a velocity spectrum of a target, wherein samples of the pulsed wave signals are processed using a two-dimensional transform which maps spectral components attributable to a constant

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velocity Doppler shift into radial lines and a radial projection of the transformed signal is taken to extract a velocity spectrum, comprising the steps of:

identifying data samples of the velocity spectrum which represent individual spectral terms by locating a mean data sample which evenly divides the spectral terms, evenly distributing spectral windows around said means data sample, and grouping spectral data samples within each window;

within each window calculating the maximum value and the width of each spectral data term;

selecting as a true velocity spectrum term, the group of data samples within a window which maximizes a function which is maximized by a large maximum value and a small width; and

suppressing all data samples which are not in the selected true velocity spectrum term.

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**5,048,529**

**ULTRASONIC TRANSDUCER PROBE**

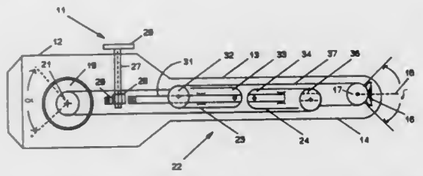
**Rafael Blumenthal, Kiryat Tivon, Israel, assignor to Elscint Ltd., Haifa, Israel**

**Filed Jul. 25, 1989, Ser. No. 384,809**

**Claims priority, application Israel, Sep. 1, 1988, 87648**

**Int. Cl.[5] A61B *8/00***

**U.S. Cl. 128—660.1** **13 Claims**



1. A probe system for use with ultrasonic medical diagnostic imaging systems, said probe system comprising:

ultrasonic transducer means,

motor means for driving a motor shaft through an arc,

a drive pulley attached to said shaft,

a driven pulley for moving the transducer means through an arc to scan a sector, said scanned sector having a center line,

the axes of said drive pulley and said driven pulley being parallel, and said drive pulley and said driven pulley having an initial rotational angular relationship,

means for coupling said motor shaft to said drive pulley,

belt coupling means for coupling said drive pulley to said driven pulley,

said belt coupling means including at least one drive idler pulley associated with and proximate to said drive pulley and at least one driven idler pulley means associate with and proximate to said driven pulley with a belt extending from said drive pulley to said at least one drive idler pulley, to said driven pulley, to said at least one driven idler pulley and back to said drive pulley.

means for changing the intial rotational angular relationship between the drive pulley and said driven pulley to change the location of said scanned sector and the location of the center line by changing the length of the belt extending between said drive pulley and said drive idler pulley relative to the length of the belt extending between the driven pulley and the driven idler pulley.

**5,048,530**

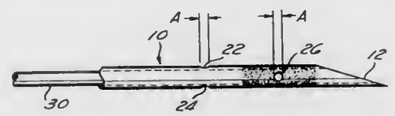
**METHOD OF USING AN AMNIOCENTESIS NEEDLE WITH IMPROVED SONOGRAPHIC VISIBILITY**

**Robert Hurwitz, 2310 Tustin Ave., Newport Beach, Calif. 92660**

**Division of Ser. No. 233,073, Aug. 17, 1988, Pat. No. 4,977,897. This application Apr. 6, 1990, Ser. No. 505,974**

**Int. Cl.[5] A61B *8/14***

**U.S. Cl. 128—662.05** **5 Claims**



1. A method of conducting sonographically monitored transabdominal amniocentesis, said method comprising the steps of:

(a) directing a beam of interrogating ultrasound of known wavelength into a gravid uterus of a human subject wherefrom a sample of amniotic fluid is to be obtained;

(b) providing an amniocentesis needle having at least one round sounding aperture formed therein, the diameter of said sounding aperture being substantially equal to the known wavelength of said interrogating ultrasound;

(c) inserting said amniocentesis needle into said gravid uterus so as to withdraw amniotic fluid therefrom and such that the interrogating ultrasound will strike said sounding aperture; and

(d) receiving and monitoring acoustical energy which is returned from said amniocentesis needle.

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**5,048,531**

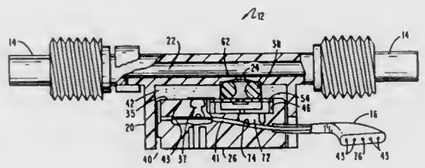
**PRESSURE SENSORS AND MANUFACTURE THEREOF**

**Edward L. Spotts, Denver; David P. Newman, Arvada, and Robert E. Farreau, Aurora, all of Colo., assignors to Core Laboratories, Inc., Lakewood, Colo.**

**Division of Ser. No. 874,225, Jun. 13, 1986. This application Oct. 4, 1989, Ser. No. 417,794**

**Int. Cl.[5] A61B *5/02***

**U.S. Cl. 128—675** **1 Claim**



1. A pressure sensor comprising

a housing defining a lumen therethrough and an opening to said lumen to provide communication between said lumen and a sensing element, said opening passing through a wall of said housing from a surface on the other side of said wall from said lumen to said lumen, said opening being smaller in area than said lumen,

a sensing element,

a support for mounting said sensing element in position for communication with said opening,

an elastomeric displacement sealing ring between said housing and said sensing element, said ring contacting said surface around said opening and providing a communication path between said opening and said sensing element, said ring being made of compressible material, and

a gel inside said sealing ring and occupying space between said communication path and said sensing element,

said gel being injected into said sealing ring prior to mounting said sensing element for communication with said opening,

said ring being sufficiently compressed so as to reduce its interior volume by an amount to cause displacement of gel so as to occupy all space between said ring and said opening and to occupy space in said opening.

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**5,048,532**

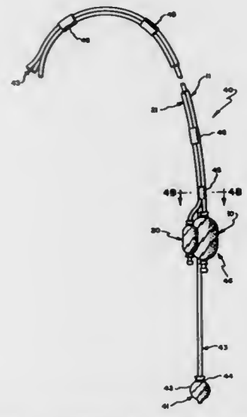
**METHOD AND APPARATUS FOR MEASURING BLOOD PRESSURE**

**Donald D. Hickey, Buffalo, N.Y., assignor to State University of New York, Albany, N.Y.**

**Filed Sep. 18, 1989, Ser. No. 409,041**

**Int. Cl.[5] A61B *5/02, 5/021***

**U.S. Cl. 128—675** **23 Claims**



11. Apparatus for measuring left atrial pressure, comprising:

a balloon-containing catheter adapted to be insertable into an esophagus;

means for positioning said balloon-containing catheter in the esophagus such that when the balloon is inflated, pressure from the left atrium affects said balloon;

means for inflating said balloon; and

means for determining mean left atrial pressure by the effect of the atrial pressure upon said balloon.

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**5,048,533**

**METHOD AND APPARATUS FOR A NON-INVASIVE EXAMINATION OF BLOOD CIRCULATION IN A LIVING ORGANISM**

**Edwin Muz, Reutlingen, Fed. Rep. of Germany, assignor to Nicolay GmbH, Fed. Rep. of Germany**

**Filed Aug. 30, 1989, Ser. No. 400,719**

**Claims priority, application Fed. Rep. of Germany, Aug. 31, 1988, 3829456**

**Int. Cl.[5] A61B *5/021***

**U.S. Cl. 128—679** **13 Claims**

1. A method for non-invasive determination of the actual blood pressure $P_M(t)$ of a living organism as a function of time, which blood pressure changes in a range comprising a diastolic and a systolic pressure, at locations of said organism which contain arteries which change their volumes dependent on said actual blood pressure and on a transmural pressure caused by said arteries;

by an apparatus which comprises:

first and second pad means, each for applying a pressure $P_{M1}$ and $P_{M2}$, respectively, to a first and a second of said locations of said organism and each having a chamber with a volume for a pressure means for producing said pressure $P_{M1}$ and $P_{M2}$, respectively,

first and second control means for said first and second pad means for setting said pressures $P_{M1}$ and $P_{M2}$, respectively, independently from each other in each of said pad means,

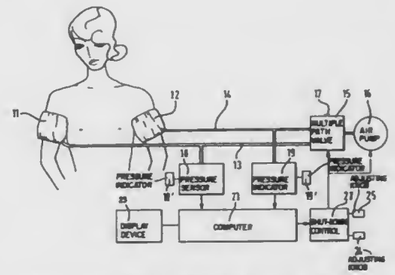
first and second sensor means for each of said first and second pad means, respectively, which sensor means respond to perceivable values $\beta_1(t)$ and $\beta_2(t)$, respectively, that change depending on said actual blood pressure and said transmural pressure and transmit signals which correspond to said values $\beta_1(t)$ and $\beta_2(t)$ and

an evaluating means for evaluating said signals of said sensor means,

said method comprising the steps of:

a) determining a blood pressure value of said organism which is dependent of said transmural pressure,

b) applying said first and second pad means to said first and second locations of said organisms, the arteries of said first and said second locations being parallel to each



other within said organism, in order to simultaneously perceive said values $\beta_1(t)$ and $\beta_2(t)$ in said first and second locations independently from each other,

c) setting equal said pressures $P_{M1}$ and $P_{M2}$ applied by said first and said second pad means at each of said first and said second locations and adjusting said evaluating means for an output of equal said perceivable values $\beta_1(t)$ and $\beta_2(t)$ derived from said signals transmitted by said first and second sensor means,

d) setting first and second predetermined pressures as said pressures $P_{M1}$ and $P_{M2}$ at each of said first and said second locations, said first and said second predetermined pressures being smaller than said diastolic pressure of said organism and differing from each other by a value Delta $P_M$ which is small compared with said diastolic pressure and actuating said first and said second sensor means for responding to said perceivable values $\beta_1(t)$ and $\beta_2(t)$, respectively, and for transmitting signals which correspond to said values, and

evaluating said transmitted signals from said sensor means received by said evaluating means for determining the blood pressure of said organism as a function of time.

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**5,048,534**

**METHOD OF AND DEVICE FOR DETERMINING QUANTITIES CHARACTERIZING THE FLOW OF A LIQUID IN A VASCULAR SYSTEM**

**Johannes L. M. Marinus, and Paulus A. C. Van Dongen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Aug. 1, 1989, Ser. No. 388,285**

**Claims priority, application Netherlands, Aug. 9, 1988, 8801982**

**Int. Cl.[5] A61B *5/0275***

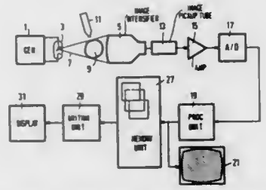
**U.S. Cl. 128—691** **4 Claims**

1. A method of determining quantities characterizing the

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flow of a liquid in a part of a vascular system, which part comprises an entrance vessel (in), a reservoir (res) and an exit vessel (ex), the method comprising the steps of arranging said part of the vascular system in an apparatus for making subtraction images by means of penetrating radiation, introducing a radiation-absorbing contrast medium into the entrance vessel, making a series of subtraction images while the liquid mixed with the contrast medium flows from the entrance vessel, via the reservoir, to the exit vessel, and deriving the quantities characterizing the flow from the difference in radiographic density TD of successive subtraction images which are due to the displacement of the contrast medium, for successive subtraction images having the ranks n and n+1 in the series, a part of the entrance vessel which adjoins the reservoir and a part of



the exit vessel which adjoins the reservoir are determined for which the following equation is satisfied:

$$\Delta TD_{res}(n) = TD_{in}(n) - TD_{ex}(n+1) \quad (2)$$

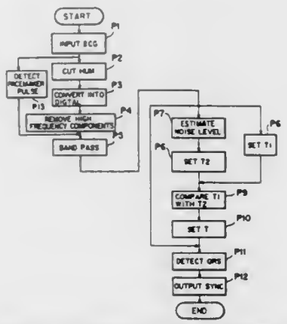
where $TD_g(n)$ generically refers to each of the right hand expressions and is defined as the total radiographic density of a region g in the subtration image having the rank n, where $\Delta TD_{res}(n)$ is defined as

$$\Delta TD_{res}(n) = TD_{res}(n+1) - TD_{res}(n) \quad (3)$$

and where the subscripts res, in and ex refer to the reservoir, part of the entrance vessel, and part of the exit vessel, respectively.

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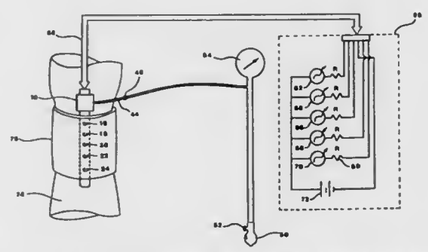
**5,048,535**
**METHOD AND APPARATUS FOR DETECTING QRS COMPLEX OF ECG**
**Mitsuya Maruyama, Tokyo, Japan, assignor to Fukuda Denshi Co., Ltd., Tokyo, Japan**
**Filed Jun. 12, 1990, Ser. No. 536,829**
**Claims priority, application Japan, Jun. 23, 1989, 1-161920**
**Int. Cl.[5] A61B** *5/0456*
**U.S. Cl. 128—708** **5 Claims**




1. A method for detecting a QRS complex of an ECG, comprising:
inputting an ECG signal;
setting a first threshold value based on a peak value of a first QRS complex of said ECG signal;
setting a second threshold value by estimating a noise level proportional to an amount of noise included in said ECG signal;
comparing said first threshold value with said second threshold value;
setting the larger one of said first and second threshold values as a third threshold value for detecting a second QRS complex;
detecting said second QRS complex by using said third threshold value; and
outputting a synchronous signal synchronized with said detected second QRS complex.

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**5,048,536**
**TOURNIQUET FOR REGULATING APPLIED PRESSURES**
**James A. McEwen, 10551 Bamberton Drive, Richmond, British Columbia, Canada V7A 1K6**
**Continuation-in-part of Ser. No. 33,770, Apr. 3, 1987, Pat. No. 4,869,265. This application Jul. 13, 1989, Ser. No. 388,699**
**Int. Cl.[5] A61B** *5/00*
**U.S. Cl. 128—748** **11 Claims**



1. Apparatus for controlling the pressure applied to a body tissue by pressure-applying means near a predetermined location relative to the pressure-applying means, comprising:
pressure-applying means responsive to a pressure control signal for applying pressure to a tissue;
transducing means comprised of:
a first flexible layer carrying a first electrical contact;
a second flexible layer carrying a second electrical contact and cooperating with the first flexible layer to define a flexible pressurizable chamber interposed between the tissue and the pressure-applying means, wherein the first and second electrical contacts are touching near a predetermined location relative to the pressure-applying means when the chamber is not pressurized; and
pressure estimation means for selectable pressurizing the chamber, and for producing an applied pressure signal representative of the lowest pressure at which the first and second electrical contacts are separated; and
pressure-regulating means responsive to the applied pressure signal for producing a pressure control signal to maintain the pressure applied to the tissue by the pressure-applying means near a predetermined reference pressure.

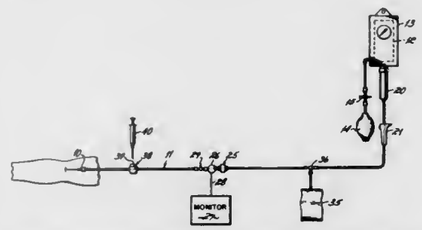
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**5,048,537**
**METHOD AND APPARATUS FOR SAMPLING BLOOD**
**Phillip D. Messinger, Powell, Ohio, assignor to Medex, Inc., Hilliard, Ohio**
**Filed May 15, 1990, Ser. No. 524,224**
**Int. Cl.[5] A61B** *5/02*
**U.S. Cl. 128—673** **5 Claims**

1. A blood sampling system comprising:



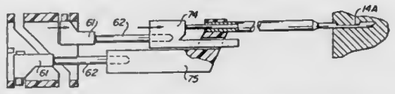
a catheter for insertion into a patient's blood vessel that has a nominal pressure of about 100 mmHg,
a source of saline solution pressurized to about 300 mmHg,
tubing connecting said source to said catheter,
a stopcock in series with said tubing,
a waste collection bag connected to said stopcock,
and a sampling site in said tubing between said catheter and said stopcock,




whereby said saline solution source may be blocked and said catheter placed in communication with said collection bag to enable the pressure in the patient's blood vessel to drive saline solution from said tubing into said waste collection bag and to drive said blood from the blood vessel at least to said sampling site.

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**5,048,538**
**BIOPSY INSTRUMENT**
**Richard A. Terwilliger, Alamo; Daniell Hebert, San Francisco, and Jack Hall, Portola Valley, all of Calif., assignors to Vance Products Incorporated d/b/a Cook Urological Incorporated, Spencer, Ind.**
**Filed May 9, 1990, Ser. No. 521,259**
**The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.**
**Int. Cl.[5] A61B** *10/00*
**U.S. Cl. 128—754** **21 Claims**

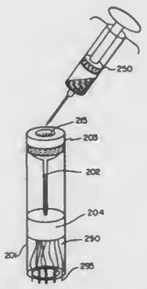


1. A motor powered instrument for removing a tissue sample from a tissue mass comprising a housing, a tissue penetrating means and severing means disposed at one end of said housing, operating means positioned in said housing and operably connected to said tissue penetrating means and severing means for causing relative linear movement of said tissue penetrating means and said severing means in a sequential manner whereby said tissue penetrating means proceeds by linear movement from a retracted to an extended position followed by linear movement of said tissue severing means from a retracted to an extended position to effect a severing of a portion of said tissue mass, said operating means including motor means and means to convert rotary motion to sequential, reciprocating linear motion to said tissue penetrating means and severing means.

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**5,048,539**
**METHODS AND APPARATUS FOR DIRECTLY SENSING AND MEASURING BLOOD RELATED PARAMETERS**
**Gary M. Schindele, Fairfield, Conn., assignor to Medical Systems Development Corporation, Fairfield, Conn.**
**Continuation of Ser. No. 547,381, Jul. 3, 1990, which is a continuation of Ser. No. 264,614, Oct. 31, 1988, abandoned. This application Sep. 28, 1990, Ser. No. 639,504**
**Int. Cl.[5] A61B** *5/00*
**U.S. Cl. 128—771** **20 Claims**

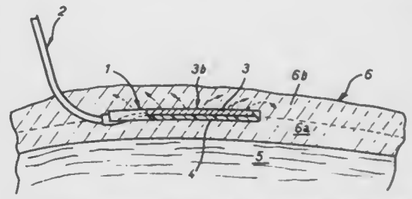
1. A method for directly sensing and measuring blood related parameters in a non-reuseable disposable container, the method comprising the steps of:
(a) introducing an unadulterated blood sample into non-reuseable disposable encapsulating means for performing both the sensing and measuring of a preselected blood related parameter;



(b) directing said blood sample to means within said encapsulating means for performing both the sensing and measuring of said preselected blood related parameter;
(c) sensing and measuring said preselected parameter entirely within said encapsulating means directly from said unadulterated blood sample; and
(d) outputting, from said encapsulating means, the measured value of said parameter.

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**5,048,540**
**CONTACT UNIT EMBEDDABLE IN AN ELECTRICALLY CONDUCTIVE CASTING FOR USE IN ELECTRICAL TREATMENT FOR THERAPEUTICAL OR BEAUTY PURPOSES**
**Gérard Ramond, 31380 Montastruc-la-Conseillere, Gragnague, France**
**Filed Feb. 15, 1990, Ser. No. 480,612**
**Claims priority, application France, Feb. 17, 1989, 89 02102**
**Int. Cl.[5] A61N** *1/04*
**U.S. Cl. 128—798** **4 Claims**

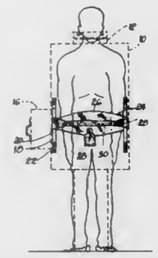


1. A contact unit adapted to be embedded in an electrically conductive casting composition applied on a person's skin for applying electric current thereto, for therapeutic or beauty purposes, said contact unit including a lead adapted to electrically interconnect a current generator and the electrically conductive composition, said contact unit comprising a flexible plate of conductive material having a substantially parallel first face inwardly directed and a second face outwardly directed and a peripheral edge therebetween, the first face being designed to face in the direction of the person's skin and the second face being designed to face away from the person's skin, an insulating liner covering the first face of the plate and extending along the peripheral edge and terminating flush with the second, or uncovered, face, a bared end of the lead being inserted into the plate, and at least a portion of the lead adapted to extend through the casting composition being sheathed with insulation.

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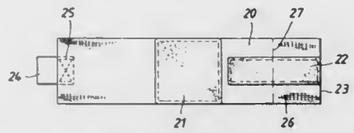
5,048,541
**X-RAY PATIENT RESTRAINT**
Michael T. Haneline, 236 Jamacha Rd., El Cajon, Calif. 92019
Filed Aug. 6, 1990, Ser. No. 562,829
Int. Cl.[5] A61F *5/37*
U.S. Cl. 128—876 13 Claims



1. An X-ray patient restraint for restraining the patient against the substantially vertical film backboard of an upright X-ray station comprising:
(a) a pair of brackets mounted to the laterally opposite sides of said backboard;
(b) a restraint strap for extending across a patient positioned against said backboard;
(c) fastener means to engage said strap to said brackets to hold said patient securely against said backboard;
(d) said strap being elongated and having ends which respectively extend through said respective brackets, and said fastener means comprising detent structure on the ends of said strap which loop back from said brackets and attach to a central portion of said strap; and,
(e) at least one genital shield for said strap, said genital shield being removably attachable to said strap and including releasible fastener means for attaching said shield to said strap.

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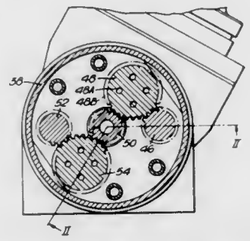
5,048,542
**SLEEP AID PADS**
J. Kent Murray, 11999 Katy Freeway, Suite 388, Houston, Tex. 77079
Filed Apr. 30, 1990, Ser. No. 516,195
Int. Cl.[5] A61F *13/06*
U.S. Cl. 128—889 7 Claims



1. A strap and pad assembly for use in comforting a patient during convalescence, comprising: a resilient, generally rectangular body; a case made of a moisture absorbent material covering said body; a first patch of fastener material secured to one side of said case; a strap made of an elastic material adapted to encircle a limb of a patient, said strap having a front side and a rear side; a second patch of fastener material secured to said front side of said strap generally centrally of the length thereof; an elongated strip of fastener material secured to said front side beginning at one end thereof and extending to the vicinity of said second patch; and a rearwardly facing tab of fastener material secured to said rear side of said strap at the other end thereof, whereby said strap can be positioned around a part of the body of a user with said second patch and said strip facing outward, said tab can be pressed against said strip to fasten said tab thereto, and said case and resilient body then can be attached to said strap by pressing said first patch of fastener material against said second patch of fastener material; said first and second patches of fastener material have substantially the same width as the width of said strap.

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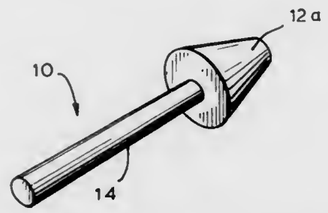
5,048,543
**CONTINUOUS ROD-MAKING MACHINES**
Michael N. Smith, High Wycombe, England, assignor to Molins Richmond Inc., Richmond, Va.
Filed Nov. 3, 1989, Ser. No. 431,207
Claims priority, application United Kingdom, Nov. 4, 1988, 8825863
Int. Cl.[5] A24C *5/18*
U.S. Cl. 131—84.4 23 Claims



1. A machine for producing rod-like articles comprising a continuous rod cut-off device and a ledger assembly, said assembly including means for supporting a rod during cutting, drive means for the ledger assembly, said drive means including a plurality of gears, and resilient means for applying pressure between at least one pair of interengaging gear teeth of said gears to reduce or eliminate undesired relative movement between the gears, wherein said gears include a least one gear having first and second substantially coaxial gears each having teeth engaged with teeth of a common further gear, and wherein said resilient means is arranged to apply torque to at least the first of said coaxial gears.

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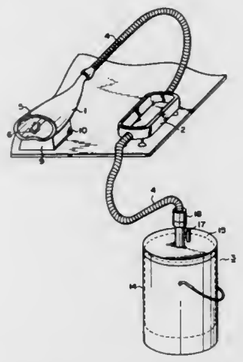
5,048,544
**CIGARETTE SUBSTITUTE**
Robert Mascarelli, and Gloria Mascarelli, both of 31 Westbridge Dr., Holbrook, N.Y. 11741
Filed Aug. 10, 1990, Ser. No. 566,161
Int. Cl.[5] A24D *1/00*; A24F *47/00*
U.S. Cl. 131—270 6 Claims



1. A cigarette substitute, comprising:
and edible lollypop portion containing a smoking substitute composition having nicotine; and,
a handle portion attached to said edible lollypop portion, said handle portion having substantially the size and shape of a cigarette.



5,048,545
**SMOKING DEVICE**
Seiichi Takagi; Takako Takagi, both of Tsuchiura, and Yuichi Takagi, Isehara, all of Japan, assignors to Seiichi Takagi and Takako Takagi, Japan, a part interest
Filed Jan. 12, 1990, Ser. No. 464,357
Claims priority, application Japan, Jan. 16, 1989, 1-6522; Apr. 2, 1989, 1-83370
Int. Cl.[5] A24F *7/00, 7/02, 47/00*
U.S. Cl. 131—330 16 Claims



1. A smoking device comprising an inhale section for inhaling the smoke of cigarettes therefrom and exhaling the inhaled smoke therein, a gas-sucking device for forcibly sucking a stream of cigarette smoke exhaled from the lungs and a smoke stream of a cigarette produced from the burning portion of a cigarette, and a storage section for storing said smoke streams of at least one cigarette.

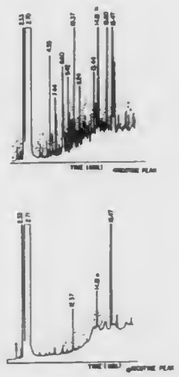
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5,048,546
**FILTER AND METHOD OF TREATING TOBACCO SMOKE TO REDUCE MATERIALS HARMFUL TO HEALTH**
Chi-Hsueh Hsu, 4 F, No. 144, Chu Lin Rd., Yung Ho, Taipei; Wen Li Yang, No. 92-1, Pai Ma Chuang, Chung Li; Shien-Yu Chuang, No. 57, Lane 20, Chih Yu Rd., Sec. 2, Shih Lin District, Taipei, all of Taiwan, and David Yue-Weilee, 105 Highland Dr., Chapel Hill, N.C. 27514
Filed Dec. 15, 1989, Ser. No. 450,310
Int. Cl.[5] A24D *3/06*
U.S. Cl. 131—331 18 Claims

1. A method of treating tobacco smoke to reduce the amount of harmful components therein, comprising
contacting tobacco smoke with "Alum" which is applied to filtering material, cigarette paper or tobacco in an amount sufficient to remove at least about 80% of nicotine present in said tobacco smoke, said sufficient amount being at least 10 mg. of alum per cigarette, said "Alum" having the formula:

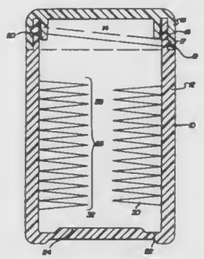
$$M^{I}M^{III}(SO_4)_2 \cdot xH_2O$$

wherein $M^{I}$ is a univalent metal ion and may be Na, K, Rb, Cs, $NH_4$, T1, Ag or a quaternary organic base (e.g. $NMe_4$); $M^{III}$ is a trivalent metal ion and may be Fe, Cr, Al, Mn, In, T1, Ga, V, Co, Ti, Rh, etc., and $SeO_4$ or $TeO_4$ may replace SO4; and x is an integer having a value of 0, 12 or 24.



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5,048,547
**NAIL POLISH REMOVER CONTAINER**
Alvin M. Walker, Clearwater, Fla., assignor to Walker Marketing, Inc., Clearwater, Fla.
Filed Dec. 27, 1988, Ser. No. 289,671
The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.
Int. Cl.[5] A45D *29/20*
U.S. Cl. 132—75 2 Claims

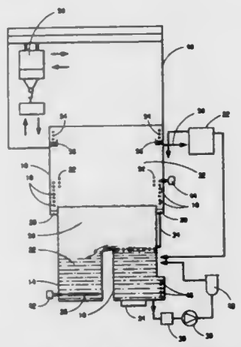


1. A manicuring device adapted for cleaning the fingernail of a finger comprising a plastic, integrally molded cylindrical container body with a closed end defining a chamber with a closed bottom portion and an open top portion of sufficient width to receive a finger, the inner surface of the closed end defining an annular channel adjacent the inner surface of the container body, said top portion being stepped and forming thread means, a flexible brush means integrally molded to the inner surface of said container body comprising a plurality of bristles extending radially inward around from the inner surface of the container body into said chamber and defining a circumferentially complete central passageway allowing a finger to pass therethrough while said finger engages said bristles and be guided into the interior of said chamber, said bristles being spaced in a plurality of rows circumferentially positioned around the inner surface of the container body and cap means removably mounted to said container.

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**5,048,548**
**VAPOR CONTROL SYSTEM FOR VAPOR DEGREASING/DEFLUXING EQUIPMENT**
Robert B. Ramsey, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 15, 1990, Ser. No. 480,606
Int. Cl.[5] B01D *5/00*
U.S. Cl. 134—108 4 Claims

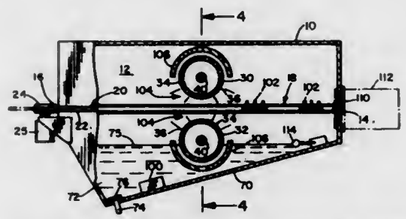


1. In a vapor degreasing apparatus, wherein a cleaning solvent is maintained at reflux conditions for degreasing/defluxing an object, comprising a boiling sump for immersing the object to be cleaned, a vapor zone and a freeboard zone above the boiling sump with an associated first heat exchanger to condense the vapors generated by the boiling sump, and a clean solvent sump for collecting the condensed vapors, rinsing the cleaned object and replenishing the solvent in the boiling sump, the specific improvement comprising:
(a) a first condenser/heat exchanger means adapted to operate at a temperature below the dew point of the solvent vapor but above about 32° F. (0° C.) for condensing the vapors produced by the boiling sump;
(b) a second condenser/heat exchanger means adapted to operate at a temperature below 32° F. (0° C.) and located above the lowest portion of the first condenser/heat exchanger for further condensing vapors produced by the boiling sump;
(c) a third condenser/heat exchanger means adapted to operate at a temperature within about 5° C. of the temperatures of the second condenser/heat exchanger means and located above the first and second condenser/heat exchanger means near the top of the freeboard zone for condensing water vapor; and
(d) a means associated with the third condenser/heat exchanger means for isolating any condensed water or frost.

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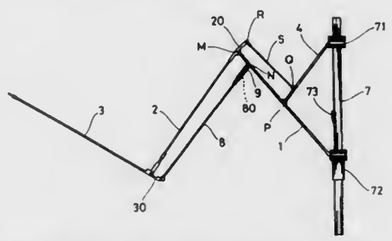
**5,048,549**
**APPARATUS FOR CLEANING AND/OR FLUXING CIRCUIT CARD ASSEMBLIES**
Gary L. Hethcoat, Ontario, Calif., assignor to General Dynamics Corp., Air Defense Systems Div., Pomona, Calif.
Division of Ser. No. 164,170, Mar. 2, 1988, Pat. No. 4,986,462.
This application Aug. 27, 1990, Ser. No. 573,442
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—122 R 9 Claims

1. Apparatus to clean or flux circuit card assemblies with a liquid, which comprises:
a substantially liquid-tight enclosure with an entrance opening and an exit opening communicating with the interior thereof;
means to move said circuit card assemblies along a substantially horizontal path through said interior with entry to and exit from said interior via said respective openings;
rotating liquid dispensing means disposed above and below said path and extending laterally thereacross, said dispensing means having separate portions above and below said path adapted to dispense said liquid in a plurality of sprays directed toward said path from above and below said path;
means to rotate said dispensing means;
conduit means to convey said liquid separately to said portions of said dispensing means under sufficient pressure to cause said sprays to be dispensed; and
a plurality of pressure regulation means disposed in said conduit means to separate control of the pressure of said liquid in each of said portions and adapted to permit the liquid in said sprays above said path to be controlled to a different pressure from the liquid in said sprays below said path.



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**5,048,550**
**STRUCTURE OF TRIPLE-FOLDING UMBRELLA SKELETON**
Peter Su, Hsinchu, Taiwan, assignor to Befashion Umbrella Co., Ltd., Taiwan
Filed Jul. 3, 1990, Ser. No. 547,259
Int. Cl.[5] A45B *19/00*
U.S. Cl. 135—25 R 1 Claim

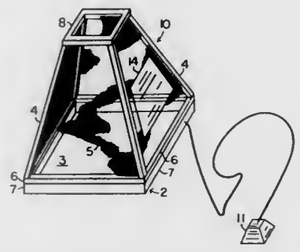


1. A triple-folding umbrella skeleton comprising:
a middle tube;
a notch mounted on the upper portion of said middle tube;
a runner slidably sleeved to the intermediate portion of said middle tube, and capable of being locked to maintain said triple-folding umbrella skeleton in an open condition; and
a plurality sets of frame pivotably mounted on said notch and runner respectively, each frame set inncluding a first rib, a second rib, a third rib, a stretcher and a first link, each member of said frame set having two ends, one end of said first rib being pivotably mounted on said runner, the two ends of said second rib being pivotably mounted to the other end of said first rib and one end of said third rib resppectively, one end of said stretcher being pivotably mounted on said notch, the other end of said stretcher being pivotably mounted to the approximately intermediate portion of said first rib, said first link being generally parallel to said first rib, said second rib having a first extension portion extending outwards from its end portion at which said first rib is mounted, and the two ends of said first link being pivotably mounted to said first extension portion and said stretcher respectively, so that said first link, said stretcher, said first rib and said first extension portion of said second rib cooperate to form a quadric link structure;
said triple-folded umbrella skeleton being characterized in that:
each frame set further includes a connecting spring and a second link generally parallel to said second rib, said third rib having a second extension portion extending outwards from its end portion at which said second rib is mounted, one end of said second link being pivotably mounted to said second extension portion, and the other end of said second link being connected to said first rib via said connecting spring, whereby each frame set can be expanded to a largest extent to obtain a largest canopy shielding area, and only a smaller force is needed to open said triple-folding umbrella skeleton, due to the retractability of said connecting spring.



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**5,048,551**
**FLOATING INSECT SCREEN**
James W. Schelfhaudt, 3775 Spring Lake Rd., Jacksonville, Fla. 32210
Filed Jun. 26, 1990, Ser. No. 544,267
Int. Cl.[5] E04H *15/24*
U.S. Cl. 135—100 9 Claims

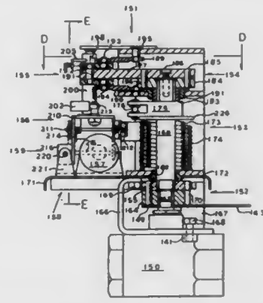


1. A floating insect screen comprising:
(A) a base member adapted to float on the surface of water, said base member having a perimeter defining a relatively large, unclosed opening on said water surface of sufficient size to surround a human torso;
(B) relatively upright, rigid frame members attached to said base member; and
(C) a mesh material attached between and to said upright frame members and to said base member, said mesh material defining a closed interior area above said water surface, whereby said large opening in said base member provides the only entry into said interior area, said mesh material having openings sufficiently small in size to preclude insects from entering said interior area

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**5,048,552**
**UNIVERSAL TRIP VALVE OPERATORS AND TRIP ACTUATING SEISMIC VIBRATION SENSORS AND TRANSDUCERS THEREFOR**
Douglas A. Bourne, 466 W. Valley Stream Blvd., Valley Stream, N.Y. 11580
Filed Jun. 28, 1990, Ser. No. 545,193
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—39 49 Claims

1. A universal trip valve operator for operating a quarter turn valve between a reset position and a returned position, comprising:
(A) return actuating means which interconnect with a quarter turn valve and which are for actuating said quarter turn valve from a reset position to a returned position;
(B) triggering means;
(C) multiple stage of leverage means for reducing the load on said triggering means which provide at least two stages of leverage at the reset position thereof, namely:
(1) a first stage of leverage means for reducing the load on said triggering means; and,
(2) a second stage of leverage means for reducing the load on said triggering means; wherein:
(3) said first stage of leverage means comprise a first lever which is rotatably mounted with respect to a support structure;
(4) said second stage of leverage means connect to said first lever through pivotal connecting means, thereby minimizing the frictional torque arm between said second stage of leverage means and said first stage of leverage means;
(5) said second stage of leverage means comprise guiding means for guiding said second stage of leverage means,



in coordination with said first stage of leverage, during actuation between the reset position and the returned position thereof thereby making said first stage of leverage means and second stage of leverage means single action resettable;
(6) at the reset position thereof, said second stage of leverage means intrinsically generate a force which biases said second stage of leverage means toward the returned position thereof thereby tending to cause the release of said second stage of leverage means upon triggering;
(7) said triggering means interact with and releasably maintain said multiple stage of leverage means at the reset position thereof; said multiple stage of leverage means thence interconnect with said return actuating means and are able to restrain said return actuating means at the reset position thereof.

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**5,048,553**
**RELIEF VALVE WITH OVERTURN SURGE CONTROL FOR STORAGE TANK**
Bryan E. VanDeVyvere, Lees Summit, Mo., assignor to Knappco Corporation, Kansas, Mo.
Filed Nov. 9, 1990, Ser. No. 611,076
Int. Cl.[5] F16K *17/10, 17/36*
U.S. Cl. 137—43 8 Claims

1. A valve for relieving pressure from within a storage tank at a predetermined tank pressure through an opening in the tank comprising:
mounting means for connecting said valve in sealed engagement with said opening and providing a valve opening and an associated valve seat, said valve opening being in communication with ambient atmosphere and the pressure within said tank;
a piston assembly having a piston rod and a piston head on one end of said piston rod, the end of said piston rod opposite said piston head being connected to said mounting means;

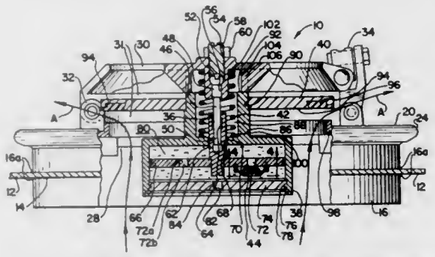
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a poppet positioned for engagement with said valve seat and exposed to said pressure within said tank through said valve opening to close and open said valve opening upon movement of said poppet in response to the predetermined pressure within said tank;

a closed piston chamber connected to said poppet and enclosing said piston head with said piston rod extending through an aperture in said chamber and in sealed sliding engagement therewith, said chamber being movable about said piston head and along said piston rod from a first position in which said poppet closes said valve seat and a second position in which said poppet opens said valve seat;

bias means connected between said mounting means and said chamber for urging said chamber and said poppet into said first position, said bias means providing a predetermined



force which, when overcome by the predetermined pressure within said tank, enables movement of said chamber and said poppet against said bias means to said second position to open said valve opening; and

surge control means for momentarily preventing movement of said chamber with respect to said piston head during overturn of said tank when said poppet can be exposed to a surge pressure greater than the predetermined pressure, said surge control means thereby preventing said poppet from opening said valve seat and venting any surge pressure from within said tank, said surge control means after a predetermined time period permitting movement of said chamber with respect to said piston head while said tank is still in said overturned state thereby enabling said poppet to vent any remaining pressure within the tank above said predetermined pressure.

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**5,048,554**

**VALVE FOR A GAS CYLINDER**

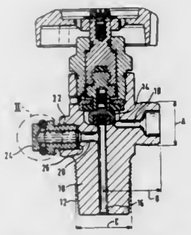
**Paul Kremer, Walferdange, Luxembourg, assignor to Ceodeux S.A., Luxembourg, Luxembourg**

**Filed Sep. 24, 1990, Ser. No. 586,880**

**Claims priority, application Luxembourg, Oct. 5, 1989, 87601**

**Int. Cl.[5] F16K** *17/40*

**U.S. Cl. 137—69** **3 Claims**



1. Valve for a gas cylinder, comprising an outlet safety channel (**20**) closed by a burstable diaphragm (**26**) wedged between the body (**10**) of the valve and a plug (**24**) mounted detachably in the body (**10**) of the valve, the said plug (**24**) comprising an axial passage (**28**) in communication with the outside and filled with a fusible material (**32**) up to where it comes into contact with the diaphragm (**26**), characterized by elastic means obstructing, towards the outside, the axial passage (**28**) and resistant to temperatures above the melting point of the fusible material.

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**5,048,555**

**PROCESS AND APPARATUS FOR PROTECTING AND SUPPORTING A SEAL OF A VALVE**

**Hans O. Mieth, Sandkrug 3, D-2058 Schnakenbek, and Erich Schlotterbeck, Pflasterstrasse 4A, D-2053 Schwarzenbek, both of Fed. Rep. of Germany**

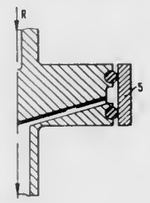
**PCT No. PCT/EP89/00044, § 371 Date Aug. 31, 1989, § 102(e) Date Aug. 31, 1989, PCT Pub. No. WO89/06763, PCT Pub. Date Jul. 27, 1989**

**PCT Filed Jan. 17, 1989, Ser. No. 415,343**

**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1988, 3801561; Jan. 20, 1988, 3801569**

**Int. Cl.[5] F16K** *3/24, 25/00*

**U.S. Cl. 137—238** **11 Claims**



1. A valve comprising:

a valve casing having a seat region;

a closing member translatorily or rotatively displaceable between a closed position, in which fluid flow past said seat region is prevented, and an open position, in which fluid flow past said seat region is permitted;

means mounted on said closing member in both said closed position and said open position for effecting a seal between said seat region and said closing member when the closing member is in said closed position, thereby preventing fluid flow past said seat region; and

a locking element movable relative to said closing member, said locking element engaging said seal effecting means when said closing member is out of said closed position, whereby said locking element protects and supports said seal effecting means when said closing member is out of said closed position,

wherein said means for effecting a seal comprises two seals spaced from one another to define a leakage cavity, and said valve further comprises means for placing said leakage cavity in fluid communication with the environment of the valve.

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**5,048,556**

**TRANSOM-MOUNTED VALVE WITH REMOTE ACTUATOR**

**Albert L. Grumelot, St. Mary's, Ohio, and William J. Mitchell, Clermont, Fla., assignors to Master Concepts Inc., Orlando, Fla.**

**Filed Jun. 12, 1990, Ser. No. 536,797**

**Int. Cl.[5] B63B** *13/00;* **F16K** *31/46*

**U.S. Cl. 137—270** **21 Claims**

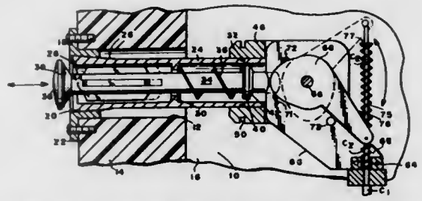
1. In a boat having a hull with a port through said hull, a valve carried by said boat providing for selective fluid communication through said port, including a valve sleeve having an axis and a valve seat, a valve head for sealing engagement with said seat and a stem projecting from said valve head within said valve sleeve;



means cooperable between said valve stem and said valve sleeve for biasing said valve stem in a direction urging said valve head into a valve-closed position, with said valve head in sealing engagement with said valve seat;

a mounting member secured on said valve sleeve at an end thereof remote from said seat, said member having a centrally located slot;

a cam carried by said member in said slot for pivotal movement and having camming surfaces and an actuating arm, said member having an opening through its inner end, enabling engagement of said camming surfaces with the end of said stem remote from said member;



means for pivoting said cam between valve-open and valve-closed positions, including an actuator connected to said arm and movable in a substantially linear direction; and

means for releasably securing said cam relative to said member in either of two positions, said cam in a first position thereof being secured to said member for pivotal movement between valve-open and valve-closed positions in response to linear movement of said actuator in a direction generally parallel to the axis of said sleeve, said cam in a second position thereof being mounted for pivotal movement between valve-open and valve-closed positions in response to linear movement of said actuator in a direction generally normal to the axis of said sleeve.

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**5,048,557**

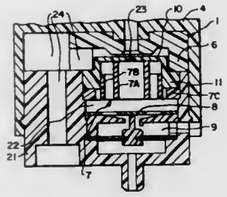
**MAIN VALVE AND SEAT FOR USE IN FILLING CONTAINERS TO A PREDETERMINED LEVEL**

**Daniel N. Campau, Grand Rapids, Mich., assignor to Flow-Rite Controls, Ltd., Grand Rapids, Mich.**

**Filed Jul. 17, 1990, Ser. No. 554,293**

**Int. Cl.[5] F16K** *31/126, 21/18*

**U.S. Cl. 137—386** **10 Claims**



1. A valve apparatus for filling a container to a predetermined level with liquid provided by supply means connected to the container through said valve apparatus, in which said valve apparatus is normally open and closes only upon the application of supply liquid pressure together with the filling of said container to said predetermined level, said apparatus, comprising:

an upper housing, a lower housing, and a main valve means contained within said upper and lower housings for controlling the supply of liquid to the container, said main valve means including a flexible main valve, a main valve seat, and a main valve support for supporting said flexible main valve to prevent substantial deflection of said main valve away from said seat when liquid pressure from said supply means is applied to said valve apparatus, said main valve being maintained a predetermined distance from said seat when liquid pressure from said suppy means is released from said valve apparatus, a portion of said main valve support being disposed within said main valve for engaging the interior periphery of said main valve and for limiting the amount of deflection of said main valve in a direction away from said main valve seat, a lower portion of said valve support extending exteriorally of said main valve to provide a substantially circumferential support about a lower external periphery of said main valve for limiting peripheral deflection of said main valve.

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**5,048,558**

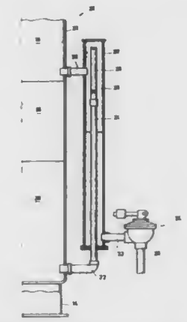
**VALVE SEAT AND METHOD OF REPAIR**

**Carl R. Calhoun, 6200 S. County Rd. 1210, Midland, Tex. 79703**

**Continuation of Ser. No. 526,507, May 21, 1990. This application Jan. 29, 1991, Ser. No. 647,283**

**Int. Cl.[5] F16K** *43/00, 51/00*

**U.S. Cl. 137—407** **7 Claims**



1. A diaphragm valve and seat assembly useable with a three phase treater, comprising:

a cylindrical tank having a base end and a second end opposite said base end, said tank having an emulsion inlet to allow entry into said tank of an emulsion comprising oil, water, and gas, said water separating from said emulsion towards said base end of said tank, said gas separating from said emulsion toward said second end of said tank, said oil separating from said emulsion towards a position between said water and said gas;

a water outlet disposed adjacent to said base end of said tank;

an equalizing line disposed adjacent to said second end of said tank;

a syphon tube juxtapositioned outside of said tank, said syphon tube having a water inlet end adjacent said base end of said tank and a gas inlet end adjacent said second end of said tank, said syphon tube having internal surfaces, said syphon tube having an opening for a syphon leg in said water inlet end of said syphon tube so that water may flow from said tank to said syphon tube, said syphon leg extending from said water outlet into said syphon tube and terminating inside of said syphon tube, said equalizing line connecting proximate said gas inlet end of said syphon tube so that gas may flow between said tank and said syphon tube, said syphon tube further including an annulus between said syphon leg and said internal surfaces, said annulus having an outlet proximate to said water inlet end of said syphon tube, said annulus having a water pressure at said annulus outlet which increases as the amount of water in said syphon tube annulus increases; and

a diaphragm valve comprising,

an upper and lower housing internally separated by a flexible diaphragm, said lower housing of said valve being connected by conduit to said syphon tube outlet

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so that water under said water pressure may flow from said syphon tube annulus into said lower housing of said valve, said flexible diaphragm having a centrally positioned seating element facing into said lower housing, said lower housing further having an outlet,

an upwardly extending valve seat removably secured to said lower housing so that it is in communication with said lower housing outlet, said valve seat being made of an erosion-resistant material, said valve seat having a body with a generally cylindrical bore therethrough, said body having a first end and a second end, said first end having a counterbore concentric with said cylindrical bore and having an axial depth D, means on said second end of said body for mounting said valve seat onto said lower housing, an insert carried by said body and received in said first end, said insert being comprised of a corrosion and erosion-resistant, synthetic polymeric material and having a passageway therethrough, said insert having a first portion defining first inner and outer concentric cylindrical surfaces, said first outer surface having a diameter greater than the diameter of said counterbore and being supportingly seated on said first end, an annular sealing surface being formed on said first portion, a second generally cylindrical portion, said second portion being received in said counterbore, means disposed between said body and said second portion of said insert to secure said second portion of said insert to said body within said counterbore and effect fluid-tight sealing between said second portion and said body,

said flexible diaphragm pressing said seating element against said annular sealing surface on said first portion of said valve seat insert with an adjustable force to thereby seal said valve, said valve opening when said water pressure acts to lift said flexible diaphragm by overcoming said adjustable force.

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**5,048,559**

## VALVE AND APPARATUS USING SAID VALVE

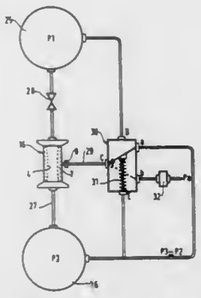
**Luc Mathieu, and Jean-Marc Paquet, both of Annecy, France, assignors to Alcatel Cit, Paris, France**

**Filed Aug. 30, 1990, Ser. No. 574,725**

**Claims priority, application France, Sep. 1, 1989, 89 11486**

**Int. Cl.[5] F16K *31/126***

**U.S. Cl. 137—488** **1 Claim**



1. Anti-hammer apparatus for an installation comprising two zones at different pressures P1 and P2 such that P1>P2, a duct provided with an on/off cock interconnecting said two zones, a valve placed in said duct in series with said on/off cock, said valve comprising: a rigid tube, a flexible tube situated within said rigid tube with opposite ends of the flexible tube being connected in a sealed manner to the two ends of said rigid tube, a control orifice provided through the wall of the rigid tube in the vicinity of a middle region thereof, a core disposed inside the flexible tube, the core being smaller in cross-section than the inside section of the flexible tube when in the rest state, and said core having a calibrated internal passage, said valve being controlled via its control orifice by means of a pneumatic slide valve, said slide valve having two communication paths enabling a common outlet C to be connected either to a first inlet a or else to a second inlet b, the slide valve including two drive inlets D and E for controlling displacement of the slide which establishes said communication paths, said slide valve being of the preferential control type with communication between inlet a and common outlet C being provided when the drive inlets D and E are subjected to equal pressures, outlet C being connected to said control orifice of said valve, the inlet a being connected to a pressure P3≦P2, and the inlet b being connected to a pressure Pa>P1, control inlet D being connected to the zone at pressure P1 and control input E being connected to the zone at pressure P2.

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**5,048,560**

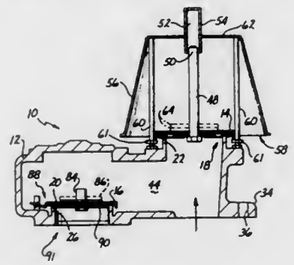
## SEALING VALVE ASSEMBLY

**Louis J. Jannotta, Orland Park, and Raymond G. Reip, Indian Head Park, both of Ill., assignors to L&J Engineering Inc., Crestwood, Ill.**

**Continuation-in-part of Ser. No. 448,874, Dec. 12, 1989, abandoned. This application Aug. 16, 1990, Ser. No. 568,474**

**Int. Cl.[5] F16K *17/194***

**U.S. Cl. 137—493.8** **20 Claims**



15. A valve assembly comprising:

a valve housing including a fluid conduit and a valve seat defining a fluid outlet of said fluid conduit;

a pressure pallet sized and adapted to move away from said valve seat in response to an increased fluid pressure in said fluid conduit;

seal means associated with said pressure pallet and acting to effectively seal said fluid outlet against fluid flow from said fluid conduit when said seal means is in contact with said valve seat, said seal means including a first flexible seal element having an outer periphery and being adapted to contact said valve seat and a second flexible seal element having an outer periphery, said first and second flexible seal elements being unsecured to said pressure pallet near their respective outer peripheries, said seal means being structured so that fluid from said fluid conduit is in the space between said first and second seal elements when said seal means is in contact with said valve seat; and

means acting to maintain a fluid space between said first and second seal elements when said seal means is in contact with said valve seat, said fluid space extending across the area of contact between the seal means and the valve seat.



**5,048,561**

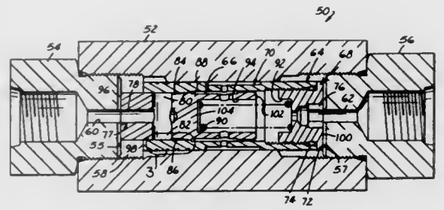
## BIDIRECTIONAL CHECK VALVE

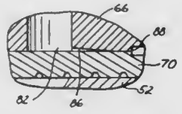
**Lael B. Taplin, Union Lake, and Vinod K. Nanda, Rochester, both of Mich., assignors to Vickers, Incorporated, Troy, Mich.**

**Division of Ser. No. 341,213, Apr. 21, 1989, Pat. No. 4,993,921. This application Nov. 5, 1990, Ser. No. 609,368**

**Int. Cl.[5] F16K *17/26***

**U.S. Cl. 137—493.9** **6 Claims**





1. A bidirectional hydraulic check valve that comprises:

a housing that includes means defining an internal cavity having an axial dimension and fluid openings at axially opposed ends of said cavity,

a first valve element that comprises a cup-shaped body having a base adjacent to one axial end of said cavity, a sidewall axially slidably embraced by said housing within said cavity and first fluid passage means extending through said base,

a second valve element that comprises a body telescopically slidable embraced within said sidewall of said first element, and second fluid passage means that extends through said body from a first end adjacent to the other axial end of said cavity to a second end internally adjacent to said sidewall of said first valve element,

third fluid passage means between said first and second valve elements variably connecting said second end of said second passage means to said first passage means as a function of axial positions of said first and second valve elements with respect to each other, and

spring means captured between said first and second valve elements and urging said valve elements toward respective ends of said cavity.

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**5,048,562**

## ONE WAY AIR ADMITTANCE VALVE

**Patrick D. Frawley, Pyrmont House, Woodland Avenue, Hartley, Kent, DA3 7BY, United Kingdom**

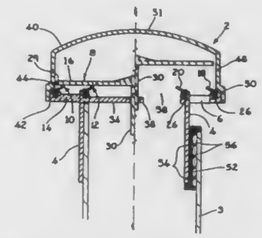
**Filed May 25, 1990, Ser. No. 529,185**

**Claims priority, application United Kingdom, Jun. 6, 1989, 8913009**

**Int. Cl.[5] F16K *15/08***

**U.S. Cl. 137—516.15** **7 Claims**

1. A one way air admittance valve for admitting air into a pipe, which valve comprises a body portion for fitting to the pipe, at least one air inlet port in the body portion, and rigid sealing means which is longitudinally movable between a first position in which it seals the air inlet port and a second position in which the air inlet port is open for the admittance of air into the pipe, the valve being such that there is only one sealing means for all of the air inlet ports, and the sealing means being such that it seals at two separate areas by engaging with a pair



of lip seals which are mounted on the body portion and which are radially spaced apart by being positioned inwardly and outwardly of the air inlet port.

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**5,048,563**

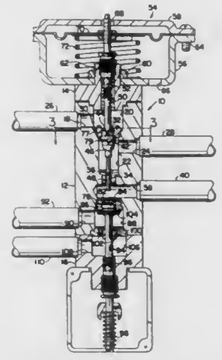
## STEAM AND FUEL OIL SUPPLY AND PURGE VALVE WITH COOLING STEAM FEATURE

**Bascom F. Buchanan, Sarasota, Fla., and Joseph R. Buchanan, Portland, Conn., assignors to ITT Corporation, New York, N.Y.**

**Filed Mar. 14, 1990, Ser. No. 493,217**

**Int. Cl.[5] F16K *11/16***

**U.S. Cl. 137—597** **9 Claims**



1. A steam and fuel oil supply and purge valve comprising a valve body defining steam and oil inlet ports, at least one discharge port, a steam purge passageway interconnecting said steam inlet and discharge ports, an oil supply passageway interconnecting said oil inlet and discharge ports, a cooling steam passageway interconnecting said steam inlet and discharge ports, a steam valve and actuator member movable between first, second, third, and fourth positions in said valve body and operable to open and close said steam purge and cooling steam passageways, a small metering passageway in said steam valve and actuator member which is so dimensioned and located as to open prior to full opening movement of the valve member and actuator relative to its seat, an oil valve member movable between first and second positions to open and close said oil supply passageway, biasing means urging said oil valve member toward its second and closed position, said steam valve and actuator member in its first and second positions respectively closing and opening said steam purge passageway, and said valve and actuator member in its third position closing said steam purge passageway and actuating said oil valve member whereby to urge said member to its first position in opposition to said biasing means and thereby open

VOL 1130 ISS 3 SE 17 1991 UMI



said oil supply passageway, and said steam valve and actuator member in its fourth position allowing said oil valve member to close said oil supply passageway at the urging of said biasing means and opening said cooling steam passageway.

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**5,048,564**

## HIGH-SPEED SOLENOID VALVE FOR A FLUID UNDER PRESSURE, E.G. FOR PNEUMATIC CIRCUITS

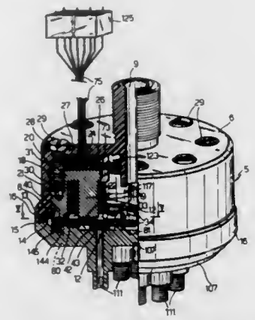
**Mario Gaiardo, Ivrea, Italy, assignor to Matrix S.r.L., Ivrea, Italy**

**Filed May 30, 1990, Ser. No. 530,348**

**Claims priority, application Italy, Jun. 2, 1989, 67429 A/89; Jun. 2, 1989, 67430 A/89**

**Int. Cl.[5] F16K** *31/06, 11/24*

**U.S. Cl. 137—599** **18 Claims**



1. A high speed solenoid valve for a fluid under pressure, e.g. for pneumatic circuits, comprising first and second coaxial members made of non-magnetic material for forming a body and defining a chamber for the fluid under pressure, an inlet duct for the fluid carried by said first member, at least one outlet duct for the fluid carried by said second member, said inlet duct and said outlet duct opening into said chamber and being disposed with their axes parallel to the axes of said first and second members, a shut-off disc for the fluid in said outlet duct, and an electromagnet arranged in said chamber for controlling said disc, said electromagnet comprising a magnetic circuit and a magnetic coil wound around an axis parallel to said axes, said magnetic circuit and said coil being both secured to said first member and both constantly lapped by the fluid under pressure, said electromagnet further comprising an armature plate pivoting about an axis perpendicular to the axis of said outlet duct, said disc being secured to a surface of said plate facing toward said outlet duct, the arrangement of said plate being such that said disc is maintained in the closed configuration of said outlet duct solely by the fluid pressure.

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**5,048,565**

## VALVE ASSEMBLY WITH CHECK VALVE FOR GAS CONTAINER

**Akira Oi, Amagasaki, Japan, assignor to Kabushiki Kaisha Neriki, Japan**

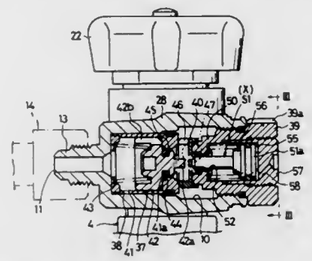
**Filed Mar. 8, 1990, Ser. No. 490,404**

**Claims priority, application Japan, Mar. 10, 1989, 1-58866**

**Int. Cl.[5] B65B** *3/04*

**U.S. Cl. 137—614.19** **10 Claims**

1. In a valve assembly with a check valve for a gas container, including a valve box, a gas inlet port and a gas outlet port connected in communication with each other through a gas inlet passage, a stop valve chamber having a circumferential wall and a gas outlet passage serially arranged within said valve box, said stop valve chamber accommodating a stop valve body adapted to be opened and closed relative to a stop valve seat through a stop valve opening and closing manipulation means; in a portion of a gas passage running from the stop valve chamber to the gas outlet port through the gas outlet passage there being provided a check valve chamber having an inlet, said check valve chamber accommodating a check valve body resiliently forced to a check valve seat by means of a checking spring; under the open condition in which the stop valve body is opened by means of the stop valve opening and closing manipulation means, when a residual pressure within a gas container is higher than a predetermined pressure, a gas within the gas container is adapted be discharged to the gas output port by separating the check valve body from the check valve seat against a valve closing force of the checking spring by means of the residual pressure; when the residual pressure within the gas container lowers to the predetermined pressure, the residual pressure is kept at the predetermined pressure by keeping the check valve body in sealing contact with the check valve seat by means of the valve closing force of the checking spring; and when a reverse flow gas flows into the check valve chamber form the gas outlet port, in addition to the valve closing force of the checking spring, a pressure of the reverse flow gas acts on the check valve body as a valve closing force to keep the check valve body in sealing contact with the check valve seat and prevents the reverse flow gas from reversely



flowing from the check valve seat into the gas inlet port through the stop valve chamber, the improvement of said valve assembly with a check valve for a gas container comprising:

said check valve chamber being located in the circumferential wall of the stop valve chamber;

the inlet of said check valve chamber is opened by movement of said check valve body toward said outlet port against the closing force exerted by the checking spring; and

a check valve body opening member is provided for valve opening actuation of said check valve body; said check valve body opening member being adapted to engage the check valve body from the inlet side of the check valve chamber, said check valve body opening member is adapted to be changed over between a valve open position where said check valve body opening member shifts the check valve body by the advancement of the check valve body opening member within the check valve chamber and a valve opening cancellation position where the check valve body opening member is retracted from the check valve chamber.

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**5,048,566**

## ONE-PIECE BLOW-MOLDED VALVE AND ACTUATOR

**Lloyd G. Cole, Tecumseh, and David R. Martin, Chatham, both of Canada, assignors to Siemens Automotive Limited, Chatham, Canada**

**Filed Sep. 21, 1990, Ser. No. 586,480**

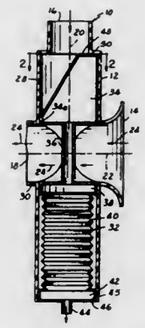
**Int. Cl.[5] F16K** *11/02, 11/065*

**U.S. Cl. 137—625.4** **9 Claims**

1. A valve assembly comprising a flow passage within which a valve element is selectively positioned by an actuator which comprises a chamber space that is expanded and contracted in volume to position said valve element and porting that provides ingress to and egress from said chamber space for a



control fluid that establishes the volume of said chamber space, and hence the position of said valve element, said valve assembly further comprising a connecting rod that is between said chamber space and said valve element to transmit the expan-



sion and contraction of said chamber space to said valve element, characterized in that said valve element and said chamber space are a single plastic part, and in that said single plastic part also comprises said connecting rod.

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**5,048,567**

## HYDRAULIC CONTROL VALVE

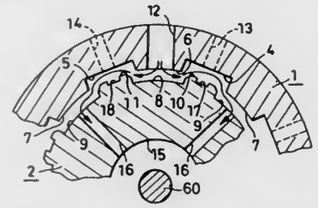
**Masahiko Noguchi, Osaka, and Tatsuro Motoyama, Kanagawa, both of Japan, assignors to Koyo Seiki Co., Ltd., Osaka and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, both of, Japan**

**Filed Mar. 11, 1991, Ser. No. 667,334**

**Claims priority, application Japan, Mar. 15, 1990, 2-66708**

**Int. Cl.[5] F15B** *9/08;* **F16K** *11/07*

**U.S. Cl. 137—625.23** **3 Claims**



1. A hydraulic control valve comprising a casing having an oil inlet channel and an oil outlet channel and formed with groove portions and land portions arranged alternately in a specified direction, and a valve member having a return oil channel and attached to the casing so as to be movable relative thereto in the specified direction, the valve member having groove portions and land portions arranged alternately in the specified direction, the groove portions and the land portions of the casing being opposed to the land portions and the groove portions of the valve member respectively when the valve is in a neutral state, permitting oil supplied from the oil inlet channel to flow into the return oil channel, the valve member being movable from the neutral state relative to the casing for the land portions of the casing and the valve member to block communication between the oil inlet channel and the return oil channel to permit the oil supplied from the oil inlet channel to flow into the oil outlet channel, the hydraulic control valve being characterized in that the land portion of the casing or the valve member is formed with a recess for permitting the oil supplied from the oil inlet channel to flow therethrough into the return oil channel when the amount of movement of the valve member from the neutral state relative to the casing becomes greater than a predetermined value.

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**5,048,568**

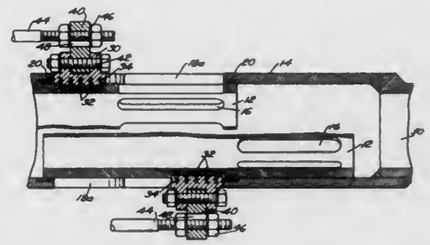
## QUICK OPENING SLIDE VALVE

**Paul E. Moody, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jun. 18, 1990, Ser. No. 539,953**

**Int. Cl.[5] F16K** *31/524, 5/04*

**U.S. Cl. 137—625.28** **5 Claims**



1. A quick opening slide valve assembly comprising:

a cylindrical tube having a plurality of tube slots;

a barrel concentric with said cylindrical tube and located radially outward of said cylindrical tube, said barrel having a plurality of barrel slots misaligned in both the axial direction and around the circumference with said plurality of tube slots when said slide valve is closed;

sealing means for providing a seal between said tube slots and said barrel slots, and the inside of said cylindrical tube and said barrel slots when said slide valve is closed; and

linkage means connected to said first cylindrical tube for transferring and modifying a driving force so as to drive said first cylindrical tube both axially with respect to said barrel and around the circumference of said barrel so that said sealing means no longer forms a seal between said first slots and said second slots and said first slots coincide with openings in said second slots to form a plurality of ports between the inside of said cylindrical tube and the outside of said barrel.

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**5,048,569**

## VALVE COMPONENT GROUP

**Kurt Stoll, and Manfred Rüdle, both of Esslingen, Fed. Rep. of Germany, assignors to Festo KG, Esslingen, Fed. Rep. of Germany**

**Filed Sep. 12, 1990, Ser. No. 581,282**

**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 4004834**

**Int. Cl.[5] F15B** *13/043*

**U.S. Cl. 137—625.64** **13 Claims**

1. A valve component group comprising:

a terminal plate containing fluid terminal ducts;

a main valve;

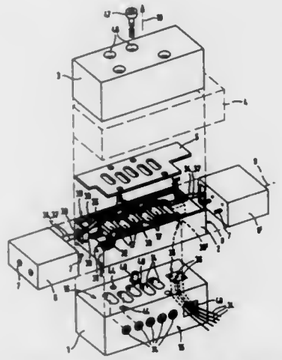
a control duct on said main valve, said main valve further having valve ducts communicating with said terminal ducts;

said terminal plate being adapted for connection with the main valve;

a pilot valve having electrical lead sections for its operation and being adapted for cooperation with said main valve and to control flow through said control duct leading to said main valve;

an intermediate plate arranged between said terminal plate and said main valve, said intermediate plate comprising intermediate ducts connecting said terminal ducts and said valve ducts, said intermediate plate also having a pilot duct thereon;

said pilot valve being arranged on said intermediate plate at a mounting site and being arranged to control flow through said pilot duct in said intermediate plate and in communication with said control duct in said main valve; and



a disconnectable male-female connector arranged between said terminal plate and said intermediate plate, one connector element of said male-female connector being connected in electrical circuit with said lead sections of said pilot valve to facilitate connection of control circuitry, connected to an other connector element of said male-female connector, to said pilot valve.

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**5,048,570**

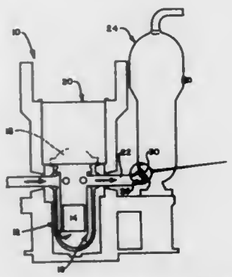
**MULTISECTIONED NOZZLE DAM**

**Eric M. Weisel, Windsor Locks, and Glen E. Schukei, South Windsor, both of Conn., assignors to Combustion Engineering Inc., Windsor, Conn.**

**Filed Apr. 21, 1986, Ser. No. 854,359**

**Int. Cl.[5] F16L *55/12***

**U.S. Cl. 138—93** **4 Claims**



1. An improved multisectioned nozzle dam for use in a steam generator with an integral bolt ring, said nozzle dam being useful for isolating the generator without the necessity of drilling holes in the nozzle surface and without creating a significant protrusion into the generator interior and including in combination;

a body having a generally circular periphery, a primary pressure receiving side and a secondary side,

redundant means of elastomeric material for sealing including at least three separate inflatable peripheral seals, a primary side flexible diaphragm and a flexible section interface seal,

redundant means for support including a plurality of independent bars having means for facilitating their being bolted to the ring and engaging the secondary side.

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**5,048,571**

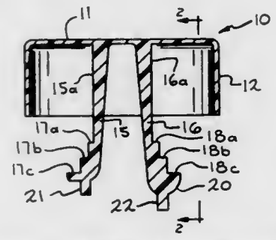
**PROTECTIVE COVER FOR END YOKE**

**John A. Ellis, Pottstown, Pa., assignor to Dana Corporation, Toledo, Ohio**

**Filed Nov. 27, 1989, Ser. No. 441,170**

**Int. Cl.[5] F16L *57/00*; B65D *85/06***

**U.S. Cl. 138—96 R** **2 Claims**



1. A protective cover adapted to be secured to a component comprising;

an end portion;

a skirt portion formed about the outer periphery of said end portion;

a pair of legs connected to said end portion and extending therefrom within said skirt portion, one of said legs terminating in a rounded surface to facilitate installation of the cover on the component, each of said legs including a plurality of shoulders formed thereon adapted to engage the component, each of said legs further including a depending tab formed thereon to facilitate removal of the cover form the component.

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**5,048,572**

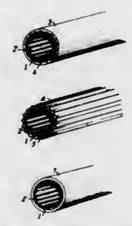
**VIBRATION DAMPING HEAT SHRINKABLE TUBING**

**Herbert R. Levine, Dover, N.H., assignor to Essex Group, Inc., Fort Wayne, Ind.**

**Filed Oct. 15, 1987, Ser. No. 108,849**

**Int. Cl.[5] F16L *9/00, 11/11***

**U.S. Cl. 138—121** **8 Claims**



1. Heat shrinkable tubing comprising an interior and exterior layer of tubular polymeric material concentrically extruded one on the other, the tubing having radial shrinkage memory and longitudinal shrinkage memory, the interior tubular polymeric material having substantially parallel raised portions along its entire interior length, such heat shrinkable article capable of shrinking in response to heat in uniform fashion to provide areas of cushioning and vibration damping after application to a substrate.

5. A method of forming a cushioned, vibration damping surface on a substrate comprising placing a heat shrinkable tubing on the substrate, applying heat to the tubing causing the tubing to shrink both radially and linearally on the substrate wherein the heat shrinkable tubing comprises an interior and exterior layer of tubular polymeric material concentrically extruded one on the other, the tubing having radial shrinkage memory and longitudinal shrinkage memory, the interior tubular polymeric material having substantially parallel raised portions along its entire interior length, such heat shrinkable article capable of shrinking in response to the heat in uniform fashion to provide areas of cushioning and vibration damping after application to the substrate.



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**5,048,573**

**NEEDLE HOLDER INSERT FOR LENO EDGE FORMING DEVICE**

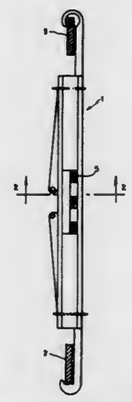
**Heinrich J. Klöcker, Borken, and Werner Wanning, Südlohn, both of Fed. Rep. of Germany, assignors to Klocker-Entwicklungs-GmbH, Borken/Westf., Fed. Rep. of Germany**

**Filed Oct. 11, 1989, Ser. No. 419,889**

**Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 8812937[U]**

**Int. Cl.[5] D03C *7/00***

**U.S. Cl. 139—54** **4 Claims**



1. A device for forming a leno edge comprising:

two reciprocally operated weaving shafts;

a thread guiding element mounted on one weaving shaft;

a needle holder having two parallel, substantially U-shaped plastic frame rails being arranged on the other weaving shaft;

said needle holder supporting another thread guiding element; and

each of said frame rails having a replaceable magnetic metal rail insert on its side facing the thread guiding element.

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**5,048,574**

**SYSTEM FOR THE STORAGE AND SEPARATION OF BOBBIN FORMERS**

**Sven Rosslé, Ingolstadt; Robert Braun, Pförring; Franz Seitz, Ingolstadt, and Michael Strobel, Eichstätt, all of Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Fed. Rep. of Germany**

**Filed Apr. 11, 1990, Ser. No. 508,249**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3912026**

**Int. Cl.[5] D03D *45/00***

**U.S. Cl. 139—245** **23 Claims**

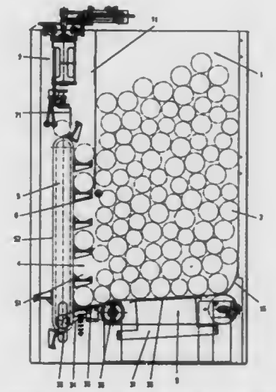
7. A device for storing and supplying bobbin formers to a textile processing machine, comprising:

(a) a bobbin former magazine having space to store a plurality of layers of bobbin formers;

(b) a discharge point in the lowest level of said magazine for discharging said formers;

(c) a former removal device for receiving formers from said discharge point and for transporting said formers to a textile machine requiring said formers;

(d) a movable support surface in the bottom of said former magazine inclined towards said discharge point for supporting the lowest layer of said bobbin formers, having a



predetermined coefficient of friction with said formers to ensure that a rolling movement is transferred to the bobbin formers; and

(e) means for moving said support surface towards said discharge point.

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**5,048,575**

**STRAP TENSIONING AND CUT OFF TOOL**

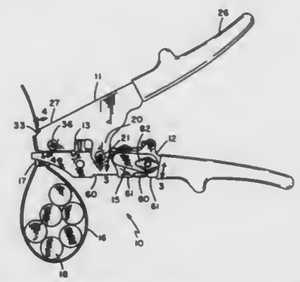
**Lester N. Smith, Annandale, Minn., assignor to Malco Products, Inc., Annandale, Minn.**

**Continuation-in-part of Ser. No. 306,299, Aug. 14, 1990, Pat. No. 4,947,901. This application Aug. 13, 1990, Ser. No. 566,629**

**The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.**

**Int. Cl.[5] B21F *9/00***

**U.S. Cl. 140—93.2** **14 Claims**



1. A tensioning and cut off tool for applying a strap wherein the strap has a locking collar and a free end, comprising

a pair of swingable handles pivotally connected together, the handles having rear ends to be manually gripped and swung, and also having front ends with strap engaging means for gripping and tensioning the strap as the handles are swung toward each other,

a cut off blade movably mounted on a portion of one of the handles to move against the strap for cutting the strap,

one of the handles having a quick release operating mechanism connected with the blade for moving the blade against the strap when released, said operating mechanism

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releasing in response to a predetermined force manually applied to the handles as tension is applied to the strap, and said mechanism operating the blade when released to move the blade with a snap action to suddenly cut the strap,

one of said handles including a support arm defining said blade mounting portion, said quick release operating mechanism including a pressure lever tiltably connected to the support arm, said pressure lever tilting on the support arm to produce movement of the blade for cutting the strap and the mechanism also including a pressure responsive releasable retainer normally retaining the pressure lever against tilting with respect to the support arm and releasing the lever for tilting when a predetermined pressure is applied on the lever causing swinging of the handle and resulting in predetermined pressure on the strap, and

the quick release operating mechanism further including adjustment means for adjusting the predetermined force for releasing the operating mechanism such that the predetermined force for releasing the operating mechanism is variable.

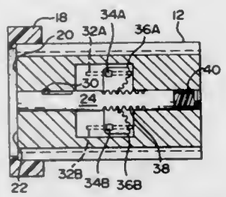
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5,048,577

## FUEL DISPENSING VAPOR ELIMINATING VALVE

James Kuusisto, P.O. Box 206, Calumet, Mich. 49913

Filed Dec. 7, 1989, Ser. No. 447,399
Int. Cl.[5] B65B 3/04; B67C 3/00
U.S. Cl. 141—293 5 Claims




1. An apparatus to be used to collect, control and eliminate fuel vapors emitted from a fuel pump nozzle and fuel tank filler neck or opening during the filling of a fuel tank comprising, in combination:

a substantially cylindrical container having a front end and a rear end;

said container is further defined by a fuel dispensing passage running from the front end to the rear end, terminating in respective first and second apertures therein;

said container is further defined by a vapor receiving passage running from the front end to the rear end terminating in respective third and fourth apertures;

first means operably engaged with said fuel dispensing, vapor receiving passages and said container for simultaneously blocking or unblocking of both said passages;

second means operably engaged with said first means for actuating said first means;

said container is further defined by a third passage running from the front end to the rear end terminating in respective fifth and sixth apertures;

wherein said second means is a plunger operably and slidably engaged with said third passage;

wherein said first means further includes first and second valve shafts operably engaged respectively, with the vapor receiving and fuel dispensing passages;

first and second valve plates operably engaged with the first and second valve shafts, respectively;

third means for movably and operably engaging said first valve shaft and said plunger;

fourth means for movably and operably engaging said second valve shaft and said plunger;

fifth means for limiting the slidable movement of said plunger to a pre-determined amount; and

sixth means for causing the first and second valve plates to return to a closed position whenever said apparatus is not in use operably engaged with said plunger.

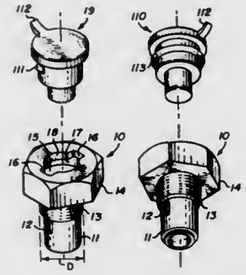
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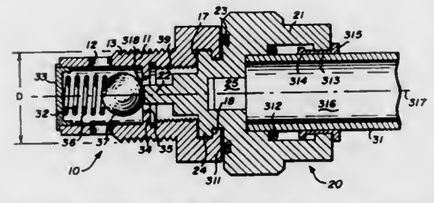
5,048,578

## OIL DRAINAGE COUPLER

Arkady Dorf, 5442 Castle Manor Dr., San Jose, Calif. 95129, and Jamie Wang, 5066 Newtrier Ave., San Jose, Calif. 95136

Continuation of Ser. No. 487,752, Mar. 1, 1990, abandoned. This application Oct. 1, 1990, Ser. No. 593,331
Int. Cl.[5] F16K 15/00; B65B 3/04
U.S. Cl. 141—346 17 Claims




1. An oil drainage coupler for engaging an oil pan to facilitate drainage of oil from within the interior of said pan and comprising:

a fitting for attachment to a conduit for passage of oil, the fitting including (a) an axial bore therethrough with an opening about an exterior end of the fitting for passage of oil through the fitting to said conduit, (b) an axial projection projecting from and positioned about said exterior end for opening a valve assembly in an associated plug, said axial projection extending beyond said opening to form a passage for oil about an exterior of said axial projection through said opening, (c) a lateral projection integral with said axial projection, projecting from and positioned about the exterior end of said bore for coupling to said associated plug and (d) a sealant means about an exterior surface of the fitting for providing a sealant to oil when the fitting is coupled to an associated plug;

a plug for engaging an opening within an oil pan and for extending between the exterior of said pan to the interior of said pan, the plug including (e) a valve assembly including biasing means in which a valve is biased into a valve seat to close the valve assembly when the plug is not coupled to the fitting, said valve seat providing an opening for passage of oil when said valve is removed away from said valve seat by said axial projection, with said passage being through said valve seat to said exterior of said axial projection, (f) a shell encompassing said valve assembly about said valve seat, an opening in a lateral wall of said shell to allow passage of oil from said pan to said seat, (g) a cylindrical hollow body having a set of exterior helical threads adapted to thread into a set of threads in a wall of said opening of said oil pan having a first diameter D, and for providing a seal between the plug and said oil pan and



(h) a head engaged to said cylindrical body for extending to the exterior of said pan and for positioning in abuttment with said pan about said opening, said head and cylindrical body having formed therethrough a coupling cavity extending to said bore, said cavity being encircled by a side wall in which is formed a first groove intersected by at least one lateral projecting slot through which said lateral projection of the fitting can pass and be rotated into said first groove to couple the fitting to the plug such that said axial projection is postioned collinear with the axis of said helical threads and such that, when the plug is coupled to the fitting, said axial projection urges the valve away from said seat without contacting other portions of the plug and providing for a spacing for passage of oil through said seat and for providing a spacing between said exterior of said axial projection and said cylindrical body, whereby oil may pass through said seat, about said exterior of said axial projection within said cylindrical body and then through said opening to said bore and plugs of various diameters D can couple to the same fitting and provide for a sealed passageway of oil from the interior of said pan to said conduit, thereby enabling a common fitting to be used with various sizes of the plug without limiting the rate of flow of oil through the plug to that of the smallest diameter plugs.

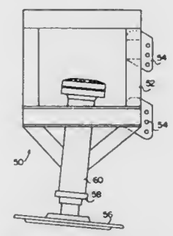
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5,048,579

## TREE STUMP CUTTER

Johnny D. Lloyd, 16 Boaker Road, Bisley Heights, Pietermaritzburg, Natal Province, South Africa

Continuation-in-part of Ser. No. 427,825, Oct. 26, 1989. This application Jul. 2, 1990, Ser. No. 547,951
Claims priority, application South Africa, Oct. 23, 1988, 88/8120; Apr. 5, 1990, 90/2657
Int. Cl.[5] A01G 23/06
U.S. Cl. 144—2 N 22 Claims




1. A tree stump cutter comprising:

(a) a support frame having a central longitudinal axis along which said stump cutter can be moved;

(b) a first pair of circular cutting blades, each of said blades having an axis of rotation and a radius and lying in a plane, each of said blades being rotatably mounted on said support frame in a configuration in which said blades lie in substantially the same plane, said blades being rotatable about parallel axes that are separated by a distance approximately equal to the sum of the radii of said blades, so that said blades rotate without interference with one another;

(c) a drive means for rotating said blades; and

(d) a coupling means for coupling said support frame to a displacement means, said coupling means being positioned and shaped such that said blades are held in a configuration so that when said stump cutter is moved and said blades are rotated, a tree stump can be cut off by said blades beneath ground level when the stump passes between the axes of rotation of said blades.

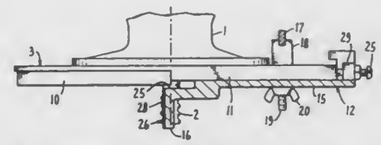
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5,048,580

## WORKPIECE GUIDE FOR PORTABLE POWER ROUTER

Ralston R. Smith, 2355 Atlas Peak Rd., Napa, Calif. 94558

Filed Jul. 9, 1990, Ser. No. 550,293
Int. Cl.[5] B27C 5/10, 5/04
U.S. Cl. 144—134 D 5 Claims




1. An attachable workpiece guide for a portable power router having a power driven bit protruding through and below a generally planar router base comprising

a guide rail extending below the router base for defining workpiece guide surfaces relative to the router bit on each side of the rail;

means for securing the guide rail to the router base; and

means for adjusting the location of the guide rail with respect to the router bit to control the depth of cut on a workpiece.

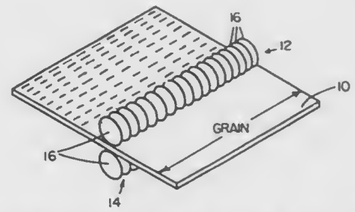
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5,048,581

## VENEER TENDERIZER APPARATUS AND PROCESS

Darrell E. Pierson, Federal Way, and Edward L. Snellgrove, Tacoma, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed May 3, 1990, Ser. No. 518,185
Int. Cl.[5] B27M 1/02
U.S. Cl. 144—362 9 Claims



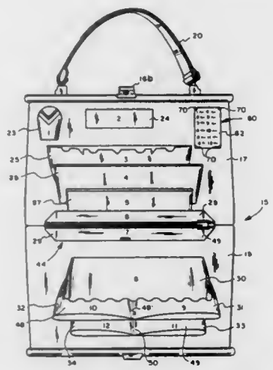

1. An apparatus for tenderizing veneer, in which the grain thereof extends in a first direction, comprising;

at least one tenderizer roller combination comprising upper and lower tenderizing rollers, wherein the upper and lower tenderizing rollers each include a plurality of spaced-apart cutter blades, each cutter blade having a plurality of cutter teeth arranged around the periphery thereof, wherein each of the cutter teeth has a blunt tip, approximately within the range of 1/32 to ¼ inch wide, the cutter teeth thereby in operation producing indentations in the veneer without causing substantial expansion of the veneer, wherein the cutter blades are arranged on the rollers such that the cutter teeth on each blade are located approximately angularly midway between the cutter teeth of adjacent blades, wherein the rollers are spaced relative to each other such that the blades on the upper and lower rollers are interleaved and such that the cutter teeth of the blades of said upper and lower rollers, respectively, in operation penetrate the upper and lower surfaces of the veneer for approximately half the thickness of the veneer.

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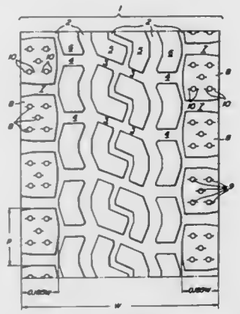


5,048,582
**COMPARTMENTED HANDBAG WITH DIRECTIONAL MAP**
Georgia L. Whitfield, 9652 S. Oblesvy, Chicago, Ill. 60617
Continuation-in-part of Ser. No. 546,308, Jul. 3, 1990. This application Dec. 26, 1990, Ser. No. 634,014
Int. Cl.[5] A45C *1/02, 3/06, 13/00*
U.S. Cl. 150—112 9 Claims



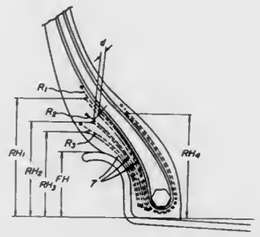
1. In a handbag having a plurality of interior compartments constructed and arranged for storing articles, the improvement comprising: a directional map located within the handbag and bearing first indicia identifying each of the compartments and second indicia identifying the contents of the compartment identified by the first indicia, and each of said compartments bearing the corresponding first indicia contained on said directional map.

5,048,583
**HEAVY DUTY PNEUMATIC TIRES**
Naoyuki Goto, and Hiroshi Ueda, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 6, 1989, Ser. No. 446,884
Claims priority, application Japan, Dec. 6, 1988, 63-306962; Oct. 5, 1989, 1-258905
Int. Cl.[5] B60C *11/12*
U.S. Cl. 152—209 R 5 Claims



1. A heavy duty pneumatic tire comprising; a tread with a pattern having a pitch pattern and provided with at least two circumferential main grooves extending circumferentially of the tire, at least one dimple per one pitch of said tread pattern arranged only in a region of an island portion extending from a side end of the tread to a position corresponding to not more than 20% of a tread width, and a pair of blind sipes disposed at opposed positions of each dimple in a widthwise direction of the tire so as to extend in the widthwise direction of the tire wherein the blind sipes do not open to a circumferential groove, and each said dimple having a cross-sectional size in the range of 5–8 mm and a depth corresponding to 40–75% of a depth of the circumferential main groove, and a ratio of total opening area of dimples to surface area of the region of the island portion ranging from the side end of the tread to a position corresponding to not more than 20% of the tread width in one pitch of the island part is in the range of 0.08:1 to 0.15:1.

5,048,584
**RADIAL TIRE FOR CONSTUCTION VEHICLE**
Minoru Nakano, Koganei; Akihito Goto, and Yoichi Nakamura, both of Kodaira, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Dec. 19, 1989, Ser. No. 452,934
Claims priority, application Japan, Dec. 22, 1988, 63-322153
Int. Cl.[5] B60C *15/06*
U.S. Cl. 152—543 18 Claims



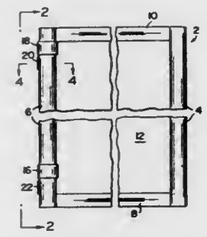
1. A radial tire for a construction vehicle, said tire comprising a substantially cylindrical tread, a pair of sidewalls extending from both ends of the tread radially inwardly and terminating in inner edges having bead cores embedded therein, a carcass made of a steel cord ply radially arranged and extending between the bead cores around which ends of the carcass are turned up, a substantially inextensible belt arranged between the carcass and the tread to form with said carcass a main reinforcing layer, and bead reinforcing layers radially outwardly extending from the proximities of the bead cores, wherein each of said bead reinforcing layers comprises at least two sets, each of the sets comprising at least two fiber cord layers, and said at least two sets of the fiber cord layers being arranged extending radially outwardly from the proximity of an axially outer portion of the bead core and are progressively spaced from each other to have a minimum spaced distance in proximity of the bead core and a maximum spaced distance at radially outer end between the two sets of fiber cord layers said fiber cord layers within said sets being substantially uniformly spaced from each other.

5,048,585
**PANEL DEVICE**
Melvin M. Miller, Bloomington, Ind., assignor to Channel - Kor Systems Inc., Bloomington, Ind.
Division of Ser. No. 144,166, Nov. 25, 1985. This application Nov. 27, 1989, Ser. No. 441,463
Int. Cl.[5] A47G *5/00*
U.S. Cl. 160—135 7 Claims

1. A vertical support which is useful in a panel device, said vertical support having an elongated body portion and a cross section which has a central U-shaped channel which is flanked on opposite sides by a pair of second U-shaped channels

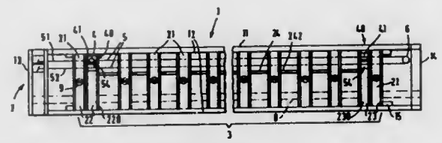


wherein the vertical support opposite of the opening of said U-shaped channels is arcuate so as to prevent interference of



the vertical support with hinge means which may be associated therewith.

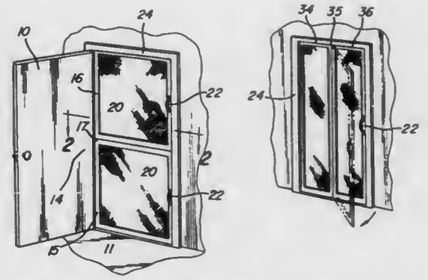
5,048,586
**GUIDE RAIL ASSEMBLY**
Gerald Howald, Saseler Str. 113, 2000 Hamburg 73, Fed. Rep. of Germany
Filed Feb. 1, 1990, Ser. No. 473,602
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1989, 8901384[U]
Int. Cl.[5] E06B *9/36*
U.S. Cl. 160—168.1 15 Claims



1. A guide rail assembly, comprising:
a rail having first and second ends;
a plurality of carriages slidably attached to said rail for sliding along said rail, said plurality of carriages including a first active carriage and at least one passive carriage, wherein active carriage includes a first releasable engagement means;
means for sliding said carriages along said rail in first and second directions, including elongated pulling means for pulling at least said first active carriage, said elongated pulling means having first locking means for detachably fixedly engaging said first releasable engagement means to enable the first active carriage to slide in either one of said first and second directions upon pulling of said pulling elongated pulling means.

5,048,587
**PORTABLE SCREEN DOOR INSERT**
Kenneth V. York, Northville, Mich., assignor to Kenway, Inc., Northville, Mich.
Filed Nov. 7, 1988, Ser. No. 267,878
Int. Cl.[5] E06B *9/00*
U.S. Cl. 160—217 6 Claims

1. A screen door insert for mounting in a standard door frame in which the screen door insert is constructed so as to be disposed in abutting relationship with the door stop member of the outer door member; said screen door insert comprising:
a frame with vertically and horizontally extending connected members;
screen material disposed on the interior of the frame formed by said connecting members;
said screen door insert being constructed so as to be useful with a selected standard door frame size;
said screen door frame being formed with a designed clearance so as to be slightly smaller in both the vertical and horizontal dimensions then the selected standard door size;
securing members mounted to both said vertically extending frame members and both said horizontally extending frame members of said frame, said securing members extending outwardly from said frame members;
the sum of the outward extend of the securing members on both said frame members being greater than the designed clearance between the screen door insert frame and the standard door frame size;
said securing members being compressible and resilient so that one of said securing members can be compressed to facilitate mounting of said screen door insert, said screen door insert when mounted having said securing members on both said sides being compressed and thus resiliently holding the screen door insert in place in the standard door frame;
said securing members extend along the entire extend of both said vertically extending frame members and said horizontally extending frame members;



said screen door frame is comprised of wood;
said securing members are D-shaped foam rubber gaskets and are disposed in channels in said frame members;
said D-shaped gasket having a straight rear wall and a semi-circular curved outer portion extending outwardly away from said straight rear wall, said semi-circular curved outer portion extending outwardly of said channels, said channels having straight rear walls, said gasket rear wall being tightly received and abutting said channel rear wall;
said screen door insert is foldable along one of its axes; and
said frame being formed from at least two frame elements each having four side frame members interconnected at their ends and forming a rectangular framed opening with screen material connected to said side members and covering said framed opening, said frame elements hingedly connected along one of said side members of each of said at least two frame elements for facilitating the folding of said screened insert.

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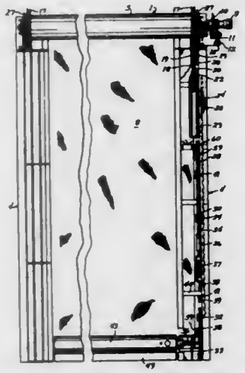


5,048,588

## ROLL-UP DOOR CONSTRUCTION

William B. Weishar, Brookfield, and Joe M. Delgado, Waukesha, both of Wis., assignors to Kelley Company Inc., Milwaukee, Wis.

Filed Jun. 26, 1989, Ser. No. 371,264
Int. Cl.[5] E06B 9/56
U.S. Cl. 160—265 10 Claims



1. A roll-up door construction for enclosing a doorway in a building, comprising rotatable drum means mounted on the building above said doorway, a flexible door panel disposed to be wound on said drum means, drive means for rotating said drum means to thereby move said door panel between a rolled-up open position and an unrolled closed position, a first flexible member having one end secured to said drum means and having the opposite end secured to a fixed object, counterbalancing means attached to said first flexible member intermediate the ends thereof for exerting a rotational force on said drum means to urge said door panel to the open position, a second flexible member having one end secured to said drum means and the opposite end connected to the lower end of said door panel, resilient means connected to said second flexible member intermediate the ends thereof and constructed and arranged to exert a downward biasing force on said door panel when the door panel is in the closed position, said flexible members being flat belts and each belt is disposed to be wound on said drum means in overlapping convolutions, said first and second flexible members being constructed and arranged such that both said flexible members are wound on said drum means in a maximum number of convolutions when said door panel is in the unrolled closed position, said resilient means comprising a spring, and adjusting means for adjusting the force of said spring.

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5,048,589

## NON-CREPED HAND OR WIPER TOWEL

Ronald F. Cook, Marietta, Ga., and Daniel S. Westbrook, Farragut, Tenn., assignors to Kimberly-Clark Corporation, Neenah, Wis.

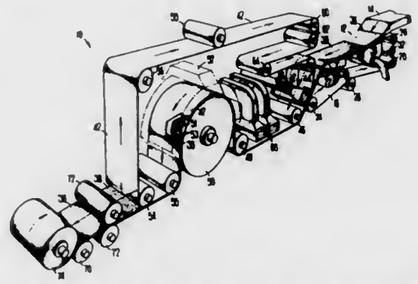
Continuation-in-part of Ser. No. 195,234, May 18, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 452,930
Int. Cl.[5] D21H 11/00, 17/00
U.S. Cl. 162—109 18 Claims

1. A towel having an absorbent capacity of at least about 385%, and an absorbent rate of about 8 seconds or less, prepared by a process comprising the steps of:

forming a furnish of cellulosic fibers, water, and a chemical debonder;

depositing the furnish on a first traveling foraminous belt thereby forming a fibrous web on top of the traveling foraminous belt;

subjecting the fibrous web to non-compressive drying to remove the water from the fibrous web; and



removing the dried fibrous web from the traveling foraminous belt without creping the fibrous web.

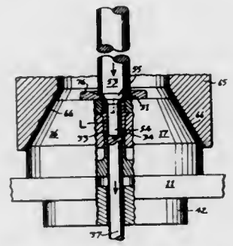
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5,048,590

## METHOD AND APPARATUS FOR FORMING BATTERY TERMINAL BUSHINGS

Warren E. Carter, Murfreesboro, Tenn., assignor to Molded Metal Services, Inc., Murfreesboro, Tenn.

Filed Aug. 1, 1990, Ser. No. 565,760
Int. Cl.[5] B22D 27/11
U.S. Cl. 164—120 16 Claims



1. A method of forming a battery terminal bushing comprising the steps of:

(a) pouring a molten lead alloy into the cavity of a mold defining the exterior surface of a battery terminal bushing and having a central axis and top and bottom ends,

(b) forcing a substantially cylindrical punch having a diameter less than the cross-sectional dimension of said exterior surface through said top open end and coaxially of said central axis to a predetermined depth through said molten lead alloy within said mold cavity and forcing a plug of said lead alloy through said open bottom end of said mold cavity,

(c) withdrawing said punch from said mold cavity to form said battery terminal bushing, and

(d) extracting said battery terminal bushing from said mold cavity.

9. An apparatus for forming a battery terminal bushing comprising:

(a) a mold cavity having an interior surface defining the exterior surface of a battery terminal bushing to be formed and having open top and bottom ends and a vertical central axis,

(b) means for pouring a molten lead alloy through said open top end into said mold cavity,

(c) an upright punch having a substantially cylindrical surface of a diameter less than the cross-sectional dimension of said interior cavity surface and a length at least as great as the height of said mold cavity between said open top and bottom ends,

(d) drive means for moving said punch coaxially downward of said mold cavity through the center of said molten lead alloy within said mold cavity and through at least said height of said mold cavity to force a plug of said lead alloy through said open bottom end of said mold cavity,

(e) means for retracting said punch from said mold cavity, and

(f) means for ejecting a bushing molded from said lead alloy from said mold cavity.



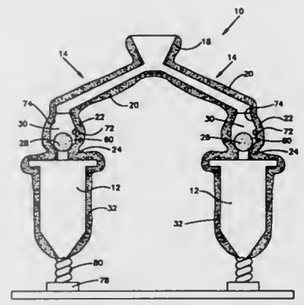
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5,048,591

## APPARATUS AND METHOD FOR USE IN CASTING

James A. Oti, Richmond Heights, and Lawrence D. Graham, Chagrin Falls, both of Ohio, assignors to PCC Airfoils, Inc., Cleveland, Ohio

Filed Jan. 22, 1990, Ser. No. 467,912
Int. Cl.[5] B22C 9/08; B22D 27/04
U.S. Cl. 164—122.1 28 Claims



1. A method of casting a reactive metal, said method comprising the steps of moving ceramic mold structure into a chamber, evacuating the chamber, conducting a flow of molten reactive metal through a feeder passage into an article mold cavity in the mold structure under the influence of gravity while the mold structure is in the evacuated chamber, and retarding the depletion of reactive elements from the molten metal in the article mold cavity by blocking the feeder passage after filling the article mold cavity with molten metal, said step of blocking the feeder passage includes moving a member to a position blocking the feeder passage by applying force against the member with the molten metal after filling the article mold cavity with molten metal.

6. A method comprising the steps of forming a pattern of an article mold cavity and molten metal feed passage, positioning a valve member in the pattern, covering the pattern with ceramic mold material, removing the pattern from the covering of ceramic mold material to form a mold structure in which the valve member is disposed, filling an article mold cavity in the mold structure with molten metal, and blocking a metal feed passage in the mold structure with the valve member after filling the article mold cavity with molten metal.

11. An apparatus for use in the casting of metals containing one or more reactive elements, said apparatus comprising a ceramic mold structure, said ceramic mold structure including means for at least partially defining an article mold cavity and means for at least partially defining a feeder passage which extends upwardly from the article mold cavity and through which molten metal is conducted downwardly to said mold cavity, and depletion retarding means for retarding depletion of reactive elements from molten metal in said article mold cavity, said depletion retarding means including valve means which is disposed above said article mold cavity and which is operable to a closed condition blocking the feeder passage by force applied against said valve means by the molten metal, said valve means including surface means for at least partially defining a valve chamber which is disposed above said article mold cavity and a valve seat at an upper end portion of said valve member, said valve means further including a valve member movable upwardly in the valve chamber into engagement with the valve seat to block the transmission of reactive elements from the mold cavity and valve chamber.

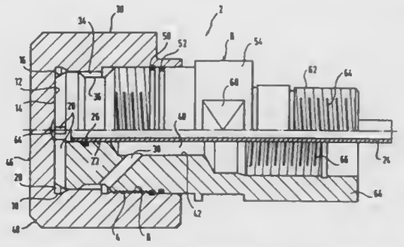
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5,048,592

## PLUNGER FOR A DIECASTING MACHINE

Andre Mueller, Ependes, Switzerland, assignor to Allper AG, Duedingen, Switzerland

Filed Feb. 9, 1990, Ser. No. 477,072
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1989, 3934778
Int. Cl.[5] B22D 17/20
U.S. Cl. 164—312 24 Claims



1. A plunger for forcing molten metal out of a casting cylinder of a diecasting machine, comprising:

(A) a supporting body which is made of a material having a first coefficient of expansion and which has an external thread and a front face formed thereon, said supporting body having a feed channel and a return channel formed therein; and

(B) a cap which is formed of a second material having a second coefficient of expansion higher than that of said first material, said cap being attached to said supporting body via an internal thread which engages said external thread of said supporting body and being thermally shrink fitted onto said supporting body, said cap having an inner cover face which bears against said front face of said supporting body and which defines an annular channel which extends along a periphery of said inner face of said cap and said front face of said supporting body, which receives coolant from said feed channel, and from which coolant is drawn off through said return channel.

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5,048,593

## APPARATUS FOR WEIGHTING AND LATERAL SUPPORT OF BOX-LESS SAND MOLD PARTS

Anders Mortenseo, Bronsboj, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

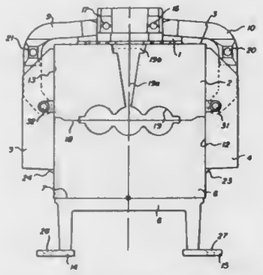
Filed Feb. 6, 1990, Ser. No. 475,973
Claims priority, application Denmark, Feb. 28, 1989, 0956/89
Int. Cl.[5] B22D 33/04; B22C 23/00
U.S. Cl. 164—341 5 Claims

1. Apparatus for weighting and laterally supporting box-less sand mold parts during pouring, solidification and cooling, said mold parts comprising an upper mold part and a lower mold part and having opposing side faces, said apparatus comprising; a weight iron having a plane bottom face abutting a top side of said upper mold part, and two clamping plates for positioning one at each side of said mold parts, whereby the bottom side of said lower mold part rests on a transport device movable in a direction of transportation, wherein said apparatus is further characterised by two substantially L-shaped arms each pivotally connected at one end to said weight iron and at another end to one of said side clamping plates, said two L-shaped arms being mounted opposite to each other in a vertical plane

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through said mold parts, said arms being laterally off-set in a horizontal plane and pivotally connected to said weight iron at



a point situated between the longitudinal symmetry line of the mold parts in said direction of transportation and the side face opposite to said clamping plate of said arms.

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**5,048,594**

**PROCESS FOR CONTROLLING CHANGE OF THROTTLING POSITION IN A SLIDING CLOSURE UNIT**

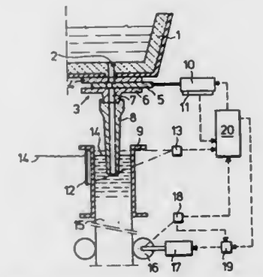
**Silvio Cecchini, Zürich, and Walter Vetterli, Winterthur, both of Switzerland, assignors to Metacon AG, Zürich, Switzerland**

**Filed Aug. 28, 1989, Ser. No. 399,200**

**Claims priority, application European Pat. Off., Aug. 31, 1988, 88114177.4**

**Int. Cl.[5] B22D** *11/18*

**U.S. Cl. 164—453** **12 Claims**



1. A process of operating a sliding closure unit to control the discharge of molten metal from a metallurgical vessel through a discharge passage of said sliding closure unit into a mold to regulate the level of said molten metal within said mold, said process comprising:

moving a sliding plate of said sliding closure unit to selected throttling positions thereof relatively restricting the size of said discharge passage;

controlling the movement of said sliding plate to regulate said level as a function of said level in a level control operation by a processor; and

periodically interrupting said level control operation and moving said sliding plate in a throttling position change operation from one throttling position through a completely open position of said discharge passage to another throttling position, such two throttling positions employing throttling surfaces of said sliding closure unit on opposite sides of said discharge passage, said throttling position change operation comprising regulating at least said throttling position at which said sliding plate is located at the conclusion of said throttling position change operation by a sequence control program included in said processor controlling said level control operation, said regulating comprising, prior to each said throttling position change operation, determining at least one preceding throttling position of said sliding plate, and based on such determination calculating said throttling position at which said sliding plate is to be located at the conclusion of said each throttling position change operation.

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**5,048,595**

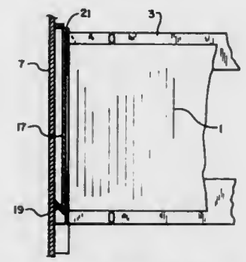
**ROTARY REGENERATIVE AIR PREHEATER BASKET SEALING**

**William F. Harder, Wellsville, N.Y., assignor to ABB Air Preheater, Inc., Wellsville, N.Y.**

**Filed Mar. 4, 1991, Ser. No. 663,359**

**Int. Cl.[5] F28D** *19/04*

**U.S. Cl. 165—9** **6 Claims**



1. An improved element basket for a rotary regenerative heat transfer device comprising

a plurality of heat transfer elements;

an open frame for holding said heat transfer elements; and

at least one side sealing member, said at least one side sealing member consisting of an imperforate sheet fastened on the outside of said frame and substantially completely covering a first side thereof and including a distal edge portion bent back upon itself and biasable against a wall surface of the heat transfer device.

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**5,048,596**

**OIL COOLER**

**James W. B. Lu, W. Bloomfield, Mich., assignor to McCord Heat Transfer Corporation, Walled Lake, Mich.**

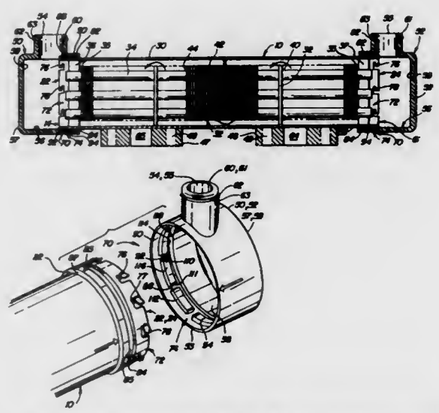
**Continuation-in-part of Ser. No. 467,999, Jan. 2, 1990, abandoned. This application Jan. 9, 1991, Ser. No. 639,078**

**Int. Cl.[5] F28F** *9/02;* **F01M** *5/00;* **F01P** *11/08*

**U.S. Cl. 165—41** **19 Claims**

1. A heat exchanger assembly comprising:

tank means (10) having a longitudinal axis extending between first (14) and second (16) ends for conveying fluid therethrough, heat exchanger means (32) disposed in said tank means (10) for removing heat energy from the fluid, attachment means (46, 47) fixed to said tank means (10) at a predetermined position extending radially from said axis for attaching said tank means (10) to a vehicle, cap means (50, 52) for closing at least one of said first (14) and second (16) ends and including a coupler (60, 61) for connection to a fluid conduit (102, 103); said assembly characterized by including connection means (70) interconnecting said cap means (50, 52) and said one end (14, 16) of said tank means (10) for maintaining a fluid impervious seal between said cap means (50, 52) and said one end (14, 16) and for allowing relative rotation between said cap means (50, 52) and said tank means (10) to annularly adjust the position of said coupler (60, 61) with said fluid conduit (102, 103), said connection means (70) including a male member (72) having at least two tabs (76) spaced circumferentially apart a predetermined arcuate distance about said axis and a female member (74) having an interior annular channel (92) intersecting with at least two axially extending interior passageways (88) disposed parallel to one another and spaced circumferentially said predetermined distance for receiving said tabs (76) of said male member (72), said male member (72) further including an annular rim (82) and said female member (74) including at least a portion of an annular wall (94, 118) and said connection means (70)



including resilient sealing means (84) compressed between said rim (82) and said wall (94, 118) for locking said tabs (76) in said annular channel (92) while establishing a fluid impervious seal therebetween and for allowing relative rotation between said cap means (50, 52) and said tank means (10).



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**5,048,597**

**LEAK-SAFE HYDROGEN/AIR HEAT EXCHANGER IN AN ACE SYSTEM**

**William H. Bond, Del Mar, Calif., assignor to Rockwell International Corporation**

**Filed Dec. 18, 1989, Ser. No. 452,133**

**Int. Cl.[5] F02K** *11/00, 9/00, 9/42, 9/72*

**U.S. Cl. 165—41** **3 Claims**

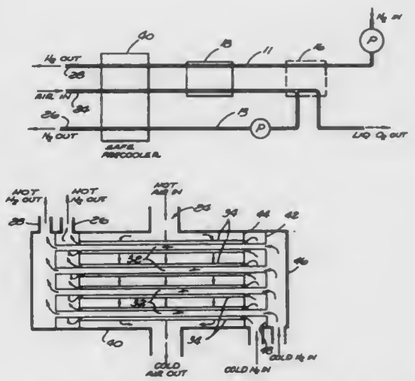
1. In the air inlet duct of an ACE propulsion system, a leak-safe hydrogen/air heat exchanger, comprising:

a plurality of generally concentric, spaced apart tubes arrayed across said inlet duct, each of said tubes comprising an inner tube member and an outer tube member with an annular passageway therebetween;

said inner tube member coupled to a source of cold hydrogen and first circulating pump means through first duct means and said outer tube member coupled to a source of inert fluid and second circulating pump means through second duct means;

said outer tube member having an outer surface in thermal exchange relationship with air in said air inlet duct and an inner surface in thermal exchange relationship with inert fluid in said annular passageway;

said inner tube member having an outer surface in thermal exchange relationship with said inert fluid in said annular passageway and an inner surface in thermal exchange relationship with cold hydrogen of said first duct means;



said inner tube member and first duct means isolated from air in said heat exchanger by inert fluid in said annular passageway and said outer tube member.

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**5,048,598**

**RESERVIOR TANK FOR A LIQUID COOLING SYSTEM**

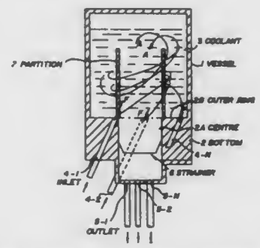
**Motohiro Takemae, Fujisawa; Takaaki Kanki, Oyama; Hirofumi Takao, Kawasaki; Hisashi Kawashima, Yokohama, and Hideo Katsumi, Kanagawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Jan. 24, 1990, Ser. No. 469,114**

**Claims priority, application Japan, Feb. 6, 1989, 1-26861**

**Int. Cl.[5] H01L** *23/473*

**U.S. Cl. 165—104.14** **6 Claims**



1. A tank for containing a coolant, comprising:

a plurality of outlets for feeding out said coolant, said outlets being located at a center portion of a bottom of said tank, and

a plurality of inlets for returning said coolant into said tank, said inlets being located at an outer periphery of said center portion, each of said inlets being slanted from a vertical line of said tank so as to generate a whirlpool effect for said coolant coaxially around a vertical axis of said tank toward an upper portion of said tank.

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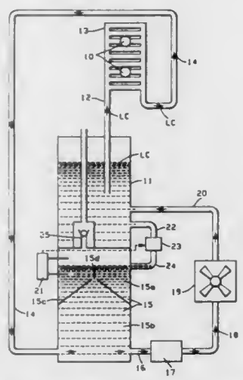


5,048,599

## LEAK TOLERANT LIQUID COOLING SYSTEM EMPLOYING AN IMPROVED AIR PURGING MECHANISM

Jerry T. Tustaniwskyj, Mission Viejo, Calif., and Johan P. Bakker, Union Lake, Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 11, 1990, Ser. No. 596,108
Int. Cl.[5] F28D *15/00*; H01L *23/473*
U.S. Cl. 165—104.32 13 Claims



1. A system for cooling electrical components, comprising:
a purge tank having a top chamber and a bottom chamber which are interconnected through a passageway;
a cooling circuit, including a pump and conduits, which circulates a liquid coolant past said electrical components and through said bottom chamber;
said bottom chamber being sized such that said coolant passes through it with a velocity which is low enough to let any air bubbles in said coolant rise and move by buoyancy through said passageway into said top chamber;
said top chamber having an input port and an output port;
control means which removes air from said top chamber through said output port by forcing said coolant in through said input port at a high rate while simultaneously pumping said coolant through said cooling circuit; and,
said passageway being adapted to limit any flow of said coolant from said top chamber to said bottom chamber to a low rate while said coolant is being forced into said to chamber.

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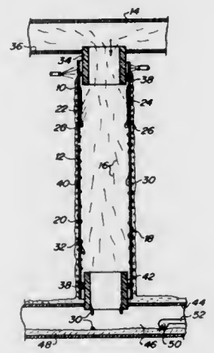
5,048,600

## CONDENSOR USING BOTH FILM-WISE AND DROP-WISE CONDENSATION

Timothy R. Stout, Placerville, and Floyd T. Wright, Fremont, both of Calif., assignors to T & G Technologies, Inc., Cameron Park, Calif.

Filed Oct. 10, 1990, Ser. No. 598,013
Int. Cl.[5] F28B *1/00*; F28F *13/04*
U.S. Cl. 165—110 11 Claims

1. A condensor comprising a vapor to be condensed, an upper condensing surface means with a vertical component to its orientation and which is wettable with respect to the condensed state of said vapor, a lower condensing surface means with a vertical component to its orientation and which is unwettable with respect to the condensed state of said vapor, and a condensate collection and removal means, where said upper condensing surface means is placed above said lower condensing surface means such that when a first portion of said vapor condenses and flows down said upper condensing surface means due to the influence of gravity, that its flow will continue off of said upper condensing surface means and onto said lower condensing surface means at a location above a dropwise condensation region of said lower condensing surface means, where said condensate collection and removal means is placed below said lower condensing surface means such that



the condensate which flows down said lower condensing surface means will flow into said condensate collection and removal means for ultimate removal from said condensor.

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5,048,601

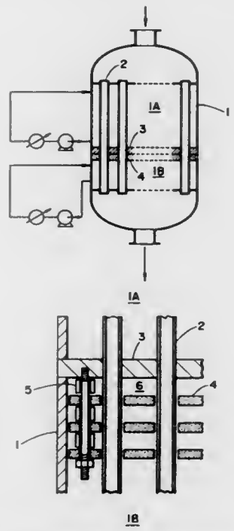
## SHELL-AND-TUBE APPARATUS HAVING AN INTERMEDIATE TUBE PLATE

Katsunobu Yamaguchi; Tateo Kurihara, both of Yokohama; Isamu Yanai; Kazuo Kikuchi, both of Yokosuka; Tomoo Saito; Suguru Hamanaka, both of Yokohama; Teruo Nagai, Chigasaki; Yasuyuki Sakakura, Yokkaichi; Takeshi Shibano, Yokkaichi; Yoji Kawatani, Yokkaichi, and Tadahiko Kondoh, Yokkaichi, all of Japan, assignors to JGC Corporation and Mitsubishi Petrochemical Co., Ltd., both of Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 481,023
Claims priority, application Japan, Feb. 17, 1989, 1-37542; Feb. 17, 1989, 1-37543
Int. Cl.[5] F28D *7/10*
U.S. Cl. 165—140 5 Claims

1. A shell-and-tube apparatus which comprises a vessel, at least one intermediate tube plate sectioning the interior of the vessel into at least two compartments of different temperatures, plural heat transferring tubes fitted in apertures to penetrate the intermediate tube plate or plates, and prevent fluid transfer from one compartment to an adjacent compartment and through which a fluid passes and is heated or cooled by a heat transfer medium surrounding the tubes, at least one insulation plate provided adjacent at least one side of the intermediate tube plate; the space or spaces thus formed between said at least one insulation plate and adjacent plates providing a stagnation zone for the heat transfer medium.





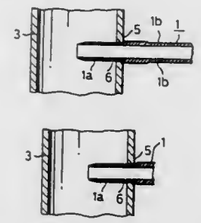
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5,048,602

## HEAT EXCHANGERS

Tutomu Motobashi; Mitsuru Nobusue; Noboru Kodachi; Ryoichi Hoshioo, and Hironaka Sasaki, all of Oyamashi, Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed May 22, 1989, Ser. No. 354,884
Int. Cl.[5] F28F *9/12*
U.S. Cl. 165—173 7 Claims



1. A heat exchanger including a core and a pair of headers connected to the core, the core including flat tubes and fins sandwiched between the tubes, the headers having holes in which the end portions of the tubes are inserted, wherein each tube comprises a stop means for insuring that an adequate length of tube end becomes inserted into the headers, said stop means being formed in the shape of a step whereby the end portions of the tubes have a smaller thickness than the thickness of the main body thereof.

7. A heat exchanger including a core and a pair of headers connected to the core, the core including flat tubes and fins sandwiched between the tubes, the headers having holes in which the end portions of the tubes are inserted, wherein each tube comprises a stop means for insuring that an adequate length of tube end becomes inserted into the headers, said stop means being a tapered step formed in the outer surface of each tube whereby the end portions of the tubes have a smaller thickness than the thickness of the main body thereof.

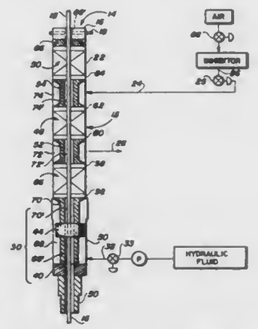
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5,048,603

## LUBRICATOR CORROSION INHIBITOR TREATMENT

Larry M. Bell, 106 Conley Pl., Odessa, Tex. 79762, and Charles L. Coskrey, 1411 Glenwood, Odessa, Tex. 79761

Filed May 29, 1990, Ser. No. 529,811
Int. Cl.[5] E21B *33/08*
U.S. Cl. 166—70 20 Claims



1. Apparatus for simultaneously cleaning and treating a wireline with treatment fluid to reduce the rate of corrosion thereof, while running tools suspended from the wireline through a wellhead and into a wellbore under pressure, comprising, in combination:
a lubricator, an upper cylinder, and a ram assembly coaxially aligned with respect to one another; said ram assembly, said upper cylinder, and said lubricator each have an upper end opposed to a lower end thereof, said ram assemble is connected to the lower end of the upper cylinder and the lower end of the ram assembly is connected to the upper end of the lubricator; the lubricator has a lower end that can be connected to a wellhead; a passageway extends axially through the lubricator, ram assembly, and upper cylinder in axially aligned relationship with respect to a wellbore to which said lubricator may be attached and through which a wireline can extend;
a plurality of spaced packer devices located within said upper cylinder for sealingly engaging and squeezingly surrounding a length of the wireline and thereby strip liquid therefrom as the wireline travels therethrough; spacer means by which said packer devices are arranged in axially spaced relationship respective to one another and within said upper cylinder; said packer devices cooperate together to form a high pressure treatment chamber that is isolated from ambient between adjacent packer devices, and a cleaning chamber between other adjacent packer devices; whereby said treatment chamber is spaced from said cleaning chamber by a packer device; means for filling said treatment chamber with treatment fluid; drain means for discharging fluid from said cleaning chamber;
said ram assembly includes a ram cylinder, a ram means reciprocatingly received within said ram cylinder for axial movement in response to pressure differential thereacross, means by which a flow of fluid is effected in said ram cylinder at a location for actuating said ram means with fluid pressure; said ram means simultaneously engages and axially compresses each packer device and thereby sealingly engage the wireline when pressure is effected across said ram means;
whereby a wireline can be cleaned and inhibited with treat-

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ment fluid as it is run into the wellbore, and can be cleaned and inhibited as it is retrieved from the wellbore.

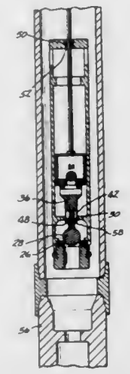
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5,048,604

## SUCKER ROD ACTUATED INTAKE VALVE ASSEMBLY FOR INSERT SUBSURFACE RECIPROCATING PUMPS

**Amnon M. Vadasz F., San Antonio de Los Altos, and Jesus E. Chacin U., Caracas, both of Venezuela, assignors to Intevep, S.A., Caracus, Venezuela**

Filed Nov. 7, 1990, Ser. No. 610,055
Int. Cl.[5] E21B *34/14;* F04B *47/00*
U.S. Cl. 166—106 4 Claims



1. In a deep well having a production tube and a sucker rod operated reciprocating subsurface pump which is selectively positioned between a first position wherein said pump is anchored in said production tube for pumping fluid from the well and a second position wherein said pump is unanchored in said production tube for non-pumping operations wherein said pump comprises a pump barrel having first valve seat defining an inlet port and a second valve seat defining an outlet port, an inlet valve for selectively sealing said inlet port and an outlet valve for selectively sealing said outlet port and a plunger reciprocally mounted within said pump barrel for pumping fluid from said inlet port to said outlet port, the improvement which comprises locking means carried by said plunger for biasing said inlet valve for locking said inlet valve against said inlet port and sealing same against pressure downhole in the well when said pump is in said second position so as to prohibit passage of fluid into said pump barrel and unlocking said inlet valve so as to allow for selective sealing and unsealing of the inlet port when said pump is in said first position for pumping fluid from said well.

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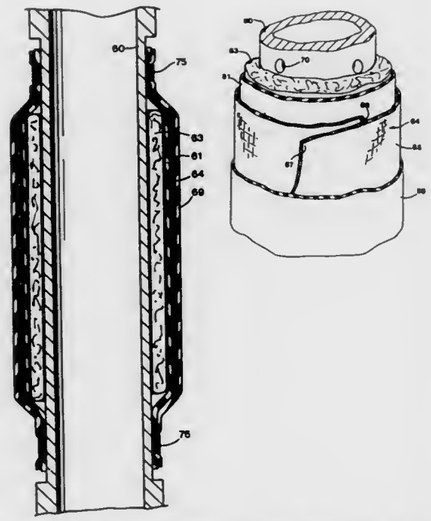
5,048,605

## PACKING-SEAL FOR BOREHOLES

**Donald A. Toon, Burlington; Peter F. Kuryllowicz; Douglas J. Belshaw, both of Georgetown; John A. Cherry N2L 5H7, and Paul E. Johnson, both of Waterloo, all of Canada, assignors to University of Waterloo, Waterloo, Canada**

PCT No. PCT/GB87/00796, § 371 Date Jul. 11, 1990, § 102(e) Date Jul. 11, 1990, PCT Pub. No. WO88/03597, PCT Pub. Date May 19, 1988
PCT Filed Nov. 9, 1987, Ser. No. 350,001
Claims priority, application United Kingdom, Nov. 14, 1986, 8627207
Int. Cl.[5] E21B *33/127*
U.S. Cl. 166—187 12 Claims

1. Packing seal assembly for a borehole, wherein:
the assembly includes an expandable annulus, having axial length;
the assembly includes a supplementary containment sleeve, which comprises a sheet of material;
the sheet of material extends around the circumference of the expandable annulus;
the sheet has upper and lower ends, and opposing left and right ends;
the dimensions and arrangement of the sheet and of the expandable annulus are such that the left and right ends of the sheet overlap;



the said material of the sheet is substantially stiff and not stretchable, to the extent that the dimensions of the material remain substantially constant, when the annulus expands;
and the sheet is so arranged in the assembly that, over at least a substantial proportion of the axial length of the annulus, the left and right ends of the sheet are free of constraint, to the extent that the left and right ends are freely slidable in the circumferential sense relative to each other, whereby the circumferential dimension of the supplementary containment sleeve is freely expandable.

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5,048,606

## SETTING TOOL FOR A LINER HANGER ASSEMBLY

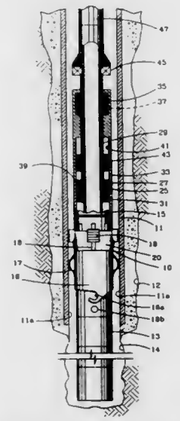
**Roger P. Allwin, College Station, Tex., assignor to Lindsey Completion Systems, Inc., Midland, Tex.**

Filed Sep. 10, 1990, Ser. No. 579,547
Int. Cl.[5] E21B *23/00*
U.S. Cl. 166—208 23 Claims

1. A setting tool and liner hanger system for use in rotating a liner hanger prior to and subsequent to setting of a liner hanger, said system including:
a tubular liner hanger having a internal threaded coupling for releasable coupling to a setting tool, and means for hanging a liner in a well casing;



a setting tool having an external threaded nut for releasable coupling to an internal threaded coupling in a liner hanger;
first coupling means on said setting tool including a clutch housing for releasably coupling to a liner hanger for imparting rotation thereto when coupled;
second coupling means on said setting tool for releasably coupling said clutch housing to said setting tool for imparting rotation thereto when coupled;



nut means on said setting tool for selectively co-rotatively coupling said clutch housing to said setting tool upon release of said second coupling means;
said second coupling means being operative prior to hanging a liner in a well casing and being releasable by to permit setting tool rotation to release said external threaded nut from said internal threaded coupling and to actuate said nut means to couple said clutch housing to said setting tool so that said liner hanger can be rotated after said external nut is released from said internal threaded coupling.

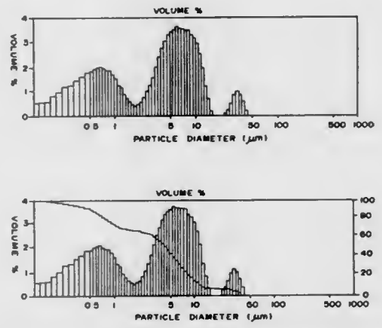
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5,048,607

## IN-SITU EMULSION POLYMERIZATION OF ETHYLENE DERIVATIVES

**Craig H. Phelps, Bakersfield, Calif.; E. Thomas Strom, and Mark L. Hoefner, both of Dallas, Tex., assignors to Mobil Oil Corporation, Fairfax, Va.**

Filed Aug. 10, 1990, Ser. No. 565,596
Int. Cl.[5] E21B *33/138, 43/22*
U.S. Cl. 166—270 24 Claims




1. A method for profile control in a subterranean hydrocarbonaceous fluid-containing formation or reservoir where substantially high flow rates or high pressures are encountered comprising:
a) injecting into a more permeable zone of said formation a water-external emulsion which contains an ethylene monomer derivative and a cross-linker in an amount sufficient to form plastic-like solid spheres; and
b) allowing said emulsion to remain in the more permeable zone for a time sufficient to form in-situ plastic-like solid spheres by polymerization therein which spheres are sufficient to divert fluids utilized in enhanced oil recovery operations from said zone where high flow rates and high pressures are encountered.

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5,048,608

## CONSOLIDATION OF HYDRAULIC FRACTURES EMPLOYING A POLYURETHANE RESIN

**Robin Wiser-Halladay, McKinney, and Durai N. Raghavan, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 304,314, Jan. 31, 1989, abandoned. This application Sep. 22, 1989, Ser. No. 410,859**
Int. Cl.[5] E21B *43/04, 43/267*
U.S. Cl. 166—276 17 Claims

1. In a method for consolidating proppant injected in a subterranean formation penetrated by a well from the earth's surface for producing to the earth's surface a desired hydrocarbonaceous fluid from the well, which involves the steps of:
a. fracturing about the well penetrating into the subterranean formation to form fractures for increased production of the hydrocarbonaceous fluid;
b. injecting a proppant in an oil-based fracturing fluid into said fractures for holding said fractures for increased production of said hydrocarbonaceous fluid; an
c. injecting a consolidating fluid for consolidating said proppant downhole;
the improvement consisting essentially of
d. providing in said consolidating fluid a mixture of quasi polyurethane prepolmer and diluent, obtained by reacting in intimate admixture in a diluent, a diol and in stoichiometric excess methylene diphenylene diisocyanate, and allowing the reactants to stand in intimate admixture sufficiently long to form oligomers containing polyurethane linkages; and
e. admixing in situ said proppant, quasi prepolymer and diluent with a catalyst, and allowing to stand for a period of time sufficient to consolidate said proppant.

14. In a method for consolidating gravel in a well which includes:
a. emplacing gravel in the wellbore; and
b. injecting a consolidating fluid and flushing to consolidate the gravel,
the improvement consisting essentially of:
c. providing in the consolidating fluid a quasi prepolymer formed by reacting in intimate admixture in a diluent, a diol and in stoichiometric excess methylene diphenylene diisocyanate and allowing the reactants to stand in intimate admixture to form oligomers of polyurethane chains; and
d. admixing with said gravel, quasi prepolymer and diluent, a catalyst and allowing to stand for a period of time sufficient to consolidate said gravel.

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5,048,609

## SELECTIVE PERMEABILITY REDUCTION IN A SUBTERRANEAN HYDROCARBON-BEARING FORMATION USING A NONSELECTIVE GEL

James E. Tackett, Jr., Littleton, and LaVaun S. Merrill, Jr., Englewood, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 14, 1990, Ser. No. 627,294
Int. Cl.[5] E21B *33/138*
U.S. Cl. 166—295 14 Claims

1. A process for selectively reducing permeability in a heterogeneous treatment zone of subterranean hydrocarbon-bearing formation having a region of high permeability and a region of low permeability in fluid communication with one another and with a well bore, the process comprising:

injecting a nonselective permeability-reducing material into said treatment zone via said well bore such that said material penetrates said low permeability region to a first radial depth from said well bore to reduce permeability therein and said material penetrates said high permeability region to a second radial depth from said well bore to reduce permeability therein, wherein said second radial depth is greater than said first radial depth;

preselecting a permeability-restoring agent having a diffusion rate through said material and a reaction rate with said material such that substantially all of said agent is consumed in reaction with said material by the time said agent diffuses through said material in said low permeability region up to said first radial depth;

injecting said agent into said treatment zone via said well bore; and

reacting said agent with said material in said low permeability region up to said first radial depth to substantially restore permeability therein while maintaining said material in said high permeability region beyond said first radial depth to substantially retain permeability reduction in said high permeability region.

5,048,610

## SINGLE BORE PACKER WITH DUAL FLOW CONVERSION FOR GAS LIFT COMPLETION

Colby M. Ross, Carrollton; Richard M. Sproul, Grapevine; Ross M. McCurley, Flower Mound, and Carter R. Young, Dallas, all of Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Filed Mar. 9, 1990, Ser. No. 491,463
Int. Cl.[5] E21B *43/16, 33/129*
U.S. Cl. 166—372 6 Claims



6. A method for producing a gas lift well of the type having a casing and a well packer having anchor slips and seal elements releasably set against said casing comprising the steps:

running a string of production tubing including a bypass seal unit into said well with said bypass seal unit having a bypass mandrel extending through a flow passage bore in said packer, the bore of said bypass mandrel defining a production flow passage for conducting formation fluid through said packer, and the annulus between said packer bore and said bypass mandrel defining an annular bypass flow passage for conducting lift gas from the well casing annulus above the packer into the packer bore;

pressurizing the well casing annulus above the packer with lift gas;

discharging pressurized lift gas from the well casing annulus above the packer into the bypass annulus between the bypass mandrel and the packer bore;

conducting lift gas through said bypass annulus and discharging it into the lower casing annulus through a radial discharge port in the packer mandrel at a location between said anchor slips and said seal elements;

sealing the annular bypass flow passage with respect to the bypass mandrel bore at a location intermediate the radial discharge port of the packer mandrel and the anchor slips;

discharging lift gas from the lower casing annulus into the production tubing through a gas lift valve attached to the production tubing at a location below said packer; and,

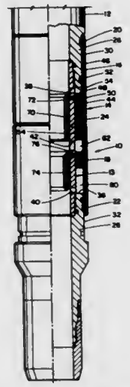
producing formation fluid from said well through said production tubing and through the production bore of said bypass mandrel.

5,048,611

## PRESSURE OPERATED CIRCULATION VALVE

Chudleigh B. Cochran, Houston, Tex., assignor to Lindsey Completion Systems, Inc., Midland, Tex.

Filed Jun. 4, 1990, Ser. No. 533,028
Int. Cl.[5] E21B *34/10*
U.S. Cl. 166—374 6 Claims



1. A circulating valve for use in a tubing string in a well bore traversing earth formations where the annulus between the tubing string and the well bore contains a liquid, said circulating valve including

a tubular mandrel assembly having an annular recess;

a tubular sleeve assembly slidably mounted in said annular recess, said sleeve assembly including first and second sleeve member;

a circulating port in said tubular mandrel assembly intermediate of the length of said annular recess;

said sleeve members having overlapped portions and seal means cooperating with said sleeve member and said mandrel assembly for defining an annular chamber in fluid communication with said circulating port in a first position on said mandrel assembly, said sleeve members being independently movable longitudinally of said mandrel assembly;

first and second release means for respectively releasably connecting said first sleeve member and said second sleeve member to said tubular assembly and for releasably maintaining said annular chamber in fluid communication with said port in said first position;

one of said sleeve members being responsive to a pressure applied in said annular chamber for releasing one of said first and second releasable means so that said one sleeve member moves longitudinally to a second position for placing the interior of said tubular mandrel assembly in fluid communication through said port with the exterior about said sleeve members;

means forming an effective pressure area on said one sleeve member and including a tubular valve seat located in the one sleeve member below said circulating port in said second position of said one sleeve member and where said valve seat and said one member are adapted to receive a sealing member so that said other sleeve member can be moved longitudinally in response to pressure to said second position for closing said circulation port; and

means cooperating with said other of said first and second sleeve members and said tubular assembly for locking said other sleeve member in said second position.

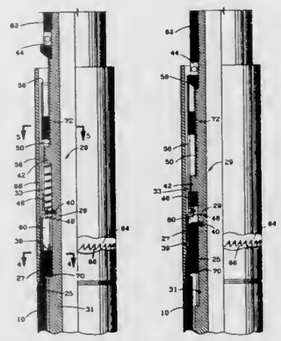


5,048,612

## DOUBLE NUT SETTING TOOL AND LINGER HANGER ASSEMBLY

Chudleigh B. Cochran, Houston, Tex., assignor to Lindsey Completion Systems, Inc., Midland, Tex.

Filed Sep. 10, 1990, Ser. No. 579,654
Int. Cl.[5] E21B *23/00, 33/14*
U.S. Cl. 166—382 22 Claims



6. In a setting tool system for use in rotating a liner hanger prior to and subsequent to setting of a liner hanger,

a setting tool having liner hanger coupling means for releasable coupling to a liner hanger; and

first coupling means on said setting tool including a clutch housing for releasably coupling to a liner hanger for imparting rotation thereto when said clutch housing is coupled to said setting tool mandrel; and

second coupling means for co-rotatively coupling said clutch housing to said setting tool mandrel, said second coupling means being operable upon release of said liner hanger coupling means from a liner hanger.

22. A method of hanging and rotating a liner in a well casing during a completion operation comprising the steps of:

lowering a setting tool and a liner hanger into a well bore where the setting tool is attached to a string of pipe and the liner hanger is attached to a liner and where the setting tool is releasably coupled to the liner hanger by a nut means threadedly connected to the liner hanger.,

upon reaching a desired setting location, hanging the liner hanger in the well to support the weight of the liner and to permit rotation of the liner;

manipulating the string of pipe to simultaneously rotate the nut means to a released condition relative to the liner hanger while rotating a lock nut in a clutch housing into a locking position in the clutch housing to engage said clutch housing with the liner; and

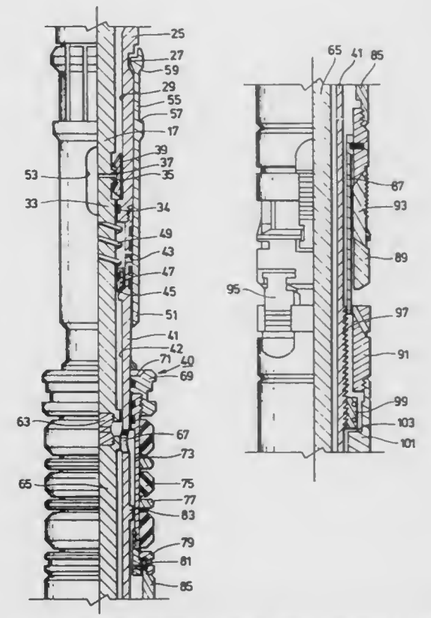
applying weight to the string of pipe to engage said clutch housing with the liner when the coupling nut is released and the lock nut is in a locking position so that the liner can be rotated by rotation of the string of pipe after the coupling nut is released.

5,048,613

## WIRELINE RESETTABLE PACKOFF ASSEMBLY

James R. Shilling, Rte. 2, Box 34, Pampa, Tex. 79065

Filed May 31, 1988, Ser. No. 200,243
Int. Cl.[5] E21B *33/127*
U.S. Cl. 166—387 23 Claims



1. A resettable apparatus for sealing against casing in a well, comprising in combination:

a packoff assembly having a slips and seal assembly for engaging the casing;

a wireline setting tool adapted to be releasably connected to the packoff assembly and lowered into the well with the packoff assembly on wireline for actuating the slips and seal assembly, the wireline setting tool being retrievable after setting the packoff assembly;

a retrieving tool adapted to be connected to a string of tubing, lowered into the well and into engagement with

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the packoff assembly for releasing the slips and seal assembly, the retrieving tool also adapted to pick up the packoff assembly and reset it at another location in the well;

check valve means mounted to the packoff assembly and operable prior to the slips and seal assembly being released, the check valve means having a bias means acting against any pressure from below the slips for allowing well fluid below the slips and seal assembly to flow upward above the slips and seal assembly to equalize pressure only if the pressure below the slips and seal assembly is greater than above by an amount sufficient to overcome the bias means, the check valve means having seat means for preventing downward flow of fluid through the check valve means past the slips and seal assembly; and

bypass passage means in the packoff assembly operable after the check valve means has been operated, for allowing well fluid in the casing to flow downward past the slips and seal assembly.

16. A method for setting and releasing a packoff assembly in a well, the packoff assembly having a slips and seal assembly, the steps comprising:

connecting a wireline setting tool releasably to the packoff assembly and lowering the packoff assembly into the well on wireline;

setting the slips and seal assembly of the packoff assembly with the wireline setting tool and retrieving the wireline setting tool;

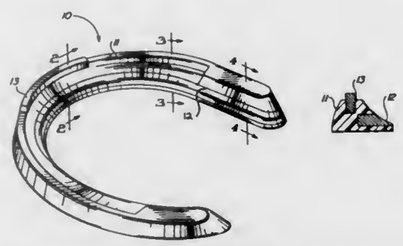
connecting a retrieving tool to a string of tubing, lowering the retrieving tool into the well and into engagement with the packoff assembly; then

allowing well fluid below the seal to flow upward through an upper port a selected distance above the slips and seal assembly if the pressure below the slips and seal assembly is greater than above, and preventing downward flow of fluid past the slips and seal assembly; then

releasing the slips and seal assembly with the tubing, and opening a lower port located above the slips and seal assembly and below the upper port to allow downward flow of fluid past the slips and seal assembly and through the lower port.

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**5,048,614**
**METAL RE-ENFORCED RESILIENT HORSESHOE**
**John Klimko, 5318 Bayshore Ave., Cape Coral, Fla. 33904**
**Filed Jul. 11, 1990, Ser. No. 551,028**
**Int. Cl.[5] A01L** *1/04, 7/04*
**U.S. Cl. 168—29** **6 Claims**



5. A composite horseshoe comprising

a main shoe body formed of resilient material in the shape of a conventional horseshoe having a front toe portion and a pair of heel portions,

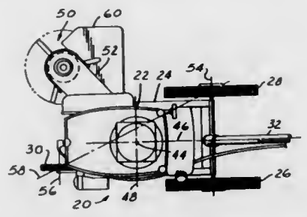
a metal core also shaped like a conventional horseshoe and embedded within the main shoe body to re-enforce the main shoe body, and

an elongated curved metal toe grab partially embedded in the toe of the resilient main shoe body and projecting upwardly away from the toe of the main shoe body,

that portion of the metal toe grab embedded in the toe of the resilient main shoe body being offset from and substantially spaced apart from the metal core whereby the force of the impact of the shoe's toe grab onto the earth is cushioned by the resilient material.

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**5,048,615**
**WEED AND GRASS TRIMMER**
**Marvin H. Feldmann, 522 W. Riverbend Dr., Plymouth, Wis. 53073**
**Filed Feb. 7, 1990, Ser. No. 476,530**
**Int. Cl.[5] A01D** *34/00*
**U.S. Cl. 172—1** **20 Claims**



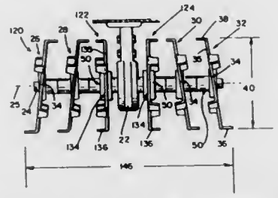
19. A method of designing and using a three-wheeled rotary implement which is easily tipped, said implement of the type having a base which supports a prime mover and an upwardly and rearwardly extending operator's handle, said base supported off of the ground by a front wheel and a first and second rear wheel, said front wheel and said first rear wheel having substantially a common plane of rotation and said first and second rear wheels having a common axis of rotation, comprising the steps of:

mounting said prime mover on said base substantially in line between said front wheel and said second rear wheel, whereby the weight of said prime mover is substantially balanced about an axis extending between said front wheel and said second rear wheel, and

tipping said base about said axis by placing a force of sufficient urging on said operator's handle.

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**5,048,616**
**GARDEN TILLER TINE ASSEMBLY**
**Stephen J. Hoff, deceased, late of Richmond, Ind. by Kenneth L. Maurer, legal representative , assignor to Hoffco, Inc., Richmond, Ind.**
**Filed Mar. 5, 1990, Ser. No. 488,213**
**Int. Cl.[5] A01B** *33/08*
**U.S. Cl. 172—42** **19 Claims**



1. An assembly for use with a tiller including a drive shaft having a longitudinal axis of rotation, the assembly comprising

at least one first rotary blade,

means for fixedly mounting the at least one first rotary blade to a first side of the drive shaft to align the at least one first rotary blade at a first predetermined angle with respect to the axis of rotation so that the at least one first rotary blade oscillates from side to side upon rotation of the drive shaft,

at least one second rotary blade,

means for fixedly mounting the at least one second rotary blade to a second side of the drive shaft to align the at least one second rotary blade at a second predetermined angle with respect to the axis of rotation so that the at least one second rotary blade oscillates from side to side upon rotation of the drive shaft, the at least one first rotary blade and the ate least one second rotary blade being angled in opposite directions at an angle of at least five degrees with respect to a plane normal to the axis of rotation,

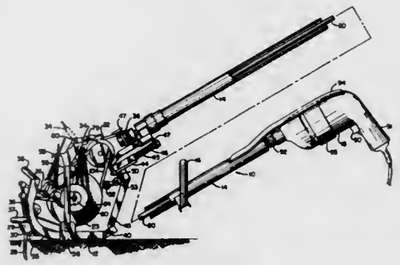
a third rotary blade coupled to the first side of the drive shaft, and

a fourth rotary blade coupled to the second side of the drive shaft, the third and fourth rotary blades being oriented to lie in a plane normal to the axis of rotation.

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**5,048,617**
**HAND-HELD TILLER MACHINE**
**Robert M. Haveo, 204 E. Emma, Lafayette, Colo. 80026**
**Filed Apr. 12, 1990, Ser. No. 507,849**
**Int. Cl.[5] A01B** *35/00*
**U.S. Cl. 172—42** **17 Claims**



1. Soil tilling apparatus comprising:

a skid;

a crank;

power transmission means for imparting rotation to said crank;

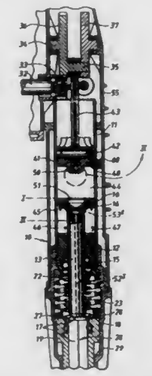
a plurality of crank arms pivotally mounted for extension in a substantially horizontal direction away from said crank, said crank having cam portions movable into and out of engagement with said crank arms in response to rotation of said crank whereby to impart vertical reciprocal motion to said crank arms, a spring-loaded tension member trained over each of said cam portions and connected to each of said crank arms to cooperate with said cam portions in controlling reciprocal motion of said crank arms in response to rotation of said crank; and

a plurality of tines pivotally connected to free ends of said crank arms for downward extension therefrom, and guide mans for controlling the directional movement of said tines along a substantially vertical path in response to reciprocal motion of said crank arms.

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**5,048,618**
**HAMMER MACHINE**
**Jöran U. Lagne, Saltsjöbaden, Sweden, assignor to Berema Aktiebolag, Solna, Sweden**
**Filed Mar. 6, 1990, Ser. No. 489,220**
**Claims priority, application Sweden, Mar. 16, 1989, 8900947**
**Int. Cl.[5] B23B** *45/16*
**U.S. Cl. 173—139** **11 Claims**

1. A hammer machine comprising a housing (10) with a cylinder (11) therein in which a reciprocating drive piston (40) via a gas cushion in a working chamber (44) of said cylinder (11) repeatedly drives a hammer piston (15) to impact on a tool (20) carried by the machine housing, characterized in that a connecting passage (52) in flow line with a throttling means (53) and a one-way valve (57) comprises means for providing fluid communication between gas external to said cylinder and said working chamber for allowing gas external to the cylinder (11) to pass freely via said throttling means (53) and aid one-way valve (57) into said working chamber (44), and for preventing flow of gas in the opposite direction, said driving piston and said hammer piston comprising main pistons, one of said main pistons having an axially protruding damping piston (50) of a diameter less than that of said one main piston from which it protrudes, said damping piston being adapted to prevent piston encounter collision by arresting the return movement of said hammer piston (15) towards said drive piston (40) in a cooperating damping cylinder (51) provided on said other one of said main pistons, said damping cylinder being adapted for substantially sealingly receiving said damping piston therein, said connecting passage (52) opening out towards said damping cylinder (51).



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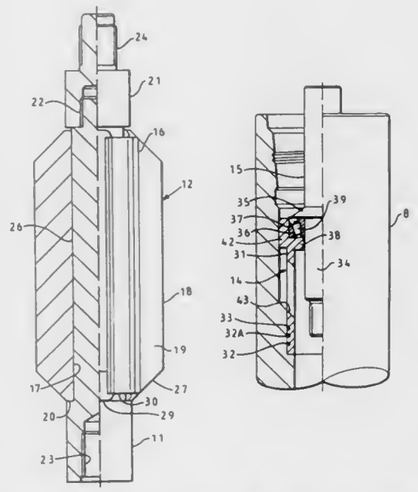
**5,048,619**
**DOWN-HOLE BEARING ASSEMBLIES**
**Peter Leaney, Cheltenham, England, and David McRobbie, Aberdeen, Scotland, assignors to Baroid Technology, Inc., Houston, Tex.**
**Division of Ser. No. 379,614, Jul. 13, 1989, Pat. No. 4,974,691.**
**This application Jun. 13, 1990, Ser. No. 537,364**
**Int. Cl.[5] E21B** *17/10*
**U.S. Cl. 175—40** **8 Claims**

1. A down-hole bearing assembly for maintaining a survey instrument assembly at a fixed angular orientation with respect to a core barrel supported by a bottomhole assembly of a rotating drill string and rotationally isolated therefrom, the bearing assembly comprising a hanger member adapted to be coupled to the survey instrument assembly so as to have the same angular orientation as the core barrel, an outer sleeve adapted to be coupled to the drill string so as to rotate the drill

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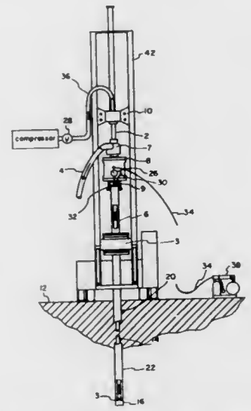
string, and an annular bearing unit positioned between an outer surface of the hanger member and an inner surface of the outer sleeve and allowing for rotation of the outer sleeve with respect to the hanger member.



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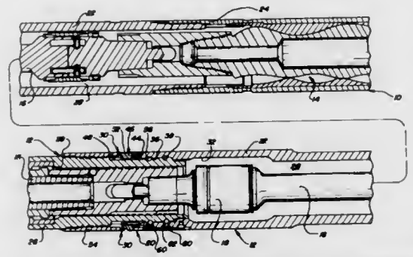
**5,048,620**
**METHOD FOR AIR ROTARY DRILLING OF TEST WELLS**
**Kevin P. Maher, 53 Londonderry Rd., Windham, N.H. 03087**
**Filed Aug. 7, 1989, Ser. No. 390,619**
**Int. Cl.[5] E21B *21/00*; E21C *7/00***
**U.S. Cl. 175—71** **2 Claims**

1. A method for air rotary drilling in saturated unconsolidated deposits, comprising the steps of:
employing a drill rod connected to a drill drive in cooperation with a drill casing to form a well in said unconsolidated deposits; simultaneously providing air at high pressure to a bore formed in the drill rod to move material from a drill bit end at a drilling location up through a space defined between the drill rod and drill casing and progressively lowering the drill rod and drill casing; and, upon termination of high pressure to said drill location, maintaining a pressure level in said well and subsequently bleeding air from said well to successively reduce the pressure of said well to ambient pressure.



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**5,048,621**
**ADJUSTABLE BENT HOUSING FOR CONTROLLED DIRECTIONAL DRILLING**
**Thomas F. Bailey, and John E. Campbell, both of Houston, Tex., assignors to MASX Energy Services Group, Inc., Houston, Tex.**
**Filed Aug. 10, 1990, Ser. No. 566,190**
**Int. Cl.[5] E21B *7/08***
**U.S. Cl. 175—74** **12 Claims**

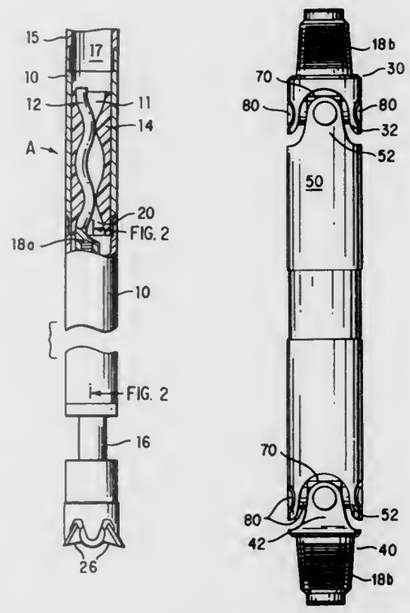


1. A downhole adjustable bent housing for use in directional drilling, said adjustable bent housing comprising:
a first sub having a longitudinal axis and an internal cylindrical surface having an axis offset from said longitudinal axis by a predetermined angle, one end of said first sub having radially inwardly disposed splines;
a second sub having a longitudinal axis and an outer cylindrical surface, said outer cylindrical surface including a first portion and a second portion having an axis offset from said longitudinal axis of said second sub by a predetermined angle, said second sub matingly received within said first sub such that said second portion of said second sub matingly engages said internal surface of said first sub for angular adjustment of said housing, said first portion of said outer cylindrical surface including radially outwardly disposed splines;
an adjusting ring mounted to said first portion of said outer cylindrical surface of said second sub, said adjusting ring having a plurality of splines for engagement with said splines of said second sub and to selectively engage said inwardly disposed splines of said first sub, said adjusting ring axially movable along said splines of said second sub between an engaged position wherein said adjusting ring engages said splines of said first sub to nonrotatably couple said first sub and said second sub and a disengaged position wherein said adjusting ring is disconnected from said splines of said first sub such that angular adjustment of said second sub relative to said first sub is permitted to adjust the bend angle of said housing; and
means for selectively securing said adjusting ring in said engaged position adjustably mounted to said first portion of said second sub outer cylindrical surface.



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**5,048,622**
**HERMETICALLY SEALED PROGRESSIVE CAVITY DRIVE TRAIN FOR USE IN DOWNHOLE DRILLING**
**Russell D. Ide, P.O. Box 744, 641 Arnold Rd., Coventry, R.I. 02816**
**Filed Jun. 20, 1990, Ser. No. 540,693**
**Int. Cl.[5] E21B *4/02*; F01C *1/10*; F16D *3/16, 3/50***
**U.S. Cl. 175—107** **29 Claims**



1. A progressive cavity drive train comprising:
a housing structure;
a stator, the stator having a longitudinal axis;
a rotor having a true center, the rotor being located within the stator;
the stator and the rotor each having coacting helical lobes which are in contact with one another at any transverse section, the stator having one more helical lobe than the rotor such that a plurality of cavities are defined between the rotor and the stator, and the rotor being adapted to rotate within the stator such that the true center of the rotor orbits the axis of the stator, the orbit having a predetermined radius and the orbiting motion of the rotor causing a progression of the cavities in the direction of the axis of the stator;
a first stub shaft having a longitudinal axis and first and second longitudinal ends, the first end of the first stub shaft being connected to and movable with the rotor, the second end of the first stub shaft comprising a yoke;
a second stub shaft having a longitudinal axis which is substantially colinear with the axis of the stator and first and second longitudinal ends, the second stub shaft being rotatably mounted about its longitudinal axis within the housing structure, the second end of the second stub shaft comprising a yoke;
a sealed cross member assembly coupling the yoke formed on the first stub shaft to the yoke formed on the second stub shaft, the cross member assembly comprising:
a cross member comprising a central body and two sets of pin portions extending from the body, each set of pin portions including two pin portions having coincident axes, the pin portions of one set being transverse to the pin portions of the other set; and
a sealing cup fixed to each of the pin portions of the cross member, the sealing cup comprising:
connecting sleeve portion fixed to the pin portion of the cross member; a flexible elastomeric section bonded to the sleeve portion and a hollow cup portion bonded to the elastomeric section and enclosing the end of the pin portion;
each hollow cup portion having an interior surface and an exterior surface, a portion of the interior surface being in sliding contact with the pin portion enclosed by the sealing cup and the exterior of the cup portion being fixed to a yoke member;
the elastomeric section of the sealing cup being sufficiently flexible so as to deform to allow pivoting of the pin portion and sleeve portion with respect to the cup portion and yoke member and the sleeve portion being sealingly connected to the pin portion such that the interior of the cup portion is hermetically sealed;
whereby the sealed cross member assembly couples the first and second stub shafts such that the first stub shaft can rotate about its axis and orbit about the axis of the second stub shaft at the same time the second stub shaft rotates about its longitudinal axis.

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**5,048,623**
**COMBINATION WEIGHING APPARATUS**
**Yoshiharu Toyoda, Akashi, Japan, assignor to Yamato Scale Company, Limited, Akashi, Japan**
**Filed Apr. 6, 1990, Ser. No. 505,764**
**Claims priority, application Japan, Apr. 7, 1989, 1-89391**
**Int. Cl.[5] G01G *13/16***
**U.S. Cl. 177—25.18** **12 Claims**

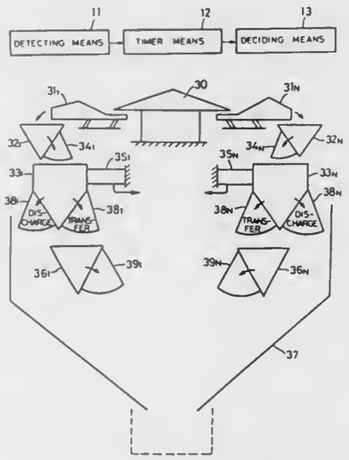
1. A combination weighting apparatus which has weighing buckets adapted to weight masses of material and and which can be employed to transfer the weighed masses of material to respective auxiliary buckets for temporary storage, the masses weighed and subsequently stored in the weighing buckets and/or auxiliary buckets being subject to selection in combination processing so as to be combined into a batch of predetermined weight, and then the weighing buckets and/or auxiliary buckets subsequently discharging said selected masses stored therein, the weighing apparatus further comprising:
(a) first detecting means for detecting an open outlet gate of each weighting bucket transferring the weighed mass stored therein to the corresponding auxiliary bucket or buckets;
(b) timer means for indicating, based on the timing of an open outlet gate of a weighing bucket detected by the first detecting means, a remaining period of time that is needed to completely transfer the mass remaining in the weighting bucket into the auxiliary bucket;
(c) second detecting means for detecting an open outlet gate of each auxiliary bucket discharging the mass which has

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been temporarily stored therein and selected in the combination processing; and

(d) setting means for setting, based on the timing of an open outlet gate of an auxiliary bucket detected by the second detecting means, the time that said outlet gate of the auxiliary bucket is open wherein the duration is calculated by




adding the remaining period of time measured by the timer means plus the period of time that is needed to completely discharge the mass from the auxiliary bucket, so that if the auxiliary bucket is opened while a mass of material is being transferred to it from a weighing bucket, the auxiliary bucket remains open until the transfer and discharge are complete.

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**5,048,624**

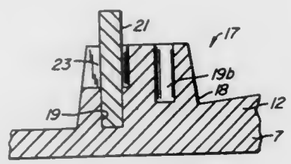
## ADJUSTABLE LOAD ARRESTOR FOR WEIGHING APPARATUS

**Timothy D. Pike, Castro Valley, Calif., assignor to F.M.E. Corporation, Hayward, Calif.**

**Filed Dec. 14, 1990, Ser. No. 628,302**

**Int. Cl.[5] G01G** *23/02*

**U.S. Cl. 177—154** **17 Claims**




1. A weighing apparatus comprising:

a base;

a load cell mounted on the base;

a load plate mounted on the load cell;

a load arrestor associated with at least one of the base and load plate, the load arrestor including a pin support and a pin, the pin support having at least two vertical holes of different effective depths, and the pin being placed in a hole of the pin support;

a load bearing surface associated with the load plate for receiving an object to be weighed; and

a portion of the load plate overlying the load arrestor so that vertical movement of the load plate is limited by the load arrestor.

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**5,048,625**

## METHOD FOR PREVENTING OVERLOADING OF NOSE WHEEL GEARS OF AIRCRAFT BEING TOWED BY A TRACTOR AND TRACTOR FOR CARRYING OUT THE METHOD

**Mogens Birkeholm, Kagsaavej 59, Herlev, Denmark 2730**

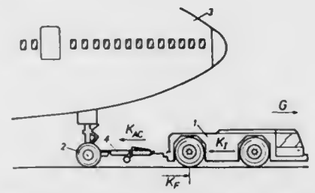
**PCT No. PCT/DK88/00165, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO89/03343, PCT Pub. Date Apr. 20, 1989**

**PCT Filed Oct. 10, 1988, Ser. No. 469,459**

**Claims priority, application Sweden, Oct. 14, 1987, 8703984**

**Int. Cl.[5] B62D** *53/00*

**U.S. Cl. 180—14.6** **10 Claims**




1. A method for preventing overloading a nose wheel gear of an aircraft being towed by a tractor, the method comprising:

continuously sensing acceleration of the tractor in the longitudinal direction of the tractor;

continuously sensing a value that is a function of power supplied to drive wheels of the tractor;

continuously calculating values of a pulling force transmitted to an aircraft nose wheel gear from the tractor as a function of the sensed values of acceleration and tractor power and a predetermined value of tractor mass; and

controlling the power supplied to the wheels of the tractor and braking of the tractor in response to the sensed tractor acceleration to maintain the calculated values of the pulling force within a preselected permissible range.

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**5,048,626**

## DRIVE SYSTEM FOR AN INDUSTRIAL VEHICLE, IN PARTICULAR FOR A PEDESTRIAN CONTROLLED FORKLIFT

**Richard Strehler, Chieming, and Wilhelm Schwibach, Munich, both of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany**

**Filed May 30, 1990, Ser. No. 530,852**

**Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917831**

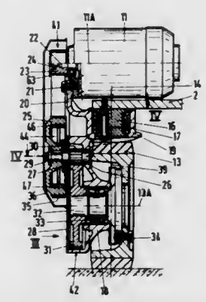
**Int. Cl.[5] B60K** *7/00;* **B62D** *51/04*

**U.S. Cl. 180—19.2** **7 Claims**

1. In a drive system for an undercarriage of an industrial vehicle, comprising means defining a frame, and means for pivotally mounting said frame means to said undercarriage about a vertical axis, said frame means supporting a series connected drive motor with a driven shaft, means defining a multi-step transmission and a drive wheel, and a brake means provided in said multi-step transmission means for retarding and blocking rotation of said rive wheel, a first transmission step in said multi-step transmission means including a drive member mounted on said driven shaft of said drive operatively coupled to a first drive member of a subsequent transmission step rotatably mounted on a pinion shaft mounted on said frame means, means on said frame means defining a gear housing, said multi-step transmission means including at least one transmission step located in said gear housing, said pinion shaft defining an input shaft to said at least one transmission step



located in said gear housing, a second driven member forming a last transmission step of said multi-step transmission means being in the form of a horizontal driven shaft extending outwardly of said gear housing and having said drive wheel mounted thereon, and an axis of rotation of said drive motor being arranged parallel with respect to an axis of said pinion



shaft and with respect to an axis of said driven shaft, the improvement wherein said first driven member is formed in the shape of a hollow braking drum of a drum brake, and wherein an interior of said hollow braking drum includes at least one brake shoe means and means supporting said brake shoe means for movement into and out of engagement with said interior of said braking drum.

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**5,048,627**

## FAIL-SAFE REAR WHEEL STEERING SYSTEM FOR VEHICLE

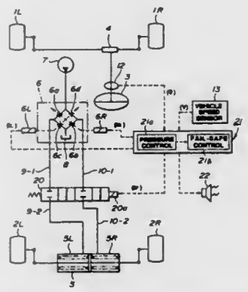
**Takaaki Eguchi, Isehara, and Norimasa Nakamura, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Jul. 5, 1989, Ser. No. 375,629**

**Claims priority, application Japan, Jul. 5, 1988, 63-165932**

**Int. Cl.[5] B62D** *5/08*

**U.S. Cl. 180—140** **10 Claims**



1. A rear wheel steering control system for a vehicle, comprising:

a hydraulic actuator for receiving control fluid pressure and varying a rear wheel steer angle in accordance with said control fluid pressure,

a control valve for varying said control fluid pressure in accordance with a control signal,

main controller means for producing said control signal to control said rear wheel steer angle, and

fail-safe means for varying said control fluid pressure gradually to a predetermined fail-safe value when said control system fails, said fail-safe means comprising a fail-safe valve, comprising a solenoid, disposed between said control valve and said hydraulic actuator for closing and opening a control fluid pressure passage connecting said control valve and said actuator, and fail-safe controller means for placing said fail-safe valve in a closed position to close said control fluid pressure passage in response to a failure detection signal,

wherein said control valve is an electromagnetic valve, and said fail-safe controller means includes means which, upon receipt of said failure detection signal, first places said fail-safe valve in said closed position, and then cuts off an electric current supplied to said electromagnetic valve.

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**5,048,628**

## POWER ASSISTED STEERING SYSTEM

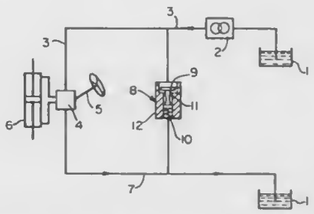
**Alan Rayner, Bristol, Great Britain, assignor to TRW Cam Gears Limited, Avon, Great Britain**

**Filed Jul. 27, 1988, Ser. No. 224,999**

**Claims priority, application United Kingdom, Aug. 7, 1987, 8718741**

**Int. Cl.[5] B62D** *5/06*

**U.S. Cl. 180—141** **10 Claims**




1. An hydraulic fluid actuated power assisted steering system having an open centre power assistance valve adjustable in response to a steering input to control power assistance and a by-pass valve which communicates between a fluid pressure source for the power assistance valve and a fluid reservoir; said by-pass valve being biased open to provide fluid flow communication therethrough from the fluid pressure source to the reservoir and reacting in response to a predetermined fluid pressure differential between said fluid pressure source and the reservoir to close and reduce fluid flow therethrough from the fluid pressure source to the reservoir.

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**5,048,629**

## REAR WHEEL STEERING METHOD FOR A FOUR WHEEL STEERING VEHICLE

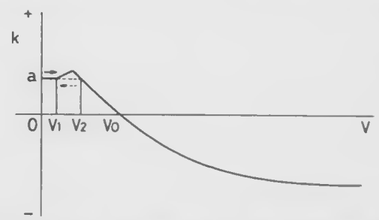
**Masaru Abe, and Takashi Kohata, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 3, 1990, Ser. No. 547,354**

**Claims priority, application Japan, Jul. 4, 1989, 1-171194**

**Int. Cl.[5] B62D** *5/06, 7/06*

**U.S. Cl. 180—140** **2 Claims**




1. A method for steering of a four wheel steering vehicle having steerable front and rear wheels, a steering ratio existing between the front and rear wheels which is determined by dividing a steering angle of the rear wheels by a steering angle of the front wheels, and the rear wheels being steered in the

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opposite direction to the front wheels in a low vehicle speed range by a predetermined steering ratio relative to the steering angle of the front wheels in matching relation to a vehicle speed, comprising the steps of:

in a first low vehicle speed range of said low vehicle speed range, steering the rear wheels by a first steering ratio relative to a steering angle of the front wheels; and

in a predetermined second low vehicle speed range of said low vehicle speed range which is higher than said first low vehicle speed range, steering the rear wheels by a second steering ratio greater than said first steering ratio of said first low vehicle speed range.

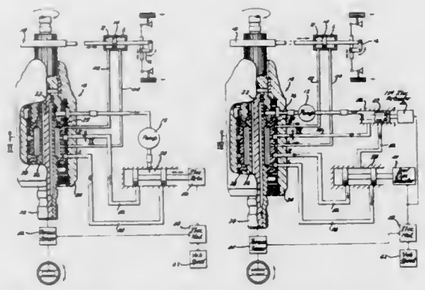
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**5,048,630**

## POWER STEERING TRIM CONTROL SYSTEM

**David H. Schaffer, Chelsea, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Apr. 9, 1990, Ser. No. 506,053**
**Int. Cl.[5] B62D *5/08***
**U.S. Cl. 180—142** **20 Claims**



20. In a fluid pressure-operated power steering gear mechanism of a vehicle having a fluid pressure source, a pressure movable part adapted to be connected to a steering linkage, a drive member connected to the pressure movable part, and a driving shaft connected to the drive member;

a torsion bar comprising a connection between the drive member and the driving shaft, said torsion bar accommodating angular displacement of the drive member relative to the driving shaft;

rotary valve means situated in and partly defining pressure distribution and flow return passages extending to the pressure movable part and to the fluid pressure source to effect pressure differential forces acting on the pressure movable part, said rotary valve means comprising an internal valve member and a surrounding sleeve, said internal valve member being connected to and rotatable with the driving shaft, said internal valve member being provided with circumferentially disposed external valve lands, said surrounding sleeve being connected to and rotatable with the drive member, said surrounding sleeve being provided with internal valve lands which are registerable with said external valve lands of said internal valve member;

said internal and external valve lands cooperating to control pressure distribution to the pressure movable part;

said internal and external valve lands comprising a first group of valve lands for operation when torque is manually applied to the driving member in a first direction and a second group of valve lands for operation when torque is manually applied in an opposing direction, said groups including a plurality of sets of valve lands, said sets being selectively adaptable for use dependent on vehicle speed, said sets of valve lands cooperating to control pressure distribution to the pressure movable part upon deflection of the torsion bar; and

at least one vehicle actuator valve means in communication with the fluid pressure source for selectively distributing fluid pressure to said sets of valve lands dependent on vehicle speed,

said at least one actuator valve means for selectively and progressively distributing fluid pressure to said internal and external valve lands, said internal and external valve lands cooperating to control pressure distribution to the pressure movable part gradually upon deflection of the torsion bar, so that the torque which is manually applied to maintain the vehicle along a desired path is continuously modified by fluid pressure delivered to the pressure movable part by said rotary valve means.

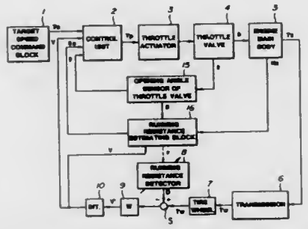
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**5,048,631**

## SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED TO CRUISE SPEED

**Yoshiyuki Etoh, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Jun. 9, 1989, Ser. No. 363,754**
**Claims priority, application Japan, Jun. 16, 1988, 63-79636[U]**
**Int. Cl.[5] B60K *31/04***
**U.S. Cl. 180—179** **12 Claims**



1. A system for automatically controlling a vehicle speed to a desired cruise speed, comprising:

a) vehicle speed detecting means for detecting the vehicle speed;

b) setting means for setting a target vehicle speed;

c) operating variable detecting means for detecting an actual operating variable of an engine driving force adjusting mechanism;

d) means for detecting an engine revolution speed;

e) running resistance deriving means for deriving a running resistance of a vehicle in which the system is mounted, on the basis of the vehicle speed, the operating variable of the engine driving force adjusting mechanism, and engine revolution speed;

f) target variable deriving means for deriving a target opening variable of the engine deriving force adjusting mechanism on the basis of the running resistance;

g) a determining means for determining whether the target vehicle speed is changed;

h) a transient control variable generating means for outputting and varying a transient controlled variable of the engine driving force adjusting mechanism until the actual operating variable coincides with the target operating variable when target vehicle speed is changed;

i) a steady state control variable generating means for outputting a controlled variable so that the actual vehicle speed coincides with the target vehicle speed and the actual operating variable coincide with the target operating variable when the target vehicle speed is not changed; and

j) an adjusting means for adjusting the actual operating variable of the engine driving force adjusting mechanism no the basis of the steady state and transient controlled variables.



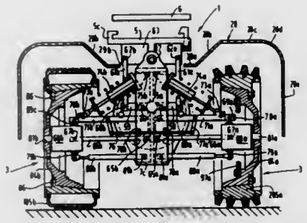
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**5,048,632**

## SELF-PROPELLED DEVICE

**Gerard R. Battel, 3, Chemin du Bois Payen, Pontoise 95300, France**

**Filed Oct. 18, 1989, Ser. No. 423,358**
**Claims priority, application France, Oct. 26, 1988, 88 13955**
**Int. Cl.[5] B60K *17/04***
**U.S. Cl. 180—181** **10 Claims**



1. A self-propelled roller skate device comprising two units disposed in parallel, each unit being supported on front and rear pairs of wheels, each of said units including:

at least one propulsion system and a steering system mounted on a support and holding structure which includes a front frame and a rear frame;

power generation and storage means mounted independently of each of said units, and remote control means operatively coupled with and acting on each of said units and said power generation and storage means:

said steering system comprising:

a pivotable sole-piece, said sole-piece being pivotable in response to an action of a load carried about a pair of longitudinally extending shafts with one disposed behind the other and said sole-piece being pivotable against the force of a resilient return means;

a steering plate attached to a lower surface of said pivotable sole-piece;

a pair of spaced, vertically disposed links pivotably connected to said steering plate and depending therefrom;

a steering "T" having a vertical portion depending from a horizontal portion, the vertical portion being mounted for pivoting movement about a shaft attached to a rear wall of said front frame, a lower end of each vertically disposed link being pivotably connected to a respective end of the horizontal portion of said "T" thereby forming a deformable parallelogram;

a pair of ball joints fixed at a lower part of said steering "T", each of said ball joints being located on a respective lateral side of said steering "T", each said ball joint cooperating with one end of a respective one of a pair of horizontally disposed links, each said horizontally disposed link receiving at an opposite end a ball-joint rod which is fixed to a hub on a respective one of said pair of front wheels; and

a pair of upper parallelograms and a pair of lower parallelograms, each one of said upper and lower parallelograms being mounted on a respective side of said front frame for pivotable movement about a longitudinal axis, each of said parallelograms having a pair of parallel branches and a triangular portion, the outermost tip of each triangular portion of said upper and lower parallelograms being connected to a respective top ball joint and lower ball joint carried by each of said hubs.

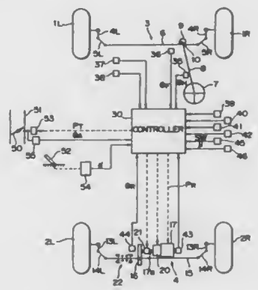
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**5,048,633**

## INTEGRATED CONTROL SYSTEM FOR STEERING AND POWER UNIT

**Shin Takehara, Higashihiroshima; Toshio Nakajima, Hatsukaichi, and Shigefumi Hirabayashi, Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jan. 16, 1990, Ser. No. 464,810**
**Claims priority, application Japan, Jan. 18, 1989, 1-9491**
**Int. Cl.[5] B60K *28/16*; B62D *5/04***
**U.S. Cl. 180—197** **11 Claims**



1. A control system for controlling steering and a power unit of a vehicle, comprising:

front-wheel steering means for steering the front wheels of the vehicle in connection with the operation of a steering handle;

rear-wheel turning means for turning the rear wheels of the vehicle in connection with steering of the front wheels and on the basis of a first characteristic representing the relation between a steering angle of the front wheels and a turning angle of the rear wheels;

adjustment means for adjusting an engine output of the vehicle;

detection means for detecting an amount in which an accelerator member is operated;

driving means for driving said engine output adjustment means on the basis of a second characteristic representing the relation between the amount in which the accelerator member is operated and an amount in which said engine output adjustment is driven;

storage means for storing a plurality of the first characteristics and a plurality of the second characteristics, as well as a plurality of combinations of the first and second characteristics, each combination consisting of an arbitrary one of the plurality of the first characteristics and an arbitrary one of the plurality of the second characteristics;

instruction means for selecting a combination of a particular first characteristic and a particular second characteristic among said plurality of the combinations; and

driving means for driving in response to said instruction said rear-wheel turning means on the basis of said particular

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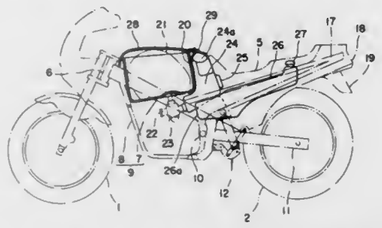
first characteristic as well as said driving means on the basis of said particular second characteristic.

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**5,048,634**
**MOTOR BICYCLE**

**Sadao Shirasagi, and Seishiro Kaneta, both of Hamamatsu, Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 221,928, Jul. 20, 1988, abandoned. This application May 1, 1990, Ser. No. 517,426**
**Claims priority, application Japan, Jul. 21, 1987, 62-180155**
**Int. Cl.[5] B62J** *9/00*
**U.S. Cl. 180—219** **1 Claim**



1. A motor bicycle having a steering front wheel and a driving rear wheel arranged at front and rear portions, respectively, of a main body of a motor bicycle, a seat located substantially above said rear wheel, and an engine unit located at a central lower portion of the main body, comprising:
- a main frame having a head tube supporting a steering shaft connected to the front wheel, said main frame including a biforked element secured to said head tube and comprised of two frame elements rearwardly extending from said head tube and diverging from each other at a certain angle;
- a box-like member defining a helmet storage box having opposed opposite sides, an inner volume of sufficient size to accommodate a helmet for a rider and an upper opening, said helmet storage box being disposed in a space defined behind said head tube, in front of said seat and above said engine unit and by said two frame elements of the biforked element which extend along the outside of the opposite sides of said helmet storage box, said helmet storage box having a bottom portion inclined forwardly downwardly;
- a cover having a top portion hinged to said helmet storage box at a rear portion thereof for covering the upper opening of said box-like member when said cover is in a closed condition;
- an air-cleaner case disposed above said engine unit and having a portion below the inclined bottom portion of said helmet storage box and a portion between said helmet storage box and said seat; and
- a fuel tank located below said seat and above said rear wheel, said fuel tank being inclined forwardly downwardly.

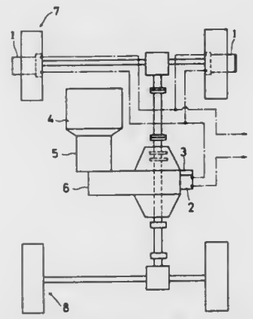
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**5,048,635**
**ELECTRICALLY ACTUATED FREE WHEEL HUB APPARATUS**

**Hideaki Wakabayashi, Nagoya; Masumi Kazaoka, Ama, and Tooru Kagata, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Sep. 28, 1990, Ser. No. 589,534**
**Claims priority, application Japan, Sep. 29, 1989, 1-115061**
**Int. Cl.[5] B60K** *17/354, 23/08*
**U.S. Cl. 180—247** **1 Claim**

1. An electrically actuated free wheel hub apparatus for a vehicle comprising:
- an axle tube;
- a wheel hub rotatably arranged about said axle tube and operated in response to a position of a device transfer mechanism;
- an electric motor disposed in a body fixed to said wheel hub;
- an axle shaft disposed in said axle tube;
- control means for transmitting power between said axle shaft and said wheel hub;
- a clutch mechanism operable to connect said axle shaft and said wheel hub in response to said control means;
- electrical supply means for supplying electrical power to said electric motor through a slip ring mounted on said axle tube and a brush elastically contacting the external circumference of said slip ring;
- syncromesh means provided in said drive transfer mechanism for synchronizing each rotation of a front wheel side drive shafts and a rear wheel side drive shaft of the vehicle; and
- delay means provided in said control means for delaying a supply of current to said electric motor subsequent to completion of said synchronizing.

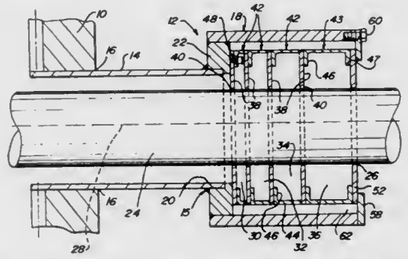


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**5,048,636**
**LOW NOISE WALLBOX FOR SOOTBLOWER**

**Eugene W. Roebrs, Lancaster, Ohio, assignor to Harness, Dickey & Pierce, New Orleans, La.**

**Filed Feb. 7, 1990, Ser. No. 476,337**
**Int. Cl.[5] F23M** *11/02*
**U.S. Cl. 181—272** **22 Claims**



17. A sootblower wallbox assembly for decreasing sound emissions during cleaning of a heat exchanger by a cleaning lance extended through said assembly, said assembly comprising:
- a plurality of generally closed sound reducing annular chambers surrounding said cleaning lance in side by side coaxial arrangement, said cleaning lance being extendable through said chambers and defining innermost walls of said chambers, said chambers being of generally equal diameter and varying in axial length to differ the sound reducing characteristics of said chambers whereby said assembly has an overall sound reduction capability which is a sum of the sound reducing characteristics of said chambers; and
- means for substantially preventing combustion products and gases from exiting said heat exchanger by passing through said assembly.

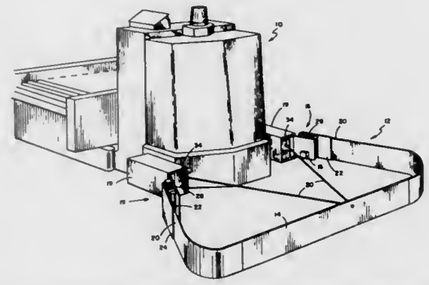


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**5,048,637**
**BUMPER SYSTEM FOR AUTOMATIC GUIDED VEHICLES**

**Peter E. Lomasney, Grand Rapids, Mich., assignor to Mannesmann Demag Corporation, Grand Rapids, Mich.**

**Filed Mar. 26, 1990, Ser. No. 498,531**
**Int. Cl.[5] B60K** *28/10*
**U.S. Cl. 180—274** **3 Claims**



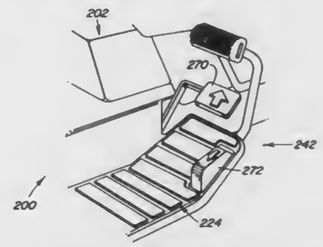
1. A bumper system for an automatic guided vehicle comprising:
- a resilient bumper projecting outwardly from the vehicle and including a pair of transversely spaced-apart ends;
- a pair of double-action spring-biased hinges attaching said bumper ends to said vehicle, each of said hinges comprising:
  - an inner base plate fixedly secured to the vehicle;
  - an outer base plate fixedly secured to a said bumper end;
  - a joining plate extending between said inner base plate and said outer base plate;
  - a first spring-loaded pivot means for hingedly joining a first end of said joining plate into said inner base and for biasing said joining plate in a home position against said base plate; and
  - a second spring-loaded pivot means for hingedly joining a second end of said joining plate to said outer base plate and for biasing said outer base plate into a home position against said joining plate; and
- a pair of switch means each operatively associated with one of said pair of hinges for sensing deflection of said outer base plate away from said inner base plate and for signaling the vehicle to stop upon such deflection;
- whereby deflection of said bumper in a first direction causes pivoting deflection of a said outer base plate about said first pivot means away from said inner base plate, and deflection of said bumper in a second direction generally opposite said first direction causes pivoting deflection of a said outer base plate about said second pivot means.

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**5,048,638**
**SYSTEM FOR CONTROLLING THE GROUND SPEED AND DIRECTION OF TRAVEL OF AN OFF-ROAD VEHICLE**

**Jerry R. Duncan, Bettendorf, Iowa; Kenneth E. Hunt, Madison, and Eugene G. Hayes, Beaver Dam, both of Wis., assignors to Deere & Company, Moline, Ill.**

**Continuation of Ser. No. 254,768, Sep. 17, 1988, abandoned. This application Aug. 16, 1990, Ser. No. 569,243**
**Int. Cl.[5] G05G** *3/00;* **B60K** *20/04*
**U.S. Cl. 180—307** **45 Claims**



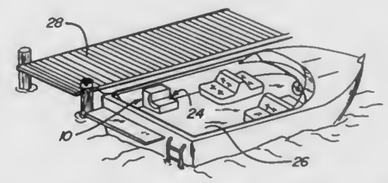
1. A mechanism for driving a vehicle having an operator seat and a variable speed transmission having forward, reverse and neutral positions, said mechanism comprising:
- a foot rest carried by the vehicle for receiving the foot of an operator, said foot rest having a heel receiving zone;
- at least two foot control pedals operatively connected to said transmission and engageable by the foot of an operator, said pedals controlling the direction of movement and the speed of said vehicle, one of said pedals controlling the speed in the forward direction and the second of said pedals controlling the speed in the reverse direction,
- said forward and reverse pedals being laterally spaced of each other and located forwardly of the heel receiving zone such that the operator can swing the forward portion of his foot laterally and engage the forward or reverse pedal while the heel portion is retained in the heel receiving zone, the direction of movement of the forward portion of the operator's foot as it depresses each of said pedals and the pedal being depressed corresponding to the direction of vehicle movement effected by depressing said pedal; and
- means, operatively connected to said foot pedals, for returning said transmission to said neutral position when said pedals are disengaged.

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**5,048,639**
**PORTABLE COOLER ASSEMBLY**

**Patrick Scherer, 39125 Ferris, Mount Clemens, Mich. 48043**

**Filed Aug. 10, 1990, Ser. No. 565,478**
**Int. Cl.[5] F25D** *23/00;* **A47C** *12/00*
**U.S. Cl. 182—18** **30 Claims**

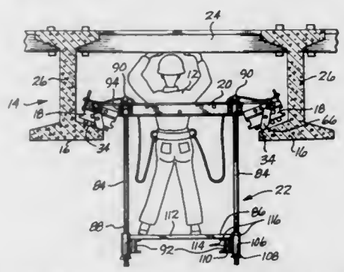


1. A portable cooler assembly (10) comprising: insulated container means (12) for storing and insulating contents therein and for minimizing heat transfer between the contents and the surrounding environment; said assembly characterized by said container means (12) including step means (24) for receiving a

force thereon at an elevation between a lower surface (26) and an upper surface (28).

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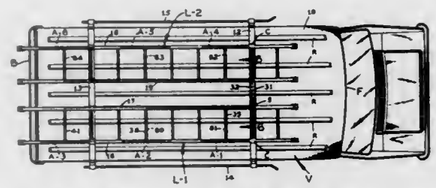
**5,048,640**
**WORK PLATFORM SUPPORTED BY STRUCTURAL BEAMS**
**James J. McConville, 1030 N. 31st St., and Allen Jeff, 583 Kirkland Ave., NE., both of Renton, Wash. 98056**
**Filed Oct. 12, 1990, Ser. No. 596,231**
**Int. Cl.[5] E04G** *3/10*
**U.S. Cl. 182—36** **30 Claims**



1. A work platform adapted to be supported by and between a pair of spaced apart work site beams having inwardly directed confronting flanges, comprising:
a pair of elongated, laterally spaced apart side frame assemblies, each side frame assembly including a pair of spaced apart longitudinal beams, and a plurality of rollers between said longitudinal beams supported for rotation about parallel axes spaced apart longitudinally of the assembly;
transverse frame members extending between and interconnecting the side frame assemblies; and
a worker support structure connected to the transverse frame members,
wherein in use the side frame assemblies are positioned above the inwardly directed flanges of the work site beams, and the rollers are in platform supporting contact with the upper surfaces of the flanges, whereby the rollers mount the work platform for travel along the flanges, lengthwise of the work site beams, for moving the worker support structure lengthwise of the work site beams.

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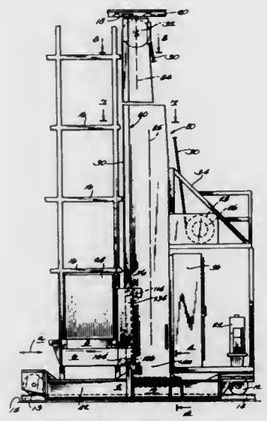
**5,048,641**
**VAN-MOUNTED LADDER ASSEMBLY WITH CONCEALED RADIO ANTENNAS**
**Jack N. Holcomb, 1400 NW. 62nd St., Fort Lauderdale, Fla. 33307, and Konrad K. Pangratz, Fort Lauderdale, Fla., assignors to Jack N. Holcomb, Pompano Beach, Fla.**
**Filed Nov. 23, 1990, Ser. No. 617,780**
**Int. Cl.[5] H01Q** *1/32;* **E06C** *5/44, 7/08*
**U.S. Cl. 182—127** **13 Claims**



1. A ladder assembly for use on a van having an opening therein, said ladder assembly comprising:
ladder support means for attachment to said van to support a ladder on said van, said support means including a standard having a hollow interior adapted to communicate with said van opening to pass electrical wiring, said standard having a side opening communicating with said hollow interior;
a ladder having first and second, opposite, elongated sides and a plurality of rungs extending between said sides;
said first side of the ladder extending next to said standard and having an opening registering with said side opening in said standard, said first side having a hollow interior extending lengthwise of said first side away from said opening in said first side;
at least one of said rungs having a hollow interior communicating with said hollow interior of said first side;
said second side of the ladder having a hollow interior communicating with the hollow interior of said one rung, said second side of the ladder being substantially transparent to RF signals;
an antenna in the hollow interior of said second side;
and electrical wiring connected to said antenna and extending therefrom through the hollow interior of said one rung, through the hollow interior of said first side, from said one rung to said standard, and through the hollow interior of said standard to pass through said opening in the van.

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**5,048,642**
**MAST STRUCTURE**
**Kurt M. Lloyd, Pewaukee, Wis., assignor to Harnischfeger Engineers, Inc., Brookfield, Wis.**
**Filed Sep. 22, 1989, Ser. No. 411,294**
**Int. Cl.[5] B66B** *7/02*
**U.S. Cl. 187—1 R** **13 Claims**

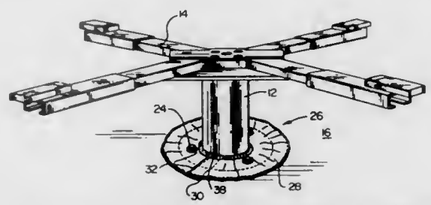


1. In a storage and retrieval machine having a base movable along a path adjacent overhead storage locations, a mast mounted on the base at a lower end of the mast, and carriage means movable in vertical directions on the mast for carrying objects to and from the overhead locations, a mast structure comprising:
a first vertical member having a length and a cross-section area perpendicular to the length;
a second vertical member having a length parallel to the length of the first vertical member and being affixed to the first vertical member along the lengths of the two members, the second vertical member including a plate extending along the length of the second vertical member and spaced from the first vertical member in the direction of said path, the plate having a cross-section area perpendicular to the length of the second vertical member;
the first and second vertical members together having a physical center and a centroidal axis both extending along the lengths of the two members; and
the cross-section area of the first vertical member is slightly greater than the cross-section area of the plate of the second vertical member such that the physical center and the centroidal axis coincide and the first and second vertical members have a maximum section modulus in the direction of said path.



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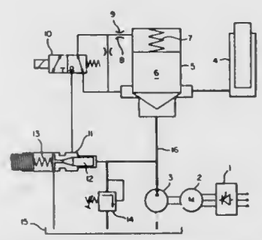
**5,048,643**
**HYDRAULIC LIFT PISTON SKIRT**
**Timothy Trapasso, 415 Oneida St., Fulton, N.Y. 13069, and John J. Howland, RD. 3, Box 424 C, Lockwood Rd., Auburn, N.Y. 13021**
**Filed Apr. 19, 1990, Ser. No. 511,310**
**Int. Cl.[5] B60S** *13/00*
**U.S. Cl. 187—8.41** **5 Claims**



1. Apparatus for preventing foreign debris from accumulating on the wiper seal encircling the piston of a hydraulic vehicle lift assembly comprising:
a) a flexible skirt having first and second surfaces and including a substantially circular inside perimeter having an elastic cord and a diameter substantially the same as the diameter of said piston when attached therearound, and an outside perimeter of predetermined outline, said skirt incluiding at least two, adjacent, free edges, each of said edges extending from said inside perimeter to said outside perimeter;
b) means to releasably attach said two free edges together; and
c) means to secure said skirt around said piston in covering relation to said wiper seal.

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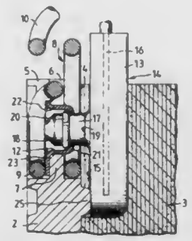
**5,048,644**
**METHOD FOR IMPROVING THE PERFORMANCE OF A MOTOR CONTROLLED HYDRAULIC ELEVATOR**
**Raimo Pelto-Huikko, Vantaa, Finland, assignor to Kone Oy, Hyvinkaa, Finland**
**Filed Nov. 3, 1988, Ser. No. 266,608**
**Claims priority, application Finland, Nov. 4, 1987, 874863**
**Int. Cl.[5] B66B** *11/04*
**U.S. Cl. 187—17** **9 Claims**



1. A method for improving the performance of a motor-controlled hydraulic elevator, in which oil is pumped from a container by a hydraulic pump driven by an electric motor, through a main supply duct, in which is disposed a regulating valve, into a lifting cylinder to move the elevator upwards, and returned to the container in a controlled manner through said regulating valve, said main supply duct, and said pump to move the elevator downwards, comprising, when the elevator descends, reducing the oil pressure in the main supply duct to a predetermined, substantially constant level by means of said regulating valve which is actively controlled by the pressure in the pump, via a feedback connection comprising a pressure compensation valve, so as to control the volume of flow from the lifting cylinder, and thereby control the rate of descent of the elevator.

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**5,048,645**
**WEAR INDICATOR FOR A BRAKE SHOE, ESPECIALLY A DISC-TYPE BRAKE SHOE, OF AN AUTOMOTIVE VEHICLE**
**Rudolf Thiel, Frankfurt am Main; Ulrich Klimt, Gross-Umstadt; Reiner Mueller, Hattersheim, and Christoph Veith, Kronberg, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany**
**Filed Jun. 1, 1990, Ser. No. 532,002**
**Claims priority, application Fed. Rep. of Germany, Jun. 1, 1989, 3917854**
**Int. Cl.[5] F16D** *66/02*
**U.S. Cl. 88—1.11** **10 Claims**



1. An automotive brake shoe having a wear indicator comprising:
a carrier plate having a recess and an aperture within said recess formed by a projection extending along a selected length of said recess;
a brake pad mounted on a face of said carrier plate and having a recess extending radially beyond said recess in said carrier plate to expose a portion of said face of said carrier plate;
a heat-resistant and electrically-insulating member having:
(a) a body portion fitted within said recess in said brake pad and supported on said carrier plate, and
(b) an axial extension, with an annular groove in said extension, extending into said aperture in said carrier plate;
an electrical conductor embedded in said body portion of said heat-resistant and electrically-insulating member;
a radially compressible snap ring fitted within said annular groove in said axial extension of said heat-resistant and electrically-insulating member;
a hollow clip extending through said aperture of said carrier plate and:
(a) mounted on said axial extension of said heat-resistant and electrically-insulating member by a constricted first end of said hollow clip disposed between said snap ring and said body portion of said heat-resistant and electrically-insulating member, and
(b) mounted on said projection of said carrier plate by an intermediate section of said hollow clip and an expanded second end of said hollow clip;
and a coil spring mounted on said projection of said carrier plate having a first loop directly bearing against said second end of said hollow clip to urge said hollow clip

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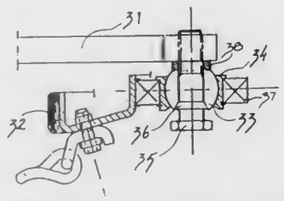
against said projection in said aperture of said carrier plate.

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**5,048,646**
**ANTI-SKID DEVICE**

**Lennart Carlsson, Skänninge, Sweden, assignor to Onspot AB, Linkoping, Sweden**

**Filed Oct. 20, 1989, Ser. No. 424,744**
**Claims priority, application Sweden, Oct. 20, 1988, 8803755**
**Int. Cl.[5] B60T** *1/04*
U.S. Cl. 188—4 B 7 Claims




1. An anti-skid device for a vehicle wheel, comprising:
a pulley having a plurality of wheel tractionincreasing chains secured thereto; and
means for mounting the pulley on a vehicle for movement between a working position wherein the pulley is engaged with a ground-engaging vehicle wheel to be rotated thereby for successively throwing said chains between a tread of a vehicle wheel and the ground, for increasing traction of that vehicle wheel on the ground, and a stowed position in which the pulley is spaced away from driven engagement with the vehicle wheel and the chains are spaced away from under the tread of the vehicle wheel;
said pulley mounting means comprising:
a swing arm having an outer end and an inner end;
means for mounting said inner end of said swing arm to a frame portion of a vehicle for pivotal movement of said swing arm to thereby move said pulley between said working position and said stowed position;
means mounting said pulley on said outer end of said swing arm;
said means mounting said pulley on said outer end of said swing arm including: means providing a ball joint ball on said outer end of said swing arm; said pulley including a radially outer portion having said chains secured thereto, and a radially inner hub; means defining a radially inwardly concave ball joint socket in said hub, said socket swivelably receiving said ball; and means defining a rotary bearing on said pulley between said radially outer portion and said hub for permitting rotation of said radially outer portion relative to said hub about a longitudinal axis of said hub.

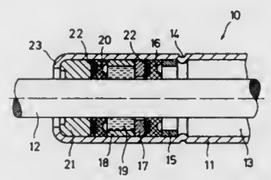
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**5,048,647**
**CONTAINER PISTON ROD UNIT**

**Castor Fuhrmann, Brachtendorf, and Herbert Freitag, Koblenz, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany**

**Filed Sep. 6, 1989, Ser. No. 403,734**
**Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831502**
**Int. Cl.[5] F16F** *9/36;* **B65D** *53/00*
U.S. Cl. 188—322.17 11 Claims

1. A container piston rod unit comprising a container (11) having an axis and two ends and defining a cavity (13) therein, said cavity containing a volume of pressurized gas, a piston rod (12) extending through at least one of said two ends, a sealing system (16,20) adjacent said at least one end in sealing engagement with said piston rod (12), said sealing system (16,20) comprising at least two annular sealing parts (16,20) located one behind the other along said axis, said annular sealing parts (16,20) being made of different caoutchouc elastic sealing materials, one of said annular sealing parts (16,20) comprising a caoutchouc elastic sealing material having a higher solidification point and a lower coefficient of permeation for the respective gas than the other annular sealing part (16,20), the other one of said annular sealing parts (16,20) comprising a caoutchouc elastic sealing material having a lower solidification point and a higher coefficient of permeation for the respective gas than said one annular sealing part (16,20).

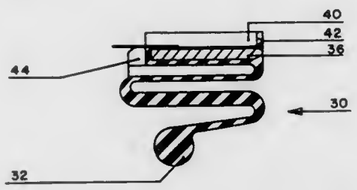



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**5,048,648**
**PISTON CAP**

**Gerard Le Deit, Courtry, France, assignor to Bendix France, Drancy, France**

**Continuation of Ser. No. 416,818, Oct. 4, 1989, abandoned. This application Jan. 11, 1991, Ser. No. 639,741**
**Claims priority, application France, Oct. 28, 1988, 88 14213**
**Int. Cl.[5] B60T** *11/00*
U.S. Cl. 188—370 1 Claim



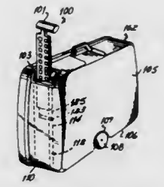

1. A piston cap for a disc brake comprising a brake motor having a piston sliding in a cylinder, said cap comprising a flexible nonmetallic material ensuring sealing between the piston and cylinder by means of a bead located at an inner periphery and for coming to rest in an annular groove in a head of the piston and of a retention part on an outer periphery and capable of coming into contact with an inner wall of a receptacle formed at an end of the cylinder, said retention part comprising an encapsulated metal insert in the form of a cylindrical ring, and portions of at least one vent path allowing the escape of air contained in a volume which the cap delimits with the piston and cylinder, the cap also preventing the entry of foreign bodies and corrosive agents into said volume, the vent path comprising a thinned portion of the retention part over most of the height of the outer periphery of only said nonmetallic material, the thinned portion communicating with both a flexible radial tongue of the flexible nonmetallic material adjacent one end of the metal insert and located axially away from a bottom of the receptacle and with a radial notch in an edge of the retention part intended to come up against the bottom of the receptacle and at a zone where the thinned portion has been formed, so that air can escape along the vent path through the radial notch, thinned portion, and flexible radial tongue.



**5,048,649**
**LUGGAGE WITH PULL HANDLE**

**Lester E. Carpenter, Middletown; Wayne I. Schmitt, Coventry, both of R.I.; Laurence Snell, Attleboro, Mass., and David Bieber, East Greenwich, R.I., assignors to American Tourister, Inc., Warren, R.I.**

**Filed Mar. 2, 1990, Ser. No. 487,459**
**Int. Cl.[5] A45C** *5/14, 13/22, 13/28*
U.S. Cl. 190—18 A 11 Claims



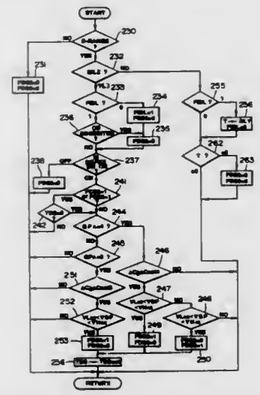

1. In luggage having a bottom wall, a top wall, opposed front and rear end walls and opposed side walls, a wheel system comprising:
a pair of major wheels rotatably mounted on transverse axles fixed to the said luggage adjacent said bottom wall and projecting below said bottom wall, said major wheels being centered longitudinally between said front and rear end walls,
a castered wheel mounted on said bottom wall adjacent each end wall,
and elongated means attached to the luggage adjacent to the upper end of said front end wall for pulling said luggage as it rolls primarily on said major wheels, said major wheels, being on fixed axles, maintaining the luggage tracking in the direction in which it is pulled, while said castered wheels provide low friction ground support for the forward and rearward ends of said bottom wall.

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**5,048,650**
**ENGINE BRAKE RUNNING CONTROL FOR AUTOMATIC TRANSMISSION IN AUTOMATIC DRIVE RANGE**

**Satoshi Takizawa, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Jul. 18, 1989, Ser. No. 381,073**
**Claims priority, application Japan, Jul. 19, 1988, 63-178055; Jul. 19, 1988, 63-178056; Aug. 2, 1988, 63-192007**
**Int. Cl.[5] F16H** *59/54*
U.S. Cl. 192—4 A 20 Claims



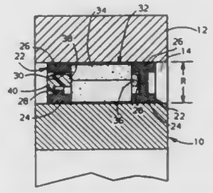

1. An engine brake running control system for an automotive vehicle including a brake pedal, and an automatic transmission, the automatic transmission being shiftable to a predetermined gear position when the automatic transmission operates in a predetermined automatic drive range, the engine brake running control system comprising:
means for detecting a depression of the brake pedal and generating a brake pedal depression indicative signal indicative of said depression of the brake pedal;
means for detecting a present gear position which the automatic transmission is conditioned in and generating a present gear position indicative signal indicative of said present gear position detected;
means for selecting, out of a predetermined group of gear positions including the predetermined gear position, a new gear position lower than said present gear position in accordance with said preset gear position indicative signal and at least one variable which the automotive vehicle is involved in as long said brake pedal depression indicative signal is generated when the automatic transmission operates in the predetermined automatic drive range;
means for effecting a downshaft from said present gear position in the automatic transmission to said new gear position when the automatic transmission operates in the predetermined automatic drive range;
means for conditioning the automatic transmission for engine brake running at said new gear position as long as said brake pedal depression indicative signal is generated when the automatic transmission operates in the predetermined automatic drive range; and
means for preventing said conditioning means from conditioning the automatic transmission for engine brake running at the predetermined gear position when said brake pedal depression indicative signal disappears subsequently when the automatic transmission operates in the predetermined automatic drive range, wherein said selecting means include a first indicator indicative of a gear position higher than and.

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**5,048,651**
**UNITIZED ROLLER CLUTCH AND BEARING**

**Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 4, 1989, Ser. No. 389,472**
**Int. Cl.[5] F16D** *41/06*
U.S. Cl. 192—45 2 Claims




1. A combined bearing and roller clutch assembly for providing load support and selective relative rotation between a pair of clutch races, said assembly comprising,
a plurality of rollers,
a pair of end rings, each having a generally I shaped cross-section formed by a pair of cylindrical flanges connected by a web defining a pair of cavities, one on each axial side of each of said end rings, each of said webs also having a series of passages therethrough,
a one-piece cage including a plurality of evenly circumferentially spaced crossbars interconnected by a plurality of axially alternating side rails having a radial thickness less than said web, and,
clasp means on said cage extending through said end ring

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web passages and into said cavities to hold said crossbars in abutment with said end ring flanges,

whereby, said end rings and cage are retained together as a unit, with said cage crossbars and flanges creating a plurality of roller pockets, and with said side rails and clasp means contained and protected within said cavities between said end ring flanges.

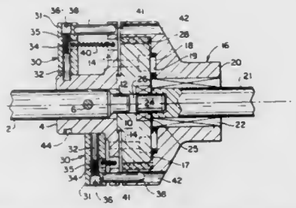
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**5,048,652**

## PROGRESSIVE ENGAGEMENT CLUTCH

**James P. Cycon, Orange; Vincent F. Millea, Stratford, and Peter G. Sanders, Waterbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Nov. 24, 1989, Ser. No. 440,824**
**Int. Cl.[5] F16D** *11/00, 23/02, 43/04*
**U.S. Cl. 192—48.4** **5 Claims**



1. A progressive engagement clutch to transfer torque from a drive shaft to a driven shaft comprising:

a clutch hub attached to the end of the drive shaft having a clutch hub section with a detent in it's peripheral surface and a clutch hub plate section;

a cylindrical centrifugal clutch attached to said plate section;

a clutch housing assembly attached to the end of the driven shaft having a clutch housing hub section, a housing section having a cylindrical cavity for receiving said centrifugal clutch, an annular ring of clutch material disposed on the inside radial wall of said housing section for engaging with said centrifugal clutch and an annular face with at least one elongated hole;

a pin engagement assembly having a pellet housing slideably disposed, axially, on said clutch hub with at least one bore extending radially in said pellet housing, a pellet slideably disposed within said bore, push force means for providing a push force on said pellet towards said clutch hub for securing said pellet in said detent, and at least one engagement pin protruding from said pellet housing towards said clutch housing for being received into said elongated hole; and

pull force means for providing a pull force to pull said pin engagement assembly towards said clutch housing when said pellet is withdrawn from said detent;

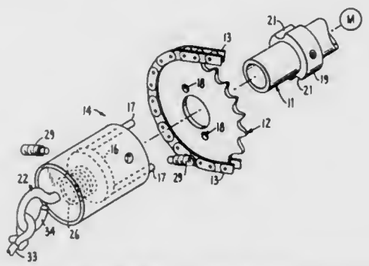
whereby said pin engagement assembly is fixably held by said pellet being disposed within said detent when the rotational velocity of said drive shaft is low, and as the drive shaft accelerates, centrifugal force causes torque transfer via engagement of said centrifugal clutch with said clutch material until the rotational velocity of the drive shaft is great enough to produce sufficient centrifugal force on said pellet to overcome said push force and displace said pellet out of said detent thereby allowing said pull force means to displace said pin engagement assembly towards said plate section causing said engagement pin to become disposed within said elongated hole to thereby provide torque transfer through said engagement pin to said clutch housing.

**5,048,653**

## SIDE MOUNT GARAGE DOOR RELEASE

**Jerry W. Fellows, 14 Pleasant Ct., Walnut Creek, Calif. 94596**

**Filed Jul. 23, 1990, Ser. No. 556,614**
**Int. Cl.[5] F16D** *11/00*
**U.S. Cl. 192—67 P** **5 Claims**



1. In a side mount garage door opener having a motor driven shaft for opening and closing the door by means of a sprocket chain, the combination of

a sprocket wheel adapted for engagement with such sprocket chain and rotatably carried by such motor-driven shaft,

and means for selectively coupling said sprocket wheel to said shaft for joint rotation and for selectively decoupling said sprocket wheel from said shaft, comprising

a clutch member adapted for securing to said shaft adjacent to said sprocket wheel and having a plurality of sprag pins projecting axially of said shaft in the direction of said sprocket wheel,

said sprocket wheel being formed with a plurality of bores in position for receiving said sprag pins therethrough,

a collar adapted for securing to said shaft on the side of said sprocket wheel opposite to said clutch member,

said collar being formed with a plurality of recesses positioned for receiving the ends of said sprag pins remote from said clutch member whereby said sprocket wheel is secured for joint rotation to said shaft when said sprag pins are projecting through said bores in said sprocket wheel and are engaged in said recesses in said collar and whereby said sprocket wheel freewheels on said shaft when said sprag pins are not projecting through said bores in said sprocket wheel.

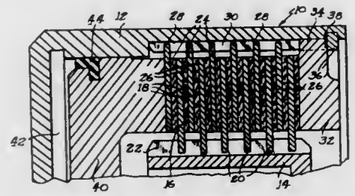
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**5,048,654**

## CERAMIC CLUTCH SEPARATOR PLATES

**Marc A. Yesnik, Chicago, Ill., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.**

**Filed Jul. 20, 1990, Ser. No. 556,601**
**Int. Cl.[5] F16D** *69/02*
**U.S. Cl. 192—70.14** **16 Claims**



1. In a clutch pack (**10**) for a vehicle automatic transmission or the like wherein clutch plates (**16**) having friction linings (**18**) are interleaved with clutch separator plates (**24**), the clutch plates being splined to one rotatable member (**14**) and the separator plates being splined to a second rotatable (**12**) and the separator plates being splined to a second coupling, the improvement comprising that each separator plate (**24**) has a surface texture which increases the coefficient of friction between the clutch plates (**16**) and separator plates (**24**) without substantially increasing the frictional wear of the friction linings, each separator plate being formed with a ceramic coating (**48**) on the opposite surfaces of the plate having a surface roughness of from 1.0 to 40.0 microinches (Ra).



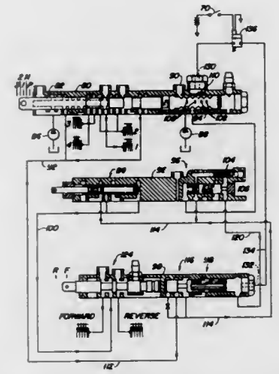
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**5,048,655**

## ELECTRIC DECLUTCH MECHANISM FOR DIRECT DRIVE CRAWLER

**Alan L. Seeba, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed May 22, 1990, Ser. No. 527,226**
**Int. Cl.[5] F16D** *25/00*
**U.S. Cl. 192—0.075** **12 Claims**




1. A work vehicle for performing a work operation, the work vehicle comprising:

a frame;

ground engaging means extending from the frame for propelling the vehicle;

an engine mounted to the frame, the engine having an output speed;

a direct drive transmission operatively coupled between the engine and the ground engaging means for driving the ground engaging means and propelling the vehicle;

a decelerator control for controlling the output speed of the engine; and

means operatively coupled to the decelerator control for declutching the direct drive transmission from the ground engaging means without shifting the direct drive transmission when inching said work vehicle.

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**5,048,656**

## FLUID OPERATED CLUTCH CONTROL SYSTEM HAVING LATCH MEMBER

**Eugene R. Braun, Royal Oak, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Aug. 29, 1990, Ser. No. 574,841**
**Int. Cl.[5] F16D** *25/08, 13/58*
**U.S. Cl. 192—85 C** **9 Claims**

1. An improved control system for a fluid operated clutch of the type including linkage operable to effect a condition of engagement or disengagement thereof, said system including first resilient biasing means operatively connected to the linkage and a movable member actuated by pressurized fluid having one end disposed within a fluid chamber contained within a stationary housing wall operably connected to the linkage, said system operable such that the first biasing means is adapted to cause the linkage to effect a selected condition of engagement or disengagement of the clutch and the movable member is adapted to correspondingly cause the linkage to effect a selected condition of disengagement or engagement of the clutch when the movable member is actuated by fluid pressure operable to create a force sufficient to overcome the first biasing means, and said improvement characterized by said system including means for latching, the movable member at a preselected position when the fluid pressure falls below a predetermined minimum value, said latching means comprising:

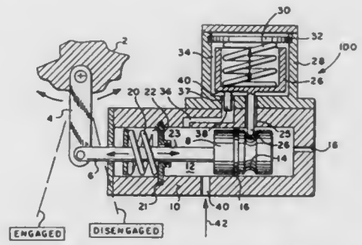
an opening through the housing wall;

engagement means on the movable member facing towards the housing wall and registerable with the housing wall opening;

a latch member extending through the housing wall opening and lockingly engageable with the movable member engagement means at the preselected position;

second resilient biasing means operable to urge the latch member into engagement with the movable member engagement means in registration therewith;

a contact surface on the latch member facing towards the chamber;




a channel extending through the housing wall between the fluid chamber and the contact surface; and

a pin movable disposed between the channel and the latch member contact surface, said pin operable to engage said contact surface and impart the force thereagainst operable to overcome the second resilient biasing means when the fluid pressure in the channel is above the predetermined minimum value;

said latching means operable such that, when the fluid pressure in the channel is above the predetermined minimum value, the resultant force of the pin against the contact surface is effective to overcome the second resilient biasing means and prevent the latch member from engaging the movable member engagement means and, when the fluid pressure in the channel between the chamber and the pin is below the predetermined minimum value, the second resilient biasing means is operable to urge the latch member into engagement with the movable member engagement means and lock the movable member at the preselected position.

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**5,048,657**

## CENTRIFUGAL CLUTCH WITH VIBRATION DAMPENING MEANS

**Walter L. Dissett, Southfield; James R. Bawks, Mt. Clemens, both of Mich., and Terry L. Kent, Conover, N.C., assignors to Dyneer Corporation, Scottsdale, Ariz.**

**Filed Dec. 26, 1989, Ser. No. 456,488**
**Int. Cl.[5] F16D** *23/10, 3/14*
**U.S. Cl. 192—105 CD** **4 Claims**

1. Centrifugal clutch means comprising:

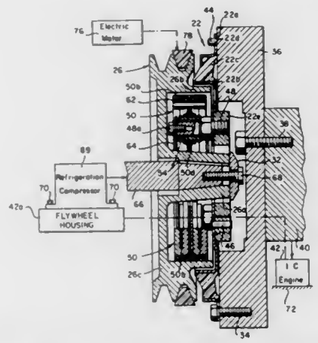
(a) internal combustion engine drive means (72) including a flywheel (36);

(b) a refrigeration compressor (69) having a driven shaft (66);

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(c) an adapter assembly (22) arranged colinearly intermediate said driven shaft and said flywheel, and including:
(1) a rigid annular outer member (22*a*);
(2) a rigid annular inner member (22*b*) arranged in concentrically spaced relation within said outer member;
(3) resilient means (22*c*) connecting said inner member with said outer member and operable to dampen relative vibrational movement therebetween, said resilient means consisting of a continuous annular resilient member arranged concentrically between and connected to said inner and outer annular members; and
(4) means including a plurality of circumferentially spaced bolts (34) connecting said annular outer member with said flywheel;
(d) a generally cylindrical pulley housing (26) arranged colinearly between said adapter assembly and said driven shaft, said housing including:
(1) a first portion (26*a*) connected with said compressor driven shaft;
(2) an annular second portion (26*b*) extending coaxially

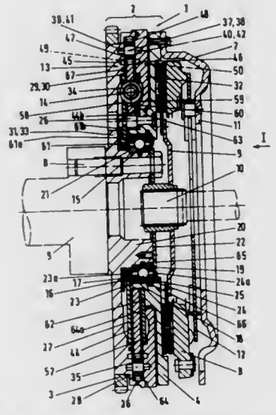



relative to the axis of said pulley housing toward said adapter assembly;
(3) said pulley housing and said adapter assembly being completely independent of each other, whereby the use of ball bearing connecting means is avoided, and
(4) a pulley belt portion (26*c*) including cylindrical belt-receiving means arranged concentrically at least partially about said annular portion; and
(e) centrifugal clutch means operable to connect said adapter assembly with said pulley housing when the rotational velocity of said flywheel exceeds a given value, said centrifugal clutch means including a plurality of rotational velocity-responsive weight members (50) movably connected with said adapter assembly inner member and extending within said pulley housing annular portion for frictional cooperation with the inner surfaces thereof, whereby when the rotational velocity of the flywheel is less than said given value, said pulley housing is disconnected from said adapter assembly to permit driving of the pulley housing by an auxiliary motor via drive belt means connected with said pulley belt portion.

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**5,048,658**
**TORQUE TRANSMITTING APPARATUS**
**Wolfgang Reik, Bühl/Baden, Fed. Rep. of Germany, assignor to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany**
**Filed Aug. 17, 1988, Ser. No. 233,337**
**Int. Cl.[5] F16D** *3/80*
**U.S. Cl. 192—106.2** **54 Claims**

51. A torque transmission system, particularly a torque transmission system which is provided in a drive train of a motor vehicle between an engine and a gear box, comprising at least two inertial masses which are rotatable relative to each other, one of which is connectable with the engine and the other of which is connectable with and disconnectable from the gear box by way of a clutch; and a hydraulic torque transmitting



unit coupling said masses and operative to transmit the entire torque between said masses by way of a pressurized hydraulic fluid.

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**5,048,659**
**CLUTCH DISC**
**Horimi Tojima, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan**
**Continuation of Ser. No. 382,445, Jul. 20, 1989, abandoned. This application Oct. 2, 1990, Ser. No. 593,354**
**Claims priority, application Japan, Aug. 5, 1988, 63-104183[U]**
**Int. Cl.[5] F16D** *13/68, 69/04*
**U.S. Cl. 192—107 C** **3 Claims**



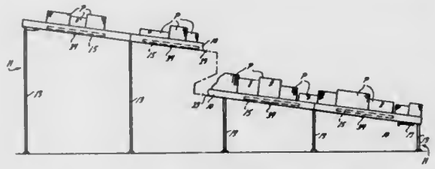
1. A clutch disc having a driven plate, first and second ceramic metal friction members each bonded to a core plate and positioned at an input side and an opposite side, respectively, of said driven plate and axially deformable cushioning plates interposed between said core plate bonded to said second friction member and said opposite side of said driven plate.
said core plate bonded said first ceramic friction member and said cushioning plates being fastened with a plurality of first rivets to the input side and opposite side, of said driven plate, said core plate bonded to said second ceramic friction member and said cushioning plates being fastened with a plurality of second rivets,
said first and second rivets being disposed within aligned



holes opening through said friction members bonded on said respective core plates and extending through said core plates and said driven plate therebetween.

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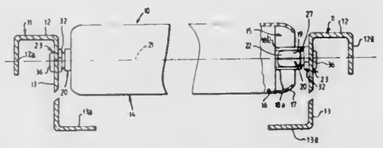
**5,048,660**
**CONTROLLED FLOW GRAVITY CONVEYOR**
**John J. Kilper, St. Louis County, Mo., assignor to Alvey, Inc., St. Louis County, Mo.**
**Filed Nov. 2, 1989, Ser. No. 430,307**
**Int. Cl.[5] B65G** *13/00*
**U.S. Cl. 193—35 A** **11 Claims**



1. A gravity-type roller conveyor for moving packages along a sloped trackway from an inlet end to a discharge end, the roller conveyor comprising;
(a) spaced apart side rails and a series of rollers operably supported between said side rails to form the trackway for packages moved by gravity; and
(b) package flow control means in the conveyor for controlling the speed of the movement of packages along the sloped trackway, said control means including:
(1) a series of brake modules spaced along the length of the trackway and positioned so that each engages different groups of rollers, and
(2) brake module operating means connected to said brake modules for indexing the operation of said brake modules to cyclicly reverse the operation of turning of said rollers engaged thereby opposite to the direction of package flow along the trackway for preventing free flow package movement.

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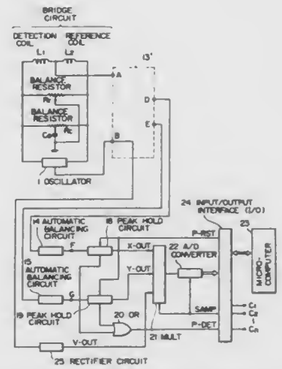
**5,048,661**
**CONVEYORS**
**Ronald D. Toye, Kidderminster, United Kingdom, assignor to Conveyors Ermanco Limited, Stourport-on-Severn, England**
**Filed Mar. 28, 1990, Ser. No. 500,444**
**Claims priority, application United Kingdom, Oct. 14, 1989, 8923188**
**Int. Cl.[5] B65G** *13/00*
**U.S. Cl. 193—35 R** **16 Claims**



1. A conveyor apparatus comprising a conveyor having a conveyor frame comprising a pair of spaced side members each having a plurality of mounting means to mount a plurality of rollers in spaced relation between the side members, the conveyor further comprising a plurality of rollers mounted between the side members, each roller being provided with a bearing means having a socket, the rollers being mounted in spaced relation between the pair of side members on spindle means which are carried by the mounting means and which are provided with a portion which extends within the socket to permit each roller to rotate about a roller axis, wherein the spindle means of at least one of the rollers comprises a pair of stub spindles each having a generally elongate end portion which in use, extends within a socket provided at one end of said at least one roller, and a support portion which inter-engages with an opening of a respective side frame member of the conveyor frame which provides a mounting means for said at least one roller, the support portion of at least one of the stub spindles comprising a retaining part and a flange with an intermediate portion between the retaining part and the flange, and said opening being configured such that with the stub spindle in a first orientation the retaining part of the support portion can be inserted into the opening by moving the stub spindle along the longitudinal axis of the end portion, and when the orientation of the stub spindle is changed to a second orientation, the retaining part of the support portion is prevented from being withdrawn from the opening by an opposite movement of the stub spindle and the flange is configured such that the flange cannot pass into the opening in the respective side frame member with a stub spindle in either of the first and second orientations, and the intermediate portion and the opening co-operate to prevent translational movement between the stub spindle and the side member and to prevent, in use, relative rotation between the stub spindle and the side member.

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**5,048,662**
**COIN DISCRIMINATOR**
**Riichiro Yamashita, and Koichi Kanehara, both of Hyogo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Mar. 16, 1990, Ser. No. 495,387**
**Claims priority, application Japan, Apr. 19, 1989, 1-44999[U]**
**Int. Cl.[5] G07D** *5/08*
**U.S. Cl. 194—317** **4 Claims**




1. A coin discriminator including a bridge circuit having a detection coil, a reference coil and a balancing circuit, an oscillator for supplying a high frequency voltage to the bridge circuit, a tuned amplifier for amplifying an output voltage of the bridge circuit, a phase shifter for producing an in-phase voltage and a voltage delayed by $\pi/2$ in respect to an oscillation voltage of the oscillator and a phase detector for detecting an in-phase component and a $\pi/2$ delayed component from an output voltage of the tuned amplifier on the basis of the in-phase voltage and the $\pi/2$ delayed voltage produced by the phase shifter to thereby discriminate a coin on the basis of a voltage variation in the in-phase component and the $\pi/2$ delayed component, comprising first and second automatic balancing circuits each including a differential amplifier and an integrator, the differential amplifiers for the first and second automatic balancing circuits having one input terminals to which output voltages of the in-phase component and the $\pi/2$ delayed component are supplied, respectively, and the other input terminals to which an output voltage of the integrator is supplied, an output signal of the differential amplifier being supplied to the integrator, a circuit for automatic compensating

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slow variation when an output of the detection coil is drifted due to a temperature, and a rectifier for converting the voltage of the oscillator supplied to the bridge circuit to a dc voltage, whereby variation voltages in the in-phase voltage component and the $\pi/2$ delayed voltage component produced from the bridge circuit through the automatic balancing circuit and a rectified output voltage supplied to the bridge circuit are calculated to discriminate a kind of the coin and a counterfeit coin.

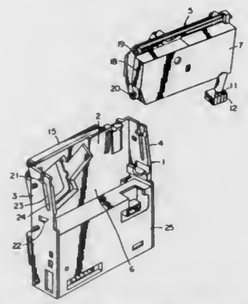
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**5,048,663**

## ELECTRONIC COIN ACCEPTOR

**Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 14, 1989, Ser. No. 407,120**
**Claims priority, application Japan, Sep. 17, 1988, 63-121192[U]; Sep. 17, 1988, 63-121193[U]**
**Int. Cl.[5] G07D *5/08***
**U.S. Cl. 194—317** **8 Claims**



1. An electronic coin acceptor comprising a particular components portion including a coin passage having opposite side walls and having a width and thickness for passing a coin of particular dimensions, at least one sensor arranged at at least one of opposite side walls (3, 4) of the coin passage for interacting with a coin travelling in the coin passage, an oscillating circuit electrically connected to the sensor for providing information signals in response to the dimensions and material of the coin and a casing enclosing the particular components, and a common components portion including a coin discriminating circuit for determining whether the information signals are indicative of an acceptable coin and producing a gate actuating signal, a coin acceptance chute, a coin rejection chute, a gate arranged at an inlet of the coin acceptance chute, an electromagnetic solenoid for actuating the gate and an outer frame enclosing the common components and having a particular components portion receiving recess, wherein the acceptance chute is provided with a pluraliity of guide plate setting slots in a side wall and an outlet guide plate which is selectively inserted into one of said plurality of guide plate setting slots from the outside to extend in and define the limits of the acceptance chute whereby the width of the acceptance chute can be adjustably set dependent upon the slot selected.

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**5,048,664**

## RECIPROCATING STAGING FIXTURE

**Timothy L. Jackson, and Ronald M. Gines, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Feb. 12, 1990, Ser. No. 478,905**
**Int. Cl.[5] B65G *43/00***
**U.S. Cl. 198—340** **5 Claims**

1. A reciprocating staging fixture, to stage an electronic component in a lead tinning system for pickup by a gripper moved by a conveyor, comprising:

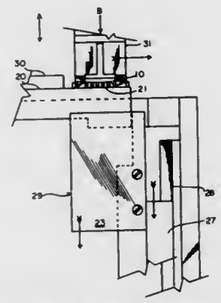
a staging platform, having means to sense when a component enters a staging area on said staging platform;

a slide guide, having a slide guide end restraint and two opposing side restraints, configured to surround said staging area on three sides;

means to reciprocate said slide guide relative to said staging platform, so that said slide guide when extended may receive and stage a component in said staging area, and so that said slide guide when retracted will not interfere with the gripper closing on a component in said staging area;

said sensing means operable so that:

when no component is sensed by said sensing means, said slide guide is extended by said reciprocating means to



surround said staging area in readiness to receive a component, and the gripper is prevented from closing as it passes near said staging area; and

when a component enters said staging area and is sensed by said sensing means, the component is stopped by said slide guide end restraint and is kept in alignment by said two side restraints, and then said slide guide is retracted away from said staging area by said reciprocating means, so that the component may be closed upon by the gripper as it passes near said staging area.

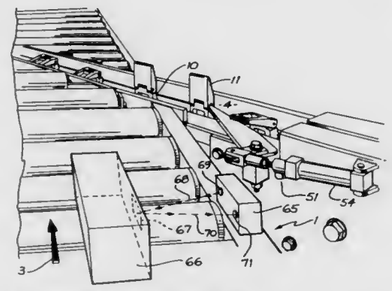
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**5,048,665**

## DIVERTER MECHANISM

**Derek Vickers, Carlingford, Australia, assignor to Dexion (Australia) Pty. Limited, Blacktown, Australia**

**Filed Jan. 12, 1990, Ser. No. 464,285**
**Claims priority, application Australia, Jan. 12, 1989, PJ2232**
**Int. Cl.[5] B65G *47/46***
**U.S. Cl. 198—350** **39 Claims**



1. A conveying system comprising:

a conveying surface for conveying articles in a longitudinal direction;

an endless member passing linearly beneath the conveying surface at an oblique angle to the longitudinal direction;

a plurality of diverter members mounted on the endless member, at least part of each diverter member pivotable about an axis substantially parallel to the endless member between a first position, wherein all of the diverter member lies beneath the conveying surface, and a second position wherein at least part of the diverter member extends above the conveying surface; and

means to selectively move diverter members between said first and second positions.

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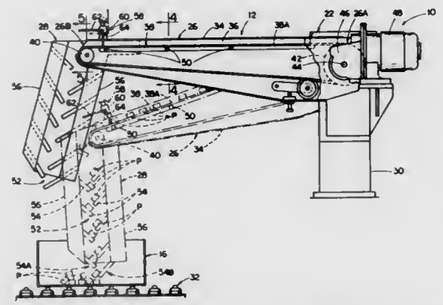


**5,048,666**

## NUCLEAR FUEL PELLET TRANSFER ESCALATOR

**Thomas B. Huggins, Sr., Columbia; Elwyn Roberts, Lugoff, and Melvin O. Edmunds, Hopkins, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Mar. 2, 1989, Ser. No. 318,107**
**Int. Cl.[5] B65G *47/26***
**U.S. Cl. 198—431** **9 Claims**



1. A nuclear fuel pellet escalator for loading nuclear fuel pellets into a sintering boat, comprising:

(a) a generally horizontally-disposed pellet transfer conveyor for moving pellets in single file fashion from a receiving end to a discharge end thereof, said conveyor being mounted about an axis at its receiving end for pivotal movement to generally vertically move its discharge end toward and away from a sintering boat when placed below said discharge end of said conveyor, said conveyor including an elongated arm swingable vertically about said axis and having an elongated channel recessed below an upper side of said arm and extending between said receiving and discharge ends of said conveyor;

(b) a pellet dispensing chute mounted to said arm of said conveyor at said discharge end thereof and extending therebelow such that said chute is carried at said discharge end of said conveyor for generally vertical movement therewith toward and away from the sintering boat;

(c) deflectable pellet handling and guiding means attached to said chute for defining a gravity feed flow path of a non-linear configuration through said chute from said conveyor discharge end that permits pellets to move downwardly along said path through said chute to the sintering boat without accumulating such momentum as would produce impact damage upon reaching the boat;

(d) said deflectable pellet handling and guiding means including a plurality of resiliently-flexible, deflectable bristled brushes and a pair of spaced brush holder structures for supporting said brushes in a pair of opposing vertical rows thereof which define said flow path therebetween with said brushes in each one row being spaced vertically out of contact with one another and having their inner ends substantially aligned vertically, said brushes in each one row also being oppositely inclined downwardly toward said brushes in the other row and vertically offset from said brushes in the other row for defining said flow path between adjacent inner ends of said brushes in said pair of opposing rows for transferring pellets at a drop rate controlled by brush deflections; and

(e) a stop element mounted at said discharge end of said conveyor and being actuatable between blocking and unblocking positions in which it respectively stops and permits the discharge of pellets from said discharge end of said conveyor.

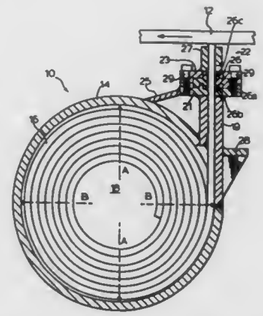
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**5,048,667**

## CONVEYOR-BELT SCRAPER

**Normand J. Morin, P.O. Box 636, 80 Nickel St., Levack, Ontario, Canada P0M 2C0**

**Continuation-in-part of Ser. No. 189,239, May 2, 1988, Pat. No. 4,877,122. This application Aug. 31, 1989, Ser. No. 367,361**
**Claims priority, application Canada, Mar. 3, 1988, 560512**
**The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.**
**Int. Cl.[5] B65G *45/16***
**U.S. Cl. 198—499** **21 Claims**



1. Apparatus for scraping a conveyor belt, wherein:

the apparatus includes a wear element, having an end portion which is arranged for direct scraping engagement against the working surface of a moving conveyor belt;

the apparatus includes walls defining an opening, which are so shaped and dimensioned as to allow the wear element to pass therethrough;

the apparatus includes a sealing means, which is so arranged as to provide a fluid-tight seal between the wear element and the walls of the opening, and to maintain that seal while allowing the wear element to pass through the opening;

the apparatus includes a fluid-tight storage chamber which is in communication with the opening;

the apparatus is arranged with the end portion of the wear element protruding from the opening, the rest of the wear element being contained within the storage chamber;

the apparatus includes a means for admitting a fluid under pressure into the said chamber;

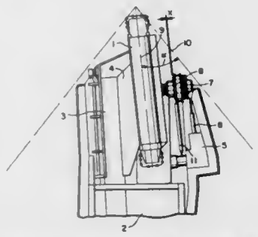
the arrangement of the apparatus is such that when fluid pressure is applied to the chamber the pressure acts upon the wear element to urge the element out of the chamber, through the opening;

the arrangement of the apparatus is such that the wear element operates in the manner of a fluid pressure operated piston that is sealingly slidable with respect to the opening.

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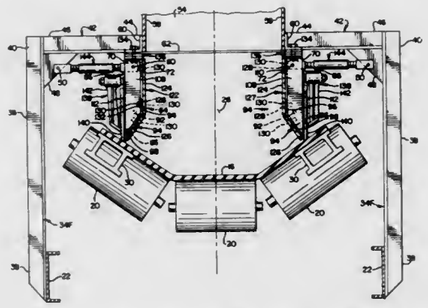
5,048,668
**MOUNTING AND DRIVING MECHANISM FOR A DRIVING GEAR**
Wolfgang Beust, Dusseldorf, Fed. Rep. of Germany, assignor to Krupp Industrietechnik GmbH, Duisburg, Fed. Rep. of Germany
Continuation of Ser. No. 851,308, Apr. 9, 1986, abandoned, which is a continuation of Ser. No. 639,601, Aug. 9, 1984, abandoned, which is a continuation of Ser. No. 396,792, Jul. 9, 1982, abandoned. This application Nov. 8, 1990, Ser. No. 610,448
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 3133344
Int. Cl.[5] B65G *17/36*
U.S. Cl. 198—509 2 Claims



1. In an apparatus for moving bulk goods and of the type comprising
(a) a main support boom,
(b) a paddle wheel rotatably mounted on said support boom for moving the bulk goods and discharging them to its interior,
(c) a discharge chute positioned to receive goods from the interior of the paddle wheel,
(d) a conveyor positioned to receive goods from said discharge chute,
(e) a drive motor mounted on said support boom, and
(f) a drive gear mechanism interposed between said motor and said paddle wheel for effecting driven rotation of said paddle wheel, the improvement characterized by
(g) said paddle wheel having a hub portion provided internally with a serrated internal profile,
(h) said drive gear mechanism having an output shaft of serrated external profile removably received within said hub portion in driving relation therewith,
(i) a connecting shaft portion joined to and extending from the end of said output shaft,
(j) said connecting shaft portion extending coaxially through said paddle wheel and having a portion exposed on the side of said paddle wheel opposite to said drive gear,
(k) fastening means engaged with the exposed end of said connecting shaft portion and with said paddle wheel to secure said paddle wheel and said drive mechanism in close-coupled relation, and
(l) a torque support element extending between said main support boom and said drive mechanism to resist movement of said drive mechanism relative to said main support.

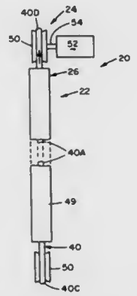
5,048,669
**MODULAR CONVEYOR BELT SEALING SYSTEM**
Robert T. Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponset, Ill.
Filed Mar. 13, 1990, Ser. No. 492,610
Int. Cl.[5] B65G *47/19*
U.S. Cl. 198—525 18 Claims

1. A modular conveyor belt sealing assembly with a plurality of modular units mounted adjacent to an edge of said conveyor belt, each modular unit including:
a frame having an interior side facing towards the center of said conveyor belt, said interior side including a flat surface extending parallel to the direction of conveyor belt travel, said flat surface extending substantially the entire length of said unit and an exterior side, facing away from the center of said conveyor belt;
a linearly extending wear liner fastened to said frame on said interior side, said wear liner positioned to be overlying and adjacent said flat surface of said interior side;
first attachment means for removably securing each said modular unit adjacent an edge of said conveyor belt; and



second attachment means for removably securing each said modular unit in adjacent alignment with said other modular units, said first and second attachment means facilitating individual removal and replacement of any modular unit of said conveyor belt sealing assembly, each said modular unit of said conveyor belt sealing assembly being interchangeable with other said units.

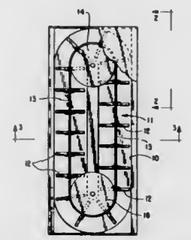
5,048,670
**FLEXIBLE CONVEYOR ASSEMBLY AND CONVEYING APPARATUS AND METHOD FOR LIFTING FLUID**
James W. Crafton, P.O. Box 606, Evergreen, Colo. 80439, and William W. Crafton, P.O. Box 134, Raymore, Mo. 64083
Filed Mar. 11, 1991, Ser. No. 667,676
Int. Cl.[5] B65G *15/00*
U.S. Cl. 198—643 32 Claims



1. A flexible conveyor assembly for use in a conveying apparatus for lifting fluid, said assembly comprising:
(a) means for forming a flexible tubular wall defining an elongated passage and having respective opposite ends; and
(b) an endless flexible rope conveyor having riser and return portions, said riser portion extending through said passage defined by said flexible tubular wall, said flexible rope conveyor also having opposite end portions interconnecting said riser and return portions and extending from said opposite ends of said flexible tubular wall, said riser portion and said flexible tubular wall which surrounds said riser portion forming an annulus therebetween extending between said opposite ends of said flexible tubular wall;
(c) said flexible rope conveyor being engageable at said opposite end portions for causing and guiding movement of said flexible rope conveyor about an endless path relative to said flexible tubular wall with said riser and return portions moving in opposite directions relative to one another, the radial dimension of said annulus and the velocity at which said flexible rope conveyor is moved relative to said flexible tubular wall being preselected so that said riser portion in moving relative to said flexible tubular wall can cause an annular-shaped turbulent stream of fluid to flow axially through said passage of said flexible tubular wall with said riser portion such that said annular-shaped stream is not substantially adhered to said riser portion of said flexible rope conveyor but instead is entrained by said moving riser portion and moved within an annular core flow region of said annulus to thereby move fluid through said passage between said opposite ends of said flexible tubular wall.



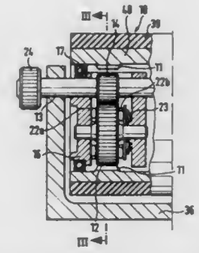
5,048,671
**BELT-PULLED DRAG CONVEYOR**
Clayton S. Ellsworth, Norfolk, Nebr., assignor to EBM Mill & Elevator Supply, Inc., Norfolk, Nebr.
Filed Nov. 19, 1990, Ser. No. 615,409
Int. Cl.[5] B65G *19/00*
U.S. Cl. 198—728 4 Claims



1. A drag type conveyor comprising a trough, flight units movably disposed transversely of said trough, flexible belt means joining and extending above said flight units, said belt means being flat and having its longer sides in a substantially vertical plane, power means in driving engagement with said belt means whereby said flight units are caused to move a material longitudinally of said trough, said power means including a driver pulley engaged with the portion of said belt means which extends above said flight units.

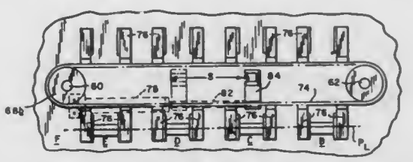
5,048,672
**ROLLER DRIVE UNIT**
Jarl Sundseth, Neuhaus, Fed. Rep. of Germany, assignor to Electro Pneumatic International GmbH, Fed. Rep. of Germany
Filed Apr. 3, 1990, Ser. No. 504,339
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911214
Int. Cl.[5] B65G *13/02*
U.S. Cl. 198—782 9 Claims

1. A roller drive unit, comprising:
a frame;
a drive shaft rotatably mounted in the frame;
a gear mounted on the drive shaft for engaging a drive motor;
a pivot support mounted on the drive shaft and pivotable from a lower rest position to an upper working position;
a drive roll rotatably mounted on the pivot support;
an internal gear attached to the drive roll;
a drive gear mounted on the drive shaft;
an intermediate gear rotatably mounted in the pivot support and engaged between the drive gear and the internal gear; and,



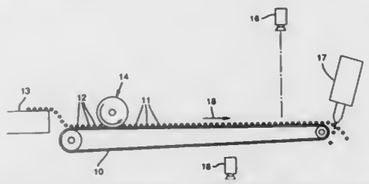
a spring connected for biasing the pivot support to the lower rest position.

5,048,673
**CARTONING MACHINE**
Richard G. Lee, Naples, Fla., and Jeremiah F. Collins, Boylston, Mass., assignors to Econocorp, Randolph, Mass.
Filed Jun. 7, 1990, Ser. No. 534,687
Int. Cl.[5] B65G *23/38*
U.S. Cl. 198—832.1 5 Claims



1. In a machine for processing cartons through a series of work stations spaced along a processing line, a transport system for incrementally advancing said cartons along said line from one work station to the next, said system comprising:
an endless chain carried by and extending between at least two rotatable idler gears, said chain consisting of articulately interconnected links and having at least one run parallel to said processing line;
arm members spaced along and protruding laterally from said chain, with the arm members along said one run extending across said processing line to contact cartons located therealong;
a piston-cylinder unit having a reciprocating piston rod longitudinally movable in opposite directions; and
connecting means for selectively connecting said piston rod to said chain during movement of said piston rod in one direction, thereby causing said chain and the arm members spaced thereon to be incrementally advanced with a corresponding incremental advancement along said processing line of cartons contacted by said arm members, said connecting means comprising a head assembly carried by said piston rod and defining a longitudinal channel accommodating passage therethrough of said chain, pin members on said head assembly, and actuating means for reciprocating said pin means transversely with respect to the length of said channel between an engaged position protruding between links of said chain, and a disengaged position withdrawn from between said links.

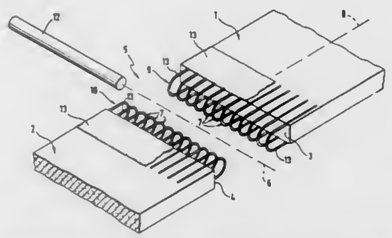
5,048,674
**PRODUCT STABILIZER**
John H. Wilbur, Medford, and Michael D. Schey, White City, both of Oreg., assignors to Simco/Ramic Corporation, Medford, Oreg.
Continuation of Ser. No. 449,499, Dec. 1, 1989, abandoned, which is a continuation-in-part of Ser. No. 337,278, Apr. 11, 1989, abandoned. This application Sep. 24, 1990, Ser. No. 587,641
Int. Cl.[5] B65G *21/20*
U.S. Cl. 198—836.2 26 Claims



1. A specimen stabilizer for stabilizing specimens transported on a moving conveyor belt, comprising:
a pair of rotatable hubs positioned astride and in driving engagement by contact with the conveyor belt; and
an inflatable bladder constructed of a pliable material and connected between the hubs, the bladder being adapted to receive a pressurizing fluid and inflatable to a generally cylindrical shape that permits the bladder to resiliently conform to specimens passing between it and the conveyor belt.

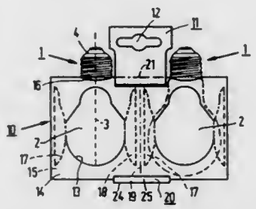
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5,048,675
**BELT CONNECTION FOR CONVEYOR BELTS**
Ilio Nadalutti, Holzheim, Fed. Rep. of Germany, assignor to Mühlen Sohn GmbH & Co., Blaustein, Fed. Rep. of Germany
Filed Feb. 6, 1991, Ser. No. 652,056
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1990, 9016586[U]
Int. Cl.[5] B65G *15/30*
U.S. Cl. 198—844.2 8 Claims



1. In a belt connection for conveyor belts wherein each one of two belt ends to be connected, at a face thereof, is provided with a plurality of U-shaped clasps that are arranged adjacent to one another in a direction transverse to a longitudinal center axis of said belts and are spaced at a distance from one another, with said clasps being attached to said be? t ends in such a manner that, at said respective faces that are opposite each other, a respective receiving channel is formed that extends in a direction transverse to said longitudinal center axis of said belts, with said clasps of said opposite faces engaging and intermeshing in a hinge-type fashion whereby said clasps when engaged in said hinge-type fashion are secured via a connecting rod inserted into said intermeshing receiving channels, the improvement wherein:
said clasps are coated with flocculent material.

5,048,676
**PACKAGED ELECTRIC LAMP**
Livio Borgis, S. Antonino di Susa, Italy, and Franciscus M. Klomp, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 14, 1990, Ser. No. 567,500
Claims priority, application Netherlands, Aug. 25, 1989, 8902149
Int. Cl.[5] B65D *85/42, 5/02*
U.S. Cl. 206—45.15 17 Claims

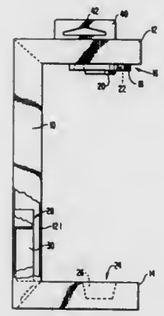


1. A package containing at least one electric lamp comprising a vessel disposed around an axis and a cap attached to the vessel on the axis, characterized in that the package comprises a cardboard strip folded around the at least one lamp and having first and second ends secured together, said package including:
a. oppositely disposed first and second sides adjacent corresponding surfaces of the lamp vessel of the at least one lamp, said package having an inspection opening in at least one of the sides for enabling inspection of said vessel;
b. first and second tongues disposed at opposing edges of the at least one inspection opening and extending into the package for inhibiting movement of said lamp in a direction transverse to said axis;
c. a third side having at least one opening through which the cap of the at least one lamp projects to facilitate electrical testing of the lamp without removal from the package; and
d. a tag extending from one side of the package for enabling hanging of the package, said tag being configured and located on said package so as not to prevent said electrical testing.

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5,048,677
**DISPLAY PACKAGE**
Richard L. Pedracine, Madison, Wis., assignor to Rayovac Corporation, Madison, Wis.
Continuation of Ser. No. 196,245, May 20, 1988, abandoned. This application Jun. 1, 1990, Ser. No. 530,429
Int. Cl.[5] B65D *5/50;* A47F *7/00*
U.S. Cl. 206—45.14 17 Claims

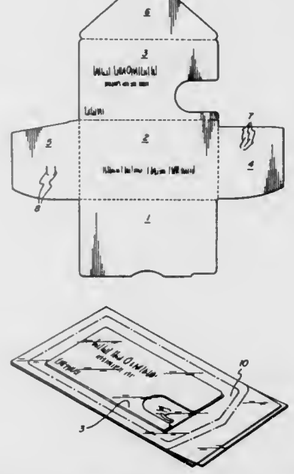
1. A package for supporting and displaying a product, comprising:
a support member having an inner wall, an outer wall, an upper portion and a lower portion;
a first arm extending from said support member in the vicinity of said upper portion, said first arm including a lower region;
a second arm extending from said support member in the vicinity of said lower portion, said second arm including an upper region;
a raised portion for cooperating with one end of a product, said raised portion extending from the lower region of said first arm toward said second arm, said raised portion including a first projection and a second projection disposed about said first projection, said first and second projections extending toward said second arm and being radially spaced from one another such that they form a trough therebetween for receiving one end of the product;
a recessed portion for receiving another end of the product, said recessed portion being formed in the upper region of said second arm and having a side wall extending toward said first arm;



whereby said raised and recessed portions enable the product to be supported, while being displayed in its substantial entirety between said support member and first and second arms.

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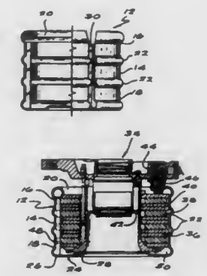
5,048,678
**SELF-CONTAINED SURGICAL SUTURE PACKAGE**
Elizabeth A. Chambers, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Apr. 19, 1989, Ser. No. 340,340
Int. Cl.[5] A61B *17/06*
U.S. Cl. 206—63.3 2 Claims



1. A direct dispensing and self-contained surgical suture package comprising a first part having a strippable envelope, and self-contained therein a second part containing a suture and confined with:
a back panel whose perimeter comprises a first top edge, a right and left side edge, and a bottom edge;
a strand flap foldably connected to the bottom edge; and
two opposite side flaps foldably connected to the right and left side edges respectively, the improvement comprising:
a label flap foldably connected to the entire first top edge, the label flap perimeter having a second top edge which is substantially parallel to and above the first top edge; and a chevron flap foldably connected to but distinct from the entire second top edge, the second part configured so that the strand flap is folded onto the back panel, the two opposite side flaps are folded onto said strand flap, the label flap is folded onto said side flaps, and the chevron flap is inserted between said side flaps and said strand flap.

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5,048,679
**AIRCRAFT BRAKE DISK STACK GLOVE**
William A. Thomas, 7405 Woodley Ave., Van Nuys, Calif. 91406
Filed Jun. 6, 1990, Ser. No. 533,882
Int. Cl.[5] B65D *85/02*
U.S. Cl. 206—303 18 Claims



1. An impact-resistant container for shipping aircraft brake assemblies, the brake assemblies comprising a stack of carbon disks, said stack of disks having a plurality of axially extending keyways on the outer periphery of spaced disks in said stack, the container comprising:
an open-ended cylindrical tube having a first and a second end, said tube being of molded, semi-flexible material;
a flexible rim extending inwardly from the first end of the cylindrical tube;
an annular base member extending inwardly from the perimeter of the second end of the tube;
a plurality of lateral shock absorbing ridges extending outward substantially around the circumference of the tube;
said rim being interrupted at a plurality of points around its periphery whereby the stack of disks may be mounted within said container by flexing said rim; and
a plurality of vertical grooves, the grooves extending inwardly from the circumference of the tube to form ribs for interlocking with said keyways;
whereby the ribs interlock with the keyways of the carbon disk stack when the disk stack is inserted into the container and said stack of carbon brake disks may be protected from shock or damage when unassembled from the aircraft.

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5,048,680
**COMPACT DISC CASE DISPLAY HOLDER AND ASSEMBLY**
Damian J. Fitzpatrick, 3414 Montrose Dr., Little Rock, Ark. 72212
Filed Sep. 27, 1990, Ser. No. 589,014
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—309 18 Claims

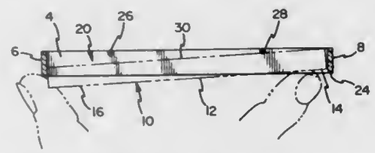
1. A display holder for a compact disc case having a top surface and sides comprising:
a) frame means having top, bottom and side portions;
b) said frame portions forming a perimeter molding having top and bottom edges;
c) said molding having a first interior compact disc receiving area and a second interior compact disc support positioning area.

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d) compact disc support means only in said second interior compact disc support positioning area;
e) said compact disc support means being comprised by rod-like members extending from one of said portions to said portion opposite thereto;
f) said compact disc support means being centrally positioned between said side portions and spaced therefrom;
g) said compact disc support positioning area being of a width not more than about one half of the width of said frame means and not less than about one seventh of the width of said frame means;
h) said molding conforming to a compact disc case and having an interior perimeter surface generally conforming to a compact disc case perimeter;
i) said molding interior perimeter providing a very slight clearance between said molding interior perimeter and the perimeter of the compact disc case when positioned in said holder;
j) whereby when a compact disc case is positioned in said holder and pressure is applied to said top surface of said compact disc case on one of said sides thereof, said compact disc support means will act as fulcrum and cause pivoting of said compact disc case in said holder to raise one side thereof to permit manual extraction of said compact disc case from said holder.

16. An assembly of display holders for a compact disc case having a top surface and sides comprising:
a) frame means having top, bottom and side portions;
b) said frame portions forming a perimeter molding having top and bottom edges;
c) said molding having a first interior compact disc receiving area and a second interior compact disc support positioning area;

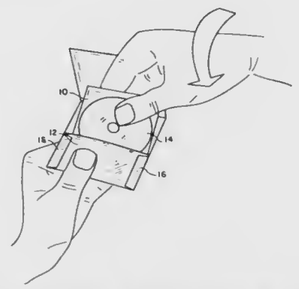



d) compact disc support means only in said second interior compact disc support positioning areas;
e) said compact disc support positioning area extending from one of said positions to said portions opposite thereto;
f) said compact disc support means being centrally positioned between said side portions and spaced therefrom;
g) said compact disc support positioned area being of a width not more than about one half of the width of said frame means and not less than about one seventh of the width of said frame means;
h) said molding conforming to a compact disc case and having an interior perimeter surface generally conforming to a compact disc case perimeter;
i) said molding interior perimeter providing a very slight clearance between said molding interior perimeter and the perimeter of the compact disc case when positioned in said holder;
j) adhesive securing means for securing said frame means of said display holders to each other to form a predetermined assembly;
k) whereby when a compact disc case is positioned in said holder and pressure is applied to said top surface of said compact disc case on one of said sides thereof said compact disc support means will act as a fulcrum and cause pivoting of said compact disc case in said holder to raise one side thereof to permit manual extraction of said compact disc case from said holder.

17. A display holder for a compact disc case having a top surface and sides comprising:
a) frame means having a front and rear, top, bottom and side portions forming an open perimeter molding from said front to said rear;
b) said open perimeter molding having a first interior compact disc receiving area and a second interior compact disc support positioning area;
c) compact disc support means only in said second interior compact disc support positioning area;
d) said compact disc support means being comprised by only one pair of rod-like members extending from one of said portions to said portion opposite thereto in said open perimeter molding;
e) said rod-like members being centrally positioned between said side portions and spaced therefrom;
f) said compact disc support positioning area being of a width not more than about one half of the width of said frame means and not less than about one seventh of the width of said frame means;
g) said open perimeter molding conforming to a compact disc case and having an interior perimeter surface generally conforming to a compact disc case perimeter;
h) said open perimeter molding providing a very slight clearance between said first interior area and the perimeter of the compact disc case when positioned in said holder;
i) means for securing said display holders to each other to form a predetermined assembly;
j) whereby when a compact disc case is positioned in said holder and pressure is applied to said top surface at said compact disc case on one of said sides thereof, only one rod-like member of said pair of rod-like members will act as a fulcrum and cause pivoting of said compact disc case in said holder to raise one side thereof to permit manual extraction of said compact disc case from said holder.

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**5,048,681**
**ENVELOPE STORAGE FOR COMPACT DISCS**
**Walter R. Henkel, 711 John St., Secaucus, N.J. 07094**
**Continuation-in-part of Ser. No. 344,246, Apr. 27, 1989, abandoned. This application Jul. 9, 1990, Ser. No. 550,134**
**Int. Cl.[5] B65D** *85/30*
**U.S. Cl. 206—312** **18 Claims**

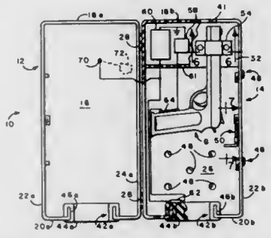



1. A packaging system for an optical informational disc, such as a compact disc, comprising:
a) slideable, semi-rigid cushion means, disposed in face to face relation with the optical surface of said optical disc, capable of gliding together with said disc so that relative movement is eliminated between said disc and said cushion means;
b) storage means, comprising a sleeve constrained in the dimension of its internal circumference to be within a small increment greater than the shortest closed arc circumscribing the face to face combination of said disc and said cushion means, said increment sufficiently small so that said combination interfers with the interior of said storage means to produce a pressure between one wall of said storage means, and the optical surface of said optical disc, said pressure urging the opposite and lateral walls of said storage means to tighten and pull fast against the outer edge and the non-optical surface of said optical disc; whereby said disc is stabilized against adverse movement, and its optical surface is protected from the damaging effects of microscopic abrasion.



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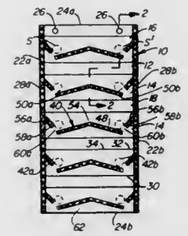
**5,048,682**
**SECURITY CASES FOR HAND GUNS**
**Gene D. Taylor, 105 W. Ross Ave., Cincinnati, Ohio 45217**
**Filed May 24, 1990, Ser. No. 527,860**
**Int. Cl.[5] B65D** *85/00*
**U.S. Cl. 206—317** **18 Claims**



1. A security case to be attached to the hand of a user and prevent loss of control of a hand gun,
said security case comprising
a first shell,
a second shell.
means pivotally connecting said shells for swinging movement between an open position and a closed position,
said shells forming, in said closed position, a compartment,
means for mounting a hand gun within said compartment,
said casing having an opening, formed in at least one of said shells, with which the muzzle of the hand gun is aligned when mounted by the mounting means,
said shells having wrist opening, defining portions, which provide a wrist opening when the shells are in their closed position,
said shells, in an open position, permitting the hand gun to be grasped by the user's hand with his wrist registered with the wrist opening, defining portions,
whereby the shells may be swung to their closed position with the user's wrist captured in said wrist opening and with the user's hand in a position to fire the hand gun.

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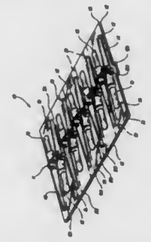
**5,048,683**
**SPONGE COUNTER BAG**
**Betsy Westlake, Norton, Mass., assignor to The Kendall Company, Mansfield, Mass.**
**Filed May 10, 1990, Ser. No. 521,494**
**Int. Cl.[5] B65D** *30/22*
**U.S. Cl. 206—362** **11 Claims**



1. A sponge counter bag, comprising:
a backing sheet of flexible material having a front surface, a rear surface, a pair of side edges, and a pair of end edges connecting the side edges; and
a plurality of pockets progressively disposed on the front surface of the backing sheet intermediate said end edges, said pockets comprising a flap of flexible material having a pair of side edges, a lower edge joined to the backing sheet, and an upper edge extending between said side edges, with the upper edge of the flaps defining an opening intermediate the flap and backing sheet to receive sponges, with a side portion of the flaps adjacent its side edges being joined to the backing sheet adjacent the side edges of the backing sheet, and with a lower portion of the flaps being joined to the backing sheet along with a first and a pair of second joinder lines, the first joinder line extending between and spaced from the opposed side edges of each of the flaps, the second joinder lines extending from the opposed side edges of each of the flaps toward the first joinder line and having ends spaced from the first joinder line to define a pair of opposed openings in each of said flaps to permit passage of fluid between the first and second joinder lines to a lower portion of the flaps, whereby to capture the fluid beneath the joinder lines.

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**5,048,684**
**COMPACT SYRINGE AND CATHETER PACKAGE**
**David F. Scott, Sandy, Utah, assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.**
**Filed Feb. 1, 1990, Ser. No. 473,558**
**Int. Cl.[5] B65D** *85/20*
**U.S. Cl. 206—364** **4 Claims**



1. A package for a plurality of identical elongate articles each having a longitudinal axis and each with a head at one end and a tail at the other with a center therebetween wherein the package comprises;
a) a pair of film members which have preprinting over at least the area of the pockets prior to thermoforming with regular indicia which is not substantially distorted by thermoforming with abutting parts of their major surfaces positioned and attached to each other along a common plane;
b) pockets formed in the film members defining non-abutting portions thereof positioned across from one another to define a plurality of article receiving spaces each shaped with the outline of the article to be packaged within said film members generally centered about the common plane, each article receiving space having a head space and a tail space with a center space therebetween for aligning the axis of each article substantially within the common plain and for positioning an article within each article receiving space with its head, center and tail in the respective spaces of each pocket when the film members are attached to one another along the abutting parts and the article receiving spaces are located in the film members in closely spaced conjugate side by side relation adjacent to one another for minimizing the abutting major surfaces between adjacent outlines and the closely spaced side by side adjacent article receiving spaces defined by

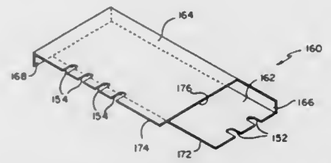
VOL 1130 ISS 3 SE 17 1991 UMI



the pockets are set in head to tail relation relative to one another so the head space for one article is positioned near the tail space of at lease one adjacent article.

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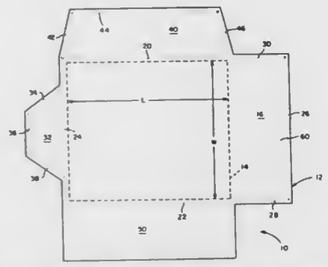
**5,048,685**
**CARRIER FOR FILM PACKAGE**
**Thomas J. Kausch, Rochester, and Matthew DiPietro, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Sep. 24, 1990, Ser. No. 587,209**
**Int. Cl.[5] B65D** *85/00*
**U.S. Cl. 206—455** **4 Claims**



1. In a carrier for use with a package containing a stack of film sheets having a length and a width, the carrier having a first wall positionable on one side of the stack of sheets and a second wall positionable on the opposite side of the stack of sheets, the improvement comprising:
the first wall being dimensioned relative to the stack of sheets so that it does not extend the full width of the stack of sheets, and the second wall being dimensioned relative to the stack of sheets so that it does not extend the full length of the stack of sheets, whereby a sheet feeding device can engage a sheet at either side of the stack of sheets to remove a sheet from the stack.

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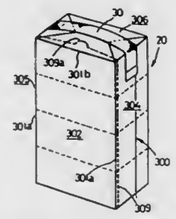
**5,048,686**
**UNIVERSAL PACKAGE FOR USE IN DIFFERENT KINDS OF EQUIPMENT**
**Thomas J. Kausch, Rochester, and Matthew DiPietro, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Sep. 24, 1990, Ser. No. 587,208**
**Int. Cl.[5] B65D** *85/00*
**U.S. Cl. 206—455** **4 Claims**



1. In a package having a light-tight pouch enclosing a stack of rectangular sheets of film with each sheet in the stack having a side containing a photographic emulsion, the pouch comprising a first face and a second face positioned on opposite sides of the stack of sheets, the improvement wherein the pouch has flap portions extending beyond first and second adjacent side edges of the sheets in the stack, one of the flaps being engageable by a pouch removing mechanism in a first kind of equipment requiring the package to be oriented so that the flap at the first side edge of the package faces the pouch removing mechanism, and the other one of the flaps being engageable by a pouch removing mechanism in a second kind of equipment requiring the package to be oriented so that the flap at the second side edge of the package faces the pouch removing mechanism.

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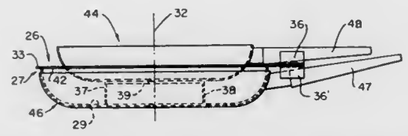
**5,048,687**
**HEAT-SHRUNK PROTECTIVE PACKAGING FOR MULTIPLE UNITS**
**Migaku Suzuki; Kazuo Ito, both of Kamakura; Chikako Minai, Yokohama, and Hiromi Takeda, Musashino, all of Japan, assignors to Weyerhaeuser Company, Tacoma, Wash.**
**Filed Apr. 23, 1990, Ser. No. 512,706**
**Int. Cl.[5] B65D** *71/08, 65/28*
**U.S. Cl. 206—497** **7 Claims**



1. A package comprising
a plurality of inner packages formed into a unit,
said unit of inner packages being tightly packed in an outer package, said outer package completely enclosing said unit of inner packages, said outer package comprising a tubular outer wrap forming side panels, and sealed top and bottom panels, and
said outer package being made of a flexible plastic film, and only the portions of said film forming said top and bottom panels being of a heat-shrinkable film whereby said unit of inner packages is tightly held when said film is heat shrunk and the occurrence of wrinkles in the side panels is minimized.

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**5,048,688**
**SCRATCH PREVENTION PAN LINER**
**Ernest W. Hicks, Jr., 2820 Rose Ave., #56, San Jose, Calif. 95127**
**Filed Jan. 22, 1991, Ser. No. 643,324**
**Int. Cl.[5] B65D** *21/04*
**U.S. Cl. 206—501** **9 Claims**



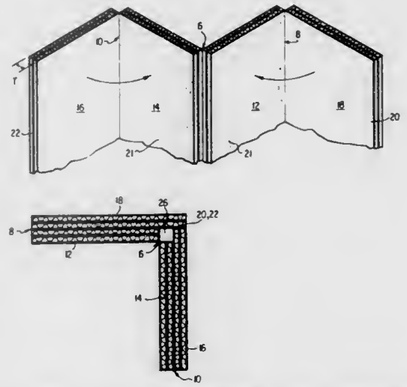
1. As an article of manufacture, a non-scratch liner for cookware having a non-stick coating on a cooking surface thereof enabling the superposition of a multiplicity of such cookware units when not in use without scratching the non-stick coating, comprising:
a) a unitary main body portion having a surface conforming to the configuration of the interior cooking surface of an article of cookware having an upper rim and a cooking surface coated with a non-stick surface coating, said unitary main body portion having a thickness substantially correlated to the depth of the cookware and a top surface substantially parallel to the top rim of the cookware and adapted for removal when the cookware is in use; and



b) a recess formed in the top surface of said main body and configured to receive and support nested in said recess a superposed cookware unit that is not in use whereby the superposed cookware unit lies isolated in non-contiguous relation to the non-stick cooking surface of the cookware unit therebelow within which said non-scratch liner is nested.

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**5,048,689**
**CORRUGATED PAPERBOARD CORNER POST**
**William W. McFarland, Cordova, Tenn., assignor to International Paper Company, Purchase, N.Y.**
**Filed Oct. 15, 1990, Ser. No. 597,232**
**Int. Cl.[5] B65D** *81/02*
**U.S. Cl. 206—586** **4 Claims**

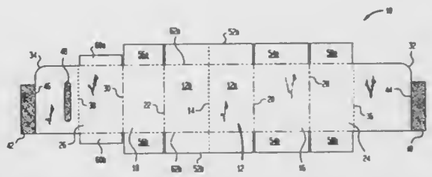


3. A unitary blank of corrugated paperboard for forming a corner post, said blank having facing layers on opposite surfaces, said blank being generally rectangular and having three slit scorelines, said slit scorelines being parallel to each other and running in the longer dimension of the blank, each of said slit scorelines extending through the corrugated paperboard and leaving one of said facing layers only, the two outermost of said three slit scorelines cut through one surface of said blank, the innermost of said slit scorelines cut through the other surface of the blank, the slit scorelines defining four generally rectangular panels in series along their longer sides, the two innermost panels being of the same width, the first of the outermost panels being of a width greater than said same width, the second of the outermost panels being of a width greater than of the first outermost panel.

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**5,048,690**
**CARTON AND BLANK FOR MAKING SAME**
**Joel Zimmerman, Elizabeth, N.J., assignor to Revlon, Inc., New York, N.Y.**
**Filed Aug. 30, 1989, Ser. No. 400,411**
**Int. Cl.[5] B65D** *5/48, 5/54*
**U.S. Cl. 206—602** **15 Claims**

1. A stackable plural carton made from a unitary blank and adapted for shipping and display purposes, comprising:
a rear panel subdivided into first and second rear subpanels, said rear panel having an upper edge, a lower edge and first and second side edges;
a first outer panel having an upper edge, a lower edge and first and second side edges, said first side edge of said first outer panel being connected to said first side edge of said rear panel;
a second outer panel having an upper edge, a lower edge and first and second side edges, said first side edge of said second outer panel being connected to said second side edge of said rear panel;
a first front panel having an upper edge, a lower edge and first and second side edges, said first side edge of said first front panel being connected to said second side edge of said first outer panel;
a second front panel having an upper edge, a lower edge and first and second side edges, said first side edge of said second front panel being connected to said second side edge of said second outer panel;
a first inner panel having an upper edge, a lower edge and first and second side edges, said first side edge of said first inner panel being connected to said second side edge of said first front panel;
a second inner panel having an upper edge, a lower edge and first and second side edges, said first side edge of said second inner panel being connected to said second side edge of said second front panel;
first attaching means for attaching said second side edge of said first inner panel to said first rear subpanel such that said first rear subpanel, said first outer panel, said first front panel and said first inner panel form a first container having an upper end and a lower end;
second attaching means for attaching said second side edge of said second inner panel to said second rear subpanel such that said second rear subpanel, said second outer panel, said second front panel and said second inner panel form a second container having an upper end and a lower end;



third attaching means for attaching said first and second inner panels together in a face-to-face manner such that said first and second containers are positioned side-by-side, said first and second inner walls forming a structural support member having rigidity sufficient to support another carton placed upon said plural carton;
a first group of flaps substantially covering said lower ends of said first and second containers, said first group of flaps including a first flap attached to said lower edge of said rear panel, a second flap attached to said lower edge of said first outer panel, a third flap attached to said lower edge of said second outer panel, a fourth flap attached to said lower edge of said first front panel, and a fifth flap attached to said lower edge of said second front panel; and
a second group of flaps substantially covering said upper ends of said first and second containers, said second group of flaps including a sixth flap attached to said upper edge of said rear panel, a seventh flap attached to said upper edge of said first outer panel, an eighth flap attached to said upper edge of said second outer panel, a ninth flap attached to said upper edge of said first front panel, and a tenth flap attached to said upper edge of said second front panel, none of said flaps of said second group of flaps being attached to said upper edges of said first and second inner panels, whereby said upper ends of said first and second containers can be opened by cutting said upper edges of said rear panel, said first and second outer panels, and said first and second front panels, and by removing said second group of flaps therefrom.

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**5,048,691**

## CONTAINER WITH AN INNER POUCH

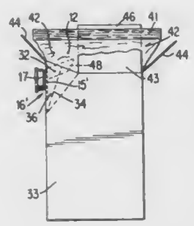
**Erich Heuberger, Trugenhofen, and Wolf-Dieter Knörrich, Heidenheim, both of Fed. Rep. of Germany, assignors to Carl Edelmann GmbH, Heidenheim, Fed. Rep. of Germany**

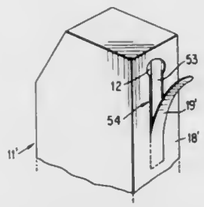
**Filed Mar. 13, 1990, Ser. No. 492,466**

**Claims priority, application Fed. Rep. of Germany, Jan. 18, 1990, 9000528**

**Int. Cl.[5] B65D** *5/46, 5/54*

**U.S. Cl. 206—611** **10 Claims**





1. A container for goods, such as goods from the group of goods consisting of liquid goods and bulk goods, comprising: an outer cardboard shell; and a leakproof inner pouch; said cardboard shell comprising a folding box with four side walls consisting of one set of opposed front and rear side walls and one set of opposed lateral side walls, said side walls having bottom flaps and top flaps, said top flaps being folded and connected, as by glue, to form a top for said box, said bottom flaps being folded and connected, as by glue, to form a bottom for said box, and an orifice provided in the front side wall; said inner pouch having wall portions with top and bottom ends, both ends of which are closed, at least the top end of the pouch wall portions being closed by a sealed seam, and a closeable spout secured in a said wall portion of said inner pouch and extending through said orifice in said front side wall; at least one of said side walls including at least one tear-off strip defined by two parallel perforated lines located in said at least one of said side walls, and also included in said at least one side wall is at least one additional perforated line which adjoins and extends from at least one of said two parallel perforated lines.

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**5,048,692**

## BAG CLOSURE STRUCTURE IN WHICH A SINGLE RESEALABLE CLOSURE ACTS AS BOTH THE PRIMARY AND SECONDARY CLOSURES

**Michael D. Handler, Weston, and Robert W. Schwier, Greenwich, both of Conn., assignors to Colgate-Palmolive Company, Piscataway, N.J.**

**Continuation-in-part of Ser. No. 504,595, Apr. 3, 1990, abandoned. This application Jun. 14, 1990, Ser. No. 537,608**

**Int. Cl.[5] B65D** *33/25*

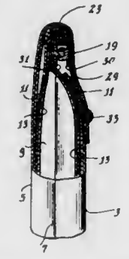
**U.S. Cl. 206—618** **16 Claims**

1. A multi-ply bag capable of being sealed and, after initial opening, being resealed, said bag including

sides, a bottom, and a linear top opening having a front panel and a back panel,

a resealable closure having attachment flanges mounted horizontally across said linear top opening by securing said flanges to said panels, said resealable closure having width running vertically and a length running horizontally thereof, an upper fold line across said front panel parallel to, proximate to, and below said resealable closure, a second fold line parallel to said upper fold line and spaced from it a distance approximately equal to said width of said resealable closure, said front and back panels being twice folded forwardly about said resealable closure in folded configuration to form a seal, and

means for maintaining said upper front and back panels in said folded configuration,



whereby a bag is formed having both primary and secondary closures.

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**5,048,693**

## METHOD AND APPARATUS FOR SORTING ARTICLES WITH SMALL DENSITY DIFFERENCES UTILIZING A FLOTATION STREAM

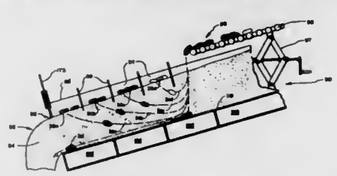
**Arthur Zaltzman, Pocatello, Id., assignor to World Agrosearch, Ltd.**

**Filed Jun. 28, 1989, Ser. No. 373,067**

**Int. Cl.[5] B03B** *5/46, 5/62, 11/00;* **B07B** *4/08*

**U.S. Cl. 209—137** **56 Claims**





1. An apparatus for using a flotation stream to effect separation of a mixture of generally uniformly sized float fraction articles having small density differences into a plurality of separate groups, the apparatus comprising:

(a) channelization means for establishing a bed through which said flotation stream continuously flows from an input end to an output end thereof, and said flotation stream being formed of a substance which comprises an essentially uniform density that is greater than the heaviest density of said articles to be separated said channelization means comprising an inclined trough and said flotation stream comprising a fluidization medium from which a fluidized bed is established, said fluidized bed continuously flowing under the influence of gravity from said input to said output end, and said apparatus further comprising a pneumatic means for forcing air upwardly through said fluidization medium to establish said fluidized bed;

(b) mixture feed means for supplying each density group of said mixture of said articles into said input end of said channelization means at a selected depth of said flotation stream so as to cause said articles to ascend to the top of said stream as said articles are flowing with said stream, thereby effecting a spatial separation of said mixture into said plurality of groups as said articles reach the top of said stream; and

(c) discharge means, positioned along the length of said flotation stream at the top thereof for separate removal of each said group from said flotation stream.



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**5,048,694**

## APPARATUS FOR PROCESSING CARD-LIKE ARTICLES

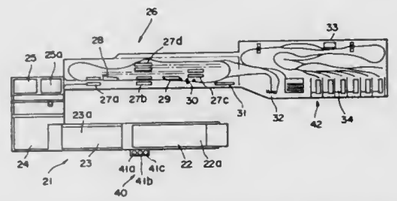
**Kozo Iwamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Apr. 25, 1990, Ser. No. 514,258**

**Claims priority, application Japan, May 10, 1989, 1-116292**

**Int. Cl.[5] B07C** *5/02*

**U.S. Cl. 209—540** **13 Claims**



7. An apparatus for sorting and conveying mail items comprising:

means for receiving a stack mail items including standardsize items and a nonstandard-size items;

means for applying sorting processes to the received mail items;

means for transferring the mail items through the applying means;

means for detecting the number of the mail items being transferred by the transferring means;

means for controlling the transfer rate of the transferring means in accordance with the number detected by the detecting means, the controlling means having various control values for determining the transfer rate of the transferring means; and

means for selecting, in accordance with the ratio of the nonstandard-size items to all mail items forming the received stack, one of the control values which is suitable for processing the mail items of the received stack.

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**5,048,695**

## REJECT STATION IN A GRAVITY CONVEYOR

**Robert L. Fuller, Jr., Issaquah; Paul E. Faville, and Mark C. Maier, both of Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Continuation of Ser. No. 469,138, Jan. 24, 1990, abandoned, which is a division of Ser. No. 270,251, Nov. 10, 1988, abandoned. This application Feb. 5, 1991, Ser. No. 652,301**

**Int. Cl.[5] B07C** *5/36*

**U.S. Cl. 209—552** **5 Claims**

1. A downwardly sloping gravity conveyor having opposite sides and comprising, in series:

a lead-in conveyor section;

a rotatable conveyor section; and

a lead-out conveyor section, each said conveyor section including a slideway along which articles slide by gravity, with the slideways of said conveyor sections normally being in linear alignment;

identification means associated with the lead-in conveyor section, for generating a scanning beam through which each article moves as it moves along the lead-in conveyor section, to determine a characteristic of the article;

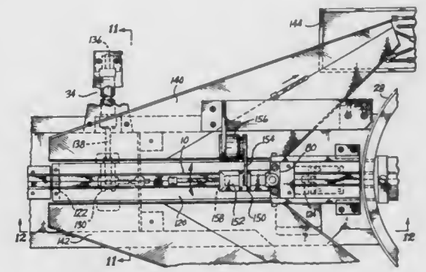
pivots mounting the rotatable conveyor section for rotation about an axis extending longitudinally of the gravity conveyor, for selective rotation towards one side of said conveyor;

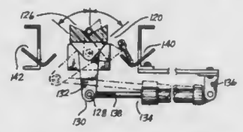
a receiving pan on said one side of the conveyor adjacent the rotatable conveyor section, said receiving pan having a downstream end;

a collection receptacle at the downstream end of said receiving pan;

a reversible drive for the rotatable conveyor section;

a computer means connected to said reversible drive;





said identification means being connected to the computer means; and

said computer means functioning in response to a signal from the identification means, indicating an unwanted article or articles, to energize the drive to rotate the rotatable conveyor section about said longitudinal axis to said one side of the conveyor, to in that manner discharge the article or articles sideways from the rotatable conveyor section into the receiving pan, whereby the article or articles will move from the receiving pan into the collection receptacle, said computer means then controlling the drive to return the rotatable conveyor section to said position of linear alignment with the lead-in and lead-out conveyor sections.

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**5,048,696**

## CONVEYED ITEM DIVIDER/SORTER

**Donald E. Evans, Hilliard, Ohio, assignor to Don Evans & Associates, Inc., Hilliard, Ohio**

**Filed Aug. 31, 1990, Ser. No. 575,917**

**Int. Cl.[5] B07C** *5/36;* **B65G** *47/91*

**U.S. Cl. 209—552** **12 Claims**

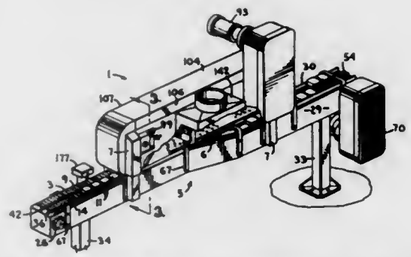
1. An apparatus for handling items comprising first items and second items, comprising:

(a) conveying means having a common path, a first path at least partially colinear with said common path, and a second path diverging from said common path for conveying said items;

VOL 1130 ISS 3 SE 17 1991 UMI



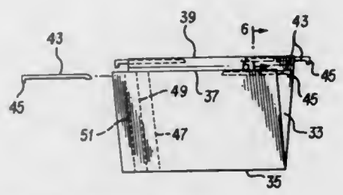
(b) transport means superimposed above said conveying means;
(c) negative pressure means for selecting said first and said second items from said common path to an abutting relationship with said transport means;



(d) control means having a first configuration for de-selecting said first items to said first path of said conveying means and a second configuration for de-selecting said second items to said second path of said conveying means; and
(e) shunting means for cooperatively urging said second items along said second path.

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**5,048,697**
**UNIVERSAL HANGING FILE SYSTEM**
**Myron E. Payne, 413 Amherst Ave., Coraopolis, Pa. 15108**
**Filed Feb. 13, 1989, Ser. No. 309,480**
**Int. Cl.[5] A47F *7/16***
**U.S. Cl. 211—45** **3 Claims**

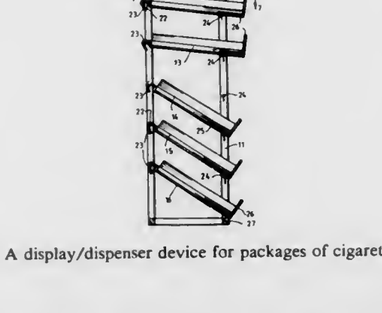


1. An improved file folder comprising:
a) a first folder half and a second folder half, said halves meeting at a folder seam;
b) each said half having a looped end distal from said seam, said looped ends extending substantially the entire lateral extent of said halves;
c) each said looped end having mounted therein a hanger at each side thereof;
d) each said half having at least one perforated line spaced from a respective side thereof, said perforated lines being aligned with one another whereby the width of said folder may be adjusted by removing a portion thereof to one side of said perforated lines.

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**5,048,698**
**OFFICE ACCESSORY MOUNTING RAIL**
**Karl Konrad, Bethlehem, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**
**Filed Jun. 12, 1990, Ser. No. 536,398**
**Int. Cl.[5] A47F *7/00***
**U.S. Cl. 211—45** **9 Claims**

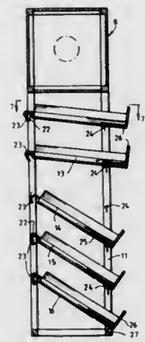
1. An office accessory mounting system for articles of office furniture, the office furniture including support means for securing accessories, the mounting system including:
(a) a rail mounting bracket comprising a rectangular, planar bracket body provided with plural planar outwardly protruding rail engagement tabs, said body further including plural linearly aligned outwardly extending bracket engagement means for securing said body on said support means; and
(b) accessory mounting means for receiving, mounting and displaying plural office articles, said mounting means comprising an elongated rail formed of plural unitarily secured members including:
(i) front and rear spaced-apart, elongated frame plates and an elongated web plate, said front end rear frame plates each having top and bottom edges and each having interior surfaces joined inwardly of said top and bottom edges by said elongated web plate;



(ii) an elongated, rearwardly facing "C"-shaped hook plate extending from said bottom edge of said rear frame plate, said hook plate having an outwardly facing exterior surface including an elongated shoulder rib;
wherein said web plate and said front and rear frame plates extending downwardly of said web plate define an elongated, downwardly facing "U"-shaped channel, wherein said elongated rail further includes:
(i) an elongated rod movably mounted in said elongated channel; and
(ii) top and bottom downward-facing elongated hanger means for mounting said rail on said planar outwardly protruding rail engagement tabs of said rail mounting bracket.

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**5,048,699**
**DISPLAY STAND AND/OR FRAME**
**Thomas R. Trevaskis, Toorak, Australia, assignor to Megaspace Pty. Ltd., Richmond, Australia**
**Filed Sep. 22, 1989, Ser. No. 410,883**
**Int. Cl.[5] A47F *7/00***
**U.S. Cl. 211—59.2** **3 Claims**

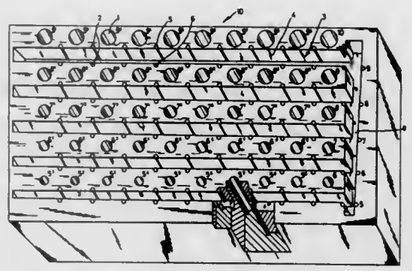


1. A display/dispenser device for packages of cigarettes or other merchandize required to be held ready for convenient removal from the front end of a compact and visible stack of said packages, said device including an open-fronted cabinet adapted to house a plurality of vertically-spaced trays having a laterally extending flange on the front portion thereof each tiltable about a rear axis between a first, lower or "use" position; and a second, raised position wherein access is facilitated for re-stocking the next lower tray or for raising the next lower tray to its second position, rear supports for the tray including vertically-spaced horizontal axle means fixed to the cabinet the axle means providing said rear axis for each tray, there being further provided for each tray a front support fixed to the cabinet, said front support being positioned to support the front of the relevant tray by supporting said flange in the first position and also to support the front of the next lower tray in the second position by supporting said flange the raising of any tray necessitating the prior raising of any or all of the trays immediately above wherein the rear supports are shaped to allow lengthwise movement of the tray.



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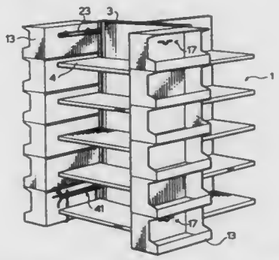
**5,048,700**
**TOOL HOLDER**
**Emil Feder, Hannoversche Str. 2, D-3501 Niestetal-Sandershausen, Fed. Rep. of Germany**
**PCT No. PCT/DE88/00559, § 371 Date Jun. 12, 1989, § 102(e) Date Jun. 12, 1989, PCT Pub. No. WO89/03284, PCT Pub. Date Apr. 20, 1989**
**PCT Filed Sep. 9, 1988, Ser. No. 378,230**
**Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734453; Mar. 22, 1988, 3809492**
**Int. Cl.[5] A47F *7/00***
**U.S. Cl. 211—70.6** **20 Claims**



1. A holder for articles of different cross-sectional area, particularly for tools having cylindrical sections of different diameter, comprising a support; at least one set of apertures of different cross-sectional area in said support for accommodating respective articles; and at least one gauge in said support for establishing the cross-sectional areas of the articles, said one gauge including at least one channel arranged to extend, and designed to receive the articles accommodated, by the apertures of said one set, and said one gauge further including a gauging element for each aperture of said one set, said gauging elements being disposed along said one channel, and each of said gauging elements representing a cross-sectional area which at least approximates the cross-sectional area of the respective aperture, said one channel opening to and at least partly bounding the apertures of said one set.

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**5,048,701**
**PRODUCT MERCHANDISER ASSEMBLY**
**Peter C. Simpson, 1430 Watersedge Road, Mississauga, Ontario, Canada L5J 1A4**
**Filed Aug. 17, 1990, Ser. No. 568,975**
**Int. Cl.[5] A47F *5/00***
**U.S. Cl. 211—189** **3 Claims**



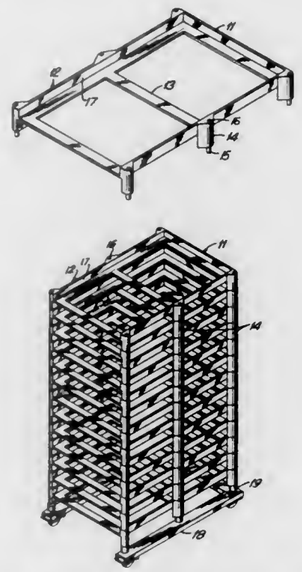
1. A product merchandiser assembly comprising a product receiving member having an apertured backwall, an elongated arm having a mounting end for mounting to an existing support and a hanger region extending from said mounting end into open space outwardly away from the existing support, and clip means for clipping through said apertured backwall of said product receiving member onto said hanger region of said arm, said hanger region of said arm having an opening for receiving said clip means, said opening being bordered by upper, lower and outer end arm portions of said hanger region trapping said clip means at said opening.

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**5,048,702**
**BAKERY RACK**
**William J. Maloney, 29 Montclair Ave., Monsey, N.Y. 10952**
**Filed Mar. 1, 1990, Ser. No. 486,792**
**Int. Cl.[5] B62B *5/00***
**U.S. Cl. 211—194** **5 Claims**

1. A transportable rack made of moldable plastic and specially adapted for transportation and temporary storage of bakery products comprising a base trolley unit and a plurality of modular shelf units vertically stackable thereon, each of said shelf units comprising longitudinally extending parallel side rails, transverse members holding said side rails in spaced, parallel relation and separating members outboard said side rails at each end and on each side thereof adapted to connect vertically to adjacent, vertically located similar shelf units and said trolley unit while maintaining vertical separation therebetween, said separating members being of enlarged section as compared to said side rails and including locking and locating means to lock said shelf units together in located position when said shelf units are vertically stacked together, said separating members, when vertically stacked, acting to transfer the

weight of each said shelf unit downward, and, when vertically stacked, forming a plurality of segmented, vertical load-bearing and bracing columns on each side and each corner of said rack.



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**5,048,703**

## CONTAINER CRANE INSTALLATION

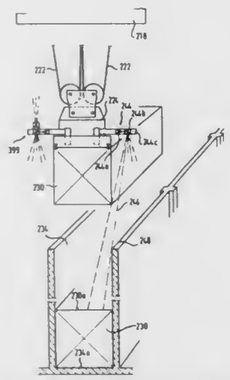
**Hans Tax, Munich, and Klaus Hösler, Eichenau, both of Fed. Rep. of Germany, assignors to Tax Ingenieurgesellschaft mbH, Munich, Fed. Rep. of Germany**

**Filed May 8, 1989, Ser. No. 349,248**

**Claims priority, application Fed. Rep. of Germany, May 18, 1988, 3816988**

**Int. Cl.[5] B65G** *67/62*

**U.S. Cl. 212—153** **20 Claims**



1. Container crane installation for transferring containers (230) between various standing positions, comprising a hoist cable carrier (218) mobile in a substantially horizontal plane (16) by means of at least one drive mechanism (260,264,268), a spreader (224) suspended on hoist cables (222) of the hoist cable carrier (218) and vertically displaceable by means of a cable hoist mechanism (276), at least part of said standing positions being laterally confined by shaft confining means defining a vertical shaft (234) adapted to the horizontal contour of a respective container (23), said respective container (230) being lowerable into and liftable out of said shaft (234), said spreader (224) having a horizontal contour such as to be lowerable into said vertical shaft (234), a remote recognition system (244) being provided on the spreader (224), with at least one beam emitter (244*a*) for the emission of a beam of radiation (246) reflectable by reflection means (248,234*a*) allocated to said shaft confining means and at least one reflection beam receiver (244*c*), data processing means (250) being controlled by said beam emitter (244*a*) and said reflection beam receiver (244*c*) for providing output information as to the relative position of said spreader (224) with respect to said shaft confining means, said output information serving for the control of at least one of said drive mechanism (260,264,268) and said cable hoist mechanism (276), such as to adjust said spreader (224) with respect to said shaft (234), said remote recognition system (244) being located on said spreader (224) above a horizontal plane corresponding to an upper face of a respective container (230) received by said spreader (224), said remote recognition system (244) being displaceable on said spreader (224) between a recognition position outside the contour of the respective container (230) and a retracted position permitting the spreader (224) to be lowered into the respective shaft (234).

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**5,048,704**

## DETACHABLE INTERCONNECTING ARRANGEMENT

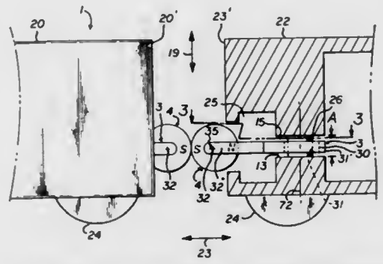
**Tokuo Takahashi, Tokyo, Japan, assignor to Kawada Co., Ltd., Tokyo, Japan**

**Filed Oct. 20, 1988, Ser. No. 260,464**

**Claims priority, application Japan, Oct. 21, 1987, 62-159960[U]**

**Int. Cl.[5] A63H** *19/18*

**U.S. Cl. 213—75 D** **7 Claims**



1. A detachable interconnection arrangement comprising, in combination:

a first body means;

a second body means for detachable coupling to said first body means, and each of said first body means and said second body means having at least one coupling end for positioning adjacent a coupling end of the other body means;

first movable detachable coupling means movably mounted on said first body means at said coupling end thereof, and said first detachable coupling means comprising:

first coupling support means on said first body means;

bracket means movably mounted on said first coupling support means for at least limited movement in a first predetermined number of directions, and having an outer portion at said coupling end of said body means;

first cylindrical magnet means rotatably mounted for rotational movement on said bracket means at said outer portion thereof for rotation about a first magnet axis, and said first magnet means having a north pole and south pole alternatively positionable outwardly disposed from said coupling end of said first body means;

second movable detachable coupling means movably mounted on said second body means at said coupling end thereof, and said second detachable coupling means comprising:

second coupling support means on said second body means;

second bracket means movably mounted on said second coupling support means for at least limited movement in a second predetermined number of directions, and having an outer portion at said coupling end of said second body means;

second cylindrical magnet means rotatably mounted for rotational movement on said second bracket means at said outer portion thereof for rotation about a second magnet axis, said second cylindrical magnet means having a north pole and south pole alternatively positionable outwardly disposed from said coupling end of said second body means;

said second cylindrical magnet means positionable contiguous said first magnet means and defining a magnetic field therebetween having a predetermined strength for detachable tangential coupling of said first magnet means to said second magnet means to thereby detachably couple said first body means to said second body means;

said first and said second coupling support means each comprising a post means having a first preselected diameter and a preselected axis;

said first and said second bracket means each have:

an inner portion spaced from said outer portion thereof, and each of said inner portions having:

walls defining an aperture having a second preselected diameter larger than said first preselected diameter of said post means;

said first coupling support means positioned in said aperture in said first bracket means, and said second coupling support means positioned in said aperture in said second bracket means;

an axle means on said outer portion of each of said first and said second bracket means; and

each of said first and said second cylindrical magnet means is tubular and mounted on said axle means of said first bracket means and said second bracket means, respectively, and each of said first and second cylindrical magnet means further comprising surface walls defining an outer surface and interior walls defining an axial aperture, and said axle means of said first bracket means positioned in said axial aperture of said first magnet means and said axle means of said second bracket means positioned in said axial aperture of said second magnet means.



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**5,048,705**

## BOTTLE AND DRINKING TUBE ASSEMBLY

**L. Grant Lynd, and Paul G. Bordner, both of Pickerington, Ohio, assignors to Lynd Properties, Inc., Pickerington, Ohio**

**Continuation of Ser. No. 318,231, Mar. 3, 1989, abandoned. This application Feb. 26, 1990, Ser. No. 485,818**

**Int. Cl.[5] A47G** *21/18;* **B65D** *47/28, 55/16*

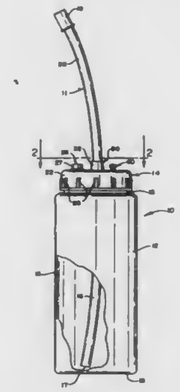
**U.S. Cl. 215—1 A** **26 Claims**

1. A bottle and drinking tube assembly for drinking of liquids comprising

(A) a closed bottle for containing a quantity of liquid that may be selectively dispensed therefrom, said bottle including a body portion having a wall structure of original configuration formed with a predetermined thickness from a material to be flexible, thereby enabling at least portions of said wall structure to be inwardly collapsed under moderate hand pressure to reduce the internal volume of the bottle to effect dispensing of liquid, said wall structure having the characteristic of resilience whereby it will return to its original configuration upon removal of collapsing force, said bottle having an aperture formed in a first wall portion thereof for passage of a drinking tube therethrough and sealing means for effecting a fluid-sealed relationship between said bottle and said drinking tube;

(B) an elongated drinking tube of a caliber through which a person may drink liquid, said tube extending through said aperture and having a first end portion projected a distance interiorly of said bottle to have at least a marginal end portion thereof immersible in a body of liquid that may be disposed in said bottle and a second end portion extending a distance exteriorly of said bottle whereby a marginal end portion thereof maybe placed in a person's mouth; and

(C) venting means carried by said bottle and selectively



operable to either a first position to prevent fluid flow into or from said bottle or to a second position to permit inflow of air into said bottle, said venting means including a venting passageway formed in a second wall portion of said bottle and disposed in spaced relationship to said drinking tube aperture and opening to the exterior and to the interior of said bottle, a valve element linearly slideably positionable with respect to said venting passageway either in a relatively open position to permit air flow through said passageway or in a relatively closed position forming a fluid-sealing relationship therewith preventing fluid flow therethrough, and retention means mechanically cooperable with said valving element for maintaining said valving element in closed, fluid-sealing relationship with said venting passageway when positioned in relatively closed relationship with respect thereto.

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**5,048,706**

## MEANS FOR TAMPERPROOF SEALING OF A CONTAINER

**Robert de Vaujany, Genas, France, assignor to Manufacture Lyonnaise de Bouchage, Lyons, France**

**Filed Aug. 31, 1989, Ser. No. 401,248**

**Claims priority, application France, Sep. 9, 1988, 88 12060**

**Int. Cl.[5] B65D** *41/48*

**U.S. Cl. 215—251** **18 Claims**

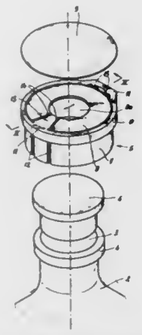
1. A cap for a container, comprising:

a hollow skirt having at least one tear-off line extending over a height of said skirt, said skirt having an upper surface;

a rigid gripping ring surrounding the skirt and connected by at least one strip of material to an upper end position of said skirt in a vicinity of said at least one tear-off line, said

gripping ring having an upper surface substantially coplanar with said skirt upper surface; and

a tear-off lid attached to said skirt and to said gripping ring;



whereby said skirt and said tear-off lid may be removed from a container by pulling said gripping ring.

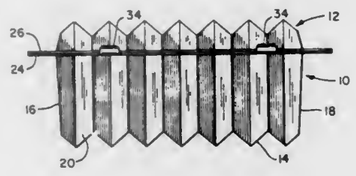
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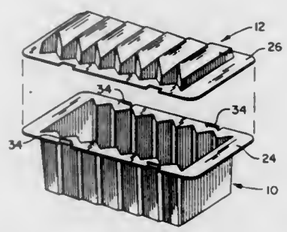
**5,048,707**

**ACCORDION BREAD PAN**

Linnea M. Hallberg, Auburn, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1989, Ser. No. 436,510
Int. Cl.[5] B65D *6/00*
U.S. Cl. 220—4.21 1 Claim





1. A bread pan comprising:

a bottom member, said bottom member having a bottom wall, a pair of opposed end walls, and a pair of opposed side walls, the end walls and the side walls of said bottom member extending outwardly from the bottom wall of said bottom member, the bottom wall and the side walls of said bottom member being provided with aligned corrugations comprising flat surfaces that extend between roots and apexes of consecutive corrugated sections, the bottom wall, the end walls and the side walls of said bottom member cooperating to define a dough-receiving recess, the edges of the side walls and end walls of said bottom member disposed opposite the bottom wall of said bottom member defining a plane, said bottom member having a rim of generally rectangular periphery extending outwardly from said plane-defining edges of said end walls and said walls of said bottom member,

a lid which cooperates with said bottom member to define a closed baking chamber, said lid having a top wall, a pair of opposed end walls, and a pair of opposed side walls, the end walls and the side walls of said lid extending outwardly from the top wall of said lid, the top wall and the side walls of said lid being provided with aligned corrugations comprising flat surfaces that extend between roots and apexes of consecutive corrugated sections, the edges of the side walls and end walls of said lid disposed opposite the top wall of said lid defining a plane, said lid having a rim of generally rectangular periphery extending outwardly from said plane-defining edges of said end walls and said side walls of said lid, said rim being generally complimentary in shape to the rim of said bottom member,

and retaining means associated with the rim of said bottom member and the rim of said lid for retaining said lid on said bottom member during baking, said retaining means comprising resilient fingers projecting from one of said rims which engage cut-outs formed in the other of said rims.

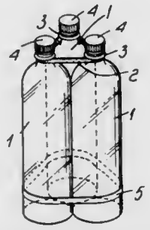
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**5,048,708**

**PACKAGE FOR CYLINDRICAL OR POLYGONAL PACKED BODIES, IN PARTICULAR PLASTIC OR GLASS BOTTLES FOR BEVERAGES, MINERAL WATER AND THE LIKE**

Ezio Musco, Via Belvedere, 26, 24016 San Pellegrino Terme, Bergamo, Italy

Filed Apr. 9, 1990, Ser. No. 506,475
Claims priority, application Italy, Apr. 14, 1989, 20153 A/89
Int. Cl.[5] B65D *71/02*
U.S. Cl. 220—23.4 1 Claim



1. A package for packaging a plurality of bottles comprising a closed loop top strip member adapted to be arranged, with a closed loop configuration, about neck portions of said bottles near collar portions thereof, to connect a plurality of said bottles so as to form a pack which can be gripped by said top strip member, a further closed loop bottom resilient strip element being moreover provided for encompassing said bottles and holding said bottles in an adjoining offset arrangement, said top strip member comprising a closed loop member of a material to be stretched about said neck portions of said bottles arranged with an adjoining clamped relationship, said top strim member being thermosealed on said neck portions, and said top and bottom strip members comprising thermoshrinkable straps including thermosealing adhesive coating materials.

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**5,048,709**

**STRAW-CONTAINING COVER ATTACHMENT AND ASSEMBLY FOR A BEVERAGE CONTAINER**

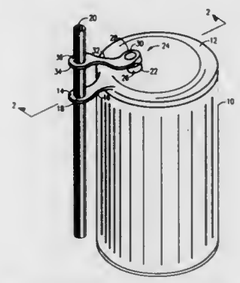
Robert M. Alverson, 1888 Shaw Mountain Rd., Boise, Id. 83712

Filed Sep. 12, 1990, Ser. No. 581,589
Int. Cl.[5] B65D *51/18*
U.S. Cl. 220—90.2 3 Claims

1. A removable cover assembly for a beverage container of the type having an annular rim encircling a sealed or previously sealed opening on a top surface of said container, including, in combination:

a. a removable lid having an annular receptacle at its outer periphery and of the same general configuration as said annular rim of said beverage container and adapted to be removably snap fitted on said rim,

b. a pull tab adjoined to the periphery of said lid and having an opening therein for receiving a straw,



c. said lid further having an opening therein generally aligned with said opening in said container,

d. a multifunctional plug member having a stem portion operative to be inserted at one orientation into said opening in said lid and an integral straw cap portion operative in another orientation of said plug member to be fitted over one end of said straw, and

e. a flexible strap connecting said multifunctional plug member to said straw.



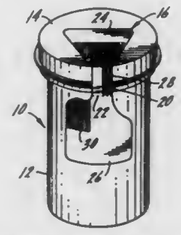
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**5,048,711**

**LABEL INDICATOR FOR SCREW THREAD CLOSURE AND METHOD OF USE**

Harvey S. Weiss, Buffalo Grove, and Lawrence G. Ponsi, Wheeling, both of Ill., assignors to Sage Products, Inc., Cary, Ill.

Filed Jun. 28, 1990, Ser. No. 545,367
Int. Cl.[5] B65D *55/00*; G09F *9/00*
U.S. Cl. 220—214 16 Claims



1. A method of indicating the proper orientation of a screw-thread closure of a container, comprising the steps of

(a) initially applying the closure to the container,

(b) selecting a label having a severable area, and having a first alignment indicator on one segment and a second alignment indicator on a second segment, said severable area being located between said segments and said indicators being unaligned with one another,

(c) applying the label in an overlapping relation to said closure and said container such that the label adheres to both the container and the closure with the severable area being located at a junction of said closure and said container,

(d) removing the closure and breaking the label at the severable area into said two segments, one segment adhering to the closure and the second segment adhering to the container, and

(e) reapplying the closure to the container and overtightening the closure to align said previously unaligned indicators.

7. A container system for indicating the proper orientation of a screw thread closure on a container, comprising

(a) a container having a screw thread closure thereon,

(b) a label applied in an overlapping relation to said closure and said container, said label having a severable area located at a junction of said closure and said container, said label further having a first alignment indicator on one segment of said label and a second alignment indicator on a second segment of said label, said severable area being located between said segments with one of said segments adhering to said closure and the other of said segments adhering to said container, and said alignment indicators being unaligned with one another.

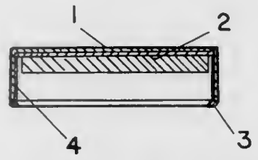
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**5,048,710**

**WET COVER FOR WALLPAPER PASTE DISPENSERS**

Ava Diston, 15091 Hunter La., Westminster, Calif. 92683

Filed Jan. 22, 1990, Ser. No. 468,183
Int. Cl.[5] B65D *51/00*
U.S. Cl. 220—212 5 Claims



1. An open box-like shaped wallpaper paste dispenser cover comprising;

a) a rectangular sheet of flexible water resistant material that is sufficiently large to cover a wallpaper paste dispenser:

b) a water absorbant strip of material attached longitudinally across the sheet of flexible water resistant material and affixed to the side that is intended to be facing the paste of a wallpaper paste dispenser;

c) a cord attached to the perimeter of the flexible water resistant material and of sufficient length to assure a snug fit to a wallpaper paste dispenser.

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**5,048,712**

**TREADLE TOP REFUSE CONTAINER**

Richard H. Wolters, 3316 S. Creek Dr., SE., Grand Rapids, Mich. 49508

Filed Oct. 13, 1989, Ser. No. 421,373
Int. Cl.[5] B65F *1/16*; B65D *43/26*
U.S. Cl. 220—262 19 Claims

1. A treadle top container support for refuse and the like, comprising:

a lower container member shaped to support said container support on a floor surface, and having a tubular portion therein;

an upper container member shaped to define an open marginal edge through which articles pass into and out of said container support, and having a tubular portion therein;

an upright container member interconnecting said lower container member and said upper container member, and

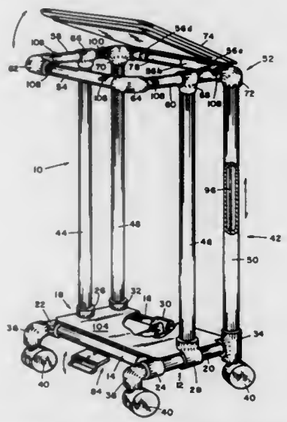
VOL 1130 ISS 3 SE 17 1991 UMI



including a tubular portion therein with opposite ends thereof communicating with the tubular portion of said lower container member and the tubular portion of said upper container member;

a foot pedal movably mounted adjacent said lower container member for shifting between first and second positions;

a lid movably mounted adjacent said upper container member; said lid being shaped to selectively close the open marginal edge of said upper container member, and adapted to move with respect to said upper container member between open and closed positions; and



a flexible actuator, having one end thereof operatively connected with said lid, and the other end thereof operatively connected with said foot pedal, and being configured such that shifting said foot pedal between said first and second positions moves said lid between said open and closed positions; said actuator extending continuously from said foot pedal through the tubular portion of said lower container member, through the tubular portion of said upright container member, and through the tubular portion of said upper container member to said lid, whereby said actuator is disposed substantially wholly within said container support to prevent damage to said actuator, and facilitate sanitation of said container.

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5,048,713

**EASY-OPENING CLOSURE FOR THE SHEET METAL LIDS OF CANS AND THE LIKE**

Egidio Tiveron, Silea, Italy, assignor to Quaker.Chiari & Forti S.p.A., Parma, Italy

Filed Sep. 21, 1989, Ser. No. 410,485
Claims priority, application Italy, Jan. 12, 1989, 19075 A/89
Int. Cl.[5] B65D *17/42*
U.S. Cl. 220—277 14 Claims

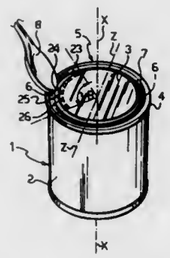
1. A closure made of thin sheet metal and secured by a seam to a container body for a can having an axis, the closure comprising:

a lid having a circular groove therein extending around the axis, the groove containing a circular line of weakening and intended for engagement by a teaspoon in order to pry the can open by breaking the line of weakening;

the lid being characterized in that the rolling direction of the sheet metal is tangent to a circumferential arc of the line of weakening at a midpoint thereof, and that applied to said arc are suitable markings indicative of easy-opening features, and wherein along at least two arcs, the line of weakening is made deeper, to reduce by 0.005 mm the thickness of the line of weakening to be left over when using steel sheet metal;

the groove having a substantially U-shaped cross-sectional configuration with an annular inboard wall, a flat bottom, and an annular outboard wall located next to the seam, the line of weakening being provided on the bottom of the groove;

the inboard wall of the groove being at a finite rake angle lying within the range of 0° to 4° to the axis;



a fillet formed between the inboard wall and the bottom of the groove, the fillet having a short fillet radius between the inboard wall and the bottom of the groove which lies within the range of 0.3 to 0.4 mm;

the line of weakening being provided at a predetermined short distance from the inboard wall of the groove, said distance lying within the range of 0.35 to 0.55 mm.

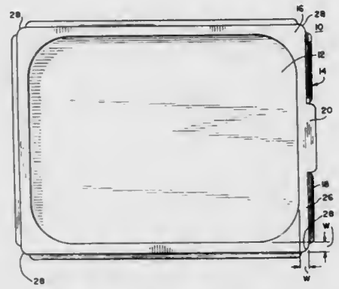
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5,048,714

**COVER FOR AN OPEN-TOPPED RECEPTACLE**

James W. Stevens, Rensselaer, N.Y., assignor to The Vollrath Company, Inc., Sheboygan, Wis.

Filed May 15, 1990, Ser. No. 523,582
Int. Cl.[5] B65D *51/02*; A47J *36/06*
U.S. Cl. 220—287 16 Claims



1. A cover for an open-topped receptacle, said receptacle having walls terminating in an upper terminus, said upper terminus having four segments and generally defining a first quadrilateral; the cover comprising:

a central web terminating in an edge terminus, said edge terminus being substantially circumjacent said web and presenting a channel, said channel generally defining a second quadrilateral having four corners, said channel being configured to effect nested reception with at least a portion of at least two of said segments within said channel; each of said corners being truncated appropriately to accommodate said nested reception of those of said segments which extend beyond said edge terminus outboard of said web.



portion, the bottom of the container having raised partitions for segregating stored items, wherein the synthetic sheet material and the cardboard material combine to form a relatively thin container having good structural support.

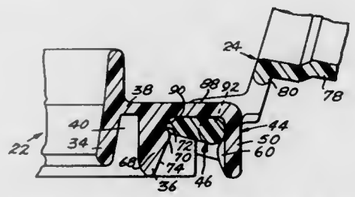
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5,048,715

**CLOSURE ASSEMBLY WITH HINGED COVER**

Martin J. Wolff, North Providence, R.I., assignor to Dart Industries, Inc., Deerfield, Ill.

Filed Sep. 7, 1989, Ser. No. 405,618
Int. Cl.[5] B65D *43/24*
U.S. Cl. 220—335 21 Claims



1. A closure assembly for a container having an open top defined by a peripheral rim, said closure assembly comprising an adapter ring coextensive with the container rim, means on said adapter ring for mounting and sealing said adapter ring to said container rim, a cover mounted on said adapter ring and moveable between a closed position overlying and closing the open top of the container, and an open position remote from said open top, means for releasably retaining said cover in the closed position, means for releasably retaining said cover in the open position against movement to said closed position, a hinge assembly joining said cover to said adapter ring for pivoted movement between the open and closed positions, said hinge assembly includes pivot pin means on said cover and hinge seat means on said adapter ring, said pivot pin means including cylindrical pin shaft means, said hinge seat means including recess means rotatably receiving said pin shaft means, and said means for releasably retaining said cover in the open position includes cooperating portions on said pivot pin means and on said hinge seat means alignable and releasably interlockable in the open position of the cover whereby positive manual manipulation of the cover relative to the adapter ring is required to release said cooperating portions and move said cover from the closed position thereof.

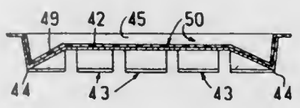
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5,048,716

**CARDBOARD CONTAINER WITH REINFORCING SLITS LINED WITH SYNTHETIC MATERIAL**

Jean A. Bodet, Versailles, and Guy A. Chazal, Sannois, both of France, assignors to Societe Parisienne d'Impression et de Cartonnage, Colombes, France

Continuation of Ser. No. 406,556, Aug. 9, 1982, Pat. No. 4,779,758. This application Apr. 13, 1987, Ser. No. 37,834
Claims priority, application France, Aug. 17, 1981, 81 15794
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[5] B65D *5/20, 5/48, 5/56*
U.S. Cl. 220—462 1 Claim



1. A container comprising a synthetic sheet material defining a bottom and side walls thereof and a sheet of cardboard closely interconnected with the sheet material, the cardboard having slits on the bottom thereof in order to interact with the sheet material to provide structural support to the container, the synthetic material holding the edges of the slits in place, the cardboard portion also having folds conforming to the shape of the synthetic material, the synthetic sheet material having preselected raised portions for interacting with said cardboard

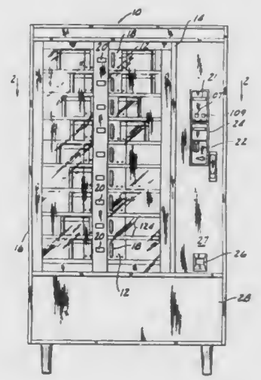
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5,048,717

**MULTIPLE-PRODUCT MERCHANDIZING MACHINE**

Leonard P. Falk, Florissant, and Paul K. Griner, St. Louis County, both of Mo., assignors to UniDynamics Corporation, New York, N.Y.

Continuation of Ser. No. 112,475, Oct. 26, 1987, Pat. No. 4,927,051. This application May 16, 1990, Ser. No. 523,979
The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.
Int. Cl.[5] G07F *11/54*
U.S. Cl. 221—2 19 Claims



1. A multiple-product merchandising machine, having a cabinet; a cylindrical merchandise carrying drum mounted within the cabinet for rotation about its central vertical axis and having a plurality of annular product supporting shelves at spaced intervals along the drum concentric with the axis of the drum, a plurality of walls extending between adjacent shelves and together with the shelves defining a plurality of individual compartments in which product may be placed; a plurality of access doors in the cabinet, one each associated with a respective shelf on the merchandise carrying drum and disposed adjacent thereto for allowing access to a compartment on the respective shelf when the compartment is aligned with it, the access doors being movable between an open position and a closed position and being normally locked in the closed position; a plurality of electronic price displays, one each associated with and disposed adjacent to a respective access door for displaying the price of an item in a compartment aligned with the respective access door; currency actuated means for allowing a selected access door to be moved from the closed position to the open position when a predetermined amount of currency is inserted by a customer which is equal to a set price for the product aligned with the door; and means for setting different prices for different compartments on each of the shelves and for causing the set price for each compartment to be displayed in the associated electronic price display as the compartment becomes aligned with its associated access door, said means for setting prices including a control panel for entering the price and means for storing the price entered and to be displayed in the electronic price display.

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**5,048,718**

## DISPENSER-CONTAINER, AND A PROCESS FOR MANUFACTURING THE SAME AND AN APPARATUS THEREFOR

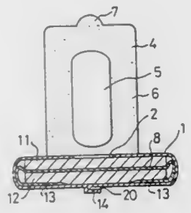
**Kenji Nakamura, Osaka, Japan, assignor to Kennak U.S.A. Inc.**

**Filed Nov. 8, 1989, Ser. No. 433,514**

**Claims priority, application Japan, Nov. 9, 1988, 63-283500; Feb. 17, 1989, 1-38549**

**Int. Cl.[5] B65H *1/00***

**U.S. Cl. 221—35** **8 Claims**



1. A dispenser-container comprising a container body provided with two containing spaces, one of said containing spaces containing contents in a wet condition and the other of said containing spaces containing contents in a dry condition, wherein:

said container body is a bag comprising a first flexible sheet of a liquid impervious material and a second flexible sheet of a liquid impervious material;

said first sheet comprising a bag of a pillow type, having longitudinal edges which overlap each other and are frangibly sealed with each other to such an extent that they can be separated without tearing said first sheet, whereby an opening for dispensing said contents in a dry condition is formed;

said second sheet having a periphery fixed to said first sheet at the entire periphery thereof and is located at the inside of said bag of the pillow type;

said first sheet having an opening or a weakened line for forming said opening, to permit dispensing of said contents in a wet condition therethrough, at a position on a surface of said container body which surface being opposite to said surface having the overlapping longitudinal edges of said first sheet, and has a flexible flap for resealably covering said opening for dispensing said contents in a wet condition; and

said contents in a wet condition are contained in one of said containing spaces formed between said first sheet and said second sheet and provided with said resealable flap.

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**5,048,719**

## APPARATUS FOR STORING, HEATING AND DISPENSING PORTIONED FOOD ITEMS

**Franz Empl, Heppenheim, and Herbert Mink, Lautertal, both of Fed. Rep. of Germany, assignors to Nestec S.A., Vevey, Switzerland**

**Filed Apr. 28, 1989, Ser. No. 345,673**

**Claims priority, application Fed. Rep. of Germany, May 10, 1988, 3816028**

**Int. Cl.[5] B65D *83/00*; G07F *11/72***

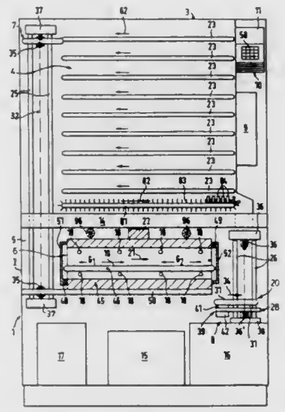
**U.S. Cl. 221—119** **39 Claims**

1. An apparatus for dispensing heated portioned food items comprising:

a storage unit, for storing and providing portioned food items for dispensing, containing a plurality of endless conveyors, each having a horizontally disposed conveying surface, arranged one above another;

a cooking unit, for heating the portioned food items provided from the storage unit, including an endless conveyor having a horizontally disposed conveying surface for transporting the portioned food items through the cooking unit;

a transport lift unit, including an endless conveyor having a horizontally disposed conveying surface, for transferring the portioned food items from the storage unit conveyors to the conveying surface of the horizontally disposed cooking unit conveyor;



an output unit, including a dispensing station, an endless conveyor and a pivoting mechanism for pivoting the output unit conveyor horizontally through 90° for transfer of heated portioned food items from the cooking unit to the dispensing station, wherein the output unit conveyor has a horizontally disposed conveying surface for receiving the heated portioned food items from the cooking unit for transfer to the dispensing station for dispensing the heated portioned food items from the apparatus.

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**5,048,720**

## TABLET DISPENSER

**Thomas C. Hoke, Natick, Mass., assignor to TCA Group, Inc., Natick, Mass.**

**Filed Sep. 17, 1990, Ser. No. 583,292**

**Int. Cl.[5] B65H *1/00***

**U.S. Cl. 221—198** **18 Claims**



11. A hand-held tablet dispenser comprising:

an elongated container for holding regularly shaped tablets in a stacked arrangement relative to said elongated direction, said container including a closed base end and an oppositely disposed top end;

discharge means positioned at said top end including a hold down bar across said top end to prevent said tablets-from exiting directly out of the top and a discharge opening along container side wall sized to allow a tablet to exit said container when it abuts said bar;



means for biasing said stacked arrangement toward said top end;

pivoting cover means positioned at said top end including pusher means, responsive to an upward pivoting of said cover, for forcing a tablet abutting said bar out of said discharge opening;

a thumb slide mounted upon said container for displacement in said elongated direction; and

means for interconnecting said thumb slide to said cover, said cover pivoting in response to displacement of said slide.

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**5,048,721**

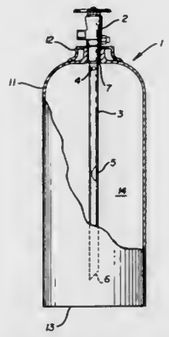
## METHOD FOR ENHANCING THE MIXTURE OF GASES WITHIN A CYLINDER

**Timothy E. Gittens, Piscataway, N.J., and Juergen D. Philipp, Mississauga, Canada, assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.**

**Filed Nov. 17, 1989, Ser. No. 437,735**

**Int. Cl.[5] B67D *5/00***

**U.S. Cl. 222—1** **9 Claims**



1. A method for delivering gas from a cylinder comprising:

(A) providing a cylinder having a cylinder shell, valve means through which gas may be passed into or out of the cylinder shell, and a tube extending through the majority of the length of the cylinder shell in flow communication with said valve means and with the cylinder shell interior, said tube having at least one perforation in the tube wall each said perforation being near the point of communication with said valve means and having no other perforation along the length of the tube, said perforation(s) enabling further flow communication between the cylinder shell interior and the tube;

(B) passing gas from the cylinder interior into and through the tube;

(C) drawing gas from the cylinder interior into the tube through said perforation(s); and

(D) delivering the gas passed into the tube in step (B) and drawn into the tube in step (C) out from the cylinder.

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**5,048,722**

## GAS IGNITION GLUE GUN

**Wang C. Lichu, No 2, Sublane 10, Lane 136, Sec. 3, Chung Shan Road, Chung Ho City, Taipei Hsien, Taiwan**

**Filed Oct. 20, 1989, Ser. No. 424,640**

**Int. Cl.[5] B67D *5/66***

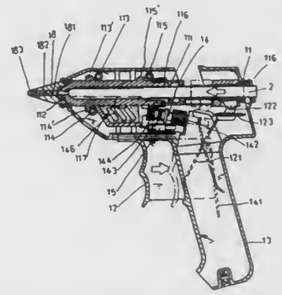
**U.S. Cl. 222—80** **3 Claims**

1. A gas ignition glue gun, including:

a gun body comprising therein a tubular insert for insertion therein of a glue stick, said tubular insert being comprised of a front half portion and a rear half portion, said front half portion comprising integrally a plurality of raised blocks firmly retained by a plurality of projecting blocks to become firmly positioned in alignment with said rear half portion, a nozzle with an axial bore, screwed onto said tubular insert at the front through which melted glue may be ejected, a plurality of radiator holes on side wall portion of the gun body to help radiation of heat,

a feed control mechanism comprising a feed control lever, a resilient element connected with said feed control lever, a clamping element connected with said resilient element at the top to retain the glue stick inserted into said tubular insert, a return spring connected with said clamping element at the back side, a spring and a connected hook-like retainer ring made of silicone rubber set in said tubular insert in the middle to firmly retain the glue stick inserted therein, a cutter set in said tubular insert to cut the inserted glue stick into two semicircular halves, and a spring and a connected ball set in the axial bore of said nozzle;

an ignition mechanism set in said gun body, comprising an ignition trigger disposed to protrude beyond the outer wall surface of said bun body, a main rod comprising a



rack portion at the top and being connected with said ignition trigger, a triggering rod in contact with the front bevel edge of said main rod, an igniter connected with said triggering rod, said igniter comprising a ignition tube at the front through which sparks may be ignited;

a gas volume regulating mechanism set in said gun body, comprising a gas volume regulating lever disposed to protrude beyond the outer wall surface of said gun body, a gear wheel connected with said gas volume regulating lever at the front and disposed to engage with the rack portion of said main rod, a return spring and a radiator fin connected to said gas volume regulating lever at the back, a cotton asbestos set at the front of the gas volume regulating mechanism adjacent to said tubular insert and being covered by a metal cover of high heat conductivity;

characterized in that said feed control mechanism controls forward feeding of glue stick, said ignition mechanism and said gas volume regulating mechanism control spark ignition and intensity of flame to completely melt the glue stick into liquid.

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**5,048,723**

## BOTTLED WATER OPENER AND FLOW CONTROLLER

**Charles M. Seymour, 6309 Sylvan Dr., Simi Valley, Calif. 93063**

**Continuation-in-part of Ser. No. 567,042, Dec. 30, 1983, abandoned. This application Jun. 12, 1986, Ser. No. 873,500**

**Int. Cl.[5] B67D *3/00***

**U.S. Cl. 222—81** **10 Claims**

1. A bottled water plastic cap opener and flow controller assembly comprising:

a hollow housing substantially open at a first end thereof, and closed with the exception of at least one opening at its other end;

said housing having a transverse medial partition with at least one opening therethrough;

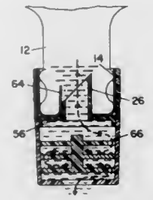
a sharp piercing member mounted on said medial partition

adjacent said opening, said piercing member extending axially toward said first end of said housing but terminating inwardly from the end thereof;

said piercing member, said medial partition, and the open end of said housing, being formed of a single plastic injection moulded part;

flow restrictor means located within said housing between said partition and the other end thereof, said flow restrictor having an axial extent which is less than the diameter thereof;

whereby a five gallon plastic water bottle sealed with a




plastic end cap may be opened by pressing the piercing member of said assembly down onto the plastic end cap to form a central hole therein, and the flow restrictor means allows a substantial time period for turning the bottle over and setting it onto a water cooler stand and

said piercing member being molded integrally with said medial partition and having a plurality of outwardly extending protrusion means on the outer surface thereon to hold a plastic cap onto said piercing member, and wherein said medial partition has at least one additional small hole through it adjacent said piercing member to facilitate draining of water.

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**5,048,724**

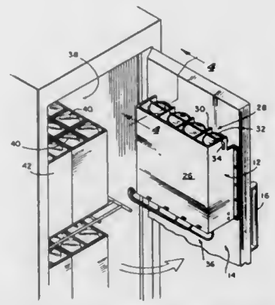
**SOFT SERVE FROZEN CONFECTION DISPENSER**

**Donald J. Thomas, Carmel, Ind., assignor to FedPak Systems, Inc., Indianapolis, Ind.**

**Continuation of Ser. No. 273,101, Nov. 22, 1988, abandoned. This application Dec. 27, 1989, Ser. No. 456,234**

**Int. Cl.[5] B65D** *35/28*

U.S. Cl. 222—95 **14 Claims**




1. A soft serve frozen confection dispensing apparatus comprising

a collapsible container for holding a frozen confection, said collapsible container having a collapsible container outlet of sufficient size to allow extrusion of the frozen confection,

an outlet conduit for receiving the extruded frozen confection, said outlet conduit including valve means for controlling the extrusion of the frozen confection,

compression means for compressing the collapsible container to extrude the frozen confection from the collapsible container into the outlet conduit,

freezer means for maintaining the temperature within the dispensing apparatus substantially within the normal soft serve frozen confection dispensing temperature, and

thermal insulation means surrounding said collapsible container within the dispensing apparatus for maintaining said collapsible container at a constant temperature ideal for dispensing a soft serve frozen confection, the apparatus including storage means for holding the tempering replacement collapsible containers filled with a soft serve frozen confection, said storage means including an access door.

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**5,048,725**

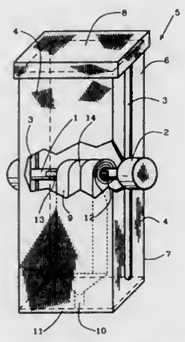
**WALL MOUNTABLE TOOTHPASTE DISPENSER WITH MAGNETIC TUBE-WINDER HOLDING MEANS**

**Mildred I. Peterson, 1000 S. Semoran Blvd., #501, Winter Park, Fla. 32792**

**Filed Dec. 3, 1990, Ser. No. 620,739**

**Int. Cl.[5] B65D** *35/34*

U.S. Cl. 222—100 **35 Claims**




1. A wall-mountable tube-packaged-product dispenser comprising;

a tube container with inside dimensions selectively longer than tubes to be inserted into it, selectively wider from side-to-side than tubes that are flattened within it and selectively thicker from front-to-back than diameters of tubes to be inserted into it;

a container bottom to which side walls of the container are attachable;

a tube outlet orifice in the container bottom;

a key channel extended selectively between a vicinity of a top and a vicinity of a bottom of each side of the container;

a tube-winder rod extendible through the key channels from an outside surface of the container at one side of the container to an outside surface of the opposite side of the container;

a tube-winder-rod orifice extended from side-to-side of the tube-winder rod with a size and shape to receive a bottom of a tube insertable into the container;

a tube-winder knob attachable to each end of the tube-winder rod at positions exterior to outside surfaces of the sides of the container and having a diameter selectively larger than a cross-sectional dimension of the tube-winder-rod;

a circumferential magnetic ring positioned selectively between the tube-winder knob and the tube-winder-rod orifice; and

a surface of each key channel having magnetic attraction to the circumferential magnetic ring.



**5,048,726**

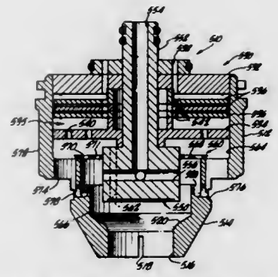
**SUPERFLOW DIFFUSER AND SPOUT ASSEMBLY**

**Gerald P. McCann, Los Angeles, and Eugene R. Kief, Saugus, both of Calif., assignors to McCann's Engineering And Manufacturing Co., Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 374,088, Jun. 30, 1989, Pat. No. 4,986,447, which is a continuation-in-part of Ser. No. 195,947, May 19, 1988, Pat. No. 4,928,854. This application May 18, 1990, Ser. No. 525,924**

**Int. Cl.[5] B67D** *5/56*

U.S. Cl. 222—129.1 **3 Claims**



1. A superflow diffuser and spout assembly for use with a liquid dispensing apparatus dispensing a syrup and a diluent, comprising

a body having a cavity extending therethrough,

a diluent inlet in said body for receiving a supply of the diluent into said cavity;

a syrup inlet in said body for receiving a supply of the syrup;

a diffuser assembly in said cavity through which at least a portion of the diluent supply passes prior to being dispensed;

a spout depending from said body having a passageway therethrough in communication with said cavity, said passageway having holes extending outwardly through the wall of said spout;

a flow separator within said cavity to divide the flow of the diluent supply therethrough;

passages to direct a portion of the divided diluent flow to the outer surface of said spout;

a syrup distributor in said spout having ports oriented to direct syrup outwardly for direct impingement on the inner wall of said spout above said holes.

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**5,048,727**

**PREASSEMBLED UNIT DOSE DISPENSER HAVING A COMPRESSIBLE CONTAINER AND A TUBE PREFILLED WITH A UNIT DOSE OF OPTHALMIC GEL.**

**Richard J. Vlasich, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Forth Worth, Tex.**

**Continuation of Ser. No. 667,625, Nov. 2, 1984, abandoned. This application Apr. 30, 1990, Ser. No. 522,393**

**Int. Cl.[5] B65D** *37/00*

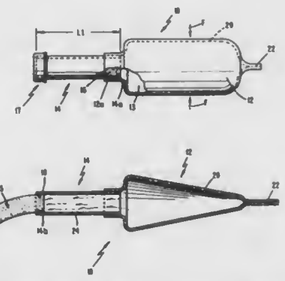
U.S. Cl. 222—209 **3 Claims**

1. A preassembled, disposable, ophthalmic gel dispensing device, comprising:

(a) a predetermined unit dosage of said ophthalmic gel;

(b) a compressible container containing a gaseous propellant; and

(c) a tube prefilled for containing said predetermined dose of gel, said tube having a discharge opening through which said predetermined gel dose is dispensed upon application of external pressure to the compressible container, causing the propellant to enter the tube and eject, by displacement, the gel from said tube, wherein said tube is substantially entirely prefilled with said unit dosage of gel which is contained only in the tube, said tube having one end permanently and directly fixed to an outlet formed directly in a side wall of said compressible container and an opposite end establishing said discharge opening, wherein said tube has a tubular side wall formed of a material that is sufficiently rigid to prevent the product stored therein from entering the compressible container when external finger pressure is applied to the tubular side wall, the



volume of said tube as defined between opposite ends thereof being less than the volume of said compressible container so that substantially entirely all prefilled product in said tube is expelled in a single dosage by propellant; and a closure cap for sealing the discharge opening to protect the sterility of the prefilled product.

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**5,048,728**

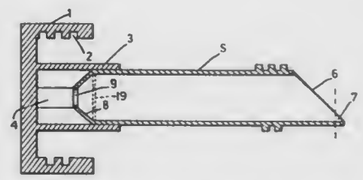
**ORAL LIQUIDS DISPENSER**

**Hector H. Gomez Acevedo, Rancho Jigüingo #25, Prado Coapa, Mexico City, Mexico 14350**

**Filed Sep. 26, 1989, Ser. No. 412,911**

**Int. Cl.[5] A61J** *7/00*

U.S. Cl. 222—215 **9 Claims**




1. An oral liquid dispenser comprising an elongated tubular body which can be filled with a liquid and has two ends, one of said ends being of a frusto-conical shape and having an orifice at a tip thereof and another of said ends being a diagonally cut open end; insertably removable means for obstructing said orifice at said tip of said frusto-conical end; and a cap adapted to be attached to a neck of a receptacle containing the liquid, said cap having a tubular wall portion perpendicularly extended and centrally positioned thereto, said tubular wall portion having means for engaging said tubular body so that said tubular body is axially inserted in said tubular wall portion with one of its two ends extending within said tubular wall portion and the other of its ends extending outwardly of said tubular wall portion, whereby said other end outwardly extending of said tubular wall portion constitutes a liquid dispensing end, wherein said tubular wall portion of said cap extends inwardly of said cap, said tubular body being inserted into said tubular wall portion with said frusto-conical end extending within said tubular wall and said diagonally cut open end extending outwardly of said tubular wall portion, said cap having an axial central extension for plugging said orifice at said tip of said frusto-conical end of said tubular body, and said diagonally cut open end of said tubular body being the dispensing end for supplying said liquid by gravity into the mouth of

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the user of the dispenser, upon removal of said cap from said receptacle and filling of said tubular body with said liquid.

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5,048,729

## AEROSOL DISPENSER WITH FLOW DIVERTER

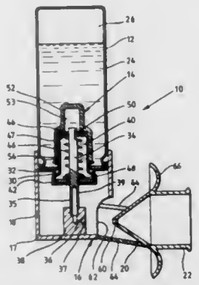
John N. Pritchard, West Hanney, United Kingdom, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 10, 1990, Ser. No. 550,486

Claims priority, application United Kingdom, Aug. 3, 1989, 8917775

Int. Cl.[5] A61M *11/00*

U.S. Cl. 222—402.1 6 Claims



1. An aerosol dispenser including an aerosol-emitting valve and an applicator through which aerosol droplets pass after emission, the applicator comprising a frusto-conical diverter defining at one end a small orifice aligned facing the valve, such that in use the aerosol droplets predominantly pass through the orifice while the gas stream entraining the droplets predominantly is diverted by the diverter.

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5,048,730

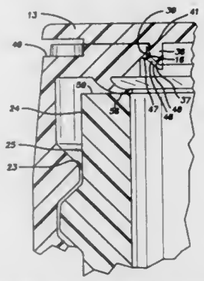
## MOISTURE-RESISTANT DISPENSING TOP

Michael J. Forsyth, Stow, and Craig C. Wiedman, Brecksville, both of Ohio, assignors to Weatherchem Corporation, Twinsburg, Ohio

Filed May 10, 1990, Ser. No. 521,389

Int. Cl.[5] B67D *3/00*

U.S. Cl. 222—482 11 Claims



1. A dispensing cap for a container comprising an injection-molded one-piece body, the body having a generally circular end wall and a generally cylindrical skirt, an aperture in the end wall of a size sufficient to allow spooning out granular product from the container through the aperture, a generally planar flap closing the aperture, the flap being hinged on the end wall along a line generally parallel to a diametral line across the end wall between an open position clear of the aperture and a closed position over the aperture, the flap lying in a plane substantially parallel to the end wall when its closed position over the aperture; major areas of the skirt, end wall and flap each having a nominal wall thickness, a sealing flash extending around the aperture, the sealing flash having a thickness that is a minor fraction of the nominal wall thickness of any of the skirt, end wall and flap and a free length sufficient in comparison to its thickness to enable it to bend, the sealing flash having an interference fit between the end wall and the flap when the flap is in the closed position and being arranged to elastically deform in local bending deflection to accommodate closing of the flap and produce a resilient seal between the end wall and the flap.

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5,048,731

## EASY LOAD—GET IT ALL DENTAL PROPHYLACTIC POLISHING PASTE CONTAINER DISPENSER WITH INTEGRAL RING LIKE HOLDING DEVICE

Ronald Moreschini, 2929 7th Ave., Pueblo, Colo. 81008

Filed Nov. 20, 1989, Ser. No. 439,107

Int. Cl.[5] B65D *47/10;* A61C *3/00*

U.S. Cl. 222—541 18 Claims



1. A dental prophylactic polishing paste container-dispenser for use with a prophy cup and polishing paste comprising: a conically shaped body member of plastic, the larger end of said body member having a central opening surrounded by a contiguous flat flange, said body member of such a shape and size to allow said prophy cup easy access for complete removal of all the polishing paste contained therein and having a ring like device as an integral part of said flange, and said ring like device being of a folded type which as unfolded is in the same plane as said flat flange and flush with the top thereof.

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5,048,732

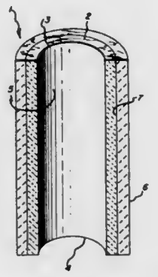
## TRANSFER TUBE

Marcus P. Borom, Schenectady; Lawrence E. Szala, Scotia; Milivoj K. Brun, Ballston Lake; Steven A. Miller, Amsterdam, all of N.Y., and David P. Mourer, Danvers, Mass., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 339,460, Apr. 17, 1989. This application May 24, 1990, Ser. No. 527,983

Int. Cl.[5] B22D *35/00*

U.S. Cl. 222—606 40 Claims



1. A transfer tube useful for transfer of molten metal comprised of a hollow high density tube having directly bonded only to its outer surface wall leaving no significant portion thereof exposed a single continuous low density shell, said high density tube and low density shell being comprised of polycrystalline ceramic oxide material, said high density tube having a density of at least about 90% of its theoretical density, said high density tube having a passageway extending through its length with a cross-sectional area at least sufficient for transfer of molten metal therethrough, said low density shell ranging in density from about 40% to about 80% of its theoretical density, said low density shell having a thermal conductivity of at least about 10% lower than that of said high density tube, said low density shell having a thermal expansion coefficient within about ±25% of the thermal expansion coefficient of said high density tube.



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5,048,733

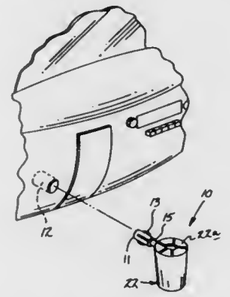
## AUTOMOTIVE ACCESSORY MOUNT

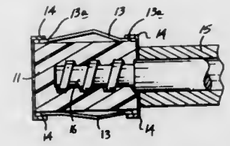
Giselle F. Nagy, 7556 Hesperia Ave., Reseda, Calif. 91335

Filed Jun. 27, 1989, Ser. No. 371,841

Int. Cl.[5] B60R *7/00*

U.S. Cl. 224—42.42 16 Claims





1. An automotive accessory apparatus in combination with an automotive cigarette lighter receptacle secured within a vehicular dash board wherein the receptacle is defined by a bore of a predetermined internal configuration, wherein the apparatus comprises,

an elongate base of an external configuration substantially equal to the predetermined internal configuration of the bore of the receptacle, and

an elongate shank member axially secured to and extending exteriorly from the cylindrical base and terminating in a forward end,

a clip member orthogonally secured relative to the shank member on a rear face of the clip member and including a slot formed on the forward face of the clip member, and

a plurality of accessory members, and

a tab plate slidably receivable within the slot and the tab plate integrally connected to one of said plurality of accessory members, and

wherein the cylindrical base is formed of an electrically insulative polymeric material, and further including a series of arcuate springs coaxially aligned with the cylindrical base and extending exteriorly of an external surface defined by the cylindrical base, and the arcuate springs each include terminal ends, each terminal end of the arcuate springs are receivable within a base slot formed to the external surface of the cylindrical base for frictional engagement with the bore of the cigarette lighter receptacle.

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5,048,734

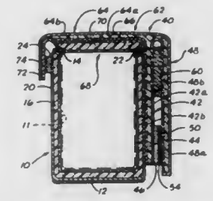
## INSULATED CONTAINER JACKET

Granvill F. Long, P.O. Box 92, Ratten, Okla. 74562

Filed Jan. 5, 1990, Ser. No. 461,420

Int. Cl.[5] B65D *23/08;* A45F *5/02*

U.S. Cl. 224—148 9 Claims



1. An insulating container jacket comprising:

a cylindrical body of flexible, insulation lined fabric having a bottom panel and having an open top at the other end of the cylindrical body from the panel; and

a T-shaped carriage and closure subassembly attached to the cylindrical body and facilitating carriage and closure of the cylindrical body when a beverage container is carried therein, said T-shaped carriage and closure subassembly comprising:

an elongated, downwardly extending leg secured to one side of said cylindrical body, and having an upper end and a lower end, and extending parallel to the axis of the cylindrical body;

a flexible, elongated belt loop element having one end secured to, and formed integrally with, the upper end of said downwardly extending leg, and having a second end extendable through a belt and connectable to the lower portion of the cylindrical body; and

cover panel means having an outer periphery and a point hingedly connected at one location on its outer periphery at said point of hinged connection to the upper end of said downwardly extending leg and to said belt loop element and comprising:

an outer closure pad having an outer periphery and extending across and covering the open top of the cylindrical body;

an inner closure pad fitting closely within said open top of the cylindrical body; and

an engaging tab on the outer periphery of said outer closure pad on the opposite side of said cover panel means from its point of said hinged connection to said downwardly extending leg.

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5,048,735

## FIREARM HOLSTER LOCKING APPARATUS AND METHOD

Michael L. McCormick, 7506 Bender Dr., Austin, Tex. 78749

Continuation of Ser. No. 447,361, Dec. 6, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 639,366

Int. Cl.[5] F41C *33/02*

U.S. Cl. 224—244 19 Claims

1. A firearm holster locking apparatus comprising:

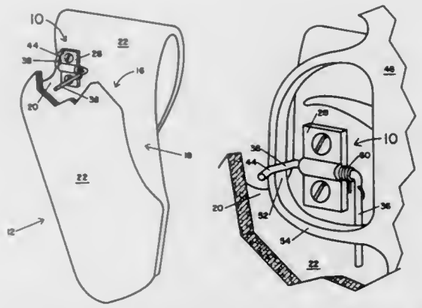
A. locking means movably secured to the holster and adapted to move between a locked position and an unlocked position, the locking means, when in the locked position, for limiting the movement of a firearm received in the holster in at least one direction other than a withdrawal direction in which the firearm is withdrawn from the holster; and

B. activating means connected to the locking means for contacting the firearm as it is inserted into the holster so as

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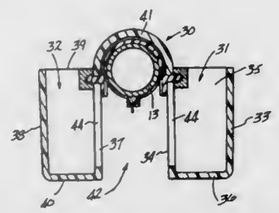
to move the locking means from the unlocked to the locked position and for contacting the firearm received in



the holster to retain the locking means substantially in the locked position.

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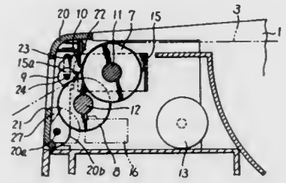
**5,048,736**
**COUPON HOLDER**
**Victor Anatra, Guilford, Conn., assignor to Anatra Enterprises, Inc., Guilford, Conn.**
**Filed Jun. 26, 1990, Ser. No. 544,233**
**Int. Cl.[5] B62B *5/00***
**U.S. Cl. 224—277** **21 Claims**



1. For use with a shopping cart having a horizontal pushing handle extending rearwardly therefrom, a coupon holder molded in one piece of rigid plastic material and having two spaced apart open top receptacles joined by an upper arcuate portion adapted to be received on said handle whereby said receptacles depend on either side of said handle and having facing sidewalls on either side of said handle, and an adaptor member adapted to be fastened to said handle having projections extending from either side thereof, said facing sidewalls having vertically extending slots therein receiving said projections whereby said holder may move vertically with respect to said handle.

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**5,048,737**
**MOTOR-DRIVEN TAPE CUTTER**
**Norio Sueda, Chiba, and Yoshihiko Chino, Mitaka, both of Japan, assignors to Elm Industry Co., Ltd., Tokyo, Japan**
**Filed Jul. 13, 1990, Ser. No. 552,302**
**Claims priority, application Japan, Aug. 1, 1989, 1-90823[U]**
**Int. Cl.[5] B65H *17/26***
**U.S. Cl. 225—11** **3 Claims**



1. A motor-driven tape cutter of the type including a cutter body having front and rear sides at longitudinal ends of said cutter body, a cavity elongated in the longitudinal direction on a top side of said cutter body, a reel provided at a longitudinal rear end of the cavity for supporting a ring-like roll of adhesive tape, a feed roller provided at a longitudinal front end of the cavity for peeling and reeling out the leading end of said adhesive tape over a predetermined length, a backing roller and a presser roller adapted to grip the unreeled tape portion from opposite sides for straightening warping of said tape, a cutter blade for cutting the unreeled tape portion, a motor for driving said feed roller and said backing roller, a switch for actuating said motor, and a switch operating means adapted to close said switch in relation with a tape cutting operation thereby reeling out a predetermined length of the ensuing tape portion, characterized in that said motor-driven tape cutter comprises:

a cutter blade holder pivotally mounted on the front side of the cutter body to openably close a longitudinal front end portion of said cavity and at least part of said feed, backing and presser rollers, and supporting said cutter blade and said presser roller thereon, said cutter blade and said presser roller being moved away from said feed and backing rollers when said cutter blade holder is opened;

wherein said holder is formed in an inverted L-shape at the longitudinal front end portion of said cavity, said holder being pivotally connected at a lower end portion thereof to said cutter body through a shaft, to permit said holder to be swung forward into an open position, said holder supporting said cutter blade and said presser roller thereon, said cutter blade and said presser roller being further from said feed and backing rollers when said holder is opened than when said holder is closed,

wherein said holder is provided with projections on a lower end portion of said inner surface, that are fittingly engageable in circumferential grooves on said backing roller when said holder is closed and when said holder is open, thereby preventing said adhesive tape on said backing roller from being caught and wound on said backing roller.

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**5,048,738**
**INTERCHANGEABLE TAPE CUTTER**
**Tom Cardamone, Grand Central Post Office, Lex. Ave. & 45th St., New York, N.Y. 10017-9998**
**Filed Nov. 21, 1986, Ser. No. 936,383**
**Int. Cl.[5] B26F *3/02***
**U.S. Cl. 225—56** **4 Claims**

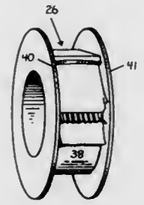
1. A cutter device for rolled tape on a spool having two opposed spool rims for carrying a roll of tape wound on a core within opposed inner sidewalls of said opposed spool rims, said cutter device comprising:

a body portion having a lower surface adapted to slideably move along the periphery of a roll of tape wound on said



core within said opposed inner sidewalls of said spool rims,

said lower surface being contoured upwardly in a direction towards a front end of said body portion to define a recessed space between said front end and the outer circumference of said roll of tape when said body portion is mounted on said roll of tape,

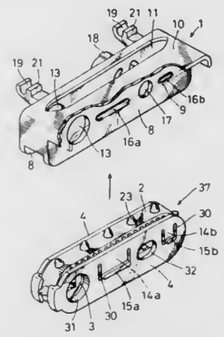


a cutting edge on said front end, and

a pair of opposed resilient side members, each of which extends laterally from opposed sides of said body portion for exerting a biasing force outwardly against the inner surfaces of said opposed rims of said tape spool to maintain said cutter device removably mounted to said roll of tape within said opposed spool rims.

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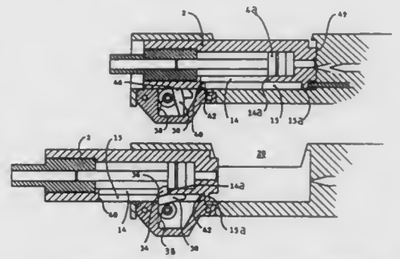
**5,048,739**
**INTEGRAL FRAME TYPE PAPER FEEDER**
**Sadao Unuma, Oobu, and Koichi Hara, Chita, both of Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan**
**Filed Nov. 20, 1990, Ser. No. 615,854**
**Claims priority, application Japan, Nov. 30, 1989, 1-312017**
**Int. Cl.[5] B65H *20/20***
**U.S. Cl. 226—74** **2 Claims**



1. An integral frame type paper feeder constructed so that perforated paper is fed by moving a feed belt, which is set in a main frame, by a driving sprocket with feed pins on said feed belt fitted in the perforations in said perforated paper, comprising a pair of sub-frames for use in assembling said feed belt and said driving sprocket with each other in the form of a sub-assembly; and a main frame of an integral structure consisting of a pair of side plates which are formed in an opposed state at both side portions thereof so as to be spaced from each other at a predetermined distance, and which are used to fix said sub-frames thereto, and an upper plate the upper surface of which constitutes a paper feed surface, which upper plate is provided with a feed belt moving bore which is formed so as to extend in the direction in which said perforated paper is fed, and which allows the portion of said feed belt on which said perforated paper is being fed to be aligned with said paper feed surface, a driving assembly, which consists of said two sub-frames, and said feed belt and said driving sprocket, which are combined with said sub-frames, being fitted between the side plates of the main frame, said sub-frames being fixed to said side plates.

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**5,048,740**
**FASTENER SETTING TOOLS**
**Richard J. Beton, South Blackburn, Australia, assignor to Ramset Fasteners (Aust.) Pty. Limited, Croyden North, Australia**
**PCT No. PCT/AU88/00255, § 371 Date Jan. 10, 1990, § 102(e) Date Jan. 10, 1990, PCT Pub. No. WO89/00483, PCT Pub. Date Jan. 26, 1989**
**PCT Filed Jul. 13, 1988, Ser. No. 459,717**
**Claims priority, application Australia, Jul. 15, 1987, PI3101**
**Int. Cl.[5] B25C *1/14***
**U.S. Cl. 227—10** **8 Claims**



1. An explosively-actuated tool for setting a fastener into a substrate, comprising a body, a barrel containing a firing piston operative upon detonation of an explosive charge to drive a fastener in the forward end of the barrel, said barrel being movable in the body from a rear position in which the tool is ready to fire to a forward position in which a breach is opened for loading of a fresh charge, said barrel including a longitudinal slot closed at its forward and rear ends and opening into the interior of the barrel, stop means movable between an operative position in which the stop means extends through the slot in the barrel into the inteior of the barrel to engage the piston during the forward movement of the barrel to reset the piston rearwardly relative to the barrel in preparation for the next firing, and a retracted position withdrawn from the slot in the barrel upon subsequent rearwards movement of the barrel to close the breach, the retracted stop means being located forwardly of the forward end of the slot when the barrel is in its rear position, means for urging said stop means to its retracted position upon movement of said barrel into its rear position, means for moving said stop means to its operational position upon movement of said barrel toward its forward position, a shoulder on said barrel, and a forward stop on the body, said forward stop on the body being engageable with said shoulder on the barrel in the forward position of the barrel to define a forward stopped position for the barrel, said stop means being spaced forwardly from the rear end of the slot when the barrel is in its forward stopped position for preventing engagement of said stop means with said rear end of said slot upon the interengagement of the said shoulder on said barrel and said forward stop on said body if said barrel is thrust forward.

VOL 1130 ISS 3 SE 17 1991 UMI

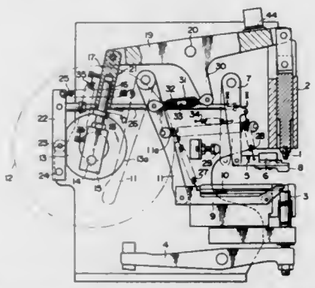


5,048,741

## APPARATUS FOR PROTECTING LIGHT PROJECTOR FROM COLLISION WITH PUNCH OF BUTTON SETTING MACHINE

Yoshiyuki Toishi, Namerikawa, and Toshiaki Sodeno, Toyama, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,910
Claims priority, application Japan, Feb. 3, 1989, 1-26299
Int. Cl.[5] A41H *37/10*
U.S. Cl. 227—18 11 Claims



1. An apparatus for protecting a horizontally reciprocable light projector from collision with a vertically reciprocable punch of a button setting machine, the button setting machine including a power-driven rotating drive member, the light projector being normally disposed directly below the punch, said apparatus comprising:

(a) first means for transmitting a driving power from the rotating drive member to the light projector to reciprocate the light projector along a horizontal path;

(b) second means for transmitting a driving power from the rotating drive member to the punch to reciprocate the punch along a vertical path; and

(c) mechanical means for producing a delay between retracting movement of the light projector and the downward movement of the punch to such an extent that the light projector is retracted from the vertical path of movement of the punch before the punch starts moving downward, wherein said first power transmitting means includes a cam rotated by the rotating drive member and a pivotable cam lever operatively connected with the light projector and driven by said cam to reciprocate the light projector toward and away from the vertical path of movement of the punch, said second power transmitting means including a crank mechanism operatively connected with the punch and said cam and driven by said cam to reciprocate the punch along the vertical path, said delay-producing mechanical means including a lost motion mechanism incorporated in said crank mechanism.

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5,048,742

## SOLDER-DESOLDER MODULAR STATION

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

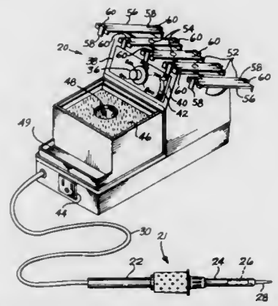
Filed Jun. 14, 1990, Ser. No. 537,581
Int. Cl.[5] B23K *3/00*
U.S. Cl. 228—20 10 Claims

1. A solder-desolder modular station comprising:

a base unit;

a remote temperature control soldering instrument power supply housed therewithin an electronically temperature controlled soldering instrument connected to said power supply for energizing its electrically heated soldering tip;

at least one modular solder-desolder tool holder; and



modular mounting means disposed along the top of said base unit and being of the character to support removably a plurality of said solder-desolder tool holders.

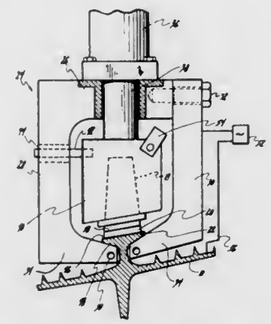
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5,048,743

## ROTOR BLADE BONDING DEVICE

Raymond M. Walker, Port St. Lucie, and John T. Sinski, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 26, 1990, Ser. No. 516,017
Int. Cl.[5] B23K *37/00*
U.S. Cl. 228—44.3 4 Claims



1. A blade repair apparatus for replacing a blade on an integrally bladed rotor having an axially extending rim to which blades are secured, comprising:

a clamp frame including a horizontally extending top member, a vertically extending first side member integral with said top member, a vertically extending side member moveably secured to said top member, and a horizontally extending finger at the bottom of each side member having a mating upper surface configured to mate with the underside of said rim;

a hydraulic ram rigidly secured to said top member and having a longitudinally moveable ram shaft;

a blade holder secured to said ram shaft;

a precision guidance arrangement between said first side member and said blade member; and

heating means for heating the interface between a blade and said blade holder and a blade stub on said rim.

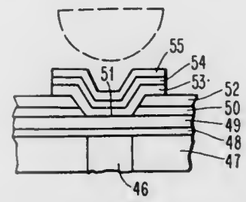


5,048,744

## PALLADIUM ENHANCED FLUXLESS SOLDERING AND BONDING OF SEMICONDUCTOR DEVICE CONTACTS

Chin-An Chang, Peekskill; Nicholas G. Koopman, Hopewell Junction; Judith M. Roldan, Ossining, all of N.Y.; Steven Strickman, Reading, Pa.; Kamalesh K. Srivastava, Wappingers Falls, and Helen L. Yeh, Katonah, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 289,174, Dec. 23, 1988, abandoned.
This application May 14, 1990, Ser. No. 522,473
Int. Cl.[5] H05K *3/34;* B23K *101/40*
U.S. Cl. 228—123 19 Claims



1. The process of fluxless bonding of copper and solder, in the presence of an oxide of at least one of copper, tin and lead, in an integrated circuit comprising in combination the steps of:

providing a layer of palladium between 200 and 1500 Angstroms thick positioned between said solder and said copper, and

heating said copper, said solder and said layer in a reducing atmosphere at at least 215° C.

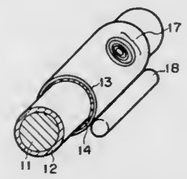
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5,048,745

## ROLL STAMPER FOR MOLDING SUBSTRATE USED FOR OPTICAL RECORDING MEDIUM, PROCESS FOR PREPARING SAME, AND PROCESS FOR PREPARING OPTICAL RECORDING MEDIUM MAKING USE OF IT

Tetsuya Sato; Osamu Kanome, both of Kawasaki; Masataka Yashima, Yokohama, and Hiroyuki Sugata, Yamato, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 514,721
Claims priority, application Japan, Apr. 26, 1989, 1-10488; Apr. 26, 1989, 1-104689; Apr. 26, 1989, 1-104690
Int. Cl.[5] B29D *17/00*
U.S. Cl. 228—132 2 Claims



1. A process for preparing a roll stamper for continuously preparing a substrate used for optical recording mediums, having a convexity and concavity preformat pattern, wherein said process for preparing a roll stamper comprises the steps of;

forming a low-melting metal layer on a roll substrate;

forming an auxiliary layer **16** on the back surface of a stamper having on its front a pattern corresponding with a convexity and concavity preformat pattern, with the auxiliary layer comprising a material different from the stamper;

overlaying the stamper on the roll substrate in such a manner that the low-melting metal layer comes into contact with the auxiliary layer; and thereafter melting the low-melting metal layer so that the stamper is fixed to the roll substrate.

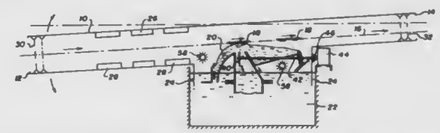
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5,048,746

## TUNNEL FOR FLUXLESS SOLDERING

Donald A. Elliott, Brossard, and Vivian G. Power, Lambert, both of Canada, assignors to Electrovert Ltd., Ontario, Canada

Filed Dec. 8, 1989, Ser. No. 448,008
Int. Cl.[5] B23K *1/00, 1/06, 35/38;* H05K *3/34*
U.S. Cl. 228—180.1 33 Claims



1. A process for soldering an element without the application of flux comprising the steps of:

conveying the element through a tunnel means containing a non-explosive gas atmosphere having less than about 10% by volume hydrogen, sufficient to achieve a fluxing action, the remaining gas being inert, and substantially excluding oxygen;

heating the element in the tunnel means;

passing the element through at least a portion of a solder wave in the tunnel means, at the same time providing a pressurizing effect in the solder wave using a moving device within the solder wave, and

retaining the element in the gas atmosphere of the tunnel means until solder on the element has solidified.

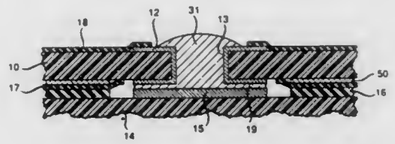
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5,048,747

## SOLDER ASSEMBLY OF COMPONENTS

William A. Clark, Randolph; Michael A. Oien, Chatham, and Walter Pelosi, Randolph, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Division of Ser. No. 372,400, Jun. 27, 1989, Pat. No. 5,014,162.
This application Jul. 31, 1990, Ser. No. 560,901
Int. Cl.[5] H05K *3/34, 3/36*
U.S. Cl. 228—180.2 10 Claims



1. A method for attaching a first component having two major surfaces to a second component comprising the steps of:

providing metalized holes in the first component so as to form associated pad areas on the two major surfaces, the pad areas of one surface to be attached to corresponding pad areas of the second component;

depositing a controlled amount of solder on the corresponding pad areas of the second component;

bringing the pad areas on one surface of the first component into contact with the solder on the second component so that the holes are aligned with the corresponding pad areas; and

heating the components to melt the solder and to cause the solder to extend through the metalized holes and form fillets on the associated pads on the opposite major surface of the first component so that the fillets may be observed, the fillets having wetting angles indicative of the wetting of the associated pads and the quality of the solder joint between the pads of the two components.

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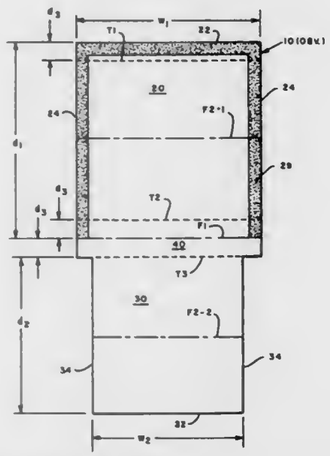


5,048,748

## SINGLE SHEET SELF-MAILER FORM WITH IMPROVED OPENING CHARACTERISTICS

Samuel W. Martin, Martin Rd., Weston, Conn. 06883, and Morton Silverberg, 24 Edgewater Commons La., Westport, Conn. 06880

Filed May 24, 1989, Ser. No. 356,901
Int. Cl.[5] B65D *27/34*
U.S. Cl. 229—92.1 4 Claims



1. A self-mailer form, comprising:

a) a substantially rectangular upper portion having opposed upper and lower edges and opposed longitudinal edges, said upper portion being weakened along a first transverse line substantially extending between said longitudinal edges substantially parallel to, and spaced from said upper edge of said upper portion by a predetermined distance, and being weakened along a second transverse line substantially co-extensive with and parallel to said first line, said said second line being spaced from said lower edge by said predetermined distance;

b) a substantially rectangular lower, message portion having a width less than said upper portion, and having opposed upper and lower edges and opposed longitudinal edges;

c) a substantially rectangular connecting portion attached along said lower edge of said upper portion and said upper edge of said lower portion having a length substantially equal to said predetermined distance, said form being weakened along said upper edge of said lower portions; wherein,

d) the dimensions of said upper portion and said lower portion are chosen so that, after a first folding of said form around said lower edge of said upper portion, a second folding of said form around a transverse fold line substantially bisecting said upper portion, and sealing of said longitudinal edges of said upper portion and said upper edge of said upper portion and said upper edge of said upper portion to said connecting portion, a mail piece is formed containing said lower portion, said lower portion being attached to said mail piece only be attachment to said connecting portion along said upper edge of said lower portion; and,

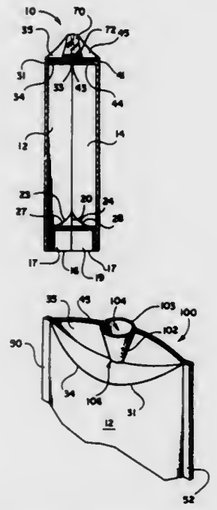
e) said form is weakened along said upper edge of said lower portion relatively less than along said transverse lines by an amount selected to allow said form to withstand the stresses of mechanical folding operation.

5,048,749

## SEALED RECLOSABLE CONTAINER

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Filed Sep. 19, 1989, Ser. No. 409,528
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—128 17 Claims



1. A container formed of a foldable sheet material, comprising:

a pair of side panels positioned to receive contents therebetween;

a pair of end flaps, one joined to each of said side panels, and each of said end flaps extending from one of said side panels toward said other side panel;

each of said end flaps including a central fold line defining an outer flap panel outwardly of said fold line and an inner flap panel connected to one of said side panels, each one of said outer flap panels being folded back along the central fold line defining each one of said outer flap panels onto the inner flap panel to which it is attached; and

means for joining said end flaps together in abutting relationship along said central fold lines with said outer flap panels folded back, whereby the end of said container is sealed.

5,048,750

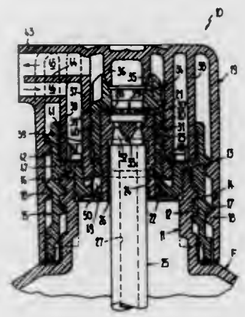
## DEVICE FOR PRODUCING AND DISPENSING FOAM

Viktor Tobler, Ober-Durnten, Switzerland, assignor to Supermatic Kunststoff AG, Uster, Switzerland

Filed Apr. 4, 1989, Ser. No. 333,294
Claims priority, application Switzerland, Apr. 5, 1988, 01251/88
Int. Cl.[5] B67D *5/58*
U.S. Cl. 222—189 15 Claims

1. A device attachment to a container for storing foamable liquids for producing and dispensing foam, comprising a mounting section which is arranged on a connecting piece of the container, a cap which covers the mounting section and is movable between open and closed positions, said cap having an opening and first and second passages which communicate with the external environment by way of said opening, and said mounting section having an axial passage which communicates with said first passage in said cap and a non-axial passage which communicates with said second passage in said cap when said cap is in said open position, a pervious planer mixing element firmly held in an axial opening in a mixing section, said mixing section having an air passage and a liquid passage each directed at the planar mixing element, wherein the mounting section is constructed as a closure element which makes sealing contact at an end face of the connecting piece and is detachably mounted on the outside wall of the connecting piece; a





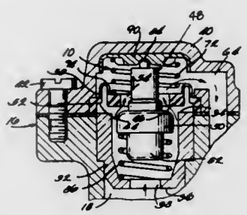
check valve is arranged between the non-axial passage in the mounting section and the internal chamber of the container, said check valve being open when said container is de-compressed to allow said opening of said cap to communicate with said internal chamber of the container by way of said second passage in said cap and said non-axial passage in said mounting section.

5,048,751

## PRESSURE AND TEMPERATURE RELIEF VALVE AND DIAPHRAGM VALVE

Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 16, 1990, Ser. No. 509,877
Int. Cl.[5] G05D *27/00*; F16K *31/12*
U.S. Cl. 236—92 C 18 Claims



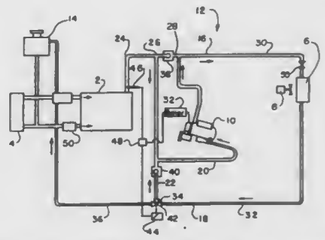
1. A temperature and pressure responsive relief valve assembly comprising a housing including an inlet and an outlet, and a fluid passageway in said housing interconnecting said inlet and said outlet and including a valve stop, a pressure responsive flexible member in said passageway and including a peripheral edge fixed to said housing and an annular combination first valve member and valve seat defining an opening forming a portion of said passageway and being movable relative to said valve stop, a thermally responsive assembly movably mounted in said passageway and including a thermally responsive actuator and a second valve member movable in response to operation of said actuator and relative to said combined first valve member and valve seat for seating engagement between said second valve member and said combined first valve member and valve seat, and means in said passageway for biasing said combined first valve member and valve seat into engaged position on said valve stop and on said second valve member.

5,048,752

## METHOD AND APPARATUS FOR HEAT CARRIER CIRCULATION FOR A VEHICLE HEATING SYSTEM HAVING A HEATER INDEPENDENT OF THE ENGINE

Hans Hintennach, and Dietrich Schmalenbach, both of Baltmannsweiler, Fed. Rep. of Germany, assignors to J. Eberspächer, Esslingen, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 242,376
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730598
Int. Cl.[5] B60H *1/02*
U.S. Cl. 237—2 A 17 Claims



1. An engine temperature control and heating system, comprising:

a heat carrier;

an engine cooled and heated by said heat carrier;

a heat generator adding heat to said heat carrier and having a first connection and a second connection;

a space heat for removing heat when heat is desired;

a forward line for transporting said heat carrier between said engine and said space heater, said forward line having a first branch-off point adjacent to said engine and a second branch-off point adjacent to said space heater, said second branch-off point being connected to said second connection of said heat generator;

a return line for transporting said heat carrier between said space heater and said drive engine, said return line having a third branch-off point;

a connecting line for transporting said heat carrier between said first branch-off point in said forward line and said third branch-off point in said return line, said connecting line having a fourth branch-off point connected to said first connection of said heat generator; and

a check valve and a plurality of control valves positioned in one of said lines causing one of the following three separate circulation paths to be selectable, a first path having said heat carrier move from said engine to said space heater and back to said engine, a second path having said heat carrier move from said engine though said heat generator and said space heater and return to said engine, and a third path said heat carrier move from said heat generator through said space heater and return to said heat generator.

5,048,753

## PORTABLE ENGINE PREHEATING SYSTEM

Michael E. Kellie, HCO1-1605-Box 10, Kenai, Ak. 99611

Filed May 15, 1990, Ser. No. 524,211
Int. Cl.[5] B60H *1/02*
U.S. Cl. 237—12.3 C 14 Claims

1. A heating system for heating a fluid including:

(a) an elongated inner heat transfer tube means surrounded by an enclosed fluid heating chamber means, said fluid heating chamber means having an upper high temperature fluid outlet and a lower low temperature fluid inlet,

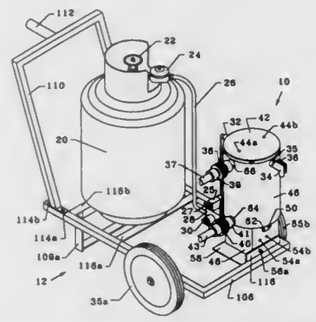
(b) a plurality of elongated cross flow heat transfer tube means, said cross flow heat transfer tube means extending through said inner heat transfer tube means and communicating with said enclosed fluid heating chamber means,

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(c) said lower low temperature fluid inlet means connected to a lower port on a fluid storage means and said upper high temperature fluid outlet means connected to an upper port on said fluid storage means,

(d) a heating means whereby the fluid in said fluid heating chamber means is heated by heat transfer from the walls of



said inner heat transfer tube means and the walls of said plurality of cross flow heat transfer tube means, and said heated fluid circulates from said fluid storage means throughout said fluid heating chamber means and said heat transfer tube means and back to said fluid storage means.

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**5,048,754**

**CONDITIONING SYSTEM FOR WATER BASED CAN SEALANTS**

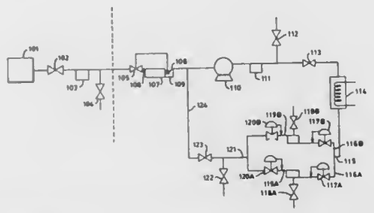
**Samuel W. Rich, Needham, Mass., assignor to W. R. Grace & Co.-Conn., Lexington, Mass.**

**Continuation-in-part of Ser. No. 335,624, Apr. 10, 1989, Pat. No. 4,910,369. This application Feb. 14, 1990, Ser. No. 479,826**

**The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.**

**Int. Cl.[5] B05B** *12/10, 1/24, 17/04*

**U.S. Cl. 239—13** **27 Claims**



24. A process for conditioning and stabilizing water based compounds comprising supplying water based compound to an inlet, passing the compound through a first means for regulating the downstream pressure of the compound, passing the compound through a pump to one or more lining nozzles which selectively open and close so as to draw off compound, passing the compound out of the one or more lining nozzles through an exit port of the one or more lining nozzles, passing the compound through a means for regulating the upstream pressure of the compound, to a return line and recirculating the compound to the pump at a point downstream of the first means for regulating the downstream pressure of the compound.

**5,048,755**

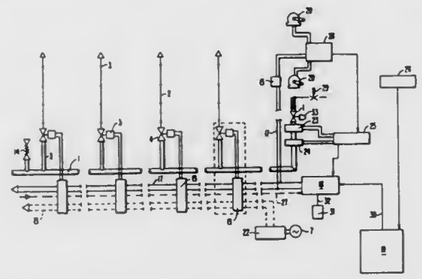
**IRRIGATION SYSTEM**

**Graeme C. Dodds, 2 Frensham Place, Round Corner Dural, New South Wales, Australia 2158 , assignor to Graeme Charles Dodds; Kevin James Peacock and Peter Geoffrey McNeil, all of New South Wales, Australia**

**Filed Apr. 16, 1990, Ser. No. 509,550**

**Int. Cl.[5] B05B** *12/04, 12/12*

**U.S. Cl. 239—64** **9 Claims**



1. An irrigation system for controlling the operation of a plurality of control valves each of which controls the flow of water in a corresponding branch pipe leading from a common supply pipe, characterised by a pair of low voltage power supply lines extending along said supply pipe, a pair of control lines also extending along said supply pipe, a control data generator connected to said control lines, and a control unit corresponding to each of said control valves and located adjacent thereto, said control units being connected to the corresponding control valve, to said low voltage power supply, and to said control lines, and including decoding means to detect data transmitted over said control lines by said data generator which identifies a predetermined one of said control units and switch means activatable by said decoding means to connect or disconnect said corresponding control valve and said power supply to operate said corresponding control valve.

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**5,048,756**

**FUEL SUPPLY CIRCUIT FOR AN ELECTROMAGNETICALLY OPERATED FUEL INJECTION VALVE OF AN INTERNAL COMBUSTION ENGINE**

**Silverio Bonfigilioli, Zola Predosa, and Francesco Morini, Bologna, both of Italy, assignors to Weber S.r.l., Turin, Italy**

**Filed Mar. 13, 1990, Ser. No. 492,624**

**Claims priority, application Italy, Mar. 14, 1989, 67180 A/89**

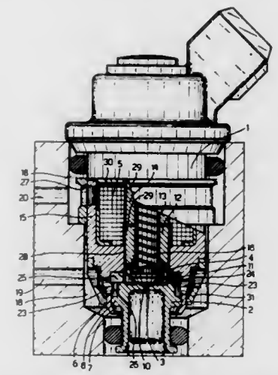
**Int. Cl.[5] F02M** *51/00*

**U.S. Cl. 239—125** **8 Claims**

1. An electromagnetically operated fuel injection valve for an internal combustion engine, said valve comprising a casing, an injection nozzle fixed to said casing and provided with at least one fuel injection orifice and a shutter member movable under the action of an electromagnet and adapted to control the passage of fuel through said injection orifice, said movable shutter member being provided with an active surface adapted to engage a corresponding seat of said nozzle within the interior of which said injection orifice is located, and said valve including passages for supplying fuel to said injection orifice from a region outside said valve, said passages being formed substantially in a region disposed peripherally around said seat and lying substantially in a plane perpendicular to the axis of said valve and which contains said seat, said valve further



including a spacer washer disposed between said nozzle and said casing, said spacer washer being disposed peripherally



around said shutter member and including a through aperture in communication with said passages.

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**5,048,757**

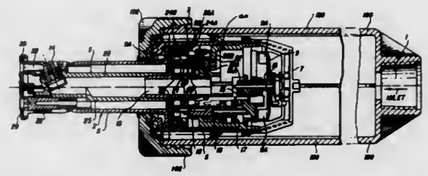
**IRRIGATION SPRINKLER WITH AN INTERNAL DRIVE CLUTCH**

**Timothy O. Van Leeuwen, Gardnerville, Nev., assignor to Garden America Corporation, Carson City, Nev.**

**Filed Apr. 7, 1989, Ser. No. 334,326**

**Int. Cl.[5] B05B** *3/04*

**U.S. Cl. 239—205** **10 Claims**



1. In a sprinkler head comprising a tubular housing having an inlet at one end, an internal assembly having a first end and a second end with the first end mounted within the housing, a nozzle mounted on the second end of said internal assembly for discharging water over a sector of land to be irrigated in response to water introduced under pressure into the housing through the inlet, said internal assembly including at least one tubular member rotatably mounted in said tubular housing in coaxial relationship therewith, the combination of: a drive ring coaxially mounted with respect to said tubular member; coupling means for positioning said drive ring in positive driving engagement with said tubular member to permit said drive ring to drive said tubular member in a direction for normally discharging water from said nozzle; and drive means mounted in said housing and responsive to water introduced under pressure into the housing for engaging said drive ring to cause said tubular member to turn in said housing, said coupling means forming a drive clutch between said drive ring and said tubular member for removing said drive ring from positive driving engagement in response to forcible rotation of said tubular member with respect to said housing to provide relative rotation between said tubular member and said drive ring so as to protect the said internal assembly.

**5,048,758**

**ROTARY SPRINKLER WITH UNIDIRECTIONAL STEPWISE ANGULAR MOVEMENT**

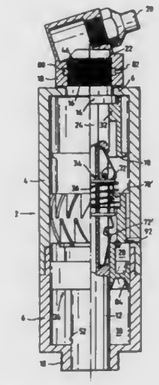
**Shalom Jackerson, 60/6 Bnei Or Street, Beer Sheva, Israel**

**Continuation of Ser. No. 527,716, May 23, 1990, abandoned, which is a continuation of Ser. No. 271,300, Nov. 15, 1988, abandoned. This application Oct. 12, 1990, Ser. No. 598,012**

**Claims priority, application Israel, Nov. 19, 1987, 84542**

**Int. Cl.[5] B05B** *3/04*

**U.S. Cl. 239—239** **8 Claims**



1. A rotary sprinkler comprising:

a stationary cylinder, one end of which is connectable to a water supply line;

an output member rotatably mounted inside said stationary cylinder, said member having a surface, an axial direction, at least one supply duct passing therethrough and directly leading to a nozzle-carrying sprinkler head attachable to the upper end of said member, as well as a plurality of separate control ducts inside, and a plurality of ports communicating with said control ducts and leading to the outer surface of, said member, at least one port communicating with said supply duct;

a slidable piston riding on said member and slidable in said stationary cylinder between an upper and a lower position, said slidable piston dividing said stationary cylinder into an upper chamber and a lower chamber, coupling means being provided for linking said member to said slidable piston in rotation while permitting said slidable piston one degree of freedom of stroke-like, reciprocating translatory movement relative to said member;

a slide valve located on said member for controlling at least some of said ports for producing said reciprocating, translatory movement, and

a set of camming means for kinematically linking said stationary cylinder and said slidable piston, whereby at least part of said translatory, reciprocating strokes of said slidable piston will produce the superposition thereupon of a stepwise, angular movement in one sense of rotation only, transmitted via said coupling means, to said member and said nozzle-carrying sprinkler head.

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**5,048,759**

**HAND-HELD SHOWER DEVICE**

**Phillip R. Mazziotta, Ramsey, N.J., assignor to Lee Matthew Enterprises, Inc., Hackensack, N.J.**

**Filed Feb. 12, 1990, Ser. No. 478,692**

**Int. Cl.[5] B05B** *1/30*

**U.S. Cl. 239—529** **12 Claims**

1. A hand-held shower device comprising:

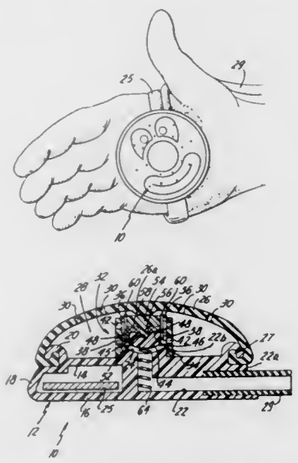
a base;

strap means connected with said base for securing said hand-held shower device to a hand of a person;

a deformable dome secured to said base in covering and liquid sealing relation thereto so as to define a chamber therebetween, said dome having a plurality of spray openings therein;

conduit means for supplying a liquid to said chamber, said conduit means having an open end extending into said chamber; and

switchable valve means positioned in said chamber for:



i) opening said open end of said conduit upon exertion of a depressing force on said dome and for maintaining said open end of said conduit in open fluid communication with said chamber upon release of said depressing force on said dome, and

ii) subsequently closing said open end of said conduit upon exertion of a subsequent depressing force on said dome and for maintaining said open end of said conduit in closed fluid communication with said chamber upon release of said subsequent depressing force on said dome.

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**5,048,760**

**PROCESS FOR SELECTIVELY COMMINUTING AND PURIFYING PSYLLIUM SEED HUSK**

**Melvin A. Barbera, Cincinnati, and Larry E. Burns, Goshen, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Continuation of Ser. No. 496,081, Mar. 15, 1990, abandoned, which is a continuation of Ser. No. 252,640, Oct. 3, 1988, abandoned. This application Nov. 8, 1990, Ser. No. 610,726**

**Int. Cl.[5] B02C *19/12***

**U.S. Cl. 241—9** **11 Claims**

1. A process for purifying impure psyllium seed husk, wherein said impure psyllium seed husk comprises psyllium seed husk previously separated from intact psyllium seeds and non-husk material, and wherein further said impurs psyllium seed husk does not include intact psyllium seeds, said process comprising the steps of (a) milling said impure psyllium seed husk in a mill which causes the husk and non-husk material to be fragmented by collision under conditions whereby the mean particle size of the husk material is reduced relatively more than the mean particle size of the non-husk material, (b) separating the milled impure psyllium seed husk into at least one fragment enriched with non-husk material and at least one material psyllium seed husk fragment reduced in non-husk material, and (c) collecting the pruified psyllium seed husk.

**5,048,761**

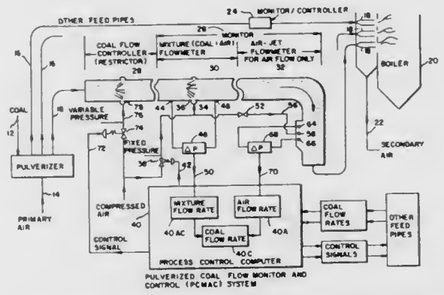
**PULVERIZED COAL FLOW MONITOR AND CONTROL SYSTEM AND METHOD**

**Raymond K. Kim, Canton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.**

**Filed Mar. 14, 1990, Ser. No. 493,171**

**Int. Cl.[5] B02C *23/34***

**U.S. Cl. 241—19** **15 Claims**




PULVERIZED COAL FLOW MONITOR AND CONTROL (PCMAC) SYSTEM

1. A method for monitoring and controlling the flow of fluid transported solid particles, comprising the steps of:

suspending solid particles in a vessel to form a mixture of solid particles in a primary fluid;

discharging the mixture through at least one feed pipe out of the vessel;

measuring the flow of the primary fluid in each feed pipe and establishing a signal indicative thereof;

measuring the flow of the mixture in each feed pipe and establishing a signal indicative thereof;

calculating a mass flow rate of the transported solid particles from a difference in the mixture flow rate and the primary fluid flow rate and establishing a control signal indicative of the mass flow rate in each feed pipe; and

controlling fluid injection in each feed pipe responsive to changes in the control signal.

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**5,048,762**

**DISPERSION APPARATUS**

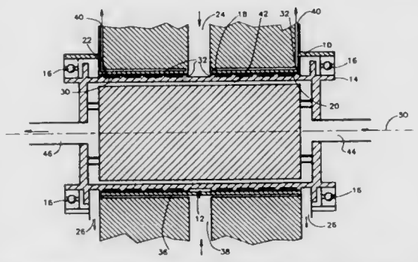
**Benzion Landa, Edmonton, Canada; Haim Hochman, Ramat Gan, and Nissim Yacoub, Herzlia, both of Israel, assignors to Spectrum Sciences B.V., Wassenar, Netherlands**

**Continuation of Ser. No. 400,721, Oct. 24, 1989, Pat. No. 5,004,165, which is a continuation of Ser. No. 306,077, Feb. 6, 1989, abandoned. This application Mar. 1, 1990, Ser. No. 486,885**

**The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.**

**Int. Cl.[5] B02C *17/16***

**U.S. Cl. 241—21** **26 Claims**



1. Apparatus for dispersion of solids in liquids comprising:



first and second relatively movable elements arranged so as to define a dispersing volume therebetween;

a multiplicity of mutually mechanically unlinked dispersing elements having a circular cross-section disposed within the dispersing volume;

means for supplying a solid suspended in a liquid to the dispersing volume and for removing a dispersed form of said solid dispersed in liquid from the dispersing volume; and

means for effecting relative movement between said first and second surfaces whereby movement is imparted to said dispersing elements mainly by means of hydrodynamic forces created by said relative movement and for causing said dispersing elements to be kept substantially non-contacting with said first and second movable elements,

wherein said first and second elements are separated at said dispersing volume by a separation distance which is between 2 micron and 100 microns greater than the diameter of said circular cross-section.

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**5,048,763**

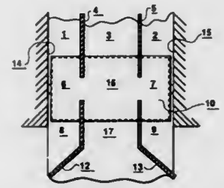
**MULTI-PASS ROLL CRUSHER**

**John S. Szazdi, Jr., Bethlehem, and Thomas R. Lawall, Emmaus, both of Pa., assignors to Fuller Company, Bethlehem, Pa.**

**Filed Feb. 21, 1990, Ser. No. 483,591**

**Int. Cl.[5] B02C *4/02***

**U.S. Cl. 241—24** **16 Claims**



1. A method for the comminution of brittle material in a roll crusher which comprises the steps of

(a) introducing fresh feed material into a roll crusher, which roll crusher is divided into two distinct feed inlet zones which are at least one initial feed inlet zone for said fresh feed material and at least one secondary feed inlet zone for feed which has been stressed at least once by said roll crusher; wherein each initial feed inlet zone and each secondary feed inlet zone directs feed into, respectively, a distinct corresponding initial feed crushing zone and a distinct secondary feed crushing zone, wherein said fresh feed material is introduced into said roll crusher only in said at least one initial feed inlet zone whereby it is stressed at pressures sufficient to cause the formation of at least some agglomerates in said material; and

(b) recirculating product formed by step (a), without causing any substantial disintegration of the agglomerates, into the roll crusher through said at least one secondary feed inlet zone so that it is further stressed at pressures sufficient to cause the formation of at least some agglomerates in said material; with the proviso that product from said initial feed crushing zone will always be recirculted through the roll crusher.

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**5,048,764**

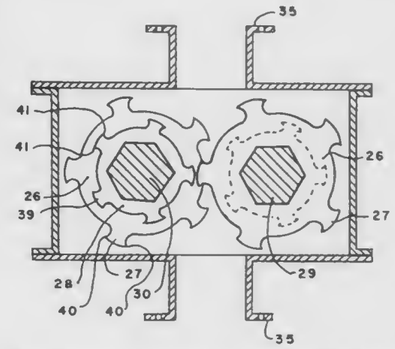
**APPARATUS FOR COMMINUTING SOLID WASTE**

**Gregory J. Flament, P.O. Box 2261, Dunedin, Fla. 34296**

**Continuation-in-part of Ser. No. 432,198, Nov. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 424,869, Oct. 20, 1989, abandoned. This application Jul. 18, 1990, Ser. No. 554,249**

**Int. Cl.[5] B02C *18/18***

**U.S. Cl. 241—36** **29 Claims**



1. Apparatus for comminuting solid waste material comprising:

(a) a casing defining therein a comminution compartment with inlet and outlet ports disposed on opposite sides of said comminution compartment and adapted for the flow of solid waste therethrough;

(b) a first shaft and a second shaft, said first and second shafts each having an upper region and said shafts being substantially parallel to each other and positioned in said comminution compartment;

(c) an arrangement of cutters mounted on said first shaft the cutters on said first shaft being adapted to be rotated upon the rotation of said first shaft upon its linear axis and said cutters on said first shaft being spaced from each adjacent cutter on the said first shaft;

(d) an arrangement of cutters mounted on said second shaft, the cutters on said second shaft being adapted to be rotated upon the rotation of said second shaft upon its linear axis and said cutters on said second shaft being spaced from each adjacent cutter on the said second shaft, the spacing of the cutters on the respective shafts being such that the cutters on one shaft can be overlapped with the cutters on the other said shaft, with the spacing of said first shaft from said second shaft being appropriate to permit such overlapping;

(e) an arrangement of spacer-cutters mounted between the respective cutters on the said two shafts, one spacer-cutter being positioned between each pair of adjacent cutters on each respective shaft, each spacer-cutter comprising a spacer means to provide the appropriate space between adjacent cutters to allow the overlapping of a cutter in one said cutter arrangement with a cutter in the other said shaft arrangement and each spacer means having cutting means positioned on the periphery of said spacer means;

(f) the said cutters and said spacer-cutters each having cutting means thereon which is capable of cutting regardless of the direction of rotation of the said cutters or said spacer-cutters; and

(g) a driving means for providing rotational force to said first shaft and said second shaft, said second shaft being driven in a direction opposite to the rotational direction of said first shaft.

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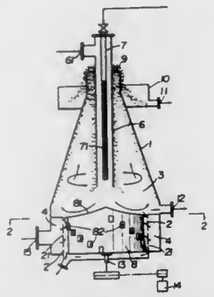


5,048,765

## PAPER MATERIAL REFINING APPARATUS

Hitoshi Satomi, Shizuoka, Japan, assignor to Satomi Seisakusho Co., Ltd., Shizuoka, Japan

Filed Aug. 31, 1990, Ser. No. 575,814
Claims priority, application Japan, Dec. 8, 1989, 1-142305[U]
Int. Cl.[5] B02C *23/24*
U.S. Cl. 241—62 10 Claims



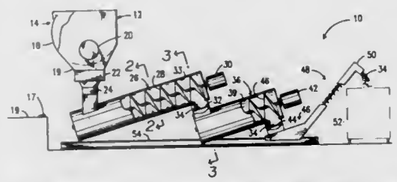
1. A paper material refining apparatus, comprising:
a tank having upper and lower portions,
a drum-type screen plate vertically situated at the lower portion of the tank, said screen plate dividing the tank into a primary chamber and a secondary chamber outside the screen plate,
a drum-type rotor vertically situated at the lower portion of the tank and arranged to be rotated along a vertical axis thereof, said rotor having a top plate and a side peripheral surface facing against the screen plate,
a material supply pipe for supplying a paper making material into said primary chamber, said material supply pipe having an end located adjacent to the top plate of the rotor, and
an air supply pipe situated inside the material supply pipe, said paper making material and air, when the apparatus is actuated, being supplied to the tank while the rotor is rotated so that the paper making material hits the top plate of the rotating rotor to select and remove foreign materials in the paper making material by centrifugal force.

5,048,766

## APPARATUS AND METHOD FOR CONVERTING INFECTIOUS WASTE TO NON-INFECTIOUS WASTE

Michael J. Gaylor, 1978 Lynnwood Ct., Dunedin, Fla. 34698, and John Hodges, 1412- 21 St., Palm Harbor, Fla. 34683

Filed May 25, 1990, Ser. No. 529,081
Int. Cl.[5] B02C *21/02*
U.S. Cl. 241—65 8 Claims



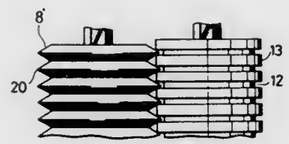
1. An apparatus for converting infectious waste into non-infectious waste, comprising:
a hopper for receiving waste materials;
said hopper having a charge port and a discharge port;
a first grinder member positioned below said discharge port so that waste materials charged into said hopper fall into said first grinder member under the influence of gravity;
a heating station having a predetermined internal temperature;
boiler means for maintaining said predetermined internal temperature of said heating station;
said heating station having an elongate construction and being upwardly inclined at a predetermined angle from a first end thereof to a second end thereof, said second end being higher than said first end;
said first end of said heating station being positioned in open communication with a discharge port of said first grinder member;
a cooling station having a predetermined internal temperature substantially less than the internal temperature of the heating station;
means for maintaining said predetermined internal temperature of said cooling station;
said cooling station having an elongate construction and being upwardly inclined at a predetermined angle from a first end thereof to a second end thereof, said second end being higher than said first end;
an air look means positioned between said second end of said heating station and said first end of said cooling station;
said second end of said heating station, said air lock means, and said first end of said cooling station being disposed in substantially vertical relation with respect to one another;
a first rotatably mounted auger member positioned within said heating station, rotation of said first auger member being operative to carry waste materials from said first end of said heating station to said second end of said heating station;
a second rotatably mounted auger member positioned within said cooling station, rotation of said second auger member being operative to carry waste materials from said first end of said cooling station to said second end of said cooling station;
said predetermined internal temperature of said heating station being sufficient to destroy infectious life forms;
said predetermined internal temperature of said cooling station being sufficient to cool waste materials to a temperature where said waste materials are safe to handle in the absence of special material handling means; and
said heating station and said cooling station being disposed in longitudinal alignment with one another to minimize the width of said apparatus so that it is transportable over public highways.

5,048,767

## CUTTER FOR SHREDDER

Chuzo Mori, Tokyo, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 506,803
Claims priority, application Japan, Apr. 12, 1989, 1-42673[U]; Jul. 27, 1989, 1-88469[U]; Oct. 30, 1989, 1-282584[U]
Int. Cl.[5] B02C *18/06*
U.S. Cl. 241—236 8 Claims



1. A cutter for a shredder comprising:
a cutter blade having a plurality of rotation blades having tips, said rotation blades being disposed and spaced parallel to each other on a shaft;
a bladeless cylinder whose circumference is provided with a plurality of annular grooves at such intervals as to be in cooperating relationship with the rotation blades when said cutter blade and said cylinder are assembled in a casing parallel to each other;
said shaft of the cutter blade and said cylinder being pivotably mounted on a casing parallel to each other such that each tip of the rotation blades is located at a center of a width of an annular groove and both said shaft and said cylinder being connected through a gear train.

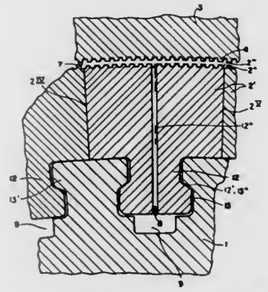


5,048,768

## CRUSHING OR GRINDING ELEMENT FOR DRUM REFINERS

Emmerich Bernhard; Johann Lileg; Johannes Kappel; Dag Bergloff, all of Graz, Austria, and Sven-Erik Henriksson, North Vancouver, Canada, assignors to Maschinenfabrik Andritz Aktiengesellschaft, Graz, Austria

Continuation-in-part of Ser. No. 267,605, Nov. 7, 1988, Pat. No. 4,936,518. This application Mar. 23, 1990, Ser. No. 498,890
Claims priority, application Austria, Nov. 5, 1987, 2925/87
Int. Cl.[5] B02C *19/00*
U.S. Cl. 241—261.1 11 Claims



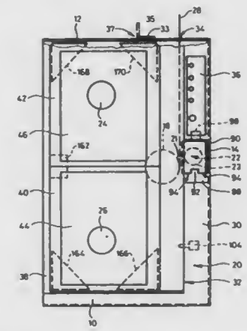
1. A grinding element for a drum refiner for the crushing or grinding of fibrous material including an engine-driven motor having a generally horizontal rotor axis, at least one material feed, a rotor jacket positioned on said rotor and having a surface of revolution, the grinding element being attachable to the rotor jacket on said surface of revolution and having a diameter increasing away from the material feed, a housing for receiving the rotor and rotor jacket therein and having an opposing inner wall with a corresponding grinding element on said rotor jacket and the grinding element on said inner wall, the grinding gap being at least partially adjustable, said grinding element on said rotor jacket including a channel spaced from the material feed for the discharge of steam, said channel having one end in fluid communication with said grinding gap and a second end in fluid communication with a bore extending generally normally to the channel, said bore being in fluid communication with a cavity in the housing, the improvement comprising said grinding element on said rotor jacket being generally formed as a segment and including a surface facing the rotor axis and a surface facing away from the rotor axis, the surface facing away from the rotor axis being shaped or curved as a part of the outer surface of the rotor jacket, said segment including an anchoring projection of generally hammerhead shape in cross section extending from said surface facing the rotor axis, said anchoring projection being engagable in a generally corresponding rotor groove of general hammerhead shape in cross section in said surface of revolution, the anchoring projection of general hammerhead shape in cross section and the groove of general hammerhead shape in cross section each include a hammerhead portion and a hammerhead stem portion with transition surfaces therebetween, the transition surfaces lying in a plane which forms an angle with respect to the rotor axis, said anchoring projection serves for the discharge of steam and is locked to said rotor jacket.

5,048,769

## TRAVERSE MECHANISM

Armin Wirz, Ossingen; Hansueli Maier, and Adolf Flueli, both of Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Continuation of Ser. No. 525,305, May 17, 1990, abandoned, which is a continuation of Ser. No. 323,113, Mar. 13, 1989, abandoned, which is a continuation of Ser. No. 126,763, Nov. 30, 1987, abandoned. This application Nov. 5, 1990, Ser. No. 610,347
Claims priority, application Switzerland, Dec. 2, 1986, 793/86
Int. Cl.[5] B65H *54/28*
U.S. Cl. 242—43 R 23 Claims



1. In combination,
a winder having a contact roll and a support surface extending in parallel to said roll and supported at at least two longitudinally spaced apart points;
an elongated carrier having means extending along the length thereof for slidable mounting on said support surface in said winder along an axis parallel to said contact roll in said winder;
at least one thread guide mounted on said carrier;
drive elements extending within said carrier for driving said guide;
said means on said carrier being disposed to interengage with said support surface during assembly to support said carrier at least at two end positions spaced in the longitudinal direction to prevent bending of said carrier between said end ppositions, to position said carrier in a predetermined operating position parallel to said contact roll and to longitudinally guide said carrier during assembly into and removal from said winder.

5,048,770

## FILM CASSETTE WITH EXPOSURE STATUS INDICATOR

Dennis E. Baxter, East Rochester, and Jeffrey R. Stoneham, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

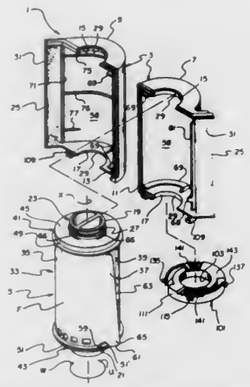
Filed May 29, 1990, Ser. No. 529,287
Int. Cl.[5] G03B *17/26*
U.S. Cl. 242—71.1 4 Claims

3. A film cassette comprising a film spool supported inside a lighttight cassette shell for rotation about an axis to thrust a filmstrip coiled about said spool to the exterior of said shell, and a film exposure status indicator supported for rotation outside said shell about said axis from an unexposed position for providing a visible indication that said filmstrip is unexposed to an exposed position for providing a visible indication that the filmstrip is exposed, is characterized in that:
said shell and said status indicator include respective engagable means at least one of which is supported for movement relative to the other substantially radially of said axis in

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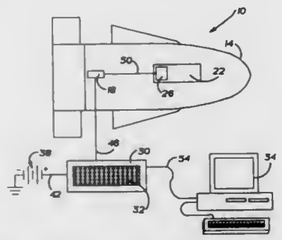
opposite directions for engagement to secure the status indicator in its unexposed and exposed positions and for



disengagement to permit rotation of the status indicator from the unexposed to the exposed position.

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**5,048,771**
**METHOD AND APPARATUS FOR A REPROGRAMMABLE PROGRAM MISSILE MEMORY**
**Erik R. Siering, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**
**Filed Nov. 15, 1989, Ser. No. 437,044**
**Int. Cl.[5] G06F *1/00***
**U.S. Cl. 244—3.15** **11 Claims**



1. A missile system including a missile to be launched and thereafter to be in flight, said launching and said flight of said missile being defined by a tactical software program, said missile system comprising:

(a) computer means, remotely located from said missile, for creating and generating instructions for said tactical software program;

(b) program memory means, contained within said missile and electronically coupled to said computer means, for receiving said generated tactical program and for storing the same therein, said program memory means comprising:

(i) an electrically erasable programmable read only memory array, electronically coupled to said computer means;

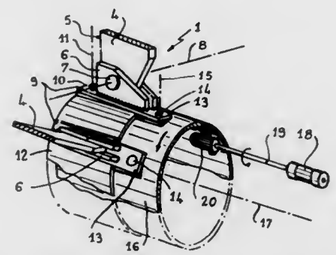
(ii) microprocessor means, electronically coupled to said electrically erasable programmable read only memory array, for controlling said reception of said generated tactical software program by said electrically erasable programmable read only memory array; and

(iii) checksum means, electronically coupled to said tactical processor means, for generating a plurality of parity checksums associated with said program memory means; and

(c) tactical processor means, contained within said missile and electronically coupled to said program memory means, for interpreting said stored tactical software program contained within said program memory means and for controlling said launching of said missile and said flight of said missile in response to said interpretation of said stored tactical software program.

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**5,048,772**
**DEVICE FOR ROLL ATTITUDE CONTROL OF A FIN-STABILIZED PROJECTILE**
**Daniel Wissbaupt, Orléans la source, France, assignor to Thomson-Brandt Armements, Boulogne, France**
**Filed Jan. 22, 1991, Ser. No. 643,899**
**Claims priority, application France, Jan. 26, 1990, 90 00945**
**Int. Cl.[5] F42B *10/00***
**U.S. Cl. 244—3.23** **7 Claims**



1. A roll control device for use in a projectile having a longitudinal axis, and external stabilizing fins, said device comprising a cylindrical part having an axis co-axial with the longitudinal axis of the projectile, said cylindrical part having a fixed part and a rotating part which can rotate around the longitudinal axis, a plurality of external stabilizing fins each fin is fitted on a foot, the foot having a first part rotationally fixed to an outer part of one of the cylindrical parts along an axis perpendicular to the longitudinal axis and a second part rotationally and loosely attached to an outer part of the other cylindrical part along an axis perpendicular to the longitudinal axis, and means being provided to rotate the rotating part of the cylindrical part in either direction in order to make each external stabilizing fin turn about an axis located in the fin plane, approximately perpendicular to the axis of the projectile thus driving said fins in one direction or the other.

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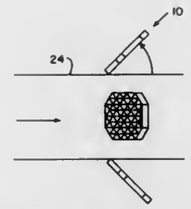
**5,048,773**
**CURVED GRID FIN**
**William D. Washington, Arab; Thomas L. Killough; Pamela F. Booth, both of Huntsville, and Billy J. Walker, Madison, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**
**Filed Jun. 8, 1990, Ser. No. 534,995**
**Int. Cl.[5] F42B *10/14***
**U.S. Cl. 244—3.28** **11 Claims**

1. A grid fin for use with a guided missile, comprising:

(a) a honeycomb porous core structure comprised of thin gauge material for permitting air to flow therethrough substantially unrestricted when said grid fin is transverse of said air flow;



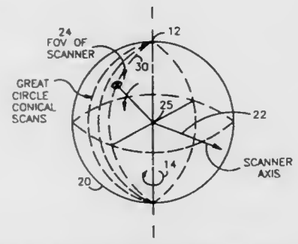
(b) a support structure for supporting said core structure; and



(c) means for mounting said support structure on a control mechanism of said missile for relative movement between said missile and said support structure.

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**5,048,774**
**HIGH-ACCURACY ATTITUDE SENSOR FOR SPIN STABILIZED SATELLITE**
**Robert C. Savoca, Ridgefield, Conn., assignor to Barnes Engineering Co., Shelton, Conn.**
**Filed Dec. 20, 1989, Ser. No. 453,707**
**Int. Cl.[5] B64G *1/36***
**U.S. Cl. 244—171** **5 Claims**



1. A high accuracy method of determining the attitude of a spin stabilized satellite with respect to the earth or other celestial bodies such as the sun and moon comprising the steps of:

mounting a conical scanner having a detector on a spinning satellite with the scanner axis directed normal to the satellite spin axis for scanning the detector over a circle producing crossing information of the bodies in the scanning path of the conical scanner;

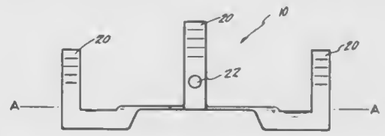
synchronizing the scan rate of the conical scanner with the spin rate of the satellite; and

slightly increasing or decreasing the scan rate of the conical scanner for precessing successive crossings through the field of view of the detector for determining the orientation of the satellite with respect to the earth and other celestial bodies.

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**5,048,775**
**DEVICE FOR SUPPORTING A PLURALITY OF PIPES IN PARALLEL RELATIONSHIP WITHIN A DEFINED SPACE**
**Charles S. Hungerford, Jr., 6 Beechwood Ct., Woodbury, Conn. 06798**
**Filed Jun. 18, 1990, Ser. No. 539,128**
**Int. Cl.[5] E21F *17/02***
**U.S. Cl. 248—62** **9 Claims**

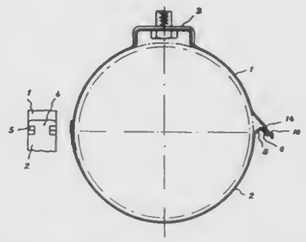
1. A device for supporting a plurality of elements in parallel relationship within a defined space comprising, in combination: a plurality of clamps fixedly mounted on a support bracket, each of said clamps having a base Portion provided with (1) a transverse slot extending along a first axis, (2) clamping means projecting from the base for releasably clamping an element for holding the element along a second axis substantially parallel to the first axis wherein the lateral dimension from the bottom of the base to the top of the clamping means of at least one of said clamps is X and (3) a bore extending through said base along a third axis substantially perpendicular to said first axis and said second axis such that said bore intersects said slot; said support bracket having an elongated member provided



with a plurality of tongue means projecting therefrom in spaced apart manner wherein each of said tongue means is received within and projects through a transverse slot in said clamps, said tongue means includes securing means for securing the clamps thereto such that all of said plurality of clamps lie with a space defined by the lateral dimension X.

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**5,048,776**
**PIPE CLAMP**
**Jacques L. Weiss, 48, rue du 19 Janvier, 92380 Garches, France**
**Filed Jan. 24, 1990, Ser. No. 469,147**
**Int. Cl.[5] F16L *3/08***
**U.S. Cl. 248—74.1** **3 Claims**



1. A pipe clamp comprising:

a substantially circular metal strip having a first end and a second end for enclosing a pipe so that the first and second ends meet;

a double elbow on the first end having a first part extending substantially radially and a second part extending from the first part substantially tangentially and away from the second end;

a third part on the second end extending over the first and second parts to substantially overlap the second part;

means for hooking the second part up with the third part; and

an aperture on the second part and an aperture on the third part, both for receiving a tool for drawing the second and third parts away from the second end thereby tightening the clamp.

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**5,048,777**
**RETRACTABLE SUPPORT STAND**
**Jacques Quellais, Saint Jorioz, France, assignor to Salomon S.A., Annecy Cedex, France**
**Filed Jan. 29, 1990, Ser. No. 471,921**
**Claims priority, application France, Jan. 31, 1989, 89 01185**
**Int. Cl.[5] A63B *55/00***
**U.S. Cl. 248—96** **27 Claims**

1. A retractable support stand for a golf bag comprising:

a base adapted to be affixed to a golf bag;

two rods journalled on said base around predetermined

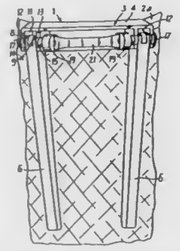
VOL 1130 ISS 3 SE 17 1991 UMI



rotational axes for movement between a rest position and a deployed position; and

means for elastically biasing each of said two rods toward either of said rest position and said deployed position;

wherein said biasing means comprise a traction spring provided for each of said rods, a first end of each said spring being affixed relative to said base at an attachment point, and a second end of each spring being affixed relative to a respective one of said rods at a traction point, said attachment points and said traction points being positioned, with



respect to one another, in a manner such that during pivoting of either of said rods from a respective rest position, at which said either of said rods is adapted to be positioned adjacent said bag, to a respective deployed position, at which said either of said rods is adapted to project from said bag, or during pivoting of said either of said rods from said deployed position to said rest position, a respective traction point passes from one side to the other of a plane passing through a respective attachment point and a respective rotational axis of said either of said rods.

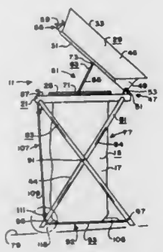
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**5,048,778**

**TRASH BAG APPARATUS**

Randolph L. Wright, 5716 Remsen, Memphis, Tenn. 38135

Filed Oct. 15, 1990, Ser. No. 597,570
Int. Cl.[5] A63B *55/08*
U.S. Cl. 248—98 13 Claims



1. An apparatus for holding a trash bag and for allowing said trash bag to be filled with trash, said trash bag including a hollow body portion having an opened end, said apparatus comprising:

a) base means having an opening therethrough for allowing said body portion of said trash bag to extend therethrough and having a lip adjacent said opening for allowing said opened end of said body portion of said trash bag to be folded there over; said lip of said base means having an upper surface;

b) funnel means having an opened first end for being positioned in communication with said hollow body portion of said trash bag and within said opening of said base means and having an opened second end, said funnel means having a passageway extending between said first and second ends for allowing trash inserted into said second end to pass therethrough into said hollow body portion of said trash bag, the cross-sectional area of said passageway at said second end of said funnel means being larger than the cross-sectional area of said passageway at said first end of said funnel means and larger than the cross-sectional area of said opened end of said body portion of said trash bag; said first end of said funnel means having a bottom portion for coacting with said lip of said base means to clamp said first end of said trash bag there between; said bottom portion of said first end of said funnel means having a lower surface;

c) hinge means attaching said funnel means to said base means for allowing said funnel means to be moved between an opened position and a closed position;

d) support means for being attached to said base means and for supporting said base means above a supporting surface; said support means being movable between an in-use position and a stored position;

e) latch means for locking said funnel means in said closed position; and

f) brace means for holding said funnel means in said opened position with the angle of rotation of said funnel means between said closed position and said opened position being less than 110 degrees.

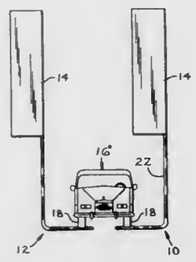
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**5,048,779**

**AUTOMOBILE WEIGHTED BANNER DISPLAY STAND**

Robert S. Wormser, Ocala, Fla., assignor to Ranger International, Inc., Ocala, Fla.

Filed Oct. 9, 1990, Ser. No. 594,639
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—158 5 Claims



1. A display stand for flags or banners characterized by its ability to be stabilized by the weight of a vehicle having pneumatic tires comprising, in combination, a base adapted to receive a vehicle's mounted tire rolled thereupon, vehicle tire weight supporting means defined on said base adapted to receive and partially support the weight of a tire rolled upon said base, an extended portion extending from said base having an outer connection end, and an elongated support member having a first end adapted to be connected to said connected end and a second end extending upwardly with respect to said base for attaching a banner or flag thereto wherein said vehicle tire weight supporting means comprises a pair of spaced legs, the tire being received on said legs such that a portion of said tire extends between said legs engaging the ground and each leg engages a portion of the tire in a tire weight bearing relationship to stabilize said stand.



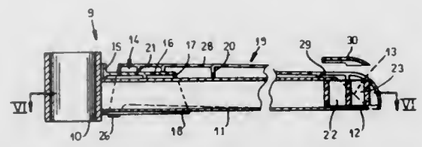
**5,048,780**

**PEDESTAL WITH RADIAL ARMS FOR CHAIRS, FURNITURE AND THE LIKE, OF VARIABLE DIMENSIONS**

Paolo Borsani, Milan, Italy, assignor to Tecno S.p.A. Mibili e Forniture per Arredamento, Milan, Italy

Filed Mar. 9, 1990, Ser. No. 491,326
Claims priority, application Italy, Mar. 10, 1989, 20715/89[U]
Int. Cl.[5] F16M *11/20*
U.S. Cl. 248—188.7 5 Claims





1. A pedestal assembly for supporting an item of furniture, said pedestal assembly comprising:

a cylindrical boss formed with a metal core centered on a vertical axis;

at least one horizontal tubular metal arm formed with an upper segment and a lower segment and provided with a first end and a free end, said tubular arm extending radially longitudinally from said axis and being operatively connected by said first end with said boss;

a boss cover member formed with a central member inserted on said metal core and with at least one branch extending radially longitudinally from said axis along said arm and terminating at a distance from said free end of said arm, said branch being formed with a pair of edges spaced apart and extending along said lower segment; and

a covering sheath mounted on said free end of said arm and extending longitudinally toward said first end, said sheath covering said upper segment of said arm and being formed with:

an elongated plastic member having substantially an inverted U-shaped cross section, said member being provided with an inner surface facing said arm and being formed with a first end and a second end,

a centering plug formed on said second end of said member and mounted in said free end of said arm,

a tie member provided on said first end of said member and having a portion thereof bridging said edges of said boss cover member, and

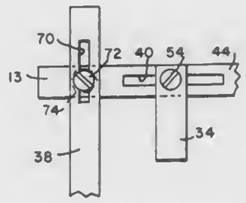
at least one rib formed on said inner surface of said member and extending inwardly toward said arm, said sheath being pulled along said arm toward said fist end of the arm and overlapping said boss cover member, so that said upper segment of the arm is covered completely by said sheath and said boss, said sheath being centered on said arm and on said boss by said tie member and said rib.

**5,048,781**

**CONCRETE MOLD ASSEMBLY DEVICE**

Edward Breen, 289 Chandler St., Tewksbury, Mass. 01876

Filed Apr. 26, 1990, Ser. No. 515,061
Int. Cl.[5] E04G *17/00*
U.S. Cl. 249—219.1 7 Claims



1. A bracket device for supporting a pair of concrete forms having inner and outer vertical surfaces in a predetermined spaced relationship to each other on a supporting surface thereby defining a concrete receiving cavity therebetween, said bracket device comprising:

an elongated horizontal member;

a pair of outer parallel arm members depending vertically from opposite ends of the horizontal member for providing contact with the outer vertical surface of the related concrete form and supporting surface;

said outer parallel arm members including vertical adjustment means for adjusting the vertical distance between the elongated horizontal member and a supporting surface; and

inner arm members depending vertically from the horizontal member in spaced parallel relationship to the inner side of each of the outer parallel arm members for providing contact with the upper portion of the inner vertical surface of a related concrete form;

said inner arm members including lateral adjustment means for adjusting the lateral distance on the horizontal member between the respective inner and outer arm members for supporting concrete forms of different widths.

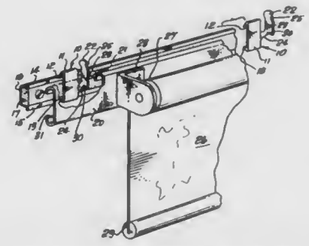
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**5,048,782**

**MAP RAIL HOOK WITH SAFETY NOTCH**

John R. Cauffman, and Janet L. Cauffman, both of 7772 Elden Ave., Whittier, Calif. 90602

Filed Oct. 22, 1990, Ser. No. 600,905
Int. Cl.[5] F21V *17/00*
U.S. Cl. 248—225.2 1 Claim



1. The combination of a map supporting assembly of the type having a channel member with upper and lower edges and an improved map rail hook of the type having a channel portion and a hook portion extending outwardly and upwardly therefrom, said hook portion having a bottom edge, a front edge including a front notch and a hook base wherein the improvement comprises:

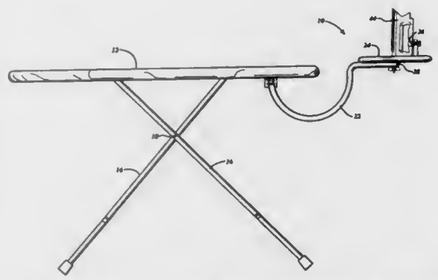
VOL 1130 ISS 3 SE 17 1991 UMI



a lower notch formed near the middle of the hook base said lower notch comprising a discreet indentation in said hook base, whereby the bottom edge of said channel member of said map supporting assembly will catch in the lower notch and be less likely to be accidentally unhooked from the improved map hook.

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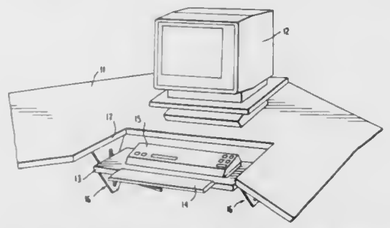
**5,048,783**
**IRONING BOARD TRAY BRACKET**
Leon Grimes, 2929 Claymille Blvd., Nashville, Tenn. 37207
Filed Dec. 10, 1990, Ser. No. 624,724
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—231.2 5 Claims



1. A device for releasably attaching a tray to an ironing board having an integral track comprising:
a. a bracket received by said track;
b. means for adjusting the width of said bracket for flush fit within said track;
c. an arm pivotally attached to said bracket extendable away from said ironing board during use and storable under said ironing board during storage; and
d. said tray pivotally attached to said arm.

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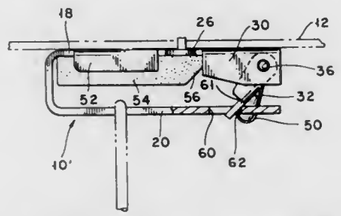
**5,048,784**
**ADJUSTABLE INSET BRACKET**
Edward M. Schwartz, Kansas City, and Wilburn D. Everman, Belton, both of Mo., assignors to Edtech Company, Kansas City, Mo.
Continuation-in-part of Ser. No. 450,146, Dec. 13, 1989, Pat. No. 4,976,407. This application Apr. 26, 1990, Ser. No. 514,820
Int. Cl.[5] A47G *29/02*
U.S. Cl. 248—244 14 Claims



1. Adjustable inset brackets for an inset, said inset being disposed in a recessed portion of a work surface, a corresponding one of said adjustable inset brackets being disposed at either longitudinal end of said inset, each of said adjustable inset brackets comprising:
(a) a first outer plate-like member having a generally L-shaped cross-section including a first vertically extending portion and a first horizontal flange portion facing outwardly, said first vertically extending portion having at least one vertical elongated slot formed therein, said first horizontal flange portion having a plurality of first spaced-apart through-holes formed therein, and said first horizontal flange portion of said first outer plate-like member being fixedly secured to an underside of said work surface by securing means passing through said plurality of first spaced-apart through-holes;
(b) a second inner plate-like member disposed face-to-face so as to contact said first outer plate-like member and having a generally L-shaped cross-section including a second vertically extending portion and a second horizontal flange portion facing inwardly, said second vertically extending portion having at least one vertical elongated slot which is aligned with the elongated slot of the first outer plate-like member, said second horizontal flange portion having a plurality of second spaced-apart through-holes formed therein, and said second horizontal flange portion of said second inner plate-like member being fixedly secured to an underside of said inset by securing means passing through said plurality of second spaced-apart through-holes;
(c) an adjustment handle having a threaded shank portion, said threaded shank portion passing through the aligned vertical elongated slots of said first outer and second inner plate-like members, respectively; and
(d) fastening means threadedly engaged with said threaded shank portion of said adjustment handle to thereby secure said first outer and second inner plate-like members together, wherein said fastening means comprises a nut spot welded to a washer, said washer having a pair of opposing tongues formed along an outer circumference thereof, each of said tongues bent inwardly so as to fit into the elongated slot of said inner plate-like member; whereby upon loosening of said adjustment handle of each of said adjustable inset brackets, said inset is adjustable to positions above, level with and below said work surface and tiltable with respect thereto.

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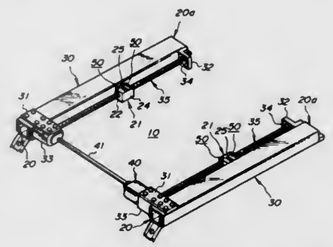
**5,048,785**
**HANGER SUPPORT DEVICE**
Anthony J. Shaw, Chappaqua, N.Y., and Lawrence W. Paricio, Wayne, N.J., assignors to D. Klein & Son Inc., Lodi, N.J.
Filed Sep. 11, 1990, Ser. No. 581,046
The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.
Int. Cl.[5] F16B *45/00*
U.S. Cl. 248—306 16 Claims



1. An improved hanger support apparatus comprising a U-shaped frame having a pair of parallel and spaced apart legs terminating in a pair of opposed ends, a latch arm pivotly mounted to the first of said legs proximate the end thereof and having a distal end adapted to contact said second leg at a point inwardly from the end thereof; the inward point having a receptacle for receiving the latch arm distal end; spring means mounted to said latch arm for biasing said arm into said contact with said receptacle, and a handle operatively connected to said latch arm to permit said latch arm to be selectively pivoted away from said second leg, said legs having opposed interior surfaces, and the latch arm disposed between said opposed surfaces.



**5,048,786**
**POWER SEAT SLIDER DRIVING MECHANISM**
Yuji Tanaka; Isao Kuwabara, and Isamu Chinomi, all of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan
Filed Dec. 15, 1989, Ser. No. 451,320
Claims priority, application Japan, Dec. 26, 1988, 63-168059[U]
Int. Cl.[5] B60N *1/02*
U.S. Cl. 248—429 11 Claims

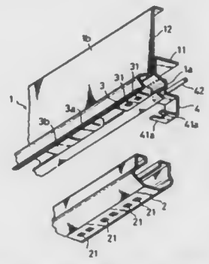


11. A vehicular power seat slide device comprising:
a guide rail rigidly mounted to a vehicle body;
a sliding rail, said sliding rail being slidably supported on said guide rail in a manner such that it is longitudinally slidable thereon;
a motor, said motor providing a power output for moving said sliding rail relative to said guide rail;
a drive shaft, said drive shaft being coupled to said motor so as to be driven to rotate thereby;
an worm gear provided on an end of said drive shaft;
a threaded shaft member, said threaded shaft member being rotatably supported on said sliding rail so as to be axially immovable relative thereto;
driver nut means, said driver nut means being coupled to said guide rail so as to be substantially immovable relative thereto, said threaded shaft member being arranged so as to have a thread thereof in engagement with a thread of said driver nut means such that rotation of said threaded shaft means forces said threaded shaft means to move axially with respect to said driver nut means;
a worm wheel, said worm wheel being provided on one end of said threaded shaft member, and being arranged so as to mesh with said worm gear so as to be driven to rotate thereby, rotation of said worm wheel causing said threaded member to rotate; and
a resilient governor member, said governor member comprising a through bore engaging a portion of said threaded shaft member for producing a frictional resistance which resists the rotation of said threaded shaft member, said governor member having a concavity for receiving said driver nut means.

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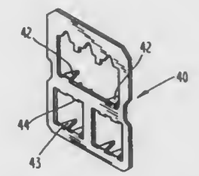
**5,048,787**
**SLIDE RAIL FOR AUTOMOTIVE SEAT**
Seishiroh Saitoh, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Apr. 10, 1990, Ser. No. 507,152
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—430 3 Claims

1. A slide rail for an automotive seat comprising:
an upper rail having a generally inverted U-shaped part opened downwardly thereof;
a lower rail in which said upper rail is slidably fitted, said lower rail being at its bottom part formed with a lock hole;
a locking means for locking and unlocking said upper rail to and from said lower rail, said locking means having a lock pawl to be engaged through said lock hole of said lower rail; and
a plurality of reinforcing members of a plate-like material; each reinforcing member are formed by bending both ends into a generally U-shaped configuration having two bent end portions, said plurality of reinforcing members being provided within said generally inverted U-shaped part of said upper rail in such manner as to extend transversely thereto, contacting their respective lateral sides with inner walls of said upper rail, and further said reinforcing members being each formed with a lock hole into which said lack paul of said locking mans is to be engaged, whereby said upper rail is protected against deformation or damage.



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**5,048,788**
**HANGING DEVICE FOR HARDBOARD**
Eugene M. Lorincz, Cinnaminson, N.J., assignor to Moore Push-Pin Company, Wyndmoor, Pa.
Continuation-in-part of Ser. No. 221,764, Jul. 20, 1988, abandoned. This application Aug. 31, 1989, Ser. No. 401,663
Int. Cl.[5] A47G *1/00*
U.S. Cl. 248—477 11 Claims



6. A hanging device for a hardboard member, the hanging device comprising a generally flat body, the body having an upper side and a lower side, the upper side including means for suspending the device from a nail, the body having a plurality of rows of prongs, a first row of prongs being disposed nearer to the upper side of the body, and other rows of prongs being disposed nearer to the lower side of the body, the prongs extending from the body and being non-perpendicular to the body, the prongs being integral with the body, the prongs being generally flat and planar, wherein the prongs of the first row are angled towards the upper side of the body in a direction pointing away from the body, wherein the prongs of each succeeding row, in the direction of the lower side, are angled in the direction opposite to that of the prongs of the preceding row, and wherein the plane of the prongs intersects the plane of the body along a line which is perpendicular to a line joining the upper and lower sides.

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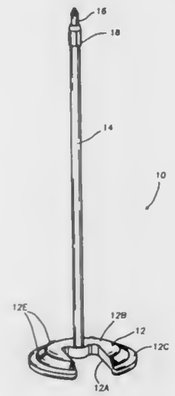


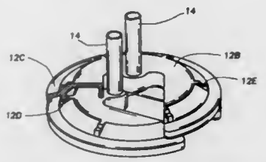
5,048,789

## MICROPHONE STAND

Donald H. Eason, and Jamie D. Porter, both of Fort Collins, Colo., assignors to Ultimate Support Systems, Inc., Fort Collins, Colo.

Filed Jan. 2, 1990, Ser. No. 459,567
Int. Cl.[5] F16B 7/00
U.S. Cl. 248—544 17 Claims





1. A support stand of the type including a base member and an upright member supported by said base member; wherein said base member includes a geometric center and a first outside edge; wherein said upright member is secured to said base member at a point between said first outside edge and said geometric center; and wherein said base member further includes at least one slot extending from an outside edge opposite said first outside edge of said base member toward said geometric center; wherein said upright member is perpendicular to said base member; and wherein said support stand is vertically nestable and stackable with another support stand of the same shape in a manner such that said upright member of a first said support stand extends through a said slot in the base member of each said support stand stacked above said first support stand, and wherein said upright member of said support stands are parallel to each other.

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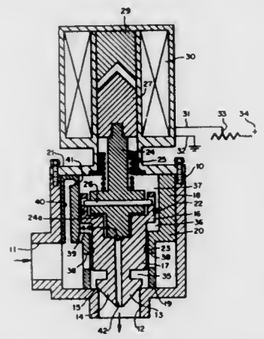
5,048,790

## SELF-MODULATING CONTROL VALVE FOR HIGH-PRESSURE FLUID FLOW

Robert A. Wells, Huntington, N.Y., assignor to Target Rock Corporation, Farmingdale, N.Y.

Filed Jul. 18, 1990, Ser. No. 554,706
Int. Cl.[5] F16K 31/383, 31/02
U.S. Cl. 251—30.04 5 Claims

1. A stabilized modulating valve for fluid flow comprising:
a valve body having inlet and outlet ports;
a main valve disc and associated seat between the ports to control the fluid flow therebetween;
said main disc comprising at least two axially spaced piston portions of different diameters in which the portion of smaller diameter is proximate the seat engaging portion;
first and second cylinder portions furnished in the valve body receiving respectively the smaller and larger piston portions of the main disc in sealing relationship;
a first pressure chamber defined by the larger piston portion and the valve body acting on the larger piston portion to urge the main disc against its seat;
a second pressure chamber defined by the smaller piston portion and the larger piston portion to urge the main disc away from its seat,
a third pressure chamber adjacent the seat engaging portion of the main disc to urge the disc away from its seat, said third chamber being formed in the disc between its seat engaging portion and the smaller piston portion and



adapted to be connected to the outlet port when the main disc leaves its seat;
port means formed in the body forming said first cylinder portion substantially closed by the smaller piston when the main disc is seated, whereby axially motion of the main disc away from its seat displaces the smaller piston to connect the inlet port to both the third pressure chamber and the outlet port through said port means;
second conduit means coupling the inlet port to the second pressure chamber; and
adjustable pressure control means to vary the fluid pressure in the first chamber to change the pressure selectively to seat and unseat the main disc.

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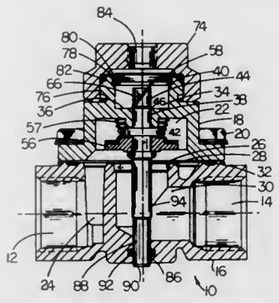
5,048,791

## SHUT OFF VALVE

John E. Ellison, Ridgeland, and Mai Ujjin, Madison, both of Miss., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Filed Nov. 29, 1990, Ser. No. 620,948
Int. Cl.[5] F16K 31/126, 31/68
U.S. Cl. 251—73 19 Claims

1. A shut off valve for shutting off fluid flow therethrough, comprising:
a body, said body including a fluid inlet, a fluid outlet and fluid passage means for conducting fluid from said inlet to said outlet, said body further including a first chamber, said first chamber being bounded by a first surface at one end thereof;
a latching member disposed in said first chamber, said latching member comprised of bendable material, said latching member including: at least one leg portion extending at an acute angle relative to said first surface; a foot portion engageable with said first surface; and a moveable member engaging portion;
blocking means for selectively blocking said fluid passage means;
moveable member means mounted for movement within said body and movable between a first position and a second position, said movable member means in operative connection with said blocking means to block said fluid passage means when said moveable member means is in the second position, said moveable member means further including engaging means in said first chamber for engaging said moveable member engaging portion of said latching member when said moveable member means is in the first position;
biasing means for biasing said moveable member toward said second position;



movement means bounding said first chamber at the other end thereof, said movement means moving said latching member towards said first surface, whereby said foot portion of said latching member engages said first surface of said chamber to bend said latching member, said moveable member engaging portion of said latching member disengages from said engagement means of said moveable member means, and the moveable member means moves to the second position shutting off flow through said valve.

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5,048,792

## MIXING FAUCET ROTARY BRAKE

Frank S. Fischer, Lorain, Ohio, assignor to Moen Incorporated, Elyria, Ohio

Filed Jun. 25, 1990, Ser. No. 542,693
Int. Cl.[5] F16K 35/04
U.S. Cl. 251—297 7 Claims



1. A control valve for use in plumbing fittings including a housing, a valve member within said housing and having a rotatable valve stem extending outwardly therefrom, handle means attached to said stem and rotationally movable therewith, cooperating stop means on said handle means and housing limiting rotation of said stem, and means for retarding rotational movement of said handle means and stem relative to said housing, including a spring member in frictional engagement with a portion of said handle means and fixed against rotation by said housing.

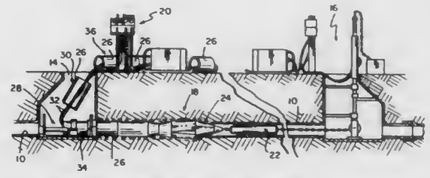


5,048,793

## PIPE JACK

John B. Mefford, Madison; Bob G. Scott, Brownsburg, and Jesse W. Cotherman, Camby, all of Ind., assignors to Miller Pipeline Corporation, Indianapolis, Ind.

Filed Jun. 14, 1990, Ser. No. 537,621
Int. Cl.[5] E21B 19/00
U.S. Cl. 254—29 R 35 Claims



1. A pipe-handling apparatus comprising
a base,
accepting means for accepting a pipe having an outer diameter,
moving means reciprocable relative to the base for moving the pipe axially with respect to the accepting means, and
controlling means for controlling the axial movement of the pipe moved by the moving means relative to the accepting means, the controlling means being movable between a first position out of engagement with the pipe allowing the moving means to move the pipe in either axial direction, and a second position engaging the pipe allowing the moving means to move the pipe in a first axial direction but preventing movement of the pipe in an opposite axial direction.

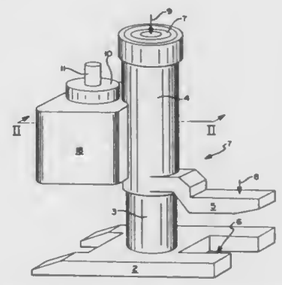
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5,048,794

## HYDRAULIC LIFT PERFECTED FOR THE LIFTING AND MANEUVERING OF HEAVY LOADS OF MANY TONS

Michel Mamessier, 7, rue Lavoisier, Saint Etienne (Loire), France

Filed Jul. 6, 1990, Ser. No. 549,263
Int. Cl.[5] B66F 3/24
U.S. Cl. 254—93 H 9 Claims



1. A hydraulic jack usable in a vertical or horizontal position comprising:
(a) a jack body having:
(1) a column,
(2) a base section comprising a fixed support shoe integral with the column,
(3) a cylindrical shaft having a top lifting section and a

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bottom lifting section, the column being located within the shaft and being slidable therein.

the bottom lifting section comprising a movable lifting lug attached perpendicular to the shaft;

(b) a hydraulic system in fluid communication with the shaft comprising:

(1) a flexible bottle having a bottom wall the bottle being adapted to contain fluid, the bottle collapsing as fluid exits the bottle.

(2) a rigid tank integral with the shaft for housing the flexible bottle.

(3) a hydraulic pump housed within the bottle, the pump comprising:

(a) a body having an intake valve submerged within the bottle;

(b) a piston; and

(c) a fluid delivery line for delivering fluid from the pump to the shaft, and wherein the flexible container collapses toward the pump as fluid exits the bottle such that fluid is always available to the intake valve.

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**5,048,795**

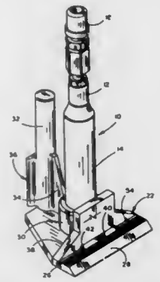
**FORCIBLE ACCESS TOOL**

**Martin H. Vitale, Osceola, Iowa, assignor to Iowa American Fire Fighting Equipment Co., Osceola, Iowa**

**Filed Aug. 6, 1990, Ser. No. 563,087**

**Int. Cl.[5] B66F *3/24***

**U.S. Cl. 254—93 R** **11 Claims**



1. A forcible access tool for separating two structural members, comprising:

a. a linear actuator including an outer casing and an axial rod extensible and retractable between a home position and an extended position;

b. a first, stationary jaw member secured to said outer casing;

c. a second, movable jaw member secured to said rod;

d. a stationary alignment sleeve secured to said outer casing and having an axial opening aligned parallel to said axial rod; and

e. a free-standing alignment pin secured to said movable jaw member and received for axial sliding movement inside said opening of said alignment sleeve which, in combination with said sleeve, prevents both axial rotation of said movable jaw and maintains axial alignment of said casing and rod, wherein

f. said stationary jaw member engages one of the structural members and said movable jaw member engages the other of the structural members to separate the two structural members when said rod is moved to said extended position.

**5,048,796**

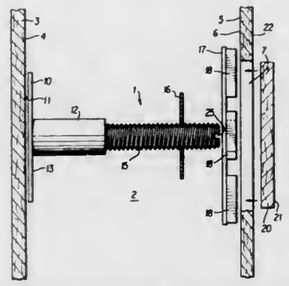
**SHEET ROCK REPAIR JACK**

**Alvin R. Maldonado, 912 Johnson St., Fairfield, Calif. 94533**

**Filed Sep. 13, 1990, Ser. No. 581,918**

**Int. Cl.[5] B66F *3/36***

**U.S. Cl. 254—100** **1 Claim**



1. A sheet rock repair jack for use in repairing a wall constructed with sheet rock, a first wall, a second wall and a space there between of at least three inches, the jack comprising of:

a base having a flat surface for engaging the internal surface of the second wall,

a barrel attached to the distal surface from the flat surface of the base,

a rod mounted to telescope with the barrel to provide the jack with a depth adjustment,

an apron attached to the rod,

a frame engaged with the apron and rod to provide support for a slat,

a pressure means for adjusting the rod relative to the barrel to securely position the jack between the second wall and sheet rock wall by causing the base to assert a pressure on the internal surface of the second wall and the slat to assert a pressure on the internal surface of the sheet rock wall and the pressure means including an adjusting means operable through the frame and at the end of the rod distal from the base.

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**5,048,797**

**SELF-PROPELLED MACHINE AND METHOD FOR LAYING A CATENARY AND/OR A CONTACT WIRE OF AN OVERHEAD LINE**

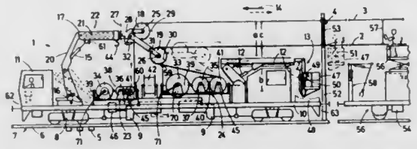
**Josef Theurer, Vienna; Friedrich Oellerer, Linz, and Leopold R. Gruber, Scheibbs, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria**

**Filed Oct. 10, 1989, Ser. No. 420,159**

**Claims priority, application European Pat. Off., Oct. 14, 1988, 88890258**

**Int. Cl.[5] B65H *59/00***

**U.S. Cl. 254—134.3 R** **26 Claims**



1. A self-propelled machine for continuously laying and immediately fixing at least one of two elongated flexible elements of an overhead line extending above a track exclusively between successively pylons spaced alongside the track, one of the two elongated flexible elements being a catenary cable and the other elongated flexible element being a contact wire, which comprises



(a) a machine frame having two opposite ends,

(b) undercarriages supporting the machine frame at the ends thereof for mobility on the track,

(c) a drive for moving the machine frame along the track in an operating direction,

(d) a driving operator's cab mounted on the machine frame,

(e) a power-driven, vertically and laterally adjustable work platform mounted on the machine frame for an operator assigned to attaching the overhead line to the pylons,

(f) a storage drum mounted on the machine frame, a length of the elongated flexible element being reeled on the storage drum and the drum being rotatable at a pay-out speed for unreeling the elongated flexible element,

(g) a drive control for adjusting the moving speed of the machine frame in response to the payout speed of the elongated flexible element,

(h) a lifting device mounted on the machine frame, the lifting device including

(1) a power-driven, vertically adjustable and laterally pivotal boom and

(2) a power-driven support and guide pulley carried by the boom for pivoting about a substantial vertical axis and arranged to support and guide the unreeled elongated flexible element from the storage drum to the operator on the work platform at a constant height determined by the vertical adjustment of the boom and a lateral position determined by the pivoting of the boom, and

(i) a device mounted on the machine frame between the storage drum and the pulley having means for continuously guiding and tensioning the elongated flexible element along a lateral zig-zag path exclusively between successive pylons so that the element is automatically tensioned and, in cooperation with said lifting device, automatically centered and oriented in the longitudinal direction of the element when the element extends in a lateral zig-zag path between successive ones of the pylons at respective sides of the track, the guiding and tensioning device including

(1) a power-driven guide roller guiding the tensioned elongated flexible element to the support and guide pulley, and

(2) a drive control for the guide roller.

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**5,048,798**

**APPARATUS FOR INSERTING THREAD INTO TUBE**

**Nobuo Araki, Tokyo; Kazufumi Tabata, Narashino; Kiyomi Yokoi, and Tadami Ashidate, both of Tokyo, all of Japan, assignors to Nippon Steel Welding Products & Engineering Co., Ltd., 805 Fifteenth Street, NW, Japan**

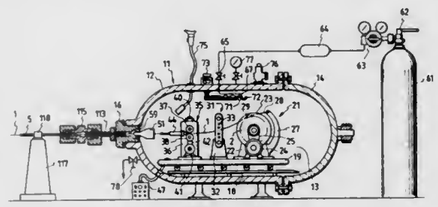
**Division of Ser. No. 310,671, Feb. 14, 1989, Pat. No. 4,953,827.**

**This application Oct. 30, 1989, Ser. No. 428,518**

**Claims priority, application Japan, Aug. 11, 1988, 63-199015; Aug. 15, 1988, 63-201910**

**Int. Cl.[5] B66F *3/24***

**U.S. Cl. 254—134.4** **36 Claims**



1. An apparatus for inserting a thread into a tube by utilizing a stream of gas which comprises:

a sealed container;

means for supplying the thread provided in the sealed container;

a pressurized gas supply source connected to the sealed container;

a coupling on said container for connecting one end of the tube into which the thread is inserted to the sealed container; and

means for vibrating the tube for giving a positive surging motion to the thread.

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**5,048,799**

**MANUAL DRIVE MECHANISM FOR A WINCH OR SIMILAR APPLIANCE**

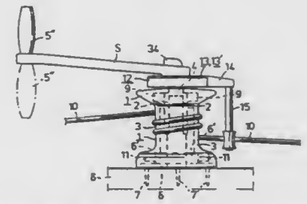
**Mikael E. G. Aronowitsch, Predikantväge 4, S-183 65 Täby; Stefan E. M. Aronowitsch, Centralvägen 4, S-150 16 Hölö , and Karl Lyth, Polhemsagtan 31, S-112 30 Stockholm, all of Sweden**

**Continuation of Ser. No. 286,089, filed as PCT SE87/00564 on Nov. 27, 1987, published as WO88/04275 on Jun. 16, 1988, abandoned. This application Oct. 10, 1989, Ser. No. 418,958**

**Claims priority, application Sweden, Dec. 3, 1986, 8605201**

**Int. Cl.[5] B66D *1/04, 1/14***

**U.S. Cl. 254—344** **9 Claims**

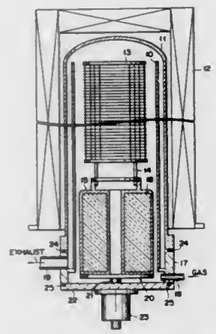


1. A manual drive arrangement for use in combination with and for manually driving a winch, said winch including an external drum and a rotational input shaft providing a drive for the winch and arranged to rotate said external drum at a first transmission ratio, the manual drive arrangement being separable from said winch and including a rotatable drive part, means including parts of said drive part and parts of said input shaft for non-rotatably coaxially coupling said drive part and said input shaft and enabling said manual drive arrangement to be coupled to and uncoupled from said drive part by relative axial shifting movement, of the drive arrangement and the drive part, so that the drive arrangement can be readily selectively removed from or placed on the winch, said manual drive arrangement further comprising a crank arm and drive transmission means enabling said crank arm to drivably co-act with said drive part to provide rotational movement to said drive part; wherein said separable manual drive arrangement constitutes a removable unit comprising said drive transmission means (12) connected between said crank arm and said drive part for transmitting rotational movement of the crank arm (5) to said drive part (4) at a second predetermined transmission ratio differing from said first transmission ratio of the winch, said manual drive arrangement further comprising a carrier unit (13) carrying said crank arm (5), said drive part (4) and said transmission means (12); torque reaction retaining means (14, 15) on said carrier unit, essentially non-rotationally mounted relative to the carrier unit; and abutment means at a fixed location relative to the winch enabling said torque reaction retaining means, and the carrier unit to which the retaining means is mounted, to be selectively rendered rotatably stationary by abutting said abutment means during the transmission of rotational movement to the drive part (4) by the crank arm, said winch being a self-tailing which which includes a sheet arm; and said torque reaction retaining means will co-act with said sheet arm (19) of said self-tailing winch.

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5,048,800
**VERTICAL HEAT TREATMENT APPARATUS**
Shinji Miyazaki; Takahiko Moriya, both of Yokohama; Yasushi Yagi, Zama; Mitsuaki Komino, Tokyo, and Katuhiko Iwabuchi, Sagamihara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tokyo Electron Sagami Limited, Kanagawa, both of, Japan
Filed Aug. 7, 1990, Ser. No. 563,345
Claims priority, application Japan, Dec. 27, 1988, 63-329946; Aug. 7, 1989, 1-204220
Int. Cl.[5] C21D *1/06*
U.S. Cl. 266—256 6 Claims

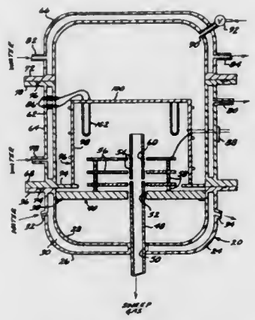


1. A vertical heat treatment apparatus, comprising:
a reaction furnace constituted by a reaction chamber having an inner tube and an outer tube and a heater arranged outside said reaction chamber;
a manifold means communicating with a lower portion of said reaction chamber to support said reaction chamber, a gas being supplied an exhausted through said manifold means;
a wafer boat having a plurality of wafers mounted thereon and arranged in a uniform temperature region in said reaction furnace;
a hollow vessel for leading a gas to said uniform temperature region and for supporting a lower end of said wafer boat; and
a plurality of first heat-insulating members made of a material selected from the group consisting of quartz, SiC, quartz-SiC and graphite-SiC, and arranged in said hollow vessel;
wherein said hollow vessel prevents a gas from being in contact with said first insulating members.

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5,048,801
**SINTERING FURNACE**
Kenneth P. Johnson, Fallbrook, and Charles A. Zwissler, Coronada, both of Calif., assignors to Risi Industries, Chula Vista, Calif.
Filed Jul. 12, 1989, Ser. No. 379,579
Int. Cl.[5] C21D *1/74*
U.S. Cl. 266—256 15 Claims

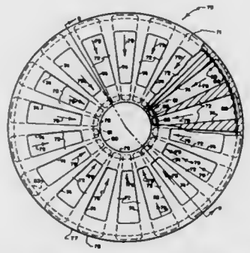
1. A sintering furnace, comprising:
a bell, including
an upper housing having a downwardly facing sealing rim at the periphery,
an insulating enclosure supported from the upper housing, the enclosure being porous to gas flow therethrough;
a base, including
a lower housing having an upwardly facing sealing rim at the periphery, the housing being dimensioned such that the downwardly facing sealing rim of the upper housing is in facing engagement with the upwardly facing sealing rim of the lower housing, to form a gas-tight seal, and
a hearth against which the insulating enclosure rests,
a gas evacuation line extending upwardly into the interior of the enclosure; and



means for introducing a flow of a sweep gas into the furnace outside the insulating enclosure, and removing the flow of sweep gas through the evacuation line.

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5,048,802
**DIFFUSER SYSTEM FOR ANNEALING FURNACE WITH CHAIN REINFORCED, NODULAR IRON CONVECTOR PLATES**
Gary L. Coble, RD #2, Box 214, DuBois, Pa. 15801
Continuation-in-part of Ser. No. 373,672, Jun. 28, 1989, abandoned, which is a continuation of Ser. No. 213,699, Jun. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 907,473, Sep. 15, 1986, Pat. No. 4,755,236, which is a division of Ser. No. 732,400, May 9, 1985, Pat. No. 4,611,791, which is a continuation-in-part of Ser. No. 456,823, Jan. 10, 1983, Pat. No. 4,516,758. This application Nov. 6, 1990, Ser. No. 609,643
Int. Cl.[5] F27B *5/06*
U.S. Cl. 266—263 13 Claims

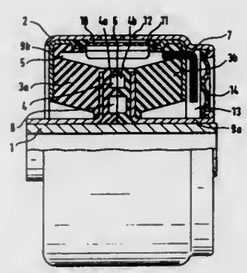


8. A convector plate for positioning in an annealing furnace at a location between first and second coils of metal that are arranged such that the second coil is above the first coil, with the first coil being supported atop a base structure of the annealing furnace for being annealed within a closed, controlled environment that is defined by the annealing furnace, and with a convector plate being positioned between the first and second coils such that the convector plate is supported by the first coil, and such that the second coil is supported by the convector plate, wherein the convector plate comprises an annular structure that has inner, outer and central portions that are formed as a one-piece nodular iron casting that has been cast in-situ about a length of steel link chain, wherein at least major portions of the length of steel link chain are embedded within the nodular iron casting, wherein with the convector plate defines a plurality of radially extending gas flow passages between the first and second coils, and wherein the steel link chain is at least one endless loop comprised of a plurality of links.



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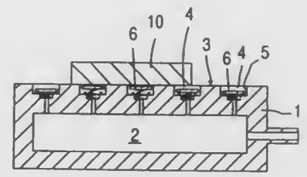
5,048,803
**HYDRAULICALLY DAMPING BEARING**
Heinrich Brenner, Ahrweiler, Fed. Rep. of Germany, assignor to Boge AG, Eitorf, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 328,466, Mar. 24, 1989. This application Nov. 28, 1989, Ser. No. 442,159
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1988, 3841193
Int. Cl.[5] F16F *13/00*
U.S. Cl. 267—140.1 22 Claims



1. Hydraulic dampening elastomeric bearing comprising:
internal element means;
external element means for being disposed around at least a portion of said internal element means and radially spaced therefrom;
spring means for resiliently connecting said internal element means to said external element means;
said spring means being disposed between said internal element means and said external element means;
said spring means defining cavity means therein;
equalizing chamber means for varying the hydraulic pressure in said cavity means;
said equalizing chamber means comprising:
first subchamber means in fluid communication with said cavity means;
channel means for transferring fluid between said cavity means and said first subchamber means;
said channel means being connected between said cavity means and said first subchamber means;
said channel means being dimensioned to substantially prevent fluid transfer between said cavity means and said first subchamber means when a fluid pressure surge occurs within said cavity means;
second subchamber means physically separated and fluidly sealed from said first subchamber means;
sealing means positioned between said first subchamber means and said second subchamber means;
said sealing means for physically separating and fluidly sealing said first subchamber means from said second subchamber means; and
opening means defined by said second subchamber means for receiving a fluid pressure from a source which is external to said second subchamber means.

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5,048,804
**APPARATUS FOR HOLDING AN OBJECT TO A SURFACE USING VALVE CONTROLLED VACUUM FORCE**
Hirotsugu Ito, Chita, Japan, assignor to FSK Inc., Aichi, Japan
Filed Oct. 9, 1990, Ser. No. 595,357
Claims priority, application Japan, May 17, 1990, 2-127389
Int. Cl.[5] B25B *11/00*
U.S. Cl. 269—21 8 Claims



1. An apparatus for holding an object to a surface, comprising:
means defining a surface (3) for receiving an object to be held thereon, said means having a plurality of suction holed (4) therein and a vacuum source (2) coupled to said suction holes (4) to apply a suction force to said suction holes;
valve means (6) in each of said suction holes (4), said valve means (6) being located between the outer space above said object receiving surface (3) and said vacuum source (2), said valve means (6) each being operable in accordance with a difference between a pressure in an outer space above said object receiving surface (3) and the pressure in an inner space within said vacuum source (2);
said vacuum source comprising a vacuum chamber (2) below said suction holes (4) and valve means (6);
biasing means for biasing the respective valve means (6) toward an open position at which communication is provided between said vacuum source (2) and said outer space via said valve means (6) and suction holes (4) and wherein the valve means (6) is opened when a pressure difference in those suction holes (4) closed or covered by an object (10) becomes smaller than a predetermined value, and wherein said valve means (6) is closed to stop communication between said vacuum source (2) and said outer space when the pressure difference in those suction holes (4) which are not closed by the object (10) and remain open becomes greater than a predetermined value, to thereby prevent loss of suction force to be exerted on the object (10) due to suction loss through open suction holes (4); and
said valve means comprising a flexible resilient valve member arranged above a valve seat, said flexible valve member comprising a peripheral leg member for normally spacing said flexible valve member away from said valve seat, said flexible valve member being flexible toward and away from said valve seat responsive to said pressure difference, and said flexible valve member being resiliently biased away from said valve seat toward said open position.

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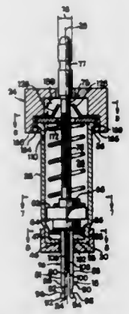
5,048,805
**CLAMP**
Michael D. Wiseman, Cypress, Tex., assignor to Avtool, Inc., Lake Charles, La.
Filed Jul. 27, 1990, Ser. No. 558,626
Int. Cl.[5] B23P *15/26*
U.S. Cl. 269—48.4 22 Claims

1. A fastening apparatus for temporarily clamping and holding workpieces, said apparatus comprising:
a housing defining a chamber and having an open end, and a sealed end with an aperture;

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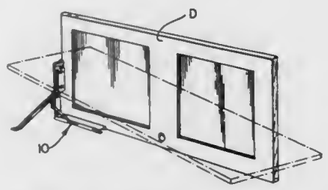
a spreader bar having a leg, said bar mounted in said chamber with said leg extending through said sealed end aperture;
means for retaining said spreader bar in said chamber;
a mandrel having a longitudinal axis and a base,
a spindle shaft extending through said open end from said base along said axis, and
at least two flexible fingers extending from said base along said longitudinal axis in an opposed direction to said spindle shaft with said spreader-bar leg between said fingers,



said shaft operable to move said base and flexible fingers to a securing position with said workpiece secured at said housing sealed end;
means for biasing said mandrel to a reference position with said base in proximity to said means for retaining, and said flexible fingers extended beyond said spreader bar leg; and,
an end-cap sealingly mounted over said open end and said means for locking, said end-cap rotatable to move said locking means to release said shaft and workpieces and return said mandrel to said reference position.

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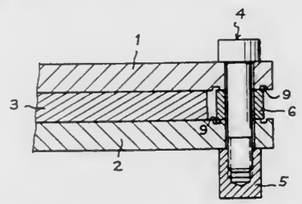
**5,048,806**
**DOOR HANGING AID**
**Stephen Deutsch, 103 Burwell Street, and Thomas D. Peever, 136 Eagle Avenue, both of Brantford, Ontario, Canada**
**Filed Jul. 2, 1990, Ser. No. 548,753**
**Int. Cl.[5] B25H** *1/08*
**U.S. Cl. 269—152** **5 Claims**



1. A door hanging aid comprising:
(a) a first and a second longitudinal door gripping member, each having a proximate and distal end;
(b) hinge means mounted at the proximate end of each member thereby providing hingeable attachment, with each door gripping member;
(c) releasable lock means adapted to lock the members into an orthogonal operative position and to release them into a collapsed juxtaposed transit position;
(d) stabilizing means carried by the aid adapted to stabilize the same when in the open operative position, so that lateral movement of the aid is inhibited; and,
(e) means on one of said members adapted to engage and to constrain a door frame therein.

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**5,048,807**
**CLAMPING TOOL FOR CARRYING OUT A CHEMICAL VAPOR INFILTRATION OF A MATERIAL WITHIN A FIBROUS PREFORM DURING THE MANUFACTURE OF COMPOSITE PARTS**
**Manuel Martinez, Merignac, and Francis Bouvier, Bordeaux, both of France, assignors to Societe Europeenne de Propulsion, Suresnes, France**
**Filed Jul. 9, 1990, Ser. No. 550,318**
**Claims priority, application France, Jul. 11, 1989, 89 09336**
**Int. Cl.[5] B25B** *1/10*
**U.S. Cl. 269—243** **6 Claims**

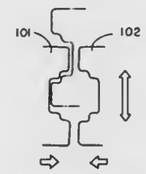


1. A clamping tool for carrying out chemical vapor infiltration of a material within a fibrous preform during the manufacture of composite parts, said tool comprising:
two plates for clamping a fibrous preform undergoing an infiltration process, said plates having confronting surfaces and including ends overlapping from said fibrous preform whereby said plates are held together with a specified spacing therebetween determined by blocking elements having a predetermined contour provided in the vicinity of said overlapping ends of said plates, said blocking elements contacting a confronting surface of at least one of said plates in a contact zone having generally the same contour as said blocking elements;
wherein the overlapping ends of the confronting surface of the at least one including said contact zone further include channels extending along the contour of the contact zone of said blocking elements, said contact zone including peripheral edge portions disposed within a width of said channel defined by a channel inner edge and a channel outer edge; and
the width of said channels being such that, irrespective of a tolerance in the positioning of said blocking elements resulting from some play in the assembling of the elements forming said clamping tool, the peripheral edge portions of said blocking elements that define said contact
zone peripheral edge portions are always located entirely between an inner edge and an outer edge of a channel, said channels providing an area proximate the peripheral edge of the contact zone of said blocking elements in which said infiltrated material may accumulate, for maintaining the specified spacing between said two plates throughout a plurality of clampings and successive chemical vapor infiltration processes.

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**5,048,808**
**CLAMPING DEVICES FOR IRREGULAR SHAPED WORKPIECES**
**Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan**
**Continuation of Ser. No. 279,912, Dec. 5, 1988, abandoned. This application Aug. 31, 1990, Ser. No. 577,073**
**Int. Cl.[5] B25B** *1/24*
**U.S. Cl. 269—258** **1 Claim**

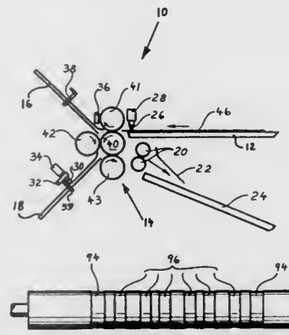
1. In a clamping device for clamping a workpiece, the device being of the type having a pair of opposite jaws, at least one of said jaws being operatively movable in a first direction towards the other jaw for clamping the workpiece therebetween, and in a second opposite direction away from the other jaw for unclamping the workpiece, the device further being of the type having at least one respective clamping member disposed on each of the jaws, each clamping member including a clamping surface carried thereon for movement therewith and at least one of the clamping members being movably mounted on one of the opposite jaws for rotational and lateral sliding movement relative to the other clamping member in response



to the shape of the workpiece clamped therebetween, wherein each of the clamping surfaces has a respective U-shaped recess formed therein terminating in a pair of opposite end arms, so that a respective corner is defined between each end arm and the recess and wherein a respective shoulder is formed in each corner of each surface, so that when the movably mounted clamping members are laterally slid and are moved in the first direction, each of the clamping surfaces and the shoulders of each clamping surface matingly engage one another.

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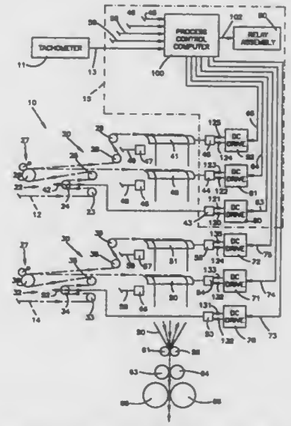
**5,048,809**
**APPARATUS AND METHOD FOR SHEET FOLDING AND SEALING**
**Patrick A. Tebbe, Anna, and Carl J. Didier, Piqua, both of Ohio, assignors to Baumfolder Corporation, Sidney, Ohio**
**Filed Apr. 26, 1989, Ser. No. 343,447**
**Int. Cl.[5] B42C** *1/00*
**U.S. Cl. 270—45** **6 Claims**



1. Apparatus for sheet folding and sealing to produce letter-like mailable objects from preprinted sheet material, said apparatus having a first side and an opposite side in relation to said first side, said apparatus comprising:
a feeder located on said first side for feeding individual sheets in seriatim from said first side, said apparatus accepting sheets through said first side;
at least one fold pan, all of said at least one fold pans being located on said opposite side, said at least one fold pan including an adjustable abutment stop;
fold/seal roll means for folding and sealing sheets in cooperation with said at least one fold pan, said fold/seal roll means comprising a main drive roll and a first, a second, and a third roll, said main drive roll and said first roll forming a first nip therebetween, said main drive roll and said second roll forming a second nip therebetween, said main drive roll and said third roll forming a third nip therebetween, wherein sheets, during folding and sealing thereof, are fed by said feeder into said first nip and thereafter are fed by said first, said second, and said third nips in that sequence therethrough, whereby folded and sealed sheets egress from said first side; and
adhesive applicator means for application of adhesive to sheets in said apparatus for mutual bonding of folded sheet portions, wherein said adhesive applicator means include a plurality of bead applicator nozzles for applying adhesive beads along the direction of motion of sheets, said bead applicator nozzles being disposed upstream from said first nip, and wherein said adhesive applicator means further include a plurality of spot applicator nozzles for applying adhesive spots in locations along a transverse direction with respect to the motion of sheets, said spot applicator nozzles being disposed in proximity to said adjustable abutment stop in at least of said at least one fold pans; and,
wherein at least one of said rolls includes a plurality of concentric cylindrical grooves disposed in axial locations exposed to contact with adhesive, a said grooves having a substantially cylindrical coating of PTFE material to prevent adhesion of adhesive thereto.

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**5,048,810**
**APPARATUS FOR ADJUSTING AN ANGLEBAR OR A COMPENSATOR ROLLER IN A FOLDER OF A PRINTING PRESS**
**Roland T. Palmatier, Durham, and Glenn A. Guaraldi, Kingston, both of N.H., assignors to Harris Graphics Corporation, Dover, N.H.**
**Filed Nov. 19, 1990, Ser. No. 615,219**
**Int. Cl.[5] B65H** *39/00*
**U.S. Cl. 270—52** **8 Claims**



1. An apparatus for adjusting the position of one of an anglebar and a compensator roller both of which guide a moving web of sheet material in a folder of a printing press, said apparatus comprising:
a first motor having an output shaft operatively connected with one of the anglebar and the compensator roller to, when driven, adjust the position of one of the anglebar and the compensator roller;
means for providing a speed reference signal indicative of the speed of movement of the web of sheet material relative to one of the anglebar and the compensator roller;
means for providing an adjustment control signal indicating

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that one of the anglebar and the compensator roller should be adjusted; and

motor control means responsive to said speed reference signal and said adjustment control signal for driving said first motor at a speed which varies with said speed of movement of the web of sheet material.

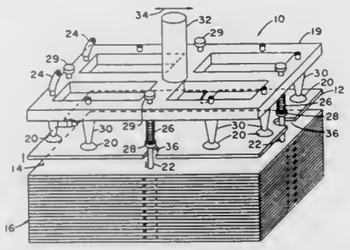
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**5,048,811**

## SINGLE HEAD DEVICE FOR REMOVING ALTERNATE ARTICLES FROM A STACK OF THE ARTICLES

**David E. Hochbein, Sarver, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.**

**Filed Jul. 31, 1989, Ser. No. 386,622**
**Int. Cl.[5] B65H *5/22***
**U.S. Cl. 271—5** **2 Claims**



1. Apparatus for sequential removal of planar green ceramic sheets and paper sheets separating the ceramic sheets from a stack of the ceramic and separating sheets, said ceramic sheets having notches extending inwardly from their edges, with all of said sheets being of the same size and aligned such that the edges of the paper sheets extend across the open areas of the notches in the ceramic sheets, the apparatus comprising:

a plurality of suction devices for engaging the uppermost sheet of said stack of sheets at spaced apart locations adjacent the edges of the uppermost sheet,

a plurality of pins located between the suction devices, and

means providing unitary support of the suction devices and pins,

said pins being located to pass through the notches in the uppermost sheet when the uppermost sheet is a green ceramic sheet, and extend to the next paper sheet in said stack when the suction devices and pins are lowered from a rest position to a pick-up position,

said pins being effective to hold the paper sheet in place beneath the notches of the uppermost ceramic sheet while the suction devices raise the uppermost ceramic sheet in a planar condition without bending the same from the paper sheet and stack when at least a partial vacuum is drawn through the suction devices,

said suction devices in addition being effective to pucker portions of the uppermost paper sheet at locations immediately beneath the suction devices when a paper sheet is the uppermost sheet in the stack while said pins hold portions of the paper sheet intermediate of the suction devices against the next uppermost ceramic sheet when a vacuum is drawn through the suction devices.

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**5,048,812**

## SHEET FEEDING APPARATUS

**John H. Holmes, Owings Mills, Md., assignor to Prime Technology, Hunt Valley, Md.**

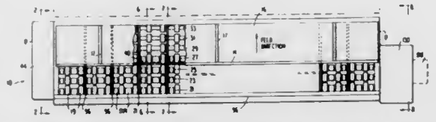
**Continuation of Ser. No. 266,465, Nov. 3, 1988, abandoned. This application Feb. 8, 1990, Ser. No. 477,155**
**Int. Cl.[5] B65H *3/10***
**U.S. Cl. 271—11** **46 Claims**

1. A sheet feeding apparatus capable of feeding a single sheet from a stack of corrugated sheets that travels from a feed end to a delivery end, comprising:

a support for the sheet, said support including the feed end and the delivery end and having feed elements;

said feed elements comprising a first plurality of feed elements and a second plurality of feed elements;

said first plurality of feed elements arranged in a first plurality of rows which extend transverse to the direction of travel of the sheet from the feed end to said second plurality of feed elements;



said second plurality of feed elements arranged in a second plurality of rows which extend from said first plurality of feed elements to the delivery end;

suction means for holding the sheet against said second plurality of feed elements while being fed thereby;

means for driving said first plurality of feed elements at a variable speed; and

means for driving said second plurality of feed elements at a constant speed.

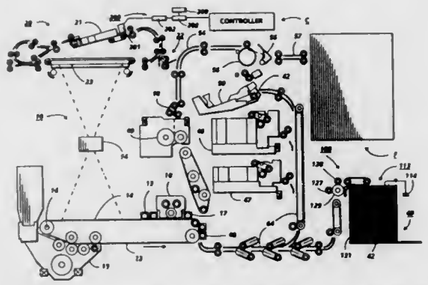
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**5,048,813**

## BOTTOM VACUUM CORRUGATION FEEDER AIR KNIFE CALIBRATION SYSTEM AND METHOD

**Ronald R. Wierszewski, Henrietta; Richard F. Scarlata, Rochester; Thomas Acquaviva, Penfield, and James F. Matysek, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 27, 1989, Ser. No. 344,197**
**Int. Cl.[5] B65H *3/14***
**U.S. Cl. 271—98** **5 Claims**



1. In a bottom sheet separator-feeder for separating and forwarding sheets seriatim, comprising: a stack tray adapted for supporting a stack of sheets, vacuum sheet feed means associated with the tray and located in a position spaced from the bottom sheet in the stack, air injection means adapted to provide a layer of air between the bottom sheet and the remainder of the sheets in the stack, the improvement for calibrating the air injection means, characterized by:

air pressure control valve means for controlling the air flow to said air knife;

means for obtaining a one sheet air pressure position of said air pressure control valve means by measuring the air pressure of said air pressure control valve means with one sheet in the stack tray; and

non-volatile memory means for storing said one sheet valve position of said air pressure control valve so that a table of values for various sheet stack heights can be accomplished by adding constant values to said one sheet valve position measurement and thereby compensate for differences in separator-feeders and altitudes.



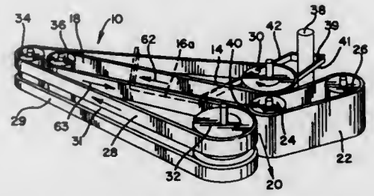
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**5,048,814**

## DOCUMENT ORIENTATION MECHANISM

**Eduard Svyatsky, Libertyville, Ill., assignor to Bell & Howell Company, Evanston, Ill.**

**Filed Mar. 16, 1990, Ser. No. 495,274**
**Int. Cl.[5] B65H *29/12***
**U.S. Cl. 271—186** **75 Claims**



1. A document orientation mechanism including means for reversing the face of documents moving in a predetermined path which does not alter the overall direction of said predetermined path of said documents, including,

input means for feeding a sequence of documents into said mechanism at a document inlet;

first directional means in said mechanism for first moving documents in the same direction as said predetermined path of said sequence of documents, and for then moving documents in a first transverse path away from said predetermined path;

second directional means positioned in opposition to said first directional means for moving documents in a second transverse path having a reverse direction from the movement of said first transverse path;

guide means for transferring each document of said sequence from said first directional means first transverse path to said second directional means;

sensor means for signaling said guide means to react for document transfer upon completion of each document input into said first transverse path;

output means for returning said documents sequentially to said overall direction of said predetermined path; and,

rotatable pivot means mounting said guide means and said sensor means for pivotable rotation back and forth around a pivot axis proximate to said first directional means as each document enters and passes through said document inlet.

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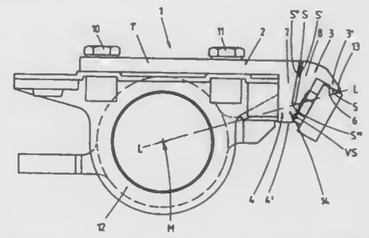
**5,048,815**

## GRIPPER DEVICE ON SHEET-FED ROTARY PRINTING MACHINES

**Dieter Bergmeier, Heidelberg, and Hans-Peter Hiltwein, Philippsburg, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany**

**Filed May 3, 1990, Ser. No. 518,209**
**Claims priority, application Fed. Rep. of Germany, May 3, 1989, 3914646**
**Int. Cl.[5] B65H *29/04***
**U.S. Cl. 271—204** **19 Claims**

1. Gripper device on a sheet-fed rotary printing machine formed of a sheet gripper seat and a sheet gripper, and having a gripper housing with a gripper arm swivellable about a gripper shaft, comprising an articulation point with an elastic restoring force on the gripper arm, said articulation point being disposed close to the start of a gripper finger having a pressure surface located on one side of a connecting line between a middle point of the gripper shaft and a front edge of the gripper-finger pressure surface, said articulation point being disposed at a location in an area starting from said connecting line



and extending over a side of said connecting line located opposite to the side thereof in which the gripper finger is located.

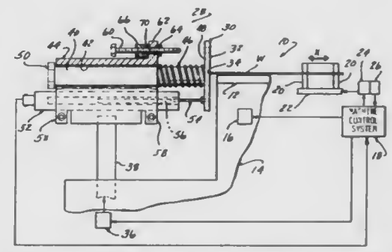
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**5,048,816**

## WORKPIECE REGISTRATION SYSTEM AND METHOD FOR DETERMINING THE POSITION OF A SHEET

**Victor L. Chun, Holland, and Gerard J. Schorn, Southampton, both of Pa., assignors to Murata Wiedemann, Inc., King of Prussia, Pa.**

**Filed Jul. 9, 1990, Ser. No. 549,937**
**Int. Cl.[5] B65H *9/18***
**U.S. Cl. 271—227** **12 Claims**



1. A system for providing sheet registration in a sheet handling apparatus having a control system for precisely moving a sheet in a plane defined by X and Y axes by means of grippers included in said apparatus adapted to hold a sheet loaded therein, a cross slide having said grippers mounted thereo; and a carriage mounting said cross slide moved along said respective X and Y axes under the guidance of said control system to carry out a part program, said system including an arrangement comprised of a locator plate positionable along said X-axis so as to have a face engaged by the edge of a sheet upon continued movement of said cross slide in one direction;

slider means mounting said locator plate for free movement away from an advanced position;

means lightly urging said locator plate towards said advanced position;

stop means precisely locating said locator plate in said advanced position;

distance transducer means generating a continuously variable electrical signal corresponding to the position of said locator plate away from said advanced position;

means transmitting said displacement transducer signals to said control system, whereby upon driving said sheet a fixed distance so as to displace said locator plate from said advanced position, said part program can take into account the exact position of said sheet in said grippers.

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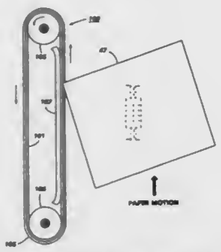


5,048,817

## DYNAMIC EDGE GUIDE FOR SIDE REGISTRATION SYSTEMS

George J. Roller, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1989, Ser. No. 425,158
Int. Cl.[5] B65H 9/16
U.S. Cl. 271—250 8 Claims



1. In a copier system having an image processor which forms images on a copy substrate, means for exposing image of documents to said processor, transfer means for transferring the image of the documents from said processor to the copy substrate, and feed means for feeding the copy substrate to said processor, the improvement comprising:

copy substrate registration means for transporting and registering the copy substrate in synchronism with an image produced by said processor including side registration means for driving the copy substrate laterally with respect to the direction of travel of the copy substrate, and edge guide means for receiving and edge registering the copy substrate driven thereinto by said side registration means, and wherein said edge guide means includes a fixedly positioned moving belt which has protrusions thereon that form a channel into which the copy substrate is driven by said side registration means.

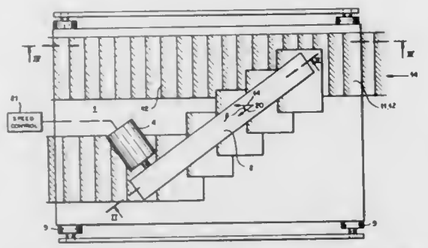
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5,048,818

## APPARATUS FOR SUBDIVIDING A SHINGLED STREAM OF PAPER SHEETS

Günther Nemeskal, Vienna, Austria, assignor to Strohal Gesellschaft M.B.H., Vienna, Austria

Filed Aug. 28, 1990, Ser. No. 574,354
Claims priority, application Austria, Aug. 31, 1989, A2059/89
Int. Cl.[5] B65H 29/00
U.S. Cl. 271—283 12 Claims



1. An apparatus for separating a main shingled stream of coextensive pairs of paper sheets overlapping and overlapped by adjacent coextensive pairs into two partial shingled streams, comprising:

a lower conveyor belt carrying said main shingled stream of coextensive pairs of paper sheets overlapping and overlapped by adjacent coextensive pairs and advancing said main shingled stream of coextensive pairs of paper sheets in a transport direction;

a perforated upper conveyor belt juxtaposed with upper surfaces of upper paper sheets of successive coextensive pairs of paper sheets of said main shingled stream and displaceable in a direction inclined away from said main shingled stream at an acute angle to said transport direction; and

means for applying suction to perforations of said upper conveyor belt for serially drawing each upper paper sheet against said upper conveyor belt whereby the displacement of said upper conveyor belt entrains said upper paper sheets in succession laterally of said main stream into one shingled partial stream while uncovering each lower paper sheet of a respective pair so that said lower paper sheets continue in said transport direction in another shingled partial stream.

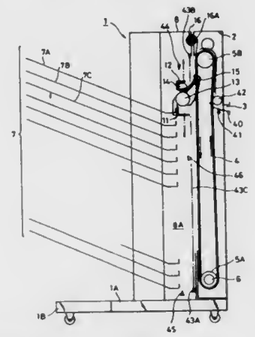
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5,048,819

## SORTING MACHINE HAVING AN UPPERMOST TRAY WHICH IS ONLY USED IN THE NON-SORTING MODE

Kenji Kosaka, Naka, and Yoshikazu Yasu, Katsuta, both of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,436
The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.
Int. Cl.[5] B65H 39/10
U.S. Cl. 271—288 8 Claims



1. A sorting machine comprising:

a sorting portion;

a feed portion which is openable with respect to said sorting portion;

a plurality of tray bins which are arranged on a frame in said sorting portion in a fixed vertical array with a predetermined space therebetween, each of said tray bins having an entrance through which sheets can be ejected thereonto;

transport means, having an endless transport belt which is disposed in said feed portion, for vertically transporting a recorded sheet introduced through a feed opening;

discharge means, disposed in said sorting portion and moveable along said entrances of said tray bins for ejecting a sheet onto said tray bins, said discharge means comprising a discharge roller mounted on a discharge roller shaft, a pulley mounted on a drive shaft and driven by said transport belt, said pulley being in contact with the exterior surface of said transport belt, and gears engaged with each other and mounted on said discharge roller shaft and said drive shaft respectively, so that said discharge roller is driven by said transport belt;

guide means for transferring the recorded sheet to said discharge means after transporting by said transport means;



shifting means, disposed in said sorting portion, for intermittently shifting said discharge means and said guide means upwardly and downwardly to a tray into which the recorded sheet is to be discharged;

hold means, being retractable in opposite directions along a transport direction of said recorded sheet in response to a shifting of said discharge means, for holding said recorded sheet between said transport means and said hold means;

means for detecting a predetermined mode of operation including a non-sorting mode;

means responsive to the detection of a non-sorting mode by said detecting means for moving said discharge means to an uppermost tray of said tray bins and locating said discharge means at a distance above said uppermost tray which is greater than said predetermined space, wherein said hold means comprises a spiral spring of elastic strip metal material which has one end wound around a rotatable member rotatably mounted on a shaft disposed in said sorting portion and the other end fastened to said discharge means, said spiral spring functioning so as to rewind with constant force around said rotatable member under its own spring force upon shifting of said discharge means upwardly; and

means responsive to the detection of a sorting mode by said detecting means for moving said discharge means to a second uppermost tray of said tray bins and, wherein said uppermost tray is not used in said sorting mode.

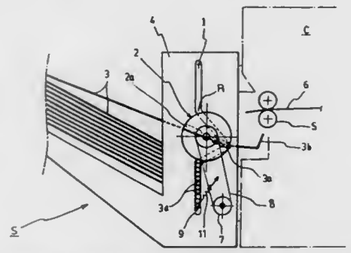
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5,048,820

## COMPACT SORTER

Jae H. Chung, Uijongbu, and Jeong H. Kim, Seoul, both of Rep. of Korea, assignors to Sindo Ricoh Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 16, 1990, Ser. No. 495,795
Claims priority, application Rep. of Korea, Jan. 25, 1990, 1990-855
Int. Cl.[5] B65H 39/10
U.S. Cl. 271—293 10 Claims



1. A compact sorter for a copy machine having means for ejecting copies, comprising:

a sorter body having opposing side plates, each of said side plates having a slot liner, said slot liner having first and second vertical portions connected by a middle portion which extends through points horizontally displaced relative to said vertical portions toward said ejecting means of said copy machine;

a plurality of bin trays, each tray having pin means which ride in said slot liner of each of said side plates and a projection extending on the side of said pin means closest to said ejecting means;

a transfer wheel rotatably mounted on said sorter body, said transfer wheel having first and second slots arranged along a diameter of said transfer wheel and extending radially inward from a circumference of said transfer wheel, said slots being dimensioned to receive said pin means and said transfer wheel having a radius of gyration and said slots having a length such that a part of each of said slots overlies a part of said middle portion over respective predetermined angles of each revolution of said transfer wheel substantially all of said middle portion of said slot liner lying within said radius of gyration of said transfer wheel;

means for urging said pin means in said first vertical portion toward said transfer wheel; and

driving means for rotating said transfer wheel,

whereby said respective pin means are successively transported from said first to said second vertical portion by said transfer wheel during rotation thereof and said respective projections are successively transported closer to said ejecting means during travel of said pin means along said middle portion.

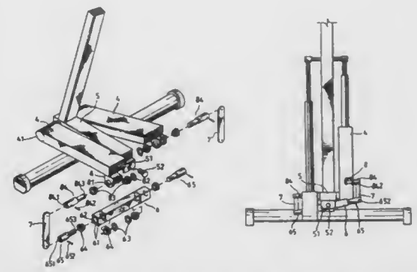
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5,048,821

## STEPPING EXERCISER STEP PLATES LINK MOTION MECHANISM

Wang Kuo-Liang, No. 1, Lane 154, Chang-Lung Rd., Tou-Pien Keng, Tai-Ping Hsiang, Taichung Hsien, Taiwan

Filed Nov. 23, 1990, Ser. No. 617,149
Int. Cl.[5] A63B 23/04
U.S. Cl. 272—70 2 Claims



1. For accurately forcing the two step plates of a stepping exerciser to smoothly alternatively oscillate back and forth at the two opposite sides of a base plate during stepping exercises, a step plates link motion mechanism comprising:

a mounting plate secured to said base plate of said stepping exerciser at the bottom of said base plate;

a lever pivotably secured to said mounting plate by a pivot bolt, having two axle seats at two opposite ends and respectively disposed beneath said two step plates, said axle seats having each a through-hole through the central axis of said lever;

a pair of holder plates respectively secured to said two step plates at the bottom of each respective step plate, and disposed above said lever, said pair of holder plates having each a through-hole disposed in parallel with the through-hole of said axle seats;

a first pair of axles respectively rotatably fastened in the

through-hole of said pair of holder plates, each having a notched end respectively disposed outside said pair of holder plates;

a second pair of axles respectively rotatably fastened in the through-hole of said two axle seats; and

a pair of flat rocker arms each having one end pivotably fastened in the notched end of said first pair of axles by a pivot pin and an opposite end pivotably fastened in the notched end of said second pair of axles.

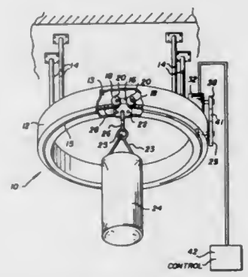
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**5,048,822**

## SIMULATED SPARRING APPARATUS AND METHOD

**Richard A. Murphy, 112 Old Forge Rd., Millington, N.J. 07946**

**Filed Sep. 17, 1990, Ser. No. 583,606**
**Int. Cl.[5] A63B *69/00***
**U.S. Cl. 272—78** **17 Claims**



1. An apparatus for simulating a sparring partner for a boxer, comprising:

a raised support structure means defining a raised horizontal non-linear path,

a target article suspended from the support structure by engagement means such that the target article is essentially at the level to be punched by a boxer standing on a surface beneath the support structure, and such that movement of the engagement means along said path causes similar horizontal movements of the target article,

drive means for moving the engagement means along said path, and hence effecting horizontal movement of the target article, said drive means being movable at different speeds to vary movements of the target article to thereby simulate varying movements of a sparring partner.

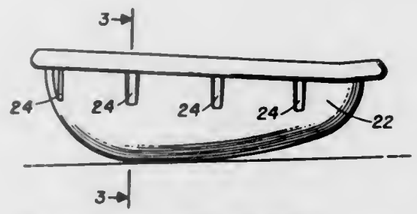
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**5,048,823**

## BALANCE BOARD

**John A. Bean, 5455 Kiowa Dr., La Mesa, Calif. 92042**

**Filed Aug. 27, 1990, Ser. No. 572,693**
**Int. Cl.[5] A63B *22/16***
**U.S. Cl. 272—111** **11 Claims**




1. A balance board simulator comprising:

an upper user surface member having a curvilinear front nose surface and a rectilinear back tail surface, said tail surface having a width smaller than the diameter of said nose surface;

a lower semi-bulbous base portion having a front nose portion and a rear tail portion, said lower base portion having a greater vertical elevation at said front nose portion than said tail portion thereof, said base portion having curvilinear indentations spacedly positioned along the upper periphery thereof;

a curvilinear rail member having an extended lip around its inner periphery; and

fastening means for securing together into a unitary structure said base portion, said lip of said rail member and said upper surface member.

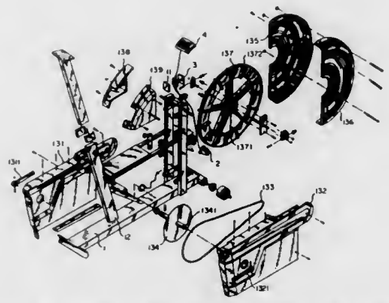
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**5,048,824**

## AIR RESISTANCE EXCERCISER WITH NEGATIVE ION GENERATOR

**U-Fu Chen, Taipei, Taiwan, assignor to Ya Te Industry Co., Ltd., Taipei, Taiwan**

**Filed Jul. 11, 1990, Ser. No. 550,921**
**Int. Cl.[5] A63B *21/00***
**U.S. Cl. 272—116** **3 Claims**



1. An air resistance exerciser with negative ion generator comprising an air resistance exerciser, a generator, a circuit board, and an ion generator; wherein said air resistance exerciser having a rotation mechanism which drives a blade wheel to rotate and thereby provides resistance to an user during exercise; said generator being disposed beside a rubber felloe of said blade wheel at a proper position so that said blade wheel drives said generator to generate voltage, said voltage is stabilized and increased through said circuit board and used as the power source for said ion generator; and wherein said ion generator is disposed on said air resistance exerciser and discharging air to the user, said ion generator being capable of purifying air and discharging negative ions at the same time and, consequently, having the function of eliminating drifting dusts in the air.

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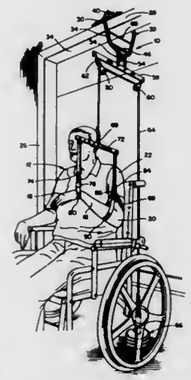
**5,048,825**

## PORTABLE DOORWAY AND FLOOR STAND EXCERCISER FOR USE BY WHEELCHAIR OCCUPANTS.

**Peggy L. Kelly, 76 Shore Dr., Clinton, Miss. 39056**

**Filed Sep. 14, 1990, Ser. No. 582,108**
**Int. Cl.[5] A63B *21/00, 21/06***
**U.S. Cl. 272—117** **11 Claims**

1. An exercise device comprising a clamp assembly, an elevated support structure supporting said clamp assembly, said clamp assembly including means releasably engaging the support structure, and user engaging exercise apparatus supported from said clamp assembly, said clamp assembly including a pair of arcuately curved clamp members having inwardly and downwardly inturned upper ends and lower ends supporting said apparatus, said exercise apparatus including means for engaging a wheelchair occupant to enable the wheelchair occupant to follow exercise regimens, and weight means connected with the means for engaging a wheelchair occupant to resist movement of said means, said exercise apparatus including an elongated support bar having a pulley at each end, means connecting said bar to said clamp members, a flexible line entrained over said pulleys, said weight means being connected to one end portion of the line and the wheelchair occupant engaging means being connected to the other end portion of the line, said elevated support structure being in the form of a door frame having horizontal trim strips defining upwardly facing shoulders, each of said clamp members including a



horizontally disposed, elongated end member engaging the upwardly facing shoulders formed by the trim strips, said clamp members being spring biased toward each other to engage the end members of the clamp members with the shoulders formed by the trim strips, and a locking rod interconnecting said clamp members to securely retain the clamp members in engagement with the door frame and enabling the clamp members to be oriented to either side of the door frame to enable a wheelchair occupant to move a wheelchair into a doorway and exercise their hands, wrists, arms, elbows and shoulders at either side of the wheelchair.

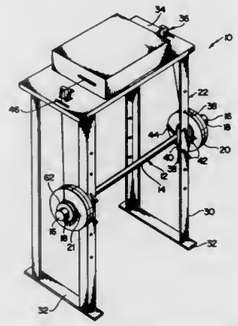
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**5,048,826**

## SAFETY APPARATUS FOR USE WITH BARBELL ASSEMBLY

**William C. Ryan, 553 Bellevue Ave., #15, Newport, R.I. 02840**

**Filed Aug. 23, 1990, Ser. No. 560,801**
**Int. Cl.[5] A63B *21/078***
**U.S. Cl. 272—123** **9 Claims**



1. A safety apparatus for use in connection with a barbell assembly comprising:



a. cable means securable to said barbell assembly;

b. support means for supporting said cable means at a point above said barbell assembly so that said cable means normally extends upwardly from said barbell assembly to said support means;

c. winch means actuatable for selectively longitudinally retracting and releasing said cable means;

d. tension sensing means for determining the tension in said cable means relative to predetermined upper and lower threshold tension values;

e. velocity sensing means for sensing the speed and direction of longitudinal travel of said cable means relative to said winch means; and

f. control means responsive to said tension sensing means and said velocity sensing means for controlling said winch means to normally maintain the tension in said cable means between said upper and lower threshold tension value unless the speed of travel of said cable means in a release direction exceeds a predetermined threshold velocity value, said control means controlling said winch means for increasing the tension in said cable means to a level above said upper threshold tension value in the event that the speed of travel of said cable means in a release direction exceeds said predetermined threshold velocity value.

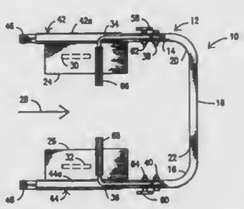
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**5,048,827**

## EXERCISE DEVICE FOR PERSONS CONFINED TO WHEEL CHAIR

**Anthony A. Caruso, Clearwater, Fla., assignor to Easy Access Corporation, Clearwater, Fla.**

**Continuation of Ser. No. 250,009, Sep. 27, 1988, abandoned. This application Nov. 9, 1989, Ser. No. 435,140**
**Int. Cl.[5] A63B *21/00***
**U.S. Cl. 272—130** **2 Claims**



1. An exercise device of the rowing machine type that requires the active participation of the exerciser, comprising:

a generally "U"-shaped base member that overlies and is supported by a support surface such as a floor;

said base member including a transversely disposed front part at a leading end thereof and a pair of longitudinally disposed side members extending in a common direction from opposite ends of said front part;

said side members being transversely spaced apart from one another a predetermined distance;

said predetermined distance being greater than the distance between the large wheels of a wheel chair so that the large wheels of a wheel chair disposed between said side members are spaced inwardly of said side members;

said base member having an open end into which a wheel chair may enter, said open end being at a trailing end of said base member;

a pair of inwardly extending flat wheel support members rigidly secured to each of said side members so that the wheels of a wheel chair rest thereupon when said device is in use to hold said base member against movement with respect to said support surface when the device is in use;

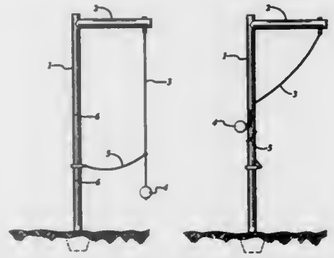
a pair of generally upstanding handle members;

each of said handle members being pivotally secured at its lowermost end to an associated side member at a predeter-

mined point remote from the leading end of said base member;
a pair of resistance members being mounted in interconnecting relation between associated side members and said handle members;
means for inhibiting lifting of the leading end of said base member when said handle members are oscillated in a rowing motion;
each of said resistance members including a housing member and a telescoping plunger member;
each of said housing members having a trailing end that is pivotally mounted to a trailing end of its associated side member;
each of said plunger members having a leading end movably mounted to its associated handle member and having a trailing end telescopically received within its associated housing member; and
said resistance members being operative to supply resistance to oscillation of said handle members when said handle members are oscillated in a vertical plane;
whereby the positioning of said resistance members between said handle members and the trailing end of said base member provides the means for inhibiting lifting of the leading end of the base member during exercise.

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**5,048,828**
**BATTING PRACTICE DEVICE**
**Carl D. Love, 4348 Baton Rouge Dr., Hermitage, Tenn. 37076**
**Filed Jul. 6, 1990, Ser. No. 549,378**
**The portion of the term of this patent subsequent to Feb. 6, 2007, has been disclaimed.**
**Int. Cl.[5] A63B *69/40***
**U.S. Cl. 273—26 E** **5 Claims**

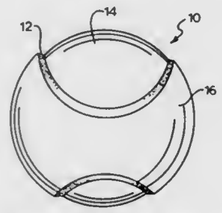


1. A batting practice device for use with a ball comprising:
a. a pole extending vertically from and secured to a practice surface;
b. a first tether means having its upper end attached proximate to the top of said pole;
c. said ball secured to the lower end of said first tether means;
d. a second tether means with one end connected to said pole, and the other end connected to said first tether means at a point intermediate its upper and lower ends.

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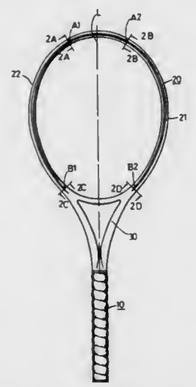
**5,048,829**
**AMUSEMENT BALL**
**Alvin Prokupek, P.O. Box 521, Downers Grove, Ill. 60515**
**Filed Feb. 13, 1991, Ser. No. 654,599**
**Int. Cl.[5] A63B *43/04, 39/06, 37/12***
**U.S. Cl. 273—58 K** **2 Claims**

1. An amusement ball comprising:
a core; and
a flexible cover attached to said core, said cover being formed of two intermeshing figure-8 sections, wherein one section is thicker than the other section, whereby an edge is formed at the transition between said sections to significantly affect the direction and degree of rebounds of said ball when bounced.



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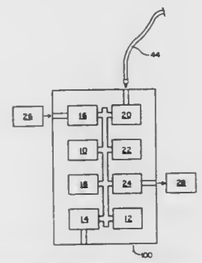
**5,048,830**
**RACKET FRAME WITH SHOCK ABSORBING CHARACTERISTICS**
**Kun-Nan Lo, No. 33, Hsiang-Ho Rd., Li-Lin Tsun, Tan-Tzu Hsiang, Taichung Hsien, Taiwan**
**Filed Sep. 20, 1990, Ser. No. 585,761**
**Int. Cl.[5] A63B *49/02***
**U.S. Cl. 273—73 C** **3 Claims**



1. A racket frame having a shaft portion, a looped frame portion, and a throat between said looped frame portion and said shaft portion, said looped frame portion having an uppermost point opposite to said throat, and a first and second portion divided by a longitudinal axis which extends along said shaft portion and passes through said uppermost point and said throat,
said looped frame portion having a gradually varying cross-section,
said first portion having a first point of smallest cross-section adjacent to said uppermost point and a second point of largest cross-section adjacent to said throat,
said second portion having a third point of largest cross-section adjacent to said uppermost point and a fourth point of smallest cross-section adjacent to said throat,
said first and third point being symmetrically positioned on the racket frame with respect to said longitudinal axis,
said second and fourth point being symmetrically positioned on the racket frame with respect to said longitudinal axis.



**5,048,831**
**ELECTRONIC GAME APPARATUS AND METHOD OF USE**
**Jim T. Sides, 218 Valhalla Rd., Cordele, Ga. 31015**
**Filed Aug. 31, 1990, Ser. No. 578,993**
**Int. Cl.[5] A63F *9/22***
**U.S. Cl. 273—85 G** **19 Claims**

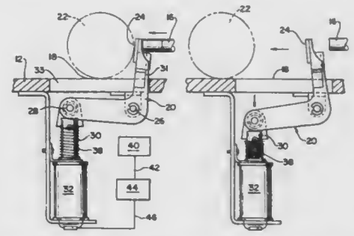


1. An electronic game apparatus for the purpose of playing one or more preprogrammed electronic games, comprising
a game display and control module having
a monitor display screen for the purpose of displaying text and graphic images;
a monitor controller unit for the purpose of controlling the image display on said monitor display screen;
a keyboard input unit having a plurality of keys for the purpose of input of data and commands to the apparatus by a user thereof;
a power supply unit for the purpose of supplying electrical power to the components of the apparatus;
a computer processor unit for the purpose of receiving, processing, and outputting data and control signals during operation of the apparatus;
a first memory unit for the purpose of temporarily storing data to be accessed by other units of the apparatus during operation of the apparatus;
a second memory unit for the purpose of storing data representing final game scores or player point totals at the conclusion of an electronic game;
a communications unit for the purpose of transmitting communications signals to and receiving communications signals from a separate electronic game apparatus so as to allow interactive play of an electronic game between two or more players; and
a communications linkage for the purpose of transmitting communications signals between communications units of two or more discrete game display and control modules of the apparatus.

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**5,048,832**
**DOUBLE BALL LAUNCHER FOR ROLLING BALL GAME**
**Joseph E. Kaminkow, Arlington Heights, Ill., assignor to Data East Pinball, Inc., Melrose Park, Ill.**
**Filed Feb. 19, 1991, Ser. No. 656,584**
**Int. Cl.[5] A63F *7/26***
**U.S. Cl. 273—129 V** **10 Claims**

1. In a rolling ball game which comprises a playfield and means for launching rolling balls onto the playfield, the improvement comprising, in combination:
said means comprising a station where a ball at rest is positioned for said launching, spring-operated, manual plunger means for launching said ball from the station, and



an electrically operated arm for launching said ball from the same station.

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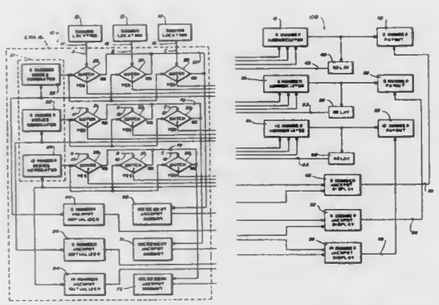
**5,048,833**
**APPARATUS FOR DETECTING A SERIES OF GAME OUTCOMES**
**Steward M. Lamle, 505 E. 79th St., New York, N.Y. 10021**
**Filed Mar. 1, 1990, Ser. No. 486,784**
**Int. Cl.[5] A63B *71/00*; A63F *1/00, 1/18***
**U.S. Cl. 273—138 A** **11 Claims**

1. An apparatus for awarding a jackpot win to a player having a winning bet placed on a gaming device, the apparatus comprising:
first random number generating means for generating a first plurality of random numbers representative of game outcomes from a series of hypothetical games;
means for comparing the first plurality of random numbers with the game outcomes from a series of actual games played on the gaming device; and
means for awarding a jackpot win to a player having a

VOL 1130 ISS 3 SE 17 1991 UMI



winning bet on the last game of said series of actual games in the event that the game outcomes from said series of



actual games are the same as the first plurality of random numbers.

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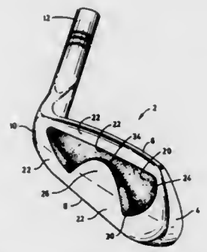
**5,048,834**

**IRON TYPE GOLF CLUB HEAD**

**Geoffrey W. Gorman, Greer, S.C., assignor to Dunlop Slazenger Corp., Greenville, S.C.**

**Filed May 29, 1990, Ser. No. 529,943**
**Int. Cl.[5] A63B** *53/04*
**U.S. Cl. 273—167 F** **4 Claims**

1. An iron type golf club head comprising a heel portion, a toe portion, a bottom sole portion, a top ridge portion, a hosel portion, a face surface having a center of percussion, a rear surface, a peripheral mass formed on said rear surface adjacent said heel, toe, bottom sole and top ridge portions, said peripheral mass defining a cavity, a bottom of said cavity being defined by said rear surface, and a weight portion extending from said rear surface and being disposed behind said center of percussion, said weight portion extending from said peripheral mass adjacent said bottom sole portion and being spaced from said peripheral mass adjacent said top ridge portion and said heel and toe portions, said weight portion having a thickness at its juncture with said peripheral mass adjacent said bottom sole



portion substantially exceeding the thickness of said weight portion at its edge closest said top ridge portion.

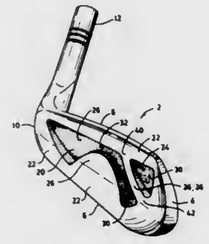
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**5,048,835**

**WEIGHTED GOLF CLUB HEAD**

**Geoffrey W. Gorman, Greer, S.C., assignor to Dunlop Slazenger Corp., Greenville, S.C.**

**Filed May 29, 1990, Ser. No. 529,957**
**Int. Cl.[5] A63B** *53/04*
**U.S. Cl. 273—167 F** **11 Claims**



1. An iron type golf club head comprising a heel portion, a toe portion, a bottom sole portion, a top ridge portion, a hosel portion, a face surface having a center of percussion, a rear surface, a peripheral mass formed onsaid rear surface adjacent said heel, toe, bottom sole and top ridge portions, said peripheral mass defining a cavity, a bottom of said cavity being defined by said rear surface, a first weight portion extending from said rear surface and being disposed behind said center of percussion, said first weight portion extending from said peripheral mass adjacent said bottom sole portion and spaced from said peripheral mass adjacent said top ridge portion and said heel and toe portions, and a second weight means extending from said rear surface, said second weight means extending from said peripheral mass and from said first weight portion, whereby to interconnect said peripheral mass and said first weight portion.

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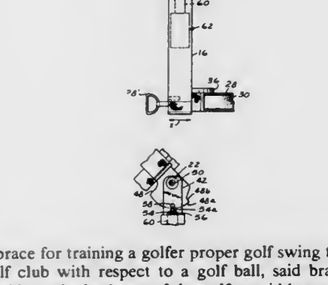
**5,048,836**

**ATHLETIC SWING PRACTICE APPARATUS**

**Miro D. Bellagamba, Orlando, Fla., assignor to International Sports Technology, Inc., Orlando, Fla.**

**Filed Oct. 9, 1990, Ser. No. 594,054**
**Int. Cl.[5] A63B** *69/36, 21/04*
**U.S. Cl. 273—183 B** **9 Claims**

1. An athletic swing practice apparatus comprising:
a lower back support belt having a pair of flexible thigh straps for strapping to a person's thighs and a flexible waist belt attachable around a person's waist and flexible buttock support strap means attached to each flexible thigh strap and to said flexible waist belt so that a person wearing the lower back support belt supports their lower back during predetermined movement of the body;
a pair of resilient cords;
strap means attached to said lower back support belt and having a pair of strap end portions extending from said lower back support belt and each strap end portion having adjustable attachment means thereon for attaching one of said resilient cords to each strap end portion; and



a pair of stationary members adapted to be positioned a predetermined distance apart and having means for attaching one said resilient cord to each stationary member at one end portion of each resilient cord member whereby a person can practice an athletic swing while wearing said lower back support belt and having said straps attached with resilient cords to positioned stationary members and thereby apply a predetermined pressure to the person's lower torso during a practice swing.

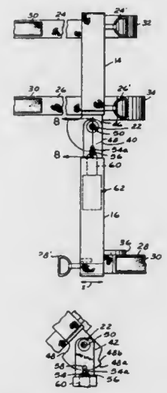
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**5,048,837**

**GOLF CLUB SWING TRAINING BRACE**

**Michael P. Manley, 1090 Oakwood, Ortonville, Mich. 48426; James J. Manley, 17671 Barry, Mt. Clemens, Mich. 48044; Brian K. Blackburn, Rochester, Mich.; Scott B. Gentry, Shelby, Mich., and Joseph F. Mazur, Washington, all of Mich., assignors to Michael Manley, Ortonville and James Manley, Mt. Clemens, Mich.**

**Filed Dec. 31, 1990, Ser. No. 636,508**
**Int. Cl.[5] A63B** *69/36*
**U.S. Cl. 273—183** **20 Claims**



1. A brace for training a golfer proper golf swing technique of a golf club with respect to a golf ball, said brace being connectable to the lead arm of the golfer, said brace comprising:
a forearm brace component, said forearm brace component being structured to extend a substantial length along of the golfer's forearm;
forearm attachment means for connecting said forearm brace component to the forearm of the golfer;
an upper arm brace component, said upper arm brace component being structured to extend a substantial length along the golfer's upper arm;
upper arm attachment means for connecting said upper arm brace component to the upper arm of the golfer;
pivot means connected with said forearm brace component and said upper arm brace component for pivotally connecting said forearm brace component with respect to said upper arm brace component; and
pivot control means connected with said pivot means for selectively locking and unlocking pivotability of said pivot means at predetermined portions of the golf swing;
wherein the golfer attaches said upper arm brace component to and parallel with the upper arm of the lead arm and attaches said forearm brace component to and parallel with the forearm of the lead arm, pivoting of said upper arm brace component with respect to said forearm brace component at said pivot means being axially aligned with the elbow of the lead arm, the golfer thereupon being unable to bend the elbow when said pivot control means locks said pivot means, and the golfer being able to bend the elbow when the pivot control means unlocks said pivot means.

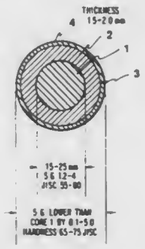
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**5,048,838**

**THREE-PIECE SOLID GOLF BALL**

**Toshio Chikaraishi, Akishima; Hidetoshi Ieiri, Kodaira; Kazuhiko Sugai, and Kazuto Maehara, both of Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan**

**Filed Mar. 15, 1990, Ser. No. 493,644**
**Claims priority, application Japan, Mar. 15, 1989, 1-063306**
**Int. Cl.[5] A63B** *37/06*
**U.S. Cl. 273—228** **8 Claims**



1. A three-piece solid golf ball comprising:
a two-piece solid core consisting of an inner layer and an outer layer and
a cover enclosing the core, wherein
said two-piece solid core consists of the inner layer having a diameter in the range of 15 to 25 mm, a weight in the range of 5 to 12 grams, a specific gravity of 1.56 to 4, and a hardness in the range of 55 to 80 in JIS C hardness scale, and the outer layer having a lower specific gravity than that of the inner layer by 0.5 to 1.5, and
said cover having a radial thickness of 1.5 to 2.5 mm.

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**5,048,839**

**MEDIATED STRATEGY GAME**

**Mark P. Hurst, 7 Porter Rd., Annapolis, Md. 21402**

**Filed Apr. 2, 1990, Ser. No. 502,742**
**Int. Cl.[5] A63F** *3/00*
**U.S. Cl. 273—240** **12 Claims**

1. A method for playing a mediated war game on at least three transparent sheets having identical geographical maps

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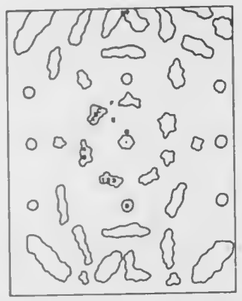


permanently affixed thereon, played by at least a first player using a first transparent play sheet having the original positions of at least a first and second game piece removably affixed thereon and by a second player using a second transparent play sheet having the original positions of at least a third and fourth game piece removably affixed thereon, and mediated by a mediator using a transparent master sheet having the original positions of the first, second, third and fourth game pieces removably affixed thereon, comprising:

1) ordering by the first player;

2) processing by the mediator of the first player's ordering;

3) ordering by the second player;



4) processing by the mediator of the second player's ordering; and

5) repeating steps **1** and **2** and steps **3** and **4** until a predetermined goal is reached by at least one player; wherein the ordering step by the first player comprises recording indicia on the first transparent play sheet to indicate to the mediator a new position for each of the first and second game pieces; and the ordering step by the second player comprises recording indicia on the second transparent play sheet to indicate to the mediator a new position for each of the third and fourth game pieces.

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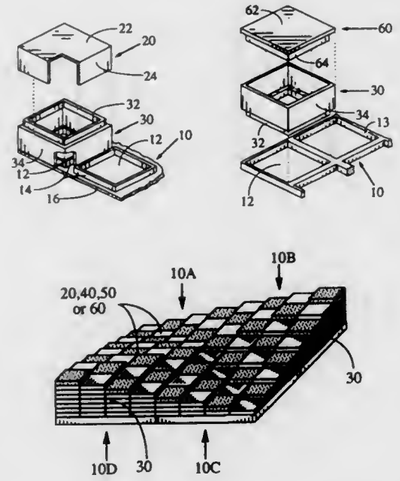
**5,048,840**
**GAMEBOARD BUILDING APPARATUS**
**Albert L. Johnson, Jr., 3913 Deborah La., Anchorage, Ak. 99504**
**Filed Oct. 9, 1990, Ser. No. 594,429**
**Int. Cl.[5] A63F *3/00*; A63H *33/08***
**U.S. Cl. 273—241** **19 Claims**

1. Gameboard apparatus which comprises

a square gameboard, said gameboard comprising a plurality of equal playing-position squares, each of said squares comprising a plurality of substantially vertical walls within bounds of said squares, said walls being fixed, adapted to receive and frictionally interlock with substantially vertical walls of superjacent stacking pieces and of superjacent top pieces,

a plurality of square stacking pieces, each of said stacking pieces comprising four substantially vertical female peripheral walls, exterior surfaces of which correspond to said bounds of said playing-position squares and a plurality of opposing substantially vertical male walls horizontally indented from said exterior surfaces of said female peripheral walls, and

a plurality of top pieces each of said top pieces comprising a top surface, each top surface defined by a substantially flat surface extending throughout said top surface, wherein the exterior surfaces of said female peripheral walls define the bounds of said substantially flat surface and a plurality of opposing substantially vertical walls frictionally interlockable with said walls of said gameboard and with said walls of said stacking pieces.




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**5,048,841**
**SIMULATED RACING BOARD GAME AND METHODS OF UTILIZING SAME**
**Rodney A. Manney, Marine City; Milton V. Manney, and Bruce I. Manney, both of Pontiac, all of Mich., assignors to Bar M. Company, Pontiac, Mich.**
**Filed May 21, 1990, Ser. No. 526,023**
**Int. Cl.[5] A63F *9/14***
**U.S. Cl. 273—246** **20 Claims**

1. A simulated racing board game apparatus for use by a plurality of players, comprising:

a game board having a playing surface provided thereon;

said playing surface having a simulated race course depicted thereon, including a plurality of adjacent racing lanes;

a plurality of playing pieces each representing a player for movement along said simulated race course;

means for establishing a sequential playing order to be followed by said players in turn;

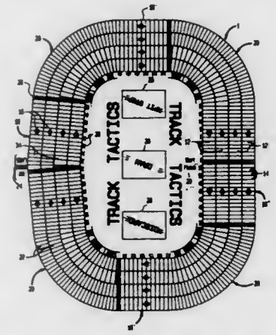
means for determining a plurality of potential movements of each said playing piece at a given player's turn;

each said racing lane being divided into a plurality of discrete, sequential playing spaces, and each said racing lane being designated by one of the four suits in a standard deck of playing cards;

said determining means including at least one deck of standard playing cards to be randomly distributed to and strategically discarded by the players throughout the course of a game for determining movement of said playing pieces along said simulated race course;



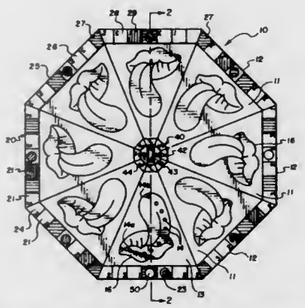
suit coding means on each playing card for determing in which lane any player's playing piece may be moved; and




a facial designation means on each playing card for determining the number of spaces by which a playing piece may be moved along the racing lane.

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**5,048,842**
**TRIVIA GAME SYSTEM**
**Angela B. Proctor, 3784 S. 610 East, Salt Lake City, Utah 84106**
**Filed Mar. 13, 1989, Ser. No. 322,682**
**Int. Cl.[5] A63F *3/00***
**U.S. Cl. 273—248** **7 Claims**



1. A game including game apparatus comprising:

a playing board divided into individual sectors for each player, each sector having a player movement track including a starting position, a terminal position and a plurality of intermediate positions therebetween and wherein the game is won by a player who first moves a progress marker from the starting position to the terminal position;

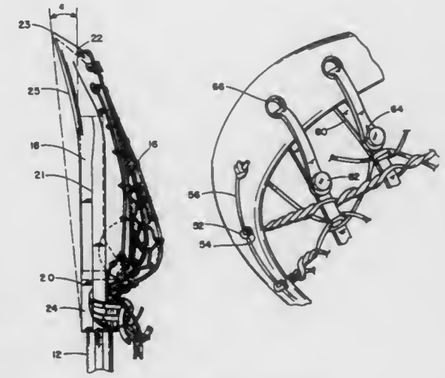
said board further including a movement track for random movement of a player piece, said track extending in unending configuration around the playing board in traversing manner by each individual sector, said movement track comprising a plurality of movement positions which include a numerical reference representing a potential number of moves of the progress marker toward the terminal position of the player movement track, said moves of the progress marker being contingent upon compliance with an instructional requirement directed to a player landing upon the movement position;

means associated with the movement track for defining instructional requirement defining action to be taken by the landing player which, if successfully accomplished, entitles the landing player to move the progress marker; and

a timing device including means for starting a timing sequence and for signaling completion of the timing sequence, said timing device further including an external holding compartment and a removable element, said removable element being supported within the compartment with most of said removable element being exposed to open view of the players and being manually removable from the timing device by any player after detection of the completion signal.

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**5,048,843**
**LACROSSE STICK**
**Kurt H. Dorfi, June Rd., North Salem, N.Y. 10560, and Richard C. Mongero, 2164 Crumpond, Yorktown Hgts., N.Y. 10598**
**Filed Oct. 17, 1990, Ser. No. 598,931**
**Int. Cl.[5] A63B *59/02***
**U.S. Cl. 273—326** **26 Claims**



1. A head for a lacrosse stick comprising

a generally V-shaped open frame;

means carried by said frame for securing a netting along a back side thereof and leaving the front side of said frame open for receiving a lacrosse ball;

said frame including a pair of side walls lying generally in a plane and joined one to the other adjacent the lower apex of said generally V-shaped frame by a base including a generally curved surface defined by an axis substantially normal to said plane, said side walls being joined one to the other at the upper end of said frame by a crosspiece;

said side walls having a first predetermined width in a direction generally normal to the plane containing said frame;

said curved surface having a recess opening therethrough and formed along a back edge of the base of the frame defining at least in part a socket in said frame base for receiving at least part of a lacrosse ball.

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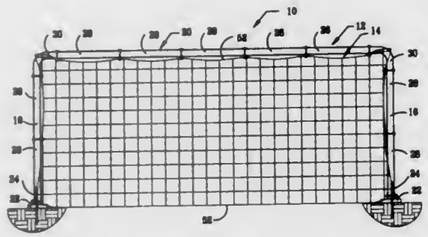


5,048,844

## PORTABLE REBOUNDING SOCCER TRAINING GOAL

Arthur S. Haseltine, Springfield, Mo., assignor to Soccerstop, Inc., Springfield, Mo.

Filed Dec. 21, 1990, Ser. No. 634,084
Int. Cl.[5] A63B *63/00*
U.S. Cl. 273—400 12 Claims



1. A soccer practice device, comprising:

frame means having first and second spaced side members, each of said side members having a top end and a bottom end, and further having a cross member extending between said side members and connected to said side members at said top ends, whereby said cross member is spaced above the ground when said frame means is in an operative position; and

net means including a net in the form of a lattice, said lattice having a perimeter corresponding substantially in shape and size to said frame means, and further including a perimeter cord connected to, and extending along, said perimeter of said net, said perimeter cord having a length less than that of said perimeter of said net, and said perimeter cord being connected to said frame at least at spaced locations along said frame, whereby said net means extends between said side members and said cross member.

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5,048,845

## ENTRAPMENT ASSEMBLY

David B. Dunipace, Fontana, Calif., assignor to Innova Champion Discs, Inc., Ontario, Calif.

Filed Mar. 30, 1989, Ser. No. 331,268
Int. Cl.[5] A63B *67/06*
U.S. Cl. 273—400 33 Claims



1. An entrapment assembly for arresting and trapping an object thrown at said assembly comprising:

(a) a pedestal means for supporting said assembly above the ground;

(b) an upwardly opening nest means for holding said thrown object including means for operatively connecting said pedestal to said nest means, said nest means having a generally basket shape with upwardly extending edge portions;

(c) a downwardly opening and generally domed-shaped top portion including means for operatively connecting said top portion to said nest means; and

(d) at least one deflection member operatively connected to said top portion and freely extending downwardly therefrom,

wherein at least two of said pedestal means, said nest means and said top portion are substantially interchangeable with each other.

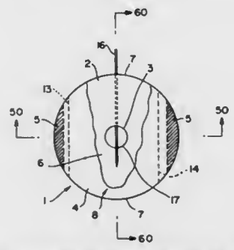
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5,048,846

## METHOD FOR SEALING GAS RELEASE VALVE

Makoto Ichikawa, Tokyo, Japan, assignor to Fujimori Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1989, Ser. No. 409,598
Claims priority, application Japan, Sep. 12, 1988, 63-227747
Int. Cl.[5] B31B *1/84*
U.S. Cl. 277—1 3 Claims



1. A method for preparing and attaching a gas release valve to a packaging container designed for holding a commodity which generates a small amount of gases over time during shelf storage, the container having a vent hole, the steps comprising:

preparing a gas release valve comprising a base film having an aperture and a valve film superimposed on one surface of the base film covering the aperture and defining therebetween a channel having opposed peripheral edges;

inserting a nozzle into said channel through the aperture so that the nozzle urges the valve film to separate from the base film to create a gap therebetween;

introducing a fluid sealant through the nozzle to the channel at a position intermediate one peripheral edge of the channel and the circumference of the aperture, whereby the gap allows the sealant admitted to spread over the channel so that the sealant is evenly distributed over the sealant, thereby filling the channel with the sealant without depositing the sealant to the periphery of the valve and leaving the sealant in the aperture; and

adhesively bonding the base film of the valve having the sealant filled in the channel to the container such that the valve allows the gases given off by the commodity to escape to the exterior through the vent hole and the channel when the gas pressure rises beyond the atmospheric pressure, whereby the valve having no sealant on the outer surfaces thereof is firmly bonded to the container without staining it and no sealant in the aperture of the valve prevents the entry of sealant through the vent hole into the container.

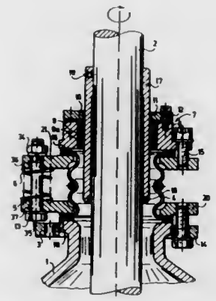


5,048,847

## STUFFING BOX FOR SEALING LARGE-SCALE DEFLECTION SHAFTS

Gyula Kovács, Monor, and Endre Gulyás, Budapest, both of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Hungary

Continuation of Ser. No. 216,284, Jul. 7, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 545,102
Claims priority, application Hungary, Jul. 10, 1987, 3254/87
Int. Cl.[5] F16J *15/52*
U.S. Cl. 277—2 5 Claims



1. A box construction for sealing a rotating shaft extending through a wall of a vessel, said construction comprising a stuffing box surrounding said shaft, a tubular compensator for accommodating axial and radial displacement of said shaft, said compensator having two ends, one end of said compensator being sealingly connected to said stuffing box and the other end sealingly connected to said wall of said vessel, wherein the ends of said compensator are held in connection by separate annular flanges, one of said flanges being connected rigidly and releasably to said vessel and the other of said flanges being connected rigidly and releasably to said stuffing box, said flanges being interconnected by means of bolts passing through peripheral holes of said flanges, said bolts having fixed stops at their outer ends, and a prestressed spring member being arranged between said flanges.

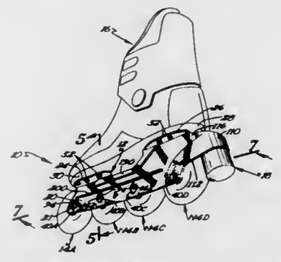
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5,048,848

## IN-LINE ROLLER SKATE WITH AXLE APERTURE PLUGS FOR SIMPLIFIED WHEEL INSTALLATION

Brennan J. Olson, Eden Prairie, and Thomas J. Brace, Minneapolis, both of Minn., assignors to Rollerblade, Inc., Minnetonka, Minn.

Filed Jun. 12, 1987, Ser. No. 57,056
Int. Cl.[5] A63C *17/06*
U.S. Cl. 280—11.22 6 Claims



1. An in-line roller skate usable by a skater on a riding surface comprising:

at least three wheels, each wheel having a central axis of rotation;

at least three wheel axles having predetermined lengths, an axle being positioned on said central axis of each said wheel;

a frame carrying said axles so as to rotatably mount said plurality of wheels on said frame and to substantially center all said wheels on a common plane with the axes of rotation of said wheels being substantially perpendicular to said common plane;

attachment means connected to said frame capable of releasably securing said frame to the skater;

each of said wheels including a tire member, a hub, and bearing means carried by said hub and supported on a said wheel axle;

said bearing means including an inner and outer race;

said frame including a plurality of axle apertures, each aperture having an upper edge, said apertures being arranged in pairs with the two apertures of each pair confronting each other and being positioned on a said wheel axis of rotation;

a plurality of axle aperture plugs, a said plug mateably engaging each said axle aperture to retain said plugs in said apertures during insertion of said wheels between said plugs, each said plug including a spacer engaging said bearing inner race and spacing said outer race of said bearing means from said frame while avoiding slippage and dislocation of said plug relative to said frame during installation of each of said wheels, each of said axle aperture plugs having a transverse axle bore therethrough coaxial with a said axle and coaxial with the said central axis of rotation of a said wheel;

each said axle and the said coaxial axle bore of said axle aperture plug having cooperating cross sections allowing said entire length of said axle to be slideably insertable through said coaxial axle bores of a pair of said axle aperture plugs and through said inner race of said bearing means positioned between said pair of axle aperture plugs having coaxial axle bores; and

clamping means on each said axle for attaching said axle to said frame and clamping said plugs and said inner races of said bearing means within said frame.

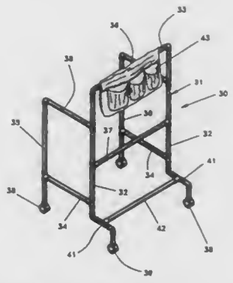
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5,048,849

## CHANGE STROLLER

Linton Mathews, and Teresa L. Mathews, both of 6621 Cowboy Trail, Las Vegas, Nev. 89131

Filed Jan. 10, 1990, Ser. No. 463,151
Int. Cl.[5] B62B *3/00*
U.S. Cl. 280—47.35 16 Claims



1. A change stroller comprising:

(a) a vertically upright framework having at least two laterally spaced vertical front posts, at least two laterally spaced vertical rear posts and at least two laterally spaced horizontal handle members, each of said handle members joining one of said front posts to one of said rear posts so that the framework is open in the rear,

(b) a laterally extending upper cross member joining the two front posts,

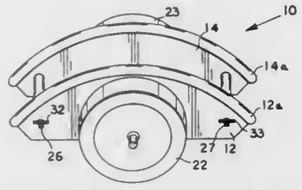
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(c) a change belt attached to the laterally extending upper cross member,
(d) the framework being mounted on a platform, and
(e) the platform including wheels thereon, at least one of the platform wheels being offset relative to the vertical front posts to provide for a proper center of gravity to keep the stroller from being tipped in a coin spilling direction by the weight of the change belt attached to the upper cross member.

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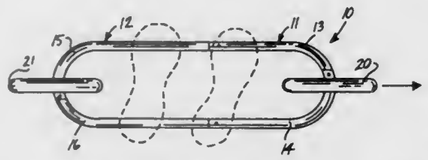
5,048,850
**WHEELED ARTICLE CARRIER**
Don C. McDonald, 2604 Barksdale Ct., Clearwater, Fla. 34621
Filed Sep. 17, 1990, Ser. No. 583,475
Int. Cl.[5] B62B *1/14*
U.S. Cl. 280—47.131 1 Claim




1. A wheeled article carrier comprising in combination, a pair of spaced side plates each having an arcuate periphery and a base, resilient elastomeric material carried by said arcuate periphery, an axle shaft carried by said plates adjacent the base thereof, a pair of wheels on said axle shaft, a pair of adjusting and supporting bolts extending laterally between and carried by said side plates and disposed at a location intermediate said arcuate periphery and said axle shaft, an adjusting nut carried by each of said bolts, a resilient elastomeric tube received by each of said bolts with the axial ends of said tube being compressed by said plates, a resilient elastomeric tube carried by said axle shaft and disposed and compressed between said side plates, the elastomeric material carried by said arcuate periphery has a longitudinal slit therein receiving said arcuate periphery, which slit terminates short of the ends of said material, said side plates have notches formed therein at the ends of said arcuate periphery, and said unslit ends of said resilient material on said arcuate portion is received and secured in said slits.

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5,048,851
**PORTABLE VEHICLE APPARATUS**
David Alarcon, RR1 2830 Bonitz, La Luz, N. Mex. 88337
Filed Aug. 30, 1990, Ser. No. 574,882
Int. Cl.[5] B62M *1/00*
U.S. Cl. 280—87.042 1 Claim

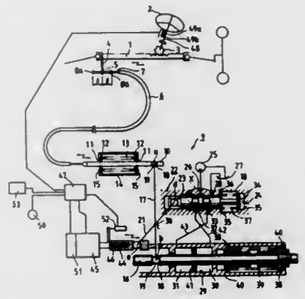



1. A portable vehicle apparatus comprising,
a longitudinally aligned elongate loop, the loop including a first "U" shaped frame selectively securable to a second "U" shaped frame, the first "U" shaped frame including a first wheel rotatably mounted to the first "U" shaped frame medially thereof, and the second "U" shaped frame including a second wheel rotatably mounted to the second "U" shaped frame medially thereof, with the first and second wheels aligned in a single plane,
and
wherein the first "U" shaped frame includes a first "J" shaped leg and a second "J" shaped leg, the first "J" shaped leg securable the second "J" shaped leg, the first "J" shaped leg including a boss plug receivable within the second "J" shaped leg, with the boss plug including a boss plug bore, and the second "J" shaped leg including a first connector pin to secure the second "J" shaped leg to the first "J" shaped leg, and the second "U" shaped frame including a third "J" shaped leg and a fourth "J" shaped leg, the fourth "J" shaped leg including a further boss plug, with the further boss plug including a further boss plug bore, the further boss plug bore receivable within the third "J" shaped leg and the third "J" shaped leg including a further first connector pin to secure the third "J" shaped leg to the fourth "J" shaped leg,
and
wherein the first and second "J" shaped legs of the first "U" shaped frame includes spaced parallel first end legs, and the third and fourth "J" shaped legs of the second "U" shaped frame includes spaced parallel second end legs, the spaced parallel second end legs complementarily and telescopingly receivable within the first end legs,
and
wherein the second end legs each include apertures equally spaced therealong, and the first end legs each include a second connector pin directed through the first end legs to secure the second end legs within the first end legs,
and
wherein each of the first end legs include a plurality of first fabric belt members orthogonally mounted across the first legs, and the second end legs include a further plurality of fabric belt members orthogonally mounted at spaced intervals along the second end legs, and the fabric belt members each include cooperative hook and loop fastener patches to secure the fabric belt members together,
and
wherein the first "U" shaped frame includes a first inflatable bladder and the second "U" shaped frame includes a second inflatable bladder, the first inflatable bladder mounted between the first wheel and an adjacent fabric belt member, and the second inflatable bladder positioned between the second wheel and an adjacent fabric belt member of the second "U" shaped frame, and each inflatable bladder includes an inflation valve to effect selective inflation of each inflatable bladder.

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5,048,852
**FOUR-WHEEL STEERING APPARATUS**
Isamu Chikuma; Satoru Shimada, and Hiroshi Eda, all of Maebashi, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 9, 1989, Ser. No. 433,915
Claims priority, application Japan, Mar. 10, 1989, 1-56299; Mar. 13, 1989, 1-57808
Int. Cl.[5] B62D *5/00*
U.S. Cl. 280—91 30 Claims

1. A four-wheel steering apparatus comprising a front wheel steering member for steering front wheels by being displaced according to a movement of a steering wheel, a rear wheel steering mechanism for steering rear wheels, a play mechanism, and a coupling mechanism mechanically coupling together said front wheel steering member and an input member of said rear wheel steering mechanism through said play mechanism for transmitting displacement of said front wheel steering member to said input member of said rear wheel steering mechanism by way of said play mechanism, said play mechanism transmitting displacement of said front wheel steering member only when said front wheel steering member is displaced in excess of a predetermined amount from a position corresponding to a neutral steering angle of the front wheels, said rear wheel steering mechanism including a mechanism for steering the rear wheels according to a movement of said input member and an independent steering mechanism for steering



the rear wheel independently of displacement of said front wheel steering member.

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5,048,853
**FOUR-WHEEL STEERING VEHICLE APPARATUS**
Harlan J. Trefz, and John N. Lesikar, both of Jackson, Tenn., assignors to Noma Outdoor Products, Inc., Jackson, Tenn.
Continuation of Ser. No. 409,574, Sep. 19, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 630,875
Int. Cl.[5] B62D *7/15*
U.S. Cl. 280—91 4 Claims



1. A four-wheel steering apparatus for controlling the steering of the front and rear wheels of a vehicle, said apparatus comprising:
(a) rotatable interconnecting means formed of a sector gear having a front portion with teeth and a cam slot formed to the rear of said teeth;
(b) front wheel steering means for steering the front wheels of said vehicle and having at least one front link assembly attached to said front wheels and said rotatable means;
(c) rear wheel steering means for steering the rear wheels of the vehicle and having:
(1) a rear link assembly having one end engaged with the cam slot of said rotatable means and an opposite end;
(2) a rear wheel steering assembly attached to the opposite end of said rear link assembly and including a rotatable pivot shaft, a pair of tie rods, a first lever arm attached between said rear link assembly and said pivot shaft and a second lever arm attached between said pair of tie rods and said pivot shaft; and
(d) said rotatable means serving to connect said front and rear steering means together to move in relation to one another such that there is a dwell period between the steering of said front wheels and the steering of said rear wheels due to the engagement of said rear link assembly with said cam slot whereby front wheel steering is initiated immediately upon rotation of said sector gear, but rear wheel steering is delayed until said sector gear is moved through an arc of approximately eight degrees, and thereafter additional movement of said sector gear causes said rear link assembly to act on said first lever arm to turn said pivot shaft and said second lever arm to cause concurrent steering of said front and rear wheels.

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5,048,854
**PIVOTING QUICK-CONNECT HITCH SYSTEM**
Murrell C. Clark, Rte. 1, Box 913, Lake Village, Ark. 71653
Filed Aug. 16, 1990, Ser. No. 568,182
Int. Cl.[5] B60D *1/18*
U.S. Cl. 280—477 17 Claims



1. A hitch system for coupling a trailer to a two vehicle, said system comprising a rigid frame comprising a cavity and a mouth opening into said cavity, a rigid, removable bar to which said trailer may be selectively attached, means for pivotally mounting said frame to said tow vehicle, means for limiting pivoting of said frame relative to said two vehicle, winch means having a cable connected thereto for drawing said bar into said cavity thereby coupling said trailer to said system, and, a means for selectively locking said bar within said cavity, said frame comprising a rigid plate adapted to contact an underside of the two vehicle, and a lower base projecting away from said mouth generally parallel with and rigidly connected with said plate, said base forming a platform for mounting said winch means with the cable passing through the cavity.

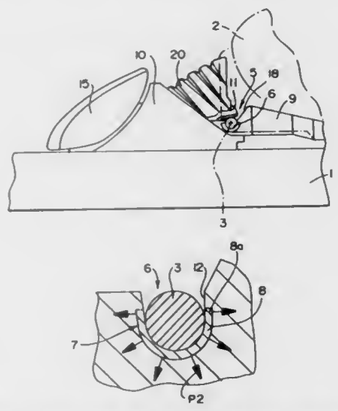
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5,048,855
**SKI BINDING APPARATUS AND BEARING INSERT THEREFOR**
Eric Girault, Seynod, and Paul Arnulf, Alby Sur Cheran, both of France, assignors to Salomon S.A., Annecy Cedex, France
Filed Apr. 12, 1990, Ser. No. 507,880
Claims priority, application France, Apr. 12, 1989, 89 05168
Int. Cl.[5] A63C *9/10*
U.S. Cl. 280—615 59 Claims

1. A binding apparatus for affixing a cross-country ski shoe to a ski, the binding apparatus having a longitudinal direction, the shoe having mounted at a front end thereof a hinge pin extending transversely to the longitudinal direction, said hinge pin having a predetermined length, said apparatus comprising:
a bearing housing adapted to be mounted on an upper surface of the ski, said bearing housing having an inner surface and an opening positioned upwardly with respect to the ski for receiving said hinge pin;
a member movable from a retracted position to a position

above said opening of said housing for retaining said hinge pin within said housing; and

an insert affixed to said housing inner surface for receiving



and contacting said hinge pin along a contact area, and for increasing the area of said housing inner surface against which forces from said hinge pin are transmitted during skiing.

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**5,048,856**

## GOLF TROLLEY

**Mark A. Sanders, Windsor, and Derek D. Roberts, Holyport, both of England, assignors to Acushnet Limited, United Kingdom**

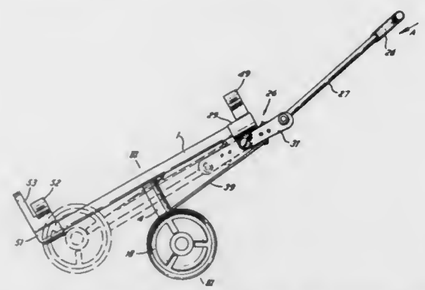
**Continuation of Ser. No. 271,899, Nov. 15, 1988, Pat. No. 4,961,593. This application Jun. 5, 1990, Ser. No. 533,466**

**Claims priority, application United Kingdom, Nov. 18, 1987, 8726958**

**The portion of the term of this patent subsequent to Oct. 9, 2007, has been disclaimed.**

**Int. Cl.[5] B62B *1/04***

**U.S. Cl. 280—646** **25 Claims**



1. In a collapsible golf trolley having an elongate chassis member forming the principal structural element of the trolley, a pair of wheel struts pivotally connected at one end to the chassis member intermediate the ends thereof and normally lying at an angle to each other on opposite sides of the median plane of the trolley, the wheel struts each carrying at their distal ends on opposite sides of the trolley a ground engaging wheel, upwardly extending bag bracket means at each end of the chassis member for receiving and retaining thereon a golf bag, an elongate handle pivotally connected to said chassis member at one end and pivotable between a first, extended position in which the handle extends from the chassis member in a direction generally coaxial therewith and a second, collapsed position in which the handle substantially lies alongside the chassis member, and rigid link means connected directly between the handle and the wheel struts, whereby, when the handle is in its first, extended position the wheel struts are splayed outwardly on opposite sides of the trolley, and, when the handle is in its second, collapsed position, the wheel struts pivot inwardly towards the chassis member so as to lie, in the collapsed condition of the trolley, substantially alongside the chassis member with the wheels closely adjacent thereto on opposite sides, the improvements comprising:

(a) the chassis member comprising an elongated, inverted channel-shaped, lightweight alloy extrusion having a cross-section that is uniform along the length of the extrusion, said cross-section providing on the underside of the chassis member a pair of downwardly divergent sidewalls defining the opposite sides of the inverted channel, and;

(b) each of the wheel struts being pivotally mounted at their proximal ends in said inverted channel.

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**5,048,857**

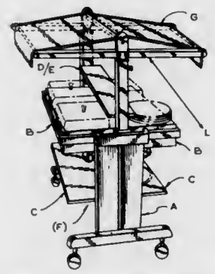
## VERTICALLY COLLAPSIBLE FOOD SERVICE CART SYSTEM

**Kenneth V. Stevens, Brooklyn, N.Y., assignor to Colgate-Palmolive Company, Piscataway, N.J.**

**Filed Oct. 26, 1989, Ser. No. 426,833**

**Int. Cl.[5] B62B *3/10***

**U.S. Cl. 280—651** **20 Claims**



1. An integrated food service cart system comprising:

a frame;

at least one panel pivotably supported on said frame so as to be pivotable between a horizontal service position and a vertical storage position;

said at least one panel having walls defining a peripheral boundary around at least one space for holding a chafer pan therein;

a support member pivotably mounted to said walls of said panel which extends below said space for holding a chafer pan, wherein said support member has a retaining portion for holding a chafer heating element for applying heat to a chafer pan held in said space for holding said chafer pan when said panel is in the horizontal service position; and

pivot portions pivotably mounting said support member to said walls of said panel so as to allow said support member to be pivoted into said space for holding said chafer pan when said panel is pivoted to the vertical storage position.



**5,048,858**

## WHEEL SUSPENSION SYSTEM FOR THE FRONT WHEELS OF A MOTOR VEHICLE

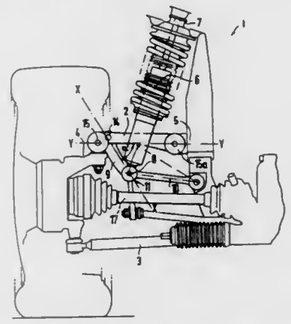
**Martin Luger, Niefern, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany**

**Filed Mar. 1, 1990, Ser. No. 486,949**

**Claims priority, application Fed. Rep. of Germany, Mar. 25, 1989, 3909942**

**Int. Cl.[5] B60G *3/20***

**U.S. Cl. 280—660** **21 Claims**



1. A wheel suspension for a wheel of a motor vehicle comprising:

an upper and a lower transverse link each pivotally connected between a wheel carrier for the wheel and a body of the motor vehicle;

a bearing lever pivotally attached to one of the upper and lower transverse links;

a spring-and-damper element having an upper end connectable at a position above the upper transverse link to the vehicle body and a lower end supported at a location between the upper and the lower transverse links by a bearing on the bearing lever; and

a control lever for controlling the bearing lever, said control lever being attachable to the body of the vehicle and to the bearing lever.

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**5,048,859**

## SUSPENSION FOR STEERABLE DRIVING WHEEL IN VEHICLE

**Yasushi Nishikuma; Seiho Kawakami; Kazukiyo Itoga; Shigenori Mae, all of Toyota, and Toshiyasu Santo, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan**

**Filed May 30, 1990, Ser. No. 530,781**

**Claims priority, application Japan, Jun. 13, 1989, 1-150139**

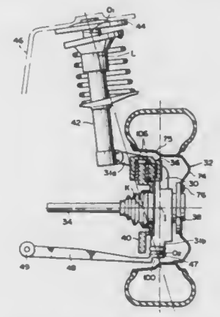
**Int. Cl.[5] B60G *3/00***

**U.S. Cl. 280—668** **14 Claims**

1. A suspension for a steerable driving wheel in a vehicle, in which a wheel supported by a wheel carrier rotatable around a steering axis is driven by a drive shaft and braked by a brake caliper located above said drive shaft, comprising:

a hub having a supported portion rotatably supported by said wheel carrier through a bearing, said hub being unrotatably connected to said drive shaft and attaching said wheel to a portion located more laterally outward of a vehicle body than said supported portion; and

a brake disk for generating a braking force in cooperation with said brake caliper, said brake disk being fixed to said hub through an annular fixing portion thereof and having an annular brake portion located more laterally inward of said vehicle body than said supported portion and connected to the annular fixing portion, said brake disk further having a disk portion connected to the annular brake portion for cooperating with said brake caliper,



wherein said wheel carrier is swingably connected to a suspension arm at a portion thereof located below said support portion.

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**5,048,860**

## VEHICLE SUSPENSION SYSTEM

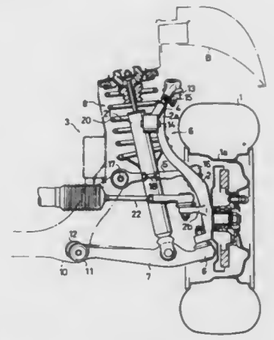
**Seita Kanai; Koji Tsuji, both of Hiroshima; Toshiro Kondo, Hatsukaichi, and Takeshi Edahiro, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Jan. 10, 1990, Ser. No. 463,255**

**Claims priority, application Japan, Jan. 13, 1989, 1-4873**

**Int. Cl.[5] B60G *3/00***

**U.S. Cl. 280—691** **20 Claims**



1. A vehicle suspension system comprising:

(a) wheel carrying means for rotatably carrying a wheel of a vehicle, the wheel carrying means being provided with an extension extending upwardly;

(b) a first upper arm member extending in a substantially longitudinal direction of the vehicle and pivotally connected at one end with an upper end portion of said extension and at the other end with a vehicle body member;

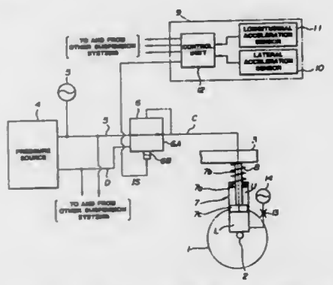
(c) a second upper arm member arranged downward of the first upper arm member, extending in a substantially transverse direction of the vehicle and pivotally connected at one end with the wheel carrying means and at the other end with the vehicle body member; and

(d) lower arm means connected at one end with a lower portion of the wheel carrying means and at the other end with the vehicle body member for restricting at least a longitudinal and transverse movement of the wheel carrying means.

VOL 1130 ISS 3 SE 17 1991 UMI



**5,048,861**
**ACTIVE SUSPENSION SYSTEM AND PRESSURE CONTROL VALVE THEREFOR**
**Kenro Takahashi, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan**
**Filed Mar. 27, 1990, Ser. No. 501,085**
**Claims priority, application Japan, Mar. 27, 1989, 1-71989**
**Int. Cl.[5] B60G *17/08***
**U.S. Cl. 280—707** **22 Claims**

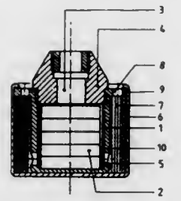


1. A pressure control valve, for adjusting pressure in a working chamber of a fluid pressure operated unit by introducing and draining working fluid into and from the working chamber, comprising:
- a first chamber connected to said working chamber for fluid communication therebetween via a first line;
- a second chamber connected to a fluid pressure source via a second line for introducing line pressure from said fluid pressure source into said working chamber;
- a third chamber connected to said fluid pressure source via a third line for draining pressurized fluid to said fluid pressure source from said working chamber;
- a valve member for selectively establishing and blocking fluid communication between said first and second chambers and said first and third chambers, the valve member being movable in a first range between a first position for establishing fluid communication between said first and second chambers through a first predetermined path opening area and a second position for establishing fluid communication between said first and third chambers through a second predetermined path opening area, and a third position, intermediate said first and second positions, where fluid communication between said first and second chambers and said first and third chambers are both blocked; and
- means, responsive to a fluid pressure in said working chamber greater than a predetermined pressure, for permitting movement of said valve member within a second range greater than the first range the second range including a fourth position in which fluid communication between said first and second chambers is established through a third path opening area greater than said second path opening area, and a fifth position, in which fluid communication between said first and third chambers is established through a fourth path opening area greater than said second path opening area.

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**5,048,862**
**GAS GENERATOR FOR AN AIRBAG**
**Richard Bender, Lauf, and Hans Winkler, Fürth, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany**
**Filed Jun. 18, 1990, Ser. No. 539,447**
**Claims priority, application Fed. Rep. of Germany, Jun. 22, 1989, 3920401**
**Int. Cl.[5] B60R *21/08***
**U.S. Cl. 280—736** **12 Claims**

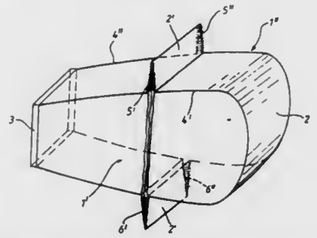
1. A gas generator for an airbag comprising a cylindrical casing defining a substantially cylindrical pressure reservoir, said reservoir being filled with gas-releasing material and an igniter element for igniting the gas-releasing material located at one end of the cylindrical casing; a support for supporting said igniter element over said gas-releasing materials and for forming an end wall of the pressure reservoir; gas outlet openings



and a filter arranged around the pressure reservoir; said filter being accommodated in a chamber outside of the casing of the pressure reservoir; gas passage openings arranged in a wall of the casing defining the pressure reservoir on a side facing away from the igniter element; and the gas outlet openings leading from the chamber and lying in a zone proximate to the igniter element.

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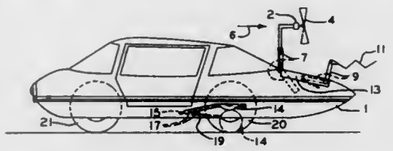
**5,048,863**
**ANTI-COLLISION CUSHION FOR THE OCCUPANTS OF A MOTOR VEHICLE**
**Wolfgang Henseler, Tübingen; Manfred Müller, Deizisau; Alban Bossenmaier, Stuttgart; Egon Katz, Nagold; Horst Mast, Stuttgart, and Luigi Brambilla, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany**
**Filed May 11, 1989, Ser. No. 350,406**
**Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3818185**
**Int. Cl.[5] B60R *21/16***
**U.S. Cl. 280—743** **5 Claims**



1. Anti-collision cushion for the occupants of a motor vehicle which is constructed with two side parts and a central part arranged between the side parts, and which is inflatable by gas from a folded initial position on a receptacle fixed to the vehicle, the volume capacity in the initial state being reduced by at least one tearing fold formed in a wall of the anti-collision cushion and fixed by rip seams which are destroyed due to the rising gas pressure so that in the final state, the entire volume capacity of the anti-collision cushion is available, wherein the rip seams connect connecting seams between the central part and the side parts which are contiguous in the region of the tearing fold, and wherein the rip seams are only in the region of the connecting seams.



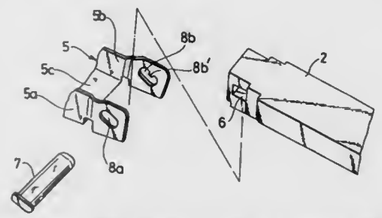
**5,048,864**
**CYCLE TYPE VEHICLES**
**Ervin D. Geiger, 11346 Avery Rd., Palm Beach Gardens, Fla. 33410**
**Filed Apr. 23, 1990, Ser. No. 513,073**
**Int. Cl.[5] B60R *21/00***
**U.S. Cl. 280—755** **3 Claims**



1. Vehicles of the bicycle or motorcycle type which may be inclosed like regular automobiles, comprising;
- a vertical stabilizing means secured to said vehicle, comprising;
- a transverse vertical hinging means forming a vertically retractable generally U shaped strut means extending on each lateral side of the vehicle; said strut means for securing transverse bilaterally spaced-apart wheels in a substantially longitudinally off-set position in relation to the said transverse hinging means; said off-set strut wheels being capable of mutual vertical floating action relative to the vehicle being vertically stabilized;
- a vertical stabilizing means; control means;
- said control means to selectively control, manually or automatically, the capacity to raise, retract at any selected position, lower to any selected position, add extra down pressure in excess of their own weight, or control at any selected vertical speeds, the off-set strut wheels.

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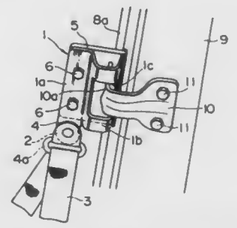
**5,048,865**
**BUCKLE STALK FOR SEAT BELT SYSTEM**
**Osamu Tokugawa, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**
**Filed Aug. 2, 1990, Ser. No. 561,686**
**Claims priority, application Japan, Aug. 3, 1989, 1-91609[U]**
**Int. Cl.[5] B60R *22/18***
**U.S. Cl. 280—801** **5 Claims**



1. In a buckle stalk suitable for use in a vehicle seat belt system, said stalk having an anchor member to be fixed on a side of a vehicle body, a buckle remitting releasable securement of a webbing thereon, and a non-metallic stalk member connecting said buckle and said anchor member to each other, the improvement wherein said buckle stalk further comprises a means for connecting said buckle and said stalk member in such a way that the direction of opening of a tongue-receiving socket of said buckle extends at an angle with respect to said stalk member;
- wherein said buckle has a buckle base equipped with a combination of opposing side walls; and said connecting means defines connecting holes through said side walls, respectively, and has a connecting pin extending through a loop of said non-metallic stalk member, said loop being arranged between said side walls, and engaging said connecting holes; and
- wherein one of said side walls has a projection extending inwardly into the corresponding connecting hole and crimped by said connecting pin upon insertion of said connecting pin whereby said connecting pin is firmly secured on said buckle base.

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**5,048,866**
**SEAT BELT MOUNT MECHANISM**
**Kiyoshi Hirasawa, Hamamatsu, Japan, assignor to Suzuki Motor Company Limited, Shizuoka, Japan**
**Filed Jun. 13, 1990, Ser. No. 537,366**
**Claims priority, application Japan, Jun. 13, 1989, 1-68733[U]**
**Int. Cl.[5] B60R *21/10***
**U.S. Cl. 280—803** **3 Claims**



1. A seat belt mount mechanism of a seat belt for use in an automotive vehicle, comprising a fixing bracket connected to a door sash element of a vehicle body; an anchor plate mounted to said door sash element by fixing means connecting said anchor plate to said fixing bracket, said anchor plate including an elongated portion extending outwardly from a lower end of said anchor plate; a shoulder belt anchor including an opening for holding a shoulder seat belt, said anchor plate including a base and an engagement portion having a substantially U-shaped cross section extending away from said base, said engagement portion of substantially U-shaped cross section having an opening formed in a center thereof; a shoulder belt support bracket secured on an interior side of the vehicle connected to a center pillar of said vehicle, said shoulder bracket having a portion extending into said opening when the door of the vehicle is closed.

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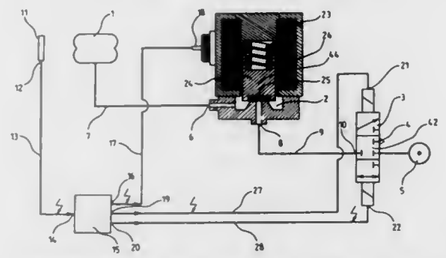
**5,048,867**
**AUTOMATIC LEVEL CONTROL SYSTEM FOR VEHICLES**
**Detlef Gradert, Nienhagen, Fed. Rep. of Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany**
**Filed May 29, 1990, Ser. No. 530,095**
**Claims priority, application Fed. Rep. of Germany, May 30, 1989, 3917458**
**Int. Cl.[5] B60S *9/00***
**U.S. Cl. 280—840** **28 Claims**

1. An automatic level control device for vehicles with air suspension comprising
- a vehicle chassis;
- a vehicle axle;
- an air suspension system spring-supporting the vehicle chassis against the vehicle axle, wherein the air suspension system includes
- a level measurement device sensing a relative horizontal level of the vehicle chassis with respect to a relative horizontal level of the vehicle axle and having an output terminal providing an electrical output signal;
- an electronic control device connected to the output terminal of the level measurement device and including a stored set-point level value and a comparison device serving for

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a comparison of the output signal of the level measurement device with a set-point level value;
a pressure means source;
a valve device connected to the electronic control device and actuatable with control output signals of the electronic control device, and wherein the valve device includes a directional control valve, with a valve body and a valve seat, where the valve body exerts, in the closure direction, a pressure of the air spring and the force of a valve closure spring onto the valve seat, and where the valve body can be lifted off the valve seat in opening direction by an actuation current of the electrical actuation device;
an air spring connected to an air spring pressure line;
a first pneumatic port furnished at the valve device, where the first pneumatic port is connected to the air spring via the air spring pressure line for loading the valve device with the pressure prevailing in the air spring and for

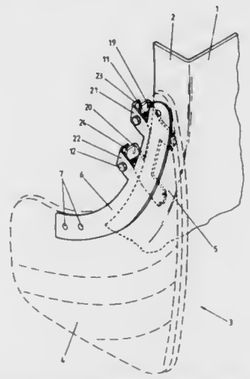


controlling a filling of the air spring with gas from the pressure means source and for emptying the air spring with an output to the atmosphere;
a second pneumatic port disposed at the valve device and connected to the pressure means source, where the second pneumatic port is loaded with the pressure of the pressure means source and can be connected with an output to the atmosphere;
an electrical actuation device disposed at the seat valve, wherein an auxiliary pressure applies a force, parallel to the force exerted by the electrical actuation device for opening of the seat valve, for the emptying of the air spring, which auxiliary pressure is exerted on the valve body against the pressure of the air spring and against the force of the valve closure spring, and wherein the auxiliary pressure, exerted on the seat valve, can be controlled by an electrical signal generated by an opening of the seat valve.

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**5,048,868**
**MUD-FLAP ATTACHMENT DEVICE**
**Knut Arenhold, Hamburg, Fed. Rep. of Germany, assignor to Cona GmbH, Kehl, Fed. Rep. of Germany**
**Filed Jun. 5, 1990, Ser. No. 533,559**
**Claims priority, application Fed. Rep. of Germany, Jun. 6, 1989, 3918802**
**Int. Cl.[5] B62B 9/16**
**U.S. Cl. 280—848** **10 Claims**

1. In a mud-flap attachment device for detachably securing an upper portion of a mud-flap to a fender fold of a motor vehicle, wherein the attachment device has at least ore clamp having a first clamping part connected to a second clamping part by at least an upper screw and a spaced-apart lower screw so that the upper portion of the mud-flap and a portion of the fender fold may be received between said first and second clamping parts and inwardly of the screws whereby the mud-flap is securable to said fender fold by tightening said screws, the improvement comprising:
(1) an upper first clamping projection on an opposite side of the first clamping part from that side at which the upper screw is disposed;
(2) a lower first clamping projection on an opposite side of the first clamping part from that side at which the lower screw is disposed;
(3) an upper free outer edge on the upper first clamping projection and a lower free outer edge on the lower first



clamping projection, with each of said outer edges having inwardly directed corner angled parts for receiving and engaging said upper portion of the mud-flap or said fender fold; and
wherein the distance between the lower screw and the lower free outer edge is greater than the distance between the upper screw and the upper free outer edge.

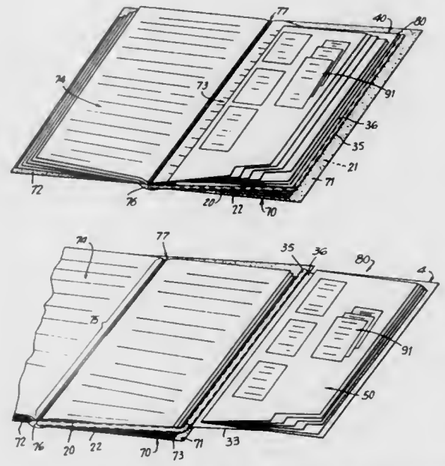
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**5,048,869**
**HYPERTEXT BOOK ATTACHMENT**
**David C. Schwartz, Southborough, Mass., assignor to Productive Environments, Inc., Southborough, Mass.**
**Continuation of Ser. No. 324,417, Mar. 16, 1989. This application Jan. 8, 1990, Ser. No. 462,633**
**Int. Cl.[5] B42D 1/00; B42F 13/30, 13/34, 13/40**
**U.S. Cl. 281—16** **42 Claims**

1. A frame attachment for a book, said frame attachment comprising:
a frame capable of being pivotably attached to said book;



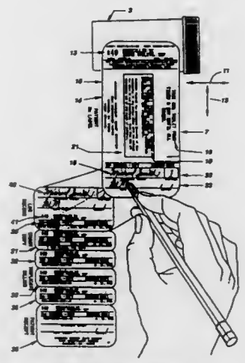
an orientation flap pivotably attached at a first end thereof to said frame;



a mounting surface pivotably attached to said orientation flap at a second end of said orientation flap; and
a leaf structure attached to said mounting surface.

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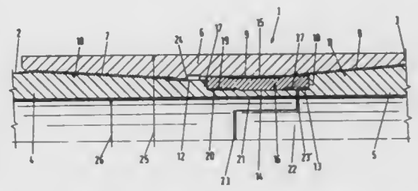
**5,048,870**
**MULTIPART FLAG LABEL FOR PHARMACEUTICAL PRODUCTS**
**Richard J. Mangini, Redwood City, and William J. Hartig, Pleasanton, both of Calif., assignors to Pharmedix, Hayward, Calif.**
**Division of Ser. No. 359,514, Jun. 1, 1989, Pat. No. 4,976,351. This application Jul. 13, 1990, Ser. No. 553,164**
**Int. Cl.[5] B42D 15/00**
**U.S. Cl. 283—81** **7 Claims**



1. A multipart flag label comprising:
a first rectangular sticker having a minor axis, a major axis, a first area, a second area and a third area, a first backing sheet and a second backing sheet, said first area, having lines of pre-printed information thereon which are orientated in a direction parallel to said minor axis and an adhesive on the back thereof, removably attached to said first backing sheet, said second area having lines of pre-printed information thereon, said third area having an elongated space for the manual insertion of information therein, said second and said third areas, having an adhesive on the back thereof, removably attached to said second backing sheet;
a plurality of stickers, each having pre-printed information thereon which is visible beyond the edge of said first sticker and an adhesive on the back thereof, removably attached to a third backing sheet; said third backing sheet having an extended portion which extends from the edge of said plurality of stickers beneath said first sticker, said extended portion being attached to said second backing sheet, a first one of said plurality of stickers adjacent to said first sticker having a first area thereof which extends beneath said third area of said first sticker; and
means for automatically transferring information manually placed in said elongated space in said third area on said first sticker to said first area of said first one of said plurality of stickers.

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**5,048,871**
**SCREWED PIPE JOINT**
**Gerd Pfeiffer, Mülheim; Erich Quadflieg, Krefeld; Friedrich Lenze, Ratingen; Gerhard Krug, Duisburg, and Josef Siekmeyer, Ratingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany**
**Filed Jul. 27, 1989, Ser. No. 386,299**
**Claims priority, application Fed. Rep. of Germany, Jul. 28, 1988, 3825993**
**Int. Cl.[5] F16L 35/00**
**U.S. Cl. 285—39** **11 Claims**



1. A screwed pipe joint for connecting first and second pipes of a drill pipe string, said pipe joint comprising:
in opposed relation the first pipe (2) having a first tapered threaded end (10) and the second pipe (3) having a second tapered threaded end (11), said first tapered pipe end and said second tapered pipe end having a different taper and pitch and being shaped so that, when said pipes are joined, said pipes engage interfittingly having an axial clearance (23, 23') therebetween; and
a bell (6) comprising first (7) and second (8) internal threaded sections complementary to and for engagement with said first (10) and second (11) threaded pipe ends; an unthreaded section (9) between said first and second internal threaded sections; and a radially inward projecting shoulder (24) on said unthreaded section (9) of said bell (6) opposite said first pipe (2); said first and second pipe ends having a respective annular recesses (14, 13) therein defining, with said unthreaded bell section (9), an annular space (15) therebetween;
a sealing sleeve within said annular space (15) having an outside diameter smaller than the inside diameter of said unthreaded section (9) of said bell (6) and being axially fixed in said recess (14) of said first pipe end; and
an unthreaded section (12) on said first pipe end adjacent said recess (14) said section (12) extending in axial direction, when said pipes are joined, beyond the end of said unthreaded section (9) of said bell (6) and said section (12) having an outside diameter less than the radial projection distance of said shoulder (24) of said bell (6).

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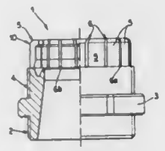


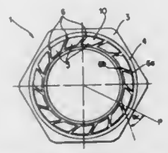
5,048,872

## FITTING FOR CABLES, TUBES AND THE LIKE

Peter Gehring, Simonswald-Griesbach, Fed. Rep. of Germany, assignor to Anton Hummel GmbH Metallwarenfabrik, Waldkirch, Fed. Rep. of Germany

Filed Feb. 2, 1990, Ser. No. 474,287
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903354
Int. Cl.[5] F16L *55/00*
U.S. Cl. 285—92 20 Claims





1. A fitting for tubes, cables and the like, comprising a first component constituting a sleeve including an externally threaded portion and an end portion having substantially axially extending deformable prongs and substantially axially extending slots alternating with said prongs, each of said slots having an inner radial end and an outer radial end and the outer of said slots being offset with reference to the respective inner ends in the same direction circumferentially of said sleeve so that said slots are inclined relative to and are intersected by planes including the axis of said sleeve and extending between the inner and outer ends of the respective slots; and a second component constituting a nut including an internally threaded portion arranged to mate with said externally threaded portion, said nut having an internal deforming surface operative to displace portions of said prongs substantially toward the axis of said sleeve in response to screwing of said nut onto said sleeve, said surface having at least element cooperating with at least one of said prongs to oppose unscrewing of said nut, said at least one detent element being at least substantially, axially parellel to an adjacent slot and the inclination of said at least one detent element relative to the plane which intersects the adjacent slots, being substantially identical with that of the adjacent slot when said threaded portions mate.

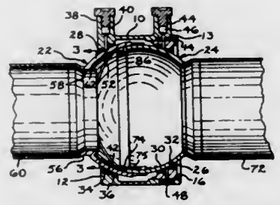
5,048,873

## DOUBLE BALL JOINT

Alan R. Allread, and Gary B. Challender, both of Jackson, Mich., assignors to Aero Quip Corporation, Jackson, Mich.

Filed Mar. 5, 1990, Ser. No. 489,149
Int. Cl.[5] F16L *27/04*
U.S. Cl. 285—261 4 Claims

4. In a ball joint assembly having a first element having a partial spherical cavity defined therein and adapted to be connected to a conduit, a second element having an end adapted to be connected to a conduit and a partial spherical end received in the first element's spherical cavity permitting relative angular displacement between the conduits, and an annular spring interposed between the first and second elements providing electrical continuity between the elements, the improvement comprising, the spring being formed of a single wire element into a relatively oblong configuration having curved ends and including a pair of homogenous arcuate legs extending from one curved end and terminating adjacent one another at the other curved end, said legs engaging a portion of the first elements spherical cavity and said curved ends engage a portion of the second element adjacent its spherical surface, said spring maintaining a relatively constant configuration as the elements are angularly displaced with respect to each other.

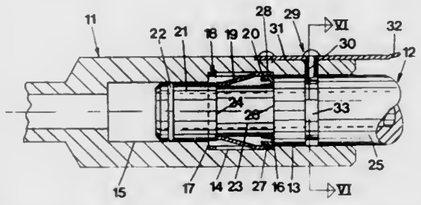


5,048,874

## QUICK COUPLING FOR INTERCONNECTION OF TWO HIGH-PRESSURE FLUID CONDUITS

Weimar Ohlsson, Solrosvägen 3, S-445 00 Surte, Sweden

PCT No. PCT/SE87/00255, § 371 Date Dec. 6, 1989, § 102(e) Date Dec. 6, 1989, PCT Pub. No. WO88/09459, PCT Pub. Date Dec. 1, 1988
PCT Filed May 21, 1987, Ser. No. 438,430
Claims priority, application Sweden, Nov. 21, 1985, 8505499-7
Int. Cl.[5] F16L *37/084*
U.S. Cl. 285—307 4 Claims



1. A quick coupling for liquid-proof interconnection of two high-pressure fluid conduits which comprises:

a female part and a male part, the female part including a hollow sleeve having a recessed portion and the male part including first and second opposed end portions interconnected by a reduced portion, the interface between the first end portion and the reduced portion defining a first collar and the interface between the second end portion and the reduced portion defining a second collar, the male part having sealing means thereon for sealing engagement with said female part to provide said liquid-proof connection, and said male part being axially movable into and out of the female part;

a locking member, the locking member including an axially split circular ring having a cylindrical portion disposed within the recessed portion of the sleeve and having a plurality of resilient tongues projecting radially inwardly to engage said second collar; and

a disengagement member in the form of a ring disposed on the reduced portion and an axially extending third collar extending from the ring in a direction from the first end portion toward the second end portion, the axial length of the third collar being less than the axial length of the cylindrical portion of the locking member, the disengagement member being movable relative to the reduced portion and being engageable with the first collar when the male part is moved axially into the female part to engage and cause retraction of the resilient fingers from their radially projecting positions to substantially axial positions and being engageable with the second collar when the male part is axially moved out of the female part to disengage from and allow the resilient fingers to move back to their radially projecting positions.

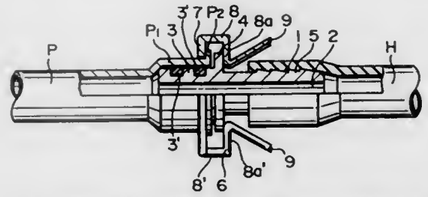


5,048,875

## CONNECTOR INTERPOSED BETWEEN SMALL-DIAMETER METALLIC PIPE AND FLEXIBLE HOSE

Masayoshi Usui, and Katsushi Washizu, both of Numazu City, Japan, assignors to Usui Kokusai Sangyo Daisha Limited, Japan

Filed Jan. 12, 1990, Ser. No. 464,306
Claims priority, application Japan, Jan. 18, 1989, 1-4098[U]
Int. Cl.[5] F16L *39/00*
U.S. Cl. 285—319 17 Claims



1. A connector for connecting a small-diameter metallic pipe having a substantially constant wall thickness and a flexible hose, the pipe having a terminal end defining an outwardly extending collar end wall, said connector comprising:

a joint having opposed first and second axial ends and being formed with a through hole extending in the axial direction of the joint from the first end to the second end thereof, a protrusion wall projecting outwardly on the joint from a location intermediate the first and second axial ends, and first and second cylindrical walls projecting axially from the protrusion wall toward the respective first and second ends, the first of said cylindrical walls having a sealing member fitted in an annular groove formed in the outer periphery thereof and being dimensioned to be fit in the end of the pipe, the second cylindrical wall being engageable with the hose, and

a retainer having an engagin wall formed with an opening larger than the diameters of both the first cylindrical wall and portions of the pipe adjacent the end thereof, but smaller than the collar end wall of the pipe, such that the engaging wall can be slidably disposed on the end of the pipe in engagement with and disengagement from the collar end wall thereof, and a plurality of elastic arm walls extending from said engaging wall in the axial direction of the connector, the elastic arm walls being spaced from one another to permit disposition of both the collar end wall of the pipe and the protrusion wall of the joint therebetween, each of said elastic arm walls having a click wall extending therefrom radially inwardly to define a cross section smaller than the cross section defined by the protrusion wall of the joint, whereby the engaging wall and the click walls of the retainer are engageable respectively with the collar end wall of the pipe and the protrusion wall of the joint for retaining the first cylindrical wall of the joint in the end of the pipe.

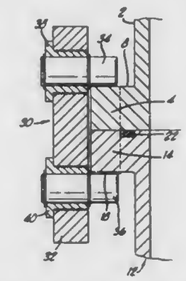
5,048,876

## CLOSURE APPARATUS FOR PIPES AND VESSELS

Harvey A. Wallskog, Irvine, Calif., assignor to Fluor Corporation, Irvine, Calif.

Filed Nov. 2, 1989, Ser. No. 431,024
Int. Cl.[5] F16L *17/06*
U.S. Cl. 285—364 7 Claims

1. Apparatus for joining together first and second elements, comprising first and second elements each including a circumferential flange having a roller-bearing surface, a ring member adapted to be placed about said circumferential flanges, two sets of rollers disposed on the interior surface of said ring member, one set of said rollers adapted to engage the bearing surface of the flange of one of said elements and the second set of rollers adapted to engage the bearing surface of the flange of said second element, at least one of said flanges having openings therein through which said rollers may pass, and means attached to said ring member and to one of said elements to rotate said ring member and to cause said rollers to move circumferentially on said bearing surfaces, whereby said ring member may be selectively moved between a locked position wherein said flanges are joined and an unlocked position wherein one of said sets of rollers is aligned with said openings in said flange to permit said flanges to be separated.

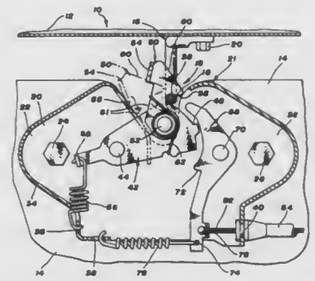


5,048,877

## POP-UP HOOD LATCH

Lloyd W. Rogers, Jr., and Michael E. Aubry, both of Utica, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 4, 1990, Ser. No. 504,208
Int. Cl.[5] E05C *3/24*
U.S. Cl. 292—110 3 Claims



1. A hood latch adapted to engage a striker for latching a hood panel movable between open and closed positions relative to a body panel, the hood latch comprising:

the striker mounted on one of the panels;

a housing mounted on the other the panel;

a latch lever mounting means movably mounted to the housing for movement between lowered and raised positions;

a pop-up spring for urging the latch lever mounting means to the raised position;

a latch lever having a hook for latching engagement with the striker, the latch lever being pivotally mounted to the latch lever mounting means for movement between latched and unlatched positions, the latch lever having a handle for manually moving the latch lever;

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a latch spring acting to rotate the latch lever towards the latched position;

a detent means for releasably engaging and retaining the latch lever mounting means in the lowered position and preventing movement to the raised position; and

means for moving the detent means to release the latch lever mounting means from the lowered position, thereby allowing the pop-up spring to move the latch lever mounting means to the raised position, by which the hood panel is moved upwardly in relation to the body panel, to expose the latch lever and handle for rotation by the handle to release the latch lever from the striker allowing the hood panel to move to the open position relative to the body panel.

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**5,048,878**

## STRIKER FOR LID OF FUEL INLET CHAMBER

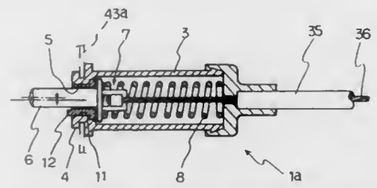
**Kazuhiro Takeshita, Utsunomiya, and Tatsuo Chiura, Wako, both of Japan, assignors to Nippon Cable System Inc., Takarazuka, Japan**

**Filed Jan. 17, 1990, Ser. No. 466,531**

**Claims priority, application Japan, Apr. 27, 1988, 63-57019[U]; Apr. 26, 1989, 1-106521**

**Int. Cl.[5] E05C *1/12***

**U.S. Cl. 292—171** **3 Claims**




1. A striker for a lid of a fuel inlet chamber, comprising:

(a) a casing attached to the wall of a fuel inlet chamber in a rotatable manner along the longitudinal axis of the casing;

(b) a bushing supported by the end of the casing in a rotatable manner and securing said casing in a rotatable manner to said wall of the fuel inlet chamber;

(c) an elastic member for elastically urging the bushing against the casing such that the end of the casing and the bushing are abutted against ecah other with their contacting surfaces being perpendicular to their axes;

(d) a lock pin supported slidably in the axial direction of said casing so as to be projected into and withdrawn from the fuel inlet chamber through a hole formed at the end of the casing and a hole formed in said bushing, said hole at the end of said casing and said hole in said bushing being eccentric with respect to the rotational axes of said casing and said bushing;

(e) radial slots provided in one of the contacting surfaces of the bushing or the casing, and radial projections provided on another contacting surface of the bushing or the casing; the slots and the projections being engageable with each other and providing a means for locking a rotation of the bushing and casing to the wall and restricting the rotation of said lock pin on an aimed position while admitting said lock pin to move in the axial direction thereof;

(f) a spring for urging said lock pin in a forward direction such that the lock pin projects into the chamber; and

(g) an operating member for withdrawing said lock pin backward.

**5,048,879**

## DOOR LOCK FOR AN AUTOMOBILE

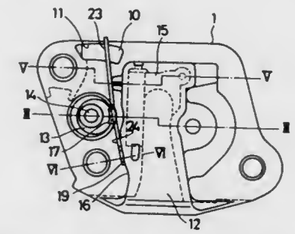
**Ryoichi Fukumoto, Nagoya, and Tetsuya Arao, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan**

**Filed Dec. 24, 1990, Ser. No. 631,701**

**Claims priority, application Japan, Dec. 27, 1989, 1-149331[U]; Dec. 27, 1989, 1-149332[U]**

**Int. Cl.[5] E05C *3/26***

**U.S. Cl. 292—216** **2 Claims**




1. A door lock for an automobile comprising:

a housing,

a latch placed in said housing,

a pawl engageable to said latch,

a slit made in said housing,

a column made in one body with said housing,

a wall portion facing said column and defining said slit,

a coil spring placed around said column,

a first support portion **(19)** supporting one end of said coil spring,

a second support portion **(21)** supporting the other end of said coil spring which is connected to said pawl.

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**5,048,880**

## DOOR KEY ASSEMBLY

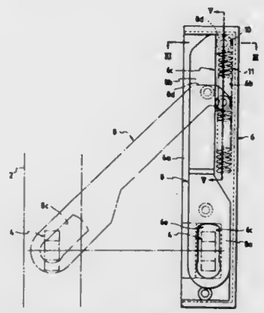
**Toshiharu Narazaki, Chiyoda, Japan, assignor to Ryobi Limited, Hiroshima, Japan**

**Filed Jun. 11, 1990, Ser. No. 535,519**

**Claims priority, application Japan, Jun. 12, 1989, 1-68720[U]**

**Int. Cl.[5] E05C *17/06***

**U.S. Cl. 292—262** **6 Claims**



1. A door key assembly to be formed between a door and a door frame opposed thereto, comprising:

a key body secured to an end face of the door, said key body being provided with a dead bolt;

a fixing plate secured inside the door frame so as to oppose the end face of the door, said fixing plate being provided with a vertically elongated recess and a groove along said recess, said recess and said groove being arranged side-by-side so as to communicate with each other through a vertically elongated window portion having a lateral opening;

a door opening angle limiting arm having one and engageable with said dead bolt and another end attached to said fixing plate, said one end having a first width and said another end having a second width which is narrower than said first width, said second width being formed by a cut-away portion in said one end thereof, said groove being disposed in a cut-away portion of the fixing plate to receive an elastic means;

a slide pin disposed in said groove of the fixing plate to be vertically slidable in association with a movement of said door opening angle limiting arm; and said door opening angle limiting arm has one end bent inward of said groove and said slide pin is secured to the bent end of the door opening angle limiting arm;

said elastic means being disposed in said groove of the fixing plate so as to urge said slide pine upward.



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**5,048,881**

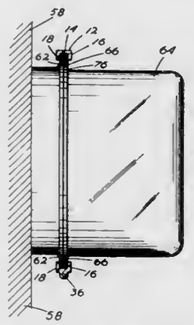
## LOCKABLE SEAL RING FOR AN ELECTRICAL METER

**Bradley W. Renfro, 1005 Hazel St., Chico, Calif. 95928**

**Filed May 21, 1990, Ser. No. 526,717**

**Int. Cl.[5] H02B *9/00*; B65D *45/32***

**U.S. Cl. 292—320** **5 Claims**




1. A lockable seal ring for placement over and tamper resistant retainment of a pair of generally aligned circular flanges abutted against one another, a first flange of said pair of circular flanges being a watt-hour electrical meter flange, a second flange of said pair of circular flanges being a meter retainment flange affixed to a meter base, said lockable seal ring structured of a generally annular sidewall having a front flange and a rear flange spaced apart from one another, said front flange and said rear flange each extending radially inwardly from said annular sidewall, said seal ring transversely split to provide a first ring end and an adjacent second ring end, said first ring end and said second ring end of said seal ring sufficiently moveable toward and away from one another by way of flexibility and resiliency of said annular sidewall and said front and rear flanges to allow installation and removal of said seal ring onto and off of said pair of abutted circular flanges;

a locking means affixed to said seal ring adapted to lock said first ring end in close proximity to said second ring end, said locking means including a lock pin affixed at a first end thereof to said first ring end, said lock pin extending generally toward said second ring end, said lock pin including a generally conically shaped enlargement affixed at an end of said lock pin oppositely disposed from said first end of said lock pin, a generally tapering end of said conically shaped enlargement oppositely disposed from said lock pin, said conically shaped enlargement concaved about a generally centered attachment point between said lock pin an said conically shaped enlargement, the concavity providing for inward collapsibility of flexible portion of said conically shaped enlargement when under pressure, said conically shaped enlargement manufactured of a generally flexible and resilient material with said resiliency of said material adapted to expand a collapsed said conically shaped enlargement outward subsequent to collapsing and release of pressure responsible for said collapsing, said locking means further including a lock housing affixed to said second ring end, said lock housing having a receiver tube with a receiver tube opening placed in alignment to accept said conically shaped enlargement, said receiver tube sized to accept said conically shaped enlargement pushed there into with said acceptance provided pressure to collapse said flexible portion of said conically shaped enlargement, said receiver tube having an enlarged area at one end thereof with said enlarged area oppositely disposed from said receiver tube opening, a convex wall surrounding an entrance of said receiver tube into said enlarged area of said receiver tube, said enlarged area of said receiver tube sized sufficiently large to relieve pressure applied to said conically shaped enlargement by said receiver tube, said convex wall adapted to generally fit within the concavity of said conically shaped enlargement thereby preventing removal of said conically shaped enlargement from said lock housing in a reverse direction from the installation there into;

said seal ring in a normally open position having a gap between said first ring end and said second ring end, said seal ring in a locked position having a reduced said gap from that of sad normally open position of said seal ring;

said lockable seal ring manufactured of single piece construction of a generally flexible and resilient thermoplastic material, said thermoplastic material generally of a contrasting color to that of said watt-hour electrical meter flange.

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**5,048,882**

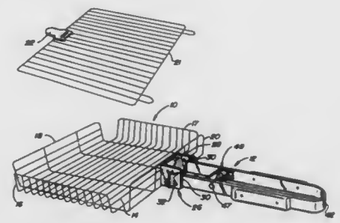
## BARBECUE BASKET WITH REMOVABLE HANDLE

**Douglas R. Fielding, and Charles S. Adams, both of Berkeley, Calif., assignors to Charcoal Companion, Berkeley, Calif.**

**Filed Apr. 10, 1990, Ser. No. 507,389**

**Int. Cl.[5] A47J *45/00***

**U.S. Cl. 294—33** **9 Claims**



1. In combination, a barbeque basket for retaining food items to be cooked and a removable handle for lifting and moving said basket, said basket comprising:

a bottom section and a front wall section extending upwardly from said bottom section;

a fixed mounting bracket attached to said front wall section having a pair of outwardly extending spaced apart flange portions, each flange portion having an opening of a predetermined shape; said handle comprising:

a generally U-shaped member having a pair of elongated tong arms connected together by an integral flexible portion at one end, a projection means at an outer unconnected end of each said tong arm said projection means being shaped in cross-section so as to extend and seat within a said opening in said mounting bracket; said openings in said flange portions of said mounting bracket each having an irregular shape formed by a plurality of inter-

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secting slots, each slot being shaped to receive a projection on a tong arm; and

means for urging said tong arms apart so that said projection means will be held in engagement with said mounting bracket when placed within said bracket openings.

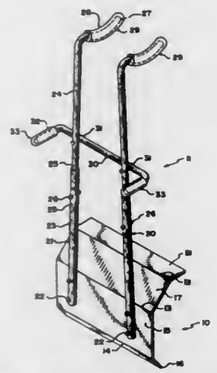
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**5,048,883**

**SNOW SHOVEL/SCRAPER**

**James P. Waluk, Winnipeg, Canada, assignor to Debra Waluk, Manitoba, Canada**

**Filed Apr. 18, 1990, Ser. No. 510,663**
**Claims priority, application Canada, Apr. 18, 1989, 597055**
**Int. Cl.[5] E01H *5/02***
**U.S. Cl. 294—54.005** **4 Claims**



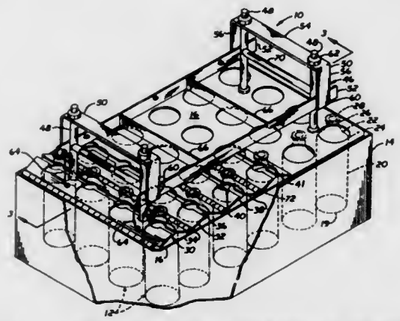
1. A snow shovel comprising a blade including a blade edge arranged to scrape the ground and a blade surface to push snow lifted by the edge, and a handle arrangement by which the blade can be pushed across the ground, the handle arrangement comprising first and second elongate rails each connected at a forward end to the blade such that the edge intersects a longitudinal axis of each rail so that longitudinal force on the rail is applied through the edge to the ground, a pair of concave receiving portions each mounted on a respective one of the rails and defining a receptacle area which extends substantially at right angles to the blade edge and to the respective rail with the portions being spaced in a direction longitudinally of the edge each for engaging an area on the user adjacent the front of the underarm, said rails mounting the receiving portions on the blade such that the receiving portions are spaced from the blade by a distance such that the receiving portions lie substantially at shoulder height with the blade edge on the ground, each of the receiving portions being integrally formed with the respective one of the rails such that the rail is bent at an upper end thereof in a direction substantially at right angles to the length of the rail to form said receiving portion, a crossbar fixedly attached directly to each of the rails at a position thereon between the receiving portions and the blades so as to extend transversely thereacross from a first end adjacent one of the rials to a second end adjacent the other of the rails including means for adjusting the position of the rails thereon so as to adjust the spacing between the rails and a pair of hand grip members each formed at a respective end of the crossbar so as to extend downwardly therefrom substantially at right angles to the crossbar and at right angles to the respective rail, the hand grip members being fixed relative to the rails so that force applied to the hand grip members is directly communicated to the rails.

**5,048,884**

**CASE FILLING AND UNLOADING APPARATUS**

**Bobby G. Cline, 2727 Bella Vista St., Lakeland, Fla. 33809-8713**

**Filed Mar. 29, 1990, Ser. No. 501,031**
**Int. Cl.[5] B25J *15/08*; B65B *21/18***
**U.S. Cl. 294—87.24** **8 Claims**



1. A case filling and unloading apparatus for handling a plurality of bottles arranged in a predetermined pattern, each bottle having a top, a lifting means proximal said top, a neck, a body portion, a shoulder interposed between the neck and the body portion, and a bottom; said case filling and unloading apparatus comprising:

a guide means to maintain said bottles in a predetermined pattern;

at least one bottle holder comprising a pair of pivoting flaps connected to said guide means, said flaps having a first edge and a second edge, said pair of flaps having an open position and a closed position, said pair of flaps having a bottle retaining means for retaining said bottles in said bottle holder, each said flap having a pivot axis about which said flap may pivot, such that said pivot axis lies below a plane defined by said bottle tops when said bottles are retained by said bottle retaining means;

a bottle holder actuating means comprising an actuating bar support means connected to said guide means, an actuating bar slidably connected to said actuating bar support means, such that said actuating bar may contact each of said flaps of said pair of flaps of each said bottle holder and a plurality of flexible cables operatively connecting said flaps of said bottle holder to said actuating bar and extending from points intermediate said first and second edges of said flaps to said actuating bar, such that when said actuating bar slides upwardly on said actuating bar support means, said connecting means pulls upward on said flaps of said bottle holder urging said flaps to said open position and when said actuating bar slides downward on said actuating bar support means, said actuating bar contacts said flaps of said bottle holder urging said flaps to said closed position; and

a lifting means connected to said guide means to provide means for lifting and moving said case filling and unloading apparatus.

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**5,048,885**

**BALE TRANSFER AND FEEDER FRAME**

**James C. Bomar, 3150 Little Dry Creek Rd., Pulaski, Tenn. 38478**

**Filed Jan. 18, 1990, Ser. No. 466,863**
**Int. Cl.[5] B60P *3/00***
**U.S. Cl. 296—6** **17 Claims**

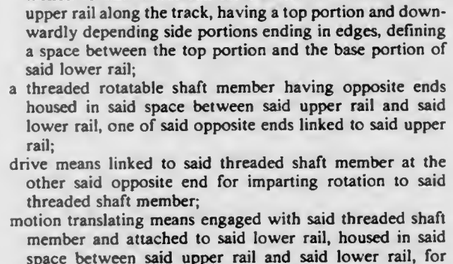
1. A bale transfer and feeder frame comprising:

a base comprising two lower beams that extend parallel to the longitudinal axis of the frame;

at least one cradle rigidly and fixedly connected to the base, said cradle comprising means for supporting a bale extending transversely to the longitudinal axis of the frame;

one antiroll bar being positioned on either side of the support means;

an upper longitudinally extending stop member connected to the support means and to the antiroll bars; and



truss members joining the antiroll bars to the base, such that the truss member inhibit movement of a bale transverse to the frame longitudinal axis when a bale is positioned in the cradle.

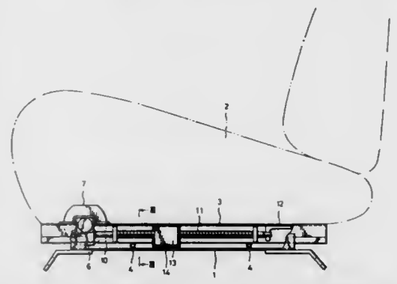
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**5,048,886**

**POWER SEAT SLIDE DEVICE FOR VEHICLES**

**Sadao Ito, Toyoake, and Hiroshi Nawa, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan**

**Filed Mar. 30, 1990, Ser. No. 501,843**
**Claims priority, application Japan, Mar. 31, 1989, 1-78451**
**Int. Cl.[5] B60N *2/06***
**U.S. Cl. 296—65.1** **8 Claims**



1. A power seat slide device for a vehicle comprising:

a lower rail for attachment to a vehicle floor defining a linear track, having a base portion and upwardly extending side portions ending in edges;

an upper rail for attachment to a vehicle seat slidably attached to said lower rail for a linear movement of said upper rail along the track, having a top portion and downwardly depending side portions ending in edges, defining a space between the top portion and the base portion of said lower rail;

a threaded rotatable shaft member having opposite ends housed in said space between said upper rail and said lower rail, one of said opposite ends linked to said upper rail;

drive means linked to said threaded shaft member at the other said opposite end for imparting rotation to said threaded shaft member;

motion translating means engaged with said threaded shaft member and attached to said lower rail, housed in said space between said upper rail and said lower rail, for translating the rotation of said threaded shaft member to the linear movement of said upper rail along the track;

engaging means for engaging said upper rail and lower rail, including upwardly depending first U-shaped members disposed at said edges of the side portions of said upper rail, and downwardly depending second U-shaped members disposed at said edges of the side portions of said lower rail, said first U-shaped members engaging said second U-shaped members;

guiding means provided in the engaging means for guiding the movement of said upper rail along the track; and

roller means disposed between the base portion of said lower rail and said first U-shaped members for slidably supporting the upper rail during movement along the track.

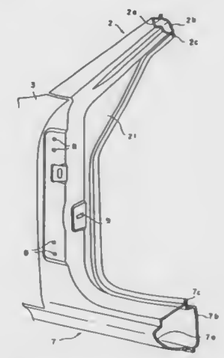
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**5,048,887**

**SEALING ARRANGEMENT FOR VEHICLE BODY CLOSURE STRUCTURES**

**Tetuo Kunishima; Minoru Ueda, and Takashi Nishigami, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Sep. 18, 1990, Ser. No. 584,573**
**Claims priority, application Japan, Sep. 29, 1989, 1-251879**
**Int. Cl.[5] B60J *10/08***
**U.S. Cl. 296—146** **5 Claims**



1. In an automotive vehicle body having a plurality of structural members defining an opening and a closure for the opening mounted on one of the plurality of structural members for swinging movement between closed and opened positions, a sealing arrangement for the closure comprises:

a corner bracket structure at a front upper portion of the closure, the closure further having a sash member above said corner bracket structure;

a reinforcement, said reinforcement being disposed on one of the plurality of structural members defining the opening, said one of the plurality of structural members being located at a front upper portion of the opening; and

a continuous sealing means securely attached to the plurality of structural members and a lower edge of said reinforcement for, when the closure is in its closed position, abutting with an inwardly facing surface of said sash member of the closure at a location above said corner bracket structure and gradually departing from contact with said inwardly facing surface of said sash member in a rearward direction of the vehicle body at the location of said corner bracket structure.

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5,048,888

## SUBASSEMBLY FOR THE FRONT AND REAR REGION OF A MOTOR VEHICLE

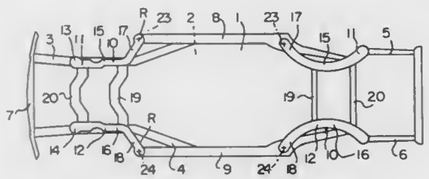
Gerd Willy, Weil; Hubert Hutai, Grafenau; Norbert Schwuchow, and Gerhard Burk, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Aug. 2, 1990, Ser. No. 561,604

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1989, 3925990

Int. Cl.[5] B60R *27/00*

U.S. Cl. 296—189 13 Claims



1. Motor vehicle body arrangement comprising:
- a first pair of laterally spaced longitudinally extending bearer members extending adjacent a vehicle passenger compartment,
- a second pair of laterally spaced longitudinally extending bearer members connected to respective ones of said first pair of bearer members an extending beyond the first pair of bearer members into a vehicle end region adjacent the passenger compartment,
- and an end region subframe disposed in the vehicle end region, said subframe including:
- a pair of carrier parts which each have an end attached to a respective bearer member of said second pair and an opposite end attached to a respective bearer member of said first pair, each of said carrier parts having a first portion extending longitudinally from its attachment at the bearer member of said second pair toward the passenger compartment and a second portion having an obtuse-angled bend about a vertical axis and extending from the first portion laterally to their respective attachment at the respective bearer member of said first pair,
- and a subframe cross member connecting the carrier parts adjacent the first and second portions thereof,
- whereby the subframe permits guided deformation of the longitudinal bearer members over a long distance and contributes to absorption of collision deformation energy by controlled deformation of the subframe in the region of the obtuse-angled bends.

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5,048,889

## MOUNTING UNIT FOR MOTOR VEHICLE SLIDING ROOFS

Rainer Hattass, Gründau, and Dieter Federmann, Hanau, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany

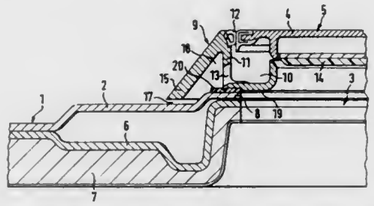
Filed Mar. 5, 1990, Ser. No. 489,126

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1989, 3908239

Int. Cl.[5] B60J *7/047*

U.S. Cl. 296—213 4 Claims

3. A mounting unit for providing a sliding roof to a motor vehicle roof having an opening fitted therein, comprising:
- an assembly frame adapted to be seated on an external peripheral edge of said vehicle roof surrounding said opening and providing a guide rail at each lateral side of said roof opening, said assembly frame includes an all-around, upwardly open water channel under a peripheral edge of a cover for closing said roof opening and a U-shaped, upwardly open reception depression provided along two lateral sides and a rear side of said assembly frame, and a partition separating said reception depression from the water channel;
- at least one sliding element in each of said guide rails;
- pivot means mounting a leading edge of said cover to a sliding element in each of said guide rails for pivoting movement of said cover about an axis at a right angle to a direction of travel of said sliding elements;
- a pivotally mounted opening lever in each of said guide rails and connected to said cover for supporting a trailing edge of said cover when said trailing edge of said cover is raised to pivot said cover about said pivot means;



swivel bearings for connecting one side of said frame assembly to said vehicle roof; and
- means for locking a side of said frame assembly opposite to aid one side to said vehicle roof, whereby said frame assembly, guide rails, cover and opening levers are mountable to the vehicle roof from above as a unit, said cover may be pivoted about said pivot means to selectively open and close said vehicle roof opening and said assembly frame may be pivoted about said swivel bearings to pivot said mounting unit away from said roof opening.

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5,048,890

## GUIDE RAIL FOR A SLIDING ROOF APPARATUS

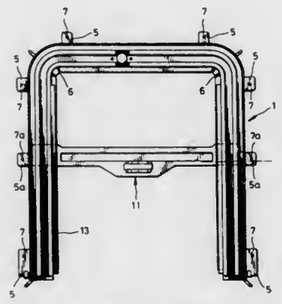
Mitsuyoshi Masuda, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed May 25, 1990, Ser. No. 528,546

Claims priority, application Japan, May 26, 1989, 1-133090; Jun. 1, 1989, 1-64151

Int. Cl.[5] B60J *7/22*

U.S. Cl. 296—216 3 Claims



1. A sliding roof apparatus for an automotive vehicle comprising:
- a guide rail for supporting a sliding roof member, said guide rail being mounted substantially adjacent an opening in a roof of the automotive vehicle, said guide rail being an integrally molded body having two parallel portions extending longitudinally relative to the vehicle and a connecting portion connecting opposing ends of said parallel portions;
- reinforcing means integrally connected to said guide rail for rigidly supporting said guide rail about said opening, said reinforcing means including a center frame connecting



substantially central portions of said parallel portions and extending tranversely relative to the vehicle, said center frame having opposite end portions;
- mounting means substantially adjacent peripheral edges of said guide rail for securing said center frame and said guide rail to brackets attached to the body of the vehicle, whereby said opposite end portions of said center frame are separately attached to brackets fixed to the body of the vehicle.

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5,048,891

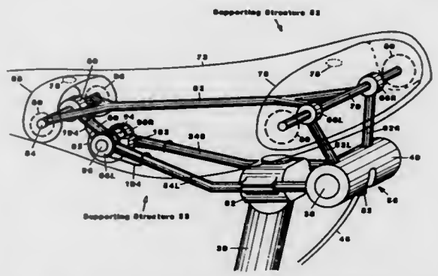
## SEAT POSITION CHANGING APPARATUS FOR A BICYCLE OR CYCLE-TYPE MACHINE

Thomas L. Yach, 3048 N. Ocean Blvd., Ft. Lauderdale, Fla. 33308

Filed Oct. 30, 1989, Ser. No. 429,075

Int. Cl.[5] B60N *2/38*

U.S. Cl. 297—195 9 Claims



1. A seat position changing apparatus for a bicycle or cycle-type machine, controllable by a rider while riding the bicycle or an operator operating the cycle-type machine, having, in combination,
- (a) the bicycle with wheels, or the cycle-type machine,
- (b) a seat post connected to the bicycle or cycle-type machine,
- (c) a seat clamp effectively connected to the seat post,
- (d) a seat, comprising a forward and rearward portion, connected to the seat clamp by supporting means,
- (e) a releasable locking means enabling intermittent seat repositioning effectuations, and,
- (f) actuating control means for unlocking the releasable locking means,

wherein, the improvement comprises, a seat supporting structure, having
- (g) bar type members, adjustably and removably secured to, and frontwardly and rearwardly exited from, the seat clamp, with,
- (h) interconnecting means connecting the rearward portion of the seat and the rearward portion of the bar type members for fore and aft and angular movement of the rearward portion of the seat relative to the bar type members, and,
- (i) interconnecting means connecting the forward portion of the seat and the frontward portion of the bar type members for fore and aft and angular movement of the forward portion of the seat relative to the bar type members.

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5,048,892

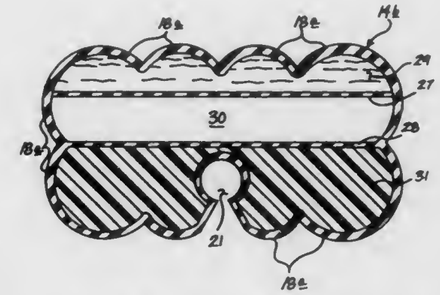
## LAWN CHAIR PAD HAVING FLUID, PNEUMATIC AND POLYMERIC CHAMBERS

Mart O. Ledbetter, 5760 Shady Oak St., Huber Heights, Ohio 45424

Filed Sep. 7, 1990, Ser. No. 578,676

Int. Cl.[5] A47C *27/00, 31/00*

U.S. Cl. 297—219 1 Claim

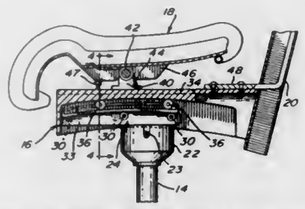


1. A lawn chair pad construction, comprising in combination,
- a chair defined by a seat tubular framework and a backrest tubular framework, and
- an elongate longitudinally aligned cushion member selectively securable to selective portions of the seat tubular framework or the backrest tubular framework, wherein the cushion member includes a longitudinally aligned elongate through-extending bore directed through the cushion member, and
- the bore including an elongate wedge-shaped slot diametrically aligned with the bore to permit selective securement of the cushion member to the seat tubular framework or the backrest tubular framework, and
- wherein the cushion member includes a forward wall spaced from a rear wall, and a serpentine exterior side wall extending coextensively between the forward wall and rear wall to define an enclosed chamber, the serpentine side wall defining parallel cushion ribs to effect comfort of an individual positioning a body part thereon in deflection of the side wall, and
- wherein the forward wall includes an air valve positioned medially of a predetermined height defined by the forward wall to permit selective inflation within the cushion member, and
- wherein the enclosed chamber includes a first planar partition wall extending longitudinally and coextensively and interiorly of the enclosed chamber and longitudinally aligned relative to the cushion member, and a second planar partition wall spaced from and parallel the first planar partition wall and longitudinally aligned within the enclosed chamber of the cushion member, and
- wherein a first chamber is defined between the first planar partition wall and the side wall, wherein the first chamber includes a predetermined quantity of fluid sealingly contained within the first chamber, and
- wherein a second chamber defined between the first planar partition wall and the second planar partition wall is in pneumatic communication with the air valve to permit selective inflation of the second chamber, and
- wherein a third chamber is defined between the second partition wall and the side wall, wherein the third chamber is completely filled with a deformable memory retentent polymeric member, wherein the polymeric member is surroundingly positioned about the elongate body slot.

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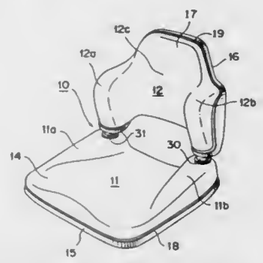


5,048,893
ERGONOMIC CHAIR
Benjamin Cowan, 46 Heath Road, Montreal, Quebec, Canada H3X 3L4; Marek Kmiciklewicz, Montreal, Canada; Christopher J. Scrase, Dorval, Canada, and Bernard Shalinsky, Montreal, Canada, assignors to Benjamin Cowan, Montreal, Canada
Filed Jul. 16, 1990, Ser. No. 552,563
Int. Cl.[5] A47C 7/50
U.S. Cl. 297—329 10 Claims



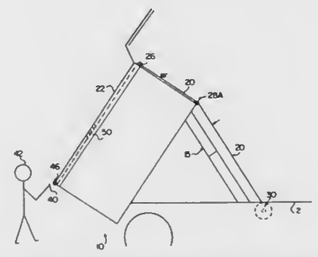
1. A chair comprising a base, at least a fixed stem extending vertically from the base, a track platform mounted at the top of the stem, a carriage mounted on the track platform for sliding movement in a convex arc relative to the carriage, one of the carriage and track platform mounting a track including at least a pair of bearing races provided in the forward and rearward directions, and the other of the carriage and track platform including bearings adapted to roll in the bearing races in the track, a seat pan mounted on the carriage for movement about fixed pivot in an axis at right angles to the direction of the bearing races, and resilient means associated with the seat pan to resist the pivoting movement of the seat pan.

5,048,894
SEAT FOR SPECIAL VEHICLE
Iwao Miyajima; Kenzo Shimada; Kazuo Shimizu; Hiroshi Moriyama, and Tatsuya Tokuda, all of Saitama, Japan, assignors to Tokyo Seat Corp., Ltd., Saitama and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan
Filed Nov. 9, 1989, Ser. No. 435,141
Claims priority, application Japan, Nov. 9, 1988, 63-146292[U]
Int. Cl.[5] A47C 7/02
U.S. Cl. 297—460 19 Claims



1. A seat for a special vehicle, comprising:
a seat cushion including a substantially horizontal bottom frame, a first cushioned padding connected to said bottom frame, and a first covering sheet;
a seat back including a back frame standing up and spaced from said bottom frame, a second cushioned padding connected to said back frame, and a second covering sheet; and
means for interconnecting said seat cushion and said seat back, said interconnecting means including a pair of elongated stays, each of said elongated stays being obtuse-angularly curved at a substantially middle portion thereof so as to allow said back frame to be supported obliquely relative to said bottom frame;
said bottom frame including a body having two spaced recess means each receiving a lower portion of one of said elongated stays, said two spaced recess means being provided at left and right regions, respectively, near a rear end of said body of said bottom frame;
said back frame including a body having a peripheral rising portion and two spaced hole means each allowing an upper portion of the one of said elongated stays to be inserted therethrough;
said interconnecting means further including first fastening means and second fastening means;
each of said stays being received at the lower portion thereof in one of said two spaced recess means of said bottom frame and secured to said bottom frame by said first fastening means, and inserted at the upper portion thereof through one of said two spaced hole means of said back frame and secured to said back frame by said second fastening means, thereby interconnecting said bottom frame and said back frame;
said first cushioned padding including a body having two spaced ridge portions formed integrally therewith, said ridge portions extending along left and right sides of said body of said first cushioned padding from a rear end thereof to approximately a middle of said sides;
said first cushioned padding being arranged on said bottom frame with said ridge portions facing upwardly and such that said ridge portions are positioned at locations corresponding to those of the lower portions of said stays which are secured to said bottom frame;
said second cushioned padding comprising a body having a lower section and an upper section, said lower section having two spaced bulged portions integrally formed with said second cushioned padding and extending along left and right sides thereof such that said lower section has a substantially C-shape in cross section, said upper section being substantially flat;
said second cushioned padding being arranged on said back frame with a surface thereof, on which said bulged portions are formed, being an outer surface and such that said bulged portions are positioned at locations corresponding to those of the upper portions of said stays which are secured to said back frame;
said first covering sheet covering said first cushioned padding; and
said second covering sheet covering said second cushioned padding.

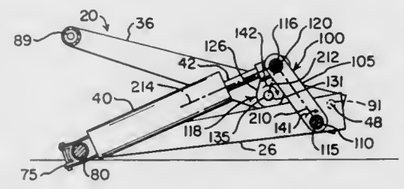
5,048,895
DUMP BODY TAILGATE LIFT
Walter F. Smith, III, 12444 Dixie Hwy., Holly, Mich. 48442
Filed Aug. 1, 1990, Ser. No. 564,422
Int. Cl.[5] B60P 1/29
U.S. Cl. 298—23 DF 4 Claims



1. A tension actuated cable hoist system for raising and lowering a tailgate on a truck having a frame, a dump body and actuating means for raising the dump body, said cable hoist system comprising;
a pair of cables having first and second ends, said first ends attached to said tailgate;
attachment means for fixedly attaching said second ends of said cables to said frame;
means for taking up slack in said cables; and
guide means for routing said cables from said tailgate, through said dump body and to said attachment means;
whereby said tailgate is raised by raising said dump body with said actuating means and said tailgate is lowered by lowering said dump body by deactivating said actuating means.



5,048,896
MINIMUM PROFILE HOIST
Glenn L. Channell, 3739 S. County Rd. 7, Loveland, Colo. 80537
Filed Apr. 20, 1988, Ser. No. 184,045
Int. Cl.[5] B60P 1/16
U.S. Cl. 298—22 J 14 Claims



1. In a scissors-type hoist for a dump truck body which has an upper frame and a lower frame pivotally connected together at a scissors axis, one end of the lower frame opposite the scissors axis being pivotally attached to the truck chassis frame and one end of the upper frame opposite the scissors axis being connected to the dump body, and a hydraulic cylinder with a hydraulically extendable and retractable rod for pivoting the upper frame in relation to the lower frame about the scissors axis, the improvement comprising:
a power hinge including an elongated guide link pivotally attached at one end to the lower frame and a lift link pivotally attached at one end to the upper frame, the other ends of said guide link and said lift link being pivotally connected together, wherein the hydraulic cylinder is pivotally connected at one end to the lower frame and at the other end to said power hinge, and wherein the axis of connection of the lift link to the upper frame and the scissors axis are disposed on opposite sides of the guide link said power hinge increasing the mechanical advantage of the hoist at and near its folded condition by multiplying the force of the hydraulic cylinder as it is applied to the upper frame.

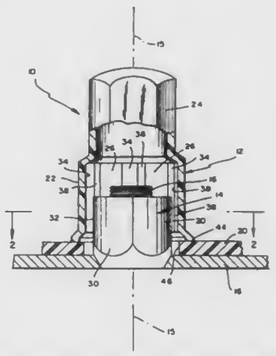
5,048,897
SPARK-PRODUCING MECHANISM FOR WHEEL ASSEMBLY
Cheng S. Yeh, Taipei, Taiwan, assignor to Lucky Star Enterprise & Co., Ltd., Taipei, Taiwan
Filed Dec. 29, 1989, Ser. No. 459,197
Int. Cl.[5] A63C 17/22; B60B 19/00
U.S. Cl. 301—5.3 1 Claim

1. A spark-producing mechanism for a wheel assembly comprising:
a first bearing including a bushing portion fitted to a shaft having a threaded end;
a second bearing including a bushing portion fitted to said shaft adjacent said first bearing;
a wheel having a central portion and annular lip depending therefrom, said central portion serving to engage said first and second bearings;
a fixing ring fitted to the bushing portion of said second bearing, said fixing ring including a plurality of spaced apart non-through holes on a circumference thereof, each of said plurality of non-through holes having a spring means and a flint disposed partially therein, said flint being substantially cylindrical and having a flange proximate one end thereof, said flint flange serving to support said spring means;
a compression ring mounted on said fixing ring circumference, said compression ring including a plurality of spaced apart through holes, each of said through holes being spaced apart in a manner corresponding to the spacing of



said fixing ring non-through holes, whereby said flints may operationally pass therethrough;
a grindstone mounted to an interior surface of said wheel annular lip; and
a nut screwed onto said shaft threaded end, said nut serving to fasten said wheel in position;
said spring means serving to urge said flints in a radially outward direction into contact with said grindstone whereby said flints rub against said grindstone to produce sparks during rotation of said wheel until the flanges of said flints come into contact with said compression ring.

5,048,898
WHEEL COVER TWIST FASTENER SYSTEM
Martin E. Russell, White House, Tenn., assignor to Del-Met Corporation, Walton, N.Y.
Filed Jul. 6, 1990, Ser. No. 549,979
Int. Cl.[5] F16B 19/00
U.S. Cl. 301—37 S 14 Claims



1. A molded thermoplastic nut cap for locking engagement

VOL 1130 ISS 3 SE 17 1991 UMI



over the corners of a polygonal nut, the cap comprising a substantially cylindrical body having an open bottom, a plurality of planar chordal faces formed on an interior wall of the body, the polygonal nut having a plurality of faces and a plurality of corners, each corner of the nut formed at the intersection of adjacent faces of the nut, the plurality of chordal faces comprising the number of faces of the nut, each planar chordal face lying in a plane parallel to a common longitudinal axis and being equidistantly spaced from the axis, the distance between the axis and the plane of each chordal face being greater than the distance between the axis and each face of the nut but less than the distance between the axis and each corner, whereby the cap may be slipped over the nut without interference in a first position when the faces of the nut are substantially parallel to the chordal faces, the cap including means for engagement with a torque applying tool for rotating the cap relative to the nut to a second position, the corners of the nut being in interference engagement with the chordal faces in the second position, the cap being lockingly engaged on the nut when the chordal faces are in interference engagement with the corners of the nut.

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**5,048,899**

## ANTI-SKID AND TRACTION CONTROL APPARATUS FOR A VEHICLE

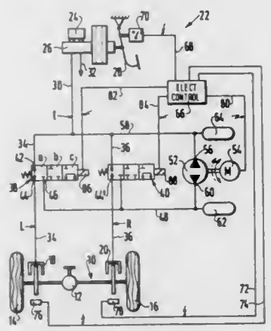
**Manfred Schmitt, Schwieberdingen, and Norbert Rittmannsberger, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jan. 16, 1990, Ser. No. 466,114**

**Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909167**

**Int. Cl.**[5] **B60T** *8/32;* **B60K** *28/16*

**U.S. Cl. 303—116** **14 Claims**



1. An anti-skid and traction control system (**100**) for avoiding wheel locking in a vehicle having drivable wheels (**14**, **16**) for braking and to limit drive slip at the drivable wheels (**14**, **16**) of the vehicle, which comprises at least a single-circuit master brake cylinder (**26**) with a pressure fluid supply container (**24**), having pressure control valve assemblies disposed between the master brake cylinder (**26**) and wheel brakes (**18**) of drivable wheels (**14**) and (**16**), and having a pump (**102**) rotatable in only one direction and including a pressure fluid inlet (**106**) and a pressure fluid outlet (**108**), and is provided with a switchover valve assembly (**104**, **152**) which in an anti-skid mode connects the pressure fluid outlet (**108**) of the pump (**102**) with the master brake cylinder (**26**) and connects the pressure fluid inlet (**106**) with the third line connection (**46**) of at least one pressure control valve assembly (**38**), while in the traction control mode the pressure fluid inlet (**106**) of the pump (**102**) communicates with the master brake cylinder (**26**) and the pressure fluid outlet (**108**) communicates with the third line connection (**46**) of the pressure control valve assembly (**38**), said pressure control valve assembly (**38**) has a first line connection (**42**) communicating with the master brake cylinder (**26**), a second line connection (**44**) communicating with the wheel brake (**18**) and a third line connection (**46**), through which quantities of pressure fluid flow in the anti-skid mode for reducing the wheel brake pressure, in the traction mode said third line connection (**46**) of the pressure control valve assembly (**38**) communicates with a pressure outlet connection (**108**) of the pump (**102**).

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**5,048,900**

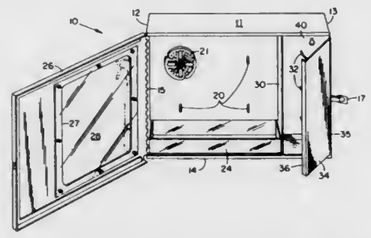
## GRINDER PLATES AND KNIVES STORAGE CABINET

**Gene Nunn, P.O. #17867, San Antonio, Tex. 78217**

**Filed May 12, 1989, Ser. No. 351,424**

**Int. Cl.**[5] **A47F** *3/00*

**U.S. Cl. 312—114** **6 Claims**



1. For use at a butcher shop for storing grinder plates and knives for use in meat processing equipment, a storage cabinet which comprises:

(a) a housing supporting a hinged door for opening and closing movement, said housing has a back wall and a parallel spaced false back wall set forwardly of said back wall and attached to said back wall along an upper edge of said false back wall;

(b) hangers within said housing for receiving grinder plates and knives thereon, said hangers comprising individual, protruding, upwardly inclined wire hooks extending from said false back wall and further including means for spacing said hooks so that dripping material from the grinder plates and knives is directed away from said false back wall;

(c) a pan in the lower portions of said housing for collecting dripping material from grinder plates and knives placed in said housing, said pan being readily accessible when said door is open such that said collected material may be redeposited on said grinder plates and knives; and

(d) means for temporarily closing said housing by closing the door thereof, said door having an opening therein for viewing grinder plates and knives stored within said housing, and further including a transparent pane closing said opening therein, said door also including a lip along said door positioned and sized to reach around said housing when said door is closed.

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**5,048,901**

## FURNITURE CONSTRUCTIONS INCLUDING HIDDEN COMPARTMENTS

**William E. DeBlaay, Manlius, N.Y., assignor to L. & J.G. Stickley, Inc., Manlius, N.Y.**

**Continuation of Ser. No. 293,986, Jan. 6, 1989, Pat. No. 4,925,255. This application Apr. 23, 1990, Ser. No. 515,562**

**The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.**

**Int. Cl.**[5] **A47B** *17/04*

**U.S. Cl. 312—204** **6 Claims**

1. A furniture piece having front and rear sides for use in free-standing condition having at least one hidden compartment therein, said furniture piece comprising, in combination:

a) frame means including leg means for resting upon a floor to support said funiture piece in said free-standing condition;

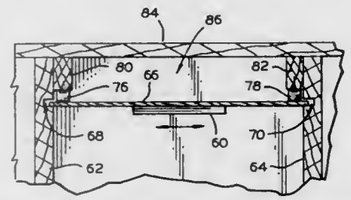


b) a first wall comprising a portion of said front side of said furniture piece, said first wall being fixed with respect to said frame and having an opening therein providing access to an interior space within said furniture piece;

c) second and third walls fixed with respect to said frame and positioned within said interior space with facing, parallel surfaces spaced by a first, predetermined distance;

d) a fourth wall fixed with respect to said frame and positioned within said interior space with a surface of said fourth wall perpendicular to and extending between said facing surface of said second and third walls;

e) a pair of elongated, parallel grooves extending into the facing surfaces of said second and third walls to respective bottom groove surfaces spaced by a second, predetermined distance, said grooves being parallel to and spaced equal distances from said fourth wall surface;



f) a removable panel having a pair of parallel edges spaced by greater than said first distance and less than said second distance, whereby said panel may be positioned with said edges in said grooves to support said panel in spaced, parallel relation to said fourth wall with first and second surfaces of said panel respectively facing toward and away from said fourth wall surface, thereby forming a hidden compartment between the opposing surfaces of said fourth wall and said panel;

g) handle means fixedly attached to said second panel surface for manuel engagement as said panel edges are positioned in and removed from said grooves; and

h) a drawer slidably moveable into and out of said interior space with said removable panel remaining stationary in said grooves.

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**5,048,902**

## DECK STORAGE CABINET

**Lewis J. Daly, Fayetteville, N.Y., assignor to Triad Technologies, Inc., Syracuse, N.Y.**

**Filed Oct. 15, 1990, Ser. No. 596,970**

**Int. Cl.**[5] **A47B** *43/00*

**U.S. Cl. 312—250** **11 Claims**

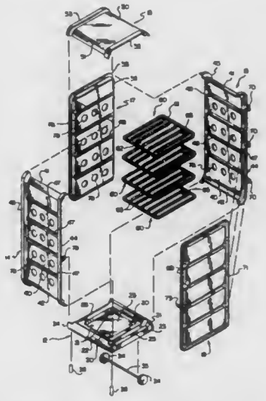
1. An upright cabinet of all molded construction for storing equipment that includes

a rectangular shaped base having arcuate shaped inwardly facing seats extending along opposite side edges of said base and L-shaped recesses formed in front and back walls of the base, said recesses curving upwardly at either end to complement the curvature of the inwardly facing seats,

a pair of opposed vertically disposed side walls mounted on the base, each side wall including a vertical panel that is curved along the top and bottom edge sections with the bottom edge section being seated securely in contact within one of said seats,

an L-shaped flanges extending along the front and rear edges of said side wall panels with the bottom section of the front and rear flanges being seated within and in contact with the curved end sections of said front and rear recesses formed in said base whereby the recesses are continued upwardly by the flanges along the front and back edges of said side walls,

a top wall having curved end sections that are seated in overlying contact with the curved top edge section of said side walls, said top wall having L-shaped flanges extending along the front and rear edges, the ends of the top wall flanges being fitted into the edge flanges of the side walls so that the recesses encircle front and rear openings defined by said base and said walls, a back wall mounted in the rear recesses for closing the rear opening, and



a door hingedly mounted in the front recess that can be opened to gain access to said cabinet.

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**5,048,903**

## TRASH ORGANIZER

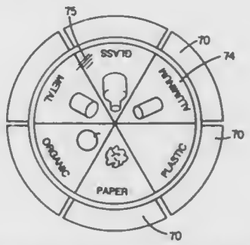
**Eldon Loblein, 6 Jackson Ave., Belfast, Me. 04915**

**Continuation-in-part of Ser. No. 472,760, Jan. 31, 1990, Pat. No. 5,013,102. This application Nov. 13, 1990, Ser. No. 613,101**

**The portion of the term of this patent subsequent to May 7, 2008, has been disclaimed.**

**Int. Cl.**[5] **A47B** *81/00*

**U.S. Cl. 312—234.1** **7 Claims**




1. In combination with a counter top of a domestic kitchen or the like, a trash collector and organizer to facilitate recycling, said organizer comprising:

a revolvable base adapted to support a circular nest of generally triangularly shaped open top trash cans,

a mount for said base holding the same at a predetermined level and location beneath the counter top,

said counter top having a trash drop hole at a preselected location above said open cans,

a top cover hinged to the counter top adapted to conceal said drop hole when closed and to expose said drop hole to receive trash when open,

a mechanism for revolving said base so as selectively to locate the open mouth of any individual can directly beneath said drop hole,

indexing means actuated by the revolving movement of said base to assist in the selection of the cans, said indexing means comprising

a rotatable indicia bearing gauge and

a drive from said revolving mechanism for rotating said gauge,

said revolving mechanism having a push button controlled drive motor for revolving the can supporting base to selected rotated positions while simultaneously actuating said indexing means, and

a door which, when open, facilitates the removal of individual cans from said base from front beneath the counter and which, when closed, serves to conceal the collector and organizer from view.

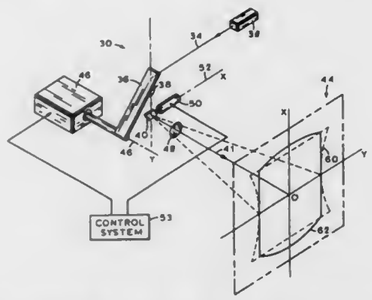
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**5,048,904**

**TWO-MIRROR SCANNER WITH PINCUSHION ERROR CORRECTION**

**Jean I. Montagu, Brookline, Mass., assignor to General Scanning, Inc., Watertown, Mass.**

**Filed Jul. 6, 1990, Ser. No. 549,228**
**Int. Cl.[5] G02B *26/08***
**U.S. Cl. 359—202** **8 Claims**




6. For scanning an object plane, a scanner comprising:

(A) An f-θ lens so disposed that one of its focal planes is the object plane;

(B) a light source or detector;

(C) a first mirror for reflecting light between (i) a first path extending from the first mirror to the source or detector and (ii) a second path;

(D) a first mirror driver for pivoting the first mirror about a first pivot axis spaced from the intersection of the first path and the second path so that the reflection position moves as the first mirror pivots.

(E) a second mirror resiliently mounted on a resilient member for pivoting about a second pivot axis so as to exhibit a natural pivoting frequency thereabout, for reflecting light between the second path and a third path that extends through the lens to the object plane; and

(F) a second mirror driver for cyclically pivoting the second mirror about the second pivot axis substantially at the natural pivoting frequency.

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**5,048,905**

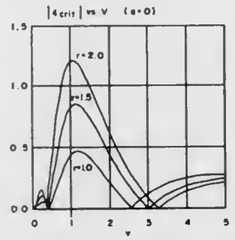
**WAVEGUIDE PHASEMATCHING**

**Martin M. Fejer, and Eric J. Lim, both of Menlo Park, Calif., assignors to The Board of Trustees of the Leland Stanford Universlty, Stanford, Calif.**

**Filed Mar. 27, 1990, Ser. No. 500,033**
**Int. Cl.[5] G02B *6/10***
**U.S. Cl. 350—96.12** **6 Claims**

1. In a method of manufacturing a dielectric waveguide which is to propagate optical radiation having at least two different frequencies in the direction of said propagation, the steps of

(a) determining the relationship of differences in phase of said two different frequencies for a discrete length of said waveguide to a plurality of potential values for a characteristic dimension of said waveguide along said discrete length; and




(b) selecting a value for said characteristic dimension which minimizes to a desired degree the effect of minor variations from the same on the coupling of energy along said length between said differing frequencies.

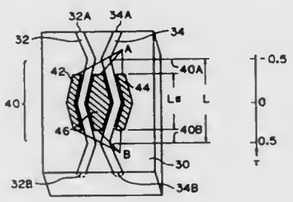
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**5,048,906**

**WAVEGUIDE TYPE PHOTOSWITCH WITH A SHORT COUPLING REGION**

**Hideaki Okayama, and Issei Asabayashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Jun. 26, 1990, Ser. No. 544,263**
**Claims priority, application Japan, Jun. 26, 1989, 1-163356**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—40** **7 Claims**




1. A waveguide type photoswitch, comprising:

a substrate;

a plurality of waveguide paths formed on said substrate side-by-side and having a coupling region, said waveguide paths being optically coupled in at least a part of said coupling region, said coupling region having opposite coupling region ends, a center between said coupling region ends and a length measured from one of said coupling region ends to the other, a distance between said waveguide paths measured at said center being greater than distances between said waveguide paths respectively measured at said coupling region ends; and

a plurality of electrodes extending along said waveguide paths in a portion of said coupling region which includes said part thereof, said electrodes each having opposite electrode ends, each of said electrode ends being located adjacent to a respective one of said coupling region ends, each of said electrodes having a length, measured from one of said electrode ends to the other, which is less than the length of said coupling region, the electrode ends of each of said electrodes being spaced equidistantly from the respective adjacent coupling region ends.

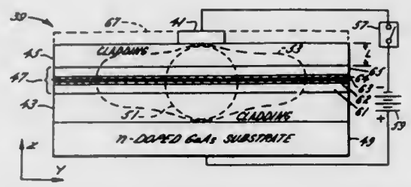


**5,048,907**

**ELECTRIC FIELD INDUCED QUANTUM WELL WAVEGUIDES**

**Randy W. Wickman, and Anthony L. Moretti, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.**

**Filed Feb. 23, 1990, Ser. No. 484,685**
**Int. Cl.[5] G02B *6/10***
**U.S. Cl. 385—2** **25 Claims**




1. A semiconductor optical element for propagating light from an optical beam comprising:

a first cladding region;

a second cladding region;

a core for receiving the optical beam interposed between the first and second cladding regions and comprising at least one quantum well structure;

each of the first and second cladding regions having dimensions that allows the light of the optical beam to spread laterally with respect to a primary direction of the beam as the light propagates through the core; and

means for applying an electric field in a selected area of the core for laterally confining the light of the optical beam to the selected area.

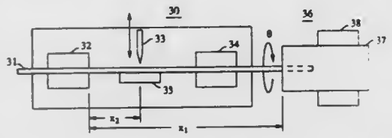
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**5,048,908**

**METHOD OF PRODUCING APPARATUS COMPRISING A LOW-REFLECTION OPTICAL FIBER CONNECTION**

**Greg E. Blonder, Summit; Bertrand H. Johnson, Murray Hill, and Carl R. Paola, Westfield, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Feb. 13, 1990, Ser. No. 479,307**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—39** **4 Claims**



1. Method of producing apparatus that comprises a low-reflection optical fiber joint, the method comprising

a) providing a length of optical fiber;

b) shaping a first end of the optical fiber such that a tilted fiber endface results;

c) incorporating the first end of the optical fiber into the optical fiber joint; and

d) completing producing the apparatus;

characterized in that step b) comprises

applying a torque to the optical fiber at or near the first end such that an end of a portion of the optical fiber is twisted through a predetermined twist angle $\theta$ relative to the other end of the portion, applying a predetermined axial tensile force to the fiber such that the portion of the optical fiber is under axial tensile stress, the tensile stress being greater than about 4200 gm/mm$^2$, and contacting the fiber with cleaving means such that the fiber separates at a point along the portion of the optical fiber, the value of $\theta$ selected such that the resulting tilted endface has a nominal tilt angle $\phi$ in the range 3°–20°.

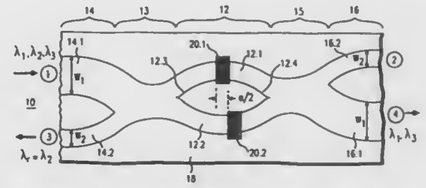
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**5,048,909**

**ADIABATIC REFLECTION APPARATUS**

**Charles H. Henry, Montgomery Township, Somerset County; Rudolf F. Kazarinov, Martinsville, and Yosi Shani, Aberdeen, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Jul. 27, 1990, Ser. No. 559,010**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—27** **18 Claims**



1. Adiabatic reflection apparatus comprising

an adiabatic Y-coupler having a first single mode waveguide branch which converts guided light to a symmetric mode, a second single mode waveguide branch which converts guided light to an anti-symmetric mode, and a common multimode waveguide section where said first and second branches merge and which supports both symmetric and anti-symmetric modes, and

a wavelength selective structure having one end coupled to said common section, said structure comprising at least two single mode waveguide arms coupled to said common section, and a reflection device disposed in each of said arms, said devices being designed to reflect guided light at atleast one predetermined wavelength $\lambda_r$,

said waveguide arms and said reflection devices being designed to convert said reflected light to an anti-symmetric mode and conversely.

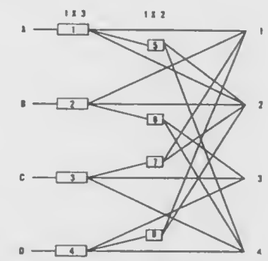
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**5,048,910**

**OPTICAL MATRIX SWITCH FOR MULTIPLE INPUT/OUTPUT PORT CONFIGURATIONS**

**Bernard G. Caron, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Continuation-in-part of Ser. No. 520,350, May 8, 1990. This application Jun. 11, 1990, Ser. No. 535,817**
**Int. Cl.[5] G02B *6/28***
**U.S. Cl. 385—17** **11 Claims**



1. An optical matrix switch having N number of input ports and M number of output ports, comprising:

where M is an even number, then a configuration of switch elements of N ((M−2)/2) number of 1×3 switch elements plus N number of 1×2 switch elements; and

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where M is an odd number, then a configuration of switch elements of N ((M−1)/2) number of 1×3 switch elements;

each said input port communicating with each said output port;

said switch elements being arranged such that each output port is connected, via a fiber optics transmission line, to N number of said switch elements, and each said switch element is connected longitudinally to one of said input ports or to an intervening switch element.

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**5,048,911**

## COUPLING OF MULTIPLE LASER BEAMS TO A SINGLE OPTICAL FIBER

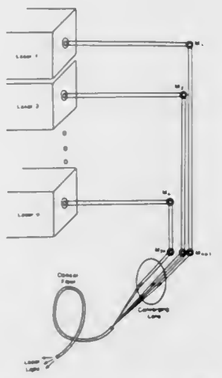
**Low K. Sang, and Tan B. Cheok, both of Selangor Darul Ehsan, Malaysia, assignors to Universiti Malaya, Juala Lampur, Malaysia**

**Filed Jun. 21, 1989, Ser. No. 369,621**

**Claims priority, application Malaysia, Nov. 15, 1988, PI8801301**

**Int. Cl.[5] G02B *6/32***

**U.S. Cl. 385—33** **7 Claims**



1. A beam delivery system for photodynamic therapy comprising:

an optical fiber;

a plurality of lasers emitting laser beams at substantially similar wavelengths;

a plurality of beam steering means, each said steering means directing one of said laser beams through at least two right angles to form an array of near parallel beams onto focussing means; and

said focussing means receiving said steered beams for focussing said steered beams into said optical fiber.

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**5,048,912**

## OPTICAL FIBER SWITCHING WITH SPHERICAL LENS AND METHOD OF MAKING SAME

**Tatsuro Kunikane, Yokohama; Kiyoshi Terai, Taito; Hideki Isono, Yokohama, and Michihiro Takamatsu, Tokorozawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**PCT No. PCT/JP89/00253, § 371 Date Nov. 9, 1989, § 402(e) Date Nov. 9, 1989, PCT Pub. No. WO89/08858, PCT Pub. Date Sep. 21, 1989**

**PCT Filed Mar. 9, 1989, Ser. No. 439,025**

**Claims priority, application Japan, Mar. 9, 1988, 63-55326; Apr. 15, 1988, 63-93829; Jul. 27, 1988, 63-185536**

**Int. Cl.[5] G02B *6/32*; C03C *27/02***

**U.S. Cl. 385—23** **9 Claims**

1. An optical device for providing an optical function for a plurality of optical fibers, comprising:

a substrate;

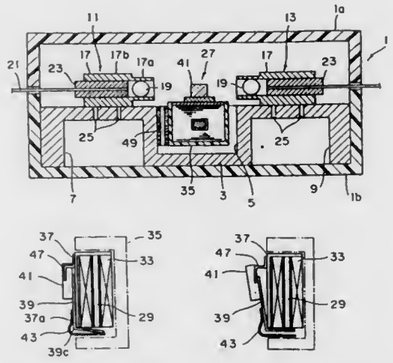
at least two fiber collimators each including:

a spherical lens (**19**),

a cylindrical lens holder including a cylindrical wall, a peripheral portion, a force fitting route, and a remaining portion, said cylindrical lens holder having a smaller inner diameter than the diameter of said spherical lens and having said spherical lens fixed therein by force fitting,

a ferrule inserted in and fixed to said cylindrical lens holder and having one of the plurality of optical fibers connected thereto, said at least two fiber collimators being fixed by welding on said substrate in a predetermined spaced relationship from each other; and

optical function means interposed between said fiber collimators for providing the optical function, wherein the thickness of the cylindrical wall of said cylindrical lens



holder is made smaller along the force fitting route of said spherical lens and the peripheral portion around the force fitting route than at the remaining portion of said cylindrical lens holder.

8. A method of manufacturing a fiber collimator for an optical fiber, said fiber collimator including a cylindrical lens holder and a spherical lens, said method comprising the steps of:

a) manufacturing an outer diameter of the cylindrical lens holder so that the outer diameter of the cylindrical lens holder is smaller along a force-fitting route of the cylindrical lens holder than at a remaining portion of the cylindrical lens holder;

b) force-fitting the spherical lens into the cylindrical lens holder along the force-fitting route; and

c) coupling the optical fiber to the fiber collimator.

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**5,048,913**

## OPTICAL WAVEGUIDE EMBEDDED TRANSVERSE SPATIAL MODE DISCRIMINATION FILTER

**William H. Glenn, Vernon; William W. Morey, West Hartford, and Gerald Meltz, Avon, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 26, 1989, Ser. No. 457,043**

**Int. Cl.[5] G02B *6/34***

**U.S. Cl. 385—37** **2 Claims**

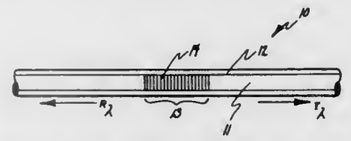
1. An optical waveguide transverse spatial mode discrimination light filtering arrangement comprising

an optical waveguide including an elongated multimode core having two longitudinally spaced end portions, and capable of guiding at least two transverse spatial modes of light of a given frequency in an elongated path along a longitudinal axis of said core; and

at least one grating region embedded in said core and having a multitude of grating elements extending with a substantially equal longitudinal spacing substantially normal to



said longitudinal axis to reflect light propagating in said path and reaching said grating elements back into said path for longitudinal propagation therein opposite to the original propagation direction, said spacing being so related to the axial wavelength of one of said transverse



spatial modes that the reflected light of said one transverse spatial mode interferes constructively while the light of any other of said transverse spatial modes passes through said grating region in said original propagation direction substantially without attenuation.

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**5,048,914**

## ELECTRICAL CONNECTORS INCORPORATING AUTOMATIC POWER CONTROL

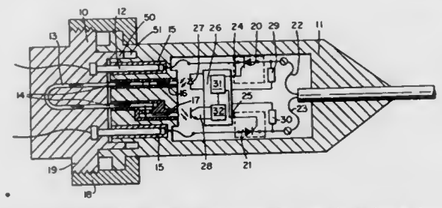
**John L. Sneddon, Aberdeen, Great Britain, assignor to NL Petroleum Services (U.K.) Limited, United Kingdom**

**Filed Dec. 13, 1988, Ser. No. 283,590**

**Claims priority, application United Kingdom, Dec. 18, 1987, 8729512**

**Int. Cl.[5] G02B *6/42***

**U.S. Cl. 385—53** **16 Claims**



1. An electrical power connector for use in a hazardous environment, said connector comprising:

first and second connector bodies;

a first electrical power contact and a first control signal transmission means associated with said first connector body;

a second electrical power contact and a second control signal transmission means associated with said second connector body;

said first and second electrical power contacts positioned to engage one another to permit power transmission when said connector bodies are mutually connected and separating from physical engagement with one another when said connector bodies are moved apart by a first predetermined distance;

said first and second control signal transmission means positioned to cooperate with one another to permit passage of an optical, magnetic or electromagnetic field control signal therebetween when said connector bodies are mutually connected and not to permit passage of said control signal therebetween when said connector bodies are moved apart by a second predetermined distance less than said first predetermined distance;

an electrical power switch associated with at least one of said first and second connector bodies and connected in use in an electrical power circuit including said first and second electrical power contacts;

said electrical power switch being responsive to said control signal so that movement of said first and second connector bodies apart by said second distance causes opening of said electrical power switch to break said electrical power circuit before said first and second electrical power contacts separate from physical engagement with one another.

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**5,048,915**

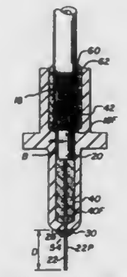
## OPTIC CABLE TERMINATION

**Bruce Coutts, P.O. Box 2162, Costa Mesa, Calif. 92628, and Kathleen M. Kruse, 6544 Archer, Riverside, Calif. 98509**

**Filed Dec. 15, 1989, Ser. No. 451,068**

**Int. Cl.[5] G02B *6/36***

**U.S. Cl. 385—86** **12 Claims**



12. An optic cable termination, comprising:

an optic cable which includes an optical fiber and a cable protective portion that inlcudes a buffer, surrounding said fiber, with said fiber extending forward of the buffer;

a terminus body with a bore that includes a bore front portion and a wider second bore portion that lies behind the fore front portion;

a quantity of adhesive lying in said terminus body;

said fiber passing through and being closely surrounded by said bore front portion and said fiber being bonded by said single quantity of adhesive to the walls of said bore, with a part of said cable protective portion extending partially into said second bore portion and with said cable part being closely received in said second bore portion;

said single quantity of adhesive extends continuously from said bore front portion through said second bore portion at least up to the front end of said cable part that extends into said second bore portion.

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**5,048,916**

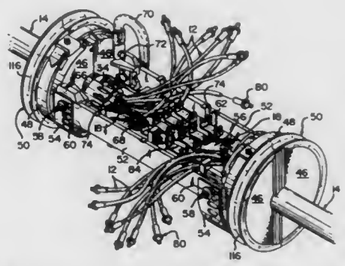
## FIBER OPTIC CONNECTION SYSTEM

**Bernard G. Caron, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Sep. 7, 1982, Ser. No. 415,123**

**Int. Cl.[5] G02B *6/36, 7/26***

**U.S. Cl. 385—71** **24 Claims**



1. A fiber optic connection system for connecting fiber optic transmission members of fiber optic cables, comprising:

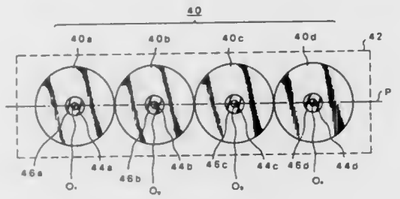
VOL 1130 ISS 3 SE 17 1991 UMI



end cap means securable onto the fiber optic cables adjacent stripped ends thereof;
bar means connected to said end cap means spacing said end cap means relative to one another;
organizer means mounted on said bar means;
ferrule means secured onto ends of the fiber optic transmission members, said ferrule means having profiled forward end means, annular shoulder means rearwardly thereof, and rear cylindrical section means extending rearwardly of said shoulder means;
tubular means having profiled bore means extending therethrough defining complementary areas in which said profiled forward end means of said ferrule means of pairs of fiber optic transmission members being connected are received thereby concentrically and axially aligning the forward ends of said profiled forward end means and the fiber optic cores of the fiber optic transmission members therein, forming fiber optic connectors;
spring clip means mountable on said organizer means, each said spring clip means having spaced ferrule-engaging means extending substantially normally from a base member capable of holdably receiving a respective said fiber optic connector therein with a said tubular means therebetween with a said tubular means therebetween and engaging respective said annular shoulder means of said ferrule means rearwardly thereof under axial spring bias, thereby cooperatingly urging together said ferrule means to maintain said ferrule means in said tubular means and said profiled front end means of said paired ferrule means in concentric alignment within said tubular means; and
sleeve means covering said organizer means and sealingly secured onto said end cap means.

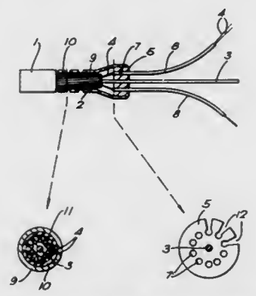
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**5,048,917**
**OPTICAL FIBER CONNECTOR AND METHOD WITH A MULTI-FERRULE STRUCTURE**
**Masao Komatsu, Tokyo, Japan, assignor to Adamant Kogyo Co., Ltd., Tokyo, Japan**
**Filed May 22, 1990, Ser. No. 526,835**
**Claims priority, application Japan, Oct. 18, 1989, 1-271263**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—78** **10 Claims**




1. A multi-ferrule structure comprising:
a base plate with a flat upper surface;
a positioning base block fixedly fastened to extend from said flat upper surface of said base plate;
a plurality of ferrule units of the same outer diameter each for a single optical fiber and each disposed in contact with an adjacent one and parallel to each other, the ferrule units being positioned on the flat upper surface of said base plate, one of said ferrules abutting said base block; and
a fixing part fixing the position of said ferrule units.

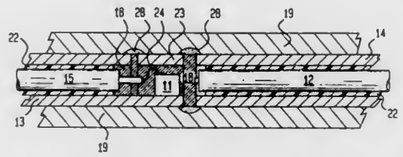
**5,048,918**
**OPTICAL FIBER CABLE TERMINATION**
**Daniel Daems, Berchem, and Patrick Clits, Houwaart, both of Belgium, assignors to Raychem Corporation, Menlo Park, Calif.**
**Filed Feb. 7, 1990, Ser. No. 477,005**
**Int. Cl.[5] G02B *6/26, 6/44***
**U.S. Cl. 385—86** **16 Claims**



1. A method of terminating an optical fibre cable, in which:
(a) a fibre of the cable is provided extending from an end of the cable;
(b) a fibre organizer is positioned at a position spaced from the end of the cable and past which the fibre extends;
(c) the fibre is located by the organizer; and
(d) the organizer is fixed at a position spaced from the end of the cable and the organizer has a dimension transverse to the cable that is different from a diameter of the end of the cable, and a bridging means which has a substantially frusto-conical portion accommodating the difference.

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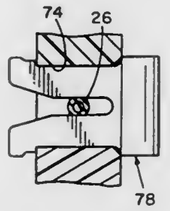
**5,048,919**
**LOW-STRESS COUPLING OF ELECTROOPTICAL DEVICE TO OPTICAL FIBER**
**Ivan Ladany, Harborton, Va., assignor to Bell Communications Research, Inc., Livingston, N.J.**
**Filed Oct. 5, 1990, Ser. No. 593,787**
**Int. Cl.[5] G02B *6/30***
**U.S. Cl. 385—49** **13 Claims**



1. A structure for joining an electrooptical device in light coupling alignment with an optical fiber, said structure comprising:
a) a first support member mounting said device;
b) a second support member mounting said fiber;
c) said first and second support members closely positioned with said device and said fiber in light coupling alignment; and
d) a layer of metal electrolytically deposited about said first and second support members to a thickness sufficient to physically maintain said members in said light coupling position.



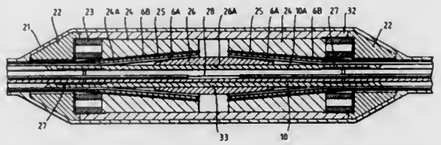
**5,048,920**
**FIBER TO FIBER CONNECTION**
**Edwin R. Newell, Wake Forest, N.C., assignor to Square D Company, Palatine, Ill.**
**Continuation-in-part of Ser. No. 242,359, Sep. 9, 1988, Pat. No. 4,911,517. This application Nov. 9, 1989, Ser. No. 433,940**
**Int. Cl.[5] G02B *6/38***
**U.S. Cl. 385—55** **7 Claims**




1. An optical fiber to fiber connection comprising:
a first optical fiber end, said first fiber end being squarely and cleanly cut and having no external rigid sleeve, guide or post surrounding said first fiber end;
a second optical fiber end, said second fiber end being squarely and cleanly cut;
a connector housing having a connection chamber;
a first, curved fiber inlet passage which communicates with said connection chamber and which snugly but slidably receives said first fiber end that is biased by the resiliency of the first fiber by the curved passage;
a second fiber inlet passage which communicates with said connection chamber and which slidably receives said second fiber end;
a shuttle slidably received within said connection chamber and movable between a first fiber connecting position and a second position, said shuttle having a fiber receiving end, and
a connection end for housing said second fiber end, said connection end being snugly but slidably received within said first fiber inlet passage so that said second fiber end faces said first fiber end;
means for biasing said shuttle toward said first fiber inlet passage from said first fiber connection position to said second position; and
means for fixing said first fiber end within said first fiber inlet passage with said first fiber end adjacent said shuttle connection end and with said shuttle held by said first fiber end in said first fiber connecting position so that said first fiber end is held in compression against said second fiber end.

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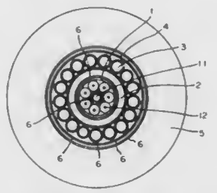
**5,048,921**
**OPTICAL FIBRE CABLE JOINT**
**Richard K. Jones, Stortford, and Paul M. Ryan, Chelmsford, both of Great Britain, assignors to STC PLC, London, England**
**Filed Jul. 11, 1990, Ser. No. 551,146**
**Claims priority, application United Kingdom, Jul. 14, 1989, 8916132**
**Int. Cl.[5] G02B *6/44, 6/36***
**U.S. Cl. 385—69** **8 Claims**



5. A joint for jointing opposed ends of an optical fibre underwater cable having an outer fibre optic transmission element and having first and second tensile strength layers of circular cross-section and surrounding the transmission element, the joint comprising a tubular member having a core for accommodating the joined transmission elements of the opposed cable ends and having an outer taper at each end, said outer tapers each having a high friction surface, first and second tapered inserts corresponding in shape to the outer taper of said tubular member and each adapted to fit between the first and second strength layers of the corresponding cable end, first and second collars each having a tapered bore which matches a respective outer taper of the tubular member, and a watertight housing structure, wherein the first and second collars can be urged together whereby to clamp opposed end portions of each said second strength layer between the respective collar and tapered insert and whereby to clamp opposed end portions of each said first strength layer between the respective tapered insert and outer taper of the tubular member, there being means associated with the housing for retaining the first and second collars in their claiming position.

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**5,048,922**
**OPTICAL FIBER CABLE**
**Kiyofumi Mochizuki, Hachioji; Yoshinori Namihira; Makoto Nunokawa, both of Kawasaki; Yoshinao Iwamoto, Fujimi, and Hitoshi Yamamoto, Yamato, all of Japan, assignors to Kokusai Densbin Denwa Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 915,893, Oct. 6, 1986, abandoned, which is a continuation of Ser. No. 638,750, Aug. 8, 1984, abandoned. This application Jan. 14, 1988, Ser. No. 145,662**
**Claims priority, application Japan, Aug. 18, 1983, 58-149643**
**Int. Cl.[5] G02B *6/44***
**U.S. Cl. 385—103** **8 Claims**



1. An optical fiber cable comprising:
an optical fiber unit comprising a central metallic tension-resisting member and a plurality of optical fibers disposed about said central metallic tension-resisting member
a metallic pressure-resisting member disposed about said optical fiber unit,
and a plurality of metallic tension-resisting wires circumferentially disposed about said metallic pressure-resisting member,
the surface material of all metallic elements, which have an ionization tendency higher than the ionization tendency of hydrogen, being comprised of metallic material that has an ionization tendency lower than the ionization tendency of hydrogen, whereby generation of hydrogen molecules in said cable due to the presence of moisture or water therein is avoided thereby avoiding degradation of the transmission characteristic of the optical fibers by hydrogen molecules in the event of entry of moisture or water into said cable.

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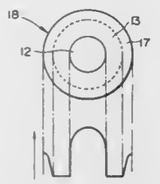


5,048,923

## IMAGE FIBER, IMAGE FIBER PREFORM, AND MANUFACTURING PROCESSES THEREOF

Takashi Tsumanuma; Toshiyuki Tanaka; Naoki Shamoto; Katsuyuki Seto, all of Sakura; Kazuo Sanada, Chiba, and Kouji Tanaka, Sakura, all of Japan, assignors to Fujikura, Ltd., Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 502,204
Claims priority, application Japan, Apr. 7, 1989, 1-87063; May 1, 1989, 1-112623
Int. Cl.[5] G02B 6/06
U.S. Cl. 385—117 10 Claims




1. An image fiber preform for use in an image fiber comprising:
(a) a plurality of optical fiber strands, each optical fiber strand including a silica glass based core which contains a dopant for increasing a refractive index of the core and a silica glass based cladding surrounding the silica glass based core, the silica glass cladding containing a fluorine dopant for decreasing a refractive index of the cladding, the cladding having an outer peripheral surface; and
(b) a quartz tube in which the optical fibers are closely arranged;
wherein the cladding has a concentration of the fluorine dopant which decreases radially outward toward the outer peripheral surface of the cladding.

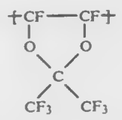
5,048,924

## FLUORINE RESIN COMPOSITION

Teruhiko Sugimori; Takashi Yamamoto; Tsuruyoshi Matsumoto, and Katsuhiko Shimada, all of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Oct. 12, 1990, Ser. No. 597,873
Claims priority, application Japan, Oct. 16, 1989, 1-266197
Int. Cl.[5] G02B 6/00; C08F 16/24
U.S. Cl. 385—145 3 Claims

1. An optical fiber cladding composed of a resin composition comprising a copolymer [I] having a number average molecular weight of at least 15,000, which comprises at least 30 mole % of the following recurring units [A]:



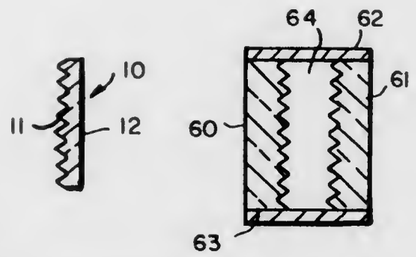

and a compound [II] having a number average molecular weight of at least 1,000, which is comprised of perfluoroalkylether recurring units [D].

5,048,925

## QUASI VOLUME DIFFRACTING STRUCTURES

Hendrick J. Gerritsen, Providence, R.I.; Richard Ian, Brookline, Mass.; Elisabeth W. King, Woolwrich, Me.; Donald K. Thornton, East Boston, and Sally N. Weber, North Cambridge, both of Mass., assignors to Advanced Environmental Research Group, Woolwrich, Me.

Continuation of Ser. No. 738,300, May 28, 1985, abandoned.
This application Apr. 29, 1988, Ser. No. 193,134
Int. Cl.[5] G02B 5/18, 17/00
U.S. Cl. 359—569 10 Claims




1. A structure for responding to incoming radiation having a range of wavelengths incident thereon within a selected range of incidence angles and for directing such incident radiation in a selected direction from said structure, said structure comprising
at least two diffracting elements each having at least one diffraction grating surface;
the grating spacings and depths of one of said at least two diffracting elements being selected to diffract incoming radiation, incident thereon within a first portion of said selected range of incidence angles, in a selected direction; the grating spacings and depths lying within a range which is substantially the same order of magnitude as the range of wavelengths of said incoming radiation;
the grating spacings and depths of said at least one other of said at least two diffracting elements being selected to diffract incoming radiation, incident thereon within another portion of said selected range of incident angles, in generally the same selected direction; the grating spacings and depths lying within a range which is substantially the same order of magnitude as the range of wavelengths of said incoming radiation;
an intermediate region having an index of refraction different from that of said at least two diffracting elements being positioned between said at least two diffracting elements, and interfacing said at least two diffracting elements at the at least one diffraction grating surfaces thereof;
said at least two diffracting elements and said intermediate region being responsive to the radiation incident on said structure so that substantially all of the incident radiation within said selected range of incident angles is transmitted through said structure, the diffraction of the incoming radiation at the diffraction grating surfaces of said at least two diffracting elements thereby causing said incoming radiation to be transmitted from said structure generally in said selected direction which remains within relatively limited confines independent of the angle of incidence of said incoming radiation over said selected range of incidence angles.

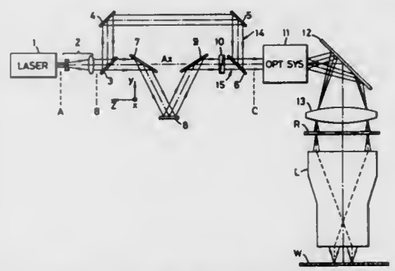


5,048,926

## ILLUMINATING OPTICAL SYSTEM IN AN EXPOSURE APPARATUS

Akikazu Tanimoto, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Feb. 22, 1989, Ser. No. 313,472
Claims priority, application Japan, Feb. 29, 1988, 63-47026
Int. Cl.[5] G02B 27/14
U.S. Cl. 359—487 22 Claims



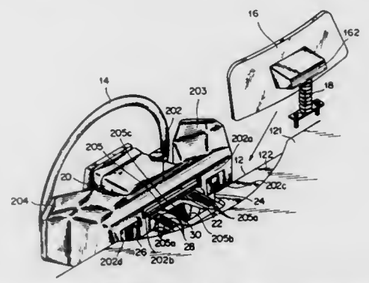

1. Apparatus including an illuminating optical system for illuminating an area of an object with light that is substantially equally spatially coherent along different directions in said area, said system comprising:
means for producing a beam of light having spatial coherence that is different along different directions perpendicular to a propagation direction of said beam:
means for dividing said beam into a plurality of beams;
means for rotating at least one of said plurality of beams relative to the others about an axis substantially parallel to the direction of propagation thereof; and
means for superposing said plurality of beams, including the at least one rotated beam, upon said area of said object;
said rotating means rotating said at least one beam by an amount that causes light illuminating said area to have substantially equal spatial coherence along different directions in said area.

5,048,927

## INDICATION DISPLAY UNIT FOR VEHICLES

Tai Inoue; Tsuyoshi Ohshima; Tatsumi Ohtsuka, and Hiroshi Ichikawa, all of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,853
Int. Cl.[5] G02B 27/14; G09G 3/02; G01C 21/00
U.S. Cl. 359—618 8 Claims



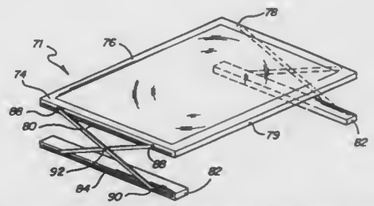

1. An indication display unit for a vehicle, comprising:
reflecting means provided on a dashboard at a position of an instrument panel, said reflecting means having a reflecting surface directed to a driver's seat, a backside of said reflecting means made of a non-transparent material, and said reflecting surface formed to attenuate an intensity of incident light and formed to reflect light; and
indicating means provided at an indicator receiving portion in a steering column, said indicating means having an indicating surface directed toward said reflecting surface of said reflecting means.

5,048,928

## COMPUTER SCREEN MAGNIFIER

Dale G. Davis, 31498 York, Fraser, Mich. 48026

Division of Ser. No. 297,038, Jan. 17, 1989, Pat. No. 4,958,907.
This application Jul. 16, 1990, Ser. No. 553,908
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—809 5 Claims



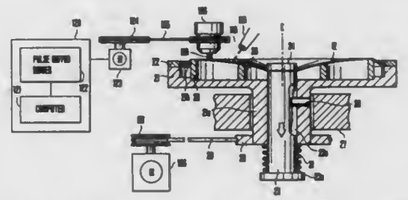

2. A holder for adjustably positioning a flat sheet magnifier proximate a visual display terminal comprising:
mounting means for retaining said magnifier therein comprising at least two diametrically opposing frame members, said members having an interior side and an exterior side, said interior side being configured to receive said magnifier therein and said exterior side defining a first channel therein; and
means for supporting and extensibly positioning said mounting means in a predetermined, spaced-apart relationship with said terminal, said means including at least two base members parallel to said at least two frame members of said mounting means, each base member having an interior side and an exterior side, said exterior side defining a second channel therein, said means further including at least two legs, each leg having two ends and a centerpoint therebetween, said legs pivotally intersecting at said centerpoints and said ends being secured in said first and second channels, whereby said mounting means is extensibly positioned by pivoting said legs from a first position to a second position.

5,048,929

## METHOD AND APPARATUS FOR FORMING CURVED SURFACE

Junji Watanabe; Tadao Saitoh, both of Tokyo, and Kazuo Matsunaga, Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jul. 25, 1989, Ser. No. 385,255
Claims priority, application Japan, Jul. 26, 1988, 63-184751; Jul. 27, 1988, 63-185357
Int. Cl.[5] G02B 27/00
U.S. Cl. 359—896 31 Claims



15. An apparatus for forming a curved surface, comprising:

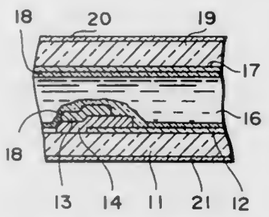
VOL 1130 ISS 3 SE 17 1991 UMI



a polishing plate consisting of a film-like elastic member;
a rotary plate for supporting a peripheral portion of said polishing plate;
two cylinders, outer and inner cylinders, on said rotary plate and having different heights and diameters;
means for spring-biasing a central portion of said polishing plate downward; and
rotating means for rotating an object to be processed and urging the object against said polishing plate, thereby a curved surface is formed on the object.

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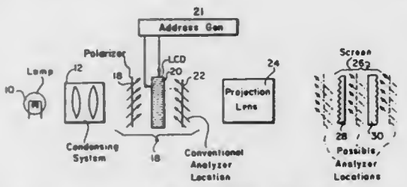
**5,048,930**
**ELECTRO-OPTICAL DEVICE**
**Yoshimi Kuroda, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan**
**Filed Mar. 14, 1989, Ser. No. 324,227**
**Claims priority, application Japan, Mar. 17, 1988, 63-64379**
**Int. Cl.[5] G02F *1/13***
**U.S. Cl. 359—58** **24 Claims**




1. An electro-optical device comprising:
a first substrate having an electrode on the inner surface thereof;
a second substrate opposed to the first substrate and having on the inner surface thereof a plurality of line electrodes, picture element electrodes and a plurality of switching elements, each switching element being comprised of amorphous silicon base material containing from 0 to less than 1% by weight of hydrogen, the line electrodes defining one of row and column electrodes and the electrode on the first substrate defining the other of the row and column electrodes; and
an electro-optical material layer sandwiched between the substrates and having optical properties which vary by applying a voltage thereacross.

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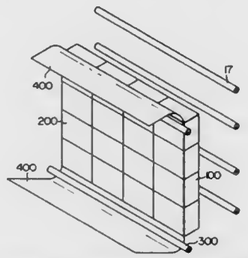
**5,048,931**
**LIQUID CRYSTAL DISPLAY PROJECTION SYSTEM HAVING IMPROVED CONTRAST**
**Stephen Magocs, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.**
**Continuation of Ser. No. 265,659, Nov. 1, 1988, abandoned, which is a continuation of Ser. No. 934,871, Nov. 25, 1986, abandoned. This application Jul. 13, 1989, Ser. No. 380,699**
**Int. Cl.[5] G02F *1/13*; G03B *21/14, 21/00*; H04N *9/31***
**U.S. Cl. 350—337** **10 Claims**




1. An electro-optical display system comprising:
an illumination source furnishing light rays;
polarization changing means, for changing the polarization of light in response to a control signal, positioned in the path of said light rays so that said polarization changing means furnishes polarization output light comprising first polarized light in the absence of said control signal and second polarized light in response to said control signal;
means for applying said control signal to said polarization changing means in accordance with information to be displayed;
display means having a first side for displaying said information and a second side substantially parallel to said first side; and
analyzer means positioned to receive said first polarized light and said second polarized light and furnishing only said second polarized light in response thereto, said analyzer means being laminated to said display means.

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**5,048,932**
**TRANSMISSION TYPE LIQUID CRYSTAL DISPLAY DEVICE**
**Kazuko Yamamoto, Osaka; Hideki Matsukawa, Matsubara; Hiroshi Esaki, Neyagawa, and Kazushi Nonaka, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**PCT No. PCT/JP89/00279, § 371 Date Nov. 8, 1989, § 102(e) Date Nov. 8, 1989, PCT Pub. No. WO89/08861, PCT Pub. Date Sep. 21, 1989**
**PCT Filed Mar. 15, 1989, Ser. No. 445,837**
**Claims priority, applicatioo Japan, Mar. 16, 1988, 63-62393; Jan. 24, 1989, 1-15332; Jan. 24, 1989, 1-15333**
**Int. Cl.[5] G02F *1/13***
**U.S. Cl. 359—48** **11 Claims**



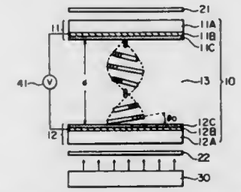

1. A transmission type liquid crystal display device comprising two transparent substrates which have been presubjected to an aligning treatment by a rubbing technique and which are disposed in opposed relationship to one another; a liquid crystal which has dichroic dye dissolved therein and which is enclosed between said transparent substrates; at least one back light source disposed behind said transparent substrates; and means for applying a dummy voltage across said liquid crystal when said back light sources are turned off to present no display on a display screen of said liquid crystgal display device.

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**5,048,933**
**TRANSMISSION TYPE LIQUID CRYSTAL DISPLAY DEVICE**
**Kazuo Asano, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan**
**Filed Apr. 10, 1990, Ser. No. 506,802**
**Claims priority, application Japan, Apr. 14, 1989, 1-92926**
**Int. Cl.[5] G02F *1/13***
**U.S. Cl. 350—347 E** **20 Claims**

1. A transmission type liquid crystal display device comprising:
a liquid crystal cell having a liquid crystal layer in which a nematic liquid crystal containing an optically active substance and having a positive dielectric anisotropy forms a twisted structure with a twist angle $\alpha$ ranging from 220° to 300° and is disposed between a pair of parallel electrode substrates each having a transparent substrate and provided thereon an electrode layer and an alignment layer so that the respective alignment layers contact the liquid crystal layer;
a pair of front and rear polarizing plates each disposed on the side of the substrate opposite to the alignment layers; and
a backlight source of illumination including red, green and blue light, said source being disposed on the side of the rear polarizing plate opposite to the substrate, wherein:
(1) the produce $\Delta n$-d, in which $\Delta n$ is a refractive anisotropy of the nematic liquid crystal and d is a thickness of the liquid crystal layer, is 0.65 to 0.90 $\mu$m;
(2) in the relation to the twist angle $\alpha$, angles $\beta$ and $\gamma$ defined by the intersection of polarizing axes of the pair of polarizing plates and the directions of aligning treatments of the






alignment layers on the electrode substrates adjacent to the respective polarizing plates, and a correction angle $\delta$ satisfy the following Equations (a) and (b):

$$\alpha+\beta-\gamma-180°=90°-\delta°<\delta<30° \quad \text{Equation (a)}$$

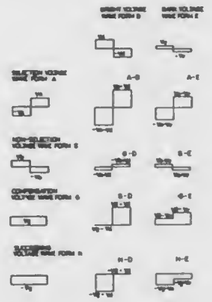
$$\beta+\gamma=+90° or -90°; \quad \text{Equation (b)}$$

(3) a pretilt angle $\theta_0$ defined by the intersection of the electrode substrate and a director of the nematic liquid crystal molecules contacting the electrode substrate is not less than 10°;
(4) luminous intensity ratios of red light to green light and red light to blue light in the backlight source are 1.2 or more; and
(5) a luminous intensity of the backlight source is not less than 200 cd/m$^2$.

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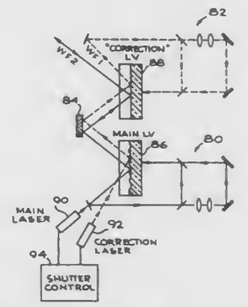
**5,048,934**
**METHOD OF DRIVING FERROELECTRIC LIQUID CRYSTAL WITHOUT TIMING CONVERSION CIRCUITRY**
**Takaji Numao, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**
**Filed Oct. 25, 1989, Ser. No. 426,171**
**Claims priority, application Japan, Nov. 1, 1988, 63-278139**
**Int. Cl.[5] G02F *1/13*; G09G *3/00, 3/36***
**U.S. Cl. 359—56** **3 Claims**

1. A method of driving a liquid crystal display panel having a plurality of scanning electrodes ($L_i$, i being a positive integer) arranged parallel to each other, signal electrodes ($S_j$, j being a positive integer) arranged parallel to each other intersecting the plurality of scanning electrodes, a plurality of pixels, one formed at each scanning and signal electrode intersection, and a ferroelectric liquid crystal sealed between the plurality of scanning electrodes and the plurality of signal electrodes, comprising the steps of:
applying a compensation voltage G, comprising a voltage which becomes positive for a predetermined time period, followed by a succeeding erasing voltage H, comprising a voltage which becomes negative for said predetermined time period, and thereafter applying a selection voltage A, comprising, in a first half of said predetermined time period, a negative voltage approximately equal to the succeeding erasing voltage H, and comprising in the second half of said predetermined time period, a positive voltage approximately equal to said compensation voltage G, to the scanning electrode $L_i$ corresponding to a pixel to be displayed out of said plurality of pixels; and
applying a bright voltage D, comprising in said first half of said predetermined time period, a positive voltage approximately equal to said selection voltage A in the second half of the predetermined time period, and comprising in the second half of the predetermined time period, a negative voltage approximately equal to said selection voltage A in the first half of the predetermined time period, to the signal electrode corresponding to said pixel to be displayed, to thereby turn ON the corresponding pixel.



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**5,048,935**
**METHOD FOR ADAPTIVE CORRECTION OF THE PHASE NON-UNIFORMITY OF A LIQUID CRYSTAL LIGHT VALVE**
**Uzi Efron, Los Angeles; Bernard H. Soffer, Pacific Palisades; Richard C. Lind, Woodland Hills; David M. Pepper, and Thomas R. O'Meara, both of Malibu, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**
**Filed Dec. 24, 1986, Ser. No. 947,575**
**Int. Cl.[5] G02F *1/24***
**U.S. Cl. 359—36** **10 Claims**




1. Apparatus for correcting surface non-uniformities inherent in a liquid crystal light valve of a laser wavefront correcting system comprising:
a main aberration correction system having a first liquid crystal light valve operatively coupled to a feedback portion for causing the liquid crystal light valve to adjust its reflective properties in a manner to drive to zero the atmospheric aberrations in a reference wavefront impinging thereon;
an auxiliary correction system having a second liquid crystal light valve operatively coupled to a second feedback

portion for causing the second liquid crystal light valve to adjust its reflective properties in a manner to store a phase correction pattern derived from the first liquid crystal light valve;

means for directing a laser beam reflected from one of the liquid crystal light valves to the other liquid crystal light valve;

a correction laser for directing a beam to the first liquid crystal light valve and thereafter by reflection to the second liquid crystal light valve and to the feedback portion of the auxiliary correction system for writing the phase correction pattern corresponding to the first liquid crystal light valve on the second liquid crystal light valve;

a main laser coupled to direct a beam to the first liquid crystal light valve and to the feedback system associated therewith for controlling the first liquid crystal light valve to correct the wavefront of an atmospheric reference beam by driving the phase errors in said wavefront to zero; and

means for alternatively activating the correction laser and the main laser to cause the auxiliary correction system to compensate for the inherent phase non-linearities of the main system for a period of time sufficient to correct for atmospheric aberrations in the reference beam.

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**5,048,936**

## LIGHT BEAM DEFLECTOR

**Masami Hatori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

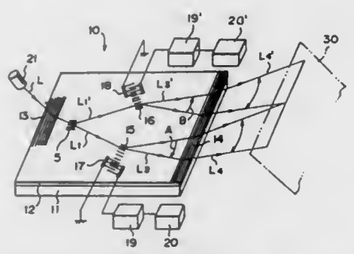
**Filed Dec. 28, 1988, Ser. No. 291,018**

**Claims priority, application Japan, Dec. 29, 1987, 62-335503; Dec. 29, 1987, 62-335504**

**The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.**

**Int. Cl.[5] G02B *6/10***

**U.S. Cl. 385—7** **12 Claims**




1. A light beam deflector comprising:

i) an optical waveguide made of a material capable of propagating surface elastic waves therethrough;

ii) light beam splitting means for dividing a single light beam introduced into said optical waveguide into a first guided wave and a second guided wave which are to be guided along respective first and second light paths through said optical waveguide;

iii) first surface elastic wave generating means for generating in said optical waveguide a first surface elastic wave which travels across said first light path to diffract and deflect said first guided wave traveling along said first light path;

iv) second surface elastic wave generating means for generating in said optical waveguide a second surface elastic wave which travels across said second light path to diffract and deflect said second guided wave traveling along said second light path; and

v) said first and second surface elastic wave generating means being arranged such that said first and second guided waves emitted out of said optical waveguide will scan a surface along respective aligned lines having ends which are adjacent to each other, wherein said first and second guided waves meet each other at maximum frequencies of said first and second surface elastic waves.

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**5,048,937**

## FARADAY ROTATOR DEVICE AND OPTICAL SWITCH CONTAINING SAME

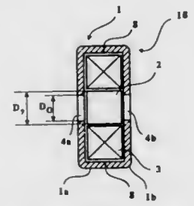
**Shigeru Takeda, and Satoshi Makio, both of Kumagaya, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan**

**Filed Jan. 30, 1990, Ser. No. 472,103**

**Claims priority, application Japan, Jan. 31, 1989, 1-21828; Jan. 31, 1989, 1-21829**

**Int. Cl.[5] G02F *1/09***

**U.S. Cl. 359—301** **15 Claims**




1. A Faraday rotator device comprising:

(a) a Faraday rotator;

(b) a wire winding encircling said Faraday rotator for changing the magnetization state of said Faraday rotator; and

(c) a hollow yoke having a body portion having an inner diameter larger than an outer diameter of said Faraday rotator and front and rear walls each having an opening having a smaller diameter than the outer diameter of said Faraday rotator, said yoke surrounding said Faraday rotator and said wire winding for forming a substantially closed magnetic circuit together with said Faraday rotator, said openings of said hollow yoke being in alignment with said Faraday rotator for permitting a light beam to pass through said hollow yoke and said Faraday rotator.

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**5,048,938**

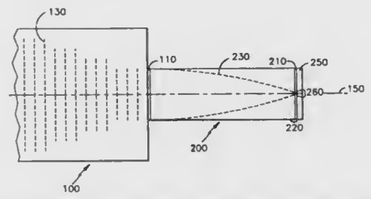
## MONOLITHIC LASER SPATIAL FILTER

**John J. Hizny, North Billerica, Mass., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Jun. 8, 1990, Ser. No. 535,261**

**Int. Cl.[5] G02B *3/02, 6/32***

**U.S. Cl. 359—652** **5 Claims**




1. A system for generating a diverging optical beam at a predetermined laser wavelength and having a substantially spherical wavefront, comprising a laser light source for generating an optical beam travelling along a beam axis;

a converging lens disposed to intercept said optical beam and focus it to a beam waist at a predetermined axial position along said beam axis; and

an aperture plate having an aperture of predetermined diameter disposed along said beam axis at said predetermined axial position, said predetermined diameter being sized to pass a predetermined portion of said beam, whereby a beam having a substantially spherical wavefront diverges from said aperture, characterized in that:

said laser generates an optical beam in a predetermined laser waveguide mode and has an emitting face for emitting said laser beam;

said converging lens is a gradient index refractive lens having a first surface oriented toward said laser, a second surface oriented toward said aperture plate, a predetermined radially varying index of refraction gradient, a predetermined rod length, and a predetermined focal length at said laser wavelength substantially equal to said predetermined rod length, whereby said beam waist is located along said axis substantially at said second surface;

said aperture plate is a film of material substantially opaque at said laser wavelength, fixedly attached to said second surface; and

said system further includes coupling means disposed between said emitting face and said first surface, for coupling radiation from said predetermined laser waveguide mode to a guided mode within said gradient index refractive lens and for suppressing reflections off said first surface, said coupling means being bonded to said emitting surface and to said first surface.



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**5,048,939**

## ZOOM LENS SYSTEM

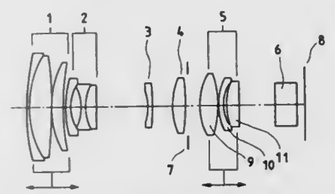
**Masahiko Yatsu; Masaharu Deguchi; Takesuke Maruyama; Hironobu Satoh; Kenji Kobayashi, and Kenji Sano, all of Kanagawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 17, 1990, Ser. No. 510,284**

**Claims priority, application Japan, Apr. 21, 1989, 1-100009; Aug. 9, 1989, 1-204637; Aug. 9, 1989, 1-204656**

**Int. Cl.[5] G02B *15/14***

**U.S. Cl. 359—683** **11 Claims**




1. A zoom lens system comprising, from an objective sequentially, a first lens group having a positive power, a second lens group and a third lens group both having negative powers and performing a zooming function by moving along an optical axis, a fourth lens group having a positive power and being always stationary, and a fifth lens group having a positive power and having an image forming function, said fourth lens group including a lens at least one surface of which is aspherical, said first lens group being movable as a whole or partially along an optical axis to perform a focusing function.

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**5,048,940**

## PROJECTION LENS FOR PROJECTOR

**Kiichirou Ueda, and Akira Ishisaka, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan**

**Filed Jan. 25, 1990, Ser. No. 470,365**

**Claims priority, application Japan, Jan. 26, 1989, 1-150167; Oct. 4, 1989, 1-257885; Oct. 24, 1989, 1-274989**

**Int. Cl.[5] B29D *11/00***

**U.S. Cl. 359—708** **5 Claims**

1. A projection lens for a projector comprising, from a screen side:

a first lens group including two positive single lenses and a negative single lens;

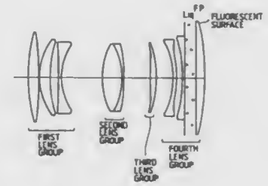
a second lens group having a strong refracting power including one positive lens and negative lens;

a third positive lens group having a relatively weak refracting power, the third lens group having at least one aspherical surface;

a fourth lens group having a negative lens with a concave surface having a strong curvature directed toward the screen, the fourth lens group having at least one aspherical surface; and

a curved object surface,

wherein the following conditions are fulfilled




$0.05 < f/f_3 < 0.55$

$0.70 < f/f_2 < 1.30$

where

$f_3$: Focal length of the third lens group

$f_2$: Focal length of the second lens group

f: Equivalent focal length of the entire system.

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**5,048,941**

## SURGICAL MISCROSCOPE WITH A MODULAR STAND

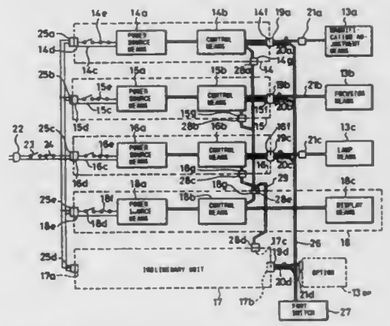
**Masami Hamada, Setagaya; Hiroshi Fujiwara; Kosaku Tsuboshima, both of Hachiouji; Masahiko Kinukawa, Higashimurayama; Toshiyuki Tsunoda, Matsumoto; Takashi Nagano, Hachiouji; Kazyuki Minami, Musashino; Shigeo Tokunaga, Hino; Masanori Kaneda, and Tomonori Ishikawa, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Oct. 5, 1989, Ser. No. 417,438**

**Claims priority, application Japan, Oct. 7, 1988, 63-130922[U]; Sep. 18, 1989, 1-108723**

**Int. Cl.[5] G02B *21/24***

**U.S. Cl. 359—368** **11 Claims**



1. A surgical microscope comprising;

a stand,

an arm attached to the stand for sustaining a microscope body at the tip thereof,

an electric equipment to be controlled, and

an electric equipment for control,

wherein said electric equipment for control is divided into a plurality of units,

each of said units being housed in a removable module which is removably fitted to said stand,

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each of said units being equipped with a respective function control means having at least one specific function different from the functions of the other function control means,

each of said units also being equipped with respective power source means connected to a respective function control means.

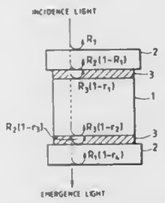
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5,048,942

## OPTICAL ELEMENT WITH REDUCED REFLECTANCE

Yasushi Ohbayashi, Shizuoka, Japan, assignor to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed Oct. 17, 1988, Ser. No. 258,430
Claims priority, application Japan, Oct. 26, 1987, 62-269578
Int. Cl.[5] G02B 1/10
U.S. Cl. 359—513 8 Claims




1. An optical element comprising:

an optical element body with a first refractive index, having a light incident surface and a light emergent surface, the optical element body being of a material that would be deleteriously changed by exposure to heat at a temperature generated by attempting to form a transparent oxide thin film on the material by sputtering or electron beam deposition;

a first transparent optical member, having a second refractive index smaller than the first refractive index, and having a surface parallel to the light incident surface of the optical element body;

a second transparent optical member, having the second refractive index, and having a surface parallel to the light emergent surface of the optical element body;

a first transparent adhesive layer, having a third refractive index larger than the refractive index of air and no greater than the first refractive index, for bonding the first optical member to the optical element body; and

a second transparent adhesive layer, having the third refractive index, for bonding the second optical member to the optical element body.

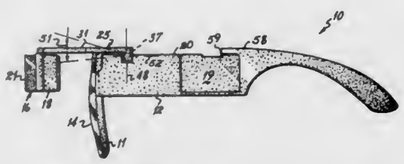
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5,048,943

## EYEWEAR WITH REARVIEW MIRROR

James H. Allen, Covington, Ky., assignor to 'totes', incorporated, Loveland, Ohio

Filed Jan. 9, 1990, Ser. No. 462,640
Int. Cl.[5] G02C 7/14
U.S. Cl. 351—50 18 Claims



1. Eyewear comprising

a frame adapted to be worn on a user's head,

a rearview mirror connected to said frame, said rearview mirror being movable between a use position spaced from said frame and a storage position juxtaposed to said frame,

a swing arm pivotally mounted by a first pivot joint at one end to said rearview mirror, said swing arm also being pivotally mounted by a second pivot joint at another end to said frame, and

a eat defined in said frame, said rearview mirror being receivable in said seat when in said storage position.

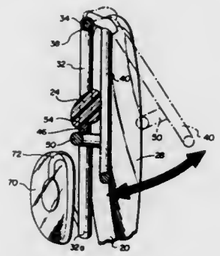
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5,048,944

## EYEGLASSES WITH REMOVABLE LENS ASSEMBLY

Ferdinand A. Porsche, St. Georgen, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.

Division of Ser. No. 68,639, Jun. 30, 1987, Pat. No. 4,822,158.
This application Sep. 20, 1988, Ser. No. 246,987
Int. Cl.[5] G02C 7/08
U.S. Cl. 351—57 2 Claims



1. An eyeglass frame assembly comprising:

a pair of eyeglass lenses; and

a generally planar unitary frame including,

a pair of lens-receiving means for mounting said lenses, each surrounding an outer periphery of one said lens and having an outside lateral end,

a bridge intermediate the lens-receiving means and having generally opposed ends joined thereto,

first means on said bridge and second means on the outside lateral ends of said lens-receiving means for engaging spaced portions of a backing member complementary shaped with respect to said unitary frame and having head-engaging means for positioning the unitary frame on the head of a wearer, and the first means comprising a hook-shaped protrusion rearwardly and downwardly extending from the bridge so as to form a recess for engaging a lateral bar carried on a backing member to which the eyeglass frame assembly is mounted.

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5,048,945

## PROGRESSIVE POWER LENS

Yasunori Ueno, Kawasaki; Fumio Takahashi, Tone, and Ryuji Aizawa, Yoshimi, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jul. 11, 1990, Ser. No. 551,082
Claims priority, application Japan, Jul. 14, 1989, 1-181936; Jul. 14, 1989, 1-181937
Int. Cl.[5] G02C 7/06
U.S. Cl. 351—169 11 Claims

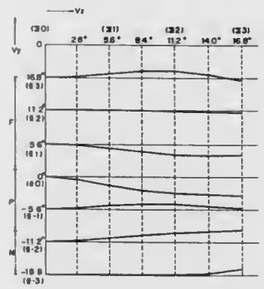
1. A progressive power lens comprising, along a principal meridional curve, a farsight portion having a refracting power corresponding to a distant view, a nearsight portion having a refracting power corresponding to a near view, and an intermediate portion, located between said farsight and nearsight portions, for continuously and smoothly connecting the refracting powers of said farsight and nearsight portions, and

wherein a vertical sectional shape of a refracting surface of said farsight portion is formed so that a value of a vertical radius of curvature is increased as it goes away from an intersection with said principal meridional curve along a horizontal section curve in an upper portion of said farsight portion, the value of the vertical radius of curvature is decreased as it goes away from an intersection with said principal meridional curve along a horizontal section curve in a lower portion of said farsight portion, and the value of the vertical radius of curvature is kept substantially constant along a horizontal section curve near a central portion of said farsight portion,

a vertical sectional shape of the refracting surface in an upper region of said intermediate portion is formed so that the value of the vertical radius of curvature is decreased as it goes away from an intersection with said principal meridional curve along a horizontal section curve, and

a vertical sectional shape of the refracting surface in a lower region of said intermediate portion is formed so that the value of the vertical radius of curvature is increased and then decreased as it goes away from an intersection with said principal meridional curve along a horizontal section curve.





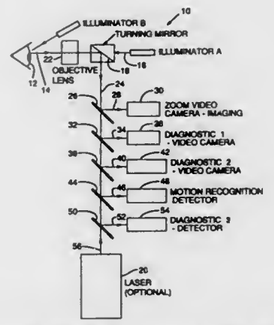
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5,048,946

## SPECTRAL DIVISION OF REFLECTED LIGHT IN COMPLEX OPTICAL DIAGNOSTIC AND THERAPEUTIC SYSTEMS

H. Alfred Sklar, San Francisco, and Alan M. Frank, Livermore, both of Calif., assignors to Phoenix Laser Systems, Inc., San Francisco, Calif.

Filed May 15, 1990, Ser. No. 523,799
Int. Cl.[5] A61B 3/14
U.S. Cl. 351—206 1 Claim




1. In an optical diagnostic system for ocular analysis in real time, including a plurality of sensors receiving reflected light from a patient's eye for diagnostic purposes, the improvement comprising,

illumination means for sending toward the eye an illuminating light beam,

the illumination means including means for emitting an illuminating light beam with specifically enhanced spectral portions such that the spectral distribution of the light beam does not follow the typical Gaussian distribution of white light,

at least one beam splitter positioned in a path of reflected light from the eye, so as to receive light from the illuminating light beam as reflected from optical surfaces in the eye, back toward said one beam splitter,

first coating means on at least the first beam splitter in the path of the reflected light, for reflecting off the path substantially all light within a first preselected wavelength range, and said first beam splitter having means for transmitting substantially all of the remaining wavelengths of the reflected light, and

a plurality of detecting optical devices each positioned to receive a portion of the reflected light from the eye, as divided by at least said one beam splitter in the plurality of successive beam splitter,

whereby a substantially greater portion of the spectrum of light in the reflected light from the eye is used for diagnostic purposes on the detecting equipment than would otherwise be available without spectrally dividing the reflected light, thereby enabling the intensity of the illuminating light beam to be minimized.

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5,048,947

## PROCESS FOR MEASURING EYE MOVEMENT

Lucille M. J. Liade, 1954 18th Ave., Greeley, Colo. 80631

Filed Mar. 30, 1990, Ser. No. 502,450
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] A61B 3/02
U.S. Cl. 351—224 6 Claims



1. A technical process for measuring the ocular tracking ability of a person comprising the use of the following:

(a) providing an ocular-pursuit measuring instrument comprising:

(i) a first upstanding leg member;

(ii) a second upstanding leg member spaced from the first leg member;

(iii) connecting means connecting said first and second leg members;

(iv) vertically adjustable chin support means at the upper end of said first leg member, said support means being adapted to stably support said person's head; and

(v) an arcuate member pivotably mounted at its midpoint to the upper end of said second leg member in a manner such that said arcuate member may be pivoted about an axis passing through said midpoint perpendicular to the axis of said second leg member; wherein said arcuate member includes a graduated scale therealong; wherein said arcuate member includes an upper edge surface;

(b) positioning such person in a manner such that the person's chin is stably supported by said chin support means;

(c) placing said arcuate member in a horizontal position;

(d) testing the person's ocular tracking ability by moving a target along said arcuate member from said midpoint to measure smooth eye movement by such person following said target; wherein said target comprises an elongated

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stem having an upper end, a colored tip secured to said upper end, and a support member attached to said stem member below said colored tip, wherein said support member includes a seat which enables said support member to be supported on said upper edge surface of said arcuate member; and

(e) recording the number of units on said graduated scale between said midpoint and the maximum point where smooth eye movement was completed accurately.

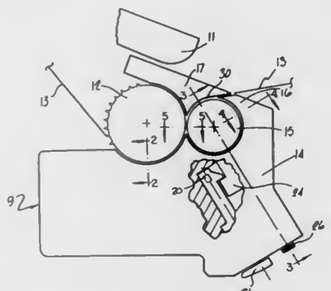
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**5,048,948**

## MINIMUM WEAR FILM GUIDE FOR ROLLING LOOP FILM TRANSPORT MECHANISM

**Neil A. Johnson, Portola Valley, Calif., assignor to NJ Engineering, Inc., San Jose, Calif.**

**Filed Oct. 16, 1990, Ser. No. 598,544**
**Int. Cl.[5] G03B *1/00***
**U.S. Cl. 352—184** **6 Claims**



1. A film guide mechanism for receiving photographic film to be projected by a rolling loop film transport mechanism and for guiding the photographic film into position for engagement by a rotor of said rolling loop film transport mechanism, the film guide mechanism comprising:

a circular inlet drive sprocket having a plurality of teeth spaced around a peripheral surface thereof at top and bottom edges thereof for engaging top and bottom perforations in the film, said inlet drive sprocket adapted for driven rotation so as to pull the film from a film supply;

circular shock double capstan means positioned tangentially adjacent to said inlet drive sprocket and adapted to be rotationally driven by said inlet drive sprocket in a direction opposite said inlet drive sprocket, said shock double capstan means having top and bottom grooves in a peripheral surface thereof for receiving the plurality of teeth of said inlet drive sprocket, the film passing between said inlet drive sprocket and said shock double capstan means;

outer guide means having a concave curved surface adjacent to and complementary with said inlet drive sprocket for maintaining the film in engagement with said plurality of teeth of said inlet drive sprocket;

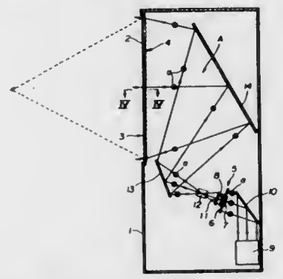
inner guide means positioned on a side of said inlet drive sprocket and said shock double capstan means opposite from said outer guide means, said inner guide means having a concave curved surface adjacent to and complementary with said shock double capstan means, a film exit gap through which the film passes being defined between the peripheral surface of said shock double capstan means and the concave curved surface of said inner guide means.

**5,048,949**

## LIQUID CRYSTAL PROJECTOR

**Makoto Sato, Fussa, and Tatsuo Shimazaki, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 273,909, Nov. 18, 1988, abandoned. This application Aug. 6, 1990, Ser. No. 563,936**
**Claims priority, application Japan, Nov. 26, 1987, 62-298640**
**Int. Cl.[5] G03B *21/28***
**U.S. Cl. 353—77** **6 Claims**



1. A liquid crystal projector comprising:

a liquid crystal display panel;

a light source for illuminating said display panel;

a translucent back-projection type screen on a surface of which is formed a lenticular lens comprising a large number of stripe lenses arranged substantially in parallel;

projection means for projecting light supplied from said display panel onto said screen;

oscillating direction control means for causing the light transmitted through said display panel to be incident upon said screen in a direction of oscillation substantially perpendicular to the direction of length of said stripe lenses;

at least one mirror arranged between said projection means and said screen; and

means for causing S polarized light to be incident upon said at least one mirror.

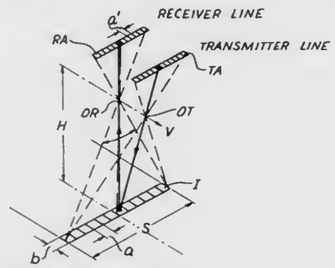
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**5,048,950**

## OPTICAL RADAR

**Walter Metzdorff, Friedrichshafen; Peter Lux, Langenargen, and Max Eibert, Friedrichshafen, all of Fed. Rep. of Germany, assignors to Dornier GmbH, Munich, Fed. Rep. of Germany**

**Filed May 14, 1990, Ser. No. 523,125**
**Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915627**
**Int. Cl.[5] G01S *7/48***
**U.S. Cl. 350—4** **4 Claims**




1. Optical radar comprising,

a first linear diode array with each diode in the array being individually controllable:

first circuit means connected to the diodes of the array for causing the individual diodes to transmit a light pulse on being triggered;

a receiver diode array different from the transmitter array positioned in side by side relation to the transmitter array and next to it but not behind it; optical imaging means positioned such that a diode of the transmitter array is imaged onto the ground and in the same area which is seen by a particular diode of the receiver array so that a 1:1 relation is established between a diode of the transmitter array providing a particular transmitted light pulse, and a diode of the receiver array that can and does receive said light pulse; and

second circuit means connected to the diodes of the receiver array as well as to the first circuit means for determining the transit time of the light pulse, commencing with triggering of a transmitter array diode and ending with receiving of the light pulse by the respectively associated receiver array diode.



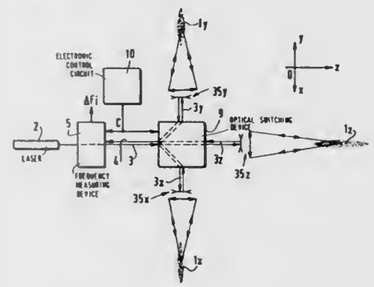
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**5,048,951**

## LASER ANEMOMETER WITH SEVERAL MEASUREMENT DIRECTIONS

**Hubert Combe, and Bertrand Morbieu, both of Valence, France, assignors to Sextan Avionique, Valence Cedex, France**

**Filed Dec. 12, 1989, Ser. No. 449,208**
**Claims priority, application France, Dec. 15, 1988, 88 16534**
**Int. Cl.[5] G01P *3/36***
**U.S. Cl. 356—28.5** **13 Claims**




1. An apparatus for measuring its own speed of movement with respect to particles that are in suspension in ambient air, comprising:

laser means for providing an incident beam selectively directed to said particles within a volume of the ambient air at a predetermined location so as to give rise to corresponding reflected beam;

means for measuring a frequency deviation (ΔFi), related to said speed, between the respective frequencies of said reflected beam and said incident beam; and

means for varying a direction along which said incident beam is selectively directed, to thereby select a different volume of ambient air to obtain a corresponding different frequency deviation,

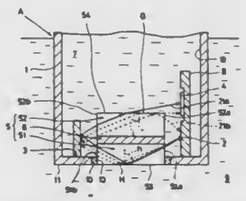
wherein said direction-varying means comprises means for intercepting said incident beam, said intercepting means including partially transparent and partially reflecting surface portions that are continuously moved in a selected plane, at a predetermined inclination to said incident beam at a point of interception, a direction of movement of said surface portions at said point of interception being perpendicular to said incident beam, said incident beam having its direction thereby selectively varied to be directed along at least two successive paths and means for controlling said measuring means and a movement of said intercepting means so that at least one frequency deviation measurement is made while said incident beam travels along each of said at least two successive paths.

**5,048,952**

## LIQUID MIXING RATIO SENSOR

**Shigeru Miyata, and Yoshitaka Yamada, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan**

**Filed Aug. 30, 1989, Ser. No. 400,450**
**Claims priority, application Japan, May 26, 1988, 1-133094; Aug. 30, 1988, 63-215839**
**Int. Cl.[5] G01N *21/41***
**U.S. Cl. 356—135** **6 Claims**



1. A liquid mixing ratio detecting sensor comprising:

a hollow cylindrical holder which is adapted to be immersed in a liquid solution;

a transparent material placed within an inner space of the holder to serve as a reference;

a transparent plate placed within the holder, the upper end of the plate being brought in contact with the transparent material to form a reference boundary between the transparent material and the transparent plate, the lower end of the transparent plate being brought in contact with the liquid solution to form a boundary between the transparent plate and the liquid solution;

a light emitting element located to face one vertical side, so that light beams emitted from the element enter into the transparent plate through its vertical side, and totally reflected from the boundary to come out from the transparent plate through the other vertical side of the plate;

a reflection plate placed within the holder to interpose the transparent plate with the light emitting element, and reflecting the light beams coming out of the other vertical side of the transparent plate to make the light beams enter into the transparent plate through the vertical side, and making the light beams totally reflect from the reference boundary, when the refractive index of the liquid solution is greater than that of the transparent material;

a light receiving element located above the light emitting element to receive the light beams refracted from the reference boundary to generate an output in accordance with the light beams received, when the refractive index of the liquid solution decreases to be smaller than that of the transparent material.

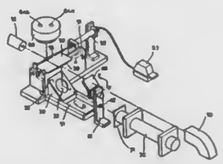
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**5,048,953**

## OPTICAL COLLIMATING, LASER RAY TARGET POSITION INDICATING AND LASER RAY ABSORBING DEVICE OF A LASER SYSTEM

**Sher-Cherng Kuo; Chin-Hen Fang, and Yu-Hsiang Lai, all of Hsin-Chu, Taiwan, assignors to Industrial Technology Research Institute, Taiwan**

**Filed Feb. 5, 1990, Ser. No. 474,934**
**Int. Cl.[5] G01B *11/26***
**U.S. Cl. 356—153** **10 Claims**



1. An optical collimating, laser ray target position indicating and laser ray absorbing device of a laser system, mounted

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between a laser generating source and a laser ray guiding device, comprising:

a reference light source, generating a reference light for facilitating the optical collimation of said laser system and for indicating the target position of a laser beam generated by said laser generating source;

a first movable reflecting mirror, reflecting light from said reference light source, which may be disposed at one of a first position for performing optical collimation and a second position for performing laser ray target position indication;

a second movable reflecting mirror which may be moved one of into and away from an operating position where light, coming from said reference source and reflected by said first movable reflecting mirror disposed at said first position thereof, may be reflected to said laser generating source for optical collimation purpose;

a movable reflecting mirror set, including a fourth reflecting mirror and a fifth reflecting mirror, which may be moved one of into and away from an operating position where said fourth reflecting mirror interrupts, by reflecting, light from said laser generating source and said fifth reflecting mirror reflects light, coming from said reference light source and reflected by said first movable reflecting mirror disposed at said second position thereof, to said laser ray guiding device for indicating said target position of said laser beam; and

an absorption device for absorbing said laser beam coming from said laser generating source and reflected by said fourth reflecting mirror of said movable reflecting mirror set.

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**5,048,954**

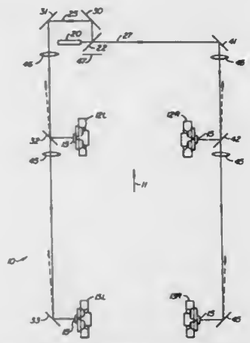
**LASER-BASED WHEEL ALIGNMENT SYSTEM**

**John M. J. Madey, Durham, N.C., and Julius M. J. Madey, Hillsdale, N.Y., assignors to Miradco, N.J.**

**Filed Jul. 7, 1989, Ser. No. 377,437**

**Int. Cl.[5] G01B *11/275***

**U.S. Cl. 356—155** **11 Claims**



1. Apparatus for use in setting desired toe-in and camber angles on at least one pair of wheels on a vehicle, comprising:

a plane mirror associated with each wheel;

means for adjustably mounting ear mirror to its associated wheel at a selected relative angular orientation that corresponds to the desired toe-in and camber angles for that wheel such that when the wheels are set to the desired toe-in and camber angles, the mirrors are vertical and parallel to each other and face outwardly;

means for generating first and second beams;

incident beam transport means for directing said beams toward respective outer surfaces of the wheels to be aligned so as to impinge on said mirrors, said beams being parallel to each other and in a reference plane when they impinge of said mirrors; and

reflected beam transport means for directing the beams reflected from said mirrors to a common region, said reflected beam transport means operating such that the reflected beams overlap at the common region when the toe-in and camber angles are correct.

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**5,048,955**

**DEVICE FOR MEASURING COLOR TEMPERATURE**

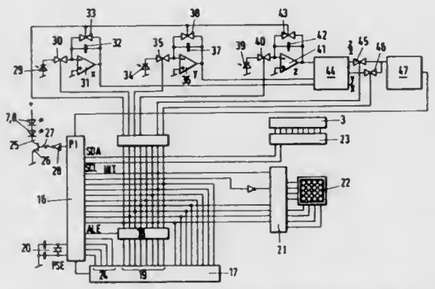
**Jean-Francois Bernhard, Morrens, Switzerland, assignor to Bron Elektronik AG, Allschwil, Switzerland**

**Filed Sep. 29, 1989, Ser. No. 415,076**

**Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833198**

**Int. Cl.[5] G01J *1/00***

**U.S. Cl. 356—213** **4 Claims**



1. In a device for measuring color temperature, having at least one measuring diffuser and at least one indicator for said color temperature, as well as operating elements for turning said device on and off, for resetting measured values, and for initiating a measurement, the improvement comprising:

two remote control transmitters for adjusting the color temperature of a light source, said remote control transmitters being installed within the device for measuring color temperature itself;

one respective adjustment control element for each one of said remote control transmitters also within the device for measuring color temperature, so that measuring and adjusting of color temperature is undertaken in the same device, with said two adjustment control elements respectively adjusting said color temperature to higher or lower values; and

said two remote control transmitters being operatively connected with a respective one of said adjustment control elements.

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**5,048,956**

**BORESCOPE APPARATUS**

**Nobuyuki Sakamoto, Hachioji; Yasuhiro Ueda, Kokubunji; Atsushi Miyazaki, Hachioji; Yoshio Shishido; Toshiaki Nishikori, both of Sagamihara; Shinichi Nishigaki, Tokyo; Morihide Mizumoto, Hachioji; Takeaki Nakamura, Hino; Eiichi Fuse, and Yoshisada Aoki, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Dec. 13, 1989, Ser. No. 450,299**

**Claims priority, application Japan, Dec. 16, 1988, 63-318217; Oct. 3, 1989, 1-258158**

**Int. Cl.[5] G02B *23/26***

**U.S. Cl. 356—241** **23 Claims**

1. A borescope apparatus comprising:

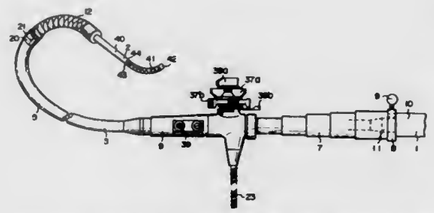
an insertion section having a bending portion and a flexible portion;

jet ports formed in a distal end of either one of said bending portion and said flexible portion;

bending means for bending said bending portion under pressure of supplied fluid;



pressurized fluid supplying means for supplying said fluid to said jet ports and said bending means; and



flow control means for controlling said fluid supplied to said jet ports and said bending means.

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**5,048,957**

**SPECIMAN RACK WITH INSERTABLE CUVETTES**

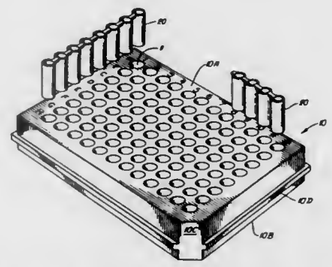
**Fritz Berthold, Euler Weg 9, 7530 Pforzheim, and Willy Lohr, Ginsterweg 75, 7547 Wildbad, both of Fed. Rep. of Germany**

**Filed Jul. 10, 1990, Ser. No. 550,494**

**Claims priority, application Fed. Rep. of Germany, Jul. 11, 1989, 3922750**

**Int. Cl.[5] G01N *21/03***

**U.S. Cl. 356—246** **8 Claims**



1. A specimen rack for holding a plurality of insertable cuvettes for performance of bioluminescence and chemiluminescence assays, comprising a holder block of radiopaque and dimensionally stable material, said block having opposed upper and lower major surfaces and being provided with a plurality of through chambers extending between said upper and lower major surfaces and arranged in a rectangular array composed of a plurality of rows and columns of through chambers for receiving and positioning a corresponding plurality of the cuvettes, so that when the cuvettes are inserted in said chambers, the material of said block forms an opaque enclosure for the inserted cuvettes over at least a portion of the height of the cuvettes, wherein said block is formed such that each said through chamber has an inner wall and an annular shoulder extending radially inwardly from said inner wall to define a rest for supporting a respective cuvette, the annular shoulder determining the insertion depth and thus the assay position of the respective cuvette in said through chamber.

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**5,048,958**

**SELF-FOCUSING OPTICAL SYSTEM FOR SPECTROPHOTOMETRIC MEASUREMENTS AND THE LIKE, WITH OPTICAL FIBER SENSORS**

**Giuliano Conforti, Florence; Massimo Brenci, Pistoia, and Andrea A. Mencaglia, Siena, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy**

**Filed Mar. 22, 1989, Ser. No. 326,962**

**Claims priority, application Italy, Mar. 25, 1988, 9369 A/88**

**Int. Cl.[5] G01N *21/01***

**U.S. Cl. 356—300** **4 Claims**



1. An optical system comprising a cavity for spectrophotometric measurements and the like, and an optical fiber for the conveyance of the light radiations from an emitting source to the cavity containing a sample to be tested and from the sample to devices for the detection of modulated radiation, wherein a first cylindrical refraction index gradient lens is matched to said optical fiber; a second cylindrical refraction index gradient lens is disposed approximately coaxial to the first lens and spaced from said first lens for delimiting, between two opposite faces of the said lenses, the cavity for the sample under test; and wherein a reflecting surface is arranged adjacent the second lens opposite to said cavity.

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**5,048,959**

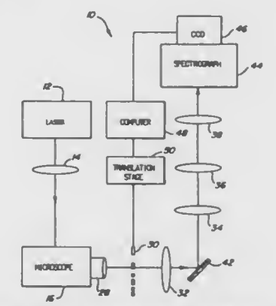
**SPECTROGRAPHIC IMAGING SYSTEM**

**Michael D. Morris, and Patrick J. Treado, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.**

**Filed Jun. 1, 1990, Ser. No. 531,871**

**Int. Cl.[5] G01J *3/44*; G01N *21/65***

**U.S. Cl. 356—301** **7 Claims**



1. A system for generating spectrographically resolved images comprising:

means for providing an image for analysis defining x and y orthogonal axes,

spatial encoding means defining encoding patterns for blocking portions of said image, said encoding means generating a multiplicity of different encoding patterns of predetermined configuration,

optical means for defining a compressed line image in which said x axis direction of said image is compressed after portions thereof have been blocked by said encoding means while preserving said y axis direction of said image,

spectrograph means for spectrally dispersing said compressed image wherein said spectral dispersion occurs along an axis perpendicular to the y direction of said compressed line image,

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two-dimensional image sensor means for detecting said dispersed image, and

data storage and processing means for recording said encoding pattern of said encoding means and the corresponding output of said image sensor for a multiplicity of said different patterns and synthesizing spectrally resolved images at desired wavelengths.

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**5,048,960**

## MICROSPECTROSCOPE

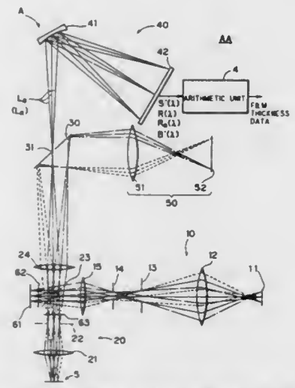
**Takahisa Hayashi, and Nariaki Fujiwara, both of Kyoto, Japan, assignors to Dainippoo Screen Mfg Co., Ltd, Japan**

**Filed Jun. 5, 1989, Ser. No. 361,406**

**Claims priority, application Japan, Jun. 8, 1988, 63-140733**

**Int. Cl.[5] G01J *3/42*; G01B *11/86***

**U.S. Cl. 356—319** **6 Claims**



1. A method of obtaining spectral data and calculating corrected spectra data, the method comprising the steps of:

obtaining spectral data B'(λ) which is representative of the spectral characteristics of light which is generated by a light source and reflected by a standard sample;

substantially concurrently with the step of obtaining the spectral data B'(λ), obtaining spectral data $R_0(\lambda)$ which is representative of the spectral characteristics of light which is generated by the light source;

after the step of obtaining the spectral data B'(λ), obtaining spectral data S'(λ) which is representative of the spectral characteristics of light which is generated by the light source and reflected by an object;

substantially concurrently with the step of obtaining the spectral data S'(λ), obtaining spectral data **R**(λ), which is representative of the spectral characteristics of light which is generated by the light source; and

λcalculating corrected spectral data **S**(λ) as a function of the spectra data S'(λ), the spectral data **R**(λ), the spectral data B'(λ), the spectral data $R_0(\lambda)$ and known spectral data B(λ) corresponding to the standard sample, the corrected spectral data S(λ) being calculated as a function of:

$$\frac{R_0(\lambda) \cdot B(\lambda)}{R(\lambda) \cdot B'(\lambda)} \cdot S'(\lambda)$$

**5,048,961**

## PHASE MODULATED FIBER-OPTIC GYROSCOPE FOR MEASURING THE ANGULAR VELOCITY OF A MOVING OBJECT

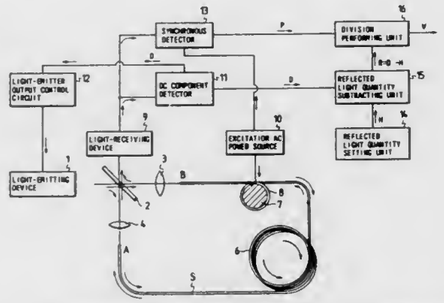
**Kenji Okamoto, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**

**Filed Mar. 7, 1990, Ser. No. 489,556**

**Claims priority, application Japan, Mar. 8, 1989, 1-57635; Mar. 8, 1989, 1-57636; Mar. 8, 1989, 1-57637**

**Int. Cl.[5] G01C *19/72***

**U.S. Cl. 356—350** **8 Claims**



1. A phase-modulated fiber-optic gyroscope for measuring the angular velocity of a moving object, comprising:

phase modulation means;

fiber-optic cable means having both ends thereof, said fiber-optic cable means comprising a sensor coil and a portion provided with said phase modulation means;

light-emitting means for emitting coherent light;

beam splitter means for splitting the coherent light from said light-emitting means into two beams which are launched at the both ends of said fiber-optic cable means, and for re-combining the light beams transmitted through said fiber-optic cable means;

light-receiving means for receiving from the both ends of said fiber-optic cable means the light beams that have been transmitted through said fiber-optic cable means and that are re-combined by said beam splitter means;

synchronous detector means which receiving an output signal from said light-receiving means for detecting a phase-modulated frequency component of the output signal of said light-receiving means;

DC component detector means that receives the output signal of said light-receiving means for detecting DC component of the output signal thereof;

reflected light quantity setting means for presetting a level of a reflected light quantity in the DC component which do not pass through said sensor coil;

reflected light quantity subtracting means for subtracting the reflected light quantity set by said reflected light quantity setting means from an output signal of said DC component detector means; and

division performing means for dividing an output signal of said synchronous detector by an output signal of said reflected light quantity subtracting means to output the result of the division.



**5,048,962**

## OPTICAL GYRO, SIGNAL PROCESSING APPARATUS FOR THE SAME AND METHOD OF DRIVING PHASE MODULATOR USED IN THE SAME

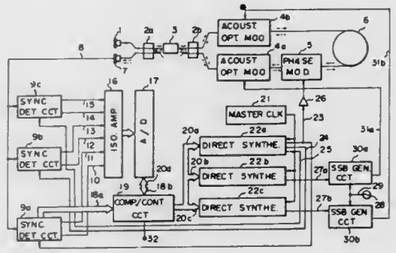
**Akihiro Kurokawa; Yoshiaki Hayakawa, and Naoshi Murayama, all of Kamakura, Japan, assignors to Mitsubishi Precision Co., Ltd., Tokyo, Japan**

**Filed Mar. 19, 1990, Ser. No. 495,558**

**Claims priority, application Japan, May 15, 1989, 1-121236**

**Int. Cl.[5] G01C *19/72***

**U.S. Cl. 356—350** **18 Claims**



1. An optical gyro comprising:

an optical propagation path in cooperation with a rotation axis, for propagating a pair of light beams therethrough simultaneously clockwise and counterclockwise, respectively, and causing a phase difference of light based on Sagnac effect;

an optical system optically coupled to said optical propagation path, for effecting a generation, a distribution or coupling, a polarization, a frequency shift and a phase modulation of light beams and transducing a light beam indicating the phase difference of light into a corresponding electric signal to output a photoelectric output signal; and

a signal processing circuit operatively connected to said optical system, for taking signal components of a same frequency as, a frequency twice and a frequency four times a phase modulation frequency out of said photoelectric output signal and digitally processing the signal components to generate drive signals for said frequency shift and phase modulation and obtain a signal proportional to an angular velocity with respect to the rotation axis.

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**5,048,963**

## DITHER SIGNAL REMOVER FOR A DITHERED RING LASER GYRO

**Mario B. Ignagni, Arden Hills, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 1, 1989, Ser. No. 430,215**

**Int. Cl.[5] G01C *19/64***

**U.S. Cl. 356—350** **7 Claims**

1. A dithered angular rate sensor comprising:

support means for supporting a pair of counter-propagating waves along a closed-loop path, each of said waves having a frequency related to the rotation of said sensor;

means for rotationally oscillating said support means relative to a mounting base in order to dither the frequency of said pair of waves;

means for producing a dither reference signal measurement related to said dithering of said support means;

means responsive to said dither reference signal for deriving information representative of the dither angle $D_a$ nd dither angular rate $D_r$ of said support means relative to said mounting base;

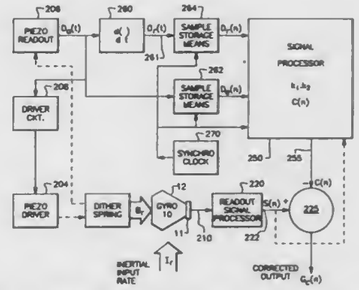
signal processing means for operating on said dither angle and dither angular rate information for providing a correction signal substantially in accordance with the function:

$$C = k_1 * D_a + k_2 * D_r$$

where $k_1, k_2$ are constants representative of the characteristics of the dither reference signal means;

readout means responsive to said waves for producing a readout signal indicative of rotation of said sensor relative to an inertial reference frame, said readout signal including a dither signal component due to said dithering of said support means relative to said mounting base;

means for subtracting said dither correction from said readout signal to provide a corrected gyro output signal devoid substantially of any dither signal component.



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**5,048,964**

## PHASE-STEPPING INTERFEROMETRY

**John R. Tyrer, Ratcliffe on the Wreake; Fernando Mendoza-Santoyo, Loughborough, and David Kerr, Hathern, all of England, assignors to National Research Development Corporation, London, England**

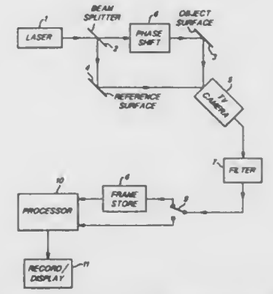
**PCT No. PCT/GB89/01030, § 371 Date Apr. 11, 1990, § 102(e) Date Apr. 11, 1990, PCT Pub. No. WO90/02930, PCT Pub. Date Mar. 22, 1990**

**PCT Filed Sep. 4, 1989, Ser. No. 469,480**

**Claims priority, application United Kingdom, Sep. 2, 1988, 8820761**

**Int. Cl.[5] G01B *9/02***

**U.S. Cl. 356—360** **11 Claims**



1. An interferometric method comprising: generating two signals representing point-by-point variations in intensity of respective patterns of electromagnetic radiation resulting from an interference of first and second beams of such radiation derived from a coherent source, with at least the first beam for each pattern being scattered, before interference with its respective second beam, from a common object surface, and with a corresponding pair of the beams, one for each pattern, having a predetermined relative phase difference of other than an integer multiple of π; and

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determining, from said two signals alone, values for a datum phase of the radiation at said surface.

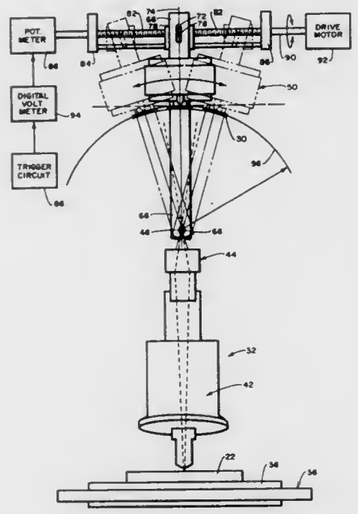
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**5,048,965**
**THREE-DIMENSIONAL IMAGING TECHNIQUE WITH OCCLUSION AVOIDANCE**
**Israel Amir, Ewing, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.**
**Filed May 2, 1990, Ser. No. 517,779**
**Int. Cl.[5] G01B *11/24***
**U.S. Cl. 356—376** **7 Claims**




1. A method for obtaining a three-dimensional image of a substrate, with reduced incidence of occlusion of shorter features on the substrate by taller features, comprising the steps of:
spanning the substrate with a first pair of lines of electromagnetic radiation directed at the substrate from opposite sides so each line irradiates a separate one of a plurality of successive pairs of spaced-apart strips of area on the surface;
sensing the intensity of electromagnetic radiation reflected from each strip of area spaced between each successive pair of spaced-apart strips irradiated by a separate one of the first pair of lines of electromagnetic radiation;
spanning the substrate with a second pair of lines of electromagnetic radiation directed at the substrate from opposite sides so each line irradiates a separate one of the plurality of successive pairs of spaced-apart strips of area on the substrate surface previously irradiated by a separate one of the first pair of lines of electromagnetic radiation;
sensing the intensity of electromagnetic radiation reflected from each strip of area lying between each successive pair of spaced-apart strips irradiated by a separate one of the second pair of lines of electromagnetic radiation; and
establishing a three-dimensional image of the substrate in accordance with a prescribed relationship between the intensity of electromagnetic radiation sensed with the substrate is spanned by a first pair of lines of electromagnetic radiation and the intensity of electromagnetic radiation sensed when the substrate is spanned by the second pair of lines of electromagnetic radiation.

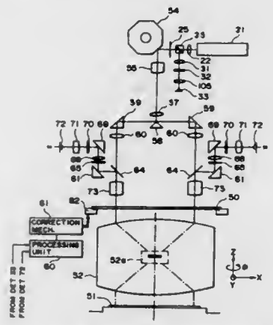
**5,048,966**
**APPARATUS AND SYSTEM FOR LINEWIDTH MEASUREMENTS**
**Richard R. Schram, 6738 Clybourne, Apt. 252, North Hollywood, Calif. 91606**
**Continuation of Ser. No. 229,655, Jan. 29, 1981, Pat. No. 4,385,837, which is a continuation-in-part of Ser. No. 908,232, May 22, 1978, abandoned. This application May 26, 1983, Ser. No. 498,575**
**The portion of the term of this patent subsequent to May 31, 2000, has been disclaimed.**
**Int. Cl.[5] G01B *11/02***
**U.S. Cl. 356—387** **8 Claims**




1. A method for measuring linewidths of microelements on wafers and lines on masks comprising the steps of:
holding said microelement or line in a selected fixed position;
projecting a magnified, real image of a field having an area less than or equal to approximately 0.8 square millimeter containing said microelement or line to be measured to a predetermined focal plane;
scanning across the magnified real image with a moving slit positioned to be substantially parallel to the edges of the microelement or line, the slit being of a predetermined size to vary the light transmitted therethrough in accordance with the optical properties of the microelement or line in contrast to the background on the wafer or mask, and the scanning directing the transmitted light onto a photosensitive device responsive through the slit to the relatively light and dark regions defined by said microelement or line and the adjacent area, the slit and photosensitive device being scanned along a flat path;
monitoring the distance of movement of the slit and an output signal from the photosensitive device;
locating both desired edges of the image of said microelement or line by a predetermined characteristic of the output signal from said photosensitive device; and
utilizing the spacings between the desired edges as determined by the amount of movement of said slit and the predetermined characteristic in output signal from said photosensitive device to generate a digital output representation proportional to the width of said microelement or line.



**5,048,967**
**DETECTION OPTICAL SYSTEM FOR DETECTING A PATTERN ON AN OBJECT**
**Akiyoshi Suzuki, Tokyo, and Hideki Ina, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 503,127, Apr. 2, 1990, abandoned, which is a continuation of Ser. No. 214,400, Jul. 1, 1988, abandoned. This application Sep. 5, 1990, Ser. No. 579,252**
**Claims priority, application Japan, Jul. 2, 1987, 62-164068**
**Int. Cl.[5] G01B *11/00***
**U.S. Cl. 356—401** **19 Claims**

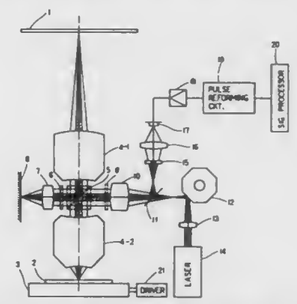



1. A detection optical system for detecting a pattern on a surface of an object, said detection optical system comprising:
illumination means for illuminating the surface of the object with a light beam;
scanning means cooperating with said illumination means for scanningly illuminating the surface of the object with the light beam;
an optical arrangement comprising light receiving means for receiving light from each point on the surface of the object as scanningly illuminated with the light beam by the cooperation of said illumination means and said scanning means, said optical arrangement forming an image of a light spot, formed by the light beam upon the surface of the object; said optical arrangement further comprising a stop member disposed at a position where the image of the light spot is formed, said stop member comprising an aperture of a size not greater than that of the image of the light spot; and
detecting means for detecting the pattern on the surface of the object on the basis of light passing through said stop member.

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**5,048,968**
**ALIGNMENT MARK DETECTING OPTICAL SYSTEM**
**Akiyoshi Suzuki, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Continuation of Ser. No. 143,232, Jan. 6, 1988, abandoned, which is a continuation of Ser. No. 808,379, Dec. 16, 1985, abandoned, which is a continuation of Ser. No. 541,066, Oct. 12, 1983, abandoned. This application May 23, 1989, Ser. No. 355,871**
**Claims priority, application Japan, Oct. 20, 1982, 57-184000**
**Int. Cl.[5] G01B *11/00***
**U.S. Cl. 356—401** **16 Claims**

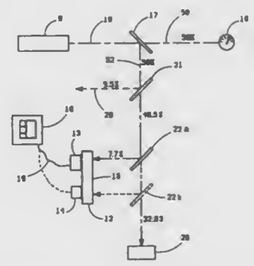
1. A projection exposure apparatus, comprising:
a projection optical system through which an image of a pattern of a first article is projected on a second article;
a polarization beam splitter disposed in an optical path of the projection optical system;
an auxiliary optical system disposed outside the optical path, the auxiliary optical system including a mirror and a λ/4 plate disposed between the mirror and the polarization beam splitter;
means for illuminating the first and second articles, wherein said illuminating means directs a beam to said beam splitter, which splits the beam into two beams, one of which is directed to one of the first and second articles and the other of which is directed to the other of the articles with said auxiliary optical system and said beam splitter, wherein said mirror of said auxiliary optical system receives the other beam from said beam splitter through said λ/4 plate and reflects said other beam to be incident on said beam splitter through said λ/4 plate, by which the other beam is directed to the other article through said beam splitter, and wherein at least one of the beams is incident on the associated one of the articles through at least a part of said projection optical system,




wherein said illuminating means includes a laser source for producing the beam comprising a laser beam and a rotational mirror for receiving and reflecting the laser beam which is produced by said laser source, and wherein the first and second articles are scanned with the laser beam by rotation of said rotational mirror; and
means for detecting a positional relation between the first and second articles using the beam, wherein said detecting means receives through said polarization beam splitter said one of the beams reflected by said one of the articles and receives through said polarization beam splitter and through said auxiliary optical system the beam reflected by the other one of the articles.

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**5,048,969**
**PIEZOELECTRIC MEASUREMENT OF LASER POWER**
**Vance A. Deason; John A. Johnson, and Kenneth L. Telschow, all of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**
**Filed Nov. 20, 1989, Ser. No. 438,378**
**Int. Cl.[5] G01N *21/00*; G01J *5/44, 1/00*; G01L *1, 16***
**U.S. Cl. 356—432** **19 Claims**

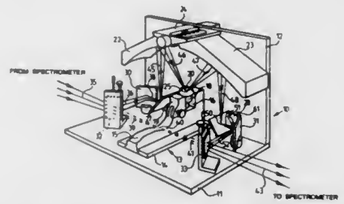


1. A method of measuring the energy of a pulsed laser beam directed at a sample comprising:
a. reflecting a portion of the pulsed laser beam;

b. absorbing the energy of the reflected portion of the pulsed laser beam in an absorbent coating, such that localized heating occurs in the absorbent coating causing thermal expansion thereof;
c. acoustically bonding a piezoelectric transducer to the absorbent coating wherein the thermal expansion of the absorbent coating generates a voltage pulse in the piezoelectric transducer; and
d. conducting the voltage pulse to means to measure a peak voltage of the voltage pulse.

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**5,048,970**
**OPTICAL ATTACHMENT FOR VARIABLE ANGLE REFLECTION SPECTROSCOPY**
**Milan Milosevic, Fishkill, N.Y., and Nicolas J. Harrick, Croton Dam Rd., Ossining, N.Y. 10562, assignors to Nicolas J. Harrick, Ossining, N.Y.**
**Filed Jun. 29, 1990, Ser. No. 546,081**
**Int. Cl.[5] G01N *21/01***
**U.S. Cl. 356—445** **16 Claims**

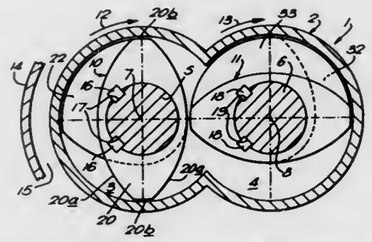


1. A variable angle reflection accessory for use in reflection spectrometry, comprising:
means for supporting a sample having a surface to receive a radiation beam,
first and second ellipsoidal segment reflectors mounted over the sample surface and in positions at first and second sides of the sample surface such that each ellipsoidal segment defines a first focus substantially at the sample surface and a second focus at, respectively, the first and second sides,
first and second plane reflectors positioned, respectively, at the first and second sides with its reflecting surface at the location, respectively, of the second focus,
optical means for directing a converging beam of radiation to the first plane reflector and for directing a diverging radiation beam from the second plane reflector,
means for rotating the first and second plane reflectors in unison thereby to change the angle of incidence of the radiation beam on the sample surface.

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**5,048,971**
**MIXERS**
**David Wall, 9 Fox Hollow, Loggerheads, Stafford, Staffordshire, and Thomas Hall, 12 Sark Close, Westland, Newcastle-under-Lyme, Staffordshire, both of England**
**Filed Feb. 15, 1989, Ser. No. 311,091**
**Claims priority, application United Kingdom, Feb. 24, 1988, 8804313**
**Int. Cl.[5] B01F *7/04***
**U.S. Cl. 366—85** **9 Claims**

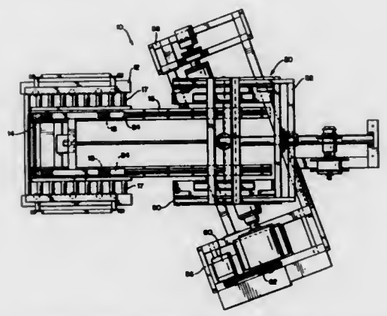
1. A mixer comprising a housing, a pair of substantially parallel shafts mounted for rotation within the housing, and a plurality of interengaging mixing and conveying paddle members mounted on each shaft, the paddle members being formed and arranged so that when the shafts are rotated each in the same direction, parts of the paddle members on one shaft are wiped by cooperating parts of the paddle members on the other shaft, and vice versa, the interengaging mixing and conveying paddle members having lobed end faces, the number of



lobes at one end face of a member being different to that at the other end face thereof.

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**5,048,972**
**TUMBLER LOADER ASSEMBLY**
**Delmar R. Wiese, Springfield, Mo., assignor to Custom Metalcraft Inc., Springfield, Mo.**
**Filed Dec. 27, 1989, Ser. No. 457,526**
**Int. Cl.[5] B01F *11/00***
**U.S. Cl. 366—213** **4 Claims**



1. A tumbler loader assembly for tumbling a bin or other container, comprising:
A loader cart having means for raising and lowering said bin;
a horizontally disposed conveyor positioned above and outwardly of the loader cart for transferring the bin to said loader cart;
means for tumbling said bin; and
means for lateral movement of said loader cart between a first loading position exterior to said tumbling means and a second loading position interior of said tumbling means.

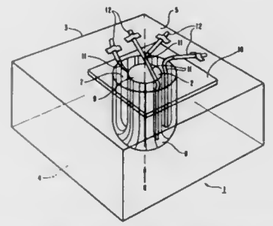
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**5,048,973**
**PLUG-TYPE HEAT FLUX GAUGE**
**Curt H. Liebert, Middleburg Hts., and John Koch, Jr., Medina, both of Ohio, assignors to United States of America, as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**
**Filed May 31, 1990, Ser. No. 531,433**
**Int. Cl.[5] G01K *17/16, 17/06***
**U.S. Cl. 374—29** **8 Claims**

1. A plug-type heat flux gauge, including an integral thermoplug, comprising:
a member having a first surface exposed to an energy source which heats said member and a second surface oppositely disposed from said first surface away from said second energy source with an annulus extending from said second surface toward said first surface,



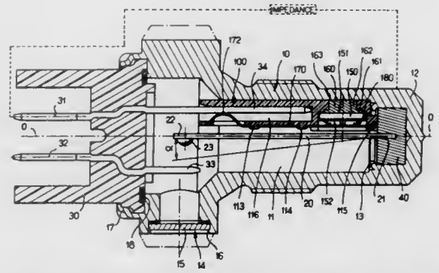
a thermoplug extending from said first surface to said second surface through said annulus with the surface of said thermoplug being spaced from the surface of said annulus thereby forming a annular chamber, said thermoplug being integrally formed from a portion of said member in said annulus so that said thermocouple is of the same material as said member whereby no seam connects the same,



at least three thermocouple wires extending into said annular chamber from said second surface, each of said thermocouple wires being in heat conducting contact with said thermoplug at a predetermined point, the spacing between each predetermined point and said first surface being different for each thermocouple wire, and
means for covering said annular chamber at said second surface whereby said wires and contact points are insulated.

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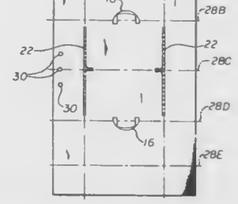
**5,048,974**
**TEMPERATURE MEASURING DEVICE INCLUDING AN ALARM CONTACT**
**Christian Dupuy, Nanterre, France, assignor to Jaeger, Levallois Perret, France**
**Filed May 2, 1989, Ser. No. 346,536**
**Claims priority, application France, May 9, 1988, 88 06214**
**Int. Cl.[5] G01K *13/00*; G08B *19/00***
**U.S. Cl. 374—142** **10 Claims**



1. A temperature measuring device in particular for motor vehicles, said device comprising:
an elongate housing made of thermally and electrically conductive material;
a bimetallic strip received in said housing and fixed to an end of the housing;
a cap made of an electrically insulating material fixed on said housing;
a first contact blade made of an electrically conductive material supported by said cap, said first contact blade being placed in regard of said bimetallic strip so that the electrical connection between said bimetallic strip and said first contact blade changes when the temperature of the bimetallic strip reaches an alarm temperature;
a second contact blade made of an electrically conductive material supported by said cap,
a support made of an electrically insulating material received in the housing and which carries a unitary module comprising:
a contact stud of thermally and electrically conductive material which emerges to the outside of the support in order to make electrical contact with the housing and to provide heat exchange therewith;
a third contact blade suitable for electrically contacting said second contact blade carried by said cap fixed to the housing;
a thermoresistive element interposed between the contact stud and the third contact blade; and
a spring element acting to guarantee good electrical and thermal contact between the contact stud and the thermoresistive element, and good electrical contact between the third contact blade and the thermoresistive element, so that measuring the impedance between the housing and the second contact blade gives an indication of the temperature of a medium surrounding the housing.

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**5,048,975**
**CONVERTIBLE BLANKET BAG**
**Gordon F. Holbrook, P.O. Box 598, Elma, Wash. 98541**
**Filed Jul. 12, 1990, Ser. No. 551,484**
**Int. Cl.[5] B65D *30/10***
**U.S. Cl. 383—4** **4 Claims**



1. A sheet assembly useful as a multipurpose tote bag, which comprises one integral material sheet, adapted to be folded in a first folding operation in an overlapping manner along vertical and horizontal axes from predetermined folding lines to form a folded sheet formation in which folded portions form a top opening and two inside portions of the tote bag, and adapted to be folded in a second folding operation along a center folding axis to form a bottom of the tote bag, and adapted to be formed into its tote bag formation by means of two pairs of fastener attachments in parallel along the vertical axes, with mating parts of each fastener attachment in parallel and extending from the bottom to the top opening of the tote bag,
the assembly being rectangle-shaped,
and wherein handles are present along an exterior surface thereof and disposed along horizontal folding axes, the fastener attachments in parallel along the vertical axes are zippers, and the exterior surface is water repellent,
the assembly further having a hood attachable centrally along a vertical border thereof.

VOL 1130 ISS 3 SE 17 1991 UMI



5,048,976

## CARRIER BAG

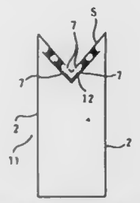
Ralf Jung, Forchheim; Martin Schledorn, Kirchehrenbach; Thomas Schnabel, Forchheim; Günter Schulz, Forchheim; Kurt Springer, Forchheim, and Adalbert Süss, Forcheim, all of Fed. Rep. of Germany, assignors to Unilever Patent Holdings B.V., Rotterdam, Fed. Rep. of Germany

Filed May 10, 1989, Ser. No. 349,665

Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3815881

Int. Cl.[5] B65D *33/06*

U.S. Cl. 383—10 2 Claims



1. A carrier bag pack made from a film, said pack including a base, a pair of side panels, each of the side panels extending from said base, a pair of end panels, and a narrow top panel connected to each of the side panels, said narrow top panel having two oblong openings extending parallel to each other and to a long side of the narrow top panel, each oblong opening having a first radiused end and a second radiused end joined by two generally parallel sides to form an outer perimeter of the oblong opening, the entire outer perimeter of each oblong opening being perforated through the narrow top panel, said oblong openings spaced a selected distance apart with a strip of material therebetween so as to define a carry handle,

a backing panel being provided on an interior side of said narrow top panel so as to underlie said oblong openings, said backing panel being directly sealed to said narrow top panel and being unattached to said side panels,

a reinforcement panel being provided between said backing panel and said narrow top panel, said reinforcement panel extending beyond the area of said narrow top panel oblong holes, said reinforcement panel also having two oblong openings with a strip therebetween, said two reinforcement panel oblong openings being aligned with said two narrow top panel oblong openings to provide a two layer carry handle, said reinforcement panel being directly sealed to said narrow top panel and being unattached to said side panels.

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5,048,977

## RIBBED FREE-STANDING ENCLOSURE

Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630

Filed Feb. 11, 1987, Ser. No. 13,627

Int. Cl.[5] B65D *30/16, 8/08*

U.S. Cl. 383—104 37 Claims

1. A self-supporting enclosure comprising:

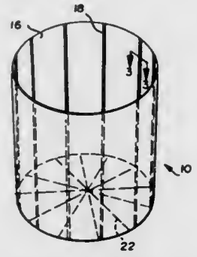
a generally tubular side wall having a predetermined elongated linear extend and defining an enclosure axis;

said side wall being formed of a one piece plastic material and including (i) a plurality of unitary, one-piece extruded ribs continuously extending along said elongated linear extent of said side wall substantially parallel to said axis and at laterally spaced positions thereabout, and (ii) a plurality of flexible non-self-supporting webs;

adjacent pairs of said ribs being unitary with, and interconnected by, a respective one of said flexible non-self-supporting webs;

said side wall being movable away from and toward said axis respectively between (a) an expanded position forming said enclosure wherein said ribs are spaced laterally one from the other generally parallel to said axis so that said enclosure is in a generally tubular open condition and (b) a collapsed closely spaced relation one to the other and to said axis with the webs folded between said ribs; and wherein

at least said ribs are formed of an extrudable high density polyethylene and are of a thickness $t_2$ which is sufficiently



greater than a thickness $t_1$ of said interconnecting webs so that said ribs are substantially nondeformable along said elongated linear extent of said side wall, said substantially nondeformable ribs providing means by which said side wall is self-supporting in the direction of said elongated linear extent when said side wall is in said expanded position to maintain the same in said tubular open condition.

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5,048,978

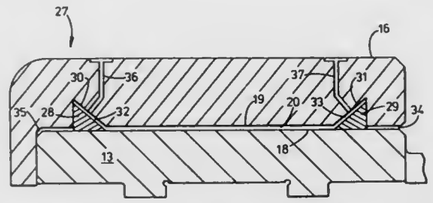
## SQUEEZE FILM DAMPER SEAL

Anant P. Singh, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jan. 14, 1991, Ser. No. 640,786

Int. Cl.[5] F16C *27/00*

U.S. Cl. 384—99 10 Claims



1. In a squeeze film shaft damper in which a bearing supported shaft has an annular bearing support fitted in an annular chamber in the bearing housing for limited radial motion therein, and where the annular bearing support and an opposed circumferential wall of said annular chamber define a thin annular oil filled damper squeeze film space therebetween, the improvement comprising

(a) a pair of spaced apart concentric grooves in said bearing housing circumferential wall with said damper squeeze film space therebetween,

(b) said grooves having a diagonal cross-section,

(c) a pair of piston ring seals in said grooves and adapted to sealingly engage said bearing support,

(d) said piston ring seals having a complementary diagonal cross-section to fit in said grooves in interfitting relationship to define a diagonal zone between the groove and ring diagonals with the diagonal of said diagonal cross-section of each ring facing in a direction towards each other.



5,048,979

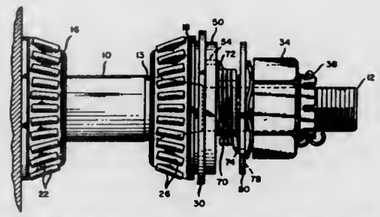
## SELF-ADJUSTING WHEEL BEARING ASSEMBLY

Gregory G. Coates, 2934 Adams St., Wall Township, Monmouth County, N.J. 07719

Filed Jun. 13, 1990, Ser. No. 537,255

Int. Cl.[5] F16C *23/08*

U.S. Cl. 384—519 5 Claims



1. A self-adjusting assembly for wheel bearings for an automotive vehicle in which the wheel is rotatably mounted on a spindle, supported by inner and outer wheel bearings, the wheel and wheel bearings maintained in position by a thrust washer and locking nut, the self-adjusting assembly positioned between said thrust washer and said locking nut, said self-adjusting assembly positioned between said thrust washer and said locking nut, said self-adjusting assembly comprising:

a threaded, self-adjusting nut, threadedly mounted on said spindle adjacent to said thrust washer, said self-adjusting nut having an outwardly extending axial tubular shank, said tubular shank having an annular lip positioned thereabout;

a non-rotatable washer slidably mounted on said spindle;

a biasing means positioned between said threaded self-adjusting nut and said non-rotatable washer, said biasing means positioned on said tubular shank adjacent said annular lip of said tubular shank, said biasing means having a first end and a second end, said first end and said second end of said biasing means being angularly positioned to engage selective receiving apertures in said threaded self-adjusting nut and said non-rotatable washer, said locking nut secured on said spindle outwardly adjacent from said non-rotatable washer, said locking nut securing said self-adjusting assembly, said inner and outer wheel bearings and said wheel to said spindle such that said biasing means continuously exerts axial pressure on said thrust washer and said outer wheel bearing.

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5,048,980

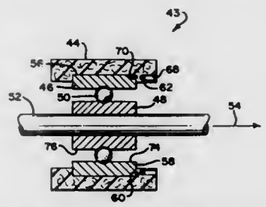
## BEARING ASSEMBLY WITH THRUST RESISTANT HOUSING

Thorn W. Dickinson, Berlin, Conn., assignor to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 449,332, Dec. 11, 1989, abandoned, which is a continuation of Ser. No. 244,230, Sep. 14, 1988, abandoned. This application Nov. 19, 1990, Ser. No. 617,283

Int. Cl.[5] F16C *27/06*

U.S. Cl. 384—536 9 Claims



1. A housing for use with a radial bearing assembly, said radial bearing assembly having an annular outer race ring with a central axis, an outer surface, a first end surface, and a second end surface, said first end surface being a leading annular face oriented in a predetermined axial direction, and a coaxial annular inner race ring radially inward of the outer race ring mountable on a shaft, said inner race ring being rotatable relative to the outer race ring, said housing comprising:

a flexible support member formed of an elastomeric material encasing said outer surface and at least part of said first and second end surfaces of the outer race ring, said flexible support member having a first portion extending radially inward in front of said first end surface and a second portion extending radially inward in back of the second end surface; and

restricting means within the flexible support member for limiting diametrical expansion of said first portion of the flexible support member to prevent leveraging of the first portion radially outward from the central axis and forward, and to prevent escape of the outer race ring from the flexible support member by excessive forward movement of the outer race ring in the predetermined axial direction.

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5,048,981

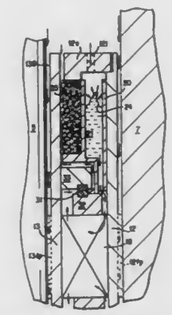
## MODULAR DROP-IN SEALED BEARING ASSEMBLY FOR DOWNHOLE DRILLING MOTORS

Russell D. Ide, P.O. Box 744, 641 Arnold Rd., Coventry, R.I. 02816

Filed Aug. 24, 1990, Ser. No. 571,928

Int. Cl.[5] F16C *33/76*; E21B *4/02*

U.S. Cl. 384—607 20 Claims



1. A sealed bearing assembly for supporting a drill bit drive shaft for rotation with respect to a casing in a downhole drilling motor in which drilling mud having a pressure flows between the shaft and the casing, the sealed bearing assembly comprising a static housing portion secured to the casing; a rotatable housing portion secured to the drill bit drive shaft; a bearing assembly extending between the static housing portion and the rotatable housing portion; the static housing portion and the rotatable housing portion being sealed so as to form a sealed housing assembly having an interior and encasing the bearing assembly; a plurality of flow passages extending through at least one of the static housing portion and the rotatable housing portion, said flow passages being completely separated from the interior of the housing assembly; at least one reservoir located in the sealed housing assembly, the reservoir having an outer end and an inner end and a fluid separating barrier member located in the reservoir for dividing the reservoir into an outer chamber and an inner chamber; at least one port formed in the housing assembly so as to allow the outer chamber to communicate with the exterior of the sealed housing assembly; and a lubricating oil filling the inner chamber the lubricating oil having a pressure; the fluid separating barrier member being movable in response to pressure differentials between the fluid in the outer chamber and the fluid in the

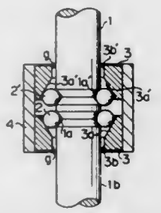
VOL 1130 ISS 3 SEP 17 1991 UMI



inner chamber so as to cause flow of the lubricating fluid from said inner chamber through said bearing assembly.

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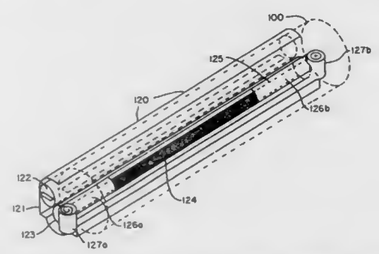
**5,048,982**
**ROTARY STRUCTURE**
Tsutomu Nakanishi, Kunitachi, Japan, assignor to C.S.U. Ltd., Tokyo, Japan
Division of Ser. No. 544,038, Jun. 28, 1990, which is a continuation of Ser. No. 7,639, Jan. 27, 1987, abandoned. This application Oct. 11, 1990, Ser. No. 596,090
Claims priority, application Japan, Jan. 29, 1986, 61-12332
Int. Cl.[5] F16C *19/10*
U.S. Cl. 384—613 6 Claims



1. A rotary structure for a VTR or floppy disc drive comprising a cylindrical shaft having an outer surface provided with a substantially annular V-shaped groove therein, a plurality of balls seated in said groove and projecting beyond an outer surface of the shaft, an outer race surrounding the outer surface of the shaft and having an inner tapered surface in contact with said balls for holding said balls in said groove with a predetermined pressure, a bearing housing surrounding said shaft and having an inner peripheral surface to which said outer race is fixed, said shaft having a second annular V-shaped groove axially spaced from the first said V-shaped groove and a plurality of further balls in said second groove, a second outer race surrounding the outer surface of the shaft and having an inner tapered surface in contact with the balls in the second groove for holding said balls therein under pressure, said second race being fixed to said inner surface of said housing, said V-shaped grooves being substantially adjacent to one another so that the balls in the first and second V-shaped grooves face one another in close proximity.

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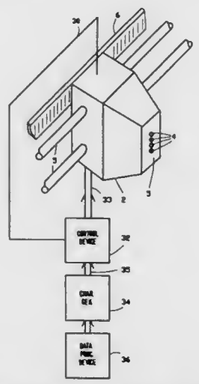
**5,048,983**
**ELECTROGRAPHIC TYPEWRITER**
Kensuke Fukae, Monsey, N.Y., assignor to Kentek Information Systems, Inc., Allendale, N.J.
Filed May 26, 1989, Ser. No. 358,695
Int. Cl.[5] B41J *2/45*
U.S. Cl. 400—119 4 Claims



1. An electrographic typewriter for electrophotographically printing information on a recording medium, comprising:
a) a housing;
b) an alphanumeric keyboard mounted on said housing;
c) a flat-plane display mounted on said housing;
d) a rotatable photoconductive drum mounted in said housing;
e) a charging unit, a selective discharging unit, a developing unit, a transfer unit, and an erasing unit arranged in sequence around said photoconductive drum in said housing;
f) a paper feed system comprising an input paper tray mounted on said housing, feeding into a paper feed path located in said housing and passing between said photoconductive drum and said transfer unit, said feed path continuing through a fuser unit mounted in said housing, said feed path terminating in an output tray mounted on said housing, and
g) electronic processing means in said housing for processing input data from said alphanumeric keyboard, and for generating output data for said flat-plane display and for said selective discharging unit,
said selective discharging unit comprising illumination means for illuminating said photoconductive drum with a light signal to be developed by said developing unit,
said electronic processing means including means for converting said input data from said alphanumeric keyboard directly into said light signal illuminated on said photoconductive drum,
whereby in a single housing, data entered into said alphanumeric keyboard is displayed on said flat-plane display, and is converted into an image on said rotatable photoconductive drum, said image being transferred to paper in said feed path by said transfer unit.

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**5,048,984**
**MATRIX PRINTER**
Horst Kringe, Netphen; Reinhold Winter, Wilnsdorf; Heinz M. Grevecoeur, Kreuztal-Ferndorf, and Hartmut Korn, Munich, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 5, 1990, Ser. No. 489,421
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3907080
Int. Cl.[5] B41J *3/02*
U.S. Cl. 400—124 7 Claims



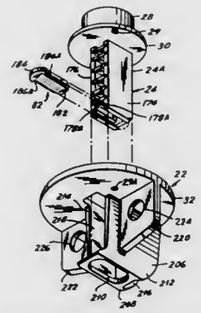
1. A matrix printer for printing a raster comprising at least one column, said printer including a print head adapted to move along a print line in a first direction and means for generating a print head position signal manifesting the position of said print head, said head including a plurality of print elements arranged to be at least in part offset from one another in said first direction, said elements for printing in said first direction in order of successive printing points at least one given printing raster on a record carrier, said printer further comprising a circuit arrangement for producing printing signals for the printing elements, the printing signals for each element being derived from element driving signals produced simultaneously for printing a raster column from at least one character generator, the combination therewith comprising:
a delay device associated with each element arranged to selectively delay the driving signal corresponding to that element applied to a data input thereto relative to the data output thereof in a given sequence, the delay time for each element having a value determined in accordance with the path of the printing head and upon the speed of the printing head corresponding to the relative offset of each printing element with respect to the raster column then being printed;
means for generating a writing pulse for writing character data into said delay devices; and
reading pulse generating means including shift register means responsive to said writing pulse and to a shift pulse applied thereto for generating a read pulse for reading character data from each said delay device, said delay time for each device being further determined by the time interval between said writing and reading pulses such that said elements print said given raster in accordance with the selective delay determined for each element.



member, said wire guide member being positioned and supported by said opening in said supporting member,
said guide member including a plurality of spaced wire guide plates supported on said wire nose of said guide member, said wire guide plates being disposed essentially parallel to said wire guide member, said wire guide plates and wire guide member each having holes aligned therein through which said print wires extend for guiding said print wires.

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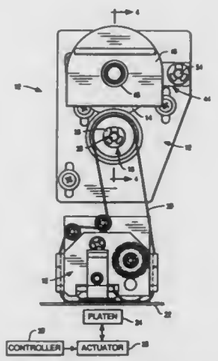
**5,048,985**
**WIRE GUIDE DEVICE FOR WIRE DOT PRINTER**
Akio Mitsuishi; Yasuhiko Nakazawa, and Takumi Sato, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Continuation of Ser. No. 235,864, Aug. 24, 1988, Pat. No. 4,915,524, which is a division of Ser. No. 823,167, Jan. 27, 1986, Pat. No. 4,767,227. This application Oct. 13, 1989, Ser. No. 421,050
Claims priority, application Japan, Jan. 25, 1985, 60-8970; Jan. 25, 1985, 60-8971; Jan. 25, 1985, 60-11854; Jan. 25, 1985, 60-11855; Jan. 25, 1985, 60-11856; Jan. 25, 1985, 60-11857; Jan. 25, 1985, 60-11858; Feb. 20, 1985, 60-23356; Feb. 20, 1985, 60-23357; Feb. 20, 1985, 60-31928
Int. Cl.[5] B41J *2/265*
U.S. Cl. 400—124 6 Claims



1. A wire dot printer using a plurality of print wires to print on a printing medium, comprising:
a print head unit;
a guide member defining a wire nose, said guide member being mounted on one end of said print head unit;
a wire guide member mounted proximate one end of said guide member and including a plurality of openings for guiding said print wires; and
a supporting member mounted on said guide member on said one end thereof having a first surface for coupling said supporting member to said printer, said supporting member having an end surface having an opening therein corresponding in size and shape to that of the wire guide

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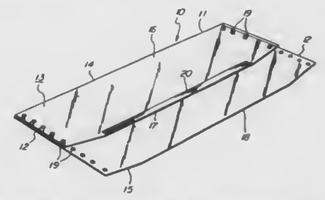
**5,048,986**
**SELF ALIGNING INKING ROLL FOR A PRINTER**
Marek W. Czesnik, Kitchener; James A. Michael, Waterloo, and Anthony J. Boon, Kitchener, all of Canada, assignors to NCR Corporation, Dayton, Ohio
Filed May 18, 1990, Ser. No. 525,563
Int. Cl.[5] B41J *31/14*
U.S. Cl. 400—202 11 Claims




1. In a ribbon inker assembly, a combination comprising:
a frame having a transfer roll mounted thereon;
an aligner member for supporting an inking roll;
a support member for supporting said aligner member; and
supporting means for supporting said support member for biasing movement towards said transfer roll;
said support member having a bearing surface and a centering portion; and
said aligner member having a support portion having an opening therein to receive said centering portion of said support member and also having a mating bearing surface to contact said bearing surface of said support member to support said aligner member on said support member.

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**5,048,987**
**PAPER GUIDE FOR TRACTOR FEED PRINTERS**
Phyllis S. Golden, 591-F E. Bonita Ave., San Dimas, Calif. 91733
Filed Dec. 27, 1989, Ser. No. 457,265
Int. Cl.[5] B41J *15/04*
U.S. Cl. 400—613.1 8 Claims



1. An accessory guide for use with elongated rectangular

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paper stock of the type adapted for use with the tractor feed mechanism of a mechanical printer by being provided with laterally aligned pairs of perforations spaced apart at regular longitudinal intervals on opposite lateral sides of said paper, said perforations being of the proper size and spacing for engagement by radially outwardly projecting pins of laterally spaced apart tractor wheels, said accessory consisting of;

a thin, generally laterally elongated, rectangular sheet of strong, flexible materials, a front longitudinal portion of said sheet being folded approximately 180 degrees back on a rear longitudinal portion of said sheet on a line perpendicular to the lateral sides of said sheet, in overlying relationship to said rear longitudinal portion of said sheet, thereby forming said overlying front folded back portion as an upper half sheet and said underlying rear longitudinal portion as a lower half sheet, said upper and lower half sheets forming a laterally disposed rectangular pocket, said upper and lower half-sheets being provided with registered laterally aligned pairs of circular holes spaced apart at regular longitudinal intervals of the proper dimensions to register with said perforations in said paper, whereby a leading lateral edge of said paper may be inserted into said pocket and said paper perforations aligned with said circular holes, thereby facilitating insertion of said paper into said tractor feed mechanism.

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**5,048,988**

## INK SHEET DRIVE SYSTEM FOR A RECORDING DEVICE

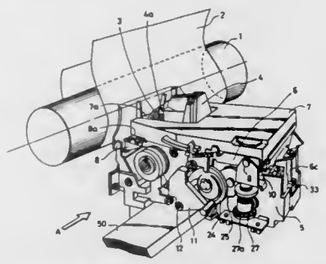
**Hiroharu Nakajima, Kodaira; Naohisa Suzuki, Yokohama, and Michihisa Kumamoto, Chofu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 535,296, Jun. 8, 1990, abandoned, which is a continuation of Ser. No. 185,345, Apr. 25, 1988, abandoned, which is a continuation of Ser. No. 815,057, Dec. 31, 1985, abandoned. This application Jan. 2, 1991, Ser. No. 634,825**

**Claims priority, application Japan, Jan. 7, 1985, 60-000665**

**Int. Cl.[5] B41J *11/60***

**U.S. Cl. 400—697.1** **6 Claims**



1. A recording apparatus comprising:

recording and correcting means which effects recording and correcting onto a recording medium;

ribbon supporting means for mounting thereon a first ribbon for recording and a second ribbon for correcting, said ribbon supporting means being movable among a first position where said first ribbon opposes to said recording and correcting means, a second position where said second ribbon opposes to said recording and correcting means, and a third position where said first and second ribbons are out of opposition to said recording and correcting means;

a motor for generating a rotation force, the motor being reversibly rotatable in a first direction and in a second direction;

ribbon transport means, cooperating with said motor, for transporting said first ribbon;

a rotation member rotated in cooperation with rotation of said motor, said rotation member in cooperation with rotation of said motor in said first direction, circulating said supporting means to said first position, said second position and said third position, and said rotation member fixing said support means to said first position upon rotation of said motor in said second direction; and

one way transmitting means being provided between said motor and said ribbon transport means for transmitting only the rotation of said motor in said second direction to said support means.

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**5,048,989**

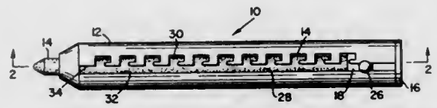
## CRAYON HOLDER

**Steven D. Stageman, 5075 S. Illinois Ave., Apt. #11, Cudahy, Wis. 53110**

**Filed Apr. 19, 1990, Ser. No. 511,208**

**Int. Cl.[5] B43K *21/00***

**U.S. Cl. 401—83** **8 Claims**



1. A holder and a stick of writing material, said holder holding said stick of material for writing or drawing, or the like, said holder comprising:

a. material retaining means for attaching and retaining a stick of writing material, the retaining means having a longitudinal axis coaxial with a longitudinal axis of the writing material and including a transversely extending positioning peg; and

b. An elongated tubular sleeve of substantially uniform interior cross-section adapted to freely axially and rotatably slidably receive the retaining means and to freely axially and rotatably slidably receive a stick of writing material, the sleeve including an elongated, axially extending slide slot to receive the positioning peg, a plurality of axially spaced, laterally extending inlet slots, each inlet slot communicating with the slide slot, and a locking slot extending from each inlet slot and in a direction substantially parallel to the slide slot for receiving and retaining the positioning peg in a fixed position when the holder is in use by preventing inward axial displacement of the retaining means, the locking slot and inlet slot defining a retaining lip adjacent the slide slot for confining the positioning peg against rotation toward and away from the slide slot and for preventing rotation between the retaining means and the stick of material relative to the sleeve.

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**5,048,990**

## WRITING INSTRUMENT WITH DRYING-PREVENTING MECHANISM

**Yasuyuki Hashimoto, and Haruo Yamashita, both of Hyogo, Japan, assignors to Ancos Co., Ltd., Osaka, Japan**

**Filed Nov. 6, 1987, Ser. No. 117,781**

**Claims priority, application Japan, Nov. 7, 1986, 61-264043; Dec. 26, 1986, 61-308851; Apr. 14, 1987, 62-89875; May 29, 1987, 62-131673**

**Int. Cl.[5] B43K *9/00***

**U.S. Cl. 401—107** **25 Claims**



1. A writing instrument comprising:

a hollow body;

writing means for writing, said writing means having a writing tip and a writing member, said writing means being accommodated in said hollow body;

means for sealing said writing tip, said sealing means including a seal cylinder provided with an opening at a front end thereof, a cover means for sealing said opening of said seal cylinder when said writing means is retracted, and a seal member provided between said seal cylinder and said writing means, said seal member always abutting against said writing means;

moving means for moving said writing means, said moving means being provided between said writing means and said body for moving said writing means forwardly thereby causing said cover means to open, for locking said writing means at a writing position and for moving said writing means backwardly to retract said writing means so as to seal said writing tip; and

means for continuously connecting said writing means to said cover means of said sealing means, said continuously connecting means being provided at an outside of a portion of said seal member, which portion abuts against said writing means, said connecting means having an end portion directly fixed to said writing means by an element attached to said writing member, said connecting means being an elongate thread-like connecting member, said connecting means allowing said writing means to move forwardly, and said connecting means closing said cover means to seal said opening of said seal cylinder after said writing tip of said writing means retracts into said seal cylinder.



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**5,048,991**

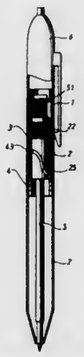
## STRUCTURE OF DRIVING BALL REFILL FOR A BALL POINT PEN

**Ching-Chung Guo, No. 29, La. 14, Ho Ping Rd., Panchiao, Taipei, Taiwan**

**Filed Jul. 3, 1990, Ser. No. 547,148**

**Int. Cl.[5] B43K *5/16, 24/02, 21/08***

**U.S. Cl. 401—116** **3 Claims**



1. A refillable ball point pen structure in which the refill can be extended or retracted by relative rotation of the parts of the pen structure through three hundred and sixty degrees, comprising:

a body tube having a ball point exposing opening at the bottom thereof;

a driving casing tube fixed in the upper end of said body tube and having an inwardly projecting projection thereon;

an external casing tube fitted over said driving casing tube and engaged with said driving casing tube for relative rotation therewith and held against relative axial movement therewith;

a driving axial tube having a smaller diameter tube body within said driving casing tube and relatively rotatable therewithin and extending upwardly to within the upper end of said external casing tube and being axially slidable and non-rotatably engaged with the interior of said external casing tube, said smaller diameter tube body having a sinuously curved groove therearound with a downwardly concave arc at the upper end forming a topmost terminal portion and an upwardly concave arc at the lower end forming a bottommost terminal portion, said inwardly projecting projection being engaged in said groove for causing longitudinal movement of said driving axial tube upon relative rotational movement between said driving axial tube and said driving casing tube;

a spring means between said driving axial tube and said driving casing tube urging said driving axial tube upwardly within said external casing tube; and

a cap fitted over said external casing tube and in which said external casing tube is relatively axially slidable and non-rotatable;

whereby with a ball point refill having a ball point thereon adjacent said ball point exposing opening and being held fixed in relation to said driving axial tube, relative rotation of said cap and said body tube causes relative rotation of said driving axial tube and said driving casing tube for causing said projection to move relatively along said groove and said ball point can be extended out of and retracted into said body tube by relative rotation of three hundred and sixty degrees between said cap and said body tube.

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**5,048,992**

## WRITING INSTRUMENT INCLUDING SHOCK RESISTANT INK COMPOSITIONS

**Rachel M. Loftin, Halifax, Mass., assignor to The Gillette Company, Boston, Mass.**

**Division of Ser. No. 347,681, May 5, 1989, Pat. No. 4,971,628, which is a continuation-in-part of Ser. No. 262,039, Oct. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 112,584, Oct. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 812,683, Dec. 12, 1985, abandoned. This application Sep. 13, 1990, Ser. No. 581,940**

**Int. Cl.[5] B43K *7/02***

**U.S. Cl. 401—209** **9 Claims**

1. A ball-point pen comprising a reservoir including a shock-resistant shear-thinning ink composition consisting essentially of:

a) from about 50 to about 99 percent by weight of a polar solvent system including at least about 50 percent by weight water,

b) colorant material is an amount up to about 30 percent by weight,

c) an amount of a water-dispersible, polymeric shear-thinning material sufficient to provide an ink having a shear-thinning index between about 0.5 to about 0.9, a viscosity of 50 cPs or greater at a shear rate of 30 $sec^{-1}$ and a viscosity of 100 cPs or less at shear rates produced by writing, and

d) an amount of a water-soluble, film-forming, polymeric, shock-resistant providing material effective to provide shock-resistance for the ink composition but ineffective to substantially affect the shear-thinning capability of the polymeric shear-thinning material.

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**5,048,993**

## BALL JOINT ASSEMBLY

**Deok Y. Yoon, Kwangmyeong, Rep. of Korea, assignor to Sam-Sung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed Sep. 28, 1990, Ser. No. 589,619**

**Claims priority, application Rep. of Korea, Dec. 30, 1989, 89-20717[U]**

**Int. Cl.[5] F16D *1/00***

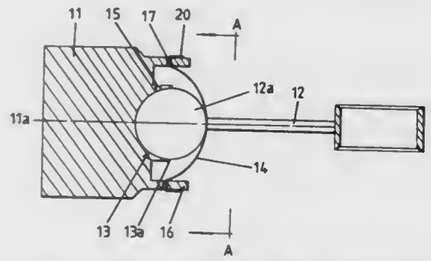
**U.S. Cl. 403—24** **19 Claims**

1. A ball joint assembly provided with a connecting rod and a piston, comprising:

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a piston having a rear end;
a cylindrical sleeve protruding from said rear end of said piston, said sleeve having a diameter less than the cross section of said piston, and having at least two inserting holes at predetermined places around circumferential wall of said sleeve;
a ball seat inside the sleeve, having a projecting section




protruding from said rear end of said piston to receive a ball head, the ball head being attachable to a connecting rod; and
a flexible member having a central portion perforated by a hole for the connecting rod to pass through, and at least two leaf portions extending from both sides or a plurality of directions from the central portion so as to support said ball in the ball seat.

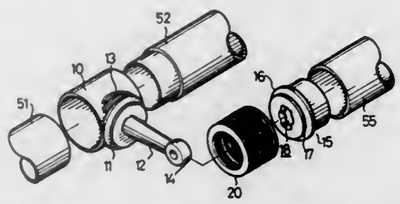
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**5,048,994**

## CONNECTOR FOR ROLL BARS OF A TRUCK

**Juan, Sung Y., No. 8, Alley 14, Lane 151, Sec. 2, Chung Shan Rd., Shu Lin Chen, Taipei Hsien, Taiwan**

**Filed Oct. 23, 1990, Ser. No. 601,363**
**Int. Cl.[5] F16B** *7/10*
**U.S. Cl. 403—51** **1 Claim**



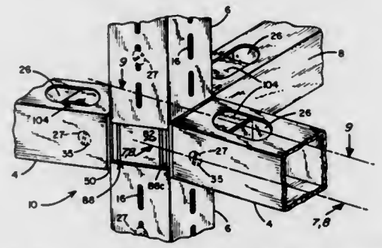

1. An improved connector for connecting roll bars used on a vehicle comprising substantially one or more transverse bars, side bars, and supporting bars interconnected to one another and fixedly secured to a floor of the vehicle at one end, said connector comprising:
a coupling sleeve for connecting the transverse bar and the side bar by virtue of having a connecting base member, said base member providing a first annular ring and an engaging pin extending from its end surface formed into a wheel-shape disk;
a cylindrical connecting block providing a peripheral flange along its outer wall to abut a supporting bar when said connecting block is inserted into the supporting bar, an end of said connecting block being provided with a second annular ring and a receiving hole; and
a bellows hose for engaging said annular rings when said wheel-shape disk is inserted into said receiving hole and said connecting block is turned around to fixedly connect said coupling sleeve and said connecting block.

**5,048,995**

## COUPLER FOR TUBULAR FRAME MEMBERS

**Bryan Beaulieu, Burnsville, Minn., assignor to Skyline Displays, Inc., Burnsville, Minn.**

**Filed Mar. 1, 1990, Ser. No. 486,769**
**Int. Cl.[5] F16B** *7/04*
**U.S. Cl. 403—264** **14 Claims**




1. An improved tripartite coupler for attaching together the tubular structural members of a structural support or display frame, said coupler comprising:
a) a receptacle having upper and lower opposed exterior end surfaces and a plurality of identical exterior side faces extending therebetween; each of said side faces including a central recess between two retaining heads;
b) a plug having sidewalls and two ends, a first end of said plug being adapted for frictional insertion into one of said structural members and a second end of said plug opposed to said first end having a plurality of projections adapted to engage said retaining heads of said receptacles; a pair of spaced apart tabs extending between said side walls and cantilevered from said first end, each tab having a locking end which is projectable into said central recess; and
c) a lock actuator comprising a lever having a graspable end and an opposed tapered projecting end positioned between said tabs, said lever having a shank extending between said ends and having a crosspin attached to said shank; said crosspin extending between said sidewalls; whereby said lock actuator may be pivoted about said crosspin to separate said tabs and to engage said locking ends with said retaining heads or to disengage said locking ends from said retaining heads.

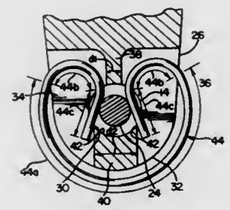
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**5,048,996**

## UNIVERSAL CONNECTOR FOR RETAINING AND LINKING MEMBERS

**Chester G. DuBois, Zion, and Kurt R. Dembski, Lake Villa, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Jul. 2, 1990, Ser. No. 547,612**
**Int. Cl.[5] B25G** *3/00*
**U.S. Cl. 403—287** **15 Claims**




1. A universal connector for linking and retaining first and second members to one another, wherein the first member has a tapered end portion for insertion into the connector, the first member having a reduced cross sectional portion forming a



retaining groove therein adjacent but spaced from said tapered end portion, said connector comprising:
a main connector body with one end portion having an aperture for receiving the second member in retaining engagement, an opposite end portion having an aperture for receiving the first member in retaining engagement, and a bridging portion interconnecting said one end portion and said opposite end portions together;
a removable resilient retainer means carried by said opposite end portion and being sufficiently flexible to permit the first member to be inserted in said aperture of said opposite end portion, said retainer means fitting within the retaining groove for retaining the first member, said retainer means being substantially the same shape and size before the first member is inserted as after the same is inserted;
said retainer means comprising a unitary curved member with a generally semicircular segment of a first diameter, with the opposite ends of the semicircular segment merging with curved segments of substantially reduced effective diameter, the outer ends of each of the curved segments merging with generally straight segments that are directed toward said semicircular segment and away from one another at a predetermined acute angle, the points of merger of the curved segments and the straight segments being spaced from one another by a distance slightly less than the diameter of the retaining groove;
said opposite end portion having a pair of slots located in the same generally plane on the outer surface thereof, said slots being adapted to receive said retainer means therein, the outer surfaces of said opposite end portion between said slots and between the aperture and the end surface of said opposite end portion providing contact surfaces for said straight segments of said retaining means.

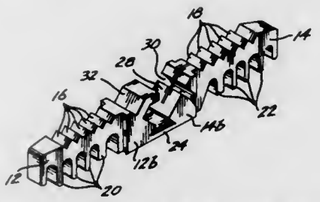
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**5,048,997**

## FLEXIBLE CORNERPIECE FOR SPACER FRAME FOR INSULATED GLASS PANEL

**Larry W. Peterson, Everett, Wash., assignor to Alumet Mfg. Inc., Marysville, Wash.**

**Filed Aug. 16, 1989, Ser. No. 394,736**
**Int. Cl.[5] F16B** *7/00, 12/00*
**U.S. Cl. 403—295** **4 Claims**




1. A cornerpiece for joining adjacent tubular spacer bars in a spacer frame for an insulated glass panel, said cornerpiece comprising:
a first arm adapted to be inserted into an end of one of the adjacent spacer bars;
a second arm adapted to be inserted into an end of another of the adjacent spacer bars;
a flexible joint means connecting said first and second arms at their respective first ends, said joint means comprising a continuous planar member with a width equal to the width of said first and second arms; and
a projection extending from said first end of said first arm, said projection including a first portion extending from said arm and a second portion extending obliquely from said first portion, each of said first and second portions having parallel, spaced first and second surfaces, said surfaces cooperating to form spaced, parallel exterior and interior corners at the junction of said first and second portions, said projection cooperatively engaging a slot formed in said first end of said second arm, said slot including first and second parallel, spaced walls, each of said first and second walls having first and second portions that cooperate to form parallel corners substantially equal to the parallel corners of said projection to provide an interference fit between said corners of said slot and the corners of said projection to releasably maintain said first and second arms at a predetermined angle.

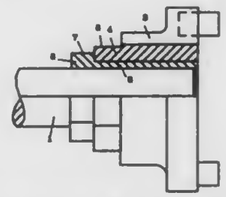
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**5,048,998**

## COMPRESSION-LOCKING CLAMPING BUSH SYSTEM

**Adalbert Viets, Pasteur Promenade 9, 6600, Saarbruecken, Fed. Rep. of Germany**

**Filed May 4, 1989, Ser. No. 347,463**
**Claims priority, application Fed. Rep. of Germany, May 7, 1988, 3816688**
**Int. Cl.[5] F16B** *7/04*
**U.S. Cl. 403—351** **13 Claims**



1. A hub-to-shaft coupling for attaching a hub, having a cylindrical bore, to a cylindrical shaft, said coupling comprising:
a unitary outer bushing being mounted within said bore of said hub and having an inner surface that bounds an inner bore of said outer bushing, said inner surface, in a plane perpendicular to an axis of the outer bushing, having a shape of an outer perimeter of at least one overlapping ellipse;
a unitary inner bushing being mounted within said inner bore of said outer bushing and having an outer surface and also having an inner surface that bounds a cylindrical bore which receives said shaft, said outer surface, in a plane perpendicular to an axis of the inner bushing, having a shape of an outer perimeter of at least one overlapping ellipse;
each of said inner and outer bushings having a cross-section in a plane normal to an axis of its respective bore such that in a first relative angular orientation of said bushings about said shaft, the inner bushing fits within the outer bushing and in a second relative angular orientation of these bushings about said shaft, the inner bushing deforms radially inward toward its axis of its cylindrical bore and the outer bushing deforms radially outward from its axis of its inner bore, whereby, in the second relative angular orientation, said coupling clamps the hub to the shaft by elastically deforming the unitary outer bushing outwardly to press against the hub and by elastically deforming the unitary inner bushing inwardly to press against the shaft.

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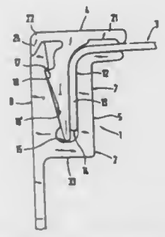


5,048,999

## CLAMPED CONNECTION BETWEEN A PROFILE PART AND A SHEET METAL PART BY MEANS OF A CLAMPING STRIP

Willi Wurl, Niefern-Oeschelbronn, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 2, 1991, Ser. No. 679,102
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1990, 4011237
Int. Cl.[5] B25G *3/20*
U.S. Cl. 403—374 12 Claims



1. A Clamped connection between a profile part and a sheet metal part by means of a clamping strip, an edge area of the sheet metal part being clamped in between a foot portion of the clamping strip and a receptacle of the profile part, and resting on an angular portion of the receptacle, wherein the edge area of the sheet metal part, which projects into the receptacle and has a rectangular design, is held in the receptacle by means of a clamping strip having an approximately T-shaped cross-section, the foot portion of the clamping strip being wedge shaped, and having at least one detent which interacts with an undercut area of the receptacle, and wherein first and second holding lips of a head section of the clamping strip extend approximately at a right angle with respect to the foot portion, said first holding lip being supported on the sheet metal part, and said second holding lip being supported on profile part.

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5,049,000

## CONTINUOUS FLOW INTERSECTION

Francisco D. Mier, 5425-3 Lake Murray Blvd., La Mesa, Calif. 92041, and Belisario H. Romo, Guadalajara 93, Col. Roma, Mexico City, Mexico

Filed Dec. 23, 1987, Ser. No. 137,372
Int. Cl.[5] E01C *1/04*
U.S. Cl. 404—1 24 Claims

1. A continuous flow intersection for accommodating traffic from a plurality of road surfaces comprising:

a first road for traffic traveling in a first direction;

a second road surface for traffic traveling in a direction opposite to said first direction;

a third road surface for traffic traveling in a direction intersecting said second then said first road surfaces;

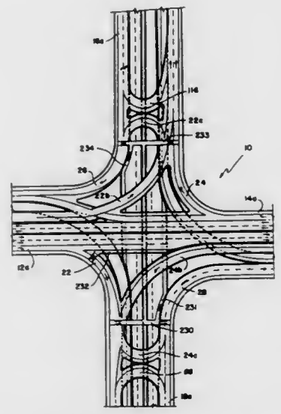
a fourth road surface for traffic traveling in a direction opposite to said traffic traveling on said third road surface;

said first and second road surfaces intersecting said third and fourth road surfaces at a crossing area;

said first and second road surfaces being disposed at a first elevation distinct from the elevations of said third and fourth road surfaces;

a first road surface left turn lane being disposed along said first road surface at a distance prior to the crossing area in the direction of travel, said first road surface left turn lane diverting traffic from said first road surface and crossing said second road surface prior to the crossing area in the direction of travel and continuing traveling in a direction opposite to said second road surface in an area to the right of said second road surface traffic direction without diverting through traffic traveling along said first and second road surfaces;

said first road surface left turn lane traverses said third and



fourth road surfaces at said first elevation distinct from the elevation of said third and fourth road surfaces and laterally from said second road surfaces, turns left and merges with said fourth road surface.

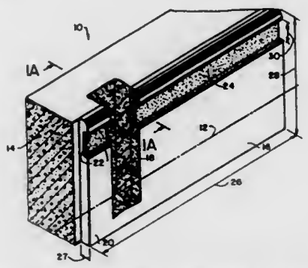
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5,049,001

## SAFETY ROADWAY DELINEATOR EFFECTIVE DURING RAINY NIGHT-TIME DRIVING CONDITIONS

Arthur M. Dinitz, New Rochelle, N.Y., assignor to Transpro Industries, Inc., New Rochelle, N.Y.

Continuation-in-part of Ser. No. 1,890, Jan. 9, 1987, Pat. No. 4,772,155. This application Sep. 20, 1988, Ser. No. 247,001
The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.
Int. Cl.[5] E01C *11/22*
U.S. Cl. 404—7 12 Claims



1. A safety roadway delineator comprising a member having an exterior surface facing the roadway and exposed to roadway traffic, said member being provided with a generally elongate marker surface recessed in relation to said exterior surface, said marker surface extending along the length direction of said roadway member and in use being inclined in relation to the horizontal to cause a water run-off; microsphere reflectors applied to said recessed marker surface for at least partially reflecting incident light in the direction of the source of incident light on the roadway; and an adhesive matrix base for substantially permanently attaching said microsphere reflectors to said marker surface by means of mechanical and non-mechanical adhesion, said microsphere reflectors defining an average microsphere reflector diameter, said microsphere reflectors being embedded within said adhesive matrix base a depth selected from the range of 51–80% of the average microsphere reflector diameter, whereby said member may serve as a roadway member forming a substantially continuous reflective delineator which is protected from normal wear and reliably exhibits reflecting properties both under dry and rainy weather conditions.

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5,049,002

## METHOD FOR CLEANING OIL SPILLS

Pamela R. Cole, 3707 N. Cherry, Kansas City, Mo. 64116

Filed Jun. 28, 1990, Ser. No. 544,989
Int. Cl.[5] C09K *3/32;* C02F *1/40;* E02B *15/04*
U.S. Cl. 405—128 17 Claims

1. A method for removing oil from an aqueous medium comprising:

melting a lipid composition comprising at least 65 percent lipids, by weight of the total composition,

heating said lipid composition to a temperature of at least 100° F.;

applying said melted lipid composition to an aqueous medium containing oil;

allowing said lipid composition to cool to solidification temperatures whereby a solidified mass forms in said aqueous medium; and

separating said solidified mass from said aqueous medium.

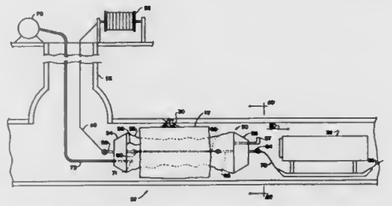
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5,049,003

## METHOD AND APPARATUS FOR REPAIRING RUPTURES IN UNDERGROUND CONDUITS

Kenneth Barton, 3921 Prospect Ave., Naples, Fla. 33940

Continuation of Ser. No. 397,771, Aug. 23, 1989, Pat. No. 4,995,761. This application Dec. 24, 1990, Ser. No. 633,472
The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.
Int. Cl.[5] F16L *1/00, 55/18*
U.S. Cl. 405—154 20 Claims



1. Apparatus for repairing ruptures in underground conduits comprising:

an inflatable bladder that is introducible into a generally cylindrical conduit proximate a rupture therein, said bladder having a generally smooth surface in its inflated condition;

a flexible sleeve that is wrapped about and directly engagable by at least a portion of said bladder and is sufficiently large to cover said rupture; and

means for inflating said bladder to urge said sleeve into generally conforming engagement with the entire inner circumferential surface of at least a section of said conduit such that said sleeve covers said rupture, said sleeve including an adhesive bonding substance that adheres said sleeve to said conduit and is hardenable to bond said sleeve to said conduit.

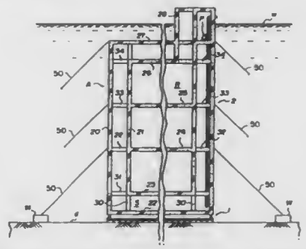
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5,049,004

## UNDERWATER BUILDING AND CONSTRUCTING METHOD THEREOF

Masateru Niimura, 6-4-4, Ohmori Mishi, Ohta-ku, Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,583
Claims priority, application Japan, Jan. 20, 1989, 1-10004
Int. Cl.[5] E02B *17/00;* B63B *35/44*
U.S. Cl. 405—204 17 Claims



1. A building constructed to be located substantially underwater, comprising:

a controllably floatable base; and

a multi-floor building structure, comprising a plurality of sequentially constructed floors and outer wall constructed with the lowest floor of the building formed on the base while said base is floating, with additional floors built sequentially thereon as said base is controllably submerged in water,

wherein said building is formed to have an enclosed space adjacent the base, said enclosed space being fillable with water to controllably adjust a corresponding flotation of the base and floors of the building being constructed thereon, said building further comprising an entrance tower located at the uppermost floor at a predetermined height selected such that entry is provided to a user of the building at an entrance located in the entrance tower above an ambient water surface level when the base with the building built thereon is finally sunk to rest at a desired location in the water.

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5,049,005

## DEVICE FOR THE ASSEMBLY OR MECHANICAL REINFORCEMENT AND THE ANTI-CORROSION TREATMENT OF ELEMENTS OF IMMERSED STRUCTURES, AND ASSEMBLY AND TREATMENT PROCESS RELATING THERETO

Francois Lazare, and Roger Genet, both of Le Lignon, Switzerland, assignors to Irete S.A., Le Lignon, Switzerland

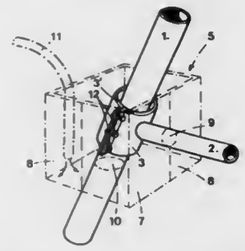
Continuation-in-part of Ser. No. 243,560, Jul. 29, 1988, abandoned. This application Jul. 9, 1990, Ser. No. 550,229
Claims priority, application Switzerland, Dec. 2, 1986, 4798/86
Int. Cl.[5] E02D *5/60, 31/06*
U.S. Cl. 405—216 29 Claims

1. A device for the rigid assembly or mechanical reinforcement and the anticorrosion protection of branch girder joints forming part of immersed structures, said branch joints made up of a main girder element (1) and at least one secondary girder element (2), said device comprising a rigid flange (3,3') fixed directly and rigidly to at least one of the secondary elements (2), said flange being shaped so as to surround the main

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element (1) with a space therebetween, and a mass of electric polymerized material (4) filling said space and encapsulating



the flange (3, 3') and portions of the elements (1) and (2) which cooperate with said flange.

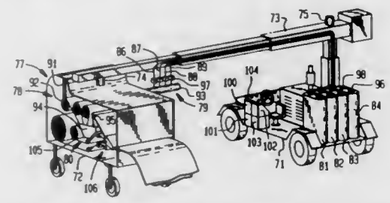
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5,049,006

**CONTINUOUS STRUCTURE FORMING METHOD AND THE RESULTING PRODUCT**

LeRoy Payne, 3300 Nicholas La., Molt, Mont. 59057

Continuation-in-part of Ser. No. 417,501, Oct. 5, 1989, which is a continuation-in-part of Ser. No. 235,205, Aug. 23, 1988, Pat. No. 4,872,784. This application May 10, 1990, Ser. No. 521,442
Int. Cl.[5] E02D *3/12*
U.S. Cl. 405—270 29 Claims



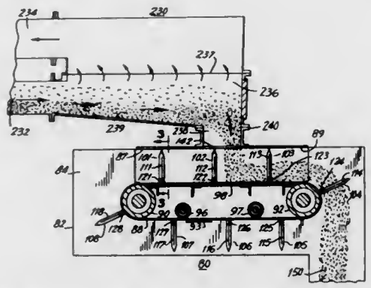
1. A method of continuously forming an extended length of a unitary structure at a job site including the steps of providing a supply of a porous flexible blanket, providing a plurality of thermosetting resin forming raw material reservoirs, advancing each raw material independently to mixing means disposed closely adjacent to mixture delivery means, mixing said raw materials in preselected proportions, immediately continuously flowing uniformly a preselected quantity of a high viscosity flowable thermosetting resin forming mixture simultaneously into an entire continuously moving width of said porous flexible blanket, applying pressure against said treated blanket to form a uniform matrix therewith, monitoring the rate of advance of said blanket, coordinating said rate of advance with the flow rate of said mixture into said blanket and with the pressure applied thereto, positioning a substantially flat non-porous flexible envelope along the length of said treated blanket, continuously positioning said envelope/blanket combination along a desired path while said combination is deformable and said matrix is adhesive, introducing a pressurized gas into said envelope, inflating said envelope to move said treated blanket into a final configuration against a supporting surface, maintaining said non-porous envelope in an inflated state until said treated blanket is set in said final configuration and bonded to said supporting surface.

5,049,007

**HORIZONTAL BELT CONVEYOR AIRLOCK**

Michael J. Abel, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 12, 1990, Ser. No. 491,500
Int. Cl.[5] B65G *53/46*
U.S. Cl. 406—62 9 Claims



1. An airlock for the continuous feeding therethrough of a material, while obstructing the free flow of a gas, said airlock comprising:

a continuous belt means, having a substantially horizontal upper surface;

a planar sealing surface located above the belt means, a substantial part of the planar sealing surface being substantially horizontal and in spaced parallel relationship above the upper surface of the belt means;

the belt means having a plurality of non-porous flight means projecting outwardly from said belt means;

each flight means having a free edge disposed outwardly from the surface of the belt means and each free edge being capable of sealingly engaging the planar sealing surface.

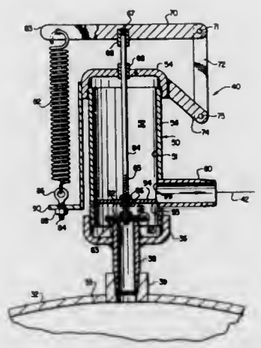
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5,049,008

**AIR PULSE DISCHARGE CONTROL VALVE FOR FLUIDIZING DRY PARTICULATE MATERIAL**

Lloyd A. Baillie, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 302,536, Jan. 25, 1989, abandoned. This application Apr. 11, 1990, Ser. No. 508,213
Int. Cl.[5] B65G *53/22, 53/38, 69/06*
U.S. Cl. 406—85 1 Claim



1. In a system for fluidizing dry bulk particulate material disposed in a storage bin, the improvement comprising:

a storage bin having wall means defining an interior chamber for holding a quantity of dry flowable particulate material;

fluidizing pad means disposed adjacent to aid wall mans and defining between said wall means and said pad means at space;

conduit means in communication with said space for delivering a pulse of pressure air into said space to flex said pad means;

a reservoir tank for holding a quantity of pressure air;

means forming a source of pressure air in communication with said reservoir tank; and

a self controlled air pulse delivering valve interposed between said reservoir tank and said conduit means for delivering pressure air to said spaced, said valve comprising

a body member defining a chamber, means forming a pressure air inlet conduit opening into said chamber and means forming a pressure air discharge conduit opening into said chamber, means forming av above seat surface, a closure member engageable with said set surface to close off the flow of pressure air into and through said chamber, an actuating piston operably connected to said closure member and disposed insaid chamber and forming with said body member a subchamber into which pressure air may flow upon sunseating of said closure member from said seat surface, said actuating piton having a peripheral surface inclose proximity to wall means defining said chamber to substantially prevent the flow of pressure air past said piston in a nearly closed position of said valve, an actuating rod interconnecting said piston and said closure member, and means engageable with said rod for biasing said closure member in a losed position of said valve, said piston and said closure member being cooperable such that at a predetermined pressure in said inlet conduit said closure member unseats from said seating surface to provide for the flow of pressure air into said valve to act on said piston to move said valve rapidly from a near closed portion to a fully opened position to permit substantially unrestricted flow of pressure air from said inlet conduit to said discharge conduit, said piston being responsive to a reduced pressure insaid chamber to permit said means for biasing said actuating rod to move said closure member to he valve closed position.



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5,049,009

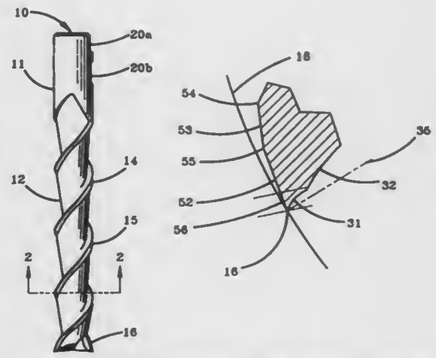
**IMPROVED CUTTING TOOL**

Graydon L. Beck, Cuyahoga Falls, and Kenneth Skrabec, Medina, both of Ohio, assignors to The Weldon Tool Company, Cleveland and SGS Tool Company, Munroe Falls, both of, Ohio

Filed Aug. 21, 1990, Ser. No. 570,427
Int. Cl.[5] B23B *51/00*
U.S. Cl. 407—54 8 Claims

1. An improved rotary cutting end mill of the type having a shank section, a means for retaining said end mill in a rotary driven apparatus, a fluted portion being an integral extension of said shank section, a terminal end of said end mill at the end opposite the shank, one or more helical teeth formed on the outer surface of said fluted portion, each tooth comprising a cutting surface and peripheral relief wall which intersect to form an angle defining a helical cutting edge, said helical cutting edge defining an outer circumferential cutting path, and said peripheral relief wall having a first and second relief surface wherein the improvement comprises:

a first relief surface of said peripheral relief wall having an arcuate land segment and a linear land segment along a substantial portion of said cutting edge, said arcuate land being substantially parallel to said cutting path, located immediately adjacent to said helical cutting edge and terminating at a point along said first relief surface, said linear land segment connecting said arcuate land segment



and said second relief surface and defining a surface tapered inward from said cutting path.

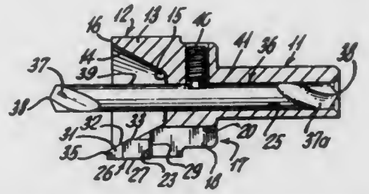
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5,049,010

**METAL CUTTING TOOL**

Harry C. Oakes, Perry, N.Y., assignor to Unibit Corporation

Filed Aug. 4, 1988, Ser. No. 228,378
Int. Cl.[5] B23B *51/04*
U.S. Cl. 408—201 21 Claims



1. A metal cutting tool for trepanning holes in a sheet metal, said cutting tool comprising

a cutter body extending from a first front end to a second rear end and having a substantially cylindrical outer wall substantially matching the diameter of a hole to be produced, a base disposed within the cutter body, an inner wall tapering radially inwardly from the first front end to the base, said inner wall joining said outer wall of the body to form a forward edge at said first front end, said cutter body having a notch extending for substantially the length of the body from said first end to said second end for removal of cut material and defined by at least side walls thereof, a socket disposed within one said side wall of the notch at the first front end of the cutter body, said socket being adapted to accept a cutting tip therein;

said cutting tip secured to the body and having at least an outer wall, an inner wall, a top surface, a rear wall, a bottom wall and a front face, said front face and said top surface join to form a cutting edge extending forwardly of the cutter body;

said top surface sloping from said cutting edge in the front to back direction relative to the direction of rotation of said

cutting tool, at least a part of said inner wall of the cutting tip slopes from the top cutting surface towards the base, said front face of the tip slopes from said cutting edge to said side wall of the notch, the cutting tip extending above the forward edge of the cutter body by at least 0.005 inches at the cutting edge;

an axial bore extending through the cutter body, pilot means disposed within said axial bore and permanently secured to said body, said pilot means being adapted for aligning the tool at the desired hole location; and a shank extending from said cutter body for releasable engagement with the drill.

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**5,049,011**

## ROTARY BORING TOOL WITH INDEXABLE CUTTER CHIPS

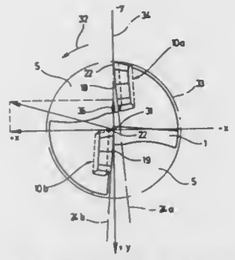
**Siegfried Bohnet, Mössingen, and Werner Gräfe, Reutlingen, both of Fed. Rep. of Germany, assignors to Cubic Defense Systems Inc., San Diego, Calif.**

**Filed May 31, 1989, Ser. No. 359,275**

**Claims priority, application Fed. Rep. of Germany, Dec. 15, 1988, 3842209**

**Int. Cl.[5] B23B *51/00***

**U.S. Cl. 408—223** **19 Claims**



1. Rotary boring tool for boring into a workpiece having a fluted cylindrical body (1) having a central axis (31) of rotation and which, upon rotation of the tool, defines a circle,

said body having an end face (8);

at least two polygonal cutter elements (10*a*, 10*b*) fitted into said body adjacent the end face (8);

one (10*a*) of said cutter elements being located on said body at the radially outer position, and

a second one (10*b*) of said cutter elements being located on said body at a radially inner position;

each cutter element having at least one cutting edge, which cutting edge includes

at least one main cutting edge portion (19) extending along a side of the polygonal element and corner cutting edge portions (22) adjacent the ends of the main cutting edge portion,

said outer cutter element (10*a*) being positioned on the body (1) with a radially outer corner cutting edge portion (22) projecting beyond the circumference of the boring tool, said outer corner cutting edge portion defining a theoretical circle (33) upon rotation of the tool about said axis (31) of rotation,

wherein said boring tool comprises

an arrangement to provide, in operation of the tool, a radially directed force against said tool body by reaction between the cutter elements and the workpiece,

said arrangement being characterized in that

the corner cutting edge portions (22) of the cutting edges of each cutter element (10*a*, 10*b*) are formed as relieved or chamfered chopped corner cutting edges (22);

the outer cutter element (10*a*) is positioned on the body (1) with its main cutting edge portion (19) oriented along a chord with respect to said theoretical circle (33), and wherein said chord is in a plane which does not pass through said axis (31) of rotation or the center of said theoretical circle (33);

the inner cutter element (10*b*) is positioned on the body with its main cutting edge portion (19) located radially inwardly of the theoretical circle (33);

both said cutter elements (10*a*, 10*b*) are positioned on the body (1) with the radially outer corner cutting edge portion (22) of the radially outer cutter element (10*a*) and the radially inner corner cutting edge portion (22) of the radially inner cutter element (10*b*) located, at least in part, on a diametrical plane (34) passing through the axis of rotation (31) of the body (1); and

wherein the inner cutter element (10*b*) is further positioned on the body (1) with its inner corner cutting edge portion (22) located in the immediate vicinity of, or at the axis of rotation (31) of the body (1),

whereby, in operation of the tool and upon contact of the cutter elements with the workpiece, when boring a bore hole (40) therein, a radially outwardly, with respect to the axis of rotation (31), directed force component is generated in the tool body.

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**5,049,012**

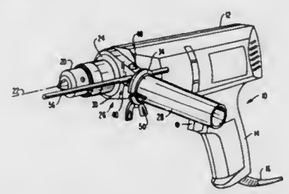
## AUXILIARY HANDLE FOR HAND-HELD DRILL

**Robert P. Cavedo, Easley, S.C., assignor to Ryobi Motor Products Corp., Pickens, S.C.**

**Filed Mar. 11, 1991, Ser. No. 667,346**

**Int. Cl.[5] B23B *45/00***

**U.S. Cl. 408—241 R** **6 Claims**



1. An auxiliary handle for a drill, said drill having a cylindrical shoulder portion at its forward end, the handle comprising:

a unitary member having an elongated handle portion and a collar portion adjacent thereto, said handle portion having a major axis and being generally cylindrical about said major axis, said collar portion being generally planar parallel to said major axis and having a generally circular opening having an axis transverse to said major axis, said circular opening being sized to accommodate therein the shoulder portion of the drill, said unitary member being formed with an open slot extending generally along said major axis from said circular opening into said handle portion, said open slot providing a separation in said collar portion; and

clamp means extending across said slot for selectively narrowing said slot to reduce the circumference of said circular opening so as to clamp said auxiliary handle on the drill shoulder portion accommodated therein.

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**5,049,013**

## MIXER APPARATUS

**David J. Engles, Springwater; Daniel J. Bentley, Rochester; Gary A. Quinter, Penfield, and Ronald N. Salzman, Rochester, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.**

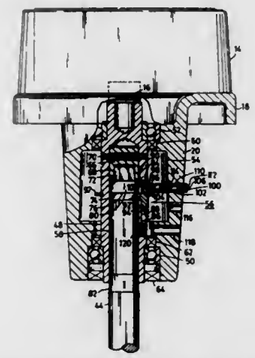
**Filed Nov. 19, 1990, Ser. No. 615,765**

**Int. Cl.[5] B23C *1/06***

**U.S. Cl. 409—231** **30 Claims**

1. A chuck mechanism for assembling a mixer impeller shaft with a mixer drive which comprises a housing, a quill having an opening for receiving said shaft rotatably mounted in said housing and connected in driving relationship with said mixer drive, a latch engagable with said mixer shaft when received in said quill opening for retaining said shaft in said quill opening, said latch being pivotally mounted on said quill and presenting an indicator surface facing outside of said quill shaft, manually actuable assembly means in said quill disposed in fixed spatial





relationship with said indicator surface, and indicator means mounted in said housing and responsive to said indicator surface for indicating when said quill and said shaft engaged with said latch are disposed in predetermined spatial relationship with said housing for enabling said assembly means to be actuated for assembling said shaft and said quill for conjoint rotation when said quill is driven by said mixer drive.

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**5,049,014**

## FASTENER ASSEMBLY

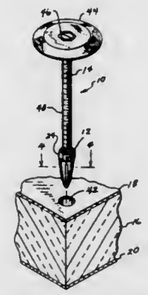
**Stuart H. Lemke, 349 River Bluff, Mosinee, Wis. 54455**

**Continuation of Ser. No. 236,666, Aug. 25, 1988, Pat. No. 4,834,600. This application Apr. 13, 1989, Ser. No. 337,251**

**The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.**

**Int. Cl.[5] F16B *13/06***

**U.S. Cl. 411—55** **9 Claims**



1. A fastener assembly for securing roofing material to a roof deck, comprising:

a fastener having a elongated shank, a plate member at an end of said shank, means on said plate member for engaging a rotary tool used to install said fastener, and a tip portion having a smaller diameter than said shank at the end of said shank remote from said plate member;

a nut mountable on said shank by means of a hole in said nut, said nut having expandable legs for securing said fastener assembly in a hole through said roof deck and a circular passageway inwardly of said legs coaxial with said hole in said nut, said passageway having an inner portion adjacent said hole and an outer portion remote from said hole, wherein said outer portion has a smaller diameter than said inner portion and said inner portion has a smaller diameter than said shank;

means on said fastener and including said circular passageway in said nut for expanding said legs in response to downward movement of said fastener into said hole in said roof deck so that said legs become positioned to hinder withdrawal of said nut from said hole; and

means on said fastener and said nut for hindering rotation of said nut in said hole during said downward movement of said fastener.

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**5,049,015**

## ANCHORING STRUCTURE

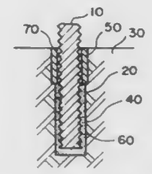
**Minoru Sawaide, and Noboru Hiraoka, both of Tokyo, Japan, assignors to Shimizu Construction Co., Ltd., Tokyo, Japan**

**Filed Jun. 27, 1989, Ser. No. 371,773**

**Claims priority, application Japan, Jun. 29, 1988, 63-159266**

**Int. Cl.[5] F16B *39/02***

**U.S. Cl. 411—82** **11 Claims**



1. An anchoring structure comprising:

a concrete support material having an anchor hole formed in a surface thereof; an anchor rod having a lower end which is disposed in the anchor hole and an upper end which extends above the surface of said concrete support material; and

a cementing material which is filled into the anchor hole and which secures said anchor rod to the inside surface of the anchor hole.

wherein a section of said anchor rod within said anchor hole is not connected to the inside surface of the hole through said cementing material, the section extending below the surface of said concrete support material for a depth equal to at least 1.5 times the diameter of the anchor hole.

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**5,049,016**

## SWAGE FASTENERS WITH A HIGH STAND-OFF COLLAR

**Keith D. Nordyke, Irvine, Calif., assignor to Huck Manufacturing Company, Irvine, Calif.**

**Division of Ser. No. 362,738, Jun. 7, 1989, Pat. No. 4,921,384. This application Apr. 30, 1990, Ser. No. 516,577**

**The portion of the term of this patent subsequent to May 21, 2008, has been disclaimed.**

**Int. Cl.[5] F16B *19/08***

**U.S. Cl. 411—361** **16 Claims**

1. In a fastening system including a fastener for securing workpieces together with said fastener adapted to be installed via a relative axial force applied by an installation tool, said fastener comprising:

a pin having an elongated shank terminating at one end in an enlarged pin head,

a lock groove portion on said shank including a plurality of helically extending lock grooves defining a thread form,

a tubular collar adapted to be located on said pin shank and to be swaged into said lock grooves in response to a first preselected magnitude of said relative axial force applicable by the installation tool,

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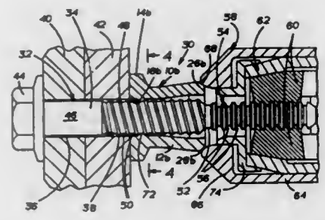


said collar having a through bore of a diameter to generally receive said lock grooves in clearance relationship,

said collar having a female thread formed on said through bore and adapted to threadably engage said thread form defined by said lock grooves whereby said collar can be torqued onto said lock groove portion,

said collar thread having a preselected strength selected to deform or shear relative to said lock grooves in response to a second preselected magnitude of said relative axial force applied between said pin and said collar by the installation tool with said second preselected magnitude being less than said first preselected magnitude,

resistance means associated with said collar and said pin for permitting the workpieces to be initially clamped together under a preselected pre-load and thereafter being responsive to said relative axial force to permit relative axial movement between said collar and said pin of a sufficient axial distance such that said collar thread will deform or shear relative to said lock grooves with the movement of said axial distance and deforming or shearing of said collar



thread occurring at a determinable magnitude of said relative axial force, said first preselected magnitude being greater than the combination of said determinable magnitude and said preselected pre-load whereby the final axial clamp up load of the workpieces is substantially uninhibited by the initial threaded engagement of said collar thread and said lock grooves,

said through bore having a reduced diameter bore portion with said female thread formed therein whereby said collar is generally threadably piloted upon said pin shank,

said collar having a collar shank portion being generally frusto conically shaped from said reduced diameter bore portion to an enlarged bore portion at an outer end of said collar,

said collar shank portion having a generally uniform wall thickness from said outer end for a distance over its swageable length whereby the frusto conical shape of said collar shank portion provides a high hold-off to resist initiation of swage of said outer end of said collar into said locking grooves of said pin shank.

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**5,049,017**

**LAMINATED NUT WITH ANTI-SPIN OFF STRUCTURE AND METHOD OF MAKING NUT**

**Richard L. Reynolds, Grosse Pointe Shores, Mich., assignor to Pac Fasteners, Southfield, Mich.**

**Filed May 21, 1990, Ser. No. 526,054**

**Int. Cl.[5] F16B** *37/08*

**U.S. Cl. 411—432** **24 Claims**

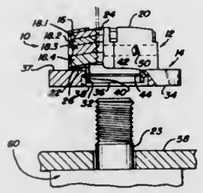
1. A laminated nut structure for use with an associated threaded bolt portion for clamping workpieces together under a preselected clamp load comprising:

a plurality of conical spring disc washers,

a cage receiving and holding said disc washers in a stacked, aligned relationship to define a central opening threaded to define a threaded bore, said cage including a ring portion and a plurality of axially extending fingers cooperating with said ring portion to hold said disc washers in said stacked, aligned relationship,

selected ones of said disc washers being of a first preselected hardness, at least one of said disc washers being of a hardness substantially less than that of said selected ones of said disc washers, said one of said disc washers having that portion of said threaded bore defined by said one of said disc washers deformed to provide a preselected initial interference to threaded engagement with the threads of the associated bolt portion to provide an initial prevailing torque characteristic of a first magnitude resisting backing off from such bolt portion prior to clamping the workpieces together,

said nut structure adapted to secure a plurality of workpieces



together under the preselected clamp load in response to the application of a first magnitude of torque,

said plurality of disc washers at least partially collapsing in response to said first magnitude of torque to provide a determinable locking force between said nut structure and the associated bolt portion,

said one of said disc washers deforming permanently in response to said first magnitude of torque to provide a final prevailing torque characteristic of a second magnitude resisting backing off in the event of loosening of said nut structure and release of said locking force after such clamping of the workpieces.

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**5,049,018**

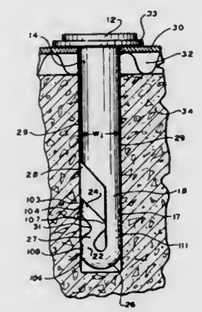
**FASTENER FOR GRIPPING A SUBSTRATE MATERIAL**

**Colin Murphy, Dover, N.J., assignor to Engineered Construction Components, Panama City, Panama**

**Continuation of Ser. No. 396,443, Aug. 21, 1989, abandoned. This application Aug. 10, 1990, Ser. No. 566,301**

**Int. Cl.[5] F16B** *15/00*

**U.S. Cl. 411—447** **4 Claims**



1. A one-piece fastener comprising:

a head portion;

a shaft portion; and

a hook portion, said hook portion including a resilient end portion having an end surface for providing gripping contact with a wall of a hole in a substrate, said end portion extending upwardly toward said head portion and angularly outwardly from the shaft portion, said end portion being resilient for flexing by a wall of a hole to effect said gripping contact; and an inner curved surface and an outer curved surface, wherein upon insertion of said fastener into a hole, said end portion bends back toward said shaft portion and a portion of said inner curved surface is forced back against and into abutment with said shaft portion.



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**5,049,019**

**METHODS OF MAKING CONTAINERS**

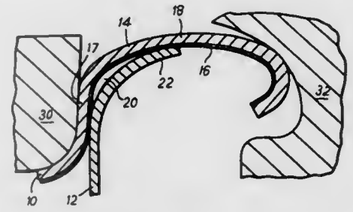
**Josef T. Franek, Chorleywood; Paul Porucznik, Kennington; Peter H. Serby, Newbury, and Christopher J. N. Tod, Steyning, all of United Kingdom, assignors to CMB Foodcan plc, England**

**Continuation of Ser. No. 899,093, Aug. 22, 1986, abandoned, which is a continuation of Ser. No. 551,205, Nov. 14, 1983, Pat. No. 4,626,157, which is a continuation-in-part of Ser. No. 293,634, Aug. 10, 1981, Pat. No. 4,423,823. This application Sep. 15, 1988, Ser. No. 244,621**

**Claims priority, application United Kingdom, Dec. 8, 1979, 7942425**

**Int. Cl.[5] B21D** *51/26, 51/46*

**U.S. Cl. 413—19** **48 Claims**



1. A method of making a container comprising the steps of:

(a) laminating a metal substrate layer and an impermeable polymeric material layer together by bonding the impermeable polymeric layer over the whole of at least one side of the metal substrate layer thereby forming a laminated container component,

(b) providing another container component,

(c) forming the another container component of step (b) into a generally tubular container body component having an opening set-off by a peripheral edge portion,

(d) forming the laminated container component of step (a) into a container closure component having a peripheral edge portion,

(e) assembling the container body component and the container closure component with the impermeable polymeric material layer in sandwiched relationship between the peripheral edge portions and in the complete absence of adding any additional sealing material between the peripheral edge portions other than the impermeable polymeric material layer of step (a), and

(f) mechanically deforming the peripheral edge portions into a mechanical joint with sufficient force to compress the impermeable polymeric material layer and form an air/-gas-tight seal between the peripheral edge portions of the mechanical joint in the absence of any bonding of the impermeable polymeric material layer within the mechanically deformed mechanical joint.

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**5,049,020**

**DEVICE FOR POSITIONING AND STABBING CASING FROM A REMOTE SELECTIVELY VARIABLE LOCATION**

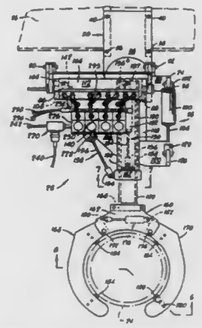
**James R. McArthur, Tishomingo, Okla., assignor to John Harrel and Charlena Harrel, both of Lindsay, Okla., a part interest**

**Continuation of Ser. No. 203,252, Jun. 2, 1988, Pat. No. 4,921,386, which is a continuation-in-part of Ser. No. 22,076, Mar. 5, 1987, abandoned, which is a continuation of Ser. No. 574,129, Jan. 26, 1984, Pat. No. 4,652,195. This application May 1, 1990, Ser. No. 517,567**

**The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.**

**Int. Cl.[5] B65G** *47/08*

**U.S. Cl. 414—22.51** **8 Claims**



1. A casing stabbing apparatus which comprises:

a derrick bracket subassembly adapted for attachment to a structural member of a well derrick;

a boom and jaw subassembly detachably connected to said derrick bracket subassembly and comprising:

an elongated, variable length boom having a first end pivotally connected to said derrick bracket subassembly, and having a second end;

a pair of casing-engaging jaws pivotally mounted on the second end of said boom opposite its first end;

means for selectively changing the length of said boom;

a yawing piston and cylinder subassembly extending at an acute angle to the longitudinal axis of the boom and connected to a medial portion of the boom for pivoting the boom from side-to-side;

radially adjustable roller means including a plurality of rollers carried on said jaws for selectively adjusting a diametric dimension defined by a circle drawn in contact with said rollers and inside said jaws to thereby facilitate stabbing casing sections of varying diametric sizes; and

a piston and cylinder subassembly connected between said jaws for pivoting said jaws in a converging, or a diverging movement so as to bring the rollers carried on said jaws into engagement with a casing section;

a remote control assembly detachably connected to said boom and jaw subassembly, said remote control assembly including a plurality of electrically controlled hydraulic valves for selectively supplying hydraulic power fluid to said piston and cylinder subassemblies;

a portable hand control device remote from said hydraulic valves of the remote control assembly and having a plurality of switches thereon;

a control cable connected between the portable hand control device and the remote control assembly for transmitting control signals from the portable hand control device to the remote control assembly;

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means for supplying electrical power to the remote control assembly;

means for supplying hydraulic power fluid to said electrically controlled hydraulic valves; and

means for returning hydraulic power fluid from said piston and cylinder subassemblies as said electric controlled hydraulic valves are shifted.

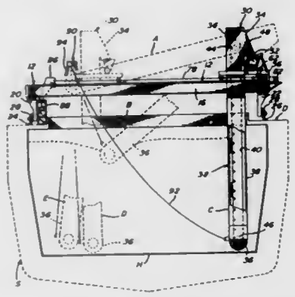
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**5,049,021**

**SELF-UNLOADING METHOD AND APPARATUS FOR SHIPS**

**Charles D. Pole, Willowdale, and Daniel B. Baker, Etobicoke, both of Canada, assignors to ULS Corporation, Toronto, Canada**

**Filed Apr. 27, 1989, Ser. No. 343,613**
**Claims priority, application Canada, Apr. 27, 1988, 565,293**
**Int. Cl.[5] B63B *27/22***
**U.S. Cl. 414—141.9** **2 Claims**



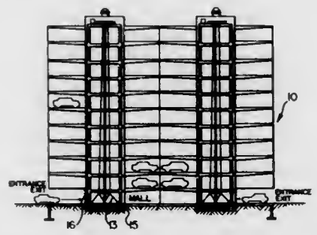
1. An apparatus for unloading particulate material from an elongated hold of a ship having a deck provided with a number of athwartship elongated hatches leading to the hold spaced apart in the fore and aft direction, the apparatus comprising mounting means above the deck for movement in the athwartship direction and in the fore and aft direction, an unloading leg in the form of an elongated housing mounting a continuous conveyor means having a discharge end and a distal end, the discharge end including a discharge chute communicating with the elongated housing, and frame means incorporated in the housing and the chute and supporting the conveyor means, the discharge chute defining a discharge opening, the frame means being pivotally mounted about a horizontal pivot axis on said mounting means such that the unloading leg can pivot in a vertical athwartship plane from a rest position above the deck to a vertical position with the distal end near the bottom of the hold, means for raising and lowering the distal end of the unloading leg into the hold by pivoting the unloading leg about said horizontal pivot axis, said horizontal pivot axis being coincident with the discharge opening in the chute such that when the frame means is pivoted about the horizontal pivot axis, the discharge opening will remain concentric to the horizontal pivot axis and a trough immediately under the discharge opening, and wherein the mounting means includes a bridge extending athwartship across the deck of the ship, track means above the deck for supporting the bridge for fore and aft movement along the deck above the hatches, carriage means on the bridge, track means extending athwartship of the bridge for supporting the carriage means for athwartship movement, an athwartship conveyor means standing along the bridge for receiving the material from the discharge opening of the chute, and wherein the trough means includes a screw conveyor for moving the material being discharged into the trough onto the athwartship conveyor and means are provided at the discharge end of the athwartship conveyor for conveying the material being discharged therefrom.

**5,049,022**

**PARKING STRUCTURE**

**Jack S. Wilson, 6758 - 203 Street, R.R. 4, Langley, British Columbia, Canada V3A 4P7**

**Filed Feb. 3, 1989, Ser. No. 305,855**
**Claims priority, application Canada, Feb. 3, 1988, 558013**
**Int. Cl.[5] E04H *6/00***
**U.S. Cl. 414—253** **4 Claims**



1. A hydraulically powered skip hoist system comprising at least two skips, a hydraulic motor for each of said skips, a connection extending between each of said skip and said respective hydraulic motor and a common hydraulic pump connected to said hydraulic motors for driving the motors, wherein each of said skips is vertically movable within a skip hoist shaft, and further comprising a plurality of storage slot modules surrounding said skip hoist shafts, each storage slot module being provided with article support means for supporting an article in the storage slot module and at least one bi-directional shuttle for each skip, said bi-directional shuttle being movable relative to said skip for positioning articles on and removing articles from said storage slot modules, wherein said bi-directional shuttle comprises a base, a middle slide mounted on said base and being movable relative thereto, an upper slide mounted on said middle slide and movable relative thereto, drive means mounted to said base and being operable to move said middle slide relative to said base and said upper slide relative to said base and said middle slide, wherein said article support means and said upper slide of the shuttle are each provided with a plurality of finger which mesh with each other for positioning articles on and removing articles from said article support means and wherein the article support means comprises a pair of article support members located in parallel spaced relationship with respect to each other and wherein said top slide of the shuttle is movable between said pair of article support members during said meshing of the fingers.

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**5,049,023**

**MECHANIZED MULTITIER STORAGE APPARATUS**

**Jury V. Knyazkin, ulitsa Palikha, 7/9, korpus 3,kv.14, and Anatoly F. Smyk, Kashirskoe shosse, 92, korpus 3, kv.413, both of Moscow, U.S.S.R.**

**PCT No. PCT/SU89/00178, § 371 Date Feb. 27, 1990, § 102(e) Date Feb. 27, 1990, PCT Pub. No. WO90/00145, PCT Pub. Date Jan. 11, 1990**
**PCT Filed Jun. 27, 1989, Ser. No. 459,737**
**Claims priority, application U.S.S.R., Jun. 28, 1988, 4446403**
**Int. Cl.[5] B65G *1/04***
**U.S. Cl. 414—280** **2 Claims**

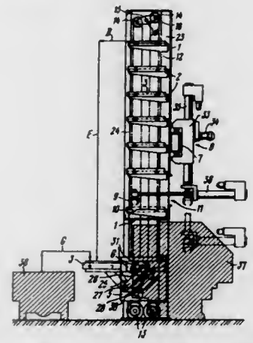
1. A mechanized multitier storage apparatus, comprising:

a housing with main load-carrying brackets installed vertically in pairs,

removable shelves installed on the main load-carrying brackets,

at least two carriages connected with a drive for producing vertical movement thereof, said carriages being arranged, one per lateral side of the removable shelves, along a width of said removable shelves, each carriage being provided with a pull-out shelf-engaging means for interaction with said removable shelves and for ensuring horizontal movement of said removable shelves outside the housing,

an industrial robot having a gripper, movably installed on a horizontal guide mounted on the housing on a side opposite to a direction of pulling out of the pull-out shelf-engaging means, and



a pair of additional brackets free from the removable shelves and arranged in line with the main load-carrying brackets, the housing, from said side opposite to the direction of pulling out of the pull-out shelf-engaging means, being provided with an opening to receive the gripper of the industrial robot and position it above one of the removable shelves installed on said pair of additional brackets.

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**5,049,024**

**REFUSE COLLECTION AND DELIVERY SYSTEM**

**Chung M. Chien, No. 69, Kuo Jung Rd., I-Lan, Taiwan**

**Filed Mar. 21, 1990, Ser. No. 496,641**
**Int. Cl.[5] B65F *3/02***
**U.S. Cl. 414—404** **5 Claims**

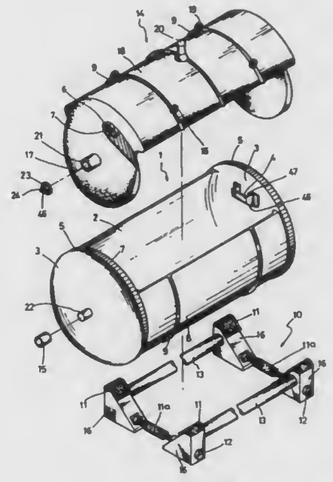
1. A refuse collection and delivery system, including a garbage can, a stand for the garbage can, and a garbage truck:

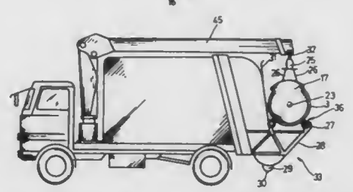
said garbage can comprising a horizontal cylindrical wall defining the can central axis, and two circular end walls extending normal to said central axis at opposite ends of said cylindrical wall; said cylindrical wall having an upwardly facing opening extending therealong for placement of garbage into the can; said circular end walls having peripheral edges formed with drive teeth extending therealong to facilitate overturnment of the garbage can for emptying purposes; a stub axle extending from each end wall on the can central axis;

a slidable cover for said garbage can, comprising an arcuate segmental main wall coextensive in length with the garbage can, and two end walls extending normal to said arcuate wall alongside a respective one of the can end walls; each cover end wall having a sleeve telescoped onto one of said stub axles whereby the cover can be rotated around the can central axis to alternately expose or cover the can opening; the thickness of each cover end wall being relatively small at its connection point to the cover main wall and being relatively great at a point diammetrically spaced from said connection point so that the center of gravity of the cover is lowered to cause the cover to be gravitationally biased to a position overlying the can opening; a plurality of lifting eyes extending from the cover main wall at axially spaced points therealong;

said stand comprising faces upright blocks spaced apart in a rectangular pattern, and connector means extending between said blocks to form a rigid unitary cradle structure for supporting the garbage can in a horizontal attitude; and a resilient cushion carried on each block for engagement with the undersurface of the can;

said garbage truck comprising a block and tackle means having a hook structure engageable with said lifting eyes, whereby the cover and garbage can are liftable as a unit from the stand; an upwardly open bin structure (33); a lid (31) normally closing said bin structure; power means (34) for moving the lid structure to an open position; and two





pairs of horizontal axis drive wheels (27) located at the mouth of the bin structure to mate with the drive teeth on the garbage can when the block and tackle means is operated to lower the garbage can toward the bin structure; said drive wheels being rotatable to overturn the garbage can while the cover remains in a stationary position above the bin structure, whereby garbage is discharged from the overturned can into the bin structure.

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**5,049,025**

**AUTOMOBILE DOLLY**

**Andrew B. Roman, P.O. Box 475, Story, Wyo. 82842**

**Filed Sep. 6, 1990, Ser. No. 578,334**
**Int. Cl.[5] B60P *3/00***
**U.S. Cl. 414—429** **9 Claims**

1. A dolly for an automobile comprising a first part and a second part,

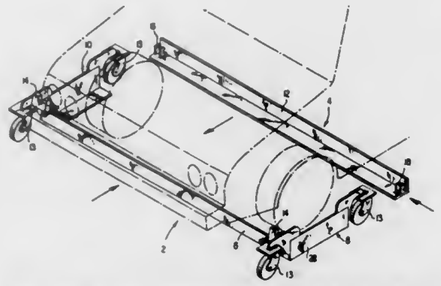
said first part comprising first and second opposed end pieces, a first side element for engaging a first side of a tire of an automobile and extending between said first and second end pieces, and wheel means for allowing said dolly and said automobile to be moved, and

said second part comprising a second side element separate from said first part and adapted to be removably attached to said first part opposite said first side element for engag-

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ing a second side of said tire and being supported entirely by said first part,



said dolly further comprising means for attaching said first side element to said second side element and for urging said first and second side elements toward each other.

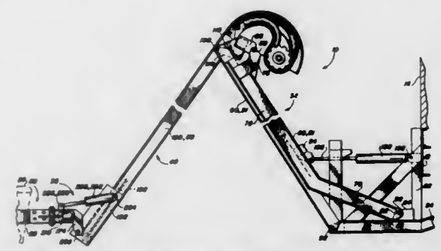
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5,049,026

## REFUSE COLLECTION AND LOADING SYSTEM

John Bingman, Mesa, and Armand G. Mezey, Phoenix, both of Ariz., assignors to Sunbelt Automated Systems, Inc., Phoenix, Ariz.

Filed Feb. 16, 1990, Ser. No. 480,815
Int. Cl.[5] B65F *3/04*
U.S. Cl. 414—408 10 Claims



1. An improved loader for a refuse vehicle for lifting a refuse container from a surface and emptying the contents thereof into a vehicle refuse compartment having an access area, said improved loader comprising:

(a) a boom having an upper and lower end, said boom being pivotally secured at one exterior side of the vehicle;

(b) means for pivotally moving said boom between a first position generally adjacent said vehicle and a second position with the upper end of said boom extended from said vehicle;

(c) lift means having an upper and lower end, said lift means being pivotally connected to said boom at the upper end thereof whereby the lower end of said lift means moves rectilinearly horizontally away from said vehicle a rate greater than a rate of movement of said lift upper end as said boom is pivoted to said second position and whereby said lower end of said lift means retracts rectilinearly horizontally toward said vehicle as said boom is moved from said first position to said second position;

(d) carriage means reciprocal along said lift means between the lower end and upper end thereof, said carriage means having a dump position into said access area when said carriage means is at the upper end of said lift means; and

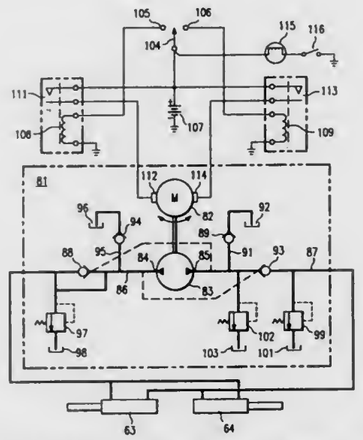
(e) gripping means carried by said carriage means for selectively gripping and releasing said refuse container at said second position.

5,049,027

## HYDRO-ELECTRIC TOOL LOCK

Jack E. Morrison, Waukegan, and John J. Kurowski, Mundelein, both of Ill., assignors to Komatsu Dresser Company, Libertyville, Ill.

Filed Feb. 21, 1990, Ser. No. 483,138
Int. Cl.[5] E02F *3/34*
U.S. Cl. 414—723 20 Claims



1. In an apparatus comprising a vehicle having a chassis, a first support arm having first and second ends, said first end of said first support arm being supported by said chassis, a tool adaptor, said tool adaptor being supported on the second end of said first support arm, a first double acting hydraulic control cylinder mounted on said tool adaptor, said first hydraulic control cylinder having a first double acting piston positioned therein and a first piston arm connected to the first piston and having a free end extending outside said first hydraulic control cylinder, said tool adaptor having a first flange mounted thereon and adapted to mate with a first surface of a tool such that an opening extending through said first flange would be in alignment with a first opening in said first surface of the tool, a first locking pin connected to the free arm of said first piston arm, said first locking pin being movable by said first piston between a first position wherein said first locking pin extends through said opening in said first flange into said first opening of a tool having its first surface mated with said first flange to thereby lock the tool in place on the tool adaptor, and a second position wherein said first locking pin is retracted from the first opening of a tool having its first surface mated with said first flange to thereby permit said tool to be removed from said tool adaptor, the improvement comprising a hydro-electric unit mounted on one of said tool adaptor and said first support arm and having first and second hydraulic ports, a first hydraulic conduit providing fluid communication between said first hydraulic port and one side of said first double acting piston in said first hydraulic cylinder, a second hydraulic conduit providing fluid communication between said second hydraulic port and the other side of said first double acting piston in said first hydraulic cylinder, said hydro-electric unit having a hydraulic pump and a bi-directional electric motor which drives said hydraulic pump to pass hydraulic fluid through one of said first and second hydraulic conduits to said first hydraulic cylinder to move said first locking pin from said first position to said second position and to pass hydraulic fluid through the other of said first and second hydraulic conduits to said first hydraulic cylinder to move said first locking pin from its second position to its first position.

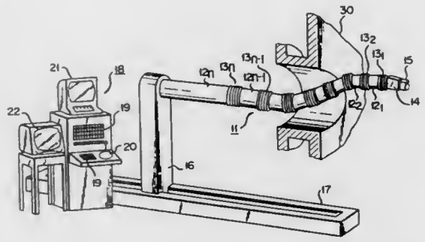


5,049,028

## CONTROL SYSTEM OF MULTI-JOINT ARM ROBOT APPARATUS

Kuniji Asano, Tokyo; Yoshiaki Arimura, Yokohama; Masao Obama, Yokosuka; Yutaka Hitomi, and Mitsunori Kondoh, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 32,282, Mar. 31, 1987, abandoned, which is a division of Ser. No. 545,275, Oct. 25, 1983, abandoned. This application Jul. 19, 1989, Ser. No. 382,030
Claims priority, application Japan, Oct. 29, 1982, 57-189071; Oct. 29, 1982, 57-189072; Oct. 29, 1982, 57-189077; Oct. 29, 1982, 57-189083
Int. Cl.[5] B25J *9/06*
U.S. Cl. 414—730 1 Claim



1. In a control system for multi-joint arm robot apparatus including a multi-joint arm having a plurality of unit arms coupled in tandem with each other through joints, said multi-joint arm having first motor means for controlling the joint angle of each of said joints, and first detecting means for detecting the joint angle of each of said joints in accordance with the rotation angle of said first motor means, and said multi-joint arm having contact sensor means for detecting which unit arm is in contact with an obstacle to generate a contact signal; and a movable support for supporting a proximal portion of said multi-joint arm, said movable support having second motor means for moving said movable support so as to move said multi-joint arm, and second detecting means for detecting the rotation angle of said second motor means;

said control system comprises:

data processing means responsive to the contact signal to cause a motor driving means to rotate the rearward joint of a contacting unit arm of said multi-joint arm until the contact signal disappears, and then rotate the forward joint of said contacting unit am in a direction opposite to the rotating direction of said rearward joint through approximately the same amount and responsive to coordinate data of a plurality of points on a path of said multi-joint arm which is determined in advance, for calculating a path equation indicating the path, and a joint angle for each of said joints such that said joints are put into the path when said movable support is moved a unit distance, and for storing calculated path and joint angle data; and

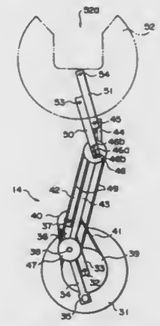
said motor driving means responsive to output data from said data processing means for driving said second motor means to move said movable support by the unit distance and said first motor means of said multi-joint arm in such a way that said joints are set to the joint angles calculated by said data processing means.

5,049,029

## HANDLING APPARATUS FOR TRANSFERRING A SEMICONDUCTOR WAFER OR LCD

Tadashi Mitsui, Yamanashi, and Susumu Saito, Kofu, both of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Continuation of Ser. No. 242,131, Sep. 9, 1988, abandoned. This application Apr. 9, 1990, Ser. No. 506,537
Claims priority, application Japan, Sep. 10, 1987, 62-226896
Int. Cl.[5] B25J *11/00*
U.S. Cl. 414—744.5 10 Claims



1. A handling apparatus arranged in a clean atmosphere, comprising:

a base member having a rotating shaft;

a multijoint arm including one end portion thereof connected to said rotating shaft;

holding means including a holding member mounted at a free end portion of said multijoint arm, for holding a plate-like object to be transported;

rotating means for rotating said holding means; and

bending means for bending said multijoint arm at the joints, to thereby extend or retract said multijoint arm;

wherein said multijoint arm comprises at least three parallel link mechanisms which define first, second and third stages, each one of said at least three parallel link mechanisms comprising a plurality of links, the first-stage of said parallel link mechanisms being fixed to the base member, and, when the multijoint arm is retracted, said parallel link mechanisms are stored between the base member and the holding member such that the maximum length of the holding member is substantially equal to the maximum length of the parallel link mechanisms, wherein planes defined by said parallel link mechanisms are parallel to one another,

wherein at least one pulley is mounted on each joint of said multijoint arm, at least one of said pulleys receiving a driving force from a wire.

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5,049,030

## MATERIALS HANDLING EQUIPMENT

Timothy L. Lockert, 3125 Cedarbrook Ln., Trussville, Ala. 35173

Filed Jun. 30, 1989, Ser. No. 374,543
Int. Cl.[5] B65H *29/36, 3/08*
U.S. Cl. 414—788.7 20 Claims

1. Apparatus for processing semi-rigid sheet-like members of various sizes, thicknesses, and flexibilities wherein said sheet-like members are initially stacked one atop another comprising:

(a) means for separating a top sheet-like member from a stack of sheet-like members supported on a vertically indexing loading table including a first and second set of vacuum gripping members selectively positioned in spaced horizontal relation and mounted for concomitant reciprocal horizontal movement and independent asynchronous vertical movement, and including transport

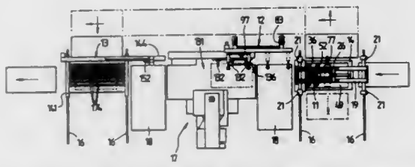
VOL 1130 ISS 3 SE 17 1991 UMI



means for urging said separated sheet-like member in a first horizontal direction coincident with the reciprocal horizontal movement of said vacuum-gripping members;

(b) means for positioning said sheet-like member on a workplace with said workplace having means for gripping said sheet-like member along one side thereof, said positioning means cooperatively positioned to receive said sheet-like member from said transport means and including means for aligning said sheet-like member in a predetermined orientation; and

(c) means for stacking sheet-like members received from said workplace including means for urging said sheetlike member from said workplace to an aligned position above a stacking table including means for grasping said sheet-like



member along said one side thereof; wherein said means for stacking said sheet-like material includes .

a frame disposed about said stacking table having an open top disposed horizontally at substantially the height of said work table; and

a plurality of elongated roller members extending parallel to said first horizontal direction, and selectively movable laterally to an extended position extending over said open top and to a retracted position laterally of said open top, subjacent said means for grasping and said means for grasping being selectively movable parallel to said roller members to a sheet-like member receiving position and a sheet-like member releasing position distal said work table.

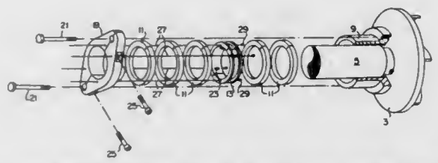
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**5,049,031**

**QUICK REMOVAL APPARTAUS AND METHOD FOR LANTERN RINGS AND PACKING IN PUMP ASSEMBLIES**

**William Mintenko, and Frank Protz, both of Prince George, Canada, assignors to Zee Impeller Breaker Inc., British Columbia, Canada**

**Filed May 8, 1990, Ser. No. 520,470**
**Claims priority, application Canada, May 19, 1989, 600169**
**Int. Cl.[5] F01D** *11/00*
**U.S. Cl. 415—112** **6 Claims**



1. In a pump assembly having an impeller-driving shaft, a lantern ring and a gland mounted coaxially at spaced locations on said shaft and packing means provided between said lantern ring and said gland, the improvement comprising providing said gland and said lantern ring with a plurality of holes aligned parallel to the axis of said shaft and providing a plurality of flexible cables each having a free end and an end provided with stop means having a sufficient diameter to prevent passage through said holes in said lantern ring, whereby said stop means of each cable abuts against said lantern ring and said free end of each said cable extends through holes in said lantern ring and said gland.

6. A method of removing a lantern ring from a stuffing box of a pump assembly having an impeller-driving shaft, a lantern ring and a gland mounted coaxially at spaced locations on said shaft and packing means provided between said lantern ring and said gland, comprising:

a) providing said gland and said lantern ring with a plurality of holes aligned parallel to the axis of said shaft;

b) providing a plurality of flexible cables each having a free end and an end provided with stop means having a sufficient diameter to prevent passage through said holes in said lantern ring;

c) mounting said lantern ring, packing, cables and gland on said shaft whereby said stop means of each cable abuts against said lantern ring and said free end of each said cable extends through holes in said lantern ring and said gland; and

d) removing said gland and pulling said free ends of said cables to remove said lantern ring.

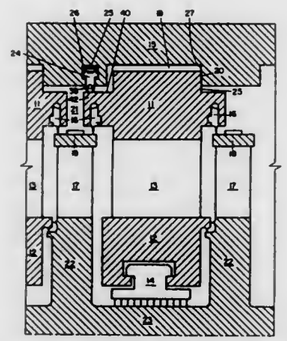
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**5,049,032**

**PARTICULATE SEAL FOR ELASTIC FLUID TURBINES**

**Ronald E. Brandon, 1734 Lenox Rd., Schenectady, N.Y. 12308**

**Filed Apr. 30, 1990, Ser. No. 516,803**
**Int. Cl.[5] F01D** *11/00;* **F16J** *15/00*
**U.S. Cl. 415—170.1** **15 Claims**



1. An elastic fluid turbine having a rotor with attached wheels and buckets adapted to be rotated at high speeds with torque provided by elastic fluid which has been accelerated to a high tangential velocity by passage through a circle of nozzles held in diaphragms enclosed in a shell which supports and locates the diaphragms and helps to contain the elastic fluid and wherein, in operation, high pressure elastic fluid expands and passes through the nozzles and buckets, with the pressure of the elastic fluid dropping as it passes through the nozzles while its tangential velocity is greatly increased, there being open spaces between adjacent diaphragms and an open space between diaphragms and the shell, the improvement which comprises particulate seals interposed between the diaphragms and the shell for precluding the influx of particulate material or contaminants present in the elastic fluid into said open spaces.

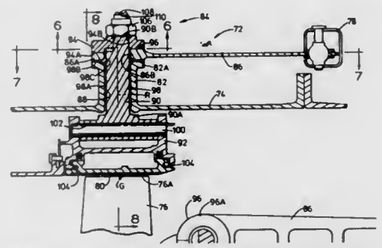


**5,049,033**

**BLADE TIP CLEARANCE CONTROL APPARATUS USING CAM-ACTUATED SHROUD SEGMENT POSITIONING MECHANISM**

**Robert J. Corsmeier, Cincinnati, and Ambrose A. Hauser, Wyoming, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio**

**Filed Feb. 20, 1990, Ser. No. 482,139**
**Int. Cl.[5] F01D** *5/20*
**U.S. Cl. 415—173.2** **21 Claims**



1. In a gas turbine engine including a rotatable rotor having a central axis an a row of blades with outer tips and a stationary casing with a shroud disposed in concentric relation with said rotor, an apparatus for controlling the clearance between said rotor blade tips and casing shroud, said apparatus comprising:

(a) a shroud segment defining a circumferential portion of said casing shroud and being separate from and spaced radially inwardly of said casing;

(b) at least one mounting structure on said stationary casing defining a passage between exterior and interior sides of said casing, said mounting structure being spaced radially outwardly from said shroud segment;

(c) a shroud segment positioning mechanism supported by said stationary casing mounting structure, coupled to said shroud segment, and being actuatable for moving said shroud segment toward and away from said rotor blade tips to reach a position relative thereto at which a desired clearance is established between said shroud segment and rotor blade tips; and

(d) an actuating member being rotatable for actuating said positioning mechanism;

(e) said positioning mechanism including

(i) a support member mounted through said passage defined by said mounting structure for radial movement relative to said mounting structure and toward and away from said rotor axis, said support member having a longitudinal axis and opposite inner and outer ends with said shroud segment being coupled to said inner end of said support member at said interior side of said casing,

(ii) a first cam element attached to said outer end of said support member and located at said exterior side of said casing and spaced outwardly from said mounting structure, and

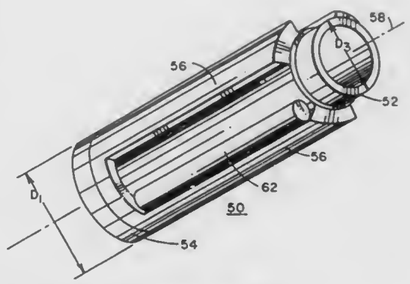
(iii) a second cam element attached to an inner end of said actuating member being mounted to said mounting structure for rotational movement relative thereto and about said longitudinal axis of said support member upon rotation of said actuating member, said second cam element being located at said exterior side of said casing between said mounting structure and said first cam element and engaged with said first cam element such that rotation of said second cam element with rotation of said actuating member produces radial movement of said first cam element and said support member and said shroud segment therewith toward and away from said rotor blade tips.

**5,049,034**

**PROPELLER HUB ASSEMBLY**

**William L. Cahoon, Winter Haven, Fla., assignor to Mach Performance, Inc., Lake Hamilton, Fla.**

**Filed Nov. 9, 1989, Ser. No. 433,747**
**Int. Cl.[5] B63H** *1/20*
**U.S. Cl. 416—134 R** **6 Claims**



1. A propeller hub assembly comprising:

an internal drive member having a cylindrical tube shaped portion having a preselected inner diameter and a preselected outer diameter, the inner diameter defining an inner axial aperture adapted for receiving a drive shaft, the aperture being formed with a plurality of axially oriented alternating grooves and ridges for establishing a non-slip connection to the drive shaft, the drive member further including a plurality of external radial ribs extending axially over at least a portion of the member, said ribs being uniformly spaced about the member and having an outer diameter corresponding to said preselected outer diameter, said member further including a reduced outer diameter extending over a portion thereof adjacent one end of said member;

a plurality of solid cylindrical rods formed of a resilient material, said rods having a length approximating the axial extent of said ribs on said drive member, and said rods having a diameter approximating the radial extent of said ribs from said member; and

an outer driven member comprising an outer cylindrical housing having an outer surface adapted for attachment of a plurality of propeller blades, an inner cylindrical housing coaxial with said outer cylindrical housing, a plurality of radial fins extending between an inner surface of said outer cylindrical housing and an outer surface of said inner cylindrical housing for fixedly coupling said inner cylindrical housing to said outer cylindrical housing with a preselected spacing therebetween, said fins extending a preselected axial distance between said inner and outer housings, said inner cylindrical housing including a plurality of radially inwardly extending ribs oriented parallel to an axis of said inner housing, said inner housing having an inner diameter corresponding to said outer diameter of said internal drive member whereby said internal drive member will slip inside said inner cylindrical housing with said radially inwardly extending ribs meshing with said external radial ribs of said internal drive member, said ribs of each of said inner cylindrical housing and said internal drive member being circumferentially sized to permit insertion of said resilient rods between adjacent sides of said ribs, said rods providing shock absorbency between said drive member and said driven member.

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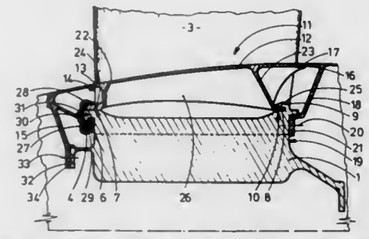


5,049,035

## BLADED DISC FOR A TURBOMACHINE ROTOR

Francois M. P. Marlin, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed Nov. 24, 1989, Ser. No. 441,045
Claims priority, application France, Nov. 23, 1988, 88 15234
Int. Cl.[5] F01D 5/22
U.S. Cl. 416—193 A 6 Claims



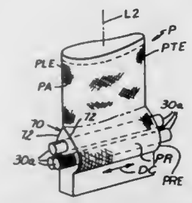
1. In a turbomachine rotor having an axis of rotation, a bladed disc comprising:
a disc having front and rear faces with respect to said axis of rotation, and a rim extending peripherally of said disc between said front and rear faces thereof, said rim having front and rear bearing surfaces adjacent said front and rear faces of said disc,
an array of blades having only a vane portion and a root portion disposed evenly around said rim of said disc and secured thereto at said root portions of said blades,
a plurality of separate platforms disposed on said rim between said blades, each of said platforms comprising
a plate defining an inner wall of the main gas flow path through said rotor, and
an element at each axial end of said plate forming front and rear securing feet which cooperates respectively with said front and rear bearing surfaces on said rim, and
securing means attaching said front and rear feet of each said platform to said disc, said securing means for said front foot comprising
a tooth-like element formed on the corresponding front face of said disc adjacent said rim,
a substantially C-shaped clamp firmly connecting said foot to said tooth-like element, and
a neighboring element of said rotor fixed to said disc, said neighboring element having a flange engaging said clamp in a manner so as to ensure axial locking thereof.

5,049,036

## COMPOSITE BLADE WITH DIVERGENT ROOT AND METHOD FOR MAKING SAME

Carlos Bailey, Farmington, and Raymond G. Spain, Farmington Hills, both of Mich., assignors to Airfoil Textron Inc, Lima, Ohio

Division of Ser. No. 243,074, Sep. 9, 1988. This application Nov. 29, 1989, Ser. No. 443,243
Int. Cl.[5] F01D 5/14
U.S. Cl. 416—230 11 Claims



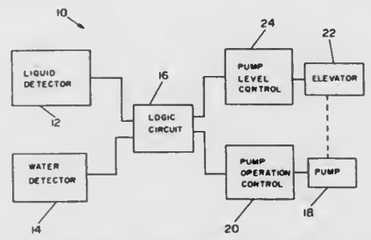
1. A gas turbine engine blade comprising a 3D braided fiber preform infiltrated with a matrix material and shaped to form a 3D braided airfoil and integral 3D braided root, said root having a plurality of fiber inserts extending chordwise of the blade therein to impart an enlarged, divergent shape to the braided root in a direction transverse to said chordwise direction.

5,049,037

## AUTOMATIC WELL PUMP SKIMMER LEVEL CONTROL

Glenn S. Carson, Mechanicsburg, and Kermit W. Bender, Elizabethtown, both of Pa., assignors to R. E. Wright Associates, Inc., Middletown, Pa.

Filed Dec. 26, 1989, Ser. No. 456,308
Int. Cl.[5] F04B 47/06
U.S. Cl. 417—36 5 Claims




1. A well pump skimmer control apparatus comprising:
a liquid pump located within a well with the pump output connected by a pipe to the ground surface above the well and the pump including a pump input through which liquid enters the pump;
a pump elevator means connected to the pump and capable of raising and lowering the pump within the well;
a liquid detector means located within the well and producing a signal when the pump input is immersed in a liquid to at least a predetermined depth;
a water detector means located within the well and producing a signal when the pump input is immersed in water; and
a logic circuit means interconnected with and receiving signals from the liquid detector means and the water detector means, and also interconnected with and providing signals to the pump elevator means and to the pump, the logic circuit means interpreting the signals it receives and controlling the action of the pump elevator means and the operation of the pump so that when the pump input is:
not in water and not below the predetermined depth, the pump is not operated and the pump elevator means lowers the pump;
in water and not below the predetermined depth, the pump is not operated and the pump elevator means is not operated;
not in water and below the predetermined depth, the pump is operated and the pump elevator means is not operated; and
in water and below the predetermined depth, the pump is not operated and the pump elevator means raises the pump.

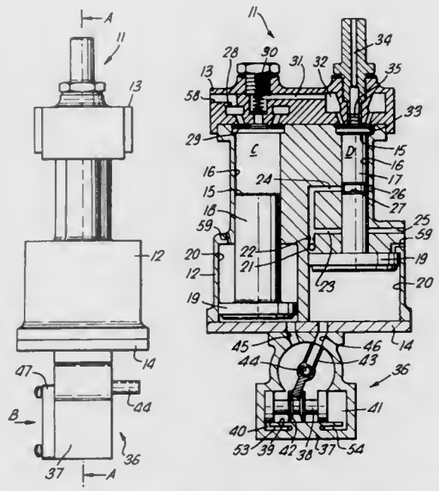


5,049,038

## FLUID COMPRESSORS

Robin H. J. Searle, Somerset, England, assignor to Normalair-Garrett (Holdings) Ltd., Yeovil, England

Filed Oct. 10, 1990, Ser. No. 595,361
Claims priority, application United Kingdom, Oct. 21, 1989, 8923739
Int. Cl.[5] F04B 3/00
U.S. Cl. 417—246 5 Claims



2. A two stage fluid compressor comprising for each stage a compression piston operative in a compression cylinder and connected to a pneumatically operated single-acting drive piston operative in a drive cylinder, pneumatically operative drive means comprising a relay valve having a double-acting piston operating a pivotable jet means for directing a supply of pressurised drive air alternately to said drive cylinders and pneumatically operated control means controlling the drive means.

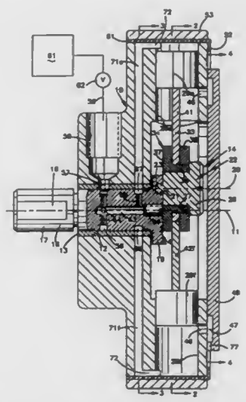
5,049,039

## RADIAL PISTON AND CYLINDER COMPRESSED GAS MOTOR

Donald E. Knoth, Dayton; James W. Bradbury, Middletown, and Mark A. Nagy, Dayton, all of Ohio, assignors to Pneumotor, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 212,971, Jun. 29, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 443,757
Int. Cl.[5] F04B 1/04; F02B 75/22; F01B 1/06
U.S. Cl. 417—273 30 Claims

1. A compressed gas motor comprising a cylinder block having cylinders therein having extremities, pistons reciprocable in said cylinders between top dead center positions adjacent to said extremities and bottom dead center positions spaced from said extremities, valved means connected to each cylinder at said extremities thereof, exhaust ports in each cylinder open only when the pistons therein are adjacent to their bottom dead center positions, said valved means operating to supply compressed gas to said extremities of said cylinders having pistons therein commencing to move toward said bottom dead center positions, said valved means also connecting at least some of said cylinders having pistons therein moving toward their top dead center position to cylinders having open exhaust ports.

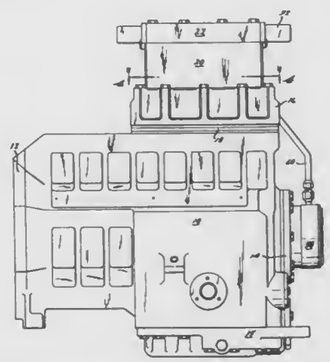


5,049,040

## COMPRESSOR CAPACITY MODULATION

Tariq A. R. Diab, Anna; Jerry L. Miller, Dayton, and Earl B. Muir, Sidney, all of Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Oct. 12, 1989, Ser. No. 420,822
Int. Cl.[5] F04B 49/00
U.S. Cl. 417—274 18 Claims



1. A variable capacity compressor comprising:
a compression chamber;
a compressing member movable in said compression chamber for compressing fluid therein;
a drive mechanism for actuating said compressing member;
a reservoir providing source of liquid lubricant;
pump means for pumping said lubricant under pressure to said drive mechanism for lubricating same;
a reexpansion chamber in fluid communication with said compression chamber;
a movable wall in said reexpansion chamber, one side of said wall defining a reexpansion space in fluid communication

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with said compression chamber, the other side of said wall defining a modulating chamber;

first and second passages for placing said modulating chamber in fluid communication with said reservoir and said pump means, respectively;

a check valve in said first passage for preventing flow therethrough in a direction toward said modulating chamber;

a check valve in said second passage for preventing flow therethrough in a direction away from said modulating chamber;

a control valve in each of said passages for selectively permitting and preventing flow therethrough; and

control means for actuating each of said control valves.

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**5,049,041**

**LUBRICATING OIL SUPPLY DEVICE FOR VAN COMPRESSORS**

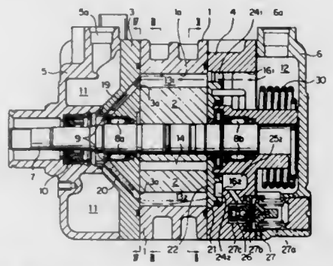
**Nobuyuki Nakajima, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Filed Feb. 7, 1990, Ser. No. 476,693**

**Claims priority, application Japan, Mar. 20, 1989, 1-68588**

**Int. Cl.[5] F04C *29/02*; F04B *49/00***

**U.S. Cl. 417—295** **8 Claims**



1. In a vane compressor having a cylinder, a driving shaft having a portion thereof arranged within said cylinder, a rotor received within said cylinder and secured on said driving shaft, at least one compression space defined between said rotor and said cylinder, a plurality of vanes carried by said rotor, a shaft seal and a bearing fitted on said driving shaft and disposed adjacent to each other, and lubricating oil supply means for supplying compression medium to said shaft seal and said bearing,

the improvement wherein said lubricating oil supply means comprises at least one passage extending between said at least one compression space and said shaft seal and said bearing, said at least one passage having an open end opening into said at least one compression space at a predetermined circumferential location at which pressure within said at least one compression space changes from a negative value into a positive value when each of said vanes passes said predetermined circumferential location.

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**5,049,042**

**ANTI-RETURN SAFETY APPARATUS**

**Luc Mathieu, and Jean-Marc Paquet, both of Annecy, France, assignors to Alcatel Cit, Paris, France**

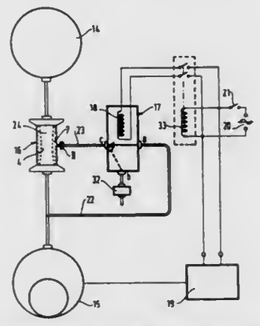
**Filed Aug. 30, 1990, Ser. No. 574,723**

**Claims priority, application France, Sep. 1, 1989, 89 11486**

**Int. Cl.[5] F04B *49/00***

**U.S. Cl. 417—295** **2 Claims**

1. An anti-return safety apparatus for an installation comprising a vacuum vessel connected to a vacuum pump having an oil seal, wherein the apparatus comprises a valve constituted by a rigid tube having a flexible tube situated therein with the two ends of the flexible tube being fixed in sealed manner to the ends of the rigid tube, a control orifice being provided through the wall of the rigid tube in the vicinity of the middle thereof, said valve being connected between the vessel and the suction inlet to said pump, and in that a slide valve suitable for establishing two different communication paths is provided suitable for establishing a connection between a common outlet C and one or other of two distinct inlets a, and b, said common outlet C being connected to the control orifice of said valve having the flexible tube, the inlet a being connected to the suction inlet of said pump, and the inlet b being opened to atmospheric



pressure, said slide valve being electromagnetically controlled by a coil, itself controlled by a relay which is actuated when the motor driving said pump is connected to a power supply voltage, and which is deactivated when said motor is disconnected from the power supply voltage, the slide valve providing communication between its common outlet C and its inlet a so long as said coil is powered, and between its common outlet C and its inlet b connected to the atmosphere whenever said coil is not powered.

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**5,049,043**

**VARIABLE CAPACITY VANE COMPRESSOR**

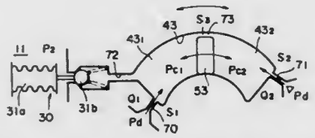
**Nobuyuki Nakajima, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Filed Mar. 22, 1990, Ser. No. 497,313**

**Claims priority, application Japan, Jul. 26, 1989, 1-195256**

**Int. Cl.[5] F04B *49/00***

**U.S. Cl. 417—295** **12 Claims**



1. In a variable capacity vane compressor including a cylinder having a pair of side blocks, a rotor rotatably received within said cylinder, one of said side blocks having an end face thereof facing said rotor, said end face having an annular recess formed therein and at least one second recess formed in a bottom of said annular recess, a control element rotatably received in said annular recess for varying the timing of compression commencement of said compressor, said control element cooperating with said second recess to define therebetween at least one pressure working space having an inner wall, said control element having at least one pressure-receiving protuberance slidably fitted in said pressure working space to divide said pressure working space into a first pressure chamber and a second pressure chamber, a communication passage extending between said first pressure chamber and a low pressure zone, and a control valve device arranged in said communication passage for opening and closing said communication passage in response to suction pressure,



the improvement comprising sealing means provided in said bottom of said annular recess and engaging portions of said control element other than said pressure-receiving protuberance, a high pressure-introducing passage for introducing high pressure into said first pressure chamber, a restriction passage for introducing high pressure into said second pressure chamber, said high pressure-introducing passage having a cross-sectional area larger than a cross-sectional area of said restriction passage, said inner wall of said pressure working space and said pressure-receiving protuberance defining therebetween a clearance smaller than the cross-sectional area of said restriction passage.

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**5,049,044**

**COMPRESSOR FOR HEAT PUMP AND METHOD OF OPERATING SAID COMPRESSOR**

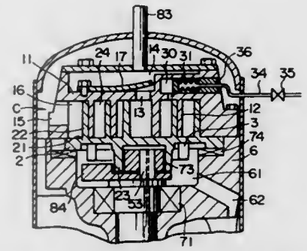
**Takahisa Hirano, Aichi Pref., Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 18, 1990, Ser. No. 467,130**

**Claims priority, application Japan, Mar. 2, 1989, 1-48653**

**Int. Cl.[5] F04B *49/08***

**U.S. Cl. 417—310** **8 Claims**



1. A method of operating a compressor for a heat pump, having a bypass passage between a discharge chamber and a compression chamber, and a valve positioned within said bypass passage, wherein during a cooling operation said bypass passage is closed, and during a heating operation said bypass passage is opened so as to allow a discharge gas to be introduced in to said compression chamber.

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**5,049,045**

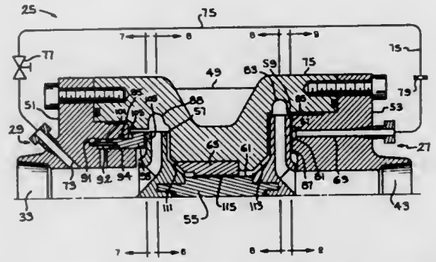
**POWER RECOVERY TURBINE PUMP**

**Robert A. Oklejas, 774 E. Hurd Rd., and Eli Oklejas, Jr., 136 Bur Oak Ct., both of Monroe, Mich. 48161**

**Continuation of Ser. No. 160,679, Feb. 26, 1988, abandoned. This application Dec. 4, 1990, Ser. No. 622,358**

**Int. Cl.[5] F04B *17/00, 35/00***

**U.S. Cl. 417—365** **30 Claims**



1. An energy recovery pump turbine for use in industrial processes where a fluid is pumped at a high pressure into the process and at least a portion of the fluid is discharged from the process at a high pressure, the turbine pump comprising:

a central body portion that defines a turbine impeller cavity and a pump impeller cavity;

a turbine inlet nozzle extending from said turbine impeller cavity through said central body portion; said turbine inlet nozzle being located adjacent said outer periphery of said turbine impeller cavity, a turbine exhaust passageway passing into said turbine impeller cavity, said turbine exhaust passageway being located adjacent said center of said turbine impeller;

a turbine positioned in said turbine impeller cavity to receive the high pressure fluid discharged from said process, said turbine having an impeller positioned on a shaft, said fluid engaging said impeller and causing said impeller and shaft to rotate;

a pump positioned in said pump impeller cavity adjacent to said turbine to receive said fluid being pumped to said process, said pump having an impeller mounted on a shaft, said shaft of said pump being operatively connected to said shaft of said turbine, said rotation of said turbine shaft causing said impeller and shaft of said pump to rotate whereby said pump assists in supplying said fluid under high pressure to said process and to recover energy from said high pressure fluid discharge from said process;

an annular groove positioned in said turbine impeller cavity said groove in said turbine impeller cavity being in communication with a high fluid pressure region in said pump turbine and fluid can flow through said groove to balance forces exerted on said pump impeller and said turbine impeller; and

a feed pump for supplying said fluid at high pressure to said process, said turbine pump being operatively connected to a supply line extending from said feed pump to said process, said fluid under pressure from said feed pump being directed to said pump of said turbine pump where said rotating impeller of said pump increases the pressure of said fluid that is pumped to said process.

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**5,049,046**

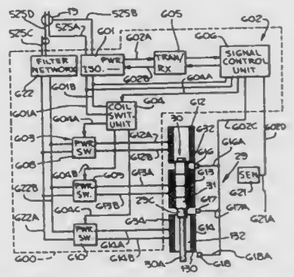
**PUMP CONTROL SYSTEM FOR A DOWNHOLE MOTOR-PUMP ASSEMBLY AND METHOD OF USING SAME**

**Nelson B. Escue, La Mesa; Vance E. Bolding, Huntington Beach, both of Calif., and Howard C. Hornsby, West Palm Beach, Fla., assignors to Escue Research and Development Company, San Diego, Calif.**

**Filed Jan. 10, 1990, Ser. No. 462,833**

**Int. Cl.[5] F04B *47/06***

**U.S. Cl. 417—411** **20 Claims**



1. A system for pumping oil well fluids from downhole to the ground surface comprising:

a surface monitoring station for communicating with at least one remote downhole motor-pump assembly;

said motor-pump assembly including a downhole motor-pump cartridge unit for pumping the well fluids to the ground surface, and a surface motor controller for con-

trolling a linear direct current motor disposed in said motor-pump cartridge unit;

said linear direct current motor including an armature assembly, said motor being coupled to said surface controller by control cable means carrying high voltage direct current pulses to cause said armature assembly in said linear direct current motor to be moved rectilinearly reciprocatively for fluid pumping purposes; and

said control cable means further simultaneously carrying low voltage frequency modulated carrier signals for communicating with a downhole motor control electronic unit disposed in said motor-pump cartridge unit to couple said high voltage pulses to selected ones of a plurality of stator pulse coils for causing said armature assembly to be moved rectilinearly reciprocatively.

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**5,049,047**

## INFUSION PUMP WITH MEANS FOR MEASURING THE TUBE INTERNAL DIAMETER

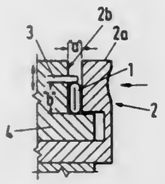
**Hans-Dietrich Polaschegg, Grünwiesenweg 9, 6370 Oberursel 4; Robert Kroh, Pfaffenwiesbacherstr. 27a, 6393 Wehrheim 1, and Gerd Krick, Kaiser-Friedrich-Promenade 92, 6380 Bad Homborg v.d.H., all of Fed. Rep. of Germany**

**Filed Dec. 15, 1989, Ser. No. 451,278**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1988, 3842404**

**Int. Cl.[5] F04B *43/12***

**U.S. Cl. 417—474** **7 Claims**




1. An infusion pump system comprising:

a supply tube formed from a flexible material;

pump means for advancing a liquid through said supply tube; and

means for measuring internal diameter of said supply tube comprising a counterpressure device arranged perpendicular to an axis of said supply tube, said counterpressure device including a movable plunger and a corresponding abutment surface for complete compression of said supply tube, and an associated measurement and evaluation unit for calculating the internal diameter of said supply tube based on distance traversed by said movable plunger.

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**5,049,048**

## HOSE PUMP

**Manfred Streicher, Beilstein, Fed. Rep. of Germany, assignor to KWW Gesellschaft für Verfahrenstechnik mbH, Dusseldorf, Fed. Rep. of Germany**

**PCT No. PCT/DE89/00522, § 371 Date Apr. 23, 1990, § 102(e) Date Apr. 23, 1990, PCT Pub. No. WO90/01638, PCT Pub. Date Feb. 22, 1990**

**PCT Filed Aug. 9, 1989, Ser. No. 477,883**

**Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827405**

**Int. Cl.[5] F04B *43/12***

**U.S. Cl. 417—477** **6 Claims**

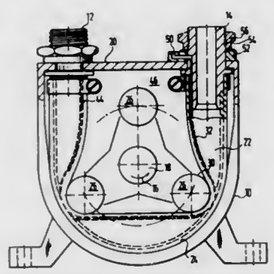
1. In a hose pump comprising

a housing including a pressure connection and an intake connection;

a hose connected to the pressure connection and to the intake connection, the first hose resting against an inner wall of the housing;

at least two squeezing members, the squeezing members being movable along the hose such that the hose is squeezed by each squeezing member from a direction of the intake connection into a direction of the pressure connection;

at least one elastically deformable conduit, the conduit being mounted in the interior of the housing such that the conduit is squeezed by the movement of squeezing members



from a direction of a first end of the conduit in a direction toward a second end of the conduit;

the improvement comprising

the first end of the conduit being in communication with the interior of the housing, and the second end of the conduit being in communication with the atmosphere outside the housing.

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**5,049,049**

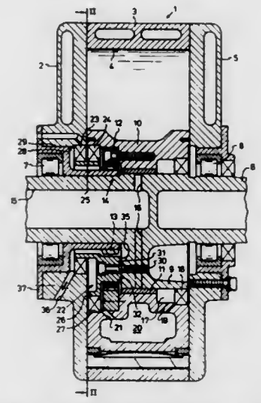
## ROTARY PISTON INTERNAL COMBUSTION ENGINE

**Dankwart Eiermann, Weissensberg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany**

**Filed May 18, 1990, Ser. No. 525,472**

**Int. Cl.[5] F01C *1/22, 19/12***

**U.S. Cl. 418—61.2** **3 Claims**



1. A rotary piston internal combustion engine having an oil cooled piston slidably jounralled for rotation and having a housing which consists of two side parts and a casing mantle part with a dual-arc trochoidal-shaped casing mantle raceway inner surfacing and having an eccentric shaft jounralled in the side parts and passing through said housing, having a triangular piston upon an eccentric of said eccentric shaft and rotating as controlled by a synchronous transmission gear drive unit, which is provided in said piston between said eccentric and a first one ofs aid side parts, said drive unit being formed by a hollow gear stationary on said piston and a pinion stationary on said housing located around said eccentric shaft, the improvement comprising:

an insert part being fastened on a sidewall of said eccentric between said hollow gear and pinion of said synchronous transmission gear drive unit covering and coinciding therewith, said insert part having a concentric hollow cylinder which is located with spacing concentrically around a holding part of said pinion and is open to both sides thereof, and a further eccentric hollow cylinder which is eccentric to said eccentric shaft and is open to said first side part and closed toward said synchronous transmission gear drive unit, said concentric hollow cylinder having a transition tangentially into said eccentric hollow cylinder along a side of an eccentricity minimum of said eccentric;

a first one-piece sealing means coaxially arranged as to said eccentric shaft adjacent to said first side part and located on a first shoulder of a shaft bore of said first side part, said first sealing means being arranged slidably on said concentric hollow cylinder and being engaged in a press-fitting manner in said first shoulder;

a second one-piece sealing means eccentric to said eccentric shaft arranged in said piston on a second shoulder provided at a seat of said hollow gear in said piston, with said second sealing means being arranged slidably on sid eccentric hollow cylinder and being engaged in a press-fitting manner in said second shoulder;

a third one-piece sealing means arranged between said eccentric and piston in a third shoulder provided at said piston for sealing off an eccentric bearing on a side remote fro msaid synchronous transmission gear drive unit, with said sealing means being slidable on said eccentric and being engaged in a press-fitting manner in said third shoulder; and

said first, second and third one-piece sealing means are in the form of sealing rings and comprise an elastomeric oil-resistant material.

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**5,049,050**

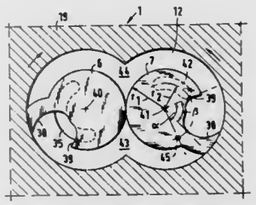
## METHOD FOR OPERATING A TWIN SHAFT VACUUM PUMP ACCORDING TO THE NORTHEY PRINCIPLE AND A TWIN SHAFT VACUUM PUMP SUITABLE FOR THE IMPLEMENTATION OF THE METHOD

**Hanns-Peter Berges, Cologne, and Wolfgang Leier, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellscbaft, Fed. Rep. of Germany**

**Filed Feb. 20, 1990, Ser. No. 482,151**

**Int. Cl.[5] F04C *29/00, 23/00***

**U.S. Cl. 418—97** **6 Claims**



1. A twin-shaft vacuum pump comprising the following:

first and second non-contacting rotors synchronously rotating about first and second axes inside a pump chamber;

said first rotor including a projection and a recess and means for opening and closing an intake opening in a first lateral shield defining a first wall of said pump chamber, said intake opening and said recess of said first rotor being spaced a similar distance from said first rotational axis;

said second rotor including a projection and a recess and means for opening and closing a discharge opening in a second lateral shield defining a second wall of said pump chamber, said discharge opening and said recess of said second rotor being spaced a similar distance from said second rotational axis;

a flushing gas line terminating in a flushing gas inlet port opening into said pump chamber adjacent said second rotor, said gas inlet port and said recess of said second rotor being disposed generally along a circle centered on said second rotational axis

said discharge opening includes an outermost edge closest to said gas inlet port, said outermost edge and said gas inlet port defining an angle alpha having sides converging at said second rotational axis;

said recess in said second rotor has a width defining an angle beta having sides converging at said second rotational axis; and said angle alpha is greater than angle beta.

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**5,049,051**

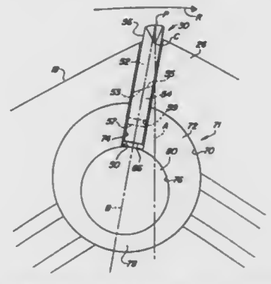
## MULTI-PIECE TILTED APEX SEAL ASSEMBLY

**Daniel B. Keleher, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Jul. 9, 1990, Ser. No. 549,844**

**Int. Cl.[5] F01C *19/04***

**U.S. Cl. 418—113** **5 Claims**



1. An apex seal assembly for a lobed rotor of a rotary engine wherein the rotor has an apex seal slot in an apex portion thereof, a seal member mounted in the slot, the seal member and the slot being inclined with respect to a center line of the rotor lobe, and the seal member having an outer sealing surface having a center of curvature which lies on the center line of the rotor lobe, characterized by:

the center line of the rotor lobe and a center line of the slot intersect at a point, said point being located near the outer surface of the seal member and said point being closer to the outer surface of the seal member than to said center of curvature.

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**5,049,052**

## LIGHT WEIGHT VANE-TYPE ROTARY COMPRESSOR

**Toshinori Aihara, Kanagawa, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan**

**Filed Apr. 13, 1989, Ser. No. 337,350**

**Claims priority, application Japan, Apr. 14, 1988, 63-50523[U]**

**Int. Cl.[5] F04C *2/344***

**U.S. Cl. 418—179** **13 Claims**

2. A vane-type rotary compressor comprising:

a rotor drivingly associated with a driving power source to be driven to rotate;

a cam ring assembly defining an enclosed non-circular opening, in which said rotor is disposed to define a top clearance which varies between a minimum clearance and a maximum clearance at different sections, said cam ring assembly including a cam ring body having an external peripheral surface;

a plurality of vanes carried by said rotor and extending radially for radial movement toward and away from the inner periphery of said opening for defining a plurality of

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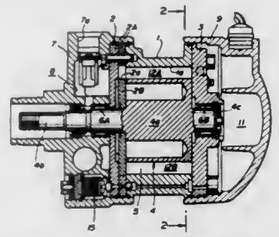


pressure chambers each pressure chamber varying volume to increase during induction stroke and to decrease during compressing and discharging stroke according to variation of clearance of said vanes within said cam ring assembly;

induction means, communicated with said pressure chamber, for supplying a fluid to be pressurized into said pressure chamber in said induction stroke;

discharge means, communicated with said pressure chamber, for discharging pressurized fluid in said pressure chamber in said compressing and discharge stroke; and

wherein the external peripheral surface of the cam ring body is exposed to an atmosphere to radiate heat created during the compressor operation, said cam ring body being formed of a material having coefficient of thermal expansion which is greater than the coefficient of thermal expansion of the material from which the rotor is formed such that the top clearance is maintained in a predetermined range over all operating speeds of the compressor.



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**5,049,053**

**METAL MOLD FOR MOLDING ANISOTROPIC PERMANENT MAGNETS**

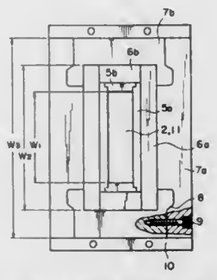
**Kazunori Tabaru, Saitama, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan**

**Filed Aug. 16, 1989, Ser. No. 394,573**

**Claims priority, application Japan, Aug. 18, 1988, 63-205214; Feb. 17, 1989, 1-38093**

**Int. Cl.[5] B30B *11/04***

**U.S. Cl. 425—3** **3 Claims**



1. A metal mold for molding anisotropic permanent magnets, said mold being disposed between a pair of laterally opposed magnetic field generating members, with upper and lower punches slidably fitted to both ends of a molding cavity defined within said mold, said mold comprising a die constituting said molding cavity constructed of a plurality of die pieces; first side plates being disposed on opposite sides of the molding cavity adjacent said die pieces; first holders being disposed on opposite sides of the molding cavity adjacent said first side plates, said first side plates and said first holders face the lateral magnetic field generating members and are made of a magnetic material; the respective widths $W_1$, $W_2$, and $W_3$ of said molding cavity, said side plates and said holder in a direction orthoginal to the lateral magnetic field generating members are formed so as to satisfy the equation $W_1 < W_2 < W_3$; second side plates disposed on opposite sides of said molding cavity adjacent to said die pieces and orthogonal to said lateral magnetic field generating members; and second holders disposed on opposite sides of said molding cavity adjacent said second side plates; said second side plates and said second holders are made of a nonmagnetic material; said side plates are forced against said die pieces by a plurality of screw members inserted into said holders.

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**5,049,054**

**PRESS HAVING A TOOL MOUNT TO BE INSERTED INTO THE PRESS**

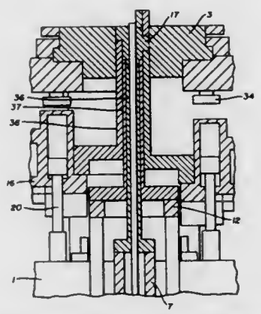
**Hubert Schaidl, Bichl, Fed. Rep. of Germany; Hermann Good, Buchs, Switzerland; Roland Fleissner, Benediktbeuern, Fed. Rep. of Germany; Josef Schroferle, Sindelsdorf, Fed. Rep. of Germany, and Dietmar Herren, Benediktbeuern, Fed. Rep. of Germany, assignors to Dorst-Maschinen- und Analagenbau, Otto Dorst und Dipl.-Ing. Walter Schlegel GmbH & Co., Fed. Rep. of Germany**

**Filed Mar. 16, 1990, Ser. No. 494,682**

**Claims priority, application Fed. Rep. of Germany, Mar. 23, 1989, 3909757**

**Int. Cl.[5] B29C *43/14*; B30B *15/02***

**U.S. Cl. 425—78** **15 Claims**



1. A press for producing multistepped compacts and including an upper and lower punch and a tool mount connected to the ower punch via a lower coupling plate and to the upper punch via an upper joining piece, and a framework mounted displaceably on a base plate of the mount and consisting of connection rods connecting the lower coupling plate with a matrix holding plate, comprising:

a) first and second die carrries (7,12) movable from a filling position spaced from the base plate downward toward the base plate into a compacting position and then upward, away from the base plate into an ejecting position; and

b) at least a third die carrier (16) movable with the upper punch downwardly toward the base from a filling position to a compacting position and then further downwardly to a withdrawal position as said first and second die carriers move upwardly to an ejecting position.



**5,049,055**

**MOLD ASSEMBLY**

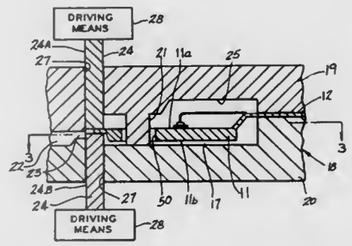
**Takaaki Yokoyama, Niiza, Japan, assignor to Sanken Electric Co., Ltd., Saitama, Japan**

**Division of Ser. No. 291,065, Dec. 28, 1988, Pat. No. 4,954,357. This application Apr. 23, 1990, Ser. No. 512,430**

**Claims priority, application Japan, Dec. 31, 1987, 62-336561**

**Int. Cl.[5] B29C *45/16, 45/33***

**U.S. Cl. 425—116** **7 Claims**




1. Mold assembly for molding plastic material about a preform comprising:

a first mold half,

a cooperating second mold half, the mold halves defining a mold cavity therebetween,

the mold halves defining a gate of a predetermined size providing an entry for plastic material into the mold assembly,

a first clamp means for clamping one end of said preform,

a second clamp means for clamping the opposite end of said preform,

said second clamp means being movably disposed within said mold cavity and being operable to change the predetermined size of said mold gate.

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**5,049,056**

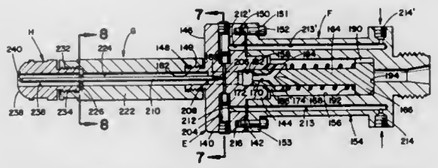
**GAS SUPPLY SPRUE BUSHING FOR INJECTION MOLDING MACHINES**

**Indra R. Baxi, Solon, Ohio, and Paul Pardy, Windsor, Canada, assignors to Nitrojection Corporation, Middlefield, Ohio**

**Filed Mar. 14, 1990, Ser. No. 493,909**

**Int. Cl.[5] B29C *45/16***

**U.S. Cl. 425—130** **20 Claims**



1. A bushing used in an injection molding machine and positioned between a nozzle and a sprue body, comprising:

an adaptor body having a longitudinal axis, a fist end and a second end;

a first bore which extends in said adaptor body parallel to said longitudinal axis from said second end to said first end of said body for accommodating a flow of a viscous fluid;

a bridge extending transversely across said first bore adjacent said adaptor body first end, fluid flow of said viscous fluid being allowed through said first bore around said bridge;

a second bore having a first end located on a surface of said adaptor body and extending to a second end located on a surface of said bridge, said second bore accommodating a flow of a non-viscous fluid, said second bore second end being substantially coaxial with said first bore; and,

a third bore having a first end located on a surface of said adaptor body in spaced relation to said second bore first end and extending to a second end communicating with said second bore.

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**5,049,057**

**DEVICE FOR CONTINUOUSLY MEASURING AND CORRECTING TACKINESS OF SHEET OF UNVULCANIZED RUBBER MATERIAL**

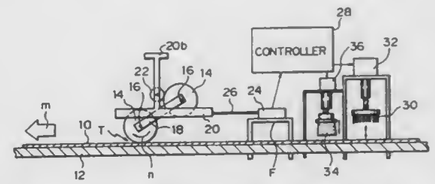
**Youichi Yamaguchi, Hiratsuka; Shohei Nakayama, Odawara, and Shigeru Shinoda, Chigasaki, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan**

**Filed May 4, 1990, Ser. No. 519,522**

**Claims priority, application Japan, May 11, 1989, 1-116191**

**Int. Cl.[5] B29C *7/00*; G01B *5/00*; G01N *19/04***

**U.S. Cl. 425—135** **15 Claims**




1. A device for continuously measuring and correcting a tackiness of sheet of rubber material, comprising:

feeding means for continuously feeding a sheet of unvulcanized rubber material along a predetermined path and in a predetermined direction;

at least one rotatable roller in contact with said sheet of unvulcanized rubber material and having a central shaft extending perpendicular to said predetermined feeding direction;

linkage means having a first end and a second end, said first end being connected to said shaft of said roller;

measuring means arranged at a fixed position on a stationary frame member and connected to said second end of said linkage means for measuring a rolling resistance of said roller relative to said sheet of unvulcanized rubber material when said roller is in contact with said sheet of unvulcanized rubber material, said rolling resistance representing a degree of tackiness of said sheet of unvulcanized rubber material;

correcting means able to act on the surface of said sheet of unvulcanized rubber material for correcting a tackiness of said sheet of unvulcanized rubber material; and

control means for controlling said correcting means in response to an output from said measuring means in such a manner that said correcting means acts on the surface of said sheet of unvulcanized rubber material when an output from said measuring means is outside a predetermined range of tackiness and does not act on the surface of said sheet of unvulcanized rubber material when an output from said measuring means is within said predetermined range of tackiness.

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**5,049,058**

**ROLLOUT APPARATUS**

**Frank E. Ives, Kent, Wash., assignor to PMC, Inc., Sun Valley, Calif.**

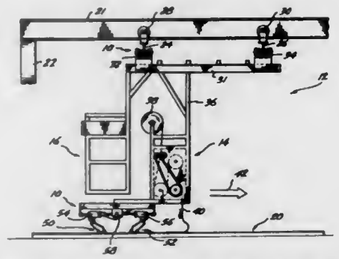
**Filed Dec. 18, 1989, Ser. No. 452,745**

**Int. Cl.[5] B29C *71/00***

**U.S. Cl. 425—328** **8 Claims**

1. A rollout apparatus for rolling trapped air from a resin impregnated fiber mat placed on a mold, said apparatus comprising:

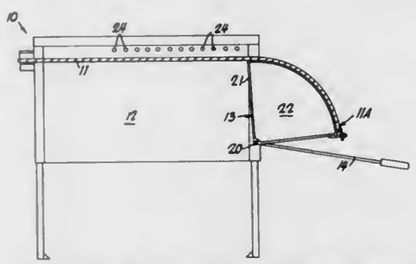
a frame having a longitudinal and a transverse dimension;
a means for moving said frame relative to the mold;
a first carriage means mounted for reciprocating movement in a longitudinal direction on said frame;
a first roller assembly having at least one roller mounted on said first carriage means for rotation about a transversely oriented axis;
a second carriage means mounted for reciprocating movement in a longitudinal direction on said frame;



a second roller assembly having at least one roller mounted on said second carriage means for rotation about a transversely oriented axis; and
means for simultaneously reciprocating said first and second carriage means toward and away from each other so that forces exerted on said frame resulting from change of direction of movement of said first and second carriage means substantially cancel each other.

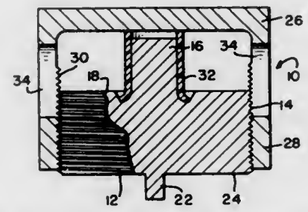
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**5,049,059**
**APPARATUS FOR FORMING POLYCARBONATE SHEETING**
**Graham Long, New South Wales, Australia, assignor to Precision Roofing Accessories Co., Pty., West Ryde, Australia**
**Division of Ser. No. 305,276, Feb. 1, 1989, Pat. No. 4,986,950. This application Dec. 4, 1990, Ser. No. 622,834**
**Int. Cl.[5] B29C *53/04, 53/24***
**U.S. Cl. 425—383** **16 Claims**



1. An apparatus for moulding a polycarbonate sheet into a generally arcuate configuration, comprising a heating chamber, guide means to hold the sheet in a predetermined position spaced from a mould member having a predetermined arcuate mould surface and being pivotably mounted in said chamber, further comprising locating means to bring said sheet into contact with a leading portion of said mould member and means to rotate said mould in a predetermined direction.

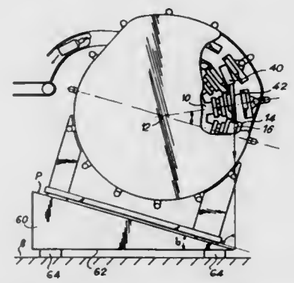
**5,049,060**
**SEAL FLARING AND SHIPPING MANDREL ASSEMBLY**
**Thomas D. O'Leary, Painted Post, N.Y., assignor to Dresser-Rand Company, Corning, N.Y.**
**Filed Sep. 21, 1990, Ser. No. 591,574**
**Int. Cl.[5] B29C *43/04, 43/44, 55/22, 57/04***
**U.S. Cl. 425—393** **13 Claims**



1. A seal flaring and shipping mandrel assembly, comprising:
platform means for receiving a cylindrical seal thereupon; and
closure means for enclosing said platform means therewithin; wherein
one of said means has a stub about which to set such seal;
one of said means has an arcuately cross-sectioned groove formed therein in which to receive and flare an end of such seal;
said closure means and said platform means have mutually engaging means for forcing an end of such seal into said groove for the flaring thereof;
said closure means comprises a cup-shaped element of circular configuration, having a circular wall; and
said wall has viewing apertures formed therein.

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**5,049,061**
**BLOW-EXTRUDER IN WHICH THE MOULDS ARE CARRIED BY A VERTICAL WHEEL**
**Alain Billoud, Meaux, France, assignor to CMB Plastique, Cedex, France**
**Filed May 23, 1990, Ser. No. 527,365**
**Claims priority, application France, May 24, 1989, 8906814**
**Int. Cl.[5] B29C *49/36***
**U.S. Cl. 425—522** **6 Claims**

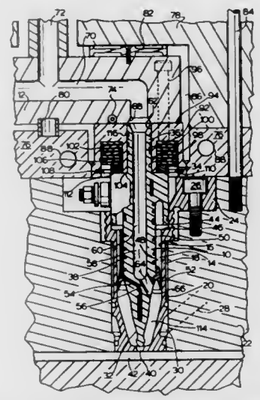


1. In a blow extruder machine comprising a frame (4) having a plane support surface (6) and supporting a wheel (10) which can rotate about its axis (12) in a vertical plane and which is equipped with moulds (14) on its periphery, the moulds being, as a function of their positions in the plane of the wheel, closed in order to create a moulding cavity (16) or open in order to receive a tubular parison (42), and an extrusion head (40) located in an area in which the opposite mould is open and intended to supply the said parison (42) according to a direction (F) which is inclined relative to the support surface (6) and downwards, the improvement which comprises a support (60; 70; 80) comprising a plane (P) which is inclined relative to the horizontal and which supports the support surface (6), the inclined plane (P) forming, with a horizontal plane, an acute angle (b) which is approximately equal to 90° less another acute angle (a) formed by the direction (F) of the parison (42) and the support surface (6) such that the direction (F) of the parison (42) is approximately vertical.



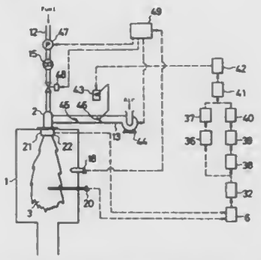
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**5,049,062**
**INJECTION MOLDING SYSTEM HAVING SPRING BIASED NOZZLES**
**Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1**
**Continuation of Ser. No. 489,548, Mar. 7, 1990, abandoned. This application Apr. 3, 1991, Ser. No. 681,634**
**Claims priority, application Canada, Feb. 27, 1990, 2010855**
**Int. Cl.[5] B29C *45/22***
**U.S. Cl. 425—549** **7 Claims**



1. In a multi-cavity injection molding apparatus having a plurality of nozzles, each nozzle having an integral heating element and being received in a cavity plate between a manifold and a respective cavity, each nozzle having a rear end and a tapered forward end in alignment with a gate leading to the respective cavity, wherein pressurized melt from a molding machine flows through a melt passage extending through the manifold and a bore extending through each nozzle to the gate leading to each cavity, the improvement wherein:
each nozzle is received in an opening in the cavity plate to reciprocate between a retracted open position and a forward closed position wherein the tapered forward end of the nozzle is seated in a respective gate, a spring and sealing housing is mounted between each nozzle and the manifold, each spring and sealing housing having a central bore, a rear face and a forward face, the rear face of the spring and sealing housing being secured against the manifold with the central bore of the housing in alignment with an outlet from the melt passage extending through the manifold, the forward face of the spring and sealing housing having a spring channel therein which extends around and is separate from the central bore of the housing, spring means mounted in the spring channel to apply a bias to the rear end of the nozzle to drive the nozzle to the forward closed position, the bore of the nozzle extending through a central sleeve portion which extends rearwardly into the central bore of the spring and sealing housing, the central sleeve portion of the nozzle having an outer surface which seals against an inner surface of the bore of the spring and sealing housing to prevent melt leakage therebetween as the nozzle reciprocates between the open and closed positions.

**5,049,063**
**COMBUSTION CONTROL APPARATUS FOR BURNER**
**Teruhiko Kishida; Syuji Iida; Kazunari Hosome; Kazuya Tomatu, and Tosizi Tachibana, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan**
**Filed Dec. 26, 1989, Ser. No. 456,478**
**Claims priority, application Japan, Dec. 29, 1988, 63-334619; Mar. 27, 1989, 1-74623; May 17, 1989, 1-123892**
**Int. Cl.[5] F23N *5/00***
**U.S. Cl. 431—78** **2 Claims**



2. A combustion control apparatus for a burner comprising:
a detector for detecting an ionic current in a flame from the burner or light power of the flame, which changes in accordance with a change of combustion condition of the flame, and outputting an electric signal corresponding to the detected ionic current or light power;
an amplifier for amplifying said electric signal;
a low-pass filter connected to the output side of said amplifier to remove a high-frequency component in said electric current, said low pass filter including a first and second output branch line;
a first circuit connected to the first output branch line of said low-pass filer to rectify the signal current having passed through said low-pass filter and thereby obtain a signal current in the form of a direct current;
a high-pass filter connected to the second output branch line of said low-pass filter to remove a low-frequency component in the signal current having passed through said low-pass filter;
a second circuit connected in the second output branch line to rectify the signal current having passed through said high-pass filter and thereby obtain a signal current in the form of a direct current;
an arithmetic unit connected to the output sides of said first and second branch lines to arithmetically determined a relation of the signal current in a specific frequency band to the signal current in the entire frequency band; and
a combustion controller connected to the output side of said arithmetic unit to affect combustion control on the basis of the output from said arithmetic unit.

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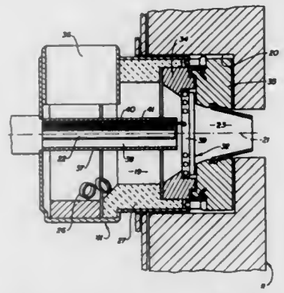
**5,049,064**
**BURNER WITH REGENERATIVE BED**
**Brian Wills, "Sandbourne", Stoney Lane, Kinver, West Midlands, United Kingdom**
**Continuation of Ser. No. 328,055, Mar. 23, 1989, abandoned, which is a continuation-in-part of Ser. No. 82,850, Aug. 6, 1987, Pat. No. 4,838,782. This application Apr. 19, 1990, Ser. No. 511,876**
**The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.**
**Int. Cl.[5] F23D *11/44***
**U.S. Cl. 431—215** **8 Claims**

1. A burner operable in fire and flue modes and comprising a housing defining an opening which is an air inlet opening when the burner is operating in the fire mode, an inner tubular structure extending within the interior of the housing to define therewith an annular regenerator chamber between the inte-

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rior of the housing and the exterior of said inner tubular structure and gas permeable heat storing means occupying said regenerator chamber said heat storing means having a first end adjacent to said opening and a second end remote from said opening, wherein said tubular structure comprises an outer wall with a free end spaced within the housing remote from said first end of the heat storing means, said tubular structure further comprises a fuel flow duct spaced inwardly from the outer wall and leading to a mixing position adjacent to the free end of said outer wall, wherein there is between the fuel flow duct and the outer wall of the tubular structure an annular space, the burner further comprises means for supplying air to the mixing position through said annular space, said opening communicates with said regenerator chamber and said regenerator chamber provides a path for the flow of air from said opening through the heat storing means in a direction from said first end thereof to said second end thereof and to the mixing position when the burner is operating in the fire mode and for the flow of products of combustion from the mixing position through the heat storing means in a direction from said second end thereof to said first end thereof and to said opening when the burner is operating in the flue mode, wherein there is adjacent to said second end of the heat storing means a frusto-conical peripheral wall of the regenerator chamber and wherein said peripheral wall has a larger diameter nearer to the first end of the heat storing means and a smaller diameter further from the first end of the heat storing means, said peripheral wall defining a further opening providing communication between the mixing position and the regenerator chamber.



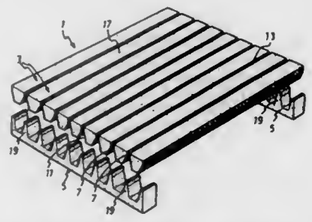
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**5,049,065**

**CONSTRUCTION OF CERAMIC PLAQUE BURNERS**

**Martin L. Smith, Birmingham; Alan Constable, Colesbill, and Alan V. Hinton, Birmingham, all of England, assignors to Valor Limited, London, England**

**Filed Dec. 21, 1989, Ser. No. 452,740**
**Int. Cl.[5] F23D *14/12***
**U.S. Cl. 431—328** **15 Claims**



1. A ceramic plaque burner comprising a number of elongate ceramic members which are arranged parallel to each other with spacer means located therebetween to thus produce an elongate burner aperture between adjacent ceramic members, the spacer means being formed as a spacer member with at least one lateral projection, a spacer member being located at each end region of the parallel elongate ceramic members so that a lateral projection engages adjacent ceramic members to define the width and an end of a burner aperture.

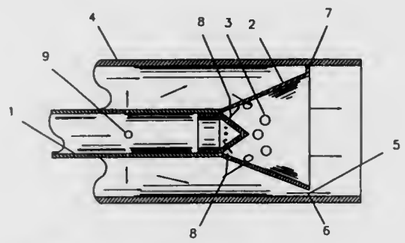
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**5,049,066**

**BURNER FOR REDUCING $NO_x$ EMISSIONS**

**Kazuo Kaiya, Sakura, and Toshimitsu Ido, Noda, both of Japan, assignors to Tokyo Gas Company Limited, Tokyo, Japan**

**Filed Oct. 23, 1990, Ser. No. 602,202**
**Claims priority, application Japan, Oct. 25, 1989, 1-277932**
**Int. Cl.[5] F23D *14/00***
**U.S. Cl. 431—352** **9 Claims**



1. A burner comprising:
an inner pipe;
an outer pipe concentrically disposed about said inner pipe, thereby forming an annular space between said inner pipe and said outer pipe;
a diverging horn affixed to an end of said inner pipe;
a first plurality of openings in said horn;
a second plurality of openings in said inner pipe, upstream of said horn;
said second plurality of openings being directed radially outward into said annular space;
a third plurality of openings in an end of said inner pipe within said horn;
said third plurality of openings being directed generally parallel to a wall of said horn; and
an alternating plurality of jetting portions and blind portions in an outer perimeter of said horn.

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**5,049,067**

**SCRAP METAL RECYCLING FURNACE SYSTEMS**

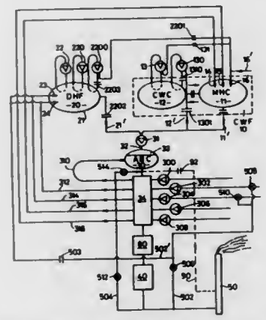
**Adrianus J. Hengelmolen, Dreumel, Netherlands, assignor to Copermill Limited, Dunkirk, England**

**Continuation-in-part of Ser. No. 170,792, Mar. 21, 1988, abandoned. This application Jul. 17, 1989, Ser. No. 380,972**
**Claims priority, application United Kingdom, Mar. 26, 1987, 8707276; Dec. 24, 1987, 8730099**
**Int. Cl.[5] C21B *9/10*; F27D *17/00***
**U.S. Cl. 432—40** **14 Claims**

1. A furnace system comprising, in combination:
a) a dry hearth furnace having a heating chamber and at least one burner for heating said chamber;
b) a closed well furnace having a main heating chamber and a closed well chamber, said main heating chamber and said closed well chamber being partially screened from one another by a refractory dividing wall, said main heating chamber having at least one primary burner and a secondary burner;
c) means for selectively supply exhaust gases directly from said dry hearth furnace to said secondary burner of said closed well furnace;
d) an afterburner chamber operatively connected to said dry hearth furnace and to said closed well furnace;



e) means for selectively supplying exhaust gases directly from said dry hearth furnace to said afterburner chamber;
f) means for selectively supplying exhaust gases directly from said closed well chamber of said closed well furnace to said afterburner chamber;
g) means for selectively supplying exhaust gases directly from said main heating chamber of said closed well furnace to said afterburner chamber;
h) a regenerator operatively connected to said afterburner chamber;
i) means for selectively supplying heated combustion air from said regenerator to said at least one burner of said dry hearth furnace;



j) means for selectively supplying heated combustion air from said regenerator to said at least one primary burner of said closed well furnace; and
k) safety cooler operatively connected to said regenerator to receive and cool exhaust gases therefrom, a fume purification plant operatively connected to said safety cooler to receive and purify exhaust gases from said safety cooler, and an exhaust stack operatively connected to said fume purification plant to receive exhaust gases from said fume purification plant and emit said exhaust gases to the atmosphere.

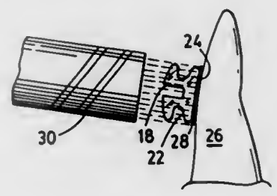
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**5,049,068**

**METHOD OF USING PULSE RADIATION FOR BONDING ORTHODENTIC BRACKETS TO TEETH**

**Terry L. Sterrett, Long Beach; Craig A. Andreiko, Alta Loma; Ronald J. Sirney, Bloomington, and Michael L. Swartz, Encino, all of Calif., assignors to Ormco Corporation, Glendora, Calif.**

**Filed Jan. 31, 1990, Ser. No. 473,038**
**Int. Cl.[5] A61C *3/00***
**U.S. Cl. 433—9** **14 Claims**



1. A method for bonding orthodontic brackets to teeth comprising the steps of:
a) applying a photopolymerisable adhesive to the base of the bracket or a tooth;
b) applying the bracket to said tooth in the desired position; and
c) directing a pulsed radiation source to said bracket and tooth so as to cure said photopolymerisable adhesive.

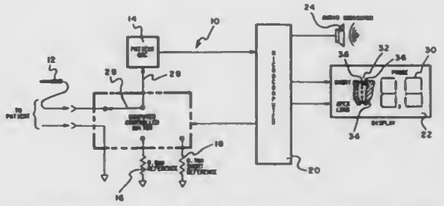
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**5,049,069**

**DIGITAL APICAL FORAMEN LOCATING APPARATUS WITH LINEAR GRAPHIC DISPLAY**

**Ronald D. Salesky, Tabernacle, N.J., assignor to Leonard Salesky, Riverside and Phyllis S. Farber, Cherry Hill, both of, N.J.**

**Filed Feb. 16, 1990, Ser. No. 481,088**
**Int. Cl.[5] A61C *19/04***
**U.S. Cl. 433—27** **9 Claims**



1. In an apical foramen locating device including a probe intended to be inserted into the root canal of a tooth, an electrical circuit means connected to said probe for generating an output signal indicative of the distance between said probe in said canal and the apex and means connected to said electrical circuit means for producing a visual display representing said distance, the improvement in said display means wherein said display is in the form of a line and wherein means are provided for adjusting the length of said line depending on the distance of said probe to the apex.

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**5,049,070**

**DENTAL DRILL INTEGRAL CAMERA AND OPTICS**

**Martin Ademovic, Soquel, Calif., assignor to High-Tech Medical Instrumentation, Inc., San Francisco, Calif.**

**Filed Jan. 9, 1990, Ser. No. 462,678**
**Int. Cl.[5] A61C *1/00, 3/00, 1/10*; H04N *7/18***
**U.S. Cl. 433—29** **25 Claims**

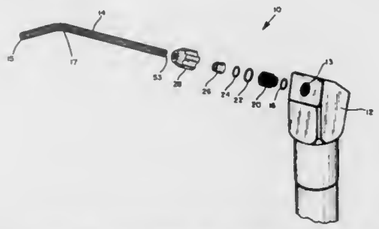


1. A dental drill comprising:
an elongated body including a handpiece, said elongated body having a first end;
a drill burr disposed at a work site located at said first end;
means for illuminating said work site, said illumination means including a fiber optic bundle extending through said handpiece; and
a video imaging device for displaying said work site at a location removed form said work site, said video imaging device being coupled to said illumination means and including a camera housed within said handpiece.

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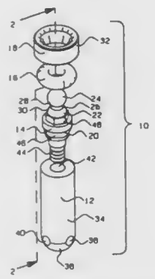
5,049,071
**DENTAL SYRINGE TIP AND ADAPTOR**
Warren Davis, 3026 Sullivan Ave., Rosemead, Calif. 91770, and David Wasserman, 2095 Mohigan Way, Las Vegas, Nev. 89109
Continuation-in-part of Ser. No. 241,081, Sep. 6, 1988. This application May 12, 1989, Ser. No. 351,431
Int. Cl.[5] A61G *17/02*
U.S. Cl. 433—80 56 Claims



1. A syringe tip comprising an elongated cylindrical rigid plastic member having a first central passageway throughout the entire length of the cylindrical member, said first central passageway being generally circular in cross-section, and a plurality of second passageways disposed circumferentially about the first central passageway, said second passageways being generally arcuate in cross-section and extending substantially the entire length of the tip, and a syringe tip extension having an interior passageway for joining the syringe tip to an adaptor.

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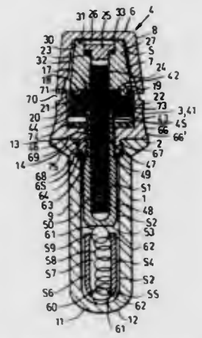
5,049,072
**O-RING ATTACHMENT SYSTEM FOR DENTAL PROSTHESIS**
Jeffrey D. Lueschen, Carlsbad, Calif., assignor to Calcitek, Inc., Carlsbad, Calif.
Filed Jun. 26, 1990, Ser. No. 543,656
Int. Cl.[5] A61C *8/00, 13/12, 13/225*
U.S. Cl. 433—173 20 Claims



1. A removable denture attachment system for use with a natural or implanted fixed root system which comprises in combination:
an elastomeric ring;
a post;
means for securing the post to the natural or implanted root in the patient's mouth;
said post further comprising a hemispherical base proximal of the securing means and a spherical end distal from the securing means, said hemispherical base and said spherical end forming opposed convex circumferential walls for receiving the elastomeric ring;
an annular retainer surrounding the elastomeric ring;
a denture surrounding said annular retainer, said ring and said post; and
means for manipulating the post securing means, the manipulating means comprising a faceted segment interposed between the hemispherical base and the securing means.

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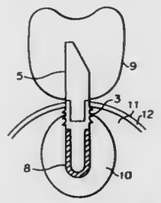
5,049,073
**DEVICE FOR FASTENING A SET OF TEETH TO A JAWBONE OF A PATIENT**
Nikola Lauks, Saalkamp 8, 2000 Hamburg 65, Fed. Rep. of Germany
Filed Nov. 27, 1989, Ser. No. 441,456
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1988, 3839837
Int. Cl.[5] A61C *8/00, 13/28*
U.S. Cl. 433—173 37 Claims



1. A device for fastening a set of teeth on a human jaw, comprising:
an elongated implant for a bore in a bone of a human jaw and having an implanted end received in said bore and an opposite end formed as a crown carrier, said implanted end having a rounded extremity lodged in said bone, said implanted end, at an extremity turned toward said crown carrier, being formed with a flange projecting radially outwardly, said flange having an underside turned toward said rounded extremity and conically converging in a direction thereof, said implant including an anchor portion adapted to be fitted into said bore and said crown carrier being spaced from said flange and resiliently connected with said implant, said crown carrier being formed from a substantially cylindrical body;
a two-part crown mounted on said crown carrier and comprising:
a primary crown part separable from and abutting said crown carrier,
a secondary crown part fitting onto said primary crown part and securable to said set of teeth, and
means for securing said primary crown part to said crown carrier, said securing means being a screw received in a bore of said crown carrier that extends centrally therealong, said screw traversing said crown carrier, said crown carrier being formed on a side turned toward said anchor portion with an annular recess surrounding said screw and extending partly into said crown carrier; and
an annular rubber washer surrounding said screw positioned between a face of said anchor portion and a surface of said crown carrier turned toward said anchor portion and radially interior of said outwardly projecting flange and an implant spacer threaded into said anchor portion adjacent said flange, said implant spacer having a recess receiving said washer and said crown carrier.



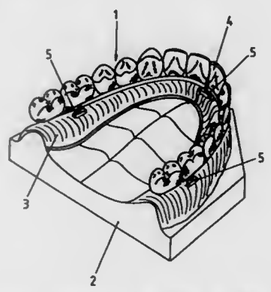
5,049,074
**DENTAL IMPLANT**
Sugio Otani, 2010-2, Kurokawa, Hishi-machi, Kiryu-shi, Gumma-ken; Sadakatsu Yanagisawa, 3-34-407, Mita 2-chome, Minato-ku, Tokyo; Kunio Niijima, No. 563, Kamiko-machi, Omiya-shi, Saitama-ken; Kazusi Matuura, Tokyo; Hirosi Matino, Yokohama, and Tooru Fuse, Tokyo, all of Japan, assignors to Sugio Otani, Kiryu; Sadakatsu Yanagisawa, Tokyo; Kunio Niijima, Omiya; Mitsubishi Kasei Corporation and Research Development Corporation of Japan, both of Tokyo, all of, Japan
Filed Mar. 29, 1990, Ser. No. 500,924
Claims priority, application Japan, Mar. 29, 1989, 1-77696; Mar. 29, 1989, 1-77697
Int. Cl.[5] A61C *8/00*
U.S. Cl. 433—173 7 Claims



1. A dental implant comprising a core material and a porous layer formed on the core material, wherein at least a part of the core material coated by the porous layer has a non-circular cross-sectional shape, said porous layer covering the non-circular cross-sectional area of said core material so as not to rotate relative to the porous layer, and wherein said porous layer has a thickness of at least 0.1 mm, and the pore size is at least 100 μm, at the surface of the porous layer and gradually decreases from the surface towards the core material side.

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5,049,075
**DENTURES, AS WELL AS TEMPORARY DENTURES, AND PROCESS FOR THEIR FABRICATION**
Luc Barrut, Krefeld, Fed. Rep. of Germany, assignor to Marc Barrut, Lyons, France
Filed Dec. 23, 1988, Ser. No. 289,975
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743674
Int. Cl.[5] A61C *13/10*
U.S. Cl. 433—196 30 Claims



1. A temporary denture for at least one jaw of a patient comprising:
a corrected plate for said at least one jaw;
a row of false teeth associated with said corrected plate, said row of false teeth extending uninterrupted for the entire length of said at least one jaw, said row of false teeth comprising a plurality false teeth, each of said false teeth being rigidly connected with at least an adjacent one of said false teeth; and
incompressible, axially adjustable means for adjustably connecting as a singular unit said row of false teeth to said corrected plate to form said temporary denture.

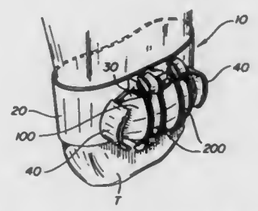
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5,049,076
**METHOD OF BONDING METAL TO DENTINE**
Hiroki Ohno, Ebetsu, Japan, assignor to Goushi Kaisha Toukuriki Shoten, Tokyo, Japan
Division of Ser. No. 367,760, Jun. 19, 1989, abandoned. This application Feb. 20, 1990, Ser. No. 481,583
Claims priority, application Japan, Jun. 22, 1988, 63-153853
Int. Cl.[5] A61C *5/00*
U.S. Cl. 433—215 20 Claims

1. The method of bonding a metallic element to dentine and dentine type material, the steps which include forming an adherent surface coating of an alloy of gallium on the metallic surface, applying an adhesive to the tooth and by means of the adhesive bonding the metallic element to the dentine material with said coating between the metallic element and the adhesive.

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5,049,077
**INTRAORAL MEDICATION RELEASING SYSTEM**
Bruce Goldin; Ronald J. Billings, both of Rochester, N.Y.; Tibor Sipos, Lebanon; Bruce E. Kohut, Colts Neck, both of N.J., and Kathleen Woodward, San Diego, Calif., assignors to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J. and Eastman Dental Center, Rochester, N.Y.
Filed Mar. 20, 1989, Ser. No. 325,815
Int. Cl.[5] A61G *17/02*
U.S. Cl. 433—229 17 Claims

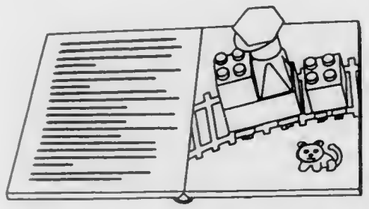


1. A system for replaceably retaining and protecting an intro-oral controlled release medication tablet, such as an intra-oral fluoride device, in the mouth comprising:
a holder having a plate for attachment on a tooth; said tablet emplaceable on said plate; and said holder having retaining means connected to said plate, said retaining means comprising a pair of retaining sides attached to said plate, said sides spread apart to permit medication to flow into said oral cavity, and said retaining means further extendable from said plate and across said tablet and capable of generally maintaining said table emplaced on said plate within said retaining means; and
wherein said retaining means further comprises a pair of retaining posts disposed between said retaining sides and upon which ligature bands are emplaceably to hold said tablet against said plate.

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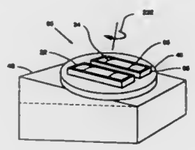
5,049,078
PICTURE BOOK WITH PLAY EFFECT
Erik D. Thomsen, Kolding, Denmark, assignor to Interlego A.G., Baar, Switzerland
Continuation of Ser. No. 163,975, filed as PCT DK87/00094 on Jul. 17, 1987, published as WO88/00492 on Jan. 28, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 434,555
Claims priority, application Denmark, Jul. 18, 1986, 3425/86
Int. Cl.[5] G09B 17/00
U.S. Cl. 434—178 4 Claims

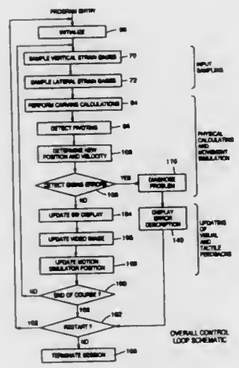


1. A picture book set with play effect comprising:
a book having at least one page containing at least one picture thereon;
a plurality of toy elements, each having at least one stud and socket thereon defining a coupling means of a modular dimension and interconnectable with each other via said coupling means, the dimensions of each of said toy elements being an integral multiple of said modular dimension of said coupling means; and,
positioning means on said page arranged within said picture for coupling at least one of said toy elements to said page to receive others of said toy elements, said positioning means having dimensions comprising integral multiples of said modular dimension of said coupling means.

5,049,079
CLOSED LOOP SKI SIMULATION AND INSTRUCTIONAL SYSTEM
Matthew P. Furtado, Los Altos, 1430 Montclair Place, Calif. 94022, and John H. Peterson, 834 A Green St., San Francisco, Calif. 94133, assignors to John H. Peterson, San Francisco, Calif.
Filed Dec. 19, 1988, Ser. No. 286,764
Int. Cl.[5] A63B 69/18
U.S. Cl. 434—253 46 Claims

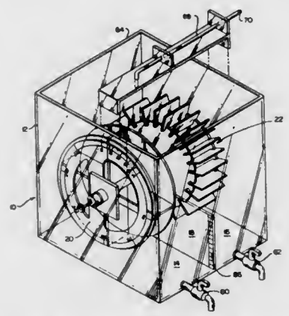
1. A foot-controlled input device responsive to pressure applied thereto by a user for providing a control signal to a computer system, the foot-controlled input device comprising:
(a) multi-variable pressure sensing means comprising at least one multi-variable pressure sensing element responsive to variations in pressure applied thereto for generating a continuous output signal indicative of the variations in applied pressure; and
(b) a foot-controlled element overlying the multi-variable pressure sensing means such that pressure applied thereto





by the user causes proportional pressure to be applied to the multi-variable pressure sensing means.

5,049,080
WATERWHEEL DEMONSTRATING APPARATUS
Mahlon E. Kriebel, and James W. Holsapple, both of Syracuse, N.Y., assignors to Kriebel and Holsapple, Inc., Syracuse, N.Y.
Filed Jul. 19, 1990, Ser. No. 554,473
Int. Cl.[5] G09B 23/00
U.S. Cl. 434—300 14 Claims

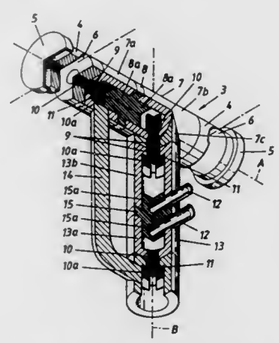


1. A device for demonstrating scientific principles comprising:
an enclosure adapted to contain a liquid having at least two compartments;
a first vaned wheel rotatably mounted in one of said compartments;



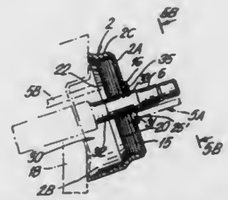
a second vaned wheel rotatably mounted in another of said compartments;
said first and second vaned wheels being interconnected for simultaneous rotation, together when one wheel is rotated;
said first vaned wheel having four vanes spaced at 90° intervals thereabout extending from the axis to the circumference thereof;
said second vaned wheel having a plurality of vanes spaced about the circumference thereof;
means for maintaining a predetermined level of liquid in the compartment in which said second wheel is mounted so as to contact some of said plurality of vanes;
liquid flow means for causing a predetermined stream of liquid to impinge upon said first vaned wheel; and
drain means for keeping said first wheel compartment empty of liquid;
whereby said first wheel is caused to rotate and in turn rotate the second wheel driving the vanes of said second wheel through the liquid in said second wheel compartment.

5,049,081
LOW-VOLTAGE LIGHTING FIXTURE
Kurt Ribitsch, Dachsbergweg 4b, A-4400 Steyr, and Andreas Zoufal, Stelzerstrasse 35, A-4020 Linz, both of Austria
PCT No. PCT/AT88/00088, § 371 Date Aug. 25, 1989, § 102(e) Date Aug. 25, 1989, PCT Pub. No. WO89/04437, PCT Pub. Date May 18, 1989
PCT Filed Nov. 4, 1988, Ser. No. 392,981
Claims priority, application Austria, Nov. 4, 1987, 2908/87
Int. Cl.[5] H01R 39/00
U.S. Cl. 439—10 8 Claims



1. A low-voltage lighting fixture comprising
(a) a pair of parallel electrical conductor rails, and
(b) an electrical current collector shoe slidingly mounted on the conductor rails, the collector shoe comprising
(1) a pair of collector heads slidingly mounted on the rails,
(2) a socket carrier electrically conductively connected to the collector heads and comprised of two electrically conductive socket carrier sections electrically insulated from each other by an insulating element positioned between the socket sections,
(3) means for mounting the socket carrier between the collector heads for rotation about an axis extending perpendicularly to the rails, and
(4) means forming a socket for a lamp on the socket carrier.

5,049,082
THRU WIRE HELM ASSEMBLY
Thomas G. Carter, Kent, Ohio, assignor to IMO Industries, Inc., Hudson, Ohio
Filed Mar. 15, 1990, Ser. No. 494,164
Int. Cl.[5] H01R 39/00
U.S. Cl. 439—15 4 Claims



1. A helm bezel assembly adapted for installation about a steering wheel shaft which extends through a dashboard of a vessel and is capable of supporting a steering wheel, said electric bezel assembly comprising:
a bezel housing having a first housing end and a second housing end, with continuous side wall surfaces extending therebetween, which define an interior cavity between said first and second housing ends, said first housing end having a fist axially disposed aperture through which said steering wheel shaft is free to pass, and said second housing end being substantially open and adapted for stationary mounting to said dashboard;
a wire coil wound in an annular configuration and having a first end portion and a second end portion;
a bezel plate having a second axially disposed aperture and circumferential dimensions permitting positioning of said bezel plate stationarily within said interior cavity of said bezel housing so as to confine said wire coil between said first housing end and said bezel plate, while said second end portion of said wire coil is permitted to extend through a third aperture formed in said bezel plate and be connected to said dashboard; and
a collar adapted for stationary mounting to said steering wheel shaft and for securing said second end portion of said wire coil adjacent said steering wheel shaft and permitting said second end portion to extend up said steering wheel shaft to said steering wheel, said collar being further adapted to rotate freely within said first axially disposed aperture in said first housing end,
whereby said helm bezel assembly is capable of providing electrical connections between said steering wheel and said dashboard as said steering wheel shaft is rotated.

5,049,083
UNIVERSAL JOINT FOR TELEPHONE USE
Edward Lin, Taipei Hsien, Taiwan, assignor to Multi-Tooling Precision Industrial Co., Ltd., Taipei, Taiwan
Filed May 10, 1990, Ser. No. 521,490
Int. Cl.[5] H01R 39/00
U.S. Cl. 439—26 1 Claim

1. A universal joint mainly adapted for use in connection of an extension cord to a telephone receiver comprising:
a dome-shaped cap having a peripheral flange at the bottom thereof and an opening disposed on a wall thereof;
a tapered cord seat having a flange at one side thereof with a number of resilient legs obliquely extended away from the flanged side with the underside of said cord seat having disposed thereon a number of contact protrusions formed by roundly bending said resilient legs; said cord seat cooperating with said opening of said dome-shaped cap;
a pair of ring washers, the first being disposed on top of said flange of said cap and the second being located thereunder in assembly;

an engagement ring member disposed on top of said ring washer and being in limiting engagement with said dome-shaped cap so to couple the same to a bottom base in assembly;

a circular pc board having a number of copper coated contact tracks disposed in concentric manner equal in number to said contact protrusions, and a number of locking protrusions disposed on the peripheral edge thereof;

a bottom base having a circular concavity into which are respectively inserted said circular pc board, said second washer, said dome-shaped cap with which said cord seat is attached, said first washer and said engagement ring member on the inner wall of said concavity, a number of grooves in correspondence with said locking protrusions of said pc board being disposed so that said pc board can be removably fixed in place; a horizontal rectangular extension projected from said bottom base being provided



with a number of wire guide grooves at the end thereof and a downwardly slanted engagement chip being disposed under said horizontal extension, on which an engagement hook is defined so that the bottom base can be engaged with a hole on a telephone receiver;

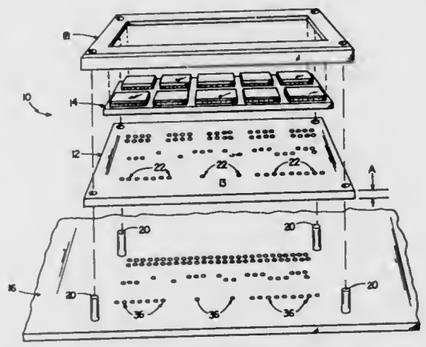
said dome-shaped cap with said cord seat engaged therewith being removably located in said concavity of said bottom base; and said circular pc board being placed under said cord seat with said copper coated concentric contact tracks in abutment with said contact protrusions of said resilient legs; said horizontal rectangular extension being engaged with a telephone receiver and an insertion head of an extension cord being coupled to said cord seat in said opening of said dome-shaped cap, whereby the extension cord will not become tangled or twisted when said telephone receiver is repositioned as a result of said dome-shaped cap being rotatable with respect to said bottom base.

**5,049,084**

## ELECTRICAL CIRCUIT BOARD INTERCONNECT

**Stephen M. Bakke, Gales Ferry, Conn., assignor to Rogers Corporation, Rogers, Conn.**

**Filed Dec. 5, 1989, Ser. No. 446,085**
**Int. Cl.[5] H01R** *9/09*
**U.S. Cl. 439— 66** **20 Claims**



1. An area array connector device for providing electrical interconnection between a plurality of first contact pads arranged on a surface of a first circuit board and a plurality of corresponding second contact pads on an opposed surface of a second opposed circuit board, said area array connector device comprising an electrically nonconductive support member adapted to be disposed between the circuit boards and comprising resilient elastomer material, said support member having support surfaces to be respectively opposed to the surfaces of the first and second circuit boards, and

a plurality of bodily-rotatable, electrically conductive interconnect elements, each said interconnect element comprising

an axially elongated, preformed rod-like rigid body member inserted in, and extending generally in the direction of the thickness of the resilient elastomer support member,

a first terminal member, and

a second terminal member,

each said terminal member having a width sufficiently greater than the diameter of said rigid body member to resist removal of said interconnect element from said elastomeric support member,

said terminal members being disposed generally coaxially with said body, and shaped to provide pad engagement surfaces about said axis capable of proper engagement with the respective contact pads regardless of orientation of the element about its axis, a line projected through said pad engagement surfaces being disposed at an acute angle to the direction of thickness of said support member, and

said first and second terminal members further defining support member engaging surfaces disposed about said axis and at least closely in opposition to said support surfaces of said support member to engage upon said support surfaces during bodily rotation of said interconnect element whereby, when said area array connector device is disposed between the circuit boards in a clamped-together relationship with said interconnect elements in registry with their respective corresponding contacts pads and with said interconnect elements rotated bodily as a result of said clamping so that said line projected through said pad engagement surfaces of each element lies at an acute angle, said interconnect elements are supported by said elastomer support member to bear with force upon the contact pads.

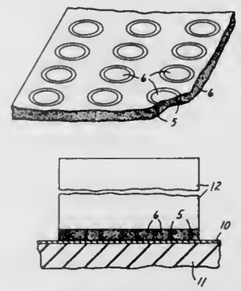


**5,049,085**

## ANISOTROPICALLY CONDUCTIVE POLYMERIC MATRIX

**Robert S. Reylek, Shoreview, and James G. Berg, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Continuation of Ser. No. 456,602, Dec. 22, 1989, abandoned, which is a continuation of Ser. No. 342,713, Apr. 21, 1989, abandoned, which is a continuation of Ser. No. 110,093, Oct. 14, 1987, abandoned, which is a continuation of Ser. No. 796,330, Nov. 6, 1986, abandoned. This application Feb. 5, 1991, Ser. No. 652,213**
**Int. Cl.[5] H01R** *9/09*
**U.S. Cl. 439—91** **26 Claims**



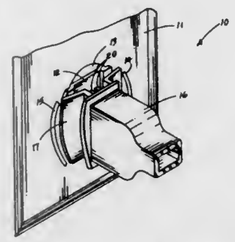
1. An anisotropically conductive polymeric matrix comprising a polymer layer having a plurality of electrically conductive members therethrough, spaced such that at least some of said members are electrically isolated from one another, said members being at least partically tubular and comprising a deformable coating of an electricallty conductive material formed in shapes which extend from one face of said layer substantially through the thickness thereof, such shapes resulting from the use of removable forming means, whereby electric current can be conducted through the thickness of said polymeric layer by said members.

**5,049,086**

## LOCKING WALL PLATE AND PLUG APPARATUS

**Donald E. Slaven, 260 S. Litchfield Rd., #C132, Litchfield Park, Ariz. 85340**

**Filed Jan. 22, 1991, Ser. No. 644,276**
**Int. Cl.[5] H01R** *13/44*
**U.S. Cl. 439—143** **5 Claims**



1. A locking wall plate and plug apparatus comprising, in combination,

a mounting plate, the mounting plate including at least one annular opening, the annular opening including a rotatable outlet plate captured within the annular opening and rotatable from a first vertical position to a second vertical position, the rotatable outlet plate including a plurality of spaced parallel electrical prong receiving slots wherein the prong receiving slots are in a vertical orientation in the first position and in a vertical orientation in the second position mounted within the rotatable outlet plate, and

an electrical plug member, the electrical plug member including a lock plate fixedly mounted to a forward end of the electrical plug member, and

the electrical plug member including a plurality of locking legs orthogonally mounted and forwardly directed of the locking plate, and

the locking legs spaced apart a predetermined diameter, and

a plurality of electrical prongs mounted to the electrical plug member between the locking legs and directed forwardly of the lock plate, and

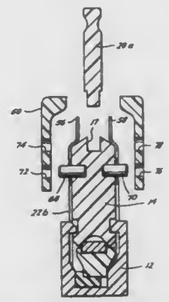
the annular opening including a right and left annular locking slot wherein the locking legs are receivable within the locking slots in the second position and are displaced from the locking slots in the first position.

**5,049,087**

## ELECTRICAL CONNECTOR USING FLEXIBLE CIRCUIT TAPE

**Chang-Hwa Chung, San Jose, Calif.; Thomas H. Hunter, and Robert H. Haskell, Jr., both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.**

**Continuation-in-part of Ser. No. 558,936, Jul. 27, 1990, which is a continuation-in-part of Ser. No. 389,927, Aug. 4, 1989, abandoned. This application Oct. 26, 1990, Ser. No. 604,048**
**Int. Cl.[5] H01K** *13/629*
**U.S. Cl. 439—259** **12 Claims**



1. An electrical connector having first and second coacting and releasable parts, each of said parts including a plurality of spaced electrical contacts for connection to the contacts on the other part comprising,

the electrical contact on said second part including a flexible electrical tape having a plurality of lead ends for connection to a circuit board,

means on the second part for coacting with and receiving a circuit board, and

a side panel having a lead support shoulder, said panel being releasably connected to the outside of said second part in first or second positions, in said first position said panel encloses and protects the lead ends of the flexible tape, and in said second position the lead support shoulder engages the lead ends adjacent to but spaced from the ends for providing support for bonding the leads to a circuit board.

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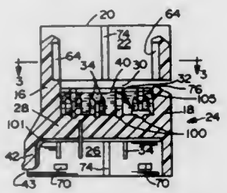


5,049,088

## MULTI CONDUCTOR ELECTRICAL CABLE CONNECTOR

**Paul L. Rishworth, Bellevue; Denis L. Rishworth, Knysna Heights, both of South Africa, and Daniel A. Dixon, Naperville, Ill., assignors to Molex Incorporated, Lisle, Ill.**

**Continuation-in-part of Ser. No. 479,302, Feb. 7, 1990, Pat. No. 5,009,612. This application Dec. 5, 1990, Ser. No. 622,457**
**Int. Cl.[5] H01R *4/24***
**U.S. Cl. 439—417** **8 Claims**



1. An electrical connector for electrical connection to each of a plurality of discrete conductors in a ribbon cable, said connector comprising:

a housing unitarily molded from a nonconductive material and having a bottom wall and a plurality of interconnected side walls extending upwardly from the bottom wall to define an open topped termination cavity, one of said upstanding side walls including an elongated cable slot for slidably receiving an end of the ribbon cable therein, a plurality of said upstanding side walls being characterized by elongated locking structures lying substantially in a common plane;

a plurality of terminals having mounting portions frictionally secured in the bottom wall of the housing such that each said mounting portion is surrounded and supported by a unitary matrix of nonconductive material, each said terminal having insulation displacement structure disposed in the termination cavity for electrical connection with one of said conductors in the ribbon cable; and,

a press member having a bottom face configured for urging the ribbon cable into the insulation displacement structure of the respective terminals in the termination cavity of the housing, said press member further comprising a plurality of side faces for sliding frictional engagement with the side walls of the housing such that the press member is frictionally retained in the housing in a first position where the bottom face of the ribbon cable is spaced from the terminals of the housing and such that the press member is slidably movable into a second position where the bottom face of the press member urges the conductors of the ribbon cable into the insulation displacement structure of the terminals in the housing, said press member further comprising a plurality of coplanar locking structures disposed and dimensioned for locking engagement with the locking structures of the housing, whereby the coplanar alignment of the locking structures of the housing and the press member prevents skewing of the press member and the cable prior to and during termination.

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5,049,089

## LOW COST ARCH CONNECTOR

**Norbert Koenig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

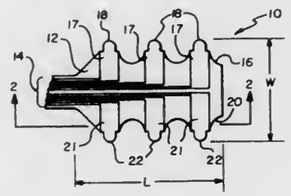
**Filed Aug. 17, 1990, Ser. No. 568,920**
**Int. Cl.[5] H01R *9/09***
**U.S. Cl. 439—493** **25 Claims**

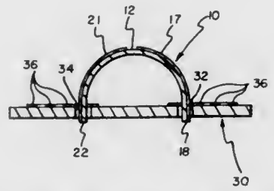
1. A flexible printed wiring arch connector integrally formed with a flexible printed wiring member and adapted to be inserted into apertures of a printed circuit board, comprising:

an elongated, flexible, insulative, planar substrate having a plurality of electrical conductors formed thereon extending from the printed wiring member in a direction parallel along the elongated dimension of the substrate;

first and second sets of finger-like projections integrally formed with the substrate on opposite elongated sides of the substrate; and

connector leads formed on the projections, electrically connected to desired individual ones of the conductors and extending in a direction generally perpendicular to the conductors, whereby arcuate bending of the projections and connector leads in a direction crosswise of the elongated substrate disposes the projections and connector leads for insertion and retention under a restoring spring force in the circuit board apertures.





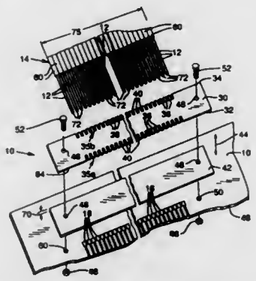
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5,049,090

## ELECTRICAL CONNECTOR

**Marvin T. Johnson, Bothell, Wash., assignor to Applied Microsystems Corporation, Redmond, Wash.**

**Filed Feb. 2, 1990, Ser. No. 475,142**
**Int. Cl.[5] H01R *9/07***
**U.S. Cl. 439—493** **24 Claims**



1. An electrical connector kit having component parts capable of being assembled to provide mechanical coupling and electrical contact between an electrically conductive substrate and plural electrical conductors arranged as a flat cable assembly, the kit comprising:

a flat substantially rigid, electrically nonconductive spacing element having first and second opposed side margins along which are positioned substantially identical alternating slots and tabs that are respectively adapted to receive and hold in spaced-apart relation the electrical conductors of the flat cable assembly;

a resilient material that is electrically conductive in directions only substantially parallel to a conduction axis and is adapted to be secured between the spacing element and the substrate to provide plural separate electrically conductive pathways between the electrical conductors and the substrate; and

a fastener adapted to fasten the resilient material between and in electrical contact with the substrate and the electrical conductors held on the spacing element.



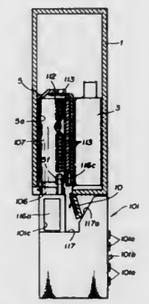
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5,049,091

## EQUIPMENT FOR CONNECTION TO ELECTRONIC EQUIPMENT

**Masato Tanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Dec. 5, 1990, Ser. No. 622,829**
**Claims priority, application Japan, Dec. 6, 1989, 1-316720**
**Int. Cl.[5] H01R *13/00***
**U.S. Cl. 439—500** **18 Claims**



1. An adapter device comprising

a tubular connecting section inserted into a battery housing section within an electronic equipment.

a main body section containing an electronic circuit and having a power supply section for supplying the power to said electronic equipment, and

a plurality of connecting terminals provided in said connecting section, said connecting terminals being electrically connectable to said electronic circuit and capable of abutting on a plurality of mating connecting terminal patterns in said battery housing section, said patterns being arrayed at right angles to the inserting direction of said connecting section,

data signals being exchanged between said electronic equipment and the electronic circuit of said main body section through at least one of said connecting terminals.

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5,049,092

## CONNECTOR ASSEMBLY FOR ELECTRICAL COMPONENTS

**T. Takano, and K. Shinzawa, both of Tokyo, Japan, assignors to Daiichi Denso Buhin Co., Ltd., Tokyo, Japan**

**Filed Jul. 10, 1990, Ser. No. 550,854**
**Claims priority, application Japan, Jul. 21, 1989, 1-85914[U]; Jul. 21, 1989, 1-85915[U]; Aug. 8, 1989, 1-93176[U]; Aug. 8, 1989, 1-93177[U]; Aug. 8, 1989, 1-93178[U]; Aug. 10, 1989, 1-94036[U]; Aug. 10, 1989, 1-94037[U]; Aug. 10, 1989, 1-94038[U]; Sep. 12, 1989, 1-106881[U]; Sep. 12, 1989, 1-106882[U]**
**Int. Cl.[5] H01R *13/74***
**U.S. Cl. 439—540** **4 Claims**

1. A connector assembly for electrical components which includes a connector subassembly, and an attachment member to which said connector subassembly is coupled, wherein

(1) said attachment member includes interior edges which define an engaging hole sized and configured to accept said connector subassembly therewithin,

(2) said connector subassembly includes:

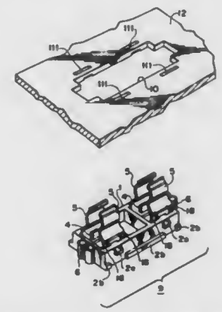
an electrically insulating base having a pair of opposed exterior wall surfaces,

paired locking tabs and flanges extending outwardly from respective ones of said exterior wall surfaces of said insulating base, said locking tabs and said flanges of each said pair being vertically spaced from one another to define an engagement space therebetween for accommodating respective portions of said interior edges of said attachment member,

connector insertion holes,

a pair of connectors mounted within said connector insertion holes of said insulating base, each said connector integrally including (i) a resilient U-shaped connector portion for holding an electrical component and for establishing electrical connection therewtih, and (ii) a plug-in receptacle for receiving a terminal portion of an electrical lead, and wherein

said electrically insulating base is positioned within said engaging hole defined by said interior edges of said attachment member, and is coupled to said interior edges of said attachment member by means of said paired locking



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5,049,093

## CARD EDGE ELECTRICAL CONNECTOR

**Dennis P. Walter, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 16, 1989, Ser. No. 422,266**
**Int. Cl.[5] H01R *9/05***
**U.S. Cl. 439—581** **6 Claims**

1. A radio-frequency connector comprising:

a connector member comprising at least one electrical contact and a slot for receiving a card-shaped object; and

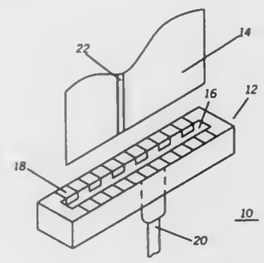
a coaxial cable having a coupling end coupled to the connector member, the coaxial cable comprising a central conductor, an insulating layer around the central conductor, and a shield, around the insulating layer;

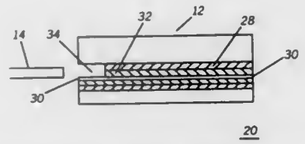
the coupling end having a portion of the shield and a portion of the insulating layer stripped and having a portion of the conductor exposed to provide an electrical contact for

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connecting in a direct manner to a contact on the card-shaped object;




and wherein the shield is coupled, with an electrical contact of the connector member, to provide a ground connection.

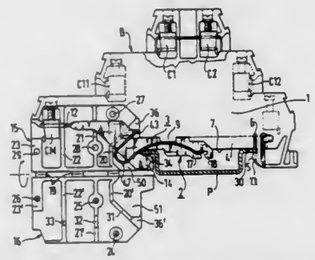
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**5,049,094**

**FIXING DEVICE FOR FIXING A TERMINAL BLOCK ON A SYMMETRICAL MOUNTING RAIL**

**Jean-Paul Heng, Lyon; Jean-Claude Bidal, Reyrieux, and Michel Predignac, Lyon, all of France, assignors to Entrelec S.A., Villeurbanne, France**

**Filed Feb. 28, 1991, Ser. No. 662,134**
**Claims priority, application France, Mar. 2, 1990, 90 02651**
**Int. Cl.[5] H01R** *9/26*
**U.S. Cl. 439—716** **3 Claims**



1. A fixing device for fixing a terminal block on a symmetrical rail, the device being situated on a base of an insulating case of the terminal block and including a metal fastening piece and a spring, the fastening piece including a body, first and second rigid hooks under the body, and a rod, the first hook being situated at the opposite end of the body to the rod, the second hook being situated at the other end of the body, and the base including a longitudinal slot in its bottom portion, wherein:

the body has a third hook and a stop between the first and second hooks, the third hook being nearer to the second hook and the stop being nearer to the first hook;

the spring is a blade spring constituted by two sub-blades separated by a slot and interconnected by first and second bridges situated at respective ends of the blade spring;

said blade spring has an arched portion followed by a curved portion bent back towards the convex side of the arched portion;

the rod is connected to the body by a connection zone including a tooth above the body; and

wherein the blade spring has its second bridge located at the end of the arched part, said second bridge cooperating with the third hook and the first bridge cooperating with said tooth to fix the blade spring onto the fastening part.

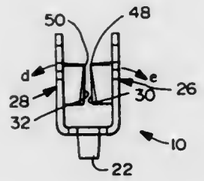
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**5,049,095**

**AUTOMOTIVE FUSE SOCKET AND TERMINALS THEREFOR**

**Robert J. Gugelmeyer, Aurora, Ill., assignor to Molex Incorporated, Lisle, Ill.**

**Filed Jun. 4, 1990, Ser. No. 532,771**
**Int. Cl.[5] H01R** *11/22*
**U.S. Cl. 439—856** **14 Claims**




1. An electrically conductive terminal stamped and formed from a unitary piece of metallic material and comprising a generally C-shaped base having a bight wall and first and second opposed arms extending unitarily from the bight wall, first and second contact beams connected to and extending from the respective first and second arms of the base and defining mating ends at locations on the contact beams remote from the base, said contact beams converging toward one another to define contact surfaces across the width of the beams at locations of minimum distance therebetween, said terminal further comprising a generally U-shaped assist structure having a bight portion in proximity to the base of the terminal portion and first and second arms extending from the bight portion and connected unitarily with the mating ends of the respective first and second contact beams, said assist structure being separated from the contact beams at locations intermediate the mating ends and the base, wherein the improvement comprises:

the contact surfaces across the width of the first and second contact beams being non-parallel in an unbiased condition of the terminal and converging toward one another at locations thereon further from the assist structure, whereby upon insertion of a blade terminal between the contact beams, each contact beam deflects about a first axis at the connection of the contact beam to the base and about a second axis at the connection of the contact beam to the assist structure, the deflection of the contact beam about the assist structure urging the contact surfaces across the width of the first and second contact beams into parallel alignment with one another upon insertion of a planar blade terminal therebetween.

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**5,049,096**

**VANED DIVERTER NOZZLE FOR JET BOATS**

**Jimmy D. Henn, 710 Wedgewood La., La Habra, Calif. 90631**

**Filed Dec. 27, 1989, Ser. No. 457,571**
**Int. Cl.[5] B63H** *11/11, 11/113*
**U.S. Cl. 440—041** **6 Claims**

1. An improved diverter for use with a jet boat comprising,

inlet means having an axial aperture therethrough,

outlet means having an axial aperture therethrough,



said inlet means and said outlet means have generally hollow cylindrical configurations,

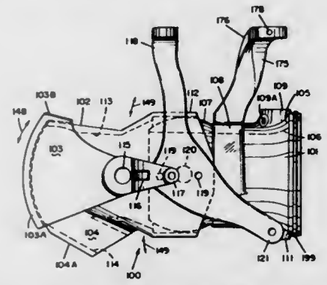
the rearward end of said inlet means comprises a ball-shaped housing,

the forward end of said outlet means is pivotally mounted to the rearward end of said inlet means by a pivot pin which passes through the surfaces of both said inlet means and said outlet means so that the respective apertures therethrough are substantially aligned,

swivel arm means connected to said outlet means and pivotable therwith relative to said inlet means,

reverse outlet means having an axial aperture therethrough,

said reverse outlet means is formed in the configuration of an oblate cylinder which has a relatively flat lower surface whereby fluid flow therethrough is relatively unimpeded in order to enhance operation of said jet boat,



said reverse outlet means disposed adjacent to said outlet means so that the axial apertures through said outlet means and said reverse outlet means are arranged at an acute angle so as to be nearly parallel to each other whereby said apertures through said outlet means and said reverse outlet means are axially displaced from each other and do not cause interaction of fluid flow through said outlet means and said reverse outlet means in the absence of a reverse bucket means whereby drag on said jet boat is reduced,

reverse bucket means pivotally mounted to said outlet means and adapted to selectively close the aperture through said outlet means thereby to divert fluid flow from said inlet means through said reverse outlet means, and

vane means attached to the interior of at least on of said inlet means and said outlet means and extending radially into the aperture thereof.

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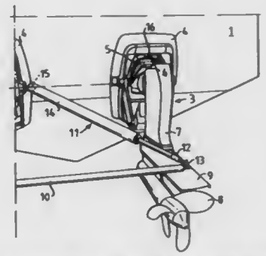
**5,049,097**

**STEERING SHOCK ABSORBER FOR BOAT PROPELLER DRIVE UNITS**

**Christian Rodskier, Torslanda, and Kjell Borgersen, Hjälteby, both of Sweden, assignors to AB Volvo Penta, Goteborg, Sweden**

**Filed Apr. 20, 1990, Ser. No. 512,384**
**Claims priority, application Sweden, Apr. 20, 1989, 8901436**
**Int. Cl.[5] B63H** *1/15*
**U.S. Cl. 440—52** **3 Claims**

1. In a boat having a propeller leg having a propeller, said propeller leg being steerable about a substantially vertical steering pivot shaft and being tiltable about a horizontal tilt shaft and having an anti-cavitation plate mounted above the propeller; the improvement comprising a shock absorber in the form of a passive pistoncylinder device which at one end is articulated directly to the anti-cavitation plate at a location remote from the steering pivot shaft and at the opposite end is



articulated to a fixed part of the boat at a point adjacent the axis of the horizontal tilt shaft.

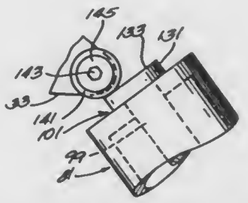
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**5,049,098**

**MARINE PROPULSION DEVICE WITH TILT AND TRIM ASSEMBLY INCLUDING ROLLER TRANSMITTED THRUST**

**Gregory J. Binversie, Grayslake, Ill.; Joseph E. Capodarco, Kenosha, Wis.; James R. DeRam, Libertyville, Ill., and H. Norman Petersen, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.**

**Filed May 14, 1990, Ser. No. 523,321**
**Int. Cl.[5] B63H** *21/26*
**U.S. Cl. 440—61** **8 Claims**

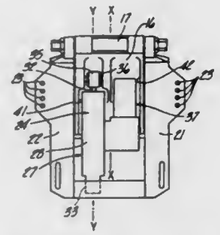



1. A marine propulsion device comprising a transom adapted to be mounted on a boat transom, a swivel bracket supported from said transom bracket for pivotal movement about a horizontal tilt axis and relative to a trim range and a tilt range extending upwardly from the trim range, a thrust roller supported by said swivel bracket for rotation about a horizontal axis parallel to said tilt axis, a tilt cylinder/piston assembly pivotally connected to said swivel bracket and to said transom bracket; a trim cylinder/piston assembly fixed to said tilt cylinder piston assembly for common pivotal movement therewith relative to said transom bracket and including a trim cylinder and a trim piston rod extending from said trim cylinder and having an outer end surface engageable with said thrust roller throughout movement of said swivel bracket in the trim range, and a propulsion unit supported by said swivel bracket for common movement therewith about said tilt axis and for pivotal steering movement relative to said swivel bracket about a steering axis transverse to said tilt axis and including a propeller shaft adapted to have mounted thereon a propeller.

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5,049,099
**POWER TILT DEVICE**
Hiroshi Ito, Shizuoka, and Ryoichi Nakase, Hamamatsu, both of Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Mamamatsu, Japan
Continuation of Ser. No. 390,656, Aug. 7, 1989, abandoned, which is a continuation of Ser. No. 619,054, Jun. 11, 1984, abandoned. This application Aug. 13, 1990, Ser. No. 567,697
Claims priority, application Japan, Jun. 11, 1984, 58-105766
Int. Cl.[5] B63H *5/12*
U.S. Cl. 440—61 6 Claims

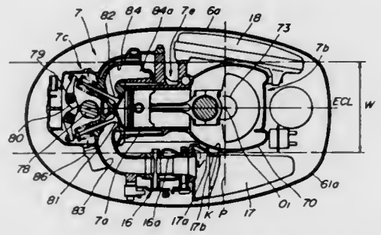


1. A power tilt and trim unit for a marine outboard drive, support means comprising a pair of spaced bracket arms lying on opposite sides of a vertically extending center plane for supporting said outboard drive by the hull of a watercraft for pivotal movement about a generally horizontally extending trim axis, a linear type fluid motor positioned on one side of said center plane between said center plane and one of said bracket arms and having a cylinder housing defining a bore, a piston reciprocal in said bore, a piston rod affixed to said piston and extending from said cylinder housing, said piston rod and said cylinder housing each providing a respective eyelet to receive a pivot pin for effecting a respective pivotal connection between the hull and said outboard drive for effecting pivotal movement of said outboard drive upon actuation of said fluid motor, a pump for actuating said fluid motor, and drive means for said pump, said pump and said drive means being positioned in proximity to said fluid motor and on the other side of said center plane and adjacent to and inboard of the other of said bracket arms, said pump, a trim pin extending between said bracket arms and adjacent the portion of said cylinder housing defining said bore for limiting the trim down adjustment of said outboard drive and for protecting said cylinder housing said drive means and said fluid motor being positioned relative to said outboard drive and said bracket arms to be protected thereby, with said pump, drive means and fluid motor being positioned between the hull and said trim pin, said outboard drive having a pair of portions one of which is positioned to nest in part between said fluid motor and said pump and said drive means on one side of said center plane and the other of which nests in part between said fluid motor and one of said bracket arms, said pair of portions providing the pivotal connection to said fluid motor on said one side of said center plane adjacent said one bracket arm.

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5,049,100
**OUTBOARD ENGINE UNIT**
Hiroshi Yamamoto; Hitoshi Suzuki, and Yasushi Itai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 17, 1990, Ser. No. 509,748
Claims priority, application Japan, Apr. 17, 1989, 1-96766; Apr. 17, 1989, 1-96768
Int. Cl.[5] B63H *21/26*
U.S. Cl. 440—77 19 Claims

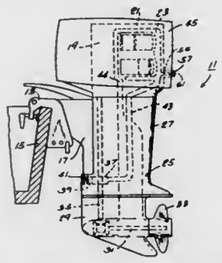
1. An outboard engine unit comprising:
a casing assembly defining an outboard engine unit external surface;
a propeller shaft disposed horizontally in a lower portion of said casing;
a propeller mounted on one end of said propeller shaft and disposed outside of said casing assembly;
an engine disposed in an upper portion of said casing assembly and including a crankshaft having an axis extending vertically and at least one cylinder having an axis extending horizontally, said axis of said crankshaft being disposed on the extension of said axis of said cylinder; and



a vertical shaft disposed vertically in said casing, for transmitting rotative power of said crankshaft to said propeller shaft;
wherein said axis of said at least one cylinder extends substantially parallel to the longitudinal central axis of said casing assembly and thereby said axes of said cylinder and said crankshaft are laterally offset from the longitudinal central axis of said casing assembly as they are viewed in plan.

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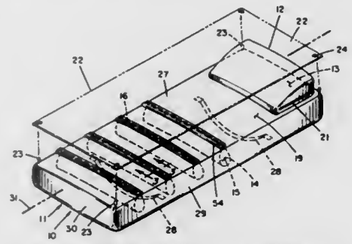
5,049,101
**MARINE PROPULSION DEVICE WITH ARRANGEMENT FOR FLUSHING ENGINE COOLING JACKET**
Gregory J. Binversie, Grayslake; George L. Broughton, Zion, and Robert L. Turk, Waukegan, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of Ser. No. 372,704, Jun. 26, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 479,936
Int. Cl.[5] B63H *21/10*
U.S. Cl. 440—88 24 Claims



9. An internal combustion engine including an engine block having a cooling jacket, a conduit extending from said engine block and including a bore communicating with said cooling jacket, and valve means in said bore for permitting inflow to said cooling jacket and for substantially preventing outflow to said cooling jacket while affording limited flow from said cooing jacket so as to provide a tell-tale.



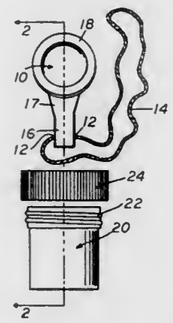
5,049,102
**RECREATIONAL RAFT APPARATUS**
Michael Hull, 4142 Crossing La., Dallas, Tex. 75220
Filed Dec. 22, 1988, Ser. No. 289,230
Int. Cl.[5] B63C *9/00*
U.S. Cl. 441—41 4 Claims



1. A recreational raft apparatus which comprises:
an inflatable, floatable body portion, to which is attached an inflatable pillow, wherein said body portion and said pillow each contain at least one essentially watertight zipper, wherein a plurality of body portion zippers are positioned on the top of said body portion and extend transversely to the axis of said raft, wherein each of said plurality of body portion zippers is associated with a pouch to contain articles, wherein said pouches extend transversely to the axis of said raft within said body portion cavity and are attached to the inner-surface of the top of said body portion;
a plurality of flaps attached to said body portion, each of which extend over and essentially cover one of said body portion zippers and said pillow zippers;
two handles attached to said body portion of said raft at a point about one-fourth of the distance to the end of said body portion; and
a plurality of means for attaching a towel to the top side of said raft.

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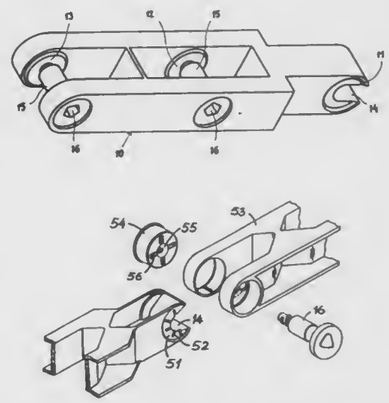
5,049,103
**BUBBLE TOY NECKLACE**
Louis Pearl, P.O. Box 436, Sausulito, Calif. 94965
Filed Feb. 4, 1991, Ser. No. 650,300
Int. Cl.[5] A63H *33/28*
U.S. Cl. 446—19 11 Claims



1. A bubble toy comprising:
(a) an elongated substantially funnel shaped blowing horn having a passage therethrough from a narrower mouthpiece end to a wider bubble forming end;
(b) a necklace cord, said horn being attached to said cord so as to permit said horn to be worn as a necklace;
(c) a bubble solution vial, the mouth of said vial being large enough to allow insertion of the bubble forming end of said horn into said vial in order to prime said horn for bubble blowing;
(d) a lid for said vial, said lid being removably mountable on said vial so as to seal bubble solution inside said vial; and
(e) a first means for removably attaching said horn to said lid so as to allow said vial, said lid, said cord, and said horn to be transported as a single unit when said lid is mounted on said vial and said horn is attached to said lid by said first means.

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5,049,104
**CONNECTING MEANS FOR A TOY BUILDING SET**
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Feb. 26, 1990, Ser. No. 485,215
Claims priority, application Denmark, Feb. 24, 1989, 872/89
Int. Cl.[5] A63H *33/12, 33/04, 33/08;* F16C *11/06*
U.S. Cl. 446—104 11 Claims



1. A connector for a toy building set, comprising a first coupling part and a second coupling part complementary to said first coupling part, said first and second coupling parts being provided on respective ones of a pair of building set elements which are to be interconnected, characterized in that the coupling parts are adapted to interconnect the elements by elastic movement between a stressed condition of at least one of said coupling parts wherein said second coupling part may be inserted within portions of said first coupling parts and a relaxed condition of said one of said coupling parts wherein said second coupling part will be retained by said portions of said first coupling part whereby relative linear and angular displacement is retarded, and that said connecting means further includes a clamping means movable between a release position in which elastic movement of said one of said coupling parts between said stressed and relaxed conditions is possible and a lock position in which said elastic movement of said one of said coupling parts is prevented.

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5,049,105
**HUB CONNECTOR FOR TUBES IN TOY CONSTRUCTION SET**
Joel I. Glickman, Huntingdon Valley, Pa., assignor to Magic Mold Corporation, Hatfield, Pa.
Filed Mar. 13, 1990, Ser. No. 492,644
Int. Cl.[5] A63H *33/08, 33/06*
U.S. Cl. 446—126 16 Claims

1. For use in a toy construction set comprising a plurality of hub-like connector elements joining hollow tube-like linear

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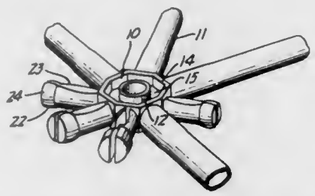
structural elements, wherein said linear structural elements have an internal diameter substantially uniform throughout their length, an improved connector element which comprises

(a) a one-piece injection molded unit including a body portion and a plurality of integral connecting lugs extending radially outward therefrom,

(b) said connecting lugs being of generally circular cross-sectional configuration for close reception within an end portion of a tubular linear structural element,

(c) each lug having a diameter and a length at least about two times said diameter,

(d) each lug having inner and outer end extremities and having a slightly enlarged outer end portion, convergently configured at said outer end extremity to facilitate insertion in a tube-like structural member,




(e) each lug having a longitudinally extending, open-ended slot recess therein extending from the outer end extremity thereof to a point closely adjacent its inner end,

(f) said slot recess extending from one side to the other of said lug to define spaced-apart, complimentary lug portions and being of sufficient width of accommodate substantial elastic displacement of said lug portions toward each other,

(g) a compression post extending between and integrally joining the spaced-apart portions of a lug at a position spaced inward from the enlarged outer end portion thereof, to increase the outward pressure of said lug portions within a tubular element applied thereover,

(h) said enlarged outer end portions having a normal outside diameter slightly larger than the internal diameter of said tube-like structural elements.

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**5,049,106**

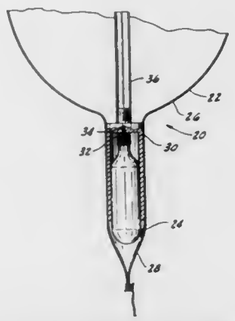
**SELF-CONTAINED, SELF-INFLATING NOVELTY BALLOON**

**Sunyong Kim, 105 Valley Forge, St. Charles, Mo. 63303, and Dae W. Lee, 1575 N. Warson Rd., St. Louis, Mo. 63132**

**Filed Jun. 4, 1990, Ser. No. 532,384**

**Int. Cl.[5] A63H** *3/06*

**U.S. Cl. 446—220** **18 Claims**




1. A self-contained, self-inflating novelty balloon unit comprising:

a closed, inflatable novelty balloon;

a canister containing compressed gas, entirely inside the balloon;

means for releasing the compressed gas from the canister into the balloon to inflate the balloon.

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**5,049,107**

**SOUND-BOX DEVICE**

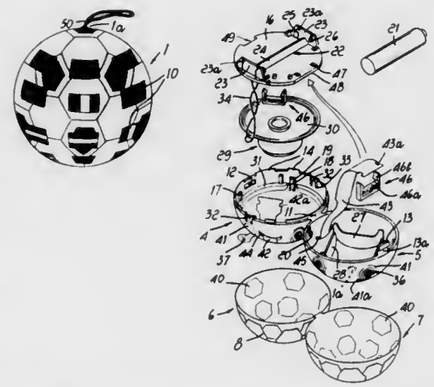
**Nicola De Nittis, Bologna, Italy, assignor to Malbo S.R.L., Bologna, Italy**

**Filed Mar. 29, 1990, Ser. No. 502,118**

**Claims priority, application Italy, Mar. 30, 1989, 4781/89[U]; Dec. 28, 1989, 4990/89[U]**

**Int. Cl.[5] A63H** *5/00*

**U.S. Cl. 446—397** **20 Claims**




1. A sound box device comprising:

a substantially spherical container having an outside surface, a first container portion and a second container portion,

a first hemispherical half-shell defined by said first container portion,

a second hemispherical half-shell defined by said second container portion,

connecting means connecting said first container portion to said second container portion, wherein said first container portion and said second container portion each comprise:

a supporting frame portion,

a deformable covering membrane portion,

coupling means attaching said deformable covering membrane portion to said supporting frame portion,

at least one base connected to said first container portion,

at least one control element having a microprocessor and being mounted on said base, said microprocessor producing a plurality of electric signals transduced into sound signals for producing an ordered plurality of sound sequences,

electric power supply means connected to said base and supplying power to said control element,

sound signal emission means housed in said first hemispherical half shell and being electrically connected to said control element,



at least one pair of films fixed to said first hemispherical half-shell and to said second hemispherical half-shell,

flattened surfaces defined on said first hemispherical half-shell and on said second hemispherical half-shell,

a plurality of contact switches provided on said films at said flattened surfaces,

a plurality of sensor elements defined by said plurality of contact switches, each of said sensor elements communicating with said electronic control element for selecting an electric signal among said plurality of electric signals transduced into sound signals and being activatable at said outside surface of said container,

a membrane keyboard formed by said plurality of sensor elements,

two substantially hemispherical membranes defined by said deformable covering membrane portion and being fixed on said outside surface of said substantially spherical container, each of said membranes having an inner membrane surface and an outer membrane surface,

graphic symbol means defined on said outer membrane surface of each of said substantially hemispherical membranes for indicating sound sequences, and

conductor means applied on said inner membrane surface of each of said hemispherical membranes beneath said graphic symbol means and being contactable with said contact switches.

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**5,049,108**

**METHOD AND APPARATUS FOR DIVIDING INTO INDIVIDUAL SAUSAGES A CONTINUOUS SAUSAGE STRAND PROVENIENT FROM A FILLING MACHINE**

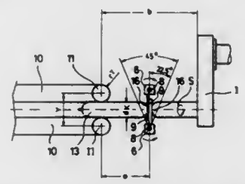
**Georg Staudenrausch, Biberach an der Riss, Fed. Rep. of Germany, assignor to Albert Handtmann Maschinenfabrik GmbH & Co. KG, Biberach an der Riss, Fed. Rep. of Germany**

**Filed Feb. 5, 1990, Ser. No. 475,166**

**Claims priority, application Fed. Rep. of Germany, Apr. 11, 1989, 3911859**

**Int. Cl.[5] A22C** *11/00*

**U.S. Cl. 452—48** **7 Claims**




1. A method for dividing a continuous sausage strand exiting from a filling machine into individual sausages comprising the steps of:

a) discharging continuously a stuffed sausage strand from a filling machine;

b) rotating said strand about its axis as it moves downstream from said machine;

c) constricting said strand at preselected spaced locations with a pair of rotating constrictor elements that rotate periodically into closely spaced position to divide the strand into individual sausages, said elements rotating about an axis perpendicular to the axis of the strand on either side of the strand, the rotational speed of the constrictor elements being variable between their speed when they are in engagement with the strand and the speed when they are disengaged from the strand to thereby vary the length of the divided sausages; and

subsequent to completion of the constricting step, continuously conveying the thus divided sausage strand always from the rotating elements while preventing it from being rotated.

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**5,049,109**

**HOG SCRAPER PADDLE**

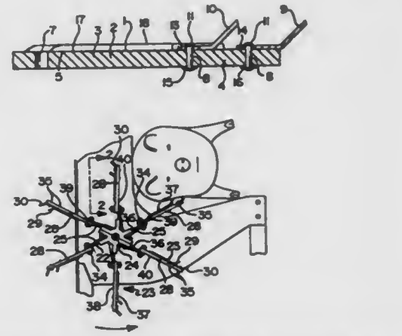
**Milorad Radovic, 12364 27 Mile Rd., Washington, Mich. 48094; John Mirkovich, 2531 Lakeshore Rd., Applegate, Mich. 48401, and Boja J. Loncarski, 2790 Mayfair, Troy, Mich. 48084**

**Continuation-in-part of Ser. No. 269,080, Nov. 9, 1988, Pat. No. 4,907,317. This application Mar. 13, 1990, Ser. No. 492,625**

**The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.**

**Int. Cl.[5] A22B** *5/08*

**U.S. Cl. 452—97** **5 Claims**




1. A hog scraper paddle for dehairing and polishing hog carcasses and the like, comprising:

a resiliently flexible substantially rectangularly block-shaped paddle body, said paddle body being made of an easy-to-clean, substantially non-porous thermoplastic material having a softening temperature endotherm peak greater than about 350° F. and a flexural modulus value selected from the group consisting of between about 100 and 6,000 psi and between about 30,000 and 150,000 psi.

mounting means for securing the paddle body to a dehairing machine;

said paddle body having an end for receiving the mounting means to secure the paddle body to the dehairing machine; and

at least one scraper blade attached to the paddle body for dehairing a carcass.

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**5,049,110**

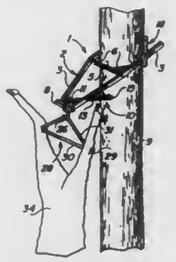
**PORTABLE GAME SUPPORT**

**James M. Owens, P.O. Box 1073, Hwy. 1204, Ball, La. 71405**

**Filed Mar. 5, 1990, Ser. No. 487,844**

**Int. Cl.[5] A22B** *1/00*

**U.S. Cl. 452—187** **20 Claims**




1. A portable game support comprising a pair of side frame members; a front frame connector connecting one end of said

side frame members; engaging frame means removably suspended from said front frame connector, said engaging frame means adapted to receive the game and suspend the game at said selected height in spaced relationship with respect to the tree or post; a central frame connector connecting said side frame members in spaced relationship with respect to said front frame connector, said central frame connector positioned to engage one side of the tree or post; and rear retainer means adjustably carried by said side frame members, said rear retainer means positioned to engage the opposite side of the tree post.

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**5,049,111**

**TORSION DAMPING DEVICE HAVING TWO COAXIAL PARTS MOUNTED FOR RELATIVE ANGULAR DISPLACEMENT AND INCORPORATING A VISCOUS DAMPING DEVICE AND A FRICTION DAMPING DEVICE**

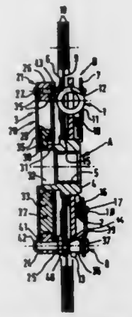
**Bernard Jamel, Paris, and Hervé Focqueur, Franconville, both of France, assignors to Valeo, Paris, France**

**Filed Aug. 23, 1989, Ser. No. 397,255**

**Claims priority, application France, Aug. 30, 1988, 88 11359**

**Int. Cl.[5] F16D** *3/12;* **F16F** *15/12, 15/16*

**U.S. Cl. 464—24** **1 Claim**



1. A torsion damping device comprising first and second coaxial parts, mounting means mounting said first and second coaxial parts for angular displacement relative to each other, said mounting means defining a predetermined range of angular displacement for relative movement of said coaxial parts, resilient means engaging said coaxial parts and resisting relative angular movement between said coaxial parts, movement damping means between said coaxial parts resisting said relative movement, said movement damping means including a viscous damping means between said coaxial parts having a fluid and calibrated passages through which said fluid flows in response to said movement and being operable for viscous damping of high speed variations between said coaxial parts and dry friction damping means between said coaxial parts for frictionally damping low speed variations between said coaxial parts, said first coaxial part comprising a damper plate and said second coaxial part comprising two guide rings disposed on opposite sides of said damper plate, said device also including a hub, said mounting means for said coaxial parts including first means mounting said damper plate around said hub and second means mounting said guide rings around said hub, one of said first and second means and said hub together defining a circumferential clearance between said coaxial parts permitting initial limited relative rotation between said coaxial parts to take up said clearance between said coaxial parts followed by rotation of said coaxial parts in unison, said dry friction damping means being arranged between said damper plate and said guide rings and said viscous damping means being disposed outside a zone bounded by said guide rings, said viscous damping means including a housing comprising two housing portions and third means mounting said housing portions for movement with respect to each other, fourth means securing together for relative rotation said hub and one of said housing portions on one hand and the other of said housing portions and that coaxial part that is not coupled for rotation to said hub on an other hand, one of said housing portions having an internal element, mutual engagement means coupling said hub and said internal element together for rotation in unison, said mutual engagement means including teeth on said internal element engaging in slots in said hub, said second means mounting said guide rings freely with respect to said hub, spacer means securing said guide rings to each other and to one of said housing portions, said housing including two face plates and a spacing ring between said face plates to constitute with said face plates said other said housing portions, and said spacer means including a shank extending through said face plates and said spacing ring.

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**5,049,112**

**DRIVING SYSTEM FOR AUXILIARY EQUIPMENT**

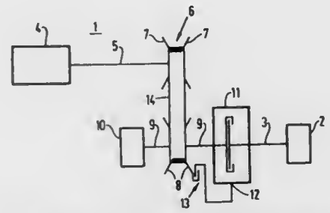
**Johannes T. G. Gunsing, Eindhoven, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands**

**Filed Nov. 8, 1990, Ser. No. 611,239**

**Claims priority, application Netherlands, Nov. 8, 1989, 8902766**

**Int. Cl.[5] F16H** *63/00*

**U.S. Cl. 474—8** **8 Claims**



1. Driving system for auxiliary equipment, characterized in that the system comprises a continuously variable transmission with a primary shaft to be driven by the engine, a secondary shaft, and an outgoing shaft selectively driveable by said secondary shaft and connectable to said auxiliary equipment.

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**5,049,113**

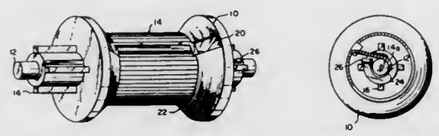
**VARIABLE CIRCUMFERENCE ADJUSTABLE-DRIVE PULLEY MECHANISM**

**James A. Graham, Jr., 3712 N. Broadway, Chicago, Ill. 60613**

**Filed Oct. 15, 1990, Ser. No. 597,318**

**Int. Cl.[5] F16H** *55/52*

**U.S. Cl. 474—49** **8 Claims**



1. A variable diameter pulley drive mechanism, comprising:
a splined, rotably supported, hollow, axle member having one or more longitudinally extending openings;
a variable diameter traction element carried by said axle member, wherein said traction element includes a pair of outwardly biased frusto-conical pulley members capable of relative axial movement along said axle member;
one or more flexible engaging elements for positively contacting power transfer means riding upon said traction assembly;
and, tensioning means operatively connected to said engaging element, whereby stress exerted upon said tensioning means causes said engaging element to retract into said axle member through said longitudinal opening, so that said flexible engaging element is tightly carried by said traction element through every degree of variation;
said frusto-conical pulley halves having one or more slots to allow storage of unused portions of the engaging elements.



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**5,049,114**

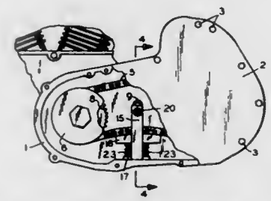
**SELF-ADJUSTING CHAIN GUIDE TENSIONER**

**Tom Hayden, 2999 Twin Oak Pl. NW., Salem, Oreg. 97304**

**Filed Mar. 21, 1990, Ser. No. 496,604**

**Int. Cl.[5] F16H** *7/08*

**U.S. Cl. 474—111** **4 Claims**



1. A chain tensioning device comprising:
a) means for containing within one axis a rubbing block in contact with a movable chain where said means comprise;
i) a slotted plate fixably attached to a case;
ii) a carriage bolt with a carriage bolt head vertically movable within a slot of said slotted plate;
iii) an inner slide plate, top block and outer slide plate fixably attached to said carriage bolt by a nut; and
b) means for movably positioning on another axis said rubbing block in contact with said movable chain.

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**5,049,115**

**PULLEY FOR DRIVE SHAFT FOR A WATER PUMP AND METHOD FOR MAKING THE SAME**

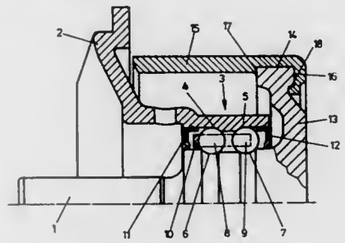
**Heinrich Kunkel, Schweinfurt; Horst Ernst, Eltingshausen; Roland Haas, Hofheim; Gerhard Herrmann, Schweinfurt; Peter Horling, Mainberg; Elmar Mause, Schweinfurt; Gunter Neder, Schweinfurt; Armin Olschewski, Schweinfurt; Robert Stolz, Schweinfurt; Leo Vogelsanger, Schwebheim, and Manfred Brandenstein, Eussenheim, all of Fed. Rep. of Germany, assignors to SKF GmbH, Scheinfurt, Fed. Rep. of Germany**

**Filed May 23, 1990, Ser. No. 527,594**

**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1989, 3918820**

**Int. Cl.[5] F16H** *55/36*

**U.S. Cl. 474—166** **11 Claims**



1. The combination comprising a shaft;
a pulley body having an outer periphery and formed intregally with the shaft; and
a rim mounted on the outer periphery of the pulley body in the form of a sleeve attached to the pulley body in a form locking or friction locking manner.

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**5,049,116**

**AUTOMATIC PLANETARY GEAR TRANSMISSION**

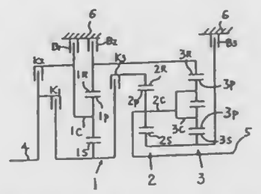
**Toshiyuki Asada, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

**Filed Nov. 21, 1989, Ser. No. 439,699**

**Claims priority, application Japan, Dec. 7, 1988, 63-307936**

**Int. Cl.[5] F16H** *3/62*

**U.S. Cl. 475—269** **4 Claims**



1. A speed changing gear device in an automatic transmission for a motor vehicle, including a first single-pinion planetary gear unit having a first sun gear, a first planetary pinion meshing with the first sun gear , a first ring gear meshing with the first planetary pinion and a first carrier rotatably supporting the first planetary pinion, a second single-pinion planetary gear unit having a second sun gear, a second planetary pinion meshing with the second sun gear, a second ring gear meshing with the second planetary pinion and a second carrier rotatably supporting the second planetary pinion, and a third double-pinion type planetary gear unit having a third sun gear, at least one pair of third planetary pinions which mesh with each other and one of which meshes with the third sun gear, a third ring gear meshing with the other of said at least one pair of third planetary pinions, and a third carrier rotatably supporting said at least one pair of third planetary pinions, said first, second and third planetary gear units being disposed coaxially with each other in the other of description, for transmitting power from an input member to an output member, at a selected one of different speed reduction ratios, wherein the improvement comprises:
said first and third ring gears being associated with each other by fixing means for fixing said first and third ring gears to each other;
said first sun gear and said second ring gear being associated with each other, by one of fixing means for fixing said first sun gear and said second ring gear to each other, or clutch means for selectively connecting said first sun gear and said second ring gear to each other;
said second and third carriers being associated with each other by fixing means for fixing said second and third carriers to each other; and
said second and third sun gears being associated with each other by fixing means for fixing said second and third sun gears to each other.

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**5,049,117**

**DUAL-ENVELOPE MAKING MACHINE AND METHOD OF USING**

**Henry H. J. Mueller, Wrentham, Mass., assignor to Sterling Envelope Corporation, Taunton, Mass.**

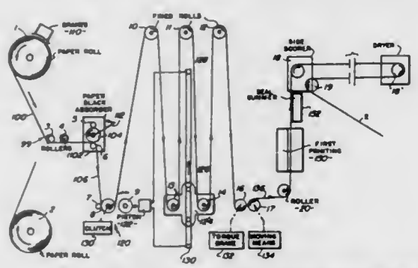
**Filed Jul. 25, 1989, Ser. No. 384,710**

**Int. Cl.[5] B31B** *3/18, 33/16*

**U.S. Cl. 493—188** **8 Claims**

1. A dual envelope making machine, comprising:
means for feeding a paper web;
means, disposed downstream of said paper web feeding means, for operating on said paper web to form each section of said paper web into a form suitable for use as at

least two at least partially formed envelopes including gumming means for printing glue strips, to be used when sealing said envelopes, said strips being oriented in a direction perpendicular to a running direction in which said paper web is moving, said operating means further including operating means further including envelope shape forming means for forming said paper web into a shape suitable for folding into two envelopes, with at least a bottom flap which will be folded to form front and back



portions of the envelope having a fold line extending in said perpendicular direction, said envelope shape forming means including cutting means for cutting out side flap configurations of said envelopes and means for making side score marks along said side flap configurations, said score marks being oriented in a direction parallel to said running direction; and

a longitudinal cutter, disposed downstream of said operating means, for longitudinally separating said paper web to separate said at least two envelopes from one another.

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**5,049,118**

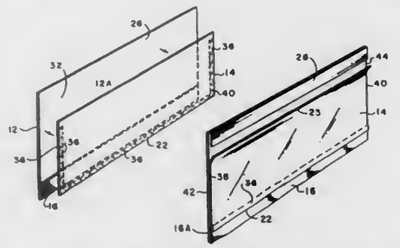
**METHOD OF CONSTRUCTING A DOCUMENT PROCESSING ENVELOPE**

**Rex P. McNabb, Dallas, Tex., assignor to Check Savers, Inc., Garland, Tex.**

**Division of Ser. No. 280,712, Dec. 6, 1988, Pat. No. 4,934,587. This application Jun. 15, 1990, Ser. No. 538,573**

**Int. Cl.[5] B31B *1/62***

**U.S. Cl. 493—216** **8 Claims**



1. A method of constructing an envelope for carrying documents to be processed on automated data processing equipment, comprising the steps of:

providing first and second substantially rectangular sheets of transparent material and a strip of opaque material, said first sheet having substantially the same length as said second sheet along respective major axes of said first and second sheets and a greater width than said second sheet along respective minor axes of said first and second sheets, each of said sheets having corresponding first, second, third and fourth edges;

disposing a strip of first adhesive material on a first major surface of said first sheet adjacent to the first edge thereof;

placing said strip of opaque material on said first major surface of said first sheet so as to substantially cover said strip of first adhesive material and allowing said first adhesive material to secure said opaque strip to said first sheet;

disposing strips of second adhesive material on a first major surface of said second sheet adjacent to the first, second and third edges of said second sheet;

placing the respective first major surfaces of the first and second sheets in facing contact so that the respective second edges of the first and second sheets are substantially in alignment and the respective third edges of the first and second sheets are substantially in alignment, the first edge of the second sheet being in overlapping relationship with a first portion of said opaque strip, a portion of said first sheet extending beyond the fourth edge of the second sheet, opposite from the first edge thereof, to define a flap member;

allowing said second adhesive material to bind said second sheet to said opaque strip sheet and to bind the first and second sheets together along respective aligned second and third edges of said sheets to define respective opposite ends of said envelope, said first portion of said opaque strip being sandwiched between said first and second sheets to define a bottom portion of said envelope, a second portion of said opaque strip extending below the first edge of said second sheet to expose said second portion of said opaque strip;

providing a flexible band having a third adhesive material disposed on one surface thereof and placing the flexible band on the flap member so that said third adhesive material is sandwiched between said flap member and said band, said flap member being foldable towards said second sheet so as to overlap the fourth edge thereof when said envelope is sealed.

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**5,049,119**

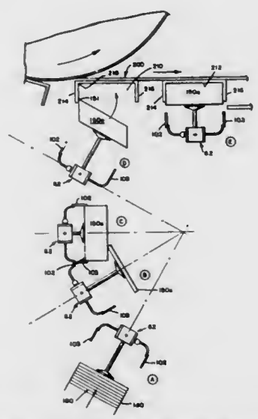
**APPARATUS FOR REMOVING A FLAT CARTON FROM A MAGAZINE, CAUSING THE CARTON TO OPEN, AND PLACING THE CARTON IN A CONVEYOR ASSEMBLY**

**Boris Bershadsky, 20982 Calle Celeste, El Toro, Calif. 92630**

**Filed Jul. 2, 1990, Ser. No. 546,892**

**Int. Cl.[5] B31B *5/80, 1/78***

**U.S. Cl. 493—315** **3 Claims**



1. An apparatus for removing a selected carton from a magazine comprising a multiplicity of stacked flat folded cartons, opening the selected carton and placing it in a carton receiving and retaining means of a conveyor assembly, the apparatus comprising:



a. a carousel having a base plate, a top plate spaced apart from the base plate, a central post including a lower end extending through the base plate and an upper end extending through the top plate, the lower end of the central post extending through a main fixed sprocket, a coupling member and a gear reducer which in turn is connected to a means for causing the carousel to rotate in a given direction;

b. at least one operating station comprising a station post positioned on said carousel radially outward from said central post, rotatably supported between said base plate and said top plate, extending through said base plate and connected to an outer sprocket, and means interconnecting the outer sprocket to said main fixed sprocket wherein as said carousel is caused to rotate, said fixed sprocket which does not rotate with said carousel causes the outer sprocket and the station post to rotate in the opposite direction to the direction of rotation of said carousel;

c. a fixed block attached to said station post and movably supporting a pair of parallel movable shafts which extend through the block, through said station post and radially outward from said station post and supporting a transverse plate at a distance radially outward from said station post;

d. an air cylinder supported by said block and further comprising a movable piston and piston rod which extends radially outward from said station post and terminates at said transverse plate, an air line connected to the air cylinder to cause the piston and piston rod to move radially inward toward said station post and outward away from said station post, and the air line also connected to an air supply source;

e. a pair of spaced apart hollow rods supported by said transverse plate and extending in a direction radially outward from said station post, each hollow rod having a front end which supports a suction cup and a rear end to which is attached a vacuum suction line leading to a vacuum source;

f. said air supply source, said air cylinder and said piston and piston rod causing said transverse plate and said suction cup hollow rods and said suction cups to move radially inward toward said station post and outward away from said station post;

g. a multiplicity of transverse posts supported on and extending radially outward from said station post and aligned adjacent said suction hollow rods and suction cups and spaced to permit said suction hollow rods and suction cups, said pair of parallel movable shafts, said transverse plate, said piston and piston rod to move radially inward toward said station post and outward away from said station post;

h. said carousel located adjacent said magazine such that said multiplicity of stacked folded cartons face said carousel and said suction cups, and the relative speeds of rotation of said carousel and said station post are coordinated to cause the linear velocity of said suction cups to be zero at the moment said suction cups are aligned with the closest folded carton in said magazine; and

i. said carousel located adjacent said conveyor assembly with said carton receiving and retaining means facing said carousel and with said conveyor assembly spaced apart from said magazine;

j. whereby said carousel is caused to rotate to cause said at least one operating station to sequentially come into alignment with said magazine and with said conveyor assembly, and when said suction cups are almost aligned with said magazine, said air supply source feeds air into said air cylinder to cause said piston and piston rod to move radially outward from said station post and thereby cause said suction cup hollow rods, said transverse plate and said suction cups to move radially outward away from said station post and to cause said suction cups to come in contact with the closest folded carton in said magazine at the moment said suction cups are aligned with the folded carton and said vacuum suction source causes the closest carton to be attached to and carried away from said magazine by said suction cups, and said air supply source then causes said piston and piston rod to move radially inward toward said station post thereby causing said suction cup hollow rods, said transverse plate and said suction cups to move radially inward toward said station post such that the carried folded carton comes in contact with said multiplicity of transverse posts which upon impact cause the carried folded carton to be at least partially broken open and when said carousel is aligned with said conveyor assembly, said suction cup hollow rods, said transverse plate and said suction cups are once again caused to move radially outward away from said station post and the carton is caused to engage said carton receiving and retaining means of said conveyor assembly and become fully opened and said suction source thereupon releases the opened carton into said carton receiving and retaining means and said suction cup hollow rods, said transverse plate and said suction cups are once again caused to move radially inward toward said station post.

3. An apparatus for removing a selected carton from a magazine comprising a multiplicity of stacked flat folded cartons, opening the selected carton and placing it in a carton receiving and retaining means of a conveyor assembly, the apparatus comprising:

a. a carousel having a base plate, a top plate spaced apart from the base plate, a central post including a lower end extending through both the base plate and an upper end extending through the top plate, the lower end of the central post extending through a main fixed sprocket, a coupling member and a gear reducer which in turn is connected to a means for causing the carousel to rotate in a given direction;

b. at least one operating station comprising a station post positioned on said carousel radially outward from said central post, rotatably supported between said base plate and said top plate, extending through said base plate and connected to an outer sprocket, and means interconnecting the outer sprocket to said main fixed sprocket wherein as said carousel is caused to rotate, said fixed sprocket which does not rotate with said carousel causes the outer sprocket and the station post to rotate in the opposite direction to the direction of rotation of said carousel;

c. a fixed block attached to said station post and movably supporting a pair of parallel movable shafts which extend through the block, through said station post and radially outward from said station post and supporting a transverse plate at a distance radially outward from said station post;

d. a first cam supported on said base plate, the first cam including a groove housing a cam follower, and a second cam supported on said top plate, the second cam including a groove housing a cam follower, and a vertical rod connected to both cam followers, the vertical rod aligned adjacent said block and said station post and connected to said pair of movable shafts;

e. a pair of spaced apart hollow rods supported by said transverse plate and extending in a direction radially outward from said station post, each hollow rod having a front end which supports a suction cup and a rear end to which is attached a vacuum suction line leading to a vacuum source;

f. said vertical rod causing said transverse plate and said suction cup hollow rods and said suction cups to move radially inward toward said station post and outward away from said station post as said vertical rod is moved by said cam followers moving in their respective cam grooves;

g. a multiplicity of transverse posts supported on and extending radially outward from said station post and aligned adjacent said suction hollow rods and said suction cups and spaced to permit said suction hollow rods and suction cups, said pair of parallel movable shafts, and said transverse plate to move radially inward toward said station post and outward away from said station post;

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h. said carousel located adjacent said magazine such that said multiplicity of stacked folded cartons face said carousel and said suction cups, and the relative speeds of rotation of said carousel and station post are coordinated to cause the linear velocity of said suction cups to be zero at the moment said suction cups are aligned with the closest folded carton in said magazine; and

i. said carousel located adjacent said conveyor assembly with said carton receiving and retaining means facing said carousel and with said conveyor assembly spaced apart from said magazine;

j. whereby said carousel is caused to rotate to cause said at least one operating station to sequentially come into alignment with said magazine and with said conveyor assembly, and when said suction cups are almost aligned with said magazine, said vertical rod causes said pair of shafts to move radially outward away from said station post and thereby cause said suction cup hollow rods, said transverse plate and said suction cups to move radially outward away from said station post and to cause said suction cups to come in contact with the closest folded carton in said magazine at the moment said suction cups are aligned with the folded carton and said vacuum suction source causes the closest carton to be attached to and carried away from said magazine by said suction cups, and said vertical rod then causes said pair of shafts to move radially inward toward said station post thereby causing said suction cup hollow rods, said transverse plate and said suction cups to move inwardly toward said station post such that the carried folded carton comes in contact with said multiplicity of transverse posts which upon impact cause the carried folded carton to be at lest partially broken open and when said carousel is aligned with said conveyor assembly, said suction cup hollow rods, said transverse plate and said suction cups are once again caused to move radially outward away from said station post and the carton is caused to engage said carton receiving and retaining means of said conveyor assembly and become fully opened and said suction source thereupon releases the opened carton into said carton receiving and retaining means and said suction cup hollow rods, said transverse plate and said suction cups are once again caused to move radially inward toward said station post.

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5,049,120

## FOLDER WITH MEANS FOR PRODUCING A SMOOTH CUT

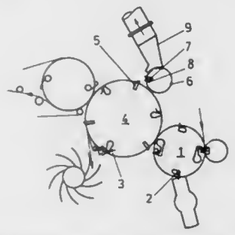
Sebastian Prüm, Kaiserslautern, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Jan. 12, 1990, Ser. No. 464,038

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1989, 3903380

Int. Cl.[5] B31B *49/00*

U.S. Cl. 493—342 10 Claims



1. In a folder adapted for folding products, the combination comprising:

a frame;

a folding jaw cylinder to which at least one cutting knife is mounted;

knife cylinder means mounted adjacent to said folding jaw cylinder and to said frame, said knife cylinder means having a knife cylinder defining an axis, a plurality of cutting knives and associated bearing pins mounted to said knife cylinder, a nozzle situated between each pair of adjacent bearing pins, and axially extending hole means which is connected to each nozzle, said axially extending hole means having a radial open portion on said knife cylinder means, said bearing pins being adapted to hold cut off trimming of product, and said nozzles being situated for removing the trimming from said bearing pins;

a suction duct, having an opening, arranged so that part of the circumference of said knife cylinder extends into said opening;

a compressed air supply duct;

a stationary block mounted to said knife cylinder means, said stationary block having a radial opening for receiving an end of the compressed air supply duct;

means defining a timing chamber having an extent in the peripheral direction about the axis of said knife cylinder which is greater than the diameter of said radial open portion, and subtending an angle about the axis of said knife cylinder substantially equal to the angle formed by the opening of said suction duct relative to the axis of said knife cylinder, such that compressed air is supplied to said nozzles in synchronism with rotation of said knife cylinder means and when that portion of the circumference of said knife cylinder associated with the cutting knives, bearing pins and nozzles extends into said opening of said suction duct;

means for pivoting said block about the axis of said knife cylinder for adjustment; and

means for clamping said block in position after such adjustment.

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5,049,121

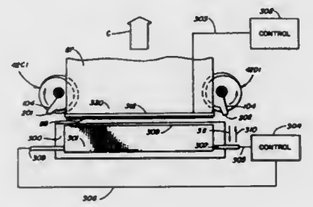
## CONTINUOUS FORM STATIONERY FOLDING AND CUTTING MACHINE

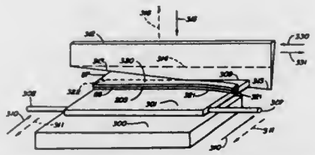
Earnest B. Bunch, III, Phoenix, Ariz., assignor to B. Bunch Company, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 279,426, Apr. 10, 1990, Pat. No. 4,915,644. This application Feb. 20, 1990, Ser. No. 481,129

Int. Cl.[5] B65H *45/107*

U.S. Cl. 493—357 2 Claims



1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein,



said paper strip including

a first side, and

a second side opposite and spaced apart from said first side,

each of said transverse lines of weakening including

a first end which is nearer to said first side than said second side of said paper strip, and,

a second end which is nearer to said second side than said first side of said paper strip,

said apparatus including

a frame,

oscillating guide means mounted on said frame for alternately distributing said successive lines of weakening in said paper strip in substantially opposite directions,

means for feeding said paper strip into said guide means at a predetermined speed,

folding means carried on said frame and operatively associated with said oscillating guide means for urging said paper strip distributed by said guide means into a folded condition, said folding means including a first spiral and a second spiral spaced apart from said first spiral, each of said spirals having helical flight means shaped and dimensioned and rotatably driven to receive said paper strip from said oscillating guide means to fold said paper strip along said transverse lines of weakening, said first spiral being positioned on said first side of said paper strip, said second spiral being positioned on said second side of said paper strip,

said guide means, feeding means and folding means moving in sychronous relationship during the operation of said apparatus,

the improvement comprising means for severing the folded paper along a selected cut line spaced away from a selected one of said folded transverse lines of weakening in a fold extending between said first side and said second side of said paper strip and extending between said first and said second spirals, said fold including an upper fold surface and a lower fold surface, said upper and lower fold surfaces extending from said selected one of said transverse lines of weakening, said severing means including

(a) cutting means mounted for movement between at least two operative positions,

(i) a first operative position spaced away from said upper fold surface such that said upper fold surface is intermediate said cutting means and said lower fold surface,

(ii) a second operative position spaced away from said lower fold surface such that said lower fold surface is intermediate said cutting means and said upper fold surface; and,

(b) means for moving said cutting means from said first operative position to said second operative position at a selected time to cut through said upper and lower fold surfaces along said selected cut line, said one of said folded transverse lines of weakening interconnecting paper having a portion extending from said one of said lines of weakening

(i) through and contacting said helical flight means of at least one of said first and second spirals, and

(ii) to a folded line of weakening selected from the group consisting of

the folded line of weakening immediately preceding said one of said folded transverse lines of weakening, and,

the folded line of weakening immediately succeeding said one of said folded transverse lines of weakening,

said immediately preceding and immediately succeeding lines of weakening being folded by said folding means.

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5,049,122

## APPARATUS FOR STRIPPING SCRAP FROM DIE CUT BLANKS

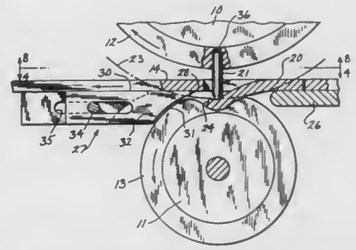
Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Continuation-in-part of Ser. No. 409,112, Sep. 19, 1989, Pat. No. 4,985,012. This application May 25, 1990, Ser. No. 528,847

The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.

Int. Cl.[5] B31B *1/74;* B26F *1/00*

U.S. Cl. 493—373 11 Claims



1. An apparatus for stripping the cutout scrap portion from a die cut blank comprising: a stripper pin carrier having a layer of a resilient deformable material on an outer surface of said carrier, an array of stripper pins demountably inserted into said deformable material layer, means for inserting said stripper pins into and removing the same from said material layer wherein said array of pins is selectively patterned to engage desired regions of said scrap portion; and,

means for indexing the stripper pin carrier with respect to the pin inserting means for providing fresh pin insertion points in the deformable material layer when changing from one pin array to another.

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5,049,123

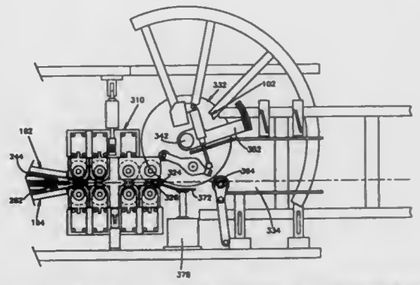
## FOLDING AND STACKING APPARATUS

Richard E. Breton, Rochester, N.H., and David B. Staley, Saundertown, R.I., assignors to Harris Graphics Corporation, Dover, N.H.

Division of Ser. No. 401,638, Aug. 31, 1989. This application Aug. 24, 1990, Ser. No. 572,897

Int. Cl.[5] B65H *29/40, 45/16, 45/22*

U.S. Cl. 493—416 16 Claims



1. An apparatus for sequentially folding and stacking a plurality of signatures, said apparatus comprising folder means for forming a fold in each of the signatures in turn with the fold extending along a path of movement of the signature through said folder means, said folder means including deflector means for forming a fold by deflecting signature to move major side surface areas on opposite sides of the fold from an initial orientation toward each other to an upright orientation and dis-

charge means for sequentially discharging folded signatures from said folder means with the major side surface areas in an upright orientation, and stacker means for stacking folded signatures received from said folder means in a stack with the major side surface areas in an upright orientation, said stacker means including signature conveyor means for engaging a leading portion of each signature in turn while a trailing portion of the signature is adjacent to said discharge means in said folder means and for moving each signature in turn away from said folder means to the stack of signatures with the major side surface areas in an upright orientation, said signature conveyor means including a wheel having a plurality of pockets for sequentially receiving signatures from said folder means, means for rotating said wheel about an upright axis to move the pockets along an arcuate path, each of said pockets having an inner end portion disposed adjacent to the axis of rotation of said wheel to receive a leading end portion of a signature and an outer end portion disposed adjacent to the peripheral surface of said wheel to receive a trailing end portion of a signature, and deflector surface means for engaging a leading end portion of a signature at the inner end portion of a pocket and deflecting the leading end portion of the signature away from the axis of rotation of said wheel toward the stack of signatures with the major side surface areas of the signature in an upright orientation.

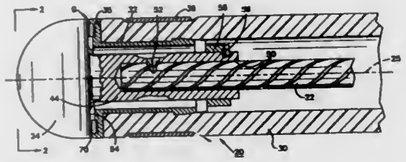
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**5,049,124**

## CATHETER DRIVE APPARATUS HAVING FLUID DELIVERY BEARING

**Thomas O. Bales, Jr., Coral Gables, Fla., assignor to Dow Corning Wright Corporation, Arlington, Tenn.**

**Continuation of Ser. No. 417,022, Oct. 14, 1989, abandoned.**
**This application Mar. 27, 1991, Ser. No. 677,603**
**Int. Cl.[5] A61B *17/32***
**U.S. Cl. 604—22** **8 Claims**



4. A catheter comprising:

a) an elongated flexible sheath defining a center passageway and having a length to extend from outside a subject to a region of interest within a subject vessel;

b) abrasion means comprising a distally located working head rotatably carried by the sheath for rotation with respect to the sheath and a drive member extending through the sheath's center passageway to apply motive power to the working head from a prime mover outside the subject; and

c) a bearing rotatably supporting the working head and defining a bearing shaft portion which extends into a distal end of the flexible sheath and a bearing end portion that abuts a distal end of the sheath; said bearing shaft portion defining one or more axial fluid delivery passageways in fluid communication with a center passageway of said sheath that extend axially along the shaft portion of the bearing to the bearing end portion;

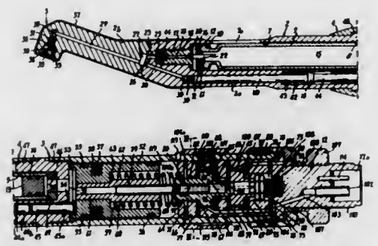
d) said bearing end portion defining one or more radial passageways in fluid communication with said axial passageways that extend radially outward from regions continuously completely covered by the working head of said abrasion means through the bearing end portion to exposed regions of a distally facing end surface of the bearing end portion that open into the subject vessel.

**5,049,125**

## NEEDLELESS INJECTION APPARATUS OF A LIQUID, NOTABLY FOR DENTAL CARE

**Claude Accaries, Route du Pont-Neuf, 64260 Arudy; Pierre Ibis, Lotissement Gilardi - 27 Chemin Cam-Loung, 64230 Lescar, and Henri Toprides, 7 rue de Crillon, 92210 Saint-Cloud, all of France**

**PCT No. PCT/FR88/00258, § 371 Date Dec. 29, 1988, § 102(e) Date Dec. 29, 1988, PCT Pub. No. WO88/09189, PCT Pub. Date Dec. 1, 1988**
**PCT Filed May 24, 1988, Ser. No. 302,233**
**Claims priority, application France, May 26, 1987, 87 07409; Apr. 11, 1988, 88 04764**
**Int. Cl.[5] A61M *5/30***
**U.S. Cl. 604—70** **31 Claims**



1. A needleless liquid injection apparatus which includes an elongated body comprising first and second separable portions,

said first separable portion (2), here also called medical portion, comprising at least one housing (7) adapted to receive a tight cartridge (8),

said tight cartridge (8) comprising a movable bottom piece (13) and containing a liquid (15) to be injected,

said first separable portion (2) further comprising at least one dosing chamber (38) in communication with said housing (7) and comprising a delivery piston (40), and a nozzle (33) in communication with said dosing chamber (38),

said nozzle (33) comprising an injector (36) adapted for forming a narrow liquid jet upon abrupt delivery of liquid from said dosing chamber (38),

said second separable portion (3), here also called motive portion (3), comprising a tubing connection (102) and an assembly adapted to perform a pneumatically controlled alternating movement,

said assembly comprising

a working piston (52) adapted for alternating motion between first and second piston positions,

a control-and-propulsion spring (62) disposed to act on said working piston (52) in a first direction,

an end piece (45) adapted to communicate the motion of said working piston (52) to said delivery piston,

a distributor (83) adapted for alternating motion between first and second distributor positions,

means (98) for preferentially positioning said distributor (83) in said first distributor position,

a tight chamber (51) which, when said distributor (83) is in said first distributor position, is in pneumatically pressurizing communication with said tubing connection (102) and which, when said distributor (83) is in said second distributor position, is pneumatically disconnected from said tubing connection (102), pressure in said tight chamber (51) acting in said first direction on said bottom piece (13) and in a second direction opposite to said first direction on said working piston (52),

said working piston (52) and said distributor (83) being disposed relative to each other such that, upon movement of said working piston (52) under the influence of pneumatic pressure, said working piston (52) comes into contact with said distributor (83), whereby said distributor (83) assumes said second distributor position, thereby interrupting pressurization,

thereby permitting said working piston (52) to move in said first direction by action of said control-and-propulsion spring (62), and thereby causing abrupt delivery of liquid from said dosing chamber (38).

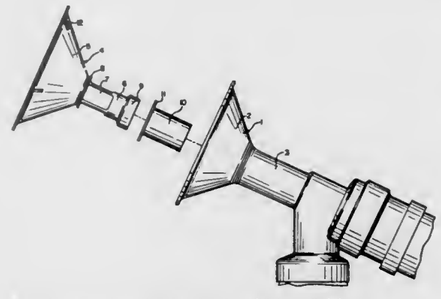
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**5,049,126**

## BREAST PUMP WITH NIPPLE STIMULATING INSERT

**Karl O. A. H. Larsson, Zug, Switzerland, assignor to ISG/AG, Baar, Switzerland**

**Filed Feb. 16, 1990, Ser. No. 480,879**
**Int. Cl.[5] A61M *1/06***
**U.S. Cl. 604—74** **7 Claims**



4. A breast pump for mother's milk comprising:

a hood body for placement over a breast, said hood body having a funnel-shaped portion applied over the breast with an outlet through which a nipple extends, and a tube extending downstream from said outlet,

means for producing an intermittent vacuum in said hood body,

means for collecting expressed milk, and

an insert received within said hood body, said insert having a funnel-shaped portion generally conforming to the shape of said hood funnel-shaped portion with an outlet through which the nipple extends, and a tubular frame extending downstream from said insert outlet within which the nipple is received,

said tubular frame having a plurality of longitudinally extending elongated openings therein spaced about said tubular frame each located at a point overlying the nipple extending within said tubular frame, a flexible membrane sleeve received on said tubular frame overlying and covering said elongated openings,

and stand-off members formed on said insert funnel-shaped portion spacing said insert funnel-shaped portion from said hood body funnel-shaped portion to form an air gap for admitting environmental air to an exterior surface of said flexible membrane sleeve, said tubular frame having a sealing portion which engages said hood body tube to form an air seal therewith,

said flexible membrane sleeve, upon the generation of a reduced pressure within said hood body and insert by the action of said means for producing an intermittent vacuum, being pulled through said elongated openings to gently squeeze and message the nipple for an enhanced expression of milk.

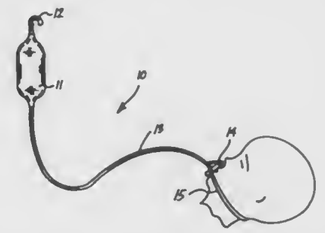


**5,049,127**

## INFANT FEEDING APPARATUS

**Esther P. Yen Tseng, 775 Sutter Ave., Palo Alto, Calif. 94303**

**Filed Mar. 26, 1990, Ser. No. 500,530**
**Int. Cl.[5] A61J *9/00***
**U.S. Cl. 604—79** **2 Claims**



1. An infant feeding apparatus comprising in combination,

an elongate flexible container bag, the container bag including a hook mounted at an upper terminal end thereof and a feed conduit in fluid communication with the container bag directed outwardly therefrom at a lower terminal end thereof, and

the feed conduit including a forward terminal end, the forward terminal end slidably receiving a nursing nipple thereon, and

the nursing nipple including an abutment flange mounted adjacent the forward terminal end of the feed conduit orthogonally disposed thereto, and

the nursing nipple secured to a support collar means for securement about an infant's head to position the nursing nipple in proximity to the infant's mouth, and

wherein the support collar means includes an elongate tube, the elongate tube including a first end and a second end, the first end of the tube defined by a cavity of a predetermined internal diameter, and the second end defined by a projection of a predetermined external diameter substantially equal to the predetermined internal diameter of the first end, and

wherein the projection includes a series of conical ribs extending rearwardly therefrom for frictionally engaging the tube cavity of the first end, and

wherein the tube further includes an enlarged support formed on the tube spaced from the first end wherein the enlarged support includes a fixed bore directed therethrough, wherein the fixed bore frictionally receives the feed conduit therethrough adjacent the forward terminal end of the feed conduit, and

further including an absorbent pad selectively mounted upon the abutment flange about the nursing nipple adjacent a lower terminal end of the nursing nipple wherein the absorbent pad includes a radial slot and a central aperture to permit directing of the absorbent pad about the nursing nipple on the abutment flange.

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**5,049,128**

## VALVED INFUSION PORT

**Irene A. Duquette, 172 Punkup Rd., Oxford, Conn. 06483**

**Filed Feb. 6, 1990, Ser. No. 475,737**
**Int. Cl.[5] A61M *37/00***
**U.S. Cl. 604—83** **8 Claims**

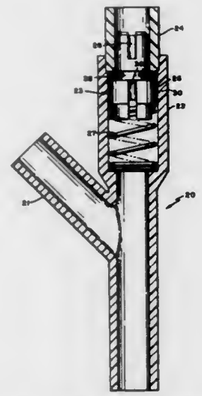
1. A valved infusion port of an infusion system comprising an injection unit having a primary infusion port and at least one secondary infusion port, characterized by the improvement to said secondary infusion port comprising:

a bidirectional valve means disposed about said secondary infusion port, said bidirectional valve means is a two-way spring valve which comprises: a spring means, a valve port, and a valve plunger having a sealing means a conduit means disposed thereabout, wherein said spring means is

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connected to said valve plunger in such a way as to permit the opening said conduit means when said spring means is recoiled such that said sealing means is not in contact with said valve port and to permit the closing of said conduit



means when said spring means is expanded such that said sealing means is in contact with said valve port; whereby said bidirectional valve means is capable of opening an closing said secondary infusion port to permit the administration of a secondary infusion without the use of a needle.

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**5,049,129**

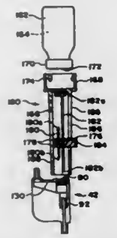
## ADAPTER FOR PASSIVE DRUG DELIVERY SYSTEM

**Brian D. Zdeb, Round Lake Park; Glenn L. Slater, Ingleside, both of Ill., and Baxter International, Inc., 02, Deerfield, Ill.**

**Division of Ser. No. 262,209, Oct. 19, 1988, abandoned, which is a continuation of Ser. No. 119,208, Nov. 5, 1987, abandoned, which is a continuation of Ser. No. 868,827, May 29, 1986, abandoned. This application Jun. 4, 1990, Ser. No. 514,382**

**Int. Cl.**[5] **A61M** *37/00*

**U.S. Cl. 604—85** **11 Claims**



1. An adapter adapted to connect with a drug vial for introducing a beneficial agent into a fluid conduit for delivery of the beneficial agent to a patient such that the beneficial agent may be passively reconstituted during fluid flow through the fluid conduit, said adapter and the drug vial, said adapter comprising:

(a) a hollow, rigid shell including an enlarged end portion for connecting to the drug vial and an opposite end portion adapted for mounting about a receptacle, said adapter further providing for selective fluid communication between the receptacle and the drug vial;

(b) a sliding plate having a handle portion extending therefrom slidably mounted within said hollow rigid shell and including inlet flow path means and outlet flow path means mounted to said sliding plate, said inlet and outlet flow path means each further including drug vial piercing means extending from the sliding plate towards the enlarged end portion and receptacle piercing means extending from the sliding plate towards the opposite end portion;

wherein movement of said sliding plate enables sliding said flow path means towards said drug vial to pierce the drug vial, thereby placing the drug vial chamber, said inlet flow path means and said outlet flow path means in open communication; and

further wherein after said vial piercing means has pierced said vial chamber and said receptacle piercing means has pierced the receptacle, said inlet flow path means and said outlet flow path means each extend into the drug vial, with said outlet flow path means disposed at an elevation higher than said inlet flow path means.

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**5,049,130**

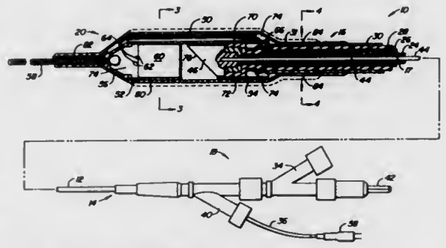
## SYSTEM AND METHOD FOR PRESSURE FILLING OF CATHETERS

**Philip E. Powell, Palo Alto, Calif., assignor to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.**

**Filed Dec. 23, 1988, Ser. No. 290,217**

**Int. Cl.**[5] **A61M** *29/02;* **A61B** *8/12*

**U.S. Cl. 604—96** **23 Claims**



1. A catheter comprising:

an elongate catheter tube having an interior, an exterior surface, a proximal end, a distal end, and at least one lumen extending through the interior from said proximal end to said distal end, said lumen being connected to a vent path which extends from the interior to the exterior surface near the distal end and which is sufficiently large to allow liquid flow therethrough; and

an elastic sheath conforming to the exterior surface near the distal end of the catheter tube and preventing fluid flow through the vent path, said sheath having a modulus of elasticity and geometry selected to allow expansion of the sheath in response to a threshold fluid pressure within the lumen, said expansion of the sheath allowing gas and liquid fluid flow from the lumen through the vent path.

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**5,049,131**

## BALLOON CATHETER

**Jacobus A. C. Deuss, Son en Breugel, Netherlands, assignor to Ashridge AG, Zug, Switzerland**

**Filed Nov. 14, 1989, Ser. No. 435,724**

**Claims priority, application Netherlands, May 31, 1989, 8901381**

**Int. Cl.**[5] **A61M** *29/00*

**U.S. Cl. 604—96** **12 Claims**

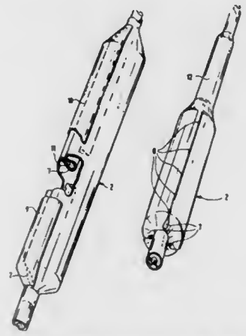
1. A balloon catheter for the widening of passages in the human body comprising:

an inflatable balloon having a predetermined length and comprising means for widening a passage in the body to a first operational diameter and widening a passage in the body to a larger operational diameter; and

pump means for delivering an inflating medium to said balloon, said pump means in connection with said balloon through a tubular body connected at one end thereof to said pump means and at a distal end thereof to said balloon;

said means for widening comprising a portion of an outer wall of the balloon, said portion having an inward fold therein, and means for fixing said inward fold in said portion of the outer wall until a predetermined pressure is





reached in said balloon whereby said means for fixing releases said inward fold;

the portion of said outer wall with said inward fold having a substantially cylindrical shape with an outer diameter corresponding to said first operational diameter, and said portion of said outer wall after release of said inward fold has a substantially cylindrical shape with an outer diameter corresponding to said larger operational diameter.

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**5,049,132**

## BALLOON CATHETER FOR DELIVERING THERAPEUTIC AGENTS

**Maureen A. Shaffer, and James E. Leone, both of Miami, Fla., assignors to Cordis Corporation, Miami Lakes, Fla.**

**Filed Jan. 8, 1990, Ser. No. 461,648**

**Int. Cl.**[5] **A61M** *29/00*

**U.S. Cl. 604—101** **13 Claims**



1. In a balloon catheter which comprises a catheter shaft which defines a first inflation lumen and a first, inflatable balloon mounted on said shaft in communication with said first inflation lumen, the improvement comprising, in combination:

a second inflation lumen, spaced from said first lumen, defined by said catheter shaft, and a second balloon mounted on said shaft in communication with said second inflation lumen, said second balloon defining aperture means sized to permit liquid flow outwardly through said second balloon, whereby medication may be delivered in controlled manner, said second balloon being spot-sealed to said first balloon in a plurality of spaced areas which are spaced from the ends of said balloons.

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**5,049,133**

## SINGLE-USE SAFETY SYRINGE

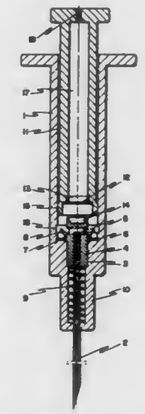
**Joeé A. Villen Pascual, Compromiso de Caspe, 1, Valencia, Spain**

**Filed Jan. 23, 1990, Ser. No. 468,735**

**Claims priority, application Spain, Jan. 24, 1989, 8900234**

**Int. Cl.**[5] **A61M** *5/00*

**U.S. Cl. 604—110** **6 Claims**



1. A single-use safety syringe comprising:

a body for containing a fluid, said body having a projection and a chamber;

a needle having a head end and a hollow core for receiving the fluid, said head end being positioned in said chamber below said projection when the syringe is in use;

piston means positioned in said body above said needle for pushing the fluid into said needle when the syringe is in use;

a spring coiled around said needle below said head end and positioned in contact with said head end and said body, said spring expanding after use of the syringe so that said needle is propelled into the upper end of said body above said projection; and

a pressure hinge positioned on said projection having a plurality of teeth-shaped triggers, said piston means having at its lower end retention means engaging the inner wall of said chamber in the vicinity of said triggers, whereby said triggers both retain said head end below said projection to prevent expansion of said spring as the syringe is in use and bear against said retention means to prevent motion of said piston means after deformation of said triggers by said piston means and expansion of said spring.

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**5,049,134**

## SEALLESS HEART PUMP

**Leonard A. R. Golding, Moreland Hills; William A. Smith, Lyndhurst, and Warren F. Wade, Orange Village, all of Ohio, assignors to The Cleveland Clinic Foundation, Cleveland, Ohio**

**Filed May 8, 1989, Ser. No. 349,000**

**Int. Cl.**[5] **A61M** *1/00;* **A61N** *5/00*

**U.S. Cl. 604—151** **3 Claims**

1. A blood pump for pumping blood through a living body, the blood pump comprising:

a housing having an inlet and outlet in fluid communication with a chamber defined therein, the housing including a portion that extends axially inwardly into the chamber;

an annular pump rotor received in the chamber around the housing portion for selective rotation relative to the hous-

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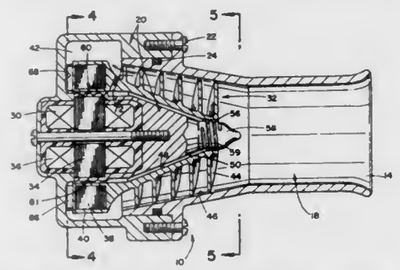


ing for pumping blood from the inlet to the outlet, the pump rotor being spaced from the housing and housing portion to define radially spaced first and second passages, respectively;

means for rotating the pump rotor relative to the housing;

means for urging blood flow through the first passage;

the second passage being narrowed at first and second ends for defining circumferentially continuous fluid bearings that support the pump rotor during pumping operation;



first and second helical grooves axially spaced on the housing portion at the narrowed first and second ends of the second passage to increase blood flow through the fluid bearings;

means for urging blood flow through the second passage in a direction independent from blood flow through the first passage; and

an opening through the pump rotor for connecting the first and second passages to permit blood flow therebetween.

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**5,049,135**

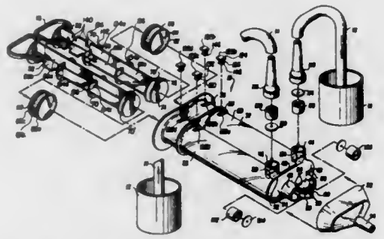
**MEDICAL LAVAGE APPARATUS**

**Richard C. Davis, Palm Harbor, Fla., assignor to Code Blue Medical Corporation, Clearwater, Fla.**

**Filed Sep. 18, 1990, Ser. No. 584,141**

**Int. Cl.[5] A61M *5/00***

**U.S. Cl. 604—181** **29 Claims**



1. A medical lavage syringe device for irrigating and aspirating a body cavity, said device comprising:

a housing defining an elongated irrigation cylinder with an irrigation bore and an elongated aspiration cylinder with an aspiration bore, said irrigation and aspiration cylinder bores each being open and unconnected at first ends thereof, said housing further defining respectively an inlet port and an outlet port in said respective irrigation and aspiration cylinders intermediate said first and second ends thereof, said housing further including an exchange tube at second ends of said irrigation and aspiration cylinder bores leading to a common nozzle;

an irrigation plunger and an aspiration plunger having first ends for respectively fitting into said first open ends of said irrigation and aspiration cylinders and having sliding seals at said first ends thereof for making sealing, sliding contact with internal cylinder surfaces of said respective bores and including hand-engaging portions at second ends outside the cylinders for engaging a hand and thereby being moved into and out of their respective bores by said hand;

a system of check valves comprising an inlet check valve located at said inlet port for allowing the flow of fresh irrigation fluid into said inlet port but hindering the flow of fluid from said inlet port, an outlet check-valve located at said outlet port for allowing the flow of aspiration fluid from said outlet port but hindering the flow of fluid into said outlet port, an irrigation check-valve located at said irrigation bore between said inlet port and said common exchange tube for allowing flow of irrigation fluid from said irrigation bore into said common exchange tube but for hindering the flow of fluid from said common exchange tube into said irrigation bore and an aspiration check-valve located at said aspiration bore between said outlet port and said common exchange tube for allowing flow of irrigation fluid from said common exchange tube into said aspiration bore but hindering flow in the opposite direction;

wherein, motion of said irrigation plunger into and out of said irrigation bore causes fluid to flow from said inlet port to said common exchange tube while motion of said aspiration plunger into and out of said aspiration bore causes fluid to flow from said exchange tube to said outlet port; and

wherein is further included a locking means for locking said aspiration plunger in an inserted position in said aspiration bore so that it cannot be forced out of said bore by pressure from said common exchange tube.

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**5,049,136**

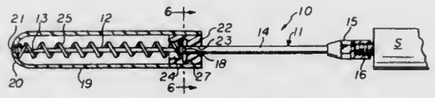
**HYPODERMIC NEEDLE WITH PROTECTIVE SHEATH**

**Gerald W. Johnson, 2010 Castlerock, Houston, Tex. 77090**

**Filed Jan. 10, 1990, Ser. No. 462,788**

**Int. Cl.[5] A61M *5/32***

**U.S. Cl. 604—198** **7 Claims**



1. A sheathed hypodermic needle comprising

a tubular fluid handling needle having a front end adapted for hypodermic penetration and a rear end adapted for connection to fluid ejection or withdrawal means,

a retractable sheath slidably mounted on said needle and movable relative thereto between a rearward retracted position exposing the front end of said needle and a forward protective position enclosing the front end of said needle to prevent inadvertent injury by contact with said needle and to facilitate disposal of said needle,

resilient means within said sheath normally holding said sheath in said forward protective position to enclose the front end of said needle,

engagement means between said needle and said sheath for releasably engaging said needle and said sheath in the protective position whereby relative longitudinal movement between said needle and said sheath is prevented while allowing rotational movement as a single unit in one direction about their longitudinal axis to facilitate connection of said needle to fluid ejection or withdrawal means, and

upon relative rotation in the opposite direction disengaging said needle and said sheath to allow relative longitudinal movement.



**5,049,137**

**PREPACKAGED SYRINGE AND CATHETER APPARATUS FOR DEEP ADMINISTRATION OF A FLUID, AND METHOD OF MAKING SAME**

**Jeffrey E. Thompson, N775 Bloomer Mill Rd., LaCrosse, Wis. 54601**

**Filed Sep. 8, 1989, Ser. No. 404,666**

**Int. Cl.[5] A61M *5/325***

**U.S. Cl. 604—240** **5 Claims**



1. An apparatus for deep administration of a fluid, comprising in combination:

a body including a cavity and having a discharge opening;

a predetermined quantity of fluid placed within said cavity;

user-actuated means associated with said body for ejecting the fluid from said cavity through said discharge opening;

a needle connected to said body and having a lumen in communication with the discharge opening of said body cavity to receive fluid ejected therefrom;

a flexible catheter interconnected with said needle and including a passage and having a proximal end and a distal end, with the distal end of said catheter being adapted for placement within a body passage of a patient and including an outlet;

a stopper member connected to the proximal end of said catheter and having a passage extending partially therethrough within which the end of said needle is received, wherein the stopper member cuts off communication between the passage of said catheter and the lumen of said needle when the end of said needle is received within said stopper member passage; and

wherein the end of said needle is removable from said stopper member for allowing direct injection of fluid through said needle into said patient, and is movable through said stopper member to place the lumen of said needle into communication with the passage of said catheter to allow deep administration of said fluid into said patient through the outlet of said catheter.

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**5,049,138**

**CATHETER WITH DISSOLVABLE TIP**

**Raymond P. Chevalier; Joseph J. Lacman, both of Bloomington, Ind., and John A. Hudson, Chelmsford, Mass., assignors to Boston Scientific Corporation, Watertown, Mass.**

**Filed Nov. 13, 1989, Ser. No. 437,048**

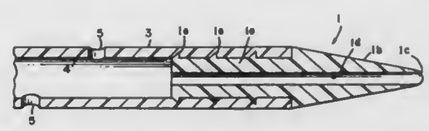
**Int. Cl.[5] A61M *5/325***

**U.S. Cl. 604—265** **27 Claims**

18. A catheter to be introduced into an internal organ in a body either percutaneously or through a body orifice where it can contact bodily fluids, said catheter comprising:

a flexible tubular member having an inner lumen;

a rigid solid tip having an inner face and a distal end, said tip being disposed at said lumen, said tip being formed entirely of a molded polymeric material that is slippery when wet, soluble in said bodily fluids and able to absorb radiographic media injected into said tubular member whereby to render said tip radio-opaque, said tip being a unitary body, said tip having an external portion shaped in a generally conical configuration and an internal portion



having a generally cylindrical configuration, said internal portion being arranged to be disposed in said lumen, said internal portion extending coaxially from the base of said external portion and being disposed within said tubular member;

a narrow passageway disposed in said tip, said passageway extending from said inner face to the distal end of said tip, said passageway adaptable to receive a guide wire for the insertion of said catheter into an internal organ.

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**5,049,139**

**APPARATUS FOR ANTIMICROBIAL USE**

**Thomas Gilchrist, Ayr, Scotland, assignor to Giltech Limited, Ayr, Scotland**

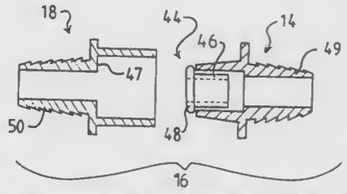
**PCT No. PCT/GB88/00701, § 371 Date Feb. 23, 1990, § 102(e) Date Feb. 23, 1990, PCT Pub. No. WO89/01793, PCT Pub. Date Mar. 9, 1989**

**PCT Filed Aug. 26, 1988, Ser. No. 465,146**

**Claims priority, application United Kingdom, Aug. 29, 1987, 8720502**

**Int. Cl.[5] A61M *5/32***

**U.S. Cl. 604—265** **10 Claims**



1. Apparatus for antimicrobial use in passage of fluid to or from a living body, the apparatus comprising a conduit for insertion into the body, a reservoir for fluid and a connector member for connecting said conduit to said reservoir external of the body, wherein said connector member includes a water-soluble glass impregnated with elemental silver or a compound of silver, said water-soluble glass defining at least a part of a passageway for fluid to flow between the reservoir and the conduit.

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5,049,140

## ANTIMICROBIAL FITTING FOR MEDICAL CATHETERS AND METHOD FOR THEIR APPLICATION

Otto Brenner, Edingen; Christoph Josefiak, Rimbach, and Günter Schuhmacher, Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Jan. 22, 1990, Ser. No. 467,951

Claims priority, application Fed. Rep. of Germany, May 22, 1989, 3916648

Int. Cl.[5] A61M *25/00, 5/32*

U.S. Cl. 604—266 9 Claims



1. An antimicrobial fitting for a catheter, comprising:

a tubular member having a Shore A hardness between about 80 and 95 fabricated from a silcone/polyurethane elastomer comprised of less than about 50% wt. organic silicone polymer having a molecular weight of about 500 to 10,000, and about 1 to 15% wt. of an antimicrobial agent uniformly dispersed in said elastomer and wherein the tubular member has a tensile strength of about 20 MPa, a breaking elongation of about 500% and a surface roughness less than about 6 micrometers.

5,049,141

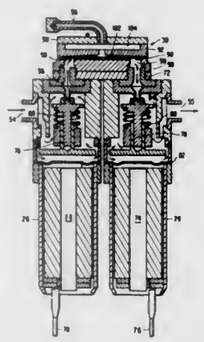
## PROGRAMMABLE VALVE PUMP

Peter Olive, Needham, Mass., assignor to Infusaid, Inc., Norwood, Mass.

Filed Apr. 25, 1990, Ser. No. 514,442

Int. Cl.[5] A61M *31/00*

U.S. Cl. 604—891.1 28 Claims



1. An implantable infusion apparatus comprising:

a housing containing,

a rechargeable constant pressure infusate reservoir,

an electronically controlled metering assembly receiving infusate from said reservoir, said metering assembly comprising a pair of normally closed valves and an accumulator positioned in fluid communication with each of said valves, said accumulator comprising an inlet and outlet, a chamber having a diaphragm and a spacer plate, said spacer plate having a series of concentric grooves in fluid communication with said inlet and outlet,

electronic means for controlling the operation of said valves, and

outlet means in fluid communication with said metering assembly to dispense infusate to a site in a living body, wherein when a first of said valves is open, infusate flows from said reservoir into said accumulator chamber and into said concentric grooves, and when the other valve is open and the first closes, infusate flows from said accumulator into said outlet, said accumulator storing and discharging predetermined volume spikes of infusate at a frequency determined by the cycling rate of said pair of valves.

5,049,142

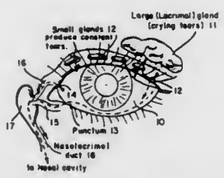
## INTRACANALICULAR IMPLANT FOR HORIZONTAL CANALICULAR BLOCKADE TREATMENT OF THE EYE

Robert S. Herrick, 4134 N. Rosemead Blvd., Rosemead, Calif. 90004, and William F. Sardi, 1613 Chelsea Road, Ste. 251, San Marino, Calif. 91108

Continuation of Ser. No. 929,895, Nov. 13, 1986, which is a division of Ser. No. 669252, Nov. 7, 1984, Pat. No. 4,660,546. This application Aug. 2, 1988, Ser. No. 227,528

Int. Cl.[5] A61M *35/00*

U.S. Cl. 604—294 23 Claims




1. An implant for insertion into the canaliculus of the human eye comprising a substantially cylindrical, solid element constructed of a material that is non-absorbable by the human body and having a selected diameter to be completely insertable into the horizontal portion of the canaliculus of the human eye without protrusion from the canaliculus to prevent the drainage of tears through the canaliculus, said element having a smooth continuously tapered end having a slope of about 8° from the cylindrical portion of the element to facilitate implantation into and removal from the canaliculus.

5,049,143

## APPARATUS AND TECHNIQUES FOR ADMINISTERING VETERINARY MEDICAMENTS

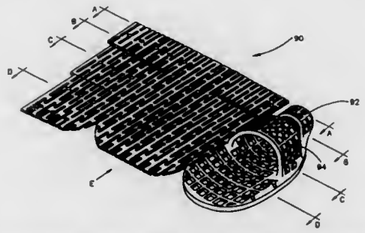
Avi Gertner, Kfar Saba, and Yosef Rubinstein, Nes Ziona, both of Israel, assignors to Agry Med Ltd., Nes Ziona, Israel

Filed Dec. 18, 1989, Ser. No. 451,679

Claims priority, application Israel, Dec. 27, 1988, 88808

Int. Cl.[5] A61F *13/00;* A61M *35/00;* A01K *29/00;* A62B *35/00*

U.S. Cl. 604—304 13 Claims



1. Apparatus for applying a medicament transdermally to animals comprising a removable enclosure bearing the medicament and means for non-invasively mounting said removable enclosure onto an animal ear.



5,049,144

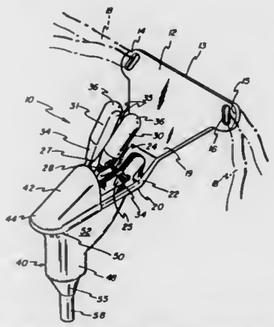
## FEMALE URINARY INCONTINENCE APPARATUS

Hugh W. Payton, 36 S. Main St., Jeffersonville, Ohio 43128

Continuation-in-part of Ser. No. 265,092, Oct. 31, 1988. This application Dec. 6, 1989, Ser. No. 446,910

Int. Cl.[5] A61F *5/44*

U.S. Cl. 604—329 8 Claims



1. A pubovaginal appliance for the collection of urine from women suffering from incontinence comprising a pad configured to engage a pubic region, a bifurcated support body attached to an end of said pad and defining a pair of spaced arm portions including means for extending from a location anterior to the vagina posteriorly along the contour of the perineum and terminating in a pair of flexible rods which are bent anteriorly and which terminate at distal ends, said rods diverging from each other with increasing distance from said arm portions, an enlarged vaginal insert carried on said distal end of each of said rods and proportioned to be received in the vaginal cavity, said rods biasing said inserts toward said pad to provide a self-holding force for said appliance between the pubis and vagina, and urine collection cup means carried by said body for enclosing the urethra and the sides of the vagina to collect urine from the urethra.

5,049,145

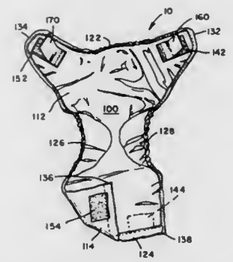
## DIAPER COVER AND DIAPER WITH SELF CLOSURE HOOK AND LOOP FASTENERS

Rachael Flug, Granada Hills, Calif., assignor to Diaperaps Limited, Northbridge, Calif.

Filed Jan. 24, 1991, Ser. No. 645,112

Int. Cl.[5] A61F *13/62*

U.S. Cl. 604—391 72 Claims



21. A diaper cover comprising:

a. a fabric having a surface and an edge;

b. at least one hook closing member having a hook mating surface, where the at least one hook closing member is nonmovably affixed onto the surface of said fabric at a location adjacent to the edge of said fabric, such that the hook mating surface of the at least one hook closing member faces away from the surface of said fabric; and

c. at least one loop covering member having a loop mating surface and an end attached to the surface of said fabric adjacent to said at least one hook closing member by a pair of spaced apart stitch lines, such that the loop mating surface of the at least one loop covering member faces the hook mating surface of said at least one hook closing member;

d. whereby said pair of spaced apart stitch lines has a hinge effect on said at least one loop covering member, which serves to cause the loop mating surface of said at least one loop covering member to contact and thereby cover the hook mating surface of said at least one hook closing member.

5,049,146

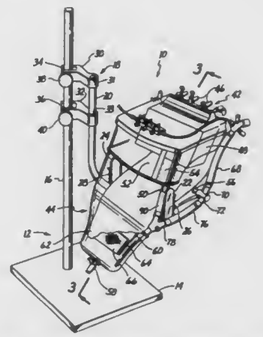
## BLOOD/GAS SEPARATOR AND FLOW SYSTEM

Richard L. Bringham, San Clemente, and R. Scott Bell, Irvine, both of Calif., assignors to Baxter International, Inc., Deerfield, Ill.

Filed May 31, 1989, Ser. No. 359,178

Int. Cl.[5] A61B *19/00*

U.S. Cl. 604—4 59 Claims



1. A venous and cardiotomy blood reservoir comprising:

a housing defining at least two separate compartments, with a second of said compartments being positioned above the first of said compartments, said housing including separate inlet and outlet ports communicating respectively with each of said compartments;

connecting means coupled to said inlet ports of a first of said compartments and said outlet ports of a second of said compartments;

a flexible bag means positioned in said housing first compartment for receiving blood through said inlet ports of said first compartment, said bag means being securely mounted in said compartment to restrict expansion of said bag means as said blood enters through said inlet ports, said bag means having a first end including a porous screen through which blood flows out of said bag means, and a second opposite end including a porous defoamer means which is at least partially coated with an antifoam material, with said partially coated portion being positioned above a maximum blood level in said reservoir;

a porous element positioned in said second compartment between said inlet and outlet ports, said porous element being coated with an antifoaming material;

a plate mounted in said housing to which said bag means is securely mounted along its edges;

said first bag means end being positioned at a level to lie partially below a minimum blood level in said reservoir;

said bag means being an elongated flexible bag which is

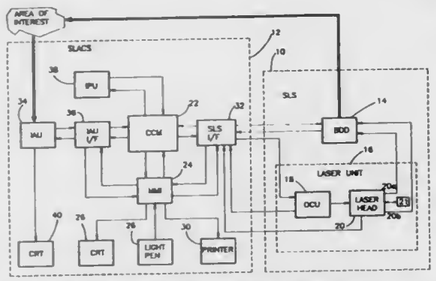
VOL 1130 ISS 3 SE 17 1991 UMI



mounted in said housing with said first end being positioned horizontally below said second end;
said screen having a porosity of from about forty to about two hundred microns;
said porous defoamer means having a porosity of from about four hundred to about eighteen hundred microns; and
said connecting means comprising a tube fitting means which connects to said inlet port of said first compartment and a flexible tubing connected to said tube fitting means and said outlet port of said second compartment.

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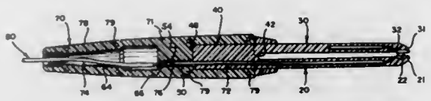
**5,049,147**
**APPARATUS FOR COMPUTERIZED LASER SURGERY**
**Nissim N. Danon, Flat 29, 15 Rabina St., Ramat Aviv, Israel**
**Filed Mar. 13, 1990, Ser. No. 493,108**
**Claims priority, application Israel, Apr. 6, 1989, 89874**
**Int. Cl.[5] A61B *17/36***
**U.S. Cl. 606—10** **19 Claims**




1. Apparatus for computerized laser surgery comprising:
means for acquiring in real time a visually sensible image of the area of surgery;
laser surgical means for directing a laser beam and being operative in a simulation mode to verify correct aiming and to produce a visible indication of laser impingement on the area of surgery and operative in a surgical mode;
display means for displaying said visually sensible image and said visible indication in overlay over said visually sensible image; and
automated means for operating said laser surgical means in said surgical mode.

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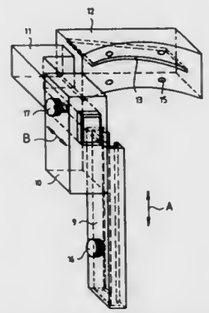
**5,049,148**
**RADIO FREQUENCY HAIR REMOVAL TWEEZER**
**Thomas L. Mehl, P.O. Box 1019, Newberry, Fla. 32669**
**Filed Jun. 29, 1989, Ser. No. 372,852**
**Int. Cl.[5] A61B *17/41***
**U.S. Cl. 606—43** **12 Claims**



1. A radio frequency hair removal tweezer comprising:
a) a hand-held housing to which radio frequency energy is supplied which has a forward end supporting a pair of tweezer arms extending outwardly therefrom;
b) the tweezer arms being a pair of relatively movable opposed and spaced flexible plastic members which are movable into contact with each other at their opposed free ends at a small angle with respect to each other;
c) each of the tweezer arms at their opposed free ends having a flat interior surface facing each other;
d) the facing interior surfaces having a radio frequency conducting hair engaging metal conducting pad with a flat surface whose periphery is slightly spaced from the outer periphery of the flat interior surface of the tweezer;
e) each of the conducting pad surfaces being raised slightly above the flat interior surface of ht tweezer free ends, whereby the tweezer arms can bring the opposed pads together at their extremities at a slight angle with no interference from the adjacent plastic surface to provide a firm forceful contact between the opposed conducting pad surfaces; and
f) at least one of the tweezer arms having a conducting pad lead wire which extends the length thereof and is connected with the conducting pad at the free end.

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**5,049,149**
**SAWING GAUGE SYSTEM**
**Joachim Schmidt, Mohnweg 18, D-5000 Cologne 40, Fed. Rep. of Germany**
**Filed Dec. 12, 1989, Ser. No. 448,094**
**Claims priority, application Fed. Rep. of Germany, Dec. 14, 1988, 3842645**
**Int. Cl.[5] A61N *1/30***
**U.S. Cl. 606—87** **10 Claims**

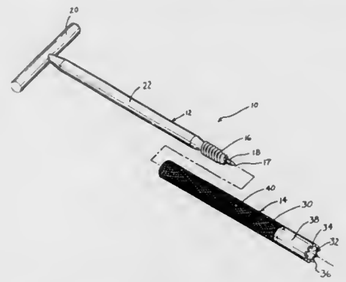


1. A sawing gauge system to be used for intertrochantery accommodation osteotomies for removing a wedge-shaped section of bone, comprising
(a) a first sawing gauge having an underside; said underside being curved like a hollow cylinder for a face-to-face engagement with the bone surface of a femur shaft;
(b) a first sawing opening provided in said first sawing gauge; the first sawing opening being oriented perpendicularly to the axis of the femur shaft when said underside of said first sawing gauge is in face-to-face engagement with the bone surface of the femur shaft;
(c) a second sawing gauge having an underside; said underside being curved like a hollow cylinder for a face-to-face engagement with the bone surface of the femur shaft;
(d) a second sawing opening provided in said second sawing gauge; the second sawing opening being oriented to form an angle of 6° with a perpendicular to the axis of the femur shaft when said second sawing gauge is in face-to-face contact with the bone surface of the femur shaft.

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**5,049,150**
**TOOL FOR GRIPPING A BONE FRAGMENT**
**Trent E. Cozad, deceased, late of Fort Wayne, Ind. by Kay M. Cozad, heir , assignor to Zimmer, Inc., Warsaw, Ind.**
**Filed Dec. 27, 1990, Ser. No. 634,674**
**Int. Cl.[5] A61F *5/00***
**U.S. Cl. 606—86** **4 Claims**

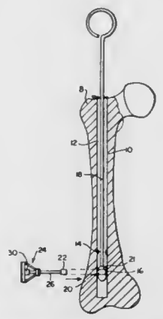
1. An orthopaedic extractor for removing a bone fragment from a main bone mass comprising a first member including threads at one end for engaging the fragment and an enlarged integral handle on an opposite end the threads to permit turning of the threads into the fragment and manipulation of the fragment away from the main bone mass once it is engaged; and a second tubular member configured for movably carrying the first member, the second member including teeth at one end for engaging the bone fragment and preventing rotation of



the fragment and defining a length such that when an opposite end of said second member abuts the handle, the length of the tube does not extend past the threaded and of the first member; whereby the second member prevents rotation of the bone fragment while the first member is threaded into the bone fragment.

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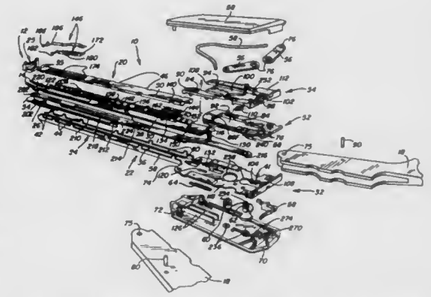
**5,049,151**
**MAGNETIC POSITIONER ARRANGEMENT FOR LOCKING SCREWS FOR ORTHOPEDIC HARDWARD**
**Alfred A. Durham, 2954 Lockridge Rd., and Dallas P. Crickenberger, 3465 Westridge Rd., both of Roanoke, Va. 24014**
**Filed Dec. 20, 1989, Ser. No. 453,967**
**Int. Cl.[5] A61B *17/56***
**U.S. Cl. 606—98** **25 Claims**



1. A positioning arrangement for positioning locking screws or pine relative to screw holes in an orthopedic implant in the limb of a patient, said arrangement including a first permanent magnet positioned in alignment with a said hole in a said orthopedic implant and providing a directional magnetic field, a further permanent magnet providing a directional magnetic field, and positioning means, including means defining a pivot axis, for mounting said further magnet so as to freely pivot about said pivot axis so as to enable the magnetic field of said further magnet to align with the magnetic field of the first magnet and thus provide alignment of the further magnet with the screw hole in the orthopedic implant at which said first magnet is positioned, thereby determining the path along which a locking screw or pin is to be advanced in order to engage in said screw hole in the implant.



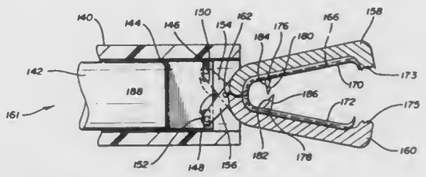
**5,049,152**
**HEMOSTATIC CLIP APPLICATOR**
**Denise M. Simon, Harbor Springs, Mich., and Darren Saravis, Long Beach, Calif., assignors to Richard-Allan Medical Industries, Richland, Mich.**
**Filed Mar. 7, 1989, Ser. No. 319,664**
**Int. Cl.[5] A61B *17/12***
**U.S. Cl. 602—143** **22 Claims**



1. In an apparatus for applying surgical clips, having a pair of opposed spaced jaws, a main body including clip housing and feed means for storing and advancing clips to the jaws, and transmission means associated with the body to actuate the clip feed means and associated with the jaws to cam the jaws against the forward end of the main body to effectuate closure of the jaws and deform a clip disposed therebetween, the improvement comprising:
an anti-distortion means associated with the forward end of the main body for preventing distortion of the forward end of the main body and for preventing rotation and misalignment of the jaws during clip closure, said anti-distortion means including means for camming the jaws at the outer edges of the jaws and means for aligning at the tope and bottom of the jaws.

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**5,049,153**
**ENDOSCOPIC STAPLING DEVICE AND METHOD**
**Naomi L. Nakao, 303 E. 57th St., New York, N.Y. 10022, and Peter J. Wilk, 185 West End Ave., New York, N.Y. 10023**
**Continuation-in-part of Ser. No. 456,960, Dec. 26, 1989, Pat. No. 5,015,249. This application Jun. 26, 1990, Ser. No. 543,704**
**Int. Cl.[5] A61B *17/00***
**U.S. Cl. 606—151** **21 Claims**



1. A surgical instrument comprising:
an endoscope including an elongate flexible outer tubular member and a biopsy channel extending longitudinally through said tubular member;
an elongate flexible forceps member slidably disposed in said biopsy channel, said forceps member being provided at a distal end with a pair of forceps jaws each formed on an inwardly facing surface with a longitudinally extending groove; actuating means for manipulating said jaws between and open and closed position; and
a staple having a spring bias tending to force said staple into

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an opened configuration, said staple being disposed in a closed prefiring configuration between said jaws when said jaws are closed, said staple having legs each disposed in said closed prefiring configuration in a respective one of the grooves, said staple having interlocking means for locking said staple in a closed postfiring configuration in opposition to said spring bias.

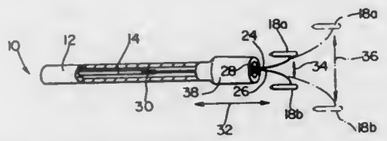
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**5,049,154**

## ADJUSTABLE INTRA-LUMINAL VALVULOTOME

**Arshad Quadri, Pittsfield, Mass., assignor to Berkshire Research & Development, Inc., Pittsfield, Mass.**

**Filed Aug. 7, 1989, Ser. No. 390,410**
**Int. Cl.[5] A61B *17/32***
**U.S. Cl. 606—159** **7 Claims**




1. An adjustable intraluminal valvulotome comprising:

a hollow tubular member having a distal end and a proximal end;

first and second opposed cutting blades movable between an extended position and a retracted position with respect to said distal end of said tubular member and between an open position in which said cutting blades are spaced apart from each other and a closed position in which said cutting blades are drawn close to each other, said cutting blades being in said closed position when in said retracted position and in said open position when in said extended position, each of said cutting blades having an inner surface, an outer surface, a forward blunt edge in the direction of extension, a rearward cutting edge in the direction of retraction, and a pair of opposed side edges, one of said side edges being a blunt edge and the other of said side edges being a cutting edge, said inner surfaces of said cutting blades substantially facing each other in all said positions;

control means slidably disposed within said hollow tubular member for moving said first and second cutting blades between said extended and retracted positions and a plurality of partially-extended positions intermediate said extended and retracted positions;

spacing means for moving said first and second cutting blades laterally apart from each other from said closed position to said open position as said control means moves said cutting blades from said retracted position to said extended position and for drawing said first and second cutting blades back towards each other from said open position to said closed position as said control means moves said cutting blades from said extended position to said retracted position; and

shielding means for shielding at least said rearward cutting edges of said first and second cutting blades in said retracted and closed positions.

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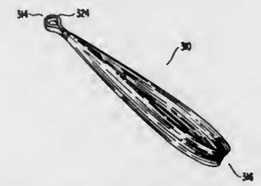
**5,049,155**

## PROSTHESIS FOR TENSILE-LOAD-CARRYING TISSUE AND METHOD OF MANUFACTURE

**William C. Bruchman; Carl W. Bolton, and James R. Bain, all of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Neward, Del.**

**Continuation of Ser. No. 732,811, May 10, 1985, abandoned, which is a continuation of Ser. No. 416,565, Sep. 10, 1982, abandoned. This application Aug. 16, 1990, Ser. No. 568,625**
**Int. Cl.[5] A61F *2/68***
**U.S. Cl. 623—17** **38 Claims**

1. Article of manufacture for use as a in vivo tensile load-bearing tissue prosthesis for connection between tensile force-applying tissues comprising, in the portion wherein attachment to the tensile force-applying tissue is required, a plurality of longitudinally adjacent parallel nonadhering strands of microporous polytetrafluoroethylene material having interconnecting voids defined by nodes and fibrils, the thickness of each of said strands being chosen in relation to the microstructure of said material such that force-applying tissue ingrowth can occur into and through substantially the entire strand thickness, the prosthesis being attached at least in part by said ingrowth,




wherein said parallel strands are formed from a plurality of elongated concentric double-ended closed loops, said plurality of loops being formed from a continuous filament of said material, wherein said loops are gathered at least at one elongated end to form at least one eyelet for initially attaching the article to tensile force-applying bone tissue, and wherein the article further includes means for restraining the gathered loop ends against ungathering.

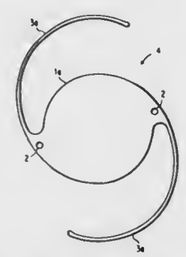
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**5,049,156**

## INTRA-OCULAR LENS

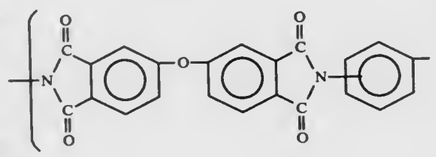
**Kazumi Higashi; Kazuhide Fujita; Yoshinori Yoshida; Kiichiro Matsushita, all of Osaka, and Kazuhiko Nakada, Aichi, all of Japan, assignors to Nitto Denko Corporation, Osaka and Menicon Co., Ltd., Aichi, both of, Japan**

**Filed Oct. 29, 1990, Ser. No. 604,318**
**Claims priority, application Japan, Oct. 30, 1989, 1-282541; Sep. 5, 1990, 2-236854**
**Int. Cl.[5] A61F *2/16***
**U.S. Cl. 623—6** **4 Claims**

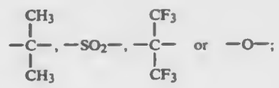



1. An intra-ocular lens comprising a lens part and a fixing part for fixing said lens part in an eye, said lens part comprising a colorless and transparent polyimide containing at least one of repeating units represented by formulae (I) to (IV):

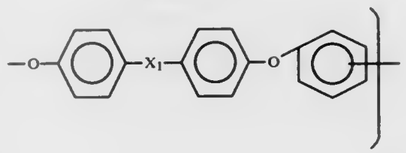
(I)



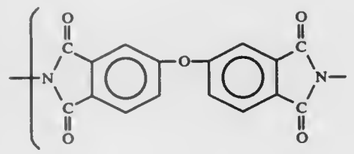


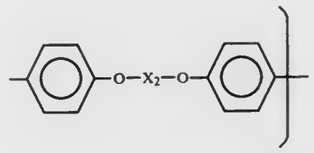



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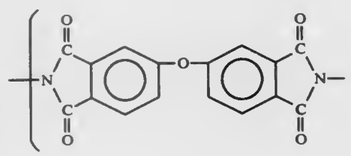


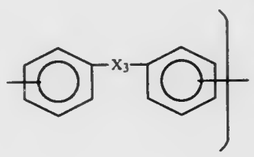

(II)



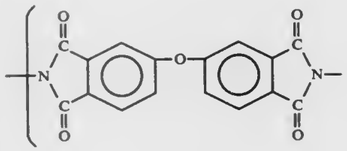


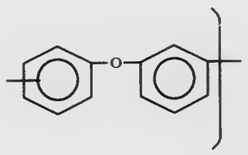

(III)





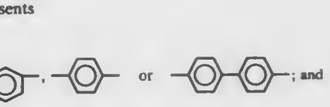

(IV)





wherein

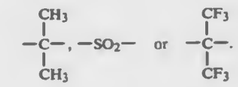
$X_1$ represents




$X_2$ represents




$X_3$ represents



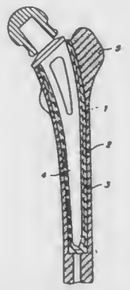

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**5,049,157**

## REINFORCED BONE CEMENT

**Heinz Mittelmeier, Homburg-Schwarzenbach, Fed. Rep. of Germany; Heinz Moser, Selzach, and Beat Leu, Ipsach, both of Switzerland, assignors to Osteo AG, Selzach, Switzerland**

**Continuation of Ser. No. 576,767, Feb. 2, 1984, abandoned, which is a continuation of Ser. No. 430,714, Sep. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 397,370, Jul. 12, 1982, abandoned, which is a continuation of Ser. No. 48,451, Jun. 14, 1979, abandoned. This application Aug. 12, 1987, Ser. No. 84,168**
**Claims priority, application European Pat. Off., Jun. 29, 1978, 78810005.5**
**Int. Cl.[5] A61F *2/02***
**U.S. Cl. 623—16** **7 Claims**



1. A bone cement for adhering a prosthetic device to a bone consisting essentially of polymethyl methacrylate or its derivatives, carbon fibers and an essentially non-absorbably mineral component in fine grained particle form, said essentially non-absorbably mineral component comprising apatite in an amount of between 1 and 301% by weight.

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5,049,158

## ACETABULAR CUP ASSEMBLY

John A. Engelhardt; Jon C. Serbousek; C. Wayne Allen, all of Warsaw; Alex M. DiNello, Fort Wayne; Jeff M. Ondrla, and Duane G. Snyder, both of Warsaw, all of Ind., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Apr. 20, 1990, Ser. No. 511,457

Int. Cl.[5] A61F *2/34;* B23B *45/12*

U.S. Cl. 623—22 26 Claims

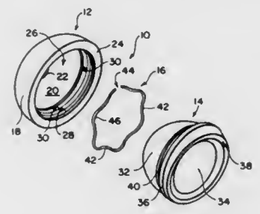
1. A prosthetic acetabular cup assembly for receiving a ball attached to a femur, the assembly comprising

a bearing component including an inner bearing surface for receiving the ball and an outer surface,

a shell component for attachment to an acetabulum to replace a natural hip socket, the shell component including an inner surface defining a cavity for receiving the bearing component therein, the inner surface of the shell component being formed to include an arcuate groove therein,

means located in the arcuate groove of the shell component for engaging the bearing component to retain the bearing component inside the shell component upon insertion of the bearing component into the shell component, and

means formed on the inner surface of the shell component




for cutting into the outer surface of the bearing component as the bearing component is inserted into the shell component to prevent rotation of the bearing component relative to the shell component.



5,049,159

## DEODORIZING MATERIAL AND PROCESS FOR PRODUCING THE SAME: CELLULOSE FIBERS TREATED WITH COPPER HYDROXIDE OR ZINC HYDROXIDE COLLOID SOLUTION

Keizou Yamaji; Natumi Satou, and Eiji Morisaki, all of Saiki, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00443, § 371 Date Dec. 13, 1989, § 102(e) Date Dec. 13, 1989, PCT Pub. No. WO89/12713, PCT Pub. Date Dec. 28, 1989

PCT Filed Apr. 27, 1989, Ser. No. 449,924

Claims priority, application Japan, Jun. 23, 1988, 63-153471; Jul. 1, 1988, 63-162476; Oct. 18, 1988, 63-260435

Int. Cl.[5] D06M *15/03, 21/00;* D21H *5/22;* A61L *9/01*

U.S. Cl. 8—125 12 Claims

1. A process for producing deodorizing fibers, comprising adding an alkaline substance to an aqueous solution containing at least one water-soluble compound selected from the group consisting of copper compounds and zinc compounds so as to form a colloid comprising hydroxide of said at least one water-soluble compound by adjusting the pH of said aqueous solution such that, in cases wherein said water-soluble compound is copper, said pH is from 5.0 to 12.0, and, in cases wherein said water-soluble compound is zinc, said pH is from 6.2 to 12.0, and attaching said hydroxide of said at least one water-soluble compound to cellulose fibers.

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5,049,160

## TAXIDERMIC CLEANING COMPOUND AND METHOD

Michael J. Seymour, 6728 Maryellen St., Normandy, Mo. 63121

Filed Jul. 19, 1989, Ser. No. 381,987

Int. Cl.[5] D06L *3/00*

U.S. Cl. 8—137 1 Claim

1. The process of cleaning hair or fur of a mounted animal comprising the steps of:

a) spraying on said hair or fur an aqueous solution consisting of about 50 weight percent carbonate peroxyhydrate, about 40 weight percent sodium carbonate, and about 10 weight percent dodecylbenzenesulfonate wherein said percentage is based on the dry weight of the composition before dissolution and wherein the proportion of said compound is one fourth teaspoon to four ounces of water;

b) maintaining said solution in contact with said hair or fur for a few minutes; and

c) removing said solution from said hair or fur.

Because the proposed changes are to the form of the claim and not to its substance, its admission is respectfully requested.

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5,049,161

## MIXTURES OF DICYANOBENZANTHRONE COMPOUNDS

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

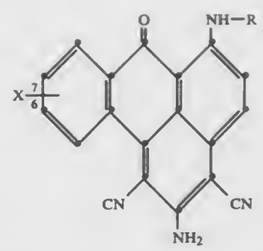
Filed Jun. 1, 1989, Ser. No. 360,577

Claims priority, application Switzerland, Jun. 6, 1988, 2135/88

Int. Cl.[5] C09B *67/22;* C07C *50/22*

U.S. Cl. 8—638 11 Claims

1. A dye mixture containing approximately equal amounts of two different dicyanobenzanthrone compounds of the formula




(I)

wherein R is hydrogen or a substituted or unsubstituted $C_1$–$C_8$-alkyl or aryl group and X is hydrogen or halogen located in the 6- or 7-position.

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5,049,162

## PROCESS FOR PRODUCING A PLASTIC SEALING ELEMENT FOR A GALVANIC PRIMARY CELL

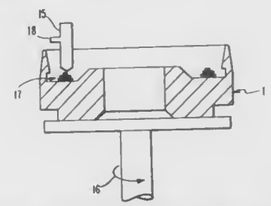
Klaus Ruggeberg, Ellwangen, and Horst-Udo Jose, Fichtenau-Unterdeufstetten, both of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Division of Ser. No. 271,021, Nov. 14, 1988, Pat. No. 4,957,832. This application May 23, 1990, Ser. No. 528,047

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1987, 3742026

Int. Cl.[5] H01M *2/08*

U.S. Cl. 29—623.2 10 Claims




1. A process for producing a plastic sealing element for a galvanic primary element in the form of a round cell including a metal casing, a metal housing cover having edge portions, a carbon rod conductor, and a radially symmetrical plastic body the upper surface of which defines a circumferential trough-shaped depression bounded by a raised rim including a circumferential projection for receiving the edge portions of the metal housing cover, comprising the steps of:

forming the plastic body as a base element for receiving an annular bead of an elastomeric plastic material;

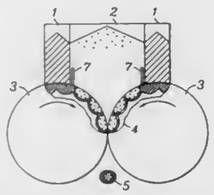
rotating the base element while simultaneously extruding plural coils of elastomeric material onto the rotating base element; and

subjecting the extruded coils of elastomeric material to a timed pressurization interval to develop an annular bead upon the base element.

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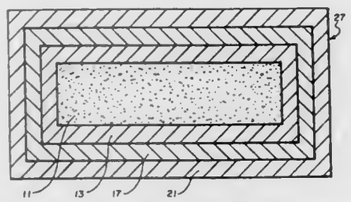


5,049,163
**PROCESS FOR REDUCING SULPHUR DIOXIDE EMISSION FROM BURNING COAL CONTAINING SULPHUR**
Zhongcheng Huang; Peilan Wang, and Xiaoxu Lei, all of Beijing, China, assignors to Briquetting Research and Design Institute, Beijing Graduate School of China University of Mining and Technology, Beijing, China
Filed Dec. 26, 1989, Ser. No. 456,303
Claims priority, application China, Dec. 28, 1988, 88108858.7
Int. Cl.[5] C10L *5/12, 5/38, 9/10*
U.S. Cl. 44—622 16 Claims



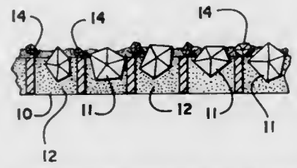
1. A process for reducing sulphur dioxide emission from burning sulphur-containing coal including at least one of anthracite coal, bituminous coal, subbituminous coal or lignite, comprising:
(a) forming an admixture of a sulphur trapping agent composition in an amount of from about 99 to about 50 weight percent with a combustible material to obtain a powder of about 30 to about 60 mesh in size;
(b) Providing a supply of coal; and
(c) preparing a coal briquette wherein the coal is wrapped up in a microporous surface layer of said admixture powder for burning.

5,049,164
**MULTILAYER COATED ABRASIVE ELEMENT FOR BONDING TO A BACKING**
Ralph M. Horton, Murray; Royce A. Anthon, W. Jordan, both of Utah, and James T. Hoggins, Plano, Tex., assignors to Norton Company, Worcester, Mass.
Filed Jan. 5, 1990, Ser. No. 461,387
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—295 44 Claims



1. A coated abrasive element for bonding at a surface thereof to a backing by means of a brazing or binder material comprising:
a substrate material selected from the group consisting of single crystal diamond, polycrystalline diamond, polycrystalline cubic boron nitride, boron carbide, silicon carbide, alumina or combinations thereof;
an inner layer of a metal or alloy coated on at least a portion of said substrate material, said inner metal layer being capable of reacting with said substrate material to form a bond therebetween;
a compliant layer of a ductile metal or alloy coated on said inner layer, said compliant layer having a thickness sufficient to substantially prevent cracking of said polycrystalline element caused by the transfer of stress to said polycrystalline element during cooling after said coated abrasive element is bonded to said backing; and
an outer layer of a metal or alloy coated on said compliant layer and having a melting point higher than said compliant layer, said outer layer being sufficiently thick so as to be substantially impervious to said brazing or binder material during bonding to said backing.

5,049,165
**COMPOSITE MATERIAL**
Naum N. Tselesin, 2900 Lookout Pl., Atlanta, Ga. 30305
Continuation-in-part of Ser. No. 303,924, Jan. 30, 1989, Pat. No. 4,925,457. This application Jan. 22, 1990, Ser. No. 467,958
Int. Cl.[5] B24D *11/00*
U.S. Cl. 51—295 23 Claims



1. In a composite material for producing abrasive and wear resistant parts, said composite material including a carrier, and a plurality of hard particles fixed with respect to said carrier for providing an abrasive quality of the carrier, the improvement wherein said carrier consists of a cellular material comprising a skeleton defining a plurality of cells within said carrier, said plurality of hard particles being primarily received within said cells of said carrier, and matrix means for holding said hard particles within said cells.

5,049,166
**LIGHT WEIGHT ABRASIVE TUMBLING MEDIA AND METHOD OF MAKING SAME**
Gregory S. Kirkendall, Lake Wales, Fla., assignor to Washington Mills Ceramics Corporation, North Grafton, Mass.
Filed Feb. 27, 1990, Ser. No. 485,955
Int. Cl.[5] B24D *3/00*
U.S. Cl. 51—293 10 Claims

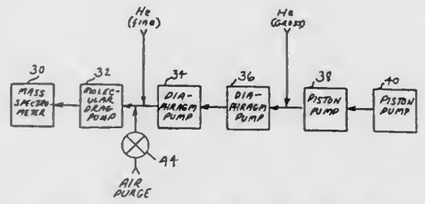
1. A method for manufacturing abrasive tumbling media consisting of discrete abrasive particles having an essentially uniform size and shape made by firing a formable mixture primarily comprising a clay, a ceramic and mixtures thereof, which method comprises adding at least 15% of a naturally occurring or synthetically produced metal carbonate to said mixture prior to firing to obtain particles having a final fired bulk density below 65 lbs/ft$^3$.

5,049,167
**MULTILAYER INTERFACIAL COMPOSITE MEMBRANE**
Robert P. Castro, Sunnyvale; Richard W. Baker, Palo Alto, and Johannes G. Wijmans, Menlo Park, all of Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.
Filed Dec. 13, 1989, Ser. No. 450,278
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—16 31 Claims

1. A separation process, comprising the steps of:
(a) providing a separation membrane having a feed side and a permeate side, said membrane comprising:
a microporous substrate layer;
a sealing layer coating said microporous substrate layer;
an interfacially polymerized permselective layer formed on said sealing layer;
(b) contacting said feed side with a feed fluid mixture comprising component A and component B;
(c) withdrawing from said permeate side a gas mixture enriched in component A compared with said feed fluid mixture.



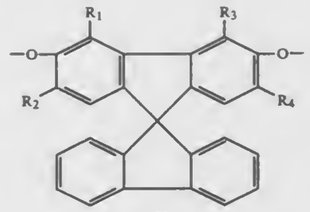
5,049,168
**HELIUM LEAK DETECTION METHOD AND SYSTEM**
Philip Danielson, 5620 Main St., Downers Grove, Ill. 60516
Continuation of Ser. No. 430,370, Nov. 2, 1989, abandoned, which is a division of Ser. No. 193,810, May 12, 1988, Pat. No. 4,893,497. This application Oct. 29, 1990, Ser. No. 604,329
Int. Cl.[5] B01D *57/00*
U.S. Cl. 55—17 7 Claims



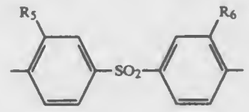

1. A method of separating one gas from at least one other gas of heavier molecular weight, comprising:
introducing a mixture of gases into a conduit means in fluid communication with the exhaust of a molecular drag pump, said exhaust of said molecular drag pump having dynamic, nonmolecular, viscous flow characteristics, said mixture having one gas having a molecular weight mixed with at least one other gas of heavier molecular weight;
said step of introducing further comprising injecting said mixture of gases into said conduit means with dynamic flow characteristics having nonmolecular, viscous flow;
directing the flow of said mixture of gases from said conduit means into said exhaust of said molecular drag pump;
separating out said one gas of lighter molecular weight from said mixture, said one gas flowing upstream through said molecular drag pump from said exhaust thereof to said inlet thereof, and said at least one other gas of heavier molecular weight being carried away downstream by said exhaust of said molecular drag pump; and
collecting said one gas in a chamber after its exit from said inlet of said molecular drag pump.

5,049,169
**POLYSULFONE SEPARATION MEMBRANE**
Takerou Teramoto; Shingo Kazama; Tsutomu Kaneta; Masao Sakashita; Masaya Furukawa, and Kazuto Shiraishi, all of Kawasaki, Japan, assignors to Nippon Steel Corporation and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan
Filed May 22, 1990, Ser. No. 526,431
Claims priority, application Japan, May 23, 1989, 1-127927; May 23, 1989, 1-127928; Aug. 31, 1989, 1-223088; Aug. 31, 1989, 1-223089
Int. Cl.[5] B01D *53/22, 71/68*
U.S. Cl. 55—158 5 Claims

1. A separation membrane comprising a soluble aromatic polysulfone having the formula—(X-Y)—, wherein X and Y are the constituent units shown below, and having an inherent viscosity ($\eta_{inh}$) of at least 0.4 dl/g, measured from a solution of 0.5 g of said polysulfone dissolved in 100 ml of N-methyl-2-pyrrolidone at 30° C.



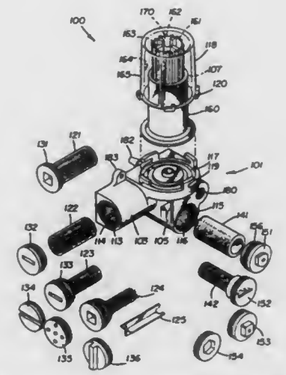

X




Y

wherein $R_1$ to $R_4$ are indcpendently H, $CH_3$ or $C_2H_5$, and $R_5$ and $R_6$ are independently H, Cl or $NO_2$.

5,049,170
**FILTER ASSEMBLY FOR GAS ANALYZER**
George K. Parnoff, Walnut Creek, Calif., assignor to Andros Incorporated, Berkeley, Calif.
Filed Sep. 11, 1990, Ser. No. 580,601
Int. Cl.[5] B01D *46/02, 39/14*
U.S. Cl. 55—323 16 Claims



1. A filter assembly for a gas analyzer comprising:
a housing including first, second, and third filter cavities, a first inlet passage and first and second outlet passages;
said first inlet passage being in fluid communication with said first filter cavity and further having means for connection to a source of gas;
said first filter cavity having means for supporting therein a substantially coarse filter for filtering particulate matter and for separating liquids;
said second filter cavity having means for supporting therein a substantially fine liquids filter for filtering liquids;
said second filter cavity being operatively positioned with respect to said first filter cavity to drain, by gravity, liquid from said first filter cavity;
said first outlet passage providing fluid communication from said second filter cavity for removal of liquid therefrom;
said third filter cavity having means for supporting therein a substantially fine gas filter for filtering the gas;

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said third filter cavity being operatively positioned with respect to said first filter cavity to receive gases filtered therefrom; and

said second outlet passage being in fluid communication with said third filter cavity and having means for connection to a pump for removal of filtered gas therefrom.

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5,049,171

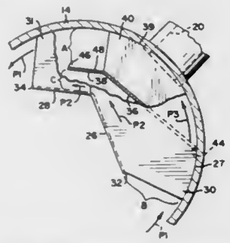
## OIL/AIR SEPARATOR

J. D. Presnell, Mocksville, and David C. Phelps, Clemmons, both of N.C., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 342,142, Apr. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 170,259, Mar. 18, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 469,700

Int. Cl.[5] B01D *53/24*

U.S. Cl. 55—338 5 Claims



1. An oil/air separator apparatus, comprising: a tank having a cylindrical wall;

a first channel wall within the tank, substantially axially aligned with the cylindrical wall, the first channel wall having a bend portion therein, the first channel wall also having a cap portion normal thereto and interconnecting the first channel wall with the cylindrical wall, the first channel wall further having a first end and a second end each of which is spaced from the cylindrical wall;

a second channel wall within the tank, positioned between and substantially axially aligned with the cylindrical and first channel walls, the second channel wall also having a cap and a base portion, the cap and base portions being spaced apart by and normal to the second channel wall, the cap and base portions interconnecting the second channel wall with the cylindrical wall, the cap portion of the second channel wall being spaced from the cap portion of the first channel wall, the second channel wall also having a first end engaged with the cylindrical wall and a second end spaced from the cylindrical wall, the first and second ends and the bend portion of the first channel wall being substantially adjacent to the first and second ends and the bend portion of the second channel wall, respectively, the first and second channel walls converging in a direction extending from the first ends thereof to the bend portion thereof, and being substantially parallel in a direction extending from the bend portions thereof to the second ends thereof;

the cylindrical wall having means for admitting an oil/air mixture into the tank, the tank having opposite ends, one of the ends having an air exit and the other of the ends having an oil exit;

the second channel wall being a means for directing the admitted oil/air mixture through a first passageway and into a first flow pattern adjacent the cylindrical wall; and

the first channel wall being a means for redirecting a first portion of the mixture in the first flow pattern through a second passageway, separated from the first passageway and into a second flow pattern separated from the means for admitting and separated from the cylindrical wall, and for redirecting a second portion of the mixture in the first flow pattern through the second passageway and into a third flow pattern separated from the means for admitting and adjacent the cylindrical wall.

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5,049,172

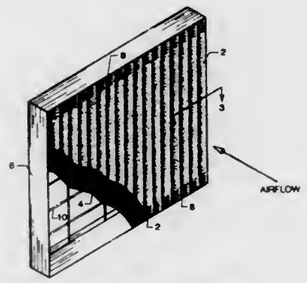
## BLOW OUT RESISTANT FILTER

Stephen P. Shary, Meggett, and Lloyd D. Waitschies, Charleston, both of S.C., assignors to Life Cycle Engineering, Inc., Charleston, S.C.

Filed Jul. 23, 1990, Ser. No. 559,217

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—495 2 Claims



1. A blow out resistant filter, comprising:

a. a filter media which is pleated in shape; and

b. a rigid, porous backing material which is pleated so as to be congruent to said filter media and which contacts said filter media on all surfaces of said filter media which are downstream of a flow of gas through said filter media, and wherein said backing material continues around two or more opposite edges of said filter media to cover a portion of an upstream side of said filter media to aid in holding and supporting said filter media, while leaving a majority of said upstream side of said filter media, uncovered.

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5,049,173

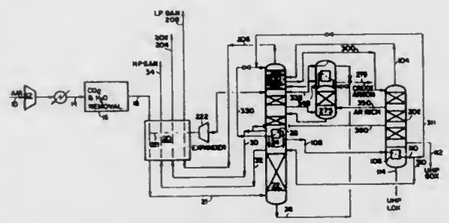
## PRODUCTION OF ULTRA-HIGH PURITY OXYGEN FROM CRYOGENIC AIR SEPARATION PLANTS

Thomas E. Cormier, Sr.; Rakesh Agrawal, both of Allentown, Pa.; Alan L. Prentice, Surbiton, England, and Donald W. Woodward, New Tripoli, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 6, 1990, Ser. No. 490,017

Int. Cl.[5] F25J *3/04, 3/02*

U.S. Cl. 62—24 16 Claims



1. In a process for the fractionation of air by cryogenic distillation using a thermally integrated dual-column cryogenic distillation system comprising a high pressure distillation column and a low pressure distillation column, wherein a feed air stream is compressed, cooled to near its dew point and fed to the high distillation column system for rectification thereby producing a nitrogen containing overhead and a crude liquid oxygen bottoms and wherein the crude liquid oxygen is reduced in pressure, fed to and further fractionated in the low pressure distillation column thereby producing a low pressure nitrogen overhead, the improvement for producing an ultra-high purity oxygen product comprising the steps of: removing an oxygen-containing stream from a location of the thermally integrated dual-column cryogenic distillation system where the removed stream is essentially free of heavier contaminants comprising hydrocarbons, carbon dioxide, xenon and krypton, and subsequently stripping the removed oxygen-containing stream in a cryogenic stripping/distillation column thereby producing an ultra-high purity oxygen product at the bottom of the cryogenic stripping/distillation column.



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5,049,174

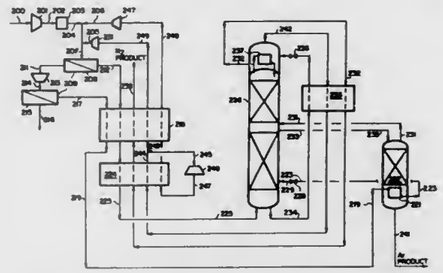
## HYBRID MEMBRANE - CRYOGENIC GENERATION OF ARGON CONCURRENTLY WITH NITROGEN

Robert M. Thorogood, Macungie, Pa.; Wilman Tsai, Cupertino, Calif.; Robert F. Weimer, Allentown, and David H. S. Ying, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 18, 1990, Ser. No. 540,028

Int. Cl.[5] F25J *3/02*

U.S. Cl. 62—24 20 Claims



1. A process for the concurrent production of gaseous and/or liquid nitrogen and crude argon from a feed gas stream comprising oxygen, nitrogen, and argon, said process comprising providing an added degree of freedom for adjusting the process parameters by:

(a) feeding said gas stream to a hybrid cryogenic air separation unit comprising a main and a secondary cryogenic unit and a membrane system to process said gas stream and yield a nitrogen product and crude argon product;

(b) withdrawing at least a portion of the treated gas which is argon-enriched from the main cryogenic distillation unit;

(c) feeding the argon-rich portion to the secondary distillation unit wherein said stream is separated to form a nitrogen-enriched distillation overhead vapor stream which is returned to the main cryogenic separation unit, and a product crude argon and oxygen bottoms liquid stream which is removed from the hybrid separation system for possible further purification;

(d) withdrawing a substantially pure gaseous nitrogen stream from the upper section of said main cryogenic distillation unit as product;

(e) compressing a second gaseous oxygen-enriched stream from the upper reboiler section of said main cryogenic distillation unit combining with the fresh compressed feed stream, and feeding the resulting stream to a first membrane unit, wherein said stream is split into a relatively argon and nitrogen-rich reject stream which is recycled after cooling to the bottom of said primary distillation unit, and a relatively oxygen-rich permeate stream;

(f) compressing said oxygen-rich permeate stream and feeding same to a second membrane unit wherein said stream is split into an oxygen-rich vent stream, and a relatively argon and nitrogen-rich stream which is recycled to the lower section of said distillation zone for condensation in the reboiler/condenser component thereof;

(g) withdrawing said condensed stream from said reboiler/condenser component of said secondary cryogenic unit and recycling same to the bottom section of said main cryogenic unit; and

(h) providing refrigeration for the operation of the cryogenic process by work expansion of a process gas stream within the cryogenic system.

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5,049,175

## METHOD OF MANUFACTURING A GLASS BODY HAVING A NON-UNIFORM REFRACTIVE INDEX

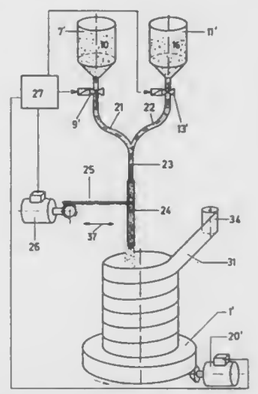
Dieter Röss, Hösbach-Feldkahl; Karlheinz Rau, Hanau, and Hans-Ulrich Bonewitz, Hammersbach, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 930,954, Nov. 12, 1986, abandoned, which is a continuation of Ser. No. 539,120, Oct. 5, 1983, abandoned. This application Apr. 19, 1988, Ser. No. 183,523

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240355

Int. Cl.[5] C03B *19/06, 37/012*

U.S. Cl. 65—3.11 18 Claims



1. A method for manufacturing an elongate light transmissive optical glass body having a central axis and a cylindrical circumference, said elongate body having a non-uniform refractive index which decreases radially between said axis and said circumference, said method comprising the following steps:

storing grains of at least two substances which yield glass having different refractive indices, in a respective at least two hoppers, said grains having diameters in the range of 0.01 $\mu$m to 1 mm,

mixing said grains in a desired proportion which will provide said non-uniform refractive index by controlled feeding into a common feed line having a pouring spout for pouring the mixed grains therefrom,

pouring said grains onto a support while rotating said support about a vertical axis of rotation,

moving said pouring spout radially between said vertical axis and means defining a circumference at a fixed radius from said axis while rotating said support,

moving said pouring spout vertically relative to said support while rotating said support,

pouring said grains from said spout during at least one of moving said spout radially and moving said spout vertically, thereby forming a cylindrical granular body having an axis coincident with said axis of rotation, and

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heat fusing the granular body to form said light transmissive cylindrical glass body.

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5,049,176

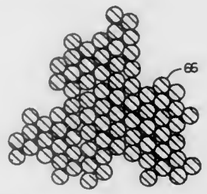
## FIBER ASSEMBLY

Lee M. Cook, Spencer; Danna A. Mancini, Worcester, and Susan M. Patterson, Watertown, all of Mass., assignors to Galileo Electro-Optics Corp., Sturbridge, Mass.

Continuation-in-part of Ser. No. 371,065, Jun. 26, 1989, abandoned. This application Jul. 9, 1990, Ser. No. 549,907

Int. Cl.[5] C03B *23/207*

U.S. Cl. 65—4.2 1 Claim




1. A method of making a tiling element which comprises

assembling a bundle of loose fibers which are round in cross-section into a relationship which is a regular hexagon in cross-section,

in which an inner portion constitutes a multiplicity of fibers, said fibers being in peak-to-valley relation each with pairs of abutting fibers, and there is a multiplicity of outer rows of fibers, each of said outer rows being identical with each other to said outer rows, at least two adjacent said outer rows each being gapped so that not every fiber of said outer rows abuts another fiber of the same outer rows,

removing predetermined fibers, said predetermined fibers being, going around the bundle, successively a corner fiber, a number of outer row fibers adjacent to said corner fiber and corresponding to half the number of fibers in the next inner row if said number is even or half said number rounded off either up or down if said number is odd, the next corner fiber, the next outer fibers corresponding to the non-corner outer fibers removed in the previous face, and correspondingly around said bundle, and

thereafter sintering said fibers into an integral multifiber.

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5,049,177

## METHOD FOR FORMING FRESNEL-TYPE PRISM LENS

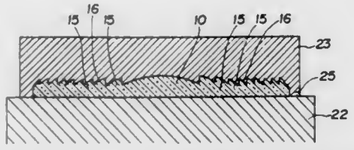
Yutaka Nakata, Isehara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Division of Ser. No. 283,719, Dec. 13, 1988, Pat. No. 4,904,069. This application Dec. 19, 1989, Ser. No. 452,508

Claims priority, application Japan, Dec. 14, 1987, 62-314290; Dec. 16, 1987, 62-316051

Int. Cl.[5] C03B *11/06*

U.S. Cl. 65—93 3 Claims




1. A method for forming from a molten sheet glass a Fresnel lens including a body having a front surface and back surface, the frontal surface being formed with a plurality of annular Fresnel-type prism elements concentrically disposed and the back surface being formed substantially flat, comprising the sequential steps of:

(a) cutting said molten sheet glass into a disk having a substantially constant predetermined thickness;

(b) disposing said disk on a stationary mold having a substantially flat surface;

(c) pressing said disk with a moving female mold having a plurality of alternating cavities and protrusions corresponding to said prism elements so that the amount of said molten sheet glass displaced by each protrusion flows substantially only into the two cavities adjacent to said protrusion;

(d) solidifying the resultant pressed disk; and

(e) withdrawing said female mold,

wherein said prism elements comprise a first prism portion defined by an aspherical surface which refracts a light beam outgoing from the focus in a direction substantially parallel to he optical axis and a riser, and a second prism portion defined by first and second virtual cylindrical surfaces perpendicular to said back surface and spaced from each other a pitch between said prism elements, and said back surface;

wherein the volume of a portion of each prism element at which said first prism portion is intersected by a virtual plane representing the surface of said disk prior to pressing is substantially equal to the sum of the volume of a region of a first protrusion defined by said first virtual cylindrical surface, said virtual plane and said aspherical surface and that of a region of a second protrusion defined by said second virtual cylindrical surface, said virtual plane and said riser.

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5,049,178

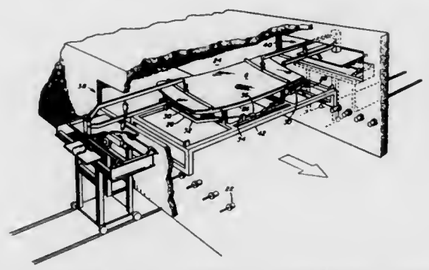
## PARTIAL PRESS APPARATUS AND METHOD FOR GLASS SHEET BENDING

Gordon F. Pereman, Columbus, and John D. Kellar, Pontypool, both of Canada, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 11, 1989, Ser. No. 405,814

Int. Cl.[5] C03B *23/023*

U.S. Cl. 65—106 17 Claims



1. In an apparatus for shaping a glass sheet to a desired contour wherein the apparatus includes a support frame, a shaping rail having a pivoting rail section to support a glass sheet to be shaped and means to heat said shaping rail and said sheet to be shaped such that the peripheral edge of said glass sheet conforms to the shape of said shaping rail, the improvement comprising:

an arm member mounted on said support frame and having a rail engaging member mounted on one end of said arm member;

shaping means supported from said frame and having a glass sheet engaging surface corresponding to the desired contour of selected portions of said glass sheet within said pivoting section of said shaping rail;

first means to bias said rail engaging member into engagement with a selected portion of said pivoting section of said shaping rail, said first biasing means includes means for moving said rail engaging member from a first position wherein said rail engaging member is spaced from said selected portion of said pivoting section of said shaping rail to a second position wherein said rail engaging member is biased against said selected portion of said pivoting section of said shaping rail; and

second means to bias said shaping means toward said selected portions of said glass sheet within said pivoting section of said shaping rail.



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5,049,179

## GLASS GOB CUTTING DEVICE HAVING A GUIDE WITH INDEPENDENT MOVEMENT

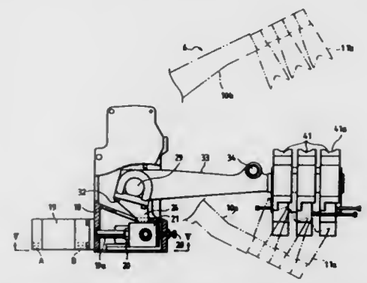
Toshio Shinpo, Fujisawa, and Kuraji Kubo, Tokyo, both of Japan, assignors to Toyo Glass Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1990, Ser. No. 576,803

Claims priority, application Japan, Sep. 22, 1989, 1-247228

Int. Cl.[5] C03B *7/12*

U.S. Cl. 65—332 9 Claims



1. A glass gob cutting device in a gob feeder for cutting a gob of molten glass supplied from an outlet defining an orifice of a forehearth and supplying the cut gob of molten glass to a glass forming machine, the glass gob cutting device comprising:

a pair of shearing blades for cutting a gob of molten glass to make said cut gob of molten glass;

a pair of supporting arms for supporting said pair of shearing blades;

a shearing mechanism for actuating said pair of supporting arms, said shearing mechanism being connected to one end portion of each supporting arm;

a guide arm extending parallel to said pair of supporting arms, said guide arm having a first end pivotally fixed about a shaft located adjacent to said shearing mechanism, said guide arm being actuated by actuating means different from said shearing mechanism; and

guide means, provided on a free end of said guide arm, for guiding said cut gob of molten glass and introducing the same into said glass forming machine.

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5,049,180

## HIGH-ANALYSIS ACID-TYPE FERTILIZER SOLUTIONS

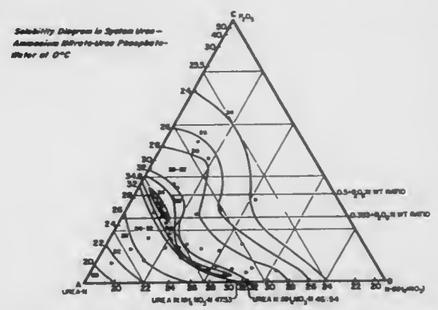
Alva W. Frazier, Florence, Ala., and Yong K. Kim, Jonesboro, Ga., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Dec. 14, 1989, Ser. No. 450,483

Int. Cl.[5] C05C *9/00, 1/00;* C05G *21/00*

U.S. Cl. 71—29 12 Claims

1. An improved product resulting from the production of high-analysis fertilizer solutions, said solutions having a total plant nutrient (TPN) content, expressed as the sum of ($N+P_2O_5+K_2O$), in the range of about 34 weight percent to about 36 weight percent, a pH ranging between about 1.3 to about 2 and being clear and substantially free, at temperatures as low as about 0° C., of precipitates generated in situ and said solutions consisting essentially of water of formulation in admixture of a urea-nitrogen source, a phosphoric acid ($P_2O_5$) source, and an ammonium nitrate-nitrogen source; said urea-nitrogen source selected from the group consisting of urea, urea and ammonium nitrate solution (UAN), urea phosphoric acid adduct, and mixtures thereof; said phosphoric acid source selected from the group consisting of urea phosphoric acid adduct, furnace-grade phosphoric acid having a $P_2O_5$ content ranging from about 54 percent to about 76 percent, wet-process phosphoric acid having a $P_2O_5$ content ranging from about 50 to about 76 percent, and mixtures thereof; said ammonium nitrate-nitrogen source selected from the group consisting of ammonium nitrate, UAN, and mixtures thereof; said UAN consisting essentially of about 34 percent by weight urea, about 46 percent by weight ammonium nitrate, and about 20 percent by weight water, and said UAN having a urea-nitrogen to ammonium nitrate-nitrogen weight ratio of about 1, the relative quantity of said urea-nitrogen source being sufficient to provide in said product, from said UAN, about 8 percent to about 57 percent by weight of nitrogen; and, the relative quantity of said ammonium nitrate-nitrogen source being sufficient to supply in said product, from said ammonium nitrate, about 4 percent to about 29 percent by weight of nitrogen; the relative quantity of said urea-nitrogen source, phosphoric acid source, and ammonium nitrate-nitrogen source being sufficient to provide in said product a weight ratio of $P_2O_5$ to total nitrogen in the range of from about 0.61 to about 0.12, a weight ratio of urea-nitrogen to ammonium nitrate-nitrogen in the range of from about $1\times10^6$ to about 2.42, and a weight ratio of urea-nitrogen to ammonium nitrate-nitrogen plus $P_2O_5$ in the range of from about 1.24 to about 1.81.



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5,049,181

## NOVEL HERBICIDALLY ACTIVE N-PHENYL-AZOLES

Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Hans Moser, Magden, and Hans-Georg Brunner, Lausen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

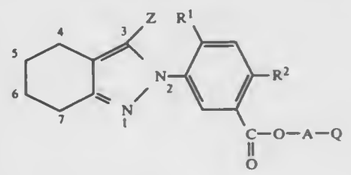
Filed Nov. 21, 1989, Ser. No. 440,007

Claims priority, application Switzerland, Nov. 25, 1988, 4384/88

Int. Cl.[5] C07D *231/54, 401/10, 403/10, 413/10*

U.S. Cl. 71—90 16 Claims

1. A 4,5,6,7-tetrahydro-indazole of the formula Ic



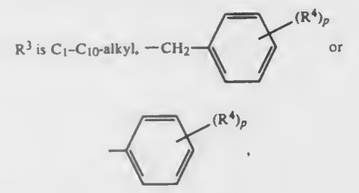

(Ic)

wherein

$R^1$ is hydrogen or halogen,

$R^2$ is halogen,

A is a straight or branched $C_1$–$C_4$alkylene chain,
Q is —S(O)$_m$—$R^3$, di-$C_1$–$C_4$-alkylamino, a 5- or 6-membered heterocyclic ring selected from the group consisting of pyridin-2-yl, 1,3-thiazol-5-yl, thiophen-2-yl, pyrrolidin-2-on-1-yl, pyrrolidin-1-yl, morpholin-4-yl, furan-2-yl, pyrrol-1-yl, imidazol-1-yl, pyrazol-1-yl and 1,2,4-triazol-1-yl, which is unsubstituted or mono- or di-substituted by $C_1$–$C_4$- alkyl, or
—A—Q is 2-(1H-indol-1-yl)ethyl




m is zero, 1 or 2,
$R^4$ is $C_1$–$C_4$-alkyl, halogen or $C_1$–$C_4$-alkoxy,
p is zero, 1, 2 or 3,
Z is halogen, methyl, $C_1$–$C_6$-alkoxy or $C_1$–$C_6$-alkylthio, or an agrochemically acceptable salt with an acid or base.

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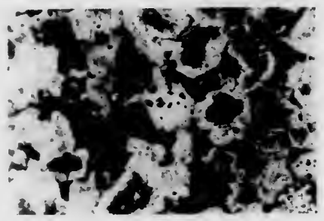
**5,049,182**
**SINGLE-PACKAGE AGRICULTURAL FORMULATIONS COMBINING IMMEDIATE AND TIME-DELAYED DELIVERY**
**Herbert B. Scher, Moraga; Marius Rodson, El Cerrito, both of Calif.; Jose L. Calvo, Finchampstead, and Miguel Gimeno, Bracknell, both of England, assignors to ICI Americas Inc., Wilmington, Del.**
Filed Feb. 3, 1989, Ser. No. 291,723
Int. Cl.[5] A01N *25/28*
U.S. Cl. 71—93 8 Claims

1. A water-based agricultural formulation comprising a continuous aqueous liquid having suspended therein:
a first dispersed phase comprised of a first herbicide in liquid form encapsulted in a porous shell of inert polymeric diffusion-limiting material which maintains the integrity of the encapsulated phase during storage and application; and
a second dispersed phase comprised of a second herbicide with no diffusion-limiting barrier at the surface thereof; and
a suspension system to prevent the dispersed phases from agglomerating within themselves and with each other wherein the suspension system includes surfactants, clays, polymers, and other suspension stabilizing materials and wherein the first and second herbicides include thiocarbamates, triazines, amides and dinitroanilines.

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**5,049,183**
**SINTERED MACHINE PART AND METHOD**
**Tsutomu Saka; Akira Fujiwara, both of Saitama; Tadayuki Tsutsui, Chiba; Osamu Murai, Chiba, and Kei Ishii, Chiba, all of Japan, assignors to Hitachi Powdered Metals Co., Ltd., Chiba and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan**
Filed Sep. 28, 1990, Ser. No. 589,413
Claims priority, application Japan, Oct. 3, 1989, 1-257061
Int. Cl.[5] C22C *29/14*
U.S. Cl. 75—244 14 Claims

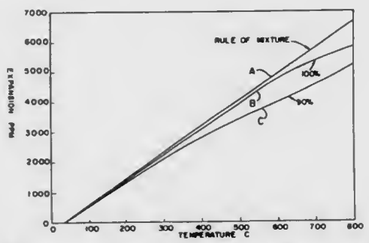
1. A method of manufacturing a machine part by sintering, the machine part being composed of 0.1 to 0.8% of carbon by weight, 2 to 6% of nickel by weight, 0.6 to 1.6% of molybdenum by weight, 1 to 3% of copper by weight and balance iron, the method comprising steps of:
(a) mixing partially diffused alloy powder composed of 2 to 6% of nickel by weight, 0.4 to 0.6% of molybdenum by weight, 1 to 3% of copper by weight and balance iron with graphite powder amounting to 0.1 to 0.8% by weight and molybdenum powder having 2 to 7 μm of mean particle size and amounting to 0.2 to 1% by weight;



(b) compacting the mixed powder obtained in the step (a) by compression to form a compact for a machine part; and
(c) sintering the compact obtained in the step (b).

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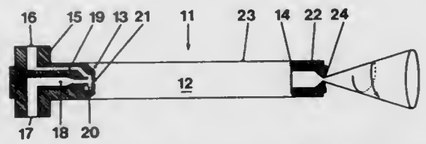
**5,049,184**
**METHOD OF MAKING A LOW THERMAL EXPANSION, HIGH THERMAL CONDUCTIVITY, COMPOSITE POWDER METALLURGY MEMBER AND A MEMBER MADE THEREBY**
**Leslie L. Harner, Ruscombmanor Township, Berks County, and Gregory J. Del Corso, Brecknock Township, Berks County, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.**
Filed Dec. 17, 1990, Ser. No. 628,200
Int. Cl.[5] B22F *9/00*
U.S. Cl. 75—246 17 Claims




14. A composite powder metallurgy member suitable for bonding to a support member at a predetermined bonding temperature and for facilitating the transfer of heat therefrom, said support member having a known thermal expansion characteristic curve over the temperature range from about 30° C. up to the bonding temperature, said member being formed of a composite material consisting essentially of at least about 5% by weight of a first metal powder and the balance being a second metal powder wherein said first metal powder has an average thermal expansion coefficient less than that of said second metal powder over said temperature range and said second metal powder has a thermal conductivity greater than that of said first metal powder, and said composite powder metallurgy member having been consolidated in a controlled manner so as to provide a thermal expansion characteristic curve that essentially matches the thermal expansion characteristic curve of said support member over said temperature range.



**5,049,185**
**METHOD AND ARRANGEMENT FOR SUPPLYING LIQUID TO AN OVEN**
**Rolf Andersson, Stockholm, Sweden, assignor to AGA Aktiebolag, Sweden**
PCT No. PCT/SE88/00490, § 371 Date May 8, 1990, § 102(e) Date May 8, 1990, PCT Pub. No. WO89/02937, PCT Pub. Date Apr. 6, 1989
PCT Filed Sep. 22, 1988, Ser. No. 469,403
Claims priority, application Sweden, Sep. 28, 1987, 8703726
Int. Cl.[5] C21D *1/48*
U.S. Cl. 75—529 6 Claims




1. A method of supplying with a lance a substance which is liquiform at ambient temperature to a heat treatment oven, the substance being vaporized by the oven heat and introduced into the oven with the assistance of a carrier gas, wherein the liquid, with the carrier gas, is atomized in an end of the lance facing away from the interior of the oven; that the atomized liquid and the carrier gas are supplied to a vaporization chamber with an outlet aperture directed towards the interior of the oven, in which chamber the atomized liquid is vaporized by the oven heat during simultaneous cooling of the chamber; and that the thus formed vapour and carrier gas are caused to depart from the vaporization chamber of the lance through the aperture forming a nozzle.

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**5,049,186**
**WATER-BASED PROTECTIVE COMPOSITIONS FOR COATING FILMS**
**Nobuaki Kawabata, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan**
Filed Mar. 16, 1990, Ser. No. 494,303
Claims priority, application Japan, Mar. 17, 1989, 1-063600
Int. Cl.[5] C09D *5/20*
U.S. Cl. 106—2 21 Claims

1. A water-based protective composition for coating films, which comprises, in a form emulsified and dispersed in water, the following essential components:
(A) 100 parts by weight of a disperse phase component comprising:
(a) 100 parts by weight of a petroleum fraction wax having a melting point of 50°–90° C.
(b) 20–75 parts by weight of an oxygen-containing wax having an oxygen content of at least 3.0 wt. % and a melting point of 50°–85° C.,
(c) 10–50 parts by weight of an ethylene/α-olefin copolymer having a number average molecular weight of 2,000–20,000, and
(d) 5–30 parts by weight of a higher fatty acid metal salt and/or a metal-modified hard wax; and
(B) 1–20 parts by weight of an emulsified component, and said disperse phase component (A) and said emulsifier component (B) are in a total amount of 5–100 parts by weight per 100 parts by weight of water.

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**5,049,187**
**AQUEOUS SOLUTION FOR FORMING A FIRE-RETARDANT PROTECTIVE COATING**
**Thomas M. Smith, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
Filed Mar. 26, 1990, Ser. No. 498,782
**The portion of the term of this patent subsequent to Jul. 23, 2008, has been disclaimed.**
Int. Cl.[5] C09K *21/04*
U.S. Cl. 106—18.17 4 Claims

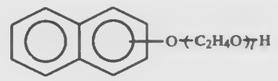
1. An aqueous coating composition for use in forming a fire-retardant protective overcoat on a surface requiring such protection, said composition consisting essentially of an aqueous solution of:
(1) a water-soluble film-forming cross-linkable copolymer of methyl vinyl ether and maleic anhydride,
(2) a water-soluble polyhydric alcohol which serves to cross-link said copolymer when a coating of said composition is applied over said surface and dried, said polyhydric alcohol being present in said aqueous solution in an amount in excess of that needed to cross-link said copolymer,
and (3) a water-soluble ammonium polyphosphate which reacts with said excess polyhydric alcohol to form a fire-retardant composition when said protective overcoat is exposed to the heat of a fire.

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**5,049,188**
**RECORDING LIQUID**
**Hiroshi Takimoto, Yokohama; Tomio Yoneyama, and Hideo Sano, both of Kawasaki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan**
Filed May 6, 1988, Ser. No. 191,254
Claims priority, application Japan, May 12, 1987, 62-115482; Jun. 13, 1987, 62-147304
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—20 18 Claims

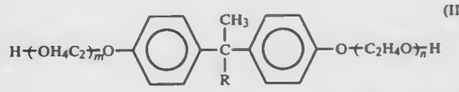
1. A recording liquid comprising from 0.2 to 12% by weight, based on the total weight of the recording liquid, of a water-soluble dyestuff, from 0.5 to 25% by weight, based on the total weight of the recording liquid, of at least one member selected from the group consisting of compounds of the following formulas I, II and III, and an aqueous medium:

(I)



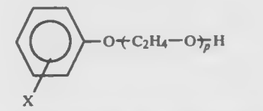

wherein l is a number of from 4 to 20,

(II)




wherein R is a lower alkyl group or a phenyl group, and each of m and n is a number of from 4 to 2, and

(III)




wherein X is a halogen atom, and p is a number of from 4 to 20.

VOL 1130 ISS 3 SE 17 1991 UMI



5,049,189

## METHOD OF PREPARING A SOLUTION OF SULFONATED ARYL AZO/DIARYL GUANIDINE-COMPLEXED DYE

Michael R. Friswell, Wayne; Michael P. Hinton, Neshanic Station, and Alejandro Zimin, Wayne, all of N.J., assignors to Morton International, Inc., Chicago, Ill.

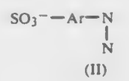
Filed Feb. 2, 1990, Ser. No. 474,427
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 9 Claims

1. A method of preparing a liquid dyestuff in organic solvent, the method comprising,

preparing an aqueous solution of a dye base having at least one moiety of the general formulae selected from:

$SO_3^-—Ar—N=N—$ or

(I)



(II)

where



represents a second aromatic ring system, and the Ar of formulae (I) or (II) may be a single, double or multiple aromatic ring system, provided that the azo or aromatic N—N grouping and the sulfonic acid group be bonded directly to the ring system,

adding an organic solvent phase comprising between about 30 and about 100 wt. percent benzyl alcohol, balance water-immiscible organic solvent,

complexing said dye base with a diaryl guanidine in said two-phase system, whereby the dye which is produced is contained in said organic solvent phase, and

separating said organic solvent phase.

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5,049,190

## PRIMER COMPOSITION FOR DENTAL METAL/PLASTIC COMPOSITE STRUCTURE

Roland Göbel; Hans-Jürgen Tiller; Rudolf Musil, all of Jena, German Democratic Rep.; Dieter Schödel, Wiesbaden; Albert Schmidt, Bad Homburg, both of Fed. Rep. of Germany, and Brigitte Magnus, Jena, German Democratic Rep., assignors to Kulzer GmbH, Fed. Rep. of Germany

Filed Oct. 24, 1989, Ser. No. 426,319
Claims priority, application German Democratic Rep., Oct. 26, 1988, 3211003
Int. Cl.[5] C09K *3/00*
U.S. Cl. 106—35 8 Claims

1. A composition for producing a dental metal/plastic composite structure having an adhesion promoting layer containing silicon dioxide and disposed between the metal and the plastic, said composition being capable to produce an adhesion promoting layer having a concentration gradient of metal oxide and comprising (a) a colloidal dispersion of silicon dioxide, (b) an acidic hydrolyzate of an alkoxysilane for cross-linking the silicon dioxide, and (c) one or more metal oxide forming components wherein the silicon content of (b) is $10^{-5}$ to 1% by weight, the silicon content of the composition is $10^{-3}$ to 10% by weight; and the metal content of the composition is $10^{-4}$ to 1% by weight.

5,049,191

## FRICTION MATERIAL

Detlef U. Pflug, Oskar-Wachtel-Wen; Wilfried Koch, Pützweg, and Armin Eckert, Mittelkamp, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Mar. 15, 1990, Ser. No. 494,160
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913952; Aug. 30, 1989, 3928703
Int. Cl.[5] C09K *314*
U.S. Cl. 106—36 2 Claims

1. An asbestos-free friction material for brake linings and clutches consisting essentially of 5 to 25% by weight of a binder material and =to 70% by weight of reinforcing material and other additives selected from the group consisting of graphite, alumina, heavy spar and brass shavings, the reinforcing material containing 1.5 to 50% by weight of the composition of sepiolite short fibers.

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5,049,192

## CORN DRYING COMPOSITIONS

Robert W. Killick, Victoria, Australia, assignor to Victorian Chemical Co. Pty. Ltd., Victoria, Australia

Continuation-in-part of Ser. No. 161,109, Feb. 26, 1988, abandoned. This application Nov. 14, 1989, Ser. No. 436,218
Int. Cl.[5] C08L *91/00*
U.S. Cl. 106—243 14 Claims

1. A composition for use in the drying of corn, consisting essentially of, in combination:

(i) a drying agent comprising at least about 65% of the total composition, the drying agent being selected singly or mixed from the alkyl esters of mixed fatty acids, the drying agent having a level of unsaturated fatty acids of at least 35%,

(ii) an emulsifier comprising between about 10–30% of the total composition, the emulsifier being selected singly or mixed from the group consisting of neutralized sulfated fatty acids and their alkyl esters, the emulsifier having a level of unsaturated before sulfation of at least about 70%, and

(iii) a coupling agent which will facilitate the homogenization of the drying agent and the emulsifier, the coupling agent being distinct from the drying agent.

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5,049,193

## HEAT STABLE IRON OXIDE PIGMENTS OF UPSILON-$FE_2O_3$ STRUCTURE, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

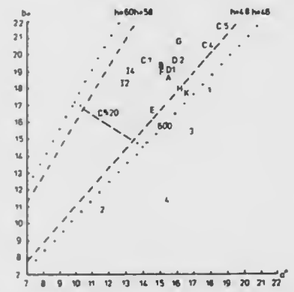
Bernd Kröckert, Wesel; Gunter Buxbaum; Axel Westerhaus, both of Krefeld, and Horst Brunn, Meerbusch-Lang, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 359,318, May 31, 1989, abandoned. This application Oct. 29, 1990, Ser. No. 608,587
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1988, 320499
Int. Cl.[5] C09C *1/22, 1/28, 1/40*
U.S. Cl. 106—456 15 Claims

1. A heat-stable isometric iron oxide brown pigment of



$\gamma$-$Fe_2O_3$ structure consisting essentially of $\gamma$-$Fe_2O_3$ having a silicon content, expressed as $SiO_2$, of 0.1 to 12 weight % and an



Al content, expressed as $Al_2O_3$, of 0.02 to 5%, the pigment being thermally stable up to 650° C.

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5,049,194

## TITANIUM DIOXIDE DISPERSIONS INCLUDING DENATURANT

Luis F. Jaramillo, Coral Gables, Fla., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 7, 1989, Ser. No. 447,355
Int. Cl.[5] C04B *14/00*
U.S. Cl. 106—436 10 Claims

1. A composition comprising a surface-treated (titanium dioxide pigment) an (isothiocyanate) and (a sulfonyl) halide deactivator dispersed in a volatile organic solvent system, said deactivator being present in an amount effective to control interaction of the isothiocyanate with said pigment to the extent that the percent isothiocyanate remaining in the composition after the composition is stored for at least twenty days at about 50° C. is about 65 percent or higher.

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5,049,195

## COLOR PURE IRON OXIDE PIGMENTS, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Wilfried Burow; Hans-Ulrich Höfs; Karl-Werner Ganter, all of Krefeld, and Gerd-Hermann Schulten, Duisburg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 189,349, May 2, 1988, Pat. No. 4,911,760. This application Nov. 22, 1989, Ser. No. 428,113
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716300
Int. Cl.[5] C09C *1/22*
U.S. Cl. 106—456 1 Claim



1. Color pure iron oxide red pigments which comprise a plurality of clusters of at least five fused spherical particles having a content of arsenic, lead or barium of less than 5 parts per million and wherein the total content of Cu, $BaSo_4$, Zn, Sb and Cr is less than 200 parts per million.

5,049,196

## METHOD OF WETTING A CEMENT OR GYPSUM-BONDED FIBROUS MIXTURE OF BUILDING MATERIALS

Hans B. Ries, Hardheim, Fed. Rep. of Germany, assignor to Maschinenfabrik Gustav Eirich, Hardheim, Fed. Rep. of Germany

Filed Apr. 20, 1989, Ser. No. 341,049
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1988, 3813341
Int. Cl.[5] C04B *7/00, 11/00*
U.S. Cl. 106—672 7 Claims

1. A method of wetting a dry mixture of hydraulic cement or gypsum, fiber containing, building materials by means of water, which comprises contacting the mixture of building materials with aqueous foam in a sufficient quantity to provide a final mixture having a powdery-crumbly consistency and blending the resulting mixture of building materials and foam until the foam is at least partly broken down, said foam containing at least one foam forming surfactant and at least one foam stabilizer.

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5,049,197

## MAGNESIUM CEMENT COMPOSITION WITH PARTICULATE FIBROUS MATERIAL

Graham K. Brown, McMasters Beach, Australia, assignor to Magnatex Industries Pty. Limited, Australia

PCT No. PCT/AU88/00365, § 371 Date Apr. 19, 1990, § 102(e) Date Apr. 19, 1990, PCT Pub. No. WO89/02422, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 16, 1988, Ser. No. 478,004
Claims priority, application Australia, Sep. 21, 1987, PI 4466
Int. Cl.[5] C04B *9/02*
U.S. Cl. 106—685 15 Claims

1. A settable magnesium cementitious composition for use as a flooring composition or for the preparation of molded products, said cementitious composition comprising a two-part mix;

a first part of the mix comprising magnesium oxide; and

a second part of the mix including a magnesium chloride component and a particulate fibrous material component, the magnesium chloride component being composed of 14 parts by weight of magnesium chloride crystals, the particulate fibrous material being 29 parts by weight of coarse, fibrous long-strand sawdust having a moisture content of about 40 to 50 percent by weight;

said first and second parts being mixed together in a weight ratio of about 20:21 first part to second part.

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5,049,198

## CALCIUM SULFATE PROCESS FOR THE COPRODUCTION OF PORTLAND CEMENT CLINKER AND CONCENTRATED SULFUR DIOXIDE ADEQUATE TO MANUFACTURE SULFURIC ACID

Roger S. Ribas, 8626 Braeburn Valley Dr., Houston, Tex. 77074

Filed Jun. 10, 1988, Ser. No. 206,018
Int. Cl.[5] C04B *7/04*
U.S. Cl. 106—739 15 Claims

1. A process for manufacturing Portland cement clinker and sulfur dioxide from a preselected amount of calcium sulfate comprising:

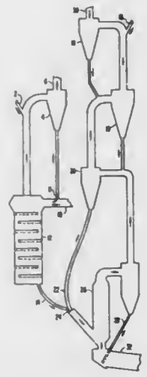
(a) reducing approximately one-quarter of said preselected amount of calcium sulfate with a carbon source in a first vessel whereby calcium sulfide is produced and carbon dioxide is released, while substantially avoiding the formation of calcium oxide;

(b) preheating approximately three-quarters of said preselected amount of calcium sulfate in a second vessel separate from said first vessel;

(c) introducing the calcium sulfide produced by step (a) and the preheated calcium sulfate resulting from step (b) into a calciner in the absence of a reducing agent whereby desul-

furization results and calcium oxide and sulfur dioxide are produced;

(d) separating the calcium oxide from the sulfur dioxide; and



(e) combining calcium oxide with the compound selected from the group consisting of iron oxides, alumina, silica, and mixtures thereof in a rotary kiln whereby Portland cement clinker is formed.

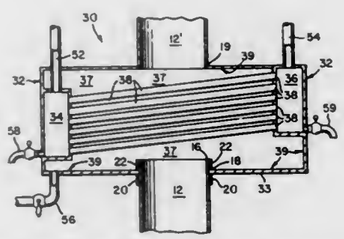
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5,049,199

## POTABLE WATER RECOVERY AND FLUID PREHEATER FOR SYRUP EVAPORATOR

David A. Capen, East Arlington, Vt., assignor to Vermont Maple Water, Inc., East Arlington, Vt.

Filed May 30, 1990, Ser. No. 530,829
Int. Cl.[5] C13D *1/12*
U.S. Cl. 127—9 11 Claims



1. In a syrup evaporator with potable water means having a boiling pan for evaporating water from sap, a hood with a vertical vent stack mounted atop the hood and a base fluid preheater, an improvement comprising:

a plenum for confining therein a tubular array, said plenum defining a base interior and exterior flanged vapor inlet and a top vapor vent and further defining baffle means for differentiating a liquid collection space from a vapor transition space therewithin, said plenum mounted by flange engagement atop said vertical vent stack and receptive at one side thereof an upper first exterior fluid conduit and at another side thereof, a second exterior fluid conduit; and

a ganged, inclined multitubular array for conducting a fluid therethrough, said array inclined to urge condensate run off towards a lower end thereof within said plenum, the condensate isolated by said baffle means, and having an input manifold and output manifold communicating with each end of said array, said input manifold disposed lower than said output manifold, said array disposed within said housing, said input and output manifolds communicating with said upper first exterior and second exterior fluid conduits, respectively, whereby a liquid sap which is to be concentrated enters said evaporator through and at said first upper exterior conduit, flows downward into said input manifold and thence into said multi-tubular array, rises by virtue of the inclined array and entering sap flow while it is subjected to heating by steam vapors rising through said vertical vent stack into said plenum, and thereafter heated fluid passes out of said array through said output manifold and into said second exterior conduit and thence to the boiling pan, while condensate runs down said inclined tubular array and collects in said plenum as potable water isolated from the vent stack by said baffle means.

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5,049,200

## PROCESS FOR THE HYDROPHILIZING AND/OR CEMENT-RESIDUE-REMOVING SURFACE TREATMENT OF SILICON WAFERS

Roland Brunner, Stubenberg; Susanne Baner-Mayer, Burghausen; Rudolf Griesshammer, Altötting, and Helmut Kirschner, Emmerting, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Oct. 5, 1988, Ser. No. 253,988
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1987, 3738651
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—2 9 Claims

1. A process for the surface treatment of silicon wafers by utilizing alkaline aqueous solutions containing hydrogen peroxide, wherein the treatment effects a result which is selected from the group consisting of hydrophilizing by means of surface oxidation, cement-residue-removal, and a combination thereof, which process comprises the step of:

contacting said wafer with at least one aqueous solution having a minimum content of 0.1% by weight of hydrogen peroxide and adjusted to a pH of 8–14 with the aid of at least one salt of the alkali metals or alkaline-earth metals formed with weak acids, to produce said treatment on the wafer surface.

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5,049,201

## METHOD OF INHIBITING CORROSION IN AN ELECTRONIC PACKAGE

Shirley Cheng, Hopewell Junction; Constance J. Araps, Wappingers Falls; Allen J. Arnold, LaGrangeville; Jeffrey T. Coffin, Wappingers Falls, and Lan T. Nguyen, Peekskill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1989, Ser. No. 370,355
Int. Cl.[5] B08B *3/08*
U.S. Cl. 134—42 20 Claims

1. A method of inhibiting corrosion on an electronic component, comprising the steps of:

a. obtaining an electronic component; and

b. cleaning said electronic component in a solution comprising a crown compound complexing agent and a solvent in which said complexing agent is soluble;

wherein said method inhibits corrosion of an electronic component after removal from said solution.

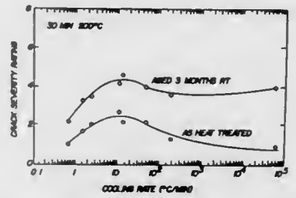


5,049,202

## METHOD OF ENHANCING THE DUCTILITY OF ALUMINUM-ZINC ALLOY COATING ON STEEL STRIP

David J. Willis, Albion Park Rail, and Michael Salon, Keiraville, both of Australia, assignors to John Lysaght (Australia) Limited, Sydney, Australia

Filed Apr. 19, 1990, Ser. No. 510,264
Claims priority, application Australia, Apr. 24, 1989, PJ3871; Aug. 24, 1989, PJ5953
Int. Cl.[5] C21D *1/00*; B32B *15/10*
U.S. Cl. 148—13 11 Claims




1. A method of enhancing the ductility of an aluminium-zinc alloy coating, comprising from 25% to 75% aluminium by weight, on a steel substrate, comprising the steps of bringing the coated substrate to a treatment temperature within the range of from 165° C. to 275° C. and cooling the coated substrate from the treatment temperature to below 121° C. at a rate not exceeding 40 Centigrade degrees per hour.

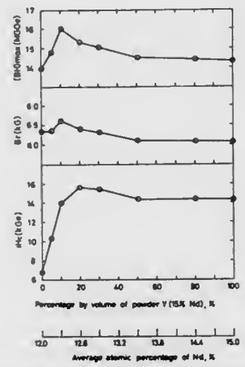
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5,049,203

## METHOD OF MAKING RARE EARTH MAGNETS

Toshio Mukai; Tatsuo Fujimoto, and Hiroaki Sakamoto, all of Kanagawaken, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,409
Claims priority, application Japan, Apr. 28, 1989, 1-107811
Int. Cl.[5] H01F *1/02*
U.S. Cl. 148—101 5 Claims




1. A method of making a rare earth magnet containing, on an atomic percent basis, 9 to 14% of a rare earth component consisting mainly of at least one of neodymium and praseodymium, and 4 to 8% of boron, the balance of its composition consisting essentially of iron and unavoidable impurities, which comprises:

mixing a powder X formed by quenching a molten alloy containing, on an atomic percent basis, at least 8% but less than 13%, of a rare earth component consisting mainly of at least one of neodymium and praseodymium, and 4 to 8% of boron, the balance of its composition consisting essentially of iron and unavoidable impurities, and a powder Y formed by quenching a molten alloy containing, on an atomic percent basis, 13 to 20% of a rare earth component consisting mainly of at least one of neodymium and praseodymium, and 4 to 8% of boron, the balance of its composition consisting essentially of iron and unavoidable impurities, to prepare a mixture containing 5 to 50% by volume of said powder Y; and

pressing said mixture at a temperature of 550° C. to 850° C. under a pressure of 0.1 to 5 tons/cm$^2$.

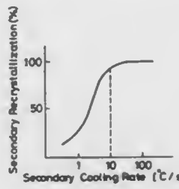
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5,049,204

## PROCESS FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL SHEET BY MEANS OF RAPID QUENCH-SOLIDIFICATION PROCESS

Isao Iwanaga; Kenzo Iwayama; Kenichi Miyazawa, and Toshiaki Mizoguchi, all of Kitakyusyushi, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,133
Claims priority, application Japan, Mar. 30, 1989, 1-79984; Mar. 30, 1989, 1-79985; Mar. 30, 1989, 1-79986
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—111 7 Claims




1. A process for producing a grain-oriented electrical steel sheet by means of a rapid quench-solidification process, which comprises quenching to solidify molten steels into a thin cast sheet of 0.7 to 3.0 mm thickness, at a cooling rate of greater than 50° C./sec. in the central portion along the direction of the thickness of said thin cast sheet, said steels comprising 2.5 to 4.5% by weight of Si and an inhibitor-forming element known per se, other elements necessary for electrical steels, and the balance consisting essentially of Fe and inevitable impurities, cooling said thin cast sheet at a cooling rate of greater than 10° C./sec. in a temperature range between 1300° to 900° C., annealing said thin cast sheet for a period between 30 seconds and 30 minutes in a temperature range between 950° to 1,200° C., applying cold rolling for once or twice or more including intermediate annealing under a final cold rolling reduction rate of not less than 80%, thereby imparting a final gage thereto, and then applying annealing for decarburization, coating of a separation agent and then finishing annealing.

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5,049,205

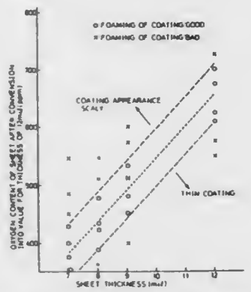
## PROCESS FOR PREPARING UNIDIRECTIONAL SILICON STEEL SHEET HAVING HIGH MAGNETIC FLUX DENSITY

Nobuyuki Takahashi; Katsuro Kuroki; Yozo Suga, and Kiyoshi Ueno, all of Fukuoka, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 27, 1990, Ser. No. 589,338
Claims priority, application Japan, Sep. 28, 1989, 1-253518; May 22, 1990, 2-131675
Int. Cl.[5] H01F *1/047*
U.S. Cl. 148—111 4 Claims

1. A process for preparing a unidirectional silicon steel sheet having a high magnetic flux density which comprises heating a silicon steel slab comprising by weight 0.025 to 0.075% of carbon, 2.5 to 4.5% of silicon, 0.015% or less of sulfur, 0.010 to 0.050% of acid-soluble aluminum, 0.0010 to 0.012% of nitrogen, 0.050 to 0.45% of manganese and 0.01 to 0.10% of tin with the balance being iron and unavoidable impurities, at 1200° C. or below; hot-rolling the slab; subjecting the slab to rolling

once or two or more times wherein an intermediate annealing is provided, thereby attaining a percentage final rolling of 80% or more; subjecting the resultant steel sheet to decarburizing annealing in a wet hydrogen atmosphere; coating the steel sheet with an annealing separator; conducting finishing annealing for secondary recrystallization and purification of the steel; and subjecting the steel sheet to a nitriding treatment between after the ignition for decarburizing annealing and before the initiation of the secondary recrystallization in the finishing annealing.




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5,049,206

## METAL-MADE CARRIER BODY FOR EXHAUST GAS CLEANING CATALYST AND PRODUCTION OF THE CARRIER BODY

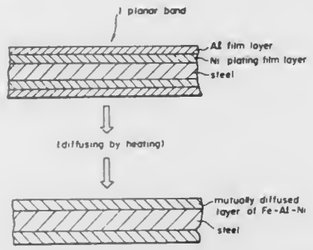
**Masayoshi Usui, and Haruo Serizawa, both of Shizuoka, Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 376,053, Jul. 6, 1989, abandoned. This application Oct. 24, 1990, Ser. No. 602,902**

**Claims priority, application Japan, Jul. 6, 1988, 63-166837**

**Int. Cl.[5] C23C *10/00*; B01J *32/00, 35/04***

**U.S. Cl. 148—127** **5 Claims**




1. A method of producing a metal-made carrier body for carrying thereon an exhaust gas cleaning catalyst, said method comprising producing a sheet band and a corrugated band individually from thin steel bands each of which has been obtained by first applying a Ni-plating film of a thickness of between about 5 to 15 μm to a starting thin steel band, then forming an aluminum coating thereon and then subjecting the resultant thin steel band to a diffusive penetration treatment to produce a mutually diffused layer consisting of metal components of said steel bands, said Ni-plating film, and said aluminum coating, superposing said produced sheet band and said produced corrugated band one over the other in a contiguous relation into a honeycomb core structure form defining many network-patterned gas flow passages along the central axis thereof, and then fixing contacts between the sheet band and the corrugated band of the honeycomb core structure.

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5,049,207

## HEAT TREATMENT PROCESS FOR BUSHING USED IN TRACK OF ENDLESS TRACK TRACTOR

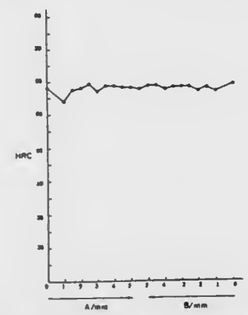
**Takahiko Sahara; Hisahiko Kusano; Masayoshi Kaneko; Masahiro Nakajima, and Toshihiko Sato, all of Tokyo, Japan, assignors to Topy Industries Limited, Tokyo, Japan**

**Filed May 12, 1989, Ser. No. 351,438**

**Claims priority, application Japan, Sep. 5, 1988, 63-222031**

**Int. Cl.[5] C21D *1/00***

**U.S. Cl. 148—150** **11 Claims**




1. A heat treatment process, for bushings having inner circumferential and outer peripheral surfaces and used in tracks or endless track tractors, of the type to harden with induction the bushings made of middle carbon low alloy steel, comprising induction heating the outer peripheral surface of a bushing until the inner circumferential surface thereof reaches the temperature ranged of $Ac_3 \leqq T \leqq Ac_3+50°$ C.; thereafter cooling the outer peripheral surface to harden the entire thickness thereof; and thereafter tempering the bushing; wherein

T is the temperature in ° C. reached by heating the inner circumferential surface and

$Ac_3$ is the transformation temperature ° C. of the low alloy steel.

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5,049,208

## PERMANENT MAGNETS

**Koichi Yajima, Urawa; Osamu Kohmoto, Ichikawa, and Tetsuhito Yoneyama, Narashino, all of Japan, assignors to TDK Corporation, Tokyo, Japan**

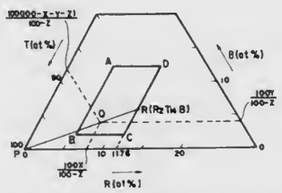
**Filed Jul. 29, 1988, Ser. No. 225,788**

**Claims priority, application Japan, Jul. 30, 1987, 62-191380; Oct. 14, 1987, 62-259373**

**The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.**

**Int. Cl.[5] H01F *1/053***

**U.S. Cl. 148—302** **19 Claims**




1. A permanent magnet formed from a magnetically hard material having a composition represented by the formula:

$$R_xT_{(100-x-y-z)}B_yM_z$$

where



R is at least one member selected from the rare earth elements including Y,

T is Fe or a mixture of Fe and Co,

B is boron,

M is at least one member selected from the group consisting of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta and W,

$5.5 \leqq x < 11.76$,

$2 \leqq y < 15$, and

$0 < z \leqq 10$, and

wherein said permanent magnet is obtained by rapid quenching from a molten alloy having said composition and wherein said permanent magnet comprises a primary phase of substantially tetragonal grain structure and at least one auxiliary phase selected from amorphous and crystalline R-poor auxiliary phases, said auxiliary phase being present as a grain boundary layer, wherein the volume ratio of auxiliary phase to primary phase, v, is smaller than the value given by the formula:

$$[0.1176/(100-z)-x]/x.$$

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5,049,209

## MAGNETIC NITRIDE FILM

**Hiroshi Sakakima, Hirakata; Koichi Osano, Neyagawa; Yuji Omata, Ibaraki; Mitsuo Satomi, Katano, and Koichi Kugimiya, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan**

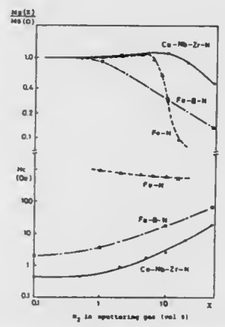
**Continuation of Ser. No. 279,715, Dec. 5, 1988, abandoned, which is a continuation of Ser. No. 24,141, Mar. 10, 1987, Pat. No. 4,836,865. This application Dec. 7, 1989, Ser. No. 445,105**

**Claims priority, application Japan, Mar. 12, 1986, 61-54054; Aug. 26, 1986, 61-199631**

**The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.**

**Int. Cl.[5] H01F *10/12***

**U.S. Cl. 148—306** **1 Claim**




1. A soft magnetic nitride film, on a substrate, consisting of a composition having formula:

$$T_XM_YN_Z$$

wherein

T is at least one metal selected from the group consisting of Fe, Co, Ni and Mn;

M is at least one metal selected from the group consisting of Nb, Zr, Ti, Ta, Hf, W and Mo;

N is nitrogen (N), and

X, Y and Z show atomic percent of said T, M and N, and values of X, Y and Z are defined by the following expressions

$75 \leqq X < 94$,

$6 \leqq Y < 25$,

$0.1 \leqq Z < 20$ and

$X+Y+Z=100$.

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5,049,210

## OIL COUNTRY TUBULAR GOODS OR A LINE PIPE FORMED OF A HIGH-STRENGTH MARTENSITIC STAINLESS STEEL

**Akihiro Miyasaka, and Hiroyuki Ogawa, both of Sagamihara, Japan, assignors to Nippon Steel Corporation, Japan**

**Filed Feb. 15, 1990, Ser. No. 480,599**

**Claims priority, application Japan, Feb. 18, 1989, 1-38956; Mar. 20, 1989, 1-68715**

**Int. Cl.[5] C22C *38/20***

**U.S. Cl. 428—586** **14 Claims**

1. Oil Country Tubular Goods (OCTG) or a line pipe formed of a high-strength martensitic stainless steel excellent in corrosion resistance and stress corrosion cracking resistance, the steel consisting essentially of: 0.1 wt % or less carbon, 1 wt % or less silicon, 2 wt % or less manganese, 8–14 wt % chromium, 1.2–4.5 wt % copper, 0.005–0.2 wt % aluminum, 0.01–0.15 wt % nitrogen and the balance being iron except for incidental elements, and

the OCTG or the line pipe being obtained by a heat-treatment process comprising the following steps:

a) austenitizing the OCTG or the line pipe at 920° C. to 1,100° C. of temperature followed by cooling at a cooling rate equal to or higher than the air cooling rate,

tempering the OCTG or the line pipe at a temperature between 580° C. and $Ac_1$ point followed by cooling at a cooling rate equal to or higher than the air cooling rate.

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5,049,211

## RAPID SOLIDIFICATION ROUTE ALUMINIUM ALLOYS CONTAINING CHROMIUM

**Howard Jones, Sheffield; Panayiotis Tsakiropoulos, Petersfield, both of England; Charles R. Pratt, Neath, United Kingdom; Robert W. Gardiner, Farnham, and James E. Restall, deceased, late of Camberley, both of England by Janet E. Restall, Executrix , assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom and Northern Ireland, London, England**

**PCT No. PCT/GB87/00735, § 371 Date Apr. 13, 1989, § 102(e) Date Oct. 13, 1989, PCT Pub. No. WO88/03179, PCT Pub. Date May 5, 1988**

**PCT Filed Oct. 10, 1987, Ser. No. 346,174**

**Claims priority, application United Kingdom, Oct. 21, 1986, 8625190**

**Int. Cl.[5] C22C *21/00***

**U.S. Cl. 148—437** **3 Claims**

1. An aluminium alloy formed by rapid solidification which alloy consists essentially of the following in proportions by weight percent:

| | |
|---|---|
| chromium | 1 to 7 |
| hafnium | 1 to 6 |
| aluminum | balance, excluding incidental impurities. |

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5,049,212

## HIGH ENERGY EXPLOSIVE YIELD ENHANCER USING MICROENCAPSULATION

**Joseph F. Colick, Clinton, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 27, 1991, Ser. No. 676,772**

**Int. Cl.[5] C06B *45/18***

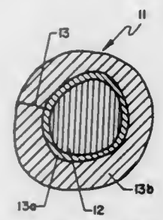
**U.S. Cl. 149—3** **16 Claims**

1. A high-energy, explosive yield enhancer in the form of separate, discrete microcapsule particles comprising an oxi-

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dizer selected from the group consisting of halogens, interhalogens and halides, said oxidizer being encapsulated within a passivated inorganic fuel wherein said passivated inorganic




fuel includes an outer inorganic fuel layer an inner passivated layer whereby said inner passivated layer breaks down only upon undergoing a threshold level stress.

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5,049,213

## PLASTIC BONDED EXPLOSIVES USING FLUOROCARBON BINDERS

**May L. Chan; Russell Reed, Jr.; Herb G. Gollmar, all of Ridgecrest, Calif.; Carl Gotzmer, Accokeek, and Robert C. Gill, White Plains, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Oct. 10, 1985, Ser. No. 791,548**
**Int. Cl.[5] C06B *45/10***
**U.S. Cl. 149—19.3** **8 Claims**

1. A high energy, thermally stable plastic bonded explosive comprising:

a solid explosive filler selected from the group consisting of: cyclotetramethylene tetranitramine, and cyclotrimethylene trinitramine;

a liquid plasticizer containing fluorine and miscible with fluorocarbon polymer materials, said plasticizer forming a plasticizer to polymer weight ratio of about 1 to 1; and

a hydroxyl-terminated fluorocarbon binder selected from the group consisting of: hydroxyl-terminated random perfluorocopolyether having the general structure

$$HOH_2C(CF_2O)_m(CF_2CF_2O)_nCH_2OH$$

where m=n such that the compound has a molecular weight of about 2000, and the hydroxyl-terminated random copolymer of vinylidene fluoride and hexafluoropropylene having the general structure

$$HOCH_2CF_2(CH_2CF_2)_p(CF{-}CF_2)_qCF_2CH_2OH$$
$$\quad\quad\quad

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cocurable with said syndiotactic 1,2-polybutadiene, sulfur, zinc oxide, and at least one pigment or colorant.

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**5,049,221**

## PROCESS FOR PRODUCING A COPPER-CLAD LAMINATE

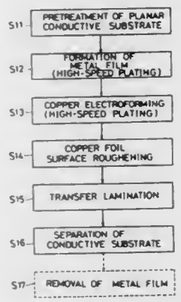
**Tatsuo Wada, Ebina; Keizo Yamashita, Shizuoka; Tasuku Touyama, Shimizu, and Teruaki Yamamoto, Shizuoka, all of Japan, assignors to Meiko Electronics Co., Ltd., Ayase, Japan**

**Continuation-in-part of Ser. No. 117,170, filed as PCT JP87/00112 on Feb. 21, 1987, published as WO87/04977 on Aug. 27, 1987, abandoned. This application May 1, 1989, Ser. No. 345,906**

**Claims priority, application Japan, Feb. 21, 1986, 61-036709; Feb. 21, 1986, 61-036710; Feb. 21, 1986, 61-036711**

**Int. Cl.[5] C25D** *5/08*

**U.S. Cl. 156—151** **12 Claims**




1. A process for producing a copper-clad laminate, comprising the steps of:

providing a planar cathode comprising an electrically conductive substrate and a metal film 70 to 250 μm thick plated onto a surface of said electrically conductive substrate; said metal film being a two-component alloy layer consisting essentially of 60% to 80% by weight of nickel and 20% to 40% by weight of cobalt;

forming a copper foil having a thickness of not more than 10 μm directly on the surface of said metal film at a deposition speed of 25 to 100 μm/min, by electroplating under the conditions that said planar cathode is spaced from a planar anode at an interelectrode distance of 3 to 30 mm from each other, from a copper sulfate plating solution at a temperature of 45° to 70° C. supplied such that said plating solution comes into contact with the electrodes at a solution contact speed of 6.0 to 12.0 m/sec and applying a current density of 0.8 to 4.0 A/cm$^2$, said copper plating solution comprising from 0.2 to 2.0 mol/l of copper, from 50 to 220 g/l of sulfuric acid and from 30 to 800 ppm of chloride ion, said copper foil adhering to said metal film with a force of adhesion smaller than that between said cathode and said metal film;

roughening the surface of said copper foil;

laminating and bonding together an insulating substrate, and said planar cathode, with the thus formed copper foil therebetween, by applying heat and pressure; and

separating only said copper foil and said

insulating substrate together from said planar cathode so that said metal film remains on the surface of said conductive substrate.

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**5,049,222**

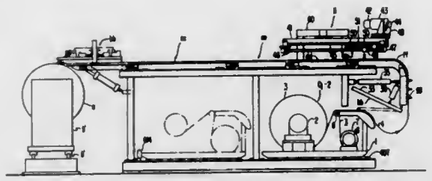
## METHOD AND APPARATUS FOR FEEDING MATERIALS IN A TIRE BUILDING MACHINE

**Nobuhiko Irie, Nagasaki, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed May 26, 1989, Ser. No. 357,595**

**Int. Cl.[5] B29C** *65/00*; **B29D** *30/08*

**U.S. Cl. 156—159** **3 Claims**



1. A method of feeding material in a tire fabricating machine having a material feeder adapted to at least feed tire constituent material for use in tire production in the machine, said method comprising:

positioning a first material truck, having a roll of tire constituent material rotatably supported thereon, at the material feeder;

subsequently, providing a second material truck, having a new roll of tire constituent material rotatably supported thereon, at a standby location at the rear or to the side of the material feeder and aligned therewith;

feeding the roll of tire constituent material from the first material truck with the material feeder to carry out a tire production operation;

stopping said feeding of the roll of tire constituent material with the material feeder at a time before the tire constituent material is consumed during the tire production operation and at which time a trailing end of the tire constituent material is derived from the roll thereof;

holding the trailing end of the tire constituent material near the material feeder once said feeding of the roll of tire constituent material is stopped;

subsequently delivering the first material truck in a direction to the front, to the rear or to the side of the material feeder and away from the second material truck positioned at the standby location;

subsequently delivering the second material truck from the standby location to the material feeder;

unwinding the new roll of tire constituent material from the second material truck once at the material feeder to derive a leading end of the new roll;

superposing the held trailing end of the tire constituent material with the leading end of the new tire constituent material;

subsequent to said superposing, splicing the leading and the trailing ends together, and releasing the trailing end, to form a provisionally spliced portion of the tire constituent materials;

cutting the tire constituent materials to the front and to the rear of the provisionally spliced portion in the material feeder;

removing said provisionally spliced portion once it has been cut from the tire constituent materials by said cutting of the tire constituent materials, and subsequently discharging the provisionally spliced portion from the material feeder; and

resplicing the tire constituent materials once the provisionally spliced portion has been removed therefrom.



**5,049,223**

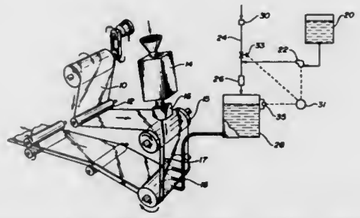
## USE OF SURFACE ACTIVE AGENTS FOR IMPROVED COOLING OF THERMOPLASTIC FILM WEBS

**Brian C. Dais, Midland, and Burdette W. Miller, Freeland, both of Mich., assignors to DowBrands, Inc., Indianapolis, Ind.**

**Filed Jan. 8, 1990, Ser. No. 461,870**

**Int. Cl.[5] B29C** *47/88*

**U.S. Cl. 156—244.11** **10 Claims**



1. A process for cooling thermoplastic closure profiles used to produce reclosable flexible bags or containers for packaging and storing food items comprising the steps of:

extruding a heated thermoplastic closure profile onto a film web; and

directing a flow of a liquid coolant mixture comprising a nontoxic water-soluble surfactant and water onto the extruded closure profile to wet the surface thereof and thereby cool and stabilize the structure thereof.

5. A process for cooling thermoplastic film webs and closure profiles for use in recloseable flexible packages for storing food items comprising the steps of:

extruding a thermoplastic film web and securing thereto a heated closure profile; and

directing a flow of a liquid coolant comprising water containing at least 100 ppm of a nontoxic water-soluble surfactant onto the extruded film web and closure profile to wet the surfaces thereof and thereby cool and stabilize the structure thereof.

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**5,049,224**

## METHOD OF FABRICATING PIPE UNITS

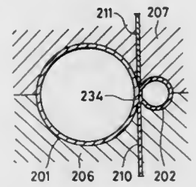
**Yoshinori Umezawa, Ebina; Yoshiharu Shitara, Yokohama; Akira Iwawaki, Yokohama, and Satoshi Araki, Yokohama, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan**

**Filed Sep. 19, 1989, Ser. No. 409,209**

**Claims priority, application Japan, Sep. 19, 1988, 63-234554; Oct. 3, 1988, 63-247391; Oct. 7, 1988, 63-251893**

**Int. Cl.[5] B29C** *49/04, 49/20*

**U.S. Cl. 156—294** **17 Claims**




1. A method of fabricating a pipe unit using a molding machine having a plurality of heads which respectively feed parisons, comprising the steps of:

(A) providing a plurality of hollows in a molding die of the molding machine;

(B) providing one or more channels connecting the hollows to each others laterally;

(C) feeding the parisons into the hollows from the heads of the molding machine;

(D) blowing air into the parisons in a manner such that a plurality of independent pipes having lateral walls are molded in the respective hollows and the pipes are joined with each other at the lateral walls thereof by the parisons which are forced in the channels; and

(E) providing spacer elements essentially of the same cross-section as the channels prior to step (C) so as to mold a bundle-like pipe unit which has a plurality of independent pipes joined with each other at the lateral walls thereof solely by the spacer elements;

(F) applying a suction force on the parisons when the parisons are fed into the hollows in step (C) to help the parisons penetrate the hollows and continuing to apply suction until the leading tips of the parisons are pulled from the bottom of the molding die by the suction force, and then moving pinch elements to close the hollows.

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**5,049,225**

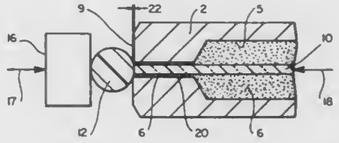
## METHOD AND APPARATUS FOR TERMINATING AN OPTICAL FIBER WITH A CURVED BORE BLOCKING MEMBER

**Robert Schlingensiepen, San Francisco, and Frank H. Levinson, Redwood City, both of Calif., assignors to Raychem Corp., Menlo Park, Calif.**

**Continuation of Ser. No. 183,511, Apr. 14, 1988, abandoned, which is a continuation of Ser. No. 860,262, May 6, 1986, abandoned. This application Nov. 27, 1989, Ser. No. 471,682**

**Int. Cl.[5] G02B** *7/00*

**U.S. Cl. 156—294** **10 Claims**




1. A method for terminating an optical fiber, comprising the steps of:

blocking a front end of a bore formed within an optical fiber contact body with a bore blocking member, the bore being filled with a solid hardened adhesive; and

softening the adhesive so as to allow an optical fiber to be inserted through the softened adhesive and into the bore; and

inserting an optical fiber through the softened adhesive and the bore such that a front end of the optical fiber contacts and deforms the bore blocking member, the blocking member having a curved shape in a region confronting the front end of the bore and sized so as to sealingly seat against the front end of the bore, such that a front face of the inserted optical fiber is recessed from a front end of the contact body after contacting the blocking member, the curved shaped region of the blocking member being made of a material which is resiliently deformable so that the curved shaped region of the blocking member removes the adhesive from the front face of the optical fiber as the optical fiber contacts and deforms the curved shaped region of the blocking member; and

hardening the adhesive.

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5,049,719

**Patent Not Issued For This Number**

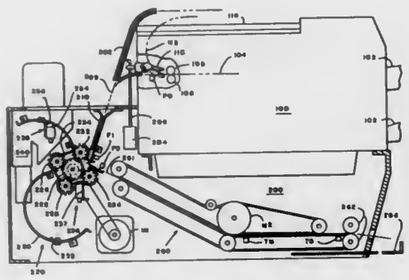
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5,049,227

## APPARATUS HAVING A DIVERTER RESPONSIVE TO JAMS FOR PREPARING A SELF-MAILER

Douglas G. Long, 104 Village Cir., Naugatuck, Conn. 06770, and Samuel W. Martin, Martin Rd., Weston, Conn. 06883

Filed Sep. 14, 1989, Ser. No. 407,400
Int. Cl.[5] B32B *31/00*; B43M *3/00*; B31F *1/00*
U.S. Cl. 156—362 11 Claims



1. An apparatus for preparing a self-mailer, comprising:
(a) printing means for printing a form sheet, said printing means including a buffer memory for storing information to be printed on said form sheet and information to be printed on at least one following form sheet;
(b) folder means for receiving said form sheet and folding said form sheet to prepare said self-mailer, said folder means further comprising:
(b1) first input means for receiving manually input form sheets;
(b2) second input means for receiving said printed form sheet from said printer means;
(b3) sensor means for sensing the progress of said form sheet through said folder means;
(c) diverter means for selectively directing said form sheet to said second input means or to an alternate output path for unfolded output from said printer means,
(d) control means, responsive to said sensor means, for:
(d1) determining that said form sheet is jammed in said folder means;
(d2) controlling said diverter means to direct said following form sheet to said alternate output path in response to said determination that said form sheet is jammed, whereby an operator may manually input said following form sheet to said first input means after clearing said jammed form sheet.

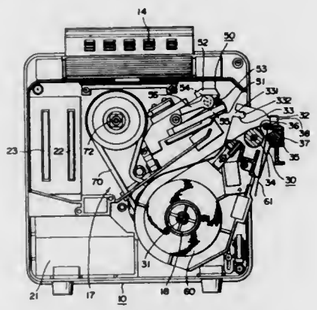
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5,049,228

## DESK TOP TYPE LABEL PRINTER

Junichi Sato, Hasudashi, Japan, assignor to Kabushiki Kaisha Shinsei Industries, Tokyo, Japan

Filed Aug. 30, 1989, Ser. No. 401,134
Claims priority, application Japan, Sep. 2, 1988, 63-220092
Int. Cl.[5] B41M *3/00*
U.S. Cl. 156—384 8 Claims



1. A desk top type label printer comprising:
a casing having an opening at one side and having a laterally openable cover for said opening;
a tape holder for holding a roll of label tape in the interior of said casing;
a thermal printing head unit inside said casing and having a thermal printing head;
a tape depressing mechanism opposed to said thermal printing head unit and having a platen roller which is movable into and out of pressure contact with said thermal printing head;
a driving means for feeding label tape inserted between said thermal printing head and said platen roller out of said casing;
an electric circuit for controlling said thermal printing head and said driving means;
an input means for entering data to be printed in said thermal printing head unit through said electric circuit; and
a supporting shaft for supporting said thermal printing head unit and having one end supported on the interior of said casing and the other end free and extending toward said opening;
said tape depressing mechanism having a support frame pivotally supported by a fixed shaft which extends parallel with said thermal printing head unit supporting shaft and having one end fixed to the interior of said casing and the other end a free end, said platen roller being at a free end of said support frame, and said thermal printing head unit and said tape depressing mechanism respectively having engaging means for engaging said tape depressing mechanism with said thermal printing head unit, said thermal printing head and said platen roller having a space therebetween which is open toward said opening for inserting a label tape between said thermal printing head and said platen roller when said tape depressing mechanism is turned to separate said platen roller from said thermal printing head unit, and said tape depressing mechanism being engaged with and fixed to said thermal printing head unit supporting shaft by said engaging means when said platen roller is urged toward said thermal printing head to press a label type to said thermal printing head;
said engaging means comprising a pair of engaging parts on said supporting shaft of said thermal printing head unit



respectively positioned on both sides of said thermal printing head and a pair of engaging cutaway parts provided on the support frame of said tape depressing mechanism respectively opposed to said engaging parts, each of said engaging parts having a cross section of a partly cutaway circle which is made up by partly cutting off a true circle with the center on the axial line of said supporting shaft, and said engaging cutaway parts respectively having a straight passage which is open at an end opposed to a corresponding engaging part and a circular hole at the other end of said straight passage, the width of said straight passage being slightly larger than the wall thickness of said engaging parts and the diameter of said circular hole being substantially the same as the diameter of said engaging parts, and a knob on said supporting shaft outside said thermal printing head unit for simultaneously rotating each of said engaging parts in corresponding circular holes of said engaging cutaway parts.

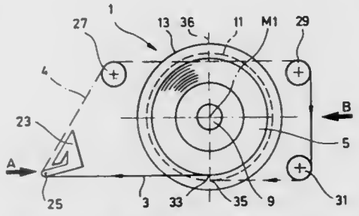
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5,049,229

## APPARATUS FOR THE APPLICATION OF AN ADHESIVE FILM

Manuel Czech, Donaustauf, Fed. Rep. of Germany, assignor to Czewo Plast Kunststofftechnik GmbH, Neutraubling, Fed. Rep. of Germany

Filed Dec. 26, 1989, Ser. No. 456,511
Claims priority, application Fed. Rep. of Germany, Jan. 4, 1989, 3900156
Int. Cl.[5] B32B *35/00*
U.S. Cl. 156—577 29 Claims



1. Apparatus for the application to a substrate of an adhesive film adhering prior to its application to a carrier tape wound onto a coil, said apparatus including an applicator by means of which said adhesive film is peeled of said carrier tape moving therepast, and a takeup reel for rewinding said carrier tape downstream of said applicator, said takeup reel being operatively connected to said carrier tape coil, characterized in that the diameter of the still empty takeup reel (**11**; **111**) is at least as great as the greatest possible diameter of said carrier tape coil (**7**; **107**), said takeup reel (**11**; **111**) and said carrier tape coil (**7**; **107**) being disposed on a common axis (**9**; **109**), and said operative connection being formed by a disc clutch (**13**;**113**).

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5,049,230

## SINGLE STEP PRE-SWELLING AND ETCHING OF PLASTICS FOR PLATING

Gordhanbhai N. Patel, Somerset, and Durgadas Bolikal, Edison, both of N.J., assignors to JP Laboratories, Inc., Piscataway, N.J.

Division of Ser. No. 268,154, Nov. 7, 1988, Pat. No. 4,941,940.
This application Mar. 6, 1990, Ser. No. 489,365
Int. Cl.[5] B05D *3/10*
U.S. Cl. 156—628 13 Claims

1. A process of single step surface etching of polymeric materials made of polymers having at least one hydrolyzable functionality, selected from the group consisting of polycarbonate, polyanhydrides, polycarboxyl esters, polysulfonic esters, polyamides and polyurethanes which comprises the step of exposing the surface to be etched to a liquid phase simultaneously capable of microroughening and hydrolysing the said functionalities on said surface to the extent needed to provide a water wettable surface capable of being plated with electroless nickel or electroless copper to provide a plated layer having a satisfactory level of adhesion to said surface wherein said liquid phase comprises a good solvent for said polymers and a substantial non-solvent for said polymers and an effective amount of an etchant therefore selected from the group consisting of alkali metal hydroxides, quaternary ammonium hydroxides and mixtures thereof, provided that where at least one member of the group of said good, said non-solvents and said etchant is immiscible with at least one other member of the group, said liquid phase further comprises a sufficient amount of solubilizing agent miscible with said immiscible components to provide a single liquid phase.

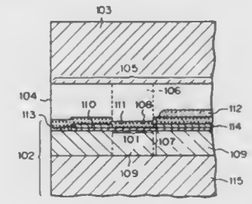
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5,049,231

## METHOD OF MANUFACTURING LIQUID INJECTION RECORDING HEAD AND SUBSTRATE THEREFOR

Makoto Shibata, Hiratsuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 357,950, May 30, 1989, abandoned, which is a continuation of Ser. No. 244,618, Sep. 15, 1988, abandoned, which is a continuation of Ser. No. 170,625, Mar. 17, 1988, abandoned, which is a continuation of Ser. No. 96,234, Sep. 8, 1987, abandoned, which is a continuation of Ser. No. 945,903, Dec. 24, 1986, abandoned. This application Nov. 28, 1989, Ser. No. 441,219
Claims priority, application Japan, Dec. 27, 1985, 60-297218
Int. Cl.[5] B44C *1/22*; C23F *1/02*; G01D *15/16*, *15/18*
U.S. Cl. 156—630 47 Claims



1. A method for fabricating a liquid jet recording head having at least one predetermined liquid path through which liquid passes, said liquid path communicating with an orifice in the recording head, said method comprising the steps of:
forming a heat resistor layer on a substrate to be provided in each liquid path for generating energy capable of discharging the liquid from the orifice;
forming a plurality of pairs of electrodes electrically connected to said heat resistor layer, each said pair of electrodes being electrodes by which voltage can be applied to said heat resistor layer, wherein one electrode of each of said pairs of electrodes is connected to a common electrode;
forming at least one liquid path for passage of the liquid by connecting said substrate provided with said heat resistor layer and said pairs of electrodes, and a member provided with a space for forming the liquid path with the space being oriented between said member and said substrate; and
thereafter cutting said pairs of electrodes from said common electrode.

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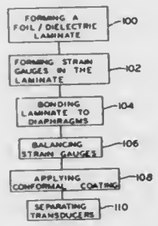


5,049,232

## METHOD OF MAKING DIAPHRAGM-TYPE PRESSURE TRANSDUCERS

Jeffry Tola, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Aug. 31, 1990, Ser. No. 576,664
Int. Cl.[5] B44C *1/22*; C23F *1/02*
U.S. Cl. 156—630 30 Claims




1. A method of making a plurality of separate pressure transducers of the type comprising a strain gauge circuit bonded to a diaphragm, the method comprising the steps of:

providing an array of a plurality of strain gauge circuits formed in a laminate sheet;

providing an array of a plurality of diaphragms corresponding to the array of the strain gauge circuits;

aligning the array of strain gauge circuits with the array of diaphragms;

bonding the laminate sheet to the array of diaphragms, with each strain gauge circuit aligned with a respective diaphragm; and

cutting the laminate thereby forming the separate pressure transducers.

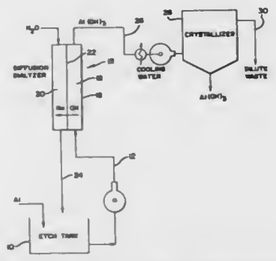
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5,049,233

## RECOVERY OF SODIUM HYDROXIDE AND ALUMINUM HYDROXIDE FROM ETCHING WASTE

Thomas A. Davis, Annandale, N.J., assignor to The Graver Company, Union, N.J.

Filed Jul. 6, 1990, Ser. No. 519,396
Int. Cl.[5] B44C *1/22*; C23F *1/00*; C03C *15/00, 25/06*
U.S. Cl. 156—642 23 Claims




1. A method of recovering sodium hydroxide from an etch tank waste solution containing dissolved aluminum comprising:

directing a stream of the waste solution into a diffusion dialyzer containing permeable membrane means that is permeable to sodium hydroxide and substantially less permeable to dissolved aluminum on one side of the membrane means;

simultaneously directing a stream of water into the dialyzer on the opposite side of the membrane means whereby sodium hydroxide migrates through said membrane means from the waste solution stream into the water stream; and recycling the sodium hydroxide-containing stream back into the etch tank.

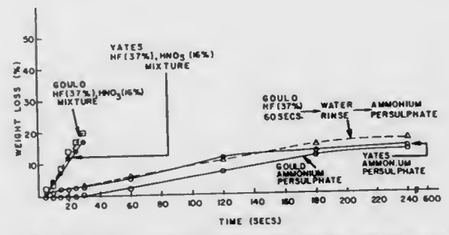
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5,049,234

## METHODS FOR REMOVING STRINGERS APPEARING IN COPPER-CONTAINING MULTI-LAYER PRINTED WIRING BOARDS

Chilengi P. Madhusudhan, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 9,319, Jan. 30, 1987, abandoned. This application Feb. 8, 1988, Ser. No. 153,388
Int. Cl.[5] C23F *1/00*
U.S. Cl. 156—644 8 Claims




1. A method for etching copper in plated through-holes in a multilayer substrate comprising layers of copper and reinforced resin before metal plating said substrate comprising contacting said substrate with a composition comprising an aqueous solution of about 37 percent by weight hydrofluoric acid, and about 16 percent by weight nitric acid.

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5,049,235

## POLY(METHYL VINYL ETHER-CO-MALEATE) AND POLYOL MODIFIED CELLULOSTIC FIBER

Robert L. Barcus, Springfield Twp., Hamilton County, and David W. Bjorkquist, Wyoming, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 28, 1989, Ser. No. 458,011
Int. Cl.[5] D21C *9/00*; D21H *11/20*
U.S. Cl. 162—9 30 Claims

1. A chemically modified fiber having a water absorbency and retention value in the range of from about 15 g/g to about 100 g/g comprising, chemically bonded together:

(a) a cellulosic fiber selected from the group consisting of chemithermomechanical pulp fiber, bleached hardwood Kraft pulp fiber, bleached softwood Kraft pulp fiber, unbleached hardwood Kraft pulp fiber, unbleached softwood Kraft pulp fiber, bleach softwood sulfite pulp fiber, bleached hardwood sulfite pulp fiber, unbleached softwood sulfite pulp fiber, unbleached hardwood sulfite pulp fiber, cotton linters, mercerized dissolving pulp fiber, unmercerized dissolving pulp fiber, and mixtures thereof;

(b) a poly(methyl vinyl ether-co-maleate) 1:1 copolymer having a number average molecular weight in the range of from about 39,000 to about 80,000, and

(c) a polyol selected from the group consisting of polyvinyl alcohol, propylene glycol, glycerin, pentaerythritol, a diol having the formula $HO(CH_2CH_2O)_nH$, wherein n is from 1 to about 154;

wherein the proportion by weight of said poly(methyl vinyl ether-co-maleate) copolymer to said polyol is from about 250:1 to about 3:1 and the weight of said poly(methyl vinyl ether-co-maleate) copolymer plus said polyol per unit weight of said cellulosic fiber, (a), is in the range from about 0.3 to about 2, the poly(methyl vinyl ether-co-maleate) copolymer weight being expressed on an acid equivalent basis.



5,049,236

## LIGNIN DERIVED QUINONIC COMPOUND MIXTURES USEFUL FOR THE DELIGNIFICATION OF CELLULOSIC MATERIALS

Donald R. Dimmel, Appleton, and John C. Wozniak, Kimberly, Wis., assignors to Institute of Paper Science and Technology, Inc., Appleton, Wis.

Filed Aug. 23, 1988, Ser. No. 235,316
Int. Cl.[5] D21C *3/20*
U.S. Cl. 162—16 11 Claims

1. A method for the preparation of a fused ring substance, the fused ring substance is useful for the delignification of cellulosic materials and being prepared by the method comprising the steps of:

a) oxidizing a the lignin substance or a lignin derived substance in a solvent by means of a first oxidizing agent to form a mixture of a first quinone product, wherein the first quinone product contains methoxy-substituted benzoquinone;

b) reacting the first quinone product containing the methoxy-substituted benzoquinone with a diene according to the Diels-Alder reaction to form a mixture of fused ring quinone and fused ring quinol products; and

c) oxidizing the mixture of fused ring quinone product and fused ring quinol products to form a final mixture of fused ring quinone compounds by means of a second oxidizing agent.

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5,049,237

## LAYERED SILICATES AND WATER-RESISTANT ARTICLES MADE THEREFROM

Walter J. Bohrn, Lancaster; Richard A. Brubaker, Willow Street; Shelly N. Garman, Lancaster; Lewis K. Hosfeld, Mountville; Kenneth K. Ko, and Thomas M. Tymon, both of Lancaster, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 15,756, Feb. 17, 1987, Pat. No. 4,877,484, which is a continuation-in-part of Ser. No. 715,973, Mar. 25, 1985, abandoned. This application Oct. 30, 1989, Ser. No. 428,725
Int. Cl.[5] B32B *5/16*; D21H *13/44, 17/69, 21/50*
U.S. Cl. 162—157.2 13 Claims

1. A flocced, 2:1 layered silicate composition which comprises a swelled layered silicate floc, the said silicate being selected from mica and vermiculite and having an average charge per structural unit that ranges from about −0.4 to about −1, said silicate containing at least some interstitial cations that consist essentially of: a cationic diamine compound.

7. The composition of claim 1 which is paper.

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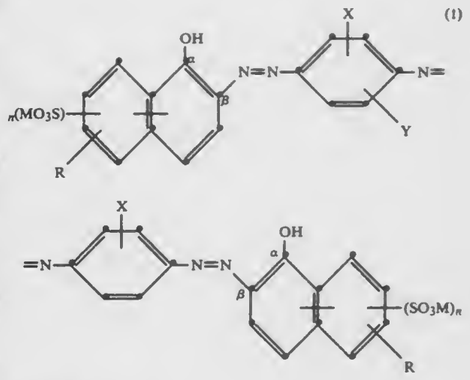
5,049,238

## METHOD OF DYEING PAPER UTILIZING TRISAZO DYES

Adolf Käser, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 19, 1989, Ser. No. 382,135
Claims priority, application Switzerland, Jul. 22, 1988, 2808/88
Int. Cl.[5] D21H *21/28*; C09B *35/35, 67/02*
U.S. Cl. 162—162 8 Claims

1. A method of dyeing paper which comprises the step of applying an unsymmetrical dye of the formula




wherein

R is hydrogen, —OH, —$OR^1$, —$NH_2$, —$NHR^1$, —NHCOR[1], —$NHSO_2R^1$, —$NHCONH_2$ or —$NHCONHR^1$, in which $R^1$ is unsubstituted alkyl or alkyl substituted by $C_1$–$C_4$-alkoxy, hydroxy-substituted $C_1$–$C_4$-alkoxy, phenyl, phenoxy or phenylcarbamoyl, in each instance the phenyl moiety being unsubstituted or substituted by $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy or phenoxy, $R^1$ is also unsubstituted phenyl or naphthyl or phenyl or naphthyl which is substituted by sulfo, carboxy, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, nitro, $C_1$–$C_4$-alkylcarbonylamino or $C_1$–$C_4$-alkoxycarbonylamino;

X, each independently of the other, is hydrogen, unsubstituted alkyl or alkoxy or alkyl or alkoxy which is substituted by $C_1$–$C_4$-alkoxy, hydroxy-substituted $C_1$–$C_4$-alkoxy, phenyl, phenoxy or phenylcarbamoyl, in each instance the phenyl moiety being unsubstituted or substituted by $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy or phenoxy, or X is halogen, sulfo or carboxy; Y is unsubstituted alkyl or alkoxy or alkyl or alkoxy which is substituted by $C_1$–$C_4$-alkoxy, hydroxy-substituted $C_1$–$C_4$-alkoxy, phenyl, phenoxy or phenylcarbamoyl, in each instance the phenyl moiety being unsubstituted or substituted by $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy or phenoxy, or Y is halogen, sulfo or carboxy;

M is hydrogen or a colorless cation; and

n is 1 or 2;

with the proviso that the —OH group in the α-position and the azo group in the β-position of the naphthalene nucleus are mutually interchangeable.

8. Paper which has been dyed by a method of claim 1.

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5,049,239

## FRAME CONSTRUCTION FOR A COMPACT PRESS SECTION OF A PAPER MACHINE

Markku Autio, Jyvaskyla, Finland, assignor to Valmet Paper Machinery Inc., Finland

Continuation-in-part of Ser. No. 181,739, Apr. 14, 1988, abandoned. This application Mar. 8, 1990, Ser. No. 490,753
Claims priority, application Finland, Apr. 14, 1987, 871649
Int. Cl.[5] D21F *3/04*
U.S. Cl. 162—274 33 Claims

1. A press section of a paper machine, said press section comprising, in a running direction of a paper web through the press section;

a front frame,

a rear frame separate from and not connected to said front frame,

a plurality of press rolls mounted on said front and rear frames, at least some of which forming a compact press roll combination in which there are press nips through

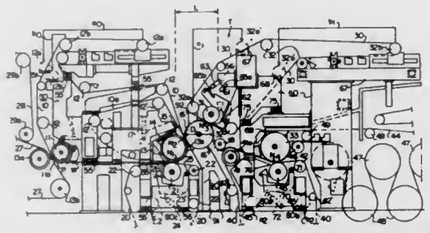
VOL 1130 ISS 3 SE 17 1991 UMI



which press fabric is passed, said compact press roll combination comprising a central roll and two other press rolls which each form a respective press nip with said central roll

wherein a space if formed between said frames and above the press roll combination, said space being constantly at least partially open and partially openable such that respective ones of said press rolls of said press roll combination are accessible for removal from said paper machine,

the press roll of the compact press combination being replaceable through said space which also facilitates replacement of the press fabric, and



one of said press rolls being mounted on an intermediate part separate from said front frame and pivotally mounted upon said rear frame at a rear part of said open and openable space and being pivotable by an actuating device to an upper position for replacement of press rolls or fabric, said intermediate part extending above said one of said press rolls and terminating approximately in the same vertical plane as the front of said one of said press rolls when it is in a position forming one of said nips with said central press roll.

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**5,049,240**

**VACCUM DISTILLATION SYSTEM**

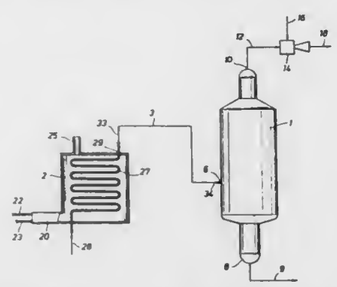
**Johannes A. Hamer; Cornelis J. Van Der Burg; Dirk Kanbier, and Pieter Van Der Heijden, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Feb. 7, 1990, Ser. No. 476,185**

**Claims priority, application United Kingdom, Feb. 10, 1989, 8903007**

**Int. Cl.[5] B01D** *3/10;* **F28F** *13/00*

**U.S. Cl. 802—153** **6 Claims**



1. Vacuum distillation system which is an upright vacuum distillation column having a column inlet, a bottom outlet and a top outlet, a furnace provided with a heat-exchange tube having a tube inlet and a tube outlet, and a connecting conduit provided with an inlet end connected to said tube outlet and an outlet end which is in fluid communication with said column inlet, and a transfer conduit extending between the outlet end of the connecting conduit and the column inlet for providing communication therebetween, wherein the inner diameter of the heat-exchange tube increases along the length of the heat-exchange tube to between 2.4 and 3 times the inner diameter of the tube inlet and wherein the inner diameter of said connecting conduit gradually increases along the length of the connecting conduit to between 2.5 and 5.4 times the inner diameter of the tube outlet, and wherein said transfer conduit has an inner diameter which is between 0.7 and 5.7 times the inner diameter of the outlet end of said connecting conduit and that said heat exchange tube has an inner diameter between 0.06 and 0.1 m and a length between 600 and 850 m and the length of said connecting conduit is between 50 and 70 m.

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**5,049,241**

**EXTRACTIVE DISTILLATION**

**Glenn F. Leverett, Vienna, W. Va., and Jan Wit, Werkendam, Netherlands, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 27, 1990, Ser. No. 500,259**

**Int. Cl.[5] B01D** *3/40*

**U.S. Cl. 203—67** **13 Claims**

1. Process of separating hydrogen chloride and tetrafluoroethylene by extractively distilling through an extractive distillation column a mixture thereof in the presence of an extractant that substantially alters the relative volatilities of the hydrogen chloride and the tetrafluoroethylene, and recovering an overhead fraction consisting essentially of hydrogen chloride and a bottom fraction consisting essentially of tetrafluoroethylene and the extractant.

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**5,049,242**

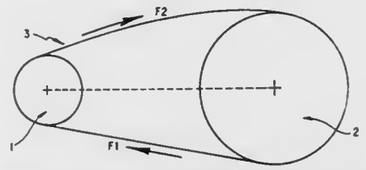
**ENDLESS METAL BELT ASSEMBLY WITH CONTROLLED PARAMETERS**

**John F. Murphy, Webster, and William G. Herbert, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 24, 1990, Ser. No. 632,519**

**Int. Cl.[5] C25D** *1/02*

**U.S. Cl. 204—9** **11 Claims**



1. A method of producing an endless belt assembly comprising a plurality of nested belts for use with a dual pulley force transmission system, comprising the steps of:

(a) determining a total stress during operation of said system on a first belt of a first thickness;

(b) determining a total stress during the operation of said system on at least one second belt of a different thickness;

(c) identifying the belt or group of belts with the lowest total stress;

(d) manufacturing said belt assembly from a plurality of belts each having the thickness of said belt with said lowest total stress.

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**5,049,243**

**ELECTROFORMING PROCESS FOR MULTI-LAYER ENDLESS METAL BELT ASSEMBLY**

**William G. Herbert, Williamson; Kenneth N. Traub, Rochester, and John F. Murphy, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 24, 1990, Ser. No. 632,998**

**Int. Cl.[5] C25D** *1/02*

**U.S. Cl. 204—9** **23 Claims**

1. An electroforming process, comprising:



submerging a mandrel in an electroforming bath;

electroforming a first belt on said mandrel;

forming a passive coating on the outer surface of said first belt;

electroforming at least one additional belt on said first belt;

wherein said mandrel remains submerged in the electroforming bath during the entire electroforming process.

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**5,049,244**

**METHOD OF MANUFACTURING DOUBLE-SIDED WIRING SUBSTRATE**

**Yoshio Yarita, Mizuho, and Yoshihiro Kawamura, Fussa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

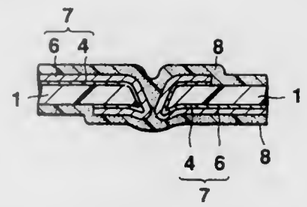
**Filed Jan. 12, 1990, Ser. No. 464,412**

**Claims priority, application Japan, Jan. 20, 1989, 1-11368; Mar. 1, 1989, 1-48777**

**The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.**

**Int. Cl.[5] C23C** *26/00*

**U.S. Cl. 204—15** **17 Claims**



1. A method of manufacturing a double-sided wiring substrate comprising the steps of:

preparing an insulating substrate having upper and lower surfaces;

piercing said insulating substrate with a pin having a sharp edge to form a hole extending from said upper surface to said lower surface;

forming a thin metal film on said upper and lower surfaces and on the inner surface of said hole of said insulating substrate by vapor deposition;

covering a region of said upper and lower surfaces of said insulating substrate, except for a wiring pattern formation region, with a resist layer;

forming a thick metal film on said thin metal film formed in said wiring pattern formation region on said upper and lower surfaces and on said inner surface of said hole of said insulating substrate by plating;

removing said resist layer; and

removing said thin metal film formed on the region except for said wiring pattern formation region using said thick metal film as a mask.

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**5,049,245**

**METHOD FOR PRODUCING RESIN-COATED RUST-PROOF STEEL SHEETS WITH PROPERTIES SUITABLE FOR ELECTRODEPOSITION COATING**

**Shingo Nomura, Akashi; Kenji Miki, Himeji, and Kanji Nakamura, Kakogawa, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Filed Mar. 6, 1990, Ser. No. 488,897**

**Claims priority, application Japan, Mar. 6, 1989, 1-53484**

**Int. Cl.[5] C25D** *5/48;* **C23C** *28/00*

**U.S. Cl. 204—27** **7 Claims**

1. A method for producing a resin-coated rust-proof steel sheet having properties suitable for electrodeposition coating, which comprises:

a) immersing a zinc- or zinc alloy-electroplated steel sheet in an acid bath containing at least one member selected from the group consisting of sulfuric acid, chloric acid, phosphoric acid, boric acid and nitric acid and salts thereof and having a pH value of less than 6, inclusive, to remove a surface layer of the electroplating; and grinding the electroplated surface with a brush or roll carrying fine abrasive grains of #200 or a higher number to remove a surface layer concurrently, before or after the immersion in said acid bath;

b) subjecting said steel sheet to chromate treatment; and

c) resin-coating said chromate-treated steel.

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**5,049,246**

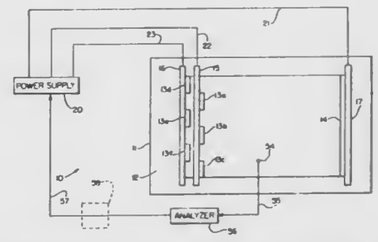
**ELECTROLYTIC PROCESSING APPARATUS AND METHOD WITH TIME MULTIPLEXED POWER SUPPLY**

**Harry F. Hull, Rau Sao Benedito, 761, 04735 Sao Paulo, and Ivan P. Da Silva, R. Dos Malnas, 30, 09790 Sao Bernardo Do Campo, SP both of Brazil**

**Filed Jun. 20, 1989, Ser. No. 368,666**

**Int. Cl.[5] C25D** *3/56, 21/12;* **C25F** *3/16;* **G01N** *27/26*

**U.S. Cl. 204—43.1** **32 Claims**




23. A method for electroplating or electropolishing of materials, comprising placing plural first electrodes in an electrolytic processing bath, placing at least one second electrode in such bath, and at different times supplying power between at least one of such first electrodes and such at least one second electrode and supplying power between at least another of such first electrodes and such at least one second electrode.

24. The method of claim 23, said placing comprising placing said electrodes in a bath to perform alloy plating, and said supplying power comprising supplying power to control the composition of such bath.

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**5,049,247**

**METHOD FOR DETECTING AND LOCATING AN ELECTROLYTE**

**Eric D. Nyberg, Belmont; Ken A. Klingman, Menlo Park; Jeff Curtis, San Francisco, and Ray F. Stewart, Redwood City, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.**

**Division of Ser. No. 17,375, Feb. 20, 1987, Pat. No. 4,888,098, which is a continuation-in-part of Ser. No. 932,763, Nov. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 831,758, Feb. 20, 1986, abandoned. This application Oct. 17, 1989, Ser. No. 422,729**

**Int. Cl.[5] G01N** *27/26*

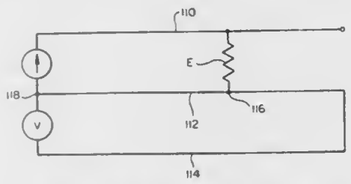
**U.S. Cl. 204—153.1** **24 Claims**

1. A method for monitoring for the presence of an electrolyte and for locating the electrolyte upon its presence, which method comprises:

(1) providing a system comprising an electrically conductive locating member and an electrically conductive source member, between which an electrical connection is made upon the presence of the electrolyte;

the locating member and/or the source member comprising (i) an electrode and (ii) an ion exchange material which is in electrical and physical contact with and substantially entirely surrounds all surfaces of the electrode; the ion exchange material having an ionic resis-

tance which depends upon the concentration of a chemical species in the electrolyte;
the connection to the locating member being effective at a first point whose location is defined by the presence of the electrolyte;
an electrochemical reaction taking place at the first point at interface of the ion exchange material and the electrode contacted thereby, generating an ionic species, substantially all the ionic species so generated passing through the ion exchange material;
the making of the connection enabling the formation of a test circuit which comprises
(a) the connection,
(b) that part of the locating member which lies between

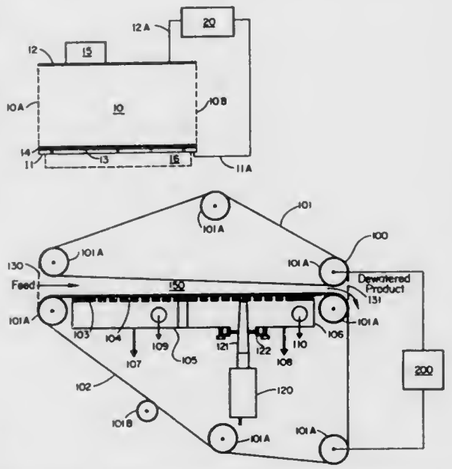



the first point and a second point on the locating member, and
(c) a power source which causes a current of known size to be transmitted between the first and second points on the locating member;
the current and locating member being such that, by measuring the voltage drop between the first and second points associated with a change in the ionic resistance of the ion exchange material, the spatial relationship between the first and second points can be determined;
(2) measuring the voltage drop between the first and second points; and
(3) determining the location of the electrolyte from the measurement made in step (2).

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**5,049,248**
**LIQUID SEPARATION PROCESS FOR SUSPENSIONS BY A PULSATING ELECTRICAL CURRENT**
**Harapanahalli Muralidhara, Dublin, and Cecil L. Criner, Columbus, both of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio**
**Continuation-in-part of Ser. No. 938,707, Dec. 8, 1986, Pat. No. 4,802,964. This application Feb. 6, 1989, Ser. No. 307,025**
**Int. Cl.[5] C02F *1/469*; B01D *43/00***
**U.S. Cl. 204—180.1** **17 Claims**

1. A method of dewatering an aqueous suspension in a dewatering chamber with an inlet and discharge outlet, and having two electrodes, one of which is water permeable, forming opposing walls of the dewatering chamber which method comprises:
a. flowing the suspensions into the dewatering chamber and between the two electrodes;
b. applying an acoustical field to the suspension at a frequency and amplitude adapted to cause separation of liquid bound to particles in the suspension;
c. concurrently with step b. applying a pulsating D.C. electrical field between the two electrodes adapted to cause particles to migrate away from the water permeable electrode and water toward the water permeable electrode;
d. removing water from the suspension through the water permeable electrode; and
e. removing the dewatered suspension from the dewatering chamber;
whereby the total amount of energy employed for separating a unit of water from the suspension is less than would be required by use of a nonpulsating D.C. electrical field to separate the unit of water.




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**5,049,249**
**LOW CURE CATHODIC ELECTRODEPOSITION COATINGS**
**Ding Y. Chung, Rochester Hills, and Tapan K. DebRoy, Utica, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Continuation of Ser. No. 275,357, Nov. 23, 1988, Pat. No. 4,900,415. This application Aug. 30, 1989, Ser. No. 401,669**
**The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.**
**Int. Cl.[5] C25D *13/06*; C08L *63/00***
**U.S. Cl. 204—181.7** **8 Claims**

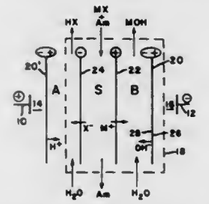
1. A method of coating an electrically conductive article with the film forming resin using cathodic electrodeposition comprising:
(1) forming a polyepoxide amine adduct;
(2) forming a blocked crosslinker by bringing into contact tetramethyl xylene diisocyanate and a polyol under conditions that will cause a reaction and then totally blocking the reaction product with an oxime;
(3) mixing said polyepoxide amine adduct with the blocked crosslinker;
(4) adding acid and water to the mixture of the epoxy amine adduct and the crosslinker thereby forming a principal emulsion;
(5) mixing the principal emulsion with the appropriate amount of water and pigment paste to form an electrocoat bath;
(6) immersing the article in the electrocoat bath; and
(7) passing a direct current across the article.

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**5,049,250**
**ELECTRODIALYTIC TREATMENT OF AQUEOUS SOLUTIONS CONTAINING AMINO ACIDS**
**Frederick P. Chlanda, Rockaway, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.**
**Filed Aug. 14, 1989, Ser. No. 393,165**
**Int. Cl.[5] B01D *13/02***
**U.S. Cl. 204—182.4** **19 Claims**

1. A process of separating at least two amphoteric compounds from an aqueous feed comprising the amphoteric compound and at least one salt, each salt comprising a salt anion and a salt cation, in an apparatus comprising at least one cell comprising at least one cation membrane, at least one anion membrane, and a bipolar membrane, the bipolar membrane comprising a cation layer and an anion layer, there being a base compartment between the anion layer of said bipolar membrane and the cation membrane, a salt compartment between said cation membrane and said anion membrane, and an acid compartment on the side of said anion membrane opposite the salt compartment comprising the steps of:
supplying the feed to said salt compartment;

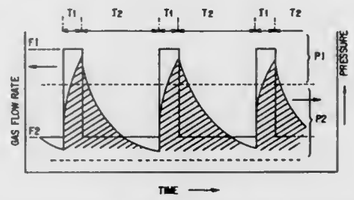





supplying a liquid comprising water to said acid and base compartments;
applying a direct current to the cell to force the salt cations to migrate to the base compartment to form base, and the salt anions to migrate to the acid compartment to form acid, the amphoteric compounds remaining in the salt compartment;
recovering acid from the acid compartment;
recovering base from the base compartment; and recovering an aqueous solution comprising the at least two amphoteric compounds from the salt compartment.

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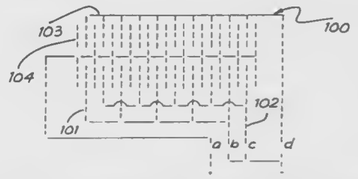
**5,049,251**
**SPUTTERING METHOD FOR FABRICATING THIN FILM**
**Minoru Inoue, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**
**Filed Jun. 7, 1989, Ser. No. 362,712**
**Claims priority, application Japan, Jun. 10, 1988, 63-141507**
**Int. Cl.[5] C23C *14/34, 14/54***
**U.S. Cl. 204—192.12** **7 Claims**




1. A method for sputtering a material on an object by a glow discharge generated in a sputtering chamber, said method comprising the steps of:
a) placing an object in a sputtering chamber having a target made of material to be sputtered on said object therein, and evacuating the sputtering chamber;
b) injecting a gas into said sputtering chamber, and increasing the pressure in said sputtering chamber to a first pressure sufficient to ignite said glow discharge;
c) decreasing the flow rate of said injection gas, and thus decreasing the pressure in said sputtering chamber to a second pressure such that said glow discharge cannot be ignited but can be maintained for a limited time if the glow discharge has previously been ignited;
d) before said glow discharge extinguishes, increasing the flow rate of said injection gas, and thus increasing the pressure in the sputtering chamber to said first pressure to at least reinforce the glow discharge; and
e) repeatedly varying the flow rate of the injection gas, and varying the pressure in the sputtering chamber as aforesaid to maintain said glow discharge and sputtering therein.

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**5,049,252**
**WATER CLEANING SYSTEM**
**Wilfred A. Murrell, Wilga Farm, Hillston, New South Wales, Australia 2675**
**Continuation-in-part of Ser. No. 5,726, Jan. 21, 1987, abandoned. This application Mar. 23, 1990, Ser. No. 497,850**
**Claims priority, application Australia, Jan. 21, 1986, PH4293**
**Int. Cl.[5] C02F *1/46***
**U.S. Cl. 204—268** **10 Claims**




1. An electrode arrangement for an electrolytic water purifier comprising:
an upper electrode bank having one or more upper vertical metallic plates commonly connected to a first terminal;
a first lower electrode bank having one or more vertical metallic plates commonly connected to a second terminal, each lower electrode spaced from, but located vertically adjacent to an upper plate in an edge to edge relationship;
each lower and its adjacent upper plate forming an electrode pair;
a plurality of commonly connected full length electrodes, each extending substantially to the combined length of an electrode pair and connected to a third terminal; and
each electrode pair disposed between two full length electrodes.

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**5,049,253**
**ELECTRODE APPARATUS FOR DIALYSIS**
**Ryuji Izuo; Seiji Tachino, and Masaaki Nakashima, all of Tokuyama, Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan**
**Filed Dec. 14, 1989, Ser. No. 450,522**
**Claims priority, application Japan, Dec. 16, 1988, 63-316189; Mar. 30, 1989, 1-76841**
**Int. Cl.[5] B01D *13/02***
**U.S. Cl. 204—301** **13 Claims**

1. An electrode apparatus for the dialysis during electrodeposition paint coating, including an electrode and an ion-exchange member having a permselectivity to ions attracted in the electrode, wherein said apparatus for the dialysis comprises

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a self-supportable tubular ion exchanger formed integrally with no side-seam, an electrode disposed within the ion exchanger and arranged in the axial direction an electrolyte from one end of the tubular ion exchanger to the other end thereof.



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**5,049,254**

**EXHAUST GAS RECIRCULATION SENSOR**

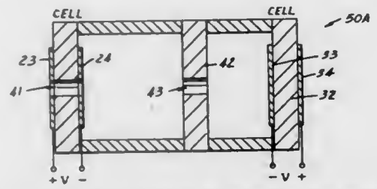
**Eleftherios M. Logothetis, Birmingham, and Richard E. Soltis, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed May 29, 1987, Ser. No. 55,821**

**The portion of the term of this patent subsequent to Mar. 20, 2007, has been disclaimed.**

**Int. Cl.[5] G01N *27/41***

**U.S. Cl. 204—425** **1 Claim**




1. An electrochemical device for measuring the percentage of exhaust gas recirculation in a combined intake air and exhaust gas mixture of an internal combustion engine, said electrochemical device including:

a first solid electrochemical pump cell having a first pair of opposing electrodes;

a second solid electrochemical pump cell having a second pair of opposing electrodes;

a supporting structure coupled to said first and second pump cells to form a restricted volume;

an aperture for providing communication between said restricted volume and an ambient of said combined intake air and exhaust gas mixture;

a first external circuit means coupled to said first pump cell to apply a constant voltage across said first pump cell so that of said first pair of opposing electrodes a first pump cell electrode inside said volume is biased negatively causing all oxygen molecules inside said volume to be pumped out by a current flowing through said first pump cell;

a second external circuit means coupled to said second pump cell to apply a constant voltage across said second pump cell so that of said second pair of opposing electrodes a second pump cell electrode inside said volume is biased negatively causing dissociation of all $CO_2$ and $H_2O$ molecules inside said volume;

a third external circuit means coupled to said second pump cell to measure a current flowing through said second pump cell, said second pump cell current being proportional to the percentage of $CO_2$ plus $H_2O$ inside said volume and also proportional to the percentage of $CO_2$ plus $H_2O$ in the combined intake air and exhaust gas mixture; and

a one piece integral wall inside said volume, said wall dividing said volume into two compartments which communicate with each other through an aperture in said wall, each of said two compartments being adjacent to only one pump cell and said wall being free of electrodes.

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**5,049,255**

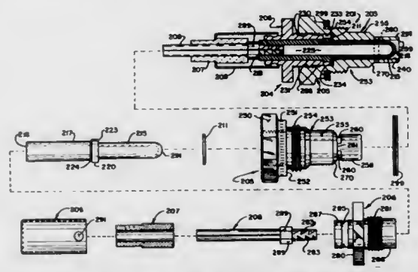
**OXYGEN SENSING UNIT**

**Michael J. Wolfe, Villa Ridge, and Robert F. Killion, Florissant, both of Mo., assignors to Tomco, Incorporated, St. Louis, Mo.**

**Filed Mar. 1, 1990, Ser. No. 487,159**

**Int. Cl.[5] G01N *27/409***

**U.S. Cl. 204—428** **11 Claims**



1. An oxygen sensing unit including a plug having an externally threaded closure cap and an internally threaded body, an oxygen sensing hollow cell with a closed outer end, and a protective shield, said cell being removably and replaceably mounted in said plug with parts thereof compressed mediately or immediately between said cap and said body, said protective shield being integral with a portion of said plug, said shield having a heavy-walled section and a nose section of lesser outside diameter than said heavy-walled section, chordal slots in said nose section contiguous said heavy-walled section communicating with a passage in which said cell is mounted, an axially outboard wall defining the outboard edge of said slots having, radially outboard of the said slots, a sloped surface making an acute angle with the axis of said passage.

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**5,049,256**

**RECOVERY OF HYDROCARBONS FROM ACID SLUDGE**

**Mark C. Luce, Napa, Calif., assignor to Chevron Research and Technology Company, San Francisco, Calif.**

**Filed Feb. 6, 1990, Ser. No. 475,627**

**Int. Cl.[5] C10G *17/06***

**U.S. Cl. 208—13** **10 Claims**

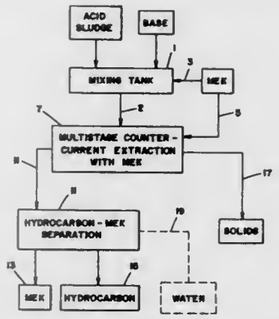
1. A process for the recovery of hydrocarbons from an acid sludge disposal site containing an aged acid sludge, said aged acid sludge containing up to 13 weight percent slufuric acid comprising the steps of:

(a) removing said aged acid sludge from said disposal site;

(b) contacting said aged acid sludge with methyl ethyl ketone and base to form a mixture;



(c) separating from said mixture a hydrocarbon-rich methyl ethyl ketone stream and a solids-containing stream; and




(d) separating from said hydrocarbon-rich methyl ethyl ketone stream a methyl ethyl ketone stream, a hydrocarbon stream and a waste water stream.

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**5,049,257**

**FLUID FOR ELECTRICAL DISCHARGE MACHINING**

**Toshihiko Furukawa, Kanagawa, Japan, assignor to Sodick Co., Ltd., Kanagawa, Japan**

**Continuation of Ser. No. 75,222, Jul. 17, 1987, abandoned, which is a continuation of Ser. No. 776,596, Sep. 16, 1985, abandoned. This application Nov. 18, 1988, Ser. No. 274,602**

**Int. Cl.[5] C10G *00/00***

**U.S. Cl. 208—14** **9 Claims**

1. Electrical discharge machining fluid comprising 1 to 30 percent by volume high-viscosity oil having a viscosity value of at least 10 (cSt) Kinematic viscosity at 200° F. added to low-viscosity mineral or synthetic base oil having a viscosity value about 0.8 (cSt) Kinematic viscosity at 200° F., wherein the mixture has a viscosity value about 1.0 to 2.0 Kinematic viscosity at 140° F.

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**5,049,258**

**REPROCESSING OF CONTAMINATED OILS**

**Karl H. Keim, Swisttal-Heimerzheim; Peter Seifried, Wesseling; Hartmut Hammer, Cologne, and Ralf Wehn, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to RWE-Entsorgung Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Nov. 22, 1989, Ser. No. 440,504**

**Claims priority, application Fed. Rep. of Germany, Nov. 25, 1988, 3839799**

**Int. Cl.[5] C10G *45/00***

**U.S. Cl. 208—184** **11 Claims**

1. A process for the recovery of clean hydrocarbon stock from hydrocarbon oil based used automobile engine oils contaminated with chlorinated hydrocarbons, heavy metals and additives associated with automobile engine oils which comprises:

(a) subjecting said contaminated hydrocarbon oil to thermal cracking at a temperature in the range of 400° to 600° C.;

(b) fractionating the effluent from step (a) by distillation and rectification into a light gasoline fraction, a naphtha fraction, a gas oil fraction containing chlorinated hydrocarbons, and a bottoms fraction; and

(c) subjecting said gas oil to hydrorefining and recovering a hydrocarbon product therefrom which is substantially completely free of chlorine.

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**5,049,259**

**MEMBRANE PROCESS FOR DRYING LIQUID HYDROCARBONS**

**Dana C. Overman, Pleasant Hill, Calif., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 191,670, May 9, 1988, abandoned, which is a continuation of Ser. No. 922,980, Oct. 24, 1986, abandoned. This application Jan. 25, 1989, Ser. No. 301,695**

**Int. Cl.[5] C10G *25/00***

**U.S. Cl. 208—188** **8 Claims**

1. A pervaporation process for dehydrating liquid hydrocarbons comprising the steps of:

(a) contacting the upstream side of an asymmetric or composite semi-permeable membrane with a mixture comprised of at least one $C_{4-15}$ liquid hydrocarbon and water, at temperatures and pressures at which the liquid hydrocarbon(s) are dehydrated, wherein the semi-permeable membrane is permeable to water and impermeable to liquid hydrocarbons and comprises a substantially homogeneous and substantially continuous discriminating layer having a thickness of less than about 1 micron and consisting of a cellulosic polymer selected from the group consisting of cellulose esters and cellulose ethers, wherein the water initially present in the liquid hydrocarbon-water mixture is dissolved or entrained in the liquid hydrocarbon(s) or is present as a separate aqueous phase, wherein the discriminating layer has a thickness which has adequate mechanical strength under process conditions and allows transport of water across the membrane at rates which result in at least about 25 percent removal of water from the liquid hydrocarbon-water mixture;

contacting the downstream side of the membrane with an inert sweep gas or vacuum under conditions such that a chemical potential gradient exists across the membrane such that the water selectively permeates through the membrane;

(c) removing the permeated water from the downstream side of the membrane; and

(d) removing the nonpermeated liquid $C_{4-15}$ hydrocarbon(s) from the upstream side of the membrane;

wherein the membrane is capable of reducing water present in a liquid hydrocarbon-water mixture to a level of about 15.7 ppm of water when a membrane with a surface area of about 33.2 centimeters$^2$ is contacted on the upstream side with a liquid hydrocarbon-water mixture containing about 47.3 ppm water at about 30° C. at a flowrate of about 4.5 centimeter$^3$/minute while contacting the downstream side of the membrane with an inert sweep gas with a relative humidity of about 11 percent.

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**5,049,260**

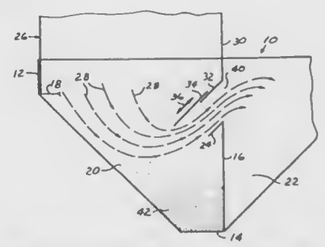
**BLAST CLEANING WET MEDIA FEED AND SEPARATION SYSTEM**

**Richard L. Spears, P.O. Box 590, Seminole, Okla. 74868**

**Filed Aug. 29, 1990, Ser. No. 574,322**

**Int. Cl.[5] B03B *7/00***

**U.S. Cl. 209—2** **6 Claims**




1. A particle size separating apparatus for use with wet slurry blasting at a blasting location where the used slurry

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containing some useable and some unuseable particles processed adjacent the blasting operation and returned to the blasting location, comprising:

an upwardly open hopper having downwardly converging side walls joined to a horizontal bottom wall;

transverse partition means extending upwardly from said bottom wall at least one half the height of said hopper for dividing said hopper and forming a plurality of slurry containing chambers,

one said chamber being disposed below the blasting location for receiving used slurry by gravity; and,

superposed baffle means coextensive between hopper opposing side walls and inclined downwardly from the vertical plane defined by said partition means into said one chamber for forming an upwardly directed slurry flow path from said one chamber to an adjacent chamber, thereby retarding the slurry flow rate through the baffle area flow path and allowing heavier reuseable slurry particles to settle-out by gravity in said one chamber.

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**5,049,261**

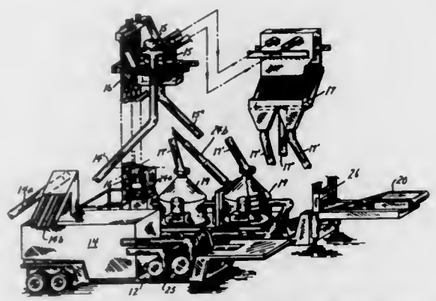
**PORTABLE COAL SLURRY WASHER**

**Eddie D. Tapp, Pine St., and Tony L. Tapp, 13016 Hopkinsville Rd., both of Nortonville, Ky. 42442**

**Filed Dec. 18, 1989, Ser. No. 451,799**

**Int. Cl.[5] B03B 7/00**

U.S. Cl. 209—17 8 Claims



1. A coal slurry washer comprising a portable platform, a mast including a pivotal end mounted on said platform and an opposite free end, means moving said mast from an operative position to a non-operative position, a cyclone mounted proximate said free end of said mast, and means introducing slurry to said cyclone, and other means discharging recovered coal from said cyclone, where a dryer is mounted on said portable platform, and where a vacant area on said portable platform between said dryer and said free end of said mast when said mast is at said non-operative position presents storage space for said cyclone.

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**5,049,262**

**MODULAR SYSTEM**

**Zanley F. Galton, 2925 SW. Canterbury La., Portland, Oreg. 97201; Lynn A. Russell, 52712 Round House La., Scappoose, Oreg. 97056, and L. Allen Dorn, 31008 Washougal River Rd., Washougal, Wash. 98671**

**Continuation-in-part of Ser. No. 275,216, Nov. 23, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 439,969**

**Int. Cl.[5] B07B 1/46, 1/18; F16B 21/14**

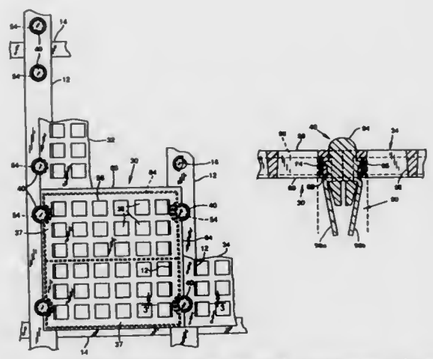
U.S. Cl. 209—399 39 Claims

1. A screening system comprising:

a substantially rigid frame for supporting a plurality of screening modules positioned on the frame, the frame including mounting aperture means;

each screening module including means defining an array of sieve apertures of a predetermined size for allowing particulate material up to the predetermined size to pass through the screening module, each screening module being positioned on the frame so that particulate material passing through the screening module passes through the frame; and

a lock pin including means for connecting the lock pin to the mounting aperture means in the frame, and also including means for interlockingly and removably engaging each



screening module to maintain the positioning of each screening module on the frame when the lock pin is connected to the frame;

the lock pin remaining connected to the frame while allowing removal of each screening module from the frame and positioning of a replacement screening module on the frame.

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**5,049,263**

**FLUID STRAINER WITH BLOCKAGE DETECTION**

**James R. Hoffman, and Michael A. Ward, both of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 529,018, May 25, 1990. This application Jun. 25, 1990, Ser. No. 543,004**

**Int. Cl.[5] B01D 35/14**

U.S. Cl. 210—86 5 Claims

1. A fluid strainer with blockage detection, comprising:

perforate strainer cup means for straining particle-bearing fluid and accumulating particles, said cup means having a top for receiving a flow of fluid and particles, a bottom and contiguous sidewall portion, said cup means passing at least a portion of said fluid flow while blocking the flow of at least a portion of said particles;

a strainer cup support base, comprising an upstanding outer wall enclosing the outer periphery of an internal flange, an upstanding inner wall enclosing the periphery of an opening through said flange, said outer wall and said inner wall being integrally connected to said flange, thereby defining an annular chamber;

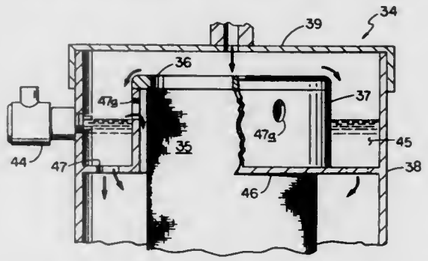


means for supporting said strainer cup means on said strainer cup support base;

rim means for permitting fluid to overflow said perforate strainer cup means and spill into said annular chamber when said strainer cup means is substantially blocked with accumulated particles;

means for mounting said strainer cup support base relative to a fluid reservoir;

means for draining fluid flow passing through said strainer cup means into said fluid reservoir;




means for directing a flow of fluid and particles into said strainer cup means;

sensor means for sensing a fluid level in said annular chamber relative to said flange;

means for controlling drainage of fluid from said annular chamber as said sensor means senses said fluid level; and

signal means for effecting a personnel alert condition in response to said sensor means.

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**5,049,264**

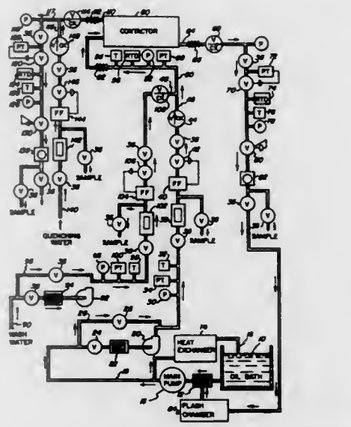
**PROCESS AND APPARATUS FOR CONTINUOUSLY REMOVING CONTAMINANTS FROM EDIBLE COOKING OIL**

**Ellen M. Rosnack, Virginia Beach; Larry A. Pray, Suffolk; Alger C. Marable, Virginia Beach, and Gerry C. Zekert, Suffolk, all of Va., assignors to Nabisco Brands, Inc., Parsippany, N.J.**

**Division of Ser. No. 205,215, Jun. 10, 1988, Pat. No. 5,008,122. This application Sep. 13, 1989, Ser. No. 406,786**

**Int. Cl.[5] B01D 21/26**

U.S. Cl. 210—117 6 Claims




1. An apparatus for continuously removing contaminates from edible oil in the cooking bath having a temperature in excess of 250° F., comprising:

a pump for withdrawing a continuous stream comprising oil and contaminates from said bath, said pump directing said contaminated oil through a closed conduit to maintain said oil under pressure substantially in excess of atmospheric pressure;

a source of liquid solvent for at least a portion of said contaminates, said solvent comprising water and having a specific gravity different than the specific gravity of said oil;

means for generating a continuous stream of said solvent, said solvent stream being transferred through a conduit;

means for mixing said continuous contaminated oil stream and said continuous solvent stream to provide a continuous oil and solvent mixture stream, said mixture stream being maintained at a pressure substantially above atmospheric pressure to inhibit vaporization of said solvent;

a centrifugal separator for separating said oil and solvent mixture stream by specific gravity into a stream comprising cleaned oil and a stream comprising solvent and contaminates;

means for reducing the pressure of the cleaned oil stream to a pressure lower than the vaporization pressure of said solvent to permit any solvent remaining in the cleaned oil stream to vaporize;

means for returning said cleaned oil stream to said bath; and

means for discarding said stream comprising solvent and contaminants.

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**5,049,265**

**EFFLUENT TREATMENT SYSTEM**

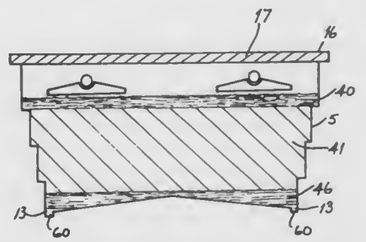
**Hugh F. Boyd, Portrush; Michael T. Weldon, Balbriggan; Patrick J. Coffey, Newbridge; Brocan Carty, Geashill, and Richard Kavanagh, Foxrock, all of Ireland, assignors to Bord Na Mona and Wavin Ireland Limited, both of Dublin, Ireland**

**Filed Feb. 12, 1990, Ser. No. 478,409**

**Claims priority, application Ireland, Feb. 10, 1989, 2435/88**

**Int. Cl.[5] C02F 3/04**

U.S. Cl. 210—150 21 Claims




1. An effluent treatment system for treating effluent which has passed through a primary treatment to remove a substantial proportion of solids comprising:

a container having an upper inlet for effluent from a primary treatment and a lower outlet for treated effluent, and

a biological effluent treatment medium in the container,

the biological effluent treatment medium comprising a homogenous mixture of biologically active peat and a fibrous material comprising the root residues of eriophorum (cotton grass) plants extracted from bog peat.

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5,049,266

## DEVICE AND METHOD FOR MICROBIOLOGICAL WATER TREATMENT

Helmut Götz, Regensdorf; Ludwig Scheibinger, Munich, and Peter Steinbach, Kallstadt, all of Fed. Rep. of Germany, assignors to Metz Mannheim GmbH, Mannheim, Fed. Rep. of Germany

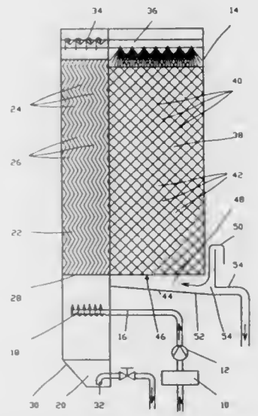
PCT No. PCT/DE89/00530, § 371 Date Apr. 5, 1990, § 102(e) Date Apr. 5, 1990, PCT Pub. No. WO90/02100, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 12, 1989, Ser. No. 466,288

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827715

Int. Cl.[5] C02F *3/30*

U.S. Cl. 210—151 8 Claims



1. A device for the microbiological treatment of water, including the elimination of nitrogen therefrom, which comprises

(a) a sedimentation compartment,

(b) a distributor disposed in the sedimentation compartment,

(c) a feeder of water to be treated, the feeder being connected to the distributor for introducing the water into the sedimentation compartment,

(d) a first fixed bed reactor for microbiological denitrification of the water, the first fixed bed reactor being positioned above the sedimentation compartment and having a base arranged at some distance from the distributor, the distributor distributing the water over the whole cross-section of the first fixed bed reactor and the first fixed bed reactor comprising

(1) a block consisting of segments composed of drawn plastic foil defining vertically rising closed channels therebetween wherethrough the water flows from below and whereby the first fixed bed reactor is flooded,

(e) an overflow device disposed above the first fixed bed reactor,

(f) a sprinkler system connected to the overflow device,

(g) a second fixed bed reactor arranged below the sprinkler system to receiver the water therefrom for the microbiological nitrification thereof, the second fixed bed reactor comprising

(1) a block of segments composed of drawn plastic foil defining therebetween internally communicating and intersecting channels wherethrough the water flows downwardly, and

(h) a drainage system disposed below the second fixed bed reactor, the drainage system comprising a catch basin.

5,049,267

## FILTER ARRANGEMENT FOR A FUEL TANK COMPRISING SHAPED MESH SECTIONS

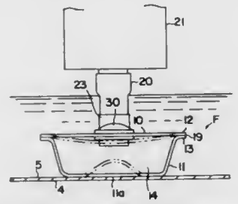
Michiaki Sasaki, Hadano; Joji Masuda, Ebina, and Koichi Takahashi, Zama, all of Japan, assignors to Nissan Motor Co., Japan

Continuation-in-part of Ser. No. 227,805, Aug. 3, 1988, abandoned. This application Feb. 13, 1990, Ser. No. 480,342

Claims priority, application Japan, Aug. 6, 1987, 62-119824[U]

Int. Cl.[5] B01D *35/02*

U.S. Cl. 210—172 31 Claims



1. A filter arrangement constructed and arranged for installation in a fuel tank comprising:

a first section made of a generally flat mesh; and

a second section made of a generally flat mesh and connected to said first section to define a pocket between said first and second sections, said second section having a different shape from said first section and a larger total surface area than said first section, wherein the first and second sections are sufficiently differently shaped and are arranged such that the pocket does not collapse when subjected to a differential pressure within the fuel tank.

5,049,268

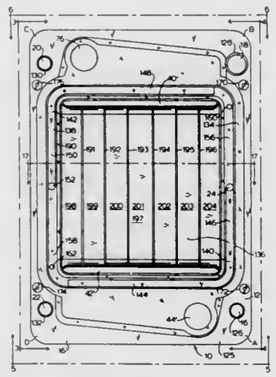
## FILTER PLATE, FILTER PLATE ELEMENT, AND FILTER COMPRISING SAME

Henry B. Kopf, 108 Coatbridge Cir., Cary, N.C. 27511

Continuation-in-part of Ser. No. 235,046, Aug. 22, 1988, Pat. No. 4,882,050, which is a continuation-in-part of Ser. No. 104,177, Oct. 2, 1987, Pat. No. 4,867,876. This application Jun. 6, 1989, Ser. No. 364,616

Int. Cl.[5] B01D *25/12, 13/00*

U.S. Cl. 210—231 6 Claims



1. A filter plate comprising:

(a) a generally rectangular and generally planar shape with main top and bottom surfaces;

(b) a first wall extending upwardly from said main top surface and circumscribingly bounding a flow channel area of generally rectangular shape thereon;

(c) a second wall on said main top surface extending upwardly therefrom, said second wall being interior to and of lesser height than said first wall and in spaced relationship to the first wall along diagonally opposed L-shaped peripheral sections of the flow channel area thereby defining an L-shaped channel therebetween;

(d) each L-shaped peripheral section comprising said L-shaped channel which comprises a leg extending transversely across the flow channel area for a major portion of the width thereof, and a leg extending longitudinally for a portion of the length of the flow channel area and communicating at its extremity with an opening extending through the plate, with peripheral portions of the flow channel area not comprising said L-shaped sections comprising ridges extending between the first and second walls;

(e) an inlet port opening in the filter plate at a first end thereof, extending through the plate, and interiorly positioned in a polymodal-shaped distribution basin on the main bottom surface of the plate, said distribution basin being bounded by generally linear side edges defining corners of the basin at respective intersections of the side edges;

(f) an inlet trough opening extending through said plate and transversely across a major portion of the width of said flow channel area and along a first side edge of said distribution basin, such that said inlet trough opening communicates said distribution basin on the main bottom surface of the plate with said flow channel area on the main top surface of the plate;

(g) an outlet port opening in the plate at a second end thereof extending through the plate, and interiorly positioned in a polygonal-shaped collection basin on the main bottom surface of the plate, said collection basin being bounded by generally linear side edges defining corners of the collection basin at respective intersections of the side edges thereof;

(h) an outlet trough opening extending through the plate and transversely across a major portion of the width of said flow channel area nd along a first side edge of said collection basin, such that said outlet trough opening communicates said collection basin on the main bottom surface of the plate with said flow channel area on the main top surface of the plate; and

(i) a plurality of transversely spaced-apart partitions extending upwardly from the floor of the flow channel area between the inlet trough opening and the outlet through opening, said partitions being of substantially the same height as the second wall and substantially parallel to one another to define a series of channels between the partitions, extending longitudinally between the inlet trough opening and the outlet through opening.



5,049,269

## FILTER ASSEMBLY WITH SPRING LOADED VALVE

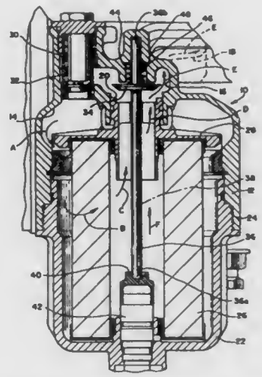
Satish S. Shah, Rockford, Ill., assignor to Sunstrand Corporation, Rockford, Ill.

Filed Jun. 8, 1989, Ser. No. 363,518

Int. Cl.[5] B01D *27/10*

U.S. Cl. 210—234 17 Claims

1. A filter assembly, comprising a valve body having an inlet and an outlet an passage means communicating between the inlet and the outlet, a valve stop in the passage means defining a valve seat, a valve member movable in the valve body to and from a closed position against the valve seat, a bowl removably attached to the valve body, a filter disposed in the bowl communicating with the passage means, valve actuating means operatively associated between the bowl and the valve member for moving the valve member to an open position in response to attaching the bowl to the valve body, spring means for biasing the valve member toward its closed position against the valve seat, and receptacle means in the valve body for positioning and receiving the spring means, the receptacle means being sealed by said valve member when the valve



member is in its open position to completely isolate the spring means from any fluid flowing through the filter assembly.

5,049,270

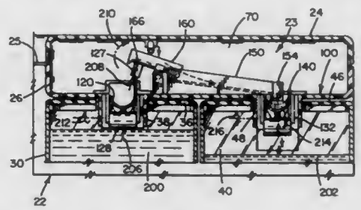
## FILTER APPARATUS HAVING LIQUID CONTROL MECHANISM

Thomas P. Carrano, Fairfield, and Raymond M. Petrucci, Middlebury, both of Conn., assignors to Cuno, Inc., Meriden, Conn.

Filed Sep. 7, 1989, Ser. No. 405,539

Int. Cl.[5] B01D *27/00;* B67D *5/00*

U.S. Cl. 210—248 10 Claims



7. A water filter comprising:

means for purifying water;

means for feeding the purified water to a plurality of containers;

means for distributing the purified water to said plurality of containers, said distributing means comprising:

first pivotal means for feeding the purified water to one of said plurality of containers until said one container is filled;

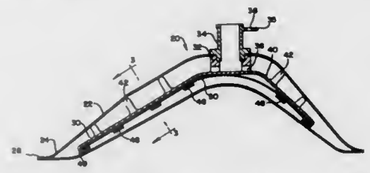
first means for ceasing the feeding of the purified water to said one container;

second pivotal means for feeding the purified water to another one of said plurality of containers until it is filled;

second means for ceasing the feeding of the purified water to said another one of said plurality of containers; and

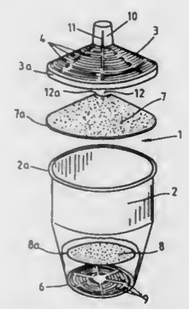
third means for sequentially feeding the purified water to the first and second means for feeding until said containers are filled, and pivotally positioned therebetween.

5,049,271
FUEL TANK FILTER
Thomas A. Cain, Woodstock, Ill., assignor to Filtertek, Inc., Hebron, Ill.
Filed Aug. 27, 1990, Ser. No. 572,761
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—250 14 Claims



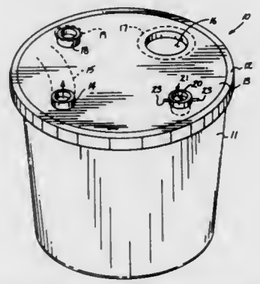
1. A fuel tank filter connectible to the inlet of a fuel pump mounted inside of a fuel tank comprising:
a) filtration material forming an envelope;
b) a separator inside the envelope; and
c) a spring attached to the separator in a manner such that the spring biases the separator to hold the envelope towards the bottom of the fuel tank.

5,049,272
FILTER CARTRIDGE WITH VENTED CAP
Heinrich Nieweg, Bielefeld, Fed. Rep. of Germany, assignor to Oxyphen AG, Zurich, Switzerland
Filed Oct. 27, 1989, Ser. No. 427,437
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1988, 8813571[U]
Int. Cl.[5] B01D *24/14*
U.S. Cl. 210—266 4 Claims



2. A filter cartridge for use in a device for filtering liquids, comprising a beakerlike container having a removable cap (3) with flowthrough openings, and flowthrough openings disposed in a bottom of the container, a granular filter composition (5) in the container, a first sieve (7) disposed between the cap (3) and the filter composition and a second sieve disposed between the bottom and the filter composition, wherein the cap (3) comprises a cone tapering toward the top and the first sieve (7) is embodied as a conical sieve corresponding generally to the shape of the cap (3), and its encompassing rim is welded to the cap (3), and the second sieve is embodied by an intrinsically flat disk and is welded with its encompassing rim to the bottom; wherein the conical cap (3), in its conical tip, has a formed-on hollow dome (10) having a sidewall rising from the cap (3) and having at least one venting slit (11) recessed in the dome sidewall (10*a*); wherein the dome (10) has a plurality of said venting slits (11), disposed uniformly over the circumference of said sidewall; wherein each venting slit is dimensioned in its total venting cross section in such a way that the water running through the filter cartridge has a dwell time dictated in accordance with an absorption or reaction time of the filter composition (5), so that the venting speed essentially determines the flow speed of the water through the filter composition (5); wherein each said venting slit (11) has a cross-sectional width which over its entire vertical length tapers toward the top in its cross-sectional width; and wherein the first sieve (7) has a hole (12) located adjacent to the dome (10) and the tip of the cone, and both the encompassing rim (12*a*) of the hole and the encompassing rim (7*a*) of the sieve are each joined by weld seams (13, 14) to the cap (3).

5,049,273
SUCTION STRAINING APPARATUS
Sheree N. Knox, 1729 Hailey Apt. E56, Sweetwater, Tex. 79556
Filed Oct. 5, 1990, Ser. No. 594,443
Int. Cl.[5] B01D *35/00;* A61M *1/00*
U.S. Cl. 210—406 3 Claims

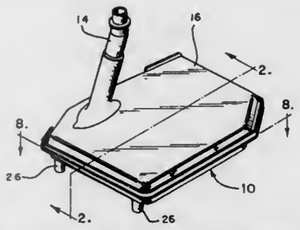


1. A suction straining apparatus comprising in combination,
a container, the container including a removable lid mounted thereon, the lid including a central web overlying the container, and
at least one vacuum port directed through the lid for securement of a vacuum hose thereto, and
a contents discharge port directed through the central web for discharge of fluids from the container, and
an internally threaded intake port directed through the intake web, with straining means mounted to the intake port underlying the central web for selective removal of particulates from fluid directed through the intake port, and
wherein the straining means includes a collar member, the collar member including an upper cylindrical connection collar mounted overlying the central web, and a coaxially aligned lower externally and internally threaded cylindrical collar, with the lower collar including external threads threadedly received within the intake port, and a strainer basket mounted to the lower collar.

5,049,274
FRICTION WELDING PROCESS AND FILTER FORMED THEREBY
Hayden Leason, Humacao, P.R.; Thomas A. Cain, Woodstock, Ill., and Andrew J. Boast, Fontana, Wis., assignors to Filtertek, Inc., Hebron, Ill.
Continuation-in-part of Ser. No. 142,071, Jan. 11, 1988, Pat. No. 4,828,694, and a continuation-in-part of Ser. No. 803,127, Nov. 29, 1985, Pat. No. 4,826,598. This application May 1, 1989, Ser. No. 345,783
Int. Cl.[5] B01D *27/00*
U.S. Cl. 210—445 22 Claims

3. A filter comprising:
a) two thermoplastic housing parts each comprising cup-shaped top and base members and each having extended flange portions connected at their periphery to enclose a volume, the volume having an inlet and an outlet, the flanges each including an opposing projecting rib and at least one of the flanges including an interfering rib spaced from the opposing projecting rib and projecting toward the other flange;
b) fibrous filtration media disposed within the volume between said inlet and said outlet; and
c) a frictional weld joint formed between the interfering rib and the opposing surface of the said other flange hermetically sealing the periphery of the filter, said opposing projecting ribs sealingly capturing the edges of the filtration media so as to prevent fluid passing from the inlet through the volume from bypassing the media before exiting through the outlet.





5,049,275
MODIFIED MICROPOROUS STRUCTURES
Gunilla E. Gillberg-LaForce, Summit, and Eric M. Gabriel, Lebanon, both of N.J., assignors to Hoechst Celanese Corp., Sommerville, N.J.
Filed Jun. 15, 1990, Ser. No. 539,096
Int. Cl.[5] B01D *67/00, 71/00*
U.S. Cl. 210—500.27 42 Claims

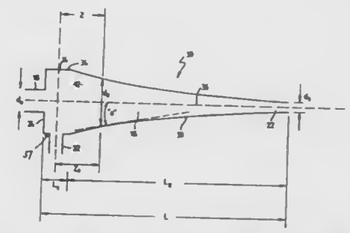
1. A process for producing a hydrophilic pore modified microporous membrane from a hydrophobic microporous membrane comprising the steps of:
(a) providing a hydrophobic microporous membrane;
(b) incorporating at least one polymerizable vinyl monomer, which when polymerized yields a hydrophilic polymer, and a polymerization initiator within the pores of said microporous membrane; and
(c) polymerizing said vinyl monomer to yield a polymerized monomer with sufficient molecular weight that said polymerized monomer is secured in said pores.

5,049,276
HOLLOW FIBER MEMBRANE
Jun Sasaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 11, 1989, Ser. No. 421,564
Claims priority, application Japan, Oct. 13, 1988, 63-257651; Oct. 13, 1988, 63-257652; Oct. 13, 1988, 63-257653
Int. Cl.[5] D01D *5/24;* D01F *1/08*
U.S. Cl. 210—500.23 2 Claims



1. A hollow fiber membrane having an outside surface, an inside surface, and an intermediate portion located between the outside surface and the inside surface,
wherein a minimum pore size exists in the intermediate portion, and
wherein the membrane has pores which continuously and gradually decrease in pore size from the outside surface to the minimum pore size in the intermediate portion and which continuously and gradually increase in pore size from the minimum pore size in the intermediate portion to the inside surface.

5,049,277
CYCLONE SEPARATOR
Charles M. Kalnins, The Woodlands, Tex., assignor to Conoco Specialty Products Inc., Houston, Tex.
PCT No. PCT/AU89/00109, § 371 Date Dec. 11, 1989, § 102(e) Date Dec. 11, 1989, PCT Pub. No. WO89/08503, PCT Pub. Date Sep. 21, 1989
PCT Filed Mar. 17, 1989, Ser. No. 457,741
Claims priority, application Australia, Mar. 17, 1988, PI298; Oct. 14, 1988, PJ0944
Int. Cl.[5] B01D *17/038*
U.S. Cl. 210—512.1 14 Claims



1. A cyclone separator for separating oil and water liquid components in a mixture thereof and having an elongate separating chamber in the form of a surface of revolution which over at least a substantial portion thereof exhibits a variation in taper, from a location towards one larger diameter end of the separating chamber to a location towards another smaller diameter end thereof, with the variation in taper thereof varying from a relatively greater angle at locations towards said one end of the separating chamber to a relatively lesser angle at locations towards said another end, the separating chamber being provided with inlet means in the form of at least one inlet disposed at or adjacent said one end of the separating chamber and arranged for inflow of the liquid to the separated into the separating chamber with a tangential component of motion, the separator having an axial overflow outlet at said one end thereof and an axial underflow outlet at said other end, said portion having a taper such that, when viewed in axial section, tangents thereto at substantially all locations along the length thereof make a taper angle in the range 1½° to 3° to the axis of the separating chamber, and wherein the following relationships also apply:
where $d_1$ is the diameter of the said separating chamber where flow enters, preferably in an inlet portion at said one end of said separating chamber, (but neglecting any feed channel) $d_{ix}$ is twice the radius at which flow enters the cyclone through the $x^{th}$ inlet (i.e., twice the minimum distance of the tangential component of the inlet center line from the axis) and

$$d_i = \frac{1}{A_i} \sum_{x=1}^{x=n} d_{ix} A_{ix}$$

where $A_{ix}$ is the projection of the cross sectional area of $x^{th}$ inlet measured at entry to the cyclone separator in a plane parallel to the axis of the cyclone separator which is normal to the plane, also parallel to the cyclone axis which contains the tangential component of the inlet center line, and where:

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$$A_i = \sum_{x=1}^{x=n} A_{ix}$$

and

$$3 \leqq \frac{\pi d_i^2}{8A_i} \leqq 30 \text{ or preferably } 20$$

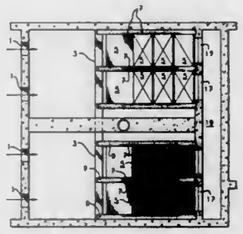
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**5,049,278**

## MODULAR PLATE SETTLER

**Sam Galper, Islington, Canada, assignor to Samdor Engineering, Islington, Canada**

**Filed Oct. 2, 1989, Ser. No. 416,060**
**Claims priority, application Canada, Aug. 30, 1989, 609813**
**Int. Cl.[5] B01D** *21/02*
**U.S. Cl. 210—521** **8 Claims**



1. In a liquid clarifier system for clarifying an influent flow liquid, comprising a tank for collecting solids, an effluent trough, and weir means for discharging an effluent flow of clarified liquid, the improvement comprising a plurality of modular plate settlers stacked end to end over said tank for receiving said influent flow of liquid, each said plate settlers including an enclosure of generally parallelogram shape as viewed in side elevation, and being connected by said effluent trough for channeling said effluent flow of liquid into said weir means, each said modular plate settlers including means for separating said solids from said liquid and depositing said solids in said tank, said means for separating comprising a plurality of inclined stacking pans in each of said modular plate settlers on which said solids settle due to gravitational force and slide downwardly into said tank, and supporting means for removably supporting said plate settlers at their respective centers of gravity in association with said tank, whereby successive ones of said modular plate settlers may be stacked end to end on said supporting means and may be readily withdrawn from engagement with said supporting means and from association with said tank.

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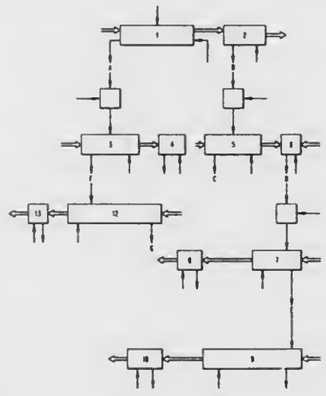
**5,049,279**

## SELECTIVE EXTRACTION OF AMINO ACIDS

**Marie-Christine Bitar, Levallois-Perret; Jean-Louis Sabot, Maisons-Laffitte, and Paul Aviron-Violet, Saint-Genis Laval, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

**Continuation of Ser. No. 66,107, Jun. 25, 1987, abandoned. This application May 5, 1989, Ser. No. 348,074**
**Claims priority, application France, Jun. 25, 1986, 86 09410**
**Int. Cl.[5] B01D** *11/04*
**U.S. Cl. 210—634** **13 Claims**

1. A process for the separation of desired amino acids from more complex admixture thereof, comprising selectively countercurrently extracting such desired amino acids from an essentially cystine free solution of a plurality of amino acids into an organic phosphorus acid extractant, or into such phosphorus acid extractant in solution in at least one alcohol, ether, ketone, hydrocarbon, or mixture thereof.



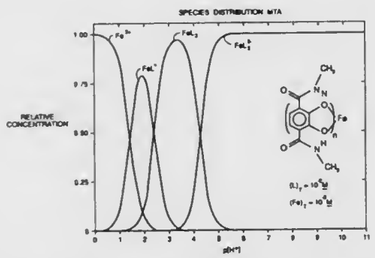
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**5,049,280**

## 2,3-DIHYDROXYTEREPHTHALAMIDES AS HIGHLY EFFECTIVE METAL ION SEQUESTERING COMPOUNDS

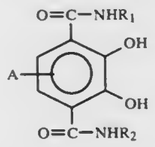
**Kenneth N. Raymond, Berkeley, Calif.; Thomas M. Garrett, Strasbourg, France, and Peter W. Miller, Poulsbo, Wash., assignors to The Regents of the University of California, Oakland, Calif.**

**Filed Mar. 29, 1989, Ser. No. 331,584**
**Int. Cl.[5] B01D** *15/00*
**U.S. Cl. 210—638** **26 Claims**




1. A process for the removal of metal ions from an aqueous solution, which process comprises:

(a) contacting the metal ion-contacting aqueous solution with a sufficient quantity of a 2,3-dihydroxy-diterephthalamide of the structure (I):



(I)

wherein:

A is selected from hydrogen or a linking-carrier group Y-Q, wherein Y is a linking group selected from alkylene, arylene, or arylalkylene covalently linked to the chelate and also to carrier Q, wherein carrier Q is selected from a higher molecular weight water soluble or water insoluble polymer having a molecular weight of between about 500 and 1,000,000 daltons,

$R_1$ is independently selected from alkyl having from 1 to 20 carbon atoms or aryl having from 6 to 14 carbon atoms,

$R_2$ is selected from $R_1$ or an organic linking group Z selected from alkylene, arylene, or aryl to a solid substrate, with the proviso that the structure will have only one linking group selected from Y or Z to a carrier Q to form a two ligand or three ligand bidentate chelate of the metal (M) ion; and

(b) separating the metal ion two ligand or three ligand bidentate chelate thus formed from the aqueous solution.

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**5,049,281**

## MULTI-BLOCK POLYMER COMPRISING A FIRST PREPOLYMER, MADE BY COMBINING EPOXY WITH DIAMINE, CHAIN EXTENDED WITH A COMPATIBLE SECOND PREPOLYMER, THE MEMBRANE MADE THEREFROM AND ITS USE IN SEPARATIONS

**Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.**

**Filed Dec. 6, 1990, Ser. No. 624,434**
**Int. Cl.[5] B01D** *61/36, 71/06*
**U.S. Cl. 210—640** **11 Claims**

1. A method for separating aromatic hydrocarbons from feed streams comprising mixtures of aromatic hydrocarbons and non-aromatic hydrocarbons, said method comprising contacting the feed stream with one side of a membrane made from a multi-block polymer material comprising a first prepolymer made by combining an (A) epoxy with a (B) diamine in an A/B or B/A mole ratio in the range 2.0 to 1.05, chain extended with a second, compatible prepolymer selected from the group of prepolymers comprising (a) an (A) diisocyanate combined with a monomer selected from (B) epoxy, polyester, dianhydride or its corresponding tetraacid or diacid-diester, and diamine in an A/B mole ratio ranging from about 2.0 to 1.05; (b) an (A) polyester combined with (B) epoxy in an A/B mole ratio ranging from about 2.0 to 1.05, and (d) an (A) diamine combined with a monomer selected from (B) diisocyanate and dianhydride or its corresponding tetraacid or diaciddiester in an A/B mole ratio ranging from about 2.0 to 1.05, and mixtures thereof, said separation being conducted under pervaporation or perstraction conditions, whereby the aromatic hydrocarbon component of the feed stream selectively permeates through the membrane.

6. A membrane made of a multi-block polymer comprising a first prepolymer made by combining (A) an epoxy with (B) a diamine in an A/B or B/A mole ratio ranging from about 2.0 to 1.05, chain extended with a second, compatible prepolymer selected from the group of prepolymers comprising (a) an (A) diisocyanate combined with a monomer selected from (B) epoxy, polyester, dianhydride or its corresponding tetraacid or diacid-diester, and diamine in an A/B or B/A mole ratio ranging from about 2.0 to 1.05; (b) an (A) polyester combined with (B) epoxy in an A/B or B/A mole ratio ranging from about 2.0 to 1.05; (c) an (A) dianhydride or its corresponding tetraacid or diaciddiester combined with a monomer selected from (B) epoxy, diisocyanate, polyester, and diamine in an A/B or B/A mole ratio ranging from about 2.0 to 1.05; and (d) and (A) diamine combined with a monomer selected from (B) diisocyanate and dianhydride or its corresponding tetraacid or diacid-diester in an A/B or B/A mole ratio ranging from a bout 2.0 to 1.05, and mixtures thereof.

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**5,049,282**

## SEMIPERMEABLE COMPOSITE MEMBRANES

**Charles Linder, Rehovot; Mara Nemas, Neve Monoson; Mordechai Perry, Petach Tikva, and Reuven Ketraro, Rishon Letzion, all of Israel, assignors to Aligena AG, Basle, Switzerland**

**Filed Apr. 11, 1990, Ser. No. 507,566**
**Claims priority, application United Kingdom, Oct. 30, 1989, 8924412**
**Int. Cl.[5] B01D** *61/08*
**U.S. Cl. 210—651** **23 Claims**

1. A semipermeable composite membrane composed of a porous substrate and at least two layers of film-forming polymers coated thereon, which comprises a first layer of monomeric or polymeric diazonium salts, which have been reacted with themselves and with an at least difunctional compound, and a second layer, which is chemically bonded to the first one, of a cross-linked, ionically charged hydrophilic polymer.

23. A process for separating solutes from an aqueous solution which comprises disposing the solution having an osmotic pressure on one side side of a composite membrane according to claim 1 and filtering it through the membrane by applying a hydraulic pressure, being greater than the osmotic pressure of said solution, against said solution and said membrane.

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**5,049,283**

## METHOD FOR THE RECOVERY OF AQUEOUS SOLUTIONS OF FREE, NEUTRAL α-AMINO ACIDS FROM AQUEOUS SOLUTIONS OF THEIR ALKALI-METAL SALTS

**Hans-Joachim Hasselbach, Hanau; Axel Kleeman, Mühlheim; Herbert Klenk, Hanau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Feb. 21, 1990, Ser. No. 483,048**
**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905275**
**Int. Cl.[5] B01D** *15/04*
**U.S. Cl. 210—662** **5 Claims**

1. In a process for recovering an aqueous solution of a free, neutral α-amino acid from an initial aqueous solution of its alkali-metal salt by means of a strongly acidic cation exchanger in the $H^+$ form; the improvement in which no elution agent is needed and wherein two equally dimensioned ion-exchange columns are used, the discharge of the first column is connected to the head of the second column, the initial solution of the alkali-metal salt is at first delivered to the head of the first column, then solution remaining after adsorption of alkali-metal cations in the first column is displaced to the second column by means of the addition of water to the head of the first column, a product-free forerun is first separated at the discharge of the second column and, when free α-amino acid begins to exit from the second column, a receiver is changed and the delivery of water to the head of the first column continues further until an average pH of the mixed solution between 5 and 7 has been achieved in the receiver, the previously first column is decoupled and regenerated, the previously second column, which is now used as the first column, is coupled to a freshly regenerated column as second column and the process et forth above is repeated.

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**5,049,284**

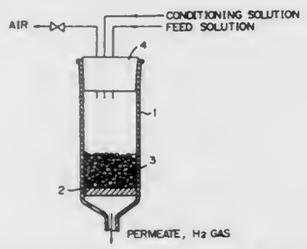
## METHOD OF REMOVING RADIOACTIVE EUROPIUM FROM SOLUTIONS OF RADIOACTIVE GADOLINIUM

**Ryozo Motoki, and Kusuo Terunuma, both of Ibaraki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan**

**Filed Oct. 2, 1989, Ser. No. 415,502**
**Claims priority, application Japan, Oct. 7, 1988, 63-253286**
**Int. Cl.[5] B01D** *15/00*
**U.S. Cl. 210—682** **2 Claims**

1. A method of removing radioactive europium from a solution of radioactive gadolinium, which method comprises:

(a) packing a mixture of a zinc and a graphite powder into a column;
(b) acidifying a feed solution containing radioactive gadolinium and radioactive europium with sulfuric acid, wherein said europium comprises $Eu^{3+}$,




(c) passing said acidified solution and an electrolytic $Eu^{3+}$ containing conditioning solution through the column, wherein the reducing action created in the column reduces $Eu^{3+}$ to $Eu^{2+}$; and,
(d) removing said radioactive europium from said solution of radioactive gadolinium by retaining $Eu^{2+}$ in said column.

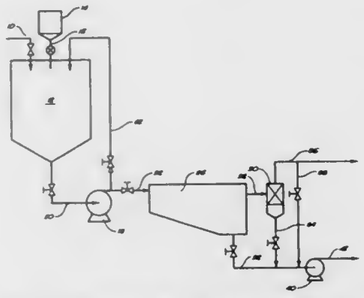
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**5,049,285**

## SOLIDIFICATION PROCESS WITH ENHANCEMENT OF HEAVY METALS INSOLUBILIZATION

**Robin B. Somerville, Galveston, Tex., and Liang-tseng Fan, Manhattan, Kans., assignors to Solidiwaste Technology, L.P., Manhattan, Kans.**

**Continuation-in-part of Ser. No. 177,613, Apr. 5, 1988, abandoned, which is a continuation of Ser. No. 883,360, Jul. 8, 1986, abandoned. This application Sep. 14, 1989, Ser. No. 407,102**
**Int. Cl.[5] C02F** *1/62*
**U.S. Cl. 210—710** **16 Claims**



1. A process for immobilizing a hazardous waste containing a heavy metal comprising the steps of:
adding a sulfide to said hazardous waste so as to generate a sulfide of said heavy metal;
mixing a chemical reagent with the hazardous waste containing the generated sulfide of said heavy metal, said chemical reagent containing a mixture of a retarder and an accelerator, said accelerator comprising calcium chloride, said retarder selected from the group consisting of: glycerine and polyethylene glycol; and
blending the mixture of said chemical reagent and said hazardous waste containing the generated sulfide of said heavy metal with a pozzolanic material.

**5,049,286**

## PROCESS FOR PURIFICATION OF NICKEL PLATING BATHS

**Robert A. Tremmel, Grosse Ile, Mich., assignor to OMI International Corporation, Warren, Mich.**

**Filed Dec. 22, 1989, Ser. No. 456,020**
**Int. Cl.[5] C02F** *1/72, 1/58*
**U.S. Cl. 210—759** **22 Claims**

1. An improved process for purifying a nickel plating bath solution including a pyridine composition as an additive, the solution containing an impurity comprising a breakdown product of the pyridine composition, comprising the steps of:
a. adjusting the pH of the nickel plating bath to a pH of equal to or greater than about 5.0;
b. adding an effective amount of an effective oxidizing agent selected from the group consisting of perborates, perchlorates, perbromates, periodates and mixtures thereof to the nickel plating bath; and
c. removing the breakdown product from the nickel plating bath.

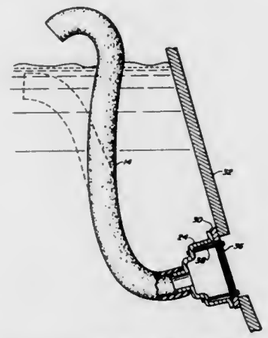
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**5,049,287**

## OIL SPILL RECOVERY METHOD AND APPARATUS

**Robert F. Pinder, III, 18 Woodland Ct., Novato, Calif. 94947**

**Filed Aug. 7, 1990, Ser. No. 563,449**
**Int. Cl.[5] E02B** *15/04*
**U.S. Cl. 210—776** **8 Claims**



1. A method of recovering oil from the surface of a body of water and into a tank vessel, said tank vessel having a below-waterline seachest member hydraulically connected to at least one internal tank, said method comprising the steps of:
providing a length of hose for carrying a flow of liquid;
providing an adaptor member on said hose, said adaptor member constructed and arranged for connection to said tank vessel seachest member; and
drawing said oil through said hose, said adaptor member, said seachest member, and into said tank vessel internal tank.

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**5,049,288**

## SET RETARDED CEMENT COMPOSITIONS AND METHODS FOR WELL CEMENTING

**Lance E. Brothers, Ninnekah; Donald W. Lindsey, Marlow, and Dralen T. Terry, Duncan, all of Okla., assignors to Halliburton Company, Duncan, Okla.**

**Continuation of Ser. No. 528,637, May 23, 1990, abandoned, which is a division of Ser. No. 372,976, Jun. 27, 1989, Pat. No. 4,941,536. This application Apr. 23, 1991, Ser. No. 690,039**
**Int. Cl.[5] C04B** *7/02;* **E21B** *33/13*
**U.S. Cl. 252—8.551** **8 Claims**

1. A retarded cement composition consisting essentially of hydraulic cement, water, a set retarder and a borate compound, wherein:
said set retarder is a copolymer consisting of acrylic acid and 2-acrylamido, 2-methylpropane sulfonic acid (AMPS) present in said copolymer in the range of from about 40 to about 60 mole percent, said copolymer having an average molecular weight below about 5,000 such that a 10 percent aqueous solution of said copolymer has a Brookfield viscosity reading at 20 rpm of the UL Adapter Spindle in the range of from about 2 to less than 5 centipoises, said copolymer being present in said cement composition in an amount in the range of from about 0.3 percent to about 5.0 percent by weight of said hydraulic cement; and further wherein
said borate compound is capable of providing a borate ion specie in said composition.



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**5,049,289**

## GRAPHITE-CONTAINING LUBRICANT COMPOSITION

**Norman L. Jacobs, 4/24 Blaxland Road Bellevue Hill, Sydney N.S.W. 2023, Australia**

**Filed Oct. 10, 1989, Ser. No. 418,024**
**Int. Cl.[5] C10M** *125/02*
**U.S. Cl. 252—22** **26 Claims**

1. A lubricant composition for use in threaded connections, said composition comprising:
10 to 70% by weight of pure crystalline graphite,
0.1 to 10% by weight (calculated on graphite) of an ionizable or polarizable additive selected from the group consisting of amines, amine salts, metal-amine complexes, amine-containing polymers, alkyl sulphates, phosphonates and sulphonates,
and the balance being a supporting vehicle.

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**5,049,290**

## AMINE COMPATIBILITY AIDS IN LUBRICATING OIL COMPOSITIONS

**Jacob Emert, Brooklyn, N.Y., and Malcolm Waddoups, Westfield, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.**

**Division of Ser. No. 48,722, May 11, 1987, Pat. No. 4,915,857. This application Apr. 10, 1990, Ser. No. 507,690**
**Int. Cl.[5] C10M** *137/10*
**U.S. Cl. 252—32.7 E** **41 Claims**

1. A composition comprising:
(a) an ashless ester containing dispersant compound selected from the group consisting of oil soluble oxazolines and esters, or mixtures thereof, of long chain hydrocarbon substituted mono- and dicarboxylic acids or their anhydrides; wherein said long chain hydrocarbon group is a polymer of a $C_2$ to $C_5$ monoolefin, said polymer having a number average molecular weight of about 700 to 5000;
(b) a high total base number detergent material;
(c) an oil soluble copper containing antioxidant material; and
(d) an amine compatibilizing material of the formula:



wherein $R^1$ and $R^2$ are independently H or hydrocarbyl groups, having from 4 to 20 carbon atoms, selected from substituted or unsubstituted alkyl, alkenyl, aralkyl, or cycloalkyl groups; and wherein $R^1$ and $R^2$ are not both H and together contain at least 8 atoms.

**5,049,291**

## LUBRICATING OIL COMPOSITION FOR TWO-CYCLE ENGINES

**Tomomi Miyaji, and Masahiko Kido, both of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan**

**Filed Aug. 31, 1989, Ser. No. 400,985**
**Claims priority, application Japan, Sep. 30, 1988, 63-244475**
**Int. Cl.[5] C10M** *141/02*
**U.S. Cl. 252—33** **20 Claims**

1. A lubricating oil composition for two-cycle engines comprising
(A) 40 to 90% by weight of one or more polymers selected from the group consisting of (a) copolymers of ethylene and an α-olefin and (b) polymers of an α-olefin 6 to 18 carbon atoms, said one or more polymers having a kinematic viscosity of 2 to 600 cSt as measured at 100° C.;
(B) 0 to 50% by weight of a polybutene having a kinematic viscosity of 2 to 600 cSt as measured at 100° C.;
(C) 5 to 50% by weight of a hydrocarbon solvent selected from the group consisting of a dimer of butene, a trimer of butene, a tetramer of butene, a pentamer of butene, a hexamer of butene and mixtures thereof and having a boiling point not higher than 300° C. and
(D) 2 to 20% by weight of a lubricating oil additive for two-cycle engines.

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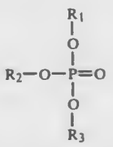
**5,049,292**

## LUBRICANT COMPOSITION FOR REFRIGERATOR SYSTEMS

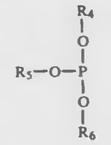
**Hans D. Grasshoff, and Vladislav Synek, both of Hamburg, Fed. Rep. of Germany, assignors to Texaco Technologie Europa GmbH, Fed. Rep. of Germany**

**Continuation of Ser. No. 873,561, Jun. 12, 1986, abandoned. This application Jun. 23, 1989, Ser. No. 371,688**
**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522165**
**Int. Cl.[5] C10M** *137/04*
**U.S. Cl. 252—49.6** **12 Claims**

1. A mineral oil lubricant containing mineral oils, synthetic lubricating fluid and/or mixtures of mineral oils and synthetic lubricating fluids, said synthetic lubricating fluids consisting of
(a) dialkylbenzenes or mixtures of mon- and dialkyl-benzenes which have straight-chain and branched-chain ($C_1$–$C_{20}$) alkyl groups and/or
(b) poly-α-olefins and
(c) additives which consist of
(i) an organic phosphate of the formula



wherein $R_1$, $R_2$ and $R_3$ are ($C_1$–$C_{15}$) alkyl, aryl and alkylaryl group, which may be the same or different, in an amount of about 0.01 to about 10 wt. %, based on the total weight of the lubricant,
(ii) an organic phosphite of the formula



wherein $R_4$, $R_5$ and $R_6$ are ($C_1$–$C_{15}$) alkyl, aryl and

alkylaryl groups, which may be the same or different, in an amount of about 0.001 to about 1.0 wt. %, based on the total amount of the lubricant, and optionally

(iii) an organic or organhalogen silicone in an amount of about 0 to about 100 mg, based on a total weight of 1 kg of the lubricant.

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**5,049,293**

## BORATED TRIAZOLE-SUBSTITUTED POLYALKENYL SUCCINIMIDES AS MULTIFUNCTIONAL LUBRICANT AND FUEL ADDITIVES

**David A. Blain, Mt. Laurel; Angeline B. Cardis, Florence, and Ronald J. Poole, Mullica Hill, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.**

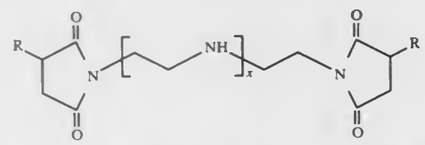
**Division of Ser. No. 449,188, Dec. 13, 1989, Pat. No. 4,981,492. This application Sep. 24, 1990, Ser. No. 587,284**

**Int. Cl.[5] C10M** *139/00*

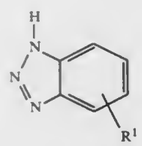
**U.S. Cl. 252—49.6** **21 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor proportion of a reaction product obtained by reacting a polyalkenyl-substituted succinimide, a triazole, and an aldehyde and thereafter boronating the resultant intermediate product and wherein the polyalkenyl-substituted succinimide, aldehyde, triazole and boronating agent are reacted in a mole ratio of succinimide to aldehyde to triazole to boronating agent respectively of between about 1:0.1:0.1:0.1 and about 1:4:4:4 and wherein the reaction is conducted at a temperature of about 100° C. to about 200° C. at ambient pressure.

2. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor proportion of a reaction product obtained by reacting a polyalkenyl-substituted succinimide having the following generalized structural formula:



where R is an alkyl or alkenyl group of 9 to 150 carbon atoms with a triazole having the following generalized structural formula:



where $R^1$ is hydrogen or an alkyl, aryl, arylalkyl, or alkylaryl group of 1 to 12 carbon atoms with an aldehyde and thereafter reacting with a suitable boronating agent.

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**5,049,294**

## MODIFIED DISPERSANT V.I. IMPROVER

**Arie Van Zon, and Gerarda J. Klaver, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Oct. 13, 1989, Ser. No. 421,425**

**Claims priority, application United Kingdom, Oct. 13, 1988, 8824037**

**Int. Cl.[5] C10M** *145/00*

**U.S. Cl. 252—51.5 A** **12 Claims**

1. A dispersant/VI improver, produced by the sequential steps of:

reacting an alpha-beta unsaturated carboxylic acid, anhydride, or ester with a star polymer having a poly(polyvinyl aromatic) nucleus and at least 4 polymeric arms linked to the nucleus, wherein the polymeric arms are selected from the group consisting of hydrogenated homopolymers and hydrogenated copolymers of conjugated dienes and monoalkenyl arenes, and mixtures thereof; and

further reacting the star polymer with a long chain alkane-substituted carboxylic acid and a $C_1$ to $C_8$ amine containing 1 to 8 nitrogen atoms or an alkane polyol having at least two hydroxy groups.

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**5,049,295**

## AROMATIC POLYESTER, AROMATIC POLYESTER AMIDE, FILAMENTS THEREOF AND COMPOSITIONS THEREOF EACH CONTAINING AN INORGANIC FILLER OR MAGNETIC POWDER

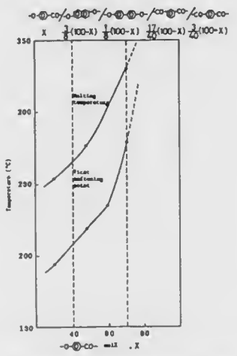
**Kazuya Takemura; Tadahiro Wakui, and Kenji Yoshino, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan**

**Filed Dec. 27, 1989, Ser. No. 457,559**

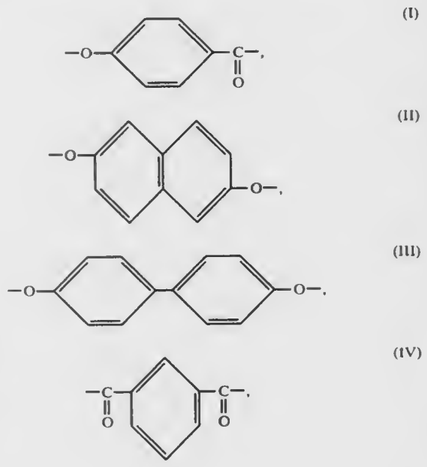
**Claims priority, application Japan, Dec. 29, 1988, 63-334273**

**Int. Cl.[5] C04B** *35/04*

**U.S. Cl. 252—62.54** **8 Claims**



1. An aromatic polyester comprising the units:

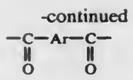


(I) (II) (III) (IV)

and



-continued



(V)

wherein Ar is selected from p-phenylene and 2,6-naphthalene groups, provided that hydrogen atoms on aromatic rings of untis (I) to (V) may be partly substituted by at least one member selected from $C_1$–$C_4$ alkyl groups, $C_1$–$C_4$ alkoxy groups, $C_6$–$C_{10}$ aryl groups, and halogen atoms; and wherein unit (I) comprises 40 to 70 mole percent, unit (II)+unit (III) comprise 15 to 30 mole percent, unit (IV)+unit (V) comprise 15 to 30 mole percent, unit (IV) comprises 5 to 25 mole percent, and 2,6-naphthalene groups in unit (V) comprise up to 5 mole percent of the total of units (I) to (V) when Ar in unit (V) is a 2,6-naphthalene group; and

wherein a molar ratio of [unit (II)+unit (III)] to [unit (IV)+unit (V)] is 1:0.9 to 1:1.1, a molar ratio of unit (III) to [unit (II)+unit (III)] is from 0.15 to 0.85, and a molar ratio of unit (V) to [unit (IV)+unit (V)] is from 0.10 to 0.90.

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**5,049,296**

## WORKING MEDIA FOR A THERMODYNAMIC ENGINEERING DEVICE OPERATING IN ACCORDANCE WITH THE GU THERMODYNAMIC CYCLE

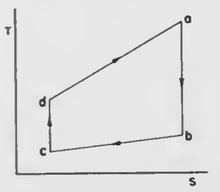
**Chujun Gu, A5 South Rd., of Liuliqiao District, Beijing, China**

**Filed Jan. 19, 1990, Ser. No. 467,775**

**Claims priority, application China, Jan. 28, 1989, 89100375.4; Dec. 9, 1989, 89109125.4**

**Int. Cl.[5] C09K** *5/04*

**U.S. Cl. 252—67** **5 Claims**




1. A refrigerant being a mixture composed of dichlorodifluoromethane/trichlorofluoromethane/trichlorotrifluoroethane/chlorotrifluoromethane having mol concentrations of 0.2/0.3/0.4/0.1, in which the isobaric phase transformation curves for the refrigerant are non-parallel with each other in the temperature entropy diagram.

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**5,049,297**

## SULFATE SCALE DISSOLUTION

**Richard L. Morris, Duncanville, and James M. Paul, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Continuation of Ser. No. 484,970, Feb. 26, 1990, abandoned, which is a continuation of Ser. No. 332,147, Apr. 3, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 610,737**

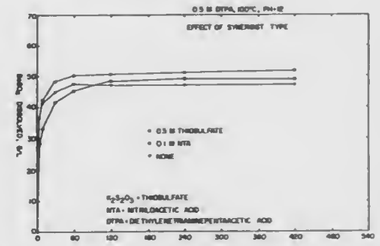
**Int. Cl.[5] C02F** *5/08;* **C23F** *11/00;* **F21B** *43/24;* **B03D** *3/06*

**U.S. Cl. 252—80** **22 Claims**

1. A composition for dissolving an alkaline earth metal sulfate scale comprising:

a) an aqueous solution having a pH of from about 8 to about 14;

b) a chelating agent comprising a polyaminopolycarboxylic acid or a salt of such an acid; and




c) a synergistic scale-dissolving quantity of thiosulfate anions present from 0.05M to 1.0M.

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**5,049,298**

## PROCESS FOR THE PREPARATION OF BLEACHING GRANULES

**Jan J. H. Ploumen, WC Roermond; Herman J. Edelijn, GA Zwolle, and Jan J. M. Reijnen, VH Utrecht, all of Netherlands, assignors to Akzo NV, Netherlands**

**Filed Nov. 15, 1989, Ser. No. 436,994**

**Claims priority, application European Pat. Off., Nov. 25, 1988, 88202691**

**Int. Cl.[5] C11D** *3/393, 7/54*

**U.S. Cl. 252—95** **11 Claims**

1. A process for the preparation of solid, free-flowing bleaching granules containing at least one water-insoluble peroxy acid compound and a hydratable inorganic material, said process comprised of mixing said at least one water-insoluble peroxy acid compound and said hydratable inorganic material at a total water content which is below the maximum hydration water content of the hydratable inorganic material and at a temperature below the hydration temperature of the hydratable inorganic material, until a powder is formed, raising the temperature of the resulting powder to at least the hydration temperature of the hydratable inorganic material and subsequently forming said powder into granules.

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**5,049,299**

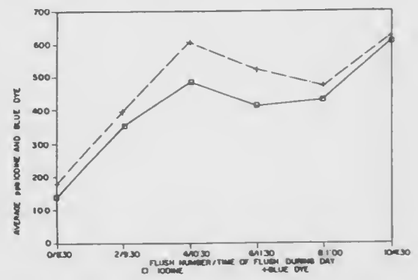
## LIQUID LAVATORY CLEANSING AND SANITIZING COMPOSITION

**Charles J. Bunczk, Norristown, and Peter A. Burke, Downingtown, both of Pa., assignors to Kiwi Brands Incorporated, Douglassville, Pa.**

**Filed Oct. 26, 1989, Ser. No. 426,793**

**Int. Cl.[5] C11D** *3/48*

**U.S. Cl. 252—106** **15 Claims**




1. A phosphate-free liquid lavatory cleansing and sanitizing

composition free of an oxidizing agent for use in a metering container consisting essentially of:

a nonionic or anionic detergent-iodine complex in an amount to provide at least 0.2% by weight of elemental iodine;

a nonionic or anionic surfactant in an amount about 2% by weight to a concentration of surfactant less than the critical micelle concentration in use;

about 0.5% to 10% of a water-soluble acid dye, water, up to about 2% by weight of a water soluble iodide, and optionally water soluble fillers.

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**5,049,300**

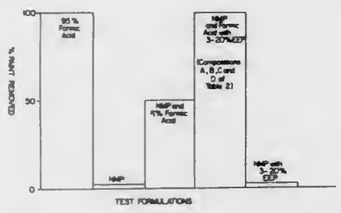
## METHOD OF ACTIVATING ACIDIFIED NMP TO PROVIDE AN EFFECTIVE PAINT REMOVER COMPOSITION

**Frank Fusiak, Bayonne, and Kolazi S. Narayanan, Palisades Park, both of N.J., assignors to Creativity Technologies Group, Inc., Greenville, S.C.**

**Filed Oct. 1, 1990, Ser. No. 590,754**

**Int. Cl.[5] C09D 9/00; C11D 7/50; B08B 7/00**

**U.S. Cl. 252—162** **21 Claims**




1. A method for effectively removing cured and uncured paint from wood or metal which comprises activating a composition consisting essentially of about 55–95% by weight NMP, about 1–25% by weight of an acid, and about 1–20% by weight of ethyl wherein said acid is an inorganic or organic acid having a pKa of lower than or equal to 4.0.

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**5,049,301**

## AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE; DICHLOROTRIFLUOROETHANE; AND METHYL FORMATE

**Peter B. Logsdon, North Tonawanda; Ellen L. Swan, Ransomville; Leonard M. Stachura, Hamburg, and Rajat S. Basu, Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Filed Dec. 20, 1989, Ser. No. 453,449**

**Int. Cl.[5] C11D 7/30, 7/50**

**U.S. Cl. 252—171** **16 Claims**

1. Azeotrope-like compositions consisting essentially of from about 55 to about 98.5 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 41 weight percent 1,1-dichloro-2,2,2-trifluoroethane, and from about 0.5 to 4.0 weight percent methyl formate which boil at about 31.4° C. +/− 0.5° C. at 760 mm Hg.

4. Azeotrope-like compositions consisting essentially of from about 55 to about 98.5 weight percent 1,1-dichloro-1-fluoroethane, from about 1 to about 41 weight percent 1,2-dichloro-1,1,2-trifluoroethane, and from about 0.5 to 4.0 weight percent methyl formate which boil at about 31.4° C. +/− 0.5° C. at 760 mm Hg.

**5,049,302**

## STABLE LIQUID DETERGENT COMPOSITIONS WITH ENCHANCED CLAY SOIL DETERGENCY AND ANTI-REDEPOSITION PROPERTIES

**Richard J. Holland, Grosse Ile; Ornie K. Bullard, Brownstown; Alicia V. York, Detroit, all of Mich.; Dieter Boeckh, Limburgerhof, Fed. Rep. of Germany; Wolfgang Trieselt, Ludwigshafen, Fed. Rep. of Germany; Paul Diessel, Mutterstadt, Fed. Rep. of Germany, and Hans-Ulrich Jaeger, Neustadt-Hambach, Fed. Rep. of Germany, assignors to BASF Corporation, Parsippany, N.J.**

**Filed Oct. 6, 1988, Ser. No. 254,467**

**Int. Cl.[5] C11D 1/83, 3/37**

**U.S. Cl. 252—174.17** **20 Claims**

1. A clear, homogeneous liquid laundry detergent composition, which exhibits good freeze/thaw and low temperature storage stability, comprising:

(a) an anionic surfactant;

(b) an anionic hydrotrope;

(c) an anti-redeposition amount of a nonionic cellulosic agent;

(d) a nonionic surfactant;

(e) a a graft copolymer resulting from the copolymerization of;

(i) a polyalkylene oxide based upon alkylene oxides having from 2 to 4 carbon atoms having a number average molecular weight of about 300 to 100,000; and (ii) at least one ethylenically unsaturated compound selected from the group consisting of a vinyl ester of a saturated monocarboxylic acid containing 1 to 6 carbon atoms, a methyl or ethyl ester of acrylic or methacrylic acid and mixtures thereof, whereby the ratio of (i);(ii) is from about 1:0.2 to 1:10; and

(f) the balance water,

wherein said detergent composition exhibits improved particulate soil detergency, particulate soil anti-redeposition, and oily soil anti-redeposition and soil release properties due to a synergism between the graft copolymer and the nonionic cellulosic anti-redeposition agent.

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**5,049,303**

## DETERGENT COMPOSITIONS CONTAINING A MIXTURE OF AN ETHYLENE OXIDE/PROPYLENE OXIDE BLOCK COPOLYMER AND A POLYCARBOXYLATE

**Isaac I. Secemski, Flushing, N.Y., and Jesse L. Lynn, Oradell, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.**

**Filed Nov. 9, 1988, Ser. No. 269,382**

**Int. Cl.[5] C11D 3/395**

**U.S. Cl. 252—548** **10 Claims**

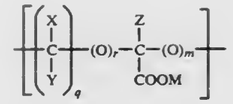
1. A detergent composition comprising:

(a) from 5% to about 50% by weight of an organic surfactant selected from the group consisting of anionic, cationic, nonionic, zwitterionic and ampholytic surfactants, and mixtures thereof;

(b) from 5% to about 80% by weight of a nonphosphorous detergent builder; and

(c) from about 1% to about 30% of a mixture of an ethylene oxide/propylene oxide block copolymer and a polycarboxylate, in which mixture the ethylene oxide/propylene oxide block copolymer: polycarboxylate weight ratio is from about 1:3 to about 3:1, said ethylene oxide/propylene oxide block copolymer having a weight average molecular weight of from about 1,000 to about 50,000 wherein said ethylene oxide/ propylene oxide block copolymer comprises at least about 80% ethylene oxide by weight, and said polycarboxylate comprises a homopolymer or copolymer formed of monomers having the general formula:






wherein X and Z are each hydrogen, hydroxy or methyl, Y is hydrogen or COOM; each M is selected from the group consisting of hydrogen, alkali metal, ammonium and substituted ammonium, m, r and q, at the same time, are 0, 0 and 1, respectively, or m, r and q, at the same time, are 1, 0 and 0, respectively; and the weight average molecular weight of said polycarboxylate is from about 4,000 to about 75,000.

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**5,049,304**

## SCALE CONTROL ADMIXTURES

**Brian Greaves, Runcorn, England, assignor to W. R. Grace & Co.-Conn., New York, N.Y.**

**Filed Dec. 20, 1989, Ser. No. 454,101**

**Claims priority, application United Kingdom, Dec. 20, 1988, 8829612**

**Int. Cl.[5] C02F 5/10**

**U.S. Cl. 252—180** **15 Claims**

1. A composition suitable for addition to an aqueous system which comprises a mixture of the following three components;

(i) a phosphonocarboxylic acid which contains at least 3 acid groups which are carboxylic and phosphonic acid groups, such that at least one acid group is a carboxylic acid group and at least one acid group is a phosphonic acid group, at least the said 3 acid groups being attached to carbon atoms, or a water-soluble salt thereof,

(ii) an amino phosphonic acid having the formula:

$$H_2\text{-}PO_3(CH_2)_n\text{-}N(R_1)(R_2)$$

in which $R_1$ and $R_2$ independently represent hydrogen, alkyl of 1 to 4 carbon atoms, $-(CH_2)_nPO_3H_2$, or $-(CH_2)_nCOOH$, and n is 1 or 2, or a water-soluble salt thereof, and

(iii) an aminophosphonic acid oxide of the formula:

$$H_2\text{-}PO_3(CH_2)_n\text{-}N(\rightarrow O)(R_1)(R_2)$$

in which $R_1$, $R_2$ and n are as defined above, or a water-soluble salt thereof.

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**5,049,305**

## PHENOXYACETATE PERACID PRECURSORS AND PERHYDROLYSIS SYSTEMS THEREWITH

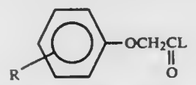
**Alfred G. Zielske, 2282 Via Espada, Pleasanton, Calif. 94566, and Ronald A. Fong, 513 Avanel Dr., Modesto, Calif. 95356**

**Division of Ser. No. 353,970, May 19, 1989, Pat. No. 4,956,117, which is a division of Ser. No. 45,197, Apr. 30, 1987, Pat. No. 4,859,800, which is a continuation-in-part of Ser. No. 927,856, Nov. 6, 1986, abandoned. This application Jun. 25, 1990, Ser. No. 543,344**

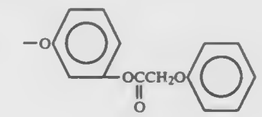
**Int. Cl.[5] C09K 3/00; C07C 69/76**

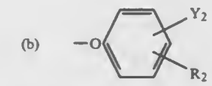
**U.S. Cl. 252—186.38** **12 Claims**

10. A peroxyacid precursor including at least one α-substituted carbonyl moiety with the structure



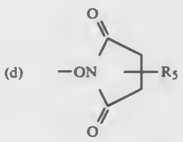

wherein R is hydrogen or an alkyl with not more than 5 carbons and L is a group whose conjugate acid has a pKa in aqueous solution of between about 5 to about 13, wherein L is selected from the group consisting of

(a) 

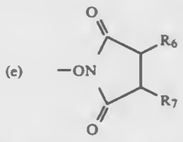
(b) 

wherein $R_2$ is hydrogen, a straight or branched alkyl with about 1–6 carbons or an alkoxy with about 1–10 carbons, and $Y_2$ is a sulfate, a carbonate, or a quaternary nitrogen;

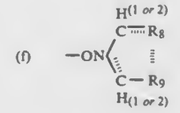
(c) $-ON{=}CR_3R_4$ wherein $R_3$ and $R_4$ are each straight or branched chain alkyl with 1 to 6 carbons, an aryl or a cycloaryl;

(d) 

wherein $R_5$ is hydrogen or an aromatic ring;

(e) 

wherein $R_6$ and $R_7$ are straight or branched hydrocarbons with about 1 to 6 carbons; and,

(f) 

wherein $R_8$ and $R_9$ are alkyl, aryl, or alkylaryl with about 1 to 20 carbons and may be part of the same aromatic or cycloalkyl ring.

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**5,049,306**

## OXYGEN GENERATING CANDLES

**John S. Greer, Ellwood City, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.**

**Filed Sep. 29, 1989, Ser. No. 414,323**

**Int. Cl.[5] C01B 11/14**

**U.S. Cl. 252—187.31** **6 Claims**

1. An oxygen candle comprising an alkali metal chlorate, iron, a fiber binder and containing between about 2 and 6% of a metal ferrate in which the iron has a valence greater than +3 and in which the metal is an alkaline earth metal having an atomic number between 12 and 56, or a transition metal selected from manganese, cobalt, nickel or zinc.

VOL 1130 ISS 3 SE 17 1991 UMI

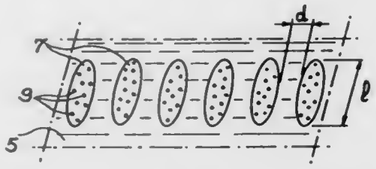


5,049,307

## PROCESS FOR THE PRODUCTION OF A FERROMAGNETIC COMPOSITION, FERROMAGNETIC LIQUID CRYSTAL OBTAINED BY THIS PROCESS AND APPARATUS USING SAID LIQUID CRYSTAL

James Tabony, Villebon sur Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 113,289, Oct. 26, 1987, Pat. No. 4,946,623.
This application May 24, 1990, Ser. No. 528,770
Claims priority, application France, Nov. 7, 1986, 86 15593
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.
Int. Cl.[5] C09K *19/52;* C01G *49/08;* B66D *1/14*
U.S. Cl. 252—299.01 20 Claims




1. A lyotropic ferromagnetic liquid crystal comprising a polar liquid, an oil, a surfactant, a co-surfactant, and ferromagnetic particles, said surfactant and co-surfactant serving as an interface between said polar liquid and said oil and forming with at least said polar liquid a plurality of elongated aggregates, said aggregates being separated from each other by said oil, said aggregates having a length which exceeds the distance between two consecutive aggregates, said ferromagnetic particles being contained within said aggregates whereby the size of said particles is smaller than the size of said aggregates, said oil being a saturated or unsaturated hydrocarbon and being present in an amount of 1 to 97% by weight, said polar liquid being present in an amount of 1 to 97% by weight, said surfactant being present in an amount of 1 to 90% by weight, said co-surfactant being present in an amount of 1 to 90% by weight, said co-surfactant being present with respect to said surfactant in a mass ratio of less than 2, said crystal being a ferromagnetic microemulsion having a stable and homogeneous composition with said ferromagnetic particles comprising an intrinsic part of said composition.

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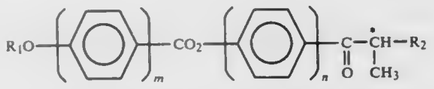
5,049,308

## FERROELECTRIC SMECTIC LIQUID CRYSTAL COMPOUND AND COMPOSITION CONTAINING THE SAME

Shigeru Mitsuhashi; Hitoshi Kondo; Tetsuharu Okazaki; Shinji Endoh; Hiroko Kudo; Akio Yamaguchi; Haruki Tsuruta, and Susumu Akutagawa, all of Tokyo, Japan, assignors to Takasago International Corporation, Tokyo, Japan

Division of Ser. No. 137,281, Dec. 23, 1987, Pat. No. 4,886,623.
This application Jun. 27, 1989, Ser. No. 372,582
Claims priority, application Japan, Dec. 23, 1986, 61-305341
Int. Cl.[5] C09K *19/20;* C07C *69/76*
U.S. Cl. 252—299.67 5 Claims

1. A liquid crystal compound represented by formula (I):




wherein $R_1$ represents a straight chain alkyl group having from 4 to 18 carbon atoms; $R_2$ represents a straight chain alkyl group having from 2 to 6 carbon atoms or a branched alkyl group having from 3 to 6 carbon atoms and having a methyl group as a side chain; m and n each represents 1; and wherein said liquid crystal compound exhibits a spontaneous polarization value of 220 $nC/cm^2$ or higher in its chiral smertic phase.

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5,049,309

## TITANIA SOL

Masashi Sakamoto; Haruo Okuda, both of Yokkaichi; Setuo Koike, Suzuka, and Yasuo Yamasaki, Yokkaichi, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Sep. 18, 1987, Ser. No. 98,463
Claims priority, application Japan, Sep. 22, 1986, 61-224409; Nov. 12, 1986, 61-268829; Feb. 17, 1987, 62-33889
Int. Cl.[5] B01J *13/00*
U.S. Cl. 252—313.1 6 Claims

1. A titania sol having a neutral pH range, comprising an aqueous dispersion containing more than 80% hydrous titanium oxide particles having a maximum particle size less than 0.1 μm and at lest one dispersion-stabilizer selected from water-soluble organic compounds and inorganic surface active agents.

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5,049,310

## ZINC STABILIZATION WITH MODIFIED ACRYLAMIDE BASED POLYMERS AND CORROSION INHIBITION DERIVED THEREFROM

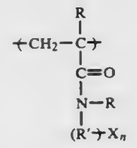
Donald A. Johnson; John E. Hoots; Dodd W. Fong, all of Naperville, and Guy A. Crucil, Bloomingdale, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 42,927, Apr. 27, 1987, abandoned. This application Oct. 10, 1989, Ser. No. 419,567
Int. Cl.[5] C23F *11/10*
U.S. Cl. 252—389.52 11 Claims

1. A method of inhibiting phosphate scale formation on and corrosion of iron containing solid surfaces in contact with industrial waters which comprises adding to the industrial waters on effective scale inhibiting and corrosion inhibiting amount of a combination of the ingredients:

(a) a water-soluble zinc salt:

(b) a water-soluble zinc stabilizing polymer having a molecular weight between about 1,000–100,000, and containing at least 5 mole percent of a monomer represented by:




wherein

R is chosen individually, at each occurrence, from the group consisting of hydrogen, methyl, and ethyl groups;

R' is a multicovalent hydrocarbonaceous bridging group containing from 1–12 carbon atoms and which may be linear alkyl, aryl, cyclic, and mixtures thereof;

X is chosen from the group consisting of $—SO_3M$, $—CO_2M$, and mixtures thereof; M is chosen from the group consisting of hydrogen, metallic cations, ammonium cations, protonated amines, quaternary amines, and mixtures thereof; and n ranges from 1–10; and

(c) orthophosphate, or an arthophosphate source; wherein the ratio of zinc: orthophosphate: polymer is within the range between about 1:1:100 to about 1:20:1.



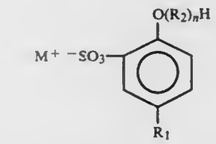
5,049,311

## ALKOXYLATED ALKYL SUBSTITUTED PHENOL SULFONATES COMPOUNDS AND COMPOSITIONS, THE PREPARATION THEREOF AND THEIR USE IN VARIOUS APPLICATIONS

Khalid Rasheed, Missouri City; Rodney Cravey, Manvel; Paul D. Berger, Missouri City, and Edwin O'Brien, Rosharon, all of Tex., assignors to Witco Corporation, New York, N.Y.

Continuation of Ser. No. 224,211, Jul. 22, 1988, abandoned, which is a division of Ser. No. 17,276, Feb. 20, 1987, abandoned.
This application Dec. 12, 1990, Ser. No. 626,382
Int. Cl.[5] C23F *11/10*
U.S. Cl. 252—389.52 6 Claims

1. A method of improving the effectiveness of corrosion inhibitors selected from the group consisting of primary, secondary and tertiary aliphatic or aromatic amines and derivatives thereof, which comprises adding to said inhibitor about 1% to about 10% weight of a compound having the general formula




wherein $R_1$ is nonyl or dodecyl, $R_2$ is ethylene oxide, $M^{30}$ is selected from the group consisting of Na, K, Li, Ca, Ba, Sr, Mg, Zn and amine salts thereof, and n is an integer from 1 to about

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5,049,312

## TEST-FLUID COMPOSITION AND METHOD FOR DETECTING LEAKS IN PIPELINES AND ASSOCIATED FACILITIES

Leslie R. Qualfe; James Szarka; Kelly J. Moynihan, and Michael E. Moir, all of Alberta, Canada, assignors to Exxon Production Research Company, Houston, Tex.

Filed Sep. 25, 1990, Ser. No. 587,708
Claims priority, application Canada, Sep. 26, 1989, 613257
Int. Cl.[5] C10L *5/00;* C10J *1/00;* C09K *5/00*
U.S. Cl. 252—408.1 15 Claims

1. A test-fluid composition for accurately locating leaks in pipelines and associated facilities comprising:

(a) dimethylsulphide

(b) a mutual solvent; and

(c) water

such that said dimethylsulphide is released from said test-fluid and is detected at a location immediate to said leaks.

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5,049,313

## THERMOSET POLYMER THICK FILM COMPOSITIONS AND THEIR USE AS ELECTRICAL CIRCUITRY

Richard L. Frentzel, Chino Hills, Calif., assignor to Advanced Products Inc., Cheshire, Conn.

Filed Sep. 5, 1989, Ser. No. 403,235
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—511 18 Claims

1. A thermally curable conductive polymer thick film composition comprising an uncured admixture of:

(a) a resin system comprising an admixture of:

(i) about 4.50 parts to about 12 parts by weight of at least one phenoxy resin; and

(ii) about 6 parts to about 15.5 parts by weight of at least one blocked polyisocyanate resin; and

(b) a particulated electrically conductive material selected from the group consisting of:

(i) about 50 parts to about 70 parts by weight silver flake; and

(ii) a mixture of about 15 parts to about 25 parts by weight graphite and about 3 parts to about 6 parts by weight carbon black.

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5,049,314

## PAINT STRIPPING COMPOSITION CONSISTING ESSENTIALLY OF NMP AND ETHYL-3-ETHOXY PROPIONATE

Sidney M. Short, Old Town, Me., assignor to Chute Chemical Company, Bangor, Me.

Continuation of Ser. No. 398,052, Aug. 24, 1989. This application Mar. 26, 1991, Ser. No. 675,286
Int. Cl.[5] C11D *3/28, 7/50, 3/44;* C23D *17/00*
U.S. Cl. 252—542 6 Claims

1. A non-toxic, biodegradable and ambient temperature non-volatile liquid paint stripping composition, wherein the active ingredient consists essentially of the combination of:

(a) at least 30–90% by weight of a five membered ring lactam;

(b) at least 10–70% by weight of an oxygenated aliphatic solvent selected from the group consisting of the methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl, hexyl, heptyl and octyl esters of 3-ethoxypropionic acid;

(c) about 0–10% by weight of a viscosifying agent selected from the group consisting of cellulose ether thickeners containing an etherifying group selected from hydroxyalkyl groups and groups derived therefrom, such etherifying groups containing 5 or 6 carbon atoms;

(d) about 0–5% by weight of a nonionic, anionic, cationic or amphoteric surface active agent; and

(e) about 0–1% by weight of a dye.

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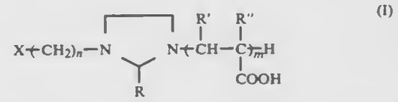
5,049,315

## POLYCARBOXYLIC ACID IMIDAZOLINES, PROCESS FOR THE PREPARATION THEREOF AND CLEANING AGENTS CONTAINING THEM

Hans Hitz; Rolf Schaefer, both of Arisdorf, Switzerland; Heinrich Baust, Plankstadt, and Wolfgang Gross, Mutterstadt, both of Fed. Rep. of Germany, assignors to Chemisches Institut Schaefer AG, Bubendorf and Joh. A. Benskiser GmbH, Ludwigshafen, both of, Fed. Rep. of Germany

Filed Jun. 8, 1990, Ser. No. 535,135
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919863
Int. Cl.[5] C11D *1/10, 1/58, 3/28;* C07D *233/02*
U.S. Cl. 252—546 9 Claims

1. A polycarboxylic acid imidazoline compound of the formula




in which

X is —Cl, —OH, $—OSO_3H$, $—OPO_3H_2$, $—O—CH_2—CH_2—COOH$, $—NH_2$, —NH(alk) or $—N(alk)_2$,

alk is an alkyl radical containing 1 to 6 carbon atoms,

n is a whole number from 2 to 4,

m is a whole number from 2 to 5,

R is a $C_{8-18}$ hydrocarbon chain which is straight-chain or branched, and saturated or 1 to 3 times unsaturated,

R' is H or a carboxyl group, and

R'' is H or $—CH_3$.

4. A cleaning or care agent comprising a compound as claimed in claim 1.

5. A cleaning or care agent as claimed in claim 4, further comprising an anionic, cationic, neutral or amphoteric tenside.

5,049,316

## WATER-SOLUBLE, FILM-FORMING INORGANIC COMPOUNDS, FIREPROOF AND FIRE-RESISTANT COMPOSITES AND FIRE-RESISTANT, FLEXIBLE, SHEET COMPOSITE COVERING MATERIALS FORMED BY THE USE OF THE COMPOUNDS, AND PROCESS FOR PREPARING FIRE-RESISTANT COVERINGS

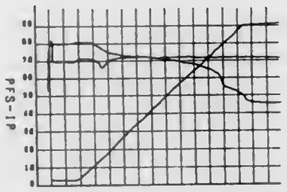
Naoto Kokuta, Himeji; Kenji Kokuta, Chigasaki; Katsuhiro Kokuta, Chigasaki, and Hiroshi Kokuta, Chigasaki, all of Japan, assignors to KOHMIX Co., Ltd., Kanagawa, Japan

Filed Jun. 12, 1989, Ser. No. 365,112

Claims priority, application Japan, Jun. 10, 1988, 63-144397; Jun. 10, 1988, 63-144398; Jun. 10, 1988, 63-144399

Int. Cl.[5] C09K *21/02;* C09D *5/16;* C01B *35/10, 33/08*

U.S. Cl. 252—602 9 Claims



1. A water-soluble film-forming inorganic compound having a specific gravity of 1.1 or more and capable of being formed into a film at ordinary temperature or by heating, said compound being formed by a reaction of a metal, hydrofluoric acid or boric acid and their salts or their submineral acid salts, and a hydroxide of an alkali metal, wherein said reaction is performed in water or a solution of said hydrofluoric acid or boric acid and their salts or their submineral acid salts, wherein said metal is silicon in a solid state and reacts with a concentrated solution of said alkali metal hydroxide, and then said hydrofluoric acid or boric acid and their salts or their submineral acid salts takes part in the reaction, wherein the reaction temperature is controlled within a temperature range of 50° C. to 100° C., and wherein said reaction solution has a solid content of 10% or more by weight and a specific gravity of 1.1 or more.

5,049,317

## METERING ARRANGEMENT FOR A GAS MIXTURE

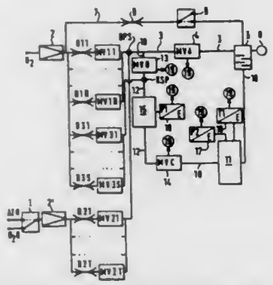
Siegfried Kiske, Gross Grönau, and Ulrich Palm, Norderstedt, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck

Filed Jul. 11, 1990, Ser. No. 550,905

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1989, 3924123

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—16 6 Claims



1. Arrangement for generating and metering a gas mixture to a consumer, the arrangement comprising:

gas supply means for supplying a carrier gas;

adjusting means for receiving the gas and adjusting the metering of said carrier gas;

vaporizing means for adding a fluid to said carrier gas;

a vaporizer line connecting said adjusting means to said vaporizing means;

a bypass line also connected to said adjusting means for conducting said carrier gas past said vaporizing means and said vaporizer line;

a switching element connected into said bypass line for opening and closing said bypass line;

calibrating means connected into said vaporizer line upstream of said vaporizing means; said calibrating means including: a calibrating vessel; first and second shutoff elements disposed upstream and downstream, respectively, of said calibrating vessel for separating said calibrating vessel from said vaporizer line; and, a level indicator connected to said calibrating vessel.

5,049,318

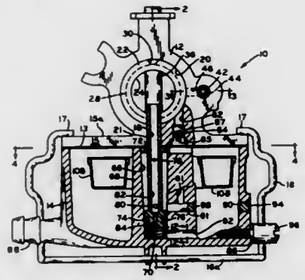
## CARBURETOR ASSEMBLY

Thomas G. Guntly, Hartford; Mark E. Federspiel, and Michael J. Kurth, both of West Bend, all of Wis., assignors to Tecumseh Products Company, Tecumseh, Mich.

Continuation of Ser. No. 267,019, Nov. 4, 1988, abandoned. This application Jun. 26, 1990, Ser. No. 545,136

Int. Cl.[5] F02M *5/12*

U.S. Cl. 261—34.1 34 Claims



1. A carburetor assembly comprising:

an extruded body, said body including a through passage having an air inlet;

a fuel bowl secured to said body;

means for conducting fuel from said bowl into said through passage; and

a generally cylindrical venturi member mounted in said through passage, said fuel conducting means adapted to conduct fuel into said venturi member;

wherein said venturi member is a generally cylindrical member, one end portion of said member being resilient and having a radially outwardly tapered circumference, whereby said one end portion, upon insertion of said venturi member into said through passage, is deflected inwardly and forms a circumferential seal with said through passage.

5,049,319

## DISTILLATION TRAY

James O. Nye, Friendswood, Tex., assignor to Nye Trays, Inc., Friendswood, Tex.

Continuation of Ser. No. 233,769, Aug. 19, 1988, abandoned. This application Feb. 25, 1991, Ser. No. 662,333

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—114.1 11 Claims

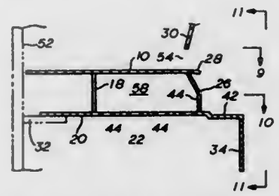
1. A downcomer assembly comprising:

(a) seal pan,

(b) a generally downwardly extending perforated plate sealed to said seal pan and



(c) a generally downwardly extending member sealed to said seal pan, and



(d) a base plate extending across and beyond said plate and said member, said base plate being perforated in the area between said plate and said member.

5,049,320

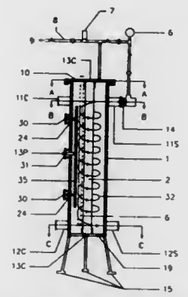
## GAS DISSOLVING SYSTEM AND METHOD

Lawrence K. Wang, Latham, N.Y.; Lubomyr Kurylko, New Providence, N.J., and Mu Hao S. Wang, Latham, N.Y., assignors to International Environmental Systems, Inc., Pittsfield, Mass.

Filed Jul. 3, 1990, Ser. No. 547,982

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—122 8 Claims



1. An apparatus for dissolving a plurality of gases into a pressurized liquid stream for simultaneous ozonation, chlorination, recarbonation, oxygenation, nitrogenation, aeration and flotation processes comprises:

an inlet pipe with an inlet valve for the influent liquid stream to enter said apparatus,

a pump forcing said influent liquid stream through a gas injector where the first gas is fed by suction under negative pressure,

a liquid inlet nozzle assembly measuring the pressure and flow rate of said influent liquid stream from said gas injector and creating high liquid velocity,

an enclosed cylindrical pressure vessel receiving the liquid from said inlet liquid nozzle assembly for pressurization, being equipped with a side liquid inlet pipe, a center liquid inlet pipe, a side liquid outlet pipe, a center liquid outlet pipe, a pressure gauge, a safety valve, a sight tube, a gas bleed-off valve, at least one wall-mounted gas dissolving plate assembly, a center gas dissolving tube, a plurality of gas inlets for feeding the second and the third gases, cover plates, support legs, gas regulators, and means to maintain the vessel at 2–7 atmospheric pressure, and over 2,500 rpm liquid rotation velocity in accordance with a swirling flow pattern surrounding said center gas dissolving tube for total gas dissolution, and

an outlet pipe with an outlet valve for discharge of the effluent from said cylindrical pressure vessel.

5,049,321

## METHOD FOR FORMING COATED PLASTIC OPTICAL ELEMENTS

George Galic, Columbia Heights, Minn., assignor to Signet Armorlite, Inc., Minneapolis, Minn.

Continuation of Ser. No. 173,290, Mar. 25, 1988, abandoned, which is a continuation of Ser. No. 818,729, Jan. 14, 1986, abandoned. This application Jan. 5, 1990, Ser. No. 461,571

Int. Cl.[5] B29D *11/00*

U.S. Cl. 264—1.4 26 Claims

1. A process for producing a coated ophthalmic lens, the process comprising:

applying a coating composition to the face of a mold, the coating composition including substantially only polymeric reactants having at least triacrylate functionality, a photoinitiator and a polymerization inhibitor reactive with oxygen and in an amount insufficient to affect substantial curing of the coating composition and in an amount insufficient to substantially affect abrasion resistance of the coating;

subjecting the coating to ultra-violet radiation in oxygen environment such that the reactants are substantially polymerized so that the coating is in a hard abrasion resistant state with sufficient acrylate functionality at a lens/coating interface for further reaction;

filling the lens mold with a lens-forming material;

permitting the lens-forming material to harden and react with the acrylate groups at the lens/coating interface; and

removing the hardened lens with coating from the mold.

5,049,322

## PROCESS FOR THE PREPARATON OF DISPERSIBLE COLLOIDAL SYSTEMS OF A SUBSTANCE IN THE FORM OF NANOCAPSULES

Jean-Philippe Devissaguet, Neuilly sur Seine; Hatem Fessi, Paris, and Francis Puisieux, Maisons Alfort, all of France, assignors to Centre National de la Recherche Scientifique (C.N.R.S.), Paris, France

Filed Dec. 31, 1987, Ser. No. 140,246

Claims priority, application France, Dec. 31, 1986, 86 18444

Int. Cl.[5] B01J *13/12;* A61K *9/51*

U.S. Cl. 264—4.1 13 Claims

1. A process for the preparation of dispersible colloidal systems in the form of spherical particles of the vesicular type and of a size less than 500 nm (nanocapsules), the wall of which is constituted by a substance A having film-forming properties and the core by a liquid substance B capable of being encapsulated by the substance A, comprising:

combining (1) a first liquid phase consisting essentially of a solution of the substances A and B in a solvent for the substances A and B or in a mixture of solvents for the substances A and B, and (2) a greater amount of a second liquid phase consisting essentially of a non-solvent or a mixture of non-solvents for the substances A and B and including one or more surfactants, the solvent or the mixture of solvents of the first phase being miscible in all proportions with the non-solvent or mixture of non-solvents of the second phase,

comprising a core of said liquid substance B surrounded by a layer of said substance A.

5,049,323

## METHOD FOR THERMOSTAMPING THERMOPLASTIC COMPOSITES

Harold F. Giles, Jr., Shelby, N.C., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 26, 1990, Ser. No. 499,121

Int. Cl.[5] B29C *35/12*

U.S. Cl. 264—25 11 Claims

1. A method for thermostamping non-woven fiber reinforced thermoplastic composites containing thermoplastic

resin, compressed reinforcing fibers, and a radio frequency sensitizing agent, said method comprising the steps of:

(a) convection heating of the composite to the glass transition of the thermoplastic resin;

(b) radio frequency energy heating of the composite from the glass transition temperature of the resin to a stamping temperature between the melt temperature of the thermoplastic resin and 100° C. above the melt temperature of the thermoplastic resin; and

(c) stamping said heated composite into a shaped article.

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**5,049,324**

## METHOD OF MAKING A FURNACE LINING WITH A FIBER FILLED RETICULATED CERAMIC

**Jeffrey R. Morris, Scio, and William E. Meinking, Alfred Station, both of N.Y., assignors to Hi-Tech Ceramics, Inc., Alfred Station, N.Y.**

**Continuation-in-part of Ser. No. 137,192, Dec. 23, 1987, abandoned. This application Jul. 28, 1989, Ser. No. 387,076**

**Int. Cl.[5] B32B *35/00*; C04B *35/71, 41/81*; F27D *1/16***

**U.S. Cl. 264—30** **14 Claims**

1. A method of lining at least a portion of a furnace comprising forming a dimensionally stable, self-supporting reticulated ceramic structure having a plurality of interconnected webs defining a plurality of interconnected pores, loading each of said pores with fibers to provide a high loading of between 0.05 and 2.25 grams per cubic centimeter of said fibers in said pores thereby forming a fiber filled reticulated ceramic structure, and arranging said fiber filled dimensionally stable reticulated ceramic structure as a lining for said portion of said furnace thereby providing the desired thermal conductivity.

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**5,049,325**

## METHOD FOR PRESS-MOLDING THERMOPLASTIC RESIN

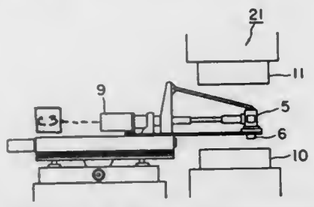
**Kazuo Aoki, Chiba; Tsutomu Moteki, Sodegaura, and Kazuhiro Kimura, Ichihara, all of Japan, assignors to Chisso Corporation, Japan**

**Division of Ser. No. 192,348, May 10, 1988, Pat. No. 4,925,381. This application Jan. 25, 1990, Ser. No. 470,162**

**Claims priority, application Japan, May 11, 1987, 62-113825**

**Int. Cl.[5] B29C *47/92***

**U.S. Cl. 264—40.4** **8 Claims**




1. A method of press-molding a plasticized resin extruded from a resin extruding machine and charged into a mold cavity of a mold of a press-molding machine comprising the steps of:

storing an amount of plasticized resin extruded from the extruding machine which exceeds that required for one molding operation;

supplying a stored resin under a constant supply pressure;

measuring an amount of the stored resin required for one molding operation by controlling the rotational speed of a rotary volumetric flow meter means to thereby regulate the resin flow rate;

charging the thus measured amount of plasticized resin into the mold cavity; and

clamping the mold to effect a press-molding operation.

**5,049,326**

## FILTER ELEMENT AND MANUFACTURE METHOD THEREOF

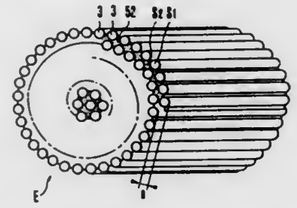
**Noriya Matsumoto, Okazaki; Hajime Akado, Anjo; Yoshihiko Oya, Kariya; Yoshihiro Taki, Nagoya, Japan, and Shuji Yamaguchi, Toyokawa, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Division of Ser. No. 376,290, Jul. 6, 1989, Pat. No. 5,002,666. This application Oct. 31, 1990, Ser. No. 606,942**

**Claims priority, application Japan, Jul. 8, 1988, 63-171315**

**Int. Cl.[5] B01D *67/00***

**U.S. Cl. 264—41** **11 Claims**




1. A manufacture method for a filter element comprising:

a first step of bending a filtering material to form a plurality of superposed portions each obtained by folding a partial region oif said filtering material with a predetermined width, and a plurality of connecting portions to interconnect adjacent ones of said superposed portions;

a second step of connecting the facing ends of said adjacent connecting portions by bonding;

a third step of spreading out said superposed portions into a tubular shape for forming tubes;

a fourth step of rolling said filtering material into a spiral shape with said tube arranged side by side parallel to one another in the axial direction; and

a fifth step of sealing the openings left between said tubes at one end face side thereof, while closing the openings of said tubes at the other end face side.

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**5,049,327**

## INJECTION MOLDING METHOD

**Hitoshi Hara, Funabashi, and Yorikazu Takeichi, Chiba, both of Japan, assignors to Sumitomo Heavy Iodustries, Ltd., Tokyo, Japan**

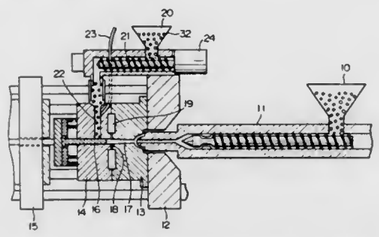
**PCT No. PCT/JP88/00719, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO89/00489, PCT Pub. Date Jan. 26, 1989**

**PCT Filed Jul. 20, 1988, Ser. No. 360,933**

**Claims priority, application Japan, Jul. 21, 1987, 62-179988; Oct. 5, 1987, 62-249867; Oct. 5, 1987, 62-249868**

**Int. Cl.[5] B29C *67/22***

**U.S. Cl. 264—45.5** **4 Claims**




1. An injection molding method comprising the steps of:

(a) mixing a foaming agent, which begins foaming after being kept at a required temperature for a required time, into molten resin;

(b) filling a mold with a sufficient amount of said molten resin mixed with said foaming agent to produce a molded product conforming to said mold;

(c) cooling a first portion of said mixture, which forms an inner part of said molded product, at a low rate sufficient to cause foaming of said first mixture portion; and

(d) cooling a second portion of said mixture, which is in contact with an inner surface of said mold, at a high rate sufficient to substantially prohibit foaming of said second mixture portion, thereby substantially eliminating undesired surface depressions and forming a substantially neat surface of the molded product, wherein said foaming agent has a structure in which a substance causing said foaming is coated with a coating agent and said foaming agent is mixed into said molten resin immediately before said molten resin is filled into said mold.



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**5,049,328**

## PURIFICATION, IMPREGNATION AND FOAMING OF POLYMER PARTICLES WITH CARBON DIOXIDE

**Bernard H. Meyer, Newtown Square, and Joseph C. Kinslow, Media, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.**

**Filed Jul. 2, 1990, Ser. No. 546,955**

**Int. Cl.[5] B29C *67/22*; C08J *9/18, 9/22***

**U.S. Cl. 264—50** **15 Claims**

1. A process for foaming polymers and copolymers, comprising the steps of

(a) placing the desired polymer or copolymer particles in a pressure vessel extractor-impregnator;

(b) continuously extracting the polymer particles with a fluid at liquid or supercritical conditions to remove low molecular weight compounds while impregnating the polymer particles with the extracting fluid;

(c) separating the purified, impregnated polymer particles from the extractor-impregnator;

(d) pre-expanding the purified, impregnated particles at a temperature above the glass transition temperature of the polymer-fluid blend; and

(e) molding the expanded particles by heating in a foam molding machine.

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**5,049,329**

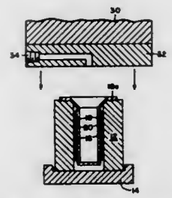
## PROCESS FOR FORMING CERAMIC MATRIX COMPOSITES

**Roger A. Allaire, and Frank Coppola, both of Big Flats, N.Y., assignors to Corning Incorporated, Corning, N.Y.**

**Filed Oct. 30, 1989, Ser. No. 428,983**

**Int. Cl.[5] C04B *35/80***

**U.S. Cl. 264—60** **11 Claims**




1. A method for debulking and consolidating a porous preform for a fiber-reinforced ceramic matrix composite article to minimize fiber buckling and ply wrinkling in the composite article, the porous preform comprising a combination of long reinforcing fibers with a finely-divided ceramic matrix material, which comprises the steps of:

heating the preform to a consolidation temperature in the range of about 500°-150° C., and

applying consolidation pressure to the porous preform through a softened glass pressurizing medium while supporting the preform against a rigid shaping surface for the preform, said consolidation pressure being applied in a direction normal to the prevailing directions of the long reinforcing fibers in the preform and while said softened glass pressurizing medium has a viscosity of at least about $10^4$ poises.

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**5,049,330**

## PROCESS AND APPARATUS FOR THE PRODUCTION OF PLASTIC OBJECTS

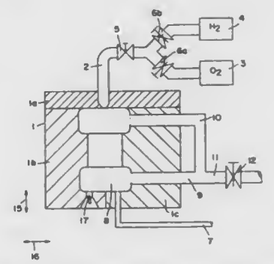
**Dieter Rebhan, Geretsried-Gelting, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany**

**Filed Jun. 26, 1990, Ser. No. 543,869**

**Claims priority, application Fed. Rep. of Germany, Jun. 27, 1989, 3921046**

**Int. Cl.[5] B29C *67/00***

**U.S. Cl. 264—84** **22 Claims**




1. A process for the production of plastic objects from shredded plastic, comprising:

introducing shredded plastic into a mold cavity corresponding to the shape of the object to to be produced and then closing the mold;

introducing an explosive, combustible gas/oxygen gaseous mixture into the closed, loaded mold, and igniting the gaseous mixture, thereby generating sufficient heat and pressure from the combustion gases to bake and fuse together plastic grains in at least a portion of the shredded plastic and form a stable plastic object in the shape of the mold cavity; and controlling the temperature and pressure in the mold cavity by releasing combustion gases from the mold cavity during the explosion.

11. An apparatus for the explosive forming of plastic articles from shredded plastic, comprising:

a mold having a source of combustible gas mixture in communication with the mold cavity;

means permeable to gas but not solide in communication with the mold cavity;

pressure release means in communication with the mold cavity for venting excess combustion gases from the mold cavity and for controlling the temperature and pressure of the mold cavity during an explosion in the mold; and

ignition means for igniting the explosion of the combustible gas mixture.

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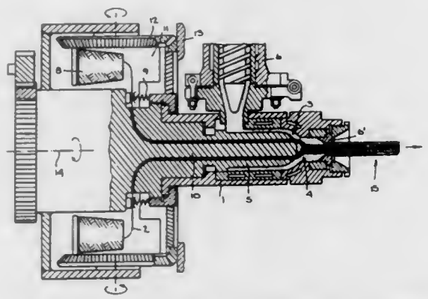


5,049,331

## METHOD OF MANUFACTURING A THREAD-REINFORCED, EXTRUDED RUBBER BODY

Jürgen Hempel, Weinheim, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 443,214
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1989, 3904588
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Int. Cl.[5] B29C *47/24*
U.S. Cl. 264—103 4 Claims



1. A method of producing a thread-reinforced, extruded rubber body by means of a shear head wherein the threads are continuously supplied, embedded in a rubber mixture which is in a continuous forward motion, and fixed in the rubber body by vulcanizing the rubber mixture, comprising: continuously embedding threads coming from orifices of a rotating shear mandrel which extend through a front surface and are distributed in circumferential direction of the shear mandrel which is in a shear head and in a continuous motion in a part of the rubber mixture contained in the shear head; and adjusting the speed of the forward motion of the rubber mixture to the rotating speed of the shear mandrel such that the rubber mixture at least approaches its lowest-possible viscosity during the embedding of the threads.

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5,049,332

## METHOD OF MAKING CONDUCTIVE METAL-FILLED SUBSTRATES WITHOUT DEVELOPING AGENTS

Karolyn E. Ziemer, Crystal Lake, and William J. E. Parr, Naperville, both of Ill., assignors to Akzo NV, Arnhem, Netherlands

Continuation-in-part of Ser. No. 204,069, Jun. 8, 1988, abandoned. This application Jul. 3, 1990, Ser. No. 547,668
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—104 6 Claims

1. A method of forming a conductive copper or nickel metal-filled substrate in which the copper or nickel is the sole source of conductivity, comprising:

a. an intermingling step of powder blending substantially non-conductive oxide coated copper or nickel metal particles having a number average particle size less than 50 microns in a finely-divided powdered substrate material having a softening point of at least about 200° C. and selected from the group consisting of polyetheretherketones (PEEK), polyetherketones (PEK), polyarylates, polysulfones, polyarylsulfone, liquid crystalline polymers, and thermoplastic polyimide resins; and

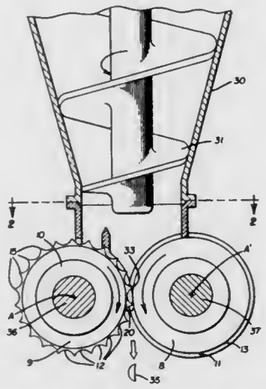
b. a molding step of subjecting the blended metal particles and the substrate first to a pressure sufficient to render the metal particles conductive and then raising the blend to a temperature at said pressure above the flow temperature of the substrate.

5,049,333

## BRIQUET FORMING APPARATUS AND METHOD

James G. Wolfe, Pleasanton, and Michael T. Humphrey, Tracy, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 17, 1990, Ser. No. 583,633
Int. Cl.[5] B29C *43/08*
U.S. Cl. 264—109 8 Claims



1. A roll press apparatus for compressing particulate matter into briquettes comprising

a series of individually paired rolls mounted for rotation in opposite directions about their respective axes, wherein

a first series and a second series of rolls paired in a tangentially operative and cooperative relationship to form a pinch area therebetween,

said first series of rolls, each individually having a plurality of circumferentially uniformly spaced U-shaped sideless depressions located in the face of each individual roll with circumferential channels spaced between each of said individual rolls,

a second series of rolls, each individual roll having a flat smooth circumferential surface and cheek plates radially disposed around the roll and spaced apart a distance equal to that between two channels of said first series of rolls and,

guide bar rods extending into said pinch area and interacting with alternating channels in said first series of rolls,

drive means for rotating said rolls,

feed means for charging particulate matter to be compressed into the pinch area of the cooperating rolls,

such that on rotation of said paired rolls there is sequential formation of at least one pocket consisting of the U-shaped depression in the first roll forming a first side, the cheek plate of said second roll interacting with a bar rod extending into said pinch area and interacting with an alternating channel in said first roll forms a third side, and the flat surface of the second roll forms the closing fourth side.

4. The method of continuously preparing compressed particulate matter into D-shaped briquettes comprising

charging the particulate matter to be briquetted into a roll press apparatus having a paired first roll and second roll;

rotating said paired rolls in opposite directions while charging particulate matter to be compressed into individual depressions in the first roll while the depression is approaching a pinch area between said paired rolls;

subjecting the particulate matter to compression within said roll press apparatus wherein the compression is performed by the tangential operative interaction of individually paired rolls forming a pinch area therebetween and having on said first roll circumferentially arranged U-shaped depressions separated by channels between rolls and on said second paired roll flat smooth surface separated by cheek plates spaced two widths apart and said cheek plates interacting with corresponding channels of said first roll, and cooperating therewith guide bar rods extending into said pinch area and interacting with the channels of said first roll.



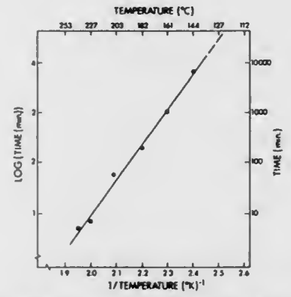
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5,049,334

## POST-PRESS HEAT TREATMENT PROCESS FOR IMPROVING THE DIMENSIONAL STABILITY OF A WAFERBOARD PANEL

Lars Bach, Edmonton, Canada, assignor to Alberta Research Council, Edmonton, Canada

Filed Sep. 25, 1990, Ser. No. 587,381
Claims priority, application Canada, Sep. 25, 1989, 613071
Int. Cl.[5] B29C *43/52*
U.S. Cl. 264—122 4 Claims




1. In a process for manufacturing a waferboard panel which comprises subjecting a mat formed wood of flakes and a heat-curable resin in admixture to a single stage pressing step at a temperature of about 250° C. for 4 minutes to thereby cure said resin and form the panel, the improvement comprising:

maintaining the panel for a further predetermined time of from about 4 days to about 10 minutes at a preselected, substantially constant temperature of from about 140° C. to about 230° C. so as to permit the stabilizing reaction to proceed towards completion, whereby the thickness swelling of the panel is reduced to a predetermined value, said time and temperature being selected in accordance with the following equation:

$$\log_t = \frac{6900}{T} - 12.8$$

where t=time in minutes for thickness swelling reduction to half of its initial value; and

T=absolute temperature in °Kelvin.

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5,049,335

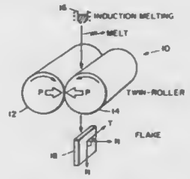
## METHOD FOR MAKING POLYCRYSTALLINE FLAKES OF MAGNETIC MATERIALS HAVING STRONG GRAIN ORIENTATION

Toshiro Kuji, Agro, Japan; Robert C. O'Handley, Andover, and Nicholas J. Grant, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 25, 1989, Ser. No. 301,868
Int. Cl.[5] B02C *4/02*; B22D *11/00*; B28B *3/12*
U.S. Cl. 264—140 17 Claims

1. Method for making from the molten state polycrystalline flakes of a magnetic material, the flakes having strong grain orientation due to a high degree of alignment of grains within the magnetic material comprising:

solidifying the molten magnetic material by cooling from two opposing surfaces of the magnetic material to provide partial alignment of the grains within the magnetic material, while deforming the magnetic material by applying compressive pressure to the two opposing surfaces of the




magnetic material to provide the high degree of alignment of the grains within the magnetic material and thus form the flakes having strong grain orientation.

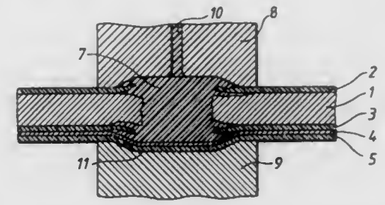
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5,049,336

## METHOD OF CONNECTING A GRIPPING DEVICE TO A SHEET OR WEB-FORMED PACKAGING LAMINATE

Anders Sjöström, Lund, Sweden, assignor to AB Profor, Lund, Sweden

Filed Dec. 14, 1989, Ser. No. 450,441
Claims priority, application Sweden, Dec. 16, 1988, 8804549
Int. Cl.[5] B29C *45/14*
U.S. Cl. 264—154 9 Claims




1. A method of attaching a gripping device to a packaging laminate comprising the steps of:

forming the packaging laminate with a recess, wherein said packaging laminate includes a central carrier layer, a first plastic layer on one side of the central carrier layer, a second plastic layer on an opposite side of the central carrier layer, a gas-tight barrier layer on the second plastic layer and a third plastic layer on the barrier layer, said recess extending through only said first plastic layer and said central carrier layer;

placing one part of an injection molding tool against the first plastic layer in surrounding relation to the recess, and placing another part of the injection molding tool which has a depression formed therein against the third plastic layer at a position opposite the one part of the tool;

delaminating the second plastic layer from the central carrier layer around said recess;

injecting molten plastic material under pressure through a channel in the one part of the tool and into the recess to cause the molten plastic to penetrate the delaminated region and to cause the molten plastic to be partly united with the first and second plastic layers while also causing the second plastic layer, the barrier layer and the third plastic layer to be urged into the depression, thereby forming an anchorage device; and

attaching a gripping device to the anchorage device.

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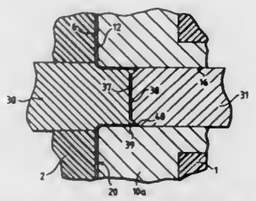


5,049,337

## MOLDING METHOD FOR MAGNETIC TAPE CASSETTE

Shingo Katagiri, and Masayoshi Moriwaki, both of Odarawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 29, 1989, Ser. No. 414,348
Claims priority, application Japan, Oct. 13, 1988, 63-255968
Int. Cl.[5] B28B *1/48, 7/16;* B29B *11/08*
U.S. Cl. 264—156 5 Claims



1. A method for image-transfer molding a half portion of a casing body of a magnetic tape cassette, comprising the steps of:

providing a band of an image transfer film comprising, in the order stated, a base layer, a peeling layer, and an image transfer layer including a protective layer, an ink layer, and an adhesive layer;

pinching said band of image transfer film between dies for molding said half portion by closing said dies, wherein said adhesive layer is positioned to abut an outer surface of the molded half portion;

placing a pair of pins in said dies in a position where a hole is to be formed in said half portion, an end of one of said pins having a peripheral edge portion projecting in a direction parallel to a longitudinal axis of said pin and forming a recess in said end of said pin, said recess receiving therein an end of the other of said pins with a portion of said image transfer film sandwiched therebetween, said ends of said pins cooperating to sever said image transfer film along said peripheral edge except for said base layer as said two dies are closed and define said hole;

injecting molten plastic into said dies, said adhesive layer contacting and adhering to said plastic;

allowing said molten plastic to harden;

opening said dies; and

peeling away said base layer causing the removal of any said severed image transfer film, including said image transfer layer, from said hole formed by said pins.

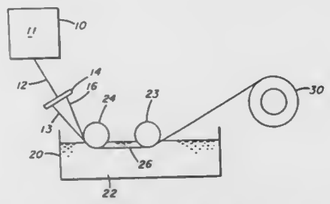
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5,049,338

## METHOD OF PROMOTING SOL GEL SILICEOUS-CONTAINING REACTIONS

Desaraju V. Varaprasad, Holland, Mich.; Agaram S. Abhiraman, Stone Mountain, Ga., and Ernest L. Lawton, Allison Park, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 293,404, Jan. 4, 1989, abandoned. This application Jun. 22, 1989, Ser. No. 370,210
Int. Cl.[5] D01F *6/96*
U.S. Cl. 264—183 14 Claims



1. Process of producing at least one siliceous-containing amorphous shape from a sol-gel process, comprising: forming at least one shape from metallic type compounds selected from the group consisting of: silicon alkoxide, dispersion of hydrated siliceous oxides, and mixtures thereof by at least partial hydrolysis in the presence of an organic solvent and water to result in a shapable ungelled polymerizate, where in forming an effective catalytic amount of at least one coagulation promoter is present to catalyze the hydrolysis and polymerization in the coagulation process, and wherein the coagulation promoter is selected from the group consisting of: aliphatic mono-, di-, and polyamines and rosin-derived amines; and reaction products of fatty acids and hydrophilic moieties selected from the group consisting of amino nitrogen moieties, quaternary nitrogen moieties; and amine oxides, polyoxyethylene alkyl-alicyclic-amines, 1-(2-hydroxyethyl)-2 alkyl-2-imidazolines, N,N,N',N'-tetrakis-substituted ethylenediamine derivatives; amines with amide linkages prepared by the condensation of carboxylic acids with a di-, or polyamine; partially amidated polyalkylenimines and acidic solutions thereof; and long chain alkyl amines, long chain alkyl amides, amidated alkyl amines, polyamino alkyl amides, partially amidated polyalkylene amides.

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5,049,339

## PROCESS FOR MANUFACTURING INDUSTRIAL YARN

John E. Hrivnak, Clinton; Donald L. Brown, Hudson, both of Ohio, and Richard M. Oblath, Huntsville, Ala., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 3, 1989, Ser. No. 374,806
Int. Cl.[5] D01D *5/12*
U.S. Cl. 264—210.8 14 Claims

1. A process for manufacturing drawn industrial yarn having high tenacity, high modulus and low shrinkage which can be made into two ply cord which exhibits a shrinkage after 2 minutes at 177° C. of less than 2%, which comprises (1) melt spinning polyethylene terephthalate into spun filaments at a spinning speed of greater than 2500 meters per minute; and (2) subsequently drawing the spun filaments at a speed which is within the range of about 100 to about 900 meters per minute in a heated zone in a separate drawing step to a draw ratio of at least about 1.05:1; wherein the draw ratio is at least about 97% of the draw ratio that would fully draw the yarn; wherein the spun filaments have a birefringence of at least about 0.075 and a crystallinity of at lest about 10%; wherein the spun filaments are in the heated zone for a residence time of at least 0.3 seconds; and wherein the yarn in the heated zone is at a temperature which is between the glass transition temperature and the melting temperature of the polyethylene terephthalate.

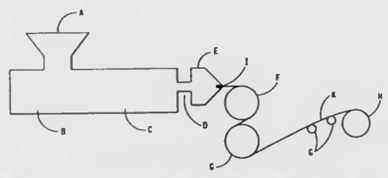
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5,049,340

## PROCESS FOR MAKING CONTINUOUS FILMS OF ORDERED POLY(ETHER KETONE KETONES)

Arthur Z. Moss, and George J. Ostapchenko, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

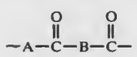
Filed Dec. 18, 1989, Ser. No. 452,143
Int. Cl.[5] B29C *41/26;* B29D *7/00*
U.S. Cl. 264—216 19 Claims



1. A continuous process for casting a high quality amorphous structure selected from the group consisting of films and

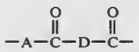


sheets (film or sheet) having a thickness of about 2.5 to 250 micrometers from an ordered poly(ether ketone ketone) resin consisting essentially of two repeating units (a) and (b) represented by the following formulas



(a)

and



(b)

where A is the p,p' -Ph-O-Ph- group, and Ph stands for the phenylene radical;

B is p-phenylene; and

D is m-phenylene;

where the (a) and (b) units occur at a ratio in the range of 80:20 to 25:75;

said resin having an inherent viscosity at 30° C., determined for a 0.5 g/100 ml solution in concentrated sulfuric acid, or about 0.6–1.2;

said process comprising the consecutive stages of melt-extruding the resin at a temperature of at most 400° C. through a die having lips through which the extended structure exits the die at a die pressure of at least 1.4 MPa, directing the molten extrudate onto the cylindrical surface of a rotating quench drum maintained at a temperature between 100° C. and 170° C. so that the resin layer forms a thin layer thereon, maintaining the molten resin layer in contact with the surface of the quench drum until the resin solidifies into the structure (a film or sheet), and removing the structure (film or sheet) from the quench drum.

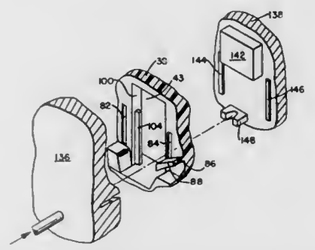
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5,049,341

## INTEGRALLY MOLDED BEARING BLOCK ASSEMBLY

Leon Rubinstein, Natick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 285,976, Jul. 23, 1981, abandoned. This application May 16, 1983, Ser. No. 494,996
Int. Cl.[5] B29C *45/00*
U.S. Cl. 264—242 9 Claims



1. The method of forming a slide bearing assembly of a support and a slide bearing carried by the support for translational movement relative thereto, said method comprising the steps of:

injecting a first plastic material into a first mold cavity to form a support defining a slide opening having opposed side edge formations and a pair of end edges, with said side edge formations diverging slightly as they extend away from one end edge;

enclosing said support in a mold which defines, with portions of said opening, a second mold cavity adjoining said one end edge of said opening and having a length within said slide opening of less than the distance between said end edges of said opening;

injecting a second plastic material into said second mold cavity to mold a slide bearing within said slide opening adjoining its said one end edge with a pair of side edge formations complementing adjoining portions of said side edge formations of said opening such that the width of said slide bearing is substantially equal to the width of said opening adjoining its said one end edge; and

advancing said slide bearing away from its molded position adjoining said one end edge to a bearing position where a sliding clearance is provided in accordance with the divergence of said side edge formations of said opening.

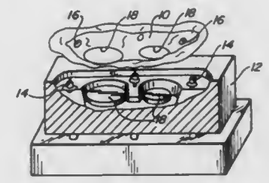
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5,049,342

## METHOD OF FABRICATING COMPOSITE STRUCTURES

John F. Scanlon, Okemos, Mich.; Hossein Saatchi; David W. Okey, both of Rockford, Ill.; John S. Church, Wilmington, Del., and Gary A. Wigell, Lansing, Mich., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 139,007, Dec. 29, 1987, abandoned. This application May 9, 1990, Ser. No. 520,975
Int. Cl.[5] B29C *45/14, 45/16*
U.S. Cl. 264—250 17 Claims



1. A method of fabricating a composite structure having at least one skin molecularly bonded to a core, comprising the steps of:

providing a skin composed of reinforcing material and a thermoplastic matrix;

thermoforming the skin to the general exterior shape of the composite structure;

molding a core in a separate step independent of and separate from the thermoforming of the skin, into the general shape of the composite structure, the core having a thermoplastic matrix complementary to the matrix of the skin; and

final forming the composite structure by placing the independently thermoformed skin and the independently molded core in juxtaposition in a forming mold and injecting a thermoplastic material into the mold under isostatic conditions, the thermoplastic material being complementary to the thermoplastic matrices of the skin and the core.

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5,049,343

## SEQUENTIALLY INJECTED MULTI-COMPONENT CORE-BACK INJECTION MOLDING

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Filed Jun. 18, 1990, Ser. No. 539,855
Int. Cl.[5] B29C *45/12, 45/16*
U.S. Cl. 264—255 21 Claims

1. A method of cyclic injection molding a first multi-component plastic product and a second multi-component plastic product in an injection molding apparatus comprising a first injection unit, a second injection unit, a right adjustable mold cavity with a primary right-mold-cavity side, a secondary right-mold-cavity side and a first moveable barring means, a left adjustable mold cavity with a primary left-mold-cavity side, a secondary left-mold-cavity side and a second moveable

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barring means, and a clamping unit, the method comprising the steps of:

(a) protracting the first barring means;

(b) retracting the second barring means;

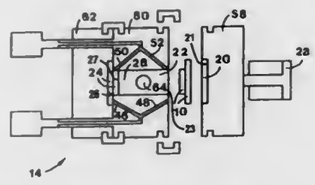
(c) shutting the clamping unit to thereby combine the primary right-mold-cavity side and the secondary right-mold-cavity side of the right mold cavity, to thereby apply clamping force simultaneously on the right and left adjustable mold cavities;

(d) injecting a first portion of a first plastic material by the first injection unit into the right adjustable mold cavity, which has its first barring means in the protracted condition, to form a first component of the first multi-component product;

(e) injecting a first portion of a second plastic material by the second injection unit into the left adjustable mold cavity which has its second barring means in the retracted position, to form a second component of said second multi-component product while the left adjustable mold cavity encases a first component of the second multi-component product which has been injected into the left adjustable mold cavity in the previous cycle, whereby the first component of the second multi-component product combines with said injected first portion of the second plastic material to thereby cast said second multi-component product;

(f) opening the clamping unit in order to thereby separate the primary left-mold-cavity side and the secondary left-mold cavity side of the left mold cavity, to open the left adjustable mold cavity;

(g) ejecting the second multi-component product;




(h) protracting the second barring means;

(i) retracting the first barring means;

(j) shutting the clamping unit to thereby combine the primary left-mold cavity side and the secondary left-mold-cavity side of the left mold cavity, tot hereby apply clamping force simultaneously on the right and left adjustable mold cavities;

(k) injecting a second portion of the first plastic material by the first injection unit into the left adjustable mold cavity, which has its second barring means in the protracted position, to form a first component of the second multi-component product and to encase the first component of the second multi-component product in the left mold cavity for employment in step (e) of the succeeding cycle;

(l) injecting a second portion of the second plastic material by the second injection unit into the right adjustable mold cavity which has its first barring means in the retracted position, to form a second component of said first multi-component product while the right adjustable mold cavity encases the first component of the first multi-component product which has been injected into the right adjustable mold cavity to step (d), whereby the first component of the first multi-component product combines with said injected second portion of the second plastic material to thereby cast said first multi-component product;

(m) opening the clamping unit in order to thereby separate the primary right-mold-cavity side and the secondary right-mold-cavity side of the right mold cavity, to open the right adjustable mold cavity; and

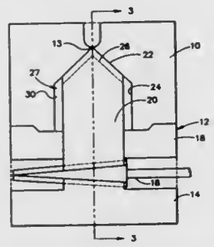
(n) ejecting the first multi-component product.

**5,049,344**

## METHOD FOR REDUCING REQUIRED MOLD-CAVITY CLAMPING FORCE AND CONTROLLING INJECTION-MOLDED-PRODUCT WALL THICKNESS

**Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Primtec, Rancho Santa Fe, Calif.**

**Division of Ser. No. 201,690, Jun. 2, 1988, Pat. No. 4,867,672.**
**This application Sep. 5, 1989, Ser. No. 402,902**
**Int. Cl.[5] B29C *45/36***
**U.S. Cl. 264—255** **9 Claims**




1. A method of injection molding a hollow, plastic product having an end wall and a cylindrical or approximately cylindrical side wall, wherein the end wall includes a fringe region bordering the side wall, the method comprising the steps of

(a) forming a mold cavity by combining a core section for forming the inside surface of the product with a cavity section for forming the outside surface of the product, with the axis of the cylindrical or approximately cylindrical side-wall defining portion of the mold cavity being the same as the mold-opening direction, herein the core section includes a protractable and retractable contact element, with the end of the contact element that faces the mold cavity including a contact surface;

(b) protracting the contact element to a forward position so that the contact surface contacts the cavity section of the mold cavity;

(c) injecting a first quantity of plastic material into the mold cavity while the contact element is in the forward position;

(d) retracting the contact element to a rear position where the contact surface ceases to contact the cavity section of the mold cavity; and

(e) injecting a second quantity of plastic material into the mold cavity while the contact element is in the rear position;

wherein step (a) comprises the step of

(f) forming the mold cavity with a contact element having a contact surface that is able to contact at least a significant part of the fringe region of the end-wall-defining portion of the cavity section;

wherein step (b) comprises the step of

(g) protracting the contact element to a forward position so that the contact surface contacts at least a significant part of the fringe region of the end-wall-defining portion of the cavity section of the mold cavity, to thereby reduce the mold cavity area as projected on a plane perpendicular to the mold opening direction, and thus reduce the clamping force required when the first quantity of plastic material is injected into the mold cavity; and

wherein step (a) further comprises the step of

(h) forming the mold cavity by combining the cavity section with the core section in which both the end-wall defining portion and the side-wall-defining portion of the core section consist of the contact element, and in which the side-wall-defining portions of the core section and the cavity section are cylindrical or approximately cylindrical.

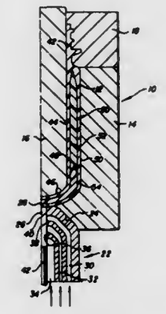


**5,049,345**

## METHOD OF FORMING A MULTI-LAYER PREFORM

**Wayne N. Collette, Merrimack; Suppayan M. Krishnakumar, Nashua, and Thomas E. Nahill, Amherest, all of N.H., assignors to Continental PET Technologies, Inc., Danbury, Conn.**

**Division of Ser. No. 265,775, Nov. 1, 1988, Pat. No. 4,923,723.**
**This application Nov. 9, 1989, Ser. No. 433,788**
**Int. Cl.[5] B29C *45/16***
**U.S. Cl. 264—255** **5 Claims**



1. A method of forming a plastic preform utilizing an injection mold and a cooperating core, said method comprising the steps of engaging said injection mold in sealed relation with a nozzle having several inlet passages each connected to a separate fluid plastic source, injecting a first premeasured volume of a first plastic from said nozzle into said mold around said core with said first premeasured volume being sufficient to form inner and outer layers of said first plastic substantially throughout the desired preform, injecting from said nozzle a second premeasured volume of a second plastic into said mold and within said first plastic to define said inner and outer layers, and injecting from said nozzle a third plastic into said mold to remove said second plastic from an end of the mold adjacent the nozzle and to displace said second plastic further into said mold and to finally fill said mold with said third plastic clearing said nozzle of said second plastic and rendering said nozzle ready for forming a next preform, said third plastic being injected at a temperature higher than the melt temperature of said second plastic and to a temperature differential wherein said higher temperature third plastic erodes solidified layers of the second plastic contacting said first plastic, the plastic preform thus having a first portion with said inner and outer layers of said first plastic and an intermediate layer of said second plastic and having a second portion with said inner and outer layers of said first plastic and an intermediate layer where said second plastic is replaced by said third plastic and having a third limited portion with said inner and outer layers of said first plastic and an intermediate layer of said third plastic within said second plastic where said third plastic has eroded said second plastic.

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**5,049,346**

## METHOD OF MOLDING A DECORATIVE TRIM

**Yukihiko Yada, Konan, and Toshiaki Kishio, Oobu, both of Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan**

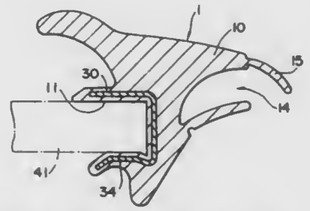
**Division of Ser. No. 288,274, Dec. 22, 1988, Pat. No. 4,884,380.**
**This application Jun. 26, 1989, Ser. No. 371,105**
**Claims priority, application Japan, May 17, 1988, 63-120385**
**Int. Cl.[5] B29C *45/14***
**U.S. Cl. 264—279.1** **4 Claims**

1. A method of producing a molding, which comprises:

interconnecting first and second moldings, each of which has a core, with each other by a connecting portion which has a decorative trim portion with a continuously varied cross sectional shape;

forming a notched portion with at least one concave portion and at least one convex portion on said core of each of said first and second moldings;

engaging said respective notched portions of the first and second moldings with each other by setting the concave portion of said first molding in the convex portion of said second molding;




disposing said engaged portions within a cavity of a mold having a cross sectional shape corresponding to the continuously varying cross sectional shape of said connecting portion; and

injecting a material for molding into said cavity of said mold so as to form a decorative trim portion around said engaged portions, which continuously connects said first and second moldings as one body.

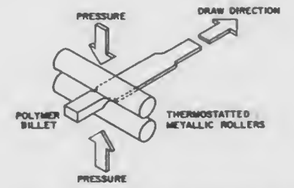
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**5,049,347**

## METHOD FOR PRODUCING DOUBLY ORIENTED POLYMERS

**Joseph H. Magill, Pittsburgh, Pa., and Manivakkam J. Shankernarayanan, Schaumburg, Ill., assignors to The University of Pittsburgh, Pittsburgh, Pa.**

**Continuation of Ser. No. 275,707, Nov. 22, 1988, abandoned, which is a continuation of Ser. No. 922,035, Oct. 22, 1986, abandoned. This application Oct. 1, 1990, Ser. No. 593,343**
**Int. Cl.[5] B29C *43/22***
**U.S. Cl. 264—280** **18 Claims**




1. A process for the solid phase preparation of a synthetic polymeric material having triaxial crystallite orientation form an orientable semicrystalline thermoplastic polymeric workpiece comprising: (a) presenting the workpiece, being of essentially unoriented polymers, at the entry mode of an opposing pair of solid rollers that are spaced apart a distance substantially less than the thickness of the workpiece; and (b) simultaneously compressing and drawing the workpiece in a single step through the paired rollers to deform the workpiece by compressive passage through the paired rollers at a nominal deformation ratio of at least 2 to 1, wherein the deformation is carried out between the glass transition temperature and the melting point of the polymeric material by applying to the workpiece, from the exit side of the paired rollers, a draw tension insufficient to cause tensile failure of the workpiece but sufficient to impart triaxial crystallite orientation to the polymeric material and to effect a draw ratio greater than the natural draw ratio of polymeric material, such that molecular

deformation, molecular alignment, and the molecular extension occur in the workpiece above the natural draw ratio otherwise attainable in the workpiece.

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5,049,348

## METHOD FOR PRODUCING THERMOPLASTIC RESIN COMPOUND

Masafumi Hongo, and Hideyuki Shigemitsu, both of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Japan

Filed Sep. 28, 1989, Ser. No. 413,848

Claims priority, application Japan, Oct. 28, 1988, 63-270968

Int. Cl.[5] C08J 5/00; C08L 51/04, 67/02, 71/12

U.S. Cl. 264—331.18 4 Claims

1. A method for producing a thermoplastic resin composition comprising the steps of

combining polyalkylene terephthalate with at least one polymer selected from the group consisting of polycarbonate resin and ethyleneglycidylmethacrylate copolymer to form 30 to 70% by weight of component (A);

combining polyphenylene ether with at least one polymer selected from the group consisting of rubber based graft copolymer, polystyrene resin and comprising the step of melting said component (A) and said compnent (B) block copolymer to form 70 to 30% by weight of component (B); and

separately and, after the ratio of viscosity (in poise) of said molten (B) to that of said molten (A) at a shear rate of $10^3(sec^{-1})$ is adjusted to 10 or less, kneading said molten (A) and (B) together.

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5,049,349

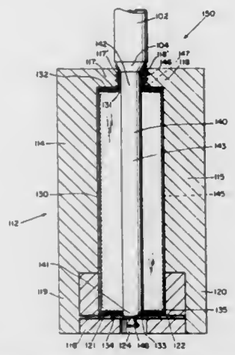
## METHOD FOR MAKING A BLOWN BAG-IN-BOX COMPOSITE CONTAINER

Michael J. McCullough, Ft. Thomas, Ky.; Gary E. McKibben, Cincinnati, and John E. Skidmore, Hamilton, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 34,357, Apr. 6, 1987, abandoned, which is a division of Ser. No. 808,587, Dec. 13, 1985, Pat. No. 4,696,840. This application Oct. 26, 1989, Ser. No. 427,966

Int. Cl.[5] B29C 49/04, 49/24

U.S. Cl. 264—515 15 Claims



1. A method of making a bag-in-box composite container comprising the steps of:

(a) erecting an initially flat blank by folding said blank to form an outer box having a top end panel and an opposing bottom end panel perpendicular to and connected by a continuous side wall to define a hollow box cavity, said top end panel having an aperture therein, an inner surface and an outer surface;

(b) placing said erected outer box within restraining means;

(c) heating a hollow, injection molded preform having a top portion and a lower body portion to soften the body portion of the preform and keeping the top portion of the preform at a temperature below its softening temperature during said heating, said top portion defining a pouring spout surrounded by an annular flange having a lower surface and said pouring spout having an outer surface;

(d) inserting said heated and softened body portion of said hollow preform into said hollow box cavity through said aperture in said top end panel until the lower surface of said annular flange rests against said outer surface of said top end panel, said top portion of said preform remaining outside said hollow box cavity;

(e) expanding said heated and softened body portion of said hollow preform within said hollow box cavity such that said body portion of said hollow preform comes into contact with said inner surface of said top end panel is held between the lower surface of said flange adjacent the outer surface of said top end panel and said expanded body portion adjacent the inner surface of said top end panel, thereby forming said bag-in-box composite container, and;

(f) removing said bag-in-box composite container from said restraining means.

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5,049,350

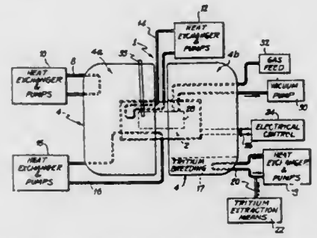
## CONTROLLED THERMONUCLEAR FUSION POWER APPARATUS AND METHOD

Robert W. Bussard, Arlington, Va., and Bruno Coppi, Winchester, Mass., assignors to FDX Patent Holding Company, N.V., New York, N.Y.

Division of Ser. No. 782,150, Oct. 1, 1985, Pat. No. 4,836,972, which is a continuation of Ser. No. 408,636, Aug. 16, 1982, abandoned, Division of Ser. No. 158,228, Jun. 10, 1980, Pat. No. 4,363,775, which is a contiouation of Ser. No. 5,104, Jan. 22, 1979, abandoned, which is a continuation of Ser. No. 755,794, Dec. 30, 1976, abandoned. This application Apr. 4, 1989, Ser. No. 333,084

Int. Cl.[5] G21B 1/00

U.S. Cl. 376—143 17 Claims



1. A fusion power generating means for generating thermal energy from fusion reactions in an ionized plasma of fusible fuel comprising:

(a) a fusion core unit including as components thereof,

1. a toroidal vacuum plasma cavity for containing said fusible fuel and

2. a plurality of toroidal field coils surrounding said plasma cavity for generating a toroidal magnetic field therein; and

3. ohmic heating means for inducing an ohmic heating current in the ionized plasma within the plasma cavity of said fusion core unit for raising the temperature of said plasma, said ohmic heating means including a transformer means contained within an area of said core so that said toroidal plasma cavity surrounds said transformer means, and said ohmic heating current generating a poloidal magnetic field within said plasma, said components of said fusion core unit being so arranged and interconnected as to allow handling of said fusion core as a single entity;



(b) disconnectable means extending into said fusion core unit for delivering said fusible fuel therein;

(c) disconnectable means for transporting a cooling fluid to and through the toroidal field coils of said fusion core unit;

(d) a power supply connected through disconnectable means to aid toroidal field coils for generating a toroidal magnetic field for confining the ionized plasma within the plasma cavity of said fusion core unit, said toroidal magnetic field having a strength of on the order of greater than 100 KG;

(e) said plurality of toroidal field coils comprising high-strength, non-superconducting conductors for sustaining said toroidal magnetic field and for withstanding thermal energy resulting from said fusion reactions;

(f) blanket mans positioned completely outside of and substantially surrounding said toroidal field coils, said blanket means comprising at least two modules;

(g) said toroidal field coils and said plasma cavity have no blanket means therebetween;

(h) means for connecting and disconnecting each of said disconnectable means, means for separating said at least two modules of each blanket means a distance sufficient to allow removal of the fusion core unit, means for removing and inserting a fusion core unit as a single entity between the separated modules of each blanket means;

(i) blanket cooling fluid transport means connected to said blanket means for transporting a cooling fluid to and through said blanket means;

(j) means, connected to at lest one of said blanket cooling fluid transport means and said toroidal field cooling fluid transport means, for extracting thermal energy therefrom;

(k) means for controlling the density of said plasma within said cavity by adjusting the amount of fuel delivered into said cavity;

(l) said ohmic heating means operable to induce said ohmic heating current to heat said plasma to a temperature of about 4 KeV while said means for controlling the density of said plasma is operable for increasing the density of said plasma for operating said reactor below a first fusion reaction rate and in which charged particle heating from said fusion reaction substantially equals bremsstrahlung losses;

(m) said density controlling means and said ohmic heating means operable for increasing the plasma density further while further heating said plasma to maintain the temperature of said plasma above the range of approximately 4 KeV, said plasma being heated by both said ohmic heating current and said charged particle heating; and

(n) said density controlling means operable for increasing the plasma density above said first fusion reaction rate, wherein said charged particle heating increases with increasing density for raising the temperature of said plasma above the temperature at which charged particle heating from said fusion reaction substantially equals bremsstrahlung losses, whereby said reactor generates thermal energy above plasma energy losses comprising bremsstrahlung losses, cyclotron radiation losses and particle conductivity losses.

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5,049,351

## METHOD AND APPARATUS FOR DETERMINING ENRICHMENT OF URANIUM DIOXIDE POWDER

Hassan J. Ahmed, Irmo, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 3, 1989, Ser. No. 375,233

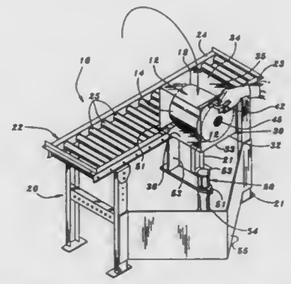
Int. Cl.[5] G21C 17/00

U.S. Cl. 376—257 10 Claims

1. The method for determining the enrichment of stored uranium dioxide powder comprising the steps of

providing a uranium dioxide powder of unknown fuel enrichment contained within a closed receptacle having top, side and bottom wall surfaces, said top surface being substantially flat, and a natural gamma radiation detector,

turning the receptacle upside down along a substantially accurate path of travel so that the uranium dioxide powder is shifted within the receptacle to obtain a more uniform bulk density of the power contained therein,while also engaging the natural radiation detector with the substantially flat top after the receptacle has been turned upside down, and



determining the degree of enrichment of the powder by detecting eh natural gamma radiation emission count emitted through the top surface by measuring the natural gamma radiation emission count and comparing said count to the emission counts of known enrichment blends.

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5,049,352

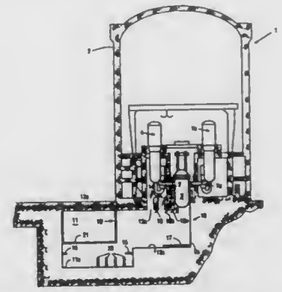
## NUCLEAR REACTOR MELT-RETENTION STRUCTURE TO MITIGATE DIRECT CONTAINMENT HEATING

Narinder K. Tutu, Manorville; Theodore Ginsberg, East Setauket, and John R. Klages, Mattituck, all of N.Y., assignors to Associated Universities, Inc., Washington, D.C.

Filed Oct. 15, 1990, Ser. No. 598,846

Int. Cl.[5] G21C 9/00

U.S. Cl. 376—280 13 Claims



1. A nuclear reactor melt-retention structure that functions to retain molten core material within a melt retention chamber to mitigate the extent of direct containment heating, said structure being adapted to be positioned within or adjacent to a pressurized or boiling water nuclear reactor containment building at a location such that at least a portion of said melt retention structure is lower than and to one side of the nuclear reactor pressure vessel, and such that said structure is adjacent to a gas escape channel means that communicates between the reactor cavity and the containment building of the reactor, comprising; a melt-retention chamber, wall means defining a passageway extending between the reactor cavity underneath the reactor pressure vessel and one side of said chamber, said passageway including vent means extending through an upper wall portion thereof, said vent means being in communication with the upper region of the reactor containment building, whereby gas and steam discharged from the reactor pressure

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vessel are vented through said passageway and vent means into the gas escape channel means and the reactor containment building, the bottom wall of said passageway being positioned a predetermined distance below the reactor cavity and above the floor of said melt-retention chamber whereby molten material discharged from the reactor pressure vessel flows through said passageway into the lower portion of the melt-retention chamber and is retained in said lower portion by the force of gravity as gas discharged from the reactor pressure vessel is vented into the reactor containment building.

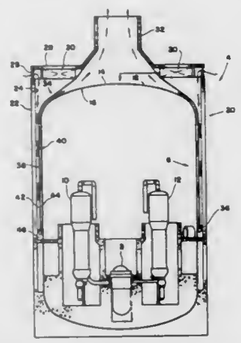
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**5,049,353**

## PASSIVE CONTAINMENT COOLING SYSTEM

**Lawrence E. Conway, Robinson Township, Allegheny County, and William A. Stewart, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 21, 1989, Ser. No. 341,442**
**Int. Cl.[5] G21C *13/00***
**U.S. Cl. 376—293** **15 Claims**



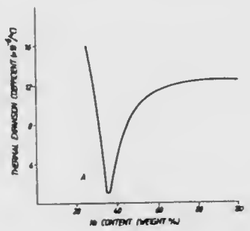
1. A passive containment cooling system comprising:
a metal containment shell encasing a reactor core and having a top and inner and outer surfaces;
a water supply disposed in an elevated position above the containment shell;
a concrete shield building surrounding the containment shell and having a top and inner and outer surfaces;
an air inlet formed radially at the top of the shield building;
a chimney formed centrally in and extending upwardly from the top of the shield building;
an air baffle extending from the top of the shield building over a substantial length of the containment shell and having inner and outer surfaces, a shape substantially conforming to the shape of the containment shell and an open lower end;
the inner surface of the shield building and the outer surface of the air baffle forming a first annular space extending from the air inlet to the open end of the air baffle;
the inner surface of the air baffle and the outer surface of the containment shell forming a second annular space extending from the open end of the air baffle to the chimney;
the first and second annular spaces defining a cooling air flow path over the outer surface of the containment; and
a fluid release system for releasing water on the top of the containment shell in stages with a highest rate occurring in a first, initial stage and a lowest rate occurring in a last stage.

**5,049,354**

## LOW THERMAL EXPANSION CAST IRON

**Takanobu Nishimura, and Motoo Suzuki, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Oct. 25, 1989, Ser. No. 426,595**
**Claims priority, application Japan, Nov. 2, 1988, 63-276045**
**Int. Cl.[5] C22C *37/00, 38/56***
**U.S. Cl. 420—27** **10 Claims**



1. A substantially nonporous cast iron having a graphite structure in an austenitic iron matrix and consisting essentially of , in weight %, at least about 1.0% and not more than about 3.5% of carbon, not more than about 1.0% of silicon, at least about 29% and not more than about 34% of nickel, at least about 4% and not more than about 8% of cobalt, and the balance substantially all iron.

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**5,049,355**

## PROCESS FOR PRODUCING AN ODS SINTERED ALLOY

**Udo Gennari, Pflach, and Wolfgang Glätzle, Reutte, both of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.**

**PCT No. PCT/EP89/00396, § 371 Date Jan. 8, 1990, § 102(e) Date Jan. 8, 1990, PCT Pub. No. WO89/09840, PCT Pub. Date Oct. 19, 1989**
**PCT Filed Apr. 13, 1989, Ser. No. 449,909**
**Claims priority, application Austria, Apr. 14, 1988, 963/88**
**Int. Cl.[5] B22F *3/12, 5/00***
**U.S. Cl. 420—425** **9 Claims**

1. A process for producing a ductile, high-strength, oxide dispersion hardened sintered (ODS) alloy of a base metal having a high melting point (Tm), comprising:
forming a powder mixture by blending a powdered form of said base metal with a dispersoid comprised of a metal oxide powder, said metal oxide powder possessing a higher bond energy value than the oxides of said base metal at temperatures less than 0.5 Tm;
pressing said powder mixture into a pressed blank form; and
sintering said pressed blank form at temperatures reaching 0.7–0.9 Tm such that said dispersoid is decomposed into its constituent components, and said constituent components are homogeneously dispersed throughout said base metal.

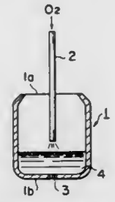


**5,049,357**

## METHOD FOR MANUFACTURING IRON-BORON-SILICON ALLOY

**Hidetoshi Matsuno; Toshio Takaoka; Yoshiteru Kikuchi; Yoshihiko Kawai, and Tadahiko Nishi, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan**

**PCT No. PCT/JP89/00361, § 371 Date Oct. 16, 1989, § 102(e) Date Oct. 6, 1989, PCT Pub. No. WO89/09842, PCT Pub. Date Oct. 19, 1989**
**PCT Filed Apr. 4, 1989, Ser. No. 427,129**
**Claims priority, application Japan, Apr. 5, 1988, 63-83492**
**Int. Cl.[5] C22C *33/04***
**U.S. Cl. 420—581** **9 Claims**




1. A method for manufacturing an iron-boron-silicon alloy, comprising the steps of:
adding a boron raw material comprising at least one of a boron ore and a boric acid, and a carbonaceous reducing agent to a molten iron in a vessel;
blowing oxygen gas into said molten iron to keep said molten iron at a constant temperature through combustion of part of said carbonaceous reducing agent, and reducing said boron raw material in said molten iron by means of the balance of said carbonaceous reducing agent to prepare a boron-containing molten iron;
continuing said blowing of oxygen gas to decarburize said boron-containing molten iron until the carbon content in said boron-containing molten iron decreases to 0.2 wt. % or less; and
adding, after the completion of said blowing of oxygen gas at least one of silicon and ferrosilicon to said boron-containing molten iron while stirring said boron-containing molten iron, thereby manufacturing an iron-boron-silicon alloy.

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**5,049,358**

## COMPOSITION AND TEST DEVICE FOR ASSAYING FOR PROTEINS

**Arthur L. Y. Lau, Granger, Ind., assignor to Miles Inc., Elkhart, Ind.**

**Filed Sep. 30, 1988, Ser. No. 251,297**
**Int. Cl.[5] G01N *21/78, 33/68***
**U.S. Cl. 422—56** **21 Claims**

1. A composition capable of exhibiting a sufficient color transition upon contacting a protein-containing liquid test sample to show the presence and/or concentration of protein in the liquid test sample comprising:
a first indicator dye capable of undergoing a detectable and measurable color transition from a first color to a second color;
a second indicator dye capable of undergoing a detectable and measurable color transition at approximately the same pH as the first indicator dye to a color that differs form the second color of the first indicator dye; and
a suitable buffer to maintain a constant pH sufficiently close to the color transition pH of the first indicator dye and the color transition pH of the second indocator dye,
wherein each dye is capable of preferentially interacting with protein in the test sample to undergo any said color transition, wherein any said color transitions of the dyes no not mutually interfere with each other, and wherein each of the dyes have approximately the same affinity for protein in the test sample.

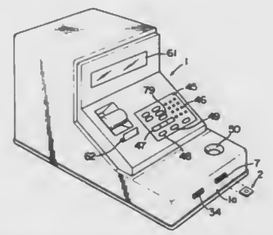
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**5,049,359**

## APPARATUS FOR BIOCHEMICAL ANALYSIS

**Masahi Azuma, Hino; Yasuhiro Satoh, Niiza, and Takashi Ishihara, Tachikawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 186,682, Apr. 21, 1988, abandoned, which is a continuation of Ser. No. 38,446, Apr. 14, 1987, abandoned, which is a continuation of Ser. No. 833,598, Feb. 27, 1986, abandoned. This application Mar. 6, 1990, Ser. No. 489,870**
**Claims priority, application Japan, Feb. 28, 1985, 60-39875**
**Int. Cl.[5] G01N *35/00***
**U.S. Cl. 422—67** **17 Claims**



1. An apparatus for biochemical analysis comprising:
conveying means having a plurality of holding portions for holding a plurality of measuring elements, each of said measuring elements including a film impregnated with a reagent;
driving means for driving said conveying means;
an insertion unit for inserting each of the plurality of measuring elements into corresponding ones of said holding portions of said conveying means;
detecting means for detecting the insertion of each of the plurality of measuring elements;
first control means for controlling the driving means, wherein when the detecting means detects the insertion of one of the plurality of measuring elements, the first control means controls the driving means to rotate the conveying means, thereby enabling the insertion of a subsequent one of the plurality of measuring elements;
a sample dispensing portion provided in a sample dispensing unit within a main body of said conveying means for dispensing a sample to be measured on said film in desired ones of said measuring elements;
photometric means for performing a photometric analysis for determining the rate of reaction of the sample with the reagent on the film and desired ones of said measuring elements and for determining the result of a reaction of the sample with the reagent of the film in desired ones of said measuring elements while said plurality of measuring elements are held on said conveying means;
discharging means for discharging said plurality of measuring elements from said conveying means after the photometric analysis by said photometric means is completed; and
second control means for sequentially controlling the insertion of said measuring elements, the operation of the sample dispensing unit, the photometric operation and the discharging operation of said measuring elements.

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5,049,360

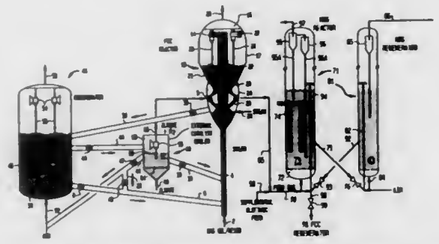
## MULTI-STAGE CONVERSION OF ALKANES TO GASOLINE

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 144,991, Jan. 19, 1988, Pat. No. 4,859,308. This application May 30, 1989, Ser. No. 358,096

Int. Cl.[5] F27B *15/00, 15/16;* B01J *8/18*

U.S. Cl. 422—141 2 Claims



1. In a facility for converting alkanes into gasoline, said facility including (A) a fluid catalytic cracking system and (B) an olefin oligomerization reactor, wherein (A) includes a fluid catalytic cracker reactor and first regenerator means in fluid communication therewith for regenerating a coke-contaminated fluid cracking catalyst in a first regeneration zone at a pressure in the range from above 20 psig to about 50 psig and a temperature in the range from about 650° C. to 790° C. (about 1200°–1450° F.) while injecting said first regenerator zone with enough oxygen-containing regeneration gas to maintain a dense fluid bed of cracking catalyst in said first regenerator zone so as to regenerate the catalyst before returning it to said fluid catalytic cracker reactor; and wherein (B) includes an oligomerization reactor containing a medium pore zeolite catalyst effective to oligomerize olefins to gasoline at superatmospheric pressure and temperature in the range from about 315.5° C. to about 538° C. (about 600°–1000° F.) operably connected to a second regenerator means for regenerating a coke-contaminated oligomerization catalyst in a second regeneration zone while injecting said second regenerator zone with enough oxygen-containing regeneration gas to maintain a dense fluid bed of oligomerization catalyst in said second regenerator zone so as to regenerate said oligomerization catalyst before returning it to said oligomerization reactor, said second regenerator means being in valved communication with said oligomerization reactor and defining a second regeneration zone operating at a pressure lower than that in said oligomerization reactor, and a temperature in the range from about 371° C. to about 538° C. (about 700°–1000° F.), the improvement comprising;

a) a first valved conduit means for withdrawing a controlled stream of said regenerated catalyst from said first regenerator means;

b) a dehydrogenation reactor in valved communication with said first regenerator means, through said first valved conduit means said dehydrogenation reactor having a dehydrogenation zone at a temperature below those prevailing in said first regeneration zone, said dehydrogenation reactor being located externally relative to said fluid catalytic cracker reactor and first regenerator;

c) means for introducing a lower alkane feedstream into said dehydrogenation zone in an amount sufficient to maintain hot withdrawn catalyst in a state of fluidization in said dehydrogenation reactor while said catalyst is being cooled therein;

d) a second valved conduit means for transporting cooled catalyst from said dehydrogenation zone to said first regeneration zone;

e) a third conduit means for withdrawing an olefinic effluent stream from said dehydrogenation reactor and directing said effluent to said oligomerization reactor;

f) a fourth valved conduit means for transporting regenerated oligomerization catalyst from said second regeneration means to said oligomerization reactor; and

g) a fifth conduit means for withdrawing a gasoline stream from said oligomerization reactor.

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5,049,361

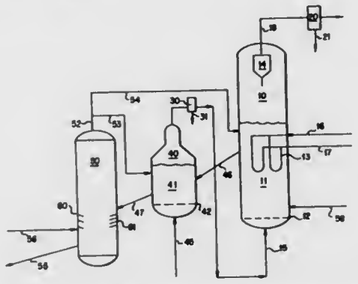
## APPARATUS FOR FLUID-BED CATALYTIC REACTIONS

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Division of Ser. No. 272,958, Nov. 18, 1988, Pat. No. 4,929,334. This application Apr. 16, 1990, Ser. No. 509,454

Int. Cl.[5] B01J *8/18;* F27B *15/16*

U.S. Cl. 422—144 3 Claims



1. An apparatus for the conversion of hydrocarbons comprising:

(a) a reactor vessel for containing a fluid bed reaction zone including finely divided catalyst, said reactor vessel further comprising a feed distributor positioned in a lower portion of said reactor vessel, a heat exchange conduit within said reactor vessel in direct contact with said fluid bed reaction zone for transferring heat from a hot circulating fluid to said fluid bed reaction zone, and a catalyst separator positioned in an upper section of said reactor vessel for segregating reaction products from entrained spent catalyst;

(b) a first conduit for withdrawing spent catalyst from said fluid bed reaction zone;

(c) a feed preheater vessel operatively connected to said first conduit (b) for contacting an aliphatic feedstream with a fluidized bed of said spent catalyst, said feed preheater vessel being sized to provide spent catalyst circulation through said preheater vessel of from about 0.1 to about 100 volumes of spent catalyst per hour, said spent catalyst circulation affording sufficient contact time between said aliphatic feedstream and said spent catalyst to preheat said aliphatic feedstream and to convert at least a portion of the coke precursors in the aliphatic feedstream to coke, whereby said spent catalyst is cooled and coke is deposited on said spent catalyst;

(d) a second conduit for charging said aliphatic feedstream to a lower section of said feed preheater vessel;

(e) a third conduit for transferring said preheated aliphatic feedstream from an upper portion of said feed preheater vessel to a lower portion of said reactor vessel;

(f) a catalyst stripper vessel for countercurrently contacting said cooled spent catalyst with a stripping gas to desorb hydrocarbons from said cooled spent catalyst;

(g) a fourth conduit for charging said stripping gas to a lower section of said catalyst stripper; and

(h) a fifth conduit for transferring a hydrocarbon enriched stripping gas from said catalyst stripper to said reactor vessel.



5,049,362

## APPARATUS FOR TREATMENT OF OBJECTS WITH UHF-ENERGY

Wilfried Baumgarten, Pattensen, Fed. Rep. of Germany, assignor to Paul Troester Maschinenfabrik, Hanover, Fed. Rep. of Germany

Filed Dec. 20, 1989, Ser. No. 454,743

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1988, 3843904

Int. Cl.[5] B01J *19/08, 19/12;* H05B *6/64, 6/78*

U.S. Cl. 422—186.05 11 Claims



1. Apparatus for treatment of objects with UHF energy, comprising an elongate treatment chamber having a bottom and sides and having an entrance end and an exit end, a conveyor for objects to be treated running through said treatment chamber, said chamber having at least one treatment section followed by a temperature equalizing section, each of said sections having a cover hinged at one side to swing from a closed position to an open position, the cover of said treatment section having at least one UHF-energy input opening and a waveguide connecting said input opening with a UHF-energy source, said waveguide comprising two sections connected to one another by a joint disposed in line with the hinge of the treatment section cover and permitting relative movement of said waveguide sections upon opening of said cover.

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5,049,363

## RECOVERY OF SCANDIUM, YTTRIUM AND LANTHANIDES FROM TITANIUM ORE

Robert J. Feuling, Sandy, Utah, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1989, Ser. No. 389,088

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] C01F *17/00;* C01G *23/02*

U.S. Cl. 423—21.1 15 Claims



1. A process for extracting scandium from titanium ore; said process comprising:

a. feeding a scandium-containing titanium ore to a fluidized bed chlorinator at 800°–1250° C. to produce a vaporous phase and a solid residue, said vaporous phase comprising titanium chloride, said solid residue comprising mostly unreacted feed and also a scandium compound; and

b. recovering the scandium compound from said solid residue.

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5,049,364

## METHODS FOR DENITRIZATION

Masafumi Yoshimoto; Tadao Nakatsuji, and Kazuhiko Nagano, all of Osaka, Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Division of Ser. No. 417,422, Oct. 5, 1989. This application Jun. 6, 1990, Ser. No. 518,560

Claims priority, application Japan, Oct. 5, 1988, 63-251361; Oct. 6, 1988, 63-253401; Nov. 2, 1988, 63-277693; Nov. 2, 1988, 63-277694

Int. Cl.[5] B01J *8/00, 8/62, 23/40;* C01B *21/00*

U.S. Cl. 423—239 4 Claims

1. A method of denitrizing nitrogen oxides contained in waste gases which consists essentially of: putting the waste gases into contact with a denitrizing catalyst which comprises:

(a) an alkali metal oxide or an alkaline earth metal oxide in amounts of 50–90% by weight as oxides;

(b) at least one metal oxide selected from the group consisting of $Co_3O_4$, $Cu_2O$, $Mn_2O_3$, NiO, PbO, $Bi_2O_3$ and $MoO_2$ in amounts of 5–50% by weight as oxides; and

(c) at least one metal or oxide of a metal selected from the group consisting of Ru, Rh, Pd, Ag, Pt and Au in amounts of 0.01–10% by weight as metals,

in the presence or absence of carbon monoxide as a reducing agent at a temperature of 400°–600° C.

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5,049,365

## PROCESS FOR TREATING AIR CONTAINING HYDROCARBON VAPOR WITH A COMPOSITE ADSORBENT MATERIAL

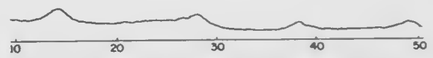
Seiji Okabayashi; Hirofumi Watanabe, both of Nakajo; Kiyoshi Abe, and Masahide Ogawa, both of Shibata, all of Japan, assignors to Mizusawa Industrial Chemicals, Ltd., Tokyo, Japan

Division of Ser. No. 299,332, Jan. 23, 1989, Pat. No. 4,963,519. This application Mar. 1, 1990, Ser. No. 486,861

Claims priority, application Japan, May 23, 1988, 63-123924

Int. Cl.[5] B01D *53/34*

U.S. Cl. 423—245.1 7 Claims




1. In a process for treating air containing hydrocarbon vapor which comprises passing the air containing the hydrocarbon vapor through a packed layer of an adsorbent to adsorb the hydrocarbon vapor into the adsorbent and passing an air free of hydrocarbon through the packed layer of the hydrocarbon-adsorbed adsorbent to cause desorption of the adsorbed hydrocarbon, the improvement wherein said adsorbent comprises a granular composition comprising 30 to 70% by weight of powdery active carbon and 30 to 70% by weight of pseudo-boehmite hydrous alumina and having a pack density of 500 to 700 g/l and an average pore radius of 13 to 20 Å.

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**5,049,366**
## CRYSTALLINE ALUMINOPHOSPHATES COMPOSITIONS

David M. Clark, and Ronald J. Dogterom, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 22, 1990, Ser. No. 468,307
Claims priority, application United Kingdom, Jan. 31, 1989, 8902083.8
Int. Cl.[5] C01B *35/12, 25/36;* B01J *27/18, 27/182*
U.S. Cl. 423—277 14 Claims

6. A process for preparing crystalline aluminophosphates having an X-ray diffraction pattern containing at least the following lines:

| d (A) | Intensity |
|---|---|
| 9.30 ± 0.2 | vs |
| 5.40 ± 0.1 | m |
| 5.30 ± 0.1 | m |
| 4.25 ± 0.05 | w |
| 4.07 ± 0.05 | w |
| 3.50 ± 0.05 | w |
| 3.30 ± 0.05 | m |
| 3.10 ± 0.05 | w |
| 2.96 ± 0.05 | w |
| 2.84 ± 0.05 | w |

from a forming solution or gel comprising a source of aluminum, a source of phosphorus, ethylenediamine and optionally a source of at least one component X which can be substituted for aluminum and/or phosphorus and is selected from the group consisting of beryllium, magnesium, titanium, manganese, iron, cobalt, zinc, vanadium, nickel, chromium, silicon, lithium, boron, gallium, germanium, and arsenic, which solution or gel is kept at a temperature between 80° C. and 185° C. for a period of time sufficient to produce said crystalline aluminophosphates followed by separating off the crystalline product obtained and drying, wherein the various components of said solution or gel or initially present in the following molar ratios:

$R:Al_2O_3=0.65-3$
$X:Al_2O_3=0-2$
$P:Al_2O_3=0.3-1.3$
$H_2O:Al_2O_3=30-500$.

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**5,049,367**
## ALUMINUM NITRIDE POWDER AND PROCESS FOR PREPARATION OF THE SAME

Kazuhiko Nakano, Ibaraki; Mitsutoshi Murase, Ehime; Norio Matsuda, Ibaraki, and Hideaki Murakami, Ehime, all of Japan, assignors to Sumitomo Chemical Co., Limited, Osaka, Japan

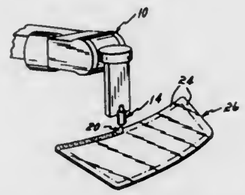
Filed Oct. 4, 1989, Ser. No. 417,104
Claims priority, application Japan, Oct. 5, 1988, 63-252774; Oct. 5, 1988, 63-252775
Int. Cl.[5] C01B *21/072;* C04B *35/58*
U.S. Cl. 423—412 11 Claims

7. An aluminum nitride powder obtained by firing and reacting a mixture of alumina powder, wherein the average particle diameter of said alumina as a starting material is not more than 5 μm, and carbon powder in a nitrogen-containing atmosphere, calcining said reaction product in air to remove an excessive carbon powder, pulverizing said aluminum nitride powder, said aluminum nitride powder having an oxygen content of not more than 20 ppm, a silicon content of not more than 20 ppm, having a tapped density of at least 1.0 g/cm$^3$, having a BET specific surface area of not more than 6 m$^2$/g and having a content of fine powders of less than 1 μm of not more than 50%.

**5,049,368**
## METHOD OF APPLYING PRIMERS ONTO THE BODY FLANGE AND WINDSHIELD OF VEHICLES

Herman E. Turner, Jr., Wellington, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Filed Mar. 12, 1990, Ser. No. 492,782
Int. Cl.[5] B05D *1/02*
U.S. Cl. 427—424 4 Claims



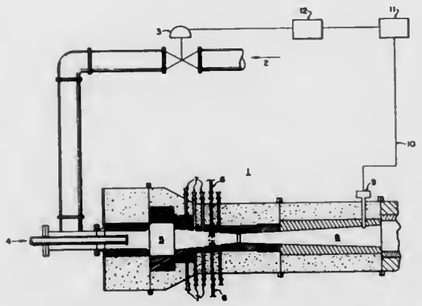

1. The method of applying liquid primer material onto the body flange of a vehicle in preparation for attachment to a section of glass, comprising:
supplying the liquid primer material to an airless nozzle means;
controlling the supply pressure of the liquid primer material to the nozzle means such that a liquid film emission is discharged from the nozzle means which is substantially free of atomized particles of liquid primer material;
positioning the body flange of the vehicle in the path of the liquid film emission discharged from the nozzle means;
producing relative movement between the nozzle means and the body flange of the vehicle to obtain a uniform, splash-free coating of the liquid primer material on a predetermined area of the body flange while substantially avoiding the application of the liquid primer material outside of the predetermined area of the body flange.

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**5,049,369**
## CONTROL OF A CARBON BLACK REACTOR

Ronald L. Howell, Big Spring, Tex., assignor to Sid Richardson Carbon & Gasoline Co., Fort Worth, Tex.

Filed Nov. 20, 1989, Ser. No. 439,621
Int. Cl.[5] C01B *31/02;* C09C *1/48*
U.S. Cl. 423—450 8 Claims



1. A method of continuously producing carbon black in a carbon black furnace having a combustion zone and a reaction zone, said method comprising:
introducing an oxygen-reactive fuel and an oxygen-containing gas into said combustion zone, said fuel and oxygen containing gas being combined in the combustion zone as an ignitable mixture;
burning said mixture in said combustion zone to form hot combustion gases that are conveyed downstream into said reaction zone of said furnace;
introducing a hydrocarbon feedstock into said hot combustion gases in said reaction zone and thermally decomposing said feedstock therein, to form an aerosol of carbon black suspended within, the hot gases of combustion and thermal decomposition;
measuring the temperature within the reaction zone during formation of said carbon black;
selectively controlling introduction of one of said fuel, said oxygen-containing gas, and said feedstock into said reactor in response to said measured reaction zone temperature to establish and maintain a preselected setpoint temperature and thereby produce a carbon black having a preselected uniform surface area determined by said setpoint reaction zone temperature;
conveying the carbon black aerosol downstream into a quench zone wherein the aerosol is quenched following decomposition of said feedstock; and
separating and recovering said carbon black from the gases of said aerosol.

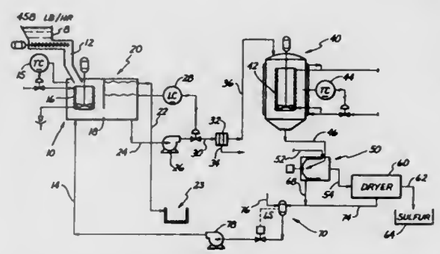


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**5,049,370**
## PROCESS AND APPARATUS FOR PURIFYING ELEMENTAL SULFUR CARRIED IN AN AQUEOUS CAKE

Nobuyasu Hasebe, Palos Verdes, and Jackson Yu, Irvine, both of Calif., assignors to Ultraclean Incorporated, Irvine, Calif.

Filed Sep. 26, 1989, Ser. No. 412,890
Int. Cl.[5] C01B *17/033, 17/05*
U.S. Cl. 423—578 R 13 Claims




1. A process for purifying crude solid phase elemental sulfur in an aqueous cake incorporating a base solvent comprising the steps of:
selecting an organic solvent for elemental sulfur, said organic solvent being substantially immiscible in the base solvent and being capable of dissolving at least approximately twice as much by weight of elemental sulfur at 100 degrees centigrade as at 20 degrees centigrade, said organic solvent including a water immiscible solvent and a water miscible solvent;
admixing said base solvent cake with said organic solvent to form an admixture, said admixing being carried out at a temperature below the boiling point of said admixture to dissolve at least a substantial portion of said elemental sulfur in said organic solvent and to form a sulfur-laden solvent;
allowing said admixture to stand and form a base solvent phase and a sulfur-laden solvent phase;
separating said base solvent phase from said sulfur-laden solvent phase;
cooling said sulfur-laden solvent phase to form elemental sulfur crystals and a sulfur saturated organic solvent; and
separating said sulfur saturated organic solvent from said elemental sulfur crystals to obtain purified sulfur.

**5,049,371**
## PROCESS FOR THE PREPARATION OF MONODISPERSE CERAMIC POWDERS

Günter Rinn, and Rüdiger Nass, both of Zellingen, Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Oct. 28, 1988, Ser. No. 263,883
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736686
Int. Cl.[5] C01B *13/14;* C01G *23/04, 25/02, 19/02*
U.S. Cl. 423—592 13 Claims



1. In a process for the preparation of particulate oxides and hydroxides by reacting hydrolyzable compounds with water in the presence of a complexing agent containing at least two atoms of O, N or S in an organic solvent the improvement wherein the reaction is carried out in the presence of a cellulose ether or a cellulose ester as a stabilizer, wherein the complexing agent is present in an amount effective to ensure the oxide or hydroxide particles of a desired size are formed, increasing amounts of complexing agent causing increasing size of the oxide or hydroxide particles, and wherein an acid concentration is maintained effective to prevent spontaneous, random precipitation or failure of precipitation of the oxide or hydroxide particles, and wherein the precipitated particles form a powder after being isolated and dried.

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**5,049,372**
## ANTICANCER ACTIVITIES IN A HOST BY INCREASING BLOOD AND PLASMA ADENOSINE 5'-TRIPHOSPHATE (ATP) LEVELS

Eliezer Rapaport, 6 Whittier Pl., Apartment 8-J, Boston, Mass. 02114

Continuation-in-part of Ser. No. 397,897, Jul. 13, 1982, Pat. No. 4,880,918. This application Jul. 25, 1988, Ser. No. 223,503
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/70;* C07H *19/16*
U.S. Cl. 424—1.1 45 Claims

1. A process for selectively arresting the growth of tumor cells in a host which comprises administering to a host having tumor cells adenosine 5'-monophosphate, or pharmaceutically acceptable salts thereof, or chelates thereof or liposomes thereof, or radio-nuclides thereof in an amount sufficient to increase the blood and plasma levels of adenosine 5'-triphosphate in said host sufficiently to thereby arrest the growth of said tumor cells.

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5,049,373

## METHOD FOR SELECTION OF PRIMATE TUMOR-ASSOCIATED ANTIGENS SUITABLE AS IN VIVO TARGETS FOR ANTIBODIES

Byron T. Ballou, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Division of Ser. No. 295,775, Jan. 11, 1989, Pat. No. 4,978,520, which is a continuation-in-part of Ser. No. 906,161, Sep. 11, 1986, Pat. No. 4,798,719. This application Jul. 13, 1990, Ser. No. 533,166

Int. Cl.[5] G01N *33/53;* A61K *39/00*

U.S. Cl. 424—1.1 7 Claims

1. A process for the selection of antigens suitable as targets for antibodies which localize in tumors in humans in vivo comprising:

(a) preparing antibodies that bind to antigens present in a human tumor;

(b) injecting the prepared antibodies into a non-tumor-bearing primate and into the perfusion fluid of a perfused human tumor;

(c) recovering the biofiltered antibodies from each of the non-tumor-bearing primate and the perfused human tumor;

(d) identifying antigens whose antibodies are not retained in vivo in the non-tumor-bearing primate but are retained by the perfused human tumor; and

(e) comparing the antibodies to determine which specificities are not retained in vivo by the non-tumor-bearing primate, but are retained in the perfused human tumor, to identify the antigens corresponding to those antibodies retained only in the perfused human tumor.

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5,049,374

## ORAL (COATED BEAD) DOSAGE FORM FOR SODIUM IODIDE I-131

Richard J. Dansereau, R.D. 1 Box 162, Sherburne, N.Y. 13460, and Raymond N. Dansereau, 275 S. Main Ave., Albany, N.Y. 12208

Filed Nov. 28, 1989, Ser. No. 441,984

Int. Cl.[5] A61K *43/00;* C09K *11/04;* A61N *5/00*

U.S. Cl. 424—1.1 3 Claims

1. A coated bead pharmaceutical composition for oral administration comprising:

a) inert substrate beads

b) a polymer film

c) and a radioactive species of sodium iodide wherein said sodium iodide is uniformly dispersed in said polymer film; wherein said polymer film is affixed to said inert substrate beads.

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5,049,375

## ORAL COMPOSITIONS CONTAINING COLLOIDAL FLUORIDE

Satoshi Tsujita; Manabu Tonomura, both of Tochigi; Shigeto Kayane, Wakayama, and Takashi Imamura, Chiba, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 24, 1990, Ser. No. 527,776

Claims priority, application Japan, May 31, 1989, 1-138036; May 31, 1989, 1-138037

Int. Cl.[5] A61K *7/18, 33/16*

U.S. Cl. 424—52 14 Claims

1. A colloidal tooth decay preventing fluoride dentrifice or mouthwash comprising colloidal particles of fluoride which are difficulty soluble in water, said colloidal particles of fluoride having a particle size of 0.005 to 1 micron, said fluoride having a fluoride ion concentration of 1 to 10,000 ppm in the state of saturation.

5,049,376

## COSMETIC POWDER BAR COMPOSITION AND PROCESS FOR MAKING SAME

John H. Murphy, Belle Mead; Hovig O. Ounanian, Princeton Junction; Kenneth A. Cohen, Aberdeen; Joseph DiSomma, Ramsey, and Harvey Gedeon, Allendale, all of N.J., assignors to Revlon, Inc., New York, N.Y.

Filed Jan. 26, 1990, Ser. No. 470,921

Int. Cl.[5] A61K *7/02*

U.S. Cl. 424—63 10 Claims

1. A cosmetic powder bar composition comprising about 20% to about 40% calcium sulfate dihydrate, about 16% to about 37% mica or mica-containing composite material, and about 0.5% to about 2.4% polyethylene, about 0.5% to about 16% talc, about 1% to about 9.5% calcium carbonate, about 1% to about 20% humectant, about 0.75% to about 4% emulsifier, about 0.1% to about 22.5% colorant, about 0.5% to about 0.75% preservative, and about 0 to about 0.75% of a catalyst which accelerates the reaction of calcium sulfate hemihydrate to calcium sulfate dihydrate at ambient conditions, all said concentrations by weight of the total composition.

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5,049,377

## HAIR-CARE COMPOSITION AND METHODS OF TREATING HAIR

Jo Ann Lamb, Midland County, and Kathy L. Dillon, Bay County, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 2, 1990, Ser. No. 487,335

Int. Cl.[5] A61K *7/075, 7/08, 7/09, 7/11*

U.S. Cl. 424—70 9 Claims

1. In a hair treating formulation containing at least one of the materials selected from the group consisting of a conditioning agent, surfactant, neutralizing agent, water soluble quaternised protein, silicone polymer, water, thickener, nonionic emulsifying wax, sunscreen, fixative and antimicrobial, the improvement comprising a conditioning agent which is a hydrophobic cationic aqueous emulsion of a highly branched and crosslinked silicone polymer present in an amount of from 0.05 to 20 percent by weight of the total weight of the composition, the polymer being an organosiloxane of the formula:

$$R_nSiO_{\frac{4-n}{2}}$$

wherein:

R is selected from the group consisting of hydrogen, a monovalent hydrocarbon radical and a halogenated monovalent hydrocarbon radical; and

n is an integer having an average value of from one to less than three, the branched and crosslinked silicone polymer being a highly branched and crosslinked polydimethylsiloxane and including less than about forty percent of linear silicone polymer as determined by extraction with toluene.

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5,049,378

## PREVENTION AND TREATMENT OF PORCINE HAEMOPHILUS PNEUMONIA (PHP)

Manuel Campos, Saskatoon, Canada, assignor to Ciba-Geigy Canada Ltd., Ontario, Canada

Filed Apr. 24, 1989, Ser. No. 342,990

Int. Cl.[5] A61K *37/66*

U.S. Cl. 424—85.4 9 Claims

1. A method of treating or preventing a disease in swine, wherein said disease is caused by infection by Actinobacillus pleuropheumoniae, said method comprising administering a dosage of an interferon to said swine that is effective in treating or preventing said disease, wherein said interferon is selected from the group consisting of porcine interferon alpha and porcine interferon gamma.



5,049,379

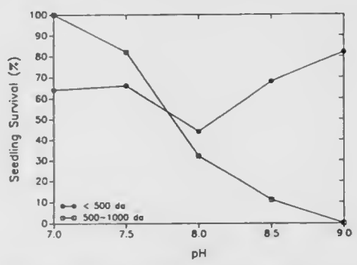
## FUNGICIDAL TOXIN AND METHOD AND INOCULUM FOR CONTROLLING ROOT ROT AND DAMPING OFF

Jo Handelsman; Larry J. Halverson, and Philip J. Balandyk, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 77,850, Jul. 22, 1987, abandoned. This application May 16, 1988, Ser. No. 194,399

Int. Cl.[5] A01N *00/00;* C12N *1/20;* A01C *1/06;* A01N *z*

U.S. Cl. 424—115 2 Claims




1. A seed inoculum for application to seeds to be protected from damping off and root rot comprising a non-interfering carrier and a sufficient quantity of *Bacillus cereus* antibiotic to inhibit the pathogenic activity of *Phytophthora megasperma,* the antibiotic produced by a bacteria selected from the group consisting of *Bacillus cereus* ATCC 53522, mutants of *bacillus cereus* ATCC 53522 which retain the ability to produce said antibiotic, and mixtures of said strains.

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5,049,380

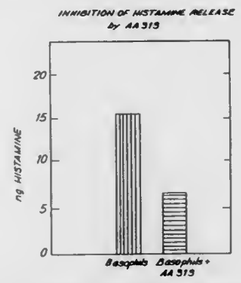
## ANTI-ALLERGIC EXTRACT

Shlomo Grossman, Ramat-Gan; Rina Reznik, Raanana, and David Altman, Ramat-Gan, all of Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel

Filed May 2, 1989, Ser. No. 346,104

Int. Cl.[5] A61K *35/78, 9/52, 9/22*

U.S. Cl. 424—195.1 3 Claims




1. A method of treating allergies in mammals comprising administering a pharmaceutically effective amount of a material selected from water soluble extracts prepared by extracting plant tissue of the Order Malvales comprising fresh leaves or stems or both, and fractions separable from said extract in water, breaking down said plant tissue to the extent necessary for the extracting step to be viable, separating the aqueous extract from insoluble matter, subjecting said separated aqueous extract to chromatographic fractionation, filtration, or lyophilization, said material characterized by having anti-allergic activity in mammals.

5,049,381

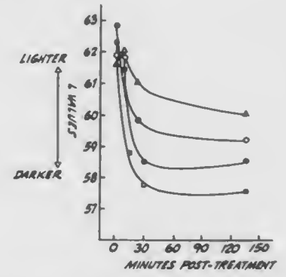
## SKIN COLORING COMPOSITIONS CONTAINING INDOLES AND QUATERNARY AMMONIUM SALTS

Thomas M. Schultz, Highland Mills, N.Y.; George Serban, Ridgefield, Conn., and Alexander C. Chan, Mineola, N.Y., assignors to Clairol Incorporated, New York, N.Y.

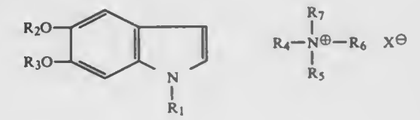
Filed Nov. 22, 1989, Ser. No. 440,536

Int. Cl.[5] A61K *7/021, 31/40*

U.S. Cl. 424—401 18 Claims




1. A skin coloring composition useful for imparting a tan appearance to the skin comprising a cosmetically acceptable carrier together with a tinctorially effective amount of a mixture of compounds represented by the following formulas A and B:



A B

wherein:

$R_1$ is hydrogen, $C_1$–$C_6$ alkyl, $C_1$–$C_6$ hydroxyalkyl or alkoxyalkyl containing a total of 2 to 6 carbon atoms;

$R_2$ and $R_3$, which may be the same or different, are hydrogen, $C_1$–$C_{12}$ alkyl, phenyl or $C_1$–$C_{18}$ acyl;

$R_4$, $R_5$, $R_6$ and $R_7$, which may be the same or different, are $C_1$–$C_{12}$ alkyl, $C_1$–$C_{12}$ hydroxyalkyl, $C_1$–$C_{12}$ alkoxyl phenyl, $C_1$–$C_{12}$ alkylphenyl, nitro substituted phenyl amino substituted phenyl, nitro substituted $C_1$–$C_{12}$ alkylphenyl or amino substituted $C_1$–$C_{12}$ alkylphenyl;

and x is halogen.

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5,049,382

## COATING AND COMPOSITION CONTAINING LIPID MICROSTRUCTURE TOXIN DISPENSERS

Ronald R. Price, Stevensville, and Robert F. Brady, Jr., Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1989, Ser. No. 343,762

Int. Cl.[5] A61K *37/22;* C09D *5/16;* C08J *6/00*

U.S. Cl. 424—450 23 Claims

1. A biocidal coating composition comprising:

a coating carrier; and

cylindrical microstructures formed upon lipid tubule templates, said cylindrical microstructures having a hollow core and an inner cylindrical surface metalized with a layer of a biocidal metal, said cylindrical microstructures being present in said carrier in a concentration effective to provide said coating with biocidal activity.

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**5,049,383**

## AQUEOUS BIOCIDAL CATIONIC DISPERSIONS OF POLYMERS AND THEIR USE AS FUNGICIDAL, BACTERICIDAL AND ALGICIDAL TREATMENT AGENTS

**Hans-Ullrich Huth, Langen; Helmut Braun, Kriftel, and Franz König, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany**

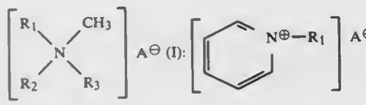
**Continuation of Ser. No. 177,697, Apr. 5, 1987, abandoned. This application Dec. 29, 1989, Ser. No. 458,966**

**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711680**

**Int. Cl.[5] A01N** *25/04, 33/12, 25/02;* **B05D** *3/02*

**U.S. Cl. 424—405** **10 Claims**

1. An antimicrobial composition comprising an antimicrobically effective amount of a fine particle dispersion containing a biocidally, cationcally active surfactant quaternary ammonium compound in an aqueous media, wherein the dispersion of a cationic polymer contains biocidal cationically surfactant quaternary organic ammonium compounds of the formula I and-/or II



in which

$R_1$=($C_8$-$C_{18}$)-alkyl or -alkenyl,

$R_2$=($C_8$-$C_{18}$)-alkyl or -alkenyl, aryl or ($C_7$-$C_{18}$)-aralkyl, in which the aromatic rings are unsubstituted or substituted with at least one member of the group consisting of chlorine and bromine

$R_3$=($C_1$-$C_4$)-alkyl or the radical —($CH_2$—$CHR^4O$)$_n$—$R^5$, in which n denotes a number from 1 to 20 and $R^4$ and $R^5$, which can be identical or different, denote H and/or ($C_1$-$C_4$)-alkyl, and

A=an anion of an organic or inorganic acid.

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**5,049,384**

## ANTIBACTERIAL COMPOSITION FOR MEDICAL USE AND A PROCESS FOR THE PREPARATION THEREOF

**Young S. Kim, Cosmos Mansion 1002, #302-62, Ichon-Dong, Yongsan-Ku, Seoul, Rep. of Korea**

**Filed Jul. 7, 1989, Ser. No. 376,588**

**Claims priority, application Rep. of Korea, Jul. 8, 1988, 88-8503[U]**

**Int. Cl.[5] A61K** *9/00*

**U.S. Cl. 424—405** **9 Claims**

1. A pharmaceutical composition for treating bacterial infections which comprises, in a weight ratio of 30:70 to 70:30 sulbactam or a pharmaceutically acceptable salt thereof and methampicillin or a pharmaceutically acceptable salt thereof.

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**5,049,385**

## SOLID HALOGEN-CONTAINING COMPOSITION AND METHOD FOR PRODUCING SAME

**Charles R. Wiedrich, Wadsworth; Robert B. Simmons, Norton, and Jonathan G. Lasch, Akron, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 30, 1988, Ser. No. 213,383**

**Int. Cl.[5] A01N** *25/12*

**U.S. Cl. 424—408** **14 Claims**

1. Solid halogen-containing disinfectant material having dispersed therein a readily discernible amount of particulate inorganic salt treated with from about 0.01 to about 5 weight percent of water-dispersible colorant, said inorganic salt and colorant being resistant to oxidation by halogen of the halogen-containing material.

**5,049,386**

## N-ω,(ω-1)-DIALKYLOXY)- AND N-(ω,(ω-1)-DIALKENYLOXY)ALK-1-YL-N,N,N-TETRASUBSTITUTED AMMONIUM LIPIDS AND USES THEREFOR

**Deborah A. Eppstein, Menlo Park; Philip L. Felgner, Los Altos; Thomas R. Gadek, Oakland; Gordon H. Jones, Cupertino, all of Calif., and Richard B. Roman, Fairbope, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

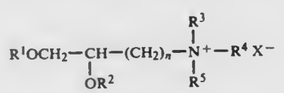
**Division of Ser. No. 428,815, Oct. 27, 1989, Pat. No. 4,946,787, which is a division of Ser. No. 114,809, Oct. 29, 1987, Pat. No. 4,897,355, which is a continuation-in-part of Ser. No. 877,916, Jun. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 689,407, Jan. 7, 1985, abandoned. This application May 15, 1990, Ser. No. 524,257**

**Int. Cl.[5] A61F** *2/00*

**U.S. Cl. 424—427** **8 Claims**

1. A method for the transdermal, topical or ocular delivery of a drug to the skin or to a mucous membrane of a human or animal subject, comprising the steps of:

(1) forming a liposome comprising a therapeutically effective amount of a drug and a compound of Formula I:



I

or an optical isomer thereof, wherein

$R^1$ and $R^2$ are the same or different and are an alkyl or alkenyl group of 6 to 24 carbon atoms;

$R^3$, $R^4$ and $R^5$ are such that:

(i) they are the same or different and are each alkyl of 1 to 8 carbon atoms, aryl, or aralkyl of 7 to 11 carbon atoms, or

(ii) two taken together form pyrrolidino, piperidino, or morpholino, and the third is alkyl of 1 to 8 carbon atoms, aryl, or aralkyl of 7 to 11 carbon atoms, or

(iii) all three together form quinuclidino;

n is 1 to 8; and

X is a pharmaceutically acceptable anion; and

(2) applying the liposome to the skin or a mucous membrane of said subject.

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**5,049,387**

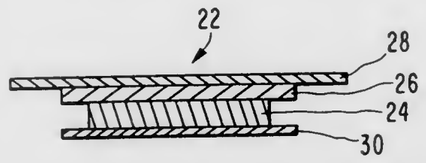
## INDUCING SKIN TOLERANCE TO A SENSITIZING DRUG

**Alfred Amkraut, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.**

**Continuation-in-part of Ser. No. 217,014, Jul. 8, 1988, Pat. No. 5,000,956. This application Jun. 9, 1989, Ser. No. 364,932**

**Int. Cl.[5] A61F** *13/00*

**U.S. Cl. 424—435** **36 Claims**




1. A method of inducing immune tolerance to a drug in a human, which drug is susceptible to inducing mucosal sensitization in the human when the drug is transmucosally administered at a therapeutically effective rate, comprising:

(a) continuously and co-extensively administering to the mucosa of the human:

(1) the drug, to a selected mucosa site, at a therapeutically effective rate and over a predetermined delivery period; and

(2) a corticosteroid, the corticosteroid being administered to the same selected site (i) at a rate and (ii) for a period of time sufficient to induce immune tolerance to the drug in the human; and thereafter

(b) discontinuing the transmucosal administration of the corticosteroid to the human, and

(c) transmucosally readministering the drug, without administering any corticosteroid, to the human, the drug being readministered at a therapeutically effective rate and for a period of time sufficient to maintain the induced immune tolerance in the human.



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**5,049,388**

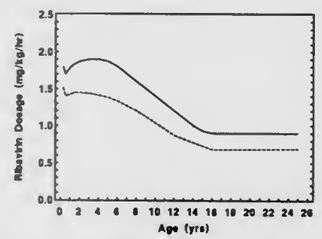
## SMALL PARTICLE AEROSOL LIPOSOME AND LIPOSOME-DRUG COMBINATIONS FOR MEDICAL USE

**Jack V. Knight; Brian E. Gilbert; Samuel Z. Wilson, all of Houston, Tex.; Howard R. Six, East Stroudsborg, Pa., and Philip R. Wyde, Houston, Tex., assignors to Research Development Foundation, Carson City, Nev.**

**Continuation-in-part of Ser. No. 927,898, Nov. 6, 1986, abandoned, and a continuation-in-part of Ser. No. 239,512, Sep. 1, 1988, abandoned. This application Jul. 21, 1989, Ser. No. 383,383**

**Int. Cl.[5] A61K** *37/22*

**U.S. Cl. 424—450** **25 Claims**




1. Aqueous aerosol droplets containing one or more liposome particles, the majority of the mass of the aerosol droplets having a diameter from 1 to 5 microns, and having an aerodynamic mass median diameter ranging from about 1 to 3 microns, the liposome particles being substantially homogeneous in size and having a diameter of less than 1 micron thereby providing deposition of the droplets containing the one or more liposome particles throughout a respiratory tract of a patient when inhaled.

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**5,049,389**

## NOVEL LIPOSOME COMPOSITION FOR THE TREATMENT OF INTERSTITIAL LUNG DISEASES

**Ramachandran Radhakrishnan, Fremont, Calif., assignor to Liposome Technology, Inc., Menlo Park, Calif.**

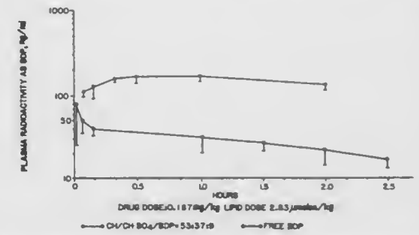
**Continuation-in-part of Ser. No. 284,158, Dec. 14, 1988, Pat. No. 4,906,476. This application Dec. 1, 1989, Ser. No. 444,738**

**The portion of the term of this patent subsequent to Mar. 6, 2007, has been disclaimed.**

**Int. Cl.[5] A61K** *37/22;* **A61F** *13/00;* **B01J** *13/02*

**U.S. Cl. 424—450** **28 Claims**

1. A nonphospholipid lipid composition for treatment of interstitial lung diseases consisting essentially of nonphospholipid lipid component and a drug, or its salt or ester, suitable for delivery by inhalation into the deep lung wherein lipid component forms lipid particles.




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**5,049,390**

## LIPOSOME CONTAINING IMMUNOTHERAPY AGENTS FOR TREATING IGE MEDIATED ALLERGIES

**Aristo Wojdani, Los Angeles, Calif., assignor to Allergy Immuno Technologies, Inc., Newport Beach, Calif.**

**Continuation of Ser. No. 92,032, Sep. 2, 1987, abandoned. This application Apr. 25, 1990, Ser. No. 515,650**

**The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.**

**Int. Cl.[5] A61K** *37/22*

**U.S. Cl. 424—450** **11 Claims**

1. An allergy immunotherapy agent comprising liposome, an allergen which causes an IgE mediated allergy and a BRM derived from Corynebacterium Parvum.

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**5,049,391**

## LIPOSOME ENCAPSULATED HEMOGLOBIN

**Kazuhiko Suzuki, and Keisuke Sakaguchi, both of Shizuoka, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan**

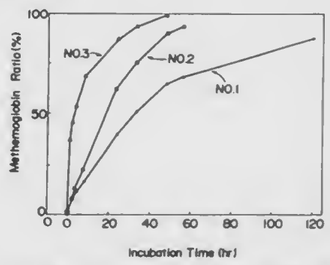
**PCT No. PCT/JP88/00208, § 371 Date Aug. 25, 1989, § 102(e) Date Aug. 25, 1989, PCT Pub. No. WO88/06437, PCT Pub. Date Sep. 7, 1988**

**PCT Filed Feb. 26, 1988, Ser. No. 408,485**

**Claims priority, application Japan, Feb. 27, 1987, 62-42826; Feb. 27, 1987, 62-42827**

**Int. Cl.[5] A61K** *37/22, 37/14*

**U.S. Cl. 424—450** **11 Claims**




1. A hemoglobin-containing liposome in which an aqueous solution of hemoglobin is incorporated comprising a liposome membrane composed of a hydrogenated phopholipid having a percentage of hydrogenation of 50% or more and an aqueous hemoglobin solution containing hemoglobin in a concentration of 30–60% (w/v).

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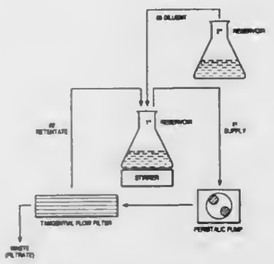


5,049,392

## OSMOTICALLY DEPENDENT VESICLES

Alan L. Weiner, Lawrenceville, and Frank G. Fielder, East Windsor, both of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Filed Jan. 18, 1989, Ser. No. 298,470
Int. Cl.[5] A61K *37/22, 39/00;* B01J *13/02*
U.S. Cl. 424—450 11 Claims



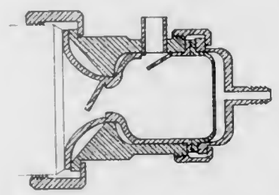
1. Method of producing liposome vesicles comprising active agent comprising contacting liposomes including an entrapped intralamellar osmotic agent one or more times with a washing solution including active agent wherein said solution is effectively hypotonic to said entrapped osmotic agent thereby causing the active agent to be encapsulated in the liposomes.

5,049,393

## ANTI-THROMBOGENIC ELASTOMER AND OBJECTS AND PROSTHESES MADE THEREFROM

George P. Noon; Louis W. Feldman, both of Houston, and Julia A. Peterson, South Houston, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 816,927, Jan. 7, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 213,760
Int. Cl.[5] A61K *9/00*
U.S. Cl. 424—484 26 Claims



1. An antithrombogenic composition consisting essentially of

a biocompatible miscible matrix material selected from the group consisting of a silicone polymer, an acrylic polymer and a urethane polymer, and

powderized graphite distributed throughout said miscible material rendering said composition anti-thrombogenic throughout.

5,049,394

## PHARMACEUTICAL COMPOSITION CONTAINING HIGH DRUG LOAD AND METHOD FOR PREPARING SAME

John R. Howard, and Anne M. Delargy, both of Merseyside, United Kingdom, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 95,498, Sep. 11, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,717
Int. Cl.[5] A61K *9/16, 9/50*
U.S. Cl. 424—490 19 Claims

1. A method for preparing a pharmaceutical composition in the form of a bead having a diameter of 0.5 to 1.5 mm and containing more than about 80% by weight medicament, which comprises forming a wet mass of medicament, non-lipophilic binder-plasticizer which is a microcrystalline cellulose in an amount within the range of from about 1 to about 15% by weight of the final composition, starch-based excipient in an amount within the range of from about 0.5 to about 12% by weight of the final composition, wherein the starch-based excipient is sodium starch glycolate, corn starch, croscarmellose, pregelatinized starch or mixtures thereof, and optionally water-soluble binder with a granulating fluid, extruding said wet mass to form an extrudate and forming said extrudate into beads and drying said beads.

2. A pharmaceutical composition in the form of a bead containing a high medicament load, comprising a medicament in an amount of more than about 80% by weight of the composition, a non-lipophilic binder-plasticizer which is microcrystalline cellulose in an amount within the range of from 1 to about 15% by weight of said composition, a starch-based excipient in an amount within the range of from about 0.5 to about 12% by weight of said composition, wherein the starch-based excipient is sodium starch glycolate, corn starch, croscarmellose, pregelatinized starch or mixtures thereof, and optionally a water-soluble binder, prepared by the process as defined in claim 1.

15. The composition as defined in claim 2 wherein said medicament is present in an amount within the range of from about 80 to about 95% by weight of said composition.

5,049,395

## CONTROLLED RELEASE VEHICLE

An-Cheng Chang, Nashua, N.H., assignor to Micro Vesicular Systems, Inc., Nashua, N.H.

Continuation-in-part of Ser. No. 320,944, Mar. 9, 1989, Pat. No. 4,959,341, and a continuation-in-part of Ser. No. 371,210, Jun. 26, 1989, Pat. No. 4,944,734, and a continuation-in-part of Ser. No. 490,356, Mar. 8, 1990, Pat. No. 4,952,550. This application May 9, 1990, Ser. No. 521,086
Int. Cl.[5] A61K *9/16, 9/24, 9/50*
U.S. Cl. 424—494 19 Claims

1. A system for providing release of an aqueous dispersible entrapped molecule upon hydration comprising:

an entrapping vehicle formed of a partially cross-linked carboxylated cellulose material, said entrapping vehicle having said molecule entrapped therein,

a hydroxyalkylcellulose coating agent which forms a barrier around said entrapping vehicle, and

cellulase, hemicellulase or mixtures thereof as release agent which is quiescent in a dry state but degrades said entrapping vehicle upon hydration to provide release of said entrapped molecule.



5,049,396

## PHARMACEUTICAL COMPOSITIONS WITH ANTI-CANCER ACTIVITY AND METHOD FOR THE TREATMENT OF CANCER SENSITIVE TO TREATMENT

Reidar Oftebro, Hvalstad; Erik O. Pettersen; John M. Dornish, both of Oslo; Bernt Borretzen, and Rolf O. Larsen, both of Porsgrunn, all of Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Mar. 27, 1989, Ser. No. 329,379
Claims priority, application United Kingdom, Apr. 29, 1988, 8810173
Int. Cl.[5] A61K *33/24, 31/34*
U.S. Cl. 424—649 9 Claims

6. A method for the treatment of cancer in a patient which comprises administering to said patent an anti-cancer effective amount of a synergistic combination of

(i) cisplatin, and p1 (ii) 5,6-O-benzylidene-L-ascorbic acid deuterated in the 1-position of the aldehyde group of the benzylidene moiety or a pharmaceutically acceptable salt thereof,

the cancer being one sensitive to the combination, the administration of (i) being by injection and the administration of (ii) being by injection or orally.

5,049,397

## DEGRADATION PRODUCT OF TOTAL PROTEIN

Winfried Kolbeck; Heinz Pyttlik, and Maruta Grasis, all of Munich, Fed. Rep. of Germany, assignors to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

PCT No. PCT/DE00881230, § 371 Date Dec. 14, 1988, § 102(e) Date Dec. 14, 1988, PCT Pub. No. WO88/07822, PCT Pub. Date Oct. 20, 1988
PCT Filed Apr. 13, 1988, Ser. No. 291,079
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712825
Int. Cl.[5] A23K *1/00*
U.S. Cl. 426—7 20 Claims

20. A process for the production of a protein hydrolysate substantially free of mineral salt, and produced by mineral acid hydrolysis of protein matter, wherein the mineral acid hydrolysis comprises dissolving the protein matter in an aqueous mineral acid, comprising

electrolytically neutralizing and reducing the mineral acid hydrolysate of protein matter, wherein the electrolytic neutralization and reduction are performed in anode and cathode compartments containing an anolyte and a catholyte, respectively, which compartments are separated by a diaphragm,

subjecting the electrolyzate to an enzymatic degradation, and,

optionally, concentrating the electrolyzate by evaporation.

5,049,398

## METHOD OF PREPARING MICROWAVE BREAD

Albert L. Saari, Long Lake; James E. Langler, White Bear Lake; Robert C. Dechaine, Minneapolis; Eugene R. Monroe, Mound; James P. Bergstrom, Golden Valley, and Willis P. Kusske, Minneapolis, all, Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 8, 1989, Ser. No. 449,048
Int. Cl.[5] A21D *8/02*
U.S. Cl. 426—20 17 Claims

1. A method of improving the crust and crumb properties of a yeast leavened wheat, flour based water containing dough bakery product upon refreshening with microwaves, which comprises:

incorporating into the dough prior to baking an effective amount of an emulsion, said emulsion comprising:

(1) an antistaling dough conditioner,

(2) up to about 20 parts per 100 parts flour or a farinaceous material having its starch component pregelatinized, and

(3) about 7 parts to 30 parts of the water.

5,049,399

## EDIBLE FOOD PRODUCT

Alvin S. Huang, Wheeling; Myron D. Nicholson, Lemont, and Rama Ramagopal, Bolling Brook, all of Ill., assignors to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 285,454, Dec. 16, 1988, Pat. No. 4,917,924. This application Feb. 1, 1990, Ser. No. 473,553
Int. Cl.[5] A22C *17/10*
U.S. Cl. 426—87 12 Claims




1. An edible food product comprising a flexible moisture-containing elevated temperature processed food body having on its outer surface a desired indicia of aluminum-organic dye lake and a binder-carrier, with said lake dispersed in said binder-carrier and bonded to the food body outer surface by said binder-carrier.

5,049,400

## APPARATUS AND METHOD FOR TREATMENT OF VARIOUS LIQUID OR SLURRY BY ULTRASONIFICATION IN CONJUNCTION WITH HEAT AND PRESSURE

Steven M. Hayden, 407 N. Broad St., Wetumpka, Ala. 36092

Continuation-in-part of Ser. No. 548,492, Jul. 2, 1990. This application Jan. 28, 1991, Ser. No. 646,238
Int. Cl.[5] A23C *3/00;* A23L *3/00*
U.S. Cl. 426—237 8 Claims

5. A method of treating a liquid or slurry to reduce bacteriological and spore contamination comprising the steps of:

(a) saturating liquid or slurry with gas or gaseous molecules;

(b) pressurizing liquid or slurry between 2 TORR and 500 TORR;

(c) maintaining of temperature of liquid and slurry within a predetermined temperature range; and

(d) sonificating liquid or slurry at a predetermined intensity, the combination of steps yielding a reduction in bacterial and spore contamination.

5,049,401

## GLUCOMANNAN PRODUCT AND A METHOD TO COAGULATE IT

Seiki Harada, Zushi; Masatsugu Ito, Tokyo; Koichi Iwanami, Tokyo, and Kenichi Hashimoto, Tokyo, all of Japan, assignors to Uni Colloid Kabushiki Kaisha, Kanagawa and Nippon Oil and Fats Company, Limited, Tokyo, both of, Japan

Filed Mar. 19, 1990, Ser. No. 496,204
Claims priority, application Japan, Mar. 17, 1989, 1-63538
Int. Cl.[5] A23L *1/0528*
U.S. Cl. 426—573 17 Claims

1. A glucomannan product, which comprises (1) glucomannan as principal component, (2) an encapsulated acidic material which comprises an acidic substance covered with a wall of a hydrophobic substance, and (3) an encapsulated alkaline material which comprises an alkaline substance covered with a wall of a hydrophobic substance, wherein the melting point of the wall of the encapsulated alkaline material is at least 5° C. lower than the melting point of the wall of the encapsulated acidic material.

5,049,402

## PROCESS FOR MINIMIZING BITTERNESS IN CITRUS FRUIT JUICE

Yoji Tamaki, Kagamigahara; Osamu Mutsushika, Kasugai, and Hiroaki Mieda, Nagoya, all of Japan, assignors to Pokka Corporation, Japan

Filed Jan. 23, 1990, Ser. No. 469,085

Claims priority, application Japan, Aug. 3, 1989, 1-200333; Dec. 5, 1989, 1-314164

Int. Cl.[5] A23L *2/06*

U.S. Cl. 426—599 5 Claims

1. A process for producing a citrus fruit juice beverage having a reduced limonin content which comprises subjecting fruit juice obtained by squeezing citrus fruit to a pressure of 1200 to 4000 kg/cm$^2$ for 1 to 30 minutes under conditions sufficient to reduce limonin content of said juice.

5,049,403

## PROCESS FOR THE PREPARATION OF SURFACE MODIFIED SOLID SUBSTRATES

Karl O. P. Larm, Bromma; Lars A. Adolfsson, and Kjell P. Olsson, both of Uppsala, all of Sweden, assignors to Horsk Hydro A.S., Oslo, Norway

Filed Oct. 12, 1989, Ser. No. 420,481

Int. Cl.[5] A01N *1/02*

U.S. Cl. 427—2 14 Claims

1. A method for the surface modification of a substrate which comprises adsorbing on the surface of a solid substrate a polyamine having a high average molecular weight and cross-linking the polyamine with crotonaldehyde.

2. A method according to claim 1 wherein the adsorption and cross-linking with the crotonaldehyde is achieved by applying to the substrate an aqueous solution containing the polyamine and the crotonaldehyde.

5,049,404

## METHOD AND APPARATUS FOR APPLYING ULTRA-THIN COATINGS TO A SUBSTRATE

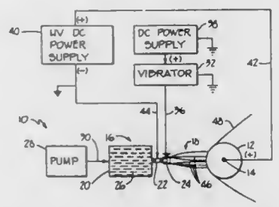
Semyon Kisler, Needham; William J. Timson, Belmont, and John E. Tremblay, Burlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 32,606, Apr. 1, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,011

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[5] B05D *1/04;* B05B *5/035*

U.S. Cl. 427—30 14 Claims




1. Apparatus for applying a uniform thickness layer of coating material to a substrate comprising:

a coating applicator adapted for coupling to a source of coating material, with said applicator having an opening therein formed of dielectric material;

means for pressurizing coating material within said coating applicator to a pressure level that will maintain a substantially constant volume of coating material at the output of said dielectric applicator opening;

means for supporting a substrate in a spaced relation from said applicator opening output to thereby form a coating gap between said output and the substrate;

means for applying a vibratory force to said applicator to thereby cause coating material flow to a selected portion of said applicator opening output and to stabilize the surface shape of coating material at said selected output portion;

means for establishing an electrostatic field in said coating gap between coating material at said applicator opening output and the substrate spaced therefrom to electrostatically atomize the coating material at said applicator opening output, thereby extracting minute coating material particles from coating material at said applicator opening output, and subsequently transport them to and deposit them on the substrate; and

means for moving the substrate through said coating gap, at a constant rate, whereby a relatively thin, uniform thickness layer of said electrostatically atomized coating material is deposited on the substrate.

12. A method of applying a uniform thickness layer of coating material to a substrate comprising the steps of:

forming a coating applicator adapted for coupling to a source of coating material, with said applicator having an opening therein composed of dielectric material;

pressurizing coating material within said coating applicator to a pressure level that will maintain a substantially constant volume of coating material at the output of said applicator opening;

supporting a substrate in a spaced relation from said applicator opening to thereby form a coating gap between said output and the substrate;

applying a vibratory force to said applicator to thereby cause coating material flow to a selected portion of said applicator opening output and to stabilize the surface shape of coating material at said selected output portion;

establishing an electrostatic field in said coating gap between coating material at said applicator opening output and the substrate spaced therefrom to electrostatically atomize the coating material at said applicator output, to thereby extract minute coating material particles from coating material at said applicator opening output, and subsequently transport them to and deposit them on the substrate; and

moving the substrate through said coating gap, at a constant rate, whereby a thin, uniform thickness layer of said electrostatically atomized coating material is deposited on the substrate.

5,049,405

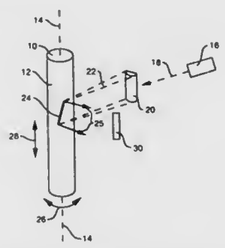
## METHOD OF THIN FILM DEPOSITION USING LASER ABLATION

Jeffrey T. Cheung, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 359,005, May 26, 1989, abandoned. This application Jun. 29, 1990, Ser. No. 547,531

Int. Cl.[5] B05D *3/06;* C23C *16/00, 14/00*

U.S. Cl. 427—53.1 10 Claims




1. A method of laser ablation for depositing a thin film of material on a substrate, comprising the steps of:

providing a target of deposition material, said target having a curved ablative surface rotatable about an axis of rotation, said curved ablative surface surrounding said axis of rotation and forming a generally circular line when taken in cross section perpendicular to said axis to rotation;

rotating said curved ablative surface about said axis of rotation;

focusing a laser beam on said rotating ablative surface along a line of incidence at an angle with respect to said axis of rotation such that said line of incidence and said axis do not form a plane;

producing a plume of laser ablated material by action of said laser beam line on said rotating curved ablative surface; and

positioning the substrate to receive said ablated material as a thin film deposit on the substrate.



5,049,406

## METHOD OF MANUFACTURING SOLID BODIES

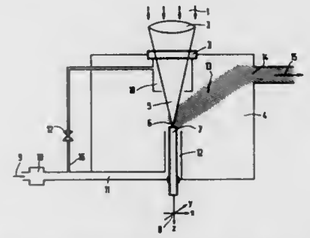
Peter E. E. Geittner, Aachen, and Hans-Jürgen Lydtin, Stolberg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 11, 1989, Ser. No. 378,555

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1988, 3824273

Int. Cl.[5] B05D *3/06*

U.S. Cl. 427—53.1 7 Claims




1. A method of manufacturing solid bodies by coating a substrate by employing at least one starting material supplied in the form of clusters, which clusters are metered by a carrier-gas stream, which clusters are conveyed to and focussed on the axis of the carrier-gas stream by a laser beam which beam is oriented so as to be parallel to said axis, has an annular intensity distribution which is concentric with said axis, and which laser beam has a maximum energy density in the outer region surrounding the carrier-gas stream at a minimum energy density on its axis, disintegrating said clusters into their molecular or atomic constituents and depositing said constituents on said substrate in the form of compact layers.

5,049,407

## PROCESS AND APPARATUS FOR PRODUCING COATED GLASS YARNS

Barbara Soszka; Jacques Mahler, and Eric Augier, all of Chambery, France, assignors to Vetrotex Saint-Gobain, Aubervilliers, France

Continuation of Ser. No. 42,200, Apr. 23, 1987, abandoned. This application Feb. 17, 1989, Ser. No. 313,347

Claims priority, application France, Apr. 24, 1986, 86 05938

Int. Cl.[5] B05D *3/06, 3/12*

U.S. Cl. 427—54.1 33 Claims

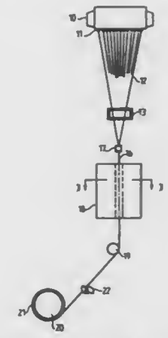
1. A process for producing coated glass yarns which comprises:

drawing a plurality of glass fibers from a source of glass material wherein said source is heated above the melting point of said material;

applying a sizing coating which is capable of polymerizing and/or crosslinking when irradiated, to the surface of said fibers immediately after drawing thereof;

gathering said coated fibers into a yarn; and

irradiating said yarn with actinic radiation to polymerize and/or crosslink said sizing coating; said method steps being carried out in less than about one second as the fibers and yarn travel over a distance of less than 5 meters.




5,049,408

## METHOD FOR COATING PHOSPHOR PARTICLES USING ALUMINUM ISOPROPOXIDE PRECURSORS AND AN ISOTHERMAL FLUIDIZED BED

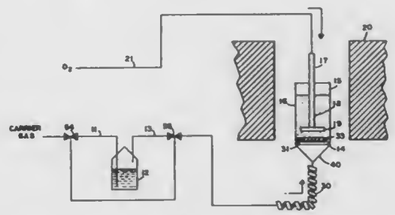
Keith A. Klinedinst, Marlborough, and Richard A. Gary, Everett, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 432,941, Nov. 7, 1989, Pat. No. 4,999,219. This application Aug. 24, 1990, Ser. No. 573,091

The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.

Int. Cl.[5] B05D *5/12, 7/00*

U.S. Cl. 427—69 7 Claims




1. A method for forming a continuous coating on phosphor particles of a fine phosphor powder comprising:

a) vaporizing aluminum isopropoxide into- an inert carrier gas at a temperature below the decomposition temperature of aluminum isopropoxide to form a carrier gas containing vaporized aluminum isopropoxide;

b) passing said carrier gas containing aluminum isopropoxide through a mixture of fine phosphor powder and up to 1 weight percent of a fluidizing aid in which the particles are suspended in the carrier gas and to envelop the fluidized particles with vapor of aluminum isopropoxide, said fluidized bed being maintained at a nearly isothermal condition and at a temperature above 300° C.;

c) passing an oxidizing gas into said fluidized bed and reacting said oxidizing gas with the vaporized aluminum isopropoxide on the phosphor powder for a period of time sufficient to form a continuous coating of predetermined thickness on the phosphor particles; and

d) shutting off the flow of said carrier gas containing vaporized aluminum isopropoxide to said fluidized bed to oxidize any unreacted carbon on the continuous coating of

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predetermined thickness on the phosphor particles at a temperature of about 300° C. to about 500° C. so that the residual carbon content on the coating is reduced.

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5,049,409

## METHOD FOR METAL OR METAL COMPOUNDS INSERTED BETWEEN ADJACENT GRAPHITE LAYERS

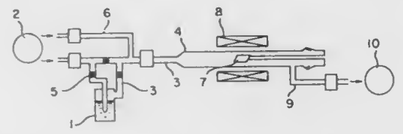
Yoshikazu Yoshimoto, Tenri; Tomonari Suzuki, Kashihara; Yoshiyuki Higashigaki, Kashiwa; Shigeo Nakajima, Nara, and Toshio Inoguchi, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 190,353, May 5, 1988, Pat. No. 4,946,370, which is a continuation-in-part of Ser. No. 841,188, Mar. 19, 1986. This application Apr. 28, 1989, Ser. No. 344,961

Claims priority, application Japan, Mar. 20, 1985, 56478; Mar. 22, 1985, 59275; Mar. 26, 1985, 64572

Int. Cl.[5] C23C *16/18, 16/26, 16/46;* B05D *5/12*

U.S. Cl. 427—122 6 Claims




1. A method for preparing a graphite intercalation compound having a metal or a metal compound inserted between adjacent graphite layers, comprising

simultaneously introducing a mixture of a vapor of both a hydrocarbon compound and an organo metallic compound selected from at least one member of the group consisting of tetraphenyl tin and tetraphenyl lead together with a carrier gas into a reactor, and

decomposing said hydrocarbon compound and said organo metallic compound on a single-crystalline substrate at a temperature within the range of from 900° to 1000° C.

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5,049,410

## LUBRICANT FILM FOR A THIN-FILM DISK

Ajay Johary; Bruce E. Kennedy; James J. Mayerle, and John C. S. Shen, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1989, Ser. No. 430,599

Int. Cl.[5] B05D *5/12*

U.S. Cl. 427—131 15 Claims

1. A method of lubricating a thin-film disk with a single lubricant layer including a fixed lubricant component and a mobile lubricant component in contact with the fixed lubricant component, wherein the lubricant layer has a total thickness of less than about 50 Å and the fixed lubricant component and the mobile lubricant component have the same chemical identity, comprising contacting the thin-film disk with a lubricant composition, comprising a lubricant and a liquid carrier, then heating the thin-film disk coated with the lubricant composition at a sufficient temperature for a sufficient time to essentially fix only the fixed lubricant component to the surface of the thin-film disk with the mobile lubricant component in contact with the fixed lubricant component.

5,049,411

## POLYMER CONCRETE COMPOSITION FOR CEMENTITIOUS ROAD REPAIR AND OVERLAY ON WET AND DRY SURFACES

Kathy B. Sellstrom, Pflugerville, and Harold G. Waddill, Austin, both of Tex., assignors to Texaco Chemical Company, White Plains, N.Y.

Filed Dec. 20, 1989, Ser. No. 453,733

The portion of the term of this patent subsequent to Feb. 27, 2007, has been disclaimed.

Int. Cl.[5] C08G *59/56*

U.S. Cl. 427—136 9 Claims

1. A method for repairing a fault in a cementitious road, comprising applying to the fault a composition comprising:

A. A binder comprising:

(1) a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule;

(2) a stoichiometric amount of a curing ;gent comprising triethyleneglycol diamine and polyoxypropylene diamine;

(3) An accelerator and

B. aggregate.

6. A method for coating a cementitious road comprising applying to the surface of the road a composition comprising:

A. A binder comprising:

(1) a vicinal polyepoxide having an average of at least 1.8 reactive 1,2-epoxy groups per molecule;

(2) a stoichiometric amount of a curing agent comprising triethyleneglycol diamine and polyoxypropylene diamine;

(3) an accelerator comprising an effective amount of a combination of piperazine and N-aminoethylpiperazine, and

B. aggregate comprising gravel, sand and fly ash wherein the aggregate:binder weight ratio is 7:1 to 12:1.

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5,049,412

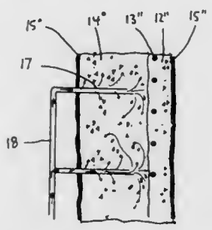
## METHOD OF REALKALIZING CONCRETE IN WHICH CARBONATION HAS OCCURRED

John B. Miller, Olso, Norway, assignor to Norwegian Concrete Technologies AS, Oslo, Norway

Continuation of Ser. No. 352,720, May 8, 1989, abandoned, which is a continuation of Ser. No. 75,771, Jul. 20, 1987, abandoned. This application Mar. 16, 1990, Ser. No. 496,042

Int. Cl.[5] B32B *35/00*

U.S. Cl. 427—140 6 Claims




1. The method of rehabilitating a concrete structure, wherein an outer layer of the concrete structure containing reinforcement has become carbonated through exposure to air over a period of time, and an adjacent layer of the concrete structure remains relatively less carbonated, which comprises the steps of:

(a) initially applying to the outer surface of said concrete structure a water-tight adherent coating,

(b) thereafter saturating said outer and adjacent layers of said concrete structure behind said water-tight coating with water from a source of water external to said concrete structure, and

(c) maintaining said concrete structure in its thus saturated condition for a period of time sufficient to effect diffusion of alkaline materials from the relatively less carbonated adjacent layer of said structure into the relatively carbonated outer layer thereof to effect realkalization said outer layer.



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5,049,413

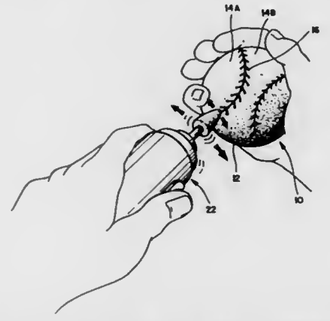
## METHOD FOR CLEANING A BALL-LIKE OBJECT ADAPTED FOR SPORT AND RECREATIONAL USE

William B. Gibson, Rte. 5, Box 238, Kings Mountain, N.C. 28086

Filed Nov. 1, 1989, Ser. No. 429,984

Int. Cl.[5] B32B *35/00;* A46B *13/00*

U.S. Cl. 427—140 20 Claims




12. A method for restoring the leather cover of a ball-like object to its original while color from a condition in which the original white color of the leather cover is discolored by soil and other debris, the ball-like object being of the type adapted for sport and recreational use and the leather cover being sewn in place by stitching across a seam defined between adjoining portions of the cover, comprising:

frictionally contacting the cover with an abrasive medium sufficient to dislodge at least some of the discoloring soil and debris while minimizing the extent to which any abrasion of the cover occurs due to the frictional contacting of the cover;

after frictionally contacting the cover and before the application of any liquid thereto, applying a dry particulate material to the cover occurs due to the frictional contacting of the cover;

after frictionally contacting the cover and before the application of any liquid thereto, applying a dry particulate material to the cover to further dislodge soil and debris from the cover; and

after said dry particulate applying step, coating the cover with a coating material formed of beeswax, the composition of the beeswax being selected to minimize any discoloration of the ball-like object due to the coating thereof.

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5,049,414

## ANTIREFLECTION SOLUTION FOR OPTICAL PARTS AND METHOD FOR ANTIREFLECTION TREATMENT USING SAID SOLUTION

Hirohisa Kato, Aichi, Japan, assignor to Ito Optical Industrial Co., Ltd., Aichi, Japan

PCT No. PCT/JP87/00819, § 371 Date Jun. 21, 1989, § 102(e) Date Jun. 21, 1989, PCT Pub. No. WO89/04004, PCT Pub. Date May 5, 1989

PCT Filed Oct. 24, 1987, Ser. No. 399,556

Int. Cl.[5] B05D *5/06*

U.S. Cl. 427—164 5 Claims

1. A solution for making an optical part non-reflecting comprising:

a) a hydrolytic derivative of a silicic ester of the formula $Si(OR)_4$, wherein R is an alkyl group of 1 to 4 carbon atoms, an alkoxyalkyl group or an acyl group, said hydrolytic derivative having been obtained by hydrolyzing 1 mole of the silicic ester with 5–60 mols of water in the presence of a solvent compatible with both the silicic ester and water to form a hydrolyzate and heating the hydrolyzate at a pH of 3–7;

b) a hydrolyzate of a silicon compound of the formula

$$R_a^1—Si(OR^3)_{4-a-b}$$
(with $R_b^2$ above the Si)

wherein $R^1$ is an alkyl group of 1 to 6 carbon atoms, a vinyl group, an epoxy group, a methacryloxy group or a phenyl group; $R^2$ is an alkyl group of 1 to 6 carbon atoms or a halogenated alkyl group; $R^3$ is an alkyl group of 1 to 4 carbon atoms, an alkoxyalkyl group or an acyl group; and a and b each are 0, 1, or 2, provided that a+b is 1, 2, or 3; and

c) colloidal silica.

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5,049,415

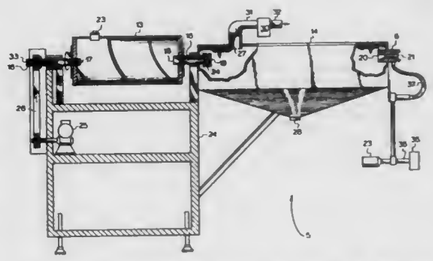
## METHOD FOR APPLYING PARTICULATE MATTER TO A CABLE CORE

Dieter E. Kundis, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Division of Ser. No. 322,343, Mar. 13, 1989. This application Dec. 20, 1990, Ser. No. 631,341

Int. Cl.[5] B05D *1/24*

U.S. Cl. 427—185 4 Claims



1. A method of applying particulate matter to a cable core comprising:

(a) providing first and second chambers, both of said first and second chambers having entrance and exit ports, said first chamber containing particulate matter therein and the exit port of said second chamber comprising an air wipe, said air wipe comprising a cable core passageway having a longitudinal axis in communication with the interior and exterior of said second chamber and at least one air passageway in communication with said cable core passageway, said air passageway having an longitudinal axis disposed at an acute angle to the longitudinal axis of the cable core passageway so that gas forced through said air passageway will be directed into the second chamber;

(b) passing a cable core through said first chamber and applying particulate material thereto to form a coated core;

(c) passing said coated core through said second chamber and said air wipe; and,

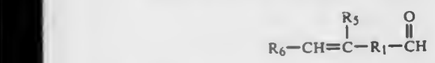
(d) forcing a gas through the air passageway on to said coated core to remove a predetermined amount of particulate matter from said coated core.

5,049,416
## METHOD FOR PREPARING PRESSURE-SENSITIVE ADHESIVE ARTICLES

Joseph J. Wilczynski, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 140,039, Dec. 31, 1987, abandoned. This application May 31, 1990, Ser. No. 531,300
Int. Cl.[5] B05D 5/10
U.S. Cl. 427—208.4 14 Claims

1. A method for preparing a pressure-sensitive adhesive article which consists essentially of coating a substrate on at least a portion of one surface thereof with a normally tacky polymer having a $T_g$ of about 0° C. or less and prepared by a method consisting essentially of copolymerizing a mixture of monomers comprising (a) at least about 40 weight percent of at least one olefinically unsaturated carboxylic acid ester monomer and (b) at least one functional monomer of the formula:

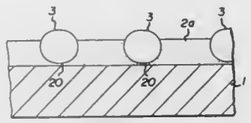


in which $R_1$ is (i) a divalent organic radical comprising a carbon atom which directly adjoins the carbonyl carbon atom of the —CHO group or (ii) a covalent bond, and $R_5$ and $R_6$ are independently selected from the group consisting of hydrogen, hydroxy, halo, thio, amino, and monovalent organic radicals.

5,049,417
## METHOD FOR PRODUCING AN AIR-PERMEABLE ADHESIVE TAPE

Kenji Tsubota, Ikeda, and Nobuo Hanatani, Takatsuki, both of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 13, 1990, Ser. No. 565,789
Int. Cl.[5] B05D 5/10
U.S. Cl. 427—208.6 8 Claims

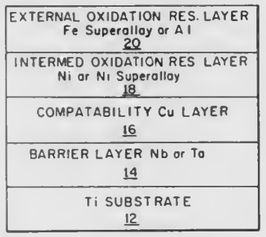



1. A method for producing an air-permeable adhesive tape comprising a substrate and a porous adhesive layer formed on said substrate, comprising the steps of:
forming a layer of a solution on a substrate, said solution containing an adhesive material in an organic solvent;
applying water drops on said layer of said solution while said organic solvent remains in said layer, thereby allowing water drops to sink into said layer,
the diameter of said water drops being in the range of 10 to 1000 μm, and the total amount of said water drops applied onto the surface of said layer being 5 to 200 g/m$^2$;
evaporating said organic solvent contained in said layer of the solution, thereby forming an adhesive layer that contains said water drops; and
evaporating said water from said adhesive layer, thereby forming communicating pores extending from the external surface to the inner surface of said adhesive layer.

5,049,418
## BARRIER COATINGS FOR OXIDATION PROTECTION INCORPORATING COMPATIBILITY LAYER

Albert G. Tobin, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 19, 1991, Ser. No. 656,433
Int. Cl.[5] C23C 16/00
U.S. Cl. 427—250 7 Claims

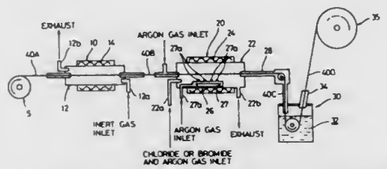



1. A coating method for protecting a substrate of titanium material comprising the steps:
depositing a diffusion barrier layer of refractory metal on the substrate;
depositing a compatibility layer of preselected metal on the barrier layer;
depositing an intermediate oxidation-resistant layer of nickel material on the compatibility layer, the compatibility layer maintaining a bond between both the barrier and intermediate oxidation-resistant layers; and
depositing an outer external oxidizable layer on the intermediate oxidation-resistant layer.

5,049,419
## METHOD FOR MANUFACTURING A PRECURSOR WIRE FOR A CARBON-FIBER-REINFORCED METAL COMPOSITE MATERIAL

Tetsuyuki Kyono; Tohru Hanano, and Tohru Hotta, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 16, 1990, Ser. No. 524,079
Claims priority, application Japan, May 18, 1989, 1-125788
Int. Cl.[5] C23C 16/30, 16/38, 16/02, 2/12
U.S. Cl. 427—251 9 Claims



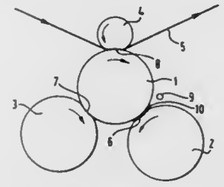

1. A method for manufacturing a precursor wire for a carbon-fiber-reinforced metal composite material, comprising:
a pretreatment process for passing a continuous fiber bundle including a number of single carbon filaments with a sizing agent adhered thereto through an inactive atmosphere at a temperature in the range of from 350° to 800° C., thereby thermally decomposing said sizing agent, the chemical structure of said sizing agent including ether linkages, and leaving a residue of thermal decomposition containing said ether linkages on the surface of each said single filament;
a chemical vapor deposition process for causing a material gas containing a titanium compound and a boron compound and a reducing gas containing zinc to act simultaneously on the continuous fiber bundle at a temperature in the range of from 700° to 800° C. after said sizing agent is thermally decomposed, thereby forming a primary layer consisting of titanium oxides and boron oxides on each said single filament, and forming a surface layer consisting of titanium and boron on said primary layer; and
a composite process for introducing said continuous fiber bundle, with said primary layer and said surface layer formed thereon, into a molten metal used to form a matrix, while isolating said continuous fiber bundle from the open air, thereby impregnating said continuous fiber bundle with said molten metal, and drawing up said continuous fiber bundle so that said molten metal is solidified.



5,049,420
## PROCESS FOR APPLYING MICROCAPSULE-CONTAINING COMPOSITIONS TO PAPER

Terence J. Simons, Chinnor, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Filed Feb. 23, 1990, Ser. No. 483,827
Claims priority, application United Kingdom, Feb. 23, 1989, 8904112
Int. Cl.[5] B05D 3/12
U.S. Cl. 427—361 11 Claims



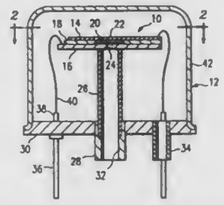

1. A process for applying a microcapsule-containing coating composition to a continuous paper web, comprising the steps of
feeding a microcapsule-containing coating composition to a region of contact between a hard applicator roll and a deformable metering roll, where the applicator and metering rolls rotate in opposite senses such that their surfaces at the region of contact move in the same direction and define an ingoing nip;
controlling the pressure between, and the relative speeds of rotation of, the applicator and metering rolls so as to permit only a controlled amount of coating composition to pass through said nip and to leave a metered amount of coating composition on the surface of the applicator roll after it has left said region of contact;
smoothing the metered amount of coating composition remaining on the surface of the applicator roll by means of a deformable smoothing roll which rotates in the same sense as the applicator roll and in contact therewith; and
transferring the smoothed coating composition on the surface of the applicator roll to a dry continuous paper web which runs in the same direction as, and no slower than, the surface of the applicator roll carrying the smoothed coating composition and which is held in temporary contact with the applicator roll by a soft backing roll which rotates in an opposite sense to the applicator roll so as to form another ingoing nip therewith.

5,049,421
## TRANSDUCER GLASS BONDING TECHNIQUE

William S. Kosh, Shelton, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 30, 1989, Ser. No. 304,358
Int. Cl.[5] A47G 19/22
U.S. Cl. 428—34.4 41 Claims

1. A method for bonding a glass tube to a glass surface of a transducer, comprising the steps of:
applying a solvent-containing polyimide adhesive to a surface of said glass tube, said polyimide adhesive being at room temperature, or below when applied;
placing the adhesive applied surface of said glass tube onto the glass surface of said transducer to form a composite structure;

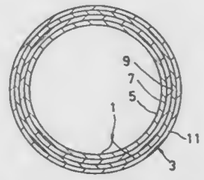



maintaining said composite structure at about room temperature or below, for a sufficiently long period of time to allow substantially all of the solvent to escape; and
thereafter raising the temperature of the composite structure to a temperature sufficient to cure the polyimide adhesive to realize a substantially void-free thermosetting bond.

5,049,422
## GOLF SHAFT

Yukihiro Honma, Yokohama, Japan, assignor to Honma Golf Club Mfg., Co., Ltd., Yokohama, Japan

Filed Sep. 25, 1989, Ser. No. 412,244
Claims priority, application Japan, Jan. 24, 1989, 1-13148
Int. Cl.[5] A63B 53/10
U.S. Cl. 428—34.6 12 Claims




1. A golf shaft having a central longitudinal axis, comprising an inner layer arranged circumferentially around said longitudinal axis, said inner layer comprising a plurality of laminated prepregs comprising carbon fibers; and an outer layer wrapped circumferentially around said inner layer, said outer layer comprising a sheet of resin-impregnated glass cloth, a plurality of metal fibers arranged on said glass cloth and extending approximately in the direction of said longitudinal axis, and a sheet of carbon fibers pressed onto said metal fibers.

5,049,423
## COMPOSITE THERMOPLASTIC FILMS FOR USE IN STRETCH/CLING APPLICATIONS

Paul M. German, Jr., Friendswood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 123,002, Nov. 19, 1987, abandoned. This application Dec. 20, 1989, Ser. No. 453,558
Int. Cl.[5] B32B 27/08
U.S. Cl. 428—35.2 4 Claims

1. A thermoplastic stretch/cling film comprising:
a) a cling layer, absent a tackifying additive, said cling layer comprising a polymer of two or more monomers, wherein a first monomer comprises ethylene and a second monomer comprises an acrylate, said polymer comprising an acrylate content of 20% to 30% by weight based upon the weight of said polymer;
b) a second layer, said second layer being a structural layer; and

VOL 1130 ISS 3 SE 17 1991 UMI



c) a third layer, said third layer being a slip layer.

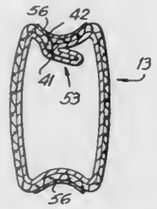
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5,049,424

## FABRIC COVERED METAL RAIL AND METHOD FOR PRODUCING SAME

L. Eugene Carden, Belden, Miss., and Richard N. Anderson, Owensboro, Ky., assignors to Hunter Douglas Ioc., Upper Saddle River, N.J.

Division of Ser. No. 302,645, Jan. 26, 1989, Pat. No. 4,864,712.
This application Jun. 22, 1989, Ser. No. 369,800
Int. Cl.[5] E06B *3/12, 9/00*
U.S. Cl. 428—35.8 3 Claims




1. A fabric covered blind rail of laminated material wherein the laminated material comprises:
(a) a strip of thin ductile metal shaped as a thin metal tube to define a closed tubular rail closed by a longitudinally extending compressed lockseam; and
(b) a strip of fabric adhesively bonded to the outer surface of the metal tube with no fabric contact in the lockseam.

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5,049,425

## POROUS YARN FOR OMS PINTLES

Klaus M. Essele, Clifton Park, N.Y., assignor to Abany International Corporation, Menands, N.Y.

Filed Jan. 4, 1989, Ser. No. 293,329
Int. Cl.[5] B32B *1/06, 1/08;* F16G *3/02, 3/14*
U.S. Cl. 428—36.1 19 Claims

1. A pintle for use in forming a pin seam on a papermachine fabric, said papermachine fabric having two ends and being woven from machine-direction strands and cross-machine direction strands, wherein said machine-direction strands form loops along said two ends, said pin seam being formed by bringing said two ends together, by meshing said loops at said two ends together to define a passage, and by directing said pintle through said passage to prevent said two ends from separating, said pintle having a length at least as long as said papermachine fabric is wide, said pintle being a composite strand formed by intertwining a plurality of individual monofilaments together, said pintle so formed thereby being porous, permeable to fluids, and compressible under load in a direction perpendicular to said length, so that said pintle may completely occupy said passage formed by said loops.

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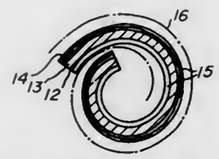
5,049,426

## HELICAL FORMED TAKE-UP LINER FOR UNCURED RUBBER MEMBERS AND METHOD OF PRODUCING THE SAME

Iwao Kimura, Kurume; Akira Toyonaga, Hikone; Koichi Sanada, Tokyo; Koji Nonaka, Tokyo, and Kenichi Haraga, Tokyo, all of Japan, assignors to Pyramid Corporation, Fukuoka and Bridgestone Corporation, Tokyo, both of, Japan

Filed Aug. 4, 1989, Ser. No. 389,467
Claims priority, application Japan, Aug. 8, 1988, 63-196073
Int. Cl.[5] B32B *1/02, 1/10, 5/26*
U.S. Cl. 428—36.2 3 Claims

1. A take-up liner for uncured rubber members, comprising a long band-like laminate of a long and inextensible band-like reinforcing cloth, a flexible foamed body arranged on one-side or both-side surfaces of the cloth, an extensible cloth arranged on the foamed body and a sheet-like elastomer layer arranged




on the outer surface of the extensible cloth, and having a helical formed shape.

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5,049,427

## LAMINATED POLARIZERS

Karl H. A. O. Starzewski, Bad Vilbel; Hanns P. Müller, Bergisch Gladbach, and Tillmann Hassel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,943
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842968
Int. Cl.[5] G02B *5/30;* B29D *11/00;* B32B *7/06*
U.S. Cl. 428—40 15 Claims

1. A laminated polarizer made from a polarizing core layer and adhesive layers on one or both sides, each of which can accept a transparent outerlayer, the polarizer comprising a polymer product containing polyacetylene as core layer, the matrix of the polymer product being a polymer having polar groups wherein as adhesive layers, a thermoplastic polyurethane-polyurea is used having a predominantly linear molecular structure with urethane segments and urea segments bonded exclusively aliphatically or cyclo-aliphatically, and which are distinguished by having
(a) a content of urea groups —NH—CO—NH— of 1-20% by weight and
(b) a content of carboxyl groups —COOH bonded directly to the main chain of the molecule in lateral positions, of 0.001-10% by weight, all relative to the total weight of the polyurethane-polyureas.

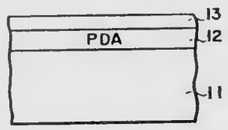
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5,049,428

## OPTICAL INFORMATION RECORDING MEDIUM

Toshiyuki Kanno, Tokyo; Yasuji Nagata, Hachioji, and Naoyuki Ueno, Machida, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 4, 1989, Ser. No. 445,533
Claims priority, application Japan, Dec. 8, 1988, 63-310713
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—64 19 Claims




1. An erasable optical information recording medium comprising:
a transparent substrate; and
a recording layer supported by said substrate and comprising a thin film comprising at least one polydiacetylene with side chains, said polydiacetylene being capable of undergoing a reversible planar-nonplanar transition of the main chain structure of said polydiacetylene due to a conformational change of said side chains produced by irradiation



of light, and having a repeating unit derived from a diacetylene monomer of the formula:

Ra—C≡C—C≡C—Rb

where Ra and Rb are respectively -X-Y-Z, wherein X is a spacer group $—(CH_2)_n—$, $—(C_mH_{2m-2})—$, $—(C_mH_{2m-4})—$, $—(C_pH_{2p}O)—$, or $—(C_pH_{2p-2}O)—$, n is an integer equal to 1 or more, m is an integer from 2 to 12, and p is an integer from 1 to 12;
Y is a bivalent functional group capable of forming hydrogen bonds, and comprising a urethane bond, an amide bond, and imide bond or an amidoimide bond; and
Z is a terminal group selected from the group consisting of a straight chain alkyl group, a straight chain unsaturated hydrocarbon group comprising a double bond, a straight chain unsaturated hydrocarbon group comprising a triple bond, an aromatic hydrocarbon group comprising a benzene ring and an aromatic hydrocarbon group comprising a naphthalene ring, said terminal group being unsubstituted or substituted by a substitutent selected from the group consisting of a cyano, hydroxyl, halogen and nitro group,
whereby said recording layer undergoes said reversible planar-nonplanar transition at portions thereof which are irradiated with light to cause a corresponding change of optical properties thereof, thereby recording information thereinto and erasing information therefrom, and,
whereby reading the recorded information is effected by detecting the change of reflectance, refractive index or transmittance of the recording layer.

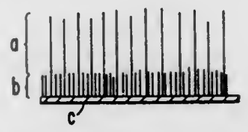
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5,049,429

## FUR-LIKE PILE FABRIC HAVING CONICAL SHAPED PILES COMPRISING GUARD HAIR-LIKE FIBERS AND DOWN HAIR-LIKE FIBERS

Yoshinori Shibukawa, Himeji, and Yuzuru Yajima, Kakogawa, both of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Filed Aug. 31, 1989, Ser. No. 401,184
Claims priority, application Japan, Aug. 31, 1988, 63-216962
Int. Cl.[5] B32B *3/02;* D03D *27/00;* D04H *11/00;* D05C *17/00*
U.S. Cl. 428—88 7 Claims




1. A fur-like pile fabric which comprises guard hair-like fibers and down hair-like fibers wherein a plurality of the fibers including the guard hair-like fibers constitute a unit and at least the guard hair-like fibers in the unit are adhered together in the form of a brush.

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5,049,430

## COPOLYESTER FIBERS SUITABLE FOR USE IN CARPETS

Thomas I. Bair, Wilmington, and Henry Kobsa, Greenville, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1989, Ser. No. 321,388
Int. Cl.[5] D04H *11/00;* D02G *3/00;* C08G *63/66*
U.S. Cl. 428—97 10 Claims

1. A copolyester fiber consisting essentially of recurring units derived from terephthalic acid as the acid component and, as the glycol component, a mixture of at least one lower alkylene glycol and a poly(tetramethylene ether) glycol having a molecular weight of 500 to 1500, the amount of the poly(tetramethylene ether) glycol being such that the fiber contains 9 to 17 weight percent of units derived from the poly(tetramethylene ether) glycol.

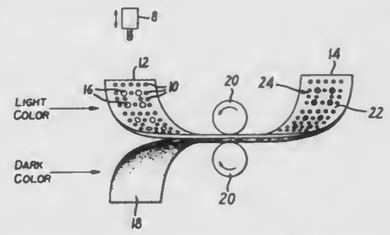
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5,049,431

## MULTI-COLORED FLOOR COVERING AND METHOD OF MANUFACTURING IT

Klaus Heckel, Weinheim; Gerhard Graab, Mannheim, and Hans-Michael Kuhl, Heimsbach, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstr., Fed. Rep. of Germany

Continuation of Ser. No. 499,925, Jun. 1, 1983, abandoned. This application Dec. 22, 1986, Ser. No. 945,193
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233448
Int. Cl.[5] B32B *31/18, 31/20*
U.S. Cl. 156—252 8 Claims




1. A method of making a floor covering, comprising:
providing a bottom layer comprised of an unvulcanized rubber sheet material;
providing a top layer comprised of a prevulcanized rubber material having a higher pressure-flow viscosity than the bottom layer;
forming a mosaic of small circular apertures through the top layer in a desired pattern of size, shape, and distribution; and
thereafter only pressing and vulcanizing the top and bottom layers together for bonding them together into the floor covering and substantially only filling the apertures of the top layer with the less-viscous bottom layer material;
whereby, when the top and bottom layers are different colors, a colored mosaic pattern corresponding to the apertures is produced.

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5,049,432

## METHOD FOR PREPARING A MARKING STRUCTURE

Willem Ooms; Frank R. Moss; all of Cookeville, and Jonnie L. Key, Algood, Robert E. Ponter, and David L. Hedgecoth, all of Tenn., assignors to Porelon, Inc., Cookeville, Tenn.

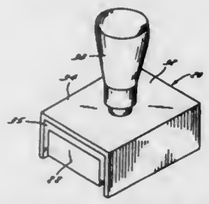
Continuation of Ser. No. 363,347, Jun. 6, 1989, Pat. No. 4,927,695, which is a continuation of Ser. No. 34,124, Apr. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 775,456, Sep. 11, 1985, abandoned. This application May 2, 1990, Ser. No. 505,973
The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.
Int. Cl.[5] B41K *1/38*
U.S. Cl. 428—159 12 Claims

1. A hand stamp, comprising: a mount;
a marking structure including a microporous layer having front and rear faces and formed from interconnected particles of a thermoplastic resin impregnated with an ink, said microporous layer having a relief pattern on a front face thereof for transferring an ink image of said relief pattern to a surface to be marked, said particles forming an open-celled network of pores allowing repetitive transfer of an ink image of said relief pattern to the marking surface, and an absorbent backing layer having front and rear faces, said front face of said backing layer being super-

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posed on said rear face of said ink impregnated layer, said backing layer containing excess ink absorbed from said ink impregnated layer in an amount in the range of about 0.3 to 0.7 grams of ink per square inch of said backing layer,



and said backing layer is bonded to said microporous layer at an interface zone wherein said resin permeates said backing layer; and

means for securing said marking structure to said mount.

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**5,049,433**

## ARCHITECTURAL SAFETY GLASS

**Frank R. Leotta, Nutley, N.J., assignor to The Answer Corp., New Hyde Park, N.Y.**

**Filed May 17, 1990, Ser. No. 525,199**
**Int. Cl.[5] B32B** *9/00*
**U.S. Cl. 428—195** **10 Claims**




1. An architectural safety glass laminate comprising:
(i) a glass sheet;
(ii) an adhesive film which is an acrylic substance; and
(iii) a plastic substrate provided with a decorative pattern on one surface thereof, said adhesive film positioned between and bonding said glass sheet to said surface of said plastic substrate.

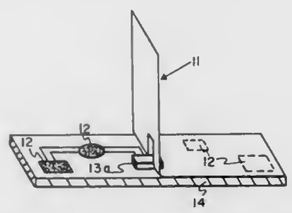
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**5,049,434**

## PRE-PATTERNED DEVICE SUBSTRATE DEVICE-ATTACH ADHESIVE TRANSFER SYSTEM

**William M. Wasulko, Anderson, S.C., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.**

**Continuation-in-part of Ser. No. 605,523, Apr. 30, 1984, Pat. No. 4,959,008. This application Oct. 5, 1984, Ser. No. 658,017**
**The portion of the term of this patent subsequent to Sep. 25, 2007, has been disclaimed.**
**Int. Cl.[5] B32B** *3/00, 7/06, 18/00*
**U.S. Cl. 428—202** **26 Claims**




1. A device substrate device-attach tape which comprises:
(a) a support film; and
(b) a pattern of conductive adhesive releasably affixed to one side of the support film, the adhesive pattern being of a size and shape so that when brought into contact with a device substrate, the adhesive is in a pattern suitable for later attachment and bonding thereon of surface mounted devices to the device substrate.

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**5,049,435**

## FLEXIBLE SHEET REINFORCED WITH POLY(AROMATIC AMIDE) NON-WOVEN FABRIC AND USE THEREOF

**Keiichi Uno, Shiga; Yoshimi Ishinami, Iwakuni; Masaaki Nakamura, Otsu, and Tomohiko Nakao, Iwakuni, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 821,304, Jan. 22, 1986, Pat. No. 4,897,301. This application Oct. 2, 1989, Ser. No. 415,959**
**Claims priority, application Japan, Jan. 23, 1985, 60-11499; Feb. 4, 1985, 60-19480; Jun. 21, 1985, 60-136287**
**Int. Cl.[5] B32B** *15/08, 27/02, 27/34;* **H05K** *1/03*
**U.S. Cl. 428—209** **8 Claims**

1. A flexible sheet which comprises a non-woven fabric made from 60% by weight or more of a poly(aromatic amide) component which is impregnated with a heat- and/or light-curable resin, wherein the non-woven fabric satisfies the following conditions:

$5\ g/m^2 < \text{weight per unit area} < 35\ g/cm^2$, and

$0.15\ g/cm^3 \leqq \text{density} \leqq 0.8\ g/cm^3$

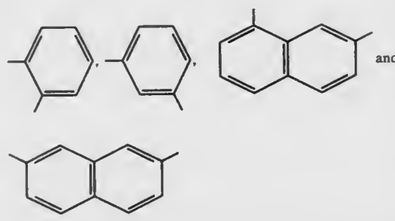
said poly(aromatic amide) component comprising chopped fibers of an aromatic homopolyamide or copolyamide composed of the following units:

$$-HN-R_1-NHOCR_2CO-, \qquad \text{formula (1)}$$

or

$$-HN-R_3-CO- \qquad \text{formula (2)}$$

wherein $R_1$, $R_2$, and $R_3$ are each substituted or unsubstituted aromatic group selected from



and any substituent on the aromatic group is a member selected from the group consisting of an alkyl having 1 to 3 carbon atoms, chlorine atom, bromine atom and phenyl.

7. In a flexible printed circuit board wherein a flexible sheet is used as a base sheet and/or a covering layer, the improvement which comprises that the flexible sheet comprises a non-woven fabric made from 60% by weight or more of a poly(aromatic amide) component which is impregnated with a heat- and/or light-curable resin, wherein the non-woven fabric satisfies the following conditions:

$5\ g/m^2 < \text{weight per unit area} < 35\ g/cm^2$, and

$0.15\ g/cm^3 \leqq \text{density} \leqq 0.8\ g/cm^3$,

said poly(aromatic amide) component comprising chopped fibers of an aromatic homopolyamide or copolyamide composed of the following unit:

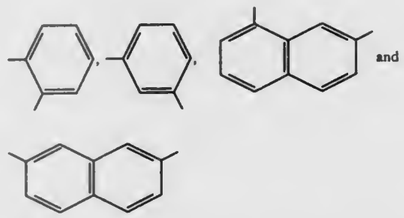
$$-HN-R_1-NHOCR_2CO-, \qquad \text{formula (1)}$$

or



$$-HN-R_3-CO- \qquad \text{formula (2)}$$

wherein $R_1$, $R_2$ and $R_3$ are each substituted or unsubstituted aromatic group selected from



and any substituent on the aromatic group is a member selected from the group consisting of an alkyl having 1 to 3 carbon atoms, chlorine atom, bromine atom and phenyl.

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**5,049,436**

## BROAD SEALING MULTI-LAYERED OPP FILMS WHICH YIELD HERMETIC SEALS

**Kevin P. Morgan, and Eldridge M. Mount, III, both of Fairport, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Filed Jun. 11, 1990, Ser. No. 535,685**
**Int. Cl.[5] B32B** *7/02*
**U.S. Cl. 428—213** **15 Claims**

1. A metallizable multilayer film which is hermetically heat sealable over a broad temperature range, the film comprising at least one heat sealable layer which comprises a polymer selected from a group consisting of ethylene-propylene-butene terpolymer, ethylene-propylene copolymer and mixtures thereof, a block-reducing proportion of an inorganic anti-block agent having an average particle size greater than about 0.8 microns and from 1000 ppm to about 7000 ppm of a fatty acid amide, the heat sealable layer having a thickness of at least 10 percent of the total film thickness.

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**5,049,437**

## NON-STICK COATING SYSTEM WITH THIN UNDERCOAT OF POLYETHER SULFONE

**Harvey P. Tannenbaum, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 21, 1989, Ser. No. 396,692**
**Int. Cl.[5] B32B** *7/02, 27/08*
**U.S. Cl. 428—215** **9 Claims**

1. A coated substrate comprising a substrate with a multilayer non-stick coating, comprising an undercoat, a primer, and a topcoat, and up to one or more intermediate coats between the primer and the topcoat, wherein:
the substrate is free of contaminants that would prevent adhesion of the undercoat,
the undercoat is applied to the substrate and consists essentially of (on a weight basis after air drying but before baking) up to 8% surfactant, up to 20% fine-particle silica, the balance polyether sulfone, and has a dry film thickness in the range of 0.1–5.0 microns,
the primer is applied to the undercoat and comprises perfluorocarbon resin and at least one of polyamic acid or polyamide imide, polyarylene sulfide and polyether sulfone and has a dry film thickness in the range of 2–15 microns, and
the topcoat comprises perfluorocarbon resin.

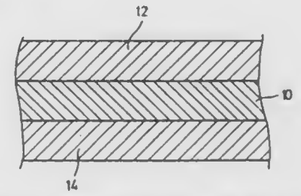
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**5,049,438**

## NONDIAPHANOUS NONWOVEN FABRIC

**Ching-Long Chen, 101-15, Cherng Fu Industry Park, Cherng Fu Lih, San Hsia, Taipei Hsien, Taiwan**

**Filed Apr. 2, 1990, Ser. No. 503,055**
**Int. Cl.[5] D04H** *1/04*
**U.S. Cl. 428—284** **4 Claims**




1. An opaque flexible wrinkle-resistant non-woven fabric comprising an inner layer and two outer layers thermally bonded to opposite surface areas of said inner layer; said inner layer consisting of 100% of discrete opaque fibers that are dimensionally stable at the temperatures used to bond the layers together; each said outer layer consisting of a mixture of discrete fibers that is approximately 80% thermoplastic fiber material and 20% opaque fiber material dimensionally stable at the temperatures used to bond the layers together; said thermoplastic fibers being blended with the associated opaque fibers so that the opaque fibers in each outer layer are evenly dispersed; said thermoplastic fibers being fusible to bond the opaque fibers together.

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**5,049,439**

## THERMOFORMABLE ARTICLE

**Leonard W. Robinson, Trenton, Mich., assignor to Fibre Converters, Inc., Three Rivers, Mich.**

**Filed May 25, 1990, Ser. No. 528,969**
**Int. Cl.[5] B32B** *3/26*
**U.S. Cl. 428—286** **10 Claims**




1. A thermoformable laminate comprising: a relatively stiff, thermoformable, synthetic resin, foam core containing from about 5 to about 30 percent by weight of relatively short, reinforcing, stable fibers uniformly distributed therein, said foam core having a Vicat softening point of at least 240° C. and a pair of fabric layers adhesively bonded to the foam core, at least one of said fabric layers being a nonwoven fabric impregnated with a thermoplastic or uncrosslinked thermosetting resin.

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**5,049,440**

## WET WIPER NATURAL ACID AND SALT PRESERVATIVE COMPOSITION

**John W. Bornboeft, III, Wilmette, Ill., and Jerry R. Nelson, Salt Lake City, Utah, assignors to The James River Corporation, Richmond, Va.**

**Filed Jul. 28, 1989, Ser. No. 388,068**
**Int. Cl.[5] A61F** *13/00;* **A61K** *9/70;* **D06M** *13/192*
**U.S. Cl. 428—288** **20 Claims**

1. A wet wiper product comprising:
(a) a fibrous wipe; and
(b) a hypotonic liquid preservative composition for the wipe comprising:

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(i) water,
(ii) naturally occurring organic acid in an amount effective to be a preservative, and
(iii) a naturally occurring salt in an amount effective to increase the efficacy of the naturally occurring organic acid.

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5,049,441
**HIGH DENSITY POLYETHYLENE COMPOSITIONS**
**Edwin A. Jenkins, Denham Springs; Jay P. Porter, and William D. Ray, both of Baton Rouge, all of La., assignors to Paxon Polymer Company, LP, Baton Rouge,, La.**
**Continuation of Ser. No. 313,320, Feb. 21, 1989, Pat. No. 4,911,985, which is a continuation of Ser. No. 115,240, Oct. 30, 1987, abandoned. This application Jan. 19, 1990, Ser. No. 467,446**
**The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.**
**Int. Cl.**[5] **C08K** *3/34;* **B32B** *9/04, 13/04*
**U.S. Cl. 428—324** **16 Claims**

1. A high density polyethylene composition suitable for use in forming one layer of a multiply construction having improved tear strength and puncture resistance, said composition consisting of:
from about 50 to about 95 weight percent of high density polyethylene having a melt flow index of about 0.1 to about 100 decigrams per minute;
from about 5 to about 40 weight percent of polyisobutylene rubber; and
from about 1 to about 30 weight percent of a filler selected from the group consisting of mica, talc and mixtures thereof.

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5,049,442
**OPALESCENT COATINGS CONTAINING FOAMED METAL OXIDES**
**Sol Panush, Farmington Hills, Mich., assignor to BASF Corporation, Clifton, N.J.**
**Filed Jan. 23, 1990, Ser. No. 468,624**
**Int. Cl.**[5] **B32B** *15/02, 5/16, 5/18*
**U.S. Cl. 428—328** **14 Claims**

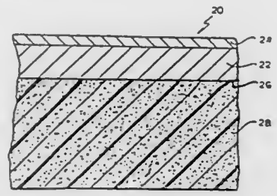
12. A substrate coated with at least one layer of a coating composition containing a foamed metal oxide, a metallic or metallic-like pigment and a transparent organic or inorganic pigment, wherein the quantity of said foamed metal oxide is effective for producing an opalescent color effect on the substrate.

13. A substrate as described in claim **12** wherein said substrate is coated with a first layer and a second layer, said first layer being a basecoat containing said foamed metal oxide, a metallic or metallic-like pigment and a transparent organic or inorganic pigment, and the second layer is a clearcoat applied over said basecoat.

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5,049,443
**STEEL MULTI-LAYERED COMPOSITE MOLDED STRUCTURE**
**Karl T. Kuszaj, and Gregory M. Gatarz, both of East Brunswick, N.J., assignors to American Standard Inc., New York, N.Y.**
**Filed Dec. 12, 1990, Ser. No. 626,238**
**Int. Cl.**[5] **B32B** *15/08, 9/04*
**U.S. Cl. 428—332** **16 Claims**

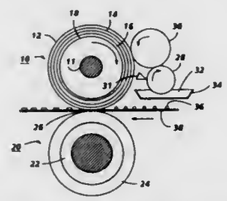
1. A durable impact, thermal-shock, and delamination resistant composite laminate structure which comprises:
a steel substrate having a finish and non-finish surface; and
a layer of plastic chemically bonded directly to said non-finish steel surface utilizing a silane coupler to form a reinforced laminate.




2. The composite laminate structure in accordance with claim 1 in which said plastic layer has a thickness of at least about $\frac{1}{8}$ inch.

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5,049,444
**SILANE ADHESIVE SYSTEM FOR FUSING MEMBER**
**George J. Bingham; Patrick J. Finn, both of Webster; George J. Heeks, Rochester; Arnold W. Henry, and Donald A. Seanor, both of Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed Dec. 15, 1989, Ser. No. 451,056**
**Int. Cl.**[5] **B32B** *27/08*
**U.S. Cl. 428—339** **9 Claims**



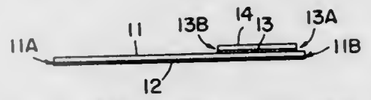

1. A multilayered fuser member for fusing thermoplastic resin toner images to a substrate in a fuser system of the type wherein a polymeric release agent having functional groups is applied to the surface of the fuser member, the multilayered fuser member comprising in sequential order a base support member, an adhesive layer comprising a copolymer of vinylidene fluoride and hexafluoropropylene and at least 20% by weight of the adhesive layer of a coupling agent comprising at least one organo functional silane represented by the formula:

$$[RO(O)_p\text{-}(RO)_m]_3Si\text{-}(R')_n\text{-}X,$$

where R can be an alkyl group having 1 to 4 carbon atoms, R' can be an alkyl group having 1 to 7 carbon atoms, where p, m and n can be 0 or 1, and X is selected from the group consisting of chlorine, amino, vinyl, methyl, glycidoxy, epoxycyclohexyl, mercepto, benzyl, bis(2-hydroxlethyl)amino, ureido, carbonate, diethylene triamine, N-beta(aminoethyl)gamma-amino, and 3(N-styrylmethyl-2-aminoethyl)amino; an activator; a tie coat layer comprising a copolymer of vinylidene fluoride and hexafluoropropylene and an outer elastomeric fusing surface comprising a copolymer of vinylidene fluoride and hexafluoropropylene and containing a metal oxide present in an amount sufficient to interact with a polymeric release agent having functional groups to provide an interfacial barrier layer between said fusing surface and toner.



5,049,445
**MASKING TAPE AND METHOD FOR MANUFACTURING ROLLS OF SUCH TAPE**
**Ola Arvidsson, Tjällmo, and Magnus Hilleby, Väderstad, both of Sweden, assignors to Intermall AB, Tjallmo, Sweden**
**PCT No. PCT/SE88/00143, § 371 Date Nov. 30, 1988, § 102(e) Date Nov. 30, 1988, PCT Pub. No. WO88/07415, PCT Pub. Date Oct. 6, 1988**
**PCT Filed Mar. 24, 1988, Ser. No. 285,969**
**Claims priority, application Sweden, Mar. 25, 1987, 8701245-6**
**Int. Cl.**[5] **B32B** *7/10, 7/12;* **B29C** *53/56*
**U.S. Cl. 428—352** **4 Claims**




1. In a masking tape comprising a strip (**11**) of tearable material having an upper face, a lower face, a transverse extent and a longitudinal extent greater than said transverse extent; the improvement wherein a first pressure sensitive adhesive layer (**12**) covers said lower face of said strip (**11**) from one side edge thereof to the opposite side edge, a second pressure sensitive adhesive layer (**13**) is applied to said upper face of said strip (**11**), said second layer having a longitudinal extent coextensive with that of said strip and a transverse extent less than half that of said strip (**11**), a release liner (**14**) covers said second adhesive layer (**13**), said second adhesive layer (**13**) with its release liner (**14**) divides said upper face of said strip (**11**) into a portion covered by said release liner and an exposed portion, said exposed portion comprising a release agent for said first adhesive layer (**12**), and said strip comprises first and second parallel opposite longitudinal edges (**11B, 11A**), said second adhesive layer (**13**) with its release liner (**14**) being applied to said strip (**11**) nearer said first edge (**11B**) than said second edge (**11A**), said second adhesive layer (**13**) having greater adhesive capacity per unit of area than said first adhesive layer (**12**).

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5,049,446
**POLY(ARYLENE SULFIDE) COMPOSITION FOR MOLDING ARTICLES**
**Jennings P. Blackwell, and William H. Beever, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**
**Division of Ser. No. 928,128, Nov. 7, 1986, abandoned. This application Oct. 18, 1989, Ser. No. 411,759**
**Int. Cl.**[5] **D02G** *3/00*
**U.S. Cl. 428—364** **13 Claims**

1. A method for improving the crack resistance of a thick-walled molded article prepared from a poly(arylene sulfide) molding composition, the method comprising incorporating a sulfone polymer having at least one recurring aliphatic group in the polymer backbone in a molding composition comprising poly(arylene sulfide) and a glass fiber reinforcing material.

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5,049,447
**POLYESTER FIBER FOR INDUSTRIAL USE AND PROCESS FOR PREPARATION THEREOF**
**Takeshi Shindo, Okazaki; Masuki Sano, Anjo, and Ken-ichiro Oka, Okazaki, all of Japan, assignors to Toray Industries, Inc., Japan**
**Filed May 2, 1989, Ser. No. 346,472**
**Claims priority, application Japan, May 9, 1988, 63-111829**
**Int. Cl.**[5] **D02G** *3/00*
**U.S. Cl. 428—373** **2 Claims**

1. A polyester untwisted multifilament yarn for industrial use, characterized in that at least 90 mole % of total recurring units of the molecule chain are composed of polyethylene terephthalate, and the untwisted multifilament yarn simultaneously satisfies all of the following requirements (A), (B), (C) and (D):
(A) the intrinsic viscosity (IV) is 0.97 to 1.15;
(B) the amorphous orientation function (fa) is not larger than 0.55;
(C) the tenacity (T) (g/d), the shrinkage (Δs) (%) as measured after standing in dry air at 150° C. for 30 minutes, the medium elongation (ME) (%) under a load of 4.5 g/d, and the dimensional stability index (Y) expressed by the formula: $Y=ME^{0.81}+\Delta s=1.32$ are within ranges defined by the following formulae (a), (b), (c), (d) and (e):

$$0.33Y+5.55 \leqq T \leqq 0.33Y+6.50 \quad \text{(a)},$$

$$8.0 \leqq T \leqq 9.5 \quad \text{(b)},$$

$$8.5 \leqq Y \leqq 10.5 \quad \text{(c)},$$

$$5 \leqq ME \leqq 10 \quad \text{(d)},$$

and

$$2 \leqq s \leqq 6 \quad \text{(e); and}$$

(D) the elongation at break is at least 11% and the product of the tenacity and elongation, which is defined by:

$$\text{(tenacity } (g/d) \text{ at break)} \times \sqrt{\text{elongation (\%) at break}},$$

is 30 to 36.

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5,049,448
**MAGNETIC RECORDING MEDIUM CONTAINING AN ESTER LUBRICANT BRANCHED FROM THE NUMBER 2 CARBON POSITION OF THE ACID RESIDUE**
**Takao Ohya; Yasuo Nishikawa; Jun Nakagawa; Fusao Yamanaka; Toshio Kawamata; Tsutomu Okita; Hiroshi Hashimoto, and Mikihiko Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Jul. 24, 1989, Ser. No. 383,514**
**Claims priority, application Japan, Jul. 22, 1988, 63-183345; Aug. 22, 1988, 63-207548; Aug. 23, 1988, 63-209187; Oct. 4, 1988, 63-250333**
**Int. Cl.**[5] **G11B** *23/00*
**U.S. Cl. 428—409** **11 Claims**

1. A magnetic recording medium comprising a nonmagnetic support having thereon a magnetic layer, wherein at least one of ester compounds represented by formula (I) is present in or on the magnetic layer,

$$R_1\text{—}\underset{\displaystyle R_2}{\underset{|}{CH}}\text{—}COOR \quad \text{(I)}$$

wherein $R_1$ represents a straight chain, saturated alkyl group having 6 to 12 carbon atoms, $R_2$ represents a straight chain, saturated alkyl group having 4 to 10 carbon atoms, and R represents a branched or straight chain alkyl group having 4 to 22 carbon atoms.

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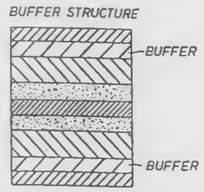
5,049,449
**INCREASED REGRIND USAGE IN COEXTRUDED STRUCTURES**
**David E. Ofstein, 106 Whistle Walk, Williamsburg, Va. 23185**
**Division of Ser. No. 149,279, Jan. 28, 1988, Pat. No. 4,894,291. This application Nov. 30, 1989, Ser. No. 444,572**
**Int. Cl.**[5] **B32B** *27/08*
**U.S. Cl. 428—476.1** **17 Claims**

1. A laminate for use in oxygen barrier applications which comprises:
(a) a protective outer layer made of a material selected from the group consisting of polypropylene, polyethylene and copolymers of propylene and ethylene;

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(b) an adhesive layer;
(c) an inner barrier layer comprising nylon;
(d) interposed between layers (a) and (b), an intermediate regrind layer formed of a blend of the materials from which (a), (b) and (c) are formed; and




(e) interposed between layers (a) and (d), a buffer layer which is formed from a blend of the materials from which layers (a) and (d) are formed and which comprises from about 5% to about 100% of the material of layer (d).

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**5,049,450**

**ALUMINUM AND BORON NITRIDE THERMAL SPRAY POWDER**

**Mitchell R. Dorfman, Smithtown, and Burton A. Kushner, Old Bethpage, both of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.**

**Filed May 10, 1990, Ser. No. 521,816**
**Int. Cl.[5] B32B *15/02***
**U.S. Cl. 428—570** **5 Claims**

1. A composite thermal spray powder formed substantially as homogeneously agglomerated particles each of which comprises pluralities of subparticles of boron nitride and subparticles of silicon-aluminum, the subparticles being bonded with an organic binder, and the alloy containing 10% to 14% silicon by weight of the alloy and balance aluminum and incidental impurities.

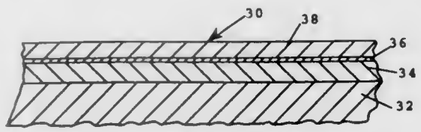
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**5,049,451**

**HIGH-COERCIVITY THIN-FILM RECORDING MEDIUM**

**Brij B. Lal, San Jose, and Atef H. Eltoukhy, Saratoga, both of Calif., assignors to HMT Technology Corporation, Fremont, Calif.**

**Continuation-in-part of Ser. No. 567,598, Aug. 15, 1990. This application Dec. 12, 1990, Ser. No. 626,193**
**The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.**
**Int. Cl.[5] B32B *15/01***
**U.S. Cl. 428—611** **11 Claims**




1. A magnetic recording medium comprising
a substrate;
a sputtered chromium underlayer on the substrate; and
a sputtered magnetic layer composed of an alloy containing between 70–80 atom percent cobalt, 10–20 atom percent chromium, 3–20 atom percent platinum, and 2–10 atom percent tantalum, on the chromium underlayer.

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**5,049,452**

**TARGET MEMBER USED FOR FORMATION OF SUPERCONDUCTING FILM**

**Takuo Takeshita, and Tadashi Sugihara, both of Saitama, Japan, assignors to Mitsubishi Metal Corporation, Tokyo, Japan**

**PCT No. PCT/JP88/01238, § 371 Date Aug. 9, 1989, § 102(e) Date Aug. 9, 1989, PCT Pub. No. WO89/05283, PCT Pub. Date Jun. 15, 1989**
**PCT Filed Dec. 8, 1988, Ser. No. 399,553**
**Claims priority, application Japan, Dec. 9, 1987, 62-311695**
**Int. Cl.[5] C22C *32/00***
**U.S. Cl. 428—614** **5 Claims**

1. A solid target used in formation of a superconducting film, comprising: metallic copper ranging from about 8% to about 40% by volume; and at least an oxide selected from the group consisting of oxides each containing an element selected from the group consisting of the rare earth metals including yttrium and an alkaline earth metal, and oxides each containing an element selected from the group consisting of the rare earth metals including yttrium, an alkaline earth metal and copper, wherein said oxide is generally uniformly dispersed throughout said metallic copper in the metallic structure thereof.

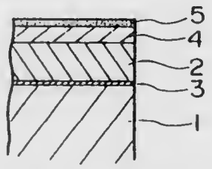
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**5,049,453**

**GALVANNEALED STEEL SHEET WITH DISTINGUISHED ANTI-POWDERING AND ANTI-FLAKING PROPERTIES AND PROCESS FOR PRODUCING THE SAME**

**Yukimasa Suemitsu; Motohiro Nakayama; Yukio Numakura; Tatsuya Kanamaru; Hisao Hayashi, all of Aichi, and Tadafumi Honda, Kanagawa, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Feb. 22, 1990, Ser. No. 483,460**
**Int. Cl.[5] B32B *15/18*; B05D *1/18***
**U.S. Cl. 428—629** **78 Claims**




1. A galvannealed steel sheet with distinguished anti-powdering property and anti-flaking property, which comprises
a matrix steel sheet;
a galvannealed coating layer having a coating weight of 45 to 90 g/m$^2$, composed of 8 to 12 wt. % Fe and 0.05 to 0.35 wt. % Al, the balance being Zn, provided on at least one side of the matrix steel sheet,
the surface region of the galvannealed coating layer being substantially composed of a $\delta_1$ phase or the surface region thereof having a structure that when at least one of $\eta$ and $\zeta$ phases exist in the surface layer of the galvannealed coating layer, the total amount of the at least one of $\eta$ and $\zeta$ phases in the galvannealed coating layer is not more than 1.5 g/m$^2$; and
a $\Gamma$ phase having a thickness of not more than 1.3 $\mu$m, formed in the region at the boundary to the matrix steel sheet therebetween.

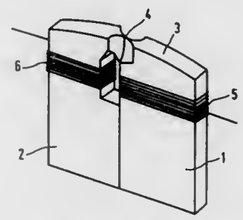


**5,049,454**

**MONOCRYSTALLINE MNZN-FERROFERRITE MATERIAL HAVING A HIGH CONTENT OF ZN, AND A MAGNETIC HEAD MANUFACTURED FROM SAID MATERIAL**

**Mark T. Johnson; Johannes F. M. Cillessen, both of Eindhoven, and Johannes A. Pistorius, Erp, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 20, 1989, Ser. No. 368,747**
**Claims priority, application Netherlands, Jul. 4, 1988, 8801685**
**Int. Cl.[5] B32B *9/00***
**U.S. Cl. 428—692** **4 Claims**




1. A monocrystalline MnZn-ferroferrite material notably suitable for use in a magnetic head, characterised in that the material corresponds to the formula

$$Mn_aZn_bFe_c^{II}Fe_2^{III}O_4,$$

wherein
$0.25<a<0.48$;
$0.50<b<0.60$;
$0.02<c<0.15$;
$a+b+c=1$.

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**5,049,455**

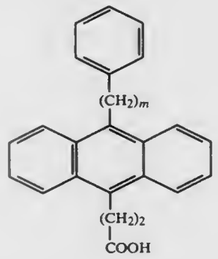
**AMPHIPHILIC ANTHRACENE DERIVATIVE**

**Masakazu Uekita, Kobe, and Yasunori Yoshioka, Ashiya, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 283,056, Dec. 7, 1988, abandoned, which is a continuation of Ser. No. 772,092, Sep. 3, 1985, abandoned. This application Sep. 5, 1990, Ser. No. 581,162**
**Claims priority, application Japan, Sep. 3, 1984, 59-183958**
**Int. Cl.[5] B27N *9/00*; C07C *53/134***
**U.S. Cl. 428—917** **2 Claims**

1. An electroluminescent device containing a Langmuir-Blodgett film prepared from an amphiphilic compound having the formula (V):

(V)




wherein m is 1 or 2.

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**5,049,456**

**ELECTROCONDUCTIVE INTERCONNECTING MEMBER AND FUEL CELL HAVING THE MEMBER**

**Keiji Matsuhiro, Nagoya; Shigenori Ito, Kasugai, and Kiyoshi Okumura, Tajimi, all of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan**

**Filed Apr. 30, 1990, Ser. No. 516,920**
**Claims priority, application Japan, Apr. 28, 1989, 1-110814**
**Int. Cl.[5] H01M *8/02***
**U.S. Cl. 429—12** **4 Claims**

1. An electroconductive interconnecting member consisting of a ceramics material consisting essentially of a mixture of 100 parts by weight of lanthanum chromite having a composition represented by the formula of $LaCrO_3$ with not more than 2.0 parts by weight of the total amount of an oxide or oxides of at least one metal selected from the group consisting of Si, Ti, Fe, Al, Cu, B, Ni, Cr and Mn.

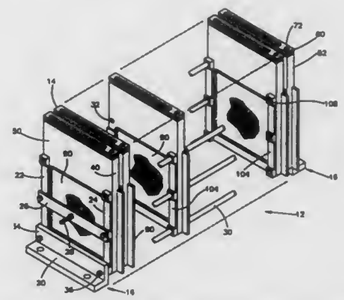
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**5,049,457**

**ELECTROLYTE FOR AN ALUMINUM AIR-BATTERY COMPRISING AN ANTI-FOAMING AGENT AND CORROSION EXHIBITOR**

**Marilyn J. Niksa; Andrew J. Niksa, both of Concord, and Jay M. Noscal, Jefferson, all of Ohio, assignors to Eltech Systems Corporation, Boca Raton, Fla.**

**Division of Ser. No. 335,005, Apr. 7, 1989, Pat. No. 4,925,744. This application Feb. 2, 1990, Ser. No. 473,767**
**Int. Cl.[5] H01M *8/08***
**U.S. Cl. 429—29** **6 Claims**



1. An electrolyte for an aluminum-air battery comprising:
a caustic or saline solution;
an anti-foaming agent in an amount effective to reduce the entrapment of hydrogen bubbles in said solution, said hydrogen bubbles being formed at the battery anode; and
a corrosion inhibiting amount of a corrosion inhibitor.

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**5,049,458**

**FUEL CELL**

**Yoshio Sato; Hirotaka Nakagawa; Hiroshi Mihara; Shigeyoshi Kosuge; Hiroshi Tsuneizumi, and Eiji Morishige, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan**

**Filed Aug. 28, 1989, Ser. No. 399,159**
**Claims priority, application Japan, Aug. 31, 1988, 63-114482[U]; Jan. 30, 1989, 1-009568[U]**
**Int. Cl.[5] H01M *8/04, 8/12***
**U.S. Cl. 429—32** **18 Claims**

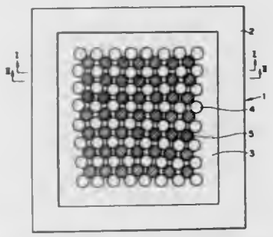
1. A fuel cell comprising:
at least two cell members, each of which has a flat-plate solid electrolyte having a fuel electrode layer on one surface thereof and an air electrode layer on the other surface thereof;
a plurality of separators, each of which is arranged between a pair of said cell members to stack up the cell members in layers and comprises a frame and a metallic sheet coupled to said frame, said metallic sheet having an array of first

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portions projecting from said sheet and intermingled with an array of oppositely directed second portions projecting from said sheet, said separators including a highest stage separator and a lowest stage separator, said highest stage separator being mounted on a cell member of the highest stage in said stack and said lowest stage separator being mounted under a cell member of the lowest stage in said stack;

a fuel supply path for supplying fuel to a space between at least some of said separators and adjacent respective fuel



electrode layers, and an air supply path for supplying air to a space between at least some of said separators and adjacent respective air electrode layers;

a fuel discharge path for discharging fuel from said space between said separators and adjacent respective fuel electrode layers, and an air exhaust path for exhausting air from said space between said separators and adjacent respective air electrode layers; and

electrically conductive collector members respectively mounted on outer sides of said highest and lowest stage separators.

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**5,049,459**

**FUEL CELL**

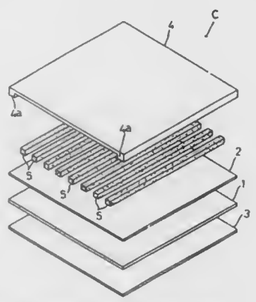
**Kousuke Akagi, Osaka, Japan, assignor to Osaka Gas, Co., Ltd., Osaka, Japan**

**Filed Mar. 16, 1990, Ser. No. 495,275**

**Claims priority, application Japan, Jul. 7, 1989, 1-176569; Sep. 6, 1989, 1-231912**

**Int. Cl.[5] H01M** *8/04*

**U.S. Cl. 429—33** **18 Claims**



1. A solid electrolye fuel cell comprising:

an electrolyte layer;

an oxygen electrode attached to one face of said electrolyte layer;

a fuel electrode attached to the other face of said electrolyte layer;

a separator formed of electrically conductive material and disposed in opposition to said oxygen electrode to be electrically connected therewith;

an oxygen-containing gas flow passage formed between said oxygen electrode and said separator;

said separator integrally including band ridges at opposed side edges thereof, said band ridges sealing side edges of said oxygen-containing gas flow passage so that an entire periphery of the cell construction along said oxygen-containing gas flow passage is formed as a fuel flow passage separated from said oxygen-containing gas flow passage; and

a conductive member formed of flexible material and provided separately from said separator in one of said oxygen-containing gas flow passage and fuel flow passage.

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**5,049,460**

**METHOD FOR PRODUCING BEAM-SHAPING DIAPHRAGMS FOR LITHOGRAPHIC DEVICES**

**Wolfgang Benecke; Uwe Schnakenberg, both of Berlin, and Burkhard Lischke, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed May 17, 1989, Ser. No. 353,062**

**Claims priority, application Fed. Rep. of Germany, May 31, 1988, 3818536**

**Int. Cl.[5] G03F** *9/00*

**U.S. Cl. 430—5** **6 Claims**

1. A method for producing a beam-shaping diaphragm for a lithography device in which the beam-shaping diaphragm is charged with a primary particle beam and comprises a semiconductor membrane which has recessed for generating a plurality of particle beam probes, comprising the steps of depositing a semiconductor layer of a first conductivity type on a semiconductor substrate of a second conductivity type, applying to the semiconductor layer a first dielectric layer and applying to the back side of the semiconductor substrate a second dielectric layer, forming a pattern on the first dielectric layer of the geometry and arrangement of the recesses which are to be produced, forming pattern on the second dielectric layer of the geometry of a through opening which is to be produced in the semiconductor substrate, etching a hole through the semiconductor layer, anisotropic etching in the through opening in the semiconductor substrate, removing the dielectric layers from said semiconductor layer and said substrate, and apply a metal layer to the semiconductor layer and the semiconductor substrate, and in which the semiconductor substrate is composed of silicon which has a (1, 1, 0) orientation.

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**5,049,461**

**METHOD OF MAKING AND USING A HIGH RESOLUTION LITHOGRAPHIC MASK**

**Patrick C. Arnett, Morgan Hill, Calif.; Andres Bryant, Essex Junction, Vt.; John S. Foster; Jane E. Frommer, both of Morgan Hill, Calif., and Jon A. C. Iwata, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 19, 1989, Ser. No. 367,815**

**Int. Cl.[5] G03F** *9/00*

**U.S. Cl. 430—5** **14 Claims**

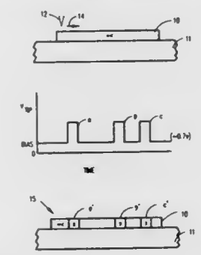
1. A method of generating a high resolution lithographic mask comprising the steps of:

moving the tunneling tip of a scanning tunneling microscope in a z direction to within electron tunneling distance from a film having a region normally of one conductivity;

applying voltage pulses to said tip in a preselected sequence while concurrently effecting relative movement between the tip and film in preselected x and y directions, said pulses being of sufficient magnitude and duration to change the conductivity of the material in selected areas of said region to another conductivity to provide from the



film a mask having a desired pattern defined by areas of different conductivity and capable of being replicated



without removing material of one of said conductivities from the film.

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**5,049,462**

**READING OUT INFORMATION STORED IN THIN POLYMER LAYERS**

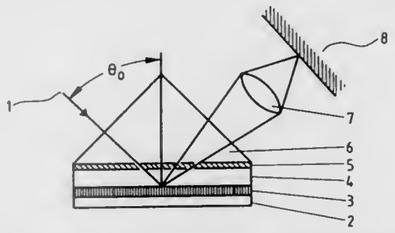
**Dirk Funhoff, Heidelberg; Harald Fuchs, Carlsberg; Ulrike Licht, Mannheim; Wolfgang Schrepp, Heidelberg; Werner Hickel, Mannheim; Wolfgang Knoll, Mainz; Gerhard Wegner, Mainz-Drais, and Gisela Duda, Dietzenbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Feb. 20, 1990, Ser. No. 481,299**

**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906521**

**Int. Cl.[5] G11C** *7/00;* **G11B** *7/00;* **B32B** *9/04;* **G03C** *11/00*

**U.S. Cl. 430—21** **12 Claims**



1. A process for storing information in a thin polymer layer and later reading out the stored information, which process comprises: 1) providing a polymer layer having a thickness of less that 0.1 $\mu$m on a metallic or semiconductor layer; 2) treating the polymer layer by imagewise exposure or a lithographic process involving electromagnetic or particle rays so as to produce a permanent change in the properties of the polymer layer and thereby store information in the form of surface plasmons on the polymer layer; and 3) reading out the stored information by subjecting the thin polymer layer containing the stored information in the form of surface plasmons to a laser beam.

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**5,049,463**

**ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE PRECURSOR**

**Eiichi Kato; Akio Oda, and Seishi Kasai, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

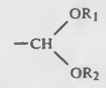
**Filed Oct. 10, 1990, Ser. No. 596,656**

**Claims priority, application Japan, Oct. 11, 1989, 1-263108; Nov. 2, 1989, 1-285021**

**Int. Cl.[5] G03G** *5/087*

**U.S. Cl. 430—49** **18 Claims**

1. An electrophotographic lithographic printing plate precursor comprising a conductive support having provided thereon at least one photoconductive layer containing photoconductive zinc oxide and a binder resin, wherein said binder resin comprises at least one resin containing at least one polymeric component having at least one of formyl group and functional groups represented by the following General Formula (I):



General Formula (I)

wherein $R_1$ and $R_2$ each represent, same or different, hydrocarbon groups or $R_1$ and $R_2$ are organic residual radicals which are combined with each other to form a ring.

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**5,049,464**

**PHOTOSENSITIVE MEMBER FOR ELECTROPHOTOGRAPHY**

**Tetsuro Kanemaru, Tokyo; Toshihiro Kikuchi; Akihiro Senoo, both of Yokohama, and Ryoji Yashiro, Yamanashi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

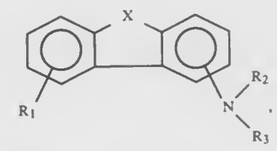
**Filed Dec. 28, 1989, Ser. No. 458,459**

**Claims priority, application Japan, Dec. 29, 1988, 63-330983**

**Int. Cl.[5] G03G** *5/06, 5/14*

**U.S. Cl. 430—59** **11 Claims**

1. A photosensitive member for electrophotography, comprising an electroconductive substrate and a photosensitive layer disposed thereon, wherein the photosensitive layer comprises a substituted amino compound having a charge-transporting function and represented by the following general formula (I):



(I)

wherein X denotes —O—, —S—, or



$R_1$ denotes a hydrogen atom, alkyl, alkoxyl or halogen atom; and $R_2$, $R_3$ and $R_4$ respectively denote an alkyl, aralkyl, aryl or heterocyclic group.

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**5,049,465**

**ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL AND METHOD OF PREPARING SAME**

**Junei Sakaguchi, Tokyo; Soichi Hasegawa, Misato, and Shuichi Arai, Saitama, all of Japan, assignors to Somar Corporation, Japan**

**Filed Nov. 13, 1989, Ser. No. 434,262**

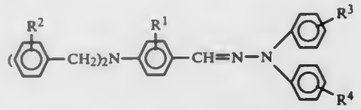
**Claims priority, application Japan, Nov. 15, 1988, 63-289624; Feb. 1, 1989, 1-23249; Feb. 28, 1989, 1-47571; Apr. 19, 1989, 1-99196**

**Int. Cl.[5] G03G** *5/06*

**U.S. Cl. 430—59** **8 Claims**

1. An electrophotographic photosensitive material comprising a charge generating layer and a charge transporting layer formed on an electrically conducting support, said charge generating layer containing a titanium phthalocyanine pigment and 25-200% of a substituted naphthalene, based on the weight of the remainder of said charge generating layer, and said

charge transporting layer containing a hydrazone compound expressed by the following general formula (I):



(I)

wherein $R^1$, $R^2$, $R^3$ and $R^4$ stand, independently from each other, hydrogen or lower alkyl.

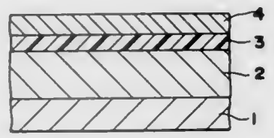
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**5,049,466**

## PHOTOSENSITIVE MEMBER WITH INTERMEDIATE LAYER OF HIGH POLYMER RESIN

**Tetsuo Kyogoku, and Yuji Shintani, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Jan. 24, 1989, Ser. No. 300,979**
**Claims priority, application Japan, Jan. 25, 1988, 63-14070**
**Int. Cl.[5] G03G 5/08**
**U.S. Cl. 430—66** **9 Claims**




1. A photosensitive member comprising:
an electrically conductive substrate;
a photoconductive layer comprising a photosensitive metal compound;
an intermediate layer formed on the photoconductive layer and comprising an organic high polymer resin, said intermediate layer having a thickness of about 0.01 to about 1 micron; and
an overcoat layer formed on the intermediate layer and comprising a ceramic material, said overcoat layer having a volume resistivity greater than that of the intermediate layer.

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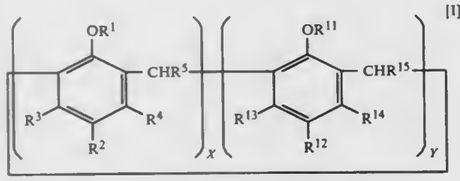
**5,049,467**

## TONER FOR USE IN THE DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES

**Schunichiro Yamanaka, Hirakata, Japan, assignor to Orient Chemical Industries, Ltd., Osaka, Japan**

**Filed Jan. 26, 1990, Ser. No. 471,271**
**Claims priority, application Japan, Jan. 30, 1989, 1-22345**
**Int. Cl.[5] G03G 9/00**
**U.S. Cl. 430—110** **2 Claims**

1. A toner for use in the development of electrostatic latent images that contains at least one calix (n) arene compound with the general formula represented by the following general formula:



[I]

wherein n=X+Y; X and Y are integers, and n=4 to 8; $R^1$ is a hydrogen atom or an alkyl group with 1-5 carbons or else $-(CH_2)_mCOOR^{10}$ (where $R^{10}$ is a hydrogen atom or a lower alkyl group, and m is an integer from 1 to 3); $R^2$ is a hydrogen atom, halogen atom, alkyl group with 1-12 carbons (which can be in the form of branched chains), aralkyl group, $-NO_2$, $-NH_2$, $-N(R^7)_2$ (where $R^7$ is a lower alkyl group), $-SO_3R^8$ (where $R^8$ is a hydrogen atom), phenyl group (which may be a substituted group), or $-Si(CH_3)_3$; $R^3$ and $R^4$ are independently a hydrogen atom, halogen atom, alkyl group with 1-3 carbons, $-NH_2$, or $-N(R^9)_2$ (where $R^9$ is a lower alkyl group); $R^5$ is a hydrogen atom or an alkyl group with 1-3 carbons; $R^{11}$ is a hydrogen atom, an alkyl group with 1-5 carbons, or $-(CH_2)_pCOOR^{20}$ (where $R^{20}$ is a hydrogen atom or a lower alkyl group, and p is an integer from 1 to 3); $R^{12}$ is a hydrogen atom, halogen atom, alkyl group with 1-12 carbons (which can be in the form of branched chains), aralkyl group, $-NO_2$, $-NH_2$, $-N(R^{17})_2$ (where $R^{17}$ is a lower alkyl group), $-SO_3R^{18}$ (where $R^{18}$ is a hydrogen atom), phenyl group (which may be a substituted group), or $-Si(CH_3)_3$; $R^{13}$ and $R^{14}$ are independently a hydrogen atom, halogen atom, alkyl group with 1-3 carbons, $-NH_2$, or $-N(R^{19})_2$ (where $R^{19}$ is a lower alkyl group; and $R^{15}$ is a hydrogen atom or an alkyl group with 1 to 3 carbons.

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**5,049,468**

## LIQUID DEVELOPERS FOR ELECTROSTATIC PHOTOGRAPHY

**Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Oct. 27, 1989, Ser. No. 427,423**
**Claims priority, application Japan, Oct. 28, 1988, 63-270826**
**Int. Cl.[5] G03G 9/12**
**U.S. Cl. 430—115** **9 Claims**

1. A liquid developer for an electrostatic photography comprising a non-aqueous solvent whose electrical resistance is at least $10^9$ Ω cm and whose dielectric constant not more than 3.5 with a resin dispersed wherein the dispersed resin particles are copolymer resin particles obtained by a polymerization reaction, of a solution which contains a monofunctional monomer (A) which is soluble in the non-aqueous solvent but which is rendered insoluble by polymerization and a monofunctional macromonomer (B) whose number average molecular weight is not more that $10^4$ obtained by bonding a polymerizable double bond group represented by the general formula (III) below;



(III)

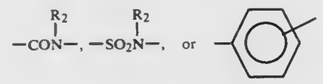
wherein, T' has the same meaning as T in general formula (II), $d^1$ and $d^2$, which may be the same or different, each has the same meaning as $b^1$ and $b^2$ in general formula (II);

to only one end of the main chain of a polymer comprising repeating units represented by the general formula (II) below;



(II)

wherein, T represents $-COO-$, $-OCO-$, $-CH_2OCO-$, $-CH_2COO-$, $-O-$, $-SO_2-$,



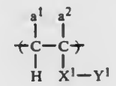


$R_2$ represents a hydrogen atom or a hydrocarbyl group which has from 1 to 18 carbon atoms; $R_1$ represents a hydrocarbyl group which has from 1 to 22 carbon atoms; $b^1$ and $b^2$, which may be the same or different, each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbyl group which has from 1 to 8 carbon atoms, a $-COO-R^3$ group or a $-COO-R^3$ group which is linked via a hydrocarbyl group which has from 1 to 8 carbon atoms, and $R^3$ represents a hydrogen atom or a hydrocarbyl group which has from 1 to 18 carbon atoms;

in the presence of a soluble resin for dispersion stabilization purposes obtained by bonding an acid group selected from the group consisting of $-PO_3H_2$, $-SO_3H$, $-COOH$, $-OH$, $-SH$ and



to just one end of at least the polymer main chain of a polymer which has a repeating unit represented by the general formula (I) below;



(I)

wherein,

$X^1$ represents $-COO-$, $-OCO-$, $-CH_2OCO-$, $-CH_2COO-$, $-O-$ or $=SO_2-$;

$Y^1$ represents an aliphatic group which has from 6 to 32 carbon atoms;

moreover, $a^1$ and $a^2$ may be the same or different, each representing a hydrogen atom, halogen atom, cyano group, hydrocarbyl group which has from 1 to 8 carbon atoms, $-COO-Z^1$ or a $-COO-Z^1$ group which is linked via a hydrocarbyl group which has from 1 to 8 carbon atoms (where $Z^1$ represents a hydrocarbyl group which has rom 1 to 22 carbon atoms); and of which a part is crosslinked, in the non-aqueous solvent.

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**5,049,469**

## TONER IMAGE PRESSURE TRANSFER METHOD AND TONER USEFUL THEREFOR

**Zona R. Pierce; Louis J. Sorriero, both of Rochester, and Dinesh Tyagi, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Dec. 27, 1989, Ser. No. 457,674**
**Int. Cl.[5] G03G 9/093**
**U.S. Cl. 430—109** **7 Claims**

1. A toner for electrophotographic copying comprising particles whose average diameters are in the range of about 2 to about 20 microns, said particles each having a core and a highly uniform enclosing shell; said core comprising a mixture of about 0 to about 20 weight percent of colorant, about 0.05 to about 5 weight percent of charge control agent, and about 80 to about 99.95 weight percent of thermoplastic polymer having a melting temperature in the range of about 40° to about 150° C., and a degree of crystallization in the range of about 5 to about 80%, and said shell comprising colloidal sized particles of a copolymer comprising about 25 to 80 weight percent of addition polymerizable nonionic oleophilic monomer; about 5 to about 45 weight percent of addition polymerizable nonionic hydrophilic monomer; about 1 to about 50 weight percent of addition polymerizable ionic monomer; and about 8 to about 20 weight percent of a crosslinking monomer having at least two addition polymerizable groups.

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**5,049,470**

## DEVELOPMENT PROCESS FOR FORMATION OF HIGH-QUALITY IMAGE

**Teruaki Higashiguchi, and Junko Mizuno, both of Tokyo, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 28, 1989, Ser. No. 442,312**
**Claims priority, application Japan, Nov. 28, 1988, 63-298385**
**Int. Cl.[5] G03G 15/09**
**U.S. Cl. 430—122** **11 Claims**

1. A magnetic brush development process for obtaining a high-quality image in the electrophotography, which a two-component type developer comprising an electroscopic toner and a magnetic carrier onto a magnet sleeve to form a magnetic brush and bringing the magnetic brush into sliding contact with the surface of a photosensitive material drum on which an electrostatic latent image is formed, to effect development, wherein a developer formed by mixing the toner and the magnetic carrier at a specific surface area ratio of from 0.7/1 to 1.3/1 is used, and the development is carried out under such conditions that the peripheral speed ratio K of the magnet sleeve to the photosensitive material drum satisfies the following requirement:

$$\frac{1.25d}{x} \cdot \frac{\log R}{9} \leqq K \leqq \frac{2d}{x} \cdot \frac{\log R}{9}$$

wherein d represents the average particle size (μm) of the magnetic carrier, x represents the saturation magnetization (emu/g) of the magnetic carrier as measured at 50 KOe, and R represents the electric resistance value (Ω-cm) of the magnetic carrier.

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**5,049,471**

## MAGNETIC BRUSH DEVELOPMENT PROCESS

**Teruaki Higashiguchi, and Junko Mizuno, both of Tokyo, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Nov. 28, 1989, Ser. No. 442,186**
**Claims priority, application Japan, Nov. 28, 1988, 63-298384**
**Int. Cl.[5] G03G 15/09**
**U.S. Cl. 430—122** **11 Claims**

1. A magnetic brush development process in the electrophotography, which comprises supplying a two-component type developer comprising an electroscopic toner and a magnetic carrier onto a magnet sleeve to form a magnetic brush and bringing the magnetic brush into sliding contact with the surface of a photosensitive material drum on which an electrostatic latent image is formed, to effect development, wherein the development is carried out under such conditions that the peripheral speed ratio K of the magnet sleeve to the photosensitive material drum satisfies the following requirement:

$$\frac{1.25d}{x} \leqq K \leqq \frac{2d}{x}$$

wherein d represents the average particle size (μm) of the magnetic carrier of the developer, and x represents the saturation magnetization (emu/g) of the magnetic carrier of the developer.

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5,049,472

## METHOD AND APPARATUS OF RECORDING IMAGE

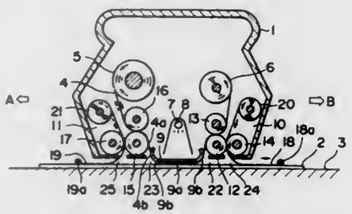
Nagao Hosono, Hachioji; Yukio Nagase, Tokyo; Tatsuo Takeuchi, Kawasaki; Hiroshi Satomura, Hatogaya; Hidemi Egami, Zama; Yuji Sakemi, Yokohama, and Yasushi Miura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 83,036, Aug. 7, 1987, abandoned. This application Oct. 27, 1989, Ser. No. 427,994

Claims priority, application Japan, Nov. 26, 1986, 61-282321; Dec. 25, 1986, 61-313167; Jan. 30, 1987, 62-19913; Jun. 8, 1987, 62-141505

Int. Cl.[5] G03G *5/00*

U.S. Cl. 430—200 9 Claims



1. A method for recording an image onto a recording medium, said method utilizing a body having incorporated therein a heat-sensitive sheet consisting of a heat-fusible supercooled substance layer on a light-transmissive base sheet, said method comprising the steps of:

positioning said body over an original image surface to be recorded;

bringing the heat-fusible supercooled substance layer of said heat-sensitive sheet into contact with the original image surface by extracting said heat-sensitive sheet from an accommodating section within said body by means of an extracting force generated by movement of said body;

providing a source of light which is a flashlight;

intermittently projecting light from said source of light through the heat-sensitive sheet and onto a predetermined area of the original image surface, said light projection taking place from the light-transmissive base sheet side of said heat-sensitive sheet, thereby forming an adhesive area of said heat-fusible supercooled substance layer corresponding to an original image portion of said original image surface form heat generated by the original image portion after absorbing light emitted from said source of light;

peeling said heat-sensitive sheet from said original image surface after forming the adhesive area of said heat-fusible supercooled substance layer;

positioning the body onto the recording medium while adhesivity of said adhesive area remains effective, thereby bringing the heat-fusible supercooled substance layer of said heat-sensitive sheet into contact with the recording medium; and

transferring said adhesive area to the recording medium by peeling the heat-sensitive sheet from said recording medium by moving said body across said recording medium thereby transferring said adhesive area to said recording medium and recording said image onto said recording medium.

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5,049,473

## METHOD OF PRESERVING COLORED IMAGES

Kazuhiko Furuya, and Satoru Sawada, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 17, 1989, Ser. No. 325,339

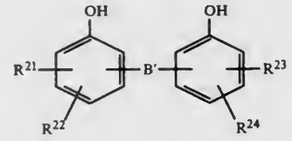
Claims priority, application Japan, Mar. 17, 1988, 63-64118

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—203 2 Claims

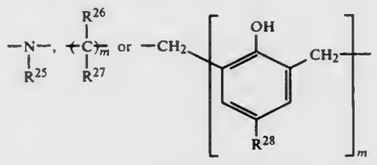
1. A method for stabilizing a dye image in a dye fixing element, comprising the steps of exposing imagewise a heat developable color photosensitive element which has a construction which includes, on a support, at least a phototsensitive silver halide, a binder and a dye providing substance which forms or releases a diffusible azo dye in proportion, or in inverse proportion, to a reaction in which the silver halide is reduced to silver; thereafter or simultaneously heating said photosensitive element to form a diffusible azo dye; and transferring the diffusible azo dye to a dye fixing element to form a dye image, wherein the dye fixing element comprises at least one compound for which the quenching rate constant for the excited triplet of arylazonaphthol dyes is at least $1\times10^5\ M^{-1}\cdot sec^{-1}$ and/or the quenching rate constant for singlet state oxygen is at least $1\times10^7\ M^{-1}\cdot sec^{-1}$,

wherein said compound is an anti-color fading agent represented by general formula (II') or (IV):

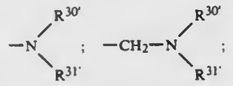


(II')

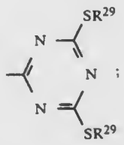
wherein $B^1$ represents —S—, —S—S—, —O—, —CH$_2$—S—CH$_2$—, —SO$_2$—, —SO—, —CH$_2$—O—CH$_2$—,



$R^{21}$, $R^{22}$, $R^{23}$ and $R^{24}$ each independently represents a hydrogen atom; an alkyl group which has from 1 to 20 carbon atoms; an aryl group; an aralkyl group; an alkylthio group; a halogen atom; an alkoxy group; an arylthio group; an aralkoxy group; an aryloxy group; —COOR$^{29}$; —NHCOR$^{29}$; —NHSO$_2$R$^{29}$; —SO$_2$R$^{29}$; —O—COR$^{29}$;

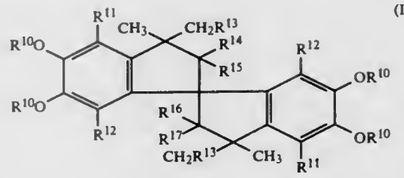


or —(CH$_2$)$_n$—A'; $R^{25}$ represents a hydrogen atom, an alkyl group or an aryl group; $R^{26}$ and $R^{27}$ each independently represents a hydrogen atom, an alkyl group or an aryl group, or they may be joined together to form a five or six membered ring; $R^{28}$ represents a hydrogen atom or a methyl group; $R^{29}$ represents an alkyl group or an aryl group; and $R^{30'}$ and $R^{31'}$ each independently represents a hydrogen atom, an alkyl group; an aryl group, a heterocyclic group or an aralkyl group, or they may be joined together to form a five or six membered heterocyclic ring which may be substituted; A' represents an ester group or





and m and n represent integers of from 1 to 3;



(IV)

wherein $R^{10}$ represents an alkyl group, an alkenyl group, an aryl group, an aralkyl group, a heterocyclic group or a group represented by $R^{18}CO$, $R^{19}SO_2$ or $R^{20}NHCO$, wherein $R^{18}$, $R^{19}$ and $R^{20}$ each independently represents an alkyl group, an alkenyl group, an aryl group or a heterocyclic group; $R^{11}$ and $R^{12}$ each independently represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, an alkoxy group or an alkenoxy group; and $R^{13}$, $R^{14}$, $R^{15}$, $R^{16}$ and $R^{17}$ each independently represents a hydrogen atom, an alkyl group, an alkenyl group or an aryl group.

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5,049,474

## COLOR LIGHT-SENSITIVE MATERIAL

Seiji Ichijima, and Kei Sakanoue, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd, Kanagawa, Japan

Filed May 20, 1988, Ser. No. 196,392

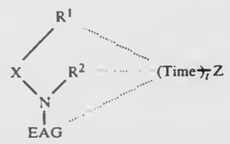
Claims priority, application Japan, May 20, 1987, 62-123497

The portion of the term of this patent subsequent to Jan. 8, 2005, has been disclaimed.

Int. Cl.[5] G03C *8/22, 7/392*

U.S. Cl. 430—223 14 Claims

1. A color light-sensitive material, which comprises a support having thereon at least a light-sensitive silver halide, an image-forming coupler, and a compound represented by formula (II):



(II)

wherein X represents an oxygen atom, a sulfur atom or a nitrogen-containing group of formula —N($R_3$)—; $R_1$, $R_2$ and $R_3$ each represents a mere bond or a group other than a hydrogen atom; EAG represents an electron accepting group; or $R_1$, $R_2$, $R_3$ and EAG are connected to each other to form a ring; Time represents a group capable of releasing Z upon cleavage of the N—X bond through a reaction subsequent to the release from the rest of the compound in the form of (Time)$_t$Z; the dotted lines represent possible bonds, provided that at least one dotted line is a bond; t represents an integer of 0 or 1; and Z represents a group which becomes a slightly mobile dye or a precursor thereof for forming an unsharp mask after being released from (Time)$_t$Z wherein said dye released from the compound represented by formula (II) has a maximum absorption wavelength of the same series color as the dye formed by said color coupler.

5,049,475

## METHOD FOR PRODUCTION OF PHOTOSENSITIVE MATERIAL FOR DIFFUSION TRANSFER PROCESS

Susumu Baba; Akio Yoshida, and Yasuo Tsubai, all of Nagaoka-kyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 437,632

Claims priority, application Japan, Jan. 16, 1989, 1-153789

Int. Cl.[5] G03C *5/54*

U.S. Cl. 430—249 7 Claims

1. A silver complex diffusion transfer process for producing images which comprises imagewise exposure to light of a photosensitive material comprising a polyolefin resin coated paper having a water content of 5.5 to 7.5% and provided thereon a water permeable silver halide emulsion layer and a water permeable hydrophilic colloid, layer, wherein at least one of the silver halide emulsion layer and the hydrophilic colloid layer contains a hydroxybenzene developing agent; when the layers on the emulsion layer coated side are immersed in a 0.1N aqueous sodium hydroxide solution at 20° C. for 1 minute, amount of solution absorbed in the layers is 3.5–7.0 ml per 1 g of hydrophilic colloid and developing the exposed material with a processing solution in the presence of a developing agent and a solvent for the silver halide to form a soluble silver complex, and transferring the thus produced imagewise silver complex to an image receiving layer containing physical development nuclei of positive material to form a silver image.

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5,049,476

## PHOTOPOLYMERIZABLE, POSITIVE WORKING, PEEL DEVELOPABLE, SINGLE SHEET COLOR PROOFING SYSTEM

Stephan J. W. Platzer, Eltville, Fed. Rep. of Germany, assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 220,479, Jul. 18, 1988, Pat. No. 4,895,787. This application Jan. 10, 1990, Ser. No. 463,075

The portion of the term of this patent subsequent to Jan. 23, 2007, has been disclaimed.

Int. Cl.[5] G03G *7/00;* G03C *5/08*

U.S. Cl. 430—253 30 Claims

1. A method for forming a colored image which comprises, in order:

(A) providing a photosensitive element which comprises, in order:

(i) a transparent support having an adhesion promoted surface; and

(ii) a single photosensitive composition layer directly on said adhesion promoted surface, which photosensitive layer comprises an organic binding resin, a colorant, a photoinitiator, and a free radical polymerizable acrylate or methacrylate component having at least two ethylenically unsaturated groups, wherein said binding resin is present in sufficient amount to bind the composition components into a uniform film, and wherein said colorant is present in sufficient amount to uniformly color the composition, and wherein said photoinitiator is present in sufficient amount to initiate the free radical polymerization of said polymerizable component upon exposure to sufficient actinic radiation, and wherein said polymerizable component is present in sufficient amount to provide image differentiation when the composition is image-wise exposed to actinic radiation; and

(iii) an adhesive layer directly adhered to said colored, photosensitive layer, which adhesive layer comprises a thermoplastic resin which has a $T_g$ in the range of from about 25° C. to about 100° C.; and

(B) either

(i) providing a receiver base to which said adhesive layer is laminated at elevated temperature and pressure; and then image-wise exposing said photosensitive composition through the transparent support to actinic radiation; or

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(ii) image-wise exposing said photosensitive composition to actinic radiation; and then providing a receiver base to which said adhesive layer is laminated at elevated temperature and pressure; and

(C) peeling apart said support and said receiver base, thereby transferring the adhesive layer and the image-wise nonexposed portions of the colored, photosensitive composition to the receiver base while the image-wise exposed portions remain on the adhesion promoted surface of the support; and

(D) optionally repeating steps (A) through (C) at least once with another photosensitive element having at least one different colorant transferred to the adhesive layer and image-wise nonexposed portions of the previously processed photosensitive element on said receiver base.

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**5,049,477**

## RADIATION RESPONSIVE COMPOSITION

**Koki Nakamura; Masayoshi Tsuboi, and Keizo Koya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

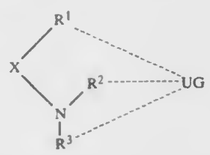
**Filed Apr. 14, 1989, Ser. No. 338,089**

**Claims priority, application Japan, Apr. 15, 1988, 63-92801**

**Int. Cl.[5] G03C *1/54*; G03F *7/004***

**U.S. Cl. 430—270** **20 Claims**

1. A radiation responsive composition comprising a compound represented by the following formula (I) and a photoreducing agent capable of forming a redox couple together with said compound:



(I)

wherein N represents a nitrogen atom; X represents an oxygen atom (—O—), a sulfur atom (—S—), or a nitrogen-containing group of formula,



$R^1$, $R^2$, $R^3$ and $R^4$ each represents a mere bond, a substituted or unsubstituted alkyl, aryl, heterocyclic, acyl, aralkyl, alkenyl, alkynyl or carbamoyl group, or a sulfonyl group into which a substituted or unsubstituted alkyl or aryl group has been introduced, provided that at least one of the substituents $R^1$ to $R^3$ be a substituted or unsubstituted aryl or heterocyclic group and that two or more of $R^1$, $R^2$ and $R^3$, or of $R^1$, $R^2$, $R^3$ and $R^4$ when X represents a nitrogen containing group of formula,



may be taken together to form a ring; UG represents a group to be released from said compound of formula (I) taking advantage of the N—X bond cleavage as a trigger, which takes place when a redox couple is formed between said compound of formula (I) and the photoreducing agent irradiated with radiant rays; and the solid lines represent bonds, while broken lines indicate that a bond may or may not be present, but at least one of the broken lines forms a bond.

**5,049,478**

## CONTINUOUS PRODUCTION OF A PHOTOSENSITIVE RECORDING ELEMENT

**Horst Koch, Gruenstadt; Karl-Rudolf Kurtz, Heidelberg; Thomas Telser, Weinheim, and Manfred Zuerger, Sinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Sep. 26, 1989, Ser. No. 412,995**

**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1988, 3833650**

**Int. Cl.[5] G03C *1/76*; B29C *47/00***

**U.S. Cl. 430—270** **17 Claims**

1. A continuous process for the production of a photopolymerizable recording layer (A), in which the photopolymerizable recording layer (A) is produced from two or more individual strata ($a_n$) which lie one on top of the other, are firmly bonded to one another and have the same or roughly the same composition or different compositions, by firmly bonding the said strata in the nip of a calender in one operation, the said continuous process comprising the steps of

(1) separately melting the mixtures ($a_n$) used for the production of the individual strata ($a_n$) and combining the resulting, separate material streams ($a_n$) in the molten state even before they enter the calender nip, without mixing them through turbulence,

(2) shaping the molten material streams ($a_n$) to give molten sheet-like structures ($a_n$) lying one on top of the other, before they enter the calender nip, before, during or directly after the said streams have been combined, without mixing them through turbulence,

(3) introducing the molten sheet-like structures ($a_n$) lying one on top of the other into the calender nip, one or both of the two outer molten sheet-like structures ($a_n$) in contact with the calender rollers forming a rotating melt bead or rotating bank, and

(4) calendering the molten sheet-like structures ($a_n$) lying one on top of the other with production of the photopolymerizable recording layer (A) consisting of individual strata ($a_n$) which lie one on top of the other and are firmly bonded to one another.

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**5,049,479**

## PHOTOPOLYMERIZABLE MIXTURE AND RECORDING MATERIAL PRODUCED THEREFROM

**Rudolf Zertani, Mainz-Bretzenheim, and Dieter Mohr, Budenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Sep. 21, 1989, Ser. No. 410,267**

**Claims priority, application Fed. Rep. of Germany, Sep. 21, 1988, 3832032**

**Int. Cl.[5] G03F *7/031*; G03C *1/735***

**U.S. Cl. 430—271** **20 Claims**

1. A photopolymerizable mixture comprising

a) a polymeric binder,

b) a free-radically polymerizable compound having at least one polymerizable group,

c) a photoreducible dye,

d) a trihalomethyl compound which can be cleaved by radiation and

e) a metallocene compound.

15. A photopolymerizable recording material comprising a support material and a photopolymerizable layer which comprises a mixture as claimed in claim 1.

16. A recording material as claimed in claim 15, wherein the photopolymerizable layer is provided with a further transparent layer which is substantially impermeable to atmospheric oxygen and is soluble in a developer liquid used for the photopolymerizable layer.



**5,049,480**

## PHOTOSENSITIVE AQUEOUS DEVELOPABLE SILVER CONDUCTOR COMPOSITION

**Willim J. Nebe, Wilmington, Del., and James J. Osborne, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Feb. 20, 1990, Ser. No. 481,841**

**Int. Cl.[5] G03C *5/44***

**U.S. Cl. 430—281** **7 Claims**

1. In an aqueous developable photosensitive silver conductor composition which is fireable in an oxidizing or substantially nonoxidizing atmosphere comprising an admixture of:

(a) finely divided particles of silver solids having a surface area-to-weight ratio of no greater than 20 $m^2/g$ and at least 80 percent by weight of the articles having a size of 0.5–10 $\mu m$ and

(b) finely divided particles of an inorganic binder having a glass transition temperature in the range of from 550° to 825° C., a surface area-to-weight ratio of no greater than 10 $m^2/g$ and at least 90 wt. % of the particles having a size of 1–10 $\mu m$, the weight ratio of (b) to (a) being in a range from 0.0001 to 0.25, dispersed in an organic vehicle comprising

(c) an organic polymeric binder,

(d) a photoinitiation system,

(e) photohardenable monomer,

(f) an organic medium wherein the improvement comprises the organic polymeric binder is a copolymer or interpolymer comprising (1) a nonacidic comonomer comprising a $C_1$–$C_{10}$ alkyl acrylate or $C_1$–$C_{10}$ alkyl methacrylate, styrene, substituted styrene or combinations thereof and (2) an acidic comonomer comprising an ethylenically unsaturated carboxylic acid, with the proviso that all acidic comonomers comprise at least 15 weight percent of the polymer, wherein the organic polymeric binder has a molecular weight no greater than 50,000 and wherein the composition upon imagewise exposure to actinic radiation is developable in an aqueous solution containing 0.8 percent by weight sodium carbonate.

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**5,049,481**

## SENSITIZERS FOR PHOTOPOLYMERIZABLE COMPOSITIONS

**Yasuo Okamoto, and Tadahiro Sorori, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan**

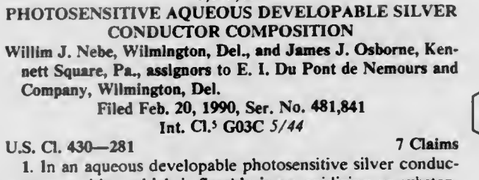
**Filed Dec. 26, 1989, Ser. No. 456,968**

**Claims priority, application Japan, Dec. 29, 1988, 63-335219**

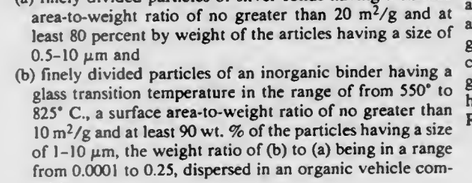
**Int. Cl.[5] G03F *7/028*, *7/029*, *7/031***

**U.S. Cl. 430—283** **22 Claims**

1. A photopolymerizable composition comprising (i) a polymerizable compound having an addition polymerizable unsaturated bond, (ii) at least one compound selected from the group of compounds consisting of those represented by formulae (Ia), (Ib) and (Ic):

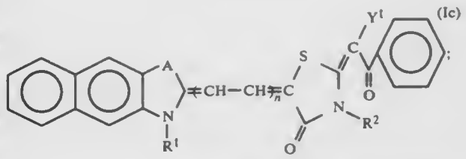


(Ia)



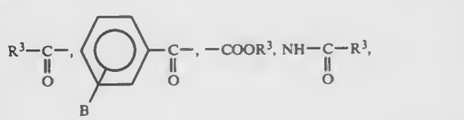
(Ib)

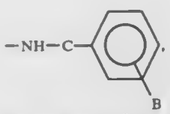
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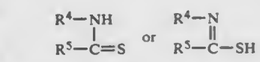
(Ic)

wherein A is an oxygen atom, a sulfur atom, a selenium atom, a tellurium atom, an alkyl- or aryl-substituted nitrogen atom, or a dialkyl-substituted carbon atom; $Y^1$ is a hydrogen atom, alkyl group, aryl group, an aralkyl group, an acyl group, or alkoxycarbonyl group; $R^1$ and $R^2$ each is a hydrogen atom, an alkyl group having from 1 to 18 carbon atoms, or an alkyl group having from 1 to 18 carbon atoms which is substituted with $R^3O$—,





$(CH_2CH_2—O—)_mR^3$, or a halogen atom, wherein $R^3$ is a hydrogen atom or an alkyl group having from 1 to 10 carbon atoms, and B represents a dialkylamino group, a hydroxyl group, an acyloxy group, a halogen atom, or a nitro group; n is 0 or an integer of from 1 to 4; and m is an integer of from 1 to 20, and (iii) at least one compound selected from the group consisting of (a) a compound having a carbon-halogen bond, (b) an aromatic onium salt, (c) an organic peroxide, (d) a thio compound represented by formula (II):



wherein $R^4$ is an alkyl group, or an aryl group; and $R^5$ is a hydrogen atom or an alkyl group; or $R^4$ and $R^5$ taken together are non-metallic atom groups of a 5- to 7-membered carbocyclic or heterocyclic ring, wherein the hetero atom is an oxygen, sulfur or nitrogen atom, (e) a hexaarylbiimidazole, and (f) a ketoxime ester.

4. A photopolymerizable composition as claimed in claim 1, wherein said photopolymerizable compound having an addition polymerizable unsaturated bond is at least one member selected from the group consisting of esters of unsaturated carboxylic acids and aliphatic polyhydric alcohols, and amides of unsaturated carboxylic acids and aliphatic polyamine compounds.

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**5,049,482**

## SILVER HALIDE LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL FORMING A DYE IMAGE OF ENHANCED LIGHT FASTNESS

**Toyoki Nishijima, and Masaki Tanji, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan**

**Filed Aug. 29, 1989, Ser. No. 400,079**

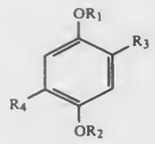
**Claims priority, application Japan, Sep. 1, 1988, 63-218749**

**Int. Cl.[5] G03C *1/34***

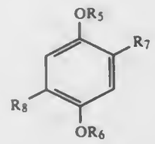
**U.S. Cl. 430—551** **9 Claims**

1. A silver halide photographic light-sensitive material com-

prising a support having thereon a silver halide emulsion layer containing a dye-forming coupler, a compound represented by the following Formula I, and a compound represented by the following Formula II:



(I)



(II)

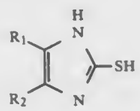
wherein $R_1$ and $R_2$ each represents a straight or branched chain alkyl group having 1 to 4 carbon atoms or a straight or branched chain alkenyl group having 1 to 4 carbon atoms; $R_5$ and $R_8$ each represents a straight or branched chain alkyl group having 5 to 18 carbon atoms or a straight or branched chain alkenyl group having 5 to 18 carbon atoms; and $R_3$, $R_4$, $R_7$ and $R_8$ each represents a straight or branched chain alkyl group having 4 to 8 carbon atoms.

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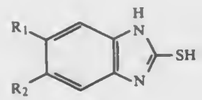
**5,049,483**
**DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND A PROCESSING METHOD THEREFOR**
**Naoko Yatsuyanagi, and Tsuyoshi Mitsuhashi, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan**
**Filed Jun. 4, 1990, Ser. No. 532,946**
**Claims priority, application Japan, Jun. 8, 1989, 1-147923; Jun. 29, 1989, 1-168640**
**Int. Cl.[5] G03C** *1/485*
**U.S. Cl. 430—597** **19 Claims**

1. A direct positive silver halide photographic light-sensitive material comprising a support having provided thereon photographic component layers including a silver halide emulsion layer, wherein said silver halide emulsion layer contains prefogged silver halide grains and an electron-accepting compound; at least one of said photographic component layers containing at least one compound selected from the group consisting of

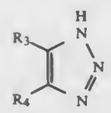
Formula I-a



Formula I-b

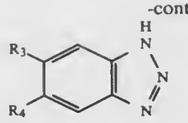


Formula II-a



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Formula II-b

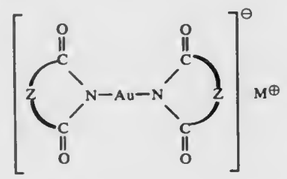


wherein $R_1$ to $R_4$ independently represent a hydrogen atom, a lower alkyl group, an alkoxy group, a carboxyl group, an alkoxycarbonyl group, a sulfo group, a halogen atom, and a nitro group, provided that at least one of $R_1$ and $R_2$ is a carboxyl group, an alkoxycarbonyl group, or a sulfo group.

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**5,049,484**
**PHOTOGRAPHIC SILVER HALIDE MATERIAL AND PROCESS**
**Joseph C. Deaton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Nov. 16, 1990, Ser. No. 614,537**
**Int. Cl.[5] G03C** *1/09*
**U.S. Cl. 430—605** **10 Claims**

1. A photographic silver halide emulsion chemically sensitized with a water-soluble gold(I) compound represented by the formula:



wherein:
Z represents the substituted or unsubstituted nitrogen and carbon atoms necessary to complete a 5- or 6-member imide nucleus; and
M is a cation.

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**5,049,485**
**PHOTOGRAPHIC SILVER HALIDE MATERIAL COMPRISING GOLD COMPOUND**
**Joseph C. Deaton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Nov. 16, 1990, Ser. No. 614,536**
**Int. Cl.[5] G03C** *1/09*
**U.S. Cl. 430—605** **10 Claims**

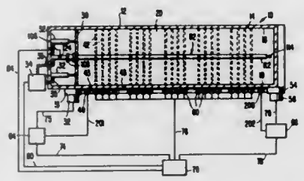
1. A photographic silver halide emulsion chemically sensitized with a soluble gold(I) compound of the formula:

$$AuL_2{}^+X^- \text{ or } AuL(L^1)^+X^-$$

wherein
L is a mesoionic compound;
X is an anion; and
$L^1$ is a Lewis donor ligand.



**5,049,486**
**TEMPERATURE MONITORING APPARATUS AND METHOD IN A COMPOSTING SYSTEM THROUGH WHICH ORGANIC MATTER IS MOVED TO EFFECT COMPOSTING**
**Kenneth R. Blackwood, Homewood, and David B. Derryberry, Irondale, both of Ala., assignors to Ashbrook-Simon-Hartley Corporation, Houston, Tex.**
**Filed Apr. 14, 1989, Ser. No. 337,868**
**Int. Cl.[5] C12Q** *3/00;* **C12M** *1/38*
**U.S. Cl. 435—3** **18 Claims**



1. A method of composting by monitoring the temperature of a mass of organic matter moved through a composting vessel and regulating the temperature in response thereto, including the steps of:
surrounding at least one elongated probe with a mass of organic matter to be composted;
moving the mass of organic matter through the composting vessel in the same direction as that in which the elongated probe extends;
measuring the temperature of the interior of the mass of organic matter at a plurality of locations along the probe; and
regulating the temperature in the vessel by temperature regulating means coupled with said probe.

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**5,049,487**
**AUTOMATED INITIATION OF TIMING OF REFLECTANCE READINGS**
**Roger Phillips, Palo Alto; Geoffery McGarraugh, Scotts Valley; Frank Jurik, San Mateo, and Ray Underwood, Red Bluff, all of Calif., assignors to Lifescan, Inc., Milipitas, Calif.**
**Division of Ser. No. 896,418, Aug. 13, 1986, Pat. No. 4,935,346. This application Feb. 11, 1988, Ser. No. 154,983**
**Int. Cl.[5] C12Q** *1/00;* **G01N** *21/77*
**U.S. Cl. 435—4** **2 Claims**

1. A method of causing an analytical measurement to be made in a reflectance-reading device at the end of a predetermined time period after an analyte reacts with a reagent in a porous, reflectance-reading matrix located in said device, which comprises:
taking a first reflectance reading from a dry first surface of said porous matrix prior to application of a sample of body fluid suspected of containing said analyte to a second surface of said porous matrix from which said sample can travel to said first surface by capillary action and react with said reagent in said porous matrix if said analyte is present in said sample;
applying said sample to said second surface of said porous matrix;
taking an additional reflectance reading from said first surface after said sample is applied to said porous matrix;
comparing said additional reflectance reading to said first reflectance reading;
initiating said predetermined time period upon a predetermined drop in reflectance sufficient to indicate that said sample has reached said first surface; and
taking a measurement reflectance reading at the end of said predetermined time period without having determined the time at which said sample was initially applied to said porous matrix.

**5,049,488**
**METHOD AND NUCLEIC ACID FOR THE PREPARATION OF LECITHIN:CHOLESTEROL ACYLTRANSFERASE**
**Bradford W. Baer, Menlo Park; Dennis T. Drayna, San Francisco; Richard M. Lawn, San Francisco, and John W. McLean, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.**
**Filed Nov. 8, 1985, Ser. No. 796,473**
**Int. Cl.[5] C12Q** *1/68*
**U.S. Cl. 435—6** **4 Claims**



1. A method for detecting a human lecithin:cholesterol acyltransferase gene or parts thereof comprising digesting a test sample of DNA with a restriction enzyme to produce a population of DNA fragments, separating the fragments and determining those fragments of at least 10 nucleotides capable of hybridizing under high stringency conditions to a human lecithin:cholesterol acyltransferase nucleic acid probe which is complementary to human lecithin:cholesterol acyltransferase DNA selected from the group consisting of human lecithin:-cholesterol acyltransferase encoding structural genomic DNA, cDNA, the flanking regions of FIG. 2, or a portion of a human lecithin:cholesterol acyltransferase structural gene which will hybridize specifically to a human lecithin:cholesterol acyltransferase structural gene.

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**5,049,489**
**16S RRNA OLIGONUCLEOTIDE PROBES FOR THE IDENTIFICATION OF SULFATE-REDUCING BACTERIA**
**Kathryn J. Aldrich, Cleveland Heights, and Donald E. Brink, Valley View, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio**
**Filed Apr. 17, 1989, Ser. No. 339,277**
**Int. Cl.[5] C12Q** *1/68;* **C07H** *15/12;* **C12N** *15/00*
**U.S. Cl. 435—6** **8 Claims**

1. A process of determining the presence of sulfate-reducing bacteria belonging to the genera Desulfovibro or Desulfotomaculum in a sample comprising the steps of:
(a) lysing the bacteria contained in a test sample to release the bacteria's 16S rRNA molecules;
(b) exposing the lysed sample to an oligonucleotide probe that selectively hybridizes to recognizable base sequences of a region of the 16S rRNA molecule of sulfate-reducing bacteria that is sufficiently distinctive to those bacteria that it does not hybridize to rRNA of other bacteria that may be present in the sample, the probe also including a detectable label thereon and selected from the group consisting of:

303 273
5' CCCTCTCAGGCCGGCTACCCATCGTCGCCTT 3'

184
5' CUCAAGAUG/

UAACUUUUUGAGGAAAGAUGGCCUCUGCUUGCAU-/

-continued

219
|
GCUAUC 3'

in which G/U means that either a G or a U is present at this position and -/G means that no base is present or a G is present at this position,

5' ATGCAAGCAGAGGCCATC 3' and

164 141
| |
5' CCTT/ATCGAGGTGTTATCCCGGTCT 3'

in which T/A indicates either T or A at this position.

(c) separating the labelled probe-rRNA complex from any labelled probe remaining in the sample that is not hybridized to the nucleic acid of the sulfate-reducing bacteria; and

(d) determining the presence of the labelled probe hybridized to the nucleic acid of the sulfate-reducing bacteria.

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**5,049,490**

## QUANTITATIVE DETERMINATION OF A DNA POLYMERASE AND A TEST KIT USEFUL IN SAME

**John W. H. Sutherland, Rochester, N.Y.; Patrick J. Sheridan, San Leandro, and Louis M. Mezei, Fremont, both of Calif., assignors to Eastman Kodak Co., Rochester, N.Y. and Cetus Corporation, Emeryville, Calif.**

**Filed Feb. 20, 1990, Ser. No. 482,137**
**Int. Cl.[5] C12Q *1/68;* C07H *15/12;* C12N *15/00***
**U.S. Cl. 435—6** **22 Claims**

1. A method for the quantitative determination of a DNA polymerase, comprising:

A. bringing into contact:

an aqueous test specimen believed to contain a DNA polymerase having activity $A_x$,

a single-stranded DNA template which is present in a concentration of at least about $10^{-8}$ molar nucleotides,

a DNA primer complementary to said template,

a polymerase metal ion cofactor,

sufficient deoxyribonucleoside triphosphates to generate a double-stranded DNA molecule from said template in the presence of said polymerase, and

a colorimetric or fluorescent dye which, when bound to said double-stranded DNA formed from said template, exhibits a detectable signal as opposed to when said dye is bound to said template, and

B. determining, with a precision having a covariance of less than about 10%, the activity $A_x$ of said polymerase in said test specimen corresponding to the rate of colorimetric or fluorometric signal generated by the binding of said dye to the double-stranded DNA formed by the action of said test specimen polymerase,

said polymerase activity $A_x$ being determined as follows:

1) generating polymerase rates of reaction from the colorimetric or fluorometric signals generated over time by each of a series of samples containing DNA polymerase having known polymerase activities, $A_1, A_2, \ldots A_i \ldots A_n$ wherein n is the number of samples evaluated and is at least two, and generating the polymerase rate of reaction from the colorimetric or fluorometric signal generated over time from said test specimen,

2) determining a calibration using said rates of step 1) and said known polymerase activities $A_i$, and

3) predicting $A_x$ using the calibration of step 2) and said polymerase reaction rate of said test specimen.

**5,049,491**

## IMMUNOLOGIC DETECTION OF FACTOR V(VA) FRAGMENTS IN HEMORRHAGIC AND THROMBOTIC CLINICAL SETTINGS

**Kenneth G. Mann, Shelbourne, and Paula B. Tracy, Essex Junction, both of Vt., assignors to The University of Vermont, Burlington, Vt.**

**Filed Nov. 19, 1987, Ser. No. 122,985**
**Int. Cl.[5] C12Q *1/00;* C07K *15/06;* G01N *33/53***
**U.S. Cl. 435—7.92** **19 Claims**



1. A method of diagnosing thrombotic or hemorrhagic events in humans comprising monitoring human blood plasma for changes in the levels of the fragmentation pattern of Factor V or Factor Va.

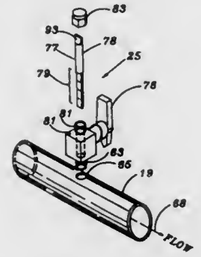
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**5,049,492**

## BIOFILM MONITORING COUPON SYSTEM AND METHOD OF USE

**Richard L. Sauer, and David T. Flanagan, both of League City, Tex., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.**

**Filed Mar. 14, 1990, Ser. No. 493,529**
**Int. Cl.[5] G01N *1/16, 1/18, 1/20***
**U.S. Cl. 435—30** **17 Claims**




1. A biofilm monitoring apparatus for use in a water distribution system having a manifold connected in the system so as to carry the water flow stream therethrough, said manifold having at least one opening in the wall thereof;

a valve means including a valve body having a passage therethrough and a valve element means mounted in said passage which is moveable between a first position in which said passage is open and a second position in which said passage is closed;

said valve element means having an orifice therethrough which is disposed in alignment with said valve passage when in the passage open position;

means for connecting said valve means to the manifold with said valve passage in fluid communication with the manifold through the manifold opening;

a biofilm sampling member of elongate form constructed so as to be asserted into the flow passage of the manifold through said valve body, said biofilm sampling member including a handle portion which is constructed so as to be slidably received through the orifice of he valve element means when in its passage open position and a sampling portion which extends into the manifold when the handle portion extends through the orifice of the valve element means wherein the sampling portion of the biofilm sampling member is of substantially flat blade-like configuration with a narrow peripheral edge and opposed planar surfaces suitable for biofilm accumulation and said biofilm sampling portion will be edge-on to the flow stream through the manifold when installed in the manifold;

means for removably connecting said biofilm sampling member to the valve body in fluid-tight sealed relationship therewith so that said biofilm sampling member is disposed int he valve passage with its sampling portion in the flow stream of the manifold whereby said elongate sampling member may be disconnected from the valve body and extracted from the manifold through the valve passage whenever it is desired to extract a biofilm sample from the manifold flow stream under positive pressure conditions of the water distribution system; and

means for moving the valve element means to the valve passage closed position immediately following the removal of said biofilm sampling member past said valve element means orifice so as to preclude the contamination of the water distribution system through said valve passage.



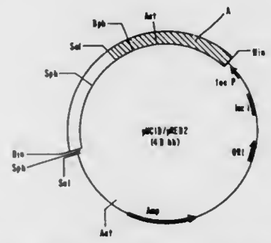
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**5,049,493**

## ENHANCEMENT OF CELL GROWTH BY EXPRESSION OF A CLONED HEMOGLOBIN GENE

**Chaitan S. Khosla, and James E. Bailey, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.**

**PCT No. PCT/US88/03745, § 371 Date Jan. 24, 1989, § 102(e) Date Jan. 24, 1989, PCT Pub. No. WO89/03883, PCT Pub. Date May 5, 1989**
**Continuation-in-part of Ser. No. 151,526, Feb. 2, 1988, abandoned, and Ser. No. 113,014, Oct. 23, 1987, abandoned. This PCT application Oct. 21, 1988, Ser. No. 342,451**
**Int. Cl.[5] C12P *21/02, 1/00;* C12N *15/31, 15/67***
**U.S. Cl. 435—69.1** **31 Claims**




17. A method of preparing an active Vitreoscilla hemoglobin or a fragment of said hemoglobin having oxygen-binding activity, consisting essentially of:

(a) preparing a portable DNA sequence which, upon expression, produces Vitreoscilla hemoglobin or a fragment of said hemoglobin having oxygen-binding activity;

(b) introducing said sequence into a heterologous microbial host cell;

(c) culturing said cell under conditions appropriate for expression of the protein; and

(d) isolating the protein.

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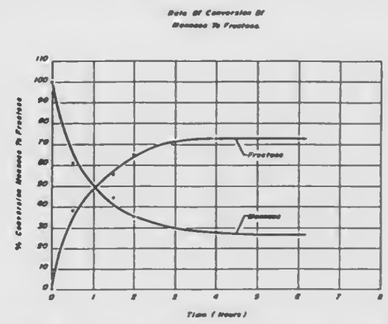
**5,049,494**

## CONVERSION OF MANNOSE TO FRUCTOSE

**Paul Allenza, Flemington, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Filed Feb. 8, 1989, Ser. No. 307,450**
**Int. Cl.[5] C12P *19/02;* C12N *11/00, 9/90, 1/20***
**U.S. Cl. 435—105** **7 Claims**

1. A method for producing fructose comprising enzymatic isomerization of mannose in an mannose-containing aqueous feedstock comprising a delignited hemicellulose hyrolysate with a mannose isomerase immobilized on a support, said isomerization conducted at a temperature from about 30° to about 60° C. and a pH from about 5 to about 8.5 for a time sufficient to convert at least 55% of the mannose to fructose, and recovering the isomerized product mixture, where said mannose isomerase has the characteristics of the mannose isomerase produced by pseudomonas cepacia and said support comprises a refractory inorganic oxide selected from the group




consisting of alumina, silica, thoria, magnesia, titania, and combinations thereof, impregnated with a polyamine selected from the group consisting of ethylenediamine, diethylenetriamine, triethylenetetraamine, tetraethylenepentaamine, pentaethylenehexaamine, and polyethyleneimines, said polyamine being crosslinked with an excess of a bifunctional reagent selected from the group consisting of phthalaldehyde, toluene diisocyanate, and $X(CH_2)_pX$, where p is an integer from 2 to about 8 and X=—CN or —CHO, so as to provide a multiplicity of pendant functional groups.

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**5,049,495**

## FERMENTATION METHOD FOR PRODUCING POLYETHER ANTIBIOTICS

**Guido M. Miescher, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Northbrook, Ill.**

**Filed May 29, 1986, Ser. No. 868,016**
**Int. Cl.[5] C12P *17/16, 17/48;* C12N *1/38;* C07D *407/00***
**U.S. Cl. 435—118** **21 Claims**

1. A method for producing the polyether antibiotic lysocellin comprising:

(a) inoculating a nutrient fermentation broth with a Streptomyces microorganism capable of producing the polyether antibiotic lysocellin during fermentation of said microorganism, the broth having a physiologically acceptable pH and containing sufficient assimilable carbon and other nutrients to establish growth of the microorganism in the broth;

(b) establishing growth of the microorganism in the broth by incubating the inoculated broth at a physiologically acceptable temperature until the pH of the broth begins to rise upon establishment of growth of the microorganism in the broth;

(c) feeding a free fatty acid into the broth when the pH of the broth begins to rise upon establishment of growth of the microorganism, to achieve and maintain a free fatty acid concentration in said broth of about 0.1% by weight or greater but less than a level at which said free fatty acid is toxic to said microorganism, wherein said free fatty acid is fed into said broth during the remainder of fermentation at about a rate at which said free fatty acid is consumed by said microorganism, to produce said polyether antibiotic.

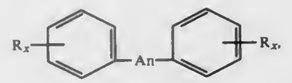
### 5,049,496
### METHOD FOR MICROBIOLOGICALLY HYDROXYLATING BIPHENYL AND TERPHENYL COMPOUNDS

David P. Mobley, and David K. Dietrich, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,887
Int. Cl.[5] C12P *15/00, 13/00, 11/00;* C12R *1/66*
U.S. Cl. 435—127 8 Claims

1. A method for preparing a hydroxylated biphenyl or terphenyl which comprises microbiologically oxidizing by the action of Aspergillus parasiticus a biphenyl or terphenyl having the formula

(I)



wherein each R is a substituent inert to bioconversion conditions, A is a divalent radical, x has a value from 0 to 4 and n i 0 or 1, and simultaneously adding a carbon source selected from the group consisting of glucose, maltose and fructose at a rate sufficient to maintain an ammonium level in the culture medium-reaction medium below about 300 ppm.

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### 5,049,497
### NOVEL PROCESS FOR THE SYNTHESIS OF THE ENANTIOMERS OF BICYCLO(4.2.0)OCT-2-EN-7-ONE AND DERIVATIVES

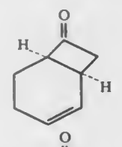
Arthur F. Kluge, Los Altos, and Dennis J. Kertesz, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 25, 1986, Ser. No. 900,029
Int. Cl.[5] C12P *7/26, 7/24, 7/02, 7/00*
U.S. Cl. 435—148 31 Claims

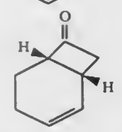
1. A process for preparing a bicyclo[4.2.0]octane derivative, which process comprises:

contacting a racemic bicyclo[4.2.0]octane derivative of the formula

(1)

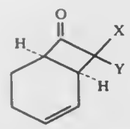


(2)



wherein X is hydro or bromo when Y is bromo, or X is chloro when Y is chloro, with Baker's Yeast under conditions sufficient to give a mixture of compounds represented by the formulas

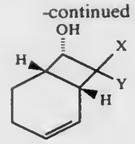
(4)



and

-continued

(5)



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### 5,049,498
### FUNGAL STRAIN USED TO MAKE 2',4,4"-M-TERPHENYLTRIOLS

James L. Spivack, Cobeskill; David P. Mobley, Schenectady; David K. Dietrich, Schenectady, and Joseph J. Salvo, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,888
Int. Cl.[5] C12R *1/66*
U.S. Cl. 435—156 4 Claims

1. A method for preparing a 2'4,4"-m-terphenyltriol which comprises microbiologically oxidizing a corresponding 2'-hydroxy-m-terphenyl by the action of *A. parasiticus.*

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### 5,049,499
### PROCESS FOR BIOTECHNOLOGICAL UPGRADING OF SHALE OIL

Ronald M. Atlas, 1603 Dunbarton Wynde, Louisville, Ky. 40205, and Jackie Aislabie, 13 Clouston Cres, Rotorua, New Zealand

Filed Jan. 19, 1989, Ser. No. 298,355
Int. Cl.[5] C12R *1/385, 1/39;* C12P *1/04;* C10G *32/00*
U.S. Cl. 435—170 11 Claims

1. A process for biotechnological upgrading of raw shale which is free of damaging nitrogen-containing compounds, said oil containing nitrogen-containing compounds along with the hydrocarbons which comprises inoculating the raw shale oil with microbial cultures selected from the group consisting of *Pseudomonas aeruginosa* ATTC 55081, *Pseudomonas aeruginosa* ATTC 55083, *Pseudomonas fluorescens* 55084 and mixtures thereof, which possess the capability of selectively degrading the nitrogen-containing compounds without attacking the hydrocarbons contained therein, said treatment being conducted in the presence of a source of carbon other than that contained in the raw shale.

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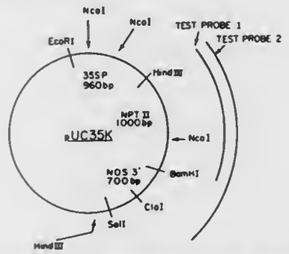
### 5,049,500
### POLLEN-MEDIATED GENE TRANSFORMATION IN PLANTS

Charles J. Arnizen, Greenville, Del.; Lorin R. DeBonte, Jr., Delran; David A. Evans, Palmyra, both of N.J.; Willie H. Loh, Philadelphia, Pa., and Joan T. O'Dell, Wilmington, Del., assignors to E. I. Du Pont de Nemours and DNA Plant Technology, Inc., both of Wilmington, Del.

Continuation of Ser. No. 2,845, Jan. 13, 1987, abandoned. This application May 5, 1989, Ser. No. 347,831
Int. Cl.[5] C12N *15/00;* A01H *1/00, 1/02*
U.S. Cl. 435—172.3 2 Claims

1. A method for transferring an exogenous DNA fragment into an incipient embryo of a corn plant comprising the steps of:

(A) contacting a pollen-receptor organ of a corn plant with a suspension comprising a DNA construct incorporating an exogenous DNA fragment in delivery medium;



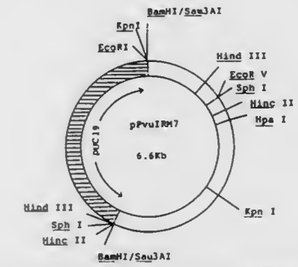

(B) contacting said pollen-receptor organ with compatible ungerminated pollen within a period of less than 5 minutes after step (A).

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### 5,049,501
### PRODUCTION METHOD FOR PVUI RESTRICTION ENDONUCLEASE

Nobuhiro Katsuragi; Bunsei Kawakami, and Yoshihiko Maekawa, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 14, 1989, Ser. No. 451,201
Claims priority, application Japan, Dec. 19, 1988, 63-321317
Int. Cl.[5] C12N *9/22, 1/21, 15/55, 21/00*
U.S. Cl. 435—199 11 Claims




1. A recombinant vector which incorporates a chromosone DNA fragment containing a PvuI restriction endonuclease gene derived from *Proteus vulgaris.*

8. A method for producing PvuI restriction endonuclease comprising culturing a host transformed with a recombinant vector incorporating a chromosone DNA fragment containing a PvuI restriction endonuclease gene derived from *Proteus vulgaris* to obtain PvuI restriction endonuclease.

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### 5,049,502
### CHICKEN-DERIVED IMMUNOGLOBULIN-PRODUCING CELL LINES

Eric H. Humphries, Dallas, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Dec. 31, 1987, Ser. No. 140,263
The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.
Int. Cl.[5] C12N *5/00, 15/00;* A61K *39/00*
U.S. Cl. 435—240.2 17 Claims

1. A method for preparing antibody-producing avian cell clones specific for a desired antigen, the method comprising:

immunizing a first bird with a desired antigen;

separating a population of antibody-producing B-lymphocytes form the first bird;

infecting said antibody-producing B-lymphocyte population with reticuloendotheliosis virus and a noncytotoxic avian helper virus;

transplanting said infected B-lymphocyte population into a second bird, the second bird having been pretreated to remove normal B-lymphocytes, and allowing said infected B-lymphocytes to proliferate in the second bird; and

isolating infected B-lymphocytes which are producing antibodies specific for said desired antigen from the second bird.

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### 5,049,503
### METHOD FOR AFFECTING FERTILITY IN PLANT VARIANTS

Eric B. Swanson, Guelph, and Marc P. Coumans, Georgetown, both of Canada, assignors to Pioneer Hi-Bred International, DesMoines, Iowa

Continuation of Ser. No. 119,452, Nov. 18, 1987, abandoned. This application Jan. 18, 1990, Ser. No. 470,449
Int. Cl.[5] C12N *5/04;* A01H *4/00*
U.S. Cl. 435—240.4 13 Claims

1. A process for creating a plant having improved fertility, comprising:

producing a culture of microspores obtained from a donor plant of the genus Brassica that has a seed yield of less than 50% of the wild type of the donor plant species;

generating a plurality of plant embryos from cells in said culture;

regenerating said embryos into whole plants; and

selecting plants regenerated from said embryos which have improved fertility.

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### 5,049,504
### BIOADHESIVE CODING SEQUENCES

Kathy J. Maugh, Walnut, Calif.; David M. Anderson, Rockville, Md.; Robert Strausberg; Susan L. Strausberg, both of Silver Spring, Md.; Russ McCandliss, Gaithersburg, Md.; Tena Wei, Rockville, Md., and David Filpula, Gaithersburg, Md., assignors to Genex Corporation, Gaithersburg, Md.

Continuation of Ser. No. 82,456, Aug. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 933,945, Nov. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 650,128, Sep. 13, 1984, abandoned. This application May 30, 1990, Ser. No. 530,449
Int. Cl.[5] C12N *1/21, 15/12, 1/19, 15/63*
U.S. Cl. 435—252.33 30 Claims

1. An isolated DNA segment comprising codons which encode the native amino acid sequence of a bioadhesive precursor protein of a marine animal selected from the group consisting of mussels and barnacles, said protein being capable of function as a bioadhesive after expression and upon hydroxylation and oxidation, or an isolated DNA segment comprising codons which encode the native amino acid sequence of a fragment of said protein, said fragment being capable of function as a bioadhesive after expression and upon hydroxylation and oxidation

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### 5,049,505
### BREEDING APPARATUS

Masahiro Sei, Kanagawa, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP88/00981, § 371 Date May 17, 1990, § 102(e) Date May 17, 1990, PCT Pub. No. WO90/03426, PCT Pub. Date Apr. 5, 1990
PCT Filed Sep. 27, 1988, Ser. No. 490,580
Int. Cl.[5] C12M *1/12*
U.S. Cl. 435—311 11 Claims

1. A seedling breeding apparatus comprising:

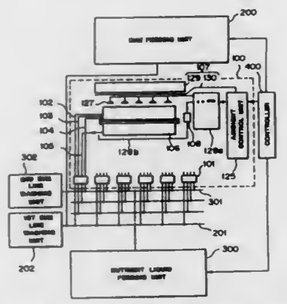
a culture unit including a culture box which includes a nutrient medium support capable of holding a nutrient-solution culture medium;

gas feeding means for feeding a gas to the culture box;

gas discharging means for discharging a gas from the culture box;

a nutrient solution feeding system including a nutrient solution reservoir tank for feeding a culture solution nutrient medium to the culture box;

a nutrient-solution discharging system for discharging a useless nutrient-solution nutrient medium out of the culture box; and



a germ entrance-preventive joint means connecting the culture box and the gas feeding means, gas discharging means and nutrient solution feeding and discharging systems and including means for sterilizing the joint means, wherein the feed gas and culture-solution nutrient medium are fed and the discharged gas and useless nutrient-solution nutrient medium are discharge in accordance with the degree of growth of cultured tissues bedded on the nutrient medium support.

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**5,049,506**

**PROLINE-CONTAINING DECAPEPTIDES AS SUBSTRATES FOR FACTOR XIII**

**Werner Stüber, Lahntal, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg/Lahn, Fed. Rep. of Germany**

**Filed Oct. 27, 1988, Ser. No. 263,158**

**Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736589**

**Int. Cl.[5] G01N *33/86*; C07K *7/06***

**U.S. Cl. 436—69** **7 Claims**

1. A peptide of the structure

$$H\text{-}A_1\text{-}A_2\text{-}A_3\text{-}A_4\text{-}Gln\text{-}A_6\text{-}Lys\text{-}Val\text{-}A_9\text{-}A_{10}\text{-}NH_2 \quad (I)$$

in which $A_1$=Leu
$A_2$=Gly, Ser
$A_3$=Pro
$A_4$=Gly, Ser
$A_6$=Ser
$A_9$=Leu, Ile and
$A_{10}$=Gly
and the salts thereof.

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**5,049,507**

**METHOD OF C-TERMINAL PEPTIDE SEQUENCING**

**David H. Hawke, Hayward, and Victoria L. Boyd, San Carlos, both of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.**

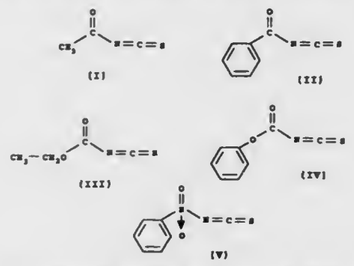
**Filed Dec. 21, 1989, Ser. No. 454,666**

**Int. Cl.[5] G01N *33/68***

**U.S. Cl. 436—89** **13 Claims**

11. A method of producing a thiohydantoin (TH) of a protected amino acid having a free carboxylic acid group, comprising

contacting the amino acid in solution with a mixed anhydride of isothiocyanic acid and carboxylic, carbonic or sulfonic acid, under basic conditions in which the carboxylic acid group of the amino acid is deprotonated, and



by said contacting, forming the TH of the amino acid in solution.

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**5,049,508**

**APPARATUS AND PROCESS FOR TOTAL SULFUR DETERMINATION**

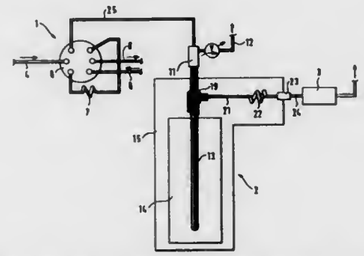
**Willi Hilscher, Wesel; Cetin Gokcek, Mulheim/Ruhr; Dietrich Schmicker, Neukirchen-Vluyn; Eberhard Riedel, Moers, and Peter Kunik, Ratingen, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany**

**Filed Oct. 21, 1988, Ser. No. 260,872**

**Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735599**

**Int. Cl.[5] G01N *33/00***

**U.S. Cl. 436—123** **16 Claims**



11. In a process for determining the total sulfur content of samples taken from a larger quantity of sulfur containing material including feeding the sample from a charge system to a pipe reactor in a gas chromatograph section, catalytically reacting the sample in the pipe reactor in the gas chromatograph section before a separation step, the improvement being in that using as the pipe reactor a pipe reactor made from aluminum oxide in a purity of at least 99.8% of the corundum type, and flowing gas in the pipe reactor at a flow rate of 25–60 ml/min. at an inlet pressure of about 1.8 bar so that said pipe reactor catalytically converts all sulfur containing compounds into hydrogen sulfide.

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**5,049,509**

**CHROMATOGRAPHIC ANALYZER**

**Julius J. Szakasits, and Robert E. Robinson, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.**

**Continuation-in-part of Ser. No. 750,343, Jun. 28, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 121,425**

**The portion of the term of this patent subsequent to Aug. 13, 2002, has been disclaimed.**

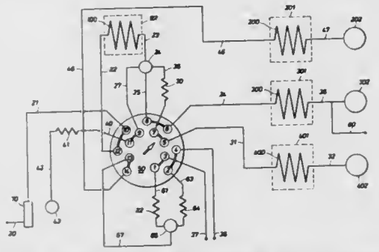
**Int. Cl.[5] G01N *33/00***

**U.S. Cl. 436—140** **10 Claims**

1. A method for analyzing a hydrocarbon sample containing isoparaffins, normal paraffins, naphthenes and aromatics, comprising:

separating said aromatics of said sample from said isoparaffins, normal paraffins, and naphthenes of said sample;

from a first portion of said separated isoparaffins, normal paraffins, and naphthenes, separating isoparaffins, normal paraffins, and naphthenes using pure hydrogen carrier gas and detecting the resulting individual isoparaffins, normal paraffins, and naphthenes having a number of carbon



atoms substantially in the range of one to thirteen by carbon number;

from a second portion of said separated isoparaffins, normal paraffins, and naphthenes, separating and detecting individual isoparaffins, normal paraffins and naphthenes components of said sample for components having a number of carbon atoms substantially in the range of one to nine;

individually separating and detecting said separating aromatics of said sample.

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**5,049,510**

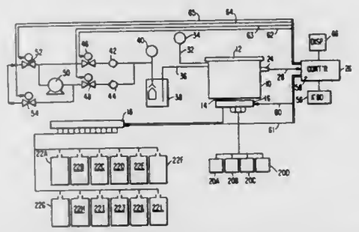
**PROCESS FOR HISTOLOGICAL TISSUE SPECIMEN TREATMENT THAT INCLUDES VARIABLE SENSITIVITY LEVEL CONTROL**

**Roger J. Repasi, Monroeville, Pa.; David G. Abichaker, West Roxbury, Mass., and Jerry C. Premus, Scottdale, Pa., assignors to Fisher Scientific Company, Pittsburgh, Pa.**

**Filed Jan. 5, 1990, Ser. No. 461,379**

**Int. Cl.[5] G01N *1/30*; A01N *1/00*; B05D *1/36***

**U.S. Cl. 436—176** **8 Claims**



1. A histological tissue specimen treatment process comprising the steps of

placing a plurality of histological tissue specimens to be processed in an open chamber structure,

closing said open chamber structure,

flowing a first tissue processing material into said chamber structure under the influence of a pressure differential,

monitoring the level of said first tissue processing material in said chamber structure with a sensor system that responds to a characteristic of the tissue processing material,

terminating said flow of said first tissue processing material when said sensor system indicates that said first tissue processing material has reached a predetermined level in said chamber structure such that said plurality of histological tissue specimens are immersed in said first tissue processing material,

flowing said first tissue processing material from said chamber structure after said plurality of histological tissue specimens have been immersed in said first tissue processing material for a predetermined time interval,

changing the sensitivity of said sensor system as a function of a characteristic of a second tissue processing material,

flowing said second tissue processing material into said chamber structure under the influence of a pressure differential,

monitoring the level of said second tissue processing material in said chamber structure with said sensor system in said changed sensitivity condition,

terminating said flow of said second tissue processing material when said sensor system indicates that said second tissue processing material has reached a predetermined level in said chamber structure such that said plurality of histological tissue specimens are immersed in said second tissue processing material,

flowing said second tissue processing material from said chamber structure after said plurality of histological tissue specimens have been immersed in said second tissue processing material for a predetermined time interval,

opening said chamber structure, and

removing said plurality of processed histological tissue specimens from said chamber structure.

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**5,049,511**

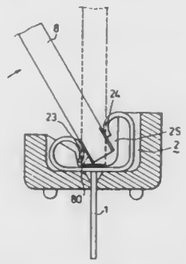
**RESILIENT CONNECTOR CAPABLE OF BEING INSERTED INTO A PRINTED CIRCUIT BOARD**

**Mu-Gen Yu, Tansui Chen, Taiwan, assignor to Silitek Corporation, Taipei, Taiwan**

**Continuation of Ser. No. 312,221, Feb. 21, 1989, abandoned. This application Apr. 26, 1990, Ser. No. 515,780**

**Int. Cl.[5] H01R *13/62***

**U.S. Cl. 439—325** **4 Claims**



1. A resilient connector formed from a single conductive, rectangular plate having opposed contact surfaces defining an opening for accommodating a printed circuit board having contact pads on either side for contacting said surfaces therethrough, comprising:

means for receiving a printed circuit board between said contact surfaces and for maintaining continuous contact between said surfaces and pads thereon as said board enters said opening at a first angle and is pivotally rotated to and fixed at a second angle without scratching said pads said means comprising;

said plate being bent into a U-shape so as to form a long arm, a short arm and a base connected between said long arm and said short arm, each arm extending upwardly and separately from one end of said base, said long arm having one free end bent into a curve having a first predetermined radius and facing said short arm thereby providing a first contact surface, said short arm having a free end bent into a curve having a second predetermined radius different from the first radius and facing said long arm thereby providing a second contact surface said contact surfaces

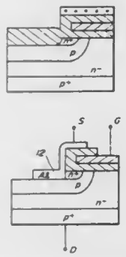
VOL 1130 ISS 3 SE 17 1991 UMI



being oriented so as to define said opening for the insertion of said printed circuit board at an acute angle to the base with the contact surfaces riding against the conductive pads and further riding against said pads as the board rotates to a fixed position extending at a 90° angle to the base; and a leg portion integrally and downwardly extending from an intermediate position of said base for supporting the same, said leg portion being formed by longitudinally severing a part of the intermediate portion of said rectangular head portion, which extends from an intermediate position of said long arm to said intermediate position of said base, and bending the severed portion downwardly at said intermediate position of said base.

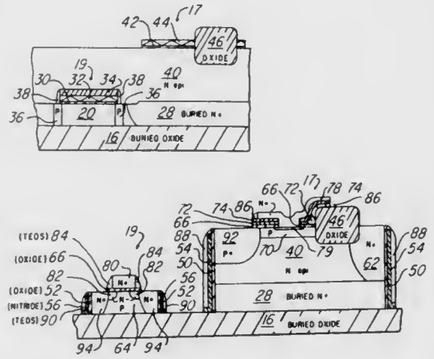
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**5,049,512**
**METHOD OF FORMING A MOS FIELD-EFFECT TRANSISTOR**
**Kraisorn Throngnumchai, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**
**Filed Sep. 22, 1988, Ser. No. 247,625**
**Claims priority, application Japan, Sep. 28, 1987, 62-240636**
**Int. Cl.[5] H01L *21/335***
**U.S. Cl. 437—29** **7 Claims**



1. A process for fabricating a MOS field-effect translator, comprising:
a first step of preparing a semiconductor body comprising a substrate and an upper layer of a first conductivity type formed on said substrate and which forms an upper surface of said semiconductor body, and forming on the upper surface of said semiconductor body a multilayer film which comprises a gate insulating layer, a polycrystalline silicon layer formed on said gate insulating layer, and an upper insulating layer;
a second step of removing a predetermined portion of said multilayer film, thereby exposing a predetermined area of said upper surface of said semiconductor body to form a window in said multilayer film;
a third step of doping said semiconductor body through said window to form a base region of a second conductivity type opposite to said first conductivity type, extending into said upper layer of said semiconductor body from said upper surface, and a source region of the first conductivity type extending into said base region from said upper surface;
a fourth step of performing thermal oxidation, thereby forming an oxide layer which extends into said source region from said upper surface, and which has a bottom surface entirely bounded by said base region and a side surface bounded by said source region, a side surface of said polycrystalline silicon layer formed within said window by said second step being oxidized during said thermal oxidation, and said polycrystalline being insulated and used as a gate electrode;
a fifth step of removing said oxide layer formed in said upper surface and forming a depression in said upper surface of said semiconductor body; and
a sixth step of forming in said depression a metal electrode contiguous to both of said base and source regions.

**5,049,513**
**BI CMOS/SOI PROCESS FLOW**
**Robert H. Eklund, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Filed Sep. 17, 1990, Ser. No. 583,418**
**Int. Cl.[5] H01L *21/265***
**U.S. Cl. 437—34** **7 Claims**

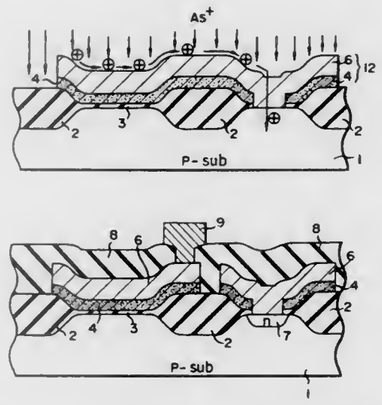


1. A method of fabricating a bipolar transistor and a CMOS transistor on an SOI substrate, said method comprising:
a forming a first epitaxial layer on the surface of the SOI substrate, said epitaxial layer having a bipolar transistor region and a CMOS transistor region;
b forming a resist patterned in the inverse of the buried collector over said first epitaxial layer;
c forming a buried collector in said bipolar region of said first epitaxial layer;
d growing a blanket second epitaxial layer over the first epitaxial layer;
e forming an oxide layer over said second epitaxial layer;
f forming an emitter opening in the oxide layer;
g depositing a polysilicon layer; and
h patterning an emitter contact in said polysilicon layer on said opening in the oxide layer and overlapping said oxide layer, whereby the oxide layer over said second epitaxial layer serves as an etch stop for the emitter etch, and whereby the process can use standard SOI CMOS and bulk BICMOS processes and has the advantage of eliminating the isolation problems encountered in a bulk BICMOS process, and whereby the buried n+ collector reduces the collector resistance.

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**5,049,514**
**METHOD OF MAKING A MOS DEVICE HAVING A POLYCIDE GATE**
**Seiichi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Jan. 18, 1990, Ser. No. 466,924**
**Claims priority, application Japan, Jan. 20, 1989, 1-11624**
**Int. Cl.[5] H01L *21/336***
**U.S. Cl. 437—41** **18 Claims**

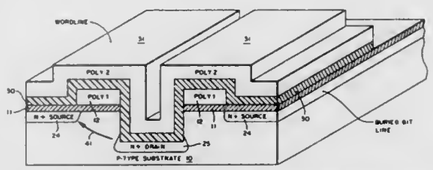
13. A method for manufacturing a semiconductor device having a polycide gate structure, comprising the steps of:
forming a gate insulation film on a semiconductor substrate;
forming a polysilicon layer on said gate insulation film;
selectively removing that portion of said polysilicon layer and that portion of said gate insulation film, which are within a contact region separated from a transistor region, to form an opening which reaches said semiconductor substrate to expose a portion of said semiconductor substrate which is within said contact region;
forming a silicide layer in direct contact with said polysilicon layer and said portion of said semiconductor substrate which is exposed by said opening and within said contact region;



patterning said polysilicon layer and said silicide layer to form a polycide gate electrode;
after forming the silicide layer, effecting an ion-implantation to form source and drain regions; and
selectively removing said silicide layer and said polysilicon layer to separate an area acting as a polycide gate electrode from said semiconductor substrate.

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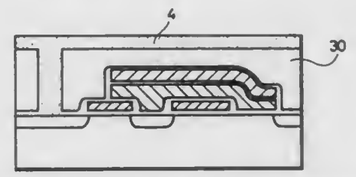
**5,049,515**
**METHOD OF MAKING A THREE-DIMENSIONAL MEMORY CELL WITH INTEGRAL SELECT TRANSISTOR**
**Jyh-Cherng J. Tzeng, Sunnyvale, Calif., assignor to Intel Corporation, Inc., Santa Clara, Calif.**
**Division of Ser. No. 491,226, Mar. 9, 1990, Pat. No. 4,964,080.**
**This application Jun. 22, 1990, Ser. No. 543,043**
**Int. Cl.[5] H01L *21/70***
**U.S. Cl. 437—43** **14 Claims**



1. A process for fabricating an array of floating gate memory cells with integral select transistors on a substrate comprising the steps of:
forming a gate oxide on said substrate;
forming a plurality of first gate members on said gate oxide from a first layer of polysilicon;
forming a plurality of slots in said substrate between alternate pairs of said first gate members;
introducing dopants into said substrate to form elongated, parallel, spaced-apart source and drain regions in alignment with said first gate members, said drain regions being formed beneath said slots;
forming elongated second gate members from a second layer of polysilicon, said second gate members being formed over, and insulated from, said first gate members and said slots.

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**5,049,516**
**METHOD OF MANUFACTURING SEMICONDUCTOR MEMORY DEVICE**
**Hideaki Arima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 266,058, Nov. 2, 1988, Pat. No. 4,907,198.**
**This application Dec. 15, 1989, Ser. No. 451,066**
**Claims priority, application Japan, Dec. 2, 1987, 62-306123**
**Int. Cl.[5] H01L *21/336***
**U.S. Cl. 437—43** **12 Claims**



1. A method of manufacturing a semiconductor memory device comprising the steps of:
preparing a semiconductor substrate of a first conductivity type having a main surface and an impurity concentration;
forming a first conductor layer and a second conductor layer spaced apart from each other on said semiconductor substrate through a first insulating film;
forming a first impurity layer of a second conductivity type between said first conductor layer and said second conductor layer on the main surface of said semiconductor substrate;
forming a third conductor layer on at least said first impurity layer of the second conductivity type, through a second insulating film, and further forming said third conductor layer on said second conductor layer and a region of the main surface of said semiconductor substrate where said first impurity layer of the second conductivity type and said first and second conductor layers are not formed, through a third insulating film;
forming a second impurity layer of the second conductivity type on a region of the main surface of said semiconductor substrate where said first through third conductor layers are not formed;
forming a third impurity layer of the second conductivity type of a region of the main surface of said semiconductor substrate where said second impurity layer of the second conductivity type and said first through third conductor layers are not formed; and
forming a fourth conductor layer on said third conductor layer through an insulating film.

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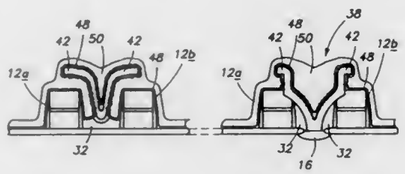
**5,049,517**
**METHOD FOR FORMATION OF A STACKED CAPACITOR**
**Yaub-Ching Liu; Pierre Fazan; Hiang Chan; Howard E. Rhodes, and Charles H. Dennison, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.**
**Filed Nov. 7, 1990, Ser. No. 612,402**
**Int. Cl.[5] H01L *21/70***
**U.S. Cl. 437—52** **27 Claims**

1. A method of forming a capacitor on a semiconductor wafer comprising the following steps:
forming an electrically conductive interconnect line on the wafer, the interconnect line having side and top portions;
electrically isolating the substantial side and top portions of the interconnect line by forming one or more electrically insulating layers about the side and top portions;
forming a first dielectric layer over the wafer atop the sub-

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stantially insulated interconnect line, the first dielectric layer having a first etch rate;
forming a second dielectric layer over the wafer atop the first dielectric layer, the second dielectric layer having a second etch rate which is slower than the first etch rate;
selectively etching contact openings through the first and second dielectric layers to align with selective active areas on the wafer;
applying an electrically conductive material atop the wafer, the electrically conductive material engaging the active areas within the contact openings;
selectively etching the applied electrically conductive material and the second dielectric layer down to the first dielectric layer to begin formation of a first terminal of a capacitor, the first capacitor terminal rising above and over the interconnect line;

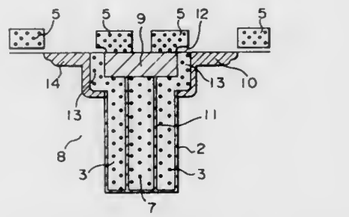



forming an oxide layer atop the electrically conductive material to enable texturizing of a top of the first capacitor terminal to increase capacitance, the oxide layer having an etch rate which is slower than the first etch rate;
etching the first dielectric layer to project the first capacitor terminal above the interconnect line to expose a bottom as well as top and side portions of the first capacitor terminal above the interconnect line;
etching the oxide layer and remaining second dielectric layer from the projecting first capacitor terminal;
forming a third dielectric layer over the exposed top, bottom and side portions of the exposed and etched projecting first capacitor terminal; and
applying an electrically conductive material atop the third dielectric layer to form a second terminal of the capacitor.

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**5,049,518**
**METHOD OF MAKING A TRENCH DRAM CELL**
**Genshu Fuse, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed Dec. 14, 1989, Ser. No. 450,515**
**Claims priority, application Japan, Dec. 20, 1988, 63-321185; Dec. 23, 1988, 63-326574**
**Int. Cl.[5] H01L** *21/70*
**U.S. Cl. 437—52** **3 Claims**

1. A method of producing a semiconductor memory, comprising at least the steps of:
(a) forming a trench in a silicon substrate;
(b) forming an insulating film on the inner surface of said trench;
(c) burying a first polysilicon material at the inside of said trench to form an electrode through said insulating film;
(d) burying a first oxide film in said trench and on said first polysilicon material;
(e) forming a second oxide film over the whole surface of said silicon substrate;
(f) partially removing said second oxide film adjacent to a side wall of said trench by using a resist so as to form an opening;
(g) digging-down a part of said silicon substrate at a portion thereof close to said side wall of said trench through said opening down to a position deeper than the top of said buried first polysilicon material to form a hole which reaches a part of said buried first polysilicon material;
(h) removing a part of said insulating film which has become exposed as a result of the formation of said hole; and




(i) burying a second polysilicon material in said hole so as to electrically connect said second polysilicon material in said hole with said first polysilicon material in said trench.

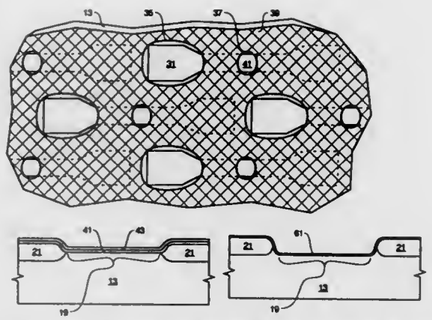
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**5,049,519**
**LATCH-UP RESISTANT CMOS PROCESS**
**Clarence W. Teng, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**
**Division of Ser. No. 776,553, Sep. 16, 1987, Pat. No. 4,947,227.**
**This application Oct. 25, 1989, Ser. No. 426,258**
**Int. Cl.[5] H01L** *21/336*
**U.S. Cl. 437—57** **18 Claims**

7. A method of fabricating a CMOS structure having improved latch-up immunity, comprising the steps of:
masking a P-type substrate for protection against ion implantation;
patterning said mask to form openings to said substrate;
forming wells in said substrate through said openings;
growing a thermal oxide isolation layer on all surface of said well for isolating said well from said P-substrate;
filling said well with semiconductor material;
doping said semiconductor material to form N-type material;
planarizing the top surface of said substrate;
forming a PMOS transistor in said well; and
forming an NMOS transistor in said P-substrate.



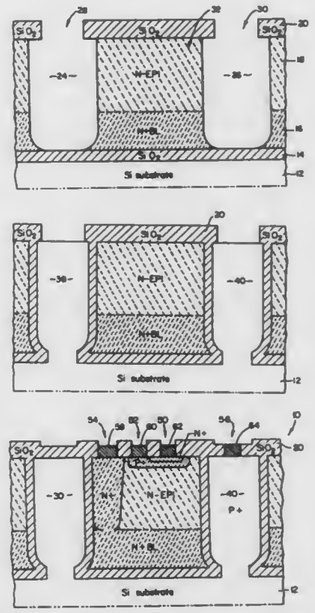
**5,049,520**
**METHOD OF PARTIALLY ELIMINATING THE BIRD'S BEAK EFFECT WITHOUT ADDING ANY PROCESS STEPS**
**David A. Cathey, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.**
**Filed Jun. 6, 1990, Ser. No. 534,588**
**Int. Cl.[5] H01L** *21/70*
**U.S. Cl. 437—60** **6 Claims**




1. A method of enlarging storage cell active areas in semiconductor circuit devices on a wafer surface, the method comprising:
a) depositing a first oxide layer superjacent the wafer surface;
b) depositing a dielectric layer superjacent said first oxide layer and patterning said dielectric layer thereby defining locations for said active areas;
c) growing field oxide on said first oxide layer not covered by said patterned dielectric layer, growing of said field oxide encroaches under the edges of said patterned dielectric thereby forming field oxide bird's beak;
d) applying a photomask to said wafer surface, said photomask having a first opening to expose an area to define a buried contact location and a second opening to expose said storage cell active areas;
e) performing a first etching step thereby etching said patterned dielectric and a horizontal portion of said field oxide, said first etching step thereby reducing said field oxide bird's beak primarily in the horizontal direction;
f) removing said photomask;
g) depositing a polysilicon layer superjacent said wafer surface;
h) depositing a second oxide layer superjacent said polysilicon layer; and
i) performing a second etching step thereby etching said second oxide layer and said polysilicon layer to form trenches into said storage cell active areas thereby enlarging said storage cell active areas primarily in the vertical direction.

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**5,049,521**
**METHOD FOR FORMING DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICES WITH CONTACT TO THE WAFER SUBSTRATE**
**Richard H. Belanger, El Toro, and Sang S. Kim, Laguna Hills, both of Calif., assignors to Silicon General, Inc., Garden Grove, Calif.**
**Filed Nov. 30, 1989, Ser. No. 444,051**
**Int. Cl.[5] H01L** *21/76*
**U.S. Cl. 437—62** **19 Claims**

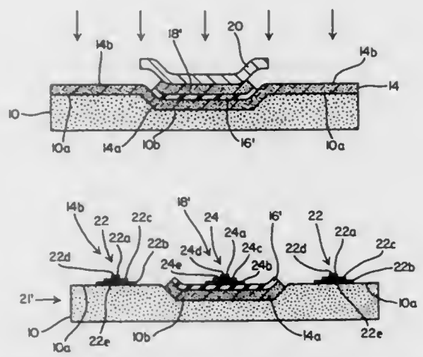



1. A method for forming a dielectrically isolated active device region on a wafer having a monocrystalline semiconductor substrate, a layer or insulator formed on said substrate, and a first epitaxial layer of a semiconductor material on said layer of insulator, comprising the steps of:
etching a plurality of trench regions in said first epitaxial layer so as to extend to said layer of insulator;
forming a layer of insulator on the sidewalls of said trench regions, wherein the layers of insulator define at least one dielectrically isolated region;
etching the bottom of the trenches so as to expose the underlying semiconductor substrate; and
forming an additional epitaxial semiconductor layer in said trench regions such as to contact the underlying monocrystalline semiconductor substrate.

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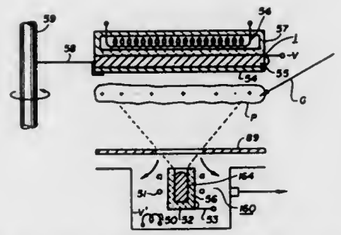
5,049,522
SEMICONDUCTIVE ARRANGEMENT HAVING DISSIMILAR, LATERALLY SPACED LAYER STRUCTURES, AND PROCESS FOR FABRICATING THE SAME
William E. Stanchina, Thousand Oaks, and Lawrence E. Larson, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Feb. 9, 1990, Ser. No. 477,700
Int. Cl.[5] H01L *31/15, 31/70, 21/20, 21/302*
U.S. Cl. 437—62 14 Claims



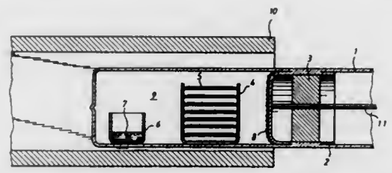

1. A process for fabricating a semiconductive arrangement, comprising the steps of:
(a) providing a substrate;
(b) forming a depression in a surface of the substrate;
(c) forming a first semiconductive layer structure on the surface including the depression;
(d) forming an electrically insulative isolation layer on the first layer structure;
(e) forming a second semiconductive layer structure on the isolation layer; and
(f) removing the second layer structure and isolation layer from the first layer structure over areas of the surface laterally external of the depression, such that the first layer structure remains on the substrate in said areas.

5,049,523
METHOD OF FORMING SEMICONDUCTING MATERIALS AND BARRIERS
John H. Coleman, Locust Valley, N.Y., assignor to Plasma Physics Corp., Locust Valley, N.Y.
Continuation of Ser. No. 180,720, Apr. 4, 1988, abandoned, which is a continuation of Ser. No. 935,606, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 716,409, Mar. 27, 1985, abandoned, which is a division of Ser. No. 857,690, Dec. 5, 1977, Pat. No. 4,226,897, which is a division of Ser. No. 88,100, Oct. 24, 1979, Pat. No. 4,328,258, which is a division of Ser. No. 355,202, Mar. 5, 1982, abandoned. This application Aug. 16, 1989, Ser. No. 394,281
Int. Cl.[5] H01L *21/20*
U.S. Cl. 437—101 7 Claims

1. The method of producing hydrogenated amorphous silicon on the surface of a substrate electrically connected to an electrode in an evacuated enclosure in which a thermal source is positioned outside of said electrode, opposite to and at a distance from said surface of said substrate which includes the steps of introducing a combination of gases comprising species comprising silicon and hydrogen at subatmospheric pressure in the region of said surface, controlling the temperature of said thermal source above 500° C. to generate at least said silicon portion of said species comprising silicon and hydrogen, applying to said surface of said substrate an electric field and controlling said pressure and said electric field to maintain said glow discharge in said species comprising silicon and hydrogen adjacent to said substrate surface to produce hydrogenated amorphous silicon film on said surface.




5,049,524
CD DIFFUSION IN INP SUBSTRATES
Jui-Yuan Kuo, Taipei, and Chia-Pin Sung, Hsinchu, both of Taiwan, assignors to Industrial Technology Research Institute, Taiwan
Filed Mar. 2, 1989, Ser. No. 317,849
Int. Cl.[5] H01L *21/223*
U.S. Cl. 437—169 3 Claims



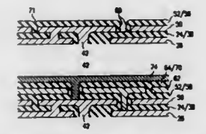
1. A process for diffusing Cd into a substrate from a diffusion source material comprising red P and $Cd_3P_2$ in a large-volume evacuated and sealed tube wherein the substrate is InP, GaInP, AlInP, InGaAsP or AlGaInP epitaxy crystal wafers or bulk crystal wafers comprising:
a. heating a diffusion furnace to form a constant diffusion temperature zone at its middle part, and then putting near the opening of the furnace an evacuated and sealed tube which contains said diffusion source material near its front end and said substrate wafers at its middle part with the front end of the tube being positioned inside the furnace and the rear end of the tube being at the opening of the furnace, until deposits which are precipitated from the vapors of the diffusion source material form on the inner wall of the rear end of the tube;
b. pushing the tube into the constant temperature zone of the furnace and keeping the tube there until the completion of diffusion; and
c. pulling the tube back such that the rear end of the tube is at the opening of the furnace, terminating the supply of heat to the furnace, and furnace cooling the tube.

5,049,525
ITERATIVE SELF-ALIGNED CONTACT METALLIZATION PROCESS
Donald J. Coleman, Jr., Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Jun. 29, 1990, Ser. No. 546,499
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—195 21 Claims

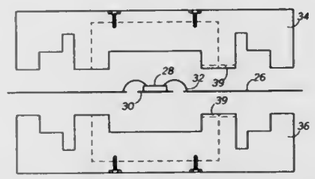
1. A method of forming multiple layers of interconnections adjacent a planar surface, comprising the steps of:
forming a first insulator layer adjacent said planar surface;



forming a first conductor layer adjacent said first insulator layer;
forming a second insulator layer adjacent said first conductor layer;
forming first and second cavities having sidewalls extending through said second insulator layer and said first conductor layer, said first cavity formed wider than said second cavity;
conformally depositing a third insulator layer adjacent said second insulator layer such that sidewall insulators are deposited on said sidewalls of said first cavity and such that said second cavity is substantially filled with insulator;
etching through said first cavity to expose a portion of said planar surface; and
conformally depositing a second conductor layer adjacent said third insulator layer such that said second conductor layer extends through said first cavity to contact said planar surface.

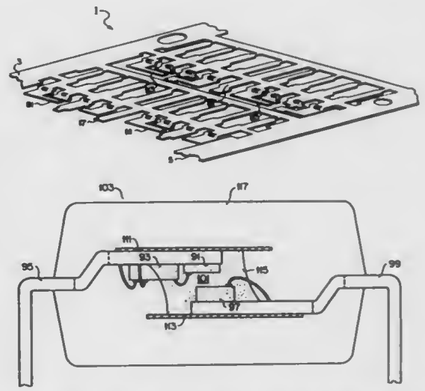


5,049,526
METHOD FOR FABRICATING SEMICONDUCTOR DEVICE INCLUDING PACKAGE
Michael B. McShane, and Paul T. Lin, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 7, 1989, Ser. No. 362,644
Int. Cl.[5] H01L *23/2*
U.S. Cl. 437—211 7 Claims




1. A method for encapsulating a semiconductor device including a package body portion and a molded carrier ring surrounding the body portion, the method comprising the steps of:
providing a mold having a first cavity for defining a carrier ring shape and a second cavity for accepting an insert;
providing an insert for said second cavity of said mold for customizing said second cavity, said insert having a cavity shaped to define a package body;
providing a lead frame;
attaching a semiconductor device die to said lead frame;
inserting said lead frame with said die attached thereto into said mold; and
filling plastic into said mold including said cavity in said insert to form a plastic body portion encapsulating said die and a plastic carrier ring surrounding said body portion.

5,049,527
OPTICAL ISOLATOR
Stephen P. Merrick, Sunnyvale, and Robert W. Teichner, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 76,094, Jul. 21, 1987, Pat. No. 4,863,806, which is a division of Ser. No. 748,520, Jun. 25, 1985, Pat. No. 4,694,183. This application Jun. 9, 1989, Ser. No. 365,148
Int. Cl.[5] H01L *21/60*
U.S. Cl. 437—220 26 Claims




1. A method for fabricating an optical isolator on a lead frame having two side rails, comprising the steps of:
down setting an LED attachment portion of the lead frame and a photodiode attachment portion of the lead frame to a downset plane below the plane of the side rails;
attaching a photodiode die to a photodiode lead of the downset photodiode attachment portion;
attaching an LED die to an LED lead of the downset LED attachment portion; and
rotating one of the attachment portions about an axis in the side rail plane which connects the side rails and thereby positioning the LED die proximate the photodiode die and separated therefrom by an isolation gap.

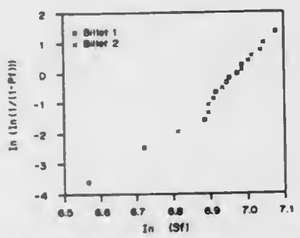
5,049,528
CERAMIC COMPOSITE PRODUCTION BY PRECIPITATION OF POLYMER SOLUTION
William C. Moffatt, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation of Ser. No. 208, Dec. 30, 1986, abandoned. This application Dec. 23, 1988, Ser. No. 288,976
Int. Cl.[5] C04B *35/02*
U.S. Cl. 501—94 16 Claims

1. A process for making extremely uniform compositions from ceramic or metallic particles comprising:
selecting a first solvent and a polymer wherein said polymer is soluble in said first solvent;
selecting a second solvent, wherein said first solvent and said second solvent are miscible and said polymer is insoluble in the mixture of said first solvent and said second solvent;
dispersing particles in a solution of said polymer and said first solvent, wherein said particles are selected from the group consisting of ceramic particles, metallic particles, and combinations thereof and are small enough to be suspended in the polymer-solvent solution; and
adding said second solvent to said polymer-solvent solution

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to co-precipitate the dispersed particles and polymer as a highly agglomerated, gel mass immobilizing the particles,




wherein the gel-like mass has a diameter of greater than or equal to one centimeter.

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**5,049,529**

**CONVERSION OF POLYCARBOSILANES INTO SILICON CARBONITRIDE CERAMICS**

**Francoise Duboudin, Pessac; Jean-Paul Pillot, Chestas; Jacques Dunogues, Talence; Marc Birot, Leognan; Odile Babot, Villenave D'Ornon, and Rene Pailler, Cestas, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

**Filed Nov. 27, 1989, Ser. No. 442,647**

**Claims priority, application France, Nov. 25, 1988, 88 15393**

**Int. Cl.[5] C04B *35/58***

**U.S. Cl. 501—97** **12 Claims**

1. A process for the production of a silicon carbonitride ceramic material, comprising (a) hardening a fusible polycarbosilane containing at least two ≡SiH groups per molecule by intimately contacting same with an effective hardening amount of gaseous elemental sulfur to produce an infusible polycarbosilane, next (b) heat treating the infusible polycarbosilane in an ammonia atmosphere to introduce nitrogen into said infusible polycarbosilane by replacement of sulfur in the polycarbosilane without completely removing the carbon therefrom, and then (c) heat treating said nitrogenated polycarbosilane in a vacuum or in an inert atmosphere to essentially completely convert it into a ceramic silicon carbonitride.

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**5,049,530**

**POWER MIXTURE AND GREEN BODY FOR PRODUCING SILICON NITRIDE BASE & ARTICLES OF HIGH FRACTURE TOUGHNESS AND STRENGTH**

**Marvin L. Huckabee, Marlboro; Sergej-Tomislav Buljan, and Jeffrey T. Neil, both of Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Division of Ser. No. 458,122, Dec. 28, 1989. This application Oct. 12, 1990, Ser. No. 596,256**

**Int. Cl.[5] C04B *35/58, 35/82***

**U.S. Cl. 501—97** **3 Claims**

1. A powder mixture for producing a densified silicon nitride-based article, said mixture comprising:

a powder blend consisting essentially of about 10–30 percent by weight of a first silicon nitride powder of an average particle size of about 0.2 μm and a surface area of about 8–12 $m^2/g$, and about 70–90 percent by weight of a second silicon nitride powder of an average particle size of about 0.4–0.6 μm and a surface area of about 2–4 $m^2/g$; and

about 10–50 percent by volume, based on the volume of said densified article, of refractory whiskers or fibers having an aspect ratio of about 3–150 and having an equivalent diameter selected to produce in said densified article an equivalent diameter ratio of said whiskers or fibers to grains of silicon nitride of greater than 1.0.

**5,049,531**

**SILICON NITRIDE SINTERED BODY**

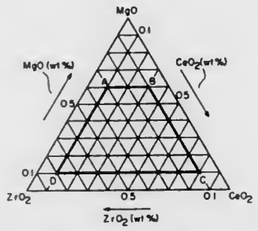
**Kenji Nakanishi, Komaki; Yo Tajima, and Masakazu Watanabe, both of Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan**

**Filed Sep. 7, 1989, Ser. No. 403,289**

**Claims priority, application Japan, Sep. 9, 1988, 63-224764**

**Int. Cl.[5] C04B *35/58***

**U.S. Cl. 501—98** **9 Claims**




1. A sintered body of silicon nitride consisting essentially of, in weight percentages of the body, 0.5 to 7.0% of a Mg component calculated as MgO, 0.5 to 7.0% of a Zr component calculated as $ZrO_2$, 0.5 to 10.0% of a Ce component calculated as $CeO_2$, and the balance being $Si_3N_4$,

said body having a strength of not less than 80 $kgf/mm^2$, a fracture toughness of not less than 6 MPa $m^{\frac{1}{2}}$, a relative density of not less than 95% of theoretical density and a weight increase after oxidation testing at 800° C. for 100 hours of no more than 0.3 $mg/cm^2$.

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**5,049,532**

**METHOD FOR SURFACE TREATING THIXOTROPIC AGENTS AND THE RESULTANT LOW MOISTURE THIXOTROPE**

**Lamar E. Brooks, 57 Temple Rd., Wellesley, Mass. 02181, and Gerald L. Brooks, Wellesley, Mass., assignors to Lamar E. Brooks, Wellesley, Mass.**

**Continuation-in-part of Ser. No. 321,588, Mar. 10, 1989, Pat. No. 4,966,871. This application Mar. 5, 1990, Ser. No. 489,065**

**The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.**

**Int. Cl.[5] C04B *33/30***

**U.S. Cl. 501—148** **9 Claims**

1. A thixotropic attapulgite having a moisture content of from about 2% to about 5%.

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**5,049,533**

**CATALYST, PROCESS FOR PREPARATION OF SAME, AND PROCESS FOR POLYMERIZATION OF OLEFINS USING SAME**

**Tetuo Nakajo; Hisayoshi Yanagihara; Masaki Fusbimi; Shigenobu Miyake, all of Oita, and Hideki Sakurai, Sendai, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan**

**Filed Jul. 11, 1990, Ser. No. 551,238**

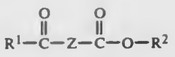
**Claims priority, application Japan, Jul. 11, 1989, 1-178620**

**Int. Cl.[5] C08F *4/64***

**U.S. Cl. 502—104** **13 Claims**

1. A process for the preparation of a catalyst component for use in the polymerization of olefins, which comprises, during or after the formation of a solid catalyst component prepared from a magnesium compound, a titanium compound and a halogen-containing compound as indispensable ingredients, treating the solid catalyst component with at least one member selected from the group consisting of keto-ester compounds represented by the following general formula (I):





(I)

wherein $R^1$ and $R^2$ independently represent a univalent hydrocarbon group having 1 to 20 carbon atoms which may have at least one halogen substituent, and Z represents a divalent hydrocarbon group having 1 to 30 carbon atoms which may have at least one halogen substituent, the $R^1$, $R^2$, and Z being selected from the group consisting of aliphatic hydrocarbons, alicyclic hydrocarbons, aromatic hydrocarbons, and polycyclic hydrocarbons.

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**5,049,534**

**CATALYST SUPPORTS**

**John W. Kelland, Middlesbrough, England, assignor to Imperial Chemical Industries plc, London, United Kingdom**

**Filed Nov. 28, 1989, Ser. No. 442,198**

**Claims priority, application United Kingdom, Nov. 28, 1988, 8827782**

**Int. Cl.[5] B01J *31/00***

**U.S. Cl. 502—107** **50 Claims**

1. A particulate silica support of high surface area and which comprises a compound of the general formula (Ia):

$$(RCOO)_2Mg \quad \text{(Ia)}$$

deposited on its surface and/or groups of the general formula (Ib):

$$R(CO_2MgO)_n- \quad \text{(Ib)}$$

where

R is a hydrocarbon radical; and

n=1 to 6;

linked to surface silicon atoms.

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**5,049,535**

**CATALYSTS FOR THE POLYMERIZATION OF OLEFINS**

**Luigi Resconi; Umberto Giannini, both of Milan, and Enrico Albizzati, Novara, all of Italy, assignors to Himont Incorporated, Wilmington, Del.**

**Filed Jan. 30, 1990, Ser. No. 471,901**

**Claims priority, application Italy, Jan. 31, 1989, 19252 A/89**

**Int. Cl.[5] C08F *4/642***

**U.S. Cl. 502—117** **16 Claims**

1. A catalyst for the polymerization of olefins comprising the product of the reaction between:

A') a zirconocenic compound of the formula

$$(C_5R'_nH_{5-n})R''_p(C_5R'_mH_{5-m})ZrX_q$$

in which $(C_5R'_nH_{5-n})$ and $(C_5R'_mH_{5-m})$ are cyclopentadienyl groups, which are the same or different from each other, and in which R' is an alkyl, alkenyl, aryl, alkylaryl or arylalkyl radical containing from 1 to 20 C-atoms, a $CR_2SiR_3$ group or $SiR_3$ group where R is the same as R', or where two or four R' substituents of the same cyclopentadienyl group form rings having from 4 to 6 C-atoms; R'' is a bivalent radical selected from the group consisting of an alkenyl group containing from 1 to 8 C-atoms,



group where R is the same as R', said R'' forming a connecting bridge between two cyclopentadienyl groups; X is hydrogen, halogen, —OH, —$OZr(C_5R'_nH_{5-n})(C_5R'_mH_{5-m})$, —OR where R is the same as R', or a hydrocarbon radical having the meaning of R'; q is 1 or 2 and when q is 1, Zr is trivalent and when q is 2, Zr is tetravalent and the X substituents are the same or different from each other; p is 0 or 1 and n, m are integers from 0 to 5; in the case where R' is a hydrocarbon radical and p=0, (n+m) is ≧5; when p=1, (n+m) is ≧3; when R' is a —$SiR_3$ or —$CR_2SiR_3$ group (n+m) is ≧1 when p=0 or when p=1 and R'' is an alkylenic group; when p=1 and R'' is



(n+m) is ≧0;

B') a trialkyl-Al compound or an alkyl-Al monohydride of the formula:

$$AlR_{3-z}H_z$$

in which R is an alkyl, alkenyl or alkylaryl radical with 1-10 C-atoms and z=0 or 1.

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**5,049,536**

**CATALYTICALLY ACTIVE SILICA AND ALUMINA GEL AND PROCESS FOR PREPARING IT**

**Giuseppe Bellussi, Piacenza; Mario G. Clerici, San Donato Milanese; Angela Carati, San Giuliano Milanese, and Fabrizio Cavani, Modena, all of Italy, assignors to Eniricerche S.p.A., Milan, Italy**

**Filed Apr. 28, 1989, Ser. No. 345,142**

**Claims priority, application Italy, May 6, 1988, 20494 A/88**

**Int. Cl.[5] B01J *21/12***

**U.S. Cl. 502—235** **12 Claims**

1. Silica and alumina gel, which is amorphous at X-rays, has a molecular ratio of $SiO_2/Al_2O_3$ comprised within the range of from 30/1 to 500/1, a surface area comprised within the range of from 500 to 1000 $m^2/g$, a total volume of pores comprised within the range of from 0.3 to 0.6 ml/g, an average diameter of the pores of the order of magnitude of 10 Å or less and is free, or substantially free, from pores having a diameter larger than 30 Å, obtained by:

(a) preparing an aqueous solution of tetra-alkyl-ammonium hydroxide (TAA-OH) in which the alkyl is selected from among ethyl, n.-propyl and n.-butyl, of a soluble compound of aluminum capable of yielding $Al_2O_3$ by hydrolysis and of a soluble silicon compound capable of yielding $SiO_2$ by hydrolysis; with the amount of the constituents of the solution being such as to comply with the following values of the following molar ratios:

| | |
|---|---|
| $SiO_2/Al_2O_3$ | from 30:1 to 500:1; |
| TAA—$OH/SiO_2$ | from 0.05:1 to 0.2:1; |
| $H_2O/SiO_2$ | from 5:1 to 40:1; |

(b) heating the so-obtained solution in order to cause the gelification to occur;

(c) drying the obtained gel; and

(d) calcining the dried gel, by operating first under an inert atmosphere and then under an oxidating atmosphere.

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**5,049,537**

## STABLE SOLID PHASES INVOLVING $V_2O_3$ - $TIO_2$ AND MIXTURES OF SAID PHASES

Mitri S. Najjar, Wappingers Falls, N.Y., and Arnulf Muan, Lacey Spring, Va., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1989, Ser. No. 457,215
Int. Cl.[5] B01J *21/06*
U.S. Cl. 502—350 20 Claims

1. Composition produced from $V_2O_3$ and $TiO_2$ wherein said composition corresponds to phase VT having vertices ABCDFGHI in a polygon shaped shaded area in the disclosed FIGURE, or phase E having vertices JKLMNOP in a polygon shaped shaded area in the disclosed FIGURE, or phase $\eta$ having vertices QSUWXYZ in a polygon shaped shaded area in the disclosed FIGURE; and wherein each area in said FIGURE has the vertices and corresponding coordinates as shown in Table Ia below;

TABLE Ia

| Vertice | Temp. °C. | Wt. % $V_2O_3$ | Wt. % $TiO_2$ |
|---|---|---|---|
| | VT | | |
| A | 20 | 83 | 17 |
| B | 1400 | 82 | 18 |
| C | 1650 | 74 | 26 |
| D | 1750 | 70 | 30 |
| F | 1700 | 65 | 35 |
| G | 1550 | 72 | 28 |
| H | 1400 | 75 | 25 |
| I | 20 | 78 | 2 |
| | E | | |
| J | 20 | 67 | 33 |
| K | 1400 | 65 | 35 |
| L | 1700 | 52 | 48 |
| M | 1750 | 49 | 51 |
| N | 1680 | 46 | 54 |
| O | 1400 | 59 | 41 |
| P | 20 | 63 | 37 |
| | $\eta$ | | |
| Q | 20 | 39 | 61 |
| S | 1400 | 36 | 64 |
| U | 1680 | 28 | 72 |
| W | 1730 | 25 | 75 |
| X | 1710 | 23 | 77 |
| Y | 1400 | 32 | 68 |
| Z | 20 | 35 | 65. |

10. A method of preparing a stable composition and mixtures of said stable composition from $V_2O_3$ and $TiO_2$, wherein said composition fall within a specific area in a binary composition diagram of $V_2O_3$ and $TiO_2$ comprising the steps of

(1) heating $V_2O_5$ powder having a particle size of less than about 50 microns in an atmosphere in which the partial pressure of oxygen is in the range of $10^{-8}$ to $10^{-10}$ atmospheres by starting at a temperature of about 600° C. and increasing the temperature over a period of about 12 to 24 hours to a final temperature of about 1300° C., and holding the final temperature for a period to ensure complete reduction of all vanadium to $V^{+3}$;

(2) heating $TiO_2$ powder having a particle size of less than about 50 microns for a period of about 10 to 14 hrs at a temperature in the range of about 600° C. to 800° C.;

(3) thoroughly grinding together about 90 to 20 wt. % of $V_2O_3$ from (1), with about 10 to 80 wt. % of $TiO_2$ to produce a mixture having a grain size of less than about 50 microns,

(4) pelletizing the mixture from (30 at a pressure of about 5,000 psi; and

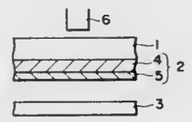
(5) heating the pellets from (4) at a temperature in the range of about 1100° C. to 1600° C. for a period in the range of about 12 to 48 hrs. in an atmosphere in which the partial pressure of oxygen is in the range of $10^{-10}$ to $10^{-8}$ atmosphere.

**5,049,538**

## SUBLIMATION TYPE THERMOSENSITIVE IMAGE TRANSFER RECORDING MEDIUM, AND THERMOSENSITIVE RECORDING METHOD USING THE SAME

Hidehiro Mochizuki, Numazu; Akira Suzuki, Mishima; Masaru Shimada, Shizuoka, and Hiroyuki Uemura, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 11, 1989, Ser. No. 392,605
Claims priority, application Japan, Sep. 7, 1988, 63-224151; Oct. 26, 1988, 63-268204
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] B41M *5/035, 5/26*
U.S. Cl. 503—227 66 Claims




23. A thermosensitive recording method comprising the steps of:

(1) superimposing a sublimation type thermosensitive image transfer recording medium on a receiving sheet, which sublimation type thermosensitive image transfer recording medium comprising a support, an ink layer formed on said support, which comprises (a) a dye supplying layer formed on said support, comprising a sublimable dye and at least one binder agent in which said sublimable dye is dispersed in the form of undissolved granules, and (b) an image transfer facilitating layer formed on said dye supplying layer, comprising the sublimable dye and at least one organic binder agent in which said sublimable dye is dissolved, said dye supplying layer and said image transfer facilitating layer being constructed in such a manner that (i) the concentration of said sublimation dye in said dye supplying layer is greater than that of said sublimable dye in said image transfer facilitating layer or (ii) the diffusion coefficient of said sublimable dye in said dye supplying layer is greater than that of said sublimable dye in said image transfer facilitating layer, and

(ii) applying heat imagewise to said sublimation type thermosensitive image transfer recording medium so as to imagewise transfer said sublimable dye from said recording medium to said receiving sheet by a heat application recording means as said recording medium and said receiving sheet are moved at an equal speed.

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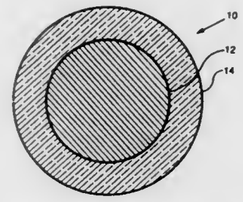
**5,049,539**

## LOW COST, FORMABLE, HIGH TC SUPERCONDUCTING WIRE

James L. Smialek, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 31, 1989, Ser. No. 305,675
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 3 Claims

1. A formable, high $T_c$ superconducting article comprising a thin copper alloy wire substrate having up to about five atom percent of elements selected from the group consisting essentially of yttrium and barium alloyed therewith, and




a highly compliant, thin, superconducting adherent $Y_1Ba_2Cu_3O_{7-x}$ scale film thereon, said film forming a major fraction of the wire cross section.



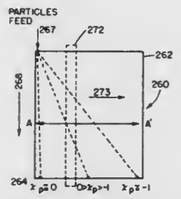
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**5,049,540**

## METHOD AND MEANS FOR SEPARATING AND CLASSIFYING SUPERCONDUCTIVE PARTICLES

Jin Y. Park, and Robert J. Kearney, both of Moscow, Id., assignors to Idaho Research Foundation, Moscow, Id.

Continuation-in-part of Ser. No. 117,490, Nov. 5, 1987, abandoned. This application May 17, 1989, Ser. No. 353,341
Int. Cl.[5] H01L *39/24;* B03B *1/ 00;* B03C *1/02*
U.S. Cl. 505—1 27 Claims




1. A method of classifying superconductive particles by volume and by degree of susceptibility to the Meissner effect force, the method comprising:

feeding superconductive particles into a fluid, at a temperature below $T_c$, said particles having various degrees of susceptibility and various volumes;

directing the fluid in a first direction;

applying a first magnetic field gradient to the fluid in a second direction to accelerate the superconductive particles in said second direction, each of the superconductive particles being accelerated in the second direction, and to spatially dispense the superconductive particles along said second direction according to the degree of susceptibility of said particles;

a second magnetic field gradient reciprocating along an axis parallel to the second direction;

applying a force to each particle in a third direction proportional to the volume of the particle, wherein the superconductive particles become spatially dispensed along said third direction according to the volumes of the particles; and

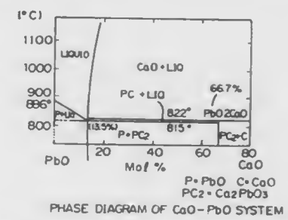
separating the superconductive particles into a plurality of groups according to the locations of the particles along said second and third directions.

**5,049,541**

## PROCESS FOR PREPARING SUPERCONDUCTOR

Takuya Uzumaki, Kawasaki; Kazunori Yamanaka, Sagamihara; Nobuo Kamehara, Isehara, and Koichi Niwa, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 19, 1989, Ser. No. 382,180
Claims priority, application Japan, Jul. 25, 1988, 63-185015; Nov. 11, 1988, 63-285125; Nov. 29, 1988, 63-301635
Int. Cl.[5] H01B *12/00;* H01L *39/12*
U.S. Cl. 505—1 16 Claims




PHASE DIAGRAM OF CaO–PbO SYSTEM

1. A process for preparing a superconductor, comprising the steps of:

preparing a first material, in the form of powder mixture or sintered mass, having a composition represented by the formula (I):

$$Bi_{u'}Pb_{v'}Sr_{w'}Ca_{x'}Cu_{y'}O_{z'} \quad (I)$$

where $1 \leqq u' 3{,}0 \leqq v' \leqq 1{,}1 \leqq w' \leqq 3{,}0 \leqq x' \leqq 12{,}1 \leqq y' \leqq 12{,}3 \leqq z' \leqq 39.5$;

adding to the first material a calcium compound, selected from the group consisting of $Ca_2PbO_4$ and $Ca_2PbO_3$, and which forms a mixed phase involving CaO and a liquid phase at a temperature not higher than 900° C.; and

firing the resulting mixture of the first material and the calcium compound at a temperature not higher than 900° C. to obtain a superconductor represented by the formula (II):

$$Bi_uPb_vSr_wCa_xCu_yO_z \quad (II)$$

where $1 \leqq u \leqq 3{,}0 \leqq v \leqq 1{,}1 \leqq w \leqq 2{,}2 \leqq x \leqq 10{,}3 \leqq y \leqq 11{,}6 \leqq z \leqq 35$.

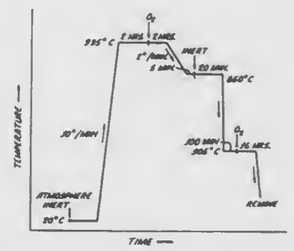
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**5,049,542**

## LA123 SUPERCONDUCTOR MATERIALS

Stephen G. Brass, Fullerton, and Mohammad H. Ghandehari, Brea, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 30, 1989, Ser. No. 374,969
Int. Cl.[5] H01L *39/12*
U.S. Cl. 505—1 26 Claims




2. A process for making orthorhombic perovskitic superconductive materials having the general formula $LaBa_2Cu_3O_y$,

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wherein y ranges between about 6.8 and about 7.0, said process comprising the steps of:

a. sintering a substantially stoichiometric mixture of lanthanum, barium and cupric oxides under under a non-reactive atmosphere at a temperature in the range from about 850° C. to about 1100° C.;

b. changing the sintering atmosphere to oxygen and continuing the time at the sintering temperature for between about 10 minutes and about 20 hours, followed by slowly lowering the temperature to a value within the range from about 400° C. to about 850° C., which value is about the tetragonal to orthorhombic transition temperature;

c. changing the sintering atmosphere to an inert gas and then rapidly lowering the temperature to one which is between a temperature below the tetragonal to orthorhombic transition temperature and about 280° C. and annealing the sintered material at this temperature for up to at least about 1 hour; and

d. changing the annealing atmosphere to oxygen and continuing the annealing operation at this temperature for at least about 1 hour, so as to produce a superconductor having a temperature wherein the T(R=0) is at least about 90° K.

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**5,049,543**

## DEVICE AND METHOD OF MANUFACTURING A DEVICE

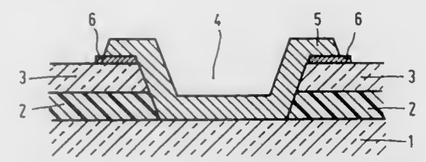
**Gerrit J. Van Der Kolk; Theunis S. Baller; Bernard Dam, all of Eindhoven; Roger De Reus, and Frans W. Saris, both of Amsterdam, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 27, 1989, Ser. No. 316,395**

**Claims priority, application Netherlands, Apr. 5, 1988, 8800857**

**Int. Cl.[5] H01B *12/00***

**U.S. Cl. 505—1** **5 Claims**




1. A device comprising semiconductor elements and conductor tracks of an oxidic superconductive material, electrically conductive connections being formed between the semiconductor elements and the conductor tracks, the electrically conductive connections comprising at least one antidiffusion layer, characterized in that the antidiffusion layer consists of an amorphous alloy of two transition metals, which alloy has a crystallisation temperature of at least 900° K.

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**5,049,544**

## PERFUMERY COMPOSITION COMPRISING 2-CYCLOHEXYLPROPIONIC ACID OR ITS DERIVATIVE

**Junji Koshino, Naga; Yoshiaki Fujikura, Utsunomiya, and Nao Toi, Sakura, all of Japan, assignors to Kao Corporation, Tokyo, Japan**

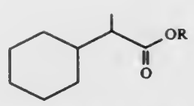
**Filed Jul. 27, 1990, Ser. No. 558,504**

**Claims priority, application Japan, Jul. 28, 1989, 1-195610**

**Int. Cl.[5] A61K *7/46***

**U.S. Cl. 512—22** **7 Claims**

1. A perfumery composition comprising a 2-cyclohexylpropionic acid or its derivative represented by the following formula (I):




(I)

wherein R is a hydrogen atom, an alkyl group having 1–4 carbon atoms, or an alkenyl group having 2–4 carbon atoms, in a mixture with conventional components of a perfumery composition.

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**5,049,545**

## INSULIN DERIVATIVES, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

**Hartmut Löbermann, Weimar; Eric P. Pâques, and Norbert Heimburger, both of Marburg, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg-/Lahn, Fed. Rep. of Germany**

**Continuation of Ser. No. 14,462, Feb. 13, 1987, abandoned. This application Mar. 15, 1989, Ser. No. 323,156**

**Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604868**

**Int. Cl.[5] A61K *37/26*; C07K *7/40***

**U.S. Cl. 514—3** **4 Claims**

1. An insulin derivative of the formula

X—$Y_1$—S—S—$Y_2$—Z-Insulin

in which

X—$Y_1$ is alpha-1-antitrypsin, albumin, pancreatic trypsin inhibitor, dextran containing amino groups, cysteine or thiamine,

$Y_2$ is —$CH_2$—$CH_2$—C=O or —$CH_2$—$CH_2$—CH(NH-acetyl)—C=O,

S is a sulfur atom,

Z is an amino group which is nonessential for the biological activity of insulin, and

Insulin denotes the biologically active natural, semi-synthetic or synthetic insulin.

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**5,049,546**

## ANTIBIOTIC AGENTS

**David F. Sesin, Rahway; Jerrold M. Liesch, Princeton Junction; Jimmy M. Fountoulakis, Westfield; Prakash S. Masurekar, Warren, all of N.J.; Louis Kaplan, New City, N.Y., and Carol F. Wichmann, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

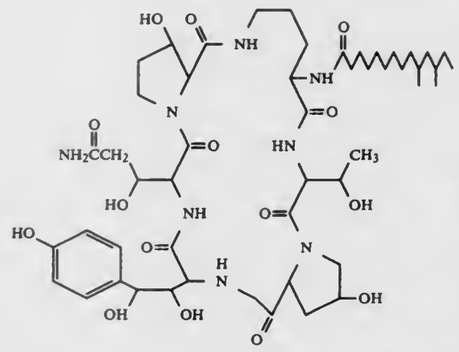
**Filed Mar. 19, 1990, Ser. No. 495,653**

**Int. Cl.[5] A61K *31/395*; C07D *7/64, 487/14***

**U.S. Cl. 514—9** **5 Claims**

1. A compound having the formula





2. A method for the treatment of or for the prevention of *Pneumocystis carinii* infections in mammals which comprises administering to mammals an anti-infective amount of the compound of claim 1.

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**5,049,547**

## COMPOSITION FOR STIMULATING INTEGUMENTAL MELANOCYTES

**Victor J. Hruby; Mac E. Hadley; Robert Dorr; Norman Levine, all of Tucson, Ariz.; Elizabeth Sugg, High Bridge, and Wayne L. Cody, Ringoes, both of N.J., assignors to University Patents, Inc., Westport, Conn.**

**Division of Ser. No. 154,823, Feb. 11, 1988, Pat. No. 4,918,055. This application Apr. 19, 1989, Ser. No. 340,305**

**The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.**

**Int. Cl.[5] A61K *37/24***

**U.S. Cl. 514—14** **10 Claims**

1. A pharmaceutical composition for the administration of an active component to stimulate melanin production in a vertebrate which comprises at least one active component of the group:

(1) alpha-MSH having the formula

Ac—Ser—Tyr—Ser—Met—Glu—His—Phe—Arg—Trp—Gly—Lys—Pro—Val—$NH_2$;

(2) alpha-MSH analogues having the formula

Ac—Ser—Tyr—Ser—M—Glu—His—D—Phe—Arg—Trp—Gly—Lys—Pro—Val—$NH_2$

wherein M is selected from the group consisting of Met, Nle, and Cys;

(3) analogues of alpha-MSH having the formula

$R_1$—W—X—Y—Z—$R_2$

wherein $R_1$ is selected from the group consisting of Ac-Gly, Ac-Met-Glu, Ac-Nle-Glu, and Ac-Tyr-Glu; wherein W is selected from the group consisting of His and D-His; wherein X is selected from the group consisting of Phe, D-Phe, Tyr, D-Tyr, and (p$NO_2$)D-Phe; wherein Y is selected from the group consisting of Arg and D-Arg; wherein Z is selected from the group consisting of Trp and D-Trp; and wherein $R_2$ is selected from the group consisting of $NH_2$, Gly-$N_2$ and Gly-Lys-$NH_2$; and

(4) alpha-MSH analogues selected from the group consisting of

[$Nle^4$, D-$Phe^7$]-alpha-MSH

[$Nle^4$, D-$Phe^7$]-alpha-$MSH_{4-10}$

[$Nle^4$, D-$Phe^7$]-alpha-$MSH_{4-11}$

[$Nle^4$, D-$Phe^7$, D-$Trp^9$]-alpha-$MSH_{4-11}$

[$Nle^4$, D-$Phe^7$]-alpha-$MSH_{4-9}$

said component being present in an amount sufficient to cause the production of melanin in said vertebrate, said composition further comprising a pharmaceutically acceptable carrier for administration of the active component to the vertebrate in which the stimulation of melanin production is desired.

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**5,049,548**

## RENIN-INHIBITORY DI-, TRI-, AND TETRAPEPTIDES

**William J. Greenlee, Teaneck, and Jan ten Broeke, Somerset, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Mar. 3, 1989, Ser. No. 319,448**

**Int. Cl.[5] A61K *37/02*; C07K *5/06, 5/08, 5/10***

**U.S. Cl. 514—18** **4 Claims**

1. A peptide selected from the group consisting of:

N-(2,2,6,6-Tetramethylpiperidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(N-Ethylpiperidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(N-Ethylpiperidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(N-Phenylpiperidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(N-Benzylpiperidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-[(Pyridin-2-yl)methyl]Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-[(Pyridin-4-yl)methyl]Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-[(Pyridin-4-yl)methyl]Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

[N-[(N-Methylpyridin-2-yl)methyl]Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

N-[(Pyridin-2-yl)methyl]Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

[N-(N-Methylpyridin-2-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

N-(Quinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(Quinuclidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

[N-(N-Methylquinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

[N-(N-Methylquinuclidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

[N-(N-2-Hydroxy)ethylquinuclidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

N-(N-Carboxymethylquinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]

[N-(N-Carboethoxymethylquinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

N-Methyl-N-(quinuclidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)

[N-(Methyl-N-(N-methylquinuclidin-4-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)]$^+Cl^-$

N-Box-N-(quinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(2-Benzylquinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(Quinuclidin-3-yl)Phe-His-ACHPA-Ile-$NHCH_2$-(pyridin-4-yl)

N-(Quinuclidin-3-yl)Tyr(OMe)-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(Quinuclidin-3-yl)HPhe-His-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(Quinuclidin-3-yl)Phe-Thiz-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

N-(Quinuclidin-3-yl)Phe-Val-ACHPA-Ile-$NHCH_2$(pyridin-4-yl)

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N-(Quinuclidin-3-yl)Phe-Phe-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Tyr(OMe)-Nle-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Nal-Nle-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Leu-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Phe-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Lys-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Orn-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-2(S)-methylbutyl
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Ile-NHCH$_2$(pyridin-2-yl)
N-(Quinuclidin-3-yl)Phe-Nle-ACHPA-Leu-NHCH$_2$CH$_2$(imidazol-4-yl)
N-(Quinuclidin-3-yl)Phe-His-ACHPA-(N-methyl)Ile-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-His-ACHPA-Ile-NH(quinuclidin-3-yl)
[N-(Quniuclidin-3-yl)Phe-His-ACHPA-Ile-NH-(N-methylquinuclidin-3-yl)]$^+$OAc$^-$
N-(Quinuclidin-3-yl)Phe-His-Cal[CH(OH)CH$_2$]Val-NHCH$_3$
N-(Quinuclidin-3-yl)Phe-His-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$
N-(Quinuclidin-3-yl)Phe-(NCl-Me)His-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$
N-(Quinuclidin-3-yl)Phe-(N-Me)Nle-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$
N-(Quinuclidin-3-yl)Nal-(N-Me)Nle-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$
N-(Quinuclidin-3-yl)Nal-(N-Me)Nle-Cal[CH(OH)CH$_2$]Ala-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-His-Cal[CH(OH)CH$_2$]Ala-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-4-yl)Phe-His-Cal[CH(OH)CH$_2$]Ala-NH-CH$_3$
[N-(N-Methylquinuclidin-3-yl)Phe-His-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$]$^+$Cl$^-$
[N-(N-Methylquinuclidin-4-yl)Phe-His-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$]$^+$Cl$^-$
[N-(N-Benzylquiniuclidin-3-yl)Phe-His-Cal[CH(OH)CH-$_2$]Ala-NHCH$_3$]$^+$Cl$^-$
N-(N-Carboxymethylquinuclidin-3-yl)Phe-His-Cal[C-H(OH)CH$_2$]Ala-NHCH$_3$]
[N-(N-Carboethoxyxymethylquinuclidin-3-yl)Phe-His-Cal[C-H(OH)CH$_2$]Ala-NHCH$_3$]$^+$Cl$^-$
N-Methyl-N-(quinuclidin-4-yl)Phe-His-Cal-[CH(OH)CH-$_2$]Ala-NHCH$_2$(pyridin-4-yl)
N-Methyl-N-(N-methylquinuclidin-4-yl)Phe-His-Cal[C-H(OH)CH$_2$]Ala-NHCH$_3$+Cl$_-$
N-Boc-N-(quinuclidin-3-yl)Phe-His-Cal-[CH(OH)CH$_2$]Ala-NHCH$_2$(pyridin-4-yl)
N-(2-Benzylquinuclidin-3-yl)Phe-His-Cal[CH(OH)CH$_2$]Ala-NHCH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)CH$_2$CH$_2$N(CH$_2$CH$_3$)$_2$
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)CH$_2$CH$_2$N(CH$_2$CH$_3$)$_2$O
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)CH(OH)CH$_2$N(CH$_2$CH$_2$)$_2$O
[N-(Quinuclidin-3-yl)Phe-His-ACHPA-(CH$_2$CH$_3$)CH$_2$CH(OH)CH$_2$N(CH$_3$)(CH$_2$CH$_2$)$_2$O]$^+$Cl$^-$
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)CH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)CH$_2$CH$_2$(pyridin-4-yl)
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_2$)$_2$O
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)-2(S)-methylbutyl
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)(CH$_2$)$_3$CH$_3$
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N(CH$_2$CH$_3$)(2,2,6,6-tetramethylpiperidin-4-yl)
N-(Quinuclidin-3-yl)Phe-His-ACHPA-N[(CH$_2$)$_4$-]CH$_2$CH(−)N(CH$_2$CH$_3$)$_2$
N-(Quinuclidin-3-yl)Phe-His-ACHPA-NH(quinuclidin-3-yl)
[N-(Quinuclidin-3-yl)Phe-His-ACHPA-NH(N-methylquinuclidin-3-yl)]$^+$OAc$^-$
N-(Quinuclidin-3-yl)Phe-His-norACHPA-O-iPr
N-(Quinuclidin-3-yl)Phe-His-norACHPA-O-2(S)-methylbutyl
[N-(N-Benzylquinuclidin-3-yl)Phe-His-norACHPA-O-2(S)-methylbutyl]$^+$−OCOPh
N-(N-Carboxymethylquinuclidin-3-yl)Phe-His-norACHPA-O-iPr
N-(2,2,6,6-tetramethylpiperidin-4-yl)Phe-His-norACHPA-O-iPr
N-[N-(Quinuclidin-3-yl)Phe-His-]-2(S)-amino-1-cyclohexyl-3(S)-hydroxy-6-methylheptane
N-[N-(Quinuclidin-3-yl)Phe-His-]-2(S)-amino-1-cyclohexyl-3(S), 4(R)-dihydroxy-6-methylheptane
[N-[N-(N-methylquinuclidin-3-yl)Phe-His-]-2(S)-amino-1-cyclohexyl-3(S), 4(R)-dihydroxy-6-methylheptane]$^+$OAc$^-$
N-[N-(Quinuclidin-3-yl)Phe-His-]-2(S)-amino-1-cyclohexyl-3(R), 4(S)-dihydroxy-5-methylheptane
N-[N-(Quinuclidin-3-yl)Phe-His-]-4(S)-amino-1-cyclohexyl-methyl-2(S), 3(R)-dihydroxy-1-(isopropylsulfonyl)pentane
N-[N-(Quinuclidin-3-yl)Phe-His-]-4(S)-amino-1-cyclohexyl-methyl-2(S), 3(R)-dihydroxy-1-(morpholin-1-yl)pentane
[N-[N-(N-methylquinuclidin-3-yl)Phe-His-]-4(S)-amino-5-cyclohexylmethyl-2(R), 3(R)-dihydroxy-1-(morpholin-1-yl)pentane]$^+$OAc$^-$
[N-(N-Benzylquinuclidin-3-yl)Phe-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)]$^+$OAc$^-$
N-(N-Benzylquinuclidin-3-yl)Phe-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)
[N-(N-Methyl-2-benzylquinuclidin-3-yl)Phe-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)]$^+$OAc$^-$
[N-(2-benzylquinuclidin-3-yl)His-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)
[N-(2-benzylquinuclidin-3-yl)Nle-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)
[N-(N-Benzylquinuclidin-3-yl)Nle-ACHPA-Ile-NHCH$_2$(pyridin-4-yl)]$^+$OAc$^-$
N-(2-Benzylquinuclidin-3-yl)His-Cal[CH(OH)CH$_2$]Ala-NHCH$_2$(pyridin-4-yl)
N-(2-Benzylquinuclidin-3-yl)His-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$
N-(2-Benzylquinuclidin-3-yl)Nle-Cal[CH(OH)CH$_2$]Ala-NHCH$_3$ and
[N-(N-Methyl-2-benzylquinuclidin-3-yl)His-Cal[CH(OH)CH-$_2$]Ala-NHCH$_2$(pyridin-4-yl)]$^+$OAc$^-$

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**5,049,549**

## RHODOMYCINS WITH A MODIFIED CARBOHYDRATE UNIT

**Cenek Kolar; Hans P. Kraemer, and Konrad Dehmel, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany**

**Filed Dec. 18, 1989, Ser. No. 451,877**

**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1988, 3842836**

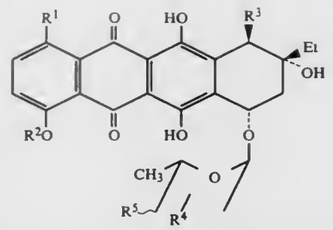
**Int. Cl.$^5$ C07H *15/252;* A61K *31/71***

**U.S. Cl. 514—34** **7 Claims**

1. A compound of the formula I



Formula I

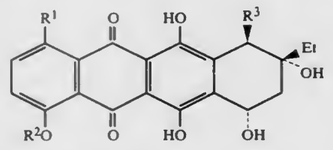


in which the radicals have the following meaning:
$R^1$ is a hydrogen atom or a hydroxyl group,
$R^2$ is a hydrogen atom or a $C_1$–$C_4$-group,
$R^3$ is a hydroxyl group, an O-acyl protective group or a methyloxycarbonyl group,
$R^4$ is a hydrogen atom, an O-acyl protective group, an azido group, an amino or trifluoroacetylamino group, a di-$C_1$–$C_4$ -alkylamino group or cyanomethylamino group and
$R^5$ is an azido group, amino or trifluoroacetylamino group, a di-$C_1$–$C_4$- alkylamino group or cyanomethylamino group, where acyl protective group denotes an acetyl, mono-, di- or trihalogenoacetyl group with fluorine or chlorine as halogen or a p-nitrobenzoyl group, and the salts thereof.

6. A pharmaceutical composition containing a therapeutically effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier.

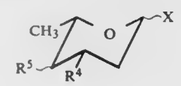
7. A process for the preparation of a compound as claimed in claim 1, which comprises reacting an aglycone compound of the formula II

Formula II

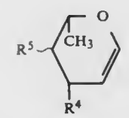


in which the radicals
$R_1$ is H or OH,
$R^2$ is H or $C_1$–$C_4$-alkyl and
$R^3$ is O-acyl group or $COOCH_3$,
with a functionalized deoxysugar of the formula III or IV

Formula III



Formula IV



in which the radicals
$R^4$ represents a hydrogen atom, an O-acyl protective group, azido group or trifluoroacetylamino group,
$R^5$ represents an azido group or a trifluoroacetylamino group and
X represents an acetyloxy, p-nitrobenzoyloxy group or a chlorine atom,
in the presence of a catalyst, selected from the group consisting of tri-$C_1$–$C_4$-alkylsilyl trifluoromethanesulfonate or the silver salt of trifluoromethanesulfonic acid, to give a 7-O-glycosyl-rhodomycinone derivative, and eliminating the acyl protective groups in the product partially or completely by alkaline hydrolysis, and converting the azido group present in the product, by hydrogenolysis in the presence of a hydrogenation catalyst such as palladium/carbon, into the amino group, resulting in a compound of the formula I
in which the radicals
$R^1$ and $R^2$ remain unchanged, and
$R^3$ represents OH or $COOCH_3$,
$R^4$ represents a hydrogen atom, a hydroxyl group, an acetyloxy, trifluoroacetyloxy or p-nitrobenzoyloxy group or an azido, trifluoroacetylamino or amino group, and
$R^5$ represents an azido group, an amino or trifluoroacetylamino group.

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**5,049,550**

## DIADENOSINE 5′, 5‴-P$^1$, P$^4$,-TETRAPHOSPHATE ANALOGS AS ANTITHROMBOTIC AGENTS

**Paul C. Zamecnik, Shrewsbury, Mass., assignor to Worcester Foundation for Experimental Biology, Mass.**

**Continnation-in-part of Ser. No. 117,475, Nov. 5, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 274,294**

**Int. Cl.$^5$ A61K *31/70;* C07H *21/02***

**U.S. Cl. 514—47** **13 Claims**

1. In a method for dissolving a thrombus in a mammal in need thereof wherein a thrombolytic agent is administered to said mammal, the thrombolytic agent selected from the group consisting of:
tissue plasminogen activator, streptokinase and urokinase, the improvement comprising coadministering to said mammal an effective thrombolytic amount of a thrombolytic agent in conjunction with an effective antithrombotic amount of an analog of Ap$_4$A or an analog thereof, the analog selected from the group consisting of:
App(CH$_2$)ppA, App(CH$_2$CH$_2$)ppA, App(CHF)ppA, App(CF$_2$)ppA, Ap$_5$p(CHF)pp$_5$A, Ap$_5$p(CF$_2$)pp$_5$A, Ap(CF$_2$)pp(CF$_2$)pA, App(CHCl)ppA, App(CCl$_2$)ppA, Ap(CHCl)pp(CHCl)pA, Ap(CCl$_2$)pp(CCl$_2$)pA, and Ap$_5$ppp$_5$A.

8. In an antithrombotic composition, the improvement comprising an effective antithrombotic amount of an analog of diadenosine 5′,5‴-p$^1$,p$^4$-tetraphosphate, the analog selected from the group consisting of:
App(CH$_2$)ppA, App(CH$_2$CH$_2$)ppA, App(CHBr)ppA, Ap$_5$p(CF$_2$)pp$_5$A, Ap$_5$ppp$_5$A, App(CHF)ppA, App(CF$_2$)-ppA, App(CHCl)ppA, App(CCl$_2$)ppA, Ap$_5$p(CHF)pp$_5$A, Ap(CHCl)pp(CHCl)pA, Ap(CCl$_2$)pp(CCl$_2$)pA, and Ap(CF$_2$)pp(CF$_2$)pA, and a pharmacologically acceptable carrier thereof.

13. An analog of Ap$_4$A, effective for inhibiting formation of a thrombus in vivo or in vitro, wherein the analog is selected from the group consisting of:
App(CHF)ppA, App(CF$_2$)ppA, Ap$_5$p(CHF)pp$_5$A, Ap$_5$p(CF$_2$)pp$_5$A, Ap(CF$_2$)pp(CF$_2$)pA, App(CHCl)ppA, App(CHCl)ppA, App(CCl$_2$)ppA, Ap(CHCl)pp(CHCl-)pA, App(CCl$_2$)pp(CCl$_2$)pA, and Ap$_5$ppp$_5$A.

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**5,049,551**

## 5-FLUOROURACIL, 2′-DEOXY-5-FLUOROURIDINE AND 1-CARBOMOYL-5-FLUOROURACIL COMPOUNDS

**Akihide Koda, Gifu; Jun'ichiro Kita, Ube; Yoshio Kaku, Ube; Iichiro Horimi, Ube, and Osami Sakamoto, Ube, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan**

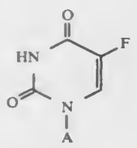
**Filed May 24, 1990, Ser. No. 528,710**

**Claims priority, application Japan, May 30, 1989, 1-134806; Jul. 6, 1989, 1-173122**

**Int. Cl.$^5$ A61K *31/505, 31/70;* C07H *19/06;* C07D *239/02***

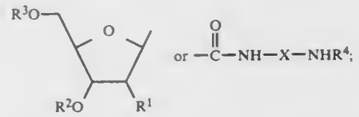
**U.S. Cl. 514—50** **15 Claims**

1. A 5-fluorouracil compound represented by the formula (1):

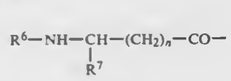


(1)

wherein A represents a group represented by



wherein $R^1$ represents a hydrogen atom or $OR^5$ group; $R^2$, $R^3$ and $R^5$ is the same or different and each represents a hydrogen atom or a group represented by the following formula (2):



(2)

wherein $R^6$ represents an unsubstituted or substituted straight or branched alkanoyl group having 1 to 13 carbon atoms, aralkylcarbonyl group or aroyl group, $R^7$ represents a hydrogen atom, a straight or branched alkyl group having 1 to 13 carbon atoms, a cyclopentyl group, a cyclohexyl group, benzyl, 2-phenethyl, a lower alkenyl group to which a halogen may be substituted, or a phenyl group to which a lower alkyl, a lower alkenyl or a halogen may be substituted, and n is an integer of 0 to 6, provided that when at least one of $R^2$, $R^3$ and $R^5$ is a group represented by the formula (2), $R^2$ and $R^5$ are both not hydrogen atoms;

$R^4$ represents a group represented by the formula (2), and X represents an alkylene group having 4 to 12 carbon atoms or a cycloalkylene group.

15. An antitumor agent which comprises the 5-fluorouracil compound represented by the formula (I) as defined in claim 1 as an active ingredient and a pharmacologically acceptable carrier.

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**5,049,552**

**COMPOSITIONS CONTAINING HEXADECYLPHOSPHOCHOLINE AND USE THEREOF**

**Hansjörg Eibl, Bovenden, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft fur Foerderung der Wissenschaften e.V., Goettingen, Fed. Rep. of Germany**

**Division of Ser. No. 97,960, filed as PCT EP86/00705 on Dec. 4, 1986, published as WO87/03480 on Jun. 18, 1987, Pat. No. 4,837,023. This application Feb. 27, 1989, Ser. No. 316,413**

**Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542893; Feb. 28, 1986, 3606631**

**Int. Cl.[5] H61K** *31/685*

**U.S. Cl. 514—77** **17 Claims**

1. The method of treating a cancer sensitive to treatment with hexadecylphosphocholine, which consists of administering to a patient afflicted with said cancer a therapeutically effective anti-cancer amount of hexadecylphosphocholine.

**5,049,553**

**METHOD FOR PREVENTING OR TREATING SYMPTOMS RESULTING FROM CLOSED HEAD INJURIES EMPLOYING AN ACE INHIBITOR**

**Abraham Sudilovsky, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**Filed Jan. 4, 1990, Ser. No. 460,704**

**Int. Cl.[5] A61K** *31/675, 31/40*

**U.S. Cl. 514—91** **15 Claims**

1. A method for preventing onset of or treating symptoms resulting from closed head injuries in a mammalian specie, which symptoms are poor balance, disorientation, dissociation of thought, rages, black out or garbled speech, which injuries are brought on by trauma which causes unconsciousness for 20 minutes or more, which comprises administering to a mammalian specie in need of such treatment an effective amount of an angiotensin converting enzyme inhibitor which is captopril, fosinopril, ceranapril, lisinopril, zofenopril, enalapril or fentiapril.

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**5,049,554**

**PHOSPHOROUS SUBSTITUTED TETRAZOLINONES AND INSECTICIDAL USE THEREOF**

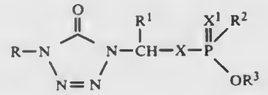
**Rupert A. Covey, Bethany, and Richard C. Moore, Wallingford, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.**

**Continuation of Ser. No. 304,385, Jan. 30, 1989, abandoned, which is a continuation of Ser. No. 16,314, Feb. 19, 1987, abandoned, which is a continuation-in-part of Ser. No. 655,477, Sep. 27, 1984, abandoned, which is a continuation-in-part of Ser. No. 552,573, Nov. 15, 1983, abandoned. This application Aug. 21, 1990, Ser. No. 572,330**

**Int. Cl.[5] C07F** *9/652;* **A01N** *57/08*

**U.S. Cl. 514—92** **22 Claims**

1. A compound having the formula:



(I)

wherein:

R is selected from the group consisting of:

$C_1$–$C_{12}$ alkyl;

$C_5$–$C_6$ cycloalkyl;

$C_2$–$C_{13}$ alkoxyalkyl;

$C_2$–$C_6$ alkylthioalkyl;

$C_1$–$C_6$ haloalkyl;

phenyl;

naphthyl:

$C_3$–$C_{12}$ alkenyl;

phenyl substituted with at least one member of the group consisting of:

halogen,

$C_1$–$C_4$ alkyl,

$C_1$–$C_4$ alkoxy,

$C_1$–$C_4$ alkylthio,

trihalomethyl,

trihalomethoxy,

$C_2$–$C_5$ alkoxycarbonyl,

nitro,

cyano,

carboxy,

methylenedioxy,

phenoxy, and

phenoxy substituted with chlorine, fluorine, bromine, iodine, $C_1$–$C_4$ alkyl or $C_1$–$C_4$ alkoxy;

benzyl; and

benzyl substituted with at least one member of the group consisting of:

halogen,

$C_1$–$C_4$ alkyl,



$C_1$–$C_4$ alkoxy,

methylenedioxy,

$C_2$–$C_5$ alkoxycarbonyl,

phenoxy,

nitro,

cyano,

trihalomethyl,

trihalomethoxy,

phenoxy substituted with fluorine, chlorine, bromine, iodine, $C_1$–$C_4$ alkyl or $C_1$–$C_4$ alkoxy;

$R^1$ is hydrogen:

$C_1$–$C_4$ alkyl; or

phenyl;

$R^2$ is $C_1$–$C_5$ alkyl;

$C_1$–$C_5$ alkoxy;

$C_1$–$C_5$ alkylthio;

$C_1$–$C_5$ alkylamino; or

$C_2$–$C_{10}$ dialkylamino;

$R^3$ is $C_1$–$C_5$ alkyl; and

X and $X^1$ are the same or different and are oxygen or sulfur.

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**5,049,555**

**ANTAGONISTS OF SPECIFIC EXCITATORY AMINO ACID RECEPTORS AS NEUROPROTECTANTS AND ANXIOLYTICS**

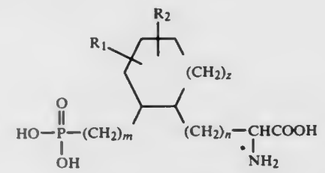
**Waclaw J. Rzeszotarski, Millersville; Maria E. Guzewska, Pasadena; Suzanne R. Ellenberger, Reisterstown; Lisa H. Conti, Baltimore; John W. Ferkany, Baltimore, and Donald J. Kyle, Baltimore, all of Md., assignors to Nova Pharmaceutical Corporation, Baltimore, Md.**

**Filed Dec. 19, 1988, Ser. No. 286,153**

**Int. Cl.[5] A61K** *31/66*

**U.S. Cl. 514—114** **19 Claims**

1. A method for treating, preventing or reducing neurodegeneration associated with ischemic insult, anoxic insult, or hypoxia comprising administering a therapeutically effective amount of an excitatory amino acid neurotransmitter antagonist of the formula:



wherein $R_1$ and $R_2$ are the same or different and are selected from the group consisting of hydrogen, lower alkyl, alkyl, fatty acid chain, aryl, aralkyl, hydroxy, the stereoisomers being in their resolved or racemic form; amino, nitro, trifluoromethyl or cyano; n and m=0, 1, 2 or 3 and Z=0, 1 or 2; the cycloalkyl ring being replaced with the cycloalkenyl ring; and the pharmaceutically acceptable salts and derivates thereof to an animal in need thereof.

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**5,049,556**

**CERTAIN N-AZABICYCLO-2,3-DIHYDRO-INDOLE-1-CARBOXAMIDES HAVING ANTI-EMETIC PROPERTIES, FURTHER FOUND USEFUL IN TREATING HEADACHES, NEURALGIA AND ANXIETY**

**Francis D. King, and Karen A. Joiner, both of Harlow, England, assignors to Beecham Group p.l.c., Brentford, England**

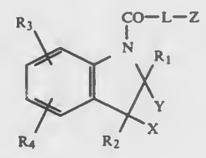
**Division of Ser. No. 202,224, Jun. 3, 1988, Pat. No. 4,871,744, which is a continuation-in-part of Ser. No. 550, Jan. 5, 1987, abandoned. This application Aug. 2, 1989, Ser. No. 389,286**

**Claims priority, application United Kingdom, Mar. 23, 1988, 8806990**

**Int. Cl.[5] A61K** *31/33;* **C07D** *221/02, 223/02, 453/02*

**U.S. Cl. 514—183** **11 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:



(I)

wherein

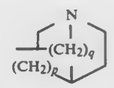
L is NH or O;

X and Y are independently selected from hydrogen or $C_{1-4}$ alkyl;

$R_1$ and $R_2$ are independently selected from hydrogen, $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl-$C_{1-4}$ alkyl, or together are $C_{2-4}$ polymethylene;

$R_3$ and $R_4$ are independently selected from hydrogen, halogen, $CF_3$, $C_{1-6}$ alkoxy, $C_{114\ 6}$ alkylthio, $C_{1-7}$ acyl, $C_{1-7}$ acylamino, $C_{1-6}$ aklylsulphonylamino, N-($C_{1-6}$ alkylsulphonyl)-N-$C_{1-4}$ alkylamino, $C_{1-6}$ alkylsulphinyl, hydroxy, nitro, amino, aminocarbonyl, aminosulphonyl, aminosulphonyamino or N-(aminosulphonyl)-$C_{1-4}$ alkylamino optionally N-substituted by one or two groups selected from $C_{1-6}$ alkyl, $C_{3-8}$ cycloalkyl, $C_{3-8}$ cycloalkyl $C_{1-4}$ alkyl, phenyl or phenyl $C_{1-4}$ alkyl groups or optionally N-disubstituted by $C_{4-5}$ by $C_{4-5}$ polymethylene;

Z is a group of formula (b)



(b)

wherein p is 1 or 2; q is 1 to 3;

with the proviso that the compound of formula (I) is other than N-(1-azabicyclo[2.2.2]oct-3-yl)-2,3-dihydroindole-1-carboxylic acid ester.

9. A method of treatment of trigeminal neuralgia in mammals, which comprises administration to a mammal in need of such treatment an effective amount of a compound according to claim 1.

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**5,049,557**

## METALLO-ORGANIC SALT COMPOUNDS AND PHARMACEUTICAL USES THEREOF

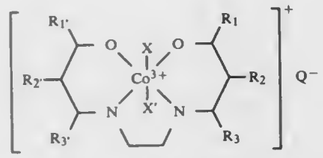
**Zvi Dori, Haifa, and David Gershon, Kiryat Tivon, both of Israel, assignors to Chai-Tech Corporation, Greenvale, N.Y.**

**Continuation-in-part of Ser. No. 147,713, Jan. 25, 1988, Pat. No. 4,866,054, and a continuation-in-part of Ser. No. 147,714, Jan. 25, 1988, Pat. No. 4,866,053, each is a continuation-in-part of Ser. No. 862,804, May 13, 1986, abandoned. This application Dec. 2, 1988, Ser. No. 279,417**

**Int. Cl.**[5] **A61K** *31/33, 31/555*

**U.S. Cl. 514—185** **16 Claims**

1. An antimicrobial composition comprising a suitable carrier and a compound in an amount effective to suppress the growth of microorganisms, the compound having the structure:



wherein $R_1$ and $R_1$, are the same or different and each is an alkyl group, a phenyl group or a substituted derivative of a phenyl group;

wherein $R_2$ and $R_2$, are the same or different and each is hydrogen, an unbranched alkyl group, a halide or a group having the structure



wherein R is hydrogen, an alkoxide group, an alkyl group, or OH;

wherein $R_3$ and $R_3$, are the same or different and each is hydrogen or an alkyl group;

wherein X and X' are the same or different and each is a water soluble group having weak to intermediate ligand field strength; and

$Q^-$ is a soluble, pharmaceutically acceptable negative ion.

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**5,049,558**

## CEPHALOSPORIN DERIVATIVES

**Robert H. Bradbury, Wilmslow, United Kingdom; Frederic H. Jung, Rilly La Montagne; Jean J. Lohmann, Hermonville, both of France; Peter R. Marsham, Poynton, United Kingdom, and Georges Pasquet, Bazancourt, France, assignors to Imperial Chemical Industries plc, London, England and ICI Pharma, Cergy Cedex, France**

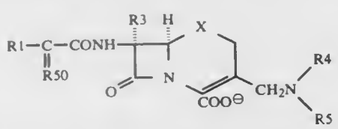
**Continuation of Ser. No. 738,646, May 28, 1985, abandoned. This application Sep. 19, 1989, Ser. No. 409,290**

**Claims priority, application European Pat. Off., May 30, 1984, 84401116**

**Int. Cl.**[5] **C07D** *501/18;* **F61C** *31/545*

**U.S. Cl. 514—202** **20 Claims**

1. A cephalosporin derivative of the formula I:



(I)

in which X is sulphur or sulphinyl (R or S configuration);

R1 is 2-aminothiazol-4-yl or 2-aminooxazol-4-yl each optionally substituted in the 5-position by fluorine, chlorine or bromine, or R1 is 5-aminoisothiazol-3-yl, 5-amino-1,2,4-thiadiazol-3-yl, 3-aminopyrazol-5-yl, 3-aminopyrazol-4-yl, 2-aminopyrimidin-5-yl, 2-aminopyrid-6-yl, 4-aminopyrimidin-2-yl, 2-amino-1,3,4-thiadiazol-5-yl or 5-amino-1-methyl-1,2,4-triazol-3-yl;

R50 is chloromethylene or a radical of the formula =N.O.R2, wherein R2 is hydrogen, (1–6C)alkyl, (3–8C)cyclo-alkyl, (1–3C)alkyl(3–6C)cycloalkyl, (3–6C)cycloalkyl(1–3C)alkyl, (3–6C)alkenyl, optionally substituted by carboxy, (5–8C)cycloalkenyl, (3–6C)alkynyl, (2–5C)alkylcarbamoyl, phenylcarbamoyl, benzylcarbamoyl, (1–4C)alkylcarbamoyl(1–4C)alkyl, di(1–4C)alkylcarbamoyl(1–4C)alkyl, (1–4C)haloalkylcarbamoyl(1–4C)alkyl, triphenylmethyl, (1–3C)haloalkyl, (2–6C)hydroxyalkyl, (1–4C)alkoxy(2–4C)alkyl, (1–4C)alkylthio(2–4C)alkanesulphinyl(1–4C)alkyl, (1–4C)alkane-sulphonyl(1–4C)alkyl, (2–6C)aminoalkyl, (1–4C)alkyl-amino(1–6C)alkyl, (2–8C)dialkylamino(2–6C)alkyl, (1–5C)cyanoalkyl, 3-amino-3-carboxypropyl, 2-(amidinothio)ethyl, 2-(N-aminoamidinothio)ethyl, tetrahydropyran-2-yl, thietan-3-yl, 2-oxopyrrolidinyl or 2-oxotetrahydrofuran-3-yl,

or —R2 is the formula $—(CH_2)_n—R6$ in which n is 1 to 4 and R6 is piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazine, each value of R6 being optionally substituted by (1–4C)alkyl, phenyl or benzyl,

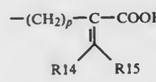
or —R2 is of the formula $—(CH_2)_m—W—R7$ in which m is 0 to 3, W is sulphur or a direct bond, and R7 is phenyl or pyridinio(1–4C)alkylene or R7 is pyridyl, imidazolyl, 1,3,4-thiadiazolyl, tetrazolyl, 1-(1–4C)alkyltetrazolyl, thiazolyl, isothiazolyl or isoxazolyl in which the link with W is via a carbon or uncharged nitrogen, each value of R7 being optionally substituted, where possible, by one or two groups selected from (1–4C)alkyl, amino, hydroxy, carboxy, carbamoyl, nitro, (2–5C)alkoxycarbonyl, cyano or sulpho,

or —R2 is of the formula $—(CH_2)_n—CO—R8$ in which n is 1 to 4 and R8 is (1–4C)alkyl, phenyl or benzyl,

or —R2 is of the formula —COR9 or $—(CH_2)_n—OCO—R9$ in which n is 1–4 and R9 is hydrogen, (1–4C)alkyl, (1–4C)haloalkyl, phenyl or benzyl,

or —R2 is of the formula $—G—CH_2—R10$ in which G is carbonyl or a direct bond and R10 is phthalimido,

or —R2 is of the formula II:



(II)

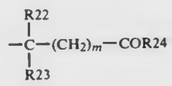
in which p is 1 or 2 and R14 and R15 are hydrogen or (1–4C)alkyl,

or —R2 is of the formula —P(O)R16R17 in which R16 is hydroxy, (1–4C)alkoxy, (2–8C)dialkylamino, phenoxy, phenylamino or one of the values given above for R6, and R17 is (1–4C)alkyl, (1–4C)alkoxy, (2–8C)dialkylamino, phenoxy, phenylamino, piperidino, pyrrolidino, morpholino, piperazino or N-methylpiperazino,

or —R2 is of the formula $—CH_2P(O)R18R19$ in which R18 and R19 are hydroxy or (1–4C)alkoxy,

or —R2 is of the formula —CH(SR20)COOR21 in which R20 is (1–4C)alkyl and R21 is hydrogen or (1–6C)alkyl,

or —R2 is of the formula III:



(III)

in which m is 0–3, R22 is hydrogen, (1–3C)alkyl or methylthio, R23 is hydrogen, (1–3C)alkyl, ($C_3$–$C_7$)cycloalkyl, cyano, carboxy, (2–5C)carboxyalkyl or methanesulfonylamino, or phenyl optionally substituted by amino or

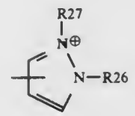


hydroxy, or R22 and R23 are joined to form, together with the carbon to which they are attached, a (3–7C) carbocyclic ring, and R24 is hydroxy, amino, (1–4C)alkoxy, (1–4C)alkylamino, phenylamino or of the formula R6 given above or of the formula NHOR25 in which R25 is hydrogen, (1–4C)alkyl, phenyl or benzyl, provided that when R2 contains phenyl, and unless otherwise stated, the phenyl is optionally substituted by 1 or 2 groups selected from halogen, hydroxy, amino, carboxy, nitro, carbamoyl, cyano and aminomethyl;

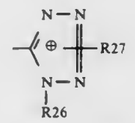
R3 is hydrogen or methoxy;

R4 is hydrogen, (1–4C)alkyl, halo(1–4C)alkyl, hydroxy(1–4C)alkyl, (1–4C)alkoxy(1–4C)alkyl, carboxy (1–4C)alkyl, amino(1–4C)alkyl, cyano(1–4C)alkyl, (1–4C)alkanoylamino(1–4C)alkyl, allyl, furfuryl, benzyl or pyridyl(1–4C)alkyl;

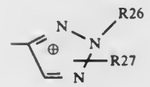
R5 is an aromatic heterocyclic ring system which is linked via carbon and is one of the formula IV to L, excluding XLII,



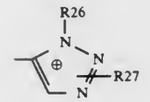
IV



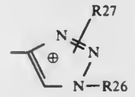
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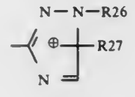
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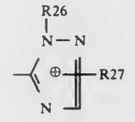
VII



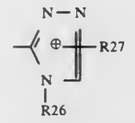
VIII



IX

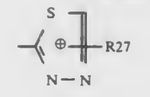


X

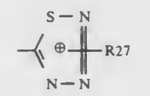


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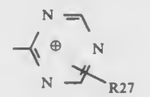
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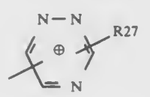
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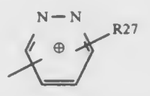
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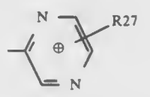
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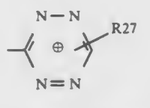
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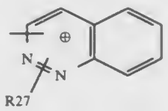
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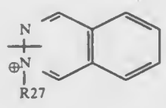
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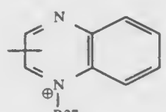
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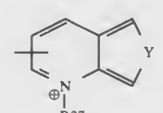
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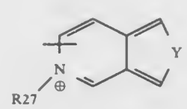
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XXI



XXII

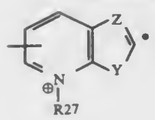


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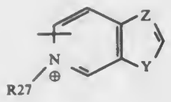
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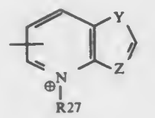
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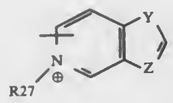
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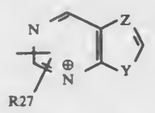
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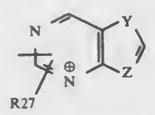
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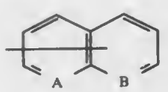
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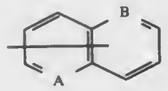
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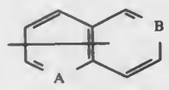
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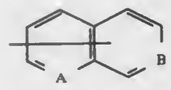
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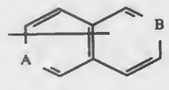
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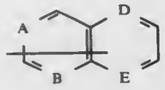
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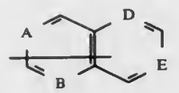


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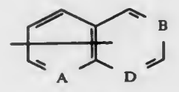


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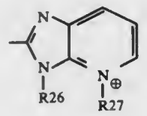
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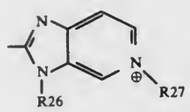
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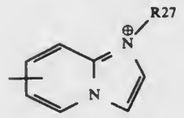
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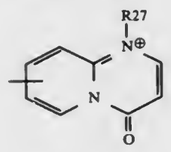
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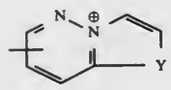
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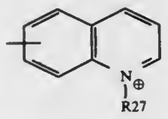
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XLIII

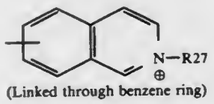


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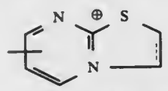
(Linked through benzene ring)

XLV



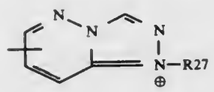
(Linked through benzene ring)

XLVI



( = single or double bond)

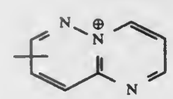
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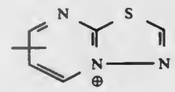


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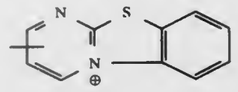
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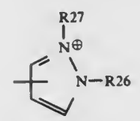


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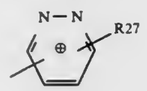


each of these ring systems being optionally substituted where possible, on a carbon atom or atoms, by one, two or three substituents selected from halogen, (1-6C)alkyl, carboxy, (2-6C)alkoxycarbonyl, (2-6C)-alkoxycarbonyl(-1-4C)alkyl, (1-6C)alkoxy, (1-6C)alkylthio, cyano, (2-4C-)cyanoalkyl, amino, (1-6C)alkylamino, (2-8C)dialkylamino, benzylamino (optionally substituted in the benzene ring thereof by nitro), thenylamino, allylamino, (1-6C)aminoalkylamino, (1-6C)alkoxy(1-6C)alkylamino, (1-6C)hydroxyalkylamino, hydroxy, mercapto, carbamoyl, (2-6)alkylcarbamoyl, (3-10C)dialkylcarbamoyl, phenylthio and heteroarylthio wherein heteroaryl is a 5- or 6-membered ring containing 1, 2 or 3 hetero atoms selected from oxygen, nitrogen and sulphur;
and in which Y is oxygen, sulphur or NR27;
Z is hydrogen or CH;
one of A, B, D and E is +NR27 and the remainder are nitrogen;
and ring systems of Formula IV, XVI or XVII,

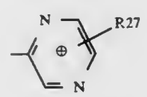
IV



XVI



XVII



which are optionally fused, or a carbon-carbon bond, with 5- or 7-membered saturated carbocyclic ring;
R27 is nitrogen-linked and is (1-6C)alkyl, (1-6C)alkyl(2-6C-)alkenyl, (2-6C)alkenyl, (2-8C)alkoxyalkyl, carboxy(1-6-C)alkyl, [(1-6C)alkoxy]carbonyl(1-6C)alkyl, carbamoyl(-1-6C)alkyl, carboxyamino-carbonyl(1-6C)alkyl, [(1-6C-)alkoxy]carbonylamino-carbonyl(1-6C)alkyl, [(2-8C)alkanoyl]methyl, benzoylmethyl, (1-6C)hydroxyalkyl, (1-6C)alkylamino, or phenyl(1-6C)alkyl or phenyl, each optionally substituted by 1 or 2 groups selected from halogen, hydroxy, amino, carboxy, nitro, carbamoyl, cyano, trifluoromethyl, and aminomethyl;
R26 is hydrogen, (1-6C)alkyl, phenyl or benzyl;
and the salts formed with acids and bases which afford pharmaceutically acceptable anions and cations, respectively.

**5,049,559**

## THIENO-TRIAZOLO-DIAZEPINE DERIVATIVES USEFUL AS ANTI-ISCHEMIC AGENTS

**Pierre Braquet, Garches; André Esanu; Jean-Pierre Laurent, both of Paris, and Jacques Pommier, Colombes, all of France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France**

**Filed May 11, 1990, Ser. No. 522,235**

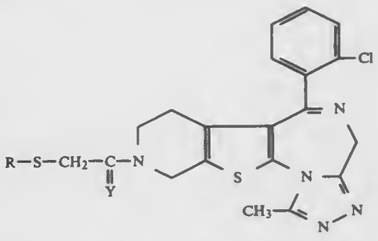
**Claims priority, application United Kingdom, May 13, 1989, 8911030**

**Int. Cl.**[5] **C07D** *495/22;* **A61K** *31/55*

**U.S. Cl. 514—219** **4 Claims**

1. Thieno-triazolo-diazepine derivatives of the general formula A

A



wherein Y represents an oxygen or sulphur atom and R represents a straight chain or branched chain alkyl group having from 1 to 20 carbon atoms; a phenyl group, unsubstituted or substituted by a straight chain or branched chain alkyl group having from 1 to 5 carbon atoms, an alkoxy group having from 1 to 5 carbon atoms, a halogen atom, a trifluoromethyl group or a phenoxy group; or a furan or thiophene ring, and therapeutically acceptable salts thereof.

2. A therapeutic composition of matter comprising as an active ingredient therein a sufficient amount of at least one of the compounds according to claim 1 associated with carriers suitable for the selected administration form.

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**5,049,560**

## SULFONYL DERIVATIVES OF THIENO-TRIAZOLO-DIAZEPINES USEFUL AS ANTI-PAF AND ANTI-ISCHEMIC AGENTS

**Andre Esanu, Paris; Pierre Braquet, Garches; Christiane Martin, Plessis Robinson, and Jean-Pierre Laurent, Paris, all of France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), France**

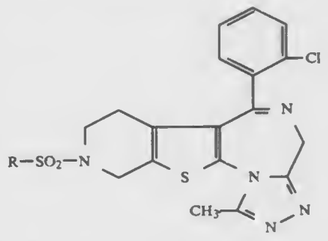
**Filed Mar. 20, 1990, Ser. No. 496,410**

**Claims priority, application United Kingdom, Mar. 31, 1989, 8907257**

**Int. Cl.**[5] **C07D** *495/22;* **A61K** *31/55*

**U.S. Cl. 514—219** **4 Claims**

1. Thieno-triazolo-diazepine derivatives of the formula



wherein R represents:

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a straight chain or branched chain alkyl group having from 1 to 20 carbon atoms;

a phenyl group, unsubstituted or substituted by an halogen atom, a straight chain or branched chain alkyl group having from 1 to 8 carbon atoms, an alkoxy group having from 1 to 5 carbon atoms, a carboxy group or an alkylsulfonyl group or an alkylthio group, or a trifluoromethyl group or a phenoxy group or

a furyl, thienyl, pyrrolyl, quinolyl, naphthyl group, and therapeutically acceptable salts thereof.

2. A therapeutic composition of matter comprising as an active ingredient therein a sufficient amount of at least one of the compounds according to claim **1** associated with carriers suitable for the selected administration form.

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**5,049,561**

## ANTHELMINTIC ACYLHYDRAZONES, METHOD OF USE AND COMPOSITIONS

**Douglas L. Rector, Kalamazoo; George A. Conder, Richland, and Sylvester D. Folz, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

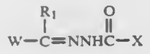
**PCT No. PCT/US88/02367, § 371 Date Jan. 30, 1990, § 102(e) Date Jan. 30, 1990**

**Continuation-in-part of Ser. No. 80,522, Jul. 31, 1987, abandoned. This PCT application Jul. 19, 1988, Ser. No. 455,321**

**Int. Cl.[5] A61K** *31/495, 31/35, 31/425;* **C07D** *241/02*

**U.S. Cl. 514—252** **5 Claims**

1. A compound, hydrate thereof or pharmaceutical acceptable salt thereof of the formula



I

wherein W is selected from the group consisting of

(1) pyrazinyl (A);

(2) pyranyl (B); or

(3) thiazolyl (C);

wherein the variable substituents (1)–(3) are optionally substituted with one or two $C_1$–$C_4$ alkyl; $C_1$–$C_3$ alkoxy; $C_1$–$C_3$ alkylthio; halo; trifluoromethyl; or hydroxy; with the proviso that when substituted with two substituents only one substituent is hydroxy;

wherein X is (a) hydrogen; (b) $C_1$–$C_{10}$ alkyl; (c) $C_2$–$C_6$ alkenyl; (d) $C_2$–$C_6$ alkynyl; (e) cyclo($C_3$–$C_{10}$)alkyl optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, or $C_2$–$C_4$ alkenyl, (f) 1-methylpyrrolidinyl; (g) 1-methylpiperidinyl; (h) $C_2$–$C_6$ alkoxyalkyl; (i) cyclo($C_3$–$C_{10}$)alkyl($C_1$–$C_4$)alkyl; (j) phenyl($C_1$–$C_4$)alkyl optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halo, or trifluoromethyl; with the proviso that when X is 3,4-dimethoxyphenylmethyl and W is 2-pyrazinyl, $R_1$ is other than methyl; (k) cyano($C_1$–$C_3$)alkyl; (l) naphthyl($C_1$–$C_3$)alkyl optionally substituted with one or two $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halo, or trifluoromethyl; with the proviso than when X is 1-naphthylmethyl and W is 2-pyrazinyl, $R_1$ is other than methyl; (m) $C_1$–$C_6$ alkoxy; (n) diphenylmethoxy; (o) cyclo($C_3$–$C_6$)alkyloxy optionally substituted with one or two $C_1$–$C_3$ alkyl; (p) phenoxy optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halo, or trifluoromethyl; (q) benzyloxy optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halo, or trifluoromethyl; (r) heteroaromatic of 5 to 10 members, containing one or two heteroatoms selected from the group consisting of oxygen, nitrogen or sulfur, and optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, $C_1$–$C_3$ alkoxy, halo, $C_1$–$C_3$ alkylthio, or trifluoromethyl; (s) phenyl optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, $C_1$–$C_3$ alkoxy, halo, trifluoromethyl, $C_2$–k$C_6$ dialkylamino, $C_1$–$C_3$ alkylthio, nitro, or phenoxy optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, $C_1$–$C_3$ alkoxy, halo, or trifluoromethyl; with the proviso that when X is 2-phenoxyphenyl or 2,5-dichlorophenyl and W is 2-pyrazinyl, $R_1$ is other than methyl; (t) phenyl optionally substituted with the divalent $C_1$–$C_2$ alkylenedioxy; (u) naphthyl optionally substituted with one or 2 $C_1$–$C_4$ alkyl, $C_1$–$C_3$ alkoxy, halo, trifluoromethyl, $C_2$–$C_6$ dialkylamino, $C_1$–$C_3$ alkylthio, or nitro; (v) bridged polycyclic hydrocarbon substituents selected from the group consisting of exo or endo-2-norbonyl, bicyclo[2,2,2]-oct-1-yl, and 1-adamantyl; (w) perhalo ($C_1$–$C_7$)alkyl; (x) N-morpholinyl($c_1$–$C_4$)alkyl; (y) N-piperidinyl($C_1$–$C_4$)alkyl; (z) N-pyrrolidinyl($C_1$–$C_4$)alkyl; and

wherein $R_1$ is hydrogen; $C_1$–$C_4$ alkyl; cyclo($C_3$–$C_6$)alkyl optionally substituted with one, 2 or 3 $C_1$–$C_3$ alkyl; phenyl optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, halo, trifluoromethyl, or $C_1$–$C_3$ alkoxy; phenyl($C_1$–$C_3$)alkyl optionally substituted with one, 2 or 3 $C_1$–$C_4$ alkyl, halo, trifluoromethyl, or $C_1$–$C_3$ alkoxy; 1,3-dioxacyclohexan-5-yl; theinylvinyl; furylvinyl; or phenylvinyl;

other than

isonicotinic acid (2-pyrazinylmethylene) hydrazide;

nicotinic acid (2-pyrazinylmethylene) hydrazide; or

picolinic acid (2-pyrazinylmethylene) hydrazide.

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**5,049,562**

## 17β-ACYL-4-AZA-5α-ANDROST-1-ENE-3-ONES AS 5α-REDUCTASE INHIBITORS

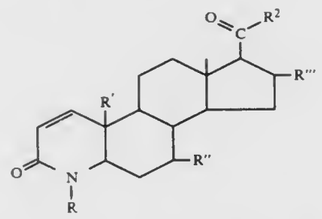
**Gary H. Rasmusson, Watchung, and Glenn F. Reynolds, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation-in-part of Ser. No. 363,567, Jun. 8, 1989, which is a continuation of Ser. No. 129,335, Dec. 3, 1987, Pat. No. 4,859,681, which is a continuation of Ser. No. 800,624, Nov. 21, 1985, abandoned, which is a continuation of Ser. No. 584,061, Feb. 27, 1984, abandoned. This application Aug. 21, 1989, Ser. No. 396,184**

**Int. Cl.[5] A61K** *31/58;* **C07J** *73/00*

**U.S. Cl. 514—284** **9 Claims**

1. A compound of formula:



wherein

R is selected from hydrogen, methyl and ethyl; and

$R^2$ is monocyclic aryl optionally containing 1 or more lower alkyl substituents of from 1–2 carbon atoms and/or 1 or more halo (Cl, F or Br) substituents; and

R', R'', R''' are each selected from hydrogen and methyl.

8. A method of inhibiting testosterone 5α-reductase in a patient in need of such inhibiting treatment comprising administration to such a patient of a therapeutically effective amount of a compound of the claim **1**.

9. A pharmaceutical composition for inhibiting testosterone 5α-reductase which comprises a pharmaceutically acceptable carrier and an effective amount of a compound of claim **1**.



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**5,049,563**

## ANNELATED INDOLEKETONES WITH AN IMIDAZOLYLALKYL SUBSTITUENT

**Hans H. Haeck; Derk Hamminga; Ineke van Wijngaarden, and Wouter Wouters, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Netherlands**

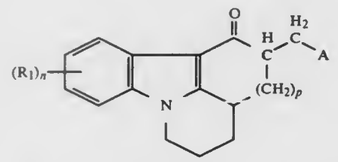
**Filed Jul. 3, 1989, Ser. No. 374,774**

**Claims priority, application Netherlands, Jul. 7, 1988, 8801714**

**Int. Cl.[5] A61K** *31/435;* **C07D** *221/18*

**U.S. Cl. 514—284** **3 Claims**

1. Compounds of formula (2):

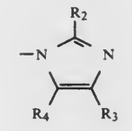


(2)

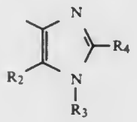
wherein

$R_1$ is alkyl or alkoxy having 1–4 C-atoms, hydroxy, halogen, trifluoromethyl, a group $R_5R_6N$ or $R_5R_6$—N—CO, wherein $R_5$ and $R_6$ are hydrogen or alkyl having 1–4 C-atoms or wherein $R_5R_6N$ is a saturated 5–6 membered ring, and n has the value 0, 1 or 2;

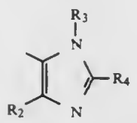
A is a group of formula 3, 4 or 5



(3)



(4)



(5)

wherein one of the groups $R_2$, $R_3$ and $R_4$ is hydrogen, alkyl having 1–4 C-atoms, cycloalkyl having 3–6 C-atoms or alkenyl having 2–4 C-atoms and the two other groups, independently of each other, are hydrogen or alkyl having 1–4 C-atoms,

has the value 0–3, and pharmaceutically acceptable acid addition salts thereof.

3. A method of preparing pharmaceutical compositions wherein as active ingredient a compound of formula (2) as defined in claim **1**, or a pharmaceutically acceptable acid addition salt thereof, is admixed with a solid or liquid carrier.

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**5,049,564**

## 5-HT SELECTIVE AGENTS

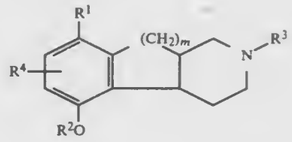
**John F. DeBernardis; Michael D. Meyer, and Kevin B. Sippy, all of Lindenhurst, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Filed Nov. 17, 1989, Ser. No. 438,825**

**Int. Cl.[5] A61K** *31/445;* **C07D** *221/16*

**U.S. Cl. 514—290** **7 Claims**

1. A compound of the formula



I

wherein

$R^1$ is hydrogen or an electron withdrawing group selected from the group consisting of

halogen,

mercapto,

acylmercapto,

alkylsulfido,

nitro,

cyano,

acetyl,

halomethyl, and

alkoxyalkylene;

$R^2$ is hydrogen, lower alkyl, or aralkyl;

m is an integer having a value of from 1 to 3;

$R^4$ is a member selected from the group consisting of

hydrogen,

halogen,

lower alkyl,

lower alkoxy, and

aryl(lower alkyl);

$R^3$ is a member selected from the group consisting of

hydrogen,

lower alkyl,

lower alkoxy,

arylamidoalkylene,

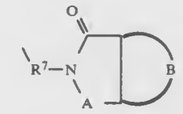
arylalkylene,

aryl(lower alkyl)amidoalkylidene,

aryl(lower alkyl)amidoalkylene, and

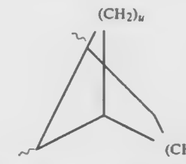
benzoalkylenedioxyalkylene,

a) a group of the formula:



wherein

B is benzo, cyclohexyl, or a bicyclo ring of the structure

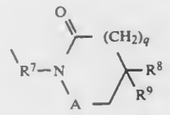


wherein u and v are independent integers of from 1 to 3;

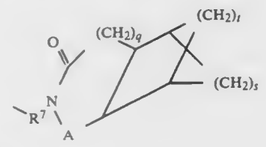
VOL 1130 ISS 3 SE 17 1991 UMI



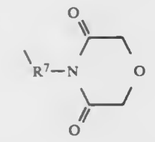
A is CO, SO, or $SO_2$, and
$R^7$ is a bivalent aliphatic hydrocarbon;
b) a group of the formula



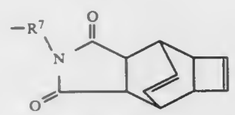
wherein
q is 0 or 1,
$R^8$ and $R^9$ are independently hydrogen or lower alkyl, or
$R^8$ and $R^9$ taken together form a ring of from 5 to 7 members, and
A and $R^7$ are as defined above;
c) a group of the formula



wherein
s and t are independent integers of from 1 to 3,
q, A, and $R^7$ are as defined above;
(d) a group of the formula



wherein $R^7$ is as defined above; and
(e) a group of the formula



wherein $R^7$ is as defined above;
with the proviso that when q is 1, A is only C═O; or
a pharmaceutically acceptable salt thereof.

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**5,049,565**

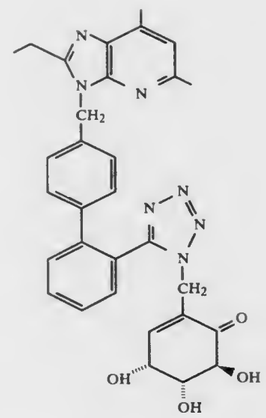
**MICROBIAL TRANSFORMATION PROCESS FOR PREPARING ANTI-HYPERTENSIVE PRODUCTS**

**Shieh-Shung T. Chen, Morganville; Raymond F. White, Englishtown, and Byron H. Arison, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

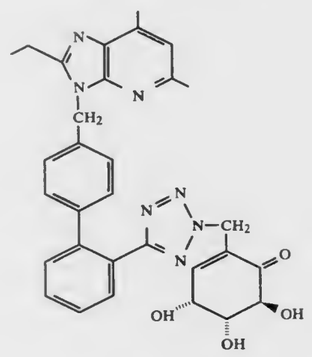
**Filed Dec. 7, 1990, Ser. No. 623,479**
**Int. Cl.[5] C07D** *471/04;* **A61K** *31/435;* **C12P** *17/12*
**U.S. Cl. 514—302** **6 Claims**

1. A compound of structural formula (I) or (II) or (III):

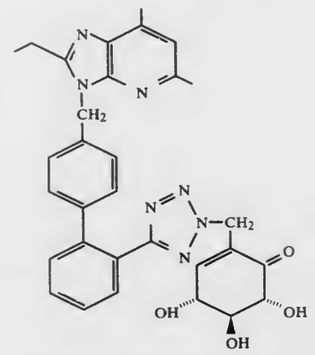
(I)



(II)



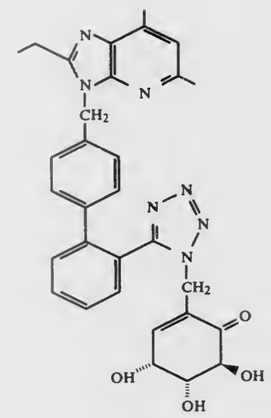
(III)



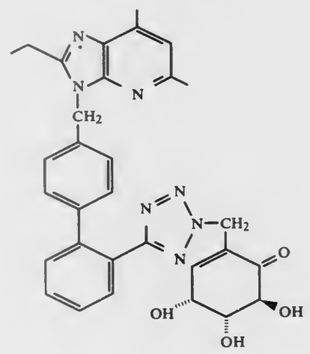
4. A process for the preparation of a compound represented by formula (I) or (II) or (III)



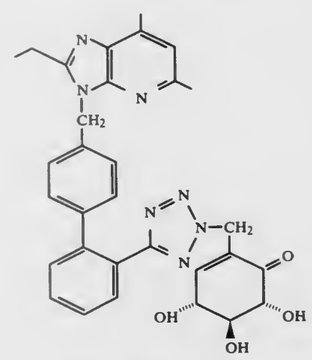
(I)



(II)

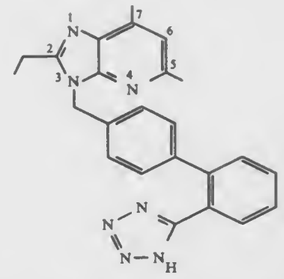


(III)



comprising the steps of culturing a microorganism Streptomyces sp. (MA 6750) (ATCC No. 55042) in a nutrient medium containing assimilable sources of nitrogen and carbon and substrate compound (IV)

(IV)



under aerobic conditions until a substantial amount of the compound is produced and isolating the compound so produced.

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**5,049,566**

**IMIDAZOLE [4,5-C] PYRIDINE DERIVATIVES HAVING GASTRIC ACID ANTISECRETORY ACTIVITY AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM**

**Paolo Chiesi; Vittorino Servadio, and Roberta Rassetti, all of Parma, Italy, assignors to Chiesi Farmaceutic S.p.A., Parma, Italy**

**Continuation-in-part of Ser. No. 223,610, Jul. 22, 1988, abandoned. This application Mar. 14, 1990, Ser. No. 493,957**
**Claims priority, application Italy, Jul. 31, 1987, 21538 A/87**
**Int. Cl.[5] A61K** *31/435;* **C07D** *471/04*
**U.S. Cl. 514—303** **3 Claims**

1. 2-[2-(N,N-dimethylanilyl)methylthio]imidazo[4,5-c]pyridine and pharmaceutically acceptable salts thereof.

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**5,049,567**

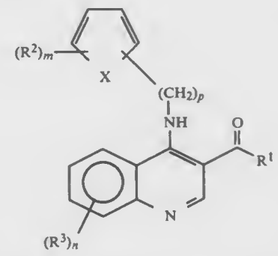
**SUBSTITUTED 4-AMINOQUINAZOLINE DERIVATIVES AND METHOD OF USE**

**Robert J. Ife, Stevenage; Thomas H. Brown, Tewin, and Colin A. Leach, Stevenage, all of England, assignors to SmithKline Beckman Intercredit B.V., Rotterdam, Netherlands**

**Division of Ser. No. 315,368, Feb. 23, 1989, Pat. No. 5,006,535.**
**This application Jan. 9, 1991, Ser. No. 638,950**
**Int. Cl.[5] A01N** *43/42;* **C07D** *215/38, 215/46*
**U.S. Cl. 514—313** **10 Claims**

1. A compound of structure (I)

(I)



in which
$R^1$ is hydrogen, $C_{1-6}$alkyl, $C_{1-6}$alkoxy, $C_{1-6}$alkoxyl-$C_{1-6}$alkyl, $C_{3-6}$cycloalkyl, $C_{3-6}$cycloalkyl$C_{1-6}$alkyl, phenyl, phenyl$C_{1-6}$alkyl;
$R^2$ is hydrogen, $C_{1-6}$alkyl, $C_{1-6}$alkoxy, $CO_2H$ or $CO_2C_{1-6}$alkyl;
m is 1, 2 or 3;
p is 0 to 4;

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$R^3$ is hydrogen, $C_{1-6}$alkyl, phenyl, $C_{1-6}$alkoxy, $C_{1-6}$alkylthio, $C_{1-6}$alkanoyl, amino, $C_{1-6}$alkylamino, di-$C_{1-6}$alkylamino, halogen, trifluoromethyl or cyano;
n is 1 or 2; and
X is NH or $NC_{1-4}$alkyl;
or a salt thereof.

8. A method of treatment of gastrointestinal diseases and other conditions caused or exacerbated by gastric acidity which comprises administering to a mammal in need thereof an effective amount of a compound according to claim 1.

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**5,049,568**

## LIQUID PHARMACEUTICAL COMPOSITION FOR PIPERIDINOALKANOL DERIVATIVES

**Joseph C. Kristof, Zionsville; DeAnne L. Byers, Indianapolis, and Richard A. Knipstein, Carmel, all of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 300,382, Jan. 23, 1989, abandoned. This application Mar. 9, 1990, Ser. No. 494,887**
**Int. Cl.[5] A61K *31/445***
**U.S. Cl. 514—317** **7 Claims**

1. A liquid pharmaceutical composition for oral administration comprising (a) α-4-(hydroxydiphenylmethyl) -1-piperidinebutanol in an amount of from2 to 25 mM; (b) a buffer, selected from the group consisting of gluconic acid buffer, lactic acid buffer, citric acid buffer and acetic acid buffer, in an amount of from 0.001 to 0.5 mM; and (c) water in an amount of from 5% to 99% by weight of the composition.

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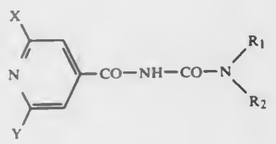
**5,049,569**

## METHOD FOR THE PROTECTION OF PLANTS AGAINST DISEASES

**Walter Kunz, Oberwill, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Mar. 20, 1989, Ser. No. 325,848**
**Claims priority, application Switzerland, Mar. 25, 1988, 1141/88**
**Int. Cl.[5] A01N *43/40***
**U.S. Cl. 514—318** **7 Claims**

1. A method of protecting plants against infection by phytopathogenic microorganisms, which comprises applying an effective amount of an active compound to the plants or their locus, said active compound being a compound of the formula



(I)

in which
X is hydrogen or halogen; Y is halogen; $R_1$, $R_2$ independently of one another are hydrogen, $C_1$–$C_6$alkyl or $C_1$–$C_6$alkyl which is substituted by halogen, cyano or $COOC_1C_3$alkyl, is $C_3$–$C_5$alkenyl or $C_3$–$C_5$alkenyl which is substituted by halogen, or is $C_3$–$C_5$alkynyl or $C_3$–$C_5$alkynyl which is substituted by halogen, or is $C_3$–$C_7$cycloalkyl or $C_3$–$C_7$cycloalkyl which is substituted by $C_1$–$C_2$alkyl, halogen, cyano or COO-$C_1$–$C_3$alkyl, is benzyl or benzyl which is substituted by $C_1$–$C_3$alkyl, $C_1$–$C_3$alkoxy or halogen; and $R_1$ can furthermore also be the radical Q or Q which is substituted by $C_1$–$C_3$alkyl, $C_3$–$C_7$-cycloalkyl, $C_1$–$C_3$alkoxy or halogen, where Q can be bonded to the N atom via a $C_1$–$C_2$alkyl; or where $R_1$ and $R_2$ together with the adjacent atom form a 5- to 8-membered saturated heterocycle which can additionally contain 1 further heteroatom selected from the group consisting of O, N and S, and a carbonyl group, said heterocycle being unsubstituted or substituted by $C_1$–$C_3$alkyl, halogen or COO-$C_1$–$C_3$alkyl; Q is a furan-2-yl, thiophen-2-yl, isoxazol-3-yl, isoxazol-5-yl, thiazol-2-yl, 1,2,4-thiadiazol-3-yl, 1,3,4-thiadiazol-2-yl, 2-, 3- or 4-pyridyl radical or a 2-, 3- or 4-pyridyl radical which is substituted by $C_1$–$C_3$alkyl, $C_1$–$C_3$alkoxy, $C_1$–$C_3$alkylthio or halogen; a 2-, 4- or 5-pyrimidyl radical or a 2-, 4-or 5-pyrimidyl radical which is substituted by $C_1$–$C_3$alkyl, $C_1$–$C_3$alkyl, $C_1$–$C_3$alkoxy, $C_1$–$C_3$alkylthio, halogen or cyclopropyl.

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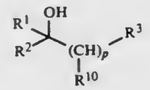
**5,049,570**

## PYRIDYLPHENYL NITROGEN HETEROCYCLE-SUBSTITUTED CARBINOLS AND DERIVATIVES THEREOF WITH ANTI-INFLAMMATORY ACTIVITY

**Douglas G. Batt, and Stephen W. Wright, both of Wilmington, Del., assignors to Du Pont Merck Pharmaceutical Company, Wilmington, Del.**

**Filed Jan. 23, 1990, Ser. No. 469,854**
**Int. Cl.[5] A61K *31/44*; C07D *401/10***
**U.S. Cl. 514—341** **54 Claims**

1. A compound of having the formula:



(I)

in the form of an individual stereoisomer, a non-racemic stereoisomer mixture or a racemic mixture or a pharmaceutically acceptable salt thereof wherein:
$R^1$ is $R^7$ or phenyl optionally substituted with 1–3 substituents independently selected from the group consisting of F, Cl, Br, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ perfluoroalkyl, $C_1$–$C_4$ alkylthio, $C_1$–$C_4$ alkylsulfonyl, CHO, $COOR^4$, $C_1$–$C_4$ *acyl*, $NR^5R^6$, $C_1$–$C_4$ alkoxy or $CH_2OR^8$;
$R^2$ and $R^7$ independently are phenyl substituted in the ortho, meta, or para position with $R^9$;
$R^3$ is imidazole;
$R^4$, $F^8$, and $R^{10}$ independently are H or $C_1$–$C_4$ alkyl;
$R^5$ and $R^6$ independently are H, $C_1$–$C_4$ alkyl, or taken together are $(CH_2)$m wherein m is 4–5;
$R^9$ is 2-, 3-, or 4-pyridyl; and
p is 1–4 provided that when p is greater than 1, then $R^{10}$ is H.

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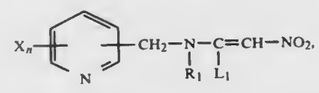
**5,049,571**

## 1-NITRO-2,2-DIAMINOETHYLENE DERIVATIVES

**Laurenz Gsell, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 224,623, Jul. 27, 1988, Pat. No. 4,918,086. This application Jan. 24, 1990, Ser. No. 469,658**
**Claims priority, application Switzerland, Aug. 7, 1987, 3051/87; Mar. 9, 1988, 888/88**
**Int. Cl.[5] A61K *31/44*; C07D *213/42***
**U.S. Cl. 514—345** **3 Claims**

1. A compound of the formula IV



(IV)

wherein
X is chlorine, fluorine, unsubstituted or halogen-substituted $C_1$–$C_5$alkyl; unsubstituted or halogen-substituted $C_1$–$C_5$alkoxy, unsubstituted or halogen-substituted $C_1$–$C_5$alkylthio, unsubstituted or halogen-substituted alkylsulfinyl, unsubstituted or halogen-substituted alkylsulfonyl; or nitro, cyano, thiocyanato, $C_3$–$C_5$haloalkenyl, $C_3$–$C_5$-haloalkynyl, hydroxy, $C_1$–$C_5$alkoxycarbonyl, amino, $C_1$–$C_4$dialkylamino, $C_1$–$C_5$alkylcarbonyl, $C_1$–$C_5$alkylcarbamoyl or $C_1$–$C_5$alkylcarbonyloxy,
n is an integer from 0 to 4,
$R_1$ is, $C_1$–$C_5$alkyl or $C_3$–$C_7$cycloalkyl and
$L_1$ is $C_1$–$C_4$alkylthio, $C_1$–$C_4$alkylsulfinyl or chlorine.



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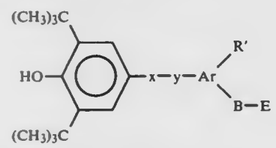
**5,049,572**

## SUBSTITUTED DI-T-BUTYLPHENOLS AND ANTI-ALLERGIC USE THEREOF

**Robert A. Scherrer, White Bear Lake, and Mark A. Rustad, Afton, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.**

**Continuation of Ser. No. 168,864, Mar. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 34,537, Apr. 6, 1987, abandoned. This application Oct. 1, 1990, Ser. No. 593,342**
**Int. Cl.[5] C07C *103/85*; C07D *257/04*; A61K *31/41, 31/165***
**U.S. Cl. 514—381** **26 Claims**

1. A compound of the formula



wherein x is carbonyl or N-R, and y is carbonyl or N-R; with the proviso that when x is carbonyl, y is N-R, and when x is N-R, y is carbonyl; further provided that:
1)
when x is N-R,
R is hydrogen,
R' is hydrogen,
B is a carbon-carbon bond,
Ar is phenyl or cyclohexyl, and
E is tetrazolyl or carboxyl,
with the proviso that when Ar is cyclohexyl, E is carboxyl and is alpha to the carbonyl-cyclohexyl bond; and
2)
when x is carbonyl,
R is hydrogen or lower alkyl,
R' is hydrogen, halogen, trifluoromethyl, lower alkyl or lower alkoxy,
Ar is phenyl,
E is carboxyl, tetrazolyl, or N-methyltetrazolyl, and
B is as follows:
when E is carboxyl, B is a carbon-carbon bond; an alkylene group containing one to about seven carbon atoms; or an alkylene group containing one to about seven carbon atoms and being either (a) interrupted by an ether linkage, a thioether linkage or a carbon-carbon double bond, or (b) attached to the phenyl ring by an oxygen atom or an unoxidized sulfur atom; or
when E is tetrazolyl or N-methyltetrazolyl, B is a carbon-carbon bond; an alkylene group containing one to about four carbon atoms; an alkylene group containing one to about four carbon atoms and being either (a) interrupted by an ether linkage, a thioether linkage or a carbon-carbon double bond, or (b) attached to the phenyl ring by an oxygen atom or an unoxidized sulfur atom; an unoxidized sulfur atom; or carboxamido;
or a derivative of said compound wherein E is carboxyl, selected from the group consisting of a lower alkyl ester, a (lower)alkylamino(lower)alkyl ester, an ester of glycolamide, a pharmaceutically acceptable (lower)alkylamino(lower)alkyl ester acid-addition salt and a pharmaceutically acceptable carboxylate salt;
or a derivative of said compound wherein E is tetrazolyl, selected from a pharmaceutically acceptable alkali metal or alkaline earth salt of the tetrazolyl moiety.

26. A method for inhibiting leukotriene biosynthesis in a mammal comprising administering to the mammal a compound according to claim 1 in an amount effective to inhibit the biosynthesis.

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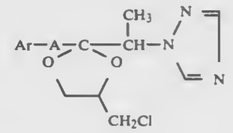
**5,049,573**

## FUNGICIDAL SUBSTITUTED TRIAZOLES

**Gerd Kleefeld, and Stefan Dutzmann, both of Duesseldorf, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Division of Ser. No. 311,327, Feb. 15, 1989, Pat. No. 4,962,118. This application May 22, 1990, Ser. No. 526,935**
**Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3804981**
**Int. Cl.[5] A01N *43/653*; C07D *405/06***
**U.S. Cl. 514—383** **5 Claims**

1. A substituted triazole of the formula



in which
Ar is phenyl which can be monosubstituted or disubstituted by identical or different substituents selected from the group consisting of fluorine, chlorine, methyl, trifluoromethyl, trifluoromethoxy and phenyl, and
A is



wherein
$R^1$ is hydrogen or methyl and
$R_2$ is hydrogen or methyl,
or an addition product thereof with an acid or metal salt.

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**5,049,574**

## 5-TRIFLUORMETHOXY-2-BENZIMIDAZOLAMINE COMPOUNDS

**Francois Audiau, Charenton Le Pont, and Christian Renault, Taverny, both of France, assignors to Rhone-Poulenc Sante, Antony, France**

**Filed Feb. 16, 1990, Ser. No. 481,063**
**Claims priority, application France, Feb. 20, 1989, 89 02168**
**Int. Cl.[5] C07D *235/30*; A61K *31/415***
**U.S. Cl. 514—395** **4 Claims**

4. A method for the treatment of a medical condition associated with effects of neuroexcitatory amino acids which comprises administering to a subject in need of such treatment an amount of 5-trifluoromethoxy-2-benzimidazolamine or one of its pharmaceutically acceptable salts with an inorganic or organic acid sufficient to inhibit such effects.

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5,049,575

## SUBSTITUTED CARBOXYLIC ACID, FUNGICIDAL COMPOSITIONS AND USE

Tadashi Ohsumi, Nishinomiya; Tatsuya Mori, Toyonaka; Sumio Nishida, Tokyo; Shigeo Nakamura, Sendai; Kiyoto Maeda, Nishinomiya, and Hirotaka Takano, Sanda, all of Japan, assignors to Sumitomo Chemical Company, Osaka, Japan

Filed Nov. 3, 1989, Ser. No. 431,668

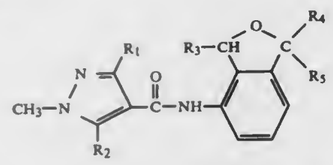
Claims priority, application Japan, Nov. 10, 1988, 63-285304; Dec. 2, 1988, 63-306665

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.[5] A01N *43/56*; C07D *405/12*

U.S. Cl. 514—406 7 Claims

1. A substituted pyrazole carboxylic acid derivative having the formula:



wherein $R_1$ is a methyl or trifluoromethyl group; $R_2$ is a halogen atom; $R_3$ and $R_4$ are, same or different, a methyl or ethyl group; $R_5$ is an ethyl, propyl, butyl group or hydrogen atom.

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5,049,576

## CARBOXAMIDE DERIVATIVES

Peter R. Bernstein, Wallingford, Pa.; Frederick J. Brown, Newark; Victor G. Matassa, Wilmington, both of Del., and Ying K. Yee, Kennett Square, Pa., assignors to ICI Americas Inc., Wilmington, Del.

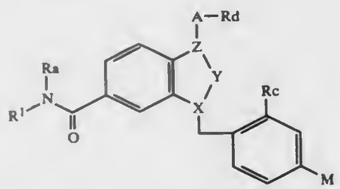
Division of Ser. No. 919,845, Oct. 16, 1986, Pat. No. 4,918,094. This application Dec. 29, 1989, Ser. No. 458,876

Claims priority, application United Kingdom, Oct. 17, 1985, 8525658; Apr. 15, 1986, 8609176

Int. Cl.[5] A61K *31/415*; C07D *231/54*

U.S. Cl. 514—407 12 Claims

1. A compound of formula I



I

wherein the group >X—Y—Z< is

>C=N—N<

wherein:

A is a direct link;

$R^1$ is selected of from a group consisting of (2-10C)alkyl optionally containing 1 or more fluorine substituents; phenyl-(1-6C)alkyl in which the (1-6C)alkyl moiety may optionally bear a fluoro or (1-4C)alkoxy substituent and in which the phenyl moiety may optionally bear a substituent selected from a group consisting of halogeno, (1-4C)alkyl, (1-4C)alkoxy and trifluoromethyl; (3-8C)cycloalkyl and (3-8C)cycloalkyl-(1-6C)alkyl, the cyclic moiety of any of which optionally may contain one unsaturated linkage and may optionally bear 1 or 2 (1-4C)alkyl substituents;

Ra is hydrogen or methyl;

Rc is selected from a group consisting of hydrogen and (1-4C)alkoxy;

Rd is hydrogen, (3-8C)cycloalkyl, (3-8C)cycloalkyl-(1-4C)alkyl or (1-10C)alkyl optionally containing one or two double or triple bonds, said (1-10C)alkyl additionally optionally bearing a substituent P selected from a group consisting of cyano, carboxy, (1-4C)alkoxycarbonyl, carbamoyl of formula $CONR^2R^3$, ureido of formula $NR^4CONR^2R^3$, carbamoyloxy of formula $OCONR^2R^3$, a carbamate of formula $NR^4COOR^5$, acylamino of formula $NR^4COR^5$, acyloxy of formula $OCOR^5$, and an (optionally oxidized) thio group of formula $(S(O)_nR^5$ in which $R^2$ is selected from a group consisting of hydrogen, (1-6C)alkyl, and phenyl, the phenyl, the phenyl moiety of which may optionally bear 1 or 2 substituents selected from a group consisting of halogeno, (1-4C)alkyl, (1-4C)alkoxy and trifluoromethyl; $R^3$ and $R^4$ are independently chosen from a group consisting of hydrogen and (1-6C)alkyl; $R^5$ is selected from a group consisting of (1-4C)alkyl and phenyl wherein the phenyl moiety may optionally bear 1 or 2 substituents selected from a group consisting of halogen, (1-4C)alkyl, (1-4C)alkoxy and trifluoromethyl; and n is the integer 0, 1 or 2; and

M is an acidic group selected from a group consisting of carboxy and an acylsulphonamide residue of formula —CO NH $SO_2R^6$ in which $R^6$ is selected from a group consisting of (1-6C)alkyl, (3-8C)cycloalkyl, (6-12C)aryl, and (6-12C)aryl-(1-4C)alkyl, in which any of the aromatic moieties may bear 1 or 2 substituents selected from a group consisting of halogeno, amino, (1-4C)alkyl, (1-4C)alkoxy, and trifluoromethyl;

or a pharmaceutically acceptable salt thereof.

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5,049,577

## 2-PYRROLIDONE SUBSTITUTED DIHYDROXY ALKANOIC, ALKENOIC AND ALKYNOIC ACIDS, COMPOSITIONS AND HMG-COA REDUCTASE INHIBITION THEREWITH

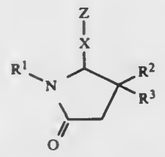
Ravi K. Varma, Belle Mead; Eric M. Gordon, Pennington, and Sam T. Chao, East Windsor, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 29, 1990, Ser. No. 471,461

Int. Cl.[5] C07D *207/24*; A61K *31/40*

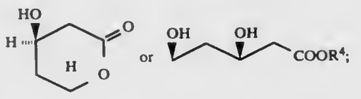
U.S. Cl. 514—409 26 Claims

1. A compound of the formula



and pharmaceutically acceptable salts thereof, wherein:

Z is



X is lower alkyl, lower alkenyl, or lower alkynyl;

$R^1$ is hydrogen, alkyl, alkenyl, aryl, alkylaryl, or substituted aryl having substituents $R^5$ and $R^6$;

one of $R^2$ and $R^3$ is hydrogen, and the other is hydrogen, alkyl, alkenyl, aryl, substituted aryl having substituents $R^7$ and $R^8$, alkylaryl, and alkyl-substituted aryl having substituents $R^7$ and $R^8$; or $R^2$ and $R^3$ are both lower alkyl; or $R^2$ and $R^3$ together complete a hydrocarbon ring that is

(1) cycloalkyl,

(2) cycloalkenyl,

(3) substituted cycloalkyl having substituents $R^5$ and $R^6$,

(4) substituted cycloalkenyl having substituents $R^5$ and $R^6$,

$R^4$ is selected from:

(1) hydrogen,

(2) ammonium,

(3) mono-, di-, or trialkylammonium,

(4) alkali metal,

(5) alkyl,

(6) alkyl substituted with phenyl,

(7) alkylarylamine, and

(8) diarylalkylamine;

$R^5$ and $R^6$ are each independently selected from:

(1) alkyl,

(2) substituted alkyl having one or more substituents selected from:

(i) halogen,

(ii) nitro,

(iii) hydroxy,

(iv) alkoxy,

(v) alkoxycarbonyl,

(vi) acyl,

(vii) acyloxy,

(viii) cyano,

(ix) aryl,

(x) substituted aryl having substituents $R^7$ and $R^8$,

(xi) alkyl-$S(O)_n$,

(xii) dialkylamino,

(xiii) cycloalkyl-$S(O)_n$,

(xiv) aryl-$S(O)_n$,

(xv) substituted aryl-$S(O)_n$, having substituents $R^7$ and $R^8$, and

(xvi) oxo,

(3) alkyl-$S(O)_n$,

(4) cycloalkyl-$S(O)_n$,

(5) aryl-$S(O)_n$,

(6) substituted aryl-$S(O)_n$ having substituents $R^7$ and $R^8$,

(7) halogen,

(8) hydroxy,

(9) alkoxy,

(10) alkoxycarbonyl,

(11) acyloxy,

(12) aryl,

(13) substituted aryl having one or more substituents $R^7$ and $R^8$,

(14) cycloalkenyl-$S(O)_n$, and

(15) hydrogen;

$R^7$ and $R^8$ are each independently hydrogen, halogen, trifluoromethyl, alkyl, nitro, alkoxy, or cyano; and

n is 0, 1, or 2.

21. A method of inhibiting HMG-CoA reductase in a mammal, which comprises administering an effective amount of the compound of claim 1.

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5,049,578

## 1-AROYL OR 1-ACYL-2-2PYRROLIDINYL-3,5-DIHYDROXY ALKANOIC AND ALKENOIC ACIDS, SALTS, ESTERS AND LACTONES

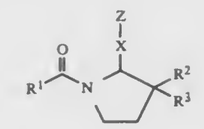
Ravi K. Varma, Belle Mead, and Eric M. Gordon, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 9, 1990, Ser. No. 490,901

Int. Cl.[5] A61K *31/40*; C07D *207/08, 405/06*

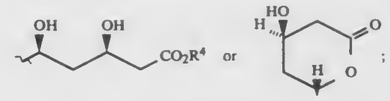
U.S. Cl. 514—409 10 Claims

1. A compound of the formula



wherein:

Z is



X is $—(CH_2)_n—$ or $—(CH_2)_p—CH=CH—(CH_2)_q—$;

n is 1, 2, 3 or 4;

p and q are each independently 0, 1, or 2, provided that p+q=2;

$R^1$ is aryl, substituted aryl, alkyl or substituted alkyl;

$R^2$ and $R^3$ are the same or different and are hydrogen, lower alkyl, lower substituted alkyl, aryl or substituted aryl; or $R^2$ and $R^3$ taken together form a cycloalkyl or substituted cycloalkyl group; and

$R^4$ is hydrogen, lower alkyl, substituted lower alkyl, alkali metal, or ammonium;

and wherein:

"alkyl" and "alkoxy" refer to straight and branched chain radicals of up to 12 carbons;

"lower alkyl" refers to groups having 1 to 4 carbons;

"substituted alkyl" and "substituted alkoxy" refer to groups having a halo, $—CF_3$, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl, or alkylcycloalkyl substituent;

"cycloalkyl" refers to saturated, cyclic hydrocarbon groups having 3 to 12 carbons;

"substituted cycloalkyl" refers to cycloalkyl groups substituted with 1 or 2 halogens, 1 or 2 lower alkyl and/or 1 or 2 lower alkoxy groups;

"aryl" refers to monocyclic or bicyclic aromatic groups having 6 to 10 carbons in the ring;

"substituted aryl" refers to aryl groups having 1 or 2 lower alkyl, 1 or 2 lower alkoxy, and/or 1 or 2 halogen substituents; and

"halogen" and "halo" refer to Cl, Br, I and F.

7. A method of inhibiting or treating hypercholesterolemia which comprises administering to a patient in need of such treatment an effective amount of a compound as defined in claim 1.

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5,049,579

## SITE SPECIFIC ALKYLATING AGENTS

Ettore Lazzari, Milan; Federico Arcamone, Nerviano; Sergio Penco, Milan; Maria A. Verini, Milan, and Nicola Mongelli, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.r.l., Milan, Italy

Division of Ser. No. 485,847, Feb. 21, 1990, Pat. No. 5,017,599, which is a continuation of Ser. No. 336,603, Apr. 7, 1989, abandoned, which is a continuation of Ser. No. 49,987, May 15, 1987, abandoned. This application Oct. 31, 1990, Ser. No. 607,339

Claims priority, application United Kingdom, May 20, 1986, 8612218

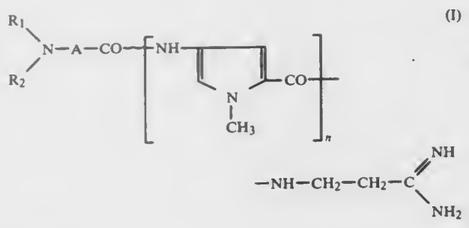
Int. Cl.[5] A61K *31/40*; C07D *403/12*

U.S. Cl. 514—422 8 Claims

1. A compound of formula (I)

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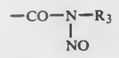


(I)

wherein
n is 2, 3 or 4;
A is a divalent thiophene said radical being unsubstituted or substituted by one or more substituents chosen from $C_1$-$C_6$ alkyl, $C_1$-$C_6$ alkoxy, provided, however, that when $R_1$ and $R_2$ are both chloroethyl, and A is



then n is 2 or 4 cyano and trifluoromethyl; and either one of $R_1$ and $R_2$ is hydrogen and the other is
a) a group



in which $R_3$ is $C_1$-$C_6$ alkyl unsubstituted or substituted by halogen atoms; phenyl; or cyclohexyl; or
b) a group —CO—$(CH_2)_m$—$R_4$ in which m is zero, 1, 2 or 3 and $R_4$ is hydrogen, halogen, hydroxy, aziridinyl or oxiranyl; or $R_1$ and $R_2$ are the same and they are both hydrogen or both a $C_1$-$C_6$ alkyl group unsubstituted or substituted by halogen, hydroxy or $C_1$-$C_6$ alkoxy, and the pharmaceutically acceptable salts thereof.

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**5,049,580**
**TREATMENT OF INFLAMED SKIN CONDITIONS INCLUDING POISON IVY AND POISON SUMAC, INSECT BITES AND ACNE**
**Gary Crouthamel, Freeport, N.Y., assignor to Total Leather Care, Inc., Oceanside, N.Y.**
**Continuation-in-part of Ser. No. 439,261, Nov. 20, 1989, abandoned. This application Aug. 13, 1990, Ser. No. 565,938**
**Int. Cl.[5] A61K** *31/40*
**U.S. Cl. 514—424** **15 Claims**

1. A method of treating an inflamed skin condition which has associated with it an oily exudate of either external or bodily origin, said method comprising topically applying to an inflamed affected area of the skin, a therapeutically effective amount of N-methylpyrrolidone.

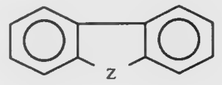
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**5,049,581**
**DIBENZOFURANS HAVING ANTI-TUMOR ACTIVITY**
**Kenneth W. Bair, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.**
**Division of Ser. No. 132,724, Dec. 11, 1987, Pat. No. 4,866,070, which is a continuation of Ser. No. 801,085, Nov. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 673,355, Nov. 20, 1984, abandoned. This application Aug. 25, 1989, Ser. No. 399,714**
**Int. Cl.[5] C07D** *307/92;* **A61K** *31/34*
**U.S. Cl. 514—468** **9 Claims**

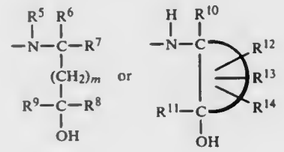
1. A compound of the formula (I):

$$ArCH_2R^1 \qquad (I)$$

or a pharmaceutically acceptable acid addition salt thereof wherein Ar is



wherein
Z is O
wherein
$R^1$ contains not more than eight carbon atoms and is a group:



wherein
m is 0 or 1:
$R^5$ is hydrogen;
$R^6$
and $R^7$ are the same or different and each is hydrogen or $C_{1-5}$ alkyl, or $C_{1-5}$ alkyl substituted by hydroxy provided that one of $R^6$ or $R^7$ is $C_{1-5}$ alkyl substituted by hydroxy; $R^8$ and $R^9$ are the same or different and each is hydrogen or $C_{1-3}$ alkyl;
—C—C—is a five- or six-membered saturated carbocyclic ring; $R^{10}$ is hydroxymethyl;
$R^{11}$, $R^{12}$ and $R^{13}$ are the same or different and each is hydrogen or methyl.

7. A pharmaceutical composition for use as an anti-tumor agent comprising an effective tumor treatment amount of the compound of claim 1 together with a pharmaceutically acceptable carrier therefor.

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**5,049,582**
**PROSTACYCLIN DERIVATIVES WITH CYTOPROTECTIVE EFFECT ON LIVER, PANCREAS AND KIDNEY**
**Guido Adler; Rolf Schulte-Hermann, both of Marburg, and Olaf Loge, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany**
**Continuation of Ser. No. 862,359, May 12, 1986, abandoned. This application Feb. 27, 1989, Ser. No. 315,878**
**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1984, 3427797**
**Int. Cl.[5] A61K** *31/19, 31/34*
**U.S. Cl. 514—469** **4 Claims**

1. A method of preventing or treating damage to the kidney of a patient in need of such prevention or treatment, comprising administering to the patient an effective amount of nileprost.



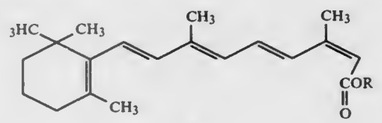
**5,049,583**
**NOREMOPAMIL, AND ITS USE FOR TREATING HYPOXIC CONDITIONS**
**Hans P. Hofmann, Limburgerhof; Werner Seitz, Plankstadt, and Hans-Joerg Treiber, Bruehl, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**
**Filed Feb. 17, 1989, Ser. No. 311,780**
**Claims priority, application Fed. Rep. of Germany, Feb. 19, 1988, 3805225**
**Int. Cl.[5] A61K** *31/275;* **C07C** *119/00*
**U.S. Cl. 514—523** **6 Claims**

1. (S)-2-isopropyl-5-phenethylamino-2-phenylvaleronitrile or a pharmaceutically acceptable salt thereof.

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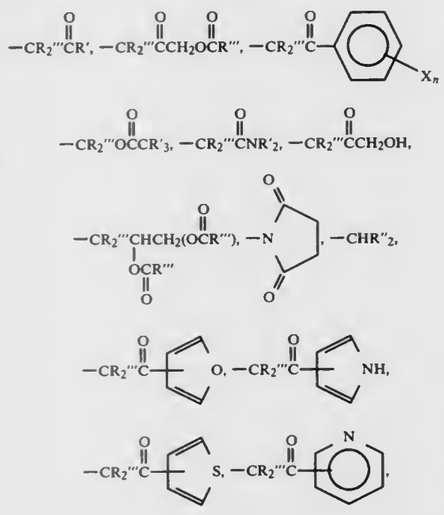
**5,049,584**
**DERMAL USES OF CIS-RETINOIDS FOR THE TREATMENT OF CANCER**
**William P. Purcell, and Harlie A. Parish, Jr., both of Memphis, Tenn., assignors to Molecular Design International, Memphis, Tenn.**
**Division of Ser. No. 284,185, Dec. 14, 1988, Pat. No. 4,994,491. This application Nov. 6, 1990, Ser. No. 609,609**
**Int. Cl.[5] A61K** *31/38*
**U.S. Cl. 514—529** **5 Claims**

1. A method for retarding and reversing the effects of skin cancer in a human subject requiring said treatment without the inducement of dermatitis which comprises topical application on a cancerous dermal site of said human subject a pharmaceutical composition which comprises an effective skin cancer treatment amount of a non-irritating retinoid having the formula



cis

wherein R is a member of the group consisting of



-continued



wherein X is a member of the group consisting of —H, —F, —Cl, —Br, —I, —OH, —OR, —OR',

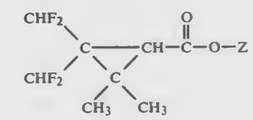


—CN, $—NO_2$, $—NH_2$, —NHR', and $—NR'_2$;
wherein n is a member of the group consisting of the numbers from 1 to 5;
wherein R' is a member of the group consisting of H and any of the lower alkyls ranging from $C_1$ to $C_6$;
wherein R'' is a member of the group consisting of and —R';
wherein each R''' is a member of the group consisting of R' and the hydrocarbon backbone of fatty acids; and further,
where there are two or more R', R'', or R''' groups attached to the same carbon or nitrogen, each R', R'', or R''' may be the same as or different from the other R', R'', or R''' groups attached to that carbon or nitrogen;
admixed with a pharmaceutically-acceptable topical vehicle.

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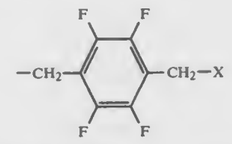
**5,049,585**
**CERTAIN 3,3-BIS-(DIFLUORO METHYL)2,2-DIMETHYL-CYCLOPROPANE CARBOXYLATES HAVING INSECTICIDAL ACTIVITY**
**Michael J. Robson, Bracknel, and Mark A. Spinney, Wokingham, both of England, assignors to Imperial Chemical Industries PLC, Millbank, England**
**Filed Oct. 6, 1989, Ser. No. 417,921**
**Claims priority, application United Kingdom, Oct. 11, 1988, 8823764**
**Int. Cl.[5] C07C** *69/74, 69/743;* **A01N** *53/00*
**U.S. Cl. 514—531** **7 Claims**

1. A compound of formula:



(I)

and stereoisomers thereof, wherein Z is selected from:



wherein X represents hydrogen, hydroxy, methoxy or ethynyl.

6. An insecticidal composition comprising an insecticidally effective amount of a compound according to claim 1 in association with an insecticidally inert diluent or carrier.

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**5,049,586**
**VALPROIC ACID TABLETS**
**Aracelis M. Ortega, and Pilar M. de Perez, both of Caracas, Venezuela, assignors to Farvalsa/AG, Zug, Switzerland**
**Continuation of Ser. No. 76,634, Jul. 22, 1987, abandoned. This application May 2, 1990, Ser. No. 517,620**
**Int. Cl.[5] A61K** *9/20, 31/195, 31/19*
**U.S. Cl. 514—557** **9 Claims**

1. A tablet comprising:

a) 55 to 65 weight percent valproic acid,
b) 10 to 25 weight percent of a filler selected from the group of clays and alkaline earth metal oxides,
c) 10 to 20 weight percent of a material selected from the group of polysaccharides having disintegrant properties,
d) 3 to 6 weight percent of binder materials selected from the group consisting of hydrophilic gel forming polymers, and
e) 0.5 to 1.2 weight percent lubricant materials selected from the group of talc, fatty acids and salts of fatty acids.

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5,049,587

## OPHTHALMIC-SOLUTION FOR INTRAOCULAR PRESSURE ADJUSTMENT

**Taira Okamoto, and Motoyuki Yajima, both of Otsu, Japan, assignors to Basotherm GmbH, Biberach an der Riss, Fed. Rep. of Germany**

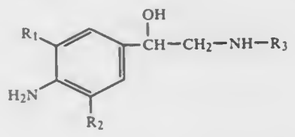
**Filed Apr. 21, 1989, Ser. No. 341,408**

**Claims priority, application Japan, Apr. 21, 1988, 63-99128; Nov. 2, 1988, 63-278317**

**Int. Cl.[5] A61K *31/135***

**U.S. Cl. 514—653** **3 Claims**

1. A method for lowering intraocular pressure which comprises instilling into the eye an ophthalmic solution comprising an intraocular pressuring lowering amount of a compound of the formula II



(II)

wherein
$R_1$ is hydrogen, fluorine, chlorine, bromine, iodine or cyano;
$R_2$ is fluorine, trifluoromethyl, nitro or cyano; and
$R_3$ is alkyl of 3 to 5 carbon atoms, hydroxyalkyl of 3 to 5 carbon atoms, cycloalkyl of 3 to 5 carbon atoms, 1-(3,4-methylenedioxy-phenyl)-2-propyl or 1-(p-hydroxy-phenyl)-2-propyl;
or a pharmaceutically acceptable salt thereof.

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5,049,588

## NOVEL TREATMENT FOR ISCHEMIA USING AN AMINOTETRALIN

**Charles D. Nicholson, Glasgow, Scotland, and Johannes Jukna, Gronau, Fed. Rep. of Germany, assignors to Beecham Group p.l.c., England**

**Filed May 8, 1989, Ser. No. 348,859**

**Claims priority, application United Kingdom, May 6, 1988, 8810748**

**Int. Cl.[5] A61K *31/13***

**U.S. Cl. 514—657** **4 Claims**

1. A method for the treatment and/or prophylaxis of disorders associated with neuronal degeneration resulting for ischaemic events in mammals, which comprises administering to the mammal in need of such treatment an effective, non-toxic amount of a 5-HT$1_A$ agonist selected from the group consisting of 8-hydroxy-2-(di-n-propylamino) tetralin and pharmaceutically acceptable salts thereof.

5,049,589

## ANTIVIRAL AEROSOL COMPOSITIONS AND PRESSURIZED CONTAINERS CONTAINING SAME

**David Lavie; Michel Revel; Dalia Rotman, all of Rehovot, Israel, and Vincent Vande Velde, Brussels, Belgium, assignors to Yeda Research and Development Company, Ltd., Rehovot, Israel**

**Division of Ser. No. 82,700, Aug. 7, 1987, Pat. No. 4,898,891. This application Dec. 19, 1989, Ser. No. 452,436**

**Claims priority, application Israel, Aug. 8, 1986, 79661**

**Int. Cl.[5] A01N *31/08, 31/045, 25/02;* A61K *9/14***

**U.S. Cl. 514—732** **8 Claims**

1. An antiviral pharmaceutical composition for aerosol administration to animals, including humans, comprising, a propellent, a pharmaceutically acceptable aerosol excipient suitable to place the composition into form for aerosol administration and, as active ingredient, an antiviral effective quantity of a pure compound selected from the group consisting of hypericin, pseudohypericin, a pharmaceutically acceptable salt of hypericin or pseudohypericin, and mixtures thereof.

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5,049,590

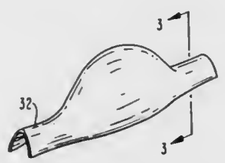
## POLY (VINYL CHLORIDE) INSULATION FITTINGS

**Christos J. Botsolas, Clearwater, and Terry C. Hayward, St. Petersburg, both of Fla., assignors to Carol Botsolas, St. Petersburg, Fla.**

**Continuation-in-part of Ser. No. 334,075, Apr. 5, 1989. This application Jan. 9, 1990, Ser. No. 462,619**

**Int. Cl.[5] C08F *14/06;* C08J *9/04***

**U.S. Cl. 521—51** **1 Claim**




1. A poly(vinyl chloride) composition comprised of:

| Ingredients | Respective Parts |
|---|---|
| poly(vinyl chloride) | 100.00 |
| dibutyl tin bis iso octyl thioglycolate | 2.00 |
| acrylic processing aid | 3.00 |
| acrylic impact modifier | 12.00 |
| titanium dioxide | 12.00 |
| calcium stearate | 1.75 |
| parafin wax | 1.25 |
| oxidized polyethylene | 0.50 |
| blowing agent dispersion | 1.25 |

wherein the blowing agent dispersion formulation is:

| Ingredients | Respective Parts |
|---|---|
| poly(vinyl chloride) | 100.00 |
| dibutyl tin bis iso octyl thioglycolate | 2.00 |
| butyl benzl phthalate | 25.00 |
| urethane elastomer | 43.00 |
| azodicarbonamide | 35.00 |
| Barium Stearate | 17.50 |
| parafin wax | 1.25 |
| calcium stearate | 1.75 |
| calcium carbonate | 35.00 |



5,049,591

## SHAPE MEMORY POLYMER FOAM

**Shunichi Hayashi, and Hiroshi Fujimura, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 28, 1989, Ser. No. 413,770**

**Claims priority, application Japan, Sep. 30, 1988, 63-244340**

**Int. Cl.[5] C08G *18/48***

**U.S. Cl. 521—159** **2 Claims**

1. A shape memory polyurethane polymer foam which takes on a deformed shape and an as-molded shape, said deformed shape being produced when the polymer foam is compressed at a temperature higher than the glass transition point of the polymer and then kept compressed at a temperature lower than the glass transition point until compression sets, said as-molded shape being produced when the compressed polymer foam is heated again to a temperature higher than the glass transition point until it recovers its original shape.

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5,049,592

## METAL OXIDE MODIFICATION FOR USE IN PROTECTIVE COATINGS

**Max Kronstein, New York, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Division of Ser. No. 204,316, Jun. 9, 1988, abandoned. This application Jun. 14, 1989, Ser. No. 366,116**

**Int. Cl.[5] C09D *5/14, 5/16;* C08K *3/20, 3/24***

**U.S. Cl. 523—122** **20 Claims**

1. A process for formulating a low leaching marine antifouling coating composition for preventing the growth of fouling organisms on marine structures, which comprises:
intensively mixing a metal oxide pigment solid with a water based latex material in the presence of water,
separating the reaction products obtained from said mixing step consisting of latex modified metal oxide powder and metal oxide modified latex filtrate, and
dispersing the latex modified metal oxide powder in a water dispersed resinous binder vehicle in the presence of a solvent.

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5,049,593

## STRANDED CONDUCTOR FILLING COMPOUND OF LOW MOLECULAR WEIGHT POLYMER AND WATER SWELLABLE ORGANIC MATERIAL

**Fabrizio Marciano-Agostinelli, and Marco Barbaro-Forleo, both of Short Hills, N.J., assignors to Pirelli Cable Corporation, Florham Park, N.J.**

**Continuation of Ser. No. 68,670, Jul. 1, 1987, abandoned, which is a division of Ser. No. 864,196, May 16, 1986, Pat. No. 4,703,132. This application Apr. 5, 1989, Ser. No. 333,773**

**Int. Cl.[5] H02G *15/00***

**U.S. Cl. 523—173** **9 Claims**

1. A filling composition for filling the interstices between a plurality of wires of a conductor, said filling composition being a polymeric compound having a 100 gram needle penetration value between 50 and 100 tenths of a millimeter at 25° C. and consisting essentially of a low molecular weight polymer having a 100 gram needle penetration value between 110 and 180 tenths of a millimeter at 25° C. and particles of a water swellable organic material having a particle size not greater than 200 microns, the weight of said particles to the weight of said polymer being in the range from 0.5 parts per hundred of the polymer to not more than 50 parts per hundred of the polymer.

5,049,594

## POLYMER COMPOSITIONS CONTAINING INORGANIC FILLERS COATED WITH LATEX AND PROCESS FOR PREPARING COATED FILLERS

**David G. Jeffs, St. Austell, United Kingdom, assignor to ECC International Limited, United Kingdom**

**Continuation-in-part of Ser. No. 291,639, Dec. 29, 1988, which is a continuation-in-part of Ser. No. 902,158, Aug. 29, 1986, Pat. No. 4,800,103. This application Jan. 17, 1990, Ser. No. 466,639**

**Claims priority, application United Kingdom, Aug. 30, 1985, 8521646**

**The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.**

**Int. Cl.[5] C08K *3/34, 3/26;* B32B *19/02***

**U.S. Cl. 523—205** **12 Claims**

11. An organic polymer composition which comprises an organic polymer and a white inorganic filler having a specific surface area of at least 1 $m^2 g^{-1}$ as measured by the BET nitrogen adsorption method, wherein the filler has been treated with a natural or synthetic latex composition comprising a suspension of polymer particles in water wherein the latex solids are selected from the group consisting of acrylic copolymers and copolymers of vinyl acetate, dewatered and then dried, the filler being coated with from 1% to 10% by weight of latex solids, based on the weight of dry inorganic material.

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5,049,595

## PLASTIC CONCENTRATE FOR PHOTOGRAPHIC SUPPORT MATERIAL COATINGS

**Ralf-Burkhard Dethlefs; Bernd Scholz, both of Osnabruck, and Wolfram Wysk, Belm, all of Fed. Rep. of Germany, assignors to Felix Schoeller jr. GmbH & Co. KG, Berg Gretesch, Fed. Rep. of Germany**

**Filed Dec. 11, 1989, Ser. No. 448,734**

**Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841457**

**Int. Cl.[5] C08J *3/20***

**U.S. Cl. 523—351** **18 Claims**

1. A method of making a master batch of plastic concentrate for the production of a photographic polyolefin substrate coating, comprising feeding at least one material from the group consisting essentially of a pigment, filling material or both, and a polyolefin consisting essentially of polyethylene, ethylene copolymerizate or mixtures thereof through a double screw extruder and at a temperature of at least about 250° C. to mix said material and polyolefin, and degassing the mix in said extruder.

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5,049,596

## EPOXY RESIN BASED POWDER COATING COMPOSITION WITH MIXED FILLER INCLUDING MICROFINE SILICA

**Yoshihisa Fujimoto, Chiba; Yoshihiro Motoki, Saitama; Kazufumi Ueji, Saitama, and Kunio Imai, Saitama, all of Japan, assignors to Somar Corporation, Tokyo, Japan**

**Continuation-in-part of Ser. No. 210,956, Jun. 24, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 437,134**

**Claims priority, application Japan, Jun. 25, 1987, 62-158638**

**Int. Cl.[5] C08L *63/00***

**U.S. Cl. 523—427** **11 Claims**

1. An epoxy resin based powder coating composition which comprises: (A) 100 parts by weight of a mixed epoxy resin having a softening point of 60°–80° C. which consists of 50 to 70 wt % of a bisphenol A epoxy resin having a number-average molecular weight of 800 to 1,800 and 30 to 50 wt % of a cresol novolak epoxy resin; (B) 5 to 80 parts by weight of a novolak resin having a softening point of 70°–120° C.; (C) 0.5 to 5 parts by weight of triphenylphosphine; (D) 60 to 200 parts by weight of an inorganic powder having an average particle size of 0.5 to 75 μm; and (E) 0.01 to 2 parts by weight of a microfine silica powder having an average particle size of 1 to 100 nm.

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5,049,597

## IMPACT RESISTANT FILLER-CONTAINING POLYMER/ELASTOMERIC FIBER COMPOSITES

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 96,098, Sep. 11, 1987, abandoned. This application Apr. 3, 1989, Ser. No. 332,793
The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.
Int. Cl.[5] C08L *63/00*
U.S. Cl. 523—457 23 Claims

1. An impact resistant, heat formable composite comprising a polymer selected from the group consisting of addition polymers and addition copolymers, a filler selected from the group consisting of metal oxide, metal carbonate silicon oxide and mixtures thereof, provided said metal is not an alkali metal, and oriented thermoplastic elastomeric fibers.

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5,049,598

## RUBBER COMPOSITION AND TIRE THAT USES IT IN THE TREAD PORTION

Yuichi Salto; Shuichi Sakamoto; Naohiko Kikuchi; Takao Wada; Mamoru Uchida, and Kiyoshige Muraoka, all of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation of Ser. No. 321,004, Mar. 9, 1989, abandoned. This application Oct. 26, 1990, Ser. No. 604,332
Claims priority, application Japan, Mar. 10, 1988, 63-59017; Mar. 11, 1988, 63-58709; Sep. 13, 1988, 63-228952
Int. Cl.[5] B60C *11/14;* C08L *7/00, 1/02, 9/00*
U.S. Cl. 524—13 6 Claims

1. A tire having a tread portion that is composed of a tire rubber composition having a degree of acetone extraction of not more than 10% which comprises a cellulosic material containing-processed powder product having an average rubber components comprise a diene-based rubber as a main ingredient with all of the remainder being a liquid diene-based rubber and wherein said cellulosic material containing-processed powder product is harder than the base rubber and is present in an amount of 3 to 25 parts by weight per 100 parts by weight of the rubber components.

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5,049,599

## FLAMEPROOFED THERMOPLASTIC MOLDING COMPOSITIONS BASED ON PHLEGMATIZED RED PHOSPHORUS

Peter Steiert, Ludwigshafen; Hans-Peter Weiss, Mutterstadt; Christoph Plachetta, Limburgerhof; Petra Baierweck, Schifferstadt; Klaus Muehlbach, Heppenheim, and Brigitte Gareiss, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 24, 1990, Ser. No. 469,396
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1989, 3905038
Int. Cl.[5] C08K *3/02*
U.S. Cl. 524—80 7 Claims

1. A flameproofed thermoplastic molding composition containing

(A) 10–99% by weight of a thermoplastic polyamide,

(B) 1–50% by weight of red phosphorus having a particle size of up to 2 mm which contains per 100 parts by weight from 0.05 to 5 parts by weight of a polyurethane or polyesterpolyurethane coated thereon as phlegmatizer,

(C) 0–60% by weight of a fibrous or particulate filler or a mixture thereof and

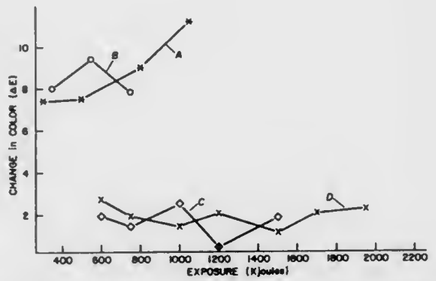
(D) 0–20% by weight of an elastomeric polymer.

5,049,600

## MULTI-COMPONENT STABILIZER SYSTEM FOR POLYOLEFINS PIGMENTED WITH PHTHALOCYANINE PIGMENTS

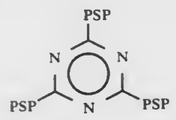
George Kletecka, Fairview Park, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jan. 23, 1990, Ser. No. 468,520
Int. Cl.[5] C08K *5/3492, 5/3495*
U.S. Cl. 524—88 30 Claims

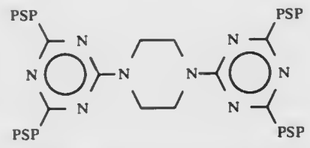



1. A method for imparting improved discoloration resistance to a shaped article of a polyolefin, comprising, incorporating into a melt from which said shaped article is formed, an effective amount, sufficient to color the article from 0.1 phr but less than 2 phr, of a phthalocyanine pigment so as to produce a phthalocyanine-pigmented article, and an effective amount, sufficient to attenuate degradation of said phthalocyanine-pigmented article when exposed to sunlight, of a combination of two primary stabilizers substantially free of secondary stabilizers, including

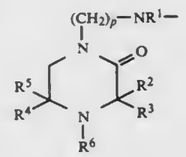
(a) a substituted oxo-piperazinyl triazine ("PIP-T") having a structure selected from the group consisting of



and



wherein PSP is a substitutent having the following formula



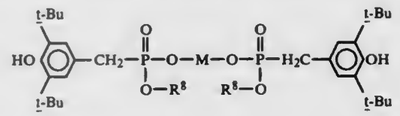
wherein $R^1$ represents $C_1$–$C_{24}$ alkyl, $C_5$–$C_7$ cycloalkyl, $C_7$–$C_{20}$ aralkyl, $C_1$–$C_{24}$ hydroxyalkyl, $C_1$–$C_{24}$ aminoalkyl, $C_1$–$C_{24}$ alkylaminoalkyl, and $C_6$–$C_{20}$ cycloaminoalkyl; $R^2$, $R^3$, $R^4$, and $R^5$,independently represent $C_1$–$C_{18}$ alkyl, or when together cyclized, $R^2$ with $R^3$, and $R^4$ with $R^5$, represent $C_4$–$C_{12}$ cycloalkyl, and $C_1$–$C_8$ alkyl-substituted cycloalkyl; and,

$R^6$ is selected from the group consisting of hydrogen, $C_1$–$C_8$ alkyl, $C_1$–$C_6$ alkoxy, $C_1$–$C_6$ alkanoyl, $C_3$–$C_8$ alkenoyl and



wherein $R^7$ represents hydrogen, $C_1$–$C_{18}$ alkyl or alkenyl, phenyl or naphthyl; and, p1 represents an integer in the range from 2 to about 10; and,

(b) a 2:1 complex of an alkylated phenol phosphonate with a metal ("3,5-DHBP") represented by the structure:



wherein $R^8$ represents $C_1$–$C_{12}$ alkyl, $C_4$–$C_{12}$ cycloalkyl, and, $C_1$–$C_8$ alkyl-substituted cycloalkyl; and, M represents a Group VIII or Group IIA metal.

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5,049,601

## HALOGENATED BIS-IMIDE FLAME RETARDANTS

Mo A. Khuddus, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 150,753, Feb. 1, 1988, Pat. No. 4,871,863. This application Jul. 24, 1989, Ser. No. 385,235
Int. Cl.[5] C08K *5/34;* C07D *207/44*
U.S. Cl. 524—94 26 Claims

1. A white product, predominantly consisting of a bis-imide selected from the group consisting of N,N'-ethylene-bis-(tetrabromophthalimide), N,N'-bis-(tetrabromophthalimide) or mixtures thereof, having an acid number of about 1.0 or less and a bromine content within the range of from about 63% to about 69%.

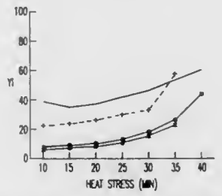
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5,049,602

## COSTABILIZERS FOR MOLDING COMPOSITIONS BASED ON POLYMERS OF VINYL CHLORIDE

Thomas Hildebrand, Dortmund, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 26, 1990, Ser. No. 589,803
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1989, 3932048
Int. Cl.[5] C07D *498/10*
U.S. Cl. 524—95 10 Claims




1. A stabilized thermoplastic molding composition comprising,

(a) a halogen-containing polymer;

(b) one or more compounds of zinc of formula (I)

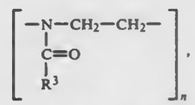


(I)



wherein $R^1$ and $R^2$ are identical or different and represent a straight-chain or branched, hydroxyl-substituted or unsubstituted aliphatic acyl group having from 8 to 21 carbon atoms or an aryl group which is optionally substituted with alkyl groups having 1 to 22 carbon atoms;

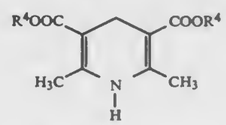
(c) at least one polymeric primary stabilizer selected from the group of polyoxazolines of formula (II)



(II)

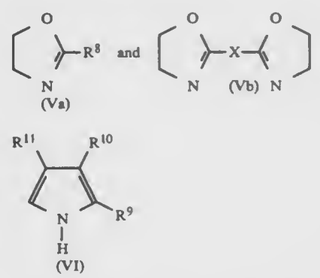
wherein each occurrence of $R^3$ can be different and is, independently, a straight-chain or branched alkyl group having from 1 to 22 carbon atoms or substituted or unsubstituted cycloalkyl or aryl group, and n represents an integer of from 10 to 10,000; and

(d) at least two primary-stabilizer-supporting compounds of the formulae (III), (V) or (VI):



(III)

wherein (V) is a copolymer of




wherein

in formula (III), $R^4$ is $C_9$–$C_{22}$-alkyl or $C_9$–$C_{22}$-alkenyl, cyclohexyl, phenyl or substituted phenyl;

in formulae (Va) or (Vb), $R^8$ is a straight-chain or branched alkyl group having from 1 to 20 carbon atoms, a cyclic and/or alkyl-substituted cyclic alkyl group having from 5 to 10 carbon atoms, a straight-chain or branched alkenyl group having from 3 to 18 carbon atoms, an alkyl-, halogeno- or hydroxyl-substituted aryl group, a straight-chain or branched alkoxy group having from 1 to 20 carbon atoms, a straight-chain or branched alkylcarbonyl group having from 1 to 20 carbon atoms or a cyano group;

X is a straight-chain or branched alkylene group having from 1 to 20 carbon atoms, a cyclic and/or alkyl-substituted cyclic alkylene group having from 5 to 10 carbon atoms, a straight-chain or branched alkenylene group having from 3 jo 18 carbon atoms, an alkyl-, halogeno-, cyano- or hydroxyl-substituted arylene group, a straight-chain or branched alkyleneoxy group having from 1 to 20 carbon atoms, a straight-chain or branched alkylenecarbonyl group having from 1 to 20 carbon atoms; and

in formula (VI), $R^9$ is methyl or phenyl, $R^{10}$ is hydrogen,

cyano, $C_2$-$C_{10}$-alkylcarbonyl, $C_7$-$C_{10}$-arylcarbonyl, phenylaminocarbonyl, m-hydroxyphenylaminocarbonyl, α-hydroxyethyl, or carboxyl which has been esterified with a $C_1$-$C_{18}$-alcohol, $C_6$-$C_8$-cycloalkanol, $C_5$-$C_{19}$-aralkanol, $C_2$-$C_{20}$-alkanediol, $C_4$-$C_{20}$-thioalkanediol or pentaerythritol, and $R^{11}$ is methyl, phenyl or ($C_1$-$C_{19}$-alkoxy)methyl.

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**5,049,603**

## POLYESTER RESIN COMPOSITION AND MOLDED ARTICLES THEREOF

**Mitsuhiro Mochizuki, Shizuoka, Japan, assignor to Polyplastics Co., Ltd., Osaka, Japan**

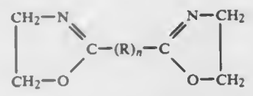
**Filed Apr. 20, 1990, Ser. No. 512,200**
**Claims priority, application Japan, May 8, 1989, 1-114769**
**Int. Cl.[5] C08K** *5/527*
**U.S. Cl. 524—97** **8 Claims**

1. A polyester resin composition prepared by mixing 100 parts by weight of a mixture comprising:

(A) 60 to 99 parts by weight of a crystalline thermoplastic polyester resin and

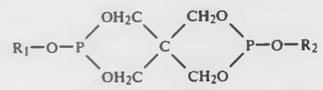
(B) 1 to 40 parts by weight of a polyester elastomer; and, per 100 parts by weight of (A) and (B),

(C) 0.01 to 5 parts by weight of a bisoxazoline compound of the formula:



wherein one or more of the hydrogen atoms may each be replaced by an alkyl or aryl group, R is a divalent organic group, and n is 0 or 1;

(D) 0.01 to 5 parts by weight of a phosphorus compound represented by the general formula:



wherein $R_1$ and $R_2$ may be the same or different from each other and are each a group selected from among alkyl, substituted alkyl, aryl and substituted aryl; and

(E) 0.01 to 5 parts by weight of one or more antioxidants selected from among thio ether compounds and hindered phenol compounds.

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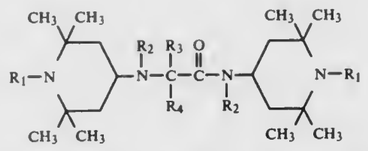
**5,049,604**

## PROCESS FOR PRODUCING PIPERIDINE DERIVATIVE AND STABILIZED RESIN COMPOSITION CONTAINING SAID DERIVATIVE

**Takeo Fujii, Toyonaka; Tamaki Ishii, Suita; Shinichi Yachigo, Toyonaka; Tatsuo Kaneoya, Toyonaka; Yukoh Takahashi, Toyonaka; Yuzo Maegawa, Ibaraki; Haruki Okamura, Osaka, and Eizo Okino, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Continuation of Ser. No. 436,699, Nov. 15, 1989, abandoned, which is a continuation of Ser. No. 754,582, Jul. 15, 1985, abandoned. This application Oct. 19, 1990, Ser. No. 600,160**
**Claims priority, application Japan, Jul. 24, 1984, 59-154633; Jul. 30, 1984, 59-161346**
**Int. Cl.[5] C08K** *5/3435*
**U.S. Cl. 524—103** **7 Claims**

1. A stabilized resin composition comprising a resin, a piperidine derivative represented by the formula (III)



(III)

wherein $R_1$ is a hydrogen atom or an alkyl group having 1 to 3 carbon atoms; $R_2$ is a hydrogen atom or an alkyl group having 1 to 12 carbon atoms; and $R_3$ and $R_4$ are each independently an alkyl group having 1 to 12 carbon atoms, a phenol-type antioxidant and a sulfur-containing antioxidant selected from the group consisting of dilauryl thiodipropionate, dimyristyl thiodipropionate, distearyl thiodipropionate, pentaerythritol tetrakis(3-dodecylthiopropionate) and 3,9-bis(2-dodecylthioethyl)-2,4,8,10-tetraoxaspiro[5.5]-undecane.

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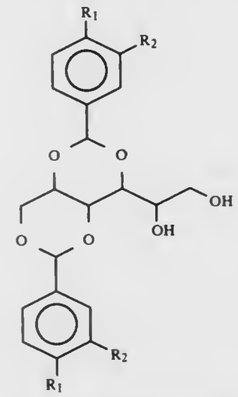
**5,049,605**

## BIS(3,4-DIALKYLBENZYLIDENE) SORBITOL ACETALS AND COMPOSITIONS CONTAINING SAME

**John W. Rekers, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.**

**Filed Sep. 20, 1989, Ser. No. 409,912**
**Int. Cl.[5] C07D** *323/04, 493/00;* **C08K** *5/05*
**U.S. Cl. 524—108** **4 Claims**

1. Bis(3,4-dialkylbenzylidene)sorbitol acetals of the formula:



in which $R_1$ and $R_2$ are independently selected from lower alkyl groups containing 1–4 carbon atoms which together form a carbocyclic ring containing up to 5 carbon atoms.

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**5,049,606**

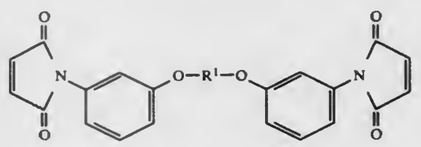
## THERMOSETTING RESIN COMPOSITION

**Norimasa Yamaya; Masahiro Ohta, and Akihiro Yamaguchi, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan**

**Continuation of Ser. No. 189,717, May 3, 1988, abandoned. This application Feb. 27, 1990, Ser. No. 488,443**
**Claims priority, application Japan, May 6, 1987, 62-108961; Dec. 18, 1987, 62-318712**
**The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.**
**Int. Cl.[5] C08L** *79/08;* **C08K** *3/38, 3/30, 3/04*
**U.S. Cl. 525—149** **1 Claim**

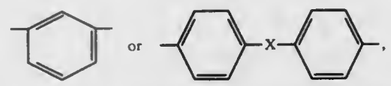
1. A thermosetting resin composition comprising:

(a) 100 parts by weight of a polyaminobismaleimide resin consisting essentially of a bismaleimide compound represented by the following formula (I):

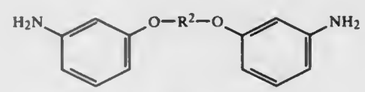


(I)

wherein $R^1$ is a divalent group of

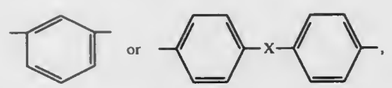


and X is a direct bond or a group selected from the group consisting of a divalent hydrocarbon group having 1 to 10 carbon atoms, a hexafluorinated isopropylidene group, a carbonyl group, a thio group, a sulfinyl group, a sulfonyl group and an oxo group, and a diamine compound represented by the following formula (II):



(II)

wherein $R^2$ is a divalent group of



and X is a direct bond or a group selected from the group consisting of a divalent hydrocarbon group having 1 to 10 carbon atoms, a hexafluorinated isopropylidene group, a carbonyl group, a thio group, a sulfinyl group, a sulfonyl group and an oxo group; and

(b) 5 to 200 parts by weight of fluororesin, the particle size distribution of which ranges from 1 to 25 μm.

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**5,049,607**

## RUBBER COMPOSITION COMPRISING ALKYL ($C_6$-$C_{22}$) AMIDES OF ROSIN ACID

**Lawson G. Wideman, and Paul H. Sandstrom, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Sep. 25, 1989, Ser. No. 411,981**
**The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.**
**Int. Cl.[5] C08J** *3/20;* **C08L** *7/00, 9/00*
**U.S. Cl. 524—274** **8 Claims**

1. A process for preparing rubber compositions which comprises admixing a rubber selected from the group consisting of natural rubber, homopolymers of conjugated diolefins copolymers of conjugated diolefins and ethylenically unsaturated monomers or mixtures thereof with an alkyl amide of rosin acid wherein the alkyl contains from about 6 to about 22 carbon atoms.



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**5,049,608**

## ACRYLIC PRESSURE SENSITIVE ADHESIVE COMPOSITIONS HAVING IMPROVED LOW TEMPERATURE ADHESION

**Steven W. Medina, Orefield, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.**

**Filed May 3, 1989, Ser. No. 346,772**
**Int. Cl.[5] C08K** *5/05*
**U.S. Cl. 524—375** **15 Claims**

1. In a low temperature pressure sensitive adhesive composition comprising an aqueous emulsion of a pressure sensitive adhesive copolymer and a post-added nonionic poly(ethyleneoxy) surfactant, the improvement which comprises a 2-ethylhexyl acrylate/polar monomer copolymer containing 40 to 97 wt % 2-ethylhexyl acrylate and having a Tg of −70° to −40° C. as the pressure sensitive adhesive copolymer, and 3–9 wt %, based on emulsion solids, nonionic poly(ethyleneoxy) ethanol surfactant containing at least 70 ethylene oxide units.

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**5,049,609**

## COATING COMPOSITION AND COATED TIRE

**George P. Patitsas, Kent, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Division of Ser. No. 322,752, Mar. 13, 1989, Pat. No. 4,911,218. This application Mar. 13, 1990, Ser. No. 492,159**
**Int. Cl.[5] C08K** *3/34, 3/40, 5/05, 29/04*
**U.S. Cl. 524—386** **2 Claims**

1. A coating composition comprised of 100 parts by weight polyvinylalcohol and about 10 to about 30 parts by weight of at least one of glycerin and polyglycerol and at least one water insoluble particulate material having a plate-like structure selected from at least one of flake mica and flake glass in a weight ratio of said particulate material to the PVA in the coating composition in the range of about 1/6 to about 1/1.

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**5,049,610**

## FIBER-REINFORCED RUBBER COMPOSITION AND PRODUCTION PROCESS AND USE THEREOF

**Takeshi Takaki; Kouhei Kaijiri; Denichi Oda; Kunio Oda; Hideo Kurihara, and Takeshi Tanabe, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan**

**Division of Ser. No. 97,101, Sep. 16, 1987, Pat. No. 5,006,603. This application Nov. 17, 1989, Ser. No. 437,811**
**Claims priority, application Japan, Sep. 26, 1986, 61-225858; Oct. 9, 1986, 61-240821; Nov. 18, 1986, 61-272822; Nov. 18, 1986, 61-272823; Jan. 21, 1987, 62-12005; Jan. 21, 1987, 62-12006**
**Int. Cl.[5] C08K** *3/04;* **C08L** *9/00, 71/00*
**U.S. Cl. 524—514** **5 Claims**

1. A bead filler rubber composition comprising (A) a reinforced rubber composition comprising 100 parts by weight of a vulcanizable rubber including 5 to 100 parts by weight of fie short fibers of a fiber-forming polyamide buried therein, said polyamide and said vulcanizable rubber being bonded through a silane coupling agent, (B) a diene type rubber and (C) carbon black, and also satisfying the conditions (I) to (IV) below:

(I) the amount of said polyamide is 2 to 20 parts by weight per 100 parts by weight of the total rubber;

(II) the proportion of the total amount of natural rubber and synthetic polyisoprene is 55 to 100% by weight based on the total rubber components in the component (A) and the component (B);

(III) the amount of the carbon black is 50 to 70 parts by weight based on 100 parts by weight of the total rubber; and

(IV) the vulcanized product obtained has a 50% modulus of 30 $kg/cm^2$ or more.

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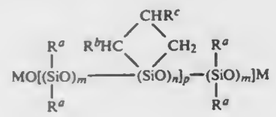
5,049,611

## SILACYCLOBUTANE FUNCTIONAL POLYMERS AND THEIR PRODUCTION

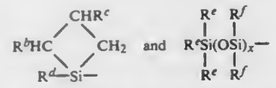
Ronald H. Baney; Carl J. Bilgrien; Gary T. Burns; Lawrence D. Fiedler, and Chi-long Lee, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 16, 1989, Ser. No. 422,211
Int. Cl.[5] C08L *83/00*
U.S. Cl. 524—588 24 Claims

1. Silacyclobutane functional polydiorganosiloxane copolymers of the structure



wherein M is selected from



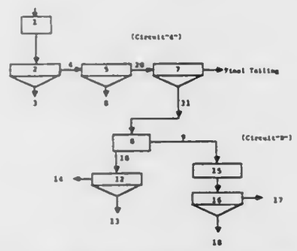
wherein $R^a$, $R^b$, $R^c$, $R^d$, $R^e$, and $R^f$ are independently monovalent radicals selected from the group consisting of hydrogen, hydrocarbon, or substituted hydrocarbon; m and x are integers of from 0 or more; n is equal to 1; and p is an integer greater than 0; with the proviso that there is at least one silacyclobutane group in the copolymer.

5,049,612

## DEPRESSANT FOR FLOTATION SEPARATION OF POLYMETALLIC SULPHIDIC ORES

Srdjan Bulatovic, Peterborough; Tim M. Jessup, Lakefield, and James F. Jackson, Sudbury, all of Canada, assignors to Falconbridge Limited, Toronto, Canada

Division of Ser. No. 188,949, May 2, 1988, Pat. No. 4,877,517.
This application Jan. 3, 1989, Ser. No. 292,967
Int. Cl.[5] C08B *31/00*; B03D *1/016*
U.S. Cl. 525—54.260 5 Claims



1. A polymeric lignin sulphonate bearing cross-linked starch polyacrylate reagent for depressing iron sulphidic minerals in a mineral froth flotation separation process, comprising the ultimate reaction product of:

a) a starch in aqueous solution causticized by heating with an alkaline solution at a temperature less than 100° C.,

b) a cross-linking agent reacted with the starch so causticized,

c) a polyacrylic acid reacted with the cross-linked starch resulting in step b) thereby yielding an aqueous colloidal suspension, and

d) a lignin sulphonate containing less than 0.1% sugar, reacted with the colloidal suspension of the cross-linked starch polyacrylate resulting in step c).

5,049,613

## THERMOPLASTIC RESIN COMPOSITION

Sachio Shimizu, Chiba; Tetsuji Miura, Tokyo; Toshio Noda, Ichihara, and Hiroshi Murakami, Isesaki, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1989, Ser. No. 310,903
Claims priority, application Japan, Feb. 24, 1988, 63-41015; Nov. 11, 1988, 63-283720
Int. Cl.[5] C08L *77/00*
U.S. Cl. 525—66 8 Claims

1. A thermoplastic resin composition comprising:

(A) from 10 to 50% by weight of a maleic copolymer of from 30 to 70 mol % of an aromatic vinyl monomer, from 30 to 50 mol % of a maleimide monomer, from 3 to 20 mol % of an unsaturated dicarboxylic anhydride monomer and from 0 to 50 mol % of other copolymerizable monomer;

(B) from 40 to 80% by weight of a polyamide; and

(C) from 3 to 40% by weight of a polyolefin polymer of an olefin monomer, selected from the group consisting of ethylene, propylene, 1-butene, isobutylene, 2-butene, cyclobutene, 3-methyl-1-butene, 4-methyl-1-butene, 4-methyl-1-pentene, cyclopentene, 1-hexene, cyclohexene, 1-octene, 1-decene and 1-dodecene and mixtures thereof, or a copolymer of said monomer and a non-conjugated diene monomer selected from 4-ethylidenenorbornane and dicyclopentadiene or with an acrylate monomer, modified by from 0.1 to 10% by weight of an unsaturated dicarboxylic anhydride monomer or an unsaturated carboxylic acid monomer and mixtures thereof,

wherein said maleimide copolymer is in the form of dispersed particles of from 0.01 to 1.0 μm.

5,049,614

## BLENDS BASED ON VINYL-AROMATIC POLYMERS HAVING HIGH TENACITY AND IMPACT STRENGTH

Gianfranco Biglione, Mantova, Italy, assignor to Montedipe S.p.A., Milan, Italy

Division of Ser. No. 303,954, Jan. 31, 1989, Pat. No. 4,937,280, which is a continuation of Ser. No. 188,074, Apr. 28, 1988, abandoned, which is a continuation of Ser. No. 889,527, Jul. 25, 1986, abandoned. This application Mar. 27, 1990, Ser. No. 499,704
Claims priority, application Italy, Jul. 26, 1985, 21733 A/85
Int. Cl.[5] C08L *51/06, 67/00, 69/00, 75/04*
U.S. Cl. 525—85 4 Claims

1. Blends based on vinyl aromatic polymers comprising:

10–99% by weight of a blend consisting of:

a) from 10 to 98% by weight of a vinyl aromatic copolymer containing from 2 to 25% by weight of an ethylenically unsaturated nitrile and a rubber not exceeding 15% by weight, and

b) from 90 to 2% by weight of a core-shell polymer consisting of an elastomeric core having a second order transition temperature lower than 10° C. and a shell consisting of vinyl monomers grafted to the elastomeric core, selected from the group consisting of derivatives of acrylic acid, derivatives of methacrylic acid, vinyl aromatic compounds, vinyl cyanide compounds, polyfunctional derivatives and mixtures thereof, the content of the elastomer being higher than 35% and up to 95% by weight, the blends of the vinyl aromatic polymers having a high tenacity and impact strength and a melt index from about 3.5 to about 8.5 g/10', and

from about 1 to 90% by weight of a compatible polymers selected from the group consisting of polycarbonate, polyesters, thermoplastic polyurethanes, polymethacrylates, styrene-methylmethacrylate copolymers, acrylonitrile-butadiene styrene, styrene-maleic anhydride copolymers, styrene-acrylonitrile copolymers, and vinyl chloride polymers.



5,049,615

## POLYINDANES AS PROCESSING AID FOR ENGINEERING THERMOPLASTICS

Song G. Chu, Hockessin, Del.; Birendra K. Patnaik, West Chester, Pa., and Keith S. Shih, Newark, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Dec. 11, 1989, Ser. No. 448,394
Int. Cl.[5] C08L *53/02, 71/12, 69/00, 2502*
U.S. Cl. 525—92 18 Claims

1. A thermoplastic engineering resin composition comprising 70–99 parts by weight of a thermoplastic resin selected from the group consisting of polyphenylene ethers, aromatic polycarbonates, polysulfones, polyaryl ether ketones, polyarylates, polyimides, polyphenylene sulfides and polyamides and 1–30 parts by weight of a polyindane resin wherein said polyindane resin is made by polymerization of diisopropenylbenzene.

5,049,616

## METHOD FOR FORMING A CROSSLINKABLE PRESSURE-SENSITIVE ADHESIVE CONSTRUCTION CONTAINING A DIORGANOPOLYSILOXANE AND AN ACYLOXYSILANE

John D. Blizzard, and Terence J. Swihart, both of Bay County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 309,749, Feb. 13, 1989, abandoned.
This application Apr. 18, 1991, Ser. No. 687,344
Int. Cl.[5] C08L *83/06, 7/00*; C08F *8/00*
U.S. Cl. 525—100 9 Claims

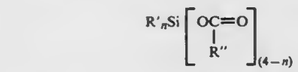
1. A method for forming a crosslinkable pressure-sensitive adhesive construction comprising: contacting a first component comprising

(I) a pressure-sensitive adhesive; and

(II) a diorganopolysiloxane fluid having at least two hydroxyl groups per molecule attached to the silicon atoms thereof, with a second component comprising

(III) a further portion of said pressure-sensitive adhesive; and

(IV) an acyloxysilane having the average formula



wherein R' is a monovalent hydrocarbyl group selected from the group consisting of a phenyl group and alkyl radicals having 1 to 6 carbon atoms, R'' is an alkyl radical having 1 to 7 carbon atoms and n is 1 to 3.

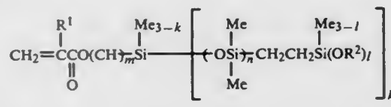
5,049,617

## ORGANOPOLYSILOXANE COMPOUND

Hiroshi Yoshioka, Tokyo; Ichiro Ono, and Hitoshi Uehara, both of Gunma, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 412,729
Claims priority, application Japan, Sep. 27, 1988, 63-239774
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—104 13 Claims

1. An organopolysiloxane represented by the formula:



wherein $R^1$ represents a methyl group or a hydrogen atom; $R^2$ represents a methyl or ethyl group; m represents an integer from 1 to 3; n represents an integer from 3 to 50; k represents the integer 1 or 2; and l represents the integer 2 or 3.

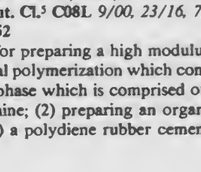
5,049,618

## VULCANIZABLE RUBBER COMPOSITIONS CONTAINING HYDROXY ARYL SUBSTITUTED MONOMALEIMIDES

Lawson G. Wideman, and Paul H. Sandstrom, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 5, 1989, Ser. No. 402,724
Int. Cl.[5] C08F *8/28, 8/30*
U.S. Cl. 525—136 13 Claims

1. A vulcanizable rubber composition comprising a sulfur vulcanizable rubber, a vulcanizing agent and the reaction product of (a) a methylene donor and (b) a methylene acceptor of the formula:



5,049,619

## POLYMERIC ALLOYS

Thein Kyu, Akron, Ohio, assignor to Edison Polymer Innovation Corporation, Broadview Heights, Ohio

Filed Apr. 14, 1989, Ser. No. 337,893
Int. Cl.[5] C06L *69/00, 33/12*
U.S. Cl. 525—148 6 Claims

1. A process for producing two-phase, solid, polymeric alloy compositions from blends of polycarbonate and polymethylmethacrylate, present in relative amounts other than those in which said polymers form a single phase at all temperatures above their glass transition temperatures, and characterized by interconnected structural morphology dependent upon spinodal decomposition comprising:

preparing a polymeric composition exhibiting a single phase, and having an single glass transition temperature, from a combination of said polymers;

heating said single phase composition at least to a first temperature, above its glass transition temperature for a time sufficient to form interconnected two-phase material the spinodal domains of which have a size of less than about 1 micron having two glass transition temperatures, and

thereafter substantially stabilizing the two-phase morphology of said two-phase material by lowering its temperature to a second temperature below the lower of its two glass transition temperatures.

5,049,620

## HIGH MODULUS RUBBER COMPOSITION

Bruce R. Hahn, Hudson; Wen-Liang Hsu, Copley; Douglas D. Callander, Akron, and Adel F. Halasa, Bath, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 21, 1989, Ser. No. 454,477
Int. Cl.[5] C08L *9/00, 23/16, 7/00*
U.S. Cl. 525—152 15 Claims

1. A process for preparing a high modulus rubber composition by interfacial polymerization which comprises: (1) preparing an aqueous phase which is comprised of (a) water and (b) a diol or a diamine; (2) preparing an organic phase which is comprised of (a) a polydiene rubber cement and (b) a diacid

halide; (3) mixing the aqueous phase with the organic phase under conditions wherein agitation is provided and which are sufficient for polymerization to occur which results in the formation of a polyamide or polyester; and (4) recovering the high modulus rubber composition from the aqueous phase and organic phase.

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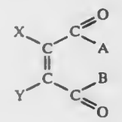
**5,049,621**

## PROCESS FOR PRODUCING BUTADIENE OLIGOMER ADDUCTS

**Toru Nakamura, and Hitoshi Yuasa, both of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Japan**

**Filed Dec. 14, 1989, Ser. No. 450,617**
**Claims priority, application Japan, Dec. 16, 1988, 63-317905**
**Int. Cl.[5] C08F *8/46, 2/14***
**U.S. Cl. 525—266** **5 Claims**

1. A process for producing butadiene oligomer adducts of (A) a butadiene oligomer or co-oligomer prepared from a monomer, selected from conjugated diolefins and vinyl-substituted aromatic compounds, and butadiene with (B) an ethylene-α, β-dicarboxyl compound which has the following general formula:



wherein X and Y may be the same or different groups and which are hydrogen or alkyl group; and A and B are hydroxyl and alkoxyl group or —O— bond being formed integrally from A and B which comprises a step of heating (A) said butadiene oligomer or co-oligomer with (B) said compound at a temperature of 120°-220° C. in the presence of 0.005-5% by weight of trimethylhydroquinone based on an amount of (A).

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**5,049,622**

## FLUORINE-CONTAINING BLOCK COPOLYMER

**Masatoshi Abe, Kitaibaraki, Japan, assignor to Nippon Mektron Limited, Tokyo, Japan**

**Filed Sep. 18, 1990, Ser. No. 584,341**
**Claims priority, application Japan, Oct. 6, 1989, 1-261370**
**Int. Cl.[5] C08F *259/08, 293/00***
**U.S. Cl. 525—267** **6 Claims**

1. A process for producing a fluorine-containing block copolymer, which comprises subjecting tetrafluoroethylene and perfluoro(methyl vinyl ether) to copolymerization reaction in the presence of an organic compound containing at least one of iodine and bromine and then successively supplying tetrafluoro-ethylene and vinylidene fluoride to the reaction system, thereby continuing the polymerization reaction.

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**5,049,623**

## ETHYLENICALLY UNSATURATED CARBAMATES AND COATING COMPOSITIONS

**William A. Dupont, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Aug. 3, 1989, Ser. No. 389,140**
**Int. Cl.[5] C08F *283/04***
**U.S. Cl. 525—293** **22 Claims**

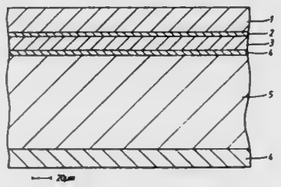
1. A substrate coated with a non-air-drying, radiation-curable, sandable coating composition comprising an ethylenically unsaturated carbamate derived from a styrene allyl alcohol copolymer and an ethylenically unsaturated isocyanate selected from the group consisting of isocyanatoalkyl acrylates, isocyanatoalkyl methacrylates, and aralkyl isocyanates.

**5,049,624**

## PACKAGING

**John F. Adams, Caversham; Michael A. Cochran, Wantage; Rickworth Folland, Faringdon; James W. Nicholas, and Melvin E. R. Robinson, both of Wantage, all of England, assignors to CMB Foodcan plc, Worcester, England**

**PCT No. PCT/GB89/00243, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989, PCT Pub. No. WO89/08557, PCT Pub. Date Sep. 21, 1989**
**Continuation-in-part of Ser. No. 340,416, Mar. 23, 1989. This PCT application Mar. 10, 1989, Ser. No. 435,404**
**Claims priority, application United Kingdom, Mar. 12, 1988, 8805931; Mar. 22, 1988, 8806752; Jul. 1, 1988, 8815699; Jan. 27, 1989, 8901761**
**Int. Cl.[5] C08K *5/00, 5/20;* B32B *27/18;* B65D *81/26***
**U.S. Cl. 525—371** **11 Claims**



1. A wall for a package comprising
(a) an outer set of one or more layers; and
(b) an inner set of one or more layers, which layer or the outermost of which layers comprises a composition comprising a synthetic polymer and having oxygen-scavenging properties,
wherein
(i) the outer set of layers would have, if separate from the inner set and in the absence of any oxygen-scavenging properties in any of the layers of the layer constituting the set, a permeance, for oxygen, of not more than 1.5 $cm^3/(m^2$ atm day);
(ii) the inner set of layers would have, if separate from the outer set and in the absence of oxygen-scavenging properties in any of the layers or the layer constituting the set, a permeance, for oxygen, of at least 2.0 $cm^3/(m^2$ atm day);
(iii) the inner set of layers would have, if separate from the outer set, a permenance, for oxygen, less than the permeance specified in (ii) by at least 1.0 $cm^3/(m^2$ atm day) by virtue of oxygen-scavenging in at least the layer specified in (b); and
(iv) the composition scavenges oxygen through the metal-promoted oxidation of an oxidisable organic component thereof.

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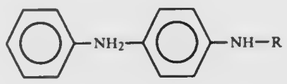
**5,049,625**

## POLYMERIC DIPHENYLDIAMINES

**James J. Tazuma, Mill Creek, Wash.; Lawson G. Wideman, and Paul H. Sandstrom, both of Tallmadge, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Filed Mar. 8, 1990, Ser. No. 493,093**
**Int. Cl.[5] C08G *73/00;* C08K *5/17***
**U.S. Cl. 525—391** **15 Claims**

1. A polymeric composition useful as an antiozonant which comprises a polymer having a molecular weight ranging from about 300 to about 3,000 and is the polymeric reaction product of
(a) a diphenyldiamine of the formula:





wherein R is a radical selected from the group consisting of an alkyl having from 3 to 16 carbon atoms and a cycloalkyl having from 5 to 12 carbon atoms: and
(b) at least one diene selected from the group consisting of (1) conjugated dienes consisting of 1,3-butadiene, isoprene, chloroprene, 2-ethyl-1,3-butadiene, 2,3-dimethyl-1,3-butadiene and piperylene: and (2) nonconjugated dienes consisting of 1,4-pentadiene, 1,4-hexadiene, ethylidene norbornene, 1,4-diisopropenylbenzene, 1,3-diisopropenylbenzene, 1,4-di-α-ethylvinylbenzene, 1,3-di-α-ethylvinylbenzene, 1-isopropenyl-4-α-ethylvinylbenzene, 1-isopropenyl-3-α-ethylvinylbenzene, 1-α-ethylvinyl-4-α'-isopropylvinylbenzene, 1-α-ethylvinyl-3-α'-isopropylvinylbenzene, 1,4-di-α-isopropylvinylbenzene, 1,3-di-α-isopropylvinylbenzene and limonene.

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**5,049,626**

## GRAFT COPOLYMER AND PROCESS FOR THE PREPARATION THEREOF AND USE

**Hideo Akimoto; Shiro Narasaki, and Reiji Miyamoto, all of Ichihara, Japan, assignors to Du Pont-Mitsui Polychemicals Co., Ltd., Tokyo, Japan**

**Filed Sep. 6, 1989, Ser. No. 403,659**
**Claims priority, application Japan, Sep. 8, 1988, 63-225730; Mar. 17, 1989, 1-65423**
**Int. Cl.[5] C08F *283/00;* C08L *35/02***
**U.S. Cl. 525—426** **7 Claims**

1. A graft copolymer comprising:
a first stock copolymer (A) including at least one monomer selected from esters of unsaturated carboxylic acids (a), ethylene (b) and carbon monoxide (c); and
1 to 40% by weight, based on the weight of said graft copolymer, of a second polyamide oligomer (B) grafted on said first stock copolymer (A), said second polyamide oligomer (B) having a primary amino group at one end of its molecule (B) and a carboxyl group at another end of its molecule, said carboxyl group being encapsulated with a primary amine having from 1 to 20 carbon atoms, said polyamide oligomer (B) having a number average molecular weight of from 600 to 10,000.

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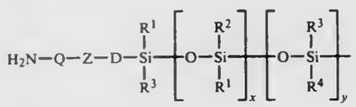
**5,049,627**

## EPOXY-AROMATIC POLYSILOXANE COMPOSITIONS

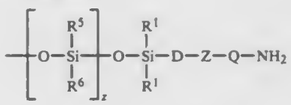
**Robert Edelman, Staten Island, N.Y., assignor to Investment Holding Corporation, Wilmington, Del.**

**Continuation of Ser. No. 194,059, May 13, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 439,009**
**Int. Cl.[5] C08L *83/08, 63/00***
**U.S. Cl. 525—476** **14 Claims**

1. A curable and compatible composition comprising:
(a) a multifunctional glycidyl ether, having at least three epoxy groups per molecule, and being free of glycidylamines, present in an amount from about 50% to about 67% by weight of the curable and compatible composition; and
(b) a hardening amount of a mixture of an aromatic diaminopolysiloxane and a rigid aromatic diamine, the diaminopolysiloxane present in an amount from about 50% to 100% by weight of the mixture and the rigid aromatic diamine present in an amount of about 0% to 50% by weight of the mixture, wherein the aromatic diaminopolysiloxane has the formula:



-continued



wherein:
Q is a substituted or unsubstituted aromatic group;
Z is selected from the functional groups consisting of —O—, —S—, $—SO_2—$, $—SO_2NH—$, $—NHSO_2—$, —C(O)ONH—, —NHC(O)O—, —C(O)O, or —OC-(O)—;
D is a substituted or unsubstituted hydrocarbylene;
$R^1$, $R^2$, $R^3$, $R^4$, $R^5$, and $R^6$ are independently selected from the group consisting of substituted or unsubstituted hydrocarbyl; and
x, y, and z each have a value from about 0-100, except that x+y+z must equal at least about 6;
and wherein the mixture of aromatic diaminopolysiloxane and aromatic diamine is present in an amount from about 33% to about 50% by weight of the curable and compatible composition; and
wherein the composition is characterized by the absence of phase separation and, when cured, has a glass transition temperature ($T_g$) of at least about 100° C.

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**5,049,628**

## UNSATURATED GROUP-CONTAINING POLYCARBOXLIC ACID RESIN, RESIN COMPOSITION AND SOLDER RESIST RESIN COMPOSITION COMPRISING THE SAME AND CURED PRODUCT THEREOF

**Kazuyoshi Nawata, Onoda; Tetsuo Ohkubo, Ube, and Minoru Yokoshima, Toride, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 27, 1989, Ser. No. 413,470**
**Claims priority, application Japan, Oct. 4, 1988, 63-250682**
**Int. Cl.[5] C08F *283/00;* C08G *8/30, 8/28;* C08L *61/00***
**U.S. Cl. 525—502** **27 Claims**

1. An unsaturated group-containing polycarboxylic acid resin produced by reacting an epoxidized compound of a condensate of a phenolic compound and an aromatic aldehyde having a phenolic hydroxyl group with (meth)acrylic acid, and further reacting the reaction product with polybasic carboxylic acid or an anhydride thereof.

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**5,049,629**

## COLOR DEVELOPER FOR PRESSURE-SENSITIVE COPYING PAPER

**Kazuhide Hayama, and Yukio Saitoh, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan**

**Filed Nov. 3, 1989, Ser. No. 431,232**
**Claims priority, application Japan, Nov. 18, 1988, 62-290055**
**Int. Cl.[5] C08G *8/28, 14/04;* C08L *61/14, 85/00***
**U.S. Cl. 525—506** **5 Claims**

1. A color developer for pressure-sensitive copying paper, which contains a polyvalent metal-modification product of a p-substituted phenol-formaldehyde condensate substantially terminated with an o-substituted phenol nucleus, with a content of a condensate component in which each of both terminal phenol nuclei thereof has a hydrogen atom at the o-position being not more than 20% by weight based on the total condensate.

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5,049,630

## BLENDS OF POLYKETONES AND ACIDIC POLYMERS STABILIZED WITH SALTS

Edgar J. Smutny, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 29, 1990, Ser. No. 471,465
Int. Cl.[5] C08K *5/09*
U.S. Cl. 525—539 17 Claims

1. A stabilized composition comprising a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon, a partially zinc-neutralized acidic polymer containing moieties of an α-olefin and an α,β-ethylenically unsaturated carboxylic acid and salt of aluminum, magnesium or scandium.

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5,049,631

## METHOD FOR PREPARATION OF VINYL CHLORIDE RESIN IN PRESENCE OF POLYGLYCIDYL COMPOUNDS

Tadashi Amano, Kanagawa, and Shigehiro Hoshida, Ibaraki, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1989, Ser. No. 432,089
Claims priority, application Japan, Nov. 16, 1988, 63-289570; Jan. 17, 1989, 1-8135
Int. Cl.[5] C08F *2/20*
U.S. Cl. 526—204 6 Claims

1. A method for the preparation of a vinyl chloride-based resin which comprises:

suspension-polymerizing vinyl chloride monomer or a monomeric mixture mainly composed of vinyl chloride in an aqueous polymerization medium containing a suspending agent and a polymerization initiator, the aqueous polymerization medium being admixed with from 0.1 to 10 parts by weight, per 100 parts by weight of the vinyl chloride monomer or the monomeric mixture, of a glycidyl compound selected from the group consisting of diglycidyl ester compounds represented by the general formula

$$G—O—CO—R^1—CO—O—G,$$

in which G is a glycidyl group and $R^1$ is an oxygen atom, methylene group, ethylene group or 1,3-cyclohexylene group, or a bis(diglycidylamino) compound represented by the general formula

$$G_2N—R^2—NG_2,$$

in which G has the same meaning as defined above and $R^2$ is an oxygen atom, methylene group, 1,3-cyclohexylene group or 1,3-cyclohexylene-bismethylene group.

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5,049,632

## N-CYCLOALKYL NORBORNENE DICARBOXIMIDE POLYMERS

Jawed Asrar, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 19, 1990, Ser. No. 629,884
Int. Cl.[5] C08F *122/40, 126/06, 271/02*
U.S. Cl. 526—262 8 Claims

1. A polymer comprising N-cycloalkyl norbornene dicarboximide units wherein said cycloalkyl ranges from cyclopropyl to cyclooctyl, wherein said polymer has a glass transition temperature of at least 180° C.

5,049,633

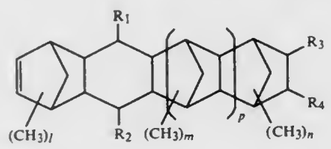
## ETHYLENE/POLYCYCLIC MONOMER COPOLYMER, PROCESS FOR PREPARATION THEREOF, AND OPTICAL ARTICLE

Yasuaki Sasaki, and Tohru Matsuoka, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Oct. 5, 1989, Ser. No. 417,409
Claims priority, application Japan, Oct. 6, 1988, 63-250805; Jun. 12, 1989, 1-149907
Int. Cl.[5] C08F *32/08*
U.S. Cl. 526—281 11 Claims

1. A random copolymer which comprises recurring units from ethylene and recurring units from a polycyclic monomer represented by the following general formula (I):

(I)



wherein

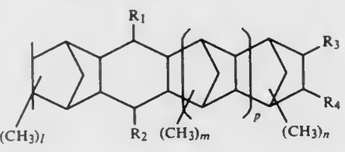
e, m, and n are 0 or 1,

p is an integer of at least 0,

$R_1$, $R_2$, $R_3$, and $R_4$ independently represent a hydrogen atom or an alkyl group having 1 to 10 carbon atoms, and $R_3$ and $R_4$ may together form a ring;

the molar ratio of ethylene/polycyclic monomer of the general formula (I) is in the range of from 90/10 to 10/90; a substantial part of the units derived from the polycyclic monomer represented by general formula (I) have a structure represented by general formula (II):

(II)



wherein

e, m, n, p, $R_1$, $R_2$, $R_3$ and $R_4$ are as defined above; and the intrinsic viscosity ($\eta$) of the random copolymer is 0.1 to 15 dl/g, as measured at 135° C. in decalin.

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5,049,634

## DERIVATIZED AND/OR CROSSLINKED PRODUCTS FROM ACETAL- AND ALDEHYDE-CONTAINING POLYSACCHARIDE GRAFT POLYMERS

John J. Tsai, Belle Mead; Patrick G. Jobe, Westfield; Robert L. Billmers, Stockton, and Rama S. Chandran, South Bound Brook, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Sep. 22, 1989, Ser. No. 411,432
Int. Cl.[5] C08G *89/03*
U.S. Cl. 527—312 20 Claims

1. A derivatized graft polymer of a polysaccharide having the structure Sacch-g-[(M—CH=N—Y)$_x$]-g-[(M)$_q$], where Sacch represents a polysaccharide; g represents a graft; M represents a repeating unit derived from one or more ethylenically or allylically unsaturated monomers, at least one of which contains an aldehyde or acetal group; Y represents (a) a monovalent group derived from a water-soluble substituted or unsubstituted aromatic compound containing only one primary amine group, or (b) a monovalent group derived from a water-soluble substituted or unsubstituted aliphatic or cycloaliphatic compound containing only one primary amine group, or (c) a multivalent group derived from a water-soluble protein containing more than one primary amine group; —CH=N—Y is the group formed by the reaction of the aldehyde or acetal group of the monomer repeating unit M with the free primary amine group of Y; x is at least 1; and q is 0 or greater.



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5,049,635

## ROOM TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION

Yoshio Inoue, Annaka, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1990, Ser. No. 467,385
Claims priority, application Japan, Jan. 27, 1989, 1-18332
Int. Cl.[5] C08G *77/06*
U.S. Cl. 528—18 7 Claims

1. A room temperature-curable organopolysiloxane composition which comprises, in admixture:

(a) 100 parts by weight of a diorganopolysiloxane blocked at each molecular chain end with a silanolic hydroxy group;

(b) from 0.5 to 10 parts by weight of an organosilicon compound represented by the general formula

$$R^1R^2Si(—OCMe=CHCOOR^3)_2,$$

in which Me is a methyl group, $R^1$ is a methyl, vinyl, 3,3,3-trifluoropropyl or phenyl group, $R^2$ is a group selected from the class consisting of methyl, vinyl, trimethyl siloxy, vinyl dimethyl siloxy, divinyl methyl siloxy, trivinyl siloxy and 3,3,3-trifluoropropyl dimethyl siloxy groups and $R^3$ is a methyl or ethyl group;

(c) from 0.1 to 5 parts by weight of an organosilane or organosiloxane compound having, in a molecule, at least three groups selected from the class consisting of alkoxy groups, iminoxy groups and alkenyloxy groups bonded to the silicon atom or atoms; and

(d) from 0.05 to 5 parts by weight of an organosilane or organosiloxane compound having, in a molecule, at least one guanidino group represented by the general formula

$$(R^4_2N)_2C=N—,$$

in which $R^4$ is a hydrogen atom or a monovalent hydrocarbon group.

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5,049,636

## ORGANOSOLS OF ORGANOPOLYSILOXANES AND A PROCESS FOR PREPARING THE SAME

Matthias Wolfgruber; Bernward Deubzer; Volker Frey, all of Burghausen, and Helmut Oswaldbauer, Stubenberg/Fürstberg, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,529
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3811155
Int. Cl.[5] C08G *77/04*
U.S. Cl. 528—33 32 Claims

1. Organosols of organopolysiloxanes are prepared by adding water-soluble organic solvents or mixtures thereof or water-soluble mixtures of water-soluble and water-insoluble organic solvents to aqueous colloidal suspensions of organopolysiloxanes which have been obtained by adding an organosilicon compound selected from the group consisting of an alkoxysilane, partial hydrolyzates thereof and mixtures thereof to water in the presence of emulsifiers at a maximum rate of 5 moles of organosilicon compound per hour per liter of water, and thereafter the water is removed by distillation.

5,049,637

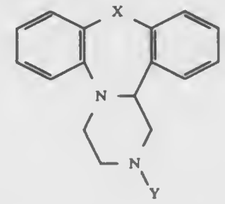
## 1,2,3,4,10,14B-HEXAHYDRODIBENZO[C,F]PYRAZINO-[1,2-A]AZEPINO DERIVATIVES AND 10-AZA, 10-OXA AND 10-THIA ANALOGUES

Frederick C. Copp, Beckenham, England; Alan L. A. Boura, Beaconsfield; William R. Jackson, Glen Waverley, and John D. Cullen, Endeavour Hills, all of Australia, assignors to Monash University, Clayton, and Australasian Drug Development Limited, South Melbourne, both of Australia, a part interest

PCT No. PCT/AU88/00095, § 371 Date Dec. 7, 1989, § 102(e) Date Dec. 7, 1989, PCT Pub. No. WO88/07997, PCT Pub. Date Oct. 20, 1988
PCT Filed Mar. 31, 1988, Ser. No. 427,840
Claims priority, application Australia, Apr. 10, 1987, PI1363
Int. Cl.[5] C07D *487/04*
U.S. Cl. 528—44 30 Claims

1. A compound of the general formula I

(I)



wherein

X=$CH_2$, O, S or $NR^4$, and

$$Y = —(CH_2)_n—\overset{Z}{\overset{\|}{C}}.NR^1R^3$$

where $R^1$=H, lower alkyl or an aryloxyalkyl group wherein the aryl group is optionally substituted by alkyl, alkoxy, halogen, alkyl substituted by halogen, and n is an integer between 0 and 5, and

Z=O, S or $NR^2$

wherein $R^2$=H, lower alkyl, hydroxy, amino, cyano, or acyl,

$R^3$=H or lower alkyl, and

$R^4$=H, lower alkyl, or lower acyl,

and pharmaceutically acceptable salts thereof.

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5,049,638

## PREPOLYMER COMPOSITION UTILIZING POLYOL COMBINATION FOR PRODUCTION OF COATINGS AND FILMS

Yukio Matsumoto, and Nobuaki Kunii, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Division of Ser. No. 229,727, Aug. 2, 1988, Pat. No. 4,945,149.
This application Jun. 29, 1989, Ser. No. 372,890
Claims priority, application Japan, Sep. 6, 1985, 60-196085
Int. Cl.[5] C08G *18/48*
U.S. Cl. 528—61 5 Claims

1. A prepolymer composition for forming a substantially non-porous moisture-permeable coating layer or film of a hydrophilic polyurethane resin by reaction with a curing agent, which prepolymer composition is a polyol combination with a stoichiometrically excess amount of a polyisocyanate compound, said prepolymer having a viscosity of at most 10,000 cp at 25° C., said polyol combination comprising:

(a) from about 50 to about 98% by weight of a polyoxyethylene polyol having an oxyethylene group content of from about 50 to about 90% by weight, at least 5% by weight of $C_3$–$C_4$ alkylene oxide residues, a hydroxyl value of from about 15 to about 60 and at least 3 hydroxyl groups; and

(b) from about 2 to about 50%s by weight of a diol having a molecular weight of from about 62 to about 2,000 which may contain oxyethylene groups;

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provided that the molar equivalent ratio of the component (b) to the component (a) is from about 0.3 to about 3, and the total oxyethylene group content in the components (a) and (b) is from about 75% to about 95% by weight.

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**5,049,639**

## RING-ALKYLATED M-PHENYLENE DIAMINE BLENDS FOR USE IN CURING EPOXY RESINS

**Robson F. Storey, Hattiesburg; Arthur C. Bayer, Ocean Springs, both of Miss., and Sudhakar Dantiki, Toledo, Ohio, assignors to First Chemical Corporation, Pascagoula and The University of Southern Mississippi, Hattiesburg, both of, Miss.**

**Filed Feb. 23, 1989, Ser. No. 314,126**

**Int. Cl.[5] C08G** *59/50*

**U.S. Cl. 528—120** **3 Claims**

1. A method of using a blend of diaminoisopropylbenzene and diaminoethylbenzene in the production of cured epoxy resins comprising mixing a blend of diaminoisopropylbenzene and diaminoethylbenzene with an epoxy resin and subjecting said mixture to conditions sufficient to cure said epoxy resin wherein said diaminoisopropylbenzene is present in an amount of from about 20 to 95 weight percent and said diaminoethylbenzene is present in an amount of from about 5 to 80 weight percent.

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**5,049,640**

## POLYETHERKETONES

**Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Feb. 23, 1989, Ser. No. 314,514**

**Int. Cl.[5] C08G** *8/02, 14/00, 69/14*

**U.S. Cl. 528—125** **23 Claims**

1. A linear alternating polyetherketone polymer wherein moieties of a di(arylene) ketone of from 2 to 4 aromatic rings, at least two of which are connected by a carbonyl group with an additional rings being fused or connected by a direct valence bond, oxy, thio, carbonyl, dioxyphenylene, or dioxydiphenylene, alternate with moieties of an oxyaryl-substituted 1,6-diaza [4.4] spirodilactam having the oxyaryl substituents on the spiro ring nitrogen atoms and, optionally moieties of a di(oxyphenyl)compound.

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**5,049,641**

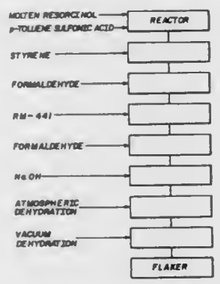
## RUBBER COMPOUNDING RESIN

**Richard T. Hood, Murrysville, and Robert M. Lamars, Pittsburgh, both of Pa., assignors to Indspec Chemical Corporation, Pittsburgh, Pa.**

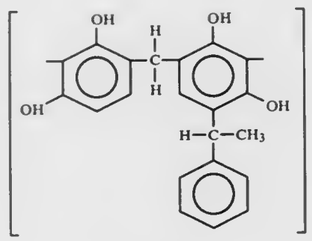
**Filed Jul. 1, 1988, Ser. No. 214,325**

**Int. Cl.[5] C08G** *14/04*

**U.S. Cl. 528—155** **1 Claim**




1. A resorcinol formaldehyde resin having units represented by the formula



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**5,049,642**

## AROMATIC POLYMERS

**Brian N. Hendy, Middlesbrough, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England**

**Filed Dec. 21, 1989, Ser. No. 454,438**

**Claims priority, application United Kingdom, Dec. 23, 1988, 8830076**

**Int. Cl.[5] G01J** *5/00;* **C08G** *65/38, 75/24*

**U.S. Cl. 528—171** **19 Claims**

1. A method of forming an aromatic polymer comprising divalent aromatic units connected by ether (—O—) and/or thioether (—S—) linkages at least one of said divalent aromatic units carrying a sulphonate group (—$SO_3$—), which method comprises polycondensing difunctional monomers having phenolic (—OH) and/or thiophenolic (—SH) and/or halogenic end groups in the presence of a dipolar aprotic solvent, at least to one of which monomers a sulphonic acid (—$SO_3H$) or salt thereof is attached, said at least one monomer comprising monomers of the formula

$$X—Ph_n—Y \qquad (I)$$

wherein:

Ph is phenylene;

X and Y are independently —OH or —SH; and

n is an integer selected from 1 to 3.

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**5,049,643**

## WHOLLY AROMATIC POLYESTER FROM MIXTURE OF NAPHTHALENE DICARBOXYLIC ACID

**Yukihiko Kageyama; Toshio Nakane, and Kenji Hijikata, all of Shizuoka, Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan**

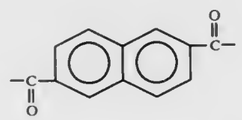
**Filed Mar. 13, 1990, Ser. No. 492,902**

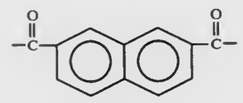
**Claims priority, application Japan, Mar. 13, 1989, 1-60231**

**Int. Cl.[5] C08G** *63/02, 63/18, 8/02;* **C08J** *67/00*

**U.S. Cl. 528—194** **11 Claims**

1. A wholly aromatic polyester capable of forming an article which exhibits excellent transparency and heat resistance consisting of moieties (1), (2), (3), and (4) which are joined to form recurring ester groups wherein:

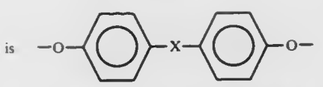
(1) is 

(2) is 

and



-continued

(3) is 

wherein X is at least one group selected from the group consisting of alkylene, alkylidene, —O—, —S—, $SO_2$— and —CO—; wherein moieties (1) and (2) are each present in a concentration of 5 to 95 mole percent based upon the total molar concentration of moieties (1) and (2); and wherein (4) is derived from at least one naphthalenedicarboxylic acid which forms moieties other than moieties (1) and (2) in a concentration of 0 to 15 mole percent.

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**5,049,644**

## FLAME-RESISTANT POLYCARBONATE CONTAINING UNITS FROM HALOGENATED TRIPHENOLBENZAMIDO COMPOUNDS

**Alberto Petri, Milan, Italy, assignor to Enichem Tecnoresine S.p.A., Palermo, Italy**

**Filed Nov. 29, 1989, Ser. No. 442,667**

**Claims priority, application Italy, Dec. 2, 1988, 22833 A/88**

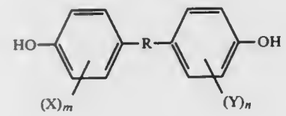
**Int. Cl.[5] C08G** *64/04, 64/14*

**U.S. Cl. 528—202** **9 Claims**

1. A thermoplastic branched polycarbonate of high molecular weight possessing flame resistant properties, from

(1) a carbonate precursor:

(2) at least one dihydroxyaromatic compound of the formula:

(I) 

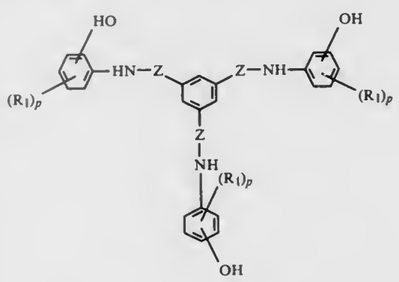
where:

R is a single bond, or R is a substituted or nonsubstituted linear or branched $C_1$–$C_5$ alkylene or R is selected from the group consisting of O, S, $SO_2$ and CO;

X and Y, which are the same or different, are H or $CH_3$;

m and n, which are the same or different, are whole numbers from 1 to 4; and

(3) at least one halogenated triphenolbenzamido compound of the formula:

(II) 

where:

Z is selected from the group consisting of CO and $SO_2$;

$R_1$ is chlorine or bromine; and

p is 1 or 2.

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**5,049,645**

## PREPARATION METHOD OF AMINO RESIN PARTICULATE HAVING NARROW PARTICLE SIZE DISTRIBUTION

**Muneo Nagaoka, London, United Kingdom, and Saburo Hayano, Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan**

**Filed Mar. 12, 1990, Ser. No. 495,695**

**Claims priority, application Japan, Mar. 14, 1989, 1-059685**

**Int. Cl.[5] C08G** *12/06*

**U.S. Cl. 528—230** **4 Claims**



1. A continuous preparation method of an amino resin particulate having a maximum particle size of 40 μm or less and an average particle size of from 5 to 15 μm, comprising the steps of reacting an amino compound with an aldehyde in the presence of an acid catalyst in an aqueous solution to form a solid product and classifying said solid product in the form of a slurry with a combination of at least two grinders and at least two classifiers.

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**5,049,646**

## POLYESTERS AND TONERS MADE THEREWITH WHICH ABSORB ULTRAVIOLET LIGHT

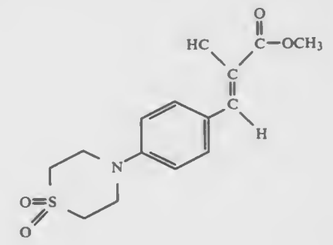
**Dinesh Tyagi, Fairport, and John C. Wilson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Nov. 13, 1989, Ser. No. 434,377**

**Int. Cl.[5] C08G** *63/685, 63/688*

**U.S. Cl. 528—272** **1 Claim**

1. An amorphous, thermoplastic polyester resin having an inherent viscosity in the range of about 0.05 to about 0.80 in methylene chloride solution at a concentration of 0.25 grams of polymer per 100 milliliters of solution, a glass transition temperature in the range of about 50° to about 120° C., and a fusing point in the range of about 65° to 200° C., said polymer containing as an integral part of the polymer backbone thereof about 0.10 to about 100 more ratio of ultraviolet light absorbing residue on a a total acid or hydroxy monomer basis, said residues being derived from at least one methine compound characterized by the formula:



5,049,647

## METHOD FOR THE REDUCTION OF IMPURITIES IN POLYESTER RESINS

Hussain A. Al-Ghatta, Fiuggi, Italy, assignor to Cobarr S.p.A., Anagni, Italy

Filed Dec. 27, 1988, Ser. No. 289,911
Int. Cl.[5] C08G *63/89*
U.S. Cl. 528—272 5 Claims

1. A method for purifying polyethyleneterephthalate based materials comprising: contacting the polyethyleneterephthalate materials with an atmosphere comprising carbon dioxide under supercritical conditions of temperature and pressure.

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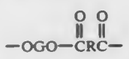
5,049,648

## THERMOPLASTIC COPOLYESTER ELASTOMER BINDER

Guenther K. Hoeschele, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

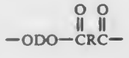
Continuation-in-part of Ser. No. 140,251, Dec. 31, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,151
Int. Cl.[5] C08G *63/66*
U.S. Cl. 528—301 6 Claims

1. A segmented thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring intralinear long chain and short chain ester units connected head-to-tail through ester linkages, said long chain ester units being represented by the following structure:



(a)

and said short chain ester units being represented by the following structure:



(b)

wherein

G is a divalent radical remaining after removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a carbon-to-oxygen ratio of about 2.0–4.3 and a molecular weight of about 600–6000;

R is a divalent radical remaining after the removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300; and

D is a divalent radical remaining after removal of hydroxyl groups from a low molecular weight diol having a molecular weight less than about 250;

with the proviso that the short chain ester units constitute about 25–65% by weight of the copolyester, at least about 75% of the R groups are 1,3-phenylene radicals, at least about 75% of the D groups are 1,4-butylene radicals, and the sum of the percentages of the R groups which are not 1,3-phenylene radicals and the D groups which are not 1,4-butylene radicals cannot exceed about 25%; said copolyester being further characterized by a melt index at 120° C. by ASTM D1238 of about 2–25 gram/10 minutes.

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5,049,649

## COLORLESS FILMS FORMED FROM FLUORINATED POLYIMIDES

H. Vora Rohitkumar, West Warwick, R.I., assignor to Hoechst Celanese Corp., Somerville, N.J.

Continuation of Ser. No. 217,795, Jul. 12, 1988, abandoned. This application Dec. 27, 1989, Ser. No. 462,276
Int. Cl.[5] C08G *12/00, 63/00, 69/26*
U.S. Cl. 528—353 6 Claims

1. A colorless, optically clear film consisting essentially of a polyimide of the formula:

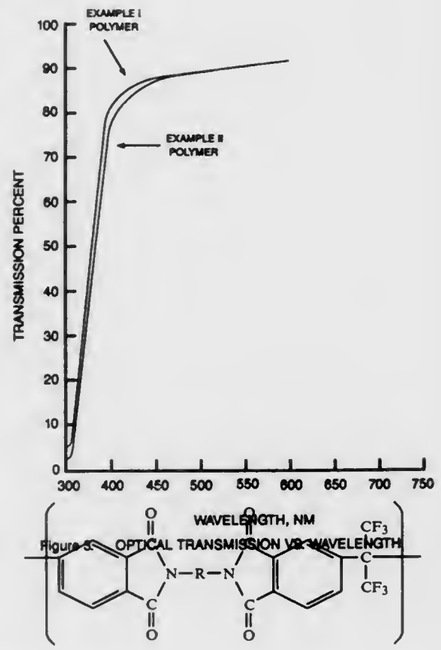
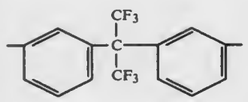
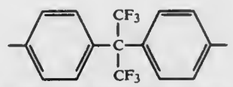



Figure 3. OPTICAL TRANSMISSION VS. WAVELENGTH

wherein R is



or



and wherein said composition has a weight average molecular weight, $M_w$ of at least 100,000, and wherein said film has as an essential characteristic at least 80% optical transmission at electromagnetic wavelengths of 400 nanometers and above when formed into a thickness of two thousandths of an inch; said film being free-standing and flexible, and also being formed from a fully imidized precursor which was synthesized in accordance with the process of:

(a) dispersing a diamine and a dianhydride in a first solvent and polymerizing the reactants at a temperature of below about 35 degrees Celsius to form a polyamic acid;

(b) chemically cyclizing said polyamic acid to form a polyimide of said reactants while maintaining the temperature below about 35 degrees Celsius; and

(c) precipitating said polyimide reaction product by dissolving said first solvent in a second solvent in which said polyimide is not solvable.



5,049,650

## POLYMERIZATION OF CO/NON-CONJUGATED DIENE/DIOL

Eit Drent, and Anthonius J. M. Breed, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 18, 1989, Ser. No. 451,918
Claims priority, application United Kingdom, Dec. 29, 1988, 8830333
Int. Cl.[5] C08G *67/02*
U.S. Cl. 528—392 10 Claims

1. A process for the production of a polyester polymer by contacting carbon monoxide, a non-conjugated diene and a diol, under polymerization conditions in the substantial absence of water, in the presence of a catalyst composition formed from a palladium compound, a tertiary monodentate phosphorus ligand, optionally a tertiary bidentate phosphorus ligand, and up to 1 mol per mol of total phosphine of an oxygen containing protonic acid having a pKa below 2.

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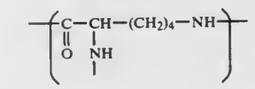
5,049,651

## PROCESS FOR THE PREPARATION OF BRANCHED (CO)POLYAMIDES BY SOLID PHASE POST-CONDENSATION, AND CORRESPONDING (CO)-POLYAMIDES

Hans-Detlef Heinz, and Rolf-Volker Meyer, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Sep. 1, 1989, Ser. No. 402,886
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831708
Int. Cl.[5] C08G *69/46*
U.S. Cl. 528—480 4 Claims

1. A process for the solid phase post-condensation of a (co)-polyamide prepared by melt polycondensation from at least one lactam, diamine/dicarboxylic acid mixtures, nylon salts or a derivative thereof, or aminocarboxylic acids or a derivative thereof, and a lysine/polycarboxylic acid reactant, wherein the (co)polyamide contains 0.1 to 2.0% by weight of lysine segments of the formula



and about equivalent amounts thereto of polycarboxylic acid segments, the process comprising heating the (co)polyamide in vacuo or under an inert gas for 0.5 to 30 hours at a temperature of 140° to 250° C. which is at least 10° C. under the melting point of (co)polyamide.

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5,049,652

## USE OF A MIXED CATALYST SYSTEM TO IMPROVE THE VISCOSITY STABILITY OF ROSIN RESINS

James Minn, Hattiesburg, Miss., assignor to Hercules Incorporated, Wilmington, Del.

Filed Nov. 30, 1990, Ser. No. 621,113
Int. Cl.[5] C09F *1/00*
U.S. Cl. 530—213 9 Claims

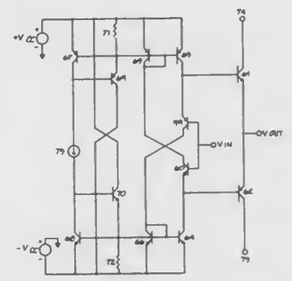
1. In a process for preparing a rosin ester having improved viscosity stability wherein rosin is esterified by heating a mixture of rosin and a polyol in the presence of a catalyst, the improvement comprising esterifying the rosin in the presence of a catalyst mixture of 0.1% to 0.6% by weight calcium bis-(ethyl 3,5-di-t-butyl-4-hydroxybenzyl phosphonate) and 0.02% to 1.0% by weight of a second calcium compound selected from calcium carbonate, calcium oxide and a calcium salt of an aliphatic carboxylic acid, all percentages being based on the weight of rosin.

5,049,653

## WIDEBAND BUFFER AMPLIFIER WITH HIGH SLEW RATE

Steven O. Smith, and Kerry A. Thompson, both of Fort Collins, Colo., assignors to Comlinear Corporation, Ft. Collins, Colo.

Continuation of Ser. No. 305,789, Feb. 2, 1989, abandoned. This application Jul. 17, 1990, Ser. No. 554,275
Int. Cl.[5] H03F *3/30*
U.S. Cl. 330—267 24 Claims



23. A wideband buffer amplifier, comprising:

a unity gain buffer amplifier having an input terminal for receiving an input signal and an output terminal, said unit gain buffer amplifier including a first transistor having a collector and a first base, and a second transistor having a second base, wherein said first base and said second base are operatively connected to said input terminal;

first means for sensing, in response to information provided by said collector of said first transistor, a rate of increase in said input signal and proportionately increasing a bias of said second transistor of said unity gain buffer amplifier; and

second means for providing a bias of said first transistor, said second means having a third transistor;

wherein said third transistor is directly connected to said first transistor.

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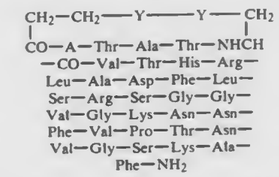
5,049,654

## CALCITONIN GENE RELATED PEPTIDE DERIVATIVES

Kaoru Morita; Toyonobu Uzawa; Masayuki Hori, and Toshiharu Noda, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Dec. 4, 1987, Ser. No. 128,950
Claims priority, application Japan. Dec. 4, 1986, 61-289597; Dec. 25, 1986, 61-310585
Int. Cl.[5] C07K *7/36*
U.S. Cl. 530—307 5 Claims

1. A compound of the formula



wherein Y is sulfur or methylene and A is Asn or Asp, or a pharmaceutically acceptable salt thereof.

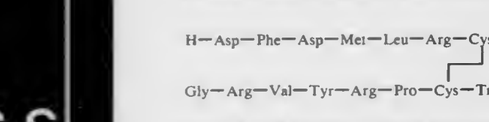
5,049,655

## MELANIN-CONCENTRATING HORMONES

Joan Vaughan, San Diego; Wolfgang H. Fischer, Solano Beach; Jean E. F. Rivier, La Jolla; Jean-Louis M. Nahon; Francoise G. Presse, both of San Diego, and Wylie W. Vale, Jr., La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Mar. 22, 1989, Ser. No. 326,984
Int. Cl.[5] C07K *7/64;* C12N *15/16*
U.S. Cl. 530—326 5 Claims

1. An essentially pure, cyclic, mammalian hormone, which hormone consists essentially of the following formula:



H—Asp—Phe—Asp—Met—Leu—Arg—Cys—Met—Leu—

Gly—Arg—Val—Tyr—Arg—Pro—Cys—Trp—Gln—Val—OH,

or is a physiologically acceptable salt of said mammalian hormone.

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5,049,656

## SEQUENTIAL PEPTIDE AND OLIGONUCLEOTIDE SYNTHESES USING IMMUNOAFFINITY TECHNIQUES

William Lewis; Jay Stout; Gino Van Heeke; Dwane E. Wylie; Sheldon M. Schuster, all of Lincoln, and Fred W. Wagner, Walton, all of Nebr., assignors to Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Dec. 21, 1988, Ser. No. 288,009
Int. Cl.[5] C07K *1/04*
U.S. Cl. 530—334 15 Claims

1. A method for the synthesis of a polypeptide which comprises:

(a) preparing a C-terminus blocked peptide of at least one amino acid in length;

(b) reacting an N-blocked, C-activated amino acid with the C-terminus blocked peptide to produce a mixture of an extended peptide and an unreacted peptide;

(c) adding an antigenic N-terminus capping agent to the mixture to antigenically cap the unreacted peptide, wherien the antigenic N-terminus capping agent is an aromatic acylating capping agent that reacts with amine groups;

(d) combining the mixture of antigenically capped unreacted peptide and extended peptide with antibodies that are selective for the antigenic cap; and

(e) isolating the extended peptide thereby producing the polypeptide.

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5,049,657

## PROCESS FOR HYDROLYSIS OF PEPTIDE OR PROTEIN

Akira Tsugita, Osaka, Japan; Hans W. Mewes, Schönau, Fed. Rep. of Germany, and Tatsuaki Ataka, Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Japan

Filed Dec. 24, 1985, Ser. No. 813,043
Claims priority, application Japan, Dec. 25, 1984, 59-279312
Int. Cl.[5] C07K *3/10, 1/12*
U.S. Cl. 530—343 11 Claims

1. A process for hydrolysis of peptide or protein comprising the steps of:

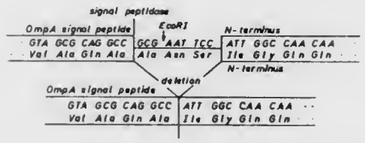
immobilizing peptide or protein in a solid phase in the form of a thin film on a solid surface; and exposing said immobilized peptide or protein to a gas phase of acid mixture to hydrolyze the immobilized peptide or protein by reaction between the solid phase and the gas phase.

5,049,658

## POLYPEPTIDE WITH CELL-SPREADING ACTIVITY

Fusao Kimizuka, Ohmihachiman; Tatsuru Kinoshita, Kyoto; Yoh'ichi Ohdate, Amagasaki; Yuki Sugahara, Otsu, and Ikunoshin Kato, Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Dec. 29, 1988, Ser. No. 291,894
Claims priority, application Japan, Jan. 5, 1988, 63-148
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—350 1 Claim




1. A polypeptide with cell-spreading activity which has the following amino acid sequence:

Ala Val Pro Pro Pro Thr Asp Leu Arg Phe

Thr Asn Ile Gly Pro Asp Thr Met Arg Val

Thr Trp Ala Pro Pro Pro Ser Ile Asp Leu

Thr Asn Phe Leu Val Arg Tyr Ser Pro Val

Lys Asn Glu Glu Asp Val Ala Glu Leu Ser

Ile Ser Pro Ser Asp Asn Ala Val Val Leu

Thr Asn Leu Leu Pro Gly Thr Glu Tyr Val

Val Ser Val Ser Ser Val Tyr Gly Gln His

Glu Ser Thr Pro Leu Arg Gly Arg Gln Lys

Thr Gly Leu Asp Ser Pro Thr Gly Ile Asp

Phe Ser Asp Ile Thr Asn Ala Ser Phe Thr

Val His Trp Ile Ala Pro Arg Ala Thr Ile

Thr Gly Tyr Arg Ile Arg His His Pro Glu

His Phe Ser Gly Arg Pro Arg Glu Asp Arg

Val Pro His Ser Arg Asn Ser Ile Thr Leu

Thr Asn Leu Thr Pro Gly Thr Glu Tyr Val

Val Ser Ile Val Ala Leu Asn Gly Arg Glu

Glu Ser Pro Leu Leu Ile Gly Gln Gln Ser

Thr Val Ser Asp Val Pro Arg Asp Leu Glu

Val Val Ala Ala Thr Pro Thr Ser Leu Leu

Ile Ser Trp Asp Ile Thr Tyr Gly Glu Thr

Gly Gly Asn Ser Pro Val Gln Glu Phe Thr

Val Pro Gly Ser Lys Ser Thr Ala Thr Ile

Ser Gly Leu Lys Pro Gly Val Asp Tyr Thr

Ile Thr Val Tyr Ala Val Thr Gly Arg Gly

Asp Ser Pro Ala Ser Ser Lys Pro Ile Ser

Ile Asn Tyr Arg Thr Glu Ile Asp Lys Pro

Ser Gln Met.



5,049,659

## PROTEINS WHICH INDUCE IMMUNOLOGICAL EFFECTOR CELL ACTIVATION AND CHEMATTRACTION

Harvey I. Cantor, Wellesley; Roberto M. Patarca, Brookline, and Joel L. Schwartz, Newton Centre, all of Mass., assignors to Dana Farber Cancer Institute, Boston, Mass.

Filed Feb. 9, 1988, Ser. No. 153,887
Int. Cl.[5] C07K *13/00*
U.S. Cl. 530—351 25 Claims

1. An essentially pure protein comprising a protein expressed by lymphoid cells, which protein is encoded by a DNA sequence as depicted in FIG. 2B, which is characterized by the ability to bind to mast cells, macrophages and T lymphocytes.

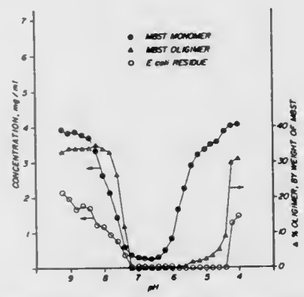
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5,049,660

## METHOD FOR PURIFYING SOMATOTROPIN MONOMERS

Stephen B. Storrs, Glencoe, Mo., and Jeffrey S. Schorey, San Antonio, Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 28, 1990, Ser. No. 486,476
Int. Cl.[5] C07K *3/24*
U.S. Cl. 530—419 41 Claims




1. A method for the separation of somatotropin proteins which comprises

a. obtaining a mixture of somatotropin proteins comprising somatotropin monomers and somatotropin oligomers in aqueous solution at a pH greater than about 7;

b. preferentially precipitating somatotropin oligomers from said solution while maintaining a major portion of somatotropin monomers in solution by reducing the pH of said solution to less than about 6; and

c. removing the precipitate to recover the somatotropin proteins remaining in solution.

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5,049,661

## SULFONATION OF LIGNINS

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 19, 1989, Ser. No. 298,677
Int. Cl.[5] C08H *5/02*
U.S. Cl. 530—500 8 Claims

1. A method of producing a sulfonated water-soluble lignin consisting essentially of dissolving a dry lignin compound, recovered as a by-product of the kraft or sulfite wood pulping processes, with sulfuric acid having a concentration of at least about 95% while maintaining the temperature of the reaction below about 40 °C. for a sufficient time to sulfonate the lignin compound.

5,049,662

## KIT FOR DIAGNOSING CANCER METASTATIC POTENTIAL

Patricia S. Steeg, Ellicott City; Lance A. Liotta, Potomac; Mark E. Sobel, and Generoso Bevilacqua, both of Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 13, 1987, Ser. No. 107,098
Int. Cl.[5] C07H *15/12, 17/00;* C12Q *1/68*
U.S. Cl. 536—27 4 Claims

1. Isolated, synthetic NM23 gene.

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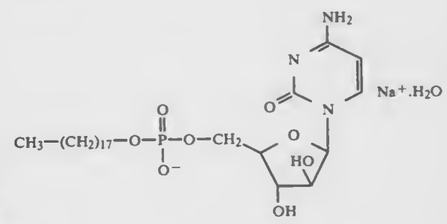
5,049,663

## PROCESS FOR PRODUCING 1-β-D-ARABINOFURANOSYLCYTOSINE-5'-STEARYL-PHOSPHATE MONOSODIUM SALT AND MONOHYDRATE THEREOF

Takashi Terada, Yono; Minoru Aoki, Tokyo; Hiroshi Ohtaki, Yono, and Manami Morozumi, Choshi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo and Yamasa Shoyu Kabushiki Kaisha, Chiba, both of, Japan

Continuation-in-part of Ser. No. 124,930, Nov. 24, 1987, which is a division of Ser. No. 28,951, Mar. 23, 1987, Pat. No. 4,812,560.
This application Aug. 25, 1989, Ser. No. 399,303
Claims priority, application Japan, Mar. 24, 1986, 61-63963; May 21, 1986, 61-114680
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[5] C07H *19/10, 1/00*
U.S. Cl. 536—29 3 Claims

1. 1-β-D-arabinofuranosylcytosine-5'-stearylphophate monosodium salt monohydrate having the melting point of about 218 to 226° C. (decomposition), which is represented by the formula:




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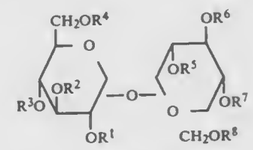
5,049,664

## TREHALOSE DERIVATIVES

Junji Yoshinaga, Neyagawa; Takeshi Shogaki, Suita; Takao Kakita, Toyanaka; Hiromi Ozeki, Osaka, and Yoshiko Kato, Nishinomiya, all of Japan, assignors to Sawai Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 16, 1989, Ser. No. 394,714
Claims priority, application Japan, Aug. 26, 1988, 63-213307; Apr. 11, 1989, 1-92791
Int. Cl.[5] C07H *13/00, 15/00*
U.S. Cl. 536—119 19 Claims

1. A trehalose derivative of the formula;




(I)

wherein one, two, three of four of $R^1$, $R^2$, $R^3$, $R^4$, $R^5$, $R^6$, $R^7$,

and $R^8$ are independently selected from the group consisting of unsubstituted or substituted $C_{1-40}$ aliphatic acyl groups and all the rest of them are hydrogen atoms wherein the substituted aliphatic group contains at least one substituent selected from the group consisting of hydroxy, methoxy, epoxy, oxo, carboxy, protected carboxy, methylene, 2, 6, 6-tremethyl-1-cyclehexen-b 1-yl, alkylcycloalkyl, cycloalkenyl, protected hdyroxy wherein the hydoxy protected group is selected from the group consisting of α-aryl (lower) alkyl,trifluoro-, chloro-, methoxy- or aryloxy-acetyl, (lower) alkoxy carbonyl, 2-tetrahydropyranyl, 2-tetrahydrothiopyranyl, tri (lower alkylsilyl, tri (lower) alkylmethyl, 1-(α-aryl (lower) alkyloxycarbonyl amino)-2, 2, 2-trifluoreoethyl, 2-(α-aryl (lower) alkyloxy carbonyl) benzoyl, tri (lower) alkylmethyloxy carbonyl, arylcarbonyl(lower)alkylcarbonyl, lower alkylidene which may be substituted with monocyclic aryl, lower alkoxy and oxo and polysiloxanediyl with the proviso that:

a) when one of them is $C_{1-40}$ aliphatic acyl group, then it is not 2-palmitoyl or 6-aliphatic acyl,

(b when two of them are $C_{1-40}$ aliphatic acyl group, then they are not located at corresponding positions with each other,

c) when three of them are $C_{1-40}$ aliphatic acyl groups, then they are not 2,3,2'-tripalmitoyl, and

d) when four of them ar $C_{1-40}$ aliphatic acyl groups, then they are not located at corresponding positions with each other or at 2,3,4,2'- or 2,3,6,2'-positions.

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**5,049,665**

## CEPHALOSPORIN DERIVATIVES

**Susumu Nakagawa, Okazaki; Hiroshi Fukatsu, Nagoya; Yoshiaki Katoh, Okazaki, and Satoshi Murase, Nagoya, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 161,100, Feb. 26, 1988, Pat. No. 4,918,070. This application Sep. 29, 1989, Ser. No. 414,389**

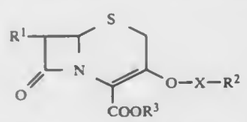
**Claims priority, application Japan, Feb. 27, 1987, 62-44166; Dec. 24, 1987, 62-327695**

**The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.**

**Int. Cl.[5] C07D** *501/59;* **A61K** *31/545*

**U.S. Cl. 540—222** **2 Claims**

1. A cephalosporin derivative having the formula:



(I)

wherein $R^1$ is a substituted amino group selected from the group consisting of:

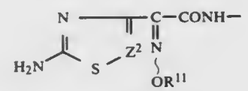
(i) $R^4—C(=N\ OR^5)—CONH—$ group, wherein $R^4$ is a phenyl, naphthyl, furanyl, thienyl, thiazolyl, 1,2,4-thiadiazolyl, pyridyl, isothiazolyl, oxazolyl, pyrimidyl group which may be substituted; $R^5$ is a hydrogen atom or a $C_{1-6}$ alkyl, $C_{3-6}$ cycloalkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, phenyl, naphthyl, benzyl, phenethyl, naphthylmethyl, pyridyl, furanyl, thienyl, imidazolyl, thiazolyl, isothiazolyl, isoquinolyl, quinolyl, oxazolyl, isoxazolyl, tetrazolyl group which may be substituted;

(ii) $R^4—C(=C(—R^6)—R^7)—CONH—$ group, wherein $R^4$ is a phenyl, naphthyl, furanyl, thienyl, thiazolyl, 1,2,4-thiadiazolyl, pyridyl, isothiazolyl, oxazolyl, pyrimidyl group which may be substituted; each of $R^6$ and $R^7$, which may be the same or different, is a hydrogen atom, a halogen atom or a $C_{1-6}$ alkyl, phenyl, naphthyl, benzyl, phenethyl, naphthylmethyl group which may be substituted;

(iii) $R^8—(Z^1)_n—CH(—R^9)—CONH—$ group, wherein $R^8$ is a $C_{1-6}$ alkyl, $C_{2-6}$ alkenyl, phenyl, naphthyl, furanyl, thienyl, benzothienyl, pyridyl, tetrazolyl, oxazolyl group which may be substituted and $R^9$ is a hydrogen atom, carboxyl group, an amino group, a sulfo group, a sulfamoyl group, a carbamoyl group, a hydroxyl group, a formyloxy group, a carbamoyloxy group, $Z^1$ is an oxygen atom or a sulfur atom and n is 0 or 1;

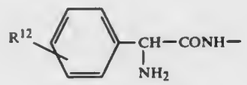
(iv) $R^{10}—CONH—$ group, wherein $R^{10}$ is pyridyl, imidazolyl, piperazinyl, thiazolyl or oxazolyl group which may be substituted;

(v)



wherein $Z^2$ is a carbon atom or a nitrogen atom and $R^{11}$ is a hydrogen atom, a $C_{1-6}$ alkyl, $C_{3-16}$ cycloalkyl, $C_{2-6}$ alkenyl, $C_{2-6}$ alkynyl, phenyl, naphthyl, benzyl, phenethyl, naphthylmethyl, pyridyl, furanyl, thienyl, imidazolyl, thiazolyl, isothiazolyl, isoquinolyl, quinolyl, oxazolyl, isoxazolyl, tetrazolyl group which may be substituted; and

(vi)



wherein $R^{12}$ represents one or two substituents selected from the group consisting of a hydrogen atom, a hydroxyl group, an acetoxy group and a halogen atom;

X is an alkylene group, $R^2$ is imidazolyl or pyrrolidinyl which may be substituted by one or more substituents selected from the group consisting of a halogen atom, a methyl group, an ethyl group, a propyl group, a hydroxymethyl group, an aminomethyl group, a sulfomethyl group, a carboxymethyl group, a cyanomethyl group, a fluoromethyl group, a chloromethyl group a difluoromethyl group, a trifluoromethyl group, a carbamoylmethyl group, an N-methylcarbamoylmethyl group, a sulfamoylmethyl group, an oxo group an N-methylaminomethyl group, an amino group, a methylamino group, a dimethylamino group, an ethylamino group, a methoxy group, an ethoxy group, a fluoromethyl group, a difluoroethoxy group, a trifluoroethyl group, a sulfamoyl group, a carboxyl group, a methoxycarbonyl group, a cyano group, a nitro group, a vinyl group, an allyl group, a propargyl group, an ethynyl group, an acetoxy group, a formyloxy group, a carbamoyloxy group, an N-methylcarbamoyloxy group, an acetamide group, a formamide group, an acetyl group, a fluoroacetyl group, a difluoroacetyl group, a trifluoroaetyl group, a hydroxyl group, a cyclopropyl group, a cyclobutyl group, a cyclopentyl group, and a cyclohexyl group and $R^3$ is a hydrogen atom, a negative charge or a residue of an ester which can form a pharmaceutically acceptable ester hydrolyzable in a living body; or a pharmaceutically acceptable salt thereof.

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**5,049,666**

## WATER SOLUBLE TMC-CROWN FORMAZANS FOR DETECTING LITHIUM

**Cheng-I Lin, and Marcel Pirio, both of San Jose, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.**

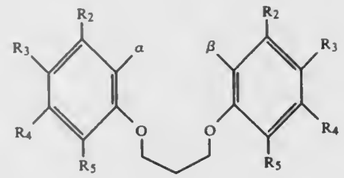
**Division of Ser. No. 866,821, May 23, 1986, Pat. No. 4,742,010. This application Mar. 4, 1988, Ser. No. 164,025**

**Int. Cl.[5] D06P** *50/04*

**U.S. Cl. 540—469** **17 Claims**

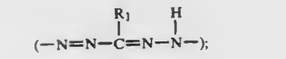
1. A compound of the formula:





wherein:

α and β are taken together to form



wherein:

$R_1$ is an electron withdrawing group selected from the group consisting of $—NO_2$, $—SO_2CF_3$, $CONX_2$, $—SO_2NX_2$ and —CN, and X is independently selected from the group consisting of hydrogen, methyl and ethyl;

$R_2$ and $R_5$ are independently selected from the group consisting of hydrogen, methoxy, carboxymethoxy, nitro, chlorine, fluorine and bromine;

$R_3$ and $R_4$ are independently selected from the group consisting of hydrogen and a hydrophilic substituent consisting of from one to twelve atoms other than hydrogen, which atoms are selected from the group consisting of carbon, oxygen, nitrogen, phosphorous, sulfur and halogen; with the proviso that not more than three of $R_3$ and $R_4$ are hydrogen.

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**5,049,667**

## NITROGEN-CONTAINING CYCLIC LIGANDS

**Michel Schaefer, Chilly-Mazarin; Didier Doucet, Livry-Gargan; Bruno Bonnemain, Villeparisis; Dominique Meyer, Paris, and Dominique Paris, Aulnay-Sous-Bois, all of France, assignors to Guerbet S.A., Villepinte, France**

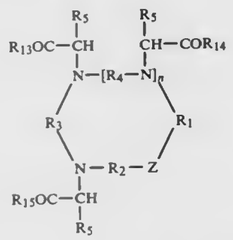
**Continuation-in-part of Ser. No. 181,056, Apr. 13, 1988, abandoned. This application Oct. 16, 1989, Ser. No. 421,592**

**Claims priority, application France, Apr. 14, 1987, 87 05288; Oct. 14, 1988, 88 13585**

**Int. Cl.[5] C07D** *259/00, 257/02*

**U.S. Cl. 540—474** **12 Claims**

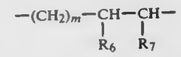
1. A ligand having the formula:



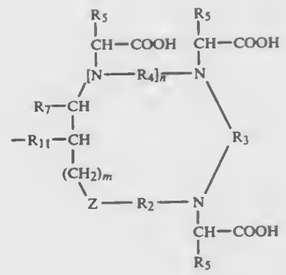
(I)

in which

$R_1$ represents a radical of the formula:



$R_6$ being selected from the group consisting of $C_1$–$C_{18}$ alkyl, $C_1$–$C_6$ hydroxyalkyl, $C_1$–$C_6$ polyhydroxyalkyl and a group of the formula:

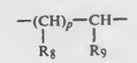


$R_{11}$ being selected from the group consisting of $C_1$–$C_8$ alkylene,

$R_7$ being selected from the group consisting of hydrogen, $C_1$–$C_{14}$ alkyl, $C_1$–$C_6$ hydroxyalkyl and $C_1$–$C_6$ polyhydroxyalkyl,

m=0 or 1,

$R_2$, $R_3$, $R_4$, identical or different represent a radical of the formula

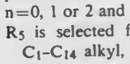


$R_8$ and $R_9$, identical or different, being selected from hydrogen, $C_1$–$C_{14}$ alkyl, $C_1$–$C_6$ hydroxyalkyl and $C_1$–$C_6$ polyhydroxyalkyl,

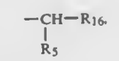
p=1 or 2,

n=0, 1 or 2 and

$R_5$ is selected from the group consisting of hydrogen, $C_1$–$C_{14}$ alkyl, $C_1$–$C_6$ hydroxyalkyl and $C_1$–$C_6$ polyhydroxyalkyl, and Z is selected from the group consisting of oxygen and a group of the formula:



$R_{10}$ being selected from the group consisting of hydrogen, $C_1$–$C_{14}$ alkyl, $C_1$–$C_6$ hydroxyalkyl, $C_1$–$C_4$ polyhydroxyalkyl, a group of the formula



$R_5$ having the meaning given previously

$R_{13}$, $R_{14}$, $R_{15}$ and $R_{16}$, identical or different being selected from the group consisting of hydroxy and a group of the formula



$R_{17}$ and $R_{18}$, identical or different being selected from the group consisting of hydrogen, $C_1$–$C_{14}$ alkyl, $C_1$–$C_6$ hydroxyalkyl and $C_1$–$C_6$ polyhydroxyalkyl, as well as salts thereof.

**5,049,668**

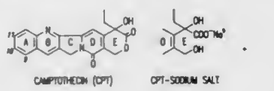
## 10,11-METHYLENEDIOXY-20(RS)-CAMPTOTHECIN ANALOGS

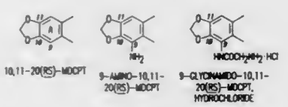
**Monroe E. Wall, Chapel Hill; Mansukh C. Wani, Durham; Allan W. Nicholas, and Govindarajan Manikumar, both of Raleigh, all of N.C., assignors to Research Triangle Institute, Research Triangle Park, N.C.**

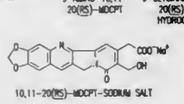
**Filed Sep. 15, 1989, Ser. No. 407,749**

**Int. Cl.[5] A61K** *31/47;* **C07D** *491/147, 491/22*

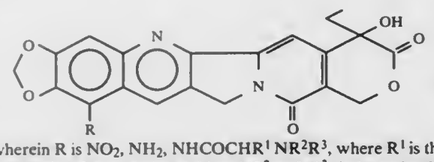
**U.S. Cl. 540—481** **18 Claims**



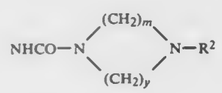




1. A camptothecin analog having the structure shown below:



wherein R is $NO_2$, $NH_2$, $NHCOCHR^1NR^2R^3$, where $R^1$ is the side-chain of an α-amino acid and $R^2$ and $R^3$, independently, are hydrogen or a lower alkyl group or $R^3$ is a peptide unit containing 1-3 amino acid units bonded to the nitrogen through a peptide bond, NHCO-$C_{2-8}$-alkylene-X or NHCO-$C_{2-8}$-alkenylene-X, where X is COOH, COO-$C_{1-12}$ alkyl or CONR—$(CH_2)_n$—$NR^2R^3$, N=1-10 and $R^2$ and $R^3$ are as defined above, NHCO-Z-$(CH_2)_n$—$NR^2R^3$, where Z=oxygen or NH, or



where M+y=3-6 and salts thereof.

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**5,049,669**

## ANALGESIC PHENOTHIAZINE DERIVATIVES

**Claude Garret, Fontenay sous Bois; Claude Guyon, Saint Maur des Fosses; Bernard Plau, Fresnes, and Gerard Taurand, Creteil, all of France, assignors to Rhone-Poulenc Sante, Antony, France**

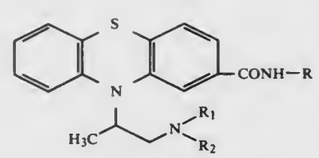
**Filed Jun. 12, 1989, Ser. No. 364,155**

**Claims priority, application France, Jun. 10, 1988, 88 07770**

**Int. Cl.[5] A61K** *31/54;* **C07D** *279/24, 417/06*

**U.S. Cl. 514—226.2** **20 Claims**

1. Compounds of the formula:



in which R is an alkyl radical containing 1 to 6 carbon atoms in a straight or branched chain and $R_1$ and $R_2$, which maybe identical or different, are linear or branched alkyl radicals containing 1 to 4 carbon atoms or form, together with the nitrogen atom to which they are attached, a heterocycle selected from the group consisting of pyrrolyl, piperidinyl, perhydroazepinyl, optical isomers of the asymmetric carbon and acid addition salt thereof.

9. A method of obtaining analgesia in a human or animal subject comprising administering to the subject an analgesic effective amount of a phenothiazine compound as claimed in claim 1.

15. A method of obtaining a diuretic effect in a human or animal subject comprising administering to the subject a diuretic effective amount of a phenothiazine compound as claimed in claim 1.

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**5,049,670**

## PERFLUOROAMINOETHERS

**George G. I. Moore, Afton, and John C. Hansen, Lakeland, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 236,033, Aug. 24, 1988, Pat. No. 4,927,725, which is a division of Ser. No. 894,311, Aug. 14, 1986, Pat. No. 4,788,339, which is a continuation-in-part of Ser. No. 773,314, Sep. 16, 1985, abandoned. This application Feb. 21, 1990, Ser. No. 482,829**

**The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.**

**Int. Cl.[5] C07D** *265/30, 211/22, 207/09*

**U.S. Cl. 544—87** **9 Claims**

1. Perfluoroaminoethers having two or more tertiary amino nitrogen atoms each of which is connected to the other(s) adjacent thereto by (1) a catenary, ether oxygen-containing, perfluoroalkylene linking group the catenary carbon atoms of which are in the form of perfluoroalkylene segments of vicinal carbon atoms that are 2 to 3 in number, said segments having up to 5 carbon atoms, (2) a catenary ether oxygen-containing perfluorocyclohexylene linking group, or (3) a catenary ether oxygen-containing linking group having said perfluoroalkylene segments and perfluorocyclohexylene moieties, the sum of the catenary ether oxygen atoms in said linking groups being 1 to 6 and each of the terminal amino nitrogen atoms being parts of a 5- or 6-member ring, with the proviso that said ring be substituted by one or more $—CF_3$, $—C_2F_5$, or $—C_3F_7$ substituents or contain either oxygen or additional tertiary amino nitrogen as ring atoms.

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**5,049,671**

## 6-SUBSTITUTED PURINE CARBOCYCLIC NUCLEOSIDES

**Susan M. Daluge, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.**

**Continuation-in-part of Ser. No. 371,789, Jun. 27, 1989, abandoned. This application Dec. 22, 1989, Ser. No. 455,538**

**Claims priority, application United Kingdom, Jun. 27, 1988, 8815265.7**

**Int. Cl.[5] C07D** *473/16, 473/18, 473/24*

**U.S. Cl. 544—276** **5 Claims**

1. A compound (±)-cis-4-(2-amino-6-(allylthio)-9H-purin-9-yl)-2-cyclopentene-1-methanol.



**5,049,672**

## COMPLEX-FORMING POLYMERS AND PROCESSES TO PREPARE THEM

**Johan Stapersma, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.**

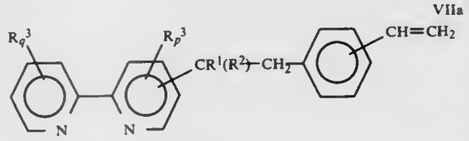
**Division of Ser. No. 295,615, Jan. 9, 1989, Pat. No. 4,910,264, which is a division of Ser. No. 945,593, Dec. 23, 1986, Pat. No. 4,814,457. This application Oct. 23, 1989, Ser. No. 425,090**

**Claims priority, application United Kingdom, Dec. 23, 1985, 8531625**

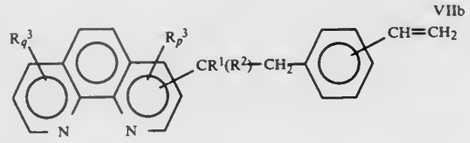
**Int. Cl.[5] C07D** *471/04*

**U.S. Cl. 546—88** **5 Claims**

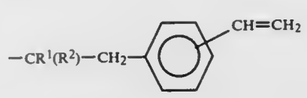
1. A process for preparing a compound of the general formula



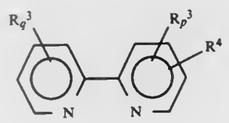

and



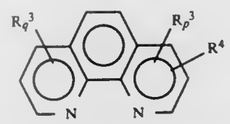

wherein the group



is bonded to the ortho-or para-position with respect to the nitrogen atom in the heterocyclic ring of general formula VIIa and VIIb, $R^1$ is selected from the group consisting of H and an alkyl group, $R^2$ is selected from the group consisting of H, and alkyl group and a vinylbenzyl group $R^1$ and $R^2$ together may form a group -$(CH_2)_n$-, wherein n is an integer from 2 to 6, unless the group -$CR^1(R^2)$--$CH_2$-- is bonded to the para-position with respect to the nitrogen atom in the heterocyclic ring of general formula VIIb, wherein each $R^3$ is individually selected from the group consisting of an alkyl, phenyl, alkoxy, phenoxy, alkylthio and phenylthio group, wherein p is an integer from 0 to 2 and q is an integer from 0 to 3, which process comprises contacting a compound selected from the group consisting of compounds of the general formula




and




wherein $R^4$ is bonded to the ortho- or para-position with respect to the nitrogen atom in the heterocyclic ring of general formula IVa and IVb, $R^4$ is selected from the group consisting of an alkyl group and a cycloaliphatic group having from 3 to 7 carbon atoms in the ring, $R^4$ has at least one hydrogen bonded to the α-carbon atom, and when $R^4$ is bonded to the para-position with respect to the nitrogen atom of the heterocyclic ring of general formula IVb $R^4$ is an alkyl group having at least two hydrogens bonded to the α-carbon atom, with a metalating agent, and reacting the metalated product with at least one vinylbenzyl halide.

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**5,049,673**

## FLUORESCENT INDICATOR DYES FOR CALCIUM WORKING AT LONG WAVELENGTHS

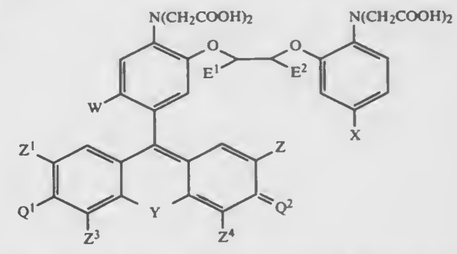
**Roger Y. Tsien, Berkeley, and Akwasi Minta, Albany, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.**

**Filed Oct. 30, 1987, Ser. No. 115,921**

**Int. Cl.[5] C07D** *211/68;* **C07C** *219/08, 311/82, 101/42, 207/00*

**U.S. Cl. 546—107** **11 Claims**

1. A chemical compound having the general formula:



and the pharmaceutically acceptable non-toxic salts and esters thereof wherein:

$E^1$ and $E^2$ are independently H, $CH_3$, $C_2H_5$, $CH_2OH$, COOH, or $CH_2COOH$, or $E^1$ and $E^2$ together are —$(CH_2)_m$—V—$(CH_2)_n$— where m and n are independently 1 or 2 and V is selected from the group consisting of —$CH_2$—, —O—, —NH—, —NMe—, —S—, and —S—S—;

W is H, OH, or COOH;

X is H, Me, COOH, F, Cl, Br, I, or $NO_2$;

Y is —O—, —NMe—, —S—, —$CH_2$—, —$CMe_2$—, —$CF_2$—,

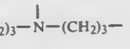


or a direct sigma bond making a five-membered central ring;

$Z^1$, $Z^2$, $Z^3$, and $Z^4$ are independently H, F, Cl, Br, I, or Me, and $Q^1$, $Q^2$ equal $R_1R_2N^-$,



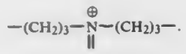
or $HO^-$, $O^=$ or $R_1R_2N$—, $O^=$, where $R^1$ and $R_2$ are independently selected from the group consisting of H, Me, and Et; or $Z^1$, $Q^1$, $Z^3$ together are



and $Z^2$, $Q^2$, $Z^4$ together are

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**5,049,674**

**THERAPEUTICALLY ACTIVE FLUORO SUBSTITUTED BENZIMIDAZOLES**

**Arne E. Brändström, Göteborg; Per L. Lindberg, Askim, and Gunnel E. Sundén, Göteborg, all of Sweden, assignors to Aktiebolaget Hässle, Mölndal, Sweden**

**Filed Dec. 20, 1989, Ser. No. 454,048**

**Int. Cl.[5] C07D *401/12***

**U.S. Cl. 546—271** **1 Claim**

1. 1-Hydroxymethyl-5-fluoro-2-[[(4-cyclopropylmethoxy-2-pyridinyl)methyl]sulfinyl]-1H-benzimidazole and 1-hydroxymethyl-6-fluoro-2[[(4-cyclopropylmethoxy-2-pyridinyl)methyl]sulfinyl]-1H-benzidazole.

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**5,049,675**

**SOLVENT-FREE PROCESS FOR THE PREPARATION OF ((PYRIDINYLOXY)PHENOXY) PROPIONATE DERIVATIVES**

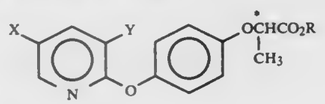
**Jim Love; Charles B. Grant, and Sterling Gatling, all of Midland, Mich., assignors to DowElanco, Indianapolis, Ind.**

**Filed Jan. 29, 1990, Ser. No. 471,347**

**Int. Cl.[5] C07D *213/64, 213/643, 213/78***

**U.S. Cl. 546—302** **10 Claims**

1. A process for the preparation of a 2-(4-(pyridinyl)-2-oxy)-propionate ester of the formula

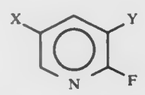


wherein

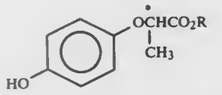
X represents Cl, Br, I or $CF_3$,

Y represents H, F, Cl, provided that when Y is H, X is $CF_3$, and

R represents lower alkyl, which comprises contacting a 2-fluoropyridine for the formula



wherein X and Y are as previously defined, with about an equimolar amount of an (hydroxyphenoxy)-propionate ester of the formula



wherein R is as previously defined, in the presence of an anhydrous base and in the absence of an added solvent at a temperature from about 55° to about 100° C.; and recovering said 2-(4-(pyridinyl-2-oxy)phenoxy)propionate ester.

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**5,049,676**

**PROCESS FOR THE PREPARATION OF OPTICAL ISOMERS OF 2-CHLOROPROPIONIC ACID ESTERS**

**Pascal Métivier, Lyons, and Harivelo Rajoharisson, Echirolles, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

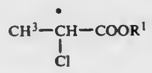
**Filed May 30, 1990, Ser. No. 530,180**

**Claims priority, application France, May 30, 1989, 89 07370**

**Int. Cl.[5] C07D *213/63, 333/32, 307/58;* C07C *69/63***

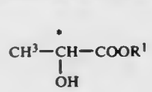
**U.S. Cl. 546—302** **12 Claims**

1. A process for the preparation of an optically active ester of 2-chloropropionic acid of the formula:



I

from an optically active lactate of the formula:



II

with inversion of configuration, comprising the steps of bringing the lactate of formula II into contact with $SOCl_2$ to obtain a chlorosulfite; and decomposing the chlorosulfite formed, wherein at least the decomposition step is carried out in the presence of an ether and wherein $COOR_1$ in formula I and formula II is a hydrolyzable group.

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**5,049,677**

**BISMUTH SALT STABILIZERS FOR 3-ISOTHIAZOLONES**

**James G. Prout, Erdenheim; Andrew B. Law, Newtown, and Gary L. Willingham, Glenside, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

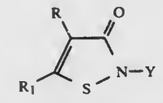
**Filed May 24, 1989, Ser. No. 356,979**

**Int. Cl.[5] A01N *25/34;* C07D *275/02***

**U.S. Cl. 548—213** **21 Claims**

1. A stabilized composition comprising:

a) a compound of the formula



wherein Y is selected from the group consisting of alkyl or halogen- or hydroxy-substituted alkyl, unsubstituted or halo substituted alkenyl or alkynyl, cycloalkyl, ($C_7$) aralkyl or halogen- or alkoxy-substituted ($C_7$) aralkyl, ($C_6$) aryl or halogen- or alkoxyl-substituted ($C_6$)aryl, and hydrogen, and R and $R_1$ independantly selected from the group consisting of hydrogen, halo and ($C_1$–$C_4$)alkyl; and

b) a stabilizing amount of a bismuth salt of an organic carboxylic acid, bismuth phosphate, or bismuth sulfate.

21. The method of stabilizing a composition comprising a 3-isothiazolone compound by addition of 0.0001 to 99.99 parts of a bismuth salt of an organic carboxylic acid, bismuth phosphate, or bismuth sulfate in the presence of an inert solvent.



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**5,049,678**

**1-HYDROXY-1,2,4-TRIAZOLES**

**Ulf Baus, Dossenheim, and Wolfgang Reuther, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

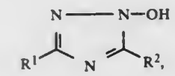
**Filed Dec. 4, 1989, Ser. No. 445,433**

**Claims priority, application Fed. Rep. of Germany, Jan. 7, 1989, 3900347**

**Int. Cl.[5] C07D *249/12***

**U.S. Cl. 548—263.2** **3 Claims**

1. A 1-hydroxy-1,2,4-triazole of the formula



(I)

wherein $R^1$ and $R^2$ are each independently of the other hydrogen, $C_1$–$C_{20}$-alkyl, fluorine, chlorine, bromine, phenyl, 1-naphthyl, 2-naphthyl, or phenyl bearing from 1 to 3 substituents selected from the group consisting of halogen and $C_1$–$C_8$-alkyl.

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**5,049,679**

**CARBOXAMIDE DERIVATIVES**

**Peter R. Bernstein, Wallingford, Pa., assignor to ICI Americas Inc., Wilmington, Del.**

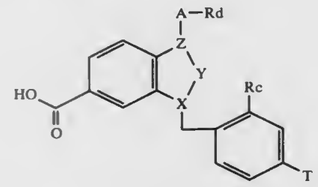
**Continuation of Ser. No. 919,845, Oct. 16, 1986, Pat. No. 4,918,094. This application Dec. 29, 1989, Ser. No. 458,868**

**Claims priority, application United Kingdom, Oct. 17, 1985, 85/25658; Apr. 15, 1986, 86/09176**

**Int. Cl.[5] C07D *209/04, 257/04, 211/68, 413/12***

**U.S. Cl. 548—491** **11 Claims**

1. A carboxylic acid of formula IV,



IV

or a lower alkyl ester or acid halide thereof, wherein the group >X—Y—Z< is selected from a group consisting of >C=CH—N< and >CH—$CH_2$—N< wherein:

A is a direct link;

Rc is selected from a group consisting of hydrogen and (1–4C)alkoxy;

Rd is hydrogen, (3–8C)cycloalkyl, (3–8C)cycloalkyl-(1–4C)alkyl or (1-10C)alkyl optionally containing one or two double or triple bonds, said (1-10C)alkyl additionally optionally bearing a substituent P selected from a group consisting of cyano, carboxy, 1H-tetrazol-5.yl, (1–4C)alkoxycarbonyl, carbamoyl of formula $CONR^2R^3$, ureido of formula $NR^4CONR^2R^3$, carbamoyloxy of formula $OCONR^2R^3$, a carbamate of formula $NR^4COOR^5$, acylamino of formula $NR^4COR^5$, acyloxy of formula $OCOR^5$, and an (optionally oxidized) thio group of formula $S(O)_nR^5$ in which (1) $R^2$ is selected from a group consisting of hydrogen, (1–6C)alkyl, and phenyl, the phenyl moiety of which may optionally bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl, and $R^3$ and $R^4$ are independently chosen from a group consisting of hydrogen and (1–6C)alkyl; or (2) $R^2$ and $R^3$ together with the adjacent nitrogen form a pyrrole, pyrrolidine, piperidine, morpholine, piperazine or N-(1–6C)alkylpiperazine ring; and $R^4$ is hydrogen or (1–6C)alkyl; $R^5$ is selected from a group consisting of (1–4C)alkyl and pheny wherein the phenyl moiety may optionally bear 1 or 2 substituents selected from a group consisting of halogen, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; and n is the integer 0, 1 or 2; and

T is an acidic group selected from a group consisting of carboxy, an acylsulphonamide residue of formula —CO.NH.$SO_2R^6$ and 1H-tetrazol-5-yl in which

$R^6$ is selected from a group consisting of (1–6C)alkyl, (3–8C-)cycloalkyl, (6–2C)aryl, heteroaryl selected from a group consisting of furyl, thienyl and pyridyl, and (6–2C)aryl-(1–4C)alkyl, in which any of the aromatic or heteroaromatic moieties may bear 1 or 2 substituents selected from a group consisting of halogeno, amino, (1–4C)alkyl, (1–4C)alkoxy, and trifluoromethyl; or a salt thereof.

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**5,049,680**

**CATIONIC LACTAM POLYMERS AND 1-(3-ALKYL AMINO PROPYL)PYRROLIDONE-2 INTERMEDIATES THEREFOR**

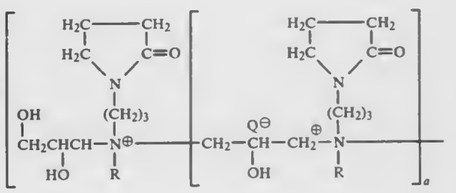
**Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to LCE Partnership, Lake Geneva, Wis.**

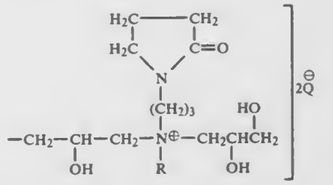
**Filed May 3, 1990, Ser. No. 518,491**

**Int. Cl.[5] C07D *207/27, 403/12***

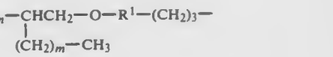
**U.S. Cl. 548—550** **17 Claims**

1. A polymeric quaternary compound conforming to the following formula;





R is selected from $CH_3$—$(CH_2)_b$—; $CH_3$—$(CH_2)_c$—(CH=CH)—$(CH_2)_d$—; $CH_3$—$(CH_2)_e$—$CH(CH_3)$—$(CH_2)_f$—; $CH_3$—$(CH_2)_b$—O—$R^1$—$(CH_2)_3$—; $CH_3$—$(CH_2)_d$—$CH(CH_3)$—$(CH_2)_e$—O—$R^1$—$(CH_2)_3$— and



$R^1$ is

—$(CH_2CH_2$—O$)_x$—$(CH_2CH(CH_3)$—O$)_y$—$(CH_2CH_2$—O$)_z$—;

x y and z are independently integers from 0 to 20;

b,c,d,e are indenpendently integers from 5 to 20;

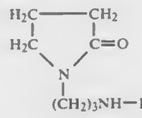
m and n are independently integers from 4 to 20; a is an integer from 2 to 125;

Q is an anionic counter ion needed for charge balance and is selected from chloride, bromide, sulfate, and phosphate.

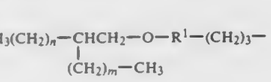
VOL 1130 ISS 3 SE 17 1991 UMI



10. A substituted lactam intermediate conforming to the following formula;



R is selected from $CH_3—(CH_2)_b—$;
$CH3—(CH2)_c—(CH=CH)—(CH_2)_d$;
$CH_3—(CH_2)_e—CH(CH_3)—(CH_2)_f—$;
$CH_3—(CH_2)_b—O—R^1—(CH_2)_3—$;
$CH_3—(CH_2)_d—CH(CH_3)—(CH_2)_e—O—R^1—(CH_2)_3—$
and



$R^1$ is

$—(CH_2CH_2—O)_x—(CH_2CH(CH_3)—O)_y—(CH_2CH_2—O)_z—$;

x y and z are independently integers from 0 to 20;
b,c,d,e are independently integers from 5 to 20;
m and n are independently integers from 4 to 20.

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**5,049,681**

**OPTICALLY ACTIVE ALLYL ALCOHOL AND PROCESS FOR PRODUCING LEUCOTRIENE $B_4$ USING THEREOF**

**Fumie Sato, Fujisawa, Japan, assignor to Nissan Chemical Industries, Ltd., Tokyo, Japan**

**Filed Jul. 8, 1988, Ser. No. 216,336**

**Claims priority, application Japan, Aug. 7, 1987, 62-170299; Aug. 7, 1987, 62-170300**

**Int. Cl.[5] C07D** *309/04;* **C07F** *7/22, 7/08;* **C07C** *33/04*

**U.S. Cl. 549—206** **3 Claims**

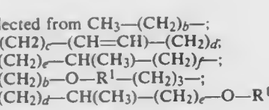
1. An allyl alcohol derivative represented by following general formula (I), (II), (III) or (IV):



(I)



(II)



(III)



(IV)

wherein A represents $R^1R^2R^3Sn$, $R^1R^2R^3$ Si, halogen atom, —C≡CH or —C≡CSi$R^1R^2R^3$, in which $R^1$, $R^2$ and $R^3$ each represents an alkyl group having 1 to 5 carbon atoms, Y represents H or OZ', Z and Z' each represents H or a protection group for a hydroxyl group selected from the group consisting of trimethylsilyl group, t-butyldimethylsilyl group, phenyldimethylsilyl group, methoxymethyl group, ethoxyethyl group, tetrahydropyranyl group, benzyloxymethyl group, trityl group, acetyl group, p-nitrobenzoyl group and 2,4-dinitrophenylcarbonyl group, R represents an alkyl group having 1 to 10 carbon atoms, a $C_1$–$C_5$ alkoxyl carbonyl-substituted alkyl group having 1 to 10 carbon atoms, a bis($C_1$–$C_4$ alkoxy)-methyl group-substituted alkyl group having 1 to 10 carbon atoms, a carboxyl-substituted alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, a $C_1$–$C_5$ alkoxy carbonyl group-substituted alkenyl group having 2 to 10 carbon atoms, a carboxyl-substituted alkenyl group having 2 to 10 carbon atoms, a bis($C_1$–$C_4$ alkoxy)methyl group-substituted alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, a $C_1$–$C_5$ alkoxy carbonyl group-substituted alkynyl group having 2 to 10 carbon atoms, a carboxyl group-substituted alkynyl group having 2 to 10 carbon atoms or a bis($C_1$–$C_4$ alkoxy)methyl group-substituted alkynyl group having 2 to 10 carbon atoms, and n is 0 or 1,

provided that A is not $R^1R^2R^3Si$ when R represents an alkyl group having 1 to 10 carbon atoms and Y represents H,

provided that A is not $R^1R^2R^3Sn$ or —C≡CH when R represents an alkyl group having 1 to 10 carbon atoms or a $C_1$–$C_5$ alkoxy carbonyl-substituted alkyl group having 1 to 10 carbon atoms and Y represents H,

provided that A is not —C≡C—Si$R^1R^2R^3$ when R represents a $C_1$– $C_6$ alkoxy carbonyl-substituted alkyl group having 1 to 10 carbon atoms or a bis($C_1$–$C_4$ alkoxy)methyl group-substituted alkyl group having 1 to 10 carbon atoms and Y represents H, and

provided that A is not halogen atom when R represents an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 1 to 10 carbon atoms or a $C_1$–$C_5$ alkoxy carbonyl-substituted alkyl group having 1 to 10 carbon atoms and Y represents H.

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**5,049,682**

**PROCESS FOR THE PREPARATION OF HALOPHTHALIC ANHYDRIDES**

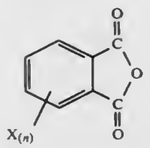
**David Y. Tang, Amherst; Mary K. Cocoman, Grand Island, and Harry E. Buckholtz, Lewiston, all of N.Y., assignors to Occidental Chemical Corporation, Dallas, Tex.**

**Filed Sep. 11, 1989, Ser. No. 405,606**

**Int. Cl.[5] C07D** *307/74*

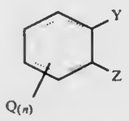
**U.S. Cl. 549—246** **42 Claims**

1. A process for the preparation of halogen substituted phthalic anhydrides of the formula



I

or an intermediate thereof, wherein each X is independently F—, Cl—, Br—, or I—, and n is 1 or 2, which comprises reacting in the liquid phase at temperatures below about 230° Celsius, a brominating agent, in the absence of an acid acceptor, with a halogen substituted hexa-, or tetra-hydrophthalo-reactant of the formula



II

wherein Q is monohalo and is the same as X or is gem-dihalo, wherein at least one halogen is the same as X, and n is the same number as in formula I, and Y and Z are CN, COBr, COCl, or COF; or Y and Z when taken together may comprise an anhydride group, with the proviso that each monohale is directly attached to a double bond carbon and with the proviso that when Y and Z are CN, COBr, COCl, or COF, the product of the reaction with a brominating agent is hydrolyzed to the dicarboxylic acid which, in turn, is dehydrated to form the anhydride and with the proviso that when a temperature above about 170° Celsius is employed, the initial reaction will be carried out at a temperature below 170° C.



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**5,049,683**

**PROCESS FOR THE PRODUCTION OF ALPHA-6-DEOXYTETRACYCLINES**

**George Krsek, Culver, Ind., assignor to Houba, Inc., Culver, Ind.**

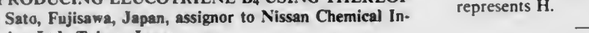
**Continuation of Ser. No. 293,224, Jan. 4, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 552,839**

**Int. Cl.[5] C07C** *103/75*

**U.S. Cl. 550—206** **4 Claims**

1. In a process for the preparation of an alpha-6-deoxytetracycline by the hydrogenation of a substrate selected-6-methylenetetracycline, a 6-deoxy-6-demethyl-6-methylene-tetracycline and salts thereof, the improvement comprising conducting the hydrogenation in the presence of a silica-supported heterogeneous rhodium catalyst prepared by:

(a) reacting a silica gel support with an alkoxysilyl-substituted alkyldiphenyl phosphine of the formula



wherein
Et is ethyl;
m is an integer from 1 to 3;
n is an integer from 1 to 6; and
Ph is phenyl, the phosphine having one or more groups capable of functioning as ligands bonding rhodium complexes thereto;

(b) removing ethanol formed by interaction of the alkoxysilyl groups of the phosphine with hydroxyl groups on the surface of the silica gel; and

(c) bonding the resulting reaction product to a rhodium complex selected from the group consisting of $Rh_2Cl_2(C_2H_4)_4$, $Rh_2Cl_2$ (cyclooctene)$_4$, $RhCl_2(PPh_3)$, and $Rh(PPh_3)_3Cl$, such that the resulting silica-supported heterogeneous rhodium catalyst contains from 0.3 to 0.6% rhodium.

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**5,049,684**

**ELECTRICALLY CONDUCTING MATERIAL AND PROCESS OF PREPARING SAME**

**Shinji Tomibe, Kyoto; Reizo Gomibuchi, Uji, and Kiyofumi Takahashi, Yawata, all of Japan, assignors to Nihon Sanmo Dyeing Co., Ltd., Kyoto, Japan**

**Continuation-in-part of Ser. No. 260,129, May 4, 1981, Pat. No. 4,378,226, and a continuation-in-part of Ser. No. 183,639, Sep. 3, 1980, Pat. No. 4,410,593. This application Sep. 3, 1982, Ser. No. 414,650**

**Claims priority, application Japan, Mar. 5, 1980, 55-28386; Jun. 3, 1980, 55-74752; Sep. 11, 1981, 56-144446**

**The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.**

**Int. Cl.[5] C07K** *1/08;* **C08K** *9/02;* **D01F** *11/06;* **D06M** *1/83;* **H01B** *1/06, 1/20*

**U.S. Cl. 556—113** **2 Claims**

1. An electrically conducting material comprising a cyanic group-containing material having adsorbed thereby copper sulfide, wherein said cyanic group-containing material includes a water-insoluble compound selected from the group consisting of phthalonitrile, isophalonitrile, N-cyanomethylaniline, and N-beta-cyanoethylaniline.

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**5,049,685**

**NUCLEAR SUBSTITUTED SALICYLIC ACIDS AND THEIR SALTS**

**Toranosuke Saito, Osaka, Japan, assignor to Sanko Kaihatsu Kagaku Kenkyusho, Ibaraki, Japan**

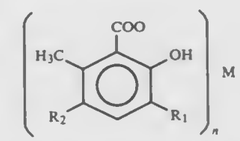
**Filed Nov. 9, 1989, Ser. No. 434,808**

**Claims priority, application Japan, Nov. 22, 1988, 63-293464; Feb. 3, 1989, 1-24005**

**Int. Cl.[5] C07F** *3/00, 3/06, 15/00, 7/00*

**U.S. Cl. 556—132** **6 Claims**

1. A salt of a nuclear substituted salicylic acid represented by the following general formula (I):



(I)

wherein $R_1$ represents a methyl group, an isopropyl group, a tert-butyl group, a tert-amyl group, a tert-hexyl group, a tert-octyl group, and α,α-dialkylbenzyl group or a nuclear substituted α,α-dialkylbenzyl group; $R_2$ represents a tert-butyl group, a tert-amyl group, a tert-hexyl group, a tert-octyl group, an α,α-dialkylbenzyl group or a nuclear substituted α,α-dialkylbenzyl group; M represents a metal atom; and n represents a valence number of the metal atom.

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**5,049,686**

**LARGE-RING DIAMINE PLATINUM(II) AND PLATINUM(IV) CHELATES**

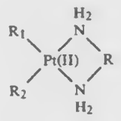
**James D. Hoeschele, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Sep. 13, 1989, Ser. No. 406,646**

**Int. Cl.[5] C07F** *15/00;* **A61K** *33/00*

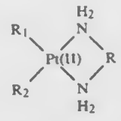
**U.S. Cl. 556—137** **13 Claims**

1. A neutral mixed-ligand platinum(II) complex of Formula I



I

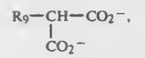
or a pharmaceutically acceptable acid addition salt thereof, wherein R is



I

in which $R_3$ and $R_4$ are hydrogen, or an alkyl group of from one to four carbon atoms and n is an integer from five to nine and

$R_1$ and $R_2$ are negatively charged monodentate ligands which may be the same or different and are selected from the group consisting of chloro, bromo, iodo, nitrato, and acetato or $R_1$ and $R_2$ taken together form a dinegatively charged bidentate ligand selected from the group consisting of sulfato, oxalato,



in which $R_9$ is hydrogen or alkyl group of from one to four carbon atoms.

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**5,049,687**

## ETHYLENE CHAIN GROWTH PROCESS

**Armen N. Abazajian, Houston, Tex., assignor to Ethyl Corporation, Richmond, Va.**

**Filed Oct. 22, 1990, Ser. No. 601,405**

**Int. Cl.[5] C07F *5/06***

**U.S. Cl. 556—190** **5 Claims**

I. An improved ethylene chain growth process in which ethylene and an alkyl aluminum compound are mixed and fed into an externally cooled, tubular coil reactor where said mixture is reacted at elevated temperature and pressure so as to form higher trialkyl aluminum compounds, the improvement comprising reducing the rate of reactor fouling by precooling the ethylene to a temperature of from about 30° C. to 70° C. prior to mixing it with the alkyl aluminum compound.

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**5,049,688**

## ALLYL CYCLOSILALACTAMS

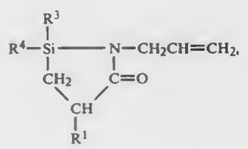
**Russell K. King, and Chi-long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Feb. 15, 1991, Ser. No. 661,564**

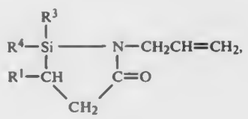
**Int. Cl.[5] C07F *7/10***

**U.S. Cl. 556—407** **5 Claims**

1. A compound selected from the group consisting a cyclosilalactam of general formula

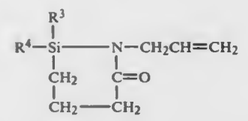


(A)



(B)

and



(C)

in which each of $R^1$, $R^3$, and $R^4$ is independently selected from the group consisting of a hydrogen atom and a monovalent hydrocarbon radical.

**5,049,689**

## PROCESS FOR THE SELECTIVE N-ACYLATION OF AMINOHYDROXAMIC ACID DERIVATIVES AND STARTING MATERIALS USED THEREIN

**Heinrich Peter, Binningen, and Théophile Moerker, Füllinsdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

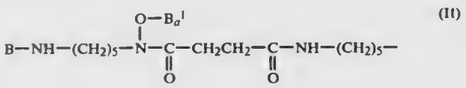
**Continuation-in-part of Ser. No. 221,953, Jul. 20, 1988, Pat. No. 4,954,634. This application Jan. 23, 1990, Ser. No. 468,513**

**Claims priority, application Switzerland, Jul. 23, 1987, 2792/87**

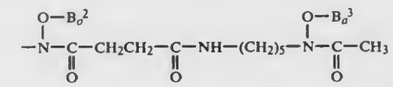
**Int. Cl.[5] C07F *7/10***

**U.S. Cl. 556—410** **3 Claims**

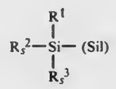
1. A compound of formula II



(II)



in which each of B, $B_o^1$, $B_o^2$ and $B_o^3$ is an organic silyl group (Sil) of the formula



wherein $R_s^1$ and $R_s^2$, independently of one another, are each unsubstituted $C_{1-8}$-hydrocarbyl and $R_s^3$ is unsubstituted $C_{1-8}$-hydrocarbyl or chlorine.

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**5,049,690**

## N,N'-DISUBSTITUTED AND N,N,N'-/N,N', N'-TRISUBSTITUTED THIOUREAS AND METHOD OF THEIR PREPARATION (II)

**Ulrich Deschler, Brasschaat, Belgium; Peter Panster, Rodenbach, and Peter Kleinschmit, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany**

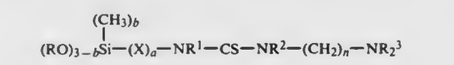
**Filed Jul. 24, 1990, Ser. No. 556,544**

**Claims priority, application Fed. Rep. of Germany, Jul. 31, 1989, 3925356**

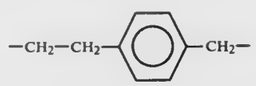
**Int. Cl.[5] C07F *7/10***

**U.S. Cl. 556—421** **3 Claims**

1. N,N'-disubstituted and N,N,N'-or N, N',N'-trisubstituted thioureas with additional organyloxysilyl function and tertiary amine function of the general formula

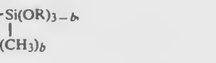


in which
b is 0, 1 or 2
R is alkyl with 1 to 6 carbon atoms, cycloalkyl with 5 to 7 C atoms, aryl or aralkyl
X is $—CH_2—$ if a=1, 3, 4, 5 or 6, or
X is

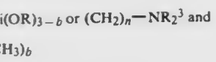




if a=1,
$R^1$ and $R^2$ are hydrogen, or
$R^1$ is hydrogen and
$R^2$ is



or $R^1$ is



and

$R^2$ is hydrogen,
$R^3$ is alkyl with 1 to 3 C atoms
n is 1 to 6.

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**5,049,691**

## PROCESS FOR TRANSHALOGENATING A HALOPHOSPHOROUS COMPOUND WITH ANHYDROUS HYDROGEN FLUORIDE

**Edward A. Burt, Baton Rouge, La.; Lester P. J. Burton, Wilmington, Del.; Meng-Sheng Ao, and Barbara C. Stahly, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.**

**Continuation-in-part of Ser. No. 239,409, Sep. 1, 1988, abandoned. This application Mar. 5, 1990, Ser. No. 487,787**

**Int. Cl.[5] C07F *9/14***

**U.S. Cl. 558—84** **22 Claims**

1. A process for exchanging a halogen bonded to a phosphorus atom with fluorine to form a fluorophosphorus product said process comprising adding anhydrous hydrogen fluoride to a phosphorus compound having 1-2 halogen atoms selected from chlorine, bromine or iodine bonded directly to phosphorus, in an inert solvent, in a manner such that said anhydrous hydrogen fluoride reacts with said phosphorus compound to replace said halogen atoms with fluorine atoms at a rate such that a substantial amount of unreacted hydrogen fluoride does not accumulate in the reaction mixture sufficient to cause the substantial decomposition of said fluorophosphorus product.

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**5,049,692**

## CATALYTIC CONVERSION OF ALKANES TO NITRILES, AND A CATALYST THEREFOR

**Masakatsu Hatano, and Atsushi Kayo, both of Yokohama, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan**

**Continuation of Ser. No. 273,924, Nov. 21, 1988, abandoned. This application Apr. 26, 1990, Ser. No. 515,687**

**Claims priority, application Japan, Nov. 25, 1987, 62-295054; Feb. 18, 1988, 63-3399; Aug. 9, 1988, 63-197126**

**Int. Cl.[5] C07C *253/24***

**U.S. Cl. 558—319** **2 Claims**

1. A process for producing acrylonitrile or methacrylonitrile, which comprises subjecting propane or isobutane and ammonia to gas-phase contact catalytic oxidation reaction in the presence of a complex oxide solid catalyst consisting of molybdenum, vanadium, tellurium, niobium and oxygen, represented by the following formula:

$$Mo_{1.0}V_aTe_bNb_oO_x$$

wherein a, b and c represent the atomic ratio of each of the elements to one atom of Mo, a being 0.01 to 1.0, b ;being 0.1 to 0.5 and c being 0.01 to 1.0, and x represents a number decided by a total number of valences of the metal elements, thereby converting said propane or isobutane to a corresponding mononitrile.

2. A process according to claim 1, wherein said gas-phase contact catalytic reaction is carried out in the presence of molecular oxygen.

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**5,049,693**

## PROCESS FOR THE SELECTIVE HYDROGENATION OF OLEFINS CONTAINING NITRILE GROUPS

**Thomas Himmler, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jun. 18, 1990, Ser. No. 539,570**

**Claims priority, application Fed. Rep. of Germany, Jun. 29, 1989, 3921263**

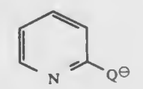
**Int. Cl.[5] C07C *253/30***

**U.S. Cl. 558—467** **10 Claims**

1. A process for the selective hydrogenation of the carbon double bonds in olefins containing nitrile groups with hydrogen in an organic solvent in the presence of a hydrogenation catalyst under hydrogen pressure of 20 to 350 bar at a temperature from 80° to 200° C., characterized in that
(i) an alkanone containing 3 to 6 carbon atoms or a cycloalkanone containing 5 to 6 carbon atoms is used as the organic solvent and
(ii) a compound corresponding to the following formula

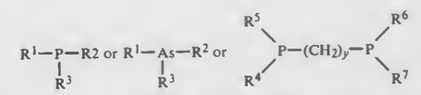
$$RuX_m(L^1)_n(CO)_p(L^2)_q \quad (IV)$$

in which
X is hydrogen, fluorine, chlorine, bromine or $SnCl_3$,
$L^1$ is an anionic radical corresponding to the following formula



(V)

in which Q is sulfur or NH,
$L^2$ is a ligand corresponding to at least one of the formulae



in which $R^1$, $R^2$ and $R^3$ are the same or different and represent linear or branched saturated alkyl radicals containing 1 to 20 carbon atoms, cyclic saturated aliphatic radicals containing 5 to 12 carbon atoms, aromatic hydrocarbon radicals from the benzene series containing 6 to 18 carbon atoms, or aralkyl radicals which, in the aliphatic part, consist of a linear or branched $C_{1-6}$ hydrocarbon radical and, in the aromatic part, of a radical of the benzene series, y is an integer of 1 to 10 and $R^4$ to $R^7$ have the same meaning as $R^1$,
m is 0, 1, or 2,
n is 1 or 2,
p is 0 or 1 and
q is 1 or 2,
is used as the hydrogenation catalyst.

**5,049,694**

## PHARMACEUTICAL COMPOSITION HAVING RELAXING ACTIVITY WHICH CONTAINS A NITRATE ESTER AS ACTIVE SUBSTANCE

**Jan Bron, Giessenburg; Geert J. Sterk, Utrecht; Jan F. van der Werf, Amsterdam-Z.O., and Hendrik Timmerman, Voorschoten, all of Netherlands, assignors to Cedona Pharmaceuticals B.V., Haarlem, Netherlands**

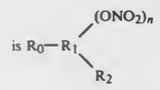
**Filed Sep. 14, 1989, Ser. No. 407,355**

**Claims priority, application Netherlands, Sep. 15, 1988, 8802276**

**Int. Cl.[5] C07C *77/02***

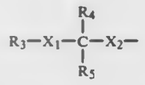
**U.S. Cl. 558—480** **11 Claims**

1. Pharmaceutical composition having relaxing activity, for example the treatment of heart and vascular diseases which contains a nitrate ester as active substance, characterized in that said ester



wherein

$R_0$ represents H,OH which may be esterified by substituted or unsubstituted aliphatic or (hetero)aromatic carboxylic acid, or a group



in which later formula

$R_3$ represents H or a substituted or unsubstituted (hetero)aromatic group, but is possibly lacking in case $X_2$ represents a triple bond,

$R_4$ represents H, OH or straight or branched alkyl, alkenyl, alkynyl or alkoxy or cyclopropyl, or is identical to $R_3$, but is possibly lacking in case $X_2$ represents a triple bond,

$R_5$ represents H or straight or branched alkyl, but is lacking in case $X_2$ represents a double or triple bond,

$X_1$ represents a single bond, methylene, a substituted or unsubstituted carboxamide group or amino group, O or S, but is lacking in case $X_2$ represents a triple bond and

$X_2$ represents a single bond, a double bond (in which case $R_5$ is then lacking), or a triple bond (in which case $R_5$ and either $R_3$—X, or $R_4$ are then lacking), a substituted or unsubstituted carboxamide group or amino group, O or S,

$R_1$ represents straight or branched alkylene having 1–8 carbon atoms in a straight chain, cycloalkylene having 3–7 carbon atoms, bicycloalkylene having 5–12 carbon atoms, a 1,4:3,6-dianhydrohexitrolylene group or a derivative from said group, or mono-, di- or tri-alkylene substituted cycloalkylene,

$R_2$ represents H, OH, straight or branched alkyl or alkylphenyl, where phenyl has the same substitution possibilities as $R_3$, or substituted or unsubstituted thioxanethenyl, substituted or unsubstituted benzocycloalkanyl having 5–7 carbon atoms in the cycloalkanyl chain, substituted or unsubstituted benzocycloalkenyl having 5–7 carbon atoms in the cycloalkenyl chain, substituted or unsubstituted dibenzocycloalkanyl having 5–7 carbon atoms in the cycloalkanyl chain, or substituted or unsubstituted dibenzocycloalkenyl having 5–7 carbon atoms in the cycloalkyl chain and

n is 1, 2 or 3, or a salt derived from such as ester.

10. A composition according to claim 1 containing, as an added ingredient, a pharmaceutically acceptable carrier.

**5,049,695**

## ALLOSTERIC HEMOGLOBIN MODIFIERS

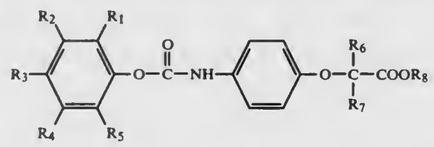
**Donald J. Abraham, Midlothian; Ahmed Mehanna, Richmond; Ramnarayan Randad, Richmond, and Mona Mahran, Richmond, all of Va., assignors to Center for Innovative Technology, Herndon and Virginia Commonwealth University, Richmond, both of, Va.**

**Filed Feb. 12, 1990, Ser. No. 478,848**

**Int. Cl.[5] C07C *271/00***

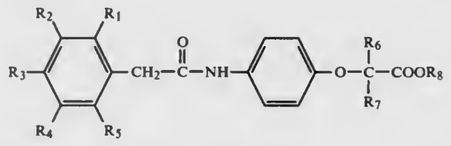
**U.S. Cl. 560—27** **3 Claims**

1. A compound having the following structural formula:



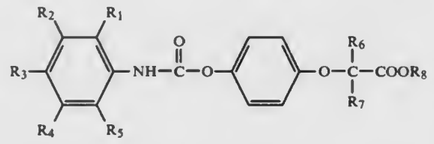
wherein $R_{1-5}$ may be hydrogen, halogen, or a substituted or unsubstituted $C_{1-3}$ alkyl group and may be the same or different, wherein $R_{6-7}$ may each be hydrogen or methyl and may be the same or different, and wherein $R_8$ may be hydrogen, a substituted or unsubstituted $C_{1-3}$ alkyl group, or a salt cation.

2. A compound having the following structural formula:



wherein $R_{1-5}$ may each by hydrogen, halogen or a substituted or unsubstituted $C_{1-3}$ alkyl group and may be the same or different, wherein $R_{6-7}$ may each be hydrogen or methyl and may be the same or different, and wherein $R_8$ may be hydrogen, a substituted or unsubstituted $C_{1-3}$ alkyl group, or a salt cation.

3. A compound having the following structural formula:



wherein $R_{1-5}$ may each be hydrogen, halogen or a substituted or unsubstituted $C_{1-3}$ alkyl group and may be the same or different, wherein $R_{6-7}$ may each be hydrogen or methyl and may be the same or different, and wherein $R_8$ may be hydrogen, a substituted or unsubstituted $C_{1-3}$ alkyl group, or a salt cation.

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**5,049,696**

## ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

**Ta J. Lee, Lansdale; Clarence S. Rooney, Worcester, and William F. Hoffman, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.**

**Division of Ser. No. 177,806, Apr. 11, 1988, Pat. No. 4,847,306. This application Jun. 14, 1989, Ser. No. 366,085**

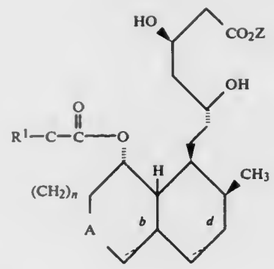
**Int. Cl.[5] C07C *69/76, 69/74;* A01N *43/16***

**U.S. Cl. 560—75** **23 Claims**

1. A compound represented by the following general structural formula (II):



(II)

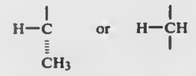


wherein:

n is 2 to 7;

$R^1$ is $C_{1-6}$alkyl substituted with a group selected from halogen or hydroxy; $C_{1-6}$alkylthio; phenylmethyl or 4-hydroxyphenylmethyl;

A is



b and d represent single bonds, or both b and d represent double bonds;

Z is hydrogen, $C_{1-5}$alkyl or $C_{1-5}$alkyl substituted with a group selected from phenyl, dimethylamino or acetylamino; and

pharmaceutically acceptable salts of the compounds of the formula (II) in which Z is hydrogen.

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**5,049,697**

## HIGH YIELD METHOD FOR PREPARATION OF DIALKYL ESTERS OF POLYHALOAROMATIC ACIDS

**Joseph M. Bohen, King of Prussia, and Anthony J. Mancuso, Trappe, both of Pa., assignors to Atochem North America, Inc., Philadelphia, Pa.**

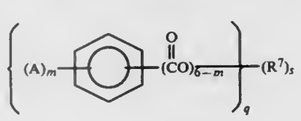
**Continuation-in-part of Ser. No. 99,361, Sep. 21, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 244,421**

**Int. Cl.[5] C07C *67/08, 69/017***

**U.S. Cl.. 560—83** **40 Claims**

1. A method for preparing esters of polyhaloaromatic carboxylic acids and anhydrides of the formula:

(I)



wherein:

(a) the aromatic rings can have all possible isomeric arrangements;

(b) A is Br or Cl;

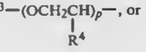
(c) m is 3, 4, or 5;

(d) q is an integer of 1 to 6;

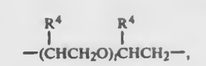
(e) $R^7$ is

(i) a substituted or unsubstituted, $C_{1-30}$ alkyl or an aryl having up to 30 carbon atoms, and with a valence (v) which is an integer of 1 to 4;

(ii)



-continued



where:

$R^3$ is H or a substituted or unsubstituted $C_{1-30}$ alkyl, or an aryl having up to 30 carbon atoms,

$R^4$ is, independently, H or $CH_3$,

p is an integer of 1 to 50, and

t is an integer of 1 to 49; or

(iii)



where $R^5$ is a substituted or unsubstituted, $C_{1-30}$ alkyl or an aryl having up to 30 carbon atoms; and

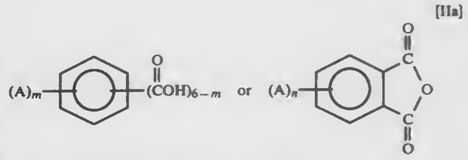
(f) s is q(6−m)/v;

q, m, and v being as above defined

which comprises reacting:

(I) at least one polyhaloaromatic carboxylic acid or anhydride of the formulas

[IIa]



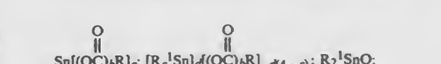
wherein A and m are as defined above and n is 3 or 4; with

(II) at least a stoichiometric quantity of alcohol or polyol of the formula

$R^7(OH)_v$

wherein $R^7$ and v are as defined above; and

(III) a catalytically effective amount of at least one metallic or organometallic catalyst compound which is:





$ZrO(OR^2)_2$; or $Zr(R^8)_4$;

wherein:

(a) R, independently, is: H, a substituted or unsubstituted $C_{1-30}$ alkyl; a substituted or unsubstituted $C_{2-22}$ alkenyl; a $C_{1-18}$ alkylene; or not present;

(b) $R^1$ is a $C_{1-8}$ alkyl or cyclo-$C_{1-8}$-alkyl;

(c) X is OH, $O_{0.5}$, or Cl;

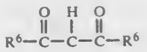


(d) $R^2$, independently, is a substituted or unsubstituted $C_{1-30}$ alkyl or a substituted or unsubstituted $C_{2-22}$ alkylene;

(e) $R^8$, independently, is $OR^2$ or the residue of a 1,3 dicarbonyl compound of the formula:

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where $R^6$, independently, is H, $OR^2$, or a substituted or unsubstituted $C_{1-30}$ alkyl;

(f) a and b are 1 or 2 with the proviso that a and b cannot be the same;

(g) c and d are 1 or 2 with the proviso that d can be 2 only when c is 1 and b is 2;

(h) b is 2 if R is not present;

(i) e is 1 or 2; and

(j) f is 1 or 2 with the proviso that b equals f.

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**5,049,698**

**PROCESS FOR MANUFACTURING 2-CHLORO-1,3-DIKETO COMPOUNDS**

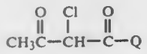
**Gordon C. Newland, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 24, 1986, Ser. No. 855,268**

**Int. Cl.[5] C07C 69/66**

**U.S. Cl. 560—174** **9 Claims**

1. Process for preparing a 2-chloro-1,3-diketo compound of the formula



wherein Q is a member selected from the group consisting of:

(i) an amino group,

(ii) a substituted amino group of the formula



wherein each R substituent is selected from the group consisting of alkyl groups of 1–20 carbons, aryl groups of 6–10 carbons, cycloalkyl groups of 4–8 carbons, or said R substituents substituted with 1–3 of alkyl of 1–4 carbons, alkoxy of 1–4 carbons, halogen, CN, $NO_2$, alkanoyl of 1–4 carbons or alkanoyloxy of 1–4 carbons, and

(iii) the group —OR wherein R is a substituent as defined above in (ii),

in a nebulizing chlorinator having wall means enclosing a chlorination zone, means for cooling said wall means, and nebulizing means communicating with said zone, said process comprising

(a) feeding a solution of the unchlorinated 1,3-diketo precursor of said compound selected from N,N-dimethylacetoacetamide, N-methylacetoacetamide, ethylacetoacetate and methylacetoacetate in an alcohol solvent to said nebulizing means,

(b) contacting said solution in said nebulizing means with a stream of gaseous chlorination medium to nebulize said solution into said zone and to effect rapid chlorination of said precursor, wherein the molar ratio of $Cl_2$/precursor feeds to the chlorinator is from about 0.7 to about 1.4, and wherein the temperature of said zone is from about 60° C. to about 210° C., and

(c) collecting the chlorinated product from the cooled wall means of said chlorinator.

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**5,049,699**

**REGIOSELECTIVE SYNTHESIS OF MONO-ALKYL CITRIC ACID ESTERS**

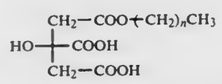
**Michael P. Kotick, Elkhart, Ind., assignor to Haarmanns' Reimer Corp, Springfield, N.J.**

**Filed Jan. 22, 1990, Ser. No. 468,171**

**Int. Cl.[5] C07C 69/66**

**U.S. Cl. 560—180** **3 Claims**

1. A method for the preparation of pure 1-mono esters of citric acid characterized by the formula:



where $(CH_2)_n$ is an alkyl group of 7 to 19 carbon atoms, which method involves the steps of:

(a) reacting citric acid with paraformaldehyde to form anhydromethylene citric acid;

(b) reacting the anhydromethylene citric acid with acetic anhydride to form the corresponding anhydride;

(c) reacting the corresponding anhydride with an alcohol of the formula $HO(CH_2)_nCH_3$ where n is as defined above to form the corresponding 1-mono substituted derivative; and

(d) refluxing the 1-mono substituted derivative with 1 equivalent of base in aqueous dioxane to provide the desired 1-mono ester of citric acid as characterized by the above formula.



**5,049,700**

**PANEL FOR FREE ACCESS TO SIGNAL CABLE AND POWER CABLE**

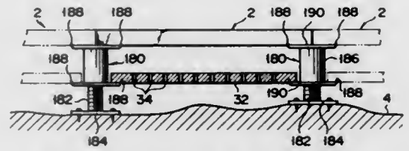
**Hiroshi Kobayashi; Tsuguhiro Hirose; Hideaki Haruyama, all of Tokyo; Jiro Kano, Kawasaki; Katsunari Kodachi, Tokyo; Yoshio Kojima, Yokohama; Humio Takeda, Hachio, and Toshihiko Muro, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 608,120, May 8, 1984, abandoned. This application Aug. 14, 1989, Ser. No. 394,161**

**Claims priority, application Japan, May 13, 1983, 58-83619; Aug. 18, 1983, 58-150497**

**Int. Cl.[5] E04B 5/58**

**U.S. Cl. 174—48** **12 Claims**




1. A panel structure including a plurality of panel sets for mounting adjacent to each other on at least a substantial portion of a surface in a building interior, each panel set comprising:

a first panel member having at least one substantially planar rectangular surface of predetermined width and length;

a second panel member having a maximum width and length substantially equal to the width and length of the first panel member; and

spacer means supporting the first and second panel members for defining a first cable space between the first and second panel members and a second cable space between the building surface and the second panel member, the spacer means including fastening means for removably fastening each first and second panel members to allow access to the first cable space and the second cable space over the entire portion of the building surface.

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**5,049,701**

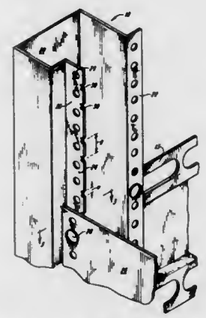
**EMI CABINET WITH IMPROVED INTERFERENCE SUPPRESSION**

**Edward R. Vowles, Leominster, and Daniel J. Calanni, Webster, both of Mass., assignors to Stratus Computer, Inc., Marlboro, Mass.**

**Filed Sep. 28, 1989, Ser. No. 414,107**

**Int. Cl.[5] H05K 9/00**

**U.S. Cl. 174—35 R** **17 Claims**



1. In the manufacture of an electrically conductive base element for use in an EMI cabinet in which an electrical component is housed,

said conductive base element having a first surface against which a conductive surface of the component is mounted in abutment with said first surface in a direction substantially normal to that surface,

the improvement for attenuating radiated electrical interference comprising the steps of

A. forming a plurality of conductive projections integrally with said base element and extending resiliently from said first surface,

B. arranging said conductive projections for abutting, in electrically conductive engagement, a conductive surface of a component mounted against said base element, and

C. providing a selected spacing of said conductive projections to maintain distances between radiation-suppressing low impedance contacts between said base element and the component which are substantially small relative to a wavelength of the interference to be attenuated.

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**5,049,702**

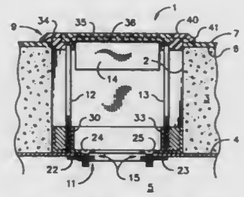
**AFTERSET**

**Robert W. Hadfield, Parkersburg, W. Va., assignor to Butler Manufacturing Company, Kansas City, Mo.**

**Filed Nov. 21, 1989, Ser. No. 439,624**

**Int. Cl.[5] H02G 3/22**

**U.S. Cl. 174—48** **7 Claims**




1. For conveying high and/or low tension conductors through a bore in a concrete floor from an electrical raceway embedded in the floor to a work station on the floor surface, an afterset comprising:

a metal attaching ring to be mounted in said bore on the top of said electrical raceway in alignment with an access hole therein;

locking means on said attaching ring and having means for securing the ring to the top in said electrical raceway while the raceway is embedded in the concrete;

said attaching ring comprising a hollow tubular body and a base on the lower end of the body with the base having an opening to be in alignment with an access hole on the top of an electrical raceway when the attaching ring is mounted thereon;

a plurality of holding posts on said base and each having a threaded hole for receiving a holding screw means;

a flush floor fitting assembly to be located on the floor surface adjacent said bore to serve said work station including a generally flat annular member having a central opening and an outwardly extending peripheral flange to interengage said floor, also including a generally flat, conductor-access plate extending across said opening, the annular member and conductor-access plate being formed of plastic material and dimensioned to be substantially flush with the floor surface; and

a plurality of holding screw means, the heads of which bear on said annular member and the threads of which are respectively threaded in said holding posts.

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5,049,703

## MAINS CONNECTION BOX

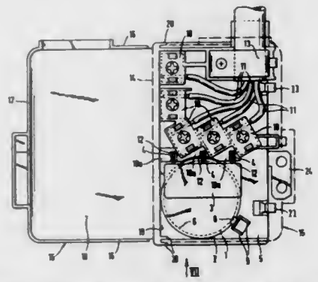
Hans Simon, Bruchhausener Strasse, D-5463 Unkel/Rhein, Fed. Rep. of Germany

Filed Oct. 5, 1989, Ser. No. 417,264

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834626

Int. Cl.[5] H05K *5/00*

U.S. Cl. 174—52.1 8 Claims



1. A mains connection box for mounting on a housing for an electrical machine and an appliance, comprising a bottom plate, chambers on said bottom plate to accommodate connection terminals for wires of a connection cable, a mounting for a suppressor filter provided with contact plates which extend laterally beyond its contours, and contact means being provided for connection of the contact plates to the connection terminals for the wires of the connection cable.

5,049,704

## ELECTRICAL CONDUCTOR ELEMENT

Thomas Matouschek, Kehlstrasse 14, 7316 Köngen, Fed. Rep. of Germany

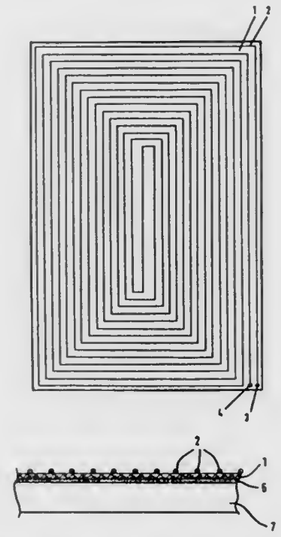
Filed Apr. 11, 1990, Ser. No. 507,433

Claims priority, application Fed. Rep. of Germany, May 9, 1989, 3915068; Nov. 7, 1989, 3937496

Int. Cl.[5] H05K *1/00*

U.S. Cl. 174—261 12 Claims

1. An electrical conductor element for providing security against forceable entry into an enclosure, comprising sheeting in the form of a base and an electrical conductor arranged thereon for attachment with the circuit of a security alarm system, such wire being attached to such base by sewing, in a



security alarm system connected to said electrical conductor for passing an electric current.

5,049,705

## PUSH BUTTON VACUUM-ELECTRIC AIR CONTROL DEVICE FOR AUTOMOTIVE VEHICLES

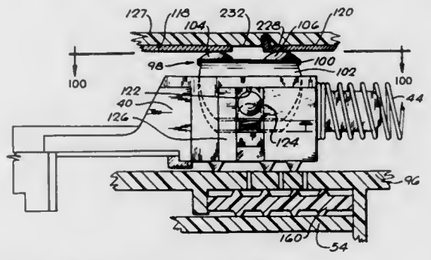
John G. Cummings, Cary, Ill., assignor to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 293,370, Jan. 4, 1989, Pat. No. 4,926,014.

This application Mar. 9, 1990, Ser. No. 491,460

Int. Cl.[5] H01H *15/00*

U.S. Cl. 200—16 C 12 Claims



1. An electrical switch, comprising

switch body means,

an electrically insulating switch carriage,

operating means for moving said switch carriage along a predetermined path on said body means,

fixed electrical contact means mounted on said body means along said predetermined path,

an electrically conductive contactor mounted on said carriage for selectively engaging said fixed contact means,

said contactor taking the form of an angle-shaped plate consisting of first and second flanges with a generally rectangular relationship therebetween,



said first flange having portions thereof slidably engageable with said fixed contact means,

said carriage having a guide slot therein for slidably receiving said second flange for sliding movement of said contactor toward said fixed contact means,

said second flange and said guide slot constituting the sole guiding and supporting means for said contactor,

and a compression spring compressed between said carriage and said first flange of said contactor for biasing said first flange toward said fixed contact means and for producing spring contact pressure between said first flange and said fixed contact means.

5,049,706

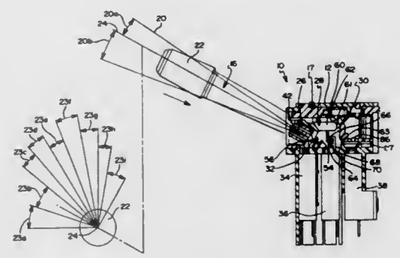
## MULTIFUNCTION STEERING COLUMN SWITCH

Daniel J. Du Rocher, 1200 Low Wood Trail, Leonard, Mich. 48367

Filed May 25, 1990, Ser. No. 529,096

Int. Cl.[5] H01H *9/00*

U.S. Cl. 200—61.54 11 Claims



1. A steering column switch for a vehicle having a steering column and at least two energizable devices, the steering column switch comprising:

a housing mountable on a steering column of a vehicle;

a switch lever mounted in and extending outward from the housing, the switch lever connected to the housing for at least pivotal movement in first and second mutually perpendicular planes;

first and second actuator means mounted in the housing, each of the first and second actuator means being independently constructed and operated and each of said actuating means being responsive to movement of the switch lever in one of the first and second mutually separate planes; and

first and second switch means, each of said switch means being separately removably mounted in the housing, each of the first and second switch means coupled to and responsive to one of the first and second actuator means and switchable between positions to selectively generate electric signals for one of the energizable devices in the vehicle depending upon the mode of movement of the switch lever.

5,049,707

## SUPER HIGH FREQUENCY SWITCHING DEVICE

Kazuo Kameya, Tokyo, Japan, assignor to Elmec Corporation, Kawasaki, Japan

Filed Aug. 15, 1990, Ser. No. 567,631

Claims priority, application Japan, Aug. 30, 1989, 1-223721

Int. Cl.[5] H01H *15/00*

U.S. Cl. 200—16 D 7 Claims

1. A super high frequency switching device, comprising:

a dielectric layer having first and second major surfaces opposing each other;

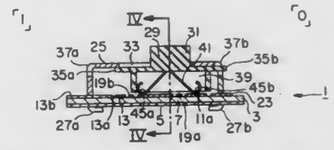
a ground electrode formed on said first major surface;

a common fixed contact formed on said second major surface and opposed to said ground electrode;

a pair of selectable fixed contacts formed on said second major surface on either side of said common fixed contact, and opposed to said ground electrode;

a pair of buffer electrodes formed in gaps defined between said common fixed contact and said selectable fixed contacts, and opposed to said ground electrode;

an insulated moveable contact holder slidably supported in a



holder guide mounted in said dielectric layer and covering said common fixed contact, said pair of selectable fixed contacts and said pair of buffer electrodes; and

moveable contacts carried by said moveable contact holder for sliding contact with said common fixed contact and said selectable fixed contacts between a first position to electrically connect said common fixed contact with one of said selectable fixed contacts and a second position to electrically connect said common fixed contact with the other of said selectable fixed contacts.

5,049,708

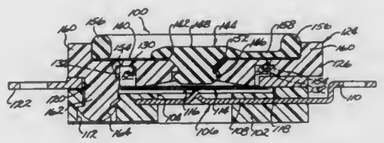
## NORMALLY CLOSED PRESSURE RESPONSIVE SWITCH

Gary A. Baker, 231 Cranberry Ridge Rd., North Scituate, R.I. 02857

Filed May 25, 1990, Ser. No. 529,060

Int. Cl.[5] H01H *35/34*

U.S. Cl. 200—83 P 13 Claims



1. A normally closed pressure switch comprising

a generally circular base member formed of electrically insulative material having a centrally disposed recess formed in a top surface of the member,

an electrical contact mounted on the base within the recess,

a generally circular snap acting disc having a downwardly facing normally convex surface configuration received in the recess,

an electrically conductive member disposed on top of the base member, the member having an effective opening therethrough smaller than the diameter of the disc to capture the disc within the recess with the outer circumference of the disc in electrical engagement with the conductive member and the center of the disc normally biased against the electrical contact,

a retainer member disposed on top of the base member and the conductive member, the retainer member having a bore extending therethrough from top to bottom,

a pressure converter comprising a generally circular element having a flat top surface and downwardly extending rib portion means adjacent its outer periphery slidably received in the bore of the retainer member, the rib portion means engageable with the disc at a location near its outer periphery but spaced inwardly therefrom,

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a flexible membrane received on top of the retainer member and pressure converter and means to form a fluid seal between the retainer member and the membrane whereby sufficient pressure of a fluid in contact with the top surface of the membrane will cause the membrane and pressure converter to move downwardly causing the disc to snap to a concave surface configuration facing the bottom surface of the recess with the disc out of electrical connection with the electrical contact and means to affix the base member to the retainer member.

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**5,049,709**

## INDEX ROTARY SWITCH WITH ROTOR CONTACT MEMBER HAVING L-SHAPED ARMS

**Tomm Prickett, Roscoe, and Melvin S. Nation, Elmhurst, both of Ill., assignors to Illinois Tool Works, Inc., Glenview, Ill.**

**Filed Jan. 30, 1990, Ser. No. 472,655**
**Int. Cl.[5] H01H** *19/62*
**U.S. Cl. 200—527** **22 Claims**



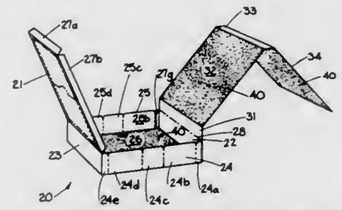
15. An index rotary switch comprising:
an electrically insulative housing;
a first stationary contact member disposed in said housing and having a first vertical contact engagement surface lying in a first plane;
a second stationary contact member disposed in said housing and having a second vertical contact engagement surface lying in a second plane, said second stationary contact member being electrically isolated from said first stationary contact member, said second contact surface lying in the second plane intersecting said first contact surface lying in the first plane at approximately 135 degrees;
a third stationary contact member disposed in said housing and having third, fourth, fifth and sixth adjacent vertical contact engagement surfaces which are serially-connected together and are located between said first and second contact surfaces, each of said third, fourth, fifth and sixth contact surfaces being disposed in respective planes which are approximately 45 degrees apart from each other;
rotor contact means including four rotor contacts disposed for rotational movement in said housing, two of said four rotor contacts simultaneously engaging two of the third, fourth, fifth and sixth contact surfaces of said third stationary contact member, one of said two remaining rotor contacts engaging one of the first and second contact surfaces on said respective first and second stationary members in each of a predetermined number of alternately on-and-off positions of said rotary contact means; and
pushbutton-operated actuator means disposed in said housing and operatively connected to said rotor contact means for sequentially rotating said rotor contact means so that said four rotor contacts alternately index with said on-and-off positions upon successive actuations of said actuator means.

**5,049,710**

## MICROWAVE FOOD CARTON HAVING TWO INTEGRAL LAYER-DIVIDER PANELS AND BLANK THEREFOR

**Robert L. Prosise, and Paul R. Bunke, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed Dec. 29, 1989, Ser. No. 458,934**
**Int. Cl.[5] H05B** *6/80*
**U.S. Cl. 219—10.55 E** **5 Claims**



1. A microwave carton formed from a one piece blank comprising a top panel, a bottom panel, and two layer-divider panels, said carton being sized to accommodate three layers of food pieces, said carton further comprising means for being erected, filled with three layers of food pieces, and closed with one of said layer-divider panels disposed between each two adjacent layers of said food pieces, and microwave susceptor means disposed on each said layer-divider panel and on said top panel and said bottom panel such that said microwave susceptor means is located in contacting relation with the upper and lower surfaces of each of said food pieces in each layer.

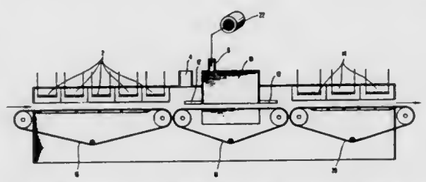
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**5,049,711**

## APPARATUS FOR PREPARING SNACK FOOD PRODUCTS

**Joseph R. August, Jupiter, Fla., assignor to Musser's Potato Chips, Inc., Mountville, Pa.**

**Division of Ser. No. 24,475, Mar. 11, 1987, Pat. No. 4,800,090.**
**This application Nov. 16, 1988, Ser. No. 273,749**
**Int. Cl.[5] H05B** *6/78*
**U.S. Cl. 219—10.55 A** **7 Claims**



1. An apparatus for preparing crisp, chip-type snack food products from potato slices, said apparatus comprising:
(a) first means for providing infrared energy to potato slices to warm an exterior of the potato slices;
(b) means for providing microwave energy to an interior of the potato slices;
(c) second means for providing infrared energy to achieve browning of the exterior of the potato slices;
(d) means for conveying said potato slices from said first infrared means to said microwave means, and for conveying said potato slices from said microwave means to said second infrared means;
(e) means for providing ultraviolet light to said potato slices; and
(f) means for conveying said potato slices from said second infrared means to said ultraviolet light means.

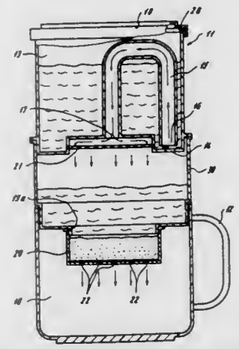


**5,049,713**

## APPARATUS FOR PREPARING HOT BEVERAGES IN A MICROWAVE OVEN

**Peter Creyaufmüller, Minden, Fed. Rep. of Germany, assignor to Melitta-Werke Bentz & Sohn, Minden, Fed. Rep. of Germany**

**Filed May 21, 1990, Ser. No. 526,007**
**Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916457; Jan. 11, 1990, 4000634**
**Int. Cl.[5] H05B** *6/80;* **A23F** *5/26*
**U.S. Cl. 219—10.55 E** **5 Claims**



1. In an apparatus for preparing hot beverages in a microwave oven, said apparatus including a carafe for receiving the finished brewed hot beverage, a reservoir for retaining fresh water therein, said reservoir having a bottom being receivable on said carafe, a shut-off member disposed in said reservoir, said shut-off member having an inlet disposed in the interior of said reservoir and having an outlet extending through said bottom of said reservoir, the improvement wherein:
said shut-off member comprises a siphoning pipe;
said reservoir being substantially air tight; and
said carafe having a vent means for allowing air to enter into and exit from said carafe;
the improvement further comprising an intermediate reservoir disposed between said reservoir and said carafe; said intermediate reservoir having a volume at least as large as the volume of said reservoir means defining a downwardly opening extension in said bottom of said intermediate reservoir and a filter holder detachably attached to said extension.

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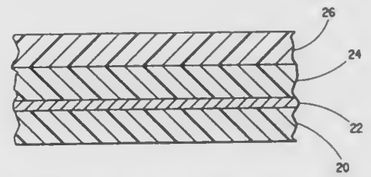
**5,049,714**

## NON-MELTING MICROWAVE SUSCEPTOR FILMS

**Aleksander Beresniewicz; Robert E. Fuller, both of Wilmington; Eric N. Mul, and John R. Fisher, both of Hockessin, all of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.**

**Filed Aug. 3, 1989, Ser. No. 388,923**
**Int. Cl.[5] H05B** *6/80;* **B65D** *81/34*
**U.S. Cl. 219—10.55 E** **7 Claims**

1. A conformable multilayer structure useful for packaging food for microwave cooking comprising:
(a) at least one layer of flexible, heat-resistant, microwave-transparent polyester film susceptible to melting upon exposure to temperatures encountered when used in conjunction with a microwave susceptor in a microwave oven;
(b) at least one layer of microwave susceptor material located on an interior surface of the film of (a) in sufficient quantity to cause the multilayer structure to heat under microwave cooking conditions to a temperature suitable for browning or crispening of food placed adjacent thereto;
(c) at least one layer formed from a melt extrudable olefin polymer having a thickness of at least 7 micrometers, having been crosslinked by exposure to at least 2 megarads of ionizing radiation, being crosslinked to a sufficient extend and present in a sufficient thickness to in combination substantially prevent melting of the structure when used in a microwave oven; and



(d) an additional layer of flexible, heat-resistant, microwave-transparent film located adjacent to the layer (c) of crosslinked thermoplastic material.

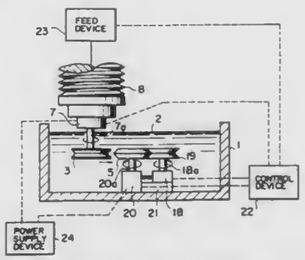
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**5,049,715**

## ELECTRIC DISCHARGE MACHINE

**Hidehiko Tanaka, Nagoya City, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 2, 1990, Ser. No. 474,567**
**Claims priority, application Japan, Feb. 3, 1989, 1-25093**
**Int. Cl.[5] B23H** *1/00, 7/26*
**U.S. Cl. 219—69.11** **13 Claims**




1. An electric discharge machine comprising:
rotary means for holding and rotating a workpiece to be processed;
an electrode disposed to oppose said workpiece;
indexing means for holding said electrode and indexing said electrode at a predetermined angular pitch;
power supply means for applying a voltage between said workpiece and said electrode to cause an electric discharge therebetween;
cutting means for removing an outer portion of said electrode which has been used for said electric discharge and which has been indexed by said indexing means to face said cutting means, said cutting means being independently rotatable and being feedable in a direction toward said electrode; and
feed means for feeding said rotary means and said workpiece in an up, down, left or right direction.

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5,049,716

## STEAM TURBINE HAVING APPLIED NOVEL EROSION RESISTANT SURFACES AND METHODS FOR APPLYING THESE SURFACES

James C. Dunmire, Longwood, and Samuel D. Reynolds, Jr., Oviedo, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 7, 1989, Ser. No. 390,138
Int. Cl.[5] B23K 9/04
U.S. Cl. 219—76.14 21 Claims

1. In a steam turbine system of the type employed for generating electric power, a method of providing an erosion resistant surface to a carbon steel steam turbine component, comprising:

(a) providing a carbon steel steam turbine component having a first surface thereon; and

(b) welding a first steel weldment comprising at least 12 wt.% Cr onto said first surface at a welding speed of about 61–132 cm, per minute, said weldment having a nominal first pass thickness of less than about 0.25 cm.

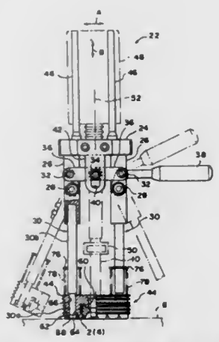
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5,049,717

## ARC STUD WELDING MACHINE

Mikihiko Yoshida, Ibaragi, and Hiroaki Yamada, Saitama, both of Japan, assignors to Okabe Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1990, Ser. No. 611,678
Claims priority, application Japan, Nov. 13, 1989, 1-294339; Nov. 13, 1989, 1-294340
Int. Cl.[5] B23K 9/20
U.S. Cl. 219—98 7 Claims



1. An arc stud welding machine having an arc shield mount section for retaining a generally semicylindrical arc shield segment,

said arc shield mount section comprising a semicylindrical inner clamp member for abutment against an inner surface of said arc shield segment,

two quarter cylinder outer clamp members for abutment against an outer surface of said arc shield segment, and

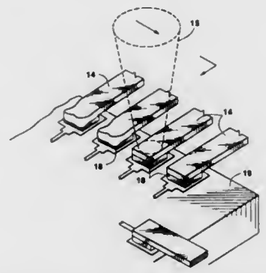
pressure means for applying to said outer clamp members at approximately the middle of the periphery thereof pressure in the direction of said arc shield segment.

5,049,718

## METHOD OF LASER BONDING FOR GOLD, GOLD COATED AND GOLD ALLOY COATED ELECTRICAL MEMBERS

Philip J. Spletter, Cedar Park; Colin A. Mackay; Claire T. Galanakis, both of Austin, and John C. Parker, Round Rock, all of Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex. and Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 405,377, Sep. 8, 1989. This application Jul. 25, 1990, Ser. No. 558,127
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.64 21 Claims



1. A method of bonding a first highly reflective metallic electrical member to a second highly reflective metallic electrical member by a laser, comprising:

coating the first electrical member with a coating alloy, comprising

(i) a metal which is the same as the metal of the second electrical member, and

(ii) a coupling material that is well absorbent to the laser energy at the wavelength of the laser, has a lower melting point than either of the electrical members, and has a low solubility in a solid bond alloy of the metal and the first and second electrical members;

aligning the first and second electrical members with the coating alloy therebetween;

holding the first and second electrical members in contact with the coating alloy to form an interface; and

bonding the first and second members at the interface by applying a laser beam, wherein the laser characteristics are selected so that as the bond alloy solidified a solidification front will drive the molten coupling material and molten compounds containing the coupling material away from the bond interface toward the exterior periphery of the bond, wherein substantially all of the solidified bond interface consists of the bond alloy, and wherein substantially all of the bond interface strength results from the bond alloy.

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5,049,720

## LASER WELDING APPARATUS WITH SKY WINDOW

Jin-Liou Fang, San Jose, and Kenny H. Mikami, Santa Clara, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 24, 1990, Ser. No. 571,692
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.63 8 Claims

1. A laser welding apparatus for sealing a plastic lid material to a plastic container, said apparatus comprising:

means for generating a laser beam;

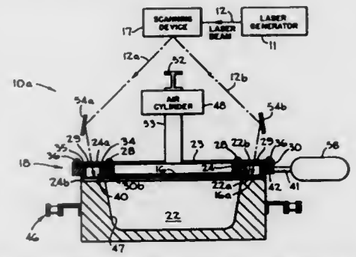
a device for pressing a plastic lid material firmly against a portion of a container;

a laser-transparent window mounted in said pressing device;

means for directing said laser beam through said window to said lid material to develop heat for sealing said lid material to said container;



means for forming an air-tight chamber between said window and said lid material; and



means for pressurizing said chamber to press said lid material against a portion of said container to facilitate sealing said lid material to said container as said laser beam heats said lid material and said container.

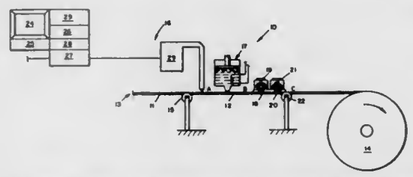
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5,049,721

## LASER MARKING APPARATUS AND METHOD FOR PROVIDING MARKINGS OF ENHANCED READABILITY IN AN OUTER JACKET OF A MOVING CABLE

Stanley J. Parnas, Yorba Linda; Leroy V. Sutter, Jr., Irvine; Randy C. Horne, Costa Mesa, all of Calif.; Robert A. Wessels, Jr., Chamblee, Ga.; Celestino Rey, Atlanta, Ga., and Jack E. Andrews, Stone Mountain, Ga., assignors to American Telephone and Telegraph Company, New York, N.Y. and Directed Energy, Inc., Irvine, Calif.

Continuation of Ser. No. 408,818, Sep. 18, 1989, abandoned. This application Jun. 20, 1990, Ser. No. 541,190
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.68 11 Claims



1. A laser marking apparatus for providing markings in an outer jacket of a moving cable wherein the outer jacket, which is of a specified color, has an outer surface and the cable, which is delivered from a supply source, is advanced under tension and is wound onto a take-up spool, said laser marking apparatus comprising:

a. laser marking means for inscribing markings in the outer jacket opening to the outer surface thereof;

b. guiding means for guiding the cable along a path of travel so that the cable passes said laser marking means adjacent thereto, said guiding means being disposed adjacent to said path of travel between the supply source and the take-up spool;

c. applicating means for applying a flowable material, the color of which is different from and contrasts with the specified color of the outer jacket, onto the outer surface of the outer jacket so that some of said flowable material flows into each of said markings; and

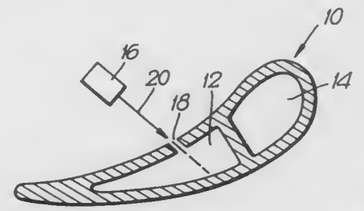
d. removing means for removing only the portion of said flowable material which is on outer surface of the outer jacket and leaving the reminder of said flowable material which is in each of said markings whereby the readability of said markings is enhanced.

5,049,722

## LASER BARRIER MATERIAL AND METHOD OF LASER DRILLING

Arthur G. Corfe, and David Stroud, both of Bristol, England, assignors to Rolls-Royce plc, London, England

Filed Sep. 14, 1990, Ser. No. 582,169
Claims priority, application United Kingdom, Sep. 16, 1989, 8921040
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.71 12 Claims



6. A method of laser drilling a hole through a wall of a hollow component into a cavity within the component, the method comprising the steps of,

(a) coating a surface of the cavity opposite said wall with a barrier material comprising a wax base containing polytetrafluoroethylene in fine granule form,

(b) drilling a hole through said wall with a laser beam, and

(c) subsequently removing the barrier material from the cavity by steaming,

whereby during step (b) said surface is protected from machining by the laser beam by virtue of the barrier material.

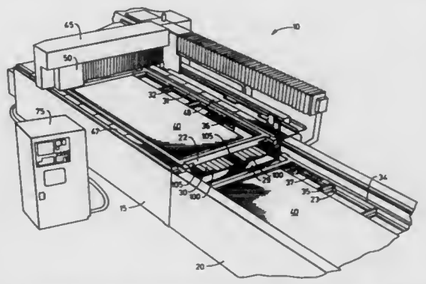
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5,049,723

## SYSTEM FOR DETECTING PENETRATION OF A BLANK

John L. Macdonald, Cincinnati, Ohio, assignor to Cincinnati Incorporated, Cincinnati, Ohio

Filed Mar. 20, 1990, Ser. No. 496,518
Int. Cl.[5] B23K 26/00
U.S. Cl. 219—121.83 22 Claims



1. A system for detecting penetration of a blank by the cutting means of a cutting device prior to cutting a workpiece from said blank, said cutting means being of the type producing detectable light at the point of penetration on the side of said blank facing away from said cutting means, said system comprising at least one sensor module positioned on said cutting device on the opposite side of said blank as said cutting means, control means for controlling said cutting means and its movement, said sensor module being operatively connected to said control, said sensor module having an output signal to said control means to initiate movement of said cutting means to cut said workpiece from said blank immediately upon detection of said penetration by said sensor module.

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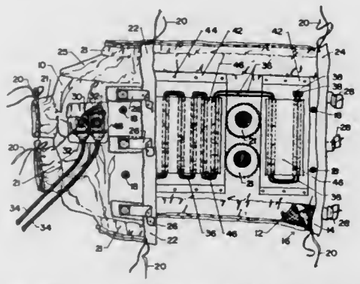


5,049,724

## THERMAL PROTECTION BLANKET FOR A BLOW OUT PREVENTOR

Robert A. Anderson, 4245 - 53 Street, Red Deer, Alberta, Canada T5M 2E1

Filed Apr. 12, 1989, Ser. No. 336,834
Int. Cl.[5] H05B *3/34*
U.S. Cl. 219—212 3 Claims



1. A thermal protecting apparatus for a blowout preventor, having external connections, the thermal protecting apparatus comprising:
- a flexible cover having a plurality of openings fitted to the shape of the blowout preventor external connections;
- an outer pad detachably attached to the inside of the flexible cover;
- an inner pad having first and second sides, the first side being attached to the outer pad;
- a self regulating electrical heating element disposed between the inner and outer pads;
- the cover being adjustable between a first position in which the blowout preventor is insulated from the environment and a second position in which the blowout preventor is exposed to and accessible from the environment;
- a metallic, heat conductive lining attached to the second side of the inner pad and disposed on the inside of the electrical heating element such that the conductive lining is disposed between the electrical heating element and the blowout preventor when the cover is in the first position;
- means for fastening the cover in the first position; and
- an electrical power source connected to the self regulated electrical heating element.

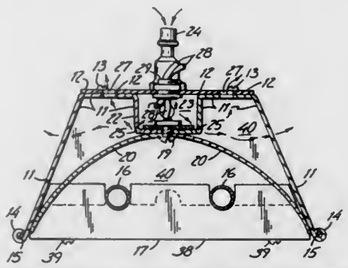
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5,049,725

## HINGEABLE RADIANT HEATING STRUCTURE

Andrew E. Abramson, Excelsior, Minn., assignor to Rcsearch, Incorporated, Eden Prairie, Minn.

Filed Jun. 13, 1990, Ser. No. 537,900
Int. Cl.[5] F26B *3/30*
U.S. Cl. 219—347 26 Claims



1. A radiant heating structure for use in supplying radiant energy to a selected object, said structure comprising:
- a first frame means having a first sheet means with both an inner surface and an outer surface on opposite sides thereof such that said outer surface at a channel enclosure portion of said first sheet means encloses an elongated channel space about either side of an access opening providing access thereto, and such that said inner surface encloses an elongated source space about either side of a transfer opening between a pair of side edge regions at opposite sides of said first sheet means, said pair of side edge regions of said first sheet means each having first portions of a corresponding hinge means provided thereat;
- a first pair of reflector means each of which is removably positioned substantially in said first sheet means source space between a corresponding one of said pair of side edge regions of said first sheet means and said channel enclosure portion of said first sheet means, said first pair of reflectors so positioned forming a radiant energy reflecting surface facing said first sheet means transfer opening; and
- a first pair of radiant energy tube holders positioned at opposite ends of said first sheet means in said first sheet means source space each capable of constraining a radiant energy tube therein to prevent substantial motion thereof in at least one direction.

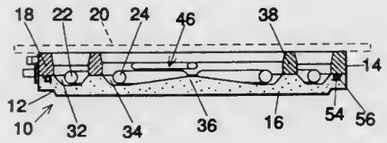
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5,049,726

## RADIANT ELECTRIC HEATERS

George A. Higgins, Hagley, and Kevin R. McWilliams, Stratford-upon-Avon, both of England, assignors to Germamaspeed Limited, Droitwich, England

Filed Nov. 20, 1990, Ser. No. 616,284
Claims priority, application United Kingdom, Nov. 21, 1989, 8926289
Int. Cl.[5] H05B *3/74*
U.S. Cl. 219—464 10 Claims



1. A radiant electric heater comprising:
- a layer of electrical and thermal insulating material;
- a wall of electrical and thermal insulating material extending over the insulating material layer;
- at least one infra-red source means having a relatively high temperature coefficient of resistance; and
- resistive means arranged to be interposed temporarily in series with said source means upon energization thereof, said resistive means being located under said wall.

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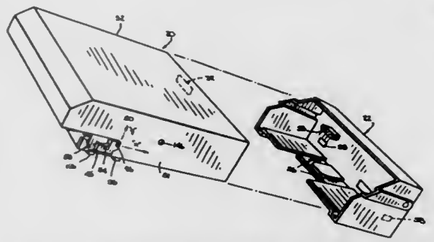
5,049,727

## LOCKING DEVICE FOR REMOVABLE POSTAGE METER

Jovito N. Abellana, Trumbull, and Danilo P. Buan, Easton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 28, 1988, Ser. No. 291,462
Int. Cl.[5] G07G *1/00*
U.S. Cl. 235—101 11 Claims

1. A combination comprising a postage meter receptacle and a postage meter insertable therein and removable therefrom;
- said postage meter comprising a housing, a printing device disposed in said housing, an aperture in said housing exposing said printing device, a cover for said aperture, means mounting said cover to said postage meter for movement of said cover from a closed position in which said cover is disposed at said aperture and an open position in which said cover is disposed away from said aperture, said cover being structured to prevent access to said printing device through said aperture when said cover is in said closed position and to permit access to said printing device when said cover is in said open position;



- said receptacle including first engaging means for engaging said cover in a predetermined position of said postage meter, and driving means for driving said first engaging means to move said cover between said closed and open positions thereof.

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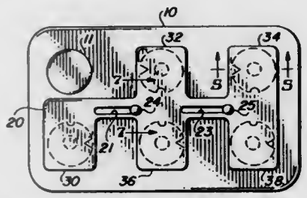


5,049,728

## IC CARD SYSTEM WITH REMOVABLE IC MODULES

George H. Rovin, Ojai Valley School, 723 El Paseo Rd., Ojai, Calif. 93023

Filed Apr. 4, 1990, Ser. No. 503,994
Int. Cl.[5] G06K *19/00*
U.S. Cl. 235—492 19 Claims



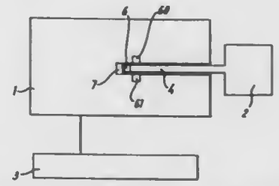
1. An IC card including in combination:
- a card body of a predetermined thickness having a first surface and having a network bus conductor therein at a distance from said first surface which is less than said predetermined thickness;
- an inlaid information processing unit in said card body having external signal connection terminals on an exposed face thereof at said first surface of said card body and electrically interconnected with said network bus conductor;
- at least one open receptacle extending from the first surface of said card body to a depth to expose said network bus conductor therein for electrical contact with conductive terminals of a removable information processing unit configured to fit into said receptacle and
- retaining means comprising cover means extending over said receptacle in a first position thereof and movable to a second position to expose said receptacle for releasably retaining removable information processing units in said receptacle.

5,049,729

## CODED KEY SYSTEM USING PULSE POLARITY

Ian J. Dease, Swinton, Great Britain, assignor to Rigby Electronics Group PLC, Manchester, England

Continuation of Ser. No. 118,844, Nov. 9, 1987, abandoned. This application May 8, 1990, Ser. No. 520,971
Claims priority, application United Kingdom, Nov. 8, 1986, 8626719
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—382 16 Claims



1. A key for contactless coded key system comprising a key housing, a circuit disposed in the housing having a memory which may be read from and/or written to, means enabling the memory to be read from and/or written to, means comprising a winding forming part of a transformer for enabling the circuit to be powered from externally of the key and means also comprising the said transformer winding for enabling information to be transmitted to and/or from the key from and/or to another part of the system, and rectifier means connected to the winding such that both positive and negative pulses appearing on the winding are rectified to provide power for the circuit and such that positive and negative pulses can be distinguished form each other to provide operational information to the key, said positive pulses defining a set of positive pulses, said negative pulses defining a set of negative pulses, the pulses of one of said sets of pulses being employed as clock pulses to clock data into the key and the pulses of the other one of said sets of pulses being used to provide the data so clocked.

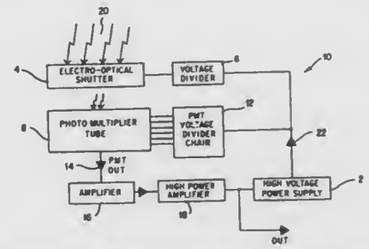
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5,049,730

## AUTOMATIC SHUTTER FOR LOW LIGHT SENSING AND AMPLIFYING DEVICE

Radon B. Loveland, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 23, 1990, Ser. No. 513,734
Int. Cl.[5] H01J *31/50, 40/14*
U.S. Cl. 250—213 VT 10 Claims




1. A device for automatically and adjustably limiting increasing amounts of monitored electromagnetic energy from impinging on a processing device comprising;
- a power supply having a supply signal;
- electromagnetic energy processing means for sensing and amplifying the monitored electromagnetic energy;
- attenuating means, interposed between the monitored electromagnetic energy and said electromagnetic energy processing means and responsive to the supply signal from

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said power supply, for attenuating the monitored electromagnetic energy transmitted therethrough, said electromagnetic energy processing means transmitting an output signal to said power supply so that as the monitored electromagnetic energy increases the output signal causes said attenuating means to attenuate the electromagnetic energy transmitted therethrough in a direct proportional relation.

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**5,049,731**

## AUTOMATIC FOCUS CONTROL DEVICE HAVING A PLURALITY OF FOCUS DETECTION AREAS

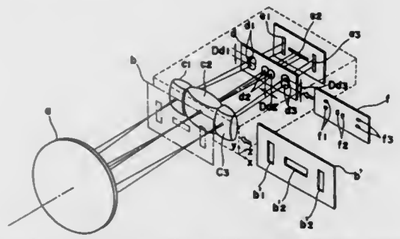
**Tokuji Ishida; Toshio Norita, and Hiroshi Ootsuka, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 141,845, Jan. 11, 1988, Pat. No. 4,904,854. This application Dec. 27, 1989, Ser. No. 457,898**

**Claims priority, application Japan, Jan. 12, 1987, 62-4621; Jan. 12, 1987, 62-4622; Jan. 12, 1987, 62-4623; Jan. 12, 1987, 62-4624; Jan. 12, 1987, 62-4625; Jan. 12, 1987, 62-4626; Jan. 12, 1987, 62-4627; Jan. 12, 1987, 62-4628**

**Int. Cl.[5] G01J** *1/20*

**U.S. Cl. 250—201.2** **12 Claims**



1. An automatic focus control device of a camera, comprising:

photo-sensor means for receiving, through a photo-taking lens of said camera, light coming from a plurality of regions different from each other in a photographic field to be photographed, said plurality of regions including a specified region having a plurality of blocks different from each other;

means for detecting focus condition of said photo-taking lens with respect to said respective regions and respective blocks on the basis of a plurality of outputs of said photo-sensor means;

means for discriminating whether or not the focus detection is possible at each of the plurality of regions, said discriminating means discriminating that the focus detection with respect to said specified region is impossible when discriminating that the focus detection with respect to all of the blocks included in said specified region is impossible; and

means for controlling a predetermined operation of the camera when the discriminating means discriminates that the focus detection is impossible at all of the plurality of regions.

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**5,049,732**

## OPTICAL PICKUP DEVICE WITH DIFFRACTION DEVICE

**Toshiya Nagahama, Nara; Yoshio Yoshida, Tenri; Yasuo Nakata, Tenri, and Yukio Kurata, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 19, 1989, Ser. No. 424,373**

**Claims priority, application Japan, Oct. 21, 1988, 63-266425; Apr. 13, 1989, 1-95646**

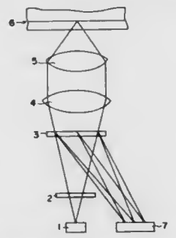
**Int. Cl.[5] G01J** *1/20;* **G11B** *7/00*

**U.S. Cl. 250—201.5** **9 Claims**

1. In an optical pickup device wherein a main beam and a pair of sub-beams are reflected from a recording medium, and directed to a light receiving device through a diffraction device, the improvement wherein:

said diffraction device comprises first, second and third diffraction regions which diffract the main beams and sub-beams along predetermined diffraction directions, said second and third diffraction regions receiving light beams from said recording medium which are substantially identical in amount to each other,

said light receiving device comprises first, second, third and fourth receiving regions, said first and second light receiving regions being juxtaposed, and separated by a line,



the main beam which has been diffracted by said first diffraction region is focused onto said line,

the main beam which has been diffracted by said second diffraction region is focused onto said first light receiving region,

the main beam which has been diffracted by said third diffraction region is focused onto said second light receiving region, and

the sub-beams which have been diffracted by said diffraction device are focused onto said third and fourth light receiving regions, respectively.

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**5,049,733**

## SEMICONDUCTOR CHIP DETECTING DEVICE FOR PROVIDING FOCUSING AND REPRODUCTION SIGNALS

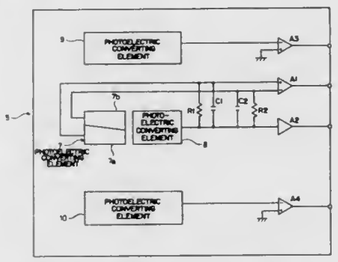
**Koji Yoshifusa; Hikaru Nishihara, and Taizo Yokota, all of Hiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Apr. 4, 1990, Ser. No. 504,672**

**Claims priority, application Japan, Apr. 7, 1989, 1-89315**

**Int. Cl.[5] G01J** *1/20;* **G11B** *7/00*

**U.S. Cl. 250—201.5** **7 Claims**




1. A photo detecting device comprising:

a photoelectric converting element formed on a semiconductor chip, said photoelectric converting element divided into first and second light receiving regions; and

a signal processing circuit formed on the same semiconductor chip, said signal processing circuit including

subtracting means for subtracting an output signal from said second light receiving region from an output signal from said first light receiving region, and



low frequency component removal means for coupling said output signals from said first and second light receiving regions and for removing low frequency components therefrom.

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**5,049,734**

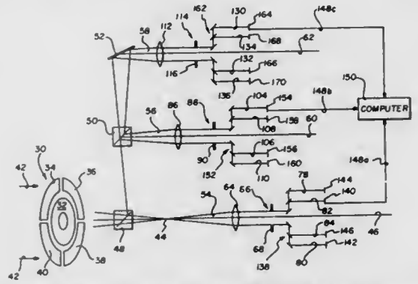
## METHOD FOR DETERMINING PETAL PISTON IN A SEGMENTED IMAGING SYSTEM

**Philip F. Marino, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 23, 1990, Ser. No. 572,076**

**Int. Cl.[5] G01J** *1/20*

**U.S. Cl. 250—201.9** **7 Claims**




1. In an imaging system for imaging scene radiation comprising a center mirror and a set of P petals adjacent to the center mirror, a method for determining petal piston for each of the P petals, the method comprising the steps of:

1) separating scene radiation into replicate first, second and third scene radiation beams;

2) processing the first scene radiation beam by

(i) dividing the first scene radiation beam into p discrete beams, in correspondence to p areas of the imaging system, such that each area p overlaps a portion of one of the P petals and a portion of the center mirror;

(ii) adding or subtracting zero path length difference to that component of each of the p discrete beams that exits the petal relative to that component which exits the center mirror, for creating p discrete zero piston beams; and

(iii) outputting the p discrete zero piston beams;

3) processing the second scene radiation beam by

(i) dividing the second scene radiation beam into p discrete beams, in correspondence to p areas of the imaging system, such that each area p overlaps a portion of one of the P petals and a portion of the center mirror;

(ii) adding path length to that component of each of the p discrete beams that exits the petal relative to that component which exits the center mirror, for creating p discrete positive piston beams; and

(iii) outputting the p discrete positive piston beams;

4) processing the third scene radiation beam by

(i) dividing the third scene radiation beam into p discrete beams, in correspondence to p areas of the imaging system, such that each area p overlaps a portion of one of the P petals and a portion of the center mirror;

(ii) adding path length to that component of each of the p discrete beams that exits the center mirror relative to that component which exits the petal, for creating p discrete negative piston beams; and

(iii) outputting the p discrete negative piston beams;

5) photodetecting each of the p discrete zero piston beams, for measuring p discrete variance of intensity magnitude.,

6) photodetecting each of the p discrete positive piston beams, for measuring p discrete variance of intensity magnitude;

7) photodetecting each of the p discrete negative piston beams, for measuring p discrete variance of intensity magnitude; and

8) determining petal piston for each of the P petals by

(i) generating a petal parabolic function by specifying at least three independent variables derived from steps 5, 6 and 7 respectively, the variables thus comprising the magnitudes of the variance of intensity of the zero, positive, and negative piston beams; and

(ii) computing a parabolic function maximum as a measure of petal piston.

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**5,049,735**

## APPARATUS FOR DETECTING LIGHT RECEIVING POSITION

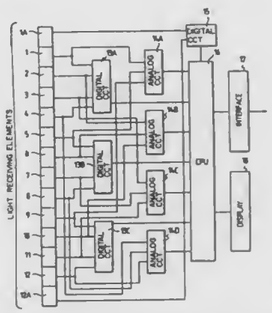
**Eiichi Kitajima, Yokohama, and Akihiko Morishita, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed Jul. 6, 1990, Ser. No. 549,417**

**Claims priority, application Japan, Jul. 10, 1989, 1-177789**

**Int. Cl.[5] H01J** *40/14*

**U.S. Cl. 250—206.1** **2 Claims**




1. An apparatus for detecting a light receiving position, comprising:

a light receiving portion composed of M groups linearly arranged each including N light receiving elements linearly arranged in order, where M and N each is an integer;

M digital circuits corresponding to the respective M groups of the light receiving portion, each digital circuit being connected to each of light receiving element of the corresponding group of said light receiving portion and adding input signals therefrom to output a detection signal information when the added value exceeds a predetermined level;

N analogue circuits each connected to the light receiving element of the same order in each of all groups of said light receiving portion and adding input signals therefrom to output an added value information; and

calculating means connected to said M digital circuits and said N analogue circuits, for calculating a light receiving position of beam light incident to said light receiving portion, on the basis of the informations from said M digital circuits and said N analogue circuits.

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**5,049,736**

## APPARATUS FOR MEASUREMENT OF GEOLOGICAL AGE BY MEASURING ZIRCONIUM COLOR

**Kunio Kai, Kawasaki, Japan, assignor to Sekiyushigen Kaihatsu Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 13, 1990, Ser. No. 565,719**

**Claims priority, application Japan, Sep. 19, 1989, 1-240639**

**Int. Cl.[5] G01J** *3/50;* **H01J** *5/16, 40/14*

**U.S. Cl. 250—226** **3 Claims**

1. A geological age measurement apparatus by the color measurement of zirconium, comprising:

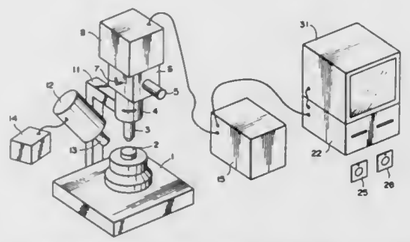
a polarizing objective lens (3) for obtaining magnified images of samples;

a slit device (4) for stopping the quantity of light;

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a lens-barrel 6 including an optical path switching lever (7) and an eyepiece (5);
a photoelectric transducer device (8) for converting light into electric signals;
said polarizing objective lens (3), said slit device (4), said lens-barrel (6) and said photoelectric transducer device (8) being arranged in order from the bottom direction to the top direction above an object sample bearer (2) for placing object samples;
a light source device (12) placed in the inclined upper direction from said object sample bearer (2), connected to a voltage stabilizer (14) and equipped with a polarizing condenser lens (13);
a color measuring instrument (15) for converting and controlling the electric signals converted by said photoelectric transducer device (8) into their color values and in-



cluding an input/output control unit (16), to which a compensation circuit 17, a color arithmetic circuit (19) and a color display system conversion circuit (20) are connected in series, and a compensation memory circuit (18) connected to said compensation circuit (17); and
an arithmetic recording computer (22) connected to the output portion of said color measuring instrument (15), an input unit (29) and a display unit (31), and including both a control arithmetic circuit (34) connected to a storage medium input/output unit (24) and said storage medium input/output unit 24 connected to both a measured result storage medium (26) and a control storage medium (25) including a calibration curve preparation program (30) showing the relation between colors and geological ages, an age arithmetic program (27) for calculating the geological ages from colors, and a basic program (28).

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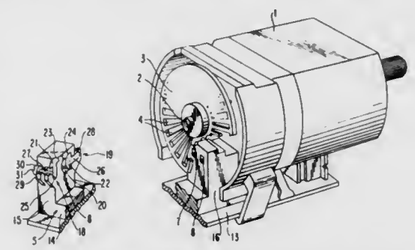
**5,049,737**

## SCANNER FOR CLOCK DISCS FOR PUTTING OUT SIGNALS TO AN EVALUATION CIRCUIT IN TYPEWRITERS OR OFFICE MACHINES OF SIMILAR CONSTRUCTION

**Ernst Kloppenburg, Strackholt; Heiner Gerken, Jever, and Wilfred Penning, Varel, all of Fed. Rep. of Germany, assignors to AEG Olympia Office GmbH, Wilhelmshaven, Fed. Rep. of Germany**

**Filed Jan. 19, 1990, Ser. No. 467,209**
**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 3901535**
**Int. Cl.[5] G01D** *5/34*
**U.S. Cl. 250—231.16** **5 Claims**

1. A scanner device for a clock disc including light transmitting slits which are uniformly distributed over the circumference of the clock disc for transmitting signals to an evaluation circuit to control the position of a driven member operated by a d.c. motor, wherein the clock disc is fixed to a drive shaft of the motor and the slits are scannable by means of a light barrier arrangement in the form of a position sensor including light source means for projecting a bundle of light beams along respective beam paths and light receiving means disposed for receiving the light beams after having passed through the slits and producing output voltages representing the received light beams, the improvement wherein said light source means comprises a sole light source which has an exit surface with a circular cross section, and further comprising two adjustable shutters, each having an identical semicircular covering face and arranged diametrically with respect to the circular cross section of the exit surface of said sole light source, said shutters being mounted for being manually pivoted into the beam paths for changing the cross section of the bundle of light



beams coming from said sole light source so that the maximum values of the output voltages of said light receiving means are adjusted to predetermined voltages, wherein the covering faces of said shutters each have circumferential faces which, when said shutters are in a position of maximum coverage of the light beams, just do not touch one another in the center of the exit surface where the light beams exit from said sole light source.

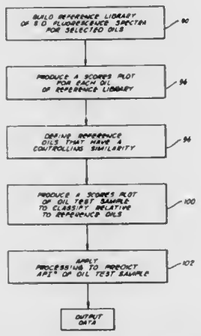
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**5,049,738**

## LASER-ENHANCED OIL CORRELATION SYSTEM

**John S. Gergely, Ponca City, Okla., and Roger K. McLimans, Wilmington, Del., assignors to Conoco Inc., Ponca City, Okla.**

**Continuation-in-part of Ser. No. 275,232, Nov. 21, 1988, abandoned. This application Feb. 23, 1990, Ser. No. 484,787**
**Int. Cl.[5] G01N** *21/64*
**U.S. Cl. 250—301** **14 Claims**




1. A method for determining the quality of one or more selected oils, comprising:
collecting 3-D fluorescence spectra for a plurality of reference oils having known maturities;
processing the 3-D fluorescence spectra and the contour plot of each oil to produce a scores plot and compiling a reference library of scores plot data;
dividing the scores plots for the plurality of oils into plural subgroups by classifying in accordance with predetermined similarity criteria;
producing a sample scores plot for the 3-D. fluorescence spectra of a selected sample oil; and
defining the sub-group within which the sample scores plot falls and, on the basis of the scores plots for the sub-group, forming a prediction model to predict the maturity of the sample oil.

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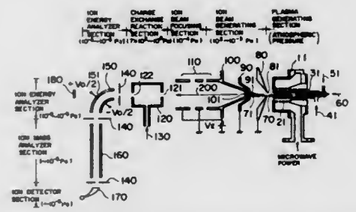


**5,049,739**

## PLASMA ION SOURCE MASS SPECTROMETER FOR TRACE ELEMENTS

**Yukio Okamoto, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 1, 1989, Ser. No. 443,499**
**Claims priority, application Japan, Dec. 9, 1988, 63-309965**
**Int. Cl.[5] H01J** *49/26*
**U.S. Cl. 250—281** **18 Claims**



1. A plasma ion source mass spectrometer for trace elements comprising:
a plasma generating section;
an ion beam generating section;
an ion beam focusing section;
an ion mass analyzer section;
an ion detector section;
a charge exchange reaction section; and
an ion energy analyzer section, the last two sections being disposed between said ion beam focusing section and said ion mass analyzer section.

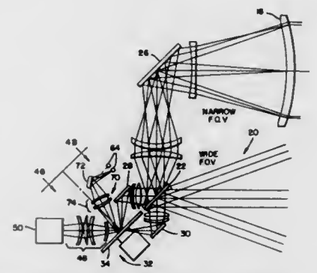
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**5,049,740**

## MULTIPLE FIELD OF VIEW SENSOR

**Michael Y. Pines, Los Angeles; Themi H. Demas, both of Los Angeles, and Robert D. Schaefer, Huntington Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Continuation-in-part of Ser. No. 686,357, Dec. 26, 1984, abandoned. This application Aug. 26, 1986, Ser. No. 917,944**
**Int. Cl.[5] H01J** *3/14;* **G02B** *26/10*
**U.S. Cl. 250—235** **9 Claims**




1. A multiple field of view sensor comprising:
a detector;
means for viewing at plural fields of view and for acquiring electromagnetic radiation therefrom;
scanner means optically coupled to said viewing means, said scanner means comprising an oscillating mirror means, said viewing means including means for directing radiations of a first and a second of the plural fields of view toward said oscillating mirror means to effect a simultaneous scanning of said first and said second fields of view by said oscillating mirror means, said scanner means further comprising folding optics for directing radiations of scanned fields of view from said mirror means to a common intersection;
a switch disposed at said intersection and synchronizd with said scanner means for alternately directing the radiations of said first and said second fields of view to said detector, said switch comprising a rotating wheel having sections thereon for the alternate directing of the radiation to said detector, one of said sections being a mirrored surface disposed parallel to a plane of rotation of said wheel; and
wherein a second section of said wheel is a reflector extending radially along said wheel and being angled relative to said plane of rotation.

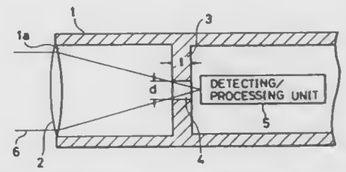
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**5,049,741**

## ELECTROMAGNETIC WAVE SHIELDING SYSTEM FOR OPTICAL SENSOR HAVING AN APERTURE

**Minoru Fukuda, Tokyo, and Shinichiro Ichikawa, Matsudo, both of Japan, assignors to National Space Development Agency of Japan, Tokyo, Japan**

**Filed Mar. 23, 1990, Ser. No. 498,064**
**Claims priority, application Japan, May 2, 1989, 1-112116**
**Int. Cl.[5] H01J** *5/02, 3/14*
**U.S. Cl. 250—239** **4 Claims**




1. An electromagnetic shielding system for use in an optical sensor system, for shielding a signal detecting and processing means thereof from electromagnetic radiation with a wavelength greater than the wavelength of light, said shielding system comprising:
an electronically conducting sensor housing having an aperture through which an optical signal is made incident on said detecting and processing means;
a conducting shielding plate disposed within said sensor housing, said shielding plate having an opening having a dimension of one-half or less of the wavelength of the electromagnetic radiation to be suppressed; and
an optical system for focusing the optical signal which passes through said aperture of said housing such that said optical signal passes through said opening in said shielding plate;
wherein said detecting and processing means of the optical sensor system is positioned in said housing for detecting and processing the optical signal which passes through said opening in said shielding plate.

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**5,049,742**

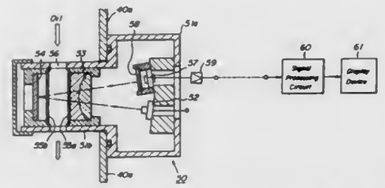
## APPARATUS FOR DETECTING DETERIORATION OF ENGINE OIL

**Kunihiko Hosonuma; Yasushi Naito, and Ryoichi Inada, all of Toda, Japan, assignors to Kyodo Oil Technical Research Co., Ltd., Tokyo, Japan**

**Filed Nov. 16, 1989, Ser. No. 437,519**
**Int. Cl.[5] G01N** *21/35*
**U.S. Cl. 250—301** **19 Claims**

1. An apparatus for detecting the deterioration of an engine oil comprising:
light source means for projecting an infrared light beam upon the engine oil whose deterioration is to be detected;

photodetecting means for receiving infrared light transmitted through said engine oil to generate a photoelectrically converted output signal, a center wavelength of said infrared light received by the light detecting means being set



substantially to an infrared absorption peak wavelength of ester of nitric acid contained in the engine oil; and

signal processing means for receiving said output signal from the photodetecting means to derive a signal representing the deterioration of the engine oil.

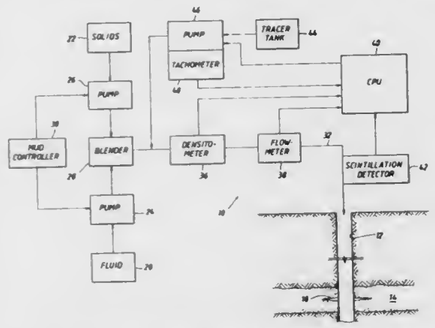
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**5,049,743**

## SURFACE LOCATED ISOTOPE TRACER INJECTION APPARATUS

**Lawrence Taylor, III, Katy; John W. Chisholm, Houston, both of Tex., and Philip T. Thayer, Littleton, Colo., assignors to ProTechnics International, Inc., Houston, Tex.**

**Filed Jan. 17, 1990, Ser. No. 466,237**
**Int. Cl.[5] G21H *5/02***
**U.S. Cl. 250—303** **13 Claims**



1. A method of controlling the flow of radioactive isotope tracers for injection into a well borehole comprising the steps of:

(a) providing a flow of treatment fluid at the surface wherein the fluid flow has desired characteristics and flow rate;

(b) injecting the fluid flow into a well at a controlled rate and pressure for formation treatment;

(c) adding a flow of fluid mixed with a radioactive isotope at the surface to the treatment fluid;

(d) prior to the entry of the treatment fluid flow into the well, measuring radioactivity of the treatment fluid resulting from the added radioactive isotope; and

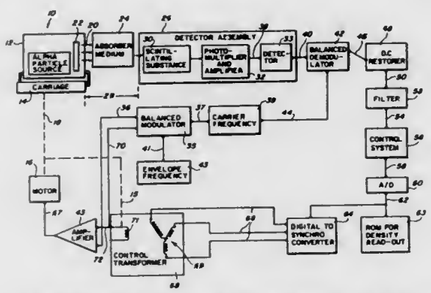
(e) dependent on the measured radioactivity, changing the relative proportion of treatment fluid flow and fluid carried radioactive isotope to obtain a desired level of radioactivity in relation to the treatment fluid flow.

**5,049,744**

## RADIOACTIVE PARTICLE DENSITOMETER APPARATUS EMPLOYING MODULATION CIRCUITRY

**Herbert A. Johnson, Walnut, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 8, 1990, Ser. No. 461,898**
**Int. Cl.[5] G01N *23/06, 9/24***
**U.S. Cl. 250—308** **16 Claims**



1. An apparatus for measuring a characteristic of a medium by measuring radioactive particle absorption in the medium, comprising:

a radioactive particle source including means for directing radioactive particles from said source into the medium,

means, spaced from said radioactive particle source by a path distance which traverses a portion of the medium, for detecting the rate of radioactive particle emission which traverses said path distance in the medium, said detecting means providing a radioactive particle detection signal,

means, responding to said detection signal, for varying said path distance for maintaining a range of predetermined fractions of the rate of emitted radioactive particles that are detected by said detecting means, and means for indicating a characteristic of the medium as a function of said path distance.

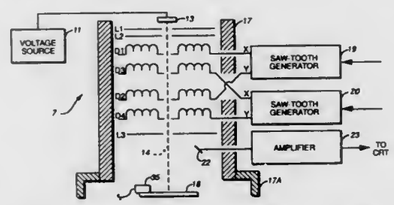
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**5,049,745**

## PHASE-COMPENSATING VIBRATION CANCELLATION SYSTEM FOR SCANNING ELECTRON MICROSCOPES

**Wayne V. Vogen, Oakland, and Martin D. Mannion, Santa Cruz, both of Calif., assignors to Amray, Inc., Bedford, Mass.**

**Continuation-in-part of Ser. No. 270,369, Nov. 14, 1988, Pat. No. 4,948,971. This application Aug. 13, 1990, Ser. No. 566,591**
**Int. Cl.[5] H01J *37/28***
**U.S. Cl. 250—310** **19 Claims**



1. A system for adjusting the scanning pattern of an electron beam in a scanning electron microscope to decrease image sensitivity to vibrations, comprising:

at least one seismometer means connected to the scanning electron microscope to sense the displacement velocity caused by vibrations in at least one direction;

integrator means for integrating output signals from the seismometer means;



phase compensation means for operating upon the integrated output signals to provide phase compensated signals that are substantially 180 degrees out of phase with the sensed vibrations; and

beam steering means for receiving and using the phase-compensated signals from the seismometer means to adjust the normal scanning pattern of the electron beam microscope in a way that reduces the effects of the sensed vibrations on images provided by the microscope.

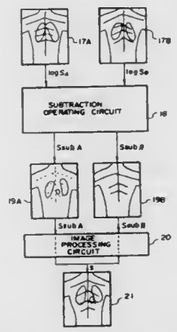
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**5,049,746**

## METHOD AND APPARATUS FOR DISPLAYING ENERGY SUBTRACTION IMAGES

**Wataru Ito, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Oct. 19, 1990, Ser. No. 599,924**
**Claims priority, application Japan, Oct. 19, 1989, 1-272219; Jan. 17, 1990, 2-7335; Apr. 4, 1990, 2-89370**
**Int. Cl.[5] G06F *15/42***
**U.S. Cl. 250—327.2** **14 Claims**



1. A method for displaying an energy subtraction image during energy subtraction processing wherein a plurality of radiation images of an object constituted of bones and soft tissues, which radiation images have been formed with at least two kinds of radiation having different energy distributions and having passed through the object and in which different images of at least part of the object are embedded, are read out and converted into a plurality of digital image signals, each of which is made up of a series of image signal components, the image signal components of the digital image signals which represent corresponding picture elements in the plurality of the radiation images are then subtracted from each other, and a difference signal representing a soft tissue image, in which the patterns of the bones represented by the radiation images have been erased, and a difference signal representing a bone image, in which the patterns of the soft tissues represented by the radiation images have been erased, are thereby obtained,

the method for displaying an energy subtraction image comprising the steps of:

i) carrying out different image processing operations on said difference signal representing said soft tissue image and said difference signal representing said bone image,

ii) adding the difference signals, which have been obtained from said image processing operations, and

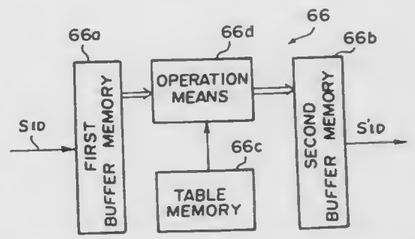
iii) reproducing a visible radiation image of said object from an image signal, which has been obtained from said addition.

**5,049,747**

## RADIATION IMAGE RECORDING AND REPRODUCING SYSTEM

**Kazuhiro Hishinuma, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Mar. 1, 1991, Ser. No. 662,609**
**Claims priority, application Japan, Mar. 6, 1990, 2-54797**
**Int. Cl.[5] H01J *37/22***
**U.S. Cl. 250—327.2** **6 Claims**




1. A radiation image recording and reproducing system, which comprises:

i) an image recording section for irradiating radiation, which carries image information about an object, onto a stimulable phosphor sheet, a radiation image of the object being thereby stored on the stimulable phosphor sheet,

ii) an image read-out section for exposing a stimulable phosphor sheet, on which a radiation image was stored, to stimulating rays, which cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to the radiation, the emitted light being detected and converted into an image signal, and

iii) an image reproducing section for reproducing a visible image of a radiation image from an image signal,

wherein the improvement comprises the provision of a signal format converting section for receiving ID information from an external apparatus, which ID information gives specifics about a radiation image and has a first signal format, and converting said ID information into ID information having a second signal format adapted to the radiation image recording and reproducing system, said signal format converting section comprising:

a) a first buffer memory for storing the ID information, which is received from the external apparatus and has the first signal format,

b) a second buffer memory for storing the ID information, which has the second signal format and into which the ID information having the first signal format was converted,

c) a conversion table memory for storing a conversion table, which is used during the conversion of the ID information having the first signal format into the ID information having the second signal format, and

d) an operation means for reading the ID information having the first signal format from said first buffer memory, converting the ID information, which has the first signal format and has been read out of said first buffer memory, into the ID information having the second signal format in accordance with said conversion table, and thereafter storing the ID information, which has the second signal format and has been generated during the conversion, in said second buffer memory.

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5,049,748

## METHOD AND APPARATUS FOR FORMING ENERGY SUBTRACTION IMAGES

Wataru Ito; Makoto Ohgoda; Yasuhiko Goto, and Kazuo Horikawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Oct. 19, 1990, Ser. No. 599,925
Claims priority, application Japan, Oct. 19, 1989, 1-272214; Oct. 19, 1989, 1-272217; Oct. 19, 1989, 1-272218
Int. Cl.[5] G03B *42/02*
U.S. Cl. 250—327.2 34 Claims




1. A method for forming an energy subtraction image during energy subtraction processing wherein a plurality of radiation images of an object constituted of bones and soft tissues, which radiation images have been formed with at least two kinds of radiation having different energy distributions and having passed through the object and in which different images of at least part of the object are embedded, are read out and converted into a plurality of digital image signals, each of which is made up of a series of image signal components, the image signal components of the digital image signals which represent corresponding picture elements in the plurality of the radiation images are then subtracted from each other with a predetermined parameter, and a difference signal representing an image, in which the patterns of the bones or the patterns of the soft tissues represented by the radiation images have been erased, is thereby obtained,

the method for forming an energy subtraction image comprising the steps of:

i) during the operation for reading out each of said radiation images, simultaneously reading out each of a plurality of images of a phantom, which at least has part exhibiting an equivalent radiation absorption coefficient to said bones and/or part exhibiting an equivalent radiation absorption coefficient to said soft tissues, together with the image of the object,

ii) finding a value of the parameter, with which the image of the part of said phantom exhibiting an equivalent radiation absorption coefficient to said bones or the image of the part of said phantom exhibiting an equivalent radiation absorption coefficient to said soft tissues, whichever image is to be erased, becomes erased in a subtraction image of said phantom obtained from subtraction processing,

iii) determining the value of the parameter, which has thus been found, as an optimum value of the parameter, and

iv) carrying out subtraction processing by using said optimum value of the parameter.

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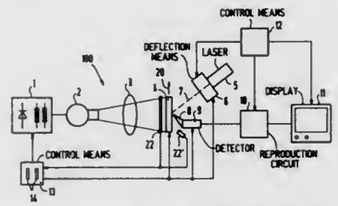
5,049,749

## X-RAY DIAGNOSTICS INSTALLATION HAVING A STORAGE LUMINESCENT SCREEN

Gottfried Lange, and Hans-Erich Reinfelder, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 8, 1990, Ser. No. 493,105
Claims priority, application European Pat. Off., Mar. 14, 1989, 89104478.6
Int. Cl.[5] G03B *42/02*; G01T *1/105*
U.S. Cl. 250—327.2 15 Claims

1. In an x-ray diagnostics installation comprising a storage luminescent screen for the latent storage of a respective x-ray image, said installation including an x-ray generator connected to an x-ray exposure means for producing x-ray images on the screen, read-out means for creating an image from the storage luminescent screen by causing a luminesce pixel-by-pixel on the basis of an area-wide scanning with a scanning beam of a radiation source, detector means for acquiring the light emitted by the storage luminescent screen, and an image reproduction system for receiving an output of said detector means, the




improvements comprising the x-ray generator being connected to the read-out means so that parameters of the read-out means are set on the basis of settings of the x-ray generator and on measurements carried out during the exposure.

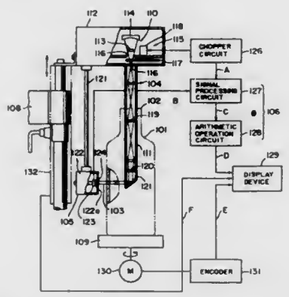
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5,049,750

## APPARATUS AND SYSTEM FOR INSPECTING WALL THICKNESS OF SYNTHETIC RESIN CONTAINERS

Masaru Hoshino, Tokyo, and Hiroaki Nose, Saitama, both of Japan, assignors to Dai Nippon Insatsu Kabusbiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/01279, § 371 Date Aug. 15, 1989, § 102(e) Date Aug. 15, 1989, PCT Pub. No. WO89/05957, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 16, 1988, Ser. No. 397,443
Claims priority, application Japan, Dec. 16, 1987, 62-316081; Jan. 29, 1988, 63-17447; Oct. 6, 1988, 63-252254
Int. Cl.[5] G01B *11/02*
U.S. Cl. 250—341 5 Claims




1. An apparatus for inspecting a wall thickness of a container made of synthetic resin, comprising:

light projector means for projecting an inspection light for insertion into a container made of a synthetic resin so the an open end of said light projector means projects said inspection light toward a wall of the container,

light receiver means arranged outside of the container so as to oppose the open end of the light projector means for receiving the inspection light passing through the wall of the container and converting the received light into an electrical signal,

inspection position changing means for changing a container inspecting position, and

calculation means for calculating the wall thickness of the container on the basis of the electric signal from the light receiver means,

wherein the light receiver means comprises a photoelectric transfer element having cooling means incorporated therein for cooling said photoelectric transfer element;

wherein the inspecting position changing means is a rotary means for rotating the container axially and comprises a



pair of clamp arms each having a roller follower and a drive roller disposed between said pair of clamp arms; and

wherein said calculation means comprises:

central control means for providing central control of the apparatus,

interface control means for controlling interfacing of data with the light receiver means,

drive means for driving a chopper,

signal processing means for processing signals of the light receiver means and the chopper,

rotary encoder means for encoding a rotary position of the container, and

arithmetic operation means for performing arithmetic operations on said data.

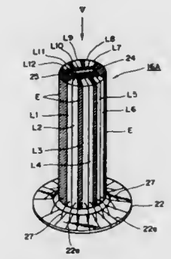
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5,049,751

## INFRARED RAYS DETECTING APPARATUS

Yukihiro Yoshida, Yokohama; Hirokazu Fukuda, Kakogawa; Hiroyuki Tsuchida, Kawasaki; Shigeki Hamashima, and Koji Hirota, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 5, 1990, Ser. No. 622,584
Claims priority, application Japan, Dec. 6, 1989, 1-315200
Int. Cl.[5] G01J *5/30, 5/04*
U.S. Cl. 250—352 8 Claims




1. An infrared rays detecting apparatus, comprising:

an outer tube having an infrared rays transmitting window;

an inner tube accommodated in said outer tube;

an infrared rays sensor of the multi-element type carried on said inner tube and having a common grounding electrode and a number of output electrodes corresponding to the number of the elements thereof;

a plurality of element lines formed on said inner tube and each connected to a corresponding one of said output electrodes;

a plurality of grounding lines formed on said inner tube and connected commonly to said common grounding electrode, said grounding lines being provided such that each of them is interposed between an arbitrary number of ones of said element lines and another arbitrary number of ones of said element lines;

low temperature cooling means for cooling said multi-element type infrared rays sensor to a low temperature; and

means for extracting signals from said element lines and grounding lines to the outside of said outer tube.

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5,049,752

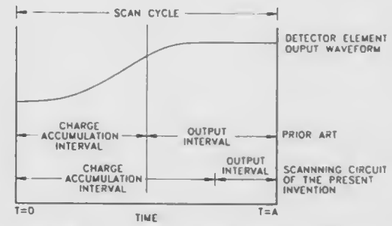
## SCANNING CIRCUIT

Thomas R. Kaiaf, Irvine, and William R. Reitman, Santa Ana, both of Calif., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Oct. 31, 1990, Ser. No. 608,976
Int. Cl.[5] H01L *27/146*
U.S. Cl. 250—370.08 24 Claims

1. A scanning circuit for improving the signal-to-noise ration of signals output from detector elements in an infrared detector array to external circuitry during a scan cycle, the scan cycle including a charge accumulation interval and an output interval, the length of the scan cycle determining the frame scan rate, the scanning circuit comprising:

(a) a plurality of first circuits connected to dedicated detector elements for accumulating charges representative of the outputs of the detector elements, the charges being accumulated over a charge accumulation interval greater than the output interval; and




(b) a plurality of dedicated second circuits connected to said first circuits for outputting signals representative of the accumulated charges to the external circuitry, the signals being output in the output interval, both the charge accumulation interval and the output interval occurring within a single scan cycle; and

(c) wherein the effects of transient noise are reduced and a more complete representation of objects within the detector elements field of view is obtained without decreasing the frame scan rate.

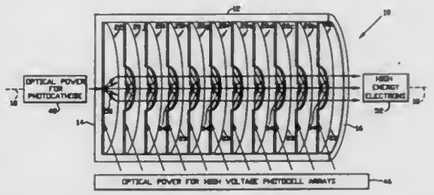
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5,049,753

## OPTICALLY POWERED CHARGED PARTICLE ACCELERATOR

Larry D. Flesner, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1990, Ser. No. 549,885
Int. Cl.[5] H01J *5/50*
U.S. Cl. 250—396 R 18 Claims




1. A apparatus comprising:

means for emitting electrically charged particles into a vacuum; and

optically powered means for controlling said electrically charged particles.

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5,049,754

## RADIATION DOSIMETER DISASSEMBLY, ASSEMBLY AND READING APPARATUSES AND METHODS

James W. Hoelscher, Pullman, Wash., and Carl D. Bloomsburg, Moscow, Id., assignors to International Sensor Technology, Inc., Pullman, Wash.

Continuation-in-part of Ser. No. 343,000, Apr. 24, 1989. This application Jun. 26, 1989, Ser. No. 371,555
Int. Cl.[5] G01T *1/02, 1/10*
U.S. Cl. 250—484.1 55 Claims

1. A tool for disassembly or assembly of a multiple part

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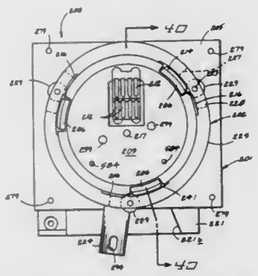


radiation dosimeter badge having at least one detachable portion which is controllably releasable from and securable to remaining portions of the dosimeter badge, comprising:

a first part having a first part face;

a second part movably connected to the first part, and having a second part face;

at least one tamper element prong connected to at least one of said parts, which extends from said first part face and said second part face, said at least one tamper element prong comprising means for extending into an aperture in



the dosimeter badge to engage at least one tamper resistant element forming a part of said dosimeter badge;

at least one locking element prong connected to the second part which extends from said second part face, said at least one locking element prong comprising means for extending into an aperture in the dosimeter badge to engage at least one locking element and allowing the locking element to be moved relative to the badge to secure or release a detachable portion of the dosimeter badge from remaining portions of the dosimeter badge when said second part is moved relative to said first part.

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**5,049,755**

**METHOD AND APPARATUS FOR THE TREATMENT OF SURFACES OF MACHINE COMPONENTS**

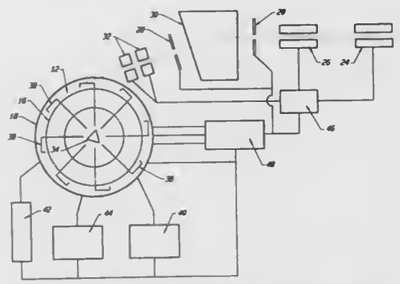
**Rolf Stenbacka, deceased, late of Huddinge, Sweden; by Marlene Stenbacka, heir, Vågsättravägen 25, S-141 40 Huddinge, Sweden, and Birger Emmoth, Alvagen 9, S-183 63 Täby, Sweden**

**PCT No. PCT/SE88/00024, § 371 Date Sep. 17, 1990, § 102(e) Date Sep. 17, 1990, PCT Pub. No. WO89/06857, PCT Pub. Date Jul. 27, 1989**

**PCT Filed Jan. 22, 1988, Ser. No. 543,810**

**Int. Cl.[5] H01J *3/26***

**U.S. Cl. 250—492.3** **14 Claims**



1. A method for treatment of metal or ceramic machine component surfaces by ion irradiation, said method comprising the steps of:

a) providing a machine component surface to be treated;

b) providing a treatment location for receiving said component;

c) providing an ion source wherein said ions from said ion source are forced to run in an essentially planar helical path inwardly to an inner region;

d) deflecting said ions by betatron oscillations and/or by static magnetic and/or electric fields towards said treatment location situated in the centre of said inner region.

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**5,049,756**

**METHOD AND SYSTEM FOR DETECTING FOREST FIRES**

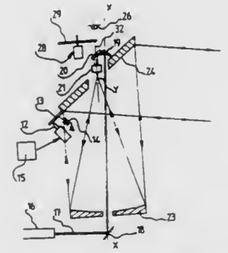
**Francois Brown de Colstoun, 5755 E. River Rd. #2909, Tucson, Ariz. 85723-6723; Jean-Paul Chambaret, 161 Av. Paul Vaillant Couturier, 94250 Gentilly, France; Yves Chambaret, 77 Avenue Parmentier, 75011 Paris, France; Arnaud le Saige de la Villesbrunne, 108 Bld de la Reine, 78000 Versailles, France, and Jean-Claude Moscovici, 66 Av. Victor Hugo, 75116 Paris, France**

**Filed Oct. 13, 1989, Ser. No. 421,122**

**Claims priority, application France, Oct. 13, 1988, 88 13498**

**Int. Cl.[5] H01L *31/14***

**U.S. Cl. 254—554** **8 Claims**



1. A method for detecting and locating a heat source such as a forest fire in an area to be watched comprising the steps of:

a. placing an infrared radiation detector having an optical axis and being capable of detecting a heat source lying substantially on the optical axis on a support structure elevated sufficiently with respect to the area that the optical axis can be directed to substantially any point in the area;

b. causing the detector to carry out a horizontal and vertical scanning motion to detect a heat source within the area to be watched;

c. defining for each point in the area to be watched angular data in a reference system comprising the angles formed by the optical axis with respect to a reference line in a horizontal and vertical plane including the optical axis when the optical axis is directed to the point;

d. associating with the angular data for each point in additional geographical data element impounding the geographical location of the point in a geographic reference system so that the location of each point in the area to be watched is defined by its associated angular data.



**5,049,757**

**METHOD FOR SCANNING A PLURALITY OF OPTICAL MEASURING REFLECTORS AND AN APPARATUS FOR PERFORMING THE METHOD**

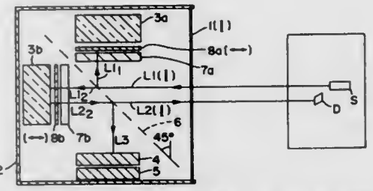
**Roland Hölzl, Munich, Fed. Rep. of Germany, assignor to Pruftechnik Dieter Busch + Partner GmbH & Co., Ismaning, Fed. Rep. of Germany**

**Filed Apr. 4, 1990, Ser. No. 504,652**

**Claims priority, application Fed. Rep. of Germany, Apr. 15, 1989, 3912406**

**Int. Cl.[5] G01N *21/86***

**U.S. Cl. 250—561** **18 Claims**



1. A method for scanning a plurality of optical measuring reflectors which are each arranged to reflect an optical low divergence scanning beam emitted as a reference, more particularly in the form of a laser beam, at a reflection angle dependent on the position in space of a respective object of interest to an optoelectronic position detector, which supplies electric measurement data signals which correspond to the size of and, when appropriate, the direction of the distance of the point of incidence of the reflected scan beam from a reference point of the position detector, characterized in that a common radiation source and a common position detector are employed for all measuring reflectors and in that:

(a) the scan beam emitted by the radiation source is split up into a number, corresponding to the number of reflectors, of beam parts directed respectively to another respective one of such reflectors,

(b) the beam parts are polarized,

(c) the polarization of the polarized beam parts is analyzed before reaching the individual reflectors and the respective beam part is only allowed to reach its respective reflector if the direction of polarization complies with a direction as preset for such reflector, and

(d) the direction of polarization of the polarized beam parts is so set by controlled rotation of their planes of polarization before reaching the polarization analyzers that it is only in the case of one reflector able to be selected in this manner that this direction of polarization complies with the direction of polarization as set for the reflector, while in the case of the others it is generally normal thereto.

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**5,049,758**

**ADAPTABLE CMOS WINNER-TAKE ALL CIRCUIT**

**Carver A. Mead, Pasadena, and Timothy P. Allen, Palo Alto, both of Calif., assignors to Synaptics, Incorporated, San Jose, Calif.**

**Division of Ser. No. 486,336, Feb. 28, 1990, which is a continuation-in-part of Ser. No. 282,176, Dec. 9, 1988, Pat. No. 4,935,702. This application Oct. 31, 1990, Ser. No. 608,972**

**Int. Cl.[5] H03K *17/687, 19/14*; G11C *11/40***

**U.S. Cl. 307—246** **1 Claim**

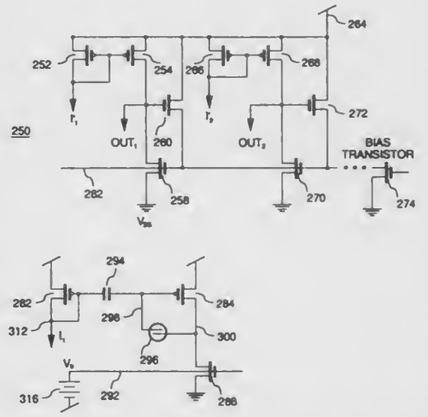
1. An adaptable circuit, communicating with a plurality of current-carrying lines, for indicating the output of the one of said plurality of current-carrying lines through which the most current is flowing, including:

a plurality of MOS current mirrors, each of said current mirrors including an input node, an output node, a driving MOS current mirror transistor and a driven MOS current mirror transistor, the sources of said driving MOS current mirror transistor and said driven MOS current mirror transistor connected to a source of fixed positive voltage, the gate and drain of each of said driving MOS current mirror transistors comprising said input node and connected to a different one of said current carrying lines and to one electrode of a first MOS capacitor, the gate of said driven MOS current mirror transistor connected to a floating node, the second electrode of said first MOS capacitor comprising a portion of said floating node, drain of said driven MOS current mirror transistor comprising said output node and connected to the gate of said follower transistor,

a second MOS capacitor associated with each of said plurality of current mirrors, each said second MOS capacitor having as a first electrode a portion of the floating node in the current mirror with which it is associated, and as a second electrode a second node,

a pulldown transistor associated with each of said current mirrors, each of said pulldown transistors having its source connected to a source of fixed negative voltage, and its gate connected to a common pulldown gate line,

a pulldown gate bias transistor, having its source connected to said source of negative voltage, its gate connected to a source of bias voltage,



a follower transistor associated with each of said current mirrors, having its gate connected to the output of the current mirror with which it is associated, and having a source-drain path connected between a source of fixed voltage and said common pulldown gate line,

means for selectively connecting the drain of said pulldown gate bias transistor to said common pulldown gate line, and for enabling said source-drain path of said follower transistor to conduct during an operating mode of said circuit, and for connecting said common pulldown gate line to a source of fixed voltage, for connecting each of said second nodes to the output node of said current mirror with which it is associated, and for disabling said source-drain path of said follower transistor during an adapting mode of said circuit,

an opaque layer covering portions of the surface of said integrated circuit containing active circuits, said opaque layer having an aperture therein above said second capacitor for allowing ultraviolet light to fall onto said first and second electrodes of said second capacitor whereby the offset voltages of said circuit can be adapted while a source of ultraviolet light is present during said adapting mode of said circuit.

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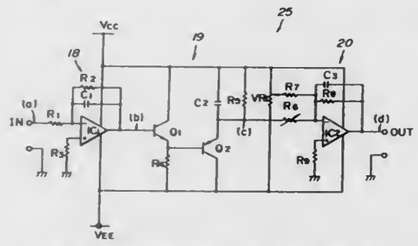


5,049,759

## SIGNAL PROCESSING SYSTEM FOR PERIOD-TO-VOLTAGE CONVERSION

Masami Kodama, Kanagawa, Japan, assignor to Atsugi Motor Parts Company, Limited, Kanagawa, Japan

Filed Apr. 21, 1989, Ser. No. 341,358
Claims priority, application Japan, Apr. 22, 1988, 63-100685
Int. Cl.[5] H03K *5/00*; G01R *19/22*
U.S. Cl. 307—261 17 Claims



1. A signal processing system for converting a constant amplitude and variable period periodic signal into a voltage signal comprising:

a signal generator circuit receiving said periodic signal and converting said periodic signal into a converted signal having an amplitude which continuously varies according to the period of said periodic signal; and

a direct current generator circuit composed of a peak detector circuit for receiving said converted signal to produce a direct current voltage signal having a voltage level variable in proportion to said amplitude of said converted signal, said direct current generator circuit including an amplifier circuit for receiving said direct current voltage signal for

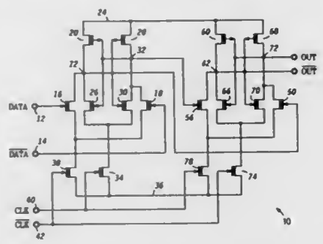
removing a ripple component superimposed on said direct current voltage signal of said peak detector circuit.

5,049,760

## HIGH SPEED COMPLEMENTARY FLIPFLOP

William J. Ooms, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 6, 1990, Ser. No. 609,538
Int. Cl.[5] H03K *1/153*
U.S. Cl. 307—279 17 Claims



1. A flipflop circuit, comprising:

first and second transistors each having a gate, a drain and a source, said gates being coupled for receiving a complementary data input signal, said sources being coupled together;

a third transistor having a gate, a drain and a source, said drain being coupled to said drain of said first transistor, said source being coupled to a first source of operating potential, said gate being coupled to said drain of said second transistor;

a fourth transistor having a gate, a drain and a source, said drain being coupled to said drain of said second transistor, said source being coupled to said first source of operating potential, said gate being coupled to said drain of said first transistor;

first means for enabling and disabling the conduction path between said sources of said first and second transistors and a second source of operating potential in response to an inverted clock signal;

a fifth transistor having a gate, a drain and a source, said gate being coupled to said drain of said second transistor, said drain providing an inverted output signal of the flipflop circuit;

a sixth transistor having a gate, a drain and a source, said gate being coupled to said drain of said first transistor, said sources of said fifth and sixth transistors being coupled together, said drain providing an output signal of the flipflop circuit;

a seventh transistor having a gate, a drain and a source, said drain being coupled to said drain of said fifth transistor, said source being coupled to said first source of operating potential, said gate being coupled to said drain of said sixth transistor;

an eighth transistor having a gate, a drain and a source, said drain being coupled to said drain of said sixth transistor, said source being coupled to said first source of operating potential, said gate being coupled to said drain of said fifth transistor;

second means for enabling and disabling the conduction path between said sources of said fifth and sixth transistors and said second source of operating potential in response to a clock signal;

a ninth transistor having a gate, a drain and a source, said drain being coupled to said drain of said first transistor and to said drain of said third transistor, said gate being coupled to said drain of said second transistor and to said gate of said third transistor;

a tenth transistor having a gate, a drain and a source, said drain being coupled to said drain of said second transistor and to said drain of said fourth transistor, said gate being coupled to said drain of said first transistor and to said gate of said fourth transistor, said sources of said ninth and tenth transistors being coupled together; and

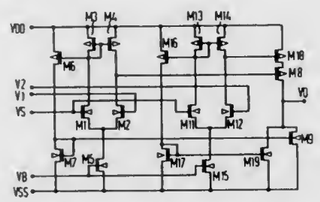
third means for enabling and disabling the conduction path between said sources of said ninth and tenth transistors and said second source of operating potential in response to said clock signal.

5,049,761

## CMOS PULSE WIDTH MODULATOR

Heinz Zitta, Drobollach, Austria, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1989, Ser. No. 412,916
Claims priority, application European Pat. Off., Sep. 26, 1988, 88115840
Int. Cl.[5] H03K *5/04, 5/24*
U.S. Cl. 307—360 3 Claims



1. Pulse width modulator configuration in complementary MOS circuit technology, comprising two comparators for comparing an input signal with two reference signals and producing results of the comparison, and output stages associated with said comparators, said output stages being interconnected for logically linking the results of the comparison, wherein said comparators have outputs, and said output stages include first output transistors being controlled by said comparator outputs and second output transistors being complementary to said first output transistors, said first output transistors having output circuits connected in series, and said second output transistors of said two comparators having output circuits connected in parallel.

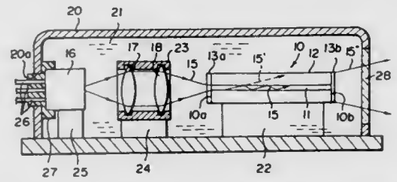


5,049,762

## OPTICAL WAVELENGTH CONVERTER SYSTEM

Takayuki Katoh, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 407,072, Sep. 14, 1989, abandoned. This application Oct. 15, 1990, Ser. No. 597,601
Claims priority, application Japan, Sep. 14, 1988, 1-230595; Oct. 13, 1989, 2-267669; Mar. 14, 1990, 65-63731
Int. Cl.[5] H03F *7/00*
U.S. Cl. 359—332 10 Claims



1. An optical wavelength converter system comprising:

a light source for emitting a fundamental wave;

an optical wavelength converter device for converting the wavelength of the fundamental wave and emitting a wavelength-converted wave, said optical wavelength converter device comprising an element made of an organic nonlinear optical material and covered with a cladding layer which has a smaller refractive index than the refractive index of said element;

an optical system for introducing said fundamental wave into said element of the optical wavelength converter device;

a closed container housing said optical wavelength converter device, said light source, and said optical system, and having a transparent window for transmitting said wavelength-converted wave therethrough; and

an inert medium filled in said closed container.

5,049,763

## ANTI-NOISE CIRCUITS

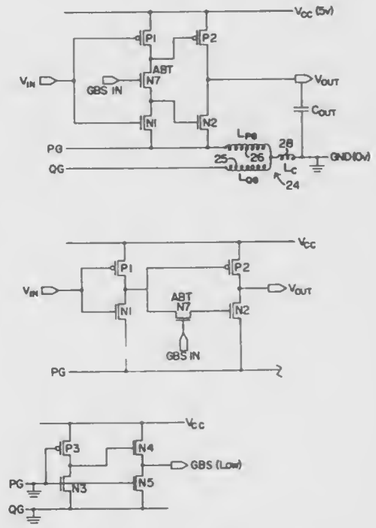
Alan C. Rogers, South Portland, Me., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 22, 1989, Ser. No. 327,348
Int. Cl.[5] H03K *17/16, 19/03, 19/92*
U.S. Cl. 307—443 88 Claims

1. An anti-noise circuit for suppressing ground bound and $V_{cc}$ droop in the power rails of an integrated circuit device having an input stage with ground and supply relatively quiet power rails and an output stage with switching output transistor elements and ground and supply output power rails characterized by lead inductance, said output power rails being subject to power rail transient voltage noise upon switching of the output transistor elements, said anti-noise circuit comprising:

a power rail noise detector circuit operatively coupled for detecting a transient voltage difference in an output power rail relative to a quiet power rail upon switching of an output transistor element and for generating a transient power rail noise signal (PRNS) during occurrence of the detected transient voltage difference;

and a noise control circuit means having an anti-noise transistor element operatively coupled to at least one output detector circuit, said anti-noise transistor element having a control node coupled to receive the PRNS for transient



suppression of turn on of said output transistor element during transient occurrence of a PRNS.

5,049,764

## ACTIVE BYPASS FOR INHIBITING HIGH-FREQUENCY SUPPLY VOLTAGE VARIATIONS IN INTEGRATED CIRCUITS

Robert G. Meyer, Berkeley, Calif., assignor to North American Philips Corporation, Signetics Div., Sunnyvale, Calif.

Filed Jan. 25, 1990, Ser. No. 469,903
Int. Cl.[5] H03K *17/16, 17/60, 19/003, 17/14*
U.S. Cl. 307—443 18 Claims

1. An integrated circuit which comprises a group of electronic circuitry elements formed in a semiconductor die comprising a semiconductive body and an adjoining electrical interconnection system that includes first and second internal power supply lines for transmitting first and second supply voltages to provide power for the circuitry elements, the die including bypass means for inhibiting variations in the supply voltages, characterized in that the bypass means comprises:

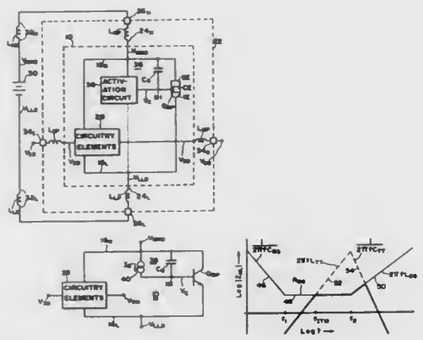
a bypass transistor having a first flow electrode coupled to the first supply line, a second flow electrode coupled to the second supply line, and a control electrode for controlling current flow between the flow electrodes, the conductivity of the transistor substantially depending on the voltage difference between the control electrode and the first electrode;

activation means for providing the control electrode with a control signal to activate the transistor so as to maintain it

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in a conductive condition substantially whenever the circuitry elements are powered; and



a sensing capacitor that provides a capacitive action between the second supply line and the control electrode.

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**5,049,765**

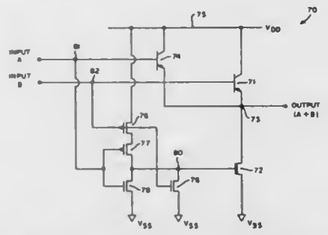
**BICMOS NONINVERTING BUFFER AND LOGIC GATES**

**Ian A. Young, and Jeffrey K. Greason, both of Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.**

**Filed Jun. 19, 1990, Ser. No. 540,342**

**Int. Cl.[5] H03K** *19/02, 19/08*

**U.S. Cl. 307—446** **9 Claims**



1. A BiCMOS binary logic circuit implementing an OR function comprising:

a plurality of emitter follower transistors, each having a base coupled to corresponding inputs of said circuit, said emitter follower transistors having their emitters commonly coupled to an output node;

a pull-down circuit means including a plurality of complementary MOS transistors connected in a CMOS NOR configuration wherein the gates of pairs of said complementary MOS transistors are coupled to said corresponding inputs and the output of said NOR configuration is coupled to the base of a bipolar transistor, for sinking current from said output node through said bipolar transistor to pull the potential of said output node low when all of said inputs are driven with a low potential.

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**5,049,766**

**DELAY MEASURING CIRCUIT**

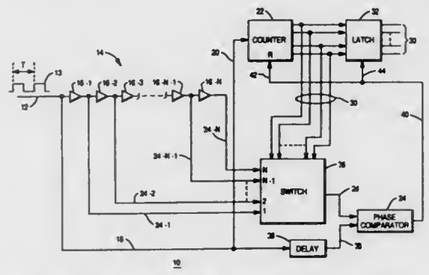
**Hans van Driest, Bilthoven; Hendrik van Bokhorst, Nijkerk, and Richard Kruithof, Voorschoten, all of Netherlands, assignors to NCR Corporation, Dayton, Ohio**

**Filed Mar. 15, 1990, Ser. No. 493,593**

**Claims priority, application United Kingdom, Oct. 27, 1989, 8924203**

**Int. Cl.[5] H03K** *5/14, 5/153*

**U.S. Cl. 307—603** **9 Claims**



1. A delay measuring circuit, comprising:

input means adapted to receive an applied clock signal;

a switching device having an intrinsic delay and having a plurality of inputs and a plurality of control inputs;

a delay line coupled to said input means, having a plurality of individual delay cells with outputs thereof respectively connected to certain of said inputs of said switching device;

counter means having an input coupled to said input means and having output means coupled to certain of said plurality of control inputs of said switching device to thereby connect a selected input of said switching device to an output thereof;

latch means coupled to said output means of said counter means for latching a count value in said counter means;

a delay device having a delay substantially equal to the intrinsic delay of said switching device and being coupled to said input device; and

phase comparator means having inputs coupled to an output of said switching device and to an output of said delay device, and having output means coupled to said counter means and to said latch means,

whereby in response to a phase comparison match, a count value in said counter means is latched into said latch means and said counter means is reset to a predetermined value, such that said latch means stores a value dependent on the delay of one of the individual delay cells.

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**5,049,767**

**SHARED INVERTER OUTPUTS DELAY SYSTEM**

**Robert M. Bennett, Canton, Mich., and Scott L. Falater, Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed May 1, 1989, Ser. No. 345,926**

**Int. Cl.[5] H03K** *5/13, 19/091*

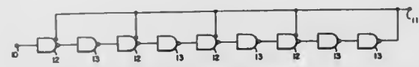
**U.S. Cl. 307—605** **12 Claims**

1. A logic level propagation delay system having an input and an output, said system comprising:

a plurality of multiple output signal level inverters, including first and second multiple output signal level inverters, each said multiple output signal level inverter having a first input and first and second outputs such that each said multiple output signal level inverter, if electrically energized, has its first and second outputs at one logic state voltage level if input signals of a magnitude range less than a first threshold value are applied to its first input and at an opposite logic state voltage level if such input signals are of a magnitude ragne exceeding a second threshold value with a change in magnitude in such input signals between said magnitude ranges leading to a corresponding change in logic state voltage levels at said first and second outputs thereof but which occurs only after first and second switching delays following such a change in magnitude in said input signals, respectively;

a set of intermediate signal level inverters having at least a first intermediate signal level inverter therein, each of said intermediate signal level inverters having a first input and an output such that each said intermediate signal level inverter, if electrically energized, has its output at one logic state voltage level if input signals of a magnitude range less than a third threshold value are applied to its first input and at an opposite logic state voltage value if such input signals are of a magnitude range exceeding a fourth threshold value with a change in magnitude in such





input signals between said magnitude ranges leading to a corresponding change in logic state voltage levels at said output thereof but which occurs only after an intermediate switching delay following such a change in magnitude in said input signals; and

an inverter sequence comprising said first and second multiple output signal level inverters and said first intermediate signal level inverter, said first multiple output signal level inverter first input serving as said system input with any of said outputs thereof electrically connected to said second multiple output signal level inverter first input being so connected solely through said first intermediate signal level inverter, said first multiple output signal level inverter first output being electrically connected to said first intermediate signal level inverter first input which is free of any direct connection from any of said outputs of said second multiple output signal level inverter, said first intermediate signal level inverter output being electrically connected to said second multiple output signal level inverter first input and said first multiple output signal level inverter second output and said second multiple output signal level inverter second output each being electrically connected to said system output.

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**5,049,768**

**REDUCING ENGINE NOISE BY ACTIVE OSCILLATORY TORQUE CONTROL**

**Anders O. Andersson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.**

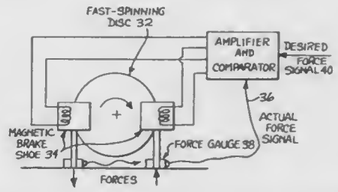
**Continuation of Ser. No. 73,617, Jul. 15, 1987, Pat. No. 4,808,863. This application Dec. 5, 1988, Ser. No. 280,054**

**Int. Cl.[5] F16F** *15/22;* **G05D** *17/02*

**U.S. Cl. 310—51** **2 Claims**

1. A method of reducing engine noise and vibration in a structure comprising the steps of:

providing a control signal having a fundamental frequency which is a function of the shaft rotation speed of the engine and harmonics of said fundamental frequency, and applying said control signal to an electromechanical energy device to vibrate said structure by application of an oscillatory torque to said structure by said electromechanical energy device.



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**5,049,769**

**COLLECTORLESS EXTERNAL-ROTOR MOTOR WITH SEMICONDUCTOR COOLING SYSTEM**

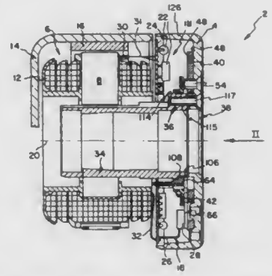
**Wilhelm Reinhardt, Schrozberg-Gütbach; Franz Jakob, Mulfingen-Zaisenhausen; Rudolf Rebenstrost, Niedernhall, and Dieter Best, Ingelfingen, all of Fed. Rep. of Germany, assignors to ebm Elektrobau Mulfingen GmbH & Co., Mulfingen, Fed. Rep. of Germany**

**Filed Dec. 13, 1989, Ser. No. 450,179**

**Claims priority, application Fed. Rep. of Germany, Dec. 17, 1988, 3842588**

**Int. Cl.[5] H02K** *5/18, 11/00;* **H02B** *1/00, 1/56*

**U.S. Cl. 310—64** **24 Claims**



1. A collectorless direct-current external-rotor motor comprising:

a stator (6) provided with stator windings (12);

said stator (6) being fastened to a motor flange (4);

an external rotor (14) surrounding said stator (6) on a side of said stator (6) directed away from said motor flange (4);

an electronic circuit arrangement (18) for driving said stator windings (12), said electronic circuit arrangement (18) including a conductor plate (24) arranged adjacent to a side of said motor flange (4) facing said stator (6);

said conductor plate (24) carrying electronic components (22) and also being electrically connected to power semiconductors (28), said power semiconductors (28) being arranged in heat-conducting contact with said motor flange (4);

an annular disk-form cooling body (40) indirectly joining said power semiconductors (28) to said motor flange (4) with heat-conducting effect;

a carrier element (42) supporting said conductor plate (24) relative to said cooling body (40); and

means for connecting said cooling body (40), said carrier element (42) and said conductor plate (24) together to form a preassembled component (44) so that said cooling body (40), said carrier element (42) and said conductor plate (24) can be inserted into and removed from said external-rotor motor (2) together as a unit.

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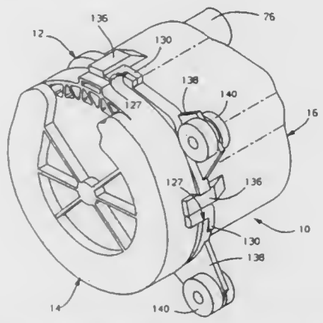


5,049,770

## ELECTRIC MOTOR-DRIVEN IMPELLER-TYPE AIR PUMP

Gerald A. Gaeth, Frankenmuth; Joseph P. Brigham, Flint; Russell L. Herlache, Saginaw, all of Mich., and Steven W. Sherrill, Athens, Ala., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1990, Ser. No. 503,596
Int. Cl.[5] H02K *5/08, 5/24, 9/06;* F04B *35/04*
U.S. Cl. 310—89 22 Claims



1. An electric air pump, having a central mounting plate, an electric motor assembly integral with a first side of said plate, and an impeller housing secured to a second side of said plate, said motor assembly having an armature shaft that extends, through a central aperture in said mounting plate, into the working chamber defined between said mounting plate and said impeller housing, to support and drive an impeller within said chamber to induce air flow through said chamber, from an inlet to an outlet, said air pump further comprising:

bearing mounting means integral with said first side of said mounting plate and coaxial with said central aperture having an armature shaft bearing positioned therein, and brush mounting means positioned relative to said central aperture having a brush assembly attached thereto, said motor armature shaft centrally supported by said armature shaft bearing in an operational relationship with said brush assembly;

a motor upper housing extending over said motor armature shaft and said brush assembly, and cooperating with said first side of said motor plate to enclose said motor;

a silencer housing enclosing said electric motor assembly having a first closed end, and a second open end which cooperates with said first side of said mounting plate to enclose said motor assembly, a central motor chamber axially extending from said first end to said second end to isolate said motor assembly within said silencer housing, an air circuit disposed radially outwardly and coaxially of said central motor chamber having an air inlet chamber and an air outlet chamber, said outlet chamber isolated from said inlet chamber, a silencer housing inlet port, interconnected to said inlet chamber for introduction of air into said silencer housing, and a silencer housing outlet port, interconnected to said outlet chamber for passage of air out of said silencer housing;

an impeller chamber inlet, extending through said mounting plate, for introducing air from said inlet chamber to the inlet side of said impeller chamber;

an impeller chamber outlet, extending through said mounting plate, for exhausting air from the outlet side of said impeller chamber to said outlet chamber; and

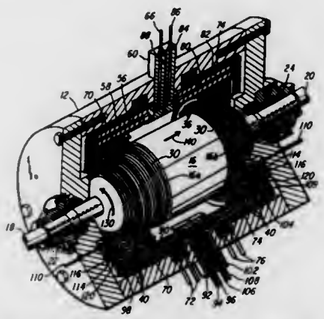
sound insulating means, disposed in said inlet and said outlet chambers.

5,049,771

## ELECTRICAL MACHINE

Antonios Challita, Bellbrook, and David P. Bauer, Xenia, both of Ohio, assignors to IAP Research, Inc., Dayton, Ohio

Filed Jun. 21, 1990, Ser. No. 541,382
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—219 11 Claims



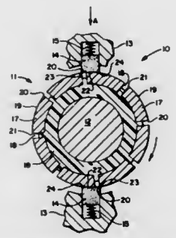
1. An electrical machine comprising a rotor, the rotor including a pair of tapered end portions, leaf type electrical collector means in engagement with the tapered end portions of the rotor and arranged in an annular formation coaxial with the rotor and encompassing the tapered end portions of the rotor, electrical conductor members electrically joined to the electrical collector means and extending therefrom, stator means encompassing the rotor for producing a magnetic field which encompasses the rotor, the leaf type electrical collector means including a plurality of leaf shape collector members which are in spaced-apart relationship, wick means positioned adjacent the collector members and in engagement with the end portions of the rotor, and fluid conduit means joined to the wick means for conducting fluid to the wick means.

5,049,772

## REDUCED NOISE COMMUTATOR

François M. Mottier, West Hartford, and George R. Wisner, Deep River, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1990, Ser. No. 580,224
Int. Cl.[5] H02K *13/00*
U.S. Cl. 310—233 15 Claims



9. A commutator member to be mounted when in use on a support for rotation about a rotational axis relative thereto and to be used in conjunction with a plurality of commutator brushes each having a concave contact surface delimited by lateral edges that extend parallel to the rotational axis, and being mounted on the support for only substantially radial movement relative thereto toward and away from, and being biased toward, the commutator member with the brush contact surface facing the latter, comprising

a plurality of circumferentially adjacent contact pads that are mechanically connected with one another and electrically separated from each other by respective intervening gaps, said pads having radially outwardly facing convex contact surfaces which substantially conform to the configurations of the concave contact surfaces of the commutator brushes and are centered on said rotational axis all at substantially the same radius therefrom to be in area contact with the contact surfaces of the commutator brushes and to cumulatively constitute a circumferential surface of the commutator member that is interrupted by said gaps, and each of which is circumferentially delimited by lateral edges extending along the adjacent ones of said intervening gaps along courses that at least partially circumferentially deviate from parallelism with the rotational axis such that different portions of each of said lateral edges of the respective brush are juxtaposed with the corresponding portions of the respective lateral edge of the respective pad at different times during the relative rotation of said commutator member.

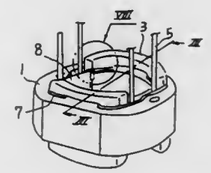


5,049,773

## STATOR ASSEMBLY FOR MOTOR

Kenji Shinagawa, and Takeshi Iitsuka, both of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,457
Claims priority, application Japan, Dec. 9, 1988, 63-160641[U]
Int. Cl.[5] H02K *11/00, 5/08*
U.S. Cl. 310—254 3 Claims



1. A stator assembly for use in an electric motor, comprising:

a stator core having pole tongue ends;

a coil wound in said stator core and having terminal ends;

a plurality of leads connected to said terminal ends at joints;

at least one sheet of insulation paper interposed between said stator core and said coil; and

at least one auxiliary insulation plate extending between ends of said sheet of insulation paper and said pole tongue ends of the stator core, said auxiliary insulation plate having engaging portions held in abutting engagement with said pole tongue ends.

5,049,774

## VIBRATORY MOTOR

Yasuo Kuwabara; Naofumi Fujie, both of Nagoya, Japan, and Takao Saeki, Farmington Hills, Mich., assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 31, 1989, Ser. No. 429,470
Claims priority, application Japan, Oct. 31, 1988, 63-276579
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 4 Claims

1. A vibratory motor comprising:

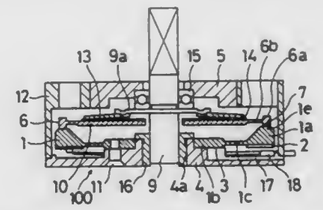
a stator means for generating a traveling wave;

a rotor member in contact with the stator means and driven by the traveling wave;

a portion of the rotor member being of increased stiffness provided by a thickened portion of the rotor member relative to another portion of the rotor member;

a sliding portion of the rotor member being in sliding contact with an elastic member of said stator;

a thinner portion of the rotor member being defined between said thickened portion and said sliding portion; and



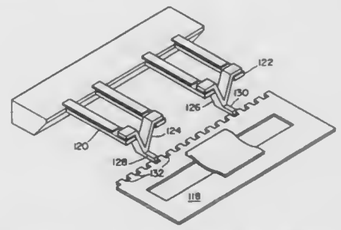
a spring member in contact with the rotor member at the high stiffness portion, said spring member pressing the rotor member to the stator means.

5,049,775

## INTEGRATED MICROMECHANICAL PIEZOELECTRIC MOTOR

Johannes G. Smits, Quincy, Mass., assignor to Boston University, Boston, Mass.

Filed Sep. 30, 1988, Ser. No. 251,565
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—328 36 Claims



1. A piezoelectric actuation machine for displacing rigid objects comprising:

first and second cantilever beams extending from a frame, the beams comprising a piezoelectric material such that application of an electric potential across the material of each beam rotationally displaces the first and second beams relative to each other; and

an actuating member secured between displaceable surfaces on the first and second beams and extending orthogonally from a plane through the beams such that relative displacement of the first and second beams displaces a portion of the member in a direction orthogonal to beam displacement and translates a rigid object contacting the displaced portion of the member relative to the member and the frame.

5,049,776

## APPARATUS FOR DETECTING ROTATION

Naoki Ogawa, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Asahi, Japan

Filed Nov. 8, 1989, Ser. No. 433,224
Claims priority, application Japan, Nov. 9, 1988, 63-283157; Nov. 9, 1988, 63-283158
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—333 14 Claims

1. An apparatus for detecting rotation, comprising:

a support member;

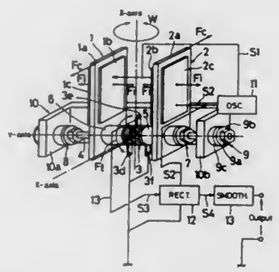
a connector member at least one end of which is supported on the support member;

a vibrating sheet member connected to the connector member;

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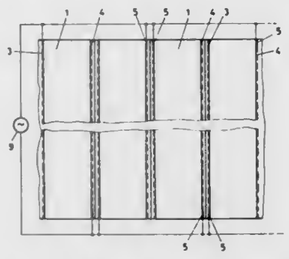
a plurality of piezoelectric members supported on the support member;
driving means rigidly fixed to the vibrating member;



torsion-detecting means for detecting rotation between the connector member and the vibrating member by detecting angular movement of the piezoelectric members; and
activating means for activating the driving means to vibrate the vibrating member.

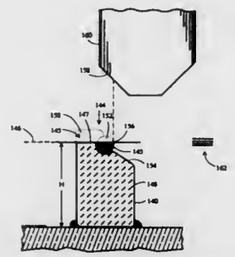
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**5,049,777**
**HIGH-POWER RADIATOR**
Günter Mechtersheimer, Nussbaumen, Switzerland, assignor to Asea Brown Boveri Limited, Baden, Switzerland
Filed Mar. 16, 1990, Ser. No. 494,424
Claims priority, application Switzerland, Mar. 29, 1989, 1140/89
Int. Cl.[5] H01J *7/26, 17/02;* H01S *3/097;* H05B *41/16*
U.S. Cl. 313—35 12 Claims



1. A high-power radiator, especially for ultraviolet light, comprising a discharge space (**10**), which is filled with a fill-gas that emits radiation under discharge conditions, of which the walls are formed by a dielectric tube (**1**; **12**; **17**), which is transparent to radiation and is provided on its surface averted from the discharge space with first and second electrodes (**3**, **4**; **13**, **14**; **18**), and comprising an alternating current source (**9**) for feeding the discharge, wherein the electrodes are constructed as metal strips (**13**, **14**), metal wires (**18**) or metal coatings (**3**, **4**), which run in the longitudinal direction of the tubes and are separated from one another spatially in the tubular circumferential direction, one electrode of each tube being connected to one terminal and the other electrode being connected to the other terminal of the alternating current source (**9**), wherein the dielectric tubes (**1**; **12**; **17**) are partially embedded in the electrically insulating molding compound (**2**).

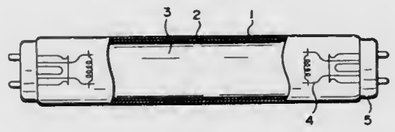
**5,049,778**
**MASK SUPPORT STRUCTURE FOR TENSION MASK COLOR CATHODE RAY TUBES**
Raymond G. Capek, Elmhurst, and Lawrence W. Dougherty, Sleepy Hollow, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.
Continuation-in-part of Ser. No. 566,721, Aug. 13, 1990. This application Dec. 27, 1990, Ser. No. 634,644
Int. Cl.[5] H01J *29/07, 9/00*
U.S. Cl. 313—407 9 Claims



1. A tension mask color cathode ray tube including a glass faceplate having on its inner surface a centrally disposed, rectangular screening area, and on opposed sides thereof, a non-metal shadow mask support structure of predetermined Q-height, said mask-support structure having a metal element embedded in an apex thereof, with the apex of said mask-support structure and said element being ground to define a surface for receiving a tensed foil shadow mask that contains a metal portion to which said mask may be welded, and a non-metal portion which supports said metal portion.

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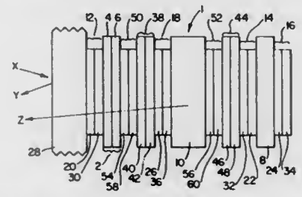
**5,049,779**
**PHOSPHOR COMPOSITION USED FOR FLUORESCENT LAMP AND FLUORESCENT LAMP USING THE SAME**
Yuji Itsuki, and Keiji Ichinomiya, both of Anan, Japan, assignors to Nichia Kagaku Kogyo K.K., Tokushima, Japan
Filed Apr. 28, 1989, Ser. No. 345,004
Int. Cl.[5] H01J *1/62*
U.S. Cl. 313—486 12 Claims



1. A phosphor composition for a low pressure mercury vapor lamp comprising:
a red luminescence component;
a green luminescence component; and
a blue luminescence component which emits blue light by the excitation of 253.7-nm ultraviolet light and has a main luminescence peak wavelength of 460 to 510 nm, a half width of the main peak of a luminescence spectrum of not less than 50 nm, color coordinates of the luminescence spectrum falling within a range of $0.15 \leqq x \leqq 0.30$ and $0.25 \leqq y \leqq 0.40$ based on CIE 1931 standard chromaticity, and a spectral reflectance of not less 80% at 380 to 500 nm, when the spectral reflectance of a smoked magnesium oxide film is 100%, the mixing weight ratio of said blue luminescence component with respect to a total composition amount within the area defined by points a, b, c, d, e and f of FIG. 1, which points are determined according to the color temperature of the luminescence spectrum of said phosphor composition.



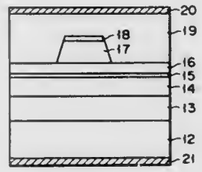
**5,049,780**
**OPTICAL INTERFERENCE, ELECTROLUMINESCENT DEVICE HAVING LOW REFLECTANCE**
Jerzy A. Dobrowolski, Ottawa; Brian T. Sullivan, Gloucester, and Robert C. Bajcar, Bramalea, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada
Filed Sep. 29, 1989, Ser. No. 414,461
Claims priority, application Canada, Dec. 2, 1988, 584863
Int. Cl.[5] G02B *1/10;* H01J *1/70;* H05B *33/22*
U.S. Cl. 313—509 15 Claims



1. An optical interference, electroluminescent device having low reflectance, comprising:
(a) an electroluminescence transmitting, electro-optical, front electrode, comprising at least one layer,
(b) an electro-optical counter electrode, disposed to the rear of the front electrode and comprising at least one layer,
(c) an electro-optical electroluminescent member, comprising at least one layer, and disposed between the front electrode and the counter electrode, and
(d) at least one optical interference member disposed in said electroluminescent device such that at least an optical interference member is in interfacial contact with a front face of the counter electrode, the optical interference member comprising at least one optical interference film which is substantially transparent to ambient light and is of a thickness and material such that the spectral reflectance of said electroluminescent device is so modified that the reflectance of ambient light by the electroluminescent device towards a viewer is reduced.

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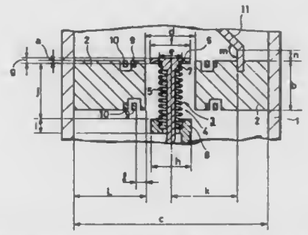
**5,049,781**
**DISCHARGE LAMP**
Hitoshi Imamura, Yokohama; Jyunichi Nakajima, Tokyo; Shigeru Okada, and Katsuyuki Ide, both of Yokohama, all of Japan, assignors to Toshiba Lighting and Technology Corporation, Tokyo, Japan
Filed Feb. 12, 1990, Ser. No. 478,964
Claims priority, application Japan, Mar. 31, 1989, 64-78646
Int. Cl.[5] H01J *17/16, 61/30*
U.S. Cl. 313—634 16 Claims



1. A discharge lamp comprising:
a metallic cylindrical lamp casing opened at both ends thereof, the cylindrical lamp casing comprising a first staged portion for supporting air-tightly the transparent glass plate, a second staged portion formed downward said first staged portion and a portion downwardly extending from the second staged portion, said first and second staged portions and said extending portion being formed integrally with each other;
a transparent glass plate air-tightly fitted to one of the opened ends of said lamp casing;
a sealing means air-tightly closing an other opened end of said lamp casing; and
a pair of electrodes sealed in said lamp casing together with discharge gas.

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**5,049,782**
**MAGNETRON WITH HARMONIC SUPPRESSION MEANS**
Masayuki Aiga, and Kazuki Miki, both of Hyogo, Japan, assignors to Sanyo-Electric Co., Ltd., Osaka, Japan
Filed Jan. 30, 1989, Ser. No. 303,929
Claims priority, application Japan, Feb. 3, 1988, 63-24584
Int. Cl.[5] H01J *25/50*
U.S. Cl. 315—39.51 16 Claims



1. A magnetron for generating microwaves of a predetermined basic frequency and which harmonics higher than the basic frequency also may be produced, the magnetron comprising:
an anode having a cylindrical shape relative to a central axis;
a cathode extending radially inside of said anode and extending in an axial direction along said central axis, said cathode having a filament defined by a width and first and second ends between which said filament extends along said central axis, said cathode having a first end shield which supports said first end of said filament, said first end shield having a flange part with an outer diameter which is greater than the width of said filament, said cathode also having a second end shield which supports said second end of said filament;
a plurality of panel-shaped vanes extending from said anode towards said central axis, each of said vanes being spaced from each other and having a periphery which includes first and second end surface which extend from said anode towards said central axis, each said periphery also including an edge extending between said first and second end surfaces, said vanes being spaced from said cathode so as to define an interaction space bounded between said edge, said cathode, and where projections extending radially inward from said first and second end surfaces to said central axis would lie,
an antenna conductor electrically connected to said first end surface of one of said vanes extending in said axial direction;
strap ring means for electrically coupling alternate ones of said vanes with each other at said first end surfaces;
magnetic field providing means for providing a magnetic field in said interaction space, said magnetic field providing means including opposing magnetic elements, said anode and said interaction space being between said opposing magnetic elements of said magnetic field providing means; and
means for suppressing generation of a fifth harmonic, said suppressing means including said flange part of said first end shield having an inner surface located in said interaction space at a location within a range of 0.1 to 0.6 mm in said axial direction from where said projections extending

VOL 1130 ISS 3 SE 17 1991 UMI



radially inward from said first end surface of said vanes to said central axis would lie.

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5,049,783
**ELECTRONIC BALLAST DEVICE FOR FLUORESCENT LAMPS**
**Armin Kröening, Nussdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**
**Filed Oct. 29, 1990, Ser. No. 604,811**
**Claims priority, application European Pat. Off., Dec. 1, 1989, 89122189.7**
**Int. Cl.[5] H05B *41/26***
**U.S. Cl. 315—102** **7 Claims**

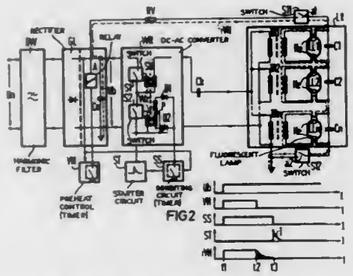


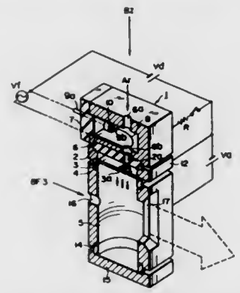
FIG2

1. Electronic ballast apparatus for operating at least one fluorescent lamp which includes heater electrodes, said apparatus comprising:
at least one load transformer including a primary winding, and a secondary winding connected to the heater electrodes;
a D.C.-A.C. converter including an input for receiving a D.C. voltage, a control input, and an output and operable to provide a high-frequency A.C. voltage at said output in response to a D.C. voltage at said input and the application of a start pulse at said control input;
input means including an input for connection to an A.C. voltage line, an output connected to said input of said D.C.-A.C. converter, and rectifier means connected between said input and said output for providing the D.C. voltage to said D.C.-A.C. converter;
a preheating resistor connected to said output of said input means; and switch means connected to said output of said input means and operable in response to the D.C. operating voltage to connect said preheating resistor, said secondary winding of said at least one load transformer and said heater electrodes in a series D.C. circuit to a reference potential to produce a preheating current only for a first predetermined time interval, said switch means including an output connected to said control input of said D.C.-A.C. converter and operable after a second predetermined time interval to produce a start pulse to cause operation of said D.C.-A.C. converter.

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5,049,784
**ELECTRON GENERATING APPARATUS**
**Masahiko Matsudo, Kofu, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan**
**Filed May 24, 1990, Ser. No. 527,946**
**Claims priority, application Japan, May 25, 1989, 1-132084**
**Int. Cl.[5] H01J *27/02***
**U.S. Cl. 315—111.81** **10 Claims**

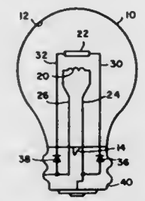
1. An electron generating apparatus, comprising:
a chamber made of a conductive refractory material and having a discharging gas supply hole and an electron extracting hole;
an insulating plate fixed on a side of said chamber;
a pair of conductive filament support members inserted in said chamber through said insulating plate;
a filament, both leg portions of which are fixed on said filament support members, housed in said chamber; and



an overhang radially extending from an upper portion of at least one of said filament support members, thereby forming a shade area on the surface of said insulating plate around a base portion of said filament support member, and substantially preventing a sputtered product of said filament from attaching to said shade area.

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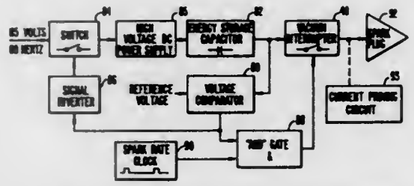
5,049,785
**TWO CONTACT, AC-OPERATED NEGATIVE GLOW FLUORESCENT LAMP**
**John W. Shaffer, Danvers, Mass., assignor to GTE Products Corporation, Danvers, Mass.**
**Filed Apr. 9, 1990, Ser. No. 506,150**
**The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.**
**Int. Cl.[5] H05B *41/23***
**U.S. Cl. 315—205** **15 Claims**



1. A negative glow fluorescent lamp comprising:
a light-transmissive envelope enclosing a fill material which emits ultraviolet radiation upon excitation;
a phosphor coating on an inner surface of said envelope, said phosphor coating emitting visible light upon absorption of ultraviolet radiation;
a cathode located in said envelope for emitting electrons;
first and second cathode leads extending through said envelope and connected to opposite ends of said cathode;
an anode located in said envelope and spaced from said cathode for collecting said electrons, said anode having opposing ends;
first diode means coupled between one end of said anode and said first cathode lead;
second diode means coupled between the other end of said anode and said second cathode lead; and
means for coupling AC power to said first and second cathode leads whereby said cathode receives said AC power during normal lamp operation.



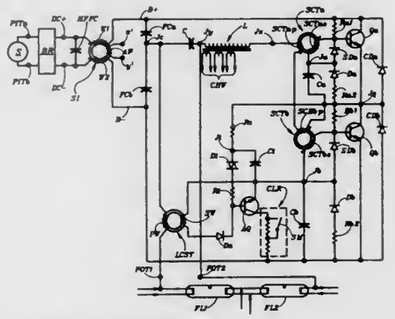
5,049,786
**HIGH ENERGY IGNITOR POWER CIRCUIT**
**Ted Gotlsar, and Ronald J. Jensen, both of Pacifica, Calif., assignors to Coen Company, Inc., Burlingame**
**Filed Aug. 9, 1990, Ser. No. 565,072**
**Int. Cl.[5] H05B *41/36***
**U.S. Cl. 315—209 CD** **28 Claims**




1. An ignitor system for firing a spark plug comprising:
an energy storage device;
means, coupled to said energy storage device, for monitoring a quantity of energy stored in said energy storage device and for issuing a control signal when a given quantity of energy is stored in said energy storage device;
a vacuum interrupter switch having first and second terminals wherein said first terminal is coupled to said spark plug, and said second terminal is coupled to said energy storage device; and
means, coupled to said means for monitoring and to said vacuum interrupter switch, for closing said vacuum interrupter switch when said control signal is asserted;
whereby when said vacuum interrupter switch closes said given quantity of energy is transferred from said energy storage device to said spark plug.

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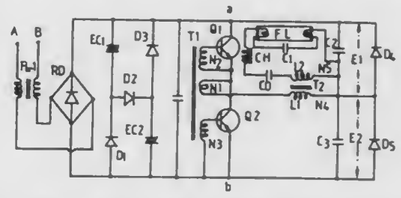
5,049,787
**CONTROLLED ELECTRONIC BALLAST**
**Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010**
**Continuation-in-part of Ser. No. 80,865, Aug. 3, 1987, Pat. No. 4,819,146, and a continuation-in-part of Ser. No. 730,596, May 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 640,240, Aug. 13, 1984, abandoned, which is a continuation of Ser. No. 412,771, Aug. 30, 1982, abandoned, said Ser. No. 80,865, is a continuation-in-part of Ser. No. 917,788, Oct. 10, 1986, Pat. No. 4,727,470. This application Feb. 21, 1989, Ser. No. 312,217**
**Int. Cl.[5] H05B *37/02, 39/04, 37/02*; G05F *1/00***
**U.S. Cl. 315—209 R** **24 Claims**



1. An arrangement comprising:
a source providing a manifestly current-limited AC voltage at an AC output; the frequency of the AC voltage being substantially higher than the frequency of the power line voltage on an ordinary electric utility power line; the source having a control input; the AC voltage having an RMS magnitude; the source having control means operative, on receipt of an action at the control input, to affect said RMS magnitude;
connect means operative to permit connection of a gas discharge lamp means with said AC output; and
control means connected with the control input; the control means being operative, provided said gas discharge lamp means is not connected with the AC output, to provide said action in such manner as to cause the RMS magnitude to be modulated at a modulation frequency lower than the frequency of the power line voltage.

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5,049,788
**LIGHTING DEVICE OF FLUORESCENT LAMP**
**Sang-Woo Lee, 187-90 Yeonbee-Dong, Seodaemoon-Ku, Seoul, Rep. of Korea**
**Filed Apr. 30, 1990, Ser. No. 516,727**
**Claims priority, application Rep. of Korea, Jan. 19, 1990, 564**
**Int. Cl.[5] H05B *37/02***
**U.S. Cl. 315—219** **4 Claims**



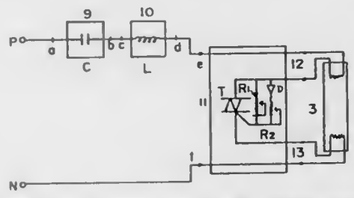
1. A lighting circuit for a fluorescent lamp, comprising:
a d.c. power supply;
first and second transistors connected in series across said power supply, said transistors being connected to each other at a first connection point;
a transformer having first and second windings connected to said first and second transistors, respectively, for switching said transistors;
a third winding on said transformer, said third winding being connected at a first end to said first connection point and at a second end through a primary winding of a booster transformer to a second connection point;
a fluorescent lamp having a first filament connected to said second connection point and a second filament connected through a choke coil and to a secondary winding on said booster transformer; and
a first capacitor connected across said first and second filaments and forming a resonant circuit with said choke coil.

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5,049,789
**ELECTRONIC CAPACITIVE BALLAST FOR FLUORESCENT AND OTHER DISCHARGE LAMPS**
**Chitradurga S. P. Kumar, New Delhi, and Balasubramanian Ravikrishnan, Benaras, both of India, assignors to Council of Scientific & Industrial Research, New Delhi, India**
**Filed Jan. 12, 1990, Ser. No. 464,424**
**Int. Cl.[5] H05B *41/14***
**U.S. Cl. 315—289** **1 Claim**

1. A combination of an electronic capacitive ballast and starting device for a fluorescent lamp comprising a leading power factor L-C combination comprising an inductance element and a capacitance element connected in series, said L-C combination including an input terminal and an output terminal, said capacitance element having a value up to 11 $\mu$F and said inductance element having a value ranging from 50 mH to 1 H, said input terminal being adapted to be connected to one of two terminals of a power source, and a starting device having first and second input terminals, the output terminal of said L-C combination being adapted to be connected to said first input terminal of said starting device through one filament

of a fluorescent lamp, said starting device comprising a triac (T) having first and second main terminals and a gate terminal, a gate circuit, said gate circuit being connected across said first main terminal and said gate terminal of said triac (T) and comprising a first variable resistor ($R_1$) connected in parallel




with a diode (D) in series with a second variable resistor $R_2$, the second input terminal of said starting device being adapted to be connected to the other of the two terminals of the power source by means of an zero impedance connection to a second filament of the fluorescent lamp.

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**5,049,790**

**METHOD AND APPARATUS FOR OPERATING AT LEAST ONE GAS DISCHARGE LAMP**

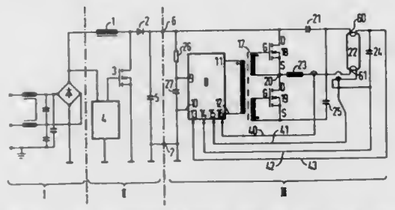
**Michael Herfurth, Gilching, and Ali-Ihsan Soeylemez, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Sep. 22, 1989, Ser. No. 410,920**

**Claims priority, application European Pat. Off., Sep. 23, 1988, 88115709.3**

**Int. Cl.[5] H05B** *41/00, 37/00*

**U.S. Cl. 315—291** **8 Claims**




1. Method for operating at least one gas discharge lamp in various states, which comprises supplying a gas discharge lamp with high-frequency alternating voltage from an externally controlled lamp generator having an operating frequency being variable for dimming the gas discharge lamp; monitoring the state of the gas discharge lamp; providing a preheating phase with an ensuing starting phase for firing the gas discharge lamp; adjusting the operating frequency of the lamp generator during the preheating phase to be greater than a rated frequency in rated operation; reducing the operating frequency at the beginning of the starting phase until the gas discharge lamp has attained a predetermined state, and subsequently maintaining the operating frequency at least at an instantaneous value thereof until the gas discharge lamp fires; reducing the operating frequency at the end of the starting phase to the rated frequency, and thereby initiating rated operation; and varying the operating frequency for dimming in an ensuing dimming operation.

**5,049,791**

**DEVICE FOR MEASURING A CHARACTERISTIC OF A COLOR CATHODE RAY TUBE**

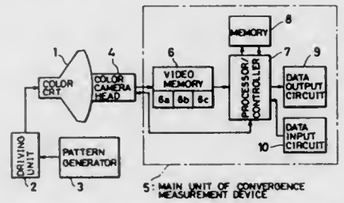
**Yuichi Kawakami, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Dec. 22, 1989, Ser. No. 455,628**

**Claims priority, application Japan, Dec. 27, 1988, 63-330931**

**Int. Cl.[5] G09G** *1/28;* **H01J** *29/51;* **H04N** *17/02*

**U.S. Cl. 315—368 R** **13 Claims**




1. A device for measuring convergence of a color CRT comprising:

image pickup means for producing three color image signals with respect to three color test patterns constituting a composite test pattern presented on a viewing screen of a color CRT;

determining means for determining the image magnification of said image pickup means according to the pitch between color phosphor elements on the viewing screen, and

calculation means for calculating respective luminous centers of gravity of the three color test patterns from the three color image signals, and calculating a misconvergence of the color CRT from the calculated luminous centers of gravity and a changed image magnification,

wherein the composite test pattern is a crosshatch pattern, said calculation means calculates respective vertical luminous centers of gravity of the three color test patterns on a horizontal line portion of the cross-hatch pattern to calculate a vertical misconvergence of the color CRT, and calculates respective horizontal luminous centers of gravity of the three color test patterns on a vertical line portion of the cross-hatch pattern to calculate a horizontal misconvergence of the color CRT.

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**5,049,792**

**CIRCUIT FOR STABILIZING HIGH VOLTAGE ACCORDING TO THE CHANGE OF HORIZONTAL OSCILLATING FREQUENCY**

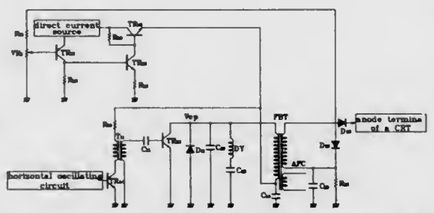
**Changseog Oh, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea**

**Filed Jun. 12, 1990, Ser. No. 536,784**

**Claims priority, application Rep. of Korea, Dec. 18, 1989, 89-19199**

**Int. Cl.[5] H01J** *29/70*

**U.S. Cl. 315—411** **1 Claim**




1. A circuit for stabilizing the high voltage generating circuit in a CRT according to the change of the horizontal oscillating frequency, comprising a diode (D12) the cathode of said diode



being connected to the intermediate terminal (AFC) of a flyback transformer (FBT), the anode of said diode (D12) being connected to first resistor (R11) and coupled to a variable resistor (VR1), a first transistor (TR11), the base of said first transistor being connected to the intermediate terminal of said variable resistor (VR1), a second transistor (TR12), a third transistor (TR13), the collector of said first transistor being connected to a grounded second resistor (R12) and to the base of said third transistor, the collector of said third transistor being connected to the base of said second transistor, the collector of said second transistor being connected to a direct current source, a fourth transistor (TR14), the emitter of said second transistor being coupled through the primary coil of said flyback transformer to the collector of said fourth transistor, the base of said fourth transistor being connected to a horizontal oscillating circuit.

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**5,049,793**

**METHOD OF CONTROLLING V/F INVERTER FOR MACHINES HAVING MECHANICAL BRAKING SYSTEMS**

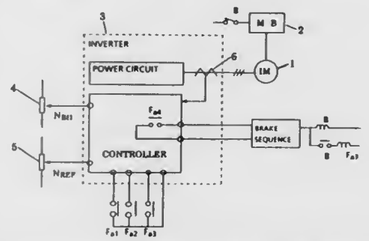
**Koji Tanaka, Yukuhashi, and Kazunori Tsutusi, Kitakyushu, both of Japan, assignors to Kabushiki Kaisha Yasakawa Denki Seisakusho, Fukuoka, Japan**

**Continuation of Ser. No. 34,827, Apr. 6, 1987, abandoned. This application May 2, 1989, Ser. No. 348,101**

**Claims priority, application Japan, Apr. 10, 1986, 61-83854**

**Int. Cl.[5] H02P** *3/26*

**U.S. Cl. 318—436** **1 Claim**




1. A method for controlling a constant V/F inverter that controls an induction motor by the use of an open-loop system wherein a quantity corresponding to the speed of the motor is not employed as a control function, the induction motor being braked by a mechanical brake, said method comprising the steps of:

controlling said induction motor to produce a starting torque which is sufficient to hold the load stationary when the machine is started and which is insufficient to move said load, said step of controlling including the step of controlling said inverter to supply a low non-zero output frequency to the induction motor which is lower than the lowest possible frequency necessary for the induction motor to drive said machine to move said load;

subsequently detecting whether an output current from the inverter is in excess of a predetermined level;

subsequently applying a release signal to the mechanical brake to release said brake when said output current from said inverter has been detected in excess of said predetermined level; and

maintaining the output frequency at said low frequency for a predetermined time following the time at which the brake is released;

said method further comprising the steps of:

stopping movement of the load by the machine, including the steps of:

terminating a mechanical brake releasing signal supplied to said mechanical brake before the output frequency of said inverter reaches a low non-zero frequency which is lower than the lowest possible output frequency which is necessary for the induction motor to drive said machine to move said load and at which a torque sufficient to hold the load stationary is produced; and

subsequently maintaining the output of the inverter at a frequency not less than said low frequency until the output current from the inverter exceeds a predetermined level.

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**5,049,794**

**AUTOMOTIVE WIPER CONTROL SYSTEM WITH FAIL-SAFE FEATURE FOR PREVENTING BURN-IN OF WIPER MOTOR**

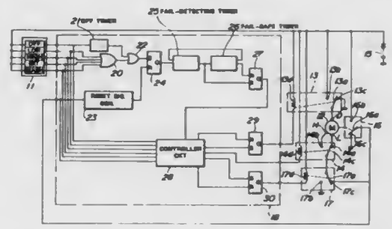
**Kazuyoshi Okada; Kiyoshi Konishi, and Youzou Masaki, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited and Jidosha Denki Kogyo Kabushiki Kaisha, both of Yokohama, Japan**

**Filed Apr. 7, 1987, Ser. No. 35,355**

**Claims priority, application Japan, Apr. 7, 1986, 61-79504**

**Int. Cl.[5] B60S** *1/08*

**U.S. Cl. 318—443** **4 Claims**




1. An automotive wiper control system comprising:

a wiper motor for driving a wiper blade assembly through each wiper cycle;

a power source for supplying power for said wiper motor;

means for detecting said wiper blade assembly at a predetermined position for producing a detector signal when said wiper blade assembly is at said predetermined position;

means for measuring an elapsed wiper cycle time during wiper operation, said measuring means being responsive to said detector signal for resetting the measured time in response to said detector signal and producing a failure indicative signal when said measured time reaches a given period of time;

controlling means including a power supply control switch means interposed between said power source and said wiper motor and operative between a first position in which said wiper motor is connected to said power source and a second position where said wiper motor is disconnected from said power source, and an intermittent control switch means interposed between said wiper motor and the ground and operative between a first position to connect said wiper motor to the ground and a second position where said wiper motor is disconnected from the ground, and means responsive to said failure indicative signals to switch one of said power supply control switch means and said intermittent control switch means to said second position to stop driving of said wiper motor.

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**5,049,795**

**MULTIVARIABLE ADAPTIVE VIBRATION CANCELLER**

**Clinton W. Moulds, III, Millersville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jul. 2, 1990, Ser. No. 551,691**

**Int. Cl.[5] G05B** *13/00*

**U.S. Cl. 318—561** **12 Claims**

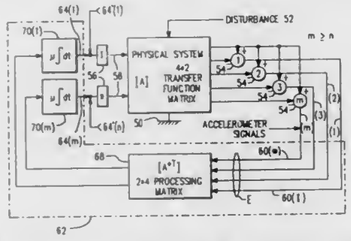
1. A multivariable adaptive vibration canceller for minimizing vibratory disturbances periodically induced in a structure comprising:

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a plurality of actuators operatively coupled to the structure for producing a counteracting vibration therein in response to a complex input signal for each actuator, the structure having a dynamic system characteristic in the form of a matrix of complex system responses to known vibrational inputs at selected harmonics of interest;

a plurality of sensors, at least equal in number to the number of actuators, said sensors being coupled to the structure for sensing vibrations induced therein by the actuators and




the disturbances, each sensor for producing a complex output representative of the algebraic sum of such vibrations sensed thereby for each harmonic; and

multivariable adaptive vibration cancellation processor means responsive to complex outputs of the sensors for producing the complex inputs to the actuators, said vibration cancellation processor means having processing characteristic in the form of a complex conjugate transpose matrix of the dynamic system characteristic matrix.

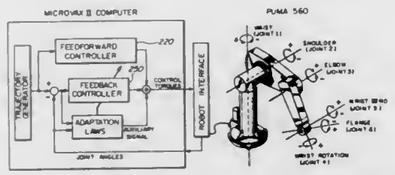
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**5,049,796**

**ROBUST HIGH-PERFORMANCE CONTROL FOR ROBOTIC MANIPULATORS**

**Homayoun Seraji, La Crescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed May 17, 1989, Ser. No. 353,411**
**Int. Cl.[5] G05B *19/42***
**U.S. Cl. 318—568.1** **19 Claims**




1. A robotic system that combines model-based and performance-based techniques to control a manipulator by a control signal developed in response to input command terms and formed from nominal and complement control-signal components, said system comprising;

a distinct feedforward circuit means, model-based and containing user-accessible inputs for receiving a priori information concerning the manipulator's dynamics, as input into said feedforward circuit means by an operator of said system, said feedforward circuit means for controlling said manipulator by a nominal signal component delivered by the feedforward circuit means to said manipulator;

a second feedback circuit means, distinct and separate forms aid feedforward means, performance-based and responding adaptively to actual performance of said controlled manipulator, for emitting a feedback-related signal complement; and

signal combining means connected to said feedforward and feedback means for combining said feedback-related signal complement with said nominal signal component from said distinct feedforward circuit means in order to form a combined control signal, which combined control signal fully controls said manipulator's performance.

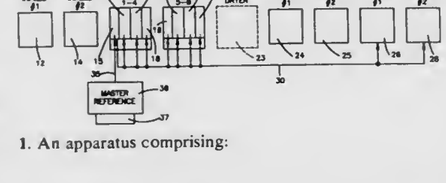
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**5,049,797**

**DEVICE AND METHOD FOR CONTROL OF FLEXIBLE LINK ROBOT MANIPULATORS**

**Warren F. Phillips, Logan, Utah, assignor to Utah State University Foundation, Logan, Utah**

**Filed Jul. 2, 1990, Ser. No. 546,924**
**Int. Cl.[5] B65B *21/02***
**U.S. Cl. 318—568.16** **17 Claims**




1. A method for controlling and dampening undesirable, vibrational movement within flexible linkage of a robot arm coupled to a moveable, controlled joint and attached drive motor, said method comprising the steps of:

1.1 determining a position displacement required to move the robot arm from the current position to a desired position;

1.2 activating the drive motor to reposition the robot arm to the desired position;

1.3 generating a position feedback signal to enable adjustment of the changing positions of the robot arm to efficiently move the arm toward the desired position;

1.4 detecting any elastic deflection arising within the robot arm;

1.5 generating a time dependent deflection signal proportional to a degree of elastic deflection of step 1.4;

1.6 generating a deflection feedback signal for input to the robot arm wherein the deflection feedback signal is approximately proportional to the deflection signal, multiplied by a gain whose value is selected to reduce further elastic deflection of the robot arm;

1.7 applying the deflection feedback signal to the robot arm to reduce further elastic deflection; and

1.8 continuously performing the procedures of steps 1.3 through 1.7 until the robot arm is properly located in the desired position.

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**5,049,798**

**CONTROL APPARATUS**

**Dale H. Jackson, Portsmouth, N.H., assignor to Harris Graphics Corporation, Dover, N.H.**

**Filed Mar. 13, 1990, Ser. No. 492,935**
**Int. Cl.[5] H02P *5/00***
**U.S. Cl. 318—640** **6 Claims**




1. An apparatus comprising:



means for providing a first position signal indicative of the desired position of a first shaft;

means for providing a second position signal indicative of the actual position of the first shaft;

means for providing a position error signal, the position error signal being the difference between the first and second position signals;

a first integrator for receiving the position error signal and for providing a first output signal corresponding to the integral of the position error signal;

a second integrator for receiving the first output signal from said first integrator and for providing a second output signal corresponding to the integral of the first output signal;

means for providing a third output signal corresponding to the sum of the first position signal and the second output signal from said second integrator; and

control means responsive to the third output signal for accelerating the first shaft.

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**5,049,799**

**HIGH PERFORMANCE CONTROLLER FOR VARIABLE DISPLACEMENT HYDRAULIC MOTORS**

**Shan-Chin Tsai, and Donald G. Kilroy, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed May 25, 1990, Ser. No. 528,553**
**Int. Cl.[5] G05B *1/06***
**U.S. Cl. 318—652** **21 Claims**

1. A control for a variable displacement hydraulic motor comprising:

an electrically controlled hydraulic servo valve for controlling the displacement of the hydraulic motor by varying a position of a wobbler in response to a servo valve control signal;

a velocity transducer, coupled to a shaft driven by the motor, for producing a velocity signal representative of the velocity of the shaft;

a wobbler position sensor, coupled to the wobbler, for producing a wobbler position signal indicative of the position of the wobbler; and

a controller for producing the servo valve control signal including a first summer which produces a first summer output signal that is a function of a difference between a commanded velocity signal and the velocity signal, a second summer which produces a second summer output signal that is a function of a difference between the first summer output signal and a signal proportional to at least one of the velocity signal indicative of the velocity of the shaft and the wobbler position signal and a third summer which produces a third summer output signal which is a function of a difference between the second summer output signal and the wobbler position signal with the servo valve control signal being a function of the third summer output signal.

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**5,049,800**

**MOTOR OUTPUT CHANGEOVER CONTROL APPARATUS**

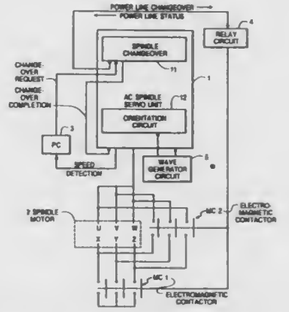
**Katsuo Kohari, Tachikawa; Kosei Nakamura, Yamanashi; Yoshiki Fujioka, Yamanashi; Shinichi Kono, Yamanashi, and Tatsuo Shinohara, Yamanashi, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan**

**PCT No. PCT/JP89/00167, § 371 Date Sep. 11, 1989, § 102(e) Date Sep. 11, 1989, PCT Pub. No. WO89/07858, PCT Pub. Date Aug. 24, 1989**
**PCT Filed Feb. 20, 1989, Ser. No. 415,248**
**Claims priority, application Japan, Feb. 22, 1988, 63-039054**
**Int. Cl.[5] H02P *1/26***
**U.S. Cl. 318—771** **14 Claims**

1. An apparatus for controlling changeover of an AC motor having a low-speed winding and a high-speed winding, said apparatus comprising:

winding changeover means for changing over a power line connection of said AC motor;

command means for issuing a power line changeover command to said winding changeover means based on a changeover request; and




current limiting means for halting driving current to the power line based on the changeover request until changeover of signal patterns and changeover of the power line connection are completed.

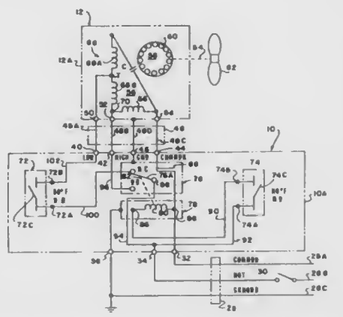
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**5,049,801**

**DUAL SPEED CONTROLLER FOR ATTIC VENTILATOR**

**Paul S. Potter, Dallas, Tex., assignor to Clark United Corporation, Dallas, Tex.**

**Filed Mar. 9, 1990, Ser. No. 491,168**
**Int. Cl.[5] H02P *1/44*; F24F *7/00***
**U.S. Cl. 318—785** **5 Claims**



1. A speed control circuit for applying electrical power from a power distribution circuit of the type having hot and return power conductors to a multiple speed induction motor of the type including an armature winding having a high speed power terminal, a low speed power terminal and a return power terminal, said controller circuit comprising, in combination:

a first-normally open thermostat having an unswitched power terminal, a switched power terminal and a temperature responsive switch element adapted to make a closed circuit between said switched and unswitched power terminals at a first temperature level;

a second normally open thermostat having a switched power terminal, an unswitched power terminal and a temperature responsive switch element adapted to make a closed circuit between said switched and unswitched power terminals at a second temperature level;

a single pole, double throw switch assembly, said switch assembly having an unswitched power terminal, normally

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closed and normally open power terminals and a movable switch element connected to said unswitched power terminal;

a solenoid including a control winding having first and second power terminals and control linkage mechanically coupled to said movable switch element for moving said switch element from electrical contacting engagement with said normally closed power terminal to said normally open power terminal in response to the application of electrical power to said control winding;

the switched power terminal of said first thermostat being adapted for connection to the low speed power terminal of said motor, the unswitched power terminal of said first thermostat being connected to the normally closed power terminal of said switch assembly, the switched power terminal of said second thermostat being electrically connected to the first power terminal of said solenoid control winding, the unswitched power terminal of said second thermostat being connected to the unswitched power terminal of said switch assembly, the second power terminal of said solenoid winding being adapted for connection to the return power terminal of said induction motor and to the return power conductor of said power source, the normally open power terminal of said switch assembly being adapted for connection to the high speed power terminal of said induction motor, and the unswitched power terminal of said switch assembly being adapted for electrical connection to the hot power conductor of said power source.

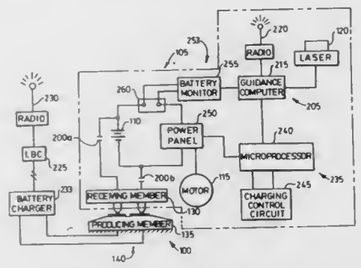
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**5,049,802**

**CHARGING SYSTEM FOR A VEHICLE**

**Robert T. Mintus, Warren, and John C. Paine, Chardon, both of Ohio, assignors to Caterpillar Industrial Inc., Mentor, Ohio**

**Filed Mar. 1, 1990, Ser. No. 487,001**
**Int. Cl.[5] H02J** *7/00;* **E04H** *6/00*
**U.S. Cl. 320—2** **19 Claims**




1. A charging system having a charging location for a vehicle, said vehicle including a rechargeable battery normally controllably connected to a vehicle motor, comprising:

a charge receiving member controllably connectable to said battery;

means for determining the position of said charging location;

vehicle control means for positioning said vehicle based on said determined position at said charging location and producing a responsive charge control signal; and

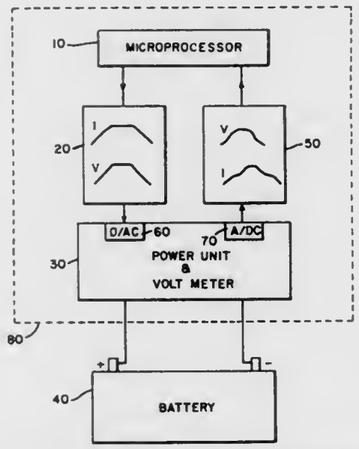
logic means for receiving said charge control signal and automatically disconnecting said vehicle motor from said battery, and connecting said charge receiving member to said battery in response to receiving said charge control signal, and thereafter charging said vehicle battery.

**5,049,803**

**METHOD AND APPARATUS FOR CHARGING AND TESTING BATTERIES**

**Thirumalai G. Palanisamy, Morristown, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Filed May 10, 1989, Ser. No. 350,071**
**Int. Cl.[5] H02J** *7/04, 7/10;* **H01M** *10/44*
**U.S. Cl. 320—20** **21 Claims**




1. A method of charging and testing a rechargeable battery which comprises the steps of:

(a) measuring the open circuit voltage of said battery and estimating the number of cells possible for the measured open circuit voltage;

(b) supplying a controllably varying charging current or voltage to the battery for a predetermined period of time while measuring the response voltage or current produced at or through the battery terminals and testing said battery for the evolution of gas;

(c) charging said battery automatically with a charge input at any charge rate until the battery charge voltage equals the estimated number of cells of the battery multiplied by a predetermined voltage which is characteristic of the battery;

(d) repeating steps (a), (b), and (c) until step (b) indicates the evolution of gas;

(e) determining the current ("Igas-up") and voltage ("Vgas-up") at which said battery evolves gas in the increasing current direction, and the current ("Igas-down") and voltage ("Vgas-down") at which the battery stops evolving gas in the decreasing current direction;

(f) determining the true number of cells in said battery from said Vgas-up and/or said Vgas-down;

(g) determining the state of charge using the true number of cells determined in step (f), the open circuit voltage measured in step (a) and the charge input to said battery by the apparatus;

(h) determining the capacity of said battery from said Igas-up when said Igas-down is lower than or equal to a predetermined value, or from the difference in said Igas-up and Igas-down when said Igas-down is greater than or equal to a predetermined value;

(i) determining defect conditions from said open circuit voltage; and

(j) determining defect conditions from the current voltage characteristics generated in step (b).

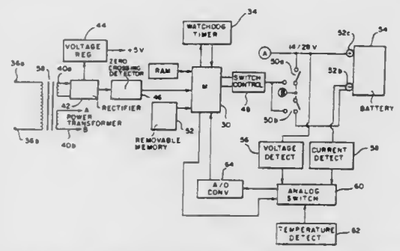


**5,049,804**

**UNIVERSAL BATTERY CHARGING SYSTEM AND A METHOD**

**Phillip D. Hutchings, Wiltshire, United Kingdom, assignor to Power-Tech Systems Corporation, Kent, Conn.**

**Division of Ser. No. 55,795, Jun. 1, 1987, Pat. No. 4,843,299.**
**This application Feb. 10, 1988, Ser. No. 154,292**
**Int. Cl.[5] H02J** *7/00*
**U.S. Cl. 320—20** **8 Claims**




1. In a battery charging system comprising a battery having a maximum voltage and a means for supplying current to the battery, a method of charging a battery comprising the steps of:

electrically connecting said battery to said current supply means;

gradually increasing the current supplied to the battery to a predetermined current check point or until a predetermined time point which ever occurs earlier;

measuring the voltage across the battery when the current is at said current check point to provide a voltage test reading;

operating said current supply means responsively to said voltage test reading.

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**5,049,805**

**VOLTAGE SENSITIVE SWITCH**

**Nicholas Celenza, Durham; Raymond M. Clemo; Ronald S. Jungling, both of Raleigh, and Brian D. Miller, Durham, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 25, 1990, Ser. No. 529,030**
**Int. Cl.[5] G05F** *1/56*
**U.S. Cl. 323—285** **13 Claims**

1. An improved electrical system for providing electrical power to a load comprising:

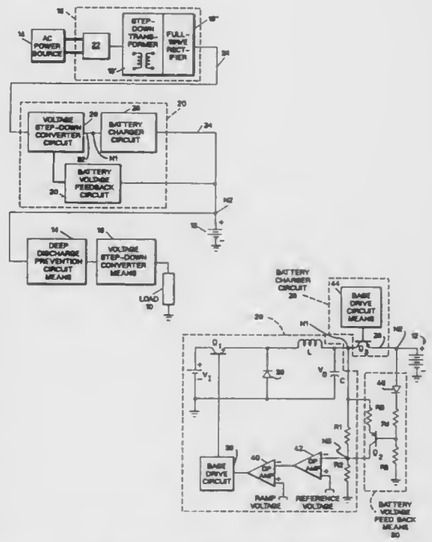
a first circuit means for receiving AC voltage signals from an AC supply main and to generate rectified DC voltage signals therefrom;

a second circuit means responsive to the rectified DC voltage signals and for generating DC voltage signals whose voltage levels are less than the rectified DC voltage signals;

a third circuit means for further reducing the voltage levels of the DC voltage signals, said third circuit means including a series pass device with an input terminal coupled to an output node (N1) of the second circuit means and another terminal coupled to a first node (N2);

a fourth circuit means for adjusting the DC voltage at the output node (N1) of the second circuit means relative to the DC voltage at the first node (N2) so that the series pass device consumes a relatively small amount of energy;

a battery interconnected between the first node (N2) and a ground potential; and




a fifth circuit means for preventing the battery from deep discharging coupled to said first node (N2).

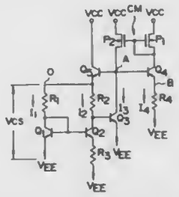
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**5,049,806**

**BAND-GAP TYPE VOLTAGE GENERATING CIRCUIT FOR AN ECL CIRCUIT**

**Yukihiro Urakawa, Kawasaki, and Masataka Matsui, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 26, 1989, Ser. No. 456,556**
**Claims priority, application Japan, Dec. 28, 1988, 63-333608**
**Int. Cl.[5] G05F** *3/30*
**U.S. Cl. 323—314** **10 Claims**




1. A voltage generating circuit comprising:

a first current source for generating a first current;

first voltage generating means for generating a first voltage age having a first temperature dependency;

second voltage generating means for generating a second voltage having a second temperature dependency different than the first temperature dependency, said second voltage generating means including a bi-polar transistor

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having a collector-to-emitter path coupled between said first current source and a first potential;

voltage adder means coupled to said first and second voltage generating means for adding the first and second voltages to generate a third voltage;

voltage replicating means coupled to said voltage adder means for replicating the third voltage as a fourth voltage of a level corresponding to the third voltage;

a second current source for generating a constant second current through a resistive element biased by the fourth voltage; and

current replicating means coupled to said first and second current sources for replicating the second current as the first current.

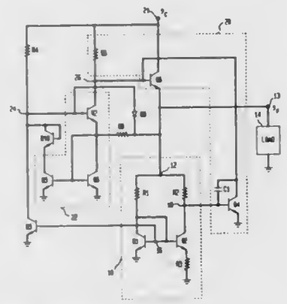
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**5,049,807**

## ALL-NPN-TRANSISTOR VOLTAGE REGULATOR

**Thomas C. Banwell, Madison, N.J., and Thomas J. Banwell, Claremont, Calif., assignors to Bell Communications Research, Inc., Livingston, N.J.**

**Filed Jan. 3, 1991, Ser. No. 637,175**
**Int. Cl.[5] G05F *3/20***
**U.S. Cl. 323—314** **14 Claims**



1. A voltage regulator comprising

a reference node point,

a bandgap reference connected to said reference node point, said bandgap reference having two internal node points whose voltages are indicative of whether or not the voltage of said reference node point is at a specified value,

a supply voltage source,

a current mirror,

two equal-valued resistors connected in parallel between said supply voltage source and said current mirror,

a first transistor having its collector connected to said supply voltage source, its emitter connected to said reference node point and its base connected to a point between one of said resistors and said current mirror,

a second transistor having the base connected to one of the internal node points of said bandgap reference, its emitter connected to a point of reference potential and its collector connected to a point between the other one of said resistors and said current mirror,

and a third transistor having its base connected to the other one of the internal node points of said bandgap reference, its emitter connected to said point of reference potential and its collector connected to the base of said first transistor,

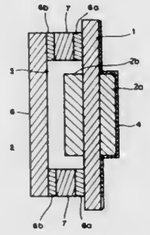
whereby a deviation of the voltage at said reference node point from said specified value causes a voltage difference to occur between said internal node points which causes a control signal to be applied to the base of said first transistor to cause its conduction to change to restore the voltage at said reference node point to said specified value.

**5,049,808**

## METHOD OF DETERMINING THE AMOUNT OF THE SUBSTANCES OR IONS CONTAINED IN AN IONIC SOLUTION OR A NON-DEIONIZED SOLUTION AND A ONE-SIDEBARRIER-COVERED CRYSTAL OSCILLATOR USED THEREFOR

**Yoshio Okahata, Kanagawa, Japan, assignor to Sogo Pharmaceutical Company Limited, Tokyo, Japan**

**Filed Sep. 8, 1989, Ser. No. 404,513**
**Claims priority, application Japan, Sep. 10, 1988, 63-225551; Aug. 31, 1989, 1-223191; Aug. 31, 1989, 1-223192**
**Int. Cl.[5] G01N *27/414*; H01L *41/00***
**U.S. Cl. 324—71.1** **14 Claims**



1. A method of determining the amount of the substance or ions contained in one of an ionic solution and a non-deionized solution by use of a one side barrier-covered crystal oscillator, said method comprising the steps of:

covering over one of two electrodes of the crystal oscillator through a predetermined insulative space substantially without being brought into contact therewith with a barrier to prevent the one of the ionic solution and the non-deionized solution from permeating therethrough,

casting an absorption film onto the other electrode of the crystal oscillator,

dipping the one side barrier-covered crystal oscillator into the one of the ionic solution and the non-deionized solution,

one of absorbing the substances contained in the one of the ionic solution and the non-deionized solution onto the absorption film and chemically bonding the ions therein with the absorption film, and

measuring frequency changes before and after the one of absorption and chemical bonding in situ in a state that the barrier-covered crystal oscillator is dipped in the one of the ionic solution and the non-deionized solution to determine the amount of the substances or ions contained in the one of the ionic solution and the non-deionized solution.

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**5,049,809**

## SENSING DEVICE UTILIZING MAGNETO ELECTRIC TRANSDUCERS

**Noboru Wakatsuki; Shigemi Kurashima, both of Kawasaki; Nobuyoshi Shimizu; Michiko Endoh, both of Yokohama; Yuji Kojima, Chigasaki; Akira Tanaka, and Hideaki Yoda, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Apr. 11, 1988, Ser. No. 180,120**
**Claims priority, application Japan, Apr. 9, 1987, 62-87749; Jun. 16, 1987, 62-149404; Sep. 16, 1987, 62-231700; Dec. 25, 1987, 62-333134**
**Int. Cl.[5] G01R *33/06***
**U.S. Cl. 324—117 R** **35 Claims**

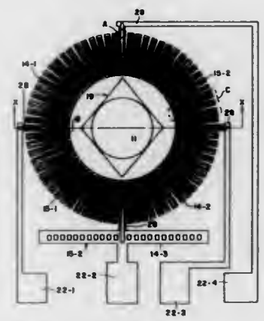
1. A device for sensing a magnetic field due to a current in a conductor comprising:

a substrate; and

a plurality of Barber-Pole magneto-resistive elements, disposed on said substrate, each of said Barber-Pole magneto-resistive elements comprising:

a plurality of strips, each of said strips being formed in a direction substantially along a radius emanating from a central point of said substrate and being connected to an adjacent one of said strips so as to form a zig-zag pattern, said plurality of Barber-pole resistive elements being arranged in a ring with adjacent ones of said





elements arranged side by side and connected to each other; and

a pair of output terminals formed on said substrate and connected to selected ones of said Barber-pole magneto-resistive elements.

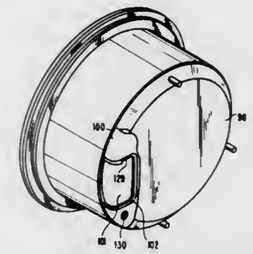
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**5,049,810**

## WATT-HOUR METER COVER WITH BATTERY HATCH RESET SWITCH AND OPTICAL COMMUNICATION PORT

**Lane C. Kirby, West Point; Lester C. Moore, West Lafayette; Christopher J. Gatz, West Lafayette, and Ronald C. Tate, Battle Ground, all of Ind., assignors to Landis & Gyr Metering, Inc., Lafayette, Ind.**

**Filed Sep. 22, 1989, Ser. No. 410,980**
**Int. Cl.[5] G01R *1/04, 19/16*; G06C *15/42***
**U.S. Cl. 324—156** **11 Claims**



1. A cover for an energy consumption meter, the meter having a reset mode of operation and a meter body having a battery mounted therein and carrying reset mode hardware for actuating the meter reset mode, the cover comprising:

a cover member mountable over the meter body;

a modular battery access hatch assembly including;

a hatch opening defined in said cover member for access to the battery therethrough when said cover member is mounted over the meter body;

a hatch cover mountable over said opening to close said hatch opening;

a resetting switch carried by said hatch cover and movable externally of said cover member to a reset position in which said resetting switch actuates the reset mode hardware;

a biasing means for normally biasing said actuating means away from said reset position; and

a latching means for latching said hatch cover onto said cover member.

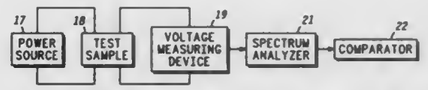
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**5,049,811**

## MEASURING INTEGRITY OF SEMICONDUCTOR MULTI-LAYER METAL STRUCTURES

**Michael Dreyer, and Robert L. Duffin, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Jul. 2, 1990, Ser. No. 546,635**
**Int. Cl.[5] G01R *15/12***
**U.S. Cl. 324—158 R** **12 Claims**




1. A method for detecting defects in conductive lines on semiconductor devices which comprises:

applying current to the conductive lines;

measuring voltages induced by the current;

determining a 1/f voltage spectral density of the measured voltages; and

comparing the 1/f voltage spectral density to a predetermined reference for detecting the presence of voids in the conductive lines.

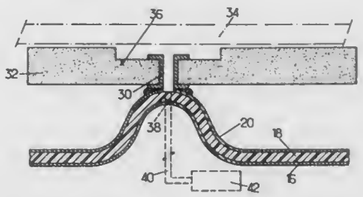
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**5,049,812**

## DEVICE FOR THE ELECTRIC CHARACTERIZATION OF SAMPLES AND APPLICATION TO ELECTRIC MAPPING OF LARGE AREA SEMICONDUCTOR SAMPLES

**Xavier Le Cleac'h, Trelevern, and Pierre-Noël Favennec, Lannion, both of France, assignors to French State, represented by the Minister of Post, Telecommunications and Space (Centre National d'Etudes des Telecommunications), Issy Les Moulineaux and Universite de Rennes, Rennes, both of, France**

**PCT No. PCT/FR88/00563, § 371 Date May 9, 1989, § 102(e) Date May 9, 1989, PCT Pub. No. WO89/04969, PCT Pub. Date Jun. 1, 1989**
**PCT Filed Nov. 16, 1988, Ser. No. 490,558**
**Claims priority, application France, Nov. 17, 1987, 87 15858**
**Int. Cl.[5] G01R *1/04***
**U.S. Cl. 324—158 R** **9 Claims**



1. Device for the electric characterization of samples, comprising UHF resonator intended to be coupled locally to said sample, characterized in that said resonator is formed by a microstrip or triplate line loop carried by a conducting plane and having a gap of small length with respect to the length of the loop and means for receiving the sample in a position in which the sample is coupled selectively to the edges of the gap without being interposed therebetween, the edges of the gap of the loop being fixed to two electrodes of small area passing through a thin plate of dielectric material having a flat face for application against the sample.

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**5,049,813**

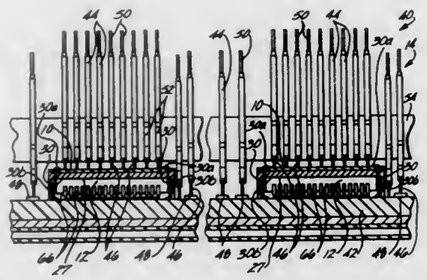
## TESTING OF INTEGRATED CIRCUIT DEVICES ON LOADED PRINTED CIRCUIT BOARDS

David R. Van Loan, Diamond Bar; Charles J. Johnston, Walnut, and Mark A. Swart, Upland, all of Calif., assignors to Everett/Charles Contact Products, Inc., Pomona, Calif.

Continuation of Ser. No. 214,365, Jul. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 142,990, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 91,536, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 39,876, Apr. 17, 1987, abandoned. This application Oct. 25, 1989, Ser. No. 427,932

Int. Cl.[5] G01R *31/00*

U.S. Cl. 324—158 F 45 Claims



13. An integrated circuit continuity test verification system for making continuity tests of circuit elements on a loaded printed circuit board having a plurality of randomly spaced apart integrated circuit packages mounted on an upper surface of the circuit board, in which electrical leads on the integrated circuit packages are spaced apart in rows along oppositely facing side edges of the integrated circuit package, the test system comprising:

a translator module adapted for releasable contact with a corresponding integrated circuit package, the module comprising a rigid housing having a top side and upright side edges, first and second rows of spaced apart electrical contacts arranged along the side edges of the module housing for releasable engagement with corresponding leads adjacent the integrated circuit package when the module housing is releasably placed over the integrated circuit package, a plurality of electrically conductive test pads in a substantially common plane on the top side of the module housing, and means on the module electrically connecting the test pads to individual ones of said contacts;

a circuit verification test unit including an array of test probes arranged for contact with individual ones of the conductive test pads on the module housing for conducting test signals used in an electrical continuity test analyzer, wherein the test pads are each generally planar and have a two-dimensional extent, substantially in said common plane on the top side of the housing, the test pads having sizes greater than the sides of the test probes adapted to contact the test pads; and

means for drawing the test probes into contact with the test pads on the module so that contact between the individual contacts on the module and corresponding leads on the circuit package can be translated electrically, via the contacts on the module, to the individual test probes in the test unit.

**5,049,814**

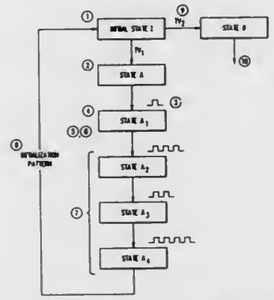
## TESTING OF INTEGRATED CIRCUITS USING CLOCK BURSTS

Robert M. Walker, III, Atherton, and Dick L. Liu, Saratoga, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 27, 1989, Ser. No. 457,910

Int. Cl.[5] G01R *31/28*

U.S. Cl. 324—158 R 9 Claims



1. A method of testing an electronic circuit having a plurality of sequential logic elements comprising the steps of:

applying test signals to logic input terminals of the circuit;

observing output signals at output terminals of the circuit so that the output signals are in a known state;

applying at least two clock signals to a clock input terminal of the circuit at a predetermined frequency;

observing the output signals at the output terminals of the circuit during a period when no clock signals are applied for purposes of testing the circuit; and

comparing the output signals to expected output signals to determine if the circuit functions at the predetermined frequency for substantially all the elements of the plurality of sequential logic elements.

**5,049,815**

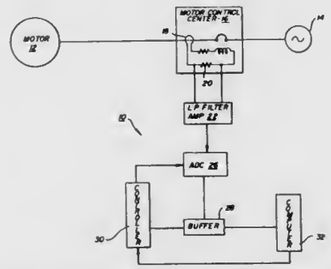
## SPECTRAL ANALYSIS OF INDUCTION MOTOR CURRENT TO DETECT ROTOR FAULTS WITH REDUCED FALSE ALARMS

Gerald B. Kliman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 512,223, Apr. 20, 1990, abandoned. This application Aug. 27, 1990, Ser. No. 572,578

Int. Cl.[5] G01R *31/02, 23/16*

U.S. Cl. 324—158 MG 17 Claims



1. A method of detecting rotor faults in an induction motor, wherein the motor includes a rotor having a multiplicity of conductive bars and a stator drawing motor current from a power supply, the method comprising the steps of:



A. deriving a current signal indicative of said motor current;

B. sampling said current signal at a predetermined sampling rate to obtain a time succession of current values over a predetermined sampling period;

C. transferring said current values to a frequency spectrum;

D. determining the fundamental frequency of said motor current from said frequency spectrum;

E. scanning said frequency spectrum in a lower sideband of said fundamental frequency for current peaks exceeding a threshold amplitude;

F. ascribing the frequency of each said current peak as a candidate indicating the slip frequency of the motor;

G. checking predetermined harmonic sidebands of said frequency spectrum at frequencies predicted from each said slip frequency candidate for matching current peaks until all but one of said slip frequency candidates are disqualified; and

H. conducting a rotor fault analysis of said frequency spectrum using the determined fundamental frequency and the qualified remaining one of said slip frequency candidates as the motor slip frequency.

**5,049,816**

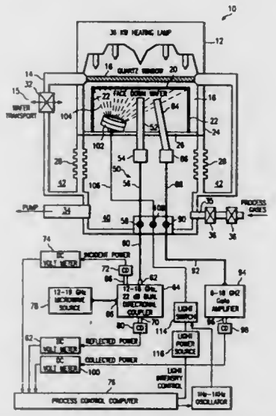
## SEMICONDUCTOR SUBSTRATE MINORITY CARRIER LIFETIME MEASUREMENTS

Mehrdad M. Moslehi, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1990, Ser. No. 532,284

Int. Cl.[5] G01R *31/26*

U.S. Cl. 324—158 D 47 Claims



1. An apparatus for semiconductor substrate minority carrier lifetime measurements of a wafer, comprising:

a signal source for generating electromagnetic waves;

a microwave emitter spaced a selected distance from said substrate for emitting said electromagnetic waves toward said substrate and a microwave detector spaced from said substrate for detecting a portion of said electromagnetic waves that reflect from said substrate;

a generator for generating a first set of signals in response to said emitted electromagnetic waves and for generating a second set of signals proportional to said detected electromagnetic waves;

an energy source for emitting photon energy toward the substrate; and

measuring circuitry for measuring said first and second sets of signals into substrate characteristics measurements and for measuring the associated substrate response to said phonton energy.

**5,049,817**

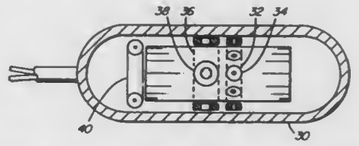
## EDDY CURRENT PROBE, INCORPORATING MULTI-BRACELETS OF DIFFERENT PANCAKE COIL DIAMETERS, FOR DETECTING INTERNAL DEFECTS IN FERROMAGNETIC TUBES

Valentino S. Cecco, and F. Leonard Sharp, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jun. 8, 1990, Ser. No. 535,522

Int. Cl.[5] G01N *27/90;* G01R *33/12*

U.S. Cl. 324—220 12 Claims



1. An eddy current probe for detecting internal defects in a tube made of a ferromagnetic material, comprising:

a probe housing made of a non-ferromagnetic material and shaped to be introduced into the tube for inspection, said housing having a central axis substantially coinciding with the axis of the tube under inspection when the probe is in use;

first and second bracelets, having inner and outer surfaces, provided in said housing, wherein said bracelets are essentially concentric with said central axis of said housing;

said first bracelet carrying, on said outer surface thereof, a plurality of first pancake coils arranged in a ring about said central axis of said housing, the said first coils being of a first diameter and operated at a first RF frequency; and

said second bracelet being adjacent to said first bracelet and carrying, on said outer surface thereof, a plurality of second pancake coils arranged in a ring about said central axis of said housing, said second coils being a second diameter larger than said first diameter and operated at a second frequency equal to or higher than said first RF frequency.

**5,049,818**

## GRADIOMETER FOR DETECTING WEAK MAGNETIC FIELDS INCLUDING GROOVES CARRYING SUPERCONDUCTING THIN FILM CONDUCTORS AND METHOD OF MAKING SAME

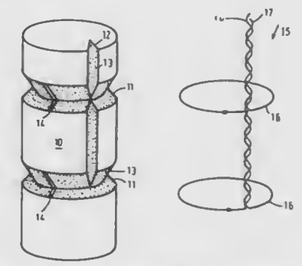
Olaf Dössel, Tangstedt, and Wilfried Edeler, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 5, 1990, Ser. No. 489,423

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3906981

Int. Cl.[5] G01R *33/035*

U.S. Cl. 324—248 13 Claims



1. A superconducting gradiometer for detecting weak magnetic fields for a measuring device comprising a coupling coil

which is connected to the gradiometer, a SQUID in a cryosystem and a signal processing device, said gradiometer comprising a non-magnetic carrier body having a surface which is provided with at least one circumferential groove and at least one adjoining axially oriented groove, each groove carrying a superconducting thin film, said circumferential groove accommodating at least one superconducting wire turn, said axially oriented groove accommodating a superconducting connection wire, both the wire turn and the connection wire being fully accommodated in said groove in an electrically contact-free manner, said circumferential thin film being interrupted.

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**5,049,819**

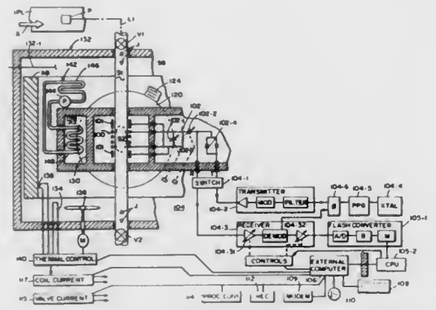
## MAGNETIC RESONANCE ANALYSIS IN REAL TIME, INDUSTRIAL USAGE MODE

**Ronald L. Dechene, Boxford, Mass.; Thomas B. Smith, Atkinson, N.H., and Ajoy Roy, Danvers, Mass., assignors to Auburn International, Inc., Danvers, Mass.**

**Continuation-in-part of Ser. No. 374,493, Jun. 30, 1989, Pat. No. 5,015,954. This application Aug. 27, 1990, Ser. No. 573,639**

**Int. Cl.[5] G01R** *33/20*

**U.S. Cl. 324—307** **8 Claims**



1. In a nuclear magnetic resonance system for industrial process monitoring comprising:

(a) means for accessing successive samples from an industrial process, placing them in a sample measuring region and discarding successive such samples from said sample measuring region,

(b) means for applying a base magnetic field to the sample measuring region to effect precession of sample nuclei and for applying a resonant excitation pulse to the sample measuring region to modify the precession and means defining receive antenna coil means and signal translating means interacting with a sample in said region to detect relaxation of the sample at the coil means as a free induction decay signal which is measurable as a free induction decay curve via said signal translating means,

(c) means for digitizing the free induction decay curve and automatically analyzing the digitized curve to zero axis intercepts of Gaussian and exponential components of the decay curve and extracting a ratio of the intercept of one of said components to the sum of intercepts of said components,

the improvement comprising the provision therein of means for extending each of the said decay curves established in multiple repetitions of the said curve establishment and automatic analysis sequence by Hahn spin-echo re-focus/-decay to capture data related to a further sub-component(s) of the sample for enhancing the accuracy of the ratio determination of (c) above and/or to identify proportion of the further sub-component(s).

**5,049,820**

## MAGNETIC RESONANCE SIGNAL ACQUISITION METHODS

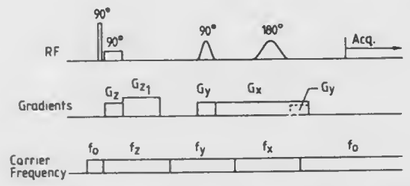
**Jacques Briand, Zurich, Switzerland, and Laurance D. Hall, Cambridge, England, assignors to National Research Development Corporation, London, England**

**Continuation of Ser. No. 442,792, Nov. 29, 1989, abandoned. This application Dec. 28, 1990, Ser. No. 633,184**

**Claims priority, application United Kingdom, Nov. 29, 1988, 8827833**

**Int. Cl.[5] G01R** *33/20*

**U.S. Cl. 324—309** **6 Claims**




1. A method of obtaining a nuclear magnetic resonance signal from a region of an object comprising subjecting the object to a static magnetic field and carrying out the following steps:

1) applying an rf selective 90° pulse in the presence of a first gradient magnetic field and applying at least one non-selective rf pulse in the absence of a gradient magnetic field so as to dephase incoherently all magnetisation in the object except in a slice orthogonal to the gradient direction of the said first gradient magnetic field;

2) in the presence of a second gradient magnetic field having a gradient extending in a direction generally orthogonal to said one direction and the said static magnetic field, applying an rf selective 90° pulse to tip into a plane perpendicular to the direction of the said static magnetic field a strip defined by the intersection of the aforesaid slice and slice orthogonal to the gradient direction of said second gradient magnetic field; and

3) in the presence of a third gradient magnetic field having a gradient direction extending generally orthogonally to the gradient directions of both the first and second gradient magnetic fields, applying an rf signal to refocus the spins of nuclei in a region defined by the intersection of said strip and a slice orthogonal to the gradient direction of said third gradient magnetic field so that the resulting free induction echo signal arises from the said region alone.

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**5,049,821**

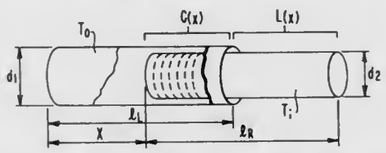
## CONTINUOUSLY VARIABLE FIELD OF VIEW SURFACE COIL FOR NMR IMAGING

**George R. Duensing; Jeffrey R. Fitzsimmons, both of Gainesville, and Don Sanford, Hawthorne, all of Fla., assignors to University of Florida, Gainesville, Fla.**

**Filed Feb. 15, 1990, Ser. No. 479,684**

**Int. Cl.[5] G01R** *33/20*

**U.S. Cl. 324—322** **15 Claims**




1. An NMR radio-frequency (RF) surface coil comprising first and second conductive sections, each said first and second conductive sections including a pair of conductive tubular legs, the conductive legs of said first and second sections being coaxial and the legs of said first section being received within the legs of said second section;

said legs of said first section including a first dielectric layer covering at least a portion of the legs received within the legs of the second section, means for supporting said first and second sections in a rectangular coil configuration such that the legs of said first section are slidingly positionable within the legs of said second section to thereby provide a variable field of view for said coil.



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**5,049,822**

## METHOD OF AND APPARATUS FOR CARRYING OUT MEASUREMENTS ON OPEN AND CLOSED FRACTURES IN A HARD ROCK FORMATION PIERCED BY A BOREHOLE

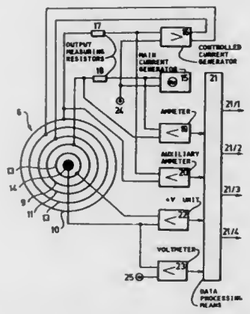
**Barlai Zoltán, Fillér str. 47/B, 1026 Budapest; Dorcsi Géza, Sutemberg tér 6, 5000 Szolnok; Réz Ferenc, Kiss F. str. 4, 1081 Budapest; Ribiczey Péter, VII. Lenin Krt. 20.1.4, 1073 Budapest, and Vámos Attila, Batthyany-U.21, 2012 Budakalász, all of Hungary**

**Filed May 24, 1989, Ser. No. 357,065**

**Claims priority, application Hungary, May 25, 1988, 2658/88; Jan. 15, 1989, 2658/88**

**Int. Cl.[5] G01V** *3/20*

**U.S. Cl. 324—367** **18 Claims**




1. A microelectric method of logging open and closed fractures in a hard rock formation pierced by a borehole, comprising the steps of

pressing at least one measuring pad made of insulating material to a region to be investigated in a borehole drilled in a hard rock formation, said pad including metallic feeding and measuring electrodes to contact said region;

generating a controlled microelectric field penetrating said hard rock formation by means of currents supplied by first and second feeding electrodes,

measuring by means of said measuring electrodes current and potential conditions created by said first and second feeding electrodes and

identifying on the basis of said measured conditions hydraulically conducting open fractures and closed fractures of low hydraulic conductivity present in said hard rock formation, wherein said

first feeding electrode is a ring shaped electrode arranged concentrically around a point-like central measuring electrode, said first feeding electrode supplying a main current into said region,

said second feeding electrode is a ring shaped electrode arranged around said first feeding electrode supplying a bucking current into said region,

said measuring electrodes include two monitoring electrodes arranged between said first and second feeding electrodes, said monitoring electrodes measuring a control potential,

said bucking current is regulated in order to ensure a value as low as possible for said control potential measured between said monitoring electrodes,

said main current, said controlled bucking current, the potential difference between said central measuring electrode and an outer measuring electrode surrounding said central measuring electrode, said outer measuring electrode being inside said first feeding electrode, and the absolute value of the potential of the central measuring electrode is measured, said central measuring electrode, said outer measuring electrode, said first feeding electrode, said two monitoring electrodes and said second feeding electrode forming a substantially concentric electrode system,

indicative dimensionless ratios of said currents and of said measured potentials are formed and

said open and closed fractures are identified and differentiated on the basis of said dimensionless ratios measured in a substantially continuous process during movement of said at least one measuring pad along the axis of said borehole, said open fractures having greater values of said dimensionless rations than said closed fractures.

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**5,049,823**

## METHOD AND DEVICE FOR MEASURING THE QUALITIES OF A MULTIPHASE FLUID

**Yvon Castel, Croissy Sur Seine; John Lynch, Rueil-Malmaison, and Jean-Pierre Burzynski, Lyons, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed May 23, 1990, Ser. No. 527,340**

**Claims priority, application France, May 23, 1989, 89 06835**

**Int. Cl.[5] G01N** *22/00*

**U.S. Cl. 324—640** **17 Claims**



1. A method of determining a quality of a fluid moving in a first direction within a tube means of known cross-section, the fluid including a first liquid and a second liquid, each liquid having a frequency-dependent intrinsic characteristic response to microwave energy, said method comprising the steps of:

(a) passing microwave energy of a first frequency through the fluid-containing tube means in a second direction not perpendicular to the first direction, the first frequency being a frequency for which the value of the intrinsic characteristic of the first liquid is large in comparison to the value of the intrinsic characteristic of the second liquid and for which the value of the intrinsic characteristic of the tube means is known;

(b) determining the value of the intrinsic characteristic of the microwave energy of the first frequency after passage thereof through the fluid-containing tube means;

(c) determining the change in frequency of the microwave energy of the first frequency after passage thereof through the fluid-containing tube means;

(d) passing microwave energy of a second frequency through the fluid-containing tube means in the second direction, the second frequency being a frequency for which the difference between the value of the intrinsic characteristic of the first liquid and the value of the intrinsic characteristic of the second liquid is small and for

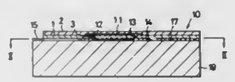
VOL 1130 ISS 3 SE 17 1991 UMI

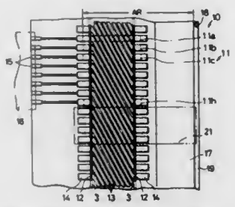


which the value of the intrinsic characteristic of the tube means is known;
(e) determining the value of the intrinsic characteristic of the microwave energy of the second frequency after passage thereof through the fluid-containing tube means;
(f) determining the change in frequency of the microwave energy of the second frequency after passage thereof through the fluid-containing tube means;
(g) determining the cross-section of the first liquid within the tube means from the known value of the intrinsic characteristic of the tube means to the microwave energy of the first frequency and the result of step (b);
(h) determining the cross-section of the combined first and second liquids within the tube means from the known value of the intrinsic characteristic of the tube means to the microwave energy of the second frequency and the result of step (e);
(i) determining the velocity of the first liquid within the tube means from the result of step (c);
(j) determining the relationship between the velocity of the first liquid and the velocity of the second liquid within the tube means from the result of step (f);
(k) determining the cross-section of the second liquid within the tube means from the results of steps (g) and (h);
(l) determining the velocity of the second liquid within the tube means from the results of steps (i) and (j);
(m) determining the volume flow rate of the first liquid within the tube means from the results of steps (g) and (i); and
(n) determining the volume flow rate of the second liquid within the tube means from the results of steps (k) and (l).

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**5,049,824**
**PHASE DISCRIMINATION TYPE ELECTROSTATIC CAPACITY DETECTOR**
**Mikio Suzuki, Kawasaki, and Satoshi Ishihara, Ageo, both of Japan, assignors to Mitutoyo Corp., Tokyo, Japan**
**Filed Dec. 5, 1989, Ser. No. 446,419**
**Claims priority, application Japan, Dec. 12, 1988, 63-161095[U]; Dec. 12, 1988, 63-313315**
**Int. Cl.[5] G01R *27/26***
**U.S. Cl. 324—660** **4 Claims**

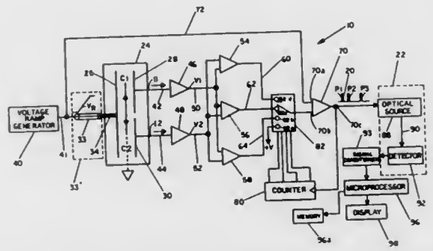




1. A phase discrimination type electrostatic capacity detector comprising a one-side electrode plate composed of a transmitting electrode and of a receiving electrode, another-side electrode plate having a coupling electrode and disposed relatively movably with respect to said one-side electrode plate in a confronting relation with the same, a power supply connected to said transmitting electrode, and a detector circuit connected to said receiving electrode, characterized in that
said one-side electrode plate having a substrate formed of a hard-workable material is partitioned on one of the surfaces of the substrate into first and second hierarchy layers by an electrical insulating layer,
a plurality of transmitting electrode elements, which constitute said transmitting electrode, are disposed in said second hierarchy layer and allowed to penetrate at ends thereof through said electrical insulating layer and extend into said first hierarchy layer,
said transmitting electrode elements of the same phase and disposed adjacent to each other are interconnected through coupling leads obliquely oriented with respect to said transmitting electrode elements and in series from the transmitting electrode elements at one side to the transmitting electrode elements at the other side in said first hierarchy layer, and
said respective transmitting electrode elements of the same phase are supplied with an electric signal of said same phase from said power supply through the respective coupling leads.

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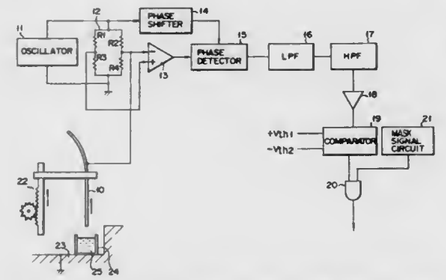
**5,049,825**
**SYSTEM AND METHOD OF ERROR REDUCTION FOR DIFFERENTIAL CAPACITIVE TRANSDUCERS**
**Bruce R. Kline, Starksboro, Vt., assignor to Simmonds Precision Products, Inc., Akron, Ohio**
**Continuation-in-part of Ser. No. 454,676, Dec. 21, 1989. This application Feb. 15, 1990, Ser. No. 481,090**
**Int. Cl.[5] G01F *23/26*; G08C *19/10***
**U.S. Cl. 324—660** **26 Claims**




1. A method of measurement of displacement of liquid fuel in a tank, comprising:
providing a tank containing liquid fuel, a ramp generator, a comparator and a first transducer, said transducer being positioned in said tank in contact with said fuel, said first transducer being connected to said generator and to said comparator, said comparator being sequentially operated to produce a first pulse set and a second pulse set, each said pulse set comprising first, second and third pulses, each of said pulses in said first pulse set being equal and opposite in magnitude to each of said pulses in said second pulse set, each said pulse set having a first time period between said second pulse and said first pulse, each said pulse set having a second time period between said second pulse and said third pulse, said first time period and said second time period of said first and second pulse sets being related to a displacement of liquid fuel in said tank, being measured by said transducer,
determining said displacement from said time periods whereby said displacement determined is independent of environmental influences.



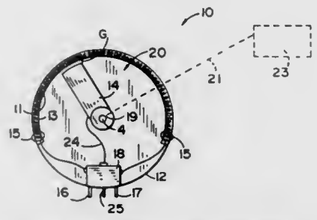
**5,049,826**
**LIQUID LEVEL SENSING APPARATUS FOR USE IN AUTOMATIC CHEMICAL ANALYSIS**
**Itsuro Sasao, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**
**Filed Aug. 9, 1988, Ser. No. 229,992**
**Claims priority, application Japan, Aug. 10, 1987, 62-198103**
**Int. Cl.[5] G01R *27/26*; G05D *9/00***
**U.S. Cl. 324—662** **5 Claims**




1. A liquid level sensing apparatus for detecting the reaching of the surface of a liquid sample by pipette means moved toward said liquid sample for extraction thereof, comprising:
impedance detection means having bridge circuit means connected to said pipette means and liquid sample, including as an impedance element the impedance between said pipette mans and liquid sample and providing a signal corresponding to the impedance;
converting means including phase detection means for phase-detecting said signal from said impedance detection means and outputting a phase-detection signal, which contains an impedance variation component generated in an initial stage of movement of said pipette means and a liquid level detection signal component corresponding to the detection of the liquid level of said liquid sample; and
liquid level signal detection means for removing said impedance variation component from said phase-detection signal from said converting means and detecting the liquid level detection signal component.

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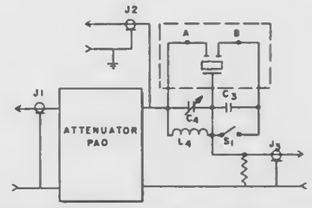
**5,049,827**
**NON-CONTACTING POTENTIOMETER**
**James D. Tasma, Grand Rapids, Mich., assignor to Jet Electronics & Technology Inc., Grand Rapids, Mich.**
**Filed Jan. 12, 1990, Ser. No. 464,238**
**Int. Cl.[5] G01R *27/08***
**U.S. Cl. 324—723** **24 Claims**



1. A non-contacting potentiometer comprising:
an impedance element formed to extend along a predetermined physical path and having terminals at opposite ends thereof;
means for applying an AC activating signal to said terminals;
a movable probe mounted to extend in spaced relationship to said impedance element, said probe moving along said path and sensing the signal level at various locations along said impedance element; and
circuit means coupled to said movable probe, said circuit means receiving the signal level on said probe for providing an output signal representative of the movement of said probe.

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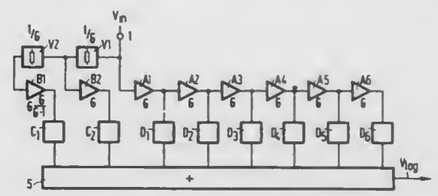
**5,049,828**
**METHOD AND APPARATUS FOR PARAMETER MEASUREMENT OF COUPLED-DUAL RESONATOR CRYSTALS**
**Samuel Toliver, Rustburg, and Gerald E. Roberts, Lynchburg, both of Va., assignors to Ericsson GE Mobile Communications Inc., Lynchburg, Va.**
**Filed Feb. 16, 1990, Ser. No. 480,773**
**Int. Cl.[5] G01R *29/22***
**U.S. Cl. 324—727** **14 Claims**




1. A method of accurately measuring selected parameters of coupled-dual resonator crystals which fail to display one or more zero phase crossing points in the phase versus frequency response of the driving-point impedance of one resonator when the other resonator is either effectively open circuited or short circuited, comprising the steps of:
connecting sufficient compensating impedance to the driving point impedance of said one resonator to force all zero phase crossing points to occur in said phase versus frequency response; and
measuring the selected parameters of said crystals.

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**5,049,829**
**LOGARITHMIC AMPLIFIER WITH SEQUENTIALLY LIMITING AMPLIFIER STAGES**
**Arnoldus Garskamp, and Cornelis J. M. Van Gils, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**
**Continuation of Ser. No. 313,652, Feb. 21, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 614,042**
**Claims priority, application Netherlands, Feb. 29, 1988, 8800510; Feb. 29, 1988, 8800511**
**Int. Cl.[5] G06G *7/24*, *7/12***
**U.S. Cl. 328—145** **6 Claims**



1. A logarithmic amplifier comprising a plurality of limiting amplifier stages having respective outputs coupled to an adder for producing an output signal which varies substantially logarithmically as a function of a signal applied to an input of the amplifier, the stages being coupled to each other in a cascade arrangement for successively limiting output signals produced thereby in response to an increasing magnitude in a signal

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applied to the input of the amplifier, characterized in that the logarithmic amplifier includes:

a. a first plurality of cascaded amplifier stages having predetermined gains, an input of a first one of said stages being coupled to the input of the logarithmic amplifier and an output of each of said stages being coupled to an input of the adder;

b. a plurality of cascaded signal attenuating means, an input of a first one of said said means being coupled to the input of the logarithmic amplifier; and

c. a plurality of limiting amplifier stages having predetermined gains, each of said stages having an output coupled to an input of the adder and having an input coupled to an output of a respective one of the signal attenuating means, the stage coupled to a last one of the cascaded signal attenuating means having a gain which is at least one db larger than the gain of any of the first plurality of cascaded amplifier stages.

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**5,049,830**

## CARRIER RECOVERY SYSTEM AND DIGITAL PHASE DEMODULATOR

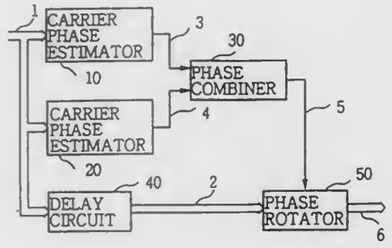
**Shousei Yoshida, Tokyo, Japan, assignor to NEC Corp., Japan**

**Filed Sep. 13, 1990, Ser. No. 581,892**

**Claims priority, application Japan, Sep. 13, 1989, 1-237855; Oct. 31, 1989, 1-283971**

**Int. Cl.[5] H04L** *27/22*

**U.S. Cl. 329—306** **5 Claims**




1. A carrier recovery system for generating a recovered carrier signal from a received input signal comprising:

first carrier recovering means responsive to said received input signal for generating a first phase signal during a first predetermined period of time;

second carrier recovering means responsive to said received input signal for generating a second phase signal during a second predetermined period of time, which is shorter than said first predetermined period of time; and

phase combining means for determining phase deviation of said second phase signal from said first phase signal and generating said recovered carrier signal in response to said first phase signal and said phase deviation.

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**5,049,831**

## SINGLE-ENDED INPUT TO DIFFERENTIAL OUTPUT AMPLIFIER WITH INTEGRAL TWO-POLE FILTER

**Alan L. Westwick, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 29, 1990, Ser. No. 501,057**

**Int. Cl.[5] H03F** *3/45*

**U.S. Cl. 330—107** **11 Claims**

1. A circuit which receives a single-ended input signal and implements a predetermined transfer function to provide a differential output signal, comprising:

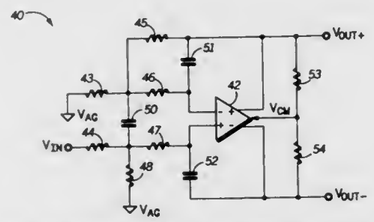
an amplifier having first and second input terminals, and first and second output terminals;

first circuit means coupled to said amplifier for receiving a reference voltage, said first circuit means implementing a first part of the predetermined transfer function and comprising:

a first resistor having a first terminal for receiving said reference voltage, and a second terminal;

a second resistor having a first terminal coupled to said second terminal of said first resistor, and a second terminal coupled to said first output terminal of said amplifier;

a third resistor having a first terminal coupled to said second terminal of said first resistor, and a second terminal coupled to said first input terminal of said amplifier;




a first capacitor having a first terminal coupled to said first input of said amplifier, and a second terminal coupled to said first output of said amplifier;

second circuit means coupled to said amplifier for receiving said single-ended input signal, said second circuit means implementing a second part of said predetermined transfer function;

a second capacitor coupled between said first circuit means and said second circuit means for implementing a third part of the predetermined transfer function, said second capacitor utilizing a voltage between said single-ended input signal and said reference voltage; and

common mode sensing means coupled between said first and second output terminals, for sensing and providing to said amplifier a common mode voltage having a value between a signal voltage on said first output terminal of said amplifier and a signal voltage on said second output terminal of said amplifier.

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**5,049,832**

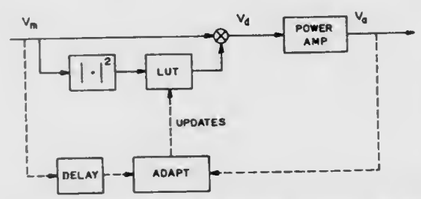
## AMPLIFIER LINEARIZATION BY ADAPTIVE PREDISTORTION

**James K. Cavers, Richmond, Canada, assignor to Simon Fraser University, Burnaby, Canada**

**Filed Apr. 20, 1990, Ser. No. 511,722**

**Int. Cl.[5] H03F** *1/26*

**U.S. Cl. 330—149** **8 Claims**




1. A method of linearizing an amplifier to produce an amplified output sample $v_o$ in response to a predistorted input sample $v_d$ derived from an input modulation sample $v_m$, such that $v_o \simeq Kv_m$, where K is the desired constant amplitude gain of said amplifier, said method comprising the steps of:

(a) deriving the squared magnitude $x_m$ of said input modulation sample $v_m$;

(b) selecting, from a table containing $N_t$ values $F_i$ where $i=0, 1, \ldots, N_t-1$, each of said entries corresponding to a squared magnitude values $x_{mi}$, and for each of which entries $F_i G(x_{mi})|F_i|^2 \simeq K$ where G(x) is the complex gain of said amplifier, a table entry $F_i$ for which $x_{mi}$ is: (i) the largest table entry less than or equal to $x_m$; or, (ii) the smallest table entry greater than or equal to $x_m$;

(c) deriving said predistorted sample $v_d$ as $v_d = v_m F_i$ in rectangular coordinates, viz:

$$Re(v_d) = Re(v_m)Re(F_i) - Im(V_m)Im(F_i)$$

$$Im(v_d) = Re(v_m)Im(F_i) + Im(V_m)Re(F_i)$$

where Re(x) is the real component of x and Im(x) is the imaginary component of x; and,

(d) driving said amplifier with said predistorted input sample $v_d$.



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**5,049,833**

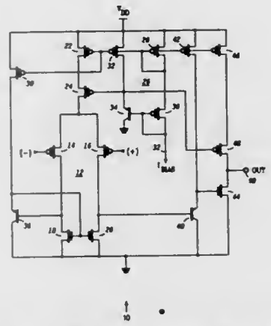
## AMPLIFIER STAGE

**Ira Miller, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Jul. 2, 1990, Ser. No. 546,978**

**Int. Cl.[5] H03F** *3/45*

**U.S. Cl. 330—253** **5 Claims**



1. An integrated differential amplifier having first and second inputs and an output, comprising:

first and second power supply conductors;

first and second MOS field effect transistors of a first conductivity type each having a gate, a drain and a source, said gates being coupled respectively to the first and second inputs, and said sources being interconnected;

current supply means coupled between said first power supply conductor and said interconnected sources of said first and second transistors for supplying a reference current thereto;

third and fourth MOS transistors of a second conductivity type, each having a gate, a drain and a source, said gates being interconnected, said sources being coupled to said second power supply conductor and said drains being coupled respectively to said drains of said first and second transistors;

means for coupling said drain of said fourth MOS transistor to the output of the amplifier; and

first transistor means of opposite conductivity than said third and fourth MOS transistors and having a base and emitter coupled between said drain and gate of said third MOS transistor, said emitter coupled to said current supply means for receiving operating current therefrom.

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**5,049,834**

## AMPLIFIER HAVING A CONSTANT-CURRENT BIAS CIRCUIT

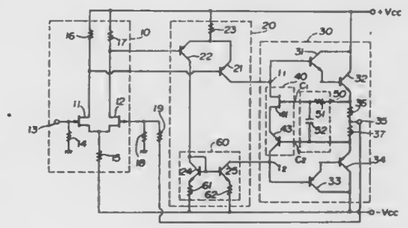
**Takafumi Kasai, 13-28, Higashi-cho 4-chome, Koganei-shi, Tokyo, Japan 184**

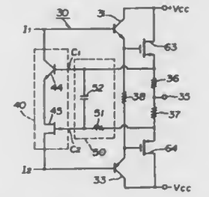
**Continuation-in-part of Ser. No. 243,337, Jun. 23, 1988, Pat. No. 4,933,645. This application Mar. 21, 1990, Ser. No. 496,768**

**Claims priority, application Japan, Nov. 21, 1986, 61-276474**

**Int. Cl.[5] H03F** *3/30*

**U.S. Cl. 330—255** **25 Claims**




9. An amplifier, comprising:

an input stage having an inverting input terminal and a non-inverting input terminal;

a voltage amplifier stage operatively connected to said input stage and having first and second relay terminals;

a SEPP output stage including a first transistor having a gate connected to said first relay terminal and a source connected to one end of a first resistor, an output terminal connected to another end of said first resistor and to one end of a second resistor, and a second transistor having a gate connected to said second relay terminal and a source connected to another end of said second resistor, said second transistor having a polarity opposite to said first transistor; and

a voltage-controlled constant current bias circuit connected between said first and second relay terminals and controlling a value of the constant current flowing through said first and second relay terminals in response to a control voltage that is a mean value of a voltage between said one end of the first resistor and said another end of the second resistor via a high-cut filter, said voltage-controlled constant current bias circuit being free of direct connection with said output terminal.

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**5,049,835**

## MODIFIED CASCODE CIRCUIT

**Carmine F. Vasile, Medford, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Feb. 27, 1990, Ser. No. 485,495**

**Int. Cl.[5] H03F** *3/16*

**U.S. Cl. 330—277** **13 Claims**

7. A cascode circuit comprising:

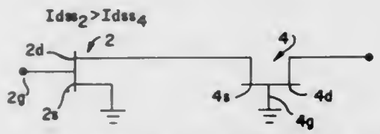
an output transistor having a first saturation current;

at least one driver transistor having a second saturation current connected to the output transistor, the saturation current of the driver transistor being greater than the saturation current of the output transistor by a ratio of

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approximately 1.5 to 2.0 such that no appreciable voltage from the output transistor is dissipated by the driver transistor as the output transistor reaches it saturation current,




to thereby enhance the output of the cascode circuit by enabling the output transistor to effect a maximum voltage swing at its output.

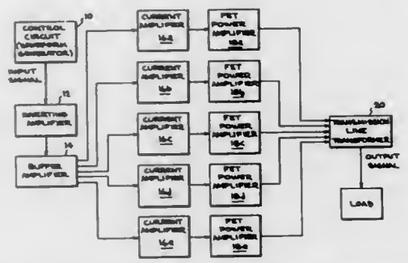
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5,049,836

## HIGH VOLTAGE ELECTRICAL AMPLIFIER HAVING A SHORT RISE TIME

David J. Christie, Pleasanton, and Gregory E. Dallum, Livermore, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1989, Ser. No. 447,454
Int. Cl.[5] H03F 3/195
U.S. Cl. 330—277 22 Claims




17. An electrical circuit for providing a pulse in response to an input control signal, said circuit comprising:

an input stage comprising a means for amplifying the voltage of the input control signal;

a buffer connected to the input stage;

a current amplifier connected to the buffer, said current amplifier having an output voltage responsive to the voltage of the input control signal,

a FET coupled to the output of the current amplifier;

means for biasing the FET into its approximately linear mode of operation, so that the FET operates in a substantially linear mode during a rising portion of the input waveform; and

a transmission line transformer coupled to the output of the FET, said transformer having an impedance that is substantially resistive.

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5,049,837

## PUSH-PULL TRANSFORMER COUPLED RF AMPLIFIER WITH RESPONSE TO DC

Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

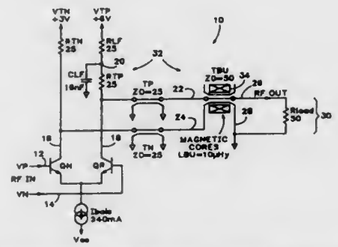
Filed Jun. 25, 1990, Ser. No. 542,560
Int. Cl.[5] H03F 3/45
U.S. Cl. 330—301 9 Claims

1. An amplifier comprising:

push-pull connected amplifying means having first and second balanced input terminals and first and second balanced output terminals, for amplifying input signals applied to the input terminals;

first load means for coupling the first balanced output terminal to a first power source, said first load means having a first impedance;

second and third load means, each having first and second terminals, the first terminal of the second load means being coupled to the second balanced output terminal, the second terminal of the second load means being coupled to the first terminal of the third load means, and the second terminal of the third load means being coupled to a second power source, said second and third load means having second and third impedances, respectively, each equal to said first impedance;




capacitive means for capacitively coupling the second terminal of the second load means to ground;

a balun transformer having first and second input terminals and first and second output terminals with a common mode inductance between said input and output terminals, the first and second transformer input terminals being coupled to the first and second balanced output terminals, respectively; and

the first and second transformer output terminals defining a single-ended amplifier output port.

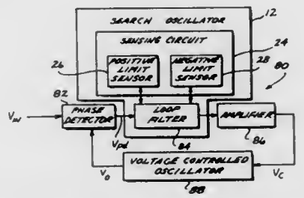
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5,049,838

## MINIMUM INTRUSION SEARCH OSCILLATOR FOR USE IN FEEDBACK LOOPS

Kenneth G. Voyce, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 19, 1989, Ser. No. 409,458
Int. Cl.[5] H03L 7/00
U.S. Cl. 331—11 12 Claims




1. A search oscillator for receiving an input signal and producing an output signal, said search oscillator comprising:

filter means for filtering said input signal to produce said output signal;

positive limit-sensing means for monitoring said output signal and providing a first output to said filter means to adjust said output signal to a first reset level if said output signal rises above some first threshold level; and

negative limit-sensing means for monitoring said output signal and providing a second output to said filter means to adjust said output signal to a second reset level if said output signal falls below some second threshold level.

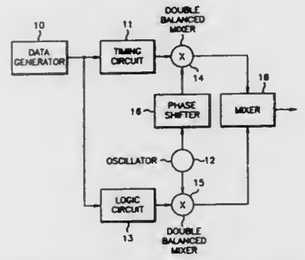


5,049,839

## BIPHASE MODULATON CIRCUIT HAVING CONTINUOUS PHASE CHANGES

Soon-Ik Jun, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 28, 1990, Ser. No. 589,620
Claims priority, application Rep. of Korea, Oct. 4, 1989, 1989-14205
Int. Cl.[5] H04L 27/20
U.S. Cl. 332—103 2 Claims




1. A biphase shift keying modulation circuit for a digital communication transmitter, particulary adaptable to an automatic vehicle location system, comprising:

a data generator for generating data for transmission in the transmitter;

a timing circuit, coupled to said data generator, for delaying the data of said data generator by timing said data in synchronism with a given pulse;

a logic circuit, coupled to said data generator, for generating a timing pulse whenever a logic level of the data of said data generator is inverted;

a local oscillator for generating a local oscillating frequency signal;

a phase shifter, coupled to said local oscillator, for shifting said local oscillating frequency signal with a phase difference of 90°;

a first mixer, coupled to said timing circuit and said phase shifter, for modulating the delayed signal of said timing circuit in synchronism with the 90° phase-shifted signal of said phase shifter;

a second mixer, coupled to said logic circuit and said local oscillator, for modulating the timing pulse of said logic circuit in synchronism with the local oscillating frequency signal of said local oscillator; and

a signal mixer, coupled between said first and second mixers, for synthesizing the output signals of said first and second mixers.

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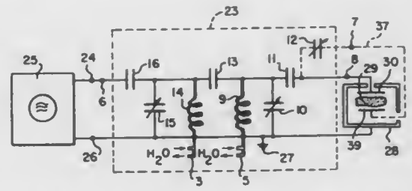
5,049,840

## COOLING DEVICE FOR ELECTRICAL CIRCUIT CONFIGURATIONS

Roland Gesche, Seligenstadt, and Stefan Locher, Alzenau, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 458,328
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1989, 3927324
Int. Cl.[5] H03H 7/38, 1/00
U.S. Cl. 333—32 4 Claims

1. A cooling device for a high frequency inductance coil comprising two tubes which are at least in part coaxially arranged with each other to thereby define an outer tube and an inner tube, said outer tube consisting of metallic material, cooling liquid flowing in said inner tube in a first direction and in the space between said inner tube and said outer tube in a second direction opposite to said first direction, said outer tube being connected to an electrical potential, characterized in that said outer tube is connected to ground potential at an opening




whereat said liquid enters into or exits from said inductance coil.

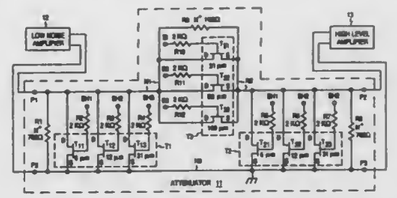
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5,049,841

## ELECTRONICALLY RECONFIGURABLE DIGITAL PAD ATTENUATOR USING SEGMENTED FIELD EFFECT TRANSISTORS

Paul D. Cooper, Baldwinsville; Paul A. Bourdelais, Liverpool; Anthony W. Jacomb-Hood, North Syracuse; John A. Windyka, Liverpool; David R. Helms, Liverpool, and Ronald J. Naster, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jul. 11, 1990, Ser. No. 551,067
Int. Cl.[5] H03H 11/24
U.S. Cl. 333—81 R 17 Claims




1. An electronically reconfigurable Pi-pad attenuator providing a set of discrete attenuation states (S21 values) comprising

A) a monolithic crystalline substrate suitable for forming mutually insulated metallizations and field effect transistors,

B) a first metallization on said member forming a first note for application of an input signal and for internal signal connection,

C) a second metallization forming a second node for internal signal connection and for derivation of an output signal,

D) a third metallization forming a third node providing a common signal return for input, output and internal signals,

E) three segmented single gate field effect transistors (FETs) formed on said substrate, each subdivided into a first (m), second (n) and third (o) plurality of selectively controlled FET segments respectively, each segment having a predetermined width to achieve a desired admittance and including

(1) a first region having a first electrode in ohmic contact with said substrate,

L(2) a second region, spaced from the first region, having a second electrode in ohmic contact with said substrate, and

(3) a third region positioned between said first and second regions having a third electrode forming a gate for switching said segment to a high admittance "ON" state or to a low admittance "OFF" state in response to the state of a digital control potential,

each of said (m) segments being serially connected between said first and third metallizations in separate parallel paths,

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each of said (n) segments being serially connected between said second and third metallizations in separate parallel paths,

each of said (o) segments being serially connected between said first and second metallizations in separate parallel paths,

F) means for maintaining said three metallizations at a common dc potential to facilitate passive, bidirectional conduction by the (m+n+o) segments of said three FETs with certain segments being in a high admittance "ON" state and other segments being in a low admittance "OFF" state in response to a binary control potential applied to the gate of each segment thereof, and

G) a plurality of control terminals for applying said binary control potential to the gate of each of said (m+n+o) segments, selected combinations of binary control potentials producing particular attenuation states for said attenuator.

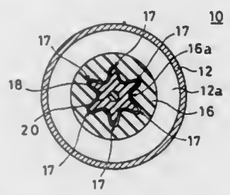
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**5,049,842**

## DIELECTRIC RESONATOR HAVING A CUTOUT PORTION FOR RECEIVING AN UNITARY TUNING ELEMENT CONFORMING TO THE CUTOUT SHAPE

**Youhei Ishikawa; Hidekazu Wada; Kouichi Takehara; Toru Tanizaki; Shigeji Arakawa, and Shinichi Kunioka, all of Nagaokakyo, Japan, assignors to Murata Mfg. Co., Ltd., Japan**

**Filed Nov. 15, 1988, Ser. No. 271,603**
**Claims priority, application Japan, Nov. 17, 1987, 62-291586**
**Int. Cl.[5] H01P** *7/10*
**U.S. Cl. 333—235** **16 Claims**




10. A dielectric resonator comprising:

a case;

input and output means on said case for the input and output of electromagnetic energy;

a cylindrical hollow electric resonator element fixed and held in said case and having a hollow axial portion;

said hollow axial portion having a cross-sectional shape which is defined by a cylindrical portion which defines an inside diameter ID of said element, and by at least three radially-directed cutout portions which extend symmetrically from said cylindrical portion toward a periphery of said dielectric resonator element; and

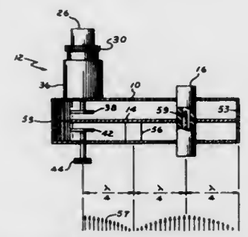
a unitary dielectric tuning unit which is capable of being axially inserted into or withdrawn from said hollow axial portion of said dielectric resonator element, and has a cross-sectional shape substantially matching the cross-sectional shape of said hollow axial portion including said cutout portions.

**5,049,843**

## STRIP-LINE FOR PROPAGATING MICROWAVE ENERGY

**Ramon M. Barnes, 109 Mt. Warner Rd., Hadley, Mass. 01036, and Edward R. Reszke, c/o Technical Univ. of Wroclaw Dept. of Electronics (I-28) Wybrzeze Wyspianskiego 27, PL - 50-370 Wroclaw, Poland**

**Filed Apr. 12, 1990, Ser. No. 508,707**
**Int. Cl.[5] H01P** *5/04;* **H01J** *23/36*
**U.S. Cl. 333—246** **6 Claims**




1. A cavity for propagating microwave energy comprising a conduit of rectangular cross-section, a strip-line disposed within said conduit and having a free end and another end attached to the rectangular conduit, an energy coupling device for transferring microwave energy onto the free end portion of said strip-line and a discharge tube which extends through an opening in the strip-line and being located at a distance of one-half wavelength of the microwave energy from the coupling device.

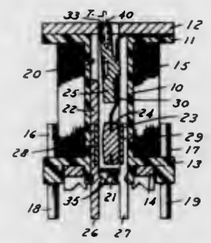
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**5,049,844**

## ENCLOSED ELECTROMAGNETIC RELAY

**Farid Mustafa, Rochester Hills, Mich., assignor to Beta Mfg. Co., Warren, Mich.**

**Filed May 16, 1990, Ser. No. 523,987**
**Int. Cl.[5] H01H** *3/00*
**U.S. Cl. 335—76** **4 Claims**




1. In an electromagnetic relay comprising a bobbin of insulating material comprising a hollow spool sandwiched between a pair of end flanges, said spool and said end flanges defining a cavity centered along the principal axis of said spool; a coil of electrically conducting wire wound around said spool and forming therewith an electromagnet constructed, upon energization of said coil to generate a stream of magnetic flux in said cavity directed along said axis; at least one fixed electrical contact rigidly attached to an inner wall of said cavity; at least one movable contact; means for suspending said movable contact in said cavity, adjacent to said fixed contact; a magnetically actuable armature connected to said movable contact suspending means, and responsive to the flow of flux in said cavity to move said movable contact from a first position in open relation to said fixed contact, to a second position in closed relation with said fixed contact; means comprising a magnetically permeable enclosure surrounding opposite sides



of said coil externally for completing the magnetic circuit for said flux, wherein said magnetically permeable enclosure is electrically connected to said means for suspending said movable contact, and is magnetically connected to provide a magnetic flux path to said armature; and said movable contact comprising spring-biasing means anchored to said magnetically permeable enclosure, the improvement wherein the magnetic armature includes means forming a cavity accessible from the exterior constructed and arranged such that said cavity is accessible from the exterior of the enclosed relay to adjust the relay after it is assembled to conform with the desired level of voltage required to actuate the relay.

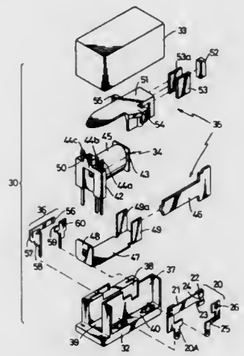
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**5,049,845**

## WELDING FREE RELAY CONTACT DEVICE

**Yoichi Yokoyama; Hiroaki Hamaguchi; Hideya Kondo; Nobuhiro Kitamura, and Takatoshi Hongyou, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Jun. 14, 1990, Ser. No. 537,632**
**Claims priority, application Japan, Jul. 12, 1989, 1-318670**
**Int. Cl.[5] H01H** *50/26, 1/16*
**U.S. Cl. 335—133** **11 Claims**




1. A contact device comprising:

a stationary contact side terminal plate;

a stationary contact secured to said stationary contact side terminal plate;

a resilient contactor;

a movable contact secured to an end of said resilient contactor which is continuous to said stationary contact upon contact closing;

a movable contact side terminal plate integrally formed at the other end of said resilient contactor; and

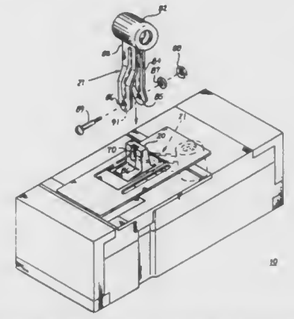
an additional mass means formed in a separate member and secured to said resilient contactor at a remote location which exerts a force in a direction perpendicular to a longitudinal axis of the resilient contactor and parallel to a direction of movement of said movable contact, so that said movable contact is caused to roll relative to said stationary contact when said movable contact and said stationary contact are contiguous.

**5,049,846**

## COMPACT MOLDED CASE CIRCUIT BREAKER WITH INCREASED AMPERE RATING

**Roger J. Morgan, Simsbury; Irenaeus S. Panus, Forestville; Ronald G. Pekrul, Southington; Thomas F. Papallo, Jr., Plainville; Robert A. Morris, Burlington; Henry J. Tucholski, Terryville, and Hamon L. Craft, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.**

**Division of Ser. No. 546,826, Jun. 29, 1990. This application Oct. 29, 1990, Ser. No. 604,538**
**Int. Cl.[5] H01H** *9/02*
**U.S. Cl. 335—202** **4 Claims**




1. A compact industrial-rated circuit breaker comprising:

a plastic circuit breaker case;

a plastic circuit cover attached to said case;

a pair of contacts arranged for automatic separation upon occurrence of an overcurrent condition through said contacts;

an operation handle extending through said cover allowing manual opening and closing of said contacts;

an arc chute proximate said contacts cooling and extinguishing an arc that occurs when said contacts become separated during said overcurrent conditions; and

an extender attached to said operating handle providing additional force to said operating mechanism to facilitate said opening and closing of said contacts, said extender comprising a pair of opposing sidearms supporting an extender handle at one end, the opposite end of said sidearms being attached to said circuit breaker handle; and

a slot on said circuit breaker handle and a protrusion on one of said sidearms, said protrusion becoming received within said slot when said extender is in a protracted position and said protrusion being out of said slot when said extender is in a retracted position.

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**5,049,847**

## DEFLECTION YOKE WITH AUXILIARY COILS FOR STRAY LINE RADIATION SUPPRESSION

**Nobutaka Okuyama; Soichi Sakurai; Masao Obara, all of Yokohama; Yosio Kikkawa, and Michitaka Ohsawa, both of Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Mizusawa Electronics Co., Iwate, both of, Japan**

**Filed Dec. 14, 1989, Ser. No. 450,573**
**Claims priority, application Japan, Dec. 19, 1988, 63-318566**
**Int. Cl.[5] H01H** *1/00, 5/00;* **H01J** *29/06*
**U.S. Cl. 335—214** **8 Claims**

7. An image display apparatus comprising:

a cathode-ray tube;

a deflection yoke disposed on the cathode-ray tube and including a magnetic core having a longitudinal axis and a longitudinal center lying on the longitudinal axis, the magnetic core having a front end lying in front of the longitudinal center and a back end lying in back of the longitudinal center;

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a first pair of auxiliary coils respectively disposed on upper and lower portions of the deflection yoke in front of the longitudinal center and being responsive to a horizontal deflection current of the image display apparatus; and

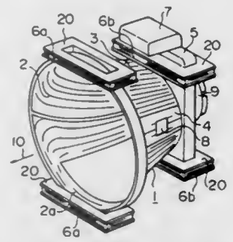
a second pair of auxiliary coils respectively disposed on upper and lower portions of the deflection yoke in back of the longitudinal center and being responsive to the horizontal deflection current;

wherein each of the auxiliary coils has a first dimension extending in a direction transverse to the longitudinal axis, and a second dimension extending in a direction transverse to the direction in which the first dimension extends, the first dimension being greater than the second dimension.

8. An image display apparatus comprising:

a cathode-ray tube;

a deflection yoke disposed on the cathode-ray tube and including a magnetic core having a longitudinal axis and a



longitudinal center lying on the longitudinal axis, the magnetic core having a front end lying in front of the longitudinal center and a back end lying in back of the longitudinal center;

a first pair of auxiliary coils respectively disposed on upper and lower portions of the cathode-ray tube in front of the longitudinal center and being responsive to a horizontal deflection current of the image display apparatus; and

a second pair of auxiliary coils respectively disposed on upper and lower portions of the deflection yoke in back of the longitudinal center and being responsive to the horizontal deflection current;

wherein each of the auxiliary coils has a first dimension extending in a direction transverse to the longitudinal axis, and a second dimension extending in a direction transverse to the direction in which the first dimension extends, the first dimension being greater than the second dimension.

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**5,049,848**

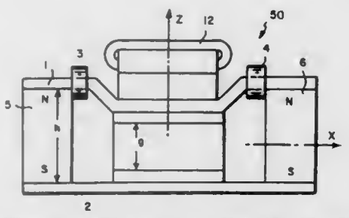
**HIGH FIELD STRENGTH MAGNET, PREFERABLY HAVING REMOTE SHIMMING OF FIELD**

**Yuly M. Pulyer, 109 Mountain Ave., Malden, Mass. 02148**

**Filed Nov. 28, 1989, Ser. No. 442,154**

**Int. Cl.[5] H01F *1/00***

**U.S. Cl. 335—296** **20 Claims**



1. A magnet configuration comprising, in combination, a primary magnet structure and a secondary magnet structure capable of providing substantial field homogeneity from the edge of the primary magnet structure facing the secondary magnet structure;

said primary magnet structure comprising a generally rectangular structure in the ZX plane having two parallel magnetic flux sources with a first upper ferromagnetic flux guiding core section ridging the tops of the sources and a first lower ferromagnetic core flux guiding core section bridging the bottom of the sources thereby defining a volumetric air gap between the sources and the flux guiding core sections;

said secondary magnetic structure comprising a generally C-shaped ferromagnetic core section having a magnetic source, the C-shaped core section being positioned relative to the primary magnetic structure with the ends of the C-shaped core section directed toward the volumetric air gap,

the strength of the magnetic sources being predetermined to define a relatively homogeneous magnetic field in the volumetric air gap beginning at the edge of the primary magnetic structure closest to the C-shaped core section and extending in the ZY plane.

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**5,049,849**

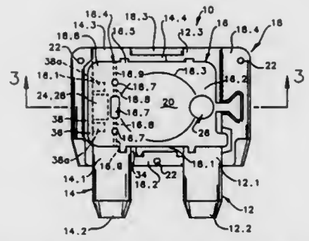
**CIRCUIT BREAKER**

**Steven K. Sullivan, Cranston, R.I.; Richard L. Jenne, Attleboro, Mass., and Gennady Baskin, Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 30, 1990, Ser. No. 575,461**

**Int. Cl.[5] H01H *31/00, 61/00, 85/00***

**U.S. Cl. 337—1** **22 Claims**



1. A circuit breaker comprising two terminals, and a thermostat metal member having a contact at one end, the member having an opposite end secured to one of the terminals to mount the member with the contact engaging the other terminal to close a circuit and to be movable in response to occurrence of a selected current in the member which generates a member temperature to open the circuit, the member having a portion intermediate the terminals of relatively smaller cross-sectional area than other portions of the member intermediate the terminals, the relatively smaller cross-sectional area being selected to be burned out by said selected current in the circuit to open the circuit in the event the contact welds to the other terminal.

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**5,049,850**

**ELECTRICALLY CONDUCTIVE DEVICE HAVING IMPROVED PROPERTIES UNDER ELECTRICAL STRESS**

**Joseph H. Evans, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.**

**Continuation of Ser. No. 141,989, Apr. 21, 1980. This application Nov. 21, 1990, Ser. No. 617,444**

**Int. Cl.[5] H01B *1/06***

**U.S. Cl. 338—22 R** **25 Claims**

1. An electrical device which comprises

(a) a PTC element composed of a conductive polymer composition which exhibits PTC behavior, which has a resistivity at 23° C. of less than $10^6$ ohm-cm and which comprises

(1) an organic polymer component which is present in amount 20 to 90% by volume of the composition;

(2) a conductive filler component which consists essentially of carbon black or graphite or a mixture of carbon black and graphite, which has been dispersed in said polymer component and which is present in amount 4 to 65% by volume of the composition; and

(3) an arc-controlling additive which is a hydrated inorganic particulate material and which has been dispersed in said polymer component; and

(b) at least two electrodes which can be connected to a source of electrical power and which when so connected cause current to flow through said PTC element.



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**5,049,851**

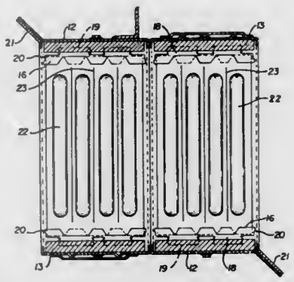
**EMBOSSED AND LANCED RESISTOR STRUCTURE**

**Victor V. Kirilloff, Lincoln, Nebr.; Robert Cummins, and William A. Benson, both of Pittsburgh, Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.**

**Filed Jan. 16, 1990, Ser. No. 465,390**

**Int. Cl.[5] H01C *3/00***

**U.S. Cl. 338—280** **7 Claims**



1. In a resistor grid comprising a rectangular frame enclosing adjoining columns of resistor ribbon fan-folded into parallel flights connected by end loops, and insulating means supporting said columns at their end loops from said frame, at least some of said flights being embossed to stiffen them, the improvement comprising at least one longitudinal slit in at least some of said flights extending intermediate said end loops less than the distance between said end loops of said flights, but severing said flights into at least two portions in the same plane over the greater extent of the lengths of said portions.

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**5,049,852**

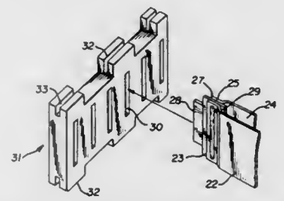
**RESISTOR GRID HEAT DISSIPATING ASSEMBLY**

**Robert Cummins, Pittsburgh, Pa.; Victor V. Kirilloff, Lincoln, Nebr.; William A. Benson, and Richard S. Dawson, both of Pittsburgh, Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.**

**Filed Jan. 16, 1990, Ser. No. 465,323**

**Int. Cl.[5] H01C *3/00***

**U.S. Cl. 338—280** **13 Claims**



1. In a fabricated resistor grid having a frame including a pair of oppositely positioned conductive members and a zigzag resistor comprising flat individual parallel strips of resistance material positioned opposite each other, each strip having an offset portion at each end, said offset portions being parallel to said strip and extending in opposite directions, each offset portion being joined to the opposite direction offset portion of the adjoining strip so as to form a current path between the said conducting members;

the improvement comprising

a short supporting member of conductive material of a gauge at least equal to that of said strip forming a sandwich between each of said joined offset portions and projecting outwardly therefrom parallel to said offset portions, and a block of insulating material carried by said conductive members having cavities in its inner surface adapted to mate with said outwardly projecting supporting members.

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**5,049,853**

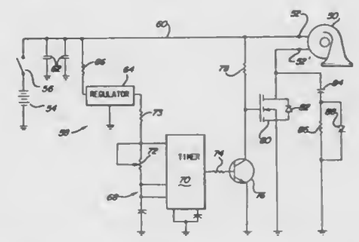
**ELECTRIC HORN WITH SOLID STATE DRIVER**

**Young S. Yoon, Brighton, Mo., assignor to Sparton Corporation, Jackson, Mich.**

**Continuation of Ser. No. 109,778, Oct. 19, 1987, abandoned. This application Nov. 3, 1989, Ser. No. 431,696**

**Int. Cl.[5] G08B *3/10***

**U.S. Cl. 340—388** **8 Claims**



1. A vehicle horn for an automotive vehicle having a vehicle battery with a voltage rating of twelve volts or greater, said horn comprising:

a closed housing having a diaphragm mounted on the housing with its periphery clamped thereto and forming a substantially closed chamber,

a driving coil mounted within said chamber,

a ferromagnetic plunger coupled to the center of said diaphragm and extending into said coil for imparting motion to the diaphragm upon energizations,

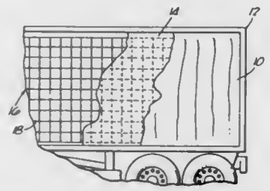
said diaphragm suspending said plunger for reciprocating motion relative to said coil and having a spring characteristic whereby the coupled diaphragm and plunger have a resonant frequency of mechanical vibration of about four hundred hertz,

a solid state drive circuit coupled between said battery and said coil for energizing said coil, said driver circuit generating a DC pulse train having a pulse repetition rate substantially equal to said resonant frequency and having a duty cycle of sixty percent or greater whereby said diaphragm vibrates at substantially said resonant frequency and generates sound waves at substantially said resonant frequency.

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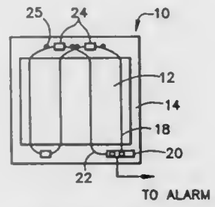


5,049,854
**SENSING ELEMENT FOR AN ALARM SYSTEM**
**Adrian F. Wolf, P.O. Box 17, Liverpool, L37 1YE, England**
**Continuation of Ser. No. 435,376, Mar. 8, 1990, abandoned. This application Jan. 24, 1991, Ser. No. 645,350**
**Int. Cl.[5] G08B *13/00***
**U.S. Cl. 340—550** **5 Claims**



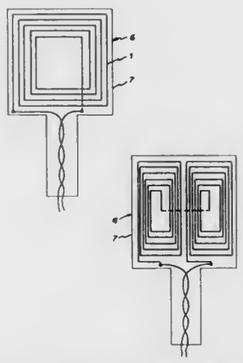

1. An alarm system for protecting a flexible closure, comprising:
a first alarm circuit at least partially defined by means of a first conductor;
a second alarm circuit independent of said first circuit and at least partially defined by means of a second conductor;
a common outer sheath, said first and second conductors being enclosed in said outer sheath; and
at least one other dummy "conductor" of substantially identical appearance to said first and second conductors but which does not form part of any circuit, said dummy "conductor" also being enclosed in said common outer sheath;
said common outer sheath and enclosed conductors defining a wire which is laid in a network over a surface of the flexible closure to be protected.

5,049,855
**SECURITY SCREEN SYSTEM**
**Charles S. Slemon, 1130 Island View La., Encinitas; William M. Lafferty, 571 D Hygeia Ave., Leucadia, both of Calif. 92024; Clark C. Guest, 11524 Alkaid Dr., San Diego, Calif. 92126; Anthony E. Diamond, 6348 Caminito Partida, San Diego, Calif. 92111, and Daniel S. Kline, 1768 Butters Rd., Carlsbad, Calif. 92008**
**Filed Oct. 24, 1989, Ser. No. 425,866**
**Int. Cl.[5] G08B *13/00***
**U.S. Cl. 340—550** **18 Claims**




1. A security screen assembly, comprising:
a screen of mesh material for covering a door or window opening;
the screen including a continuous optical path extending in a generally serpentine pattern across the screen, the path comprising at least one optical fiber integrally woven into the screen material;
light emitting means connected to the path for transmitting light through said optical path;
detector means connected to said path for detecting a light signal emitted from said path;
electro-optical interface means connected to said light emitting means and detector means for activating a remote alarm control unit if said detected light signal is below a predetermined intensity, said interface means including a switch, output means connected across said switch for connection to a remote alarm control unit for activating an alarm if said switch is open, and means for opening said switch if said detected light signal is below said predetermined intensity; and
the optical path comprising a series of spaced, parallel optical fibers extending between opposite side edges of the screen, each fiber having a first end at one side edge of the screen and a second end at the opposite side edge of the screen, said light emitting means being connected to a first end of one of the fibers and said detector means being connected to a first end of a second, adjacent one of the fibers, and further including a series of spaced, arcuate optical splice means along each edge of the screen for connecting the remaining first ends of the fibers together in pairs and the second ends of the fibers together in pairs, respectively, to form a continuous, serpentine light path through all the fibers from the first end of the first fiber to the first end of the second fiber, said optical splice means comprising means for changing the direction of the light path at each turn in the serpentine light path.

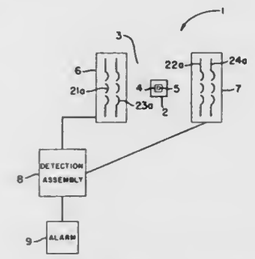
5,049,856
**ANTIPILFERAGE SYSTEMS**
**Michael D. Crossfield, Brackley, United Kingdom, assignor to Scientific Generics Limited, Cambridge, United Kingdom**
**Filed Dec. 4, 1989, Ser. No. 445,765**
**Claims priority, application United Kingdom, Apr. 15, 1988, 8808933**
**Int. Cl.[5] G08B *13/24*; H01Q *1/36***
**U.S. Cl. 340—551** **5 Claims**




1. An interrogating system for use in an anti-pilferage system, wherein the interrogating system comprises a magnetic field generator which is in the form of a substantially planar spirally wound coil, and means for detecting the response of a magnetic tag positioned within the effective field generated by said magnetic field generator, said detection means comprising one or more pairs of coils wound spirally and positioned so as to overlay the magnetic field generator coil.

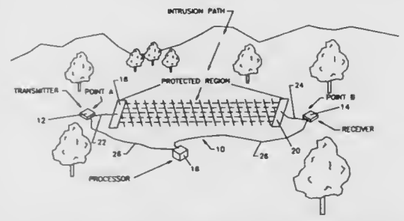


5,049,857
**MULTI-MODE ELECTRONIC ARTICLE SURVEILLANCE SYSTEM**
**Christopher B. Plonsky, Boynton Beach; Harry E. Watkins, Boca Raton, and Marco A. Paez, Wellington, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.**
**Filed Jul. 24, 1989, Ser. No. 384,556**
**Int. Cl.[5] G08B *13/24***
**U.S. Cl. 340—551** **62 Claims**



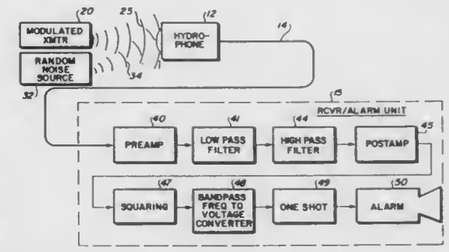

1. An electronic article surveillance system for detecting the presence of articles passing through an interrogation zone, the articles carrying tags including magnetic markers, comprising:
first means from transmitting magnetic energy into said zone and for receiving magnetic energy including magnetic energy from said zone, said first means having at least first and second different modes of operation in which magnetic energy is transmitted into said zone;
and second means responsive to said first means and for controlling said first means to operate in at least said first and second modes in order to make a determination as to the presence of an article in said zone.

5,049,858
**INTRUSION DETECTION SYSTEM**
**Melvin L. Price, Huntsville, Ala., assignor to Physitron, Inc., Huntsville, Ala., a part interest**
**Filed Apr. 23, 1990, Ser. No. 512,476**
**Int. Cl.[5] G08B *13/18***
**U.S. Cl. 340—552** **8 Claims**




1. An intrusion detection system for use in an area to be protected comprising:
a transmitter for transmitting pulses of RF energy, said pulses disposed for conduction on or near the surface of said area to be protected;
a receiver disposed in spaced relation with said source of electrical pulses to receive said electrical pulses therefrom; and
processing means disposed for receiving sequential electrical signals corresponding to said electrical pulses and for determining the frequency/amplitude spectrum of said electrical signals and comparing said sequential signals to detect any changes in said signals, said processing means including Fourier Transform means for determining said frequency/amplitude spectrum of said electrical signals; and,
said transmitter disposed for producing electrical pulses with an amplitude of 1 kv and above, an adjustable pulse width of between 5 to 50 ns, a risetime of less than 1 ns and a repetition rate of 10 or more pulses per second.

5,049,859
**WATER ENTRY ALARM SYSTEM**
**Clifford G. Arnell, Elizabeth, Colo., assignor to Karla J. Roffee, Phoenix, Ariz., a part interest**
**Filed Oct. 9, 1990, Ser. No. 594,401**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—573** **10 Claims**




1. A water-entry alarm system for providing warning of the entry of non-swimmers into a body of water including in combination:
water-activated transmitter means adapted to be worn on the body of a non-swimmer, said transmitter means continuously transmitting signals in the audible frequency range having predetermined characteristics whenever said transmitter means is immersed in water;
signal sensor means for location in a body of water for sensing signals of said predetermined characteristics;
an alarm; and
signal processing means coupled between said signal sensor means and said alarm and responsive to signals of said predetermined characteristics sensed by said signal sensor means for operating said alarm in a first alarm mode continuously producing an audible alarm warning signal when said signals of said predetermined characteristics continuously occur, and for operating said alarm in a second monitoring mode to produce short term "beep" alarm signals when signals of said predetermined characteristics momentarily are sensed by said sensor means.

5,049,860
**TWO WIRE FLOW CONDITION SENSING SYSTEM**
**Jonathon E. Farrell, and Mark C. Anthony, both of 8 Chomley Street, Cranbourne, Victoria, Australia 3977**
**Continuation of Ser. No. 123,678, Nov. 23, 1987, Pat. No. 4,945,344. This application Mar. 21, 1990, Ser. No. 496,662**
**Claims priority, application Australia, Nov. 24, 1986, PH9156**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—610** **4 Claims**

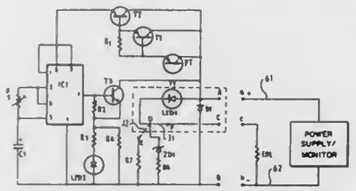
1. A flow sensor system comprising:
a flow sensor having a light emission means and a light detector means and constructed and arranged such that when a predetermined flow condition occurs at the sensor, light emanating from the light emission means will be detected by the light detector means, said light detector means having an output,
first and second circuit elements comprising current supply means and current return means, respectively, for said flow sensor, and
remote monitor means coupled to said first and second circuit elements for sensing electrical conditions existing in

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said first and second circuit elements to determine changes in the resistance of the flow sensor,

the light emission means being connected across said first and second circuit elements and constructed and arranged such that if the light emission means should fail and go open circuit, the resistance of the flow sensor will change such as to be detectable at said monitor means to indicate a fault in the sensor, if the light emission means should fail




and go to short circuit, the resistance of the flow sensor will change such as to be detectable at said monitor means to indicate an alarm condition and, said output of the light detector means being connected across said first and second elements for altering the resistance of the flow detector responsive to the detection of light by said light detector means such as to be detectable at said monitor means to indicate the occurrence of the predetermined flow condition.

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**5,049,861**

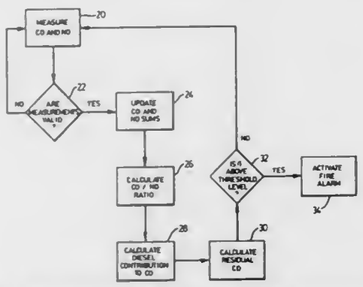
**METHOD AND SYSTEM FOR DETECTING UNDERGROUND MINE FIRES**

**Richard Grace; Alberto M. Guzman, both of Pittsburgh, and David A. Purta, Gibsonia, all of Pa., assignors to American Intell-Sensors Corp., Pittsburgh, Pa.**

**Filed Jun. 1, 1990, Ser. No. 532,892**

**Int. Cl.[5] G08B *17/10***

**U.S. Cl. 340—632** **13 Claims**




1. A fire detection system for detecting underground mine fires comprising a plurality of remotely located sensor pairs, one sensor in each pair capable of measuring the Co concentration and the other sensor capable of measuring the $NO_x$ concentration; a data processor; and a communications network for periodically transmitting the measured CO and $NO_x$ concentration levels at the sensors to the data processor; wherein a dynamic $CO/NO_x$ ratio is calculated by the data processor using a variable number of measurements, said variable number dependant upon a particular sensed condition and is sued to determine the presence of a fire.

**5,049,862**

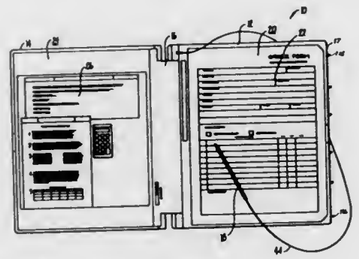
**KEYLESS FLAT PANEL PORTABLE COMPUTER—COMPUTER AIDED NOTEBOOK**

**James Dao, Hillsborough; David C. Foyt, Belmont; Jeffrey J. Dao, Hillsborough, and Kenneth R. Allen, Palo Alto, all of Calif., assignors to Communication Intelligence Corporation ("CIC"), Menlo Park, Calif.**

**Filed Oct. 6, 1989, Ser. No. 418,009**

**Int. Cl.[5] G09G *3/02***

**U.S. Cl. 340—706** **19 Claims**



1. A portable computer comprising:

a first panel having a first flat surface;

a second panel having a second flat surface;

hinge means for joining said first panel to said second panel such that said first flat surface is juxtaposed to said second flat surface in a closed position and is disposed side by side in a common plane in one of a selection of open positions;

said first flat surface comprising a first digitizer;

said second flat surface comprising a second digitizer and a display juxtaposed together to form a digitizer-display unit; and

a stylus connectable to at least one of said first panel and said second panel for interacting with at least one of said first digitizer and said second digitizer, wherein data entered on one of said digitizers and displayed on said digitizer-display unit is freely alterable on said digitizer-display unit.

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**5,049,863**

**CURSOR KEY UNIT FOR A COMPUTER HAVING A MOUSE FUNCTION REMOVABLY MOUNTED ON A KEYBOARD SECTION OF A BASE**

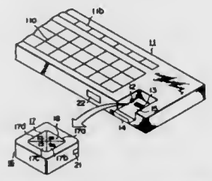
**Mayumi Oka, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 9, 1990, Ser. No. 477,458**

**Claims priority, application Japan, Feb. 10, 1989, 1-31336**

**Int. Cl.[5] G06F *15/00*; G09G *3/02***

**U.S. Cl. 340—710** **19 Claims**



1. An input unit for a computer comprising;

a base unit including a keyboard section having a keyboard and a holding portion;

a cursor key unit having cursor keys and a mouse mechanism removably mounted on the holding portion;

connection means for electrically connecting the cursor key unit and the base unit when the cursor key unit is mounted on the holding portion; and

signal transmission means for transmitting a signal from the cursor key unit to the base unit when the cursor key unit is removed from the holding portion.



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**5,049,864**

**DISPLAY SCHEME FOR DECOMPRESSION DATA**

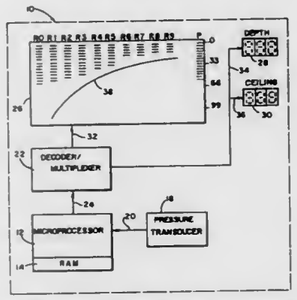
**Craig W. Barshinger, St. John, V.I., assignor to Orca II, Inc., Wilmington, Del.**

**Continuation of Ser. No. 219,015, Jnl. 14, 1988, abandoned, which is a continuation of Ser. No. 786,723, Oct. 15, 1985, Pat. No. 4,782,338, which is a continuation of Ser. No. 648,797, Sep. 7, 1984, abandoned, which is a continuation of Ser. No. 341,281, Jan. 21, 1982, abandoned. This application Oct. 10, 1989, Ser. No. 420,621**

**The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.**

**Int. Cl.[5] G09G *3/00***

**U.S. Cl. 340—753** **10 Claims**




1. A portable device for displaying decompression data comprising:

a pressure sensor for sensing ambient pressure and for generating a signal representative of the sensed pressure;

a programmed computer for receiving pressure signals from the pressure sensor and for periodically generating data representative of the level of dissolved gases in each of a plurality of tissue models having differing saturation half-times;

memory means for periodically receiving and storing the dissolved gas level data for each of the tissue models and information concerning a predetermined dissolved gas level limit for each of the tissues modeled; and

display means, including a graphic display device for receiving and simultaneously displaying the dissolved gas level data for one of the tissue models and the predetermined dissolved gas level limit information for the displayed tissue model.

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**5,049,865**

**DISPLAY APPARATUS**

**Tadashi Nakamura, and Toshiro Wakabayashi, both of Tokyo, Japan, assignors to NEC Corporation, Japan**

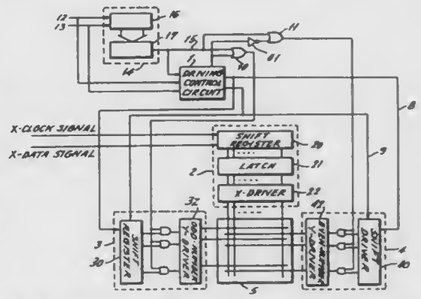
**Filed Oct. 31, 1988, Ser. No. 265,245**

**Claims priority, application Japan, Oct. 29, 1987, 62-275151; Oct. 29, 1987, 62-275152**

**Int. Cl.[5] G09G *3/04, 3/36***

**U.S. Cl. 340—758** **9 Claims**

1. A display apparatus, comprising: a display panel having display cells and a first group of electrodes and a second group of electrodes effective for activating therewith desired ones of said display cells, a first driving circuit connected to said first group of electrodes for selectively applying driving signals to electrodes thereof, a second driving circuit connected to said second group of electrodes for selectively applying driving signals to electrodes of said second group in correspondence with the signal applying timing of said first driving circuit, a first control means for controlling said first driving circuit such that each of said first group of electrodes is sequentially selected one after another in a time-division multiplexed mode, a second control means for controlling said first driving circuit such that a plurality of adjacent electrodes of said first group of electrodes are simultaneously selected and different pluralities




of adjacent electrodes are selected in a time-division multiplexed mode, and, a third control means for actuating one or the other of said first control means and said second control means.

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**5,049,866**

**LIQUID CRYSTAL DISPLAY DEVICE**

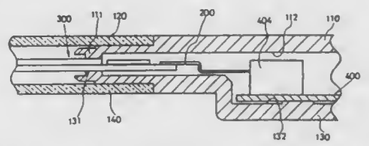
**Akira Miyajima, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Jul. 19, 1989, Ser. No. 381,953**

**Claims priority, application Japan, Jul. 26, 1988, 63-98645**

**Int. Cl.[5] G09G *3/36***

**U.S. Cl. 340—784** **3 Claims**



1. A liquid crystal display device inserted between a light source and a lens of a projector for projecting an image on a liquid crystal display panel onto a screen, comprising:

a housing including a front cover and a rear cover forming a panel housing portion and a control circuit housing portion of said housing which are longitudinally arranged, said liquid crystal display panel being housing in said panel housing portion;

a control circuit housed in said control circuit housing portion;

circuit chips mounted on glasses of said liquid crystal display panel for driving electrodes of the panel;

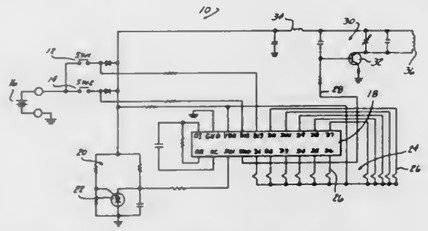
connecting means for connecting said circuit chips with said control circuit; and

a pair of attached portions formed on opposite longitudinal sides of said panel housing portion, which are arranged to be attached to the projector, a thickness of each of said attached portions being less than 6 mm, and a width of said panel housing portion being about 50 mm.

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5,049,867
**VEHICLE SECURITY APPARATUS**
Peter J. Stouffer, Auburn, Mich., assignor to Code-Alarm, Inc., Madison Heights, Mich.
Filed Nov. 30, 1988, Ser. No. 278,251
Int. Cl.[5] B60R *25/10*; G08B *26/00*
U.S. Cl. 340—426 16 Claims

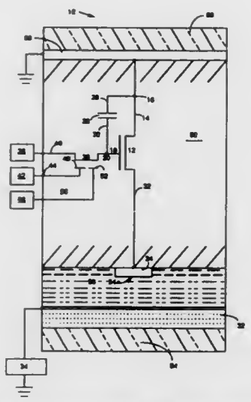


1. A vehicle security apparatus comprising:
transmitter means carried by a user for transmitting a first discrete coded signal identifying a specific transmitter means;
sensor means mounted on the vehicle for sensing attempted access to the vehicle;
receiver means, mountable in the vehicle, for receiving and recognizing the first discrete coded signal from the transmitter means, the receiver means including;
anti-theft means;
means for learning a first discrete coded signal associated with a specific transmitter means while the first discrete coded signal is being transmitted by the transmitter means and received by the receiver means; and
means for arming the anti-theft means upon the first receipt and recognition of a learned discrete coded signal and for disarming the anti-theft means upon the second receipt and recognition of the learned discrete coded signal.

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5,049,868
**ELECTROCHROMIC DISPLAY DOT DRIVE MATRIX**
Paul E. Green, La Mirada, and Margie M. Nicholson, San Marino, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Sep. 19, 1989, Ser. No. 409,540
Int. Cl.[5] G02F *1/15*; G09G *3/38*
U.S. Cl. 340—785 10 Claims

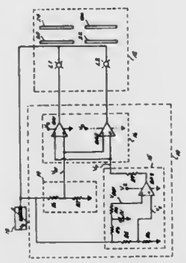
1. A planar matrix of electrochromic display dot drive picture elements, wherein:
a) each picture element comprises:
1) a drive transistor
i) connected between a planar drive electrode, common to all picture elements, and the display dot and
ii) connected for turning on in response to the application of a turn-on voltage to a control terminal, and for turning off in response to the application of a turn-off voltage to the control terminal;
2) a capacitor connected between the drive electrode and the control terminal;
3) a planar counter electrode common to all picture elements, connected to the drive electrode through an electric power source; and
4) means for selectively connecting the control terminal and capacitor to, or insulating them from, a turn-on/turn-off voltage source;
b) the display dot and the counter electrode are so situated and constructed that, when the drive transistor is turned on, it impresses the display dot with electricity from the electric power source sufficient to change the color of the display dot; and



c) the display dots are situated to be simultaneously viewed by an observer off the plane of the matrix.

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5,049,869
**DIMMING CIRCUIT FOR DUAL DISPLAY AIRCRAFT INSTRUMENTS**
Gregory W. Harris, Everett, Wash., assignor to Korry Electronics Company, Seattle, Wash.
Filed Jun. 19, 1989, Ser. No. 368,257
Int. Cl.[5] G09G *5/00*
U.S. Cl. 340—815.01 25 Claims

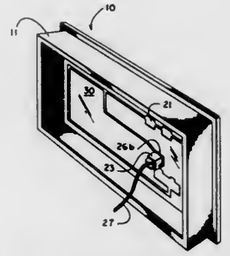


1. A dimming circuit responsive to the magnitude of a supply voltage produced by a variable voltage source for controlling first and second lamps in a dual display, said dimming circuit comprising:
(a) input means for receiving the supply voltage produced by the variable voltage source and producing an input voltage whose magnitude tracks the supply voltage produced by the variable voltage source;
(b) threshold voltage means for receiving the supply voltage produced by the variable voltage source and producing a threshold voltage having a high value when the supply voltage produced by the variable voltage source has a high value and a low value when the supply voltage produced by the variable voltage source has a low value, such that said high value of said threshold voltage is substantially greater than the magnitude of said input voltage and said low value of said threshold voltage is substantially less than the magnitude of said input voltage; and,
(c) a switch having a first input coupled to receive said input voltage, a second input coupled to receive said threshold voltage, a first output coupled to the first lamp of the dual display, and a second output coupled to the second lamp of the dual display, said switch being responsive to said input voltage and said threshold voltage, such that when said threshold voltage exceeds said input voltage said switch produces a low voltage at said first output of said switch that causes the first lamp to be brightly lit and a high voltage at said second output of said switch that causes the second lamp to be off and, such that when said threshold voltage is less than said input voltage said switch produces a high voltage at said first output of said switch that causes the first lamp to be off and a low voltage at said second output of said switch that causes the second lamp to be dimly lit.



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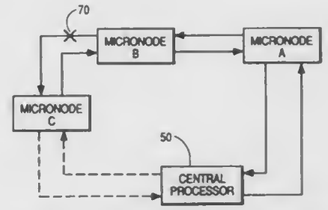
5,049,870
**GRAPHIC DISPLAY PANEL**
Charles A. Fitzgerald, Stone Mountain, and Daniel S. Sweeney, Buford, both of Ga., assignors to Fitzgerald Engineering Company, Inc., Atlanta, Ga.
Filed Oct. 31, 1988, Ser. No. 264,864
Int. Cl.[5] G08B *5/36*, *5/00*
U.S. Cl. 340—815.2 11 Claims



5. A graphic display device for monitoring and displaying information, comprising:
a light-transmissive display panel carrying a graphic display and having a front side and a back side;
a light-transmissive support panel disposed behind said display panel immediately adjacent said back side of said display panel and having an uninterrupted back surface;
at least one light emitting means illuminating only a localized area of the back surface of said display panel;
a first support member having a front side and a back side;
said first support member having on the back side a semi-permanent adhesive backing removably attached to said support panel and permitting repositioning of said first support member on the uninterrupted back surface of said support panel; and
said light emitting means including a second support member selectively removably attachable to the first support member for removably mounting said light emitting means to said first support member, thus permitting quick and easy rearrangement and repositioning of the light emitting means associated with the graphic device, at any selected location on the uninterrupted back surface, by relocating the first support member on the back surface and then reattaching the light emitting means to the relocated first support member.

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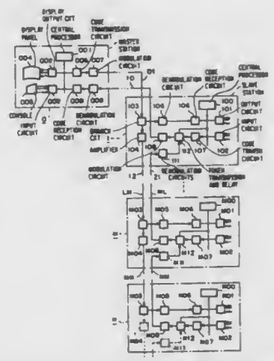
5,049,871
**LOOP COMMUNICATION SYSTEM**
Donald P. Sturgis, Claremont, and Michael Wolpert, Los Angeles, both of Calif., assignors to American Magnetics Corporation, Carson, Calif.
Continuation of Ser. No. 4,964, Jan. 20, 1987, abandoned. This application May 16, 1990, Ser. No. 524,682
Int. Cl.[5] H04Q *3/00*
U.S. Cl. 340—825.05 8 Claims




1. A loop network comprising a plurality of micronodes and a central processor, said network including first and second transmission lines connected to said plurality of micronodes and said central processor, each of said lines being constructed and interconnected to transmit signals in first and second directions, said central processor including means responsive to a first command from said central processor in a first direction on said lines to transmit a next succeeding command only in a second direction, each of said micronodes being responsive to a command from said central processor in a first direction to transmit a response in a second direction on said lines.

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5,049,872
**REMOTE SUPERVISORY CONTROL SYSTEM**
Torao Yamanaka; Hirofumi Morimoto, and Takeshi Kawahara, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 228,124, Aug. 4, 1988, abandoned. This application Aug. 31, 1990, Ser. No. 576,088
Claims priority, application Japan, Sep. 14, 1987, 62-228370
Int. Cl.[5] H04B *3/00*
U.S. Cl. 340—825.05 5 Claims



1. A remote supervisory control system including a master station and a plurality of slave stations which are interconnected in a linear configuration and which share the transmission route connected to the master station and for which the presence and absence of data to be sent to the master station thereof are enquired by the master station wherein
a master station is connected to a plurality of slave stations extending in a linear series interconnected sequence from

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the master station to an end slave station connected at the end location of the transmission route of said linear sequence, such that communication between said master station and said slave stations flows linearly in opposite directions through a communication path extending from said master station to said end slave station;

said slave station connected at the end location of the transmission route is responsive to a polling signal issued from the master station such that responsive to the presence of data to be sent to the master station, the slave station transmits a code with a "busy" token specifying the data so as to send the code to a slave station at the next upper location in the direction opposite to the direction of the initiation of transmission of said polling signal transmitted from the master station to the slave station and that responsive to the absence of data to be sent to the master station, the slave station at the end location transmits a code in said opposite direction with a "free" token to a slave station at the next upper location;

in slave stations connected at intermediate locations between said master station and said slave station at the end location, when a code with a "busy" token is received from a slave station at a lower location, the receiving slave station relays the entire code associated with the "busy" token in said opposite direction to a slave station at the further upper location or to the master station and when a code with a "free" token is received and there exist data to be sent to the master station, said slave station replaces the "free" token with the "busy" token and subsequently sends the code associated with the data and when there do not exist data to be sent to the master station, said slave station relays a code with a "free" token in said opposite direction to a slave station at the next upper location or to the master station.

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**5,049,873**

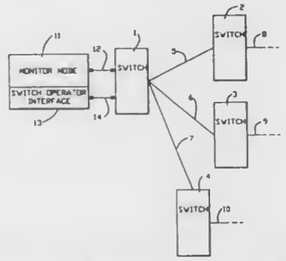
## COMMUNICATIONS NETWORK STATE AND TOPOLOGY MONITOR

**Paul A. Robins, San Francisco; Paul D. Alvik, Cupertino; Christopher S. Helgeson, Mountain View; Michael R. Gannon, Menlo Park; William A. Bishop, Mountain View; Sandra L. Mumaw, San Jose; Karen L. Forkish, Redwood City; Seck-Eng Tan, Mountain View; Tim O. Radzykewycz, Newark, all of Calif., and Roland Dupont, Grand Duchy, Luxembourg, assignors to Network Equipment Technologies, Inc., Redwood City, Calif.**

**Continuation of Ser. No. 150,354, Jan. 29, 1988, abandoned. This application May 4, 1990, Ser. No. 520,111**

**Int. Cl.[5] H04M *15/00*; G05B *23/00***

**U.S. Cl. 340—825.06** **27 Claims**




1. An apparatus for gathering and displaying information concerning status of a communications network, the network including a plurality of distributed switching nodes and a plurality of links connecting the switching nodes, each of the switching nodes performing tasks including communications functions, maintenance of a node list of alarm conditions for the switching node, and maintenance of a node configuration database identifying a configuration for the switching node; the apparatus comprising:

a monitor node, coupled to a first switching node of the plurality of distributed switching nodes, comprising

an operator input interface,

first means for maintaining topology data indicating the topology of the network and for supporting a first protocol with the first switching node,

second means for maintaining a monitor list of alarm conditions entered in the switching node lists of alarm conditions in the network and for supporting a second protocol through the network with the plurality of distributed switching nodes,

third means for maintaining a monitor database indicating the configuration of the switching nodes as entered in the switching node configuration databases in the network and for supporting a third protocol through the network with the plurality of distributed switching nodes, and

display means, responsive to operator inputs identifying a subject switching node in the network and coupled to the monitor database, the monitor list of alarm conditions and the topology data, for displaying configuration data about the subject switching node, the network topology and the alarm conditions to the operator;

means, on the first switching node, for generating the topology data in response to the communications functions performed on the plurality of switching nodes and for sending, in response to messages according to the first protocol, the topology data to the first means; and

means, on each of the plurality of distributed switching nodes in the network, coupled to the switching node list of alarm conditions on the respective switching node, and responsive to messages according to the second protocol, for packaging and sending data indicating alarm conditions to the second means, wherein said data from each of the plurality of distributed switching nodes except the first switching node passes through the network to the first switching node, and through the first switching node to the second means;

means, on each of the plurality of distributed switching nodes in the network, coupled to the switching node configuration database on the respective switching node, and responsive to messages according to the third protocol, for packaging and sending data from the switching node configuration database to the third means, wherein said data from each of the plurality of distributed switching nodes except the first switching node passes through the network to the first switching nodes, and through the first switching node to the third means.

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**5,049,874**

## PAGING RECEIVER WITH EXTERNAL MEMORY MEANS

**Shinjiro Ishida, Kodaira, and Yoshiaki Mukai, Oome, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Sep. 15, 1989, Ser. No. 408,105**

**Claims priority, application Japan, Sep. 20, 1988, 63-123315[U]; Sep. 20, 1988, 63-123316[U]; Sep. 20, 1988, 62-123317[U]**

**Int. Cl.[5] H04B *7/00***

**U.S. Cl. 340—825.44** **24 Claims**

1. A paging receiver having a receiver main body and external memory means, wherein said receiver main body comprises:

frame register means for storing numbers of frames;

address register means for storing addresses;

receiving means for receiving and demodulating a radio signal;

reception control means coupled to said receiving means for operating said receiving means, on the basis of reception control data, in a predetermined period including a period



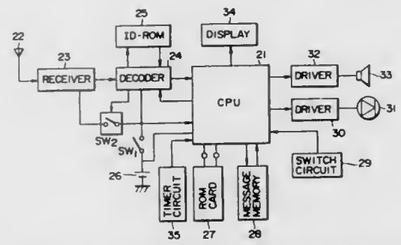
in which a frame stored in said frame register means is transmitted;

address checking means for checking whether an address included in an address codeword received by said receiving means coincides with an address stored in said address register means;

means for continuously turning on said receiving means and fetching a message codeword when a coincidence is detected by said address checking means;

internal memory means for storing the number of a frame to which an individual calling signal assigned to said receiver is transmitted and an address signal assigned to said receiver;

setting means for setting a frame position number and the address stored in said internal and external memory means in said frame and address register means;




said external memory means comprising storing means detachably mounted in said receiver main body for storing a frame position number and an address for receiving contact information supplied from an information service company, said storing means being accessible by said setting means when said storing means is mounted in said receiver main body;

said reception control data including remaining reception number data representing the number of times capable of receiving the contract information; and

said paging receiver further comprising:

updating means for updating the remaining reception number data each time said paging receiver receives the contract information; and

inhibiting means for inhibiting said paging receiver from receiving the contract information when the remaining reception number data reaches a predetermined value.

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**5,049,875**

## METHOD AND APPARATUS FOR OUT OF RANGE DETECTION IN RESPONSE TO NONDETECTION OF PREDETERMINED BAUD RATES

**Joan S. DeLuca, Boca Raton; Richard A. Erhart, Boynton Beach, and Michael J. DeLuca, Boca Raton, all of Fla., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Sep. 13, 1989, Ser. No. 406,489**

**Int. Cl.[5] H04Q *7/00***

**U.S. Cl. 340—825.44** **13 Claims**

13. A selective call receiver having an address comprising:

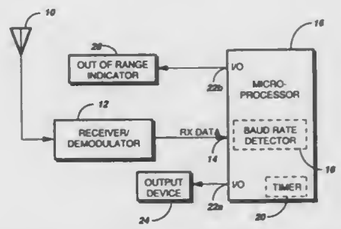
an antenna for receiving signals comprising first message signals and second message signals, said first message signals intended for reception by said selective call receiver, comprising address signals corresponding to said address, and having a first of a plurality of predetermined baud rates and said second message signals not intended for reception by said selective call receiver and having a second of said plurality of predetermined baud rates;

a receiver circuit coupled to said antenna for receiving and demodulating said first and second message signals on at least one frequency;

decoder means coupled to said antenna for decoding said first message signals according to a predetermined signalling format;

baud rate detection means coupled to said receiver circuit for determining whether said first and second message signals have one of said plurality of predetermined baud rates;

indication means coupled to said baud rate detection means for generating an out of range signal if said signals do not have any of said plurality of predetermined baud rates;




message generating means coupled to said decoder and said baud rate detection means for generating a message from said first message signals; and

output means for presenting said message.

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**5,049,876**

## DATA COMMUNICATION SYSTEM

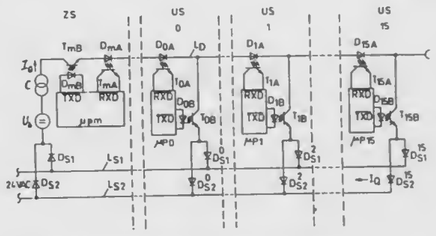
**Arno Kahle, Muehlheim; Heinz Daab, Darmstadt; Dieter Ehlers, Muehlheim, and Bernd Scheler, Bad Orb, all of Fed. Rep. of Germany, assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Jul. 10, 1989, Ser. No. 377,472**

**Claims priority, application European Pat. Off., Jul. 16, 1988, 88111460**

**Int. Cl.[5] H04Q *9/00*; H04L *11/16***

**U.S. Cl. 340—825.57** **11 Claims**




1. A data communication system, comprising:

(a) a first bus;

(b) a second bus;

(c) a central station, which includes:

(i) current source means, connected between said first and second bus, for providing a current onto said first bus;

(ii) first transmitter means, connected in a series arrangement with said first bus, for transmitting information onto said first bus;

(iii) first receiver means, connected in a series arrangement with said first bus, for receiving information on said first bus; and

(iv) first processor means, operatively connected to said first transmitter means and to said first receiver means, for processing information to be transmitted and received onto said first bus; and

(d) at least one substation, wherein each substation includes:

(i) second receiver means for receiving information transmitted from said central station, each second receiver means of each substation being connected in a series arrangement with said first bus;

(ii) second transmitter means for transmitting information to said central station, each second transmitter means of

each substation being connected in a parallel arrangement between said first bus and said second bus; and

(iii) second processor means, each second processor means of each substation being operatively connected to its respective second receiver means and second transmitter means, for processing predetermined information received and transmitted onto said first bus, wherein said current from said current source is modulated according to a bit pattern of information by said first and second transmitter means.

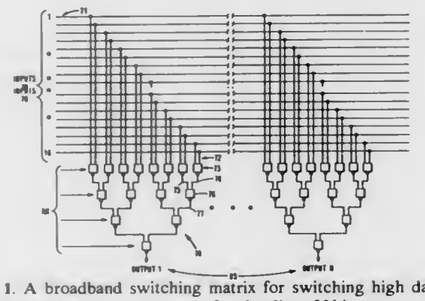
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**5,049,877**

## BROADBAND SWITCH MATRIX WITH NON-LINEAR CASCADING

**Michael Cooperman, Framingham; Richard W. Sieber, Attleboro, and Arnold Paige, Natick, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Continuation of Ser. No. 324,845, Mar. 17, 1989, abandoned. This application Dec. 13, 1990, Ser. No. 626,340**
**Int. Cl.[5] H04Q *1/00***
**U.S. Cl. 340—825.8** **15 Claims**



1. A broadband switching matrix for switching high data rate signals between any one of a plurality of N input ports to any one of a plurality of output ports, each of said input ports being connected to an input signal line, comprising:

a parallel combination of multiplexing means each having an input end connected to the input signal lines and an output end connected to a respective one of said output ports;

each of said multiplexing means including a plurality of selection means arranged in $\log_2 N$ cascaded stages to form a vertical tree configuration wherein the first of said stages is said input end and the last of said stages is said output end;

each of said selection means having a first input line, a second input line, an input control means, and an output line wherein the output line drives a single input line of a selection means in the next stage, said selection means further including a buffer means having an input coupled to said input lines and having an output coupled to the output line wherein said buffer means electrically isolates said input lines from said output line;

wherein the input control means of each selection means in a respective stage of a particular multiplexing means are connected in common;

said selection means being operable in response to a first control condition at the respective control input means to provide a closed circuit condition between the first input line and the output line thereof and an open circuit condition between the second input line and the output line thereof; and

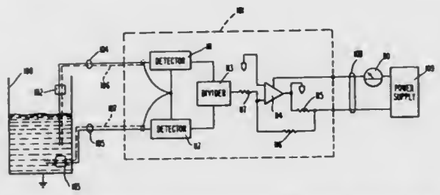
said selection means being operable in response to a second control condition at the respective control input means to provide an open circuit condition between the first input line and the output line thereof and a closed circuit condition between the second input line and the output line thereof.

**5,049,878**

## TWO-WIRE COMPENSATED LEVEL MEASURING INSTRUMENT

**David M. Stern, Merion Station, Pa., assignor to Drexelbrook Engineering Company, Horsham, Pa.**

**Division of Ser. No. 615,151, May 29, 1984, Pat. No. 4,851,831, which is a continuation of Ser. No. 263,351, May 13, 1981, Pat. No. 4,485,673. This application Apr. 10, 1989, Ser. No. 336,008**
**The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—870.4** **13 Claims**




1. A circuit for performing division of first and second signals, comprising:

integrator circuit means;

means for supplying said integrator circuit means with a first predetermined initial condition $V_i$;

means for controlling operation of said integrator circuit means to integrate a first signal $V_R$, defining a first integrated signal, until a second predetermined signal value is reached;

means for measurement of the time T required for said integration;

means for thereafter supplying said integrator means with a second signal $V_L$;

means for controlling operation of said integrator means to integrate said second signal, defining a second integrated signal, for an equal length of time T;

said integrator at the end of said equal length of time of integration containing an output value $E_o(T)$; and

means for outputting a signal proportional to the ratio of the difference between said output value $E_o(T)$ and said second predetermined value to the difference between said second predetermined value and said first predetermined initial condition $V_i$, equal to the ratio of said second integrated signal to said first integrated signal $V_L/V_R$.

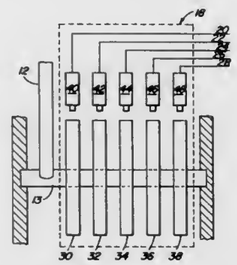
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**5,049,879**

## POSITION ENCODER UTILIZER SPECIAL GRAY CODE

**Dean H. Symonds, Cherryvale, Kans., assignor to Deere & Company, Moline, Ill.**

**Filed Oct. 31, 1990, Ser. No. 606,239**
**Int. Cl.[5] H03M *1/24, 1/28***
**U.S. Cl. 341—10** **1 Claim**



1. A position encoder for detecting the position of a member which is movable to a plurality of positions, the encoder having a plurality of encoded elements, the elements having indicia which represent a plurality of binary multi-bit position-representing words of a Gray code, each word being unique and representing only one of said plurality of positions, characterized by:

the indicia being arranged so that, for each and every word of the code, a modified word obtained by changing only one bit of any particular position-representing word will be:

a) identical to a word which represents a position of the movable member which is immediately adjacent to the position represented by said particular word; and

b) different from all said position-representing words.



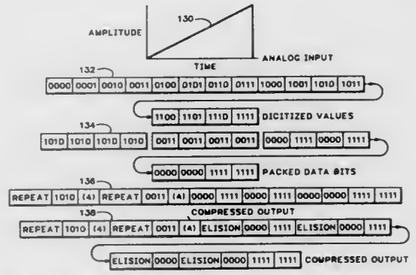
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**5,049,880**

## BIT-WISE RUN-LENGTH ENCODING FOR DATA COMPRESSION

**Douglas C. Stevens, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Apr. 2, 1990, Ser. No. 503,009**
**Int. Cl.[5] H03M *7/46***
**U.S. Cl. 341—63** **16 Claims**




10. A method for compressing an analog signal comprising the steps of:

a. repeatedly digitizing the analog signal to generate a sequence of digital data values representing said analog signal, said sequence being composed of M-bit data words, M being a positive integer;

b. generating a sequence of N-bit data words by successively selecting groups of N-word data sequences, for each group selecting bit values from a specified bit position in each data word to generate an N-bit data word and repeating the process for each bit position to produce M N-bit data words for each group, N being a positive integer; and

c. storing said N-bit data words, said step of storing including the substeps of

c1. storing a repeat indicator for each sequence of the N-bit data words that are equal when the number of such equal N-bit data words in sequence is greater than or equal to a minimum value;

c2. storing a representative N-bit data word from the repetitive sequence of equal N-bit data words; and

c3. storing a count representing the number of times said N-bit data word is repeated in the sequence.

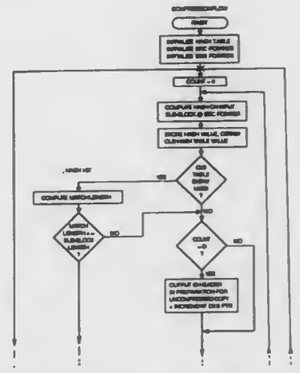
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**5,049,881**

## APPARATUS AND METHOD FOR VERY HIGH DATA RATE-COMPRESSION INCORPORATING LOSSLESS DATA COMPRESSION AND EXPANSION UTILIZING A HASHING TECHNIQUE

**Dean K. Gibson, Harbor City, and Mark D. Graybill, Agoura Hills, both of Calif., assignors to Intersecting Concepts, Inc., Agoura Hills, Calif.**

**Filed Jun. 18, 1990, Ser. No. 539,880**
**Int. Cl.[5] H03M *7/30***
**U.S. Cl. 341—95** **15 Claims**



1. A compression method for compressing a stream of input data into a compressed stream of output data based on a minimum number of characters in each input data subblock to be compressed, said compression method comprising the steps of:

a. initializing a hash table and initializing an SRC pointer;

b. processing input data in the order in which the characters in the data appear and hashing input data subblocks of the minimum compression size selected;

c. maintaining a hash table which contains at each entry, an SRC pointer which points to a previous subblock which hashed to this hash table entry, such that the possibility of any string of data previously occurring in the input block may be tested by hashing the current subblock to a hash table entry, obtaining the previous SRC pointer contained in that entry, and comparing the two strings of data;

d. if the two strings of data match on at least the size of the subblock, then generating a backwards pointer to the previous occurrence of the same string of data and thereby compressing the second occurrence of the string of data;

e. if the two strings of data do not match, then storing the string of data as incompressible data; and

f. continuing steps b. through e. until the entire input data has been processed.

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**5,049,882**

## HIGH SPEED ANALOG-TO-DIGITAL CONVERTER

**James L. Gorecki, Vail, and Michael J. McGowan, Tucson, both of Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.**

**Filed Dec. 20, 1990, Ser. No. 630,539**
**Int. Cl.[5] H03M *1/36, 1/38***
**U.S. Cl. 341—143** **19 Claims**

1. A high speed analog-to-digital converter comprising in combination:

(a) a unity gain amplifier;

(b) a flash encoder having a plurality of inputs all connected to an output of the amplifier;

(c) a plurality of voltage reference circuits each producing a different group of selectable reference voltages during a plurality of successive approximation passes through the

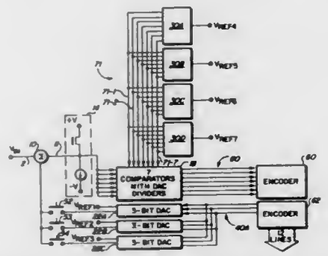
VOL 1130 ISS 3 SE 17 1991 UMI



analog-to-digital converter, respectively, corresponding reference voltages produced by each of the voltage reference circuits being successively lower during each of the successive passes;

(d) means for conducting the reference voltages to corresponding threshold inputs of a plurality of comparators contained in the flash encoder, respectively;

(e) means for encoding output signals of the flash encoder to produce different binary words during the successive passes, respectively;




(f) a plurality of digital-to-analog converters receiving and converting the binary words during the successive passes, respectively;

(g) means for summing analog output signals of the digital-to-analog converter with an analog input signal and applying a resulting residual signal to an input of the amplifier, binary representations of the output signals of the comparator during the various passes forming a single binary output word.

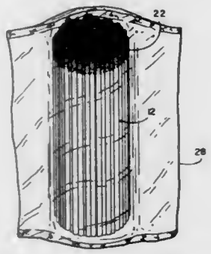
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**5,049,883**

**COMBINED MICROWAVE AND INFRARED CHAFF**

**Elmer D. Woodward, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 30, 1978, Ser. No. 915,031**
**Int. Cl.[5] H01Q *15/00*; F42B *12/68***
**U.S. Cl. 342—12** **10 Claims**




1. A microwave and infrared countermeasure chaff comprising:

a bundle of slow burning filaments, each said filament having a metallized coating extending along at least a portion of the surface thereof; and

said bundle having means disposed thereon for igniting said filament.

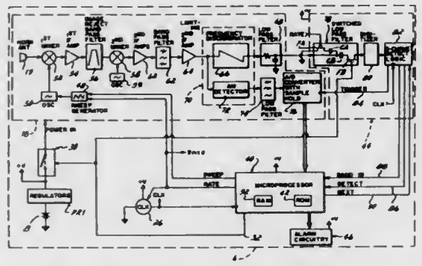
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**5,049,884**

**BATTERY POWERED POLICE RADAR WARNING RECEIVER**

**James L. Jaeger, Cincinnati, and Michael A. Biggs, Mason, both of Ohio, assignors to Cincinnati Microwave, Inc.; Cincinnati, Ohio**

**Filed Oct. 10, 1990, Ser. No. 595,270**
**Int. Cl.[5] G01S *7/40*; H04B *17/00***
**U.S. Cl. 342—20** **23 Claims**



1. A police radar warning receiver comprising:

a housing containing operating circuitry and a compartment for holding a battery within the housing for powering the operating circuitry, the operating circuitry including:

energizable RF front end circuit means for interrogating at least one police radar band and outputting low frequency signals in response to signals in the band;

switch means having first and second states for coupling said RF front end circuit means to the battery in said first state and de-coupling same in said second state whereby to selectively energize and de-energize said RF front end circuit means; and

duty cycle means for causing said switch means to be in said first state not more often than once every about one-half second and after a period of time to switch to said second state, said period of time defining a duty cycle rate not greater than about 25%.

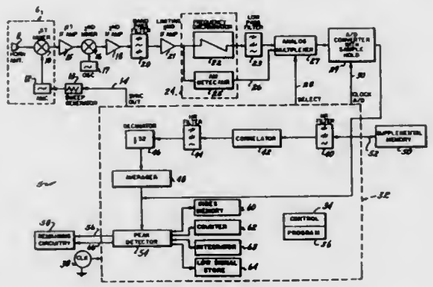
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**5,049,885**

**LONG RANGE POLICE RADAR WARNING RECEIVER**

**Steven K. Orr, Loveland, Ohio, assignor to Cincinnati Microwave, Inc., Cincinnati, Ohio**

**Continuation of Ser. No. 481,509, Feb. 20, 1990, Pat. No. 4,954,828, which is a continuation-in-part of Ser. No. 421,525, Oct. 13, 1989. This application Jul. 27, 1990, Ser. No. 558,668**
**The portion of the term of this patent subsequent to Sep. 4, 2007, has been disclaimed.**
**Int. Cl.[5] G01S *7/40*; H04B *17/00***
**U.S. Cl. 342—20** **22 Claims**



1. A police radar warning receiver comprising:



IF signal means for producing an IF sweep pattern as an oscillator signal is swept in frequency between a first frequency and a second frequency in response to mixing of received RF signals in at least one band of police radar signal frequencies with said swept oscillator signal;

FM discriminator means responsive to IF signal means for producing an FM sweep pattern corresponding to FM demodulation of said IF sweep pattern as said IF sweep pattern is produced;

sampler means for repeatedly sampling at sample intervals said FM sweep pattern as it is produced whereby to produce a series of digital sample words each associated with a respective sample interval;

correlator means for correlating each digital sample word as it is produced with a plurality of proceeding said digital sample words and a complex correlator function whereby to provide a series of complex digital correlator words each associated with a respective sample interval;

averager means for accumulating for each of at least a plurality of said sample intervals, an average of the complex digital correlator word produced each sweep and associated with a said sample interval over a plurality of sweeps of the oscillator signal whereby to produce a series of averager words each associated with a respective one of said plurality of sample intervals;

alarm enable means responsive to said averager means for providing an alarm enable if, after a given sweep of the oscillator signal, an averager word meets at least a first criterion whereby to indicate receipt of a police radar signal.

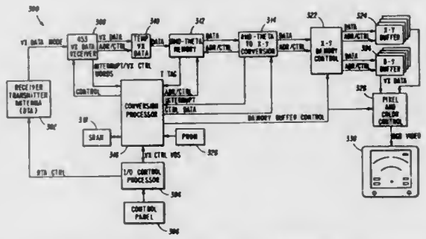
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**5,049,886**

**WEATHER RADAR SYSTEM WITH IMPROVED DISPLAY CHARACTERISTICS**

**Thomas E. Seitz, Cedar Rapids; John G. Pensis, and Daniel L. Woodell, both of Marion, all of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Sep. 26, 1990, Ser. No. 589,309**
**Int. Cl.[5] G01S *9/66***
**U.S. Cl. 342—26** **2 Claims**



1. An improved airborne weather radar system comprising:

receiver and transmitter means for transmitting and receiving radar signals;

temporary storage means for storing weather data received by said receiver and transmitter means;

a Rho-Theta memory, coupled with said temporary storage means, for storing said weather data in a Rho-Theta format;

conversion processor means for controlling said Rho-Theta memory,

Rho-Theta to X-Y conversion means for variable conversion of addresses associated with said weather data in said Rho-Theta memory from said Rho-Theta format to an X-Y format, in response to a command from said conversion processor means;

means for providing an air speed signal and an aircraft rotation signal to said conversion processor means;

said conversion processor means further for variable conversion of said addresses in response to said air speed signal and said aircraft rotation signal;

means for storing weather data in an X-Y format, which is coupled with said conversion means; and

display means for displaying said weather data in said X-Y format, which is coupled with said means for storing weather data in an X-Y format.

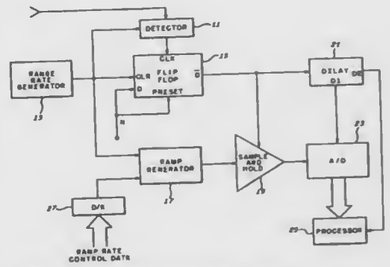
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**5,049,887**

**TARGET RANGE DETECTOR WITH MOVING TARGET INDICATION**

**Michael R. Henning, Crozet, and Thomas M. Woolfolk, Gordonsville, both of Va., assignors to Sperry Marine Inc., Charlottesville, Va.**

**Filed Oct. 16, 1990, Ser. No. 598,529**
**Int. Cl.[5] G01S *13/64***
**U.S. Cl. 342—110** **7 Claims**




1. A range determining apparatus comprising:

means for providing a gating signal having a predetermined timed interval which is representative of a predetermined range segment;

means enabled by said gating signal for receiving a signal reflected from a target and for providing a detection signal in response to said signal reflected from said target;

means enabled by said gating signal and responsive to said detection signal for providing a control signal having first and second levels;

means responsive to said gating signal for providing an output signal having an amplitude which varies with time;

means coupled to said output signal means and said controlled signal means for sampling said output signal when said control signal is at said first level and terminating said sampling when said control signal is at said second level, said output signal amplitude, upon termination of said sampling, being representative of said target position within said range segment.

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**5,049,888**

**METHOD FOR INSTANTANEOUS PROCESSING OF THE GLINT NOISE AND TRACKING MONOPULSE RADAR RECEIVER CARRYING OUT THIS METHOD**

**Michel Prenat, Boulogne, France, assignor to Thomson CSF, Paris, France**

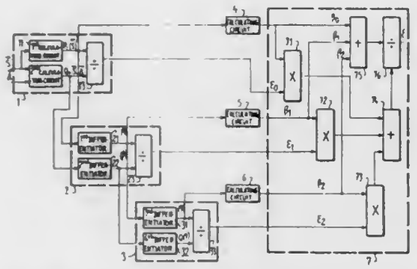
**Filed Dec. 15, 1983, Ser. No. 562,186**
**Claims priority, application France, Dec. 30, 1982, 82 22087**
**Int. Cl.[5] G01S *13/44***
**U.S. Cl. 342—149** **12 Claims**

1. A method for processing glint noise in a monopulse radar having an antenna which receives a signal and produces sum signal $\bar{S}$ and difference signal $\Delta$ whose phases vary as functions of time, comprising the following steps;

calculating successive derivatives $Q^{(k)}$ of order k, as a function of time, from $k=0$ up to $k=N'$ ($N' \geq 2$), of the scalar product $Q=\bar{S}.\Delta$ of the sum signal $\bar{S}$ and difference signal $\Delta$;

calculating successive derivatives $p^{(k)}$ of order k, as a func-

tion of time, from k=0 up to k=N', of the power $P=|\bar{S}|^2$ of the signal received, which is equal to the square of the modulus of the sum signal $\bar{S}$:



calculating (N'+1) derived angle-error measurement operators

$$\epsilon_K = \frac{Q^{(k)}}{P^{(k)}} \text{ for } k = 0 \text{ up to } k = N';$$

and

calculating a combined angle-error measurement operation $\epsilon$ such that

$$\epsilon = \frac{\sum_{k=0}^{N'} \beta_K \cdot \epsilon_K}{\sum_{k=0}^{N'} \beta_K}$$

in which (N'+1) weighting coefficients $\beta_K$, for k=0 to k=N', are coefficients depending on the quality, relative to the angle-error measurement of the barycenter of the target, of the derived angle-error measurement operators $\epsilon_{78}$ which correspond thereto.

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**5,049,889**

## MOVING TARGET INDICATION UNIT

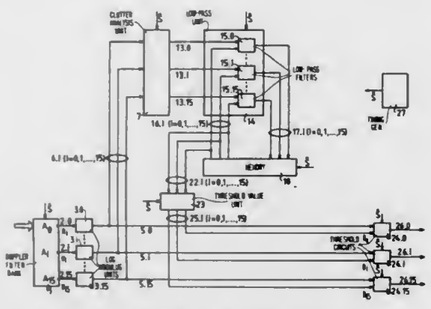
**Willem A. Hol, Hengelo, and Jan Bergman, Haaksbergen, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands**

**Filed Jan. 3, 1989, Ser. No. 292,674**

**Claims priority, application Netherlands, Jan. 4, 1988, 8800002**

**Int. Cl.[5] G01S** *13/534*

**U.S. Cl. 342—160** **8 Claims**



1. A moving target indication unit comprising:

a. a doppler filter bank having n output channels $A_i$ (i=0, 1, 2, . . . , n−1), said filter bank producing on said channels output signals derived from echoes returned from a plurality of azimuth cells;

b. a detection and registration unit electrically connected to the output channels and including means for determining and storing from the signals produced on k of said n output channels, for each of the azimuth cells, k respective parameters representative of the amount of clutter in said cell, where k≧2, and for producing threshold values from the parameters, said unit further including interpolation means for processing at least certain ones of said k parameters to determine at least one interpolated threshold value; and

c a plurality of threshold circuits electrically connected to the output channels and to the detection and registration unit, threshold levels of said circuits being set for said azimuth cells by respective one of said threshold values and interpolated threshold values.

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**5,049,890**

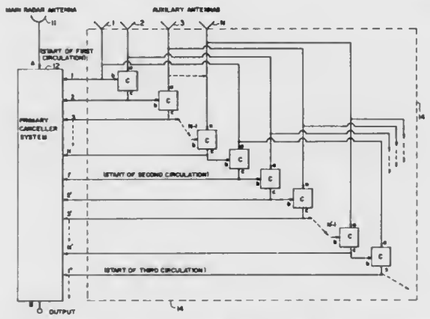
## SAMPLED DATA PROCESSING

**James P. Hansen, Waldorf, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 23, 1974, Ser. No. 508,774**

**Int. Cl.[5] G01S** *3/16, 3/28*

**U.S. Cl. 342—384** **11 Claims**



1. A system for preprocessing desired and undesired signals of a multiple signal environment comprising:

a plurality of independent channel means for receiving signals from a multiple signal environment and providing a plurality of output signals;

an output terminal coupled to provide one of said independent channel means output signals as an unaltered first independent preprocessed auxiliary sample; and

second means coupled to said output terminal and each of the remaining independent channel means for sequentially decorrelating each remaining independent channel means output signal to form a plurality of independent preprocessed auxiliary samples as a first circulation, said second means being constructed to decorrelate each independent channel means output signal of the sequence from a prior preprocessed auxiliary sample to form one of said plurality of independent preprocessed auxiliary samples wherein said first independent preprocessed auxiliary sample forms said prior preprocessed auxiliary sample for decorrelating the first independent channel means output signal of the sequence and each preceeding independent preprocessed auxiliary sample of the sequence forms said prior preprocessed auxiliary sample for decorrelating the next succeeding independent channel means output signal of the sequence.



**5,049,891**

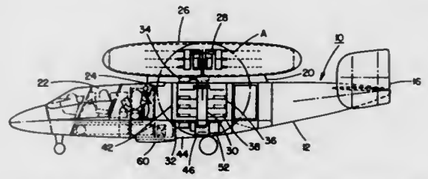
## RADOME-ANTENNA INSTALLATION WITH ROTATING EQUIPMENT RACK

**John J. Ettinger, Bayshore; Eric S. Wimberger, Farmingdale, and John DeMartino, Bethpage, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Feb. 23, 1990, Ser. No. 484,389**

**Int. Cl.[5] H01Q** *1/280, 1/420*

**U.S. Cl. 343—705** **23 Claims**



1. In an aircraft having a fuselage, a pylon projecting from the upper end of said fuselage, and being fixed attached thereto; a radar surveillance system including a generally disc-shaped radome rotatably mounted above said pylon and having the maximum diameter thereof oriented in a plane substantially in parallel with the longitudinal axis of said fuselage; antenna means fixedly secured within said radome; a shaft extending vertically through said fuselage and traversing said pylon, said radome being fastened tot he upper end of said shaft; means for imparting rotation to said shaft about the longitudinal axis of the shaft and concurrently to said radome and antenna means; rack means mounted on said shaft interiorly of said fuselage, said rack means being rotatably with said shaft; electronic surveillance system components operatively connected with said antenna means and including high-power RF and analog-to-digital conversion components being fixedly supported on said rack means for rotation therewith; electric power generating means being mounted on said shaft proximate the lower end thereof for supplying electrical power to said system components and said antenna means; and a generally disc-shaped shelf being mounted on said shaft proximate the lower end thereof and being rotatable with said shaft, said electric power generating means being fastened to the lower surface of said shelf.

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**5,049,892**

## PANE ANTENNA SYSTEM HAVING FOUR TERMINAL NETWORKS

**Heinz Lindenmeier, Planegg, and Gerhard Flachenecker, deceased, late of Ottobrunn, both of Fed. Rep. of Germany by Hildegard Flachenecker, heiress , assignors to Hans Kolbe & Co. Nachrichtenübertragungstechnik, Bad Salzdetfurth, Fed. Rep. of Germany**

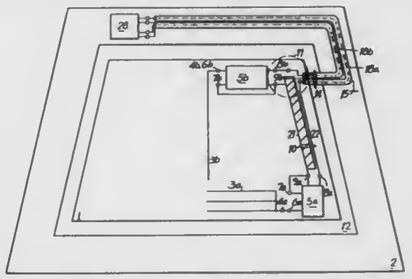
**Filed Apr. 6, 1990, Ser. No. 505,975**

**Claims priority, application Fed. Rep. of Germany, Apr. 6, 1989, 3911178**

**Int. Cl.[5] H01Q** *1/320, 21/000*

**U.S. Cl. 343—713** **23 Claims**

1. An antenna system comprising at least two antennas for frequencies up to an ultrahigh-frequency range, the antennas being arranged on a non-conductive sheet framed by a metal body of a motor vehicle, and each antenna having at least one antenna conductor, said antenna conductor being secured with the non-conductive sheet, each antenna also having a connection point on the antenna conductor and each antenna also having a four-terminal network having two input terminals and two output terminals, each of said four-terminal networks being supported by the non-conductive sheet and said four-terminal networks not being spatially concentrated in a portion of the non-conductive sheet which is small compared with the entire non-conductive sheet, each of said connection points being coupled to one input terminal of the respective four-terminal network via a short conductor having an impedance and a length which is small compared with the wavelengths of said frequencies so that the impedance of said short conductor for said frequencies is negligible, the other input terminal of the respective four-terminal network being connected to one output terminal thereof; at least one high-frequency output line, each consisting of at least two output line conductors, each of said at least one high-frequency output line being supported by said non-conductive sheet and being connected at at least one end thereof to the output terminals of one of said four-terminal networks, each of said output terminals of said one of said four-terminal networks at the at least one end of said high-frequency output line being connected to one of said output line



conductors, and each of said at least one high-frequency output line extending to an interconnection area located in the vicinity of the metal body on the non-conducting sheet; a ground point provided on the metal body; a single cable of at least two transmission lines extending on said metal body and having an initial cable portion extending into said interconnection area; and each of said output line conductors of said at least one high-frequency output line being connected to at least one of the transmission lines of said cable, and means connecting the other of said four-terminal networks to one of the transmission lines of said cable.

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**5,049,893**

## MICROWAVE ENERGY DISTRIBUTOR CAPABLE OF RADIATING DIRECTLY

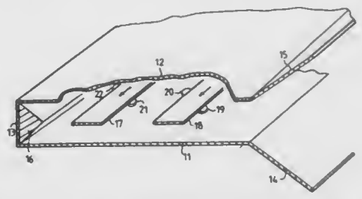
**Hervé Coppier, Noyon; Jean-Lonis Pourailly, Vincennes, and Joseph Roger, Bures sur Yvette, all of France, assignors to Thomson-CSF, Puteaux, France**

**Filed Jun. 29, 1990, Ser. No. 546,371**

**Claims priority, application France, Jul. 7, 1989, 89 09174**

**Int. Cl.[5] H01Q** *13/00;* **H03H** *5/00*

**U.S. Cl. 343—772** **7 Claims**



1. A microwave energy distributor comprising

an elongated open guide provided with side walls parallel to each other and joined on one side by a back wall and separated to the other side by an aperture open essentially on its entire length;

an absorbent load extending along the guide in front of the back wall;

at least one elongated, thin conductive strip placed between the absorbent load and the open side of the guide in a median plane between the parallel side walls, said at least

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one conductive strip being electrically unconnected to said guide and serving as propagation lines for energy;

and asymmetrical obstacles distributed within the guide along the strip in pairs, each pair including two similar obstacles of which one obstacle is close to a first longitudinal edge of the strip and the other obstacle is close to the other longitudinal edge of the strip, said obstacles generating, from the incident energy on the strip, a radiation of a fraction of said energy that is propagated directionally towards the aperture of the guide, and wherein said asymmetrical obstacles are joined to the inner surface of the parallel side walls of the guide.

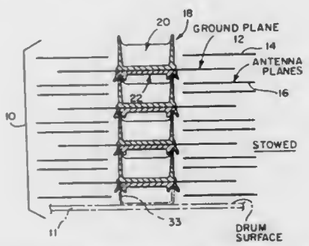
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**5,049,894**

**LAUNCH SUPPORT FOR THREE-LAYER RADAR MEMBRANE**

**Peter K. Homer, Langhorne, Pa., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Sep. 11, 1990, Ser. No. 580,584**
**Int. Cl.[5] H01Q *1/12***
**U.S. Cl. 343—878** **8 Claims**




1. A support for a multi-layered membrane rolled on to a drum, the membrane having a ground plane layer; and at least one antenna plane layer including a plurality of spaced adjacent coplanar sheets positioned in rolled radial spaced relationship with the ground plane layer, the support including a plurality of interlocking bracket assemblies, each of which comprises:

a first bracket secured to a first surface of the ground plane layer and having spaced flanges disposed generally longitudinally of the drum and extending through the space between adjacent antenna plane sheets; and

a second bracket secured to an opposite surface of the ground plane having notch means for engaging the flanges of a radially aligned and adjacent first bracket;

thereby minimizing axial shifting of the membrane on a central drum.

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**5,049,895**

**FLAT CIRCULAR WAVEGUIDE DEVICE**

**Yoshiharu Ito, No. 2-1, 2-Chome, Jin-nan, Shibuya-Ku, Tokyo; Kunitaka Arimura, No. 2-16, 2-Chome, Matsunami, Chigasaki-shi, Kanagawa-ken, and Naohisa Goto, No. 6-15-1-A514, Tsuchihashi, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, all of Japan**

**Filed Jan. 24, 1985, Ser. No. 694,411**
**Int. Cl.[5] H01Q *13/00***
**U.S. Cl. 343—785** **26 Claims**

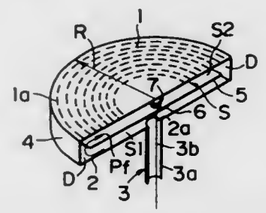
1. A flat circular waveguide device comprising:

a pair of metallic plates arranged in a face-to-face relation with an interval therebetween, one of said metallic plates having means defining a plurality of openings for radiation of a power wave therethrough;

a peripheral metallic wall connecting the circumferences of the metallic plates with each other to define a flat cylinder;

means defining a wave-guiding space inside of the flat cylinder and dimensioned to allow a power wave to travel through the wave-guiding space; and

means for feeding a power wave to the wave-guiding space so that the power wave is guided through the wave-guiding space to travel from a circumferential part of the wave-guiding space near the peripheral metallic wall toward a central part of the wave-guiding space, the means being comprised of a feed portion through which




the power wave is fed into the wave-guiding space, at least one intermediate metallic plate between said feed portion and said openings and attached to said flat cylinder by way of a spacer and disposed substantially in parallel with the metallic plates within the wave-guiding space, and means defining a bypass gap between the intermediate metallic plate and the peripheral metallic wall for guiding the power wave.

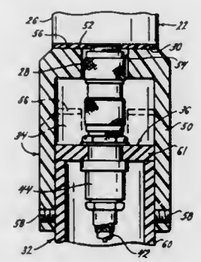
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**5,049,896**

**ANTENNA MOUNT**

**James B. Conley, P.O. Box 645, Fenton, Mo. 63026**

**Filed Apr. 27, 1990, Ser. No. 515,241**
**Int. Cl.[5] H01Q *1/12***
**U.S. Cl. 343—888** **15 Claims**



1. Apparatus for mounting an antenna at an upper end of a mast, the antenna having a lower end and a first electrical connector extending forward from its lower end, the mast having a second electrical connector extending upward from its upper and interchangeable with the first connector, the apparatus comprising:

a head moveably adjustable on the upper end of the mast, the head having a skirt surrounding the mast and an upper surface, the upper surface having an opening therein dimensioned for passage of the connectors, the head being movable downwardly on the upper end of the mast to a lowered retracted position and movable upwardly on the upper end of the mast to a raised extended position, when the head is in its retracted position the second connector extends up through the opening above the upper surface for connection of the connectors, when the head is in its extended position the lower end of the first connector extends down through the opening and the upper surface of the head is in abutting relationship with the lower end of the antenna and the skirt surrounds the second connector; and



means for securing the head in its said raised extended position to the mast.

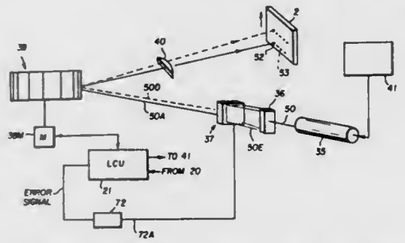
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**5,049,897**

**METHOD AND APPARATUS FOR BEAM DISPLACEMENT IN A LIGHT BEAM SCANNER**

**Yee S. Ng, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 9, 1990, Ser. No. 491,029**
**Int. Cl.[5] G01D *9/42*; H04N *1/21***
**U.S. Cl. 346—1.1** **22 Claims**




1. A method for light beam scanning of a scan receiving member, comprising the steps of:

generating a light beam;

admitting a portion of the light beam and blocking the remainder of the light beam so as to form an admitted light beam;

deflecting the admitted light beam so as to effect plural line scanning of the scan receiving member;

providing spacing between sequential scan lines;

determining potential scan line spacing error; and

controlling the admitted light beam portion in accordance with the potential scan line spacing error so as to displace the admitted light beam to compensate for such error.

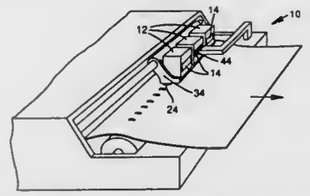
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**5,049,898**

**PRINTHEAD HAVING MEMORY ELEMENT**

**Alan R. Arthur, Salem, and Robert R. Beeson, Corvallis, both of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 326,121, Mar. 20, 1989, abandoned. This application Jul. 13, 1990, Ser. No. 554,102**
**Int. Cl.[5] B41J *2/01***
**U.S. Cl. 346—1.1** **13 Claims**




9. In an ink jet printing system having a carriage for carrying an ink jet printhead relative to a printing medium, the carriage including means for orienting the printhead's housing in a predetermined orientation in relation thereto, the printhead including a plurality of orifii and means for expelling ink therefrom in response to firing signals, an improvement method comprising the steps:

storing data related to the relative alignment of the printhead's orifii and its housing in a memory mounted to the printhead;

retrieving said alignment data from the memory; and

compensating the timing of the firing signals in accordance with said alignment data to reduce the effects of any misalignment between the orifii and the printhead housing.

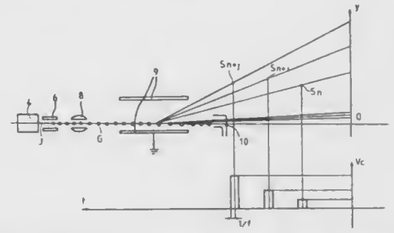
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**5,049,899**

**METHOD OF HIGH RESOLUTION PRINTING USING SATELLITE INK DROPS IN A CONTINUOUS INK JET PRINTER**

**Alain Dunand, Valence, and Eric Margaillan, Bourg de Péage, all of France, assignors to Imaje (SA), Bourg-Lès-Valence, France**

**PCT No. PCT/FR89/00533, § 371 Date May 17, 1990, § 102(e) Date May 17, 1990, PCT Pub. No. WO90/04518, PCT Pub. Date May 3, 1990**
**PCT Filed Oct. 16, 1989, Ser. No. 460,338**
**Claims priority, application France, Oct. 18, 1989, 88 14073**
**Int. Cl.[5] G01D *15/18***
**U.S. Cl. 346—1.1** **9 Claims**




1. Method of high resolution printing using satellite ink drops, used in a continuous ink jet printer in which a continuous ink jet (J) leaving a nozzle (2) is broken up by a breaking up means (4, 5) into substantially equidistant droplets of equal dimensions, in a charging electrode (6) where said droplets are selectively charged electrostatically, said droplets then passing between deflection electrodes (9) where they are deflected depending on their charge density, characterized in that it consists in causing the appearance of a satellite drop (Sn) from a drop (Gn) downstream of the position at which the jet (J) is broken up, by application of an appropriate charging voltage (Vn) in the charging electrode (6) during the formation of said drop (Gn) and in preventing the coalescence of a satellite drop thus formed intended for printing with the next drop (Gn+1), until said satellite drop intended for printing is deflected between the deflection electrodes (9), by application to the charging electrode during the formation of the drop (Gn+1) of a charging voltage (Vn+1) substantially equal to the charging voltage (Vn), the value given to the charging voltage (Vn) and consequently to the voltage (Vn+1) being chosen also as a function of the amplitude of deflection desired for the satellite drop intended for printing.

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**5,049,900**

**KNURLED ROLLER FILM TRANSPORT AND REALTED METHOD**

**Harvey Bidner, Plainview, and Amnon Goldstein, Pelham, both of N.Y., assignors to Bidco Inc., Hickville, N.Y.**

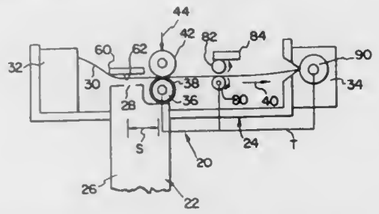
**Filed Oct. 16, 1989, Ser. No. 422,127**
**Int. Cl.[5] G01D *9/42***
**U.S. Cl. 346—108** **27 Claims**

1. Apparatus comprising a source of film, said film including a base and a laser sensitive material on said base, a film takeup means for collecting said film, laser means for scanning the film with a laser beam during movement of the film from said source to said takeup means, and at least one knurled roller for engaging said film and drawing the same from said source, opposed exit rollers on opposite sides of said film between the knurled roller and said takeup means, drive means to drive one of the exit rollers, and means to apply a weight against the

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other of the exit rollers to press said other exit roller towards said one exit roller; said source including a roller on which said film is wound, a casing within which the roller is mounted and which is provided with a slot for the exiting of said film, pressure lips adjacent the slot to create a drag on the film exiting from the casing, a roller in said source to support said film in



the form of a roll, and a friction brake means to prevent uncontrolled spooling off of the film from the roll; a further roller within the takeup means to collect said film in the form of a roll, drive means to drive said further roller and slip clutch means coupling the latter said drive means to said further roller to take up the film without stretching or breaking the same to compensate for the accumulation of film.

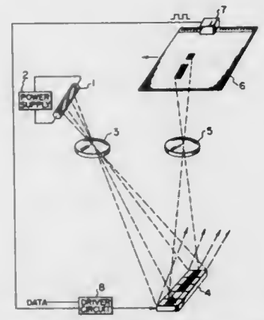
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**5,049,901**

## LIGHT MODULATOR USING LARGE AREA LIGHT SOURCES

**Daniel Gelbart, Burnaby, Canada, assignor to CREO Products Inc., Burnaby, Canada**

**Filed Jul. 2, 1990, Ser. No. 546,902**
**Int. Cl.[5] G01D *9/42*; H04N *1/21***
**U.S. Cl. 346—108** **9 Claims**



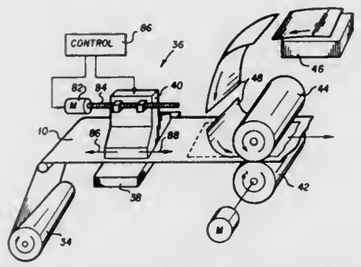
1. A light modulation and exposure system comprising: a light source; a light sensitive material; a two dimensional light modulator containing a plurality of rows of light modulating cells; means of imaging said light source onto said light modulator; means of imaging said light modulator onto said light sensitive material; means of generating relative motion between image of said light modulator and said light sensitive material with the direction of said motion substantially perpendicular to direction of said rows of light modulating cells; means of shifting into the first of said rows the data to be imaged onto said light sensitive material and means of transferring said data from the first row to subsequent rows of said modulator at a rate keeping the image of any data pattern substantially stationary relative to said light sensitive material until data shifted out of the last of said rows, this sequence continuing until all data to be imaged has passed through said light modulator.

**5,049,902**

## SYSTEM FOR RECORDING AN IMAGE

**Ronald J. Duke, Miamisburg, Ohio, assignor to The Mead Corporation, Dayton, Ohio**

**Filed Oct. 17, 1989, Ser. No. 422,923**
**Int. Cl.[5] G01D *9/42***
**U.S. Cl. 346—110 R** **3 Claims**



1. A system for recording a color image, comprising:
a sheet of photosensitive media having a supportive substrate with a layer of intermixed first and second microcapsules coated thereon, said first microcapsules containing a first color image forming agent and a first photohardenable composition responsive to light of a first wavelength, and said second microcapsules containing a second color image forming agent and a second photohardenable composition responsive to light of a second wavelength;
a cathode ray tube having a faceplate and first and second color phosphor coatings applied on an inside surface of said faceplate, said first and second coatings being applied to define first and second stripes respectively extending across said faceplate and having first and second widths respectively;
said faceplate comprising an array of parallel optical fibers;
means for generating first and second image signals corresponding to first and second color components respectively of an image to be recorded;
control means for receiving said first and second image signals and controlling said cathode ray tube to write said first color component onto said first phosphor coating and to write said second color component onto said second phosphor coating so as to scroll said first and second color components at a first scroll rate over said phosphor coatings;
means for supporting said sheet and for moving said sheet past said faceplate with said microcapsules adjacent thereto, at a rate equal to image comprised of said first and second color components is exposed onto said sheet; and
wherein said first width for said first stripe is greater than said second width for said second stripe, said widths being less than the length of said image.

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**5,049,903**

## THERMAL TRANSFER MATERIAL

**Takayuki Suzuki, Saitama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 16, 1989, Ser. No. 367,482**
**Claims priority, application Japan, Jun. 17, 1988, 63-149879**
**Int. Cl.[5] G01D *9/00, 15/10***
**U.S. Cl. 346—135.1** **6 Claims**

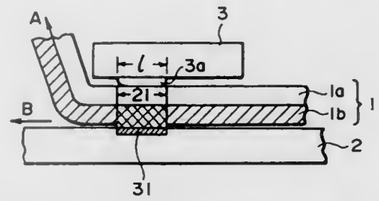
1. A thermal transfer material, comprising a support and an ink layer disposed thereon which comprises a binder and a colorant; said binder having a melt viscosity ($\eta$ poise) satisfying the following formula:

$$1.9\times 10^{13}\cdot e^{-0.26T}\leqq\eta\leqq 4.8\times 10^{17.3-0.26T},$$

wherein T denotes a temperature (°C.) and e denotes the base of natural logarithm, in the range of 50–150° C.; and



said thermal transfer material is capable of recording on a recording medium when both said thermal transfer material and said recording medium are moved past a record-



ing head, during said recording said thermal transfer material being moved in a unit time more slowly than said recording medium so as to effect relative motion between said thermal transfer material and said recording medium.

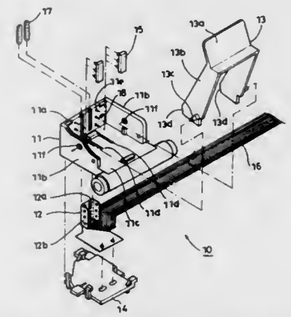
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**5,049,904**

## PRINTER HAVING IDENTIFIABLE INTERCHANGEABLE HEADS

**Mitsuaki Nakamura, and Itaru Kohsaka, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan**

**Filed Dec. 29, 1989, Ser. No. 458,885**
**Claims priority, application Japan, Jan. 27, 1989, 1-19285**
**Int. Cl.[5] B41J *2/32, 2/015***
**U.S. Cl. 346—140 R** **3 Claims**



1. A printer for printing characters, symbols and patterns on a paper sheet placed on a platen roller by means of a printing head, said printer comprising:
a carriage adapted so as to interchangeably on hold ink-jet printing head cartridge and thermal printing head cartridge, said carriage comprising a framework, a terminal plate having a plurality of first contact terminals, said framework being provided with a pair of cartridge-positioning recesses, and said terminal plate being fixed to said framework by means of pins with cushion members inserted between said terminal plate and said framework;
said ink-jet printing head cartridge provided with a pair of cartridge-positioning tenons arranged so as to be received by said cartridge-positioning recesses, said ink-jet printing head cartridge having a plurality of second contact terminals electrically connected to corresponding ink-jet firing resistors built in said ink-jet printing head cartridge, said second contact terminals being arranged so as to come into contact with said first contact terminals when said ink-jet printing head cartridge is held by said carriage;
said thermal printing head cartridge provided with a pair of cartridge-positioning tenons arranged so as to be received by said cartridge-positioning recesses, said thermal printing head cartridge having a plurality of third contact terminals electrically connected to corresponding dot resistors of said thermal printing head cartridge, said third contact terminals being arranged so as to come into contact with said first contact terminals when said thermal printing head cartridge is held by said carriage;
a cartridge identification means for identifying which one of said ink-jet printing head cartridge or said thermal printing head cartridge is held by said carriage; and
an electric circuit for supplying said ink-jet firing resistors and said dot resistors with pulse currents having a pulse width which is varied according to a cartridge identification signal outputted from said cartridge identification means,
whereby said printer is made capable of interchangeably functioning as an ink-jet printer and as a thermal type printer.

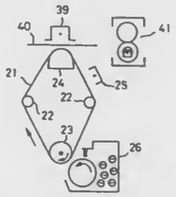
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**5,049,905**

## IMAGE FORMING METHOD, EXPOSURE METHOD, IMAGE FORMING APPARATUS AND DEPOSITED TONER LAYER CONTROL APPARATUS

**Makoto Tomoyori, Iwate, and Keiichi Akiyama, Tamayama, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Jan. 11, 1988, Ser. No. 142,841**
**Claims priority, application Japan, Mar. 16, 1987, 62-59027; Mar. 16, 1987, 62-59028; Mar. 16, 1987, 62-59029; Mar. 16, 1987, 62-59031**
**Int. Cl.[5] G03G *15/00, 15/08***
**U.S. Cl. 346—153.1** **6 Claims**



1. An image forming apparatus comprising:
a rotatable endless sensitized member;
an electrifier to electrically charge an entire first surface of said sensitized member with a charge of a first polarity in a first rotation of said sensitized member and electrically charge with a charge of second polarity opposite the first polarity residual toner adhering to the sensitized member in a second rotation of said sensitized member;
a developing unit to deposit toner charged with the second polarity on said first surface in the first rotation of said sensitized member and to remove the residual toner from said first surface in the second rotation;
an exposure unit to expose said sensitized member selectively in the first rotation so as to reduce an adhering force of toner adhered to said first surface thereof located at a transfer image corresponding to an image to be formed on said sensitized member and in the second rotation to expose said first surface so as to remove a residual electrical charge therefrom; and
a transfer unit to transfer the toner at the transfer image on said sensitized member to a recording medium in the first rotation;
wherein one image forming process is carried out while said sensitized member is rotated twice.

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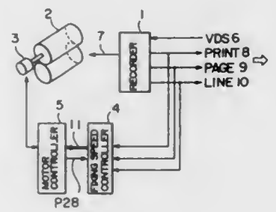


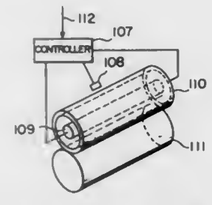
5,049,906

## FIXING PROCESS CONTROLLER FOR ELECTROPHOTOGRAPHIC RECORDER

Shinya Kobayashi, Mito, and Teruaki Mitsuya, Katsuta, both of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Mar. 20, 1989, Ser. No. 325,368
Claims priority, application Japan, Mar. 22, 1988, 63-65637
Int. Cl.[5] G03G *15/20*
U.S. Cl. 346—160.1 10 Claims




1. A fixing process controller for controlling a fixing unit of an electrographic printer which records a toner image on a recording medium on the basis of digital pixel data output from a computer, said fixing unit fixing an unfixed toner image on said recording medium by passing said recording medium between two fixing rollers, said controller comprising:

means for detecting a thickness of said unfixed toner image on said recording medium on the basis of said digital pixel data;

means for determining an operating parameter of said fixing rollers suitable for fixing toner having said thickness detected by said toner thickness detecting means; and

control means for controlling said fixing rollers to operate with said operating parameter determined by said determining means.

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5,049,907

## CAMERA HAVING CHAMBER FOR STORING EXPOSED FILM UNITS DURING THEIR DEVELOPMENT

Richard J. Fraser, Franklin; Kenneth J. Launie, Cambridge, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 8, 1990, Ser. No. 610,803
Int. Cl.[5] G03B *17/52*
U.S. Cl. 354—86 10 Claims

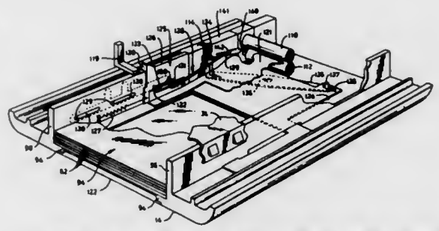
1. Photographic apparatus comprising:

means for supporting a film cassette containing a plurality of instant type film units in position for their sequential exposure;

means for defining an imbibition chamber, said means including a window through which an image in an exposed film unit may be viewed subsequent to its formation;

first means for advancing a film unit, subsequent to its exposure, toward said imbibition chamber, said first advancing means including a first film engaging means for moving an exposed film unit from the film cassette and means for spreading a processing liquid across a layer of the exposed film unit so as to initiate the formation of a visible image therein; and

second means for advancing the exposed film unit from said spreading means to said imbibition chamber, said second advancing means including a second film engaging means mounted for movement from a first position, wherein it is



located on an inboard side of said spreading means and out of a path of travel of the exposed film unit as it approaches said spreading means, toward a second position, where it is located on an exit side of said spreading means while simultaneously engaging a trailing end of the exposed film unit and advancing it into said imbibition chamber.

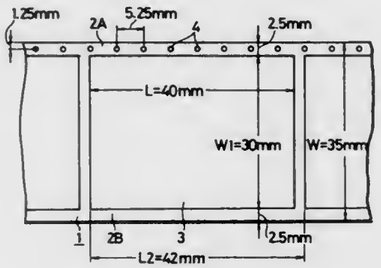
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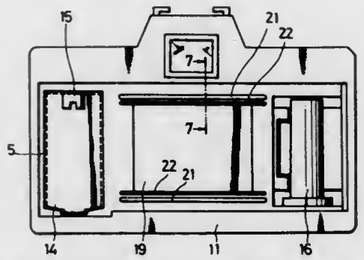
5,049,908

## PHOTOGRAPHIC CAMERA AND FILM

Susumu Murakami, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 28, 1989, Ser. No. 399,028
Claims priority, application Japan, Aug. 31, 1988, 63-217825; Aug. 31, 1988, 63-217826; Sep. 2, 1988, 63-219740
Int. Cl.[5] G03B *1/18, 17/26*
U.S. Cl. 354—173.1 61 Claims




1. A photographic camera system using a 35 mm-wide photographic film in a cartridge comprising:

a 35 mm-wide photographic film devoid of sprocket holes and having a quadrilateral effective photographic area of which one side in the width direction of the photographic film is selected to be substantially 30 mm long and being wound in a standard size 35-mm film cartridge;

a camera body having a first accommodating portion formed in said camera body to accommodate the standard size 35-mm film cartridge and a second accommodating portion formed in said camera body to accommodate said photographic film supplied from the cartridge;

transporting means provided in said camera body for transporting said photographic film between said first and second accommodating portions;

guide means provided in said camera body for defining the position of said photographic film in its width-wise direction between said first and second accommodating portions and including two pairs of parallel film guide rails formed on a rearwardly facing inner surface of said camera body, a first one of said pairs of film guides being spaced apart by substantially 35-mm and extending rearwardly for a predetermined distance and a second one of said pairs of film guides being spaced apart by substantially 30-mm and extending rearwardly for a distance less than said predetermined distance; and

exposing means provided in said camera body for exposing an image of an object to be photographed onto the effective photographic area of said photographic film guided by said guide means.



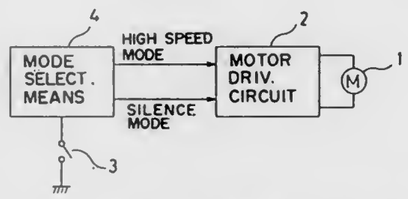
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5,049,909

## PHOTOGRAPHIC CAMERA PROVIDED WITH AN ELECTRICALLY FILM DRIVING SYSTEM

Norio Ishikawa, and Takeshi Egawa, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 346,542, May 2, 1989, abandoned. This application Jan. 9, 1991, Ser. No. 638,143
Claims priority, application Japan, May 4, 1988, 63-109749
Int. Cl.[5] G03B *1/12*
U.S. Cl. 354—173.1 15 Claims




1. A photographic camera comprising:

an electric motor for advancing the film;

film advancement controlling means for controlling a film advancement achieved by said electric motor so as to advance the film by one frame whenever a shutter release member is depressed;

a signal output member for selectively outputting either one of a first signal and a second signal in compliance with manual operation; and

motor driving means for driving said motor in either one of a first mode in which said motor driving means drives said motor at a low speed so as to lower winding noise and a second mode in which said motor driving means drives said motor at a high speed, said first mode being selected when said first signal is outputted, said second mode being selected when said second signal is outputted.

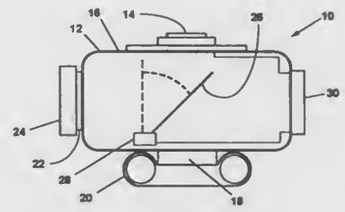
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5,049,910

## DUAL MODE CAMERA

Charles J. Hsiung, 500 S. Atlantic Blvd., Monterey Park, Calif. 91754

Filed Jul. 5, 1990, Ser. No. 548,615
Int. Cl.[5] G03B *19/06*
U.S. Cl. 354—210 13 Claims




1. A photographic camera comprising:

at least one body portion,

at least one lens system mounted on said body portion,

at least two film mounting members mounted on said, body portion in a position to receive light passed by said lens system, each of said film mounting means being formed to mount a respective type of film,

at least one shutter mechanism interposed between said lens system and said film mounting members, and

a control simultaneous or sequential unit operable to selectably control passage of light to said film mounting members.

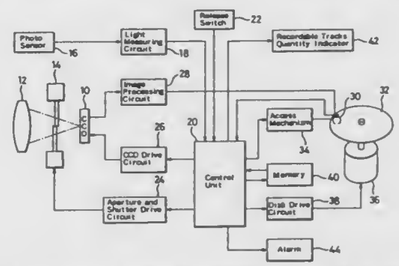
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5,049,911

## DEVICE FOR INDICATING A REMAINING QUANTITY OF RECORDABLE PARTS OF A RECORDING MATERIAL IN A CAMERA

Hitoshi Shimizu, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1989, Ser. No. 418,272
Claims priority, application Japan, Oct. 7, 1988, 63-253241
Int. Cl.[5] G03B *1/18*
U.S. Cl. 354—217 11 Claims




1. A device for indicating a remaining quantity of recordable tracks of a magnetic disk mounted in a still video camera, said magnetic disk having tracks for recording an electric signal thereon corresponding to an object image formed by an imaging device of said still video camera, said indicating device comprising;

means for sensing the remaining number of recordable tracks on said magnetic disk, said sensing means comprises means for sensing unrecorded tracks existing at a point midway between outer and inner peripheries of said magnetic disk; and

means for giving a warning when said remaining number of recordable tracks on said magnetic disk becomes less than a predetermined value, said warning means including

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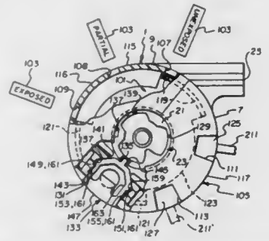
means for counting the remaining number of recordable tracks on said magnetic disk.

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**5,049,912**
**FILM CASSETTE WITH LOCKING MEANS FOR EXPOSURE STATUS INDICATOR**

**Daniel M. Pagano, Henrietta, and Robert P. Cloutier, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 11, 1990, Ser. No. 596,670**
**Int. Cl.[5] G03B *17/26, 1/00, 1/04***
**U.S. Cl. 354—275** **14 Claims**




1. A film cassette comprising a film spool supported within a lighttight shell for rotation to thrust a filmstrip coiled about said spool automatically to the exterior of said shell, and a film exposure status indicator supported for movement relative to said shell from an unexposed position for providing a visible indication that said filmstrip is unexposed to an exposed position for providing a visible indication that the filmstrip is exposed, is characterized in that:

engageable means is arranged for engagement to lock said status indicator in the unexposed position to prevent its movement to the exposed position;

said shell includes integral means for supporting a locking member to permit its movement between a locking position for engaging said engageable means and a non-locking position for disengaging the engageable means; and

respective cooperating means are formed on said shell and said locking member for fixing the shell and the locking member to each other when the locking member is in the locking and non-locking positions to prevent its movement between the two positions and are releasable when the locking member is in the locking and non-locking positions to Permit its movement between the two positions.

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**5,049,913**
**FILM CASSETTE WITH LOCKING MEANS FOR EXPOSURE STATUS INDICATOR**

**Daniel M. Pagano, Henrietta; Stephen H. Miller, Rochester, and Thomas D. Jensen, Himrod, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

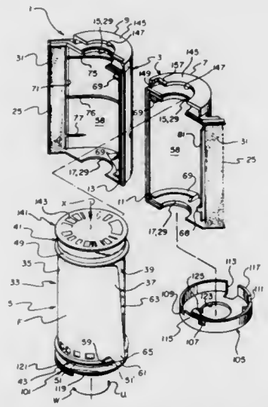
**Filed Jul. 31, 1990, Ser. No. 560,922**
**Int. Cl.[5] G03B *17/26***
**U.S. Cl. 354—275** **4 Claims**

1. A film cassette comprising a film spool supported within a lighttight cassette shell for rotation about an axis to thrust a filmstrip coiled about said spool to the exterior of said shell whether said filmstrip is unexposed or is only partly exposed, and a film exposure status indicator supported for rotation within said shell about said axis from an unexposed position to respective partly exposed and fully exposed positions for providing visible indications that said filmstrip is only partly exposed or is substantially exposed, is characterized in that:

said spool and said status indicator are fixed coaxially to each other;

said spool has three spaced detents arranged at separate locations for respective engagement to lock said status indicator in its unexposed, partly exposed and fully exposed positions; and

said shell has an end cap including a locking pawl supported adjacent an underside of said end cap to individually



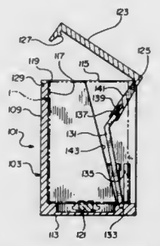
engage any one of said detents, but moved to disengage any one of the detents when a force is applied to said locking pawl inwardly of the end cap in a direction substantially parallel to said axis.

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**5,049,914**
**CASSETTE EJECTING APPARATUS**

**William F. Dassero, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 26, 1990, Ser. No. 543,923**
**Int. Cl.[5] G03B *17/02***
**U.S. Cl. 354—288** **1 Claim**



1. A photographic camera comprising a chamber for receiving a film cassette, a door normally covering said chamber and opened manually to uncover the chamber, and ejecting means connected to said door for pushing a film cassette at least part way out of said chamber when said door is opened, is characterized in that:

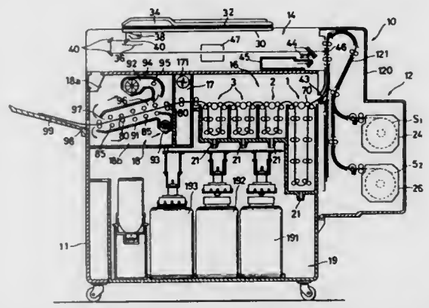
said ejecting means includes overcentering means initially moved to slightly beyond a centered position without moving a film cassette in said chamber in response to opening said door manually a certain amount, and thereafter automatically moved further without having to continue to open the door manually, for then simultaneously pushing the film cassette out of said chamber and further opening the door without manual intervention.



**5,049,915**
**PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS WITH DRYER**

**Takashi Nakamura, Minami-ashigara; Kiyotaka Hori, Hatano, and Kaoru Uchiyama, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Apr. 13, 1990, Ser. No. 508,671**
**Claims priority, application Japan, Apr. 14, 1989, 1-94419**
**Int. Cl.[5] G03D *3/08***
**U.S. Cl. 354—339** **9 Claims**



1. In apparatus for processing photographic silver halide photosensitive material having an emulsion layer, comprising a processing section for wet processing the photosensitive material and a drying section for drying the processed photosensitive material, said drying section including a region which comes in contact with the emulsion surface of the photosensitive material, the improvement wherein

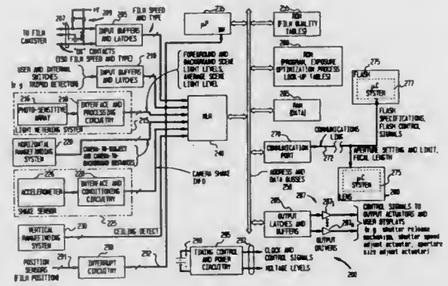
said contact region is at least partially provided with a coating containing a hydrolytic silicon oxide condensate or a silicone resin.

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**5,049,916**
**AUTOMATIC OPTIMIZATION OF PHOTOGRAPHIC EXPOSURE PARAMETERS THROUGH DETERMINATION AND UTILIZATION OF EXTRA SYSTEM SPEED**

**William R. O'Such, Rochester; Roger W. Wilson, Pittsford, and RIchard B. Wheeler, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 23, 1990, Ser. No. 572,600**
**Int. Cl.[5] G03B *7/097, 7/16, 15/03***
**U.S. Cl. 354—412** **86 Claims**



1. In an imaging device, a method for use in capturing an image of a scene comprising the steps of:

determining initial values for pre-defined parameters wherein said initial values collectively provide a predefined baseline exposure of a scene to be imaged, said initial values defining an initial set of parameter values;

ascertaining corresponding values of said parameters in accordance with pre-defined requirements of said scene;

varying, in response to a difference occurring between said initial and corresponding values for at least a pre-defined one of said parameters, the value of at least a pre-selected one of said parameters from a corresponding initial value thereof to an associated new value therefor; and

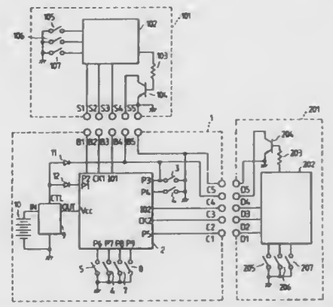
imaging said scene with an exposure specified in accordance with said new value of said one pre-selected parameter so as to produce a captured image thereof such that the captured image has a level of quality that is at least equal to or better than the quality which would result in a corresponding image of the scene captured with said baseline exposure.

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**5,049,917**
**CAMERA SYSTEM**

**Seiichi Yasukawa, Kawasaki; Tetsuro Goto, Funabashi; Takashi Saegusa, Kawasaki; Tsutomu Wakabayashi, and Norikazu Yokonuma, both of Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan**

**Filed May 23, 1989, Ser. No. 355,359**
**Claims priority, application Japan, May 24, 1988, 63-124837**
**Int. Cl.[5] G03B *7/26***
**U.S. Cl. 354—484** **5 Claims**



1. A camera system including a camera and an accessory mountable thereon, and capable of data communication between said camera and said accessory mounted on said camera, comprising:

circuit means provided in said camera;

power supply means provided in said camera, for supplying power to said circuit means;

timer means provided in said camera, for performing a counting operation to count a predetermined period and stop the supply of power from said power supply means to said circuit means after the count of said predetermined period;

activating means provided in said accessory, for outputting an activation signal which causes said power supply means to start supplying power to said circuit means and causes said timer means to perform said counting operation;

extending means provided in said accessory, for outputting an extension signal after the output of said activation signal, wherein said extension signal causes said timer means to perform said counting operation; and

discriminating means provided in said accessory, for discriminating whether or not data communication between said camera and said accessory has been performed within another predetermined period, causing said activating means to output said activating signal when data communication between said camera and said accessory has been performed within the another predetermined period and causing said extending means to output said extending signal when data communication between said camera and

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said accessory has not been performed within the another predetermined period.

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5,049,918

## COLOR IMAGE RECORDING APPARATUS

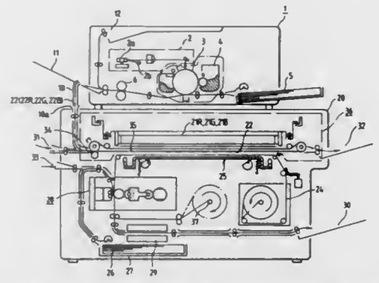
Hidenori Hisada, Tokoname; Makoto Suzuki, Nagoya, and Hiroshi Taira, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 24, 1989, Ser. No. 397,832

Claims priority, application Japan, Aug. 25, 1988, 63-210987; Aug. 27, 1988, 63-213406; Oct. 21, 1988, 63-265635; Oct. 21, 1988, 63-265636

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 21 Claims



1. An image recording apparatus for recording on a photosensitive recording medium an image corresponding to an original image using at least one mask member having a surface on which a light shielding image corresponding to the original image is formed with a light shielding material, wherein the mask member coated with the light shielding material has a first light transmission rate and the mask member with no light shielding material has a second light transmission rate, the apparatus comprising:

exposure means for exposing the photosensitive recording medium to light through the mask member to form a latent image corresponding to the light shielding image on the photosensitive recording medium, said exposure means including an exposure lamp for emitting a light;

developing means for developing the latent image formed on the photosensitive recording medium to provide a visible image;

fixing means for thermally fixing the visible image, said fixing means including a heat generating element;

first detecting means for detecting the first light transmission rate and producing a first signal indicative of the first light transmission rate;

second detecting means for detecting the second light transmission rate and producing a second signal indicative of the second light transmission rate;

control means responsive to both the first signal and the second signal for controlling an amount of light applied to the photosensitive recording medium by said exposure means.

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5,049,919

## IMAGE RECORDING APPARATUS HAVING REVERSAL SHEET FEEDING DEVICE AND CONTROL MEANS FOR STARTING IMAGE RECORDING OPERATION IN CONNECTION WITH THE REVERSAL SHEET FEED

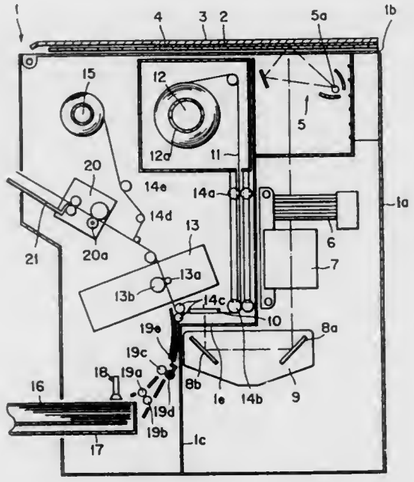
Kenji Sakakibara, Ichinomiya; Yumio Matsumoto, Kasugai, and Takashi Nakata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 19, 1990, Ser. No. 599,981

Claims priority, application Japan, Oct. 24, 1989, 1-276374; Oct. 26, 1989, 1-279212

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 8 Claims



1. An image recording apparatus using an elongated photosensitive recording medium, the elongated photosensitive recording medium being formed with a precedent latent image section and subsequent non imaging section with respect to a longitudinal direction thereof, the apparatus comprising;

a copy start key which generates a copy start signal for starting a copying operation;

a medium cartridge for storing therein a rolled elongated photosensitive recordign medium;

a takeup means for taking up the imaging section of the photosensitive recording medium, the photosensitive recording medium being fed from the medium cartridge to the takeup means;

an exposure means positioned between the medium cartridge and the takeup means for exposing the photosensitive recording medium to light for providing the latent image section;

reversal sheet feeding means for reversely feeding the photosensitive recording medium so as to position the subsequent non imaging section to upstream of the exposure means; and

control means for automatically starting a next copying operation in response to manipulation of the copy start key at the reversal sheet feed phase, the control means comprising memory means for storing therein the copy start signal and for automatically starting the next copying operation upon completion of the reversal sheet feeding operation, the copy start signal being generated by the manipulation of the copy start key manipulated at the reversal sheet feeding phase.



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5,049,920

## PHOTOCOPYING METHOD AND APPARATUS

Kazuo Sangyoji; Takemi Yamamoto; Shunichi Higashiyama; Masashi Ueda; Akira Sago; Osamu Takagi; Yumio Matsumoto, all of Nagoya, and Kiyoharu Hayakawa, Aichi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

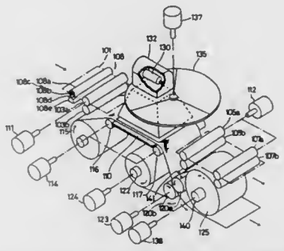
Continuation of Ser. No. 136,738, Dec. 22, 1987, abandoned.

This application Oct. 18, 1989, Ser. No. 423,683

Claims priority, application Japan, Dec. 29, 1986, 61-314359; Jan. 30, 1987, 62-21629; Mar. 16, 1987, 62-60721; Jun. 4, 1987, 62-140182; Jun. 9, 1987, 62-143487

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 46 Claims



1. A multicolor photocopying apparatus comprising:

exposure means for exposing a photo-pressure sensitive sheet to a light passing through a colored original, said sheet carrying uniformly at least two kinds of microcapsules thereon, each kind of said microcapsules having therein a chromogenic material chemically reactive with a developing agent and a photo sensitive material which changes mechanical strength of said microcapsule by absorption of said light;

developing means for developing an image on a photo-pressure sensitive sheet for a transfer sheet having said developing agent by rupturing said microcapsules of low mechanical strength among said microcapsules and by having said chromogenic material chemically react with said developing agent on said photo-pressure sensitive sheet or said transfer sheet, said original being fit on said sheet through a permeable member;

said exposure means comprising:

a cam rotatable about a shaft;

a clamp arm swingable about an axis and contacting said cam at one end thereof;

a clamp sub-arm swingable about an axis and contacting another end of said clamp arm at one end thereof;

an exposure bed supported on another end of said clamp sub-arm;

a tray supporting said exposure bed movably; and

elastic members inserted between said exposure bed and said tray.

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5,049,921

## SHEET CARTRIDGE AND IMAGE RECORDING APPARATUS USING THE SHEET CARTRIDGE

Katsuyoshi Sonobe; Tatsuya Shindo, both of Nagoya; Yoshiya Tomatsu, Ichinomiya; Hideo Nishigaki, Nagoya; Kenji Sakakibara, Ichinomiya; Yumio Matsumoto, Kasugai, and Eiji Shibata, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jan. 26, 1990, Ser. No. 470,900

Claims priority, application Japan, Jan. 30, 1989, 1-20503; Jan. 31, 1989, 1-10583[U]; Jan. 31, 1989, 1-21767; Feb. 20, 1989, 1-39965; Apr. 6, 1989, 1-87240

Int. Cl.[5] G03B *27/32*

U.S. Cl. 355—27 27 Claims

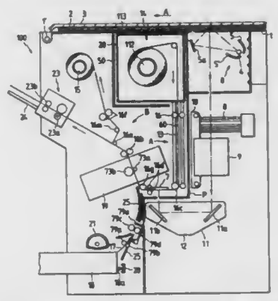
1. An image recording apparatus for recording an image on an image recording medium, the image corresponding to an image of an original, the image recording apparatus comprising:

a frame;

a sheet cartridge detachably mounted on the frame, the sheet cartridge accommodating therein a rolled image recording medium, the sheet cartridge comprising a cartridge casing formed with an opening, and retaining means connectable to a leading end portion of the image recording medium to avoid retraction of the medium into the cartridge casing and for covering the opening;

an exposure stand positioned downstream of the sheet cartridge and at which a part of the image recording medium is exposed to light for providing a latent image corresponding to the image of the original;

a pressure developing unit positioned downstream of the exposure stand for pressure developing the latent image and for providing a visible image;



a first sheet transferring means defining a first sheet path for feeding the image recording medium to the pressure developing unit;

a takeup means for winding therearound the light exposed image recording medium; and

a second sheet transferring means defining a second sheet path for feeding the image recording medium to the takeup means; wherein the retaining means comprises:

locking means foldable into two halves and sandwiching the leading end portion of the image recording medium for connecting the halves to the medium in its folding state, the locking means providing a folded edge line; and

light shielding means provided integral with the locking means, the folded edge line being positioned ahead of the shielding means with respect to a running direction of the image recording medium along the first sheet path.

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5,049,922

## IMAGE FORMING APPARATUS USING MASK ORIGINAL FORM

Susumu Kuzuya, Gifu; Takauni Sonoda, Toyoake; Kazunori Tanabe; Toshio Sakai, both of Nagoya; Hiroshi Taira, Ichinomiya; Tomoaki Hattori; Makoto Suzuki, both of Nagoya, and Hidenori Hisada, Tokoname, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 13, 1990, Ser. No. 611,501

Claims priority, application Japan, Dec. 11, 1989, 1-321229

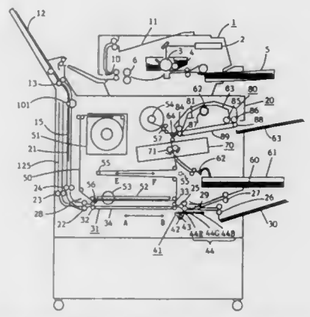
Int. Cl.[5] G03B *27/32, 27/52;* G03G *15/01*

U.S. Cl. 355—32 17 Claims

1. An image forming apparatus for forming an image on a photosensitive recording medium by exposure to light through a plurality mask members in sequence, each mask member sequentially placed on an exposure position, said apparatus comprising:

a plurality of holding positions linearly connected to said

exposure position to each of which one of said mask members is selectively moved and held; and



transport means for transporting said mask members from said exposure position, to said holding positions and returning said mask members to said exposure position.

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**5,049,923**

**MICROFILM READER/PRINTER**

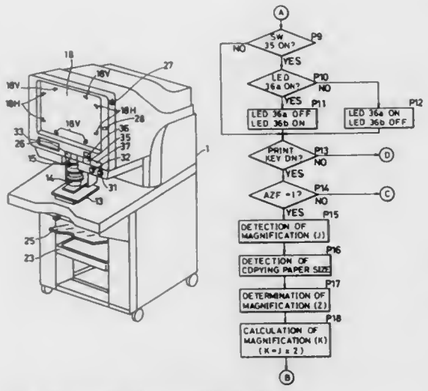
**Katsunori Sakakibara, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Jun. 22, 1990, Ser. No. 542,268**

**Claims priority, application Japan, Jun. 23, 1989, 1-161672; Sep. 14, 1989, 1-236893**

**Int. Cl.[5] G03B *13/26, 13/28***

**U.S. Cl. 355—45** **29 Claims**




1. A microfilm reader/printer including:

a screen onto which an image on a microfilm is projected;

an image forming means for reproducing the microfilm image on a recording medium;

a projection means for projecting the microfilm image onto said screen and said image forming means at a desired magnification;

a projective magnification changing means for changing the projective magnification used in said projection means into a second magnification which is smaller by a predetermined ratio than the desired projective magnification;

an image rotating means for rotating the projected image by a predetermined angle;

an image forming operation instructing means for giving operation start instructions to said image forming means; and

a control means which, in response to the instructions given by said image forming operation instructing means, operates said image rotating means to rotate the projected image by a predetermined angle, further operates said projective magnification changing means to change the projective magnification to the second magnification, and thereafter starts the operation of said image forming means.

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**5,049,924**

**IMAGE FORMING APPARATUS**

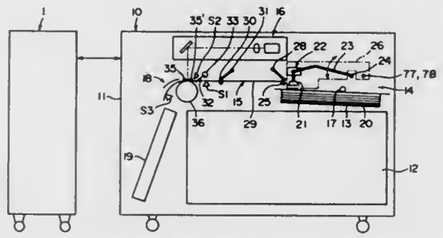
**Fuminori Moro, Machida; Yukiyosbi Yamakoshi, Isehara; Hiroshi Tomita, Sagamihara; Hajime Takei, Machida; Naoyuki Matsuda, Machida, and Homare Sano, Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 19, 1990, Ser. No. 615,335**

**Claims priority, application Japan, Nov. 22, 1989, 1-303811; Dec. 5, 1989, 1-316093**

**Int. Cl.[5] G03G *21/00;* G03B *27/48, 27/50***

**U.S. Cl. 355—50** **8 Claims**



1. An image forming apparatus for forming an image on a photosensitive sheet, comprising:

means for storing the photosensitive sheet in a manner to shield the sheet from light;

means for transporting the sheet stored in the sheet storing means to an exposure station;

means for detecting whether a problem occurs while the sheet is being transported by the sheet transporting means; and

control means responsive to the problem detecting means for reversing the sheet transporting means in order to return the sheet to the sheet storing means.

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**5,049,925**

**METHOD AND APPARATUS FOR FOCUSING A WAFER STEPPER**

**John Aiton, Boise; Patrick W. Vaughn, Caldwell, and Eugene DeLarosa, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.**

**Filed Apr. 20, 1990, Ser. No. 511,272**

**Int. Cl.[5] G03B *27/42***

**U.S. Cl. 355—53** **13 Claims**

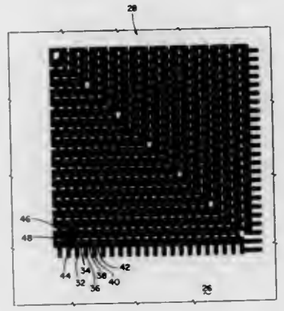
1. Apparatus for focusing a lens system in which a lens projects an image of a mask to create a lithographically-



defined pattern on a wafer, said lens having a focal plane which is substantially parallel to a wafer received in said system, said apparatus comprising:

means for adjusting the position of the lens focal plane and a surface of the wafer relative to one another;

a reticle having a plurality of parallel, opaque rectangles formed thereon; and



a plurality of elongate, transparent segments disposed between said rectangles and having elongate edges which define edges of adjacent rectangles, said rectangles having a width bearing a ratio to the width of said segments of in excess of 2:1.

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**5,049,926**

**IMAGE RECORDING APPARATUS HAVING A MECHANISM FOR VARYING COPYING MAGNIFICATION**

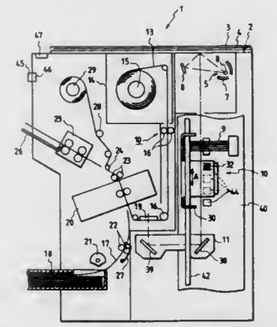
**Michitoshi Akao; Katsuyoshi Sonobe; Kazuichi Sakaida; Nobuo Aoki, all of Nagoya; Satoshi Uchiyama, Kasugai, and Hiroshi Igarashi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Filed Jan. 26, 1990, Ser. No. 470,899**

**Claims priority, application Japan, Jan. 27, 1989, 1-9155[U]; Jan. 30, 1989, 1-9774[U]; Jan. 31, 1989, 1-21769; Feb. 20, 1989, 1-39964**

**Int. Cl.[5] G03B *27/52***

**U.S. Cl. 355—55** **17 Claims**



1. An image recording apparatus for recording an image corresponding to an original on a photosensitive recording medium by irradiating light onto the original and converging light from the original onto said photosensitive recording medium, the apparatus comprising:

a frame;

a light source for irradiating light onto said original;

a lens unit provided between said light source and an exposure zone at which the recording medium is exposed, said lens unit movably supported by said frame along a path of light from said original for converging light from said original and forming an image on said photosensitive recording medium;

drive means for moving said lens unit along said path of light;

magnification setting means for setting magnification;

a plurality of position setting portions provided in said frame and arrayed in parallel to said path of light, neighboring position setting portions being spaced away from each other;

position setting means provided on said lens unit and being engageable with one of said position setting portions for fixing said lens unit to said frame;

urging means provided on said lens unit for urging said position setting means toward said frame;

actuating means provided on said lens unit for actuating said position setting means so that said position setting means moves away from said frame against urging force of said urging means when electric current is supplied to said actuating means and

control means for controlling said drive means and said actuating means to move said lens unit in response to said magnification set by said magnification setting means while supplying electric current to said actuating means.

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**5,049,927**

**PROCESS FOR RECORDING AN IMAGE, A FILM STRUCTURE THEREFOR AND ITS APPLICATIONS**

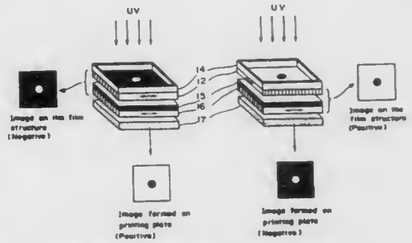
**Hiroshi Tsushima; Masami Kawabata, and Yasuyuki Takimoto, all of Takatsuki, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan**

**Filed Oct. 29, 1990, Ser. No. 603,841**

**Claims priority, application Japan, Oct. 27, 1989, 1-280603; Jul. 26, 1990, 2-79952[U]**

**Int. Cl.[5] G03B *27/72, 27/02***

**U.S. Cl. 355—71** **5 Claims**




1. A process for recording an image comprising

(i) inserting an anisotropic molecular oriented film between two polarizing film of which polarization directions are parallel or perpendicular to each other, so that the anisotropy of said anisotropic molecular oriented film forms an angle of 45° to the polarization directions of said polarizing film, and

(ii) completely or incompletely degrading the anisotropy of an image portion in said anisotropic molecular oriented film.

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**5,049,928**

**SPOOLED PHOTOSENSITIVE WEB CARTRIDGE**

**George F. Tirone, Miamisburg, Ohio, assignor to The Mead Corporation, Dayton, Ohio**

**Filed Jun. 21, 1990, Ser. No. 541,666**

**Int. Cl.[5] G03B *27/58***

**U.S. Cl. 355—72** **45 Claims**

1. A spooled photosensitive web cartridge comprising:

an opaque, generally cylindrical core;

a pair of opaque end caps, each having an axis and a trans-

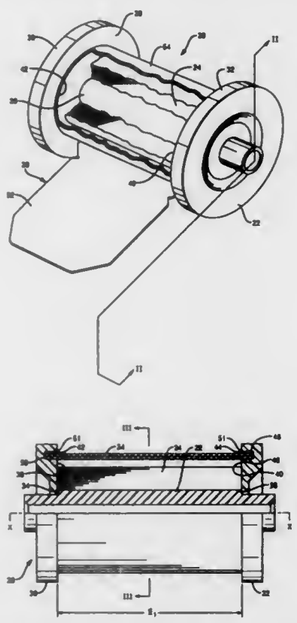
VOL 1130 ISS 3 SE 17 1991 UMI



verse outer size larger than the diameter of said core, said pair of end caps being disposed coaxially on said core at an axial distance between each other;

a length of photosensitive material wound onto that portion of said core between said pair of end caps to form a cylindrical web of a certain diameter not greater than said transverse outer size;

a leader sheet secured to a leading end of said photosensitive material, said leader sheet including an opaque wider portion circumferentially disposed entirely around said web to form a tubular protection means for said photosensitive material, said wider portion having a width greater





than said axial distance between said pair of end caps and having opposite side edges extending circumferentially about the axis of said core, said tubular protection means having a substantially linear cross section taken along the axis of said core entirely along the width of said wider portion; and

means for detachably connecting said opposite side edges of said wider portion respectively to said pair of end caps so as to mechanically retain said tubular protection means on said pair of end caps as well as to provide a light-tight seal between said tubular protection means and said pair of end caps.

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**5,049,929**

**CONFLICT RESOLUTION WITH WARNING IN A REPROGRAPHIC SYSTEM**

**Karen K. Anderson; John W. Daughton; Robert L. Sklut, and Keith G. Bunker, all of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Dec. 5, 1989, Ser. No. 446,517**

**Int. Cl.[5] G03G *15/00***

**U.S. Cl. 355—204** **15 Claims**

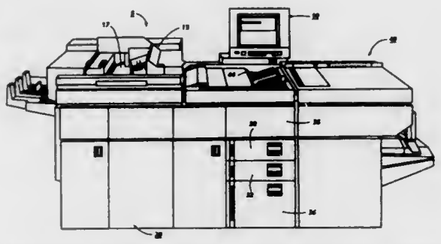
1. A reproduction system having

a means for selecting a plurality of features associated with the execution of a copying job,

a means for storing all of said previously selected features associated with a copying job in system memory,

a means for comparing each subsequently selected feature, at the time of selection, to determine if a conflict exists with another feature,

a means for reporting the existence of such a conflict to the system controller,



a means for determining the higher priority of two conflicting features,

a means for deselecting one of said conflicting features with the lowest priority, and

a means for notifying the user that the conflict has been resolved, including an indication of the feature that was deselected.

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**5,049,930**

**SYSTEM FOR PREVENTING ERRONEOUS MOUNTING OF DEVELOPER TANKS ACCOMMODATED IN A DEVELOPING DEVICE**

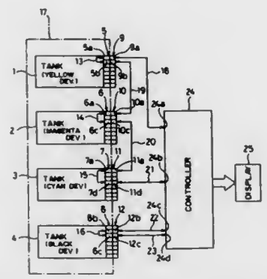
**Tokiyuki Okano, Yamatokoriyama; Yoichi Shimazawa; Kazunori Sohda, both of Nara; Kiyoshi Inamoto, Sakai; Kazuyuki Ohnishi, Nara, and Masato Tokishige, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 20, 1989, Ser. No. 409,931**

**Claims priority, application Japan, Sep. 29, 1988, 63-244798**

**Int. Cl.[5] G03G *21/00***

**U.S. Cl. 355—206** **6 Claims**




1. A system for preventing erroneous mounting of a plurality of developer tanks accommodated in a developing device of an electrophotographic apparatus, said developer tanks containing respective developers which are different in color from each other and being detachably mounted in respective predetermined mounting portions of the device, said system comprising:

a first connector means formed on each of said developer tanks;

a second connector means formed on each of said mounting portions of the device;

said first and second connector means being electrically connected with each other when a developer tank is properly mounted in its predetermined mounting portion of the device;

interconnect means electrically connecting second connector means of one developer tank to second connector means for a different developer tank, wherein properly mounted developer tanks form a circuit; and

discrimination means connected to said interconnect means for outputting a discrimination signal at one end of said circuit and receiving said signal at the other end of said circuit, wherein reception of said signal indicates the correct placement of developer tanks connected to said interconnect means.

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**5,049,931**

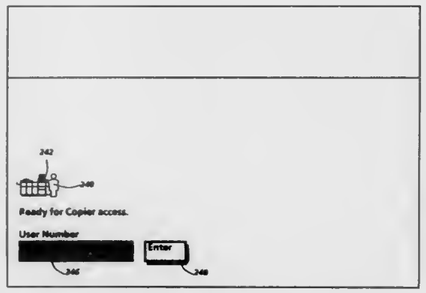
**REPRODUCTION MACHINE HAVING A JOB RUN DISPLAY SCREEN WITH GRAPHIC SYMBOL**

**Ruediger W. Knodt, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Aug. 20, 1991, Ser. No. 569,898**

**Int. Cl.[5] G03G *21/00***

**U.S. Cl. 355—209** **13 Claims**




1. In a reproduction machine having a control and user interface with a touch screen display for providing operator prompts and selectable features for programming the operation of the machine, the method of operator-machine dialogue comprising the steps of:

providing a graphic symbol, the graphic symbol having an operator action required mode and an operator no-action required mode,

displaying the operator action required mode of the graphic symbol to initiate operator dialogue with the machine and operator commencement of a job run having a plurality of job features,

responding to the operator commencement of a job run to display the operator no-action required mode of the graphic symbol, and

concurrently displaying an exhibit of the plurality of job features and displaying an exhibit of valid job features that can be altered during the job run.



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**5,049,932**

**COPIER HAVING AN EDITING FUNCTION**

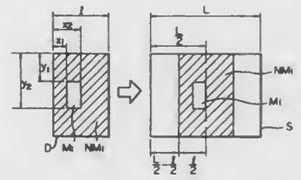
**Hiroyasu Sumida, Ichikawa, Japan, assignor to Ricoh Company, Ltd., Japan**

**Filed Feb. 6, 1990, Ser. No. 475,888**

**Claims priority, application Japan, Feb. 10, 1989, 1-32317**

**Int. Cl.[5] G03G *21/00***

**U.S. Cl. 355—218** **5 Claims**




1. A copier having an editing function and operable in a trimming mode for extracting part of an image printed on a document as a trimmed image and transferring said trimmed image to a paper sheet, a masking mode for omitting part of said image as a masked image and transferring a non-masked image surrounding said masked image to said paper sheet, and a centering mode combinable with either one of said trimming mode and said masking mode for shifting the center of said image on said document into register with the center of said paper sheet and transferring said shifted image to said paper sheet, said copier comprising:

first centering means for shifting the center of the image on the document by an amount which is calculated on the basis of a size of said document and a size of the paper sheet and transferring said shifted image to the center of said paper sheet; and

second centering means for shifting the center of the trimmed image by an amount which is calculated on the basis of a size of said trimmed image and the size of the paper sheet and transferring said shifted trimmed image to the center of the paper sheet;

said second centering means being selected when the centering mode is combined with the trimming mode while said first centering means being selected when said centering mode is combined with the masking mode.

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**5,049,933**

**IMAGE EDIT INPUT DEVICE FOR USE IN COPYING MACHINE**

**Hirokazu Yamada, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Jan. 23, 1990, Ser. No. 468,933**

**Claims priority, application Japan, Jan. 27, 1989, 1-18946; Jan. 27, 1989, 1-18947; Jan. 27, 1989, 1-18948; Jan. 27, 1989, 1-18949**

**Int. Cl.[5] G03G *15/00***

**U.S. Cl. 355—218** **8 Claims**

1. An original document image edit input device for supplying data on a copying mode and an editing mode to a copying machine which can reproduce an image of an original document on a copying paper, which device comprises:

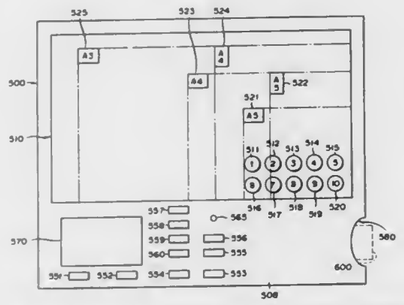
a tablet provided with a surface conforming to an original document to be copied;

coordinate data forming means adapted to produce, in response to a depression on the surface of said tablet in an ordinary input mode, coordinated data corresponding to the coordinates of the position of said depression;

switching means for switching the input mode from said ordinary input mode to a numerical value input mode, and

numerical data forming means for forming, in response to a depression exerted at a desired position on the surface of said tablet in the situation in which said numerical value input mode has been set by said switching means, numeri-

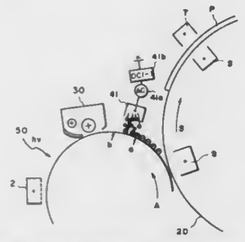
cal data corresponding to the position of said depression, said numerical data differing from said coordinate data



and said surface of said tablet having numerical information thereon.

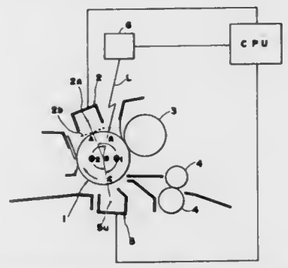
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**5,049,934**
**IMAGE FORMING APPARATUS HAVING IMAGE TRANSFER MEANS**
**Rie Saito, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Aug. 28, 1990, Ser. No. 573,683**
**Claims priority, application Japan, Aug. 31, 1989, 1-225349**
**Int. Cl.[5] G03G *21/00***
**U.S. Cl. 355—219** **48 Claims**



1. An image forming apparatus, comprising:
an image bearing member movable along an endless path;
primary charging means for electrically charging said image bearing member for formation of a latent image thereon;
developing means for developing the latent image with toner into a toner image;
transfer charging means for transferring the toner image onto a recording material;
discharging means, disposed between said transfer charging means and said primary charging means and actable directly on said image bearing member not through the recording material after the toner image is transferred from said image bearing member to the recording material, for effecting electric discharge biased to a polarity opposite to a charging polarity of said transfer charging means, wherein a degree of the bias to the opposite polarity is larger for a first portion of said image bearing member corresponding to a trailing edge of the recording material than for a second portion which is different from the first portion.

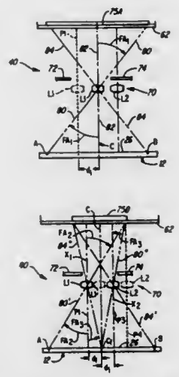
**5,049,935**
**ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS WITH REVERSAL DEVELOPMENT**
**Hitoshi Saito, Machida, and Masami Eda, Itami, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed Feb. 8, 1991, Ser. No. 652,775**
**Claims priority, application Japan, Feb. 10, 1990, 2-30978**
**Int. Cl.[5] G03G *15/02***
**U.S. Cl. 355—219** **7 Claims**




1. An electrophotographic image forming apparatus with reversal development system comprising:
first charge means for charging a photosensitive member to first polarity;
second charge means provided at downstream side of said first charging means with respect to rotational direction of the photosensitive member and for charging the photosensitive member to second polarity opposite to said first polarity; and
control means for controlling said first charge means to charge the photosensitive member to the first polarity and controlling said second charge means to charge the photosensitive member which is charged by said first charge means to the second polarity without operating an exposure means before image forming process with said reversal development.

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**5,049,936**
**ELECTROPHOTOGRAPHIC COPIER/DUPLICATOR HAVING DUAL IMAGING APPARATUS**
**Mark M. Meyers, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Jan. 2, 1990, Ser. No. 459,502**
**Int. Cl.[5] G03G *15/04***
**U.S. Cl. 355—232** **16 Claims**

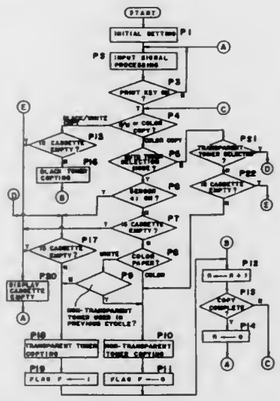


1. A copier or duplicator in which an electrostatic latent image of an original can be formed, developed, and fixed to form a sheet copy of such original, the copier or duplicator including:
(a) a movable endless photoconductive imaging member having a width 2W, and a plurality of 2W×L image areas; and
(b) optical imaging apparatus including a plurality of lenses operable in a single imaging mode wherein a movable first lens has a first position coincident with the center axis of an original document object placed on an exposure platen of the copier or duplicator for forming a single 2W×L electrostatic latent image of the original document object in a single 2W×L image area of said imaging member, and in a dual imaging mode wherein said first lens has a second position offset a first predetermined distance to a first side of the center axis of an original document object placed on said platen, and a second lens has a position offset a second predetermined distance to a second and opposite side of the center axis of the original document object for simultaneously forming two L×W electrostatic latent images of the original document object in a single 2W×L image area of said imaging member.



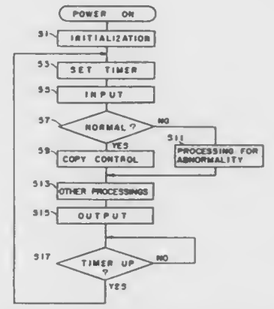
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**5,049,937**
**IMAGING DEVICE WHICH USES TRANSPARENT OR NON-TRANSPARENT DEVELOPER BASED ON MEDIUM USED**
**Katsuhiko Takeda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed Apr. 4, 1990, Ser. No. 503,962**
**Claims priority, application Japan, Apr. 5, 1989, 1-84784; Apr. 5, 1989, 1-84785**
**Int. Cl.[5] G03G *15/06***
**U.S. Cl. 355—245** **10 Claims**



1. An electrophotographic imaging device comprising: .
first developer for carrying transparent type toner;
second developer for carrying non-transparent type toner;
first supplying means for supplying first recording medium;
first recording medium detecting mean for detecting the type of recording medium loaded in said first supplying means from transparent recording medium and non-transparent recording medium; and
control means for controlling the selection between said first and second developers such that said first developer is selected when said first recording medium detecting means detects that transparent recording medium is loaded in said first supplying means.

**5,049,938**
**ABNORMALITY DETECTING SYSTEM IN AN IMAGE FORMING APPARATUS**
**Masahide Ueda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed Apr. 10, 1990, Ser. No. 507,128**
**Claims priority, application Japan, Apr. 11, 1989, 1-91670; Apr. 11, 1989, 1-91671**
**Int. Cl.[5] G03G *00/00***
**U.S. Cl. 355—246** **15 Claims**




1. An image forming apparatus for developing an electrostatic latent image formed on a surface of a photosensitive member into a visual image using developer, said apparatus comprising:
a developing unit accommodating the developer;
agitating means for agitating the developer accommodated in said developing unit;
pulsation detecting means for detecting pulsation of the developer caused by said agitating means;
comparing means for comparing a cycle of the pulsation detected by said pulsation detecting means and a cycle of agitation caused by said agitating means with each other; and
abnormal signal output means for outputting a signal indicative of an abnormality of the apparatus based on a result obtained by said comparing means.

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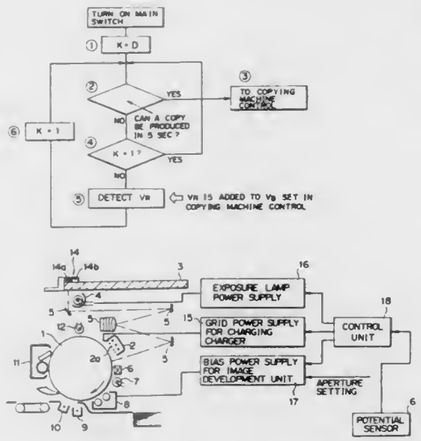
**5,049,939**
**METHOD OF CONTROLLING IMAGE FORMATION IN IMAGE GENERATING APPARATUS**
**Yasushi Koichi, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**
**Filed Dec. 14, 1988, Ser. No. 284,396**
**Claims priority, application Japan, Dec. 14, 1987, 62-315785; Nov. 14, 1988, 63-287245**
**Int. Cl.[5] G03G *15/06***
**U.S. Cl. 355—246** **2 Claims**

1. A method of controlling image formation in an image generating apparatus by controlling image forming conditions including $V_D$, $V_L$ of the latent images of a reference black pattern and a reference white pattern which are formed on a latent image carrier, said method comprising the steps of:
detecting the potentials $V_D$, $V_L$ of the latent images of the reference black and white patterns which are formed on the latent image carrier immediately before or after an image forming cycle;
detecting a residual potential $V_R$ of the surface of the latent image carrier after charges are uniformly removed from the surface of the latent image carrier by applying light to the surface of the latent image carrier, said light having a sufficient intensity to remove as many charges as possible leaving the residual potential $V_R$; and
correcting an image developing bias voltage $V_B$ applied when developing an image on the latent image carrier, a

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preset level of the potential $V_D$ of the latent image of said reference black pattern, and a preset level of the potential $V_L$ of the latent image of said reference white pattern,




based on said detected residual potential $V_R$, such that said bias voltage and said preset levels will be of potentials in a prescribed relationship.

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**5,049,940**

**IMAGE FORMING APPARATUS**

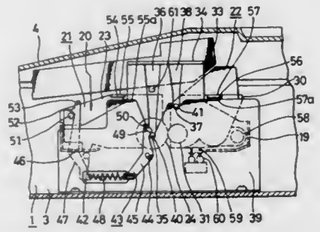
**Yasuyoshi Yamaguchi; Yasuhiko Ozawa; Masataka Suzuki; Akira Sato; Yoshinori Asai; Yoshiharu Horii, and Takashi Shimaoka, all of Shizuoka, Japan, assignors to Tokyo Electric Company, Ltd., Tokyo, Japan**

**Filed Jan. 25, 1990, Ser. No. 470,308**

**Claims priority, application Japan, Jan. 30, 1989, 1-20349; Jan. 30, 1989, 1-20350; Jan. 30, 1989, 1-20351**

**Int. Cl.[5] G03B** *15/06*

**U.S. Cl. 355—260** **7 Claims**



1. An image forming apparatus comprising:

a lower body containing a paper conveying path and a transfer portion disposed in said paper conveying path;

an upper body connected to the upper surface of said lower body so as to be openable and closable;

an image forming portion comprising an image carrier unit and a developing unit, said image carrier unit having an image carrier;

support portions formed in said lower body so as to abut said image forming portion; and

retaining means provided in said lower body so as to engage said image forming portion, said retaining means comprising means for pressing said image forming portion in a direction toward said support portions so as to lock said image forming portion to said support portions.

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**5,049,941**

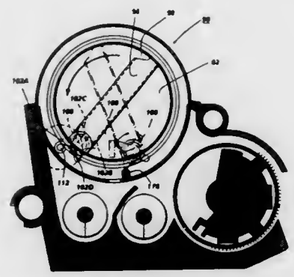
**TONER SUPPLY CARTRIDGE AND DISPENSING SYSTEM**

**Eugene Manno, Ontario, and Joseph G. Mestnik, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 25, 1990, Ser. No. 542,553**

**Int. Cl.[5] G03G** *15/06*

**U.S. Cl. 355—260** **3 Claims**



3. A toner dispensing cartridge comprising:

a tube-like cylinder adapted to contain a supply of toner; said cylinder having a toner discharge at one end and an end cap assembly connected to said end of the cartridge, said end cap having a scoop element formed therein, said element being a central cavity extending traversely therethrough, said central cavity having a toner entry aperture for introducing toner into said cavity during rotation, and a toner exit aperture.

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**5,049,942**

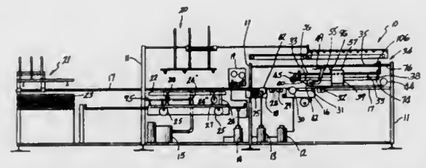
**ELECTROSTATIC TRANSFER DEVICE**

**David P. Bujese, Southington, Conn., assignor to Olin Corporation, Cheshire, Conn.**

**Continuation-in-part of Ser. No. 178,652, Apr. 7, 1988, Pat. No. 4,921,772. This application Jan. 2, 1990, Ser. No. 459,881**

**Int. Cl.[5] G03G** *15/16*

**U.S. Cl. 355—272** **17 Claims**



7. An apparatus for transferring a developed image from a master having a permanent latent image therein to a receiving surface comprising,

a) a frame assembly,

b) means for moving said master on said frame assembly from a first position to a second position whereat said master and said receiving surface are in overlapping relationship for transferring the image to said receiving surface and for returning said master to its first position, after image transfer,

c) a moveable member,

d) gap spacers in the form of elongated strips mounted in said moveable member and extendable therefrom with the end extending from said moveable member attached to said frame,



e) means for moving said moveable member from a first position wherein the gap spacers are remote from said receiving surface to a second position wherein said gap spacers extend over said receiving surface as said master moves to its second position so the gap spacers are positioned between said receiving surface and said master to maintain a gap there between during transfer of the image said gap spacers including a first layer of dielectric material and a second layer of electrically conductive material, said electrically conductive material being positioned on the side of each said gap spacer to engage said receiving surface when said gap spacers extend over the receiving surface, the width of the electrically conductive layer on said gap spacers being less than the width of the dielectric layer, and

f) means for imparting an electrical charge to said gap spacers through said moveable member, said electrical conductive layer on said gap spacers being isolated from said frame.

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**5,049,943**

**FIXING ROTATING MEMBER COATED WITH AN ELASTIC LAYER AND AN OFFSET PREVENTION LAYER WITH A PREDETERMINED OIL ABSORPTION RATE**

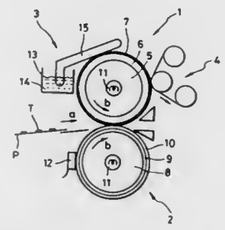
**Takeshi Menjo, Tokyo; Masaaki Sakurai, Yokohama; Tatsuo Takeuchi, and Yasuo Nami, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 16, 1990, Ser. No. 524,074**

**Claims priority, application Japan, May 24, 1989, 1-128969**

**Int. Cl.[5] G03G** *15/20, 21/00*

**U.S. Cl. 355—284** **10 Claims**



1. A fixing device comprising:

a fixing rotating member contacting an unfixed image and for grasping and conveying a recording material supporting an unfixed image; and

coating means for coating release oil on said fixing rotating member, wherein

said rotating member comprises an elastic rubber layer and an offset prevention layer provided on said elastic rubber layer, an oil absorption rate of said elastic rubber layer for said oil being 5–20 wt %, and an oil absorption rate of said offset prevention layer for said oil being 30–150 wt %.

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**5,049,944**

**METHOD AND APPARATUS FOR CONTROLLING THE APPLICATION OF A FUSER RELEASE AGENT**

**Frederick C. DeBolt, Penfield; Kenneth R. Rasch, Webster; Barry G. Rickett, Pittsford, and Mark T. Miller, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Apr. 7, 1989, Ser. No. 334,415**

**Int. Cl.[5] G03G** *15/20, 21/00*

**U.S. Cl. 355—284** **12 Claims**

1. Apparatus for applying offset preventing liquid to a fuser roll including:

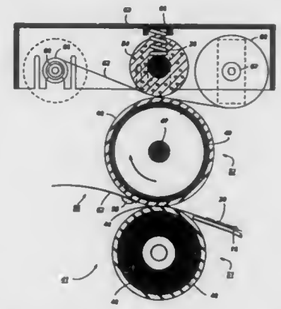
a supply core;

a rotatable take up core;

an oil impregnated web member adapted to be moved from the supply core to the take up core;

a motor for driving the web member from the supply core to the take up core, the motor having a variable duty cycle

a pressure roll in engagement with the web member and positioned to provide a contact nip for the web member



with the fuser roll opposite the pressure roll wherein the contact of the web member with the fuser roll transfers oil from the web member to the fuser roll, wherein the improvement comprises;

control means to vary the duty cycle of the motor to drive the web member at a relatively constant linear speed at the pressure roll, fuser roll contact nip.

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**5,049,945**

**IMAGE FORMING APPARATUS WITH A SIMPLIFIED PAPER UNJAMMING MECHANISM**

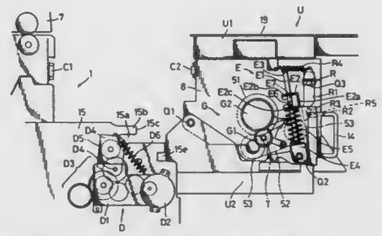
**Masahiko Fukano, Osaka, and Akihiro Kondo, Sakai, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan**

**Filed Feb. 22, 1990, Ser. No. 483,369**

**Claims priority, application Japan, Feb. 23, 1989, 1-21255; Feb. 23, 1989, 1-44344**

**Int. Cl.[5] G03G** *15/20*

**U.S. Cl. 355—290** **11 Claims**



1. An image forming apparatus, comprising:

a fixing means including a heating member and a pressure member brought into contact with the heating member for fixing a toner image transferred to a surface of a paper sheet by inserting the paper sheet therebetween;

a lower unit provided such that said lower unit can be pulled out from a main body of the image forming apparatus, said lower unit including a pressure member located in said fixing means;

an upper unit rotatably attached to said lower unit and including a heating member located in said fixing means;

a locking means for preventing rotation of the upper unit so as to maintain a state wherein said heating member and said pressure member are in contact with each other; and

rotating means for slightly rotating the upper unit when said locking means is released, to release the heating member

with the pressure member, wherein the rotating means includes a guide shaft turnably supported with the lower unit at one end portion thereof so as to turn around the one end portion, a slider slidably fitted on the guide shaft and detachably engaged with the upper unit, and a coil spring arranged between the one end portion of the guide shaft and the slider for pressing the slider in such a direction as to be separated from the one end portion of the guide shaft.

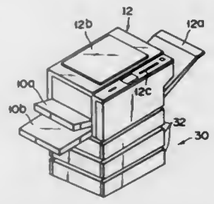
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5,049,946

## BASE FOR SUPPORTING AN IMAGE FORMING APPARATUS, AND FUNCTION-ADDING DEVICE FOR COMBINATION THEREWITH

Kentaro Harada, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 17, 1989, Ser. No. 422,553
Claims priority, application Japan, Oct. 17, 1988, 63-261213; Oct. 17, 1988, 63-261214
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—309 8 Claims




1. An image forming apparatus comprising:
a first device including means for conveying a copy medium, means for forming an image on the copy medium conveyed by the conveying means, and means, mounted at a predetermined position on a bottom surface of the first device for introducing a copy medium supplied to the predetermined position on the bottom surface toward the conveying means; and
a second device detachably located on the bottom surface of the first device, and including a plurality of units which can be detachably stacked in interchangeable order on each other,
at least one of the units having means for conveying a copy medium and discharging the copy medium from the at least one unit toward a predetermined position corresponding to the predetermined position on the bottom surface of the first device, means for supplying the copy medium to the conveying means, and means for introducing a copy medium, supplied thereto from the at least one unit, toward the conveying means of the at least one unit.

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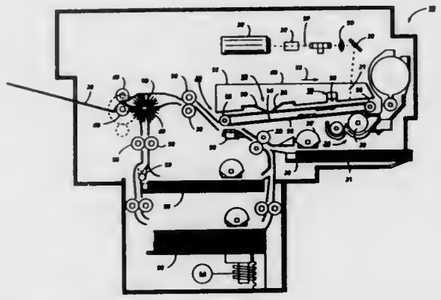
5,049,947

## ROTATING BRUSH DECISION GATE

David J. Fish, Webster; Gerard R. Sturnick, Rochester, and Peter A. Sardano, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1989, Ser. No. 375,180
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—318 13 Claims

1. An automatic printing machine comprising means to form an image on a sheet substrate at a given process speed and a multi-mode sheet output station comprising a brush decision gate having a bidirectionally rotatable cylindrical fibrous brush to direct sheets upwardly over the top of said brush in a first sheet transport path when rotated in a counter clockwise direction and downwardly under the bottom of said brush in a second sheet transport path when rotated in a clockwise direction and means to selectively rotate said brush in a clockwise and counter clockwise direction at a speed faster than the process speed of said printing machine and wherein each of said first and second paths has at least one pair of bidirectionally rotatable nip rolls to selectively drive a sheet forward and backward through said nip.



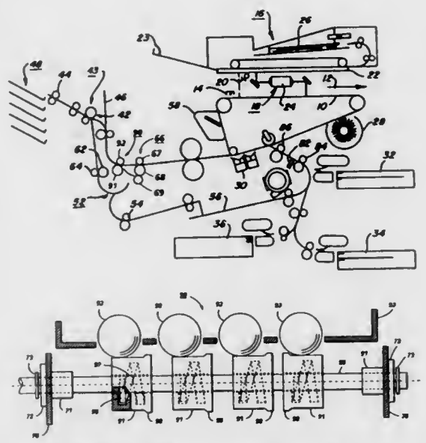
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5,049,948

## COPY SHEET DE-REGISTRATION DEVICE

George B. Brown, Fairport, and Dennis M. Ankrom, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1988, Ser. No. 288,491
Int. Cl.[5] G03G *15/00;* B65H *9/16*
U.S. Cl. 355—319 9 Claims



1. In an apparatus capable of duplex copying, the improvement of de-registration of each copy sheet to the back of the apparatus within a limited amount of paper path distance so that each sheet can subsequently be registered against a registration wall before duplexing takes place, characterized by a set of pinch rolls that move each sheet toward the back of the apparatus, said pinch rolls being mounted on a shaft which has perpendicular pins therein that move within helical slots in drive rolls of the set of pinch rolls when said shaft is rotated, such that each sheet moving in a forward direction is unaffected and each sheet moving in a reverse direction with respect to the sheet feed direction is moved laterally.

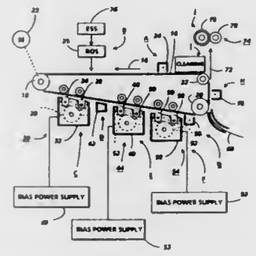


5,049,949

## EXTENSION OF TRI-LEVEL XEROGRAPHY TO BLACK PLUS 2 COLORS

Delmer G. Parker, and Jerome E. May, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1989, Ser. No. 373,127
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—328 13 Claims




1. A method of creating toner images on a charge retentive surface, said method including the steps of:
uniformly charging said charge retentive surface;
exposing said uniformly charged surface to form a tri-level latent image comprising a charged-area image, a discharged-area image and a background area;
using toner particles, developing one of said images;
modifying said background area to form another image;
using toner particles, developing said another image;
developing the other of said images.

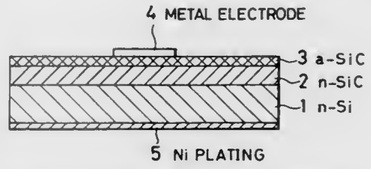
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5,049,950

## MIS STRUCTURE PHOTOSENSOR

Yoshihisa Fujii, Nagoya; Mitsuhiro Shigeta, Joyo; Katsuki Furukawa, Sakai; Kenji Nakanishi, Shijonawate, and Atsuko Ogura, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 218,905, Jul. 14, 1988, abandoned. This application Aug. 9, 1990, Ser. No. 565,206
Claims priority, application Japan, Jul. 14, 1987, 62-175216
Int. Cl.[5] H01L *45/00, 27/14, 31/00*
U.S. Cl. 357—2 6 Claims



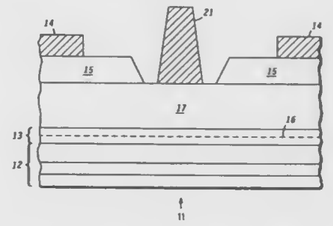

1. A structure for a MIS photosensor comprising:
a semiconductor layer having a top surface and formed on n-type single crystal silicon carbide;
a photoconductive insulator layer is formed of amorphous silicon carbide and disposed on said top surface of said semiconductor layer;
a translucent metal layer disposed on said photoconductive insulator layer and biased with a negative voltage with respect to a semiconductor substrate; and
an inversion layer developed at said top surface of said semiconductor layer is response to said translucent metal layer being biased with said negative voltage so that the capacitance between said semiconductor layer and said translucent metal layer changes corresponding to the selective illumination of said translucent metal layer.

5,049,951

## SUPERLATTICE FIELD EFFECT TRANSISTOR WITH MONOLAYER CONFINEMENT

Herbert Goronkin, Tempe; Saied N. Tehrani, Scottsdale, and X. Theodore Zhu, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1990, Ser. No. 630,613
Int. Cl.[5] H01L *27/12, 29/161, 29/80*
U.S. Cl. 357—4 14 Claims




1. A heterojunction field effect transistor (HFET) comprising: a semi-insulating substrate; a superlattice formed on the semi-insulating substrate, wherein a superlattice layer farthest from the substrate serves as a channel layer; a charge supply layer formed over the channel layer; a pair of source/drain regions coupled to the channel layer; and a gate electrode formed on the charge supply layer so that a voltage applied to the gate electrode controls charge in the channel layer.

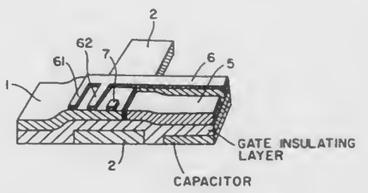
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5,049,952

## THIN FILM TRANSISTOR FOR USE IN A FLAT PLATE DISPLAY

Kwangsu Choi, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Rep. of Korea

Filed May 23, 1990, Ser. No. 527,270
Claims priority, application Rep. of Korea, Dec. 30, 1989, 89-21037
Int. Cl.[5] H01L *45/00, 27/12, 49/02, 29/78*
U.S. Cl. 357—4 1 Claim



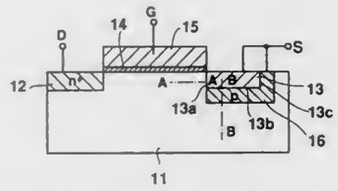

1. A thin film transistor for use in a flat plate display, comprising:
an amorphous silicon layer;
a gate electrode deposited on said amorphous silicon layer;
a drain electrode connected with said gate electrode;
a picture element electrode connected with said drain electrode;
a source electrode deposited on said amorphous silicon layer and crossing said gate electrode, said source electrode further comprising a first source subelectrode and a second source subelectrode, said first and second source subelectrodes being arranged electrically parallel with each other.

5,049,953

## SCHOTTKY TUNNEL TRANSISTOR DEVICE

Teruyoshi Mihara; Kenji Yao, both of Yokosuka; Tsutomu Matsushita, Yokohama, and Yoshinori Murakami, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 18, 1990, Ser. No. 465,750
Claims priority, application Japan, Jan. 18, 1989, 1-7764
Int. Cl.[5] H01L *29/48, 29/10, 27/02, 29/34*
U.S. Cl. 357—15 9 Claims



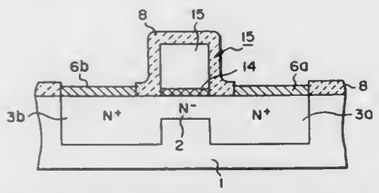

1. A semiconductor device, comprising:
a semiconductor substrate of a first conductivity type, the substrate having a first surface;
a drain region located in the substrate;
a gate electrode located on the first surface of the substrate via an insulating film located between the gate electrode and the first surface;
a Schottky metal located as a source region in the first surface of the substrate away from the drain region, the Schottky metal and the substrate constituting a Schottky junction at an interface between the Schottky metal and the substrate near the gate electrode, a part of the Schottky junction constituting a channel equivalent region where the gate electrode controls a tunnel current; and
a shield layer of a second conductivity type different from the first conductivity type, the shield layer being interposed between the Schottky metal and the substrate except at the channel equivalent region.

5,049,954

## GAAS FIELD EFFECT SEMICONDUCTOR DEVICE HAVING SCHOTTKY GATE STRUCTURE

Kizashi Shimada, Yokohama; Tatsuo Akiyama, Tokyo, and Yutaka Koshino, Hyogo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 5, 1989, Ser. No. 446,467
Claims priority, application Japan, Dec. 7, 1988, 63-309368
Int. Cl.[5] H01L *29/48, 29/56*
U.S. Cl. 357—15 3 Claims



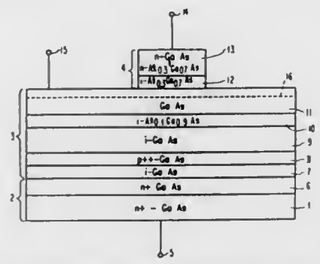

1. A GaAs field effect semiconductor device, comprising:
a GaAs semiconductor substrate including source and drain regions; and
a Schottky gate electrode between the source and drain regions of said GaAs semiconductor substrate, said Schottky gate electrode including:
a Ti film having a thickness of greater than or equal to 2 nm and less than or equal to 25 nm, and
a refractory electrode film on said Ti film.

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## SEMICONDUCTOR BALLISTIC ELECTRON VELOCITY CONTROL STRUCTURE

John L. Freeouf, Katonah; Thomas N. Jackson, Peekskill; Peter D. Kirchner, Garrison; Jeffrey Y. Tang, Pleasantville, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 726,858, Apr. 25, 1985. This application Jun. 12, 1987, Ser. No. 61,036
Int. Cl.[5] H01L *29/80, 29/161, 29/72, 29/12*
U.S. Cl. 357—22 18 Claims



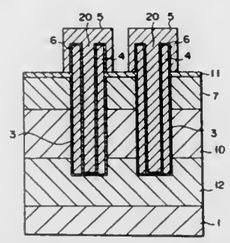

1. In a compound semiconductor structure of the type where carriers in a semiconductor crystal material are launched from an emitter for ballistic transport across a base to a collector, the improvement for controlling the kinetic energy gained by the ballistic transport carriers comprising a first barrier in said base adjacent said emitter and a planar doped type barrier in said base adjacent said collector, said first barrier and said planar doped type barrier operable to provide an essentially level conduction band profile across the base of the semiconductor structure between the two carriers under suitable bias voltages.

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## MEMORY CELL STRUCTURE OF SEMICONDUCTOR MEMORY DEVICE

Tohru Yoshida, Warabi, and Mitsumasa Furukawa, Ooita, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 6, 1990, Ser. No. 549,081
Claims priority, application Japan, Jul. 13, 1989, 1-179145
Int. Cl.[5] H01L *29/68, 29/06, 27/02*
U.S. Cl. 357—23.5 4 Claims




1. A memory cell employed in an erasable programmable read-only memory, comprising:
a semiconductor substrate having a surface;
a source region formed on the substrate;
a channel region formed on the source region;
a drain region formed on the channel region;
a trench penetrating the drain region and the channel region, reaching the source region, and extending in a direction substantially perpendicular to the surface of the substrate the trench including an inner surface;
a floating gate comprising a first gate insulating layer formed on the inner surface of the trench, including an inner surface, and a first conductor formed in partial contact with the inside surface of the first gate insulating layer, and including a portion not in contact with the first gate insulating layer; and
a control gate comprising a second gate insulating layer formed on the portion of the first conductor which is not in contact with the first gate insulating layer, and a second conductor formed on the second gate insulating layer opposite to the portion in contact with the first conductor;
wherein a portion of the floating gate and a portion of the control gate project perpendicularly from the surface of the semiconductor substrate.

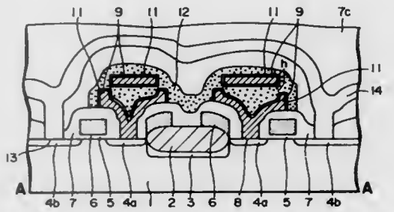


5,049,957

## MOS TYPE DYNAMIC RANDOM ACCESS MEMORY

Satoshi Inoue; Akihiro Nitayama, both of Kawasaki; Kazumasa Sunouchi, Yokohama, and Fumio Horiguchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1990, Ser. No. 528,086
Claims priority, application Japan, May 26, 1989, 1-134094
Int. Cl.[5] H01L *29/68, 27/02, 21/70*
U.S. Cl. 357—23.6 11 Claims




1. A semiconductor memory device of a laminated capacitor structure comprising:
a MOSFET comprising a gate electrode, a source region and a drain region formed on a surface of a substrate;
a word line connected to the gate electrode;
a bit line connected to one of the source region and the drain region of the MOSFET through a bit line contact hole opened in an insulating film covering the MOSFET; and
a capacitor comprising a storage node electrode, a capacitor insulating film and a plate electrode;
wherein the storage node electrode is connected to another one of the source region and the drain region through a storage node contact hole opened in the insulating film and has at least one cavity, the capacitor insulating film is formed on an outer surface of the storage node electrode and an inner surface of the cavity, and the plate electrode is formed on the capacitor insulating film covering both the outer surface of the storage node electrode and the capacitor insulating film covering the inner surface of the cavity.

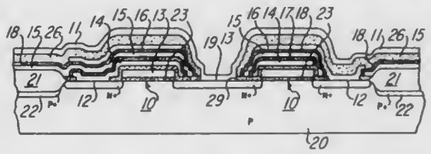
5,049,958

## STACKED CAPACITORS FOR VLSI SEMICONDUCTOR DEVICES

David A. Baglee, Albequerque, N. Mex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 303,098, Jan. 27, 1989, abandoned, which is a continuation of Ser. No. 773,832, Sep. 4, 1985, abandoned, which is a continuation of Ser. No. 415,068, Sep. 7, 1982, abandoned. This application May 8, 1990, Ser. No. 520,152
Int. Cl.[5] H01L *29/68, 27/02*
U.S. Cl. 357—23.6 20 Claims

1. A semiconductor memory device including an array of one-transistor memory cells, each cell having an access transistor with a source-drain path and a gate, comprising:
a stacked tantalum capacitor structure shared by each pair of adjacent cells of said array; the stacked tantalum capacitor structure shared by each pair of adjacent cells of array; the stacked tantalum capacitor structure having first, second and third tantalum layers overlying one another and overlying the gates of said access transistors of said pair of adjacent cells; the first and third tantalum layers being



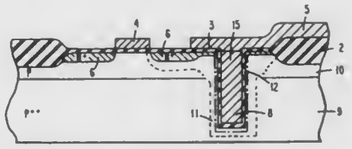

separately connected to source-drain paths of opposite ones of the access transistors of said pair of adjacent cells; the second tantalum layer being connected to a common electrical potential; and tantalum oxide dielectric between the first and second and between the second and third tantalum layers.

5,049,959

## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

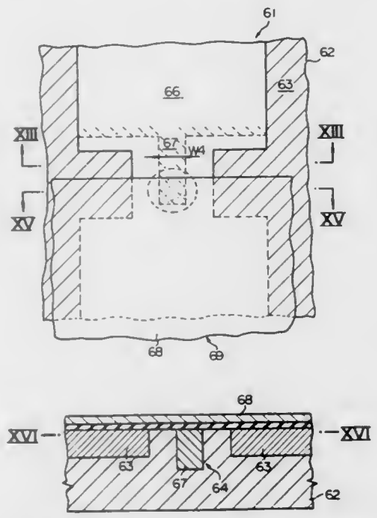
Shinichi Satoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 232,551, Aug. 15, 1988, abandoned, which is a continuation of Ser. No. 47,607, May 1, 1987, abandoned, which is a continuation of Ser. No. 694,322, Jan. 24, 1985, abandoned. This application May 21, 1990, Ser. No. 526,943
Claims priority, application Japan, Apr. 17, 1984, 59-78928
Int. Cl.[5] H01L *29/68, 29/06, 27/02*
U.S. Cl. 357—23.6 7 Claims




1. A semiconductor integrated circuit device having at least one capacitor, comprising:
a first semiconductor layer of a first conductivity type having a relatively high impurity concentration in a range of $1\times10^{16}$ through $1\times10^{21}/cm^3$;
a second semiconductor layer of said first conductivity type having a thickness of at least 2 microns formed on said first semiconductor layer and having a relatively low impurity concentration in a range of $1\times10^{14}$ through $1\times10^{16}/cm^3$;
a groove having sidewall surface areas extending through said second semiconductor layer and into said first semiconductor layer;
an oxide layer formed on said sidewall surface areas of said groove;
a capacitor electrode in said groove bounded by said oxide layer lining said groove; and
a third semiconductor layer of a second conductivity type surrounding said groove and a depletion layer surrounding said third semiconductor layer;
wherein a storage capacitance is formed between said capacitor electrode and said third semiconductor layer, a first junction capacitance is formed by the depletion layer between said third semiconductor layer and said first semiconductor layer and a second junction capacitance is formed by the depletion layer between said third semiconductor layer and said second semiconductor layer.

5,049,960
**CHARGE COUPLED DEVICE FREE FROM AFTER IMAGE DUE TO RESIDUAL ELECTRIC CHARGES**
Kazuo Miwada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Feb. 20, 1990, Ser. No. 482,096
Claims priority, application Japan, Feb. 20, 1989, 1-40770
Int. Cl.[5] H01L *29/78*; G11C *19/28*
U.S. Cl. 357—24 3 Claims




1. A charge coupled device fabricated on a lightly doped semiconductor substrate of a first conductivity type, comprising;

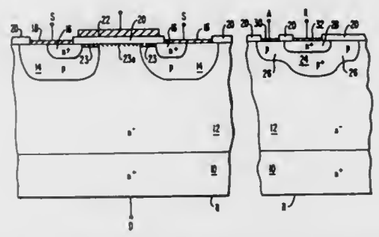
a) a plurality of photo electric converting elements implemented by a plurality of first impurity region of a second conductivity type formed in said semiconductor substrate and a plurality of second impurity regions of said first conductivity type respectively formed in the first impurity regions so as to form p-n junctions, respectively, said photo electric converting elements being formed into a plurality of element groups;

b) a plurality of vertical shift registers respectively associated with said plurality of element groups and having third impurity regions of said second conductivity type, respectively;

c) an insulating film covering said first, second and third impurity regions; and

d) a plurality of gate transistors provided between said photo electric converting elements and the associated vertical shift registers, respectively, and having transfer gate electrodes respectively extending over channel forming areas between said first impurity regions and said third impurity regions, said first impurity regions being partially located under transfer gate electrodes, respectively, in which each of said first impurity regions comprises a wide portion and a narrow portion contiguous to the wide portion and having a boss sub-portion located in that area not overlapped with said transfer gate electrode and a leading end sub-portion overlapped with said transfer gate electrode, and in which said narrow portion is separated from a heavily doped channel stopper of said first conductivity type by said semiconductor substrate smaller in impurity concentration than the channel stopper.

5,049,961
**MONOLITHIC TEMPERATURE SENSING DEVICE**
Nathan Zommer, Los Altos, and Mark B. Barron, Danville, both of Calif., assignors to Ixys Corporation, San Jose, Calif.
Filed Jan. 10, 1989, Ser. No. 295,956
Int. Cl.[5] H01L *23/58*
U.S. Cl. 357—28 9 Claims



1. A semiconductor power device comprising a power transistor and a temperature sensing diode device for sensing the temperature of the power transistor, the power transistor having a substrate, a first conductivity type epitaxial layer with a first depth, and a first conductivity type source region, the temperature sensing diode device comprising:

(a) a second conductivity type first diode region with a second depth less than said first depth;

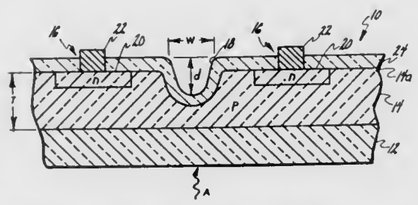
(b) a second conductivity type second diode region disposed in said first diode region with a third depth greater than said second depth but less than said first depth, and encircled by said first diode region, said second diode region and said first diode region having relatively different doping levels; and

(c) a heavily doped first conductivity type third diode region for preventing latch-up and being disposed in said second diode region with a fourth depth less than said second depth, and in contact with said first diode region;

said source region being electrically connected to a region of said diode for preventing voltage breakdown;

the application of a bias and a constant current to the diode generating a voltage across said diode which varies linearly with the temperature of the power transistor.

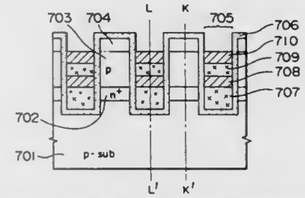
5,049,962
**CONTROL OF OPTICAL CROSSTALK BETWEEN ADJACENT PHOTODETECTING REGIONS**
Chao Huang, Goleta, and Paul R. Norton, Santa Barbara, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.
Filed Mar. 7, 1990, Ser. No. 490,011
Int. Cl.[5] H01L *27/14, 29/06, 27/10*
U.S. Cl. 357—30 21 Claims




1. An array of photodetecting active regions comprising a layer of photoresponsive material differentiated into a plurality of said photodetecting active regions, said layer having a composition which varies across a thickness of said layer from a first surface of said layer to a second surface of said layer such that a magnitude of an effective energy bandgap of said layer decreases from the first surface to the second surface for constraining charge carriers to exist within a region of said layer which is substantially adjacent to said second surface, said array including a plurality of groove structures formed within the second surface of said layer and extending into said layer to a predetermined depth which is less than the thickness of said layer, individual ones of said groove structures being interposed between at least two adjacent ones of said active regiops for substantially preventing minority carriers from laterally diffusing from one of the active regions to an adjacent one of the active regions.



5,049,963
**HOLOGRAPHIC TELEVISION APPARATUS WITH SEMICONDUCTOR DEVICE**
Takahiro Yamada, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 20, 1990, Ser. No. 496,024
Claims priority, application Japan, Mar. 24, 1989, 1-072440
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 8 Claims




1. A three-dimensional image detection apparatus for detecting a three-dimensional holographic optical interference pattern, comprising:

an image detector for detecting successively two-dimensional portions of the three-dimensional holographic optical interference pattern; and

an actuator means for moving said image detector at predetermined regular intervals in a depth direction normal to said two-dimensional image portions to obtain information with respect to the three-dimensional optical interference pattern at uniformly spaced two-dimensional layers thereof corresponding to said intervals.

5,049,964
**BIPOLAR TRANSISTOR AND METHOD OF MANUFACTURING THE SAME**
Tetsuchi Sakai, Atugi, and Yoshiji Kobayashi, Tokyo, both of Japan, assignors to Nippon Telegraph & Telephone Corp., Tokyo, Japan
Continuation of Ser. No. 170,504, Mar. 21, 1988, abandoned, which is a division of Ser. No. 104,544, Sep. 29, 1987, Pat. No. 4,780,427, which is a division of Ser. No. 858,618, May 1, 1986, abandoned. This application Mar. 22, 1990, Ser. No. 498,463
Int. Cl.[5] H01L *29/72, 29/04, 23/48*
U.S. Cl. 357—34 5 Claims

1. A bipolar transistor comprising:

a collector region comprising a first semiconductor region of a first conductivity type, said collector region being formed in contact with a surface of a semiconductor layer;

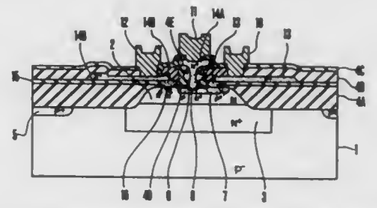
a base region comprising a second semiconductor region of a second conductivity type formed within said collector region to be in contact with the surface of said semiconductor layer;

an emitter region comprising a third semiconductor region of the first conductivity type formed within said base region to be in contact with the surface of said semiconductor layer;

collector and base lead out electrodes connected to said collector and base regions at opposite edges of a single opening formed in a field insulating film covering the surface of said semiconductor layer, said collector and base lead out electrodes comprising a polysilicon conductor;

an emitter lead out electrode connected to said emitter region and comprising a polysilocon conductor;

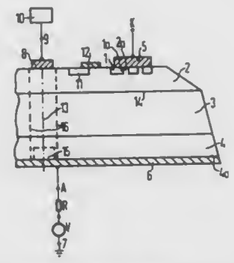
a first insulating interlayer formed between said collector lead out electrode and said emitter lead out electrode; and



a second insulating interlayer formed between said emitter lead out electrode and said base lead out electrode,

wherein a distance in the sub-micron range between said collector and emitter lead out electrodes on the surface of said semiconductor layer is substantially the same as that between said emitter lead out electrode and said base lead out electrode.

5,049,965
**THYRISTOR HAVING ADJUSTABLE BREAKOVER VOLTAGE AND METHOD OF MANUFACTURE**
Hans-Joachim Schulze, Ottobrunn, and Heinz Mitlehner, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Nov. 10, 1988, Ser. No. 269,376
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739394
Int. Cl.[5] H01L *29/74, 29/747*
U.S. Cl. 357—38 4 Claims



1. A thyristor comprising a semiconductor body that comprises an n-emitter (1) contacted by a cathode electrode (5) and having an adjacent p-base and that comprises a p-emitter (4) contacted by an anode electrode (6) and having an adjacent n-base (3) that is in turn separated from said p-base (2) by a p-n junction (14), characterized by a sub-region (15) of said p-emitter that is arranged in the lateral region of an ignition contact (8) and exhibits a higher p-doping concentration than the remaining parts of said p-emitter (4).

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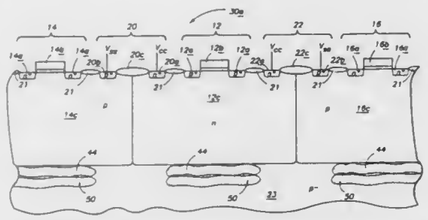


5,049,966

## LATERAL TRANSISTOR BETA REDUCTION BY INCORPORATION OF ELECTRICALLY ACTIVE MATERIAL

P. Gregory Wald, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Nov. 15, 1990, Ser. No. 613,410
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—42 3 Claims



1. An electronic semiconductor apparatus having enhanced resistance to detrimental minority carrier substrate injection, the apparatus comprising:

a semiconductor substrate of a first conductivity type material having a first predetermined dopant density, the material having conduction and valence energy state band edges which are separated by an energy band gap;

an active area of a second conductivity type formed within the substrate, the active area in operation being a source of injection of minority carriers into the substrate;

an implant region formed beneath the active area to promote recombination of minority carriers with majority carriers within the first conductivity type substrate material in a region of the substrate local to the implant region, the implant region comprising discrete clusters of an implant material which is electrically complimentary to accept minority carriers emanating from the active area, the implant material having an allowable electrically active energy which is substantially within the energy band gap of the semiconductor substrate material; and

a minority carrier deflecting region formed within the substrate and positioned beneath the implant region, the allowable electrically active energy of the implant material being within the energy band gap substantially midway between the conduction band edge and the valence band edge of the semiconductor substrate material, the minority carrier deflecting region being of the first conductivity type and having a second predetermined dopant density which is greater than the first predetermined dopant density, the minority carrier deflecting region having a dopant peak density which is formed within the substrate at a location beneath the implant region.

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## SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND A METHOD FOR MANUFACTURING THE SAME

Atsuo Watanabe, Hitachiota; Takahide Ikeda, Tokorozawa; Kiyoshi Tsukuda, Hitachi; Mitsuru Hirao, Ibaraki; Touji Mukai, Sanda, and Tatsuya Kamei, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 159,956, Feb. 24, 1988, Pat. No. 4,980,744, which is a continuation-in-part of Ser. No. 554,794, Nov. 23, 1983, abandoned. This application Dec. 21, 1990, Ser. No. 631,907
Claims priority, application Japan, Nov. 24, 1982, 57-204671
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—42 52 Claims

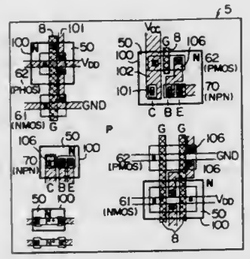
1. A semiconductor integrated circuit device having a bipolar transistor and complementary MOS transistors, comprising:

a semiconductor layer of a predetermined conductivity type formed on a semiconductor substrate of a predetermined conductivity type;

one or more first well regions of a second conductivity type formed at a predetermined position of a surface of said semiconductor layer, an impurity concentration of said first well regions gradually decreasing as it goes from the surface of said semiconductor layer toward said semiconductor substrate;

a second well region of a first conductivity type formed in contact with said first well regions at the surface of said semiconductor layer and to surround said first well regions, an impurity concentration of said second well region gradually decreasing at it goes from the surface of said semiconductor layer toward said semiconductor substrate;

one or more first buried regions of the second conductivity type formed between said first well regions and said semi-



conductor substrate and adjacent to said first well region, said first buried regions having a higher impurity concentration than an adjacent area of adjacent first well regions;

a second buried region of the first conductivity type formed between said second well region and said semiconductor substrate and adjacent to said second well region, said second buried region having a higher impurity concentration than an adjacent area of the adjacent second well region; at least one vertical bipolar transistor formed in one of said first well regions;

at least one MOS transistor of the first conductivity type formed in one of said first well regions; and

at least one MOS transistor of the second conductivity type formed in said second well region,

wherein a source-drain path of at least one of said MOS transistors of said first conductivity type or said second conductivity type is connected between the base and collector of the vertical bipolar transistor.

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5,049,968

## DIELECTRICALLY ISOLATED SUBSTRATE AND SEMICONDUCTOR DEVICE USING THE SAME

Akio Nakagawa, Hiratsuka; Kazuyoshi Furukawa, Kawasaki; Tsuneo Ogura, and Katsujiro Tanzawa, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 307,770, Feb. 8, 1989, abandoned. This application Feb. 28, 1990, Ser. No. 486,395
Claims priority, application Japan, May 16, 1989, 1-122311; Aug. 7, 1989, 1-202936; Dec. 11, 1989, 1-318980
Int. Cl.[5] H01L 27/02, 27/04, 27/12, 21/302
U.S. Cl. 357—49 15 Claims

1. A dielectric isolation substrate comprising:

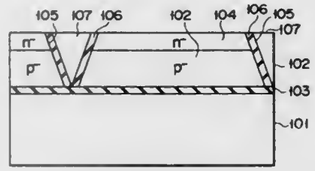
a first semiconductor wafer;

a second semiconductor wafer bonded on said first semiconductor wafer with a first insulating layer interposed therebetween;

an epitaxial semiconductor layer formed on the second semiconductor wafer and having a conductivity type opposite to the conductivity type of the second semiconductor wafer;



a first groove formed in said semiconductor layer and said second semiconductor wafer so as to reach said insulating



layer, thereby forming isolated regions of the semiconductor layer and the second semiconductor wafer; and

a second insulating layer formed in the first groove.

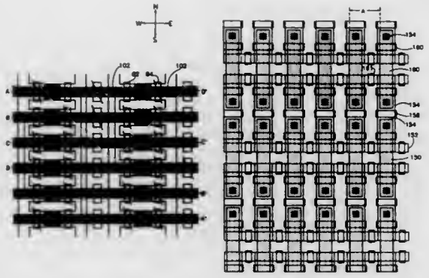
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5,049,969

## CUSTOMIZABLE SEMICONDUCTOR DEVICES

Zvi Orbach, 143A Derech Yayam; Meir Janai, 12 Martin Buber Street; Uzi Yoeli, 8 Givat Downs Street, all of Haifa, and Gideon Amir, 4 Hashalom Street, Ra'anana, all of Israel

Continuation-in-part of Ser. No. 222,514, Jul. 21, 1988, Pat. No. 4,933,738. This application Apr. 28, 1989, Ser. No. 344,582
Claims priority, application Israel, Apr. 25, 1988, 86162
The portion of the term of this patent subsequent to Jun. 12, 2007, has been disclaimed.
Int. Cl.[5] H01L 27/02, 27/20, 23/48
U.S. Cl. 357—51 11 Claims



8. A selectably customizable semiconductor device comprising:

a metal I layer disposed in a first plane and comprising first elongate strips extending parallel to a first axis, first fusible links being formed on said metal I layer; and

a metal II layer disposed over said metal I layer in a second plane generally parallel to and electrically insulated from said first plane and comprising second elongate strips extending parallel to a second axis, said second axis being generally perpendicular to said first axis, whereby a multiplicity of elongate strip overlap locations are defined at which the elongate strips of said metal I and metal II layers lie in overlapping electrical insulating relationship, second fusible links being formed on said metal II layer at locations which overlap said first elongate strips.

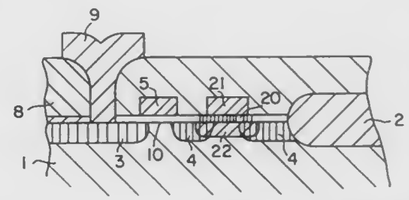
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5,049,970

## HIGH RESISTIVE ELEMENT

Kenichi Tanaka; Shigeo Onishi, both of Nara; Toshiyuki Okumura, Tenri, and Keizo Sakiyama, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 272,662, Nov. 17, 1988, abandoned. This application Jun. 12, 1990, Ser. No. 537,154
Claims priority, application Japan, Nov. 17, 1987, 62-290832
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—51 4 Claims



1. A high resistive element that constitutes an element of integrated circuits comprising an oxide film formed on a semiconductor substrate and a polysilicon film formed on said oxide film, said polysilicon film being positioned above an impurity region in said substrate, wherein said high resistive element is prepared in said oxide film at the same time that said impurity region is formed by ion injection of silicon ions and conductive impurities in said substrate through said polysilicon film so that the concentration of silicon and the concentration of conductive impurities are both greatest at the interface between the semiconductor substrate and the oxide film, wherein said high resistive element exhibits a resistance of 1 teraohm or more.

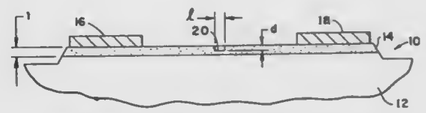
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5,049,971

## MONOLITHIC HIGH-FREQUENCY-SIGNAL SWITCH AND POWER LIMITER DEVICE

Charles F. Krumm, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 544,294, Oct. 21, 1983, abandoned. This application Nov. 15, 1990, Ser. No. 614,579
Int. Cl.[5] H01L 29/06, 27/24, 27/01, 29/10
U.S. Cl. 357—55 3 Claims



1. A switch and power limiter device comprising:

a) a semi-insulating substrate;

b) a semiconductor layer formed at a surface of said substrate, said layer having a groove therein extending across

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the width of said layer, said groove having a depth less than the thickness of said layer and having a length less than approximately 3000 Å; and

c) first and second contacts provided to said semiconductor layer on opposite sides of said groove, respectively.

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**5,049,972**

## METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

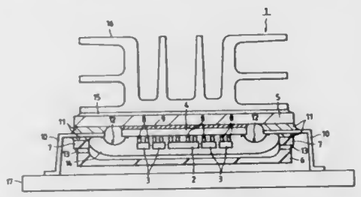
**Takayuki Uda; Tasuku Tanaka, both of Ohme; Yoshiaki Emoto, Higashiyamato, and Shigeo Kuroda, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 299,540, Jan. 18, 1989, abandoned. This application Jun. 26, 1990, Ser. No. 544,064**

**Claims priority, application Japan, Jan. 29, 1988, 63-19804; Jan. 29, 1988, 63-19805; Jan. 29, 1988, 63-19806; Jan. 29, 1988, 63-19807**

**Int. Cl.[5] H01L** *23/48, 27/02, 27/10*

**U.S. Cl. 357—68** **16 Claims**



1. A semiconductor integrated circuit device, comprising:

a memory cell array portion on a semiconductor substrate, and including a plurality of memory cells arranged in the shape of a matrix;

a peripheral circuit portion including a plurality of transistors on said semiconductor substrate;

a plurality of external terminals on said semiconductor substrate; and

a plurality of bump electrodes each connected to each of said plurality of external terminals, wherein said plurality of external terminals are at a portion of said semiconductor substrate other than at said memory cell array portion.

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**5,049,973**

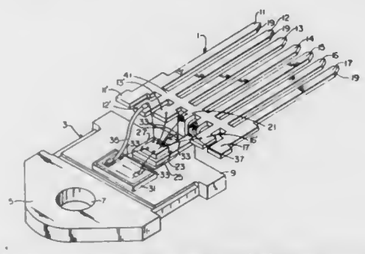
## HEAT SINK AND MULTI MOUNT PAD LEAD FRAME PACKAGE AND METHOD FOR ELECTRICALLY ISOLATING SEMICONDUCTOR DIE(S)

**Robert J. Satriano, Hackettstown, N.J., and Thomas R. McLean, Mountaintop, Pa., assignors to Harris Semiconductor Patents, Inc., Melbourne, Fla.**

**Filed Jun. 26, 1990, Ser. No. 543,307**

**Int. Cl.[5] H01L** *23/48*

**U.S. Cl. 357—70** **14 Claims**



1. An assembly for packaging electrical components, comprising:

a heat sink including a portion thereof providing a substantially flat mounting surface for receiving electrical components;

a lead frame including a plurality of juxtaposed leads, each being formed to provide contact fingers at outer ends, respectively, the inner portions of said leads being initially connected together via bridging elements formed therebetween, selected ones of inner ends of said leads being formed to provide terminal pads for receiving electrical conductors, at least one of said inner ends of said leads being rigidly attached to said heat sink for retaining said leads in a first plane substantially spaced above and parallel with the primary plane of the mounting surface of said heat sink, with the inner ends of a majority of said leads being substantially above a lower edge of the mounting surface of said heat sink, at least one of said inner ends being both extended and formed into a paddle-like mounting pad positioned over and spaced away from a preselected area of the mounting surface of said heat sink, said mounting pad having a top surface for receiving an electrical component;

a first dielectric material being inserted between a bottom surface of said mounting pad and the underlying mounting surface of said heat sink, for electrically isolating said mounting pad and its associated lead from said heat sink, and thereby so electrically isolating any electrical component mounted upon said mounting pad;

the one of said inner ends rigidly attached to said heat sink, being bent substantially at a right angle from the plane of said lead frame toward the plane of said heat sink, and rigidly attached to the face of an edge of said heat sink underlying said lead frame; and

a second dielectric material being molded over and enclosing in an encapsulated manner, the mounting surface of said heat sink and associated electrical components, said mounting pad and its associated electrical component, and said terminal pads, whereby after said second dielectric material is formed about said assembly, said bridging elements between said leads are severed, leaving the inner ends of said leads bonded to and separated from said heat sink by said second dielectric material.

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**5,049,974**

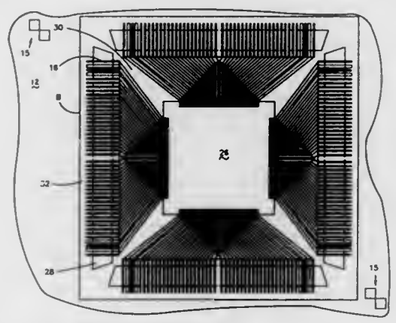
## INTERCONNECT DEVICE AND METHOD OF MANUFACTURE THEREOF

**Gregory H. Nelson, Gilbert, Ariz.; Sanford Lebow, Westlake, Calif., and Eugene Nogavich, Gilbert, Ariz., assignors to Roger Corporation, Rogers, Conn.**

**Division of Ser. No. 352,112, May 15, 1989, Pat. No. 4,995,941. This application Jun. 29, 1990, Ser. No. 534,038**

**Int. Cl.[5] H01L** *23/48, 29/44, 29/52, 29/60*

**U.S. Cl. 357—70** **11 Claims**



1. An interconnect device for electronic components comprising:



a conductive pattern of leads bonded to a sheet of dielectric on one side thereof;

a conductive sheet bonded to said dielectric sheet on the side thereof opposite to said leads;

a plurality of via holes extending through said conductive sheet and dielectric sheet to said leads;

electrically conductive material extending through said via holes and over said conductive sheet to form a conductive layer and electrically interconnecting at least one of said leads with said conductive sheet;

at least one window through said conductive layer, conductive sheet, and dielectric sheet, said window exposing said leads;

at least one frame surrounding said window, said frame being defined by second windows spaced from said first window and passing through said conductive layer, conductive sheet, and dielectric sheet to expose said leads;

said via holes and windows being formed at least in part by laser etching wherein said conductive sheet forms a mask for laser etching of said via holes and said conductive layer forms a mask for laser etching of said windows.

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**5,049,975**

## MULTI-LAYERED INTERCONNECTION STRUCTURE FOR A SEMICONDUCTOR DEVICE

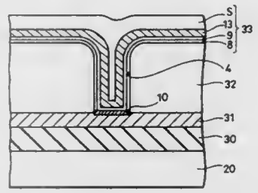
**Natsuo Ajika, and Hideaki Arima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 12, 1990, Ser. No. 492,032**

**Claims priority, application Japan, Mar. 14, 1989, 1-63066; Sep. 27, 1989, 1-250890**

**Int. Cl.[5] H01L** *23/48*

**U.S. Cl. 357—71** **5 Claims**



1. An interconnection layer for a semiconductor device, comprising:

a refractory metal silicide layer formed on a surface of a silicon layer;

a first refractory metal nitride layer formed on said refractory metal silicide layer by a sputtering process so as to provide said first refractory metal nitride layer with a first crystalline structure;

a second refractory metal nitride layer formed on said first refractory metal nitride layer by thermal nitriding process so as to provide said second refractory metal nitride layer with a second crystalline structure which differs from said first crystalline structure of said first refractory metal nitride layer, said second crystalline structure comprising a close packed structure; and

a conductor layer on said second refractory metal nitride layer.

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**5,049,976**

## STRESS REDUCTION PACKAGE AND PROCESS

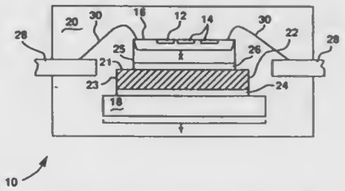
**Jeffrey C. Demmin, Palo Alto, and Rajendra D. Pendse, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Jan. 10, 1989, Ser. No. 295,595**

**Int. Cl.[5] H01L** *23/48*

**U.S. Cl. 357—71** **10 Claims**

1. An integrated circuit package, which comprises a die attach pad, a stress reduction pad attached to said die attach pad, said stress reduction pad having a coefficient of thermal expansion equal to or approximately matching the coefficient of thermal expansion of silicon, a silicon integrated circuit die attached to a surface of said stress reduction pad facing away from said metal die attach pad, the surface having a portion extending beyond each side of said integrated circuit die, and an encapsulating body of thermosetting resin around said die attach pad, said stress reduction pad and said integrated circuit die, said thermosetting resin adhering to the surface portion to produce an enhanced stress reduction, said stress reduction pad



having vertical edges extending above said die attach pad proximate to vertical edges of the integrated circuit die, said vertical edges of said stress reduction pad resisting forces applied by said thermosetting resin to said vertical edges of the stress reduction pad and to said integrated circuit die to reduce stress applied by said thermosetting resin to said integrated circuit die, said integrated circuit die being symmetrically placed on said stress reduction pad and said stress reduction pad having a width of about $(x+y)/2$, where x is a width of said integrated circuit die and y is a width of said die attach pad.

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**5,049,977**

## PLASTIC MOLDED TYPE SEMICONDUCTOR DEVICE

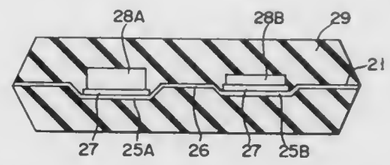
**Shigeki Sako, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jul. 12, 1990, Ser. No. 551,442**

**Claims priority, application Japan, Jul. 18, 1989, 1-185623**

**Int. Cl.[5] H01L** *23/28, 23/16, 29/52, 29/44*

**U.S. Cl. 357—72** **7 Claims**



1. A resin-molded type semiconductor device comprising:

a metal plate-like lead frame being partially bent and having an upper surface;

at least two islands, each having an upper surface located below the upper surface of said lead frame, the upper surface of each of said at least two islands being spaced from the upper surface of said lead frame by a different distance;

at least two semiconductor chips, at least one of said chips mounted on each of said at least two islands, said at least two semiconductor chips having substrates of different thicknesses; and

a resin package containing said semiconductor chips;

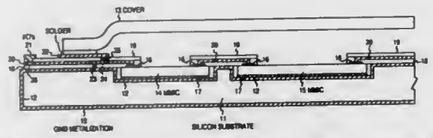
wherein the distances between the upper surfaces of said lead frame and the upper surfaces of said at least two islands and determined in accordance with the thicknesses of said substrates.

5,049,978

## CONDUCTIVELY ENCLOSED HYBRID INTEGRATED CIRCUIT ASSEMBLY USING A SILICON SUBSTRATE

David A. Bates, Fayetteville; Ronald B. Browne, Liverpool, and David P. Smith, Clay, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Sep. 10, 1990, Ser. No. 579,652
Int. Cl.[5] H01L *23/12, 23/14, 23/06, 23/10*
U.S. Cl. 357—74 15 Claims




1. A conductively enclosed hybrid integrated circuit assembly for operation at microwave and millimeter wave frequencies comprising:

(a) a substrate of silicon having at least one shallow recess of a predetermined depth and having a flat bottom for reception of an integrated circuit chip, the upper and under surfaces of said substrate, including the bottom of each recess, being conductive and connected together to provide a low impedance signal ground,

(b) at least one integrated circuit chip having a thickness equal to said predetermined depth, the upper surface thereof having electrical terminal pads thereon and the under surface thereof having a ground plane, bonded to the bottom of said recess to bring the upper surfaces of said at least one chip and substrate into coplanarity, the bond being electrically conductive to connect the chip ground plane to the substrate signal ground,

(c) a first dielectric layer bonded to the upper surface of said substrate and to the upper surface of said at least one chip for bridging said upper surfaces, said dielectric layer being perforated over said chip terminal pads and in a cover sealing region;

(d) a first patterned metallization applied to said first dielectric layer and penetrating said perforations for connection to said chip terminal pads, for input/output (I/O) connections and for electrically grounding a cover,

(e) a second dielectric layer having the bottom surface bonded to the upper surface of said first dielectric layer and perforated over said first metallization for I/O connections and in said cover sealing region,

said first and second dielectric layers bounding said first patterned metallization being of a thickness suitable for efficient wave transmission at said operating frequencies,

(f) a second patterned metallization applied to said second dielectric layer and penetrating said perforations for I/O connection and in said cover sealing region for attaching and grounding a conductive cover, and

(g) a conductive cover for said assembly of a solderable material, solder-sealed to the cover attaching surfaces of said second patterned metallization to complete a sealed, conductive enclosure.

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5,049,979

## COMBINED FLAT CAPACITOR AND TAB INTEGRATED CIRCUIT CHIP AND METHOD

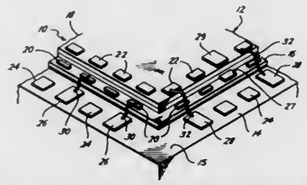
Seyed H. Hashemi, and David H. Carey, both of Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Filed Jun. 18, 1990, Ser. No. 539,632
Int. Cl.[5] H01L *23/12, 23/14, 23/52*
U.S. Cl. 357—75 19 Claims

1. A combined flat capacitor and TAB integrated circuit chip, comprising:

an integrated circuit chip having a top active surface with a plurality of bonding pads including power and ground pads on the top around the outer periphery of the chip, wherein the bonding pads are bonded to TAB leads, and

a flat capacitor, having first and second electrodes and a dielectric therebetween with the first electrode connected to a capacitor power pad on the top surface of the capacitor and the second electrode connected to a capacitor



ground pad on the top surface of the capacitor, and having an area smaller than the top area of the chip, inverted with the capacitor power pad and capacitor ground pad aligned with and bonded to the TAB leads connected to power and ground pads on the chip, thereby providing a close-attached capacitor which reduces switching noise in the chip.

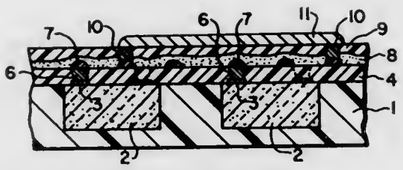
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5,049,980

## ELECTRONIC CIRCUIT DEVICE AND METHOD OF MANUFACTURING SAME

Tamio Saito, Ome; Masayuki Ohuchi, Komae, and Akira Niitsuma, Ohta, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 14, 1988, Ser. No. 181,526
Claims priority, application Japan, Apr. 15, 1987, 62-92290
Int. Cl.[5] H01L *39/02, 23/16, 23/48*
U.S. Cl. 357—80 9 Claims




1. An electronic circuit device, comprising:

an insulating substrate;

a plurality of semiconductor elements formed in respective recesses of said insulating substrate, and electrodes formed on the semiconductor elements and in a same plane as a main surface of said insulating substrate;

a first photosensitive dry film on said main surface of the substrate and on said semiconductor elements, and having openings at locating corresponding to said electrodes of said semiconductor elements;

a plurality of first conductors, each filling in said openings of the first photosensitive dry film; and

first wiring patterns formed on the first photosensitive dry film and connected to the first conductors.

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5,049,981

## HEAT SINK FOR ELECTRONIC CIRCITRY

D. W. Dahringer, Glen Ridge, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 19, 1990, Ser. No. 599,947
Int. Cl.[5] H01L *23/02, 39/02;* F28F *7/00;* H02G *3/08*
U.S. Cl. 357—81 19 Claims

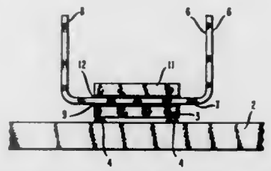
1. An article comprising

an element mounted on a surface of a support base,

a heat-sink of a high heat conductivity material having a bottom portion attached to an upper surface of the element and at least one flange projecting from the bottom portion, and

a stress-balancing insert positioned on the bottom portion,





the bottom portion of the heat-sink being secured to the element and to the insert by means of an adhesive, and the insert being of a material having coefficient of thermal expansion, $\alpha_1$, which is different from the coefficient of thermal expansion of the high heat conductivity material of the heat sink, $\alpha_2$.

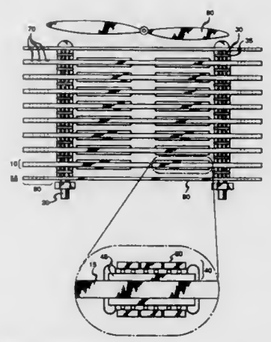
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5,049,982

## ARTICLE COMPRISING A STACKED ARRAY OF ELECTRONIC SUBASSEMBLIES

Yung-Cheng Lee, Boulder, Colo., and John M. Segelken, Morristown, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 387,480, Jun. 6, 1989, abandoned. This application May 10, 1990, Ser. No. 519,728
Int. Cl.[5] H01L *23/02*
U.S. Cl. 357—81 11 Claims



1. An article, comprising:

(a) at least two primary substrates, each having two substantially planar, parallel major surfaces which are electrically insulating, each primary substrate incorporating at least one thermally conductive layer, to be referred to as a "thermally conductive member;"

(b) means for supporting the primary substrates along a stacking direction, here referred to as "vertical", such that the primary substrates are in a stacked relationship and the major surfaces are substantially perpendicular to the vertical direction;

(c) spacer means included between the at least two primary substrates such that the spacer means are in touching contact with a major surface of each of the at least two primary substrates and the primary substrates are separated by a predetermined distance, the spacer means comprising multiple, essentially independent channels for conducting electricity in a substantially vertical direction;

(d) impelling means for causing a coolant fluid to pass substantially in the vertical direction through at least a portion of the stack;

(e) a pattern of electric conductors formed on at least one major surface of each primary substrate, the conduction pattern overlying the thermally conductive member, such that at least one conductor pattern on a given primary substrate is electrically connected to a conductor pattern on the other primary substrate through at least two independent channels in the spacer means that are included between the primary substrates; and

(f) at least two electronic integrated circuits overlying and in electrical contact with each conductor pattern such that at least a portion of the heat generated by the integrated circuits flows into the underlying thermally conductive member, wherein

(g) each primary substrate is divided into an interior region and a peripheral region at least partially surrounding the interior region, each conductor pattern overlies a corresponding interior region, and each peripheral region is perforated by a pattern of holes such that heat flowing from integrated circuits into the corresponding thermally conductive member can flow toward the holes;

(h) the impelling means cause the coolant fluid to pass through at least some of the holes of each primary substrate; and

(i) the predetermined distance between primary substrates is adapted to cooperate with the hole patterns to create turbulence in the coolant flow which enhances thermal contact between the coolant fluid and at least one major surface of each base member, resulting in efficient heat exchange at the major surface.

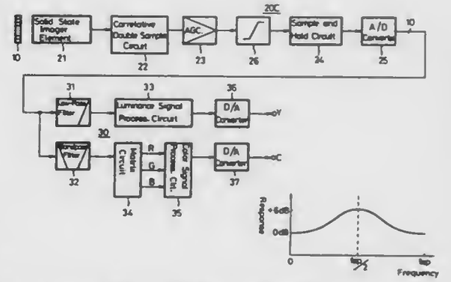
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5,049,983

## DIGITAL CAMERA APPARATUS HAVING AN ANALOG EMPHASIS CIRCUITRY

Hiroaki Matsumoto, Chiba; Tokuya Fukuda, Tokyo, and Tetsuya Senda, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 9, 1990, Ser. No. 593,964
Claims priority, application Japan, Oct. 19, 1989, 1-272340
Int. Cl.[5] H04N *9/083, 9/68*
U.S. Cl. 358—44 6 Claims




1. A digital camera apparatus comprising:

a color filter assembly in which one primary color filter element and three complementary color filter elements are arranged in a plurality of rows and columns in a checkered pattern;

a solid-state imager element having light receiving picture elements arranged in a two-dimensional array, wherein said primary and complementary color filter elements and said light receiving picture elements are opposed to each other, and from which an analog luminance signal component and an analog carrier chrominance signal component are produced upon horizontally scanning two rows of said light receiving picture elements simultaneously;

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an emphasizing circuit for emphasizing said carrier chrominance signal component; and

processing means for digitally processing said analog luminance signal component and said emphasized carrier chrominance signal component for producing a digital luminance signal and a digital chrominance signal.

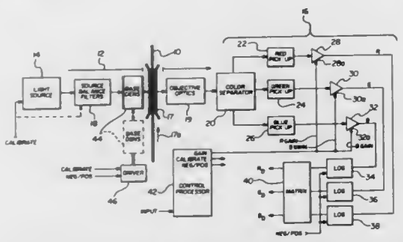
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**5,049,984**

## MOTION PICTURE TELECINE BALANCED FOR NEGATIVE SCANNING

**Leslie G. Moore, Jr., Webster, and Glenn L. Kennel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sep. 12, 1989, Ser. No. 406,407**
**Int. Cl.[5] H04N** *9/11*
**U.S. Cl. 358—54** **26 Claims**



1. Telecine scanning apparatus for processing color motion picture negative and print film in a scanner which interposes said film in an optical light path between a light source and a pickup stage that develops a plurality of separate color output signals corresponding to respective color light transmissions through the film, characterized in that

said pickup stage provides substantially equivalent output levels in the respective colors for respective color light transmissions through the film substantially equivalent to corresponding light transmissions through the base density of a negative film, said base density further embodied in an optical filter that is selectively inserted into the optical light path for print scanning to maintain substantial equivalence of the output levels whether scanning negative or print film.

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**5,049,985**

## COLOR IMAGES READING APPARATUS HAVING TRANSFORMATION TABLE FORMED BASE ON AVERAGE VALUES OF PLURAL COLOR COMPONENT SIGNALS

**Ken-Ichi Outa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

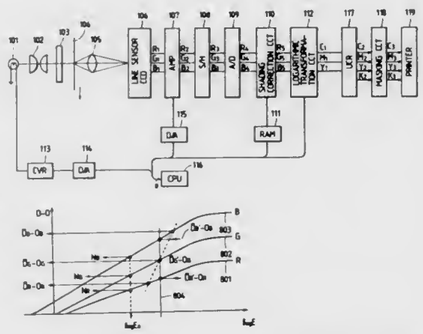
**Filed Oct. 11, 1989, Ser. No. 419,702**
**Claims priority, application Japan, Oct. 13, 1988, 63-256024; Oct. 13, 1988, 63-256025**
**Int. Cl.[5] G03F** *3/10*
**U.S. Cl. 358—76** **17 Claims**

1. A color image reading apparatus comprising:

reading means for color-separating and reading a color image;

operating means for obtaining an average value of each of a plurality of color-component signals output from said reading means; and

transforming means for transforming the plurality of color-component signals from said reading means into a plurality of color density signals, wherein said transforming means performs transformation such that average values of the plurality of color-density signals become substantially equal to each other on the basis of the average values



of the plurality of color-component signals obtained by said operating means.

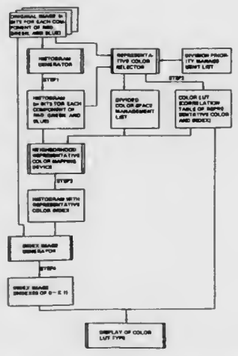
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**5,049,986**

## METHOD AND APPARATUS FOR COLOR IMAGE QUANTIZATION

**Masaki Aono, Tokyo, and Kazutoshi Sugimoto, Wakoh, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 26, 1989, Ser. No. 427,680**
**Claims priority, application Japan, Oct. 27, 1988, 63-269514**
**Int. Cl.[5] H04N** *1/46*
**U.S. Cl. 358—80** **7 Claims**



1. A method for color image quantization which comprises selecting "k" display colors among $2^{\epsilon ni}$ colors obtained by assigning $n_i$ bits for representing the intensity level of each of "a" kinds of basic color, wherein the index (i) has values $(1 \leqq i \leqq a)$, and quantizing an original color image comprising a number of pels for which any one of the said $2^{\epsilon ni}$ colors may be assigned so that it may be displayed with said "k" display colors, further comprising:

(a) inputting the said original image, sampling it in a color-space defined by assigning $m_i (m_i \leqq n_i)$ bits for representing intensity level of each of said "a" kinds of basic color, and generating an a-dimension histogram,

(b) repeating dividing a color-space into X child-spaces, when calculating a space-occupying number by:



calculating the number of pels assigned for colors within each generated child-space, referring to the said histogram,

and multiplying the calculation result by a weighting-factor corresponding to a level of the divided color-space, the weighing-factor having a decreasing value for deeper levels of division,

(c) preparing a tree-structured list which describes a parent-child relationship of color-spaces, and updating the list by registering a newly generated color space each time a color space is divided,

(d) selecting "k" color spaces as representative color spaces in descending order of the space-occupying number, among those located at ends of the tree-structured list.

(e) selecting a representative color for each of the said "k" representative color-spaces, and providing the representative color with an index,

(f) for a color other than the representative color within each of the said "k" representative color-spaces, giving the non-representative color the index assigned to the representative color of the color-space,

for a color within a color-space other than the said representative color-spaces in the said tree-structured list, finding a representative color-space located close to the color-space in said tree-structured list, and giving it the index assigned to the found representative color-space,

(g) for each pel in said original image, obtaining an index given to the color assigned to the pel, and storing it in a storage means.

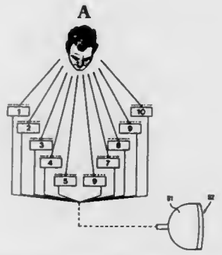
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**5,049,987**

## METHOD AND APPARATUS FOR CREATING THREE-DIMENSIONAL TELEVISION OR OTHER MULTI-DIMENSIONAL IMAGES

**Reuben Hoppenstein, 303 Second Ave., New York, N.Y. 10003**

**Filed Oct. 11, 1989, Ser. No. 420,158**
**Int. Cl.[5] H04N** *13/00*
**U.S. Cl. 358—88** **10 Claims**




1. An apparatus for creating multi-dimensional images comprising:

(a) a plurality of image capture devices arranged in a predetermined pattern about a target image;

(b) a first lenticular device located at a first predetermined position between said image capture devices and said target image;

(c) means for displaying images captured by said image capture devices; and

(d) a second lenticular device located at a second predetermined position adjacent to said displaying means, said first and second lenticular devices being identical in shape and optical characteristics.

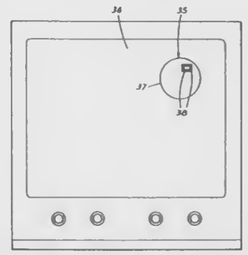
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**5,049,988**

## SCANNING T.V. CAMERA

**Alan K. Sefton, Haslemere, and David J. Cotton, Aldershot, both of United Kingdom, assignors to Pearpoint Limited, Bordon, United Kingdom**

**Filed Aug. 10, 1989, Ser. No. 392,425**
**Int. Cl.[5] H04N** *7/18, 5/222*
**U.S. Cl. 358—93** **9 Claims**



1. In a camera system for scanning a field of view and having a camera lens, an image-sensor which is movable in the focal plane of said lens, drive means for moving the image-sensor in said focal plane, and a monitor screen; the improvement comprising means for deriving feed-back signals from said image-sensor drive means to display on said screen the position of said image-sensor and thus that section of a field of view which is being inspected, an optical overlay on said screen representing the field of view of the camera, and the position of said image-sensor being displayed within said overlay.

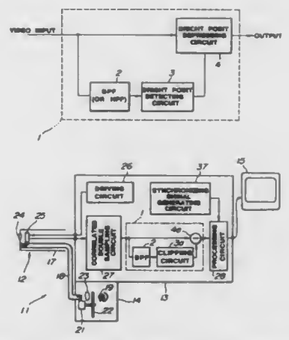
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**5,049,989**

## METHOD AND CIRCUIT FOR REDUCING THE INFLUENCE OF A BRIGHT IMAGE AREA IN AN ENDOSCOPE IMAGE SIGNAL

**Kiyoshi Tsuji, Musashino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Jan. 4, 1990, Ser. No. 460,784**
**Int. Cl.[5] A61B** *1/04;* **H04N** *5/235*
**U.S. Cl. 358—98** **33 Claims**



1. A method of reducing influence of a bright part of an image in an endoscope image signal comprising respective steps of:

extracting, from said endoscope image singal, a signal component of said bright part of said image in which a difference in brightness level at a periphery of said image is above a predetermined value and a spatial size of said bright part is below a predetermined value; and

depressing said bright part of said image in said endoscope image signal or a signal based on said endoscope image

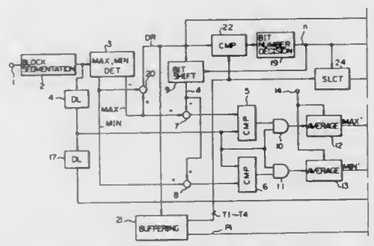
VOL 1130 ISS 3 SE 17 1991 UMI



signal by using said signal component of said bright part of said image.

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**5,049,990**
**HIGHLY EFFICIENT CODING APPARATUS**
**Tetsujiro Kondo, and Atsuo Yada, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**
**Filed Jul. 17, 1990, Ser. No. 553,333**
**Claims priority, application Japan, Jul. 21, 1989, 1-189888**
**Int. Cl.[5] H04N** *7/12*
**U.S. Cl. 358—133** **10 Claims**

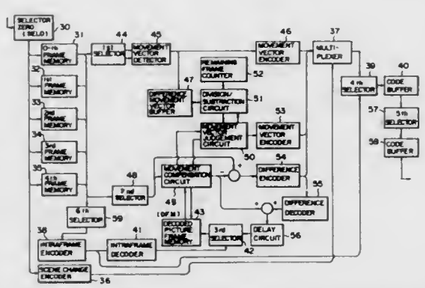


1. A highly efficient coding apparatus for coding digital video data in a bock format allowing video data compression for transmission by data transmission means having a predetermined transmission capacity, said coding apparatus comprising:
detecting means for detecting maximum and minimum values of the digital video data of plural picture elements in a block;
first averaging means for averaging the digital video data having values between said maximum value and a first value which is a first predetermined level lower than said maximum value for generating a modified maximum value;
second averaging means for averaging the digital video data having values between said minimum value and a second value which is a second predetermined level higher than said minimum value for generating a modified minimum value;
means for subtracting said modified minimum value from the digital video data for each of said picture elements to generate modified digital video data;
means for generating modified dynamic range information from said modified maximum and minimum values;
means for determining an encoding bit number for each block during a predetermined period on the basis of said predetermined transmission capacity of said data transmission means;
edge-match encoding means for encoding said modified digital video data with said encoding bit number; and
means for transmitting an output of said encoding means, a first additional code for each block formed of at least two of said modified maximum and minimum values and a signal based on said modified dynamic range information, and a second additional code for each said predetermined period.

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**5,049,991**
**MOVEMENT COMPENSATION PREDICTIVE CODING/DECODING METHOD**
**Takami Niihara, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan**
**Filed Feb. 20, 1990, Ser. No. 482,178**
**Claims priority, application Japan, Feb. 20, 1989, 1-41347**
**Int. Cl.[5] H04N** *7/137*
**U.S. Cl. 358—136** **10 Claims**

1. A movement compensation predictive coding method where a frame of picture information to be processed is divided into blocks and a movement vector is obtained by comparing corresponding picture information in the divided blocks between frames, and producing coded picture signal based on the movement vector, said coding method including:
a first step of detecting a movement vector $MV_M$ which is a difference between a N-th frame ($N \geqq 0$) and a (N+M)-th frame ($M \geqq 2$) of a series of inputted frames of picture signal, said movement vector $MV_M$ being assumed as an initial value of a difference movement vector MVe, and to detect a movement vector MVi which is a difference between the (N+1)-th frame (i=0, 1, 2, . . . , M−1) and (N+i+1)-th frame;
a second step wherein when a detected movement vector MVi exists in the vicinity of a predictive movement vector MVe/(M−i) predicted from the difference movement vector MVe, the predictive movement vector MVe/(-M−i) is assumed as a correct movement vector, and a



movement compensation predictive coding is performed on a frame of pixels to be processed presently based on pixels predicted from adjacent pixels in a vicinity of a coordinate indicated by the predictive movement vector MVe/(M−i), and obtaining a first subsegment difference movement vector by subtracting the predictive movement vector MVe/(M−i) from the difference movement vector MVe; and
a third step wherein when no detected movement vector MVi exists in the vicinity of a predictive movement vector MVe/(M−i), the detected movement vector MVi is assumed a movement vector, and a movement compensation predictive coding is performed on a frame of pixels using the movement vector MVi, and obtaining a second subsegment difference movement vector by subtracting the movement vector from the difference movement vector MVe.

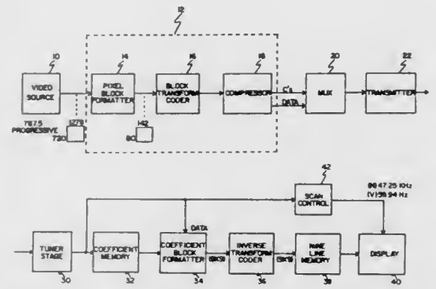
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**5,049,992**
**HDTV SYSTEM WITH RECEIVERS OPERABLE AT DIFFERENT LEVELS OF RESOLUTION**
**Richard W. Citta, Oak Park, and Jerry K. Pearlman, Wilmette, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.**
**Filed Aug. 27, 1990, Ser. No. 573,436**
**Int. Cl.[5] H04N** *7/01, 11/20*
**U.S. Cl. 358—140** **49 Claims**

1. A television signal transmission system comprising:
means for sub-band coding a wideband video signal characterized by a raster comprising P progressively scanned horizontal lines per frame for providing a plurality of (×N) blocks of spectral coefficients, each of said N×N) blocks representing a respective spatial portion of a frame of said video signal;
means for compressing the coefficients of each of said (N× N) blocks;
means for transmitting said compressed coefficients;
means for receiving said transmitted compressed coefficients;



processing means responsive to said received coefficients for deriving a block of video pixels of dimension (n×n) corresponding to each of said blocks of coefficients, where n is less than N by a first selected factor; and



display means responsive to said derived pixels for reproducing a video image characterized by a raster comprising p progressively scanned horizontal lines per frame, where p is less than P by a second selected factor, representing sad wideband video signal.

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**5,049,993**
**FORMAT CONVERSION PREPROCESSING METHOD AND CIRCUIT**
**Didier J. LeGall, Los Altos, Calif., and Fure-Ching Jeng, Belle Mead, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.**
**Filed Oct. 3, 1990, Ser. No. 592,195**
**Int. Cl.[5] H04N** *7/01*
**U.S. Cl. 358—140** **7 Claims**

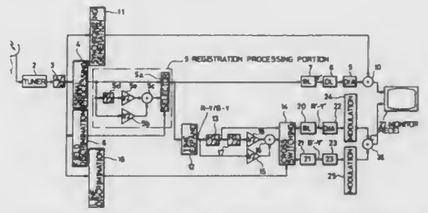


1. A method for converting between a high resolution interlaced video sequence having two fields per frame and a low resolution progressive video sequence comprising the steps of
filtering said interlaced sequence in the vertical-time domain with a low-pass linear filter having a diamond-shaped pass-band to form a first intermediate progressive sequence,
filtering said first intermediate progressive sequence with a non-linear filter to form a second intermediate progressive sequence, and
decimating said second intermediate progressive sequence to form said low resolution progressive sequence.

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**5,049,994**
**SYSTEM FOR CONVERTING INTERLACED VIDEO SIGNALS TO SEQUENTIAL VIDEO SIGNALS**
**Katsumi Nakamuva, Misato, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan**
**Filed May 3, 1990, Ser. No. 518,526**
**Claims priority, application Japan, May 13, 1989, 1-120128**
**Int. Cl.[5] H04N** *7/01*
**U.S. Cl. 358—140** **6 Claims**

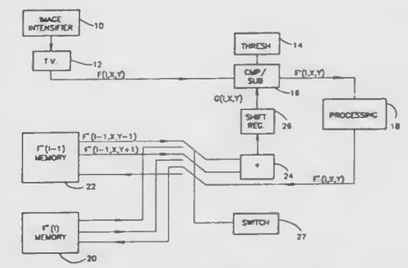
1. A system converter device for converting a first video signal having a first predetermined number of scanning lines per frame based on an interlaced scanning system to a second video signal having a second predetermined number of scanning lines per frame based on a sequential scanning system comprising:
receiving means for receiving the first video signal;
conversion means, operatively connected to said receiving means, for converting the first predetermined number of the scanning line signals for each field included in the first video signals to the second predetermined number; and
registration means, operatively connected to said conversion means, for positioning scanning line signals of two continuous fields converted by said conversion means;
said registration means including,



at least one delay means, operatively connected to an output of said conversion means, for delaying a signal of either an even or an odd number field converted by said conversion means by a predetermined period of time,
adding means for adding a signal delayed by said delay means and a signal of the numbered field not delayed by said delay means, and
selecting means, operatively connected to outputs of said conversion means and said adding means, for providing either signals from said conversion means or signals from said adding means.

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**5,049,995**
**IMAGE INTENSIFIER SYSTEM**
**Yair Shimoni, Jerusalem, Israel, assignor to Israel Aircraft Industries Ltd., Lod, Israel**
**Filed Jan. 19, 1990, Ser. No. 467,814**
**Claims priority, application Israel, Jan. 20, 1989, 89019**
**Int. Cl.[5] H04N** *5/30*
**U.S. Cl. 358—211** **41 Claims**



1. An image intensification system comprising:
an image intensifier for receiving light from an image and providing an image intensifier light output;
a camera for receiving said image intensified light output and for transmitting a television signal including a multiplicity of pixel sets;
a television monitor for receiving said television signal and for translating said television signal into a television image;
means for reducing spikes in said television signal by detecting the spikes in a first pixel set and correcting the spikes with information derived form a second pixel set.

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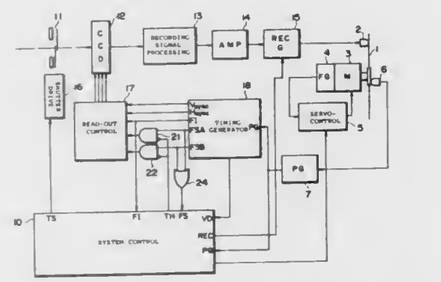


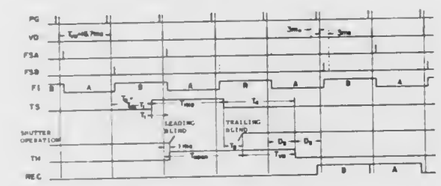
5,049,996

## STILL-VIDEO CAMERA FOR INHIBITING READ-OUT OF A VIDEO SIGNAL WHEN THE SHUTTER IS OPEN

Klyotaka Kaneko; Izumi Miyake, both of Tokyo; Kazutsugu Ogata, Omiya; Kazuhisa Seki, Omyia; Kouji Kaneko, Omiya, and Satoshi Mikajiri, Omiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 13, 1989, Ser. No. 406,547
Claims priority, application Japan, Sep. 16, 1988, 63-229890
Int. Cl.[5] H04N *3/14, 5/335, 5/225*
U.S. Cl. 358—213.13 6 Claims





1. A still-video camera comprising:
an electronic image pick-up device for picking up an image of a subject;
a shutter for controlling incidence of the image of the subject upon said electronic image pick-up device;
timing generator means for generating a field-shift signal, which controls read-out of a video signal from said electronic image pick-up device, slightly later than a synchronizing signal related to recording of the video signal being started;
inhibiting means for inhibiting read-out by the field-shift signal while the shutter is open; and
controlling means for controlling said inhibiting means in such a manner that inhibiting of read-out by said inhibiting means fails to be canceled in an interval from the synchronizing signal to generation of the field-shift signal.

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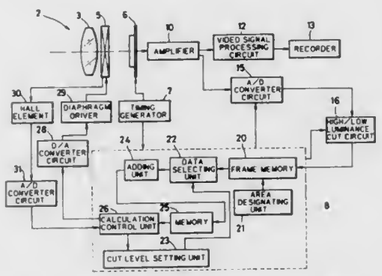
5,049,997

## VIDEO CAMERA EXPOSURE CONTROL METHOD AND APPARATUS FOR PREVENTING IMPROPER EXPOSURE DUE TO CHANGING OBJECT SIZE OR DISPLACEMENT AND LUMINANCE DIFFERENCE BETWEEN THE OBJECT AND BACKGROUND

Fumihito Arai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1990, Ser. No. 505,368
Claims priority, application Japan, Apr. 10, 1989, 1-89923; Apr. 10, 1989, 1-89924; Apr. 14, 1989, 1-94744
Int. Cl.[5] H04N *3/14, 5/335*
U.S. Cl. 358—213.11 16 Claims

1. An exposure control method comprising the steps of:
performing a multi-point photometry of a scene to be imaged with an image area sensor;
dividing said scene into a plurality of areas and calculating an average luminance value of each of said areas;
obtaining a difference between average luminance values of said plurality of areas, and comparing said difference with a threshold value to discriminate a type of scene;



selecting a calculation equation prepared for each type of scene in accordance with said discrimination of said scene, and calculating a luminance value of said scene by using at least one of said average luminance values; and
driving exposure control means in accordance with said scene luminance value.

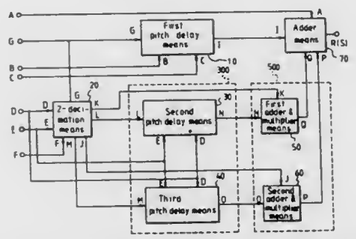
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5,049,998

## CIRCUIT FOR IMPROVING PICTURE QUALITY BY INTERPOLATION IN A VIDEO CAMERA

Hyo-sam Lee, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 4, 1990, Ser. No. 503,943
Claims priority, application Rep. of Korea, Sep. 7, 1989, 89-12947
Int. Cl.[5] H04N *3/15*
U.S. Cl. 358—213.17 9 Claims



1. A circuit for improving picture quality by interpolation, in a video camera, comprising;
a basic clock input terminal for input of a basic clock signal;
first delay means for sampling and holding an input video signal for output as a delayed video signal delayed by a first period;
decimation means for separating said input video signal into two separate signals, a first one of said two separate signals representative of odd pixels of said input video signal and a second one of said two separate signals representative of even pixels of said input video signal, and for sampling said first one of said two separate signals for outputting a first sampled signal and for sampling said second one of said two separate signals for outputting a second sampled signal, said two separate signals also being provided as outputs of said decimation means;
second delay means for delaying said first sampled signal for a second period twice said first period to output a delayed first sampled signal;
third delay means for delaying said second sampled signal for said second period to output a delayed second sampled signal;
first adder and multiplier means for adding said first one of said two separate signals and said delayed first sampled signal for producing a first added signal and for multiplying said first added signal by ½;
second adder and multiplier means for adding said second one of said two separate signals and said delayed second sample signal for producing a second added signal and for multiplying said second added signal by ½; and
means for adding said first added signal multiplied by ½, said second added signal multiplied by ½, said delayed video signal from said first delay means, and said basic clock signal for producing an improved picture signal.

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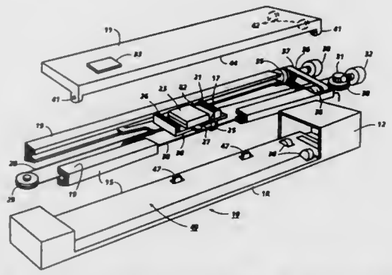


5,049,999

## COMPACT MULTIMODE INPUT AND OUTPUT SCANNER

Denis J. Stemmle, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 2, 1990, Ser. No. 547,887
Int. Cl.[5] H04N *1/028, 1/034, 1/10*
U.S. Cl. 358—296 24 Claims



1. A compact combined input scanner and output scanner comprising a frame assembly containing a carriage movably mounted in said frame assembly for scanning movement in a scanning path in a first direction along the length of said frame assembly, said scanning carriage including a co-mounted reading head secured thereto for scanning a document to produce a digital image of at least a portion of the document and a printing head secured thereto for relative movement with respect to a copy sheet and electrically connected to said reading head for printing said digital image on said copy sheet, said frame assembly including copy sheet and document transport paths including means to index a document through said document path in a direction transverse to said first direction and to index a copy sheet through said copy sheet path in the opposite transverse direction of indexing of said document and wherein the right side pixel of the read head coincides with the lead edge of a portion of a document to be copied and the left side pixel of the print head coincides with the lead edge of the print of said portion on a copy sheet to form a right reading image on the copy sheet.

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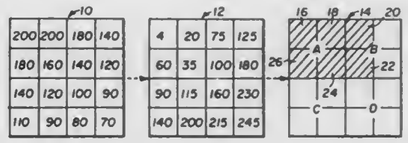
5,050,000

## ERROR DIFFUSION OF SUBCELLS IN DIGITAL HALFTONING

Yee S. Ng, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 21, 1990, Ser. No. 525,583
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—298 11 Claims

1. A method of processing image data for reproduction by a binary rendering device, said method including the steps of:
dividing the image data into a plurality of halftone cells;
subdividing the halftone cells into a plurality of subcells each containing a plurality of input pixels with corresponding input data values;
thresholding the image data to determine with pixels will be reproduced by a subcell by the binary rendering device;



calculating for an entire subcell, any error between the pixels to be rendered and the input data values for the pixels in the subcell; and
comparing an average of the input data values of the pixels in the entire subcell to at least one threshold value.

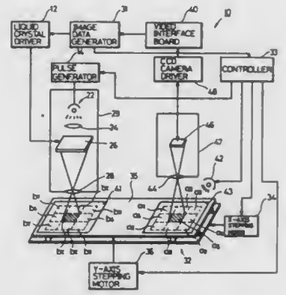
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5,050,001

## PRINTING SYSTEM WITH LIQUID CRYSTAL SHUTTER MATRIX PANEL

Isamu Hatanaka, and Masaaki Takimoto, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 6, 1990, Ser. No. 549,038
Claims priority, application Japan, Jul. 7, 1989, 1-176818; Jul. 7, 1989, 1-176819
Int. Cl.[5] H04N *1/036, 1/10;* B41J *2/445;* G01D *15/14*
U.S. Cl. 358—302 9 Claims



1. A printing system comprising:
a liquid crystal shutter matrix panel;
illuminating means for illuminating said liquid crystal shutter matrix panel from the back thereof;
a photosensitive medium disposed in confronting relation to said illuminating means with said liquid crystal shutter matrix panel interposed therebetween;
positioning means for positioning said liquid crystal shutter matrix panel and said photosensitive medium longitudinally and transversely with respect to each other;
image data generating means for generating image data;
driving means for driving a shutter of said liquid crystal shutter matrix panel based on the image data generated by said image data generating means; and
focusing means for focusing an image formed by said liquid crystal shutter matrix panel onto said photosensitive medium.

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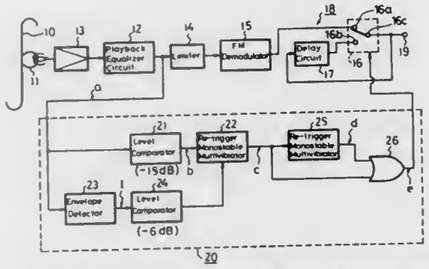


5,050,002

## CIRCUIT FOR DETECTING A DROP-OUT OF A FREQUENCY MODULATED VIDEO SIGNAL

Hideto Suzuki; Teruyuki Yoshida, and Hideki Arai, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 203,804, Jun. 8, 1988, abandoned. This application Apr. 13, 1990, Ser. No. 511,983
Claims priority, application Japan, Jun. 8, 1987, 62-142446
Int. Cl.[5] H04N *5/94*
U.S. Cl. 358—336 3 Claims




3. A drop-out detecting circuit for detecting a drop-out in a frequency modulated video signal reproduced from a slant track on a tape, said circuit comprising:

means for generating a first reference level having a given polarity;

means for generating a second reference level lower than said first reference level but having said given polarity;

means responsive to the frequency modulated video signal for forming an envelope signal corresponding to the frequency modulated video signal;

first level comparing means directly responsive to the envelope signal for making a first comparison of the envelope signal with the first reference level and generating an output signal having a reference period that depends on said first comparison;

second level comparing means directly responsive to the frequency modulated video signal for making a second comparison of the frequency modulated video signal with the second reference level and generating a rectangular waveform output signal having a period that depends on said second comparison; an

period detecting means responsive to said period of the rectangular waveform signal and to said reference period for generating a drop-out detecting signal in accordance with the relation of said period of the rectangular waveform signal to the period of said reference signal.

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5,050,003

## IMAGE PROCESSING APPARATUS CAPABLE OF DISPLAYING A PLURALITY OF SCREENS

Hiroyuki Horii; Yoichi Yamagishi, both of Kawasaki; Hiroyoshi Misumi, Yokohama, and Makoto Takayama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

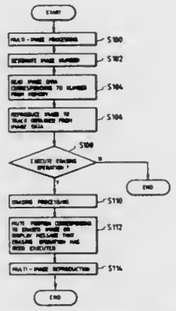
Continuation of Ser. No. 230,042, Aug. 9, 1988, abandoned. This application Nov. 7, 1990, Ser. No. 609,077
Claims priority, application Japan, Aug. 11, 1987, 62-200670; Aug. 12, 1987, 62-201556; Aug. 12, 1987, 62-201557; Sep. 3, 1987, 62-221150; Sep. 3, 1987, 62-221151
Int. Cl.[5] H04N *5/781*
U.S. Cl. 358—342 25 Claims

1. An image processing apparatus comprising:

a) reproducing means for reproducing recorded image data from a medium on which a plurality of image data are recorded;

b) mean for supplying to a monitor the reproduced image data as a multi-screen wherein one screen of the monitor displays a plurality of smaller screens each corresponding to a respective one of the plurality of image data;

c) means for designating at least one of the smaller screens displayed on the multi-screen; and




d) means for erasing from the medium image data corresponding to one of the smaller screens designated by the designating means.

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5,050,004

## FACSIMILE MACHINE TRANSMISSION RATE FALL-BACK ARRANGEMENT

Alfred C. Morton, Jr., Oceanport, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 26, 1989, Ser. No. 457,070
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—405 11 Claims

TABLE 1
THRESHOLD VALUES - STANDARD RESOLUTION

| TRANSMISSION SPEED | TH 0 | TH 1 | TH 2 |
|---|---|---|---|
| 9600 | 20 | 2 | 0 |
| 7200 | 20 | 3 | 1 |
| 4800 | 40 | 8 | 2 |
| 2400 | 80 | 12 | 4 |

TABLE 2
THRESHOLD VALUES - FINE RESOLUTION

| TRANSMISSION SPEED | TH 0 | TH 1 | TH 2 |
|---|---|---|---|
| 9600 | 40 | 20 | 2 |
| 7200 | 40 | 20 | 3 |
| 4800 | 80 | 40 | 8 |
| 2400 | 160 | 80 | 12 |

1. Apparatus for determining the quality of a facsimile page composed of a plurality of scan lines each received at a predetermined transmission rate, said apparatus comprising

means for determining the number of said lines that contain errors,

means operative following receipt of a predetermined number of said scan lines for comparing said number with a threshold value associated with said transmission rate and for causing said predetermined transmission rate to be changed to another transmission rate if said number at least equals said threshold, and

means responsive to said change for changing the value of said threshold as a function of said other transmission rate.

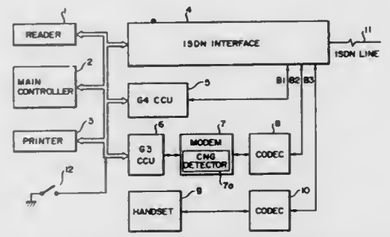


5,050,005

## FACSIMILE APPARATUS

Naoto Kagami, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 320,058
Claims priority, application Japan, Mar. 15, 1988, 63-59248
Int. Cl.[5] H04N *1/32*
U.S. Cl. 358—434 10 Claims




1. A facsimile apparatus connected to an ISDN, comprising:

first communication means for communication with G4 facsimile apparatus via the ISDN in G4 facsimile mode;

second communication means for communicating with G3 facsimile apparatus via the ISDN in G3 facsimile mode;

detecting means for detecting whether or not a signal received via a B channel comes from G3 facsimile apparatus; and

control means for selecting either said first communication mean or said second communication means according to the detection by said detecting means.

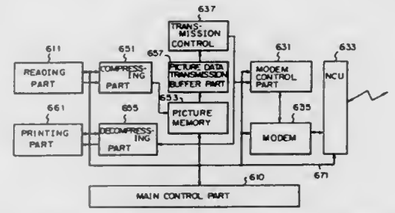
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5,050,006

## MULTI-ADDRESS CALLING SYSTEM

Satoshi Ogawa, Tama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 5, 1989, Ser. No. 333,251
Claims priority, application Japan, Apr. 14, 1988, 63-092397
Int. Cl.[5] H04N *1/00*
U.S. Cl. 358—440 17 Claims




1. A multi-address calling system for transmitting the same picture data to a plurality of destinations, comprising:

reading means for reading the picture data;

compressing means for compressing the picture data read by said reading means;

storing means for storing the picture data compressed by said compressing means;

communication control means for transmitting and receiving signals of communication procedures to and from the destinations; and

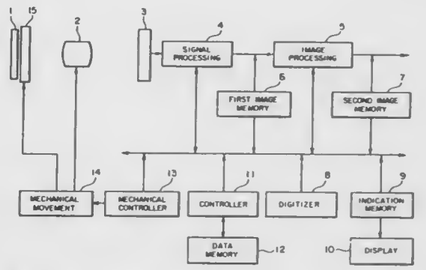
control means for controlling said communication procedures with the destinations so that said communication procedures are effected in parallel with and asynchronous with the operation of said reading means, said compressing means, and said storing means.

5,050,007

## IMAGE-SCANNING APPARATUS AND METHOD THEREFOR

Yuichi Akanabe, Konitachi; Masayuki Inai, Ome; Takashi Niu, Yokohama; Tsuyoshi Katsuta, Hachioji; Tatsuya Kaneniwa, Hachioji, and Yasuhito Shiraishi, Hachioji, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 5, 1989, Ser. No. 375,594
Claims priority, application Japan, Jul. 8, 1988, 63-170271
Int. Cl.[5] H04N *1/387*
U.S. Cl. 358—451 17 Claims




1. An image scanning apparatus for inputting image data representing a plurality of documents to an image processing means, comprising:

a plurality of image document holding means for holding a plurality of corresponding image documents;

a document holder storing means for storing said plurality of image document holding means therein, and individually transferring each of said image document holding means to a scanning means;

said scanning means for irradiating an image document located on a document supporting means, and inputting said image data from said irradiated image document with an input means through a magnification means;

said magnification means for changing the magnification of said image document located on the document supporting means at said input means so that the magnification of said image data is changed; and

said document supporting means being capable of changing the angle of said image document located on the document supporting means relative to said scanning means so that the angle of said image data is changed.

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5,050,008

## TAPE GUIDE APPARATUS HAVING TAPE POSTURE CONTROL POLE

Yuji Kondo, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 27, 1989, Ser. No. 457,879
Claims priority, application Japan, Dec. 27, 1988, 63-329726
Int. Cl.[5] G11B *5/027*
U.S. Cl. 360—85 4 Claims

1. A tape guide apparatus comprising:

a tape posture control post for controlling widthwise inclination of a tape;

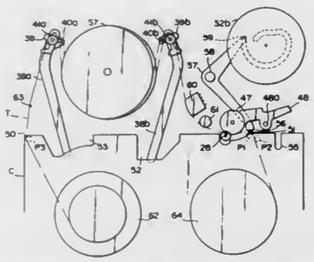
a tape posture control post-moving means for:

moving said tape posture control post into a tape-takeout section of a tape cassette containing a tape when said tape cassette is located at a predetermined loading position,

moving said tape posture control post away from said tape cassette, to allow drawing of said tape from said tape cassette through said tape-takeout section, and

moving said tape posture control post through said tape-takeout section upon drawing of said tape from said tape cassette, so as to allow positioning of said tape posture control post adjacent and parallel to a guide

post of said tape cassette, placing of said tape posture control post in contact with an inner side of said tape drawn from said tape cassette through said tape-takeout



section, and controlling of the widthwise inclination of said tape by said tape posture control post; and

means for adjusting the position of said tape posture control post in the widthwise direction of the tape.

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**5,050,009**

## VIDEO TAPE RECORDER WITH A JOINT-RECORDING CAPABILITY AND A VIDEO CAMERA HAVING THE SAME

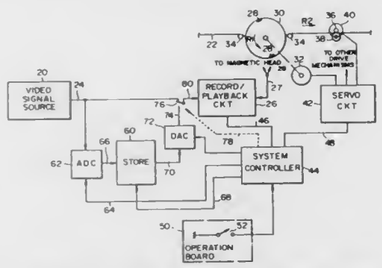
**Kimihide Takahashi, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Oct. 13, 1988, Ser. No. 257,097**

**Claims priority, application Japan, Oct. 13, 1987, 62-256194; Jul. 2, 1988, 63-164116**

**Int. Cl.[5] H04N** *5/76*

**U.S. Cl. 360—33.1** **13 Claims**



1. A video tape recorder for recording video signals on a magnetic tape by helical scanning, comprising:

recording means including a head cylinder which carries a magnetic head therewith for rotating said head cylinder and applying the video signals to said magnetic head to record the video signals on the magnetic tape by helical scanning;

tape transporting means for transporting the magnetic tape while maintaining the magnetic tape in sliding contact with said head cylinder;

servo-lock determining means for determining when said recording means is in a servo-locked condition;

operating means for entering commands which are associated with recording the video signals on the magnetic tape; and

main control means responsive to an operation of said operating means for controlling said recording means and said tape transporting means, said main control means including,

first controlling means for controlling, in response to a record command entered on said operating means, said tape transporting means to transport the magnetic tape in a first direction to thereby record the video signals on the magnetic tape,

continuing means for continuing, in response to a record stop command entered on said operating means, to record the video signals on the magnetic tape until a predetermined period of time expires after entry of the record stop command, controlling said tape transporting the magnetic tape by a first predetermined length in a second direction which is opposite to the first direction, and

second controlling means for controlling, in response to a next record command entered on said operating means, said tape transporting means to transport the magnetic tape in the first direction while servo-controlling said recording means and, when said servo-lock determining means determines the servo-locked condition, controlling said recording means to record the video signals on the magnetic tape,

wherein the predetermined period time is selected such that a position on the magnetic tape where the servo-locked condition has been determined fails to substantially precede a position on the magnetic tape which is associated with an instant when the record stop command has been entered.

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**5,050,010**

## DUAL VIDEO SIGNAL SIMULTANEOUS RECORDING APPARATUS FOR A VCR

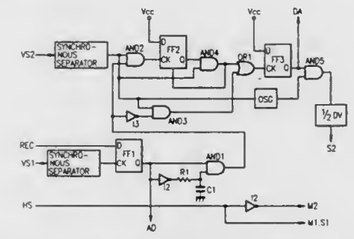
**Kwang S. Park, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea**

**Filed Dec. 15, 1988, Ser. No. 284,665**

**Claims priority, application Rep. of Korea, Dec. 15, 1987, 22188/1987**

**Int. Cl.[5] H04N** *5/782*

**U.S. Cl. 360—33.1** **6 Claims**



1. A dual video signal simultaneous recording apparatus for a video cassette tape recorder, comprising:

a first record system for converting a first video signal into a recording signal and for applying said first recording signal to first video heads through first record/play switches;

synchronous separators for separating respectively first and second synchronous signals from said first video signal and from a second video signal;

gate array means for producing first and second conversion control signals and a first switching control signal from said first and second synchronous signals generated by said synchronous separators and from a record control signal and for also producing a second switching control signal and memory control signals from a head switching signal;

an analog/digital converter for converting said second video signal into a digital signal under control of said first conversion control signal;

a first switch for outputting said digital signal of said analog/digital converter selectively to one of two terminals according to said second switching control signal;

field memories for storing and outputting said selectively output signal from said two terminals of said first switch by one field according to said memory control signals;



a second switch for selecting and outputting said output signal of said field memories according to said first switching control signal;

a digital/analog converter for converting the output signal of said second switch into an analog signal according to said second conversion control signal; and

a second record system for converting said analog signal output of said digital/analog converter into a second recording signal and for applying said second recording signal to second video heads through second record/play switches,

said gate array means comprising

a first flip-flop, coupled to said record control signal and said first synchronous signal, for outputting said first conversion control signal,

a first inverter, coupled to said first conversion control signal, for outputting an inverted first conversion control signal,

a first AND gate, coupled to said inverted first conversion control signal through first delay means, and to said first conversion control signal, for outputting a first AND signal,

a second AND gate, coupled to said first AND signal and said second synchronous signal, for outputting a second AND signal,

a second flip-flop, coupled to said second AND signal, for outputting a flip-flop signal, and

a third flip-flop, coupled to said flip-flop signal, said second synchronous signal and said first AND signal, through a gating means, for outputting said second conversion control signal.

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**5,050,011**

## RECORDING CONTROL APPARATUS

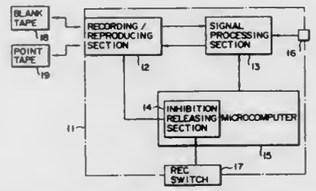
**Kenjiro Endoh, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation of Ser. No. 214,129, Jun. 30, 1988, Pat. No. 4,965,680. This application May 24, 1990, Ser. No. 512,418**

**Claims priority, application Japan, Jun. 30, 1987, 62-163002; Jun. 30, 1987, 62-163021; Jun. 30, 1987, 62-163022; Jan. 20, 1988, 63-9883; Jan. 20, 1988, 63-9884**

**Int. Cl.[5] G11B** *15/04*

**U.S. Cl. 360—60** **2 Claims**



1. A recording control apparatus comprising:

a recording medium capable of having an information signal recorded thereon;

a recording device for recording said information signal on said recording medium;

restriction means for restricting said recording device from recording said information signal on said recording medium in the presence of a restriction signal;

a release-signal-holding medium having a release signal for releasing the recording restriction of said restriction means said release-signal-holding medium not including said information signal to be recorded on said recording medium, said release-signal-recording medium being physically separable from the recording device so as to permit selective distribution of said release-signal-recording medium separately from distribution of said recording device; and

releasing means responsive to said release signal for enabling the recording device to record said information signal in the presence of said restriction signal.

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**5,050,012**

## HIGH-SPEED ERASING APPARATUS FOR USE IN MAGNETIC RECORDING/REPRODUCING SYSTEM

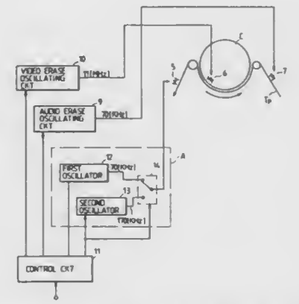
**Hiroshi Nishiumi, Kawasaki, and Yasuomi Namiki, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Japan**

**Filed Apr. 19, 1989, Ser. No. 340,308**

**Claims priority, application Japan, Apr. 20, 1988, 63-97513**

**Int. Cl.[5] G11B** *5/03*

**U.S. Cl. 360—66** **2 Claims**



1. A high-speed erasing apparatus for use in a magnetic recording/reproducing system for erasing recorded signals including a video signal and an audio signal in an audible frequency range on a magentic tape with said magnetic tape being transported by drive means at N times as high as an industry standard travelling speed of said magentic tape where N is a positive number, said magnetic recording/reproducing system including a rotational cylinder around which said magentic tape is wrapped, said high-speed erasing apparatus comprising:

erasing head means comprising a flying-erasing head mounted on said rotational cylinder, a full-erasing head provided at a preceding position of said flying-erasing head with respect to a travelling direction of said magnetic tape, and an audio-erasing head provided at a succeeding position of said flying-erasing head with respect to said travelling direction of said magentic tape, said magentic tape travelling in contact relation to said erasing head means;

a high-speed erase oscillating circuit for supplying said full-erasing head with an oscillation output having a frequency higher than N times an upper limit of the audible frequency range;

a video-erase oscillating circuit for supplying said flying-erasing head with an oscillation output having a frequency higher than an upper limit of a carrier frequency range of the video signal;

an audio-erase oscillating circuit for supplying said audio-erasing head with an oscillation output having a frequency higher than the upper limit of the audible range; and

a control circuit coupled to said drive means and said oscillating circuits, for causing said oscillating circuits and said drive means being controlled so that, at an initial state, the recorded signals are erased by said erasing head means with said magnetic tape being transported at the industry standard travelling speed and for subsequently causing after elapse of a predetermined time, said high-speed erase oscillating circuit and said drive means being controlled that the recorded signals are erased by only said full-erasing head with said magentic tape being transported at a

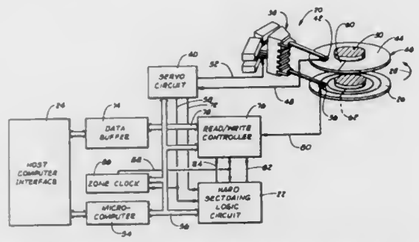
VOL 1130 ISS 3 SE 17 1991 UMI



speed changed to N times the industry standard travelling speed.

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**5,050,013**
**HARD SECTORING CIRCUIT AND METHOD FOR A ROTATING DISK DATA STORAGE DEVICE**
**Steven V. Holsinger, Oklahoma City, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.**
**Continuation of Ser. No. 445,753, Dec. 4, 1989, abandoned. This application May 4, 1990, Ser. No. 519,497**
**Int. Cl.[5] G11B** *27/10, 27/30*
**U.S. Cl. 360—72.1** **15 Claims**




9. A method for generating sector location pulses for locating data storage sectors on data tracks of a rotating disk data storage device having a transducer head adjacent the surface of a rotating disk for writing to and reading from the data storage sectors, comprising the steps of:

maintaining a continuous count of a time from index following passage of a selected index location on the disk by the transducer head;

maintaining an accumulation of sector times, each sector time equal to the time required for a data storage sector to pass the transducer head along a selected track, following passage of the index location by the transducer head;

adding a sector time to said accumulation of sector times each time the time from index attains a value at least as large as the accumulation of sector times;

generating a sector location pulse each time the time from index attains a value at least as large as the accumulation of sector times;

setting the accumulation of sector times to zero each time the transducer head is moved to a new track on the disk; and

repetitively accumulating sector times following movement of the transducer head to a new track on the disk until the accumulation of sector times exceeds the time from index.

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**5,050,014**
**MAGNETIC RECORDING APPARATUS FOR CORRECTING THE ABSOLUTE TRACK POSITION**
**Yutaka Maeda; Kiyotaka Kaneko; Izumi Miyake; Yoshio Nakane, and Hiroshi Shimaya, all of Tokyo, Japan, assignors to Fuji Photo Film, Ltd., Kanagawa, Japan**
**Filed Mar. 21, 1989, Ser. No. 326,685**
**Claims priority, application Japan, Mar. 22, 1988, 63-65632**
**Int. Cl.[5] G11B** *21/02*
**U.S. Cl. 360—75** **14 Claims**

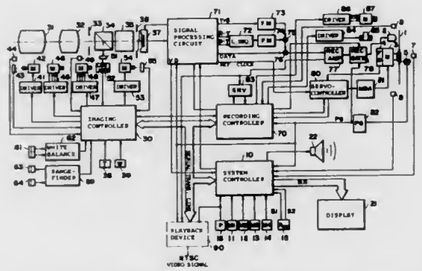
3. A method of feeding a magnetic head diametrically of a magnetic recording medium provided with a plurality of concentric track for positioning the magnetic head of a designated track, comprising the steps of:

(a) detecting a peak position of an envelope of a recorded signal that has been recorded on at least one predetermined track;

(b) detecting an amount of deviation of the peak position from an absolute track position of said one predetermined track;

(c) causing the magnetic head to be positioned at the absolute track position of the designated track, when recording is to be performed on said designated track, if the amount of deviation fails to be detected;

(d) causing the magnetic head to be positioned at an adjusted track position, which is determined by correcting with the

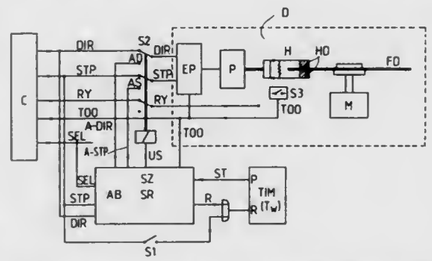



amount of deviation from the absolute track position of the designated track, if the amount of deviation of the peak position is detected; and

(e) stopping the magnetic head at the adjusted track position if the amount of deviation of the peak position is detected.

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**5,050,015**
**METHOD AND ARRANGEMENT FOR REDUCING WEAR IN A MAGNETIC STORAGE MEANS**
**Joachim Hack, Ludwigshafen; Werner Grau, Bobenheim-Roxheim; Werner Sickmueller, Sandhausen; Heinrich Mannsperger, Dossenheim, and Helmut Jakusch, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**
**Filed Oct. 17, 1989, Ser. No. 422,457**
**Claims priority, application Fed. Rep. of Germany, Oct. 22, 1988, 3836129**
**Int. Cl.[5] G11B** *21/02, 5/55*
**U.S. Cl. 360—075** **10 Claims**




1. A method for reducing wear in a magnetic storage means having at least one magnetic head and at least one, in particular flexible, magnetic disk having a magnetic layer, write and read operations taking place during contact between the magnetic head and the magnetic layer in at least one magnetic track, comprising

determining whether said at least one magnetic head which is in a waiting position is positioned on said at least one magnetic track (waiting track),

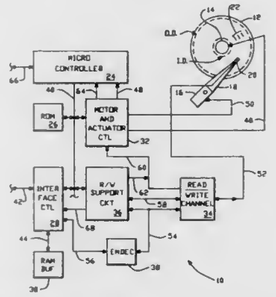
determining if the magnetic head in the waiting position has exceeded a predetermined waiting time on said at least one waiting track,

moving the magnetic head away from the at least one waiting track for a predetermined anti-wear time and, after said predetermined anti-wear time has elapsed, repositioning the magnetic head back onto the at least one waiting track.



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**5,050,016**
**DISK DRIVE SERVO SYSTEM USING GAIN LIMITED HIGH-FREQUENCY TRACK-FOLLOWING COMPENSATOR**
**John P. Squires, Boulder, Colo., assignor to Conner Peripherals, Inc., San Jose, Calif.**
**Filed Oct. 12, 1989, Ser. No. 420,370**
**Int. Cl.[5] G11B** *5/596, 21/10*
**U.S. Cl. 360—77.08** **5 Claims**




1. A disk drive comprising:

a) means, responsive to an adjustment value, for adjusting the position of a head with respect to data tracks located on the surface of a disk;

b) means, coupled to said head, for reading servo information from the surface of said disk;

c) means, coupled to said adjusting means, for determining said adjustment value, said adjustment values being determined dependent on a gain factor, said determining means being coupled to said reading means to receive servo information indicative of the position of said head relative to the center line of a predetermined data track, said determining means determining whether the position of said head is oscillating about the center line of said predetermined data track at a frequency above a predetermined frequency by determining a present position of said head relative to the centerline of said predetermined data track and an anticipated position correction term for said head relative to the centerline of said predetermined data track and further determining whether said present position and said anticipated position correction term are effectively on complementary sides of the centerline of said predetermined data track, said determining means reducing said gain factor applied in determining said adjustment value when said head is oscillating about the centerline of said predetermined data track at a frequency above said predetermined frequency.

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**5,050,017**
**MEMORY GUIDED MAGNETIC TAPE TRACKING**
**Thomas D. Carr, Cardiff, and James R. Harrer, San Diego, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.**
**Filed Aug. 23, 1989, Ser. No. 397,547**
**Int. Cl.[5] G11B** *5/584*
**U.S. Cl. 360—77.12** **8 Claims**

1. Tracking control apparatus for use with magnetic tape, said apparatus comprising

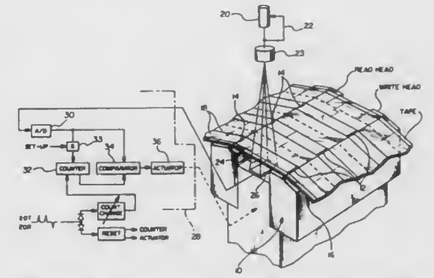
a. magnetic head means,

b. means for producing relative motion, widthwise of said tape, between said magnetic head means and said tape,

c. photosensitive means disposed proximate the edge of said tape so as to fall at least partially in the shadow of the edge of said tape,

d. means for illuminating the edge of said tape,

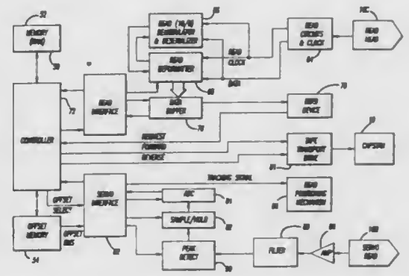
e. first means cooperative with said photosensitive means for effectively memorizing therefrom a signal, updated a function of location along the length of said tape, that corresponds to reference positions relative of said head means and said tape, and




f. second means cooperative with said photosensitive means for comparing the instantaneous output of said photosensitive means with said stored signal of said means for storing, thereby to provide an error signal for application to said means for providing relative motion between said head means and said tape.

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**5,050,018**
**APPARATUS AND METHOD FOR READING HELICALLY RECORDED TRACKS AND REREADING TRACKS AS NECESSARY**
**Steven P. Georgis, Boulder, and E. Christopher Pisciotta, Louisville, both of Colo., assignors to Exabyte Corporation, Boulder, Colo.**
**Filed Apr. 19, 1990, Ser. No. 511,312**
**Int. Cl.[5] G11B** *5/588, 5/09, 15/20*
**U.S. Cl. 360—77.16** **34 Claims**




7. A method for reading information recorded on a storage medium in helical tracks, with each track comprising a plurality of blocks of data with each block having unique block-identifying information, said method comprising:

transporting said storage medium in a direction of medium travel past a rotatable drum, said rotatable drum having a portion of a peripheral surface thereof contiguous with said storage medium as said storage medium is transported therepast;

rotating said rotatable drum whereby reading means mounted on said drum traverses original azimuthal paths across said storage medium;

reading blocks including said block-identifying information recorded along at least a portion of each of said original azimuthal paths;

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using said block-identifying information to determine whether any blocks expected to be read during the traversal of said original azimuthal paths were not read; and,

repositioning, in response to said determination, said reading means whereby said reading means traverses modified azimuthal paths in an attempt to read a block which should have been previously read but was not previously read, said modified azimuthal paths being offset with respect to said original azimuthal paths relative to said direction of medium travel.

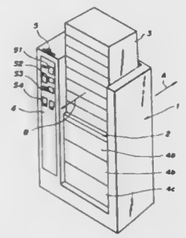
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**5,050,019**

## METHOD FOR AUTOMATIC CONTINUOUS CHANGING OF CARTRIDGE-TYPE MAGNETIC TAPES

**Toshihiro Koyama; Munetake Kanna, and Masatoshi Ishikawa, all of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 3, 1989, Ser. No. 305,648**
**Claims priority, application Japan, Feb. 19, 1988, 63-35091**
**Int. Cl.[5] G11B** *15/68*
**U.S. Cl. 360—92** **7 Claims**



1. A method for continuous changing of cartridge-type magnetic tapes with a cartridge changer by loading/unloading the cartridges into an adjacent magnetic tape unit, comprising the steps of:

setting a plurality of cartridge-type magnetic tapes in a magazine and loading the magazine into the tape changer;

performing a cartridge-type magnetic tape handling operation with the cartridge changer including loading one of said cartridge-type magnetic tapes set in said magazine into said magnetic tape unit, data processing the one cartridge-type magnetic tape loaded in said magnetic tape unit and receiving in said magazine the one cartridge-type magnetic tape after being unloaded from said magnetic tape unit;

sequentially repeating the cartridge handling operation for each of the cartridge-type magnetic tapes set in said magazine;

prior to completing the performing of the cartridge handling operation for each of said cartridge-type magnetic tapes, replacing data processed ones of said cartridge-type magnetic tapes set in said magazine with fresh cartridge-type magnetic tapes yet to be data processed; and

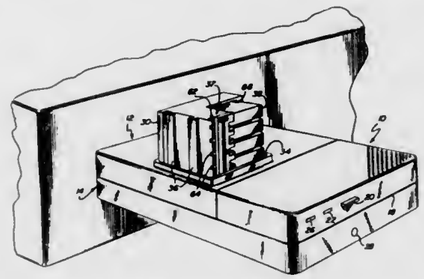
continuing with the performing of the cartridge handling operation for each of said cartridge-type magnetic tapes set in said magazine that have not yet been data processed and for the fresh cartridge-type magnetic tapes replaced in said magazine.

**5,050,020**

## CARTRIDGE LOADER FOR LOADING EACH OF A PLURALITY OF CARTRIDGES INTO A CARTRIDGE INSERTION SLOT

**Kenneth C. Campbell, Orange, Calif.; Roger M. Gray, and Barry C. Kockler, both of Lewisville, Tex., assignors to Archive Corporation, Costa Mesa, Calif.**

**Filed Nov. 9, 1989, Ser. No. 434,036**
**Int. Cl.[5] G11B** *15/68*
**U.S. Cl. 360—92** **19 Claims**



1. A loader, for loading each of a plurality of cartridges into a drive having an exposed space on at least one side and having a cartridge acceptor within said exposed space, comprising:

a housing having a conduit extending therethrough and having at least one open end, said conduit defining a channel, and said open end of said housing being mounted to said exposed space of said drive, said housing projecting away from said drive;

a holder, having a guide extending along a side thereof, mounted through said conduit with said guide in said channel, said holder defining a plurality of spaces, each of said plurality of spaces sized and shaped to receive a cartridge;

means for displacing said holder above or below said housing by generating motion and engaging said guide on said holder thereby transferring said motion to said holder, for selectably aligning each of said plurality of spaces with said cartridge acceptor; and

a pusher supported by said housing for pushing a cartridge positioned within one of said plurality of spaces to said acceptor of said drive so that said acceptor accepts said cartridge, said pusher being driven by a pusher drive system which propels said pusher from a first position not touching said cartridge to a second position in contact with said cartridge.

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**5,050,021**

## EXPANDED MICRO CASSETTE PLAYER-RECORDER

**Stephen K. Shu, Fountain Valley; John A. Rawson, Orange, and Robert C. Beauchamp, Westminster, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.**

**Filed Mar. 16, 1990, Ser. No. 495,034**
**Int. Cl.[5] G11B** *5/11*
**U.S. Cl. 360—95** **3 Claims**

1. A magnetic tape cassette player-recorder, comprising:

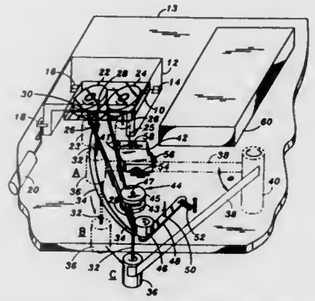
means for housing a cassette;

a recorder head disposed distal to said cassette housing means;

insulation means to insulate said head from magnetic flux fields;

extraction means for pulling a loop of said tape out of said cassette and across said head, said extraction means including a single capstan that fits within a single capstan port within said cassette;

motorized means for propelling and accurately guiding said extracting means, said motorized means being attached to said capstan through a slot in said insulation means such that said capstan of the extracting means powered by said



motorized means will take said loop of said tape and hold said tape across said head.

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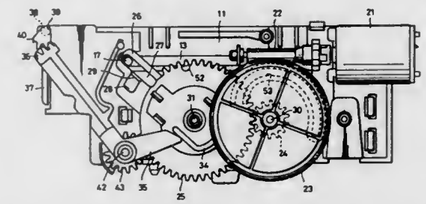


**5,050,022**

## CASSETTE LOADING APPARATUS HAVING DRIVING GEARS

**Hidekuni Aizawa, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed May 4, 1990, Ser. No. 519,433**
**Claims priority, application Japan, May 31, 1989, 1-137683**
**Int. Cl.[5] G03B** *1/04;* **G11B** *5/008*
**U.S. Cl. 360—96.5** **7 Claims**



1. A cassette loading apparatus in which a tape cassette holder is moved by a drive source through a gear train to locate a tape cassette to a predetermined loading position, comprising:

(a) a pair of gears arranged in mutual engagement and forming a part of the gear train, at least one gear of said pair of gears being formed as a geneva stop gear;

(b) a locking member attached to one gear of said pair of gears; and

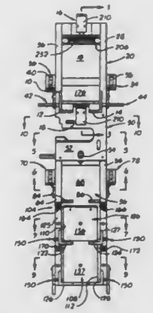
(c) a cam formed on the other gear of said pair of gears, said cam being arranged for engagement with said locking member, said cam having a predetermined length on said other gear so that when said pair of gears are in engagement with each other said locking member is out of contact with said cam, and when said pair of gears are disengaged from each other by said geneva stop gear said locking member contacts said cam so that said pair of gears are rotated at a rotational ratio substantially equal to a rotational ratio caused by a gear ratio of said pair of gears by said cam contacting said locking member, wherein when said cassette holder is moved to a loading position said locking member binds against said cam so that relative rotation between said pair of gears is stopped, thereby locking the cassette holder.

**5,050,023**

## DISKETTE SEQUENTIAL LOADING AND STORING APPARATUS

**Harrel D. Ashby, 1200 N. Marion, R.R. #2, Box 247A, Hinton, Okla. 73132**

**Division of Ser. No. 457,971, Dec. 27, 1989. This application Mar. 4, 1991, Ser. No. 664,543**
**Int. Cl.[5] G11B** *17/08*
**U.S. Cl. 360—98.06** **9 Claims**



1. An apparatus for sequentially loading and feeding diskettes to and through a diskette drive subassembly comprising:

a diskette-containing magazine;

means for consecutively releasing single diskettes from a plurality of diskettes contained in said magazine;

a drop chute frame for receiving released diskettes from said magazine, said drop chute frame including a pair of downwardly extending, opposed, substantially parallel side rails having parallel grooves therein for guiding a gravitating diskette, and limiting lateral movement of the gravitating diskette as it moves downwardly on said parallel side rails;

a disk drive subassembly including a slotted plate inclined to the vertical and positioned to receive a diskette gravitating on, and guided by, said pair of opposed, substantially parallel side rails;

diskette arresting means mounted on said slotted plate at a position substantially central to the transverse width of said plate, and including a retractable rod extending into the path of movement of a diskette sliding down said rails with the opposite edges of the diskette in said grooves at a time when said diskette becomes positioned on the upper side of said slotted plate of said disk drive subassembly; and

rigid parallel diskette guiding members located on the opposite side of said disk drive subassembly from, and in alignment with, said opposed side rails for guiding a diskette leaving said disk drive subassembly as it gravitates downwardly away form said disk drive subassembly.

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**5,050,024**

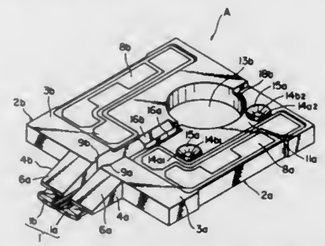
## DOUBLE AZIMUTH MAGNETIC HEAD WITH TWO-PIECE ADJUSTABLE BASE

**Shinichi Nanjyo, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Jan. 29, 1990, Ser. No. 471,391**
**Claims priority, application Japan, Jan. 31, 1989, 1-21177**
**Int. Cl.[5] G11B** *5/48, 21/16*
**U.S. Cl. 360—104** **16 Claims**

1. A double base type double azimuth magnetic head comprising two head bases and a pair of head chips **1***a*, **1***b* bonded and anchored thereto respectively, said two head bases having integral anchor lugs **4***a*, **4***b* with flat reverse surfaces for anchoring the head chips thereto, said head bases further having joint surface plane regions **11***a*, **11***b*, said head bases being joined to each other as said joint surface regions in such a

manner that said anchor lugs are placed mutually adjacent in a same direction and the flat reverse surfaces of said anchor lugs become flush with each other, wherein the pair of anchored head chips are so disposed as to constitute a double azimuth head while being positioned mutually adjacent on one line



parallel to the plane of said joint surface plane regions with a predetermined gap left therebetween, and said head bases each having shaped portions 13*a*, 13*b* which in combination form a screw-setting circular aperture in the joined head bases for attachment to a rotary drum.

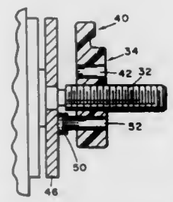
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5,050,025

## LEAD SCREW AND FOLLOWER-TYPE HEAD POSITIONER FOR DATA RECORDERS

Michael E. Carlson, Ann Arbor, Mich., assignor to Irwin Magnetic Systems, Inc., Ann Arbor, Mich.

Filed Feb. 22, 1989, Ser. No. 314,454
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—106 16 Claims



1. Positioning apparatus for movably-mounted transducer heads in data-storage devices, comprising in combination: a lead screw and follower, said lead screw having a motor-driven end portion for imparting rotation thereto and said follower being threadedly engaged with said lead screw to move along the lead screw in response to rotation of the lead screw; means for coupling said follower to at least one movably-mounted transducer head in a data-storage device and for transferring motion of said follower along said lead screw upon rotation thereof to said head to move the head with respect to a storage media in said device; means for stopping the motion of said follower along said lead screw, said stop means fixed to said lead screw for rotation therewith and located generally adjacent said motor-driven end portion; and stop-engagement means carried with said follower to engage said stop means at a point disposed radially outward of said lead screw, said stop means applying an angular force to said stop-engagement means upon further rotation of said lead screw following such engagement to thereby preclude such further rotation of said lead screw, whereby further movement of said follower toward said motor-driven end of said lead screw is precluded; said stop-engagement means carried with said follower to engage said stop means comprising a member projecting away from other portions of said follower and located at a radial distance away from said lead screw, said member being oriented toward said motor-driven end portion of said lead screw; and said projecting member being selectably positionable at one of a plurality of mounting locations carried on said follower.

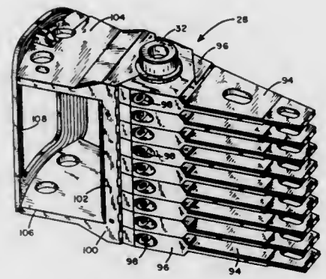
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5,050,026

## VERTICAL FLAT COIL FOR HEAD ACTUATOR

Lloyd C. Goss, Bloomington, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Continuation of Ser. No. 451,200, Dec. 15, 1989, abandoned.
This application Jan. 7, 1991, Ser. No. 634,975
Int. Cl.[5] G11B *5/55*
U.S. Cl. 360—106 19 Claims



1. In a disc drive having a stationary frame, a magnetic disc mounted with respect to the frame for rotation relative to the frame, a magnetic transducing head for storing data onto the disc and for retrieving data previously stored on the disc, a rotary actuator for controllably positioning the head with respect to the disc; said rotary actuator assembly including:

a longitudinally extended actuator shaft, and means for supporting the shaft with respect to the frame to pivot relative to the frame about a longitudinal pivot axis;

a transducer support arm means integrally mounted to the shaft for rotation therewith, said transducer support arm means extending away from the shaft in a first radial direction, and at least one magnetic transducing head mounted to the support arm means at an end portion thereof remote from the shaft, for travel in an arcuate path as the shaft rotates;

a permanent magnet assembly mounted to the frame in spaced apart relation to the shaft, said magnet assembly having a concave magnet face directed toward the shaft and curved about the pivot axis;

a coil support means integrally mounted to the shaft and extended away from the shaft in a second radial direction; and

an electrically conductive voice coil mounted to the coil support means for arcuate travel about the pivot axis as the actuator shaft pivots, said voice coil having a uniform thickness radially and being disposed radially inwardly of the magnet face, said coil being curved about the pivot axis to conform to the curvature of the magnet face, and with the longitudinal and circumferential width dimensions of said voice coil each being at least five times in magnitude larger than the radial thickness dimension of the voice coil.

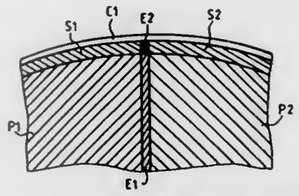


5,050,027

## MAGNETIC RECORDING/PLAYBACK HEAD WITH ABRASION-RESISTING LAYER

Paul L. Meunier, Paris; Jean C. Lehureau, Ste Genevieve des Bois, and Jean L. Rolland, Paris, all of France, assignors to Thomson-CSF, Puteaux, France

PCT No. PCT/FR88/00516, § 371 Date Jun. 27, 1989, § 102(e) Date Jun. 27, 1989, PCT Pub. No. WO89/04039, PCT Pub. Date May 5, 1989
PCT Filed Oct. 21, 1988, Ser. No. 377,831
Claims priority, application France, Oct. 27, 1987, 87 14823
Int. Cl.[5] G11B *5/193, 5/31*
U.S. Cl. 360—122 8 Claims



1. Magnetic recording/playback head comprising two ferrite magnetic poles (P1, P2) separated by a gap (E1) made of non-magnetic material, said head further comprising:

on the media confronting surface of each magnetic pole (P1, P2), a first layer (S1, S2) of a magnetic material having a high coefficient of bonding relative to the ferrite magnetic poles (P1, P2) and a carbon-based second layer formed on each said first layer and said gap said each second layer has a high bonding coefficient.

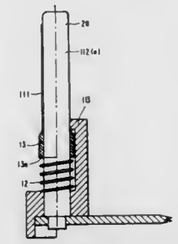
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5,050,028

## RESILENT TENSION SENSOR PIN FOR MAGNETIC TAPE GUIDANCE

Hartmut Schandl, Villingen, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Sep. 22, 1989, Ser. No. 411,152
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836621
Int. Cl.[5] G11B *15/60;* B65H *27/00, 23/32*
U.S. Cl. 360—130.23 6 Claims



1. An apparatus for the guiding of a segment of a magnetic tape to a feed-in entrance side of a head drum of a magnetic tape recorder, comprising:

a tape tension lever;

a tape tension sensing pin being fitted on said lever for engaging said tape segment and for varying a position of said lever in accordance with a tension formed in said tape segment so as to regulate said tension in said tape segment as said tape segment is being pulled out of a tape supply reel;

a flange fitted on said tension sensing pin for engaging an edge of said tape segment; and

resilient means engaging said flange for resiliently varying by a spring action a position of said flange in a direction that is generally perpendicular to a direction of a motion of said tape segment and, thereby, of said edge of said tape segment relative to said lever, wherein said tension sensing pin is movable in said perpendicular direction relative to said lever in accordance with said spring action of said resilient means.

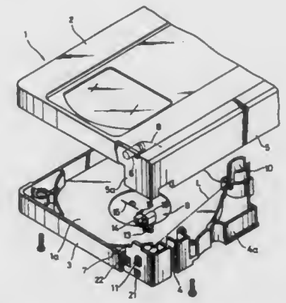
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5,050,029

## LID LOCK MEMBER TAPE CASSETTE WITH LIGHT LEADING

Takanori Inose, Saitama, and Shin Sasaki, Miyagi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 483,449
Claims priority, application Japan, Feb. 23, 1989, 1-043654
Int. Cl.[5] G11B *23/02*
U.S. Cl. 360—132 20 Claims



1. A tape cassette for use with a recording and/or reproducing apparatus, the apparatus having a light emitting element and a light receiving element for optically detecting a tape end, comprising:

a cassette housing having a front wall with a tape withdrawing mouth and a side wall with an opening corresponding to the location of the light receiving element;

an aperture for inserting the light emitting element into the cassette housing such that a light path is defined between the light emitting and receiving elements, through the opening in the side wall;

a lid pivotally supported at both side walls of the housing so as to have an open position and a closed position which respectively uncover and cover the tape withdrawing mouth; and

a lid lock member for locking the lid at the open position or the closed position, having a light guide which extends over a portion of the light path from the light emitting element to the light receiving element and which is longer than the width of the lid lock member.

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5,050,030

## DISK CASSETTE WITH SHUTTER ATTACHING FEATURE

Tsuneo Nemoto, Miyagi; Masayuki Harada, Kanagawa, and Kouji Funawatari, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 116,478, Nov. 3, 1987, abandoned. This application Apr. 5, 1991, Ser. No. 682,865
Claims priority, application Japan, Nov. 6, 1986, 61-264367; Nov. 20, 1986, 61-178832[U]
Int. Cl.[5] G11B *23/03*
U.S. Cl. 360—133 7 Claims

1. A disk cassette comprising:

a rotatable disk;

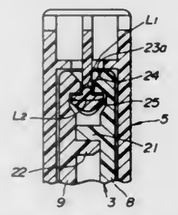
a case in which said disk is rotatably supported, said cash having a first surface in which a first head access opening

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is formed, a second surface which interconnects with said first surface, said second surface having a guide slot formed therein, the guide slot having a tapered portion, and a third surface disposed opposite said first surface, wherein one or both or said first and third surfaces is formed with a head access opening; and

a shutter, said shutter being formed with first, second and




third plate sections, said first, second and third plate sections being arranged to define a U-shaped cross-section, said first and third plate sections of said shutter being disposed against said first and third surfaces, respectively, and wherein said shutter further includes a reinforced, barbed projection extending from said second plate section between said first and third plate sections and which is received in the tapered portion of said guide slot.

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**5,050,031**

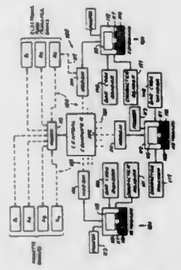
**VIDEO CASSETTE RENTAL SYSTEM AND METHOD AND RECORD PLAYBACK COUNTER THEREFOR**

John F. Weiley, Paddington, Australia, assignor to Capital Cities/ABC Video Systems, Inc., New York, N.Y.

Continuation of Ser. No. 160,022, Feb. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 9,340, Apr. 21, 1986, abandoned, and Ser. No. 117,813, Nov. 5, 1987, abandoned. This application Aug. 29, 1990, Ser. No. 576,143

Int. Cl.[5] G06F *15/21*

U.S. Cl. 360—137 21 Claims



1. A video record rental system, said system comprising in combination, a plurality of computer rental terminals each located at a separate rental site, a central computer, a data transmission link between each of said rental terminals and said central computer a plurality of computer terminals, each located on the premises of an entity entitled to share in the proceeds of renting a number of records, data links connecting said central computer with each of the latter computer terminals, and means enabling the recording of rental transactions at the rental terminals, including the number of plays of each record rented, and for transmitting said rental data to said central computer, means for enabling said central computer to compile rental data from the rental terminals into a report and transmit the report to the appropriate one of said entities.

**5,050,032**

**SEALED ENVELOPE BASED ON A FILAMENTARY WINDING, AND APPLICATION TO A COMPOSITE LIGHTNING ARRESTER**

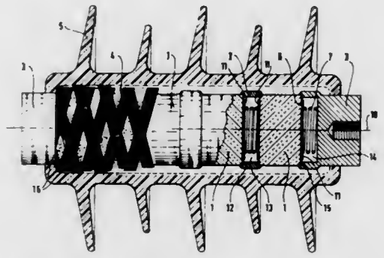
Guy Thevenet, Beaumont-les- Randan; Denis Thuillier, Vichy, and René Parraud, Chateldon, all of France, assignors to Sediver Societe Europeenne d'Isolateurs en Verre et Composite, France

Filed May 14, 1990, Ser. No. 522,800

Claims priority, application France, May 12, 1989, 89 06268

Int. Cl.[5] H02H *1/04*

U.S. Cl. 361—117 7 Claims



1. A sealed envelope based on a filamentary winding constituted by resin-impregnated glass fibers, for equipment likely to be subjected to large thermal stresses and thus to be the seat of internal excess pressures, said winding adhering to the outside surface of said equipment, wherein said outside surface of said equipment coated with said winding has fiber-free zones forming resin-filled gaps, with the percentage of the surface area not covered with fibers being not less than about 15%.

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**5,050,033**

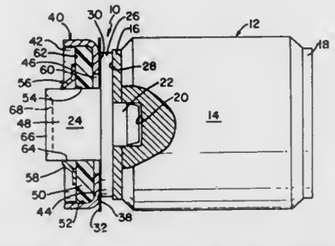
**BACK-UP SURGE ARRESTERS**

Emanuel J. Pagliuca, Patchogue, N.Y., assignor to TII Industries, Inc., Copiagne, N.Y.

Filed Feb. 19, 1991, Ser. No. 657,074

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—119 8 Claims



1. A back-up surge arrester suitable for use with a conventional arrester having at least one electrically conductive electrode provided with a dimpled recess therein, comprising, in combination:

a) elongated rivet means having;

i) two ends, one end thereof adapted to be received into and being in electrically conductive contact with said one electrode of said surge arrester having said dimpled recess; and

ii) collar means, disposed remote from said rivet means one end, providing a flat surface circumferentially disposed around said elongated rivet means facing away from said one end;

b) first generally flat insulator means having a centrally disposed aperture with a diameter generally equal to the



diameter of said rivet means disposed upon said flat surface of said collar means;

c) cupped washer means having a flat portion and an extending portion disposed generally perpendicular to said washer flat portion, said extending portion facing away from said one end of said rivet means, said washer means flat portion being provided with an aperture having a diameter greater than said rivet means diameter, said washer means flat portion and said arrester dimpled electrode sandwiching said first insulator therebetween;

d) second flat insulator means having a diameter generally equal to the diameter of said cupped washer means flat portion and a centrally disposed aperture with a diameter generally equal to said rivet diameter adapted to be received and cooperate with the flat portion of said cupped washer means; and

e) locking washer means having a tapered portion and a flat portion, said flat portion and said cupped washer means flat portion sandwiching said second insulator therebetween, said locking washer means tapered portion having an aperture adapted to be force fit and frictionally held upon said rivet means second end being in electrically conductive contact with said rivet means, said locking washer means forcing and retaining said first and second insulator means and said cupped washer means against said rivet collar means.

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**5,050,034**

**PRESSURE SENSOR AND METHOD OF MANUFACTURING SAME**

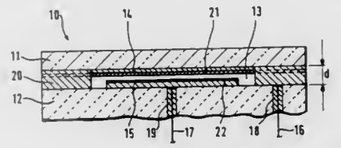
Frank Hegner, Lörrach; Manfred Frank, Maulburg, and Thomas Klähn, Freiburg/Br., all of Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Aug. 21, 1990, Ser. No. 570,312

Claims priority, application European Pat. Off., Jan. 22, 1990, 90810045.6

Int. Cl.[5] H01G *7/00;* G01L *9/12*

U.S. Cl. 361—283 7 Claims



1. Pressure sensor comprising a substrate and a diaphragm which are joined together, particularly in a defined spaced relationship and parallel to each other, forming a chamber sealed at least at the edge, wherein

the substrate and/or the diaphragm are made of ceramic, glass, or a single-crystal material,

the side of the diaphragm facing the substrate is covered with a layer of silicon carbide, niobium, or tantalum which, in turn, is covered with a protective layer and serves as one capacitor electrode,

the side of the substrate facing the diaphragm is covered within the chamber with at least one additional layer of any one of said materials which, in turn, is covered with an additional protective layer and serves as the second capacitor electrode, and

the substrate and the diaphragm are soldered together by a formed part of active solder which also serves as a spacer.

**5,050,035**

**CAPACITIVE PRESSURE SENSOR AND METHOD OF MANUFACTURING SAME**

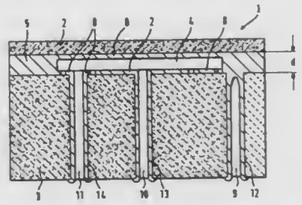
Frank Hegner, and Manfred Frank, both of Maulburg, Fed. Rep. of Germany, assignors to Endress u. Hauser GmbH u. Co., Fed. Rep. of Germany

Filed Mar. 20, 1990, Ser. No. 496,539

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1989, 3909185

Int. Cl.[5] H01G *7/00, 5/16, 4/12*

U.S. Cl. 361—283 20 Claims



7. A capacitive pressure sensor comprising

a diaphragm having an outer surface and a substantially planar inner surface,

a substrate including a top surface facing the inner surface of the diaphragm, the substrate being formed to include at least one aperture extending therethrough in communication with the top surface,

a first conductive layer formed on the inner surface of the diaphragm,

a second conductive layer formed on the top surface of the substrate,

a third conductive layer configured to line said aperture extending through the substrate, the third conductive layer being electrically coupled to the second conductive layer, and

an intermediate layer for coupling the diaphragm to the substrate to position the inner surface of the diaphragm a predetermined distance away from the top surface of the substrate to provide a capacitor therebetween formed by the first and second conductive layers, the intermediate layer and the first, second, and third conductive layers being formed from a material having a uniform composition.

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**5,050,036**

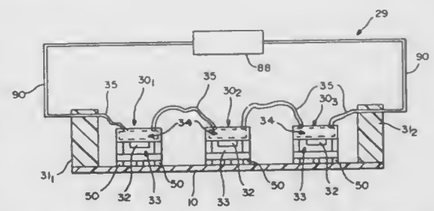
**LIQUID COOLED INTEGRATED CIRCUIT ASSEMBLY**

Tom A. Oudick, Eastsound, Wash., and Gregory Shmunis, San Francisco, Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 24, 1989, Ser. No. 426,093

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—385 6 Claims



1. A package, housing an integrated circuit, comprising:

a package body having an integrated circuit cavity and a coolant cavity, and a common wall separating and defining portions of aid integrated circuit and coolant cavities, said integrated circuit being provided in said integrated

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circuit cavity and bonded to said common wall, said coolant cavity housing a coolant which is in direct contact with said common wall;

means for electrically interconnecting the integrated circuit to the environment external to the package body; and

means for supplying coolant to said coolant cavity.

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5,050,037

## LIQUID-COOLING MODULE SYSTEM FOR ELECTRONIC CIRCUIT COMPONENTS

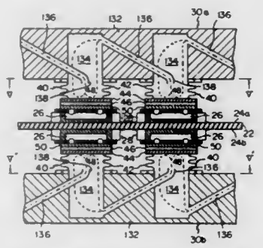
Haruhiko Yamamoto; Kouji Katsuyama, both of Yokohama; Mitsuhiko Nakata, Kawasaki, and Shunichi Kikuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 27,074, Mar. 17, 1987, abandoned, which is a continuation of Ser. No. 693,432, Jan. 22, 1985, abandoned. This application Sep. 29, 1988, Ser. No. 251,978

Claims priority, application Japan, Jan. 26, 1984, 59-13005; Jan. 26, 1984, 59-13006; Jan. 26, 1984, 59-13007

Int. Cl.[5] H05N 7/20

U.S. Cl. 361—385 24 Claims



1. A liquid-cooling module for cooling integrated circuit chips mounted on first and second faces of a printed circuit board comprising:

liquid-cooling plates having therein passage means for flowing liquid coolant under pressure and a plurality of liquid coolant supply head means; and

a plurality fo resilient heat transfer means held by each said liquid-cooling plates and arranged in alignment with said integrated circuit chips, each of said resilient heat transfer means having a liquid coolant receiving chamber closed at one end thereof by a heat transfer plate in compressive contact with one of said integrated circuit chips on said first and second faces of said printed circuit board wherein equal but opposite pressure is applied to said first and second faces of said printed circuit board by said resilient heat transfer means held by each said liquid cooling plates, and at another end of said liquid coolant receiving chamber fluidly communicating with one of said liquid coolant supply head means, said liquid coolant supply head means being fluidly and serially intercommunicated with one another by means of said passage means, wherein each of said liquid coolant supply head means comprises a liquid coolant chamber formed in each said liquid-cooling plate and having a liquid inlet and a liquid outlet, and a nozzle means connected to said liquid inlet of said liquid coolant chambser and directed toward each said heat transfer plate for impinging said liquid coolant against each said heat transfer plate.

5,050,038

## HEAT SINK DEVICE OR SURFACE MOUNT TYPE COMPONENT MOUNTED ON A PRINTED CIRCUIT BOARD

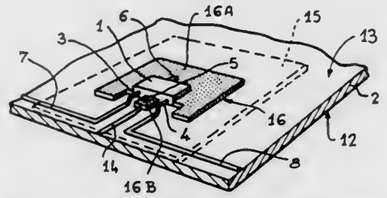
Claude Malaurie, Ermont, and Joël Bertet, Sartrouville, both of France, assignors to Alcatel Business Systems, Paris, France

Filed Jul. 10, 1990, Ser. No. 550,849

Claims priority, application France, Jul. 10, 1989, 89 09246

Int. Cl.[5] H05K 7/20

U.S. Cl. 361—386 3 Claims



1. A thermally protected surface mount component and printed circuit board mounting arrangement comprising:

a printed circuit board;

first and second metallic heat dissipating plates, located face to face on opposite sides of the printed circuit board and being thermally linked together through said printed circuit board, said second metallic heat dissipating plate surrounding the surface mount component and being connected to said surface mount component through at least one heat lead on one side of said printed circuit board, said first metallic heat dissipating plate being located on the other side of said printed circuit board and having a surface area larger than the surface area of said second metallic heat dissipating plate, and wherein said second metallic heat dissipating plate is superimposed on said first metallic heat dissipating plate.

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5,050,039

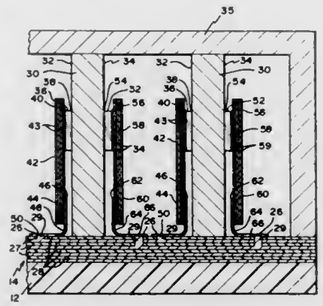
## MULTIPLE CIRCUIT CHIP MOUNTING AND COOLING ARRANGEMENT

John E. Edfors, Middlesex, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 26, 1990, Ser. No. 543,411

Int. Cl.[5] H05K 7/20

U.S. Cl. 361—388 19 Claims



1. A circuit chip mounting comprising:

a horizontally disposed circuit chip mounting board having a plurality of electrical interconnects formed therein for carrying power and control signals to a plurality of circuit chips, and including at least a first multiple circuit chip mounting site and a first plurality of bonding pads on said chip mounting site electrically connected to said interconnects; and,



at least a first circuit chip assembly mounted at a first location on said first chip mounting site, said assembly including:

a) a heat sink having front and back vertical sides;

b) a first and a second plurality of circuit chips, each having top sides and bottom connection sides, said first plurality of circuit chips being thermally and mechanically attached by their top sides to said front side of said heat sink and said second plurality of circuit chips being thermally and mechanically attached by their top sides to said back side of said heat sink;

c) first and second vertically disposed interconnect boards, said first interconnect board being mechanically and electrically connected to the bottom connection sides of said first plurality of circuit chips and said second interconnect board being mechanically and electrically connected to the bottom connection sides of said second plurality of circuit chips; and

d) means to electrically connect said first and second vertically disposed interconnect boards to said bonding pads on said chip mounting site of said horizontally disposed circuit chip mounting board.

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5,050,040

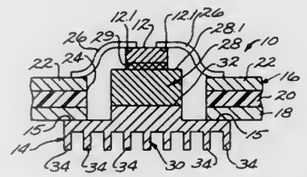
## COMPOSITE MATERIAL, A HEAT-DISSIPATING MEMBER USING THE MATERIAL IN A CIRCUIT SYSTEM, THE CIRCUIT SYSTEM

Joseph M. Gondusky, Warwick, R.I.; Henry F. Breit, Attleboro, and Karen A. Auguston, Brigthon, botb of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 260,970, Oct. 21, 1988. This application May 7, 1990, Ser. No. 520,291

Int. Cl.[5] H05K 7/20

U.S. Cl. 361—388 6 Claims



1. A circuit system comprising å substrate supporting circuit paths means thereon, a semiconductor device having selected terminals and having a selected coefficient of thermal expansion, means connecting at least some of said terminals to at least some of said circuit path means, and a heat-dissipating member mounting the semiconductor device in the system, the member having a first component with a coefficient of thermal expansion in the range from about 1.4 to 10.2 ppm/°C., with a first selected shape having a surface compactly and reliably mounting the semiconductor device thereon, and having an opposite surface, the member having a second component with a second selected shape differing from the first selected shape particularly adapted for dissipating heat therefrom, the second component having one surface metallurgically bonded in heat-transfer relation to the opposite surface of the first component to receive heat from the semiconductor device transferred through the first component, the second component having sufficient thermal conductivity and having a plurality of heat dissipating means projecting from an opposite surface of the second component such that heat is dissipated from the semiconductor device to permit reliable operation of the device.

5,050,041

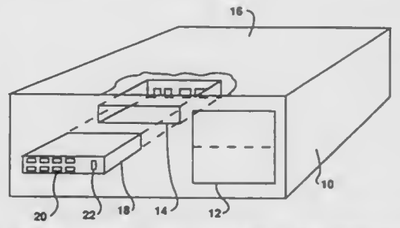
## MODEM MOUNTABLE IN WALL OF A COMPUTER HOUSING WITH READILY ACCESSIBLE, ON/OFF SWITCH, INDICATOR MEANS AND INTERNAL SWITCH CONNECTING EITHER MODEM OR AN AUXILIARY SERIAL PORT TO AN I/O PORT

Max Shafi, 3031 Kaiser Dr. #D, Santa Clara, Calif. 95051

Filed Jun. 25, 1990, Ser. No. 543,671

Int. Cl.[5] H05K 7/14, 5/00

U.S. Cl. 361—391 8 Claims



5. Modem apparatus for insertion into a slot formed in the front of a computer housing comprising:

electronic modem circuitry;

means for providing power to said modem circuitry;

a front panel having an on/off switch;

at least one jack for connecting said modem circuitry to an external communications line;

means forming an auxiliary I/O port;

means for connection of said modem circuitry to a computer I/O port; and

switching means responsive to said on/off switch for connecting said modem to said computer I/O port when said on/off switch is in the on position and for connecting said auxiliary I/O port to said computer I/O port when said on/off switch is in the off position.

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5,050,042

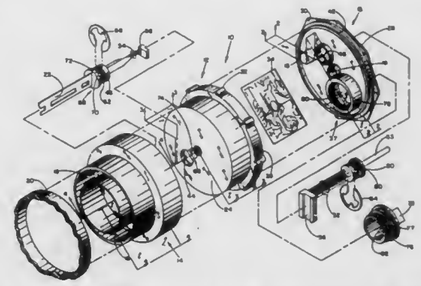
## HOUSING ASSEMBLY FOR ELECTRICAL COMPONENTS WITH WINDOW FOR VIEWING ELECTRICAL COMPONENTS, SEALING RINGS, AND SLEEVES ACCEPTING DIFFERENT SIZES OF CONDUIT

James W. Richmond, Carmel, and Ronald E. Cole, Greenwood, both of Ind., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 8, 1990, Ser. No. 564,099

Int. Cl.[5] H05K 5/06

U.S. Cl. 361—395 8 Claims



8. A housing assembly for electrical components comprising:

a housing including a cup shaped member having an open end and a cover closing same,

a groove around the outer periphery of said cup shaped member, a sealing ring carried in said groove, a rib extending from said cover engaging said groove and forming an interference fit between said rib and said sealing ring to

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apply pressure to said sealing ring to form a leak tight seal between said cup shaped member and said cover,

seating means carried in the cup shaped member carrying electrical components,

first and second openings in said housing permitting lead wires to be fed to and from said electrical components, a third opening in said housing permitting said electrical components to be viewed from outside said housing, and

an adapter including connecting means attaching to said cup shaped member several sleeves of different diameters for accepting different diameter conduits.

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**5,050,043**

## SOLID ELECTROLYTE CAPACITOR IN A CHIP STRUCTURE HAVING A FUSED ELEMENT

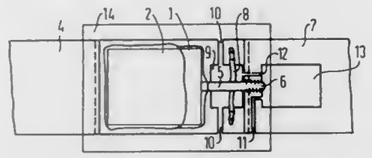
**Werner Schnabel, Nattheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Aug. 30, 1990, Ser. No. 574,798**

**Claims priority, application Fed. Rep. of Germany, Sep. 19, 1989, 3931246**

**Int. Cl.[5] H01G** *1/10, 9/00*

**U.S. Cl. 361—534** **3 Claims**



1. In a solid electrolyte capacitor in a chip structure and of the type having a fuse element, and in which a sintered anode member has an anode wire sintered therein and extending therefrom and is arranged in a system carrier which includes an anode terminal and a cathode terminal, the cathode terminal being connected to a cathode contact carried by the sintered anode member, and in which a plastic envelope covers the capacitor and the fuse element, the improvement therein comprising:

an opening in the anode terminal;

the fuse element connected across the opening of said anode terminal; and

parting locations in said anode terminal at said opening bridged by said fuse element.

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**5,050,044**

## FLASH DEVICE

**Yoshinobu Shibayama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 356,601, May 25, 1989, abandoned, which is a continuation of Ser. No. 50,519, May 18, 1987, abandoned. This application Jul. 16, 1990, Ser. No. 552,845**

**Claims priority, application Japan, May 21, 1986, 61-117107; May 21, 1986, 61-117108; Apr. 15, 1987, 62-92417; Apr. 15, 1987, 62-92418**

**Int. Cl.[5] G03B** *15/05*

**U.S. Cl. 362—18** **15 Claims**

1. A flash device comprising:

(A) a light emitting portion;

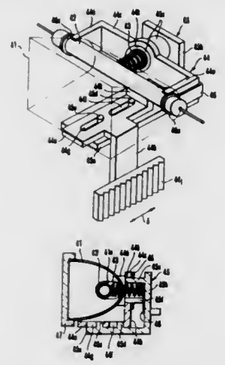
(B) a reflector for reflecting a light emitted by said light emitting portion;

(C) means for producing relative movement between said light emitting portion and said reflector;

(D) an elastic electrical connecting member connected from outside of the reflector to said light emitting portion to feed a trigger voltage to said light emitting portion to energize said light emitting portion, wherein said electrical connecting member comprises a spring;

(E) first supporting means for supporting said spring, said first supporting means being arranged to move relative to said light emitting portion; and

(F) second supporting means for supporting said light emitting portion, said second supporting means having an



opening for passing said spring to a position between said light emitting portion and said first supporting means, wherein said first supporting means comprises an entering portion arranged to enter the opening.

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**5,050,045**

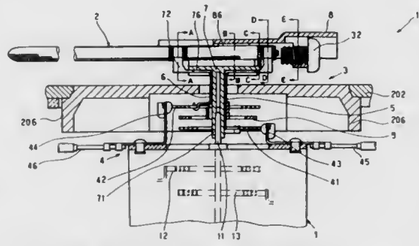
## SELF-LUMINESCENT POINTER DEVICE FOR A GAUGE

**Miki Kato, Kariya; Katsuhiro Kumazawa, Anjo, and Kazuhiko Miyazaki, Nishikamo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Oct. 1, 1990, Ser. No. 591,097**

**Int. Cl.[5] G01D** *11/28*

**U.S. Cl. 362—23** **7 Claims**



1. A pointer device for a gauge comprising:

a pointer driving means for rotating a pointer shaft in response to input signals;

a self-luminescent pointer provided with a discharge tube having a constricted portion on a part of the outer surface of an elongated hollow rod bulb thereof, and interior electrode provided at the end of the bulb and a strip-shaped exterior electrode provided on the outer surface of the bulb in an axial direction thereof;

a pointer setting means fitted on the pointer shaft for securing the constricted portion of the discharge tube and fitting the discharge tube across the pointer shaft; and

a power supply terminal for supplying power to the interior electrode and the exterior electrode of the discharge tube.



**5,050,046**

## SURFACE LIGHTING APPARATUS

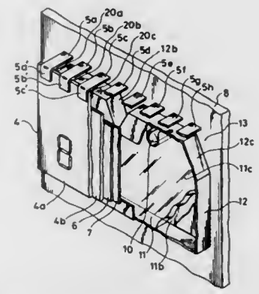
**Masahiko Tada, Sanda, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 26, 1989, Ser. No. 385,175**

**Claims priority, application Japan, Jul. 27, 1988, 63-188825**

**Int. Cl.[5] F21V** *8/00*

**U.S. Cl. 362—26** **3 Claims**



1. Surface lighting apparatus comprising:

at least one light source for emitting light;

a light guide of light conductive material having at least one light receiving end face which is arranged to surround said light source, part of said light guide being trapezoidal in shape with sides arranged to have an angle of about 45° with the base of the trapezoid and said light receiving end face and said part of said light guide that is trapezoidal being formed along a longest dimension of said light guide;

a light-diffusing reflective layer provided on a rear face of said light guide; and

reflective frame having light reflective inside walls and a light output opening in a front face thereof, and surrounding said light guide closely, to reflect light uniformly in said light guide.

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**5,050,047**

## ASSEMBLIES AND APPARATUS FOR LIGHTING ESPECIALLY SPOTLIGHTING

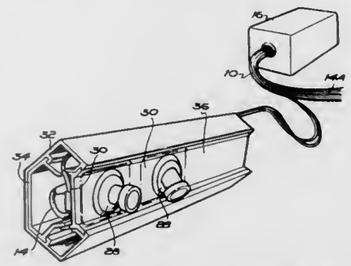
**Peter Viner, Wetherby, United Kingdom, and Stuart L. Moore, 65 Summit Ridge Rd., Stamford, Conn. 06902, assignors to Stuart L. Moore, New York, N.Y.**

**Filed Oct. 30, 1987, Ser. No. 115,134**

**Claims priority, application United Kingdom, Oct. 30, 1986, 8626033**

**Int. Cl.[5] F21V** *8/00*

**U.S. Cl. 362—32** **6 Claims**



1. An assembly for directing beams of light onto an object or area for illumination purposes, comprising a plurality of bodies each having a lens means and defining a light input and a light output, a fiber optic cable having a plurality of output ends at said respective light inputs so that the light transmitted along said cable passes through means so as to be focussed by the lens means into beams emanating from the light outputs, and a mounting bar receiving the plurality of said bodies for angular adjustment whereby the angles of the beams of light from the light outputs can be individually adjusted.

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**5,050,048**

## HEADLIGHT FOR VEHICLES

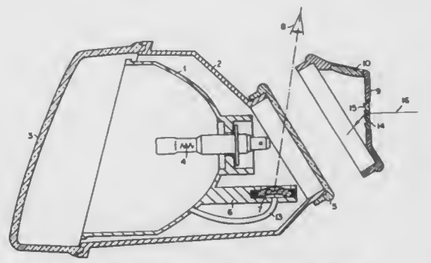
**Wolfgang Hendrischk, Soest, and Reiner Jocher, Aidlingen, both of Fed. Rep. of Germany, assignors to Hella KG Hueck & Co., Fed. Rep. of Germany**

**Filed Jul. 25, 1990, Ser. No. 557,646**

**Claims priority, application Fed. Rep. of Germany, Sep. 13, 1989, 8910911[U]**

**Int. Cl.[5] B60Q** *1/00*

**U.S. Cl. 362—61** **8 Claims**



1. In a headlight for a vehicle of a type having:

a reflector mounted in an interior of a fixed-position housing which is enclosed at its front, in a light-exiting direction, by a light-transmitting shield and at its rear by a releasable housing cap;

the reflector being mounted to be pivotable about a horizontal axis;

a level affixed on the reflector for allowing observance of an orientation of the reflector;

the housing defining an opening thereinto above the level; and

the opening being covered by a transparent cover; the improvement wherein:

the level is mounted on an end portion of a protrusion of the reflector extending toward the housing cap;

an edge of the housing defining the opening, which is covered by the housing cap, extends at such an angle to the horizontal that one can view into the interior of the housing therethrough from the vertical;

the end portion of the protrusion having the level mounted thereon extends sufficiently close to the housing opening that the level can be viewed therethrough from the vertical; and

the housing cap is transparent in at least one portion thereof above the level.

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**5,050,049**

## AUTOMOBILE HEADLAMP SYSTEM

**Masanori Shichijoh, Kosai; Shigehito Uchiyama, Shizuoka; Yoshio Takeuchi, Ohbu, and Hiroyasu Hayakawa, Chiryu, all of Japan, assignors to Asmo Co. Ltd. and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan**

**Filed Jul. 23, 1990, Ser. No. 556,326**

**Claims priority, application Japan, Jul. 25, 1989, 1-192204**

**Int. Cl.[5] B60Q** *1/05*

**U.S. Cl. 362—65** **36 Claims**

1. A retractable automobile headlamp system comprising:

a headlamp retractably mounted to an automobile body such that said headlamp is movable between a retracted posi-

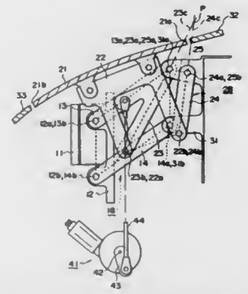
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tion inside the automobile body and an exposed position outside the body;

a lamp cover moveably mountable to the automobile such that when the headlamp is in said retracted position, said lamp cover covers the headlamp;

support means comprising a plurality of linkages extending between the automobile body, headlamp and cover for supporting said lamp cover such that the lamp cover is



movable between an open position and a closed position, the support means being configured to rotate said lamp cover about an instantaneous center located above and behind a rear end of the lamp cover when the cover is advanced from said closed position to said open position; and

driving means for driving said headlamp and said lamp cover via said support means such that said cover moves between said open position and said closed position.

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**5,050,050**

**AUXILIARY BRAKE LAMP**

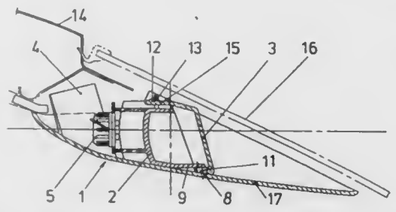
**Dietmar Alder, Geseke, Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Lippstadt, Fed. Rep. of Germany**

**Filed Nov. 21, 1990, Ser. No. 616,592**

**Claims priority, application Fed. Rep. of Germany, Nov. 23, 1989, 8913812**

**Int. Cl.[5] B60Q *1/26***

**U.S. Cl. 362—80.1** **6 Claims**



1. In an auxiliary brake lamp of a type comprising a lamp housing defining a rectangular light exit port and having a reflector positioned therein which is covered by a releasably-mounted light-transmission shield, the lamp housing being bowl shaped with its open side adjacent a vehicle body and being attached thereat, a portion of the housing projecting beyond the reflector in the manner of a cap bill which in a mounted position is adjacent a rear windshield, the improvement wherein:

apparatus for attaching opposite edges of the light-transmission shield to the rest of the auxiliary brake lamp at long edges of the light transmission shield includes shield-attaching means on opposite rim edges of the light-transmission shield, and corresponding attaching means for mating with said shield-attaching means being arranged on the reflector at one edge and on the housing at the other edge.

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**5,050,051**

**AUTOMOBILE SIGNAL LAMP**

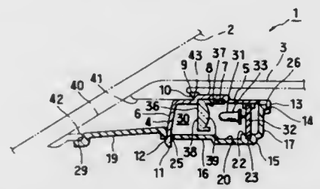
**Tsutomu Machida; Toshiyasu Mochizuki, and Susumu Masuda, all of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Shizuoka, Japan**

**Filed Jan. 26, 1990, Ser. No. 471,578**

**Claims priority, application Japan, Jan. 31, 1989, 1-22101**

**Int. Cl.[5] B60Q *1/26***

**U.S. Cl. 362—80.1** **12 Claims**



1. An automobile high-mount stop lamp for mounting on the inside of a rear window of an automobile, comprising:

an outer lens member having a top plate portion and a front surface portion formed integrally with said top plate portion and depending downward from a front edge of said top plate portion, a plurality of spaced pawl pieces projecting from a lower end of said front surface portion, and a plurality of downward projecting receptacle pieces disposed along a rear edge of said top plate portion having retaining openings formed therein, said top plate portion, said front surface portion, said pawl pieces and said receptacle pieces being molded integrally with one another;

a body member having a base plate portion, a rear plate portion extending vertically upward from a rear end of said base plate portion, side plate portions extending vertically upward from opposite side edges of said base plate portions and connected to respective side edges of said rear plate portion, an extended portion extending forward from a front edge of said base portion with a rear facing step being formed between said base plate portion and said extended portion, a plurality of spaced retaining openings being formed in said base plate portion adjacent said step each receiving a respective one of said pawl pieces of said outer lens member, a plurality of spaced pawl members formed along an upper edge of a rear surface of said rear plate projecting rearward and with each received in a respective one of said retaining openings of said lens member, and a plurality of rearward projecting mounting pieces formed on said rear plate portion, said base plate portion, said rear plate portion, said side plate portions, said extended portion, and said pawl members being molded integrally with one another; and

a light source member disposed in a space between said outer lens member and said base member.

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**5,050,052**

**AQUATIC LAMP MOUNTING STRUCTURE**

**Charles E. Wade, Diamond Bar, Calif., assignor to Wade Ventures Limited and Ann I. Hoyer, both of Diamond Bar, Calif.**

**Filed Nov. 21, 1988, Ser. No. 274,289**

**Int. Cl.[5] F21V *33/00***

**U.S. Cl. 362—101** **17 Claims**

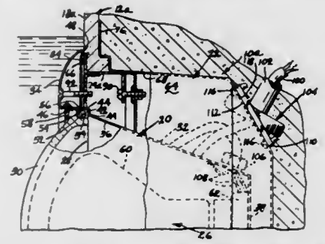
1. A lamp housing body for a water-tight aquatic light, comprising:

a one piece relatively thin-walled shell having a front end opening for containing a transparent lens and including a circumferential side wall having front and rear ends and a front end portion circumferentially surrounding said front



end opening, a rear end wall integrally joined to the rear end of said side wall, and a face ring about and integrally joined to the front end of said side wall, and wherein

said front end portion of said shell side wall is radially outwardly stepped to form an inner, forwardly and radially inwardly opening annular recess surrounding said front end opening rearwardly of said front end of said shell side wall for receiving the perimeter of a lens positioned in said opening and a seal ring for sealing the lens to said shell, said recess has a forwardly facing, annular rear wall sur-



face disposed in a transverse plane of said shell and a radially inwardly facing circumferential wall surface extending forwardly from said rear wall surface to the front end of said shell side wall, said face ring projects radially out from the front end of said shell side wall and has a rear seating surface about its perimeter, and said face ring is devoid of any projection radially inward beyond said circumferential wall surface which obstructs placement of a lens in and removal of a lens from said shell front end opening.

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**5,050,053**

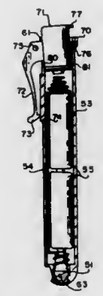
**FLASHLIGHT OF SELECTABLE COLORS**

**Kevin McDermott, 196 Phililips Dr., Hampstead, Md. 21074**

**Filed Sep. 11, 1990, Ser. No. 580,572**

**Int. Cl.[5] F21L *7/00***

**U.S. Cl. 362—204** **11 Claims**



1. A flashlight, which comprises:

a) a removably insertable light producing and electrical subsystem which comprises:

at least one dry cell battery that comprises an axial positive terminal at one end; a return negative surface at the opposing end; and an insulating cover surrounding the remaining body surface of said battery including an insulating strip contiguously upon the perimeter of said negative surface;

a lamp bulb comprising a base return terminal and an axial input terminal for continuous contact with said axial positive battery terminal;

a one-piece electrical conductor that comprises a lamp bulb base holding spring; a central segment for bridging across said insulating covers of all included batteries; and an on-off electrical switching spring for contacting said battery negative return surface for activating and extinguishing the light emission of said lamp bulb; and

b) a mechanical structure for housing said insertable lighting and electrical subsystem which comprises:

a non-corrosive electrically insulating opaque tubular case for containing therein said light producing and electrical subsystem; said case comprising, at a front end thereof an internal axial holding cavity for said lamp bulb and a restrictive axial aperture for projection of light from said lamp bulb; an elongated central segment for housing said batteries and said one-piece electrical conductor; and an open end at the rear of said case for insertion and removal of said light producing and electrical subsystem;

a means for reversibly closing said open end at the rear of said case for holding the assembly of said light producing and electrical subsystem within said case and for operating said on-off electrical switching spring to activate and extinguish said projection of light from said lamp bulb in response to control by said user.

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**5,050,054**

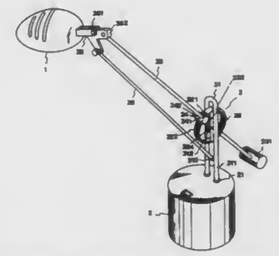
**ILLUMINATION APPARATUS ADJUSTING STRUCTURE**

**Angela Hsu, 1F, No. 8, Lane 313, Sec. 3 Chung Chin N. Rd., Taipei, Taiwan**

**Filed Jan. 3, 1991, Ser. No. 637,192**

**Int. Cl.[5] F21V *21/14***

**U.S. Cl. 362—285** **1 Claim**



1. An illumination apparatus adjusting structure, comprising:

a lamp holder having a lamp socket surrounded by a lamp shade for holding a lamp bulb;

a lamp stand having an electric circuit set therein, two mounting holes at the top;

an adjustable lamp support mounted on said mounting holes of said lamp stand for holding said lamp holder in a desired angle position; and

characterized in that:

said adjustable lamp support is comprised of an invertedly disposed U-shaped balance rack, an adjusting ring, a lamp supporting rod, a clamp, a steering rod, and a steering shaft, said U-shaped balance rack comprising two unitary, parallel posts having each a hole made at the inner side, and a cross beam connected between said two unitary, parallel posts at a lower position, said adjusting ring having two symmetrical openings on the face thereof, a plurality of rough, ridged surface portions bilaterally disposed by said openings, a center shaft held by two symmetrical side plates, said center shaft having two opposite ends respectively fastened in said hole on each of said two unitary, parallel posts of said U-shaped balance rack, said clamp being clamped on one of said two symmetrical openings of said adjusting ring and having a retaining hole made thereon for inserting said lamp supporting rod, said lamp supporting rod having one end inserted through said retaining hole of said clamp and said symmetrical open-

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ings of said adjusting ring and then coupled with a handhold and an opposite end connected to said lamp holder via said steering shaft, said steering rod having one end connected to said cross beam of said balance rack and an opposite end coupled to said steering shaft.

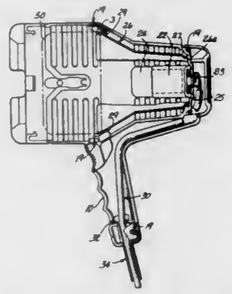
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**5,050,055**

## HEAT DISSIPATING HIGH INTENSITY LAMP HOUSING

**James R. Lindsay, Brea; Ronald A. Meyer, San Dimas; Alexander Garcia, Jr., Upland, Calif., and Alexander Waluszko, Pasadena, all of Calif., assignors to UVP, Inc., San Gabriel, Calif.**

**Filed Aug. 28, 1989, Ser. No. 399,709**
**Int. Cl.[5] F21V *29/00***
**U.S. Cl. 362—293** **15 Claims**



1. A high-intensity ultraviolet lamp comprising:
a filter assembly comprising a filter for the ultraviolet source; and
a housing for encasing the ultraviolet source and filter assembly,
wherein top, bottom, and side surfaces of the housing have a series of multiple elongated ventilation slots formed therein for dissipating heat generated by the ultraviolet source to ambient atmosphere outside the housing, and
wherein the lamp further comprises a thermally conductive shield surrounding the source, and the filter assembly further comprises a thermally conductive chassis surrounding the filter and partially overlapping the shield, whereby the shield and chassis assist in dissipating heat to the ambient atmosphere.

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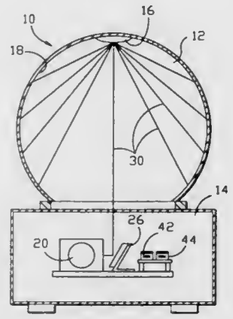
**5,050,056**

## APPARATUS FOR PRESENTING AN AUDIO SIGNAL TO VISUAL ANALOG DISPLAY

**Wes Ellison, Rte. 3, Box 215, Baldwin City, Kans. 66006**

**Filed Dec. 20, 1990, Ser. No. 631,471**
**Int. Cl.[5] F21S *1/00***
**U.S. Cl. 362—300** **17 Claims**

1. An apparatus for presenting shiftable light patterns comprising:
a source of a beam of light;
a housing having substantially surrounding translucent wall presenting interior surfaces for transmitting and diffusing light impinging on said surfaces for viewing exteriorly of said housing and substantially therearound;
a redirecting mirror mounted stationary relative to said housing and positioned for redirecting said light beam onto said interior surfaces;
at least one vibration mirror including means for mounting said mirror in the path of said beam and positioning said mirror for reflecting said beam onto said redirecting mirror; and
vibration means coupled with said vibration mirror for receiving vibration signals from a source thereof and for vibrating said vibration mirror in accordance with said signals,
said vibration mirror being operable for shifting the impingement location of said beam on said redirecting mirror in accordance with said vibrating,



said redirecting mirror presenting a curved surface and being operable for shifting the impingement position of said beam on said interior surfaces in accordance with the shifting of the beam impingement location of redirecting mirror and in accordance with the curvature thereof for thereby presenting shiftable light patterns.

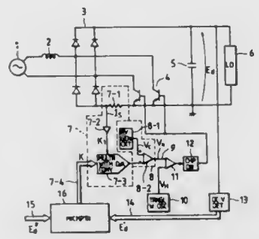
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**5,050,057**

## POWER SOURCE APPARATUS

**Yasuo Notohara, Hitachi; Tsunehiro Endo, Hitachioota; Koujirou Yamashita; Motoo Futami, both of Hitachi, and Shigeru Kishi, Oohira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 243,615, Sep. 13, 1988, abandoned. This application Jan. 18, 1989, Ser. No. 467,280**
**Claims priority, application Japan, Sep. 16, 1987, 62-229580; Oct. 28, 1987, 62-270461**
**Int. Cl.[5] H02M *5/45***
**U.S. Cl. 363—37** **16 Claims**



1. A power source apparatus comprising:
a rectifying circuit for converting AC power into DC power, said DC power including a power source current and a power source voltage;
a smoothing circuit for smoothing said power source voltage to obtain a smoothed DC output voltage;
a chopper circuit, including an inductor and at least one switching element, for improving a power factor of said power source apparatus; and
a power source current detecting and amplifying circuit for detecting said power source current and amplifying said detected power source current in accordance with an amplification factor so as to produce an amplified power source current, wherein said amplified power source current is utilized as an OFF signal for controlling said at least one switching element so as to improve said power factor of said power source apparatus;
said power source apparatus further comprising a motor speed controller in which an inverter and a motor are connected to an output terminal of said smoothing circuit, and a DC voltage detecting circuit for detecting said smoothed DC output voltage and inputting the detected smoothed DC output voltage to said motor speed controller, wherein said motor speed controller controls the speed of said motor by preparing a DC voltage instruction so that a deviation between the speed of said motor and a speed instruction for said motor becomes zero, and changing said amplification factor so that a deviation between said detected smoothed DC output voltage which is input to the motor speed controller and said DC voltage instruction becomes zero.



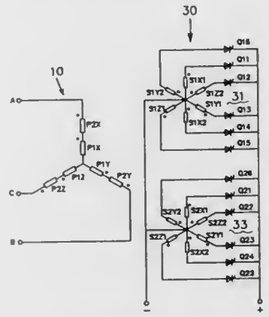
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**5,050,058**

## FAMILY OF POWER CONVERTERS USING RECTIFIER TRANSFORMERS CONNECTED IN SERIES ON THE PRIMARY SIDE

**Georges-Emile April, and Guy Olivier, both of Montreal, Canada, assignors to La Corporation de l'Ecole Polytechnique, Montreal, Canada**

**Filed Aug. 14, 1990, Ser. No. 567,948**
**Int. Cl.[5] H02M *7/06***
**U.S. Cl. 363—65** **6 Claims**



1. A power converter apparatus, comprising:
at least two three-phase transformer arrangements including primary winding means and secondary winding means;
said primary winding means comprising a plurality of primary windings connected in series to form a wye configuration;
said secondary winding means comprising at least two converter arrangements, each converter arrangement comprising a plurality of secondary windings connected in a double-wye configuration, said converter arrangements being connected in parallel;
a separate rectifier connected in series with each secondary winding of each said converter arrangements.

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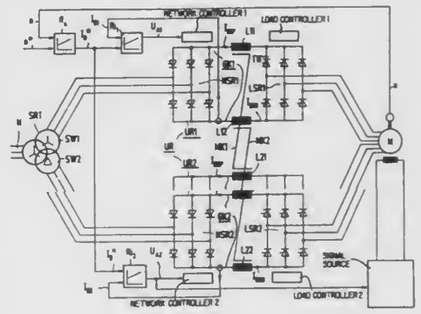
**5,050,059**

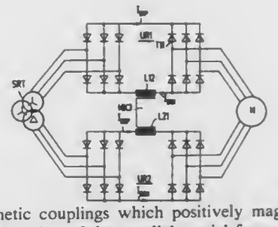
## FREQUENCY CHANGER HAVING PARALLEL PARTIAL FREQUENCY CHANGERS WITH A DC CIRCUIT

**Gerhard Neeser, Neunkirchen, and Jens Hamann, Fuerth-Stadeln, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 14, 1989, Ser. No. 393,665**
**Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 8810279[U]**
**Int. Cl.[5] H02M *5/45***
**U.S. Cl. 363—65** **7 Claims**

1. In a frequency changer having at least two parallel partial frequency changers, each partial frequency changer having an intermediate dc circuit and chokes in the intermediate dc circuit, where each partial frequency converter forms a separate single or multiphase system that works in parallel on a load such that each of the single or multiphase systems causes a rotating field in the load, the improvement comprising:





magnetic couplings which positively magnetically couple the chokes of the parallel partial frequency changers to each other such that a change of the dc current in the intermediate dc circuit of one partial frequency changer causes a change of the dc currents in the intermediate dc circuits of another parallel partial frequency changer in the sense of a precontrol.

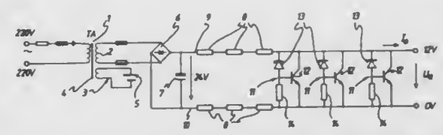
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**5,050,060**

## INTRINSICALLY SAFE POWER SUPPLY UNIT

**Guy Geuns, Wuppertal, Fed. Rep. of Germany, assignor to Hermann Hemscheidt Maschinenfabrik GmbH & Co., Wuppertal, Fed. Rep. of Germany**

**Filed Mar. 2, 1990, Ser. No. 487,380**
**Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906621**
**Int. Cl.[5] H02M *7/06***
**U.S. Cl. 363—126** **3 Claims**



1. An intrinsically safe power supply unit, more particularly for face supports in mining, comprising a transformer, a rectifier connected thereto, resistance wiring for limiting the current and connected to the dc voltage output of the recitifier, and a voltage-limiting circuit comprising voltage limiters connected in parallel and containing Zener diodes which keep the output voltage constant, wherein the transformer is a resonance transformer stabilising the secondary voltage and having a resonant circuit on the secondary side, the resistance wiring comprises power resistors disposed symmetrically in a positive

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line and a negative line, and the voltage limiting circuit comprises three parallel voltage limiters, each voltage limiter comprising a transistor whose collector-emitter portion is disposed between the positive line and the negative line and whose base is actuated via a voltage divider comprising a Zener diode and a high-value resistor and disposed between the positive line and the negative line.

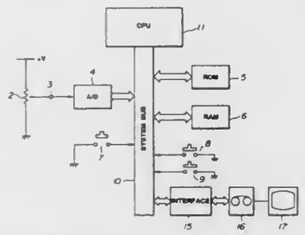
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**5,050,061**

## APPARATUS FOR GENERATING PREDETERMINED CONTROL DATA CORRESPONDING TO AN OPERATING POSITION OF A MANUALLY OPERABLE CONTROL DEVICE OR LEVER

**Naoki Nishio, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Apr. 4, 1989, Ser. No. 332,999**
**Claims priority, application Japan, Apr. 6, 1988, 63-84025**
**Int. Cl.[5] H03K** *17/94;* **H03M** *11/00*
**U.S. Cl. 364—900** **9 Claims**




1. A system for generating control data comprising:
a movable member movable within a plurality of predetermined positions;
position detecting means for detecting said plurality of predetermined positions of said movable member and outputting a respective position signal depending on the predetermined position of said movable member;
converting means for converting each said position signal to a respective digital position signal, and for outputting said digital position signal corresponding to a current predetermined position of said movable member as a read address, whereby said plurality of predetermined positions correspond to a plurality of read addresses;
memory means for storing a plurality of control data in a range of respective read addresses therein, and for storing in a further memory area said read addresses from said converting means in a selected correspondence with said range of respective read addresses of said plurality of control data;
writing means for writing into said further memory area, in an adjustment mode when said movable member is successively placed at said predetermined positions, each respective one of said read addresses when said movable member is at the respective predetermined positions, in said correspondence to the respective one of said read addresses of said memory means at which the respective control data is stored;
interpolation means for interpolating, in said adjustment mode after said writing into said further memory area of said read addresses corresponding to said predetermined positions, between said read addresses of said memory means of said desired control data corresponding to said predetermined positions;
reading means for reading out said control data from said read addresses of said memory means; and
output means for outputting said control data read out from said memory means;
wherein, after completion of an adjustment of said adjustment mode, a respective desired one of said control data is output for each predetermined position of said movable member.

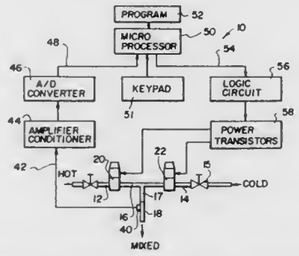
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**5,050,062**

## TEMPERATURE CONTROLLED FLUID SYSTEM

**David N. Hass, R.D. #5, Box 223, Wynantskill, N.Y. 12198**

**Filed Feb. 6, 1989, Ser. No. 307,369**
**The portion of the term of this patent subsequent to Jun. 5, 2007, has been disclaimed.**
**Int. Cl.[5] G05D** *23/30*
**U.S. Cl. 364—152** **30 Claims**




1. A temperature controlled fluid system, comprising:
a hot fluid supply connection, for supplying hot fluid to said system;
a cold fluid supply connection, for supplying cold fluid to said system;
hot and cold fluid valves connected, respectively, to said hot and cold fluid supply connections, said hot and cold valves each having a valve seat and a valve member movable with respect to said valve seat to control a flow of fluid through said valve;
first and second valve motors connected, respectively, to said hot and cold fluid valves for moving said hot and cold valve members, respectively, in relationship to their associated valve seats;
means, connected to said hot and cold fluid valves, for receiving the flow of hot and cold fluids from said valves and mixing said fluids together into a fluid mixture having a substantially uniform temperature for all radial locations within a given cross section of the mixed fluid flow;
an outlet connection connected to said mixing means, for discharging said mixed fluid from said system;
means for generating an electrical signal corresponding to the actual temperature of the mixed fluid discharged from said outlet connection;
digital processing means connected to said temperature signal generating means, for computing an error value between the actual temperature of said mixed fluid and a selected temperature therefor, and also for applying a digitally implemented feedback control algorithm to said error value so as to generate a feedback control signal for controlling the fluid flow through said hot and cold valves; and
logic means connected to said digital processing means and also to said first and second valve motors, for receiving said feedback control signal and for controlling said valve motors in response to said control signal, to move said hot and cold valve members so as to cause the actual temperature of the mixed fluid to approach the selected temperature therefor.

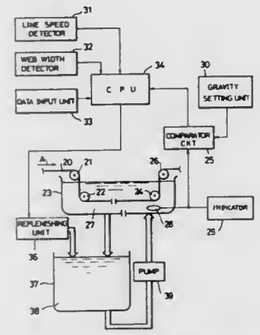


**5,050,063**

## METHOD FOR CONTROLLING THE CHARACTERISTICS OF AN AQUEOUS SOLUTION

**Naoki Sekiguchi, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Aug. 1, 1989, Ser. No. 387,975**
**Claims priority, application Japan, Aug. 1, 1988, 63-192246**
**Int. Cl.[5] G05B** *13/02*
**U.S. Cl. 364—165** **13 Claims**




1. A method for controlling the characteristics of an aqueous solution for treating the surface of a continuously moving web travelling through said solution, said solution having a property with a detectable value, said method comprising the steps of:
detecting physical parameters of said moving web;
effecting a feedforward control to change the value of said property of said solution at a fundamental period of time, said fundamental period depending upon said detected physical parameters of said moving web;
detecting a change in the value of said property of said solution under said feedforward control; and
effecting a feedback control for changing said fundamental period of said feedforward control in accordance with the difference between said detected value of said property and a predetermined value of said property to which said solution is to be controlled.

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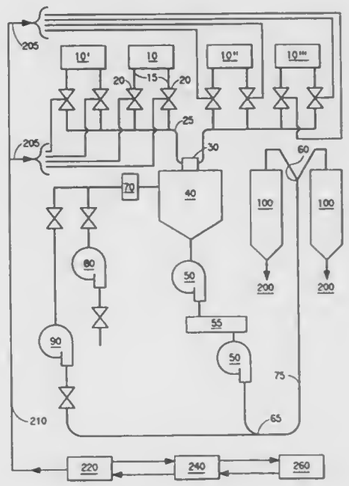
**5,050,064**

## METHOD FOR CONTROLLING THE BLENDING OF SOLIDS WITH A COMPUTER

**Robert L. Mayhew, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Dec. 6, 1989, Ser. No. 446,772**
**Int. Cl.[5] G06F** *15/46*
**U.S. Cl. 364—172** **3 Claims**

1. A method of controlling with a computer the blending of solids from a plurality of sources, said solids in each source having at least one common physical property, to produce a blend having a predetermined goal value of said common physical property, comprising:
a) providing the computer with a data base including at least;
(i) the predetermined goal value of the common physical property;
(ii) a value of the common physical property for each of the sources; and
(iii) a predetermined lower and upper time limit for withdrawing solids from the sources;
b) assigning the value of the common physical property of each source greater than the predetermined goal value to a first data array in the computer;
c) assigning the value of the common physical property of each source less than the predetermined goal value to a second data array in the computer;
d) selecting from the first data array a first source with the common physical property value closest to the predetermined goal value;
e) selecting from the second said data array a second source with the common physical property value closest to the predetermined goal value;




f) pairing the first and second sources;
g) calculating a time t(1) and a time t(2) for withdrawing solids from the paired sources according to the equations;

$$t(2) = (x + y)[P(g) - P(1)]/[P(2) - P(1)] \text{ and}$$
$$t(1) = (x + y) - t(2);$$

where;
P(g)=the predetermined goal value
P(1)=the value of the common physical property of a first source in the first data array
P(2)=the value of the common physical property of a second source in the second data array
t(1)=time for withdrawing solids from the source in the first data array,
t(2)=time for withdrawing solids from the source in the second data array,
subject to;

$$x \leqq t(1) \leqq y,$$
$$x \leqq t(2) \leqq y \text{ and}$$
$$t(1) + t(2) = (x + y),$$

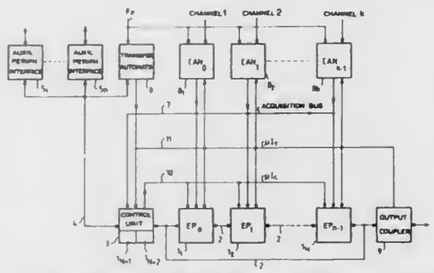
where;
x=the lower time limit for withdrawing solids from the sources,
y=the upper time limit for withdrawing solids from the sources,
h) storing the calculated time t(1) and the calculated time t(2) in a buffer in the computer;
i) assigning a default value to t(1) and t(2) equal to (x+y)/2 for each solids source having a common physical property equal to P(g) and storing t(1) and t(2) in the buffer; and
j) controlling the physical property of the blend by withdrawing solids from the sources, for the times t(1) and t(2) stored in the buffer.

5,050,065

## RECONFIGURABLE MULTIPROCESSOR MACHINE FOR SIGNAL PROCESSING

Luc Dartois, Colombes, and Eric Lenormand, Asnieres, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Nov. 2, 1988, Ser. No. 266,147
Claims priority, application France, Nov. 6, 1987, 87 15420
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—200 6 Claims



1. A multiprocessor machine for signal processing of the type in which the analog signals to be processed are received from K different signal channels and converted to the form of digital samples by K analog-to-digital converters connected respectively to each channel, comprising:

N monolithic elementary signal processors, each connected by means of a sample acquisition bus common to all of the N processors, to the K sample outputs of said K analog-to-digital converters and also inter-connected to each other by way of a ring bus common to all of the N processors so as to permit circulation between each of said N processors of the results of computation performed on the samples received by each processor;

a control unit for controlling accesses to and from said N processors and for controlling the performance of computations to be carried out by said N processors on the samples received by them as well as the transfer of samples on the acquisition bus; and

at least one transfer automat means synchronized by a common clock signal for controlling the transfer of the computation results between processors on the ring bus,

said each processor comprising

a computation unit and a program memory wherein the computation unit is for carrying out indifferently tasks of computation in the single instruction multiple data (SIMD) or multiple instruction multiple data (MIMD) mode under the control of an instruction derived from the unit for control of instructions contained in its own program memory (MIMD mode) or from instructions supplied by the control unit (SIMD mode)

and wherein each processor further comprises:

a data memory; and

a memory interface circuit for coupling the data memory either to the computation unit or to the ring bus.

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5,050,066

## APPARATUS WITH A SINGLE MEMORY AND A PLURALITY OF QUEUE COUNTERS FOR QUEUING REQUESTS AND REPLIES ON A PIPELINED PACKET BUS

Mark S. Myers, Portland, and Eileen Riggs, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 14, 1988, Ser. No. 257,857
Int. Cl.[5] G06F *13/14, 13/42*
U.S. Cl. 364—200 14 Claims

1. Apparatus for queuing bus requests and bus replies on a pipelined packet bus comprising:

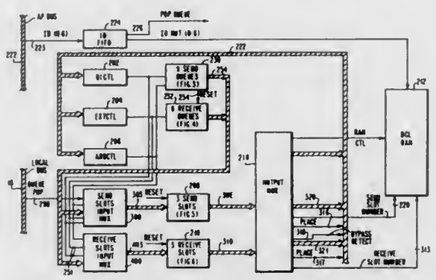
a RAM (212) for buffering bus requests by storing packet information corresponding to each said bus request to be sent over said bus in bus time slots allotted to each said bus request;

each said bus request being comprised one of either a send request or a receive request;

a number (n) of send slots (208) for keeping track of the state of n send requests that are stored in said RAM (212);

a number (m) of receive slots (210) for keeping track of the state of m receive requests that are stored in said RAM (212);

a plurality of send queue counters (230) comprising a first state logic for providing a series of first states corresponding to a series of send queues for tracking a said request and for tracking a corresponding send reply;



a plurality of receive queue counters (232) comprising a second state logic for providing a series of second states corresponding to a series of receive queues for tracking a receive request and for tracking a corresponding receive reply;

an output MUX (214) connected to said send and receive slots for generating status information as to the state of said slots; and,

means (203, 204, 206) connected to said output MUX (214), responsive to said status information as to the state of said slots, for incrementing or decrementing said send queue counters (230) and said receive queue counters (232) in accordance with a predetermined system bus protocol.

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5,050,067

## MULTIPLE SLIDING REGISTER STACKS IN A COMPUTER

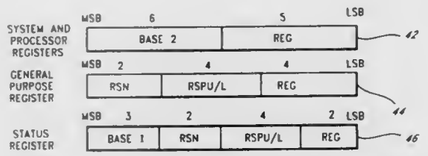
Angus McLagan, Newport Beach; Gei-Jon Pao, Garden Grove, and Chong S. Un, Anaheim, all of Calif., assignors to Davin Computer Corporation, Irvine, Calif.

Continuation of Ser. No. 88,616, Aug. 20, 1987, abandoned. This application Feb. 27, 1990, Ser. No. 489,722
Int. Cl.[5] G06F *7/00*
U.S. Cl. 364—200 6 Claims

4. A register architecture for a computer which reduces computer overhead by decreasing the number of times the contents of a set of registers are saved in said computer, said register architecture comprising:

a sliding register stack of general purpose registers, said sliding stack having an addressable window which slides along said register stack to occupy a plurality of positions along said stack, each of said positions corresponding to a range of addresses for the general purpose registers in said sliding register stack, each of said positions further corresponding to a particular program portion being executed by said computer, said general purpose registers storing data for the program portion corresponding to each said position of said addressable window; and

a plurality of status registers which store information relating to the status of said computer when executing program portions associated with said ranges of address for the general purpose registers in said sliding register stack, said status registers being located outside of said stack of general purpose registers, said computer operating to change said position of said addressable window in response to a change in the program portion executed by said computer, the data in said general purpose registers addressed by a first position of said addressable window remaining unchanged when said addressable window is in a second position independent of said first position so that when said addressable window again addresses said first position, the data stored in said general purpose registers addressed by said first position are immediately available, thereby reducing the overhead required in switching from said second position back to said first position.



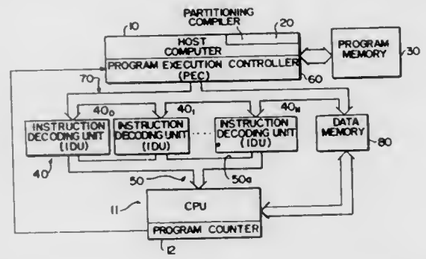
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5,050,068

## METHOD AND APPARATUS FOR USING EXTRACTED PROGRAM FLOW INFORMATION TO PREPARE FOR EXECUTION MULTIPLE INSTRUCTION STREAMS

Apostolos Dollas; Robert F. Krick, both of Durham, N.C., and Blair D. Milburn, Beaverton, Oreg., assignors to Duke University, Durham, N.C.

Filed Oct. 3, 1988, Ser. No. 252,791
Int. Cl.[5] G06Z *9/38, 9/30*
U.S. Cl. 364—200 33 Claims



13. Apparatus for fetching, for execution by a computer central processing unit (CPU), of instructions of a computer program having program flow changes, the apparatus comprising:

means for extracting program flow information from the computer program prior to execution;

means for monitoring execution of the computer program;

means for selectively storing, based on the program instruction being executed and the program flow information, different portions of the computer program in a plurality of fetch units such that all instructions that potentially could be needed as the program execution continues by the CPU are stored in said fetch units, and such that no single fetch unit contains both a program portion having a branch taken instruction and a program portion containing a branch not taken instruction for the same branch instruction; and

means for selectively communicating instructions from said fetch units to the CPU based on determination of the next instruction to be executed.

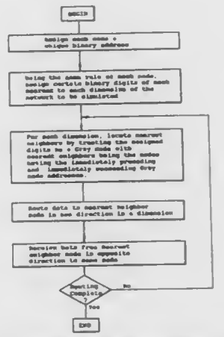
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5,050,069

## METHOD AND APPARATUS FOR SIMULATING M-DIMENSION CONNECTION NETWORKS IN AND N-DIMENSION NETWORK WHERE M IS LESS THAN N

W. Daniel Hillis, Brookline; Brewster Kahle, Sommerville; George G. Robertson, Marblehead, and Guy L. Steele, Jr., Lexington, all of Mass., assignors to Thinking Machines Corporation, Cambridge, Mass.

Filed Apr. 27, 1987, Ser. No. 42,761
Int. Cl.[5] G06F *13/20*
U.S. Cl. 364—200 42 Claims



1. A method of simulating an interconnection network of m dimensions in an array of nodes in a binary cube interconnection network of n dimensions where m is less than n comprising computer performed steps of:

assigning to each node a unique binary number of at least n digits wherein each of n digits specifies the node's position in one dimension of the network of n dimensions,

for each node, allocating to each of at least two of m dimensions certain of the digits in the binary number assigned to the node according to a rule which is applied to each binary number in like fashion, and

for each node and with respect to each of the m dimensions for which said allocating step is performed, identifying that node's nearest neighbors in a dimension in the network of m dimension as those nodes at which the allocated digits of the binary numbers assigned to said nodes immediately precede and immediately succeed the allocated digits assigned to that node when the allocated digits are regarded as Gray code values.

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5,050,070

## MULTI-PROCESSOR COMPUTER SYSTEM HAVING SELF-ALLOCATING PROCESSORS

David M. Chastain, Plano; James E. Mankovich, Garland, and Gary B. Gostin, Coppell, all of Tex., assignors to Convex Computer Corporation, Richardson, Tex.

Filed Feb. 29, 1988, Ser. No. 161,768
Int. Cl.[5] G06F *15/16, 9/44*
U.S. Cl. 364—200 6 Claims

1. A method for parallel execution of a process in a computer system having a plurality of processors, the method comprising the steps of:

initiating execution of said process and writing process state parameters for said process into defined registers in a

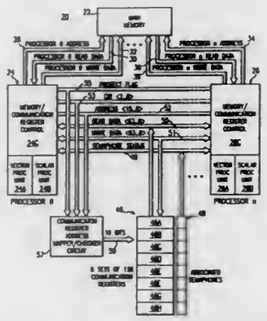
VOL 1130 ISS 3 SE 17 1991 UMI



communications register set which is accessible to the processors in the system,

commencing serial execution of the instruction code of said process by said first of said processors,

upon execution of a parallelization instruction for said process by said first processor, which parallelization instruction indicates parallel process operations for said process which can be executed in parallel, (a) writing additional process state parameters for said process into said communication register set to allow other of said processors to join in the execution of said parallel process operations for said process, and (b) signaling to other of said processors that said parallel process operations are available for execution by setting a semaphore register associated with said process state parameter,



monitoring of said semaphore register by one or more of said other processors, when said other processors are in an idle state, to detect when said first processor has posted said semaphore to request that other ones of said processors join in execution of said parallel process operations of said process,

upon detection of the setting of said semaphore by one or more of said other processors, accessing said process state parameters stored in said communication register set and commencing execution of said parallel process operations by said one or more processors, and

resuming serial execution of the instruction code of said process by one of said processors after completion of said execution of said parallel process operations.

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**5,050,071**

**TEXT RETRIEVAL METHOD FOR TEXTS CREATED BY EXTERNAL APPLICATION PROGRAMS**

**Edward S. Harris, 2726 Van Hise Ave., Madison, Wis. 53705; Paul Kleinberger, 4 Hamaapilim Street, Jerusalem, 92545; Natan Blanks, Emek Hashoshanim 21/6, Ness Tiona 70400, both of Israel; Richard B. Kraus, 35 Sycamore Ct., Lawrenceville, N.J. 08648, and Thomas R. Wolfe, 5110 Minocqua Crescent, Madison, Wis. 53705**

**Filed Nov. 4, 1988, Ser. No. 267,011**

**Int. Cl.[5] G06F** *15/401*

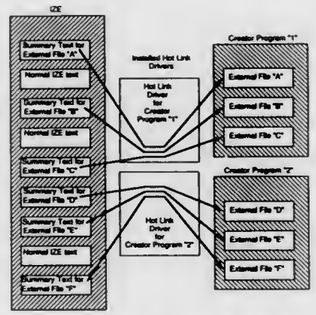
**U.S. Cl. 364—200** **3 Claims**

1. A computer program method utilizing a computer processor and connected memory means for retrieving information stored in a text base of texts wherein some of the texts are internal texts created by the program and others of the texts are external text files created by an external application program, the method comprising the steps, performed by the computer processor, of

a) building a list of keywords from the texts and indexing an association of those keywords with the internal texts;

b) creating, for each external text file, an internal text which is a summary text, the summary text including a list of keywords having an association with both the summary text and the external text file;

c) searching among the internal texts in the text base for those internal texts having a user-defined relationship to at least one keyword until a particular text of interest is identified;



d) if the identified text is an internal text which is not a summary text, displaying the internal text; and

e) if the identified text is a summary text for an external text file, suspending operation of the program and initiating operation of the external application program which created the external text file to gain access to the external text file.

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**5,050,072**

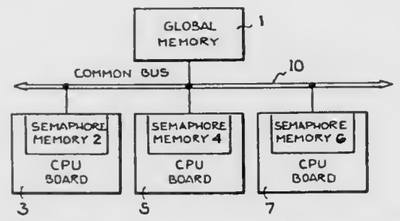
**SEMAPHORE MEMORY TO REDUCE COMMON BUS CONTENTION TO GLOBAL MEMORY WITH LOCALIZED SEMAPHORES IN A MULTIPROCESSOR SYSTEM**

**William E. Earnshaw, N. Lauderdale, and Steven J. McKinney, Coral Springs, both of Fla., assignors to Modular Computer Systems, Inc., Fort Lauderdale, Fla.**

**Filed Jun. 17, 1988, Ser. No. 207,878**

**Int. Cl.[5] G06F** *15/16, 13/16*

**U.S. Cl. 364—200** **3 Claims**




1. A multiprocessor system employing a semaphore mechanism, comprising:

a global memory for storing semaphore protected data structures;

a plurality of CPU boards, each one of said CPU boards containing a central processing unit and local memory for storing semaphores which are identical to semaphores stored in the local memory of each of the other of said CPU boards, each semaphore including a lock bit which can be set and reset in dependence of whether a data structure in global memory is being used by a one of the central processing units;

a common bus interconnecting said global memory and said plurality of CPU boards;

spin loop means in each said central processing unit for gaining access to a given semaphore stored in local memory by continously checking the status of the local lock bit associated with the given semaphore until it is determined that the local lock bit is reset, locking the common bus to prevent other central processing units from gaining access to said common bus, reading the local lock bit to ensure it is still reset, and thereafter setting the associated local lock bit for gaining access to the given semaphore; and

bus monitoring logic means on each said CPU board coupled to the central processing unit and the local memory of that CPU board for writing to said common bus the local set lock bit, and for monitoring the common bus for a set lock bit written to said common bus by another bus monitoring logic means on one of the other CPU boards and writing the set lock bit written onto said common bus by the other bus monitoring logic means into local memory to ensure coherency of the lock bits throughout said multiprocessor system.



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**5,050,073**

**MICROINSTRUCTION EXECUTION SYSTEM FOR REDUCING EXECUTION TIME FOR CALCULATING MICROINSTRUCTION**

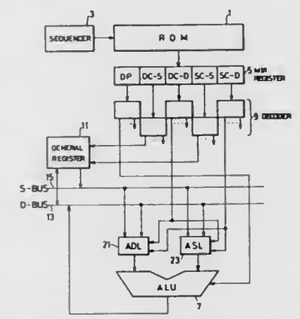
**Kosei Okamoto, Kunitachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Dec. 30, 1987, Ser. No. 139,814**

**Claims priority, application Japan, Jan. 9, 1987, 62-1871**

**Int. Cl.[5] G06F** *9/22*

**U.S. Cl. 364—200** **4 Claims**




1. A microinstruction executing system for reducing execution time of calculation microinstructions, comprising:

(a) general storing means for storing data, including source data and destination data;

(b) calculating means for performing calculation operations upon data;

(c) destination data register means, coupled to said general storing means and to said calculating means, for temporarily storing destination data sent from said general storing means to be transferred to said calculating means;

(d) source data register means, coupled to said general storing means and to said calculating means, for temporarily storing source data sent from said general storing means to be transferred to said calculating means;

(e) means, coupled to said general storing means, to said calculating means, to said destination data register means, and to said source data register means, for executing calculation microinstructions, each of said microinstructions being

(1) for performing a calculation operation by said calculating means upon said source data and said destination data temporarily stored in said source data register means and said destination data register means, respectively,

(2) for transferring a calculated result of said calculation operation to said destination data register means, and

(3) for transferring source data necessary for a succeeding calculation operation from said general storing means to said source data register means;

whereby each microinstruction performs (1), (2), and (3) all within a predetermined cycle.

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**5,050,074**

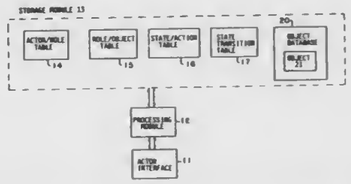
**SYSTEM FOR FACILITATING COORDINATION OF ACTIVITIES BY A PLURALITY OF ACTORS WITH AN OBJECT DATABASE AND STATE/ACTION IDENTIFICATION**

**David A. Marca, Lowell, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.**

**Filed Mar. 28, 1988, Ser. No. 173,768**

**Int. Cl.[5] G06F** *15/21*

**U.S. Cl. 364—200** **5 Claims**




1. A system for coordinating actions by a plurality of actors in connection with various constituents of an activity, comprising:

actor interface means for initiating use of the system by a selected actor, for providing information to the system from the actor, and for providing responses to the actor from the system;

actor/role definition means for storing and defining a plurality of roles that the actor may assume with respect to the constituents;

an object database for storing a plurality of objects, each object being associated with a constituent, wherein each object comprises:

identifier means for identifying the object;

state means for defining a state of the object;

information means for storing information relating to the associated constituent;

state/action definition means for storing and defining a plurality of actions that the actors may perform in connection with the various states of each object;

state transition definition means for storing and defining state transitions for each object in connection with each action defined by the action/state definition means;

role/object access definition means for storing and defining the objects which may be accessed by the actor assuming a particular role;

processing means, responsive to the information provided by the actor interface means,

for determining, in response to the role/object access definition means, whether the actor assuming a particular role, as defined by the actor/role definition means, may access an object,

for determining, in response to the state/action definition means, whether the actor may perform an action on the object,

for performing the action on the object according to the information provided by the actor interface means, in response to the determination as to whether the actor may access the object and the determination as to whether the action may be performed on the object, and

for modifying the state of the object as defined by the state transition definition means in response to the action performed on the object.

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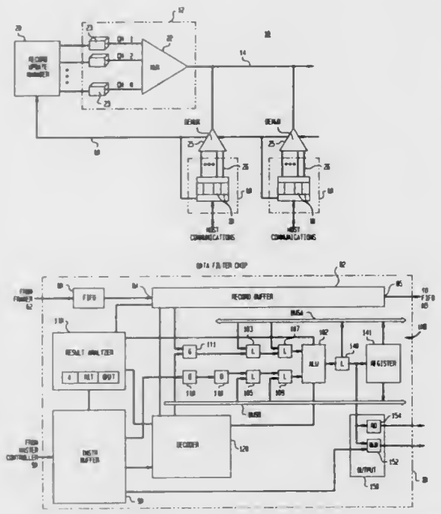


5,050,075

## HIGH PERFORMANCE VLSI DATA FILTER

Gary E. Herman, South Orange; Kuo-Chu Lee, Franklin Township, Somerset County, and Takako Matoba, Morristown, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Oct. 4, 1988, Ser. No. 253,240
Int. Cl.[5] G06F *7/22*
U.S. Cl. 364—200 11 Claims



1. A data filter for performing queries on a high speed data stream organized into a sequence of records which form a database, said data filter comprising

buffer means for receiving and buffering each of said records forming the high speed data stream in sequence,

memory means for storing a batch of instructions arranged in a specific order for carrying out a query in response to a request for information from the database,

pipelined processing means in communication with said buffer means and said memory means for executing said instructions stored in said memory in said specific order for each of said records while each record is buffered in said buffer means, and

intermediate result accumulation means in communication with said processing means for storing an output of said processing means resulting from the execution of particular ones of said instructions by said processing means and for providing an input to said processing means for enabling said processing means to execute subsequent ones of said instructions depending on the contents of the intermediate result accumulation means.

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5,050,076

## PREFETCHING QUEUE CONTROL SYSTEM

Toshio Misaka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 4, 1988, Ser. No. 252,927
Claims priority, application Japan, Oct. 5, 1987, 62-249975
Int. Cl.[5] G06F *9/30, 9/38*
U.S. Cl. 364—200 2 Claims

1. A prefetching queue control system for controlling an operation of prefetching in a computer in which parallel to execution of a current instruction, a subsequent instruction is prefetched, comprising:

a buffer memory including a plurality of first registers each for storing an instruction in response to a first set signal;

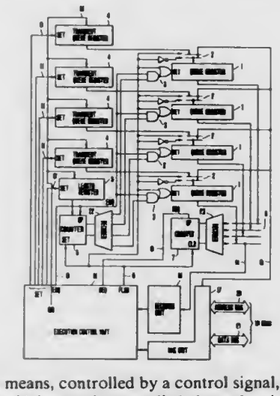
means for generating said first set signal;

a decoding unit for selecting and decoding an output from one of said plurality of first registers of said buffer memory;

a bus unit, connected to a main memory through address and data buses, for outputting through a prefetching bus an instruction prefetched from said main memory;

first memory means, including a plurality of second registers of a number equal to at most the number of said first registers, for prestoring an instruction sequence which is to be executed by utilizing a time interval before an instruction at a destination of a branch is supplied from said main memory in response to a branch instruction;

second memory means for prestoring length data of said instruction sequence prestored in said first memory means;



selection means, controlled by a control signal, for selecting either said instruction supplied through said prefetching bus or an output from said first memory means and outputting selected data to said buffer memory; and

an execution control unit for controlling prestoring operations of said first and second memory means respectively to prestore said instruction sequence and said length data, for controlling execution of an instruction output from said decoding unit, for generating said control signal when branching occurs, and for controlling said first set signal generating means, said selection means, and said decoding means to transfer said instruction sequence stored in said first memory means to said buffer memory as a transferred instruction sequence in accordance with said length data stored in said second memory means, to sequentially receive said transferred instruction sequence through said decoding means, and to execute said transferred instruction sequence for a time interval before the instruction at said destination of said branch is supplied.

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5,050,077

## MEETING SCHEDULER WITH ALTERNATIVE LISTING

James P. Vincent, Arlington, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 406,890, Sep. 12, 1989, abandoned, which is a continuation of Ser. No. 153,111, Feb. 8, 1988, abandoned. This application Jul. 9, 1990, Ser. No. 551,687
Int. Cl.[5] G06F *15/21*
U.S. Cl. 364—401 7 Claims

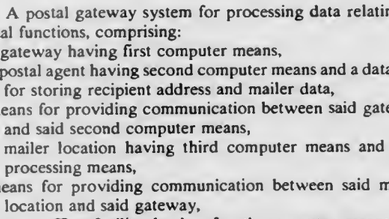
1. A method of scheduling a meeting using attendee calendars stored in a computer system, said method comprising the steps of:

presenting a scheduler with a prompting screen for keying in a plurality of desired meeting parameters including at least: a list of desired attendees, a desired date range, and a desired time span;

establishing an initial period of time equal to all available time within said desired date ranges;

comparing in said computer system said initial period of time with each desired attendees' calendar;

in response to said comparing, subdividing said initial period




of time into a plurality of shorter periods of time, each of said shorter periods of time have a specified beginning time, a specified ending time and a designation of any desired attendee who is unavailable during that shorter period of time; and

presenting an option screen to said scheduler displaying available times for selection of a meeting time within one of said plurality of shorter periods of time which complies with said desired meeting parameters.

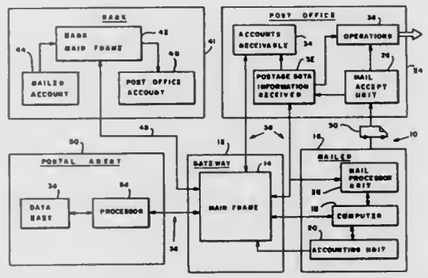
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5,050,078

## MAIL PROCESSING AND ACCOUNTING SYSTEM WITH COMMUNICATION AMONG PROCESSING UNITS AND DATA REFORMATTING

Ronald P. Sansone, Weston, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 3, 1989, Ser. No. 416,734
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—406 13 Claims




1. A postal gateway system for processing data relating to postal functions, comprising:

a gateway having first computer means,

a postal agent having second computer means and a database for storing recipient address and mailer data,

means for providing communication between said gateway and said second computer means,

a mailer location having third computer means and mail processing means,

means for providing communication between said mailer location and said gateway,

a post office facility having fourth computer means, accounts receivable means, and mail processing means,

means for providing communication between said gateway and said fourth computer means,

a bank having fifth computer means including a post office account and a mailer account, and

means for providing communication between said gateway and said fifth computer means.

8. A postal communication system for processing data relating to postal functions, comprising:

a postal agent having first computer means and a database for storing mailer information,

at least one mailer location having second computer means and mail processing means,

at least one post office facility having third computer means, accounts receivable means, and an operations unit,

a bank having fourth computer means comprising a post office account and a mailer account, and

means for providing communication between at least said first computer means and said second, third and fourth computer means.

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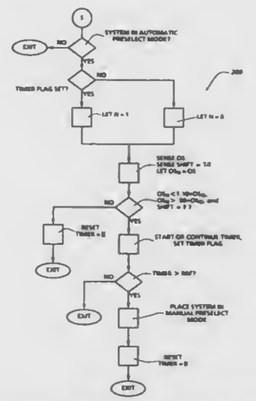


5,050,079

## MODE CONTROL FOR MECHANICAL TRANSMISSION SYSTEM WITH SEMI-AUTOMATIC SHIFT IMPLEMENTATION AND MANUAL AND AUTOMATIC SHIFT PRESELECTION MODES

Jon A. Steeby, Schoolcraft, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 17, 1990, Ser. No. 568,797
Int. Cl.[5] B60K *41/08, 41/18*
U.S. Cl. 364—424.1 10 Claims



1. A control method (200) for controlling a vehicular semi-automatic mechanical change gear transmission system comprising a fuel throttle controlled engine (E), a multi-speed change gear mechanical transmission (10), a manually controlled master friction clutch (C) drivingly interposed between the engine and the transmission, a first sensor (98) for providing a first input signal indicative of transmission input shaft (16) rotational speed, a second sensor (100) for providing a second input signal (OS) indicative of the rotational speed of the transmission output shaft (90) under at least certain transmission operating conditions, a nonmanually controllable transmission actuator (112, 70, 96) for controlling shifting of the transmission and for provide a signal indicative of transmission shifting (Shift=T) and not shifting (Shift=F) conditions thereof, a mode selector (108) for manual selection of either a manual or an automatic preselection mode of operation and for providing a mode input signal indicative of said selected mode, and a central processing unit (106) for receiving said input signals and for processing same in accordance with predetermined logic rules to issue command output signals, said central processing unit including means responsive to manual and automatic preselection of a transmission shift from a currently

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engaged ratio for automatically issuing command output signals to said actuator to cause the transmission to be shifted into neutral;

said method characterized by:

if said central processing unit is operating in said automatic preselection mode of operation, sensing the rotational speed of said output shaft and the transmission shifting-/nonshifting condition; and

if, for a predetermined period of time (REF), the speed of said output shaft is substantially constant, and said transmission is not shifting (Shift = F), then causing said control processing unit to operate in the manual preselection mode.

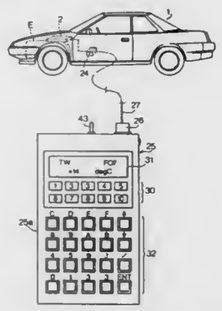
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**5,050,080**

## DIAGNOSTIC SYSTEM FOR A MOTOR VEHICLE

**Kunihiro Abe, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Sep. 22, 1989, Ser. No. 411,553**
**Claims priority, application Japan, Sep. 28, 1988, 63-243669**
**Int. Cl.[5] G01M *15/00***
**U.S. Cl. 364—424.04** **6 Claims**



1. In a diagnostic system for diagnosing an electronic control system of a motor vehicle, said electronic control system having sensing means for sensing operating conditions of said motor vehicle, control means for processing sensor data from said sensing means so as to calculate control data for controlling said vehicle, said first memory means for storing said sensor data and said control data, the diagnostic system having a diagnostic device and connecting means for connecting said diagnostic device with said electronic control system, said diagnostic device including a keyboard, a control unit for communicating with said electronic control system through said connecting means to read out said sensor data and said control data from said first memory means in response to a diagnosis mode inputted through said keyboard in accordance with programs stored in second memory means, and a display for displaying said sensor data and said control data read out by said control unit, the improvement in the diagnostic and electronic control systems which comprises:

third memory means provided in said electronic control system for storing address numbers of said first memory means storing said sensor data and said control data respectively; and

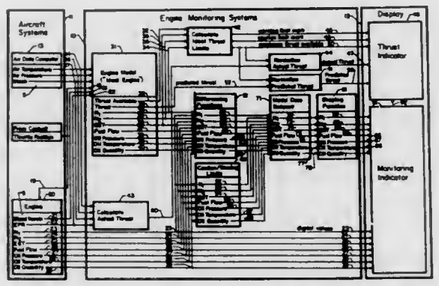
fourth memory means provided in said control unit of said diagnostic device, upon demand of transmission of said address numbers from said electronic control system, for storing said address numbers in said control unit when said diagnostic device is initialized, so as to enable immediate and accurate read out of said sensor data and said control data from said first memory means by designating one of said address numbers corresponding to said sensor data and said control data.

**5,050,081**

## METHOD AND SYSTEM FOR MONITORING AND DISPLAYING ENGINE PERFORMANCE PARAMETERS

**Terence S. Abbott, Williamsburg, and Lee H. Person, Jr., Yorktown, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Nov. 14, 1988, Ser. No. 270,189**
**Int. Cl.[5] G06F *15/50***
**U.S. Cl. 364—424.06** **27 Claims**



1. A method of monitoring and displaying the actual, predicted, and available thrust of an aircraft engine under determined operating conditions comprising the steps of:

calculating the actual thrust of said aircraft engine under said determined operating conditions and generating an output signal representative thereof:

calculating the predicted thrust of a functional model of said aircraft engine under said determined operating conditions and generating an output signal representative thereof:

calculating the available thrust of said functional model of said aircraft engine under said determined operating conditions: and

simultaneously displaying the representative values of said actual, predicted, and available thrusts.

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**5,050,082**

## SYSTEM FOR CONTROLLING AUTOMOTIVE AUTOMATIC TRANSMISSION

**Yuji Kato, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Japan**

**Filed Dec. 5, 1988, Ser. No. 279,690**
**Claims priority, application Japan, Dec. 7, 1987, 62-308948**
**Int. Cl.[5] G05D *17/02*; G06F *15/50***
**U.S. Cl. 364—431.01** **11 Claims**

1. In a vehicle having an internal combustion engine and an automatic transmission,

octane value determining means for determining an octane value of fuel on which the engine is operated and means for producing an octane signal responsive thereto;

a first control unit which produces an ignition control signal in response to the determined octane value thereby to control an ignition timing of the engine responsively to the octane value;

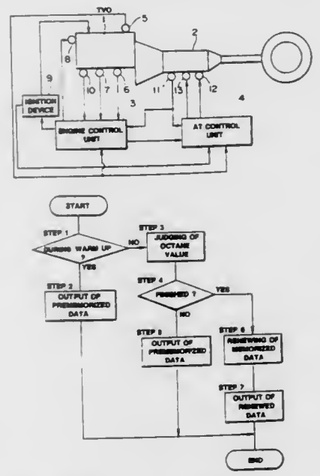
a second control unit which produces a gear control signal and a line pressure control signal in response to sensed load applied to the engine thereby to control a gear change point of the transmission and a line pressure of the same responsively to a load applied to the engine;

said second control unit including:

first correcting means for correcting the line pressure at a first rate in response to said octane signal when the transmission is operating in a single gear; and

second correcting means for correcting the line pressure at a second rate in response to said octane signal when the transmission is undergoing a gear change,





each of said first and second correcting means correcting the line pressure by increasing the line pressure as the octane value of the fuel increases.

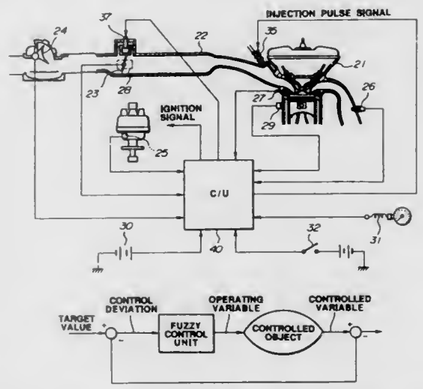
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**5,050,083**

## SYSTEM AND METHOD FOR CONTROLLING AIR/FUEL MIXTURE RATIO FOR INTERNAL COMBUSTION ENGINE

**Masaaki Ucbida; Hideki Uema; Fumio Yukawa; Kunifumi Sawamoto; Toyaki Nakagawa, and Naoki Nakada, all of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Sep. 29, 1989, Ser. No. 414,002**
**Claims priority, application Japan, Sep. 29, 1988, 63-245805; Dec. 9, 1988, 63-160181[U]; Dec. 9, 1988, 63-311355; Dec. 13, 1988, 63-314760**
**Int. Cl.[5] G06F *15/48*; F02M *51/00, 41/00*; G06G *7/70***
**U.S. Cl. 364—431.05** **36 Claims**



1. A system for controlling an air/fuel mixture ratio for an internal combustion engine, comprising:

a) first means for detecting engine driving conditions;

b) second means for calculating a basic fuel supply quantity to said engine on the basis of said detected engine driving conditions;

c) third means for detecting an actual air/fuel mixture ratio of the engine to produce a detected air/fuel mixture ratio;

d) fourth means for measuring a deviation of said detected air/fuel mixture ratio from a target air/fuel mixture ratio;

e) fifth means for determining whether there is an inversion of a relationship of magnitudes of both said target air/fuel mixture ratio;

f) sixth means for measuring an accumulated parameter of an engine operation after said inversion of said relationship of said the air/fuel mixture ratios whenever said fifth means determines that said relationship of said magnitudes of both said air/fuel mixture ratios has been inverted;

g) seventh means for setting a criterion to be compared with said measured accumulated parameter;

h) eighth means for comparing said measured accumulated parameter with said criterion and setting an integration constant which satisfies both a requirement of stability at a time of an engine steady driving condition and a requirement of a preferable responsive characteristic at a time of an engine transient driving condition on the basis of a result of comparison;

i) ninth means for calculating an integration portion from said set integration constant and measured deviation and calculating a feedback correction quantity of air/fuel mixture ratio including at least said integration portion; and

j) tenth means for correcting said basic fuel supply quantity with said feedback correction quantity to determine a fuel supply quantity for said engine.

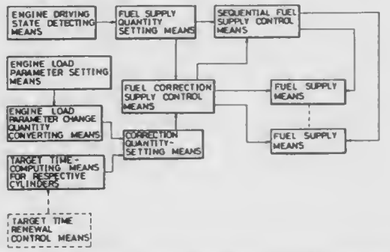
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**5,050,084**

## METHOD AND APPARATUS FOR CONTROLLING SUPPLY OF FUEL INTO INTERNAL COMBUSTION ENGINE

**Shinpei Nakaniwa, Isesaki, Japan, assignor to Japan Electronic Control Systems Co., Ltd., Isesaki, Japan**

**Filed Jan. 31, 1990, Ser. No. 473,032**
**Claims priority, application Japan, Feb. 1, 1989, 1-20843**
**Int. Cl.[5] F02D *41/10, 41/34*; F02B *3/12***
**U.S. Cl. 364—431.07** **15 Claims**



8. An apparatus for controlling a supply of fuel to an internal combustion engine, which comprises:

fuel supply quantity determining means for determining a fuel supply quantity based on an engine driving state including at least a state of intake air, which is included in an intake air quantity of said engine detected by engine driving state detecting means;

sequential fuel supply control means for independently actuating fuel supply means disposed for respective cylinders at predetermined supply initiating times based on said fuel supply quantity to perform normal fuel supply at times matched to intake strokes of said respective cylinders;

engine load parameter setting means for setting a parameter relative to an engine load based on a variable controlled

opening area of an intake path system of said engine and a revolution number of said engine;

engine load parameter change quantity computing means for computing a quantity of change of an engine load parameter per unit time;

target time computing means for computing target times up to a target crank angle position in an intake stroke individually for said respective cylinders;

correction quantity setting means for setting a quantity of correction of said fuel supply quantity individually for said respective cylinders based on said quantity of change of said engine load parameter and a time set for each cylinder of said respective cylinders by said target time computing means; and

corrected fuel supply control means for performing at least one of normal corrected supply control for correcting and setting said supply control means for performing at least one of normal corrected supply control for correcting and setting said fuel supply quantity based on said quantity of correction set for each cylinder of said respective cylinders and causing said sequential fuel supply control means to perform said normal fuel supply while maintaining a corresponding relation to said cylinders and additional supply control for actuating said fuel supply means of a corresponding cylinder based on a corrected quantity for said each cylinder, independently from said sequential fuel supply control means.

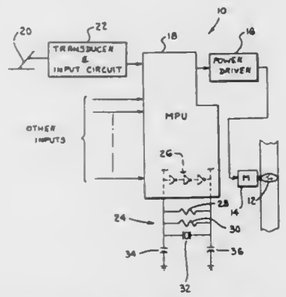
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**5,050,085**

## ENGINE CONTROL MICROPROCESSOR START-UP CIRCUIT

**Danny O. Wright, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.**

**Filed Jun. 22, 1990, Ser. No. 542,300**
**Int. Cl.[5] H03B** *5/36*
**U.S. Cl. 364—431.11** **18 Claims**




13. In a microprocessor-based control, one or more input means for delivering one or more input signals to the microprocessor, and one or more output means via which one or more output signals from the microprocessor exercises control over one or more aspects of a controlled means, and wherein the microprocessor is programmed to develop the one or more output signals in accordance with an algorithm which utilizes information derived from said one or more input signals, and the microprocessor comprises internal circuitry which is connected with external circuitry that includes the parallel circuit combination of a crystal and a starting resistance configured to initiate and sustain electrical oscillation of the combined circuitries and cause the generation of an internal clock signal within the microprocessor at a frequency related to said electrical oscillation, the improvement which comprises said starting resistance comprising two individual resistance means connected in parallel circuit relationship with each other and directly connected to said microprocessor internal circuitry, said two individual resistance means having respective resistance values which in their parallel circuit relationship connection are effective to cause the initiation of said electrical oscillation and which are also individually effective to cause the initiation of said electrical oscillation so that in the event that either one of said individual resistance means experiences an open circuit fault, said oscillation can nonetheless be initiated and sustained by the other of said individual resistance means.

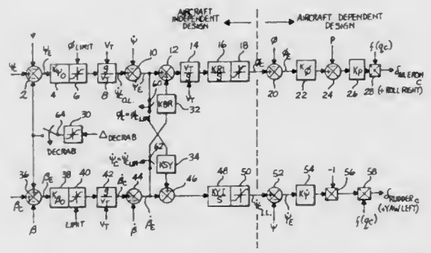
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**5,050,086**

## AIRCRAFT LATERAL-DIRECTIONAL CONTROL SYSTEM

**Antonius A. Lambregts, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Apr. 30, 1990, Ser. No. 516,755**
**Int. Cl.[5] G05D** *1/02*; **B64C** *13/16*
**U.S. Cl. 364—434** **27 Claims**




1. A method of controlling an aircraft's horizontal flight path and sideslip angle, said aircraft having at least one aileron and a rudder, said method comprising:

providing a roll control loop, and a yaw control loop,

during flight, determining a yaw rate error and a sideslip rate error;

generating, in said roll control loop, an incremental aileron position command signal as a function of the sum of said yaw rate error and said sideslip rate error; and generating, in said yaw control loop, an incremental rudder position command signal as a function of the difference between said yaw rate error and said sideslip rate error; and

in response to said signals, producing incremental changes in the aileron's position and the rudder's position to control the aircraft's horizontal flight path and sideslip angle.

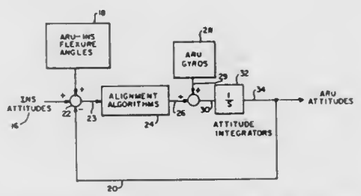
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**5,050,087**

## SYSTEM AND METHOD FOR PROVIDING ACCURATE ATTITUDE MEASUREMENTS AT REMOTE LOCATIONS WITHIN AN AIRCRAFT

**Craig D. Walrath, Catonsville; Kristie L. Drude, Pasadena, and Steven T. Nyman, Hanover, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Nov. 29, 1989, Ser. No. 442,601**
**Int. Cl.[5] G06F** *15/50*
**U.S. Cl. 364—434** **33 Claims**




1. A method for accurately determining the attitude of a location in a vehicle that flexes with respect to the said location of a first attitude sensor mounted within the vehicle and having an output by means of a second attitude sensor that is mounted at said flexing location and having attitude output accompanied by a greater error than said output of said first attitude sensor, comprising the steps of:

a. periodically determining the flexure angle between said first and second attitude sensors by comparing said attitude outputs of each, and

b. generating attitude information for said flexing location based on said second sensor output and also based on a master input formed by the sum of said first sensor output and said flexure angle, thus slaving said output of said second attitude sensor to said master input to reduce the error associated with said output of said second sensor.



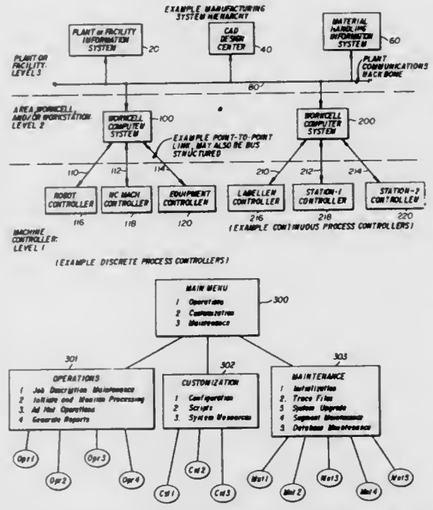
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**5,050,088**

## PRODUCTION CONTROL SYSTEM AND METHOD

**Andrew J. Buckler, Ontario; Richard A. Roland, Fairport, and Christopher W. Nerkowski, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 29, 1989, Ser. No. 330,327**
**Int. Cl.[5] G06F** *15/46*
**U.S. Cl. 364—468** **81 Claims**




1. A production control method for interfacing an automated material handling system to at least one manufacture workcell having processing equipment therein for performing processing jobs on provided material comprising the steps of:

forming an addressable library of program modules with each module defining a sequence of operations that are to be performed by at least one piece of processing equipment within a manufacturing workcell;

generating process scripts for addressing selected program modules;

selecting program modules for performing the desired processing operations on the provided material in accordance with formed job descriptions and said process scripts;

programming each piece of processing equipment to be responsive to the sequence of processing operations defined by the selected program modules;

executing said process scripts for causing the flow and processing of material to and through each workstation to be in accordance with the formed job descriptions and executing process scripts;

event tracking the processing operations of the processing equipment within a workcell for providing an indication of the performance of an operation, in the defined sequence of processing operations, being performed on the material; and

tracking the work in process within a workcell to provide data representative of a quality rating for the operations being performed on the material.

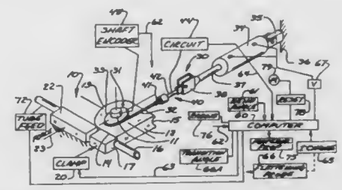
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**5,050,089**

## CLOSED-LOOP CONTROL SYSTEM

**Kim A. Stelson, Edina, and Woon-Chung Wang, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, St. Paul, Minn.**

**Filed Sep. 8, 1989, Ser. No. 404,796**
**Int. Cl.[5] B21D** *7/12*
**U.S. Cl. 364—474.07** **11 Claims**




1. An apparatus for correcting for spring back in bending tubes comprising: a bending die, means for holding a tube on the bending die, guide means for guiding the tube as it is moved by the die during bending, means for driving said bending die to bend a tube a selected number of degrees, said means for driving including means for measuring a function of force exerted by the means for driving, means for correlating the measured function of force and the effective lever arm through which the measured function of force acts to move the bending die to determine the bending moment needed for bending the tube on the bending die, means providing a signal indicating the moment of inertia of the tube being bent, and control means for operating the means for driving responsive to the signal indicating the moment of inertia and to the means for correlating the measured function of force and the effective lever arm to drive the means for driving to cause overbending of the tube an amount proportional to the determined bending moment to compensate for springback of a tube being bent.

7. An apparatus for bending tubes comprising a bending die having a rotatable die element, power means for driving said rotatable die element to bend a tube, means for measuring loads exerted by the power means on said bending die while bending such tube, and means for determining the bending moment on said tube during the driving of said rotatable die element.

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**5,050,090**

## OBJECT PLACEMENT METHOD AND APPARATUS

**Alexander J. Golub, Lewisville; Oscar F. Garza; C. Pat Joiner, both of Winston-Salem, and Alan W. Neebe, Chapel Hill, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.**

**Filed Mar. 30, 1989, Ser. No. 331,621**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—478** **44 Claims**

1. A method for placing physical objects of differing placement characteristic types in a physical three-dimensional space of predetermined size, comprising the steps of:

(a) storing in a computer, a library of object placement patterns, each pattern in the library representing placement of a plurality of objects;

(b) storing in the computer, a representation of the physical

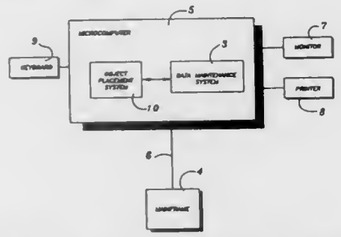
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objects to be placed and a representation of the physical three-dimensional space in which the physical objects are to be placed;

(c) selecting, in the computer, from the stored representation of the physical objects, a given number of first type representation of an object to be placed in the representation of the three-dimensional space;

(d) choosing, in the computer, from the stored library, a pattern set comprising at least one pattern for placement of said first type representation of an object in the representation of the three-dimensional space which minimizes the portion of said representation of the three-dimensional space used, to place the given number of first type representation of objects within a portion of the representation




of the three-dimensional space consistent with at least one constraint factor;

(e) repeating steps (c) and (d) in the computer, for the remaining representations of objects to be placed in the representation of the three-dimensional space, to thereby place the representation of the physical objects in the representation of the physical three-dimensional space;

(f) producing an indication of the placed representation of the objects in the representation of three-dimensional space; and

(g) placing the physical objects in the physical three-dimensional space in conformance with the indication of the placed representation of the objects in the representation of three-dimensional space.

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**5,050,091**

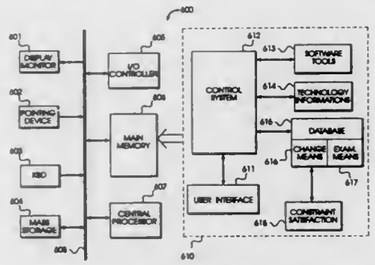
## INTEGRATED ELECTRIC DESIGN SYSTEM WITH AUTOMATIC CONSTRAINT SATISFACTION

**Steven M. Rubin, Portola Valley, Calif., assignor to Electric Editor, Inc., San Jose, Calif.**

**Continuation of Ser. No. 338,414, Apr. 11, 1989, abandoned, which is a continuation of Ser. No. 937,959, Dec. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 707,125, Feb. 28, 1985, abandoned. This application Aug. 21, 1990, Ser. No. 572,325**

**Int. Cl.[5] G06F** *15/60*

**U.S. Cl. 364—488** **11 Claims**




1. A system for designing electrical circuits comprising:

a computer having a memory and a processor;

a display device coupled to said computer;

a keyboard device coupled to said computer for entering information;

a cursor-control device coupled to said computer for generating signals for moving a cursor on said display device; and

programming means stored in said memory for instructing said processor to perform the steps of:

representing alterable components of the circuit as nodes;

representing interconnections between nodes as arcs;

imposing constraints with regard to the design only upon the arcs;

creating a desired set of the nodes and the arcs representative of the arcs;

effecting a change to the circuit to thereby change at least one selected node;

examining the constraints on the arcs coupled to the selected node, and in response effecting those changes imposed by the constraints on the arcs coupled to the selected node; and

displaying on the display device a representation of the circuit.

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**5,050,092**

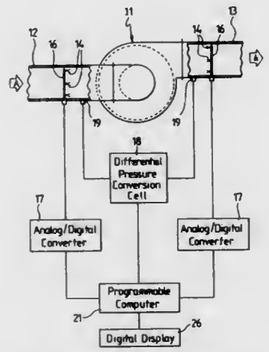
## FAN EFFICIENCY MEASURING APPARATUS

**Robert E. Perry, 1348 Starcross Dr., Birmingham, Ala. 35216**

**Filed Feb. 26, 1990, Ser. No. 484,246**

**Int. Cl.[5] G01M** *19/00*

**U.S. Cl. 364—506** **8 Claims**




1. Apparatus for monitoring the efficiency of a fan in an air conduit comprising:

(a) first means for sensing average air temperature within an air conduit on the discharge side of a driven fan comprising a plurality of thermocouples spaced apart within said air conduit;

(b) second means for sensing average air temperature within an air conduit on an inlet side of said fan comprising a plurality of thermocouples spaced apart within said air conduit;

(c) means for sensing the air pressure differential from the inlet of said fan and the discharge of said fan; and

(d) means operatively connected to said first and second temperature sensing means and said pressure sensing means to receive signals derived from the parameter sensed thereby for converting said signals into a fan efficiency ratio based on the formula

$$\text{Fan efficiency} = \frac{T_1[(K-1)/K][(P_2-P_1)/P_1]}{T_2-T_1}$$

wherein:



$T_t$ = fan discharge temperature in degrees Fahrenheit plus 460°,

$T_2$ = fan inlet temperature in degrees Fahrenheit plus 460°,

$P_2$ = fan discharge pressure in inches water gauge plus 406.9 inches,

$P_1$ = fan inlet pressure in inches water gauge plus 406.9 inches,

K = ratio of gas specific heat at constant pressure to constant volume; and

(e) means for displaying said fan efficiency.

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**5,050,093**

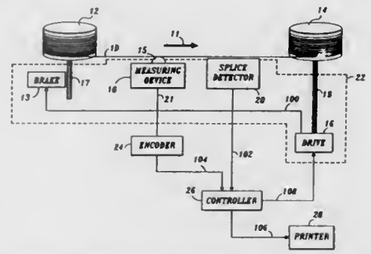
## METHOD AND APPARATUS FOR INSPECTING ELECTRICAL WIRE

**Mahender Reddy, Renton; Douglas M. Sargent; Jerome D. Johnson, both of Kirkland, and James C. Stevens, Issaquah, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Oct. 19, 1989, Ser. No. 424,750**

**Int. Cl.[5] G01R** *31/08*

**U.S. Cl. 364—507** **18 Claims**




1. A method of inspecting an insulated electrical wire comprising the steps of:

(a) advancing the electrical wire from a first position to a second position;

(b) measuring the length of the electrical wire as it is advanced and producing electrical wire length data representative of the running total length of the electrical wire;

(c) detecting splices in the electrical wire and producing a splice pulse for each detected splice;

(d) using the splice pulses and the electrical wire length data to determine the location of the detected splices along the length of the electrical wire and producing splice location data that are representative of the locations of the splices as measured from a first reference point proximate to a leading end of the electrical wire as the electrical wire is advanced from the first position to the second position;

(e) producing reversed splice location data that are representative of the locations of the splices as measured from a second reference point proximate to a trailing end of the electrical wire; and

(f) generating a report that includes the electrical wire length data, the splice location data, and the reversed splice location data.

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**5,050,094**

## COMPENSATING METHOD AND DEVICE FOR INSTRUMENTAL ERROR IN ROTARY DISPLACEMENT FLOWMETER

**Akitoshi Kitano, 38-3, Aza Inokute, Oaza Nagakute, Nagakute-cho, Aichi-gun, Aichi-ken, Japan**

**Filed Jan. 3, 1989, Ser. No. 292,899**

**Claims priority, application Japan, Jan. 26, 1988, 63-15157**

**Int. Cl.[5] G01F** *25/00*

**U.S. Cl. 364—510** **4 Claims**

1. An instrumental error compensation apparatus for a fluid flow measuring instrument comprising:

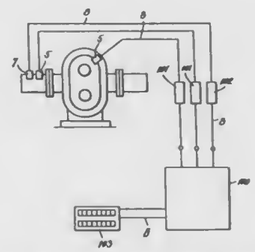
a positive displacement flowmeter having a rotor means and inlet and outlet means for measuring the flow rate of fluid flowing therethrough;

temperature sensor means mounted on said flowmeter for measuring the temperature of the fluid flowing through the flowmeter and producing an electrical signal representing the measured temperature;

rotation sensor means mounted on said flowmeter for measuring the rotational speed of said rotor means and producing an electrical pulse signal representing the measured speed;

microprocessor control unit means for receiving said electrical signals from said temperature and rotation sensor means; and

electric signal conducting means operatively connecting said temperature and rotation sensor means to said control unit means for conducting said signals from said sensors to said control unit means;




said microprocessor control unit means comprising,

means for correlating the viscosity of the fluid as a function of the measured temperature with the instrumental error and storing the correlated temperature-viscosity data,

means for determining the period of pulse signals transmitted for each rotation of said rotor means, and calculating a compensation value from instrumental error compensation data based on the correlated temperature-viscosity data stored in the microprocessor means,

means for calculating a first flow rate from said signal representing rotor speed and modifying said first flow rate by said compensation value to produce a second flow rate, and

means to output and indicate said second modified flow rate on real time.

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**5,050,095**

## NEURAL NETWORK AUTO-ASSOCIATIVE MEMORY WITH TWO RULES FOR VARYING THE WEIGHTS

**Tariq Samad, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Continuation-in-part of Ser. No. 200,384, May 31, 1988, abandoned. This application Jan. 10, 1990, Ser. No. 463,917**

**Int. Cl.[5] G06F** *15/18*

**U.S. Cl. 364—513** **11 Claims**

1. A neural network associative memory, comprising,

a single layer of processing elements having source and destination ones of said elements which are respectively referenced as (i) and (j) elements,

each of said elements having available a summation means for summing weighted inputs to said elements and a transfer function means for computing transformation of said summed weighted inputs,

an input means for and associated with individual ones of said elements for receiving patterns to be learned and patterns to be identified,

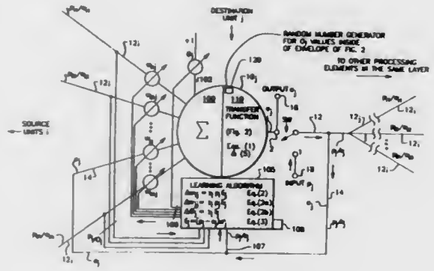
an output means for and associated with individual ones of said elements for outputting patterns generated by said individual ones of said processing elements,

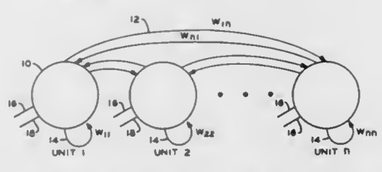
VOL 1130 ISS 3 SE 17 1991 UMI



a first set of unidirectional connections comprising a first set of variable value weights extending respectively from said a plurality of said output means of said elements to a plurality of said summation means of other individual ones of said elements,

a second set of unidirectional connections forming a second set of variable value weights extending respectively from said output means of a plurality of said elements to said summation means of the same ones of said elements, and






means for varying the values of said first set of weights pursuant to the rule $\Delta w_{ij}=\eta p_i \delta_j$ and the values of said second set of weights pursuant to the rule $\Delta w_{jj}=\eta p_j \delta_j$, wherein ($w_{ij}$) are variable connection weights between functionally adjacent ones (i) and (j) of said elements, ($\eta$) is a constant that determines the learning rate, ($w_{jj}$) are variable feedback connection weights for each of said elements, ($p_i$) are predetermined values of said patterns to be learned and identified associated with said (i) elements and ($\delta_j$) are error signals respectively of said (j) elements.

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**5,050,096**

**PATH COST COMPUTING NEURAL NETWORK**

**Abraham N. Seidman, Beverly Hills, Calif., assignor to Northrop Corporation, Hawthorne, Calif.**

**Filed Sep. 26, 1989, Ser. No. 412,696**
**Int. Cl.[5] G06F** *15/18*
**U.S. Cl. 364—513** **12 Claims**

1. A method for computing a cost minimum resulting from traversing a path through a network of nodes each of which represents a cost function

providing an array of cells corresponding to the nodes,

interconnecting said cells into a n-dimensional network such that each cell is connected for data communication to its nearest neighbors in the network but not to other members of the network,

causing each cell to receive and retransmit a signal from every neighbor cell

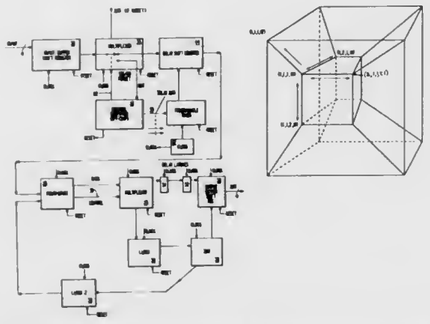
introducing a data packet signal at one origin cell in the network,

generating and adding a unique cell identifier to each received signal before retransmission from the respective cell,

imposing a delay on the retransmitted signal proportional to the cost function value at each respective cell,

retransmitting delayed signal with identifiers to the nearest neighbor cells,

said introduced signal dividing and travelling by all possible paths to a predetermined target cell in the array by all possible paths of nearest neighbor connections between cells and carries with it identifiers for each cell traversed and a time delay proportional to the sum of the delays



incurred as a result of the cost function stored a each cell node traversed, and

outputting, responsive to receipt of a data packet at the target cell, a list of identifiers for at least the first received data packet.

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**5,050,097**

**BOUNDARY DETECTOR AND GRAPHIC PROCESSING SYSTEM INCORPORATING THE SAME**

**Kouki Hasebe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

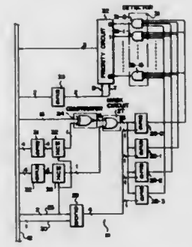
**Continuation of Ser. No. 291,350, Dec. 29, 1988, abandoned, which is a continuation of Ser. No. 55,596, May 29, 1987, abandoned. This application Oct. 13, 1989, Ser. No. 423,503**
**Claims priority, application Japan, May 31, 1986, 61-126341; May 31, 1986, 61-126342**
**Int. Cl.[5] G06K** *9/39*
**U.S. Cl. 364—518** **18 Claims**

17. An apparatus for processing image data being comprised of a plurality of segments for an image comprising:

a frame memory having means for storing image data and means for outputting a first selected segment of said image data;

means for generating boundary condition data, said boundary condition data indicating a condition of said image data;

means for respectively comparing a second predetermined selected segment of said image data to said boundary condition data to determine a coincidence between the indicated condition and the data in said second predetermined selected segment of said image data and for generating boundary data corresponding to the determinations of coincidence of the data in said second predetermined selected segment of said image data;



means for detecting a boundary in said second predetermined selected segment of said image data in response to said boundary data and for outputting the position of said boundary in said second predetermined selected segment of said image data.

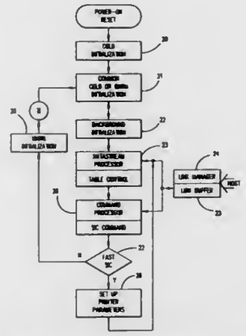
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**5,050,098**

**PRINTER INITIALIZATION SYSTEM**

**John K. Brown, III; James C. Buchanan; Carl P. Cole, and Patrick O. Bischel, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.**

**Filed Aug. 25, 1989, Ser. No. 398,872**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—519** **3 Claims**



1. A printer having means for utilizing an initializing procedure wherein the printer is connected with a host application and wherein said host application is operable to present initializing instructions to said printer to automatically set up said printer, said means for utilizing an initializing procedure comprising:

means for selectively altering printer default parameters;

means for selectively deleting previously downloaded fonts and macros;

means for selecting one of several printer emulation modes so that the printer is enabled to process a datastream format associated with the selected printer emulation mode; and

said means for utilizing an initializing procedure being operable for a subsequent job while a preceding job is still being printed, as long as the previously selected emulation mode is unchanged for the subsequent job and as long as fonts needed for the job being printed are not deleted until the font is no longer needed, thus enabling said printer to process commands and data for said subsequent job while still printing said preceding job.

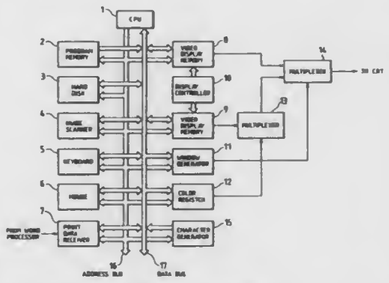


**5,050,099**

**IMAGE DISPLAY DEVICE**

**Toyotaro Nishihara, Hiratsuka, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 24, 1990, Ser. No. 556,577**
**Claims priority, application Japan, Jul. 27, 1989, 1-192516**
**Int. Cl.[5] G06K** *15/00*
**U.S. Cl. 364—519** **10 Claims**



1. An image display device comprising:

data input means for inputting character and figure data, said data input means includes a print data receiving circuit for receiving print data from an external word processing means;

display memory means for storing said input data;

memory means for storing screen data, said screen data being edited or otherwise modified input data from said display memory means;

display means for displaying the data stored in said memory means; and

control means for controlling said data input means including said print data receiving circuit, said display memory means, said memory means and said display means, said control means providing controls for analyzing said print data received by said print data receiving circuit and for writing said received print data to said display memory means in accordance with the result of said analysis of said received print data.

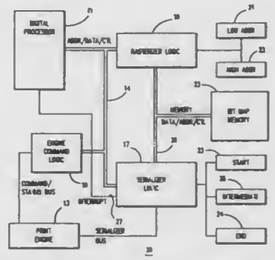
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**5,050,100**

**BIT MAP MEMORY MANAGEMENT FOR A PAGE PRINTER**

**Brian W. Damon; Cuong M. Hoang; Jeffrey A. Minnick; Terry W. Ringle; Warren J. Spina, and Stephen R. Troyer, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.**

**Filed Aug. 17, 1990, Ser. No. 569,323**
**Int. Cl.[5] G06K** *15/00*
**U.S. Cl. 364—514** **4 Claims**



1. A printer having a print engine, a bit map memory including at least one page image area defined by a beginning address and an end address, means for rasterizing information to be

printed into the page image area, and means for serializing information to be printed from the page image area to the print engine, the improvement comprising:

means for storing the highest and lowest addresses in the page image area at which information is written during rasterization; and

means for defining, after rasterization of the page image area, a modified smaller page image area having a beginning address based upon said lowest address and an ending address based upon said highest address, whereby portions of bit map memory in the page image area that are not in the modified page image area are available for rasterization of other page image areas.

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**5,050,101**

**PRINTING APPARATUS**

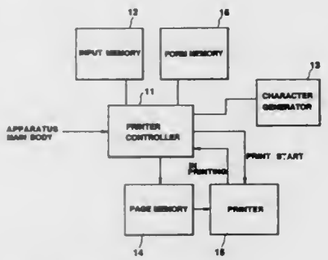
**Hiroyoshi Kiuchi, Hachiooji, and Kazumi Dote, Fussa, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Nov. 3, 1989, Ser. No. 431,663**

**Claims priority, application Japan, Nov. 29, 1988, 63-301921**

**Int. Cl.[5] G06K *15/00***

**U.S. Cl. 364—519** **4 Claims**




1. A printing apparatus, comprising:

storage means for storing partial form information, a reference output position of said partial form information, and item data of print data to be arranged in the form information, in accordance with each form type representing each type of partial form;

control means for receiving print data and information designating a partial form type corresponding thereto, and for reading out partial form information from said storage means in accordance with a received partial form type;

means for adding print data corresponding to the item data to the readout partial form information and for outputting the added print data and the partial form information;

update means for updating the reference output position every time the added print data and the partial form information is output; and

means for printing the print data to which the partial form information is added at the updated reference output position.

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**5,050,102**

**APPARATUS FOR RAPIDLY SWITCHING BETWEEN OUTPUT DISPLAY FRAMES USING A SHARED FRAME GENTIFICATION MEMORY**

**Szu-Cheng Sun, Mountain View, and Serdar Ergene, San Jose, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.**

**Filed Apr. 28, 1989, Ser. No. 345,211**

**Int. Cl.[5] G06F *15/62***

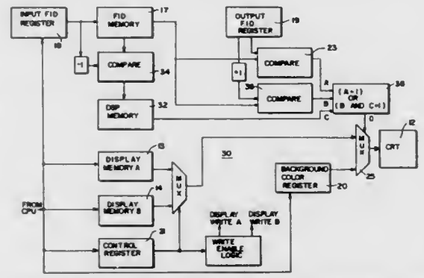
**U.S. Cl. 364—521** **11 Claims**

1. A computer output system for rapidly displaying a plurality of individual frames of information on display means including a display, comprising:

a first and second pixmapped display memories comprising a first and second plurality of pixel storage positions for storing a first and second frames of said frames of information;

a pixmapped frame identification memory comprising a third plurality of pixel storage positions simultaneously corresponding to said first and second pixel storage positions for storing a plurality of n-bit frame indications, each of said n-bit frame indication indicative of one of said individual frames of information;

input means coupled to said first and second display memories and said frame identification memory for alternately inputting said first frame and its n-bit frame indication into said corresponding first and third plurality of pixel storage positions, and said second frame and its n-bit frame indication into said corresponding second and third plurality of pixel storage positions;




comparison means coupled to said frame identification memory and said input means for comparing said n-bit indications stored in said third plurality of pixel storage positions, said n-bit indication in said input means and an indication indicative of a particular frame to be displayed on said display in a predetermined manner, and outputing enabling signals for said first and second plurality of pixel storage positions if said indications compare successfully under said predetermined manner at said corresponding third plurality of pixel storage positions; and

control means coupled to said first and second display memories and said comparison means for selecting one of said first and second frames stored in said first and second plurality of pixel storage positions and displaying said frame information of said selected frame stored at said pixel storage positions based on said enabling signals.

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**5,050,103**

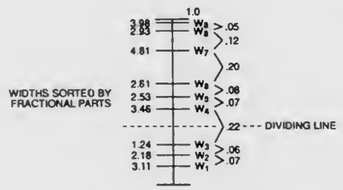
**METHOD FOR DISPLAYING KANJI CHARACTERS**

**Stephen N. Schiller, Menlo Park, and William H. Paxton, Los Altos Hills, both of Calif., assignors to Adobe Systems Incorporated, Mountain View, Calif.**

**Filed May 12, 1989, Ser. No. 351,668**

**Int. Cl.[5] G06F *15/60***

**U.S. Cl. 364—521** **9 Claims**




1. A method for displaying characters having regularities, said characters being scaled to a device on which they are to be displayed and being defined at least in part by pluralities of vertical and horizontal stems which define counters therebetween, the widths of which are measured by a number of pixels which may be integral or fractional, comprising:

grouping counters of a character defined by a first plurality of stems into a first chain of counters;

determining the widths of said counters within said first chain to provide counter width information;

adjusting the widths of certain counters within said first chain relative to other counter widths of counters within said first chain using only said counter width information and rounding up or down the counter widths of counters within said first chain which are not an integral number of pixels to an integral number of pixels in a manner to most faithfully reproduce the character to be displayed, said adjustment being carried out on the counters within each chain, the width of each of said counters having an integral and a fractional portion, by grouping said counters according to said fractional portions of their widths and rounding said fractional portions up or down to integers according to the grouping in which they fall, thereby creating a dividing line between the grouping rounded up and the grouping rounded down; and

grouping the counters in the character which are not in said first chain into one or more chains and rounding selected counter widths which are not an integral number of pixels, chain by chain, to counter widths having an integral numbers of pixels.



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**5,050,104**

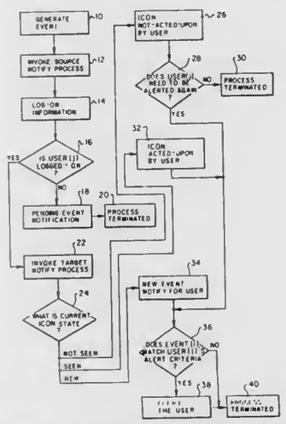
**METHOD FOR NOTIFYING A TERMINAL USER OF AN ASYNCHRONOUS EVENT OCCURRENCE**

**John G. Heyen, Carrollton; Chander Kasiraj, Irving; Lovie A. Melkus, Carrollton, and Timothy J. Wolf, Bedford, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 18, 1988, Ser. No. 182,542**

**Int. Cl.[5] G06F *15/62***

**U.S. Cl. 364—521** **7 Claims**




1. The method for notifying the user of a terminal attached to a host processor of the occurrence of an asynchronous event affecting said user, said method comprising the steps of:

determining whether said user is in communication with said host processor;

generating and displaying a graphic representation at said terminal indicative of said asynchronous event if said user is in communication with said host processor;

storing an indication of said asynchronous event if said user is not in communication with said host processor; and

generating and displaying a graphic representation at said terminal indication of said stored indication of said asynchronous event in response to said user initiating communication with said host processor.

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**5,050,105**

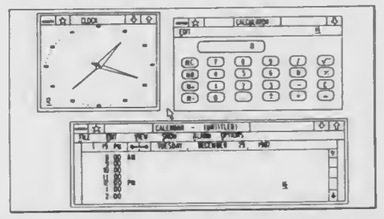
**DIRECT CURSOR-CONTROLLED ACCESS TO MULTIPLE APPLICATION PROGRAMS AND DATA**

**Anthony M. Peters, Bedford, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 26, 1988, Ser. No. 148,730**

**Int. Cl.[5] G06F *3/14*; G09G *1/00***

**U.S. Cl. 364—521** **9 Claims**



1. An interactive method for navigating between windows of at least one computer application program installed on a computer system, said method comprising the steps of:

monitoring a user input to determine if an exploding cursor function has been activated; and

linking said windows in an arbitrary sequence to form a chain of windows when said exploding cursor function has been activated, said windows being identified by a file stored in said computer system and ordered in the file in a sequence according to an order in which the windows were activated in a computer session.

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**5,050,106**

**ARTICLE RECOGNIZING SYSTEM**

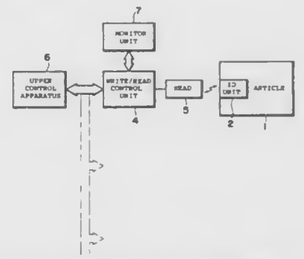
**Saburo Yamamoto, Takatsuki, and Kimio Igarashi, Gosen, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan**

**Continuation of Ser. No. 251,523, Sep. 30, 1988, abandoned. This application Sep. 6, 1990, Ser. No. 579,093**

**Claims priority, application Japan, Oct. 7, 1987, 62-253060; Oct. 8, 1987, 62-255349; Oct. 8, 1987, 62-255350**

**Int. Cl.[5] G06F *15/46***

**U.S. Cl. 364—550** **7 Claims**




1. An article recognizing system comprising:

an ID unit, attached to an article to be recognized, for storing article identification data;

a head for writing and reading predetermined data to and from said ID unit in a contactless manner;

a write/read control unit for controlling writing and reading operations of the data into and from the ID unit through said head in accordance with a command from an upper control apparatus;

a monitor unit having a group of keys and a display device

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and means for connecting said monitor unit to said write/-read control unit wherein said monitor unit has a mode setting device for selecting one of a run mode and a monitor mode and a key input apparatus for inputting commands and data relating to the writing and reading operations for the ID unit;

and wherein said write/read control unit has means for controlling data writing and reading operations into and from the ID unit, said means being responsive to a command from said upper control apparatus in the run mode and responsive to an input command from said key input apparatus in the monitor mode.

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**5,050,107**

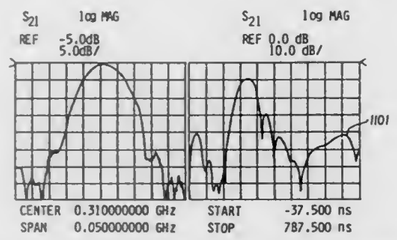
## SIDE-BY-SIDE DISPLAYS FOR INSTRUMENT HAVING A DATA PROCESSING SYSTEM

**Wayne C. Cannon, Forestville; S. Bruce Donecker, Sebastopol, and Michael J. Neering, Santa Rosa, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

**Continuation of Ser. No. 931,482, Nov. 14, 1986, abandoned, which is a division of Ser. No. 569,531, Jan. 9, 1984, Pat. No. 4,616,387. This application Feb. 3, 1989, Ser. No. 307,197**

**Int. Cl.[5] G06F** *15/00;* **G09G** *1/06;* **G01R** *13/20*

**U.S. Cl. 364—550** **15 Claims**




1. A display system associated with a signal measurement system for processing measurement instrument data acquired by the signal measurement system, comprising:

processor means connected to the signal measurement system for digitally manipulating the acquired measurement instrument data;

memory means connected to the processor means for storing the digitally manipulated data;

selection means connected to the processor means, the selection means being actuable by a user for selecting from among a predetermined set of display formats to display digitally manipulated data in display formats appropriate for the signal measurement system by which the measurement instrument data is acquired; and

display means comprising a single display screen, the display means connected to the processor means and to the memory means and the display screen comprising a visual display for substantially simultaneously displaying two traces of digitally manipulated data, the traces having their respective abscissa axes parallel, but displaced in the direction of the abscissa axes, so as to form two separate displays that are side by side.

**5,050,108**

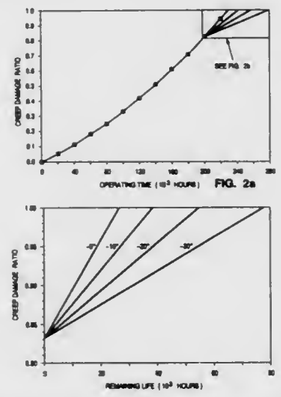
## METHOD FOR EXTENDING THE USEFUL LIFE OF BOILER TUBES

**Kimble J. Clark, Los Altos; Kevin G. Hara, Fremont; Clayton Q. Lee, Mountain View; Richard S. Moser, San Lorenzo, and Terry W. Rettig, Los Altos, all of Calif., assignors to Aptech Engineering, Inc., Sunnyvale, Calif.**

**Filed Nov. 30, 1989, Ser. No. 444,043**

**Int. Cl.[5] G01B** *17/00;* **G01K** *17/00;* **G01N** *9/24;* **F28F** *27/00*

**U.S. Cl. 364—551.01** **16 Claims**




1. A method of increasing the reliability and remaining useful life of a system of boiler tubes, comprising:

(a) evaluating the current condition of the tubes;

(b) obtaining the operating temperatures of the tubes;

(c) determining the flow redistribution which would be required in the tubes in order to optimize operating temperature profile; and

(d) modifying the tubes to achieve said required flow distribution.

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**5,050,109**

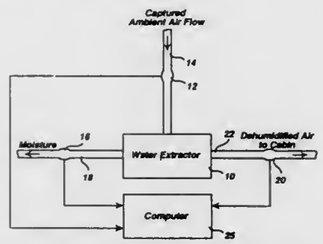
## METHOD AND APPARATUS FOR MEASURING THE HUMIDITY OF AMBIENT AIR SURROUNDING AN AIRCRAFT IN FLIGHT

**Michael M. Ladd, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Dec. 19, 1989, Ser. No. 452,817**

**Int. Cl.[5] G01N** *5/02*

**U.S. Cl. 364—556** **26 Claims**




24. An apparatus for measuring the humidity of air surrounding an aircraft while in flight, comprising:

an air intake coupled to said aircraft and directing a flow of moist air from external to said aircraft into said aircraft;

an air mass flow meter coupled to said aircraft and positioned aft of said air intake and within a flow path of moist air from said air intake;

a dehumidifier coupled aft of said air mass flow meter within said airflow path and extracting moisture from said moist air;

a moisture mass flow meter coupled aft of said dehumidifier and measuring the mass flow rate of the extracted moisture from said moist air; and

an electronic computer coupled to said mass flow meters and receiving said measured flow rates and to determine the humidity of said moist air external to said aircraft.

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**5,050,110**

## PROCESS AND MECHANISM FOR DETERMINING THE EFFECTIVE AIR TEMPERATURE IN AT LEAST ONE PNEUMATIC TIRE OF A VEHICLE

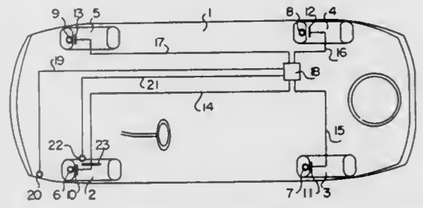
**Erich Rott, Augsburg, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany**

**Filed Dec. 12, 1989, Ser. No. 448,994**

**Claims priority, application Fed. Rep. of Germany, Dec. 19, 1988, 3842723**

**Int. Cl.[5] B60C** *23/20*

**U.S. Cl. 364—557** **19 Claims**




1. A device for determining the effective air temperature in at least one pneumatic tire of a vehicle wheel comprising:

a first temperature sensor means arranged at an interior side of a rim of the respective vehicle wheel for measuring the temperature at an interior side of the rim;

a second temperature sensor means in the immediate environment of a vehicle brake for measuring the temperature in the immediate environment of the vehicle brake;

a third temperature sensor means for measuring the ambient temperature of the vehicle; and

a computing unit connected to said three temperature sensor means for computing the effective air temperature in the respective pneumatic vehicle tire from the three measured temperatures.

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**5,050,111**

## ALIGNMENT AND EXPOSURE APPARATUS AND METHOD FOR MANUFACTURE OF INTEGRATED CIRCUITS

**Naoki Ayata, Tokyo; Mitsugu Yamamura, Yokohama; Bunei Hamasaki, Yokohama; Masao Kosugi, Yokohama; Kazuo Takahashi, Kawasaki, and Mitsuaki Seki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 271,360, Nov. 16, 1988, abandoned, which is a continuation of Ser. No. 788,494, Oct. 17, 1985, abandoned. This application Jun. 25, 1990, Ser. No. 542,653**

**Claims priority, application Japan, Oct. 18, 1984, 59-217307; Nov. 30, 1984, 59-251924; Nov. 30, 1984, 59-251925; Nov. 30, 1984, 59-251926; Nov. 30, 1984, 59-251927; Nov. 30, 1984, 59-251928; Nov. 30, 1984, 59-251929; Nov. 30, 1984, 59-251930; Dec. 20, 1984, 59-267454; May 13, 1985, 60-99512; May 13, 1985, 60-99513**

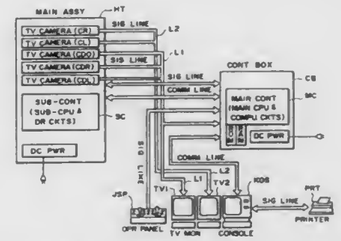
**Int. Cl.[5] G06F** *15/46;* **H04N** *7/18*

**U.S. Cl. 364—559** **7 Claims**

1. A device for aligning, one by one, different shot areas on a single wafer with respect to a reticule, said device comprising:

an alignment system for aligning each shot area with the reticule;

mode setting means for selectively setting first and second automatic alignment modes in accordance with each of which said alignment system executes automatic alignment of each shot area, wherein in said first alignment mode said alignment system is caused to align each shot area with respect to the reticule without measurement of respective positional errors of each such individual shot area with respect to the reticule, and wherein in said second alignment mode said alignment system is caused to align each individual shot area with respect to the reticule on the basis of measurement of respective positional errors of each such individual shot area with respect to the reticule;




reading means for reading alignment marks provided in relation to predetermined ones of the shot areas on the wafer; and

discriminating means for discriminating, when said first alignment mode is set by said mode setting means and in response to the reading by said reading means but prior to the execution of the automatic alignment by said alignment system, the ineffectiveness of automatic alignment mode for said alignment system when the automatic alignment by said alignment system in said first alignment mode, said discriminating means thereafter causing said mode setting means to set said second alignment mode for said alignment system when the automatic alignment in said first alignment mode is discriminated as being ineffective.

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**5,050,112**

## SPECIMEN COORDINATE AUTOMATED MEASURING MACHINE/FIDUCIAL AUTOMATED MEASURING MACHINE

**Robert E. Hedglen, Bethel Park; Howard S. Jacket, Pittsburgh, and Allan I. Schwartz, Turtle Creek, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Aug. 8, 1989, Ser. No. 390,852**

**Int. Cl.[5] G01B** *5/03*

**U.S. Cl. 364—560** **9 Claims**

7. A three-dimensional method for measuring dimensional changes in samples in a hot cell comprising:

supporting a specimen frame that contains a plurality of specimens and at least one standard, each specimen having X, Y, and Z dimensions;

controlling the movement of the specimen frame and specimens in the +/−X and Y directions;

making measurements along the +/−Z direction at a desired X and Y location of the specimen frame;

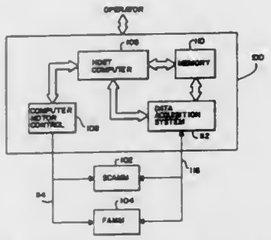
converting the X and Y coordinates of the specimen frame to desired dimensional measurements;

detecting the temperature of the specimens and correcting the desired dimensional measurements for temperature

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effects so that temperature variations that are encountered do not adversely affect measurement accuracy;




repeating and statistically evaluating the measurements to achieve the desired accuracy before measuring is determined to be completed.

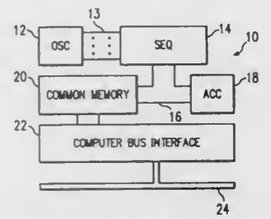
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**5,050,113**

## LOW POWER TIMEKEEPING SYSTEM

**William J. Podkowa, and Clark R. Williams, both of Plano, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.**

**Filed Jun. 17, 1988, Ser. No. 208,889**
**Int. Cl.[5] G06F *15/20, 13/00***
**U.S. Cl. 364—569** **1 Claim**




1. A method for keeping time in a timekeeping system which includes a sequencer, a memory, and an accumulator connected to each other by a data bus, comprising the steps of repeatedly:

a) placing seconds data from said memory onto said data bus;

b) reading said seconds data ihto said accumulator;

c) incrementing said seconds data in said accumulator;

d) placing said incremented seconds data onto said data bus from said accumulator; and

e) storing said incremented seconds data in said memory and holding said incremented seconds data on said data bus at least until a next read operation into said memory or a next write operation from said accumulator;

whereby substantially correct time data is maintained in said memory with low power consumption.

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**5,050,114**

## SIMULATION OF TWO-PHASE LIQUID COOLING FOR THERMAL PREDICTION OF DIRECT LIQUID COOLING SCHEMES

**Tien-Yu T. Lee, Scbottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Sep. 17, 1990, Ser. No. 583,759**
**Int. Cl.[5] G06F *15/20***
**U.S. Cl. 364—578** **6 Claims**

1. A method for predicting optimal operating conditions for two-phase liquid cooling of integrated circuits, comprising;

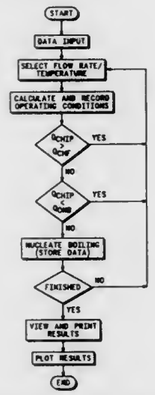
providing a data base which contains physical and thermodynamic properties for a plurality of liquid coolants used in a plurality of cooling schemes;

selecting one of the plurality of liquid coolants and one of the plurality of cooling schemes from the data base;

entering physical properties related to an integrated circuit, at least comprising entering integrated circuit surface heat flux;

selecting a temperature and a flow rate as a set of test conditions for the selected liquid coolant from a range of temperatures and flow rates;

calculating operating conditions for the integrated circuit based upon the selected cooling scheme and test conditions, at least comprising calculating boiling incipience heat flux and critical heat flux;




comparing the heat flux of the integrated circuit to the calculated boiling incipience heat flux and critical heat flux to determine if the test conditions provide for nucleate boiling;

repeating the method, beginning with selecting a temperature and a flow rate, until the entire range of temperatures and flow rates has been selected;

displaying results in printed or graphic form; and

using the results displayed to choose an appropriate flow rate for the selected liquid coolant.

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**5,050,115**

## ELECTRONIC CALCULATOR

**Eichika Matsuda, 808, Matsuzuka, Yamatotakada-shi, Nara-ken, and Makoto Kado, 492, Minosho-cho, Yamatokoriyama-shi, Nara-ken, both of Japan**

**Continuation of Ser. No. 133,294, Dec. 15, 1987, abandoned. This application Mar. 2, 1990, Ser. No. 490,523**
**Claims priority, application Japan, Dec. 15, 1986, 61-298178; Dec. 23, 1986, 61-315500; Dec. 23, 1986, 61-315501**
**Int. Cl.[5] G06F *3/00***
**U.S. Cl. 364—709.07** **11 Claims**

1. An electronic calculator comprising:

first input means for inputting numerical data;

second input means for inputting at least a first unit data and a second unit data, said first and second unit data being assigned to a same operand but having different levels such that said first unit data is higher in level than said second unit data;

display means, operatively connected to said first and second input means, for displaying said numerical data and the unit data;

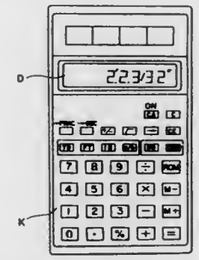
said display means including,

a plurality of digit position means for displaying said numerical data, and

a plurality of unit indicator means for displaying either said first unit data or said second unit data after any digit position; and



first inhibit means for inhibiting entry of said first unit data when said first unit data is inputted immediately after



entering numerical data followed by said second unit data for the same operand.

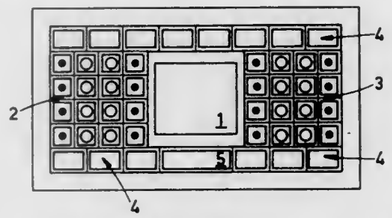
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**5,050,116**

## KEYBOARD FOR DATA PROCESSING EQUIPMENT

**Willi Stahnke, Gomaringer Strasse 9, 7000 Stuttgart 70, Fed. Rep. of Germany**

**Filed Sep. 3, 1987, Ser. No. 92,667**
**Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3630034; May 2, 1987, 3714707**
**Int. Cl.[5] G06F *3/023***
**U.S. Cl. 364—709.15** **14 Claims**




1. A keyboard for data processing equipment, comprising:

a display screen;

at least one key group switchable between different sets of functions, said at least one key group being arranged on one side of said display screen;

wherein at least one image of said key group and functions assigned to keys of said key group appear on said display screen and said images representing said functions of said keys being arranged in a same line and at the same level as said assigned keys; and

at least two key groups, arranged on respective sides of said display screen;

wherein said display screen displays both an image of said key groups and functions assigned to said keys, and said images representing said functions of said keys being arranged in a same line as said assigned keys.

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**5,050,117**

## SPATIAL LIGHT REBROADCASTER OPTICAL COMPUTING CELLS

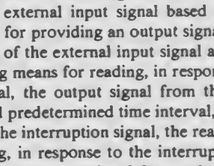
**Alastair D. McAulay, Kettering, Ohio, assignor to Wright State University, Dayton, Ohio**

**Filed Feb. 6, 1990, Ser. No. 475,727**
**Int. Cl.[5] G06F *1/04***
**U.S. Cl. 364—713** **19 Claims**

1. An optical logic cell comprising:

a first spatial light rebroadcaster (SLR) responsive to light of a first wavelength $W_1$ for receiving information into said first SLR and responsive to light of a second wavelength $W_2$ for providing information from said first SLR, information provided from said first SLR being in the form of rebroadcast light of a third wavelength $W_3$; and

a second SLR responsive to light of said third wavelength $W_3$ received from said first SLR for receiving information




into said second SLR and responsive to light of a fourth wavelength $W_4$ for providing information from said second SLR, information provided from said second SLR being in the form of rebroadcast light of a fifth wavelength $W_5$.

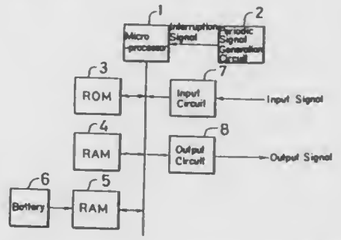
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**5,050,118**

## PLC DEVICE HAVING COMBINED HARDWARE AND SOFTWARE INPUT FILTERING

**Michiya Inoue, Hachioji, and Takashi Yamauchi, Minamitsuru, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan**

**PCT No. PCT/JP88/00561, § 371 Date Jan. 25, 1989, § 102(e) Date Jan. 25, 1989, PCT Pub. No. WO88/09963, PCT Pub. Date Dec. 15, 1988**
**Continuation of Ser. No. 305,868, filed as PCT JP88/00561 on Jun. 9, 1988, published as WO88/09963 on Dec. 15, 1988, abandoned. This PCT application Jun. 9, 1988, Ser. No. 626,314**
**Claims priority, application Japan, Jun. 12, 1987, 62-146701**
**Int. Cl.[5] G06F *15/31***
**U.S. Cl. 364—724.01** **1 Claim**




1. A programmable logic control (PLC) device for effecting arithmetic operations, comprising:

periodic signal generating means for generating an interruption signal at a predetermined time interval;

input circuit means for receiving an external input signal, for filtering the external input signal based on a first time constant and for providing an output signal responsive to said filtering of the external input signal and;

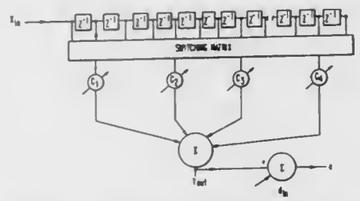
filter processing means for reading, in response to the interruption signal, the output signal from the input circuit means at said predetermined time interval, for filtering, in response to the interruption signal, the read output signal, for providing, in response to the interruption signal, the filtered received output signal for use by the arithmetic operations based on a second time constant that is larger than the first time constant, and including

means for executing the arithmetic operations based on a sequential program, and for filtering the output signal in response to receiving the interruption signal.

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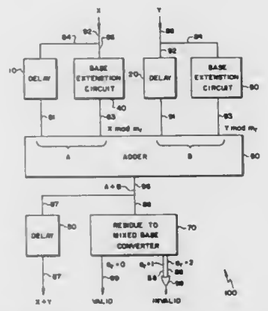
**5,050,119**
## OPTIMIZED SPARSE TRANSVERSAL FILTER
**Charles A. Lish, Yorktown Heights, N.Y., assignor to North American Philips Corporation, New York, N.Y.**
**Filed Oct. 6, 1989, Ser. No. 418,417**
**Int. Cl.[5] G06F *15/31***
**U.S. Cl. 364—724.16** **9 Claims**



1. A method of optimizing a sparse transversal filter for processing information, said filter having M taps and N multipliers where N<M, said method comprising:
providing a plurality of selectable connection paths between a plurality of said N multipliers and a greater plurality of said M taps,
selecting a first set of connection paths from said plurality of selectable connection paths, wherein each multiplier is connected to a respective tap,
establishing initial multiplier values of each multiplier for that first set, and summing outputs of the multipliers to determine the response of said filter with said first set of connection paths and said initial multiplier values,
optimizing first multiplier values of each multiplier with said first set of connection paths,
storing information defining the first multiplier values and said first set,
repeating the steps of selecting, establishing, summing, optimizing and storing until all of the taps have been utilized,
combining the stored information to define a globally optimum set and N multiplier values, and
processing information using said globally optimum set and N multiplier values.

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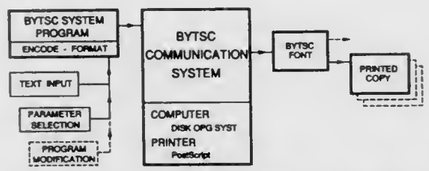
**5,050,120**
## RESIDUE ADDITION OVERFLOW DETECTION PROCESSOR
**Theodore L. Houk, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.**
**Filed Sep. 29, 1989, Ser. No. 414,276**
**Int. Cl.[5] G06E *1/04*; G06F *7/38*; H03M *7/02***
**U.S. Cl. 364—746** **33 Claims**



1. A residue addition overflow detection processor which adds a first non-redundant residue input number and a second non-redundant residue input number, said overflow detection processor comprising:
a first base extension circuit which receives said first non-redundant residue input number and which generates a first redundant residue digit;
a second base extension circuit, in parallel to said first base extension circuit, which receives said second non-redundant residue input number and which generates a second redundant residue digit;
a first adder which receives said first non-redundant residue input number and said first redundant residue digit as a first operand, and receives said second non-redundant residue input number and said second redundant residue digit as a second operand, said first adder adding said first operand to said second operand using modular addition to produce a first sum in residue representation;
a residue to mixed base converter which receives said first sum, converts said first sum into mixed base representation, and generates at least one mixed base digit corresponding to said mixed base representation; and
a validity determination circuit which receives said at least one mixed base digit and transmits at least one signal indicating whether overflow has occurred in addition of said first non-redundant residue input number to said second non-redundant residue input number.

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**5,050,121**
## COMMUNICATION SYSTEM WHICH USES CHARACTERS THAT REPRESENT BINARY-CODED DECIMAL NUMBERS
**H. W. Vaughan, 4136 Courtshire Dr., Dallas, Tex. 75229**
**Filed Jan. 22, 1990, Ser. No. 467,965**
**Int. Cl.[5] G06F *15/38*; G06G *7/60***
**U.S. Cl. 364—900** **7 Claims**




1. A computer system for creating many styles of character sets by selecting the design, coding, and format to represent either a group of five-bit or a group of eight-bit binary-coded decimal numbers, said characters being useful for common communication, other than handwriting, by people or machines, in any sensible medium;
and for producing information in a sensible medium using the created character set by supplying the system with cleartext information and converting each character of such cleartext information to the corresponding character of the created character set;
said system comprising:
design means for designing said character set by
means for setting logical switches expressed as programmed instructions, said switches selecting five- or eight-bit binary characters, selecting choices of designs for expressing bits, selecting whether zeros will be indicated in characters or simply left blank, and the like;
means for setting parametric values included in the programmed instructions which determine dimensions, measurements, placement, and spacing of the parts which will be assembled into whole characters; and
means for changing programmed instructions to define new shapes and expressions of parts and assembled characters to achieve the same design and styling

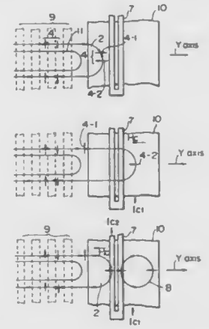


freedom as is commonly practiced in typography to express conventional Roman and other character sets;
codes means for coding said character set, said code means comprised of
means for maintaining a programmed coding array and dictionary by changing the coding for any character; encoding new characters into the character set;
means for setting a programmed logical switch to select either five- or eight-bit binary characters; and
means for retrieving the identity of each successive cleartext character called to be coded, retrieving the binary and alpha code for said character called to be coded from said coding array and dictionary, and making that code so retrieved available to a format means;
said format means for formating said character set, said format means comprised of
means for retrieving successively the code for each cleartext character called by the program and retrieving the elements selected by the design means;
means for assembling the elements so selected into a virtual image of the binary character to represent said cleartext character according to the information retrieved from the design means process, and the instructions of the program; and
means for accumulating the character images so assembled into a character set and making said character set available for output, and available for production of information expressed therewith;
delivery means for delivering the product of the computer system, that is, the created character set or information expressed using said created character set, to its destination as defined by the instructions of the program; and
demonstration means to demonstrate the computer system and invite practice, learning and extension of its capability, said demonstration means comprised of
means for defaulting the functions of the design, code and format means, whereby the system is operated as is, using preset programmed parametric and switch settings and a sample of clear text, and means for delivering said sample expressed in typical varied formats of binary-coded character sets, including delivering check fonts of both the cleartext characters and their equivalent conversion to binary-coded characters.

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**5,050,122**
## BLOCH LINE MEMORY DEVICE AND METHOD FOR OPERATING SAME
**Youji Maruyama, and Ryo Suzuki, both of Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Feb. 19, 1987, Ser. No. 16,656**
**Claims priority, application Japan, Feb. 28, 1986, 61-41776**
**Int. Cl.[5] G11C *19/08***
**U.S. Cl. 365—29** **16 Claims**

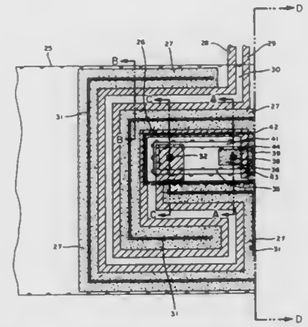
11. A Bloch line memory device comprising:
a magnetic medium film;
means for holding a stripe magnetic domain including at least one pair of Bloch lines at a desired region of the magnetic medium film;
means for applying an in-plane magnetic field to the magnetic medium film;
means for simultaneously stretching a head portion of the stripe magnetic domain on the means for applying the in-plane magnetic field to the magnetic medium film by applying a magnetic force in a direction opposite to a vertical bias magnetic field perpendicular to the film plane and for splitting the pair of Bloch lines by applying the in-plane magnetic field provided by the means for applying the in-plane magnetic field in a plane parallel to that where the magnetic medium film exists; and
means for chopping the stripe magnetic domain at the head portion of the stripe magnetic domain by bringing upper



and lower sides of a domain wall of the stripe magnetic domain closer to each other.

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**5,050,123**
## RADIATION SHIELD FOR EPROM CELLS
**Hernan A. Castro, Shingle Springs, Calif., assignor to Intel Corporation, Santa Clara, Calif.**
**Filed Nov. 13, 1990, Ser. No. 612,452**
**Int. Cl.[5] G11C *7/02***
**U.S. Cl. 365—53** **7 Claims**



1. In an electrically programmable read-only memory (EPROM) fabricated on a semiconductor substrate and organized into an array of individual cells, wherein each of said cells is normally erased upon exposure to radiation, an improvement for shielding at least one EPROM cell from radiation comprising:
a first shielding member having first and second cover sections separated by a slot and upstanding members extending from said first cover section to said substrate disposed about said EPROM cell, said first and second sections substantially covering said cell except for said slot;
a second shielding member covering said slot such that radiation incident upon said memory only reaches said cell after traveling a circuitous route defined by said upstanding members, said route attenuating the radiation so that it is incapable of erasing said cell.

VOL 1130 ISS 3 SE 17 1991 UMI

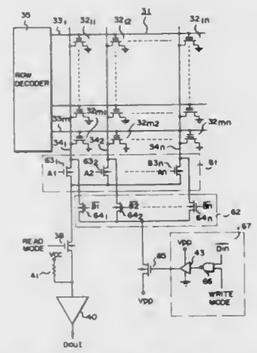


5,050,124

## SEMICONDUCTOR MEMORY HAVING LOAD TRANSISTOR CIRCUIT

Yukihiro Saeki, and Toshimasa Nakamura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1987, Ser. No. 94,706
Claims priority, application Japan, Sep. 30, 1986, 61-231721; Sep. 30, 1986, 61-231803
Int. Cl.[5] G11C *7/00, 11/40, 11/412, 16/02*
U.S. Cl. 365—104 4 Claims



1. A semiconductor memory comprising:
a PROM cell of a first channel type having a source-drain path, said PROM cell being electrically programmable;
a source of a data writing voltage;
a first load transistor of a second channel type different from the first channel type, said first load transistor having a source-drain path connected in series to the source-drain path of said PROM cell and a back gate coupled to said source of a data writing voltage; and
a second load transistor of the second channel type having a source-drain path connected in series to the source-drain path of said first load transistor and a back gate coupled to said source of a data writing voltage, wherein said first and second load transistors determine the operation point of said PROM cell when the memory is set in a data-writing mode.

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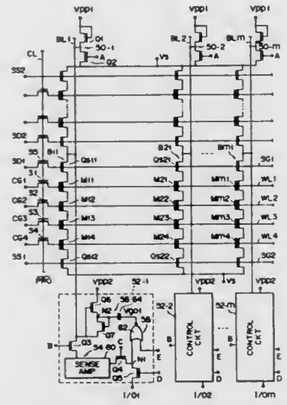
5,050,125

## ELECTRICALLY ERASABLE PROGRAMMABLE READ-ONLY MEMORY WITH NAND CELLSTRUCTURE

Masaki Momodomi, Yokohama; Koichi Toita, Tokyo; Yasuo Itoh, Kawasaki; Yoshihisa Iwata; Fujio Masuoka, both of Yokohama; Masahiko Chiba, Aomori; Tetsuo Endo, Yokohama; Riichiro Shirota, Kawasaki, and Ryouhei Kirisawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 17, 1988, Ser. No. 272,404
Claims priority, application Japan, Nov. 18, 1987, 62-290858; May 10, 1988, 63-111620; Aug. 19, 1988, 63-204670
Int. Cl.[5] G11C *16/06*
U.S. Cl. 365—185 6 Claims

1. An erasable programmable read-only memory comprising:
a semiconductive substrate;
parallel bit lines formed above said substrate;
parallel word lines formed above said substrate and insulated from said bit lines;
field effect transistors formed at intersections of said bit lines and said word lines and functioning as memory cells, said transistors arranged in a cell array which has a series-circuit of cell transistors, and each of said cell transistors including an electrically floating gate layer functioning as a carrier storage layer and a control gate layer connected to a corresponding word line; and
control means connected to said bit lines and said word lines, for applying, when a desired cell is selected from said memory cells of said cell array in a data write mode, an "L" level voltage to a word line connected to the selected cell of said cell array, for applying an "H" level voltage to all word lines positioned between said selected word line and a contact node connecting said cell block to a selected bit line associated therewith, for selectively applying one of the "H" level voltage and an intermediate voltage having a voltage intermediate between the "H" and "L" level voltages to said selected bit line in accordance with logic data to be written to said selected cell, and for applying the intermediate voltage to nonselected bit lines,



thereby writing by tunneling the data in said selected cell while preventing over-erasing in nonselected cells;
wherein said control means comprises:
a plurality of intermediate voltage generator means, respectively connected to each of said bit lines, for generating the intermediate voltage which is applied to a corresponding bit line in the write mode; and
high voltage generator means, connected to said bit lines, for detecting whether data to be written in the write mode is logic "1" or logic "0" data, and for generating the "H" level voltage which is applied to said selected bit line, said intermediate voltage generator means connected to said selected bit line being automatically electrically disconnected from said selected bit line when the "H" level voltage is applied.

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5,050,126

## BUFFER MEMORY CONTROL APPARATUS

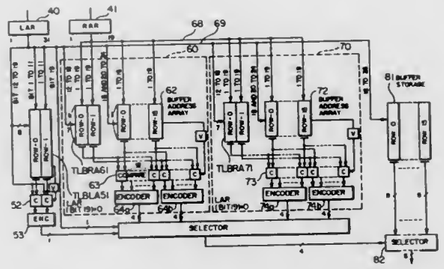
Atsushi Tanaka, and Tsuyoshi Watanabe, both of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,686
Claims priority, application Japan, Oct. 7, 1987, 62-251472
Int. Cl.[5] G11C *7/00, 11/407*
U.S. Cl. 365—189.07 11 Claims

1. A buffer memory control apparatus comprising:
an address register for holding a logical address, the logical address having a first group of bits, a second group of bits, and a third group of bits, the groups being mutually exclusive of each other;
a buffer storage memory for storing a part of information stored in a main storage, the buffer storage memory being addressable by a combination of the first and second groups of bits;



a buffer address array for storing first real addresses of data blocks stored in said buffer memory;
a translation lookaside buffer for translating the logical address into a one of the first real addresses when an access request is made by said logical address, the translation lookaside buffer being addressable by a combination of the second and third groups of bits;
a plurality of real address storage portions provided in said translation lookaside buffer for storing second real addresses in columns of said plurality of real address storage portions, each real address storage portion being addressable by a combination of the first group of bits and a part of the second group of bits;
a plurality of buffer storage address sub-arrays provided in said buffer address array in such a manner that said plurality of buffer address sub-arrays are equal in number to said plurality of real address storage portions, for storing the first real addresses in columns, each of said plurality of buffer address sub-arrays being addressed by a combination of the first group of bits and a part of the second group of bits and being combined with said real address storage portions correspondingly and respectively to thereby form combinations of said real address storage portions and said buffer address sub-arrays, each combination being formed on a common LSI chip;



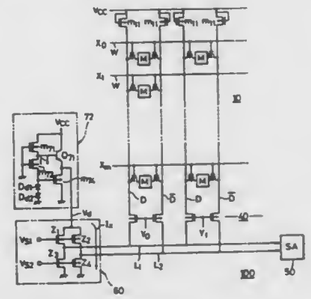
a plurality of comparator means, each disposed correspondingly and respectively to said combinations of said real address storage portions and said buffer address sub-arrays, each for detection of coincidence between a second real address obtained by translating the logical address for which the access request is made by using said address translation lookaside buffer, and a first real address stored in said buffer address array, each of the comparator means being formed on said LSI chip common to the combination; and,
selection means for selecting one of the comparison results from a plurality of LSI chips based on the remaining part of the second group of bits.

5,050,127

## MEMORY DEVICE WITH IMPROVED COMMON DATA LINE BIAS ARRANGEMENT

Kinya Mitsumoto; Shinji Nakazato, both of Koganei; Yoshiaki Yazawa, Hitachi; Masanori Odaka, Kodaira; Hideaki Uchida, Takasaki, and Nobuaki Miyakawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 253,181, Oct. 4, 1988, abandoned, which is a continuation of Ser. No. 108,623, Oct. 15, 1987, Pat. No. 4,829,479, which is a continuation of Ser. No. 745,424, Jun. 17, 1985, abandoned. This application Oct. 19, 1989, Ser. No. 423,947
Claims priority, application Japan, Jun. 15, 1984, 59-121820
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[5] G11C *11/413*
U.S. Cl. 365—189.09 20 Claims



1. A memory device comprising:
a first terminal to which a first power supply voltage is applied;
a second terminal to which a second power supply voltage is applied, the first power supply voltage being greater than the second power supply voltage;
memory cell means for storing data therein;
differential bipolar transistors having their bases coupled to receive a pair of signals based on the data stored in the memory cell means, their emitters coupled in common to form a common emitter, and their collectors coupled to provide output signals in response to the pair of signals;
a first MOSFET for providing an operating current for the differential bipolar transistors, the first MOSFET having a source-drain path coupled between the common emitter of the differential bipolar transistors and the second terminal, the first MOSFET being selectively turned on to read out the data stored in the memory cell means by using the differential bipolar transistors;
base bias means coupled between the first and second terminals for biasing the bases of the differential bipolar transistors at a third voltage, the third voltage being between the first and second power supply voltages; and
collector bias means coupled between the first and second terminals for providing a fourth voltage to the collectors of the differential bipolar transistors, the fourth voltage being between the first and second power supply voltages and being equal to or greater than the third voltage,
wherein the base and collector bias means prevent the differential bipolar transistors from operating in a saturation region, and
wherein said base bias means includes a pair of second MOSFETs having their source-drain paths coupled between the second terminal and the respective bases of the differential bipolar transistors and their gates coupled to a gate of the first MOSFET so that the first MOSFET and the pair of second MOSFETs are simultaneously turned on, said base bias means further including a first level shift circuit which is coupled between said first terminal and

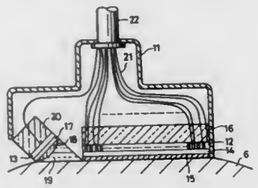
the respective bases of the differential bipolar transistors and which has at least one bipolar transistor and diode elements.

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**5,050,128**
**ULTRASONIC PROBE HAVING AN ULTRASONIC PROPAGATION MEDIUM**

**Koetsu Saitoh, Tokyo; Masami Kawabuchi, Yokohama, and Masakuni Watanabe, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 240,472, Sep. 6, 1988, abandoned, which is a continuation of Ser. No. 31,732, Mar. 30, 1987, abandoned. This application Dec. 27, 1989, Ser. No. 453,375**
**Claims priority, application Japan, Apr. 2, 1986, 61-75703; Apr. 17, 1986, 61-88542**
**The portion of the term of this patent subsequent to Feb. 20, 2007, has been disclaimed.**
**Int. Cl.[5] A61B *8/00***
**U.S. Cl. 367—7** **3 Claims**



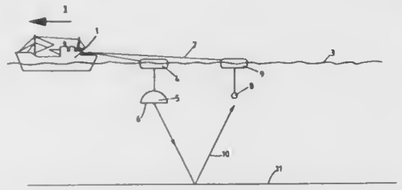
1. An ultrasonic probe comprising:
ultrasonic transducer means for transmission of ultrasonic waves into a water or living body and for reception of echo waves returning from said water or living body; and
an ultrasonic propagation medium provided directly or indirectly between said ultrasonic transducer means and said water or living body, said ultrasonic propagation medium being made of butadiene rubber, butadiene rubber which contains sulfur, vulcanization accelerator, zinc oxide and stearic acid or butadiene rubber which contains any one of vulcanizing agent, carbon, calcium carbonate, titanium oxide, magnesium oxide and magnesium carbonate, becomes substantially equal to that of said water or living body and its acoustic attenuation coefficient becomes lower than that of silicon rubber.

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**5,050,129**
**MARINE SEISMIC DATA CONDITIONING**

**Philip S. Schultz, Clamart, France, assignor to GECO A/S, Sandvika, France**

**Continuation of Ser. No. 454,319, Dec. 26, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 649,178**
**Claims priority, application United Kingdom, Jan. 3, 1989, 8900037**
**Int. Cl.[5] G01V *1/38***
**U.S. Cl. 367—21** **5 Claims**



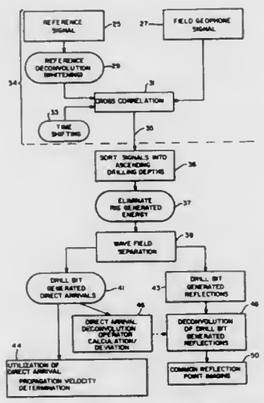
1. A method of acquiring and preconditioning marine seismic data, said method comprising the steps of:
deploying at least one marine seismic source for movement with respect to a reflecting body;
deploying a plurality of marine seismic receivers for movement with respect to the reflecting body;
moving said at least one source and said receivers at the same predetermined velocity and in the same direction relative to said reflecting body;
defining a moving reference frame having coordinates and moving relative to said reflecting body from coordinates of said at least one source and said receivers;
producing encoded acoustic signals by said at least one source to be reflected by said reflecting body;
receiving reflected signals from said reflecting body by said receivers to provide marine seismic data in the form of a plurality of seismic traces;
repeatedly actuating said at least one marine seismic source to produce said acoustic signals at intervals;
recording for each actuation of said at least one marine seismic source said seismic traces of acoustic signals received by said plurality of marine seismic receivers of said moving reference frame; and
producing derived traces from said plurality of seismic traces by linear interpolation along a trajectory defined by said predetermined velocity organized in a common offset section.

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**5,050,130**
**SIGNAL PROCESSING TO ENABLE UTILIZATION OF A RIG REFERENCE SENSOR WITH A DRILL BIT SEISMIC SOURCE**

**James Rector, Menlo Park; Bruce Marion, Mountain View; Bernard Widrow, Stanford, all of Calif., and Iraj A. Salehi, Naperville, Ill., assignors to Gas Research Institute, Chicago, Ill.**

**Continuation of Ser. No. 260,784, Oct. 21, 1988, Pat. No. 4,926,391. This application May 9, 1990, Ser. No. 521,229**
**Int. Cl.[5] G01V *1/40, 1/28***
**U.S. Cl. 367—41** **30 Claims**




1. An apparatus for providing information on a subterranean geologic formation, which comprises a drill bit source of energy in a borehole, at least one seismic wave sensor spaced from the borehole in the earth for receiving seismic waves imparted into the earth by said drill bit source of energy, a reference sensor for acoustic waves imparted into the borehole by said drill bit source of energy, a means connected to receive a reference signal from said reference sensor and a signal from said at least one seismic wave sensor simultaneously, recorded during a period of time when said drill bit source of energy is activated at a selected source depth and to generate a cross-correlation function between the reference and seismic wave sensor signals, a means connected to receive the reference signal to derive a whitening filter, and a means connected to receive the filter for removal of the combined effects of reference signal source spectral shaping and multipath from the cross-correlation function, the whitening filter being derived as an inverse to the reference signal and being applied to the cross-correlation function by time-reversing and then convolving the filter with the cross correlation function or alternatively being applied by time-reversing the filter and convolving the filter with the time-reversed reference signal prior to cross-correlation, said apparatus being configured to carry out its signal processing operations repetitively for a series of source depths, generating a series of filtered cross-correlation functions, said reference sensor being located at or proximate to a top of the borehole distant to said drill bit source of energy.



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**5,050,131**
**QUANTITATIVE METHOD FOR EVALUATING VELOCITY MODEL QUALITY**

**Shein S. Wang; Douglas W. Hanson, and Thomas D. Cavanaugh, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Jan. 17, 1991, Ser. No. 643,387**
**Int. Cl.[5] G01V *1/36***
**U.S. Cl. 367—73** **9 Claims**



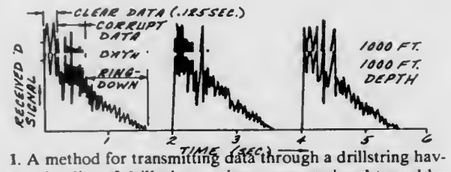
1. A method for quantitatively evaluating the quality of a velocity model comprising the steps of:
receiving a seismic model having at least one reflector;
selecting a point on said reflector;
forming a common reflection point gather;
choosing a first velocity;
adjusting said first velocity to flatten said common reflection point gather;
decreasing said first velocity to calculate a second velocity so that the center of the far offset wavelet is a predetermined distance shallower than the near offset wavelet;
increasing said first velocity to calculate a third velocity so that the center of the far offset wavelet is said predetermined distance deeper than the near offset wavelet;
determining an error value;
calculating a relative error value using said error value; and
determining an image quality factor indicating the reliability of the image for said reflector.

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**5,050,132**
**ACOUSTIC DATA TRANSMISSION METHOD**

**Allen Duckworth, Middlefield, Conn., assignor to Teleco Oilfield Services Inc., Meriden, Conn.**

**Filed Nov. 7, 1990, Ser. No. 610,433**
**Int. Cl.[5] G01V *1/40***
**U.S. Cl. 367—82** **5 Claims**



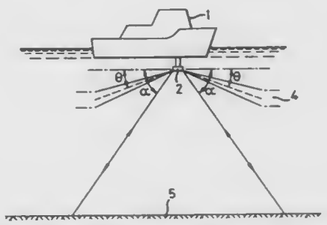

1. A method for transmitting data through a drillstring having a plurality of drill pipe sections connected end-to-end by joints from a first location below the surface of the earth to a second location at or near the surface of the earth, the length and cross-sectional area of the drill pipe sections being different from the length and cross-sectional area of the joints, the method comprising the steps of:
(1) generating acoustic data signals having a single frequency content in at least one passband of the drillstring;
(2) transmitting said data signals through the drillstring from either said first location to said second location or from said second location to said first location during a time period prior to the onset of reflective interference caused by said data signals reflecting from along the length of the drillstring, said time period being equal to or less than the time for said data signals to travel three lengths of the drillstring;
(3) stopping the transmission of data signals at the onset of said reflective interference and allowing the acoustic signals to substantially attenuate; and
(4) detecting the data signals at said respective first or second location.

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**5,050,133**
**MARINE CURRENT DETERMINATION**

**David L. Buddery, Camberley, England, assignor to The British Petroleum Company p.l.c., London, England**

**Continuation of Ser. No. 517,009, May 1, 1990, abandoned. This application Feb. 12, 1991, Ser. No. 655,239**
**Claims priority, application United Kingdom, May 4, 1989, 8910184**
**Int. Cl.[5] G01S *15/60***
**U.S. Cl. 367—91** **12 Claims**

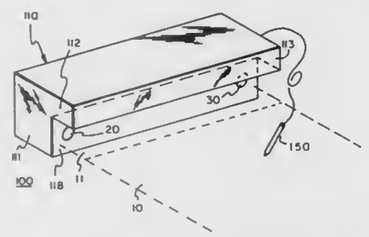


1. A method for the determination of in-line and cross-line components of water velocity relative to a vessel heading on a chosen line, which method comprises the steps of:
(a) generating electronic pulses and relaying these to a Doppler - Sonar transducer,
(b) radiating pulses from the Doppler - Sonar transducer in a number of directions at an angle $\theta$ relative to the horizontal to a layer of water below but near to the surface of the water, and, simultaneously,
(c) radiating pulses from the Doppler Sonar transducer in a number of directions at an angle $\alpha$ relative to the horizontal, and greater than $\theta$, to the water bed,
(d) detecting reflected signals from the pulses of stage (b), comparing the frequency of the reflected signals with the frequency of the pulses radiated and computing the water velocity relative to the vessel, and, simultaneously,
(e) detecting reflected signals from the pulses of stage (c), comparing the frequency of the reflected signals with the frequency of the pulses radiated and computing the velocity of the vessel relative to the sea bed, and
(f) computing the water velocity relative to the chosen line heading and at right angles to this heading.

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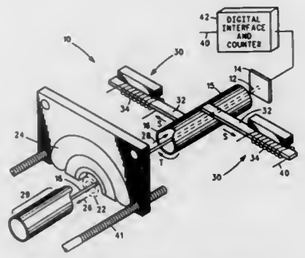
5,050,134
**POSITION DETERMINING APPARATUS**
Robert Butler, Milford, Conn., assignor to Science Accessories Corp., Stratford, Conn.
Filed Jan. 19, 1990, Ser. No. 467,632
Int. Cl.[5] G01S *15/00*
U.S. Cl. 367—118 20 Claims




1. Apparatus for determining the position of a movable element, comprising:
an elongated housing for positioning generally adjacent an edge of an area in which the position of the movable element is to be determined, said housing having a base portion which contains a pair of spaced-apart transducers that are mounted in the surface of said base portion and face said area, said housing having an upper body portion which is disposed above said base portion and which protrudes in cantilevered fashion toward said area, so that said transducers are recessed from said area beneath the protruding upper body portion of said housing; and
means for determining the position of said movable element from the transit times of energy propagating in either direction between said movable element and said transducers.

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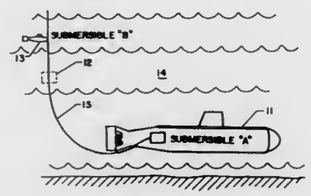
5,050,135
**MAGNETOSTRICTIVE MULTIPLE POSITION SENSING DEVICE**
Ramdas M. Pai, Racine, and James A. Beck, Franksville, both of Wis., assignors to Unico, Inc., Franksville, Wis.
Filed Dec. 20, 1989, Ser. No. 453,867
Int. Cl.[5] G01B *17/00, 7/00*
U.S. Cl. 367—127 12 Claims




1. A position monitoring device, comprising:
an ultrasound transducer disposed along a line;
means for generating an ultrasound interrogation pulse along said ultrasound transducer;
a plurality of electromagnets disposed along said line of said ultrasound transducer, each of said electromagnets selectively actuated for generating a magnetic field for interacting with said ultrasound interrogation pulse and causing generation of a reflected torsional strain pulse and twisting of said ultrasound transducer;
sensor means for detecting the arrival of said reflected torsional strain pulse;
means for determining a time difference interval between generation of said ultrasound interrogation wave and the arrival of said reflected torsional strain pulse; and
means for converting said time difference interval into a position measurement.

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5,050,136
**SUPER POLYELECTROLYTIC COMMUNICATION LINKS**
Richard H. Nadolink, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 1, 1990, Ser. No. 590,717
Int. Cl.[5] H04B *11/00*
U.S. Cl. 367—134 9 Claims

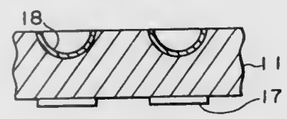



1. Apparatus for providing communication between a first submersible and a second submersible comprising:
a first submersible and a second submersible that is launched by said first submersible;
a polyelectrolytic polymer thread disposed in electrical contact with each of said first submersible and said second submersible;
said polyelectrolytic polymer thread having the inherent physical property characteristics of being flexible and stretchable over thousands of times its natural length without breaking or rupturing to thereby permit communication between the first and second submersibles over extended distances and regardless of relative speed and maneuvering of said first and said second submersibles;
said polyelectrolytic polymer thread including an organic solvent having dispersed therein a first polymer consisting of a water insoluble low molecular weight polymer and a second polymer consisting of a semi-water soluble high molecular weight polymer; and
said first polymer forming a conductive polymer backbone in essentially singular molecular thread form and said second polymer effectively surrounding said conductive polymer backbone.

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5,050,137
**ULTRASONIC PROBE**
Kazuo Sato, Tokyo; Hiroshi Kanda, Tokorozawa; Shigeo Kato, Mitaka; Kuninori Imai, Tsukui; Takeji Shiokawa, Fuchu; Shinji Tanaka, Akishima; Isao Ishikawa, Hino; Harumasa Onozato, Oume; Hisayoshi Hashimoto, Ushiku; Morio Tamura, Tsuchiura; Kazuyoshi Hatano, Higashiibaraki; Fujio Sato, Tsukuba; Ken Ichiryuu, Niihari; Kiyoshi Tanaka, Mizukaido, and Takao Kawanuma, Niihari, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd. and Hitachi, Ltd., both of Tokyo, Japan
Division of Ser. No. 336,685, Apr. 12, 1989, Pat. No. 5,003,516. This application May 14, 1990, Ser. No. 522,928
Claims priority, application Japan, Apr. 13, 1988, 63-89059; Nov. 16, 1988, 63-287720
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—150 16 Claims

1. A lens comprising:
a lens body of substrate material having an outer surface that is concave on one side of said lens body, said concave lens surface of said lens body being an etch profile on said substrate material of said lens body, wherein said substrate



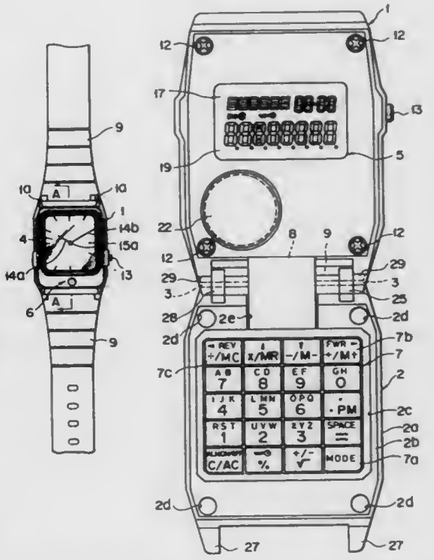

material is a single-crystal silicon, and further including a thin film of silicon dioxide uniformly coated on the outer surface of said concave lens surface.

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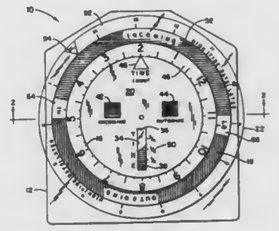
5,050,138
**ELECTRONIC WRIST WATCH HAVING A SOUND PRODUCING UNIT AND AN ELECTROOPTIC DATA DISPLAY UNIT**
Wataru Yamada, Tachikawa; Yukio Kido, Fussa; Hiroyuki Abe, Fussa; Shunji Minami, Fussa; Shigeru Katoh, Tachikawa, and Junro Yano, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 443,081, Nov. 27, 1989, which is a continuation of Ser. No. 403,304, Sep. 5, 1989, abandoned. This application Mar. 1, 1990, Ser. No. 486,785
Claims priority, application Japan, Sep. 12, 1988, 63-226576[U]; Dec. 27, 1988, 63-168654[U]; Mar. 6, 1989, 1-24715[U]; Mar. 17, 1989, 1-29828[U]; Mar. 20, 1989, 1-30793[U]; Mar. 20, 1989, 1-30794[U]; Mar. 20, 1989, 1-30798[U]; Jun. 29, 1989, 1-165294[U]
Int. Cl.[5] G04B *47/00, 23/02*
U.S. Cl. 368—10 9 Claims

1. An electronic wrist watch having a sound producing unit and an electronic data display unit, comprising:
plate member means having an upper surface on which a switch input section for data input is mounted;
case member means attached to an end of said plate member means so as to be freely opened and closed over said plate member means, said switch input section being exposed for operation by a user when said case member means is opened;
analog display means mounted on the upper surface of the case member means and having a motor and hands, the hands being moved on the basis of rotation of the motor to display present time;
electrooptic data display means, mounted on the lower surface of the case member means, for displaying data;
auxiliary electrooptic data display means disposed on the upper surface of said case member means;
sound producing means, arranged in said case member means at a position not to overlap said analog display means, for emitting sound in a direction toward said upper surface of said case member means;
electronic circuit means, housed in said case member means, for driving said analog display means and said sound producing means, said electronic circuit means being electrically connected to said switch input section so as to cause said electrooptic data display means to display data from said switch input section;
said electronic circuit means including phone number data memorizing means for memorizing a large quantity of phone number data; and
read-out switch means provided in said case member means and being operable with said case member means closed, said read-out switch means being manually operable to sequentially read the phone number data from said phone number data memorizing means and to cause said auxiliary electrooptic data display means to display the phone number data read out from said phone number data memorizing means.




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5,050,139
**TIDE CLOCK**
E. Ernest Oberst, 404 Patton Dr., Cheshire, Conn. 06510
Filed Mar. 13, 1991, Ser. No. 668,486
Int. Cl.[5] G04B *19/26*
U.S. Cl. 368—19 20 Claims



1. A tide clock comprising:
a frame;
timepiece means comprising a drive shaft, said timepiece means mounted to said frame for driving said shaft;
tide dial means mounted to said frame for rotation about a first axis, said tide dial means comprising a water level figure and opposed indicator hands for indicating high and low tides;
solar time dial means mounted to said frame for rotation

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about the first axis, said time dial means comprising peripheral graduations defining a time scale;

face plate means disposed axially forwardly of said tide dial means and said solar time dial means and defining a window with opposing portions denoting high and low water levels;

gear means rotatably coupling said tide dial means and said solar time dial means to said drive shaft for driving said tide dial means in a first rotation direction at a first uniform rate of one revolution during a whole number of tide time cycles and driving said time dial means in said first rotation direction at a second uniform rate of one revolution during a whole number of twelve hour time cycles,

so that said figure moves relative to said window to indicate rising and falling water level during successive tide cycles and the time of the next high and low tides is indicated by alignment of the hands with the time scale of the solar time dial means.

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**5,050,140**

## ALARM CLOCK

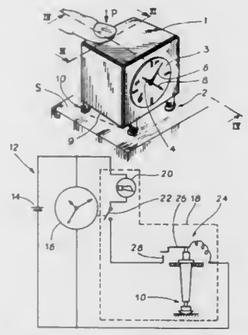
**Christophe Aubert, Fontainemelon, Switzerland, assignor to Eta S.A. Fabriques d'Ebauches, Granges, Switzerland**

**Filed Mar. 13, 1991, Ser. No. 669,096**

**Claims priority, application Switzerland, Mar. 13, 1990, 00814/90**

**Int. Cl.[5] G04B** *23/02*

**U.S. Cl. 368—262** **8 Claims**



1. An alarm clock comprising a case in which is housed a clock movement, this movement being associated with an alarm circuit comprising an alarm signal generator and means for setting and cancelling said alarm signal generator, said case being adapted to rest on a rigid surface by foot means capable of movement between two positions and projecting from the base of the case, said foot means being furthermore connected to said means for setting and cancelling in such a way that, on the one hand, the latter are capable of being actuated by pressure applied to the top of the case and that, on the other hand, the case is capable of being shifted from a first position to a second position in response to said pressure, wherein the foot means furthermore comprise means for returning the case of the alarm clock from its second position to its first position following application of said pressure, said foot means comprising auxiliary means permitting the alarm circuit to be set and cancelled by successive applications of pressure to the case, whilst the foot means are connected to means for display of the set and cancelled status of the alarm circuit of the alarm clock.

**5,050,141**

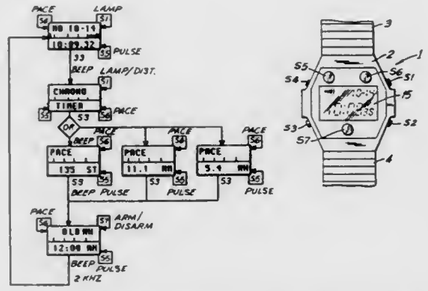
## PROGRAM TO SYNCHRONIZE PACE IN A MULTIMODE ALARM TIMEPIECE

**Tom Thinesen, Sunnyvale, Calif., assignor to Timex Corporation, Middlebury, Conn.**

**Filed Jul. 30, 1990, Ser. No. 559,770**

**Int. Cl.[5] G04B** *23/02;* **G04F** *8/00;* **G01C** *22/00*

**U.S. Cl. 368—73** **17 Claims**





1. Improvement in a multimode electronic timepiece having an electroptic display, an audible device, a plurality of manually actuated actuators and a mask programmable integrated circuit programmed to keep time and to provide a plurality of timepiece operating modes including a pace mode, wherein said integrated circuit is programmed to permit an operator to switch between modes in response to actuation of at least a first of said actuators; said integrated circuit being further programmed to accept and store information in memory in response to actuation of at least a second of said actuators, to perform calculations thereon and to display said information and results of said calculations on said elec display; said integrated circuit being further programmed to provide, upon actuation of at least a third of said actuators, audible periodic electronic sounds produced by said audible device, wherein the frequency of said sounds varies proportionately to the value of a preselected pace of said operator, and wherein said improvement comprises:

means responsive to first manual actuation of a selected actuator coinciding with one footfall of the operator to commence a timing event;

means responsive to second manual actuation of said selected actuator coinciding with a later footfall of the operator to terminate said timing event;

program means to alter said preselected pace and store an altered pace which is inversely proportional to the time elapsed between first and second actuation of said selected actuator; and,

means for displaying said altered pace and causing said audible device to sound at a rate equivalent to said altered pace.



**5,050,142**

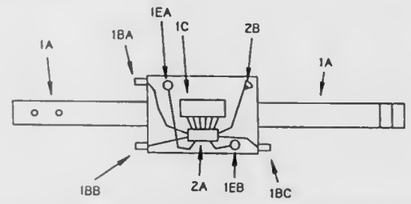
## PILL TAKER'S WRIST WATCH WITH TWO TEMPERATURE SENSORS

**John H. Gibbs, 333 S. Clay St., Mooresville, Ind. 46158**

**Filed Apr. 30, 1990, Ser. No. 516,903**

**Int. Cl.[5] G04B** *47/06*

**U.S. Cl. 368—11** **1 Claim**



1. An electronic digital wrist watch for people who have to take pills on a regular schedule, comprising

a case having a front and back;

display means for showing time, date, and alarm programming;

key button means for controlling time, date, and alarm programming;

two temperature sensor means each having an output, one of said temperature means is located near the on top of the watch and the other of said sensor is near the bottom of said watch such that the top sensor will sense the temperature near the top and the bottom sensor will sense the temperature near the bottom, whereby the differences in outputs determines whether one is wearing the watch;

an audible sound generator for producing audible sound;

electronic means responsive to said key means for controlling said display means and in response to said sensor outputs and a set time for controlling said sound generator;

whereby an alarm or reminder can be sounded based on whether one is wearing the watch or not.

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**5,050,143**

## DEVICE FOR OPTICAL READING AND MAGNETIC WRITING ON A DATA CARRIER

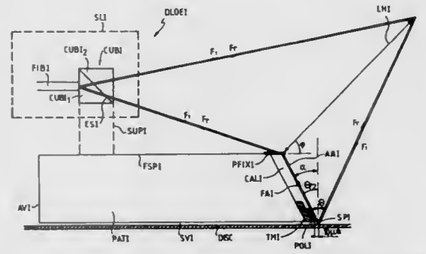
**Pierre Bernstein, Neauphle-le-Chateau, France, assignor to Bull, S.A., Paris, France**

**Filed Oct. 4, 1988, Ser. No. 253,038**

**Claims priority, application France, Oct. 5, 1987, 87 13739**

**Int. Cl.[5] G11B** *11/10, 13/04*

**U.S. Cl. 369—13** **16 Claims**



1. An optical reading and magnetic writing device (DLOEI) for data on a magnetooptic recording carrier (DISC) including:

magnetic writing means including:

a transducer (TMI) for writing data on the carrier disposed on a head (PATI) flying above the carrier;

optical reading means including:

a light source (SLI) comprising a separator element (ESI) through which is emitted an incident beam of polarized light ($F_i$) through an optical means (LHI) to the surface of the carrier at a predetermined site thereon, wherein a magnetic state of the carrier at said predetermined site is adapted to produce a rotation of a plane of polarization of the light;

said optical means (LHI) affixed to the head for focusing the incident beam ($F_i$) onto the surface of the carrier, said incident beam forming a light spot (SPI) on the surface of the carrier, said incident beam further being reflected at the carrier, becoming a reflected beam ($F_r$), said reflected beam ($F_r$) travels through said optical means to the separator element which separates the route of propagation of the incident beam ($F_i$) from the route of propagation of the reflected beam, which is then transmitted to:

means (MDKI) for detecting an angle of rotation of the plane of polarization of the reflected beam, furnishing an electric signal a voltage or current of which is a function of a value of the data located at said predetermined site, the source of polarized light (SLI) being disposed on and affixed to the head containing the writing transducer (TMI);

the optical means for focusing the beam ($F_i$) comprising a holographic lens (LHI) which is affixed to an upper portion (FSPI) of the head (PATI) and forms an angle of approximately 45° with the surface of said upper portion.

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**5,050,144**

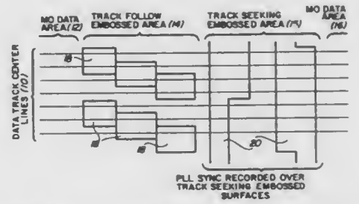
## RECORDING INTENSITY MODULATED SIGNALS AND POLARIZATION-MODULATED OPTICAL SIGNALS IN THE SAME AREA OF A STORAGE MEMBER

**Ian E. Henderson, and Morovat Tayefeh, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 11, 1989, Ser. No. 449,260**

**Int. Cl.[5] G11B** *11/18, 11/00*

**U.S. Cl. 369—13** **12 Claims**



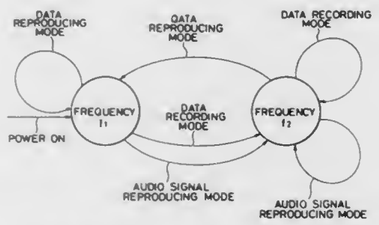
1. In apparatus for reading signals from a magnetooptic disk which has embossed circumferentially spaced-apart mark areas among magnetooptic data recording areas and a magnetooptic coating over the entirety of the disk, first data patterns in the embossed mark areas recorded as surface fluctuations which reflect a light beam to intensity modulate a reflected light beam such that the reflected light carries the data pattern as an intensity modulation pattern, second data patterns in the embossed mark areas recorded in the magnetooptic coating and which coating reflects an impinging light beam to carry the second data pattern as modulated linear polarizations in the reflected light beam:

the improvement including, in combination:

readback means for sensing the embossed mark areas, said magnetooptic data recording areas including means for sensing data recorded as surface fluctuations in the embossed mark areas and magnetooptic modulated recorded data patterns in the data recording and embossed mark areas; and

control means connected to the readback means for actuating the readback means to read magnetooptic signals recorded in the embossed mark areas.

**5,050,145**
**OPTICAL DISK RECORDING AND REPRODUCING APPARATUS HAVING FASTER REPRODUCING SPEED THAN RECORDING SPEED**
**Tadao Yoshida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan**
**Filed Jan. 22, 1990, Ser. No. 468,245**
**Claims priority, application Japan, Feb. 14, 1989, 1-34486**
**Int. Cl.[5] G11B** *13/04*
**U.S. Cl. 369—13** **3 Claims**

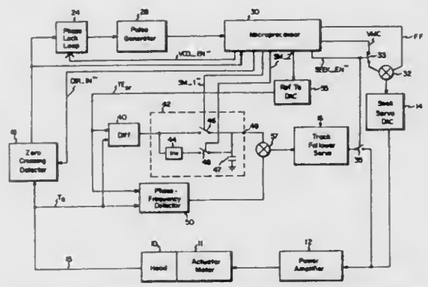



1. An optical disk recording and reproducing apparatus comprising:
an optical disk having an optical recording medium capable of optically recording and reproducing an information signal;
recording and reproducing means for recording an information signal in said optical disk and reproducing an information signal recorded in said optical disk in a normal playback mode;
rotary driving means for rotationally driving said optical disk;
means for controlling said rotary driving means so that a rotational speed of said optical disk upon reproducing of an information signal recorded in said optical disk performed by said recording and reproducing means during the normal playback mode is higher than the rotational speed of said optical disk upon recording of an information signal in said optical disk by said recording and reproducing means; wherein said control means includes clock signal generating means for generating basic clock signals having different respective frequencies upon recorded and reproducing said optical disk by said recording and reproducing means and wherein said control means includes decoder means for detecting a frame sync signal from a detection output from said recording and reproducing means and forming a sync signal of a reproduced frame on the basis of the clock signal from said clock generating means.

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**5,050,146**
**TRACK SEEK RECOVERY SYSTEM AND METHOD**
**Jerome F. Richgels, San Jose, and John C. Kuklewicz, Sunnyvale, both of Calif., assignors to Literal Corporation, Colorado Springs, Colo.**
**Filed Jul. 31, 1989, Ser. No. 387,910**
**Int. Cl.[5] G11B** *7/085*
**U.S. Cl. 369—32** **12 Claims**

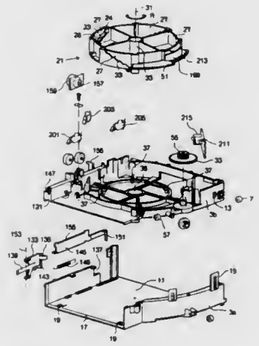
1. Track seek recovery system for an information storage disk drive system adapted to move a head rapidly during a track seek operation to a target track at the end of the seek, the recovery system comprising:
means for generating track crossing signals as said head moves across data tracks formed on said information storage disk;
means including a head actuator motor for executing a track seek operation adapted normally to result in arrival of said head with zero velocity over the target track at the end of the seek;
and means responsive to failure of the head to stop over the target track for generating and applying one or more braking current pulses to the head actuator motor, each pulse adapted to retard continued forward motion of the



head to a predetermined non-zero fraction of the velocity of the head existing just prior to application of each of said pulses.

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**5,050,147**
**DISC CHANGER, AND ASSOCIATED PLAYER COOPERATING WITH THE DISC CHANGER**
**Henri M. Grobben, Hasselt; Willem J. Borgions, Louvain, and Paul P. M. Mathijs, Hasselt, all of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.**
**Filed Apr. 3, 1989, Ser. No. 333,056**
**Claims priority, application Netherlands, Apr. 5, 1988, 8800859**
**Int. Cl.[5] G11B** *5/48, 7/08*
**U.S. Cl. 369—34** **22 Claims**

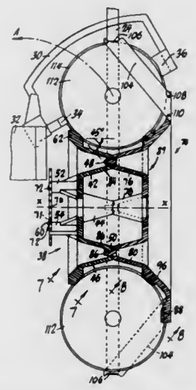


1. A disc changer, comprising:
a frame,
a cassette holder having a positioning surface for a cassette comprising a plurality of supports each having a supporting surface for a disc,
means for moving said supports into and out of the cassette, and
retaining means for retaining a disc outside the cassette, characterized in that the disc changer comprises a motor-driven cassette lift for moving the cassette holder rectilinearly relative to the frame in a direction transverse to the positioning surface of the cassette holder to transfer the supports to one predetermined plane, the cassette lift comprising a lift element which is rotatably connected to the cassette holder and which is coupled to drive means, which lift element has an axis of rotation extending transversely of the positioning surface of the cassette holder and comprises at least one guide surface which is inclined relative to the positioning surface of the cassette holder and at least one guide element which cooperates with the guide surface, to produce said movement of the cassette holder during a rotary movement of the lift element.



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**5,050,148**
**ROTARY COMPACT DISC MAGAZINE HAVING DISC RECEIVING MEANS LIMITED TO A MINOR SEGMENT OF A DISC**
**Mark L. Simpson, Kentwood, Mich., assignor to Rowe International, Inc., Whippany, N.J.**
**Filed Jun. 14, 1990, Ser. No. 538,130**
**Int. Cl.[5] G11B** *17/22*
**U.S. Cl. 369—37** **20 Claims**

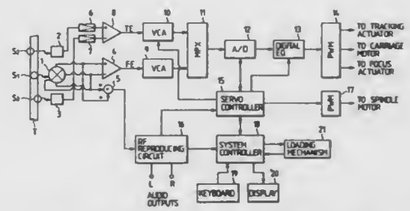


1. In a jukebox of the type having a magazine mounted for rotation around a generally horizontal axis so as to present a top and an upper front portion thereof and an automatic mechanism for engaging a compact disc in a position adjacent to the top of the magazine at generally diametrically opposite points on the disc and removing the disc from the magazine through the upper front portion thereof, an improved magazine for storing a plurality of compact discs including in combination a hub, said hub having a front and a back, disc-receiving means at spaced locations around said hub, said hub being mounted for movement around a generally horizontal axis so that discs carried by said disc-receiving means are individually moved to said position, said hub being devoid of disc-receiving means at said locations over a region above and in front of a line passing through said points so that said disc-receiving means at said locations are limited to a segment of a disc at said position below and to the rear of a line passing through said points, a plurality of belt guides carried by said hub, a belt and means for directing said belt into engagement with said guides over the lower portion of said magazine and away from said guides over the upper portion of said magazine.

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**5,050,149**
**SERVO DEVICE FOR DISC PLAYER**
**Hidehiro Ishii; Noriyoshi Takeya; Chiharu Miura, and Tatsuya Fukuda, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**
**Filed Jul. 12, 1989, Ser. No. 378,937**
**Claims priority, application Japan, Oct. 5, 1988, 63-251223**
**Int. Cl.[5] G11B** *7/095*
**U.S. Cl. 369—43** **5 Claims**

1. In a disc player servo device of the type having an A/D converter for digitizing analog error signals formed from an output signal of a pickup adapted to read record data from a data record disc. and means for driving said pickup according to the level of said error signal, the improvement comprising:
a variable gain amplifier provided on the input side of said A/D converter for amplifying said error signals and supplying said amplified error signals to said A/D converter; digital signal variable amplification means connected to receive the digitized output signals from said A/D converter, and




control means connected to said variable gain amplifier , and said amplification means and responsive to the open/-closed loop condition of said servo for controlling the amplification factors of said amplifier and amplification means to achieve substantially equal overall gain for both open loop and closed loop error signals while greatly increasing the voltage range of said closed loop error signals input to said A/D converter.

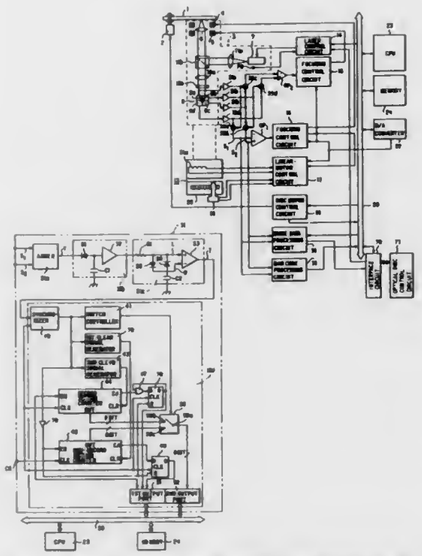
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**5,050,150**
**INFORMATION DISC APPARATUS**
**Hietoshi Ikeda, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan**
**Filed Sep. 27, 1990, Ser. No. 589,017**
**Claims priority, application Japan, Sep. 29, 1989, 1-254880**
**Int. Cl.[5] G11B** *7/00*
**U.S. Cl. 369—44.27** **10 Claims**

1. An apparatus for reading and reproducing information on and from a recording medium in accordance with data representative of characteristics of the recording medium, the data having at least two pre-recorded sectors separated from each other by a non-record inter-sector gap therebetween in a specific area on the recording medium, the pre-recorded sectors having recorded segments spaced by a non-record inter-segment gap shorter than the inter-sector gap, comprising:
means for optically reproducing the information from the recording medium;
means for placing the reproducing means on the specific area of the recording medium;
means for converting the information reproduced by the reproducing means into a binary data;
first means for measuring the segment of the pre-recorded sector based on the binary data from the converting means;
second means for measuring the inter-segment gap based on the binary data from the converting means, said second

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means having a limited capacity which is not sufficient to measure the inter-sector gap; and



means for processing the data based on measurements obtained by the first measuring means and the second measuring means.

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**5,050,151**

**APPARATUS FOR PLAYING BACK DATA READ OUT OF DATA TRACKS ON A RECORDED MEDIUM**

**Arthur Kurz, Karlsruhe, Fed. Rep. of Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Fed. Rep. of Germany**

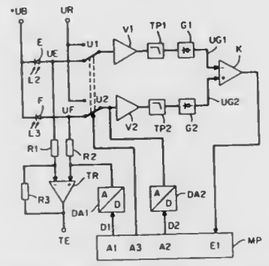
**Filed Sep. 28, 1988, Ser. No. 250,730**

**Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732941**

**Int. Cl.[5] G11B** *7/095*

**U.S. Cl. 369—44.290** **10 Claims**

1. An arrangement for playing back data read out of data tracks on a recorded medium, comprising: an optical pick-up for reading data out of said data tracks; a focusing circuit for focusing at least one beam of light on said recorded medium; a tracking circuit for positioning said beam of light on said data tracks; a photodetector having a plurality of photodiodes with means for generating a data signal, a focusing-error signal as an actual value for said focusing circuit, and a tracking-error signal as an actual value for said tracking circuit from said beam of light reflected by said recorded medium onto said photodetector, said data signal corresponding to data read out of said data tracks; a tracking control amplifier in said tracking circuit; means for applying an offset compensation voltage to one input of said tracking control amplifier, said tracking error signal being generated from photovoltages of predetermined ones of said photodiodes, said tracking circuit having an operating point, said means for applying said offset-compensation voltage varying said offset-compensation voltage until one of said photovoltages is equal to the sum of said offset-compensation voltage and of another one of said photovoltages to maintain the operating point of the tracking circuit at an optimal midpoint; one photodiode with photovoltage for generating said tracking-error signal having an electrode connected to an inverting input of said tracking control amplifier; comparator means and a series circuit having a low-pass filter and a rectifier, said comparator means having an inverting input connected to said electrode of said one photodiode through said series circuit; another photodiode with photovoltage for generating the tracking-error signal having an electrode connected to an on-inverting input of said tracking control amplifier; another series circuit having another low-pass filter and another rectifier, said comparator means having a non-inverting input connected to the electrode of said other photodiode through said other series circuit; control means having an input connected to an output of said comparator means; a digital-to-analog converter having an input connected to a first output of said control means; said digital-to-analog converter having an output connected to the non-inverting input of said tracking control amplifier.



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**5,050,152**

**OPTICAL PICKUP DEVICE COMPENSATING FOR CARRIAGE/GUIDE PLAY OR WOBBLE**

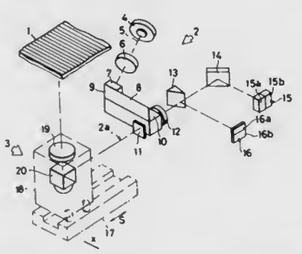
**Syuichi Honda, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jul. 10, 1989, Ser. No. 377,718**

**Claims priority, application Japan, Jul. 13, 1988, 63-175460**

**Int. Cl.[5] G11B** *7/00*

**U.S. Cl. 369—44.32** **7 Claims**



1. An optical pickup device for an optical disk having a recording surface, comprising:

means for transmitting and receiving a light beam along a first optical axis;



a guide disposed along said first optical axis;

a carriage mounted on said guide to move along said first optical axis;

a deflecting member disposed on said carriage and having a deflecting surface, wherein the light beam transmitted along said first axis from said means for transmitting and receiving is received at a deflection point of said deflecting surface and is deflected by the deflecting member along a second optical axis and a light beam incident on the deflection point along said second optical axis is deflected by the deflecting member to said means for transmitting and receiving along said first optical axis; and

an object lens disposed on said carriage and positioned on said second optical axis between the optical disk and said deflecting member for converging the light beam which is received along said first optical axis by the deflection point of said deflecting surface and is deflected thereby toward the recording surface of said optical disk along said second axis and for directing a light beam reflecting from the recording surface toward the deflection point of said deflecting surface along said second optical axis;

wherein a distance between the deflection point of said deflecting surface and a center of said object lens is approximately twice a focal length of said object lens to compensate for carriage/guide play or wobble.

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**5,050,153**

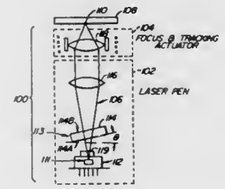
**SEMICONDUCTOR LASER OPTICAL HEAD ASSEMBLY**

**Wai-Hon Lee, 10332 Noel Ave., Cupertino, Calif. 95014, assignor to Wai-Hon Lee, Sunnyvale, Calif.**

**Filed Jun. 6, 1989, Ser. No. 362,124**

**Int. Cl.[5] G11B** *7/12*

**U.S. Cl. 369—112** **22 Claims**



1. An optical head for reading information recorded on a reflective medium, comprising:

a) a semiconductor laser for emitting a laser beam that travels along a forward beam path to the reflective medium, reflects off the reflective medium, and continues along a return beam path;

b) a photodetector disposed along the return beam path for detecting the laser beam after the laser beam has reflected off the reflective medium; and

c) a holographic lens assembly disposed along the forward and return beam paths, the assembly including:

(i) a transparent plate positioned oblique to the beam paths, the transparent plate having a first and second surfaces; and

(ii) a hologram lens structure;

whereby the transparent plate corrects beam aberrations in the laser beam on the forward beam path, the hologram lens diffracts the laser beam onto the photodetector on the return beam path, and both the transparent plate and the holographic lens add beam aberrations to the diffracted laser beam on the return beam path.

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**5,050,154**

**OPTICAL RECORDING/REPRODUCING MODULE HAVING REDUCED SIZE**

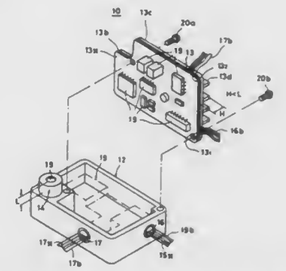
**Kenji Shimozawa, Musashino, and Tsutomu Morita, Mitaka, both of Japan, assignors to TEAC Corporation, Japan**

**Filed Nov. 29, 1988, Ser. No. 277,337**

**Claims priority, application Japan, Dec. 1, 1987, 63-183221[U]**

**Int. Cl.[5] G11B** *7/135*

**U.S. Cl. 369—112** **8 Claims**



1. An optical recording/reproducing module for recording/reproducing information to/from a recording medium, said module comprising:

a housing having a depression therein;

a focusing actuator provided on one side of said housing for carrying an objective lens such that the lens is movable in a direction perpendicular to said one side;

an optical system accommodated in said depression, said optical system including an optical source means for producing a first optical beam to be directed to said objective lens and the recording medium, an optical detector means supplied with a second optical beam received by said objective lens from the recording medium for producing an electrical output signal responsive to said second optical beam, and an array of optical elements for guiding the first optical beam produced by the optical source means to said objective lens and for guiding the second optical beam received by said objective lens to the optical detector means;

a cover lid adapted to be mounted on said one side of the housing, said cover lid having a shape adapted to close said depression; and

an electrical system provided on said cover lid for driving said optical source means and for amplifying said electrical output signal from said optical detector means.

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**5,050,155**

**PICK-UP DEVICE FOR USE IN AN OPTICAL INFORMATION RECORDING SYSTEM UTILIZING A DIFFRACTION GRATING WITH BLAZE CHARACTERISTICS**

**Yukio Kurata; Hideaki Sato; Yasuo Nakata, and Nobuo Ogata, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Continuation-in-part of Ser. No. 928,395, Nov. 10, 1986, Pat. No. 4,849,825. This application Mar. 30, 1989, Ser. No. 330,429**

**Claims priority, application Japan, Nov. 11, 1985, 60-254483; Dec. 28, 1985, 60-285960**

**Int. Cl.[5] G11B** *7/00*

**U.S. Cl. 369—112** **12 Claims**

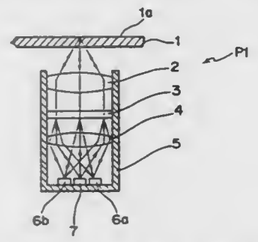
1. In an optical information storage system for reproducing information stored on a recording medium which modulates a light beam projected thereon, a pick-up device comprising:

light source means for directing light having a certain wavelength $w_0$, along a primary axis to the recording medium;

photo-detector means, disposed adjacent said light source

means, for reading information from the recording medium; and

diffraction grating means, having a depth, d, and indices of refraction, $n_1$ and $n_2$, being disposed between the recording medium and said photo-detector means and having a blaze characteristic, for directing said light from said light source means along said primary axis to a desired portion of the recording medium and along a secondary direction




to an undesired portion of the recording medium, said blaze characteristic satisfying a relation where $0.2*w_0 \leqq (n_2-n_1)*d \leqq 0.7*w_0$;

said diffraction grating means directing light modulated by said desired portion to said photo-detector means to provide information to said photo-detector means while passing light reflected from said undesired portion away from said photo-detector means.

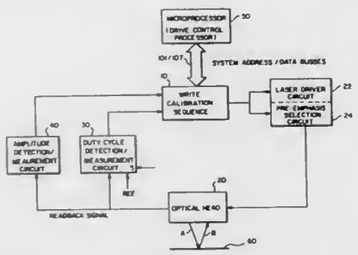
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**5,050,156**

**METHOD AND APPARATUS FOR CALIBRATING THE WRITING POWER APPLIED TO AN OPTICAL MEDIA**

**Mark A. Barton, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 25, 1989, Ser. No. 426,268**
**Int. Cl.[5] G11B** *7/00*
**U.S. Cl. 369—116** **10 Claims**




1. A method for calibrating the writing power applied to an optical recording media by a write laser comprising the steps of:

writing at different positions on said optical recording media with a write signal having a different power level for each position;

reading out the level of the write signal at each different position to form read-out signals;

comparing the level of each different read-out signal against a known standard read-out signal; and

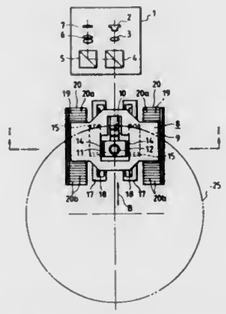
selecting the write power level that yielded the read-out signal closest to the standard read-out signal for thereafter recording data on said optical recording media.

**5,050,157**

**FRICTION REDUCING PIEZOELECTRIC FEED GUIDE MECHANISM**

**Masafumi Miura, and Susumu Ito, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan**

**Filed Nov. 18, 1988, Ser. No. 272,825**
**Claims priority, application Japan, Nov. 30, 1987, 62-302540**
**Int. Cl.[5] G11B** *19/00, 17/30, 5/24, 5/48*
**U.S. Cl. 369—215** **14 Claims**



1. A feed guide mechanism for a movable member which moves along a desired path comprising:

a guide member for supporting and guiding the movable member along the desired path; and

means to move said guide member so as to form stationary waves therewith, said guide member moving so that said movable member oscillates and rises upward with respect to the guide member.

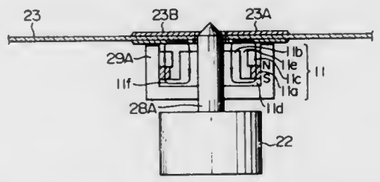
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**5,050,158**

**MAGNETIC CLAMP FOR A DISK MEDIUM**

**Yasuo Kitada, Odawara, and Toshiyasu Hattori, Minamiashigara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 29, 1988, Ser. No. 277,648**
**Claims priority, application Japan, Dec. 2, 1987, 62-303260**
**Int. Cl.[5] G11B** *25/00, 5/84, 17/02*
**U.S. Cl. 369—270** **9 Claims**




1. A magnetic clamp device for clamping a disk medium having magnetic material, comprising:

a driver for rotation the disk medium,

a spindle rotated by said driver,

a disk medium table provided at the upper section of said spindle and adapted to hold the disk medium,

an inner magnetic core made of magnetic material and shaped in a hollow cylinder, said inner core being mounted on said disk medium table concentrically with said spindle,

an outer magnetic core made of magnetic material and shaped generally in a ring, said outer core being mounted on said disk medium table concentrically with said spindle,



a linkage magnetic core made of magnetic material having opposite ends,

a magnetic gap formed between and directly adjacent upper end portions of said inner and outer cores, and

a permanent magnet having opposite end portions connected serially between one of said inner and outer cores and said linkage core, wherein one said end of said permanent magnet is connected to a bottom portion of said one core, the other end of said permanent magnet is connected to one said end of said linkage core, and the other end of said linkage core is connected to a bottom portion of the other of said inner and outer cores to form a magnetic circuit closed by said magnetic gap.

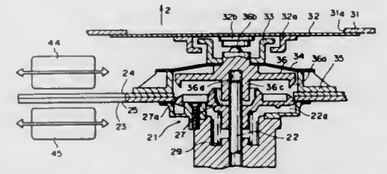
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**5,050,159**

**DOUBLE-SIDES PLAYABLE DISC PLAYER**

**Isami Kenmotsu, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jul. 6, 1988, Ser. No. 216,211**
**Claims priority, application Japan, Dec. 15, 1987, 62-190267[U]; Dec. 18, 1987, 62-320558**
**Int. Cl.[5] G11B** *17/28*
**U.S. Cl. 369—270** **3 Claims**



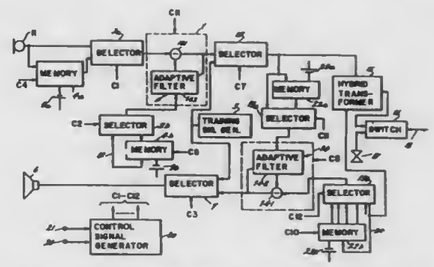

1. A double-sides playable disc player for playing back an information recording disc, said information recording disc being composed of a pair of circular base plates having respective signal recording layers and central holes and joined to each other with the signal recording layers inside, said double-sides playable disc player comprising a turntable, a disc centering device for centering the information recording disc with respect to said turntable, and a disc clamp mechanism for pressing the information recording disc against said turntable, said disc clamp mechanism comprising a support member movable in a plane substantially normal to a disc carrying surface of said turntable, drive means for driving said support member, a rotatable member rotatably mounted on said support member, and a presser mounted on said rotatable member through a resilient member for pressing said information recording disc against said disc carrying surface, said disc centering device comprising a first centering member fittable in a central hole of one of the circular base plates and movable into and out of said disc carrying surface through said central hole along a central axis of rotation of the turntable, urging means for normally urging said first centering member to project outwardly into the disc carrying surface, and a second centering member rotatably mounted together with a resilient member on said rotatable member and fittable into the central hole of the other circular base plate, the arrangement being such that when said second centering member is fitted into the central hole of said other circular base plate, said first centering member is moved out of said disc carrying surface of the turntable, said resilient member comprising a spring capable of toggling from a first state into a second state.

**5,050,160**

**TRAINING METHOD FOR AN ECHO CANCELLER FOR USE IN A VOICE CONFERENCE SYSTEM**

**Hitoshi Fuda, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Jun. 12, 1990, Ser. No. 536,447**
**Claims priority, application Japan, Jun. 13, 1989, 1-151647**
**Int. Cl.[5] H04M** *9/08*
**U.S. Cl. 370—32.1** **2 Claims**




1. A method of training an echo canceller for cancelling an echo by subtracting an estimated echo signal generated in response to a receive-in signal fed to a loudspeaker from an echo signal which is generated by a microphone in response to said receive-in signal, said method comprising the steps of:

generating, at the time of a first training, an initial echo signal by feeding an initial training signal to the loudspeaker;

training the echo canceller in response to the initial echo signal and the initial training signal to obtain a response characteristic of the echo canceller to the echo signal;

storing the initial echo signal and the initial training signal; and

training, after the first training, the echo canceller by using the stored initial echo signal and the stored training signal.

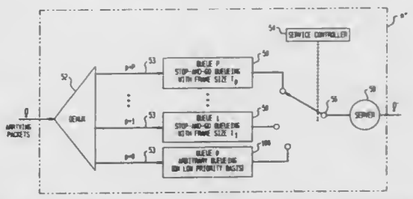
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**5,050,161**

**CONGESTION MANAGEMENT BASED ON MULTIPLE FRAMING STRATEGY**

**S. Jamaloddin Golestani, Morristown, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.**

**Filed Dec. 4, 1989, Ser. No. 445,784**
**Int. Cl.[5] H04Q** *11/04*
**U.S. Cl. 370—60** **15 Claims**




9. A method for transmitting packets in a packet switching network comprising a plurality of nodes interconnected by links, each of said packets belonging to a connection k of type p, p=1, . . . P, said method comprising

transmitting said packets between nodes via said links in time frames, packets belonging to type p connections being transmitted in frames of duration $T_p$, where $T_p$ is chosen individually for each type p,

limiting the number of packets admitted to the network in a frame of duration $T_p$ to $r_k.T_p$ where $r_k$ is a transmission rate allocated to connection k, and

delaying each of said packets at each of said nodes so that

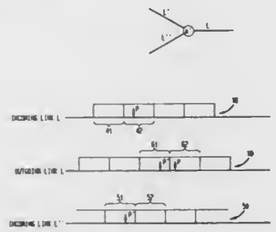
VOL 1130 ISS 3 SE 17 1991 UMI



each of said packets, belonging to a type p connection and arriving at one of said nodes via an incoming link during a particular one of said frames of duration $T_p$ and destined for a particular outgoing link, is transmitted from said one node via said particular outgoing link in a frame of duration $T_p$ which begins at or after the end of the frame of duration $T_p$ in which the packet arrived at said one node.

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**5,050,162**
**CONGESTION FREE PACKET NETWORK**
**S. Jamaloddin Golestani, Parsippany-Troy Hills, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.**
**Filed Mar. 20, 1989, Ser. No. 326,027**
**The portion of the term of this patent subsequent to Sep. 17, 2008, has been disclaimed.**
**Int. Cl.[5] H04Q** *11/04*
**U.S. Cl. 370—60** **21 Claims**



1. A method for transmitting packets in a packet switching network comprising a plurality of nodes interconnected by links, said packet network supporting a plurality of connections, each such connection k interconnecting a source node and a destination node, said method comprising the steps of

for each link of said packet network, defining a sequence of successive, non-overlapping time intervals of duration T and transmitting packets between said nodes via said links in said intervals,

for each connection k in said, packet network, limiting the number of packets admitted to the network at the source node in each successive interval of duration T to $R_k$·T where $r_k$ is a rate allocated to each said connection k such that the packet stream of connection k is smoothed at its source, and

at each node is said packet network, delaying packets arriving at a node in a particular time interval at least until the particular interval has expired and then transmitting said delayed packets in a time interval following the particular interval.

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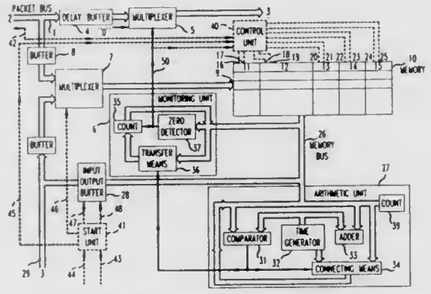
**5,050,163**
**METHOD OF ATD (ASYNCHRONOUS TIME DIVISION) SWITCHING OF DATA PACKETS AND AN ARRANGEMENT FOR IMPLEMENTING THIS METHOD**
**Petrus J. M. Van Bavel; Gijsbertus G. Van Ooyen, and Harmanus Van Tellingen, all of Hilversum, Netherlands, assignors to AT&T Bell Laboratories, Murray Hill, N.J.**
**Filed Mar. 6, 1990, Ser. No. 489,645**
**Claims priority, application Netherlands, Mar. 16, 1989, 8900640**
**Int. Cl.[5] H04Q** *11/04*
**U.S. Cl. 370—60** **4 Claims**

1. A method of ATD (Asynchronous Time Division) switching of data packets, according to which each packet is assigned a uniform identification code for each connection, characterized in that for each connection a time interval and a maximum number of packets to be transmitted within this time interval are chosen when time interval and which maximum number of packets to be transmitted within this time interval are stored per identification code at first and second memory locations respectively, for the duration of the connection, in that for each connection a predetermined time limit is stored at a third memory location, and in that a representation of a number of packets still authorized to be transmitted is stored at a fourth memory location, whilst a real-time count representative of the duration of each connection is obtained and is compared with the time limit for each packet that is presented to be transmitted, and

I. if the real-time count exceeds the time limit:

(a) the time limit at the third memory location is replaced by a new time limit which is determined by adding the time interval to the real-time count,

(b) the number of packets still authorized to be transmitted



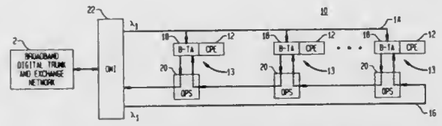
in the new time interval is replaced by the maximum number of packets to be transmitted, and

(c) the packet to be transmitted is switched; and

II. if the real-time count falls short of the time limit: it is established whether the number of packets still authorized to be transmitted in the relevant time interval exceeds the value "zero", in which case the remaining number of packets still authorized to be transmitted is switched, and if the number of packets still authorized to be transmitted is decremented by the value "one" and the packet to be transmitted is switched, and if the number of packets still authorized to be transmitted is equal to "zero", the switching of the packet to be transmitted is blocked.

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**5,050,164**
**OPTICAL CUSTOMER PREMISES NETWORK**
**Hung-Hsiang J. Chao, Lincroft; Gennady Shtirmer, Morris Plains, and Lanny S. Smoot, Morris Township, Morris County, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.**
**Filed Oct. 31, 1989, Ser. No. 429,845**
**Int. Cl.[5] H04J** *14/00*
**U.S. Cl. 359—135** **11 Claims**



1. An optical customer premises network for interconnecting a plurality of units of customer premises equipment to a broadband digital trunk and exchange network, said optical premises network comprising:

first transmission means for optically broadcasting downstream information to said units of customer premises equipment using the Asynchronous Transfer Mode information transfer protocol,

second transmission means sequentially connecting said units of customer premises equipment for optically transmitting upstream information from said units of customer premises equipment using the Asynchronous Transfer Mode information transfer protocol,

an optical network interface connecting said first and second transmission means from said optical customer premise network to said broadband digital trunk and exchange network,

first means included in said optical network interface for receiving information encoded into an Asynchronous Transfer Mode bit stream from said broadband trunk and exchange network, transferring said information to said first transmission means to optically broadcast said information to all of said customer premises equipment,

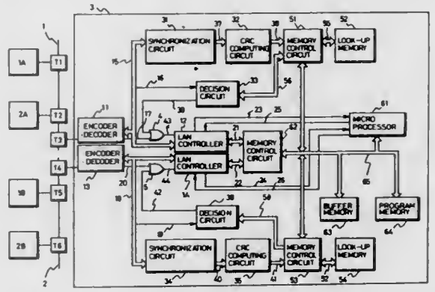
second means included in said optical network interface for receiving upstream information from customer premises equipment via said second transmission means and transferring said information to said Asynchronous Transfer Mode bit stream of said broadband trunk and exchange network, and

third means included in said optical network interface for transferring said information from said second transmission means to said first transmission means for communication between particular units of said customer premises equipment.



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**5,050,165**
**BRIDGE CIRCUIT FOR INTERCONNECTING NETWORKS**
**Ryuichi Yoshioka, and Ikuo Furuya, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan**
**Filed Jun. 1, 1989, Ser. No. 359,568**
**Int. Cl.[5] H04J** *3/02*
**U.S. Cl. 370—85.13** **17 Claims**



1. A bridge circuit for interconnecting at least first and second local area networks each having a plurality of stations and each of which stations is formed to send or receive a message signal, the message signal including an address signal of a destination station and an address signal of a source station, said bridge circuit comprising:

(a) first circuit means coupled with said first and second local area networks for receiving said message signal to from said source station and sending said message signal to said destination station;

(b) second circuit means coupled with said first and second local area networks for carrying out a cyclic redundancy check of said address signal of said destination station and said address signal of said source station included in said received message signal;

(c) first memory means for storing an address information of said source station included in said received message signal;

(d) memory control means coupled with said second circuit means and said first memory means for controlling said first memory means using results obtained by said second circuit means in carrying out said cyclic redundancy check;

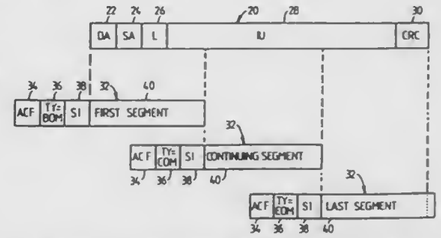
(e) decision means coupled with said memory control means and said first circuit means for judging whether the reception of said message signal is stopped or not in accordance with the address information read from said first memory means and outputting a stop signal to said first circuit means when the decision means judges that the reception of said message signal is stopped;

(f) second memory means coupled with said first circuit means for storing the received message signal; and

(g) microprocessor means coupled with said first circuit means and said memory control means for controlling the first circuit means to receive or transmit said message signal.

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**5,050,166**
**TRANSFER OF MESSAGES IN A MULTIPLEXED SYSTEM**
**Antonio Cantoni, 44 Emmerson Street, North Perth, Western Australia, and Robert M. Newman, 52 Davallia Road, Duncraig, Western Australia, both of Australia**
**PCT No. PCT/AU88/00075, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO88/07293, PCT Pub. Date Sep. 22, 1988**
**PCT Filed Mar. 17, 1988, Ser. No. 283,364**
**Claims priority, application Australia, Mar. 17, 1987, PI0884**
**Int. Cl.[5] H04J** *3/24;* **H04Q** *11/04;* **H04L** *12/54*
**U.S. Cl. 370—94.1** **14 Claims**



1. A method of transmitting variable length messages on a network from a source having a source address to a destination having a destination address, said method including the steps of:

segmenting each message into a plurality of fixed length slots including a first slot, continuing slots, and a last slot, each of said slots including a header field which includes a source identifier field, which is substantially shorter than said destination address, and a message segment;

providing a source identifier code in the source identifier field, each source identifier code being uniquely associated with the message to be transmitted;

entering said destination address in the message segment of said first slot;

transmitting the slots on the network; and

controlling reassembly of slots at the destination in accordance with the source identifier code of slots received at the destination.

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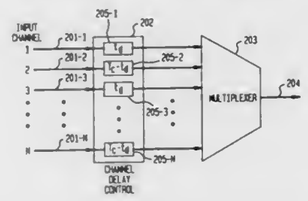
**5,050,167**
**TIMING EXTRACTION IN MULTIPLEXED MULTICHANNEL HIGH SPEED FIBER OPTIC TRANSMISSION SYSTEM**
**Hossein Izadpanah, Randolph, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.**
**Filed Aug. 10, 1989, Ser. No. 392,118**
**Int. Cl.[5] H04J** *3/04, 3/06*
**U.S. Cl. 370—112** **13 Claims**

1. In the transmitter of a time-division multiplexed system which multiplexes at a clock frequency data pulses from plural input channels onto an output data pulse stream, each output data pulse being within a time slot, multiplex control means for

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controlling the position of the data pulse for each channel within the time slot associated with that channel comprising means for offsetting the position of the data pulse by a predetermined delay from the beginning of the each time slot associated with selected ones of the plural input channels, and means for offsetting the position of the data pulse by said predetermined delay from the end of each time slot associated with the other of the plural input channels, wherein the power density spectrum of the multiplexed data stream has an enhanced discrete component at said clock frequency and the continuous portion of said spectrum has a dip in the region of said clock frequency.




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**5,050,168**

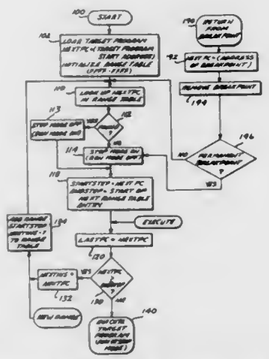
**TEST COVERAGE ANALYZER**

**Timothy L. Paterson, 13416 SE. 187th Pl., Renton, Wash. 98058**

**Filed Dec. 29, 1989, Ser. No. 458,789**

**Int. Cl.[5] G06F *11/00***

**U.S. Cl. 371—19** **19 Claims**




1. A method for monitoring the execution of a target program comprising a series of instructions to determine which instructions have been executed, the target program being executable on a computer in a run mode in which instructions are executed without interruption, and in a step mode in which instructions are executed one at a time, the method comprising the computer performed steps of:

executing a portion of the target program in step mode;

while executing the target program in step mode, maintaining a table of target program instructions that have been executed;

when a branch instruction that transfers control to a first branch path is executed in step mode, inserting one or more breakpoints into the target program such that upon the next execution of the branch instruction, a breakpoint will be encountered at least for the case in which said next execution transfers control to a second branch path different from the first branch path;

switching to run mode when an instruction in said table is encountered while executing in step mode; and

switching to step mode when a breakpoint is encountered while executing in run mode.

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**5,050,169**

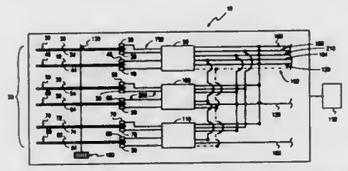
**METHOD AND APPARATUS FOR TESTING MAGNETIC DISKS**

**Michael R. Monett, Santa Clara, Calif., assignor to Memory Technology, Boulder, Colo.**

**Filed May 23, 1989, Ser. No. 355,979**

**Int. Cl.[5] G06F *11/00***

**U.S. Cl. 371—21.2** **17 Claims**



13. An apparatus for detecting flaws in computer disks, the disks being included in a head disk assembly, where the assembly includes a first read/write head associated with a first surface of each disk and a second read/write head associated with a second surface of each disk, the assembly further including a plurality of head control chips for controlling read and write operations of the heads, where a predetermined number of heads is controlled by each such chip, said assembly being configured so that different data signals may not be supplied to said heads simultaneously, the apparatus comprising:

means for simultaneously providing a write signal to all of the first heads for storing identical data on said first surfaces;

means for reading said data from said first surfaces via said first heads; and

means for comparing said read data with said written data for detecting the presence of flaws on said first surfaces of said computer disks.

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**5,050,170**

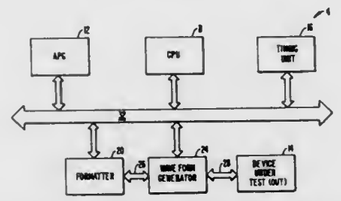
**APPARATUS FOR COMBINING SIGNALS FROM FIRST AND SECOND INFORMATION PROCESSING ELEMENTS**

**David G. Abdoo, Simi Valley, Calif., assignor to Schlumberger Technologies, Inc., San Jose, Calif.**

**Continuation of Ser. No. 903,820, Sep. 4, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 93,840**

**Int. Cl.[5] G01R *31/28***

**U.S. Cl. 371—27** **13 Claims**




1. A circuit for combining signals from first and second information processing elements comprising:

first input means for receiving a first signal from the first information processing element;

second input means for receiving a second signal from the second information processing element;

pulse forming means, coupled to the second input means, for generating a first pulse in response to the second signal; and



pulse output means, coupled to the first input means and to the pulse forming means, for emitting a second pulse when a first signal is received from the first input means and the first pulse is received from the pulse forming means.

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**5,050,171**

**BURST ERROR CORRECTION APPARATUS**

**Tomoharu Ishijima, Tokyo, Japan, assignor to Kabushiki Kaisha CSK, Tokyo, Japan**

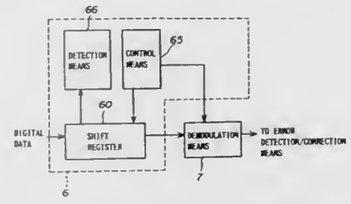
**PCT No. PCT/JP89/00129, § 371 Date Nov. 13, 1989, § 102(e) Date Nov. 13, 1989, PCT Pub. No. WO89/07825, PCT Pub. Date Aug. 24, 1989**

**PCT Filed Feb. 9, 1989, Ser. No. 444,159**

**Claims priority, application Japan, Feb. 16, 1988, 63-33813**

**Int. Cl.[5] G06F *11/10***

**U.S. Cl. 371—47.1** **6 Claims**




5. A burst error correction apparatus for correcting burst error due to a bit slip in a self-clocking signal containing resync codes at predetermined intervals before the signal is demodulated, said apparatus comprising:

a shift register for receiving the self-clocking signal in series;

a detection means for detecting, in response to parallel outputs from a section adjacent to an entrance of said shift register, there sync codes and an inhibited pattern which has not existed in the self-clocking signal; and

a control means for detecting a direction and a number of bits on the basis of a detection signal from said detection means and respectively controlling clocks applied to said shift register and a rear stage of said shift register;

wherein, on as is of results of detection of the inhibited pattern and position at which the inhibited pattern is detected, said control means shifts data appearing from a position adjacent to the inhibited pattern between adjacent resync codes to a subsequent one of these resync codes in accordance with the direction and the number of bits based on a detection signal from said detection means, or said control means shifts a later half of data between the adjacent resync codes where the bit slip takes places in accordance with the direction and the number of bits of the bit slip by controlling clocks to said shift register and said rear stage.

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**5,050,172**

**MICROCOMPUTER CONTROLLED ELECTRIC CONTACTOR WITH POWER LOSS MEMORY**

**Robert T. Elms, Monroeville Boro, and Gary F. Saletta, Penn Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 8, 1989, Ser. No. 348,940**

**Int. Cl.[5] G11C *14/00***

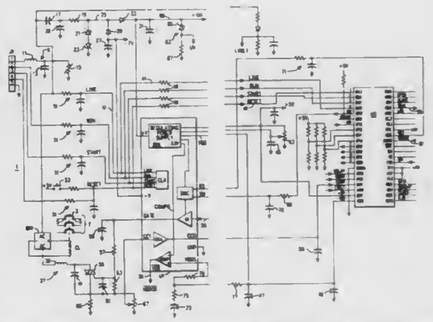
**U.S. Cl. 371—66** **2 Claims**

2. A microcomputer having a memory in which data generated by the microcomputer is stored;

a power supply energizing said microcomputer, and including a reserve power source;

a control circuit generating reset signals which are applied to said microcomputer when said power supply is powered up and when a voltage generated by said power supply collapses; and

means generating a logic signal of a first level when a voltage generated by said power supply is above a preselected level and having a second logic level otherwise; said means generating said logic signal comprising a zenor diode and a resistor connected in series across a portion of the power supply, a logic level input port to the microcomputer which generates said logic level signal of the first logic level when an applied signal is above a predetermined threshold and generates said logic level signal of the second level otherwise, and means applying the voltage across said resistor to said logic level input port as said applied signal, said zener diode having a break over voltage and said resistor having a value selected to generate a voltage across said resistor which exceeds said threshold when said voltage of the power supply is above the selected value; and



said microcomputer being programmed to operate in a normal mode in which same microcomputer is fully energized by said power supply in response to the first logic level of said logic signal and a reset signal, and to operate in the stop mode in which said memory is energized by said reserve power source in response to the second level of said logic signal and a reset signal, said reserve power source comprising a capacitor charged by said power supply and connected to a power input to said microcomputer, said capacitor being of a size to store sufficient charge to supply current to the microcomputer to operate in the stop mode for a preselected interval of time; means for monitoring the voltage across said capacitor and

wherein said microcomputer is further programmed to clear out selected data in said memory in response to a reset signal and a first logic level of said logic signal when said voltage across the capacitor is below a predetermined voltage needed to maintain the integrity of said memory.

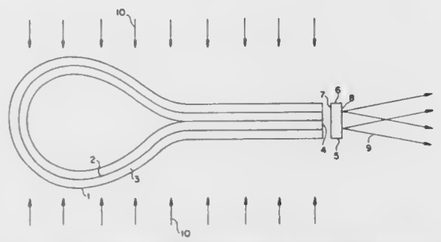
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**5,050,173**

## LOOPED, PHASED ARRAY LASER OSCILLATOR

**John L. Hughes, Glen Waverley, Australia, assignor to Phased Array Lasers Pty Ltd., Melbourne, Australia**

**PCT No. PCT/AU89/00190, § 371 Date Apr. 16, 1990, § 102(e) Date Apr. 16, 1990, PCT Pub. No. WO89/11172, PCT Pub. Date Nov. 16, 1989**
**PCT Filed May 3, 1989, Ser. No. 477,879**
**Claims priority, application Australia, May 3, 1988, PI7995**
**Int. Cl.[5] H01S *3/07***
**U.S. Cl. 372—6** **6 Claims**



1. A scaleable phased locked single aperture, single mirror looped fiber laser bundle oscillator with the optically polished ends of the said fiber laser oscillator loops positioned to form the said single output aperture and optically matched to the said single, optically polished mirror which partially transmits at the laser wavelength, said fiber laser loop oscillators being optically excited using arrays of semiconductor light sources.

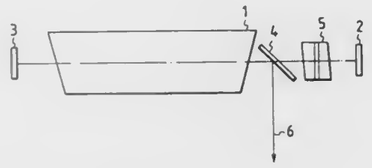
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**5,050,174**

## LASER DEVICE

**Koichi Wani; Yasuhiro Shimada; Hidehito Kawahara; Mutsumi Mimasu, and Tadaaki Miki, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Feb. 14, 1990, Ser. No. 480,152**
**Claims priority, application Japan, Feb. 14, 1989, 1-33999; Sep. 4, 1989, 1-228549; Sep. 26, 1989, 1-249533; Sep. 26, 1989, 1-249534; Oct. 30, 1989, 1-282102**
**Int. Cl.[5] H01S *3/10***
**U.S. Cl. 372—20** **4 Claims**



1. A laser device comprising:
an optical resonator which includes a laser medium having an optical axis extending therethrough, a first totally reflecting mirror disposed on one side of said laser medium and extending perpendicularly to said optical axis, and a second totally reflecting mirror disposed on another side of said laser medium;
a partially reflecting mirror disposed between said laser medium and said second totally reflecting mirror, for outputting an output laser beam, which comprises a radiation propagating from said laser medium to said partially reflecting mirror, out of said optical resonator; and
a wavelength selection element disposed between said partially reflecting mirror and said second totally reflecting mirror.

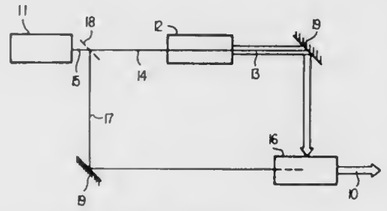
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**5,050,175**

## PULSED POWER LASER WITH MOPA STRUCTURE WITH NONLINEAR ENERGY TRANSFER MEDIUM

**Jean-Luc Ayral, and Jean-Pierre Huignard, both of Paris, France, assignors to Thomson-CSF, Puteaux, France**

**Filed Jun. 5, 1990, Ser. No. 533,439**
**Claims priority, application France, Jun. 13, 1989, 89 07785**
**Int. Cl.[5] H01S *3/10***
**U.S. Cl. 372—21** **19 Claims**



1. A pulsed power laser comprising:
a low energy laser oscillator stage for generating a low-level output beam;
a laser amplifier stage for receiving at least a fraction of the low-level output beam to generate a pump beam; and
energy transfer means for amplifying the low-level output beam of the low energy laser oscillator stage by energy transfer from the pump beam generated by the laser amplifier stage without phase transfer from said pump beam to said low-level beam during amplification.

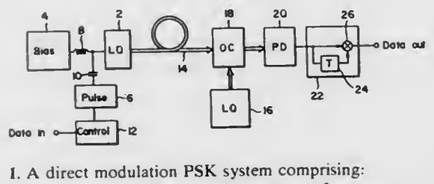
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**5,050,176**

## DIRECT MODULATION PHASE-SHIFT-KEYING SYSTEM AND METHOD

**Takao Naito, Kawasaki; Terumi Chikama, Machida; Shigeki Watanabe, Kawasaki; Tetsuya Kiyonaga, Kawasaki; Hiroshi Onaka, Kawasaki, and Yoshihito Onoda, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Jun. 19, 1990, Ser. No. 540,284**
**Claims priority, application Japan, Jun. 19, 1989, 1-154664**
**Int. Cl.[5] H01S *3/10***
**U.S. Cl. 372—26** **15 Claims**




1. A direct modulation PSK system comprising:
a laser diode emitting a light beam at a frequency corresponding to an injection current;
a bias current circuit for supplying said laser diode with a bias current;
a modulating current pulse circuit for superposing a modulating current pulse with a pulse width smaller than one time slot T of a binary-coded input signal on said bias current; and
an amplitude and pulse width control circuit for controlling the amplitude and pulse width of said modulating current pulse in accordance with the binary-coded input signal so that an integrated value of a frequency varied by said modulating current pulse may become $\pi$ or $-\pi$ as a phase amount.

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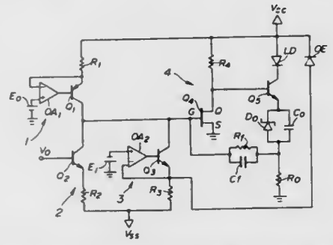


**5,050,177**

## LASER DIODE DRIVING CIRCUIT

**Hidetoshi Ema, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Nov. 8, 1990, Ser. No. 610,582**
**Claims priority, application Japan, Nov. 22, 1989, 1-304329**
**Int. Cl.[5] H01S *3/10***
**U.S. Cl. 372—38** **7 Claims**



1. A laser diode driving circuit for driving a laser diode comprising:
a driving transistor controlling a forward current of the laser diode;
photoelectric conversion means for receiving an optical output of the laser diode and for outputting a photocurrent proportional to the optical output;
converting means for converting an external light emission instruction signal into a light emission instruction signal current; and
a source grounding circuit amplifying a current which corresponds to a difference between the light emission instruction signal current from said converting means and the photocurrent from said photoelectric conversion means, so as to output an amplified current,
said source grounding circuit applying the amplified current to said driving transistor and controlling said driving transistor so that the light emission instruction signal current becomes equal to the photocurrent.

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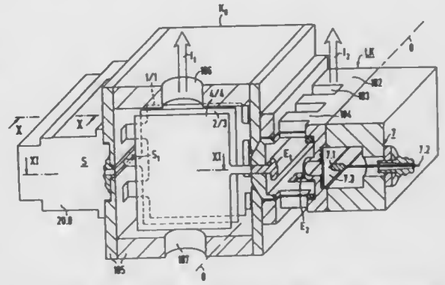
**5,050,178**

## MULTICHANNEL PSEUDO-SPARK SWITCH AND EXCITATION CIRCUIT FOR GAS LASERS HAVING THE SWITCH

**Volker Brückner, Mömbris; Willi Bette, Erlangen; Dirk Friede, Goldbach, and Hans-Jürgen Cirkel, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Continuation of Ser. No. DE89/00266, Apr. 26, 1989. This application Oct. 26, 1990, Ser. No. 604,829**
**Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3814050; Nov. 15, 1988, 3838723**
**Int. Cl.[5] H01S *3/00***
**U.S. Cl. 372—38** **13 Claims**

1. An excitation circuit for gas lasers operating according to the TE principle, comprising:
A) a gas laser housing with a laser chamber having first and second sides and defining a gas space in and an optical axis of said laser chamber, at least two laser electrodes disposed in said laser chamber for generating a homogeneous glow discharge between said laser electrodes, said laser electrodes being spaced apart and opposite each other and having electrode surfaces extended parallel to the optical axis of said laser chamber;
B) a pulse forming network being connectable to a high voltage source at its input side and having a high anode potential and lines connected to said laser electrodes at its output side, at least one fast acting high voltage switch having lines connected to said pulse forming network at the input side thereof to be activated or fired for generating high voltage pulses at said laser electrodes with said pulse forming network;
C) means for preionizing the gas space of said laser chamber before the high voltage pulse applied to said laser electrodes reaches a firing threshold of the laser glow discharge;
D) said pulse forming network including at least first and second network capacitors and associated equivalent inductances of the excitation circuit resulting at least from inherent inductance of said high voltage switch, said laser chamber, said lines and of said network capacitors;
E) said at least first and second network capacitors being connected within said pulse forming network and having first and second types of coatings with a given stacking direction and intermediate dielectric layers, said coatings and said dielectric layers being stacked according to said stacking direction substantially parallel to the optical axis of said laser chamber to form a stacked capacitor packet and parallel to one of the first sides of the laser chamber;
said switch being a multi-channel pseudo-spark switch having a longitudinal axis oriented parallel to said given stacking direction and including:



a) auxiliary and trigger electrodes, a plurality of individual pseudo-spark switches being electrically connected in parallel to each other and disposed sequentially in a line parallel to the laser axis, said individual pseudo-spark switches having mutually opposite electrode chambers disposed in pairs and a pair of anode and cathode electrodes having electrode surfaces and facing their electrode surfaces;
b) said cathode electrodes of each of said individual pseudo-spark switches being connected to ground potential in said pulse forming network;
c) said anode electrodes of each of said individual pseudo-spark switches being distributed along the axial length of said capacitor packet and being connected to the high anode potential of said pulse forming network; and
d) a common multiple pseudo-spark chamber having a housing with a first side disposed at one of the first sides of said part of said gas laser housing containing said capacitor packet, said anode and cathode electrodes and said auxiliary and trigger electrodes being disposed within said common multiple pseudo-spark chamber;
e) said electrode surfaces of said multi-channel pseudo-spark switch have different polarities and face each other with a given distance therebetween, at least the distance of said electrode surfaces belonging to one of said polarities being increased in comparison to the distance of a plane parallel electrode configuration by a special shape in said given distance.

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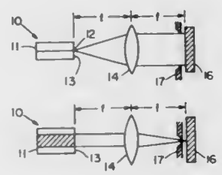


5,050,179

## EXTERNAL CAVITY SEMICONDUCTOR LASER

Aram Mooradian, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 20, 1989, Ser. No. 341,028
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—44 24 Claims



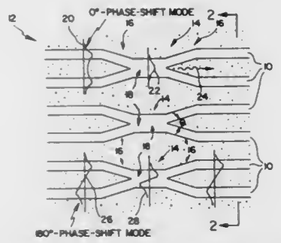
1. An external cavity diode laser system comprising a diode laser having a facet and a single active gain region of width D much greater than height H for emitting a single lobe of light and coupled to an external resonator having two ends and comprising beam shaping optics disposed between the ends of the resonator and an output coupling mirror positioned at the end of the resonator opposite the diode laser and optically aligned with the diode laser to focus light from the facet back upon the facet and including a mode aperture dimensioned such that only a single spatial mode of light will propagate in the system and wherein light propagated from the facet in two orthogonal planes travels through the optics in two different paths.

5,050,180

## PHASE-LOCKED ARRAYS OF COUPLED X-JUNCTIONS

Dan Botez, Redondo Beach, and Luke J. Mawst, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Oct. 10, 1989, Ser. No. 419,289
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—45 20 Claims




1. A semiconductor laser array structure, comprising:

means for producing lasing action in a semiconductor structure, including a substrate, an active semiconductor layer, electrodes for applying a voltage across the active layer, and a pair of reflective facets, at least one of which is an emitting facet, located at opposite ends of the array structure; and

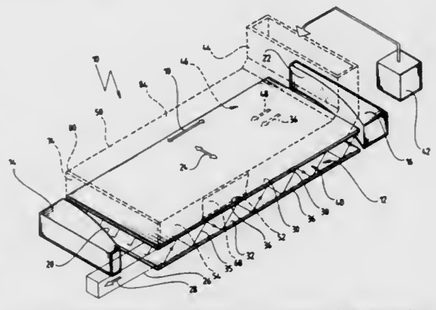
an array of waveguides with generally parallel longitudinal axes, the waveguides having a first set of parallel elements extending from one end of the structure to an intermediate region and a second set of parallel elements aligned with the first set and extending from the intermediate region to the other end of the structure, wherein each adjacent pair of the waveguides in the first set of parallel elements is coupled to an aligned pair of the waveguides in the second set of parallel elements, by an X-shaped junction located in the intermediate region and configured to provide significant losses for the 0°-phase-shift array mode and thereby discriminate against 0°-phase-shift array mode operation, whereby the laser array structure operates in the 180°-phase-shift array mode and produces a diffraction-limited beam at high output powers and drive currents substantially above threshold.

5,050,181

## WAVEGUIDE LASER WITH MICROWAVE EXCITATION

Frank Gekat, Korb, Fed. Rep. of Germany, assignor to Deutsche Forschungsanstalt fur Luft- und Raumfahri e.V., Fed. Rep. of Germany

Filed Nov. 6, 1990, Ser. No. 609,937
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1989, 3937491
Int. Cl.[5] H01S 3/09
U.S. Cl. 372—69 27 Claims



1. A waveguide laser comprising a resonator having mirrors arranged in spaced, opposite relation to each other in the direction of a resonator axis and a beam path extending in both the direction of said resonator axis and a transverse direction perpendicular thereto, an optical waveguide extending with a waveguide longitudinal direction essentially in the direction of said resonator axis between said mirrors and having optical waveguide surfaces extending in facing, parallel relation to each other in a plane parallel to the direction of said resonator axis and to said transverse direction and guiding said beam path by reflections, and a gas-discharge volume located between said optical waveguide surfaces and containing a laser gas, characterized in that a microwave source (42) is provided, in that microwaves are introducible into a waveguide (44) leading to said optical waveguide (30) from said microwave source (42), and in that an overcoupling structure (46) separate from said laser gas in said gas-discharge volume (40) is arranged on a side of one of said optical waveguide surfaces (32, 34) opposite said gas-discharge volume (40), said overcoupling structure being connected to said waveguide (44), extending in an overcoupling direction (48) parallel to said optical waveguide surface (34) and bringing about in a strip region (64) in said gas-discharge volume (40) along said overcoupling direction (48) a substantially constant coupling-in of the microwave power.

5,050,182

## CHEMICAL PROCESS YIELDING STIMULATED EMISSION OF VISIBLE RADIATION VIA FAST NEAR RESONANT ENERGY TRANSFER

James L. Gole, Atlanta, Ga.; James R. Woodward, Chagrin Falls, Ohio, and Stephen H. Cobb, Mayfield, Ky., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 296,512, Jan. 12, 1989. This application Jul. 3, 1989, Ser. No. 375,049
Int. Cl.[5] H01S 3/095
U.S. Cl. 372—89 31 Claims

1. A chemical process yielding stimulated emission of visible radiation via fast near resonant intermolecular energy transfer comprising the steps of:

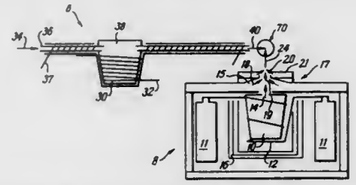


(a) providing a first source of vapor selected from the group consisting of metal and semimetal vapor to be reacted with an appropriate reactant to produce a metastable excited state reaction product which serves as an energy storage medium;

(b) providing a second source of atomic vapor selected from the group consisting of metal and semimetal vapor to serve as receptor atoms to receive the energy from said metastable excited state of the reaction product;

(c) providing a source of reactant to react with the first source of vapor in a highly exothermic reaction which liberates energy exceeding 2.5 eV, said reactant being selected rom the group consisting of ozone, nitrogen oxide, nitrogen dioxide, and halides;

(d) chemically reacting the reactant and the first source of vapor to form metastable states of a final reaction product;



(e) transferring energy stored in the metastable states of the reaction product to the second source of atomic vapor serving as receptor atoms by means of near resonant energy transfer to form electronically excited receptor atoms generating a population inversion relative to a terminal laser level of excitation of said receptor atoms; and

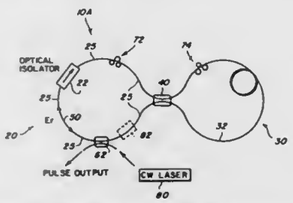
(f) introducing a quenching gas into the region in which the second source of atomic vapor receives energy in a near resonant energy transfer; and depleting said terminal laser level by means selected from the group consisting of near resonant energy transfer between the quenching gas and the terminal laser level, and complexation of the quenching gas with the terminal laser level or both, such that the population inversion between the excited and the terminal laser level of the receptor atoms can be maintained more effectively.

5,050,183

## FIGURE EIGHT SHAPED COHERENT OPTICAL PULSE SOURCE

Irl N. Duling, III, Middleburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 5, 1990, Ser. No. 608,764
Int. Cl.[5] H01S 3/083
U.S. Cl. 372—94 24 Claims




1. An optical pulse source for producing short optical pulses comprising:

first and second optical loops coupled together by a beam splitter so as to define a figure eight optical path in which a light beam propagating toward said beam splitter in one of said first and second loops is split by said beam splitter to form two light beams propagating in opposite directions around the other of said first and second loops, said first loop including direction dependent loss means for reducing the intensity of light propagating in a predetermined direction around said first loop, said second loop including nonlinear means having an intensity dependent nonlinear optical transmission characteristic, and a first one of said first and second loops including an optical gain medium;

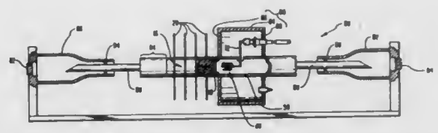
means for coupling pump light into said first one of said first and second loops including said gain medium, and for coupling optical pulses out of said source.

5,050,184

## METHOD AND APPARATUS FOR STABILIZING LASER MIRROR ALIGNMENT

George A. Nelson, 2586 E. Falcon Way, Sandy, Utah 84093

Filed Feb. 23, 1990, Ser. No. 485,250
Int. Cl.[5] H01S 3/08
U.S. Cl. 372—107 29 Claims



1. An enclosure for a dispenser cathode of a laser, said enclosure comprising:

a. a tubular cathode housing enclosing therein the dispenser cathode and also enclosing therein a means for generating a laser beam along a longitudinal axis of said housing; and

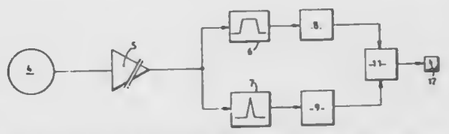
b. means for insulating a portion of the exterior of said cathode housing which contains said dispenser cathode from direct contact with ambient temperature conditions so as to permit the occurrence of unrestrained longitudinal, temperature-related dimensional changes in said cathode housing caused by heat from the dispenser cathode.

5,050,185

## PROCESS AND APPARATUS FOR MEASURING THE INSTABILITY OF AN ARC IN AN ELECTRICAL ARC FURNACE FOR PROCESSING LIQUID METAL

Michel Bourge, Arnaville; Gilbert Engler, Woippy, and Ghislain Maurer, Chatel-St-Germain, all of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), Puteaux, France

Filed Jun. 12, 1990, Ser. No. 536,400
Claims priority, application France, Jun. 15, 1989, 89 07951
Int. Cl.[5] H05B 7/148
U.S. Cl. 373—104 9 Claims



1. Process for measuring the instability of an arc in an electrical furnace for processing a liquid metal, characterized in that: a signal representing the derivative of the intensity of the current in the arc is sensed,

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the sensed signal is amplified,
the amplified signal is directed simultaneously into two band pass filters respectively having a high frequency broad band and having a narrow band centered on a low fundamental frequency,
the signals emanating from the filters are transmitted to effective value extractors
by means of a divider module, an energy signal is formulated, which is proportional to the ratio of the effective value of the signal emanating from the broad band filter and the effective value of the signal emanating from the narrow band filter,
and the proportional energy signal obtained is displayed on a scale where it is expressed as a percentage, this percentage being indicative of the behaviour of the arc, signifying the formulation phase.

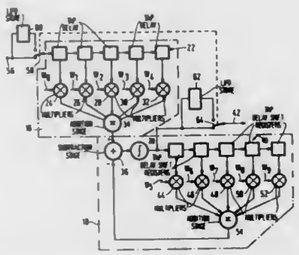
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**5,050,186**

## SIGNAL EQUALIZING ARRANGEMENT AND A METHOD OF EQUALIZING A RECEIVED DATA SIGNAL

**Mustafa K. Gurcan, Crawley, and Timothy J. Moulsley, Caterham, both of England, assignors to U.S. Philips Corp., New York, N.Y.**

**Filed Jan. 4, 1989, Ser. No. 293,169**
**Claims priority, application United Kingdom, Jan. 8, 1988, 8800386**
**Int. Cl.[5] H04B** *3/04*
**U.S. Cl. 375—14** **14 Claims**



1. A method of equalising a data signal distorted by transmission though a dispersive communications channel, comprising:
(a) reversing the sequence of the data;
(b) applying the data with its sequence reversed to a decision feedback equaliser; and
(c) reversing the sequence of decisions produced by the equaliser.

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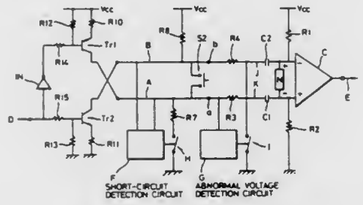
**5,050,187**

## COMMUNICATION SYSTEM EQUIPPED WITH AN AC COUPLING RECEIVER CIRCUIT

**Takamichi Ichie, Chigasaki, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan**

**Filed Apr. 10, 1989, Ser. No. 335,541**
**Claims priority, application Japan, Apr. 12, 1988, 63-90100; Dec. 28, 1988, 63-329226; Dec. 28, 1988, 63-329227**
**Int. Cl.[5] H03G** *11/04*
**U.S. Cl. 375—36** **10 Claims**

4. A communication system including a pair of first transmission lines as a balanced transmission line, and at least one transmitter circuit and at least one AC coupling receiver circuit both connected to the first transmission lines, said AC coupling receiver circuit comprising:
AC coupling capacitors connected at respective input sides of the AC coupling capacitors to said pair of first transmission lines, respectively;
a pair of second transmission lines connected respectively to output sides of said AC coupling capacitors;
voltage comparator means connected to said pair of second transmission lines, so as to be thereby connected to the output sides of said AC coupling capacitors via said pair of second transmission lines;
a non-linear element having opposite ends connected directly to respective ones of said pair of second transmision lines at locations between said voltage comparator means and said AC coupling capacitors, said non-linear element including means for causing said pair of second transmission lines to be substantially conductive to one another when a voltage applied across said non-linear element is higher than a predetermined voltage; and




impedance altering means arranged at input sides of said AC coupling capacitors, respectively, for selectively altering impedances of the first transmission lines at the input sides of said AC coupling capacitors; and
said impedance altering means including means responsive to one of said pair of first transmission lines being opened, for bringing the impedance of the open first transmission line at the input side of the corresponding AC coupling capacitor, to a low impedance state.

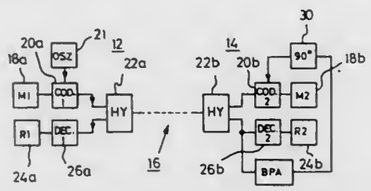
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**5,050,188**

## METHOD AND APPARATUS FOR TRANSMITTING CODED INFORMATION

**Josef Dirr, Neufahrner Str. 5, D-8000 Munich 80, Fed. Rep. of Germany**

**Filed Jun. 7, 1988, Ser. No. 203,710**
**Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719670; Feb. 19, 1988, 3805263**
**Int. Cl.[5] H04L** *27/28*
**U.S. Cl. 375—38** **21 Claims**



1. Process for the simultaneous transmission of first information from a first to a second station and of second information from the second to the first station over a single transmission path, comprising the following steps:
carrying out the following steps in said first station: (a) producing an essentially sinusoidal first signal having a predetermined frequency as well as a predetermined phase and consists of a sequence of oscillation periods each of which at any given time contains two half-waves following one another with predetermined duration and opposite polarity, wherein said half-waves are able to take on at least two different discrete amplitude values which set forth a code representing said first information, and wherein all amplitude values are greater than zero, (b)



transmitting said first signal from said first station to said second station over said single transmission path,
carrying out the following steps in said second station: (a) obtaining a second sinusoidal oscillation having said predetermined frequency and phase by passing the transmitted first signal through separation means, (b) decoding the transmitted first signal in order to retrieve said first information, (c) feeding said second sinusoidal oscillation as an input signal into a 90-degree-phase shifter, which delivers an output signal, phase shifted by 90 degrees with respect to said input signal and thus shifting the phase of said second sinusoidal oscillation by 90 degrees, (d) producing an essentially sinusoidal second signal out of the phase-shifted second oscillation, wherein said second signal has the phase of the phase-shifted second oscillation and the predetermined frequency and consists of a sequence of oscillation-periods, each of which at any given time contains two half-waves following on each other with predetermined duration and opposite polarities, wherein said half-waves are able to take on at least two different discrete amplitudes, which set forth a code representing said second information, and wherein all amplitude values are greater than zero, (e) transmitting said second signal over said single transmission path to said first station, and carrying out the following step in said first station: decoding the transmitted second signal in order to retrieve said second information.

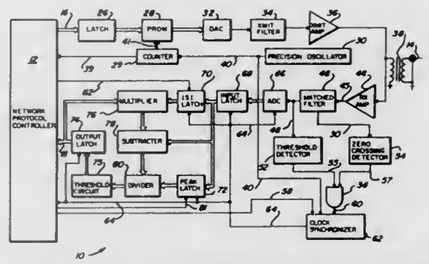
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**5,050,189**

## MULTIBIT AMPLITUDE AND PHASE MODULATION TRANSCEIVER FOR LAN

**William M. Cox; Michael A. Fischer, both of San Antonio; Charles Lawrence, Lytle, all of Tex.; Peter H. Halpern, Longwood, and Larry W. Koos, Winter Park, both of Fla., assignors to Datapoint Corporation, San Antonio, Tex.**

**Filed Nov. 14, 1988, Ser. No. 270,739**
**Int. Cl.[5] H04L** *5/12, 23/02*
**U.S. Cl. 375—39** **56 Claims**




1. A transceiver for communicating multiple bits per signal element between a plurality of nodes interconnected by a communication medium of a LAN, comprising:
transmitter means receptive of a multiple bit digital input value originating at the node, and operative for converting the digital input value into an analog signal having an amplitude and a phase which is defined by a predetermined correlation code to the bit pattern of the digital input value, said transmitter means further transmitting the analog signal over the medium to other nodes of the LAN; and
receiver means responsive to each received analog signal transmitted by another node over the medium, and operative for converting the amplitude and phase of the received analog signal into a multiple bit digital output value which has a bit pattern that corresponds to the bit pattern of the digital input value, said receiver means using the predetermined correlation code to make the conversion, said receiver means further comprising:
means receptive of the received analog signal and operative for supplying a primary signal having an amplitude related in a predetermined manner to the amplitude of the received analog signal;
means responsive to the characteristics of the primary signal for generating a sample clock signal which defines the point at which the amplitude of the primary signal is to be converted to the digital output value; and
means responsive to the sample clock signal for converting the amplitude of the primary signal to the digital output value.

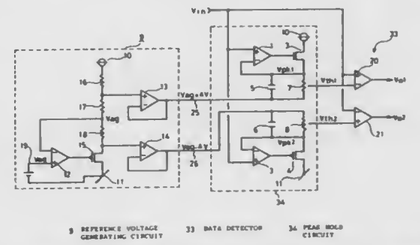
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**5,050,190**

## SIGNAL DETECTION CIRCUIT NOT AFFECTED BY MINUTE VOLTAGE FLUCTUATIONS CONTAINED IN INPUT SIGNAL AND OPERATION METHOD THEREFOR

**Hiromi Shimada, and Harufusa Kondoh, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 1, 1989, Ser. No. 444,213**
**Claims priority, application Japan, Dec. 14, 1988, 63-316909**
**Int. Cl.[5] H04L** *25/06;* **H03K** *5/22*
**U.S. Cl. 375—76** **9 Claims**




1. A signal detection circuit for detecting pulse signals, having a variable magnitude, on an incoming signal line whereon voltage fluctuations, smaller than said pulse signals, tend to occur, said signal detection circuit comprising:
comparator means having first and second input terminals for generating an output signal;
means for applying data signals on said incoming signal line to said first input terminal of said comparator means;
means for generating a first reference voltage having a magnitude proportional to each peak voltage of said incoming pulse signals;
means for generating a second reference voltage having a magnitude slightly greater than the magnitude of said voltage fluctuations;
means, responsive to said second reference voltage, for shifting the magnitude of said first reference voltage and generating a third reference voltage; and
means for applying said third reference voltage to said second input terminal of said comparator means.

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**5,050,191**

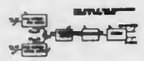
## SYNCHRONIZATION DETECTOR USING PATH METRIC AND BRANCH METRIC VALUES OF A VITERBI DECODER

**Jong-Seon No, Germantown, Md., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Oct. 24, 1989, Ser. No. 427,167**
**Int. Cl.[5] H04L** *27/06*
**U.S. Cl. 375—94** **16 Claims**

1. In a Viterbi decoder, a method of detecting synchronization status using a sequence of differences between minimum path metrics and corresponding minimum branch metrics, said method comprising the steps of:
a) non-linearly mapping each of said differences into either a

first or a second set of mapped values to produce a sequence of mapped values, where a sign of a value in said first set is different from all signs of mapped values in said second set,



b) summing said sequence of mapped values to produce a sequence of sums, and

c) comparing each of said sums to a threshold to determine said synchronization status.

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**5,050,192**

**AUTOMATIC GAIN CONTROL**

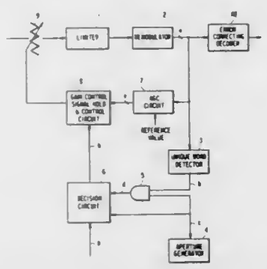
**Hizuru Nawata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Nov. 21, 1990, Ser. No. 616,956**

**Claims priority, application Japan, Nov. 21, 1989, 1-300889**

**Int. Cl.[5] H04L** *27/08*

**U.S. Cl. 375—98** **9 Claims**



1. An automatic gain control (AGC) for a demodulator which receives digitally modulated burst signals time-serially from a plurality of stations, comprising:

demodulating means for demodulating digitally modulated waves from the plurality of stations to produce a demodulated signal;

unique-word detecting means for detecting candidates of unique words out of said demodulated signal to output unique-word candidate detection pulses;

aperture generating means for generating apertures for detecting unique words;

gate means for detecting true unique words on the basis of said unique-word candidates detection pulses and said apertures to produce unique-word detection pulses;

deciding means for determining whether or not the burst signals exist on the basis of said unique-word detection pulses and said apertures to produce a status decision signal;

means for generating a gain control signal from a power value of said demodulated signal and a predetermined reference value;

control means responsive to said status decision signal for outputting said gain control signal as a control signal when the burst signals are absent and for outputting, when any burst signal is present, the gain control signal occurred at the time when a burst signal was absent immediately before said burst signal as the control signal, respectively;

variable attenuating means in response to said control signal for providing an amount of attenuation of input waves and outputting an attenuated signal; and

limiter means for limiting said attenuated signal and for providing a limited signal which is applied as the modulated waves to said demodulating means.

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**5,050,193**

**DEVICE FOR SYNCHRONIZING A CLOCK IN RELATION TO AN INCIDENT DIGITAL SIGNAL, IN PARTICULAR AT HIGH TRANSMISSION RATES**

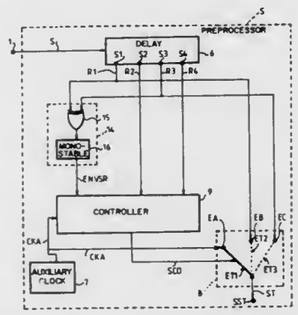
**Benoit Ponsard, Boulogne Billancourt, France, assignor to Electronique Serge Dassault, Saint-Cloud, France**

**Filed Nov. 21, 1988, Ser. No. 274,478**

**Claims priority, application France, Nov. 25, 1987, 8716357**

**Int. Cl.[5] H04L** *02/02*

**U.S. Cl. 375—108** **21 Claims**



1. A device for processing an incident digital signal carrying in a baseband messages coded by a succession of high and/or low states occurring at a transmission clock frequency, comprising:

a) a clock reconstitution stage including a main adjustable clock for providing a main adjustable clock signal having a rated frequency which is K times the frequency of the transmission clock, where K is an integer at least equal to one, and including synchronisation means for synchronisation of the main adjustable clock in response to a synchronization signal;

b) delay means responsive to the incident digital signal for providing first and second replicas of the incident signal whereby the second replica is delayed in time from the first replica by a fraction of one cycle of the main adjustable clock signal rated frequency;

c) an auxiliary clock for providing an auxiliary clock signal operating at a frequency harmonically related to the rated frequency of the main adjustable clock signal;

d) detection means for determining the presence or absence of the incident digital signal; and

e) control means responsive to the detection means and the delay means for:

e1) providing, in the absence of the incident digital signal, the auxiliary clock signal as the synchronization signal to the synchronisation means so that the main adjustable clock signal is synchronized to the auxiliary clock signal; and

e2) providing, in the presence of the incident digital signal, the first replica or the second replica of the incident signal as the synchronization signal to the synchronisation means, depending on the timing relationship between the auxiliary clock signal and the incident digital signal.



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**5,050,194**

**HIGH SPEED ASYNCHRONOUS DATA INTERFACE**

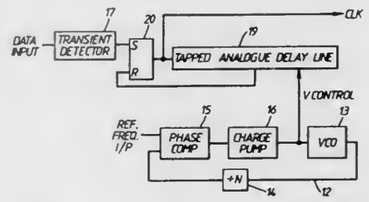
**Andrew J. Pickering, Rugby, and Ian J. Lawrie, Dorset, both of England, assignors to Plessey Overseas Limited, Ilford and GEC Plessey Telecommunications Ltd, Coventry, both of, England**

**Filed Mar. 14, 1990, Ser. No. 493,730**

**Claims priority, application United Kingdom, Mar. 30, 1989, 8907152**

**Int. Cl.[5] H04L** *7/033*

**U.S. Cl. 375—108** **5 Claims**



1. A high speed asynchronous data interface comprising at least one interface transmitter and at least one interface receiver, and a transmission line interconnecting the transmitter and receiver, by way of which data is transmitted from the transmitter to the receiver, wherein each receiver includes a data decoder and data clock extraction circuit which are connected to a data alignment circuit arranged to generate output data, characterized in that the data clock extraction circuit comprises a delay line, a latch and a transient detector, the latch receiving from the transient detector a set pulse at an input for each transient state of the data, and causing an output of the latch to adopt a low logic level, the output of the latch is coupled to the delay line which propagates the low level and generates a reset pulse which resets the latch and restores a high logic level at the output of the latch, wherein, any data dependent transient pulse generated while the latch is reset is overidden at this time and the clock is extracted from the output of the latch.

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**5,050,195**

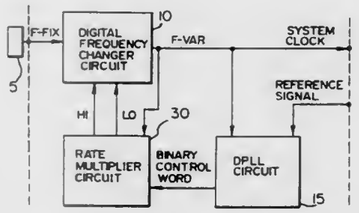
**NARROW RANGE DIGITAL CLOCK CIRCUIT**

**Ernst A. Munter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada**

**Filed Feb. 23, 1989, Ser. No. 314,029**

**Int. Cl.[5] H03D** *3/24*

**U.S. Cl. 375—119** **16 Claims**



1. A digital clock circuit for generating an output clock signal having a frequency varying between predetermined limits, the circuit comprising:

a first input terminal for receiving a fixed frequency signal and an output terminal for providing the output clock signal;

a second input terminal for receiving a reference signal;

a digital frequency changer circuit connected to the first input terminal and responsive to the fixed frequency signal and to control signals for controlling the frequency of the output clock signal;

a measurement circuit responsive to the reference signal and to the output clock signal for generating a signed binary control word representative of a frequency difference therebetween; and

a rate multiplier circuit responsive to the binary control word and the output clock signal for generating the control signals, the latter corresponding to an increase or decrease in the frequency of the output clock signal;

the digital frequency changer circuit including oscillator means for providing a high frequency local clock signal and comprising circuit mans for periodically adjusting the frequency of the output clock signal by one increment that causes it to approach the same frequency as that of the reference signal, each increment corresponding to zero, or plus one, or minus one cycle of thee local clock signal.

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**5,050,196**

**RADIATION GAUGE**

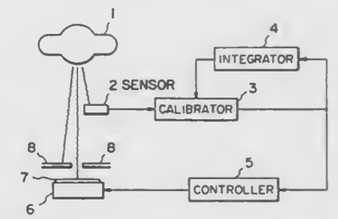
**Tsuneaki Kadosawa, Ninomiyamachi, and Nobushige Korenaga, Atsugi, both of Japan, assignors to Canon Kabusbiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 159,351, Feb. 23, 1988, abandoned. This application Jun. 1, 1990, Ser. No. 532,114**

**Claims priority, application Japan, Feb. 26, 1987, 62-41514**

**Int. Cl.[5] H05G** *1/26*

**U.S. Cl. 378—34** **16 Claims**



1. An exposure apparatus for exposing a substrate to radiation rom a radiation source, said apparatus comprising:

detecting means, sensitive to the radiation from the radiation source, for detecting the radiation to produce a detection output;

correcting means for correcting the detection output to produce a corrected output signal; and

an integrator for integrating the corrected output signal from said correcting means to produce an integration output signal; and

control means for controlling the exposure of the substrate to the radiation in accordance with the corrected output signal from said correcting means;

wherein said correcting means adjusts a degree of correction of the detection output in accordance with the integration output signal from said integrator.

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**5,050,197**

**MAMMOGRAPHIC METHODS AND APPARATUSES**

**Arto Virta; Kari Malmén, both of Helsinki, and Pekka Strömmer, Espoo, all of Finland, assignors to Automed Oy, Finland**

**PCT No. PCT/FI89/00082, § 371 Date Dec. 19, 1989, § 102(e) Date Dec. 19, 1989, PCT Pub. No. WO89/11248, PCT Pub. Date Nov. 30, 1989**

**PCT Filed May 4, 1989, Ser. No. 438,460**

**Int. Cl.[5] A61B** *6/04*

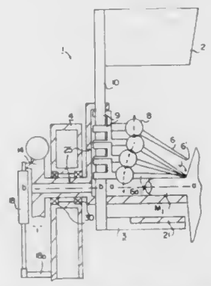
**U.S. Cl. 378—37** **18 Claims**

1. Method in mammographic photography, said method comprising the steps of pressing and spreading a breast (M) to be photographed between a pair of holders (6, 7) attached to a

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photographing apparatus, directing a beam (R) of X-radiation from one side of said holders (6, 7) through the breast (M) placed between the holders to impinge on depicting means (21), placing said depicting means at the opposite side of the holders in relation to a source (2) of X-radiation, placing said depicting means inside a film cassette or equivalent placed in connection with the frame of the apparatus, and further comprising placing the breast M to be photographed on the top face of the lower, of said holders (6, 7), pressing the breast M to be photographed against said lower holder from a root



portion thereof (J) of its upper side by means of an outer tip portion (6') of the upper, of said holders (6, 7), displacing said upper holder by pivoting it around an articulation point (8) thereat such that it becomes substantially parallel to the support plane of the lower holder (7) in a frame part (10) which is stationary relative to the source (2) of radiation and a part (3) for holding the depicting means (21), and further comprising, when the upper and lower holders (6, 7) become substantially parallel to one another, if necessary or desirable, pressing the breast further by displacing the upper holder in linear guides connected thereto so that it retains its orientation.

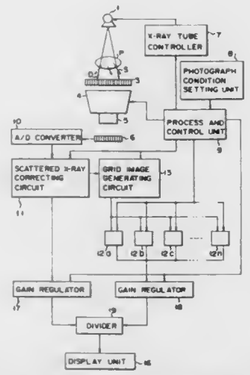
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5,050,198

**METHOD AND SYSTEM FOR PROCESSING X-RAY IMAGE IN X-RAY EQUIPMENT**

**Michitaka Honda, Yaita, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 5, 1990, Ser. No. 487,054**
**Claims priority, application Japan, Mar. 9, 1989, 1-57211**
**Int. Cl.[5] H05G *1/64;* H04N *5/32***
**U.S. Cl. 378—99** **13 Claims**




6. A system for processing X-ray images in X-ray equipment, the system comprising:

grid image acquiring means for acquiring a plurality of grid images in accordance with a plurality of grid image photograph conditions;

storing means for storing the plurality of grid images;

subject image acquiring means for acquiring a subject image in accordance with a subject image photograph condition;

comparing means for comparing the subject image photograph condition with the grid image photograph condition; and

dividing means for dividing the subject image by one of the stored grid images in accordance with the comparison result.

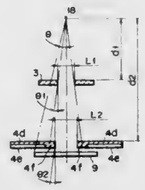
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5,050,199

**RADIOGRAPHIC APPARATUS**

**Naoto Watanabe, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jun. 15, 1990, Ser. No. 538,910**
**Claims priority, application Japan, Jun. 16, 1989, 1-153868**
**Int. Cl.[5] G21K *5/10***
**U.S. Cl. 378—146** **18 Claims**



1. A radiographic apparatus comprising:

X-ray source means, having an X-ray tube focal point, for radiating X-rays from the focal point;

two slit members sequentially arranged to oppose said X-ray source means, a subject being arranged between said slit members, and each of said slit members having at least one linear slit for narrowing the X-rays radiated from said X-ray source means to obtain a slit-like X-ray beam;

driving means for moving said slit members and the object relative to each other in such a manner that the X-ray tube focal point and the slits of said slit members are always aligned with each other; and

recording means for two-dimensionally recording a slit-like X-ray beam obtained by causing the X-rays radiated from the said X-ray source means to pass through the subject and the linear slits of said slit members;

said slit members including a first slit member directly opposing said X-ray source means, and a second slit member, arranged below said first slit member, for narrowing a slit-like X-ray beam which passes through at least one slit of said first slit member and the subject, said second slit member having a first X-ray shielding portion close to the slit and directly receiving the X-rays passing through the slit of said first slit member, and a second X-ray shielding portion which is formed to be thinner than said first X-ray shielding portion.

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5,050,200

**RADIATION CONTROL DEVICE WITH VARIABLE ACTIVE SURFACE**

**Marco Tirelli, Villebon sur Yvette; René Romeas, Palaiseau, and Yves Gregoire, Paris, all of France, assignors to General Electric CGR S.A., Issy les Moulineaux, France**

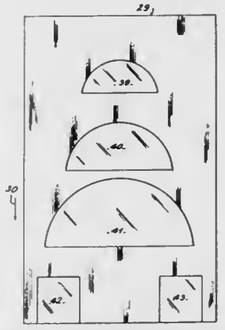
**Filed Apr. 26, 1990, Ser. No. 514,963**
**Claims priority, application France, Apr. 28, 1989, 89 05663**
**Int. Cl.[5] G21K *1/04;* A61B *6/04***
**U.S. Cl. 378—149** **2 Claims**

1. A device for the control of radiation in a radiology system that comprises at least one source of X-radiation and one detector of the X-radiation that has gone through an object to be



observed, of the type having a converter of X-radiation into photon radiation and a photomultiplier tube for the amplification of photons emitted by the converter, said detector giving an electric signal used to control the time of exposure of the object, said device further comprising:

at least one mask supported by a movable belt, which is opaque to light radiation, but transparent to X-radiation, and which is interposed between the radiation converter



and the photomultiplier, said mask having at least one zone transparent to light radiation, the shape and the area of the transparent zone being adapted to the dimensions of the object to be observed or to the type of examination that is performed wherein;

said supporting movable belt has several transparent zones with respect to light transmission and which are arranged in successive position of said belt with each of these zones being different from one zone to the next.

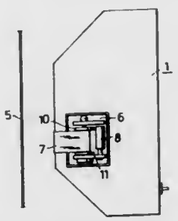
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5,050,201

**APPARATUS INCORPORATING A MEASURING HEAD**

**Johannes Baecklund, and Lars Börjesson, both of Oskarshamn, Sweden, assignors to Refina Instrument AB, Sweden**

**Filed May 16, 1990, Ser. No. 523,874**
**Claims priority, application Sweden, May 17, 1989, 8901764-4**
**Int. Cl.[5] G21K *1/00;* H01J *35/16;* H05G *1/00***
**U.S. Cl. 378—161** **4 Claims**



1. Apparatus including a measuring head and intended for determining with the aid of X-ray fluorescence or X-ray absorption measuring techniques the surface weight of a test subject comprising coatings or surface deposits, or for determining the concentration of basic substances in a test subject in the form of liquids, slurries, powder or solid samples, said apparatus including means for providing relative movement between the measuring head and the test subject so as to enable the measuring head to measure the test sample and between the measuring head and a reference sample so as to enable the measuring head to measure the reference sample the improvement wherein the measuring head includes a measuring aperture covered with a protective film for preventing the ingress of particles from the test subject into said aperture, and wherein said apparatus further comprises a film movement control device, in which said film is arranged, for controlling advancing of said film and means for enabling dirt coatings on the protective film to be checked regularly and for sending to said film movement control an instruction to advance film when the dirt coating is found to be unacceptable.

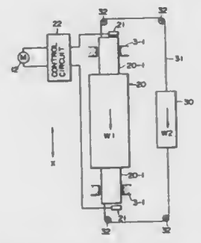
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5,050,202

**X-RAY RADIOGRAPHING APPARATUS**

**Masakatsu Yanome, Nishinasunomachi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jan. 25, 1990, Ser. No. 470,138**
**Claims priority, application Japan, Jan. 27, 1989, 1-18313**
**Int. Cl.[5] H05G *1/02;* G03C *5/16***
**U.S. Cl. 378—167** **13 Claims**



1. An X-ray radiographing apparatus comprising a power assist device for causing driving means to generate force for assisting that force which is added to a handle assembly in a direction, so that a heavy component is moved by the sum of both forces in the direction,

said power assist device comprising:

means for detecting a movement of the handle assembly in the direction, and outputting a detecting signal responsive to the movement of the handle assembly;

control means for receiving the detecting signal, and supplying a driving signal responsive to the detecting signal to the driving means, so that the heavy component is moved in the direction; and

balancing means, including a counter weight, for balancing a component of the weight of the handle assembly with that of the counter weight, whereby the detecting means is prevented from being wrongly operated by the component of the weight of the handle assembly.

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5,050,203

**DEVICE FOR CENTERING X-RAY FILM CASSETTES**

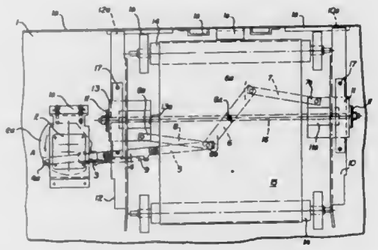
**Bernd Mirlieb, Fellbach, and Heinz Killguss, Kornwestheim, both of Fed. Rep. of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.**

**PCT No. PCT/EP88/00404, § 371 Date Nov. 8, 1989, § 102(e) Date Nov. 8, 1989, PCT Pub. No. WO88/09003, PCT Pub. Date Nov. 17, 1988**
**PCT Filed May 9, 1988, Ser. No. 455,355**
**Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715665**
**Int. Cl.[5] G03B *42/04***
**U.S. Cl. 378—181** **8 Claims**

1. In an X-ray film cassette centering device of the power operated type in which guide members are movable in parallel toward and away from each other to accommodate cassettes of different widths, the improvement comprising:

a lever arrangement operatively connected to said guide members for accomplishing the parallel movement; and

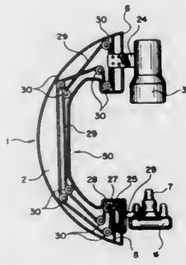
a link movable by a power source and operatively connected to said lever arrangement, said link comprising telescop-



ing portions having force absorbing means operating when said portions are telescoped together.

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**5,050,204**
**C-ARM DIAGNOSTIC EQUIPMENT**
**Bernard W. Siczek, and Aldona A. Siczek, both of 1252 Chinook Way, Boulder, Colo. 80303**
**Filed May 4, 1989, Ser. No. 353,359**
**Int. Cl.[5] H05G** *1/02*
**U.S. Cl. 378—197** **9 Claims**

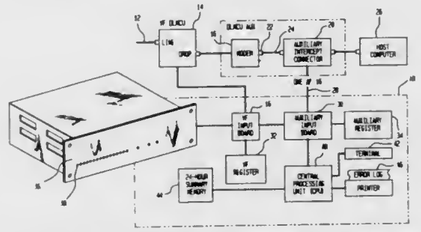


1. A C-arm apparatus being used in diagnostic examinations, said apparatus comprising:
a support means having a C-arm mounted thereon, which C-arm being an arc structure having an X-ray source (with a rack) X-ray receptor moveably mounted on opposite ends thereof and being connected with an actuating means causing displacement of said X-ray source and said X-ray receptor in unison toward and away from one another, said actuating means including: said rack moveably mounted on said arc structure, a pinion engaging said rack and mounted on a shaft, which shaft has also a drum mounted thereon, and a cable affixed to and wound over said drum for the length of said displacement, said cable extended over various pulleys.

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**5,050,205**
**DIAL LINE MONITOR AND CONTROL UNIT**
**Robert J. Kelly, Old Tappan, and Tadhg D. Kelly, Randolph, both of N.J., assignors to Communication Devices, Inc., Clifton, N.J.**
**Filed Oct. 25, 1990, Ser. No. 603,410**
**Int. Cl.[5] H04M** *3/08, 3/24;* **G06F** *11/00*
**U.S. Cl. 379—2** **28 Claims**

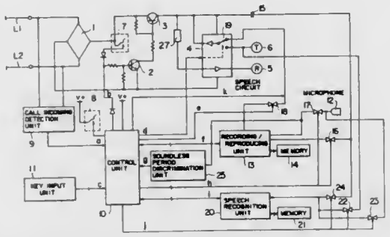
1. A system for analyzing the status of each one of a group of telephone lines and defects of corresponding equipment attached to respective ones thereof, each said telephone line generating line signals for said corresponding equipment, said system comprising;
plurality of voice frequency intercept means, one for each telephone line, each providing at least two condition signals for examination, said condition signals depending, but isolated, from said line signals;
central processing means for processing the condition signals from each said voice frequency intercept means and, in turn, being responsive to said condition signals, and providing responses identifiable with the use of each said telephone line and with the malfunctioning of each said corresponding equipment;
voice frequency register means for storing said responses for each identifiable telephone line and for each said corresponding equipment;



said central processing means further for examining said voice frequency register means upon acquisition of each said response;
use-reporting means for recording on a periodic basis all responses as to telephone line usage received by said voice frequency register means;
defect-reporting means for recording all responses from said voice frequency register means for the malfunctioning of each said corresponding equipment;
whereby telephone line usage and said corresponding equipment defects are apparent upon examination of said use-reporting and said defect-reporting means.

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**5,050,206**
**TELEPHONE SYSTEM RESPONSIVE TO A COMMAND INCOMING DURING MESSAGE REPRODUCTION**
**Masanobu Shimanuki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan**
**Filed Dec. 29, 1989, Ser. No. 459,354**
**Claims priority, application Japan, Jan. 5, 1989, 64-623**
**Int. Cl.[5] H04M** *1/65*
**U.S. Cl. 379—67** **7 Claims**

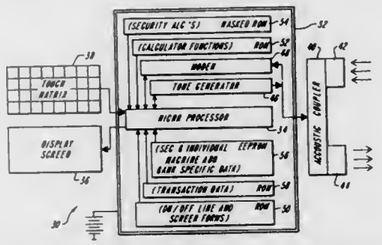


1. A telephone system comprising:
recording/reproducing means for recording an answering message to be transmitted to a calling subscriber and for reproducing the answering message, wherein a predetermined command from the calling subscriber is received through a telephone line during transmittal of the reproduced answering message to said telephone line, and a corresponding predetermined operation is executed in response to the receipt of said predetermined command
control means for controlling the recording/reproducing means so as to prolong a soundless period of the answering message when the answering message is reproduced, and for generating a recognition period indication signal during the prolonged soundless period of the reproduced answering message; and
command reception means for receiving said predetermined command when enabled by said recognition period indication signal during the sending of the reproduced answering message to said telephone line.



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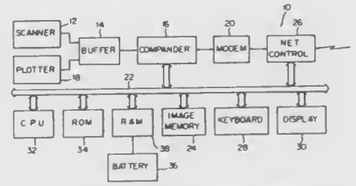
**5,050,207**
**PORTABLE AUTOMATED TELLER MACHINE**
**Roger C. Hitchcock, Southboro, Mass., assignor to National Transaction Network, Inc., Hudson, Mass.**
**Filed Nov. 3, 1989, Ser. No. 431,524**
**Int. Cl.[5] H04M** *11/00;* **G06K** *5/00;* **G06F** *15/00;* **G07G** *1/14*
**U.S. Cl. 379—96** **22 Claims**



16. A machine for transacting business with a remote host computer, said machine being coupled to the remote host computer via a handset of any telephone station and is secured against unauthorized usage, comprising:
a housing;
I/O means mounted to said housing for enabling data and command entry and for displaying data and possible command selections;
memory means mounted to said housing for storing a predetermined personal identification number and a predetermined machine identity number at different memory locations; and
bi-modal means mounted to said housing and cooperative with said I/O means and responsive only to the predetermined personal identification number (PIN) entered via said I/O means for both allowing a block of data representative of a transaction to be transacted with the remote host computer to be set-up in the memory means via the I/O means in an off-line mode and for transmitting that block of data and including the predetermined machine identity number to the remote host computer via the handset of any telephone station in an on-line mode after the block of data has been set-up substantially completely in the off-line mode, and responsive only to the predetermined machine identity number (MIN) having been matched at the remote host computer for receiving data back from the remote host computer representative of the status of the transaction via the handset of any telephone station in the on-line mode and for displaying the data received back from the remote host computer representative of the status of the transaction via the I/O means again in an off-line mode.

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**5,050,208**
**RELAYING DESTINATION AND DESIGNATION SYSTEM**
**Yoshinori Wada, Miura, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**
**Continuation-in-part of Ser. No. 262,136, Oct. 21, 1988, abandoned, which is a continuation of Ser. No. 57,639, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 751,526, Jul. 3, 1985, abandoned. This application Mar. 16, 1990, Ser. No. 494,752**
**Claims priority, application Japan, Jul. 5, 1984, 59-138025**
**Int. Cl.[5] H04M** *11/00*
**U.S. Cl. 379—100** **1 Claim**



1. A system for transmitting fax data comprising:
a plurality of stations each capable of sending and receiving facsimile data; wherein
at least one of said stations may act as a relay station having a store and sequential transmission function and which further comprises:
means for converting a telephone number of a destination station to a telephone number of the relay station as a reference;
and further wherein at least one of said stations operates as a transmitting station wherein said transmitting station comprises:
means to transmit to said station acting as a relay station, relay station conversion instruction data having valid data for validating a conversion function, of the facsimile apparatus, at the station acting as a relay station and conversion invalid data for invalidating said conversion data such that said conversion valid data is provided when the telephone number of a destination station is to be specified, with the transmitting station as a reference or to add said conversion invalid data to the telephone number of a destination station, when the telephone number of the destination is to be specified with the relay station as a reference; and
further wherein said station acting as a relay station comprises:
means to convert the telephone number by said means for converting if said conversion valid data is not added to the telephone number of the destination or not to convert the telephone number if said conversion valid data is added to the telephone number.

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**5,050,209**
**TELEPHONE SET**
**Hidetaka Yoshida, Tokyo, Japan, assignor to NEC Corporation, Japan**
**Filed Aug. 28, 1989, Ser. No. 399,720**
**Claims priority, application Japan, Aug. 31, 1988, 63-113381[U]**
**Int. Cl.[5] H04M** *1/00, 1/04*
**U.S. Cl. 379—388** **7 Claims**

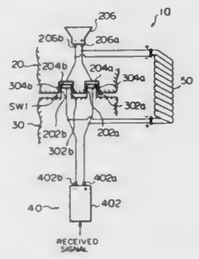
1. A telephone set selectively usable in an on-hook and an off-hook state, said set comprising:
a speaker amplifier;
a speaker;
a handset unit and a cradle having an on-cradle position and an off-cradle position;
a coiled cord including a pair of wires for interconnecting

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said speaker amplifier and said speaker and for feeding a voice signal which is responsive to a received signal from said speaker amplifier to said speaker when said handset unit is in the on-cradle position; and

electrical circuit means coupled to both ends of each of said wires for providing parallel connections to said pair of




wires in order to substantially short-circuit each of said wires when said telephone set is in the on-cradle position; whereby the voice signal of said speaker amplifier is supplied to the speaker with less attentuation when the telephone set if in the on-cradle position than the attenuation that is present when the telephone set is in the off-cradle position.

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**5,050,210**

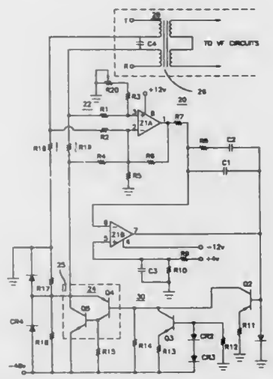
**METALLIC CURRENT LIMITER**

**Philip L. Dillon, Arlington, and Joseph L. Whitehead, Decatur, both of Tex., assignors to Reliance Comm/Tec Corporation, Chicago, Ill.**

**Continuation of Ser. No. 321,874, Mar. 10, 1989, abandoned. This application Apr. 3, 1990, Ser. No. 504,049**

**Int. Cl.[5] H04M** *1/174*

**U.S. Cl. 379—413** **14 Claims**




1. A circuit for limiting the amplitude of metallic current flowing in a pair of telephone line conductors to a predetermined amplitude, said circuit comprising:

a) means for sensing only said flowing metallic current and generating a signal having an amplitude indicative thereof;

b) means responsive to said signal indicative of said flowing metallic current and to a signal having an amplitude representative of said predetermined metallic current limit amplitude for generating a first control signal when said indicative signal exceeds said representative signal, said control signal generating means having input means and output means;

c) frequency compensating means connected between said control signal generating means input means and output means for providing said control signal generating means with stability at high frequencies and a transient response which does not adversely affect transmission and detection of dial pulses and supervisory signaling on said pair of telephone line conductors; and

d) a controlled and variable voltage source connected between said control signal generating means and said telephone line conductors and to a source of constant amplitude voltage, said variable source responsive to said first control signal for providing across said telephone line conductors a voltage whose amplitude differs from the amplitude of said constant voltage by an amount sufficient to maintain said flowing metallic current at said predetermined limit amplitude.

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**5,050,211**

**SAFETY INTERLOCK**

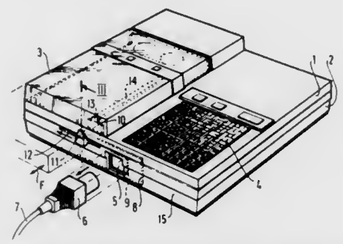
**Giovanni Dortu, Cormeilles en Parisis, and Francois Buhagiar, Drancy, both of France, assignors to Telic Alcatel, Paris, France**

**Filed Oct. 13, 1989, Ser. No. 421,433**

**Claims priority, application France, Oct. 13, 1988, 88 13478**

**Int. Cl.[5] H04M** *1/00*

**U.S. Cl. 379—438** **5 Claims**




1. A safety interlock for a cover (3) of a housing in a telephone apparatus case (1, 2), the telephone apparatus being connected to a telephone line via a connector having two pluggable portions constituted by a receptacle fixed to the case and a plug (6) fixed to the end of a connection cord (7), the interlock being characterized in that it comprises access controlling means for preventing the plug (6) gaining access to the receptacle when the cover is open, for requiring the connection cord (7) to be disconnected prior to opening the cover (3), and for allowing the plug (3) to gain access to the receptacle in order to be plugged thereto for providing connection to the cord (7) when the cover (3) is closed.

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**5,050,212**

**METHOD AND APPARATUS FOR VERIFYING THE INTEGRITY OF A FILE STORED SEPARATELY FROM A COMPUTER**

**Patrick Dyson, Mountain View, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.**

**Filed Jun. 20, 1990, Ser. No. 540,960**

**Int. Cl.[5] G06F** *7/02;* **H04L** *9/32*

**U.S. Cl. 380—25** **6 Claims**

1. A method for verifying the integrity of a file stored separately from a computer, comprising:

preparing a first file for said computer, said file including a header and a body, said header including a selected number portion;

following a defined mathematical procedure to generate a unique first identifier based on the contents of said first file;



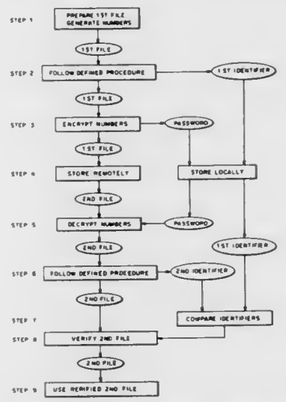
storing said first identifier on said computer;

encrypting said selected number portion of said header of said first file with a password stored on said computer;

storing said first file at a storage location separate from said computer;

at a later time, retrieving from said storage location an unverified second file;

decrypting said selected number portion of said header of




said unverified second file with said password stored on said computer;

following said defined mathematical procedure, generating a unique second identifier based on the contents of said unverified second file;

comparing said first and said second identifiers to identify a possible match which would verify the integrity of said second file; and

using the verified said second file on said computer.

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**5,050,213**

**DATABASE USAGE METERING AND PROTECTION SYSTEM AND METHOD**

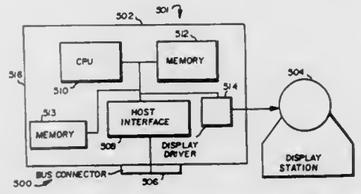
**Victor H. Shear, Bethesda, Md., assignor to Electronic Publishing Resources, Inc., Bethesda, Md.**

**Continuation of Ser. No. 310,938, Feb. 16, 1989, Pat. No. 4,977,594, which is a division of Ser. No. 918,109, Oct. 14, 1986, Pat. No. 4,827,508. This application Aug. 6, 1990, Ser. No. 562,996**

**The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.**

**Int. Cl.[5] H04L** *9/32;* **G06F** *13/14*

**U.S. Cl. 380—25** **25 Claims**




1. A secure database access system for use by at least one user, said system comprising:

an optical storage arrangement located at said user site, said storage arrangement storing at least one encrypted database component of at least one database, said database being adapted for being searched and retrieved in response to search criteria;

input means for providing database search criteria in response, at least in part, to user input;

searching means, operatively connected to said storage arrangement and to said input means, for searching and identifying a portion of said at least one database that corresponds to said search criteria;

reading means operatively connected to said searching means for reading an identified database portion so as to provide digital signals;

decrypting means, operatively connected to receive said provided digital signals, for decrypting an encrypted database portion; and

control means, operatively connected to at least one of (a) said storage arrangement, (b) said searching means, (c) said reading means, and (d) said decrypting means, for metering at least one of (a) processing, and (b) usage, of at least one part of said at least one database, and for facilitating communicating of information indicative of at least part of said metered at least one of (a) processing, and (b) usage, to at least one location distant from said user.

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**5,050,214**

**REMOTE CONTROL CIRCUIT**

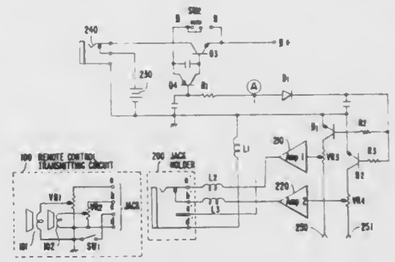
**Kyu-An Lee, Suwon-city, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Division of Ser. No. 395,506, Aug. 18, 1989, Pat. No. 5,001,774. This application Nov. 23, 1990, Ser. No. 608,359**

**Claims priority, application Rep. of Korea, Aug. 23, 1988, 10715/1988**

**Int. Cl.[5] H04R** *5/02*

**U.S. Cl. 381—25** **21 Claims**




1. A remote control circuit of a stereo-headphone, comprising:

a headphone switch for, during a first mode remotely controlling from said stereo-headphone, power of a main set, and for shifting control to the headphone of volume of stereophonic audio signals amplified by the main set;

a first plurality of variable resistors for separately controlling volume of different ones of said stereophonic audio signals in said stereo-headphone during said first mode;

a four terminal headphone coupler associated with a common terminal of said headphone switch and other connection terminals for said first plurality of variable resistors;

a second coupler configured to engage and provide electrical connection with headphone coupler;

switching means for controlling flow of the power to the main set during said first mode in dependence upon operation of said headphone switch;

volume impedance control means for switching control of the volume of the stereophonic audio signals transmitted by a main amplifier, between said first plurality of variable resistors of the headphone and a second plurality of variable resistors coupled in the main set for separately controlling volume of said different ones of said audio signals, in dependence upon said headphone switch; and

a second switch coupled to said switching means for switching the main set between said first mode and a second mode.

VOL 1130 ISS 3 SE 17 1991 UMI

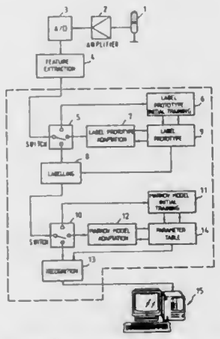


5,050,215

## SPEECH RECOGNITION METHOD

Masafumi Nishimura, Kanagawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 256,886, Oct. 12, 1988, abandoned.
This application May 10, 1990, Ser. No. 524,689
Claims priority, application Japan, Oct. 12, 1987, 62-254821
Int. Cl.[5] G10L 5/00, 5/04, 5/06
U.S. Cl. 381—41 11 Claims



1. In a speech recognition method wherein Markov models trained by an initial training label set and initial training speech are adapted using adaptation speech, an improvement comprising:

interpreting said adaptation speech into adaptation label strings using an adaptation label set different from said initial training label set;

connecting each label in each of said adaptation label strings with each state or each state transition of a Markov model which corresponds to the adaptation label strings concerned;

determining a confusion probability of each label in said initial training label set and each label in said adaptation label set being confused with each other, based on connection between each label in said adaptation label set and each of said states or state transitions, and parameter values of the Markov model concerned in respect of said initial training set; and

determining parameter values of each of said Markov models in respect of said adaptation label set, based on said confusion probabilities and said parameter values of the Markov model concerned in respect of said initial label set.

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5,050,216

## EFFECTOR FOR ELECTRONIC MUSICAL INSTRUMENT

Kohtaro Hanzawa; Shigenori Morikawa, and Kazuhisa Nakamura, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 295,917, Jan. 11, 1989, abandoned, which is a continuation of Ser. No. 902,513, Sep. 2, 1986, abandoned. This application Dec. 26, 1990, Ser. No. 634,926
Claims priority, application Japan, Sep. 13, 1985, 60-202698; Sep. 18, 1985, 60-205516; Sep. 19, 1985, 60-207147; Sep. 19, 1985, 60-207150
The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.
Int. Cl.[5] H03G 3/00
U.S. Cl. 381—62 16 Claims

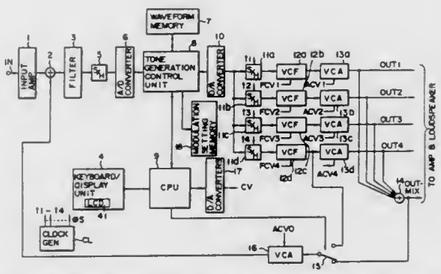
1. An effector, comprising:

analog-to-digital conversion means for converting an input analog waveform signal into a digital signal;

waveform memory means for storing the digital signal provided from said analog-to-digital conversion means, and for providing a predetermined effect on an acoustic signal produced on the basis of the digital signal when rad out from said waveform memory means;

control means having a plurality of waveform read/write channels for effecting a selected one of the reading and writing operations of said digital signal with respect to said waveform memory means and said plurality of waveform read/write channels are operative independently and time divisionally;

read/write control means for causing said digital signal from said analog-to-digital conversion means to be written in said waveform memory means through a selected one of said waveform read/write channels of said control means by providing a writing address signal changing with a



constant rate, and for causing said written digital signal to be read out in a real time basis from said waveform memory means through at least two other said waveform read/write channels of said control means by providing different reading address signals, at least one of phase, rate and depth of modulation for the reading address signals being set differently with one another; and

sounding means for converting said digital signals read through at least two said waveform read/writ channels into analog signals to be sounded;

said read/write control means further including delay time setting means for setting respective delay times when said digital signal is read out from said waveform memory means through at least two said waveform read/write channels.

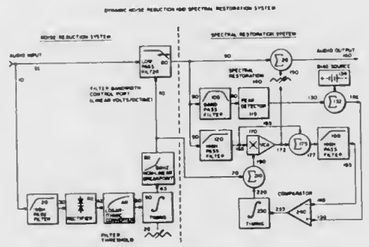
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5,050,217

## DYNAMIC NOISE REDUCTION AND SPECTRAL RESTORATION SYSTEM

Robert A. Orban, Belmont, Calif., assignor to AKG Acoustics, Inc., Stamford, Conn.

Filed Feb. 16, 1990, Ser. No. 482,063
Int. Cl.[5] H04B 15/00
U.S. Cl. 381—94 11 Claims



1. A dynamic audio noise reduction and spectral restoration system comprising:



a noise reduction circuit which is coupled to receive an input audio signal;

a spectral restoration circuit coupled to receive the output of said noise reduction circuit and which provides an output audio signal for said system;

said noise reduction circuit including a lowpass filter, the bandwidth of which is controlled by a control signal developed in a sidechain, said sidechain receiving said input audio signal as an input and including a breakpoint circuit for providing a breakpoint in said control signal such that said bandwidth of said lowpass filter increases much more rapidly above a breakpoint frequency when compared to increases in said bandwidth below said breakpoint frequency.

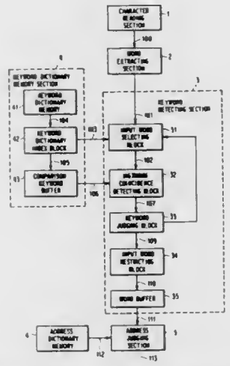
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5,050,218

## APPARATUS FOR RECOGNIZING ADDRESS APPEARING ON MAIL ARTICLE

Osamu Ikeda, and Kazunari Egami, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 89,458, Aug. 26, 1987, abandoned. This application Feb. 19, 1991, Ser. No. 657,612
Claims priority, application Japan, Aug. 26, 1986, 61-201015; Aug. 26, 1986, 61-201016
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 12 Claims



1. An apparatus for recognizing an address appearing on an article, comprising:

character reading means for reading an address description appearing on an article to produce character data;

word extracting means responsive to said character data for extracting words from said character data, to produce a string of words;

keyword detecting means for detecting a keyword contained in said string of words by comparing each word of said string of words outputted from said word extracting means with a plurality of predetermined keyword dictionaries, to produce keyword information, when said string of words contains at least one keyword;

word combining means, responsive to said keyword information, for combining remaining non-keyword words contained in said string to produce a plurality of word combinations which are to be subjected to address recognition;

an address dictionary memory for storing a plurality of address dictionaries; and

address comparing means for comparing selected ones of said address dictionaries stored in said address dictionary memory with each word combination of said plurality of word combinations produced by said word combining means.

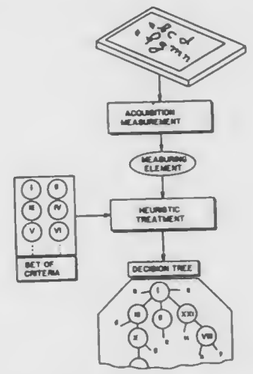
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5,050,219

## METHOD OF HANDWRITING RECOGNITION

Xavier Maury, Paris, France, assignor to Anatex, France

Continuation of Ser. No. 93,825, Sep. 8, 1987, abandoned. This application Nov. 14, 1989, Ser. No. 436,457
Claims priority, application France, Sep. 11, 1986, 86 12692; European Pat. Off., Apr. 17, 1987, 87400911.1
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—3 8 Claims



1. Method for the recognition of handwritings comprising writing elements to be recognized, such as letters and numerals, which comprises the steps of:

causing each person the handwriting of which is to be recognized to write a known text comprising the writing elements to be recognized;

analyzing the known handwritten text of each such person by applying thereto a multitude of analyzing criteria each having a predetermined number of values for the purpose of establishing for each writing element the value among said predetermined number of values which can be associated to each said writing element;

establishing for each writing element of said known handwritten text among all analyzing criteria the criterion which has the greatest power to discriminate the writing elements from one another, called the most discriminating one, to form a first series of sets each including only writing elements having the same first most discriminating criterion value;

applying to each set of said first series all criteria except for said first most discriminating one for forming a series of first subsets each containing writing elements having the same value of the applied criterion:

determining among the applied criterion the most discriminating one called second most discriminating criterion;

associating to each of said first series sets the first subsets resulting from the application of said second most discriminating criterion;

applying to each of said first subsets all criteria except the already applied first and second most discriminating ones for forming a series of second subsets for each criterion and determining the third most discriminating criterion;

continuing the steps recited hereinabove in order to establish sequences of subsets resulting from successively applying only the most discriminating criteria until obtaining subsets referring to only one writing element;

establishing from said sequences of sets and subsets a decision tree for each said known handwritten text; and

recognizing an unknown handwritten text comprising writing element tracings of a person for the handwriting of which a decision tree has been previously established by applying to the tracings to be recognized the first most discriminating criterion indicated in the decision tree

previously established for this person to obtain a criterion value,

selecting in the decision tree the set including writing elements having this value

applying to this selected set the second most discriminating criterion indicated in the decision tree and determining the second most discriminating criterion value for the writing element to be recognized,

selecting in the decision tree among the first subsets associated to said selected set the subset which includes writing elements having the determined value,

applying to this subset the third most discriminating criterion which is indicated in the decision tree as being associated to this subset, and

continuing the steps recited hereinabove in accordance with the decision tree until reaching a subset referring to one writing element only, the analyzed tracing being considered to correspond to only said one writing element.

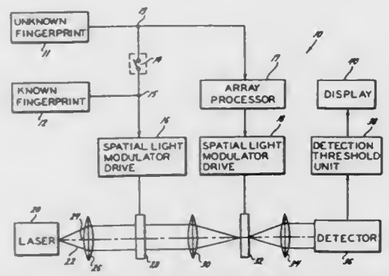
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**5,050,220**

## OPTICAL FINGERPRINT CORRELATOR

**Ronald A. Marsh, Ridgecrest, Calif., and George S. Petty, Jamestown, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 24, 1990, Ser. No. 556,224**
**Int. Cl.[5] G06K 9/74**
**U.S. Cl. 382—4** **16 Claims**




1. An apparatus for correlating fingerprints and producing correlation indicia, said apparatus comprising:

a means for introducing a known fingerprint image to said apparatus;

a means for introducing an unknown fingerprint image to said apparatus;

a switching means for connecting the outputs of said means for introducing a known fingerprint and said means for introducing an unknown fingerprint, said switching means having a first side connected to said means for introducing an unknown fingerprint and a second side connected to said means for introducing a known fingerprint;

a first means for producing spatial light modulation;

a second means for producing spatial light modulation disposed coaxially in optical alignment with said first means for producing spatial modulation;

a first spatial light modulator drive connected between the second side of said switching means and said first means for producing spatial light modulation;

a means for producing a matched filter from said unknown fingerprint image, said means for producing a matching filter having an input and an output, said input being connected to the first side of said switching means;

a second spatial light modulator drive connected between the output of said means for producing a matched filter and said second means for producing spatial light modulation;

a first Fourier transform lens coaxially disposed in optical alignment with and between said first and second means for producing spatial light modulation;

a second Fourier transform lens coaxially disposed in optical alignment with and on the side of said second means for producing spatial light modulation opposite the side facing first Fourier transform lens;

a means for detecting correlation indicia, said means for detecting correlation indicia being disposed coaxially in optical alignment with said second Fourier transfer lens and on the opposite side of said lens from said second means for producing spatial light modulation;

a means for displaying said indicia of correlation, said means for displaying said indicia connected to said means for detecting correlation indicia; and

a means for providing collimated coherent light to and disposed coaxially in optical alignment with said first means for producing spatial modulation.

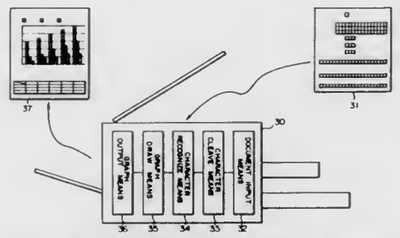
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**5,050,221**

## IMAGE GENERATING APPARATUS

**Junichi Ohta, and Yoshiyuki Namizuka, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan**

**Filed Feb. 12, 1990, Ser. No. 479,617**
**Claims priority, application Japan, Feb. 13, 1989, 1-31201; May 19, 1989, 1-124427; May 31, 1989, 1-135965; Sep. 5, 1989, 1-228257; Dec. 15, 1989, 1-323955**
**Int. Cl.[5] G06K 9/34**
**U.S. Cl. 382—9** **9 Claims**




1. An image generating apparatus comprising:

image inputting means for producing binary image data by optically reading a document in which numerical values for graphing, characters representative of a title and so forth are handwritten;

character image cleaving means for cleaving images representative of the characters and numerals located at predetermined positions out of the binary image data;

character recognizing means for outputting character codes and numeral codes by recognizing the cleaved images;

graph formating means for producing a graph image on the basis of character and numeral data recognized by said character recognizing means; and

mode selecting means for selecting either one of an ordinary copy mode and a graph mode.

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**5,050,222**

## POLYGON-BASED TECHNIQUE FOR THE AUTOMATIC CLASSIFICATION OF TEXT AND GRAPHICS COMPONENTS FROM DIGITIZED PAPER-BASED FORMS

**Yongchun Lee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed May 21, 1990, Ser. No. 526,928**
**Int. Cl.[5] G06K 9/48**
**U.S. Cl. 382—21** **3 Claims**

1. A method of classifying components of an image into text or graphics comprising the steps of:

a) digitizing the image to form a bit map representation of the image;



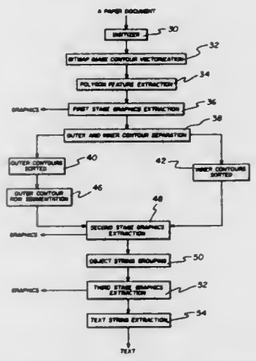
b) extracting a set of contour vectors from the bit map image; and

c) extracting from the set of contour vectors a set of polygon features;

d) employing the set of polygon features to classify a first set of graphics components;

e) separating the image contour vectors into inner and outer contours;

f) sorting all of the inner and outer contours according to horizontal location in their respective group;




g) employing the inner and outer contours and the row segregation to classify a second set of graphic components;

h) employing the polygon features and row segmentation to detect space between polygons in a horizontal projection between two consecutive polygons to identify a group of object strings;

i) extracting from the group of textual strings a third set of graphic components in the form of single like text strings.

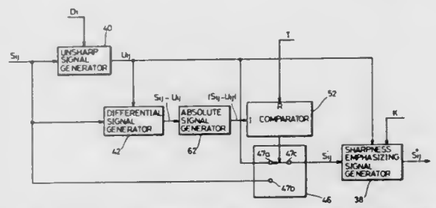
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**5,050,223**

## METHOD OF AND APPARATUS FOR PROCESSING IMAGE SIGNAL

**Katsuto Sumi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Oct. 18, 1989, Ser. No. 423,477**
**Claims priority, application Japan, Oct. 20, 1988, 63-265601**
**Int. Cl.[5] G06K 9/00**
**U.S. Cl. 382—54** **12 Claims**




1. A method of processing an image signal in an image scanning apparatus by generating a new image signal ($S'_{ij}$) from an image signal ($S_{ij}$), comprising the steps of:

generating an unsharp signal ($U_{ij}$) based on the image signal (Sij),

determining whether the configuration of the distributrion of the image signal ($S_{ij}$) at a point of interest (i,j) is upwardly convex, or downwardly convex, or otherwise based on the image signal ($S_{ij}$) and the unsharp signal ($U_{ij}$);

employing, as the new image ($S'_{ij}$), the original image signal ($S_{ij}$) at the point of interest (i,j) if the configuration is upwardly convex or downwardly convex; and

employing, as the new image signal ($S'_{ij}$), the unsharp signal ($U_{ij}$) if the configuration is otherwise.

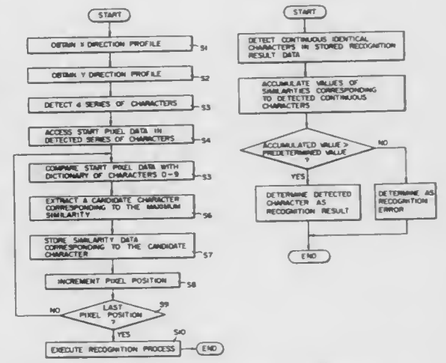
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**5,050,224**

## CHARACTER RECOGNITION APPARATUS

**Kazuhiro Mori, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 15, 1990, Ser. No. 523,375**
**Claims priority, application Japan, May 20, 1989, 1-127519**
**Int. Cl.[5] G06K 9/68, 9/34**
**U.S. Cl. 382—34** **11 Claims**




1. A character recognition apparatus comprising:

character string detecting means for detecting an image pattern of a character string including a series of characters;

means for comparing the image pattern with a dictionary pattern while relative positions of the image and dictionary patterns are sifted by a predetermined distance;

means for obtaining results of recognition and corresponding similarity values at each of the relative positions of the image and dictionary patterns in response to a comparison result in said comparing means;

means for detecting an area in which each of the results of recognition are the same at adjacent relative positions;

means for obtaining a sum of similarity values corresponding to the relative positions in the area detected by said detecting means; and

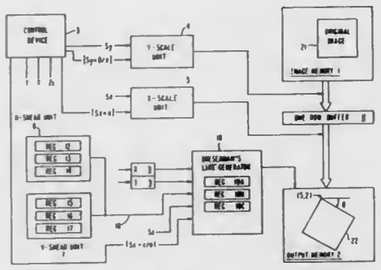
means for outputting the results of recognition detected in said area when the sum of the similarity values exceeds a predetermined value.

5,050,225

## IMAGE PROCESSING APPARATUS AND METHOD

Masaharu Itoh, Yamato, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1990, Ser. No. 515,372
Claims priority, application Japan, Apr. 28, 1989, 1-07295
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—46 12 Claims



1. An image processing apparatus for rotating an original image composed of picture elements arranged in rows and columns through a selected rotation angle and generating a rotated version of said image in an output image memory, comprising:

scaling means, responsive to scaling values determined by said selected rotation angle, for generating each row of a scaled version of said original image;

shearing means, responsive to values of horizontal and vertical shears determined by said selected rotation angle, for performing horizontal shear and vertical shear operations on the first picture elements of each row of said scaled version and generating respective addresses in said output image memory into which the first picture elements after shearing are to be stored;

line generator means, responsive to said respective addresses of said first picture elements and said value of vertical shear, for generating addresses in said output image memory into which all the remaining picture elements of said rows of said scaled version are to be stored; and

control means for controlling said scaling means, shearing means, and line generator means and storing all of the first picture elements and all the remaining picture elements of said rows in said generated addresses of said output image memory to produce a rotated version of said original image.

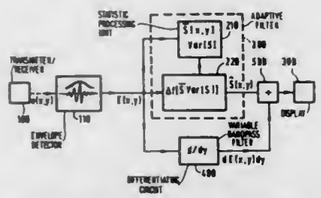
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5,050,226

## ULTRASONIC ECHOGRAPHIC IMAGING DEVICE UTILIZING AN IMPROVED ADAPTIVE FILTER

Antoine Collet-Billon, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1990, Ser. No. 496,478
Claims priority, application France, Mar. 24, 1989, 89 03931
Int. Cl.[5] G06K 9/00; G01V 1/00
U.S. Cl. 382—54 2 Claims



1. An ultrasonic echographic imaging device for two dimensions (x,y), comprising an adaptive filter for reducing the interference noise in the images obtained in a signal E (x, y) derived from a scanning beam produced by an echographic imaging system, a circuit for differentiating the signal (E(x, y)) applied to said adaptive filter and a circuit for forming the weighted sum of a signal (S(x, y)) generated by the adaptive filter in response to said applied E(x, y) signal and a signal (dE(x, y)/dy) output by said differentiating circuit, the signal E(x, y) applied to the adaptive filter being the envelope of the echographic signal (e(x, y)) received, the output signal of said adaptive filter being given by:

$$\hat{S}(x,y) = \bar{S}(x,y) + \frac{Var[S(x,y)]}{2Var[S(x,y)] + S(x,y)} [E^2(x,y) - \bar{S}(x,y)]$$

where Var[S(x,y)] and $\bar{S}(x,y)$ are the variance and the mean value, respectively, of a signal S(x, y) which represents the intensity of a signal s(x, y) derived from the envelope E(x,y) by statistical deconvolution of the interference noise.

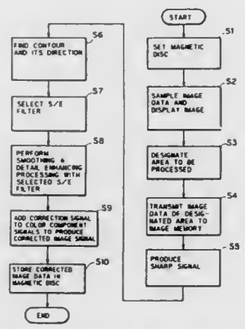
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5,050,227

## METHOD OF AND APPARATUS FOR IMAGE SMOOTHING ALONG A TANGENTIAL DIRECTION OF A CONTOUR

Katsuhiko Furusawa; Makoto Hirosawa, and Takashi Sakamoto, all of Tenjinkitamachi, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 6, 1989, Ser. No. 446,888
Claims priority, application Japan, Dec. 15, 1988, 63-317337
Int. Cl.[5] G06K 9/40, 9/48
U.S. Cl. 382—54 16 Claims



1. A method of retouching an image through correcting image data, comprising the steps of:

(a) preparing image data representing an image with respect to each pixel;

(b) designating retouching area in said image to be retouched;

(c) detecting a tangential direction of a contour included in said retouching area; and

(d) computing a weighted mean value of said image data with respect to each pixel and a prescribed area around each pixel in said retouching area while using weighting factors distributed in said tangential direction, said weighting factors smoothing said image data in said tangential direction, thereby producing corrected image data representing a retouched image on the basis of said weighted mean value, wherein

said weighting factors are further distributed in a normal direction perpendicular to said tangential direction, and said weighting factors enhance detail of said image in said normal direction,



said weighting factors are arranged in a pixel matrix of a prescribed size,

a first group of said weighting factors assigned to first pixels, which form a line of a prescribed width drawn through a central pixel of said pixel matrix in said tangential direction, has a first sign, and a second group of said weighting factors assigned to second pixels other than said first pixels in said pixel matrix has a second sign opposite to said first sign.

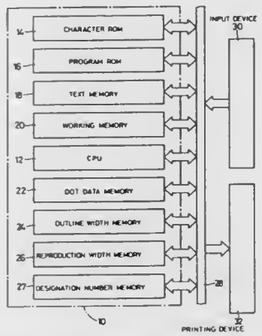
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5,050,228

## APPARATUS FOR CONVERTING IMAGE OUTLINE DATA INTO DOT DATA REPRESENTATIVE OF IMAGE DOTS

Hitoshi Yoshida, Kohnan; Takahiro Kanegae, Nagoya, and Naoyuki Kawamoto, Toki, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 28, 1990, Ser. No. 486,225
Claims priority, application Japan, Mar. 4, 1989, 1-52524; Mar. 7, 1989, 1-54577
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—55 14 Claims



1. A data converting apparatus for converting a batch of outline data representative of only an outline of a character having at least one stroke, into a batch of dot data which includes dot-forming bits each indicative of the presence of an image dot to be formed at a position of a corresponding dot-forming picture element which lies within the outline of each of said at least one stroke so as to satisfy a predetermined requirement, when said outline of said character is superimposed on a coordinated pixel screen wherein picture elements are defined by a plurality of parallel x-axis pixel lines and a plurality of parallel y-axis pixel lines perpendicular to said x-axis pixel lines, wherein the improvement comprises:

determining means for determining whether or not a difference between an outline width of said each stroke of the character as defined by said outline data and a reproduction width of said each stoke as reproduced according to said dot data as normally prepared based on said outline data exceeds a predetermined reference value; and

data changing means for changing the normally prepared dot data so as to reduce said difference between said outline and reproduction widths, if said determining means determines that said difference exceeds said reference value,

and wherein said determining means includes (a) first calculating means for calculating as said outline width a distance between coordinates of a pair of intersections between two segments of said outline of said each stroke and each of at least one of said plurality of parallel x-axis pixel lines and said plurality of parallel y-axis pixel lines of said coordinated pixel screen, based on the outline data representative of said two segments as superimposed on said coordinated pixel screen, and (b) second calculating means for calculating as said reproduction width the number of said dot-forming bits which correspond to the successive dot-forming picture elements which lie within said distance between said two segments so as to satisfy said predetermined requirement, said second calculating means calculating said number based on said coordinates of said pair of intersections on said coordinated pixel screen which are calculated by said first calculating means.

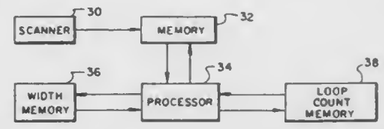
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5,050,229

## METHOD AND APPARATUS FOR THINNING ALPHANUMERIC CHARACTERS FOR OPTICAL CHARACTER RECOGNITION

Lori L. Barski, Pittsford, and Hin-Leong Tan, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1990, Ser. No. 533,309
Int. Cl.[5] G06K 9/44
U.S. Cl. 382—55 19 Claims



1. In an optical character recognition system, a character thinning pre-processor comprising:

means for determining a certain character stroke width from a character image;

thinning means for removing successive layers of boundary pixels including boundary pixels which are also end point pixels from said character image; and

control means for preventing said means for removing from removing boundary pixels which are also end point pixels of said character image whenever the number of layers removed is at least equal to a predetermined fraction of said certain stroke width.

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5,050,230

## HYBRID RESIDUAL-BASED HIERARCHICAL STORAGE AND DISPLAY METHOD FOR HIGH RESOLUTION DIGITAL IMAGES IN A MULTIUSE ENVIRONMENT

Paul W. Jones, Churchville, and Paul W. Melnychuck, West Henrietta, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 442,872, Nov. 29, 1989. This application Sep. 27, 1990, Ser. No. 576,029
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—56 27 Claims

1. A hierarchical storage method for color images comprising the steps of:

(a) forming a digital representation of the image wherein each pixel in said representation is associated with three color values;

(b) combining the three color values for each pixel using a color matrixing procedure to form a luminance image and two chrominance images;

(c) decomposing said luminance image according to the following steps:

1. lowpass filtering and subsampling said luminance image to form a lower .esolution luminance image;

2. interpolating said lower resolution luminance image to the dimensions of the higher resolution luminance image to form a prediction image;

3. subtracting said prediction image from the higher resolution luminance image to form a luminance residual image;

4. encoding and storing said luminance residual image;

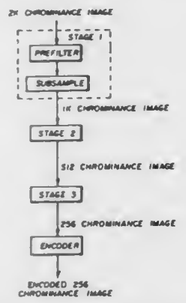
5. creating a plurality of encoded and stored luminance residual images of different resolutions by iterating steps 1, 2, 3, and 4 where the input to the lowpass filtering and subsampling operation at each iteration is the lower resolution luminance image formed in the previous iteration; and
6. further decomposing the lowest resolution luminance image formed in step 5 into a plurality of lower resolution images according to the following steps:

subsampling the even-numbered pixels on the even-numbered lines to create a first partitioned image;

subsampling the odd-numbered pixels on the even-numbered lines to create a second partitioned image;

subsampling the even-numbered pixels on the odd-numbered lines to create a third partitioned image; and

subsampling the odd-numbered pixels on the odd-numbered lines to create a fourth partitioned image;




(d) encoding and storing said partitioned images;

(e) decomposing a first of said chrominance images according to the following steps:

1. lowpass filtering and subsampling said chrominance image to form a lower resolution chrominance image; and
2. iterating step 1 under the dimensions of said lower resolution chrominance image are equal to the dimensions of said partitioned images where the input to the lowpass filtering and subsampling operation at each iteration is the lower resolution chrominance image formed in the previous iteration;

(f) encoding and storing the lowest resolution chrominance image formed in (e); and

(g) repeating (e) and (f) for said second chrominance image to create, encode, and store a second lowest resolution chrominance image.

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**5,050,231**

**RELIEF IMAGE SCANNER**

**Naohiro Watanabe; Takehito Sekiguchi; Tohru Kitagawa, and Shunji Sakai, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Filed Apr. 11, 1990, Ser. No. 507,468**

**Claims priority, application Japan, Apr. 12, 1989, 1-92373; Jul. 13, 1989, 1-181910**

**Int. Cl.[5] G06K** *7/00, 9/48, 7/04*

**U.S. Cl. 382—58** **8 Claims**

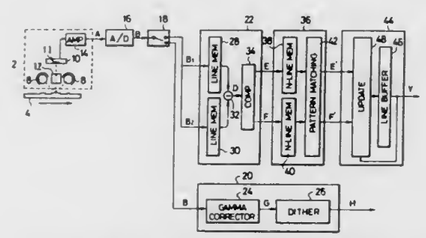
1. An image scanner for capturing a relief image from a surface of an information-carrying medium, comprising:

optical scanning means for illuminating each of a succession of linear areas on said surface from a first direction and from a second direction, and converting light reflected from said linear areas to an analog electrical signal;

an A/D converter, electrically coupled to said optical scanning means, for converting said analog electrical signal to first gray-level data during illumination from said first direction and to second gray-level data during illumination from said second direction;

ternarizing means, electrically coupled to said A/D converter, for comparing said first gray-level data with said second gray-level data, producing a first edge signal if said first gray-level data exceeds said second gray-level data by a certain threshold, and producing a second edge signal if said second gray-level data exceeds said first gray-level data by said threshold;

skeletonizing means, electrically coupled to said ternarizing




means, for selecting one of a series of consecutive first edge signals and one of a series of consecutive second edge signals and producing a selected first edge signal and a selected second edge signal; and

connecting means, electrically coupled to said skeletonizing means, for setting binary output data to a first state when said selected first edge signal is produced and to a second state when said selected second edge signal is produced, said binary output data not being changed when neither said selected first edge signal nor said selected second edge signal is produced.

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**5,050,232**

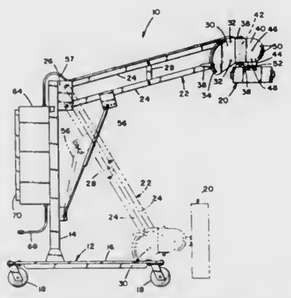
**MOVABLE HEAT TREATING APPARATUS UTILIZING PROPORTIONALLY CONTROLLED INFRARED LAMPS**

**Charles H. Bergman, Ham Lake; David E. Bannick, Roseville; Richard A. Stein, Rush City, and Donald H. Wattenhofer, Fridley, all of Minn., assignors to BGK Finishing Systems, Inc., Blaine, Minn.**

**Filed Mar. 28, 1990, Ser. No. 501,090**

**Int. Cl.[5] F26B** *9/00*

**U.S. Cl. 392—412** **7 Claims**



1. An apparatus for heat treating a surface of a body, said apparatus comprising:

at least one infrared lamp;

a stand for mounting said lamp in any one of a plurality of positions opposing a surface to be heat treated;

power connect means for connecting said lamp to a source of electrical power;

heat detection means for detecting a temperature of said surface;



circuit means for controlling the energization of said lamp, said circuit means including parameter input means for permitting an operator to input at least one operating parameter, said circuit means further including proportional control means responsive to said heat detection means and responsive to said parameter input means to control said lamp;

said circuit means including input means for inputting a desired temperature of said surface, said circuit means further including means for comparing said desired temperature to a temperture detected by said heat detection means, said proportional control means including said tolerance including means for defining a proportional band surrounding said desired temperature with said circuit means proportionately controlling said intensity when said detected temperature is within said band.

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**5,050,233**

**ROTARY COMPRESSOR**

**Toshiaki Hitosugi, Numazu, and Izumi Onoda, Fuji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed May 25, 1988, Ser. No. 198,436**

**Claims priority, application Japan, Aug. 31, 1987, 62-216638**

**Int. Cl.[5] F04B** *25/00*

**U.S. Cl. 417—427** **7 Claims**

1. A rotary compressor comprising:

a motor section;

a first compressor section having a first cylinder with a suction port and driven by the motor section to compress gas;

a second compressor section having a second cylinder with a second suction port and driven by the motor section to compress gas, the second cylinder having a volume different from the of the first cylinder;

first valve means for opening and closing the suction port of the first cylinder;

second valve means for opening and closing the second suction port of the second cylinder;

release means for releasing a part of the gas being compressed in the first compressor section so as to lower capacity of the first compressor section; and

a control section for controlling operation of the release means and the first and second valve means to change capacity of the compressor in accordance with loads applied thereto, said control section selectively setting, in response to the loads applied thereto, a first operation mode wherein the first and second valve means are opened while the release means is left in an inoperative state; a second operation mode wherein the first and second valve means are opened while the release means is made operative; a third operation mode wherein the first and second valve means are opened and closed, respectively, while the release means is left in an inoperative state; a fourth operation mode wherein the first and second valve means are opened and closed, respectively, while the release means is made operative; and a fifth operation mode wherein the first and second valve means are closed and opened, respectively while the release is left in an inoperative state.

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**5,050,234**

**METHOD FOR CONNECTING A CHANNEL BETWEEN A BASE STATION AND A MOBILE STATION**

**Youichi Ohteru, Tokyo, Japan, assignor to NEC Corp., Japan**

**Filed Mar. 29, 1990, Ser. No. 501,614**

**Claims priority, application Japan, Mar. 30, 1989, 1-79869**

**Int. Cl.[5] H04Q** *7/00;* **H04B** *1/00*

**U.S. Cl. 455—34** **5 Claims**

1. A method for establishing a radio communication link between a base station and a mobile station, comprising the steps of:

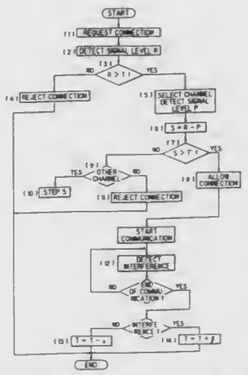
(a) providing a plurality of subsystems each including a base station having a plurality of communication channels and a mobile station;

(b) receiving a first signal from said mobile station at said base station;

(c) detecting a level of said first signal and comparing said first signal level to a first threshold level;

(d) selecting a first selected channel from said plurality of channels and noting a second signal level associated with said first selected channel, when said first signal level is higher than said first threshold level;

(e) calculating a difference between said first and second signal levels and comparing said difference to a second threshold level;




(f) establishing a radio communication link between said mobile station and said first selected channel when said difference is larger than said second threshold level, whereby communication is then carried out between said base and mobile stations;

(g) monitoring said radio communication link for the presence of radio interference emanating from a neighboring subsystem; and

(h) changing said first threshold level on the basis of whether or not interference from a neighboring subsystem has occurred during said radio communication link.

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**5,050,235**

**TRANSMITTER USING GALLIUM ARSENIDE FET WITH MEANS FOR CONTROLLING GATE BIAS VOLTAGE OF THE FET FOR SUPPRESSING UNDESIRED SIGNAL AT A START CONDITION OF THE TRANSMITTER**

**Tatsuru Kojima, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Jan. 26, 1990, Ser. No. 470,868**

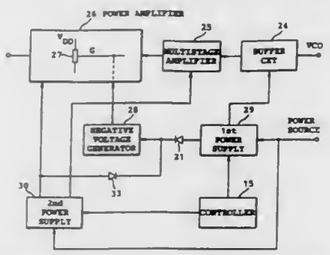
**Claims priority, application Japan, Jan. 26, 1989, 1-19038**

**Int. Cl.[5] H01Q** *11/12*

**U.S. Cl. 455—127** **5 Claims**

1. In a transmitter circuit for use in sending out a transmission signal to a transmission line comprising a power amplifier having a gallium arsenide FET (Field Effect Transistor) as a main amplifying element for power amplifying a signal delivered thereto to send out a power amplified signal to said transmission line as said transmission signal, biassing voltage generating means coupled to said gallium arsenide FET and responsive to an input power supplied thereto for producing a biassing voltage of a negative level determined by a voltage level of said input power to deliver said biassing voltage to said gallium arsenide FET as a gate biassing voltage for the gallium arsenide FET, control means for producing, upon start of said transmitter circuit, a first power-on signal and thereafter a second power-on signal with a time delay from producing said

first power-on signal, first power supply means coupled to said control means and said biassing voltage generating means and responsive to said first power-on signal for generating a first electric power to deliver said first electric power to said biassing voltage generating means as said input power, and second power supply means coupled to said control means and said power amplifier and responsive to said second power-on signal for producing a second electric power of a voltage level higher than said first electric power to supply said second electric power to said power amplifier, the improvement which comprises first diode means connecting said first power supply




means and said negative voltage generating means for permitting said first electric power to be supplied from said first power supply means to said biassing voltage generating means therethrough but with a voltage drop, and second diode means connecting said second power supply means and said biassing voltage generating means for supplying said second electric power from said second power supply means to said biassing voltage generating means with a voltage drop as said input power in place of said first electric power, whereby said biassing voltage is increased in the negative level in response to production of said second power-on signal.

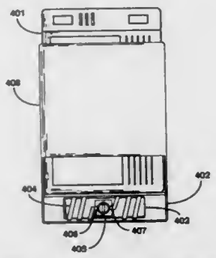
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**5,050,236**

**RADIO FREQUENCY FIELD STRENGTH ENHANCER**

**Thomas G. Colman, Arlington Heights, Ill., and Gregg Rasor, Boynton Beach, Fla., assignors to Motorola Inc., Schaumburg, Ill.**

**Filed Jun. 4, 1990, Ser. No. 532,774**
**Int. Cl.[5] H01Q *7/08, 11/12;* H04B *1/18***
**U.S. Cl. 455—193** **3 Claims**




1. A radio frequency field strength enhancement system for use with a radio frequency communication device having an integrally mounted antenna system, comprising:

a loop antenna system having a first reactance, at least one tuning impedance capable of achieving a second reactance having a magnitude opposite and at least equal to the first reactance, the at least one tuning impedance being coupled from a first to a second terminal on the loop antenna for adjusting a desired frequency response associated with the loop antenna system, a core having a magnetic permeability of at least one, and a plurality of turns of a conductive material wound around the core, the resulting loop antenna system yielding a high efficiency antenna that re-radiates a received signal at a higher radiated power; and

a carrying case capable of receiving and retaining the radio frequency communication device in close proximity to the member such that electromagnetic radiation is coupled between the integrally mounted antenna system and the high efficiency radiating antenna.

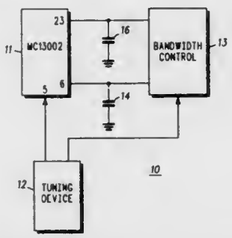
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**5,050,237**

**RADIO RECEIVER HAVING AUTOMATIC BANDWIDTH CONTROL DURING TUNING**

**Lawrence M. Ecklund, Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 145,335, Jan. 19, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 415,372**
**Int. Cl.[5] H04B *1/16***
**U.S. Cl. 455—200** **4 Claims**




4. In a radio receiver that receives broadcast signals and converts said broadcast signals into audio signals, a method of minimizing interstation noise while tuning a broadcast signal for reception, comprising the steps of:

A) detecting when said radio receiver is not tuned to a broadcast signal;

B) reducing bandwidth of said audio signals, but not reducing bandwidth of non-audio signals when said radio receiver is not tuned to a broadcast signal; and

C) allowing said bandwidth of said audio signals to increase when said radio receiver becomes tuned to a broadcast signal.

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**5,050,238**

**SHIELDED FRONT END RECEIVER CIRCUIT WITH IF AMPLIFIER ON AN IC**

**Kazuo Tomizuka; Sakae Sugayama; Takao Saeki, all of Gunma, and Fumio Sandoh, Tochigi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**Filed Jul. 11, 1989, Ser. No. 378,397**
**Claims priority, application Japan, Jul. 12, 1988, 173007; Aug. 12, 1988, 202197; Nov. 17, 1988, 291450**
**Int. Cl.[5] H04B *1/10, 1/28***
**U.S. Cl. 455—300** **11 Claims**

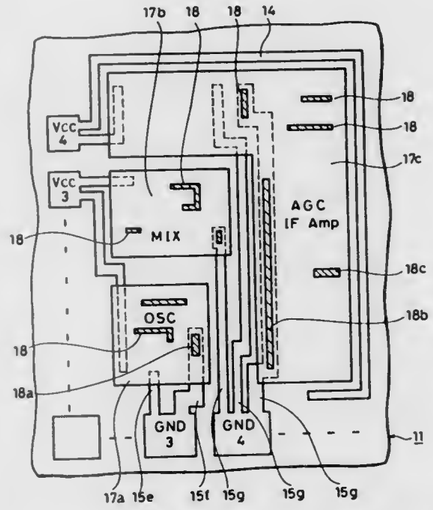
1. A semiconductor integrated circuit for a radio receiver, comprising:

a front end circuit block which includes at least an oscillation circuit and a mixing circuit for converting a radio frequency signal to an intermediate frequency signal, said front end circuit block being formed in a region of a semiconductor chip, said oscillation circuit being formed in a corner of said semiconductor chip;

an amplifying circuit block formed in another region of said chip for amplifying said intermediate frequency signal and limiting an amplitude thereof, said blocks being separated from each other for reducing mutual interference from arising as between said blocks;

a plurality of shield electrodes for absorbing undesirable radiation generated from said first end circuit block and for absorbing undesirable radiation which would be otherwise interfer with said front end circuit block, said shield electrodes covering said front end circuit block, one of said shield electrodes covering only said oscillation circuit;

a dedicated contact pad connected to the one shield electrode; and




other contact pads which are connected to the other of said shield electrodes, said dedicated contact pad and said other contact pads being different and separated from each other so as to avoid having a common conductor impedance with each other.

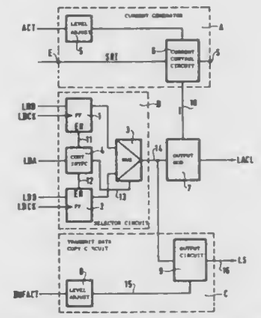


**5,050,239**

**LASER POWER SUPPLY AND CONTROL DEVICE FOR A FIBER OPTIC LINK BETWEEN A SUBSCRIBER AND A TELECOMMUNICATIONS CENTRAL OFFICE**

**Pierre Albouy, Lannion, and Gérard Chartie, Trebeurden, both of France, assignors to Alcatel Cit, Paris, France**

**Filed Mar. 21, 1990, Ser. No. 496,710**
**Claims priority, application France, Mar. 22, 1989, 89 03758**
**Int. Cl.[5] H04B *10/00***
**U.S. Cl. 359—180** **8 Claims**




1. Laser power supply and control device for a laser of a fiber optic link between a subscriber and a telecommunications central office, said device comprising:

a current generator for supplying a laser current,

means responsive to an activation signal for activating and deactivating said current generator,

external means for varying the level of said laser current,

a selector circuit selecting one of two data sources and an output modulator having an input connected to said current generator and to said selector circuit, and an output adapted to be connected to said laser, and said output modulator including means for modulating said current according to data supplied by a selected one of said data sources.

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# DESIGN PATENTS

## GRANTED SEP. 17, 1991

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D08-057 | 319,942 |
| D15-138 | 320,027 |
| D23-202 | 320,055 |
| D21-247 | 320,061 |

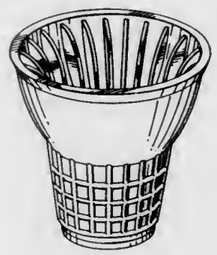
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1991
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319,912
SHELL FOR AN ICE CREAM CONE
Garry G. Buttermann, Jr., 737 Yorkwood Pl., Louisville, Ky. 40223
Filed Jan. 11, 1988, Ser. No. 141,884
Term of patent 14 years
U.S. Cl. D1—116



319,913
ICE CREAM CONE
Frederick A. George, 3435 Lamor Rd., Hermitage, Pa. 16148
Filed Sep. 14, 1990, Ser. No. 581,973
Term of patent 14 years
U.S. Cl. D1—116



319,914
ICE CREAM CONE
Tino Antonacci, 500 Edgemont La., Park Ridge, Ill. 60068
Filed Jul. 3, 1989, Ser. No. 375,291
Term of patent 14 years
U.S. Cl. D1—118



319,915
GARMENT PROTECTOR FOR USE DURING TRIAL OF APPAREL
Beulah D. Cook, 1638 Maumee Dr., Xenia, Ohio 45385
Filed Dec. 24, 1987, Ser. No. 137,659
Term of patent 14 years
U.S. Cl. D2—225



319,916
UTILITY BOOT
Clyde E. Bathurst, Riverview, Mich., and James M. Forté, Cincinnati, Ohio, assignors to Utility Manufacturing, Inc., Riverview, Mich.
Filed Oct. 4, 1989, Ser. No. 417,213
Term of patent 14 years
U.S. Cl. D2—271



VOL 1130 ISS 3 SE 17 1991 UMI



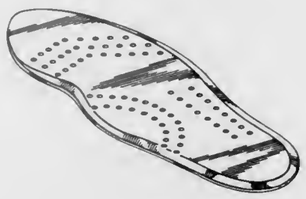
319,917
MARINE BOOT
Mitsutaka Mishima, 5-1-11 Sakai, Musashino-shi, Tokyo, Japan
Filed Dec. 19, 1988, Ser. No. 286,665
Term of patent 14 years
U.S. Cl. D2—275



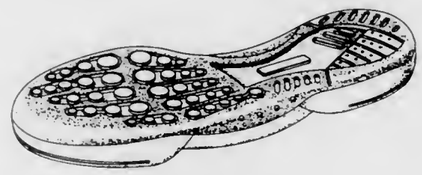
319,918
SHOE UPPER
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., Beaverton, Oreg.
Continuation-in-part of Ser. No. 559,575, Jul. 27, 1990. This application Dec. 21, 1990, Ser. No. 628,117
Term of patent 14 years
U.S. Cl. D2—314



319,919
SHOE INSOLE
Stephen Niarhos, 3307 Canfield Rd., Youngstown, Ohio 44511
Filed Jan. 6, 1989, Ser. No. 294,045
Term of patent 14 years
U.S. Cl. D2—318



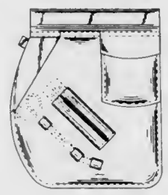
319,920
SHOE SOLE
Kiyotaka Nakano, Kurume, Japan, assignor to Kabushiki Kaisha Asahi Corporation, Tokyo, Japan
Filed Jul. 21, 1989, Ser. No. 382,966
Claims priority, application Japan, Jan. 23, 1989, 1-2075
Term of patent 14 years
U.S. Cl. D2—321



319,921
BABY CARRIER
M. Sue Philipak, Fayetteville, Ark., assignor to Pak-A-Poos, Inc., Fayetteville, Ark.
Filed Feb. 20, 1990, Ser. No. 485,326
Term of patent 14 years
U.S. Cl. D3—31

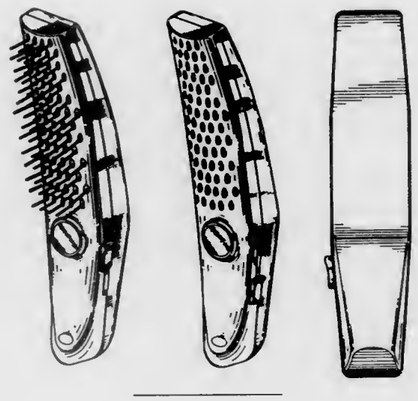


319,922
SIDE POCKET FOR NURSES
Bernadene Flake, 59 E. Barber Ave., Woodbury, N.J. 08096
Filed Aug. 29, 1988, Ser. No. 237,878
Term of patent 14 years
U.S. Cl. D3—100





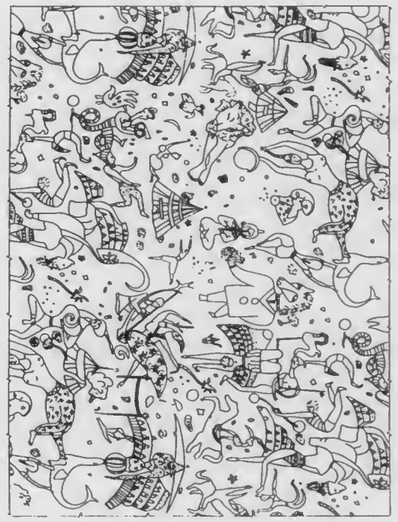
319,923
HAIRBRUSH
Fargo Chou, 306 chung cheng Road, Yung-Ho City, Taipei, Taiwan
Filed Jul. 31, 1989, Ser. No. 386,683
Term of patent 14 years
U.S. Cl. D4—121



319,924
HAIR BRUSH HANDLE
Victor Carranza, Independencia, Mexico, and Stephen M. Smith, deceased, late of Preston-Hollow, N.Y. by Anne Smith, legal representative , assignors to Godinger Silver Art Co., Inc., New York, N.Y.
Filed Mar. 8, 1988, Ser. No. 165,885
Term of patent 14 years
U.S. Cl. D4—138



319,925
PATTERN FOR CLOTH
Gesine Arps, Di Urbino, Italy, assignor to Piero Guidi di Pierino Giuseppe Guidi & C.S.N.C., Italy
Filed Oct. 3, 1989, Ser. No. 417,001
Claims priority, application Italy, Apr. 4, 1989, 20848 B/89
Term of patent 14 years
U.S. Cl. D5—27

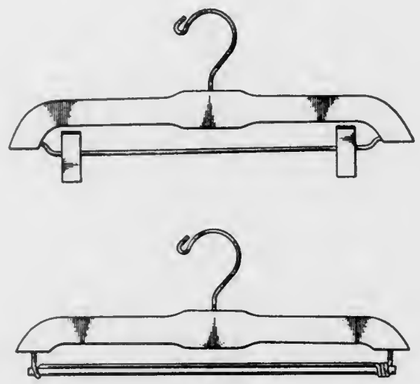


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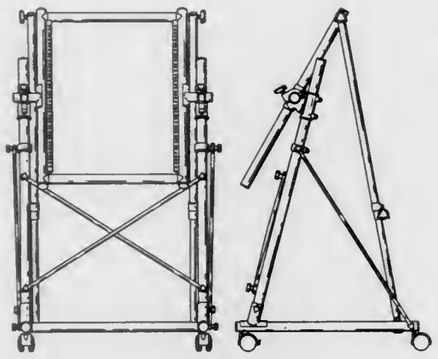


319,926
ADJUSTABLE EASEL STAND
Allen Solomon, 2029 E. 17th St., Brooklyn, N.Y. 11229
Filed Jun. 21, 1988, Ser. No. 211,025
Term of patent 14 years
U.S. Cl. D6—312

319,927
HANGER
Keith J. Beverly, Beverly Coat Hanger Co., Inc., 1215 Fairfax Ave., San Francisco, Calif. 94124
Filed Oct. 4, 1989, Ser. No. 417,821
Term of patent 14 years
U.S. Cl. D6—326



319,928
ADJUSTABLE GARDEN KNEELER
Mark Weimholt, 1704 2nd Ave. N., Minneapolis, Minn. 55405
Filed May 2, 1988, Ser. No. 189,137
Term of patent 14 years
U.S. Cl. D6—330







319,929
CHILD'S ROCKER
Billy E. Smith, 1236 Tramnier Rd., Castroville, Tex. 78009
Filed Aug. 11, 1988, Ser. No. 230,986
Term of patent 14 years
U.S. Cl. D6—348



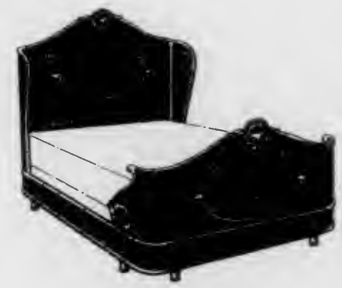
319,930
CHAIR FRAME OR SIMILAR ARTICLE
Scott Glendinning, 5515 Doyle St., #2, Emeryville, Calif. 94608
Filed Aug. 15, 1988, Ser. No. 231,976
Term of patent 14 years
U.S. Cl. D6—370



319,931
ADJUSTABLE DRESSING TABLE FOR A BABY
Vinh V. Vuong, and Lan M. Vuong, both of 11551 Garden Grove Blvd., Garden Grove, Calif. 92643
Filed Mar. 14, 1988, Ser. No. 167,443
Term of patent 14 years
U.S. Cl. D6—384



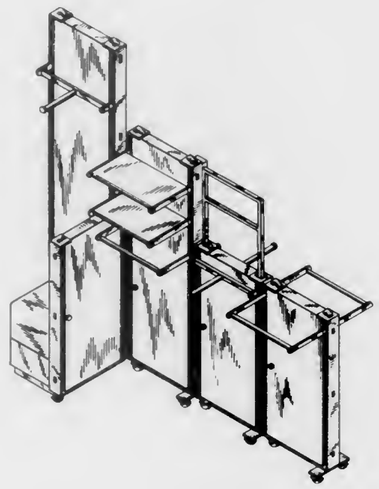
319,932
BED
Ralph Lauren, New York, N.Y., assignor to Polo Ralph Lauren Corporation, New York, N.Y.
Filed Oct. 28, 1988, Ser. No. 264,212
Term of patent 14 years
U.S. Cl. D6—393



319,933
DRAWER WALL SIDE MEMBER
Erich Röck, Höchst; Helmut Hollenstein, Lustenau, and Josef Brunner, Höchst, all of Austria, assignors to Julius Blum Gesellschaft m.h.H., Hochst, Austria
Division of Ser. No. 75,882, Jul. 21, 1987. This application Sep. 5, 1990, Ser. No. 577,697
Claims priority, application Austria, Jan. 21, 1987, 27399/447/1987; Jan. 21, 1987, 27427/477/1987
Term of patent 14 years
U.S. Cl. D6—492



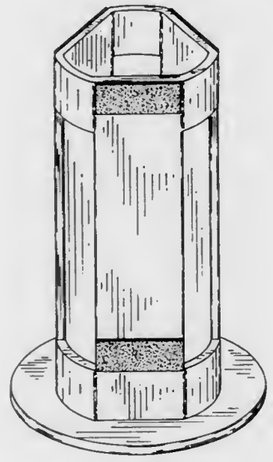
319,934
MOBILE MERCHANDISE DISPLAY RACK
James Terrell; Gunji Tachikawa, both of New York; John Cedelnik, Yorktown Heights; Ellen Daniel; Jo Miller, both of New York; Allen McNeary, Brooklyn; Robert Bernard, New York, and Elisabeth Ortenberg, Fire Island, all of N.Y., assignors to Liz Claiborne, Inc., New York, N.Y.
Filed Sep. 28, 1988, Ser. No. 250,424
Term of patent 14 years
U.S. Cl. D6—414



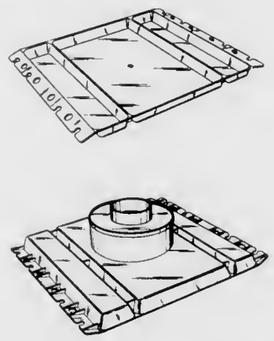
319,935
DESK
Charles Heidmann, Strasbourg, France, assignor to Steelcase Strafor, Strasbourg, France
Filed Nov. 10, 1988, Ser. No. 269,545
Claims priority, application France, May 13, 1988, 883235
Term of patent 14 years
U.S. Cl. D6—422



319,936
REMOTE CONTROL HOLDER
Terry J. Lowe, 1202 Virginia Ave., Goodlettsville, Tenn. 37072
Filed Oct. 25, 1988, Ser. No. 262,507
Term of patent 14 years
U.S. Cl. D6—466

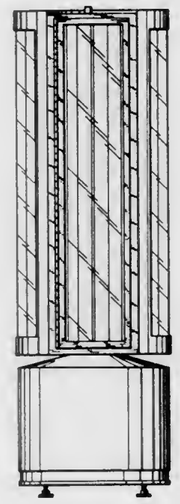


319,937
TRAY FOR AUTOMOBILE PARTS AND TOOLS
Thomas A. Denton, 787 Phelan Rd., #9, Pinon Hills, Calif. 92372
Filed Jul. 12, 1988, Ser. No. 217,818
Term of patent 14 years
U.S. Cl. D6—469

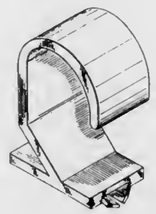




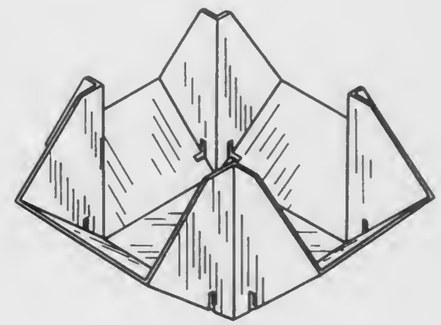
319,938
ARTICLE DISPLAY STAND
James A. Dyment, Cincinnati, Ohio; Floyd R. Callon, Punta Gorda, Fla.; Harvey W. Benison, Cincinnati, Ohio; Karl E. Haschart, Cincinnati, Ohio, and John S. Veach, Cincinnati, Ohio, assignors to Dyment Limited, Toronto, Canada
Continuation-in-part of Ser. No. 764,849, Aug. 12, 1985, Pat. No. D. 295,812. This application Mar. 10, 1988, Ser. No. 167,622
Term of patent 14 years
U.S. Cl. D6—472



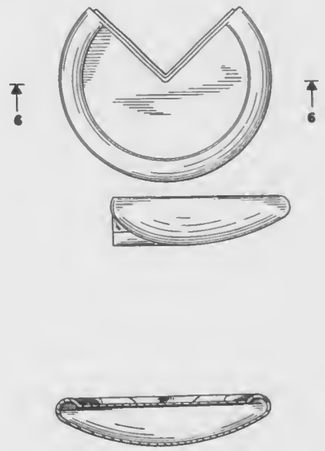
319,939
COLLAPSIBLE TOOTHPASTE OR SHAMPOO TUBE HOLDER
Thomas H. Wolf, Buffalo Grove, and Andy L. Berger, Grayslake, both of Ill., assignors to Superwares, Inc., Hodgkins, Ill.
Filed Oct. 24, 1989, Ser. No. 426,085
Term of patent 14 years
U.S. Cl. D6—541



319,940
FOLDABLE TRAY UNIT FOR A PRODUCT MERCHANDISING DISPLAY STAND
William G. Ehlebracht, West Des Moines, Iowa, assignor to Chesapeake Display and Packaging Company, West Des Moines, Iowa
Filed Mar. 16, 1988, Ser. No. 168,753
Term of patent 14 years
U.S. Cl. D6—510



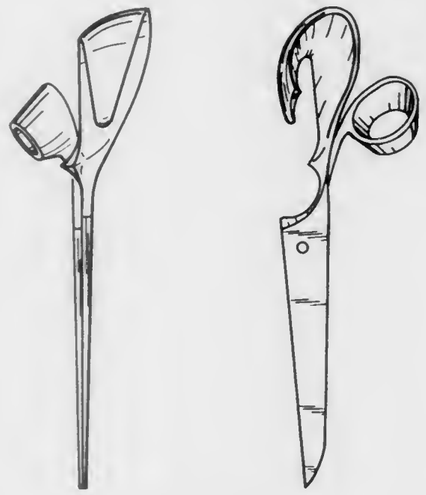
319,941
WALL-MOUNTED SHELF OR THE LIKE
Axel Enthoven, Wijnegem, Belgium, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 111,521, Oct. 19, 1987, Pat. No. D. 315,844.
This application Feb. 20, 1991, Ser. No. 658,379
Term of patent 14 years
U.S. Cl. D6—574



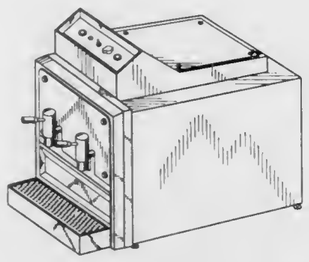
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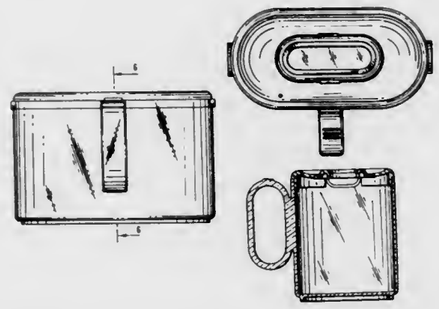


319,942
SCISSORS
Zoltan Schubert, Ibolya u. 6, Budapest, Hungary H-1036
Filed Feb. 21, 1989, Ser. No. 313,139
Term of patent 14 years
U.S. Cl. D8—57



319,943
COUNTERTOP BEVERAGE DISPENSING MACHINE
Rodney N. Sexton, Laguna Hills; Floyd S. Woolf, Lake Matthews, and Timothy W. Rund, Laguan Hills, all of Calif., assignors to ICEE-USA Corp., Anaheim, Calif.
Filed May 9, 1988, Ser. No. 192,307
Term of patent 14 years
U.S. Cl. D7—308

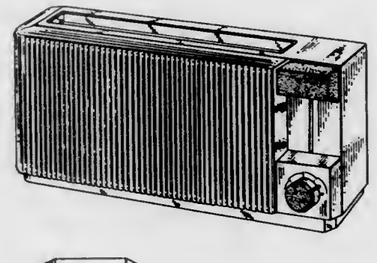


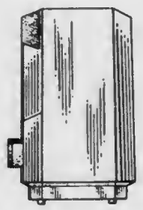


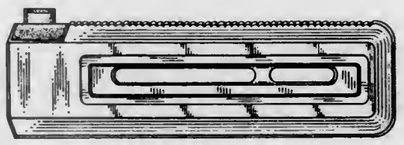
319,944
CARAFE
Duane D. Adams, Deep River, and Masao Tsuji, Old Lyme, both of Conn., assignors to North American Philips Corp., New York, N.Y.
Division of Ser. No. 212,858, Jun. 29, 1988. This application Dec. 27, 1990, Ser. No. 634,379
Term of patent 14 years
U.S. Cl. D7—315



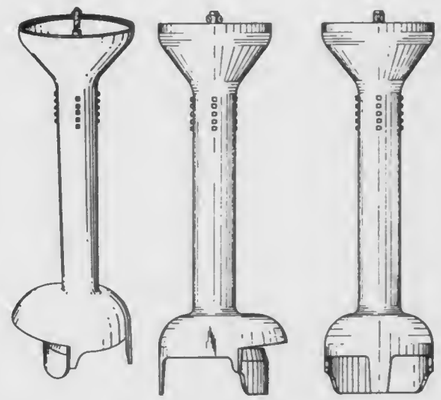
319,945
TOASTER
Lutz Gebhardt, Darmstadt, Fed. Rep. of Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Sep. 1, 1988, Ser. No. 239,412
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 5MR10823
Term of patent 14 years
U.S. Cl. D7—330



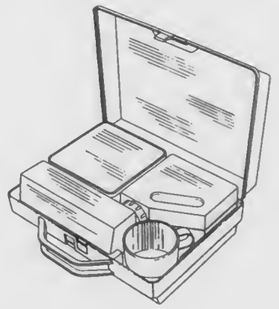




319,946
ATTACHMENT FOR DOMESTIC FOOD MIXER
Jean-Louis Barrault, 102, rue du Chateau, F-92100 Boulogne-Billancourt, France
Filed Jul. 5, 1988, Ser. No. 215,590
Claims priority, application France, Jan. 6, 1988, 880049
Term of patent 14 years
U.S. Cl. D7—412



319,947
COMBINED CARRYING CASE AND CONTAINERS FOR FOOD, DRINK, AND PENCILS
John G. Ryan, 13 Castle Green, Weybridge, Surrey KT13 9QL, England
Filed Feb. 24, 1989, Ser. No. 315,037
Claims priority, application United Kingdom, Aug. 31, 1988, 1053311
Term of patent 14 years
U.S. Cl. D7—626



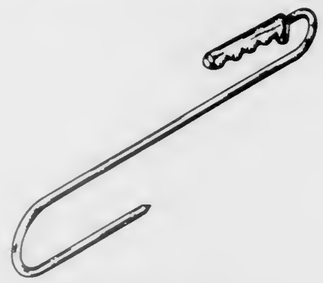
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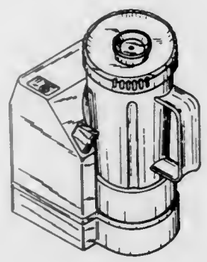
319,948
SINGLE HEAD JUICE EXTRACTOR
David N. Anderson, Lakeland, Fla., and Paul D. Eckstedt, San Jose, Calif., assignors to FMC Corporation, Chicago, Ill.
Filed Mar. 6, 1989, Ser. No. 319,231
Term of patent 14 years
U.S. Cl. D7—665



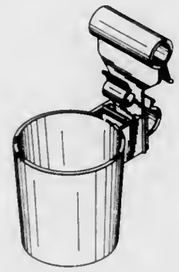
319,949
ROAST LIFTING TOOL
Hyman Pollack, 41 Stonicker Dr., Lawrenceville, N.J. 08648
Filed Oct. 20, 1989, Ser. No. 424,835
Term of patent 14 years
U.S. Cl. D7—683



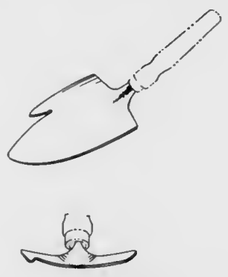
319,950
BLENDER
Rudolf Maass, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Nov. 22, 1988, Ser. No. 275,539
Claims priority, application Fed. Rep. of Germany, May 26, 1988, 5MR9861
Term of patent 14 years
U.S. Cl. D7—378



319,951
HANDLE SUPPORT ASSEMBLY
Gail B. Frankel, Dallas, Tex., assignor to Kel-Gar, Inc., Dallas, Tex.
Filed Jun. 1, 1989, Ser. No. 360,705
Term of patent 14 years
U.S. Cl. D7—620



319,952
TROWELING AND WEEDING GARDEN TOOL BLADE
Louis Harvey, Sr., 15107 Ilene, Detroit, Mich. 48238
Filed Apr. 20, 1990, Ser. No. 513,155
Term of patent 14 years
U.S. Cl. D8—9

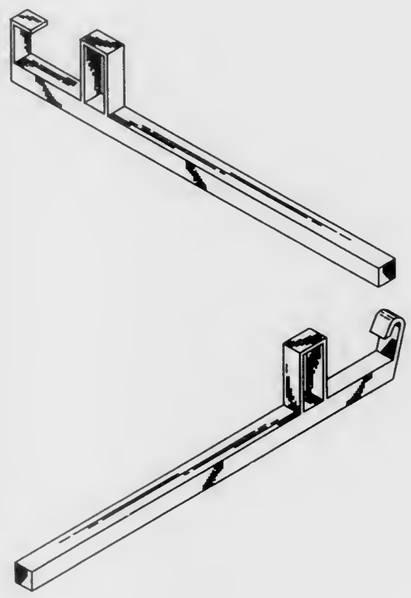


319,953
TOOL FOR STRIPPING SHINGLES
John A. Machak, 1117 Clement St., Joliet, Ill. 60435
Filed Feb. 18, 1988, Ser. No. 157,338
Term of patent 14 years
U.S. Cl. D8—14





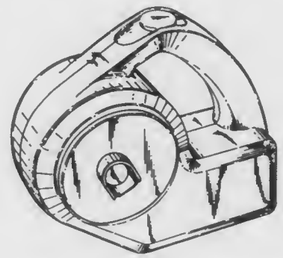
319,954
CONTAINER OPENER
Curtis D. Able, 8107 St. Andrew Rd.; Sebert C. Atzinger, 1501 Sand Dr., and Logan A. Atzinger, 7900 Conifer Dr., all of Louisville, Ky. 40258
Filed Feb. 22, 1989, Ser. No. 314,205
Term of patent 14 years
U.S. Cl. D8—18



319,955
RADIATOR CAP REMOVER
Jimmy L. Keller, Rte. 1, Box 88, and Lloyd R. Stark, Rte 1, Box 9, both of Sawyer, Kans. 67134
Filed Sep. 28, 1988, Ser. No. 250,425
Term of patent 14 years
U.S. Cl. D8—21



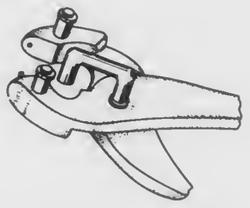
319,956
HAND-HELD ELECTRIC CAN OPENER
Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France
Filed Aug. 15, 1989, Ser. No. 394,503
Claims priority, application France, Feb. 15, 1989, 89 1108
Term of patent 14 years
U.S. Cl. D8—36



319,957
CORK REMOVER
Josef J. Bergmeister, P.O. Box 640347, San Francisco, Calif. 94164
Filed Sep. 11, 1989, Ser. No. 405,851
Term of patent 14 years
U.S. Cl. D8—42



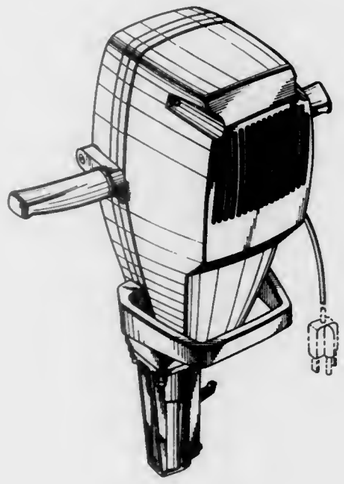
319,958
FENCE MENDING PLIERS
Karl G. Fletcher, Buffalo, Mo., assignor to Buffalo Fencing Pliers, Inc., Buffalo, Mo.
Filed Jun. 30, 1988, Ser. No. 213,730
Term of patent 14 years
U.S. Cl. D8—52



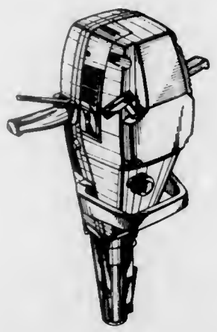
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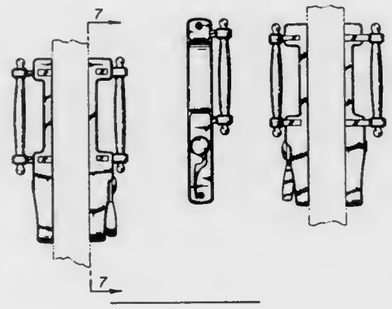
319,959
HAND-HELD TOOL
Alf K. Johansson, Kalmar, Sweden, assignor to Atlas Copco Berema Aktiebolag, Nacka, Sweden
Filed Oct. 13, 1988, Ser. No. 257,413
Claims priority, application Sweden, Apr. 22, 1988, 881000
Term of patent 14 years
U.S. Cl. D8—61



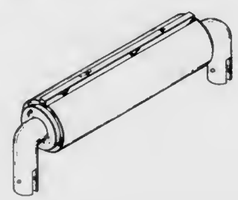
319,960
HAND-HELD TOOL
Alf K. Johansson, Kalmar, Sweden, assignor to Atlas Copco Berema Aktiebolag, Nacka, Sweden
Filed Oct. 13, 1988, Ser. No. 257,414
Claims priority, application Sweden, Apr. 22, 1988, 880999
Term of patent 14 years
U.S. Cl. D8—61



319,961
COMBINED DOOR HANDLE AND LOCK UNIT
Paul D. Fleming, Glendale, and Nandor Gajer, Woodland Hills, both of Calif., assignors to W&F Manufacturing, Inc., Glendale, Calif.
Filed Apr. 3, 1989, Ser. No. 332,097
Term of patent 14 years
U.S. Cl. D8—302

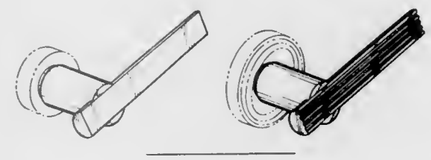


319,962
LUGGAGE HANDLE
Michael A. Cousins, New York, N.Y., assignor to Tumi Imports, Middlesex, N.J.
Filed Aug. 26, 1988, Ser. No. 236,775
Term of patent 14 years
U.S. Cl. D8—306

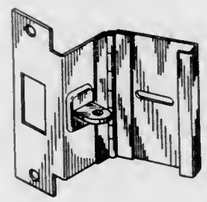




319,963
HANDLE FOR A DOOR
Eric Britz, Wernersville, and Wayne E. Baker, Mohnton, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.
Filed Nov. 13, 1989, Ser. No. 436,387
Term of patent 14 years
U.S. Cl. D8—308



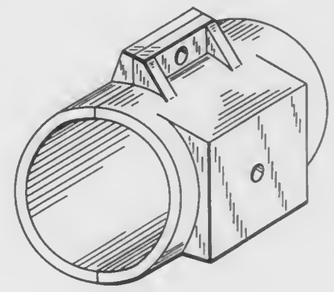
319,964
DOOR LOCK
Blair E. Johns, Phoenix, Ariz., assignor to Modern Manufacturing, Phoenix, Ariz.
Division of Ser. No. 530,086, May 25, 1990, which is a division of Ser. No. 336,647, Apr. 7, 1989, abandoned, which is a continuation of Ser. No. 10,433, Feb. 3, 1987, abandoned. This application Sep. 27, 1990, Ser. No. 588,973
Term of patent 14 years
U.S. Cl. D8—344



319,965
STAINED GLASS PANEL HANGER
Leslie A. Oldar, 1517 W. 16th St., San Pedro, Calif. 90732
Filed Nov. 25, 1987, Ser. No. 125,077
Term of patent 14 years
U.S. Cl. D8—367



319,966
MOUNTING BRACKET FOR AUTOMOTIVE ROLL BAR OR SIMILAR ARTICLE
Terry W. Ellison, P.O. Box 53, Kenton, Tenn. 38233
Filed Jul. 13, 1987, Ser. No. 73,203
Term of patent 14 years
U.S. Cl. D8—382



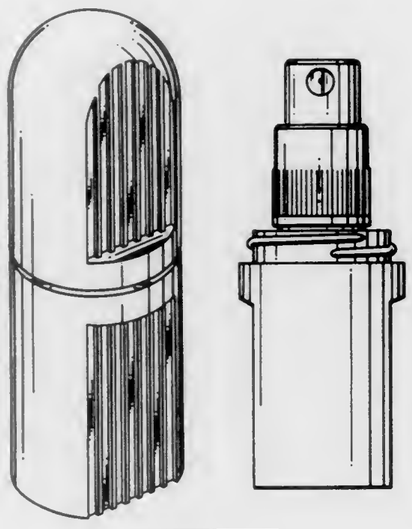
319,967
DISPENSER
Piero Battegazzore, Alessandria, Italy, assignor to Guala S.p.A., Alessandria, Italy
Filed Sep. 18, 1988, Ser. No. 246,536
Term of patent 14 years
U.S. Cl. D9—300



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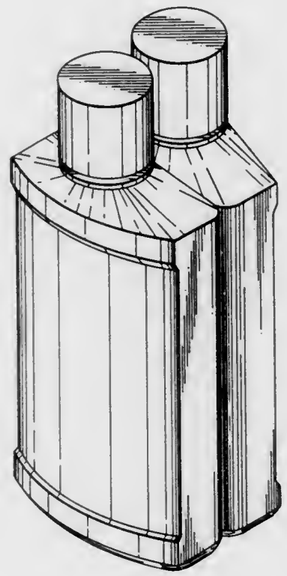
319,968
SPRAY DISPENSER OR SIMILAR ARTICLE
Jörg Zintzmeyer, Zürich, Switzerland, assignor to Toko AG, Alstatten, Switzerland
Filed May 31, 1989, Ser. No. 359,077
Term of patent 14 years
U.S. Cl. D9—300



319,969
BOTTLE
Serge Mansau, Neuilly sur Seine, France, assignor to Kenzo, Paris, France
Filed Aug. 18, 1988, Ser. No. 233,573
Claims priority, application World Int. Prop. O., Feb. 22, 1988, DMA000732
Term of patent 14 years
U.S. Cl. D9—336



319,970
DUAL BOTTLE UNIT
Everett C. Beeman, Wallingford, Conn., assignor to Silgan Plastics Corporation, New London, Conn.
Filed Jun. 12, 1989, Ser. No. 364,988
Term of patent 14 years
U.S. Cl. D9—341

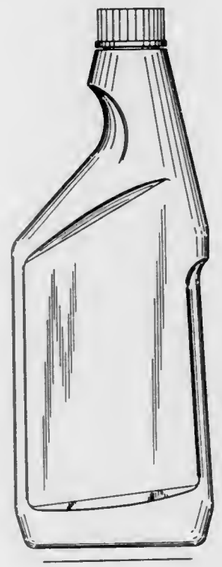


319,971
COMBINED PERFUME BOTTLE AND STOPPER OR SIMILAR ARTICLE
Christopher D. Rhodes, Beckenham, England, assignor to Oman Perfumery LLC, Oman
Filed Aug. 15, 1989, Ser. No. 394,101
Term of patent 14 years
U.S. Cl. D9—354





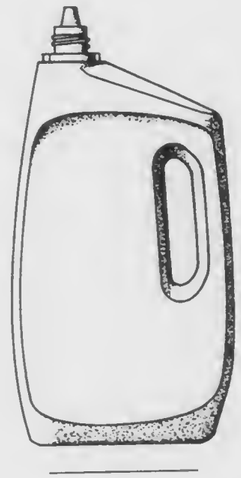
319,972
COMBINED BOTTLE AND CAP
Umberto D. I. Segati, Brussels, Belgium, and Jon Zogg, Brooklyn, N.Y., assignors to Colgate-Palmolive Company, Piscataway, N.J.
Filed Aug. 25, 1988, Ser. No. 236,686
Claims priority, application Denmark, Mar. 2, 1988, 264/88
Term of patent 14 years
U.S. Cl. D9—375



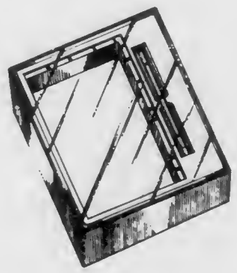
319,973
DISPENSING BOTTLE
Rodney G. Offley, Rothley, and Brian G. Tunnah, Cramlington, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 18, 1988, Ser. No. 273,432
Claims priority, application United Kingdom, May 18, 1988, 1050835
Term of patent 14 years
U.S. Cl. D9—376



319,974
DISPENSING BOTTLE
Rodney G. Offley, Rothley, and Brian G. Tunnah, Cramlington, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 18, 1988, Ser. No. 273,434
Claims priority, application United Kingdom, May 18, 1988, 1050834
Term of patent 14 years
U.S. Cl. D9—376



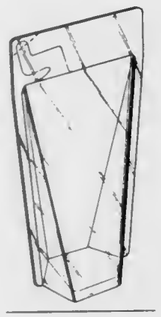
319,975
DISPLAY PACKAGE
Mark S. Mallon, Chicago, Ill., assignor to Accurate Leather & Novelty Co., Inc., Chicago, Ill.
Filed Nov. 30, 1988, Ser. No. 278,072
Term of patent 14 years
U.S. Cl. D9—415



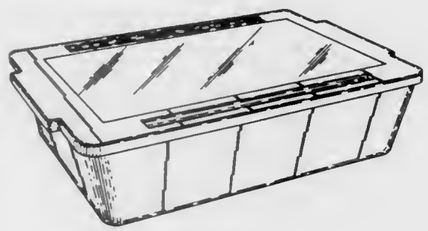
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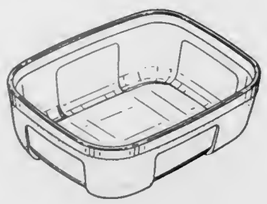
319,976
FLUID CONTAINER
Russell B. Wortley, Racine, and Fred L. Billman, Caledonia, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Feb. 2, 1989, Ser. No. 305,993
Term of patent 14 years
U.S. Cl. D9—417



319,977
STORAGE CONTAINER FOR DRAWING UTENSIL OR SIMILAR ARTICLE
Stephen A. Curry, Edina, Minn., assignor to Anthony Williams, Inc., Minneapolis, Minn.
Filed Oct. 24, 1989, Ser. No. 427,351
Term of patent 14 years
U.S. Cl. D9—425



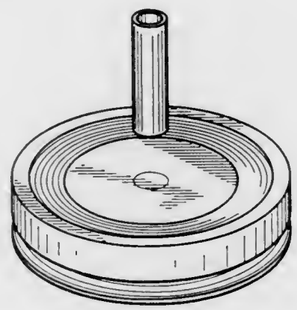
319,978
FOOD CONTAINER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Nov. 18, 1988, Ser. No. 275,022
The portion of the term of this patent subsequent to Apr. 30, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—431



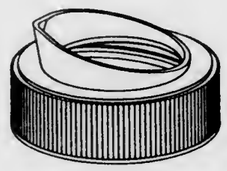
319,979
DISPENSING CLOSURE
Robert C. Johnson, Okeana, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Oct. 13, 1989, Ser. No. 421,459
Term of patent 14 years
U.S. Cl. D9—434



319,980
BEVERAGE CAN CLOSURE
Danny W. Garner, 6219 Old Lebanon Rd., Campbellsville, Ky. 42718
Filed Jun. 22, 1988, Ser. No. 210,288
Term of patent 14 years
U.S. Cl. D9—447

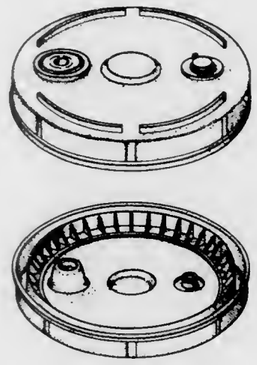


319,981
POUR SPOUT FOR CONTAINERS
Larry C. Sledge, Midlothian, Va., assignor to Specialty Packaging Licensing Company, Wilmington, Del.
Filed Oct. 17, 1988, Ser. No. 258,335
Term of patent 14 years
U.S. Cl. D9—447

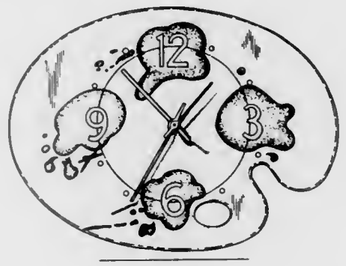




319,982
REMOVABLE LID
Walter A. Matthews, Rothesay, Canada, assignor to Irving Oil Limited, New Brunswick, Canada
Filed Mar. 26, 1990, Ser. No. 498,382
Claims priority, application Canada, Sep. 27, 1989, 27-09-89-3
Term of patent 14 years
U.S. Cl. D9—447



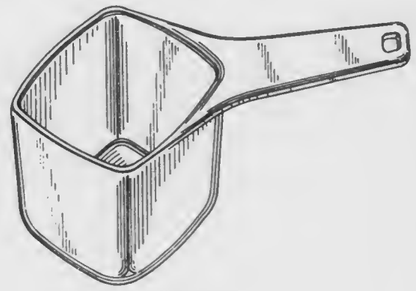
319,983
WALL CLOCK
Thomas J. Cannon, P.O. Box 1194, Montclair, N.J. 07042
Continuation-in-part of Ser. No. 903,094, Sep. 2, 1986, Pat. No. 301,551. This application Apr. 13, 1989, Ser. No. 337,434
Term of patent 14 years
U.S. Cl. D10—6



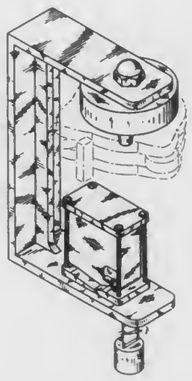
319,984
WRISTWATCH
Benjamin E. Woomer, 1597 E. 30th St., Cleveland, Ohio 44114
Filed Nov. 21, 1988, Ser. No. 273,509
Term of patent 14 years
U.S. Cl. D10—39



319,985
MEASURING SCOOP
John C. Crawford, R.D. 7, South Lake Blvd., Lake Mahopac, N.Y. 10541, and Adrian Lee, 904 Garden St., Hoboken, N.J. 07030
Filed Jun. 21, 1989, Ser. No. 369,552
Term of patent 14 years
U.S. Cl. D10—46.2



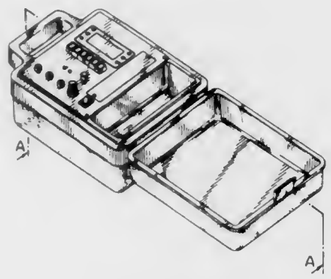
319,986
HEIGHT FINDER FOR A SURVEYING INSTRUMENT SUPPORT
Edgar E. Dudley, 5352 First Ave. North, Birmingham, Ala. 35212
Continuation-in-part of Ser. No. 889,010, Jul. 24, 1986, Pat. No. Des. 302,251, and Ser. No. 279,283, Dec. 5, 1988, Pat. No. 4,888,881. This application May 30, 1989, Ser. No. 358,845
Term of patent 14 years
U.S. Cl. D10—74



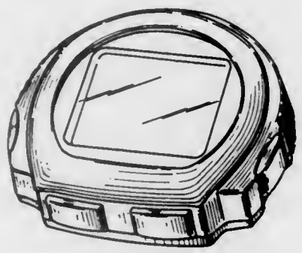
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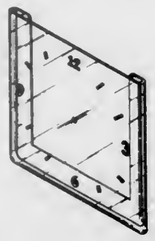
319,987
PORTABLE ENGINE DIAGNOSTIC TESTER
Hiroyuki Ueno, Oomiya, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 6, 1989, Ser. No. 320,752
Claims priority, application Japan, Sep. 9, 1988, 63-35758
Term of patent 14 years
U.S. Cl. D10—78



319,988
BICYCLE METER
Takashi Ueda, Izumi, Japan, assignor to Tsuyama Mfg. Co., Osaka, Japan
Filed Mar. 17, 1989, Ser. No. 324,637
Claims priority, application Japan, Sep. 21, 1988, 63-37335
Term of patent 14 years
U.S. Cl. D10—96



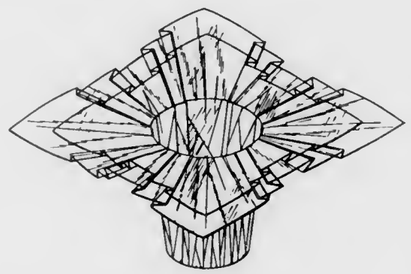
319,989
CLOCK FACE
Donald A. Peacock, 26 Skylark La., Stony Brook, N.Y. 11790, and Daniel T. McBryde, 1208 Oakwood Dr., Colonial Heights, Va. 23834
Filed Jul. 13, 1988, Ser. No. 218,121
Term of patent 14 years
U.S. Cl. D10—125



319,990
RING
Stephen J. Berti, 411 Northview Dr., Fayetteville, N.C. 28303
Filed Feb. 8, 1988, Ser. No. 153,455
Term of patent 14 years
U.S. Cl. D11—30




319,991
FLOWER POT COVER
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 108,316, Oct. 13, 1987, Pat. No. Des. 316,838, which is a continuation-in-part of Ser. No. 613,053, May 22, 1984, Pat. No. Des. 293,224. This application May 25, 1989, Ser. No. 357,103
Term of patent 14 years
U.S. Cl. D11—164

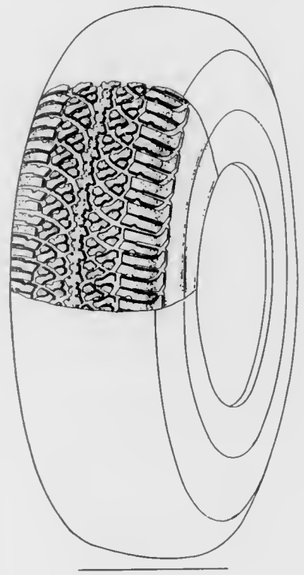


319,992
PAIR OF MOUNTAIN BIKE HANDGUARDS
Franco Acerbis, Albino, Italy, assignor to Acerbis Plastica Italia, Italy
Filed Mar. 13, 1989, Ser. No. 322,069
Term of patent 14 years
U.S. Cl. D12—114

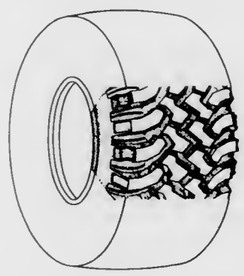




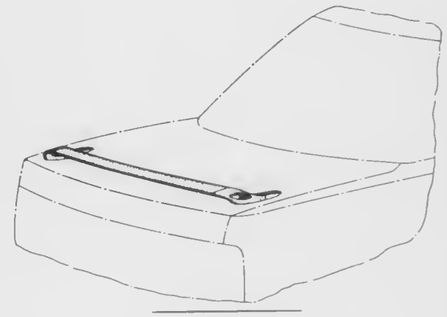
319,993
TIRE
Curt D. Croley, North Royalton, and Laurie W. Killian, Cuyahoga Falls, both of Ohio, assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio
Filed Jul. 14, 1988, Ser. No. 219,030
Term of patent 14 years
U.S. Cl. D12—147



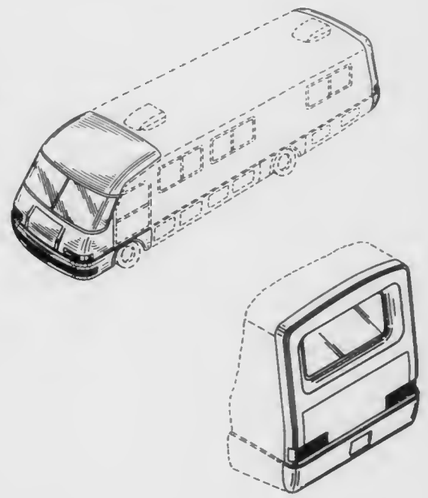
319,994
TIRE
Miroslav Manestar, Norton, and Aristides E. Makris, Cuyahoga Falls, both of Ohio, assignors to The Uniroyal Goodrich Tire Company, Akron, Ohio
Filed Jun. 1, 1989, Ser. No. 360,169
Term of patent 14 years
U.S. Cl. D12—147



319,995
SPOILER FOR THE REAR DECK OF AN AUTOMOBILE
Craig A. Stapleton; Curtis J. Nordin; Mark C. Towns, and Charles R. Schriner, all of Port Huron, Mich., assignors to Huron/St. Clair Incorporated, Taylor, Mich.
Filed Jul. 24, 1989, Ser. No. 384,513
Term of patent 14 years
U.S. Cl. D12—181



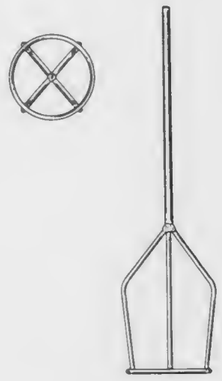
319,996
MOTOR HOME BODY FRONT AND REAR PANEL UNIT EXTERIOR SURFACE
Wade F. B. Thompson, New York, N.Y., and David Willis, Huntsville, Ohio, assignors to Airstream, Inc., Jackson Center, Ohio
Filed Nov. 28, 1988, Ser. No. 277,054
Term of patent 14 years
U.S. Cl. D12—196



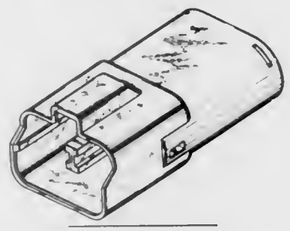
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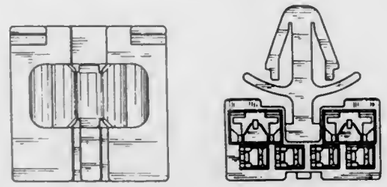
319,997
RING PADDLE OR SIMILAR ARTICLE
Herbert Goller, Pittsburgh, Pa., assignor to Ardex, Incorporated, Coraopolis, Pa.
Filed Nov. 28, 1989, Ser. No. 441,908
Term of patent 14 years
U.S. Cl. D12—215



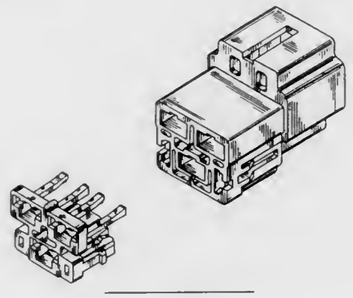
319,998
HOUSING FOR AN ELECTRICAL CONNECTOR
Seiji Kozono, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan
Filed Aug. 2, 1989, Ser. No. 388,225
Claims priority, application Japan, Feb. 8, 1989, 1-4140
Term of patent 14 years
U.S. Cl. D13—133



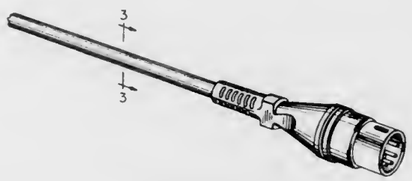
319,999
ELECTRICAL CONNECTOR
Kenzi Ohkura, Hisai, and Sho-Ichi Sugata, Suzuka, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., Suzuka, Japan
Filed Jan. 11, 1988, Ser. No. 142,905
Claims priority, application Japan, Jul. 10, 1987, 62-28168
Term of patent 14 years
U.S. Cl. D13—146



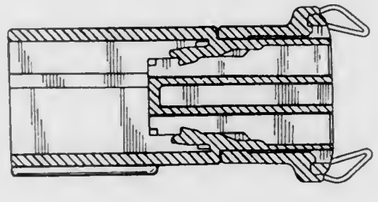
320,000
ELECTRICAL CONNECTOR HOUSING
Kenji Takenouchi; Toshihiko Makita, and Teruhisa Norizuki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jan. 17, 1989, Ser. No. 297,512
Claims priority, application Japan, Jul. 15, 1988, 63-28044
Term of patent 14 years
U.S. Cl. D13—146



320,001
MUSICAL INSTRUMENT DIGITAL INTERFACE PLUG
Ryuzo Hirabayashi, Tokyo, Japan, assignor to MIT, Inc., Tokyo, Japan
Filed Jun. 2, 1989, Ser. No. 360,753
Claims priority, application Japan, Dec. 8, 1988, 63-47654
Term of patent 14 years
U.S. Cl. D13—146

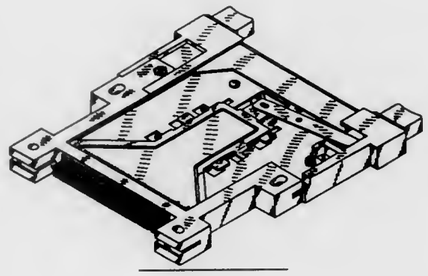


320,002
ELECTRICAL CONNECTOR
Nobuyuki Asakawa, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Suzuka, Japan
Filed Sep. 29, 1987, Ser. No. 102,523
Claims priority, application Japan, Mar. 30, 1987, 62-12040
Term of patent 14 years
U.S. Cl. D13—147

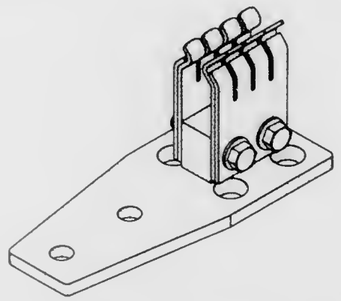




320,003
MEMORY CARD CONNECTOR
Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan
Filed Nov. 16, 1988, Ser. No. 271,846
Claims priority, application Japan, May 26, 1988, 63-20786
Term of patent 14 years
U.S. Cl. D13—147



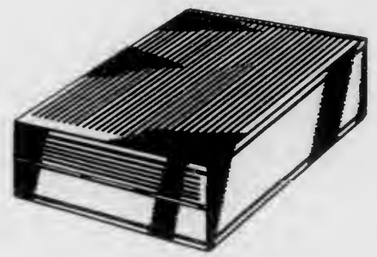
320,004
SWITCHGEAR CONTACT
Gregory C. Benson, and Victor Golowash, both of Birmingham, Ala., assignors to Electrical Equipment, Inc., Birmingham, Ala.
Filed May 8, 1989, Ser. No. 348,648
Term of patent 14 years
U.S. Cl. 213—173



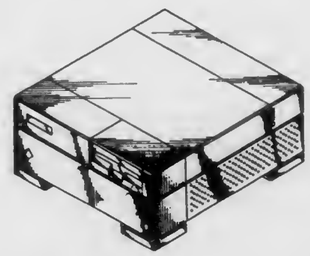
320,005
COMPUTER KEYBOARD
Dennis C. Stead, South Orleans, Mass., assignor to Sun Microsystems, Inc., Mountain View, Calif.
Filed Feb. 27, 1989, Ser. No. 316,439
Term of patent 14 years
U.S. Cl. D14—100



320,006
PERSONAL COMPUTER HOUSING OR SIMILAR ARTICLE
Gavin R. Ivester, Palo Alto, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Aug. 4, 1989, Ser. No. 389,828
Term of patent 14 years
U.S. Cl. D14—100



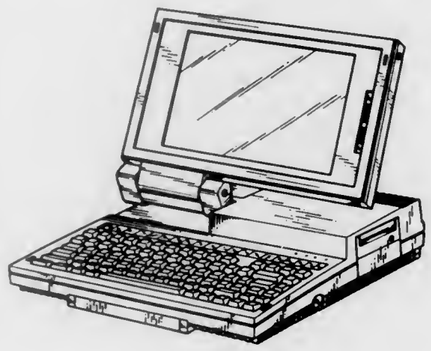
320,007
COMPUTER HOUSING
Craig M. Leveranlt, Mountain View; Peter C. D. Ta, Newark, and Howell Hsiao, Moutain View, all of Calif., assignors to Sun Microsystems, Inc., Moutain View, Calif.
Filed Jul. 25, 1990, Ser. No. 558,172
Term of patent 14 years
U.S. Cl. D14—100



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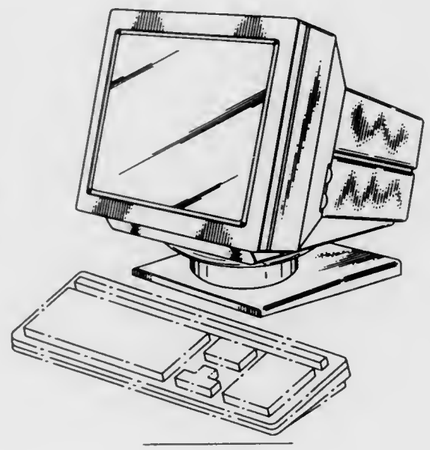
320,008
PORTABLE COMPUTER
Won M. Choi, Seoul, D.P.R. of Korea, assignor to Gold Star Co., Ltd., Seoul, D.P.R. of Korea
Filed Nov. 29, 1989, Ser. No. 443,645
Claims priority, application D.P.R. of Korea, May 31, 1989, 7255/1989
Term of patent 14 years
U.S. Cl. D14—106



320,009
LAP TOP COMPUTER
Yosuki Yamamoto, Morioka, Japan, and Michael R. Barry, Stanford, Calif., assignors to Alps Electric Co., Ltd., Tokyo, Japan
Filed Nov. 29, 1989, Ser. No. 443,700
Claims priority, application Japan, Jun. 14, 1989, 1-21887
Term of patent 14 years
U.S. Cl. D14—106



320,010
VIDEO DISPLAY TERMINAL
Anthony R. Orchard, Wantagh; Paul Matwey, Mt. Sinai; Lloyd A. Samuels, Kew Garden Hills; Brian K. Fisher, Douglaston, and Robert G. Doherty, Massapequa Park, all of N.Y., assignors to NCR Corporation, Dayton, Ohio
Filed Nov. 16, 1988, Ser. No. 272,046
Term of patent 14 years
U.S. Cl. D14—113

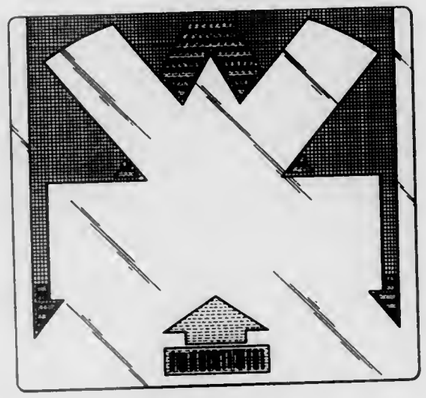


320,011
WINDOW FOR AN OPTICAL SCANNER
Eleanor J. Fulton, Kensington; Brian S. Stewart, San Francisco, both of Calif., and Nicolas N. Tabet, Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.
Filed Jan. 4, 1989, Ser. No. 293,231
Term of patent 14 years
U.S. Cl. D14—114

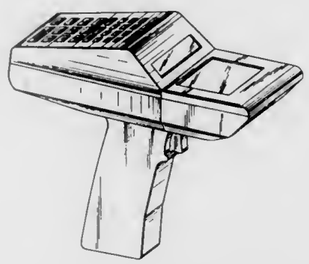




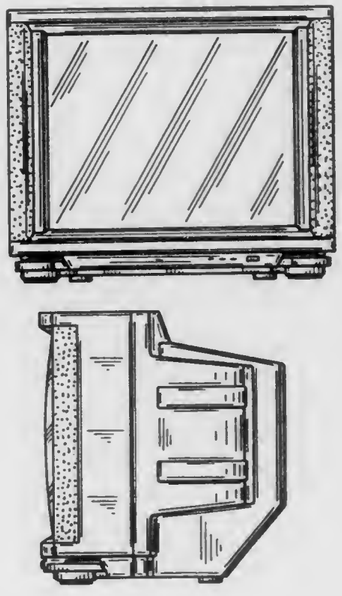
320,012
WINDOW FOR AN OPTICAL SCANNER
Eleanor J. Fulton, Kensington; Neil R. Taylor, Alameda, both of Calif., and Nicolas N. Tabet, Eugene, Oreg., assignors to Spectra-Physics, Inc., San Jose, Calif.
Filed Jan. 4, 1989, Ser. No. 293,383
Term of patent 14 years
U.S. Cl. D14—114



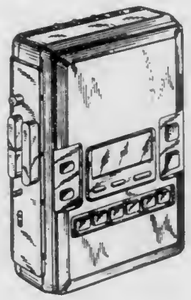
320,013
HAND HELD OPTICAL SCANNER
Bish Siemiatkowski, Los Gatos, and Daniel M. Humphreys, Mountain View, both of Calif., assignors to Symbol Technologies, Inc., Bohemia, N.Y.
Filed May 17, 1989, Ser. No. 334,130
Term of patent 14 years
U.S. Cl. D14—116



320,014
TELEVISION SET
Taisuke Saeki; Yoshito Fujii, and Touru Ootani, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 27, 1989, Ser. No. 372,257
Claims priority, application Japan, Dec. 28, 1988, 63-51361
Term of patent 14 years
U.S. Cl. D14—126



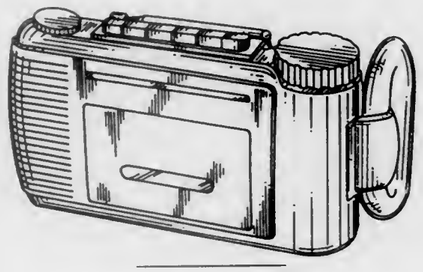
320,015
COMBINED TAPE PLAYER AND RADIO TUNER
Ryuta Kanno, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 14, 1989, Ser. No. 337,550
Term of patent 14 years
U.S. Cl. D14—163



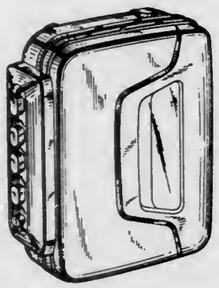
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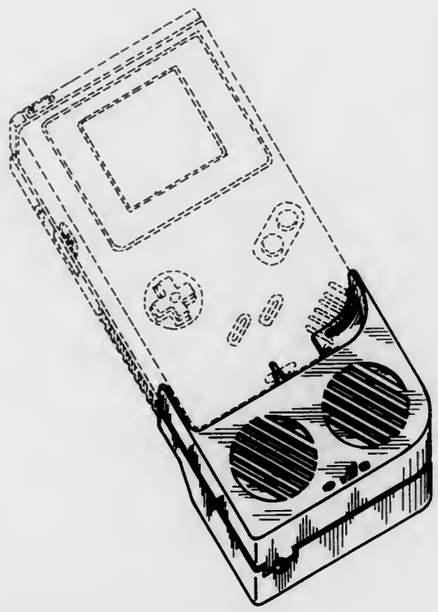


320,016
COMBINED CASSETTE RECORDER AND RADIO
William To Yung Pang, Kowloon, Hong Kong, assignor to Saple International Ltd., Kowloon, Hong Kong
Filed Apr. 17, 1989, Ser. No. 339,433
Claims priority, application United Kingdom, Dec. 23, 1988, 1055965
Term of patent 14 years
U.S. Cl. D14—163



320,017
TAPE PLAYER
Etsuroh Ikeyama, Tokyo, Japan, and Masayoshi Tsuchiya, Milan, Italy, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 7, 1989, Ser. No. 447,249
Claims priority, application Japan, Jun. 16, 1989, 1-22438
Term of patent 14 years
U.S. Cl. D14—165





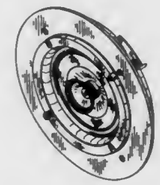
320,018
COMBINED AMPLIFIER AND SPEAKER FOR PORTABLE HAND HELD COMPUTER GAME
Louis J. Bakanowsky, III, 582 Westminster St., Fitchburg, Mass. 01420
Filed Dec. 17, 1990, Ser. No. 628,660
Term of patent 14 years
U.S. Cl. D14—172



320,019
LIGHTED HEADPHONES
Raed Murad, 5525 N. Artesian, 3rd Floor, Chicago, Ill. 60625
Filed Dec. 2, 1988, Ser. No. 279,139
Term of patent 14 years
U.S. Cl. D14—205

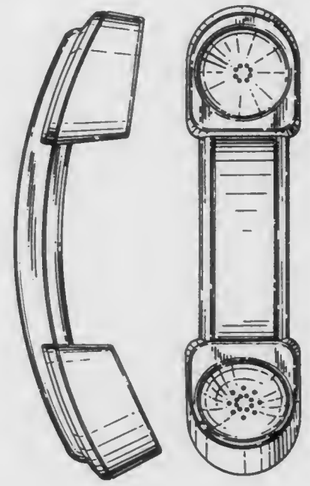


320,020
SPEAKER
Akihiro Iwano, Tokyo, Japan, assignor to Kabushiki Kaisha Seidenko, Japan
Filed Nov. 24, 1989, Ser. No. 441,084
Claims priority, application Japan, May 23, 1989, 1-18694
Term of patent 14 years
U.S. Cl. D14—216





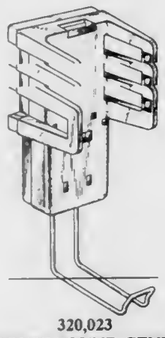
320,021
TELEPHONE HANDSET
Gary K. Dalton, Suffolk, England, assignor to British Telecommunications public limited company, England
Filed May 14, 1990, Ser. No. 522,863
Claims priority, application United Kingdom, Nov. 14, 1989, 2002450
Term of patent 14 years
U.S. Cl. D14—248



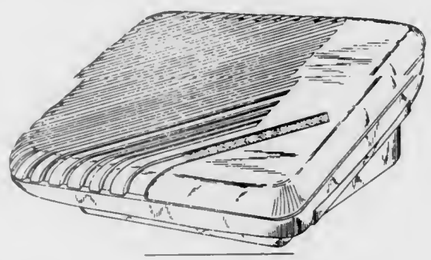
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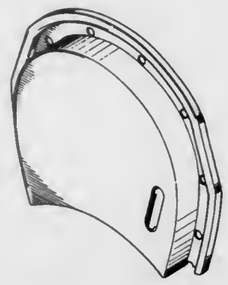
320,022
**HOLDER FOR A PORTABLE RADIO TELEPHONE**
Katsuhito Watanabe, and Masami Suda, both of Tokyo, Japan, assignors to Oki Electric Industry, Co., Ltd., Tokyo, Japan
Filed Aug. 11, 1989, Ser. No. 392,288
Claims priority, application Japan, Feb. 15, 1989, 1-5210
Term of patent 14 years
U.S. Cl. D14—251



320,023
**ELECTRONIC SOUND GENERATOR**
Robert L. Gault, Raleigh, N.C., assignor to Marpac Corporation, Wilmington, N.C.
Filed Apr. 14, 1989, Ser. No. 338,634
Term of patent 14 years
U.S. Cl. D14—299



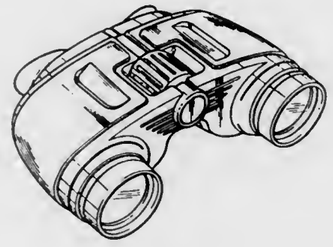
320,024
**CAP FOR TIMING CHAIN COVER**
William J. Segal, Torrance, Calif., assignor to Mr. Gasket Company, Cleveland, Ohio
Filed Nov. 30, 1988, Ser. No. 278,165
Term of patent 14 years
U.S. Cl. D15—5



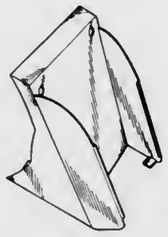
320,025
**HANGER FOR EYEGLASSES OR THE LIKE**
Troy T. Horrall, 1760 E. 1700 South, Salt Lake City, Utah 84108
Filed Aug. 7, 1987, Ser. No. 83,415
Term of patent 14 years
U.S. Cl. D16—129



320,026
**BINOCULARS**
Choon J. Lee, Seoul, Rep. of Korea, assignor to Daeyang Optical Co., Ltd., Daejeon, Rep. of Korea
Filed Dec. 12, 1988, Ser. No. 283,520
Term of patent 14 years
U.S. Cl. D16—133

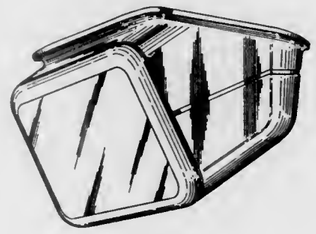


320,027
**SUPPORT STAND FOR A MOTOR CONTROL PENDANT**
S. Stanley Mintz, Monrovia; Tsu-Hsun Ku, Rosemead, both of Calif., and Edward T. Liljenwall, Everett, Wash., assignors to Servo Products Company, Pasadena, Calif.
Filed Dec. 12, 1988, Ser. No. 283,755
Term of patent 14 years
U.S. Cl. D15—138

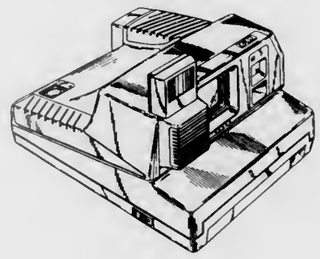




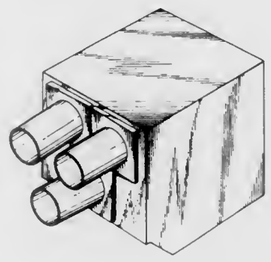
320,028
**HOUSING FOR A TELEVISION MONITOR**
Marty Sedighzadeh, 11504 Wo Barry Plo, Littleton, Colo. 80127, and Robert Bromley, Boulder, Colo., assignors to Marty Sedighzadeh, Littleton, Colo.
Filed Feb. 29, 1988, Ser. No. 161,833
Term of patent 14 years
U.S. Cl. D16—203



320,029
**POP-UP STROBE AUTOFOCUS CAMERA OR SIMILAR ARTICLE**
John H. Betts, New York, N.Y., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Mar. 14, 1988, Ser. No. 167,431
Term of patent 14 years
U.S. Cl. D16—211



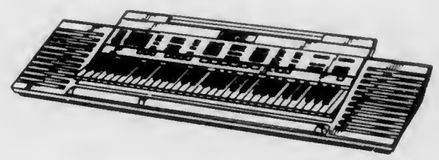
320,030
**TRIPLE-BEAM PROJECTOR HEAD**
Rodney F. Allen, Angmering, United Kingdom, assignor to Singer Link-Miles Limited, Lancing, United Kingdom
Filed Apr. 21, 1988, Ser. No. 184,158
Claims priority, application United Kingdom, Oct. 30, 1987, 1045967
Term of patent 14 years
U.S. Cl. D16—235



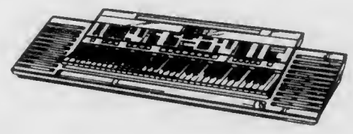
320,031
**SUNGLASSES TEMPLE**
Ken Wilson, 12269 Calle Albara #3, El Cajon, Calif. 92019
Filed Apr. 20, 1989, Ser. No. 340,586
Term of patent 14 years
U.S. Cl. D16—127



320,032
**ELECTRONIC KEY BOARD MUSICAL INSTRUMENT**
Yasuhiro Hoshina, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka, Japan
Filed May 23, 1989, Ser. No. 355,400
Claims priority, application Japan, Nov. 30, 1988, 63-46985
Term of patent 14 years
U.S. Cl. D17—1



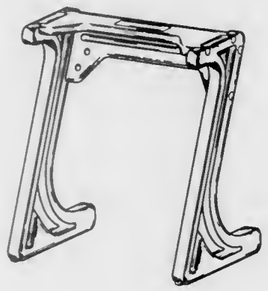
320,033
**ELECTRONIC KEY BOARD MUSICAL INSTRUMENT**
Yasuhiro Hoshina, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka, Japan
Filed May 23, 1989, Ser. No. 355,403
Claims priority, application Japan, Nov. 30, 1988, 63-46984
Term of patent 14 years
U.S. Cl. D17—1



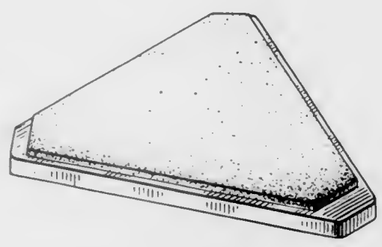
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320,034
KEYBOARD STAND
Lawrence D. Brooks, Las Cruces, N. Mex., and Darrell A. Schoenig, Fort Collins, Colo., assignors to Ultimate Support Systems, Inc., Fort Collins, Colo.
Filed Feb. 8, 1989, Ser. No. 308,143
Term of patent 14 years
U.S. Cl. D17—9



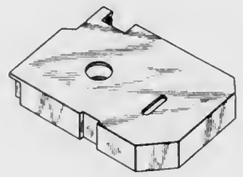
320,035
DRUM PRACTICE PAD
Thomas O. Magruder, 133 Lawand Dr., Columbia, S.C. 29210
Filed Aug. 4, 1989, Ser. No. 389,560
Term of patent 14 years
U.S. Cl. D17—22



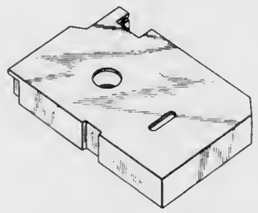
320,036
CASH REGISTER
Chi-Chung Chen, 7th Fl., No. 61, Chung Shan N. Rd., Sec. 2, Taipei, Taiwan
Filed Oct. 6, 1989, Ser. No. 417,843
Term of patent 14 years
U.S. Cl. D18—4



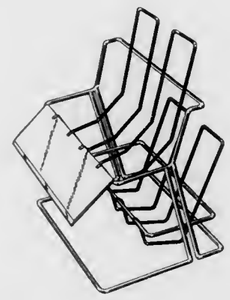
320,037
INK RIBBON CASSETTE FOR ELECTRONIC TYPEWRITER
Fumiya Matsuoka, Kawasaki, and Toshiyuki Ohnishi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 8, 1988, Ser. No. 165,572
Claims priority, application Japan, Sep. 9, 1987, 62-37057
Term of patent 14 years
U.S. Cl. D18—12



320,038
INK RIBBON CASSETTE FOR ELECTRONIC TYPEWRITER
Fumiya Matsuoka, Kawasaki, and Toshiyuki Ohnishi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 8, 1988, Ser. No. 165,574
Claims priority, application Japan, Sep. 28, 1987, 62-39934
Term of patent 14 years
U.S. Cl. D18—12

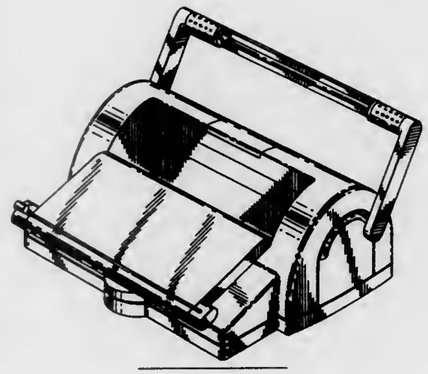


320,039
COMBINED FAN-FOLD PAPER GUIDE AND STAND
Kenneth E. Neir, San Jose, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed Oct. 26, 1988, Ser. No. 264,250
Term of patent 14 years
U.S. Cl. D18—22

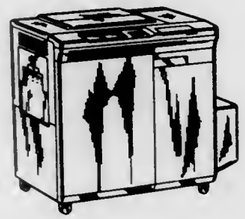




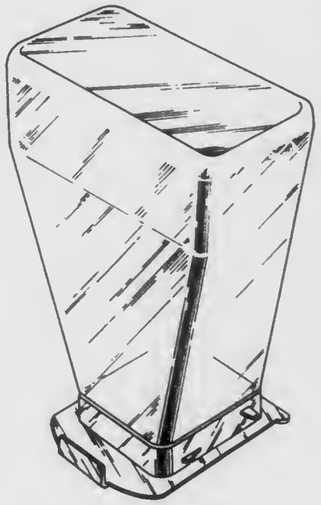
320,040
PAPER BINDING MACHINE
Alden R. Miles, Burnsville, Minn., and Paul S. Montgomery, San Francisco, Calif., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed May 12, 1989, Ser. No. 351,722
Term of patent 14 years
U.S. Cl. D18—34



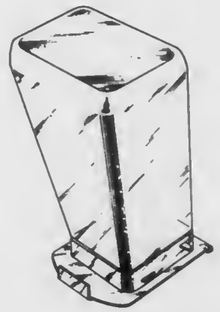
320,041
COPYING MACHINE
Takeishi Komada, Yokohama; Tomohiko Hirata, Kawasaki; Minoru Aoyama, and Yutaka Okayama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 18, 1988, Ser. No. 220,259
Claims priority, application Japan, Jan. 19, 1988, 63-1808
Term of patent 14 years
U.S. Cl. D18—39



320,042
TONER BOTTLE
Kenneth D. Corby, Rochester; Frank Hacknauer, Heneoye Falls, and Ronald R. Vacek, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 14, 1989, Ser. No. 393,926
Term of patent 14 years
U.S. Cl. D18—43



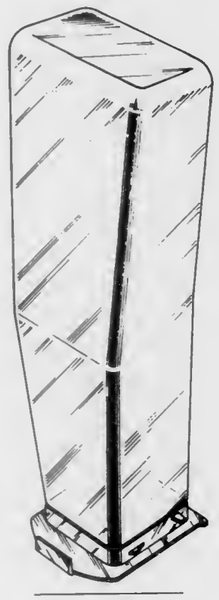
320,043
TONER BOTTLE
Kenneth D. Corby, Rochester; Frank Hacknauer, Heneoye Falls, and Ronald R. Vacek, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 14, 1989, Ser. No. 393,927
Term of patent 14 years
U.S. Cl. D18—43



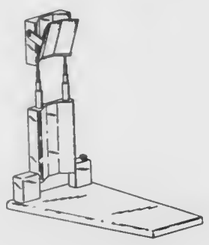
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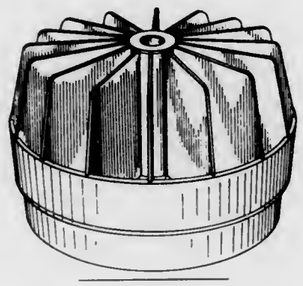
320,044
TONER BOTTLE
Kenneth D. Corby, Rochester; Frank Hacknauer, Heneoye Falls, and Ronald R. Vacek, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 14, 1989, Ser. No. 393,928
Term of patent 14 years
U.S. Cl. D18—43



320,045
COLLAPSIBLE COPY HOLDER STAND
Dorr J. Mead, 9344 Hix, Livonia, Mich. 48150
Filed Jan. 4, 1988, Ser. No. 140,350
Term of patent 14 years
U.S. Cl. D19—88



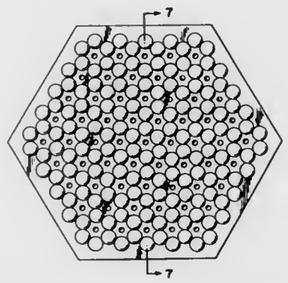
320,046
VERTICAL FILE
Elmo D. Clinehens, 13149 Roosevelt Rd., Mishawaka, Ind. 46544
Filed Feb. 25, 1988, Ser. No. 160,503
Term of patent 14 years
U.S. Cl. D19—90



320,047
CURRENCY CHANGER
Frank A. Novak, Kirtland Hills, Ohio, assignor to Ardac, Inc. (Dixie-Narco), Eastlake, Ohio
Filed Apr. 4, 1988, Ser. No. 177,034
Term of patent 14 years
U.S. Cl. D20—1



320,048
GAME BOARD
Michel Lalet, Paris, and Laurent Levi, Gif S/Yvette, both of France, assignors to Abalone Games Corporation, New York, N.Y.
Filed Feb. 2, 1988, Ser. No. 151,593
Term of patent 14 years
U.S. Cl. D21—20

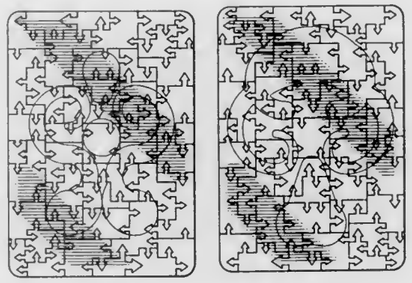




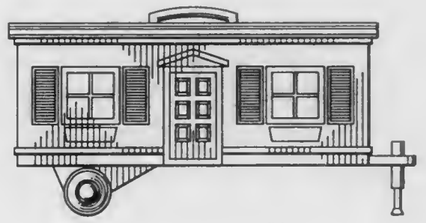

320,049
TETHERER RATTLE TOY
Takehiko Takahashi; Yoshiyasu Ishii; Kenshun Ishii, and Hiroaki Matsuda, all of Tokyo, Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Mar. 17, 1989, Ser. No. 325,340
Claims priority, application Japan, Sep. 22, 1988, 63-37061
Term of patent 14 years
U.S. Cl. D21—62



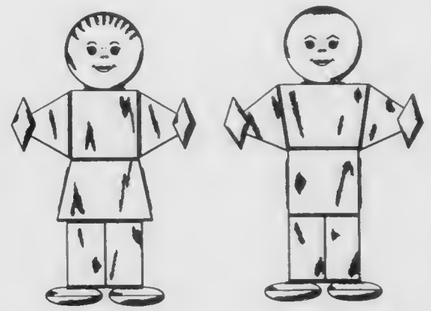
320,050
DOUBLE-SIDED JIGSAW PUZZLE
Richard A. Mannino, 212 Old Liverpool Rd., Bldg. 2 Apt. #4, Liverpool, N.Y. 13088
Filed Mar. 27, 1989, Ser. No. 328,598
Term of patent 14 years
U.S. Cl. D21—105



320,051
TOY MOBILE HOME
Frances L. Phillips, 33 Peppers Ferry Rd., Radford, Va. 24141
Filed Jan. 31, 1989, Ser. No. 304,409
Term of patent 14 years
U.S. Cl. D21—124



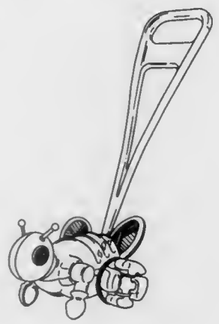
320,052
DOLL
Joanne E. Davis, 104 Stanwood La., Manlius, N.Y. 13104
Filed Nov. 4, 1988, Ser. No. 273,327
Term of patent 14 years
U.S. Cl. D21—166



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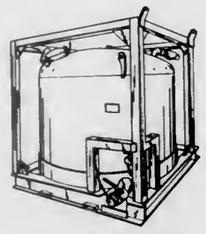
320,053
LIGHTNING BUG WHEELED PUSH TOY
Ronald R. Klawitter, Berger, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed Apr. 20, 1989, Ser. No. 340,591
Term of patent 14 years
U.S. Cl. D21—185



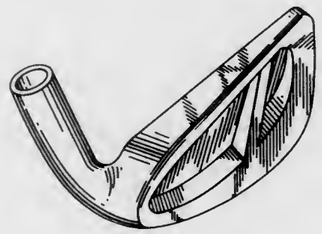
320,054
ISOMETRIC EXERCISER
Ronald T. Yanazaki, 1223 Koko Head Ave. #5, Honolulu, Hi. 96816
Filed Apr. 28, 1989, Ser. No. 344,838
Term of patent 14 years
U.S. Cl. D21—198



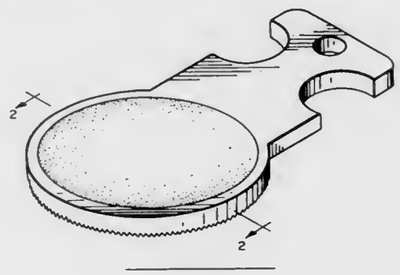
320,055
FLUID STORAGE TANK FOR USE ON OIL RIGS
Thomas R. Parker, and Webster J. Delcambre, both of New Iberia, La., assignors to Pro-Log, Inc., Youngsville, La.
Filed Apr. 11, 1990, Ser. No. 507,908
Term of patent 14 years
U.S. Cl. D23—202



320,056
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Dec. 28, 1988, Ser. No. 290,903
Term of patent 14 years
U.S. Cl. D21—220



320,057
CUE TIP TAPPER AND SHAPER
Michael L. Roberts, 360 Gloria, Shreveport, La. 71105
Filed Apr. 4, 1989, Ser. No. 332,949
Term of patent 14 years
U.S. Cl. D21—232

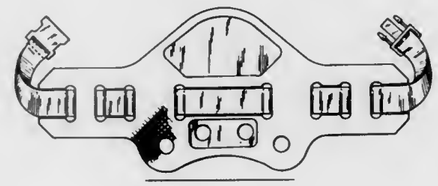



320,058
ELECTRONIC BILLIARD CUE
Rogelio Reyes, 25 Pleasant Hill La., Tamarac, Fla. 33319
Filed May 26, 1989, Ser. No. 357,309
Term of patent 14 years
U.S. Cl. D21—232

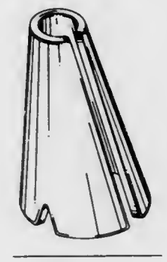




320,059
DEEP WATER EXERCISE BELT
Diahanne Bedortha, Springfield; Richard L. Brown, and Lewis C. Thorne, both of Eugene, all of Oreg., assignors to Excel Sports Science, Inc., Eugene, Oreg.
Filed Jul. 25, 1989, Ser. No. 384,466
Term of patent 14 years
U.S. Cl. D21—238



320,060
COMBINED FISHHOOK AND BAIT HOLDER
John R. Austin, 3394 Lakeview Dr., Naples, Fla. 33962
Filed Feb. 21, 1989, Ser. No. 313,137
Term of patent 14 years
U.S. Cl. D22—144



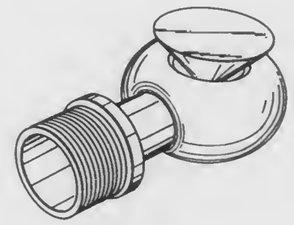
320,061
AMUSEMENT RIDE
Gerard Reda, Plainview, N.Y., assignor to Toddler University Inc., Westport, Conn.
Filed Jan. 3, 1989, Ser. No. 292,740
Term of patent 14 years
U.S. Cl. D21—247



320,062
END CAP FOR A FILTER CARTRIDGE
Christopher A. Meissner, Camarillo, Calif., assignor to Meissner Filtration Products, Inc., Oxnard, Calif.
Filed Jun. 29, 1990, Ser. No. 546,785
Term of patent 14 years
U.S. Cl. D23—209



320,063
WATER JET NOZZLE
Shizuo Kobayashi, Matsunuma-cho 18-10, Tatebayashi-shi, Gunma-Ken 374, Japan
Filed May 24, 1988, Ser. No. 197,904
Term of patent 14 years
U.S. Cl. D23—213



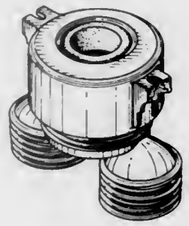
320,064
HAND HELD SHOWER HEAD
Constantin Presman, Bat Yam, Israel, assignor to Brass-Craft Manufacturing Company, Southfield, Mich.
Filed Mar. 7, 1988, Ser. No. 165,201
Term of patent 14 years
U.S. Cl. D23—223



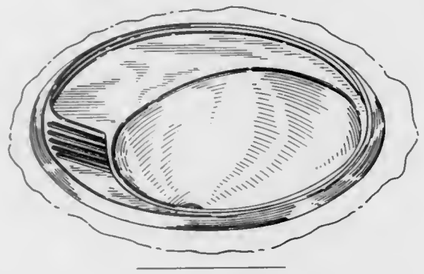
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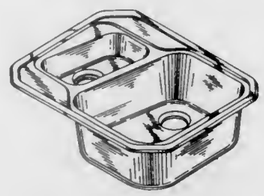
320,065
FAUCET COUPLING
Henny Chou, No. 139, Lane 285, Sec. 1, Ney Hwu Road, Taipei, Taiwan
Filed Apr. 11, 1988, Ser. No. 180,038
Term of patent 14 years
U.S. Cl. D23—262



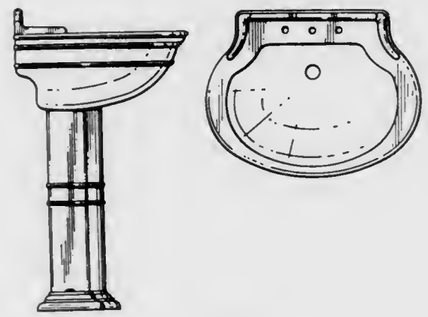
320,066
LAVATORY
Todd D. Dannenberg, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Dec. 16, 1988, Ser. No. 285,825
Term of patent 14 years
U.S. Cl. D23—284



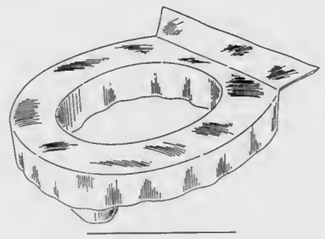
320,067
SINK
Klaus W. Göcke, Detmold, and Manfred Mück, Kürnbach, both of Fed. Rep. of Germany, assignors to Blanco GmbH & Co. KG, Oberderdingen, Fed. Rep. of Germany
Filed Dec. 28, 1988, Ser. No. 290,897
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1988, 10 AR 88/88
Term of patent 14 years
U.S. Cl. D23—290



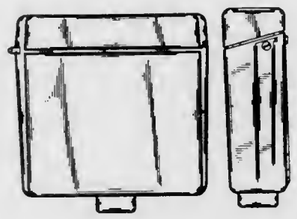
320,068
PEDESTAL LAVATORY
Jonathan G. Waldren, London, England, assignor to B. C. Sanitan Limited, Berkshire, England
Filed Jan. 19, 1990, Ser. No. 467,225
Term of patent 14 years
U.S. Cl. D23—292



320,069
TOILET SEAT COVER
Jean T. Rossiter, 476 Kalamunda Rd., High Wycombe, Western Australia, Australia 6057
Filed Dec. 30, 1987, Ser. No. 139,713
Term of patent 14 years
U.S. Cl. D23—311

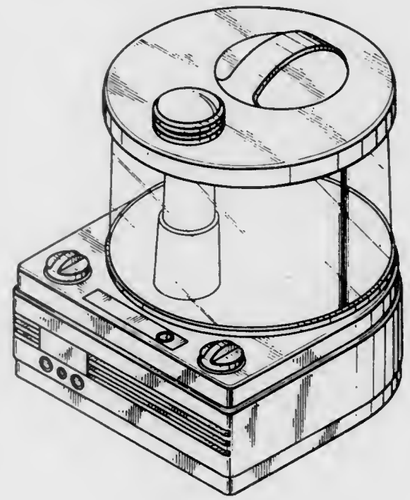


320,070
TOILET TANK
Uli Witzig, Wolfhausen, Switzerland, assignor to Geberit AG, Jona, Switzerland
Filed Jan. 19, 1988, Ser. No. 146,147
Claims priority, application Hague, Jul. 17, 1987, DM/008973
Term of patent 14 years
U.S. Cl. D23—313

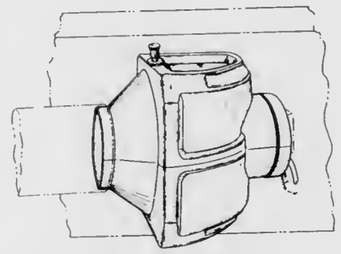




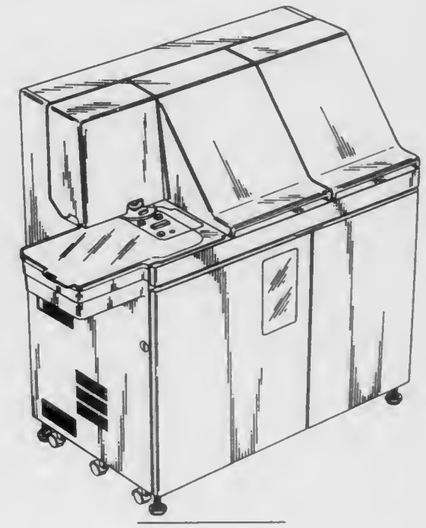
320,071
HUMIDIFIER
Robynn M. Cook, Long Beach, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.
Filed Aug. 6, 1990, Ser. No. 562,954
Term of patent 14 years
U.S. Cl. D23—356



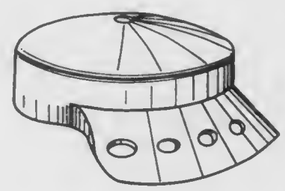
320,072
HUMIDIFIER
Judy L. Youngeberg, Manheim, Pa., assignor to Herrmidifier Company, Inc., Lancaster, Pa.
Filed Jun. 25, 1990, Ser. No. 543,077
Term of patent 14 years
U.S. Cl. D23—357



320,073
CHEMICAL ANALYZER
Toshio Sakagami, Chofu, and Yasuo Hattori, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Dec. 5, 1988, Ser. No. 280,513
Claims priority, application Japan, Jun. 8, 1988, 63-22852; Jun. 9, 1988, 63-22966
Term of patent 14 years
U.S. Cl. D24—232



320,074
OPTHALMIC APPLICATOR FOR IRRADIATION OF INTRA-OCULAR TUMORS OR THE LIKE
Richard B. Frost, Eastwood, and Christopher A. Karolis, Randwick, both of Australia, assignors to Unisearch Limited, New South Wales, Australia
Filed Oct. 14, 1987, Ser. No. 109,842
Claims priority, application Australia, Apr. 16, 1987, 1316/87
Term of patent 14 years
U.S. Cl. D24—158



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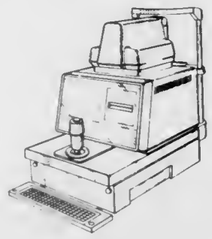
320,075
COMBINED DENTAL MIRROR AND SUCTION INSTRUMENT
Göran Berlin, Balsta, Sweden, assignor to Multimir AB, Sollentuna, Sweden
Filed May 22, 1989, Ser. No. 354,099
Claims priority, application Sweden, Nov. 22, 1988, 88-2668
Term of patent 14 years
U.S. Cl. D24—112



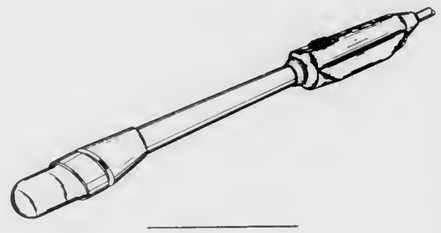
320,076
DENTAL INSTRUMENT HANDLE
Wendell Guthrie, Missoula, Mont., assignor to Hu-Friedy Manufacturing Co., Inc., Chicago, Ill.
Filed Jun. 22, 1989, Ser. No. 369,925
Term of patent 14 years
U.S. Cl. D24—154



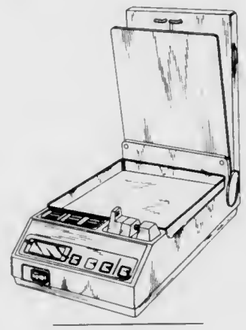
320,077
OPHTHALMOMETER OR SIMILAR ARTICLE
Hiroyuki Koizumi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 9, 1988, Ser. No. 230,121
Claims priority, application Japan, Feb. 12, 1988, 63-5422
Term of patent 14 years
U.S. Cl. D24—172



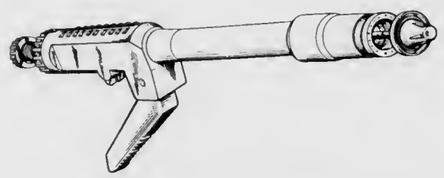
320,078
TRANSVAGINAL ULTRASOUND PROBE
Richard A. Terwilliger, San Ramon; Tjado Van Namen, Danville, and John T. Norberg, Pleasanton, all of Calif., assignors to Diasonics, Inc., Milpitas, Calif.
Filed Oct. 4, 1988, Ser. No. 253,723
Term of patent 14 years
U.S. Cl. D24—158



320,079
AUTOMATIC SEPARATOR FOR BLOOD COMPONENTS
Kenichi Kida, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed May 26, 1988, Ser. No. 199,021
Claims priority, application Japan, Dec. 1, 1987, 62-48904
Term of patent 14 years
U.S. Cl. D24—169



320,080
SURGICAL SUTURING GUN
Viktor A. Lipatov, ul. Profsojuznaya, 91-3-27, 117279, Moskva; Igor A. Guskov, ul. Tulinskaya, 10-1-80, 109033, Moskva, and Nikolai N. Kanshin, ul. Filevskaya, 68-10, 121433, Moskva, all of U.S.S.R.
Filed May 5, 1988, Ser. No. 200,319
Claims priority, application U.S.S.R., Nov. 20, 1987, 44508
Term of patent 14 years
U.S. Cl. D24—145

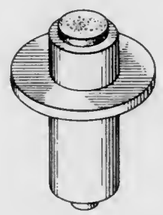




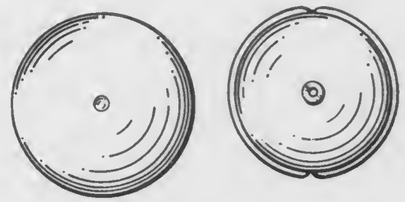
320,081
BIODEGRADABLE SURGICAL STAPLE
Lanny L. Johnson, 3800 S. Hagadorn Rd., Okemos, Mich. 48864
Filed Nov. 23, 1988, Ser. No. 275,551
Term of patent 14 years
U.S. Cl. D24—145



320,082
COMBINED GUARD AND INJECTION SITE FOR INTRAVENOUS INFUSION OR THE LIKE
Philip W. Wyatt, Glendale, and Michael R. Pescovitz, Saugus, both of Calif., assignors to Migada Inc., Burbank, Calif.
Filed Mar. 21, 1988, Ser. No. 171,522
Term of patent 14 years
U.S. Cl. D24—129



320,083
COMBINED EYEDROP DISPENSER AND COVER
William J. Casey, Palm Beach Gardens, Fla., assignor to Acorn Laboratories, Inc., Palm Beach Gardens, Fla.
Filed Jan. 3, 1989, Ser. No. 293,146
Term of patent 14 years
U.S. Cl. D24—115



320,084
VAGINAL APPLICATOR
Mark L. Stewart, and Irene Stewart, both of P.O. Box 347, Hannibal, Mo. 63401
Filed Feb. 9, 1989, Ser. No. 307,982
Term of patent 14 years
U.S. Cl. D24—141



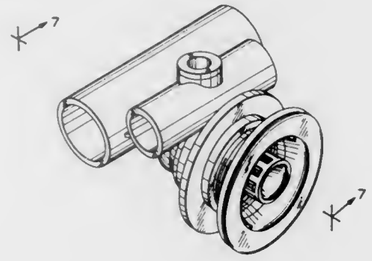
320,085
BABY FEEDER
Ernst Beranek, and Peter W. Röhrig, both of Vienna, Austria, assignors to MAM Babyartikel Gesellschaft mbH, Vienna, Austria
Filed Apr. 4, 1988, Ser. No. 177,016
Claims priority, application Austria, Oct. 9, 1987, 543849
Term of patent 14 years
U.S. Cl. D24—197



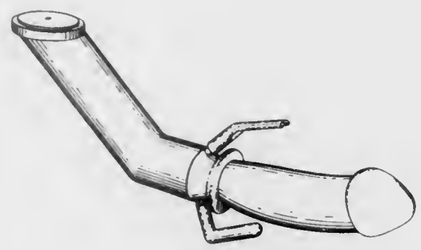
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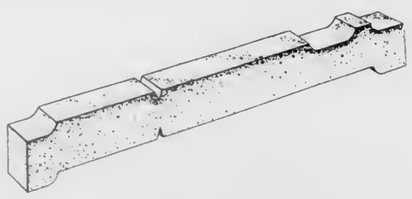
320,086
WHIRLPOOL JET NOZZLE FOR BATHTUBS OR THE LIKE
William L. Moeller, Allentown, N.J., assignor to American Standard Inc., New York, N.Y.
Filed Apr. 7, 1989, Ser. No. 335,156
Term of patent 14 years
U.S. Cl. D24—204




320,087
EROGENIC STIMULATOR
Steve Sholzberg, 3448 Griffith, St. Laurent, Quebec, Canada H4T 1A7 , and Gerald S. Sidel, 4586 Harvard, Montreal, Quebec, Canada H4A 2X2
Filed Apr. 11, 1989, Ser. No. 336,309
Term of patent 14 years
U.S. Cl. D24—215



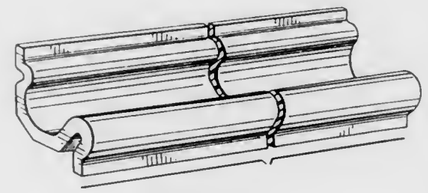
320,088
MODULAR BLOCK
Angelo Risi, and Antonio Risi, both of Richmond Hill, Canada, assignors to Rothbury Investments Limited, Gormley, Canada
Filed Jun. 16, 1989, Ser. No. 367,108
Claims priority, application Canada, Dec. 16, 1988, 16-12-88-8
Term of patent 14 years
U.S. Cl. D25—113



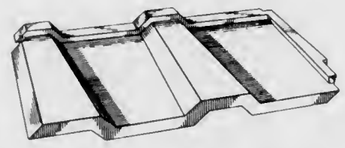
320,089
OVERHEAD DOOR WEATHERSTRIPPING
Tom Boer, 5409 Derry Road, Milton, Ontario, Canada
Filed Mar. 17, 1989, Ser. No. 327,501
Term of patent 14 years
U.S. Cl. D25—119



320,090
DECORATIVE MOULDING
Walter Ermellini, 512 Evans Avenue, Toronto, Ontario M8W 2T7, Canada
Filed Sep. 23, 1988, Ser. No. 254,111
Claims priority, application Canada, Apr. 5, 1988, 05-04-88-14
Term of patent 14 years
U.S. Cl. D25—136

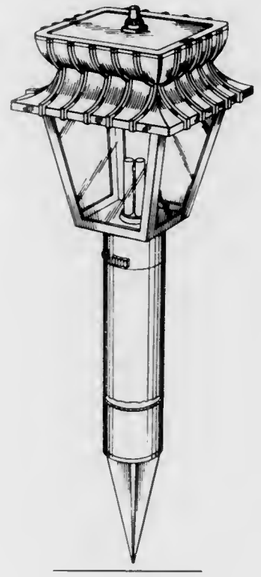


320,091
SHINGLE
Jean-Paul Paquette, 91, rang des Etangs, Saint-Jean Baptiste de Rouville, Province of Quebec, Canada J0L 2B0
Filed Dec. 24, 1987, Ser. No. 137,723
Term of patent 14 years
U.S. Cl. D25—139

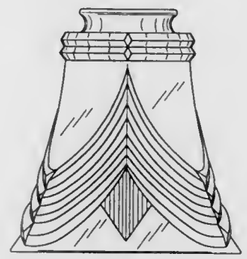




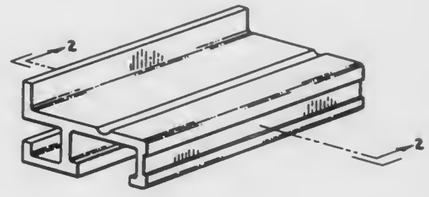
320,092
LANTERN
Kwok Hung Liu, Hong Hong, Hong Kong, assignor to Transistolite Mfg., Ltd., New Territories and Sol-Lite Mfg. Co., Ltd., Kowloon, both of, Hong Kong
Filed Jun. 13, 1989, Ser. No. 365,681
Claims priority, application United Kingdom, Dec. 13, 1988, 1055661
Term of patent 14 years
U.S. Cl. D26—68



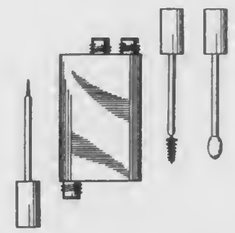
320,093
GLASS LAMP SHADE
Fran M. Dordick, Lyndhurst, Ohio, assignor to The L. D. Kichler Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 365,033, Jun. 12, 1989. This application Oct. 30, 1989, Ser. No. 428,738
Term of patent 14 years
U.S. Cl. D26—131



320,094
SUPPORTING CHANNEL FOR WALL MOUNTED TRACK LIGHTING SYSTEM
Ruth E. Miller, and Jack V. Miller, both of 700 N. Auburn Ave., Sierra Madre, Calif. 91024
Filed Aug. 10, 1989, Ser. No. 391,841
Term of patent 14 years
U.S. Cl. D26—140




320,095
COMBINED CONTAINER/BOTTLE AND COSMETIC WAND APPLICATORS OR THE LIKE
Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, and Gino H. Cassai, deceased, late of Brooklyn, N.Y. by Josephine Cassai, legal representative , assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 337,538, Apr. 14, 1989, Pat. No. 306,502, which is a division of Ser. No. 765,394, Aug. 14, 1985, abandoned. This application Aug. 23, 1989, Ser. No. 397,299
The portion of the term of this patent subsequent to Mar. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—7



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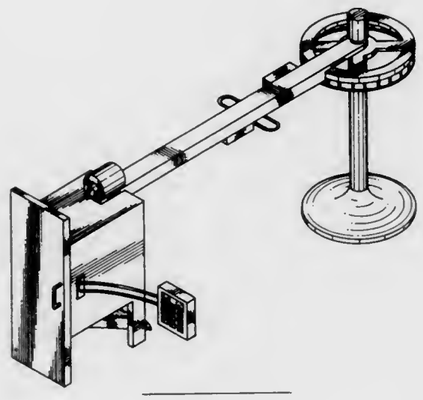
320,096
COMPACT
Isabelle Canovas, 39, rue de l'Université, 75007 Paris, France
Filed Apr. 17, 1989, Ser. No. 339,365
Claims priority, application France, Dec. 19, 1988, 88 7790
Term of patent 14 years
U.S. Cl. D28—83



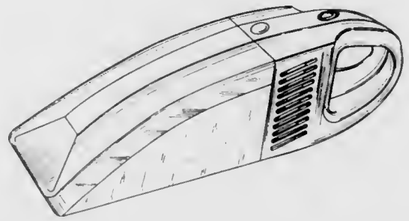
320,097
BIRD FEEDER
Thomas L. Vajtay, Somerset, N.J., assignor to SLM Manufacturing Corporation, Somerset, N.J.
Filed Feb. 22, 1990, Ser. No. 483,518
Term of patent 14 years
U.S. Cl. D30—127



320,098
AUTOMATED MACHINE FOR DELIVERING AND RECEIVING DRY CLEANING AND LAUNDRY
Sammy D. Lange, Rte. 9, Box 336, Lubbock, Tex. 79423
Filed May 19, 1987, Ser. No. 51,303
Term of patent 14 years
U.S. Cl. D32—6

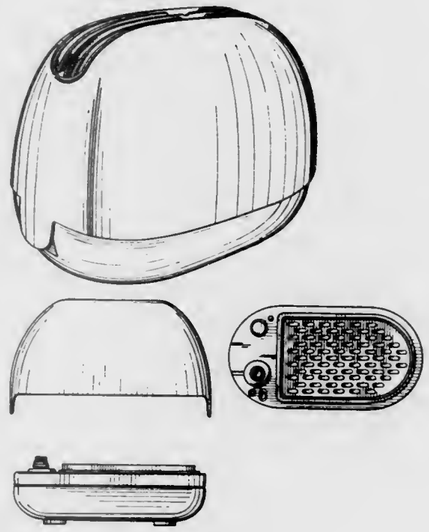


320,099
PORTABLE HAND HELD VACUUM CLEANER
Robert Case; James D. Morrow, and Michael J. Scola, all of Cook County, Ill., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Sep. 26, 1988, Ser. No. 249,083
Term of patent 14 years
U.S. Cl. 932—18

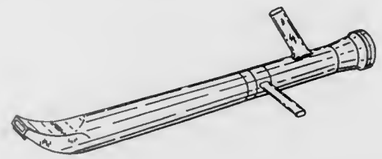




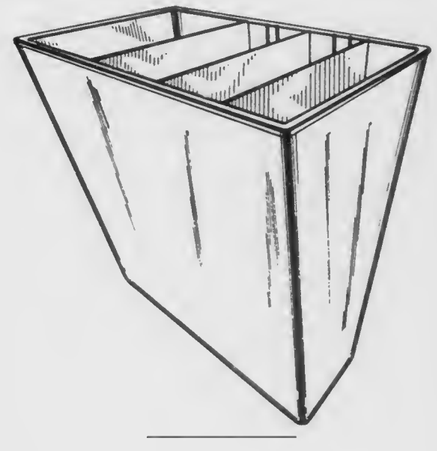
320,100
STEAM IRON CASE
Giuseppe Giannelli, Olgiate Comasco, Italy, assignor to Micromax S.p.A., Como, Italy
Filed Sep. 1, 1988, Ser. No. 240,899
Claims priority, application Italy, Mar. 1, 1988, 20760/88[U]
Term of patent 14 years
U.S. Cl. D32—73



320,101
PORTABLE BLOWER
Martin P. Gierke; Robert P. Straub, both of Baltimore, and Jonathan L. Miner, Timonium, all of Md., assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 13, 1987, Ser. No. 119,997
Term of patent 14 years
U.S. Cl. D32—15



320,102
REFUSE CONTAINER
James J. Harford, Jr., 601 Lake Dr., Princeton, N.J. 08540
Filed Apr. 13, 1989, Ser. No. 337,431
Term of patent 14 years
U.S. Cl. D34—1



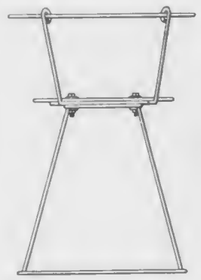
320,103
COMBINED TRASH CONTAINER AND DOLLY THEREFOR
Jordan E. Wilson, 967 Continental, Detroit, Mich. 48215
Filed Jan. 3, 1989, Ser. No. 293,147
Term of patent 14 years
U.S. Cl. D34—5

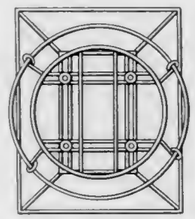


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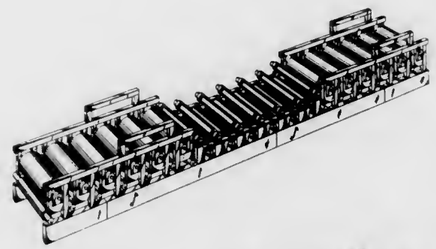


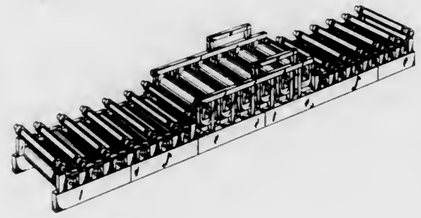
320,104
GARBAGE CAN RACK
Johnny G. Allen, 603 Cedar Ave., P.O. Box 3667, Albany, Ga. 31706
Filed Nov. 20, 1989, Ser. No. 438,233
Term of patent 14 years
U.S. Cl. D34—5





320,105
WEB DRYING SECTION
Borgeir Skaugen, and Gregory L. Wedel, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.
Division of Ser. No. 14,569, Feb. 13, 1987. This application Jun. 19, 1990, Ser. No. 540,420
Term of patent 14 years
U.S. Cl. D34—28





# LIST OF PATENTEES

TO WHOM

## PATENTS WERE ISSUED ON THE 17TH DAY OF SEPTEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Selvaagbygg: *See*—
Thorsnes, Ola O., 5,048,256, Cl. 52-730.000.
AB Profor: *See*—
Sjostrom, Anders, 5,049,336, Cl. 264-154.000.
AB Tetra Pak: *See*—
Kudo, Mutsuo; Traegaardh, Paul; and Gunji, Masaru, 5,048,267, Cl. 53-492.000.
AB Volvo Penta: *See*—
Rodskier, Christian, 5,048,291, Cl. 60-323.000.
Rodskier, Christian; and Borgersen, Kjell, 5,049,097, Cl. 440-52.000.
Abany International Corporation: *See*—
Essele, Klaus M., 5,049,425, Cl. 428-36.100.
Abazajian, Armen N., to Ethyl Corporation. Ethylene chain growth process. 5,049,687, Cl. 556-190.000.
ABB Air Preheater, Inc.: *See*—
Harder, William F., 5,048,595, Cl. 165-9.000.
Abbott Laboratories: *See*—
DeBernardis, John F.; Meyer, Michael D.; and Sippy, Kevin B., 5,049,564, Cl. 514-290.000.
Abbott, Terence S.; and Person, Lee H., Jr., to United States of America, National Aeronautics and Space Administration. Method and system for monitoring and displaying engine performance parameters. 5,050,081, Cl. 364-424.060.
Abdoo, David G., to Schlumberger Technologies, Inc. Apparatus for combining signals from first and second information processing elements. 5,050,170, Cl. 371-27.000.
Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Electronic coin acceptor. 5,048,663, Cl. 194-317.000.
Abe, Hiroyuki: *See*—
Yamada, Wataru; Kido, Yukio; Abe, Hiroyuki; Minami, Shunji; Katoh, Shigeru; and Yano, Junro, 5,050,138, Cl. 368-10.000.
Abe, Kiyoshi: *See*—
Okabayashi, Seiji; Watanabe, Hirofumi; Abe, Kiyoshi; and Ogawa, Masahide, 5,049,365, Cl. 423-245.100.
Abe, Kunihiro, to Fuji Jukogyo Kabushiki Kaisha. Diagnostic system for a motor vehicle. 5,050,080, Cl. 364-424.040.
Abe, Masaru; and Kohata, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Rear wheel steering method for a four wheel steering vehicle. 5,048,629, Cl. 180-140.000.
Abe, Masatoshi, to Nippon Mektron Limited. Fluorine-containing block copolymer. 5,049,622, Cl. 525-267.000.
Abel, Michael J., to Philip Morris Incorporated. Horizontal belt conveyor airlock. 5,049,007, Cl. 406-62.000.
Abellana, Jovito N.; and Buan, Danilo P., to Pitney Bowes Inc. Locking device for removable postage meter. 5,049,727, Cl. 235-101.000.
Abhiraman, Agaram S.: *See*—
Varaprasad, Desaraju V.; Abhiraman, Agaram S.; and Lawton, Ernest L., 5,049,338, Cl. 264-183.000.
Abichaker, David G.: *See*—
Repasi, Roger J.; Abichaker, David G.; and Premus, Jerry C., 5,049,510, Cl. 436-176.000.
Abraham, Donald J.; Mehanna, Ahmed; Randad, Ramnarayan; and Mahran, Mona, to Center for Innovative Technology; and Virginia Commonwealth University. Allosteric hemoglobin modifiers. 5,049,695, Cl. 560-27.000.
Abramson, Andrew E., to Research, Incorporated. Hingeable radiant heating structure. 5,049,725, Cl. 219-347.000.
Accaries, Claude; Ibis, Pierre; and Toprides, Henri. Needleless injection apparatus of a liquid, notably for dental care. 5,049,125, Cl. 604-70.000.
Ackeret, Peter, to Licinvest AG; and Licinvest AG. Apparatus for cyclic rearrangement of a sheet stack. 5,048,209, Cl. 40-511.000.
Acquaviva, Thomas: *See*—
Wierzewski, Ronald R.; Scarlata, Richard F.; Acquaviva, Thomas; and Matysek, James F., 5,048,813, Cl. 271-98.000.
Acushnet Limited: *See*—
Sanders, Mark A.; and Roberts, Derek D., 5,048,856, Cl. 280-646.000.
Adachi, Takeshi; Kurakake, Yasushi; Suzuki, Hideo; and Mizuno, Kotaro, to Yamaha Corporation. Tone visualizing apparatus. 5,048,390, Cl. 84-464.00R.
Adam, Jean-Marie, to Ciba-Geigy Corporation. Mixtures of dicyanobenzanthrone compounds. 5,049,161, Cl. 8-638.000.
Adamant Kogyo Co., Ltd.: *See*—
Komatsu, Masao, 5,048,917, Cl. 385-78.000.
Adams, Charles S.: *See*—
Fielding, Douglas R.; and Adams, Charles S., 5,048,882, Cl. 294-33.000.
Adams, John F.; Cochran, Michael A.; Folland, Rickworth; Nicholas, James W.; and Robinson, Melviny E. R., to CMB Foodcan plc. Packaging. 5,049,624, Cl. 525-371.000.
Ademovic, Martin, to High-Tech Medical Instrumentation, Inc. Dental drill integral camera and optics. 5,049,070, Cl. 433-29.000.
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Spanio, Marino, 5,048,366, Cl. 74-567.000.
Brembilla, Sandro; and Romani, Mario, to W. R. Grace & Co.-Conn. Vacuum packaging method and apparatus. 5,048,268, Cl. 53-511.000.
Brenci, Massimo: *See*—
Conforti, Giuliano; Brenci, Massimo; and Mencaglia, Andrea A., 5,048,958, Cl. 356-300.000.
Brenner, Heinrich, to Boge AG. Hydraulically damping bearing. 5,048,803, Cl. 267-140.100.
Brenner, Otto; Josefiak, Christoph; and Schuhmacher, Gunter, to Carl Freudenberg, Firma. Antimicrobial fitting for medical catheters and method for their application. 5,049,140, Cl. 604-266.000.
Bresson, Rene ; and Grossard, Guy, to S I M U. Double-glazing insulating panel. 5,048,245, Cl. 52-171.000.
Breton, Richard E.; and Staley, David B., to Harris Graphics Corporation. Folding and stacking apparatus. 5,049,123, Cl. 493-416.000.
Briand, Jacques; and Hall, Laurance D., to National Research Development Corporation. Magnetic resonance signal acquisition methods. 5,049,820, Cl. 324-309.000.
Bridgestone Corporation: *See*—
Chikaraishi, Toshio; Ieiri, Hidetoshi; Sugai, Kazuhiko; and Machara, Kazuto, 5,048,838, Cl. 273-228.000.
Goto, Naoyuki; and Ueda, Hiroshi, 5,048,583, Cl. 152-209.00R.
Kimura, Iwao; Toyonaga, Akira; Sanada, Koichi; Nonaka, Koji; and Haraga, Kenichi, 5,049,426, Cl. 428-36.200.
Nakano, Minoru; Goto, Akihito; and Nakamura, Yoichi, 5,048,584, Cl. 152-543.000.
Briggs & Stratton Corporation: *See*—
Dykstra, Richard A., 5,048,502, Cl. 123-602.000.
Brigham, Joseph P.: *See*—
Gaeth, Gerald A.; Brigham, Joseph P.; Herlache, Russell L.; and Sherrill, Steven W., 5,049,770, Cl. 310-89.000.
Brigham & Women's Hospital: *See*—
Popitz, Michael D., 5,048,136, Cl. 5-431.000.
Bringham, Richard L.; and Bell, R. Scott, to Baxter International, Inc. Blood/gas separator and flow system. 5,049,146, Cl. 604-4.000.
Brink, Donald E.: *See*—
Aldrich, Kathryn J.; and Brink, Donald E., 5,049,489, Cl. 435-6.000.
Briquetting Research and Design Institute, Beijing Graduate School of China University of Mining and Technology: *See*—
Huang, Zhongcheng; Wang, Peilan; and Lei, Xiaoxu, 5,049,163, Cl. 44-622.000.
British Gas plc: *See*—
McGuire, Brian E., 5,048,174, Cl. 29-451.000.
British Petroleum Company p.l.c., The: *See*—
Buddery, David L., 5,050,133, Cl. 367-91.000.
Bron Elektronik AG: *See*—
Bernhard, Jean-Francois, 5,048,955, Cl. 356-213.000.
Bron, Jan; Sterk, Geert J.; van der Werf, Jan F.; and Timmerman, Hendrik, to Cedona Pharmaceuticals B.V. Pharmaceutical composition having relaxing activity which contains a nitrate ester as active substance. 5,049,694, Cl. 558-480.000.
Bronkal, Bernhard, to Robert Bosch GmbH. Method and apparatus for reducing the residual injection fluid in an injection pump. 5,048,488, Cl. 123-467.000.
Brooks, Gerald L.: *See*—
Brooks, Lamar E.; and Brooks, Gerald L., 5,049,532, Cl. 501-148.000.
Brooks, Lamar E.; and Brooks, Gerald L., to Brooks, Lamar E. Method for surface treating thixotropic agents and the resultant low moisture thixotrope. 5,049,532, Cl. 501-148.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Akao, Michitoshi; Sonobe, Katsuyoshi; Sakaida, Kazuichi; Aoki, Nobuo; Uchiyama, Satoshi; and Igarashi, Hiroshi, 5,049,926, Cl. 355-55.000.
Hisada, Hidenori; Suzuki, Makoto; and Taira, Hiroshi, 5,049,918, Cl. 355-27.000.
Kuzuya, Susumu; Sonoda, Takauni; Tanabe, Kazunori; Sakai, Toshio; Taira, Hiroshi; Hattori, Tomoaki; Suzuki, Makoto; and Hisada, Hidenori, 5,049,922, Cl. 355-32.000.
Sakakibara, Kenji; Matsumoto, Yumio; and Nakata, Takashi, 5,049,919, Cl. 355-27.000.



Sangyoji, Kazuo; Yamamoto, Takemi; Higashiyama, Shunichi; Ueda, Masashi; Sago, Akira; Takagi, Osamu; Matsumoto, Yumio; and Hayakawa, Kiyoharu, 5,049,920, Cl. 355-27.000.
Sonobe, Katsuyoshi; Shindo, Tatsuya; Tomatsu, Yoshiya; Nishigaki, Hideo; Sakakibara, Kenji; Matsumoto, Yumio; and Shibata, Eiji, 5,049,921, Cl. 355-27.000.
Yoshida, Hitoshi; Kanegac, Takahiro; and Kawamoto, Naoyuki, 5,050,228, Cl. 382-55.000.
Brothers, Lance E.; Lindsey, Donald W.; and Terry, Dralen T., to Halliburton Company. Set retarded cement compositions and methods for well cementing. 5,049,288, Cl. 252-8.551.
Brotman, Charles J.; and Gottlieb, Mark. Portable, knockdown toilet kit. 5,048,130, Cl. 4-483.000.
Broughton, George L.; and Breckenfeld, Paul W., to Outboard Marine Corporation. Marine propulsion device with closed deck cylinder block construction. 5,048,468, Cl. 123-41.740.
Broughton, George L.: *See*—
Binversie, Gregory J.; Broughton, George L.; and Turk, Robert L., 5,049,101, Cl. 440-88.000.
Brown de Colstoun, Francois; Chambaret, Jean-Paul; Chambaret, Yves; le Saige de la Villesbrunne, Arnaud; and Moscovici, Jean-Claude. Method and system for detecting forest fires. 5,049,756, Cl. 254-554.000.
Brown, Donald L.: *See*—
Hrivnak, John E.; Brown, Donald L.; and Oblath, Richard M., 5,049,339, Cl. 264-210.800.
Brown, Dwight C. Plant support constructed for compact nesting. 5,048,231, Cl. 47-45.000.
Brown, Frederick J.: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 5,049,576, Cl. 514-407.000.
Brown, George B.; and Ankrom, Dennis M., to Xerox Corporation. Copy sheet de-registration device. 5,049,948, Cl. 355-319.000.
Brown, Graham K., to Magnatex Industries Pty. Limited. Magnesium cement composition with particulate fibrous material. 5,049,197, Cl. 106-685.000.
Brown, Ian E.: *See*—
Lever, Roland N. J.; and Brown, Ian E., 5,048,445, Cl. 114-222.000.
Brown, John K., III; Buchanan, James C.; Cole, Carl P.; and Bischel, Patrick O., to Lexmark International, Inc. Printer initialization system. 5,050,098, Cl. 364-519.000.
Brown, Thomas G. S. Sail handling system. 5,048,443, Cl. 114-104.000.
Brown, Thomas H.: *See*—
Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., 5,049,567, Cl. 514-313.000.
Brown, William S., to Rockwell International Corporation. Extendible nozzle. 5,048,289, Cl. 60-267.000.
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Brubaker, Richard A.: *See*—
Bohrn, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hosfeld, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 5,049,237, Cl. 162-157.200.
Bruchman, William C.; Bolton, Carl W.; and Bain, James R., to W. L. Gore & Associates, Inc. Prosthesis for tensile-load-carrying tissue and method of manufacture. 5,049,155, Cl. 623-17.000.
Bruckner, Volker; Bette, Willi; Friede, Dirk; and Cirkel, Hans-Jurgen, to Siemens Aktiengesellschaft. Multichannel pseudo-spark switch and excitation circuit for gas lasers having the switch. 5,050,178, Cl. 372-38.000.
Brun, Milivoj K.: *See*—
Borom, Marcus P.; Szala, Lawrence E.; Brun, Milivoj K.; Miller, Steven A.; and Mourer, David P., 5,048,732, Cl. 222-606.000.
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Pissiotas, Georg; Moser, Hans; and Brunner, Hans-Georg, 5,049,181, Cl. 71-90.000.
Brunner, Roland; Bauer-Mayer, Susanne; Griesshammer, Rudolf; and Kirschner, Helmut, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the hydrophilizing and/or cement-residue-removing surface treatment of silicon wafers. 5,049,200, Cl. 134-2.000.
Bryant, Andres: *See*—
Arnett, Patrick C.; Bryant, Andres; Foster, John S.; Frommer, Jane E.; and Iwata, Jon A. C., 5,049,461, Cl. 430-5.000.
BTG Kalle Inventing AB: *See*—
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Buan, Danilo P.: *See*—
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Buchanan, Bascom F.; and Buchanan, Joseph R., to ITT Corporation. Steam and fuel oil supply and purge valve with cooling steam feature. 5,048,563, Cl. 137-597.000.
Buchanan, James C.: *See*—
Brown, John K., III; Buchanan, James C.; Cole, Carl P.; and Bischel, Patrick O., 5,050,098, Cl. 364-519.000.
Buchanan, Joseph R.: *See*—
Buchanan, Bascom F.; and Buchanan, Joseph R., 5,048,563, Cl. 137-597.000.
Buchilly, Claude: *See*—
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Buckholtz, Harry E.: *See*—
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Buckler, Andrew J.; Roland, Richard A.; and Nerkowski, Christopher W., to Eastman Kodak Company. Production control system and method. 5,050,088, Cl. 364-468.000.
Buddery, David L., to British Petroleum Company p.l.c., The. Marine current determination. 5,050,133, Cl. 367-91.000.
Buhagiar, Francois: *See*—
Dortu, Giovanni; and Buhagiar, Francois, 5,050,211, Cl. 379-438.000.
Bujese, David P., to Olin Corporation. Electrostatic transfer device. 5,049,942, Cl. 355-272.000.
Bulatovic, Srdjan; Jessup, Tim M.; and Jackson, James F., to Falconbridge Limited. Depressant for flotation separation of polymetallic sulphidic ores. 5,049,612, Cl. 525-54.260.
Buljan, Sergej-Tomislav: *See*—
Huckabee, Marvin L.; Buljan, Sergej-Tomislav; and Neil, Jeffrey T., 5,049,530, Cl. 501-97.000.
Bull, S.A.: *See*—
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Bullen, Terence C.: *See*—
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Bunch, Earnest B., III, to B. Bunch Company, Inc. Continuous form stationery folding and cutting machine. 5,049,121, Cl. 493-357.000.
Bunczk, Charles J.; and Burke, Peter A., to Kiwi Brands Incorporated. Liquid lavatory cleansing and sanitizing composition. 5,049,299, Cl. 252-106.000.
Bunke, Paul R.: *See*—
Prosise, Robert L.; and Bunke, Paul R., 5,049,710, Cl. 219-10.55E.
Bunker, Keith G.: *See*—
Anderson, Karen K.; Daughton, John W.; Sklut, Robert L.; and Bunker, Keith G., 5,049,929, Cl. 355-204.000.
Burgio, Joseph T., Jr. Shutter system for shielding a coated substrate during a radiation-curing process. 5,048,198, Cl. 34-4.000.
Burk, Gerhard: *See*—
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Burle Technologies, Inc.: *See*—
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Burns, Gary T.: *See*—
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Burns, Larry E.: *See*—
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Burow, Wilfried; Hofs, Hans-Ulrich; Ganter, Karl-Werner; and Schulten, Gerd-Hermann, to Bayer Aktiengesellschaft. Color pure iron oxide pigments, a process for their preparation and their use. 5,049,195, Cl. 106-456.000.
Burr-Brown Corporation: *See*—
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Burroughs Wellcome Co.: *See*—
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Daluge, Susan M., 5,049,671, Cl. 544-276.000.
Burt, Edward A.; Burton, Lester P. J.; Ao, Meng-Sheng; and Stahly, Barbera C., to Ethyl Corporation. Process for transhalogenating a halophosphorous compound with anhydrous hydrogen fluoride. 5,049,691, Cl. 558-84.000.
Burt, Harold S.; and DiFalco, Benjamin P., to Mid-West Conveyor Co., Inc. Integrated conveyor system with transfer of trollies. 5,048,426, Cl. 104-88.000.
Burton, Lester P. J.: *See*—
Burt, Edward A.; Burton, Lester P. J.; Ao, Meng-Sheng; and Stahly, Barbara C., 5,049,691, Cl. 558-84.000.
Burzynski, Jean-Pierre: *See*—
Castel, Yvon; Lynch, John; and Burzynski, Jean-Pierre, 5,049,823, Cl. 324-640.000.
Bushnell, Andrew H.; Dunn, Joseph E.; and Clark, R. Wayne, to Foodco Corporation. High pulsed voltage systems for extending the shelf life of pumpable food products. 5,048,404, Cl. 99-451.000.
Bussard, Robert W.; and Coppi, Bruno, to FDX Patent Holding Company, N.V. Controlled thermonuclear fusion power apparatus and method. 5,049,350, Cl. 376-143.000.
Butkovich, George M.: *See*—
Orsborn, Jesse H.; Butkovich, George M.; Bessman, Thomas K.; and Link, John F., 5,048,273, Cl. 56-10.200.
Butler Manufacturing Company: *See*—
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Butler, Robert, to Science Accessories Corp. Position determining apparatus. 5,050,134, Cl. 367-118.000.
Buxbaum, Gunter: *See*—
Krockert, Bernd; Buxbaum, Gunter; Westerhaus, Axel; and Brunn, Horst, 5,049,193, Cl. 106-456.000.
Byers, DeAnne L.: *See*—
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C.S.U. Ltd.: *See*—
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C-Tec, Inc.: *See—*
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Cadwell, Robert M., to Dresser Industries, Inc. Method for controlling the sensitivity and linearity of capacitive transducer systems. 5,048,165, Cl. 29-25.410.
Cahoon, William L., to Mach Performance, Inc. Propeller hub assembly. 5,049,034, Cl. 416-134.00R.
Cain, Thomas A., to Filtertek, Inc. Fuel tank filter. 5,049,271, Cl. 210-250.000.
Cain, Thomas A.: *See—*
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Calcitek, Inc.: *See—*
Lueschen, Jeffrey D., 5,049,072, Cl. 433-173.000.
Caldwell, Mark A. Adjustable wrench. 5,048,380, Cl. 81-165.000.
Calhoun, Carl R. Valve seat and method of repair. 5,048,558, Cl. 137-407.000.
Calico Light Weapon Systems: *See—*
Davis, James C., 5,048,215, Cl. 42-72.000.
California Institute of Technology: *See—*
—Khosla, Chaitan S.; and Bailey, James E., 5,049,493, Cl. 435-69.100.
Callander, Douglas D.: *See—*
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Calvo, Jose L.: *See—*
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Camino Laboratories, Inc.: *See—*
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Campau, Daniel N., to Flow-Rite Controls, Ltd. Main valve and seat for use in filling containers to a predetermined level. 5,048,557, Cl. 137-386.000.
Campbell, Bradley J.; and Rosanio, Ronald R., to Hill Refrigeration Division of the Jepson Corporation. Open front refrigerated display case with improved ambient air defrost means. 5,048,303, Cl. 62-256.000.
Campbell, Bruce W.: *See—*
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Campbell, James W.: *See—*
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Campbell, John E.: *See—*
Bailey, Thomas F.; and Campbell, John E., 5,048,621, Cl. 175-74.000.
Campbell, Kenneth C.; Gray, Roger M.; and Kockler, Barry C., to Archive Corporation. Cartridge loader for loading each of a plurality of cartridges into a cartridge insertion slot. 5,050,020, Cl. 360-92.000.
Campbell, Van-De R. Tree trunk protector. 5,048,229, Cl. 47-24.000.
Campos, Manuel, to Ciba-Geigy Canada Ltd. Prevention and treatment of porcine haemophilus pneumonia (PHP). 5,049,378, Cl. 424-85.400.
Canada, Her Majesty the Queen in right of: *See—*
Herget, Gerhard H.; and Kapeller, Franz, 5,048,344, Cl. 73-784.000.
Cang, John N.; Gast, Joseph R.; Hensley, John J.; and Waldhelm, Christian M., to Solar Turbines Incorporated. Method of making and repairing turbine blades. 5,048,183, Cl. 29-889.100.
Cannon, Wayne C.; Donecker, S. Bruce; and Neering, Michael J., to Hewlett-Packard Company. Side-by-side displays for instrument having a data processing system. 5,050,107, Cl. 364-550.000.
Canon Kabushiki Kaisha: *See—*
Ayata, Naoki; Yamamura, Mitsugu; Hamasaki, Bunei; Kosugi, Masao; Takahashi, Kazuo; and Seki, Mitsuaki, 5,050,111, Cl. 364-559.000.
Horii, Hiroyuki; Yamagishi, Yoichi; Misumi, Hiroyoshi; and Takayama, Makoto, 5,050,003, Cl. 358-342.000.
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Satomura, Hiroshi; Egami, Hidemi; Sakemi, Yuji; and Miura, Yasushi, 5,049,472, Cl. 430-200.000.
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Kagami, Naoto, 5,050,005, Cl. 358-434.000.
Kanemaru, Tetsuro; Kikuchi, Toshihiro; Senoo, Akihiro; and Yashiro, Ryoji, 5,049,464, Cl. 430-59.000.
Menjo, Takeshi; Sakurai, Masaaki; Takeuchi, Tatsuo; and Nami, Yasuo, 5,049,943, Cl. 355-284.000.
Nakajima, Hiroharu; Suzuki, Naohisa; and Kumamoto, Michihisa, 5,048,988, Cl. 400-697.100.
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Saito, Rie, 5,049,934, Cl. 355-219.000.
Sato, Tetsuya; Kanome, Osamu; Yashima, Masataka; and Sugata, Hiroyuki, 5,048,745, Cl. 228-132.000.
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Suzuki, Akiyoshi, 5,048,968, Cl. 356-401.000.
Suzuki, Takayuki, 5,049,903, Cl. 346-135.100.
Cantoni, Antonio; and Newman, Robert M. Transfer of messages in a multiplexed system. 5,050,166, Cl. 370-94.100.
Cantor, Harvey I.; Patarca, Roberto M.; and Schwartz, Joel L., to Dana Farber Cancer Institute. Proteins which induce immunological effector cell activation and chemattraction. 5,049,659, Cl. 530-351.000.
Capek, Raymond G.; and Dougherty, Lawrence W., to Zenith Electronics Corporation. Mask support structure for tension mask color cathode ray tubes. 5,049,778, Cl. 313-407.000.
Capen, David A., to Vermont Maple Water, Inc. Potable water recovery and fluid preheater for syrup evaporator. 5,049,199, Cl. 127-9.000.
Capital Cities/ABC Video Systems, Inc.: *See—*
Weiley, John F., 5,050,031, Cl. 360-137.000.
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Cardamone, Tom. Interchangeable tape cutter. 5,048,738, Cl. 225-56.000.
Cardan, Alan. Fuel line conditioning apparatus. 5,048,498, Cl. 123-538.000.
Carden, L. Eugene; and Anderson, Richard N., to Hunter Douglas Inc. Fabric covered metal rail and method for producing same. 5,049,424, Cl. 428-35.800.
Cardiovascular Imaging Systems, Inc.: *See—*
Powell, Philip E., 5,049,130, Cl. 604-96.000.
Cardis, Angeline B.: *See—*
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Carey, David H.: *See—*
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Carl Edelmann GmbH: *See—*
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Carl Freudenberg, Firma: *See—*
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Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See—*
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Carlen, Eric T., 5,048,384, Cl. 82-170.000.
Carlen, Eric T., to Carlen Controls, Inc. Centering device. 5,048,384, Cl. 82-170.000.
Carlisi, Angelo. Self-cleaning kitty litter box. 5,048,465, Cl. 119-166.000.
Carlisle, Billy M., Jr. Universal accumulator. 5,048,309, Cl. 62-503.000.
Carlson, Michael E., to Irwin Magnetic Systems, Inc. Lead screw and follower-type head positioner for data recorders. 5,050,025, Cl. 360-106.000.
Carlsson, Lennart, to Onspot AB. Anti-skid device. 5,048,646, Cl. 188-4.00B.
Carlton, Raymond R. Circular saw blade with saw chain providing cutters. 5,048,389, Cl. 83-838.000.
Caron, Bernard G., to AMP Incorporated. Optical matrix switch for multiple input/output port configurations. 5,048,910, Cl. 385-17.000.
Caron, Bernard G., to AMP Incorporated. Fiber optic connection system. 5,048,916, Cl. 385-71.000.
Carpenter, Lester E.; Schmitt, Wayne I.; Snell, Laurence; and Bieber, David, to American Tourister, Inc. Luggage with pull handle. 5,048,649, Cl. 190-18.00A.
Carpenter Technology Corporation: *See—*
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Carr, Thomas D.; and Harrer, James R., to Eastman Kodak Company. Memory guided magnetic tape tracking. 5,050,017, Cl. 360-77.120.
Carrano, Thomas P.; and Petrucci, Raymond M., to Cuno, Inc. Filter apparatus having liquid control mechanism. 5,049,270, Cl. 210-248.000.
Carroll, David T. Teething brush. 5,048,143, Cl. 15-110.000.
Carson, Glenn S.; and Bender, Kermit W., to R. E. Wright Associates, Inc. Automatic well pump skimmer level control. 5,049,037, Cl. 417-36.000.
Carter, Thomas G., to IMO Industries, Inc. Thru wire helm assembly. 5,049,082, Cl. 439-15.000.
Carter, Warren E., to Molded Metal Services, Inc. Method and apparatus for forming battery terminal bushings. 5,048,590, Cl. 164-120.000.
Carty, Brocan: *See—*
Boyd, Hugh F.; Weldon, Michael T.; Coffey, Patrick J.; Carty, Brocan; and Kavanagh, Richard, 5,049,265, Cl. 210-150.000.
Caruso, Anthony A., to Easy Access Corporation. Exercise device for persons confined to wheel chair. 5,048,827, Cl. 272-130.000.
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Hanzawa, Kohtaro; Morikawa, Shigenori; and Nakamura, Kazuhisa, 5,050,216, Cl. 381-62.000.
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Forler, C. Richard, to E-P Corporation. Lamination repair method by installation of a substitute electrical heat sensor. 5,049,217, Cl. 156-64.000.

Forster, Albert J.; and Zeller, James J. Apparatus for transplanting plants. 5,048,434, Cl. 111-105.000.

Forsyth, Michael J.; and Wiedman, Craig C., to Weatherchem Corporation. Moisture-resistant dispensing top. 5,048,730, Cl. 222-482.000.

Fortune, William S. Solder-desolder modular station. 5,048,742, Cl. 228-20.000.

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Franek, Josef T.; Porucznik, Paul; Serby, Peter H.; and Tod, Christopher J. N., to CMB Foodcan plc. Methods of making containers. 5,049,019, Cl. 413-19.000.

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Hoppenstein, Reuben. Method and apparatus for creating three-dimensional television or other multi-dimensional images. 5,049,987, Cl. 358-88.000.
Hori, Ichiro: *See—*
Ueda, Shigeki; Nishimoto, Kaeko; Hori, Ichiro; Kurita, Hitoshi; and Akiyoshi, Mitsuo, 5,048,400, Cl. 99-332.000.
Hori, Kiyotaka: *See—*
Nakamura, Takashi; Hori, Kiyotaka; and Uchiyama, Kaoru, 5,049,915, Cl. 354-339.000.
Hori, Masayuki: *See—*
Morita, Kaoru; Uzawa, Toyonobu; Hori, Masayuki; and Noda, Toshiharu, 5,049,654, Cl. 530-307.000.
Horiguchi, Fumio: *See—*
Inoue, Satoshi; Nitayama, Akihiro; Sunouchi, Kazumasa; and Horiguchi, Fumio, 5,049,957, Cl. 357-23.600.
Horii, Hiroyuki; Yamagishi, Yoichi; Misumi, Hiroyoshi; and Takayama, Makoto, to Canon Kabushiki Kaisha. Image processing apparatus capable of displaying a plurality of screens. 5,050,003, Cl. 358-342.000.
Horii, Yoshiharu: *See—*
Yamaguchi, Yasuyoshi; Ozawa, Yasuhiko; Suzuki, Masataka; Sato, Akira; Asai, Yoshinori; Horii, Yoshiharu; and Shimaoka, Takashi, 5,049,940, Cl. 355-260.000.
Horikawa, Kazuo: *See—*
Ito, Wataru; Ohgoda, Makoto; Goto, Yasuhiko; and Horikawa, Kazuo, 5,049,748, Cl. 250-327.200.
Horimi, Iichiro: *See—*
Koda, Akihide; Kita, Jun'ichiro; Kaku, Yoshio; Horimi, Iichiro; and Sakamoto, Osami, 5,049,551, Cl. 514-50.000.
Horling, Peter: *See—*
Kunkel, Heinrich; Ernst, Horst; Haas, Roland; Herrmann, Gerhard; Horling, Peter; Mause, Elmar; Neder, Gunter; Olschewski, Armin; Stolz, Robert; Vogelsanger, Leo; and Brandenstein, Manfred, 5,049,115, Cl. 474-166.000.
Horne, Randy C.: *See—*
Parnas, Stanley J.; Sutter, Leroy V., Jr.; Horne, Randy C.; Wessels, Robert A., Jr.; Rey, Celestino; and Andrews, Jack E., 5,049,721, Cl. 219-121.680.
Hornsby, Howard C.: *See—*
Escue, Nelson B.; Bolding, Vance E.; and Hornsby, Howard C., 5,049,046, Cl. 417-411.000.
Horsk Hydro A.S.: *See—*
Larm, Karl O. P.; Adolfsson, Lars A.; and Olsson, Kjell P., 5,049,403, Cl. 427-2.000.
Horton, Ralph M.; Anthon, Royce A.; and Hoggins, James T., to Norton Company. Multilayer coated abrasive element for bonding to a backing. 5,049,164, Cl. 51-295.000.
Hoscheler, Arnulf, to Hydromatik GmbH. Hydrostatic transmission. 5,048,295, Cl. 60-461.000.
Hosfeld, Lewis K.: *See—*
Bohrn, Walter J.; Brubaker, Richard A.; Garman, Shelly N.; Hosfeld, Lewis K.; Ko, Kenneth K.; and Tymon, Thomas M., 5,049,237, Cl. 162-157.200.
Hoshida, Shigehiro: *See—*
Amano, Tadashi; and Hoshida, Shigehiro, 5,049,631, Cl. 526-204.000.
Hoshino, Hiroyasu, to Elm Industry Co., Ltd. Automatic stamper. 5,048,414, Cl. 101-93.180.
Hoshino, Masaru; and Nose, Hiroaki, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus and system for inspecting wall thickness of synthetic resin containers. 5,049,750, Cl. 250-341.000.
Hoshino, Ryoichi: *See—*
Motohashi, Tutomu; Nobusue, Mitsuru; Kodachi, Noboru; Hoshino, Ryoichi; and Sasaki, Hironaka, 5,048,602, Cl. 165-173.000.
Hoshizaki Denki Kabushiki Kaisha: *See—*
Wakatsuki, Yuji; Kondo, Shigekazu; Takaoka, Mitsuyuki; and Suzuki, Nobuya, 5,048,306, Cl. 62-419.000.
Hosler, Klaus: *See—*
Tax, Hans; and Hosler, Klaus, 5,048,703, Cl. 212-153.000.
Hosome, Kazunari: *See—*
Kishida, Teruhiko; Iida, Syuji; Hosome, Kazunari; Tomatu, Kazuya; and Tachibana, Tosizi, 5,049,063, Cl. 431-78.000.
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Satomura, Hiroshi; Egami, Hidemi; Sakemi, Yuji; and Miura, Yasushi, to Canon Kabushiki Kaisha. Method and apparatus of recording image. 5,049,472, Cl. 430-200.000.

Hosonuma, Kunihiko; Naito, Yasushi; and Inada, Ryoichi, to Kyodo Oil Technical Research Co., Ltd. Apparatus for detecting deterioration of engine oil. 5,049,742, Cl. 250-301.000.
Hostetler, Robert H., to Avtron Inc. Hanger for water supply system and method of installation. 5,048,462, Cl. 119-72.000.
Hotta, Tohru: *See*—
Kyono, Tetsuyuki; Hanano, Tohru; and Hotta, Tohru, 5,049,419, Cl. 427-251.000.
Houba, Inc.: *See*—
Krsek, George, 5,049,683, Cl. 550-206.000.
Houk, Theodore L., to Boeing Company, The. Residue addition overflow detection processor. 5,050,120, Cl. 364-746.000.
Howald, Gerald. Guide rail assembly. 5,048,586, Cl. 160-168.100.
Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Impact resistant filler-containing polymer/elastomeric fiber composites. 5,049,597, Cl. 523-457.000.
Howard, John R.; and Delargy, Anne M., to E. R. Squibb & Sons, Inc. Pharmaceutical composition containing high drug load and method for preparing same. 5,049,394, Cl. 424-490.000.
Howe, Michael G.; Arthur, James C.; and Usleman, Robert T., to Arvin Industries, Inc. Tuned exhaust processor assembly. 5,048,287, Cl. 60-288.000.
Howell, James: *See*—
Hampton, Duane R.; Wagner, Ross; and Howell, James, 5,048,334, Cl. 73-290.00R.
Howell, Ronald L., to Sid Richardson Carbon & Gasoline Co. Control of a carbon black reactor. 5,049,369, Cl. 423-450.000.
Howland, John J.: *See*—
Trapasso, Timothy; and Howland, John J., 5,048,643, Cl. 187-8.410.
Hoyer, Ann I.: *See*—
Wade, Charles E., 5,050,052, Cl. 362-101.000.
Hoyland Fox Limited: *See*—
Gray, Martin, 5,048,152, Cl. 16-110.00R.
Hrivnak, John E.; Brown, Donald L.; and Oblath, Richard M., to Goodyear Tire & Rubber Company, The. Process for manufacturing industrial yarn. 5,049,339, Cl. 264-210.800.
Hruby, Victor J.; Hadley, Mac E.; Dorr, Robert; Levine, Norman; Sugg, Elizabeth; and Cody, Wayne L., to University Patents, Inc. Composition for stimulating integumental melanocytes. 5,049,547, Cl. 514-14.000.
Hsiung, Charles J. Dual mode camera. 5,049,910, Cl. 354-210.000.
Hsu, Angela. Illumination apparatus adjusting structure. 5,050,054, Cl. 362-285.000.
Hsu, Chi-Hsueh; Yang, Wen Li; Chuang, Shien-Yu; and Yue-Weilee, David. Filter and method of treating tobacco smoke to reduce materials harmful to health. 5,048,546, Cl. 131-331.000.
Hsu, Wen-Liang: *See*—
Hahn, Bruce R.; Hsu, Wen-Liang; Callander, Douglas D.; and Halasa, Adel F., 5,049,620, Cl. 525-152.000.
Huang, Alvin S.; Nicholson, Myron D.; and Ramagopal, Rama, to Viskase Corporation. Edible food product. 5,049,399, Cl. 426-87.000.
Huang, Chao; and Norton, Paul R., to Santa Barbara Research Center. Control of optical crosstalk between adjacent photodetecting regions. 5,049,962, Cl. 357-30.000.
Huang, Zhongcheng; Wang, Peilan; and Lei, Xiaoxu, to Briquetting Research and Design Institute, Beijing Graduate School of China University of Mining and Technology. Process for reducing sulphur dioxide emission from burning coal containing sulphur. 5,049,163, Cl. 44-622.000.
Huck Manufacturing Company: *See*—
Nordyke, Keith D., 5,049,016, Cl. 411-361.000.
Huckabee, Marvin L.; Buljan, Sergej-Tomislav; and Neil, Jeffrey T., to GTE Laboratories Incorporated. Power mixture and green body for producing silicon nitride base & articles of high fracture toughness and strength. 5,049,530, Cl. 501-97.000.
Hudson Associates, Inc.: *See*—
Hagenlocher, Thomas K.; Linnig, Karl-Heinz; Toomey, Michael P.; Hudson, Donald L.; and Bolen, David T., 5,048,302, Cl. 62-228.400.
Hudson, Donald L.: *See*—
Hagenlocher, Thomas K.; Linnig, Karl-Heinz; Toomey, Michael P.; Hudson, Donald L.; and Bolen, David T., 5,048,302, Cl. 62-228.400.
Hudson, John A.: *See*—
Chevalier, Raymond P.; Lacman, Joseph J.; and Hudson, John A., 5,049,138, Cl. 604-265.000.
Huels Aktiengesellschaft: *See*—
Hildebrand, Thomas, 5,049,602, Cl. 524-95.000.
Huggins, Thomas B., Sr.; Roberts, Elwyn; and Edmunds, Melvin O., to Westinghouse Electric Corp. Nuclear fuel pellet transfer escalator. 5,048,666, Cl. 198-431.000.
Hughes Aircraft Company: *See*—
Efron, Uzi; Soffer, Bernard H.; Lind, Richard C.; Pepper, David M.; and O'Meara, Thomas R., 5,048,935, Cl. 359-36.000.
Hyman, Julius, Jr.; Beattie, John R.; Matossian, Jesse N.; Wu, Owen K.; Lam, Juan F.; and Anderson, Lawrence, 5,048,457, Cl. 118-723.000.
Krumm, Charles F., 5,049,971, Cl. 357-55.000.
Madhusudhan, Chilengi P., 5,049,234, Cl. 156-644.000.
No, Jong-Seon, 5,050,191, Cl. 375-94.000.
Pines, Michael Y.; Demas, Themi H.; and Schaefer, Robert D., 5,049,740, Cl. 250-235.000.
Siering, Erik R., 5,048,771, Cl. 244-3.150.
Stanchina, William E.; and Larson, Lawrence E., 5,049,522, Cl. 437-62.000.
Hughes, Frederick R.; Rintz, Carlton L.; Sergeant, Ronald G.; and Zemlin, Karl E., to Burle Technologies, Inc. Worm gear lubrication retainer and transfer apparatus. 5,048,363, Cl. 74-467.000.
Hughes, John L., to Phased Array Lasers Pty Ltd. Looped, phased array laser oscillator. 5,050,173, Cl. 372-6.000.
Huignard, Jean-Pierre: *See*—
Ayral, Jean-Luc; and Huignard, Jean-Pierre, 5,050,175, Cl. 372-21.000.
Hull, Harry F.; and Da Silva, Ivan P. Electrolytic processing apparatus and method with time multiplexed power supply. 5,049,246, Cl. 204-43.100.
Hull, Michael. Recreational raft apparatus. 5,049,102, Cl. 441-41.000.
Humphrey, Michael T.: *See*—
Wolfe, James G.; and Humphrey, Michael T., 5,049,333, Cl. 264-109.000.
Humphries, Eric H., to Board of Regents, The University of Texas System. Chicken-derived immunoglobulin-producing cell lines. 5,049,502, Cl. 435-240.200.
Hungerford, Charles S., Jr. Device for supporting a plurality of pipes in parallel relationship within a defined space. 5,048,775, Cl. 248-62.000.
Hunns, Jeremy C. B.: *See*—
Lywood, Warwick J.; Hunns, Jeremy C. B.; and Davidson, Peter J., 5,048,284, Cl. 60-39.020.
Hunt, Kenneth E.: *See*—
Duncan, Jerry R.; Hunt, Kenneth E.; and Hayes, Eugene G., 5,048,638, Cl. 180-307.000.
Hunt, Robert J.; and Crockard, Kenneth F., to James Mackie & Sons Limited. Drawing machines. 5,048,282, Cl. 57-267.000.
Hunter Douglas Inc.: *See*—
Carden, L. Eugene; and Anderson, Richard N., 5,049,424, Cl. 428-35.800.
Hunter, Thomas H.: *See*—
Chung, Chang-Hwa; Hunter, Thomas H.; and Haskell, Robert H., Jr., 5,049,087, Cl. 439-259.000.
Huppi, Karl. Floor-cleaning machine with improved brush pressure control. 5,048,141, Cl. 15-49.100.
Hurst, Mark P. Mediated strategy game. 5,048,839, Cl. 273-240.000.
Hurwitz, Robert. Method of using an amniocentesis needle with improved sonographic visibility. 5,048,530, Cl. 128-662.050.
Hussain, Yousif A.; and Machacek, Milos J., to Foxboro Company, The. Electromagnetic driver and sensor. 5,048,350, Cl. 73-861.380.
Hutai, Hubert: *See*—
Willy, Gerd; Hutai, Hubert; Schwuchow, Norbert; and Burk, Gerhard, 5,048,888, Cl. 296-189.000.
Hutchings, Phillip D., to Power-Tech Systems Corporation. Universal battery charging system and a method. 5,049,804, Cl. 320-20.000.
Huth, Hans-Ullrich; Braun, Helmut; and Konig, Franz, to Hoechst AG. Aqueous biocidal cationic dispersions of polymers and their use as fungicidal, bactericidal and algicidal treatment agents. 5,049,383, Cl. 424-405.000.
Hwang, Kyu B., to Hyundae Precision Co., Ltd. Set screw fixing device for spring hinge. 5,048,155, Cl. 16-301.000.
Hydromatik GmbH: *See*—
Hoscheler, Arnulf, 5,048,295, Cl. 60-461.000.
Hyman, Julius, Jr.; Beattie, John R.; Matossian, Jesse N.; Wu, Owen K.; Lam, Juan F.; and Anderson, Lawrence, to Hughes Aircraft Company. Plasma/radiation assisted molecular beam epitaxy method and apparatus. 5,048,457, Cl. 118-723.000.
Hyundae Precision Co., Ltd.: *See*—
Hwang, Kyu B., 5,048,155, Cl. 16-301.000.
Ian, Richard: *See*—
Gerritsen, Hendrick J.; Ian, Richard; King, Elisabeth W.; Thornton, Donald K.; and Weber, Sally N., 5,048,925, Cl. 359-569.000.
IAP Research, Inc.: *See*—
Challita, Antonios; and Bauer, David P., 5,049,771, Cl. 310-219.000.
Ibis, Pierre: *See*—
Accaries, Claude; Ibis, Pierre; and Toprides, Henri, 5,049,125, Cl. 604-70.000.
Ichie, Takamichi, to Furukawa Electric Co., Ltd., The. Communication system equipped with an AC coupling receiver circuit. 5,050,187, Cl. 375-36.000.
Ichijima, Seiji; and Sakanoue, Kei, to Fuji Photo Film Co., Ltd. Color light-sensitive material. 5,049,474, Cl. 430-223.000.
Ichikawa, Hiroshi: *See*—
Inoue, Tai; Ohshima, Tsuyoshi; Ohtsuka, Tatsumi; and Ichikawa, Hiroshi, 5,048,927, Cl. 359-618.000.
Ichikawa, Makoto, to Fujimori Kogyo Co., Ltd. Method for sealing gas release valve. 5,048,846, Cl. 277-1.000.
Ichikawa, Shinichiro: *See*—
Fukuda, Minoru; and Ichikawa, Shinichiro, 5,049,741, Cl. 250-239.000.
Ichikoh Industries, Ltd.: *See*—
Nakata, Yutaka, 5,049,177, Cl. 65-93.000.
Ichinomiya, Keiji: *See*—
Itsuki, Yuji; and Ichinomiya, Keiji, 5,049,779, Cl. 313-486.000.
Ichiryuu, Ken: *See*—
Sato, Kazuo; Kanda, Hiroshi; Kato, Shigeo; Imai, Kuninori; Shiokawa, Takeji; Tanaka, Shinji; Ishikawa, Isao; Onozato, Harumasa; Hashimoto, Hisayoshi; Tamura, Morio; Hatano, Kazuyoshi; Sato, Fujio; Ichiryuu, Ken; Tanaka, Kiyoshi; and Kawanuma, Takao, 5,050,137, Cl. 367-150.000.
ICI Americas Inc.: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 5,049,576, Cl. 514-407.000.
Bernstein, Peter R., 5,049,679, Cl. 548-491.000.



Scher, Herbert B.; Rodson, Marius; Calvo, Jose L.; and Gimeno, Miguel, 5,049,182, Cl. 71-93.000.
ICI Pharma: *See*—
Bradbury, Robert H.; Jung, Frederic H.; Lohmann, Jean J.; Marsham, Peter R.; and Pasquet, Georges, 5,049,558, Cl. 514-202.000.
Idaho Research Foundation: *See*—
Park, Jin Y.; and Kearney, Robert J., 5,049,540, Cl. 505-1.000.
Ide, Katsuyuki: *See*—
Imamura, Hitoshi; Nakajima, Jyunichi; Okada, Shigeru; and Ide, Katsuyuki, 5,049,781, Cl. 313-634.000.
Ide, Russell D. Hermetically sealed progressive cavity drive train for use in downhole drilling. 5,048,622, Cl. 175-107.000.
Ide, Russell D. Modular drop-in sealed bearing assembly for downhole drilling motors. 5,048,981, Cl. 384-607.000.
Idemitsu Kosan Co., Ltd.: *See*—
Miyaji, Tomomi; and Kido, Masahiko, 5,049,291, Cl. 252-33.000.
Ido, Toshimitsu: *See*—
Kaiya, Kazuo; and Ido, Toshimitsu, 5,049,066, Cl. 431-352.000.
Ieiri, Hidetoshi: *See*—
Chikaraishi, Toshio; Ieiri, Hidetoshi; Sugai, Kazuhiko; and Machara, Kazuto, 5,048,838, Cl. 273-228.000.
Ife, Robert J.; Brown, Thomas H.; and Leach, Colin A., to SmithKline Beckman Intercredit B.V. Substituted 4-aminoquinazoline derivatives and method of use. 5,049,567, Cl. 514-313.000.
Igarashi, Hiroshi: *See*—
Akao, Michitoshi; Sonobe, Katsuyoshi; Sakaida, Kazuichi; Aoki, Nobuo; Uchiyama, Satoshi; and Igarashi, Hiroshi, 5,049,926, Cl. 355-55.000.
Igarashi, Kimio: *See*—
Yamamoto, Saburo; and Igarashi, Kimio, 5,050,106, Cl. 364-550.000.
Ignagni, Mario B., to Honeywell Inc. Dither signal remover for a dithered ring laser gyro. 5,048,963, Cl. 356-350.000.
Iida, Syuji: *See*—
Kishida, Teruhiko; Iida, Syuji; Hosome, Kazunari; Tomatu, Kazuya; and Tachibana, Tosizi, 5,049,063, Cl. 431-78.000.
Iijima, Yutaka, to Duplo Corporation. Multi-color printing apparatus. 5,048,416, Cl. 101-115.000.
Iitsuka, Takeshi: *See*—
Shinagawa, Kenji; and Iitsuka, Takeshi, 5,049,773, Cl. 310-254.000.
Ikeda Bussan Co., Ltd.: *See*—
Tanaka, Yuji; Kuwabara, Isao; and Chinomi, Isamu, 5,048,786, Cl. 248-429.000.
Ikeda, Hietoshi, to Kabushiki Kaisha Toshiba. Information disc apparatus. 5,050,150, Cl. 369-44.270.
Ikeda, Mitsuakira, to Nippon Sheet Glass Co., Ltd. Non-contact machining of spherical surface. 5,048,238, Cl. 51-317.000.
Ikeda, Osamu; and Egami, Kazunari, to NEC Corporation. Apparatus for recognizing address appearing on mail article. 5,050,218, Cl. 382-1.000.
Ikeda, Takahide: *See*—
Watanabe, Atsuo; Ikeda, Takahide; Tsukuda, Kiyoshi; Hirao, Mitsuru; Mukai, Touji; and Kamei, Tatsuya, 5,049,967, Cl. 357-42.000.
Ikegami Tsushinki Co., Ltd.: *See*—
Kosaka, Kenji; and Yasu, Yoshikazu, 5,048,819, Cl. 271-288.000.
Illinois Tool Works, Inc.: *See*—
Prickett, Tomm; and Nation, Melvin S., 5,049,709, Cl. 200-527.000.
Imai, Kuninori: *See*—
Sato, Kazuo; Kanda, Hiroshi; Kato, Shigeo; Imai, Kuninori; Shiokawa, Takeji; Tanaka, Shinji; Ishikawa, Isao; Onozato, Harumasa; Hashimoto, Hisayoshi; Tamura, Morio; Hatano, Kazuyoshi; Sato, Fujio; Ichiryuu, Ken; Tanaka, Kiyoshi; and Kawanuma, Takao, 5,050,137, Cl. 367-150.000.
Imai, Kunio: *See*—
Fujimoto, Yoshihisa; Motoki, Yoshihiro; Ueji, Kazufumi; and Imai, Kunio, 5,049,596, Cl. 523-427.000.
Imai, Teruaki: *See*—
Orii, Makoto; Hayashi, Katsuhiko; and Imai, Teruaki, 5,048,151, Cl. 16-64.000.
Imaje (SA): *See*—
Dunand, Alain; and Margaillan, Eric, 5,049,899, Cl. 346-1.100.
Imamura, Hitoshi; Nakajima, Jyunichi; Okada, Shigeru; and Ide, Katsuyuki, to Toshiba Lighting and Technology Corporation. Discharge lamp. 5,049,781, Cl. 313-634.000.
Imamura, Takashi: *See*—
Tsujita, Satoshi; Tonomura, Manabu; Kayane, Shigeto; and Imamura, Takashi, 5,049,375, Cl. 424-52.000.
IMO Industries, Inc.: *See*—
Carter, Thomas G., 5,049,082, Cl. 439-15.000.
Imperial Chemical Industries plc: *See*—
Beck, Michael W.; Harding, Malcolm D.; and Rowe, Anthony J., 5,048,420, Cl. 102-275.300.
Bradbury, Robert H.; Jung, Frederic H.; Lohmann, Jean J.; Marsham, Peter R.; and Pasquet, Georges, 5,049,558, Cl. 514-202.000.
Hendy, Brian N., 5,049,642, Cl. 528-171.000.
Kelland, John W., 5,049,534, Cl. 502-107.000.
Lywood, Warwick J.; Hunns, Jeremy C. B.; and Davidson, Peter J., 5,048,284, Cl. 60-39.020.
Robson, Michael J.; and Spinney, Mark A., 5,049,585, Cl. 514-531.000.
Ina, Hideki: *See*—
Suzuki, Akiyoshi; and Ina, Hideki, 5,048,967, Cl. 356-401.000.
Inada, Ryoichi: *See*—
Hosonuma, Kunihiko; Naito, Yasushi; and Inada, Ryoichi, 5,049,742, Cl. 250-301.000.
Inai, Masayuki: *See*—
Akanabe, Yuichi; Inai, Masayuki; Niu, Takashi; Katsuta, Tsuyoshi; Kaneniwa, Tatsuya; and Shiraishi, Yasuhito, 5,050,007, Cl. 358-451.000.
Inami, Yasuhiko: *See*—
Sugihara, Takashi; Uda, Kazutaka; Tabuchi, Hiroki; Miyoshi, Shuji; Inami, Yasuhiko; Hashizume, Nobuo; and Furubayashi, Hisatoshi, 5,048,336, Cl. 73-336.500.
Inamoto, Kiyoshi: *See*—
Okano, Tokiyuki; Shimazawa, Yoichi; Sohda, Kazunori; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; and Tokishige, Masato, 5,049,930, Cl. 355-206.000.
Indak Manufacturing Corp.: *See*—
Cummings, John G., 5,049,705, Cl. 200-16.00C.
Indspec Chemical Corporation: *See*—
Hood, Richard T.; and Lamars, Robert M., 5,049,641, Cl. 528-155.000.
Industrial Technology Research Institute: *See*—
Kuo, Jui-Yuan; and Sung, Chia-Pin, 5,049,524, Cl. 437-169.000.
Kuo, Sher-Cherng; Fang, Chin-Hen; and Lai, Yu-Hsiang, 5,048,953, Cl. 356-153.000.
Infusaid, Inc.: *See*—
Olive, Peter, 5,049,141, Cl. 604-891.100.
Ingersoll-Rand Company: *See*—
Presnell, J. D.; and Phelps, David C., 5,049,171, Cl. 55-338.000.
Inland Steel Company: *See*—
Landreth, Ronald R.; and Anderson, Lee R., 5,048,431, Cl. 110-343.000.
Innova Champion Discs, Inc.: *See*—
Dunipace, David B., 5,048,845, Cl. 273-400.000.
Inoguchi, Toshio: *See*—
Yoshimoto, Yoshikazu; Suzuki, Tomonari; Higashigaki, Yoshiyuki; Nakajima, Shigeo; and Inoguchi, Toshio, 5,049,409, Cl. 427-122.000.
Inose, Takanori; and Sasaki, Shin, to Sony Corporation. Lid lock member tape cassette with light leading. 5,050,029, Cl. 360-132.000.
Inoue, Masayuki: *See*—
Kobayashi, Tatsunori; and Inoue, Masayuki, 5,048,388, Cl. 83-504.000.
Inoue, Michiya; and Yamauchi, Takashi, to Fanuc Ltd. PLC device having combined hardware and software input filtering. 5,050,118, Cl. 364-724.010.
Inoue, Minoru, to Fujitsu Limited. Sputtering method for fabricating thin film. 5,049,251, Cl. 204-192.120.
Inoue, Satoshi; Nitayama, Akihiro; Sunouchi, Kazumasa; and Horiguchi, Fumio, to Kabushiki Kaisha Toshiba. MOS type dynamic random access memory. 5,049,957, Cl. 357-23.600.
Inoue, Tai; Ohshima, Tsuyoshi; Ohtsuka, Tatsumi; and Ichikawa, Hiroshi, to Yazaki Corporation. Indication display unit for vehicles. 5,048,927, Cl. 359-618.000.
Inoue, Yoshio, to Shin-Etsu Chemical Co., Ltd. Room temperature-curable organopolysiloxane composition. 5,049,635, Cl. 528-18.000.
Institut de Recherches de la Siderurgie Francaise (IRSID): *See*—
Bourge, Michel; Engler, Gilbert; and Maurer, Ghislain, 5,050,185, Cl. 373-104.000.
Institut Francais du Petrole: *See*—
Castel, Yvon; Lynch, John; and Burzynski, Jean-Pierre, 5,049,823, Cl. 324-640.000.
Institute of Paper Science and Technology, Inc.: *See*—
Dimmel, Donald R.; and Wozniak, John C., 5,049,236, Cl. 162-16.000.
Intel Corporation: *See*—
Castro, Hernan A., 5,050,123, Cl. 365-53.000.
Leonov, Mark A., 5,048,195, Cl. 33-645.000.
Myers, Mark S.; and Riggs, Eileen, 5,050,066, Cl. 364-200.000.
Young, Ian A.; and Greason, Jeffrey K., 5,049,765, Cl. 307-446.000.
Intel Corporation, Inc.: *See*—
Tzeng, Jyh-Cherng J., 5,049,515, Cl. 437-43.000.
Interlab, Inc.: *See*—
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Nakaniwa, Shinpei, to Japan Electronic Control Systems Co., Ltd. Method and apparatus for controlling supply of fuel into internal combustion engine. 5,050,084, Cl. 364-431.070.
Nakano, Kazuhiko; Murase, Mitsutoshi; Matsuda, Norio; and Murakami, Hideaki, to Sumitomo Chemical Co., Limited. Aluminum nitride powder and process for preparation of the same. 5,049,367, Cl. 423-412.000.
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Okubo, Junya; Kuramoto, Kazukuni; and Ohkubo, Shinji. Method of cultivating *agaricus blazei* mushroom. 5,048,227, Cl. 47-1.100.

Okuda, Haruo: *See—*
Sakamoto, Masashi; Okuda, Haruo; Koike, Setuo; and Yamasaki, Yasuo, 5,049,309, Cl. 252-313.100.

Okuda, Hiroshi; and Kamoshita, Kyoichi, to Mitsubishi Denki Kabushiki Kaisha; and Tohatsu Corporation. Ignition circuit with timing control. 5,048,486, Cl. 123-418.000.

Okumura, Kiyoshi: *See—*
Matsuhiro, Keiji; Ito, Shigenori; and Okumura, Kiyoshi, 5,049,456, Cl. 429-12.000.

Okumura, Toshiyuki: *See—*
Tanaka, Kenichi; Onishi, Shigeo; Okumura, Toshiyuki; and Sakiyama, Keizo, 5,049,970, Cl. 357-51.000.

Okuyama, Nobutaka; Sakurai, Soichi; Obara, Masao; Kikkawa, Yosio; and Ohsawa, Michitaka, to Hitachi, Ltd.; and Hitachi Mizusawa Electronics Co. Deflection yoke with auxiliary coils for stray line radiation suppression. 5,049,847, Cl. 335-214.000.

O'Leary, Thomas D., to Dresser-Rand Company. Seal flaring and shipping mandrel assembly. 5,049,060, Cl. 425-393.000.

O'Lenick, Anthony J., Jr., to LCE Partnership. Novel cationic lactam polymers and 1-(3-alkyl amino propyl)pyrrolidone-2 intermediates therefor. 5,049,680, Cl. 548-550.000.

Olin Corporation: *See—*
Bujese, David P., 5,049,942, Cl. 355-272.000.
Swartout, Terry L., 5,048,421, Cl. 102-431.000.

Olive, Peter, to Infusaid, Inc. Programmable valve pump. 5,049,141, Cl. 604-891.100.

Olivier, Guy: *See—*
April, Georges-Emile; and Olivier, Guy, 5,050,058, Cl. 363-65.000.

Olschewski, Armin: *See—*
Kunkel, Heinrich; Ernst, Horst; Haas, Roland; Herrmann, Gerhard; Horling, Peter; Mause, Elmar; Neder, Gunter; Olschewski, Armin; Stolz, Robert; Vogelsanger, Leo; and Brandenstein, Manfred, 5,049,115, Cl. 474-166.000.

Olsen, Flemming H., to Interlego A.G. Connecting means for a toy building set. 5,049,104, Cl. 446-104.000.

Olsen, Robert W., to Construction Specialties, Inc. Louver with maximum free area. 5,048,253, Cl. 52-473.000.

Olson, Brennan J.; and Brace, Thomas J., to Rollerblade, Inc. In-line roller skate with axle aperture plugs for simplified wheel installation. 5,048,848, Cl. 280-11.220.

Olsson, Kjell P.: *See—*
Larm, Karl O. P.; Adolfsson, Lars A.; and Olsson, Kjell P., 5,049,403, Cl. 427-2.000.

Olympus Optical Co., Ltd.: *See—*
Hamada, Masami; Fujiwara, Hiroshi; Tsuboshima, Kosaku; Kinukawa, Masahiko; Tsunoda, Toshiyuki; Nagano, Takashi; Minami, Kazyuki; Tokunaga, Shigeo; Kaneda, Masanori; and Ishikawa, Tomonori, 5,048,941, Cl. 359-368.000.





Kanno, Toshiyuki; Nagata, Yasuji; and Ueno, Naoyuki, 5,049,428, Cl. 428-64.000.
Sakamoto, Nobuyuki; Ueda, Yasuhiro; Miyazaki, Atsushi; Shishido, Yoshio; Nishikori, Toshiaki; Nishigaki, Shinichi; Mizumoto, Morihide; Nakamura, Takeaki; Fuse, Eiichi; and Aoki, Yoshisada, 5,048,956, Cl. 356-241.000.
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Omata, Yuji: *See—*
Sakakima, Hiroshi; Osano, Koichi; Omata, Yuji; Satomi, Mitsuo; and Kugimiya, Koichi, 5,049,209, Cl. 148-306.000.

O'Meara, Thomas R.: *See—*
Efron, Uzi; Soffer, Bernard H.; Lind, Richard C.; Pepper, David M.; and O'Meara, Thomas R., 5,048,935, Cl. 359-36.000.

OMI International Corporation: *See—*
Tremmel, Robert A., 5,049,286, Cl. 210-759.000.

Omron Corporation: *See—*
Yamasawa, Tsutomu; Yoshimura, Manabu; and Toriu, Mamoru, 5,048,523, Cl. 128-421.000.

Omron Tateisi Electronics Co.: *See—*
Yamamoto, Saburo; and Igarashi, Kimio, 5,050,106, Cl. 364-550.000.

Onaka, Hiroshi: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onaka, Hiroshi; and Onoda, Yoshihito, 5,050,176, Cl. 372-26.000.

Onari, Mikihiko; Funabashi, Motohisa; Sekozawa, Teruji; Atago, Takeshi; and Shioya, Makoto, to Hitachi, Ltd. Electronic engine control method and system for internal combustion engines. 5,048,495, Cl. 123-492.000.

Ondrla, Jeff M.: *See—*
Engelhardt, John A.; Serbousek, Jon C.; Allen, C. Wayne; DiNello, Alex M.; Ondrla, Jeff M.; and Snyder, Duane G., 5,049,158, Cl. 623-22.000.

Onishi, Shigeo: *See—*
Tanaka, Kenichi; Onishi, Shigeo; Okumura, Toshiyuki; and Sakiyama, Keizo, 5,049,970, Cl. 357-51.000.

Ono, Ichiro: *See—*
Yoshioka, Hiroshi; Ono, Ichiro; and Uehara, Hitoshi, 5,049,617, Cl. 525-104.000.

Onoda, Izumi: *See—*
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Onoda, Yoshihito: *See—*
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; Onaka, Hiroshi; and Onoda, Yoshihito, 5,050,176, Cl. 372-26.000.

Onozato, Harumasa: *See—*
Sato, Kazuo; Kanda, Hiroshi; Kato, Shigeo; Imai, Kuninori; Shiokawa, Takeji; Tanaka, Shinji; Ishikawa, Isao; Onozato, Harumasa; Hashimoto, Hisayoshi; Tamura, Morio; Hatano, Kazuyoshi; Sato, Fujio; Ichiryuu, Ken; Tanaka, Kiyoshi; and Kawanuma, Takao, 5,050,137, Cl. 367-150.000.

Onspot AB: *See—*
Carlsson, Lennart, 5,048,646, Cl. 188-4.00B.

Ooms, Willem; Moss, Frank R.; and Key, Jonnie L., to Porelon, Inc. Method for preparing a marking structure. 5,049,432, Cl. 428-159.000.

Ooms, William J., to Motorola, Inc. High speed complementary flip-flop. 5,049,760, Cl. 307-279.000.

Ootsuka, Hiroshi: *See—*
Ishida, Tokuji; Norita, Toshio; and Ootsuka, Hiroshi, 5,049,731, Cl. 250-201.200.

Optyl Eyewear Fashion International Corporation: *See—*
Porsche, Ferdinand A., 5,048,944, Cl. 351-57.000.

Orbach, Zvi; Janai, Meir; Yoeli, Uzi; and Amir, Gideon. Customizable semiconductor devices. 5,049,969, Cl. 357-51.000.

Orban, Robert A., to AKG Acoustics, Inc. Dynamic noise reduction and spectral restoration system. 5,050,217, Cl. 381-94.000.

Orca II, Inc.: *See—*
Barshinger, Craig W., 5,049,864, Cl. 340-753.000.

Orient Chemical Industries, Ltd.: *See—*
Yamanaka, Schunichiro, 5,049,467, Cl. 430-110.000.

Orii, Makoto; Hayashi, Katsuhiko; and Imai, Teruaki, to K.K. Sankyo Seiki Seisakusho. Mechanical door check. 5,048,151, Cl. 16-64.000.

Ormco Corporation: *See—*
Sterrett, Terry L.; Andreiko, Craig A.; Sirney, Ronald J.; and Swartz, Michael L., 5,049,068, Cl. 433-9.000.

Orr, Matthew F.: *See—*
Jones, Dallas W.; and Orr, Matthew F., 5,048,278, Cl. 56-295.000.

Orr, Steven K., to Cincinnati Microwave, Inc. Long range police radar warning receiver. 5,049,885, Cl. 342-20.000.

Orsborn, Jesse H.; Butkovich, George M.; Bessman, Thomas K.; and Link, John F., to J. I. Case Company. Method and apparatus for controlling operation of an agricultural implement. 5,048,273, Cl. 56-10.200.

Ortega, Aracelis M.; and de Perez, Pilar M., to Farvalsa/AG. Valproic acid tablets. 5,049,586, Cl. 514-557.000.

Orzel, Daniel V.; Davenport, Martin F.; and Hamburg, Douglas R., to Ford Motor Company. System for internal combustion engine. 5,048,493, Cl. 123-489.000.

Orzel, Daniel V.: *See—*
Davenport, Martin F.; Orzel, Daniel V.; and Hamburg, Douglas R., 5,048,492, Cl. 123-489.000.

Osaka Gas, Co., Ltd.: *See—*
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Osano, Koichi: *See—*
Sakakima, Hiroshi; Osano, Koichi; Omata, Yuji; Satomi, Mitsuo; and Kugimiya, Koichi, 5,049,209, Cl. 148-306.000.

Osborn, Richard K., to Nu-Air Manufacturing Co. Window grid with cam lock. 5,048,252, Cl. 52-456.000.

Osborne, James J.: *See—*
Nebe, Willim J.; and Osborne, James J., 5,049,480, Cl. 430-281.000.

Oshina, Morio; Kanai, Takashi; Ochiai, Masami; and Nozaki, Koji, to Hitachi Construction Machinery Co., Ltd. Safety device for hydraulic closed circuit. 5,048,294, Cl. 60-468.000.

Ostapchenko, George J.: *See—*
Moss, Arthur Z.; and Ostapchenko, George J., 5,049,340, Cl. 264-216.000.

Osteo AG: *See—*
Mittelmeier, Heinz; Moser, Heinz; and Leu, Beat, 5,049,157, Cl. 623-16.000.

O'Such, William R.; Wilson, Roger W.; and Wheeler, RIchard B., to Eastman Kodak Company. Automatic optimization of photographic exposure parameters through determination and utilization of extra system speed. 5,049,916, Cl. 354-412.000.

Oswaldbauer, Helmut: *See—*
Wolfgruber, Matthias; Deubzer, Bernward; Frey, Volker; and Oswaldbauer, Helmut, 5,049,636, Cl. 528-33.000.

Otani, Sugio; Yanagisawa, Sadakatsu; Niijima, Kunio; Matuura, Kazusi; Matino, Hirosi; and Fuse, Tooru, to Otani, Sugio; Yanagisawa, Sadakatsu; Niijima, Kunio; Mitsubishi Kasei Corporation; and Research Development Corporation of Japan. Dental implant. 5,049,074, Cl. 433-173.000.

Oti, James A.; and Graham, Lawrence D., to PCC Airfoils, Inc. Apparatus and method for use in casting. 5,048,591, Cl. 164-122.100.

Otis Engineering Corporation: *See—*
Ross, Colby M.; Sproul, Richard M.; McCurley, Ross M.; and Young, Carter R., 5,048,610, Cl. 166-372.000.

Oudick, Tom A.; and Shmunis, Gregory, to Amdahl Corporation. Liquid cooled integrated circuit assembly. 5,050,036, Cl. 361-385.000.

Ounanian, Hovig O.: *See—*
Murphy, John H.; Ounanian, Hovig O.; Cohen, Kenneth A.; DiSomma, Joseph; and Gedeon, Harvey, 5,049,376, Cl. 424-63.000.

Outa, Ken-Ichi, to Canon Kabushiki Kaisha. Color images reading apparatus having transformation table formed base on average values of plural color component signals. 5,049,985, Cl. 358-76.000.

Outboard Marine Corporation: *See—*
Binversie, Gregory J.; Capodarco, Joseph E.; DeRam, James R.; and Petersen, H. Norman, 5,049,098, Cl. 440-61.000.
Binversie, Gregory J.; Broughton, George L.; and Turk, Robert L., 5,049,101, Cl. 440-88.000.
Broughton, George L.; and Breckenfeld, Paul W., 5,048,468, Cl. 123-41.740.
DuBois, Chester G., 5,048,751, Cl. 236-92.00C.
DuBois, Chester G.; and Dembski, Kurt R., 5,048,996, Cl. 403-287.000.

Outokumpu Oy: *See—*
von Alfthan, Georg C.; and Ahonen, Antti I., 5,048,325, Cl. 73-61.00R.

Overman, Dana C., to Dow Chemical Company, The. Membrane process for drying liquid hydrocarbons. 5,049,259, Cl. 208-188.000.

Owen, Hartley: *See—*
Harandi, Mohsen N.; and Owen, Hartley, 5,049,360, Cl. 422-141.000.
Harandi, Mohsen N.; and Owen, Hartley, 5,049,361, Cl. 422-144.000.

Owens, James M. Portable game support. 5,049,110, Cl. 452-187.000.

Oxyphen AG: *See—*
Nieweg, Heinrich, 5,049,272, Cl. 210-266.000.

Oya, Yoshihiko: *See—*
Matsumoto, Noriya; Akado, Hajime; Oya, Yoshihiko; Taki, Yoshihiro; and Yamaguchi, Shuji, 5,049,326, Cl. 264-41.000.

Ozawa, Yasuhiko: *See—*
Yamaguchi, Yasuyoshi; Ozawa, Yasuhiko; Suzuki, Masataka; Sato, Akira; Asai, Yoshinori; Horii, Yoshiharu; and Shimaoka, Takashi, 5,049,940, Cl. 355-260.000.

Ozeki, Hiromi: *See—*
Yoshinaga, Junji; Shogaki, Takeshi; Kakita, Takao; Ozeki, Hiromi; and Kato, Yoshiko, 5,049,664, Cl. 536-119.000.

Pac Fasteners: *See—*
Reynolds, Richard L., 5,049,017, Cl. 411-432.000.

Pacific Dunlop Limited: *See—*
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Paez, Marco A.: *See—*
Plonsky, Christopher B.; Watkins, Harry E.; and Paez, Marco A., 5,049,857, Cl. 340-551.000.

Pagano, Daniel M.; and Cloutier, Robert P., to Eastman Kodak Company. Film cassette with locking means for exposure status indicator. 5,049,912, Cl. 354-275.000.

Pagano, Daniel M.; Miller, Stephen H.; and Jensen, Thomas D., to Eastman Kodak Company. Film cassette with locking means for exposure status indicator. 5,049,913, Cl. 354-275.000.

Pagliuca, Emanuel J., to TII Industries, Inc. Back-up surge arresters. 5,050,033, Cl. 361-119.000.

Pai, Ramdas M.; and Beck, James A., to Unico, Inc. Magnetostrictive multiple position sensing device. 5,050,135, Cl. 367-127.000.

Paige, Arnold: *See—*
Cooperman, Michael; Sieber, Richard W.; and Paige, Arnold, 5,049,877, Cl. 340-825.800.

Pailler, Rene: *See—*
Duboudin, Francoise; Pillot, Jean-Paul; Dunogues, Jacques; Birot, Marc; Babot, Odile; and Pailler, Rene, 5,049,529, Cl. 501-97.000.

Paine, John C.: *See—*
Mintus, Robert T.; and Paine, John C., 5,049,802, Cl. 320-2.000.
Palanisamy, Thirumalai G., to Allied-Signal Inc. Method and apparatus for charging and testing batteries. 5,049,803, Cl. 320-20.000.
Palm, Ulrich: *See—*
Kiske, Siegfried; and Palm, Ulrich, 5,049,317, Cl. 261-16.000.
Palmatier, Roland T.; and Guaraldi, Glenn A., to Harris Graphics Corporation. Apparatus for adjusting an anglebar or a compensator roller in a folder of a printing press. 5,048,810, Cl. 270-52.000.
Pangratz, Konrad K.: *See—*
Holcomb, Jack N.; and Pangratz, Konrad K., 5,048,641, Cl. 182-127.000.
Panster, Peter: *See—*
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Panus, Irenaeus S.: *See—*
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Panush, Sol, to BASF Corporation. Opalescent coatings containing foamed metal oxides. 5,049,442, Cl. 428-328.000.
Pao, Gei-Jon: *See—*
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Paola, Carl R.: *See—*
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Papallo, Thomas F., Jr.: *See—*
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Paques, Eric P.: *See—*
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Paquet, Jean-Marc: *See—*
Mathieu, Luc; and Paquet, Jean-Marc, 5,048,559, Cl. 137-488.000.
Mathieu, Luc; and Paquet, Jean-Marc, 5,049,042, Cl. 417-295.000.
Pardy, Paul: *See—*
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Paricio, Lawrence W.: *See—*
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Paris, Dominique: *See—*
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Parise, Vital A.: *See—*
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Parish, Harlie A., Jr.: *See—*
Purcell, William P.; and Parish, Harlie A., Jr., 5,049,584, Cl. 514-529.000.
Park, Jin Y.; and Kearney, Robert J., to Idaho Research Foundation. Method and means for separating and classifying superconductive particles. 5,049,540, Cl. 505-1.000.
Park, Kwang S., to Goldstar Co., Ltd. Dual video signal simultaneous recording apparatus for a VCR. 5,050,010, Cl. 360-33.100.
Parker, Delmer G.; and May, Jerome E., to Xerox Corporation. Extension of tri-level xerography to black plus 2 colors. 5,049,949, Cl. 355-328.000.
Parker Hannifin Corporation: *See—*
Ellison, John E.; and Ujjin, Mai, 5,048,791, Cl. 251-73.000.
Parker, John C.: *See—*
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Parnas, Stanley J.; Sutter, Leroy V., Jr.; Horne, Randy C.; Wessels, Robert A., Jr.; Rey, Celestino; and Andrews, Jack E., to American Telephone and Telegraph Company; and Directed Energy, Inc. Laser marking apparatus and method for providing markings of enhanced readability in an outer jacket of a moving cable. 5,049,721, Cl. 219-121.680.
Parnoff, George K., to Andros Incorporated. Filter assembly for gas analyzer. 5,049,170, Cl. 55-323.000.
Parr, William J. E.: *See—*
Ziemer, Karolyn E.; and Parr, William J. E., 5,049,332, Cl. 264-104.000.
Parraud, Rene : *See—*
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Pascoal, Luis N. Wheel position gauging device. 5,048,192, Cl. 33-203.180.
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Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Recirculating positive-pressure respirator. 5,048,517, Cl. 128-205.280.
Patarca, Roberto M.: *See—*
Cantor, Harvey I.; Patarca, Roberto M.; and Schwartz, Joel L., 5,049,659, Cl. 530-351.000.
Patel, Gordhanbhai N.; and Bolikal, Durgadas, to JP Laboratories, Inc. Single step pre-swelling and etching of plastics for plating. 5,049,230, Cl. 156-628.000.
Paterson, Timothy L. Test coverage analyzer. 5,050,168, Cl. 371-19.000.
Patitsas, George P., to Goodyear Tire & Rubber Company, The. Coating composition and coated tire. 5,049,609, Cl. 524-386.000.
Patnaik, Birendra K.: *See—*
Chu, Sung G.; Patnaik, Birendra K.; and Shih, Keith S., 5,049,615, Cl. 525-92.000.
Patterson, Susan M., to Galileo Electro-Optics Corp. Fiber assembly. 5,049,176, Cl. 65-4.200.
Paul Flum Ideas, Inc.: *See—*
Bidwell, Christopher C.; and Fowler, Dewalt W., 5,048,171, Cl. 29-401.100.
Paul, James M.: *See—*
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Paul Troester Maschinenfabrik: *See—*
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Paxon Polymer Company, LP: *See—*
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Paxton, William H.: *See—*
Schiller, Stephen N.; and Paxton, William H., 5,050,103, Cl. 364-521.000.
Payne, LeRoy. Continuous structure forming method and the resulting product. 5,049,006, Cl. 405-270.000.
Payne, Myron E. Universal hanging file system. 5,048,697, Cl. 211-45.000.
Payton, Hugh W. Female urinary incontinence apparatus. 5,049,144, Cl. 604-329.000.
PCC Airfoils, Inc.: *See—*
Oti, James A.; and Graham, Lawrence D., 5,048,591, Cl. 164-122.100.
Peacock, Kevin James: *See—*
Dodds, Graeme C., 5,048,755, Cl. 239-64.000.
Pearl, Louis. Bubble toy necklace. 5,049,103, Cl. 446-19.000.
Pearlman, Jerry K.: *See—*
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Pearpoint Limited: *See—*
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Lazzari, Ettore; Arcamone, Federico; Penco, Sergio; Verini, Maria A.; and Mongelli, Nicola, 5,049,579, Cl. 514-422.000.
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Penning, Wilfred: *See—*
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Pensis, John G.: *See—*
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Pereman, Gordon F.; and Kellar, John D., to PPG Industries, Inc. Partial press apparatus and method for glass sheet bending. 5,049,178, Cl. 65-106.000.
Perkin-Elmer Corporation, The: *See—*
Dorfman, Mitchell R.; and Kushner, Burton A., 5,049,450, Cl. 428-570.000.
Perry, Mordechai: *See—*
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Perry, Robert E. Fan efficiency measuring apparatus. 5,050,092, Cl. 364-506.000.
Person, Lee H., Jr.: *See—*
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Peter, Heinrich; and Moerker, Theophile, to Ciba-Geigy Corporation. Process for the selective n-acylation of aminohydroxamic acid derivatives and starting materials used therein. 5,049,689, Cl. 556-410.000.
Peter, Ribiczey: *See—*
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Peters, Anthony M., to International Business Machines Corporation. Direct cursor-controlled access to multiple application programs and data. 5,050,105, Cl. 364-521.000.
Petersen, H. Norman: *See—*
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Peterson, John H.: *See—*
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Peterson, Julia A.: *See—*
Noon, George P.; Feldman, Louis W.; and Peterson, Julia A., 5,049,393, Cl. 424-484.000.
Peterson, Larry W., to Alumet Mfg. Inc. Flexible cornerpiece for spacer frame for insulated glass panel. 5,048,997, Cl. 403-295.000.
Peterson, Mildred I. Wall mountable toothpaste dispenser with magnetic tube-winder holding means. 5,048,725, Cl. 222-100.000.
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Terazawa, Tadashi; Nakashima, Hiroshi; and Taguchi, Yoshinori, to Aisin Seiki Kabushiki Kaisha. Throttle control method for internal combustion engine. 5,048,485, Cl. 123-399.000.

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Yamashita, Haruo: *See*—
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Yamashita, Riichiro; and Kanehara, Koichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Coin discriminator. 5,048,662, Cl. 194-317.000.

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# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF SEPTEMBER, 1991

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Adams, Harold P., Jr.; Maitland, Andrew B.; Hill, David R.; Banton, William E.; Richey, Lee M.; and Taylor, David C., Re. 33,690, Cl. 166-53.000.

Bean, John C.; and Ourmazd, Abbas, to AT&T Bell Laboratories. Device using ordered semiconductor alloy. Re. 33,693, Cl. 357-30.000.

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McElroy, David J., to Texas Instruments Incorporated. Dynamic memory array with segmented bit lines. Re. 33,694, Cl. 365-149.000.

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Adams, Harold P., Jr.; Maitland, Andrew B.; Hill, David R.; Banton, William E.; Richey, Lee M.; and Taylor, David C., Re. 33,690, Cl. 166-53.000.

Texas Instruments Incorporated: *See—*
McElroy, David J., Re. 33,694, Cl. 365-149.000.

Yamaha Corporation: *See—*
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TO WHOM

CERTIFICATES WERE ISSUED

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Basseen, Sanjiv K.; and Harlan, Richard A., to Pioneer Air Systems, Inc. High efficiency air driving system. B1 4,761,968, 9-17-91, Cl. 62-271.000.

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Manestar, Miroslay; and Makris, Aristides E., 319,994, Cl. D12-147.000.
Unisearch Limited: *See—*
Frost, Richard B.; and Karolis, Christopher A., 320,074, Cl. D24-158.000.
Utility Manufacturing, Inc.: *See—*
Bathurst, Clyde E.; and Forte, James M., 319,916, Cl. D2-271.000.
Vacek, Ronald R.: *See—*
Corby, Kenneth D.; Hacknauer, Frank; and Vacek, Ronald R., 320,042, Cl. D18-43.000.
Corby, Kenneth D.; Hacknauer, Frank; and Vacek, Ronald R., 320,043, Cl. D18-43.000.
Corby, Kenneth D.; Hacknauer, Frank; and Vacek, Ronald R., 320,044, Cl. D18-43.000.
Vajtay, Thomas L., to SLM Manufacturing Corporation. Bird feeder. 320,097, 9-17-91, Cl. D30-127.000.
Van Namen, Tjado: *See—*
Terwilliger, Richard A.; Van Namen, Tjado; and Norberg, John T., 320,078, Cl. D24-158.000.
Veach, John S.: *See—*
Dyment, James A.; Callon, Floyd R.; Benison, Harvey W.; Haschart, Karl E.; and Veach, John S., 319,938, Cl. D6-472.000.
Vuong, Lan M.: *See—*
Vuong, Vinh V.; and Vuong, Lan M., 319,931, Cl. D6-384.000.
Vuong, Vinh V.; and Vuong, Lan M. Adjustable dressing table for a baby. 319,931, 9-17-91, Cl. D6-384.000.
W&F Manufacturing, Inc.: *See—*
Fleming, Paul D.; and Gajer, Nandor, 319,961, Cl. D8-302.000.
Waldren, Jonathan G., to B. C. Sanitan Limited. Pedestal lavatory. 320,068, 9-17-91, Cl. D23-292.000.
Watanabe, Katsuhito; and Suda, Masami, to Oki Electric Industry, Co., Ltd. Holder for a portable radio telephone. 320,022, 9-17-91, Cl. D14-251.000.
Wedel, Gregory L.: *See—*
Skaugen, Borgeir; and Wedel, Gregory L., 320,105, Cl. D34-28.000.
Weder, Donald E., to Highland Supply Corporation. Flower pot cover. 319,991, 9-17-91, Cl. D11-164.000.
Weimholt, Mark. Adjustable garden kneeler. 319,928, 9-17-91, Cl. D6-330.000.
Willis, David: *See—*
Thompson, Wade F. B.; and Willis, David, 319,996, Cl. D12-196.000.
Wilson, Jordan E. Combined trash container and dolly therefor. 320,103, 9-17-91, Cl. D34-5.000.
Wilson, Ken. Sunglasses temple. 320,031, 9-17-91, Cl. D16-127.000.
Witzig, Uli, to Geberit AG. Toilet tank. 320,070, 9-17-91, Cl. D23-313.000.
Wolf, Thomas H.; and Berger, Andy L., to Superwares, Inc. Collapsible toothpaste or shampoo tube holder. 319,939, 9-17-91, Cl. D6-541.000.
Wolff, Martin J., to Dart Industries Inc. Food container or the like. 319,978, 9-17-91, Cl. D9-431.000.
Woolf, Floyd S.: *See—*
Sexton, Rodney N.; Woolf, Floyd S.; and Ruud, Timothy W., 319,943, Cl. D7-308.000.
Woomer, Benjamin E. Wristwatch. 319,984, 9-17-91, Cl. D10-39.000.
Wortley, Russell B.; and Billman, Fred L., to S. C. Johnson & Son, Inc. Fluid container. 319,976, 9-17-91, Cl. D9-417.000.
Wyatt, Philip W.; and Pescovitz, Michael R., to Migada Inc. Combined guard and injection site for intravenous infusion or the like. 320,082, 9-17-91, Cl. D24-129.000.
Yamaha Corporation: *See—*
Hoshina, Yasuhiro, 320,032, Cl. D17-1.000.
Hoshina, Yasuhiro, 320,033, Cl. D17-1.000.
Yamamoto, Yosuki; and Barry, Michael R., to Alps Electric Co., Ltd. Lap top computer. 320,009, 9-17-91, Cl. D14-106.000.
Yanazaki, Ronald T. Isometric exerciser. 320,054, 9-17-91, Cl. D21-198.000.
Yazaki Corporation: *See—*
Kozono, Seiji, 319,998, Cl. D13-133.000.
Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, 320,000, Cl. D13-146.000.
Youngeberg, Judy L., to Herrmidifier Company, Inc. Humidifier. 320,072, 9-17-91, Cl. D23-357.000.
Zintzmeyer, Jorg, to Toko AG. Spray dispenser or similar article. 319,968, 9-17-91, Cl. D9-300.000.
Zogg, Jon: *See—*
Segati, Umberto D. I.; and Zogg, Jon, 319,972, Cl. D9-375.000.

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# LIST OF PLANT PATENTEES

Bear Creek Gardens, Inc.: *See*—
Warriner, William A., 7,650, Cl. 9.000.
Conard-Pyle Company, The: *See*—
Meserve, Kathleen K., 7,652, Cl. 65.000.
Harkhill Farm: *See*—
McLaren, Peter W., 7,651, Cl. 45.000.
Harrison, Richmond E., to Manukau Horticulture Limited. Zantedeschia plant 'Apricot Glow'. 7,653, 9-17-91, Cl. 68.000.
Manukau Horticulture Limited: *See*—
Harrison, Richmond E., 7,653, Cl. 68.000.
May, Earl T., to May Floral Company, Inc. Chrysanthemum plant named White Splendor. 7,654, 9-17-91, Cl. 74.000.
May Floral Company, Inc.: *See*—
May, Earl T., 7,654, Cl. 74.000.
McLaren, Peter W., to Harkhill Farm. Navel orange tree named 'Rohde Summer Navel'. 7,651, 9-17-91, Cl. 45.000.
Meserve, Kathleen K., to Conard-Pyle Company, The. Ilex plant-Mesgolg variety. 7,652, 9-17-91, Cl. 65.000.
Warriner, William A., to Bear Creek Gardens, Inc. Rose plant Jacmiss. 7,650, 9-17-91, Cl. 9.000.



# CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 17, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**
49 R 5,048,121
69 5,048,122
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79 5,048,124
5,048,125
125 5,048,126
149 5,048,127
204 5,048,128
424 5,048,129

**CLASS 4**
483 5,048,130
559 5,048,131
578 5,048,132

**CLASS 5**
81 B 5,048,133
82 R 5,048,134
109 5,048,135
431 5,048,136
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**CLASS 7**
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**CLASS 8**
125 5,049,159
137 5,049,160
158 5,048,139
638 5,049,161

**CLASS 15**
1.7 5,048,140
49.1 5,048,141
97.1 5,048,142
110 5,048,143
184 5,048,144
250.36 5,048,146
250.42 5,048,145
319 5,048,147
321 5,048,148
328 5,048,149

**CLASS 16**
49 5,048,150
64 5,048,151
110 R 5,048,152
223 5,048,153
267 5,048,154
301 5,048,155

**CLASS 19**
66 CC 5,048,156
288 5,048,157

**CLASS 24**
16 R 5,048,158
20 R 5,048,159
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704.1 5,048,161

**CLASS 29**
1.2 5,048,162
25.01 5,048,163
5,048,164
25.41 5,048,165
91.1 5,048,167
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235 5,048,169
5,048,170
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5,048,172
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623.2 5,049,162
734 5,048,177
830 5,048,166
5,048,178
840 5,048,179
5,048,180
5,048,181
889.1 5,048,183
895.21 5,048,182

**CLASS 30**
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183 5,048,185
233 5,048,186
276 5,048,187
288 5,048,188
293 5,048,189
299 5,048,190
346.54 5,048,191

**CLASS 33**
203.18 5,048,192
265 5,048,193
558 5,048,194
645 5,048,195
734 5,048,196
829 5,048,197

**CLASS 34**
4 5,048,198
9 5,048,199
32 5,048,200
77 5,048,201
151 5,048,202

**CLASS 36**
32 R 5,048,203
50 5,048,204

**CLASS 37**
265 5,048,206
281 5,048,207

**CLASS 40**
312 5,048,208
511 5,048,209
575 5,048,210

**CLASS 42**
70.11 5,048,211
5,048,212
71.01 5,048,213
72 5,048,215
72.02 5,048,214
76.01 5,048,216
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**CLASS 43**
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6 5,048,221
9.1 5,048,222
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**CLASS 44**
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**CLASS 47**
1.01 5,048,226
1.1 5,048,227
9 5,048,228
24 5,048,229
40.5 5,048,230
45 5,048,231

**CLASS 49**
440 5,048,232
501 5,048,233
502 5,048,234

**CLASS 51**
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77 BS 5,048,236
168 5,048,237
293 5,049,166
295 5,049,164
5,049,165
317 5,048,238

**CLASS 52**
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4 5,048,240
102 5,048,241
126.6 5,048,242
167 R 5,048,243
169.6 5,048,244
171 5,048,245
173 DS 5,048,246
255 5,048,247
309.9 5,048,248
403 5,048,249
437 5,048,250
456 5,048,251
5,048,252
473 5,048,253
475 5,048,254
533 5,048,255
730 5,048,256
747 5,048,257
789 5,048,258

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370.8 5,048,260
399 5,048,261
401 5,048,262
429 5,048,263
430 5,048,264
439 5,048,265
469 5,048,266
492 5,048,267
511 5,048,268
512 5,048,269
551 5,048,270
587 5,048,271

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16 5,049,167
17 5,049,168
158 5,049,169
323 5,049,170
338 5,049,171
495 5,049,172

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5,048,274
12.8 5,048,275
16.9 5,048,276
236 5,048,277
295 5,048,278
320.2 5,048,279

**CLASS 57**
238 5,048,280
264 5,048,281
267 5,048,282

**CLASS 59**
78.1 5,048,283

**CLASS 60**
39.02 5,048,284
204 5,048,285
226.1 5,048,288
226.3 5,048,286
267 5,048,289
288 5,048,287
299 5,048,290
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413 5,048,292
420 5,048,293
461 5,048,295
468 5,048,294
5,048,296
520 5,048,297
726 5,048,298

**CLASS 62**
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5,049,174
46.2 5,048,299
48.1 5,048,300
101 5,048,301
228.4 5,048,302
256 5,048,303
271 B1 4,761,968
305 5,048,304
372 5,048,305
419 5,048,306
457.4 5,048,307
476 5,048,308
503 5,048,309

**CLASS 63**
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13 5,048,310

**CLASS 65**
3.11 5,049,175
4.2 5,049,176
93 5,049,177
106 5,049,178
332 5,049,179

**CLASS 66**
132 T 5,048,312
141 5,048,313

**CLASS 68**
205 R 5,048,314

**CLASS 70**
12 5,048,315

**CLASS 71**
29 5,049,180
90 5,049,181
93 5,049,182

**CLASS 72**
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19 5,048,316
347 5,048,317
405 5,048,318

**CLASS 73**
1 D 5,048,319
1 R B1 4,446,715
23.3 5,048,321
23.41 5,048,322
32 A 5,048,323
40.7 5,048,324
61 R 5,048,325
105 5,048,326
118.2 5,048,327
153 5,048,328
168 5,048,329
5,048,330
170 R 5,048,331
204.16 5,048,332
290 R 5,048,333
5,048,334
304 C 5,048,335
336.5 5,048,336
384 5,048,337
462 5,048,338
515 5,048,339
597 5,048,340
620 5,048,341
669 5,048,342
766 5,048,343
784 5,048,344
788 5,048,345
804 5,048,346
821 5,048,347
861.04 5,048,348
861.37 5,048,349
861.38 5,048,350
5,048,351
862.45 5,048,352
862.55 5,048,353
863.25 5,048,354

**CLASS 74**
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60 5,048,356
110 5,048,357
112 5,048,358
190.5 5,048,359
347 5,048,360
380 5,048,361
439 5,048,362
467 5,048,363
493 5,048,364
553 5,048,365
567 5,048,366
573 F 5,048,367
579 E 5,048,368
594.6 5,048,369
606 R 5,048,370
730.1 5,048,371
860 5,048,372
866 5,048,373
5,048,374

**CLASS 75**
244 5,049,183
246 5,049,184
529 5,049,185

**CLASS 76**
108.6 5,048,375

**CLASS 81**
15.8 5,048,376
57.15 5,048,377
124.2 5,048,378
124.4 5,048,379
165 5,048,380
477 5,048,381

**CLASS 82**
1.11 5,048,382
127 5,048,383
170 5,048,384

**CLASS 83**
34 5,048,385
37 5,048,386
344 5,048,387
504 5,048,388
838 5,048,389

**CLASS 84**
464 R 5,048,390
634 5,048,391

**CLASS 88**
1.11 5,048,645

**CLASS 89**
41.02 5,048,392
45 5,048,393

**CLASS 91**
361 5,048,394
447 5,048,395
512 5,048,396
535 5,048,397

**CLASS 92**
225 5,048,398

**CLASS 98**
2.01 5,048,399

**CLASS 99**
332 5,048,400
339 5,048,401
348 5,048,402
355 5,048,403
451 5,048,404
470 5,048,405
482 5,048,406
519 5,048,407

**CLASS D12**
154 B1 8,286,524

**CLASS 100**
12 5,048,408
48 5,048,409
5,048,410
93 RP 5,048,411
137 5,048,412
226 5,048,413

**CLASS 101**
93.18 5,048,414
103 5,048,415
115 5,048,416
123 5,048,417
178 5,048,418

**CLASS 102**
226 5,048,419
275.3 5,048,420
431 5,048,421
434 5,048,422
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**CLASS 104**
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12 5,048,425
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**CLASS 105**
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**CLASS 106**
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18.17 5,049,187
20 5,049,188
22 5,049,189
35 5,049,190
36 5,049,191
243 5,049,192
436 5,049,194
456 5,049,193
5,049,195
672 5,049,196
685 5,049,197
739 5,049,198

**CLASS 108**
90 5,048,428
106 5,048,429

**CLASS 110**
193 5,048,430
260 5,048,433
343 5,048,431
345 5,048,432

**CLASS 111**
105 5,048,434

**CLASS 112**
168 5,048,435
228 5,048,436
235 5,048,437
255 5,048,438
458 5,048,439

**CLASS 114**
39.2 5,048,440
90 5,048,441
102 5,048,442
104 5,048,443
144 R 5,048,444
219 5,048,446
222 5,048,445
255 5,048,447
263 5,048,448
280 5,048,449
363 5,048,450

**CLASS 116**
35 A 5,048,451
225 5,048,452

**CLASS 118**
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302 5,048,454
642 5,048,455
718 5,048,456
723 5,048,457

**CLASS 119**
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17 5,048,459
19 5,048,460
52.3 5,048,461
72 5,048,462
163 5,048,463
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**CLASS 122**
406.5 5,048,466

**CLASS 123**
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59 AC 5,048,472
65 A 5,048,473
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90.66 5,048,476
180 P 5,048,477
195 A 5,048,478
198 D 5,048,479
321 5,048,480
333 5,048,481
5,048,482
339 5,048,483
361 5,048,484
399 5,048,485
418 5,048,486
5,048,487
467 5,048,488
5,048,489
479 5,048,490
5,048,491
489 5,048,492
5,048,493
5,048,494
492 5,048,495
531 5,048,496
533 5,048,497
538 5,048,498
5,048,499
549 5,048,500
554 5,048,501
602 5,048,502
632 5,048,503

**CLASS 124**

86 5,048,504

**CLASS 126**

9 R 5,048,505
262 5,048,506
430 5,048,507

**CLASS 127**

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**CLASS 128**

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5,048,511
156 5,048,513
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204.26 5,048,515
205.25 5,048,516
205.28 5,048,517
207.14 5,048,518
5,048,519
419 PG 5,048,521
421 5,048,522
5,048,523
634 5,048,524
637 5,048,525
648 5,048,526
660.03 5,048,527
660.1 5,048,529
661.09 5,048,528
662.05 5,048,530
673 5,048,537
675 5,048,531
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691 5,048,534
708 5,048,535
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771 5,048,539
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876 5,048,512
5,048,541
889 5,048,542

**CLASS 131**

84.4 5,048,543
270 5,048,544
330 5,048,545
331 5,048,546

**CLASS 132**

75 5,048,547

**CLASS 134**

2 5,049,200
42 5,049,201
108 5,048,548
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**CLASS 135**

25 R 5,048,550
100 5,048,551

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69 5,048,554
238 5,048,555
270 5,048,556
386 5,048,557
407 5,048,558
488 5,048,559
493.8 5,048,560
493.9 5,048,561
516.15 5,048,562
597 5,048,563
599 5,048,564
614.19 5,048,565
625.23 5,048,567
625.28 5,048,568
625.4 5,048,566
625.64 5,048,569

**CLASS 138**

93 5,048,570
96 R 5,048,571
121 5,048,572

**CLASS 139**

54 5,048,573
245 5,048,574

**CLASS 140**

93.2 5,048,575

**CLASS 141**

293 5,048,577
346 5,048,578

**CLASS 144**

2 N 5,048,579
134 D 5,048,580
362 5,048,581

**CLASS 148**

13 5,049,202
101 5,049,203
111 5,049,204
5,049,205
127 5,049,206
150 5,049,207
302 5,049,208
306 5,049,209
437 5,049,211

**CLASS 149**

3 5,049,212
19.3 5,049,213
109.4 5,049,214

**CLASS 150**

112 5,048,582

**CLASS 152**

209 R 5,048,583
543 5,048,584

**CLASS 156**

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64 5,049,216
5,049,217
71 5,049,218
73.1 5,049,219
116 5,049,220
151 5,049,221
159 5,049,222
244.11 5,049,223
252 5,049,431
294 5,049,224
5,049,225
307.3 5,049,226
362 5,049,227
384 5,049,228
577 5,049,229
628 5,049,230
630 5,049,231
5,049,232
642 5,049,233
644 5,049,234

**CLASS 160**

135 5,048,585
168.1 5,048,586
217 5,048,587
265 5,048,588

**CLASS 162**

9 5,049,235
16 5,049,236
109 5,048,589
157.2 5,049,237
162 5,049,238
274 5,049,239

**CLASS 164**

120 5,048,590
122.1 5,048,591
312 5,048,592
341 5,048,593
453 5,048,594

**CLASS 165**

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41 5,048,596
5,048,597
104.14 5,048,598
104.32 5,048,599
110 5,048,600
140 5,048,601
173 5,048,602

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70 5,048,603
106 5,048,604
187 5,048,605
208 5,048,606
270 5,048,607
276 5,048,608
295 5,048,609
372 5,048,610
374 5,048,611
382 5,048,612
387 5,048,613

**CLASS 168**

29 5,048,614

**CLASS 172**

1 5,048,615
42 5,048,616
5,048,617

**CLASS 173**

139 5,048,618

**CLASS 174**

35 R 5,049,701
48 5,049,700
5,049,702
52.1 5,049,703
261 5,049,704

**CLASS 175**

40 5,048,619
71 5,048,620
74 5,048,621
107 5,048,622

**CLASS 177**

25.18 5,048,623
154 5,048,624

**CLASS 180**

14.6 5,048,625
19.2 5,048,626
140 5,048,627
5,048,629
141 5,048,628
142 5,048,630
179 5,048,631
181 5,048,632
197 5,048,633
219 5,048,634
247 5,048,635
274 5,048,637
307 5,048,638

**CLASS 181**

272 5,048,636

**CLASS 182**

18 5,048,639
36 5,048,640
127 5,048,641

**CLASS 187**

1 R 5,048,642
8.41 5,048,643
17 5,048,644

**CLASS 188**

4 B 5,048,646
322.17 5,048,647
370 5,048,648

**CLASS 190**

18 A 5,048,649

**CLASS 192**

0.075 5,048,655
4 A 5,048,650
45 5,048,651
48.4 5,048,652
67 P 5,048,653
70.14 5,048,654
85 C 5,048,656
105 CD 5,048,657
106.2 5,048,658
107 C 5,048,659

**CLASS 193**

35 A 5,048,660
35 R 5,048,661

**CLASS 194**

317 5,048,662
5,048,663

**CLASS 198**

340 5,048,664
350 5,048,665
431 5,048,666
499 5,048,667
509 5,048,668
525 5,048,669
643 5,048,670
728 5,048,671
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832.1 5,048,673
836.2 5,048,674
844.2 5,048,675

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16 C 5,049,705
16 D 5,049,707
61.54 5,049,706
83 P 5,049,708
527 5,049,709

**CLASS 203**

67 5,049,241

**CLASS 204**

9 5,049,242
5,049,243
15 5,049,244
27 5,049,245
43.1 5,049,246
153.1 5,049,247
180.1 5,049,248
181.7 5,049,249
182.4 5,049,250
192.12 5,049,251
268 5,049,252
301 5,049,253
425 5,049,254
428 5,049,255

**CLASS 206**

45.14 5,048,677
45.15 5,048,676
63.3 5,048,678
303 5,048,679
309 5,048,680
312 5,048,681
317 5,048,682
362 5,048,683
364 5,048,684
455 5,048,685
5,048,686
497 5,048,687
501 5,048,688
586 5,048,689
602 5,048,690
611 5,048,691
618 5,048,692

**CLASS 208**

13 5,049,256
14 5,049,257
184 5,049,258
188 5,049,259

**CLASS 209**

2 5,049,260
17 5,049,261
137 5,048,693
399 5,049,262
540 5,048,694
552 5,048,695
5,048,696

**CLASS 210**

86 5,049,263
117 5,049,264
150 5,049,265
151 5,049,266
172 5,049,267
231 5,049,268
234 5,049,269
248 5,049,270
250 5,049,271
266 5,049,272
406 5,049,273
445 5,049,274
500.23 5,049,276
500.27 5,049,275
512.1 5,049,277
521 5,049,278
634 5,049,279
638 5,049,280
640 5,049,281
651 5,049,282
662 5,049,283
682 5,049,284
710 5,049,285
759 5,049,286
776 5,049,287

**CLASS 211**

45 5,048,697
5,048,698
59.2 5,048,699
70.6 5,048,700
189 5,048,701
194 5,048,702

**CLASS 212**

153 5,048,703

**CLASS 213**

75 D 5,048,704

**CLASS 215**

1 A 5,048,705
251 5,048,706

**CLASS 219**

10.55 A 5,049,711
10.55 E 5,049,710
5,049,713
5,049,714
69.11 5,049,715
76.14 5,049,716
98 5,049,717
121.63 5,049,720
121.64 5,049,718
121.68 5,049,721
121.71 5,049,722
121.83 5,049,723
212 5,049,724
347 5,049,725
464 5,049,726

**CLASS 220**

4.21 5,048,707
23.4 5,048,708
90.2 5,048,709
212 5,048,710
214 5,048,711
262 5,048,712
277 5,048,713
287 5,048,714
335 5,048,715
462 5,048,716

**CLASS 221**

2 5,048,717
35 5,048,718
119 5,048,719
198 5,048,720

**CLASS 222**

1 5,048,721
80 5,048,722
81 5,048,723
95 5,048,724
100 5,048,725
129.1 5,048,726
189 5,048,750
209 5,048,727
215 5,048,728
402.1 5,048,729
482 5,048,730
541 5,048,731
606 5,048,732

**CLASS 224**

42.42 5,048,733
148 5,048,734
244 5,048,735
277 5,048,736

**CLASS 225**

11 5,048,737
56 5,048,738

**CLASS 226**

74 5,048,739

**CLASS 227**

10 5,048,740
18 5,048,741

**CLASS 228**

20 5,048,742
44.3 5,048,743
123 5,048,744
132 5,048,745
180.1 5,048,746
180.2 5,048,747

**CLASS 229**

92.1 5,048,748
128 5,048,749

**CLASS 235**

101 5,049,727
382 5,049,729
492 5,049,728

**CLASS 236**

92 C 5,048,751

**CLASS 237**

2 A 5,048,752
12.3 C 5,048,753

**CLASS 239**

13 5,048,754
64 5,048,755
125 5,048,756
205 5,048,757
239 5,048,758
529 5,048,759

**CLASS 241**

9 5,048,760
19 5,048,761
21 5,048,762
24 5,048,763
36 5,048,764
62 5,048,765
65 5,048,766
236 5,048,767
261.1 5,048,768

**CLASS 242**

43 R 5,048,769
71.1 5,048,770

**CLASS 244**

3.15 5,048,771
3.23 5,048,772
3.28 5,048,773
171 5,048,774

**CLASS 248**

62 5,048,775
74.1 5,048,776
96 5,048,777
98 5,048,778
158 5,048,779
188.7 5,048,780
225.2 5,048,782
231.2 5,048,783
244 5,048,784
306 5,048,785
429 5,048,786
430 5,048,787
477 5,048,788
544 5,048,789

**CLASS 249**

219.1 5,048,781

**CLASS 250**

201.2 5,049,731
201.5 5,049,732
5,049,733
201.9 5,049,734
206.1 5,049,735
213 VT 5,049,730
226 5,049,736
231.16 5,049,737
235 5,049,740
239 5,049,741
281 5,049,739
301 5,049,738
5,049,742
303 5,049,743
308 5,049,744
310 5,049,745
327.2 5,049,746
5,049,747
5,049,748
5,049,749
341 5,049,750
352 5,049,751
370.08 5,049,752
396 R 5,049,753
484.1 5,049,754
492.3 5,049,755
561 5,049,757

**CLASS 251**

30.04 5,048,790
73 5,048,791
297 5,048,792

**CLASS 252**

8.551 5,049,288
22 5,049,289
32.7 E 5,049,290
33 5,049,291
49.6 5,049,292
5,049,293
51.5 A 5,049,294
62.54 5,049,295
67 5,049,296
80 5,049,297
95 5,049,298
106 5,049,299
162 5,049,300
171 5,049,301
174.17 5,049,302
180 5,049,304
186.38 5,049,305
187.31 5,049,306
299.01 5,049,307
299.67 5,049,308
313.1 5,049,309
389.52 5,049,310
5,049,311
408.1 5,049,312
511 5,049,313
542 5,049,314
546 5,049,315
548 5,049,303
602 5,049,316

**CLASS 254**

29 R 5,048,793
93 H 5,048,794
93 R 5,048,795
100 5,048,796
134.3 R 5,048,797
134.4 5,048,798
344 5,048,799
554 5,049,756

**CLASS 261**

16 5,049,317
34.1 5,049,318
114.1 5,049,319
122 5,049,320

**CLASS 264**

1.4 5,049,321
4.1 5,049,322
25 5,049,323
30 5,049,324
40.4 5,049,325
41 5,049,326
45.5 5,049,327
50 5,049,328
60 5,049,329
84 5,049,330
103 5,049,331
104 5,049,332
109 5,049,333
122 5,049,334
140 5,049,335
154 5,049,336
156 5,049,337
183 5,049,338
210.8 5,049,339
216 5,049,340
242 5,049,341



250 5,049,342
255 5,049,343
5,049,344
5,049,345
279.1 5,049,346
280 5,049,347
331.18 5,049,348
515 5,049,349

**CLASS 266**

256 5,048,800
5,048,801
263 5,048,802

**CLASS 267**

140.1 5,048,803

**CLASS 269**

21 5,048,804
48.4 5,048,805
152 5,048,806
243 5,048,807
258 5,048,808

**CLASS 270**

45 5,048,809
52 5,048,810

**CLASS 271**

5 5,048,811
11 5,048,812
98 5,048,813
186 5,048,814
204 5,048,815
227 5,048,816
250 5,048,817
283 5,048,818
288 5,048,819
293 5,048,820

**CLASS 272**

70 5,048,821
78 5,048,822
111 5,048,823
116 5,048,824
117 5,048,825
123 5,048,826
130 5,048,827

**CLASS 273**

26 E 5,048,828
58 K 5,048,829
73 C 5,048,830
85 G 5,048,831
129 V 5,048,832
138 A 5,048,833
167 F 5,048,834
5,048,835
183 5,048,837
183 B 5,048,836
228 5,048,838
240 5,048,839
241 5,048,840
246 5,048,841
248 5,048,842
326 5,048,843
400 5,048,844
5,048,845

**CLASS 277**

1 5,048,846
2 5,048,847

**CLASS 280**

11.22 5,048,848
47.131 5,048,850
47.35 5,048,849
87.042 5,048,851
91 5,048,852
5,048,853
5,048,854
477 5,048,855
615 5,048,856
646 5,048,857
651 5,048,858
660 5,048,859
668 5,048,860
691 5,048,861
707 5,048,862
736 5,048,863
743 5,048,864
755 5,048,865
801 5,048,866
803 5,048,867
840 5,048,868
848

**CLASS 281**

16 5,048,869

**CLASS 283**

81 5,048,870

**CLASS 285**

39 5,048,871
92 5,048,872
261 5,048,873
307 5,048,874
319 5,048,875
364 5,048,876

**CLASS 292**

110 5,048,877
171 5,048,878
216 5,048,879
262 5,048,880
320 5,048,881

**CLASS 294**

33 5,048,882
54.005 5,048,883
87.24 5,048,884

**CLASS 296**

6 5,048,885
65.1 5,048,886
146 5,048,887
189 5,048,888
213 5,048,889
216 5,048,890

**CLASS 297**

195 5,048,891
219 5,048,892
329 5,048,893
460 5,048,894

**CLASS 298**

22 J 5,048,896
23 DF 5,048,895

**CLASS 301**

5.3 5,048,897
37 S 5,048,898

**CLASS 303**

116 5,048,899

**CLASS 307**

246 5,049,758
261 5,049,759
279 5,049,760
360 5,049,761
443 5,049,763
5,049,764
446 5,049,765
603 5,049,766
605 5,049,767

**CLASS 310**

51 5,049,768
64 5,049,769
89 5,049,770
219 5,049,771
233 5,049,772
254 5,049,773
323 5,049,774
328 5,049,775
332 Re.33,691
333 5,049,776

**CLASS 312**

114 5,048,900
204 5,048,901
234.1 5,048,903
250 5,048,902

**CLASS 313**

35 5,049,777
407 5,049,778
486 5,049,779
509 5,049,780
634 5,049,781

**CLASS 315**

39.51 5,049,782
102 5,049,783
111.81 5,049,784
205 5,049,785
209 CD 5,049,786
209 R 5,049,787
219 5,049,788
289 5,049,789
291 5,049,790
368 R 5,049,791
411 5,049,792

**CLASS 318**

436 5,049,793
443 5,049,794
561 5,049,795
568.1 5,049,796
568.16 5,049,797
640 5,049,798
652 5,049,799
771 5,049,800
785 5,049,801

**CLASS 320**

2 5,049,802
20 5,049,803
5,049,804

**CLASS 323**

285 5,049,805
314 5,049,806
5,049,807

**CLASS 324**

71.1 5,049,808
117 R 5,049,809
156 5,049,810
158 D 5,049,816
158 F 5,049,813
158 MG 5,049,815
158 R 5,049,811
5,049,812
5,049,814
220 5,049,817
248 5,049,818
307 5,049,819
309 5,049,820
322 5,049,821
367 5,049,822
537 Re.33,692
640 5,049,823
660 5,049,824
5,049,825
662 5,049,826
723 5,049,827
727 5,049,828

**CLASS 328**

145 5,049,829

**CLASS 329**

306 5,049,830

**CLASS 330**

107 5,049,831
149 5,049,832
253 5,049,833
255 5,049,834
267 5,049,653
277 5,049,835
5,049,836
301 5,049,837

**CLASS 331**

11 5,049,838

**CLASS 332**

103 5,049,839

**CLASS 333**

32 5,049,840
81 R 5,049,841
235 5,049,842
246 5,049,843

**CLASS 335**

76 5,049,844
133 5,049,845
202 5,049,846
214 5,049,847
296 5,049,848

**CLASS 337**

1 5,049,849

**CLASS 338**

22 R 5,049,850
280 5,049,851
5,049,852

**CLASS 340**

388 5,049,853
426 5,049,867
550 5,049,854
5,049,855
551 5,049,856
5,049,857
552 5,049,858
573 5,049,859
610 5,049,860
632 5,049,861
706 5,049,862
710 5,049,863
753 5,049,864
758 5,049,865
784 5,049,866
785 5,049,868
815.01 5,049,869
815.2 5,049,870
825.05 5,049,871
5,049,872
825.06 5,049,873
825.44 5,049,874
5,049,875
825.57 5,049,876
825.8 5,049,877
870.4 5,049,878

**CLASS 341**

10 5,049,879
63 5,049,880
95 5,049,881
143 5,049,882

**CLASS 342**

12 5,049,883
20 5,049,884
5,049,885
26 5,049,886
110 5,049,887
149 5,049,888
160 5,049,889
384 5,049,890

**CLASS 343**

705 5,049,891
713 5,049,892
772 5,049,893
785 5,049,895
878 5,049,894
888 5,049,896

**CLASS 346**

1.1 5,049,897
5,049,898
5,049,899
108 5,049,900
5,049,901
110 R 5,049,902
135.1 5,049,903
140 R 5,049,904
153.1 5,049,905
160.1 5,049,906

**CLASS 350**

4 5,048,950
96.12 5,048,905
337 5,048,931
347 E 5,048,933

**CLASS 351**

50 5,048,943
57 5,048,944
169 5,048,945
206 5,048,946
224 5,048,947

**CLASS 352**

184 5,048,948

**CLASS 353**

77 5,048,949

**CLASS 354**

86 5,049,907
173.1 5,049,908
5,049,909
210 5,049,910
217 5,049,911
275 5,049,912
5,049,913
288 5,049,914
339 5,049,915
412 5,049,916
484 5,049,917

**CLASS 355**

27 5,049,918
5,049,919
5,049,920
5,049,921
32 5,049,922
45 5,049,923
50 5,049,924
53 5,049,925
55 5,049,926
71 5,049,927
72 5,049,928
204 5,049,929
206 5,049,930
209 5,049,931
218 5,049,932
5,049,933
5,049,934
219 5,049,935
5,049,936
232 5,049,937
245 5,049,938
246 5,049,939
5,049,940
260 5,049,941
5,049,942
272 5,049,943
284 5,049,944
5,049,945
290 5,049,946
309 5,049,947
318 5,049,948
319 5,049,949
328

**CLASS 356**

28.5 5,048,951
135 5,048,952
153 5,048,953
155 5,048,954
213 5,048,955
241 5,048,956
246 5,048,957
300 5,048,958
301 5,048,959
319 5,048,960
336 B1 4,798,465
350 5,048,961
5,048,962
5,048,963
5,048,964
360 5,048,965
376 5,048,966
387 5,048,967
401 5,048,968
5,048,969
432 5,048,969
445 5,048,970

**CLASS 357**

2 5,049,950
4 5,049,951
5,049,952
15 5,049,953
5,049,954
22 5,049,955
23.5 5,049,956
23.6 5,049,957
5,049,958
5,049,959
24 5,049,960
28 5,049,961
30 Re.33,693
5,049,962
5,049,963
34 5,049,964
38 5,049,965
42 5,049,966
5,049,967
49 5,049,968
51 5,049,969
5,049,970
55 5,049,971
68 5,049,972
70 5,049,973
5,049,974
71 5,049,975
5,049,976
72 5,049,977
74 5,049,978
75 5,049,979
80 5,049,980
81 5,049,981
5,049,982

**CLASS 358**

44 5,049,983
54 5,049,984
76 5,049,985
80 5,049,986
88 5,049,987
93 5,049,988
98 5,049,989
133 5,049,990
136 5,049,991
140 5,049,992
5,049,993
5,049,994
211 5,049,995
213.11 5,049,997
213.13 5,049,996
213.17 5,049,998
296 5,049,999
298 5,050,000
302 5,050,001
336 5,050,002
342 5,050,003
405 5,050,004
434 5,050,005
440 5,050,006
451 5,050,007

**CLASS 359**

36 5,048,935
48 5,048,932
56 5,048,934
58 5,048,930
135 5,050,164
180 5,050,239
202 5,048,904
301 5,048,937
332 5,049,762
368 5,048,941
487 5,048,926
513 5,048,942
569 5,048,925
618 5,048,927
652 5,048,938
683 5,048,939
708 5,048,940
809 5,048,928
896 5,048,929

**CLASS 360**

33.1 5,050,009
5,050,010
60 5,050,011
66 5,050,012
72.1 5,050,013
75 5,050,014
77.08 5,050,016
77.12 5,050,017
77.16 5,050,018
85 5,050,008
92 5,050,019
5,050,020
95 5,050,021
96.5 5,050,022
98.06 5,050,023
075 5,050,015
104 5,050,024
106 5,050,025
5,050,026
122 5,050,027
130.23 5,050,028
132 5,050,029
133 5,050,030
137 5,050,031

**CLASS 361**

117 5,050,032
119 5,050,033
283 5,050,034
5,050,035
385 5,050,036
5,050,037
386 5,050,038
388 5,050,039
5,050,040
391 5,050,041
395 5,050,042
534 5,050,043

**CLASS 362**

18 5,050,044
23 5,050,045
26 5,050,046
32 5,050,047
61 5,050,048
65 5,050,049
80.1 5,050,050
5,050,051
101 5,050,052
204 5,050,053
285 5,050,054
293 5,050,055
300 5,050,056

**CLASS 363**

37 5,050,057
65 5,050,058
5,050,059
126 5,050,060

**CLASS 364**

152 5,050,062
165 5,050,063
172 5,050,064
200 5,050,065
5,050,066
5,050,067
5,050,068
5,050,069
5,050,070
5,050,071
5,050,072
5,050,073
5,050,074
5,050,075
5,050,076
401 5,050,077
406 5,050,078
424.04 5,050,080
424.06 5,050,081
424.1 5,050,079
431.01 5,050,082
431.05 5,050,083
431.07 5,050,084
431.11 5,050,085
434 5,050,086
5,050,087
468 5,050,088
474.07 5,050,089
478 5,050,090
488 5,050,091
506 5,050,092
507 5,050,093
510 5,050,094
513 5,050,095
5,050,096
514 5,050,100
518 5,050,097
519 5,050,098
5,050,099
5,050,101
521 5,050,102
5,050,103
5,050,104
5,050,105
550 5,050,106
5,050,107
551.01 5,050,108
556 5,050,109
557 5,050,110
559 5,050,111
560 5,050,112
569 5,050,113
578 5,050,114
5,050,115
709.07 5,050,116
709.15 5,050,117
713 5,050,118
724.01 5,050,119
724.16 5,050,120
746 5,050,061
900 5,050,121

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**CLASS 365**

29 5,050,122
53 5,050,123
104 5,050,124
149 Re.33,694
185 5,050,125
189.07 5,050,126
189.09 5,050,127

**CLASS 366**

85 5,048,971
213 5,048,972

**CLASS 367**

7 5,050,128
21 5,050,129
41 5,050,130
73 5,050,131
82 5,050,132
91 5,050,133
118 5,050,134
127 5,050,135
134 5,050,136
150 5,050,137

**CLASS 368**

10 5,050,138
11 5,050,142
19 5,050,139
73 5,050,141
262 5,050,140

**CLASS 369**

13 5,050,143
5,050,144
5,050,145
32 5,050,146
34 5,050,147
37 5,050,148
43 5,050,149
44.27 5,050,150
44.290 5,050,151
44.32 5,050,152
112 5,050,153
5,050,154
5,050,155
116 5,050,156
215 5,050,157
270 5,050,158
5,050,159
291 Re.33,695

**CLASS 370**

32.1 5,050,160
60 5,050,161
5,050,162
5,050,163
85.13 5,050,165
94.1 5,050,166
112 5,050,167

**CLASS 371**

19 5,050,168
21.2 5,050,169
27 5,050,170
47.1 5,050,171
66 5,050,172

**CLASS 372**

6 5,050,173
20 5,050,174
21 5,050,175
26 5,050,176
38 5,050,177
5,050,178
44 5,050,179
45 5,050,180
69 5,050,181
89 5,050,182
94 5,050,183
107 5,050,184

**CLASS 373**

104 5,050,185

**CLASS 374**

29 5,048,973
142 5,048,974

**CLASS 375**

14 5,050,186
36 5,050,187
38 5,050,188
39 5,050,189
76 5,050,190
94 5,050,191
98 5,050,192
108 5,050,193
5,050,194
119 5,050,195

**CLASS 376**

143 5,049,350
257 5,049,351
280 5,049,352
293 5,049,353

**CLASS 378**

34 5,050,196
37 5,050,197
99 5,050,198
146 5,050,199
149 5,050,200
161 5,050,201
167 5,050,202
181 5,050,203
197 5,050,204

**CLASS 379**

2 5,050,205
67 5,050,206
96 5,050,207
100 5,050,208
388 5,050,209
413 5,050,210
438 5,050,211

**CLASS 380**

25 5,050,212
5,050,213

**CLASS 381**

5,050,214
41 5,050,215
62 5,050,216
94 5,050,217

**CLASS 382**

1 5,050,218
3 5,050,219
4 5,050,220
9 5,050,221
21 5,050,222
34 5,050,224
46 5,050,225
54 5,050,223
5,050,226
5,050,227
55 5,050,228
5,050,229
56 5,050,230
58 5,050,231

**CLASS 383**

4 5,048,975
10 5,048,976
104 5,048,977

**CLASS 384**

99 5,048,978
519 5,048,979
536 5,048,980
607 5,048,981
613 5,048,982

**CLASS 385**

2 5,048,907
7 5,048,936
17 5,048,910
23 5,048,912
27 5,048,909
33 5,048,911
37 5,048,913
39 5,048,908
40 5,048,906
49 5,048,919
53 5,048,914
55 5,048,920
69 5,048,921
71 5,048,916
78 5,048,917
86 5,048,915
5,048,918
103 5,048,922
117 5,048,923
145 5,048,924

**CLASS 392**

412 5,050,232

**CLASS 400**

119 5,048,983
124 5,048,984
5,048,985
202 5,048,986
613.1 5,048,987
697.1 5,048,988

**CLASS 401**

83 5,048,989
107 5,048,990
116 5,048,991
209 5,048,992

**CLASS 403**

24 5,048,993
51 5,048,994
264 5,048,995
287 5,048,996
295 5,048,997
351 5,048,998
374 5,048,999

**CLASS 404**

1 5,049,000
7 5,049,001

**CLASS 405**

128 5,049,002
134 5,049,003
204 5,049,004
216 5,049,005
270 5,049,006

**CLASS 406**

62 5,049,007
85 5,049,008

**CLASS 407**

54 5,049,009

**CLASS 408**

201 5,049,010
223 5,049,011
241 R 5,049,012

**CLASS 409**

231 5,049,013

**CLASS 411**

55 5,049,014
82 5,049,015
361 5,049,016
432 5,049,017
447 5,049,018

**CLASS 413**

19 5,049,019

**CLASS 414**

22.51 5,049,020
141.9 5,049,021
253 5,049,022
280 5,049,023
404 5,049,024
408 5,049,026
429 5,049,025
723 5,049,027
730 5,049,028
744.5 5,049,029
788.7 5,049,030

**CLASS 415**

112 5,049,031
170.1 5,049,032
173.2 5,049,033

**CLASS 416**

134 R 5,049,034
193.A 5,049,035
230 5,049,036

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36 5,049,037
246 5,049,038
273 5,049,039
274 5,049,040
295 5,049,041
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5,049,043
310 5,049,044
365 5,049,045
411 5,049,046
427 5,050,233
474 5,049,047
477 5,049,048

**CLASS 418**

61.2 5,049,049
97 5,049,050
113 5,049,051
179 5,049,052

**CLASS 420**

27 5,049,354
425 5,049,355
581 5,049,357

**CLASS 422**

56 5,049,358
67 5,049,359
141 5,049,360
144 5,049,361
186.05 5,049,362

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21.1 5,049,363
239 5,049,364
245.1 5,049,365
277 5,049,366
412 5,049,367
450 5,049,369
578 R 5,049,370
592 5,049,371

**CLASS 424**

1.1 5,049,372
5,049,373
5,049,374
52 5,049,375
63 5,049,376
70 5,049,377
85.4 5,049,378
115 5,049,379
195.1 5,049,380
401 5,049,381
405 5,049,383
5,049,384
408 5,049,385
427 5,049,386
435 5,049,387
450 5,049,382
5,049,388
5,049,389
5,049,390
5,049,391
5,049,392
484 5,049,393
490 5,049,394
494 5,049,395
649 5,049,396

**CLASS 425**

3 5,049,053
78 5,049,054
116 5,049,055
130 5,049,056
135 5,049,057
328 5,049,058
383 5,049,059
393 5,049,060
522 5,049,061
549 5,049,062

**CLASS 426**

7 5,049,397
20 5,049,398
87 5,049,399
237 5,049,400
573 5,049,401
599 5,049,402

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2 5,049,403
30 5,049,404
53.1 5,049,405
5,049,406
54.1 5,049,407
69 5,049,408
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131 5,049,410
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164 5,049,414
185 5,049,415
208.4 5,049,416
208.6 5,049,417
250 5,049,418
251 5,049,419
361 5,049,420
424 5,049,368

**CLASS 428**

34.4 5,049,421
34.6 5,049,422
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35.8 5,049,424
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40 5,049,427
64 5,049,428
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159 5,049,432
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332 5,049,443
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373 5,049,447
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476.1 5,049,449
570 5,049,450
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614 5,049,452
629 5,049,453
653 B1 4,278,740
692 5,049,454
917 5,049,455

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29 5,049,457
32 5,049,458
33 5,049,459

**CLASS 430**

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21 5,049,462
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59 5,049,464
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66 5,049,466
109 5,049,469
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253 5,049,476
270 5,049,477
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281 5,049,480
283 5,049,481
551 5,049,482
597 5,049,483
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**CLASS 431**

78 5,049,063
215 5,049,064
328 5,049,065
352 5,049,066

**CLASS 432**

40 5,049,067

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27 5,049,069
29 5,049,070
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173 5,049,072
5,049,073
5,049,074
196 5,049,075
215 5,049,076
229 5,049,077

**CLASS 434**

178 5,049,078
253 5,049,079
300 5,049,080

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4 5,049,487
6 5,049,488
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5,049,490
7.92 5,049,491
30 5,049,492
69.1 5,049,493
105 5,049,494
118 5,049,495
127 5,049,496
148 5,049,497
156 5,049,498
170 5,049,499
172.3 5,049,500
199 5,049,501
240.2 5,049,502
240.4 5,049,503
252.33 5,049,504
311 5,049,505

**CLASS 436**

69 5,049,506
89 5,049,507
123 5,049,508
140 5,049,509
176 5,049,510

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29 5,049,512
34 5,049,513
41 5,049,514
43 5,049,515
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52 5,049,517
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57 5,049,519
60 5,049,520
62 5,049,521
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101 5,049,523
169 5,049,524
195 5,049,525
211 5,049,526
220 5,049,527

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10 5,049,081
15 5,049,082
26 5,049,083
66 5,049,084
91 5,049,085
143 5,049,086
259 5,049,087
325 5,049,511
417 5,049,088
493 5,049,089
5,049,090
500 5,049,091
540 5,049,092
581 5,049,093
716 5,049,094
856 5,049,095

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52 5,049,097
61 5,049,098
5,049,099
77 5,049,100
88 5,049,101
041 5,049,096

**CLASS 441**

41 5,049,102

**CLASS 446**

19 5,049,103
104 5,049,104
126 5,049,105
220 5,049,106
397 5,049,107

**CLASS 452**

48 5,049,108
97 5,049,109
187 5,049,110

**CLASS 455**

34 5,050,234
127 5,050,235
193 5,050,236
200 5,050,237
300 5,050,238

**CLASS 464**

24 5,049,111

**CLASS 474**

8 5,049,112
49 5,049,113
111 5,049,114
166 5,049,115

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269 5,049,116

**CLASS 493**

188 5,049,117
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342 5,049,120
357 5,049,121
373 5,049,122
416 5,049,123

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94 5,049,528
97 5,049,529
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98 5,049,531
148 5,049,532

**CLASS 502**

104 5,049,533
107 5,049,534
117 5,049,535
235 5,049,536
350 5,049,537

**CLASS 503**

227 5,049,538

**CLASS 505**

1 5,049,539
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5,049,541
5,049,542
5,049,543

**CLASS 512**

22 5,049,544

**CLASS 514**

3 5,049,545
9 5,049,546
14 5,049,547
18 5,049,548
34 5,049,549
47 5,049,550
50 5,049,551
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91 5,049,553
92 5,049,554
114 5,049,555
183 5,049,556
185 5,049,557
202 5,049,558
219 5,049,559
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284 5,049,562
5,049,563



290 5,049,564
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303 5,049,566
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318 5,049,569
341 5,049,570
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381 5,049,572
383 5,049,573
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469 5,049,582
523 5,049,583
529 5,049,584
531 5,049,585
557 5,049,586
653 5,049,587
657 5,049,588
732 5,049,589

**CLASS 521**

51 5,049,590
159 5,049,591

**CLASS 523**

122 5,049,592
173 5,049,593
205 5,049,594
351 5,049,595
427 5,049,596
457 5,049,597

**CLASS 524**

13 5,049,598
80 5,049,599
88 5,049,600
94 5,049,601
95 5,049,602
97 5,049,603
103 5,049,604
108 5,049,605
274 5,049,607
375 5,049,608
386 5,049,609
514 5,049,610
588 5,049,611

**CLASS 525**

54.260 5,049,612
66 5,049,613
85 5,049,614
92 5,049,615
100 5,049,616
104 5,049,617
136 5,049,618
148 5,049,619
149 5,049,606
152 5,049,620
266 5,049,621
267 5,049,622
293 5,049,623
371 5,049,624
391 5,049,625
426 5,049,626
476 5,049,627
502 5,049,628
506 5,049,629
539 5,049,630

**CLASS 526**

204 5,049,631
262 5,049,632
281 5,049,633

**CLASS 527**

312 5,049,634

**CLASS 528**

18 5,049,635
33 5,049,636
44 5,049,637
61 5,049,638
120 5,049,639
125 5,049,640
155 5,049,641
171 5,049,642
194 5,049,643
202 5,049,644
230 5,049,645
272 5,049,646
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301 5,049,648
353 5,049,649
392 5,049,650
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**CLASS 530**

213 5,049,652
307 5,049,654
326 5,049,655
334 5,049,656
343 5,049,657
350 5,049,658
351 5,049,659
419 5,049,660
500 5,049,661

**CLASS 536**

27 5,049,662
29 5,049,663
119 5,049,664

**CLASS 540**

222 5,049,665
469 5,049,666
474 5,049,667
481 5,049,668

**CLASS 544**

87 5,049,670
276 5,049,671

**CLASS 546**

88 5,049,672
107 5,049,673
271 5,049,674
302 5,049,675
5,049,676

**CLASS 548**

213 5,049,677
263.2 5,049,678
491 5,049,679
550 5,049,680

**CLASS 549**

206 5,049,681
246 5,049,682

**CLASS 550**

206 5,049,683

**CLASS 556**

113 5,049,684
132 5,049,685
137 5,049,686
190 5,049,687
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84 5,049,691
319 5,049,692
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**CLASS 560**

27 5,049,695
75 5,049,696
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4 5,049,146
22 5,049,124
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10 5,049,147
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| | 5,019,172 | | 5,048,348 | | 5,049,285 | | 5,050,105 | | 5,049,695 | | 5,050,168 |
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| | 5,049,434 | | 5,048,417 | | 5,049,311 | | 5,050,121 | | 5,049,887 | | 5,049,702 |
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| | 5,048,853 | | 5,048,611 | | 5,049,519 | | 5,049,491 | | 5,048,695 | | 5,048,615 |
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| | 5,048,931 | | 5,048,621 | | 5,049,630 | | 5,048,199 | | 5,049,058 | | 5,048,989 |
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## DESIGN PATENTS


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| 01 : | 319,986 | | 320,062 | | 320,045 | | 319,977 | | 320,010 | 41 : | 319,918 |
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| | 319,931 | 09 : | 319,944 | | 319,954 | 34 : | 319,922 | | 320,052 | 44 : | 319,978 |
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## PLANT PATENTS


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| 06 : | 7,650 | | 7,654 | 12 : | 7,652 | | | | | | |


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Robert A. Mosbacher, *Secretary*
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Harry F. Manbeck, Jr., *Commissioner*

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Vol. 1130 Number 4

# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 24 1991

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UNITED STATES PATENT AND TRADEMARK OFFICE
September 24, 1991 Volume 1130 Number 4

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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees ( in U.S. dollars) is as follows:

| | |
|---|---|
| Transmittal fee: | 170.00 |
| Search Fee | |
| U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA) | |
| —No corresponding prior U.S. national application filed | 550.00 |
| —Corresponding prior U.S. national application filed | 380.00 |
| —Supplemental search fee, per additional invention | 150.00 |
| European Patent Office as ISA | 1320.00 |
| Preliminary examination fee | |
| USPTO as International Preliminary Examining Authority (IPEA) | |
| —Search fee paid to USPTO as ISA | 400.00 |
| —Additional examination fee, per additional invention | 130.00 |
| —ISA not the USPTO | 600.00 |
| —Additional examination fee, per additional invention | 200.00 |
| International fees | |
| Basic fee | 490.00 |
| Basic Supplemental fee (for each page over 30) | 10.00 |
| Designation fee per country or region for the first 10 national or regional offices | 119.00 |
| Designation fee for 11th and subsequent designations | No Charge |
| Handling fee | 150.00 |

U.S. National Stage fees

| | Small Entity | Regular |
|---|---|---|
| USPTO was IPEA | 165.00 | 330.00 |
| USPTO was ISA but not IPEA | 185.00 | 370.00 |
| USPTO was neither ISA nor IPEA | 250.00 | 500.00 |
| USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4) | 25.00 | 50.00 |
| —For each independent claim in excess of 3 | 18.00 | 36.00 |
| —For each claim in excess of 20 | 6.00 | 12.00 |
| —For each application containing a multiple dependent claim | 60.00 | 120.00 |
| —Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1) | 60.00 | 120.00 |
| —Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1) | 30.00 | 30.00 |

June 27, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks.*

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### Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on September 20, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,771,477 through 4,773,099
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 18, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,471,495 through 4,472,834
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:





37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

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### Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

*PATENTS WHICH EXPIRED JULY 14, 1991*
*DUE TO FAILURE TO PAY MAINTENANCE FEES*

| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,392,258 | 06/435,903 | 7/12/83 |
| 4,392,261 | 06/216,805 | 7/12/83 |
| 4,392,266 | 06/339,734 | 7/12/83 |
| 4,392,267 | 06/307,676 | 7/12/83 |
| 4,392,276 | 06/249,983 | 7/12/83 |
| 4,392,277 | 06/271,360 | 7/12/83 |
| 4,392,279 | 06/301,495 | 7/12/83 |
| 4,392,285 | 06/312,537 | 7/12/83 |
| 4,392,289 | 06/268,780 | 7/12/83 |
| 4,392,295 | 06/233,285 | 7/12/83 |
| 4,392,299 | 06/223,493 | 7/12/83 |
| 4,392,307 | 06/327,363 | 7/12/83 |
| 4,392,310 | 06/274,963 | 7/12/83 |
| 4,392,314 | 06/349,003 | 7/12/83 |
| 4,392,317 | 06/279,263 | 7/12/83 |
| 4,392,326 | 06/277,102 | 7/12/83 |
| 4,392,332 | 06/275,794 | 7/12/83 |
| 4,392,333 | 06/293,096 | 7/12/83 |
| 4,392,335 | 06/368,211 | 7/12/83 |
| 4,392,336 | 06/243,611 | 7/12/83 |
| 4,392,341 | 06/379,413 | 7/12/83 |
| 4,392,342 | 06/261,430 | 7/12/83 |
| 4,392,344 | 06/279,080 | 7/12/83 |
| 4,392,356 | 06/235,868 | 7/12/83 |
| 4,392,360 | 06/305,462 | 7/12/83 |
| 4,392,361 | 06/267,874 | 7/12/83 |
| 4,392,380 | 06/233,354 | 7/12/83 |
| 4,392,382 | 06/241,888 | 7/12/83 |
| 4,392,383 | 06/244,783 | 7/12/83 |
| 4,392,390 | 06/239,183 | 7/12/83 |
| 4,392,402 | 06/333,104 | 7/12/83 |
| 4,392,405 | 06/235,960 | 7/12/83 |
| 4,392,406 | 06/275,984 | 7/12/83 |
| 4,392,411 | 06/249,618 | 7/12/83 |
| 4,392,422 | 06/275,994 | 7/12/83 |
| 4,392,425 | 06/253,992 | 7/12/83 |
| 4,392,426 | 06/249,176 | 7/12/83 |
| 4,392,437 | 06/226,880 | 7/12/83 |
| 4,392,444 | 06/222,377 | 7/12/83 |
| 4,392,447 | 06/294,333 | 7/12/83 |
| 4,392,459 | 06/348,863 | 7/12/83 |
| 4,392,464 | 06/266,802 | 7/12/83 |
| 4,392,465 | 06/281,023 | 7/12/83 |
| 4,392,467 | 06/285,313 | 7/12/83 |
| 4,392,478 | 06/282,692 | 7/12/83 |
| 4,392,479 | 06/266,123 | 7/12/83 |
| 4,392,481 | 06/225,493 | 7/12/83 |
| 4,392,483 | 06/253,303 | 7/12/83 |
| 4,392,490 | 06/236,750 | 7/12/83 |
| 4,392,494 | 06/250,104 | 7/12/83 |
| 4,392,495 | 06/298,030 | 7/12/83 |
| 4,392,500 | 06/230,443 | 7/12/83 |
| 4,392,506 | 06/307,670 | 7/12/83 |
| 4,392,508 | 06/254,446 | 7/12/83 |
| 4,392,515 | 06/236,237 | 7/12/83 |
| 4,392,517 | 06/218,325 | 7/12/83 |
| 4,392,518 | 06/254,120 | 7/12/83 |
| 4,392,519 | 06/231,372 | 7/12/83 |
| 4,392,521 | 06/410,415 | 7/12/83 |
| 4,392,526 | 06/257,085 | 7/12/83 |
| 4,392,530 | 06/259,329 | 7/12/83 |
| 4,392,531 | 06/309,910 | 7/12/83 |
| 4,392,541 | 06/259,513 | 7/12/83 |
| 4,392,549 | 06/354,446 | 7/12/83 |
| 4,392,552 | 06/240,091 | 7/12/83 |
| 4,392,555 | 06/260,205 | 7/12/83 |
| 4,392,571 | 06/319,965 | 7/12/83 |
| 4,392,575 | 06/259,626 | 7/12/83 |
| 4,392,579 | 06/313,394 | 7/12/83 |
| 4,392,593 | 06/244,630 | 7/12/83 |
| 4,392,596 | 06/237,594 | 7/12/83 |
| 4,392,600 | 06/236,426 | 7/12/83 |
| 4,392,605 | 06/283,457 | 7/12/83 |
| 4,392,618 | 06/243,305 | 7/12/83 |
| 4,392,621 | 06/251,695 | 7/12/83 |
| 4,392,629 | 06/287,290 | 7/12/83 |
| 4,392,646 | 06/284,822 | 7/12/83 |
| 4,392,651 | 06/395,133 | 7/12/83 |
| 4,392,666 | 06/243,424 | 7/12/83 |
| 4,392,676 | 06/350,312 | 7/12/83 |
| 4,392,682 | 06/239,883 | 7/12/83 |
| 4,392,683 | 06/295,275 | 7/12/83 |
| 4,392,687 | 06/265,360 | 7/12/83 |
| 4,392,689 | 06/255,710 | 7/12/83 |

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| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,392,695 | 06/291,240 | 7/12/83 |
| 4,392,697 | 06/234,882 | 7/12/83 |
| 4,392,717 | 06/223,289 | 7/12/83 |
| 4,392,718 | 06/221,499 | 7/12/83 |
| 4,392,727 | 06/301,096 | 7/12/83 |
| 4,392,728 | 06/381,944 | 7/12/83 |
| 4,392,739 | 06/356,682 | 7/12/83 |
| 4,392,743 | 06/349,926 | 7/12/83 |
| 4,392,744 | 06/248,337 | 7/12/83 |
| 4,392,758 | 06/227,873 | 7/12/83 |
| 4,392,762 | 06/264,023 | 7/12/83 |
| 4,392,764 | 06/303,685 | 7/12/83 |
| 4,392,765 | 06/250,082 | 7/12/83 |
| 4,392,771 | 06/218,613 | 7/12/83 |
| 4,392,774 | 06/308,400 | 7/12/83 |
| 4,392,776 | 06/264,153 | 7/12/83 |
| 4,392,784 | 06/309,123 | 7/12/83 |
| 4,392,787 | 06/226,330 | 7/12/83 |
| 4,392,792 | 06/240,859 | 7/12/83 |
| 4,392,793 | 06/309,781 | 7/12/83 |
| 4,392,798 | 06/251,003 | 7/12/83 |
| 4,392,821 | 06/308,561 | 7/12/83 |
| 4,392,823 | 06/295,496 | 7/12/83 |
| 4,392,831 | 06/301,781 | 7/12/83 |
| 4,392,840 | 06/224,290 | 7/12/83 |
| 4,392,845 | 06/324,920 | 7/12/83 |
| 4,392,846 | 06/264,389 | 7/12/83 |
| 4,392,850 | 06/324,194 | 7/12/83 |
| 4,392,851 | 06/324,200 | 7/12/83 |
| 4,392,852 | 06/363,926 | 7/12/83 |
| 4,392,857 | 06/256,698 | 7/12/83 |
| 4,392,867 | 06/330,107 | 7/12/83 |
| 4,392,868 | 06/316,352 | 7/12/83 |
| 4,392,874 | 06/325,082 | 7/12/83 |
| 4,392,876 | 06/302,574 | 7/12/83 |
| 4,392,877 | 06/309,333 | 7/12/83 |
| 4,392,879 | 06/413,920 | 7/12/83 |
| 4,392,887 | 06/327,450 | 7/12/83 |
| 4,392,889 | 06/275,981 | 7/12/83 |
| 4,392,892 | 06/307,092 | 7/12/83 |
| 4,392,896 | 06/340,183 | 7/12/83 |
| 4,392,901 | 06/350,333 | 7/12/83 |
| 4,392,905 | 06/288,589 | 7/12/83 |
| 4,392,908 | 06/223,864 | 7/12/83 |
| 4,392,911 | 06/377,336 | 7/12/83 |
| 4,392,920 | 06/272,152 | 7/12/83 |
| 4,392,928 | 06/342,683 | 7/12/83 |
| 4,392,929 | 06/288,443 | 7/12/83 |
| 4,392,943 | 06/373,183 | 7/12/83 |
| 4,392,947 | 06/307,047 | 7/12/83 |
| 4,392,953 | 06/238,072 | 7/12/83 |
| 4,392,958 | 06/246,803 | 7/12/83 |
| 4,392,959 | 06/263,869 | 7/12/83 |
| 4,392,966 | 06/339,570 | 7/12/83 |
| 4,392,973 | 06/245,013 | 7/12/83 |
| 4,392,988 | 06/262,230 | 7/12/83 |
| 4,392,989 | 06/262,280 | 7/12/83 |
| 4,393,002 | 06/360,031 | 7/12/83 |
| 4,393,006 | 06/396,016 | 7/12/83 |
| 4,393,011 | 06/355,481 | 7/12/83 |
| 4,393,012 | 06/336,081 | 7/12/83 |
| 4,393,022 | 06/318,923 | 7/12/83 |
| 4,393,029 | 06/286,038 | 7/12/83 |
| 4,393,033 | 06/332,236 | 7/12/83 |
| 4,393,040 | 06/246,993 | 7/12/83 |
| 4,393,042 | 06/323,394 | 7/12/83 |
| 4,393,046 | 06/229,806 | 7/12/83 |
| 4,393,067 | 06/325,029 | 7/12/83 |
| 4,393,068 | 06/337,039 | 7/12/83 |
| 4,393,077 | 06/280,072 | 7/12/83 |
| 4,393,084 | 06/263,703 | 7/12/83 |
| 4,393,086 | 06/243,382 | 7/12/83 |
| 4,393,089 | 06/331,510 | 7/12/83 |
| 4,393,090 | 06/378,360 | 7/12/83 |
| 4,393,093 | 06/272,823 | 7/12/83 |
| 4,393,095 | 06/344,257 | 7/12/83 |
| 4,393,104 | 06/264,705 | 7/12/83 |
| 4,393,108 | 06/340,992 | 7/12/83 |
| 4,393,112 | 06/265,317 | 7/12/83 |
| 4,393,121 | 06/323,518 | 7/12/83 |
| 4,393,124 | 06/303,739 | 7/12/83 |
| 4,393,131 | 06/362,938 | 7/12/83 |
| 4,393,132 | 06/371,076 | 7/12/83 |
| 4,393,134 | 06/424,096 | 7/12/83 |
| 4,393,142 | 06/344,331 | 7/12/83 |
| 4,393,143 | 06/266,299 | 7/12/83 |
| 4,393,150 | 06/375,807 | 7/12/83 |
| 4,393,151 | 06/283,322 | 7/12/83 |
| 4,393,152 | 06/283,718 | 7/12/83 |
| 4,393,173 | 06/303,732 | 7/12/83 |
| 4,393,180 | 06/390,468 | 7/12/83 |
| 4,393,185 | 06/380,801 | 7/12/83 |
| 4,393,189 | 06/321,971 | 7/12/83 |
| 4,393,190 | 06/303,998 | 7/12/83 |
| 4,393,192 | 06/451,998 | 7/12/83 |
| 4,393,199 | 06/262,935 | 7/12/83 |
| 4,393,202 | 06/408,987 | 7/12/83 |
| 4,393,206 | 06/359,221 | 7/12/83 |
| 4,393,212 | 06/263,335 | 7/12/83 |
| 4,393,215 | 06/280,754 | 7/12/83 |
| 4,393,218 | 06/327,753 | 7/12/83 |
| 4,393,221 | 06/318,172 | 7/12/83 |
| 4,393,222 | 06/386,888 | 7/12/83 |
| 4,393,224 | 06/312,914 | 7/12/83 |
| 4,393,230 | 06/305,554 | 7/12/83 |
| 4,393,237 | 06/279,906 | 7/12/83 |
| 4,393,238 | 06/265,321 | 7/12/83 |
| 4,393,240 | 06/230,220 | 7/12/83 |
| 4,393,245 | 06/326,597 | 7/12/83 |
| 4,393,247 | 06/335,551 | 7/12/83 |
| 4,393,253 | 06/310,099 | 7/12/83 |
| 4,393,255 | 06/329,481 | 7/12/83 |
| 4,393,258 | 06/386,994 | 7/12/83 |
| 4,393,260 | 06/270,703 | 7/12/83 |
| 4,393,269 | 06/229,494 | 7/12/83 |
| 4,393,273 | 06/226,561 | 7/12/83 |
| 4,393,281 | 06/293,977 | 7/12/83 |
| 4,393,282 | 06/245,170 | 7/12/83 |
| 4,393,297 | 06/286,510 | 7/12/83 |
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| 4,393,336 | 06/250,262 | 7/12/83 |
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| 4,393,371 | 06/264,232 | 7/12/83 |
| 4,393,374 | 06/246,842 | 7/12/83 |
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| 4,393,446 | 06/258,122 | 7/12/83 |
| 4,393,478 | 06/285,344 | 7/12/83 |
| 4,393,483 | 06/291,000 | 7/12/83 |
| 4,393,507 | 06/222,500 | 7/12/83 |
| 4,393,512 | 06/281,141 | 7/12/83 |
| 4,393,515 | 06/229,136 | 7/12/83 |
| 4,679,254 | 06/819,680 | 7/14/87 |
| 4,679,256 | 06/922,455 | 7/14/87 |
| 4,679,261 | 06/767,331 | 7/14/87 |
| 4,679,263 | 06/782,870 | 7/14/87 |
| 4,679,267 | 06/846,204 | 7/14/87 |
| 4,679,274 | 06/758,652 | 7/14/87 |
| 4,679,275 | 06/837,298 | 7/14/87 |
| 4,679,276 | 06/760,311 | 7/14/87 |
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| 4,679,282 | 06/870,541 | 7/14/87 |
| 4,679,285 | 06/797,957 | 7/14/87 |
| 4,679,292 | 06/779,766 | 7/14/87 |
| 4,679,295 | 06/879,102 | 7/14/87 |
| 4,679,316 | 06/859,691 | 7/14/87 |
| 4,679,324 | 06/795,969 | 7/14/87 |
| 4,679,325 | 06/852,314 | 7/14/87 |
| 4,679,330 | 06/808,037 | 7/14/87 |
| 4,679,337 | 06/761,110 | 7/14/87 |
| 4,679,338 | 06/879,254 | 7/14/87 |
| 4,679,343 | 06/830,322 | 7/14/87 |
| 4,679,344 | 06/888,589 | 7/14/87 |



| Patent Number | Serial Number | Issue Date |
|---|---|---|
| 4,679,345 | 06/852,747 | 7/14/87 |
| 4,679,346 | 06/764,543 | 7/14/87 |
| 4,679,348 | 06/912,326 | 7/14/87 |
| 4,679,349 | 06/827,942 | 7/14/87 |
| 4,679,365 | 06/779,961 | 7/14/87 |
| 4,679,366 | 06/758,085 | 7/14/87 |
| 4,679,370 | 06/852,087 | 7/14/87 |
| 4,679,383 | 06/797,679 | 7/14/87 |
| 4,679,388 | 06/797,816 | 7/14/87 |
| 4,679,389 | 06/828,838 | 7/14/87 |
| 4,679,391 | 06/782,040 | 7/14/87 |
| 4,679,396 | 06/569,157 | 7/14/87 |
| 4,679,413 | 06/890,266 | 7/14/87 |
| 4,679,418 | 06/847,133 | 7/14/87 |
| 4,679,419 | 06/855,639 | 7/14/87 |
| 4,679,424 | 06/906,280 | 7/14/87 |
| 4,679,429 | 06/807,404 | 7/14/87 |
| 4,679,430 | 06/593,277 | 7/14/87 |
| 4,679,436 | 06/893,253 | 7/14/87 |
| 4,679,439 | 06/777,101 | 7/14/87 |
| 4,679,444 | 06/734,170 | 7/14/87 |
| 4,679,445 | 06/825,413 | 7/14/87 |
| 4,679,446 | 06/773,954 | 7/14/87 |
| 4,679,452 | 06/892,732 | 7/14/87 |
| 4,679,455 | 06/747,793 | 7/14/87 |
| 4,679,459 | 06/855,869 | 7/14/87 |
| 4,679,467 | 06/841,824 | 7/14/87 |
| 4,679,467 | 06/841,824 | 7/14/78 |
| 4,679,471 | 06/740,271 | 7/14/87 |
| 4,679,476 | 06/847,771 | 7/14/87 |
| 4,679,486 | 06/708,050 | 7/14/87 |
| 4,679,487 | 06/319,926 | 7/14/87 |
| 4,679,488 | 06/805,119 | 7/14/87 |
| 4,679,497 | 06/777,348 | 7/14/87 |
| 4,679,499 | 06/753,901 | 7/14/87 |
| 4,679,503 | 06/730,333 | 7/14/87 |
| 4,679,504 | 06/674,484 | 7/14/87 |
| 4,679,512 | 06/855,134 | 7/14/87 |
| 4,679,513 | 06/921,733 | 7/14/87 |
| 4,679,518 | 06/863,032 | 7/14/87 |
| 4,679,520 | 06/742,917 | 7/14/87 |
| 4,679,521 | 06/792,831 | 7/14/87 |
| 4,679,523 | 06/761,088 | 7/14/87 |
| 4,679,526 | 06/891,163 | 7/14/87 |
| 4,679,551 | 06/704,631 | 7/14/87 |
| 4,679,553 | 06/735,331 | 7/14/87 |
| 4,679,554 | 06/726,159 | 7/14/87 |
| 4,679,562 | 06/861,342 | 7/14/87 |
| 4,679,565 | 06/790,471 | 7/14/87 |
| 4,679,570 | 06/670,854 | 7/14/87 |
| 4,679,574 | 06/832,168 | 7/14/87 |
| 4,679,578 | 06/788,098 | 7/14/87 |
| 4,679,598 | 06/839,961 | 7/14/87 |
| 4,679,600 | 06/774,019 | 7/14/87 |
| 4,679,602 | 06/402,347 | 7/14/87 |
| 4,679,605 | 06/878,618 | 7/14/87 |
| 4,679,606 | 06/882,254 | 7/14/87 |
| 4,679,615 | 06/707,152 | 7/14/87 |
| 4,679,617 | 06/698,807 | 7/14/87 |
| 4,679,622 | 06/727,294 | 7/14/87 |
| 4,679,636 | 06/919,650 | 7/14/87 |
| 4,679,643 | 06/820,543 | 7/14/87 |
| 4,679,644 | 06/799,712 | 7/14/87 |
| 4,679,645 | 06/706,146 | 7/14/87 |
| 4,679,647 | 06/867,838 | 7/14/87 |
| 4,679,648 | 06/857,759 | 7/14/87 |
| 4,679,651 | 06/446,425 | 7/14/87 |
| 4,679,655 | 06/918,145 | 7/14/87 |
| 4,679,658 | 06/751,872 | 7/14/87 |
| 4,679,677 | 06/755,066 | 7/14/87 |
| 4,679,687 | 06/782,874 | 7/14/87 |
| 4,679,691 | 06/764,723 | 7/14/87 |
| 4,679,692 | 06/692,587 | 7/14/87 |
| 4,679,695 | 06/650,729 | 7/14/87 |
| 4,679,696 | 06/727,534 | 7/14/87 |
| 4,679,697 | 06/799,894 | 7/14/87 |
| 4,679,700 | 06/917,708 | 7/14/87 |
| 4,679,705 | 06/404,790 | 7/14/87 |
| 4,679,717 | 06/590,470 | 7/14/87 |
| 4,679,735 | 06/847,238 | 7/14/87 |
| 4,679,746 | 06/830,950 | 7/14/87 |
| 4,679,749 | 06/655,526 | 7/14/87 |
| 4,679,757 | 06/864,296 | 7/14/87 |
| 4,679,761 | 06/313,245 | 7/14/87 |
| 4,679,764 | 06/638,194 | 7/14/87 |
| 4,679,765 | 06/853,312 | 7/14/87 |
| 4,679,768 | 06/756,232 | 7/14/87 |
| 4,679,772 | 06/886,335 | 7/14/87 |
| 4,679,776 | 06/732,452 | 7/14/87 |
| 4,679,784 | 06/742,217 | 7/14/87 |
| 4,679,790 | 06/838,829 | 7/14/87 |
| 4,679,792 | 06/824,166 | 7/14/87 |
| 4,679,793 | 06/833,308 | 7/14/87 |
| 4,679,797 | 06/757,152 | 7/14/87 |
| 4,679,803 | 06/822,574 | 7/14/87 |
| 4,679,806 | 06/830,810 | 7/14/87 |
| 4,679,810 | 06/879,968 | 7/14/87 |
| 4,679,811 | 06/878,629 | 7/14/87 |
| 4,679,818 | 06/827,580 | 7/14/87 |
| 4,679,821 | 06/726,272 | 7/14/87 |
| 4,679,824 | 06/843,413 | 7/14/87 |
| 4,679,836 | 06/842,151 | 7/14/87 |
| 4,679,837 | 06/848,202 | 7/14/87 |
| 4,679,838 | 06/851,203 | 7/14/87 |
| 4,679,839 | 06/860,554 | 7/14/87 |
| 4,679,845 | 06/760,898 | 7/14/87 |
| 4,679,853 | 06/803,805 | 7/14/87 |
| 4,679,856 | 06/653,872 | 7/14/87 |
| 4,679,859 | 06/791,938 | 7/14/87 |
| 4,679,862 | 06/824,195 | 7/14/87 |
| 4,679,872 | 06/822,655 | 7/14/87 |
| 4,679,873 | 06/906,219 | 7/14/87 |
| 4,679,882 | 06/777,055 | 7/14/87 |
| 4,679,892 | 06/658,109 | 7/14/87 |
| 4,679,901 | 06/800,576 | 7/14/87 |
| 4,679,905 | 06/762,198 | 7/14/87 |
| 4,679,906 | 06/808,727 | 7/14/87 |
| 4,679,915 | 06/821,064 | 7/14/87 |
| 4,679,923 | 06/760,828 | 7/14/87 |
| 4,679,924 | 06/878,588 | 7/14/87 |
| 4,679,944 | 06/863,751 | 7/14/87 |
| 4,679,947 | 06/755,493 | 7/14/87 |
| 4,679,950 | 06/909,555 | 7/14/87 |
| 4,679,955 | 06/857,475 | 7/14/87 |
| 4,679,956 | 06/894,553 | 7/14/87 |
| 4,679,957 | 06/872,525 | 7/14/87 |
| 4,679,970 | 06/296,333 | 7/14/87 |
| 4,679,974 | 06/792,306 | 7/14/87 |
| 4,679,975 | 06/857,184 | 7/14/87 |
| 4,679,980 | 06/686,982 | 7/14/87 |
| 4,679,986 | 06/673,320 | 7/14/87 |
| 4,679,992 | 06/656,374 | 7/14/87 |
| 4,679,994 | 06/507,891 | 7/14/87 |
| 4,680,001 | 06/327,827 | 7/14/87 |
| 4,680,015 | 06/782,127 | 7/14/87 |
| 4,680,018 | 06/849,211 | 7/14/87 |
| 4,680,019 | 06/823,845 | 7/14/87 |
| 4,680,020 | 06/851,461 | 7/14/87 |
| 4,680,021 | 06/527,624 | 7/14/87 |
| 4,680,022 | 06/581,424 | 7/14/87 |
| 4,680,023 | 06/725,093 | 7/14/87 |
| 4,680,028 | 06/626,963 | 7/14/87 |
| 4,680,069 | 06/581,040 | 7/14/87 |
| 4,680,074 | 06/732,813 | 7/14/87 |
| 4,680,077 | 06/747,140 | 7/14/87 |
| 4,680,088 | 06/703,950 | 7/14/87 |
| 4,680,091 | 06/843,063 | 7/14/87 |
| 4,680,092 | 06/539,288 | 7/14/87 |
| 4,680,099 | 06/848,942 | 7/14/87 |
| 4,680,106 | 06/761,113 | 7/14/87 |
| 4,680,112 | 06/685,146 | 7/14/87 |
| 4,680,128 | 06/727,454 | 7/14/87 |
| 4,680,138 | 06/790,247 | 7/14/87 |
| 4,680,142 | 06/920,225 | 7/14/87 |
| 4,680,145 | 06/891,825 | 7/14/87 |
| 4,680,147 | 06/804,312 | 7/14/87 |

VOL 1130 ISS 4 SE 24 1991 UMI



| Patent Number | Serial Number | Issue Date | 4,680,461 | 06/775,947 | 7/14/87 |
|---|---|---|---|---|---|
| | | | 4,680,471 | 06/713,922 | 7/14/87 |
| 4,680,148 | 06/739,291 | 7/14/87 | 4,680,481 | 06/636,922 | 7/14/87 |
| 4,680,153 | 06/614,920 | 7/14/87 | 4,680,487 | 06/898,033 | 7/14/87 |
| 4,680,160 | 06/807,943 | 7/14/87 | 4,680,501 | 06/405,819 | 7/14/87 |
| 4,680,169 | 06/814,831 | 7/14/87 | 4,680,502 | 06/750,784 | 7/14/87 |
| 4,680,173 | 06/252,306 | 7/14/87 | 4,680,518 | 06/908,701 | 7/14/87 |
| 4,680,174 | 06/613,803 | 7/14/87 | 4,680,523 | 06/839,346 | 7/14/87 |
| 4,680,177 | 06/579,905 | 7/14/87 | 4,680,527 | 06/894,217 | 7/14/87 |
| 4,680,185 | 06/826,742 | 7/14/87 | 4,680,536 | 06/784,543 | 7/14/87 |
| 4,680,190 | 06/898,777 | 7/14/87 | 4,680,542 | 06/736,857 | 7/14/87 |
| 4,680,214 | 06/838,942 | 7/14/87 | 4,680,554 | 06/779,945 | 7/14/87 |
| 4,680,222 | 06/630,598 | 7/14/87 | 4,680,571 | 06/711,447 | 7/14/87 |
| 4,680,237 | 06/827,089 | 7/14/87 | 4,680,573 | 06/790,310 | 7/14/87 |
| 4,680,242 | 06/871,306 | 7/14/87 | 4,680,574 | 06/717,128 | 7/14/87 |
| 4,680,243 | 06/761,993 | 7/14/87 | 4,680,586 | 06/779,672 | 7/14/87 |
| 4,680,260 | 06/751,798 | 7/14/87 | 4,680,601 | 06/885,814 | 7/14/87 |
| 4,680,286 | 06/735,424 | 7/14/87 | 4,680,612 | 06/843,380 | 7/14/87 |
| 4,680,287 | 06/665,241 | 7/14/87 | 4,680,616 | 06/861,555 | 7/14/87 |
| 4,680,290 | 06/639,543 | 7/14/87 | 4,680,617 | 06/613,172 | 7/14/87 |
| 4,680,296 | 06/787,971 | 7/14/87 | 4,680,618 | 06/530,093 | 7/14/87 |
| 4,680,300 | 06/690,295 | 7/14/87 | 4,680,667 | 06/778,997 | 7/14/87 |
| 4,680,301 | 06/774,776 | 7/14/87 | 4,680,668 | 06/687,381 | 7/14/87 |
| 4,680,303 | 06/798,846 | 7/14/87 | 4,680,676 | 06/816,521 | 7/14/87 |
| 4,680,304 | 06/710,791 | 7/14/87 | 4,680,677 | 06/713,221 | 7/14/87 |
| 4,680,305 | 06/816,937 | 7/14/87 | 4,680,679 | 06/853,060 | 7/14/87 |
| 4,680,311 | 06/848,483 | 7/14/87 | 4,680,682 | 06/904,699 | 7/14/87 |
| 4,680,322 | 06/794,846 | 7/14/87 | 4,680,685 | 06/893,503 | 7/14/87 |
| 4,680,327 | 06/823,744 | 7/14/87 | 4,680,706 | 06/615,563 | 7/14/87 |
| 4,680,354 | 06/865,555 | 7/14/87 | 4,680,717 | 06/651,480 | 7/14/87 |
| 4,680,360 | 06/671,004 | 7/14/87 | 4,680,731 | 06/867,886 | 7/14/87 |
| 4,680,382 | 06/825,290 | 7/14/87 | 4,680,752 | 06/613,392 | 7/14/87 |
| 4,680,402 | 06/868,443 | 7/14/87 | 4,680,756 | 06/839,509 | 7/14/87 |
| 4,680,408 | 06/872,320 | 7/14/87 | 4,680,765 | 06/759,252 | 7/14/87 |
| 4,680,411 | 06/588,566 | 7/14/87 | 4,680,770 | 06/821,156 | 7/14/87 |
| 4,680,415 | 06/885,993 | 7/14/87 | 4,680,778 | 06/783,132 | 7/14/87 |
| 4,680,416 | 06/755,389 | 7/14/87 | 4,680,787 | 06/907,125 | 7/14/87 |
| 4,680,424 | 06/805,818 | 7/14/87 | 4,680,794 | 06/891,496 | 7/14/87 |
| 4,680,426 | 06/766,978 | 7/14/87 | 4,680,795 | 06/812,687 | 7/14/87 |
| 4,680,435 | 06/838,915 | 7/14/87 | 4,680,799 | 06/873,146 | 7/14/87 |
| 4,680,446 | 06/782,460 | 7/14/87 | 4,680,807 | 06/774,860 | 7/14/87 |
| 4,680,447 | 06/756,739 | 7/14/87 | 4,680,809 | 06/607,014 | 7/14/87 |
| 4,680,454 | 06/914,944 | 7/14/87 | 4,680,811 | 06/681,113 | 7/14/87 |

## NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below is considered as not having expired but is subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

| Patent No. | Serial No | Patent Date | Application Filing Date | Delayed Payment Acceptance Date |
|---|---|---|---|---|
| 4,612,442 | 06/617,789 | 9/16/86 | 6/06/84 | 7/16/91 |

### Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b).

**4,103,167**, Re. S. N. 07/748,338, Filed Aug. 21, 1991, Cl. 250/432R, ULTRAVIOLET PURIFICATION SYSTEM, Sidney Ellner, Owner of Record: *Ultraviolet Purification Systems, Inc., Bedford, N.Y.*, Attorney or Agent: Austin R. Miller, Ex. Gp.: 256

**4,165,832**, Re. S. N. 07/746,452, Filed Aug. 16, 1991, Cl. 229/054R, THERMOPLASTIC BAG, Milton C. Kuklies, et. al., Owner of Record: *Mobil, Fairfax, Va.*, Attorney or Agent: James P. O'Sullivan, Sr., Ex. Gp.: 241

**4,792,778**, Re. S. N. 07/745,013, Filed Aug. 14, 1991, Cl. 338/174, POTENTIOMETER, Lopez Arriazu, Owner of Record: *Navaraa De Componentes Electronicos, S.A., Spain*, Attorney or Agent: Roger J. French, Ex. Gp.: 216

**4,816,392**, Re. S. N. 07/676,953, Filed Mar. 28, 1991, Cl. 187/435.7, RAPID STICK TEST FOR DETECTION OF CIGUATOXIN AND OTHER POLYETHER TOXINS FROM TISSUES, Yoshitsugi Hokama, Owner of Record: *Hawaii Chemtect Inc., Honolulu, Hi.*, Attorney or Agent: Janice A. Sharp., Ex. Gp.: 187

**4,832,136**, Re. S. N. 07/704,810, Filed May 23, 1991, Cl. 175/057, DRILL BIT AND ROLLER CUTTER FOR SAID DRILL BIT, Michael Mattsson, et. al., Owner of Record: *Santrade Ltd., Luzern, Switzerland*, Attorney or Agent: Alan E. Kopecki, Ex. Gp.: 356



**4,857,503**, Re. S. N. 07/746,112, Filed Aug. 15, 1991, Cl. 503/277, THERMAL DYE TRANSFER MATERIALS, Susan K. Jongewaard, et. al., Owner of Record: *Minnesota Mining and Manufacturing Co., St. Paul, Minn.*, Attorney or Agent: Mark A. Litman, Ex. Gp.: 159

**4,861,102**, Re. S. N. 07/746,624, Filed Aug. 19, 1991, Cl. 297/162, TRAY ASSEMBLY FOR ATTACHMENT TO FOLDING CHAIRS AND OTHER SUPPORTING STRUCTURES, Jerald W. Fuller, Owner of Record: *Inventor*, Attorney or Agent: Robert A. Vanderhye, Ex. Gp.: 357

**4,858,613**, Re. S. N. 07/747,726, Filed Aug. 20, 1991, Cl. 128/660.03, LOCALIZATION AND THERAPY SYSTEM FOR TREATMENT OF SPATIALLY ORIENTED FOCAL DISEASE, Francis J. Fry, et. al., Owner of Record: *Laboratory Equipment Corp., Mooresville, Ind.*, Attorney or Agent: David Halvorson, Ex. Gp.: 335

**4,870,302**, Re. S. N. 07/720,275, Filed June 24, 1991, Cl. 307/465, CONFIGURABLE ELECTRICAL CIRCUIT HAVING CONFIGURABLE LOGIC ELEMENTS AND CONFIGURABLE INTERCONNECTS, Ross H. Freeman (Deceased), Owner of Record: *Xilinx, Inc., Los Gatos, Calif.*, Attorney or Agent: Edel M. Young, Ex. Gp.: 254

**4,901,355**, Re. S. N. 07/747,077, Filed Aug. 19, 1991, Cl. 381/183, COMBINATION MULTIPLE SUPPORTED VARIABLE POSITION AUDIO INTAKE CONTROL DEVICES, Michael R. Moore, Owner of Record: *Inventor*, Attorney or Agent: Robert K. Rhea, Ex. Gp.: 261

**4,915,935**, Re. S. N. 07/748,306, Filed Aug. 31, 1991, Cl. 424/047, PROCESS FOR APPLYING REFLECTIVE PARTICLES TO HAIR, John F. Corbett, et. al., Owner of Record: *Clairol Inc., New York, N.Y.*, Attorney or Agent: Anthony M. Santini, Ex. Gp.: 152

**4,925,606**, Re. S. N. 07/748,314, Filed Aug. 21, 1991, Cl. 264/50, METHOD FOR ENHANCING THERMAL EXPANDABILITY OF DIRECT-INJECTION FOAMS, Peter S. Francis, Owner of Record: *Arco Chemical Technology, Inc., Wilmington, Del.*, Attorney or Agent: John C. Martin, Jr,. Ex. Gp.: 136

**4,928,283**, Re. S. N. 07/744,112, Filed Aug. 9, 1991, Cl. 378/020, X-RAY TOMOGRAPHY APPARATUS, Bernard M. Gordon, Owner of Record: *Analogic Corp., Peabody, Mass.*, Attorney or Agent: Toby H. Kusmer, Ex. Gp.: 256

**4,981,294**, Re. S. N. 07/721,082, Filed June 24, 1991, Cl. 272/073, EXERCISE MACHINES WITH DUAL RESISTANCE MEANS, W.T. Dalebout, et. al., Owner of Record: *Proform Fitness Products, Inc.*, Attorney or Agent: Thomas J. Rossa, Ex. Gp.: 332

**5,010,738**, Re. S. N. 07/748,791, Filed Aug. 22, 1991, Cl. 062/135, ICE MAKER WITH THERMAL PROTECTION, Ralph W. Brown, et. al., Owner of Record: *White Consolidated, Inc., Cleveland, Ohio*, Attorney or Agent: W.A. Gail, Ex. Gp.: 344

### Requests for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**D. 309,027**, Reexam. No. 90/002,412, Requested Aug. 21, 1991, Cl. D25/139, TAB PORTION OF A SHINGLE, Michael J. Noone, et. al., Owner of Record: *Certainteed Corp., Valley Forge, Pa.*, Attorney or Agent: John F. McNulty, Paul & Paul, Philadelphia, Pa., Ex. Gp.: 291, Requester: Owner

**3,981,683**, Reexam. No. 90/002,402, Requested Aug. 15, 1991, Cl. 122/057, TEMPERATURE RESPONSIVE STERILITY INDICATOR, Raymond P. Larsson, et. al., Owner of Record: *Info-Chem, A.K.A, Pymah Corp., Inc., Somerville, N.J.*, Attorney or Agent: Robert Hardy Falk, Hubbard, Thurman, Tucker & Harris, Dallas, Tex., Ex. Gp.: 344, Requester: Owner

**3,993,947**, Reexam. No. 90/002,406, Requested Aug. 21, 1991, Cl. 324/610, ADMITTANCE MEASURING SYSTEM FOR MONITORING THE CONDITION OF MATERIALS, Frederick L. Maltby, et. al., Owner of Record: *Drexelbrook Controls, Inc., Horsham, Pa.*, Attorney or Agent: Norman L. Norris, Woodcock, Washburn, Kurtz, Mackiewicz & Norris, Philadelphia, Pa., Ex. Gp.: 267, Requester: Endress & Hauser, Inc., Greenwood, Ind.

**4,146,834**, Reexam. No. 90/002,405, Requested Aug. 21, 1991, Cl. 324/610, ADMITTANCE MEASURING SYSTEM FOR MONITORING THE CONDITION OF MATERIALS, Frederick L. Maltby, et. al., Owner of Record: *Drexelbrook Controls, Inc., Horsham, Pa.*, Attorney or Agent: Norman L. Norris, Woodcock, Washburn, Kurtz, Mackiewicz & Norris, Philadelphia, Pa., Ex. Gp.: 267, Requester: Endress & Hauser, Inc., Greenwood, Ind.

**4,166,388**, Reexam. No. 90/002,407, Requested Aug. 21, 1991, Cl. 073/304R, RF ADMITTANCE MEASURING METHOD AND APPARATUS FOR DETERMINING THE LEVEL OF A CONDUCTIVE LIQUID, Robert J. Sun, et. al., Owner of Record: *Robert J. Sun, Bala Cynwyd, Pa. and Frederick J. Maltby, Jenkintown, Pa.*, Attorney or Agent: Norman L. Norris, Woodcock, Washburn, Kurtz, Mackiewicz & Norris, Philadelphia, Pa., Ex. Gp.: 246, Requester: Endress & Hauser, Inc., Greenwood, Ind.

**4,170,821**, Reexam. No. 90/002,410, Requested Aug. 20, 1991, Cl. 030/041, RAZOR CARTRIDGES, Anthony R. Booth, Owner of Record: *Warner-Lambert Co., Morris Plains, N.J.*, Attorney or Agent: Stephen A. Schneeberger, Warner-Lambert Co., Milford, Conn., Ex. Gp.: 324, Requester: American Safety Razor, Verona, Va.

**4,454,158**, Reexam. No. 90/002,411, Requested Aug. 20, 1991, Cl. 514/649, ALLYL AMINE MAO INHIBITORS, Philippe Bey, Owner of Record: *Merrell Dow France et. cie. (A.K.A. Merrell Toraude et Compagnie), Strasbourg, Cedex, France*, Attorney or Agent: Finnegan, Henderson, Farabow, Garrett & Dunner, Washington, D.C., Ex. Gp.: 125, Requester: Owner

**4,748,960**, Reexam. No. 90/002,413, Requested Aug. 21, 1991, Cl. 123/549, FUEL SYSTEM, Gilbert Wolf, Owner of Record: *Inventor, Skokie, Ill.*, Attorney or Agent: Leydig, Voit & Mayer, Washington, D.C., Ex. Gp.: 342, Requester: Jack R. Veach, Arctic Fox Heaters, Inc., Hopkins, Minn.

**4,772,269**, Reexam. No. 90/002,408, Requested Aug. 19, 1991, Cl. 604/175, PERITONEAL DIALYSIS CATHETER, Zbylut J. Twardowski, et. al., Owner of Record: *Curators of the University of Missouri, Columbia, Mo.*, Attorney or Agent: Daniel D. Ryan, Baxter Travenol Labs, Inc., Deerfield, Ill., Ex. Gp.: 336, Requester: Sil Med Corp., Taunton, Mass.

**4,775,148**, Reexam. No. 90/002,415, Requested Aug. 23, 1991, Cl. 280/276, ABDOMINAL EXERCISER, Gary G. McLaughlin, Owner of Record: *Inventor, Arleta, Calif.*, Attorney or Agent: Lawrence S. Cohen, Freilich, Hornbaker & Rosen, Los Angeles, Calif., Ex. Gp.: 316, Requester: Owner

**4,919,112**, Reexam. No. 90/002,414, Requested Aug. 23, 1991, Cl. 128/004, LOW-COST SEMI-DISPOSABLE ENDOSCOPE, Walter P. Siegmund, Owner of Record: *Schott Fiber Optics, Southbridge, Mass.*, Attorney or Agent: Bachman & LaPointe, New Haven, Conn., Ex. Gp.: 333, Requester: Arthur Freilich, Freilich, Hornbaker & Rosen, Los Angeles, Calif.

**4,953,995**, Reexam. No. 90/002,409, Requested Aug. 19, 1991, Cl. 400/121, DOT MATRIX PRINTER AND METHOD FOR PRINTING MULTIPLE LINES AT DIFFERENT LINE SPACINGS, Louis Sims, et. al., Owner of Record: *Output Tech-*

*nology, Inc., Spokane, Wash.*, Attorney or Agent: David L. Roberts, Wells, St. John & Roberts, Spokane, Wash., Ex. Gp.: 337, Requester: Dataproducts Corp., Woodland Hills, Calif.

**4,971,344**, Reexam. No. 90/002,416, Requested Aug. 26, 1991, Cl. 272/139, BICYCLE WITH A FRONT FORK WHEEL SUSPENSION, Paul H. Turner, Owner of Record: *Rockshox, Inc., Fletcher, N.C.*, Attorney or Agent: David S. Safran, Sixbey Friedman, Leedom & Ferguson, McLean, Va., Ex. Gp.: 332, Requester: Owner

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**Department of Commerce**
**Patent and Trademark Office**
**[Docket No. 910235-1173]**

*Agency:* Patent and Trademark Office, Commerce.
*Action:* Notice.

**Notice of Termination of Status of International Depositary Authority under Budapest Treaty**

*Summary:* Notice is hereby given that In Vitro International, Inc.'s status as an international depositary is terminated effective Sept. 25, 1991.
*Address:* Questions should be submitted to H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231.
*For Further Information Contact:* H. Dieter Hoinkes, Office of Legislation and International Affairs, (703) 557-3065.
*Supplementary Information:* Since Nov. 30, 1983, In Vitro International, Inc. (IVI) of Linthicum, Maryland, has been recognized as an international depositary authority under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure. The Patent and Trademark Office has received a letter from Dr. Rex A. D'Agostino, President of IVI, dated May 24, 1991, stating that IVI can no longer continue to perform its functions as an international depositary authority under the Budapest Treaty.

By letter dated June 25, 1991, the Patent and Trademark Office has notified the Director General of the World Intellectual Property Organization that "the United States withdraws its declaration of assurances made on behalf of IVI on Sept. 9, 1983". As a consequence, the termination of the status of IVI as an international depositary authority takes effect on Sept. 25, 1991.

All deposits stored with IVI under the Budapest Treaty were transferred on June 20, 1991, to a substitute authority, which is the American Type Culture Collection (ATCC), 12301 Parklawn Dr., Rockville, Md., 20852, (Telephone No. (301) 881-2600). All mail or other communications addressed to IVI regarding those deposits, including all files and other relevant information, have also been transferred to ATCC. In its capacity as a substitute authority, ATCC has agreed to store all deposits transferred from IVI for an initial period of not less than three months from July 5, 1991, the date of first notice in the Federal Register of IVI's termination as an international depository authority. Patent owners and applicants who wish to preserve their date of original deposit must contact ATCC by Oct. 5, 1991, to make arrangements to pay ATCC's fee for continued maintenance and storage of their deposits past the initial storage period. ATCC will not accept responsibility for continued storage of deposits in respect of which depositors have failed to make appropriate arrangements by Oct. 5, 1991.

For further information, contact H. Dieter Hoinkes, Office of Legislation and International Affairs, Box 4, Patent and Trademark Office, Washington, D.C. 20231; telephone (703) 557-3065.

July 10, 1991

HARRY F. MANBECK, Jr.
*Assistant Secretary and Commissioner of Patents and Trademarks*



**Status of PTO Services**

The following is an update of the status of PTO services for July 1991:

| Service Item | FY 1991 Goal (Calendar Days )* | Monthly Average (Calendar Days )* |
|---|---|---|
| Filing Receipts: | | |
| Patents | 22 | 18 |
| Trademarks | 30 | 39 |
| Patent/Trademark Copies: | | |
| Special Window Coupons | 24 Hours | 14 Hours |
| Window Coupons | 5 | 2 |
| Mail Coupons | 12 | 6 |
| Letter Orders | 16 | 12 |
| Electronic Ordering Service (EOS) | 11 | 4 |
| Certified Copies: | | |
| Trademark Registrations | 21 | 10 |
| Applications-As-Filed | 17 | 17 |
| File-Wrapper/Contents | N/A | 26 |
| Walk-up Certification | 1 | 1 |
| Patent Application Expedited | 5 | 6 |
| Trademark Search Library: | | |
| Filing Pending Marks | 23 | 25 |
| Filing Reg. Certificates | Issue Date + 2 days | On Goal |
| Filing Temp. Drawings | 8 | 9 |
| Assignments: | | |
| Recording Patent-New Applications | 20** | 14 |
| Recording Patent-Mail Room Recpts. | 20 | 15 |
| Return Patents-New Applications | 34** | 35 |
| Return Patents-Mail Room Recpts. | 34 | 35 |
| Recording Trademarks | 20 | 15 |
| Returning Trademark Documents | 34 | 30 |
| Avg. Days from Issue Fee Payment to Issue Date | 90-100 | 103 |
| Issue Fee Receipts Mailed | 4 weeks prior to Issue Date | On Time |
| Patent Copies Available | 95% on Issue Date | 93% on Issue Date |
| Trademark Copies Available | 95% on Issue Date | 99% on Issue Date |

* Unless otherwise noted.
** Goal reflects the number of days from the date the filing receipt is mailed.

**Improvements to Services**

• *Public Service Center (PSC) Facilities* — The PSC has installed a Telecommunications Device for the Deaf (TDD) system to better serve the needs of members of the public with hearing and speech impairments. The TDD number is (703) 557-2275.

August 30, 1991

THERESA BRELSFORD
*Assistant Commissioner for Administration*

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# PATENT NOTICES

**Certificates of Correction For Week of September 24, 1991**

| | | | |
|---|---|---|---|
| B1. 3,762,220 | 4,879,994 | 4,919,143 | 4,939,224 |
| Re. 33,187 | 4,880,218 | 4,920,360 | 4,939,311 |
| 4,751,727 | 4,880,516 | 4,922,516 | 4,939,438 |
| 4,761,760 | 4,880,862 | 4,922,790 | 4,939,565 |
| 4,775,902 | 4,881,092 | 4,922,809 | 4,939,990 |
| 4,790,058 | 4,882,322 | 4,923,086 | 4,940,337 |
| 4,792,889 | 4,882,465 | 4,925,018 | 4,940,579 |
| 4,795,333 | 4,883,359 | 4,925,664 | 4,940,672 |
| 4,795,565 | 4,883,402 | 4,926,505 | 4,941,358 |
| 4,804,467 | 4,886,241 | 4,928,815 | 4,941,737 |
| 4,804,504 | 4,887,804 | 4,929,157 | 4,941,763 |
| 4,809,077 | 4,888,410 | 4,929,253 | 4,942,211 |
| 4,810,634 | 4,890,858 | 4,929,741 | 4,942,249 |
| 4,816,784 | 4,891,132 | 4,930,675 | 4,942,941 |
| 4,831,022 | 4,892,949 | 4,931,809 | 4,943,254 |
| 4,831,716 | 4,894,730 | 4,931,828 | 4,943,366 |
| 4,833,511 | 4,894,809 | 4,931,973 | 4,943,517 |
| 4,835,671 | 4,896,077 | 4,932,134 | 4,943,572 |
| 4,835,686 | 4,898,151 | 4,932,699 | 4,943,680 |
| 4,837,294 | 4,898,783 | 4,932,788 | 4,943,767 |
| 4,840,786 | 4,899,365 | 4,932,808 | 4,944,257 |
| 4,840,946 | 4,899,389 | 4,932,966 | 4,944,303 |
| 4,841,727 | 4,901,007 | 4,933,582 | 4,944,356 |
| 4,842,720 | 4,901,455 | 4,933,688 | 4,944,426 |
| 4,844,731 | 4,902,742 | 4,933,793 | 4,944,803 |
| 4,847,286 | 4,902,799 | 4,934,391 | 4,944,862 |
| 4,852,722 | 4,902,801 | 4,934,401 | 4,944,907 |
| 4,857,911 | 4,903,659 | 4,934,552 | 4,945,030 |
| 4,860,472 | 4,904,784 | 4,934,680 | 4,945,157 |
| 4,861,789 | 4,906,837 | 4,935,341 | 4,945,212 |
| 4,864,336 | 4,908,848 | 4,935,449 | 4,945,218 |
| 4,864,559 | 4,909,824 | 4,935,488 | 4,946,034 |
| 4,864,660 | 4,909,917 | 4,935,546 | 4,946,355 |
| 4,864,792 | 4,910,862 | 4,935,937 | 4,946,693 |
| 4,866,021 | 4,911,243 | 4,936,149 | 4,946,917 |
| 4,867,204 | 4,911,768 | 4,936,226 | 4,947,035 |
| 4,869,522 | 4,911,949 | 4,936,492 | 4,947,130 |
| 4,869,561 | 4,912,171 | 4,937,025 | 4,947,705 |
| 4,870,428 | 4,912,214 | 4,937,383 | 4,948,111 |
| 4,874,215 | 4,912,418 | 4,937,475 | 4,958,123 |
| 4,874,536 | 4,913,250 | 4,937,580 | 4,982,212 |
| 4,876,440 | 4,915,623 | 4,937,665 | 4,991,218 |
| 4,876,695 | 4,916,529 | 4,937,698 | 4,992,877 |
| 4,876,717 | 4,916,927 | 4,937,779 | 5,004,487 |
| 4,877,650 | 4,917,169 | 4,938,419 | 5,015,397 |
| 4,878,851 | 4,917,407 | 4,938,708 | 5,018,628 |
| 4,878,967 | 4,917,644 | 4,939,177 | 5,019,011 |
| 4,879,270 | 4,918,546 | 4,939,221 | |





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Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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**Expiration of patents:** The patents within the range of numbers indicated below expire during August 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term ot 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,827,085 to 3,832,735 inclusive
Plant Patents ..... 3,581 to 3,603



# REEXAMINATIONS

SEPTEMBER 24, 1991

Matter enclosed in heavy brackets **[ ]** appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

**B1 3,863,114 (1560th)**
**TAPPING DEVICE FOR GENERATING PERIODIC MECHANICAL PULSES**
**John F. De Mayo, Oyster Bay, N.Y., assignor to Sensonics, Inc.**
**Reexamination Request No. 90/002,152, Oct. 2, 1990.**
**Reexamination Certificate for Patent No. 3,863,114, issued Jan. 28, 1975, Ser. No. 411,737, Nov. 1, 1973.**
**Int. Cl.[5] H02K** *33/02*
**U.S. Cl. 361—139**

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **4** and **5** are cancelled.

Claims **1**, **2**, **6**, **7** and **9** are determined to be patentable as amended.

Claims **3**, **8** and **10**, dependent on an amended claim, are determined to be patentable.

New claim **11** is added and determined to be patentable.

**1**. A tapping device to be mounted on apparatus for imparting periodic mechanical pulses thereto, comprising a base for attachment to said apparatus, an electromagnet disposed on said base and comprising a ferromagnetic core perpendicular to the base and a winding around said core, an anvil projecting from said base at one side of said electromagnet and parallel to said core, armature supporting means projecting from said base at the opposite side of said electromagnet from said anvil, an armature extending across said electromagnet from said supporting means to said anvil, said armature having a first end disposed above said anvil and a second end pivotally supported by said supporting means for movement of said armature between a first position in which said first end of the armature engages said anvil and a second position in which said first end of said armature is spaced from said anvil, means biasing said armature in a direction from said first position to said second position, means limiting movement of said armature in said direction, and circuit means for periodically energizing said electromagnet at regular fractional second intervals to attract said armature to strike said anvil to generate a mechanical pulse which is transmitted through said base to apparatus on which said tapping device is mounted, *and*

*a non-metallic bumper an at least one of said anvil and said second end portion of said armature, said bumper being sufficiently hard to generate a strong mechanical pulse when said armature strikes said anvil while at the said time avoiding metal-to-metal impact between the armature and anvil.*

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Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,696

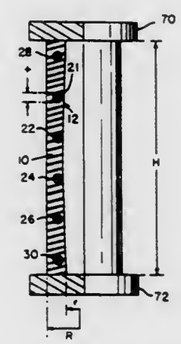
## COMPOSITE SPRING

Andrew Stevenson, Hertford, England, assignor to The Paton Corporation, Seattle, Wash.

Original No. 4,817,921, dated Apr. 4, 1989, Ser. No. 149,944, Jan. 28, 1988. Continuation of Ser. No. 886,753, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 680,841, Dec. 12, 1984, abandoned. Application for reissue Jun. 12, 1990, Ser. No. 536,697

Int. Cl.[5] F16F *3/10*

U.S. Cl. 267—33 11 Claims




1. A spring having a force vs. deflection curve with a constant rate region which persists for about the initial 20% of its columnar deflection, a rising rate region which persists for about the last 40% of its columnar deflection, and an intermediate plateau region, said spring comprising: an elongated tubular elastomeric body having a generally straight sided longitudinal profile and a matching inner surface under zero columnar deflection, and a coil spring embedded in said body for controlling deformation of said body such that said plateau region persists for a substantial portion of such columnar deflection so long as the occurrence of a series of symmetric bulging instabilities at a plurality of locations spaced apart along the length of said body under a predetermined axial load condition, said body and said coil spring being constructed and arranged according to the following:

$$S = \frac{(R - r)n}{2H} \quad (a)$$

$$E = \frac{(R - r)}{t} \quad (b)$$

where

S=stability factor

E=reinforcing efficiency factor

H=total axial length of said body,

n=the total number of coils of said coil spring,

r=the internal radius of said body,

R=the external radius of said body,

(R−r)=the wall thickness of said body, and

t=the wire diameter of the coils of said coil spring,

wherein the value of S is between about 0.05 and 0.2 and the value of E is between about 0.05 and [0.2] *3*.

Re. 33,697

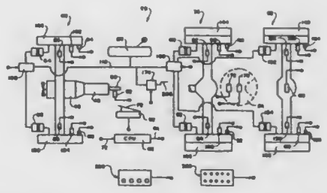
## TRACTOR-TRAILER BRAKE CONTROL SYSTEM

Joseph H. McNinch, Jr., 11314 Brookfield, Livonia, Mich. 48150

Original No. 4,818,035, dated Apr. 4, 1989, Ser. No. 43,009, Apr. 27, 1987. Application for reissue Aug. 8, 1989, Ser. No. 391,217

Int. Cl.[5] B60T *8/00, 8/58, 7/12*

U.S. Cl. 303—7 7 Claims



1. A method for controlling the brake system on a tractor-trailer vehicle having a fifth wheel/king pin connecting structure and individually controllable tractor and trailer sub-vehicle brake system, said method characterized by:

(a) sensing [from a location on said trailer sub-vehicle] the value of a parameter indicative of the vertical force exerted on the fifth wheel king pin/connection;

(b) sensing [from a location on said trailer sub-vehicle] the value of a parameter indicative of the horizontal force exerted by the king pin on the fifth wheel;

(c) sensing [from a location on said trailer sub-vehicle] the value of a parameter indicative of the acceleration of the vehicle;

(d) modulating the braking forces exerted by *at least one of* the *tractor and* trailer sub-vehicle brake [system only] *systems* to minimize the value of the expression:

$$E = \text{a function of } [(H_F/V_F)+a]\ (H_F - V_F{}^{*}a)$$

where:

E=error;

$H_F$=horizontal force at the fifth wheel/king pin connection;

$V_F$=vertical force imposed at the fifth wheel/king pin connection; and

a=forward acceleration of vehicle (expressed in units of gravity).

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Re. 33,698

## COLOR CATHODE RAY TUBE HAVING A FACEPLATE-MOUNTED SUPPORT STRUCTURE WITH A WELDED-ON HIGH-TENSION FOIL SHADOW MASK

James R. Fendley, Arlington Heights, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Original No. 4,730,143, dated Mar. 8, 1988, Ser. No. 832,493, Feb. 21, 1986. Application for reissue Oct. 16, 1989, Ser. No. 421,909

Int. Cl.[5] H01J *29/07*

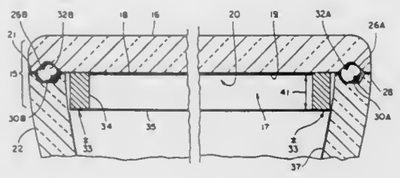
U.S. Cl. 313—407 26 Claims

*10. In a color cathode ray tube, a front assembly including a*

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*faceplate having on its inner surface a centrally disposed phosphor target, on each of opposed sides of which and secured to said inner*




*surface are mask support means which is segmented at its interface with said inner surface.*

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Re. 33,699

**GROWTH HORMONE-RELEASING FACTOR ANALOGS**

**Keith A. Drengler, Lindenhurst, Ill., assignor to International Minerals & Chemical Corp., Northbrook, Ill.**

**Original No. 4,801,456, dated Jan. 31, 1989, Ser. No. 71,351, Jul. 9, 1987. Application for reissue May 21, 1990, Ser. No. 526,469**

**Int. Cl.**[5] **A61K** *37/43;* **C07K** *7/10*

**U.S. Cl. 424—422** **12 Claims**

*17. A method for stimulating the release of growth hormone (GH) in animals, comprising:*

*administering to said animals an amount of a human growth hormone-releasing factor (hGRF) analog sufficient to stimulate the release of growth hormone (GH), the hGRF analog having the sequence* $[Asn^{25}, Nle^{27}]$*-hGRF(1–31)—*$NH_2$.

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Re. 33,700

**PARTS SUBJECT TO WEAR WHICH COME INTO CONTACT WITH METAL MELTS**

**Günter Gelsdorf, Nordenstadt; Hermann Leupold, Walluf, both of Fed. Rep. of Germany, and Franc Schellberg, Sevres, France, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany**

**Original No. 4,212,926, dated Jul. 15, 1980, Ser. No. 714,196, Aug. 13, 1976. Application for reissue Dec. 9, 1987, Ser. No. 131,165**

**Claims priority, application Fed. Rep. of Germany, May 31, 1976, 2624299**

**Int. Cl.**[5] **B32B** *15/04;* **C04B** *7/32, 7/34, 9/00*

**U.S. Cl. 428—472** **8 Claims**

1. Parts *of a slide-valve closure means which are* subject to wear *and* which come into contact with a metal melt, said parts comprising means for contacting a steel melt and withstanding stresses caused by said steel melt, said means including a hydraulically setting high-alumina refractory concrete, said refractory concrete having following physical properties:

(a) a compression strength of at least 400 kp/cm$^2$ as measured cold on a dried crude product;

(b) a compression strength of at least 700 kp/cm$^2$ after firing at 1400° C.; and

(c) a dimensional stability of at least ±0.2% at said 1400° C.

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Re. 33,701

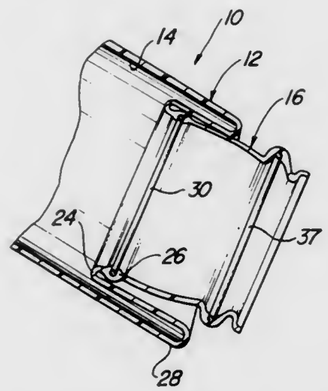
**STEERING COLUMN BOOT**

**Fred Triquet, Paw Paw, Mich., assignor to Arco Industries Corporation, Schoolcraft, Mich.**

**Original No. 4,826,466, dated May 2, 1989, Ser. No. 198,601, May 2, 1988. Continuation-in-part of Ser. No. 95,570, Sep. 11, 1987, abandoned. Application for reissue May 29, 1990, Ser. No. 530,118**

**Int. Cl.**[5] **F16D** *3/84;* **B62D** *1/16*

**U.S. Cl. 464—173** **8 Claims**




1. A resilient boot assembly (**10**) of the type for containing a steering shaft (**22**) therein, said assembly (**10**) comprising; a tubular body portion (**12**) including a passageway (**14**) extending therethrough and first and second end portions (**16,18**), and attachment means for attaching at least one of said end portion (**16**) of said body portion (**12**) to a support structure (**20**), characterized by a said assembly (**10**) being a unitary tubular member and including roll-up means for rolling up and maintaining at least one of said end portions (**16**) upon said body portion (**12**) from an extended position defining a first axial length of said assembly (**10**) to a retracted seated position defining a second shorter axial length of said assembly (**10**) and rolling down said one end portion (**16**) to said extended position.

# PLANT PATENTS

## GRANTED SEPTEMBER 24, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**7,655**

***ACER×FREEMANI* NAMED 'DTR 102'**

**Willet N. Wandell, R.R. 1, Box 286, Oquawka, Ill. 61469**

**Filed Mar. 5, 1990, Ser. No. 487,882**

**Int. Cl.**[5] **A01H** *5/00*

**U.S. Cl. Plt.—51** **1 Claim**

1. A new and distinctive variety of *Acer×freemani* named 'DTR 102', as described and illustrated herein, that differs from all other varieties by the unique combination of characteristics intermediate between red and silver maples with (1) simultaneous red fall color on all leaves of all ages of trees; (2) broadly ovate crown, short trunk, central but not dominant leader, and numerous ascending main branches; and (3) drought resistance and rapid growth of silver maple without the susceptibility to crown damage or breakage due to excessive snow loads.

**7,656**

**REGAL PELARGONIUM '315-(83-48-1)'**

**Richard Craig, State College, Pa., and Glenn G. Hanniford, Worthington, Ohio, assignors to Research Corporation Technologies, Inc., Tuscon, Ariz.**

**Filed Jul. 21, 1989, Ser. No. 383,958**

**Int. Cl.**[5] **A01H** *5/00*

**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct cultivar of regal Pelargonium substantially as illustrated and described herein, particularly characterized as being compact and self-branching, early flowering and floriferous, and having bright salmon pink flowers with ruby feathering on the upper petals.

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**7,657**

**SPATHIPHYLLUM PLANT NAMED GIGANT**

**Nico J. Kuipers, De Kwakel, Netherlands, assignor to Reginald Deroose, Belgium**

**Filed May 7, 1990, Ser. No. 520,355**

**Int. Cl.**[5] **A01H** *5/00*

**U.S. Cl. Plt.—88** **1 Claim**

1. A new and distinct Spathiphyllum plant named Gigant, as described and illustrated.

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# PATENTS

## GRANTED SEP. 24, 1991

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 062-133 | 5,050,561 |
| 123-523 | 5,050,603 |
| 222-464 | 5,050,806 |
| 385-095 | 5,050,945 |
| 385-033 | 5,050,946 |
| 385-009 | 5,050,947 |
| 385-002 | 5,050,948 |
| 385-024 | 5,050,950 |
| 385-017 | 5,050,951 |
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| 385-113 | 5,050,957 |
| 385-102 | 5,050,958 |
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| 351-159 | 5,050,979 |
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| 352-184 | 5,050,985 |
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| 356-445 | 5,050,994 |
| 440-075 | 5,051,102 |
| 439-825 | 5,051,108 |
| 604-263 | 5,051,109 |
| 429-192 | 5,051,211 |
| 544-320 | 5,051,429 |
| 523-411 | 5,051,470 |
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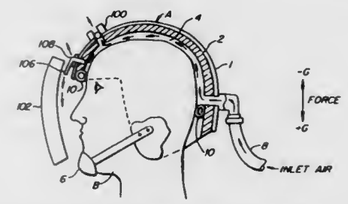
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# PATENTS

GRANTED SEPTEMBER 24, 1991

## GENERAL AND MECHANICAL

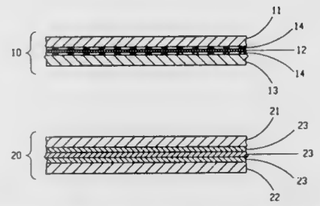
**5,050,240**
**AIR CUSHION HELMET SUPPORT AND VENTILATION SYSTEM WITH AIR PRESSURE REGULATOR**
**James L. Sayre, San Jose, Calif., assignor to Kaiser Aerospace and Electronics Corporation, Oakland, Calif.**
**Filed May 14, 1990, Ser. No. 523,449**
**Int. Cl.[5] A42B** *3/12*
**U.S. Cl. 2—6** **24 Claims**




1. A bladderless fluid cushion helmet comprising:
attaching means for positioning and holding said helmet relative to a wearer's head;
a sealing means, mounted proximate to and extending along a periphery of said helmet, for defining a volume between a wearer's head and an inner surface of said helmet;
an inlet port, coupled to a fluid supply, wherein a compressible fluid is supplied through said inlet port to said volume, and wherein said helmet is supported by the compressible fluid contained in said volume; and
a fluid pressure regulator disposed between said inlet port and said fluid supply to control a pressure of the fluid contained in said volume.

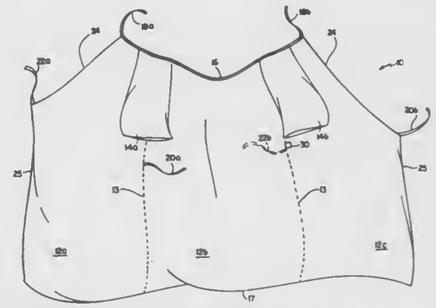
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**5,050,241**
**GARMENT FOR PROTECTION AGAINST HOT LIQUIDS**
**Danny S. Flowers, Leland, N.C., and Timothy R. Wiseman, Sr., Richmond, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Continuation-in-part of Ser. No. 419,848, Oct. 11, 1989. This application Jun. 14, 1990, Ser. No. 538,282**
**Int. Cl.[5] A41D** *13/00*
**U.S. Cl. 2—81** **14 Claims**




1. A garment, particularly suited for protecting its wearer against splashes and spills of hot organic liquids, having a multi-layered outer shell and an adjacent insulating inner liner, the outer shell comprising a laminate of a vapor-permeable, liquid-impermeable sheet of poly(tetrafluoroethylene) which is positioned between two fabrics of poly(m-phenylene isophthalamide) staple fiber yarns, the outermost surface layer of the shell being a woven fabric of crystalline poly(m-phenylene isophthalamide) yarns.

**5,050,242**
**HOSPITAL GOWN**
**C. Leland Udell, 5 Collamer Cir., Shelburne, Vt. 05482**
**Filed Oct. 29, 1990, Ser. No. 604,929**
**Int. Cl.[5] A41D** *13/12*
**U.S. Cl. 2—114** **9 Claims**




1. A gown for wear by a patient in a hospital and the like, comprising:
a body portion of flexible material having an inside surface and an outside surface, a first longitudinal edge defining a neckline and a second longitudinal edge defining a hemline, said body portion having a center body panel portion and first and second side body panel portions extending from said center body panel portion, each said body panel portion being of width at least sufficient to span a region of the patient's body between intersections of a coronal plane of the patient's body, said first and second side body panel portions each defining a side edge extending generally between said neckline and said hemline;
a pair of arm openings defined in said body portion adjacent said neckline, said arm openings being spaced apart by a shoulder width and equidistant from ends of said neckline;
a pair of first securing members, one said first securing member being attached to said inside surface of said body portion and the other said first securing member being attached at the edge of said first side body panel portion, said pair of first securing members adapted for securement to one another;
a pair of second securing members, one said second securing member being attached to said outside surface of said body portion and the other said second securing member being attached at the edge of said second side body panel portion, said pair of second securing members adapted for securement to one another; and
tactile indicator means attached upon the outside surface of said body portion at least adjacent to where said one said first securing member is attached upon the inside surface of said body portion.

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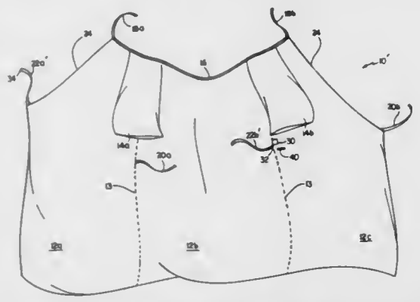
**5,050,243**
**HOSPITAL GOWN**
**C. Leland Udell, 5 Collamer Cir., Shelburne, Vt. 05482**
**Continuation of Ser. No. 604,929, Oct. 29, 1990. This application Jan. 7, 1991, Ser. No. 638,106**
**Int. Cl.[5] A41D** *13/12*
**U.S. Cl. 2—114** **6 Claims**

1. A gown for wear by a patient in a hospital and the like, comprising:
a body portion of flexible material having an inside surface and an outside surface, a first longitudinal edge defining a neckline and a second longitudinal edge defining a hem-

line, said body portion having a center body panel portion and first and second side body panel portions extending from said center body panel portion, each said body panel portion being of width at least sufficient to span a region of the patient's body between intersections of a coronal plane of the patient's body, said first and second side body panel portions each defining a side edge extending generally between said neckline and said hemline;

a pair of arm openings defined in said body portion adjacent said neckline, said arm openings being spaced apart by a shoulder width and equidistant from ends of said neckline;

a pair of first securing members, one said first securing member having a base end attached to said outside surface of said body portion, said body portion defining an opening adjacent said base end, and the other said first securing



member being attached at the edge of said first side body panel portion and having a free end adapted to pass through said opening, said pair of first securing members adapted for securement to one another;

a pair of second securing members, one said second securing member being attached to said outside surface of said body portion and the other said second securing member being attached at the edge of said second side body panel portion, said pair of second securing members adapted for securement to one another; and

tactile indicator means attached to the outside surface of said body portion at least adjacent to said base end of said first securing member,

said first securing members and said second securing members comprising ties.

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**5,050,244**

**FIREFIGHTER'S TROUSERS WITH A SELECTIVELY FOLDABLE TORSO SECTION**

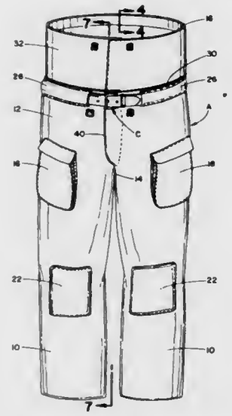
**H. Leonard Kleinman, 9818 Mountain View Dr., Waite Hill, Ohio 44094-9310**

**Filed Oct. 5, 1989, Ser. No. 417,709**
**Int. Cl.[5] A41D** *1/06*
**U.S. Cl. 2—227** **19 Claims**

1. Flame-retardant trousers suitable to be worn by firefighters in firefighting, when worn by a firefighter as intended comprising:

a pair of leg sections, each having a top and bottom;

a torso section, the torso section having a top edge, the top of the leg sections merging into the bottom of the torso section, the top edge of the torso section extending substantially above the firefighter's waist about the entire circumference of the firefighter's body, the top edge of the torso section being selectively folded outwardly and



downwardly so that the hinge point of folding is substantially at the firefighter's waist.

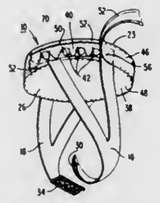
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**5,050,245**

**CEPHALIC TOOL FOR CONSTRUCTION OF A CEILING**

**David L. Nearhood, 27 Swan St., Lambertville, N.J. 08530**

**Filed Apr. 23, 1990, Ser. No. 512,938**
**Int. Cl.[5] A42B** *1/06*
**U.S. Cl. 2—410** **7 Claims**



1. A tool comprising manipulation means for cephalically manipulating a large flat board used for construction of a ceiling and attachment means to detachably affix the tool to a wearer's head, said manipulation means being shaped to fit on top of the wearer's head, said manipulation means being detachably affixable to the wearer's head and wherein said manipulation means further comprises a thick cylindrical member made of a soft spongy material, said member having a flat top surface, and said member being attached to the wearer's head by said attachment means.

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**5,050,246**

**FAUCET EXTENDED NUT**

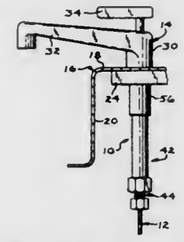
**Howard H. Huntoon, 2940 Park Dr., Jackson, Mich. 49203**

**Filed Mar. 30, 1990, Ser. No. 501,290**
**Int. Cl.[5] E03C** *1/04;* **F16L** *35/00*
**U.S. Cl. 4—192** **10 Claims**

1. A faucet extended nut adapted for both anchoring a faucet to a sink and connecting a fluid supply line thereto wherein the faucet includes a threaded stem extending through an opening formed in the sink between opposed spaced sides, and the fluid supply line having a head defined on one end adapted to be compressed into a sealing relationship with the stem, comprising, in combination, an outer elongated part having a first end, a second end, and an axial passage extending therethrough



intersecting said first and second ends, a first threaded section defined in said passage adjacent said first end adapted to mate with the faucet's threaded stem, a second threaded section defined in said passage axially spaced from said first end, first torque transfer means defined upon said outer part adjacent said second end for imposing torque upon said outer part about the axial length thereof to rotate said outer part's first threads upon the threaded stem whereby upon rotating said outer part in a tightening direction said first end compresses against one side of the sink drawing the faucet tightly against the opposing side, an inner elongated part adapted to be received within said outer part's passage having an outer end, an inner end axially spaced from said outer end, an axial passage extending there-



through between said inner and outer ends, an exteriorly threaded portion axially intermediate said inner and outer ends adapted to mate with the outer part's second threaded section, said inner part's passage having a diameter sufficient to receive the fluid supply line whereby the head is disposed adjacent to said inner end and adapted to move therewith, and second torque transfers means defined upon said inner part's outer end for imposing torque on said inner part to rotate said inner part with respect to said outer part whereby upon rotating said inner part in a tightening direction said inner end and the supply line head move toward the outer part's first end to force the head into a sealing engagement with the stem received in said outer part.

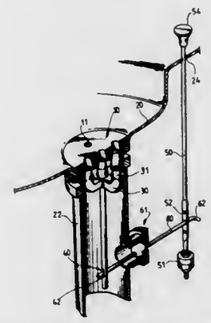
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**5,050,247**

**DRAIN VALVE AND LIFT ROD CONNECTION**

**Frederick D. Hsu, No. 1, Alley 1, Lane 134, An Ping Rd., Chung-Ho,, Taipei Hsien, Taiwan**

**Filed Mar. 27, 1990, Ser. No. 499,683**
**Int. Cl.[5] E03C** *1/22, 1/24*
**U.S. Cl. 4—203** **13 Claims**



1. A drain valve assembly for a sink having a drain hole, comprising:

a drain hole screen mounted in the drain hole having an outer side facing the sink and an inner side facing oppositely to said outer side;

a plurality of tapered openings in said screen having a smaller cross-section at said outer side than at said inner side;

a plug disposed adjacent said inner side of said screen;

a plurality of tapered stems extending from said plug inserted in and substantially conforming with respective ones of said tapered holes;

a lift rod extending from said plug in a direction substantially opposite to said stems; and

control bar means operatively connected to said lift rod for reciprocating said lift rod toward and away from said screen, so that operation of said control bar in a valve closing direction reciprocates said lift rod toward said screen to displace said plug and stems so that the stems are in a fully inserted position in said screen and tapered holes for closing the drain valve, and operation of said control bar in a valve opening direction reciprocates said lift rod in a direction away from said screen to displace said plug and stems in a direction away from said outer side of said screen for opening the drain valve, the amount of the displacement in said direction away from said outer side controlling the flow rate through the drain hole.

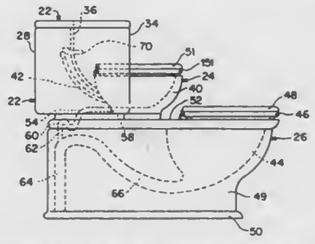
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**5,050,248**

**COMBINATION TOILET AND URINAL**

**Carlo Olivero, 124 Saunders St., Dalzell, Ill. 61320**

**Filed Aug. 21, 1990, Ser. No. 570,599**
**Int. Cl.[5] E03D** *9/00*
**U.S. Cl. 4—341** **28 Claims**



25. A combination toilet and urinal, comprising:

a flush tank having a front wall;

a toilet positioned in front of said flush tank front wall;

a urinal extending out away from said flush tank front wall and positioned rearward of said toilet;

a support structure connected to and supporting said flush tank, toilet, and urinal;

said urinal including a seat and said toilet including a seat with each seat providing a sitting area for supporting a person when sitting on said sitting area; and

said urinal including a drain having a curved configuration and a vertical section, said toilet including a drain having a curved configuration and a vertical section, said urinal drain being positioned directly above said toilet vertical section and said urinal vertical section opening into the vertical section of said toilet drain.

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**5,050,249**

**HUMAN PRIVATE PARTS WASHING APPARATUS**

**Hisanobu Takeda, Aichi, and Tomio Oguma, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Continuation of Ser. No. 196,430, May 29, 1990, abandoned. This application Jul. 30, 1990, Ser. No. 560,288**
**Claims priority, application Japan, May 28, 1987, 62-132931; May 29, 1987, 62-136409; Aug. 30, 1987, 62-217034**
**Int. Cl.[5] A47K** *3/22;* **A61H** *35/00*
**U.S. Cl. 4—443** **8 Claims**

1. A human private parts washing apparatus adapted to be installed on the top of a toilet bowl at the rear, comprising:

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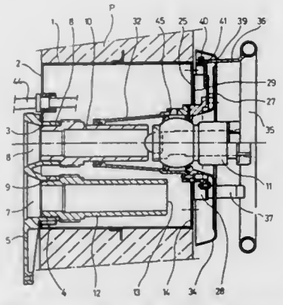
a washing water splashing means for splashing washing water to human private parts; and
a washing water supplying means for supplying washing water from a washing water supply source,
wherein said washing water splashing means comprises:
a nozzle supporter;
a washing water supply tube supported with said nozzle supporter, held in a manner declining obliquely and directed toward an inside of said toilet bowl, wherein a rear end of said washing water supply tube communicates with said washing water supply means;
a washing nozzle supported by said nozzle supporter, held




slidably in a manner declining obliquely and directed toward the inside of said toilet bowl, wherein said washing nozzle accommodates said water supply tube in a rear end side thereof;
at least one sealing member disposed between said washing water supply tube and said washing nozzle, comprising means such that said sealing member seals between said washing water supply tube and said washing nozzle in a water-proof manner only immediately after a hydraulic pressure of said washing water is supplied in said washing water supply tube; and
a washing nozzle driving means for driving said washing nozzle between a storage position and operation positions.

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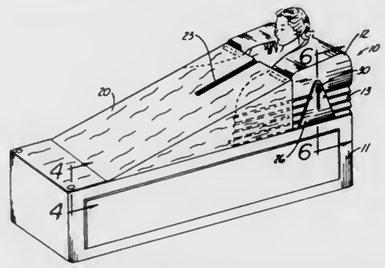
**5,050,250**
**COUNTERCURRENT INSTALLATION FOR SWIMMING POOLS**
**Jaime Morral Gispert, Santa Perpetua de Mogoda, Spain, assignor to Astral Sociedad Anonima de Construcciones Metalicas, Spain**
**Filed Sep. 12, 1990, Ser. No. 581,512**
**Claims priority, application Spain, Sep. 13, 1989, 8903573**
**Int. Cl.[5] E04H** *3/18;* **A47K** *3/10;* **A61H** *9/00*
**U.S. Cl. 4—492** **4 Claims**




1. A countercurrent installation for swimming pools, of a type comprising a main housing built into a swimming pool wall and provided with a face plate having controls and a discharge orifice for water mixed with air, and with a handgrip, in said housing water is suctioned and discharged by means connected to a pump, characterized in that the main housing is provided on the rear surface thereof with two openings (**3**) to which there is removably attached a plate (**5**) which extends frontally forming two tubular stubs (**8** and **9**) on which there are threadedly mounted tubes corresponding, respectively, to connection (**10**) with the discharge orifice (**11**) and the direct suction (**12**) of the water (A) from the swimming pool.

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**5,050,251**
**APPARATUS FOR CONVERTING A BATHTUB INTO A SAUNA**
**John T. Pride, 1735 104th Ave., Oakland, Calif. 94603**
**Filed Oct. 29, 1990, Ser. No. 604,102**
**Int. Cl.[5] A61H** *33/00, 33/06*
**U.S. Cl. 4—534** **10 Claims**

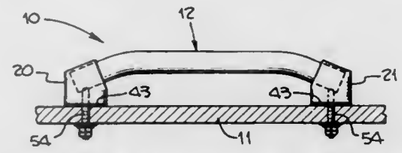



1. Apparatus comprising:
a bathtub having container means for selectively collecting and holding water, said container means including a substantially horizontally disposed ledge surrounding said container means, said ledge including a front portion and a rear portion;
hood means extending over the front portion of said ledge for covering a person's body;
slot means for permitting a person's head to extend through said hood means while said person's body is in said container means;
means attached to said hood means and to said ledge for adjusting the height of said hood means with respect to said ledge;
a flexible waterproof sheet extending over said hood means and over the portion of said ledge which is not covered by said hood means; and
means for attaching said sheet to the rear portion of said ledge.

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**5,050,252**
**UNIVERSAL ADJUSTABLE GRAB BAR ASSEMBLY**
**Rik Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc, Valencia, Calif.**
**Filed Aug. 14, 1990, Ser. No. 567,920**
**Int. Cl.[5] A47K** *3/12*
**U.S. Cl. 4—576** **26 Claims**

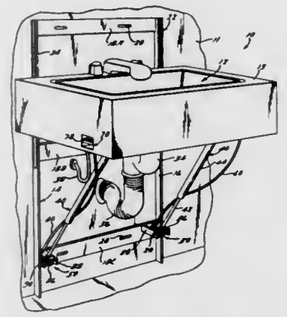
1. An adjustable and universal grab bar assembly for attachment to a surface comprising:
a bar having a cross section, a generally straight midportion having a central axis and angled and portions located at opposite ends of said midportion, each of said angled end portions having a central longitudinal axis;
a pair of holders, each of said holders having a main body portion with a top and bottom, said main body portion including a socket formed therein, said socket having an interior and a central longitudinal axis whereby said central axis of said socket forms a first angle with a line parallel to the bottom of the main body portion; and
a line perpendicular to the central longitudinal axis of said angled end portions forms a second angle with a line perpendicular to the central axis of said midportion




wherein said first and second angles being substantially the same and approximately equal to 22°30', said bar and said holders being configured such that said bar can be rotated within said sockets to change the orientation of said midportion with respect to said holders.

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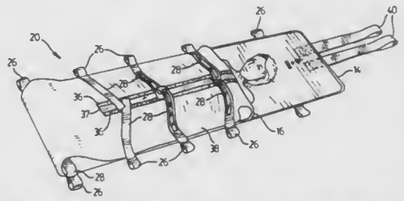
**5,050,253**
**ADJUSTABLE VANITY**
**Gregory A. Wasek, 3350 Tracy, Sterling Heights, Mich. 48310**
**Filed Apr. 19, 1990, Ser. No. 510,953**
**Int. Cl.[5] A47K** *1/05*
**U.S. Cl. 4—645** **16 Claims**



1. A height-adjustable sink assembly comprising:
a sink;
reciprocable motion means for enabling said sink to move generally parallel to a stationary wall surface for adjusting the height of said sink relative to a floor surface, said reciprocable motion means adapted to connect said sink to said stationary wall surface;
force generating means for selectively permitting and restricting movement of said sink, said force generating means comprises at least one internally pressurized fluid device having a sealed tubular housing connected at one end thereof to said sink and defining an internal chamber therein and a piston rod, said piston rod having a piston at one end disposed for movement within said internal chamber and a second end attached to one of said stationary wall surface and said floor surface; and
actuation means adapted for inhibiting movement of said force generating means when said actuation means is in a first position and for permitting movement of said force generating means when said actuation means is in a second position, said actuation means comprises a switch assembly having a switch member movable between said first and second positions and an actuation cable means adapted for interconnecting said movable switch member and said fluid control means for selectively actuating said fluid control means in response to movement of said switch member, said force generating means providing continuously variable height adjustment of said sink relative to said floor surface through a predetermined range of reciprocal motion when said actuation means is in said second position and said tubular housing attached to said sink, said pressurized fluid device further comprising fluid control means selectively actuated by said actuation means for selectively permitting reciprocable movement of said piston rod relative to said tubular housing when said actuation means is in said second position and restricting movement of said piston rod when said actuation means is in said first position.

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**5,050,254**
**PATIENT EVACUATION ENVELOPE**
**Wendy J. Murphy, 48 Southvale Drive, Toronto, Ontario, Canada M4G 1G3**
**Filed May 29, 1990, Ser. No. 530,193**
**Int. Cl.[5] A61G** *1/00, 1/044, 1/048*
**U.S. Cl. 5—82 R** **13 Claims**




1. An evacuation sheet adapted to form an evacuation envelope for use when evacuating bedridden patients from a hospital bed or the like comprising:
(a) a thin web of flexible fire-retardant material of generally uniform thickness, having; a first end, a second end and a longitudinally elongated body extending therebetween, and a pair of oppositely disposed side edges and a width extending between the side edges, said thin web being sufficiently flexible to permit it to assume a compact storage configuration,
(b) a first portion of said web extending inwardly from the first end and a second portion extending inwardly from the second end, the first and second portions each having a length that is about to the height of the patient that is to be accommodated therebetween in use, said web being foldable across the width thereof to locate the second portion in an overlying relationship with respect to the first portion to form an evacuation envelope that is proportioned to accommodate the body of the patient and which is closed at one end,
(c) binding means for releasably connecting the side edges of the first and second portions of the web to retain said second portion in said overlying relationship, and
(d) lifting handle means attached to the said edges of the first portion and located at adjacent opposite ends and at about the middle of the length of the side edges of the first portion to permit the envelope to be lifted to carry a patient therein.

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**5,050,255**
**PICNIC BLANKET AND STORAGE POUCH**
**Geneva Denson, 656 Vernon Ave., SE., Atlanta, Ga. 30316**
**Filed Apr. 26, 1990, Ser. No. 514,601**
**Int. Cl.[5] A47G** *9/06*
**U.S. Cl. 5—417** **4 Claims**

1. A picnic blanket, comprising:
a first piece of cloth having a left edge and a right edge spanning the length of said piece of cloth, and a top edge and a bottom edge spanning the width of said piece of cloth;
a second piece of cloth having a slit therein, a left edge and a right edge spanning the width of said piece of cloth, and

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a top edge and a bottom edge spanning the width of said piece of cloth, said first and second pieces of cloth having the same dimensions in length and width;

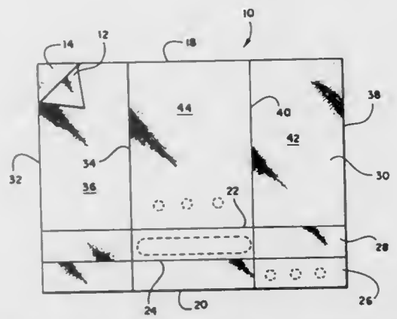
a top seam connecting said first and second pieces of cloth along said top edges;

a first bottom seam connecting said first and second pieces of cloth along said bottom edges:

a second bottom seam connecting said first and second pieces of cloth and being positioned parallel to said first bottom seam and spaced therefrom a preselected distance;

a first left side seam extending between said top seam and said second bottom seam;

a second left side seam extending between said top seam and said first bottom seam and defining a left panel between said first and second left side seams.




a first right side seam extending between said top seam and said second bottom seam;

a second right side seam extending between said top seam and said first bottom seam and defining a right panel between said first and second right seams;

a center panel positioned between said left and right panels;

a pocket formed between said first and second pieces of material and defined by said first and second bottom seams and said second left and right side seams, said slit being an entrance to said pocket;

a first fastening means attached to said second piece of material in said center panel; and

a second fastening means attached to said second piece of material in said right panel.

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**5,050,256**

**ALLERGEN PROOF BEDDING SYSTEM WITH COVER PERMEABLE TO WATER VAPOR**

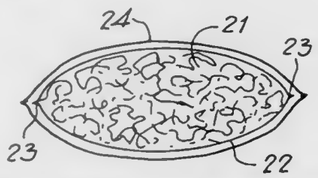
**Ashley Woodcock, Hale, England, assignor to Slumberland PLC, Greenfield, England**

**Continuation of Ser. No. 289,541, Dec. 23, 1988, abandoned. This application May 30, 1990, Ser. No. 530,210**

**Claims priority, application United Kingdom, Dec. 29, 1987, 8730252**

**Int. Cl.[5] A47C** *27/00*; **A47G** *9/00*

**U.S. Cl. 5—448** **3 Claims**




1. A bedding system comprising an item of bedding for the control of mite-induced allergy, said system having interior upholstery and cover means for said upholstery including permeable mite barrier material of coated fabric totally enclosing all of said upholstery and being permeable to water vapor in excess of 2,500 g/m$^2$day, said upholstery and cover means including top and bottom panels and side panels devoid of any apertures therein for the passage of fluid between inside and outside of the mattress, said material not having pores greater in size than 10 microns.

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**5,050,257**

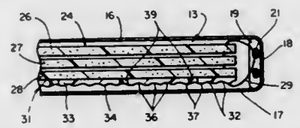
**EASY DRAINING WATERBED MATTRESS AND METHOD**

**John B. Johenning, Beverly Hills, Calif., assignor to Strata Flotation, Inc., Torrance, Calif.**

**Filed Aug. 17, 1990, Ser. No. 569,094**

**Int. Cl.[5] A47C** *27/08*

**U.S. Cl. 5—450** **10 Claims**




1. In a waterbed mattress: a flexible bladder defining a chamber for holding water, a horizontally extending insert of fibrous material disposed in the chamber for reducing wave action in the water, a drain valve opening through the bladder for removing water from the chamber, a horizontally extending drainage manifold positioned beneath the fibrous insert and having a plurality of channels formed therein for receiving water from the fibrous insert and carrying said water toward the drain valve.

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**5,050,258**

**METHOD AND APPARATUS FOR CONTROLLING COLOR DISTRIBUTION IN A TEXTILE DYEING PROCESS**

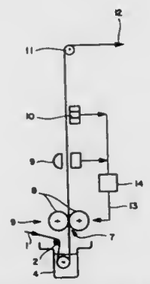
**Rüdiger Fischer, Düsseldorf, and Kurt van Wersch, Wegberg, both of Fed. Rep. of Germany, assignors to A. Monforts GmbH & Co., Monchengladbach, Fed. Rep. of Germany**

**Filed Jul. 25, 1990, Ser. No. 558,074**

**Claims priority, application Fed. Rep. of Germany, Aug. 1, 1989, 3925444**

**Int. Cl.[5] D06B** *15/02, 23/26*

**U.S. Cl. 8—151** **17 Claims**




1. In a textile dyeing process in which a textile web continuously travels through a textile padding machine for the application of dye liquor with the initial dye liquor pick up being controlled by a nip device that removes excess dye liquor from the textile web, resulting in an initial moisture content in the textile web, the improvement comprising:

sensing a color characteristic of the textile web following the removal of excess dye liquor from said textile web portion by the nip device; and

controlling the operation of the nip device in response to said color characteristic sensing to control the liquor pick up and thereby control the initial moisture content for desired color distribution on said textile web.

10. In a textile dyeing arrangement having a textile padding machine for applying dye liquor to a textile web continuously traveling therethrough with the initial dye liquor pick up being controlled by a nip device that removes excess dye liquor from the textile web, resulting in an initial moisture content in the textile web, a feedback control system comprising:

means for sensing a color characteristic of the textile web following the removal of excess dye liquor from said textile web portion by the nip device; and

means for controlling the operation of the nip device in response to said color characteristic sensing to control the liquor pick up and thereby control the initial moisture content for desired color distribution on said textile web.



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**5,050,259**

**DRUM TYPE WASHING APPARATUS AND METHOD OF PROCESSING THE WASH USING SAID APPARATUS**

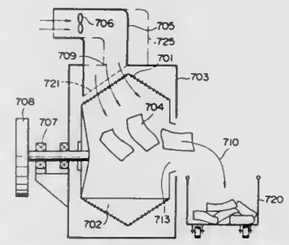
**Yasuhiro Tsubaki; Kazuo Kitajima; Ishihara Hidetoshi; Shoichi Hayashi; Atsushi Ueda; Kenichi Yagami, and Shuji Yamada, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Churyo Engineering Kabushiki Kaisha, both of Tokyo, Japan**

**Continuation of Ser. No. 430,610, Nov. 1, 1989, abandoned, which is a division of Ser. No. 315,948, Feb. 23, 1989, abandoned. This application Oct. 11, 1990, Ser. No. 596,741**

**Claims priority, application Japan, Feb. 23, 1988, 63-40513; Mar. 15, 1988, 63-61281; Jul. 28, 1988, 63-188661; Sep. 13, 1988, 63-227418; Oct. 26, 1988, 63-139766; Dec. 6, 1988, 63-306942; Jan. 25, 1989, 1-15580**

**Int. Cl.[5] D06F** *23/02, 25/00*

**U.S. Cl. 8—159** **2 Claims**




1. A method for washing clothes, comprising the steps of:

providing a rotary drum rotatable about an axis;

placing clothes within the rotary drum by passing the clothes through a door provided on the axis of the rotation of the rotary drum;

rotating the drum about the axis, for creating a centrifugal force and washing and dewatering the clothes;

preventing the clothes from being brought into tight contact with an inner wall surface of the rotary drum during the rotating step by providing the rotary drum with a peripheral wall with a pot-shaped contour having a single corrugated portion in a direction of the drum axis and additionally providing the single corrugated portion with a corrugated angle opened between 90° and 160° including a direction of action of the centrifugal force of the drum;

removing the clothes from the peripheral wall of the rotary drum by arranging a plurality of beaters at the peripheral wall and rotating the rotary drum;

drying the clothes; and

blowing air into the rotary drum from an airblowing duct disposed at an outer drum around the rotary drum, through nozzles, for discharging the clothes from the rotary drum through said door by the blowing of the air.

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**5,050,260**

**TOOL RING, A METHOD OF MAKING IT, AND A HOLDING TOOL FOR USE IN THE PERFORMANCE OF THE METHOD**

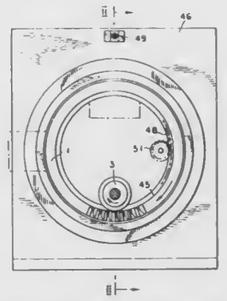
**Ove Nielsen, Middelfart, Denmark, assignor to Enkotec A/S, Skanderborg, Denmark**

**PCT No. PCT/DK87/00134, § 371 Date Jun. 22, 1990, § 102(e) Date Jun. 22, 1990, PCT Pub. No. WO89/03734, PCT Pub. Date May 5, 1989**

**PCT Filed Oct. 23, 1987, Ser. No. 473,996**

**Int. Cl.[5] B21G** *3/12*

**U.S. Cl. 10—52** **13 Claims**




1. A tool ring for securing blanks in a machine of the type comprising a pair of rotating rings where opposite, plane side faces of the rings are formed with a plurality of holding tools so adapted that an oblong blank can be secured substantially radially between a pair of holding tools in respective ones of said rings, and where at least one ring has a groove adapted to receive the holding tools, said tool ring comprising:

spacer tools adapted to be fixed relative to the groove between the holding tools, each of said spacer tools and adjacent holding tools have cooperating wedge faces, one or more holding tools being secured between a pair of spacer tools, for forcing the holding tools into engagement with an engagement face of the groove, which face is disposed coaxially with the axis of the ring.

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**5,050,261**

**ANGULARLY ADJUSTABLE ADAPTER FOR PAINT ROLLERS**

**Roland J. Hofacker, 5325 Carmilfra Dr., Sarasota, Fla. 34231**

**Filed Dec. 10, 1990, Ser. No. 624,559**

**Int. Cl.[5] B05C** *17/02*

**U.S. Cl. 15—144 R** **3 Claims**

1. An angularly adjustable adapter for paint rollers comprising:

a pivotable knuckle having a longitudinal axis and including first and second formed members pivotable one to another about a central transverse axis;

said first member having an upper distal end structured for coaxial engagement into the distal end of a handle of a paint roller;

said second member having a lower distal end structured for coaxial engagement with an elongated extension arm;

said second member also having two spaced opposing generally parallel outwardly facing friction surfaces oriented perpendicularly to said central transverse axis;

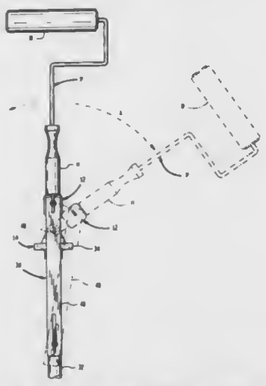
an elongated friction bar positioned on either side of said knuckle pivotally connected at an upper end to a midpoint of said first member about an upper transverse axis spaced above and parallel to said central transverse axis;

said friction bars parallel and spaced apart and extending

downwardly below the corresponding said friction surfaces to a lower transverse pivotal connection of the lower ends of said friction bars about a lower transverse axis passing through said extension arm;

said lower and upper transverse axes parallel;

said friction surfaces spaced apart sufficiently such that, the lower ends of said friction bars being compressively biased toward said extension arm at said lower transverse pivotal connection, said friction bars are biased against the corresponding said friction surfaces;



said friction surfaces having sufficient transverse length to maintain friction contact against said friction bars when said first and second members are pivoted at an acute angle out of axial alignment one to another sufficiently to maintain any preselected angle during painting use;

said friction bars slotted longitudinally at said lower pivotal connection to allow the lower end of said friction bars to articulate downwardly as well as pivotally about said lower pivotal connection as said first and second members are pivoted out of axial alignment one to another.

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**5,050,262**

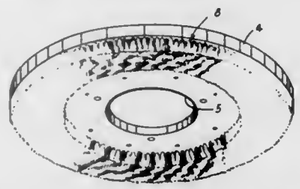
**FLOOR MAINTENANCE BRUSH OR THE LIKE**

**Terrance J. Maiish, 2520 Red Fox Pass, Willoughby, Ohio 44094**

**Continuation of Ser. No. 22,068, Mar. 5, 1987, abandoned. This application Jun. 7, 1989, Ser. No. 363,289**

**Int. Cl.[5] A46B *9/06***

**U.S. Cl. 15—180** **5 Claims**



1. A brush of the type for attachment to a high-speed rotary floor maintenance machine of the type for cleaning, buffing, burnishing and polishing applications having a generally circular shaped base member with a centrally located hole extending therethrough to provide attachment of the brush to the floor maintenance machine, said brush comprising a plurality of tuft units projecting outwardly in a direction away from one side of said base member, said tuft units being disposed in singular rows, the rows each being laterally spaced from one another and extending radially outwardly in a direction away from the rotational axis of the base member, each of the rows defines a substantially similar arcuate configuration, in top plan view, in said radial direction, each of the rows including at least three individual tuft units, each tuft unit consisting essentially of a plurality of individual bristles of a single type of material wherein the tuft units in each of the rows alternate between a first tuft unit type having bristles made from a substantially non-absorbent and non-abrasive polymeric material and a second tuft unit type having bristles made from an absorbent and slightly abrasive material, such that adjacent tuft units in each row arc of differing material and wherein the polymeric bristles are comprised of a polyester material and the absorbent bristles are made from a natural material.

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**5,050,263**

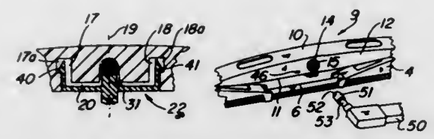
**WIPER BLADE ASSEMBLY**

**Cedric S. K. Charng, Taipei, Taiwan, assignor to China Wiper Special Rubber Co. Ltd., Taipei, Taiwan**

**Filed Jul. 23, 1990, Ser. No. 557,310**

**Int. Cl.[5] B60S *1/40***

**U.S. Cl. 15—250.32** **10 Claims**



1. A wiper blade assembly comprising a main yoke having a central portion provided with spaced apart opposite side walls, an underside, transverse socket means formed in said central portion and opening into each of said opposite side walls for receiving a sidewise extending wiper arm pivot pin having an annular recess spaced from a free end thereof, means defining a lengthwise extending recess which is formed in, and is open to the underside of, said central portion, first engaging means carried by said yoke, and an integrally molded latching member made of plastics material comprising a first body part having spaced apart opposite side regions and spaced apart opposite end regions, a second body part having opposite ends integrally joined to respective ones of said opposite end regions and being resiliently displaceable relative to the first body part from a latching position, second engaging means on said first body part interengageable with said first engaging means for securing the latching member within said lengthwise extending recess, latch means on the second body part which, when the second body part is in its latching position, are located in the annular recess of said wiper arm pivot pin received within said socket means for retaining the wiper arm pivot pin therein and, between said opposite ends of said second body part, actuating means movably engageable to facilitate resilient displacement of said second body part relative to said first body part out of its latching position for moving the latch means clear of the annular recess thereby enabling removal of the wiper arm pivot pin from the socket means.

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**5,050,264**

**UNIVERSAL AIRFLOW VACUUM CLEANER MODULE**

**John J. Breslin, Los Altos, Calif., assignor to Beamco, Inc., Mountain View, Calif.**

**Filed Apr. 16, 1990, Ser. No. 510,210**

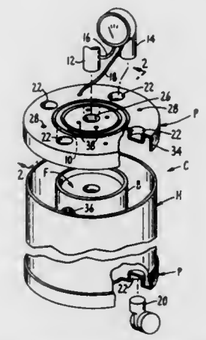
**Int. Cl.[5] A47L *5/36***

**U.S. Cl. 15—327.1** **13 Claims**

1. A universal module for use as an end or separator plate in a canister type vacuum cleaner, said module comprising:



(a) a disk-shaped body having a plurality of closed peripheral recesses formed therein at spaced intervals , said recesses being capable of being opened to form passages through the body; and,



(b) a groove formed generally centrally of the body to the interior of the recesses, said groove being adapted to receive and locate a baffle relative to the module.

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**5,050,265**

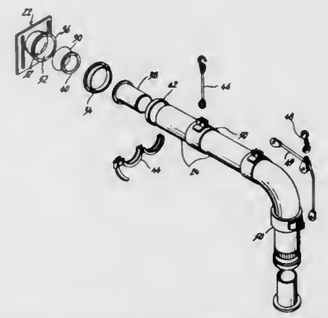
**SWIVEL BOWL WEAR INSERT FOR DEBRIS INTAKE APPARATUS**

**Claude E. Stout, and Claude R. Stout, both of 2 Chaffee La., Southington, Conn. 06489**

**Filed Dec. 10, 1990, Ser. No. 628,507**

**Int. Cl.[5] A47L *9/00*; E01H *1/08***

**U.S. Cl. 15—340.1** **3 Claims**



1. A vacuum debris collector comprising, a vehicle movable over the area to be cleared, an enclosed vacuum tank on the vehicle having an intake opening, a flexible pick-up hose having a debris intake end and a debris discharge end, the debris discharge end of the pick-up hose directed into the vacuum tank intake opening, a swivel bowl having inner and outer walls, the swivel bowl connected to the hose, a plate adapter having an inner wall to receive the swivel bowl for swivel action, and a wear insert for placement between the inner and outer walls of the swivel bowl, the wear insert secured to the plate adapter to serve to divert the collected debris away from the inner wall of the plate adapter and into the intake opening of the vacuum tank.

**5,050,266**

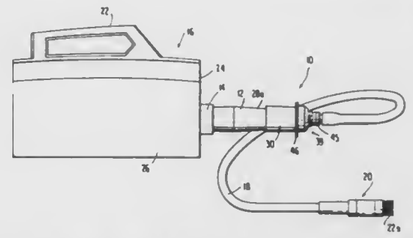
**VACUUM CLEANER ADAPTER FOR MICRO TOOLS**

**Norman J. Schneider, 1120 S. King St., Honolulu, Hi. 96814**

**Filed Nov. 21, 1989, Ser. No. 439,918**

**Int. Cl.[5] A47L *9/02***

**U.S. Cl. 15—421** **10 Claims**



1. A vacuum cleaner adaptor for a micro tool for a vacuum cleaner employing an air cooled or air pass through motor for preventing overheating of the vacuum cleaner motor during operation, said vacuum cleaner including suction and positive air pressure sides passing air flow over or through said vacuum cleaner motor, said adaptor comprising a tubular assembly including an adaptor body having a large diameter tube section for attachment to the suction or positive air pressure side of the vacuum cleaner, a small diameter tube section sized to the micro tool for coupling thereto, and an integral transition section connecting the large diameter section to the small diameter section, one of said adaptor body sections comprising a plurality of air flow ports opening to the interior of the adaptor, and a shield rotatably mounted on said section carrying said plurality of air flow ports for rotation between a first position in which the ports are open to air flow between the interior and exterior of said adaptor body section, and a second position in which said ports are partially closed off to said air flow and said adaptor further includes stop means for limiting movement of said shield to rotation between said first and second positions thereby insuring prolonged air flow through said tubular assembly for passage through or over said motor adequate to prevent overheating of the vacuum cleaner motor with the rate of air flow through the vacuum cleaner being readily adjustable depending upon the nature of the micro tool attached thereto.

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**5,050,267**

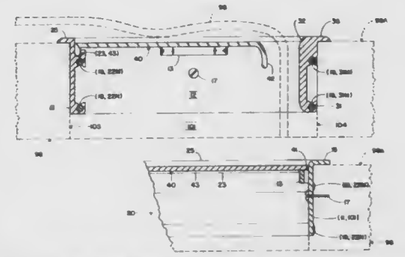
**ELECTRICAL CABLE ACCESS GROMMET**

**Thomas A. Quest, 906 S. 117th Ct., Omaha, Nebr. 68154**

**Filed Aug. 31, 1990, Ser. No. 576,364**

**Int. Cl.[5] H02G *3/22*; F16L *5/00***

**U.S. Cl. 16—2** **6 Claims**



1. Electrical cable access grommet for use in office furniture having a rectangular opening through which at least one electrical cable extends vertically therethrough, said furniture rectangular opening including a pair of directionally longitudi-

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nally extending upright-sides and a pair of directionally transversely extending upright-ends, said electrical cable access grommet comprising:

(A) a pair of upright and transversely extending end-panels, each having a similar finite transverse-length, and comprising:

(Ai) an upright lead-face for uprightly confronting a rectangular opening upright-end,

(Aii) an upright trail-face provided with a horizontally extending end-ledge,

(Aiii) located above said end-ledge and in an angular relationship to said lead-face, and end-flange adapted to downwardly rest upon said office furniture, and

(Aiv) said end-panel below said end-ledge being apertured to accommodate a horizontally extending fastener for fastening to said rectangular opening upright-end;

(B) a longitudinally extending upright rear-panel confronting the trail-faces of the two end-panels and removably attached thereto, said rear-panel comprising:

(Bi) an upright leadward-face for uprightly confronting a rectangular opening upright-side,

(Bii) an upright trailward-face provided with a horizontally extending side-ledge, and

(Biii) located above said side-ledge and in an angular relationship to said leadward-face, a side-flange adapted to downwardly rest upon said office furniture; and

(C) a horizontal, rectangular, and removably positioned cover-plate comprising:

(Ci) a pair of transversely extending plate-ends, each plate-end having a transverse-extent less than said transverse-length and resting downwardly upon a said end-ledge,

(Cii) a longitudinally extending aft-end resting downwardly upon said side-ledge, and

(Ciii) a linearly generated, upright, longitudinally extending fore-end, whereby said at least one vertically extending electrical cable is locatable adjacently externally of said fore-end.

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**5,050,268**

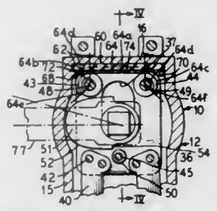
## DOOR CLOSER WITH BACK CHECKING MEANS

**George F. Toledo, Fall Brook, Calif., assignor to Thomas Industries, Inc., Los Angeles, Calif.**

**Continuation of Ser. No. 376,401, Jul. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 70,024, Jul. 6, 1987, abandoned. This application Feb. 12, 1991, Ser. No. 655,220**

**Int. Cl.[5] E05F** *3/00*

**U.S. Cl. 16—53** **21 Claims**



1. A door closer comprising:

a housing having top, bottom, side and back walls;

at least one member movable within said housing;

a cam within said housing which, when connected to a door, rotates in response to an opening and closing movement of said door between a closed position and a normal full open position to drivingly engage said member to move said member during an opening movement of said door; and

back checking means comprising a resilient cushion bar having a front face and a perimeter edge surrounding said front face, the cushion bar arranged interior of said housing and engageable and compressible by said member during a final few degrees of opening of said door prior to said normal full open position to provide an increasing resistance to opening of said door during said final few degrees of opening; and

said housing providing wall means projecting inwardly from at least one of said walls beyond said perimeter edge of said resilient cushion bar for capturing said cushion bar at a select position within said housing.

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**5,050,269**

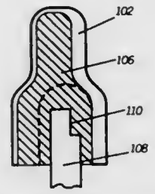
## CONTROL KNOB

**Scott M. Engstrom, North Lauderdale; Pete B. Gilmore, Sunrise, both of Fla., and Quah T. Hoh, Paya Terubung, Malaysia, assignors to Motorola, Inc., Schaumburg, Ill.**

**Continuation of Ser. No. 402,312, Sep. 5, 1989, abandoned. This application Dec. 28, 1990, Ser. No. 634,947**

**Int. Cl.[5] E05B** *1/00*

**U.S. Cl. 16—118** **2 Claims**



1. An instrument control knob comprising:

an inner portion comprising a plastic material having a substantially cylindrically main body; a blade portion longitudinally attached to said main body,

an outer portion comprising a substantially cylindrical body having an outer surface and a cylindrical bore defined therein; said bore having a longitudinal slot communicating with said outer surface,

said outer portion fitting over said inner portion so that at least a part of the inner portion is visible through the slot and the outer portion comprising a plastic material having a reduced hardness factor with respect to the inner portion; the color of the outer portion being different from that of the inner portion.

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**5,050,270**

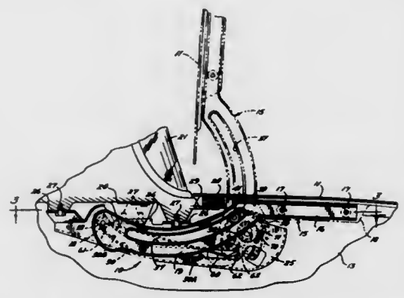
## HINGE FOR AN AUTOMOBILE TRUNK LID

**Russell J. Burgei; Lavern R. McCallips, and Teddy B. Johnson, all of Rockford, Ill., assignors to Atwood Industries, Inc., Rockford, Ill.**

**Filed Aug. 15, 1990, Ser. No. 567,749**

**Int. Cl.[5] E05F** *1/12*

**U.S. Cl. 16—298** **6 Claims**



4. A hinge for mounting the trunk lid of a vehicle for swinging upwardly on a vehicle body from a normally closed position to an open position relative to a trunk compartment, said hinge comprising a bracket adapted to be attached to said body within said compartment, an arm adapted to be attached to the underside of said lid, and means interconnecting said arm and said bracket and supporting said arm to move relative to said bracket to permit swinging of said lid between said closed and open positions, said means comprising a first elongated slot formed in said bracket, a first follower attached to said arm and received in said first slot to move back and forth therealong, a second elongated slot formed in said arm, a second follower attached to said bracket and received in said second slot to help guide said arm as said lid is moved between said closed and open positions, a cam mounted on said bracket to rotate about a predetermined axis and having a peripheral surface, a spring connected between said bracket and said cam and loaded to bias said cam in a first direction about said axis when said lid is in said closed position, an elongated flexible element having one end connected to said first follower and having an opposite end connected to said cam at a point spaced radially from said axis, said flexible element preventing said cam from being rotated in said first direction by said spring when said lid is in said closed position and wrapping around the peripheral surface of said cam when the latter rotates in said first direction as said lid is released from said closed position for movement toward said open position.



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**5,050,271**

## ROTATION AND STANDSTILL RESPONSIVE LOCKING DEVICE FOR AN ACCESS DOOR OF A TEXTILE MACHINE

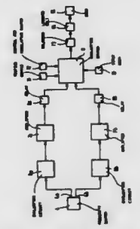
**Fritz Hösel, Mönchengladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany**

**Filed Apr. 17, 1990, Ser. No. 509,752**

**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1989, 3912737**

**Int. Cl.[5] D01G** *31/00*

**U.S. Cl. 19—98** **7 Claims**



1. In a textile machine having a rotary part, an openable and closable cover having a closed position in which access to the rotary part is prevented and an open position in which access to the rotary part is allowed; locking means cooperating with said cover and having a bolted position in which said cover is locked in the closed position and an unbolted position in which said cover is allowed to be moved into said open position; standstill monitoring means for sensing rotation and standstill of said rotary part; said standstill monitoring means being operatively connected to said locking means for placing the locking means into said bolted or unbolted position; the improvement wherein said standstill monitoring means comprises a rotary sensor coupled to said rotary part and being arranged to control said locking means and normally emitting a signal representing rotation of said rotary part; and means for preventing the locking means from being placed in the unbolted position in an absence of said signal during rotation of said rotary part.

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**5,050,272**

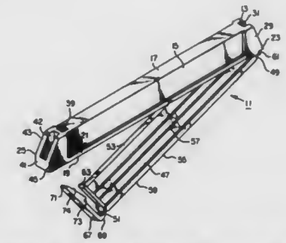
## CLOSURE MEMBER FOR AN ICE BAG

**Steven R. Robinson, Hurst, and Olifton G. Hampton, Bedford, both of Tex., assignors to Anago, Inc., Ft. Worth, Tex.**

**Filed Oct. 16, 1990, Ser. No. 598,357**

**Int. Cl.[5] B65D** *77/10*

**U.S. Cl. 24—30.5 R** **10 Claims**



1. In a closure member for a bag, the closure member having a sheath with generally parallel side walls, the side walls having inner edges joining each other and outer edges spaced apart from each other, the sheath having a pivot end and a locking end, the closure member having a blade with a pivot end which pivotally connects to the pivot end of the sheath and a locking end, the blade being rotatable about its pivot end between an open position exterior of the sheath and a closed position snapped into the sheath, the blade having an outer edge and a parallel inner edge, the inner edge of the blade locating in the sheath when the blade is in the closed position, the improvement comprising in combination:

a partition connected between the side walls of the sheath near the locking end of the sheath, the partition having a first side facing the pivot end of the sheath and a second side facing the locking end of the sheath, the partition having a shoulder which faces toward the inner edges of the side walls of the sheath;

a retaining wall located at the locking end of the sheath, the retaining wall joining the side walls of the sheath and extending from the outer edges of the side walls a selected distance toward the inner edges of the side walls;

the inner edges of the side walls of the sheath between the retaining wall and the partition being separated from each other; and

a flexible locking member located at the locking end of the blade, the locking member joining the outer edge of the blade and extending in a direction toward the inner edge of the blade, terminating in a tip which extends past the inner edge of the blade, the locking member being separated from the locking end of the blade by a clearance, the locking member having a shoulder located in the clearance which faces toward the outer edge of the blade; and wherein

in the closed position, the locking member locates between the retaining wall and the partition with the shoulder of the locking member engaging the shoulder of the partition and the tip protruding past the inner edges of the side wall of the sheath, to enable the tip to be engaged by a user for releasing the locking member from the partition, if desired.

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**5,050,273**

## SUSPENDING WIRE OF CABLE CLAMP FOR TELEPHONE LINE

**Masahiko Okura, 11-7, 4-chome, Shiroganedai, Minatoku, Tokyo, Japan**

**Filed Jul. 9, 1990, Ser. No. 550,039**

**Int. Cl.[5] F16L** *3/00*

**U.S. Cl. 24—136 R** **1 Claim**

1. A clamp for a telephone cable, comprising

a body member having a channel;

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a wedge member fitted into the channel of said body member for holding the telephone cable therebetween; and
a suspending wire connected to said clamp for attachment to a holding means; wherein
said suspending wire is a single strand wire looped over itself at substantially the center thereof to form a closed end portion at the looped over center, an intermediate portion



comprising two segments of the single strand wire and attached to each other, and an open end portion wherein the two ends of the single strand wire are separated from each other, said closed end portion being fixed to the clamp, and the two open end portions of the single strand wire being each bendable at least once over each other to form therebetween an opening for attaching to said holding means.

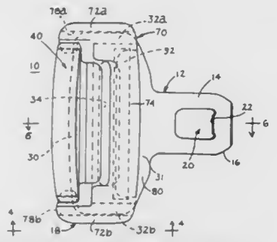
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**5,050,274**

## FREE RUNNING AND CINCHING LATCH PLATE

**Gary P. Staniszewski, Shelby Township, Macomb County, and Surendra D. Narayan, Sterling Heights, both of Mich., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.**

Filed Dec. 18, 1990, Ser. No. 629,524
Int. Cl.[5] A44B *11/06*
U.S. Cl. 24—171 7 Claims



1. A latch plate assembly (**10**) comprising:
a plate (**12**) having a tongue (**14**) formed at one end (**16**) thereof, and a back portion (**18**) opposite the tongue (**14**);
the tongue (**14**) including means for receiving (**20**) a locking mechanism of a cooperating buckle, such receiving means (**20**) including at least one aperture (**22**) formed in the tongue (**14**);
the back portion (**18**) including a front cross bar (**31**) and a rear cross bar (**30**), sides (**32***a*, **32***b*) joining the front cross bar (**31**) with the rear cross bar (**30**) and a first opening (**34**) of sufficient size to receive seat belt webbing (**36**);
a web guide (**40**), insert molded about the rear cross bar (**30**) and including an elevated member (**44**) spaced from a base member (**42**) and, spaced from the rear cross bar (**30**), the base and elevated members (**42**, **44**) cooperating to define a web guide slot (**46**), positioned above a plane containing the rear cross bar (**30**) and laterally extending to receive the seat belt webbing (**36**);
the elevated member (**44**), including a sloped surface (**48**) extending away from the first opening (**34**) and a first engagement surface (**50**) extending laterally across the rear cross bar (**30**) at the rear of the first opening (**34**);
a cover (**70**), slidingly received about plate (**12**), comprising:
first and second side members (**72***a*, **72***b*), a top crossmember (**74**) and a bottom crossmember (**76**), each of the first and second side members (**72***a*, **72***b*) including a slot (**78***a*, **78***b*) through which is received a corresponding side (**32***a*, **32***b*) of the plate (**12**);
the top crossmember (**74**) joining the first and second side members (**72***a*, **72***b*) and slidably received relative to a top surface (**80**) of the front cross bar (**31**); the top crossmember (**74**) includes a rib (**82**) extending into the first opening (**34**) so as to engage a front side of the first opening (**34**) when the cover (**76**) is slid forward on the plate (**12**) and to compressively load the seat belt webbing (**36**) against the first engagement surface (**50**) when the cover (**70**) is moved rearwardly, the top crossmember (**74**) including reinforcement means (**90**) for stiffening same, such reinforcement means (**90**) including a bar (**92**) within the top crossmember (**74**);
the bottom crossmember (**76**), joins the first and second side members (**72***a*, **72***b*) and is spaced (**98**) from the underside (**94**) of the plate (**12**) and the bottom (**96**) of the rib (**82**) such that the webbing (**36**) may extend through the first opening (**34**) and extend through the underside space (**98**) forward of the bottom crossmember (**76**) to exert a rearward pressure thereon.

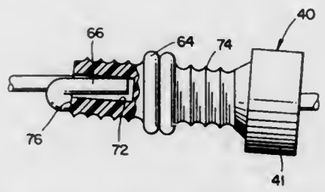
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**5,050,275**

## HOSE CLAMP

**Bernt Schroer, Herzebrock, and Ernst-Udo Ebert, Bad Sassendorf, both of Fed. Rep. of Germany, assignors to Markisches Federwerk GmbH & Co. KG, Ludenscheid, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 358,533, May 30, 1989, abandoned, which is a continuation of Ser. No. 186,172, Apr. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 38,058, Apr. 14, 1987, abandoned. This application Jan. 16, 1990, Ser. No. 466,661**
**Claims priority, application Fed. Rep. of Germany, Apr. 14, 1986, 8610111; Aug. 7, 1989, 8909472**
Int. Cl.[5] A44B *1/04*
U.S. Cl. 24—283 21 Claims



1. A hose clamp for fastening a hose to a connecting piece having an axis comprising:
a tightening ring formed from hard spring wire, a portion of the tightening ring surrounding the hose through 360° at a clamping location and defining a clamping plane generally perpendicular to the connecting piece axis, having a pair of ends which overlap, each end having an outwardly directed bend;
a portion of the ring being formed as a threaded lug; and
at least one threaded clamping element cooperating with the ends of said tightening ring, being positioned between the ends of the tightening ring essentially parallel to the overlap of said ends, the clamping element acting in compression, the clamping element having an external thread which is received by the threaded lug, and an end portion which cooperates with the end having an outwardly directed bend, the clamping element releasably engaging the outwardly directed bend with a plug-in type connection, being a detent against turning of the clamping element, and acting on the ends of the tightening ring at an angle to the clamping plane.

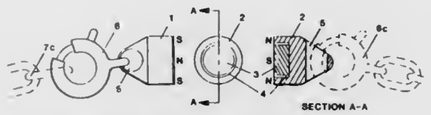


**5,050,276**

## MAGNETIC NECKLACE CLASP

**J. C. Pemberton, P.O. Box 20005, San Diego, Calif. 92120**

Filed Jun. 13, 1990, Ser. No. 537,854
Int. Cl.[5] A44B *21/00*
U.S. Cl. 24—303 8 Claims




1. Magnetic necklace clasp comprising:
a small left half magnetic shell having a cylindrical portion, a front face and an opposite tapered end;
said left tapered end having an eyelet means for securing one end of a necklace or bracelet;
said front flat face of said left half magnetic shell having a cavity means for holding a piece of magnetic material;
a left core of magnetic material cemented into said cavity means with non magnetic cement and forming a flush flat surface with said front face of said left shell;
a small right half magnetic shell having a cylindrical portion, a front face, and an opposite tapered end;
said right tapered end having an eyelet means for securing the other end of the necklace or bracelet;
said front face of said right half having a cavity means for holding a piece of magnetic material;
a right core of magnetic material cemented into said cavity means of said right shell with non magnetic cement and forming a flush flat surface with said front face of said right shell;
said left and right cores of magnetic materials having opposite polarities when cemented in their respective cavities;
said left face and said right face when placed in juxtaposition with each other being magnetically attracted because said left and right cores of magnetic materials being of different polarity from each other and from said magnetic shells associated therewith and attracting one another, said left and right portions forming the magnetic clasp having dissimilar polarities when positioned adjacent to each other.

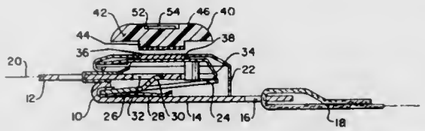
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**5,050,277**

## SEAT BELT BUCKLE ACTUATOR ACCESSORY

**Ivan Jimenez, and Irving Rubin, both of 5555 Treadwell, Wayne, Mich. 48184**

Filed Apr. 13, 1987, Ser. No. 37,806
Int. Cl.[5] A44B *11/26*
U.S. Cl. 24—633 3 Claims



1. In combination with a pre-existing restraint system for restraining a seat occupant by means of belting wherein portions of the belting releaseably connect via a buckle and tongue to gird the occupant, and the buckle is of the type comprising a casing which contains a spring-loaded latching mechanism for releaseably latching the buckle and the tongue when the two are mutually engaged, said casing comprising an aperture which exposes an actuating button for depression by a person's thumb or fingertip to cause the latching mechanism to release the buckle and tongue from latching condition, the improvement which comprises an accessory button for more conveniently operating the actuating button, said accessory button comprising a head portion disposed exterior of the buckle casing and a neck portion which extends from the head portion to join with the actuating button, said neck portion of said accessory button being joined to the actuating button of the pre-existing buckle by means of an adhesive which bonds the distal end of the neck portion to the actuating button and having an organization and arrangement of its head and neck portions such that depression of the accessory button head portion toward the casing is effective via the accessory button's neck portion to depress the actuating button sufficiently to cause the latching mechanism to release the buckle and the tongue from latching condition.

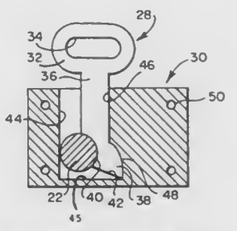
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**5,050,278**

## HARNESS STRAP LUG LOCK MECHANISM

**Armand J. Aronne, Massapequa, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.**

Filed Feb. 22, 1990, Ser. No. 482,886
Int. Cl.[5] A44B *11/25*
U.S. Cl. 24—653 1 Claim

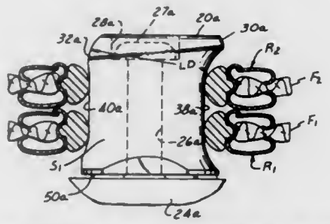


1. A lock lug mechanism comprising:
a lug having a first end for receiving a strap;
an intermediate straight section extending from the first end;
an opposite lug end extending from the intermediate straight section and including
a) an arcuate cut-out formed along a first straight section edge for receiving a pin which is retractable along a direction coincident with an axis of the pin, the axis also being coincident with the arcuate cut-out center, the cut-out embracing less than 180 degrees of the pin periphery, and
b) a curved shoulder extending from a second straight section edge;
a lug keeper having an internal recess including
c) a curved surface having the same curvature as the shoulder so as to snugly engage the shoulder in a locked condition, and
d) a straight surface opposite the curved surface for tangentially contacting the pin when in the locked condition;
means for retracting the pin from contact with the straight surface and the cut-out;
whereby tension on the strap, when the pin is retracted, results in movement of the lug away from the curved keeper surface and subsequent displacement of the lug out from the keeper.

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5,050,279
SNAP FASTENER
John E. Nemazi, Troy; Ralph M. Burton, Marine City, and Tirupathi R. Chandrupatla, Flint, all of Mich., assignors to Snap Fast Industries, Harper Woods, Mich.
PCT No. PCT/US87/02414, § 371 Date Jun. 28, 1989, § 102(e) Date Jun. 28, 1989, PCT Pub. No. WO89/02230, PCT Pub. Date Mar. 23, 1989
PCT Filed Sep. 18, 1987, Ser. No. 382,666
Int. Cl.[5] A44B *17/00*
U.S. Cl. 24—662 14 Claims

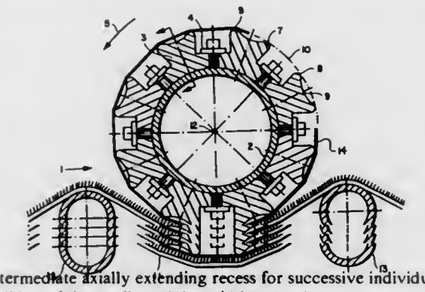


1. A snap fastener assembly comprising, in combination;
a generally cylindrical stud having a head at one end and intended to be mounted in upstanding relation at its opposite end on a member to be fastened;
receiver seats disposed on opposite sides of the stud beneath said head;
a latching shoulder on the head above one of the seats;
a retaining lobe on the head above the opposite seats;
said stud through the latching shoulder and retaining lobe being generally pear-shaped;
the dimension of the stud measured from the apex of said lobe to the seat on the opposite side of the stud being grater than the dimension of the stud measured from the apex of said shoulder to the seat on the other side of the stud to lock a receiver in said seats beneath the head;
a receiver to be secured to a part to be fastened and having a circular aperture for reception over the stud with the surface of the receiver at the aperture confronting the stud; and
said receiver seat beneath said lobe being generally concave and having a radius of curvature substantially greater than the radius of curvature of the confronting surface of the receiver whereby the stud will accommodate receivers of varying thickness.

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5,050,280
EMERIZING APPARATUS WITH MULTIPLE BEATER BLADES
Hans Hartkorn; Romuald Vaisoys, and Albert Vroomen, all of Moenchengladbach, Fed. Rep. of Germany, assignors to Gebruder Sucker and Franz Muller GmbH & Co., Fed. Rep. of Germany
Filed Feb. 9, 1990, Ser. No. 477,578
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1989, 304003
Int. Cl.[5] D06C *11/00*
U.S. Cl. 26—28 3 Claims

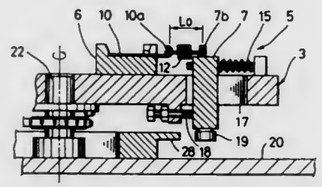
1. An emerizing apparatus comprising an emery-covered roller for peripheral surface contact with a textile web traveling continuously under a tractive force independent of said roller to produce a raised surface nap on the textile web, and means for rotating said roller in a direction independent of the direction of travel of the textile web, said roller having a plurality of beater blades arranged in parallel relation to the axis of rotation of said roller and an emery-covered belt wound outwardly about said beater blades, each said beater blade having a pair of axially extending beater edges spaced apart by an



intermediate axially extending recess for successive individual striking of the textile web by said beater edges.

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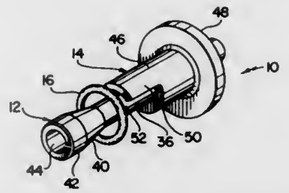
5,050,281
APPARATUS FOR FITTING COIL SPRINGS
Yasuhiro Yamashina, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 421,936, Oct. 16, 1989, Pat. No. 4,982,491.
This application Oct. 3, 1990, Ser. No. 592,651
Claims priority, application Japan, Oct. 17, 1988, 63-261113
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—227 3 Claims



1. An apparatus for interconnecting two components with a helical extension spring, comprising:
a turntable;
a plurality of holding units disposed on said turntable at regular angular intervals, each said holding unit being adapted to hold a first component and comprising a supporting table fixed on said turntable and a sliding block having a hook, said sliding block being slidable relative to said fixed supporting table;
driving means for intermittently turning said turntable so as to locate each said holding unit at a component supplying position where a said first component is placed on each said supporting table, a spring attaching position where a said helical extension spring is attached between each said component and a corresponding said hook, and a component connecting position where each said first component with said helical extension spring is attached to a second component; and
shifting means for shifting each said slidable block so as to expand a said helical extension spring to a predetermined length when each said holding unit is moved by said turntable to said component connecting position from said spring attaching position.



5,050,282
O-RING INSERTION TOOL
Frank Zannini, Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 27, 1990, Ser. No. 573,925
Int. Cl.[5] B23P *19/02*
U.S. Cl. 29—235 10 Claims

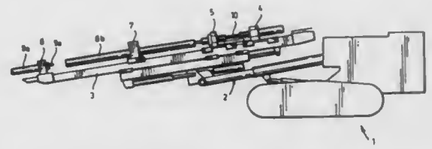


1. A tool for installing an O-ring in a female socket connector, said socket connector having an open end, an inwardly facing inner O-ring groove and an inwardly facing main inner surface between said O-ring groove and said open end, said O-ring groove having a first side edge which is adjacent said main inner surface and an opposite second side edge which is spaced from said first side edge in a direction away from said open end, said main inner surface having a first diameter, said O-ring groove having a second diameter which is at least slightly greater than said first diameter, said O-ring having an outer diameter which is substantially equal to said second diameter, an inner diameter which is at least slightly less than said first diameter and a thickness defined by the distance between the inner and outer diameters thereof, said tool comprising an elongated guide shaft including a cylindrical main shaft portion having a diameter which is less than said first diameter by an amount equal to at least twice said thickness and a flared portion on an end of said shaft portion, said flared portion having a flared outer surface, said flared portion having a point of maximum diameter where the diameter of said flared portion is just slightly less than said first diameter, said flared portion flaring outwardly from said main portion to said point of maximum diameter over a distance which is at least equal to said thickness, said guide shaft being receivable in an operative position in said socket connector so that said point of maximum diameter is located adjacent said O-ring groove second edge and so that said flared surface is spaced from said main inner surface by a distance at least equal to said thickness, said tool further comprising a contact member including attachment means rotatably and slidably attaching said contact member on said guide shaft and a contact finger extending from said attachment means toward said flared portion, said contact finger being receivable in said socket connector when said guide shaft is in said operative position for urging said O-ring into said O-ring groove.

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5,050,283
ARRANGEMENT FOR HANDLING DRILL RODS IN A ROCK DRILLING UNIT OR THE LIKE
Jusha Piipponen, Tampere; Pekka Heiskanen, Nokia; Juhani Lappalainen, Tampere; Kari Färlin, Siivikkala, and Pekka Salmi, Tampere, all of Finland, assignors to Oy Tampella Ab, Tampere, Finland
Filed Mar. 19, 1990, Ser. No. 494,748
Claims priority, application Finland, Mar. 23, 1989, 891418
Int. Cl.[5] B25B *13/50*
U.S. Cl. 29—240 17 Claims

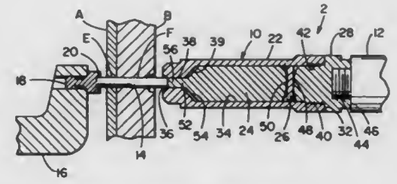
1. In a rock drilling unit having a feed beam movable along a longitudinal axis, apparatus for handling drill rods comprising:
a breaking device displaceable along the feed beam of the drilling unit, said breaking device including a body having an opening for the drill rod and at least one clamping element for retaining the drill rod immobile in its longitudinal direction with respect to the breaking device at least during breaking of a thread on the drill rods;
means mounting said breaking device for rotation about an axis transverse to the longitudinal axis of the feed beam to enable a drill rod for disposition in and removal from said opening of the breaking device in a direction transverse to the longitudinal axis of the feed beam;



said at least one clamping element of said breaking device being operable to retain the drill rod clamped in said breaking device when said breaking device is turned into a direction to align the drill rod carried thereby parallel to the feed beam.

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5,050,284
RIVET SETTING APPARATUS AND METHOD OF SETTING A RIVET
Stephen F. Howard, Juliet, and Terry W. Hopkins, Murfreesboro, both of Tenn., assignors to Avco Corporation, Providence, R.I.
Filed Sep. 7, 1990, Ser. No. 579,875
Int. Cl.[5] B23P *11/00*
U.S. Cl. 29—243.54 18 Claims



1. A rivet setting apparatus comprising:
a first driver;
a first deforming nose piece connected to said first driver and having a forward deforming seat;
a second driver opposite said first driver; and
a second deforming nose piece connected to said second driver, said second nose piece having an outer housing and an inner ram, said outer housing having a forward end with a deforming seat and an aperture with a portion of said inner ram movably mounted in said aperture such that said first and second deforming nose pieces can be driven towards each other to deform a rivet therebetween and, said ram and said outer housing are adapted to be moved in the same direction, but at different rates of displacement from home positions, such that said ram and outer housing can sequentially deform a rivet.

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5,050,285
HYDRAULIC TOOL FOR DISASSEMBLY OF UNIVERSAL JOINTS
Brian L. Wrage, R.R. 1, Lincoln, Ill. 62656
Filed Feb. 22, 1990, Ser. No. 483,893
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—252 2 Claims

1. A device for dismantling a universal joint which has first and second yoke members between a transmission and drive shaft of a motor vehicle, each yoke member having a pair of opposed first and second arms which seat respective press fit

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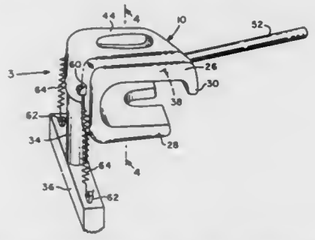
caps and a cross shaft cooperating with the caps to mount the yoke members, said device comprising:

(a) a generally C-shaped housing having a fork at lower end and an abutment at upper end so as to fit between the first arm of the first yoke member;

(b) a main piston extending vertically from said housing;

(c) a bar transversely attached to distal end of said main piston;

(d) hydraulic means within said housing for forcing said main piston downwardly so that said transverse bar will bear against the arms of the second yoke member to cause the cap from the second arm of the first yoke member to disengage therefrom, wherein said housing further includes a handle formed on the top so that said device can be carried and positioned by user of said device;



(e) a pair of reservoirs carried within said housing for holding a hydraulic fluid;

(f) a pump piston positioned between said reservoirs;

(g) a pump handle pivotally mounted at one end on said housing to activate said pump piston; and

(h) a pair of check valves positioned on opposite sides of said pump piston so that when said pump handle is operated activating said pump piston whereby said check valves will cause the hydraulic fluid to flow from said first reservoir into said second reservoir forcing said main piston downward.

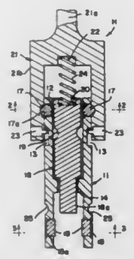
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**5,050,286**

**DRIVING MECHANISM FOR ANCHOR**

**Masaaki Miyanaga, Ashiya, Japan, assignor to Kabushiki Kaisha Miyanaga, Miki, Japan**

**Filed Sep. 14, 1989, Ser. No. 407,110**
**Int. Cl.[5] B25B *27/14***
**U.S. Cl. 29—275** **4 Claims**



1. Apparatus for driving an expander relative to an anchor bolt in a hole having an undercut portion, said apparatus having a forward end and a rearward end, comprising

an outer member having a rearward portion for connection with a hammer drill and having a forward tubular portion which is open at said forward end, said tubular portion having an interior recess in its inner axial surface,

an inner tubular member telescopically engaged within said tubular portion and adapted to engage at said forward end with one end of the expander, said inner tubular member having a radial hole through it,

a ball held in said hole and movably radially of said hole and having a diameter larger than the thickness of said inner tubular member,

a columnar guide member telescopically engaged within said inner tubular member, means coupling said guide member and said inner tubular member for limiting relative axial movement, and adapted to engage at said forward end with the outer end of the bolt, said guide member having an outer recess in its axially extending surface, and

resilient means between said outer member and said columnar guide member for forwardly urging said guide member,

said inner recess and said radial hole being normally aligned radially with each other, and said outer recess being normally displaced in a fixed distance forwardly from said hole, so that said ball normally engages with said inner recess to connect said outer and inner members in driving relation, and

when said outer member has moved with said inner member said distance forwardly relative to said guide member, said radial hole and said outer recess are radially aligned with each other, so that said ball may move out of said inner recess and into said outer recess.

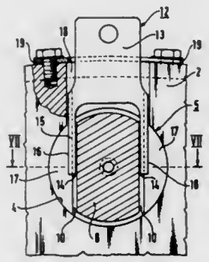
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**5,050,287**

**FORK FOR USE IN ASSEMBLING A ROTOR OF A STEAM TURBINE CONSTITUTED BY DISKS SHRUNK ONTO A SHAFT**

**Daniel Fleury, Nanteuil Le Haudouin, France, assignor to Alsthom S.A., Paris, France**

**Division of Ser. No. 194,253, May 16, 1988, Pat. No. 4,860,418. This application Mar. 27, 1989, Ser. No. 329,233**
**Claims priority, application France, May 14, 1987, 87 06784**
**Int. Cl.[5] B23P *15/04***
**U.S. Cl. 29—281.5** **4 Claims**



1. A fork for use in assembling a rotor of a steam turbine constituted by disks shrunk onto a shaft, said disks being provided with cavities facing one another and having female pegs disposed in said cavities in one disk and male pegs disposed in the facing cavities of an adjacent disk with each of the disk being shrunk on while dispensing the male pegs of said disks into the female pegs of the already shrunk-on adjacent disk, wherein spacer means are provided in the female pegs prior to inserting the male pegs in the female pegs so that the male pegs do not come into contact with the female pegs, with said spacer means subsequently being removed, said fork being employed in conjunction with a male peg comprising a tenon having two walls parallel to the axis of the rotor and having a thickness a between the two parallel walls, and a female peg having a complementary slot with two lateral spaced walls parallel to the walls of the tenon and at a spacing of a+2d, where d is the width of the gap between each of the walls of the tenon and the facing wall of the slot receiving the tenon, with the tenon centered laterally therebetween, said fork constitutes said spacer means and comprising a handle and two laterally spaced tines integral with said handle constitute a prolongation of the handle, said tines being of a thickness slightly less than d, said tines having laterally spaced outside edges which are at the spacing of a+2d for disposal against the walls of said complementary slot of said female peg for preventing a male peg from coming into contact with a female peg.



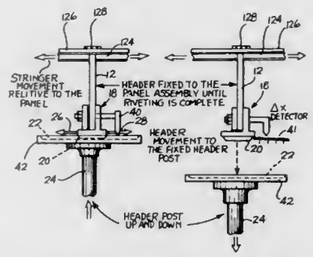
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**5,050,288**

**DYNAMIC DIMENSIONAL CONTROL MATRIX SYSTEM**

**Quentin T. Woods, Woodinville, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Dec. 15, 1989, Ser. No. 451,425**
**Int. Cl.[5] B23P *11/00***
**U.S. Cl. 29—407** **3 Claims**




1. For use in assembling an aircraft structural component, a method for connecting together at least two parts of such component by sequentially drilling holes into said parts and installing a series of fasteners, one at a time into said holes, advancing along a line from a beginning position to an ending one, the improvement comprising:

(a) permitting said parts to freely expand or contract relative to each other without any substantive restraint ahead of the line of advancement of said sequential drilling and installation of said series of fasteners;

(b) defining a series of normal positions along said parts where said parts are to be sequentially drilled and fasteners installed along said line of advancement;

(c) defining at least one reference point forwardly of said series of normal positions, said reference point being operatively connected to at least one of said parts in a manner so that said reference point moves in response to expansion or contraction of said at least one of said parts;

(d) drilling a hole into said parts and fastening said parts together at one of said defined normal positions by inserting a fastener into said hole, such drilling and installing causing said parts to expand or contract relative to each other;

(e) sensing the displacement of said at least one reference point as a result of part expansion or contraction caused by the drilling and fastening of the previous step;

(f) determining a normal next-in-line drilling and fastening position of said series of normal positions;

(g) determining an adjusted next-in-line drilling and fastening position by adjusting said normal next-in-line normal position as determined in step (f) above by a certain amount proportionate to the displacement of said at least one reference point as sensed in step (e) above; followed by

(h) drilling a hole into said parts at said adjusted next-in-line position as determined in step (g) and fastening said parts together by inserting a fastener into said hole; followed by

(i) repeating steps (e) through (h) until sequential drilling and installing of a selected number of fasteners is completed.

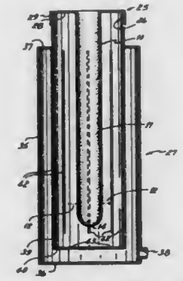
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**5,050,289**

**HANDLE GRIP**

**Paul J. Uffindell, Morrow, Ohio, assignor to 'totes', incorporated, Loveland, Ohio**

**Continuation of Ser. No. 405,900, Sep. 12, 1989. This application Apr. 5, 1990, Ser. No. 504,980**
**Int. Cl.[5] B23P *11/02***
**U.S. Cl. 29—450** **3 Claims**



1. A method of installing a grip on a hand held implement, said implement having a handle with a free end, said method comprising the steps of:

providing said grip with a thin walled stretchable tubular member open at one end and closed at the other end by a boot formed integral therewith, said tubular member having a longitudinal axis,

providing the open end of said tubular member with an outwardly flaring generally cup-shaped flange formed integral therewith, said cup-shaped flange having an annular floor extending generally radially outward of said tubular member relative to said longitudinal axis, and an annular rim joined with said floor at a shoulder located at an outer edge of said floor,

deforming said rim relative to said tubular member at said shoulder, thereby spacing said rim from said tubular member, and thereby forming an annular gap having a width about equal to the width of said floor,

stretching said rim over a collar of a vacuum chamber after inserting said tubular member in said chamber,

exposing said tubular member to a vacuum, thereby expanding said member throughout its length, and inserting said free end of said handle therein,

releasing said vacuum, thereby contracting said tubular member into a friction fit with said handle, and

thereafter severing said cup-shaped flange from said tubular member, and removing said cup-shaped flange from said handle, thereby leaving said grip in friction fit relation with said hand held implement throughout the length of said grip.

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**5,050,290**

**PROCESS FOR MANUFACTURING OF A LOST CASING FROM MODULAR FRAMES**

**Ahmad Massoudi, Tehran, Iran, assignor to Darya Paye Jetty Co. Ltd., United Kingdom**

**Filed Jun. 29, 1989, Ser. No. 373,790**
**Claims priority, application Netherlands, Jul. 1, 1988, 8801677**
**Int. Cl.[5] B23P *19/04*; E02D *7/00***
**U.S. Cl. 29—455.1** **15 Claims**

1. Method for manufacturing a double-walled hollow lost casing, for use in the production of marine engineering civil works including piers, jetties, reservoirs, having a bottom and planar, vertically-oriented inner and outer walls each made of assembled pre-cut plates of such size and shape that horizontal cross-sections of the lost casing at all vertical levels are inwardly and outwardly polygonal in shape, a lower portion of the casing adjacent the bottom slopes downwardly and out-

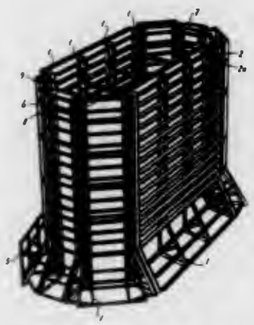
VOL 1130 ISS 4 SE 24 1991 UMI



wardly, and the inner and outer walls are joined together to form a sharp edge around the perimeter of the bottom of the lost casing, said method comprising the steps of:

assembling a first jig by interconnecting a pluality of standard frames, each comprising horizontally spaced vertical beams integrally joined to vertically spaced horizontal beams, stacked upon each other in vertical planes to a desired height, which interconnected frames present an outer surface generally corresponding in shape to the polygonal shape of the inner wall of a lost casing to be produced;

assembling on and releasably attaching to the outer surface of said first jig a first plurality of plates pre-cut to predetermined sizes and shapes, thereby forming the inner wall of the lost casing;



seamlessly joining the assembled plates at abutting edges;

attaching to the inner wall a plurality of outwardly projecting spacer elements having means at their outer ends for connecting a plate thereto;

attaching to the outer ends of said spacer elements a second plurality of plates pre-cut to predetermined sizes and shapes;

seamlessly joining the attached plates at abutting edges, thereby forming the outer wall of a lost casing;

joining the inner and outer walls around their bottom perimeters to form a sharp edge;

releasing the inner wall of the lost casing from said first jig; and

lifting the double-walled lost casing from said first jig.

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**5,050,291**

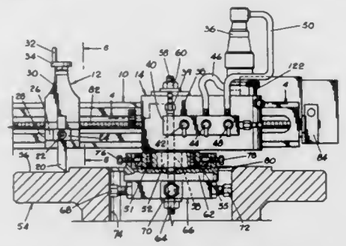
**UNIVERSAL TOOL**

**Guy T. Gilmore, 1823 Wildcat La., Crosby, Tex. 77532**

**Continuation of Ser. No. 350,927, May 12, 1990, abandoned. This application Nov. 14, 1990, Ser. No. 612,501**

**Int. Cl.[5] B23B** *3/26, 5/04, 5/16*

**U.S. Cl. 29—560** **4 Claims**



1. A portable machine tool for machining a workpiece to a tolerance of 0.0005 inch at its usual location of use, said portable machine tool weighing less than fifteen pounds and including in combination

bed means having a longitudinal axis and a counterweight on one end, said counterweight having controlled moment and balance,

tool station means positioned on said bed means and adapted for non-continuous movement both vertically and horizontally with respect to said longitudinal axis, and

positioning means mounted on said bed means and adapted for substantially rigid connection to said workpiece, said positioning means including a base plate having a plurality of adjustment screws for alignment of said bed means on said workpiece, a cylindrical member positioned below said base plate and having a plurality of positioning bolts for engagement within said workpiece, and drive means including a manifold, gear means including a three speed transmission for selective torque and speed transmission, a drive shaft coupled to said gear means, and braking means coupled to said drive shaft to control rotational speed of said drive shaft.

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**5,050,292**

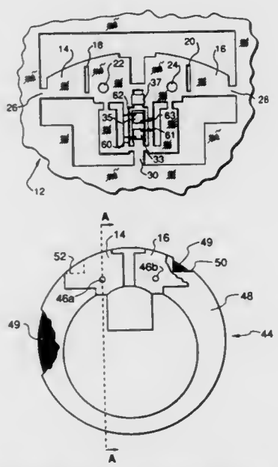
**AUTOMATED METHOD FOR THE MANUFACTURE OF TRANSPONDER DEVICES BY WINDING AROUND A BOBBIN**

**Glen L. Zirbes, Silver Lake; Leonard D. Hadden, Minneapolis, both of Minn., and Philip R. Troyk, Morton Grove, Ill., assignors to Trovan Limited, Douglas, Isle of Man**

**Filed May 25, 1990, Ser. No. 530,048**

**Int. Cl.[5] H01F** *7/06;* **H05K** *7/02*

**U.S. Cl. 29—605** **17 Claims**



1. An automated method for manufacturing a passive transponder device, comprising:

providing a leadframe including a plurality of individual assembly sites each having a plurality of leads;

bonding an electronic identification device comprised of at least one integrated circuit chip to each said site;

electrically connecting each said identification device to said leads at each said site;

molding a cap around each said identification device and first portions of the leads at the site such that second portions of the leads protrude from said cap;

severing the second portions of said leads thereby disassociating each said cap from said leadframe;



attaching a bobbin to said second portion of said leads protruding from each said cap;

winding a conductive wire around each said bobbin; and

conductively connecting each wire to the corresponding leads.

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**5,050,293**

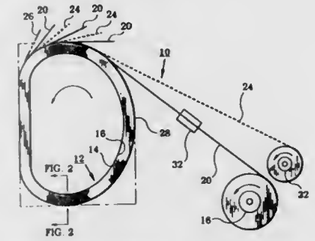
**METHOD OF MAKING A LAMINATED CONDUCTOR FOR HIGH CURRENT COILS**

**Robert W. Baldi, Wing Span Drive, and Thomas E. Johnson, San Diego, both of Calif., assignors to General Dynamics Corporation/Space Systems Div., San Diego, Calif.**

**Filed Nov. 17, 1989, Ser. No. 437,702**

**Int. Cl.[5] H01F** *7/06*

**U.S. Cl. 29—605** **12 Claims**



1. A method for fabricating a coil conductor for a high current coil which comprises the steps of:

providing a rotatable mandrel provided with a forming face having a predetermined shape;

wrapping an inner layer of insulation completely around the forming face;

rotating the mandrel to wind a layer of sheet copper around the forming face of the mandrel a predetermined number of turns;

providing means to bond together adjacent turns of the sheet copper;

wrapping an outer layer insulation completely around the wound turns of copper sheet to provide a wound laminated conductor; and

raising the temperature of the conductor to a predetermined temperature for a predetermined period of time in order to bond adjacent turns of the sheet copper to one another to form a unitary structure.

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**5,050,294**

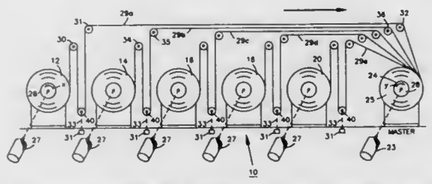
**METHOD FOR MAKING A TRANSFORMER CORE COMPRISING AMORPHOUS STEEL STRIPS SURROUNDING THE CORE WINDOW**

**Donald E. Ballard, Conover, and Willi Klappert, Hickory, both of N.C., assignors to General Electric Company, King of Prussia, Pa.**

**Continuation of Ser. No. 505,593, Apr. 6, 1990, abandoned. This application Dec. 5, 1990, Ser. No. 622,364**

**Int. Cl.[5] H01F** *41/02*

**U.S. Cl. 29—609** **16 Claims**



1. A method of making a transformer core comprising strips of amorphous metal wrapped about a window of the core, comprising the steps of:

(a) providing a plurality of spools of amorphous metal strip in each of which the strip is wound in single-layer thickness,

(b) simultaneously unwinding the single-layer thickness strips from said plurality of spools and combining the single-layer thickness strips to form a strip of multiple-layer thickness,

(c) winding said multiple-layer thickness strip onto a plurality of master reels in each of which the strip is wound in multiple-layer thickness,

(d) unwinding the multiple-layer thickness strips from said master reels and combining said multiple-layer thickness strips into a composite strip that has a thickness in strip layers equal to the sum of the combined multiple-layer thickness strips,

(e) cutting said composite strip into a plurality of lengths of composite strip, and

(f) constructing with said lengths of composite strip a hollow core form having a window about which said lengths of composite strip are wrapped.

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**5,050,295**

**MULTILAYER THROUGH HOLE CONNECTIONS**

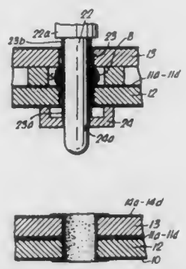
**Melvyn Sullivan, Sawbridgeworth; John A. Durban, Epping; Peter D. Stanier, Harlow, and Robert E. J. Edwards, Waltham Abbey, all of United Kingdom, assignors to STC PLC, London, England**

**Filed Oct. 12, 1990, Ser. No. 596,380**

**Claims priority, application United Kingdom, Oct. 14, 1989, 8923213**

**Int. Cl.[5] H05K** *1/02*

**U.S. Cl. 29—830** **5 Claims**



1. A method of making a through-hole connection between conductive layers of a multilayer circuit board assembly whose thickness is liable to expansion and contraction, the method comprising assembling at least two boards in an adjacent configuration with through-holes or channels aligned, inserting a tubular flexible conductive member into the holes or channels, expanding said conductive member at a location intermediate its ends whereby to engage the through-holes or channels and to contact an intermediate one of said conductive layers, and urging said boards together so as to further expand the flexible member whereby to retain the expanded portion of the tubular member in said holes or channels.

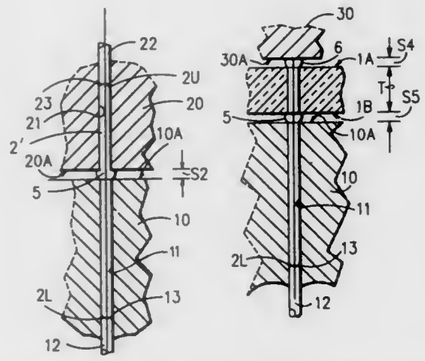
VOL 1130 ISS 4 SE 24 1991 UMI



5,050,296
**AFFIXING PLUGGABLE PINS TO A CERAMIC SUBSTRATE**

Alan J. Emerick, Warren Center, Pa.; Eugene L. Marsh, Endicott, N.Y.; Thomas L. Miller, Vestal, N.Y., and Jerzy M. Zalesinski, Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1990, Ser. No. 534,891
Int. Cl.[5] H01R 9/14
U.S. Cl. 29—845 7 Claims




1. A method for affixing plural pins to a ceramic member, said method comprising the steps of:

inserting the opposite first and second ends of a plurality of elongated pin blank members in pin blank receiving first and second cavities, respectively, of first and second die blocks, respectively,

placing said inserted first and second ends of said pin blank members in contact with first and second end means, respectively, of first and second pin rods, respectively, disposed in said first and second cavities, respectively, to provide a predetermined space between said first and second blocks having an intermediate portion of each of said pin blank members within said space, at least said first pin rods being adjustably positionable within said first cavities,

relatively moving said first and second die blocks towards each other to decrease said space and to thereby form radial first expansions of said intermediate portions within the decreased said space between said first and second die blocks, retracting said second die block to remove said elongated members from said second cavities, inserting said pin blank members from said second ends into openings therethrough of a ceramic planar member to extend said second ends outwardly from said openings on one side of said ceramic member and to place said radial first expansions in contact with said ceramic member on the opposite side thereof,

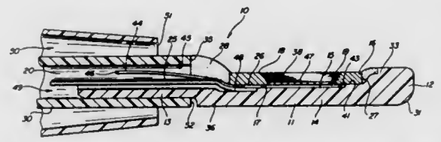
adjusting said first pin rods in said first cavities to provide a predetermined clearance between said first die block and said first expansions and maintaining contact of said first ends with said first end means of said first pin rods,

juxtaposing a pin head forming surface of a third die block adjacent to said second ends, and relatively moving said first and third die blocks towards each other to form a pin head at each of said second ends in contact with said one side of said ceramic member and a radial second expansion in each of said said pin members between said second ends and said first expansions thereof to contact said ceramic member within said openings, said pin members being thereby affixed to said ceramic member between said first radial expansions and said heads thereof, and thereafter retracting said first and third die blocks away from said ceramic member and said pin members affixed thereto.

5,050,297
**METHOD FOR ASSEMBLY OF A DIRECTLY EXPOSED CATHETER SENSOR ON A SUPPORT TIP**

Mark G. Metzger, San Jose, Calif., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 21, 1989, Ser. No. 410,564
Int. Cl.[5] H01R 43/00
U.S. Cl. 29—855 5 Claims



1. A method for assembling and supporting a sensor with a first side and a second side at a distal end of a catheter tube comprising the steps of:

a) mounting said sensor to a support member with a distal end shaped to ease introduction of a catheter into a living body and a proximal extension sized and shaped for fitment of said extension into a lumen of said catheter, the said support member distal end and said proximal extension joined by an intermediate part for peripherally supporting said sensor over an open recess in said intermediate part;

b) attaching said sensor to an area whereupon there is a means for connection to electrical conductors, said conductors transmitting input to and signals from said sensor;

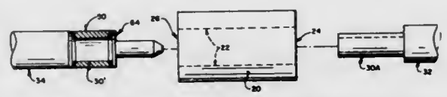
c) inserting said proximal extension into a lumen of said catheter with said conductors passing through said lumen; and

d) peripherally sealing said sensor over said open recess, said recess communicatively connected to said lumen of said catheter and open to said second side of said sensor with said first side of said sensor exposed to said living body.

5,050,298
**METHOD OF MANUFACTURING A MECHANICALLY-BONDED, MONOLITHIC SEALING RING FOR STUFFING BOX INCLUDING AXIALLY CENTRAL PORTION MADE OF COMPRESSED FLEXIBLE FOAMED GRAPHITE TAPE**

Andy R. Dodson, Columbiana, Ala., assignor to Sealing Equipment Products Co., Pelham, Ala.

Division of Ser. No. 248,163, Sep. 23, 1988. This application Jun. 12, 1990, Ser. No. 536,755
Int. Cl.[5] F16J 15/12
U.S. Cl. 29—888.3 6 Claims



1. A method for producing a mechanically-bonded, monolithic sealing ring for a stuffing box of a high pressure, high temperature valve or pump, said method comprising:

convolutely spiral-winding onto a cylindrical mandrel a length of foamed flexible graphite tape;

inserting the thusly tape-wrapped mandrel into a die having a cylindrical inner peripheral wall;

coaxially engaging the wrapping of tape from two axially opposite ends with respective annular punches and thereby axially compressing the wrapping of tape to a first, intermediate extent, to form a unitary, consolidated intermediate annular article having an axial throughbore and two axially opposite ends provided with respective annular, axially outwardly opening recesses which are contiguous with said axial throughbore and integrally surrounded by respective annular collars of said compressed foamed flexible graphite tape;

removing said engagement by said punches;

coaxially depositing an anti-extrusion end ring into each of said recesses, thereby providing an intermediate assembly;

while supporting said intermediate assembly on a cylindrical mandrel in a die having a cylindrical inner peripheral surface, coaxially engaging said intermediate assembly from two axially opposite ends with respective annular punches and thereby: axially compressing said intermediate assembly, crimping respective of said annular collars against respective of said end rings, mechanically uniting said end rings with said intermediate annular article, further compressing said intermediate annular article into a central portion of said sealing ring, and causing said central portion of said sealing ring to become axially outwardly coterminous, on said annular collars thereof, with respective of said end rings; and

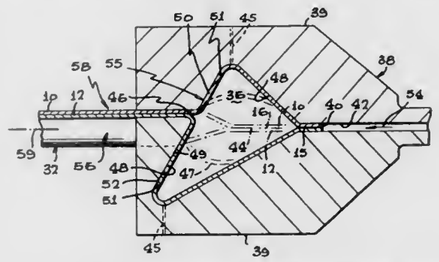
removing said sealing ring from engagement by said mandrel, said die and said punches.



5,050,299
**PROCESS FOR PRODUCING A CAP FLANGE STRUCTURE**

Gilles A. Rainville, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 3, 1990, Ser. No. 503,578
Int. Cl.[5] B21D 39/03
U.S. Cl. 29—897.32 18 Claims




1. A process for producing a cap flange structure which comprises

providing a pair of metal workpieces bonded together in at least one predetermined area, leaving at least one area between said workpieces and adjacent an outer edge thereof unbonded,

inserting said at least one unbonded area of the resulting assembly of workpieces into a die, heating the die and introducing a gas under pressure therein and into said at least one unbonded area between said workpieces,

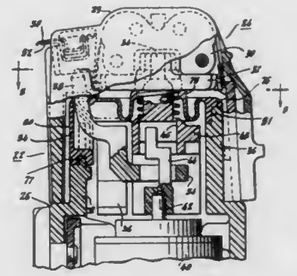
simultaneously moving said workpieces by the gas pressure within said die and expanding said workpieces into the shape of the die by accordion expansion, sufficient unbonded material of said workpieces being present in the die to enable the workpieces to slide in the die and bend to the shape of the die during said accordion expansion, and

trimming the expanded workpieces to form the desired cap flange structure on a web having a central plane and formed by the workpieces bonded in said at least one predetermined area.

5,050,300
**ELECTRIC DRY SHAVER HAVING AN IMPROVED SEALING ARRANGEMENT**

Aivars Miska, Stratford, Conn., assignor to Remington Products, Inc., Bridgeport, Conn.

Filed Sep. 17, 1986, Ser. No. 908,325
Int. Cl.[5] B26B 19/06
U.S. Cl. 30—34.1 4 Claims



1. An improved electric dry shaver comprising:

a. an electric dry shaver having a housing;

b. a cutter head positioned at one end of said housing;

c. said cutter head having a short hair cutter and a trimmer;

d. electrically energized actuating means for imparting reciprocating motion to said cutter and to said trimmer;

e. said actuating means including first and second drive members engaging said cutter and trimmer, respectively for reciprocating in mutually opposite directions;

f. said housing having a top wall and a side wall thereof and an aperture formed in said top and side walls at said end of said housing;

g. said drive members extending from within said housing and through said aperture; and,

h. a sealing body positioned in the aperture for restricting the passage of shaving debris and foreign material through said aperture into an interior of said housing;

i. said sealing body formed of a resilient material and having first and second segments;

j. first and second apertures formed in said first and second segments, respectively of said sealing body, said apertures sized to provide for the snug extension of said cutter and trimmer drive members, respectively through said first and second apertures, respectively in the sealing body;

k. said sealing body adapted to be folded for sealing said shaver aperture at said top wall and said side wall; and,

l. said sealing body including integral, peripheral segments formed for engaging said housing wall, and, integral wall segments of relatively smaller thickness than said aperture segments for coupling said aperture segments to said mounting segments.

5,050,301
**RAZOR ASSEMBLY**

Domenic V. Apprille, Jr., Arlington, Mass., assignor to The Gillette Company, Boston, Mass.

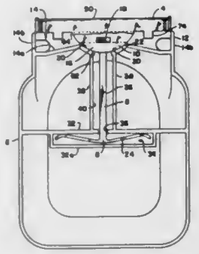
Filed Sep. 19, 1990, Ser. No. 585,259
Int. Cl.[5] B26B 21/14, 21/16, 19/00, 19/28
U.S. Cl. 30—87 21 Claims

1. A razor assembly of the wet-shave type comprising a razor handle, a head portion extending from said razor handle, said head portion having therein a cavity with a hemispherically shaped bottom portion, spring retention means disposed in said razor handle, and spring means comprising a foot portion retained by said spring retention means, said foot portion comprising a leaf spring portion, a stem portion connected at a first end to a central point on said leaf spring portion, said leaf spring portion extending transversely of said stem portion, said stem portion extending from said foot portion toward said head

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portion, a flange portion extending from a second end of said stem portion, and blade assembly connector means on said flange portion adapted for attachment to a blade assembly, said



spring means being adapted to facilitate pivotal movement of said blade assembly during a shaving operation, said spring means being operative to urge said blade assembly to a neutral position in said razor head cavity.

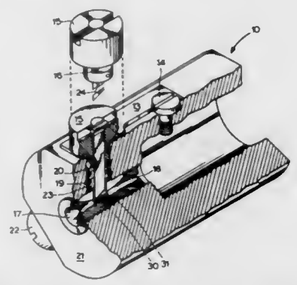
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5,050,302

**TOOL FOR SLITTING THE EXTERIOR LAYER OF CYLINDRICAL OBJECTS**

Gregory A. Mills, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Feb. 26, 1991, Ser. No. 661,332
Int. Cl.[5] B21F *13/00*
U.S. Cl. 30—90.8 9 Claims



1. A tool for slitting an exterior layer of a cylindrical object, comprising:

(a) a frame having a cylindrical passage therein having a longitudinal axis and a cylindrical passage radius CR, and two radially extending blade slots in communication with said cylindrical passage, said blade slots separated by an angle $\phi$ whose vertex is on said longitudinal axis with respect to a plane perpendicular to said longitudinal axis;

(b) a blade slideably received in each blade slot; and,

(c) a shim on said frame limiting penetration of a blade into its blade slot.

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5,050,303

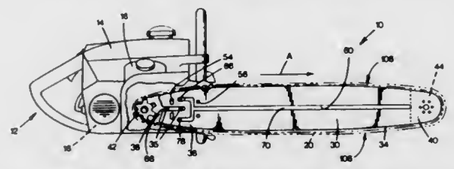
**CHAIN SAW BAR FLUID PASSAGE SYSTEM**

James B. Sinclair, Waterloo; Paul W. Pink, Kitchener, both of Canada; Michael D. Harfst, Milwaukie, and Robin A. Plumbley, Portland, both of Oreg., assignors to Blount, Inc., Montgomery, Ala.

Filed Dec. 14, 1990, Ser. No. 628,421
Int. Cl.[5] B23D *59/04*
U.S. Cl. 30—123.4 17 Claims

1. A saw bar for a chain sawing device having a frame, drive means, means for attaching the saw bar to the frame, an endless cutting chain mounted on the saw bar, and means for driving the cutting chain with the drive means, the saw bar comprising:

a bar member having an attachment end for attachment to the frame, a nose end opposite the attachment end, a peripheral edge including guide means for guiding the endless cutting chain about the peripheral edge, and two opposing side surfaces defining a bar thickness therebetween, with one of the side surfaces having a slot formed



therein through at least a portion of the bar thickness, the slot extending from adjacent the attachment end to adjacent the nose end; and

channel means positioned in cooperation with the slot and extending from the attachment end toward the nose end for forming a fluid delivery channel in the saw bar to an outlet means in said channel means for permitting the discharge of fluid therefrom.

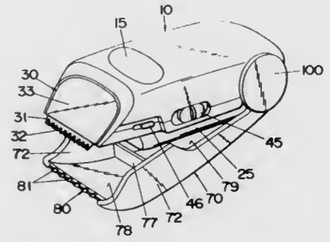
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5,050,304

**HAIR CLIPPER**

Sboji Fujikawa, Isbibe; Masakatsu Araki, Hikooe, and Shinichiro Tsujimura, Nagahama, all of Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Dec. 5, 1989, Ser. No. 446,124
Claims priority, application Japan, Dec. 15, 1988, 63-316884
Int. Cl.[5] B26B *19/04*
U.S. Cl. 30—196 15 Claims



1. A hair clipper comprising:

a cutter head comprising a stationary blade with a toothed edge and a movable blade with a toothed edge, said movable blade being driven to reciprocate relative to said stationary blade in hair shearing engagement between the toothed edges of said stationary and movable blades, said toothed edge of the stationary blade defining a cutting edge; and

a hair entrapping member movable relative to said cutting head between an open position where it is spaced from said cutting edge of said cutter head and a closed position where it is held in close proximity to said cutting edge, said hair entrapping member allowing hairs to extend past said cutting edge in said open position and seizing said hairs between said cutting edge and said hair entrapping member in said closed position for shearing said hairs by cooperation of said movable and stationary blades said cutter head being formed at a forward end of an elongated housing and said hair entrapping member being formed at a forward end of an elongated base, said housing being pivotally connected to said base at the respective rearward ends so that said hair entrapping member is capable of moving between said open and closed positions as said base pivots relative to said housing; said base being of a generally U-shaped configuration having a bottom wall and a pair of opposed side walls extending from the lateral sides of said bottom wall to define therebetween an area for receiving a bottom portion of said housing, said housing includes a battery case which projects on the rear bottom thereof and accommodates therein a battery for energizing an electric motor to drive said movable cutter to reciprocate,

said area being divided by a transverse partition into longitudinally spaced front and rear portions, said front portion having said bottom wall terminating at said hair entrapping member and defining therein a dust chamber for receiving clipped hairs, and said rear portion defining a chamber for receiving said battery case projecting on the rear bottom of said housing.

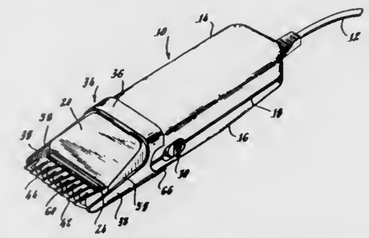
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5,050,305

**HAIR TRIMMER WITH COMB ATTACHMENT**

Richard I. Baker; Robert A. Mockovak, both of Newtown, and Edward Szymansky, Fairfield, all of Conn., assignors to Remington Products, Inc., Bridgeport, Conn.

Filed Sep. 13, 1985, Ser. No. 775,752
Int. Cl.[5] B26B *19/20, 19/02*
U.S. Cl. 30—201 3 Claims



1. An improved electrically energized, hair trimmer, comprising:

a. an electrically energized hair trimmer having an outer housing of predetermined cross-sectional configuration adjacent one end thereof, a power source, and a hair trimming means projecting from said one end of the housing in a predetermined plane;

b. a comb member demountably positioned on the trimmer adjacent the one end thereof in operative relationship to the trimming means;

c. said comb having a band-like support member with a cross sectional configuration conforming with and larger than the trimmer housing configuration;

d. said support member having an inner upper surface thereof;

e. said comb having a bottom wall and side walls extending forwardly from the support member toward the trimming means;

f. said bottom wall having a surface thereof;

g. said comb having a substantially open top end thereto;

h. a plurality of comb teeth extending from the front edge of the bottom wall across the front end of the hair trimmer, said teeth having tips in confronting and operative relationship with the trimming means;

i. a plurality of contact surfaces projecting inwardly from the interior surface of the support member of the comb for adjusting the comb between predetermined positions of maximum and minimum trim length and for defining interior passages between the trimmer housing and the interior comb surface for all operative positions of comb and housing;

j. said inner upper surface of said support member and substantially the entire length of said inner surface of said bottom wall of the comb fitted with contact surfaces for frictional engagement with the trimmer housing and for defining interior passages between said comb and trimmer for the free passage of hair being trimmed.

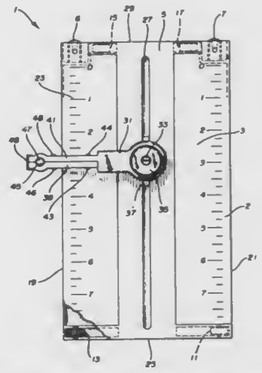
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5,050,306

**WALLPAPER BORDER MARKER/CUTTER DEVICE**

Fredric T. Renaud, R.D. #2, Box 202E Sunset Dr., Basking Ridge, N.J. 07920

Filed Apr. 25, 1991, Ser. No. 691,506
Int. Cl.[5] B26B *1/08*
U.S. Cl. 30—293 15 Claims



1. A wallpaper border marker and cutter device for marking walls and for trimming wallpaper at a preselected level below a ceiling, which comprises:

(a) a base having a substantially flat face surface, and having a protruding member extending outwardly from said face surface for receiving a slidable blade holder;

(b) a first plurality of wheels mounted on said base in planes at about 90 degrees to said face surface of said base for rolling the cutter device along a wall;

(c) a second plurality of wheels mounted on said base in a plane parallel to said face surface of said base for rolling the cutter device along a ceiling, and, in combination with said first plurality of wheels for rolling said cutter device simultaneously along a wall and a ceiling;

(d) at least one holder mounting slot located on said protruding member for slidably mounting a holder;

(e) a blade holder removably and slidably mounted in said holder mounting slot, said holder adapted to receive and hold at least one cutting blade;

(f) a marker holder adapted to receive at least one marking device and being connectively related to said blade holder for said cutting blade;

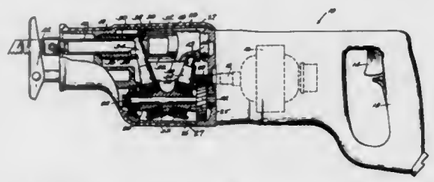
(g) a locking mechanism connected to said marker holder and said holder mounting slot so as to permit temporary locking of said blade holder at a preselected location along said plurality of parallel blade holder mounting slots; and,

(h) a blade receiver and clamping mechanism attached to said blade holder and located such that a blade clamped therein could have a cutting edge extend beyond said blade receiver.

VOL 1130 ISS 4 SE 24 1991 UMI

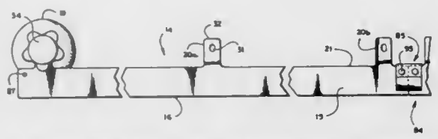


5,050,307
**WOBBLE PLATE DRIVE**
Bernhard Palm, Brookfield, Wis., assignor to Milwaukee Electric Tool Corporation, Del.
Continuation-in-part of Ser. No. 541,093, Jun. 20, 1990, which is a continuation-in-part of Ser. No. 487,219, Mar. 1, 1990. This application Dec. 5, 1990, Ser. No. 622,431
Int. Cl.[5] B23D *49/04*
U.S. Cl. 30—392 5 Claims



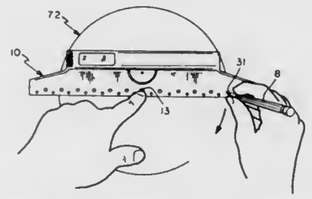
1. A reciprocating drive mechanism comprising,
a housing,
a shaft rotatably mounted in said housing,
means rotating said shaft,
a spindle mounted in said housing for reciprocating motion,
a wobble plate mounted on said shaft and connected to said spindle at opposite sides of the axis of said spindle to restrain said spindle against rotation.

5,050,308
**TOOL GUIDE AND CONTOUR SANDER FOR USE THEREWITH**
David C. Walsh, 102 Tall Tree Rd., Bogart, Ga. 30622
Filed Nov. 20, 1989, Ser. No. 438,165
Int. Cl.[5] B43L *13/00*
U.S. Cl. 33—430 11 Claims



1. Holding apparatus for temporary noninvasive attachment to a work surface, comprising:
an elongated member having a longitudinal edge surface maintained in spaced-apart relation off the work surface when the member is disposed on the work surface;
a plurality of support members longitudinally spaced apart from each other along the elongated member and extending from the elongated member so as not to interfere with the edge surface;
a plurality of securement means operative for selective securement to the work surface and operatively connected with the respective support members so as to urge the elongated member into engagement with the work piece, with the edge surface thereby maintained spaced apart from the surface; and
means operatively associated with at least one support member to adjust the angular relation between that support member and the corresponding securement means so that the support member urges the elongated member into firm contact with the work surface.

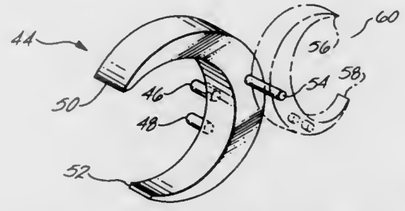
5,050,309
**ROLLING RULER HAVING A RETRACTABLE AND ROTATABLE PIVOT PIN**
Wei Wang, 3757 16th Ave. South, Minneapolis, Minn. 55407
Continuation of Ser. No. 452,010, Dec. 18, 1989, abandoned. This application Sep. 24, 1990, Ser. No. 588,099
Int. Cl.[5] B43L *13/02*
U.S. Cl. 33—449 2 Claims



2. A multiple purpose drafting instrument that a person can hold and manipulate with one hand to permit the user to draw various geometric shapes comprising:
a transparent housing, said transparent housing having a general elongated semi-cylindrical shape to permit a user to grasp and manipulate the multiple purpose drafting instrument with the fingers and thumb of one hand, said housing having a semi-cylindrical cavity therein for insertion of a roller, said housing including means for rotatably supporting a roller therein;
a rotatable roller located in said transparent housing, said rotatable roller having a first end and a second end, said rotatable roller having an axis of rotation extending through said rotatable roller;
a first roller wheel having a frictional surface thereon located on one end of said rotatable roller and a second roller wheel having a frictional surface thereon located on the opposite end of said rotatable roller to permit a user to move said multiple purpose drafting instrument along a work surface, said roller wheel rotatingly supporting said transparent housing above the work surface;
a flat member extending outward from said housing, said flat member having a center region, said flat member including a straight edge located thereon to permit a user to draw straight lines by guiding the tip of a pencil along said straight edge, said flat member including a first set of spaced openings for insertion of a point of a pencil, said first set of spaced openings located in a line that is parallel to the axis of rotation of said cylindrical roller so that a user can draw lines perpendicular to the axis of rotation of said cylindrical roller by placing a pencil point in one of said plurality of openings and rolling said roller wheels along the work surface; said flat member having a pivot pin opening located in said center region of said flat member for receiving a pivot pin, said pivot pin opening in said flat member sufficiently large to permit a retractable and rotatable pivot pin to rotate freely therein, said flat member having an annular recess therein for receiving a collar of a retractable and rotatable pivot pin;
a retractable and rotatable pivot pin mounted in said pivot pin opening in said center region of said flat member said retractable and rotatable pivot pin having an end surface with a plurality of surface engaging means said, plurality of surface engaging means comprising a plurality of conical points spaced on said end surface over an extended area to thereby permit said surface engaging means located thereon to engage the work surface over said extended area without slippage of said plurality of surface engaging means, said retractable and rotatable pivot pin having a central axis and located axially displaceable in said flat member, said retractable and rotatable pivot pin rotatably mounted in said flat member to permit rotation of said flat member about said retractable and rotatable pivot pin when said retractable and rotatable pivot pin is held stationary, said retractable and rotatable pivot pin having a first collar extending from said retractable and rotatable pivot pin, said retractable and rotatable pivot pin having a second collar extending from said retractable and rotatable pivot pin, said first collar and said second collar forming a spool like retractable and rotatable pivot pin for rotational and axial displacement in said opening in said flat member, said second collar co-acting with said first collar to limit axial displacement of said retractable and rotatable pivot pin in said flat member, said annular recess forming a compartment for said second collar so said second collar can retract into said recess to prevent said second collar from interfering with the placement of said drafting instrument, said first set of spaced openings and said retractable and rotatable pivot pin operable to push into frictional engagement with the work surface located beneath said flat member to permit a user to draw a circle by placing a pencil point in one of said plurality of openings and then rotating said multiple purpose drafting instrument about said retractable and rotatable pivot pin with the pencil point; and
a first measuring scale located on said flat member to permit a user to perform a number of different tasks with one instrument.



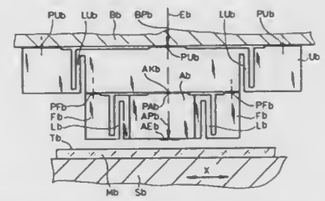
5,050,310
**PLASTIC-PIPE OVALITY GAUGE**
Stephen L. Jiles, 1513 Dogwood Ave., Anaheim, Calif. 92801
Continuation-in-part of Ser. No. 421,161, Oct. 13, 1989, Pat. No. 5,020,401. This application Oct. 9, 1990, Ser. No. 595,279
Int. Cl.[5] G01B *3/38*
U.S. Cl. 33—550 8 Claims



1. A first ovality gauge for checking the ovality of a first plastic pipe of a first predetermined nominal outside diameter by determining whether the maximum diameter of the pipe differs from the minimum diameter of the pipe by more than a predetermined permissible amount, said first ovality gauge including a C-shaped body portion terminating in a single pair of immovable tips facing each other for receiving said pipe, such facing tips being spaced from each other by a distance which is smaller by a predetermined amount equal to one-half of said permissible difference between said maximum and minimum diameters than the outside diameter of the first plastic pipe whose ovality is to be checked, the ability of said pipe to pass between said tips being indicative of said permissible amount being exceeded due to the ovality of the pipe.

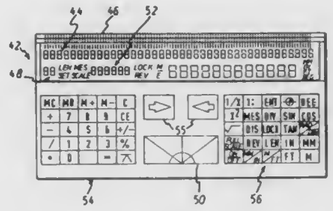
5,050,311
**LENGTH OR ANGLE MEASURING APPARATUS**
Guenther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany
Continuation of Ser. No. 174,606, Mar. 29, 1988, abandoned. This application Nov. 14, 1990, Ser. No. 614,031
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1987, 3711070
Int. Cl.[5] G01B *11/04*
U.S. Cl. 33—704 29 Claims

1. In a length or angle measuring apparatus for measuring the relative position of two objects, said measuring apparatus comprising a scale connected to a first object to be measured, said scale having a graduation and defining a measuring direction X; a scanning unit connected to a second object to be measured, said scanning unit having at least one scanning element for scanning said graduation of said scale at a scanning point; wherein the second object and the scanning unit have different thermal expansion coefficients, the improvement comprising:



fastening means for fastening said scanning unit to said second object at a fastening point, said fastening point lying on a line defined by the intersection of a plane perpendicular to the measuring direction X and a plane parallel to the measuring direction X, which line includes said scanning point of said scanning element of said scanning unit.

5,050,312
**GRAPHIC CALCULATOR**
Dominic V. McCannon, Birkenhead, England, assignor to RJP International Limited, Central, Hong Kong
Filed May 15, 1989, Ser. No. 352,120
Claims priority, application United Kingdom, May 16, 1988, 8811538
Int. Cl.[5] G01B *3/02*; B43L *7/00*
U.S. Cl. 33—700 22 Claims



1. A graphic calculator comprising:
a generally planar base;
a display on said base, comprising an array of actuatable display elements;
an angular origin located on said base;
input means located on said base; and
calculating means controlled in response to signals from said input means for actuating said actuatable display elements of said array either to display a set of division markers corresponding to a set of scaled division markers of a particular scale rule at a selected scale or to display an angular measurement with respect to said angular origin.

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5,050,313

## DRYER AND METHOD FOR CONTROLLING THE OPERATION THEREOF

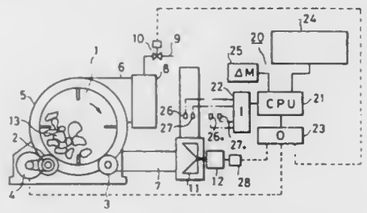
Shioji Wakaeya; Shozo Shionome, both of Kawasaki; Moritaka Ohta, and Masatoshi Shimbashi, both of Matto, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki; Inamoto Manufacturing Co., Ltd., Matto and Toyo Menka Kaisha, Ltd., Osaka, all of, Japan

Division of Ser. No. 259,245, Oct. 18, 1988, abandoned. This application Aug. 15, 1990, Ser. No. 569,390

Claims priority, application Japan, Oct. 20, 1987, 62-265102; Apr. 12, 1988, 63-89448; Apr. 27, 1988, 63-105067

Int. Cl.[5] F26B *21/06*

U.S. Cl. 34—27 8 Claims




1. A dryer comprising:

a container for holding goods to be dried therein;

a suction duct and an exhaust duct both of which are communicated with said container;

means for blowing the surrounding air through said suction duct, said container and said exhaust duct in the order named;

means for heating air flowing through said suction duct;

means for measuring the degree of absolute humidity in exhaust air flowing through said exhaust duct at a predetermined time interval;

means for presetting a predetermined value of absolute humidity;

means for comprising the degree of absolute humidity in the exhaust air measured by said absolute humidity measuring means with said predetermined value of absolute humidity;

means for interrupting the drying operation of said dryer when a comparison result output derived from said comparison means has a predetermined relationship;

means for determining a drop of decreasing rate of absolute humidity measured by said absolute humidity measuring means;

means for determining the absolute humidity of the surrounding air; and

means for correcting said predetermined value of absolute humidity to a value higher than the absolute humidity in the surrounding air in response to an output signal derived from said drop determining means.

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5,050,314

## METHOD FOR REGULATING DRYING KILN AIR FLOW

Leon Breckenridge, N. 904 Wilbur Rd., Spokane, Wash. 99206

Continuation-in-part of Ser. No. 265,253, Oct. 31, 1988. This application Sep. 28, 1989, Ser. No. 414,180

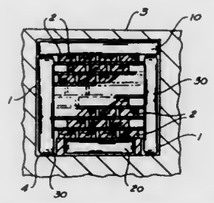
Int. Cl.[5] F26B *21/06*

U.S. Cl. 34—34 4 Claims

1. A method of directing a drying airflow in a drying kiln through a stack of product, said stack generally having top, bottom, end, and side stack surfaces, said method comprising the steps of:

(a) disposing within said kiln one or more inflatable baffle bags for engagement with at least one of said stack surfaces;

(b) inflating said bags to a pressure sufficient to resist displacement by said drying airflow so that said bags cover a substantial portion of said engaged stack surface from exposure to said airflow.



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5,050,315

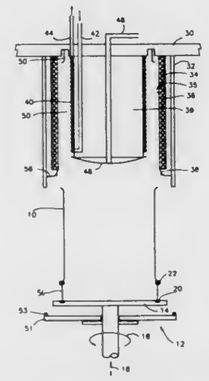
## APPARATUS FOR SOLVENT RECOVERY FROM INDUCTION HEATED COATED DRUMS

David Reznik, 2151 Barbara Dr., Palo Alto, Calif. 94303

Filed Jan. 17, 1989, Ser. No. 297,428

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—60 10 Claims



1. Apparatus for drying or curing a coating on a metal substrate comprising: p1 an induction coil arranged in a generally cylindrical configuration;

a cooling coil arranged in a cylindrical configuration, generally cocylindrical with and spaced from the induction coil, thereby defining a receiving volume therebetween for removably receiving a generally cylindrical coated metal substrate;

a top member sealing the top of said receiving volume; and

means for selectably inserting and removing the coated metal substrate from said receiving volume.

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5,050,316

## FILTER-BOX FOR A SPIN DRYER

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,627

Claims priority, application Japan, Aug. 31, 1989, 1-223241

Int. Cl.[5] F26B *17/24*

U.S. Cl. 34—58 4 Claims

1. A filter-box which is positioned on a spin dryer for use in drying semiconductor wafers, said filter-box comprising:

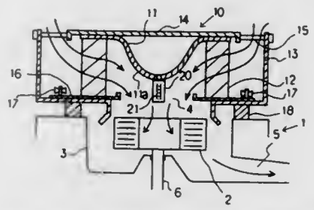
a ceiling plate, said ceiling plate being downwardly-convex in shape so that a center portion of said ceiling plate forms its lowermost portion;

a bottom plate;



an annular filter provided between the ceiling plate and the bottom plate;

means for introducing air through the filter into the spin dryer from an upper zone of the spin dryer; and



a static electricity removing member having ionizer means for ionizing air, said static electricity removing member being provided on the lowermost portion of said ceiling plate so that the air introduced through the filter is guided to the ionizer means to effect the ionization of air prior to being introduced into the spin dryer.

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5,050,317

## DRYING END FOR A MACHINE FOR MANUFACTURING FIBER WEBS

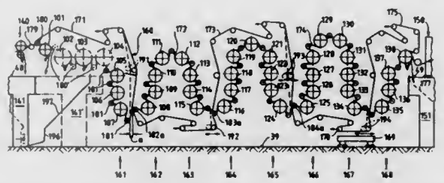
Werner Kade, Neenah, Wis.; Johann Preisetanz, and Georg Kugler, both of Heidenheim. all of Fed. Rep. of Germany, assignors to J. M. Voith G.m.b.H., Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 442,547

Claims priority, application Fed. Rep. of Germany, May 20, 1989, 8906273[U]

Int. Cl.[5] F26B *11/02*

U.S. Cl. 34—117 15 Claims



1. A drying end for a machine for manufacturing fiber webs, wherein:

(a) the drying end comprises a plurality of heatable drying cylinders arranged for form a plurality of drying groups, with at least one guide roller arranged between every two drying cylinders;

(b) each drying group has a respective endless support belt for guiding the fiber web, which travels alternately over the drying cylinders and over the guide rollers so that the fiber web comes into direct contact with the cylinders;

(c) within each drying group, at least some of the drying cylinders are arranged to form a cylinder row which is arranged at least approximately vertically;

(d) in a first drying group having a first support belt and being arranged where the fiber web enters the drying end, the fiber web travels downward through a first substantially vertical cylinder row, a lower side of the web contacting the drying cylinders, and an upper side of the web contacting the first support belt;

(e) in a second drying group having a second support belt and being arranged directly behind the first drying group, the fiber web travels upward through a second substantially vertical cylinder row, the upper side of the web contacting the drying cylinders, and the lower side of the web contacting the second support belt; and

(f) the drying end includes at least two directly adjacent double-row drying groups, each said double-row drying group having a respective web support belt, the guide rollers in one of said double-row drying groups being arranged on outer sides of the cylinder rows, while the guide rollers in said adjacent double-row drying group being arranged on inner sides of the cylinder rows.

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5,050,318

## DRIER RACKING SYSTEM

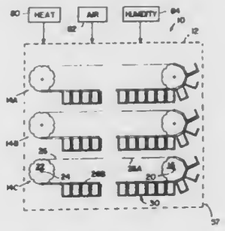
Petrus F. Du Bruyn, Brits, South Africa, assignor to Vetsak Koöperatief Beperk, Transvaal, South Africa

Filed Mar. 28, 1990, Ser. No. 500,770

Claims priority, application South Africa, Mar. 31, 1989, 89/2386

Int. Cl.[5] F26B *19/00*

U.S. Cl. 34—217 9 Claims




1. A drier racking system for use in a produce drying barn which includes at least one conveyor which is mounted inside the barn and which extends from a doorway of the barn to an inner region of the barn, and a plurality of containment devices, the conveyor including at least a first guide which is rotatably mounted adjacent the doorway of the barn, at least a second guide which is rotatably mounted at the said inner region of the barn, and at least one endless flexible member which passes over the first and second guides, the said plurality of containment devices being fixed to the endless member, adjacent one another, over at least approximately half of the length of the endless member, the conveyor being movable in a first direction whereby containment devices are moved in succession past the doorway, for loading with produce, to respective drying positions inside the barn below the conveyor and, in a second direction which is opposite to the first direction, whereby containment devices are moved in succession past the door, so that produce can be unloaded from the containment devices, to respective positions inside the barn above the conveyor.

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5,050,319

## INNER LINING FOR SKI BOOT

Riccardo Perotto, Venegazzu, and Antonio Dalla Lana, Montebelluna, both of Italy, assignors to Lange International S.A., Fribourg, Switzerland

Filed Nov. 13, 1989, Ser. No. 434,911

Claims priority, application Switzerland, Nov. 24, 1988, 4365/88

Int. Cl.[5] A43B *5/04*

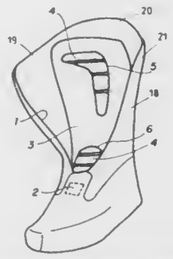
U.S. Cl. 36—117 11 Claims

1. An inner lining for a ski boot, comprised of a part made from a relatively hard synthetic material, said part defining an area said area being of such shape and contour as to generally conform to the shape of the instep and the forward portion of the lower leg, the part being lined internally on the area with a synthetic material of lesser hardness (**4**; **24**), wherein the part made from a relatively hard synthetic material (**3**) possesses at least one cut-out aperture (**5**, **6**; **14**; **22**, **23**) of continuous con-

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tour, said cut out aperture extending over a portion of the instep and forward portion of the leg above the instep such that



the synthetic material of lesser hardness spans the aperture and avoids localized zones of compression.

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**5,050,320**

**MULTI-SHAFT KNEADING AUGER SYSTEM**

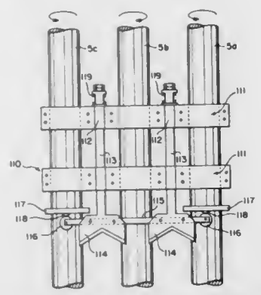
**Mitsuhiro Shibazaki, Tokyo, and Tsutao Takahashi, Kanagawa, both of Japan, assignors to Kajima Corporation and Chemical Grouting Co., Ltd., both of, Japan**

**Filed Oct. 23, 1989, Ser. No. 424,987**

**Claims priority, application Japan, Oct. 26, 1988, 63-138669[U]; Oct. 26, 1988, 63-268226**

**Int. Cl.[5] E02F *5/04***

**U.S. Cl. 37—81** **4 Claims**



1. A multi-shaft kneading auger system comprising:

a plurality of kneading shafts for forming a continuous wall in the ground; and

grouting blades positioned near the lower ends of said kneading shafts and driven to form said continuous wall, said grouting blades

i.) having a grouting edge formed at a predetermined angle with the surface of said kneading shafts, and

ii) being fixed to and which are driven by the movement of a chain encircling but not rigidly affixed to said kneading shafts.

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**5,050,321**

**SNOW PLOW HITCH PIN ASSISTING MEANS**

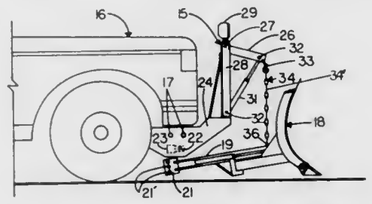
**Roy C. Evans, P.O. Box, Round Pond, Me. 04564**

**Filed Oct. 23, 1990, Ser. No. 601,523**

**Int. Cl.[5] E01H *5/04***

**U.S. Cl. 37—232** **10 Claims**

1. In combination, a vehicle having a main frame, a snowplow assembly adapted to be fixedly secured to the vehicle frame and a plow structure adapted to be detachably secured to the vehicle attaching structure by hitch pins for pivoted adjustment from the ground, said vehicle attaching structure having a hydraulic lift arm, a lifting chain with laterally spaced two chain legs connected between the lift arm and the plow structure adjacent its center of gravity to establish fore and aft balance when lifted free of the ground, said vehicle attaching and plow structures having hitch pin holes to be placed in transverse alignment with one another to pivotally attach the plow structure to the vehicle attaching structure with the insertion of the hitch pins and measured thrust hitch pin assisting means extending between vehicle attaching structure and



its lift chain to press forwardly thereupon and to align the pin holes of the plow structure with the pin holes of the vehicle attaching structure as the plow structure is lifted in suspension and free from the ground, whereby to make for easy insertion of the hitch pins between aligned holes of the plow and vehicle attaching structures.

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**5,050,322**

**SNOWPLOW APPARATUS**

**David A. Burkard, P.O. Box 263, Hillsboro, Ohio 45133**

**Filed Jan. 25, 1990, Ser. No. 470,073**

**Int. Cl.[5] E01H *5/04***

**U.S. Cl. 37—270** **8 Claims**



1. A snowplow apparatus adapted to be attached to and driven by an automotive vehicle having a single-point hitch assembly comprising

1) a blade assembly adapted for traversing movement over a ground surface having blade means including an upright, elongated plowing face for effecting displacement of snow accumulated on the ground surface over which said blade assembly is caused to traverse;

2) an elongated tongue having a first end secured to said blade assembly and extending in substantially orthogonal relationship to said plowing face at a side opposite thereto and a second end provided with connector means adapted to mechanically couple with the vehicle hitch assembly to permit angular displacement of said tongue in both vertical and horizontal planes about the point of interconnection of said connector means and the hitch assembly with respect to a horizontal plane, said tongue operative to effect displacement of said blade assembly in either direction with respect to said tongue's longitudinal axis; and

3) tongue stabilizing means mechanically coupled with said tongue and adapted to be mechanically coupled with the vehicle to which the tongue may be coupled and operative to substantially prevent said tongue from oscillating about the point of interconnection of said connector means and the hitch assembly in a horizontal plane.



**5,050,323**

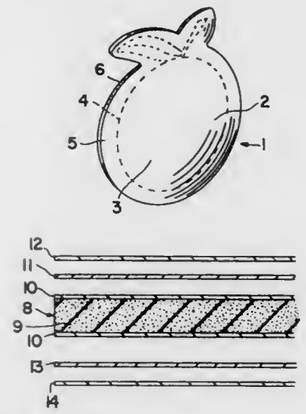
**BADGE**

**Raymond Gagnon, Montreal, Canada, assignor to Badgeco, Inc., Montreal, Canada**

**Continuation-in-part of Ser. No. 85,309, Aug. 10, 1987, Pat. No. 4,858,358, which is a continuation of Ser. No. 596,503, Apr. 3, 1984, abandoned. This application Aug. 22, 1989, Ser. No. 396,946**

**Int. Cl.[5] A44C *3/00***

**U.S. Cl. 40—1.5** **10 Claims**



1. A badge comprising:

a body layer of synthetic foam material comprising a central portion and a marginal portion which extends all around said central portion and has a smaller thickness than that of said central portion, said body layer having a front face, a back face and a peripheral edge, said front face sloping toward said back face at said marginal portion to define said smaller thickness and give said front face a generally bulging configuration;

an image-bearing layer adhering to the front face of said body layer, and

fastening means carried by the back face of said body layer to attach said body layer to a wearer's clothing; wherein:

the foam material forming the body layer is of the type having no memory when compressed;

said foam material is left exposed at the peripheral edge of said body layer; and,

said badge further comprises a protecting transparent film covering said image-bearing layer.

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**5,050,324**

**ARTISTIC DISPLAYS OF TEMPORARILY STORED AUDIO RECORDINGS, AND METHODS**

**Steven J. Casull, Salt Lake City, Utah, assignor to J. Frames International, Ltd., Draper, Utah**

**Continuation-in-part of Ser. No. 306,968, Feb. 2, 1989, abandoned. This application May 2, 1990, Ser. No. 518,006**

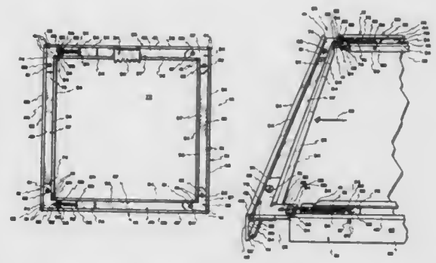
**Int. Cl.[5] G09F *1/12***

**U.S. Cl. 40—152** **20 Claims**

1. Artistic display structure comprising:

audio recording container means comprising a planar face comprising exposed artwork, compartment means adapted to receive an audio recording, and a perimeter bounding the face;

display frame means sized and shaped to generally surround the perimeter of the audio recording container means when placed therein, the frame means comprising frame corner means which further comprise two translatable and rotatable connector means and movable access gate means comprising opposite ends, the corner frame means comprising means allowing for the movable access gate means to both translate and rotate with respect to static frame means, the access gate means being movably connected to the static frame means at the opposite ends thereof by the translatable and rotatable connector means by which the access gate means are manually opened by first translation and then rotation to one stable self-retaining position and



closed by first rotation and then translation to another stable self-retaining position for selective ingress and egress of the container means;

the display frame means further comprising means defining a visually open front for exposing to view the artwork when the container means are disposed within the display frame means.

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**5,050,325**

**DISPLAY INDICATOR AND REED SWITCH**

**John Browne, Oakville, Canada, assignor to Dayco Products Canada, Inc., Weston, Canada**

**Filed May 14, 1990, Ser. No. 522,739**

**Int. Cl.[5] G09F *3/04***

**U.S. Cl. 40—447** **15 Claims**

1. In a display device having:

a movable and a stationary element,

said movable element being mounted on said stationary element to move between:

an ON position where a bright surface is displayed, over an area in a viewing direction; and

an OFF position

means, adapted, in the OFF position of said movable element, to provide that said area appears dark in the viewing direction,

a permanent magnet movable with said movable element,

a high remanence magnetic first core adapted to cooperate with said permanent magnet to move said movable element to ON and OFF positions in one and the other polarity, respectively,

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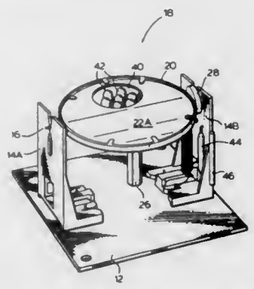


an energizing winding about said core adapted to switch said polarity:

the improvement comprising:

a reed switch located in the return flux path of said first core,

said reed switch controlling the open and closed states of an electric circuit connected thereto,



a second core approximately parallel to said first core, located so that said reed switch is in the path of return flux from said second core,

said first and second cores and said reed switch being located and oriented so that in said one and the other polarity of said first core the combined return flux of said first and second cores is adapted to place said reed switch in one and the other states.

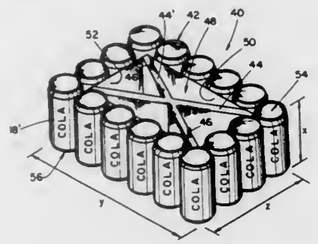
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**5,050,326**

**MODULAR DISPLAY REPLICA**

**Ronald L. Munsey, 3218 Hunterwood, Missouri City, Tex. 77459**

**Filed Oct. 17, 1988, Ser. No. 258,804**
**Int. Cl.[5] G09F *1/08***
**U.S. Cl. 40—538** **3 Claims**



1. A modular mass display replica of a selected prepackaged product, comprising

a plurality of vertically stackable display sections, each section having a four-sided prism configuration having a predetermined height, depth and width functionally related to a preselected number of a plurality of the prepackaged products to be displayed in each of said display sections, each of said sections being rigidly formed of a preselected plastic resin material, the outer vertical surfaces of each of said display sections replicating the typical external visual trade dress of said preselected number of a plurality of the prepackaged products stacked in adjacent contacting relationship based on said predetermined height, depth and width functionally related to said preselected number of the prepackaged products to be displayed in each of said display sections, and

stacking means cooperating with each of said display sections for permitting removable vertical stacking of each of said display sections and prohibiting relative horizontal movement between adjacent ones of said vertically stackable display sections,

wherein said stacking means further includes upper and lower surfaces disposed on each of said display sections that will accept and will nest with a registering horizontal surface of a vertically disposed adjacent display section for aiding in vertical stacking of said display sections,

a plurality of laterally-spaced bores disposed vertically in the upper and lower horizontally-disposed portions of each of said display sections in an opposed registering relationship when said display sections are vertically stacked, and

a plurality of connecting rod members each adapted for partial insertion into each of said opposed registering bores of said vertically adjacent display sections for preventing relative horizontal movement between said vertically adjacent stacked display sections.

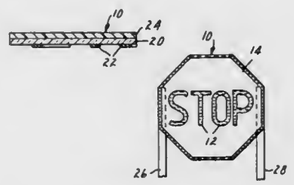
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**5,050,327**

**RETROREFLECTIVE SIGN HAVING IMPROVED LEGIBILITY**

**Henry L. Woltman, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 17, 1989, Ser. No. 438,691**
**Int. Cl.[5] G09F *13/16***
**U.S. Cl. 40—582** **20 Claims**



1. A sign located adjacent a road having a face bearing an informational legend thereon, said face comprising at least one legend portion and at least one background portion, each of said legend portions of said face defining a cross-sectional legend segment of said sign, said legend segment extending from said legend portion through the entirety of said sign, and each of said background portions of said face defining a cross-sectional background segment of said sign, said background segment extending from said background portion through the entirety of said sign,

wherein at least one of said legend and background segments is both retroreflective and translucent such that light incident to the front surface of said retroreflective and translucent segment is retroreflected and light incident to the back surface of said retroreflective and translucent segment is transmitted through said front surface.

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**5,050,328**

**TRIGGER LOCK**

**Harry I. Insko, Clearwater, Pinellas County, Fla., assignor to Harry A. Insko and Susan W. Insko, both of Oldamar, Fla.**

**Filed Mar. 8, 1991, Ser. No. 666,360**
**Int. Cl.[5] F41A *17/54***
**U.S. Cl. 42—70** **14 Claims**

1. A trigger lock for firearms comprising:

a bolt means removably engageable with a receiver means;

said bolt means comprising:

a plate;

a pair of pins attached to said plate in spaced apart relation to one another and extending normal thereto, at least one of said pins comprising a nub formed thereon in spaced apart relation to said plate; and

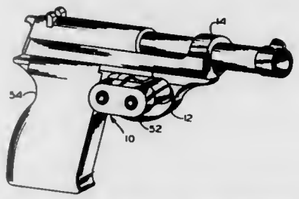
said receiver means comprising:

a base having a first side and a second side,

a first and a second cylinder, each cylinder having an axis



and a first and second end, said second end of each cylinder being attached in spaced apart relation and generally normal to said first side of said base, and said first ends of said cylinders remaining free; each said cylinder having a first axial aperture extending from said first end to a plane located at a predetermined position intermediate said first ends and said second side of said base; each said cylinder further comprising a second aperture extending from said second side of said base to said plane, each said second aperture having an axis that is generally coincident to the axis of a respective one of said first apertures, said first and second apertures intersecting at said plane; said second aperture



of at least one cylinder having a circumference greater than the circumference of said respective first aperture at said plane such that a ledge is defined by that circumference difference; said pins and said receiver means being dimensioned and configured such that said pins are received by a respective one of said first apertures of said receiver means and said pins being advanced into said first apertures until said nub releasably engages said ledge of a respective said cylinder, whereby, when said trigger lock is inserted within the trigger guard of a firearm, the trigger of the firearm is bracketed by said first and said second cylinders to block the trigger's normal movement.

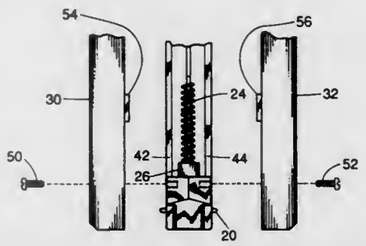
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**5,050,329**

**TWO-PIECE HANDGRIP FOR HAND GUN**

**Aaron G. Hogue, and Patrick L. Hogue, both of Atascadero, Calif., assignors to Hogue Grips, Atascadero, Calif.**

**Filed Mar. 4, 1991, Ser. No. 663,476**
**Int. Cl.[5] F41C *23/14***
**U.S. Cl. 42—71.02** **2 Claims**



1. An accessory that permits replacement of a one-piece standard plastic handgrip by a personally-selected two-piece handgrip, said one-piece standard plastic handgrip secured to a frame of a gun by a laterally-extending pin and including an inclined socket for retaining one end of a main spring, said accessory comprising:

a block including a laterally-extending hole sized to accept the laterally-extending pin, an inclined socket for retaining the end of the main spring, and further including laterally-extending threaded holes for receiving screws that are used for securing the two pieces of the personally-selected two-piece handgrip to the frame of the gun.

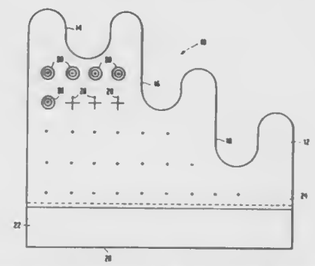
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**5,050,330**

**GUN REST**

**Johnny C. Pilgrim, and Johnny D. Franks, both of Kingwood, Tex., assignors to Pilgrim Archery Products, Inc., Kingwood, Tex.**

**Filed May 17, 1990, Ser. No. 524,519**
**Int. Cl.[5] F41A *23/00***
**U.S. Cl. 42—94** **4 Claims**



1. A gun rest comprising a support body of foam plastic material having a front surface adapted to be substantially vertically disposed in a shooting position, a bottom surface adapted to rest on a suitable support, a slit extending into said body from said bottom surface and extending upwardly substantially parallel to said front face for fitting over a top edge of a motor vehicle window and a top surface having a plurality of parallel grooves formed therein substantially perpendicular to said front face with each groove having a bottom surface spaced from the bottom surface of said body at different respective distances.

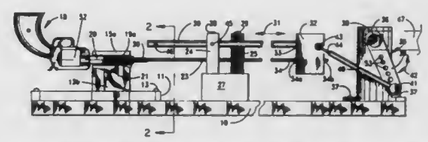
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**5,050,331**

**CLEANING APPARATUS FOR A PISTOL**

**Randall W. Burkhalter, Rte. I, Box 78, Blackwell, Okla. 74631**

**Filed Dec. 20, 1990, Ser. No. 631,280**
**Int. Cl.[5] F41A *29/00***
**U.S. Cl. 42—95** **13 Claims**



1. A cleaning apparatus for a gun having a barrel comprising:

(a) a base;

(b) a cleaning rod having a first and second end;

(c) vise means for securing the barrel of the gun in parallel relationship to said base;

(d) means for securing said vise means to said base;

(e) cleaning rod securing means attached to said base and slidably positioned in axial alignment with said barrel;

(f) cleaning rod stiffening means slidably mounted in said securing means;

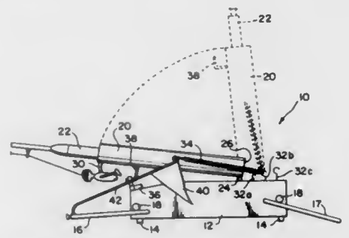
(g) attachment means for securing said stiffening means and said first end of said cleaning rod; and,

(h) actuating means for moving said cleaning rod and said stiffening rod simultaneously along said axis of said gun barrel and by a distance at least as long as said gun barrel.

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5,050,332
**FISH HOOKING DEVICE**
Darrel G. Cross, 4725 Chandler, Missoula, Mont. 59802
Filed Aug. 2, 1990, Ser. No. 561,938
Int. Cl.[5] A01K *97/12*
U.S. Cl. 43—15 3 Claims

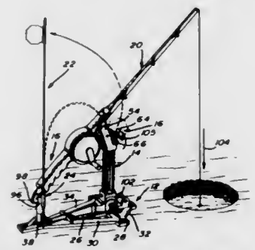


1. A fish hooking device comprising:
a base having a forward end and a rearward end with the forward end for resting on a support surface;
a generally "U" shaped forward leg hingedly mounted at a forward end of the base for rotation from a position below the base to an extended position beyond the forward end of the base, and a first stop means for preventing the forward leg from rotating beyond the extended position;
the forward leg when rotated to the extended position is positioned for resting on the support surface;
a generally "U" shaped rearward leg hingedly mounted at the rearward end of the base for rotation from a position below the base to an extended position behind the rearward end, and a second stop means for preventing the rearward leg from rotating beyond this extended position;
the rearward leg when rotated to its extended position is positioned for resting on the support surface;
a rod holder means for removably receiving a fishing rod;
the rod holder having an end hingedly mounted to the base to permit the fishing rod held by the rod holder to rotate from a generally horizontal position to a generally vertical position;
a spring loaded latch dog pivotally mounted to the base for movement between a normal position to a cocked position;
the rod holder further having a latch pin with a free end extending away from the rod holder;
the latch dog being provided with a keeper hole for receiving the free end of the latch pin;
a plurality of hooks mounted to the base and positioned in a staggered line extending from the rod holder toward the rearward end of the base;
a coil spring having a first end secured to the rod holder in spaced apart relation to the end hingedly mounted to the base and having a second end secured to one of the plurality of hooks;
the hooks mounted on the base being progressively sized to support the second end of the coil spring a greater distance above the base the further the hook is away from the rod holder and the hooks being staggered to prevent the coil spring from inadvertently snagging one of the hooks when the device is tripped.

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5,050,333
**FISHING RIG**
Joe Debreczeni, 695 Victor Hugo, Brossard Quebec, Canada
Filed Nov. 29, 1990, Ser. No. 619,489
Int. Cl.[5] A01K *97/01, 97/10, 97/12*
U.S. Cl. 43—17 19 Claims

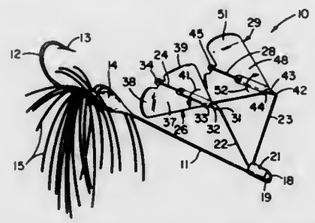
1. A fishing rig comprising, in combination:
base means adapted to reside, when in use, atop a supporting surface, said base means embodying a front portion and a rear portion;
upright means mounted, when in use, to said front portion of said base means and including a rearwardly extending oblique upper portion defining a fulcrum point thereon;
a tiltable fishing rod mounted, when in use, to said fulcrum point and defining first and second sections on either side of said fulcrum point, said first section including a line supporting pole; said second section including a handle and a line reel; further including means for mounting said rod to said fulcrum point;
flag means including a flexible staff having a lower end thereof mounted to said rear portion of said base means;



means adapted to reside, when in use, at said rear portion of said base means for receiving the lower end of said flexible staff and for supporting said second section of said fishing rod; and
triggering means pivotally mounted to said upright means, said triggering means including line engaging means and flag engaging means adapted to contact an opposite end of said staff, when flexed, whereby a pulling force on said line causes said triggering means to pivot to thus free said opposite end of said staff.

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5,050,334
**AUDIBLE FISHING LURE**
Calvin G. Standish, Jr., Rte. 1, Box 119, Pequot Lakes, Minn. 56472
Filed May 21, 1984, Ser. No. 612,749
Int. Cl.[5] H01K *85/00*
U.S. Cl. 43—42.13 14 Claims

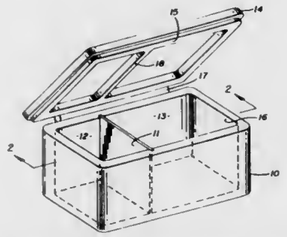


1. An audible fishing lure comprising: body means having an elongated linear member having a first end and a second end, hook means connected to the second end of the body means, first weight means mounted on the body means adjacent the hook means, pair of arms attached to the first end of the body means, each of said arms comprising elongated linear arm members having outer ends, said arm members diverging from each other from the first end of the body means and located in a transverse plane generally normal to the elongated linear member, second weight means securing the arm members to the first end of the body means, loop means projected forwardly from said second weight means providing an eye to accommodate a fish line, a pair of generally parallel rod members joined to the outer ends of the arm members, said rod members being shorter than the elongated linear member of the body means and extended generally parallel to the linear member of the body means, and spinner means rotatably mounted on each rod member, said spinner means comprising a pair of spinners, each spinner having a body and oppositely turned ears on opposite end portions of the body, said ears of one spinner being extended in the opposite direction as the ears in the other spinner whereby the spinners rotate in opposite directions as the lure is moved forwardly in the water, said spinner means having portions that contact each other on rotation of the spinner means thereby providing fish attracting intermittent sounds.



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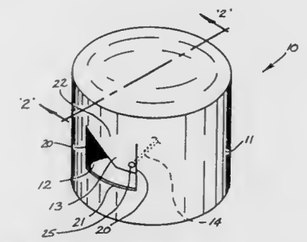
5,050,335
**MINNOW AND FISH PRESERVING CONTAINER**
Frank L. Hisey, P.O. Box 205, New Bedford, Pa. 16140
Filed Sep. 10, 1990, Ser. No. 579,947
Int. Cl.[5] A01K *97/00*
U.S. Cl. 43—55 2 Claims



1. A minnow and fish preserving container consisting of an insulated open top rectangular receptacle; an insulated closure for sealing engagement with said open top of said receptacle, said receptacle and closure being air and watertight, a cold conducting thin wall partition sealingly positioned within said receptacle so as to form separate large and small chambers for caught fish and live minnows respectively, said chambers being capable of holding different amounts of water and ice at a temperature acting to lower the metabolism of said minnows to substantially increase their life span, said thin wall partition comprising a sheet of thin material, ribs formed on at least one surface of said sheet of thin material.

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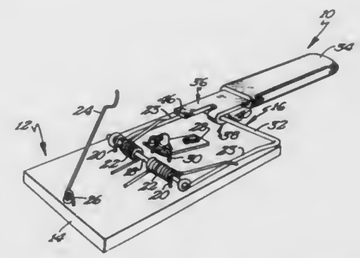
5,050,336
**DISPOSABLE ANIMAL TRAP**
Luke V. Paassen, 941 - 14th St. S., Lethbridge, Alberta, Canada T1J 2Y9
Filed May 29, 1990, Ser. No. 529,559
Int. Cl.[5] A01M *23/00*
U.S. Cl. 43—61 26 Claims



1. A small animal trap comprising:
an enclosure formed by a thin wall of resilient plastic defining a chamber of a size to readily house the animal, said wall being a cylindrical side wall, a door flap being formed in and separated from the surrounding wall by slits in the wall, a portion of the wall adjacent the door flap being attached to the door flap by a non-slitted hinge portion such that the resiliency of the thin-walled plastic allows the door flap to be forcibly bent inwardly to an animal admitting open condition but normally biases the door flap to a closed condition flush with the surrounding wall, the complete wall and door flap of the enclosure being formed as a integral unit molded of plastic, the integral unit including a flat base, the cylindrical side wall and a top, and
a trip means connectable between the door flap and the wall for holding the door flap in the open animal admitting condition, said trip means in a connected position being readily disconnectable by activity of an animal entering or within the chamber for permitting the door flap to return to the flush closed condition.

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5,050,337
**TRAP SETTING DEVICE**
Nathan J. Moore, and Arthur R. Moore, both of 2263 County Rd. H, Deer Park, Wis. 54007
Filed Feb. 12, 1990, Ser. No. 478,612
Int. Cl.[5] A01M *23/28*
U.S. Cl. 43—97 18 Claims



1. Device for assisting the setting of a trap, with the trap including a striker including a cross bar interconnected to an arm extending in a nonlinear manner from the cross bar, with the cross bar being movable and biased toward an entrapment member, comprising, in combination: an elongated handle; and means attached to the handle for moving the cross bar against the bias away from the entrapment member comprising a hook for removable engagement with the cross bar of the striker of the trap and a first finger for removable engagement with the arm of the striker of the trap, with the first finger extending longitudinally from the handle and including a free end, with the hook formed by a second finger separate from the first finger and extending from the handle generally parallel to and spaced from the first finger and formed into a generally U-shape, with the hook having a free end extending in a direction opposite to the free end of the first finger, with the first finger and the hook being nonmovable relative to each other.

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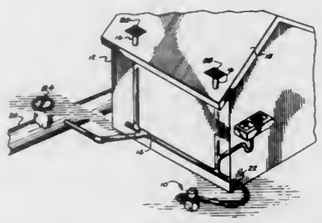
5,050,338
**ELECTROSTATIC DUSTING APPARATUS AND METHOD THEREFOR**
Peter P. Doakley, 7865 N. 49th Ave., Glendale, Ariz. 85301, and Christopher M. Bruemmer, 7202 W. Turney, Phoenix, Ariz. 85033
Filed Nov. 13, 1989, Ser. No. 435,155
Int. Cl.[5] A01M *1/20*
U.S. Cl. 43—132.1 1 Claim

1. A method of exterminating pests from a building draining system having a clean-out plug and a vent, said method comprising the steps of:
coupling an exhaust port of an air propelling device to a reservoir which holds a pesticide dust;
forcing air from said air propelling device into said reservoir to propel said pesticide dust along with said air out from said reservoir;

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limiting the air flow from said air propelling device to a rate of less than 300 cubic feet per minute;
transporting said propelled pesticide dust through a conductive tube;
locating an electrode having a multiplicity of spaced apart conductive bristles within said tube so that said conductive bristles are distributed within and insulated from said conductive tube and so that said propelled pesticide dust comes in proximity with said electrode;



energizing said electrode relative to said tube to electrostatically charge said pesticide dust;
routing said electrostatically charged dust and air into said draining system clean-out plug;
stopping said routing step when said electrostatically charged dust escapes from said draining system vent; and
attaching a screen to said vent to prevent escape of said pests from said vent.

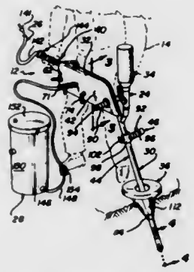
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**5,050,339**
**CONTAINER PLANT STAND**
**Randolpb W. Howell, 4595 125th Ave. S., Lake Worth, Fla. 33467**
**Filed Mar. 13, 1989, Ser. No. 322,342**
**Int. Cl.[5] A47G *7/00***
**U.S. Cl. 47—39** **5 Claims**



1. A container plant stand having a wide base and a smaller neck portion for receiving a plant container comprising: first, a large ring, second, a vertically spaced smaller ring, and a series of connecting wires, each wire having two legs and a connecting U-shaped portion. . . each leg having a first portion extending from a point of intersection with said larger ring upward to a point of intersection with said smaller ring, a second portion which extends beyond said smaller ring to said neck portion, and a rebent portion extending radially away from said neck portion to a U-portion joined to said other leg whereby a plant container may be placed in and resiliently gripped by said neck portion of said plant stand and held from tipping over by means of said wide base.

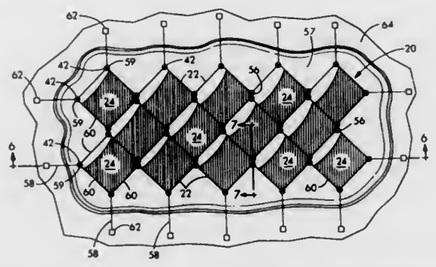
**5,050,340**
**PNEUMATIC SOIL PENETRATOR AND CHEMICAL APPLICATOR ASSEMBLY**
**L. Eugene Selfert, 557 W. 4800 South, Ogden, Utah 84405**
**Filed May 14, 1990, Ser. No. 522,548**
**Int. Cl.[5] A01G *29/00***
**U.S. Cl. 47—48.5** **20 Claims**



1. A pneumatic soil penetrator and chemical applicator assembly to inject a chemical under a surface of a soil area, comprising:
(a) an applicator gun means including a primary inlet means connected to a main discharge means to selecltively and independently direct controlled amounts of an inlet fluid and a chemical through said main discharge means;
(b) a fluid supply means connected to said primary inlet means;
(c) a chemical supply means connected to said primary inlet means; and
(d) said primary inlet means includes first valve means to independently control flow of fluid only to said main discharge means; second valve means to independently control flow from a chemical inlet means; and third valve means to independently control flow of fluid to a fluid penetrator means;
whereby said primary inlet means is selectively and independently operable to convey chemical from said chemical supply means through said chemical inlet means, supply fluid to said fluid penetrator means to open a hole in the soil area, and dispense the fluid and chemical laterally of said main discharge means.

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**5,050,341**
**THERMOPLASTIC AQUATIC BIOMASS CONTAINMENT BARRIER WITH REINFORCED HINGE**
**Harlon W. Breezer, and William F. Price, both of Portage, Wis., assignors to Penda Corporation, Portage, Wis.**
**Filed May 2, 1990, Ser. No. 518,014**
**Int. Cl.[5] A01G *7/00***
**U.S. Cl. 47—59** **12 Claims**



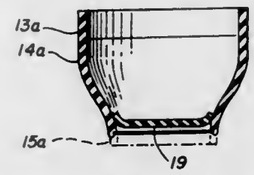
7. A network of floating aquatic biomass containment barriers, comprising:



(a) a plurality of twin-sheet thermoformed containment barrier segments, each segment having a first extended linear thermoplastic sheet member and a second extended linear thermoplastic sheet member of substantially the same dimensions as the first member fused together to form a composite unit member having two ends, with reinforcing thermoplastic inserts located between the first and second members at each end with each insert fused to the first and second members to form reinforced hinge sections, wherein the hinge sections have a protruding hinge knuckle with portions defining a pinhole; and
(b) wherein the segments are joined to form a network of cells with at least three sides adapted to restrain a floating aquatic biomass.

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**5,050,342**
**MULTI-PURPOSE RECEPTACLE**
**Luisito A. Figueroa, 183 Sinag St., Mandaluyong, M.M., Philippines 1501**
**Continuation of Ser. No. 370,259, Jun. 16, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 617,390**
**Int. Cl.[5] A01G *9/02***
**U.S. Cl. 47—66** **7 Claims**

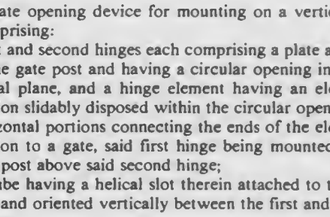


1. A multi-purpose receptacle formed from a vehicle tire of the type having a circumferential central tread portion, side wall portions on either side of said tread portion, and terminal wire-reinforced beads to engage a wheel rim on the edges of said side walls opposite said tread portion and wherein said tire has been cut with a first cut perpendicular to the axis of rotation of said tire through the middle of said tread portion and cut transversely in two second cuts perpendicular to said first cut, said receptacle comprising
a hollow body, said body having two ends formed by said second cuts, means joining said two ends together to form a body of substantially lesser circumference and radius than said tire,
said body having a substantially cylindrical upper portion formed by the portion of said tread portion bounded by said first and second cuts, a downward converging lower portion below said upper portion formed by one said side wall portion and a bottom edge below said lower portion formed by one said terminal bead,
and a bottom wall having a disk and edges around said disk, said edges engaging the inside of said lower portion to close off the bottom of said body.

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**5,050,343**
**METHOD AND APPARATUS FOR ARTIFICIAL IRRIGATION OF PLANTS**
**Martti Henttonen, Box 227, S-572 01 Oskarshamn, Sweden**
**PCT No. PCT/SE89/00362, § 371 Date Feb. 28, 1990, § 102(e) Date Feb. 28, 1990, PCT Pub. No. WO90/00347, PCT Pub. Date Jan. 25, 1990**
**PCT Filed Jun. 27, 1989, Ser. No. 469,508**
**Claims priority, application Sweden, Jul. 5, 1988, 8802512**
**Int. Cl.[5] A01G *25/00***
**U.S. Cl. 47—79** **8 Claims**

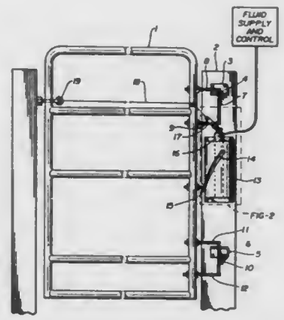
1. An irrigation system for growing plants in individual pots, said system comprising:
(a) at least one elongated hose, said hose defining an elongated internal passageway, and said hose including longitudinally spaced flexible segments (4,4) such that the hose can be laid in a trench of serpentine shape, said hose having non-flexible segments (3,3) between said spaced flexible segments (4,4), at least some of said non-flexible segments defining upwardly openable portions (2 or 6), coupling means for connecting the opposed ends of said elongated hose to provide a closed water storage system,
(b) frusto-conically shaped imperforate riser tubes, each of said tubes having a bottom end that is perforated and a top



end which is open so as to receive a pot or the like, said tubes provided in at least some of said upwardly openable portions of said non-flexible hose portions,
(c) said perforated bottom end of said tube provided the bottom interior boundary of said non-flexible hose segment so that when said tube is filled with a substrate capable of wicking water upwardly inside the tube a pot placed on the open top of said tube will be irrigated.

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**5,050,344**
**GATE OPENING DEVICE**
**Wayne B. Skeem, 1742 Targhee, Twin Falls, Id. 83301**
**Filed Mar. 30, 1989, Ser. No. 330,623**
**Int. Cl.[5] E05F *1/04***
**U.S. Cl. 49—237** **3 Claims**




1. A gate opening device for mounting on a vertical gate post comprising:
(a) first and second hinges each comprising a plate attached to the gate post and having a circular opening in a horizontal plane, and a hinge element having an elongated portion slidably disposed within the circular opening and horizontal portions connecting the ends of the elongated portion to a gate, said first hinge being mounted to the gate post above said second hinge;
(b) a tube having a helical slot therein attached to the gate post and oriented vertically between the first and second hinges;
(c) a bearing element attached to the gate and engaging the helical slot in the tube;
(d) an extendable drive mechanism vertically disposed within the tube below the first hinge element such that when the drive mechanism is extended, the drive mechanism abuts the upper hinge element and exerts a vertical force on the upper hinge element.

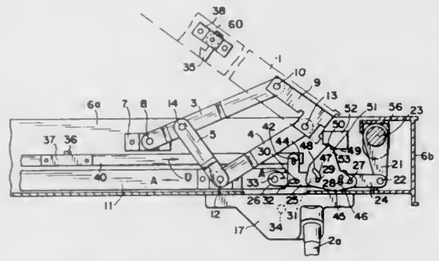
VOL 1130 ISS 4 SE 24 1991 UMI



5,050,345
**WINDOW**

Yoshikazu Nakanishi, Tokyo, Japan, assignor to Nakanishi Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,287
Claims priority, application Japan, Dec. 28, 1988, 63-329271
Int. Cl.[5] E05F *11/02*
U.S. Cl. 49—279 9 Claims



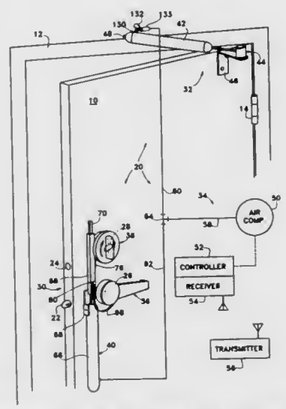
1. A window comprising, a rectangular window frame having oppositely disposed horizontal top and bottom sides and oppositely disposed vertical sides; a first driving rod and a first acting rod associated with one of the horizontal sides of the window frame and reciprocable in a longitudinal direction of said one horizontal side; a first window sash disposed parallel to one of the vertical sides of the window frame and having a top side and a bottom side; and a first window stay including a first arm having one end pivotally attached to said one horizontal side of the window frame and its other end pivotally attached to the bottom side of the window sash, said first arm effective to swing the window sash about a point of attachment of the first arm to said window frame as the first driving rod is actuated, a second arm having one end pivotally attached to the bottom side of the window sash and its other end pivotally attached to the first driving rod, said second arm effective to swing the window sash about the point of attachment of the first arm to the window sash as the driving rod is actuated, and a third arm having one end pivotally attached to the first arm intermediate both ends of the first arm and its other end pivotally attached to the first driving rod, said third arm effective to swing the first arm together with the window sash about the point of attachment of the first arm to the window frame as the first driving rod is actuated; a first locking means for locking the window sash in a closed position and for unlocking said window sash and including a latch provided on the bottom side of the window sash and a locking bolt fixed on the first acting rod for engaging with the latch and for releasing from the latch by reciprocation of the first acting rod; operating means associated with the horizontal sides of the window frame for reciprocating the first driving rod and the first acting rod; and a differential means provided between the operating means and both the first driving rod and the first acting rod for moving the first driving rod and the locking bolt relatively with a time difference therebetween in order to make the locking bolt engage with or release from the latch in a closed position of the window sash; said differential means being effective, when the locked window sash is opened, to move the first acting rod prior to the first driving rod for releasing the locking bolt from the latch to unlock, and, when the window sash is closed to be locked, to make the first acting rd delayed with respect to the first driving rod near the closed position of the window sash to engage the locking bolt with the latch; said differential means comprising a second connecting rod moved together with said operating means to reciprocate the first acting rod; a third connecting rod moved with said second connecting rod to reciprocate the first driving rod; said second and third connecting rods being connected to effect a time difference between the first acting rod and the first driving rod by fitting in a relatively slidable form an elongated slot of the second connecting rod and a pin of the third connecting rod; a swing plate pivotally attached to the first connecting rod, said swing plate having an arcuate slot which has a center at the pivotal center and an elongated slot extending substantially radially from one end of the arcuate slot, said arcuate sot effective to prevent relative movement of the second and third connecting rods to move the second and third connecting rods integrally by fitting with a pin, said elongated slot effective to allow relative movement of the second and third connecting rods by fitting with said pin of the third connecting rod a spring constantly urging the swing plate to rotate in a direction such that the pin of the third connecting rod moves relatively from the elongated slot to the arcuate slot; and a cam swings the swing plate such that the pin of the third connecting rod moves relatively from the arcuate slot to the elongated slot against the spring or toward the opposite direction associated with the rotating power of the spring.

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5,050,346
**AUTOMATIC OPERATING SYSTEM FOR SWINGING DOOR**

Jon E. Eccleston, 88 Los Cerros Ave., Walnut Creek, Calif. 94598

Filed Jul. 30, 1990, Ser. No. 559,639
Int. Cl.[5] E05F *15/00*
U.S. Cl. 49—280 5 Claims



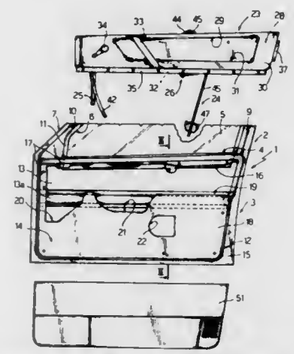

1. An automatic operating system for a swinging door having latching means including knob means, comprising:
knob operating means attachable to said knob means without modification thereof for manual and power operation thereof;
power means for operating said knob operating means;
door opening and closing means;
power supply means for supplying power to said power means and said door opening and closing means; and
manually operated control means for controlling said power supply means;
said system being entirely external to the structure of said door but for fastening means which fasten said knob operating means, said power means, and said door opening and closing means to said door;
said knob operating means being uncoupled from said power means when said operating system is in its quiescent state.



5,050,347
**VEHICLE DOOR**

Enzo Brusasco, Turin, Italy, assignor to Roltra, Morse S.p.A. and Du Pont de Nemors Italiana S.p.A., both of, Italy

Filed Nov. 7, 1990, Ser. No. 609,771
Claims priority, application Italy, Nov. 9, 1989, 67985 A/89
Int. Cl.[5] E05F *11/48;* B60J *5/04*
U.S. Cl. 49—348 8 Claims



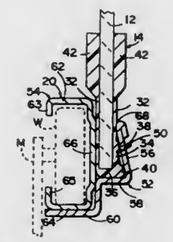
1. A vehicle door (1) having an upper window opening (6) fitted with a sliding window (5), and comprising, at the bottom, a box body (12) defined by an inner sheet (14) and an outer sheet (13) connected peripherally to each other; characterised by the fact that said inner sheet (14) presents an opening (16) extending over a relatively small upper portion of the same; a first self-supporting interior finish panel (23) being connected in removable manner to said inner sheet (14) for closing said opening (16); a second interior finish panel (51) being provided outside said box body (12) for covering said inner sheet (14); and door locking means (26, 27) and window regulating and guide means (24, 25) being connected to the surface of said first panel (23) facing said outer sheet (13).

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5,050,348
**PANEL AND BRACKET ASSEMBLY AND METHOD FOR MAKING SAME**

Edmund J. Kane, Holland, and Robert S. Herrmann, Grand Haven, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Jul. 16, 1990, Ser. No. 554,013
Int. Cl.[5] E05F *11/44*
U.S. Cl. 49—351 38 Claims



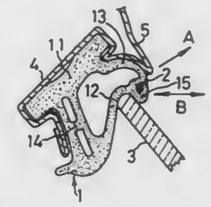
1. A panel assembly comprising:
a sheet of material;
a peripheral gasket formed from a polymeric material and extending along one edge portion of said sheet;
a bracket mounted on said gasket, said bracket including receiving means for receiving a portion of said gasket and said one edge portion of said sheet;
said gasket and bracket including means for slidably mounting said receiving means thereover after said gasket is attached to said sheet;
said gasket including retaining means engaging said receiving means for holding said bracket on said sheet without requiring fasteners to extend into or through said sheet.

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5,050,349
**WEATHER STRIP FOR MOTOR VEHICLE**

Yoshinori Goto, Kakamihara, and Masahiro Nozaki, Ama, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Sep. 6, 1990, Ser. No. 578,290
Claims priority, application Japan, Sep. 18, 1989, 1-108819[U]
Int. Cl.[5] E06B *7/16*
U.S. Cl. 49—488 5 Claims



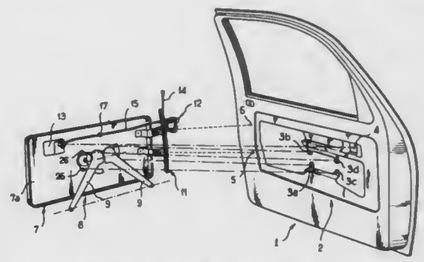
1. A weather strip to be attached along a door opening of a body of a motor vehicle and to be pushed by a peripheral edge of a door glass of a sashless door, comprising:
a base portion to be fitted in a retainer which is attached along the door opening;
a tubular sealing portion integral with said base portion, said tubular sealing portion having a seal wall for sealing engaging an upper end edge of the door glass and an outer side wall, and being composed of a soft elastic material; and
a linear insert composed of a solid material having a solid, continuous, and uniform cross-section integrally embedded in a corner portion which connects said seal wall and said outer side wall serially in the longitudinal directional of said tubular sealing portion.

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5,050,350
**INNER TRIM PANEL FOR A VEHICLE DOOR, CORRESPONDING DOOR, AND METHOD FOR MOUNTING THE DOOR**

Carlo Bertolini, Paris; Philippe Becceril, Darvoy, and Patrice Cardine, Orleans, all of France, assignors to Rockwell Automotive Body Systems S.A., France

Filed Jun. 22, 1990, Ser. No. 542,337
Claims priority, application France, Jun. 27, 1989, 89 08550
Int. Cl.[5] B60J *5/04*
U.S. Cl. 49—502 6 Claims



1. A door assembly including a door panel providing struc-

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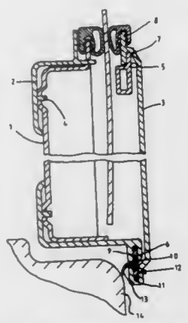
tural integrity for said assembly and defining an opening therein comprising:
- a trim panel;
- means for fastening said trim panel to said door panel;
- a window lift and a window slide disposed on said trim panel for guiding a window;
- a lock disposed on said trim panel;
- an inside opening control disposed on said trim panel;
- a rod disposed on said trim panel for actuating said lock;
- said opening providing access to assemble said trim panel having said window lift, lock, inside opening control and rod disposed therein, as a preassembled unit such that said opening is sealed by said trim panel; and
- wherein said window lift is disposed on said trim panel by means of fasteners which engage said trim panel, said window lift and said door panel.

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**5,050,351**
**VEHICLE DOOR**

**Hubert Goldbach, Ratingen, and Boris Koch, Wermelskirchen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Oct. 15, 1990, Ser. No. 597,831**
**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1989, 3935857**
**Int. Cl.[5] B60J 5/04**
**U.S. Cl. 49—502** **4 Claims**



1. A vehicle door consisting of a base, a cover facing a passenger compartment, and an outside door leaf joined to the base and cover, the door leaf having peripheral edges releasably connected to the base and cover, at least one pair of corresponding edges in the cover and door leaf comprising grooves located in the plane of the door and opening toward one another, and a joining and sealing resilient profile strip in the grooves constructed and arranged to compensate for differences in thermal expansion.

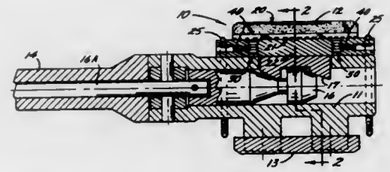
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**5,050,352**
**HONING STONE ASSEMBLY**

**Mark R. Estabrook, Rockford, and Charles R. Van Sickle, Winnebago, both of Ill., assignors to Barnes Drill Co., Rockford, Ill.**

**Filed Oct. 2, 1989, Ser. No. 415,590**
**Int. Cl.[5] B24D 33/00; B24B 9/02**
**U.S. Cl. 51—330** **15 Claims**

1. A honing stone assembly comprising an elongated abrasive stick having an outer working face and an inner non-working face, a shell secured to said stick and having an inner web lying against the non-working face of said stick, a hole formed through said web and disposed in opposing relation with the non-working face of said stick, a mounting stud extending slidably through said hole and projecting inwardly from said web, said stud having an enlarged outer end portion engageable with said web to retain said stud against inward movement through said hole and engageable with the non-working face of said stick to retain said stud against outward movement through said hole, and an elongated holder for said shell and said stick, said holder having a hole receiving said stud, means



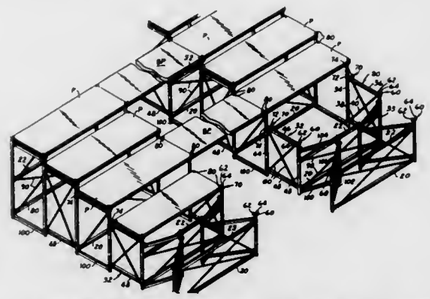
for releasably anchoring said stud in said hole in said holder thereby to secure said shell and said stick to said holder, said means comprising a screw threaded into said holder and having an end engaging said stud, said screw extending substantially perpendicular to said stud.

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**5,050,353**
**FOLDABLE, MULTI-LEVEL STAGING AND SEATING SUPPORT**

**Orley D. Rogers, Farwell; Kenneth E. Staten, and Calvin K. Randall, both of Clare, all of Mich., assignors to Stageright Corporation, Clare, Mich.**

**Filed Jul. 6, 1990, Ser. No. 549,098**
**Int. Cl.[5] E04H 3/12**
**U.S. Cl. 52—8** **5 Claims**



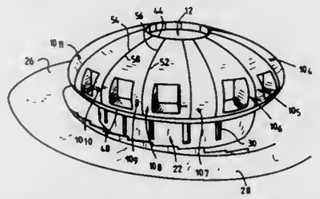
1. A staging and seating understructure assembly, foldable for storage and extendable for use, which comprises:
(a) a series of vertical lateral cross frames, each with a vertical column at each end,
(b) a pair of side frame gates at each end of said lateral cross frames connected between respective vertical columns at the respective ends of said lateral cross frames,
(c) each side frame gate of said pairs having an inner end and an outer end, the outer ends being pivotally connected to respective vertical columns of the respective ends of said lateral cross frames, and the inner ends being pivotally connected to each other and to an inwardly displaceable vertical column at said inner ends,
(d) said side frame gates being collapsible to lie adjacent and between said lateral cross frames when said understructure is collapsed, and said gates being extendible outwardly to lie in a plane between vertical columns and to position said displaceable vertical column on said plane.



**5,050,354**
**PREFABRICATED HOUSE INCLUDING MOLDED ELEMENTS**

**Dante Vendramini, 34, rue du Général Leclerc, 92270 Bois Columbes, France**

**Filed Sep. 28, 1989, Ser. No. 413,593**
**Claims priority, application France, Oct. 3, 1988, 88 12916**
**Int. Cl.[5] E04H 3/00**
**U.S. Cl. 52—80** **9 Claims**



1. A prefabricated house of the type comprising adjacent, radial, molded elements which are assembled to one another to form a low dome, wherein the house comprises a central support structure (12) in the form of a hollow cylindrical shaft erected on a floor slab and forming a circular centrally enclosed area, and wherein each molded element comprises an external wall made of a sandwich of composite material and constituting both side wall and roof of the house, said outside wall being delimited by a top edge for attachment to an upper edge of the central support structure, a bottom edge for attachment to the floor slab, and two side edges for assembling to two corresponding side edges belonging to two adjacent mounted elements.

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**5,050,355**
**GROUND ANCHOR**

**Mikhail Pildysh, 30 Douglas Bank Drive SE., Calgary, Alberta, Canada T2Z 2B7**

**Filed Jul. 30, 1990, Ser. No. 559,826**
**Claims priority, application Canada, Apr. 3, 1990, 2013773**
**Int. Cl.[5] E02D 5/74**
**U.S. Cl. 52—163** **7 Claims**



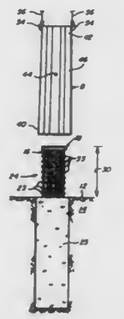
1. An anchor device comprising sleeve means for hammering into the ground; blade means releasably mounted in the bottom end of said sleeve means for facilitating entry of the device into the ground; rod means for insertion into and removal from said sleeve means; elongated plate means, including a center portion extending across and pivotally mounted on said rod means, an upper, resilient leg extending outwardly and upwardly from said center portion on one side of said rod means; and a lower resilient leg extending outwardly and downwardly from the center portion on the other side of said rod means; anchor means pivotally mounted on said rod means for rotation around a horizontal axis, said anchor means being slidable in said sleeve means with said rod means; and spring means on said rod means biasing said anchor means outwardly against said sleeve means when the rod means and anchor means are inserted therein, whereby, when the sleeve means carrying the remainder of the device is hammered into the ground and then extracted while the rod means is held down against the blade means, the spring means biases the anchor means into a ground engaging position.

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**5,050,356**
**IMMURED FOUNDATION**

**Mark S. Johnson, and Gordon T. French, Jr., both of Houston, Tex., assignors to Houston Industries Incorporated, Houston, Tex.**

**Continuation of Ser. No. 221,082, Jul. 19, 1988. This application Mar. 8, 1990, Ser. No. 490,747**
**Int. Cl.[5] E02D 27/42; E04B 1/00**
**U.S. Cl. 52—295** **9 Claims**



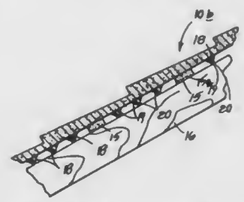
1. A foundation for supporting a pole above the ground about a hole formed in an earthen surface, comprising:
- a reinforcing cage positioned in the hole;
- said reinforcing cage having a lower portion in the hole and an upper portion extending upwardly from the hole above grade on the earthen surface;
- a first body of concrete filling the hole to the earthen surface about said reinforcing cage;
- a pole base member mounted on said first body of concrete at the earthen surface
- said pole base member enclosing said upper portion of said reinforcing cage; and
- a second body of concrete filling said pole base member above grade on the earthen surface to a level covering said upper portion of said reinforcing cage.

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**5,050,357**
**SHEET ROOFING ORGANIZATION**

**Gregory E. Lawson, 680 Grovewood Dr., Gretna, La. 70056**

**Filed Oct. 15, 1990, Ser. No. 597,559**
**Int. Cl.[5] E04D 1/26**
**U.S. Cl. 52—314** **2 Claims**



1. A sheet roofing organization defining an elongate, flexible

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panel, wherein the panel includes a forward surface and a rear surface, the forward surface including plural rows of face members extending beyond the forward surface, wherein each row of face members is offset relative to adjacent rows, and

a plurality of spaced parallel adhesive strips mounted to the rear surface for adhesive securement to an underlying roof panel, and

including a horizontal nailing flange mounted coextensively to an upper edge of the sheet-like member, with the horizontal nailing flange including a horizontal nailing flange top surface recessed below a face member top surface defined by the face members, and the sheet-like member including an elongate bottom edge, and a bottom edge recess groove directed into the rear surface adjacent the bottom edge, wherein the recessed groove is defined by a recessed groove width and wherein the horizontal nailing flange is defined by a horizontal nailing flange width, wherein the horizontal nailing flange width is equal to the recess groove width, and

including a vertical nailing flange formed coextensively to a left edge of the sheet-like member, and

including parallel rows of resilient engagement ribs mounted coextensively to the rear surface of the sheet-like member between the adhesive strips.

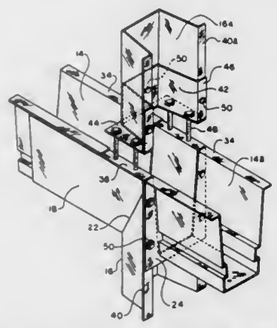
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**5,050,358**

**STRUCTURAL MEMBERS AND BUILDING FRAMES**

Neven I. Vladislavic, San Juan 4705, San Miguel, Santiago, Chile

Filed Aug. 1, 1990, Ser. No. 561,693
Int. Cl.[5] E04B *5/36*
U.S. Cl. 52—334 5 Claims



1. An elongated, hollow steel structural member useful for fabricating structures therefrom comprising a trough-like profile that includes:

a closed bottom;

an open top;

two sides; and

horizontal flat wing-like flanges,

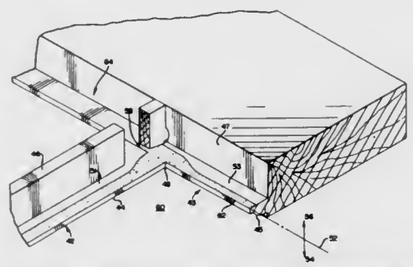
said sides diverging as they extend upward from said bottom to said top; said flanges extending outward from said top, parallel to said bottom, and said bottom having dimpled boss indentations extending into the interior of said profile in which at least one end of said member has a connection flange attached at right angles to the outside perimeter of said end.

**5,050,359**

**JOINT ADAPTABLE FOR USE IN A CLOSURE AND CLOSURE INCLUDING SUCH JOINT**

Mark R. Lorge, Neenah, and John T. Verch, Oshkosh, both of Wis., assignors to Morgan Products Ltd., Oshkosh, Wis.

Filed May 8, 1990, Ser. No. 521,078
Int. Cl.[5] E06B *3/70*
U.S. Cl. 52—456 28 Claims



1. A joint adaptable for use in a closure, said closure having an inside and an outside, the joint comprising a first member and a second member, said first member substantially copingly fitting said second member across an expanse; said first member and said second member cooperating to establish a boundary between said inside and said outside across said expanse; said first member and said second member further cooperating to establish a pass substantially at said boundary, said pass being of appropriate dimension to accept application of a weather-sealing material to establish a weather-resistant barrier at said boundary.

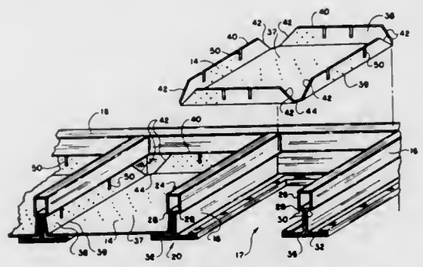
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**5,050,360**

**SUSPENDED CEILING PANEL**

J. Lynn Gailey, Clover, S.C., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Apr. 18, 1990, Ser. No. 510,482
Int. Cl.[5] E04B *9/00*
U.S. Cl. 52—488 13 Claims



1. A suspended ceiling panel system comprising:

a) an assembly of inverted T-beam support members suspended in a horizontal plane to form a desired grid pattern, and a plurality of ceiling panels for engagement within said assembly to form a substantially continuous ceiling;

b) said T-beam support members comprising a vertical center leg terminating at a lower end by a pair of oppositely directed horizontal arms and having a pair of oppositely directed ribs projecting from an upper end of said vertical center leg;

c) said ceiling panel including a main body portion and integral resilient side walls extending at an angle from said body portion and adapted for captured engagement between said horizontal arms and ribs of said T-beam support members; and

d) each of said side walls having a top edge spaced from said body portion including at least one elongate slit located intermediate spaced ends of said top edge extending transversely from said top edge toward said main body portion to resist removal of said panel from captured engagement with said support members.

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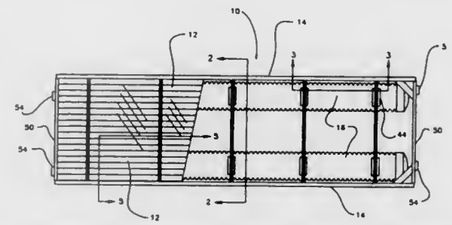


**5,050,361**

**DECK STRUCTURE**

John Hallsten, Sacramento, Calif., assignor to Hallsten Supply Company, Sacramento, Calif.

Filed Dec. 29, 1988, Ser. No. 291,768
Int. Cl.[5] F04B *1/38;* B44D *5/08*
U.S. Cl. 52—581 9 Claims



1. A weldless deck structure formed of a plurality of modular panels, comprising,

a plurality of panels, each panel including a multiplicity of parallel, edge to edge planks, and a framing transverse cross member at each end of the multiplicity of deck planks, each transverse cross member extending across the width of all the deck planks, with a channel in each of the cross members receiving the ends of the deck planks, the deck planks being solely supported at their ends and said ends of the deck planks being secured to said channel without welds, and including means for preventing separation of the deck planks or lateral movement of the deck planks with respect to the cross members,

at least one interconnecting means on the cross members, on the outside of the cross members opposite the channels, for engaging and interlocking the opposed outside faces of two adjacent cross members, so as to connect two adjacent panels together,

the two interconnected, interlocked cross members forming structural beams having structural strength sufficient to support an intended load placed on the cross members and spanning generally between the ends of the cross members, with the cross members being unsupported except near their ends so as to span an unsupported distance via said structural beams while carrying loads applied to the deck planks,

and locking means engaging the two interconnected cross members, for preventing disengagement of the cross members,

the deck structure being entirely without welds.

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**5,050,362**

**CONSTRUCTIONAL PANELS**

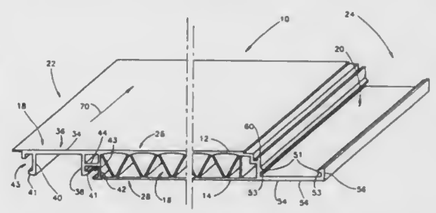
Danny Tal; Gilad Hakim, and Haim Hakim, all of Kibbutz Ramat Hashofet, Israel, assignors to Polygal, Kibbutz Ramat Hashofet, Israel

Filed Jan. 17, 1990, Ser. No. 465,722
Claims priority, application Israel, Jan. 19, 1989, 89005
Int. Cl.[5] E04C *3/00*
U.S. Cl. 52—588 13 Claims

1. A constructional panel having first and second edge portions arranged for interconnection with respective second and first edge portions of similar panels, said first and second edge portions being configured for mating engagement at at least two locations, said first edge portion including a generally flat portion arranged to permit attachment of the edge portion to an external support by a fastener extending through said flat portion, the mating engagement of said first and second edge portions being such that said generally flat portion and said fastener are covered by said second edge portion, and wherein

said panel comprises first and second spaced apart portions defining respective first and second outer surfaces lying in respective first and second planes, said first edge portion having a third outer surface substantially coplanar with said first surface and said second edge portion having a fourth outer surface substantially coplanar with said second outer surface, and

said first edge portion defines a first protrusion defining said third outer surface, said first protrusion also defining first and second locking portions, and said second edge portion defines a second protrusion defining said fourth outer surface and a pair of spaced apart teeth mounted onto said second protrusion so as to extend transversely to said second plane and towards said first plane and so as to be lockably engageable with said first and second locking portions, thereby to define said at least two locations.



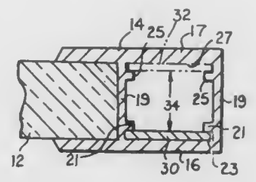
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**5,050,363**

**BULLET RESISTANT FRAME STRUCTURE**

James P. Fornell, 25257 W. Eight Mile Rd.,, Detroit, Mich. 48240

Filed Aug. 13, 1990, Ser. No. 566,131
Int. Cl.[5] E06B *3/10, 5/10;* E05G *1/026*
U.S. Cl. 52—656 18 Claims



1. An architectural framing system resistant to ballistic penetration, comprising:

a hollow rail means of a first material, said rail means having a longitudinal front wall constituting a potential ballistic target, a longitudinal rear wall spaced an appreciable distance behind the front wall, and two longitudinal side walls interconnecting said front and rear walls;

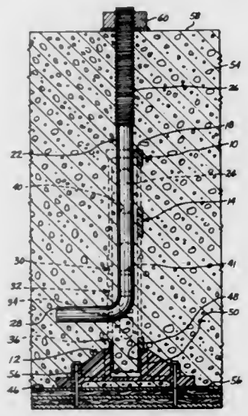
parallel internal rib means extending longitudinally along inner surfaces of said two side walls to form a first track between the rib means and the front wall; and

a ballistic panel of a second material insertable into the first track adjacent and parallel to said front wall.

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5,050,364
## TWO-PART ANCHOR BOLT HOLDER
Michael S. Johnson, Everett, and James I. Mothersbaugh, Bothell, both of Wash., assignors to Anchor Bolt, Inc., Kirkland, Wash. and Aztec Concrete and Accessories, Inc., Infortuna, Calif.
Filed Mar. 21, 1990, Ser. No. 496,988
Int. Cl.[5] E04C 5/12
U.S. Cl. 52—705 17 Claims



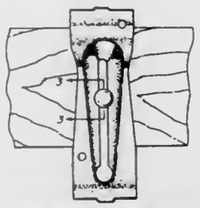
1. An anchor bolt holder for use in setting an anchor bolt in a concrete slab and the like, the anchor bolt having an elongated shank with a threaded end, and an opposite end extending laterally relative to said shank, said anchor bolt holder comprising:

a base member, mountable to a forming surface that underlies said concrete slab during pouring of the same; and

a hollow, cylindrically-shaped sleeve member, said sleeve member being connectable to said base member in a manner so that said sleeve member is in a generally vertically upstanding position relative to said base member, and further, said sleeve member receiving at least a portion of said anchor bolt's elongated shank, said sleeve member having an elongated vertical split extending along at least one side thereof, said split being defined by a pair of spaced-apart lateral side edges, said edges being adapted to grip therebetween said anchor bolt's laterally-extending end, for holding said bolt in a certain position above said forming surface.

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5,050,365
## CONCRETE FORM SNAP TIE
Roy L. Edgar, Springboro, and Joseph N. Young, Centerville, both of Ohio, assignors to Dayton Superior Corporation, Miamisburg, Ohio
Filed Jul. 23, 1990, Ser. No. 556,137
Int. Cl.[5] E04B 1/38
U.S. Cl. 52—713 5 Claims



1. For use in maintaining a predetermined spaced relation between opposed forms prior to and during the pouring of a concrete wall therebetween, the combination comprising:

(a) a steel rod of predetermined uniform cylindrical section over the major portion of the length thereof,

(b) a head of substantially larger diameter than said rod integrally formed on each end of said rod,

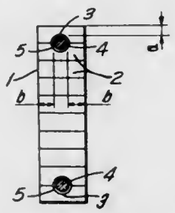
(c) said rod including a cylindrical shoulder portion adjacent the inner side of each said head which has a diameter intermediate the diameter of said uniform cylindrical section and said heads, and

(d) a wedge having an elongated slot therethrough of a predetermined width intermediate said diameters of said shoulder portions of said rod and each said head,

(e) whereby upon assembly of said rod in said slot with one said head thereof in engagement with said wedge, the adjacent said shoulder portion of said rod will lie within said slot.

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5,050,366
## REINFORCED LAMINATED TIMBER
Guy P. Gardner, 14 Nansen Street, Northgate, Queensland 4013, Australia, and Robert D. Eaton, 16 Emerald Street, Clontarf, Queensland, 4019, Australia
Filed Dec. 4, 1989, Ser. No. 453,122
Claims priority, application Australia, Nov. 11, 1987, PI5351
Int. Cl.[5] E04C 3/30
U.S. Cl. 52—730 24 Claims



1. A laminated structural timber member comprising a plurality of longitudinally extending wooden laminations bonded together by a resin adhesive and reinforced by at least two longitudinally extending solid metal rods, each rod having on an outer surface thereof an integral spiral winding projecting outwardly from said surface, said timber member being formed with grooves receiving said metal rods, said metal rods being each bonded to at least one lamination by said resin adhesive, one of said metal rods being bonded at a location between a longitudinal central axis of the timber member and one longitudinal edge of the timber member but extending within the timber member, and another of said metal rods being bonded at a location between the longitudinal central axis of the timber member and another longitudinal edge of the timber member but extending within the timber member, said spiral winding having a profile which enables a keying effect to be produced between the metal rods, said resin adhesive and said laminations to key the metal rod in place within the adhesive and the timber member without penetrating into the wooden laminations.

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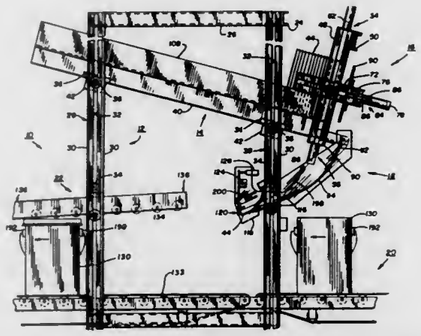
5,050,367
## AUTOMATIC ON-DEMAND SEPARATING AND PLACING OF LIDS
Raymond A. Heisler, 657 Dokota Trail, Franklin Lakes, N.J. 07417
Filed Mar. 7, 1991, Ser. No. 665,773
Int. Cl.[5] B65B 7/28
U.S. Cl. 53—72 27 Claims

1. An improved apparatus for separating, feeding, metering, and placing of a preformed cover onto a traveling preformed container, said preformed cover being a first and lowermost cover of a nested stack, said apparatus including:

(a) a main frame assembly;

(b) an inclined hopper assembly adjustably mounted on said main frame assembly, said hopper assembly adapted for advancing said nested stack of covers towards a cover separating assembly, said advancing of said nested stack in a direction substantially opposite to a direction of advancement for said traveling preformed container;

(c) said cover separating assembly adjustably carried on a lowermost end of said hopper assembly, said cover separating assembly including, a frame member carrying a first retaining means, a second retaining means, and a cover stop means, said first retaining means and second retaining means selectively actuated for retaining at least a second of the preformed covers in the nested stack, said first retaining means and second retaining means cooperating to retain said second cover and subsequent covers from advancing down said inclined hopper during a selected period, said cover stop means adapted to provide an extent to the advancing of said nested stack when and as said nested stack is not retained by said first and second retaining means, said cover stop means also providing for the subsequent separation of said first cover from retained said second cover, and said cover stop means further adapted for allowing said first cover to fall into and onto a transfer chute assembly by gravity;



(d) a first sensing means for determining the retention of a top portion of the second cover by said first retaining means independently of the distance traveled by said first retaining means, a second sensing means for determining the retention of a bottom portion of the second cover by the second retaining means, independently of a distance traveled by the second retaining means, said determination of said first sensing means and said second sensing means providing for the actuation of the cover stop means for providing said separation of said first cover from said second cover;

(e) said transfer chute assembly being carried on said frame member of the cover separating assembly, said transfer chute assembly including a receiving end, a curved transition portion, and an elongated inclined portion, said receiving end adapted for receiving said first cover guided by said cover stop means, said curved transition portion adapted for tilting said first cover, advancing by gravity thereon, from a substantially vertical disposition to a selected inclined disposition on said elongated inclined portion, said inclined portion including a discharge end, said inclined portion adapted for advancing said first cover, by gravity, to and towards the discharge end;

(f) a placing assembly mounted at and on said discharge end of the elongated inclined portion, said placing assembly adapted to guide and subsequently stop advancement of said first cover in substantially centered alignment with said traveling container, said placing assembly further providing a means for engaging a leading edge of the traveling container with a mating portion of the first cover, said placing assembly further adapted for selectively releasing said first cover onto said traveling container; and

(g) a third sensing means adapted for sensing the presence of a cover at said discharge end of said transfer chute assembly, said third sensing means providing a control signal for the selective advancement or the stopping of said preformed container on an infeed conveyor prior to reaching said discharge end.

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5,050,368
## SHRINK PACKAGING APPARATUS
Chuji Noh, Sakai, Japan, assignor to Tokiwa Kogyo Co., Ltd., Osaka, Japan
Filed Jan. 11, 1990, Ser. No. 463,431
Int. Cl.[5] B65B 53/06
U.S. Cl. 53—442 20 Claims



1. A method for shrink packaging articles comprising the steps of:

feeding articles through a former;

forming a continuous belt-like heat-shrinkable film into a tubular shape in the former;

enclosing the articles in the tubular film as the articles move through the former;

solely supporting sides of the articles after the articles have moved from the former so that the film covered tops and bottoms of the articles being unsupported and entirely exposed while the sides of the articles are solely supported;

heating film at tops and bottoms of the articles while the articles are solely supported at their sides;

conveying the articles while supporting at least the bottoms thereof after the articles have moved from the former, film at the sides of the articles being exposed during the step of conveying;

heating film at the sides of the articles during the step of conveying; and

heat-shrinking the film during the steps of heating and cutting the film in response to the heat-shrinking to thereby form individual packages of articles.

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5,050,369

## METHOD OF AND APPARATUS FOR FILLING AND CAPPING CONTAINERS FOR BEVERAGES AND THE LIKE

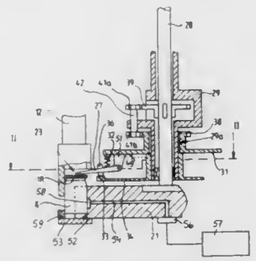
Wolfgang Fiwek, Wohltorf, and Josef Sterba, Hamburg, both of Fed. Rep. of Germany, assignors to Alfill Getränketechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Aug. 15, 1990, Ser. No. 568,257

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1989, 3927911

Int. Cl.[5] B65B *3/00, 7/28;* B67B *3/064*

U.S. Cl. 53—471 25 Claims



1. A method of at least partially filling successive cans of a series of cans having liquid-admitting inlets with a liquid and of applying closures to successive filled cans, comprising the steps of advancing successive cans of the series along a predetermined path; filling successive cans of the series in a first portion of said path; delivering discrete closures to positions of overlap and alignment with the inlets of successive filled cans of the series of cans in a second portion of said path downstream of said first portion, including placing the closures above the inlets of the aligned filled cans; advancing successively delivered closures with the respective cans along a third portion of said path; biasing the closures against the inlets of the aligned filled cans during advancement from the second to the third portion of said path, including pressing the closures downwardly against the inlets of the aligned filled cans with a predetermined force; and sealingly connecting the closures to the overlapped filled cans in the third portion of said path.

5,050,370

## DEVICE FOR THE PACKING OF WEIGHED QUANTITIES OF ELONGATED PRODUCTS

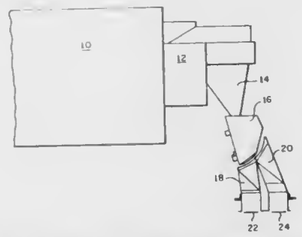
Wolfgang Stederoth, Friedberg, Fed. Rep. of Germany, assignor to Spang & Brands Maschinenfabrik GmbH & Co., Friedrichsdorf, Fed. Rep. of Germany

Filed May 22, 1990, Ser. No. 526,664

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1990, 9000612

Int. Cl.[5] B65B *39/00, 35/24;* B65G *47/18*

U.S. Cl. 53—502 4 Claims



1. In an apparatus for packing elongated products in weighed quantities, said devices comprising a weighing station with a plurality of scales, at least one packing machine, and means, including a plurality of guiding chutes for keeping the products received thereby aligned during the travel thereof downwardly through the chutes and at least one associated conveyor belt for receiving products discharged from the guiding chutes, for interconnecting the scales and the packing machines, the improvement wherein the guiding chutes are each, from the top thereof downwardly, bent or curved at least in the discharge area thereof so that a component of velocity in the direction of movement of the conveyor belt is imparted to the products during the travel thereof downwardly through the chute, and so as to prevent free fall of a product downwardly through the chute, the vertical distance between the bottom edge of the baffles defining the guiding chutes and the conveyor belt being smaller than the greatest length of a product but being sufficiently great to preclude a product from simultaneously contacting two baffles and the conveyor belt, the guiding chutes being disposed directly adjacent to each other in the direction of movement of the conveyor belt so that the rear baffle of one chute is the front baffle of the adjacent chute, the greatest width of the cross section of the chute being smaller than the length of the elongate products so that the products cannot turn when falling through the chute and so that the products thus fall onto, and lie upon, the conveyor belt lengthwise of the belt, and said apparatus providing a continuously, unobstructed opening at the lower ends of said chutes.

5,050,371

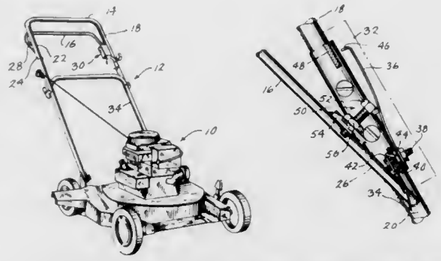
## LAWNMOWER IGNITION SHUT-OFF SWITCH

Paul A. Tharman, and John C. Schmit, both of Milwaukee, Wis., assignors to Briggs & Stratton, Wauwatosa, Wis.

Filed Sep. 21, 1990, Ser. No. 586,533

Int. Cl.[5] A01D *75/20*

U.S. Cl. 56—10.5 12 Claims



1. A lawnmower engine ignition system shut-off switch, said lawnmower including a handle assembly having a handle member and a bale lever that engages said handle member, said bale lever moving relative to said handle member between a run position and a stop position, said switch comprising:

a ground terminal attached to and in electrical connection with said lawnmower;

a flexible switch contact in electrical connection with said engine ignition system; and

tab means attached to said bale lever for moving said flexible switch contact away from said ground terminal to prevent the grounding of said engine ignition system when said bale lever is in its run position.



5,050,372

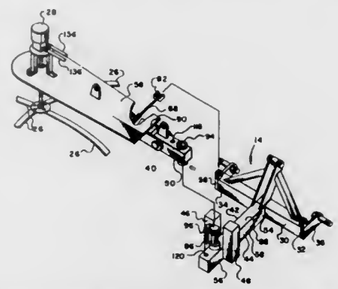
## FENCE ROW CLEANER

Merle L. Heiskell, 602 Cherry, Dalhart, Tex. 79022

Filed Jul. 11, 1990, Ser. No. 551,491

Int. Cl.[5] A01D *34/64*

U.S. Cl. 56—12.7 16 Claims



1. An agricultural fence row cleaner hitched to an agricultural tractor and comprising in combination therewith:

a. a hitch assembly connected to the tractor;

b. a cleaner frame mixed to the hitch assembly; and

c. a cutting assembly attached to the frame and having;

1. a flail shaft journalled to the cleaner frame;

2. said flail shaft having an upper shaft end and a distal shaft end;

3. at least two cutting flails attached at the distal shaft end of the claim shaft;

4. each of said cutting flails being: i. flexible ii. about two feet in length, and iii. about five pounds in weight; and

5. a power unit rotatingly connected to the flail shaft;

d. said flails being a fabric reinforced rubber bat;

e. each of said flails being about three quarters of an inch thick and about three inches wide;

f. the power unit rotates the flail shaft at varying speeds up to 600 revolutions per minute;

g. the power unit is a hydraulic motor;

h. the cutting assembly is located at a power unit end of a boom and the cutting assembly further comprises;

1. a disk fixed to the distal shaft end;

2. each cutting flail being attached to the disk;

3. the flail shaft being journalled to the boom within bearings located at a boom bottom face;

j. an extension beam fixed to the hitch assembly;

k. said extension beam being oriented so that it extends away from the tractor at the hitch assembly;

l. said extension beam being further oriented so that a center line of the extension beam is parallel to a center line of the tractor; and

m. the boom pivotally connected to the extension beam about an upright pintle axis that is perpendicular to and intersects a center line of the extension beam.

5,050,373

## MOWING APPARATUS HAVING UNIFORMLY MOVING CUTTING TEETH

Kinpei Asatsuma, Kanagawa, Japan, assignor to Komatsu Zenoah Company, Tokyo, Japan

Filed May 17, 1990, Ser. No. 524,790

Claims priority, application Japan, Nov. 18, 1988, 63-290277

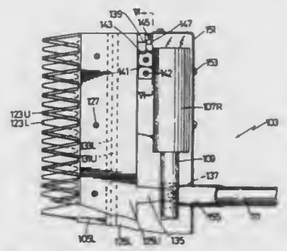
Int. Cl.[5] A01D *34/30*

U.S. Cl. 56—17.6 20 Claims

1. A mowing apparatus comprising:

a pair of first and second cutting members slidably superposed with each other, each of the cutting members including a plurality of aligned cutting teeth;

means for reciprocally moving the first cutting member relative to the second cutting member between a first position where one of the teeth of the first cutting member is superposed on one of the teeth of the second cutting member and a second position where said one of the teeth of the first cutting member is superposed on a tooth adjacent to said one of the teeth of the second cutting member in the direction of the aligned cutting teeth without decelerating the first cutting member; and



a drive source for driving the moving means.

5,050,374

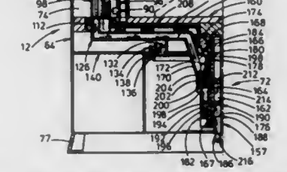
## GASIFICATION/COMBUSTION SYSTEM

John Hunter, 34 Campus Avenue, Edinburgh, EH10 6QU, Scotland

Filed Aug. 1, 1990, Ser. No. 561,619

Int. Cl.[5] F02C *3/28*

U.S. Cl. 60—39.02 20 Claims



1. A gasifier for use in a gasification system, said gasifier having fuel inlet means for being coupled to a non-gaseous fuel source and outlet means for providing fuel to a gasification location

an annular fluidised bed for retaining particles of fuel to be combusted, said bed being disposed in an annular plenum chamber,

a cylindrical outlet chamber disposed radially inwardly of said fluidised bed and in communication with said outlet means, said cylindrical outlet chamber having a base,

a central shaft to which said fluidised bed is coupled, said central shaft having an axis of rotation, said fluidised bed being rotatable about said axis of rotation of said central shaft to generate a centrifugal force which acts on the particles to be combusted,

said annular plenum chamber having oxidant inlet means for receiving an oxidant in a direction opposite to the direction of said centrifugal force whereby, in operation, particles to be gasified are retained in equilibrium in said fluidised bed, and rotation of said fluidised bed produces a fuel gas vortex travelling towards said outlet means in said outlet chamber,

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said outlet chamber having re-entrant wall reflector means for reflecting said fuel gas vortex in a direction away from said outlet means and central reflection mean disposed in said base for reflecting said fuel gas vortex to said outlet means, said wall reflector means and said central reflector means being provided to increase the residence time of particles in said gasifier and maximise the combustion and carbon conversion of said fuel particles.

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5,050,375

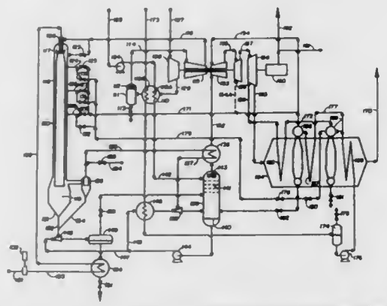
## PRESSURIZED WET COMBUSTION AT INCREASED TEMPERATURE

Norman L. Dickinson, Monte Sereno, Calif., assignor to Dipac Associates, Monte Sereno, Calif.

Continuation-in-part of Ser. No. 123,280, Nov. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 813,486, Dec. 26, 1985, Pat. No. 4,714,032. This application Jul. 21, 1989, Ser. No. 388,069

Int. Cl.[5] F02C *7/00, 3/26*

U.S. Cl. 60—39.12 21 Claims



1. A continuous process of combusting an aqueous slurry of solid fuel particles so as to provide a clean, hot, pressurized fluid for driving a gas turbine expander comprising the steps of:

pressurizing the fuel slurry;

pressurizing an oxygen-containing gas;

mixing the fuel slurry and the oxygen-containing gas in an inlet zone of an elongated combustion reactor;

permitting the fuel particles to burn in the presence of at least one atmosphere of steam while controlling the maximum temperature within a range of 1600 to 2600 degrees F, forming gaseous and solid combustion products;

cooling gaseous products, carrying entrained solid product particles, at essentially combustion pressure, to a temperature below their dewpoint, resulting in a clean gas-steam mixture and an aqueous fines slurry containing the solid particles;

reheating the gas-steam mixture to an approach to combustion temperature;

conducting the reheated mixture to the inlet of the gas turbine.

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5,050,376

## CONTROL SYSTEM FOR DIESEL PARTICULATE TRAP REGENERATION SYSTEM

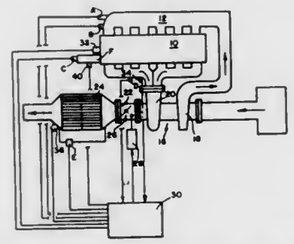
Paul M. Stiglic, Torrance; Brian C. Gabelman, Los Angeles, and James A. Hardy, Playa Del Rey, all of Calif., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Feb. 8, 1990, Ser. No. 477,019

Int. Cl.[5] F01N *3/02*

U.S. Cl. 60—274 18 Claims

1. Method of regenerating an exhaust gas particulate trap in an exhaust system for an internal combustion engine, comprising the steps of measuring the air/fuel ratio of said internal combustion engine, generating a signal representing a commanded value of the air/fuel signal corresponding to an air/fuel ratio with sufficient excess air to burn the particles stored in the trap, generating an error signal representing the difference between the measured air/fuel ratio and the commanded value of the air/fuel ratio, and controlling the air/fuel ratio of said engine as a function of said error signal, said exhaust system including a valve for regulating exhaust gas flow through said



system to thereby vary the backpressure on said engine, said step of controlling the air/fuel ratio of the engine including the step of operating said backpressure valve in response to said error signal to thereby control said air/fuel ratio by controlling the backpressure on said engine.

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5,050,377

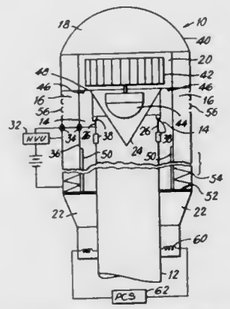
## EXHAUST EMISSION CONTROL APPARATUS

Joseph W. Eng, 216-27 31st Rd., Bayside, N.Y. 11360, assignor to Joseph W. Eng, Bayside, N.Y.

Filed Jan. 31, 1990, Ser. No. 472,960

Int. Cl.[5] F01N *3/02, 3/26*

U.S. Cl. 60—275 5 Claims



1. An exhaust control apparatus for muffling noise and treating odors and pollutants, including solid particulate and gases in the exhaust of an internal combustion engine, comprising

an exhaust inlet tube for receiving the exhaust generated by an internal combustion engine;

a cyclone barrier concentrically surrounding the exhaust inlet tube, a ring cavity between the cyclone tube and exhaust inlet tube defining a cyclone chamber in which the exhaust is treated;

means for directing the exhaust from the exhaust inlet tube into the cyclone chamber;

electrode means having a plurality of small openings through which the exhaust passes to enter the cyclone chamber, the electrode means generating electrostatic forces which charge the solid particulate in the exhaust, ionize air and generate ozone in the cyclone chamber near the electrode;

means for injecting air into the cyclone chamber causing centrifugal flow-of the air and the exhaust within the cyclone chamber and increasing a dwell time of the exhaust within the cyclone chamber;

wherein the centrifugal flow forces the solid particulate toward the outer boundary of the cyclone chamber, wherein odorous gases in the exhaust are neutralized in the cyclone chamber by reacting with the ozone, ionized air and an oxygen component of the air injected into the cyclone chamber, and wherein other gases are oxidized to form exhaust output gases;

means for collecting solid particulate separated from the exhaust in the cyclone chamber and through which the exhaust from the cyclone chamber passes to enter a muffler chamber concentrically surrounding the cyclone chamber;

an outer wall comprised of a sound damping material concentrically surrounding the cyclone chamber and defining the muffler chamber between the outer wall and the cyclone barrier, the outer wall also defining an opening through which treated exhaust exits the exhaust control apparatus;

means for increasing the flow path of the exhaust in the muffler chamber;

wherein the centrifugal flow in the cyclone chamber and the increased flow path in the muffler chamber enable a reaction time for oxidizing and deodorizing the exhaust and for returning the ozone to oxygen.



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5,050,378

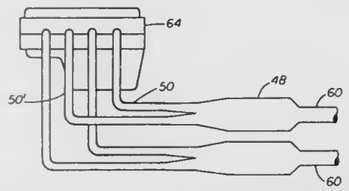
## EXHAUST RECHARGING OF A FOUR CYCLE INTERNAL COMBUSTION ENGINE

William B. Clemmens, 521 Skydale, Ann Arbor, Mich. 48105

Filed Apr. 14, 1989, Ser. No. 337,917

Int. Cl.[5] F02B *27/02*

U.S. Cl. 60—313 30 Claims



1. In a four cycle internal combustion engine comprising at least one combustion chamber and means to expand and contract the combustion chamber, separate intake and exhaust conduit means in fluid communication with the combustion chamber, at least one intake valve in the intake conduit means and at least one exhaust valve in the exhaust conduit means, and means to open and close said valves in timed sequence with the expansion and contraction of the combustion chamber,

the improvement comprising expansion means to draw a portion of an intake charge into the exhaust conduit means, downstream reflective means in the exhaust conduit means to cause a compression wave in the exhaust gases to be reflected back upstream to the exhaust valve and timing means to open the exhaust valve when the intake valve has effectively closed and thereby permit the reflected compression wave to force the re-entry of the intake charge in the exhaust conduit means back into the combustion chamber through the open exhaust valve with the reverse flow re-entry intake charge thereby increasing the charge and pressure in the combustion chamber.

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5,050,379

## DISPLACEMENT OF A VARIABLE DISPLACEMET HYDRAULIC PUMP AND SPEED OF AN ENGINE DRIVING THE PUMP CONTROLLED BASED ON DEMAND

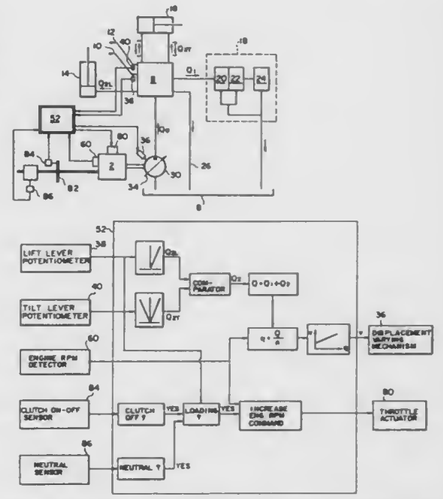
Katsumi Nagai; Teruyuki Nishimyou, both of Kariya; Masataka Osawa, Nagoya, and Hitoshi Ban, Oobu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, both of, Japan

Filed Aug. 23, 1990, Ser. No. 571,732

Claims priority, application Japan, Aug. 25, 1989, 1-219686; Sep. 5, 1989, 1-228336

Int. Cl.[5] F16D *31/00*

U.S. Cl. 60—368 16 Claims




9. A hydraulic fluid flow control apparatus used for a hydraulic system for an industrial vehicle having a hydraulic pump, an engine for driving said hydraulic pump, a transmission for converting the output of said engine into driving power of the vehicle, a clutch for connecting or turning on, or disconnecting or turning off power between said engine and said transmission, at least one loading/unloading hydraulic unit, and a control valve for supplying or discharging hydraulic fluid to be pumped by said hydraulic pump from or to said loading/unloading hydraulic unit, and a control lever for operating said control valve, said hydraulic fluid flow control apparatus comprising:

a variable displacement type hydraulic pump

a lever operating degree detector for detecting the degree of operation of said control levers;

an engine speed detector for detecting the speed of said engine;

a clutch ON-OFF detector for detecting the ON-OFF state of said clutch;

a neutral detector for detecting when said transmission is in neutral;

a controller for determining a quantity of hydraulic fluid necessary for loading/unloading operations based on a signal from said lever operation degree detector, determining a discharge capacity of hydraulic fluid per revolution of said hydraulic pump so as to increase the discharge quantity of hydraulic fluid from said hydraulic pump by said determined quantity, outputting a signal corresponding to said determined discharge capacity, and outputting

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a signal for raising the speed of said engine to a predetermined value based on signals from said engine speed detector and said lever operating degree detector when said controller determines based on signals from said clutch ON-OFF detector or said neutral detector and said lever operating degree detector that said clutch is OFF or said transmission is in neutral and that said control lever is being operated;

means for varying the discharge capacity of hydraulic fluid per revolution of said hydraulic pump based on a signal from said controller so as to obtain said determined discharge capacity; and

a throttle actuator for regulating fuel supplied to said engine so as to raise the speed of said engine to a predetermined value based on a signal from said controller.

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**5,050,380**

**MEANS FOR RECEIVING AND SUBSEQUENTLY EMPTYING HYDRAULIC FLUID FROM A HYDRAULIC SYSTEM**

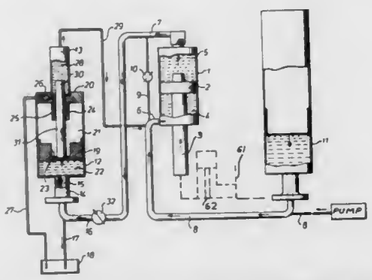
**Allan Jonsson, Kil, Sweden, assignor to Kamyr Aktiebolag, Karlstad, Sweden**

**Filed Aug. 20, 1990, Ser. No. 569,444**

**Claims priority, application Sweden, Sep. 1, 1989, 8902892**

**Int. Cl.[5] F16D** *31/02*

**U.S. Cl. 60—413** **11 Claims**



1. A means for receiving and subsequently emptying hydraulic fluid from a hydraulic system comprising a working cylinder; a supply conduit disposed between a pump and the working cylinder for supplying hydraulic fluid at high pressure within a predetermined interval; a receiving cylinder with a piston which on one side defines a space for the receipt of hydraulic fluid from said working cylinder with an emptying pressure essentially lower than said high pressure, and on the other side defines a chamber containing gas at low pressure; a high-pressure cylinder with a liquid space and a device movable therein to alter the liquid volume, said liquid space being connected to said supply conduit to receive and return hydraulic fluid at high pressure therefrom and thereto, respectively; and a piston rod disposed between said liquid volume altering device in said high-pressure cylinder and said piston in said receiving cylinder to transmit movements from said liquid volume altering device to said piston and reversed, the area of said piston in said receiving cylinder which is pressure-influenced by hydraulic fluid, being essentially greater than the area of said liquid volume altering device which is pressure-influenced by hydraulic fluid.

**5,050,381**

**MASTER CYLINDER WITH ADJUSTABLE LEVERAGE**

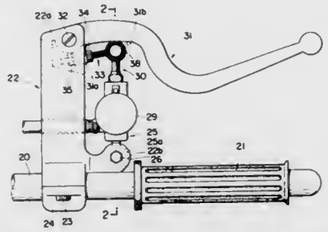
**Isao Matsuno, and Masayuki Seki, both of Nagano, Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan**

**Filed Sep. 11, 1990, Ser. No. 580,744**

**Claims priority, application Japan, Sep. 13, 1989, 1-107610[U]; Sep. 18, 1989, 1-108726[U]; Jan. 23, 1990, 2-5018[U]**

**Int. Cl.[5] B60T** *11/30;* **F15B** *7/10*

**U.S. Cl. 60—584** **5 Claims**



1. A master cylinder apparatus for a vehicle comprising:

a bracket attached to a bar type steering handle;

a master cylinder having one end pivoted on said bracket;

a piston fitted movable in a liquid tight manner in said master cylinder;

an operating lever pivoted on said bracket by a support shaft;

an adjust bolt provided thrustable forward and backward to said operating lever; and

a push rod having one end abutting on a rear end of said piston and an other end abutting on an operating portion of said operating lever and pivoted on a free end of said adjust bolt.

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**5,050,382**

**TANDEM MASTER CYLINDER FOR HYDRAULIC BRAKE SYSTEMS**

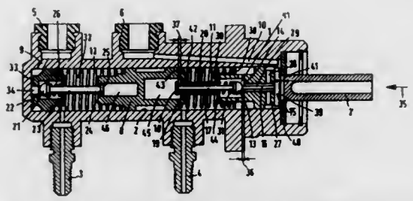
**Jochen Burgdorf, Offenbach-Rumpenheim; Hans-Dieter Reinartz, Frankfurt am Main, and Helmut Steffes, Hattersheim, all of Fed. Rep. of Germany, assignors to ALfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Oct. 12, 1989, Ser. No. 420,187**

**Claims priority, application Fed. Rep. of Germany, Oct. 18, 1988, 3835382**

**Int. Cl.[5] B60T** *11/20, 11/232*

**U.S. Cl. 60—589** **6 Claims**



1. A tandem master cylinder for a hydraulic brake system for an automotive vehicle, said cylinder comprising:

a housing having a longitudinal bore;

a push rod piston movable within said bore along said bore;

a floating piston movable within said bore along said bore; and a valve within said push rod piston having:

(a) a valve closure member having a first face and a second face,

(b) a valve seat,

(c) a pull member disposed between said first face of said valve closure member to which it is rigidly connected and said floating piston, said pull member including a stop which engages said floating piston to pull said valve closure member off said valve seat when said brake system is in an anti-locking control mode, and

(d) a push member including a first end adapted to engage said second face of said valve closure member and a transverse stop adapted to abut against said housing on its opposite end, said transverse stop abutting against said housing and causing said first end of said push member to push said valve closure member off said valve seat when said brake system is in a release position.

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**5,050,383**

**HYDRAULIC PRESSURE CONTROL VALVE**

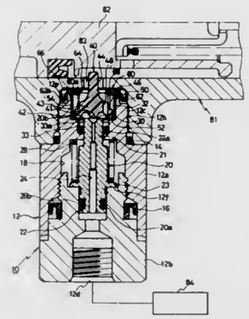
**Ken Nakaharai, Yokosuka, Japan, assignor to Nippon Air Brake Co., Ltd., Hyogo, Japan**

**Filed Feb. 6, 1990, Ser. No. 475,712**

**Claims priority, application Japan, Feb. 14, 1989, 1-16152[U]**

**Int. Cl.[5] B60T** *11/28;* **F15B** *7/08*

**U.S. Cl. 60—589** **18 Claims**



1. A hydraulic pressure control valve for use with a master cylinder having a piston therewithin, said master cylinder having a discharge section for hydraulic fluid, said hydraulic pressure control valve comprising:

a valve body having, at one end thereof, an attaching section for said discharge section of said master cylinder and, at the other end, a piping connecting section;

a valve chamber formed in said attaching section of said valve body and opening to said discharge section of said master cylinder;

a stepped bore formed in said valve body for communication between said valve chamber and said piping connecting section of said valve body;

an annular recess formed in said valve body at a location of an end of said stepped bore, which opens to said valve chamber;

a stepped piston arranged within said stepped bore for sliding movement therealong, said stepped piston being formed therein with a communication bore for communication between said valve chamber and said piping connecting section of said valve body;

preload spring means arranged within said valve body for biasing said stepped piston toward said piping connecting section of said valve body;

a valve seat formed in said stepped piston at a location of an end of said communication bore therein, which opens to said valve chamber;

a valve element arranged within said valve chamber for movement therewithin, in facing relation to said valve seat, said valve element having stud means which extends to an interior of said master cylinder and which receives, from said piston within said master cylinder, such a force as to cause said valve element to fall down, said valve element further including a valve section at an opposite center and a leg portion surrounding said valve section;

valve spring means arranged within said valve chamber for biasing said valve element so as to be seated against said valve seat;

seal means arranged within said annular recess for sealing between said stepped piston and said valve body; and

annular preventing means formed separately from said valve element and said valve body, said annular preventing means being arranged between said valve element and the end of said stepped bore, which opens to said valve chamber, said annular preventing means substantially covering an annular end of said annular recess, which opens to said valve chamber, for preventing said seal means from coming out of said annular recess; wherein said leg portion of said valve element is normally seated against said annular preventing means; and

restricting means arranged within said valve chamber and extending from said annular preventing means toward an end of said valve chamber, which opens to said discharge section of said master cylinder, for restricting movement of said valve element within said valve chamber, to a predetermined range;

wherein said annular preventing means and said restricting means cooperate with each other to form a single integral tubular member which has, at its one end, a flange serving as said annular preventing means, and a tubular peripheral-wall section serving as said restricting means, said flange extending radially inwardly from one end of said tubular peripheral-wall section.

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**5,050,384**

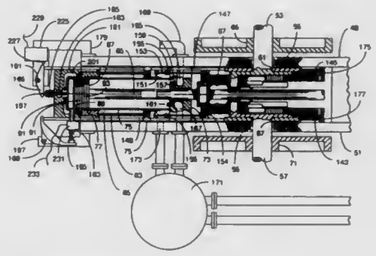
**TWO-STROKE CYCLE INTERNAL COMBUSTION ENGINE**

**Ivan L. Crockett, 2004 Lexington, San Mateo, Calif. 94402**

**Continuation of Ser. No. 149,413, Jan. 29, 1988, abandoned. This application Nov. 8, 1989, Ser. No. 434,540**

**Int. Cl.[5] F02B** *37/00, 33/12, 41/04, 75/32*

**U.S. Cl. 60—605.1** **10 Claims**



1. A power plant comprising:

an internal combustion engine comprising:

a first cylinder having a first closure means for closing said cylinder at one end and a second closure means for closing said cylinder at the other end;

a first piston closely fitted in said first cylinder and movable therein, said first piston and said first closure means forming a first combustion chamber of varying volume as said first piston moves in said first cylinder, and said first piston and said second closure means forming a first air pumping chamber of varying volume as said first piston moves in said first cylinder;

first connecting rod means associated with said first piston, said first connecting rod means having a first end connected to said first piston and said first connecting rod means passing through a seal means in said second closure means;

crank means for converting linear motion of said first piston into rotary motion, a second end of said first connecting rod means rotatably connected to said crank means, said crank means constraining the motion of said

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first piston to reciprocate in said first cylinder with a first stroke length, one end of said stroke near said first closure means, that end of stroke being top dead center, the other end of said stroke being bottom dead center;

shaft means for conducting rotary power outside said internal combustion engine, said shaft means associated with said crank means such that rotary motion of said crank means induces rotary motion of said shaft means;

first air-intake valve means for controlling flow of air for combustion into said first combustion chamber, said air-intake valve means connected by air passage means to said air pumping chamber and having an opening into said first combustion chamber adjacent said piston when said piston is at bottom dead center, said air pumping chamber being connected to an air-inlet passage by a one-way in-valve directed into said air pumping chamber, and said air pumping chamber being connected to said air passage means by a one-way out valve directed out of said air pumping chamber;

first fuel injection means for introducing combustible fuel into the air flowing into said first combustion chamber;

first exhaust valve means in said first closure means for porting said first combustion chamber to an exhaust manifold means, said first exhaust valve means opening at the same time in operation that said first air-intake valve means opens, and closing at a point in time that said first piston is moving in said first cylinder toward said first closure means, the portion of said stroke of said first piston toward said first closure means with said exhaust valve means closed being a compression stroke, and the portion of said stroke of said first piston toward said first closure means with said exhaust valve means open being an exhaust stroke, the stroke in the opposite direction being a power stroke; and

control means for varying the time of closing of said first exhaust valve means to cause the absolute pressure in said combustion chamber at the end of said power stroke to be substantially the same as said pressure in said air pumping chamber at the end of said power stroke, so that said power stroke is substantially longer than both the compression stroke and the exhaust stroke.

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**5,050,385**

## INNER CYLINDER FOR A GAS TURBINE COMBUSTOR REINFORCED BY BUILT UP WELDING

**Fumiyuki Hirose, and Nobuyuki Iizuka, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 891,133, Jul. 31, 1986, abandoned, which is a continuation of Ser. No. 832,123, Feb. 24, 1986, abandoned, which is a continuation of Ser. No. 691,905, Jan. 16, 1985, abandoned, which is a continuation of Ser. No. 537,846, Sep. 30, 1983, abandoned. This application Jun. 22, 1990, Ser. No. 541,946**

**Claims priority, application Japan, Oct. 6, 1983, 57-174601**

**Int. Cl.[5] F02C *1/00***

**U.S. Cl. 60—757** **2 Claims**

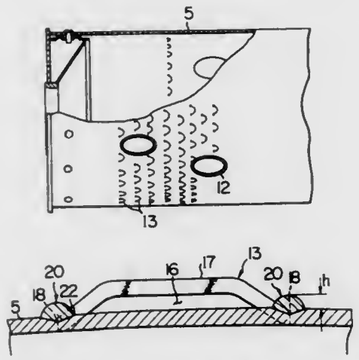
1. A gas turbine combustor comprising:

an outer cylinder;

an inner cylinder disposed within said outer cylinder to define therebetween a predetermined annular space through which combustion air and cooling air pass;

a plurality of air inlets provided in a peripheral wall of said inner cylinder through which cooling air is introduced into said inner cylinder to cool said peripheral wall of said inner cylinder, each of said air inlets being defined between two peripheral wall portions of said inner cylinder separated from each other by an arcuate slit, one of said peripheral portions is radially disaligned with respect to the other peripheral wall portion so as to form said air inlet and provide keen cut edges at opposite ends of the arcuate slit and;

a built-up weldment welding cracks formed at each of said keen cut edges due to the disalignment of said peripheral wall portions provided at the respective keen cut edges, a molten metal of said built-up weldment having a substantially hemispherical shape and protruding outwardly from said inner cylinder, wherein said built-up weldment is formed of the same material as said inner cylinder, a height of the respective built-up weldment gradually




decreases as a distance from the respective keen edges decreases so as to enable a stress absorption in a radial direction, and wherein a center of said substantially hemispherical shape is located on the respective keen cut edges so as to enable the cooling air to be smoothly introduced into the inner cylinder.

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**5,050,386**

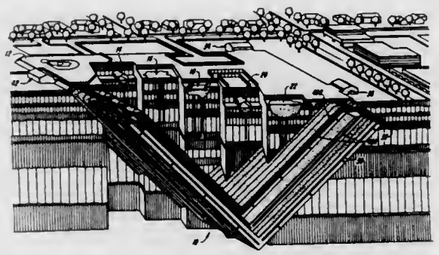
## METHOD AND APPARATUS FOR CONTAINMENT OF HAZARDOUS MATERIAL MIGRATION IN THE EARTH

**Ronald K. Krieg, Blaine, and John A. Drumheller, Issaquah, both of Wash., assignors to RKK, Limited, Bellevue, Wash.**

**Continuation-in-part of Ser. No. 392,941, Aug. 16, 1989, Pat. No. 4,974,425, which is a continuation-in-part of Ser. No. 281,493, Dec. 8, 1988, Pat. No. 4,860,544. This application Jul. 31, 1990, Ser. No. 560,147**

**Int. Cl.[5] F17C *1/00***

**U.S. Cl. 62—45.1** **24 Claims**



1. A method for reversibly freezing a predetermined volume extending downward beneath a surface region of the Earth, and for establishing, and removing at least one substantially frustum-shaped cell extending downward from said surface region and within said volume, the method comprising the steps of:

A. establishing an array of elongated heat transfer devices extending downward from spaced-apart locations throughout said surface region, said array including a first subset of said devices positioned on the lateral surfaces of said cell, and including a second subset of said devices positioned at least within said cell,

B. establishing a relatively low temperature on the outer surface of said heat transfer devices of said second set, whereby the water in the portions of the Earth adjacent to said heat transfer devices of said second set freezes to establish ice columns extending axially along and radially bout the central axes of said heat transfer devices of said second set, wherein the position of said central axes, the radii of said columns, and the lateral separations of said heat transfer devices of said second set are selected so that adjacent columns overlap, said overlapping columns collectively filling at least the periphery of said cell to establish a frozen volume substantially containing at least the Earth therein,

C. establishing a relatively high temperature on the surface of said heat transfer devices of said first set, whereby the water in the portions of the Earth adjacent to said heat transfer devices of said first set and along the lateral surfaces of said cell is substantially unfrozen, said unfrozen portions of the Earth defining the lateral surfaces of said cell,

D. removing said cell from said volume by lifting said cell from its in situ position in said volume.



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**5,050,387**

## METHOD AND CONTAINER FOR STORING AND DISTRIBUTION OF FOODSTUFFS

**Hans Bruce, Stockholm, Sweden, assignor to Pallet-Cooler KB, Märsta, Sweden**

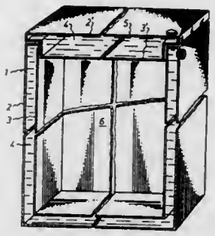
**PCT No. PCT/SE89/00080, § 371 Date Jul. 30, 1990, § 102(e) Date Jul. 30, 1990, PCT Pub. No. WO89/08061, PCT Pub. Date Sep. 8, 1989**

**PCT Filed Feb. 24, 1989, Ser. No. 476,480**

**Claims priority, application Sweden, Mar. 2, 1988, 8800743**

**Int. Cl.[5] B65B *63/08***

**U.S. Cl. 62—60** **9 Claims**



1. A method for maintaining an intended temperature at or close to 0° C. in a product affected by variations in temperature, during transport and storage at an ambient temperature deviating from 0° C., while using a product holding container having walls, lid and bottom comprising:

freezing a multitude of integrated compartments which contain water or a water mixture and are arranged within the container walls, bottom and lid, so as to provide a water-tight assembly during transport and storage of the product;

inserting products having the intended temperature through an opening in said container and into a product receiving space after freezing said compartments;

arranging said walls, bottom, and lid such that said opening in said container is closed and said integrated compartments, with frozen water or water mixture, together provide a frozen water-containing confinement which encloses the product-receiving space from all sides.

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**5,050,388**

## RECLAIMING OF REFRIGERANT FLUIDS TO MAKE SAME SUITABLE FOR REUSE

**Joseph J. Packo, St. Simons Island, Ga., assignor to American Patent Group, St. Simons Island, Ga.**

**Continuation-in-part of Ser. No. 515,482, Apr. 27, 1990. This application Jun. 4, 1990, Ser. No. 532,862**

**Int. Cl.[5] F25B *45/00***

**U.S. Cl. 62—77** **14 Claims**

1. In a method for the recycling and/or reclamation of a refrigerant fluid which has been removed from an air conditioning or refrigeration unit, comprising passing said refrigerant through a reclamation and/or decontamination circuit in which moisture, acid and other contaminants are removed, the improvement comprising

injecting into said refrigerant fluid a moisture-removing liquid in an amount sufficient to reduce the moisture content of said refrigerant to below 20 ppm.

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**5,050,389**

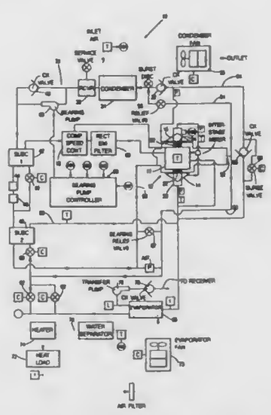
## REFRIGERATION SYSTEM WITH OILESS COMPRESSOR SUPPORTED BY HYDRODYNAMIC BEARINGS WITH MULTIPLE OPERATION MODES AND METHOD OF OPERATION

**David B. Wigmore, San Diego; John C. Lentz, Poway; Edward S. Blain, and Peter D. Waters, both of San Diego, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.**

**Filed Jul. 10, 1990, Ser. No. 550,432**

**Int. Cl.[5] F25B *43/02***

**U.S. Cl. 62—84** **27 Claims**



1. A refrigeration system having a compressor rotor rotatably supported by a plurality of hydrodynamic bearings lubricated by oiless pressurized liquid refrigerant and pressurizing refrigerant which flows to a condenser providing liquid refrigerant which flows to an evaporator in fluid communication with the condenser and the compressor comprising:

a refrigerant circuit, coupled to the compressor, for providing pressurized liquid refrigerant to the hydrodynamic bearings from the compressor and to the evaporator;

a bearing pump, coupled to the refrigerant circuit and to the condenser, for providing pressurized refrigerant to the refrigerant circuit;

a first temperature sensor sensing a temperature Tsink of a heat exchange fluid at the condenser and providing a temperature signal representative of the temperature Tsink of the heat exchange fluid at the condenser;

a second temperature sensor sensing a temperature Tsource of a heat exchange fluid at the evaporator and providing a temperature Tsource signal representative of the temperature of the heat exchange fluid at the evaporator; and

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a controller, coupled to the temperature sensors, for controlling activation of the compressor, and bearing pump as a function of the temperature signals representative of Tsink and Tsource to provide for three modes of operation with the first mode of operation being activation of only the compressor, the second mode of operation being activation of the bearing pump and the compressor and the third mode of operation being activation of only the bearing pump.

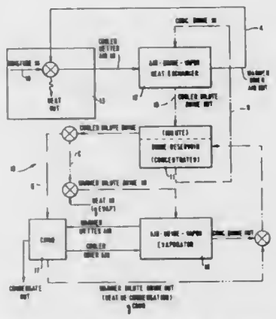
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**5,050,390**

## METHOD OF AND MEANS FOR CONTROLLING THE CONDITION OF AIR IN AN ENCLOSURE

**Gad Assaf, Rehovat, Israel, assignor to Geophysical Engineering Company, Seattle, Wash.**

**Continuation of Ser. No. 600,882, Apr. 16, 1984, Pat. No. 4,803,846. This application Feb. 13, 1989, Ser. No. 309,159**
**Int. Cl.[5] F25D *17/06***
**U.S. Cl. 62—94** **27 Claims**



1. Apparatus for conditioning air in an enclosure comprising:
a) a reservoir of brine;
b) a first direct contact air-brine-vapor heat exchanger and a brine evaporator in the form of a second, direct contact air-brine-vapor heat exchanger;
c) a brine circulation system including pump means for exchanging brine between the reservoir and the first heat exchanger, and between the reservoir and the evaporator;
d) a condenser operatively associated with the evaporator;
e) a primary air circulation system for exchanging air between the heat exchanger and the enclosure for drying the air contacted in the heat exchanger;
f) means for conveying air from the evaporator to the condenser for evaporating water from the brine contacted in the evaporator;
g) means for transferring the heat of vaporization of water evaporated from the brine in the evaporator to the air in the enclosure; and
h) means for heating the air conveyed to the condenser prior to contact of this air with the brine in the evaporator.

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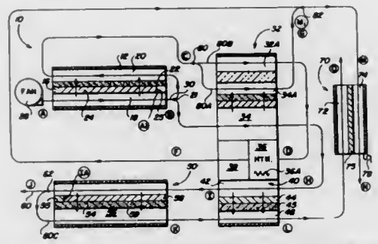
**5,050,391**

## METHOD AND APPARATUS FOR GAS COOLING

**Alexandre Tsimerman, Odessa, U.S.S.R., assignor to Ari-Tec Marketing, Inc., Phoenix, Ariz.**

**Filed Jan. 18, 1991, Ser. No. 642,897**
**Int. Cl.[5] F25D *17/06***
**U.S. Cl. 62—94** **21 Claims**

1. A process for treating a total stream of gas to condition the same comprising:
(a) treating the total gas stream in initial heat exchange zone by flowing the total gas along a first moisture-impervious surface to extract heat at substantially constant moisture conditions to produce a dry cooled gas in a first stage;
(b) diverting a portion of the total stream of dry cooled gas to establish a secondary gas flow and a primary gas flow;
(c) directing the secondary gas flow in a secondary heat exchange zone counter-currently to the total gas stream along an absorbent surface adjacent said first moisture-impervious surface in heat exchange relationship with said total flow to heat and humidify said secondary gas flow;
(d) directing the primary stream of dry cooled gas through a sorbent zone to heat and dehumidify same in a second stage treatment;



(e) directing the heated dehumidified primary gas flow from said sorbent zone to a dry cooling chamber in a final heat exchange zone along a moisture impervious surface to extract heat therefrom to cause dry cooling at substantially constant moisture conditions to produce a dry cooled gas; and
(f) diverting a portion of the gas exiting the final heat exchanger and directing it countercurrently to the flow in the cooling chamber of the final heat exchange stage in a secondary final stage wherein said flow is along an absorbent surface opposite said final exchanger impervious surface.

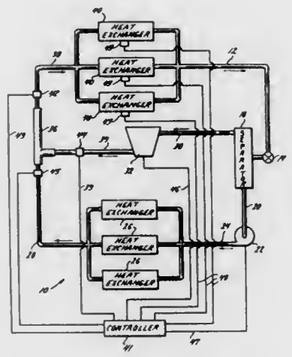
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**5,050,392**

## REFRIGERATION SYSTEM

**Craig S. Messmer, St. Louis, and Glenn A. Anderson, St. Charles, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.**

**Filed Jun. 8, 1990, Ser. No. 535,317**
**Int. Cl.[5] F25B *1/00***
**U.S. Cl. 62—114** **19 Claims**




1. A closed cooling system, comprising:
a) a refrigerant for circulating within the closed system;
b) a coolant for circulating within the closed system;
c) a means for separating the refrigerant from the coolant;
d) a pump means coupled to the separating means for providing motive force to the coolant;
e) a plurality of first heat exchange means connected downstream of the pump means for allowing the coolant to absorb heat from a cooling load;
f) a compression means coupled to the separating means for increasing the pressure of a vapor of a refrigerant;
g) a means, connected to both the compression means and the first heat exchange means, for mixing the vapor of the refrigerant and the coolant so as to condense the refrigerant vapor to a liquid;
h) a plurality of second heat exchange means, coupled downstream of the mixing means, for releasing heat from a mixture of the liquid refrigerant and the coolant to a heat sink; and
i) a means, interconnected between the second heat exchange means and the separating means, for decreasing the pressure of a mixture of the liquid refrigerant and the coolant so as to vaporize the liquid refrigerant.



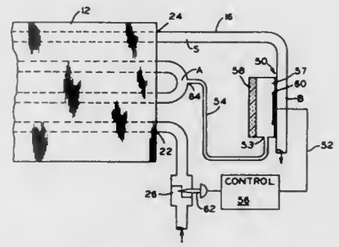
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**5,050,393**

## REFRIGERATION SYSTEM WITH SATURATION SENSOR

**Ralph S. Bryant, Brentwood, Tenn., assignor to Inter-City Products Corporation (U.S.A.), LaVergne, Tenn.**

**Filed May 23, 1990, Ser. No. 527,530**
**Int. Cl.[5] F25B *1/00, 41/00***
**U.S. Cl. 62—115** **11 Claims**




1. A refrigeration system comprising:
a compressor;
an evaporator, said evaporator including an inlet, and an outlet;
a suction line connected to said outlet;
a control means for controlling the saturation condition of refrigerant in said evaporator, said control means including a reservoir having an inlet, a conduit connecting said reservoir inlet to said evaporator at a point intermediate said evaporator inlet and outlet, said reservoir mounted in substantial heat exchange relationship with said suction line whereby the superheat level in said suction line controls the level of liquid refrigerant in said reservoir and said control means controls the location of the saturation point in said evaporator.

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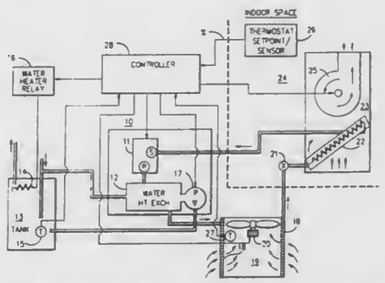
**5,050,394**

## CONTROLLABLE VARIABLE SPEED HEAT PUMP FOR COMBINED WATER HEATING AND SPACE COOLING

**Kevin F. Dudley, Cazenovia; Lowell E. Paige, Pennellville, and Kevin B. Dunshee, Syracuse, all of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.**

**Filed Sep. 20, 1990, Ser. No. 585,386**
**Int. Cl.[5] F25B *40/04***
**U.S. Cl. 62—115** **10 Claims**

1. A heat pump system that is capable of providing cooling to an environmental comfort zone and also providing water heating, wherein said heat pump system includes a compressor that is controlled as a function of cooling load imposed on the system; a water heat exchanger receiving a compressed refrigerant from said compressor for heating water by transfer of heat from said compressed refrigerant fluid; an outdoor heat exchanger having an outdoor fan and an outdoor condenser coil receiving the compressed refrigerant from said water heat exchanger for transfer of heat to outdoor air from the refrigerant fluid; an indoor heat exchanger having an indoor evaporator coil receiving the refrigerant fluid from the outdoor coil for transfer of heat from air in said environmental comfort zone to the refrigerant fluid, the refrigerant fluid returning from the indoor coil to an intake of said compressor; thermostat means for establishing a setpoint temperature for said comfort zone, sensing the temperature in said comfort zone, and providing a cooling load signal indicative of a cooling load that is a function of said comfort zone temperature; sensor means providing a water temperature signal having a value representing the temperature of the water heated by said water heat exchanger; outdoor coil temperature sensor means providing an outdoor coil temperature signal having a value representing the temperature of said outdoor coil; and controller means having inputs coupled to said thermostat means, said water temperature




sensor means, and said outdoor coil temperatures sensor means and outputs connected to said compressor and to said outdoor fan; the controller being operative to compare said cooling load signal with a preset cooling load value; to compare said water temperature signal with predetermined desuperheating temperature value; to compare said outdoor coil temperature signal with a predetermined pressure limit temperature value; to operate said system in a water heat exchanger full condensation mode when said cooling load signal is below said preset cooling load value, said water temperature signal is below said desuperheating temperature value, and said outdoor coil temperature signal is below said predetermined limit temperature value, but to operate the system in a water heat exchanger desuperheating mode under all other conditions of said cooling load signal, said water temperature signal, and said outdoor coil temperature signal; in said full condensation mode said controller holding said outdoor fan off; and in said desuperheating mode said controller energizing said outdoor fan.

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**5,050,395**

## METHOD OF SWITCHING AN AIR CONDITIONER OF A MOTOR VEHICLE

**Joachim Berger, Winterbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

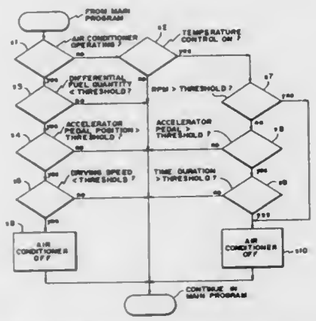
**Filed Apr. 30, 1990, Ser. No. 516,724**
**Claims priority, application Fed. Rep. of Germany, May 2, 1989, 3914445**
**Int. Cl.[5] B60H *1/32***
**U.S. Cl. 62—133** **7 Claims**

1. A method for switching on an air conditioner of a vehicle having an internal combustion engine in dependence upon special conditions when a temperature switch-on condition is fulfilled for the air conditioner, the method comprising the steps of:
computing the difference between the actual permissible full-load fuel quantity of the engine and the actual available no-load fuel quantity of the engine;
determining the actual accelerator pedal position; and,

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switching off the air conditioner when said difference is less than a predetermined minimal difference and said pedal




position simultaneously exceeds a switch-off threshold value.

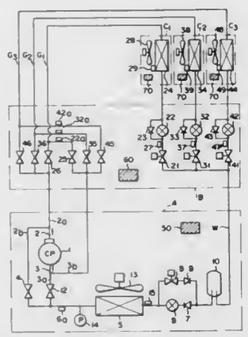
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**5,050,396**

## MULTI-SYSTEM AIR CONDITIONING MACHINE

**Seizi Ohkoshi, and Eiji Kuwahara, both of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 23, 1990, Ser. No. 483,819**
**Claims priority, application Japan, Feb. 27, 1989, 1-45739; Feb. 27, 1989, 1-45740**
**Int. Cl.[5] F25B *13/00***
**U.S. Cl. 62—160** **11 Claims**



1. A multi-system air conditioning machine comprising:
an outdoor unit including a compressor for drawing, compressing, and delivering a refrigerant, an outdoor heat exchanger for exchanging heat of the supplied refrigerant and heat of outer air, and an outdoor fan for circulating the outer air in said outdoor heat exchanger;
a plurality of indoor units each including an indoor heat exchanger for exchanging the heat of the supplied refrigerant and heat of inner air, and an indoor fan for circulating the inner air in said indoor heat exchanger, for requesting a cooling operation mode and a cooling capability or a heating operation mode and a heating capability;
means for supplying the refrigerant delivered from said compressor to said outdoor heat exchanger, supplying the refrigerant to one or said plurality of indoor units which request a cooling operation mode, and returning the refrigerant to said compressor when a total cooling capability requested from one or said plurality of indoor units is larger than a total heating capability requested from the remaining one or plurality of indoor units;
means for supplying a part of the refrigerant delivered from said compressor to one or said plurality of indoor units which request a heating operation mode to cause the part of refrigerant to join the flow of the refrigerant to one or said plurality of indoor units which request a cooling operation mode, when a total cooling capability requested from one or said plurality of indoor units is larger than a total cooling capability requested from the remaining one or plurality of indoor units;
means for supplying the refrigerant delivered from said compressor to one or said plurality of indoor units which request a heating operation mode, supplying the refrigerant to said outdoor heat exchanger, and returning the refrigerant to said compressor, when a total heating capability requested from one or said plurality of indoor units is larger than a total cooling capability requested from the remaining one or plurality of indoor units;
means for supplying a part of the refrigerant supplied from one or said plurality of indoor units which request a heating operation mode to one or said plurality of indoor units which request a cooling operation mode, and returning the refrigerant to said compressor, when a total heating capability requested from one or said plurality of indoor units is larger than a total cooling capability requested from the remaining one or plurality of indoor units;
first detecting means for detecting a degree of superheat or supercool of the refrigerant in said outdoor heat exchanger;
regulating means for regulating an amount of refrigerant supplied to said outdoor heat exchanger to set a detection result of said first detecting means to be constant;
second detecting means for detecting a pressure or temperature of the refrigerant in said outdoor heat exchanger; and
controlling means for controlling a speed of said outdoor fan to set a detection result of said second detecting means to be constant.

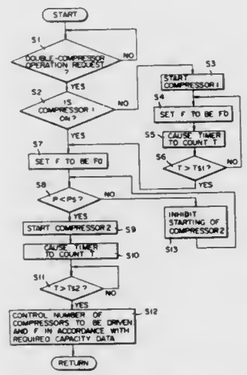
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**5,050,397**

## AIR CONDITIONER APPARATUS WITH STARTING CONTROL FOR PARALLEL OPERATED COMPRESSORS BASED ON HIGH PRESSURE DETECTION

**Akiyoshi Sugiyama; Tsunetoshi Inoue, and Norihisa Hasegawa, all of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jun. 19, 1990, Ser. No. 540,273**
**Claims priority, application Japan, Jul. 28, 1989, 1-195715**
**Int. Cl.[5] F25B *5/02***
**U.S. Cl. 62—175** **5 Claims**




1. A multi-type air-conditioner apparatus comprising:
an outdoor unit comprising at least two compressors, at least one of said compressors being a variable-capacity compressor, and an outdoor heat exchanger coupled to said two compressors;
a plurality of indoor units each including at least one heat exchanger and means for outputting required capacity data in accordance with an air-conditioning load, for at least a heating operation, of said indoor heat exchanger;
a distribution unit for parallel-coupling said plurality of indoor units to said outdoor unit to form a plurality of refrigeration cycles for at least said heating operation, said distribution unit including a plurality of refrigerant flow rate control means for the respective refrigeration cycles;
pressure detecting means for detecting a high-pressure-side pressure of the refrigeration cycle;
first control means for supplying flow rate control commands to said refrigerant flow rate control means of said distribution unit, respectively, in accordance with said required capacity data for said heating operation from said plurality of indoor units, and for controlling a number of said compressors to be driven and an operating frequency of said variable-capacity compressor in accordance with a sum of the required capacity data;
second control means for sequentially starting said two compressors at intervals to shorten a rising time of said heating operation and controlling said compressors in a parallel operation state for a predetermined period of time regardless of the required capacity data when the heating operation is started; and
third control means comprising:
means for fetching pressure data from said pressure detecting means and comparing the pressure data with a reference value, after said first compressor is started and prior to starting said second compressor, when said two compressors are to be sequentially started at the intervals established by said second control means,
means for providing a command for allowing start of operation of said second compressor to said second control means when the pressure data is determined by said comparing means to be equal to or higher than the reference value, and
means for providing a command for inhibiting start of operation of said second compressor to said second control means when the pressure data is determined by said comparing means to be equal to or higher than the reference value,
said third control means eliminating stopping of the two compressors and frequent ON and OFF operation of said second compressor when said air-conditioner apparatus is overloaded and said high-pressure-side pressure is extraordinarily increased.



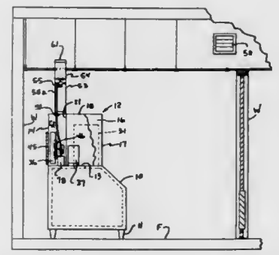
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**5,050,398**

## ICE MAKING MACHINE WITH REMOTE VENT

**Robert C. Lane, Rockford, Ill., and Joseph M. Lee, Houston, Tex., assignors to Specialty Equipment Companies, Inc., Rockton, Ill.**

**Filed Sep. 4, 1990, Ser. No. 577,198**
**Int. Cl.[5] F25B *39/04***
**U.S. Cl. 62—183** **9 Claims**



1. A self-contained ice making machine including a cabinet having a bottom, side walls extending upwardly from the bottom and a top wall, partition means dividing the cabinet into first and second separate compartments, ice making means including evaporator means in the first compartment, compressor means and air cooled condenser means in the second compartment and connected in a refrigeration system with the evaporator means in the first compartment, the cabinet having air inlet means in one of the side walls for communicating the second compartment with a room in which the ice making machine is installed, condenser cooling fan means in the second compartment for drawing air through the air inlet means and through the condenser means into the second compartment, the cabinet having an air discharge opening communicating with the second compartment, vent pipe means connected to the air discharge opening for venting the second compartment outside of a room in which the ice making machine is installed, exhaust fan means in the vent pipe means for exhausting air from the second compartment through the vent pipe means, and circuit means for controlling operation of said compressor means and said condenser means and said exhaust fan means, the circuit means including means for turning the condenser cooling fan means on and off to control compressor discharge pressure, and means for operating said exhaust fan means when the compressor means is operating.

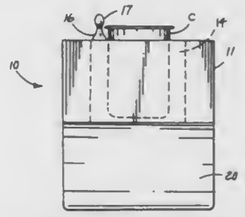
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**5,050,399**

## AUTOMOTIVE COOLER APPARATUS

**Christopher J. Peahl, Coot Bay Rd. RR 3, Box 800, Rindge, N.H. 03461**

**Filed Jul. 23, 1990, Ser. No. 559,679**
**Int. Cl.[5] B60H *1/32***
**U.S. Cl. 62—244** **1 Claim**




1. An automotive cooler apparatus for mounting onto an elongate automotive transmission tunnel housing, the apparatus comprising,
an elongate support container, the support container defined by spaced side walls including a support container cavity therewithin, the support container cavity defined by a predetermined height, and
the support container including a "U" shaped support base defining a concave bottom surface arranged for receiving the transmission tunnel housing, the "U" shaped support base including a central platform defining a floor of the container, and
a forward and rear arcuate leg extending outwardly of the central platform at opposed ends of the platform defining a "U" shaped support base, and
each arcuate leg formed of a memory retentent material to engage the automotive tunnel housing, and
the support container cavity including a plurality of insert holders positionable within the cavity, and
wherein the insert holder includes an insert holder container defined by spaced side walls, the side walls defining an insert holder cavity therewithin, and the spaced side walls defined by a predetermined height, and the insert holder cavity including a deformable refrigerant container therewithin for securement of a beverage container, and
wherein the deformable refrigerant chamber includes a cylindrical bore medially directed and extending through

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the refrigerant chamber, the cylindrical bore arranged for reception of the beverage container therewithin, and

the deformable refrigerant chamber includes a fill conduit, the fill conduit including a fill nozzle and a closure cap to selectively direct a predetermined quantity of a refrigerant within the refrigerant chamber within each insert holder, and

wherein each insert holder container is defined by a predetermined volume, and the support container cavity defined by a support container volume equal to twice the predetermined volume, and

wherein each insert holder container includes a rear wall, each rear wall including a "U" shaped hanger extending upwardly and rearwardly of the insert holder container for selective removal and positioning of each insert holder container in a spaced relationship relative to the support container cavity, and

wherein the deformable refrigerant chamber is fixedly mounted within each insert holder container cavity.

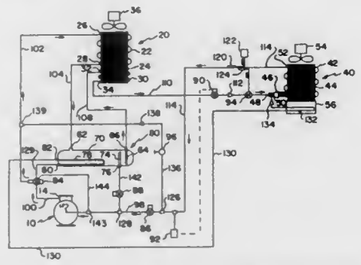
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**5,050,400**

## SIMPLIFIED HOT GAS DEFROST REFRIGERATION SYSTEM

**Paul F. Lammert, Danville, Ill., assignor to Bohn, Inc., Danville, Ill.**

**Filed Feb. 26, 1990, Ser. No. 484,847**
**Int. Cl.[5] F25D *21/06***
**U.S. Cl. 62—278** **8 Claims**



1. A refrigeration system having refrigeration and defrost cycles comprising:

a compressor having suction and discharge ports,

a condenser having an inlet and an outlet,

a refrigerating evaporator subject to frosting and having an inlet, including inlet valve means, and an outlet,

compressor discharge passage means including compressor discharge valve means connected to the compressor discharge port, a first conduit connecting said valve means with the condenser inlet, and a second conduit connecting said valve means with the evaporator inlet valve means, said valve means being operable to direct compressor discharge refrigerant to the first conduit during the refrigeration cycle, and to the second conduit during the defrost cycle,

condenser outlet passage means for directing refrigerant from the condenser outlet to the evaporator inlet valve means during the refrigeration cycle,

evaporator outlet passage means for directing refrigerant from the evaporator outlet to the compressor during the refrigeration and defrost cycles,

defrost passage means for directing refrigerant from the evaporator outlet to the condenser inlet and from the condenser outlet to the compressor during the defrost cycle, and

compressor suction valve means in the evaporator outlet passage means for blocking refrigerant flow directly to the compressor from the evaporator and directing refrigerant flow through the defrost passage means during the defrost cycle, characterized by

a refrigerant superheater/receiver located in the condenser discharge passage means for receiving refrigerant from the condenser,

a receiver outlet conduit connecting the superheater/receiver to said evaporator inlet valve means which are operable to direct refrigerant to the evaporator during the refrigeration cycle,

the defrost passage means including a superheater outlet conduit connecting the superheater/receiver to the compressor suction valve means which are operable to direct refrigerant to the compressor during the defrost cycle,

and the second conduit including a superheat portion in heat exchange relationship with the superheater/receiver, thus enabling heat transfer from the compressor discharge refrigerant to the compressor suction refrigerant during the defrost cycle to superheat the compressor suction refrigerant, to assure that it is vaporous, and desuperheat the vaporous refrigerant delivered to the evaporator, thus enhancing operation of the system during the defrost cycle.

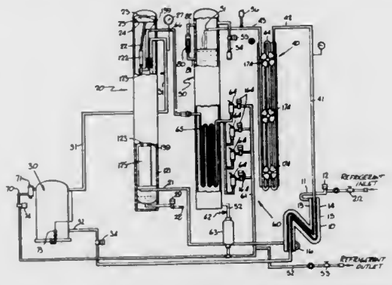
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**5,050,401**

## COMPACT REFRIGERANT RECLAIM APPARATUS

**Leon R. Van Steenburgh, Jr., 850 East La., Estes Park, Colo. 80515**

**Continuation-in-part of Ser. No. 380,691, Jul. 13, 1989, Pat. No. 4,967,570, which is a continuation of Ser. No. 109,958, Oct. 19, 1987, abandoned. This application Jan. 22, 1990, Ser. No. 468,229**
**Int. Cl.[5] F25B *45/00***
**U.S. Cl. 62—292** **5 Claims**



1. An apparatus for reclaiming refrigerant comprising, in combination, means for removing gaseous or liquid refrigerant from a container, vaporizing means for vaporizing all of said liquid refrigerant, and oil separator chamber for separating oil from the gaseous refrigerant, a compressor for receiving and compressing said gaseous refrigerant from said oil separator chamber, oil accumulator means for receiving and removing oil mist from the gaseous refrigerant before it enters said compressor, and condenser means for receiving and condensing said gaseous refrigerant from said container, wherein said oil accumulator means is located within said oil separator chamber.

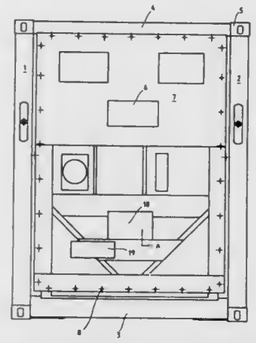


**5,050,402**

## CONTAINER FOR TEMPERATURE-CONTROLLED AND ENVIRONMENTALLY CONTROLLED TRANSPORT OF PERISHABLE GOODS

**Wolfgang Graaff, Hildesheim, Fed. Rep. of Germany, assignor to Graaff GmbH, Elze, Fed. Rep. of Germany**

**Filed May 15, 1990, Ser. No. 523,595**
**Claims priority, application Fed. Rep. of Germany, May 16, 1989, 3915925**
**Int. Cl.[5] F17C *13/00*; F25B *21/00***
**U.S. Cl. 62—457.9** **7 Claims**



1. A container for the temperature-controlled and environmentally-controlled transport of perishable goods, comprising:

a closed container having a wall supported between vertical corner posts and horizontal top and bottom girders,

a temperature-regulating unit mounted on that wall for controlling the temperature within the container, the temperature-regulating unit being spaced from the corner posts and girders, and

an environment-regulating unit for controlling the environment within the container, the environment-regulating unit including a number of individual components physically separated from each other, and means for functionally interconnecting said components, and

the components of the environment-regulating unit being located in the spaces between the temperature-regulating unit and the corner posts and girders.

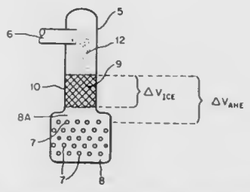
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**5,050,403**

## COOLING CONTAINER FOR A SORPTION APPARATUS

**Peter Maier-Laxhuber, Munich, Fed. Rep. of Germany, assignor to Zeo-Tech (Zeolith Technolgie GmbH), Munich, Fed. Rep. of Germany**

**Filed Nov. 7, 1989, Ser. No. 432,560**
**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1988, 3837880**
**Int. Cl.[5] F25B *17/08***
**U.S. Cl. 62—480** **5 Claims**




1. A cooling container for a sorption apparatus and having an interior chamber, the cooling container comprising:

a liquid operating medium positioned in a preselected portion of the interior chamber and which, during an adsorption phase of operation of the sorption apparatus, cools off by partial evaporation and solidifies into a solidifying layer starting from a surface of the liquid operating medium;

a heat exchanger for absorbing heat from a liquid passing through the heat exchanger and being positioned in a preselected portion of the interior chamber; and

a configuration of the interior chamber and relative positioning of the liquid operating medium and heat exchanger therein cooperating during the adsorption phase to limit the formation of the solidifying layer extending downwardly in the interior chamber to a maximum thickness and preventing the heat exchanger from contacting the solidifying layer and so that the liquid operating medium below the solidifying layer transfer the heat absorbed by the heat exchanger to the solidified operating medium.

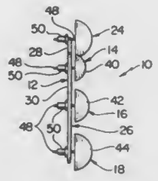
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**5,050,404**

## FRAME ASSEMBLY FOR EARRINGS

**Nathaniel H. Sugerman, 93 Bluff Ave., Cranston, R.I. 02905**

**Filed Oct. 19, 1990, Ser. No. 600,573**
**Int. Cl.[5] A44C *7/00***
**U.S. Cl. 63—13** **1 Claim**




1. A frame assembly for pierced earrings comprising:

a. a frame member including a leg portion comprising at least one elongated narrow leg member, said leg portion having a pair of reduced spaced apertures therein, and means for suspending said leg portion from a plating frame;

b. a pair of pierced earrings, each of said earrings including a post and a clutch received on the post thereof and each being assembled on said leg portion so that the post thereof is received in a different one of said apertures; and

c. said suspending means including a hanger member integrally formed with said frame member, said hanger member being defined by a hanger element which is formed to define a hanging loop, said hanger element having a reduced aperture therethrough, said frame assembly further comprising a supporting pierced earring, the post of said supporting pierced earring being received in the reduced aperture in said hanger element and being operative for alternatively suspending said frame assembly from an ear lobe of a wearer.

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**5,050,405**

## METHOD FOR POSITIVELY FEEDING AN ELASTIC YARN, AND CIRCULAR KNITTING MACHINE

**Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to IRO AB, Ulricehamn, Sweden**

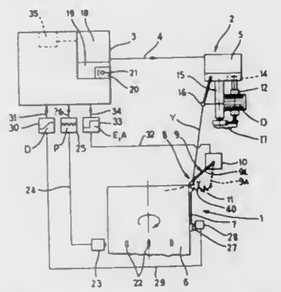
**PCT No. PCT/EP88/00384, § 371 Date Jan. 4, 1990, § 102(e) Date Jan. 4, 1990, PCT Pub. No. WO88/08893, PCT Pub. Date Nov. 17, 1988**
**PCT Filed May 5, 1988, Ser. No. 445,620**
**Claims priority, application Sweden, May 5, 1987, 8701876**
**Int. Cl.[5] D04B *15/50***
**U.S. Cl. 66—132 R** **13 Claims**

1. In a method for positively feeding an elastic yarn to a knitting system of a circular knitting machine including an electronic control unit for controlling the positive feeding of the elastic yarn from a positive yarn feeder apparatus to said

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knitting system, said control unit being normally operable in response to the lead-in and take-out of the elastic yarn by means of a yarn guide of said knitting system to generate a start signal and a stop signal, respectively, for an electric drive motor of said positive yarn feeder apparatus, said drive motor being responsive to said start signal for causing said positive yarn feeder apparatus to positively feed the elastic yarn to the knitting system until said stop signal is generated, said control unit being supplied with position signals derived from the operation of said circular knitting machine for controlling said drive motor by means of speed control signals corresponding to the yarn demand during the interval between said start



signal and said stop signal, the improvement wherein said control unit delays the generation of said stop signal for a preselected space of time after receiving a yarn take-out signal so that said drive motor continues to effect said positive yarn feeding operation for the duration of said preselected space of time, and wherein said control unit thereafter generates said stop signal for said drive motor only after said preselected space of time has expired, said space of time being selected in accordance with the yarn characteristics and/or the yarn length between said yarn feeder apparatus and said knitting system so that said elastic yarn between said positive feeder apparatus and said knitting system is substantially relaxed when said drive motor is stopped.

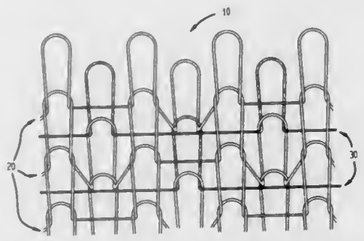
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**5,050,406**

## FABRIC FOR RECREATIONAL CLOTHING

**Isidore Strauss, Clark, N.J., and Sam A. Rankin, Jr., Ashboro, N.C., assignors to Miller Harness Company, Inc., East Rutherford, N.J.**

**Filed Nov. 15, 1988, Ser. No. 271,630**
**Int. Cl.[5] D04B** *9/08, 1/14*
**U.S. Cl. 66—177** **43 Claims**



1. A knit fabric for recreational clothing, said knit fabric comprising,

a. a corespun yarn having a core of a resilient continuous filament yarn and a cotton fiber outer covering said core; and

b. a cotton yarn knit with said corespun yarn by the Swiss Pique stitch so that only said cotton yarn is exposed on a first side of said fabric and a combination of said corespun yarn and said cotton yarn is exposed on a second side of said fabric, such that said fabric is substantially made up of cotton yet provides a high degree of recovery and strength for various recreational activities while being comfortable next to the skin of an individual.

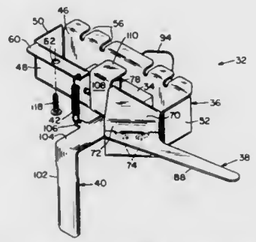
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**5,050,407**

## COMBINATION UNBALANCED LOAD AND LID SWITCH ASSEMBLY

**Daniel J. Wild, Oshkosh, Wis., assignor to Speed Queen Company, Lexington, Mass.**

**Filed Oct. 19, 1990, Ser. No. 599,952**
**Int. Cl.[5] D06F** *33/02, 37/28*
**U.S. Cl. 68—12.06** **14 Claims**



1. In a washing machine having a clothes basket positioned in a tub inside a cabinet having a lid wherein the washing machine further includes means for spinning said clothes basket during a spin cycle, a switch assembly for disabling said spinning means whenever said lid is open or whenever said clothes basket has an unbalanced load during one of said spin cycles, said switch assembly comprising:

a switch having a plunger;

a lid lever comprising a pivot and an actuator arm responsive to said lid being in a closed position for pivoting said lid lever;

an unbalanced load lever comprising a switch plunger actuating finger, said unbalanced load lever being pivotally linked to said lid lever wherein said unbalanced load lever is pulled by said lid lever such that said actuating finger depresses said switch plunger when said lid lever is pivoted by closing said lid; and

said unbalanced load lever further comprising a downward extension responsive to lateral excursion of said tub during a spin cycle caused by an unbalanced load in said clothes basket for pivoting said unbalanced load lever with respect to said lid lever wherein said actuating finger slides off said switch plunger to disable said spinning means.

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**5,050,408**

## DIAPER CLEANING DEVICE

**John Toupin, 32910 W. 13 Mile, Farmington Hills, Mich. 49024, and Joel Toupin, 207 Wabasso, Walled Lake, Mich. 48088**

**Filed Sep. 20, 1990, Ser. No. 585,237**
**Int. Cl.[5] D06F** *51/00*
**U.S. Cl. 68—241** **15 Claims**

1. An apparatus for substantially removing waste from a soiled diaper and the like, said apparatus comprising:

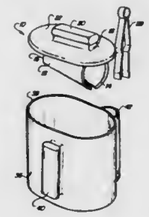
an elongated conical body having a longitudinal axis, said body having a first end aperture and a second end aperture,

said first end aperture being wider than said second end aperture, whereby said diaper is inserted into said first end aperture and is withdrawn from said second end aperture; and

means for accommodating the drawing through of said diaper and for exhausting said waste from said body, said



means for accommodating the drawing through and exhausting having a slot extending longitudinally through



said body to interconnect said first end aperture and said second end aperture.

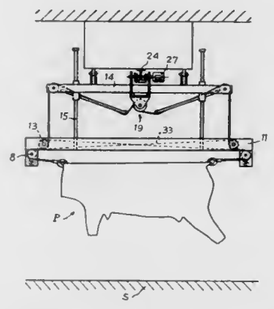
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**5,050,409**

## METHOD AND APPARATUS FOR HANDLING SKINS OR HIDES

**Roger Allamanche, Les Mésanges 3, Rue Joseph Grenouillet, 38780 Pont Eveque, France**

**Filed Nov. 7, 1989, Ser. No. 432,490**
**Claims priority, application France, Nov. 7, 1988, 88 15187**
**Int. Cl.[5] C14B** *1/02, 1/58;* **C14C** *15/00*
**U.S. Cl. 69—33** **17 Claims**



1. A method of handling skins or hides having a central line of increased thickness along the back between a tail end portion and a front end portion, the method being of the type consisting in displacing the skin or hide to a workstation by means of two clamping pincers on a handling apparatus,

the method comprising the following steps:

engaging the pincers on the tail and front portions of a skin or hide;

moving the pincers away from each other in order to put the skin or hide under tension along the back line of increased thickness;

raising the skin or hide so as to allow it to fold along said back line of increased thickness while hanging freely;

displacing the skin or hide to the workstation while the skin or hide is hanging in the folded position;

laying the folded skin or hide out flat under tension on a reception plane at the workstation; and

releasing the pincers from the tail and front portions of the skin or hide.

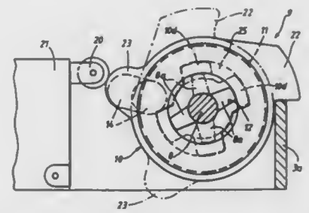
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**5,050,410**

## LOCKING DEVICE FOR MOTOR VEHICLES WITH SLEEVE-ACTUATED SWITCH

**Klaus Claar, Sindelfingen; Hans Deischi, Jettingen, and Kurt Raffelsiefer, Velbert, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Stuttgart, Fed. Rep. of Germany**

**Continuation of Ser. No. 393,230, Aug. 14, 1989, abandoned. This application Feb. 4, 1991, Ser. No. 651,042**
**Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 3827564**
**Int. Cl.[5] E05B** *65/36*
**U.S. Cl. 70—237** **10 Claims**



1. A vehicle locking device having a mechanical rotary connection between a cylinder core of a lock cylinder and a lock lever system of an associated lock to effect a mechanical rotary actuation function, comprising:

a driver coupling having two sleeve bodies which are mounted coaxially to one another and are positively coupled to one another through interposition of a rotary lost motion connection,

the cylinder core providing rotary movement of one of the sleeve bodies via a rotary connection for controlling an additional function superposed on the rotary actuation function of the cylinder core;

the other sleeve body being rotatable by the cylinder core through the one sleeve body and the lost motion connection, and being dynamically coupled to a securing element of the lever system for actuating the associated lock;

the two sleeve bodies of the driver coupling being rigidly mounted on a support component, independently of the lock cylinder; and

the rotary connection of the cylinder core is connected only to the one sleeve body,

wherein circumferentially spaced trip cams project radially from the one sleeve body and define a curved track for controlling a microswitch with a switching contact scanning the rotary movement of the one sleeve body along the track, with the circumferential spacing between the cams being sufficient to permit the securing element of the lever system to take up multiple stable end positions at which the cams prevent further movement of the one sleeve body.

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**5,050,411**

## SHIFT LEVER LOCKING DEVICE FOR AUTOMATIC TRANSMISSION OF COLUMN TYPE

**Tomonori Kawachi; Minoru Morikawa; Noriyuki Suzuki; Masami Watanabe; Nobuyoshi Yasuhara, and Yoshitaka Sato, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan**

**Filed Jun. 25, 1990, Ser. No. 542,629**
**Claims priority, application Japan, Jun. 26, 1989, 1-74797[U]**
**Int. Cl.[5] E05B** *65/12*
**U.S. Cl. 70—248** **12 Claims**

1. A shift lever locking device for an automatic transmission of column type having a body member mounted on a steering column, comprising:

a key rotor mounted on said body, said key rotor being turnable between an off position where a key can be en-

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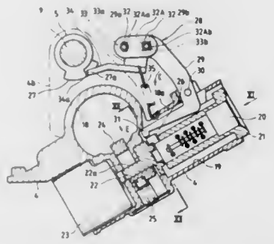
gaged with and disengaged from said key rotor and a on position where said key cannot be disengaged from said key rotor;

a driving cam turned with said key rotor;

a shift shaft arranged along said steering column, said shift shaft being turned by operating a shift lever so that said automatic transmission is shifted to a plurality of positions;

a lock part formed on said shift shaft;

a link mechanism provided movably which has at least a lever which is swung to operate in a link mode a drive part confronting with said driving cam of said key rotor and a lock member confronting with said lock part of said shift shaft; and



an adjusting mechanism provided for said lever of said link mechanism to adjust the positional relationships between said driving cam and said drive part and between said lock part and said lock member,

wherein when said shift shaft is shifted to a particular position, said key rotor being allowed to be turned to an off position, so that said shift shaft is locked at said particular position with the aid of said lock part and said lock member, and

when, with said key rotor at the on position, said shift lever is shifted to a position other than said particular position, said drive part preventing said driving cam from rotation thereby to prevent said key rotor from being turned to the off position.

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**5,050,412**

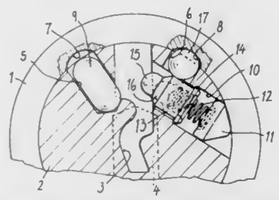
**FLAT KEY CYLINDER LOCK WITH ANTI-BURGLAR FEATURES**

**Deo Errani, Faenza, Italy, assignor to Costruzioni Italiane Serrature Affini C.I.S.A. S.p.A., Faenza, Italy**

**Continuation of Ser. No. 736,585, May 21, 1985, abandoned. This application Feb. 25, 1987, Ser. No. 16,969**

**Int. Cl.[5] E05B** *27/06*

**U.S. Cl. 70—358** **3 Claims**



1. In a cylinder lock comprising a casing having an axial cylindrical bore defining inner wall, a cylindrical plug arranged in said axial cylindrical bore rotatable about an axis of rotation of said cylindrical plug, means defining a channel formed in said plug for receiving there in a proper key, the key including lateral actuating land formations and lateral notch formations, said channel being directed axially along said axis of rotation, said plug having a normal key insertion angular position with respect to said casing, main tumbler pin means in said plug and said casing, at least one first auxiliary locking pin unit in said plug and said casing,

wherein said first auxiliary locking pin unit is of the type having first locking formations normally preventing rotation of said plug with respect to said casing when the key is removed from the channel, said first locking pin unit type further having actuation surface portions normally protruding into said channel and actuated by said actuating land formations of the proper key when inserted into said channel thereby disactivating the locking action of said first locking pin unit to thereby allow rotation of said plug with respect to said casing,

the improvement comprising at least one second auxiliary locking pin unit of a type different from said first auxiliary locking pin unit and arranged in said plug and said casing at a distance from said first auxiliary locking pin unit, and

wherein at least one of said first auxiliary locking pin units and at least one of said second auxiliary locking pin units are both arranged on the same side of said channel, and

wherein said second auxiliary locking pin unit is of the type having second locking formations normally allowing rotation of said plug with respect to said casing when the key is removed from the channel, and wherein said second locking pin unit type has second actuation surface portions normally protruding into said channel and normally received in notch formations on the proper key when the key is inserted into said channel to allow free rotation of the plug with respect to the casing when the proper key is inserted therein and for locking said plug onto said casing when said second actuation surface portions are actuated by land formations provided on a bogus key inserted into said channel.

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**5,050,413**

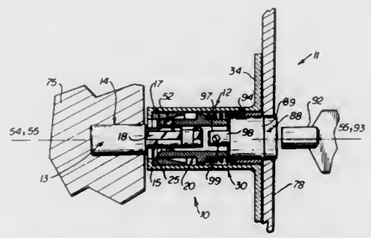
**DOOR LATCH WITH LOCK AND RELEASE FOR VENDING MACHINES AND THE LIKE**

**Woodrow C. Stillwagon, Fulton County, Ga., and Donald Embry, Breckinridge County, Ky., assignors to Star Lock Systems, Inc., Columbus, Ohio**

**Continuation of Ser. No. 358,888, May 30, 1989, which is a continuation-in-part of Ser. No. 327,250, Mar. 22, 1989, Pat. No. 4,900,182. This application Jul. 23, 1990, Ser. No. 557,305**

**Int. Cl.[5] E05B** *25/00*

**U.S. Cl. 70—386** **18 Claims**



1. Latching apparatus for releasably latching a first element to a second element, said apparatus comprising:

a post member being supportable by a first element;

a collar assembly being supportable by a second element and comprising

an outer sleeve,

an inner shell defining a cylindrical passage for receipt of said post member, said inner shell being connected to said outer sleeve and being movable in a first direction with respect to said outer sleeve in response to movement of said post member into said cylindrical passage in said first direction, and

a detention means for effecting a grip on said post member when said post member is at least partially located within said passage; and releasing means for releasing said grip between said post member and said collar assembly.



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**5,050,414**

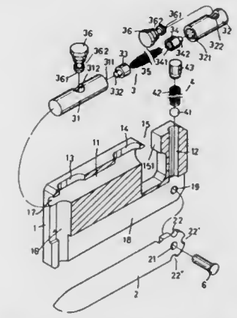
**STRUCTURE OF KEY-RING ASSEMBLY**

**Yu-Hwei Huang, No. 5, Alley 2, Lane 85, Min Tsu Road, Lu Chou Hsiang,, Taipei Hsuan, Taiwan**

**Filed Aug. 1, 1990, Ser. No. 561,429**

**Int. Cl.[5] A44B** *15/00*

**U.S. Cl. 70—456 R** **1 Claim**



1. A key-ring assembly, comprising a casing, a blade cutter, a lock bolt mechanism, a locating device and at least one key-ring, said casing having internally therein a first elongate hole at one side thereof, a second elongate hole opening at another side thereof adjacent said first elongate hole, an elongate recess at a further side of the casing opposite to said first elongate hole, said elongate recess having a pin hole at one end, a retaining channel at a side of the casing opposite to said second elongate hole, and a pair of external notches extending along said one side and respectively in communication with said first elongate hole, an opening between said first and second elongate holes and a feed hole respectively in communication with said retaining channel and said first elongate hole; wherein

said blade cutter includes a mounting hole at one end thereof corresponding to said pin hole for the insertion therein of a lock pin to secure said blade cutter to said elongate recess and permitting said blade cutter to rotate on said lock pin through an angle of 180°, said blade cutter further comprising a plurality of notches formed on the periphery of said one end around said mounting hole for positioning control; and

positioning device means for selectively locking and positioning said blade cutterr at selected angles relative to said elongate recess, said positioning device means including an insert, a compression spring and a ball member respectively received inside said second elongate hole with said compression spring firmly retained by said insert to bias said ball to partly project over said elongate recess for locking in either of the notches of said blade cutter to retain said blade cutter in a slected position.

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**5,050,415**

**METHOD AND APPARATUS FOR ADJUSTING AND CHANGING THE HEIGHT OF THE PLANE OF PASSAGE OF THE MATERIAL TO BE ROLLED THROUGH ROLLS OF ROLLING STANDS OF A SHAPE ROLLING MILL**

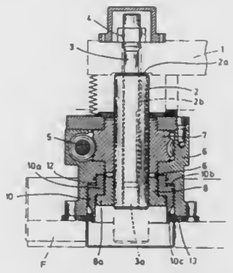
**Jürgen Albers, Peine; Georg Engel, K-arst, and Burkhard Porombka, Greverbroich, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

**Filed Oct. 11, 1989, Ser. No. 419,823**

**Claims priority, application Fed. Rep. of Germany, Oct. 11, 1988, 3834587**

**Int. Cl.[5] B21B** *37/08*

**U.S. Cl. 72—12** **3 Claims**



1. An arrangement for adjusting and changing the height of a plane of passage of a material being rolled through rolls of consecutive rolling stands in a rolling train of a shape rolling mill, which train includes a flange upsetting stand between two universal stands, the arrangement comprising:

means for raising and lowering at least one of, the rolling stands and parts of the rolling stands containing the rolls, as the material rolls through the rolls of the rolling stands;

means for controlling, changing and fixing the height of the plane of passage of the material as it rolls through the rolls of the flange upsetting stand during a rolling operation, so that a web central position relative to an adjusted plane of passage through the remaining rolling stands can be corrected, said raising and lowering means including positionally adjustable elevating devices, said flange upsetting stand being arranged upon said elevating devices, said raising and lowering means including a common support baseplate located upon elevating devices which are driven in a mechanical-hydraulic manner and which are positionally adjustable, the universal stands being arranged on said common supports; and

measuring means for determining measured values of dimensional deviations of the rolled bar passing through the rolling train, the thus determined measured values being used to change the height adjustment.

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**5,050,416**

**SEALING ELEMENT FOR FEEDING THROUGH AT LEAST ONE ELONGATED OBJECT SUCH AS WIRE AND A VACUUM APPARATUS PROVIDED WITH ONE OR MORE OF SEALING ELEMENTS**

**Guy Gobin, Oostende; Geert De Doncker, Bellem; Alex Colpaert, Zulte; Norbert Van Wassenhove, Merelbeke; Robert Hoogewijs, De Pinte; Lucien Flermans, Gent; Roger De Gryse, Oosterzele, and Joost Vennik, Aalter, all of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium**

**Filed Nov. 2, 1989, Ser. No. 430,288**

**Claims priority, application Netherlands, Nov. 16, 1988, 8802822**

**Int. Cl.[5] B21B** *9/00;* **F16J** *15/00*

**U.S. Cl. 72—38** **10 Claims**

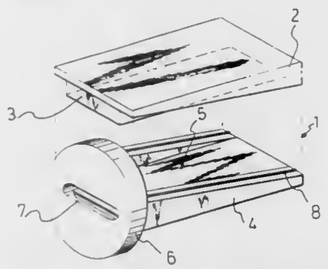
1. A sealing element for application in a vacuum apparatus

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for the continuous feeding therethrough of at least one elongated object, said sealing element comprising:

a) a casing comprising first and second ends and first and second detachable parts, said first detachable part having an underside with a projection thereon, said projection having a longitudinal cross-sectional area that increases in a direction from said second end to said first end, said second detachable part having a hollow portion with a longitudinal cross-sectional area that decreases in a direction from said first end to said second end, the projection




fitting in and partially filling the hollow portion and including a gap between said hollow portion and a lower planar surface of said projection, said second detachable part having a groove extending around a portion of the perimeter of an upper surface thereof;

b) a resilient sealing means in said groove for providing a seal when the underside of the first detachable part abuts against the upper surface of said second detachable part, said resilient sealing means resting against the underside of the first detachable part.

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**5,050,417**

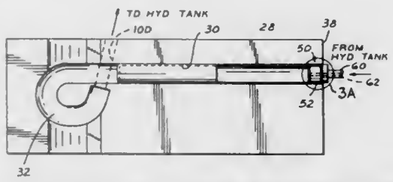
## APPARATUS FOR MAKING AN IRREGULARLY SHAPED DRAWN TUBE

**Bruce R. Johnson, Muskegon, Mich., assignor to Muskegon Automation Equipment, Inc., Muskegon Heights, Mich.**

**Filed Jun. 18, 1990, Ser. No. 539,685**

**Int. Cl.**[5] **B21D** *22/10*

**U.S. Cl. 72—60** **15 Claims**




1. Apparatus for forming a tubular metal member of a shape and length having an opened end and a closed end into an element which is formed of a different shape and length by forcing and thereby flowing the metal of the tubular member from one mold cavity to another:

said apparatus comprising a form mold having an entrance cavity of a shape and length generally corresponding to the tubular member and in which the entire tubular member is initially located and an exit cavity of a different shape and length in which the flowing metal of the tubular metal member is forced to form the element having the shape and length of the exit cavity;

said form mold having an entrance opening in a side wall thereof which is connected to said entrance cavity;

the tubular metal member being initially located entirely within the entrance cavity of the form mold, with the closed end thereof located adjacent the exit cavity and the opened end of the tubular metal member being located at the entrance opening to the entrance cavity;

means for simultaneously applying a mechanical force and a hydraulic force in a first direction to the tubular metal member to thereby flow the metal of the tubular member from the entrance cavity into the exit cavity in the first direction to form the formed element;

said form mold has a passage leading from said exit cavity to an external source for the supply of hydraulic fluid which reacts against the closed end of the tubular metal member in a second direction in opposition to the hydraulic and mechanical forces applied in said first direction to the tubular metal member in order to control the speed of the formation of the formed element; and

said means for simultaneously applying a mechanical force and a hydraulic force includes a piston and rod assembly, with the piston having a first portion forming a plug which extends through the entrance opening of the form mold into the opened end of the tubular metal member to provide a seal therebetween and a second portion which is larger than said first portion and of a size to abut the opened end of said tubular member and to fit within said entrance cavity and thereby mechanically force and flow the metal of the tubular member through the entrance cavity section into the exit cavity, said piston and rod assembly having a passage extending therethrough for delivering hydraulic fluid under pressure from an external source to the interior of the tubular member between the closed end thereof and said piston to apply a hydraulic force to said closed end to move the tubular metal member in said first direction.

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**5,050,418**

## BAR STEEL ROLLING MILL WITH A COOLING SEGMENT FOR THERMOMECHANICAL FINISH ROLLING

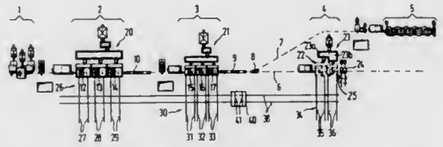
**Johann Grotepass, Ratingen, Fed. Rep. of Germany, assignor to SMS Schloemann Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany**

**Filed Sep. 5, 1989, Ser. No. 403,591**

**Claims priority, application Fed. Rep. of Germany, Sep. 5, 1988, 3830101**

**Int. Cl.**[5] **B21B** *1/18, 31/08, 45/02*

**U.S. Cl. 72—201** **9 Claims**




1. A bar steel rolling mill, comprising:

rolling stands arranged in a roll line and combined into a roughing train, at least one intermediate train, and one finishing train; and

a cooling segment arranged in the rolling line directly upstream of the finishing train for thermomechanical finish rolling, the at least one intermediate line including identical stands or groups of stands each with one pair of vertical rolls and horizontal rolls, stands of the at least one intermediate line being adjusted to a larger rolled cross-section than a cross-section of stands of the finishing train in the rolling line, the stands of the at least one intermediate train being identical to the stands of the finishing line, and forming a structural unit with drives including a drive motor, the stands of the intermediate line being configured so as to be repositionable for operation in a stand location downstream of the cooling segment in place of the stands of the finishing line so that when bar steel is rolled with a next larger dimension exceeding a rolled dimension possible with the finishing train, one stand in the finishing train can be removed and replaced by a stand from the intermediate train.



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**5,050,419**

## METHOD FOR ELIMINATING OF LONGITUDINAL UPSET SEAMS

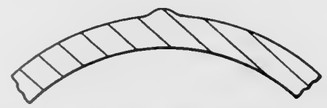
**Michael J. Schindler, Ratingen, and Wulff-Eckard Von Borcke, Haan, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany**

**Filed Apr. 10, 1990, Ser. No. 508,010**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1989, 3912423**

**Int. Cl.**[5] **B21J** *05/06*

**U.S. Cl. 72—306** **9 Claims**



1. A method of eliminating longitudinal upset seams which are formed upon the hot upsetting of pipe ends by means of a tool comprising upset half shells which are pressed together in pairs and an axially pressing supporting mandrel which has an abutment collar, the supporting cross-section and the elasticity behavior of the tool being selected to form a lens-shaped upset seam of only slight radial extent and with a rounded transition into the surrounding region of the pipe being upset, said method comprising:

a. opening the upset half shells which have been pressed together and withdrawing the supporting mandrel immediately after the completion of the process,

b. lifting the pipe end out of the tool,

c. rotating the longitudinal upset seams formed in the pipe end through a predetermined angle relative to the tool and out of the parting plane of the upset half shells,

d. pressing the pipe end between the upset half shells while maintaining the pipe end's previous axial position to the tool and,

e. after the introduction of the supporting mandrel, additionally pressing the pipe end radially without using the abutment collar to exert axial upset forces.

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**5,050,420**

## MULTI-FUNCTIONAL RIVETER

**Yang-Ting Liu, No. 23-25-5, Cheng Kung Rd.,, Taipin Hsiang, Taichung Hsien, Taiwan**

**Filed Aug. 29, 1990, Ser. No. 574,134**

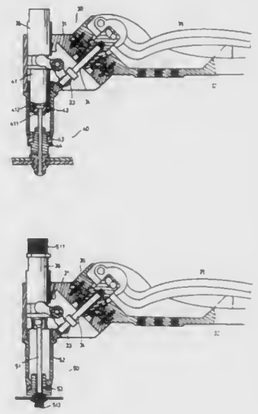
**Int. Cl.**[5] **B21J** *15/04, 15/38*

**U.S. Cl. 72—391.4** **1 Claim**

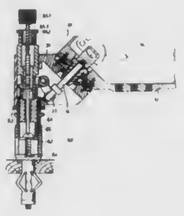
1. A multi-functional riveter having a hollow body head with an extended hand grip, said hollow body head having therein a hinged lever, one end of said lever being fastened to a transmission shaft, said transmission shaft being coupled to a hinged press handle extending external said hollow body head of the riveter to provide an activating force; the other end of said lever being connected to a sleeve, said sleeve comprising means for providing a rivet-pulling apparatus, a nut-pulling apparatus, or an anchor riveting apparatus to be used interchangeably as desired, and

wherein said rivet-pulling apparatus comprises a rivet holding tube adapted to be to a lower end of said sleeve, said rivet holding tube has two conical blocks, one press block, and one coiled spring disposed in that order therein, an outer sleeve head surrounding said holding tube and adapted to be attached to said hollow body head at a base end thereof, said outer sleeve head being secured to a fixed screw nut threadedly secured thereto and a sleeve ear threadedly secured to said fixed screw nut, said rivet holding tube adapted to be linearly displaced by said sleeve for pulling a rivet by an activating force derived from the press handle which is concurrently displaced;

wherein said nut-pulling apparatus comprises a pulling rod adapted to be located within said sleeve, an upper end portion of said pulling rod constituting a press head which is rotatably located within an outer screw tube adapted to be threadedly secured to an upper end of said said sleeve, a lower end of said pulling rod constituting an outer screw thread; said body head being secured to an outer sleeve head, said outer sleeve head being threadedly secured to an adjustable screw having a set screw nut mounted thereon, said pulling rod being displaced responsive to a displacement of said press handle thereby to force a pulling nut adapted to be threadedly secured to said pulling rod to be firmly attached to a metal lamella;







wherein said anchor riveting apparatus comprises a pull tube adapted to be attached to a base of said sleeve, a base of a said pull tube constituting a square pull block which has a U-shaped slot formed through a frontal end therefore; an outer sleeve head adapted to be attached to said hollow body head, said outer sleeve head extending externally of said hollow body head, said pull block being slideably displaceable within said outer sleeve head, a set screw nut is secured between the hollow body head and said outer sleeve head, said set screw nut being used to determine the position of said outer sleeve head with respect to stopper block having a U-shaped slot, said recovery rod adapted to extend through said sleeve and extending through said outer sleeve head and said pull tube, a press head being secured to an upper end of the recovery rod, a screw nut and a coiled spring being disposed at a mid-section of the recovery rod, said recovery rod having a base end formed

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in a cross-sectional shape of a tapered cross, said pull tube being displaced resonsive to a displacement of said sleeve by said press handle, resulting in a displacement and expansion of an anchor rivet, wherein said cross-sectional shaped tapered cross of said recovery rod is adapted for contiguously interfacing with and rotationally adjusting the position of a screw rod of an anchor rivet; and

said construction of the multi-functional riveter being used interchangeably with said rivet-pulling apparatus, said nut-pulling apparatus, and said anchor riveting apparatus.

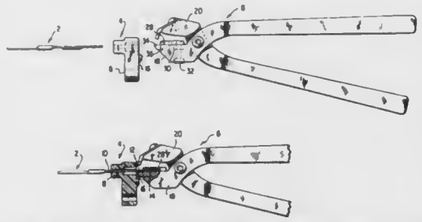
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**5,050,421**

## HAND TOOL FOR FASTENING A TERMINAL IN AN INSULATOR

**Kenneth Smith, Richman, Tenn., assignor to Adams Industries, Inc., Cookeville, Tenn.**

**Filed Feb. 8, 1990, Ser. No. 476,702**
**Int. Cl.[5] H01R *43/042***
**U.S. Cl. 72—409** **4 Claims**



1. A hand tool for securing a terminal through a slot in a terminal block, said terminal comprising an end portion and a substantially coplanar tabbed portion to be deflected, said hand tool comprising:

first and second jaw members pivotally connected to each other;

means for receiving the end portion of the terminal extending through the slot in the terminal block in a nose portion of said first jaw member with a longitudinal axis of the terminal substantially perpendicular to the pivotal axis between said first and second jaw members, wherein said receiving means comprises a channel having an open end of width greater than that of the end portion of the terminal received wherein but less than the width of the tabbed portion to be deflected;

means having a width substantially equal to that of said terminal end portion adjacent said open end for supporting said terminal; and

means having a width substantially equal to that of said tabbed portion for deflecting said tabbed portion of the terminal, said deflecting means being secured to said second jaw member;

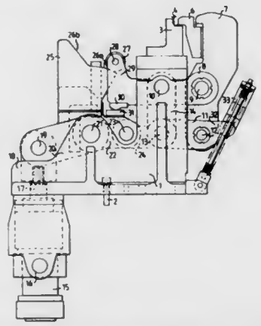
wherein the end portion of the terminal is longitudinally entered in said receiving means in said first jaw and said jaws are pivoted to a closed position, wherein said deflecting means deflects the tabbed portion of the terminal away from the plane of the end of the terminal and the terminal is fastened to the insulator preventing withdrawal of the terminal therefrom.

**5,050,422**

## BENDING APPARATUS FOR BENDING A MARGINAL FLANGE ON A WORKPIECE

**Michael W. Dorsett, Weybridge, Great Britain, assignor to AB Volvo, Goteborg, Sweden**

**PCT No. PCT/SE89/00107, § 371 Date Aug. 20, 1990, § 102(e) Date Aug. 20, 1990, PCT Pub. No. WO89/09103, PCT Pub. Date Oct. 5, 1989**
**PCT Filed Mar. 7, 1989, Ser. No. 566,399**
**Claims priority, application Sweden, Mar. 21, 1988, 881037**
**Int. Cl.[5] B21J *9/18***
**U.S. Cl. 72—450** **4 Claims**



1. Apparatus for bending a margin flange (5) which projects at an angle to a surface of a workpiece (4) against said surface, the apparatus including a bending tool (6) which is mounted on a tool holder (7) which, by means of a linkage system (8–13) is connected to a stand (1) which carries the workpiece (4), and further includes a drive arrangement (15–24) which is connected to the tool holder (7) for movement of the tool holder in relation to the stand (1), characterized in that the linkage system connecting the tool holder (7) with the stand (1) includes two mutually parallel carrier links (8, 11) each of which is pivotally mounted at one end thereof on a respective journal pin (9, 12) located on the tool holder (7); in that the other end of one said carrier link (8) is pivotally mounted on a journal pin (10) which is fixedly mounted on the stand (1) and which also pivotally carries one end of a connecting link (14), the other end of which is pivotally connected to the other end of the other said carrier link (11) by means of a pin (13); and in that the drive arrangement includes a drive member (15, 17) which is fixedly mounted on the stand and connected to said other carrier link (11) for movement thereof and therewith for movement of the tool holder (7), and also a camming device (25) operationally connected with and driven by the drive member (15, 17) for coaction with a cam follower element (27) which is attached to said one carrier link (8) and projects from the other end of said one carrier link in a direction away from the tool holder.

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**5,050,423**

## MULTI-VARIABLE SENSOR CALIBRATION

**Walter S. Czarnocki, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.**

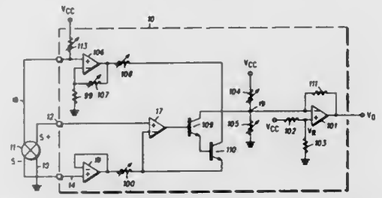
**Filed Dec. 4, 1989, Ser. No. 445,580**
**Int. Cl.[5] G01L *27/00, 19/04***
**U.S. Cl. 73—4 R** **1 Claim**

1. A calibration network for a pressure sensor that generates an output signal whose value varies with variations in temperature, comprising:

compensating means coupled to the sensor for deriving from the sensor a temperature compensating current that is substantially pressure-independent and that has an amplitude which varies in accordance with temperature-induced variations in the sensor's output signal, the temperature compensating current being adjustable to provide a substantially zero value at a reference temperature;

signal conditioning means arranged to receive the sensor's output signal and to provide an amplified sensor current whose amplitude is adjustable;

means for generating an adjustable offset current; and



means for combining the amplified sensor current with the temperature compensating current and the offset current so that, at the reference temperature, the substantially zero value of the compensating current permits the amplified sensor current and the offset current to be adjusted independently of any effect from the temperature compensating current.

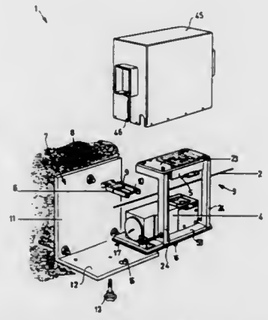
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**5,050,424**

## TELECOORDINOMETER

**Francesco Anesa; Alessandro Azzoni, both of Bergamo; Giuseppe Guerini, Schilpario, and Marco Vergani, Imbersago, all of Italy, assignors to Ismes S.p.A., Bergamo, Italy**

**Filed Jul. 18, 1990, Ser. No. 555,040**
**Claims priority, application Italy, Jul. 20, 1989, 21249 A/89**
**Int. Cl.[5] G01M *5/00***
**U.S. Cl. 73—1 D** **8 Claims**



1. A device for detecting displacement of a structure, wherein the device comprises an absolute reference element having a main axis and detection means for detecting the position of the structure relative to the absolute reference element, wherein the structure is attached to the earth, and wherein the device comprises:

a) a relative reference element fixedly attached to the structure and positioned between the absolute reference element and the detection means, wherein said relative reference element comprises:

1) a first pin having a main axis, wherein said main axis of said first pin is parallel to the main axis of the absolute reference element, and

2) a second pin having a main axis, wherein said main axis of said second pin is parallel to the main axis of the absolute reference element;

wherein said first pin and said second pin are on opposite sides, one from the other, of the absolute reference element and wherein the distance between said first pin and said second pin represents a sample distance for calibrating the detection means so that the detection means detects the position of the structure relative to the absolute reference element by detecting changes in the distance between the absolute reference element and at least one of said pins and the detection means calibrates and checks itself by detecting said sample distance.

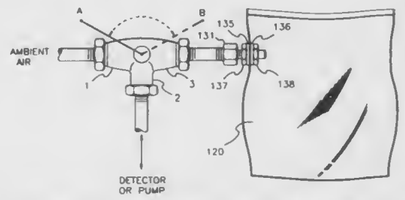
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**5,050,425**

## APPARATUS AND METHOD FOR MEASURING VOLATILE CONSTITUENTS IN EARTH SAMPLES

**Gary A. Robbins, Manchester, Conn., assignor to University of Connecticut, Storrs, Conn.**

**Filed Dec. 1, 1989, Ser. No. 444,517**
**Int. Cl.[5] G01N *33/18, 33/24***
**U.S. Cl. 73—19.1** **15 Claims**




1. Apparatus for measuring the presence of a volatile constituent of a sample of ground water or soil mixed with water, comprising:

a valve system having a plurality of branches;

a reclosable and collapsible bag for receiving said sample, said bag having a hole in a wall thereof;

means for air-tight coupling a first of said branches to said bag via said hole;

a detector of said volatile constituent coupleable to a second of said branches of said valve system;

said valve system being operative, in one position thereof, to close off said first branch so as to isolate said bag, and in another position thereof, to couple said first and second branches so that said detector can communicate with said bag.

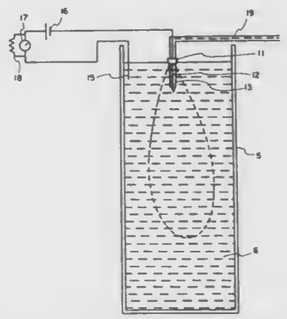
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**5,050,426**

## METHOD FOR DETERMINING THE RELIABILITY OF MEN'S CONTRACEPTIVES

**Jos'e Torres-Ibanez, Tuset 19, Barcelona, Spain**

**Filed Dec. 20, 1989, Ser. No. 454,045**
**Int. Cl.[5] G01M *3/04***
**U.S. Cl. 73—45.5** **3 Claims**



1. A method for determining the reliability of condoms, comprising the steps of:

submerging the condom in a first liquid disposed in a container,

injecting a second liquid into the condom in pulses to generate shock waves capable of rupturing a condom of low reliability.

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**5,050,427**

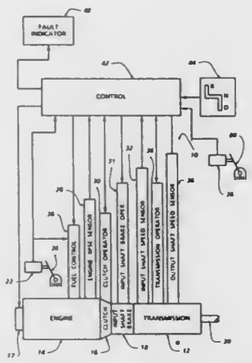
## METHOD FOR CONTROLLING AMT SYSTEM INCLUDING SPEED SENSOR SIGNAL FAULT DETECTION AND TOLERANCE

**William F. Cote, Farmington Hills, and Donald Speranza, Canton, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio**

**Continuation of Ser. No. 848,544, Apr. 7, 1986, Pat. No. 4,849,899. This application Oct. 14, 1988, Ser. No. 258,287**

**Int. Cl.[5] G01M** *15/00*

**U.S. Cl. 73—118.1** **7 Claims**




1. An abnormality determination system for revolution speed sensors comprising:

a first speed sensor for detecting a revolution speed of one shaft of an automatic transmission and for outputting a first speed signal corresponding to the speed;

a second speed sensor for detecting a revolution speed of another shaft of said automatic transmission and for outputting a second speed signal corresponding to the speed;

abnormality determination means for determining if either of said speed sensors is abnormal by comparing the first signal from said first speed sensor with the second speed signal from said second speed sensor, and for outputting an abnormality determination signal if it is determined that one of said speed sensors is abnormal;

shifting detection means for detecting that said automatic transmission is shifting and for outputting a shifting indication signal which denotes that a shift of the automatic transmission is being executed; and

abnormality determination halt means for halting the abnormality determination executed by said abnormality determination means when the shifting indication signal is received.

**5,050,428**

## APPARATUS FOR MEASURING AIR FLOW INTAKE OF INTERNAL COMBUSTION ENGINE

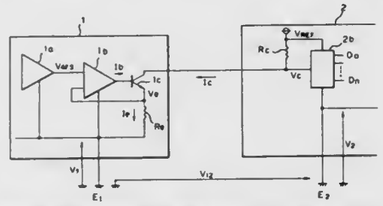
**Setsuhiro Shimomura; Toshiro Hara; Masanori Inada, and Sakae Kiguchi, all of Hyogo, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan**

**Continuation of Ser. No. 425,147, Oct. 23, 1989, abandoned. This application Mar. 21, 1991, Ser. No. 672,784**

**Claims priority, application Japan, Nov. 9, 1988, 63-284436**

**Int. Cl.[5] G01F** *1/68*

**U.S. Cl. 73—118.2** **14 Claims**




1. An apparatus for measuring the level of an air flow intake of an internal combustion engine, comprising:

a first means (*1a*) for outputting a voltage signal ($V_{AFS}$) corresponding to said level of said air flow intake of said internal combustion engine;

a second means (*1b*, 1c and Re) for outputting a current (Ic) proportional to said voltage signal ($V_{AFS}$) output from said first means;

first current-conducting means electrically connecting a voltage reference point of said first and second outputting means to a first point at a first ground potential;

a third means (*2b*) for converting said current (Ic) output from said second means into an output voltage and for outputting the output voltage; and

second current-conducting means electrically connecting a voltage reference point of said third means to a point at a second ground potential;

so that said current and said output voltage from said third means are independent both of voltage drops across said first and second current-conducting means and also of a difference in said first and second ground potentials.

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**5,050,429**

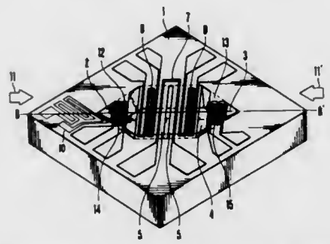
## MICROBRIDGE FLOW SENSOR

**Ikuo Nishimoto; Takashi Kurosawa, and Tomoshige Yamamoto, all of Kanagawa, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan**

**Filed Feb. 20, 1990, Ser. No. 482,198**

**Int. Cl.[5] G01F** *1/68*

**U.S. Cl. 73—204.26** **1 Claim**




1. A microbridge flow sensor for detecting material flow comprising:

integral bridge portions formed on a surface of a semiconductor substrate so as to be spatially isolated from said semiconductor substrate and defining a through hole passing under the bridge portions communicating a right opening to a left opening; a detecting portion mounted on a surface of the bridge portions including a heating element extending substantially the length of a bridge portion, and temperature-measuring elements which extend alongside the heating element, wherein a first pair of temperature-measuring elements straddle and abut the heating element and a second pair of temperature-measuring elements straddle the heating element and are disposed in a spaced-apart relationship with respect to the heating element, said microbridge flow sensor detecting a flow speed on the basis of changes in resistance of said temperature-measuring elements; and wherein said bridge portions are integrally formed adjacent to the right and left openings, respectively, and substantially at right angles to a direction of flow.

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**5,050,430**

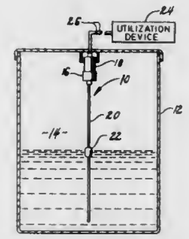
## MAGNETOSTRICTIVE LINEAR POSITION DETECTOR WITH TEMPERATURE SENSORS

**John D. Begin, and Richard D. Koski, both of Troy, Mich., assignors to MagneTek Controls, Clawson, Mich.**

**Filed Jun. 19, 1990, Ser. No. 540,568**

**Int. Cl.[5] G01F** *23/30;* **G01K** *7/16, 23/62;* **G01B** *7/26*

**U.S. Cl. 73—292** **15 Claims**




1. A combined magnetostrictive linear displacement detector and plural location temperature detector comprising:

a magnetostrictive wire having opposite head and foot ends and defining a measurement interval therebetween;

a return wire having a foot end electrically coupled to said foot end of said magnetostrictive wire and a head end;

a magnet disposed for displacement along the said magnetostrictive wire within said measurement interval, the position of said magnet within said measurement interval being the linear displacement detected;

a plurality of temperature dependent resistors disposed at intervals within said measurement interval, each of said plurality of temperature dependent resistors having a resistance dependent upon temperature;

a first reference resistor having a resistance substantially independent of temperature which is less than the lowest expected resistance of said plurality of temperature dependent resistors;

a second reference resistor having a resistance substantially independent of temperature which is greater than the higher expected resistance of said plurality of temperature dependent resistors;

a sequential switching circuit connected to each of said plurality of temperature dependent resistors, and to said first and second reference resistors, said sequential switching circuit having a common terminal for sequentially and alternately connecting to said common terminal one resistor selected from the set of said first and second reference resistors, and said plurality of temperature dependent resistors in a predetermined sequence;

a resistance measurement means connected to said common terminal of said sequential switching circuit for measuring the resistance of said one resistor connected to said common terminal;

a pulse generator connected to said resistance measurement means for generating a predetermined number of pulses having a pulse period therebetween corresponding to said resistance measured by said resistance measuring means, the minimum such pulse period being greater than the maximum time required for a torsional strain to propagate the length of said magnetostrictive wire;

a torsional motion excitation means disposed proximate to said head end of said magnetostrictive wire and connected to said pulse generator for imparting a predetermined torsional motion within said magnetostrictive wire for each pulse generated by said pulse generator;

an electrical pulse detection means electrically coupled to said head end of said magnetostrictive wire and said head end of said return wire for detecting an electrical signal through said magnetostrictive wire induced by the passage of torsional motion within said magnetostrictive wire by the position of said magnet;

a two-wire transmission line; and

an electrical line driver circuit connected to said pulse generator, said electrical excitation detection means and said two-wire transmission line for transmitting an electrical signal via said two-wire transmission line when either said pulse generator generates a pulse or said electrical pulse detection means detects an electrical signal.

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**5,050,431**

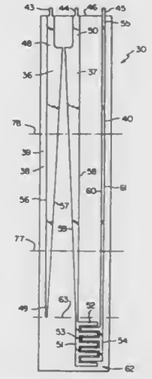
## LIQUID LEVEL SENSING DEVICE AND METHODS OF MAKING AN OPERATING THE SAME

**Charles W. McDonald, Gallatin, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Sep. 12, 1990, Ser. No. 581,014**

**Int. Cl.[5] G01F** *23/26*

**U.S. Cl. 73—304 C** **14 Claims**




1. A liquid level sensing device for determining the level of a liquid in a liquid confining means, said device comprising a pair of electrode plate means disposed in spaced apart relation so as to be adapted to be in a certain position relative to said confining means and having opposed ends, electrical means connected to said electrode plate means for creating a voltage signal means therefrom that varies in relation to the level of said liquid in said confining means relative to said electrode plate means, and means for determining the actual level of said liquid from said signal means, the improvement wherein a third electrode plate means is disposed in spaced apart relation to said pair of electrode plate means and is adapted to cooperate with one of said pair of electrode plate means to provide a reference voltage signal to determine the electrolytic base of said liquid, said third electrode plate means having opposed ends one of which is disposed adjacent one of said ends of said one of said pair of electrode plate means, said adjacent ends of said plate means being adapted to be disposed adjacent the

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bottom of said liquid confining means with the other ends thereof disposed adjacent the top of said liquid confining means, said adjacent ends of said electrode plate means respectively having portions thereof interleaved with each other in spaced apart relation while the remaining portions of said electrode plate means are not interleaved, the other electrode plate means of said pair of electrode plate means having one of said ends thereof disposed short of said interleaved portions so as to be adapted to be disposed above said interleaved portions when said interleaved portions are disposed above said bottom of said liquid confining means, the other of said ends of said third electrode plate means and said other ends of said pair of electrode plate means all being disposed adjacent each other.

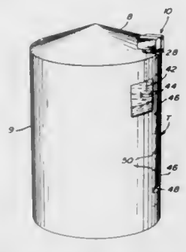
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**5,050,432**

## TANK GAUGE

**Brian Barritt, 15 McCullough Crescent, Red Deer, Alberta, Canada T4R 1S4**

**Filed Nov. 1, 1989, Ser. No. 429,994**
**Int. Cl.[5] G01F *23/40, 23/56***
**U.S. Cl. 73—309** **2 Claims**



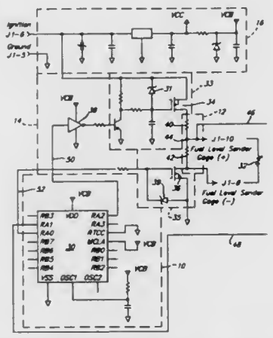
1. A tank gauge comprising a first sealed housing sealingly mounted on the roof of a liquid containing, upstanding, cylindrical tank, the housing having parallel vertical walls including a first vertical planar wall, and aperture means communicating the first housing with the interior of the tank maintaining the interior volume of the tank and the first housing sealed from the atmosphere, a pulley shaft journaled in the vertical walls of the first housing and exteriorly through the first vertical planar wall, seal means engaging the pulley shaft at the first vertical planar wall, a second housing provided adjacent the first housing enclosing a portion of the pulley shaft extending exteriorly relative to the first housing and the first vertical planar wall being a common wall to the first and second housing, a first pulley fixedly mounted to the pulley shaft in the first housing and a second pulley fixedly mounted on the pulley shaft in the second housing, whereby the torque provided by either pulley is directly transmitted to the other pulley, a first suspension cable having a first end attached to the first pulley, said first suspension cable being wound on the first pulley and passing through the aperture means into the tank and a floating member having a predetermined weight and a buoyancy sufficient to float on the liquid in the tank provided at the other end of the first suspension cable in the tank, a second suspension cable having a first end attached to the second pulley, said second suspension cable being wound on the second pulley opposite to the winding on the first pulley and suspended exteriorly of the tank parallel to an outer surface of a tank wall, and a weight and indicator provided at the other end of the second cable, wherein the weight weighs less than the weight of the float but sufficient to act as a counterweight on the system and to maintain the first and second suspension cables taut wherein the tank has scale means which cooperate with said indicator to indicate the level of a liquid inside the tank.

**5,050,433**

## ELECTRONIC CIRCUIT FOR FUEL LEVEL SENSOR

**Jeffrey J. Lumetta, Union Lake, Mich., assignor to Jabil Circuit Company, Madison Heights, Mich.**

**Filed Sep. 14, 1990, Ser. No. 582,753**
**Int. Cl.[5] G01F *23/36***
**U.S. Cl. 73—313** **10 Claims**



1. A circuit for interconnecting a variable impedance fuel level sender of a fuel tank with a fuel gage of the type having nonlinear character, comprising:
a source of input ignition voltage;
a synchronizing circuit;
a pulsed energy source controlled by said synchronizing circuit supplying a voltage level in proportion to said input ignition voltage and coupled to said sender for periodically energizing said sender;
an impedance matching circuit having an impedance related to the impedance of said gage and coupled to said sender for sensing a condition indicative of the level of fuel in the fuel tank;
a sample and hold circuit coupled to said impedance matching circuit and to said gage and controlled by said synchronizing circuit for sampling said condition sensed by said impedance matching circuit and supplying a signal for causing said gage to display the level of fuel in the fuel tank.

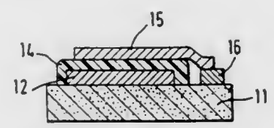
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**5,050,434**

## CAPACITIVE HUMIDITY SENSOR

**Ullrich Demisch, Freiburg i.Br., Fed. Rep. of Germany, assignor to Testoterm Messtechnik GmbH & Co., Lenzkirch, Fed. Rep. of Germany**

**Filed Jun. 13, 1990, Ser. No. 536,882**
**Claims priority, application Fed. Rep. of Germany, Jun. 19, 1989, 3919864**
**Int. Cl.[5] G01W *1/00***
**U.S. Cl. 73—336.5** **8 Claims**



1. A capacitive humidity sensor, comprising:
a) a capacitor with at least two metallic layers forming electrodes, at least one of which is permeable to water vapor; and
b) a humidity-sensitive polyimide film disposed between the electrodes as a dielectric, the polyimide film consisting of polyether imide.

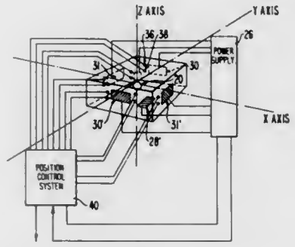


**5,050,435**

## POSITION DETECTION SYSTEM FOR A SUSPENDED PARTICLE ACCELEROMETER

**George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.**

**Filed Jul. 18, 1989, Ser. No. 381,385**
**Int. Cl.[5] G01P *15/13***
**U.S. Cl. 73—517 B** **12 Claims**



1. An accelerometer, comprising:
three mutually orthogonal sets of opposed field plates each set corresponding to a respective x, y and z axis extending therebetween;
a charged particle electrostatically suspended between each set of opposed field plates, the particle initially in a null position at an intersection of said x, y, and z axes when the sum of the forces on the accelerometer equals zero;
a first pair of light emitting diodes for projecting light beams on opposite sides of the particle along the x-axis to define first opposed boundaries of said null position between said opposed plates;
a second pair of light emitting diodes for projecting light beams on opposite sides of the particle along the y-axis to define second opposed boundaries of said null position;
a third pair of light emitting diodes for projecting light beams on opposite sides of the particle along the z-axis to define third opposed boundaries of said null position;
means for detecting variation in light intensity of said light beams when said particle moves from the null position into the paths of said light beams; and
means responsive to said detecting means for varying the electrostatic field generated by said opposed plates to return said particle to the null position.

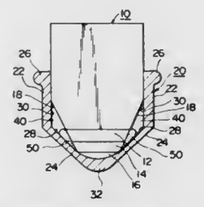
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**5,050,436**

## ULTRASONIC PROBE AND ACOUSTIC LENS ATTACHMENT

**Yutaka Kunii, and Yusiti Kikuti, both of Nishinasunomachi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Feb. 13, 1990, Ser. No. 479,241**
**Claims priority, application Japan, Feb. 14, 1989, 1-34401**
**Int. Cl.[5] G01N *29/00***
**U.S. Cl. 73—644** **16 Claims**



1. An ultrasonic probe comprising:
a probe body including an electrical/acoustic transducer element, a matching layer formed on a surface of said transducer elements, and a first acoustic lens formed on said matching layer, said probe body being provided with acute-angled surfaces from said transducer elements to said matching layer and said first acoustic lens to focus ultrasonic waves from said transducer elements to one focal point through said matching layer and said first acoustic lens; and
an attachment mounted on said probe body to cover parts of said matching layer and said first acoustic lens, said attachment being provided with tight contact portions which have edge portions brougt into contact with an outer surface of said probe body and have projections on edges thereof, said attachment also being provided with a second acoustic lens, an inner surface of which has a larger curvature than that of an outer surface of said first acoustic lens, said second acoustic lens setting a focal point different from said one focal point when said second acoustic lens is mounted on said first acoustic lens, and connecting portions for connecting said second acoustic lens and said tight contact portions through obtuse-angled surfaces and for forming escape portions into which an ultrasonic transmission medium disposed between the first acoustic lens and the second acoustic lens can escape, said escape portions being defined by at least said acute-angled surfaces, said obtuse-angled portions, and surface portions of said tight contact portions which are not brought into tight contact with said probe body.

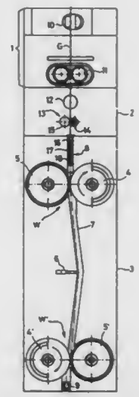
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**5,050,437**

## APPARATUS FOR DETERMINING STRENGTH PROPERTIES OF LONG TEXTILE TEST MATERIAL

**Heinz Etter, Winterthur, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland**

**Filed Jun. 19, 1990, Ser. No. 540,338**
**Claims priority, application Switzerland, Jun. 20, 1989, 2292/89**
**Int. Cl.[5] G01N *3/08***
**U.S. Cl. 73—830** **23 Claims**



23. Apparatus for determining strength properties of long textile test material comprising drawing-off means for continuously drawing-off the test material from a supply, a store for receiving test material from said drawing-off means, a first drivable clamping assembly for receiving test material from said store, and a second drivable clamping assembly at a distance from said first drivable clamping assembly for receiving test material from said first drivable clamping assembly, at least one of said clamping assemblies being formed by a roller pair in which the surface of one of the rollers of the pair is alternately in contact with and spaced from the surface of the other roller of the pair as the rollers are rotated, so that such clamp-

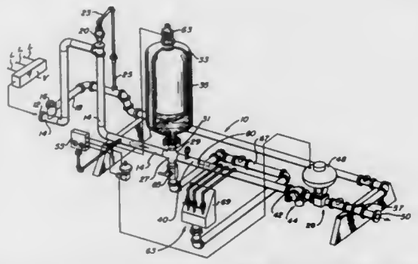
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ing assembly provides a periodically opening and closing clamping gap for the test material and so that tension for strength property determination is applied to the test material between the clamping assemblies when said clamping gap is closed.

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**5,050,438**
**METHOD AND APPARATUS FOR MEASURING THE FLOW OF HEAVY CRUDE**
**Oscar L. Ezell, Jr., 310 E. Woodrow, Taft, Calif. 93268**
**Filed Oct. 2, 1989, Ser. No. 415,727**
**Int. Cl.[5] G01F *1/00***
**U.S. Cl. 73—861** **9 Claims**



1. Test apparatus for measuring the flow of viscous source fluids being pumped from one of a selected number of sources at a low flow rate, comprising in combination

a manifold through which the source fluid flow flows;

a fluid accumulator means, said fluid accumulator means being mounted to said manifold;

means defining a fluid passage between said manifold and said fluid accumulator means; a valve in said manifold downstream of said fluid accumulator means operable between an open and closed position such that when said valve is closed, fluid in said manifold flows into, and is accumulated under pressure in said fluid accumulator means;

means for sensing fluid pressure in said fluid accumulator means, control means connected with said pressure sensing means and said valve for opening said valve upon pressure in said fluid accumulator means reaching a predetermined level, so that accumulated fluid in said accumulator is injected into said manifold, and flow meter means disposed in said manifold between said fluid accumulator means and said valve for measuring the combined fluid flow.

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**5,050,439**
**CORIOLIS-TYPE MASS FLOWMETER CIRCUITRY**
**Duane T. Thompson, Franklin, Mass., assignor to The Foxboro Company, Foxboro, Mass.**
**Division of Ser. No. 116,257, Oct. 29, 1987, Pat. No. 4,911,020, which is a continuation-in-part of Ser. No. 923,847, Oct. 28, 1986, Pat. No. 4,891,991. This application Oct. 12, 1989, Ser. No. 420,569**
**Int. Cl.[5] G01F *1/84***
**U.S. Cl. 73—861.38** **21 Claims**

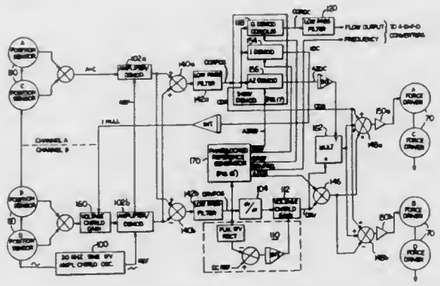
1. A signal processing and control method for a Coriolis-type mass flowmeter having several oscillating conduit sections, comprising

oscillating a conduit section, detecting the displacements of the respective ends of said section and producing two corresponding complementary sensor outputs, each including a drive component and a Coriolis component,

recovering the drive component from the two sensor outputs,

controlling the oscillation of each conduit in accordance with the drive signal derived from the recovered drive component,

applying complementary forms of said drive signal to com-

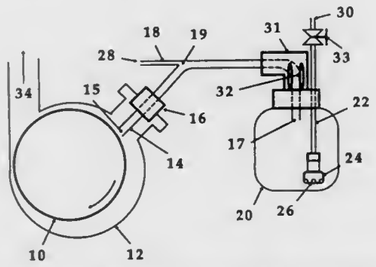


plementary force drivers at opposite ends of each section, and

developing a signal indicative of drive force imbalance between the complementary force drivers.

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**5,050,440**
**PROCESS AND APPARATUS FOR SAMPLING GAS-ENTRAINED PARTICULATE MATERIALS**
**Anthony B. Giddens, Birchwood, Tenn., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**
**Filed Jun. 29, 1990, Ser. No. 564,588**
**Int. Cl.[5] G01N *1/14***
**U.S. Cl. 73—863.83** **14 Claims**



1. Apparatus for sampling a stream of gas-entrained particulate matter comprising:

a sample receiver;

a sampling tube having an inlet exposed to the stream of gas-entrained particulate matter and extending to an outlet in said sample receiver;

a source of pressurized gas;

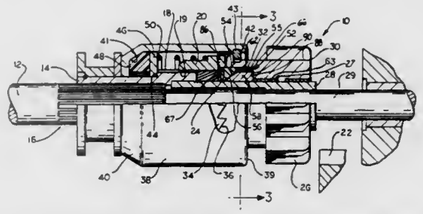
gas injection port between said inlet and outlet which introduces said pressurized gas into said sample tube and directs said gas toward said sample receiver, the introduction of said gas acting to decrease the gas pressure present at the inlet of said sampling tube to induce the particulate matter to be substantially continuously drawn into said tube and deposited into said receiver;

means for adjusting the rate at which the particulate matter is drawn into said sampling tube; and

vent means for venting gas introduced into said receiver while retaining the particulate matter in said receiver.



**5,050,441**
**ENGINE STARTER GEARING**
**Paul F. Giometti, Horseheads, N.Y., assignor to Purolator Products Company, Tulsa, Okla.**
**Filed Oct. 22, 1990, Ser. No. 601,468**
**Int. Cl.[5] F02N *11/00***
**U.S. Cl. 74—7 C** **30 Claims**



1. An engine starter gearing for selectively starting an engine having a starting gear, comprising:

a power shaft having an axis of rotation;

a sleeve slidably, but non-rotatably, secured to said power shaft, said sleeve having external helical splines formed on one extremity thereof;

a pinion gear slidably journaled to said power shaft for axial movement relative thereto, said pinion gear structured for movement into and out of engagement with said starting gear of said engine to be started;

a driving clutch member slidably mounted on said sleeve, said driving clutch member having an internal helical spline engaging said external helical splines formed on said sleeve;

a driven clutch member integral with said pinion gear disposed adjacent to said driving clutch member, said driven clutch member having at least three equally spaced longitudinal flyweight recesses provided at an end thereof adjacent to said driving clutch member, said flyweight recesses being separated from each other by longitudinal webs, each longitudinal web having a projection longitudinally extending towards said driving clutch member, said projections having external surfaces which are inclined towards said axis of rotation of said power shaft;

complementary mutually engageable inclined teeth for transmitting torque therebetween in one direction of rotation provided on facing surfaces of said driving and driven clutch members;

a housing having an open end, said housing being slidably supported on said sleeve and spatially encompassing said driving clutch member and a portion of said driven clutch member;

abutment means disposed within said housing for retaining said driving clutch member and said portion of said driven clutch member within said housing;

resilient means disposed within said housing for biasing said driving clutch member towards said driven clutch member and said complementary mutually engageable inclined teeth into mutual engagement;

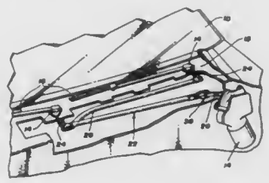
a radially inwardly extending shoulder provided on said driving clutch member adjacent said driven clutch member;

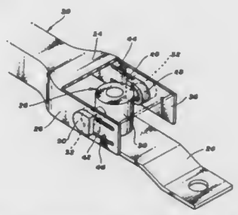
an annular thrust washer having an internal conical surface circumscribing said projections of said driven clutch member, said annular thrust washer operative to engage said radially inwardly extending shoulder and axially displace said driving clutch member when said annular thrust washer is axially displaced away from said projections; and

a centrifugal flyweight member disposed in each of said at least three equally spaced longitudinal flyweight recesses, said centrifugal flyweight member having an inclined surface abutting said internal conical surface of said annular thrust washer, each said centrifugal flyweight member being operative to be radially displaced in response to centrifugal forces generated by a high speed rotation of said driven clutch member, said radial displacement of said centrifugal flyweight members axially displacing said annular thrust washer and said driving clutch member in a direction away from said driven clutch member, said axial displacement of said driving clutch member from said driven clutch member disengaging said complementary mutually engageable inclined teeth, said projections of said longitudinal webs retaining each said centrifugal flyweight member in a respective said at least three equally spaced longitudinal flyweight recess when said annular thrust washer is displaced in said direction away from said driven clutch member.

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**5,050,442**
**WINDSHIELD WIPER WITH EXCESS LOAD RELIEF**
**Glenn R. Reed, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**
**Filed May 24, 1990, Ser. No. 528,313**
**Int. Cl.[5] B60S *1/02***
**U.S. Cl. 74—42** **2 Claims**





1. For use in a vehicle wiper system having a rotating crank arm and a drive link having an axis, and in which said drive link is potentially subjected to compression and tension loads along its axis in excess of the normal compression and tension loads as said wiper system operates, an improved means for coupling said crank arm and drive link so as to relieve said excessive loads, comprising,

a toggle member having two ends and pivoted between said ends to said crank arm,

a beam member comprising a first beam extending in one direction and a second beam extending in the opposite direction relative to said drive link axis, each of said beams further having a free end joined to an end of said toggle member and a fixed end anchored relative to said drive link, so that one beam is put into tension and the other into compression along their length as said drive link experiences excess loads, said beams further having a critical buckling load greater than said normal loads but less than said excess loads,

whereby, said crank arm drives said drive link through said toggle member and beam member, with one of said beams buckling under excess compression load and the other under excessive tension load, thereby allowing said drive link to effectively yield.

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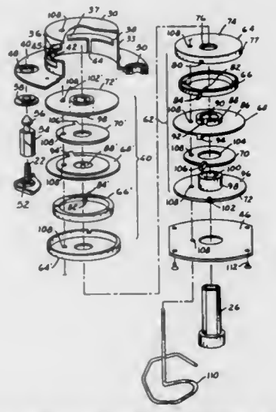


5,050,443

## STEERING WHEEL RETURN ASSIST DEVICE

Raymond Stocker, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 19, 1990, Ser. No. 615,664
Int. Cl.[5] B62D *1/16, 5/02;* F16F *1/10*
U.S. Cl. 74—492 22 Claims



1. A steering wheel return assist apparatus for use in a vehicle steering system having a steering column assembly rotatably supporting a steering shaft, said shaft having one end connected to a steering gear and its other end connected to a steering column assembly having a steering wheel, said apparatus comprising:

a housing including an aperture for receiving said shaft therethrough and further including means for permitting a limited degree of free rotation of said shaft within said housing;

first return assist means operatively associated with said shaft and disposed in said housing for urging said shaft and said steering wheel to a near central neutral position after rotation of said steering wheel, said first return assist means including:

a spool including an aperture for receiving said shaft therethrough;

spring means for transmitting a spring force to said shaft in a direction opposite to the rotation of said steering wheel, said spring means operative to engage said spool upon rotation of said shaft;

driver means drivingly engageable with said shaft and operatively associated with said spool so that rotation of said shaft causes rotation of said driver means, resulting in the winding of said spring means about said spool whereby said spring means urges said shaft and said steering wheel to said near central neutral position.

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5,050,444

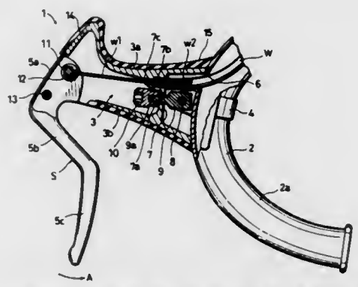
## BICYCLE BRAKE LEVER ASSEMBLY

Mitsuo Nishimura, Sakai, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Jul. 31, 1990, Ser. No. 560,841
Claims priority, application Japan, Aug. 28, 1989, 1-100097[U]
Int. Cl.[5] F16C *1/10;* G05G *11/00*
U.S. Cl. 74—502.2 16 Claims

1. A bicycle brake lever assembly for attachment to a handlebar of a bicycle, the assembly comprising: a mount bracket having a front end and a base end fixable to the handle bar, said mount bracket having a generally unobstructed upper surface shaped for generally mating engagement with a rider's palm and capable of acting as a palm rest, the upper surface of the mount bracket having a substantially straight portion which is integral with a hand stopper projecting upward from said upper surface at said front end of said mount bracket, the assembly further comprising a brake lever extending downward from said mount bracket and having a connecting end pivotally connected to said front end of said mount bracket; wherein

said brake lever has a first finger engaging portion which is



substantially straight and extends rearward from said connecting end to approach said base end of said mount bracket; and

said brake lever further has a second finger engaging portion which is directly connected to said first finger engaging portion and which is substantially straight and abruptly bent relative to said first finger engaging portion to extend downward away from said mount bracket.

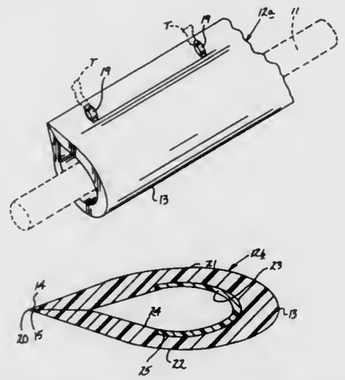
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5,050,445

## STREAMLINED GUIDE WIRE COVER APPARATUS

Niall J. Duffy, 41 Fayette St., Watertown, Mass. 02172

Filed Mar. 15, 1990, Ser. No. 493,631
Int. Cl.[5] F16C *1/26*
U.S. Cl. 74—502.5 2 Claims



1. A streamlined guide wire cover apparatus comprising,

an elongate sheath of a generally parabolic cross-sectional configuration in combination with an elongate wire, the sheath includes a forward arcuate surface extending rearwardly to a top arcuate surface overlying and coextensive with a bottom arcuate surface defining a cavity therewithin rotatably and slidably mounted about and receiving the wire, and

the top arcuate surface extending rearwardly of the forward arcuate surface to a first rear terminal edge, and the bottom arcuate surface extending rearwardly of the forward arcuate surface to a second rear terminal edge, the first and second rear terminal edges are normally biased towards one another in a first contiguously arranged position relative to the first and second rear terminal edges and are separable to a second position to permit reception of the wire within the cavity between the first and second rear terminal edges, and

wherein the first and second rear terminal edges are coextensive with the forward surface and are arranged generally parallel thereto and define a single coextensive rear edge, the rear edge bisects a longitudinal axis of the cavity defined by the sheath, and

wherein the sheath is coextensive with the elongate wire, and

wherein the first and second rear terminal edges and the cavity define opposed top and bottom surfaces, the top surface overlying the bottom surface, and

wherein the top and bottom surfaces include an adhesive therebetween to fixedly secure the top and bottom surface together when the wire is positioned within the cavity, and

including a plurality of apertures directed through the top and bottom surfaces, and a flexible indicator marker mounted within each aperture to provide visual indication of wind direction, and

wherein the cavity is defined by a coextensive interior surface, the interior surface includes a stepped recess formed within the interior surface about a major portion thereof extending in a spaced relationship relative to the top and bottom surface of the first and second rear terminal edges, and a rigid liner defined by a predetermined thickness substantially equal to a predetermined height of the stepped recess fixedly mounted within the recess, the rigid liner formed of a predetermined material to resist erosion of the interior surface.



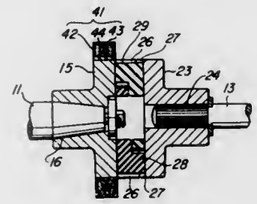
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5,050,446

## VIBRATION AND TORSIONAL DAMPING COUPLING FOR A POWER TRANSMISSION

Kazutoshi Takashima; Hiroaki Fujimoto, and Masaki Okazaki, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 21, 1988, Ser. No. 146,349
Claims priority, application Japan, Jan. 28, 1987, 62-17908
Int. Cl.[5] F16F *16/10*
U.S. Cl. 74—574 4 Claims



1. A torsional and vibration damping coupling for a power transmission for directly coupling a drive shaft for simultaneous rotation with an engine output shaft that experiences torsional vibrations comprising a first coupling member fixed for rotation directly to said engine output shaft and rotating simultaneously therewith, an inertial member coupled for rotation with and carried by said first coupling member and torsionally rotatably relative to said first coupling member for absorbing torsional vibrations of said engine output shaft, a second coupling member affixed directly for rotation with aid drive shaft, an elastic coupling means for simultaneously coupling said first and said second coupling members for rotation and for permitting limited relative rotation between said first and said second coupling members for absorbing torque variations in said engine output shaft.

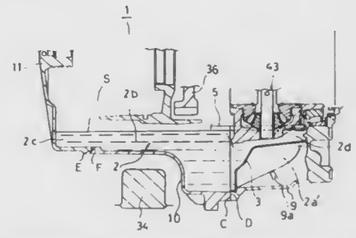
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5,050,447

## OIL RESERVOIR DEVICE FOR AN AUTOMATIC TRANSMISSION

Youichi Hayakawa, Toyoake, and Ryoichi Shirai, Okazaki, both of Japan, assignors to Aisin Aw Co., Ltd., Anjo, Japan

Filed Jan. 4, 1989, Ser. No. 293,248
Claims priority, application Japan, Aug. 11, 1988, 63-201402
Int. Cl.[5] F16H *57/02*
U.S. Cl. 74—606 R 9 Claims



1. A combination of an oil reservoir device and an automatic transmission comprising:

an integral casing formed of a transaxle casing having a front junction surface, a rear junction surface and side surfaces, a transaxle housing having a rear junction surface, and a rear cover having a front junction surface, said transaxle casing and transaxle housing having lower sections, and automatic transmission mechanisms situated inside the integral casing,

a valve body positioned on one of the side surfaces of the transaxle casing;

an oil reservoir space defined by the lower sections of the transaxle casing and the transaxle housing wherein the front junction surface of the transaxle casing and the rear junction surface of the transaxle housing are joined oil-sealingly so that the lower sections are generally communicated with each other;

an oil pump for supplying oil to the automatic transmission mechanisms; and

an oil strainer situated between the oil reservoir space and the oil pump for providing oil from the oil reservoir to the oil pump after filtration.

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5,050,448

## WET FLYWHEEL HOUSING

I. Bruce Kardal; Kevin A. Walker; Daniel Pakosh, all of Winnipeg, Canada, and Richard W. Koning, Capac, Mich., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Oct. 5, 1989, Ser. No. 417,612
Int. Cl.[5] F16H *57/04*
U.S. Cl. 74—606 R 6 Claims

1. A flywheel housing encapsulating a flywheel and a driven gear set transferring rotational power from an engine to a driven apparatus comprising:

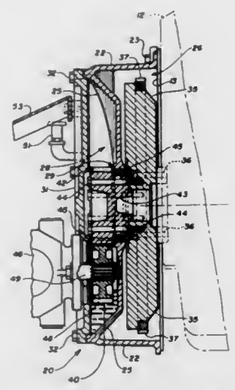
a base member detachably connected to said engine and defining a first cavity adjacent said engine within which said flywheel is rotatable due to connection thereof to said engine and a second cavity within which said driven gear set is rotatable due to a detachable connection thereof to said flywheel so as to be rotatable in response to the rotation of said flywheel with said engine, said first cavity being disposed between said engine and said second cavity, said first cavity operating in a normally dry environment;

a web member in engagement with said base member to define a separating wall between said first and second cavities, said driven gear set including a hubbed gear having a hub portion directly connected to said flywheel, said web member having an opening therethrough for the passage of the hub portion of said hubbed gear for connec-

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tion thereof to said flywheel, said web member supporting an oil-tight seal engageable with said hub portion and said web member to prevent the passage of oil between said first and second cavities; and



a detachable lid member sealingly engageable with said base member to define with said web member said second cavity which contains an oil bath for said driven gear set without permitting a migration of oil into said first cavity and whereby said flywheel operates in a dry environment eliminating any power losses due to fluid drag.

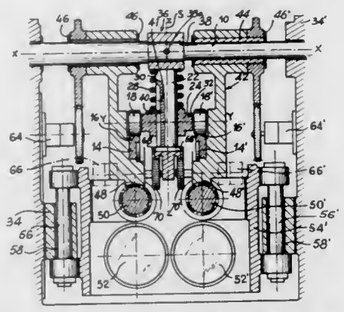
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**5,050,449**

## DEVICE FOR ACTUATING IN ROTATION A MECHANISM AND CONTROL STICK INCORPORATING SAID DEVICE

**Gérard Falcou, Sollies-Toucas; Christian M. J. Vigne, Carqueiranne; Henri Serindat, Toulon, and Claude J. G. Sorin, Saint Tropez, all of France, assignors to Societe ECA, Asnieres, France**

**Filed Mar. 6, 1990, Ser. No. 489,359**
**Claims priority, application France, Mar. 17, 1989, 89 03502**
**Int. Cl.[5] F16H** *27/02*
**U.S. Cl. 74—625** **14 Claims**



1. Device for actuating in rotation a mechanism, said device comprising a support, a control shaft having an axis of rotation and mounted to be rotatable about said axis on said support, elastic means for applying to the control shaft a reaction torque having a magnitude which is a function of the angle of rotation of the shaft about said axis, said elastic means comprising a reaction lever having an axis perpendicular to the axis of the control shaft, a cam follower structure which is axially slidably mounted on the reaction lever, a reaction member, a cam profile provided in confronting relation to the cam follower structure on the reaction member, means for elastically biasing the cam follower structure in such manner that the cam follower structure is slidable along the reaction lever and cooperative with the cam profile, the cam follower structure being movable relative to the reaction member when the control shaft is rotated about the axis of rotation of the control shaft and the cam profile extending in a plane perpendicular to the control shaft.

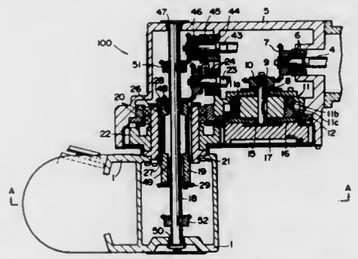
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**5,050,450**

## WRIST MECHANISM FOR INDUSTRIAL ROBOT OR THE LIKE

**Satoru Nakamura, Kobe, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan**

**Filed Oct. 19, 1989, Ser. No. 423,979**
**Claims priority, application Japan, Jan. 20, 1989, 1-12258**
**Int. Cl.[5] F16H** *37/06;* **B25J** *17/02*
**U.S. Cl. 74—665 M** **2 Claims**



1. A wrist mechanism for an industrial robot, comprising:
a first wrist element rockably mounted to a robot arm at a first wrist joint;
a second wrist element rockably mounted at a second wrist joint;
a third wrist element rotatably mounted at a third wrist joint;
drive means for driving each of said first, second and third wrist elements at said respective first, second and third wrist joints,
wherein each of said first, second and third wrist joints comprises one of said arm and said first and second wrist elements, respectively, as a driving side element and one of said first, second and third wrist elements, respectively, as a driven side element, and wherein said drive means includes a reduction gear means for each of said first, second and third joints, each of said reduction gear means being mounted at a driving side element side of one of said first, second and third wrist joints,
wherein said first wrist joint comprises:
an arm;
an elongate wrist element;
a hollow shaft rockably mounted said elongate wrist element on said arm about an axis perpendicular to the direction of elongation of said elongate wrist element;
a gear wheel mounted to said hollow shaft, said gear wheel being driven by the reduction gear means of said first joint;
concentric shafts mounted in said hollow shaft and along said axis; and
bevel gears mounted on said hollow shaft.

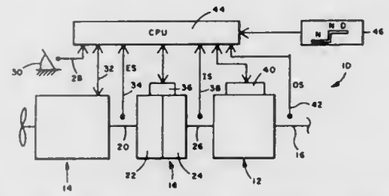


**5,050,451**

## TRANSMISSION LUBRICANT TEMPERATURE/VISCOSITY DETERMINATION METHOD/APPARATUS

**Syed F. Hussain, Kalamazoo, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Oct. 1, 1990, Ser. No. 591,305**
**Int. Cl.[5] B60K** *41/18*
**U.S. Cl. 74—844** **18 Claims**



1. A control method for sensing transmission lubricant sump viscosity above a preselected value in a vehicular automated mechanical transmission system (**10**) comprising a throttle controlled engine (**14**), a mechanical change gear transmission (**12**) having a plurality of gear ratio combinations selectively engageable between a transmission input shaft (**26**) and output shaft (**18**), said transmission including a lubricant sump (**70**) in which a plurality of gears constantly drivingly engaged to said input shaft (**64, 66, 68, 70, 72, 73**) are at least partially submerged, and a selectively engageable and disengageable master friction clutch (**16**) drivingly interposed said engine and said transmission, said automated mechanical transmission system additionally comprising an information processing unit (**44**) having means for receiving a plurality of input signals including an input signal indicative of rotational speed of said transmission input shaft (**38**) and means for processing said input signals in accordance with predetermined logic rules for generating command output signals whereby said transmission system is operated in accordance with said logic rules, and means (**32, 36, 40**) associated with said transmission system effective to actuate said transmission system to effect engagement and disengagement of selected ones of said gear ratio combinations in response to said output signals from said processing unit, the method characterized by;
causing the transmission to be shifted to neutral, then causing the rotational speed of the input shaft (IS) to be equal to or greater than a predetermined reference value (REF 1);
then, while maintaining the transmission in neutral, disengaging the clutch and determining the value of a time derivative (dIS/dt) of the rotational speed of the input shaft; and
comparing said value of the time derivative of the rotational speed of the input shaft to a second reference value (REF 2).

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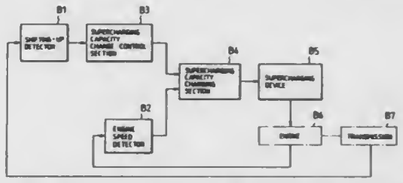
**5,050,452**

## AIR SUPPLY CONTROL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

**Hiroyuki Morioka, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Oct. 11, 1989, Ser. No. 420,138**
**Claims priority, application Japan, Oct. 15, 1988, 63-258368**
**Int. Cl.[5] F02D** *23/00;* **F02B** *33/44*
**U.S. Cl. 74—858** **11 Claims**

10. An air supply control system for an internal combustion engine comprising:
supercharging means provided for supercharging the internal combustion engine and operative to work with supercharging capacity varying in accordance with operating condition of the internal combustion engine,
engine speed detecting means for detecting speed of the internal combustion engine,
shifting-up detecting means for detecting a shifting-up operation performed in a transmission coupled with the internal combustion engine,
supercharging capacity changing means operative to vary the supercharging capacity of said supercharging means to be reduced when the speed of the internal combustion engine detected by said engine speed detecting means is



relatively low and to be increased when the speed of the internal combustion engine detected by said engine speed detecting means is relatively high, and
supercharging capacity change control means operative to restrain said supercharging capacity changing means so as to vary the supercharging capacity of said supercharging means to be slowly reduced when the shifting-up operation is detected by said shifting-up means detecting means as compared with non-shift-up operation.

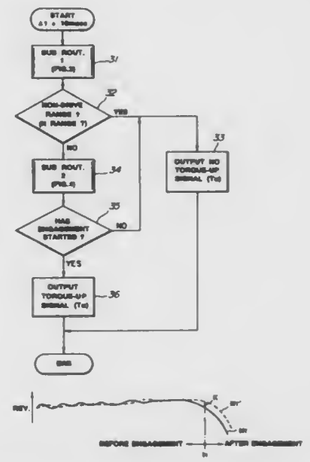
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**5,050,453**

## COMPENSATION FOR A DROP IN IDLING SPEED UPON SELECTING DRIVE RANGE FROM NEUTRAL RANGE

**Hiroshi Yamaguchi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Aug. 8, 1989, Ser. No. 390,908**
**Claims priority, application Japan, Aug. 8, 1988, 63-196079**
**Int. Cl.[5] F16H** *59/68, 59/74*
**U.S. Cl. 74—858** **8 Claims**



1. A system for compensating for a drop in idling speed of an engine of a drive system of a vehicle, the drive system including an automatic transmission having an output shaft and an input shaft drivingly connected via a torque converter to the engine, the automatic transmission having a control valve assembly including a manual valve shiftable from a neutral

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range position to a drive range position, the automatic transmission having at least one start-up friction element adapted to be engaged by a servo activating hydraulic fluid pressure when the servo activating hydraulic fluid pressure is allowed to be delivered to the start-up friction element after the manual valve has been shifted to the drive range position from the neutral range position, the system comprising:

means for detecting which range position the manual valve is shifted to and generating a range indicative signal indicative of the range position detected;

means for detecting an instance when the start-up friction element is brought into engagement after said range indicative signal has changed to indicate a change in range position from the neutral range position to the drive range position and generating a command signal after the instance detected; and

means responsive to said command signal for causing the engine to increase an output torque thereof.

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**5,050,454**

## ENGINE/AUTOMATIC TRANSMISSION UNIFIED CONTROL DEVICE

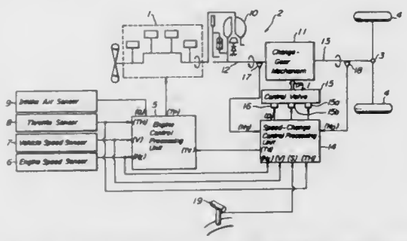
**Hiroshi Yamaguchi, Yokohama; Yuji Kato, Tokyo; Tatsuo Wakahara, Kawasaki; Shigeki Shimanaka, Hadano; Hiroshi Asano, Zama, and Shinsuke Nakazawa, Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan**

**Filed Feb. 19, 1991, Ser. No. 656,317**

**Claims priority, application Japan, Feb. 20, 1990, 2-37160; Mar. 28, 1990, 2-76691**

**Int. Cl.[5] F16H *61/06***

**U.S. Cl. 74—858** **8 Claims**



1. An engine/automatic transmission unified control device for an automotive vehicle including an engine and driving wheels driven by said engine through an automatic transmission with a driving clutch which is maintained disengaged in a neutral or parking range of the transmission and operated into engagement upon selection of a running range of the transmission, said control device comprising:

reduction control means operative during a changeover of said transmission into the running range from a racing state in which an accelerator pedal is stepped on with the neutral or parking range of the transmission selected, said reduction control means being adapted to carry out a reduction control of at least one parameter representing an output power to be transmitted from the engine to the driving wheels of the vehicle via said transmission;

detecting means associated with said driving clutch for detecting completion of engagement thereof upon completion of the changeover of the transmission into the running range; and

reduction control stopping means associated with the reduction control means and the detecting means, for stopping the reduction control of the parameter in question as soon as the detecting means detects completion of engagement of the driving clutch.

**5,050,455**

## METHOD OF CONTROLLING CONTINUOUS VARIABLE TRANSMISSION

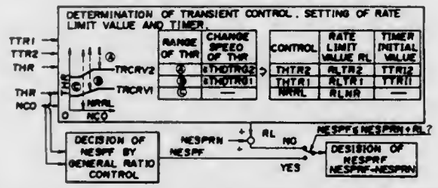
**Yosbinori Yamashita; Sadayuki Hirano, both of Shizuoka; Takumi Tatsumi, and Hiroaki Yamamoto, both of Hyogo, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizouka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan**

**Filed Sep. 26, 1990, Ser. No. 588,614**

**Claims priority, application Japan, Sep. 30, 1989, 1-256343; Jan. 31, 1990, 2-21727**

**Int. Cl.[5] B60K *41/12***

**U.S. Cl. 74—866** **2 Claims**




1. In a method of controlling a continuous variable transmission including a fixed pulley member and a movable pulley member which is supported relative to the fixed pulley member so as to be movable toward and away from the fixed pulley member, including the steps of decreasing and increasing the width of a groove between the pulley members to thereby respectively increase and decrease the rotational radius of a belt which is received between the pulley members in the groove, and in the case where there occurs a change in a target engine rotational speed which is calculated on the basis of a vehicle velocity and a throttle opening degree during vehicle running, executing a speed change control so as to change a belt ratio by executing a rate limit control on the basis of a predetermined rate limit value, the improvement comprising the steps of providing a control unit, using the control unit for (1) receiving the vehicle velocity and the throttle opening degree, (2) executing a throttle transient control so as to change a final target engine rotational speed on the basis of a rate limit value larger than the predetermined rate limit value, and (3) starting the throttle transient control in the case where (a) an actual throttle opening degree is equal to or larger than a throttle opening degree trigger value which is determined by the vehicle velocity and the throttle opening degree, and (b) a change speed of the throttle opening degree is equal to or larger than a throttle opening degree change speed trigger value.

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**5,050,456**

## AUTOMATIC SPEED CHANGING APPARATUS FOR VEHICLE

**Masao Fukuda, Saitama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**PCT No. PCT/JP89/00079, § 371 Date Sep. 14, 1989, § 102(e) Date Sep. 14, 1989, PCT Pub. No. WO89/07057, PCT Pub. Date Aug. 10, 1989**

**PCT Filed Jan. 27, 1989, Ser. No. 415,340**

**Claims priority, application Japan, Jan. 29, 1988, 63-9543[U]**

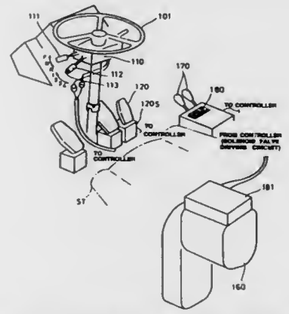
**Int. Cl.[5] B60K *41/08***

**U.S. Cl. 74—866** **2 Claims**

1. An automatic speed changing apparatus for a vehicle including at least a forward movement/rearward movement shifting lever for shifting movement of said vehicle from forward movement to rearward movement and vice versa so that when said forward movement/rearward movement shifting lever is actuated to either of forward movement and rearward movement, a speed stage of the vehicle is automatically selected to match the movement speed of the vehicle at this time point, said automatic speed changing apparatus comprising:



a hold switch adapted to be actuated independently of the forward movement/rearward movement shifting lever and for instructing whether or not a speed stage selected at this tiem point is to be maintained in response to actuation of said hold switch to an ON or an OFF position; and



a controller for storing and maintaining control data on the speed stage automatically selected at this time point in response to actuation of said hold switch to an ON position and then automatically maintaining the selected speed stage with the use of the stored and maintained control data until the hold switch is actuated to an OFF position.

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**5,050,457**

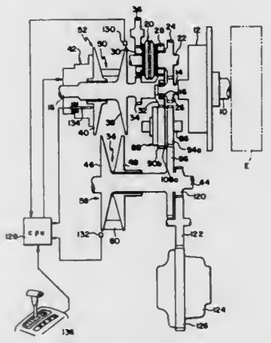
## CONTINUOUSLY VARIABLE TRANSMISSION

**Mitsunao Takayama; Tsutomu Yasue; Akiyoshi Morishita, and Kozo Yamauchi, all of Nagoya, Japan, assignors to Aichi Kikai Kogyo Kabushiki Kaisha, Nagoya, Japan**

**Filed Jul. 11, 1989, Ser. No. 378,085**

**Int. Cl.[5] B60K *41/04*; F16H *37/06***

**U.S. Cl. 74—866** **2 Claims**



1. A V belt type continuously variable transmission comprising:

main power transmitting path means including an input pulley mounted on an input pulley shaft, an output pulley mounted on an output pulley shaft and a V belt frictionally engaged between said input and said output pulley, each of said input pulley and said output pulley comprising a pair of half pulleys, one of said half pulley of said input pulley being stationarily mounted to said input pulley shaft and the other of said half pulley of said input pulley being slidably mounted to said input pulley shaft so as to move toward and away from said stationarily mounted half pulley for continuously varying the rotational speed of said output pulley shaft relative to the rotational speed of said input pulley shaft;

sub power transmitting path means distinct from said main power transmitting path means for transmission of rotation of said input pulley shaft to said output pulley shaft, and

control means for performance of cooperative power transmission by said main transmitting path means and said sub power transmission path means, said control means being composed of a 2- way differential clutch provided in said sub power transmission path means.

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**5,050,458**

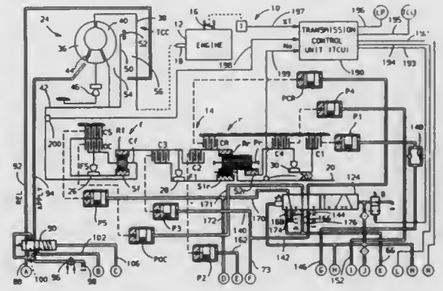
## DOUBLE TRANSITION UPSHIFT CONTROL FOR AN AUTOMATIC TRANSMISSION

**William J. Vukovich, Ypsilanti; Melissa M. Koenig, Ann Arbor, and Tsunlock A. Yu, Ypsilanti, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Feb. 7, 1991, Ser. No. 651,888**

**Int. Cl.[5] B60K *41/18***

**U.S. Cl. 74—866** **3 Claims**




1. In an automatic transmission including input and output shafts coupled through first and second interconnected gearsets, each gearset being adapted to provide multiple speed ratios, and various selectively engageable torque transmitting devices adapted to change speed ratios provided by said first and second gearsets to thereby establish multiple overall speed ratios between said input and output shafts, an upshift being carried out by releasing an off-going torque transmitting device to increase the speed ratio provided by said first gearset while applying an on-coming torque transmitting device to decrease the speed ratio provided by said second gearset, thereby achieving a decrease in the overall speed ratio between said input and output shafts, a method of operation for coordinating such release and apply, comprising the steps of:

initiating the apply of said on-coming torque transmitting device at a predefined rate to effect an initial decrease in said overall speed ratio;

initiating the release of said off-going torque transmitting device when a specified decrease in the overall speed ratio is detected;

detecting a condition of insufficient torque capacity of said on-coming torque transmitting device based on a determined rate of change of said overall speed ratio during the release of said off-going torque transmitting device; and

increasing the rate of apply of said on-coming torque transmitting device in response to such detection to thereby achieve a timely completion of said upshift.

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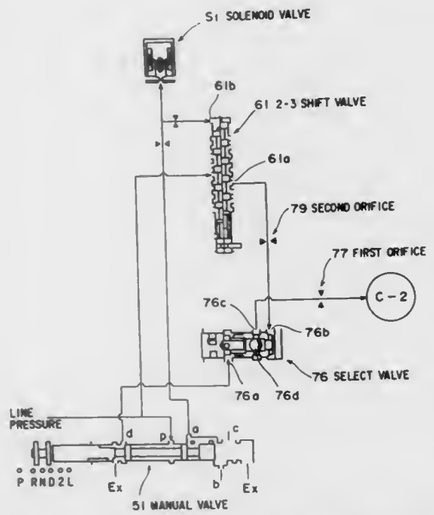


5,050,459

## HYDRAULIC CONTROL SYSTEM IN AUTOMATIC TRANSMISSION AND HYDRAULIC CONTROL METHOD IN SAME

Kazunori Ishikawa; Yasuhiro Kamei; Yutaka Taga, and Kunihiro Iwatsuki, all of Aichi, Japan, assignors to Aisin-Aw Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Apr. 17, 1990, Ser. No. 510,191
Claims priority, application Japan, Apr. 19, 1989, 1-99295
Int. Cl.[5] B60K *41/06*
U.S. Cl. 74—867 4 Claims



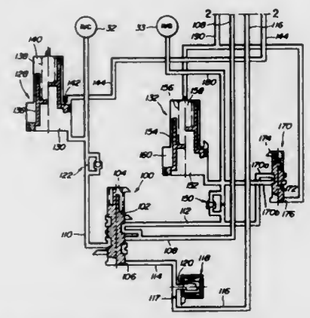

1. A hydraulic control system in an automatic transmission comprising:
a frictional engaging element for engaging and disengaging an element of a gear mechanism;
a hydraulic servo for operating the frictional engaging element;
shift change means connected to the hydraulic servo for supplying hydraulic fluid to the hydraulic servo and draining hydraulic fluid therefrom;
a select valve for selectively supplying hydraulic fluid to the hydraulic servo through the shift change means, said select valve having:
a first input port connected to the shift change means for supplying a hydraulic fluid to said select valve in forward,
a second input port connected to the shift change means for supplying a hydraulic fluid to said select valve in reverse, and
an output port connected to the hydraulic servo for supplying a hydraulic fluid to said hydraulic servo and selectively communicating with said first input port in forward and with said second input port in reverse;
first orifice means provided between said first input port and said shift change means for supplying hydraulic fluid to said first input port in forward at a pressure less than that to the second input port in reverse; and
second orifice means provided between said output port and said hydraulic servo;
whereby said orifice means prevents shock in forward and in reverse.

5,050,460

## SHIFT CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazubiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 10, 1989, Ser. No. 391,772
Claims priority, application Japan, Aug. 11, 1988, 63-198937
Int. Cl.[5] F16H *5/60*
U.S. Cl. 74—867 7 Claims



1. In an automatic transmission:
a main gear train including a forward one-way clutch and an overrunning clutch arranged in parallel therewith;
an auxiliary gear train operatively coupled with said main gear train, said auxiliary gear train including a first friction element for high gear position and a second friction element for low gear position;
a source of hydraulic fluid;
a first hydraulic passage;
a second hydraulic passage connected with said first friction element;
shift valve means for supplying the hydraulic fluid from said source of hydraulic fluid selectively to said first hydraulic passage and said second hydraulic passage;
a third hydraulic passage connected with said second friction element;
a fourth hydraulic passage connected with said overrunning clutch;
means for supplying the hydraulic fluid to said fourth hydraulic passage when an engine brake is demanded; and
means connected between said third hydraulic passage and said first hydraulic passage for controlling supply of hydraulic fluid from said first hydraulic passage to said third hydraulic passage in response to the pressure of the hydraulic pressure in said fourth hydraulic passage.

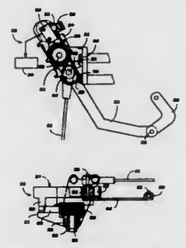
5,050,461

## ASSIST DEVICE FOR SHIFT OPERATION OF MARINE PROPULSION SYSTEM

Akihiro Onoue, and Hirofumi Imaeda, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 16, 1990, Ser. No. 481,976
Claims priority, application Japan, Feb. 17, 1989, 1-36110
Int. Cl.[5] B60K *41/04*
U.S. Cl. 74—872 6 Claims

1. In a transmission control having an element moveable between a forward drive condition, a reverse drive condition and a neutral drive condition, an operating member adapted to be operated by an operator between a forward drive control position, a reverse drive control position and a neutral drive control position, linkage means including a link connecting said operating member to said transmission element for moving said transmission element between its conditions in response to movement of said operating member between its positions, a shift assist element pivotally carried by said link, said shift assist element being formed with a slot receiving said operating member and traversed thereby upon movement of said operating member, the direction of said slot being related to the pivot axis of said shift assist element for movement of said shift assist



element between a normal position and a shift assist position in response to movement to said operating member from either of said forward drive control or said reverse drive control positions to said neutral drive control position, and a control circuit operated by movement of said shift assist element to its shift assist position.

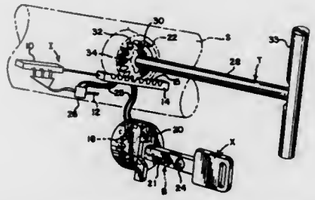


5,050,462

## TOOL AND METHOD FOR DECIPHERING CODES AND RECREATING LOST VEHICLE IGNITION KEYS

W. Richard Perry, Summit, Ill., assignor to A-Affordable Key & Lock Inc., Summit, Ill.

Filed Oct. 12, 1990, Ser. No. 596,762
Int. Cl.[5] B21D *53/42;* F05B *19/00*
U.S. Cl. 76—110 18 Claims



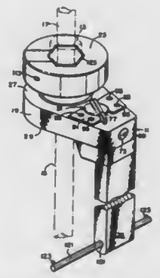
1. A method of identifying the electronic code of a vehicle ignition system of the type employing an electronic security diode having a code on the ignition key and an electronic security system for sensing the correct code on the diode specific to the vehicle from a plurality of possible different codes, and wherein the ignition system which is operated by the key includes an ignition switching assembly having a start position which is operated by rack and pinion gears which are in the steering column of the vehicle, comprising the steps of:
removing from the steering column the lock portion of the ignition system which is adapted to normally receive the key, but leaving the removed lock portion electronically connected to the security system;
inserting a first key blank having a diode bearing one of the possible codes into the removed lock portion;
moving the rack gear to operate the switching assembly to the start position; and
if necessary, sequentially inserting other key blanks each having a diode bearing other ones of the possible codes into the removed lock portion and repeating the aforementioned movement of the rack gear between each such key blank insertion until the vehicle starts.

5,050,463

## RATCHET WRENCH

Erwin H. Stielow, 1164 Glenn St., Philadelphia, Pa. 19115

Continuation-in-part of Ser. No. 118,542, Nov. 9, 1989, Pat. No. 4,928,559. This application May 24, 1990, Ser. No. 528,739
Int. Cl.[5] B25B *13/46*
U.S. Cl. 81—63 15 Claims



1. An offset basin ratchet wrench for loosening and tightening nuts connecting cooper tubing to faucet connections comprising
a wrench body portion having a top surface and a bottom surface,
the wrench body portion having a circular hole extending between the wrench body portion top surface and the wrench body portion bottom surface,
the wrench body portion having a passageway between the circular hole and an outer front side portion of the wrench body portion,
the wrench body portion having a recess next to and in partial contact with the circular hole,
a single pawl mounted on the wrench body portion inside the recess,
pawl holding means for holding the pawl in position after the pawl has been set in a tightening position or a loosening position,
a nut driver having a hole extending through the nut driver from its top to its bottom,
the nut driver having an upper portion and a lower portion,
the hole through the nut driver in the nut driver upper portion having a hexagonal-shaped periphery for engaging a nut connecting copper tubing to a faucet connection,
the lower portion of the nut driver having a substantially circular outer periphery and having a row of teeth encircling its outer periphery that are engaged by the pawl when the lower portion of the nut driver rests inside the circular hole of the wrench body portion,
the nut driver having a main portion and a detachable wedge portion mounted on the main portion,
the nut driver having an opening extending from the top of the nut driver to the bottom of the nut driver created by detaching the nut driver wedge portion from the nut driver main portion,
the nut driver being separable from the wrench body portion so that the nut driver, including its detachable wedge portion, may be attached to tubing while disengaged from the wrench body portion, and
a handle attached to the bottom surface of the wrench body portion,
whereby the nut driver may be placed onto the tubing by detaching the nut driver wedge portion from the nut driver main portion, placing the nut driver main portion onto the tubing, and reattaching the nut driver wedge portion to the nut driver main portion such that the nut driver surrounds the tubing,
whereby the nut driver may then be slid into the hole in the wrench body portion after the wrench body portion has been inserted around the tubing so that the pawl engages

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the teeth encircling the lower portion of the nut driver and

whereby the wrench may then be moved such that the nut is positioned inside the hexagonal-shaped portion of the hole in the nut driver.

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**5,050,464**

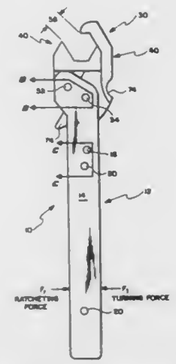
## MULTI-SURFACE WRENCH

**Carl R. Hurtig, Cohasset, Mass., assignor to Encor Limited, Cohasset, Mass.**

**Continuation of Ser. No. 258,193, Oct. 14, 1988, abandoned. This application Sep. 7, 1990, Ser. No. 581,072**

**Int. Cl.[5] B25B** *13/28*

**U.S. Cl. 81—90.1** **7 Claims**



1. A multi-surface wrench operative on a plurality of standard nuts of different sizes, comprising:

a wrench head assembly including

a body member having first and second contacting surfaces and a confronting surface having a predetermined configuration, and

a hook member having at least one contacting surface and not more than two contacting surfaces and a confronting surface having a predetermined configuration complementary to portions of said predetermined configuration of said confronting surface of said body member,

said first contacting surface and said second contacting surface of said body member and said at least one contacting surface of said hook member in combination defining a wrench opening for said wrench head assembly;

a handle assembly including spring means for exerting a biasing force against said hook member; and

means for pivotally coupling said wrench head assembly to said handle assembly, said pivotal coupling means including

a first pivot pin for pivotally coupling said body member to said handle assembly, and

a second pivot pin for pivotally coupling said hook member to said handle assembly,

said body and hook members being pivotally coupled to said handle assembly with said confronting surfaces thereof disposed in opposed relation;

said opposed confronting surfaces of said body and hook members having a gap therebetween for any nut within said predetermined range captured by said contacting surfaces of said body and hook members such that said disposition of said confronting surfaces of said body and hook members in combination defines a predetermined range for said multi-surface wrench, said predetermined range having a maximum nut width and a minimum nut width that encompasses the plurality of standard nuts of different sizes that may be operated on by said multi-surface wrench and wherein portions of said confronting surfaces of said body and hook members are in contact with each other only when said contacting surfaces are disposed apart at a width greater than the maximum nut width or a width less than the minimum nut width;

said hook member being pivotable about said second pivot pin against said biasing force in response to a capture force applied to said handle assembly to enlarge said wrench opening wherein any nut within the said predetermined range may be captured by said wrench head assembly, said biasing force causing said hook member to pivot so that said contacting surfaces of said body and hook members engage the captured nut;

said hook member being pivotable about said second pivot pin against said biasing force in response to a ratchet force applied to said handle assembly to ratchet with respect to the captured nut through a predetermined ratchet angle, said biasing force causing said hook member to pivot so that said contacting surfaces of said body and hook members reengage the captured nut.

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**5,050,465**

## PLIERS DEVICE

**Audun Haugs, Natlandsfjeller 56 - N-5030, Landas, Norway**

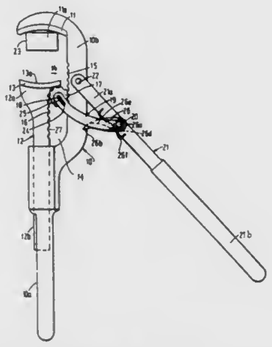
**PCT No. PCT/NO88/00071, § 371 Date Apr. 26, 1990, § 102(e) Date Apr. 26, 1990, PCT Pub. No. WO89/02806, PCT Pub. Date Apr. 6, 1989**

**PCT Filed Sep. 26, 1988, Ser. No. 469,556**

**Claims priority, application Norway, Sep. 25, 1987, 874022**

**Int. Cl.[5] B25B** *13/12*

**U.S. Cl. 81—126** **7 Claims**



1. A pliers device comprising

a first pliers member having a first jaw member;

a second pliers member movably mounted in said first pliers member and having a second jaw member opposite said first jaw members;

an actuating handle pivotally mounted on said first pliers member;

a first actuating means between said handle and said second pliers member for moving said second pliers member relative to said first pliers member in response to pivoting of said handle to move said jaw members toward each other to close on an object therebetween; and

a second actuating means between said handle and said second pliers member for moving said second pliers member relative to said first pliers member in response to pivoting of said handle to move said jaw members toward each other to exert a clamping force on an object therebetween.



**5,050,466**

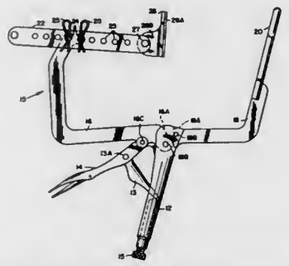
## CLAMPING TOOLS FOR AIR BRAKES

**Charles M. Cameron, 904 Briar Ct., Cheyenne, Wyo. 82007**

**Division of Ser. No. 65,284, Jun. 22, 1987, Pat. No. 4,776,079. This application Jul. 1, 1988, Ser. No. 214,546**

**Int. Cl.[5] B25B** *7/02*

**U.S. Cl. 81—419** **2 Claims**



1. A clamping tool for securing and controllably releasing a retention ring of the type having two ends fastened together by means of a bolt and nut, said clamping tool comprising:

(a) a pair of handle members pivotally connected to each other;

(b) a pair of clamping arms carried by said handle members; wherein a first said clamping arm includes a first jaw member comprising a socket member; wherein said socket member is pivotally attached to said first clamping arm; wherein a second said clamping arm includes a second jaw member comprising an upstanding back wall and spaced-apart parallel side walls extending from said back wall toward said first jaw member; wherein said back wall defines a fork having first and second spaced-apart fingers; wherein said fingers are adapted to engage said retention ring on opposite sides of said nut in a manner such that said nut is accessible to be loosened or tightened on said bolts;

wherein said handle members are movable between first and second positions in a manner such that said jaw members on said clamping arms are moved towards each other when said handle members are in said first position and said jaw members are moved away from each other when said handle members are in said second position; wherein said socket member is adapted to slidably engage said bolt and said fingers are adapted to engage said retention ring adjacent said nut when said handle members are in said first position and said retention ring is disposed between said side walls.

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**5,050,467**

## WRENCH SOCKET RETAINER

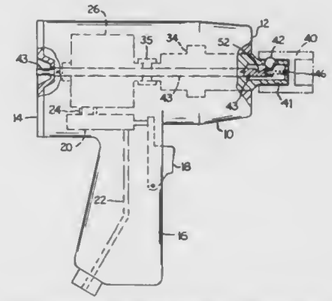
**Thomas L. Brown, 6160 S. Quail Hwy., Littleton, Colo. 80127, and Andrew F. Roe, 5780 S. Delaware, Littleton, Colo. 80120**

**Filed Aug. 6, 1990, Ser. No. 562,939**

**Int. Cl.[5] B25B** *21/02*

**U.S. Cl. 81—466** **1 Claim**

1. A rotary torque wrench comprising a housing having a front face and a rear face, a rotary air motor located within the housing near the housing rear face, a rotary socket-drive anvil element (**34**) axially aligned with the motor between the motor and the housing front face, said anvil element having an external plug with flat side faces thereon for transmission of a rotary drive force to a wrench socket insertable onto the plug, said anvil having a square hole extending axially therethrough in alignment with the motor axis, a square cross-sectioned push rod (**43**) extending axially through the motor and the square hole in the anvil so that the push rod rotates with the anvil, the square cross-sectioned push rod being slidably keyed to the square hole in the anvil so that the push rod can be moved axially, said push rod having an end section thereof extending within the external plug, a ball-shaped detent element (**42**) floatably mounted in an opening in a side face of the plug for transverse projection into a recess in a wrench socket; said square cross-sectioned push rod having a flat side-facing support surface engageable with said detent element to normally support said detent element against retraction into the plug; said push rod having a spherical pocket in its side-facing support surface adapted to register with the detent element when



said push rod is moved axially forwardly, said push rod having a front end within the external plug, and a coil spring located with the external plug in pressure engagement with the front end of the push rod for normally positioning the rod so that the detent element is supported against retraction into the plug, said push rod having a rear end extending through and beyond the housing rear face whereby an axial pushing force on the rod rear end moves the rod to a position wherein the spherical pocket is in registry with the ball-shaped detent element.

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**5,050,468**

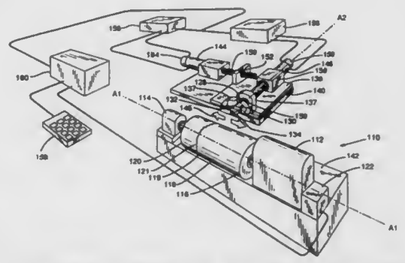
## METHOD AND APPARATUS FOR CUTTING A CIRCUMFERENTIAL SERPENTINE GROOVE IN A WORKPIECE USING AN ENGINE LATHE

**James D. Nydigger, Albany, Oreg., assignor to B-J Enterprises, Inc., Albany, Oreg.**

**Division of Ser. No. 433,045, Nov. 7, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 629,051**

**Int. Cl.[5] B23B** *3/00, 3/28*

**U.S. Cl. 82—1.11** **16 Claims**



1. An apparatus operable with an engine lathe for cutting a circumferential serpentine-patterned groove in a target surface of a workpiece supported and turned about an axis of rotation by the lathe using a cutting tool, the apparatus comprising:

(a) slide means including a base affixed to the lathe laterally adjacent the target surface and a slide block mounted to the slide base and longitudinally slidable on the base adjacent the target surface;

(b) tool oscillation means including a first reversible electrical motor mounted to the slide block, the first motor having an armature operably coupled to the cutting tool so as to effect oscillation of the cutting tool about its axis;

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(c) tool reciprocation means including a second reversible electrical motor mounted to the slide base, the second motor having an armature operably coupled to the slide block so as to effect reversible linear sliding motion of the slide block relative to the slide base;

(d) motor driving means electrically connected to the first and second electrical motors for controllably effecting periodic forward and reverse rotation of the first and second motor armatures as the workpiece is rotating, thereby effecting oscillatory and reciprocating motions, respectively, of the cutting tool relative to the target surface, with the oscillatory and reciprocating motions being synchronous with each other and timed relative to the angular velocity of the workpiece so as to cut a continuous circumferential serpentine-shaped groove of the desired shape in the target surface when the cutting tool is urged into cutting engagement with the target surface.

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**5,050,469**

## CUTTING OF PLASTIC SHEET

**Peter J. Snelling, West Lakes, Australia, assignor to Vinidex Tubemakers Pty. Limited, Gordon, Australia**

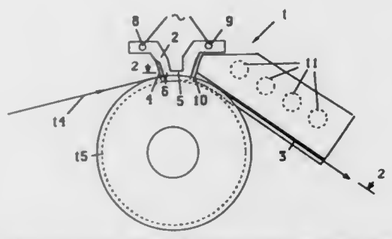
**PCT No. PCT/AU88/00409, § 371 Date Jun. 19, 1989, § 102(e) Date Jun. 19, 1989, PCT Pub. No. WO89/03750, PCT Pub. Date May 5, 1989**

**PCT Filed Oct. 19, 1988, Ser. No. 382,791**

**Claims priority, application Australia, Oct. 19, 1987, PI4944**

**Int. Cl.[5] B26D** *7/10, 7/27*

**U.S. Cl. 83—16** **11 Claims**



1. Apparatus for slitting a continuously moving sheet of thermoplastics material comprising a slitting blade at a first location, means to raise and maintain a temperature of the slitting blade to a temperature equal to or above a melting temperature of the thermoplastics material selected to be slit by the slitting blade, and cooling means at a second location downstream of said slitting blade adapted to effect a rapid cooling of any melted thermoplastics material, said cooling means including a cooling blade located behind the slitting blade and means to effect a cooling of said cooling blade.

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**5,050,470**

## RECEIVER FOR SPECIMENS FROM CRYOGENIC MICROTOME

**John L. Ward, 1006 Barnwell St., Columbia, S.C. 29601**

**Filed May 15, 1989, Ser. No. 352,044**

**Int. Cl.[5] G01N** *1/06*

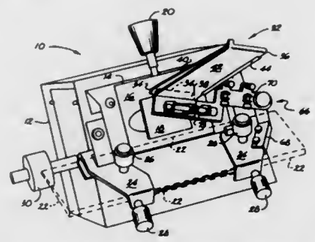
**U.S. Cl. 83—167** **28 Claims**

1. An improved shield mechanism for use with a microtome having a blade for cutting tissue slices from a tissue specimen, said shield mechanism comprising:

first and second members cooperatively arranged so as to define a tissue slice receipt channel therebetween and an opening to said channel; and

support means for supporting said first and second members relative the microtome such that said opening is situated relatively adjacent the microtome blade;

whereby tissue slices cut from a tissue specimen with the microtome enter said tissue slice receipt channel through said opening, for storage of such tissue slices within said receipt channel; and



wherein said support means adjustably supports said members relative the microtome, with such adjustability being selectively actuable in separate, plural axes.

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**5,050,471**

## APPARATUS FOR SUPPORTING AND GUIDING CIGARETTE RODS AND THE LIKE

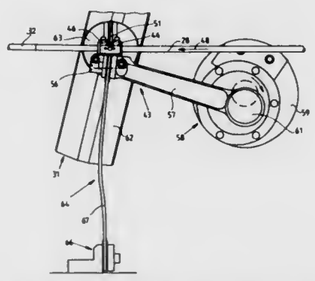
**Helmut Niemann, Ahrensburg, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany**

**Filed Oct. 4, 1989, Ser. No. 416,962**

**Claims priority, application Fed. Rep. of Germany, Oct. 17, 1988, 3835314**

**Int. Cl.[5] A24C** *5/28*

**U.S. Cl. 83—310** **8 Claims**



1. Apparatus for supporting a rod-like product of the tobacco processing industry during subdivision into sections of selected length while the product is advanced at a predetermined speed, in a predetermined direction and along a predetermined path, comprising guide means at least partially surrounding a portion of said path; means for alternatingly moving said guide means in said direction at said speed and counter to said direction, including a reciprocating member having a motion transmitting portion connected with said guide means, an input member and means for orbiting said input member along an endless path, a single one-armed leaf spring extending substantially transversely of said path for supporting said motion transmitting portion, said reciprocating member comprising a connecting rod having a second portion coupled to said input member and said connecting rod comprising a head which constitutes said motion transmitting portion and is fixedly connected to said leaf spring.



**5,050,472**

## CONTOUR CUTTING MACHINE

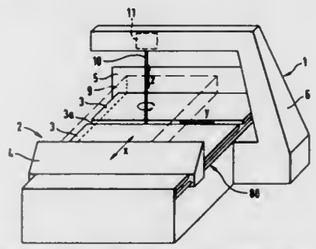
**Rolf Pötzsch, Freudenberg, Fed. Rep. of Germany, assignor to Albrecht Bäumer KG, Freudenberg, Fed. Rep. of Germany**

**Filed Jul. 6, 1989, Ser. No. 376,364**

**Claims priority, application European Pat. Off., Apr. 1, 1989, 89105761.4**

**Int. Cl.[5] B26D** *1/10, 1/48, 1/54*

**U.S. Cl. 83—424** **11 Claims**



1. A machine for cutting contours in workpieces comprising first and second machine main sections wherein said first main section includes:

(a) a cutting unit carrier having first upper and second lower guide means arranged in parallel superposed relationship,

(b) upper and lower tool carriages of which said upper tool carriage is guided longitudinally of said upper guide means and said lower tool carriage is guided longitudinally of said lower guide means,

(c) means for driving said upper and lower tool carriages in the same direction and by the same distances,

(d) a narrow band blade having a longitudinal extension and adapted to extend in a tensioned condition between said upper and lower tool carriages and defining a cutting plane,

(e) means for actuating said blade in the direction of said longitudinal extension, and

(f) a turning means for said blade comprising first and second turning devices disposed in respective ones of said upper and lower tool carriages and adapted to turn said cutting plane of said blade in accordance with said contour to be cut in said workpiece,

and wherein said second machine main section includes:

(g) a table structure having a divided table plate to provide a support surface for said workpiece to be cut, said table plate having a narrow gap therein for said blade to pass therethrough, and

(h) first and second sliders adapted to be moved towards each other for clamping said workpiece therebetween on said table plate and adapted to be moved jointly with each other on said table plate for moving said workpiece relative to said band blade and thereby cutting said contours.

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**5,050,473**

## MITER APPARATUS

**Janice Ingram, and Keith W. Ingram, both of 2158 Pelwood Dr., Centerville, Ohio 45459**

**Filed May 12, 1989, Ser. No. 351,701**

**Int. Cl.[5] B27B** *11/04*

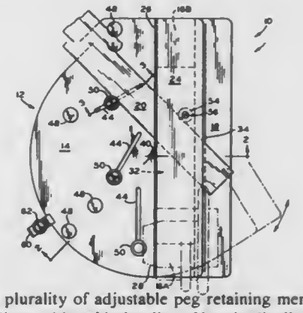
**U.S. Cl. 83—454** **20 Claims**

11. A miter apparatus for use with a portable electric saw, comprising:

a generally planar base having a saw support surface bridging two spaced apart support members and a work surface which are oriented generally parallel to each other, said saw support surface adapted to support a saw, said work support surface adapted to support a workpiece;

saw guide means supported by said work support surface and bridging said space whereby said workpiece maybe inserted into said space;

workpiece retaining means for retaining a workpiece in a selected orientation on said work support surface for cutting by a saw, said workpiece retaining means including a first peg retaining member secured to said work support surface, a plurality of second peg retaining members secured to said work support surface, a plurality of longitudinally extending slots in said work support surface



and a plurality of adjustable peg retaining members slidably disposed in said plurality of longitudinally extending slots, whereby a workpiece may be retained for cutting by a saw against said first peg retaining member and against a selected one of said plurality of second peg retaining members and a selected one of said plurality of adjustable peg retaining members.

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**5,050,474**

## ANALOG SIGNAL SYNTHESIZER IN PCM

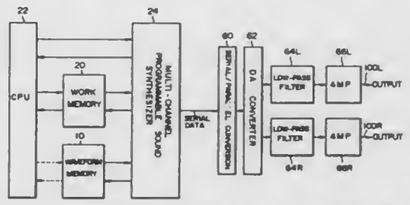
**Toru Ogawa, and Seijchi Sato, both of Tokyo, Japan, assignors to Namco Ltd., Tokyo, Japan**

**Filed Apr. 10, 1989, Ser. No. 335,383**

**Claims priority, application Japan, Apr. 13, 1988, 63-90575**

**Int. Cl.[5] G10H** *7/12;* **H03M** *1/08;* **H04L** *27/06*

**U.S. Cl. 84—603** **21 Claims**




1. An apparatus for synthesizing analog signals in PCM, said apparatus comprising waveform memory adapted to store a plurality of analog signals as PCM data sampled with different sampling frequencies, the portion of said PCM data corresponding to plural channels being read from said waveform memory and used to synthesize the analog signals, said apparatus being characterized in that it comprises:

oversampling means for shifting the sampling frequency of said PCM data read from a waveform memory for each channel to the side of high frequency;

means for summing said oversampled PCM data for the respective channel;

D/A converting means for converting the summed data into an analog signal; and

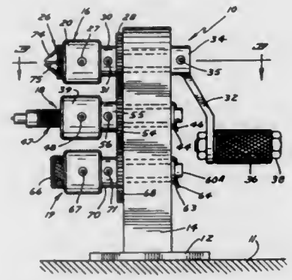
a low-pass filter for setting a cut-off frequency based on the sampling frequencies shifted to the side of high frequency and for eliminating any aliasing noise included in the PCM data from the synthesized analog signal;

whereby the elimination of the aliasing noise included in the PCM data for each channel can be carried out at the common low-pass filter.

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5,050,475
**BULLET CASING DEBURRING TOOL**
John Kolmer, 4890-145th St. West, Savage, Minn. 55378
Filed Nov. 19, 1990, Ser. No. 615,238
Int. Cl.[5] F42B *33/02*
U.S. Cl. 86—23 17 Claims



1. A cartridge case reconditioning apparatus comprising:
column means;
a first tool holder;
means mounting the first tool holder on the column means;
a first gear connected to the first tool holder;
a first reconditioning tool mounted on the first tool holder;
a second tool holder;
means mounting the second tool holder on the column means;
a second hear connected to the second tool holder and in meshing engagement with the first gear;
a second reconditioning tool mounted on the second tool holder;
a third tool holder;
means rotatably mounting the third tool holder on the column means;
a third gear connected to the third tool holder and in meshing engagement with the second gear;
a third reconditioning tool mounted on the third tool holder;
means for manual rotation of one of said tool holders resulting in rotation of the other tool holders for reconditioning a spent cartridge case;
one of said reconditioning tools comprised as a tool to deburr the outside edge of the mouth of a cartridge case;
another of said reconditioning tools comprised as a tool to deburr the inside edge of the mouth of a cartridge case; and
another of said reconditioning tools comprised as a tool to clean the primer pocket of a cartridge case.

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5,050,476
**THERMALLY MARKED TARGET MISSILE SYSTEM**
William B. McKnight, Huntsville; Thomas E. Honeycutt, Athens, and Walter B. Jennings, Jr., Toney, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 30, 1973, Ser. No. 408,885
Int. Cl.[5] F41G *7/22*
U.S. Cl. 89—1.11 3 Claims

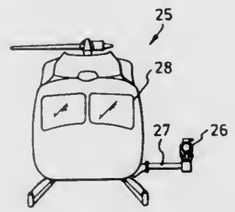
1. A missle system for intercepting a target including:
a high power laser for heating said target for from 1 to 5 seconds to thermally mark said target by creating a hot spot thereon; and



a heat seeking missile for intercepting said target by homing in on the heat radiating from said hot spot after said laser heating is removed.

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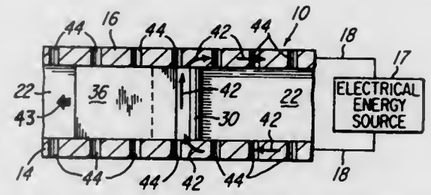
5,050,477
**HELICOPTER INCLUDING MISSILE TRANSPORTING AND LAUNCHING APPARATUS**
Roy L. Cowdery, and James W. Schofield, both of Sherborne, England, assignors to Westland plc, Yeovil, England
Filed Mar. 19, 1985, Ser. No. 742,079
Claims priority, application United Kingdom, Mar. 19, 1984, 8407135
Int. Cl.[5] F41F *3/04*; F41A *9/00*
U.S. Cl. 89—1.802 7 Claims



1. A helicopter including a fuselage, missile storage means for storing a plurality of missiles laterally within said fuselage, first support means mounted on each of said missiles, second support means in said missile storage means, said first and second support means interengaged for retaining said missiles in said storage means, an outrigger extending laterally from the fuselage, missile launcher means mounted at the end of said outrigger for pivotal movement about a vertical axis between a loading position in which the longitudinal axis of the missile launcher means extends generally perpendicular to the longitudinal centerline of the fuselage and a launch position in which the longitudinal axis of the missile launcher means extends generally parallel to the longitudinal centerline of the fuselage, third support means for a missile on said missile launcher means, and transfer means operatively connected to said missile launcher means for transferring a missile and the first support means mounted on said missile from said second support means in said missile storage means to the third support means on said missile launcher means when said missile launcher means is in the loading position.



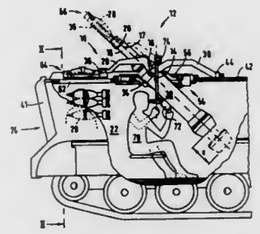
5,050,478
**RAILGUN STRUCTURE FOR ENHANCED PROJECTILE VELOCITY**
John M. Juston, Yellow Springs, and John P. Barber, Dayton, both of Ohio, assignors to IAP Research, Inc., Dayton, Ohio
Filed Nov. 27, 1989, Ser. No. 441,527
Int. Cl.[5] F41B *6/00*
U.S. Cl. 89—8 21 Claims




1. Railgun structure comprising a pair of electrically conductive rails, means for applying electrical energy to the rails, each of the rails being provided with a series of vent apertures extending along the length of the rails, a vessel positioned between the rails and in engagement therewith, the vessel having openings therein, means within the vessel forming an electrically conductive plasma within the vessel, whereby as electrical energy is applied to the rails electrical energy flows through the rails and through the plasma and the vessel travels at a high velocity along the rails, and whereby the plasma within the vessel reaches a high temperature and pressure, the openings in the vessel being moved into communication with the series of vent apertures as the vessel travels along the rails, and whereby gaseous pressure of the plasma within the vessel is controlled as portions of the plasma flow outwardly from the openings in the vessel and through the apertures in the rails as the vessel travels along the rails.

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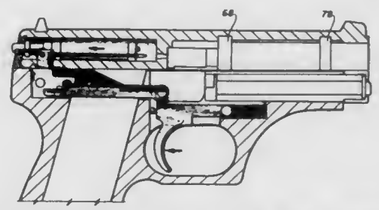
5,050,479
**LOADING MANIPULATOR FOR A FRONT-LOADING MORTAR**
Wolfgang Heintz; Herbert Lipp, and Erich Zielinski, all of Düsseldorf, Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Aug. 29, 1990, Ser. No. 574,281
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1989, 3938900
Int. Cl.[5] F41A *9/13*
U.S. Cl. 89—46 10 Claims



1. A front-loading mortar mounted on a base, comprising
(a) a cradle tube;
(b) a weapon tube having a muzzle; said weapon tube being supported in said cradle tube;
(c) a trunnion axis about which the cradle tube including said weapon tube is pivotal for setting an elevation of the weapon tube;
(d) a cardan ring surrounding the cradle tube and being circumferentially displaceable about the weapon tube relative thereto;
(e) an additional pivot axis defined in said cardan ring at a location situated in front of the trunnion axis; and
(f) a loading manipulator including
(1) a loading rocker being articulated to said cardan ring for pivotal motion about said additional pivot axis;
(2) a loading tray secured to said loading rocker for carrying a round of ammunition from a fixed location at the base to a location in front of the muzzle as the loading rocker swings about said additional pivot axis;
(3) an eongate positioner being articulated to said cardan ring for pivotal motion about said additional pivot axis; said positioner having an end remote from said additional pivot axis; and
(4) a bearing affixed to said base and receiving said end of said positioner for longitudinal sliding motion and pivotal motion therein.

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5,050,480
**TRIGGER ASSEMBLY FOR A FIREARM**
C. Reed Knight, Jr., Vero Beach, and Eugene M. Stoner, Palm City, both of Fla., assignors to Kniarmco Inc., Vero Beach, Fla.
Filed Dec. 8, 1989, Ser. No. 447,601
Int. Cl.[5] F41A *19/35*
U.S. Cl. 89—147 12 Claims



1. A semi-automatic, double action only firearm comprising:
an elongated frame having an axial slideway therein and a grip portion,
an elongated slide mounted on said frame for movement along said slideway between a slide battery position and a slide recoil position,
a firing pin assembly including a firing pin carried in said slide for axial movement between a retracted position and a firing position through a safety position, and
a trigger assembly including:
a trigger that reciprocates axially in said frame,
a sear reciprocated axially in said frame by said trigger, and
means that permits said sear to engage said firing pin when said sear moves away from said firing pin firing position, but prevents said sear from engaging said firing pin when said sear moves toward said firing pin firing position, said sear comprises an elongated flat strip member having a first leg extending from its distal end plus an upper second leg and lower third leg extending from its proximal end, a firing pin engagement lug that extends laterally from said second leg, and a cam surface on said third leg and, said frame carries a roller cam that engages said cam surface to cause said sear to pivot downward as said sear approaches the end of said movement of said sear away from said firing pin firing position.

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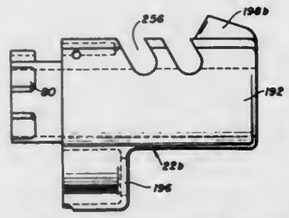


5,050,481

## ROLLING SUPPORTS FOR TRIGGER AND FIRING PIN ASSEMBLIES IN A FIREARM

C. Reed Knight, Jr., Vero Beach, and Eugene M. Stoner, Palm City, both of Fla., assignors to Kniarmco Inc., Vero Beach, Fla.

Division of Ser. No. 447,601, Dec. 8, 1989. This application May 14, 1990, Ser. No. 523,472
Int. Cl.[5] F41A *19/35*
U.S. Cl. 89—147 8 Claims



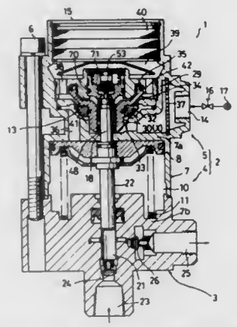

1. A semi-automatic, double action only firearm comprising:
an elongated frame having an axial slideway therein,
an elongated slide mounted on said frame for movement along said slideway between a slide battery position and a slide recoil position,
a firing pin assembly including a firing pin carried in said slide for axial movement between a retracted position and a firing position through a safety position, and
a trigger assembly including:
a trigger that reciprocates axially in said frame,
a sear pivoted to said trigger for reciprocation therewith, and
roller bearings fixedly connected to said trigger, said sear, and said frame to rollingly support said trigger and sear on said frame.

5,050,482

## APPARATUS FOR DRIVING PISTON BY FLUID PRESSURE

Keitaro Yonezawa, and Akihiro Nakata, both of Kobe, Japan, assignors to Kabushiki Kaisha KOSMEK, Kobe, Japan

Filed Jan. 29, 1991, Ser. No. 647,253
Claims priority, application Japan, Jan. 31, 1990, 2-23065
Int. Cl.[5] F01L *25/02*
U.S. Cl. 91—304 7 Claims



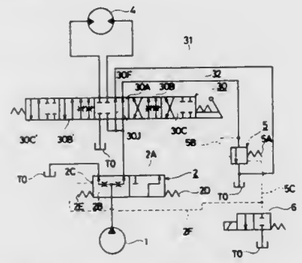
1. An apparatus for driving a piston by fluid pressure, wherein:
a main member (4) of the apparatus, being of a single-acting spring returning type, is so constructed that a piston (8) inserted into a cylinder (7) is driven to descend by fluid pressure in an actuation chamber (9);
a fluid pressure supply-discharge valve (13) allows pressure fluid to be supplied to or discharged from the actuation chamber (9), being provided with a supply-discharge valve casing (29) disposed above the cylinder (7) and a supply-discharge valve member (30) inserted into the supply-discharge valve casing (29) so as to be slidable up and down;
the supply-discharge valve member (30) can be turned switchably between the upper supply position (X) by the pressure fluid in a supply actuation chamber (33) formed therebelow and the lower discharge position (Y) by the pressure fluid in a discharge actuation chamber (35) formed thereabove, the pressure-receiving cross-sectional area (F) of a discharge actuation valve-face (30c) which confronts the discharge actuation chamber (35) being set to a value greater than the pressure-receiving cross-sectional area (D) of a supply actuation valve-face (30a) which confronts the supply actuation chamber (33); and
a pilot valve (18) allows pressure fluid to be supplied to or discharged from the discharge actuation chamber (35), being provided with a pilot valve casing (71) supported by the supply-discharge valve casing 29, a pilot-pressure valve member (46) linked with the piston (8), and a pilot-pressure valve seat (48) that makes sealing contact with the valve member (46),
the improvement comprising:
a cylinder chamber (70a) disposed above the supply-discharge valve member (30);
the pilot valve casing (71), having its bottom face, inserted into the cylinder chamber (70a) so as to be hermetically slidable up and down;
a pressure-receiving actuation chamber (70b) formed so as to confront the bottom face of the pilot valve casing (71) and communicated with the discharge actuation chamber (35); and
a return spring (73) adapted to urge the pilot valve casing (71) downwardly.

5,050,483

## FLOW CONTROL DEVICE

Kouzou Yoshikawa, Kobe, and Takahiro Kobayashi, Himeji, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho and Nippon Air Brake Co., Ltd., both of Kobe, Japan

Filed Jul. 18, 1990, Ser. No. 553,604
Claims priority, application Japan, Aug. 10, 1989, 1-208989
Int. Cl.[5] F15B *11/08*
U.S. Cl. 91—442 2 Claims



1. A flow control device comprising:
a control valve including a discharge line to be connected to a hydraulic motor, a supply line to be connected to a hydraulic pump, a first bleed-off control passage having a line connected to a tank, and a second bleed-off control passage having a line connected to the tank through a secondary control valve;
a flow dividing valve provided in the supply line, and having a first position for allowing a first desired flow of oil discharged from the hydraulic pump and a second position for allowing a second desired flow of the oil; and



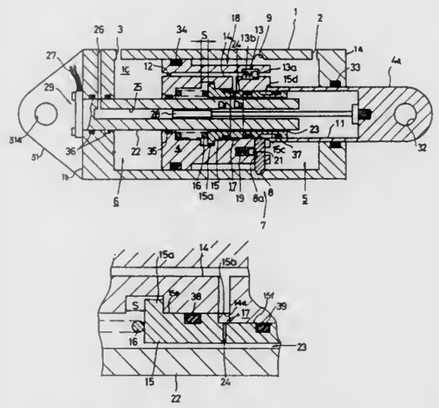
a selector valve operable for the secondary control valve and the flow dividing valve, and having a first selection position for closing the secondary control valve and shifting the flow dividing valve to the second position and a second selection position for opening the secondary control valve and shifting the flow dividing valve to the first position.

5,050,484

## HYDRAULIC ACTUATOR WITH LOCKING MECHANISM

Toshio Kamimura, Iwate, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Apr. 25, 1990, Ser. No. 514,288
Claims priority, application Japan, May 1, 1989, 1-112659
Int. Cl.[5] F01B *25/26*
U.S. Cl. 92—5 L 11 Claims



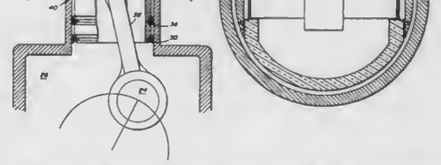
1. A hydraulic actuator comprising:
a cylinder formed with an axial cylinder chamber, a first port, and a second port;
a main piston provided in said cylinder chamber and dividing said chamber into a first chamber communicating with said first port and a second chamber communicating with said second port;
said main piston being formed with a locking chamber;
an annular locking groove formed in said cylinder;
a locking member cooperating with said annular locking groove to lock said main piston in an axially intermediate position between axially opposite ends of said cylinder;
said locking member being supported to said main piston so as to move radially inwardly into an unlocking position to unlock said main piston and radially outwardly into a locking position to lock said main piston;
a locking-unlocking piston for moving said locking member into aid locking and unlocking positions;
said locking-unlocking piston being provided in said locking chamber of said main piston;
pressure introducing means for selecting said first or second chamber that is higher in pressure and introducing the higher pressure in said selected chamber into said locking chamber of said main piston;
said pressure introducing means being formed in said main cylinder and comprising a passageway having first and second ends opening to said first and second chambers and a third end opening to said locking chamber of said main piston; and
said locking-unlocking piston being moved by the pressure introduced by said pressure introducing means to move said locking member into said locking and unlocking positions.

5,050,485

## CUSHIONING OF PISTON SIDETHRUST IN GAS LUBRICATED ENGINE

David P. Hoult, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 1, 1987, Ser. No. 33,588
Int. Cl.[5] F01B *31/00*
U.S. Cl. 92—126 4 Claims



1. In a gas lubricated reciprocating engine, a cylinder and a piston fitting therein with clearance, said piston having a top surface adjacent to a combustion chamber of said engine, and a cylindrical skirt surface extending downward from the top surface and facing an inner wall of said cylinder, said piston connected through a wrist pin and connecting rod to a crankshaft of said engine situated in a crankcase chamber, said piston having a range with a limit for travel from a position concentric with said cylinder wall to a position where it jams against said cylinder wall, said piston comprising
a gas lubricated crown seal extending around the piston and positioned near the combustion chamber,
a gas lubricated bottom seal extending around the piston and positioned below said wrist pin and near the bottom of the skirt surface so that a major portion of said skirt surface lies between said top and bottom seals,
a thrust side cushion chamber being defined by said crown seal, said bottom seal, the cylinder wall, and a portion of the skirt surface of the piston situated on the thrust side of the piston between the top and bottom seals,
an anti-thrust side cushion chamber being defined by said crown seal, said bottom seal, the cylinder wall, and a portion of the skirt surface of the piston situated on the anti-thrust side of the piston between the top and bottom seals,
said thrust side and said anti-thrust side cushion chambers

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communicating through passages defined by said crown seal, said bottom seal, the cylinder wall, and the portions of the skirt surface of the piston situated on the front and back sides of the piston between the crown and bottom seals,

wherein

diameter of the piston, clearance between the piston and the cylinder wall, clearance between the gas lubricated seals and the cylinder wall, area of piston skirt between said gas lubricated seals, the range of radial motion of the piston, and average pressure in the cushion chambers are mutually interrelated so that

an average pressure is maintained in the cushion chambers sufficiently greater than that in the crankcase chamber to be effective in producing cushioning forces, and so that

differential pressures between said cushion chambers accompanying flow of gas from one of said cushion chambers to the other of said cushion chambers induced by an excursion of the piston toward the cylinder wall in response to a horizontal operating force exerted on the piston by the connecting rod retard motion of the piston to prevent piston excursion to said limit of range for a period of $\frac{1}{2}$ crankshaft rotation throughout the operating range of said engine,

said piston having an additional gas lubricated seal controlling the average gas pressure between said bottom and crown gas lubricated seals.

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**5,050,486**

## AIR-CONDITIONING SYSTEM FOR VEHICLES

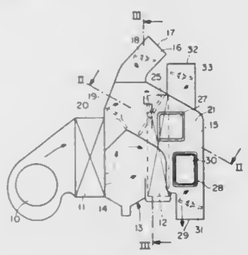
**Klaus Arold; Heinz Koukal; Gernot Karioth, all of Sindelfingen, and Hans Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany**

**Filed Aug. 2, 1990, Ser. No. 561,598**

**Claims priority, application Fed. Rep. of Germany, Aug. 3, 1989, 3925726**

**Int. Cl.[5] B60H** *1/00*

**U.S. Cl. 98—2.08** **15 Claims**



1. Air-conditioning system for vehicles comprising:

an evaporator arranged downstream of the blower,

a heat exchanger,

and an air distributor box which has air-outflow ports for at least one middle nozzle, for side nozzles, and a for at least one foot-space, back and deicer nozzles, said air distributor box being connected directly by means of its inlet cross-section to the evaporator and receiving the heat exchanger approximately centrally in such a way that it is subdivided by the heat exchanger into a front space portion facing the evaporator and into a rear space portion located behind the heat exchanger,

wherein an air-guide connection piece branches off from the front space portion of an upper region of the air distributor box as seen from the evaporator, said connection piece carries the air-flow port for the middle nozzle at its end, at least one inflow port located in the air distributor box and extending over the entire evaporator width is selectively closeable by means of a cold-air scoop flap, wherein the heat exchanger completely covers the cross-section of the air distributor box, wherein there extends from the rear space portion of the air distributor box two bypass channels which are guided laterally around the heat exchanger and which terminate in the air-guide connection piece, wherein the air outflow ports of the bypass channels are selectively closeable by means of temperature control flaps, and wherein the air-outflow ports for the side nozzles are arranged in the two bypass channels.

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**5,050,487**

## HEATING/AIR CONDITIONING SYSTEM FOR A MOTOR VEHICLE WITH ABSORPTION FILTER

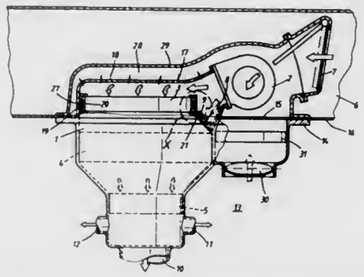
**Klaus Arold; Heinz Koukal, both of Sindelfingen; Hans Trube, Herrenberg; Karlheinz Witzel, Stuttgart, and Wolfgang Volz, Magstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany**

**Filed Nov. 8, 1989, Ser. No. 433,122**

**Claims priority, application Fed. Rep. of Germany, Nov. 9, 1988, 3837967**

**Int. Cl.[5] B60H** *3/06*

**U.S. Cl. 98—2.11** **10 Claims**



1. Heating/air conditioning system for a motor vehicle comprising an exchangeable and selectively bypassable absorption filter which is arranged in a channel shaped housing having a shut off bypass line and through which at least one of fresh air and circulating air can flow, means for collecting unprocessed air passing through internal leakage points at an absorption filter holder and at the shut off bypass line means for conveying said collected unprocessed air via at least one line, to a location which is separated from a passenger space and has a pressure level lower than a pressure level on a flow off side of the absorption filter, and means for guiding untreated air which escapes through external leakage points of a housing partition located upstream of the absorption filter outside the passenger space, at the same time being prevented from overflowing into the passenger space.

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**5,050,488**

## METHOD OF LOCKING A PIVOTABLE ASSEMBLY FOR SHIPPING

**John A. Beasley, Clarksville, Tenn., assignor to American Standard Inc., New York, N.Y.**

**Filed Dec. 21, 1990, Ser. No. 632,253**

**Int. Cl.[5] F24F** *7/007, 13/00*

**U.S. Cl. 98—34.6** **18 Claims**

1. A damper interlock mechanism comprising:

a housing including first and second apertures;

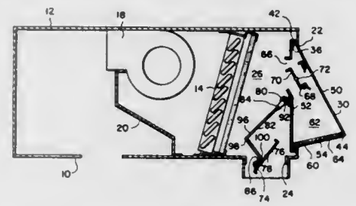
a damper assembly pivotably mounted in the first aperture;

a swing out unit pivotably mounted in the second aperture for pivotal movement between a first shipping position and a second operational position;

means for actuating the damper; and

a first damper control rod having a first end operationally connected to the actuator means, a second end operationally connected to the damper assembly, and an intermediate portion including means for interlocking the damper





control rod with the swing out unit when the swing out unit is in the shipping position.

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**5,050,489**

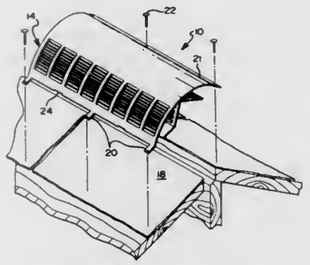
## ROOF VENTILATOR

**John P. Mankowski, 70 Boston Blvd. W., Detroit, Mich. 48202**

**Filed Jun. 15, 1990, Ser. No. 538,564**

**Int. Cl.[5] F24F** *7/02*

**U.S. Cl. 98—42.21** **30 Claims**



12. A roof ridge ventilator designed for placement on substantially one side of a roof ridge peak in the recirculation region of a roof, comprising:

a contoured, substantially rounded cover member including a vent therein, said vent having a plurality of openings to allow circulating air to pass therethrough from a ventilation opening in the roof to which it is attached;

at least one interior vent located underneath the contoured cover member with a plurality of openings therein;

an attachment means for securing the cover member to the roof,

said ventilator being only attached at one side to the roof ridge peak and at the other side to one side of the roof ridge peak in the recirculation zone so that the net free area of the ventilator may be maximized while infiltration of foreign matter through the ventilator into the attic is minimized.

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**5,050,490**

## DOMESTIC FOOD COOKING APPARATUS

**Shimon Yahav, Rehovot, and Yair Daar, Moshav Galia, both of Israel, assignors to Lancet S.A., Panama**

**Filed Apr. 3, 1989, Ser. No. 332,327**

**Claims priority, application Israel, Apr. 29, 1988, 86234; Feb. 10, 1989, 89260**

**Int. Cl.[5] A47J** *27/00;* **B01F** *7/14*

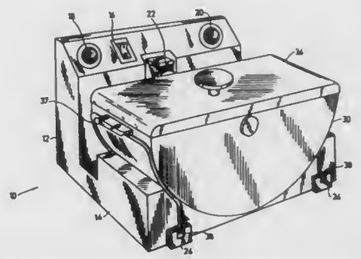
**U.S. Cl. 99—348** **21 Claims**

1. Domestic food cooking apparatus comprising:

a container for holding a food product to be prepared and defining a heating surface;

electrical heating means associated with said heating surface; and

automatically operative stirring means operative associated with said container for providing stirring of the food product therein and including a motor, stirring drive means, gear means coupling the motor to said stirring drive means, and quick coupling means for automatically coupling the stirring drive means to a stirrer, and wherein



said container is configured to have a curved bottom surface of generally circular configuration and of generally uniform cross section.

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**5,050,491**

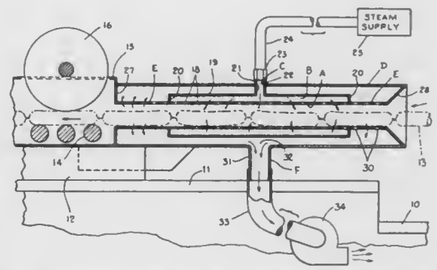
## STEAM ELIMINATOR FOR FRANKFURTER PEELER

**James H. Thompson, Rte. 3, Box 397-AA Emerald Rd., Greenwood, S.C. 29646**

**Filed Apr. 25, 1990, Ser. No. 514,133**

**Int. Cl.[5] A22C** *11/00*

**U.S. Cl. 99—483** **3 Claims**




1. A combustion chamber for a frankfurter peeler comprising:

an elongated perforate conditioning chamber;

an enlarged imperforate chamber surrounding said perforate conditioning chamber defining a manifold therebetween for receiving steam and delivering same into said perforate conditioning chamber for conditioning frankfurters passed therethrough prior to peeling;

a source of steam connected to said manifold;

a jacket surrounding said enlarged imperforate chamber defining an eliminator chamber for receiving exhaust steam and condensate from said perforate conditioning chamber;

an extension of said perforate conditioning chamber communicating with said eliminator chamber for delivering said exhaust steam and condensate thereto;

an end closure member at remote ends of said perforate conditioning chamber and said elimination chamber forming a substantially imperforate suction chamber whereby evacuation of said exhaust steam from said elimination chamber is enhanced; and

a source of suction connected to said eliminator chamber for drawing said exhaust steam and condensate into said eliminator and removing same therefrom.

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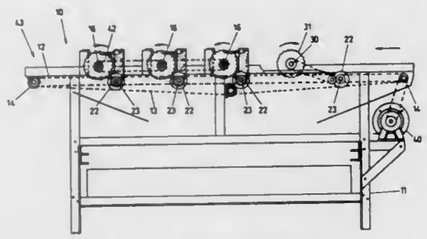


5,050,492

## CHERRY SPLITTER

Phillip J. Wotton; Glynn F. Liebelt, both of Carey Gully, and Robert G. Washington, Upper Sturt, all of Australia, assignors to Belt-Ton Grading Pty. Ltd., Carey Gully, Australia

Filed Oct. 5, 1990, Ser. No. 593,079
Claims priority, application Australia, Oct. 10, 1989, PJ6775
Int. Cl.[5] A23N *15/02, 15/00*
U.S. Cl. 99—638 11 Claims



1. A cherry splitting machine comprising:
a frame,
a plurality of belt upper portions lying side by side and extending between pulleys carried on shafts journalled in bearings which are fast with respect to the frame,
a plurality of cutter assemblies each cutter assembly comprising a cutter lying between adjacent said belts with at least portion of the cutter upstanding above said belts,
drive means coupled to the belts and the cutters and operable to effect relative movement therebetween,
and at least one separator located between belts upstream of and aligned with each respective said cutter,
the shape and location of each said separator being such as to divide the cherries of a bunch when being transported by the belts when driven by said drive means towards the cutters, in turn locating said cherries of the bunch on opposite sides of a said cutter, the shape of each said cutter being effective in separating stalks of cherries when on said opposite sides of the cutter.

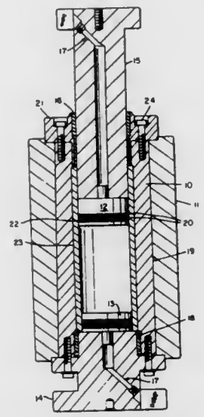
5,050,493

## BI-DIRECTIONALLY DRAINING PORE FLUID EXTRACTION VESSEL

Joseph Prizio, Boulder; Alexander Ritt, Lakewood; Timothy E. Mower, Wheat Ridge, and Lonn Rodine, Arvada, all of Colo., assignors to The United States of America as represented by the Secretary of Interior, Washington, D.C.

Filed Mar. 6, 1990, Ser. No. 490,898
Int. Cl.[5] B30B *9/02*
U.S. Cl. 100—106 2 Claims

1. A bi-directionally draining pore fluid extraction vessel for forcing gas and water out of a porous solid specimen comprising:
a means for laterally and axially confining and axially compressing a porous solid specimen, said means including an outer corpus steel ring and an inner corpus steel ring, said steel rings having a substantial interference fit along matching tapered surfaces;
a steel specimen sleeve located inside said inner corpus ring for laterally confining a solid specimen within said sleeve, said sleeve being easily removable from said inner corpus ring;
said means further including a top drainage plate and a bottom draining plate for axially confining and translating axial compression to a solid specimen within said sleeve, said draining plates each having a draining port;
said means further including a piston for translating a compression load axially to said top drainage plate and thereby to a solid specimen within said sleeve;
a collecting means connected to said draining ports for collecting gas and water discharged from a solid specimen within said sleeve; and
a means for injecting an inert gas into one of said top and



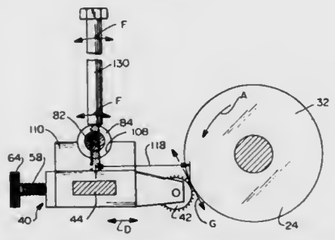
bottom drainage ports for extracting residual water from a solid specimen within said sleeve after the load capacity of said means for laterally and axially confining and axially compressing a solid specimen has been reached.

5,050,494

## FINE ADJUSTMENT SYSTEM OF FINISHING HEAD IN A PRINTING, DUPLICATING AND LIKE MACHINE

Eber L. Goodwin, Arlington Heights, Ill., assignor to Am International, Inc., Chicago, Ill.

Filed Oct. 13, 1989, Ser. No. 420,925
Int. Cl.[5] B41F *13/56*
U.S. Cl. 101—76 18 Claims



1. In a printing, duplicating and like machine wherein copy sheets are fed through a printing couple and then to a finishing couple which includes an impression cylinder rotatably mounted on appropriate shaft means extending between spaced side frame plates of the machine, a system for adjusting a finishing head in a direction transverse to the impression cylinder and its shaft means to vary the depth at which a finishing wheel on the head penetrates a copy sheet on the impression cylinder, comprising:
a bar rotatably mounted between the side frame plates;
mounting means for mounting the finishing head directly on the bar such that the finishing wheel is in position to engage a copy sheet on the impression cylinder;
lever means, separate from said mounting means, fixed to the bar and extending transversely outwardly therefrom; and
an adjusting shaft engageable with the lever means at a location spaced from the bar, the shaft being threadedly mounted on the machine to move the lever means and rotate the bar in response to rotation of the shaft whereby a very fine adjustment of the finishing wheel relative to the impression cylinder is achieved through the pitch of the shaft threads and a movement reduction of the lever means.

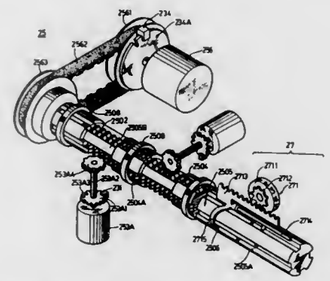


5,050,495

## PRINT WHEEL SETTING MECHANISM

Sheng J. Wu, P.O. Box 1-79, Taipei, Taiwan

Filed May 5, 1989, Ser. No. 347,863
Int. Cl.[5] B41L *47/46*
U.S. Cl. 101—91 22 Claims



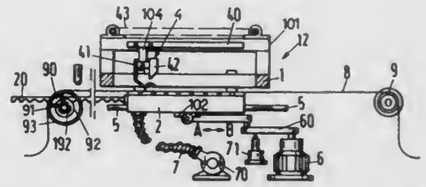
1. A digital mark-printer comprising:
a printing head;
a main shaft for supporting said printing head;
a main shaft driver means connected to said main shaft for rotatably driving said main shaft;
a plurality of wheel means disposed on an outer surface portion of said printing head;
a plurality of wheel driver means each individually connected to a respective one of said plurality of wheel means to individually drive each one of said wheel means, whereby said plurality of wheel means can be driven simultaneously;
a central processing unit connected to said main shaft driver means for controlling said main shaft driver means and to said plurality of wheel drivers means for controlling said plurality of wheel driver means;
a plurality of gears, one each attached to a respective one of said plurality of wheels;
a plurality of first racks, one each arranged for cooperative engagement with a respective one of said plurality of gears;
a plurality of second racks, each of said second racks having a first end for cooperative engagement with and for being driven by a respective one of said wheel driver means, and a second end longitudinally displaced from said first end;
each of said plurality of first racks including an arcuate hook arm member which extends from a respective first rack to a respective second rack, each said arm member including a lower free end that engages said second end of a respective second rack, thereby connecting each of said plurality of first racks to a respective second rack, and whereby each of said second racks is disposed angularly about a longitudinal center line of said main shaft relative to the respective first rack to which it is connected.

5,050,496

## SCREEN PRINTING MACHINE WITH A MOVING SCREEN AND A MOVING SQUEEGEE FOR PRINTING A WEB

Gerhard Klemm, Bielefeld, Fed. Rep. of Germany, assignor to Gerhard Klemm Maschinenfabrik GmbH & Co., Bielefeld, Fed. Rep. of Germany

Division of Ser. No. 374,967, Jun. 30, 1989, Pat. No. 4,964,335.
This application Sep. 13, 1990, Ser. No. 581,677
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823200
Int. Cl.[5] B41F *15/08*
U.S. Cl. 101—123 15 Claims



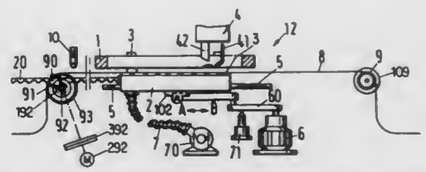
1. A screen printing machine for repeatedly applying paste to a web, comprising means for repeatedly advancing the web in a first direction through a relatively short first distance along an elongated path; an assembly including a flat bed at one side of said path, a screen at the other side of said path, at least one squeegee adjacent said screen and means for transporting said at least one squeegee relative to said screen and said bed; and means for moving said assembly relative to said path in a second direction counter to said first direction while the web is being advanced in said first direction through a first distance by said advancing means and for moving said assembly jointly with the web in said first direction through a longer second distance subsequent to each advancement of the web through a first distance, said at least one squeegee being operative to apply paste to the web through said screen during movement of said assembly in said first direction.

5,050,497

## SCREEN PRINTING MACHINE WITH A MOVING SCREEN AND STATIONARY SQUEEGEE FOR PRINTING A WEB

Gerhard Klemm, Bielefeld, Fed. Rep. of Germany, assignor to Gerhard Klemm Maschinenfabrik GmbH & Co., Bielefeld, Fed. Rep. of Germany

Division of Ser. No. 374,967, Jun. 30, 1989, Pat. No. 4,964,335.
This application Sep. 13, 1990, Ser. No. 581,664
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1988, 3823200
Int. Cl.[5] B41F *15/08*
U.S. Cl. 101—124 14 Claims



1. A screen printing machine for repeatedly applying paste to a web of material to be repeatedly printed, comprising means for repeatedly advancing the web through relatively short distances in a first direction along an elongated path; an assembly including a flat bed at one side of said path and a screen at the other side of said path opposite said bed; means

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for moving said assembly relative to said path with the web through longer second distances in said first direction subsequent to each advancement of the web through a short distance in said first direction; and at least one stationary squeegee adjacent said screen at said other side of said path to apply paste to the web through said screen during movement of the web with said assembly in said first direction.

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**5,050,498**

## STENCIL MANUFACTURING AND PRINTING PROCESS AND APPARATUS

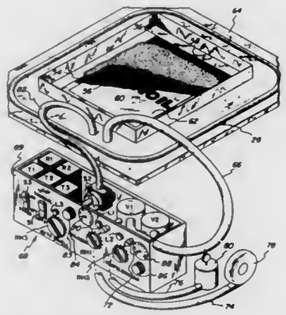
**Michael S. Smith, 7256 Rte. 212, Saugerties, N.Y. 12477**

**Continuation-in-part of Ser. No. 25,322, Mar. 12, 1987, Pat. No. 4,843,961, which is a continuation-in-part of Ser. No. 667,633, Nov. 2, 1984, Pat. No. 4,649,817. This application Jun. 26, 1989, Ser. No. 371,545**

**The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.**

**Int. Cl.[5] B41F** *15/20, 15/34*

**U.S. Cl. 101—127.1** **20 Claims**



1. A printhead comprising:

a tautly stretched sealed screen member secured at its periphery to a supporting frame and having a recognized screen tension constant;

a gasket wall member secured to said frame, said gasket wall member maintaining said frame and the periphery of the screen member at a selected fixed off contact distance from a supporting surface throughout operation of said printhead, the gasket wall member further serving as a peripheral seal which creates an air-tight chamber between the frame and the supporting surface;

means for controllably reducing the air pressure in said chamber to deflect a central portion of the screen member under atmospheric pressure into the chamber and into contact, to a selected variable extent and in a contact pattern commencing at a center of the central portion and progressively spreading outward therefrom, with a substrate resting on the supporting surface; and

means for monitoring the reduced pressure within the chamber in order to obtain a precise measure of screen member area of contact with the substrate, the monitored pressure within the chamber being correlated with the screen tension constant of the screen member and the off contact distance of the frame to obtain said precise measure of screen member area of contact.

**5,050,499**

## ARRANGEMENT FOR CORRECTING REGISTRATION IN A MULTI-COLOR ROTARY SHEET PRINTING PRESS

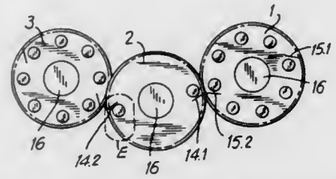
**Otfried Rudolph, Dresden; Gunter Peter, Radebeul; Christian Schneider, Weinböhla, and Steffen Piesch, Gröbern, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 7, 1990, Ser. No. 564,537**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1989, 3315277**

**Int. Cl.[5] B41F** *5/16*

**U.S. Cl. 101—183** **6 Claims**



1. An arrangement for correcting registration during guiding sheets in a multi-color, rotary sheet printing press including:

a plurality of printing units each having a printing cylinder, a transfer cylinder connected between printing cylinders of two adjacent printing units for transferring sheets between the printing units;

a plurality of gear drives for driving the printing and transfer cylinders;

said arrangement comprising a plurality of adjusting devices arranged within said gear drives, each of said adjusting devices including two conical sleeves fixedly mounted within said gear drives, two conical bushings matingly cooperating with said two conical sleeves, and an adjusting spindle with means for supporting said two conical bushings and linearly moving said conical bushings towards and away from each other.

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**5,050,500**

## SHEET TRANSFER WEB

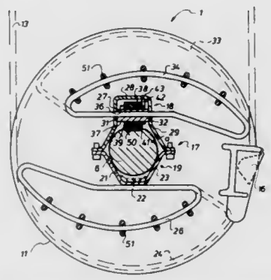
**Wolfgang C. J. Spiess, Würzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Würzburg, Fed. Rep. of Germany**

**Filed Aug. 6, 1990, Ser. No. 562,850**

**Claims priority, application Fed. Rep. of Germany, Sep. 2, 1989, 3929228**

**Int. Cl.[5] B41F** *21/00*

**U.S. Cl. 101—420** **7 Claims**



1. A sheet transfer drum for a rotary printing machine, said sheet transfer drum comprising:

a rotatable shaft;

a plurality of sheet carrying segments, each of said sheet carrying segments being secured to said shaft by a fast-acting closure and being shiftable axially along said rotatable shaft; and

a plurality of spaced sheet support elements positioned on each of said sheet carrying segments, each of said sheet support elements being shiftable axially and circumferentially with respect to its one of said sheet carrying segments.



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**5,050,501**

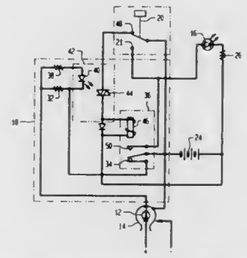
## PROJECTED GRENADE SIMULATOR

**Irving F. Barditch, Baltimore, and Paul G. Schabdach, Churchville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 7, 1991, Ser. No. 637,911**

**Int. Cl.[5] F42B** *35/00*

**U.S. Cl. 102—293** **7 Claims**



1. A projected grenade simulator test circuit which comprises:

diode means for indicating sufficiency of battery charge to operate said simulator circuit;

direct current power means for supply voltage to said test circuit; momentary pushbutton switch means for momentarily electrically coupling said power means to said diode means;

female jack means electrically coupled to said test circuit for receiving a test fire signal;

relay means for applying said test fire signal to said simulator test circuit;

input resistance means electrically coupled to said fire signal by said relay means for simulating a 1.2 ohm resistance of an actual grenade before firing; and

optocoupler triac driver means electrically coupled through said relay means to said fire signal and through said pushbutton means to said power means for opening a path to ground for said incoming fire signal in approximately 3 millionseconds, thereby simulating the time required to open the circuit by an electric match of an actual grenade and for presenting an open circuit to ground before firing.

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**5,050,502**

## AMMUNITION UNIT HAVING A SLEEVE ON A PRIMER TUBE

**Ulf Hellman, and Christer Sundell, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden**

**Filed Mar. 2, 1990, Ser. No. 487,118**

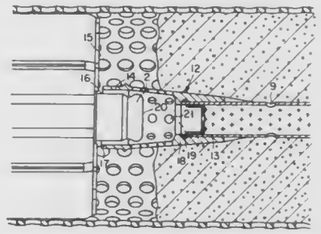
**Claims priority, application Sweden, Mar. 2, 1989, 8900718**

**Int. Cl.[5] E42B** *5/02*

**U.S. Cl. 102—430** **7 Claims**

1. An ammunition unit comprising a cartridge case, a shell having a rear surface and located in the forward end of the cartridge case; a tracer cartridge secured to the rear surface of the shell, a propellant charge in the cartridge case, a primer having an elongate primer tube extending in the cartridge case through the propellant charge and a space defined in the longitudinal direction of the case between the tracer cartridge and a forward portion of the primer tube,

a sleeve member having a first end portion mounted onto the forward portion of the primer tube and a second end portion surrounding and spaced from the tracer cartridge



and a partition member projecting inwardly inside said sleeve member intermediate said end portions for preventing longitudinal displacement of said sleeve member with respect to the primer tube and therefore preventing collision between the tracer cartridge and the primer tube.

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**5,050,503**

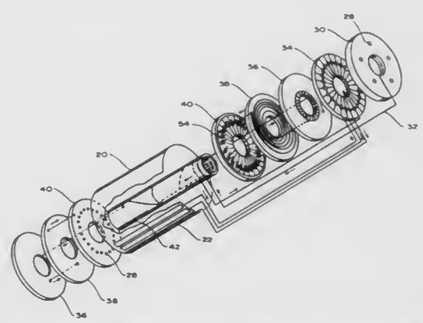
## SELECTIVELY AIMABLE WARHEAD INITIATION SYSTEM

**Fred L. Menz; Michael R. Osburn, both of China Lake, and Jerry O. Jones, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 20, 1971, Ser. No. 182,196**

**Int. Cl.[5] F42B** *12/20*

**U.S. Cl. 102—475** **3 Claims**



1. In a weapon system having a cylindrical, formable warhead and means for outputting target signals based on target encounter geometry;

a selectively aimable warhead initiation system comprising:

a circuit of explosive trails;

a plurality of warhead forming charges;

explosive logic network means for receiving said target signals and producing a single detonation signal along one of a plurality of explosive trails extending from said network means;

said plurality of explosive trails being equal in number to said plurality of forming charges;

a plurality, equal in number to said plurality of warhead forming charges, of first two way branches wherein said explosive trails branch into first and second explosive trails;

said first explosive trail extending to a forming charge select circuit wherein said first trail branches into third, fourth and fifth explosive trails;

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said third explosive trail extending through a first OR explosive logic element and to a first warhead forming charge which has been pre-selected by said target signal outputting means;

said fourth and fifth explosive trails extending to the second and third OR explosive logic elements, respectively, and then to second and third warhead forming charges, respectively;

said second and third forming charges being the nearest neighbors of said first forming charge;

said second plurality of explosive trails extending coaxial with, and along the inner surface of, and from the forward end of a cylindrical helix-detonation transfer line towards the middle of said transfer line and then extending through a plurality, equal in number to said plurality of forming charges, of holes and to a second plurality, equal in number to said plurality of forming charges, of two way branches;

said plurality of explosive trails extending from said plurality of two-way branches along a plurality of helical paths located on the surface of said transfer line to a position on the fore and aft ends of said transfer lines;

the ends of said helical trails being diametrically opposite each other;

each of said plurality of helical paths extending from the fore and aft end of said transfer line to respective booster select explosive circuits, wherein a preselected one of a plurality, equal in number to said plurality of warhead forming charges, of explosive control rectifier can be gated;

said helical trails extending from the fore and aft ends of said transfer line extending also to respective multi-input OR circuits and through respective explosive delay lines and to said respective booster select explosive circuits, wherein said two explosive trails branch into a first and second plurality of explosive trails equal in number to said plurality of forming charges, each trail extending to one of said plurality of explosive controlled rectifiers, only one of which can be gated;

said first and second plurality of explosive trails then extend to a plurality of forward and plurality of aft boosters, respectively, said plurality of boosters being equal in number to said plurality of forming charges;

whereby said warhead may be formed by the simultaneous detonation of one of said forming charges and its two nearest neighbors and subsequently detonated by the simultaneous detonation of one forward booster and one aft booster located diametrically opposite said forming charges.

2. In a weapon system having means for outputting signals based on target encounter geometry and a cylindrical, formable warhead,

a selectively aimable warhead initiation system comprising:

a plurality of detonation modes; and

logic means for sequentially detonating certain of said modes in a pattern determined by said signals;

a plurality of warhead forming charges;

a plurality of warhead booster charges; and

said forming and booster charges being adjacent said selectively aimable warhead;

means for detonating selected booster charges; and

means for delaying detonation of said selected booster charges until after detonation of said selected forming charges;

means for detonating selected forming charges comprising:

a plurality of explosive trails equal in number to said plurality of forming charges;

each of said trails being straight and of equal length;

the initial point of each trail lying in a common first circle;

the terminal point of each trail lying in a common second circle;

said circles being concentric and coplanar;

said second circle being greater in diameter than said first circle by the length of said trails;

branch points on each of said trails lying in a third concentric circle;

the diameter of said third circle being intermediate of the diameters of said first and second circles;

branches extending from said branch points away from said first circle to the two nearest neighbors of said trails;

each of said branches and the respective trail to which said branches lead being connected to inputs to a multi-input OR element.

3. In a weapon system having means for outputting signals based on target encounter geometry and a cylindrical, formable warhead,

a selectively aimable warhead initiation system comprising:

(a) a plurality of detonation modes comprising:

a plurality of warhead forming charges;

a plurality of warhead booster charges; and

said forming and booster charges being adjacent said selectively aimable warhead;

(b) logic means for sequentially detonating certain of said modes in a pattern determined by said signals comprising:

means for detonating selected forming charges;

means for detonating selected booster charges;

means for delaying detonation of said selected booster charges until after detonation of said selected forming charges;

whereby said warhead is properly formed prior to detonation of said booster charges;

said forming charges and said booster charges being evenly spaced about the circumference of a round warhead;

said booster charges and said forming charges being equal in number; and

means for selecting a booster charge located on a portion of said warhead diametrically opposite said forming charge to be detonated comprising:

a helix detonation transfer line comprising:

a cylinder;

first, second and third pluralities of hole defining walls;

each of said pluralities of holes defining walls being equal in number to said plurality of forming charges;

each of said three pluralities of hole defining walls being evenly spaced around a circumference of said cylinder;

said first and second plurality of hole defining walls being located at the forward end of said cylinder;

said first plurality of hole defining walls being nearer the forward end of said cylinder;

said third plurality of hole defining walls being located at the center of said cylinder;

a plurality of straight, non-overlapping explosive trails equal in number to said plurality of forming charges; and being located on a surface of said cylinder;

each trail of said plurality of explosive trails being associated with one hole defining wall from each of said pluralities of hole defining walls and connecting said three hole defining walls in an essentially straight line;

a plurality of helical, non-overlapping explosive trails equal in number to said plurality of forming charges and being located on a surface of said cylinder opposite the surface on which said plurality of straight explosive trail are located;

each of said helical trails being associated with one hole defining wall of said third plurality of hole defining wall and being connected to one of said straight trails; and

each of said plurality of helical trails extending from its associated hole defining wall of said third plurality of hole defining walls to each end of said cylinder and half way around said cylinder;

whereby a detonation entering said helix detonation transfer line exits said transfer line at a point diametrically opposite the point where it enters.

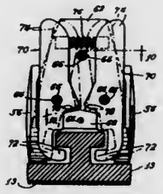


**5,050,504**

## BABY WALKER WITH SAFETY TRACK FEATURE

**Donald L. Mulcaster, 359 Dennie Ave., Newmarket, Ontario, Canada L3Y4M8**

**Division of Ser. No. 103,178, Sep. 30, 1987, Pat. No. 4,795,151.**
**This application Jul. 28, 1988, Ser. No. 225,399**
**Int. Cl.[5] A61B *12/02***
**U.S. Cl. 104—242** **3 Claims**



1. A tracking caster adapted for movable but removable securement to a protuberance of track means and adapted for securement to a baby walker or like device comprising; locking means including hand operable lock-on levers and means for urging said lock-on levers into locked-on movable but removable securement to said track means, and comprising also rolling means associated with said locking means adapted for rollable engagement with a flat portion of said track means, and wherein said hand-operable lock-on levers include hand grippable means for counteracting said urging means for assisting with attachment to and removal of said device from said track.

**5,050,505**

## RADIO CONTROL DEVICE FOR TRACK-TRAVELLING TOY

**Sunao Konno, Tokyo, Japan, assignor to Tomy Company, Ltd., Tokyo, Japan**

**Filed Jul. 31, 1989, Ser. No. 387,079**
**Claims priority, application Japan, Aug. 5, 1988, 63-103778**
**Int. Cl.[5] A63H *30/04***
**U.S. Cl. 104—295** **11 Claims**

1. A radio control device for a track travelling toy having a radio receiver, comprising:

a control box having an interior;

a transmit mechanism including an antenna for transmitting control signals to the receiver, and being disposed in the interior of the control box;

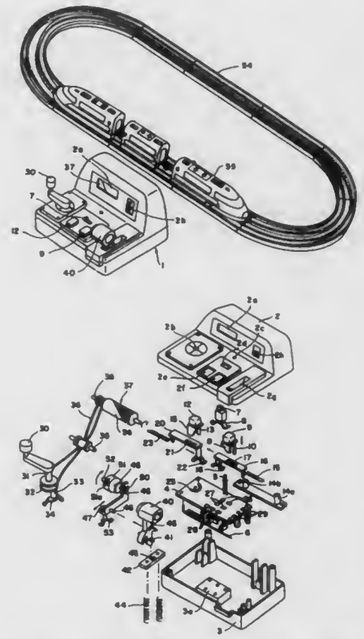
a speed change lever operatively coupled to the transmit mechanism for controlling a speed of the track travelling toy;

indicator means for indicating the speed of the track travelling toy;

means for mechanically coupling the indicator means to the speed change lever, wherein the indicator means is driven by the speed change lever;

a directional control lever pivotally mounted in the control box and being operatively coupled to the transmit mechanism for selecting a direction of movement of the track travelling toy; and

second indicator means for indicating the selected direction of movement of the travelling toy, and second means for mechanically coupling the second indicator means to the directional control lever, wherein the second indicator means comprises a drum rotatably mounted in the control box and visible through a window provided in the control box, and the second mechanical coupling means comprises a link pivotally connected to the directional control lever and having an electrical contact at one end which moves



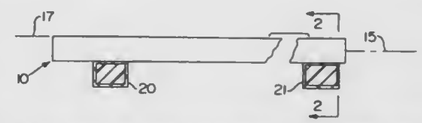
in response to movement of the directional control lever and an elongated slot provided at the opposite end for receiving an eccentric shaft of the drum so that the drum rotates in response to the sliding movement of the link.

**5,050,506**

## PALLET

**Leslie C. Fiedler, Rte. 12, Box 157 C, Bakersfield, Calif. 93312**

**Filed Jan. 15, 1987, Ser. No. 3,634**
**Int. Cl.[5] B65D *19/38***
**U.S. Cl. 108—51.1** **5 Claims**




1. A pallet for carrying articles stacked upon it, said pallet comprising:

a plurality of platform runners extending parallel to one another along a first axis and defining a support plane;

a plurality of support runners extending parallel to one another along a second axis abutting said platform runners, defining a base plane, said support runners being disposed on the same side of the platform runners, said axes being non-parallel to one another;

adhesive means joining said platform runners and support runners at their intersection;

said runners having an external shell made of an imperme-

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able, non-absorptive material with an internal wall at least partially bounding an axially extending cavity; and

a cast-in-place closed cell structural foam core completely filling each said cavity and self-adhered to the entire said internal wall to form a unitary monolithic structure, whereby said runner is capable of resisting substantial compressive deformation, said foam filled runners also having substantial resistance to bending forces, and the capability to exclude liquids and not to absorb them.

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**5,050,507**

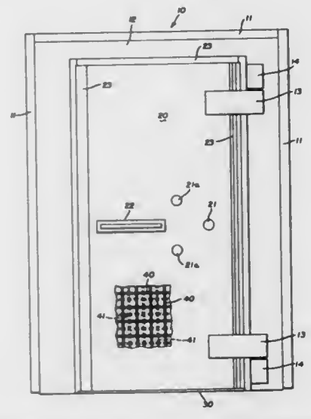
**VAULT DOOR AND MIX FOR CASTING SAME**

**Leslie Shoyat, Wadsworth, Ohio, assignor to Lindsay Concrete Products Co., Inc., Canal Fulton, Ohio**

**Filed Feb. 20, 1990, Ser. No. 481,223**

**Int. Cl.[5] C04B *7/02*; E04B *2/84***

**U.S. Cl. 109—83** **10 Claims**



1. A burglary resistant cast door assembly for use in a burglary resistant vault, said door comprised of concrete consisting essentially of:

| Constituents | % Weight |
|---|---|
| Type I cement | About 21.6 to 25.4 |
| Sand | About 31.5 to 37.2 |
| #8 gravel | About 30.7 to 36.8 |
| Water reducer | About 0.4 to 0.7 |
| Steel fiber | About 2.3 to 5.1 |
| Water | About 3.8 to 5.4 |

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**5,050,508**

**SYSTEM FOR THE INCINERATION OF REFUSE AND THE TREATMENT OF THE INCINERATION EXHAUST GASSES**

**Paul Wilson, Charleston Heights, S.C., assignor to HCR, Hartsville, S.C.**

**Filed Oct. 9, 1990, Ser. No. 594,028**

**Int. Cl.[5] B09B *3/00***

**U.S. Cl. 110—235** **18 Claims**

2. A method for the incineration of refuse and the treatment of incineration exhaust gasses comprising;

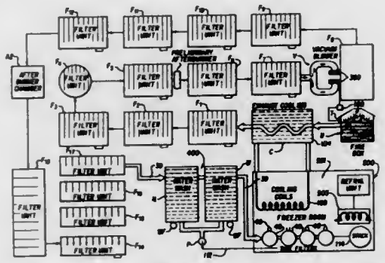
incinerating said refuse in a fire box having air intake means, oil decomposition product removal means, and exhaust gas off take means,

directing said exhaust gasses from said off take means to cooling means,

treating said exhaust gasses in said cooling means by heat exchange with a cooling liquid,

passing said exhaust gasses through filtration means whereby particulates are removed from the exhaust gasses,

subjecting said exhaust gasses to after-burning in a closed after-burner chamber,



passing said exhaust gasses through a wash assembly whereby the exhaust gasses are passed through a water bath and subjected to a water spray, and

discharging the cleaned exhaust gasses to the atmosphere.

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**5,050,509**

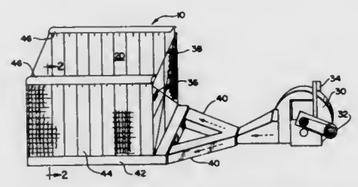
**COMMERCIAL BURNING SYSTEM BURNING BOX**

**Sam Mormino, 3024 Palm La., Northbrook, Ill. 60062**

**Filed Aug. 2, 1990, Ser. No. 562,020**

**Int. Cl.[5] B09B *3/00*; F23D *14/00***

**U.S. Cl. 110—235** **3 Claims**



1. An above ground enclosure for burning refuse comprising first horizontal tubes at the base of and on at least two opposite sides of the enclosure, a plurality of vertical tubes opening into and extending upwards from said first horizontal tubes, said vertical tubes having an entrance end adjacent said first horizontal tube and an exit end opening into second horizontal tubes said second horizontal tubes having openings directed into said enclosure whereby cool air is directed from said first horizontal tube into said vertical tubes entrance end and is further directed from said vertical tube exit end into said second horizontal tube over said enclosure whereby an air curtain is formed over burning refuse and smoke and ash do not enter the environment.

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**5,050,510**

**ALUMINUM CATCH TRAY SYSTEM**

**Frank D. Vona, and James H. Rafferty, both of Erie, Pa., assignors to Zurn Industries, Inc., Erie, Pa.**

**Filed Jan. 29, 1990, Ser. No. 471,605**

**Int. Cl.[5] F23G *5/00, 5/44*; F23H *11/18, 11/24***

**U.S. Cl. 110—257** **20 Claims**

1. In combination a furnace for burning solid fuel containing tramp aluminum, a moving grate moving continuously from an upstream end to a downstream end and inclined trays,

said grate having an upper part extending between said upstream end and said downstream end and providing a combustion area in which fuel may be burned,

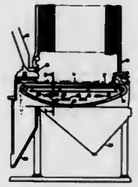


said grate having a lower part through which said grate returns from said downstream end to said upstream end,

tray support means on said furnace supporting said inclined trays between said upper part of said moving grate and said lower part of said moving grate.

means for removing and replacing said inclined trays in said furnace,

said inclined trays having an inclined plate having an upwardly facing surface inclined at an acute angle to the



vertical whereby molten aluminum falling through said upper part of said moving grate impinges on said upwardly facing surface of said inclined plate is cooled and adheres to said upwardly facing surface and ash falling through said moving grate impinges on said upwardly facing surface is shed downwardly therefrom by gravity, and said inclined trays may be removed from said furnace for cleaning aluminum therefrom and said inclined trays may be replaced in said furnace.

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**5,050,511**

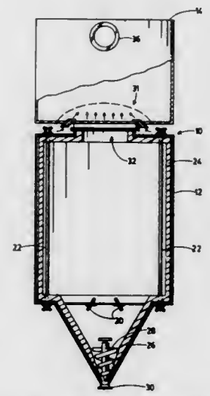
**PROCESS FOR THE DESTRUCTION OF ORGANIC WASTE MATERIAL**

**Douglas J. Hallett, Acton, and Kelvin R. Campbell, Guelph, both of Canada, assignors to 655901 Ontario Inc., Rockwood, Canada**

**Continuation of Ser. No. 481,197, Feb. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 335,481, Apr. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 82,452, Aug. 5, 1987, Pat. No. 4,819,571. This application Dec. 21, 1990, Ser. No. 631,847**

**Int. Cl.[5] F23G *7/00***

**U.S. Cl. 110—346** **67 Claims**



1. A process for the treatment of organic waste material comprising the steps of:

i) subjecting the waste material to direct chemical reduction by mixing the material with a reducing agent, subsequent reduction at a temperature above about 600° C. within a substantially oxygen-free isolated first zone;

ii) transferring reduced gaseous components to a cooling zone within the first zone;

iii) introducing a first aqueous component into the cooling zone, and cooling and condensing a first portion of the gaseous components therein into a liquid such that an aqueous liquid phase is formed and collecting the aqueous liquid phase in a collection zone; and

iv) recycling a portion of the aqueous liquid phase by introducing the portion as the first aqueous component into the cooling zone.

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**5,050,512**

**COMBUSTION CHAMBER AND PROCESS FOR COMBUSTING AT LEAST PARTIALLY COMBUSTIBLE SUBSTANCES**

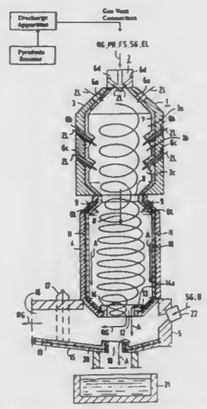
**Herbert Tratz, Ottensoos, and Georg Lösel, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Jul. 16, 1990, Ser. No. 552,812**

**Claims priority, application European Pat. Off., Jul. 19, 1989, 89113285.4**

**Int. Cl.[5] F23G *5/00***

**U.S. Cl. 110—346** **41 Claims**



1. Combustion chamber for combusting a substance, comprising:

a burner; and

at least three successively disposed parts including a primary chamber, a secondary chamber and an ash discharge chamber;

said burner being associated with and conducting a first air flow to said primary chamber;

said primary chamber having a wall and an inlet for a second air flow disposed in said primary chamber and aligned obliquely relative to said wall of said primary chamber; and

said secondary chamber having an inlet for conducting a third air flow and said secondary chamber having walls and a material lining said walls being resistant to fluid clinker.

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**5,050,513**

**STICH CONTROLLER FOR AN ELECTRIC SEWING MACHINE**

**Samuel R. Frankel, 211 Maple St., Shillington, Pa. 19607**

**Filed Feb. 7, 1991, Ser. No. 652,090**

**Int. Cl.[5] D05B *19/00, 69/22***

**U.S. Cl. 112—121.11** **9 Claims**

1. A stitch controller for installation on an electric sewing machine which has a treadle with a circuit to vary the ma-

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chine's stitching speed from zero to a defined maximum and a needle positioner with a circuit for halting the needle in a first up position and a second down position comprising:

(a) a box which contains the controller;

(b) a preprogrammable central processing unit within the box, the CPU having:

(i) a memory for storing a multiplicity of sets of instructions as a program with a label;

(ii) translation means for translating signals received by the CPU from the needle positioner circuit and the treadle circuit into data,

(iii) means for compiling the data into the multiplicity of sets of instructions,

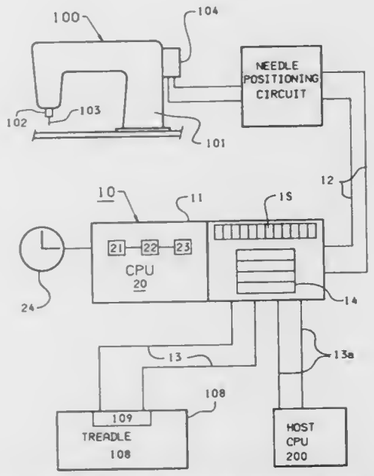
(iv) means for transmitting each set of instructions to the needle positioner circuit;

(v) means for disabling the treadle circuit;

(vi) a clock;

(vii) a first resettable counter register for counting stitches made by the machine such that the counter decrements by a count of one for each stitch;

(viii) a second resettable counter register for counting runs of stitches such that the counter decrements by a count of one for each run;




(ix) means for halting the needle positioner in the second down position when the first counter is decremented to zero;

(x) means for halting the needle positioner in the first up position when the second counter is decremented to zero;

(xi) means for connecting the controller to the needle positioner circuit at a defined location;

(xii) means for connecting the controller to the treadle circuit at a defined location;

(xiii) means to calculate the machine's stitching speed;

(xiv) means to define the stitching speed;

(xv) means to disable the CPU's memory selectively;

(xvi) means to store in the CPU's memory a program comprising the first, second, third and fourth sets of instructions;

(c) a display mounted adjacent to the box, said display being connected to the CPU which displays information;

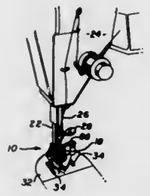
(d) a key pad mounted adjacent to the box, said key pad being connected to the CPU for entering data into the CPU's memory.

**5,050,514**

## SATIN STITCH PRESSER FOOT HAVING THREAD AND FABRIC GUIDES

**Clare J. Niederkorn, 1371 Calle Violeta, Thousand Oaks, Calif. 91360**

**Filed Mar. 20, 1990, Ser. No. 495,999**
**Int. Cl.[5] D05B** *29/00, 29/08, 29/12*
**U.S. Cl. 112—235** **17 Claims**




1. A hem stitching presser foot detachably mounted to a lower end of a presser bar of a sewing machine having a needle vertically reciprocated and swingable laterally of a fabric feeding direction, the presser foot comprising:

a sole to be pressed against a fabric to be sewn;

a needle dropping hole formed in the sole for allowing the needle to penetrate the fabric;

a fabric guide associated with the sole for engaging an edge of the fabric to guide the fabric therealong; and

a thread guide pin fixed relative to the fabric guide and extending below the needle dropping hole, wherein the thread guide pin lies parallel to the fabric feeding direction;

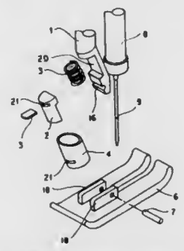
wherein the sole includes parallel fabric-engaging skis extending the length of the sole in the fabric feeding direction and defining the lateral limits of the needle dropping hole, a front lateral bar extending across the thread guide pin to define a forward limit of the needle dropping hole, and a heel portion extending between the skis to define a rearward limit of the needle dropping hole, wherein the heel portion and the skis cooperatively define a channel on the underside of the sole of sufficient depth to accommodate a thickened satin-stitch hem passing therethrough.

**5,050,515**

## PRESSER FOOT RETAINER SYSTEM FOR SEWING MACHINE

**George Lawrie, Mississeuga, Canada, assignor to SSMC Inc., Edison, N.J.**

**Filed Jul. 31, 1990, Ser. No. 560,930**
**Int. Cl.[5] D05B** *29/08, 29/12*
**U.S. Cl. 112—240** **6 Claims**




1. A presser foot retainer system for use in a sewing machine, said system comprising:

a presser foot device including an elongated generally horizontal foot, a horizontal cross pin positioned above the foot and extending in a direction generally at right angles to the direction of elongation of the foot, and a first means connected to the pin and the foot to support the pin in said position;

a presser bar having upper and lower ends, the bar having an exterior surface and a slot adjacent to the lower end of the bar, said slot being generally parallel with the pin and having an opening flush with said exterior surface for accommodating the pin; and

a second means disposed at the lower end of the bar and cooperating with the slot and the pin to enable the pin to be detachably engaged in the slot to detachably secure the device to the bar, said second means including a plate slidable on and along the surface between a first position at which the opening of the slot is exposed and a second position at which the opening of the slot is covered.

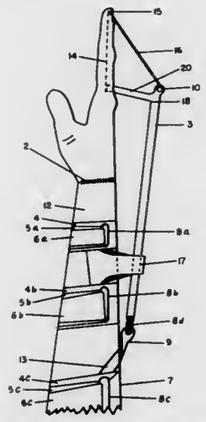


**5,050,516**

## WINDSURFER HAND HARNESS

**Robert A. Soudan, Jr., 517 Benjamin St., Ann Arbor, Mich. 48104, assignor to Robert A. Soudan, Jr., Chicago, Ill.**

**Filed Aug. 1, 1990, Ser. No. 531,580**
**Int. Cl.[5] B63B** *35/00*
**U.S. Cl. 114—39.2** **9 Claims**




1. An arm mounted harness for use with a sailboard having a boom, the harness comprising:

a hollow sleeve mountable about the forearm of the user;

strap means mounted on the sleeve for releasably securing the sleeve on the forearm fo the user;

a rigid finger having a first linear portion and a second end portion bent at an angle with respect to the first linear portion, said finger being disposed adjacent a back side of a user's forearm secured in said sleeve,

means for pivotally mounting one end of the first linear portion of the finger on the sleeve,

webbing means attached to one end of the sleeve extending in web-like fashion between two fingers of a user, and

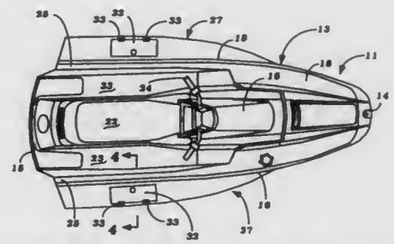
connector means connected at one end to the webbing means and, at another end, to an intermediate portion of the finger between the first and second ends of the figure for pivoting the second end portion of the finger between a first position spaced from the fingers of a user and a second position in which the second end portion of the finger extends between the fingers of a user and engages the boom of a sailboard when the user's fingers are wrapped around the boom of the sailboard.

**5,050,517**

## SMALL SIZED JET PROPULSION BOAT

**Noboru Kobayashi, Iwata, Japan, assignor to Yamaha Hatsudoke Kabushiki Kaisha, Iwata, Japan**

**Continuation-in-part of Ser. No. 260,940, Oct. 21, 1988, Pat. No. 4,909,176. This application Nov. 13, 1989, Ser. No. 435,984**
**Int. Cl.[5] B63B** *43/14*
**U.S. Cl. 114—123** **9 Claims**



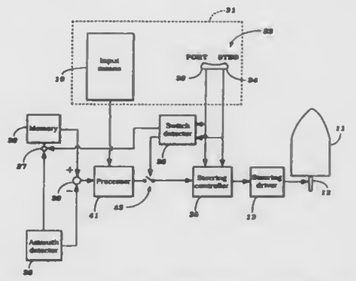

1. In a hull configuration for a small watercraft comprises of a bow portion and a stern portion and defining a rider's area therebetween, said hull being defined at least in part by a pair of upstanding side walls, including a seat adapted to accommodate a rider in a straddle fashion between the sidewalls and rearward of the bow portion, the improvement comprising means for detachably affixing a pair of containers in a fixed position to said hull one each side of said upstanding side walls, said containers each providing a substantial enclosed volume extending along the respective side wall, and means for permitting a displaced rider to selectively flood a selected one of said containers to reduce the buoyancy and facilitate reentry, said flooding means being a container access hatch.

**5,050,518**

## AUTOMATIC STEERING DEVICE

**Ryozo Okita, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Continuation of Ser. No. 276,313, Nov. 25, 1988, abandoned. This application Oct. 1, 1990, Ser. No. 592,338**
**Claims priority, application Japan, Nov. 27, 1987, 62-297829**
**Int. Cl.[5] G06F** *15/50*
**U.S. Cl. 114—144 A** **4 Claims**

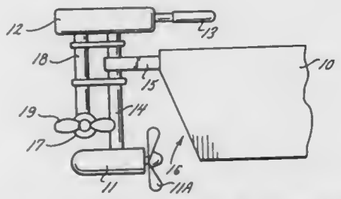



1. A ship steering system comprising a steering device, an automatic course controlling device for operating said steering device to maintain a preset course in response to an input signal, manually operated means for operating said steering device, memory means for memorizing a setting of said steering device upon operation of said manually operated means, and means for inputting the memorized setting of said steering device as the input signal to said automatic course controlling device for automatically maintaining the course set by said memory means at the completion of a manual steering operation of said manually operated means.

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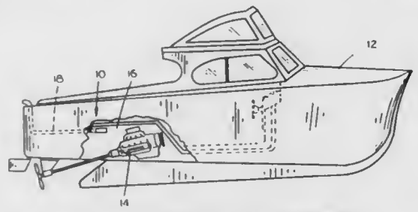


5,050,519
## BOAT TROLLING MOTOR CONTROL
David A. Senften, St. Peters, Mo., assignor to Architectural Control Systems, Inc., St. Louis, Mich.
Continuation of Ser. No. 342,103, Apr. 24, 1989, abandoned.
This application Jul. 26, 1990, Ser. No. 560,011
Int. Cl.[5] B63H *25/00*
U.S. Cl. 114—144 E 23 Claims



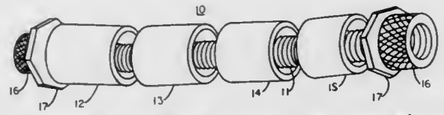
1. A system for effecting automatic movement of a boat to maintain the boat at selected distances from selected objects, such as shores, fixed structures, and suspected fish habitats, the system comprising:
motor means supported by the boat for propelling and steering the boat;
a controller carried by the boat with circuit means for automatically controlling said motor means, said controller further comprising;
means for transmitting signals toward a selected object;
means for sensing the distance from the boat to the selected object in response to said transmitted signals;
means for selecting a desired distance to be maintained between the boat and said object;
means for comparing the sensed distance with the selected desired distance; and
means for operating said motor means, upon the sensed distance being different from the selected desired distance, to drive the boat toward a position where the sensed and selected desired distances are substantially the same.

5,050,520
## FUME EXHAUSTION SAFETY DEVICE
Elmer I. Ballard, P.O. Box 1866, Council Bluffs, Iowa 51502, assignor to Elmer I. Ballard, Council Bluffs, Iowa; Emmett L. Steffes, Omaha, Nebr.; Stephen M. Davis, Missouri Valley and Don Frerichs, Malvern, both of, Iowa
Filed Dec. 14, 1990, Ser. No. 627,733
Int. Cl.[5] B63J *2/00*
U.S. Cl. 114—211 9 Claims



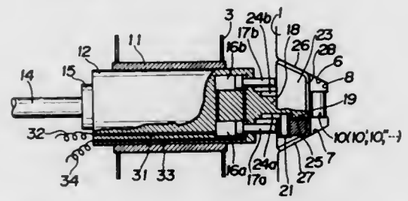
1. A fume exhaustion safety device, comprising:
a hollow tubular member for the passage of a gaseous fluid from an upstream end to a downstream end;
means connected to said tubular member for detecting the flow of gas through said tubular member; and
electrical switch means operably connected to said gas flow detecting means, operable to a first position to open an electrical circuit when no gas is flowing through the tubular member, and operable to a second position to close an electrical circuit when gas is flowing through said tubular member.

5,050,521
## MOORING LINE SYSTEM
John A. Stone, 1407 Seagull Ct., Punta Gorda, Fla. 33950
Filed Apr. 25, 1990, Ser. No. 514,209
Int. Cl.[5] B63B *21/00*
U.S. Cl. 114—230 2 Claims



1. A dock and mooring line roller and chafe resistor adapted to allow vertical movement of a moored vessel comprising:
a spiral wound, high impact, plastic tube;
a plurality of high impact plastic spools disposed on said tube and having a longitudinal inside diameter sufficient to permit a loose fit when disposed on said tube and having an outer thickness of at least ¼", and
a first end cap flange mounted on a first end of said tube and a second end cap flange mounted on a second end of said tube, said first and second end cap flanges consisting of high impact plastic.

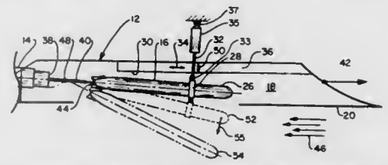
5,050,522
## APPARATUS FOR CONNECTING A PUSHER BOAT AND A BARGE
Takuma Yamaguchi, 1-308, No. 10, 3-chome, Natsumidai, Funabashi-shi, Chiba-ken, Japan 273 , and Kiyoshi Mogami, Odakyuhaitsu 11-304, No. 5-16, 2-chome, Fujimidai, Nagareyama-shi, Chiba-ken, Japan 270-01
Filed Aug. 21, 1990, Ser. No. 571,097
Claims priority, application Japan, Sep. 1, 1989, 1-101773[U]
Int. Cl.[5] B63B *21/56*
U.S. Cl. 114—249 23 Claims



1. Apparatus for connecting a pusher boat and a barge, wherein the barge has a hull receiving notch formed in its stern with a pair of vertically extending side slots formed at opposing positions in a peripheral wall of the hull receiving notch, and the pusher boat has a hull portion which is complementary in shape to the hull receiving notch, said apparatus comprising:
a pair of side connecting pins;
side pin mounting means for mounting said side connecting pins to the hull portion of the pusher boat such that said side connecting pins can slide between extended positions in which they are adapted to engage in the side slots formed in the peripheral wall of the hull receiving notch, and retracted positions;
side pin actuating means for moving said side connecting pins between their extended and retracted positions, respectively;
a pair of projection members fixedly mounted to and projecting from end faces of said side connecting pins, respectively;
a pair of pressing shoes mounted on said projection members, respectively, for movement between inner positions adjacent said end faces of said side connecting pins and outer positions spaced from said end faces of said side connecting pins, respectively; and
pressing shoe actuating means for moving said pressing shoes to said outer positions, respectively.



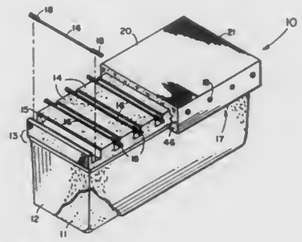
5,050,523
## PIVOTED VEHICLE LAUNCH FOR SUBMARINE
John A. Schwemin; Richard H. Baker, both of Middletown; James M. Sowle, Portsmouth, and Stephen A. Jordan, Narragansett, all of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 17, 1990, Ser. No. 599,558
Int. Cl.[5] B63B *35/44*
U.S. Cl. 114—259 13 Claims



1. A system for launching a vehicle having front and back portions, from the submerged hull of a vessel that is moving forward through water, comprising:
first means carried on a submerged exterior surface of the hull and connected to the front portion of the vehicle, for initially supporting the vehicle front portion adjacent to the hull in the direction of hull travel and then selectively releasing the front portion of the vehicle when the front portion has moved laterally away from the hull;
second means connected between the vessel and the back portion of the vehicle, for initially providing stationary support to the back portion of the vehicle adjacent to the hull while the first means supports the front portion and then providing releasable pivoting support to the back portion as the vehicle front portion moves laterally away from the hull; and
third means cooperating with the first means, for urging the front portion laterally away from the hull until the front portion is released by the first means;
whereby the vehicle is released from the first and second means and thereby launched from the hull into the water flowing along the hull.

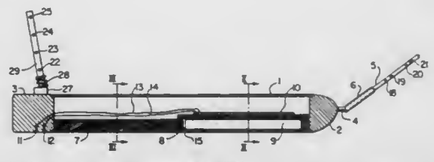
5,050,524
## FLOATING CONCRETE DOCK SECTIONS AND METHOD OF CONSTRUCTION
John P. Kyhl, 3558 Muirfield Dr., Titusville, Fla. 32780, and Arnold A. Finn, 3605 Conway Garden Rd., Orlando, Fla. 32809
Filed May 9, 1988, Ser. No. 191,333
Int. Cl.[5] B63B *35/38*
U.S. Cl. 114—263 6 Claims

1. A method of construction of a floating dock section comprising the steps of:
a) preparing an expanded polystyrene billet;
b) inverting the billet;
c) coating bottom and sides of the billet with a fiberglass-concrete mixture;
d) turning the inverted billet upright;
e) forming transverse channels in top surfaces of the billet;
f) installing a pouring collar around the top surface of the billet;
g) installing through rods in the transverse channels and bolting the rods to the pouring collar;
h) pouring concrete around the through rods and to the top of the pouring collar;



i) curing the concrete; and
j) unbolting and removing the collar.

5,050,525
## GAMMA SURVEY PROBE FOR USE ON OCEAN, LAKE, ESTUARY AND RIVER SEDIMENTS
David R. Lee, Deep River, and William J. Beattie, Petawawa, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Japan
Filed Jun. 12, 1990, Ser. No. 536,804
Claims priority, application Canada, Jul. 4, 1989, 604746
Int. Cl.[5] B63B *39/02*
U.S. Cl. 114—244 20 Claims



1. An underwater gamma radiation survey probe adapted to be towed by a tow cable along the bottom of a body of water; the probe comprising a slim tubular shell with a nose cone having a waterproof connector for the tow cable, the nose cone closing one end of the tubular shell in a waterproof manner and an end plug closing the tubular shell's other end in a waterproof manner, at least one weight of high density material being located in a lower half of the tubular shell, the weight containing a cavity having an opening which faces the tubular shell with a first radiation detector being located in said cavity and positioned to detect radiation through said opening.

5,050,526
## BOAT ATTACHMENT
Lee N. Nelson, 14722 Lone Eagle Dr., Fla. 32821, and James J. Powers, III, 3176 Crested Cir., both of Orlando, Fla. 32821
Filed Aug. 21, 1989, Ser. No. 396,047
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—364 8 Claims

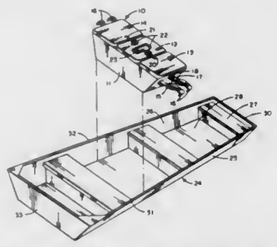
1. An attachment for a fishing boar comprising:
an elongated container having a well container formed therein, and having a separate insulated ice chest formed therein and said container having a pair of end portions shaped to follow the sides of a fishing boat and said elongated container having a plurality of doors opening thereinto, one said door opening into said ice chest which door is a formed tray having glass holding coasters formed therein;
a bait container shaped to fit inside said well;
a plurality of flexible straps fixedly attached to each end of said elongated container, each said flexible strap being adjustable whereby adjustments can be made for different boats, and each said strap having a loop formed on one

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end thereof and inserted in said opening in the end of said container and being attached to said container and a pair of strap holding rods located in said container;

a pair of strap holding rods located in said container and each said strap holding rod being passed through two of said strap loops to hold said straps to said container; and



a plurality of hook brackets, one hook bracket attached to each said strap and shaped to hook over each side of a fishing boat gunnel, said container being suspended with the adjustable flexible straps and hook brackets attached to the boat gunnels.

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**5,050,527**

**AUTOMOTIVE METER WITH ILLUMINATOR**

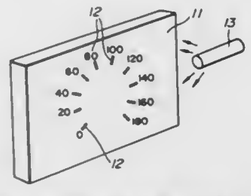
**Tsuyoshi Kameda, Saitama, Japan, assignor to Kanto Seiki Co., Ltd., Omiya, Japan**

**Filed Sep. 14, 1989, Ser. No. 407,312**

**Claims priority, application Japan, Sep. 19, 1988, 63-122609[U]**

**Int. Cl.[5] G01D** *13/20*

**U.S. Cl. 116—334** **2 Claims**



1. An automotive meter dial board display comprising an opaque base plate constructed of decorative natural wood; and graduations for cooperating with an automotive meter pointer, said graduations being printed directly on a front face of said base plate without any bonding material interposed therebetween, said graduations being made of a paint which contains a fluorescent material and responds to radiation from an ultraviolet lamp positioned in front of said base plate.

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**5,050,528**

**ROTARY DRUM GRANULATING AND COATING APPARATUS**

**Shuri Yamada, Kawagoe, and Goro Nagami, Tokyo, both of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan**

**Filed Feb. 5, 1990, Ser. No. 475,016**

**Claims priority, application Japan, Feb. 6, 1989, 1-26980**

**Int. Cl.[5] B05C** *5/00*

**U.S. Cl. 118—19** **4 Claims**

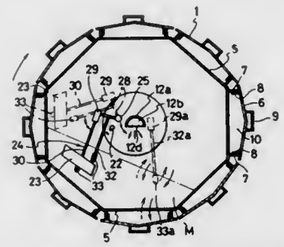
1. A granulating and coating apparatus comprising,

a rotary drum for containing a powdery or granular material to be processed, said rotary drum having a porous wall member covered by outer enclosure members whereby to form gas flow spaces therebetween;

a nozzle unit for feeding at least one of a coating liquid and a binder liquid into said rotary drum; and

a gas blow-out means for introducing a gas into said drum provided independently of and proximal to said nozzle unit within said rotary drum,

said last mentioned means being rotatable whereby the flow



direction of the gas from the gas blow-out means is adjustable between at least a substantially horizontal and at least a substantially downward flow to exit said drum via said gas flow spaces.

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**5,050,529**

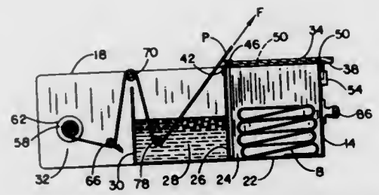
**WALLPAPER PREPARATION APPARATUS**

**Chris Pardee, P.O. Box 917, Cameron Park, Calif. 95682**

**Filed Aug. 27, 1990, Ser. No. 573,882**

**Int. Cl.[5] B05C** *3/12*

**U.S. Cl. 118—40** **18 Claims**



1. An apparatus for preparing prepasted wallpaper for hanging on a surface comprising:

a) means for holding a roll of said wallpaper;

b) means for wetting said wallpaper with a wetting agent;

c) means for assisting in the cutting of said wetted wallpaper to a sized sheet; and

d) means for maintaining said size sheet of wallpaper in said wetted condition for a period of time to permit relaxation of said wallpaper before applying said wallpaper to said surface.

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**5,050,530**

**LIQUID APPLICATOR**

**Roy D. Studebaker, Chehalis, and Todd L. Studebaker, Seattle, both of Wash., assignors to Wilen Manufacturing Co., Inc., Atlanta, Ga.**

**Filed Oct. 25, 1989, Ser. No. 427,254**

**Int. Cl.[5] B05C** *1/00*

**U.S. Cl. 118—264** **22 Claims**

1. A liquid applicator for applying liquid to a floor, comprising:

(a) a tank for containing a liquid to be applied to the floor adapted for movement in a longitudinal path of movement over the floor, said tank having a bottom portion;

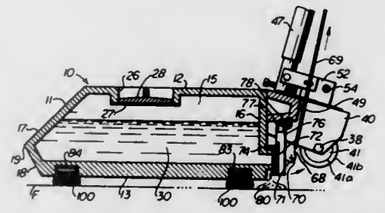
(b) a pair of transversely extending longitudinally spaced flexible wick pads removeably secured to said bottom portion of said tank, said wick pads protruding from beneath said tank and being adapted to movably support said tank upon the floor;

(c) means for moving said tank in the longitudinal path of movement;



(d) a plurality of spaced liquid outlets adjacent said tank for discharging liquid from said tank ahead of said wick pads;

(e) valve means for opening and closing said outlets for permitting the flow of liquid from said tank through said outlets when said valve means is opened and for interrupting the flow of liquid from said outlets when said valve means is closed; and



(f) control means connected to said valve means and mounted to said means for moving said tank for controlling the opening and closing of said valve means.

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**5,050,531**

**APPARATUS FOR PRODUCING AN IMAGE RECORDING MEDIUM**

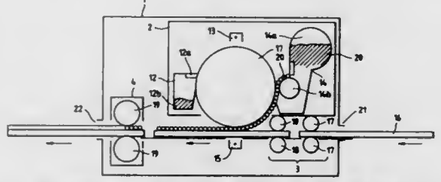
**Jun Sakai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan**

**Continuation of Ser. No. 253,614, Oct. 5, 1988, abandoned. This application Apr. 27, 1990, Ser. No. 517,557**

**Claims priority, application Japan, Oct. 9, 1987, 62-256003**

**Int. Cl.[5] B05B** *5/25*

**U.S. Cl. 118—621** **3 Claims**



1. An image recording medium producing apparatus for producing an image recording medium having a support member and a developer material coated thereon, said apparatus not including an exposure device, comprising:

a housing including an inlet and an outlet;

feed roller pairs for feeding a support member through said inlet to said outlet;

a drum within the housing;

first charging means, located at a position adjacent to the drum, for charging the drum to a first polarity;

supplying means, located adjacent to the drum downstream from said first charging means, for supplying developer material onto the drum, said supplying means including a reservoir and a sleeve disposed in substantial contact with the outer periphery of the drum;

second charging means, located adjacent to the drum downstream from said supplying means and downstream from said feed roller pairs, for charging said support member to a second polarity so that said developer material supplied to said drum is transferred from said drum to said support member; and

fixing means, locating downstream from said second charging means, for fixing said developer material to said support member.

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**5,050,532**

**METHOD OF MOISTENING SUCH ARTICLES AS TOOLS OR WORKPIECES WITH A LIQUID, SUCH AS A LUBRICANT, COOLANT, OR ADHESIVE, AND DEVICE FOR CARRYING OUT THE METHOD**

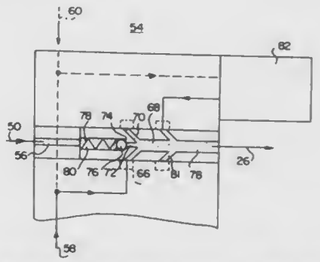
**Klaus Ruppert, Siegen, Fed. Rep. of Germany, assignor to Hundt & Weber Schaltgerate GmbH, Freudenberg, Fed. Rep. of Germany**

**Filed Sep. 25, 1989, Ser. No. 412,028**

**Claims priority, application Fed. Rep. of Germany, Oct. 3, 1988, 3833581**

**Int. Cl.[5] B05B** *7/04, 12/12*

**U.S. Cl. 118—663** **20 Claims**



1. In apparatus for moistening articles while they are being used as tools, or as workpieces worked on by such tools, said apparatus comprising:

(a) a source for a liquid intended as the moistening agent, the source being in the form of a reservoir containing the liquid;

(b) at least one nozzle means adapted to be mounted in the vicinity of the article to be moistened; and

(c) a pump, communicating via tubing with said source and with said at least one nozzle means, for forwarding the liquid from said source to said at least one nozzle means;

the improvement wherein said apparatus further comprises:

(1) a gyration chamber connected between said pump and said at least one nozzle means, said gyration chamber communicating also with a source of pressurized gas and having means for gyrating the incoming gas together with a prescribed volume of liquid;

(2) means for generating electrical pulses in response to an input signal;

(3) control means, responsive to said electrical pulses, for selectively activating the pump in such a way that a prescribed number of volume units of liquid per unit of time is supplied as the prescribed volume of liquid;

(4) means for monitoring the control means and the pressurized gas; and

(5) a housing for enclosing the pump, the control means for activating the pump, the monitoring means, the gyration chamber and the tubing for passing the liquid to and from the pump.

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**5,050,533**

**APPLICATION OF THERMAL-CURE MATERIALS**

**Robert J. Zaber, Detroit, Mich., assignor to Technadyne Engineering Corporation, Detroit, Mich.**

**Division of Ser. No. 375,122, Jul. 3, 1989, abandoned, which is a division of Ser. No. 223,630, Jul. 25, 1988, Pat. No. 4,890,573. This application Oct. 25, 1990, Ser. No. 603,121**

**The portion of the term of this patent subsequent to Jan. 2, 2007, has been disclaimed.**

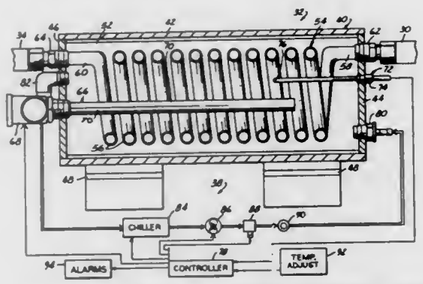
**Int. Cl.[5] B05C** *11/10*

**U.S. Cl. 118—667** **11 Claims**

1. A system for applying a fluent one-part thermal-cure material at predetermined constant flow rate to a substrate in which the system includes means for supplying the material under pressure at said predetermined constant flow rate, means

for heating the material to a predetermined elevated temperature above ambient, means for applying the material at said elevated temperature to a substrate, and conduit means for feeding the material from said supplying means to said heating means and thence to said applying means, characterized in that said means for heating the material comprises:

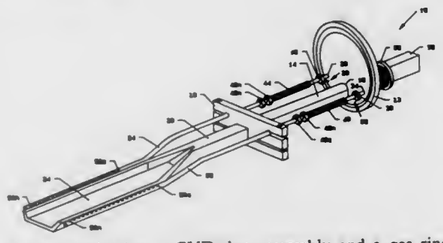
a hollow enclosure having an internal volume, a spirally coiled tube suspended within said enclosure and having first and second tube ends coupled to said conduit means, said coiled tube having a diameter and length coordinated with said predetermined constant flow rate of material through said heating means and with said predetermined




temperature to provide a predetermined fixed residence time of material in said heating means at said predetermined constant material flow rate such that material exiting said heating means is at said predetermined temperature, a heater positioned within said enclosure and having means responsive to application of electrical power for heating said volume, temperature sensing means positioned within said volume for supplying electronic signals as a function of temperature thereof, and electronic control means including means responsive to said electronic signals for selectively applying electrical power to said heater to maintain temperature within said volume at said elevated temperature.

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**5,050,534**
**MOBILE INJECTOR SYSTEM**
**Cleon R. Yates, Austin, Tex., assignor to Cryco Twenty-Two, Inc., Austin, Tex.**
**Filed Aug. 3, 1989, Ser. No. 388,919**
**Int. Cl.[5] C23C** *16/00*
**U.S. Cl. 118—733** **4 Claims**



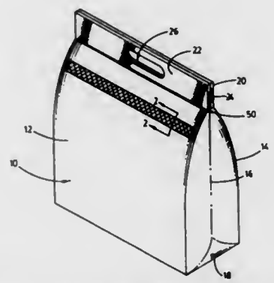
4. In combination, a CVD door assembly and a gas ring assembly, said combination comprising:

a. a CVD door assembly including a paddle hole, and at least one gas inlet port extending through said door; and,

b. a gas ring assembly for engaging against and between a front end flange of a process tube and a CVD door, the gas ring including gas inlet means for engaging with a gas inlet channel of a CVD door, back ring for engaging against a back end flange of a process tube, and means securing said gas ring to said back ring.

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**5,050,535**
**BAG FOR CONTAINING LIVE FISH**
**Kelly McKellar, and Robert M. Pozzebon, both of 24 Fay Road, S.E., Calgary, Alberta T2H-1H4, Canada**
**Filed Aug. 7, 1989, Ser. No. 390,417**
**Int. Cl.[5] A01K** *63/02*
**U.S. Cl. 119—3** **1 Claim**



1. A bag for containing and transporting live fish in a controlled temperature environment comprising:

(A) a multilayer bag wall that includes

(1) a multilayer front wall having an opaque outer layer having an outer surface, an inner layer having an inner surface and insulation sandwiched between said front wall inner layer and outer layer, a top edge, a bottom edge, and two side edges,

(2) a gas permeable, liquid impermeable membrane in said bag front wall, said membrane being located closely adjacent to said front wall top edge and extending completely across said bag front wall from one of said side edges to the other of said two side edges, said membrane extending from said front wall outer surface to said front wall inner surface, said insulation stopping adjacent to said membrane and said membrane having none of said insulation therein,

(3) a lock element on said front wall top edge, and

(4) a first handle element attached to said front wall top edge;

(B) a multilayer bottom wall having a front edge attached to said front wall bottom edge, a rear edge, two side edges each located adjacent to one of said front wall side edges, said bottom wall having an opaque outer layer having an outer surface, an inner layer having an inner surface and insulation sandwiched between said bottom wall inner layer and outer layer;

(C) two multilayer side walls, each side wall having an opaque outer layer having an outer surface, an inner layer having an inner surface and insulation sandwiched between each side wall inner layer and outer layer, a top edge connected to said front wall top edge, a bottom edge connected to said one of said bottom wall side edges, and two side edges with one of said side wall side edges being connected to one of said front wall side edges, each sidewall further including a foldline extending from said side wall top edge to said side wall bottom edge and dividing said side wall into two portions that fold on top of each other;

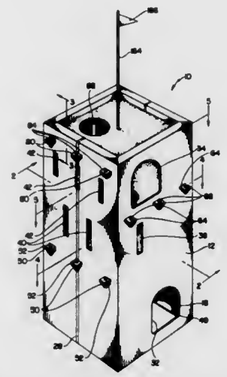
(D) a multilayer rear wall having an opaque outer layer having an outer surface, an inner layer having an inner surface and insulation sandwiched between said rear wall inner and outer layers, a top edge, a bottom edge connected to said bottom wall rear edge, and two side edges each connected to one of said side wall side edges, said rear wall further including a rear lock element on said rear wall top edge, and a second handle element attached to



said rear wall top edge, said rear lock element cooperating with said front wall lock element to lock said rear wall to said front wall and said rear wall handle element cooperating with said front wall handle element to form a handle.

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**5,050,536**
**PLAYHOUSE FOR CATS**
**Reginald D. Baker, Whale Rock Pt., Narragansett, R.I. 02882**
**Filed Apr. 18, 1990, Ser. No. 510,514**
**Int. Cl.[5] A01K** *1/00*
**U.S. Cl. 119—15** **17 Claims**

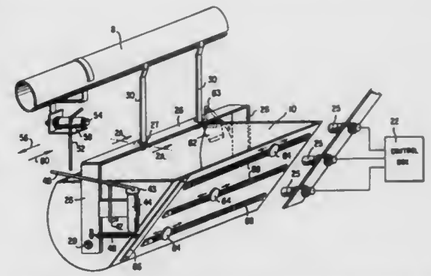


1. A playhouse for cats, comprising a collapsible housing having a plurality of vertical panels that are formed in a one-piece construction and that are movable relative to each other to a closed, collapsed position whereby the housing is conveniently stored or shipped, a plurality of interior horizontal deck members located within said housing and being disposed in vertically, spaced relation to define a plurality of spaced interior compartments therein, said deck members including an upper member that forms the top of the housing, means for supporting said deck members within the housing, an opening formed in at least one of said vertical panels which communicates with an interior compartment to provide access for a cat thereto, and means for locking said vertical panels in the open erected position, said locking means including locking flap assemblies that are joined to said vertical panels at the uppermost ends thereof and that are foldable to a locked position to define horizontal upper perimeter rampart segments that cooperate with the upper deck member to secure the vertical panels in a stable, erected position.

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**5,050,537**
**AUTOMATIC ANIMAL FEEDING SYSTEM**
**Harvey Z. Fox, R.D. 3, Box 11A, Thorp, Wis. 54771**
**Filed May 1, 1990, Ser. No. 517,185**
**Int. Cl.[5] A01K** *5/02*
**U.S. Cl. 119—51.02** **21 Claims**

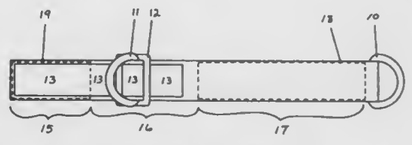
1. A feeding system comprising a plurality of feed bowl means for receiving and dispensing feed, track means for supporting said plurality of feed bowl means and for transporting said feed bowl means along a path, loading means for loading said feed into each of said plurality of feed bowl means, and means for emptying each of said feed bowl means; wherein said emptying means comprises trip arm means on each of said feed bowl means for causing said feed bowl means to empty when said trip arm means is tripped and a plurality of ripping means adjacent said path for allowing said plurality of feed bowl means to move along said path in a first direction without tripping said trip arm means and for tripping said trip arm



means when said plurality of feed bowl means are moved along said path in a second direction.

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**5,050,538**
**BREAK-AWAY PET COLLAR**
**John A. Gurski, Jr., 625 Cheswick Rd., Philadelphia, Pa. 19128**
**Filed May 11, 1990, Ser. No. 521,906**
**Int. Cl.[5] A01K** *27/00*
**U.S. Cl. 119—106** **5 Claims**



1. A safety release pet collar comprising:

a flat strip of flexible material doubled back upon itself along its width and secured together by fastening means so as to form a one-piece band of two layers of said flexible material having a closed loop at one end;

said fastening means passing through both layers of flexible material and located along portions of the band adjacent both ends;

a first ring fixedly retained in said closed loop;

an opening formed between said layers of flexible material where said layers are not secured together, said opening located between the fastened portions of the band;

a second ring retained in said opening and movable therein;

a slide for restraining the movement of said second ring; both layers of flexible material passing through said slide and said slide being located along said opening, beneath said second ring; and

cooperating force-release connectors at each end of the band, said connectors comprising strips of hook-and-loop material;

whereby, the ends of said band are fastened together by said strips of hook-and-loop material to encircle a pet's neck and upon application of extensive force to the band, said strips of hook-and-loop material are separated from one another, releasing the ends of the band, thus freeing the collar from the pet;

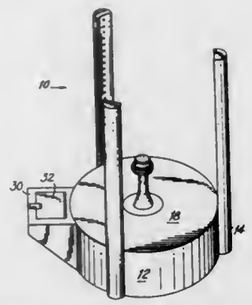
and whereby, when the ends of the band are fastened together by said strips of hook-and-loop material, the first and second rings are positioned adjacent each other so as to enable a snap hook at the end of a leash to be and-loop material;

and whereby, said slide and said second ring cooperate to form a means for adjusting the size of the collar to accommodate different sized pets.

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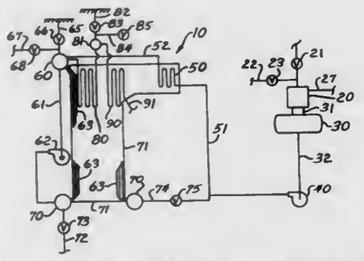


5,050,539
**ACARICIDE DISPENSER**
Kenneth B. Liegner, 8 Barnard Rd., Armonk, N.Y. 10504
Filed Jul. 30, 1990, Ser. No. 559,161
Int. Cl.[5] A01K *29/00*
U.S. Cl. 119—159 11 Claims



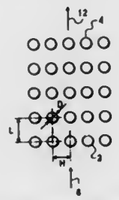
1. An apparatus for delivering a spray of substance to an animal comprising:
bait means on a platform means providing a lure for the desired animal into a predetermined location in a natural setting wherein access to the bait means is substantially unobstructed so as to attract animals of the wild;
sensing means comprising means of sensing the animal on the platform means;
source of substance to be sprayed;
delivery means for delivering a said spray the predetermined location with respect to the bait; and
said delivery means being activated by said sensing means when said sensing means senses the presence of the desired animal so as to spray said substance on the desired animal in addition to other animals within the envelope of the spray.

5,050,540
**METHOD OF GAS BLANKETING A BOILER**
Arne Lindberg, 2902 Hawkshead, New Lenox, Ill. 60451
Filed Jan. 29, 1991, Ser. No. 647,260
Int. Cl.[5] B09B *3/00*; F22B *1/00*
U.S. Cl. 122—4 R 21 Claims



1. A method of blanketing a boiler with a first gas adapted to reduce the level of a second gas dissolved in a liquid in the boiler, the boiler including a vent, said method comprising the steps of:
a. creating a gas blanket in the boiler, said gas blanket being comprised of said first gas;
b. preserving said gas blanket in the boiler during the subsequent filling of the boiler with the liquid; and
c. providing sufficient contact in the boiler between the liquid and the first gas to allow said first gas to reduce the level of said dissolved second gas in the liquid.

5,050,541
**BOILER EQUIPPED WITH WATER TUBES**
Hiroshi Kobayashi; Yoshiharu Ueda; Keiryo Tou, and Masamichi Yamamoto, all of Osaka, Japan, assignors to Hirakawa Iron Works, Ltd., Osaka, Japan
Continuation-in-part of Ser. No. 452,273, Dec. 18, 1989, abandoned. This application Oct. 9, 1990, Ser. No. 595,370
Claims priority, application Japan, Dec. 29, 1988, 63-333970
Int. Cl.[5] F22B *37/10, 15/00*
U.S. Cl. 122—235.23 6 Claims

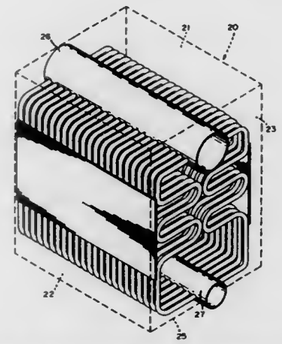


1. In a boiler having a combustion chamber and a convective heating zone, a water tube bank through which combustion gases of the boiler flow in a predetermined flow direction, said water tube bank comprising:
a plurality of rows of water tubes disposed in the combustion chamber;
a plurality of rows of water tubes disposed downstream from the combustion chamber with respect to said predetermined direction so as to absorb heat only by convection; and
for at least some of the respective rows of water tubes disposed in the combustion chamber and/or for the respective rows of water tubes disposed downstream from the combustion chamber, the water tubes in each of said respective rows being respectively aligned with water tubes in the respective row immediately downstream therefrom in said flow direction so as to constitute an in-line arrangement of water tubes in the boiler, and
the value of L/D for said in-line arrangement of water tubes being no less than 1.8 and no greater than 2.5, the value of $\alpha$ for said in-line arrangement being within the range of 60–70 Kcal/m$^2$H°C., and the value of $\alpha \times a_o$ being within the range of 1500–2500 Kcal/m$^3$h°C.,
wherein L is a longitudinal pitch of said respective rows of water tubes as taken in said flow direction and D is the outer diameter of each of the water tubes in said respective rows, $\alpha$ is the mean heat transfer coefficient of the water tubes in said respective rows, and $a_o$ designates the area of heating surface per unit volume m$^2$/m$^3$ of the water tubes in said respective rows.

5,050,542
**BOILER**
George Cooke, Arvada, Colo., assignor to Volcano Energy Systems, Inc., St.-Hyacinthe, Canada
Filed Dec. 27, 1990, Ser. No. 634,584
Int. Cl.[5] F22B *15/00, 25/00*
U.S. Cl. 122—235.23 10 Claims

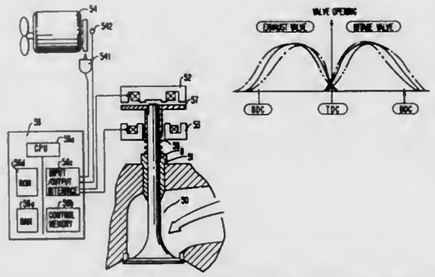
1. A boiler comprising: a housing having a top provided with a gas outlet, a bottom, opposite side walls and front and rear walls; said housing containing an upper manifold and a lower manifold substantially parallel to the top, bottom and side walls; first and second sets of tubes each comprising a plurality of tubes, one set joining the upper manifold to the lower manifold on one side, and the other set joining the upper manifold to the lower manifold on the other side, the tubes rising from the lower manifold upwardly along their side wall, crossing the housing to the center where they are substantially in contact one to the other, recrossing the housing to their respective side wall, rising therealong and eventually joining the upper manifold so as to form a plurality of superposed passages; individual tubes being differently bent so as to form access openings from each passage to the passages above and below; the openings from passage to passage being offset so as to require a gas flowing through said passages to traverse one passage from front to back and the next passage from back to front; means for introducing liquid into one of the manifolds





for withdrawing the liquid from the other manifold and means for introducing hot gases into the lowermost of the superposed passages; the hot gases rising successively through the passages which they successively and alternately traverse from front to back, then from back to front, until they exist from the uppermost passage through the gas outlet at the top; liquid flowing through the manifolds and tubes being heated by the hot gases.

5,050,543
**VALVE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE**
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan
Filed Oct. 31, 1989, Ser. No. 429,477
Claims priority, application Japan, Oct. 31, 1988, 63-275307
Int. Cl.[5] F01L *9/04*
U.S. Cl. 123—90.11 1 Claim



1. A control system for controlling intake and exhaust valves of an internal combustion engine, said valves each being constructed of a ceramic material and each having a valve body and an elongated valve stem, said stem having one end attached to said body and a distal end spaced from said body, said system comprising:
electromagnetic actuator means for opening and closing the intake and exhaust valves, said actuator means comprising an actuator for each valve, each actuator comprising a magnetic member mounted on the corresponding valve stem and first and second electromagnets, said electromagnets being spaced apart longitudinally of said stem and disposed on respective opposite sides of the magnetic member;
an engine speed sensor for detecting the rotational speed of the internal combustion engine;
a crankshaft angle sensor for detecting the angular position of the crankshaft of the internal combustion engine;
timing calculating means for calculating the timing at which the intake and exhaust valves are to be opened and closed, based on a detected signal from said crankshaft angle sensor;
calculating means for calculating the angular positions at which the intake and exhaust valves are to be opened and closed with respect to the crankshaft angle, based on detected signals from said engine speed sensor and said crankshaft angle sensor, said calculating means including means for reducing the duration of the period during which the intake and exhaust valves are open when the rotational speed of the internal combustion engine is lower and for increasing the duration of the period during which the intake and exhaust valves are open when the rotational speed of the internal combustion engine is higher; and
control means for applying drive signals to said electromagnetic actuator means in response to the calculated angular position, said control means comprising operating means for each valve for selectively energizing one of the electromagnets to open the corresponding valve, deenergizing said one electromagnet and energizing the other electromagnet to close said corresponding valve when the crank shaft reaches a first predetermined angular position, and deenergizing said other electromagnet and energizing said one electromagnet to open said corresponding valve when the crank shaft reaches a second predetermined angular position.

5,050,544
**STRUCTURE FOR MOUNTING THE SAME TYPE OF CAMSHAFTS ON DIFFERENT TYPES OF CYLINDER HEADS**
Yoshikazu Tanaka, and Kazuaki Ueda, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed May 21, 1990, Ser. No. 526,302
Claims priority, application Japan, May 22, 1989, 1-58077[U]
Int. Cl.[5] F01L *1/04*
U.S. Cl. 123—90.27 7 Claims

1. A structure for mounting the same type of camshafts on two different types of cylinder heads, wherein the two types of cylinder heads have opposite intake valve/exhaust valve arrangement orders so that a transverse plane centered between an intake valve and an exhaust valve of a cylinder in one type of cylinder head is staggered longitudinally with respect to a transverse plane centered between an intake valve and an exhaust valve of a respective cylinder in the other type of cylinder head by an amount delta, cylinder bore centers of the one type of cylinder head being coincident with respective cylinder bore centers of the other type of cylinder head in locations along a line parallel to the longitudinal axis of an engine of each type, the structure comprising:
two types of thrust bearing housings, one type of bearing housing being formed in one type of cylinder head and the other type of bearing housing being formed in the other type of cylinder head, each type of thrust bearing housing having thrust planes at opposite sides thereof, the thrust

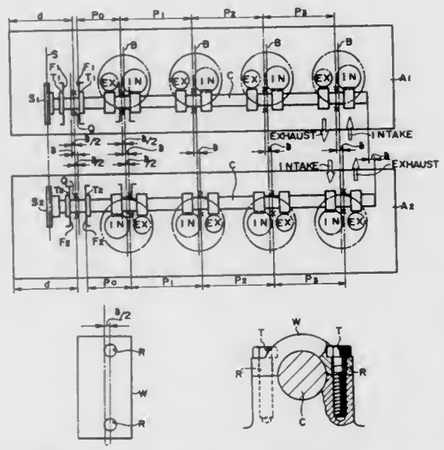
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planes of the one type of thrust bearing housing formed in the one type of cylinder head being machined so as to be staggered with respect to the thrust planes of the other type of thrust bearing housing formed in the other type of cylinder head by an amount delta in the direction parallel to the engine longitudinal axes;

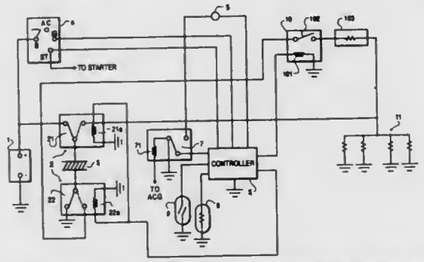
a single type of thrust bearing cap adapted to be fixed to each of the two types of thrust bearing housings, the single type of thrust bearing cap having a bolt hole spaced from a transverse centerline of the thrust bearing cap by one-half the amount delta; and

two types of tapped hole means, each including a tapped hole formed in the thrust bearing housing in the respective type of cylinder head, the tapped hole in the one type of thrust bearing housing being provided at a location spaced longitudinally by one-half the amount delta in one direction from a transverse plane centered between the thrust planes of the one type of thrust bearing housing formed in the one type of cylinder head and the tapped hole in the other type of thrust bearing housing being provided at a location spaced longitudinally by one-half the amount delta in a direction opposite to said one direction from a transverse plane centered between the thrust planes of the other type of thrust bearing housing formed in the other type of cylinder head, the same type of camshafts being mounted in the thrust bearing housings so that the camshaft mounted in the one type of thrust bearing housing formed in the one type of cylinder head is staggered longitudinally with respect to the camshaft mounted in the other type of thrust bearing housing formed in the other type of cylinder head by the amount delta, the single type of thrust bearing cap being mounted on each type of thrust bearing housing, with a thrust bearing cap being mounted on the one type of thrust bearing housing in reversed relation to a thrust bearing cap mounted on the other type of thrust bearing housing and the thrust bearing cap being fixed to each thrust bearing housing by a bolt which penetrates the bolt hole and is screw-coupled to the respective tapped hole.




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**5,050,545**
**ENGINE PREHEATING SYSTEM**
**Akihiro Shirata, Yokohama; Toshifumi Koshizawa, Kawasaki; Yuichi Koyama, Machida, and Ken Kurabayashi, Chigasaki, all of Japan, assignors to Isuzu Motors, Ltd., Tokyo, Japan**
**Filed Mar. 30, 1990, Ser. No. 501,749**
**Claims priority, application Japan, Sep. 29, 1989, 1-254498**
**Int. Cl.[5] F02P** *19/02*
**U.S. Cl. 123—179 H** **4 Claims**




1. An engine preheating system for preheating a diesel engine, comprising:

a heating member heatable by a current flowing therethrough for heating the diesel engine;

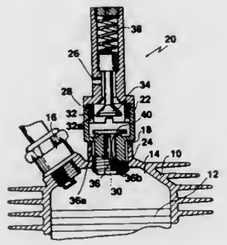
a power supply for applying a voltage to said heating member;

a capacitor chargeable by said power supply; and

connection control means for connecting said capacitor and said power supply in series with each other to charge said capacitor and to connect said capacitor and said heating element when the diesel engine is to be preheated quickly.

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**5,050,546**
**VALVE DEVICE**
**Shigeki Nomoto, Musashimurayama, Japan, assignor to Komatsu Zenoah Company, Tokyo, Japan**
**Filed Jun. 27, 1989, Ser. No. 371,720**
**Claims priority, application Japan, Jun. 29, 1988, 63-85024[U]**
**The portion of the term of this patent subsequent to Apr. 16, 2008, has been disclaimed.**
**Int. Cl.[5] F02N** *17/08*
**U.S. Cl. 123—182** **11 Claims**



1. A valve device for an internal combustion engine, the internal combustion engine including a cylinder and a combustion chamber defined in the cylinder, and the valve device being mounted on the cylinder for temporarily communicating



the combustion chamber with the atmosphere, the device comprising:

a casing having a first path, an accumulator and a second path, the first path communicating the accumulator to the combustion chamber of the cylinder, and the second path communicating the accumulator to the atmosphere;

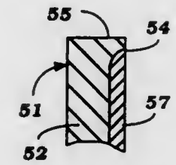
a first valve for permitting compressed gas generated in the combustion chamber to pass only in a direction from the combustion chamber into the accumulator through the first path;

a second valve for closing the second path in response to pressure of the compressed gas in the accumulator, the second valve being adapted to close the second path to keep the pressure inside the accumulator at a substantially constant level when the pressure of the compressed gas passing from the combustion chamber into the accumulator through the first path reaches a preset value responsive to a sudden increase of the pressure of the compressed gas; and

means for biasing the second valve to open the second path when the pressure inside the accumulator falls below the preset value.

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**5,050,547**
**CYLINDER SLEEVE FOR ENGINE**
**Masanori Takahashi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**
**Filed Jul. 3, 1990, Ser. No. 547,493**
**Claims priority, application Japan, Jul. 3, 1989, 1-169955**
**Int. Cl.[5] F02F** *1/00*
**U.S. Cl. 123—193 C** **14 Claims**




1. A cylinder liner for a reciprocating machine having a piston having means for sealing engagement with said cylinder liner, said liner comprising a generally cylindrical sleeve formed from a first material, said cylindrical sleeve having an inner bore adapted to slidably receive the piston and an upper end portion adapted to engage means for forming a compression seal, and a wear resistant plating formed on said inner bore through substantially the entire area engaged by the means of the piston having sealing engagement, said plating terminating at a location such that machining of the upper end portion will not remove the plating.

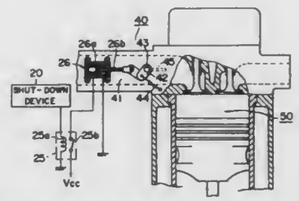
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**5,050,548**
**DIESEL ENGINE SHUT-DOWN DEVICE**
**Masami Minegishi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**
**Division of Ser. No. 366,677, Jun. 15, 1989, Pat. No. 4,924,827.**
**This application Feb. 22, 1990, Ser. No. 483,370**
**Claims priority, application Japan, Jun. 24, 1988, 63-84353**
**Int. Cl.[5] F02B** *77/00*
**U.S. Cl. 123—198 D** **6 Claims**

1. In a diesel engine shut-down device provided to an air suction system comprising a solenoid having an excitation coil in a cylinder and a plunger to advance from and retreat in one end of said cylinder, an intake air pipe mounted on a diesel engine and having said solenoid therein, a link rotatably mounted on said pipe and fixed to a point end of said plunger, a valve installed in said intake pipe and supported by a shaft in order to regulate intake air quality to the engine, timer means for outputting an engine stop signal for a predetermined time when a key switch is turned off, and drive means for actuating said solenoid to stop the engine through a switching device in accordance with said engine stop signal from said timer means, wherein said timer means comprises:

first and second diodes being connected in series and connected to an ON contact of said key switch;

a capacitor being connected to said first and second diodes in series;



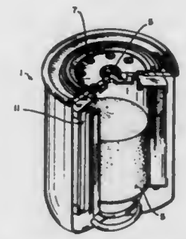

first and second resistors in series being connected to said first and second diodes in parallel;

third to fifth resistors in series being connected to said second diode and said capacitor in parallel; and

a first NPN-type transistor having a base electrode connected to said first and second resistors, a collector electrode connected to said third and fourth resistors, and an emitter electrode grounded to an earth.

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**5,050,549**
**METHOD OF CLEANING INTERNAL COMBUSTION ENGINE COOLING SYSTEM AND FILTER FOR USE THEREIN**
**George R. Sturmon, 608 Indian Hills Dr., St. Charles, Mo. 63301**
**Filed Jun. 14, 1990, Ser. No. 538,220**
**Int. Cl.[5] F02B** *77/00*
**U.S. Cl. 123—198 E** **20 Claims**



1. A method for cleaning gel and corrosion products from a cooling system of an internal combustion engine, the method comprising attaching into the cooling system a filter containing at least one chelant cleaning agent, and operating the engine to disperse the cleaning agent throughout the cooling system to remove corrosion products and gel from the system, the amount of cleaning agent in the filter being chosen to produce a concentration of cleaning agent in the circulating coolant of at least one-half part per thousand, by weight.

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**5,050,550**
**HYBRID STEP COMBUSTION SYSTEM**
**Litang Gao, #32, Door 3, 439 Building, Chuangye Street Changchun, Jilin Province, China 130011**
**Filed Jul. 11, 1990, Ser. No. 551,157**
**Int. Cl.[5] F02B** *19/10;* **F02M** *43/00*
**U.S. Cl. 123—275** **11 Claims**

1. A hybrid step combustion system for an internal combustion engine having a gasoline supply means and a diesel supply means, said combustion system comprising:

a combustion chamber formed by a cylinder, a piston, at

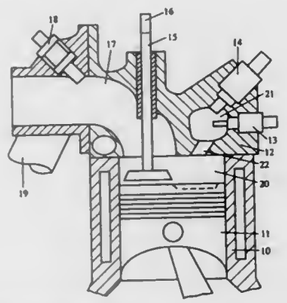
VOL 1130 ISS 4 SE 24 1991 UMI



least one intake valve, at least one exhaust valve and a cylinder head in which combustion of a mixture of at least one fuel and air occurs;

an intake valve assembly disposed in said combustion chamber and interconnecting said combustion chamber with an intake manifold port;

an exhaust valve assembly disposed in said combustion chamber and interconnecting said combustion chamber with an exhaust manifold port;




said gasoline supply means supplying gasoline fuel into an intake air charge which is introduced into said combustion chamber; and

said diesel supply means supplying diesel fuel into said combustion chamber, said gasoline supplying means and said diesel supply means selectively operable in a single fuel combustion mode or a dual fuel combustion mode.

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**5,050,551**

**SYSTEM FOR CONTROLLING IGNITION TIMING AND FUEL INJECTION TIMING OF A TWO-CYCLE ENGINE**

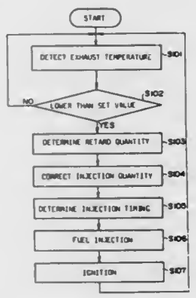
**Koji Morikawa, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 22, 1990, Ser. No. 601,937**

**Claims priority, application Japan, Nov. 22, 1989, 1-306079**

**Int. Cl.[5] F02M *67/00*; F02P *5/15***

**U.S. Cl. 123—305** **3 Claims**




1. A system for controlling a two-cycle engine having at least one cylinder, a fuel injector provided for injecting fuel directly in the cylinder, a spark plug for igniting the air fuel mixture, and a catalytic converter in an exhaust passage for exhaust gas emission, the system comprising:

a temperature sensor for detecting temperature of exhaust gas in the exhaust passage upstream of said catalytic converter;

a comparator for comparing the temperature with a reference temperature for activating said catalytic converter and for producing a temperature signal when the temperature is lower than the reference temperature;

retard quantity determining means responsive to said temperature signal for determining a retard quantity for the ignition timing and fuel injection timing;

retarding means for retarding the ignition timing and the fuel injection timing based on said retard quantity; and

correcting means for increasing quantity of injected fuel in accordance with said retard quantity so as to compensate reduction of engine power caused by retarding the ignition timing.

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**5,050,552**

**SYSTEM FOR ELECTRONICALLY CONTROLLING THE POWER OF AN INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE**

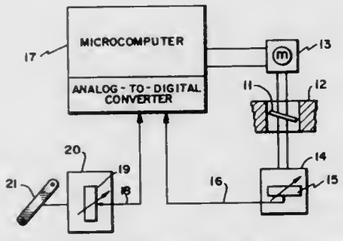
**Thomas Riehemann, Bühlertal, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 1,082, Nov. 29, 1988. This application Jul. 30, 1990, Ser. No. 559,349**

**Claims priority, application Fed. Rep. of Germany, Nov. 18, 1989, 3938378**

**Int. Cl.[5] F02D *41/22***

**U.S. Cl. 123—361** **12 Claims**




1. A system for electronically controlling the power of an internal combustion engine of a motor vehicle, the system comprising:

an electrically actuable actuator for influencing the power of the engine;

adjusting means for adjusting said actuator in dependence upon a pregiven value and an actual value for producing a match between said values;

checking means for checking a change of the pregiven value and the actual value of the position of the actuator;

derivation means for deriving the presence and discontinuance of an electrical fault from said change; and,

means for resuming the function of said system in a delayed manner after the discontinuance of a previously detected electrical fault of the system.

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**5,050,553**

**CAPACITOR IGNITION SYSTEM**

**Werner Erhard, Cadolzburg, Fed. Rep. of Germany, assignor to Prüfrex-Elektro-Apparatebau Inh. Helga Müller, geb. Dutschke, Cadolzburg, Fed. Rep. of Germany**

**Filed Apr. 26, 1990, Ser. No. 514,992**

**Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 3914026**

**Int. Cl.[5] F02P *5/15***

**U.S. Cl. 123—418** **10 Claims**

1. In a capacitor ignition system for an internal combustion engine having a magnetic generator, a primary firing pulse generator triggered by the magnetic generator for charging a capacitor, an electronic switch connected to discharge the capacitor via the primary winding of an ignition coil,

storage means for storing a characteristic ignition field program including starting ignition advance characteristics and operating ignition advance characteristics having

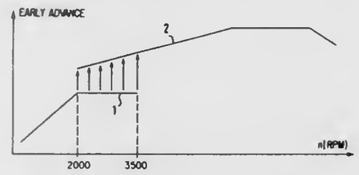


different advance curves for the same engine rpm under different conditions,

means for delaying the output of said primary firing pulse generator to produce a firing pulse,

a tachometer responsive to the output of the primary pulse generator and stored characteristics in said storage means for controlling said delaying means to effect an rpm-dependent delay in the firing pulse relative to the state of the magnetic generator,

and a switching over device responsive to the operating conditions of the engine for selectively controlling the delaying means as a function of the starting and operating ignition advance characteristics,




the improvement wherein the starting and operating ignition characteristics overlap in a given rpm range of said engine, said overlapping range having the idling rpm of the engine as an upper limit, the value of the operating ignition advance curve being always greater than the value of the starting ignition advance curve for any engine rpm, the operating ignition advance characteristic having a lower limit rpm which is set at a value of the engine rpm that is higher than the rpm achievable by cranking the engine, said switching over device comprising a user accessible mechanical switch.

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**5,050,554**

**IGNITION TIMING CONTROL APPARATUS FOR ENGINES**

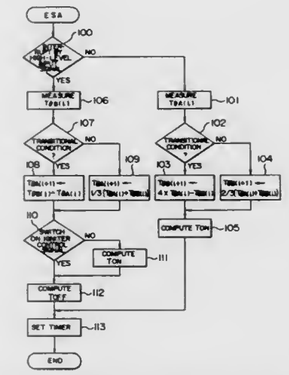
**Akira Ichikawa, Obu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan**

**Filed Apr. 23, 1990, Ser. No. 512,455**

**Claims priority, application Japan, Apr. 26, 1989, 1-106802; Aug. 5, 1989, 1-203643**

**Int. Cl.[5] F02P *5/06, 5/00, 5/14***

**U.S. Cl. 123—419** **20 Claims**




1. An ignition timing control apparatus for an engine comprising:

means for detecting rotational angles of the engine under an engine acceleration condition to generate a first signal at a first rotational angle of the engine which bonds between a first rotational angle period of an ignition cycle during which an engine speed change is high and a second rotational angle period of said cycle curing which said engine speed change is lower, said first rotational angle marking a change of engine speed from said small change to said large change, and to generate a second signal at a second rotational angle which bounds between said second rotational angle period and said first rotational angle period, said second rotational angle marking a change of engine speed from said large change to said small change;

rotation time interval detecting means for detecting a first rotation time interval which is a time interval beginning at the generation of said first signal and ending at the generation of said second signal, and for detecting a second rotation time interval which is a time interval beginning at the generation of said second signal and ending at the generation of said first signal;

first estimating means for estimating a next second rotation time interval for another ignition cycle of said engine in accordance with said detected first and second rotation time intervals during said engine acceleration condition, wherein said engine approximately makes a uniform acceleration motion during said first rotation interval; and

first setting means responsive to said second rotation time interval estimated by said first estimating means to set a timing for generating an ignition signal.

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**5,050,555**

**SYSTEM AND METHOD FOR CONTROLLING IGNITION TIMING FOR INTERNAL COMBUSTION ENGINE IN WHICH ALCOHOL IS MIXED WITH GASOLINE**

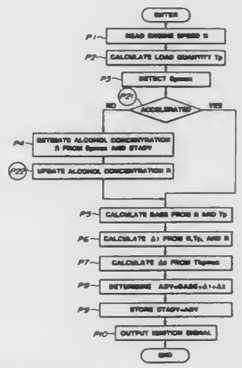
**Hisashi Mitsumoto, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Apr. 19, 1990, Ser. No. 511,149**

**Claims priority, application Japan, Apr. 24, 1989, 1-105609**

**Int. Cl.[5] F02P *5/15***

**U.S. Cl. 123—422** **11 Claims**




1. A system for controlling an ignition timing for an internal combustion engine, comprising:

a) first means for detecting engine driving conditions, the engine being driven with a particular fuel containing an alternative fuel, the engine having a lean air/fuel mixture ratio;

b) second means for detecting an inner cylinder pressure of the engine;

c) third means for detecting whether the engine operating conditions fall in a predetermined transient operating state;

d) fourth means for setting a basic ignition timing for the

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particular fuel on the basis of the engine operating conditions;

e) fifth means for detecting a crank angular position at which the inner cylinder pressure becomes maximum on the basis of an output signal derived from the second means;

f) sixth means for calculating an ignition timing feedback correction quantity $\Delta_1$ for the ignition timing for avoiding occurrence of engine knock and/or generating a maximum torque as derived from the signal of the second means;

g) seventh means for comparing the crank angular position at which the inner cylinder pressure becomes maximum with the current ignition timing to estimate a percentage of alternative fuel to the particular fuel and hating the estimation when the engine is transferred into the predetermined transient condition;

h) eighth means or calculating a second correction quantity $\Delta_2$ for the ignition timing according to the estimated percentage of mixture of the alternative fuel;

i) ninth means for correcting the basic ignition timing using the first and second correction quantities to determine a final ignition timing; and

j) tenth means for igniting the air/fuel mixture supplied to the engine at a time derived by the ninth means.

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**5,050,556**

## CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

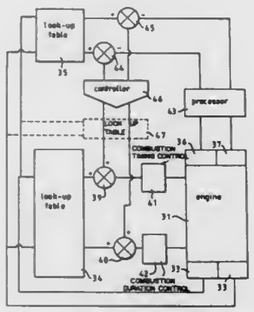
**David Williams, Kingsbury; David K. Bryers, and David Nutton, both of Solihull, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England**

**Filed Sep. 5, 1989, Ser. No. 402,190**

**Claims priority, application United Kingdom, Sep. 9, 1988, 8821230; Apr. 28, 1989, 8909824**

**Int. Cl.[5] F02D** *41/14, 43/04*

**U.S. Cl. 123—425** **18 Claims**




1. A control system for an internal combustion engine, comprising a first device for controlling the timing of the combustion process; a second device for controlling the duration of the combustion process; means for providing first and second signals representing respectively the actual positions of a crankshaft of the engine at which the combustion process starts and ends; means for determining a desired position of the crankshaft for the start of the combustion process, and also a desired position of the crankshaft for the end of the combustion process, said determining means determining the desired crankshaft positions in accordance with engine operating conditions; and means for correcting the timing and duration of the combustion process in accordance with a control strategy so as to cause the actual start of the combustion process to occur at the desired position and to cause the actual end of the combustion process to occur at the desired position, said correcting means being responsive to the first and second signals and to said determining means and providing outputs for said first and second control devices.

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**5,050,557**

## STRATIFIED-COMBUSTION INTERNAL COMBUSTION ENGINE

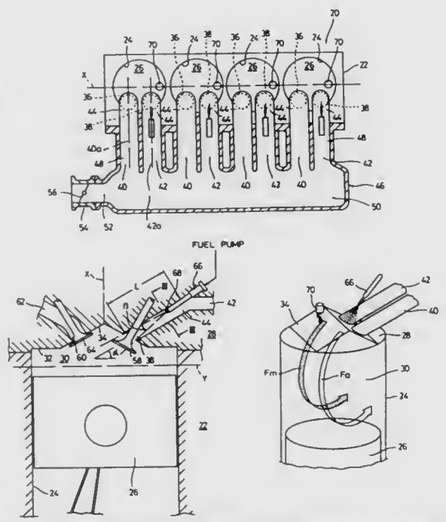
**Tetsuro Ishida; Yoshiaki Danno, both of Kyoto, and Hiromitsu Ando, Okazaki, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 28, 1990, Ser. No. 500,761**

**Claims priority, application Japan, Mar. 31, 1989, 1-81015; Mar. 1, 1990, 2-50474**

**Int. Cl.[5] F02B** *15/00*

**U.S. Cl. 123—432** **15 Claims**




1. A stratified-combustion internal combustion engine connected with an intake passage, comprising:

cylinder means including a cylinder bore in which a piston having a head surface is fitted, a combustion chamber defined in the cylinder bore by the head surface of the piston, and at least two intake ports situated on one side of a cross-sectional region of the combustion chamber, with respect to a vertical plane containing the axis of the cylinder bore, and opening into the combustion chamber;

intake means for introducing air through the intake passage into the combustion chamber, said intake means including a plurality of guide passages each having one end connected to a corresponding one of the intake ports and another end connected to the intake passage, and a partition wall arranged between adjacent guide passages and extending from the one end to said another end of the guide passage to thereby form independent guide passages, whereby when air is introduced from the intake passage into the individual guide passages during an intake stroke in which the piston moves from a top dead center to a bottom dead center, the air in the guide passages is introduced separately through the corresponding intake ports into the combustion chamber;

swirl producing means for causing most of air introduced separately from the intake ports into the combustion chamber to produce air swirls flowing along the axis of the cylinder bore, the swirl producing means including a straight portion of each guide passage extending straight substantially from the one end to said another end thereof, projections of the respective axes of the straight portions on a horizontal plane, parallel to the cross-section of the combustion chamber, extending substantially at right angles to the vertical plane and substantially parallel to each other, tilt angle $\alpha$ between the axis of each straight portion and the horizontal plane being set such that the air introduced from each intake port into the combustion chamber during the intake stroke is directed to an inner wall portion of the cylinder bore located on the other side of the cross-sectional region of the combustion chamber, whereby as the piston moves, the air directed to the inner wall portion of the cylinder bore forms swirls flowing along the inner wall of the cylinder bore; and

fuel injection means for producing an air-fuel mixture by injecting fuel into the air flowing through at least one of the guide passages.



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**5,050,558**

## FUEL INJECTION PUMP FOR INTERNAL-COMBUSTION ENGINES

**AndréLa Coliniére, 2 route de Vourles, F-69230 Brunel, St. Genis-Laval; Gérard Duplat, 6 rue de la Vaviodiére,, F-69670 Vaugneray, and Jean Leblanc, 25 rue Claude Farrére,, F-69003 Lyon, all of France**

**PCT No. PCT/DE87/00148, § 371 Date Nov. 16, 1987, § 102(e) Date Nov. 16, 1987, PCT Pub. No. WO87/06307, PCT Pub. Date Oct. 22, 1987**

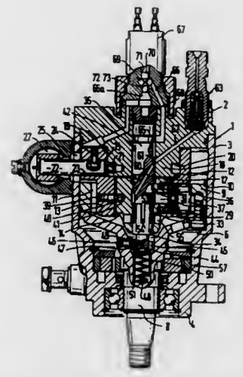
**PCT Filed Apr. 4, 1987, Ser. No. 135,433**

**Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612942**

**The portion of the term of this patent subsequent to Aug. 24, 2007, has been disclaimed.**

**Int. Cl.[5] F02M** *39/00*

**U.S. Cl. 123—453** **44 Claims**



1. A fuel injection pump for internal combustion engines with injection points, comprising:

means for forming a pump working space (53);

at least two pump pistons (37) reciprocably moving in said pump working space (53) so as to have an injection-effective pump piston pressure stroke and a suction stroke;

a distributor (35) having a periphery and a distributor orifice (61) arranged on said periphery in constant connection with said pump working space (53), said distributor being formed to drive synchronously with said pump pistons (37);

a plurality of pressure channels (62) connectable via injection lines (63) to injection points (64) of the internal combustion engine, said working space (53) being connected to a respective one of said pressure channels (62) during said pressure stroke;

means for providing fuel and including a fuel storage (58) and a filling line (54, 55) communicating with said fuel storage (58), said distributor (35) being connected to said fuel storage via said filling line (54, 55) during said suction stroke;

means for relieving pressure from said working space (53) and including a relief channel (66);

means for communicating said distributor (35) with said relief channel (66) during said pressure stroke and including an electrically controlled valve (67) therebetween;

means for controlling said injection-effective pump piston pressure stroke and including cam drive means formed to reciprocably move said pistons (37), said cam drive means including at least an essentially stationary part (13, 33, 93) and a rotary-driven part (9, 13'', 33'), one of said parts having a cam contact surface (11) with cams lying in a radial plane relative to an axis of said rotary part and the other part having a piston carrier (33, 33') and a roller carrier (13, 13'') with radial guide bores (29);

means for guiding said pump pistons (37) and including radial guide bores (36) formed in said piston carrier (33, 33') through which said pump pistons (37) interact with said cam surface (11), said cam drive means having rollers (31) guided in said radial guide bores (29) of said roller carrier and interposed between said parts, said pistons (37) being formed to move in response to said rollers (31) running on said cam contact surface (11) in response to a relative movement of said parts;

a coupling (46, 47, 49);

means for guiding said distributor (35) coaxially relative to said rotary driven part and including a distributor cylinder (42), said distributor (35) being formed as a shaft and being coupled via said coupling (46, 47, 49) to said rotary-driven part (8); and

means for compensating for misalignments and including a coupling part (39, 97) coupling said piston carrier (33, 33') to said roller-carrier (13, 13''), said coupling part (39, 97) being connected rigidly to one of said carriers (13, 13'' or 33, 33') and having a spherical shape in contact to the other of said carriers (13, 13'' or 33, 33') so that misalignments are compensated in radial and axial directions due to said spherical shape being in said contact.

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**5,050,559**

## FUEL INJECTION CONTROL SYSTEM FOR A TWO-CYCLE ENGINE

**Shinichi Kurosu, Ageo; Mitsugi Chonan, Koga; Fusao Tachibana, Shiraoka; Kazuo Suzuki, Ageo, and Yoshiki Yuzuriha, Isezaki, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo; Japan Electronic Control Systems Co., Ltd., Gunma, both of, Japan and Polaris Industries L.P., Minneapolis, Minn.**

**Filed Oct. 25, 1990, Ser. No. 603,274**

**Int. Cl.[5] F02D** *41/04*

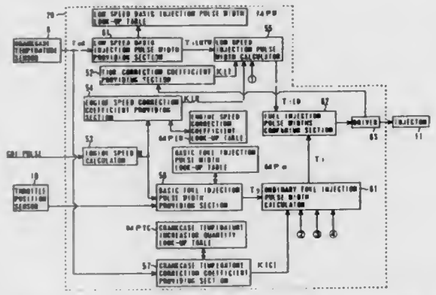
**U.S. Cl. 123—478** **3 Claims**

1. A fuel injection control system for a two-cycle engine having a crankcase, a fuel injector and a microcomputer for controlling the engine in accordance with operating conditions of the engine, the system comprising:

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a crankcase temperature sensor for detecting temperature of the crankcase;
low speed pulse width providing means for providing a low speed basic injection pulse width based on the detected crankcase temperature;
first correcting means for reducing said low speed basic injection pulse width with an elapse of time for providing a low speed injection pulse width;



ordinary pulse width providing means for providing an ordinary fuel injection pulse width in accordance with engine operating conditions;
comparator means for comparing said low speed injection pulse width and said ordinary fuel injection pulse width with each other and for determining a larger injection pulse width; and
driving means for operating said fuel injector at the larger injection pulse width.

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**5,050,560**

**SETTING SYSTEM (OPEN-LOOP AND/OR CLOSED-LOOP CONTROL SYSTEM) FOR MOTOR VEHICLES**

**Güter Plapp, Filderstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

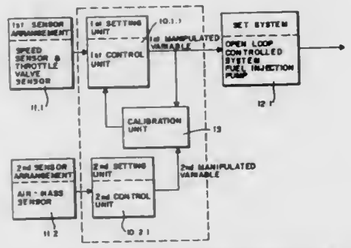
**PCT No. PCT/DE88/00483, § 371 Date Mar. 5, 1990, § 102(e) Date Mar. 5, 1990, PCT Pub. No. WO89/02030, PCT Pub. Date Mar. 9, 1989**

**PCT Filed Aug. 5, 1988, Ser. No. 490,666**

**Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729635**

**Int. Cl.[5] F02D *41/14***

**U.S. Cl. 123—488** **5 Claims**



1. A setting system for a control variable in an internal combustion engine of a motor vehicle, the setting system comprising:
a plurality of sensors for providing signals indicative of operating characteristic variables such as rotational speed and throttle-flap position;
a first setting unit for providing a first signal in dependence upon a first group of said sensors;
a second setting unit for processing at least a signal of a further one of said sensors and providing a second signal;
calibrating means for calibrating said control variable, which is dependent upon the first signal, in specific operating conditions and in dependence upon the output signal of said one sensor;
said first group of said sensors including means for determining the volume or mass of air drawn into the engine through the intake pipe;
said further sensor being an air mass sensor disposed in said intake pipe; and,
said calibration means including means for performing the calibration in quasi-steadystate conditions.

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**5,050,561**

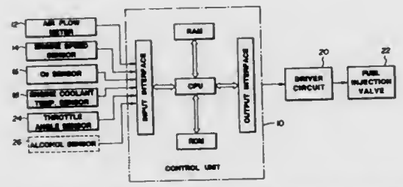
**AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH A HIGH DEGREE OF PRECISION IN DERIVATION OF ENGINE DRIVING CONDITION DEPENDENT CORRECTION COEFFICIENT FOR AIR/FUEL RATIO CONTROL**

**Masuo Kashiwabara, and Yoshiki Yuzuriha, both of Gunma, Japan, assignors to Japan Electronic Control Systems Company, Isezaki, Japan**

**Filed Mar. 12, 1990, Ser. No. 491,695**

**Int. Cl.[5] F02M *51/00***

**U.S. Cl. 123—489** **5 Claims**



1. An air/fuel ratio control system for an internal combustion engine, comprising:
first sensor means for monitoring an engine revolution speed to produce a first sensor signal;
second sensor means for monitoring an engine load to produce a second sensor signal;
third sensor means for monitoring oxygen concentration to produce a third sensor signal;
fourth means for deriving a basic fuel delivery amount on the basis of said first and second sensor signals;
fifth means for deriving a first correction value used for correcting said basic fuel delivery amount through proportional-integral control, said first correction value being composed of a proportional component and an integral component, said integral component being corrected on the basis of said basic fuel delivery amount;
sixth means for deriving a second correction value used for correcting said basic fuel delivery amount on the basis of engine driving conditions; and
seventh means for deriving a fuel delivery amount by correcting said basic fuel delivery amount on the basis of said first and second correction values so as to control a fuel amount to be delivered to an engine combustion chamber.



**5,050,562**

**APPARATUS AND METHOD FOR CONTROLLING A CAR**

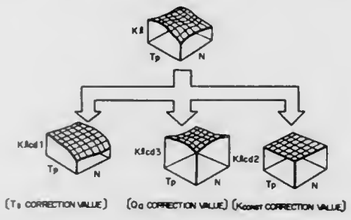
**Junichi Ishii, Katsuta; Matsuo Amano, Hitachi; Nobuo Kurihara, Hitachiota; Takeshi Atago, Katsuta, and Junichi Makino, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jan. 11, 1989, Ser. No. 295,820**

**Claims priority, application Japan, Jan. 13, 1988, 63-3728; Jul. 22, 1988, 63-181794**

**Int. Cl.[5] F02D *41/14***

**U.S. Cl. 123—489** **11 Claims**



1. A car control apparatus, comprising:
(a) an operating condition detection means for detecting one of a plurality of operating condition parameters in an actuating system of a car;
(b) a regulation means for regulating the operating conditions of said actuating system of said car;
(c) a control signal generation means for generating a control signal for controlling said regulation means on the basis of an output of said operating condition detection means; and
(d) a correction means for obtaining a learning factor by feedback of said one car operating condition parameter, and for deriving at least two correction factors from said learning factor; said correction factors including a control constant correction factor for correcting a control constant component to be used for generating at least the control signal, and an output constant correction factor for correcting an output constant component of said operating condition detection means; and for correcting the control constant of said control signal and the output correction constant using said correction factors.

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**5,050,563**

**MIXTURE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE**

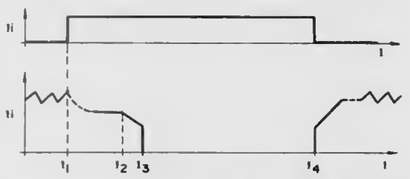
**Rolf Kohler, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Aug. 7, 1990, Ser. No. 563,627**

**Claims priority, application Fed. Rep. of Germany, Aug. 8, 1989, 3926096**

**Int. Cl.[5] F02D *41/12, 41/14***

**U.S. Cl. 123—489** **4 Claims**



1. A mixture control system for an internal combustion engine, the mixture control system comprising:
lambda control means for controlling the fuel mixture supplied to the engine in dependence upon the composition of the engine exhaust gas;
said lambda control means having at least an integral component having an integral action performance capability; and,
said lambda control means further including ancillary control means for acting on said integral component to controllably reduce the fuel metered to the engine at the start of the overrun operation ($t_1$) and for a predetermined time interval ($t_1$–$t_3$) thereafter during the overrun operation and, at the end of the overrun operation ($t_4$), to then controllably increase the fuel metered to the engine.

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**5,050,564**

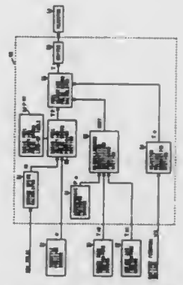
**FUEL INJECTION CONTROL SYSTEM FOR AN ENGINE OF A MOTOR VEHICLE PROVIDED WITH A CONTINUOUSLY VARIABLE BELT-DRIVE**

**Kazuo Suzuki; Fusao Tachibana; Shinichi Kurosu, all of Saitama, and Mitsugi Chonan, Ibaragi, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan and Polaris Industries L.P., Minneapolis, Minn.**

**Filed Oct. 24, 1990, Ser. No. 602,579**

**Int. Cl.[5] F02D *41/10***

**U.S. Cl. 123—492** **2 Claims**



1. A fuel injection control system for an engine of a motor vehicle with a continuously variable belt-drive transmission having clutch means which engages when speed of the engine is higher than a clutch engaging speed, the system comprising:
first detector means for detecting the speed of the engine;
second detector means for detecting opening degree of a throttle valve of the engine;
a memory storing a plurality of basic pulse widths for injecting fuel, which are arranged in accordance with the engine speed and the throttle valve opening degree,
some of said basic pulse widths in a speed range lower than said clutch engaging engine speed being increased for acceleration of the engine;
retrieving means for retrieving one of said basic pulse widths in accordance with the detected engine speed and the throttle valve opening degree;
calculator means for calculating a fuel injection pulse width based on the retrieved basic pulse width.

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**5,050,565**

**FUEL CONTROL SYSTEM FOR ENGINE**

**Toshihiro Ishihara; Tetsushi Hosokai; Tetsuro Takaba, and Hideki Kobayashi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan**

**Filed Dec. 14, 1990, Ser. No. 627,816**

**Claims priority, application Japan, Dec. 15, 1989, 1-326447**

**Int. Cl.[5] F02D *41/18***

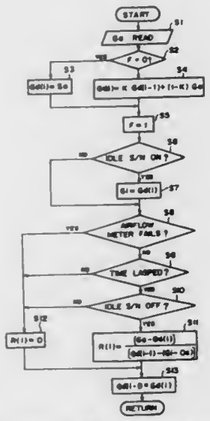
**U.S. Cl. 123—494** **5 Claims**

1. A fuel control system for an engine comprising
an airflow meter which detects an amount of intake air flowing through an intake passage of the engine,
a fuel feed means for feeding fuel to the engine in an amount

which is determined according to the amount of intake air detected by the airflow meter,

a moving average calculating means which calculates moving averages of outputs of the airflow meter,

a ratio calculating means which calculates the ratio of the difference between each output of the airflow meter and




the moving average to a value derived from the moving average, and

a fuel increase means which causes the fuel feed means to increase the amount of fuel to be fed to the engine when the ratio is not smaller than a predetermined reference threshold value.

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**5,050,566**

**FLOW DUCT FOR AN INTERNAL COMBUSTION ENGINE**

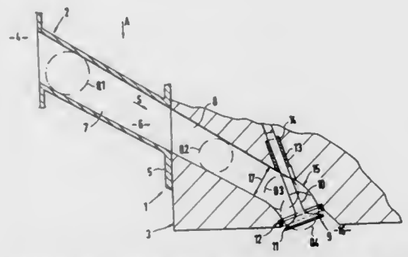
**Winfried Distelrath, Stuttgart, and Roland-Dieter Zebli, Wurmberg, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany**

**Filed Jul. 20, 1990, Ser. No. 554,896**

**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1989, 3924544**

**Int. Cl.[5] F02M** *35/10*

**U.S. Cl. 123—52 M** **9 Claims**



1. A flow duct, particularly an intake duct, in an intake system and a cylinder head of an internal-combustion engine, in which a gas flow is controlled by means of a valve which comprises a valve disk interacting with a valve seat and a valve stem having a longitudinal axis which is connected with the valve seat and, in an axially movable manner, is disposed in a valve stem guide, the valve stem being arranged adjacent to the valve seat ring in the intake duct in such a manner that it is subjected to the gas flow, wherein the intake duct is divided into a first, contracting duct section in the intake system and a second, widening duct section in the cylinder head, said intake duct extending in a linear non-offset manner from a plane including the valve stem axis and being provided with a defined flow profile which, until it reaches a cross-sectional transition area situated relatively close and upstream of the valve stem, has a uniform cross-sectional contraction and, downstream of said contraction, has a uniform cross-sectional widening.

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**5,050,567**

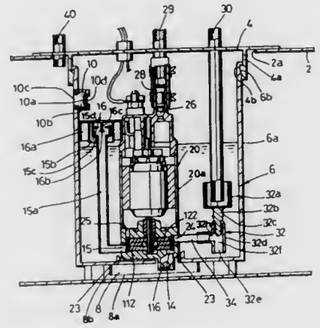
**FUEL SUPPLY SYSTEM**

**Isamu Suzuki, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan**

**Filed Feb. 1, 1991, Ser. No. 649,714**

**Int. Cl.[5] F02M** *37/10, 37/18, 37/20*

**U.S. Cl. 123—514** **5 Claims**



1. A fuel supply system comprising:

a main tank for storing a fuel;

a subtank provided in said main tank for storing a part of said fuel;

a first communication line for communicating said main tank to said subtank;

a first pump provided in said first communication line for supplying said fuel from said main tank through said first communication line to said subtank;

first means provided downstream of said first pump in said first communication line for limiting an amount of said fuel to be supplied from said first pump to said subtank and maintaining a level of said fuel to be stored in said subtank;

a second communication line for communicating said subtank to an engine;

a second pump provided in said second communication line for supplying said fuel from said subtank through said second communication line to said engine;

a fuel return pipe for returning an unconsumed part of said fuel from said engine to said subtank; and

second means for regulating an amount of said fuel to be supplied from said second pump to said engine according to an amount of said fuel to be returned from said engine through said fuel return pipe to said subtank.

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**5,050,568**

**REGULATED FLOW CANISTER PURGE SYSTEM**

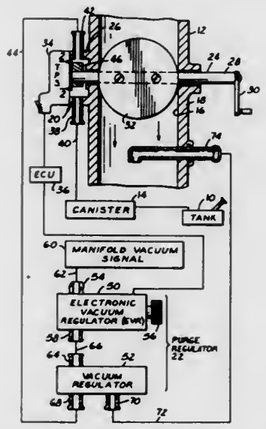
**John E. Cook, Chatham, Canada, assignor to Siemens Automotive Limited, Chatham, Canada**

**Continuation-in-part of Ser. No. 490,791, Mar. 8, 1990, which is a continuation-in-part of Ser. No. 452,664, Dec. 18, 1989, Pat. No. 4,995,369. This application Oct. 4, 1990, Ser. No. 591,219**

**Int. Cl.[5] F02M** *25/08*

**U.S. Cl. 123—521** **5 Claims**

1. For controlling the purging of a fuel vapor collection canister of an evaporative emission control system associated with the fuel system of an internal combustion engine, a regulated flow canister purge arrangement comprising an electronic vacuum regulator having a vacuum inlet at which engine manifold vacuum is received, an outlet at which is delivered a percentage of the engine manifold vacuum received at the vacuum inlet as determined by an electronic control signal supplied to a control input of the electronic vacuum regulator, a canister purge inlet to which a canister that is to be purged of gaseous fuel vapors is communicated, a canister purge outlet that is communicated to engine manifold vacuum, valve means for controlling flow between said canister purge inlet and said canister purge outlet, and a movable wall for operating said valve means, one side of said movable wall bounding one variable volume chamber and another side of said movable wall bounding another variable volume chamber, biasing means acting on said movable wall so as to cause said valve means to be biased toward blocking flow between said canister purge inlet and said canister purge outlet, and means communicating the outlet of said electronic vacuum regulator with said one variable volume chamber to cause the volumes of said chambers to vary in relation to the percentage of manifold vacuum applied to said one variable volume chamber, characterized in that: vacuum in said another variable volume chamber is caused to be correlated in a predetermined manner with




engine manifold vacuum; in that in steady state operating conditions wherein the magnitude of intake manifold vacuum and the value of said control signal are held constant, said valve means operates to allow a corresponding, substantially constant flow rate from said canister purge inlet to said canister purge outlet that is correlated with the intake manifold vacuum and control signal values; in that for a certain steady state value of intake manifold vacuum and a certain steady state value of said control signal, said valve means operates to allow a certain corresponding flow rate from said canister purge inlet to said canister purge outlet; in that in response to a change in intake manifold vacuum from said certain steady state value thereof while said control signal remains unchanged at said certain steady state value thereof, said valve means is re-adjusted such that the flow rate between said canister purge inlet and said canister purge outlet is allowed to continue substantially unchanged at said certain flow rate; and in that in response to a change in said control signal from said steady state value thereof while the magnitude of intake manifold vacuum remains unchanged at said steady state value thereof, said valve means is re-adjusted such that the flow rate between said canister purge inlet and said canister purge outlet is changed from said certain flow rate to an amount correlated with the change in said control signal.



**5,050,569**

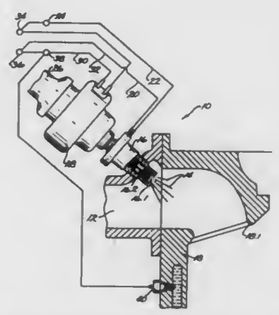
**FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE AND FUEL HEATING DEVICE THEREFOR**

**Gerrit J. Beunk, and Frederik M. N. Van Den Elst, both of Almelo, Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 22, 1989, Ser. No. 455,487**

**Int. Cl.[5] F02M** *31/00*

**U.S. Cl. 123—549** **12 Claims**



1. A fuel injection system having air supply means, a fuel injection spray valve for selectively spraying fuel to mix with air from the air supply means, fuel pump means furnishing fuel to the fuel injection spray valve under pressure, and a fuel heating device for heating the fuel furnished to the fuel injection spray valve to improve vaporizing of the fuel for enhancing mixing of the fuel and air, the fuel heating device comprising a heating disc of electrical resistance material, means for directing electrical current through the heating disc for generating heat, and housing means secured in sealing relation to the heating disc for defining fuel flow path along at least one side of the heating disc to pass the fuel in heat-transfer relation to the heating disc for heating the fuel, the heating disc comprising a flat disc of ceramic material of positive temperature coefficient of resistivity with both sides metallized, and the housing means comprising a pair of housing elements of stiffly resilient, compressible material secured together for forming a chamber therebetween accommodating the heating disc therein, the housing elements having a pair of openings extending into the chamber and having at least one spiral groove therein pressed against a flat side of the heating disc for defining a spiral fuel flow path over said flat disc side.

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**5,050,570**

**OPEN CYCLE, INTERNAL COMBUSTION STIRLING ENGINE**

**Robert H. Thring, Rte. 1, Box 241C, Devine, Tex. 78016**

**Filed Apr. 5, 1989, Ser. No. 333,326**

**Int. Cl.[5] F02G** *5/00;* **F02B** *33/10*

**U.S. Cl. 123—556** **19 Claims**

1. An internal-combustion fluid engine comprising:

means, including a hot piston, for defining a combustion chamber;

means for causing combustion within said combustion chamber;

means, including a cold piston, for defining a compression chamber for pressurizing a fluid;

inlet control means for controlling flow of the fluid into said compression chamber;

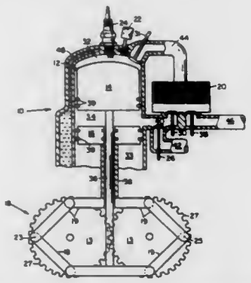
cooling means for maintaining lower temperature in said compression chamber than in said combustion chamber;

means, comprising linkage between said hot piston and said cold piston, for varying the volume of said compression chamber in relation to the volume of said combustion

chamber in a manner characteristic of a conventional Stirling engine;

a manifold connected in fluid communication between said combustion chamber and said compression chamber for enabling flow of the fluid from said compression chamber to said combustion chamber;

transfer control means for controlling the flow of the fluid



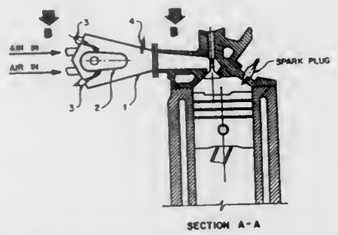
from said compression chamber to said combustion chamber;

heat transfer means connected to said manifold for transferring heat from gases exhausted from said combustion chamber to the fluid flowing from said compression chamber to said combustion chamber; and

exhaust control means for controlling the exhaust of gases from said combustion chamber.

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**5,050,571**
**DIESEL FUEL CONVERSION MEANS FOR SPARK-IGNITION ENGINES**
**Constantin Daniels, 47-07 41 St., Apt. 3-H, Sunnyside, N.Y. 11104**
**Filed Feb. 26, 1990, Ser. No. 468,016**
**Int. Cl.[5] F02M *31/00***
**U.S. Cl. 123—557** **6 Claims**




1. An ignition system for spark-ignited internal combustion engines operating with Diesel fuel at a compression ratio in the range of about 17.5:1 to 21:1, said internal combustion engines having spark igniting means for the combustion chamber of each cylinder, said ignition system comprising:

a. an intake manifold,

b. an exhaust manifold extending at least in part through said intake manifold,

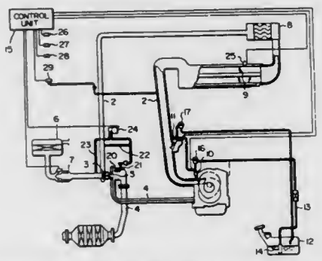
c. said exhaust manifold being heated, in normal operation of the engine, to a Diesel fuel vaporizing temperature, and

d. at least one fuel injector for injecting Diesel fuel into the combustion chamber of each engine cylinder,

e. said fuel injector being positioned to direct the fuel upon a portion of the part of the exhaust manifold that extends through the intake manifold,

f. whereby the exhaust manifold heat vaporizes the Diesel fuel before it enters the combustion chamber.

**5,050,572**
**SUPERCHARGE PRESSURE CONTROL SYSTEM FOR AUTOMOTIVE ENGINE WITH SUPERCHARGER**
**Masaaki Tamekiyo, Hatsukaichi, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan**
**Filed Jan. 31, 1990, Ser. No. 472,557**
**Claims priority, application Japan, Jan. 31, 1989, 1-19774**
**Int. Cl.[5] F02D *23/00***
**U.S. Cl. 123—564** **7 Claims**




1. A supercharging pressure control system for an automotive engine with a supercharger for controlling a supercharging pressure into the automotive engine, said supercharge pressure control system comprising:

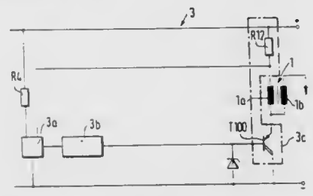
control means for controlling a pressure of incoming supercharging air into the automotive engine;

feedback control means for feedback-controlling said pressure of incoming supercharging air to a target pressure of supercharging air predetermined depending upon engine operating conditions; and

gain control means for varying a control gain of said feedback control means higher when said pressure of incoming supercharging air is higher than said target pressure of supercharging air when compared to said pressure of said incoming supercharging air being lower than said target pressure of supercharging air.

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**5,050,573**
**IGNITION DEVICE FOR AN INTERNAL COMBUSTION ENGINE**
**Horst Meinders, Reutlingen, and Ulrich Nelle, Sonnenbühl, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**
**PCT No. PCT/DE88/00425, § 371 Date Apr. 19, 1990, § 102(e) Date Apr. 19, 1990, PCT Pub. No. WO89/03937, PCT Pub. Date May 5, 1989**
**PCT Filed Jul. 7, 1988, Ser. No. 477,993**
**Claims priority, application Fed. Rep. of Germany, Oct. 21, 1987, 3735631**
**Int. Cl.[5] F02P *3/12***
**U.S. Cl. 123—644** **8 Claims**




1. An ignition device for an internal combustion engine, comprising:

an ignition transformer including a primary winding and a secondary winding;



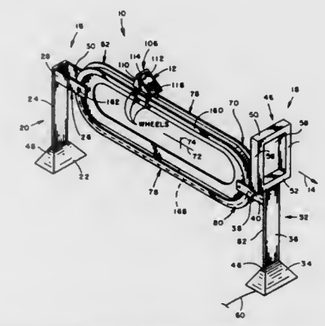
a direct current source coupled to the primary winding for supplying electric current thereto;

first means coupled to the primary winding for controlling the flow of electric current therethrough, the first means including a control stage and an output stage, the output stage including a first transistor having a first conductivity, the collector terminal of the first transistor being directly coupled to a ground connection of the ignition device;

second means coupled between the control stage and the output stage for decoupling the output stage from the control stage and preventing the uncontrolled starting of the output stage, the second means including a second transistor, the collector terminal thereof being coupled to the base terminal of the first transistor, the emitter terminal thereof being coupled to the emitter terminal of the first transistor, and the base terminal thereof being coupled to the positive terminal of the direct current source, the second means father including a first resistor coupled between the base terminal of the second transistor and the positive terminal of the direct current source.

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**5,050,574**
**BASEBALL PITCHING MACHINE**
**Aubrey Ramirez, 728 Ridge Dr., Sand Springs, Okla. 74063**
**Filed Jun. 5, 1990, Ser. No. 533,528**
**Int. Cl.[5] B41B *6/00***
**U.S. Cl. 124—3** **5 Claims**




1. A baseball pitching machine comprising:

A) a rear pedestal standard having a rear connection link thereon;

B) a forward pedestal standard having a forward connection link thereon;

C) a rectangular electromagnet having a top end, a bottom end, a first side and a second side mounted on said forward pedestal standard, with said sides and ends defining a central opening through which a baseball passes;

E) a track having a peripheral shape of a prolate ellipse with a horizontally extending major axis and a vertically extending minor axis and being oriented in a vertical plane with respect to a ground surface, said track including

(1) a Y-shaped cross-section having a bight portion which has an inner surface and an outer surface, two side legs extending from said bight portion inner surface, a central leg extending from said bight portion outer surface centrally between said side legs and in a direction opposite to said side legs, and two side flanges extending from said bight portion below said outer surface in the same direction as said central leg,

(2) an acceleration straightaway,

(3) a return straightaway,

(4) a forward return portion,

(5) a rear return portion, with said return portions connecting said straightaways together and said acceleration straightaway being positioned at a height greater than the height of said return straightaway;

F) a baseball carrying cart movably mounted on said track and including

(1) a ball carrying body which includes an outer surface having the shape of a hollow right triangular pyramid with a first side oriented to extend perpendicularly and outwardly of said track, a second side oriented to extend parallel to the track and being connected at one end thereof to said first side thus forming a right angle with said first side, and a hypotenuse connected at one end thereof to said first side and at another end thereof to said second side, and an inner surface of said hollow right triangular pyramid with a bottom side extending parallel to said second side and a rear side which intersects said bottom side and extends at an oblique angle with respect to said bottom side,

(2) four cart legs, each attached to said first side of said cart outer surface and extending away from said cart outer surface toward said track when said cart is on said track, each outer leg being located to be spaced from said track side legs when said cart is mounted on said track and including

(a) a first wheel supporting axle mounted on a lower end of said each outer leg and extending from said lower end toward said track central leg and extending to a location between said track central leg and one of said side flanges,

(b) a lower wheel rotatably mounted on said first wheel supporting axle and being sized to contact said track bight portion outer surface between said one side flange and said track central leg,

(c) four cart inner legs, each to said first side of said cart outer surface and spaced from said cart outer legs so that all of said cart inner legs lie within a perimeter defined by said cart outer legs, and an upper wheel rotatably contacting said track bight portion inner surface; and

G) a control circuit electrically connecting said electromagnet to a power source and including

(1) a first switch mounted on said acceleration straightaway near said track forward return portion,

(2) a second switch in electrical series with said first switch,

(3) a first switch control arm mounted on said track and controlling said first switch,

(4) a projection mounted on said cart in position to move said switch control arm from one position to another, and

(5) electrical lead means connecting said switches to the power source and to said electromagnet.

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**5,050,575**
**DISK LAUNCHER**
**Darryl B. Killion, 236 E. Palm, Orange, Calif. 92666**
**Filed Feb. 6, 1990, Ser. No. 475,857**
**Int. Cl.[5] F41B *7/08***
**U.S. Cl. 124—8** **12 Claims**

11. For use in launching a disk-shaped object in a spinning flight, a disk launcher comprising:

a housing having an interior cavity, an arced travel path defining an outer arced gripping surface for causing said disk-shaped object to roll against said gripping surface, and exit slot defined therein;

a pivotable shuttle member having a surface for thrusting said disk-shaped object outwardly when moved toward said exit slot;

pivot means pivotably supporting said shuttle member within said interior cavity;

spring means coupled to said shuttle member urging it in a first pivotal direction;

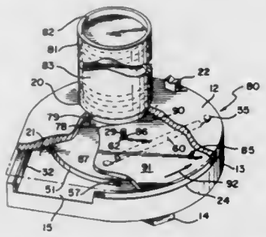
trigger means for releasably locking said shuttle member in a cocked position opposed by said spring means; and

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loading means for positioning a disk-shaped game object in direct contact with said shuttle member when in said cocked position,

said trigger means being operable to release said shuttle member from said cocked position whereby said shuttle



member is rapidly pivoted in said first direction by said spring means to force said disk-shaped object against said gripping surface causing said disk-shaped object to be launched through said slot having a spinning motion imparted thereto.

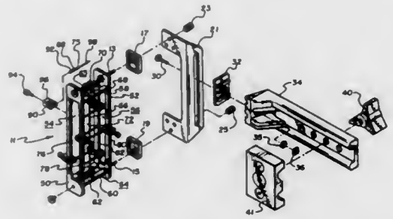
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**5,050,576**

**CROSS HAIR BOW SIGHT**

**Marlow W. Larson, Ogden, Utah, assignor to Browning, Morgan, Utah**

**Filed Oct. 31, 1990, Ser. No. 606,535**
**Int. Cl.[5] F41G *1/46;* F41B *5/00***
**U.S. Cl. 124—87** **7 Claims**



1. A sight for archery bows, comprising:

a body member with a pair of approximately parallel vertical side elements, together defining a sight window, each said side element including:

a pair of approximately parallel vertical serrated rack elements, the respective said pairs of rack elements being oriented to define first and second access slots communicating with said sight window,

individual serrations of each said rack element being out of vertical registration with corresponding serrations of the access slot with which said rack element is associated; and

a plurality of sight pins, each having

a body portion adapted to be clamped to register with a selected said serration within a said access slot, and

a shaft portion which extends horizontally into said window when said body portion is so clamped into position.

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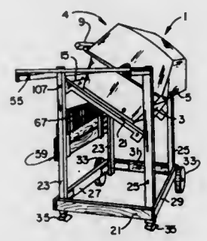
**5,050,577**

**PRE-ASSEMBLED GAS BARBEQUE GRILL**

**William R. Baynes; Henry C. Schubert, both of Perry County, Ill., and Arlen Ferguson, Shelby County, Tenn., assignors to Charmglow Industries, Inc., DuQuoin, Ill.**

**Filed May 21, 1990, Ser. No. 526,373**
**Int. Cl.[5] F24C *1/16***
**U.S. Cl. 126—9 R** **20 Claims**

1. A barbeque grill including leg support means attached to and supporting a grill housing, said grill housing being movable to a collapsed position relative to said leg support means for shipping and also being movable to an extended position relative to said leg support means during operation and use of said barbeque grill, said leg support means including a plurality of spaced fixed leg supports arranged and supported relative to one another in a predetermined peripheral fixed array, said grill housing having a peripheral dimension smaller than the



predetermined peripheral fixed array of spaced fixed leg supports, means pivotally mounting said grill housing relative to said spaced fixed leg supports so as to be received within the predetermined peripheral array of spaced fixed leg supports when the grill housing is collapsed in a lower pivot position, and means fixedly securing said grill housing in an upper horizontal position relative to said spaced fixed leg supports during operation and use of said grill.

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**5,050,578**

**COMMERCIAL HOT AIR IMPINGEMENT COOKING APPARATUS**

**Clement J. Luebke, Burlington, Vt.; Gerald W. Sank, Pasadena, Md., and Frank A. Slade, Mountain Top, Pa., assignors to Welbilt Corporation, New Hyde Park, N.Y.**

**Division of Ser. No. 279,094, Dec. 2, 1988, Pat. No. 4,972,824.**
**This application Oct. 5, 1990, Ser. No. 593,246**
**Int. Cl.[5] F24L *15/32;* A21B *1/08***
**U.S. Cl. 126—21 A** **9 Claims**

1. A multi-tiered air impingement cooking oven comprising:

a housing having positioned therein a vertically stacked series of air plenum boxes, each of said air plenum boxes having:

an internal cooking chamber,

an essentially flat, relatively large area perforated food support and cooking member horizontally supported within said cooking chamber and adapted to support a food item within said cooking chamber,

a front opening through which a food item may be placed on and removed from said food support and cooking member,

upper air supply plenum means positioned above said food support and cooking member for receiving pressurized air from a source thereof and converting the received air into a spaced series of downwardly directed, relatively high velocity air jets which laterally diffuse prior to striking and evenly blanketing the upper side surface of said food support and cooking member to transfer air heat thereto at an accelerated rate,

lower air supply plenum means positioned below said food support and cooking member for receiving pressurized air from a source thereof and converting the received air into a spaced series of upwardly directed, relatively high velocity air jets which laterally diffuse prior to transversely striking and evenly blanketing the lower side surface of said food support and cooking member to transfer air heat thereto at an accelerated rate,

an inlet opening communicating with said upper and lower supply plenum means, and

an outlet passage communicating with said cooking chamber between said food support and cooking member and said upper plenum means;

heated air recirculating means operable to create within said housing a recirculating flow of heated air which operatively traverses at least one of said air plenum boxes, said heated air recirculating means including:

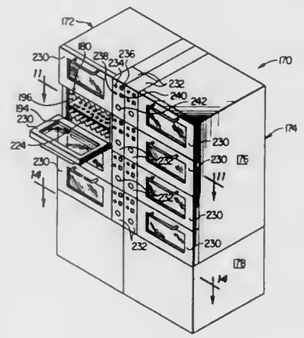
an air supply passage having an inlet, and a series of outlets each positioned to flow air into one of said inlet openings of said air plenum boxes,

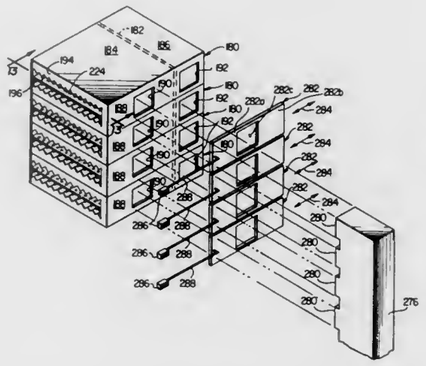
a return passage adapted to receive air discharged from said outlet passages of said air plenum boxes and having an outlet end,

a fan operatively interconnected between the inlet of said air supply passage and the outlet end of said return passage, and

heating means for heating air recirculated by said fan to a food cooking temperature; and







control means for controlling heated air flow through each of said air plenum boxes, said control means including:

a series of damper members each associated with one of said air plenum boxes and movable between a closed position in which air flow through the inlet opening and outlet passage of its air plenum box is substantially precluded, and an open position in which air flow through the inlet opening and outlet passage of its air plenum box is permitted,

means for opening a selected number of said damper members to initiate in their associated air plenum boxes a cooking cycle having a predetermined duration, and

means for automatically closing each opened damper member at the completion of the cooking cycle time of its associated plenum box.

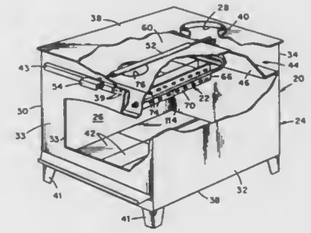
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**5,050,579**

**COMBUSTOR ASSEMBLY FOR A FUEL-BURNING ROOM HEATER**

**James E. Melton, and William E. Edmondson, both of Sweetwater, Tenn., assignors to Vestal Manufacturing Company, Sweetwater, Tenn.**

**Filed Apr. 12, 1990, Ser. No. 508,843**
**Int. Cl.[5] F24C *1/14***
**U.S. Cl. 126—77** **20 Claims**



1. A pollutant-controlling combustor assembly for use with a fuel-burning room heater so that gaseous combustion products which are generated within the heater are directed through the assembly before being discharged into the atmosphere, said assembly comprising:

at least two combustors each having an upstream side through which combustion products enter the combustor and a downstream side through which combustion products exit the combustor; and

means for supporting said combustors in parallel flow relationship with one another so that a stream of combustion products flowing through one combustor is prevented from mixing with a stream of combustion products flowing through any other combustor in said assembly while each stream moves between the upstream and downstream sides of its corresponding combustor and so that the downstream side of one combustor in said assembly is facing the downstream side of another combustor in said assembly for receiving radiant heat generated by the downstream side of said another combustor.

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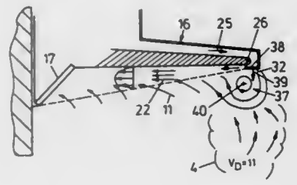
**5,050,580**

**Patent Not Issued For This Number**

VOL 1130 ISS 4 SE 24 1991 UMI



5,050,581
**PROCESS AND DEVICE FOR DRAWING OFF VAPORS AND FUMES**
**Hannelore Röhl-Hager, Schöenberger Strasse 18, 8400 Regensburg, and Georg Koppenwallner, Himmelsstieg 1, 3400 Göttingen, both of Fed. Rep. of Germany**
**Filed May 24, 1990, Ser. No. 528,202**
**Claims priority, application Fed. Rep. of Germany, Jun. 9, 1989, 3918870**
**Int. Cl.[5] F24C** *15/20*
**U.S. Cl. 126—299 D** **8 Claims**

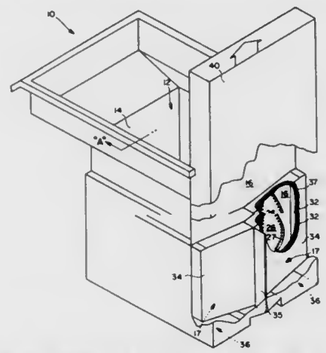



1. An exhaust hood for installation over a cooking place, or a corresponding source of dust or fumes, comprising:
a hood including a suction fan, a filter, air ducts, and a lower hood edge blast nozzle arrangement at a forward end of said hood,
wherein said lower hood edge blast nozzle arrangement is shaped to direct blast air (22) under said hood and against said filter that is positioned in a rear area of the hood; and,
said blast air nozzle arrangement is shaped to provide a wall jet of air directed horizontally adjacent and along a horizontal underside of said hood for drawing off fumes (4) and carry said fumes along said horizontal underside (28) of said hood, such that said wall jet is limited in its upward movement by said horizontal underside and further directs air slightly downward from said blast nozzle (26) so that a lower borderline of said wall jet extends toward a lower edge of said filter (17);
said filter in the rear hood area is attached to said horizontal underside (28) and extends obliquely from said horizontal underside (28) down toward the rear of the hood.

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5,050,582
**FLUID HEATING APPARATUS AND PROCESS PARTICULARLY SUITABLE FOR A DEEP FAT FRYER**
**James Almond, Mountain Home; Wayne Wooldridge, Gassville; Robert E. Davis, and Ralph Wooldridge, both of Mountain Home, all of Ark., assignors to Arkansas Patents, Inc., Mountain Home, Ark.**
**Filed Jul. 23, 1990, Ser. No. 556,747**
**Int. Cl.[5] F24D** *1/00*
**U.S. Cl. 126—391** **13 Claims**

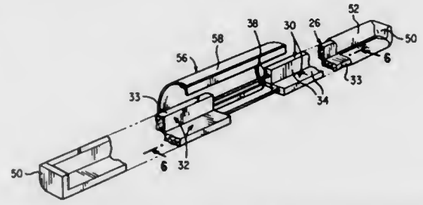
1. A fluid heating apparatus comprising:
a fluid container having a front wall, a rear wall, side walls and a bottom wall;
at least one combustor each comprising a combustion tube positioned between said front wall and said rear wall, a front end plate and a rear end plate, fuel-air inlet means for admitting a fuel-air mixture into said combustion tube, ignition means for igniting said fuel-air mixture, and said rear end plate having a plurality of through holes about at least a portion of a periphery of said rear end plate;
a plenum adjacent said rear wall, said plenum in communication with each said combustion tube;
baffle means forming a passageway for directing flue gases




from said plenum in a flow over a primary portion of an outer surface of said fluid container and then in a counterflow, with respect to said flow, over a secondary portion of said outer surface; and
a flue stack in communication with said passageway and a surrounding atmosphere.

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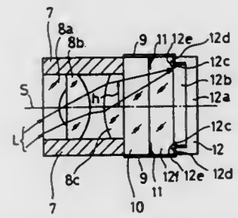
5,050,583
**DEVICE FOR PROTECTIVELY COVERING HEARTHS**
**Anthony J. Chapek, 2425 Danver La., Buford, Ga. 30518, and Robert E. Parks, 479 Loma Ct., Lilburn, Ga. 30247**
**Filed Aug. 8, 1990, Ser. No. 564,194**
**Int. Cl.[5] F24B** *1/18*
**U.S. Cl. 126—500** **5 Claims**




1. A device for protectively covering an edge of an exposed hearth, comprising:
(a) a frame member having an inner surface shaped complementary to a hearth edge, and an outer surface, said frame member further comprising a pair of sections having opposed ends;
(b) a means for detachably securing the frame member onto the hearth over the edge;
(c) a resilient means on the outer surface of the frame member for providing a protective cover for the hearth; and
(d) a means for adjusting the length of the frame member depending upon the length of the hearth edge wherein the means is positioned intermediate to the opposed ends of the frame member and the means for adjusting length includes a threaded member secured about its top to one of the opposed ends and having its bottom being threadedly received within the other of the opposed ends.



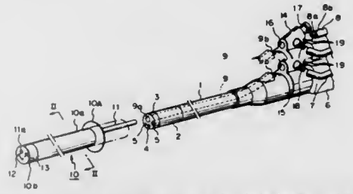
5,050,584
**ENDOSCOPE WITH A SOLID-STATE IMAGE PICKUP DEVICE**
**Nobuyuki Matsuura, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**
**Filed Jul. 24, 1990, Ser. No. 557,560**
**Claims priority, application Japan, Sep. 22, 1989, 1-247492; Apr. 20, 1990, 2-104913**
**Int. Cl.[5] A61B** *1/00*
**U.S. Cl. 128—4** **9 Claims**




1. An endoscope having a distal end portion, the distal end portion comprising:
an objective lens system comprising a plurality of lenses and having an optical axis and a diameter;
a supporting frame for supporting the objective lens system;
a first optical member fixed behind the supporting frame to the objective lens system and having a diameter larger than that of the objective lens system; and
a solid-state image pickup device fixed behind the first optical member;
the objective lens system being designed in such a manner that among the effective rays incident on the solid-state image pickup device, the ray imaged at the farthest position from the optical axis of the objective lens system increasingly goes away from the optical axis as the ray approaches the solid-state image pickup device and that the distance between the ray at the image plane of the solid-state image pickup device and the optical axis is larger than the radius of the objective lens system.

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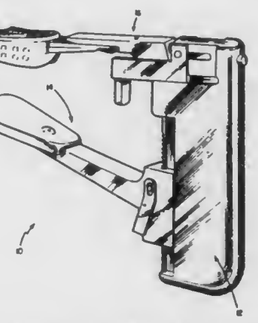
5,050,585
**SHEATHED ENDOSCOPE**
**Nagashige Takahashi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Continuation-in-part of Ser. No. 436,130, Nov. 14, 1989, abandoned, which is a continuation of Ser. No. 328,511, Mar. 24, 1989, abandoned. This application Jul. 13, 1990, Ser. No. 552,328**
**Claims priority, application Japan, Mar. 28, 1988, 63-74129**
**Int. Cl.[5] A63B** *1/00*
**U.S. Cl. 128—4** **11 Claims**




1. A sheathed endoscope having a flexible insert tube in the form of an elongated cylinder having proximal and distal ends, and a distal end portion with a viewing window which is coupled to the distal end of said insert tube, said endoscope comprising:
a flexible guide tube inserted in said insert tube so as to extend over the entire length of said insert tube, one end of said guide tube opening to the outside at said distal end portion, and the other end of said guide tube opening to the outside at the proximal end of said insert tube;
a sheath which is transparent at least a portion thereof which is adapted to be positioned over the surface of said viewing window, said sheath adapted to be positioned over the surface of said viewing window, said sheath adapted to be removably fitted over said insert tube to isolate said insert tube from the external environment; and
at least one channel tube inserted in said sheath so as to extend through the entire length of said sheath, one end of said channel tube opening to the outside at the distal end portion of said sheath, and the other end of said channel tube being inserted into said guide tube at the distal end of said guide tube and drawn out of the proximal end of said guide tube.

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5,050,586
**MANDIBLE MANIPULATOR**
**Leonard Bonnell, Huntingdon Valley, Pa., assignor to Leonard Medical, Huntingdon Valley, Pa.**
**Filed Sep. 21, 1989, Ser. No. 410,286**
**Int. Cl.[5] A61B** *1/24*
**U.S. Cl. 128—12** **10 Claims**




1. A medical apparatus for the manipulation of the mandible comprising:
an instrument body defining a handle;
a mouth tray of a size suitable for insertion into a patient's mouth and having a member of a shape generally approximating that of the lower jaw of a patient, said mouth tray adapted for attachment to said instrument body;
a chin rest defining a surface adapted for engagement beneath a patient'chin, said chin rest attached to said instrument body; and
means for adjustment of the relative positions of said mouth tray and said chin rest along said instrument body in a manner to hold the patient's mandible firmly between said chin rest and the said mouth tray.

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5,050,587
**VIBRATOR SYSTEM AND VIBROTHERAPEUTIC DEVICE USING THE SAME**
**Shinji Sagara, Kitamoto, and Youichi Endo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama and Kabushiki Kaisha Fukoku, Saitama, both of, Japan**
**Filed Jul. 8, 1988, Ser. No. 216,560**
**Claims priority, application Japan, Jul. 8, 1987, 62-170375; Oct. 14, 1987, 62-156190[U]; Oct. 14, 1987, 62-156191[U]; Nov. 16, 1987, 62-287413; Dec. 12, 1987, 62-189030[U]**
**Int. Cl.[5] A61H** *1/00*
**U.S. Cl. 128—24 AA** **16 Claims**

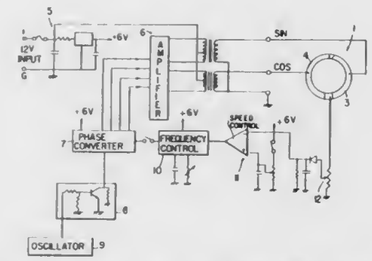
1. A vibrator system, comprising:
an ultrasonic motor comprising a stator, an electrode di-

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vided into at least two sections, and a rotator having an output shaft, said rotator being placed in parallel to said electrode;

a driver circuit which supplies forwardly rotary and reversely-rotatory signals to each section of said electrode; and




a switching control circuit which alternately switches the signals so that each section of said electrode alternately receives the forwardly-rotatory and reversely-rotatory signals,

whereby a vibration is generated at the output shaft of said ultrasonic motor.

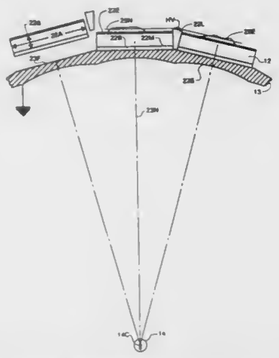
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**5,050,588**

## HIGH ENERGY ULTRASONIC LENS ASSEMBLY WITH MOUNTING FACETS

**Richard Grey, 1400 Arbor La., Alamo, Calif. 94507, and Frank C. Ford, 48 Golf Rd., Pleasanton, Calif. 94566**

**Filed Feb. 8, 1990, Ser. No. 476,874**
**Int. Cl.[5] A61B *8/00***
**U.S. Cl. 128—24 AA** **33 Claims**



1. A high energy ultrasonic device for in vivo treatment, comprising:

a rigid curved support means for defining an in vivo target region;

a convex outer mounting surface on the curved support means having a plurality of generally planar mounting facets formed thereon;

a plurality of electric to ultrasonic transducers mounted on the convex outer surface of the curved support means, each of said transducers having an inner mounting face which is generally planar for mounting onto one of the mounting facets, and each of said transducers having an outer contact face for connection to an electric voltage source;

each of said transducers having a major dimension extending generally parallel to the underlying mounting facet and a minor dimension extending generally normal to the underlying mounting facet;

electrical connector means for establishing an electric field across each of said transducers between the outer contact face and the inner mounting face for conversion into ultrasonic energy; and

a concave inner surface on the curved support means having a plurality of focusing means thereon, each one of said focusing means immediately opposed to each of said mounting facets on the outer surface, each of said focusing means forming an ultrasonic unit with each of the opposed mounting facets and each of the transducers mounted thereover to focus the ultrasonic energy from each of the transducers.

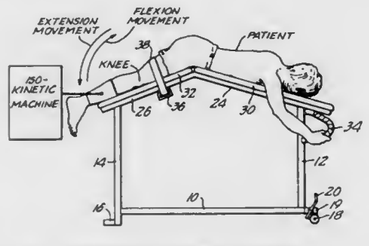
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**5,050,589**

## ISOKINETIC KNEE TABLE

**Robert P. Engle, 1150 Berkshire Blvd., Wyomissing, Pa. 18854**

**Continuation of Ser. No. 559,402, Jul. 26, 1990, abandoned, which is a continuation of Ser. No. 148,064, Jan. 25, 1988, abandoned. This application Oct. 10, 1990, Ser. No. 599,280**
**Int. Cl.[5] A61H *1/02***
**U.S. Cl. 128—25 R** **9 Claims**




1. A knee rehabilitation system comprising:

(1) an isokinetic rehabilitation machine for extension and flexion of muscles around a knee joint of a patient, said machine having an arm on which there is a means for attaching a portion of a leg below the knee joint of the patient to said arm of said machine; and

(2) a patient support means for positioning said patient is a prone position, said support means comprising:

a) a base;

b) a support member extending upward from said base one end of said support member affixed to said base;

c) an inverted V-shaped table affixed to the other end of said support member, said inverted V-shaped table comprises:

(i) a first support platform connected to a second support platform, said first support platform forming an acute angle with said second support platform and said acute angle remaining constant during extension and flexion of muscles around the knee joint by said patient;

(ii) a handle affixed to said first support platform for grasping by hands of said patient when said patient is in a prone position on said inverted V-shaped table and

(iii) strap means affixed to said second support platform for holding a portion of the leg above the knee joint of said patient securely against the second support platform such that when the portion of the leg below the knee joint is attached to said arm of the machine, the hamstring muscles in the leg of the patient that is attached to the arm of the machine and held against the second support platform work against gravity during flexion movement and the quadriceps work with gravity during extension movement.

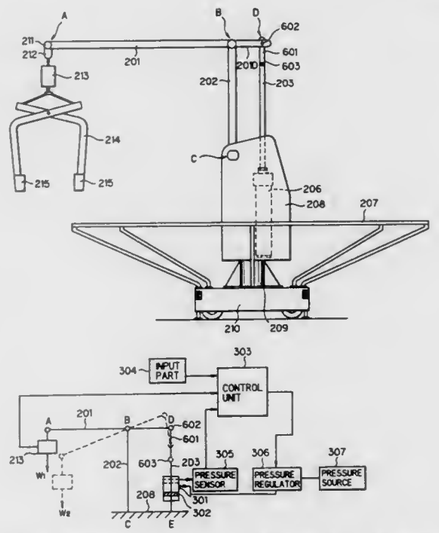


**5,050,590**

## APPARATUS FOR PRACTICE OF AMBULATION

**Kazuhiko Futakami, Shizuoka, Japan, assignor to Japan Em Co., Ltd., Shizuoka, Japan**

**Filed Aug. 31, 1989, Ser. No. 401,088**
**Claims priority, application Japan, Sep. 2, 1988, 63-219867**
**Int. Cl.[5] A61H *1/02***
**U.S. Cl. 128—25 R** **7 Claims**




1. An apparatus for practice of ambulation by a patient, comprising:

a pivotable suspending arm having a distal end portion, said distal end portion having an end point to which the weight of the patient is applied, and a proximate end portion;

means for producing a force which causes said suspending arm to balance against a load based on the weight of the patient;

a vertical rod positioned between said suspending arm and said force producing means and actuated by said force producing means to move in a vertical direction; and

means for operatively engaging said vertical rod with said suspending arm in said proximate portion thereof;

wherein said engaging means having a fulcrum, and said engaging means is constructed to convert a vertical motion of said vertical rod into a pivoting motion of said suspending arm around said fulcrum so as to convey the force applied to said vertical rod by said force producing means to said suspending arm without horizontal shift of said vertical rod.

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**5,050,591**

## FLEXIBLE WATER MASSAGE MAT

**Giannino Sandrin, Pordenone, Italy, assignor to Albatros System S.p.A., Spilimbergo, Italy**

**Filed May 3, 1990, Ser. No. 518,542**
**Claims priority, application Italy, May 5, 1989, 45726A/89**
**Int. Cl.[5] A61H *9/00, 23/00;* A47K *3/12;* A47C *27/08***
**U.S. Cl. 128—65** **16 Claims**

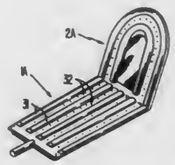
1. A water massage mat comprising:

a soft and flexible cover formed of a pair of soft and flexible leaves interconnected by weld lines, said weld lines including a perimetrical weld line about a perimeter of said cover and inside weld lines for forming a first channel and a second channel distinct from said first channel, said first channel being hermetically sealed and said second channel having a plurality of small holes formed in a top surface thereof;

port means, formed in said first channel, for allowing said first channel to be filled with fluid and emptied of the fluid;

means for selectively sealing said port means;

conduit means for connecting said second channel to a compressed air source, such that compressed air can be fed into said second channel and can flow out through said small holes; and



a plurality of suction cups mounted to a lower surface of said first channel for attaching said water massage mat to a surface of a tub;

wherein, when inflated, said first channel has a vertical dimension greater than a vertical dimension of said second channel so that said first channel is adapted to support the body of a user, and so that said top surface of said second channel is lower than a top surface of said first channel such that the body of the user can be supported on the first channel with a gap formed between the body of the user and said small holes formed in said top surface of said second channel.

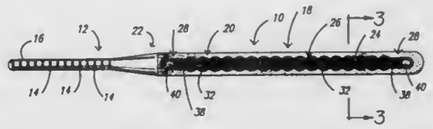
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**5,050,592**

## PENILE PROSTHESIS

**Raul Olmedo, 42 Clemenceau, Cordoba 5000, Argentina**

**Filed May 7, 1990, Ser. No. 519,657**
**Int. Cl.[5] A61F *2/26***
**U.S. Cl. 128—79** **6 Claims**

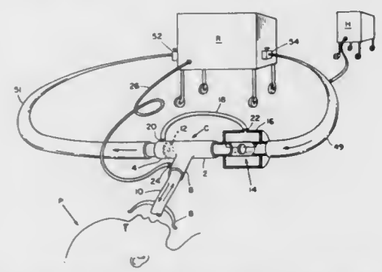


1. A penile prosthesis movable between a dependent and erect position comprising an elongated member including a flexible substantially cylindrical proximal section and an elongated malleable substantially cylindrical distal section, said elongated malleable substantially cylindrical distal section includes a centrally disposed inner memory member comprising an elongated flexible element extending through a plurality of stiffening elements extending longitudinally through said elongated malleable cylindrical distal section to selectively maintain the penile prosthesis in the dependent or erect position, each said stiffening elements comprises an outer arcuate surface having a substantially flat surface formed on each end thereof, each said substantially flat surface includes a corresponding conical recess formed therein, said corresponding conical recesses of each said stiffening element being connected by a centrally disposed channel including a side wall to receive said elongated flexible element therethrough such that said side walls engage said elongated flexible element to control the position of said flexible substantially cylindrical proximal section and to prevent contact of said elongated flexible element with said substantially flat surfaces.

VOL 1130 ISS 4 SE 24 1991 UMI



5,050,593
**RESPIRATOR TRIGGERING MECHANISM**
Chi-Sang Poon, Lexington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Jun. 1, 1990, Ser. No. 531,949
Int. Cl.[5] A61M *16/20*
U.S. Cl. 128—204.23 4 Claims

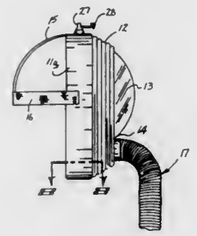


1. A system for triggering insufflation by a respirator comprising:
a) a connector, including,
i) an inspiratory conduit for connection to an inspiratory valve of the respirator,
ii) an expiratory conduit for connection to an expiratory valve of the respirator, and
iii) a patient-connecting conduit for connection with a breathing passage of a patient;
b) a one-way expiratory valve disposed in the expiratory conduit which is moveable from a closed position to an open position responsive to exhalation of the patient through the patient-connecting conduit, whereby the patient's breath passes through the one-way expiratory valve to the respirator when the respirator is in an expiratory mode;
c) a shutter valve disposed in the inspiratory conduit, said shutter valve including a collapsible elastomeric ring and being moveable between an open position, wherein fluid communication is provided between the patient-connecting conduit and the inspiratory valve through the elastomeric ring, and a closed position by collapse of the collapsible elastomeric ring, whereby the shutter valve seals the patient-connecting conduit from the inspiratory valve; and
d) an air tap disposed at a portion of the connector which is between the one-way expiratory valve and the shutter valve and which extends from the connector to the respirator, and responsive to voluntary inhalation by the patient to move the one-way expiratory valve and the shutter valve from their open positions to their closed positions to cause pressure within the connector and in the air tap to diminish in an amount sufficient to trigger the respirator to shift from an expiratory mode to an inspiratory mode, in which the expiratory valve closes and the inspiratory valve opens, and in which air is directed from the respirator through the inspiratory valve to force the shutter valve from the closed position to the open position, thereby causing insufflation of the patient by the respirator.

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5,050,594
**ADJUSTABLE RESPIRATOR MASK APPARATUS**
Lynn D. Babb, 7227 SW. 22nd Pl., Gainesville, Fla. 32607
Filed Oct. 15, 1990, Ser. No. 597,501
Int. Cl.[5] A62B *18/08*
U.S. Cl. 128—206.24 6 Claims

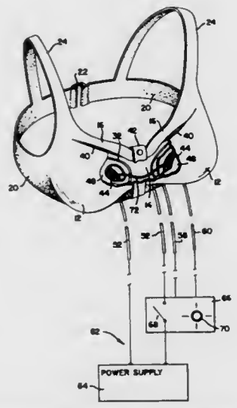
1. An adjustable respirator mask apparatus comprising in combination,
a flexible facial accommodating face ring, the face ring including a forward edge spaced from a rear edge, and the face ring including an adjustment ring coextensively mounted to the forward edge of the face ring, and
a shield means mounted overlying the adjustment ring to enclose an individual's face mounted within the face ring, and
a flexible hose in fluid communication with the shield means, and
a securement means mounted to the face ring spaced from



the adjustment ring to secure the face ring to an individual's head, and
wherein the adjustment ring is defined by an accordion ring, the accordion ring including a series of segments to permit extension of the accordion ring relative to the face ring, and
wherein the accordion ring further includes a series of spaced parallel encircling reinforcing wire rings where at least one wire ring is directed through each of the segments.

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5,050,595
**THERAPEUTIC GARMENT**
Pam Krafft, 70 Pemberwick Rd., Greenwich, Conn. 06831
Filed Aug. 1, 1989, Ser. No. 388,581
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—379 15 Claims

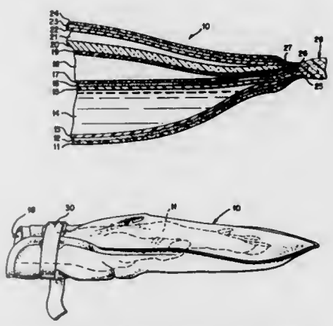



6. A women's support garment comprising, in combination:
a pair of breast supporting cups each of which is formed with an inner and an outer panel defining therebetween one of two cupped shaped pockets, each of said cups having an opening communicating with one of the pockets formed by said inner and outer panel, at least one of said inner and outer panel being composed of a soft, flexible, elastic fabric stretchable in two directions:
two cupped shaped, thermal gel packs one of each of which is inserted through said opening and positioned in one of said pockets, said gel packs each having a central opening for accommodating the nipple area of the women's breast;
an electrical heating element within each of said pockets adjacent to a respective one of said thermal gel packs, said heating element being composed of a woven, flexible, cupped shaped, electrically conductive fabric having a central opening for accommodating the nipple area of the women's breast,
circuit means for supplying electrical current to said heating element;
means for adjusting the tightness of said cups around the women's breast; and
two side panels composed of said soft, stretchable fabric each one of which is connected to one of said breast supporting cups, said side panels being dimensioned and configured to encircle the wearer and hold said cups in place with said gel packs surrounding the women's breast, said side panels being wide enough to support the tissues adjacent to said breast and thereby ease the back pain caused by the swelling of said breast.



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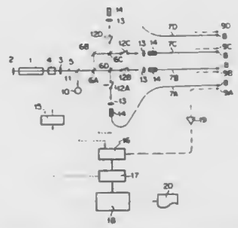
5,050,596
**REUSABLE AND MICROWAVABLE HOT OR COLD THERAPY MITT AND METHOD OF MANUFACTURE**
Steven P. Walasek, and Stuart J. Walasek, both of Shavertown, Pa., assignors to Packaging Electronics & Devices Corp., Nanticoke, Pa.
Continuation-in-part of Ser. No. 448,864, Dec. 12, 1989. This application Oct. 30, 1990, Ser. No. 605,460
Int. Cl.[5] A61F *7/00*
U.S. Cl. 128—381 16 Claims



1. A therapy mitt for a user's hand comprising:
a first layer of fabric having a top surface;
a first layer of adhesive spread on the top surface of the first layer of fabric;
a first layer of plastic adhered to the top surface of the first layer of fabric by the first layer of adhesive;
a first pocket means for containing a gel above the first layer of plastic;
a second layer of plastic being positioned above the first pocket means for containing the gel, said second layer of plastic having a top surface;
a second layer of adhesive spread on the top surface of the second layer of plastic;
a second layer of fabric adhered to the top surface of the second layer of plastic by the second layer of adhesive;
a second pocket means for providing an open air space for receiving the user's hand above the second layer of fabric;
a layer of open-celled material being positioned above the second pocket means for receiving the user's hand, said layer of open-celled material having a top surface;
a layer of insulative wadding provided on the top surface of the layer of open-celled material;
a third pocket means for providing a dead air space as additional insulation above the layer of insulative wadding;
a third layer of plastic positioned above the third pocket means for enclosing the dead air space. said third layer of plastic having a top surface;
a third layer of adhesive spread on the top surface of the third layer of plastic; and
a third layer of fabric adhered to the top surface of the third layer of plastic by the third layer of adhesive.

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5,050,597
**LASER IRRADIATION SYSTEM FOR THERMOTHERAPY**
Norio Daikuzono, Ichihara, Japan, assignor to S.L.T. Japan Co., Ltd., Japan
Continuation of Ser. No. 163,925, Mar. 4, 1988, abandoned. This application Apr. 5, 1990, Ser. No. 505,077
Claims priority, application Japan, Mar. 5, 1987, 62-50723
Int. Cl.[5] A61N *5/06;* A61F *7/00*
U.S. Cl. 128—395 15 Claims



1. A laser irradiation system for thermotherapy which comprises laser beam guides for guiding laser beams from laser source means to a plurality of laser beam emitting ends; laser beam switching means in the respective guides; temperature sensing means associated with the respective laser beam emitting ends for detecting temperatures of living tissue and for generating a temperature signal representative of said detected temperature; on-off control means for separately controlling said switching means in response to tissue temperature signals from respective associated temperature sensing means.

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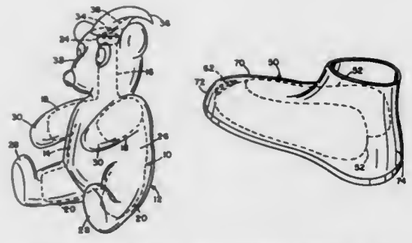
5,050,598
**BODY WARMING BLADDER**
Dalton R. Tucker, 18218 Paradise Mountain Rd., No. 91, Valley Center, Calif. 92082
Filed Nov. 7, 1989, Ser. No. 432,550
Int. Cl.[5] A61F *7/08*
U.S. Cl. 128—403 9 Claims

1. A body warming bladder device for fitting over a foot inside a slipper or other footwear, comprising:
a hollow bladder of pliable, waterproof material comprising upper and lower layers having peripheral edges of matching shape, the layers being joined together around their peripheral edges to define a cavity and the bladder being of V-shape having a central, apex portion and two separate limbs extending from the central portion and diverging away from one another to form the V-shape with the limbs being unconnected and separate from one another along their length between the apex of the V-shape and the outermost free ends of the limbs;
the bladder having an inlet/outlet opening in one of said layers spaced from said peripheral edges for filling the

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bladder with warm liquid and subsequently emptying the bladder; and



releasable end cap means for releasably sealing the inlet/outlet opening.

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5,050,599

## IMPLANTABLE MEDICAL DEVICE FOR DETECTING EVENTS OCCURRING WITH RESPECT TO A PHYSIOLOGICAL FUNCTION WITH VARIABLE SENSITIVITY AND A METHOD FOR THE OPERATION OF SUCH A DEVICE

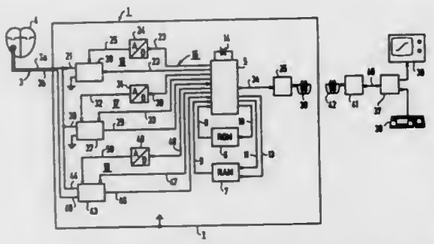
Kurt Hoegnelid, Västerhaninge, Sweden, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 525,133

Claims priority, application European Pat. Off., May 22, 1989, 89109157.1

Int. Cl.[5] A61N *1/362*

U.S. Cl. 128—419.0 PG 18 Claims



1. A medical device implantable into the body of a living being comprising first detector means for detecting events relating to a physiological function of the living being; setting means for setting the sensitivity (S) of the first detector means; and second detector means for detecting the events relating to the physiological function, the sensitivity thereof at least corresponding to the sensitivity (S) of the first detector means, and wherein the setting means is connected to the second detector means automatically sets the sensitivity (S) of the first detector means such that the first detector means detects each event detected by the second detector means.

5,050,600

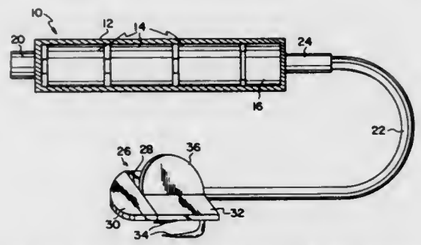
## CARDIAC PACEMAKER

Lance K. Parks, 311 Parkhill, Billings, Mont. 59101

Filed Oct. 2, 1989, Ser. No. 415,600

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 P 3 Claims



1. A disposable pacemaker apparatus for transmitting electrical pulses to a heart, the pacemaker apparatus comprising:

a battery source for providing electrical power;

an electrical pulse transmitting means, connected to and powered by the battery, for transmitting a train of electrical pulses;

a selection means for selecting a pulse rate for the train of pulses within the range of approximately 60 to 120 pulses per minute;

an electrode insertion unit including:

a first member;

a second member having a bottom side and a top side;

a hinge means for hingedly connecting the first member to the second member;

resilient means for resiliently maintaining the first and second members in a predetermined position with respect to the hinge means;

a pair of barbless hooks attached to the bottom side of the second member and protruding in the same direction therefrom said first member attached to the second member for attaching the second member to the heart by pressing the hooks against the heart and drawing the hooks into and far across the heart;

a gripping tab extending outwardly from the top side of the second member for manipulating the hooks; and an electrically conductive lead having a first end and a second end, the first end being electrically connected to the pulse transmitting means and the second end being connected to the barbless hooks of the electrode insertion unit.

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5,050,601

## CARDIAC DEFIBRILLATOR ELECTRODE ARRANGEMENT

Joel Kupersmith, 40 River Hill Rd., Louisville, Ky. 40207, and Igor Singer, 5820 Orion Rd., Louisville, Ky. 40222

Filed May 29, 1990, Ser. No. 529,312

Int. Cl.[5] A61N *1/39*

U.S. Cl. 128—419 D 10 Claims

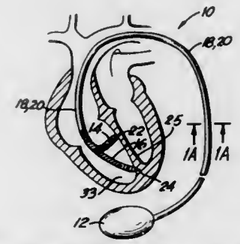
1. In an implantable cardiac defibrillator having an implantable pulse generator, a case connected to a first pole of said implantable pulse generator and having within the case means for delivering a predetermined defibrillating pulse of energy in response to a predetermined sensor signal indicating fibrillation, the improvement comprising:

first and second catheters,

first and second defibrillating electrodes, said defibrillating electrodes being carried on the distal portions of respective ones of said first and second catheters and connected by lead wires through said catheters to a second pole of said pulse generator,

each of said catheters being sufficiently pliable and having diameters sufficiently small to permit perveneously placing said catheters through the tricuspid valve into the right ventricle of a patient's heart,

each of said catheters containing extractable fixing means at the distal ends thereof to permit affixing the distal ends of



each of said catheters in the wall of the septum at predetermined positions along the wall of the septum,

whereby defibrillation may be achieved with minimal energy.

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5,050,602

## DEVICE FOR CONNECTING IMPLANTED LEADS WITH CARDIAC PACEMAKERS

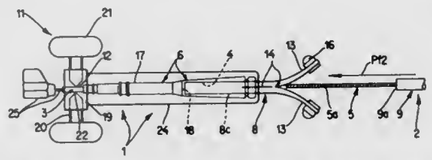
Peter Osypka, Basler Strasse 109, D-7889 Grenzach-Wyhlen, Fed. Rep. of Germany

Filed Mar. 2, 1990, Ser. No. 489,066

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 3906598

Int. Cl.[5] A61N *1/372*

U.S. Cl. 128—419 P 35 Claims



1. A fitting for connecting a cardiac pacemaker with an implanted or implantable lead wherein a bare proximal end of a conductor extends from a proximal end of an insulating tube, comprising a deformable tubular conductive socket having a proximal end connectable with the pacemaker, a distal end and an axial passage for reception of proximal end of the conductor; an insulating sleeve having a proximal end coupled with the distal end of said socket and a distal end with a hole for the proximal end of the insulating tube; and means for facilitating introduction of the proximal end of the insulating tube into the distal end of said sleeve, comprising a substantially tubular guide disposed in said hole at the distal end of said sleeve, said guide having a first portion which is confined in and constitutes an internal liner for at least a portion of the distal end of said sleeve and a second portion extending form the distal end of said sleeve to facilitate extraction of the first portion from the sleeve upon completed introduction of the bare proximal end of the conductor into said socket and introduction of the proximal end of the tube into said first portion.



5,050,603

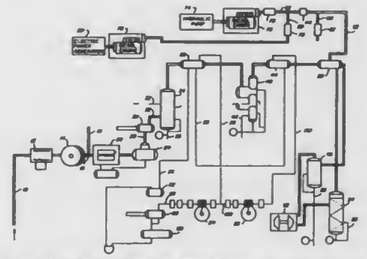
## MOBILE VAPOR RECOVERY AND VAPOR SCAVENGING UNIT

Charles A. Stokes, Naples, Fla., and Daniel E. Steppe, Houston, Tex., assignors to Public Service Marine, Inc., Irvine, Calif.

Filed Oct. 24, 1988, Ser. No. 261,760

Int. Cl.[5] F02M *17/16*

U.S. Cl. 123—523 6 Claims



1. A mobile anti-pollution apparatus, for the recovery of hydrocarbon emissions, comprising:

a) a mobile platform upon which is mounted

b) a vapor recovery unit for recovering vapors including light hydrocarbons, said vapor recovery unit having an inlet and an outlet end, said inlet end adapted for coupling to an external source of hydrocarbon vapor emissions to recover a portion of the vapors including light hydrocarbons emitted therefrom, and said outlet end adapted for connection to a means for conveying unrecovered vapors to

c) a vapor scavenging unit, said vapor scavenging unit comprising an internal combustion engine adapted for utilizing light hydrocarbons in the unrecovered vapors exiting from said vapor recovery unit as supplemental fuel.

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5,050,604

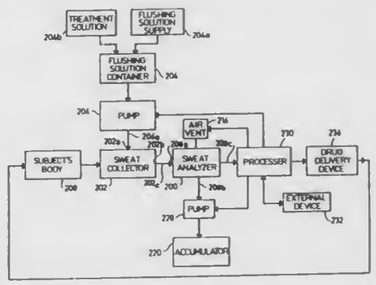
## APPARATUS AND METHOD FOR MONITORING THE HEALTH CONDITION OF A SUBJECT

Israel Reshef, Hameri Street 38, 53330 Givatayim, and Mordechai Erez, Sharsheret 19, 69697 Tel Aviv, both of Israel

Filed Oct. 16, 1989, Ser. No. 421,890

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—632 14 Claims



1. Apparatus for monitoring the health condition of a subject, comprising:

a sweat collector unit having an inlet and an outlet;

a sweat analyzer unit having a liquid inlet and an electrical-signal outlet for outletting electrical signals corresponding to the analysis of the sweat therein;

a container for containing a flushing solution;

first conduit means connecting said container to the inlet of said sweat collector unit, and second conduit means for

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connecting the outlet of said sweat collector unit to the liquid inlet of said sweat analyzer unit, for introducing a flushing solution from said container into the sweat collector unit, and for flushing the sweat collected therein to said sweat analyzer unit;

body attaching means for attaching said sweat collector unit and said sweat analyzer unit to the body of the subject for continuously collecting and analyzing the subject's sweat;

and processor means for processing the electrical signals outletted by the sweat analyser unit, for controlling said first conduit means in response thereto, and for providing a continuous indication of the health condition of the subject.

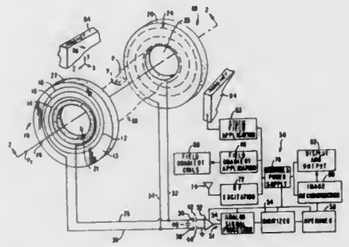
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**5,050,605**

## MAGNETIC RESONANCE IMAGING ANTENNAS WITH SPIRAL COILS AND IMAGING METHODS EMPLOYING THE SAME

**Gregory Eydelman, West Hempstead; Anthony Glambalvo, Kings Park, and Raymond V. Damadian, Woodbury, all of N.Y., assignors to Fonar Corporation, Melville, N.Y.**

**Filed Apr. 12, 1989, Ser. No. 337,041**
**Int. Cl.[5] A61B *5/055***
**U.S. Cl. 128—653 OSC** **26 Claims**



1. A method of magnetic resonance imaging comprising the steps of:

(a) providing an antenna including a first spiral coil having an axis, having radial directions orthogonal to said axis and including a plurality of turns of progressively varying radial extent, an innermost one of said turns defining an aperture surrounding said axis;

(b) juxtaposing said first spiral coil with the body of a subject so that a part of the body extends through said aperture, and the turns of said first spiral coil encircle said part of said subject's body whereby the turns of said first spiral coil having progressively larger radial extent are disposed at progressively greater distances from the surface of the encircled body part;

(c) extending nuclear magnetic resonance in the body of said subject;

(d) receiving magnetic resonance signals from said subject by means of said antenna; and,

(e) reconstructing an image of at least a portion of said body part of said subject from said received resonance signals.

**5,050,606**

## METHOD FOR MEASURING PRESSURE WITHIN A PATIENT'S CORONARY ARTERY

**William A. Tremulis, Redwood City, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.**

**Division of Ser. No. 401,031, Aug. 31, 1989, which is a continuation-in-part of Ser. No. 350,500, May 11, 1989, Pat. No. 4,953,553, which is a continuation-in-part of Ser. No. 103,109, Sep. 30, 1987, abandoned. This application May 25, 1990, Ser. No. 528,860**
**Int. Cl.[5] A61B *5/00***
**U.S. Cl. 128—637** **1 Claim**



1. A method for measuring pressure within a patient's coronary arteries, comprising:

a) introducing a guiding catheter with a preformed distal tip into a patient's cardiovascular system and advancing the guiding catheter therein until the distal tip thereof is disposed within the ostium of one of the patient's coronary arteries;

b) providing a guiding member having

an elongated main tubular member with an inner lumen which extends therethrough to ar opening at the distal end thereof;

a tubular extension secured by the proximal end thereof to the distal end of the main tubular member and having a wall defining an inner lumen with at least one pressure monitoring port therein which connects in fluid communication the inner lumen of the main tubular member with the ambient through the inner lumen of the tubular extension;

a core member which is secured by the proximal end thereof within the inner lumen of the main tubular member and which extends through and out the distal end of the tubular extension, the transverse cross-sectional area of the core member disposed within the inner lumen of the main tubular member being substantially less than the transverse cross-sectional area of the inner lumen thereof;

a flexible body disposed about and secured to the portion of the core member extending out the distal end of the tubular extension;

c) advancing the guiding member through the guiding catheter until the portion of the tubular extension which has the at least one pressure monitoring port is disposed within a desired location;

d) filling the guiding member with fluid; and

e) monitoring the pressure of said fluid from the proximal end of the tubular member.

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**5,050,607**

## HIGH RESOLUTION MAGNETIC RESONANCE IMAGING OF BODY CAVITIES

**William G. Bradley, Pasadena, and Lawrence W. Jones, San Marino, both of Calif., assignors to Huntington Medical Research Institutes, Pasadena, Calif.**

**Continuation of Ser. No. 21,758, Mar. 4, 1987, abandoned. This application Sep. 1, 1989, Ser. No. 403,918**
**Int. Cl.[5] A61B *5/055***
**U.S. Cl. 128—653 A** **29 Claims**

1. An MR imaging system which includes:

a magnet for producing a magnetic field to which a patient is subjected,

an RF transmitter coupled to a body coil within the magnet,

an RF receiver wherein RF signals generated by the RF transmitter are sent from the RF transmitter and detected by the RF receiver,

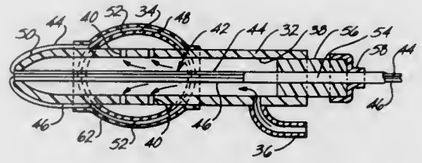
a surface coil apparatus for use in producing high resolution MR images of tissue within a body cavity of the patient, the surface coil apparatus comprising:

(a) support means adapted for insertion into and withdrawal from said body cavity;

(b) a flexible antenna wire mounted on the support means and having a normal position in which portions of the antenna wire are spaced apart from one another;

(c) means mounted on the support means for expanding said portions of the antenna wire apart from one another to an expanded position wherein said portions of the antenna wire are held in their expanded spaced apart





relation so that the expanded position of the antenna wire can be used for detection of RF signals generated by said transmitter to produce an image of body tissues located adjacent the antenna wire; and

(d) means for contracting said portions of the antenna wire to the normal position for use in withdrawing the supporting means and the antenna wire thereon from the body cavity;

the RF receiver being coupled to the antenna wire for detecting RF signals induced in the antenna wire; and

processing means coupled to the RF receiver for converting the detected signals induced in the antenna wire into an MR image display of the body tissues located adjacent the antenna wire of the surface coil apparatus.

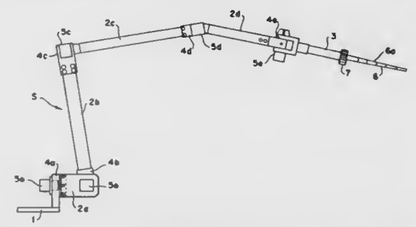
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**5,050,608**

## SYSTEM FOR INDICATING A POSITION TO BE OPERATED IN A PATIENT'S BODY

**Eiju Watanabe, Tokyo; Shinya Manaka, Kanagawa, and Yukio Kosugi, Tokyo, all of Japan, assignors to Medirand, Inc., Tokyo, Japan**

**Continuation of Ser. No. 217,836, Jul. 12, 1988, abandoned. This application Sep. 4, 1990, Ser. No. 577,068**
**Int. Cl.[5] A61B *19/00***
**U.S. Cl. 128—653 R** **9 Claims**



1. A system for indicating a position in a patient's body where an operation is to be performed, comprising:

an articulated arm including a base and a plurality of arms, one of said plurality of arms being a foremost arm; said plurality of arms and base being connected to each other by a joint whereby said plurality of arms are adapted to move and are connected by joints;

a pointer having a tip connected to the end of the foremost arm for pointing at surgical positions;

angular displacement sensing means provided at each of the joints, for producing angular signals representing an angular displacement of an adjacent arm;

a cathode-ray tube display for displaying a plurality of tomographic images of a patient's body combined with coordinates associated with the tomographic images;

calculator means for responding to the angular signals and for producing arm position signals representing the position of the pointer, with respect to arm-base coordinates;

coordinate conversion means for converting the arm position signals, based on the arm-base coordinates, to tomographic position signals corresponding to the tomographic images on the cathode-ray tube display with respect to CT coordinates;

means, responsive to the tomographic position signals, and the position of said tip for producing a mark video signal;

display means responsive to said mark video signal for displaying the position of the tip of the pointer on the cathode-ray tube display as a mark superimposing on the tomographic images developed on the cathode-ray tube display.

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**5,050,609**

## MAGNETIZATION TRANSFER CONTRAST AND PROTON RELAXATION AND USE THEREOF IN MAGNETIC RESONANCE IMAGING

**Robert S. Balaban, Bethesda, Md., and Steven D. Wolff, Durham, N.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.**

**Continuation-in-part of Ser. No. 109,242, Oct. 4, 1988, abandoned. This application Apr. 14, 1989, Ser. No. 337,980**
**Int. Cl.[5] A61B *5/05***
**U.S. Cl. 128—653 CA** **30 Claims**



1. A method for obtaining spatial information about the rate of exchange of a reaction using the technique of saturation transfer by collecting NMR data from a sample in which the reaction occurs comprising:

irradiating a first pool of nuclei with sufficient electromagnetic radiation to magnetically label said nuclei;

electromagnetically exciting a second pool of nuclei that is in exchange with said first pool;

applying magnetic field gradients to spatially resolve the NMR signal intensity of said second pool of nuclei;

collecting and reading NMR data obtained from said signal; and

determining said spatial information about said reaction.

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**5,050,610**

## TRANSESOPHAGEAL ULTRASONIC SCANHEAD

**Frank B. Oaks, Kent; Perry W. Kaminski, Seattle, and Eugene A. Larson, Bellevue, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.**

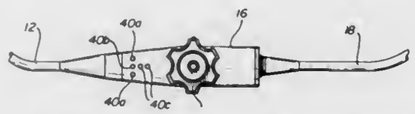
**Filed Nov. 14, 1990, Ser. No. 613,338**
**Int. Cl.[5] A61B *8/00***
**U.S. Cl. 128—660.01** **11 Claims**

1. An ultrasonic diagnostic system, including a scanhead for providing ultrasonic diagnostic information from the interior of a body comprising:

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probe means for insertion into the body, including transducer means having first and second modes of operation for ultrasonic scanning;
means adapted to be located external to the body during use of the scanhead for manipulating said probe means;
means for connecting said scanhead to instrument means;
switch means, located on said manipulating means, for producing a selection signal; and




means, responsive to said selection signal, for controlling the selection of one of said ultrasonic scanning modes of operation; and
said system further includes instrument means adapted for coupling with said scanhead connecting means, and responsive to signals by said transducer means for producing a diagnostic image in one or more predetermined image formats, and said instrument means is further responsive to said selection signal for producing a display indicative of said selected mode of operation.

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**5,050,611**

## ULTRASONIC IMAGING APPARATUS

**Kinya Takamizawa, Utsunomiya; Makoto Hirama, and Hironobu Hongo, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Oct. 4, 1989, Ser. No. 417,023**
**Claims priority, application Japan, Oct. 5, 1988, 63-251251**
**Int. Cl.[5] A61B** *8/06*
**U.S. Cl. 128—661.09** **17 Claims**




1. An ultrasonic imaging apparatus comprising:
means for selecting a B-mode for obtaining a tomographic image and a D-mode for obtaining Doppler data;
ultrasonic transducer means, constituted by at least one ultrasonic transducer element, for outputting an ultrasonic beam and converting an echo wave of the ultrasonic beam to a B-mode echo signal corresponding to the B-mode or a D-mode echo signal corresponding to the D-mode;
transmitting means, connected to said ultrasonic transducer means, for supplying a drive pulse to the transducer element, to generate the ultrasonic beam;
receiving means, connected to said ultrasonic transducer means, including gain control means for controlling the gain of at least one of the B-mode and D-mode echo signals output from said transducer means so as to equalize the level of the B-mode echo signal to that of the D-mode echo signal and outputting a gain-controlled echo signal, and conversion means for converting the gain-controlled echo signal to a received signal;
B-mode processing means, connected to said receiving means, for producing a B-mode image signal from said received signal;
D-mode processing means, connected to said receiving means, for producing Doppler data from said received signal; and
display means, connected to said B-mode processor means and said D-mode processor means, for displaying the B-mode image signal and the Doppler data.

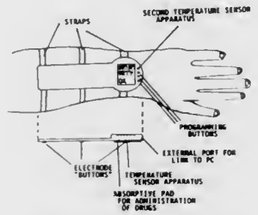
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**5,050,612**

## DEVICE FOR COMPUTER-ASSISTED MONITORING OF THE BODY

**Kenneth N. Matsumura, 2107 Dwight Way, Berkeley, Calif. 94704**

**Filed Sep. 12, 1989, Ser. No. 406,148**
**Int. Cl.[5] A61B** *5/02*
**U.S. Cl. 128—670** **5 Claims**




1. Device comprising: an analogy temperature sensing means including a temperature sensor and means to generate an analog electric signal representative of the sensed temperature; an analog to digital converter to convert the analog signal from said sensing means to a digital signal; a microprocessor means connected to said converter to record and microprocess said electric signal; insulating material surrounding said temperature sensor to insulate said sensor from heat generated from said microprocessor means; a small battery powering said sensing means, said converter, and said microprocessor means; a switch means for intermittently turning on and off certain power drawing circuits; a switch means for turning on and off power drawing circuits; an externally controllable switch to enable said switch means from the outside of said device; said device hermetically sealed inside a durable, light-weight, biocompatible rotund housing; means to promote retention of the device within a vagina; means to facilitate intravaginal insertion and removal.

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**5,050,613**

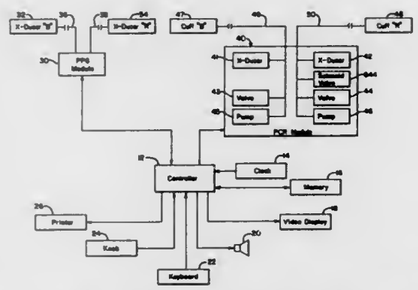
## METHOD AND APPARATUS FOR VASCULAR TESTING

**Dennis Newman, Golden; Gary G. Steffenson, Arvada; Angela G. Willenbring, Westminster; David C. Jones, Arvada; George E. Self, Boulder; Scott N. Wing, Westminster, and Alan R. Schmitz, Lafayette, all of Colo., assignors to Imex Corporation, Golden, Colo.**

**Filed Sep. 15, 1989, Ser. No. 408,060**
**Int. Cl.[5] A61B** *5/02*
**U.S. Cl. 128—670** **43 Claims**

1. Vascular testing apparatus for determining the vascular condition of a patient, comprising:
capillary blood flow detection means for detecting changes in the capillary blood flow of the patient and for generating capillary blood flow signals indicative of changes in the capillary blood flow of the patient;
blood pressure detection means for detecting changes in the blood pressure of the patient and for generating blood pressure signals indicative of changes in the blood pressure of the patient;
error detection means connected to said capillary blood flow detection means and to said blood pressure detection means for detecting whether said capillary blood flow detection means and said blood pressure detection means are functioning properly and that said capillary blood flow detection means and said blood pressure detection means are properly connected to the patient;
display means having a scale for selectively displaying the capillary blood flow signals and the blood pressure signals;






memory means for storing the capillary blood flow signals and the blood pressure signals;
reproducing means for reproducing the capillary blood flow signals and the blood pressure signals in hard copy form; and,
control means connected to said error detection means, said display means, said memory means, and said reproducing means for controlling and coordinating the operation thereof.

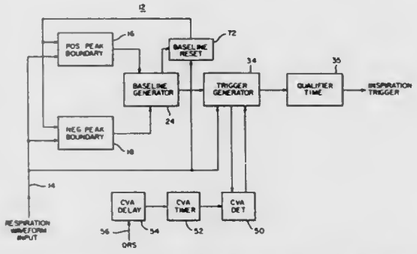
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**5,050,614**

## APPARATUS AND METHOD FOR INSPIRATION DETECTION

**Charles H. Logan, Woodinville, Wash., assignor to SpaceLabs, Inc., Redmond, Wash.**

**Filed Aug. 6, 1986, Ser. No. 893,835**
**Int. Cl.[5] A61B** *5/08*
**U.S. Cl. 128—716** **26 Claims**




1. An apparatus for detecting inspiration of a patient in response to a time varying signal representative of the patient's respiration comprising:
means for establishing a baseline level for said respiration signal which falls between the peak to peak variations of said respiration signal;
means for establishing a trigger level for said respiration signal representative of inspiration;
means for generating inspiration trigger signals in response to selected crossovers of said trigger level by said respiration signal;
means for automatically detecting shifts in the baseline level of said respiration signal; and
means responsive to said baseline shift detection means for re-establishing said baseline and trigger levels.

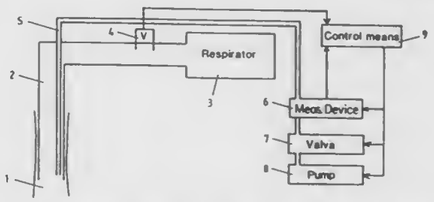
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**5,050,615**

## METHOD FOR THE DETERMINATION OF A GAS COMPONENT CONTENT IN THE RESPIRATORY GAS OF A PATIENT

**Lauri Malkamäki, Vantaa, Finland, assignor to Instrumentarium Corp., Finland**

**Filed Aug. 29, 1989, Ser. No. 400,076**
**Claims priority, application Finland, Sep. 2, 1988, 884048**
**Int. Cl.[5] A61B** *5/08*
**U.S. Cl. 128—719** **18 Claims**




1. A method for determining the content of one or more gaseous components in the gas exhaled by a patient in the course of respiration, the respiration occurring in cycles, said method comprising the steps of:
withdrawing a sample of the respiratory gas exhaled by a patient during a respiratory cycle of the patient, the withdrawal occurring at a sampling location;
moving the withdrawn sample incrementally away from the sampling location toward an analysis location;
repeating the withdrawing and moving steps, whereby the moving step becomes one of simultaneously, incrementally moving a plurality of successively withdrawn, respiratory gas samples in seriatim toward the analysis location; and
determining the gaseous component content of the gas exhaled by the patient from the respiratory gas samples at the analysis location.

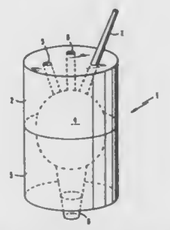
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**5,050,616**

## UNIVERSAL COLLECTOR FOR SUBMANDIBULAR-SUBLINGUAL SALIVA

**Andy Wolff, Raanana, Israel, and Ronald L. Davis, Fort Washington, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.**

**Filed Mar. 14, 1990, Ser. No. 493,538**
**Int. Cl.[5] A61B** *5/00*
**U.S. Cl. 128—760** **19 Claims**



1. A fluid sampling device comprising a chamber means having first and second opposed surfaces, said chamber means defining an interior space having inclined wall surfaces, two through-holes located in said first surface of said chamber means, wherein one of said through-holes is adapted to receive

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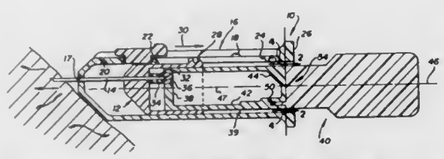
a sampling tube, a tube connecting means located on said first surface of said chamber means, and being in fluid communication with said interior space and a storage tube receiving means located on said second surface of said chamber means being in fluid communication with said interior space, said first surface comprising a substantially spherical surface.

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**5,050,617**
**REMOVABLE HANDLE AND MEANS FOR ATTACHMENT TO A SYRINGE OR PHLEBOTOMY DEVICE**

**Richard L. Columbus, Rochester, and Johannes J. Porte, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Feb. 20, 1990, Ser. No. 481,839**
**Int. Cl.[5] A61B** *5/00*
**U.S. Cl. 128—763** **4 Claims**



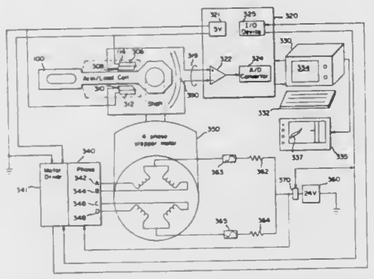
1. A phlebotomy device comprising a blood collection container having at least one liquid-confining compartment, two opposite ends and a longitudinal axis extending between said ends, one of said ends being a liquid access end constructed to mate with a needle to draw blood into said compartment, and a removable handle on said other end, said handle and said other end including attaching means for removably attaching said handle to said other end by rotation of said handle, said attaching means comprising, as part of said handle or said other end, a mating pin and aperture extending parallel to and displaced from said axis, and latching means for preventing said pin from sliding out of said aperture when said latching means are engaged so that said handle pivots away from said axis when it is unlocked.

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**5,050,618**
**METHOD AND APPARATUS FOR MEASUREMENT OF JOINT STIFFNESS**

**Lawrence E. Larsen, 308 Hamilton Ave., Silver Spring, Md. 20901**

**Filed Apr. 17, 1990, Ser. No. 510,201**
**Int. Cl.[5] A61B** *5/103*
**U.S. Cl. 128—774** **12 Claims**



1. Apparatus for measuring the elastic component of resistance to angular displacement of a body joint between body members, comprising

(a) means for incremental angular rotation of the joint, including

(1) an elongated linkage having one end arranged concentric with the axis of the joint and a second end adapted for connection with one of said body members;

(2) drive means connected with said linkage one end for transmitting incremental angular rotation thereto; and

(3) means connected with said drive means for controlling the operation thereof;

(b) means connected with said rotation means for measuring the static strain of said linkage in selected incremental rotational positions throughout the range of angular displacement of the joint, thereby to produce a strain signal as a function of angular position; and

(c) processing means connected with said measuring means for calculating the slope of said strain signal to determine the elastic component of resistance of the joint as a measure of joint stiffness.

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**5,050,619**
**CONTRACEPTIVE DEVICE**

**Andrew R. B. Ferguson, 11 Harcourt Close, Henley-on-Thames, Oxon, RG9 1UZ, England**

**PCT No. PCT/GB89/00423, § 371 Date Dec. 22, 1989, § 102(e) Date Dec. 22, 1989, PCT Pub. No. WO89/10105, PCT Pub. Date Nov. 2, 1989**
**PCT Filed Apr. 20, 1989, Ser. No. 457,698**
**Claims priority, application United Kingdom, Apr. 20, 1988, 8809337**
**Int. Cl.[5] A61F** *13/00*
**U.S. Cl. 128—844** **4 Claims**



1. A male contraceptive device comprising an inner sheath and an outer sheath within which the inner sheath fits, the sheaths being generally cylindrical in shape and substantially self-supporting, the outer sheath being closed at one end and open at the other end, and the inner sheath being open at the end corresponding to the open end of the outer sheath, the sides of the inner sheath and the other end of the inner sheath being closed except for at least one aperture formed in the region of said other end, at least one of the outer surface of the inner sheath and the inner surface of the outer sheath having at least one of ripples and corrugations such that a gap is defined between the sheaths and air is allowed to pass to and from the inside of the inner sheath via said at least one aperture and said gap.

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**5,050,620**
**ANKLE BRACE**

**Ronald L. Cooper, 16305 W. 141st St., Olathe, Kans. 66062**

**Filed Jun. 7, 1990, Ser. No. 534,462**
**Int. Cl.[5] A61H** *5/00*
**U.S. Cl. 128—80 H** **9 Claims**

1. An ankle brace for protecting a human ankle comprising:

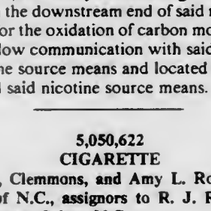
an underliner made of stretchable material for receiving and fitting over a wearer's foot and presenting a sole portion at the bottom thereof;

a lateral strap of flexible relatively inelastic material secured to the sole portion of the underliner and presenting a remote end including means for releasable attachment to said underliner;

a medial strap of flexible relatively inelastic material secured to the sole portion of the underliner and presenting a remote end having means for releasable attachment to said underliner;

means located on said underliner relatively proximate the medial side of the ankle for releasably receiving said medial strap in tension thereon; and

means located on said underliner relatively proximate the lateral size of the ankle for releasably receiving said lateral strap in tension thereon,



said lateral strap and said medial strap each being secured to said underliner at a common location along the bottom of the sole portion of the underliner for conforming said underliner to the foot and for selectively and alternately positioning and maintaining said foot at a neutral, inverted or everted position.

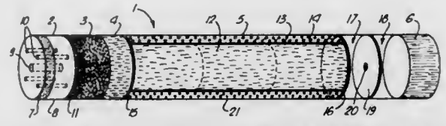
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**5,050,621**
**SMOKING ARTICLES**

**David E. Creighton, Asburst, and Colin C. Grieg, Salisbury, both of England, assignors to British-American Tobacco Company Limited, London, England**

**Filed Jul. 17, 1989, Ser. No. 380,385**
**Claims priority, application United Kingdom, Aug. 12, 1988, 8819291**
**Int. Cl.[5] A24D** *1/00, 1/18, 3/06*
**U.S. Cl. 131—331** **21 Claims**



1. A smoking article, which comprises; a heating unit; aerosol generation means having a first end and a second end, said first end being in flow communication with said heating unit; nicotine source means having a first end and a second end, the first end of the nicotine source means being in flow communication with said heating unit; a mixing space in flow communication with said second end of the aerosol generation means and in flow communication with the second end of said nicotine source means; a velocity accelerating orifice in flow communication with the downstream end of said mixing space; and a catalytic unit for the oxidation of carbon monoxide to carbon dioxide, in gas flow communication with said heating unit and with said nicotine source means and located intermediate said heating unit and said nicotine source means.

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**5,050,622**
**CIGARETTE**

**Mark L. Raker, Clemmons, and Amy L. Robinson, Winston-Salem, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.**

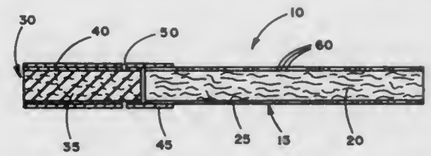
**Filed Aug. 22, 1991, Ser. No. 570,770**
**Int. Cl.[5] A24D** *1/02*
**U.S. Cl. 131—365** **15 Claims**

1. A cigarette comprising:

(a) a rod of smokable material contained in a circumscribing paper wrapping material thereby forming a smokable rod; the wrapping material (i) having a cellulosic base web containing inorganic filler including magnesium hydroxide, (ii) having a basis weight of greater than about 40 g/m$^2$, (iii) organic acid in a disassociated and/or non-disassociated form which has been incorporated into the paper in non-disassociated form, and (iv) including water soluble alkali metal salt in an amount greater than about 30 mg alkali metal ions per gram of dry base web, the alkali metal salt including potassium malate;

(b) a filter element positioned adjacent one end of tobacco rod; and

(c) tipping material circumscribing the filter element and an adjacent region of the tobacco rod.

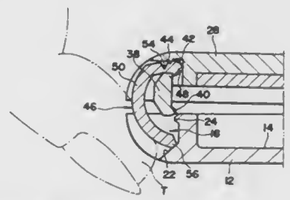


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**5,050,623**
**VANITY CASE**

**Yukitomo Yuhara, Abiko, and Yoshiharu Hatakeyama, Tokyo, both of Japan, assignors to Yoshida Industry Co., Ltd., Tokyo, Japan**

**Filed Jan. 12, 1988, Ser. No. 143,055**
**Claims priority, application Japan, Jan. 21, 1987, 62-5976[U]; Apr. 24, 1987, 62-61439[U]; Aug. 24, 1987, 62-127402[U]; Sep. 10, 1987, 62-137470[U]; Sep. 11, 1987, 62-138314[U]**
**Int. Cl.[5] A45D** *42/02*
**U.S. Cl. 132—301** **21 Claims**



1. A vanity case comprising:

a receptacle member;

a cover member hinged with said receptacle member at rear ends thereof;

latch means formed on front ends of said receptacle member and said cover member for maintaining said cover member in a closed position with respect to said receptacle member;

a recess formed in a marginal portion of said receptacle member, said recess fully opening in upward and outward directions and partially opening in a downward direction and being defined by an inner wall and by side walls, said inner wall comprising an upper vertical surface and a lower slant surface inclined downwardly and forwardly toward a lower edge thereof; and

unlatching means for releasing engagement of said latch means, said unlatching means including an upper end and a body having a lower end, said upper end being connected to said cover member at a position directly above said recess and inwardly offset from a peripheral edge of said cover member to permit said body to swing about said upper end, said body extending downwardly to close said recess with said lower end abutting said lower slant surface when said cover member is in said closed position, said body and marginal portions of said cover and receptacle members having equal curvatures such that the outer surface of said body is flush with outer surfaces of said

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marginal portions of said cover and receptacle members when said cover member is in said closed position;

whereby an inwardly directed pressure applied to said body causes said cover member to move upwardly with respect to said receptacle member.

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5,050,624

## DISPOSABLE EYE MAKEUP SHIELD

Vivian Kobe, and Brian Kobe, both of 6933 SW. 110th Ave., Miami, Fla. 33173

Filed Jan. 2, 1991, Ser. No. 636,698
Int. Cl.[5] A45D *40/30*
U.S. Cl. 132—319 13 Claims



1. A disposable eye makeup shield for use during the application of makeup to areas surrounding the eye to protect a lower eyelid and surrounding facial area from makeup falling thereon as well as to maintain a surrounding makeup application area in a clean, sanitary condition, the eye makeup shield comprising:

a substantially rigid, yet flexible interior body having a curved construction and including an outer convex side and an inner concave side, said interior body being structured and disposed so as to form a frame structure defining an overall general configuration of the makeup shield,

said interior body further including a lower portion and an upper portion, said upper portion including outwardly extending, oppositely disposed wings with a top edge extending therealong and connecting therebetween, said top edge being structured and configured so as to conform with the outer configuration of a user's lower eyelid,

an outer layer of porous, substantially absorbent material adhered to said outer convex side in substantially covering relation thereto, said outer layer being adapted to catch and absorb excess makeup falling thereon during application by the user, and

an inner layer of soft, substantially absorbent material adhered to said inner concave side of said interior body in substantially covering relation thereto.

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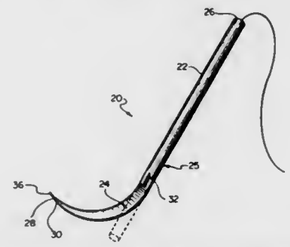
5,050,625

## DENTAL FLOSS THREADING DEVICE

John D. Siekmann, Waukegan, Ill., assignor to Plastisonics, Inc., Chicago, Ill.

Filed Oct. 16, 1990, Ser. No. 598,534
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—323 12 Claims

1. A threading device for inserting dental floss between dental structures for cleaning therebetween, said device comprising: an elongated tube into which a charge of floss of a predetermined length is loaded, said tube including an integrally formed handle portion and a reduced diameter portion; said handle portion being dimensioned for containing said charge of floss, a fill aperture formed in said handle portion for receiving said floss therethrough; said reduced diameter portion integrally formed on an end of said handle portion distal said fill aperture for insertion between dental structures; a threading tip formed on an end of said reduced diameter portion distal said handle portion having a tip aperture formed in



an end thereof through which a lead portion of said charge of floss projects.

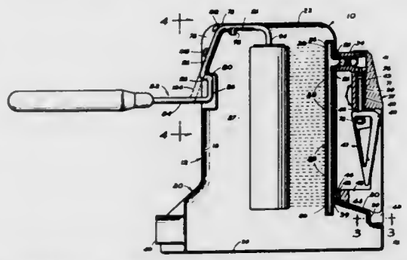
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5,050,626

## APPARATUS FOR CLEANING PAINT ROLLERS

John W. Brockage, 4008 Rhoda Ave., Oakland, Calif. 94602, and Donald J. Brockhage, 1137 Park Brook Cir., Milpitas, Calif. 95035

Continuation-in-part of Ser. No. 371,562, Jun. 28, 1989, abandoned. This application Jun. 27, 1990, Ser. No. 544,711
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—138 57 Claims



1. Apparatus for use in cleaning a roller of a paint roller assembly comprising:

a container having an opening for receiving the roller;

means on the container and adapted to be coupled with the paint roller assembly for mounting the roller of the assembly in the container for rotation about the central axis of the roller;

a manifold in the container and having a plurality of holes therethrough to permit water to be directed out of the manifold under pressure and onto a roller in the container; and

a handle carried by the container and coupled with the manifold, said container handle being mounted on the container for pivotal movement about a second axis, there being means defining a fluid passage communicating with the manifold and adapted to be coupled with a source of water under pressure.

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5,050,627

## UMBRELLA FRAME SYSTEM

Chuang-Lee Hengtzu, No. 58, Ten Hsin Li, Hsih Pu Chang Hsinchu Shien, Taiwan

Filed Dec. 29, 1989, Ser. No. 459,340
Int. Cl.[5] A45B *25/12*
U.S. Cl. 135—23 1 Claim

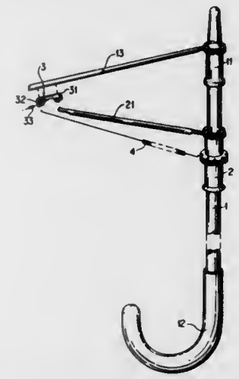
1. Am umbrella frame system for an umbrella having a one-piece molded shaft extending in a longitudinal direction and a notch member fixedly secured to an upper end of said shaft, said umbrella frame system including a runner member slideably received on said shaft responsive to opening and closing of the umbrella, comprising:

(a) a plurality of elastic cross-sectional U-shaped main rib members, each of said main rib members being pivotally coupled to said notch member on a first end of each of said main rib members;

(b) a plurality of elongated stretcher members, each of said stretcher members pivotally coupled to said runner member on a first end of each of said stretcher members;

(c) a plurality of inverted U-shaped joint members secured to a second end of each of said main rib members and a





second end of each of said stretcher members, said stretcher members being pivotally connected to said joint member; and,

(d) a plurality of coiled spring members coupled on opposing ends between said joint members and said runner member, whereby said coiled spring members are tensioned when said umbrella is opened and are released of tensioning forces when said umbrella is closed, said inverted U-shaped joint members being coupled to respective stretcher and coiled spring members on opposing ends thereof distributing the force load on respective main rib members.

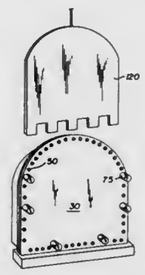
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5,050,628

## TANK ENTRY PROCEDURE AND APPARATUS

Ian Ripley, and Anthony H. Needham, both of Cleveland, Great Britain, assignors to Great Eastern (Bermuda) Ltd.

Filed Jan. 16, 1990, Ser. No. 464,859
Claims priority, application United Kingdom, Feb. 1, 1989, 8902117
Int. Cl.[5] F16K *43/00;* F16L *55/10*
U.S. Cl. 137—15 13 Claims



1. A method for gaining access to the interior of an enclosure, which enclosure has a passageway with one end of the passageway communicating with the interior of the enclosure and its other end communicating with the exterior of the enclosure, said other end terminating with a passageway flange surrounding at least a portion of the passageway having a cover plate secured to said flange forming a cover plate/flange assembly, which cover plate seals the passageway, characterized in the steps of:

a) separating the cover plate from the passageway flange and inserting a blanking plate between the cover plate and the passageway flange;

b) securing the blanking plate to the passageway flange;

c) removing the cover plate and permitting access to the interior of the enclosure;

d) juxtaposing an adapter member adjacent to the blanking plate, said adapter member having an adapter flange at one end thereof and at least one or more opening means to allow access to the interior of the enclosure at its other end;

e) securing the adapter member flange to the passageway flange; and

f) removing the blanking plate.

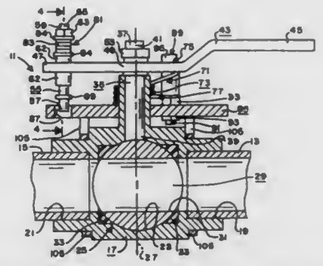
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5,050,629

## EARTHQUAKE SHUTOFF VALVE

Morris T. Willoughby, 4048 Cecil Dr., Memphis, Tenn. 38116

Filed Nov. 21, 1990, Ser. No. 616,345
Int. Cl.[5] F16K *17/36*
U.S. Cl. 137—38 8 Claims



1. A valve for controlling the passage of fluid between a first conduit and a second conduit, said valve comprising:

(a) a valve body having a first port for being coupled to said first conduit, having a second port for being coupled to said second conduit, and having a valve chamber joining said first and second ports;

(b) a valve gate mounted within said valve chamber of said valve body for movement between an opened position in which fluid is allowed to pass between said first and second ports through said valve chamber and a closed position in which fluid is prevented from passing between said first and second ports through said valve chamber; said valve body including a face plate having a cavity therein;

(c) a latch member having an extended position and a retracted position, said latch member having a first end and a second end;

(d) first urging means for urging a portion of said latch member against a portion of said valve body when said latch member is in said extended position and said valve gate is in said opened position to hold said latch member in said extended position and to hold said valve gate in said opened position, and for urging said valve gate to said closed position when said latch member is in said retracted position; said first end of said latch member extending into said cavity of said face plate when said latch member is in said extended position and being forced against a portion of the wall of said cavity by said first urging means when said latch member is in said extended position and said

valve gate is in said opened position to hold said latch member in said extended position and to hold said valve gate in said opened position;

(e) second urging means for urging said latch member to said retracted position when said valve is subjected to a predetermined amount of vibration; said second urging means being adjustable for varying the amount of vibration said valve must be subjected to before said second urging means will urge said latch member to said retracted position;

(f) a handle member coupled to said valve gate, said handle member being movable between a first position and a second position for moving said valve gate between said opened position and said closed position; said handle member including a first end, a second end, and a midportion; and

(g) a stem member having a first end attached to said midportion of said handle member and having a second end attached to said valve gate for coupling said handle member to said valve gate.

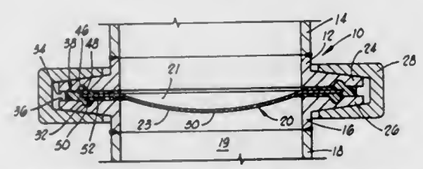
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**5,050,630**

## SELF-POSITIONING RUPTURE DISK ASSEMBLY

**Stephen Farwell, Owasso, and Arnold L. Mundt, Tulsa, both of Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.**

**Filed Dec. 3, 1990, Ser. No. 620,904**
**Int. Cl.[5] F16K *17/14***
**U.S. Cl. 137—68.1** **20 Claims**



1. A self-positioning rupture disk assembly comprising:

inlet and outlet rupture disk supporting members adapted for attachment in a fluid flow passageway;

means for clamping said supporting members together connected thereto;

a rupture disk adapted to be clamped between said supporting members for closing said flow passageway until a predetermined fluid pressure is exerted thereon, said rupture disk having an inlet side positioned adjacent said inlet supporting member and an outlet side-positioned adjacent said outlet supporting member;

a gasket member attached to a peripheral portion of said rupture disk for providing a seal between at least one side of said rupture disk and the adjacent supporting member and having a first protuberance thereon facing said adjacent supporting member; and

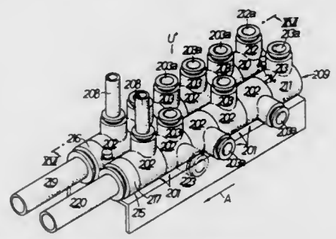
said adjacent supporting member having a recess therein for receiving said protuberance, said recess being of a size and position whereby when said rupture disk and gasket member are clamped between said supporting members with said protuberance positioned within said recess, said rupture disk is aligned between said supporting member with the inlet and outlet sides thereof positioned adjacent said inlet and outlet supporting members, respectively.

**5,050,631**

## FLUID DIVERGING SYSTEM

**Mitsuo Konno; Masaki Kawada; Mamoru Machida, and Hisashi Noro, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 397,550, Aug. 23, 1989, abandoned.**
**This application Jan. 9, 1991, Ser. No. 637,963**
**Int. Cl.[5] F16L *39/04***
**U.S. Cl. 137—270** **9 Claims**



1. A fluid diverging system comprising:

a plurality of fluid diverging blocks separably connected longitudinally in a row to one another and each having a horizontal cylindrical portion with a through-hole longitudinally passed therethrough and a communication passage communicating with said through-hole and capable of being connected to external fluid transfer means;

each cylindrical portion having an axis aligned with an axis of a horizontal cylindrical portion of another fluid diverging block in a connected state of said fluid diverging blocks;

means for closing a rear end of the through-hole of a rear end one of said fluid diverging blocks;

joint means mounted at least between the individual adjacent two of said plurality of the fluid diverging blocks to connect said fluid diverging blocks and to put the through-holes in said fluid diverging blocks into fluid-tight communication with one another; and

adjacent fluid diverging blocks are relatively rotatable about the axes of their horizontal cylindrical portions in an assembled state.

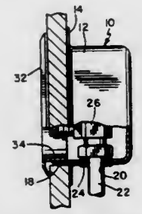
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**5,050,632**

## ANGLE STOP BOX

**Orville D. Means, Jr., 25570 Highway 79, San Ysabel, Calif. 92070**

**Filed Dec. 11, 1990, Ser. No. 625,849**
**Int. Cl.[5] F16L *5/00***
**U.S. Cl. 137—360** **13 Claims**



1. An angle stop box for the installation of cut off lines to plumbing fixtures, comprising:

a generally box-like housing having an open front and an outwardly extending flange for attachment to a wall stud;

an aperture through one wall of said housing;

a stub line extending through said aperture and secured in said wall by means of a grommet;



an angle stop valve mounted on one end of said stub line within said housing; and

an extension wall extending beyond said flange for extending through a wall panel, wherein said housing comprises an outer housing defining said outwardly extending flange, and an inner housing defining said extension wall.

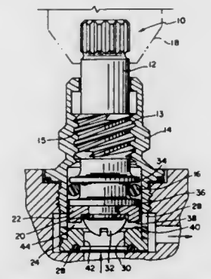
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**5,050,633**

## FLUID VALVE

**Matthew G. Tarnay, Pasadena, and Teodoro J. Gonzalez, Canyon Country, both of Calif., assignors to Emhart Inc., Newark, Del.**

**Continuation of Ser. No. 368,003, Jun. 19, 1989, abandoned.**
**This application Dec. 14, 1990, Ser. No. 629,047**
**Int. Cl.[5] F16K *1/02, 1/34***
**U.S. Cl. 137—454.5** **9 Claims**



1. A fluid valve for use with a faucet system for controlling the flow of water, comprising:

a bonnet having a first opening at one end thereof and a second opening at another end thereof with a communicating passageway therebetween along an axis of the bonnet;

the bonnet formed with a third opening which is in communication with the passageway;

a stem having a first end, a second end and a central body all integrally formed along an axis thereof;

the first end and the central body of the stem being located for movement within the first opening of the bonnet along the axis thereof and extending through at least a portion of the passageway and movable therein;

a valve seat formed from ceramic material and having an opening therethrough;

at least portions of the valve seat being removably located within the second opening of the bonnet and other portions of the valve seat extending outside of the bonnet adjacent the second opening thereof;

the opening of the valve seat being in communication with the passageway and the second opening of the bonnet to allow for the flow of water between the second and third openings of the bonnet and through the opening of the valve seat;

the valve seat being shaped in a disc-like configuration and having a flat polished surface located in a first flat plane perpendicular to the axis of the stem;

means formed on the bonnet for mounting the bonnet on a support body of the faucet system;

the bonnet being formed with structure to facilitate the capture of the valve seat between the bonnet and the support body upon assembly of the bonnet on the support body;

a sealing member formed from ceramic material and firmly secured to the first end of the stem and positioned to engage at least portions of the valve seat to cover and seal the opening of the valve seat and thereby prevent the flow of water between the second and third openings of the bonnet; and

the sealing member being shaped in a disc-like configuration and having a flat polished surface located in a movable flat plane perpendicular to the axis of the stem;

a faucet handle mounted on the second end of the stem externally of the bonnet for facilitating movement of the stem relative to the bonnet to move the flat polished surface of the sealing member into sealing engagement with the flat polished surface of the valve seat when the faucet is in assembly with the support body and to move the valve seat outwardly from the second opening of the bonnet and thereby move the valve seat from assembly with the bonnet when the faucet is not in assembly with the support body.

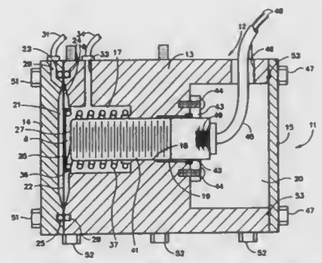
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**5,050,634**

## VERY LOW DIFFERENTIAL PRESSURE SWITCH

**Bradley T. Fiechtner, San Diego, Calif., assignor to Hasstech, Inc., San Diego, Calif.**

**Filed Dec. 28, 1990, Ser. No. 635,285**
**Int. Cl.[5] G05D *7/06***
**U.S. Cl. 137—486** **26 Claims**



1. A low pressure, low flow, very low differential pressure switch comprising:

a first cavity for receiving a first fluid pressure from a first fluid source;

a second cavity for receiving a second fluid pressure from a second fluid source;

a flexible diaphragm dividing said first and second cavities and being adapted to move in response to a very low pressure differential existing between said first cavity and said second cavity;

a sensor target located against and moving with said diaphragm within said second cavity;

a non-contacting proximity sensor having a sensor head spaced by a predetermined distance under no differential pressure condition from said target, said sensor being responsive to the relative position of said target and said sensor head produce an output signal indicative of a pressure differential condition existing between said first and second cavities and;

means for converting said output signal to ON/OFF switch signals.

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**5,050,635**

## RELIEF VALVE

**Hidetoshi Tetsuka, Saitama; Kiyoshi Hayashi, Tokyo, and Tsuyoshi Ando, Tochigi, all of Japan, assignors to Tokyo Keiko Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 274,296, Nov. 21, 1988, abandoned.**
**This application Dec. 11, 1989, Ser. No. 453,034**
**Claims priority, application Japan, Nov. 27, 1987, 62-180509; Apr. 28, 1988, 63-104040**
**Int. Cl.[5] F16K *31/38***
**U.S. Cl. 137—489** **6 Claims**

1. A relief valve comprising:

a main valve unit incorporating a main valve member adapted for engagement with a cylindrical member; and

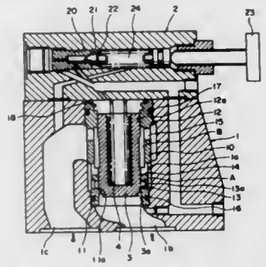
a pilot valve unit for controlling a pressure of a fluid; said

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cylindrical member is formed integrally with a seat portion formed with a seat opening adapted for engagement with said main valve member and a sleeve portion formed with a sliding surface associated with said main valve member,

said cylindrical member being further formed with a plurality of through holes on a downstream side of said seat portion said through holes forming a radially zig-zagged path for fluid flowing through said main valve member whereby abnormal sound is reduced or eliminated;



said main valve unit including an inlet port communicated by an internal pilot passage with a control chamber of said pilot valve unit through a choke formed in a seat member of said pilot valve unit;

said seat member being integrally formed with said choke in a single-body construction and including an expanded portion having an enclosed end and a plurality of through holes communicating said expanded portion with said internal pilot passage at said internal pilot passage side of said choke, said through holes being substantially perpendicular to said choke.

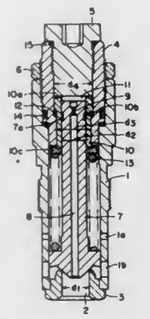
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**5,050,636**

**RELIEF VALVE**

**Toyoaki Sagawa, and Toshiyuki Yoshida, both of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan**

**Filed Oct. 17, 1990, Ser. No. 597,724**
**Int. Cl.[5] F16K *21/10***
**U.S. Cl. 137—494** **9 Claims**



1. A relief valve to be disposed in a hydraulic circuit, comprising:

a casing of substantially cylindrical structure having one and another ends;

a valve seat fitted into one end of said casing and provided with an inflow hole through which a pressurized fluid flows;

a plunger of substantially columnar shape disposed in said casing and having one flanged end slidably engaged with an inner surface of said one end of the casing, said plunger having a central through hole extending in an axial direction thereof in communication with said inflow hole of the valve seat;

a stepped piston member disposed in said casing and having an outwardly stepped one end slidable along an inner surface of the other end of said casing and an outer surface of another end of said plunger; and

a spring member disposed between the other end of said stepped piston member and the flanged one end of said plunger,

a fluid chamber being defined between another end of said casing and the one end of said stepped piston member, said casing being provided with an inwardly stepped portion and a damping chamber being defined between said stepped portions of said stepped piston member and said casing, said fluid chamber and said damping chamber being communicated with each other through a communication passage, said through hole of the plunger having a throttle portion having a predetermined length, and said other end of said stepped piston member having an outer diameter substantially equal to an inner diameter of said inflow hole of the valve seat.

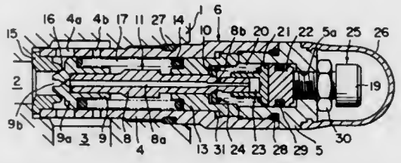
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**5,050,637**

**RELIEF VALVE**

**Toyoaki Sagawa, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan**

**Filed May 23, 1990, Ser. No. 527,733**
**Int. Cl.[5] F16K *17/04***
**U.S. Cl. 137—529** **4 Claims**



1. A relieve valve comprising:

a valve main body defining a communicating passage therethrough extending between a supply side and a relief side of the valve;

a moving body disposed within said valve main body so as to be axially movable therein over a predetermined distance between respective positions at which the moving body opens and closes said communicating passage;

a spring receiving member disposed between an outer periphery of said moving body and an inner periphery of said main body of the relief valve so as to be axially movable over a predetermined distance with said main body;

a main spring disposed between one end portion of said spring receiving member and one end of said moving body, said main spring urging said moving body toward one end of the relief valve and urging said spring receiving member toward the other end of the relief valve;

a fluid chamber defined at the other end portion of said moving spring receiving member;

said moving body defining a hole therethrough open to the supply side of the valve and to said fluid chamber such that a portion of hydraulic fluid acting on one end of said moving body at the supply side of the valve is flowable into said fluid chamber through said hole; and

an adjustment spring provided in said fluid chamber and urging said moving body in the axial direction of said main body for establishing the set pressure by compressing said main spring via said moving spring receiving member under the influence of hydraulic pressure generated in said fluid chamber, and adjustment means operable from the exterior of said main body of the relief valve for adjusting the urging force exerted by said adjustment spring.

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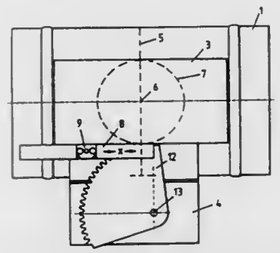


**5,050,638**

**DEVICE FOR CONTROLLING A VOLUMETRIC RATE OF FLOW IN A GUIDE TUBE**

**Adalbert Zeller; Hermann Kurrle, and Wolfgang Ruf, all of Kolbingen, Fed. Rep. of Germany, assignors to Schako Metallwarenfabrik, Kolbingen, Fed. Rep. of Germany**

**Filed May 29, 1990, Ser. No. 529,960**
**Claims priority, application Fed. Rep. of Germany, May 29, 1989, 3917360**
**Int. Cl.[5] F16K *37/00, 31/04***
**U.S. Cl. 137—553** **3 Claims**



1. In a ventilation system having a conduit for transporting air and an adjustable flap valve pivotably mounted about an axis within said conduit for controlling the volumetric rate of flow of air through said conduit, a device for pivoting said flap valve for adjusting the volumetric rate of flow of air through said conduit in response to a sensed condition comprises: adjusting means mounted on said conduit, control means mounted on said adjusting means, said control means includes motor means responsive to a sensed condition sensed by a remote sensing means for driving a first driven means, said adjusting means includes a second driven means associated with said flap valve for pivoting said flap valve about said axis and coupling means for coupling said first driven means to said second driven means such that said flap valve is adjusted upon said sensing means sensing a change in said sensed condition wherein said first driven means comprises a geared disk which is seated on a shaft of the motor means, said second driven means comprises a geared wheel and said coupling means comprises a geared member wherein said geared member is positioned between and engages said first driven means and said second driven means such that linear displacement of the geared member by said first driven means drives said second driven means for rotating said adjustable flap valve and provides position indication of said adjustable flap valve.

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**5,050,639**

**OVERFILL PROTECTING ARRANGEMENT FOR A LIQUID STORAGE TANK**

**Emil A. Sørensen, Schützenmatte 2 A, CH-6362 Stansstad, Switzerland**

**Filed Aug. 7, 1990, Ser. No. 563,708**
**Int. Cl.[5] B63B *25/08***
**U.S. Cl. 137—587** **6 Claims**

1. An overfill protecting arrangement for a liquid storage tank, comprising in combination

a venting valve

(1) having a valve opening at an elevation above the top level of the tank and

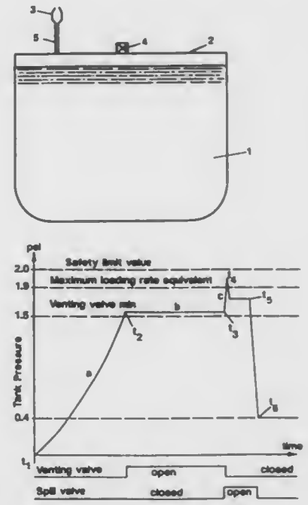
(2) having an opening pressure lower than a safety limit value and a closing pressure lower than said opening pressure, said venting valve

(3) being so dimensioned that the pressure drop caused by a flow of gas corresponding to a loading rate prescribed as maximum permissible, as expressed in volumetric quantity per time unit, is substantially lower than said safety limit value, said pressure drop being referred to in the following as the maximum loading rate equivalent, and

a spill valve

(4) having a valve opening at a level lower than that of the valve opening of the venting valve and

(5) having an opening pressure distinctly higher than said maximum loading rate equivalent, but lower than said safety limit value,




(6) and also lower than said maximum value plus the pressure drop caused by a flow of liquid at said loading rate from the top level of the tank to the level of the valve opening of the venting valve,

(7) and also lower than the hydrostatic pressure of a column of liquid of a height corresponding to the difference of levels between the valve opening of the venting valve and that of the spill valve,

(8) and being constructed for quick opening to a position in which the pressure drop caused by a flow of liquid corresponding to said loading rate is lower than the hydrostatic pressure as defined in point (7).

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**5,050,640**

**WATER SUPPLY INSTALLATION**

**George E. Cowley, 'Idlewild' Bradford Lane, Nether Alderley, Cheshire, England**

**Filed Mar. 2, 1990, Ser. No. 488,152**
**Int. Cl.[5] F16K *11/24***
**U.S. Cl. 137—606** **12 Claims**

1. An improved water-mixing installation which includes a body; a first conduit for supplying hot water to said body; a second conduit for supplying cold water to said body; an outlet flow path for said body; an outlet valve in said outlet flow path; wherein the improvement comprises:

a cut-off valve in said second conduit only; and

an operative connection connected between said cut-off valve and said outlet valve to close said cut-off valve upon closure of said outlet valve, said first conduit remaining in flow connection with said body;

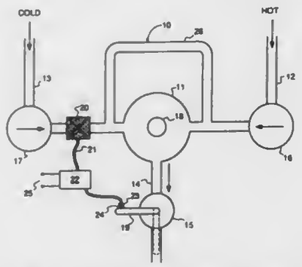
to prevent further flow of cold water to said body and to prevent mixing of cold water in said second conduit with

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water in said body, and to promote thermal transfer between hot water in said first conduit and water in said body;

wherein said cut-off valve is a solenoid valve and wherein




said operative connection includes a sensor adapted to sense that said outlet valve has been closed and control circuitry connecting said sensor and said solenoid valve, said solenoid valve being closed upon the activation of said circuitry by said sensor.

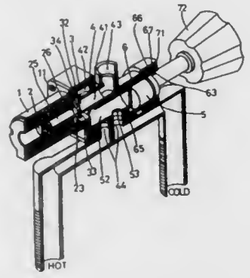
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**5,050,641**

**PHOTOELECTRIC SINGLE HANDLE FAUCET**

**Sheu Shwu-Fen, 9F, No. 572, Min Chuan East Road, Taipei, Taiwan**

**Filed May 8, 1990, Ser. No. 520,790**
**Int. Cl.[5] F16K *11/07, 31/40***
**U.S. Cl. 137—607** **2 Claims**




1. A photoelectric automatic sensing faucet, comprising:

a water inlet,

a compact water temperature regulating and water stopping solenoid,

a photoelectric sensing means for controlling said solenoid,

a piston rod actuated by said solenoid,

a piston rod fixing seat accommodating said piston rod, said piston rod fixing seat having a sound-muffling groove disposed at one end,

a constant pressure water stop element, having a replaceable coated metal fixer plate,

said fixer plate having a centrally disposed pressure release hole and a constant pressure hole disposed on a side,

a water output control valve seat,

a rotatable temperature regulating and water stop shaft having a water inlet temperature regulating hole, a hot/-cold water mixing chamber, and a water outlet opening,

a single handle controller attached to said temperature regulating and water stop shaft,

a shaft positioning and fixing key for limiting movement of said shaft,

a temperature regulating and water stop shaft fixing seat disposed circumferentially around said temperature regulating and water stop shaft, said seat arranged and constructed to adapt to changing temperature conditions, and

a pliable water inlet hole overflow check pad, said check pad arranged and constructed to prevent overflow, and to facilitate adjustment of said temperature regulating and water stop shaft,

whereby said temperature regulating and water stop shaft is displaceable automatically or manually, to control the temperature and flow of water.

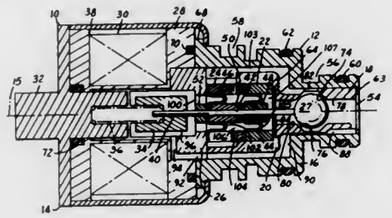
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**5,050,642**

**PRESSURE-COMPENSATED THREE-WAY SOLENOID VALVE**

**John S. Bright, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.**

**Filed Aug. 23, 1990, Ser. No. 571,798**
**Int. Cl.[5] F15B *13/044***
**U.S. Cl. 137—625.65** **16 Claims**



1. A three-way valve that is operated by a solenoid and comprises a valve body containing three ports, namely a source port adapted to be communicated to a source of pressure fluid, a control port adapted to be communicated to a load that is to be controlled, a drain port adapted to be communicated to a drain, and internal fluid passageway structure providing fluid communication between said ports, two valve seats each of which comprises a corresponding orifice and which are disposed in said passageway structure in coaxially-aligned, spaced-apart, face-to-face relation to axially constrain between themselves within a first portion of said passageway structure a valve element which can move back and forth between said seats to alternately open and close said orifices, said passageway structure comprising a second portion that communicates a first of said ports with said first passageway portion, a third portion that communicates a second of said ports with a first of said orifices, and a fourth portion that communicates a third of said ports with a second of said orifices, a mechanism including said solenoid that acts directly on said valve element along the co-axis of said seats to control the motion of said valve element, characterized in that the valve comprises pressure-compensating means for pressure-compensating the valve with respect to pressure differential between two particular ones of said three ports, said pressure-compensating means comprising internal pilot passage structure within said body, a diaphragm that has an outer perimeter sealed to a wall portion of said pilot passage structure for creating in cooperation with said wall portion two zones that are fluid-isolated from each other by said diaphragm, said diaphragm having a central region that is affixed to a portion of said mechanism disposed within said pilot passage structure so as to move in unison with said mechanism, said pilot passage structure comprising a first pilot portion piloting one of said two particular ones of said three ports to a first of said zones and a second pilot portion piloting the other of said two particular ones of said three ports to a second of said zones, said valve body comprising a tubular outer body portion and a tubular inner body portion which is disposed within said tubular outer body portion such that said tubular outer body portion circumferentially surrounds said tubular inner body portion, said mechanism passing through said tubular inner body portion, at least one of said first and second pilot portions having a portion thereof cooperatively defined by and between said tubular outer body portion and said tubular inner body portion, said diaphragm being sealed to and extending across said tubular inner body portion such that said first and second zones extend into said tubular inner body portion to opposite sides of said diaphragm.



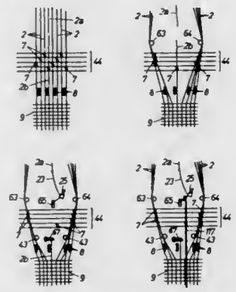
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**5,050,643**

**ON LOOM SYSTEM FOR MENDING BROKEN WARP YARN**

**Yujiro Takegawa, Ishikawa, and Souichi Nakai, Kanazawa, both of Japan, assignors to Tsudakoma Corp., Ishikawa, Japan**

**Filed Jan. 31, 1990, Ser. No. 473,151**
**Claims priority, application Japan, Feb. 2, 1989, 1-24673; Jun. 9, 1989, 1-147003**
**Int. Cl.[5] D03J *1/14***
**U.S. Cl. 139—1 R** **2 Claims**



2. A device for automatically mending warp yarn in a loom comprising:

a broken warp yarn moving device composed of a knotter for tying a broken warp yarn to a mending yarn;

a holding means for holding an end of the mending yarn at a yarn passing position;

a suction pipe for extracting a broken warp yarn at the side of a reed through which the broken warp yarn is passed by a passing means and a moving means for holding the broken warp yarn and for moving the broken warp yarn in the direction of the width of the loom for a predetermined amount;

a detecting device composed of a sensor for detecting the space between the adjacent reed wires and a drive means for moving the sensor and a yarn passing device in the direction of the width of the loom, said yarn passing device including means for receiving an output of the sensor, and for inserting a yarn passing needle provided with a hook into a through hole of a heddle corresponding to the broken warp yarn based on detected adjacent reed wires having an enlarged space therebetween after said yarn passing device has been caused to stop moving in the direction of the width of the loom in response to the sensor output, and for thereafter passing the end of the mending yarn through the through hole of the heddle and the enlarged space between the adjacent reed wires of the reed;

wherein the broken warp yarn at the side of the reed through which the broken warp yarn is passed is extracted by the suction pipe when the warp yarn is broken, and is moved in the direction of the width of the loom for the predetermined amount while being held by the moving means whereby the enlarged space between the adjacent reed wires from said extraction is detected by the drive means of the detecting device in the direction of the width of the loom, and the yarn passing needle provided with the hook is inserted into a through hole of the heddle corresponding to the broken warp yarn from the enlarged space between the adjacent reed wires, and thereafter, the end of the mending yarn is passed into the through hole of the heddle and the enlarged space between the adjacent reed wires of the reed.

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**5,050,644**

**COUPLING ARRANGEMENT FOR A LOOM HARNESS SHAFT**

**Hans Peter, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland**

**Filed Jun. 25, 1990, Ser. No. 543,220**
**Claims priority, application Switzerland, Jul. 7, 1989, 2544/89**
**Int. Cl.[5] D03C *13/00***
**U.S. Cl. 139—88** **12 Claims**



1. In a loom, the combination comprising

at least one shaft;

a first coupling element secured to said shaft;

a push rod;

a second coupling element mounted on said push rod for coupling with said first coupling element;

a clutch element for selectively coupling said coupling elements to each other, said clutch element being pivotally mounted on said second coupling element; and

an actuating tool pivotally mounted on a pivot axis for moving said clutch element to couple and uncouple said coupling elements relative to each other, said tool including a pair of diametrically offset members exterior to said clutch element for pivoting about said pivot axis to abut and move said clutch element into coupling engagement with said coupling elements.

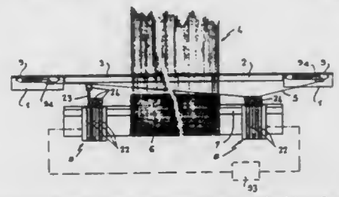
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**5,050,645**

**MOBILE WEFT CLAMPS FOR A SHUTTLE BOX LOOM**

**Aimé Fabre, La Pomatitèore, Brangues 38510, France**

**Filed Feb. 21, 1990, Ser. No. 482,766**
**Claims priority, application France, Feb. 28, 1989, 89 02870**
**Int. Cl.[5] D03D *45/50***
**U.S. Cl. 139—170.3** **10 Claims**



1. A device adapted to be mounted on each side of a weaving loom in generally opposing relationship to a loom batten wherein the loom includes shuttles which are movable between shuttle boxes on each side of the loom batten and wherein controls are provided for operation of the loom batten and shuttle boxes, the device being positioned generally between the selvedge of fabric being made in the loom and adjacent shuttle box and which device further maintains weft yarns under tension leaving a loop shed defined by weft yarns wherein the device comprises in combination:

a) a series of extendable members in a number equal to the number of shuttles of the loom, said extendable members extending parallel to the warp yarns and being vertically spaced with respect to one another;

b) a clamp provided at the end of each of said extendable members and including means to grip weft yarn which has been deposited by one of said shuttles and which releases the yarn when said one of said shuttles emerges from an adjacent shuttle box;

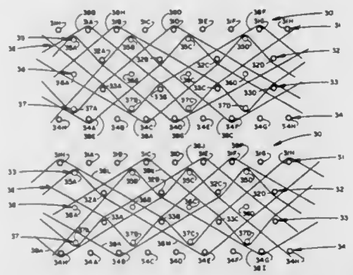
VOL 1130 ISS 4 SE 24 1991 UMI



c) adjustable support means for raising and lowering said extendable members in a vertical plane;
d) means associated with said extendable members for selectively moving each of said clamps to a first extended position in which said clamps are disposed adjacent to the batten so as to enable the clamps to seize weft yarn which has just been deposited, a retracted position in which said clamps are positioned outside the reciprocating movement of the batten, and a mean position for which said clamps lie at a short distance from the batten to enable weft yarns to be released as the shuttles enter into the shed; and
e) an automatic control means for actuating said adjustable support means and said means associated with each of said extendable members in synchronism with the controls for the batten and the shuttle boxes.

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**5,050,646**
**PAPERMAKERS FABRIC FOR CORRUGATION MACHINES**
**Ted Fry, Summerville, S.C., assignor to Asten Group, Inc., Charleston, S.C.**
**Filed May 15, 1989, Ser. No. 351,717**
**Int. Cl.[5] D03D *11/00***
**U.S. Cl. 139—383 A** **24 Claims**

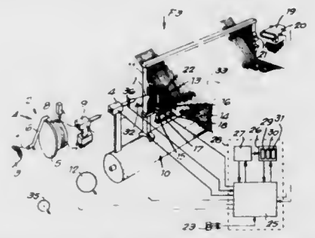


1. A corrugator apparatus for manufacturing corrugated paper products, the apparatus having a series of heat element means spaced from and associated with pressure application means to facilitate the processing of the corrugated paper product, and a papermakers fabric which traverses between said heat element means and said pressure application means to transport the paper product across the heat element means, wherein the papermakers fabric comprises a system of monofilament warp yarns interwoven with at least four layers of bulky filling yarns and first, second and third intermediate layers of monofilament filling yarns in a repeat pattern such that at least two of said bulky yarn layers and at least said third monofilament filling layer are disposed between said first and second intermediate monofilament yarn layers.

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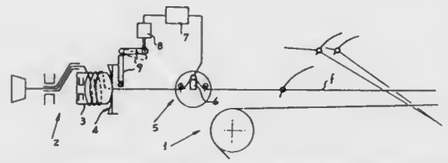
**5,050,647**
**DAMAGED WEFT THREAD ELIMINATION IN AIRJET WEAVING MACHINES**
**Robert Baeck, De Pinte; Dirk Lewyllie, Wervik, and José Vangheluwe, Ieper, all of Belgium, assignors to Picanol N.V.,naamloze vennootschap, Belgium**
**Filed Oct. 3, 1990, Ser. No. 592,256**
**Claims priority, application Belgium, Oct. 4, 1989, 8901056**
**Int. Cl.[5] D03D *47/34***
**U.S. Cl. 139—450** **19 Claims**

1. A method for feeding weft threads to the shed in an airjet weaving machine by means of which a weaving process is performed, comprising the steps of automatically inserting a length of weft thread into the shed upon determining that a waiting period during which the weft thread has not been used for weaving exceeds a predetermined length of time, and removing the automatically inserted length of weft thread from the shed before starting a weaving process.



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**5,050,648**
**SYSTEM TO CONTROL WEFT TENSION IN A LOOM WITH CONTINUOUS WEFT FEED**
**Luigi Pezzoli, Leffe, Italy, assignor to Vamatex S.p.A., Villa Di Serio, Italy**
**Filed Aug. 7, 1989, Ser. No. 389,974**
**Claims priority, application Italy, Sep. 8, 1988, 21864 A/88**
**Int. Cl.[5] D03D *47/38***
**U.S. Cl. 139—450** **10 Claims**

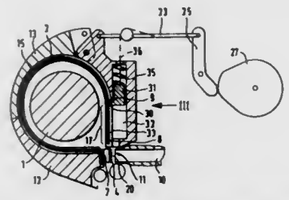


1. The combination of a continuous weft feed loom, of the type equipped with a weft feeder having yarn brake means and a device measuring and outputting signals of the weft yarn tension and a system to control the tension of weft yarns fed to the loom, said system including an electronic interface unit for processing the signals from the weft yarn tension measuring device, said signals representing the value of the actual weft yarn tension, and an actuator controlled by said electronic interface circuit for controlling the braking means to maintain a desired weft yarn tension, wherein the desired tension is a reference tension preset in the electronic interface circuit, and wherein the weft yarn tension measuring device is a warp stop motion device.

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**5,050,649**
**STRAP AND TOOL FOR LOOPING AND CLAMPING AROUND ELONGATE ARTICLES**
**Viktor Kurmis, Pinneberg, Fed. Rep. of Germany, assignor to Paul Hellermann GmbH, Pinneberg, Fed. Rep. of Germany**
**Filed Nov. 14, 1990, Ser. No. 613,247**
**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1989, 8913514; May 2, 1990, 9004993**
**Int. Cl.[5] B21F *09/02***
**U.S. Cl. 140—93 A** **14 Claims**

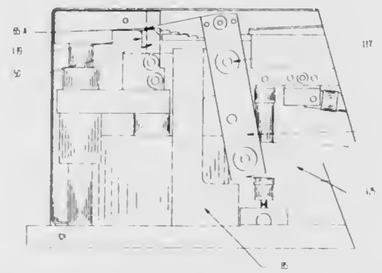
1. A strap and a tool for looping and clamping the strap around an elongate article, the strap comprising a strap tongue and a strap lock which has an orifice for receiving the strap tongue, and the tool possessing a looping guide closable around the article and intended for the ready-to-close strap, with a retention means for the strap lock, a guide aligned approximately with the retention means and intended for guiding the free strap end of the strap tongue, and a device for generating a relative movement occurring between the retention means and the guide and pushing the free strap end into the orifice, wherein the strap tongue has a central recess and the device for generating the relative movement has a pushing-forward finger interacting with the recess.



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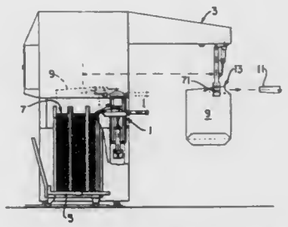
**5,050,650**
**AXIAL LEAD ELECTRICAL COMPONENT FEEDER**
**Gregory W. Holcomb, 6336 Bryce Ave., Orange, Calif. 92667, and Samuel R. Holcomb, Orange, Calif., assignors to Gregory W. Holcomb, Orange, Calif.**
**Filed Oct. 9, 1990, Ser. No. 595,351**
**Int. Cl.[5] B21F *45/00***
**U.S. Cl. 140—105** **24 Claims**



1. A component lead cutting and forming apparatus for axial lead electronic components respectively having first and second leads secured to tape, comprising:
a lead cutting and forming station, wherein successive components secured to the tape are processed to cut and form the leads and presented at a station pickup location for robotic pickup;
means for driving the tape so as to present successive components secured to the tape to a process-start location comprising said station; and
wherein said station is further characterized in that the lead forming and cutting operations are performed as the component-in-process is moved from said process-start location to said pickup location within said station, and comprises:
(i) upper forming die disposed above said process-start location, and having lead forming elements and lead cutting surfaces;
(ii) lower support means for supporting said component-in-process body and leads during the lead cutting and forming operations;
(iii) lower component lead cutting die members for acting in cooperation with said lead cutting surfaces of said upper forming die to cut the component-in-process leads to a desired length during the component lead cutting and forming operations;
(iv) means for translating said lower support means and said lower cutting members to carry said component-in-process from said process-start position to said pickup position, said component-in-process leads being cut and formed during said translation, wherein said component leads are cut and formed, and the component-in-process is moved from said process-start position to said pickup position in a single movement; and
(v) means for providing strain relief clamping of the leads of said component-in-process against said lower support means during said cutting and forming operation.

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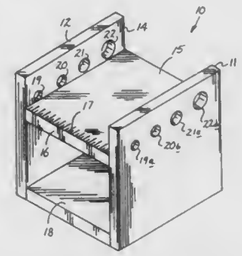
**5,050,651**
**APPARATUS FOR THE OPENING AND SEPARATING OF VALVE BAGS**
**Christian Hejlesen, Aalborg, Denmark, assignor to Bates Ventil Saekke Co. A/S, Norresundby, Denmark**
**Filed Jul. 26, 1990, Ser. No. 558,778**
**Int. Cl.[5] B65B *1/04*; B67C *3/00***
**U.S. Cl. 141—314** **5 Claims**



1. Apparatus for opening upper and lower surfaces of a flat-folded valve of a valve bag and separating a valve bag from a stack of valve bags comprising a wedge-shaped insertion member having two separate mutually movable parts, each of said movable parts having a distal inserting end and a proximal end, said insertion member being supported at each of said proximal ends by carriage means which cooperates with said insertion member to move the inserting ends of the insertion member into a flat-folded valve of a valve bag; means for distending said upper and lower surfaces of said valve by the mutual movement away from each other of the said movable parts; attached to roller means attached to the inserting end of one of the movable parts of the insertion member to assist the inserting end to roll on the lower surface of said valve; and means for moving said carriage means to separate the valve bags from a stack of valve bags.

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**5,050,652**
**DOWELL ROD CUTTING APPARATUS**
**Hershel Bumpus, R.R. #2, Dixon, Ky. 42409**
**Filed Aug. 30, 1990, Ser. No. 574,887**
**Int. Cl.[5] B25H *1/00***
**U.S. Cl. 144—286 R** **8 Claims**



1. A dowel rod cutting apparatus comprising,
a right wall spaced from and parallel a left wall, the right wall includes a right wall interior surface, and the left wall includes a left wall interior surface, wherein the right wall

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interior surface is arranged parallel and spaced from the left wall interior surface and coextensively positioned thereto, and

an upper web orthogonally and fixedly mounted between the right and left walls spaced below a right wall upper edge and left wall upper edge, and

a lower web spaced below and parallel the upper web and fixedly and integrally mounted between the right wall interior surface and the left wall interior surface at lower respective terminal ends of the right and left wall, and

a plurality of left wall apertures including at least a first and second left wall aperture directed through the left wall above the upper web, and

a plurality of right wall apertures including at least a first and second right wall aperture, wherein the first left wall aperture and the first right wall aperture defines a first pair, and the second left wall aperture and the second right wall aperture define a second pair, wherein the first pair and second pair are coaxially aligned relative to one another said apertures tangentially intersecting a top surface of the upper web to permit support of a dowel rod directed through a selective pair of a pair of apertures.

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**5,050,653**

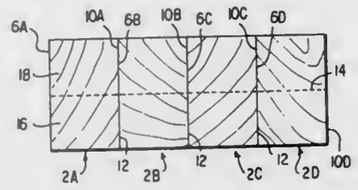
## LAMINATED WOOD PROCESS FOR USING WASTE OFFCUT STRIPS AND PRODUCTS THEREOF

**Donald W. Brown, 12 Trimont Trail, Franklin, N.C. 28734**

**Filed Jun. 1, 1990, Ser. No. 531,743**

**Int. Cl.[5] B27G** *11/00*

U.S. Cl. 144—351 **17 Claims**




1. A process for making a quartersawn laminated wood plank from flatsawn offcut strips having top and bottom surfaces and two opposite sides, said process comprising:

preparing opposite sides of flatsawn wood offcut strips for glueing in quartersawn orientation;

preparing top surfaces of said flatsawn wood offcut strips to make each of said flatsawn offcut strips substantially the same height; and

glueing said opposite sides of said wood strips to adjacent sides of adjacent wood strips to form a laminated plank having said wood strips in quartersawn orientation with respect to top and bottom surfaces of said plank, wherein said top and bottom surfaces of said laminated plank each include at least one joint between glued strips.

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**5,050,654**

## UMBRELLA TABLE COVER

**James K. Howell, and Rae E. Howell, both of 3410 Wild Oak Bay Blvd., #110, both of Bradenton, Fla. 34210**

**Continuation of Ser. No. 125,208, Nov. 25, 1987, abandoned. This application Jul. 16, 1990, Ser. No. 554,174**

**Int. Cl.[5] B65D** *65/02*

U.S. Cl. 150—138 **3 Claims**

1. An umbrella table cover for an umbrella table having an umbrella pole aperture disposed generally through a central portion of the table, the aperture for slidably receiving and supporting an upright umbrella pole, said table cover comprising:

a flexible flat sheet structured to freely lay atop and to cover the table, said flat sheet extending beyond and freely hanging downward from all edges of the table;

said flat sheet having a continuous upstanding, elastic collar connected to, and upwardly extending from, a mid point of said flat sheet;

said elastic collar aligning with the umbrella pole aperture and sized to snuggly receive and extend upwardly from the table around the umbrella pole when the umbrella pole is passed through said elastic collar;

said elastic collar elastically squeezing against the umbrella pole to resist upward movement of the central portion of said table cover when blown by a breeze;




said table cover further comprising an annular-shaped container structured to be supported atop the table surrounding the umbrella pole aperture and to receive the umbrella pole passed therethrough;

said container sized to fit beneath and be at least partially concealed by said elastic collar;

said container at least partialiy open along its upper margin to receive liquid and the stems of cut flowers placed therein for displaying the flowers upwardly extending from said elastic collar and against the umbrella pole.

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**5,050,655**

## COMBINATION SNAP LOCK GOLF CLUB COVER AND CLEANING TOOL

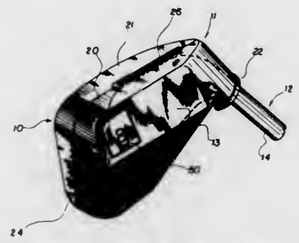
**Charles Borenstein, Miami, Fla., assignor to BSF Industries, Inc., Miami, Fla.**

**Continuation-in-part of Ser. No. 303,309, Jan. 27, 1989, Pat. No. 4,971,126. This application Dec. 14, 1989, Ser. No. 450,838**

**The portion of the term of this patent subsequent to Nov. 20, 2007, has been disclaimed.**

**Int. Cl.[5] A63B** *57/00*

U.S. Cl. 150—160 **23 Claims**




1. A combination snap lock golf club cover and cleaning tool comprising:

cover means having a first cover half and a second cover half, and designed to correspond to the shape of and enclose a golf club head;

means to pivotally connect said first and second cover halves;

means to lock said first cover half to said second cover half, and



means attached to said cover means to clean a golf club head.

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**5,050,656**

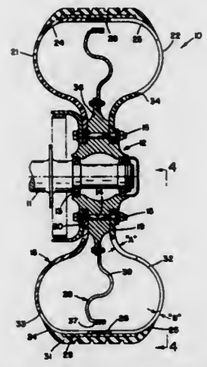
## NON-PNEUMATIC TIRE WHEEL

**Fanghual H. Ho, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio**

**Filed Apr. 23, 1990, Ser. No. 513,378**

**Int. Cl.[5] B60C** *7/14*

U.S. Cl. 152—11 **24 Claims**



1. A non-pneumatic tire wheel comprising a hub section for receiving an axle; said hub section having a central bore with a central axis; a yieldable annular carcass extending radially outwardly from said hub section to cooperatively define a toroidal shape therewith; said carcass having a pair of axially spaced sidewalls, a pair of axially spaced circumferentially extending shoulders and an annular crown; said crown being generally linear in cross section and parallel to said central axis, said crown merges with said shoulders; said sidewalls merge with said shoulders and said hub section; a tread ring encompassing said crown and integral therewith to define a ground engaging element; each of said sidewalls having a plurality of circumferentially spaced slots that extend radially from adjacent said hub section into said annular crown; and said slots being spaced to define a plurality of circumferentially spaced beam members that extend radially on both sides of said tire wheel that provide a yielding and resiliency to said tire wheel under load.

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**5,050,657**

## PNEUMATIC TIRE WITH STEEL CORDS HAVING A CLOSED TWISTED STRUCTURE OR A COMPACT STRUCTURE

**Yujiro Umezawa, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan**

**Continuation of Ser. No. 254,074, Oct. 6, 1988, Pat. No. 4,917,165, which is a continuation of Ser. No. 40,676, Apr. 21, 1987, Pat. No. 4,788,815, which is a continuation of Ser. No. 810,460, Dec. 18, 1985, Pat. No. 4,707,975. This application Feb. 13, 1990, Ser. No. 479,558**

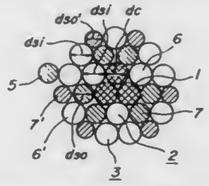
**Claims priority, application Japan, Feb. 26, 1985, 63-35215; Feb. 26, 1985, 60-35216**

**The portion of the term of this patent subsequent to Nov. 24, 2005, has been disclaimed.**

**Int. Cl.[5] B60C** *9/00, 9/18;* **D02G** *3/36*

U.S. Cl. 152—527 **6 Claims**

1. A pneumatic radial tire having a steel cord as a reinforcement of a belt ply comprising: a central base structure composed of 2 to 4 steel filaments, and a coaxial layer composed of plural steel filaments arranged around the central base structure, the steel filaments of said coaxial layer and the central base structure being twisted in a same direction at a same pitch, the steel filaments constituting the central base structure have a same diameter (dc), while steel filaments of the coaxial layer




have a diameter (dso) smaller than the diameter (dc) of the steel filaments in the central base structure and a ratio of dc/dso is within a range of 1.03 to 1.25.

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**5,050,658**

## PNEUMATIC VEHICLE TIRE

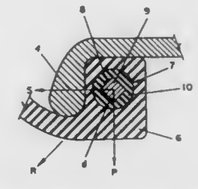
**Stephan Kessel, Aachen, and Karlheinz Evertz, Herzogenrath, both of Fed. Rep. of Germany, assignors to Uniroyal Englebert Reifen GmbH, Aachen, Fed. Rep. of Germany**

**Filed Jan. 26, 1990, Ser. No. 471,206**

**Claims priority, application Fed. Rep. of Germany, Jan. 27, 1989, 3902403**

**Int. Cl.[5] B60C** *15/04*

U.S. Cl. 152—540 **5 Claims**




1. In a pneumatic vehicle tire mounted on a one-piece wheel rim having radially inwardly disposed rim shoulders which are adjoined axially outwardly by essentially radially inwardly extending rim flanges for holding inverted bead portions of said tire on said rim shoulders, with each of said tire bead portions having a bead ring that is resistant to compression and bending, whereby said bead ring comprises a steel element core that is enveloped by a hard rubber coating that has a round cross-sectional configuration, the improvement wherein:

said steel element core is formed of flat strips, whereby the longest dimension of the cross-sectional configuration of said flat strips is disposed in and parallel to the direction of a run-flat force that acts upon that bead portion.

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**5,050,659**

## MACHINE FOR THE REMOVAL AND REPLACEMENT OF TIRES FOR THE WHEELS OF AUTOMOBILES

**Giorgio Scalambra, Carpi, Italy, assignor to G. S. S.R.L., Correggio, Italy**

**Filed Apr. 27, 1990, Ser. No. 515,967**

**Int. Cl.[5] B60C** *25/08*

U.S. Cl. 157—1.24 **7 Claims**

1. Machine for the removal and replacement of tires for wheels of automobiles comprising:

a frame (1) on which a self-centering platform (2) is arranged rotatable around a vertical or almost vertical axis on which a wheel rim can be centered and blocked;

a substantially horizontal arm (4) which at an end is coupled with a first vertical toolhead arm (3) mounted to said frame (1);

a second vertical toolhead arm (5), positionable above said

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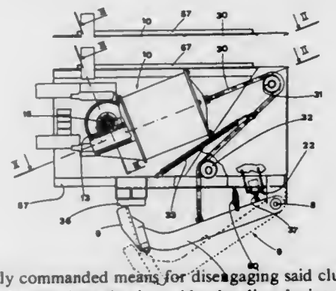


self-centering platform (2) and coupled at an end in an auxiliary slidable way to said substantially horizontal arm (4);

an unbeading device (6) mounted to one external side of the machine;

further comprising:

first of two pneumatic motors having a first pneumatic cylinder (10) for transmission of rotation to said self-centering platform (2) by means of a rack and pinion mechanism (13 and 14) with a clutch interposed, and having simultaneous function of activating said unbeading device (6); pneumatically commanded means for disengaging said clutch and simultaneously activating said unbeading device (6);



second of two pneumatic motors comprising a pneumatic cylinder (39) located co-axially to said self-centering platform (2) and commanding, by movement of its stem, movement of jaws (38) mounted on said platform (2) for gripping of a wheel blocked on same platform (2);

a tank (59) for compressed air used in powering the machine comprising a straight tubular section structural element, whose convex external surface also forms part of an upper surface of the body of the machine, above which are arranged said platform (2) and said vertical tool head (3).

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**5,050,660**

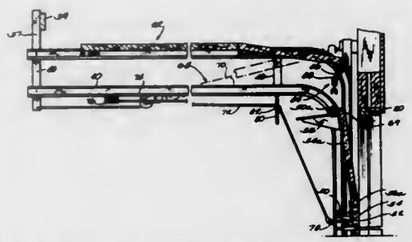
**SCREEN DOOR FOR LARGE DOOR OPENING**

**Ralph E. Bleichwehl, P.O. Box 2466, 1222 West 18th, Oshkosh, Wis. 54903-2466, and Jeff M. Nason, 320 Westbrook Dr., Oshkosh, Wis. 54901**

**Filed May 7, 1990, Ser. No. 519,502**

**Int. Cl.[5] E06B *3/48***

**U.S. Cl. 160—113** **12 Claims**



1. In an enclosure provided with a vertical wall, having a pair of spaced, vertical support members and a nominally horizontal overhead sill structure cooperating to define a doorway in the wall, a first horizontally spaced track having a vertical portion mounted on the inner face of the wall adjacent said vertical members and a generally horizontal, overhead portion disposed within the enclosure and interconnected with said vertical portion, and a vertically shiftable, articulated first door shiftably carried by said track and movable between a closed position within the enclosure closing said doorway and adjacent said sill structure and an open position above said closed position, a second door apparatus comprising:

a second door including a plurality of hingedly interconnected frames, one or more of said frames presenting a central opening;

each of said frames which has such a central opening having foraminous material secured thereto in covering relationship to the opening;

a second track shiftably carrying said frames and mounted to said first tract within said enclosure, said second track having a vertical portion extending upwardly with said vertical portion of said first track and horizontally beneath said horizontal portion of said first track;

said frames being carried by said second track by means of a plurality of sets of rollers which run along said track, each said set of rollers journaled to brackets affixed to a respective one of said frames;

said frames including an uppermost frame hingedly attached to the frame below it, and attached to the uppermost one of said sets of rollers by means of a freely slidable bracket for permitting the uppermost edge of said uppermost frame to be freely shiftable between a first position where said uppermost frame edge is tiled away from the sill structure and a second position where said uppermost frame edge is in contact with the sill structure; and

attachment means for releasably attached said uppermost frame edge to said sill structure so that said uppermost frame edge is attached in its second position;

whereby said second door may be shifted between a first position adjacent said sill structure and closing said doorway and a second position beneath said first door in its open position and clearing said doorway.

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**5,050,661**

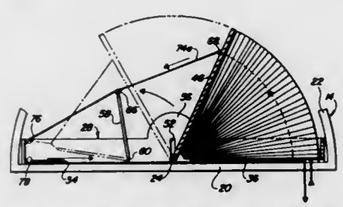
**BLIND FOR ROUNDED WINDOW SECTION**

**Arthur L. Sikkema, R.R. 5, Geneseo, Ill. 61254, and Cynthia R. Hook, R.R. 1, Box 366, Thomson, Ill. 61285**

**Filed Oct. 9, 1990, Ser. No. 594,117**

**Int. Cl.[5] E06B *3/94***

**U.S. Cl. 160—84.1** **10 Claims**



1. A blind structure for a circular window having a horizontal base and an outer circular frame member formed about an axis adjacent the surface of the base, said blind structure comprising: a U-shaped upwardly opening trough structure fixed to and extending along the base; a pleated fan-shaped blind adapted to lie when in repose in a horizontal stack in said trough structure, said blind including an arm fixed to an upper pleat and having a lower pleat fixed to said trough structure, the length of said pleated blind being substantially the radius of said circular frame member and said arm having an inner end located in the area of said axis; vertically self-adjusting horizontal pivot means connecting said inner end of said arm to said trough structure, the axis of said pivot means being shiftable vertically between positions coextensive with said axis of said circular frame member and vertically above the latter axis; control cords connected to said arm, one of said cords used to swing said arm and blind from a fully open position in which said blind is in said horizontal stack and in said trough structure to a fan-shaped disposition in which it covers said window, and another of said cords being used to return the blind to said horizontal stack; and a cord control element being positioned relative to said one control cord so that the direction of force between it and said blind arm will have a vertical upward component.



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**5,050,662**

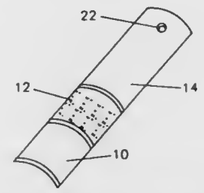
**DECORATIVE VENETIAN BLIND**

**Julius Kellener, 68 Bangor St., Staten Island, N.Y. 10314, assignor to Julius Kellener, Staten Island, N.Y.**

**Filed Aug. 13, 1990, Ser. No. 565,718**

**Int. Cl.[5] E06B *9/00***

**U.S. Cl. 160—168.1** **1 Claim**



1. A louver system comprising a plurality of slats depending vertically from a mounting to form a screen, said slats being collectively displaceable and rotatable on their mountings, certain of the slats being multi-layered over at least a part of their length to form a laminate, each layer of said slats depending from the same mounting and being curvi-linear in cross section, each successive layer being shorter than the preceding layer, each multi-layered slat being coordinated with the one next to it to permit the formation of graphics in the face of the screen.

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**5,050,663**

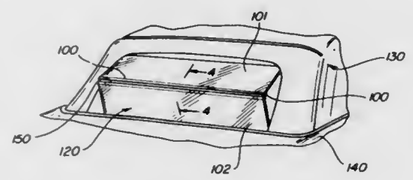
**FOLDING HINGE AND WEATHER SEAL FOR A FOLDING WINDOW**

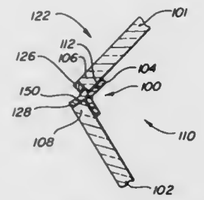
**Barbra D. Rhoads, Troy; Michael A. DeBolt, Dearborn, and Ray A. Dickie, Northville Township, Wayne County, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Apr. 3, 1990, Ser. No. 504,144**

**Int. Cl.[5] E06B *3/48***

**U.S. Cl. 160—231.2** **24 Claims**





1. A folding window for use in an automobile vehicle having a fold-down convertible tope comprising:

a pair of panes comprising a window having an inner surface and an outer surface, each of said pair of panes having a peripheral edge, a first portion of said peripheral edge on one of said pair of panes being disposed generally adjacent a first portion of said peripheral edge on the other of said pair of panes, said adjacent peripheral edge portions being spaced from one another by a gap;

flexible strip means located on said inner surface of said window for joining said adjacent peripheral edge portions of said pair of panes to one another;

means for bonding said strip means to said inner surface of said window; and

means located within said gap for sealing said gap to protect said flexible strip means from environmental degradation.

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**5,050,664**

**SECTIONAL SLAT FOR CLOSURE BY CURTAIN, AND RESPECTIVE CLOSING CURTAIN**

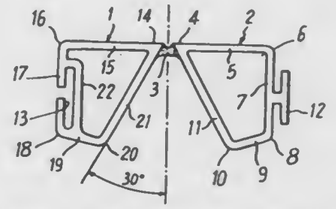
**Joseph Legeais, 32 Avenue de la Source, Nogent-Sur-Marne, France 94130**

**Filed Oct. 20, 1989, Ser. No. 242,755**

**Claims priority, application France, Oct. 28, 1988, 88 14160**

**Int. Cl.[5] E06B *9/00***

**U.S. Cl. 160—236** **9 Claims**



1. An articulated slat for an articulated curtain comprising two substantially symmetrical half-slats of extended length, said half-slats being integrally connected lengthwise by a flexible joint to form a unitary sectional slat, each said half-slat being a polygon in cross section, said polygon comprising a first side forming a portion of a front face of said slat and a second side perpendicular to said first side and being a lateral face of said slat, and further comprising a third side and fourth side in said polygonal cross section of each said half-slat, said joined half-slats meeting at said joint with an acute angle between the first side and the fourth side of each said half-slat.

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**5,050,665**

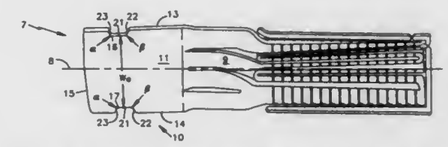
**INVESTMENT CAST AIRFOIL CORE/SHELL LOCK AND METHOD OF CASTING**

**James A. Judd, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Dec. 26, 1989, Ser. No. 456,418**

**Int. Cl.[5] B22C *9/10*; B22D *33/04***

**U.S. Cl. 164—137** **20 Claims**



1. An investment casting mold having a core and a shell mold, said core including a core main body having a longitudinal axis and a core/shell lock for supporting the core within the shell mold in order to form a cavity within a cast metal article, wherein said core and said shell mold are subjected to heating prior to casting said metal article, and during such heating said shell mold undergoes greater thermal expansion

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than said core thereby tending to cause said shell mold to loosen from said core, said core/shell lock comprising:

a tapered elongate member extending from said core main body along said longitudinal axis, said elongate member including

a first surface that slopes toward said longitudinal axis, and

positioning means for controlling shifting of said core with respect to the shell mold, said means for controlling shifting including a first notch in said first surface which cooperates with a first protrusion on said shell mold.

19. In making a cast metal article having a hollow cavity and a wall of variable thickness, wherein a core is supported within a shell mold by a core/shell lock having a plurality of surfaces which extend into a wall of the shell mold and terminate in an end such that the core is spaced from the mold and contacts the mold only at the core/shell lock, and the core, due to differing thermal expansion of the core and the shell mold during preheat and casting processes, is subject to excessive shitting within said shell mold which may result in the cast article having a wall thickness which is beyond desired tolerances, the improvement which comprises a method of reducing shift of the core and thereby maintaining the wall thickness within desired tolerances, including:

extending the end of the core/shell lock a distance into the wall of the shell mold that is sufficient to resist those hydraulic and buoyancy forces on the core caused by introduction of molten metal into the shell mold,

compensating for the differing thermal expansion between the core and the shell mold by allowing the shell mold to slip with respect to the surfaces of the core/shell lock by tapering said surfaces which bear upon said shell mold,

maintaining the position of the core within the shell mold during the preheat and casting processes by providing the core with notch means which cooperate with protrusion means on said shell mold to maintain the relative positions of the core and shell mold despite thermal expansion, so that any force which acts to shift the core during the casting process produces no shift greater than that which results in a wall thickness within desired tolerances.

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**5,050,666**

## OSCILLATION GEAR ASSEMBLY PROVIDED FOR A MOLD OF A CONTINUOUS CASTING PLANT

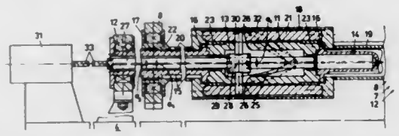
**Kurt Engel, Florian, Austria, assignor to Voest-Alpine Industrieanlagenbau GmbH, Turmstrasse, Austria**

**Filed Jun. 8, 1990, Ser. No. 535,339**

**Claims priority, application Fed. Rep. of Germany, Jun. 16, 1989, 3919753**

**Int. Cl.[5] B22D** *11/04*

**U.S. Cl. 164—416** **15 Claims**



1. In a continuous casting mold assembly and an oscillation gear assembly therefor,

wherein said mold and gear assemblies are stationarily supported on an oscillatable table,

wherein said oscillation gear assembly comprises a rotatable longitudinally disposed eccentrically mounted shaft of a first diameter and a rotatable eccentrically mounted sleeve of a second diameter surrounding and supported by said shaft, said shaft and sleeve as an assembly being disposed along the same longitudinal axis,

wherein said oscillation assembly includes gear drive means for rotating said eccentrically mounted shaft and sleeve, and

wherein the relative eccentricities of said shaft and sleeve assembly are rotationally coordinated one with respect to the other to provide a desired amplitude for vibrating said mold in the direction of its vertical axis,

the improvement comprising:

at least one elongated groove on each of said eccentrically mounted shaft and eccentrically mounted sleeve,

an adjustment rod passing longitudinally and concentrically through said shaft,

drive means cooperably associated at one end of said rod for applying a force to said rod to displace it along its longitudinal axis and/or to rotate said rod,

and force-transmission means located on said rod co-actable with said grooves for applying a rotational force to one or both of said shaft and sleeve,

whereby the eccentricity of each of said shaft and sleeve is rotationally coordinated by said force-transmission means one with respect to the other to provide a range of amplitudes as desired for vibrating the oscillatable table and hence the mold in the direction of its vertical axis.

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**5,050,667**

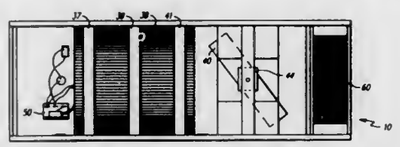
## AIR VENTILATION AND HEAT EXCHANGE APPARATUS

**Erling Berner, Loretohohe 5, CH-6300 Zug, Switzerland, and Rolf E. Berner, R.D. #6, New Castle, Pa. 16103**

**Filed May 15, 1990, Ser. No. 523,612**

**Int. Cl.[5] F28D** *17/02*

**U.S. Cl. 165—4** **6 Claims**



1. Apparatus for exchanging air within an enclosure with outside air, comprising:

a duct providing air communication between a source of said outside air and said enclosure;

a heat storing matrix disposed within said duct;

a single fan disposed within said duct and adapted to produce substantially axial air flow within said duct, said fan being mounted for movement between a first position, wherein air flow is produced from said source of outside air to said enclosure, and a second position, wherein said air flow is reversed; and

means for moving said fan at preset intervals from said first position to said second position.

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**5,050,668**

## STRESS RELIEF FOR AN ANNULAR RECUPERATOR

**Brian G. Peterson, Redondo Beach; Robert P. Urciuoli, Hermosa Beach, and David G. Bridgnell, Rolling Hills, all of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Continuation-in-part of Ser. No. 405,366, Sep. 11, 1989, Pat. No. 4,993,223. This application Aug. 29, 1990, Ser. No. 575,038**

**Int. Cl.[5] F28F** *7/00;* **F28D** *9/00*

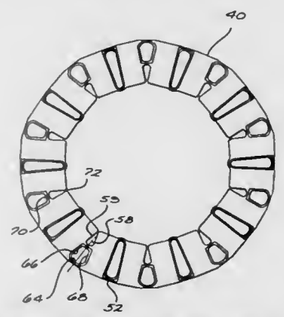
**U.S. Cl. 165—81** **10 Claims**

1. An annular recuperator core for use with a combustion power plant which utilizes a flow of ambient air and produces a flow of hot exhaust gas, said annular core comprising:

a stacked plurality of generally disk shaped plates enclosing an annular chamber, each of said plates including a plurality of generally trapezoidally shaped inlet passageways and a plurality of voids disposed radially inward of said inlet passageways, said voids communicating with said annular chamber through gaps in an inner diameter of said disk shaped plates, said inlet passageways and voids alternately arranged in paired sets with a plurality of generally triangularly shaped outlet passageways; each of said passageways bordered at least partially by ridges extending a height of between the spacing between adjacent plates and a fractional portion thereof;

a plurality of exhaust passageways disposed between alternate pairs of said stacked plurality of plates within the spaces defined by said paired adjacent inlet and outlet passageways;

a plurality of enclosed passageways alternately stacked with respect to said exhaust passageways between alternate pairs of said stacked plurality of plates;



a first plurality of openings within said ridges bordering said inlet passageways of said plates, said first openings communicating with said enclosed passageways between alternate pairs of said stacked plurality of plates to distribute air thereto; and

a second plurality of openings within said ridges bordering said outlet passageways of said plates, said second openings communicating with said enclosed passageways between alternate pairs of said stacked plurality of plates to receive heated air therefrom.

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**5,050,669**

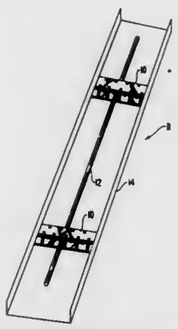
## TUBE SUPPORT

**Kurt F. Nenstiel, and Mark A. Adams, both of York, Pa., assignors to York International Corporation, York, Pa.**

**Filed Sep. 26, 1990, Ser. No. 588,546**

**Int. Cl.[5] F28F** *9/00*

**U.S. Cl. 165—162** **8 Claims**



1. A tube support for use in a heat exchanger wherein a heat transfer medium flows outside and parallel to the tubes, the support comprising:

at least three parallel plates having plate surfaces and leading and trailing edges;

multiple plate retaining members, oriented orthogonally to the plate surfaces for retaining said plates in a spaced parallel relationship, said parallel plates and said retaining members being configured and arranged so as to provide minimal flow blockage at any one cross-section to the direction of fluid flow,

said retaining members being proximate the leading and trailing edges of the plates, and

the retaining members proximate the trailing edge being staggered, in a direction orthogonal to the axes of the tubes and parallel to said plates, with respect to said retaining members proximate the leading edge.

5. A support for tubes, the support for use the heat exchanger wherein a heat transfer medium flows outside and parallel to a plurality of tubes, the support comprising:

multiple parallel plates having plate surfaces and leading and trailing edges; and

multiple plate retaining members, oriented orthogonally to the plate surfaces, for retaining said plates in a spaced parallel relationship, said retaining members being arranged to allow the movement of the tubes in a direction orthogonal their axes and parallel to said plates,

said retaining members being proximate the leading and trailing edges of the plates, and

said retaining members proximate the leading edge being spaced at least two tube diameters from each other, and said retaining members proximate the trailing edge being spaced at least two tube diameters from each other and spaced, in the direction orthogonal to the parallel to said plates, from said the leading edge.

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**5,050,670**

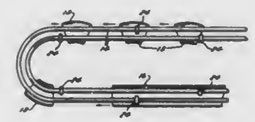
## FOUR PIECE ELBOW FOR A MULTI-TUBE HEAT EXCHANGER

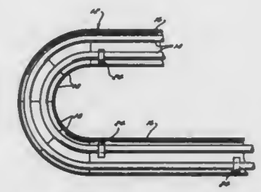
**Hervé X. Bronnert, 21495 Partridge Ct., Brookfield, Wis. 53005**

**Filed Jul. 26, 1990, Ser. No. 558,633**

**Int. Cl.[5] F28D** *7/06*

**U.S. Cl. 165—163** **8 Claims**





6. A process for assembling the components of a high pressure, multiple tube and shell thyme heat exchanger comprising the steps of:

forming a number of U-shaped tubular members into a bundle,

sliding a number of elbow sections over said tubular members to form a jacket around the U-shaped end of said tubular members,

welding said elbow sections together to form a sealed U-shaped jacket,

sliding an elongate tubular section over the tubular members into engagement with the sealed U-shaped jacket, welding the tubular sections to the U-shaped jacket, and

securing a tube sheet to said tubular sections and tubular members.

7. A high pressure, multiple tube and shell heat exchanger comprising

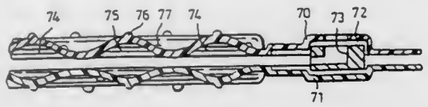
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a number of curved, one piece tubular elbow sections connected in an end to end relation to form a "U"-shaped end section,
a tubular elongate section mounted on each end of said end section to form a sealed jacket,
each of said elbow sections and said tubular elongate sections being equal in cross sectional diameter to produce a constant heat exchange rate through said jacket,
a number of U-shaped tubular heat conductive members positioned in said jacket,
and a tube sheet mounted on each end of said jacket and said tubular members.

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**5,050,671**
**PANEL HEAT EXCHANGERS FORMED FROM THERMOPLASTIC POLYMERS**
**Eldon L. Fletcher, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada**
**Filed May 10, 1990, Ser. No. 521,497**
**Claims priority, application United Kingdom, May 12, 1989, 8910966**
**Int. Cl.[5] F28F *3/08***
**U.S. Cl. 165—166** **13 Claims**

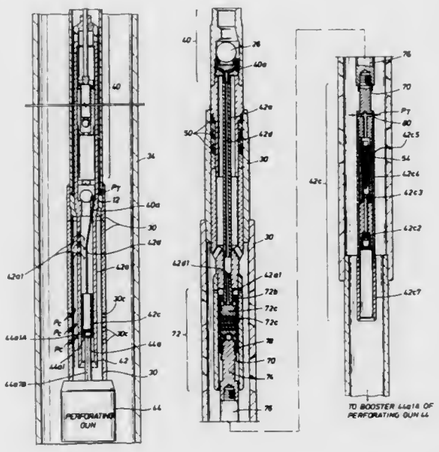



10. A sheet formed from a thermoplastic polyamide, said sheet having a thickness of 0.07 to 0.7 mm and a plurality of spaced apart elongated grooves extending across the width of said sheet with the ends of said grooves being spaced apart from an edge of the sheet, said sheet further having a plurality of projections on at least one groove, said sheet having a recess located at at least one end thereof that is in fluid-flow communication with at least one groove.

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**5,050,672**
**PUMP APPARATUS INCLUDING A FIRING HEAD FOR USE WITH A PERFORATING GUN ON A TUBING STRING**
**Klaus B. Huber, Missouri City; A. Glen Edwards, Hockley; William M. Hill, Pearland, and Antoni Miszewski, Missouri City, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.**
**Filed Jun. 23, 1989, Ser. No. 353,988**
**Int. Cl.[5] E21B *43/11***
**U.S. Cl. 166—55** **28 Claims**

1. An apparatus adapted to be disposed in a wellbore, comprising:
a tubing string;
a perforating gun devoid of a firing head and attached to one end of said tubing string; and
a pump including a first portion and a second portion, said first portion connected to said firing head and adapted to be inserted into the other end of said tubing string, said second portion adapted to rest adjacent the other end of said tubing string when said first portion is inserted into the other end of said tubing string,
said first head being disposed within said tubing string when said first portion of said pump is inserted into the other end of said tubing string,

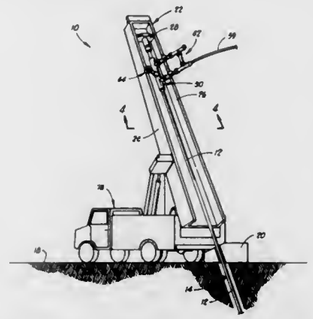



said perforating gun on said tubing string detonating in response to a detonation of said firing head in said pump.

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**5,050,673**
**LIFT THROUGH PLUG CONTAINER FOR SLANT RIG**
**Morris G. Baldridge, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**
**Filed May 15, 1990, Ser. No. 523,787**
**Int. Cl.[5] E21B *23/10, 33/05***
**U.S. Cl. 166—70** **13 Claims**

1. A cement plug container apparatus, comprising:
a lift through container body having an upper end and a lower end defining a longitudinal axis therebetween;
a cementing manifold attached to said container body and extending generally radially outward therefrom;
a plug release assembly attached to said container body and extending generally radially outward therefrom;
said plug release assembly and said manifold being positioned on said container body relative to each other such that an angle of no greater than about 135° about said longitudinal axis of said container body is defined between said plug release assembly and said manifold, said container body being substantially free of any radial protrusions outside said angle; and

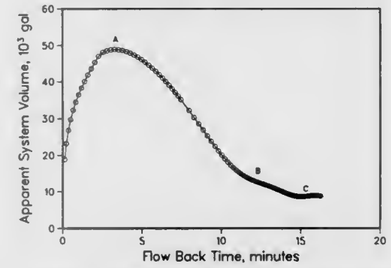


a lifting sub means attached to said upper end of said container body for lifting said container body and a casing string supported from a lower end thereof.

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**5,050,674**
**METHOD FOR DETERMINING FRACTURE CLOSURE PRESSURE AND FRACTURE VOLUME OF A SUBSURFACE FORMATION**
**Mohamed Y. Soliman, Lawton, Okla., and A. Ali Danesky, Leiden, Holland, assignor to Halliburton Company, Duncan, Okla.**
**Continuation-in-part of Ser. No. 520,488, May 7, 1990, abandoned. This application Oct. 9, 1990, Ser. No. 595,326**
**Int. Cl.[5] E21B *47/06, 43/26***
**U.S. Cl. 166—250** **10 Claims**



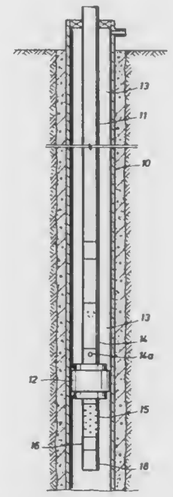

1. A method of determining characteristics of a fracture subterranean formation comprising the steps of:
(a) injecting fluid into a wellbore penetrating said subterranean formation to generate a fracture in said formation;
(b) measuring pressure of the fluid over time after injection of said fluid has ceased; and
(c) determining fracture closure pressure at onset of constant volume behavior of the said pressure and time measurements, wherein said constant volume behavior is determined by the pressure and time measurements satisfying the equation:

$$dV = -CV\,dP$$

where
C=fluid compressibility
V=system flow-back or wellbore volume
dV=change in volume corresponding to a change in pressure
dP=change in pressure corresponding to a change in volume.

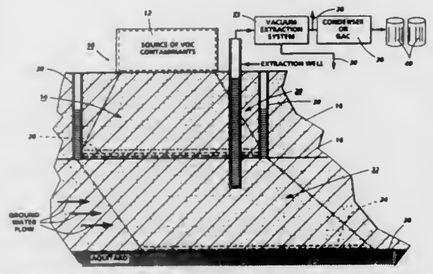
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**5,050,675**
**PERFORATING AND TESTING APPARATUS INCLUDING A MICROPROCESSOR IMPLEMENTED CONTROL SYSTEM RESPONSIVE TO AN OUTPUT FROM AN INDUCTIVE COUPLER OR OTHER INPUT STIMULUS**
**James M. Upchurch, Sugerland, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.**
**Division of Ser. No. 454,091, Dec. 20, 1989, Pat. No. 4,971,160.**
**This application Aug. 10, 1990, Ser. No. 565,774**
**The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.**
**Int. Cl.[5] E21B *34/06***
**U.S. Cl. 166—250** **6 Claims**



1. A system for generating control signals and for changing a state of a device in response to said control signals, comprising:
inductive coupler means including a first coil connected to a first point and a second coil connected to a second point, said first coil and said second coil adapted to inductively couple said first point to said second point, an input signal from said first point propagating through said first coil, a corresponding signal being induced in said second coil, the corresponding signal propagating from said second coil to said second point;
control means connected to said second point and responsive to said corresponding signal for generating said control signals, the control means including,
memory means for storing a first stored signature and a second stored signature, and
processor means connected to said second point and to said memory means and responsive to said corresponding signal from said second point for generating a first of said control signals when said first stored signature in said memory means at least most nearly matches a signature of said corresponding signal and for generating a second of said control signals when said second stored signature in said memory means at least most nearly matches a signature of said corresponding signal;
the state said device changing from a first state to a second state in response to said first of said control signals,
the state of said device changing from said second state to said first state in response to said second of said control signals.

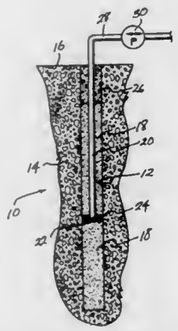
5,050,676
**PROCESS FOR TWO PHASE VACUUM EXTRACTION OF SOIL CONTAMINANTS**
Ronald E. Hess, Webster; Albert A. Hooper, Pittsford, both of N.Y.; Steven R. Morrow, Hatboro, Pa.; Dianne J. Walker, Norristown, Pa., and Erich Zimmerman, Collegeville, Pa., assignors to Xerox Corporation, Stamford, Conn.
Filed Sep. 27, 1989, Ser. No. 413,273
Int. Cl.[5] E21B *43/00, 43/34*
U.S. Cl. 166—267 13 Claims



1. A process for two phase removal of contaminants from a contaminated area of the ground, wherein the contaminated area has a subsurface water table and a vadose zone above the water table, contaminants being present in the vadose zone and below the water table, comprising the steps of:
providing a borehole in a selected portion of the contaminated area;
placing in the borehole a perforated riser pipe, wherein at least some of the perforations of the riser pipe are disposed below the water table;
applying a vacuum to the riser pipe so as to draw soil gases and entrained liquid into the riser pipe and transport both the gases and the liquid to the surface as a common stream;
forming from the common stream a stream which is primarily liquid and a stream which is primarily gaseous; and
separately treating the separated liquid and gas streams.

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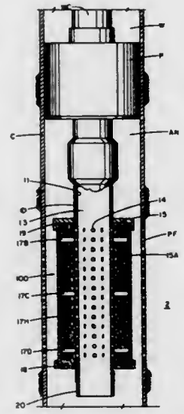
5,050,677
**WELL CONSTRUCTION METHOD**
Frederick C. Payne, Charlotte, Mich., assignor to Midwest Water Resource, Inc., Charlotte, Mich.
Continuation of Ser. No. 488,941, Mar. 5, 1990, abandoned. This application Jan. 7, 1991, Ser. No. 634,973
Int. Cl.[5] E21B *43/04*
U.S. Cl. 166—278 2 Claims



1. A method of constructing a well comprising the steps of:
(a) drilling a bore hole of a pre-determined depth into a sector of earth;
(b) partially filling said bore hole with a fill material to form a layer which is highly fluid permeable;
(c) packing said bore hole with a filter material on top of said fill material, said filter material constituting means for stabilizing said fill material against mobilization into an end of a conduit, then inserting a conduit into said bore hole to a depth terminating above that of said layer and into said filter material;
(d) filling the remainder of said bore hole about said conduit with said fill material to substantially ground level; and
(e) placing a fluid impermeable cap about said conduit to seal the bore hole against fluid leakage.

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5,050,678
**GRAVEL PACK SCREEN HAVING RETENTION MEANS AND FLUID PERMEABLE PARTICULATE SOLIDS**
John E. Gaidry, Lafayette; Larry J. Quebedeaux, Sunset, both of La.; Joseph F. Donovan, Spring, and Jefferson P. Ashton, Conroe, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.
Continuation-in-part of Ser. No. 253,967, Oct. 5, 1988, Pat. No. 4,917,183. This application Oct. 27, 1989, Ser. No. 427,710
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] E21B *43/04, 43/08*
U.S. Cl. 166—278 22 Claims

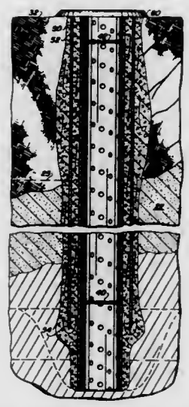


1. An apparatus for use on a subterranean well conduit to prevent particulate matter in said well of a pre-determinable size from passing into said conduit with the well production fluids, comprising:
a cylindrically shaped inner tubular member having an interior wall and an exterior wall;
a fluid flow passageway defined within the interior wall of said tubular member;
fluid flow passage means extending from the interior of said tubular member through the exterior wall of said tubular member and in communication with said fluid flow passageway;
retention means disposed around the exterior wall of said tubular member and passing across said fluid flow passage means, and having fluid flow openings therethrough;
a fluid permeable bed of particulate solids around the exterior of said retention means sized to prevent effectively all such particulate matter in said well from passing inwardly with the production fluids through said fluid permeable bed and through said fluid flow passage means and into said fluid flow passageway when said conduit and said apparatus are positioned within said subterranean. well, whereby said openings in said retention means are sized to prevent the particulate solids of said fluid permeable bed from passing into said fluid flow passage means and into said fluid flow passageway and further sized to permit any particulate matter in said well passing through said fluid permeable bed to pass through the retention means and through the subterranean well conduit; and
a circumferentially shaped outer fluid permeable housing positioned around the exterior of said fluid permeable bed and having fluid passages therethrough for transmission of the production fluids within said well through said housing, said fluid passages in said outer housing being sized to prevent effectively all of said particulate solids of said fluid permeable bed from passing exteriorly through said housing and into said well at least one of said inner tubular member and said fluid permeable housing being securable at at least one of its respective ends to the subterranean well conduit, said retention means having a cross-sectional area less than the cross-sectional area of the outer fluid permeable housing and directly interfaces circumferentially around and on and is directly secured to the inner tubular member.



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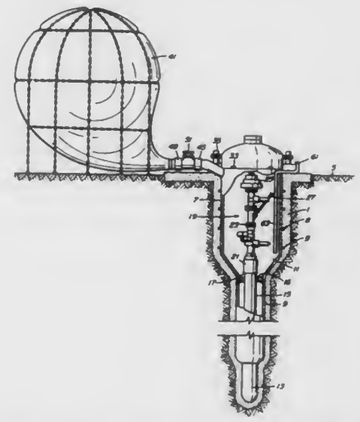
5,050,679
**METHOD OF SEALING CONTAMINATED WELLS**
Leroy George, 15627 West Grand Ave., Surprise, Ariz. 85374
Filed Sep. 17, 1990, Ser. No. 583,491
Int. Cl.[5] E03B *3/12*
U.S. Cl. 166—285 11 Claims



1. A method of in situ treatment of wells having a first perforated casing extending to an aquifer through a subterranean layer that inhibits percolation of surface water, said method comprising:
(a) positioning a second generally cylindrical imperforate well casing about the first well casing, said second well casing depending a predetermined depth to at least said layer and defining an annulus between the outer diameter of the first casing and inner diameter of the second casing; and
(b) filling the annulus with a sealant to seal the perforations in the first casing along an upper portion of the first casing to form a barrier to the entry of surface water into the well through the said upper portion of the well structure.

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5,050,680
**ENVIRONMENTAL PROTECTION FOR SUBSEA WELLS**
Robert J. Diehl, Wallis; Roger S. Osborne, Houston, and Jeff Elwood, Missouri City, all of Tex., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Mar. 21, 1990, Ser. No. 496,683
Int. Cl.[5] E21B *43/01;* E02D *29/00*
U.S. Cl. 166—356 26 Claims



1. Apparatus for receiving and containing surplus fluid from a subsea well installation on the ocean floor including a subsea wellhead assembly disposed in an enclosed protective chamber, comprising:
a fluid-carrying conduit connected to the exterior of said protective chamber in fluid communication with the interior of said protective chamber;
an inflatable dracon disposed upon and against the ocean floor in protective relation thereto when deflated and releasably connected in fluid communication to an outlet of said conduit; and
pressure-balanced relief valve means disposed in said conduit between said outlet and said protective chamber for communicating surplus fluid from the interior of such chamber to said dracon when the fluid pressure within such chamber exceeds a predetermined value.

25. A method of completing an underwater well, comprising the steps of:
installing a hollow cylindrical silo body with attached conductor guide casing into the sea floor;
drilling and casing a well through the silo body and conductor guide casing;
installing a wellhead assembly on top of the drilled and cased well inside of the silo body;
installing a pressure-containing lid on top of the silo body, forming an enclosed protective chamber and isolating the interior of the chamber from the surrounding hydrostatic head of the sea water;
releasably attaching an inflatable dracon through a fluid-carrying conduit to the interior of the chamber, said inflatable dracon being disposed upon and against the ocean floor in protective relation thereto when deflated;
installing pressure-balanced relief valve means in the fluid-carrying conduit between the dracon and chamber, said relief valve means being adapted for releasing surplus fluid from the chamber into the dracon when the chamber pressure exceeds a predetermined value; and
filling the chamber with a corrosion- and marine life-inhibiting protective fluid at a pressure below said predetermined value.

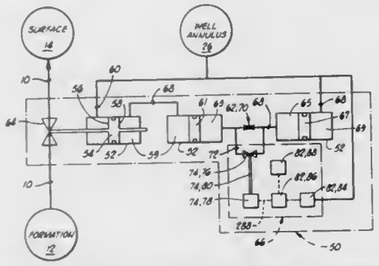
VOL 1130 ISS 4 SE 24 1991 UMI



5,050,681
## HYDRAULIC SYSTEM FOR ELECTRONICALLY CONTROLLED PRESSURE ACTIVATED DOWNHOLE TESTING TOOL

Neal G. Skinner, Lewisville, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Jul. 10, 1990, Ser. No. 551,693
Int. Cl.[5] E21B *34/10*
U.S. Cl. 166—374 41 Claims




1. A downhole tool apparatus responsive to changes in pressure in a well annulus comprising:
a tool housing;
a power piston slidably disposed in said tool housing, said piston having a first side and a second side;
a first pressure conducting passage means, defined in said tool housing, for communicating said well annulus with said first side of said power piston;
reference pressure means, disposed in said tool housing, for providing a reference pressure communicated with said second side of said power piston, so that a change in well annulus pressure creates a pressure differential across said power piston to move said power piston between a first position and a second position relative to said tool housing; and
selectively operable deactivating means for temporarily deactivating said power piston so that said power piston is no longer responsive to changes in well annulus pressure.

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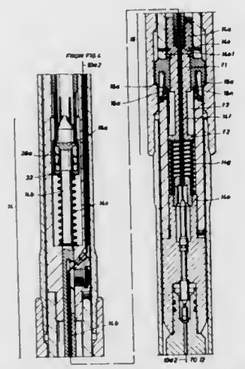
5,050,682
## COUPLING APPARATUS FOR A TUBING AND WIRELINE CONVEYED METHOD AND APPARATUS

Klaus B. Huber, Missouri City; Joe C. Hromas, Sugar Land, and Arnold G. Edwards, Hockley, all of Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.

Division of Ser. No. 451,279, Dec. 15, 1989, Pat. No. 5,025,861.
This application Nov. 20, 1990, Ser. No. 616,452
Int. Cl.[5] E21B *23/02, 23/00*
U.S. Cl. 166—377 6 Claims

1. A method of releasing a latch from a tubing, the latch connecting a tool string to said tubing, comprising the steps of:
pulling upwardly on a fishing neck until a downward weight of said tool string substantially equals an upward force on said fishing neck;
when said weight of said tool string substantially equals said force on said fishing neck, pushing a member in a longitudinal direction until a recess in said member is aligned with a latch surrounding said member;
when the recess is aligned with said latch, pushing said latch in a radial direction until said latch moves into said recess, said latch being released from said tubing when said latch moves into said recess.

2. A coupling apparatus for releasably attaching a tool string to a tubing, said tool string having a weight, comprising:
neck means adapted for connection to an overshot, said neck means being movable in a longitudinal direction in response to a pulling force applied to said neck means by said overshot;
member means operatively associated with said neck means for moving in response to movement of said neck means, said member means including a top part, a bottom part, and a connecting means for connecting the top part to the bottom part, the top part, bottom part, and connecting means defining a recess disposed between the top and bottom parts;
first biasing means engaging the bottom part for providing an upwardly directed biasing force to said member means;
at least one latch means disposed radially adjacent to said member means and initially attaching said tool string to said tubing for moving radially and releasing said tool string from said tubing; and
second biasing means for providing a radially directed biasing force to said latch means,



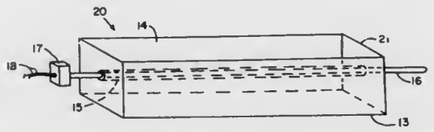
said second biasing means initially urging said latch means against said top part of said member means when said pulling force applied to said neck means is not substantially equal to said weight of said tool string thereby attaching said tool string to said tubing,
said first biasing means moving said member means in an upward direction until said recess is in radial alignment with said latch means and said second biasing means moving said latch means in a radial direction into said recess and against said connecting means of said member means when said pulling force applied to said neck means is substantially equal to said weight of said tool string thereby releasing said tool string from said tubing.

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5,050,683
## EXTINGUISHING ROCKET/MISSILE SOLID PROPELLANTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 14, 1990, Ser. No. 522,707
Int. Cl.[5] A62C *3/00, 13/62*
U.S. Cl. 169—46 4 Claims




1. A method for extinguishing rocket or missile solid propellant including the employment of a device in combination with said method to explosively drive, in substantially an instantaneous time interval, a large amount of extinguishant agent to the burning sites of propellant, said device comprising a container for containing a liquid extinguishant agent, and an explosive charge having detonator means to initiate said explosive charge for said method which comprises:
(i) providing a container of a predetermined capacity for containing a containing a liquid extinguishant agent, said container being a container which is non-reactive with said liquid extinguishant agent and said container having a structure of a three-sides rectangular steel box without cover and wherein said explosive charge explosively drives said extinguishant agent through the area normally occupied by said cover, and wherein said extinguishant agent is comprises of about 55 weight percent ethylene glycol, of about 25 weight percent water, and of 20 weight percent foaming agent;
(ii) adding said liquid extinguishant agent to substantially fill said container;
(iii) submerging a predetermined length of a detonator cord into said liquid extinguishant agent, said detonator cord containing a predetermined amount of an explosive charge per length of said detonator cord and said detonator cord having a portion of said detonating cord protruding out of said liquid extinguishant agent;
(iv) equipping said portion of said detonator cord protruding out of said liquid extinguishant agent with a detonator having means to detonate said detonator which subsequently initiates said explosive charge contained in said detonator cord; and,
(v) positioning said device an effective distance form a rocket or missile solid propellant being tested or stored and which may result in abnormal burning of said solid propellant to take place and whereby said device when functioned provides the capability of explosively driving an extinguishant agent instantaneously to sites of burning solid propellant; and, (vi) detonating said detonator which initiates said explosive charge explosively drive said extinguishant agent to the burning sites of solid propellant to achieve extinguishing of said rocket or missile solid propellant.

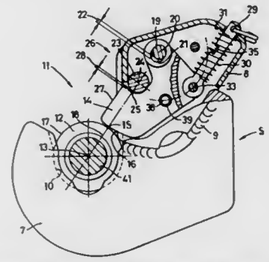


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5,050,684
## COUPLING HOOK

Jürgen Vollmer, Lohmar, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Fed. Rep. of Germany

Filed Apr. 4, 1990, Ser. No. 505,245
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1989, 3912414
Int. Cl.[5] A01B *51/00, 59/043*
U.S. Cl. 172—272 13 Claims



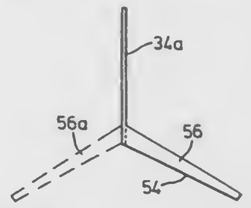
1. A coupling hook suitable for use on a lower steering arm of a three-point attaching device of a tractor for receiving and locking an implement pin or a bearing ball mounted on an implement pin, the coupling hook, comprising:
a housing defining a recess in which a pin or ball may be received;
a spring-loaded locking catch movable into a locking position in which the catch has a contact point with the pin or ball in the housing recess to retain it in the housing recess, the locking catch having an oblong hole and being pivotal about a bearing pin supported by the housing into an unlocking position against the force of a spring; and
a locking stop for the locking catch, supported by the housing and defining the locking position of the locking catch by engagement with the locking catch, the bearing pin supporting the locking catch through the oblong hole with clearance and play along or parallel to a line from said contact point to a center point of the housing recess defined by the housing, the locking stop engaging the catch in a recess of the catch, the recess of the catch having an entrance and an undercut extending inwardly of the entrance, the undercut having a size no greater than that of the clearance and play with which the bearing pin supports the catch.

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5,050,685
## SPLIT BENTLEG PLOW

H. Page Harrison, Edmonton, Canada, assignor to The Governors of the University of Alberta, Edmonton, Canada

Division of Ser. No. 190,827, May 6, 1988, Pat. No. 4,924,947.
This application Apr. 25, 1990, Ser. No. 514,227
Int. Cl.[5] A01B *3/00*
U.S. Cl. 172—699 4 Claims

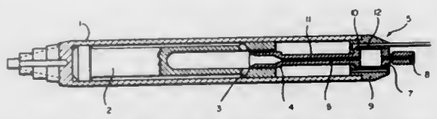



1. A bentleg plow apparatus having a forward direction, the apparatus comprising:
mounting means,
an upper blade-like portion secured to said mounting means and extending generally downwardly from said mounting means,
a first lower blade-like portion connected to said upper portion and extending downwardly and laterally therefrom to one side thereof,
a second lower blade-like portion connected to said upper portion and extending downwardly and laterally therefrom to the other side thereof,
the whole of each lower blade-like portion being planar and having a rectilinear leading edge and a rectilinear trailing edge, both leading edges and both trailing edges sloping downwardly and laterally from the upper blade-like portion,
each lower portion having a rake angle with respect to the forward direction, the rake angle being defined, when the plow apparatus is moving horizontally on a horizontal terrain, as the angle made to the horizontal by the intersection of the respective lower portion with a vertical plane parallel to said forward direction, the rake angles being such that the lower portions tend to penetrate further into soil being plowed as the plow apparatus is moved in said forward direction.

VOL 1130 ISS 4 SE 24 1991 UMI

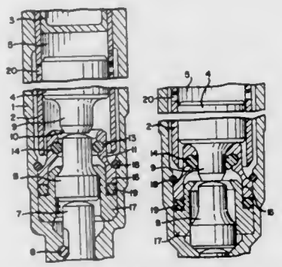


5,050,686
**PERCUSSION DRILL**
Dietmar Jenne, Strengelbach, Switzerland, assignor to Terra Ag fuer Tiefbautechnik, Strengelbach, Switzerland
Filed Dec. 29, 1989, Ser. No. 458,954
Claims priority, application Switzerland, Jan. 12, 1989, 89/89
Int. Cl.[5] B25D *9/00*
U.S. Cl. 173—91 6 Claims



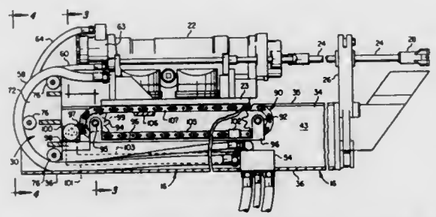
1. A percussion drill having an axially adjustable control device for controlling forward and backward travel, said drill including an adjusting and locking device connected to said control device; said adjusting and locking device including a double-acting piston-cylinder unit and a first and second compressed air line in communication with said double-acting piston-cylinder unit; said double-acting piston-cylinder unit including a cylinder chamber having a piston operatively retained therein, said piston having a first and a second side; said first air line communicating with said double-acting piston-cylinder unit on said first side of said piston for controlling said axially adjustable control device for driving said percussion drill in a forward direction; said second air line controllably communicating with said double-acting piston cylinder unit on said second side of said piston for controlling said axially adjustable control device for driving said percussion drill in a reverse direction; a control valve in communication with said first and second air lines selectively controlling the direction of movement of said percussion drill.

5,050,687
**COMPRESSION-VACUUM ACTION PERCUSSIVE MACHINE**
Ivan A. Prokhorov, ulitsa Smuryakova, 9, kv. 48, Moskovskaya oblast, Ivanteevka; Vitold A. Kezik, ulitsa Stradnieku, 99, kv. 54; Igor S. Agafonov, ulitsa Karla Marxa, 25, kv. 5, both of Daugavpils; Jury N. Kolgan, ulitsa Planernaya, 14, korpus 2, kv. 13, Moscow; Boris G. Goldshtein, ulitsa Molodogvardeiskaya, 24, korpus 1, kv. 26, Moscow, and Igor V. Nikolaev, ulitsa Musy Dzhalilya, 29, korpus 1, kv. 152, Moscow, all of U.S.S.R.
PCT No. PCT/SU89/00206, § 371 Date May 14, 1990, § 102(e) Date May 14, 1990, PCT Pub. No. WO90/03252, PCT Pub. Date Apr. 5, 1990
PCT Filed Aug. 9, 1989, Ser. No. 460,345
Claims priority, application U.S.S.R., Sep. 23, 1988, 4485925
Int. Cl.[5] B25D *9/04, 17/24*
U.S. Cl. 173—133 1 Claim



1. A compression-vacuum action percussive machine comprising:
a casing (1) accommodating a tool (7) at one end thereof;
a cylinder (2) within the casing (1) for housing a piston (3) adapted to reciprocally move within the cylinder (2);
a striker (4) having an extension (9) including an end face formed by a chamfer (10) facing the tool (7) for impacting on the tool (7) and being separated from the piston (3) by a cushion of air (5); and
means for trapping the striker comprising, a sleeve (11) coaxial with the striker (4) and having an end facing the striker (4) and an annular groove (13) formed within an inner wall (12) of the sleeve (11) containing a resilient ring (14) wherein a portion of the resilient ring (14) conforms to the shape of the annular groove (13), an inner annular rib (15) between the annular groove (13) and said end of the sleeve (11), wherein the diameter (d) of the annular rib (15) is smaller than the diameter (D) of the inner wall (12) of the sleeve (11) and greater than the diameter of the extension (9) at the end face, and the inner diameter of the resilient ring (14) is smaller than the diameter of the extension (9) of the striker (4).

5,050,688
**ROCK DRILL FEED SUPPORT**
William N. Patterson, 2796 Foxtail Way, Montrose, Colo. 81401
Filed Nov. 21, 1989, Ser. No. 440,018
Int. Cl.[5] E21C *5/06*
U.S. Cl. 173—147 13 Claims

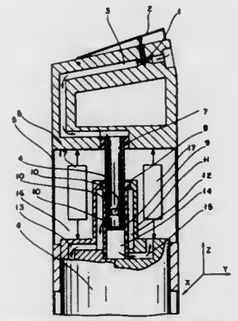


12. A feed support for a pressure fluid operated drill, said drill having a drill motor operated by pressure fluid to activate an elongated drill stem and bit, said feed support comprising:
an elongated feed beam having a substantially open channel space over a predetermined length of said feed beam;
feed mechanism connected to said drill motor for advancing said drill motor along said feed beam, said feed mechanism comprising a support member, an endless flexible chain supported for movement on said support member and spaced apart sprocket means for supporting said chain;
means for connecting said drill motor to said chain at a predetermined point along a first longitudinal run of said chain between said sprocket means;
means for connecting said chain to said feed beam at a predetermined point along the other longitudinal run of said chain between said sprocket means; and
motor means drivably connected to said chain for advancing said drill motor along said feed beam.

5,050,689
**COMPRESSED AIR SUPPLY SYSTEM OF VIBRO-ISOLATED TOOLS**
Marian W. Dobry; Czestaw Cempel, and Wieslaw Garbatowski, all of Poznan, Poland, assignors to Politechnika Poznanska, Poznan, Poland
Continuation of Ser. No. 325,192, Mar. 16, 1989, abandoned. This application May 16, 1990, Ser. No. 525,293
Claims priority, application Poland, Mar. 29, 1988, 271524
Int. Cl.[5] B25D *17/24*
U.S. Cl. 173—162.002 1 Claim
1. A compressed-air supply system for a tool comprising:

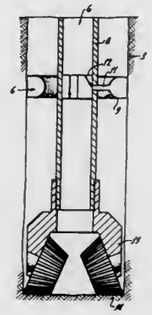


a housing including a grip for holding and manipulating said tool,
a compressed air engine vibrating within the housing,
an air duct extending through said grip, said duct having an air inlet and an air outlet,
a valve mounted at the inlet to said air duct,
an air conducting pipe mounted at the outlet of said air duct, said pipe extending from said grip, one end of said pipe being secured to said grip by means of an elastic connection to provide vibroisolation of said pipe within said grip, the other end of said pipe being closed, the wall of said pipe having openings therethrough spaced apart along the length of the pipe, said holes being of differing diameter,



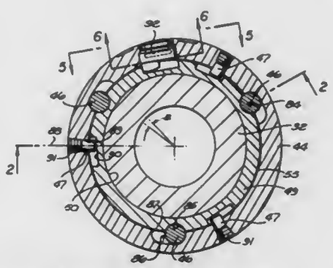
an air inlet sleeve for said compressed air engine mounted on its body,
said closed end of said pipe extending into said sleeve and being axially movable relative thereto,
the wall of said sleeve having a hole therethrough providing a path for supply air to said engine, the holes of said pipe being positioned to individually overlap the hole through said sleeve depending upon the relative position of said pipe within said sleeve, and
means for venting the space formed in said air inlet sleeve between said closed end of said pipe and said body of said engine.

5,050,690
**IN-SITU STRESS MEASUREMENT METHOD AND DEVICE**
John C. Smith, Pasadena, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
Filed Apr. 18, 1990, Ser. No. 510,480
Int. Cl.[5] E21B *49/00;* G01B *5/30;* G01N *3/10*
U.S. Cl. 175—50 15 Claims



1. A method for determining an in-situ stress of a subterranean formation portion penetrated by a borehole containing a drill bit attached to a fluid conducting drill string, the method using: a source of pressurized fluid; a membrane attached to the drill string and inflatable by the fluid, wherein the membrane is capable of causing the formation to fracture when inflated; and a means for diverting at least a portion of the fluid from the drill string to the membrane, said method comprising:
a. running the drill string into the borehole, until the membrane is located proximate to the portion of the formation;
b. diverting at least a portion of the fluid from the drill string to within the membrane causing the membrane to tend to inflate;
c. inflating the membrane until the membrane contacts the formation portion;
d. increasing the pressure of the fluid within the membrane while measuring the rate of pressure change until a rate change caused by a formation fracture is detected; and
e. calculating an in-situ stress based upon the pressure at which the rate change occurred.
9. A fracture producing apparatus for measuring in-situ stress within a borehole extending from a surface and penetrating a subsurface formation comprising:
tubing for conducting a fluid, extending from the surface into said borehole, forming an annular-like space between said tubing and said borehole;
an operating device attached to one end of said tubing and locatable within said borehole;
an inflatable plenum for containing said fluid, said plenum attached to said tubing near said operating device and capable of fracturing said formation when inflated by said fluid;
means for inflating said plenum within said annular-like space until formation fracture;
means for measuring a property of the inflating fluid when said formation fractures, wherein said property is related to an in-situ stress of the formation prior to inflating;
means for calculating said in-situ stress based upon said inflating fluid property, wherein said calculating excludes a measured radial displacement proximate to said subsurface formation; and
means for deflating said plenum.

5,050,691
**DETACHABLE TORQUE TRANSMITTING TOOL JOINT**
John K. Moses, Houston, Tex., assignor to Varco International, Inc., Orange, Calif.
Filed Oct. 10, 1989, Ser. No. 419,532
Int. Cl.[5] E21B *17/043*
U.S. Cl. 175—57 40 Claims



1. A torque transmitting device comprising:
a tubular structure having a thread adapted to be advanced into engagement with a thread of a rotary pipe by turning said structure relative to said pipe about an axis in a predetermined make-up direction, to form a joint for transmitting torque from said structure to said pipe;
a ring carried by said tubular structure and rotatable therewith and having a shoulder engageable axially against a shoulder of said pipe to limit advancement of the threads together;

interengaging bearing surfaces for transmitting force axially from said structure to said ring in a direction axially toward said pipe and permitting limited rotary movement of said structure and said thread thereof relative to the ring;

said bearing surfaces being constructed to retain said ring in a predetermined fixed axial position relative to said tubular structure, preventing any axial movement of said ring relative to said structure, as the structure turns about said axis relative to the ring; and

means limiting the rotary movement of said tubular structure relative to said ring in a joint breaking direction the opposite of said make-up direction to a predetermined angle constituting a small portion of a turn.

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**5,050,692**

## METHOD FOR DIRECTIONAL DRILLING OF SUBTERRANEAN WELLS

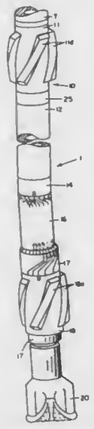
**Herbert W. Beimgraben, Houston, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.**

**Continuation-in-part of Ser. No. 83,520, Aug. 7, 1987, Pat. No. 4,817,740. This application Dec. 16, 1988, Ser. No. 285,081**

**The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.**

**Int. Cl.[5] E21B *7/08***

**U.S. Cl. 175—61** **5 Claims**



1. Method for positioning a motor driven drilling bit relative to a well bore to control the direction of further drilling during directional and deviated drilling operations of a subterranean well, comprising the steps of:

securing to a drill string an apparatus comprising a drill bit and, thereabove, a downhole motor having a housing supportable on the drill string and mounting a fluid motor driven by pressurized fluid supplied through the drill string;

a first tubular housing having an upper end concentrically secured to the lower end of said motor housing;

the lower end of said first tubular housing having a first surface form thereon having an axis angularly disposed relative to the axis of the first tubular housing;

a second tubular housing having a second surface engagable with the first surface;

said second surface being angularly disposed relative to the axis of said second tubular housing, whereby the extent of engagement of the first and second surfaces determines the angular position of the axis of said second tubular housing relative to the axis of the first tubular housing;

means for selectively adjusting the extent of engagement of said first and second surfaces comprising a threaded connection between said surfaces and a selected number of shims inserted between the adjacent ends of said first and second surfaces;

a third tubular housing concentrically secured to the lower end of said second tubular housing;

the third tubular housing having an external surface that is eccentric relative to the bore axis of said third tubular housing;

first angular stabilizer means rotationally adjustably mounted on said external surface;

the first angular stabilizer having an external cylindrical surface that is eccentric relative to the external surface, whereby the lateral position of the first angular stabilizer may be selectively adjusted;

means for rotatably mounting a drilling bit on the third tubular housing;

drive means including universal joints, traversing the bores of the first, second and third tubular housings to operatively connect the fluid motor and the drill bit, and a second adjustable eccentric stabilizer secured to the exterior of the upper end of the motor housing;

continuously actuating the fluid motor through said universal joints and applying a predeterminable weight on the drill bit;

manipulating the apparatus within the well while weight is applied on the bit and the motor is actuated by rotating the drill string when the apparatus encounters straight portions, the drill string not being rotated when said drill string and said apparatus encounter deviated portions of said well, the axis of rotation of the bit being maintained at an angle to the axis of rotation of the housing during all phases of said directional drilling.

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**5,050,693**

## BALANCE AND PROCESS FOR CALIBRATING AND OPERATING THE BALANCE

**Johannes Wirth, and Mario Gallo, both of Zurich, Switzerland, assignors to Wirth Gallo Messtechnik AG, Zurich, Switzerland**

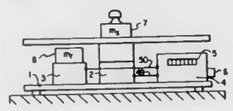
**PCT No. PCT/CH88/00165, § 371 Date May 30, 1989, § 102(e) Date Jul. 10, 1989, PCT Pub. No. WO89/03023, PCT Pub. Date Apr. 6, 1989**

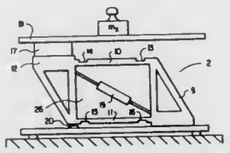
**PCT Filed Sep. 29, 1988, Ser. No. 372,371**

**Claims priority, application Switzerland, Sep. 30, 1987, 3791/87**

**Int. Cl.[5] G01G *19/00, 19/40, 23/10***

**U.S. Cl. 177—200** **12 Claims**





1. Balance for true measurement of mass in which the weight of the material being weighed is compared with the weight of a reference mass, said balance being calibrated by the manufacturer and able to calculate the mass of the material being weighed correctly without recalibration when the gravitational acceleration g deviates from the normal values and vertical acceleration is present, in this case both an angular deviation and vertical acceleration depending on their influence may amount to large fractions of the gravitational acceleration g, characterized by the fact that

two independent dynamometers (2,3) are mounted with elastic initial load on a base plate (1), one of which, dynamometer (2), determines the weight of the material being weighed, and the other, dynamometer (3), determines the weight of a reference mass (8, 22,24),

each dynamometer (2,3) exhibits a load sensor (19), which converts the compressive or tensile force acting on it into an electric signal,

each dynamometer (2,3) exhibits a parallel guide (26), and the two dynamometers are mounted on the base plate (1) in such manner that the degrees of freedom of the two parallel guides (26) are parallel to each other and with a horizontal balance agrees with the direction of gravitational acceleration g,

the two dynamometers (2,3) exhibit linear characteristic line,

a computer (4) is present for mathematical processing of electric signals provided by the dynamometers (2,3) and for receipt of external control commands,

each of the two dynamometers (2,3) exhibits a stop for limitation of the load-stipulated path.



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**5,050,694**

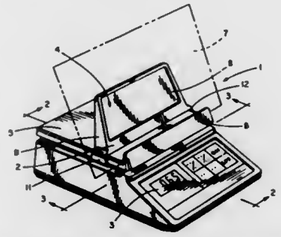
## ADJUSTABLE PLATFORM STAND FOR A WEIGH SCALE

**Charles Liang, Glenview, Ill., assignor to Pelouze Scale Co., Evanston, Ill.**

**Filed Feb. 26, 1990, Ser. No. 484,939**

**Int. Cl.[5] G01G *21/22***

**U.S. Cl. 177—262** **15 Claims**



1. A weigh scale having an adjustable platform stand comprising a scale platform for receiving on a platform weighing surface one or more items to be weighed, an item support slidably engaging the scale platform so that the support is adjustably slideable relative the platform weighing surface to vary the area of surface available for receiving items to be weighed.

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**5,050,695**

## POWER ATTACHMENT FOR WHEELCHAIR

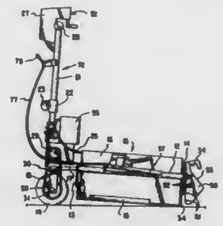
**Henry Kleinwolterink, Jr., Sheldon, Iowa**

**Filed Jul. 16, 1990, Ser. No. 552,982**

**Int. Cl.[5] B62D *1/02***

**U.S. Cl. 180—13** **4 Claims**

1. In combination with a wheelchair adapted to run on a surface and having a chair frame with large rear wheels and castoring front wheels mounted on said chair frame, a motorizing unit having means engaged with said chair frame to raise and support said front wheels above said surface, stand means on said motorizing unit to support said unit apart from said chair, a power drive wheel on said unit, said chair including bar means pivotally attached to said frame, hook means on said motorizing unit and adapted to engage said bar means to lift said unit so that said stand is above said surface and latch means engageable between said chair and said motorizing unit



whereby said chair when latched to said unit is supported by said large wheels and said power driven wheel.

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**5,050,696**

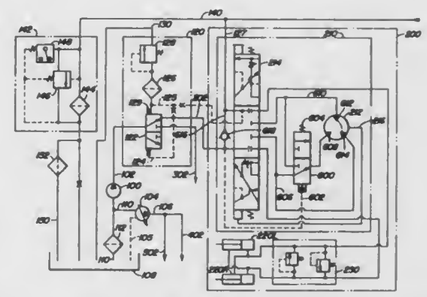
## SECONDARY HYDRAULIC STEERING SYSTEM

**Donald E. McGovern, and Stanley L. Irwin, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.**

**Filed Oct. 20, 1988, Ser. No. 260,158**

**Int. Cl.[5] B62D *5/097***

**U.S. Cl. 180—133** **14 Claims**



1. A secondary steering system for a vehicle, the vehicle having a steering controller operable to control the flow of fluid from a source of pressurized fluid to a fluid operated steering system, the steering controller having a valve assembly that is fluidly coupled to a source of pressurized fluid and a reservoir and which has a first position and a second operating position, a fluid actuated means for imparting follow-up movement to the valve assembly proportional to fluid flow through the valve assembly, the secondary steering system comprising:

a multi-displacement fluid meter that comprises the fluid actuated means, the multi-displacement fluid meter having a full displacement operational configuration and a reduced displacement operational configuration;

a fluid supply path for supplying fluid to the multi-displacement fluid meter when pressurized fluid is not being supplied to the valve assembly from the source of pressurized fluid; and

means for automatically switching the operational configuration of the multi-displacement fluid meter in response to a fluid pressure signal from the source of pressurized fluid.

VOL 1130 ISS 4 SE 24 1991 UMI

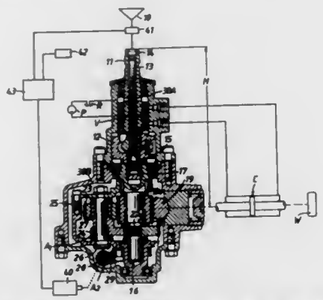


5,050,697

## STEERING APPARATUS FOR AUTOMOTIVE VEHICLE

Atsushi Umemura, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 2, 1990, Ser. No. 591,519
Claims priority, application Japan, Oct. 2, 1989, 1-115960
Int. Cl.[5] B62D *5/06, 5/04*
U.S. Cl. 180—141 5 Claims



1. A steering apparatus adapted for use in an automotive vehicle, comprising:

an input member arranged to be operatively connected to a steering wheel;

an intermediate member coaxially arranged with said input member and being interconnected with said input member for relative rotation on aligned axes;

a support shaft coaxially arranged with said intermediate member and being connected with said intermediate member for rotation therewith;

an output pinion rotatably mounted on said support shaft and being in mesh with the toothed portion of a rack member for operative connection with a set of dirigible road wheels of the vehicle; and

a differential gear mechanism including an input sun gear mounted on said support shaft at a position adjacent said output pinion, first and second planetary gears respectively in mesh with said input sun gear and said output pinion and being rotatably mounted on a common shaft, and a carrier supporting thereon said common shaft and being arranged to be rotated about said support shaft.

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5,050,698

## SYSTEM AND METHOD FOR CONTROLLING VEHICLE SPEED TO DESIRED CRUISE SPEED FOR VEHICLES

Takenori Maeda; Yukio Ikeda, and Yasunori Shimada, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Kanagawa, Japan

Filed Jan. 2, 1990, Ser. No. 460,010
Claims priority, application Japan, Jan. 12, 1989, 1-2416[U]
Int. Cl.[5] B60K *31/04*
U.S. Cl. 180—175 5 Claims

1. A cruise control system for an automotive vehicle comprising:

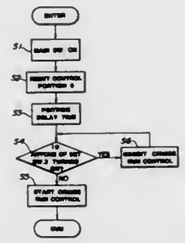
a vehicle speed controlling means for adjusting vehicular traveling speed;

at least one cruise speed setting means for manually commanding a desired cruise speed, said cruise speed setting means being operable between an active state in which a desired cruise speed is commanded and an inactive state in which a command for the desired cruise speed is absent;

a vehicle speed monitoring means for monitoring an actual vehicle traveling speed to produce a vehicle speed indicative signal;

a controller responsive to the manually entered command from said cruise speed setting means for setting a target cruise speed, comparing the actual vehicle traveling speed represented by said vehicle speed indicative signal with said target cruise speed and outputting a cruise control signal for controlling operation of said vehicle speed control means to reduce a difference between said actual vehicle traveling speed and said target cruise speed to zero;

a power supply means for supplying power to said controller, said power supply means including an ON/OFF switch for establishing a power supply for said controller



at an ON position for placing said controller at a stand-by state for accepting said cruise speed command as entered, and blocking the power supply at an OFF position; and

means, responsive to initiation of said power supply for said controller, for discriminating a status of said cruise speed setting means, enabling said controller when said cruise speed setting means is in an inactive state and disabling said controller when said cruise speed setting means is in an active state.

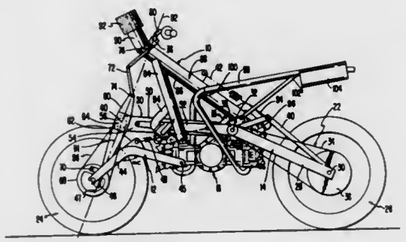
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5,050,699

## TRANSMISSION FOR A VEHICLE HAVING AT LEAST ONE DRIVING WHEEL

Franck Savard, 22, Rue de Launay, Langueux, France 22360

PCT No. PCT/FR89/00297, § 371 Date Feb. 13, 1990, § 102(e) Date Feb. 13, 1990, PCT Pub. No. WO89/12571, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 12, 1989, Ser. No. 477,856
Claims priority, application France, Jun. 13, 1988, 8807859
Int. Cl.[5] B62K *11/00*
U.S. Cl. 180—219 9 Claims



1. A vehicle comprising:

a frame;

at least one front wheel;

at least one rear wheel;

a motor mounted on said frame and operatively connected to drive said front wheel and said rear wheel;

a gear box connected to said motor and having an output shaft;

a front suspension arm operatively supporting said front wheel and pivotally mounted about said output shaft for pivotal movement in the plane of said front wheel; and

a rear suspension arm operatively supporting said rear wheel and pivotally mounted about said output shaft for pivotal movement in the plane of said rear wheel.



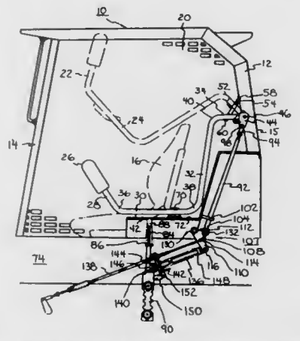
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5,050,700

## SAFETY APPARATUS FOR A SKID-STEER LOADER

In-Keun Kim, Sangok-Dong, Rep. of Korea, assignor to Daewoo Heavy Industries Ltd., Rep. of Korea

Continuation-in-part of Ser. No. 361,302, Jun. 5, 1989, abandoned. This application May 14, 1990, Ser. No. 522,668
Int. Cl.[5] B60R *21/00*
U.S. Cl. 180—268 8 Claims



1. A safety apparatus for a skid-steer loader comprising:

a frame;

a cabin mounted on the frame, said cabin having a front opening, a back side wall and two flank side walls;

a seat bar adapted to restrain or release the operator of the loader, each of said seat bar having a lever integrally secured thereto and rotatably pivoted at a bolt which is fixed to the nearer flank side wall;

a pair of supporting blocks adjustably mounted on the inner surface of the respective flank side walls for retaining said seat bar in a preselected upper and a preselected lower position, each supporting block having an upper and a lower inclined facets so that said seat bar is engaged with the upper facet when said seat bar is placed in its upper position and is engaged with the lower facet when said seat bar is placed in its lower position;

a pair of mounting blocks secured to a lower portion of the respective flank side walls, each mounting block having a convex sliding surface and a concave surface adjacent to the sliding surface to retain said seat bar in its lower position;

a pair of actuating mechanisms adapted to selectively lock or unlock a parking brake of the loader and operating in relation to the positioning of said seat bar, each actuating mechanism having an elongated rod pivotally connected to the lever of said seat bar, an actuating lever pivotally mounted on a side portion of the frame and associated with the lower end of the elongated rod, and means for biasing the actuating lever on an upwardly pushed condition to lock the parking brake wherein said actuating lever is functionally connected to the parking brake through a cable, wherein said each supporting block is held between a pair of brackets integrally attached to its nearer flanked side wall.

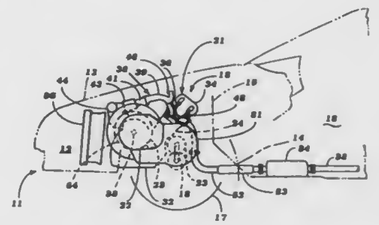
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5,050,701

## ENGINE MANIFOLDING AND ORIENTATION FOR THE ENGINE COMPARTMENT OF A MOTOR VEHICLE

Kaoru Okui, and Manabu Kobayashi, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed May 2, 1989, Ser. No. 346,545
Claims priority, application Japan, May 31, 1988, 63-131491; May 31, 1988, 63-131492; May 31, 1988, 63-131493
Int. Cl.[5] B60K *5/04, 13/04*
U.S. Cl. 180—297 8 Claims



1. In a motor vehicle having an engine compartment with a forward end disposed forwardly with respect to the normal direction of travel for said vehicle and a rearward end, means defining an air flow path through said engine compartment from the forward end toward the rearward end, an engine disposed transversely in said engine compartment, said engine including a cylinder arrangement having a plurality of rearwardly facing exhaust ports, an exhaust manifold affixed to said cylinder arrangement rearwardly thereof for collecting the exhaust gases from said exhaust ports and shielded from air flowing through said engine compartment by said cylinder arrangement, said cylinders being aligned and inclined rearwardly relative to said rearward end of said engine compartment for lowering said exhaust ports, and an exhaust catalyzer positioned in proximity to said exhaust manifold and at the lower portion of said vehicle and rearwardly of said engine compartment for receiving and catalyzing the exhaust gases flowing therefrom.

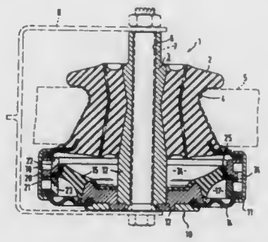
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5,050,702

## CHASSIS MOUNT

Wolfgang Sauer, Ransbach, Fed. Rep. of Germany, assignor to Metzeler GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 26, 1990, Ser. No. 485,162
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905868
Int. Cl.[5] B16F *13/00*
U.S. Cl. 180—300 6 Claims



1. Chassis mount for a vehicle having a chassis and a wheel suspension, comprising an approximately frustoconical rubber body having a lower surface and being retained in the chassis, a central bushing disposed inside said rubber body, a bolt

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having ends and being guided in said central bushing, a fork structure articulatingly connecting the ends of said bolt to the wheel suspension, and a hydraulically damping mount element having two liquid chambers communicating with one another through an overflow conduit, said chambers including a working chamber with an upper surface, said hydraulically damping mount element being mounted as a modular component onto said lower surface of said rubber body with said lower surface of said rubber body forming said upper end surface of said working chamber, wherein said rubber body has a lower outer edge, said hydraulically damping mount element has an external cylindrical housing flanged to said lower outer edge of said rubber body, said overflow conduit is multi-helical, extends inside said housing and has a lower outlet, said central bushing has an axial extension with approximately the same length as said housing and an end surface, and including a rigid plate being flanged to said end surface of said extension and having an outer periphery and a smaller diameter than said housing defining a gap between said outer periphery of said plate and said housing, and two mutually spaced apart parallel annular rubber walls bridging said gap, said lower outlet discharging between said walls.

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**5,050,703**

## ELECTRODYNAMIC TRANSDUCER HEAD

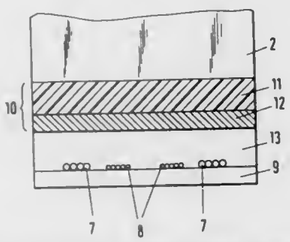
**Alfred Graff, Essen; Friedhelm Schlawne, Kerpen; Michael Wächter, Ratingen, and Wolfgang Böttger, Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany**

**Filed Oct. 5, 1989, Ser. No. 417,329**

**Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3834248**

**Int. Cl.[5] G01N** *29/04*

**U.S. Cl. 181—106** **28 Claims**




1. An electrodynamic transducer head for non-destructive testing of workpieces having an electrically conductive surface comprising

a rare earth alloy magnet system, having a front face disposed on the side of the magnet system toward the workpiece, for generating of a quasi-static magnet field;

an insulating layer adjoining at a first side the front face of the magnet system;

an electrically conductive shielding layer, adjoining at a first side of the insulating layer wherein the insulating layer and the electrically conductive layer form an intermediate part, and wherein the intermediate part is disposed between the transducer coil and said front face of the magnet system, and wherein the intermediate part is associated with the transducer coil, wherein the intermediate part is soildly connected with said front face and with the transducer coil adjoining at the insulating layer, and wherein the thickness of the material of the electrically conductive layer is larger than the skin depth of an electromagnetic field for a given high-frequency of the electromagnetic field;

a casting layer made of a castable plastic and adjoining with one end a second face of the electrically conductive layer;

a first transducer coil embedded within said casting layer for generating ultrasound signals with the transducer coil;

a second transducer coil dispersed substantially concentric to the first transducer coil for picking up reflected signals.

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**5,050,704**

## HARNESS FOR A SAFETY LINE

**Ronny Olsson, Bollnäs, Sweden, assignor to Sala Equip AB, Sala, Sweden**

**PCT No. PCT/SE89/00207, § 371 Date Oct. 19, 1990, § 102(e) Date Oct. 19, 1990, PCT Pub. No. WO89/10160, PCT Pub. Date Nov. 2, 1989**

**PCT Filed Apr. 14, 1989, Ser. No. 585,061**

**Claims priority, application Sweden, Apr. 20, 1988, 8801454**

**Int. Cl.[5] A62B** *35/00*

**U.S. Cl. 182—9** **4 Claims**




1. A harness for a safety line of the type which is intended to hold a person climbing a pole or the like, while allowing him to have his hands free, comprising two fastening means (13,13') for the safety line (2) which are each arranged along a shoulder strap (7,7') of the harness, whereby tensile stresses applied to said fastening means from the safety line are distributed to the harness via said shoulder straps, characterised in that each fastening means (13,13') is movable along a guide (12;7,7') associated with the pertaining shoulder strap and acted on by one or more resilient means (16,23) yieldingly counteracting the movements of the fastening means along said guide.

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**5,050,705**

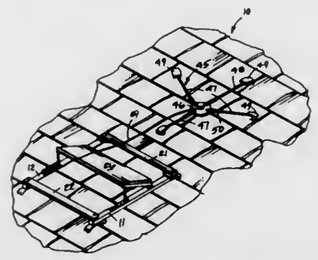
## ROOF CREEPER KIT APPARATUS

**Peter J. Natwick, 9024 6th Ave. NW., Seattle, Wash. 98117**

**Filed Aug. 8, 1990, Ser. No. 564,119**

**Int. Cl.[5] E04G** *3/00*

**U.S. Cl. 182—45** **10 Claims**



1. A roof creeper kit apparatus comprising, in combination,

a support member, the support member including a first deflecting frame rail spaced from parallel to and coextensive with a second deflecting frame rail, and each deflecting frame rail including a deflecting frame rail forward end, and each deflecting frame rail including a deflecting frame rail rear end, and each forward end including a "J" shaped forward hook plate, and each rear end including a "U" shaped hook plate, and

a forward frame brace orthogonally mounted to an upper surface of each frame rail, and

a rear frame brace orthogonally and integrally mounted adjacent the rear terminal end of each frame rail, and

a support platform orthogonally mounted overlying the first and second frame rail, with the support platform including an elongate forward pivot rod, with the forward pivot rod including a right and left end portion, and each respective right and left end portion pivotally mounted to the respective first and second frame rail, and

a "U" shaped adjusting rod mounted underlying a rear terminal end of the support platform, and the "U" shaped adjusting rod including a right and left downwardly depending "L" shaped leg, and

a right and left adjusting bracket mounted to the respective first and second frame rail underlying each "L" shaped leg to permit selective reception of each "L" shaped leg within each respective adjusting bracket to adjustably position the support platform relative to the respective first and second frame rail and

wherein each "J" shaped hook plate includes an elongate body and a single forward hook, with the single forward hook underlying the elongate body defining an acute angle therebetween, and each rear hook plate including a rear elongate body and a single rear hook integrally mounted underlying a forward portion of the rear elongate body, with the single hook defining the acute angle between the single hook and the rear elongate body, and the rear hook plate further including a bifurcated rear hook, with the bifurcated rear hook defining an obtuse included angle between the rear elongate body and the rear bifurcated hook.



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**5,050,706**

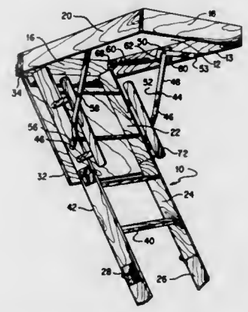
## CEILING LADDER

**Paul E. Cole, Burghill; Barry L. Guy, Poland, both of Ohio, and Jay S. Wasser, Greenville, Pa., assignors to R. D. Werner Co., Inc., Greenville, Pa.**

**Filed Aug. 10, 1990, Ser. No. 565,813**

**Int. Cl.[5] E04F** *11/06*

**U.S. Cl. 182—78** **10 Claims**



1. A counterbalance assembly for a foldable ladder in a ceiling frame comprising:

a spring connected to the ceiling frame;

a linkage comprised of a first arm having an offset to which the spring is attached, a second arm rotatably connected to the first arm, and a third arm rotatably connected to the second arm and to the ladder; and

a pivot plate fixedly connected to the ceiling frame and rotatably connected to the second arm such that when the ladder is fully extended, the offset of the first arm allows the rotatable connection of the first and second arms to be in alignment with the axis of the spring.

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**5,050,707**

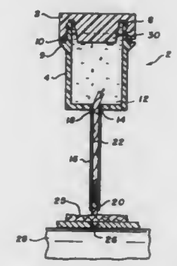
## AUTOMATIC OILING DEVICE

**Arne Wilhelmsen, 4897 Patrick Pl., Burnaby, Canada V5J 3A5**

**Filed Jan. 22, 1990, Ser. No. 468,404**

**Int. Cl.[5] F16N** *23/00*

**U.S. Cl. 184—87** **7 Claims**



1. An automatic oiling device for delivering oil to a bearing comprising:

a sealable container defining a reservoir for oil, said container having an opening therein;

a hollow tube having first and second ends, said first end extending from said opening and communicating with the interior of said sealable container and said second end being open;

wicking material in said hollow tube that extends into the interior of said sealable container at said first end and extends from said open second end of said hollow tube for delivering oil to the bearing;

said hollow tube and said wicking material co-operating to function as an automatic valve to release oil from said sealable container as needed by said bearing, said wicking material being packed into said hollow tube to a density sufficient to allow for an automatic valving cycle that controls the flow of oil involving capillary flow of said oil from said reservoir through said wicking material to said bearing, said flow of oil lowering pressure in said sealable container which eventually results in said capillary flow being curtailed whereupon the lowered pressure in said sealable container is sufficient to draw air through said wicking material and into said sealable container to increase the pressure in said sealable container such that capillary flow resumes and the automatic valving cycle is repeated.

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**5,050,708**

## WHEELCHAIR TRANSFER MECHANISM

**Gregg D. Wood, 3820 Orchard View Ave., Rochester Hills, Mich. 48063**

**Filed Nov. 7, 1989, Ser. No. 432,562**

**Int. Cl.[5] B66B** *9/08*

**U.S. Cl. 187—12** **10 Claims**

10. A wheelchair transfer mechanism for a stairway between top and bottom landings in a staircase, comprising:

a wheelchair having front and rear wheels and adapted to sea a person;

first and second guide rails mounted in vertically spaced relationship on each side wall of the staircase;

a support platform extending fully across the stairway between said first and second guide rails and movably mounted on said first and second guide rails;

a drive means for moving said support platform along said first and second guide rails between the top and bottom landings of the stairway;

said support platform including first and second rod mem-

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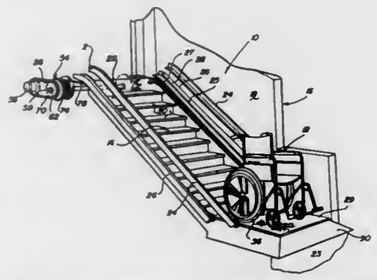


bers being longitudinally spaced and transversely extending and secured to a bottom side of said support platform;

said first and second rod members including a roller rotatably mounted to each end and adapted to translate along said first and second guide rails, respectively;

said support platform including an upper surface and a pair of laterally spaced recesses extending downwardly from said upper surface, said recesses being generally arcuate in shape to receive said rear wheels of said wheelchair;

said second rod member including a pulley secured adjacent said roller;



said first guide rail including a lower horizontal portion extending transversely, said roller of said first rod member being adapted to contact said lower horizontal portion;

said second guide rail including lower and upper horizontal portions extending transversely, said roller of said second rod member being adapted to contact either said lower or upper horizontal portion and disposed therebetween; and

said drive means including a drum, cable wound about said drum and having one end fixed at the top landing of the stairway and passed around said pulley, and a motor for rotating said drum to extend and retract the other end of said cable to move said support platform up and down the stairway.

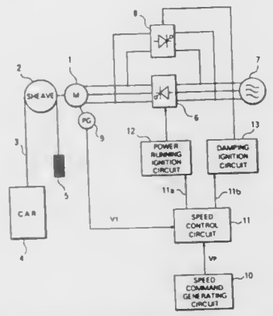
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**5,050,709**

**ELEVATOR CONTROL APPARATUS**

**Masahide Okumura, and Shigemi Iwata, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 13, 1990, Ser. No. 552,220**
**Claims priority, application Japan, Jul. 18, 1989, 1-184934**
**Int. Cl.[5] B66B** *1/30*
**U.S. Cl. 187—116** **4 Claims**




1. An elevator control apparatus comprising:

electric power control means for controlling electric power for feeding to an electric motor which drives the car of an elevator;

speed command generating means for generating a speed command signal of said car;

speed detecting means for detecting the speed of said car;

computing means for calculating the deviation between a speed detecting signal obtained by said speed detecting means and a speed command signal generated by said speed command generating means;

compensating means for outputting an electric power command signal in which gain properties and phase properties have been compensated in accordance with the deviation calculated by said computing means;

comparing means for determining whether or not the deviation calculated by said computing means exceeds a first specified value; and

damping gain setting means for, when said comparing means determines that said deviation exceeds said first specified value, adding a correction value which is based on said deviation to the electric power command signal from said compensating means in order to output the added correction value as an electric power control signal to said electric power control means.

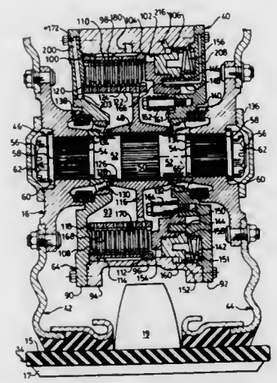
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**5,050,710**

**WET DISC BRAKE MECHANISM**

**Brent C. Bargfrede, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.**

**Filed Apr. 10, 1990, Ser. No. 506,737**
**Int. Cl.[5] F16D** *55/02*
**U.S. Cl. 188—71.6** **13 Claims**



1. A wet disc brake mechanism for a vehicle comprising:

a wheel assembly having an axially inner side portion, an axially outer side portion, a wheel shaft connecting the inner and outer side portions, an annular housing assembly rotatably supporting the wheel shaft for rotation about an axis and located between the side portions within the wheel assembly;

a support member connected to the vehicle and extending radially inwardly between the side portions and connected to the housing assembly for supporting the wheel assembly;

a brake hub connected to the wheel shaft;

adjustment means for adjusting the angular disposition of the housing assembly relative to the support member and thereby the angular disposition of the wheel axis;

a brake assembly including a first plurality of plates connected to the housing assembly, a second plurality of plates connected to the brake hub and interleaved with the first plurality of plates, and actuating means within the housing assembly for controllably clamping the interleaved plates together and braking the wheel assembly; and



passage means for delivering a control fluid to the actuating means for controlled operation of the brake assembly, the passage means being defined within the support member and the housing assembly, said passage means including coupling means for retaining fluid within the housing assembly while said adjustment means are being adjusted, said coupling means including a telescopic coupling sleeve positioned within said passage means and a plurality of sealing rings positioned on said coupling sleeve.

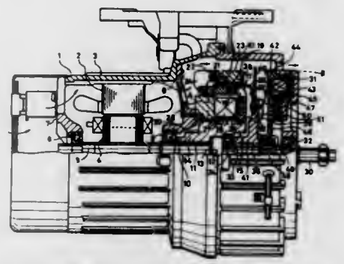
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**5,050,711**

**ELECTROMAGNETIC BRAKE APPARATUS**

**Tatsuya Sawato, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 15, 1990, Ser. No. 493,732**
**Claims priority, application Japan, Mar. 16, 1989, 1-64200**
**Int. Cl.[5] B60L** *7/00*
**U.S. Cl. 188—164** **5 Claims**



1. An electromagnetic brake apparatus comprising:

a yoke fixed to a bracket;

a stationary brake member having a through-hole at the center thereof, which is fixed integrally to said bracket facing said yoke, and including

(a) a first press-worked plate having a first cylinder part, a first bottom part which defines said through-hole, which extends from one end of said first cylinder part, and which includes plural engaging members raised toward an inside of said first cylinder part, and a first brim part which extends from an other end of said first cylinder part, and

(b) a second press-worked plate having a second cylinder part which is laminated on said first cylinder part of said first pressed-worked plate, a second bottom part which defines said through-hole, which extends from one end of said second cylinder part, and which includes plural first hooks for gripping an inside edge of said first bottom part which forms said through-hole, and a second brim part which extends from an other end of said second cylinder part and which includes plural second hooks for gripping an outside edge of said first brim part along an outside edge of said second brim part;

a rotatable armature which is connected to an output shaft;

means for rotating said armature while said stationary brake member is maintained in a stationary position; and

an exciter coil which is positioned between said yoke and said stationary brake member to magnetically bring said armature into frictional contact with said stationary brake member to stop said rotation of said armature.

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**5,050,712**

**SHOCK ABSORBER**

**Robert J. Heldeman, Westland, Mich., assignor to Enertrols, Inc., Westland, Mich.**

**Filed Apr. 25, 1989, Ser. No. 342,912**
**Int. Cl.[5] F16F** *9/48, 9/34*
**U.S. Cl. 188—287** **16 Claims**

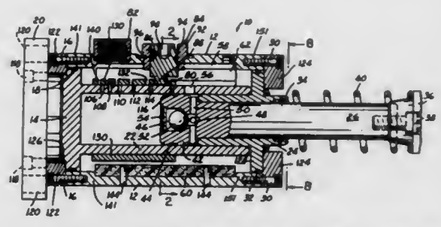
1. A shock-absorbing device suitable to be mounted on a structure and of the type employing hydraulic fluid for absorbing the kinetic energy of a moving member so as to decelerate the member, comprising:

a tubular cylinder having a plurality of longitudinally spaced holes therein through which said fluid may flow;

a piston slidable within said cylinder and adapted to be displaced by said member to force said hydraulic fluid through said holes;

a sleeve slidably surrounding said cylinder, said sleeve including a plurality of longitudinally spaced openings therein cooperable with said holes in said tubular cylinder to meter the amount of said hydraulic fluid flowing through said holes, each of said openings being defined by a cross-cut opening extending through a portion of the wall of said sleeve and transverse to the longitudinal axis of said sleeve;

adjustment means coupled with said sleeve for sliding said sleeve in an endless orbital path relative to said tubular cylinder so as to control the registration of said holes with said openings, said adjustment means being shiftable to any of a plurality of positions respectively representing choices of metering rates for said hydraulic fluid; and



an outer tube surrounding and radially spaced from said tubular cylinder to define a volume within said device for containing said hydraulic fluid, a pair of end caps having end faces respectively closing opposite ends of said outer tube;

a pair of retainers respectfully bearing against the opposite ends of said outer tube and overlying said end caps, and threaded fastening means extending through said retainers into said outer tube;

a mounting plate for mounting said shock absorbing device on said structure;

means for releasably securing said mounting plate on one of said retainers, and said one retainer being ring-shaped and including a plurality of circumferentially spaced openings therein, one of said end faces being adjacent said one retainer and having a boss extending into an inner periphery of said one retainer; and

said securing means including a plurality of threaded fasteners respectfully extending into said openings in said one retainer.

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**5,050,713**

**TRAVEL BAG**

**Robert M. Lee, Reno, Nev., assignor to Hunting World, Incorporated, Sparks, Nev.**

**Filed Feb. 12, 1990, Ser. No. 478,420**
**Claims priority, application Italy, Feb. 13, 1989, 20568 B/89**
**Int. Cl.[5] A45C** *13/10, 13/26*
**U.S. Cl. 190—108** **12 Claims**

1. A travel bag comprising:

(a) two structurally independent and separately usable pouches each having a back wall with a top formed as a horizontally extending bar; and

(b) means for securely yet detachably interconnecting said pouches in back-to-back relation to each other, said interconnecting means including

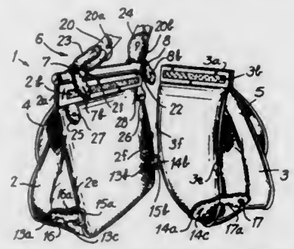
(i) first interengageable fastening means having portions

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respectively attached to the two pouches for holding the respective bars of the two pouches together and

(ii) second interengageable fastening means having portions respectively attached to the two pouches for holding the lower portions of the two pouches together, said second fastening means comprising at least two tongues interconnecting the sides of said pouches by passing through a ring link.



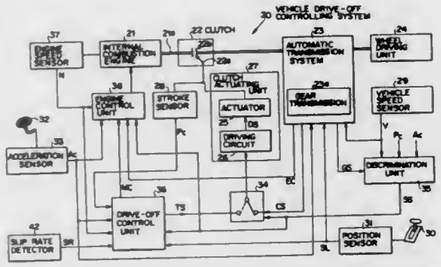
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5,050,714

## SYSTEM AND METHOD FOR CONTROLLING VEHICLE DRIVE-OFF

**Kazumasa Kurihara, and Shigeru Yajima, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan**

Filed Dec. 12, 1989, Ser. No. 449,267
Claims priority, application Japan, Dec. 15, 1988, 63-314977
Int. Cl.[5] B60K *41/02*
U.S. Cl. 192—0.032 17 Claims



1. A drive-off control system for a vehicle powered by an internal combustion engine whose rotational output is transmitted through a clutch to a wheel driving assembly, said system comprising:

means for detecting the operation of an accelerating member;

means for determining a target clutch stroke of the clutch in response to the level of operation of said accelerating member in order to drive the vehicle off;

means for discriminating whether or not the engine is in a condition of power insufficiency and whether said engine has subsequently recovered from said condition;

means for detecting an actual clutch stroke of the clutch;

means for controlling the clutch to provide an actual clutch stroke which follows the target clutch stroke for driving the vehicle off, said means for controlling being inhibited by a power insufficiency signal from said means for discriminating;

means for establishing a clutch stroke which will result in recovery of said engine from said power insufficiency;

means for producing correction data based on the difference between the target clutch stroke and the actual clutch stroke at a time the engine has recovered from power insufficiency, and in response to said discriminating means;

a correcting means for correcting the target clutch stroke by an amount corresponding to the correction data to obtain a corrected target clutch stroke; and

means for providing the corrected target clutch stroke to said control means after the recovery from power insufficiency, such that the clutch engagement is controlled to follow the corrected target clutch stroke following said recovery.

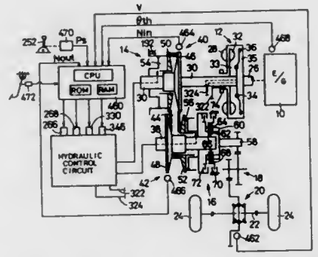
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5,050,715

## HYDRAULIC CONTROL APPARATUS FOR VEHICLE POWER TRANSMITTING SYSTEM HAVING FLUID COUPLING INCORPORATING LOCK-UP CLUTCH

**Hiroshi Itoh; Kunio Morisawa, both of Toyota; Ryoji Habuchi, Aichi; Masami Sugaya, and Yoshinobu Soga, both of Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan**

Filed Feb. 7, 1990, Ser. No. 476,350
Claims priority, application Japan, Feb. 13, 1989, 1-33142
Int. Cl.[5] F16D *33/00;* B60K *41/28*
U.S. Cl. 192—3.3 11 Claims



1. A hydraulic control apparatus for a power transmitting system for an automotive vehicle having a fluid coupling equipped with a lock-up clutch, and a transmission to which power is transmitted from an engine of the vehicle through the fluid coupling, the fluid coupling having an engaging chamber and a releasing chamber for operating the lock-up clutch such that the lock-up clutch is engaged and released with a working fluid supplied to one of the engaging and releasing chambers and discharged from the other of the chambers, wherein the improvement comprises:

a discharge passage communicating with said engaging chamber of said fluid coupling, for normally draining said engaging chamber to a drain;

a lock-up clutch rapid release valve connected to said discharge passage, and operable to bypass connect said discharge passage to said drain therethrough, for thereby rapidly draining said engaging chamber to rapidly release said lock-up clutch; and

a lock-up pressure regulating valve for regulating a lock-up clutch pressure applied to said fluid coupling, normally to a first value, and upon operation of said lock-up clutch rapid release valve, to a second value higher than said first value.

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5,050,716

## TORQUE CONVERTER DRIVE UNIT

**Reed K. Christensen, 4445 Whispering Oaks Cir., Roseville, Calif. 95661**

Filed Oct. 23, 1990, Ser. No. 602,860
Int. Cl.[5] B60K *17/02*
U.S. Cl. 192—3.23 13 Claims

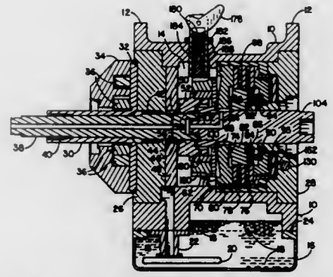
1. A torque converter drive apparatus, comprising:

(a) a rotatable driving element, said driving element including means for receiving rotational energy from a torque converter;

(b) a rotatable driven element, said driven element including means for transferring rotational energy to a vehicle transmission;

(c) friction coupling means for coupling said driving element to said driven element whereby rotational energy applied to said driving element is transferred to said driven element;





(d) braking means for preventing said driven element from rotating, said braking means being coupled to said driven element; and

(e) braking control means for selectively engaging and disengaging said braking means, rotational energy applied to said driving element being transferred to said vehicle transmission upon disengagement of said braking means.

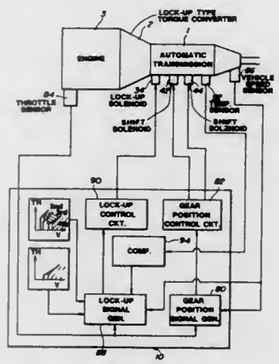
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5,050,717

## TEMPERATURE RESPONSIVE LOCK-UP CONTROL FOR MOTOR VEHICLE WITH AUTOMATIC TRANSMISSION

**Takashi Shibayama, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan**

Filed Mar. 29, 1990, Ser. No. 500,956
Claims priority, application Japan, Mar. 31, 1989, 1-82430
Int. Cl.[5] F16H *45/02;* B60K *41/28*
U.S. Cl. 192—0.052 6 Claims



1. In a motor vehicle having an engine, a torque converter with a fluid operated lock-up clutch, and an automatic transmission including a plurality of fluid operated frictional devices, the automatic transmission being drivingly connected via the torque converter to the engine, the automatic transmission being shiftable among a plurality of gear positions including a predetermined gear position, a lock-up control comprising:

means for detecting a fluid temperature of hydraulic fluid which is used in the torque converter and the automatic transmission and generating a fluid temperature indicative signal indicative of said fluid temperature detected;

means responsive to said fluid temperature indicative signal for setting a lock-up range at the predetermined gear position when said fluid temperature indicative signal fails to be greater than a predetermined temperature value, and setting said lock-up range to stretch beyond said predetermined gear position to include at least another one of the plurality of gear positions such that said lock-up range covers both said predetermined gear position and said another of the plurality of gear positions when said fluid temperature indicative signal is greater than said predetermined temperature value;

means for detecting predetermined operating variables of the motor vehicle and generating signals indicative of said predetermined operating variables detected;

means for generating a lock-up signal when said signals indicative of said predetermined operating variables indicate that the motor vehicle operates in said lock-up range; and

means for engaging the lock-up clutch in response to the presence of said lock-up signal.

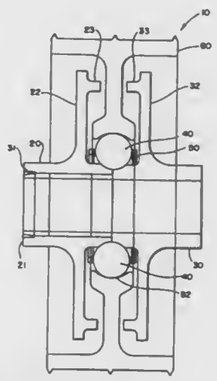
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5,050,718

## CONVEYOR TRANSFERRING DEVICE

**Donald P. Orlosky, Timberlake, Ohio, assignor to Axia Incorporated, Oak Brook, Ill.**

Continuation of Ser. No. 291,205, Dec. 28, 1988, abandoned.
This application Feb. 20, 1990, Ser. No. 483,324
Int. Cl.[5] B65G *13/00*
U.S. Cl. 193—35 R 18 Claims



1. A conveyor wheel, comprising:

a male hub having first and second portions, said first portion having an axially outer end and an axially inner end, said axially inner end defining a curved surface, said second portion having a reduced outer diameter with respect to said first portion;

a female hub having an outer diameter substantially identical to the outer diameter of the first portion of the male hub and mateably engaging the male hub on the second portion of the male hub, the female hub having an axially inner end and an axially outer end, said axially inner end of said female hub defining a curved surface;

an outer wheel hub having an outer circumference for supporting an object and an inner curved surface; and

a plurality of ball bearings supporting the outer wheel hub with respect to the male and female hubs, the ball bearings being contained in a channel formed by the inner curved surface of the outer wheel hub, the curved surface at the axially inner end of the first portion of the male hub, and

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the curved surface at the axially inner end of the female hub;

wherein the outer wheel hub includes at least one ridge of substantially triangular cross-section extending around the entire outer circumference.

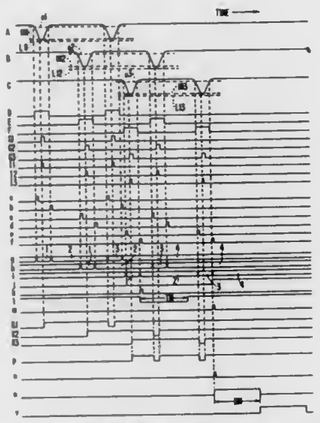
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5,050,719

## COIN RECEIVING APPARATUS FOR A VENDING MACHINE

Kazuo Shimizu, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 14, 1989, Ser. No. 450,750
Claims priority, application Japan, Dec. 14, 1988, 63-315895
Int. Cl.[5] G07F *3/02*
U.S. Cl. 194—202 10 Claims



5. A coin receiving apparatus comprising:

first coin detector means for detecting the diameter of a deposited coin as the deposited coin passes through a coin detection path and outputting a signal corresponding to the diameter of the deposited coin;

at least one additional coin detector means for detecting coin characteristics other than coin diameter as the deposited coin passes through the coin detection path and outputting at least one additional signal corresponding to detected characteristics of the deposited coin;

coin authenticity decision means, responsive to the signal output from the first coin detector means and the at least one additional signal output from the at least one additional coin detector means, for determining whether a deposited coin is authentic and outputting an authentic coin signal if the deposited coin is determined to be authentic;

consecutive deposit determination means, responsive to the first coin detector means and the at least one additional coin detector means, for outputting a consecutive deposit signal when a first deposited coin is detected by one of the at least one additional coin detector means after a second deposited coin is detected by the first coin detector means and outputting a consecutive deposit signal;

timer means, responsive to the consecutive deposit signal, for outputting a timer signal having a predetermined length of time; and

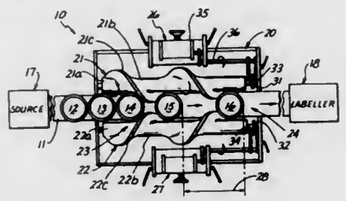
coin acceptance control means, responsive to the authentic coin signal, consecutive deposit signal and the timer signal, for controlling the acceptance or rejection of a deposited coin, whereby a deposited coin is accepted when the authentic signal is present and no consecutive deposit signal and timer signal are present, and is rejected when a consecutive deposit signal and timer signal are present.

5,050,720

## INTERCHANGEABLE FEEDSCREW SYSTEM

Michael Crankshaw, Santa Fe Springs, Calif., assignor to Label-Aire Inc., Fullerton, Calif.

Filed Oct. 27, 1989, Ser. No. 428,123
Int. Cl.[5] B65G *33/02*
U.S. Cl. 198—467.1 12 Claims




1. A feedscrew system, comprising:

means defining a support structure for rotatably supporting a selected feedscrew assembly adjacent a conveyor in order to control articles moving on the conveyor toward a processing station;

mounting means for releasably and rotatably mounting the selected feedscrew assembly on the support structure so that the selected feedscrew assembly can be mounted on and removed from the support structure as a unit;

drive means for driving the selected feedscrew assembly at a desired rotational speed;

a plurality of interchangeable feedscrew assemblies, including at least a first feedscrew assembly and a second feedscrew assembly;

the first feedscrew assembly including a first feedscrew and first coupling means mounted on the first feedscrew for coupling the first feedscrew assembly to the drive means so that the first feedscrew assembly rotates at a first rotational speed;

the second feedscrew assembly including a second feedscrew and second coupling means mounted on the second feedscrew for coupling the second feedscrew assembly to the drive means so that the second feedscrew assembly rotates at a second rotational speed which is different from the first rotational speed; and

said drive means being capable of accommodating and driving the coupling means of said first and second feedscrew assemblies.

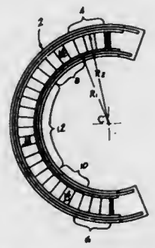
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5,050,721

## STEP RISER PROFILE FOR CURVED ESCALATOR

Frank Sansevero, West Hartford, Conn.; Peter Borchers, Bad Nenndorf/OT Hackmuhlen, and Knut Wallbaum, Wunstorf, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Sep. 11, 1990, Ser. No. 580,742
Int. Cl.[5] B66B *21/00, 23/12*
U.S. Cl. 198—328 5 Claims



1. An escalator step for use in an escalator having a path of travel in plan which is defined by a fixed radius struck from a constant center, said step comprising:

a. a tread; and

b. a riser connected to said tread, said riser being defined by curves in side elevation which have a maximum radius at the point of intersection of said riser with said tread and a minimum radius at the point on said riser most distal from said tread.



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5,050,722

## APPARATUS FOR ORIENTING ARTICLES

Frank Beswick, Phoenixville, Pa., assignor to The West Company Incorporated, Phoenixville, Pa.

Division of Ser. No. 391,088, Aug. 8, 1989. This application Mar. 2, 1990, Ser. No. 488,680
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—392 3 Claims



1. An orientor for orienting elements having a top side, and a bottom side of smaller cross section than the top side, said elements including a flange, said orientor comprising a central conically shaped rotatable bowl defining an open chamber for said elements where they are positioned in random fashion to a discharge station, a first trackway communicating with said chamber to direct said elements from said chamber to an annular surface of said bowl defining a pathway for said elements above said chamber wherein said elements are still disposed in random fashion, a first deflector means spaced above said annular surface a height slightly greater than the height of said elements to orient said elements so that they are oriented on said annular surface either top or bottom side down and a second deflector means downstream of said first deflector means positioned to narrow the path on said annular surface so that only said elements facing top side down can proceed along said path to said discharge station, said second deflector extends across said pathway to a point where the distance between the inner edge of said pathway and said second deflector is less than the diameter of said enlarged flanged portion of said element and is spaced above said pathway a predetermined distance slightly greater than the thickness of said flange whereby said stoppers oriented in a flange, or face down position continue along said pathway and said elements with a flange, or face up position are deflected back into said bowl.

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5,050,723

## BOTTLE ORIENTING DEVICE

Kenneth Herzog, 135 Industrial Blvd., Riverhead, N.Y. 11901

Filed Oct. 31, 1990, Ser. No. 606,771
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—395 7 Claims

1. A device for orientating random bottles onto a conveyor comprising:

a) a frame member which sits upon a flat surface;

b) a rotating feed drum carried on said frame member, said feed drum sized to hold a plurality of random deposited bottles therein;

c) a chute to transport the random bottles end to end from said feed drum;

d) a table top carried on said frame member and located at the distal lower end of said chute;

e) a stop member positioned on said table top to retain one of the horizontal bottles;

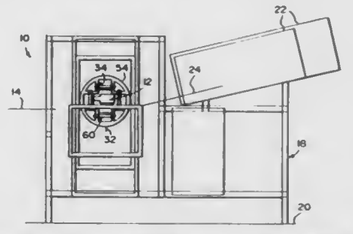
f) a push member positioned on said table top transversely adjacent to said stop member;

g) an orientation wheel having a plus sign shaped aperture and rotatably carried between a plurality of rotors on said frame member opposite from said push member;

h) a first sensor located within said stop member to register the presence of a horizontal bottle against said stop member so as to send a signal to said push member to move the horizontal bottle into the aperture in said orientation wheel;

i) means for rotating said orientation wheel clockwise and counterclockwise ninety degrees;

j) a second sensor located on said table top between said stop member and said push member to register the presence of the neck or body of the bottle against said stop member so as to send a signal to said rotating means to rotate said orientation wheel clockwise ninety degrees when the body of the bottle was against said stop member and rotate said orientation wheel counterclockwise ninety degrees when the neck of the bottle was against said stop member so that the bottle will always be placed into an upright position;



k) a dead plate positioned adjacent said orientation wheel opposite from said table top so as to receive the upright bottle when another horizontal bottle is moved into said orientation wheel;

l) a conveyor positioned next to said dead plate to receive each upright bottle; and

m) a guide roller carried on said conveyor to cushion the discharge of each upright bottle to turn when going from said dead plate onto said conveyor.

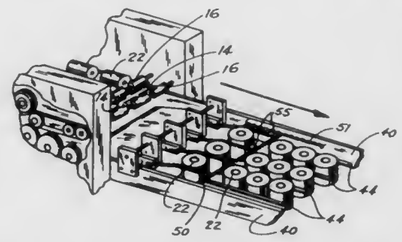
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5,050,724

## ROLL INFEED CONVEYOR

John E. Nordstrom, 2408 Jefferson St., Two Rivers, Wis. 54241, assignor to John E. Nordstrom and Barbara Ann Nordstrom, both of Two Rivers, Wis., a part interest

Filed Sep. 26, 1990, Ser. No. 588,246
Int. Cl.[5] B65G *47/24*
U.S. Cl. 198—407 10 Claims



1. A device for moving workpieces in a conveyor system comprising:

a first conveyor which advances the workpieces in axial end to end contact;

a plurality of upper accelerating rollers;

a plurality of lower accelerating rollers;

a second conveyor comprising a belt supported on at least

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one set of moveable rollers with a first vertically moveable roller, a second median roller, and a third end roller;

a frame supporting the first vertically moveable roller;

the first vertically moveable roller being pivotable about an axis generally central with the second median roller and driving means for driving at least one of the plurality of said upper accelerating rollers at a rate faster than the remaining said upper and lower accelerating rollers;

whereby the first vertically moveable roller of the second conveyor may be moved to a position generally below the plane of the plurality of lower accelerating rollers and at least one upper accelerating roller is driven at a rate faster than the remaining upper and lower accelerating rollers to successive work pieces so that the workpieces on the first conveyor are turned 90 degrees and deposited on the second conveyor.

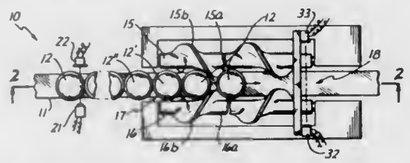
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**5,050,725**

## FEEDSCREW SYSTEM AND METHODOLOGY

**Arthur B. Newell, Santa Ana, and Dwain M. Gipson, Corona, both of Calif., assignors to Label-Aire Inc., Fullerton, Calif.**

**Filed Oct. 27, 1989, Ser. No. 428,121**
**Int. Cl.[5] B65G *47/26***
**U.S. Cl. 198—444** **18 Claims**



1. A feedscrew system, comprising:

conveyor means for moving articles from a source of the articles toward a processing station;

feedscrew means for spacing the articles, the feedscrew means including at least one feedscrew located proximate the conveyor means, the feedscrew having an entrance and an exit;

first sensing means for sensing the occurrence of a gap between any two adjacent articles as the articles are moved by the conveyor means toward the feedscrew; and

control means responsive to the first sensing means sensing the occurrence of such a gap for controlling the rate at which the feedscrew operates in order to maintain a jam-feed condition;

the control means including means for stopping the feedscrew in order to reduce the rate at which the feedscrew operates to zero;

motor means for driving the feedscrew and clutch means for coupling the motor means to the feedscrew;

the means for stopping the feedscrew is configured to disengage the clutch means in order to reduce the rate at which the feedscrew operates to zero if the gap continues for a predetermined period of time;

second conveyor means located proximate the feedscrew for engaging a top portion of each of the articles as each of the articles moves out of the feedscrew; and

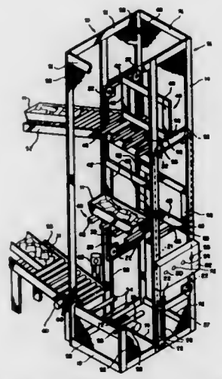
means for delaying disengagement of the clutch means when the top portion of an article within the feedscrew is engaged by the second conveyor means until the article is out of the feedscrew.

**5,050,726**

## VERTICAL LIFT CONVEYOR

**Rodger H. Flagg, 2101 Crystal Plaza Arc., Suite 135, Arlington, Va. 22202, and Cristopher H. Flagg, 8514 Sinon St., Annandale, Va. 22003**

**Filed Oct. 15, 1990, Ser. No. 597,330**
**Int. Cl.[5] B65G *47/04***
**U.S. Cl. 198—475.1** **20 Claims**



1. An improved vertical lift conveyer apparatus, for moving articles between different heights, comprising:

a) a support structure having opposed first and second sides disposed in parallel, spaced relation, with cross braces extending between the first and second sides;

b) a first drive means secured by a plurality of rotating means to the first side of the support structure; and a second drive means secured by a plurality of rotating means to the second side of the support structure; the first and second drive means each forming a rectangular path of travel of equal length, in a vertically offset alignment of a pre-determined distance;

c) at least one cantilevered platform having at least three spaced, horizontal supports secured to a rear support;

d) a first, mounting bracket secured to the cantilevered platform on one side in proximity to the rear support; and a second, mounting bracket secured to the cantilevered platform on the opposite side in proximity to the rear support, the first and second mounting brackets secured to the cantilevered platform in a vertically offset alignment of a pre-determined distance substantially equal to the offset alignment of the first and second drive means;

e) a first horizontal pin secured to the first drive means and positioned to rotatably engage the first mounting bracket, and a second horizontal pin secured to the second drive means and positioned to rotatably engage the second mounting bracket, in vertical offset alignment of a pre-determined distance substantially equal to the vertical offset alignment of the first and second drive means;

f) a first roller rotatably secured adjacent to the first drive means in axial alignment with the first horizontal pin; and a second roller rotatably secured adjacent to the second drive means in axial alignment with the second horizontal pin;

g) a first channel having a base and sides, the base secured to the first side of the support structure, substantially in alignment with the rectangular path of travel of the first drive means; a second channel having a base and sides, the base secured to the second side of the support structure substantially in alignment with the rectangular path of travel of the second drive means; the first and second channels sized to freely receive the respective first and second rollers therein; and

h) a power means secured to the support structure, and



positioned to rotate the first and second drive means at equal speeds, about the vertically offset, rectangular path of travel.

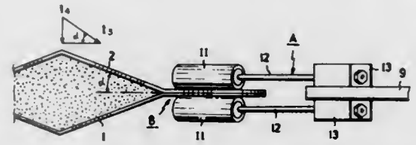
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**5,050,727**

## CONVEYING METHOD AND CONVEYOR APPARATUS

**Toshio Akesaka, Kanagawa, Japan, assignor to Kabushikikaisha Isekikaihatsu Koki, Japan**

**Filed Oct. 10, 1989, Ser. No. 419,036**
**The portion of the term of this patent subsequent to Jun. 26, 2007, has been disclaimed.**
**Int. Cl.[5] B65G *15/14***
**U.S. Cl. 198—626.1** **14 Claims**



1. A conveying method comprising superimposing portions of two oppositely arranged belts; applying tensile forces in the direction of the width to the said superposed belts; generating pinching and holding forces for pinching and holding the material to be conveyed by the superposed belts by utilizing the said tensile forces; depositing material to be conveyed upon one of the said belts; and moving the belts and pinching and holding the conveyed material between the superposed belts.

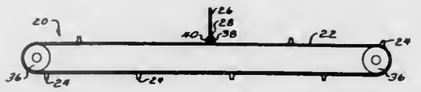
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**5,050,728**

## SWATHER BELT CONNECTOR

**Jerry R. Dimmer, and Antonin Pelc, both of Wahpeton, N. Dak., assignors to Wahpeton Canvas Co., Inc., Wahpeton, N. Dak.**

**Filed Feb. 5, 1990, Ser. No. 451,568**
**Int. Cl.[5] B65G *15/30***
**U.S. Cl. 198—844.2** **11 Claims**



1. A belt connector for holding the inside surface of one end of a belt against the inside surface of the other end, the connector comprising:

an integral stud having elongated head with length at least approximately three times its width and threaded male portion protruding perpendicularly to the head; and

an elongated integral nut having length at least approximately three times its width and a threaded aperture proportioned to receive the protruding male portion, the aperature extending perpendicular to the length of the nut;

wherein the stud further comprises a raised portion on the head opposite the male portion, the raised portion being centrally located with respect to the width of the head and extending the majority of the length of the head.

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**5,050,729**

## TOOTH STORAGE CONTAINER

**Edith M. Karbowniczak, P.O. Box 0493, E. Syracuse, N.Y. 13057**

**Filed Aug. 8, 1990, Ser. No. 564,117**
**Int. Cl.[5] A61C *19/10*; B65D *27/04***
**U.S. Cl. 206—83** **4 Claims**

1. A tooth storage container comprising in combination,

an envelope body, the envelope body including a forward wall positioned adjacent to a rear wall with the forward wall and rear wall defining an envelope body cavity therebetween, a V-shaped recess is directed downwardly and medially of an upper edge of the forward wall and a cover flap mounted to the rear wall is arranged to complementarily overlie the V-shaped recess,

and

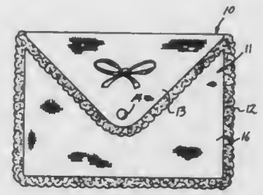
the cover flap defined by a triangular configuration, the cover flap including a first snap fastener member mounted adjacent a medially oriented apex of the cover flap to cooperate with a second snap fastener member with the second snap fastener member mounted through the forward wall adjacent a lower apex of the V-shaped recess,

and

wherein an adhesive strip is mounted longitudinally of the rear wall and includes a first peel away flexible layer overlying the adhesive strip to permit selective exposure of the adhesive strip for mounting of the envelope body,

and

wherein the forward wall includes a convex transparent window mounted through the forward wall with the window including a window top wall and a window bottom wall with the window top wall and window bottom wall each arranged orthogonally relative to the forward wall of the envelope body to protrude the window beyond the forward wall, and the window defining a pocket with a rear wall directed through the forward wall and interiorly of the envelope body coextensively with the window to define a pocket.



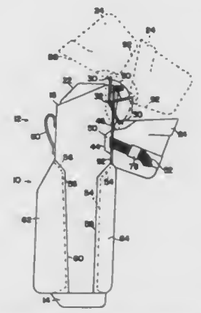
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**5,050,730**

## GOLF CLUB STORAGE AND TRANSPORT CONTAINER

**James E. Suberbielle, Rte. Box 220-6, Jasper, Tex. 75951**

**Filed Aug. 7, 1989, Ser. No. 390,100**
**Int. Cl.[5] A63B *55/00***
**U.S. Cl. 206—315.4** **8 Claims**



1. A golf bag to be used and transported on a golf cart including:

an elongated container having an upper access opening formed therein, a first recessed portion formed in an upper portion of the elongated container, and a second recessed portion aligned under and adjacent to the first recessed portion;

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means for covering the access opening of the container when in a first position and for spacing the container a predetermined diagonal distance from a back portion of the golf cart when in a second position, the covering and spacing means including a recessed portion formed in a lower portion thereof, aligned above and adjacent to the first recessed portion in the elongated container;

means for pivotally coupling the covering and spacing means to the container so that when the covering and spacing means is pivoted to the first position the access opening in covered and so that when the covering and spacing means is pivoted to the second position the access opening is open and the container is positioned to extend diagonally outwardly from the golf cart thereby achieving a predetermined longitudinal angle to allow access to the container by the user; and

an abutment formed at an upper portion of the first recessed portion.

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**5,050,731**

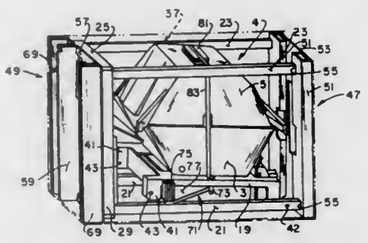
**PACKAGING SYSTEM FOR PRE-ASSEMBLED GAS BARBEQUE GRILL**

**William R. Baynes, and Henry C. Schubert, both of Perry, Ill., assignors to Charmglow Industries, Inc., DuQuoin, Ill.**

**Filed Jul. 23, 1990, Ser. No. 557,317**

**Int. Cl.[5] B65D** *85/00*

**U.S. Cl. 206—320** **25 Claims**



1. A packaging system for a pre-assembled barbeque grill having spaced leg supports and a grill housing located in a collapsed position relative to said leg supports during shipping, said grill housing subsequently movable to an extended position relative to said leg supports during operation and use of the barbeque grill, said packaging system being usable when said grill housing is located in its collapsed position and including:

a carton surrounding the collapsed grill housing and associated leg supports;

separate end pad means positioned at opposite ends of said leg supports between said leg supports and said carton, each said separate end pad means extending both longitudinally and laterally beyond said leg supports for absorbing shock during shipping and handling; and

grill housing pad means independent of each said separate end pad means for limiting movement of said grill housing relative to said leg supports in the shipping carton during shipping and handling.

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**5,050,732**

**PACKAGING FOR COMPONENTS HAVING FLEXIBLE LEADS**

**Harry E. Hunsicker, Jr., 7806 Naulton Ct., Hanover, Md. 21076**

**Filed Apr. 4, 1990, Ser. No. 503,917**

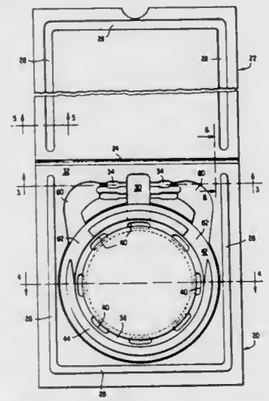
**Int. Cl.[5] B65D** *73/02*

**U.S. Cl. 206—332** **6 Claims**

5. A container for a component having a body portion and elongate flexible leads extending therefrom comprising:

a base panel having a first recess configured to receive the body portion of the component, a second recess, and a third, circular recess adjacent said first recess, said third recess having a bottom wall provided with holes at spaced intervals therearound, said second recess extending from said first recess along a curving path meeting said third recess tangentially, said second and third recesses being configured to receive the leads of the component in an orderly fashion;

a first flange attached to said base panel and projecting



radially inwardly over the outer portion of said third recess;

a second annular flange attached to said base panel and projecting radially outwardly over the inner portion of said third recess to form, with said first flange, a cover for said third recess; and

a cover panel formed integrally with said base panel and connected thereto by an integral hinge.

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**5,050,733**

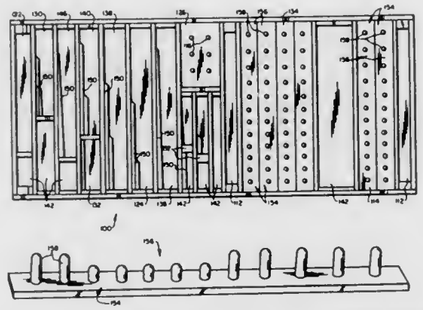
**SOCKET WRENCH ORGANIZER ASSEMBLY**

**Thomas P. Brennan, One Burr Ave., Morganville, N.J. 07751**

**Filed Aug. 13, 1990, Ser. No. 566,100**

**Int. Cl.[5] B65D** *85/00*

**U.S. Cl. 206—373** **13 Claims**



1. A multi-compartment socket wrench organizer assembly comprising:

a support base having first and second sidewalls and first and second endwalls, at least one vertical wall extending between said first and second sidewalls so as to define at least first and second compartments on said support base, at least one of said compartments including a plurality of vertically extending dowel elements for receiving and retaining a socket element in a predetermined position on said support base, at least one of said compartments being an elongated substantially rectilinear compartment, means within said elongated substantially rectilinear compartment extending along at least a portion of the length thereof for progressively varying a width of a storage space defined within said elongated substantially rectilinear compartment so that said storage space has a maximum width adjacent a first longitudinal end of said portion and a minimum width adjacent a second longitudinal end thereof.



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**5,050,734**

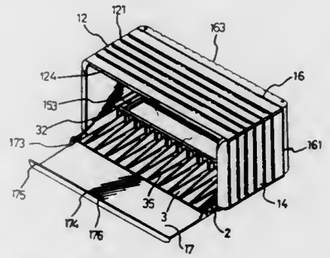
**STORAGE BOX**

**Shun-Teng Chen, Tao Yuan Hsien, Taiwan, assignor to Shern Diau Enterprise Co., Ltd., Tao Yuan Hsien, Taiwan**

**Filed Oct. 29, 1990, Ser. No. 604,541**

**Int. Cl.[5] A24F** *15/00*

**U.S. Cl. 206—444** **2 Claims**



1. A storage box comprising:

top wall, bottom wall, left wall, right wall, rear wall, turnable front door and plate;

wherein left wall and right wall are mirror-images, said top wall and bottom wall having resilient fingers at each corner to be received by corresponding recesses formed on left and right walls respectively;

said left and right wall, each having a pair of protrusions each to be received by its corresponding hole formed on said rear wall;

said bottom wall further comprising a pair of rails each formed on the left and right ends respectively, so that slides formed on ends of said plate;

a link having a pair of through hole provided with one end pivotally mounted on plate, another end pivotedly mounted on an ear of said front turnable wall;

said plate having a plurality of rear spacers being substantially short but sufficient to hold compact disks;

said turnable front door further comprising a latching means to be received by another latching means formed on said top wall;

exterior surfaces of said walls having a plurality of V-shaped reinforcement grooves.

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**5,050,735**

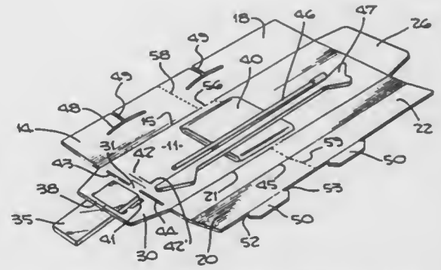
**SPECIMEN STRIP PACKAGE**

**Abner Levy, 325 N. Oakhurst Dr., Beverly Hills, Calif. 90210**

**Continuation of Ser. No. 446,613, Dec. 6, 1989, abandoned, which is a continuation of Ser. No. 244,490, Sep. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 112,283, Oct. 26, 1987, abandoned. This application Jul. 13, 1990, Ser. No. 552,332**

**Int. Cl.[5] B65D** *85/48*

**U.S. Cl. 206—456** **15 Claims**



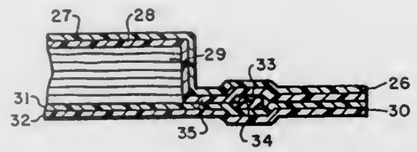
1. A specimen package assembly for containment of a specimen strip and specimen identification marks, said package assembly comprising a sheet of package material in initial form having a central base portion of relatively long rectangular configuration with long side edges and short end edges, a first side panel having a captive edge joined to an adjacent side edge of the base portion at a fold line and a free edge, a second side panel having a captive edge joined to the other side edge of the base portion at a fold line and a free edge, a first end panel having a captive edge joined at an adjacent end edge of the base portion and a free edge, a second end panel having a captive edge joined to the other end edge of the base portion and a free edge, one of said end panels having retaining means engaging one end of said specimen strip with a substantial portion of said strip extending beyond said free edge of said one of said end panels towards the other of said end panels, thereby to support and retain the specimen strip in a position overlying the central base portion, there being latching means adjacent free edges of said side panels for holding all said panels and aid specimen strip in packaged position, and an area of said central base portion receptive of specimen identification marks beneath a window in said one of said end panels.

13. A specimen package assembly for containment of a specimen strip and specimen identification marks, said one package assembly comprising a sheet of package material in initial form having a central base portion, a plurality of side panels and end panels joined to said central base portion, one of said end panels having a free edge and retaining means engaging one end of said specimen strip with a substantial portion of said strip extending beyond said free edge thereby to support and retain the specimen strip in a position overlying the central base portion, there being latching means on said side panels for holding all said panels and said specimen strip in packaged position, such that said strip can be moved with said panel from a packaged position against said base portion to a raised position away from said base portion for easy grasping of said strip.

VOL 1130 ISS 4 SE 24 1991 UMI



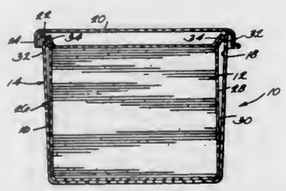
5,050,736
## RECLOSABLE PACKAGE
Ray H. Griesbach, Monona, and Gerald O. Hustad, McFarland, both of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.
Division of Ser. No. 313,430, Apr. 22, 1989, Pat. No. 5,005,707, and a continuation of Ser. No. 309,645, Feb. 13, 1989, Pat. No. 5,014,856, each is a continuation of Ser. No. 218,388, Jul. 12, 1988, Pat. No. 4,823,961, which is a continuation of Ser. No. 841,916, Mar. 20, 1986, Pat. No. 4,782,951. This application Oct. 30, 1989, Ser. No. 429,130
The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.
Int. Cl.[5] B65D *75/26, 81/20*
U.S. Cl. 206—484 14 Claims




1. A reclosable hermetically sealed vacuum package comprising a vacuum product-receiving cavity in which a product is initially hermetically sealed in film packaging material under vacuum, said package having a hermetically sealed opening for providing access to the product cavity and having means for reclosing said opening after the hermetic seal of said opening is opened, said reclosing means comprising one or more interlocking ribs and grooves extending across the package opening, said interlocking ribs and grooves being adapted to reclose the package opening after the hermetic seal has been opened, said hermetic seal of said opening being located inwardly of said interlocking ribs and grooves and comprising a hermetic vacuum peel seal having sufficient opening force to withstand processing, handling, and shipping, and to maintain a vacuum, yet low enough to allow access to the product cavity and to ensure that the structural and functional integrity of the film packaging material, interlocking ribs and grooves, and remaining seals, is maintained.

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5,050,737
## SYSTEM FOR PACKAGING MOIST TOWELETTES
Daniel V. Joslyn, and Randy L. Rudolph, both of Sheboygan, Wis., assignors to Rockline, Inc., Sheboygan, Wis.
Filed May 29, 1990, Ser. No. 530,016
Int. Cl.[5] A47K *10/20*
U.S. Cl. 206—494 4 Claims

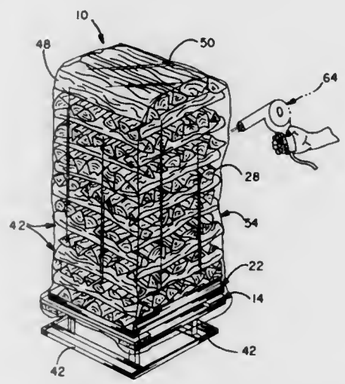


1. A disposable baby wipe insert package for use in conjunction with a durable main container formed of a moisture impervious self-sustaining plastic, said insert package comprising;
- a plurality of premoistened disposable baby wipes arranged in vertically stacked relation so as to form a solid generally rectangular stack having six sides;
- a first membrane formed of a flexible moisture impervious non-self-sustaining plastic, said first membrane defining an open ended five-sided generally rectangular interior cavity having substantially the size and shape of said stack of said baby wipes and containing therein said stack of said baby wipes, said first membrane further including an outwardly extending peripheral flange around the periphery of the open end of said interior cavity, said peripheral flange being substantially coplanar with the adjacent surface of said stack of said baby wipes when said stack is within said interior cavity;
- a generally rectangular second membrane formed of a flexible moisture impervious non-self-sustaining plastic disposed over said open end of said interior cavity, said second membrane including an outer peripheral portion overlying said peripheral flange of said first membrane; and
- sealing means for sealing said outer peripheral portion of said second membrane to said peripheral flange of said first membrane to thereby seal said stack of said baby wipes within said interior cavity, said sealing means being releasable to permit said second membrane to be peeled away from said first membrane to thereby expose said stack of said baby wipes within said interior cavity of said first membrane;
- said first and second membranes being shaped and dimensioned so that substantially the entire outer surface of said stack of said baby wipes is in contact with substantially the entire inner periphery of the interior volume defined by said first and second membranes when said stack of said baby wipes is contained by said first and second membranes.

3. A partially reusable container system for packaging, shipping, storing and using premoistened disposable baby wipes in an economical and environmentally responsible manner, said container system comprising:
- a relatively durable main container formed of a moisture impervious, self-sustaining plastic, said main container having a hollow interior accessible through an opening substantially as large as the plan view dimension of said hollow interior to permit unencumbered access to said hollow interior, said main container further including a closeable lid for selectively sealing said opening;
- a substantially rectangular six-sided stack of premoistened disposable baby wipes, each of said baby wipes being of substantially rectangular configuration; and
- a relatively disposable inner envelope formed of a pair of flexible, non-self-sustaining moisture impervious plastic membranes engaging and completely surrounding said stack of premoistened disposable baby wipes in close proximity thereto, the first of said membranes covering five sides of said stack of said baby wipes and the second of said membranes comprising a substantially planar sheet defining a removable cover covering the remaining side of said stack, said inner envelope contacting substantially the entire outer surface of said stack, said inner envelope comprising substantially less plastic than said main container;
- said hollow interior of said main container being shaped and dimensioned to receive therein said inner envelope and said stack of baby wipes therein disposed so that individual ones of said baby wipes can be easily removed from said hollow interior through said opening following removal of said second membrane and so that a fresh stack of said baby wipes can be replaced into said hollow interior of said main container from a fresh one of said inner envelopes following depletion of the initial stack of said baby wipes.

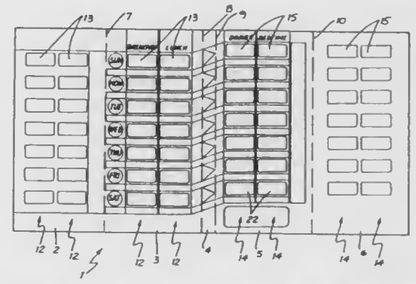


5,050,738
## FIREWOOD PACKAGE
William J. McAdams, 3006R N. Main St., Ft. Worth, Tex. 76106
Continuation-in-part of Ser. No. 183,093, Apr. 20, 1988, Pat. No. 4,879,861. This application Nov. 7, 1989, Ser. No. 432,890
The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.
Int. Cl.[5] B65D *65/00*
U.S. Cl. 206—497 2 Claims




1. A firewood package comprising;
- a bottom support member having an outer periphery substantially defining a square,
- said bottom support member further comprising a first pair of cross members each having an outer cross member edge aligned with two opposing sides of the square, and a second pair of cross members each having an outer cross member edge aligned with another two opposing sides of the square, each of said first cross members fastened to each of said second cross members,
- a plurality of layers of substantially equal length firewood lengths disposed atop one another with a bottom most one said layer atop said bottom support member to provide a firewood stack, said firewood lengths having opposite end surfaces axially spaced from one another a distance substantially equal to the length of each side of said outer periphery of said square bottom support member,
- said firewood lengths in each said layer disposed adjacent to and parallel each other with all said end surfaces at each end of said length disposed in a vertical plane substantially flush with said outer periphery of said bottom support member,
- said firewood lengths in each said layer axially disposed in a direction normal to that of said firewood lengths in next adjacent ones of said layers to provide a cross-stacked assembly having a top most layer,
- a tray including upturned walls defining said outer periphery,
- said tray disposed atop said bottom support member and below said plurality of layers of firewood, and
- a shrink wrap casing surrounding said firewood stack and having top and bottom portions, said top portion closed and said bottom portion open, said portions respectively overlying said stack and underlying said bottom support member, whereby
- said shrink wrap casing horizontally biases inwardly against said firewood length and surfaces and vertically biases said top layer toward said bottom support member to provide a stable, unitized package.

5,050,739
## DISPOSABLE FOLDABLE MEDICATION CARD
Paul J. Hannan, Newport, and Gerard T. Stevens, Abbotsford, both of Australia, assignors to Manrex Australia Pty. Ltd., Abbotsford, Australia
Continuation of Ser. No. 432,563, Nov. 6, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 652,448
Claims priority, application Australia, Nov. 11, 1988, PJ1392
Int. Cl.[5] B65D *83/04, 75/36, 21/02*
U.S. Cl. 206—531 11 Claims



1. A disposable medication dispensing package comprising:
- a pre-printed, thin, stiffly-flexible, paperboard card blank, fold lines being formed in said blank and dividing it into rectangular panels, said panels including two pairs of adjacent panels which are each formed with an array of apertures and which are folded over one another along a fold line to bring the apertures of the two panels of the pair into registration with one another;
- a plurality of blister sheet and foil combinations each comprising a rectangular blister packaging sheet having a planar first face and a pattern of manually-depressible packaging blisters projecting from a second face of the sheet, and a rupturable metal foil adhering to said first face of the blister packaging sheet and providing a backing that occludes said blisters, one blister sheet and foil combination being sandwiched between the two panels of each pair of panels with the blisters protruding through the apertures of one panel of the pair and the metal foil backing exposed through the apertures of the other panel of the pair;
- medication tablets of capsules held in place in said blisters by said foil; and
- means sealing areas of the panels of each pair to the confronting surfaces of the blister sheet and foil combination sandwiched between them,
- the preprinting on the blank associating each blister in the assembled package with a particular time and day of the week in which the medication in the blister is to be taken, and the stiffness of the blister sheet and foil combination being sufficiently enhanced by the two card panels sealed thereto to withstand buckling of the package when the blisters are manually depressed to eject their contents.

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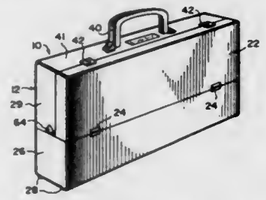
5,050,740
## HARD CASE FOR CHESS EQUIPMENT
Eli Lucero, 460-B Manewal Dr., Cheyenne, Wyo. 82009
Filed Aug. 28, 1990, Ser. No. 575,393
Int. Cl.[5] B65D *69/00;* A45C *11/00*
U.S. Cl. 206—579 12 Claims

1. A hard case for chess equipment comprising:
- a) a housing having three front compartments separated by two partitions and a rear compartment;
- b) a lid hinged to said housing over the three front compartments;
- c) a door hinged to one end wall of said housing at the rear compartment;

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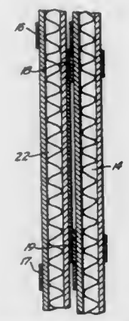
d) means for holding, protecting storing chess pieces within the first and third front compartments in said housing;
e) means for holding, protecting and storing a chess clock within the second front compartment in said housing;
f) means for holding, protecting and storing a roll up type chess board within the rear compartment; and
g) means attached to one side wall of said housing, for carrying



said hard case from place to place, wherein said chess pieces holding, protecting and storing means are two removable padded receptacles, each sized to hold the chess pieces therein and insertable into the first and third front compartments in said housing, so that when each said receptacle is removed therefrom all the chess pieces are taken out at once to allow for a quick set up of the chess pieces.

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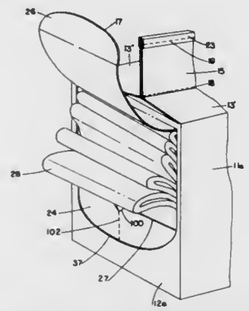
**5,050,741**
**CONTAINER WITH WIDE TEAR STRIP OPENING FEATURE**
**Myun H. Kim, 141 Meserole Ave. #2L, Brooklyn, N.Y. 11222**
**Continuation-in-part of Ser. No. 947,806, Dec. 30, 1986. This application Jul. 25, 1990, Ser. No. 558,307**
**Int. Cl.[5] B65D** *3/26*
**U.S. Cl. 206—606** **9 Claims**



8. A tear-open construction for a container having an openable wall, which comprises
(a) a pair of spaced-apart upper and lower internal tear bands arranged in parallel relation and secured to the interior surface of said openable wall,
(b) the upper edge of the upper tear band and the lower edge of the lower tear band constituting spaced-apart cutting edges,
(c) said internal tear bands defining between their respective cutting edges a tear strip portion of said openable wall,
(d) said tear strip portion being substantially wider than said tear bands,
(e) guide strip means, for guiding the tear strip portion, secured to the exterior surface of said openable wall in parallel relation to said internal tear bands and having portions above the upper tear band and portions below the lower tear band,
(f) said guide strip means having portions forming upper and lower guide strip cutting edges generally aligned with and cooperating with the spaced-apart cutting edges of said tear bands and,
(g) the tear strip portion of said openable wall having at one end extremity thereof a grip portion extending vertically between and structurally joining said tear bands and thereby enabling said tear bands and said tear strip portion to be gripped and pulled away as a unit from said openable wall,
(h) said grip portion being relatively free of attachment to any underlying portions of the container, whereby said grip portion is accesible at an end extremity thereof to be lifted by the fingers and gripped for removal of said tear strip portion,
(i) said grip portion being formed with notches at said end extremity, at vertically spaced points immediately adjacent said guide strip means to facilitate initial tearing of said tear strip portion along said cutting edges,
(j) the end extremity of said grip portion being of continuous construction between said cutting edges whereby said spaced apart tear bands are simultaneously pulled away along with said grip portion,
(k) said tear bands being coterminous at their free ends with said grip portion, such that no free portions of said tear bands extend beyond the end extremity of said grip portion and said tear bands are accessible only by pulling on said grip portion.

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**5,050,742**
**EASY OPENING PACKAGE CONTAINING COMPRESSED FLEXIBLE ARTICLES**
**Delmar R. Muckenfuhs, Middleton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**
**Filed Nov. 2, 1990, Ser. No. 608,661**
**Int. Cl.[5] B65D** *85/16, 85/18*
**U.S. Cl. 206—610** **20 Claims**

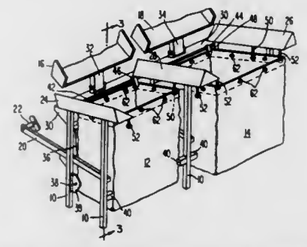


1. A substantially rectangular flexible package containing compressed flexible articles, said flexible package comprising:
(a) a front and a back panel connected to one another by means of a pair of side panels, a bottom panel and a top panel;
(b) an opening device comprising a pair of substantially vertically oriented lines of weakness located within one of said side panels of said flexible package, said substantially vertically oriented lines of weakness defining a predetermined portion of said side panel to be at least partially separated from the remainder of said side panel without releasing the tension in the remainder of said side panel, said predetermined portion of said side panel being partially separated by applying a grasping force to a tear flap extending from the lowermost end of said opening device, whereupon said flexible articles coinciding with the aperture thus formed in said side panel expand through said aperture in a fan-like array while the portion of said flexible articles coinciding with the remaining tensioned portion of said side panel are retained in a substantially compressed condition;
(c) an internal reinforcement sheet comprised of flexible material located on the innermost surface of said side panel containing said opening device and said tear flap, said reinforcement sheet substantially coinciding with said tear flap and having an uppermost end substantially coinciding with the point of joinder between the lowermost end of said opening device and the uppermost end of said tear flap; and
(d) a substantially vertically oriented line of weakness located in said reinforcement sheet, said substantially vertically oriented line of weakness being automatically rupturable by the expansion of said compressed flexible articles when said opening device is activated, thereby releasing the tension in said reinforcement sheet, whereupon said compressed flexible articles expand through the portion of said aperture coinciding with said reinforcement sheet in a fan-like array while the portion of said compressed flexible articles coinciding with the remaining tensioned portion of said side panel are retained in a substantially compressed condition.

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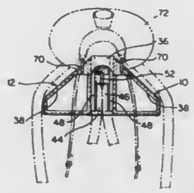
**5,050,743**
**COMBINED SACK AND TRAY SYSTEM FOR MAIL COLLECTION**
**Sebastian J. Lazzarotti, Broomall, Pa., assignor to Unisys Corporation, Blue Bell, Pa.**
**Continuation of Ser. No. 414,677, Sep. 29, 1989, abandoned. This application Aug. 17, 1990, Ser. No. 569,218**
**Int. Cl.[5] B42F** *17/00*
**U.S. Cl. 211—12** **9 Claims**



1. An apparatus for supporting a mail sack comprising:
a frame having height, width and depth dimensions;
a pair of downwardly projecting, pivotal, spring-biased sack support members connected to said frame at a first height above a base of said frame, said pair of downwardly projecting, pivotal, spring biased sack support members being separated by a first width, said pair of downwardly projecting, pivotal, spring biased sack support members being capable of grasping any point on an inside peripheral rim of a sack without puncturing said sack;
a first pair of downwardly projecting stationary sack support members connected to said frame at a second height above said base of said frame and separated by a second width substantially equal to said first width between said pair of downwardly projecting, pivotal, spring biased sack support members, said first pair of downwardly projecting stationary sack support members positioned at a first depth forward from said pair of downwardly projecting, pivotal, spring biased sack support members,, said first pair of downwardly projecting stationary sack support members being capable of grasping any point on an inside peripheral rim of a first sized sack without puncturing said first sized sack, said first pair of downwardly projecting stationary sack support members and said pair of downwardly projecting, pivotal, spring biased sack support members serving as four support corners for said first sized sack; and
a second pair of downwardly projecting stationary sack support members connected to said frame at a third height above said base of said frame and separated by a third width substantially equal to said first width between said pair of downwardly projecting, pivotal, spring biased sack support members, said second pair of downwardly projecting stationary sack support members positioned at a second depth forward from said pair of downwardly projecting, pivotal, spring biased sack support members, said second depth forward from said pair of downwardly projecting, pivotal, spring biased sack support members being greater than said first depth forward, said second pair of downwardly projecting stationary sack support members being capable of grasping any point on an inside peripheral rim of a second sized sack without puncturing said second sized sack, said second sized sack having a larger inside peripheral rim than said first sized sack, said second pair of downwardly projecting stationary sack support members and said pair of downwardly projecting, pivotal, spring biased sack support members serving as four support corners for said second sized sack.

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**5,050,744**
**UNIVERSAL TACK TREE**
**Glen C. Floyd, P.O. Box 82, Chester, Id. 83421-0082**
**Filed Jan. 10, 1990, Ser. No. 462,748**
**Int. Cl.[5] A47F** *7/00*
**U.S. Cl. 211—13** **13 Claims**



1. A tack tree for temporary storage of a saddle, saddle pads and blankets as well as other accessories, said tack tree including horizontally elongated structure incorporating horizontally elongated, opposite side and upwardly convergent panels extending longitudinally of said structure and including upper and lower marginal portions, said upper marginal portions being spaced apart and joined by an elongated horizontal bridging member extending longitudinally of said structure and disposed between said upper marginal portions, said elongated structure including first and second opposite ends, said first end of said elongated structure including a vertically elongated mount portion having upper and lower ends, said mount portion upper end being anchored relative to the end of said bridging member corresponding to said first end of said elongated structure and with said mount portion extending downwardly from said bridging member, horizontally elongated brace means extending between and interconnecting the ends of said lower marginal portions at said first end of said elongated structure and the lower end of said mount portion, a horizontally elongated support arm extending longitudinally of said structure and including first and second terminal ends corresponding to said first and second ends of said elongated structure, respectively, said support arm being spaced below said bridging member and above a horizontal plane containing said lower marginal portions and having said first terminal end thereof supported from said mount portion intermediate the upper and lower ends thereof, at least a major portion of the length of said support arm forward of said first terminal end and being spaced from and free of connections with the remainder of said elongated structure, each of said first and second ends of said elongated structure including a pair of oppositely directed generally right triangular frames including spaced apart height sides, upwardly convergent inclined slant

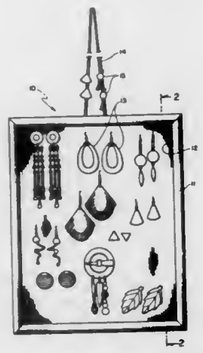
VOL 1130 ISS 4 SE 24 1991 UMI



height sides and base sides extending in opposite directions from said height sides, said panels including opposite end margins anchored relative to said slant height sides, the upper ends of said slant height sides being anchored relative to the corresponding ends of said bridging member and the adjacent ends of said base sides of said frame at said first end of said elongated structure being braced relative to the lower end of said vertically elongated mount portion.

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**5,050,745**
**EARRING STORAGE HOLDER**
**Patricia A. Sanders, 2108 Neilson Way, Santa Monica, Calif. 90405**
**Filed Oct. 31, 1990, Ser. No. 608,173**
**Int. Cl.[5] A47F 7/00**
**U.S. Cl. 211—13** **2 Claims**

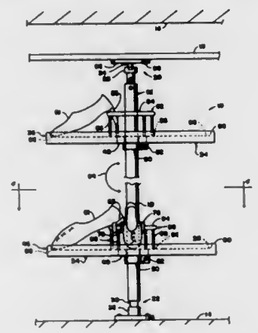


1. A holder for storing and displaying earrings comprising:
a frame having top and bottom members joined at their opposite ends with side members to define a central opening area;
a netting secured to said respective members occupying said central opening area and having its edge marginal region fixedly secured to said members so as to make said netting taut;
said netting having a plurality of openings defined as close mesh for insertably receiving mounting fasteners of earrings;
said netting supporting the earrings in a random display visually available to the user;
said earrings comprise both clip-on and pierced ear types;
a closed loop carried on said top member for supporting earrings of said clip-on type; and
a reinforcing mat secured to said netting edge marginal region sandwiching said edge marginal region against the backside of said frame members.

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**5,050,746**
**ROTARY SHOE RACK**
**Doris N. Frankel, 4703 SE. 17th Pl., #101, Cape Coral, Fla. 33904**
**Filed Nov. 15, 1990, Ser. No. 614,854**
**Int. Cl.[5] A47F 7/00**
**U.S. Cl. 211—34** **18 Claims**

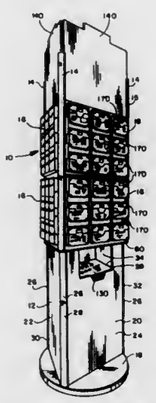
1. A rotary shoe rack for mounting in a storage space having generally fixed upper and lower surfaces, said rack comprising:
a shaft that extends generally vertically between said upper and lower surfaces;
upper and lower bearing means for rotatably mounting upper and lower ends of said shaft, respectively, to said upper and lower surfaces of said storage space;
a plurality of storage shelves secured to said shaft at spaced apart intervals for supporting respective groups of shoes thereon, at least one said shelf being disposed about said shaft and having a generally horizontal platform that includes inner and outer sections; and
heel support means attached to said inner section of said platform and being disposed about said shaft for elevating a heel portion of each shoe in said respective group above



said platform such that a forward portion of said shoe is engaged with said outer section of said platform, said heel support means including a rail that extends annularly about said shaft and is engageable by the heel portion and a plurality of support posts mounted to said inner section of said platform for supporting said rail above said platform.

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**5,050,747**
**COUPON DISPLAY AND DISTRIBUTION UNIT**
**Richard G. Krautsack, Arlington Heights, Ill., assignor to Comark Merchandising, Inc., Elk Grove Village, Ill.**
**Filed Nov. 30, 1989, Ser. No. 443,770**
**Int. Cl.[5] A47F 7/00**
**U.S. Cl. 211—50** **6 Claims**

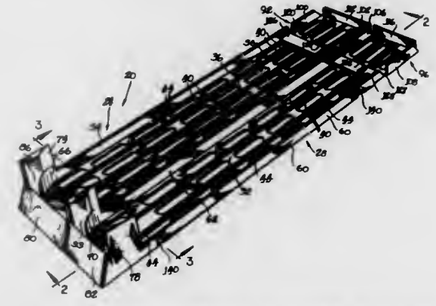


1. A coupon display and distribution unit, comprising:
a plurality of channel members having longitudinal slots formed therein; and
a removable modular coupon holder slidably received in two of said channel members, said removable modular coupon holder having a plurality of coupon holding pockets formed therein, each of said coupon holding pockets having a transparent front face extending a distance sufficient to cover substantially all of a coupon placed in said coupon holding pocket.

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**5,050,748**
**GRAVITY-FEED COOLER RACK**
**Ronald Taub, 1154 Sheridan Rd., Highland Park, Ill. 60035**
**Filed Aug. 30, 1990, Ser. No. 575,327**
**Int. Cl.[5] A47F 5/00**
**U.S. Cl. 211—59.2** **7 Claims**

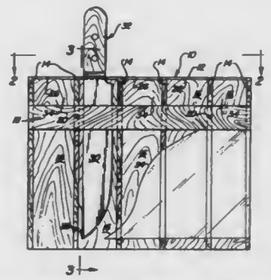


1. A rack for holding containers for sequential removal from a cooler;
said rack comprising an elongate tray including lattice-like floor means for supporting containers as a stacked, lineal, columnar array thereon to travel therealong;
lineally extending, spaced, parallel, upstanding guide wall means at each of lateral boundaries of said tray for retaining and for guiding movement of containers traversing said floor means of said tray;
segmental module means integrally formed at an end of said tray and joined to said floor means of said tray for extending the length of said tray, said module means including sidewalls aligned with said guide wall means of said tray as extensions thereof,
frangible connector means joining said module means to said tray and delineating a fracture zone facilitating separation of said module means from said tray;
said connector means being integrally formed with said tray at opposed guide wall means thereof at outer lateral faces of said guide wall means for intercoupling one said tray with a second tray as a lineally coextensive, laterally-abutting and transversely-joined columnar pair of trays;
elongate rail means located between said guide wall means and extending substantially coextensively with a parallel to said guide wall means for supporting said containers on said floor means during travel along said tray;
said floor means being formed with rows of lineally and laterally spaced openings along a length expanse of said tray for facilitating access of cooling fluid to containers supported on and traversing said tray;
base wall means joined to and defining means constituting a stop abutment for and an end limit of travel of containers contained in said rack.

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**5,050,749**
**KNIFE RACK**
**Paul J. Scaglione, 25495 Skye Dr., Farmington Hills, Mich. 48336**
**Filed Sep. 28, 1990, Ser. No. 589,415**
**Int. Cl.[5] A47F 7/00**
**U.S. Cl. 211—70.7** **3 Claims**

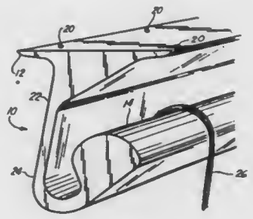
1. A knife rack (10) adapted to be attached to a supporting surface for storing knives, characterized in that:
(a) said knife rack (10) includes a vertical back plate (12) having a front side with a top edge that can be attached to a supporting surface;
(b) said back plate (12) has provided on the front side thereof a plurality of vertical ribs (14) which are laterally spaced apart to provide a plurality of channels (16) for the reception and storage of knives (32);
(c) at least one horizontal retainer bar (18) having a top edge is disposed on the vertical ribs (14), in a position spaced apart from the front side of the knife rack (10), for retaining different size knives (32) securely stored in the channels (16), between the ribs (14);
(d) the horizontal retainer bar (18) is spaced downwardly in close proximity from the upper end of the back plate (12)



to provide a flat, straight downward striking area for the points of knives (32) being mounted in the channels (16) of the knife rack (10); and,
(e) the top front edge (26) of the back plate (12) between each of the ribs (14) is tapered so that a knife handle, upon insertion of a knife (32) into a channel (16), will slide downward by its own weight into an engagement with said back plate tapered edge (26) and the knife (32) will be pivoted outwardly, away from the back plate (12), and into sliding engagement with the retainer bar (18) and cause the point (28) of the knife blade (30) to rest against the back plate (12) and thereby secure the knife (32) in the rack (10) without distortion of the knife blade (30).

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**5,050,750**
**SHELF-SUPPORTING CLOSET CLOTHES RACK**
**Roland V. Mason, 239 Carmel Dr., Lot 5, Fort Walton Beach, Fla. 32548**
**Filed Dec. 21, 1990, Ser. No. 631,997**
**Int. Cl.[5] A47F 5/00**
**U.S. Cl. 211—123** **18 Claims**



1. A clothes hanging apparatus comprising:
(a) an elongated base plate having a relatively planar upper surface and a plurality of openings therethrough;
(b) longitudinal stiffening means forming a part of and positioned on an underneath side of said base plate for imparting longitudinal rigidity to said base plate;
(c) a clothes hanger support means suspended from said base plate, the upper perimeter of said clothes hanger support

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means being configured to accommodate the curvature of a plurality of clothes hangers; and,

(d) means for suspending said clothes hanger support from said base plate.

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**5,050,751**

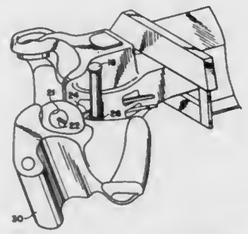
**RAILWAY FREIGHT CAR COMBINATION COUPLER KNUCKLE HANGER AND KNUCKLE PIN HOLDER**

**Jimmie R. Thrift, Rt. 3, P.O. Box 537, Waycross, Ga. 31501, and Nass Hendley, 201 William St., Homerville, Ga. 31634**

**Filed May 11, 1990, Ser. No. 508,121**

**Int. Cl.[5] B61G *7/00***

U.S. Cl. 213—111 **19 Claims**



1. A knuckle hanger tool for use in suspending a knuckle of a railway coupler on another portion of a coupler during repair of a coupler requiring removal of a knuckle pin and knuckle of a coupler, said tool comprising a fork shaped base section for releasably securing said tool to a coupler, said base section including a pair of generally parallel prong portions for insertion into casting cavities of a coupler, and a generally curved portion integrally connecting said prong portions, and an elongated knuckle hanging peg having opposite ends with one said end being integrally attached to said curved portion, said hanging peg extending outwardly of said base section, where said base section is attachable to dispose another said end in a position for receiving and suspending a knuckle of a coupler thereon during repair of a coupler.

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**5,050,752**

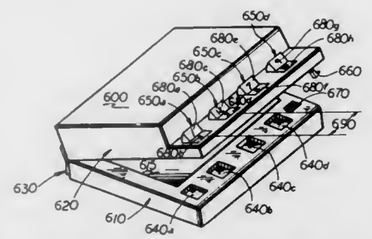
**CHILD RESISTANT CONTAINER**

**Bart J. Zoltan, Old Tappan, N.J.; Roseamrie T. Specian, Mahopac, N.Y., and Linda A. Walker, Hawthorne, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed Apr. 24, 1990, Ser. No. 513,641**

**Int. Cl.[5] A61J *1/00***

U.S. Cl. 215—206 **6 Claims**



1. A container for medicines, said container being child resistant but accessible to the elderly or infirm, which comprises:

enclosure means for surrounding said medicine;

a plurality of two position switch means cooperating with said enclosure means, said switch means comprising switches adapted so as to pivot about an axis between two discreet positions, said switch means positioned sufficiently apart to allow the elderly or infirm to manipulate one switch without affecting any adjacent switch, each of said switch means being of sufficient size to be easily manipulated by the elderly or infirm between said two discreet positions, one discreet position permitting opening of the enclosure means and the other discreet position preventing opening of the enclosure means;

engaging means cooperating with said enclosure means and said switch means to prevent opening when one or more of said switch means are in the prevent opening position and to allow opening when all of said switch means are in the permit opening position; and

instruction means comprehendible to an adult but not to a child for describing how to position all of the switch means in the permit opening position.

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**5,050,753**

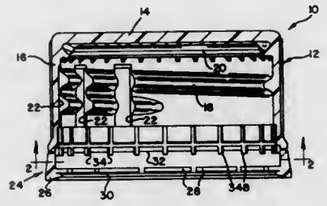
**PREFERENTIALLY STRENGTHENED TAMPER-INDICATING PLASTIC CLOSURE**

**Hubert D. Trump, Crawfordsville; Stephen W. McBride, Brownsburg, and Lawrence M. Smeyak, Lafayette, all of Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.**

**Filed Aug. 27, 1990, Ser. No. 572,249**

**Int. Cl.[5] B65D *41/34***

U.S. Cl. 215—252 **16 Claims**



1. A tamper-indicating closure for a container, comprising

a plastic closure having a top wall portion, and a depending, annular skirt portion, said skirt portion including an internal thread formation extending more than 360° circumferentially of said skirt portion to thereby define a region of said skirt portion having an overlapping, double thread profile, and a region having a single thread profile;

a tamper-indicating pilfer band positioned beneath said skirt portion, said pilfer band including means for engaging said container for tamper-indication; and

preferentially strengthened frangible means at least partially detachably connecting said pilfer band to said skirt, said frangible means comprising a plurality of circumferentially spaced frangible bridges extending between the inside surfaces of said pilfer band and said skirt portion, including at least one relatively strengthened frangible bridge spaced from said region of said skirt portion having said double thread profile.

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**5,050,754**

**CAP FOR A NECK FINISH ON A WIDE MOUTH CONTAINER**

**Michael Marino, New Castle, Pa., assignor to West Penn Plastics, Inc., New Castle, Pa.**

**Continuation-in-part of Ser. No. 424,915, Oct. 23, 1989, abandoned. This application Jun. 13, 1990, Ser. No. 537,253**

**The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.**

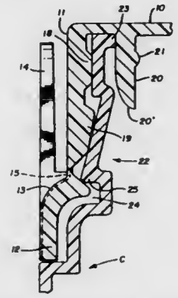
**Int. Cl.[5] B65D *17/40***

U.S. Cl. 215—256 **5 Claims**

1. A resilient deformable cap for engagement on a neck finish of a wide mouth container; said cap comprising a top portion having a depending annular flange on its peripheral edge and an annular depending sealing flange inwardly



thereof, the space between the depending annular flange and said annular depending sealing flange being such that said neck finish will be sealingly engaged in said cap when said cap is positioned thereon; a wide flat rib on the inner surface of said depending annular flange for resilient sealing engagement with said neck finish, said wide flat rib being positioned in opposite relation to said annular depending sealing flange so as to urge a portion of said neck finish against said annular depending sealing flange; a thickened downwardly tapered section on the inner surface of said depending annular flange below said wide flat rib for resilient sealing and fastening engagement with said neck finish, said inner surface of said annular depending flange above said wide flat rib and below said top portion being of a known vertical dimension and the surface of said wide flat rib being of a vertical dimension twice that of said known vertical dimension of the inner surface of said annular depending flange so as to position said wide flat rib opposite said annular depending sealing flange midway between its upper and lower ends, an annular area of weakness in said depending annular flange below said thickened tapered section and extending thereabout on a horizontal line, a lower annular outwardly offset secondary flange below said annular area of weakness for registry with said neck finish; an annular rib on the inner surface of said lower annular outwardly offset secondary flange defining the lower portion of said depending annular flange for sealing and fastening engagement with said neck finish; an upstanding pull tab on said lower outwardly offset secondary flange, an upward extending weakened area in said lower annular outwardly offset secondary flange adjacent said upstanding pull tab whereby said pull tab, said annular rib and said lower annular outwardly offset secondary flange may be manually removed from said cap whereby said wide flat rib and said thickened tapered section of said annular depending flange remain in fastening and sealing position with respect to said neck finish.



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**5,050,755**

**MODULAR RECEPTACLES SUCH AS TRASH CANS**

**Glenn G. Strawder, 9200 Edwards Way, #1116, Adelphi, Md. 20783**

**Filed Mar. 28, 1990, Ser. No. 501,950**

**Int. Cl.[5] B65D *25/22***

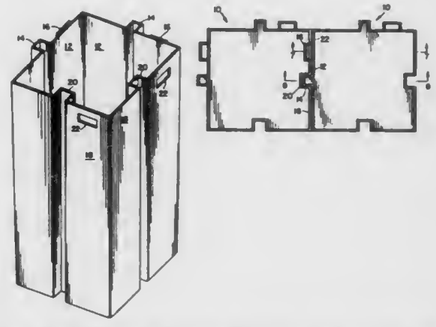
U.S. Cl. 320—23.4 **7 Claims**

1. A receptacle capable of mating with a similar receptacle, comprising:

a body portion for receiving products placed in the receptacle,

said body portion having a first male portion and a first female portion, said first male portion and said first female portion being so positioned that when said receptacle mates with another receptacle having male and female portions similar to those on said body portion, said first male portion will mate with the first female portion of said another receptacle to position the receptacles in a desired relative position to each other,

said body portion having a second male portion and a second female portion each positioned so that when said first named receptacle and said another receptacle mate with each other the second male portion of one of the receptacles will mate with the second female portion of the other receptacle, said second male portion comprising a handle, said body member having a wall,



said wall defining an opening extending through the wall, said opening constituting said second female portion,

said mating of said first-named receptacle with said another receptacle including said handle of said first-named receptacle projecting through said opening in said another receptacle.

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**5,050,756**

**METHOD AND APPARATUS FOR STORING, TRANSPORTING AND TRANSFERRING PRODUCTION GOODS**

**Uwe G. Tielker, Costrop-Rauxel, and Heinz-Georg Pater, Ense, both of Fed. Rep. of Germany, assignors to Lista AG, Erlin, Switzerland**

**Continuation of Ser. No. 174,202, Mar. 28, 1988, abandoned, which is a continuation of Ser. No. 811,401, Dec. 20, 1985, abandoned. This application Sep. 24, 1990, Ser. No. 587,027**

**Int. Cl.[5] B65D *25/20***

U.S. Cl. 220—23.4 **8 Claims**

1. An apparatus for storing, transporting and transferring production goods such as tools, workpieces and other parts which comprises:

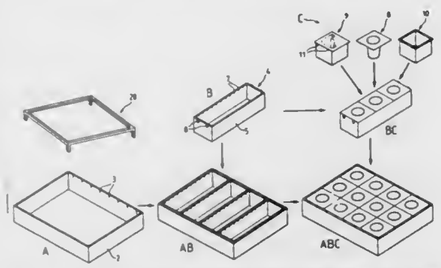
a base free constructed as a basic supporting member, said base frame having a plurality of walls with two opposite ones of said walls being substantially identical and having a plurality of substantially uniformly spaced recesses defining a first inner wall grid system solely along said two walls;

at least two intermediate frames each constructed as a supporting member for at least two parts receptacles for holding said production goods, each said intermediate frame being sized to fit within said base frame and having a plurality of walls, a first set of opposed ones of said intermediate frame walls having a plurality of pins defining an outer wall grid system, said pins mating with re-

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spective ones of said recesses defining said first inner wall grid system for positioning said intermediate frame within said base frame, each said intermediate frame further having a second set of opposed substantially identical walls each having a plurality of substantially uniformly spaced recesses defining a second inner wall grid system solely along said second set of walls, said second set of walls being substantially perpendicular to said first set of walls and to said two opposite walls of said base frame;



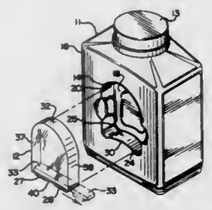

each said parts receptacle being sized to fit while one of said intermediate frames and having positioning means for engaging and positioning said receptacle within said intermediate frame;

at least one of said part receptacles having a support member and a plurality of facing engagement cavities intended to achieve non-positive engagement with one of said intermediate frames; and

one of the engagement cavities forming part of a resiliently constructed snap element having a hollow section.

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**5,050,757**
**CONTAINER SYSTEM**
**Daniel P. Hidding, Rte. 2 Ridgecraft La., Barrington Hills, Ill. 60010, and David E. Hidding, 284 W. Old Plum Grove Rd., Palatine, Ill. 60067**
**Filed Sep. 28, 1990, Ser. No. 590,228**
**Int. Cl.[5] B65D *79/00***
**U.S. Cl. 220—23.83** **4 Claims**

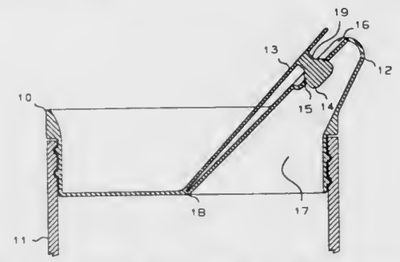


1. A container system wherein a small container is nested in a larger container comprising:

a first container formed from a resilient plastic material having a bottom wall and a side wall with a compartment recessed therein to receive a smaller container, the compartment having a back wall and peripheral walls which terminate with the side wall of the container;

a second smaller container having a peripheral profile that substantially matches the periphery of the recessed compartment, the smaller container being completely and frictionally retained within the confines of the recessed compartment with no portions protruding outwardly from the recessed compartment, said recessed compartment being completely surrounded by portions of the side wall, whereby preventing accidental dislodgement of the smaller container from its nested position within said recessed compartment.

**5,050,758**
**SPILL-PROOF CLOSURE FOR A BEVERAGE CONTAINER**
**Mark A. Freeman, 15317 W. 91st Pl., Lenexa, Kans. 66219, and Timothy K. Stringer, 8921 W. 80th, Overland Park, Kans. 66204**
**Filed Nov. 16, 1990, Ser. No. 615,805**
**Int. Cl.[5] A47G *19/22***
**U.S. Cl. 220—90.4** **18 Claims**



11. A controllable valved closure for use in dispensing a beverage from a container, said closure comprising:

(a) a substantially planar cover portion conforming in shape to the opened end of said container;

(b) attachable means for selectively maintaining said closure in covering relation with said container;

(c) an elongated passageway having an outer end, said passageway extending upwardly and outwardly from said cover portion;

(d) an opening in said closure which communicates between the interior and exterior of said passageway near its outer end whereby said opening is completely contained within the users mouth during operation;

(e) an external deflectable member having attachable means for attaching said deflectable member to the outer surface of said closure, said deflectable member extending upwardly and outwardly along the outer surface of said passageway and in close proximity with the outer surface of said passageway, said deflectable member being depressible when inserted between the upper and lower lip of the user when lip pressure is applied, said deflectable member being biased so as to automatically return to its original position upon removal of lip pressure; and

(f) a sealing member for sealing said opening, said sealing member having means for attaching to said deflectable member, said sealing member functioning to provide sealing engagement of said opening in the closed portion, said sealing member becoming disengaged from said opening in the open position upon application of lip pressure applied to said deflectable member.

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**5,050,759**
**INFANT DRINKING CUP**
**Alan D. Marble, 1501 Pineville Rd., Apt. 3A, Neosho, Mo. 64850**
**Filed Oct. 12, 1990, Ser. No. 596,358**
**Int. Cl.[5] A47G *19/22***
**U.S. Cl. 220—90.4** **11 Claims**

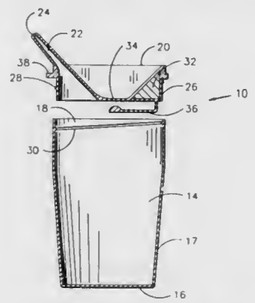
1. A combination drinking cup and lid which comprises:

a cup having a continuous substantially cylindrical wall and a substantially circular opening at a longitudinal end of said cylindrical wall; and

a removable lid for closure of said opening in said cup, said lid having a substantially circular edge mating with said circular opening, a spout near the circumferential edge, and a weight near said circumferential edge radially opposed from said spout,



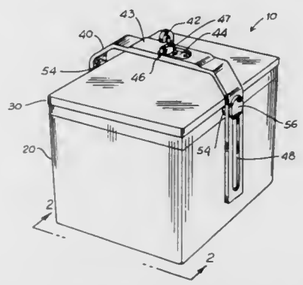
whereby when said cylindrical wall rests on a surface, the force of gravity will radially rotate said cup and said lid so



that said weight will rotate towards said surface and said spout will rotate away from said surface.

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**5,050,760**
**CLOTHESPIN CADDY**
**Robert L. Garcia, 6847 S. 4th Ave., Tucson, Ariz. 85706**
**Filed Oct. 5, 1990, Ser. No. 592,993**
**Int. Cl.[5] B65D *25/28***
**U.S. Cl. 220—94 R** **14 Claims**



1. A caddy for efficiently dispensing clothespins while hanging clothes on a clothesline and for storing them between uses, comprising:

(a) a container, sufficiently large to house a multiplicity of average size clothespins and having a removable lid to permit easy access to them, the bottom of said container featuring an aperture to provide drainage and ventilation to the interior of said container;

(b) a collapsible handle slideably fastened to two opposite sides of said container and incorporating a hook for handling said caddy and for securing it to the clothesline; and

(c) means for slideably fastening said collapsible handle to said container.

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**5,050,761**
**DOUBLE WALL EXTRUSION FOR CONTAINER COVERS**
**Luann J. Cutler, Crestview, Fla., assignor to The United States of America as represented by the Scretary of the Air Force, Washington, D.C.**
**Filed May 15, 1990, Ser. No. 528,513**
**Int. Cl.[5] B65D *43/00, 45/00***
**U.S. Cl. 220—200** **3 Claims**

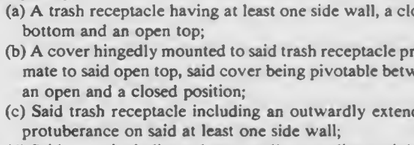
1. A shipping container cover comprising:

(a) first and second rectangular end elements and first and second rectangular side elements each having first and second ends arranged and welded at corresponding said first and second ends into a rectangular cover configuration;

(b) each of said end and side elements comprising a substantially hollow extruded wall structure including:

(ii) side walls along said first and second sides, said side walls substantially closing a space between said inner and outer walls;

(iii) at least one web interconnecting said inner and outer

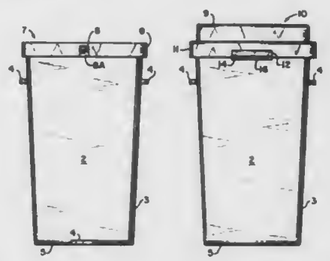


walls intermediate said side walls and extending along said space between said inner and outer walls from said first end to said second end thereof, said at least one web separating said space into a plurality of chambers defined between said inner and outer walls and providing structural support to said inner and outer walls; and

(c) a top plate attached to said rectangular configuration along corresponding first sides of said end and side elements.

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**5,050,762**
**TRASH CONTAINER**
**Dusaline Giorgi, 995 Lake Ave., Greenwich, Conn. 06831**
**Filed Mar. 30, 1990, Ser. No. 502,455**
**Int. Cl.[5] B65D *43/10***
**U.S. Cl. 220—281** **6 Claims**



1. A trash container adapted to prevent access to trash within the container by scavenger animals, said trash container comprising;

(a) A trash receptacle having at least one side wall, a closed bottom and an open top;

(b) A cover hingedly mounted to said trash receptacle proximate to said open top, said cover being pivotable between an open and a closed position;

(c) Said trash receptacle including an outwardly extending protuberance on said at least one side wall;

(d) Said cover including a downwardly extending peripheral skirt having an opening therein,

(e) Said cover being mounted to said receptacle such that said protuberance and said opening are aligned with each other for receiving said protuberance in said opening when said cover is in the closed position, and

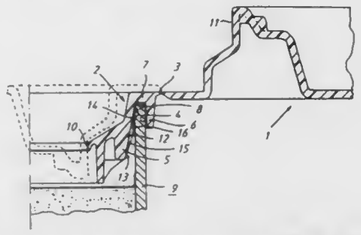
(f) Said trash receptacle having a resilient band around the open top thereof, said protuberance on said trash receptacle being carried by said band and being formed of a resilient material while the remainder of said trash receptacle is formed from a rigid material.

5,050,763

## RECLOSING ARRANGEMENT FOR SQUARELY CROSS CUT CONTAINERS

Lars Christensson, Bromma, Sweden, assignor to Akerlund & Rausing Licens Aktiebolag, Jarfalla, Sweden

Filed Nov. 21, 1989, Ser. No. 440,032
Claims priority, application Sweden, Nov. 23, 1988, 8804229
Int. Cl.[5] B65D *43/06*
U.S. Cl. 220—355 21 Claims



1. Reclosing arrangement for a container (9) of cardboard, plastic or sheet metal and of the type which is adapted to be connected to a lid frame (2) having an all around extending and downwardly open frame groove (4) in which a squarely cross cut top part of the container is to be introduced and secured in position by means of glue, wax, hot-melt or a similar connection and sealing material, and in which a reclosing lid (1) is adapted to be connected inside or outside the lid frame (2), in particular under a powder proof or steam proof condition, characterized

in that at least the inner wall (5) of the frame groove (4) tapers inwardly into the frame groove and in the direction towards the upper end (7) of the frame groove (4), in that at least the inner wall (5) of the frame groove (4) is formed with several ribs (12) extending mainly in the direction of introducing the container (9) in the frame groove (4), and in that the ribs (12) are formed with a lower, tapered upwards and to the inner portion of the frame groove (4) extending entering part (15) for facilitating the introduction of the container sliding on the edges of the ribs (12) of the frame groove (4), and an upper rib part (16) forming side walls for a volume of connection and sealing material and against the edges of which the container is likewise adapted to slide when being introduced in the frame groove (4), thereby preventing the connection and sealing material from being forced out of the frame groove (4).

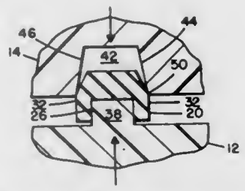
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5,050,764

## LATERAL COMPRESSION SEALING SYSTEM AND METHOD OF MAKING SEAL

Lavelle K. Voss, Altadena, Calif., assignor to Pacesetter Infusion, Ltd., Sylmar, Calif.

Filed Mar. 8, 1990, Ser. No. 490,219
Int. Cl.[5] B65D *53/00*
U.S. Cl. 220—378 19 Claims



1. A housing assembly comprising:

a first housing member defining a case having a chamber therein, said first housing member having a projecting seal receiving portion comprising a raised portion of said first housing member;

a second housing member defining a lid for said case, said second housing member having a recessed seal receiving portion, said recessed portion having generally sloped sides; and

a gasket having a receiving slot and at least partially sloped sides, said gasket being mounted on said first housing member with said projecting portion extending into said slot and, said second housing member being connected to said first housing member with said gasket and said projecting portion being received in said recessed portion wherein said recessed portion sloped sides laterally compress said gasket therebetween and seal said first housing member with said second housing member, and wherein said gasket is a closed loop for forming a sealed chamber in said case and said lid.

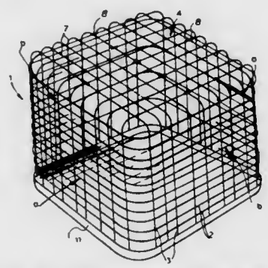
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5,050,765

## TRANSPORT AND/OR STORAGE CONTAINER FOR FLOWABLE MATERIALS

Georges Roser, Wingen; Pierre Pfeiffer, and Andre Hamm, both of Drulingen, all of France, assignors to Sotralentz S.A., Drulingen, France

Filed Oct. 16, 1989, Ser. No. 422,390
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835257; Nov. 12, 1988, 3838495; Nov. 26, 1988, 3839999; Feb. 25, 1989, 3905976
Int. Cl.[5] B65D *88/26*
U.S. Cl. 220—401 8 Claims



1. A transport and storage container for flowable materials, the container comprising:

an outer side comprised of a plurality of vertical flat panels each formed by a gridwork of horizontal and vertical bars, the horizontal bars being interconnected with the panels forming an upwardly open rectangular-section tube;

a generally rectangular bottom formed as a gridwork of horizontal bars and having respective sides juxtaposed with the panels of the side, the vertical bars of the side having horizontally bent lower ends lying against respective bars of the bottom, at least some of the bent lower ends of adjacent panels of the side crossing one another;

an inner vessel composed of a plastic material enclosed by the outer side and supported on the bottom; and

respective welds securing together the crossing lower ends of the side and securing the lower ends and the bars of the bottom together.

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5,050,766

## COLLAPSIBLE ICE CHEST

Gregory I. Groh, 387 Plaza Blvd., Pennsbury Ct. Apts., Apt. 121, Morrisville, Pa. 19067

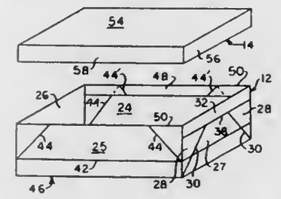
Filed Mar. 5, 1990, Ser. No. 488,592
Int. Cl.[5] B65D *30/04*
U.S. Cl. 220—412 14 Claims

1. A collapsible cooler formed of sheet material and comprising:



a box-like structure having a bottom panel and opposed side and end panels joined together to form an open top, leak-proof structure,

fold lines formed in said side and end panels in parallel spaced relationship to said bottom panel, said fold lines defining the top edge of an ice tray portion,



said side panels and end panels being foldable along said fold lines with portions above said fold lines folded toward each other to cover said tray portion and form a collapsed box-like structure, and

a lid forming a cover telescopically fitting over said collapsed box-like structure or over said open top, leak-proof structure.

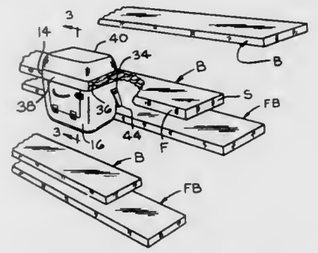
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5,050,767

## PERSONAL CONTAINER FOR SPECTATORS

Daniel Peer, 1460 Pepperell, Temperance, Mich. 48182

Filed Oct. 17, 1990, Ser. No. 599,289
Int. Cl.[5] B65D *25/24*
U.S. Cl. 220—480 12 Claims



1. A device for supporting personal articles beneath a stadium bleacher, or the like, having a front edge and a given thickness, said device comprising

a container including

front and rear walls having upper and lower ends,

first and second opposed side walls having upper and lower ends,

a bottom connected to the lower ends of said front, rear and first side and second side walls,

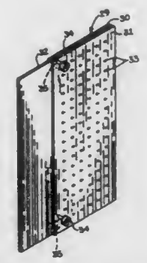
a rigid support bracket comprising upper and lower flanges and a depth flange connected to said upper and lower flanges and rigidly supporting them in substantially parallel relationship to each other spaced apart a distance equal to or greater than the given thickness, and means connecting said lower flange to said container along or adjacent to said upper ends of said front, rear and first and second side walls so that said depth flange is positioned opposite said rear wall, wherein said bracket is operable to support said container under the stadium bleacher, or the like, with said upper flange above the bleacher, said lower flange beneath the bleacher and said depth flange adjacent to the front edge of the stadium bleacher, or the like.

5,050,768

## REFUSE RECYCLING ORGANIZER CONTAINER

Rory W. Alden, 1736 Blake St., Berkeley, Calif. 94703

Filed May 24, 1990, Ser. No. 527,854
Int. Cl.[5] B65D *1/24*
U.S. Cl. 220—551 2 Claims



1. A refuse organizing container comprising,

a container defined by a forward wall spaced from and parallel a rear wall, and a first side wall spaced from and parallel a second side wall, and

each wall orthogonally mounted to a floor defined of the container, the container including a plurality of compartments therewithin, and

at least one longitudinal panel mounted between the forward wall and rear wall, the forward and rear walls including slot means formed within the forward and rear walls for selectively receiving the at least one longitudinal panel adjustably between the forward wall and rear wall, and

wherein the slot means include a first series of slots formed within and vertically aligned with an interior surface of the forward wall and the rear wall, the first series of slots of the forward and rear walls aligned relative to one another, and the slot means further including a second series of slots formed within and vertically aligned with interior surfaces of the forward and rear walls wherein the second series of slots within the forward and rear walls are aligned relative to one another wherein the second series of slots adjustably receive the at least one longitudinal panel therebetween, and

including a lateral panel mounted orthogonally between the second side wall and the at least one longitudinal panel, the lateral panel including a further first series of slots, the further first series of slots mounted coextensively within each side of the lateral panel and wherein the further first series of slots are aligned with the first series of slots of the forward wall and the rear wall, and

including a first cross panel mounted between the first series of slots of the forward wall and confronting the further first series of slots of the lateral panel, and a second cross panel mounted within one of said further first series of slots of said lateral panel and one of said first series of slots of said rear wall wherein the first cross panel and the second cross panel are adjustably mounted within selective aligned pairs of said first and further first series of slots between the forward wall and lateral panel or between the rear wall and lateral panel, and

including a lid selectively mounted overlying the container, the lid including peg means mounted to a bottom surface of the lid to position the lid to the container, and

at least one further longitudinal panel positionable within the second series of slots includes a first apertured panel spaced from and parallel to a seconc apertured panel defined by a predetermined spacing and a slide panel defined by a predetermined thickness substantially equal to the predetermined spacing complementarily received therewithin, and the first and second apertured panels include aligned rows and columns of apertures therethrough wherein a plurality of plug members are selec-

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tively positionable within aligned apertures of the first and second apertured panels to define an abutment to abut an interior edge of the slide panel to permit selective positioning of the slide panel between the first and second apertured panels.

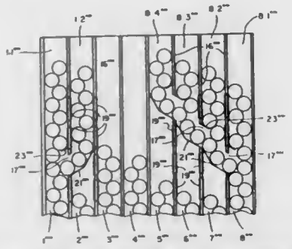
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5,050,769

## VEND SPACE ALLOCATION MEANS AND METHOD

Joseph L. Levasseur, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Filed Apr. 11, 1989, Ser. No. 336,348
Int. Cl.[5] G07F *11/10*
U.S. Cl. 221—001 95 Claims



73. A method for determining and for communicating to authorized personnel a preferred vend space allocation configuration allocating a greater number of product storage area to a lesser number of classes of selectable vendable products for a vending system capable of vending from among a plurality of classes of selectable vendable products a product from a selected product class, which vending system has a plurality of product storage areas for vend product storage, an established vend space allocation configuration allocating the product storage areas to the classes of selectable vendable products, and communication means, comprising the steps of:

(A) recording and updating for product vend operations as products are vended over a period of time the product demand by class of product,

(B) determining from said recorded product demand for such period of time a preferred allocation of such greater number of product storage areas to the lesser number of classes of vendable products whereby maximally contemporaneous sellout of the various classes of products by such ending system would be anticipated for substantially fully loaded storage areas and a continuing unchanged product demand, and

(C) effecting communication by such communication means of space allocation information identifying said preferred allocation to authorized personnel.

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5,050,770

## METHOD AND APPARATUS FOR DELIVERING PARTICULATE MATERIAL

Gordon D. Smiley, Rte. 4, Box 245, Greensburg, Ind. 47240

Filed Aug. 11, 1989, Ser. No. 392,600
Int. Cl.[5] B67D *5/00*
U.S. Cl. 222—1 15 Claims

1. A method of delivering particulate material from a vertical conduit into an open receptacle while reducing the amount of dust discharged into the atmosphere, which method comprises the steps of:

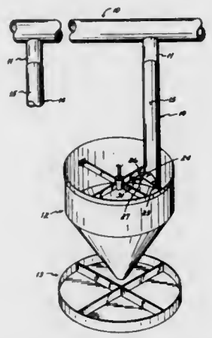
closing the lower end of said vertical conduit;

supplying particulate material to said vertical conduit;

sensing the accumulation of particulate material in said vertical conduit;

opening said lower end of said vertical conduit to allow said material to be discharged therefrom when a first predetermined quantity of said material accumulates in said conduit;

sensing the material in said conduit and reclosing the lower end of said conduit when the quantity accumulated in said conduit drops to a second predetermined amount to maintain the lower end of said conduit filled with a quantity of particulate material effective to inhibit the escape of dust from said conduit.



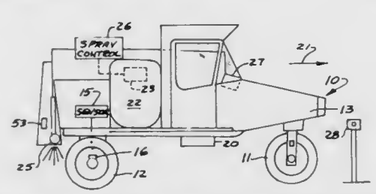
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5,050,771

## REPEATABLE PATTERN FIELD SPRAYING CONTROL

Lowell D. Hanson, White Bear Lake, and John R. Schafer, Minneapolis, both of Minn., assignors to Field Control Systems, Inc., Roseville, Minn.

Filed Jul. 31, 1989, Ser. No. 387,710
Int. Cl.[5] B67B *7/00*
U.S. Cl. 222—1 7 Claims




1. An apparatus for creating and storing a program in permanent data storage, and for subsequently repeating a previously created and stored program for automatically repeating application of a material onto soil in portions of a preselected field, including a programmable microprocessor adapted to be carried on a prime mover and including an operative program correlated to a known start position in a field for application of a material to control a condition in the field, the prime mover traversing the field in a number of repeatable passes each laterally offset from the others and having a length, controllable apparatus adapted to be carried on the prime mover for applying the material to soil, said programmable microprocessor including a programmable permanent data storage memory, means for inputting signals to start and stop the controllable operation of the apparatus into said programmable permanent data storage memory by an operator of the prime mover during initial passes across the field and storing the start and stop signals for use at a subsequent time when traversing in substantially the same path in the field, means for providing a signal to the programmable memory indicating the distance traveled by the prime mover from a reference position, and control means responsive to signals from a previously stored program from permanent data storage correlated to the distance signal and correlated to each particular pass along the field after the start position for operating the controllable apparatus to apply the material and for automatically turning the controllable apparatus on and off during each subsequent pass duplicating the initial pass across the same field when the program was created.



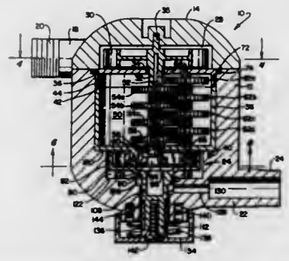
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5,050,772

## APPARATUS FOR MONITORING A FLOW OF FLUID THROUGH A FILTER MEDIUM

Earl P. Brane, Hideaway Hills, Ohio, and Douglas K. Brane, Largo, Fla.

Filed Apr. 9, 1990, Ser. No. 507,352
Int. Cl.[5] B67D *5/30*
U.S. Cl. 232—20 20 Claims



1. Apparatus for monitoring a flow of fluid through a conduit comprising:

a housing having an input port and an output port connectable with said conduit;

a turbine chamber within said housing in fluid communication with said input port for receiving fluid under pressure;

a turbine mounted within said turbine chamber and rotatable by fluid incident thereon from said input port;

a gear chamber within said housing in fluid communication with said turbine chamber;

a reduction gear train within said gear chamber rotatably drivably coupled with said turbine, having a predetermined reduction ratio and a rotational eccentric output component;

a valve seat within said housing adjacent said output port and including an open valve cam surface, and a valve closing detent portion,

a rotatable valve member mounted within said housing having a rotational drive component positioned adjacent and movable in select correspondence with said eccentric output component and a valve closure portion extending therefrom including a camming stem slideably movable upon said valve cam surface to retain said valve closure position in an open valve orientation and movable within said valve seat detent portion to effect blockage of fluid flow through said output port; and

reset means for repositioning said rotatable valve camming stem upon said valve cam surface to effect opening said valve for permitting the flow therethrough of a predetermined quantity of fluid.

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5,050,773

## ELECTRIC TOOTHPASTE DISPENSER

Min K. Choi, 21710 Park Valley, Katy, Tex. 77450

Filed Feb. 12, 1990, Ser. No. 478,412
Claims priority, application Rep. of Korea, Jun. 12, 1989, 18497
Int. Cl.[5] B65D *35/28*
U.S. Cl. 222—63 14 Claims

1. A toothpaste dispensing apparatus having a housing which contains a toothpaste container, comprising:

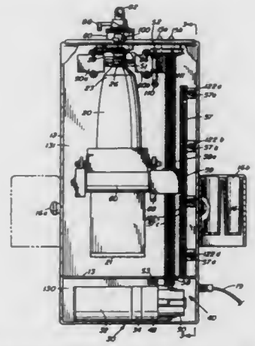
a long screw;

a means for driving which drives said long screw;

a carriage assembly defining at least two bearing cavities for supporting a first and a second roller and a threaded hole through which said long screw passes for driving said carriage assembly;

a rack fixed to the housing parallel to said long screw;

a first pinion driven by said rack as said carriage assembly is driven by said long screw for driving said first roller;



means for grasping the toothpaste container for holding and stabilizing the toothpaste container within the housing; and

control means located on the housing for activating said drive means.

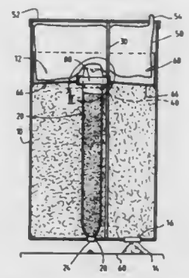
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5,050,774

## COMBINATION MIXER DISPENSER

James O. Camm, 51 Millew Ave., Chadstone Victoria, and Stephen J. Camm, 11 Kaisman Sq., Wantirna Victoria, both of Australia

Filed Jun. 7, 1990, Ser. No. 534,468
Claims priority, application Australia, Jun. 13, 1989, PJ4700
Int. Cl.[5] B67D *5/00*
U.S. Cl. 222—80 4 Claims



1. A dispenser for dispensing two components, said dispenser comprising a first container for containing one of the components and a second container for containing a second of the components, said first container having a first piston for movement in the first container for forcing the first component out of the first container, said second container having a second piston for forcing the second component out of the second container, a second piston moving means including a cutting means fixed relative to the first piston for cutting said second container as the first piston is moved, said second piston moving means being for moving said second piston relative to said second container when said first piston is moved to thereby cause movement of the first piston and the second piston in a fixed manner relative to one another to dispense a predetermined amount of the first component and second component from the first and second containers respectively, and wherein cutting of the second container by the cutting means enables

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movement of the first piston, the second piston moving means and the second piston relative to the first container and the second container, the second container being arranged within the first container and the first piston having an opening through which the second container extends, said second piston moving means comprising a blade extending across said opening and being mounted above said second piston such that, upon movement of the first piston, the end portions of the blade slice the second container and an intermediate portion of the blade abuts the second piston and pushes the second piston to cause the second piston to move with the first piston relative to the second container.

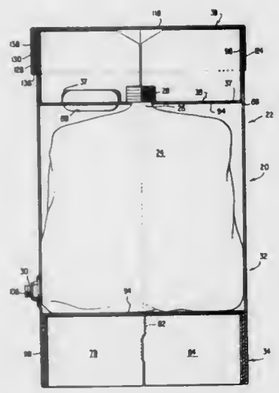
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**5,050,775**

**BEVERAGE DISPENSER AND CUP HOLDER**

**John R. Marquardt, Fond Du Lac, Wis., assignor to International Paper Company, Purchase, N.Y.**

**Filed Oct. 31, 1989, Ser. No. 430,661**
**Int. Cl.[5] B65D *35/24***
**U.S. Cl. 222—93** **14 Claims**



1. In a beverage dispenser, a carton for supporting a collapsible bag, said carton comprising a tubular body, a bag supporting base telescoped within and locked relative to said body, a bag outlet opening in said body above said base, a bag filler support slidably mounted in said body above said base, and a cap telescoped over a top portion of said body, whereby the bag filler support is freely slidable within the carton body and may move up or down depending on whether the bag is being filled with a liquid or a liquid therein is being dispensed.

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**5,050,776**

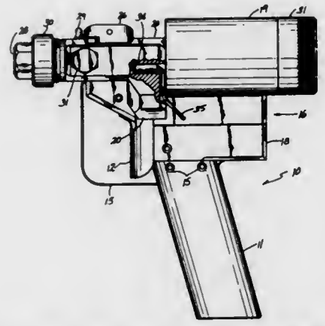
**CARTRIDGE HEATER FOR FOAM DISPENSING APPARATUS**

**William F. Rosenplanter, Wallingford, Conn., assignor to Olin Corporation, Cheshire, Conn.**

**Filed Jan. 2, 1990, Ser. No. 459,925**
**Int. Cl.[5] B05B *1/24***
**U.S. Cl. 222—146.5** **13 Claims**

1. In a plural component dispensing apparatus for dispensing foam formed from the mixing of plural components supplied through flow channels in a valve block to a mixing chamber for impingement mixing therewithin, the improvement comprising:

heating means mounted in and easily removable from the valve block in the dispensing apparatus for heating the mixing chamber within the dispensing apparatus to a



desired temperature prior to supplying thereto and the mixing and reaction therewithin of the plural components.

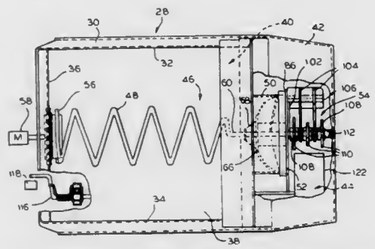
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**5,050,777**

**ICE DISPENSER CONVEYING APPARATUS HAVING A ROTATING BLADE AUGER THAT OPERATES IN CONNECTION WITH A BAFFLE OPENING TO PREVENT WEDGING OF ICE BODIES THEREBETWEEN**

**William J. Buchser, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Jan. 2, 1990, Ser. No. 459,651**
**Int. Cl.[5] B67D *5/62***
**U.S. Cl. 222—146.6** **22 Claims**



1. An ice dispenser for a refrigeration apparatus comprising:

a container for storing ice bodies, said container having a front access opening;

a housing secured at the front access opening of said container and having a dispensing space for dispensing ice bodies;

an ice conveyor for transferring ice bodies stored in said container to said dispensing space, including

a wire auger having an inner end rotatably coupled at a rear wall of said container and an outer end,

a rotatable drum dispenser enclosed in said housing and having a center hub receiving said wire auger outer end and being rotatable therewith, a cylindrical outer wall coaxial with said hub, and a pair of opposed, helical blade augers extending between the hub and the cylindrical outer wall, the blade augers having outer edges spaced inwardly from an outer edge of said outer wall, and

a baffle mounted outwardly of said drum dispenser in said housing and including a planar outer wall having a center coaxial with said hub, said planar wall having an enlarged opening therethrough disposed between said drum dispenser and said dispensing space, the opening being generally arcuate and extending partially about said center, and having a cutoff edge extending from a first point adjacent the drum dispenser outer wall to a second point and forming an acute angle with a first radius drawn from the hub to the first point across said opening, the second point being intermediate the hub and the drum dispenser outer wall on a second radius angularly displaced from said first radius; and

drive means for rotating said wire auger and said drum dispenser to deliver ice bodies from said container to said dispensing space, whereby the spacing of said blade auger outer edges and the orientation of said opening cutoff edge prevent ice bodies from wedging between said blade augers and said baffle.



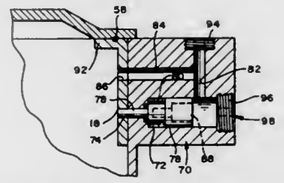
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**5,050,778**

**DRY FLOWABLE MATERIAL DISPENSING AND CONTENTS PRESERVATION AND STERILIZATION APPARATUS**

**Pat Corrado, 497 - 79th St., South, St. Petersburg, Fla. 33707, and Stephen Corrado, 9412 Laura Anne Dr., Seminole, Fla. 33542**

**Continuation-in-part of Ser. No. 526,955, May 23, 1990, Pat. No. 4,982,879, which is a continuation of Ser. No. 456,193, Dec. 19, 1989, abandoned, which is a continuation of Ser. No. 204,303, Jun. 9, 1988, abandoned. This application Nov. 2, 1990, Ser. No. 608,479**
**Int. Cl.[5] A61L *2/00*; B65D *45/00*; E05C *1/06***
**U.S. Cl. 222—152** **6 Claims**



1. A container having a removable cover; means for pressurizing the container with an inert gas; means for locking the cover to the container when the container is pressurized, said locking means mounted on the container comprising a lock housing, a stepped cylinder formed in the housing, a stepped piston slidably mounted in the stepped cylinder, a keeper bolt formed at the end of the piston, a first passage at the end of the cylinder through which the keeper bolt can slide; a cooperating bolt-receiving second passage in the container cover; the length of the first and second passages and the keeper bolt is such that when the container is pressurized, the bolt passes into each passage and a third passage at the rearward end of the cylinder connecting the interior of the container with the cylinder and to the means for pressurizing the container, and control means operative with the means for pressurizing the container, said control means including a valve in the housing at the said rearward end of the cylinder.

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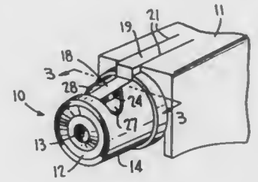
**5,050,779**

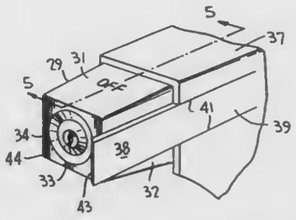
**DISPENSER HAVING CHILD-RESISTANT NOZZLE ASSEMBLY**

**Michael G. Knickerbocker, Upland, Calif., assignor to Calmar Inc., Watchung, N.J.**

**Filed Jul. 13, 1990, Ser. No. 552,067**
**Int. Cl.[5] B67B *5/00***
**U.S. Cl. 222—153** **8 Claims**

1. A fluid dispenser which includes a dispenser body having a nozzle end, said body having a discharge passage extending through said end, a child-resistance nozzle assembly comprising a nozzle cap in engagement with said nozzle end for rotation of said cap about a central axis thereof between off and on positions of said cap, cooperating valve means acting between said passage and said cap for closing and opening said passage respectively in said off and on positions of said cap, said cap having an external open groove defining an anti-rotative stop, and said body having a spring biased tab in abutting engagement with said stop in said off position for locking said cap against rotation from said off position, said tab being adapted





for manual outward flexing movement for disengagement from said stop to permit rotation of said cap to said on position, and said cap having an external recess opening into said tab to provide manual access to said tab to facilitate manual outward movement thereof.

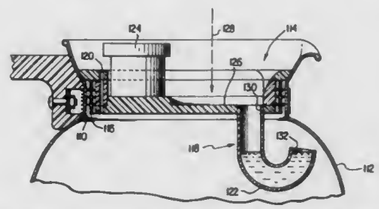
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**5,050,780**

**SELF SEALING TOP ASSEMBLY FOR OPEN MOUTH COFFEE POTS**

**Wayne B. Stone, Bethesda, Md., assignor to Wood Manufacturing Co., Inc., Flippin, Ark.**

**Continuation of Ser. No. 532,980, Sep. 16, 1983, abandoned. This application Oct. 22, 1986, Ser. No. 921,881**
**Int. Cl.[5] B67D *1/08***
**U.S. Cl. 222—188** **2 Claims**



1. A method of brewing, maintaining, and pouring coffee to reduce oxidation and evaporation of coffee as brewed by an automatic coffee maker comprising:

brewing coffee in an automatic coffee maker;

providing a coffee pot having an opening which establishes a single passageway into which brewed coffee is received from the automatic coffee maker and from which brewed coffee is dispensed from the pot;

establishing a flow of brewed coffee through the single passageway into the coffee pot;

trapping a portion of the brewed coffee within the single passageway to create a liquid seal; and

pouring brewed coffee through the single passageway while continuously trapping a portion of the brewed coffee in the single passageway to thereby maintain the liquid seal

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until substantially all of the coffee has been dispensed from the coffee pot.

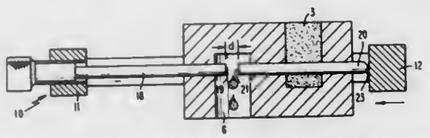
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5,050,781

## DEVICE FOR DOSING A LIQUID CONTAINED IN A FIRST CHAMBER AND FOR TRANSFERRING SMALL DOSES THEREOF INTO A FLUID FLOWING IN A SECOND CHAMBER

Philippe Cloup, Cauze de Francs, 33570 Lussac, France

Filed Jan. 11, 1990, Ser. No. 463,610
Claims priority, application France, May 16, 1989, 89 06384
Int. Cl.[5] G01F *11/00*
U.S. Cl. 222—305 12 Claims



1. A device for dosing a first liquid contained in a first chamber and for transferring small doses thereof into a fluid flowing in a second chamber, comprising:

a body having a first cavity, called the dosing cavity, and a second cavity, called the distribution cavity, situated beside the dosing cavity in said body, and a recess having a regular geometric shape and of which a portion joins the first cavity and the second cavity;

a mobile member housed partially and sealingly in said recess and having two abutment surfaces situated in mutually facing relation and separated from one another by a predetermined distance whereby a free space is delimited therebetween, the first of said abutment surfaces, called the internal abutment surface, penetrating alternatively into said cavities, and the second of said abutment surfaces, called the external abutment surface, being situated adjacent said dosing cavity with respect to said distribution cavity;

a follower element housed sealingly and slidably in said free space and at least partially in said recess, said follower element having a shape conforming to said free space, as well as an internal end face and an external end face situated respectively in facing relation to said internal abutment surface and said external abutment surface, said internal end face penetrating alternatively into said cavities, said end faces being separated by a first distance which is less than a second distance separating said abutment surfaces, by a third distance (d) corresponding to a maximum stroke of the follower element relative to said mobile member, said maximum stroke being less in length than the portion of the recess which joins the two cavities to one another;

means for blocking the follower element with respect to said body in a position in which the internal end face of the follower element is in the distribution cavity; and,

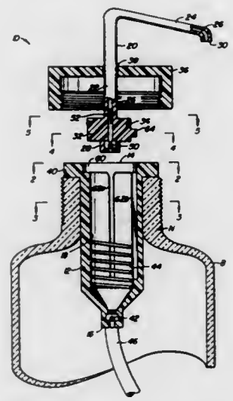
the mobile member being displaced in a reciprocating movement between a first position in which the internal abutment surface and the internal end face are juxtaposed in said dosing cavity, and a second position in which the internal abutment surface and the internal end face are situated in the distribution cavity and separated from one another by said third distance.

5,050,782

## MEASURED VOLUME LIQUID DISPENSER HAVING A ROTATABLE PLUNGER WITH A RADIAL PROJECTION FOR SELECTIVELY ENGAGING ONE OF A PLURALITY OF AXIAL CHANNELS FORMED IN THE PUMP CYLINDER

David H. Cheng, Saratoga, Calif., assignor to Linda J. Wei, Saratoga, Calif.

Filed Apr. 18, 1990, Ser. No. 510,910
Int. Cl.[5] G01F *11/06*
U.S. Cl. 222—309 8 Claims



1. A measured volume liquid dispenser comprising:

an elongate barrel having top and bottom ends and a cylindrical bore extending therebetween;

an inlet check valve at the bottom end of the cylindrical bore;

means at the top end for securing the elongate barrel to an opening in a liquid container;

a plunger slidably disposed within the cylindrical bore of the elongate barrel, said plunger having top and bottom ends and an axial passage extending therebetween;

an outlet check valve disposed within the axial passage; and

means responsive to rotation of the plunger for selectively limiting the downward travel of the plunger in order to dispense a measured volume of liquid, wherein said means for selectively limiting is located wholly within the barrel and comprises a plurality of axial channels formed in the cylindrical bore and means on the plunger for selectively engaging an individual channel corresponding to a premeasured volume.

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5,050,783

## HOSIERY APPLIER

Ronald L. Hunter, 1190 W. Oregon Dr., Lakewood, Colo. 80232

Filed Nov. 13, 1990, Ser. No. 612,228
Int. Cl.[5] A47G *25/90*
U.S. Cl. 223—112 3 Claims



1. A hosiery applier device which can be stabilized by the



legs of the user and operated with both hands comprising an outer tubular member with a handle end and a clamping member end, with a raceway slot disposed longitudinally at the clamping member end, an inner telescoping member sliding within said outer tubular member, and a clamping member with resilient coatings thereon comprising a lower horseshoe-shaped element fastened to said outer tubular member at said clamping end, and an upper horseshoe-shaped element fastened to said inner telescoping member through said raceway slot in said outer tubular member, and a stabilizing member comprising a pair of support elements, fastened to said outer tubular member, for stabilizing the device by contacting the legs of the user, and a handle member disposed at the handle end of said outer tubular member.

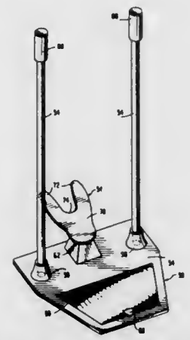
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5,050,784

## BOOTJACK STAND WITH REMOVABLE BOOTJACK AND SUPPORT POSTS

Posie C. Turner, 815 57th Pl., NE., Fairmount Heights, Md. 20743

Continuation-in-part of Ser. No. 273,441, Nov. 18, 1988, abandoned. This application Jul. 2, 1990, Ser. No. 546,803
Int. Cl.[5] A47G *25/80, 25/84, 25/86*
U.S. Cl. 223—114 3 Claims



1. A bootjack stand comprising a flat support plate adapted to rest directly on the floor or ground and at least one bootjack secured to said support plate, said support plate having socket means on an upper surface thereof with said support plate and socket means being formed of integral one piece die-cast construction, said socket means having a socket disposed at an acute angle to said upper surface of said support plate and said bootjack being comprised of a flat, substantially U-shaped plate having a downwardly extending projection on a lower surface thereof with a cylindrical pin extending therefrom in parallel spaced relation to said flat U-shaped plate with said flat, U-shaped plate, said projection and said pin being formed of integral one piece die-cast construction, said pin being detachably mounted in said socket.

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5,050,785

## BICYCLE RACK FOR FIFTH-WHEEL TRAILER

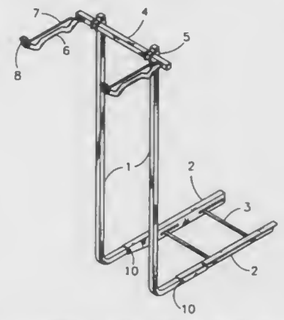
Gayle Hays, P.O. Box 394, Libby, Mont. 59923

Filed May 31, 1990, Ser. No. 531,233
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—42.045 R 11 Claims

1. A bicycle rack for non-permanent attachment to a hub apparatus on having opposing parallel side surfaces a fifth-wheel trailer, comprising:

a structural support means;

an attachment means comprising two parallel corresponding components fastened to said structural support means and adapted to be attached to said opposing parallel sides of a hub apparatus of a fifth-wheel trailer by fastening its two parallel corresponding components of said attachment means to one another around said hub apparatus such that the structural support means is securely fastened to the hub apparatus of the fifth-wheel trailer; and



a means to releasably secure one or more bicycles to said structural support means.

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5,050,786

## WAIST-ATTACHED CABLE HOLDER

Garth D. DeMott, N. 4876 Messer Rd., Merrimac, Wis. 53561

Filed Mar. 26, 1990, Ser. No. 498,422
Int. Cl.[5] A45F *5/00*
U.S. Cl. 224—253 2 Claims

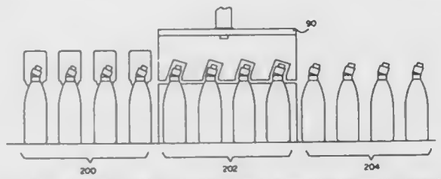


1. A device attachable to a person's belt for partially supporting the weight of a plural number of welding tool cables while the person is operating a welding tool attached to the cables; said device comprising a belt-attachment loop means having a lower end portion thereof locatable below the person's belt; an upright rigid hollow tube pivotably suspended from the lower end portion of said loop means, said tube having an axis that is essentially vertical when the device is attached to a person's belt; said tube having two parallel vertical side walls and two parallel connecting vertical end walls; one side wall of the hollow tube having an access slot (25) extending therealong parallel to the tube axis for insertion of a plural number of cables into the tube; and a manually-retractable clamp means located within said tube for clamping the inserted cables in fixed positions within the tube; said clamp means comprising an elongated support arm having one end thereof swingably attached to the tube for motion around a horizontal axis extending normal to the plane of said access slot, and a cable-engagement element attached to the other end of said support arm; said clamp means further comprising a lifter means (35) extending upwardly from said support arm, said lifter means having an exposed manual grip portion located above the tube.

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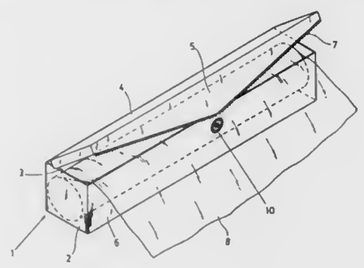
5,050,787
**METHOD FOR REMOVING FLASHING FROM BLOW MOLDED BOTTLES**
Thomas F. Greene, 2 Harrison Eaton La., Amesbury, Mass. 01913
Division of Ser. No. 351,950, May 15, 1989, Pat. No. 4,944,667. This application Mar. 30, 1990, Ser. No. 502,574
Int. Cl.[5] B29C *49/04, 49/50, 49/74*
U.S. Cl. 225—1 3 Claims

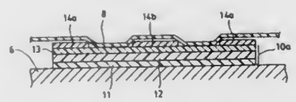



1. A method for removing flashing from low density plastic bottle wherein the flashing is joined to the top and neck of the bottles along a juncture which comprises in sequence:
(a) nesting a first bottle(s) in a housing;
(b) moving the housing with the nested bottle(s) along a first axis;
(c) engaging the flashing with jaws which clamp the flashing along the juncture of the flashing with the nested bottle(s);
(d) rotating the jaws about an axis parallel to the first axis while the bottle(s) is nested in the housing to remove the flashing from the bottle(s);
(e) opening the jaws to discharge the flashing;
(f) releasing the bottle from the housing; and
(g) repeating sequentially steps (a) through (f) on a second bottle(s) having flashing joined to its top and neck.

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5,050,788
**DISPENSING CARTON FOR A ROLL FILM**
Takashi O. Taguchi, Ohomiya; Akio Ouchi, Katsuta, and Mitsunobu Uchida, Tokyo, all of Japan, assignors to Kureha Chemical Industry Company, Limited, Tokyo, Japan
Filed Feb. 16, 1990, Ser. No. 480,840
Claims priority, application Japan, Feb. 21, 1989, 1-40550
Int. Cl.[5] B65D *85/67*
U.S. Cl. 225—25 6 Claims

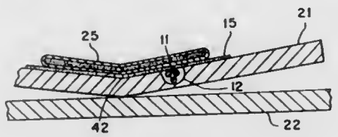



1. A dispensing carton containing film wound cylindrically comprising a box including a bottom panel, a rear panel, a front panel and both side panels, a lid member joined to said rear panel to cover an upper opening of said box, a cutter for cutting the film pulled out from said opening, and adhesive retaining means disposed on a front surface of said front panel, said adhesive retaining means including a base member, a sticking layer mounted on one surface of said base member to fix said base member on the surface of said front panel, an adhesive layer mounted on an other surface of said base member on which the film left after the pulled out film has been cut by said cutter hands and a resin layer mounted on a partial surface of said adhesive layer, a force of retaining said film by a surface of said resin layer is weak as compared with a force of retaining said film by the surface of said adhesive layer.

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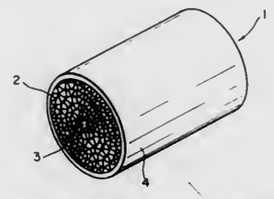
5,050,789
**APPARATUS AND METHOD FOR EXPLOSIVE BONDING TO EDGE OF FLYER PLATE**
Laurence J. Bement, Newport News, and Anne C. Kushnick, Williamsburg, both of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.
Filed Oct. 2, 1990, Ser. No. 591,644
Int. Cl.[5] B23K *20/08*
U.S. Cl. 228—107 40 Claims




1. An apparatus for miniature explosive joining of a metallic surface to a base plate, comprising:
(a) a flyer plate bent to an optimum collision angle forming a bond line;
(b) a ribbon explosive centered over the bend line of the flyer plate;
(c) a detonating means for initiating the ribbon explosive;
(d) an adhesive means for holding the ribbon explosive to the flyer plate;
(e) the flyer plate having a notch containing a filler material;
(f) the filler material having a density similar to the density of the flyer plate; and
(g) the filler material being in intimate contact with the flyer plate.

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5,050,790
**PROCESS FOR THE FABRICATION OF METAL-MADE CARRIER BODY FOR EXHAUST GAS CLEANING CATALYST**
Kazunori Takikawa, Numazu, and Yuzo Hitachi, Shizuoka, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Japan
Continuation of Ser. No. 288,082, Dec. 22, 1988, abandoned. This application Mar. 19, 1990, Ser. No. 495,883
Claims priority, application Japan, Dec. 28, 1987, 62-329463
Int. Cl.[5] C23C *9/00*; B23K *1/008, 101/02*
U.S. Cl. 228—181 12 Claims

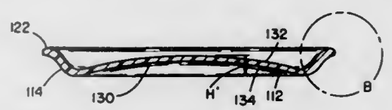



1. A process for the fabrication of a metal-made carrier body for an exhaust gas cleaning catalyst, which comprises superposing at least one sheet-like metal band and at least one corrugated metal band, each of said bands being made of a thin metal sheet, one over the other so as to establish contacts therebetween, thereby forming a multi-layered composite body defining a number of network-patterned gas flow passages along the central axis thereof, dipping the composite body in an electroless plating bath capable of forming a brazing coating layer on the composite body so as to form a brazing coating layer at least in the vicinity of each contact except for the contact itself, and then subjecting the resultant coated composite body to a heat treatment so as to braze the composite body at the contacts between the sheet-like metal band and corrugated metal band while preventing bonding material from being interposed between the contacts between the sheet-like metal band and the corrugated metal band.



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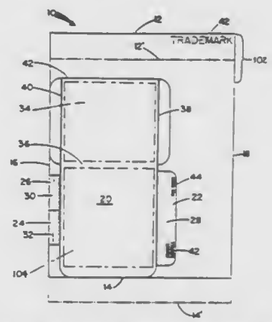
5,050,791
**CROWNED MEAT TRAY**
Thomas A. Bowden, Moraga, Calif., and Brian L. Wilt, Frankfort, Ill., assignors to Mobil Oil Corporation, Fairfax, Va.
Continuation-in-part of Ser. No. 240,306, Sep. 6, 1988, Pat. No. 4,899,925, which is a continuation-in-part of Ser. No. 175,076, Mar. 30, 1988, abandoned. This application Feb. 8, 1990, Ser. No. 477,364
The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.
Int. Cl.[5] B65D *1/42*
U.S. Cl. 229—2.5 R 11 Claims




1. In a molded packaging tray for the packaging of meat, fish, poultry, comestibles or non-food commodities, for use with a transparent overwrap film extending thereabout, said tray comprising upwardly and outwardly inclined side walls forming sides for said tray; bottom wall means for supporting said meat, fish, poultry, comestibles or commodities including a flat peripheral bottom wall portion; and a curvilinear wall portion extending between and joining said bottm wall and lower ends of said sidewalls so as to provide a smoothly contoured transitional surface therebetween of a thickness which is at least equal to the thickness of the adjoining bottom wall and sidewalls, the improvement wherein:
(a) said inclined sidewalls have a radially outwardly extending lip portion extending about said sidewalls proximate the upper ends thereof;
(b) said bottom wall portion of said tray including a high-crowned central portion of a generally ellipsoid, oval or circular configuration having continually upwardly curving walls, the highest point of said upwardly curving walls being at the center of said tray bottom, and crowned central portion of said tray bottom having an elevated height above the tray, bottom plane of at least 40 to 50% the maximum internal depth of said tray for the raised support of a product in said tray encompassed by a peripheral tray bottom surface forming a support surface for said packaging tray; and
(c) said bottom and sidewalls define a generally circular tray configuration.

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5,050,792
**FLOPPY DISK DIRECTORY ENVELOPE FORM**
Peter L. Segall, New York, N.Y., assignor to JMS Enterprises, Inc., Conn.
Continuation of Ser. No. 119,137, Nov. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 860,500, May 7, 1986, Pat. No. 4,708,285. This application Jan. 22, 1991, Ser. No. 644,680
Int. Cl.[5] B65D *27/00*
U.S. Cl. 229—68 R 11 Claims




1. An envelope form for a computer storage member of the type having a number of computer files recorded thereon, said files having names and said computer storage member being of the type which is readable using a computer system programmed with a program having a the capability of causing said computer to drive a printer to print a directory listing of said names of said files recorded on said computer storage member on a sheet of paper with said directory listing positioned in a particular area on said sheet, comprising a sheet form configured and dimensioned to be fed into said printer and having a directory printing surface portion which substantially coincides with said particular area, marks positioned on said sheet form, said marks being configured and dimensioned to define an envelope blank having a front panel and a rear panel, said rear panel being disposed substantially adjacent to said front panel, said front and rear panels being disposed on said sheet at positions which substantially coincide with said directory printing surface on said sheet form and said panels having configurations and dimensions to substantially coincide with said particular area, an envelope closing extension associated with and substantially adjacent to one of said panels, said envelope closing extension being positioned, configured, and dimensioned to be folded over to close an open side of an envelope body formed by the folding of said front panel over said rear panel and an adhesive layer disposed on at least a portion of said envelope closing extension for keeping said envelope closing extension folded over.

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5,050,793
**SYSTEM FOR INTERCONNECTING PANELS**
Andrew S. Graham, Jr., 2802 Jefferson Ct., Ambler, Pa. 19002
Continuation-in-part of Ser. No. 293,828, Jan. 5, 1989, Pat. No. 4,914,874, which is a continuation-in-part of Ser. No. 117,215, Nov. 4, 1987, Pat. No. 4,796,392, which is a continuation-in-part of Ser. No. 841,477, Mar. 19, 1986, abandoned, which is a continuation-in-part of Ser. No. 710,492, Mar. 11, 1985, Pat. No. 4,584,806. This application Apr. 9, 1990, Ser. No. 506,664
Int. Cl.[5] B65D *19/16, 9/12*
U.S. Cl. 229—125.23 14 Claims

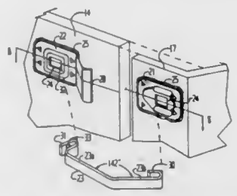
1. A fastening system for joining panels of a container in overlapping relationship comprising:
first plate means having a raised portion with an aperture, said first plate means being mounted on a first of said

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panels in a position on the panel offset from a side edge thereof;

a second plate means having a raised central portion having an aperture, said second plate means being mounted on a second panel adjacent a side edge thereof, the side edge of the second panel being disposed adjacent to the first plate means with the portion of the second panel adjacent to the side edge being in face-to-face contact with the region of the first panel between the first plate means and the side edge thereof;



a resilient spring clip having a pair of oppositely extending spring arms, one of said arms having an end hook portion adapted to fit over the side edge of the aperture in one of said plates, the other spring arm having a detent end portion, said detent end portion being dimensioned to fit within the aperture in the other of said plate means, the detent end portion and the raised portion being relatively dimensioned and proportioned to provide clearance for the detent portion with respect to the panel;

said first plate means having a raised retainer flange disposed in overlapping relationship with the side edge of the second panel.

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**5,050,794**

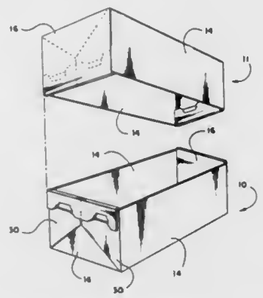
**TAMPER-RESISTANT LEAKPROOF CONTAINER**

**Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.**

**Filed Dec. 12, 1989, Ser. No. 449,597**

**Int. Cl.[5] B65D *5/22***

**U.S. Cl. 229—125.26** **16 Claims**



1. An enclosed container, comprising:

a top, comprising:

a top panel;

a plurality of exterior side panels having interior surfaces and extending downwardly from said top panel;

a first top connecting panel foldably connected to a first of said exterior side panels;

a second top connecting panel foldably connected to a second of said exterior side panels and to said first top connecting panel;

said top connecting panels being positioned against one another and against the interior surface of one of said exterior side panels such that one of said top connecting panels is exposed, the one of said top connecting panels that is exposed defining a first opening therethrough;

a top retention panel foldably connected to the lowermost horizontal edge of said one exterior side panel, said top retention panel being folded up against said exposed top connecting panel; and

a top locking tab defined in said top retention panel, said top locking tab extending into said first opening in said exposed top connecting panel; and

a bottom, comprising:

a bottom panel;

a plurality of interior side panels having exterior surfaces and extending upwardly from said bottom panel;

a first bottom connecting panel foldably connected to a first of said interior side panels;

a second bottom connecting panel foldably connected to a second of said interior side panels and to said first bottom connecting panel;

said bottom connecting panels being positioned against one another and against the exterior surface of one of said interior side panels such that one of said bottom connecting panels is exposed, the one of said bottom connecting panels that is exposed defining a second opening therethrough;

a bottom retention panel foldably connected to the uppermost horizontal edge of said one interior side panel, said bottom retention panel being folded down against said exposed bottom connecting panel; and

a bottom locking tab defined in said bottom retention panel, said bottom locking tab extending into said second opening in said exposed bottom connecting panel.

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**5,050,795**

**PROCESS AND APPARATUS FOR REGULATING AN INTERIOR TEMPERATURE OF A MOTOR VEHICLE**

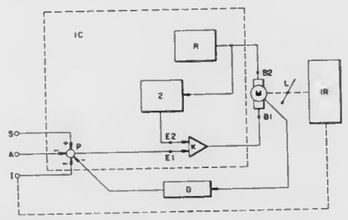
**Otto Knittel, Soest., Fed. Rep. of Germany, assignor to Hella KG Hueck & Co., Fed. Rep. of Germany**

**Filed Oct. 23, 1990, Ser. No. 601,356**

**Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935592**

**Int. Cl.[5] B60H *1/00*; F24F *11/06***

**U.S. Cl. 236—13** **16 Claims**



1. In a process to control the interior temperature of a motor vehicle, in which a nominal temperature is set and exterior and interior temperatures are measured, in which a motor is cyclically controlled to position an adjustable control member for influencing the quantity of heat channeled to an interior, and in which a first cyclical signal is created which influences the creation of a second cyclical signal to control the motor via a comparator, the improvement wherein:

a difference signal is developed from the nominal temperature, the interior temperature, the exterior temperature and a position signal representing a position of the adjustable control member;

the first cyclical signal is applied to the motor via a second terminal and synchronizes the second cyclical signal, with the comparator receiving the second cyclical signal and the difference signal for forming a third cyclical signal which is applied to the motor via a first terminal, so that an effective motor current corresponds to a difference between the first and third cyclical signals.



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**5,050,796**

**FUEL PREHEATING DEVICE FOR A HEATER**

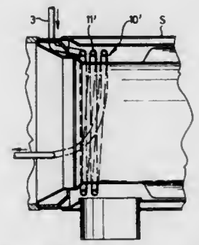
**Dieter Raethel, Mittelstetten; Christof Schumacher, Krailling; Wilfried Renovanz, Groebenzell, and Bernhard Umlauf, Seefeld, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany**

**Filed Mar. 2, 1990, Ser. No. 487,113**

**Claims priority, application Fed. Rep. of Germany, Mar. 30, 1989, 3910241**

**Int. Cl.[5] B60H *1/02***

**U.S. Cl. 237—12.3 C** **20 Claims**



1. Auxiliary heating device for a motor vehicle, with a burner that is connected to a fuel flow pipe containing a fuel filter for fuel supply to the burner and to a fuel return pipe for removal of excess fuel, and with a counterflow heat exchanger in surrounding relationship to a combustion chamber for transferring heat from hot combustion gases generated during combustion of the fuel supplied to a heat exchange medium flowing through the heat exchanger as the gases flow in a direction from an outlet end of the combustion chamber toward the burner, said heat exchanger having an exhaust gas collection chamber disposed in proximity to said burner at a downstream end of the heat exchanger in a direction of gas flow therethrough at an inlet end of the combustion chamber, and an exhaust gas discharge outlet through which the combustion gases, after passage through the heat exchanger, exit the heating device; wherein said fuel flow pipe has a fuel preheating pipe section which is disposed in a turbulent region of the flow of the combustion gases through the heat exchanger in an area of said exhaust gas collection chamber as a means for warming the fuel in the fuel flow pipe at a location upstream of the filter in a direction of fuel flow to the burner.

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**5,050,797**

**RAIL FASTENING FOR POINTS OF RAILWAY TRACKS**

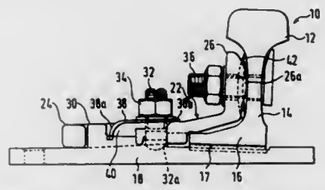
**Jean-Pierre Allegrucci, Schifflange, Luxembourg, assignor to Kihn S.a.r.l., Luxembourg**

**Filed Feb. 13, 1990, Ser. No. 479,450**

**Claims priority, application Luxembourg, Feb. 14, 1989, 87450**

**Int. Cl.[5] E01B *9/00***

**U.S. Cl. 238—336** **4 Claims**



1. A device for fastening a rail of a railway track to a railway sole plate, wherein the rail includes a head, a web, said web having inner and outer sides extending vertically downwardly from the head, and an outer foot, said foot extending horizontally from the outer side of the web and wherein the rail lacks an inner foot to permit installation of a movable rail point which is transversely displaceable relative to the inner side of the web, comprising:

a fastening shoe, said shoe comprising a horizontally extending first portion and a vertically extending second portion;

first fastening means for flexibly securing the first portion of the shoe to the sole plate; and

second fastening means for flexibly securing the second portion of the shoe to the outer side of the web;

wherein the web and the second portion of the shoe each include bolt holes and the second fastening means comprise a bolt extending through said bolt holes from a head to a threaded end, an adjusting nut threadably engaging said threaded end of said bolt and a flexible curved plate disposed between the second portion of the shoe and the web;

said apparatus supporting the track against lateral overturning moments while providing vertical elasticity between the shoe and the sole plate and lateral elasticity of the rail relative to the sole plate.

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**5,050,798**

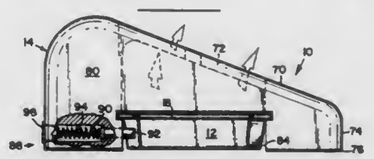
**STATIC AIR FRESHENER DEVICE AND CARTRIDGE**

**William E. Sullivan, Blythewood, S.C., assignor to Ecolab Inc., St. Paul, Minn.**

**Filed Sep. 13, 1989, Ser. No. 406,463**

**Int. Cl.[5] A61L *9/04***

**U.S. Cl. 239—58** **24 Claims**



1. An air freshener device having a cartridge having a fragrance, comprising:

(a) an outer housing defining a cavity for receiving the cartridge, the outer housing having a front member having air passage openings and a back member adapted and configured to be mounted on a surface, top and bottom members cooperatively connecting the front member to the back member, the top and bottom members having cartridge receiving openings, the cartridge receiving openings defining a slot, the slot extending the length of the outer housing;

(b) the slot sized and configured to receive the cartridge whereby when the cartridge is expired a second cartridge is inserted into the slot proximate the top member and the second cartridge is moved in the slot toward the bottom member, the expired cartridge moves downward in the slot and is forced out the bottom member by movement of the second cartridge thereby refilling the outer housing; and

(c) whereby the air passage openings receive air which moves over the cartridge picking up the fragrance resulting in an air-fragrance mixture which exits the air passage openings thereby allowing dispersion of the fragrance.

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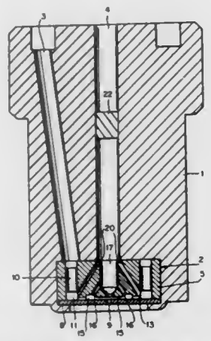


5,050,799

## INJECTION NOZZLE FOR LIQUID MEDIA

Ulrich Rohs, Roonstrasse 11, D-5160 Düren, Fed. Rep. of Germany

Continuation of Ser. No. 787,919, Oct. 16, 1985, abandoned.
This application May 15, 1990, Ser. No. 524,704
Int. Cl.[5] B05B *1/34*; F02M *61/00*
U.S. Cl. 239—124 3 Claims



1. In an injection nozzle for liquid media, such as fuel and the like, of the type including a nozzle body having a front surface and a central core with a front area, a central return duct disposed in said core, an inlet duct, a swirl space at least partially defined by an annular recess formed in said front surface of said nozzle body and surrounding said core front area, at least one swirl duct joined to said inlet duct and leading tangentially into said swirl space, a cover plate having a central opening, secured on the nozzle body, said core front area and said plate defining therebetween a disk-shaped gap connecting said swirl space to a space between said outlet opening and said return duct and thus causing a pressure drop between said swirl space and said space between said outlet opening and said return duct, said outlet opening having a cross section area substantially larger than the area of the superficies of the disk-shaped gap, the improvement comprising:

said swirl space being directly connected to said return duct by at least one injector bore, a receiving chamber surrounding and connected to said swirl space, said receiving chamber also being connected to the inlet duct and directly connected to the return duct by at least one injector bore.

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5,050,800

## FULL RANGE SPRINKLER NOZZLE

John W. Lamar, P.O. Box 1107, Oak View, Calif. 93022

Continuation-in-part of Ser. No. 319,357, Mar. 6, 1989, abandoned. This application Mar. 28, 1990, Ser. No. 500,723
Int. Cl.[5] B05B *1/16*
U.S. Cl. 239—201 14 Claims

1. A sprinkler nozzle, comprising:

a nozzle member having a base at one end and a head at the opposite end;

the base having an outer end and an inlet at its outer end for connection to a water supply outlet;

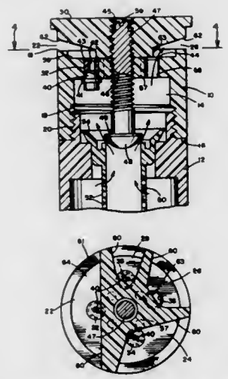
the head having a plurality of spaced spray orifices arranged in a ring around the outer periphery of the head for directing radial sprays in different directions, the orifices including at least two orifices of different dimensions;

the base having a plurality of internal passageways, each internal passageway connecting a respective spray orifice to the inlet;

flow restricting means removably mounted in each of said internal passageways for selectively cutting off the inlet from the respective outlet;

adjustable flow rate control means mounted in said nozzle member for controlling the flow rate of water into said inlet; and

precipitation rate control means for controlling the effective cross-sectional area of each passageway to provide predetermined precipitation rates from each spray orifice for a given flow rate;



said precipitation rate control means comprising means for matching the precipitation rates from each of the orifices.

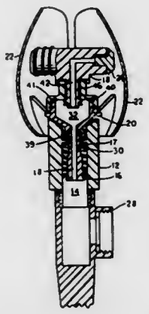
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5,050,801

## LAWN SPRINKLER

Ruggero Ferrari, St. Naviglia 11/A 43100, Parma, Italy

Filed Jun. 11, 1990, Ser. No. 536,430
Int. Cl.[5] B05B *15/10*
U.S. Cl. 239—211 16 Claims



10. In combination a sprinkler and an ornament.

said sprinkler having a sprinkler head and a body

said ornament supported on said body,

a water actuated means on said body adapted to move said ornament from a first position obscuring said sprinkler head to a second position exposing said sprinkler head,

said ornament comprises a flower having a plurality of petals,

each said petal being swingably attached to said body.

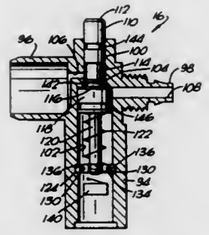


5,050,802

## FLUID DELIVERY EQUIPMENT

David C. Gill, and Garry K. Pressey, both of Bristol, Great Britain, assignors to Nomix Manufacturing Company Limited, Bristol, United Kingdom

Division of Ser. No. 221,285, Jul. 19, 1988, Pat. No. 4,901,975.
This application Nov. 13, 1989, Ser. No. 435,712
Claims priority, application United Kingdom, Jul. 20, 1987, 8717046
Int. Cl.[5] B05B *3/10*
U.S. Cl. 239—224 5 Claims



1. Liquid delivery equipment comprising:

a delivery head;

a motor-driven rotary distribution element supported by the delivery head;

an electric switch which is operable to supply electrical power to the delivery head to drive the rotary distribution element;

a liquid supply duct opening adjacent the rotary distribution element for supplying liquid to the distribution element;

a manually operable valve disposed in the liquid supply duct, the valve comprising:

a body having two aligned bores of different diameter,

an inlet and an outlet aperture, each opening into a different one of the bores,

a closer member which is sealingly engageable with a transition surface between the bores,

a manually operable operating element connected to the closure element and adapted to displace the closure member to open and close the valve,

the equipment further comprises an operating rod which extends from the closure member in a direction away from the transition surface to operate the electrical switch upon displacement of the operating element to open the valve.

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5,050,803

## ACTUATION SYSTEM FOR POSITIONING A VECTORING EXHAUST NOZZLE

Thomas G. Wakeman, Lawrenceburg, Ind.; Thomas S. Clayton, Cincinnati, and Conrad D. Wagenknecht, Westchester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 12, 1989, Ser. No. 420,413
Int. Cl.[5] F02K *1/00*
U.S. Cl. 239—265.35 9 Claims

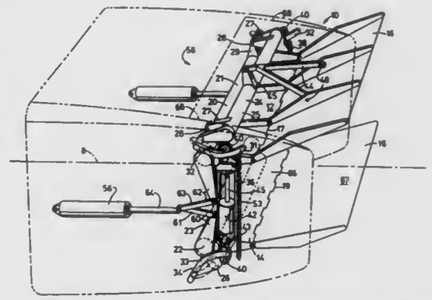
1. A two-dimensional gas turbine engine exhaust nozzle having opposed sidewalls, opposed convergent flaps, and variable position opposed divergent flaps defining a portion of an exhaust stream flow path, comprising:

convergent flap crank means positioned at other than a hinge point between said convergent and divergent flaps for supporting said convergent flaps;

cam crank means, pivotably attaclied to said convergent flap crank means, for positioning said divergent flaps;

means for rotating said cam crank means; and

link arm means, extending from said cam crank means to said divergent flaps, for translating travel of said cam crank



means into movement of said divergent flaps to vector an exhaust stream.

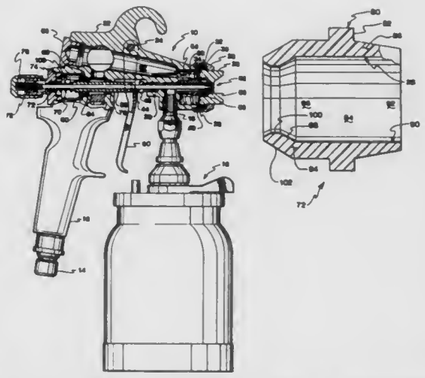
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5,050,804

## SHAFT SEAL FOR PORTABLE PAINT GUN

John M. Svendsen, Corcoran; Timothy D. Steinberg, Coon Rapids, and Richard W. Gunderson, Elk River, all of Minn., assignors to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Aug. 3, 1990, Ser. No. 560,744
Int. Cl.[5] B05B *7/06*
U.S. Cl. 239—296 11 Claims



1. In a portable paint gun of the type having a control shaft for controlling a supply of pressurized air to atomize a selectively provided stream of paint, an improved shaft seal in combination therewith comprising:

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a) a mediate portion having a radially outwardly projecting flange and a generally cylindrical interior recess located radially inwardly of the flange;
b) a first conical rim extending axially in a first direction away from the flange and having a shallow taper from a relatively thicker cross section proximal of the flange to a relatively thinner cross section distal of the flange and having a first extension of the generally cylindrical interior recess radially inwardly of the first conical rim;
c) a cylindrical portion extending axially in a second direction opposite the first direction away from the flange and having a second extension of the generally cylindrical interior recess extending axially along and radially inwardly thereof;
d) a second conical rim extending axially in the second direction from the cylindrical portion; and
e) a conical inner surface extending from the second extension of the generally cylindrical interior recess to a cylindrical shaft sealing surface located axially distal of the flange in the second direction

wherein the second conical rim has a tapered sealing surface adapted for interfitting and in contact with a mating correspondingly tapered bore in an element of the paint gun such that the shaft seal prevents the passage of air between the control shaft and the shaft sealing surface and between the sealing surface and the tapered bore.

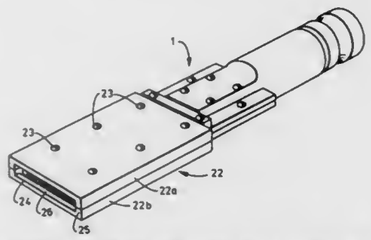
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**5,050,805**

## NOISE ATTENUATING SUPERSONIC NOZZLE

**Daniel L. Lloyd, Mason, and Richard J. Madlener, Cincinnati, both of Ohio, assignors to Cold Jet, Inc., Loveland, Ohio**

**Continuation of Ser. No. 308,173, Feb. 8, 1989, abandoned. This application Apr. 6, 1990, Ser. No. 506,556**
**Int. Cl.[5] B05B *1/00*; F01N *1/14***
**U.S. Cl. 239—424** **42 Claims**



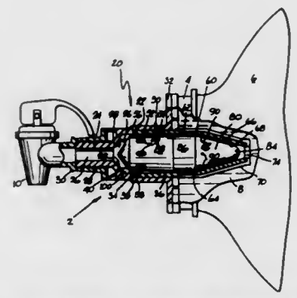
1. A sound attenuating supersonic nozzle connectable to a flow of compressible fluid, said nozzle comprising:
(a) a nozzle body having an exterior surface;
(b) a supersonic passageway having an interior wall, said supersonic passageway formed in said nozzle body and having an inlet, a throat, and an exit, said supersonic passageway having a converging section between said inlet and said throat, said supersonic passageway having a diverging section between said throat and said exit, said supersonic passageway adapted for producing sonic flow at said throat and supersonic flow in said diverging section; and
(c) means for reducing the coalescence of sound waves, said means comprising a plurality of longitudinal grooves formed in said internal wall adjacent said exit.

**5,050,806**

## FLOW CONTROL APPARATUS

**David A. Anderson, Lakewood; Lowell T. Whitney, Arvada, and David C. Young, Westminster, all of Colo., assignors to Golden Technologies Company, Inc., Golden, Colo.**

**Filed Dec. 14, 1989, Ser. No. 450,739**
**Int. Cl.[5] B67D *5/60***
**U.S. Cl. 222—464** **10 Claims**



1. Flow control apparatus for use in dispensing a liquid from a container at a relatively low pressure wherein the liquid in the container is under relatively high pressure comprising:
a hollow housing having a main body portion;
mounting means for mounting said hollow housing on said container so that said fluid may flow therethrough;
an integral valve attaching portion located on one side of said main body portion;
said integral valve attaching portion having a passageway extending therethrough for permitting said liquid to flow therethrough;
said main body portion having a generally cylindrical inner surface;
said main body portion having an abutment surface extending between said generally cylindrical inner surface and said passageway;
a dispensing valve member secured on said valve attaching portion;
a hollow core member having a front end portion mounted in said main body portion and an integral back end portion projecting toward said container;
said front end portion having a continuous cylindrical inner surface;
said back end portion having a continuous inner surface having a first part having a cylindrical surface having the same diameter as said cylindrical surface of said front end portion and a second part having a conical inner surface;
said back end portion having an open end to provide a passageway for said liquid in said container;
a flow regulator located within said hollow core member;
abutment means on said flow regulator for contacting said abutment surface of said main body portion;
said flow regulator having an outer surface having a cross-sectional configuration that is slightly smaller than facing portions of said continuous inner surfaces of said hollow core member;
said outer surface having a central portion that is cylindrical and an adjoining portion that is conical;
spacing means for providing a spaced relationship between said inner and outer surfaces for permitting the flow of said liquid from said container through said spaced relationship and said hollow housing to said valve member comprising a first plurality of circumferentially spaced apart protuberances projecting outwardly from said conical outer surface and in contact with portions of said conical inner surface; and a second plurality of circumferentially spaced apart protuberances projecting outwardly from said adjoining portion and in contact with portions of said cylindrical inner surface; and
connecting means for connecting said hollow housing, said hollow core member and said flow regulator in a fixed relationship with said abutment means in contact with said abutment surface and said first plurality of circumferentially spaced apart protuberances in contact with said conical inner surface.

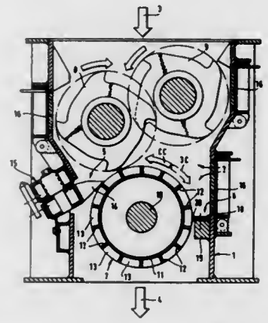
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**5,050,807**

## CRUSHER

**Pekka Bäckström, and Juhani Lystilä, both of Kauhajoki, Finland, assignors to Onninen Oy, Kauhajoki, Finland**

**Filed Feb. 13, 1990, Ser. No. 479,534**
**Claims priority, application Finland, Feb. 15, 1989, 890710**
**Int. Cl.[5] B02C *18/08***
**U.S. Cl. 241—101 R** **7 Claims**



1. An apparatus for comminution of different kinds of solid fuel material, comprising:
a housing, a rotating member and a comminution means, said rotating member and said communition means being supported in said housing;
said rotating member being adapted to feed the material to be comminuted and to function as a counter element for said comminution means in the comminution operation, said rotating member being arranged for rotation in two opposite directions,
said comminution means including a first and a second comminution means, said first comminution means being arranged for comminution of a first group of said materials which is fed to said first comminution means by said rotating element while rotating in a first direction, and said second comminution means being arranged for comminution of a second group of materials fed to said second comminution means by said rotating element while rotating in a second direction opposite to the first direction of rotation; and
wherein said first comminution means operates on a cutting principle and is particularly intended for wooden materials, and said second comminution means operates on a crushing principle and is particularly intended for sod peat and materials with similar characteristics.

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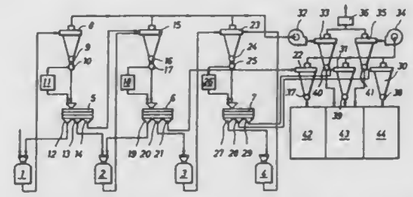
**5,050,808**

## MILLING APPARATUS AND SYSTEM THEREFOR

**Toshihiko Satake, Hiroshima; Satoru Satake, Tokyo, and Yukio Hosaka, Hiroshima, all of Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan**

**Filed Dec. 18, 1989, Ser. No. 452,271**
**Int. Cl.[5] B02C *23/00***
**U.S. Cl. 241—37** **20 Claims**

1. An apparatus for milling granular material, comprising:
a roll mill for milling the granular material into milled particles, the roll mill including a pair of rolls which are rotatably arranged in facing relation to each other, at least one of the pair of rolls being movable toward and away from the other, and gap adjusting means associated with said at least one roll for moving said at least one of the pair of rolls toward and away from the other roll to adjust a gap between said pair of rolls thereby adjusting a milling degree of the milled particles; and
measuring means for issuing an output signal representative of the milling degree of the milled particles, said measuring means being arranged downstream from said roll mill and connected to said gap adjusting means, and having a picture processing means for measuring projected areas of the milled particles,
wherein said gap adjusting means is operative in response to said output signal from said measuring means to move said at least one roll toward and away from the other roll, thereby automatically adjusting the milling degree of the milled particles.



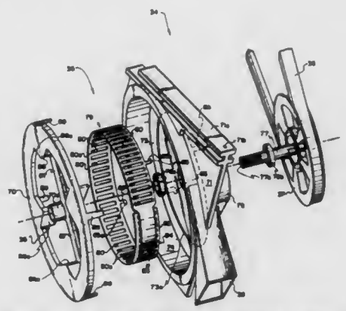
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**5,050,809**

## FLAVORED SHAVED CUBE ICE MACHINE

**Carl A. Rupp, 2382 S. Redwood Rd., Salt Lake City, Utah 84119**

**Filed Mar. 23, 1990, Ser. No. 503,760**
**Int. Cl.[5] B02C *19/12***
**U.S. Cl. 241—86.1** **6 Claims**

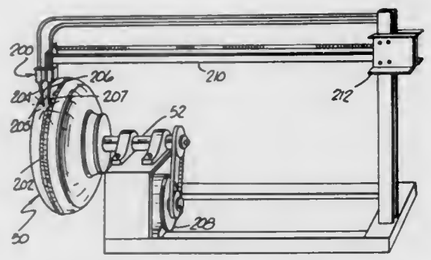


1. A cube ice shaving machine comprising, a cabinet; a cube ice shaver arranged in said cabinet, and said cube ice shaver includes a shaving head consisting of: a housing, a spindle, with a plurality of paddles mounted on said spindle for rotation therewith, a ring-shaped blade assembly closely surrounding said paddles, said blade assembly having lateral slots spaced at intervals therearound, each with an outwardly projecting rear edge as an ice shaving means, and means to axially rotate said spindle; means to direct ice cubes into said cabinet; means within said cabinet for containing and directing ice cubes into said cube ice shaver the cube of ice traveling between said paddles and blade assembly; means to direct ice shavings formed by movement of ice cubes over said blade assembly out of the cabinet for capture in a vessel; and means for containing and dispensing syrup on demand into a vessel containing ice shavings.

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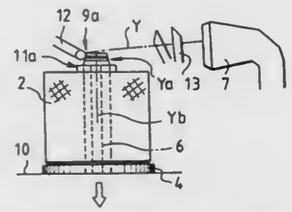


5,050,810
**ONE-PIECE PULVERIZING ROLLER**
Robert L. Parham, 1675 Larimer St., Ste. 625, Denver, Colo. 80202
Division of Ser. No. 464,870, Jan. 16, 1990. This application Jun. 18, 1990, Ser. No. 539,574
Int. Cl.[5] B02C *15/14*
U.S. Cl. 241—293 4 Claims




1. A pulverizing mill roller for mounting on a pulverizing mill shaft assembly, comprising:
(a) a roller body having a circumferential portion, said circumferential portion having a hardness of less than 300 Brinnell Hardness; and
(b) an overlay of welding beads welded to said circumferential portion.

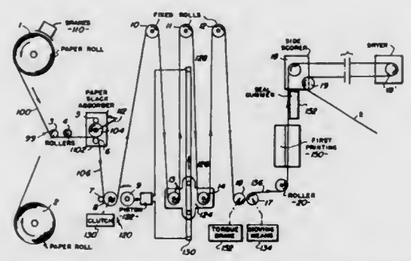
5,050,811
**METHOD AND APPARATUS FOR PROCESSING YARN END OF PACKAGE**
Yoshihiro Nishimura, Kaga, and Noboru Sekitani, Ohtsu, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Jul. 17, 1989, Ser. No. 380,875
Claims priority, application Japan, Jul. 20, 1988, 63-179088; Dec. 19, 1988, 63-318585; Dec. 19, 1988, 63-318586; Dec. 24, 1988, 63-324816
Int. Cl.[5] B65H *54/00, 65/00*
U.S. Cl. 242—18 R 10 Claims




1. A method for processing a yarn end of a package comprising the steps of:
supplying a cheese or cone type package to a winder while the package is carried on a tray;
winding the yarn end of the package around an extremity end of a peg disposed on the tray or a head part of a take-up tube of the package by several turns; and
inserting the extremity end of the yarn end into a central hole of the peg or the take-up tube.

4. An apparatus for processing a yarn end, comprising:
a suction mouth for drawing out a yarn end of a yarn supplying package having a shaft projected along its axis;
yarn end guide means for pulling the drawn-out yarn end so as to cause the yarn end to be engaged with a side part of the shaft;
package rotating means for rotating the yarn supplying package around its axis upon the yarn end being engaged with the side part of the shaft by the yarn end guide means to wind the yarn end about the shaft;
cutter means, disposed between the suction mouth and the yarn end guide means, for cutting the yarn end to a predetermined length; and
a suction pipe in suction communication with the projecting shaft to suction the cut yarn end downwardly along a central hole of the projecting shaft.

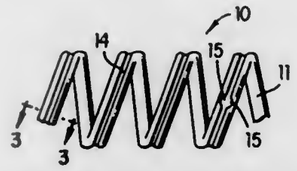
5,050,812
**DUAL-ENVELOPE MAKING MACHINE AND METHOD OF USING**
Henry H. J. Mueller, Wrentham, Mass., assignor to Sterling Envelope Corporation, Tauton, Mass.
Filed Dec. 5, 1990, Ser. No. 622,476
Int. Cl.[5] B65H *19/18, 23/188, 23/16*
U.S. Cl. 242—58.1 5 Claims



1. A system for maintaining uniform a tension on a flat sheet, comprising:
a first small roller;
a second roller, larger than said first roller, and engaged against said first roller, and adapted to receive said flat sheet passing between said second roller and said first small roller;
at least one fixed roller, disposed downstream of said first and second rollers, so that said sheet passes from between said first and second rollers to said fixed roller;
a dancer roller assembly, formed to be movable relative to said fixed roller, to move toward said fixed roller and away from said fixed roller;
upper and lower limit switches, mounted adjacent said dancer roller assembly, and actuated by said dancer roller assembly approaching a position of said limit switches;
a third roller larger than said second roller, and movable to be selectively biased against said second roller,
said second roller underfeeding said paper such that said dancer assembly moves in a first direction as a response to said underfeeding, and
said third roller overfeeding said paper assembly such that said dancer assembly moves in a second direction opposite to said first direction; and
controlling means, responsive to said first and second limit switches, for selectively actuating said third roller to bias against said second roller to reverse a direction of movement of said dancer roller assembly, based on actuations of said limit switches indicative of said dancer roller reaching limits of its travel.



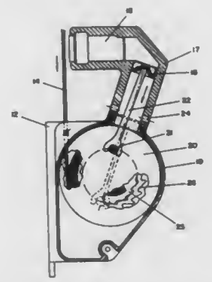
5,050,813
**CORD RETAINING AND WINDING DEVICE**
Takeshi Ishikawa, and Atsuko Kobayashi, both of 420 E. 80th St., New York, N.Y. 10021
Filed Dec. 26, 1989, Ser. No. 457,150
Int. Cl.[5] B65H *75/34*
U.S. Cl. 242—85.1 5 Claims




4. A cord retaining device adapted for retaining and winding at least one cord therein, said cord having a width and a thickness equal to or smaller than the width, comprising, a spirally wound elongated body having a plurality of convolutions defining a cylindrical form, said elongated body having a base portion, two side portions extending radially outwardly from the base portion, and axially extending flange portions at the outer ends of the side portions, axially adjacent side portions of neighboring convolutions of the elongated body being attached to one another, said elongated body having ductility,
said base portion, side portions, and flange portions defining at least one groove formed in the elongated body so that at least one cord is situated and retained therein, said groove including an inner portion having a width substantially corresponding to the width of the cord to be retained and a narrow portion formed between the axially extending flange portions communicating with the inner portion, said narrow portion having a width smaller than the width of the cord, said cord, when situated in the groove, passing through the narrow portion and situated in the inner portion such that the width and length of the cord accord the width and length of the inner portion, whereby the cord is securely retained inside the groove, and
a plurality of pairs of notches provided on the flange portions adjacent the narrow portion, said cord being taken out of the elongated body through a desired pair of notches.

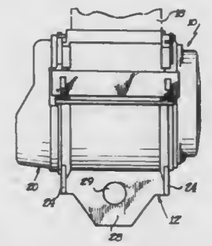
5,050,814
**SAFETY BELT REELING MECHANISM**
Klaus Butenop, Herzhorn, and Doris Kröger, Tornesch, both of Fed. Rep. of Germany, assignors to Autoflug GmbH & Co. Fahrzeugtechnik, Rellingen, Fed. Rep. of Germany
Filed Feb. 2, 1990, Ser. No. 475,647
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1989, 3903148
Int. Cl.[5] B60R *22/46*
U.S. Cl. 242—107 6 Claims

1. In a safety belt reeling means having a tightening device comprising a drive that is activated in the event of an incident, with said drive being spaced from a belt winding spindle of said belt reeling means and being connectable thereto, in the event of actuation of said drive, via coupling means that comprises a first coupling member, which is mounted on a driven disc and in the event of rotation of said disc is adapted to engage a second coupling member which is connected to said belt winding spindle, the improvement wherein:
said driven disc is in the form of an inertia disc that is rotatable via said drive, and



said drive comprises a gas pressure-operated cylinder/piston unit, with said piston being connected to said inertia disc via a piston rod.

5,050,815
**COMPACT SAFETY BELT RETRACTOR**
Gerald A. Doty, Crown Point, Ind., and James L. Zygutis, Frankfort, Ill., assignors to Occupant Safety Systems Inc., Olympia Fields, Ill.
Filed Jan. 18, 1990, Ser. No. 467,170
Int. Cl.[5] B60R *22/40*
U.S. Cl. 242—107.4 A 9 Claims



1. A safety belt retractor of compact size for storing a large length of seat belt webbing thereon in a coil,
said retractor comprising:
a frame having a base portion and a pair of sidewalls extending outwardly from the base portion,
a reel having a reel shaft mounted for rotation in the pair of sidewalls with the reel shaft spanning the sidewalls and with the seat belt webbing wound in a coil on the reel shaft,
a pair of toothed ratchet wheels on the reel shaft for rotation with the reel shaft, tips on the teeth of the ratchet wheels defining circles off a first diameter,
a lock bar spanning the pair of sidewalls and having a pair of elongated columnar pawl teeth being movable from a position spaced from the teeth on the ratchet wheels to a locking position engaging the teeth on the ratchet wheels and holding the reel against rotation and thereby further belt unwinding from the reel at first predetermined loads,
said retractor frame sidewalls having cutouts formed therein with said toothed ratchet wheels located in the cutouts;
a coil of seat belt webbing on the retractor having a larger diameter than the first diameter defined by the ratchet wheel teeth tips, said coil having side edges adjacent the frame sidewalls,
a vehicle sensitive inertia-actuating means including an inertia weight displaceable to actuate the lock bar to swing the pawl teeth into locking engagement with the ratchet wheel teeth,

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said pair of pawl teeth being disposed in the planes of the respective sidewalls laterally outwardly of the side edges of the webbing coil to engage the ratchet wheels when the coil has a larger diameter than the first diameter;

each of said elongated, columnar pawl teeth being pivotably mounted in the retractor frame sidewall, a cross bar on the lock bar extending across the belt reel and joining the pawl teeth;

resilient mounting means exterior of the frame sidewalls for mounting the reel shaft in the sidewalls for reel rotation, said mounting means being deflectable under loads greater than said first predetermined loads to allow the ratchet wheel teeth and reel shaft to deflect, the cutouts having walls located adjacent the ratchet toothed wheels to be engaged by the ratchet wheel teeth when the mounting means is deflected; and

said ratchet teeth engaging the cutout walls in the retractor frame walls when the resilient mounting means is deflected at loads greater than the first predetermined loads translating the reel and both of the ratchet teeth to generally simultaneously engage the cutouts to stop rotation of the ratchet wheels and translation displacement of the reel.

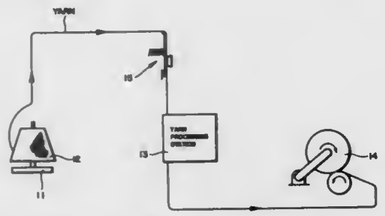
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**5,050,816**

## STRAND TENSION CONTROLLER

**Kurt W. Niederer, Charlotte, N.C., assignor to Belmont Textile Machinery Co., Inc., Belmont, N.C.**

**Filed Mar. 14, 1990, Ser. No. 494,154**
**Int. Cl.[5] B65H *59/24***
**U.S. Cl. 242—149** **26 Claims**



1. A strand tension controller, comprising:

(a) an elongate strand sensing lever arm having a strand guiding input end and an opposing end downstream of the input end;

(b) friction means positioned between said input end and said opposing end of said lever arm for applying tension between a range of zero and a preset maximum tension on said strand;

(c) mounting means downstream of said friction means for mounting said lever arm for pivotal movement responsive to strand tension sensed at the strand engaging input end of said lever arm and for subtracting from the tension applied by said friction means the tension sensed on strand at the input end of said lever arm.

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**5,050,817**

## COMBINED ROAD AND AIRCRAFT VEHICLE

**Harvey R. Miller, 3655 E. Amazon, Eugene, Oreg. 97405**

**Filed Oct. 16, 1989, Ser. No. 421,672**
**Int. Cl.[5] B64C *37/00***
**U.S. Cl. 244—2** **7 Claims**

1. A combined road and aircraft vehicle comprising:

a chassis having front, rear and side portions,

a propeller assembly for driving the vehicle in the air,

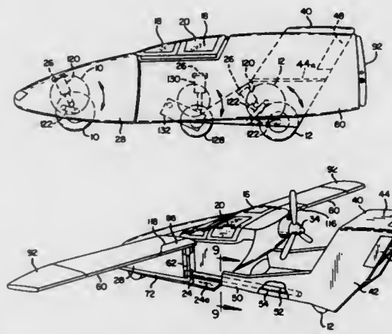
said propeller assembly being disposed between the front and rear of said chassis and facing the rear,

wing assemblies on opposite sides of said chassis for supporting the vehicle in the air,

folding support means for said wing assemblies arranged to support said wing assemblies in an outward aircraft form of the vehicle or in a folded stored position lying along the side of the chassis in a road form of the vehicle,

a tail assembly on said chassis,

shift means arranged to slidably shift said tail assembly alternately between a forward compacted road vehicle position and a rearward aircraft position spaced from said propeller assembly,



first wheel means on the front of said chassis providing front end support of the vehicle on a road and runway,

and second wheel means on said tail assembly providing rear end support of the vehicle both on a road in the road form of the vehicle and on a runway in the aircraft form of the vehicle.

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**5,050,818**

## METHOD FOR THE REPULSING OF AIRBORNE OBJECTS

**Peter Sundermeyer, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany**

**Filed Mar. 2, 1989, Ser. No. 321,663**
**Int. Cl.[5] F41G *7/30***
**U.S. Cl. 244—3.15** **7 Claims**



1. A method for the warding-off of an airborne object approaching a target area through a guidable defensive airborne body intercepting said airborne objects, comprising the steps of:

(a) determining and mathematically extrapolating an approach trajectory of the airborne object to said target area through the intermediary of a navigational computer when said object is still at an extremely considerable distance from said target area;



(b) determining a spatially and timewise optimized collision point between said defensive airborne body and said airborne object upon launching said airborne body from the vicinity of said target area, determining ahead of said collision point an acutely-angled transient funnel sector about approach trajectory of said airborne object which is tangent therewith at the collision point between said airborne object and said airborne body, and transmitting data thereto and at points along the path for a nominal trajectory for said airborne body for homing into the base of said transient funnel sector prior to the launching of said defensive airborne body;

(c) computing in a simulation computer in a time-staggered sequence on board said defensive airborne body subsequent to launching thereof with consideration of a dynamic model of the airborne body which has the nominal trajectory momentarily specified to a superordinated flight controller and position-finding information obtained on board the defensive airborne body relative to an airborne object acquired thereby, a four-dimensional point in space and time of the closest approach by the defensive airborne body which is to be actually expected from the actual conditions of motion to the airborne object which is to be intercepted;

(d) iteratively repeating said computation with consideration of the actual relative positional data of the defensive airborne body to the airborne object which is to be intercepted, until computed modified trajectory data indicate expectations of a sufficiently close actual approach to the airborne object in a specified relative orientation of the defensive airborne body;

(e) varying in the flight controller the guidance inputs for the originally preset and assumed nominal trajectory pursuant to the extent of such corrected trajectory;

(f) and repeating the time-staggered iterative preliminary computation of the actually expected collision conditions with the changed trajectory data and the actual relative position-finding information, so as to correlate such data and information with the inputs to the flight controller.

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**5,050,819**

## ROTATABLE NON-CIRCULAR FOREBODY FLOW CONTROLLER

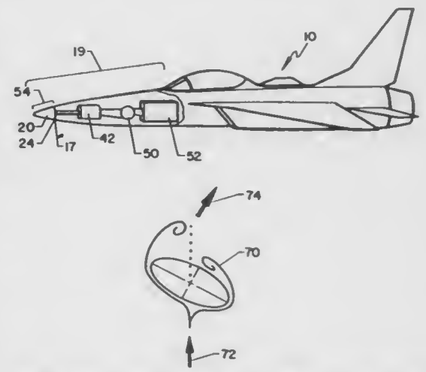
**Cary A. Moskovitz, Blacksburg, Va., assignor to The United states of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Aug. 10, 1990, Ser. No. 565,090**
**Int. Cl.[5] B64C *19/00***
**U.S. Cl. 244—75 R** **12 Claims**

1. An apparatus for controlling yawing moment of an aircraft having a forebody with a circular cross-section and an apex, the apparatus comprising:

a rotatable, geometric device having a circular base,

the circular base of the geometric device fitting flush upon the circular cross-section of the forebody of the aircraft,



the geometric device having a plurality of non-circular cross-sections that extend from the circular base thereof to the apex of the aircraft.

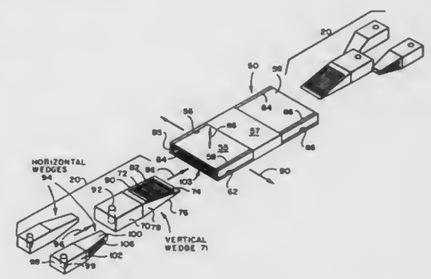
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**5,050,820**

## INTERLOCKING STRUCTURAL MEMBERS EMPLOYING TRIPLE INTERFITTING WEDGE

**Robert E. Anderson, Huntington Station, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.**

**Filed Feb. 21, 1989, Ser. No. 312,984**
**The portion of the term of this patent subsequent to Jan. 9, 2007, has been disclaimed.**
**Int. Cl.[5] B64C *1/06*; F16B *2/14***
**U.S. Cl. 244—131** **8 Claims**



1. An expansion fastener comprising:

a hollow receptacle having

a) a first hollow section including a continuous wall, and

b) at least one additional hollowed section integrally extending coaxially from the first section and having slits formed in the wall thereof; and

a triple interlocking wedge received within the slitted section for expanding the slitted wall thereof, the triple wedge including a first central wedge member having

a) at least one tapered surface for contacting a mating tapered surface within the wall of the slitted section,

b) the tapered surface being ridged for engaging a mating ridge surface within the wall of the slitted section;

two wedge members adapted to be driven into the slitted section alongside the central first wedge member, each of the latter wedge members having an inwardly tapering

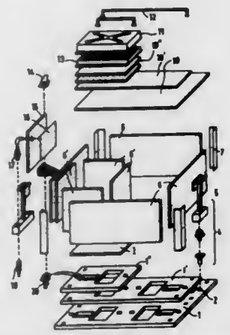
VOL 1130 ISS 4 SE 24 1991 UMI



rippled sidewall adapted to securely engage a mating rippled surface formed i the wall of the slitted section;
the driving insertion of the first central wedge member resulting in independent expansion of the receptacle in a first direction, and further wherein the driving insertion of the latter two wedge members into the receptacle results in independent expansion of the receptacle in a second direction orthogonal to the first direction.

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**5,050,821**
**MODULAR PAYLOAD TRANSPORT AND OPERATING DEVICE FOR SPACE VEHICLE**
**Lothar Kerstein, Sottrum; Manfred Riess, Ganderkesee, and Juergen Weydandt, Bremen, all of Fed. Rep. of Germany, assignors to Erno GmbH, Bremen, Fed. Rep. of Germany**
**Filed Mar. 20, 1987, Ser. No. 28,238**
**Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609770**
**Int. Cl.[5] B64G *1/00***
U.S. Cl. 244—158 R **12 Claims**

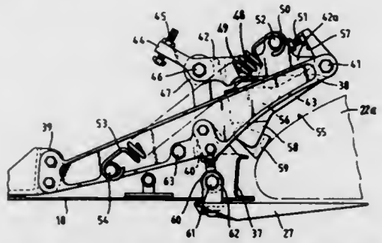


2. A payload transport and operating device for space vehicles, comprising:
a plurality of standardized payload fastening plates of different size;
a plurality of container parts including bottoms; side walls of different dimensions and tops or covers of different dimensions for assembling therefrom containers by interconnecting respective selected walls, a bottom and a top, as selected from said parts, to obtain a plurality of different payload transport and operating containers; and
a selected one of said plates being fastened to a selected one of said containers upon being assembled, in a releasable and exchangeable fashion.

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**5,050,822**
**WING FLAP AERODYNAMIC NOISE SUPPRESSION**
**Ian R. Whitehouse, and James K. Chu, both of Herts, England, assignors to British Aerospace Public Limited Company, London, England**
**Filed Dec. 21, 1989, Ser. No. 452,834**
**Claims priority, application United Kingdom, Dec. 21, 1988, 8829836**
**Int. Cl.[5] B64C *3/50***
U.S. Cl. 244—215 **5 Claims**

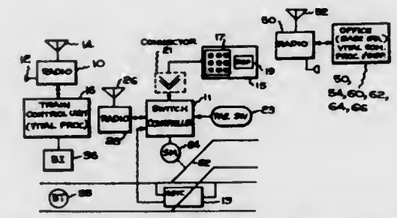
1. An aircraft wing including means for suppressing aerodynamic noise generated by a cavity effect, as a result of airflow interaction between a wing flap lower shroud and at least one deployed trailing edge flaps, comprising:
an aircraft wing having a flap shroud,
at least one spanwise extending trailing edge flap located upon said wing and movable between a stowed cruise configuration and at least one selected flight setting whereby a slot is formed between a lower surface of an upper portion of said flap shroud and said trailing edge flap, and
at least one spanwise noise suppression vane associated with each trailing edge flap portion, said noise suppression vane being movable separate from movement of said trailing edge flap,
wherein said noise suppression vane is so positioned with



respect to a lower shroud trailing edge and a leading edge of said trailing edge flap when said flap are at least partially deployed that eddies and vortices resulting from airflow separation at the termination of the shroud lower surface are diverted sufficiently by said noise suppression vane into the slot so that there is no significant noise inducing impingement of said separated flow on said flap leading edge.

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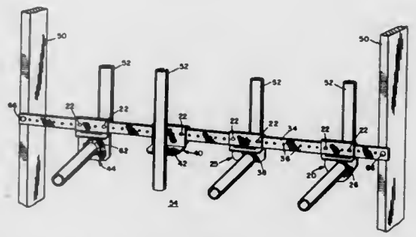
**5,050,823**
**RADIO-BASED RAILWAY SWITCH CONTROL SYSTEM**
**John W. Parker, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.**
**Filed Nov. 30, 1989, Ser. No. 444,506**
**Int. Cl.[5] B61L *7/08, 5/06***
U.S. Cl. 246—5 **12 Claims**



7. Apparatus for controlling a railway track switch by data transmitted over a communications link which addresses the switch and instructs it to move to a requested position which comprises means for programming when manually enabled a memory with address data corresponding to the address of said switch, means for storing in said memory at least one check word for said address, a check register, means for writing at least one check value message into said check register while presenting said message to said memory to supplant said check work therein, means for causing said switch to move to said requested position when said data which is transmitted corresponds to the address programmed in said memory, and when words corresponding to said check words are produced rather than said message thereby representing a failure mode which enables writing of said message into said memory, and means for producing from the message in said check register and from the data in said memory said check words in the absence of said failure mode.



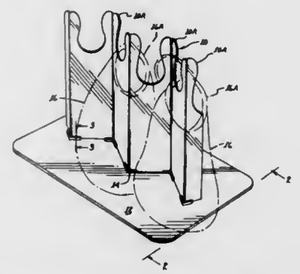
**5,050,824**
**SECURE SUPPORT PIPE FASTENER**
**George R. Hubbard, P.O. Box 3644, Rancho Sante Fe, Calif. 92067, assignor to George R. Hubbard, San Diego, Calif.**
**Filed May 2, 1990, Ser. No. 518,737**
**Int. Cl.[5] F16L *3/22***
U.S. Cl. 248—57 **12 Claims**



1. A pipe bracket for fastening a metallic pipe to a metallic strap attached to a stud bay comprising
a metallic pipe bracket having a U-shaped portion, at least one locking tab and a pipe attachment portion having a support flange, said U-shaped portion having a front section, an interior section, and a back section forming a U-channel, said locking tab extending from the front or back section of said U-shaped portion into said interior section, said U-shaped portion being attached to said pipe attachment portion, said pipe bracket being attachable to said metallic strap, said metallic strap having a plurality of locking holes disposed in a manner such that when said U-shaped portion snaps onto said metallic strap a portion of said metallic strap is located in said interior section and such that said locking tab fits into at least one of said locking holes, said support flange being connectable to said metallic pipe.

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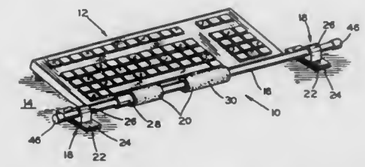
**5,050,825**
**PORTABLE AND COLLAPSIBLE SUPPORT FOR PLASTIC GROCERY BAGS**
**David A. Bratset, 6135 E. Joan de Arc, Scottsdale, Ariz. 85254**
**Filed Jun. 25, 1990, Ser. No. 542,965**
**Int. Cl.[5] A63B *55/04***
U.S. Cl. 248—97 **4 Claims**



1. A portable assembly for receiving and supporting a plurality of filled shopping bags each having a pair of flexible handles, said assembly comprising:
(a) a base member for receiving and supporting said plurality of filled shopping bags;
(b) a plurality of upright members detachably secured to said base member and extending substantially perpendicularly therefrom;
(c) each of said upright members secured to an adjacent upright member to form an acute horizontal angle therebetween to stiffen said assembly; and
(e) the upper portion of said upright members forming a plurality of shopping bag handle supporting ends each adapted to receive and retain all the flexible handles of a respective one of said filled shopping bags.

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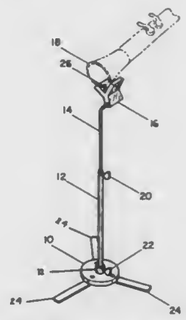
**5,050,826**
**BODY SUPPORT APPARATUS**
**Keith M. Johnston, Toledo, Ohio, assignor to Ability Center of Greater Toledo, Sylvania, Ohio**
**Filed Jul. 3, 1990, Ser. No. 547,676**
**Int. Cl.[5] B43L *15/00***
U.S. Cl. 248—118.3 **10 Claims**



1. A body supporting apparatus comprising:
a shaft having a longitudinal axis body support means; and
means for mounting said body support means to said shaft for permitting rotation of said body support means to said shaft and about the axis of said shaft and for axial movement relative to said shaft along the axis of said shaft.

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**5,050,827**
**FLOOR SUPPORT FOR CLARINET, SOPRANO SAXOPHONE, OBOE AND ENGLISH HORN**
**James Christie, 1930 W. San Marcos Blvd. #274, San Marcos, Calif. 92069, and Robert Shelton, 2318 Starlight Dr., Anderson, Ind. 46012**
**Filed Jun. 29, 1990, Ser. No. 545,889**
**Int. Cl.[5] A47G *29/00***
U.S. Cl. 248—125 **11 Claims**



1. A support stand for the instruments described comprising a base having foldable support arms into side by side relationship, an insert in center of said base, a vertical tube and rod inserted in said tube are adjustable in length removeably mounted in said insert, means for determining different sitting positions the height of said support stand, said tube is approximately 11 inches long, said rod is about 11 inches long and bent near a thirty degree angle from said rod's vertical end, means for receiving a mount and a stop means for resting said instrument's weight, and mount being Y shaped and attached to bent end of said rod at right angle to said rod's center, said stop is attached to center equidistant from inner sides of said mount,

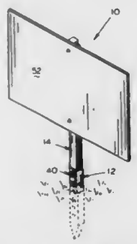
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said stop is approximately one inch long providing means for resting the bell of said instruments securely without lateral movement restrictons, whereby all of said instrument's weight is on said stop.

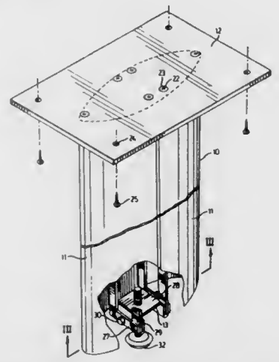
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**5,050,828**
**REMOVABLE SIGN POST ASSEMBLY**
**Curtis E. Wolff, Rte. 2, Box 71, Aurora, Nebr. 68818**
**Filed Apr. 17, 1990, Ser. No. 510,180**
**Int. Cl.[5] A45F** *3/44*
**U.S. Cl. 248—156** **2 Claims**



1. A removable sign post assembly, comprising,
a vertically disposed lower post portion having upper and lower ends adapted to be positioned in the ground so that its upper end is positioned above ground level,
said lower post portion having a generally U-shaped cross-section defined by a web portion having side portions extending therefrom,
said web portion having a plurality of vertically spaced openings formed therein adjacent the upper end of said lower post portion,
an upper post portion having upper and lower ends and front and back walls,
the lower end of said upper post portion being removably received between said side portions of said lower post portion adjacent one side of said web position,
said lower end of said upper post portion having at least two vertically spaced locking lugs extending horizontally from the front wall thereof through a pair of openings in said web portion, said locking lugs having outer end portions which are positioned outwardly of said web portion,
said locking lugs having an enlarged head portion on the outer end portions;
a locking bar means removably mounted on the outer ends of said locking lugs for selectively removably maintaining said upper post portion on said lower post portion,
said locking bar means including a pair of vertically spaced openings having vertical slots extending upwardly therefrom, said openings having a diameter greater than the head portions to receive said head portions therethrough, said slots having a width less than the diameter of the head portions to prevent horizontal movement of the locking bar means off of said locking lugs;
said locking bar means having a horizontally extending handle means projecting outwardly from said locking bar means, for vertically moving said locking bar means on said locking lugs;
means on said upper post portion for securing a sign thereto;
said means for securing the sign to said upper post portion comprising at least a first pair of vertically spaced projections on said front wall having enlarged, tapered head portions adapted to pierce through a sign and maintain the sign thereon.

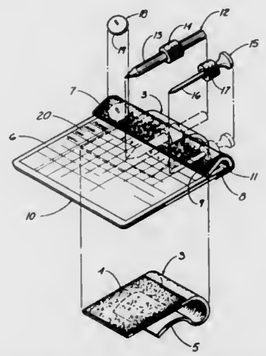
**5,050,829**
**SUPPORTING ASSEMBLY**
**Christopher C. Sykes, 211 Queens Quay West, Apartment 902, Toronto, Ontario, Canada M5J 2M6**
**Filed Sep. 27, 1990, Ser. No. 588,856**
**Int. Cl.[5] F16M** *11/16*
**U.S. Cl. 248—188.8** **7 Claims**



1. A supporting assembly comprising two identical generally channel section extruded halves which are interfitted and form an elongated hollow body the ends of which provide means integrally extruded with each half for connecting horizontal plates, and in which said means for connecting horizontal plates comprise screw bosses integrally extruded with each said half, each screw boss comprising a pair of arcuate arms having a gap between their ends facing toward the interior of the channel and defining a circular opening with raised portions spaced around the circumference of said opening capable of being engaged by the threads of a self-tapping screw.

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**5,050,830**
**DETACHABLE GOLF SCORECARD HOLDER**
**Lawrence Hall, P.O. Box 1975, Truckee, Calif. 95718**
**Filed Sep. 26, 1990, Ser. No. 588,565**
**Int. Cl.[5] A44B** *1/18*
**U.S. Cl. 248—205.2** **6 Claims**

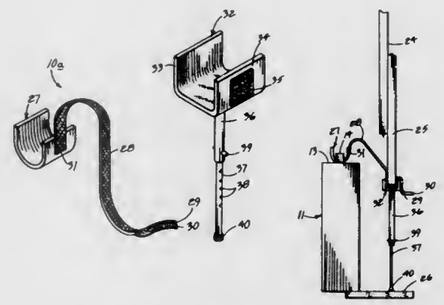


1. A golf scorecard and accessory holder which comprises:
a resilient support sheet having an edge and an edge region along said edge that is curled back against a remaining flat region of said support sheet thereby forming a convex surface and providing that a score card may be detachably secured between said edge and said remaining flat portion and permitting that said remaining portion may support said scorecard when it is desired to write on said scorecard;
a resilient strap bent to form a U-shaped clip having a convex surface opposite adjacent concave surfaces thereby providing that said clip may be hooked onto the lip of a golfbag positioned between said concave surfaces;
said convex surfaces of said clip and said sheet having a preparation in operable combination to provide that said convex surfaces will detachably adhere to one another when brought into contact when it is desired to store said scorecard attached to said sheet with said golfbag and permit detaching said sheet from said clip to enable a user to conveniently write on said scorecard supported by said sheet.



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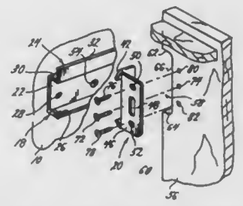
**5,050,831**
**FAN MOUNTING CLAMP APPARATUS**
**Marc R. Joyal, 27 Getchell Ave., Woonsocket, R.I. 02895**
**Filed Feb. 28, 1990, Ser. No. 486,362**
**Int. Cl.[5] A47F** *5/00*
**U.S. Cl. 248—208** **1 Claim**



1. A fan mounting clamp apparatus in combination with a ventilation fan assembly wherein the fan assembly includes a surrounding housing including a top wall, and
a "U" shaped handle mounted onto the top wall defining a slot between the handle and an upper surface of the top wall, and
a first support means mounted within the slot for underlying securement of the handle and securement of the fan assembly, and
a second support means spaced forwardly of the first support means for securement of a window sash therewithin, and
an elongate securement member securing the first and second support means together, and
wherein the first support means is defined by a first "U" shaped rigid positioning member, the first rigid "U" shaped positioning member including a rear and forward leg and the elongate securement member including a serpentine elongate semi-rigid strip, the semi-rigid strip integrally mounted to the forward leg of the first "U" shaped rigid positioning member and a rear end of a semi-rigid strip, and a first hook and loop fastener surface mounted to a bottom surface of the semi-rigid strip adjacent a forward terminal end of the semi-rigid strip, and the second support means including a second "U" shaped rigid positioning member, and
wherein the second "U" shaped rigid positioning member includes a first leg spaced from and parallel a second leg and a floor connecting the first and second legs together, and a second hook and loop fastener patch mounted to an exterior surface of the second leg, and a first post integrally and orthogonally mounted to a bottom surface of the floor, and the first post telescopingly receiving a second post therewithin, and the second post including adjustment apertures cooperative with the positioning pin directed through the first positioning post to vertically adjust the second post relative to the first post, and a friction tip mounted to a lower terminal end of the second post, and the first hook and loop fastener patch securable to the second post, and the first hook and loop fastener patch securable to the second hook and loop fastener patch when the first "U" shaped rigid positioning member is directed through the slot and the second "U" shaped positioning member is positioned underlying a window sash to secure the fan assembly between the window sash and an upper surface of an underlying window sill.

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**5,050,832**
**MODULAR STORAGE UNIT MOUNTING SYSTEM**
**E. Desmond Lee, and Charles Camilleri, both of St. Louis, Mo., assignors to Lee/Rowan Company, St. Louis, Mo.**
**Filed May 18, 1990, Ser. No. 524,807**
**Int. Cl.[5] E04G** *5/06*
**U.S. Cl. 248—225.2** **18 Claims**



1. A storage unit mounting system adapted to detachably mount a modular storage unit to a wall in a horizontally and vertically adjusted position relative to the wall, the system comprising:
a wall channel member having a predetermined length and adapted to be mounted to a vertical wall; and
bracket means adapted to be adjustably secured to a modular storage unit and detachably attached to the wall channel member mounted on the vertical wall to thereby detachably suspend the modular storage unit on the vertical wall, the bracket means being further adapted to be moved relative to the storage unit once secured thereto to enable the adjustment of the orientation of the storage unit on the wall.

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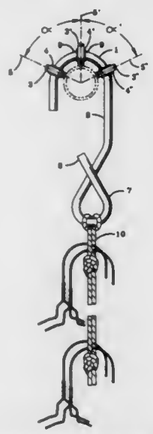
**5,050,833**
**ANGLED ROLLER DEVICE FOR MULTIPLE GARMENT HANGER ROPE-SLING**
**Daniel C. Usner, 9535 Greystone Pkwy., Brecksville, Ohio 44141**
**Continuation-in-part of Ser. No. 505,234, Apr. 5, 1990, abandoned. This application Feb. 5, 1991, Ser. No. 652,214**
**Int. Cl.[5] B42F** *13/00*
**U.S. Cl. 248—340** **4 Claims**

1. In a two-ended garment hanger, rope gang-sling hook support, having means for engaging and retaining said gang-

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sling at its lower end, open arcuate hook means at its upper end for hanging the combined assembly from either a trolley or hanger bar, the improvement comprising three low-friction rollers disposed in fixed position on said hook means and rotatable about the linear axis thereof, one of said rollers being centrally located and having a plane of rotation that is essentially vertical when said device is in its normal position of repose, said first mentioned roller flanked on either side by a second and third roller respectively, each of said second and third roller having a plane of rotation, with respect to that of said first mentioned roller, lying within the range of 30° and 89°, all of said rollers positioned to be in substantially constant contact with said trolley or hanger bar, the plane of rotation of

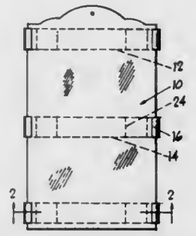


each of said three rollers being essentially normal to a tangent of said trolley or hanger bar cross section, occurring at the point of contact therewith of each of said three rollers, the instant device being devoid of any structure extending above the top surface of the centrally disposed roller, said means for engaging and retaining said rope gang-sling is a loop having an overlapping spur projecting generally upwardly, the curved arc segment of said arcuate hook means for hanging the assembly from a trolley or hanger bar is concentric with the cross section of said trolley or hanger bar when in operative juxtaposition, the rope gang-sling hook support, including said upwardly projecting spur and said hook means at its upper end, is of one-piece, unitary construction, and is fashioned from a piece of stock having an essentially circular cross section.

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**5,050,834**
**MAGNETICALLY SUPPORTED FRAME FOR PHOTOGRAPHIC PICTURE CARDS**
**Calvin L. Tardiff, 778 Northshore Dr., Holland, Mich. 49424**
**Filed Apr. 6, 1990, Ser. No. 505,580**
**Int. Cl.[5] A47F *1/14***
**U.S. Cl. 248—467** **2 Claims**

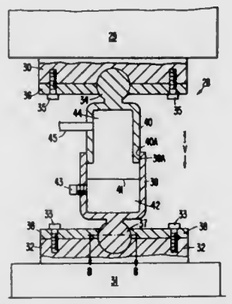
1. In combination with a supporting plate having parallel side edges,
- a pair of elongated holding bars adapted to span said side edges of said plate and each bar having an integrally molded hook flange on each sized to fit the thickness of said plate at its side edges, said flanges extending reversely in overlapping relation to the body of the bar to frictionally grip the side edges of the plate,
- each of said holding bars having an integrally molded projection along one edge of its side facing said hooks to supportingly and retainingly engage the edges of cards between said plate and said bars,



said bars being molded with a slight convex bow toward said hooks whereby the bars are are tensioned against the surface of said plate when applied thereto.

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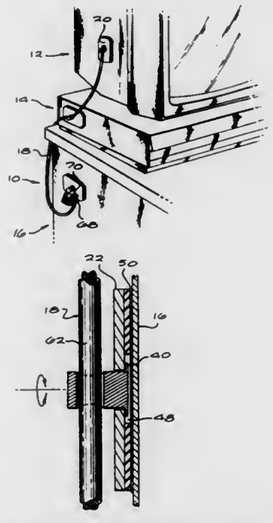
**5,050,835**
**ACTIVE ACCUMULATOR VIBRATION ABSORBING SUPPORT SYSTEM**
**Jaromir Tobias, 322 E. 57th St., New York, N.Y. 10022**
**Filed Sep. 29, 1989, Ser. No. 414,254**
**Int. Cl.[5] F16M *13/00***
**U.S. Cl. 248—550** **28 Claims**



1. A vibration isolation support mounting system for supporting a vibrating load with respect to a relatively fixed support, comprising:
- at least one load support vibration isolation mount including a first mount part securable to a vibrating load, a second mount part securable to a relatively fixed support, guide means for guiding relative movement of the first and second mount parts, first spring cushion means and high pressure fluid medium means disposed in series between the first and second mount parts to attenuate vibration induced force transfer between said first and second mount parts,
- main hydraulic fluid accumulator means,
- pump means for maintaining a predetermined pressure of hydraulic of fluid in the main accumulator means,
- and high pressure fluid line means continuously communicating the main accumulator pressure with the high pressure fluid medium means at the at least one load support mount.



**5,050,836**
**SECURITY DEVICE FOR PORTABLE EQUIPMENT**
**Joseph M. Makous, 1617 E. Darby Rd., Suite 203, Havertown, Pa. 19083**
**Filed Jun. 21, 1990, Ser. No. 541,557**
**Int. Cl.[5] E05B *73/00***
**U.S. Cl. 248—553** **13 Claims**

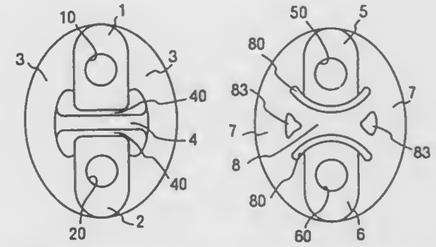


1. A security device for portable equipment having a mounting surface for attachment of the security device, comprising:
- a rigid base plate, having first and second sides and having a shape adapted to generally conform to the mounting surface of the portable equipment, said base plate having an aperture therethrough;
- a rotatable cable attachment fitting having a shaft dimensioned such that said attachment fitting is rotatable within said base plate aperture, said shaft having first and second longitudinal ends, with one of said ends being enlarged and having a diameter greater than the diameter of said base plate aperture, said shaft extending through said base plate, with said enlarged end being adjacent to said second side of said base plate;
- means for receiving a cable on said attachment fitting, said enlarged shaft end and said cable serving to retain said rotatable attachment fitting within said base plate aperture when said cable is received in said attachment fitting; and
- a resilient elastomeric base pad having first and second sides, with one side permanently secured to said second side of said base plate, and the other side adapted to generally conform to said surface of said portable equipment and adapted to be adhered to said mounting surface.

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**5,050,837**
**MUFFLER HOLDING MEMBER**
**Masaaki Hamada; Yoshio Iida, both of Komaki; Motohiro Katayama, Kasugai, and Ikuo Sasaki, Komaki, all of Japan, assignors to Tokai Rubber Industries, Ld., Komaki, Japan**
**Filed Mar. 23, 1990, Ser. No. 498,741**
**Claims priority, application Japan, Aug. 1, 1989, 1-199903**
**Int. Cl.[5] F16M *13/00***
**U.S. Cl. 248—610** **6 Claims**

1. A muffler holding member consisting essentially of elastic material comprising:
- a first holding part having a first through hole into which a supporting member of an automotive body is inserted;
- a second holding part positioned with a space between said first holding part and having a second through hole into which a supporting member of a muffler is inserted;
- a pair of side parts formed integrally with and connecting said first holding part and said second holding part at both sides thereof; and

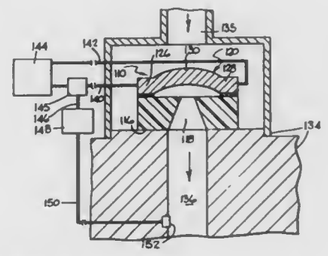


- a center connecting part positioned in said space between said first holding part and said second holding part and integrally connected to each said side part at the central portion thereof,

wherein mainly tensile stress and compression stress are working in said center connecting part.

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**5,050,838**
**CONTROL VALVE UTILIZING MECHANICAL BEAM BUCKLING**
**Christopher C. Beatty, Fort Collins, and Jerome E. Beckmann, Loveland, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Jul. 31, 1990, Ser. No. 560,933**
**Int. Cl.[5] F16K *31/70***
**U.S. Cl. 251—11** **14 Claims**



14. A microvalve comprising:
- a) a composite wafer comprising:
  - i) a substrate;
  - ii) at least one coating layer integrally bonded to said substrate;
- b) said at least one coating layer being patterned to define a beam having end portions integrally bonded to said substrate and having a midportion which is deformably displaceable relative said substrate;
- c) said substrate comprising an aperture extending therethrough positioned in alignment with said midportion of said beam;
- d) said beam being selectively thermally deformable for

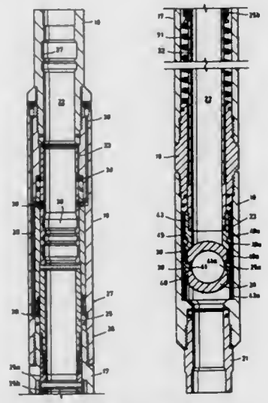
VOL 1130 ISS 4 SE 24 1991 UMI



covering and uncovering said aperture for terminating and initiating fluid flow through said aperture.

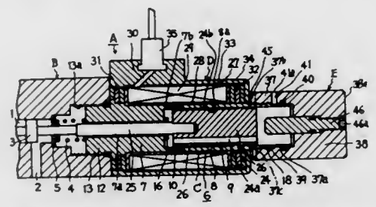
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5,050,839
VALVE
Rennie L. Dickson, Carrollton; Craig W. Godfrey, Richardson; Kenneth L. Schwendemann, Lewisville, and Timothy J. Noack, Grapevine, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.
Filed Feb. 15, 1989, Ser. No. 310,697
Int. Cl.[5] F16K *31/122*
U.S. Cl. 251—58 14 Claims



1. A subsurface safety valve comprising:
a body having a flowway therethrough,
a traveling valve seat and cooperable rotatable ball valve member below said seat controlling flow through said flowway,
traveling disc means rotatable about a common axis with said ball valve member,
means including first boss means on one of said body and disc means and first hole means in the other of said body and disc means for rotating said disc means,
said (means including) first boss means spaced from said rotational axis of said ball valve member and on the side of a plane opposite said valve seat with the valve in closed position, said plane extending through the rotational axis of said valve member and perpendicular to the flowway axis, and
means including second boss means on one of said disc means and ball valve member cooperable with second hole means in the other of said disc means and ball valve member for rotating said ball valve member in response to rotation of said disc means,
said second boss means on the side of a vertical plane through the axis of rotation of the ball opposite said first boss means and urging said valve member away from said valve seat during movement from closed to open position.

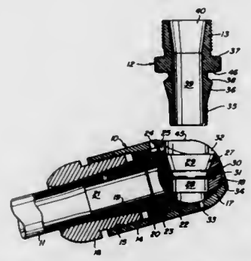
5,050,840
ELECTROMAGNET FOR SOLENOID VALVES AND METHOD OF MANUFACTURING SAME
Yusuke Koodo, and Shinji Nakamura, both of Nagoya, Japan, assignors to Sanmeidenki Kabushikikaisha, Aichi, Japan
PCT No. PCT/JP89/01203, § 371 Date Jun. 26, 1990, § 102(e) Date Jun. 26, 1990, PCT Pub. No. WO90/06464, PCT Pub. Date Jun. 14, 1990
PCT Filed Nov. 29, 1989, Ser. No. 499,446
Claims priority, application Japan, Dec. 1, 1988, 63-156900
Int. Cl.[5] F16K *31/06*; H01F *7/16*
U.S. Cl. 251—129.15 4 Claims



1. An electromagnet for solenoid valves, having a pipe unit provided with a hollow therein to house a movable core that can be moved forward and backward, and a mounting portion at one end part thereof, which is used to join said pipe unit to a valve body with an opening at said end part of said pipe unit communicating with a liquid passage in said valve body; a cap used for closing an opening at the other end part of said pipe unit and joined to the same end part thereof; a cylindrical coil body fitted around said pipe unit; and a movable core housed in said hollow in said pipe unit so that said core can be moved forward and backward therein, characterized in that said cap is connected rotatably to said pipe unit, and said rotatable cap is provided with an air vent hole opened in the inner circumferential surface of a circumferential side wall thereof.

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5,050,841
QUICK COUPLING INCLUDING SPHERICAL VALVE
Rolf A. Jacobsson, Saltsjö-Boq, Sweden, assignor to Atlas Copco Tools AB, Stockholm, Sweden
Filed Jun. 28, 1990, Ser. No. 545,370
Claims priority, application Sweden, Jun. 29, 1989, 8902387
Int. Cl.[5] F16L *37/28*
U.S. Cl. 251—149.9 2 Claims

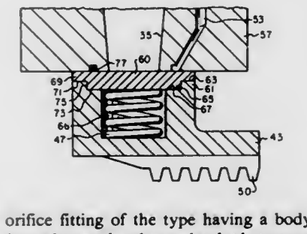


1. A rotary valve type quick coupling for interconnecting two pressure medium conduits, comprising:
a coupling unit (10) including a casing (14) and a spherical rotary valve element (18) formed with a socket (27);
a tubular connector nipple (12) which is guidingly received in said socket (27);
an elongated aperture (32) in said casing (14) permitting said connector nipple (12) to be introduced into said socket (27) and to be rotated jointly with said valve element (18) between a connect/disconnect position and a connected position; and
a first transverse annular shoulder (38) on said connector nipple (12) arranged to engage in said connected position a peripheral lock ridge (34) on an inner edge of said aperture (32) for axial locking of said connector nipple (12) relative to said casing (14);
said connector nipple (12) having a second transverse annular shoulder (46) facing said first transverse annular shoulder (38); and
said casing (14) having an outer guide surface (45) partially surrounding said elongated aperture (32) and arranged to cooperate with said second transverse annular shoulder (46) as said connector nipple (12) is fully introduced in said valve element socket (27) in said connect/disconnect position, to thereby guide said connector nipple (12) and said valve element (18) in said connect/disconnect position.



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5,050,842
VALVE SEAL STRIP ORIFICE FITTING
James H. Foster, 5050 Ambassador Way, No. 301, Houston, Tex. 77056, and John Beson, 10938 Leaning Ash, Houston, Tex. 77079
Filed Feb. 4, 1991, Ser. No. 650,081
Int. Cl.[5] F16K *3/02*
U.S. Cl. 251—176 7 Claims

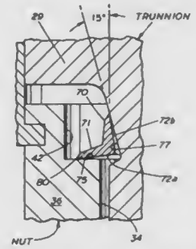


1. In an orifice fitting of the type having a body with an upper chamber, a lower chamber and a slot between the upper and lower chambers, an improved means for sealing against a seat surrounding the slot, comprising in combination:
a slide valve carrier having an upper side containing a pair of spaced apart parallel shoulders, defining a rectangular receptacle;
a seal strip having an upper surface for sealing against the seat, the seal strip having on opposite sides a pair of outward extending flanges, each of which overlies one of the shoulders of the slide valve carrier, the flanges having upper surfaces for sealing against the seat, the seal strip having a lower section located below each flange for reception between the shoulders of the receptacle;
at least one spring mounted between the slide valve carrier and contacting the lower section of the seal strip for urging the seal strip tightly against the seat; and
means for moving the slide valve carrier between open and closed positions transverse to the movement of the plate carrier to open and close the slot.

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5,050,843
PLUG VALVE WITH METAL-TO-METAL SEALING
Robert T. Brooks, Aberdeen, Scotland, assignor to Manifold Systems, Inc., Alice, Tex.
Filed Aug. 15, 1990, Ser. No. 567,738
Int. Cl.[5] F16K *5/04, 41/00*
U.S. Cl. 251—214 12 Claims

1. A metal to metal dynamic sealing system for pressure sealing a rotatable shaft relative to a housing member comprising:
a housing member having a cylindrically shaped opening disposed along a first central axis and arranged to be subjected to internal pressure;
a cylindrically shaped shaft having a second central axis, said shaft being rotatively mounted in said housing member with said first and second central axes in alignment, said shaft being subject to transverse movement relative to said housing member in response to internal pressure to move said first and second central axes out of alignment;
said sealing system including
(a) an annular transverse sealing surface on said housing member,
(b) a frusto-conical sealing surface on said shaft were said frusto-conical sealing surface adjoins a cylindrically shaped surface which defines an annular space with respect to said housing member, and
(c) an annular resilient metal sealing element having a V-shaped cross section with first and second outer sealing surfaces extending between an apex of the V and the terminal ends of said first and second outer sealing surfaces; said metal sealing element having an included element angle for the first and second outer sealing surfaces which is greater than the included sealing angle between said frusto-conical sealing surface and said transverse sealing surface in an unloaded condition of said sealing



element so that said metal sealing element can be disposed between said shaft and said housing member with said terminal ends of said first and second outer sealing surfaces in contact with said transverse sealing surface and said frusto-conical sealing surface and so that the terminal end of said metal element can be resiliently biased inwardly to a loaded sealing condition by relative longitudinal movement between said shaft and said housing member along said first and second central axes to bring said first and second outer sealing surfaces in sealing contact with said transverse sealing surface and said frusto-conical sealing surface and so that the included element angle and said first and second outer sealing surfaces are conformed to the included sealing angle between said frusto-conical sealing surface and said transverse sealing surface;
said housing member at said transverse sealing surface having a wall surface spaced annularly outward from the terminal end of said outer sealing surface on said transverse sealing surface so that said shaft and said metal sealing element can shift in a direction transverse to its central axis while maintaining the pressure seal of said metal sealing element against said transverse sealing surface an said frusto-conical sealing surface in response to internal pressure.

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5,050,844
LIFT ASSEMBLY
Marion N. Hawk, Gladstone, Mo., assignor to VBM Corporation, Louisville, Ky.
Filed Oct. 5, 1989, Ser. No. 417,488
Int. Cl.[5] B66F *3/00*
U.S. Cl. 254—89 H 35 Claims

1. A lift assembly comprising:
a base member;

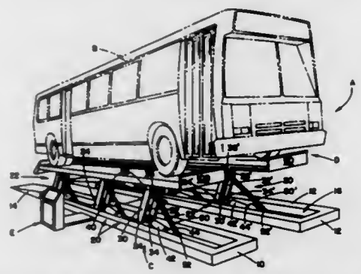
VOL 1130 ISS 4 SE 24 1991 UMI



first and second lift platforms operatively connected to the base member;

means for selectively moving the lift platforms toward and away from the base member; and

means for synchronizing movement of the first and second lift platforms relative to the base member, the synchronizing means including means for sensing height differential



between the lift platforms including first and second arms interconnecting the lift platforms with the base member, a lateral member operatively engaging one of the first and second arms and extending between the first and second arms, and means for sensing relative rotational movement between the arms indicating height differential between the platforms.

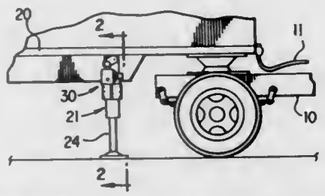
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5,050,845

**PNEUMATIC LIFT FOR TRAILERS**

Scott M. Aline, 43 Hallock Ave., Smithtown, N.Y. 11787, and Theodore A. Riedlinger, 64 Hillside Ave., St. James, N.Y. 11780

Filed Jun. 6, 1990, Ser. No. 533,850
Int. Cl.[5] B60S 9/06
U.S. Cl. 254—419 25 Claims



1. Landing gear including a gear reduction assembly in combination with a pneumatic system for raising and lowering the landing gear comprising:

(a) a pneumatic motor totally supported by said landing gear;

(b) a source of pressurized air;

(c) a valve coupling said source of pressurized air to said pneumatic motor;

(d) means for displacing said landing gear; and

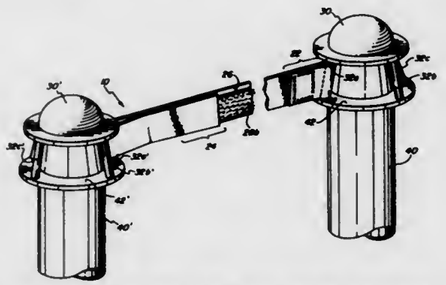
(e) a speed reducer coupling said pneumatic motor to said means for displacing the landing gear.

5,050,846

**ADJUSTABLE LENGTH, NON-MECHANIZED PEDESTRIAN TRAFFIC BARRIER SYSTEM**

Charles S. Goodman, Mount Kisco, and Richard P. Whalen, Hopewell Junction, both of N.Y., assignors to Ship'n Out Company, Brewster, N.Y.

Filed Nov. 1, 1990, Ser. No. 607,530
Int. Cl.[5] E04H 17/00
U.S. Cl. 256—1 18 Claims



1. An adjustable length traffic barrier system comprising:

a) an elongated strip of flexible material having a first end portion, a second end portion and an intermediate segment disposed therebetween, said second end portion having a first element of an attachment means disposed thereat, and wherein a complementary element or elements of said attachment means is disposed along said intermediate segment so as to permit attachment of said second end portion at a plurality of locations on said intermediate segment;

b) a first headpiece having at least one means associated therewith to engage and thereby attach thereto said first end portion of said flexible material; and

c) a second headpiece having at least one means associated therewith to engage and thereby attach thereto said flexible material, wherein said flexible material extends from said first headpiece to said second headpiece and said first and second headpieces being spaced and supported along a pedestrian traffic area.

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5,050,847

**STAGED VALVE MULTI-HOLE INJECTION BLOCK AND METHOD**

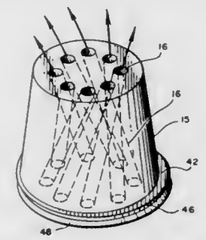
Patrick D. King, Rantoul, Ill., assignor to Flo-Con Systems, Inc., Champaign, Ill.

Continuation-in-part of Ser. No. 53,080, May 22, 1987, Pat. No. 4,771,992, which is a continuation-in-part of Ser. No. 14,999, Feb. 17, 1987, Pat. No. 4,799,649, which is a continuation-in-part of Ser. No. 885,873, Jul. 15, 1986, Pat. No. 4,824,079. This application Apr. 27, 1990, Ser. No. 515,413
Int. Cl.[5] C21C 5/48
U.S. Cl. 266—44 17 Claims

1. A refractory injection block for use with an injection valve,

said block comprising a refractory member having opposed end portions, said block having means at ne end portion for engaging a sliding injection plate and an injection mechanism, said block having a plurality of orifices and corresponding passages passing from the sliding injection plate into the block, the improvement comprising

a plurality of permeable members, at least one in each passage, staggered in sequential increasing depth in said passages with the upper portion of the passages closed in



staggered sequential increasing depth by the refractory block.

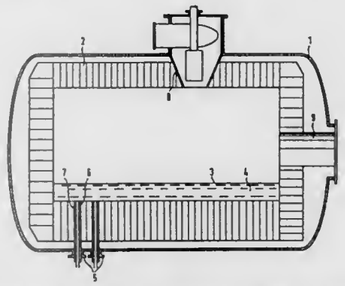
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5,050,848

**APPARATUS FOR POST COMBUSTION**

Gregory J. Hardie, and John M. Ganser, both of Amberg, Fed. Rep. of Germany, assignors to Klockner CRA Patent GmbH, Duisburg, Fed. Rep. of Germany

Division of Ser. No. 308,584, Feb. 10, 1989. This application Dec. 6, 1989, Ser. No. 446,737
Claims priority, application Australia, Feb. 12, 1988, PI6741; Feb. 12, 1988, PI6745; Jul. 29, 1988, PI9558
Int. Cl.[5] F27B 3/28
U.S. Cl. 266—81 11 Claims



1. Apparatus for the post combustion of reaction gases generated from a molten bath of iron in a reaction vessel, said post combustion being in the space above the molten bath surface, to transfer energy produced by the post combustion to the molten bath, said apparatus comprising:

reaction vessel means for containing a molten iron bath having carbon monoxide and hydrogen being generated therein and passing into said space;

feed means for introducing at least one of iron ore, prereduced iron ore or carbonaceous material into the vessel below the molten bath surface; and

injection means for injecting at least one jet of oxidizing gas into said space and in a direction toward the molten bath surface to combust in said space the carbon monoxide and the hydrogen, said injection means including swirl means for imparting a swirl to said jet to cause the jet to be injected into said space with a tangential momentum component.

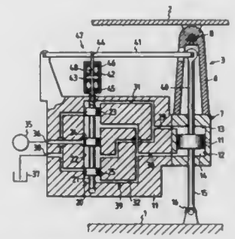


5,050,849

**VIBRATION BUFFER**

Shigeyuki Takagi, Gifu, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Jun. 12, 1990, Ser. No. 536,989
Claims priority, application Japan, Jun. 20, 1989, 1-164125
Int. Cl.[5] F16M 1/00
U.S. Cl. 267—136 7 Claims



1. A hydraulic vibration buffer for buffing vibration between first and second members comprising:

a housing having an internal space;

a piston dividing said internal space into first and second chambers and having respective rods adapted for connection to said first and second members;

means for supplying hydraulic fluid;

a return tank for said fluid;

means for establishing a plurality of fluid path connections between said first and second chambers and said supplying means and said return tank;

control valve means having a valve member disposed in said fluid path connection and movable responsive to movement of said piston for establishing a specific path connection causing pressure in said first chamber to decrease and pressure in said second chamber to increase when said piston moves in the direction of said first chamber in response to movement between said first and second members in one direction and movable responsive to movement of said piston for establishing a second path connection causing pressure in said second chamber to decrease and pressure in said first chamber to increase in response to movement between said first and second members in the opposite direction; and

mechanical means connected between one of said rods and said control valve means for urging said valve member to reverse the direction of movement thereof in response to movement of said piston so as to lessen the vibration communicated between said first and second members, wherein said mechanical means includes a casting, a link rod mounted for movement in said casing and having a center portion and first and second springs engaging said center portion.

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5,050,850

**ELECTRORHEOLOGICAL ANTI-VIBRATION BUSH**

Takeshi Noguchi, and Tatsuro Ishiyama, both of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 316,573, Feb. 28, 1989, abandoned, which is a continuation of Ser. No. 95,312, Sep. 11, 1987, abandoned. This application Aug. 28, 1990, Ser. No. 574,523
Claims priority, application Japan, Sep. 16, 1986, 61-217646
Int. Cl.[5] F16F 7/00
U.S. Cl. 267—140.1 16 Claims

1. An anti-vibration bush comprising:

an outer casing adapted to be mounted on one of a vibration generating member or a vibration receiving member;

a shaft disposed in said outer casing and adapted to be mounted on the other of said vibration generating member and said vibration receiving member;

a first elastic member disposed between said outer casing and

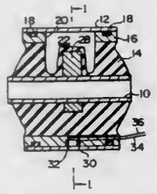
VOL 1130 ISS 4 SE 24 1991 UMI



said shaft and defining a plurality of liquid chambers arranged inside of the outer casing between said first elastic member and an inner surface of said outer casing;

an electrorheologic fluid filling said liquid chambers and having a viscosity which varies with an electric field applied thereto;

an intermediate cylinder disposed between said outer casing and said first elastic member, and partially defining said liquid chambers along with said first elastic member and said outer casing;



a restricted narrow path formed radially inside said outer casing comprised of a groove along an arc of the circumference of said intermediate cylinder for permitting said liquid chambers to be in communication with each other; and

electrode means formed in an arc-shape, and including a pair of narrow electrode plates disposed in parallel and positioned in said restricted narrow path for electrically activating said electrorheologic fluid, whereby vibration over a wide range of intensity and frequency is controlled by adjusting of the viscosity of said electrorheologic fluid by varying the electric field.

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**5,050,851**

**MACHINE FOR PLACING INSERTS BETWEEN THE PANELS OF FOLDED SHEETS**

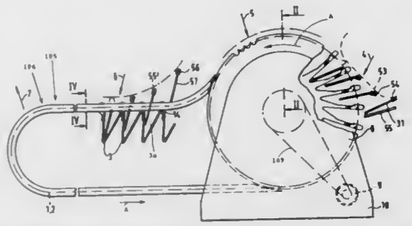
**Albert Eugster, Strengelbach, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland**

**Filed Mar. 2, 1989, Ser. No. 317,737**

**Claims priority, application Switzerland, Mar. 31, 1988, 1236/88**

**Int. Cl.[5] B65H** *5/30*

**U.S. Cl. 270—55** **21 Claims**



1. Machine for inserting stuffers between the panels of folded sheets, particularly for placing inserts between the panels of newspapers, comprising a plurality of equidistant receptacles for folded sheets; means for transporting said receptacles in a predetermined direction and at a predetermined speed along an endless path; means for admitting folded sheets into receptacles in a first portion of said path; a stuffer admitting device adjacent a second portion of said path downstream of said first portion; means for opening folded sheets in said receptacles; means for moving said opening means in said direction and at said predetermined speed only along a third portion of said path between said first and second portions; and means for removing folded sheets and stuffers from receptacles in a fourth portion of said path downstream of said second portion.

**5,050,852**

**BLANK FEEDER AND METHOD FOR CONTROLLING THE SAME**

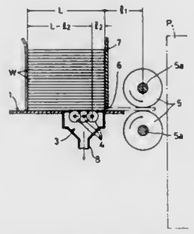
**Tetsuya Sawada; Hidetoshi Hoshiyama; Ikuo Yoshimoto, and Shinichi Sogo, all of Osaka, Japan, assignors to Rengo Co. Ltd., Osaka, Japan**

**Filed Aug. 17, 1990, Ser. No. 569,795**

**Claims priority, application Japan, Aug. 23, 1989, 1-217151; Oct. 3, 1989, 1-259713**

**Int. Cl.[5] B65H** *5/08*

**U.S. Cl. 271—11** **3 Claims**



1. A method for controlling a blank feeder including a blank feed table upon which blanks such as corrugated fiberboards are stacked, suction means provided under said blank feed table for sucking the lowermost one of said blanks downward, first feed rolls mounted in said suction means for feeding said blanks, a vertical guide plate located at the front portion of said blank feed table, second feed rolls located downstream of said vertical guide plate by a distance $l_1$ for delivering said blanks to a next step, comprising the steps of starting said first feed rolls by applying a timing signal thereto which is obtained based on a signal which represents one cycle, so as to intermittently feed said blanks one at a time through a gap defined by said blank feed table and said vertical guide plate, accelerating said first feed rolls to the speed of said second feed rolls by the time when the front end of said each blank reaches said second feed rolls, so that the value obtained by integrating the speed curve for said first feed rolls from the start of feeding of the blank by said first feed rolls to the time when the front end of the blank has reached said second feed rolls will be equal to $l_1$, and driving said first feed rolls synchronized with said second feed rolls until said blank clears said first feed rolls, by controlling a motor for said first feed rolls, separate from a motor for said second feed rolls.

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**5,050,853**

**DEVICE FOR DISCHARGING SHEETS FROM THE BOTTOM OF A STACK**

**Peter G. LaVos, MA Baarlo, and Sietse Vlietstra, HH Venlo, both of Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands**

**Filed Mar. 27, 1990, Ser. No. 499,945**

**Claims priority, application Netherlands, Mar. 28, 1989, 8900754**

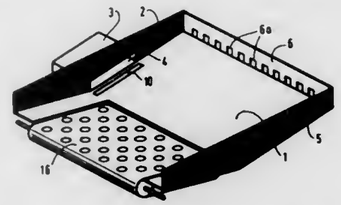
**Int. Cl.[5] B65H** *3/12*

**U.S. Cl. 271—98** **8 Claims**

1. A device for discharging sheets one by one from the bottom of a stack of sheets comprising: a holder for a stack of sheets provided with a carrier and a plurality of lateral supports; a pneumatic means being provided for blowing air against the side edge of the stack, as considered with respect to the direction of transport of the sheets, to create a layer of air at least between the bottom sheet and the stack thereabove; and a transport means to discharge the bottom sheet, wherein the carrier has a transversely extending downwardly depressed portion such that it is nonplanar and is provided with at least one aperture beneath at least one edge portion of a side edge of the stack of sheets in the holder wherein a partial vacuum can be created in the aperture by a vacuum means, the downward



depressed portion of the carrier comprising a depression in an upper surface of the carrier extending levelly, entirely along its length in the direction transversely to the direction of sheet



transport, and the pneumatic means for blowing air against the stack side edge is so disposed that the air flow is blown out over the depressed portion of the carrier.

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**5,050,854**

**PAPER FEEDER**

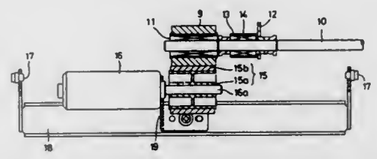
**Akio Tajima, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan**

**Filed Apr. 13, 1990, Ser. No. 509,101**

**Claims priority, application Japan, Apr. 28, 1989, 1-110114; Jun. 9, 1989, 1-146972**

**Int. Cl.[5] B65H** *3/52*

**U.S. Cl. 271—122** **41 Claims**



1. A paper feeder comprising a pickup roller means feeding sheets from a stack of sheets, a rotatable feed roller and a retard roller means biasingly urged toward one another, said rotatable feed roller and said retard roller means being downstream of said pickup roller means, said feed roller means being rotatable in a feed direction for feeding a paper sheet between said feed roller means and said retard roller means, a pivot arm means pivotably supporting said retard roller means, and motor means mounted on said pivot arm means and operable to apply a turning torque to said retard roller means in a direction opposite to said direction of feed of said feed roller means, said motor means applying a turning torque to said retard roller means which is less than the product of the coefficient of friction between one sheet being fed and said retard roller means and the nip force between said retard roller means and said feed roller means but greater than the product of the coefficient of friction between two sheets and the nip force with which said retard roller means engages said sheet.

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**5,050,855**

**APPARATUS FOR EXTRACTING (PACK) BLANKS FROM A BLANK MAGAZINE**

**Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany**

**Filed Jan. 31, 1990, Ser. No. 473,028**

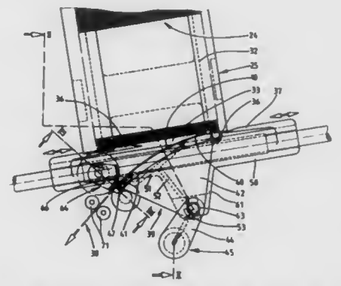
**Claims priority, application Fed. Rep. of Germany, Feb. 21, 1989, 3905214**

**Int. Cl.[5] B65H** *5/10*

**U.S. Cl. 271—132** **13 Claims**

1. In an apparatus for receiving a stack of blanks made of thin cardboard and for extracting individual blanks from the blank stack, the blank stack being held in a blank magazine having an extraction opening for the individual blanks, the blanks being extracted from the blank magazine by an extraction means movable to and fro, the improvement:

wherein said extraction means (39) comprises a holding plate (41) having a contact surface (40) on which the entire surface of each extracted blank (10) rests;



wherein said holding plate (41) has, in a side facing a discharge outlet for the extracted blank (10), recesses (69, 70); and

wherein said apparatus comprises counter roller means (67, 68) for entering said recesses (69, 70) and engaging the blank (10) to discharge the blank.

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**5,050,856**

**MACHINE AND METHOD FOR SLOWING DOWN A SERIES OF IRON SHEETS TRAVELING IN CLOSE SUCCESSION AFTER EACH OTHER ALONG A PRODUCTION LINE**

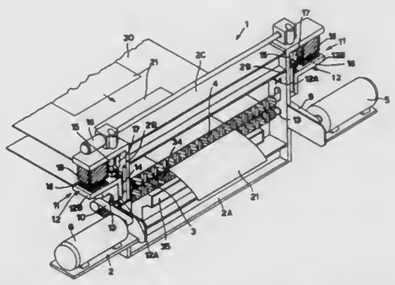
**Marcello Parigi, Milan, and Pompeo Rovelli, Como, both of Italy, assignors to FIMI S.p.A. Fabbrica Impianti Macchine Industriali, Como, Italy**

**Filed Sep. 28, 1989, Ser. No. 413,820**

**Claims priority, application Italy, Oct. 11, 1988, 22266 A/88**

**Int. Cl.[5] B65H** *29/68*

**U.S. Cl. 271—182** **39 Claims**



23. A machine for slowing down a series of sheets being conveyed in close spaced succession to each other comprising means for conveying a series of sheets in close spaced succession to each other at a first speed along a path of travel, first and second rolls each having an axis of rotation disposed transversely to the path of travel, said first and second rolls defining a gap of a predetermined size therebetween through which successive sheets pass during conveyance along said path of travel, means for rotating said rolls at selected peripheral speeds, means for movably supporting one of said first and second rolls, control means for rotating said rolls at a first peripheral speed substantially equal to the first speed of a first sheet prior to the first sheet being gripped by said first and second rolls, means for gripping said first sheet by selectively

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reducing the predetermined gap size through movement of said one roll relative to the other of said first and second rolls when said first sheet first speed and first and second roll speeds are substantially equal, and said control means being constructed and arranged for controlling the operation of said rolls rotating means by rotating said rolls at a peripheral speed less than the first speed when said first sheet is gripped between said first and second rolls and the first sheet first speed is thereby reduced.

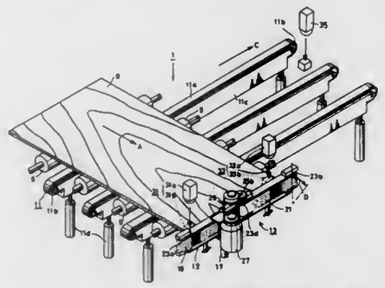
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5,050,857

## DEVICE FOR ORIENTING A SHEET

Teruaki Aoto, Obu, Japan, assignor to Meinan Machinery Works, Inc., Obu, Japan

Filed Dec. 21, 1989, Ser. No. 454,687
Claims priority, application Japan, Dec. 26, 1988, 63-168495
Int. Cl.[5] B65H *9/06*
U.S. Cl. 271—227 10 Claims



1. A device for orienting a rectangular-shaped sheet into a straight position with the leading edge thereof presented in substantially perpendicular relation to a forward direction in which the sheet is fed, comprising:

means providing a feeding area of said device for feeding the sheet in said forward feeding direction;

first means disposed at the downstream end of said feeding area for orienting the sheet in conjunction with the feeding force imparted to the sheet by said feeding means;

second means disposed at the downstream end of said feeding area in closely adjacent relation to said first orienting means for orienting the sheet in conjunction with said feeding force;

said first orienting means having a working surface contactable by one of the corners on said leading edge of the sheet when fed by said feeding means in a position inclined in one way, and said second orienting means having a similar working surface contactable by the other corner of said leading edge of the sheet when fed in a position inclined in the other way; and

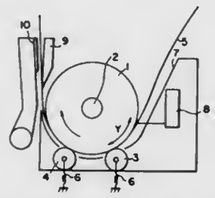
drive means for driving each of said working surfaces of said first and second orienting means in such opposite directions that said working surfaces move away from each other, whereby the sheet having either one corner on the leading edge thereof brought into contact with its said corresponding working surface is caused to be turned into said straight position by the feeding force acting on the sheet to move it forward and by the force of said corresponding working surface acting on the corner of the sheet to move it in direction substantially perpendicular to that of the feeding force and away from said other working surface.

5,050,858

## SHEET FEED CONTROL METHOD

Tadashi Nakamura, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1989, Ser. No. 447,968
Claims priority, application Japan, Jan. 9, 1989, 1-2285
Int. Cl.[5] B65H *7/02*
U.S. Cl. 271—265 3 Claims



1. A sheet feed control method for use in a printing machine that prints a plurality of lines of text in which a sheet is inserted between a sheet feeding cylindrical sheet feed roller and a small roller in pressure contact with the outer peripheral surface of the sheet feed roller, and rotation from a driving source is transmitted to the sheet feed roller through a gear transmission mechanism to rotate the sheet feed roller thereby conveying the sheet to a printing portion and thereafter conveying the sheet through said printing portion with a predetermined feed distance between each line of text to be printed, characterized by forecasting a time at which a rear end of a sheet passes between said sheet feed roller and said small roller, and conveying the sheet a distance other than said predetermined feed distance when said rear end of the sheet passes between said sheet feed roller and said small roller to compensate for a backlash in a gear of said gear transmission mechanism.

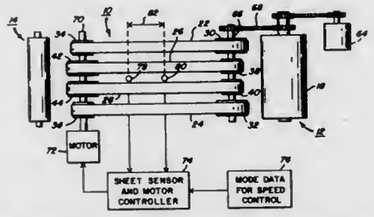
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5,050,859

## VARIABLE SPEED SHEET TRANSPORT SYSTEM

James F. Paxon, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 18, 1990, Ser. No. 539,655
Int. Cl.[5] B65H *5/02*
U.S. Cl. 271—270 15 Claims




1. A sheet transport system for conveying a sheet from a first process station of a hard-copy output machine to a second process station of the machine, said system comprising:

a plurality of belts positioned between the first and second process stations;

first means for moving a predetermined number of the belts at a first linear speed which is substantially equal to the discharge speed of a sheet from the first process station;

second means for moving a predetermined number of the belts, other than those moved by the first moving means, at a second linear speed;

all of the belts being of substantially the same length and each belt being disposed around a circular member at each end of the belt;

all of the circular members at one end of all the belts being rotatable about a first common axis, and with all of the circular members at the other end of all the belts being rotatable about a second common axis;

means for sensing the speed of a sheet being moved between the process stations by the transport system; and

means for controlling the second moving means such that the second linear speed is a function of the sensed speed of the sheet.



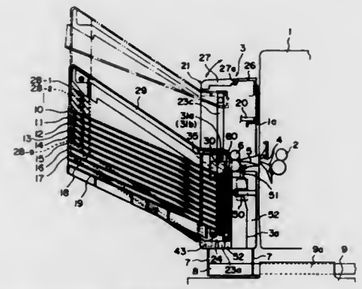
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5,050,860

## SHEET SORTER

Kazuhiro Matsuo, Tokyo, and Kimiaki Hayakawa, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 304,486, Feb. 1, 1989, abandoned. This application Feb. 15, 1991, Ser. No. 656,029
Claims priority, application Japan, Feb. 2, 1988, 63-21370; Feb. 4, 1988, 63-22831; Feb. 8, 1988, 63-25708
Int. Cl.[5] B65H *31/24*
U.S. Cl. 271—293 14 Claims



1. A sheet sorter, comprising:

a plurality of bin trays arranged in the form of multi-stage trays;

a plurality of followers provided on said bin trays adjacent sheet receiving sides of said bin trays; and

rotatable means for sequentially moving said followers to expand a gap between adjacent bin trays;

wherein an accommodating portion is provided with substantially vertical independent spaces which are disposed at respective sides of the sheet receiving side of said sheet sorter and which are defined by walls to accommodate said rotatable means, wherein said walls, a vertically and laterally long connecting member for connecting the walls at the respective sides and members for defining grooves for guiding movements of the plurality of followers, are integrally molded, and wherein the members for defining the grooves are parts of such portions of the walls from which the connecting member is extended.

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5,050,861

## ADJUSTABLE BENCH-STEP

Laurie Thomas, 442 Hunter Dr., Carol Stream, Ill. 60188, and Robert W. Nicholas, 8606 Main St., Downers Grove, Ill. 60506

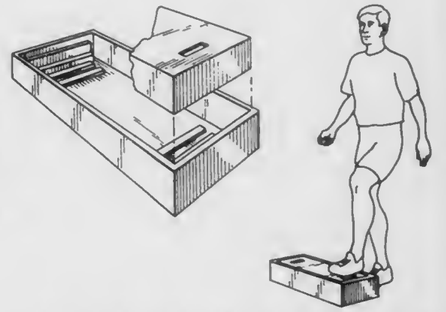
Filed Dec. 14, 1990, Ser. No. 628,183
Int. Cl.[5] A63B *23/04;* F16M *11/00;* A47B *57/34, 9/00*
U.S. Cl. 272—70 5 Claims

1. An adjustable bench-step for use in benching, comprising:

a base with upwardly extending walls around the perimeter;

a manually movable platform nestable within said base, including a downwardly extending apron having a horizontal engaging surface; and

means for supporting said platform from said base at a plurality of different heights, said supporting means including at least one spacer manually mountable in different positions on said base, said spacer also having one or more upwardly facing horizontal support surfaces each adapted to mate with at least a portion of said horizontal engaging surface of said apron when said spacer is mounted on said base, with a portion of at least one of said horizontal



support surfaces contacting at least a portion of said horizontal engaging surface of said apron along said wall to support said platform at one of said different heights.

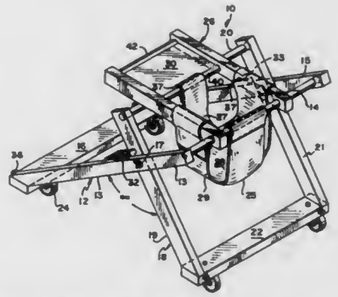
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5,050,862

## FOLDABLE CHILD'S WALKER

Behrouz Saghafi, 15005 Concord Dr., Woodbridge, Va. 22192

Filed Apr. 23, 1990, Ser. No. 504,755
Int. Cl.[5] A61H *3/00*
U.S. Cl. 272—70.3 6 Claims



1. A child's walker, comprising

a first frame member having a pair of arms connected to an upper support means and a lower support means,

a second frame member having a pair of arms connected to an upper support means and a lower support means, said lower support means for said first and second frame members having wheel means mounted thereon, said first frame member being pivoted to said second frame member for rotation with respect to one another to thereby define an open position and a closed position,

a third frame member having a flexible seat supported thereon, a rear portion of said third frame member being freely pivoted to said upper support means of said first frame member and a front portion of said third frame member being disposed across said upper support means of said second frame member and resting unsecured thereon to thereby define a horizontal plane when said first and second frame members are in said open position and supported on a floor,

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tray means arranged on said front portion of said third frame member,

height adjusting means secured to said arms of said first frame member, said adjusting means serving to raise and lower said flexible seat relative to the floor, said adjusting means comprising a pair of blocks, each said block including an integral pin mortised thereinto and extending outward therefrom, said height adjusting means further including a threaded bolt and a nut, said integral pin and nut and bolt securing said adjusting means in place in a manner which prevents each of said blocks from swivelling out of place.

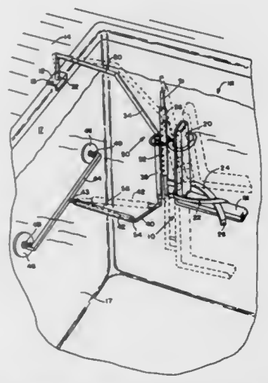
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**5,050,863**

## EXERCISE CHAIR FOR USE IN SWIMMING POOL

**Anton Yacoboski, 3070 Kerner Blvd., Ste. S, San Rafael, Calif. 94901**

**Filed Jul. 17, 1989, Ser. No. 380,583**
**Int. Cl.[5] A63B *31/00***
**U.S. Cl. 272—71** **8 Claims**



1. A chair for supporting a person while performing underwater physical arm and leg exercises in a swimming pool comprising:

a generally C-shaped support frame having a generally horizontal upper beam, a generally horizontal lower beam and an interconnecting upright post;

means for adjusting the angle of said upright post to the vertical;

means for anchoring the distal end of said upper beam to a stationary structure adjacent a swimming pool;

a means on the distal end of said lower beam adapted to engage the side wall of said swimming pool below the surface of water therein without damaging the surface of the said side wall;

a narrow seat carried on and extending from said upright post to support a person astride it while enabling the free movement of said person's legs from the hips; and

an upright narrow back rest secured to said seat to engage said person's back just along the spine to enable simultaneous free underwater movement of the shoulders and arms and means fixing said back rest generally parallel to said upright post; and

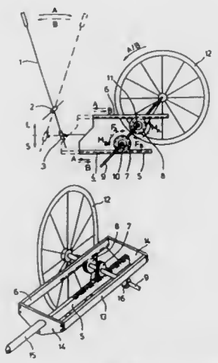
strap means carried on at least one of said seat and back rest to engage around said person's mid-section to hold said person on said seat without impeding said arm and leg movements.

**5,050,864**

## SPORTING AND EXERCISE APPARATUS

**Oswald Pertramer, Kravoglstr. 6, I-39020 Marling, Italy**

**Filed Jan. 19, 1990, Ser. No. 467,494**
**Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 3901642; Oct. 5, 1989, 3933280**
**Int. Cl.[5] A63B *69/16***
**U.S. Cl. 272—73** **2 Claims**



1. A sporting and trimming apparatus movable by muscular power consisting of an undercarriage with an elongated area for a user and supported on the ground by at least two wheels and a hand-lever drive for converting lever motion into rotary motion of at least one of said wheels, wherein the hand-lever drive is mounted on a pivot point in the undercarriage and has a hinge on which is articulated a drive element comprising two racks which act upon a respective gear lodged in a drive axle in a manner such that, when the direction of movement is the same, said racks actuate to the right and to the left the corresponding gear and wherein each time only one gear causes the drive axle to rotate along with it via associated free wheels while the other gear spins freely in an opposite direction, characterized in that the position of said racks (**5,6**) upon said gears (**7,8**) is defined by an additional guide rail (**13**), said guide rail (**13**) being firmly connected with racks (**5,6**) and sliding upon a ball bearing (**16**) which is mounted upon said drive axle (**9**) and embraces it on both sides for laterally guiding said drive element (**4**).

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**5,050,865**

## CYCLE TRAINING DEVICE

**Quent Augspurger, and Charles H. Bartlett, both of 2519 E. Thomas Rd. #A, Phoenix, Ariz. 85016**

**Continuation-in-part of Ser. No. 138,152, Dec. 28, 1987, Pat. No. 4,817,939. This application Mar. 6, 1989, Ser. No. 319,331**
**The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.**
**Int. Cl.[5] A63B *69/00***
**U.S. Cl. 272—73** **12 Claims**

1. A user-operated exercise device comprising:

(a) a base member;

(b) a pedal-operated crank operatively connected to drive a shaft at a first power transmission means;

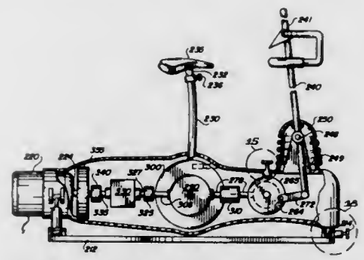
(c) an AC induction electrical device having an input shaft, said electrical device connectable in a power circuit and being operable as an asynchronous generator upon reaching a predetermined speed;

(d) first uni-directional clutch means operatively interposed between the input shaft of said electrical device and the said drive shaft whereby said input shaft is driven in only one rotational direction by operation of said pedal-operated crank;

(e) seat means for supporting the user; and



(f) arm means on said base, said arm means having handle means adapted to be grasped by the user, said arm means being pivotally secured to said base member and being



connected through second power transmission means to said drive shaft to enable the user to pivotally operate said arm means to drive the drive shaft.

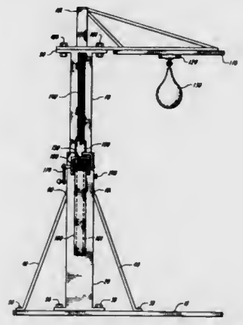
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**5,050,866**

## PUNCHING BAG SUPPORT DEVICE

**John P. Fucci, 111 Riverside St., Watertown, Mass. 02172**

**Filed Aug. 18, 1989, Ser. No. 395,760**
**Int. Cl.[5] A63B *63/08, 69/00***
**U.S. Cl. 272—78** **20 Claims**



1. An apparatus for supporting a punching bag comprising:

a base means;

a first elongated support member having a hollow cross-sectional area being attached to and extending substantially perpendicularly from the base means;

a second support member having a cross-sectional dimension sized to telescopically fit inside the first support member and extending substantially in the same direction as the first support member;

an upper support means for supporting therefrom a punching bag;

a gear means for moving the second support member with respect the first support member;

a pressure cylinder disposed between the base means and the second support member;

a locking means attached to the first support member for engaging the gear means to prevent movement of the second support member;

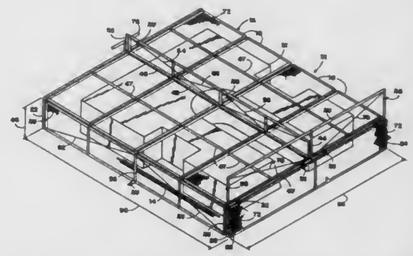
whereby operating the gear means causes the second support member to be raised or lowered to vary the height of the upper support means and punching bag attached thereto while the pressure cylinder prevents the second support member form falling when the locking means is released.

**5,050,867**

## PORTABLE PROTECTIVE CAGE FOR ATHLETIC EQUIPMENT

**Delbert B. Rand, 12765 SW. Camellia St., Beaverton, Oreg. 97005, and Thomas G. Lindahl, Portland, Oreg., assignors to Delbert B. Rand, Beaverton, Oreg.**

**Filed Jul. 21, 1989, Ser. No. 383,870**
**Int. Cl.[5] A63K *3/04***
**U.S. Cl. 272—101** **20 Claims**



1. In combination with athletic field equipment including a landing pit pad assembly having a plurality of sides, apparatus for helping to prevent damage to said athletic field equipment, comprising:

(a) a lightweight frame of a size large enough to surround said landing pit pad assembly with at least a predetermined separation from the landing pit pad assembly thereabove and on all sides thereof;

(b) a strong durable covering mounted on said frame, said frame and covering in combination forming a portable protective enclosure including a top assembly and a plurality of upstanding walls for preventing a person from reaching the landing pit pad assembly stored therein; and

(c) means associated with a lower portion of said frame for selectively supporting the said frame and said covering to facilitate movement thereof along the ground.

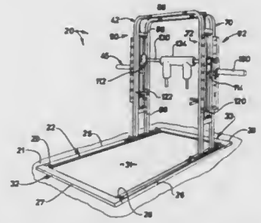
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**5,050,868**

## LEG TRAINING MACHINE FOR BODY BUILDERS

**Bruce E. Pearson, Searcy, Ark., assignor to Criterion Bodybuilding Equipment, Inc., Searcy, Ark.**

**Filed Mar. 16, 1990, Ser. No. 494,447**
**Int. Cl.[5] A63B *21/06***
**U.S. Cl. 272—117** **4 Claims**



1. A machine for use by an exerciser for muscle conditioning, muscle rehabilitation, body building, weight training, and exercising, said machine comprising:

a rigid, generally planar frame adapted to be disposed upon a supporting surface such as the floor of a gymnasium, said frame comprising a front and a back, and a pair of parallel, spaced apart side rails extending generally horizontally between said front and said back;

a resilient, skid-resistant base defined by said frame between said side rails upon which the exerciser may stand;

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a carriage assembly movable by said exerciser relative to said frame, said carriage assembly comprising:

a pair of spaced apart vertically upwardly extending sides slidably supported upon said frame rails for movements generally between said frame front and said frame back, each side comprising vertical guide rod means;

weight bar means operatively extending between said sides for supporting user-selected weights, said weight bar means comprising:

yoke means engageable by said exerciser;

sleeve means coupled to said guide rod means facilitating slidable, generally vertical, axial weight bar movements with respect to said sides;

means for rotatably coupling said weight bar means to said sleeve means to facilitate torsional displacements of said weight bar means concurrently with up and down movements thereof; and,

means for dynamically varying in length for resiliently compensating for non-parallel alignment of said carriage sides;

restraint means for resting said weight bar means at a desired elevation above said floor to temporarily support the weights, said restraint means comprising a rotatable, vertical stanchion associated with each of said carriage sides, said stanchion being spaced apart from said guide rod means and comprising wing means adapted to be rotated into position to selectively contact said weight bar means to at least temporarily hold same;

compensation linkage means for synchronizing rotation of said vertical stanchions on each of said carriage means sides;

drop bar means for preventing injury to said bodybuilder by limiting downward travel of said weight bar in response to inadvertent release or dropping of said weight bar means, said drop bar means comprising pairs of support struts disposed along said carriage sides for slidably receiving said weight bar means;

means for joining and retaining said carriage sides in proper parallel alignment;

whereby said carriage means may move relative to said frame concurrently with movements of said weight bar means to facilitate the practice of weighted lunges or similar exercises by said exerciser.

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**5,050,869**

**PORTABLE EXERCISE MACHINE**

**Richard A. Frate, 250 Hilisboro Rd., N.W., Orangeburg, S.C. 29115**

**Filed Jun. 7, 1990, Ser. No. 534,550**

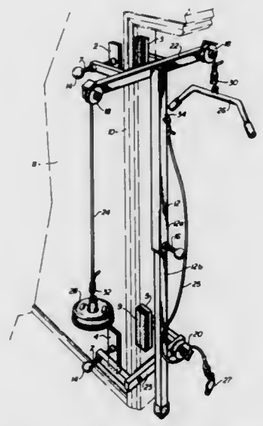
**Int. Cl.[5] A63B *21/06***

**U.S. Cl. 272—117** **9 Claims**

1. A portable exercise unit which may be mounted to a door frame, comprising:

a. two or more of pairs of pads, in a vertical array in which at least one of each of said pair of pads may be adjustably moved toward the other so as to .apply pressure to a wall adjacent to a door frame;

b. a member which connects said pairs of pads;



c. one or more pulleys mounted to said member; and

e. one or more cables running through said pulleys, and having weights attached at one end.

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**5,050,870**

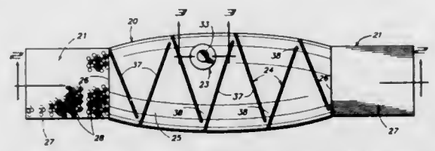
**WATER FILLED EXCERCISE WEIGHT**

**Todd E. Pollock, W. 3216-21st Ave., Spokane, Wash. 99204**

**Filed Aug. 31, 1990, Ser. No. 575,842**

**Int. Cl.[5] A63B *21/065, 23/00;* A61F *7/00***

**U.S. Cl. 272—119** **1 Claim**



1. An exercise weight fillable with selective amounts of fluidic medium to provide variable mass, comprising in combination:

an elongate body peripherally defined by a tubular membrane of resiliently flexible material having its opposed ends closed to define a fluid chamber for containment of weighting fluid, said body having a length to extend around a limb of a user whereat it is to be positioned and defining fastening tabs at each elongate end;

fastening means carried by the fastening tabs at each opposed end of the body to releasably fasten to each other in adjustable relationship to maintain the body in an annular configuration about a limb of a user;

a closable orifice communicating through the tubular membrane of the body to the fluid chamber defined therein to allow filling and emptying of fluidic medium in the fluid chamber; and

flexible partitioning structure carried within the fluid chamber to prevent rapid passage of substantial volumes of fluid between parts of the chamber's said partitioning structure comprising a plurality of angulated linear portions of the opposed surfaces of the tubular membrane fastened together to form a series of triangle-like subchambers extending between the opposed longer sides of the body, each subchamber interconnected with an adjacent subchamber by a single orifice, all subchambers having at least one orifice communicating to an adjacent subchamber, and orifices defined in adjacent partitions being distal from each other and adjacent opposite longer sides of the body.



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**5,050,871**

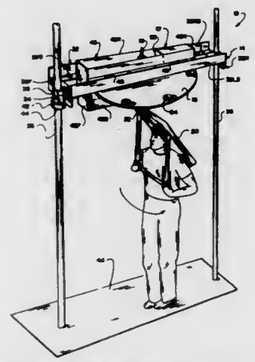
**ENERGY ABSORBING EXERCISING AND TRAINING MACHINE**

**D. Scott Douglas, 505 Hillcrest Dr., North, Clearwater, Fla. 34615, and John D. Webb, Clearwater, Fla., assignors to D. Scott Douglas, Clearwater, Fla.**

**Continuation of Ser. No. 388,116, Aug. 1, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 607,641**

**Int. Cl.[5] A63B *21/00***

**U.S. Cl. 272—128** **31 Claims**



1. An exercising and training machine for exercising a person's ability to accelerate a portion of the person's body through a non-continuous path of motion, comprising in combination:

flywheel characterized as having a large amount of inertia; frame;

bearing means for rotatably connecting said flywheel relative to said frame allowing said flywheel to freely rotate in both directions relative to said frame;

harness assembly for connection to the portion of the person's body to be exercised;

means for interconnecting said flywheel and said harness assembly allowing said flywheel to rigidly engage relative to said harness assembly upon acceleration of said harness assembly relative to said flywheel in a first direction along the path of motion of the body portion being exercised and against only the inertia of said flywheel and to disengage and freely rotate relative to said harness assembly upon deceleration of said harness assembly relative to said flywheel such that the body portion being exercised may be accelerated in said first direction along the path of motion against only the inertia of said flywheel and upon deceleration of the body portion, said flywheel disengages relative to said harness assembly thereby precluding said flywheel from exerting a force on the body portion along the path of motion.

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**5,050,872**

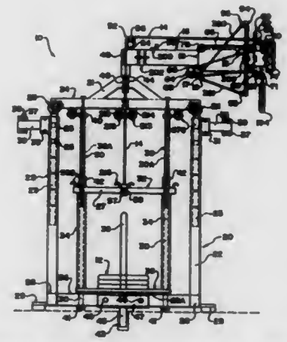
**EXERCISE AND TRAINING APPARATUS**

**Douglas W. Farenholtz, 5409-45th Avenue, Delta British Columbia, Canada V4K 1L3**

**Continuation-in-part of Ser. No. 341,353, Apr. 21, 1989, Pat. No. 4,951,943. This application Mar. 19, 1990, Ser. No. 495,125**

**Int. Cl.[5] A63B *21/00***

**U.S. Cl. 272—134** **27 Claims**



1. A training and exercise apparatus for applying force against a resisting force, comprising:

(a) an upstanding frame;

(b) a rotatable arm supported by said frame for unrestricted horizontal rotation about the top of said frame in an arm rotation axis of rotation, when in use;

(c) force receiving means longitudinally slideable along said arm to cause force to be applied against said resisting force when said force receiving means is slid along said arm towards said frame, for receiving force applied by a user;

(d) a resisting force; and

(e) connecting means for connecting said force receiving means to said resisting force responsive to the application on said force receiving means to cause force to be applied against said resisting force.

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**5,050,873**

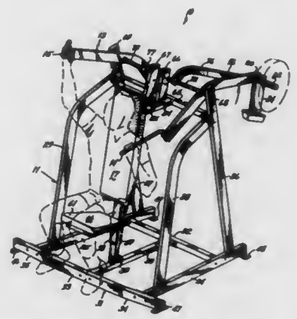
**PULLDOWN EXERCISE MACHINE**

**Gary A. Jones, Falmouth, Ky., assignor to Hammer Corporation, Ky.**

**Filed Apr. 26, 1990, Ser. No. 514,869**

**Int. Cl.[5] A63B *21/00, 21/22***

**U.S. Cl. 272—134** **15 Claims**



1. A pulldown exercise machine comprising:

a frame;

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a seat connected to the frame and adapted to support a person in a seated position straddling a first vertical plane;

a lever pivotally connected to the frame and adapted to be pivoted about an axis located behind and above said seat, the lever having a rearward end for holding a removable weight;

a handle connected to a forward end of the lever and adapted to be grasped and pulled in a downward direction by a person supported on said seat, said downward pulling motion pivoting said lever in an outer vertical plane that diverges from said first vertical plane.

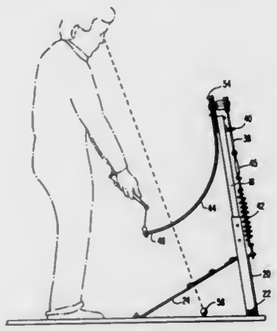
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**5,050,874**

**SWING TRAINING AND EXERCISING APPARATUS**

**Robert E. Fitch, Bloomington, Ind., assignor to Gruv-A-Swing, Inc., Norcross, Ga.**

**Filed May 23, 1990, Ser. No. 527,314**
**Int. Cl.[5] A63B *69/36, 23/00***
**U.S. Cl. 272—136** **13 Claims**



1. A gold swing training and exercise apparatus for simulating the proper swing path and for exercising the gold swing muscles comprising:

a base for supporting a user;

a mounting frame connected to said base and extending in a generally vertical direction;

a parabolic shaped swing arm having a vertical proximal end rotatably attached to said mounting frame by a shaft which rotates with said swing arm and extending in an arcuate configuration toward a user of said apparatus and having a distal end terminating in a generally horizontal direction;

a handle in the shape of a gold grip;

a linkage member connecting said handle to said distal end of said swing arm for permitting universal movement between said handle and said swing arm; and,

a resistance means cooperating with said shaft for providing resistance to movement of said swing arm when said swing arm is rotated by said user during the simulation of a golf swing.

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**5,050,875**

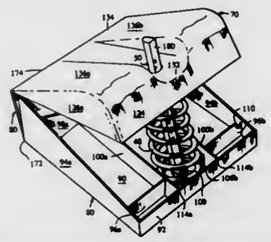
**ABDOMINAL EXERCISING DEVICE**

**Gary N. Lewkovich, 656 Matagual, Vista, Calif. 92083**

**Filed May 17, 1990, Ser. No. 525,256**
**Int. Cl.[5] A63B *21/02***
**U.S. Cl. 272—137** **19 Claims**

1. A method for enabling a user to directly exercise his or her abdominal muscles, comprising the following steps:

providing an exercise device comprising a base member adapted to engage a stable surface, an outer member adapted to be applied against said user's low back, a hinge means pivotally connecting said members, and a resilient means disposed between said members and positioned so as to urge said members apart, such that said members form a generally V-shaped opening when so urged apart, said base member and said outer member each having an internal surface, an external surface, a pivotal end, and a nonpivotal end, and said outer member having a central contour of sufficient recess to receive the bony protuberances of said user's spine, and with said recess extending longitudinally on said outer member, being deepest on said non-pivotal end and gradually diminishing in depth, becoming flush with said outer member and,



placing said external surface of said base member against said stable surface, and said external surface of said outer member against user's low back, and exercising one's abdominal muscles by pulling these muscles inward so as to force one's low back to push said base member and said outer member together against the resistance of said resilient means, then relaxing one's abdominal muscles so as to let said members move apart, and repeating said last two steps so as to cause said members to repeatedly move together and apart, thereby exercising one's abdomen by a direct retraction movement of one's abdominal muscles.

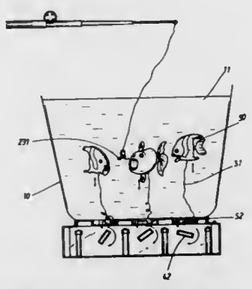
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**5,050,876**

**MAGNETIC FISHING TOY**

**Chuan-Tien Chuang, No. 40, Lane 174, Ta Hsing Street, Tainan, Taiwan**

**Filed Jan. 16, 1991, Ser. No. 641,959**
**Int. Cl.[5] A63F *9/00***
**U.S. Cl. 273—456** **4 Claims**



1. A magnetic fishing toy comprising:

a base plate mounting thereon a plurality of rotating magnetic pieces;

a vessel capable of containing therein a buoying fluid capable of buoying therein/thereon a plurality of fish/fishes each of which has a mouth and connects thereto a connecting line; and

a housing positioned between said base plate and said vessel, and including a plurality of recesses respectively incapable of receiving therein said fish/fishes and respectively disposing therein a plurality of magnetic counterparts each of which will rotate when a respective said magnetic piece rotates and is capable of securing thereto said connecting line in a manner that when rotated, said each magnetic counterpart can repeatedly wind therearound and unwind therefrom said connecting line.



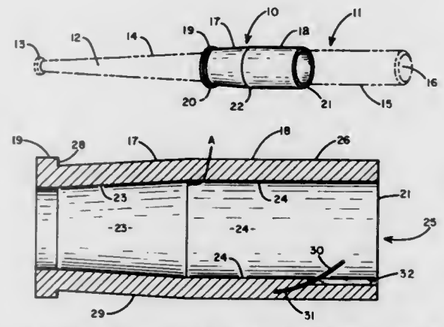
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**5,050,877**

**WARM-UP WEIGHT FOR SOFTBALL BAT**

**Alan Wales, 10258 Arrowwood Dr., Eden Prairie, Minn. 55347**

**Continuation of Ser. No. 263,380, Oct. 27, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 438,049**
**Int. Cl.[5] A63B *71/00***
**U.S. Cl. 273—26 B** **6 Claims**



1. A warm-up weight for a standard softball bat, the softball bat including a conical section defining a proximate handle portion and a cylindrical section defining a distal ball hitting portion, the warm-up weight comprising:

a) a hollow open-ended cylindrical elongate integral section having an inner surface for extending over, conforming to, and bearing against the cylindrical portion of the softball bat, a leaf spring member having an end affixed to said inner surface, said spring member having a free end extending away from said inner surface and directed toward one end of said cylindrical section;

b) a hollow conical elongate integral section attached to the other end of said cylindrical section for fitting over and being wedged against the conical section of the softball bat, said conical section being integrally connected to said cylindrical section to provide a removable warm-up weight.

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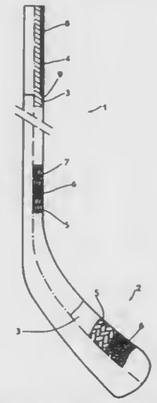
**5,050,878**

**HOCKEY STICK MADE OF COMPOSITE MATERIALS AND ITS MANUFACTURING PROCESS**

**Claude Deleris, Montauban, France, assignor to Destra S.A., Montech, France**

**Filed Oct. 10, 1989, Ser. No. 418,540**
**Claims priority, application France, Oct. 7, 1988, 88 13391**
**Int. Cl.[5] A63B *59/12***
**U.S. Cl. 273—67 A** **16 Claims**

1. Composite hockey stick comprising an expanded polyvinylchloride foam core substantially in the shape of an elongate handle attached to a blade; a first mesh composed of at least one of fiberglass and carbon fibers tightly surrounding at least a portion of said expanded polyvinylchloride foam core; at least one additional mesh composed of at least one of fiberglass and carbon fibers tightly surrounding at least a portion of said first mesh; and each mesh in a direction outwardly from said core has a greater weaving angle with respect to the longitudinal axis of said core than a preceding mesh, to thereby provide an offsetting of threads of one mesh to another.



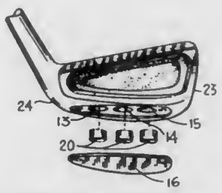
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**5,050,879**

**GOLF DRIVER WITH VARIABLE WEIGHTING FOR CHANGING CENTER OF GRAVITY**

**Donald J. C. Sun, San Diego, Calif., and Wen J. Tai, Kaohsiung, Taiwan, assignors to Cipa Manufacturing Corporation, Kaohsiung, Taiwan**

**Continuation of Ser. No. 468,087, Jan. 22, 1990. This application Apr. 25, 1990, Ser. No. 514,142**
**Int. Cl.[5] A63B *53/08***
**U.S. Cl. 273—80 A** **3 Claims**



1. In a golf club head having sole, toe and heel portions and a face plate, the improvement comprising:

three similarly dimensioned cavities including a central cavity, a cavity towards said toe portion, and a cavity towards said heel portion formed in said sole portion, said cavities being arranged in a line with adjacent cavities being spaced equidistantly from each other along said sole portion between the toe and heel portions, one of the ends of said cavities being open,

a set of weight members, all of said weight members having the same dimensions which enables any one of said weight members to be fitted into any one of said cavities, some of the weight members of said set being of different density materials and different weights,

cover plate means for removably covering the open ends of said cavities to retain the weights therein,

said weight members being selectively installable in said cavities to provide a variety of different centers of gravity for said club head, the center of gravity being variably located horizontally between the toe and heel portions of said club head, said center of gravity being located at a position at the center of said central cavity when the weights of the weight members in the cavities towards the

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toe and heel portions are equal in weight to each other, the center of gravity being laterally shiftable from said position in accordance with a calculated value equal to the difference between the weight of the weight member in the cavity towards the toe portion and the weight of the weight member in the cavity towards the heel portion times the center to center distance between any two of the said adjacent cavities divided by the total weight of the club head.

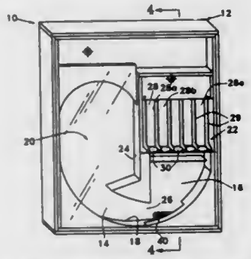
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**5,050,880**

## RANDOM DISTRIBUTION MACHINE

**Randy Sloan, 3360 Kings Row, Reno, Nev. 89503**

**Filed Aug. 17, 1990, Ser. No. 569,177**
**Int. Cl.[5] A63F** *9/00*
**U.S. Cl. 273—144 B** **5 Claims**



1. A random distribution machine for mixing and randomly distributing a plurality of lightweight game pieces into a matrix of rows and columns containing all of the game pieces, comprising,

a housing formed by a pair of parallel plates, one being a front plate with at least a portion of the front plate transparent for viewing by a user,

divider means separating the housing into a pair of chambers connected by a narrow channel between the chambers, namely a first or mixing chamber and a second or holding chamber,

a plurality of lightweight balls contained in the housing between the parallel plates, the spacing between which is adequate to accommodate only one width of a ball game piece, to establish a two-dimensional arrangement of the balls, and the balls being capable of communication between the two chambers, with some of the balls having different surface marking from the remainder of the balls so as to be distinguishable by a user viewing the balls through the transparent portion,

first air movement means in the first or mixing chamber, for moving the balls randomly,

a series of vertical stacking spaces for the balls in the second or holding chamber, for receiving the balls in parallel columns so as to form a matrix including all of the balls,

second air moving means in the holding chamber, for moving air in such a direction as to move the balls randomly into the matrix, and

means for retaining the balls in the matrix after all of the balls have entered the matrix.

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**5,050,881**

## SLOT MACHINE

**Yuji Nagao, Tokyo, Japan, assignor to Sigma, Incorporated, Tokyo, Japan**

**Continuation of Ser. No. 239,400, Sep. 1, 1988, abandoned. This application Sep. 17, 1990, Ser. No. 584,497**
**Int. Cl.[5] A63F** *9/24*
**U.S. Cl. 273—143 R** **16 Claims**

1. A slot machine, comprising:

a plurality of reels with each reel having a plurality of symbols arranged thereon;

means for displaying said symbols;

means for assigning a distinguishing identifier to each and every combination of symbols among the reels when one symbol of each reel is selected;

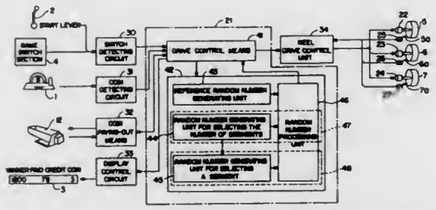
storage means for storing the assigned distinguishing identifiers;

identifier selection means for selecting one of the distinguishing identifiers stored in said storage means;

means for stopping said reels in accordance with the selected distinguishing identifier such that the combination of symbols represented by said distinguishing identifier is displayed by said means for displaying;

said distinguishing identifiers being numbers and said identifier selection means including random number generator means for generating a random number which is representative of said one of the distinguishing identifiers;

said random number generating means comprising a reference random number generating means and a random number processing means;



said reference random number generating means having means for generating a reference random number from a predetermined length of a natural number sequence which extends without repeating each generated random number;

said random number processing means having means for setting a plurality of non-overlapping preset segments of said predetermined length of a natural number sequence, said preset segments having the same number of natural numbers as the total number of distinguishing identifiers; and

segment selecting means for selecting one preset segment out of said plurality of preset segments, said identifier selection means utilizing a reference random number generated by said reference random number generating means only when the reference number is in the preset segment selected by said segment selecting means, and said reference random number generating means continues to generate a new random number in one play until a random number generated by said reference random number generating means is processed by said identifier selection means as a random number for selecting a distinguishing identifier.

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**5,050,882**

## LIQUID FILLED RANDOM NUMBER DISPLAY DEVICE

**Pao-Kung Yang, No. 6, Alley 13, Lane 406, Wu Chuan 3st, Taichung, Taiwan**

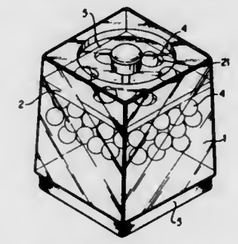
**Filed Jun. 27, 1990, Ser. No. 544,435**
**Int. Cl.[5] A63F** *9/00*
**U.S. Cl. 273—144 B** **4 Claims**

1. A numeral toy comprising:

a transparent container having a bottom board and containing a liquid and a plurality of small balls with each ball having a different numeral printed thereon, said plurality of small balls having a specific gravity lower than that of said liquid, said bottom board having a post extending upward from a center thereof; and

a separating board having a center guide ring projecting downward from said separating board, said center guide ring secured to said guide post of said bottom board for holding said separating board a fixed distance from said bottom board, and said center guide ring having two small air holes for permitting air to pass therethrough, said separating board dividing said container into an upper chamber and a lower chamber and having a plurality of





receiving holes arranged in a circle about said center guide ring;

wherein said plurality of balls are maintained in said lower chamber above said separating board when said container is in an upright position, and said plurality of small balls float into said plurality of receiving holes and are adjacent said bottom board when said container is in an upside-down position.

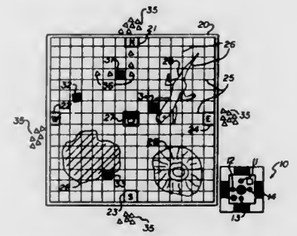
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**5,050,883**

## SELF-CONTAINED COMPETITIVE GAME FOR DEVELOPING SPATIAL SENSE IN YOUNG CHILDREN

**Adolph E. Goldfarb, Westlake, and Martin I. Goldfarb, Santa Monica, both of Calif., assignors to Adolph E. Goldfarb, Los Angeles, Calif.**

**Filed Feb. 7, 1990, Ser. No. 476,748**
**Int. Cl.[5] A63F** *9/06, 3/00*
**U.S. Cl. 273—153 R** **13 Claims**



1. A self-contained electronic game for stimulating and developing abstract spatial-relations sense in young children, without requiring verbal or spelling ability or the ability to operate a typewriter-like keyboard; said game comprising:

first dedicated digital electronic memory means defining a maze;

second dedicated digital electronic memory means defining a position in the maze for each player of the game respectively;

manually operable dedicated directional input means for use by a player in entering an attempted move;

dedicated annunciator means for communicating to players whether an attempted move is valid;

dedicated digital electronic processing means, interconnected to receive information from the directional input means and from the first and second memory means, for responding to any attempted move which each player respectively enters at the input means by actuating the annunciator means to communicate whether that move is valid for that player's position in the maze;

the processing means having no functional interconnection with any device for displaying a direct pictorial representation of any portion of the maze;

wherein the directional input means comprise means for receiving direction of the attempted move from a single respective manual motion;

passive pictorial means, having no electronic interconnection with the processing means, for pictorially representing an array of game positions, conceptually corresponding to an abstract array of geometric positions that includes geometric positions constituting the maze; and

position-defining means for manual placement in relation to the pictorial means to adid a player in visualizing position in and progress through the game positions.

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**5,050,884**

## GOLF CLUB COMBINED WITH SHAFT PROTECTOR

**Rex Flory, 6044 Ensign Ave., North Hollywood, Calif. 91606**

**Filed Dec. 19, 1990, Ser. No. 629,900**
**Int. Cl.[5] A63B** *53/00, 57/00*
**U.S. Cl. 273—162 R** **5 Claims**



1. An improved golf club assembly, said assembly comprising, in combination:

a) a golf club with a head, hosel and non-metallic shaft, the latter with a golf grip; and,

b) a golf shaft guard comprising flexible, resilient, spongy material releasably disposed around said shaft, abutting said hosel and extending along the length of said shaft towards said grip, said guard comprising an elongated hollow tube having a generally central tubular space extending the length thereof and holding shaft therein to protect it from wear, said tube having a slit the length thereof, extending from the outer surface thereof to said central space for insertion of said shaft in said central space.

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**5,050,885**

## GOLF SWING TRAINING APPARATUS

**James T. Ballard, 9352 NW. 48, Miami, Fla. 33178; Norlin O. Lewis, Remlap; Carlton W. Montgomery, Clay, both of Ala., and Charles H. Birdsong, Meridian, Miss., assignors to James Troy Ballard, Miami, Fla.**

**Filed Nov. 30, 1990, Ser. No. 620,271**
**Int. Cl.[5] A63B** *69/36*
**U.S. Cl. 273—183 B** **16 Claims**

1. A golf swing training apparatus comprising:

a saddle for attachment to the hips of a golfer;

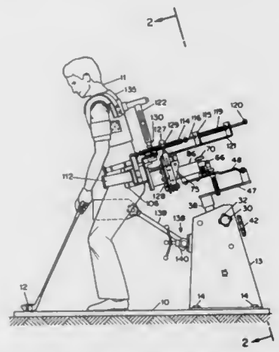
a first assembly which guides the saddle in lateral movements during a golf swing; and

a second assembly which operatively connects the saddle to

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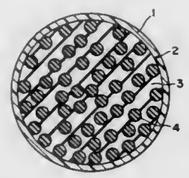
the first assembly and which promotes (a) a rotational movement of the saddle around a first axis during a golf-



er's backswing and (b) a rotational movement of the saddle around a second axis during a golfer's follow-through.

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**5,050,886**
**GOLF BALL**
**Katsunobu Yamagishi, and Yasuhiro Fukui, both of Kagawa, Japan, assignors to Kamatari Co., Ltd., Japan**
**Filed Oct. 1, 1990, Ser. No. 591,041**
**Claims priority, application Japan, Oct. 23, 1989, 1-276466**
**Int. Cl.[5] A63B** *37/06*
**U.S. Cl. 273—220** **5 Claims**

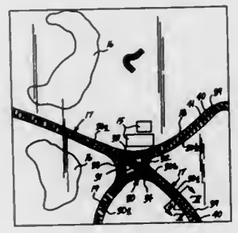


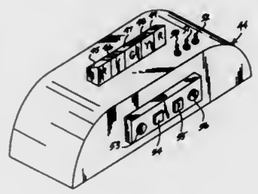
1. A golf ball comprising:
a core composed of (a) a matrix formed of a first, relatively hard rubber having a Shore D hardness of 55–70,and (b) a multiplicity of particles dispersed in said matrix and accounting for 10–65% of the volume of said core, said particles being formed of a second, relatively soft rubber having a Shore D hardness of 15–50 and having a particle size of greater than 0.8 mm but not greater than 7.0 mm, and said core requiring a load of 250–550 kg for being deformed by pressing to such a degree that the diameter thereof is reduced by 10 mm in the pressing direction; and
a shell surrounding said core to provide a gold ball which may be driven a long distance by a golfer without exhibiting unpleasant shock on hitting.

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**5,050,887**
**TRAFFIC SIMULATION BOARD GAME APPARATUS**
**Douglas W. Kemp, 143B Apt. C, Rte. 125, Dover, N.H. 03820**
**Filed Dec. 5, 1990, Ser. No. 622,978**
**Int. Cl.[5] A63F** *3/00*
**U.S. Cl. 273—237** **4 Claims**

1. A traffic simulation board game apparatus simulating travel upon highway paths, wherein the apparatus comprises,
a board member including a planar top playing surface, the board member including a first board member and a second board member, including a fastener member to align the first board member and second board member together, and
a plurality of sequitous path segments directed about the top playing surface, with each of the path segments intersecting at a predetermined number of intersections, the intersections defined by a first coloration, and
the path segments defined by second and third colorations dispersed about the path segments, and a plurality of tokens for movement on said path segments, and
directional controller unit for determining the movement of said tokens, said directional controller unit including a series of indicator lights operatively associated with a first, second, and third coloration switches, wherein the



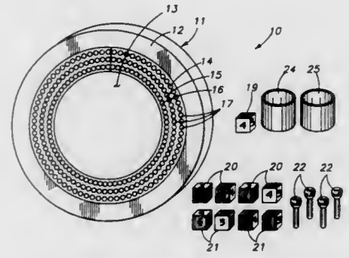




actuation of any one of said switches illuminates all of said indicator lights in an alternating sequence, said first, second, and third coloration switches are color coded to correspond to the first, second, and third coloration about the path segments, and said directional controller unit having mounted thereon a plurality of buttons, each button representing an instruction for movement, said buttons comprising a first go button, a second stop button, a third right lane change button, and a fourth left lane change button, wherein the actuation of any one of said buttons stops the alternating sequence of illuminating lights and randomly illuminates only one of said lights indicating whether or not the instruction represented on said actuated button is to be followed.



**5,050,888**
**BOARD GAME METHOD**
**Ronald D. Schultz, Rte. 2 Box 785, and Richard A. Krueger, 602 E. Adam St., both of Colby, Wis. 54421**
**Filed Oct. 5, 1990, Ser. No. 594,447**
**Int. Cl.[5] A63F** *3/00, 9/04*
**U.S. Cl. 273—248** **1 Claim**

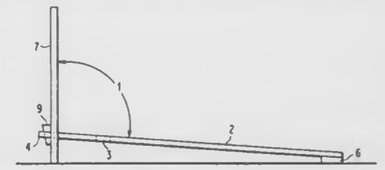


1. A method of playing a board game by a plurality of players comprising the steps of,
A. providing a player board to include a plurality of individual tracks with each track formed of a series of blind bores, and
B. providing each of the players with a predetermined number of player die, and
C. providing a single pace die member, and
D. providing each of the players with at least one peg member wherein each peg member is formed for complementary reception within one of said bores, and
providing each of the player die members and the pace die member with six sides, and
providing each of the six sides with a differing whole integer representation, and
alternatively directing each of the players to throw the pace die member, and
subsequently throw the player die members and match integer representations of the player die members with the pace die member for indicating movement along a respective track by a respective player, and
wherein step B further includes providing each player die member and pace die member with a first coloration of two sides of the six dies, and a second coloration of two further sides of the six sides, and a third coloration of two further sides of the six sides, and awarding points for matching of the first, second, and third colorations with a first, second, or third coloration indicated by the pace die member, and
wherein a point total defined by matching of the colorations and the point total defined by matching of the integers of the pace die member and the player die members are totaled to define a total score and the total score as a whole integer indicates a one to one relationship of a predetermined number of blind bores of a respective track to be traversed by a respective player.

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**5,050,889**
**PORTABLE TOSSING GAME AND TARGET ASSEMBLY**
**Kevin M. Walker, Charleston Air Force Base, S.C.**
**Filed Aug. 31, 1990, Ser. No. 576,064**
**Int. Cl.[5] A63B** *67/06*
**U.S. Cl. 273—402** **8 Claims**

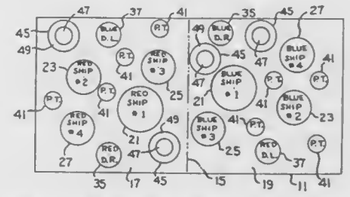
1. An improved game-playing target assembly comprising a gameboard having an inclined planar surface including a circular hole of a size sufficient to permit a tossed projectile to pass through the hole and a backboard having a vertical planar surface, the improvement comprising at least one stabilizing wedge piece, a tab extending from the gameboard's rearward edge which tab includes at least one slot for receiving the wedge piece for stabilizing the backboard against the gameboard rearward edge, and a horizontal slot near the base of the



backboard of a size sufficient to receive the gameboard tab and permit the tab to pass through the plane of the backboard.

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**5,050,890**
**DART BOARD GAME**
**Randal L. Havens, 9880 E. Twin Bridges Rd., Warren, Ill. 61087**
**Filed Jan. 7, 1991, Ser. No. 637,770**
**Int. Cl.[5] F41J** *3/00, 3/02*
**U.S. Cl. 273—408** **5 Claims**



1. Apparatus for a dart game played by two people, comprising a supply of darts for each player; a rectangular dart board subdivided into two equal size rectangular zones, one for each player; a plural number of targets located in each zone; the targets in one zone representing military units controlled by one player; the targets in the other zone representing military units controlled by the other player, whereby each player attempts to destroy the opposing player's targets by throwing darts onto the respective targets a specified number of times; a number of shield-increase spaces in each zone; each shield-increase space being effective when struck by a dart to increase the number of times that a player's target must be struck before being considered destroyed; at least one dart-loss space in each zone; each dart-loss space being effective when struck by a dart to require a reduction in the number of darts supplied to a specified player; at least one dart-regain space in each zone; each dart-regain space being effective when struck by a dart to require an increase in the number of darts supplied to a specified player; and a plural number of power token spaces in each zone; each power token space being effective when struck by a dart to enable a player to multiply the effect of a thrown dart on a struck target; each dart-loss space being located in the zone containing the opposing player's targets, whereby a player throwing a dart at the opposing player's target runs the risk of losing a dart if that dart should be off course; each dart-regain space being located in the specified player's zone, whereby a player throwing a dart at the dart-regain space runs the risk of striking his own target if that dart should be off course.

VOL 1130 ISS 4 SEP 24 1991 UMI

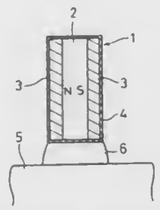


5,050,891

## SEALING MEMBER FOR FERROFLUID SEAL

Ryubei Ishikawa, Tokyo, Japan, assignor to Nippon Ferrofluidice Corporation, Tokyo, Japan

PCT No. PCT/JP89/00343, § 371 Date Nov. 29, 1989, § 102(e) Date Nov. 29, 1989, PCT Pub. No. WO89/09356, PCT Pub. Date Oct. 5, 1989
PCT Filed Mar. 31, 1989, Ser. No. 444,165
Claims priority, application Japan, Mar. 31, 1988, 63-80607
Int. Cl.[5] F16J *15/54*
U.S. Cl. 277—80 2 Claims




1. A sealing member for a ferrofluid seal to be disposed so as to surround an external circumference of a working member such as a shaft, said sealing member comprising:

an annular magnet and annular pole pieces arranged at each side thereof and forming an electrically conductive ferrofluid seal by interposing an electrically conductive ferrofluid between the sealing member and the working member; and

an electrically conductive nonmagnetic coating on internal circumferential surfaces of said magnet and pole pieces, wherein said coating extends over said annular pole pieces.

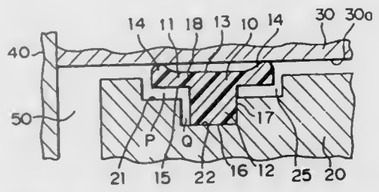
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5,050,892

## SEALING ARRANGEMENT FOR PISTON IN COMPRESSOR

Katsunori Kawai; Hayato Ikeda; Naoya Yokomachi, and Kazuhiro Tanikawa, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Mar. 8, 1990, Ser. No. 490,730
Claims priority, application Japan, Mar. 9, 1989, 1-26977[U]
Int. Cl.[5] B65D *53/00*
U.S. Cl. 277—168 5 Claims




1. A sealing arrangement for a piston in a compressor having a cylinder block with a cylinder bore having an inner surface, formed therein to axially displaceably accommodate said piston, and a cylinder head attached to said cylinder block for forming a compression chamber on one side of said piston, the sealing arrangement comprising:

a ring groove on an outer surface of said piston and comprising opposite side surfaces and a bottom surface between the side surfaces having first and second adjacent cylindrical portions; and

a discontinuous ring seal member made of a plastic material and fitted in said ring groove and comprising,

a main sealing portion having a main sealing outer surface and a pair of flexible lip portions arranged on opposed sides of said main sealing portion and outwardly circumferentially projecting from said main sealing outer surface,

an inner surface comprising an inner bearing portion adapted to contact said first cylindrical portion of said bottom surface of said ring groove whereby said flexible lip portions contact the inner surface of said cylinder bore and are prestressed inwardly when said inner bearing portion contacts said first cylindrical portion, and

an inner pressure receiving portion contiguous with said inner bearing portion wherein said inner pressure receiving portion faces said second cylindrical portion and provides a clearance between said inner pressure receiving portion and said second cylindrical portion while said inner bearing portion contacts said first cylindrical portion to receive pressure from said compression chamber, to thereby allow said ring seal member to expand and said main sealing outer surface to contact the inner surface of the cylinder bore.

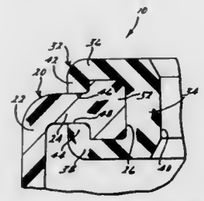
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5,050,893

## VALVE STEM OIL SHIELD

Bernard G. Stritzke, Roselle, Ill., assignor to Macrotech Fluid Sealing, Inc., Salt Lake City, Utah

Filed Sep. 19, 1990, Ser. No. 584,779
Int. Cl.[5] F01L *3/08*; F16J *15/56*
U.S. Cl. 277—178 1 Claim




1. An oil shield for the valve stem of an internal combustion engine comprising:

a cup-shaped deflector having a generally cylindrical portion with a radially extending flange at one end thereof, the flange of said deflector having a central aperture with an axially enlarged portion on the periphery thereof for the acceptance of a valve stem; and

an annular resilient grommet mounted in the aperture in the radial flange of said deflector, said grommet being of generally U-shaped radial cross section defined by an axially extending bight portion and a pair of axially spaced radially outwardly extending leg portions, the bight portion of said grommet being adapted to be compressively engaged between a radially facing face of the axially enlarged portion on the radial flange of said deflector and the valve stem, the leg portions of said U-shaped grommet having axially extending end portions directed toward one another so as to engage the radial flange on said deflector in resilient sealing relationship, the leg portions of said grommet being free to move radially outward upon compression of the bight portion thereof so as to produce tensioned hoop stress in the axially extending end portions thereof whereby subsequent contraction of the leg portions induced by heat increases retention pressure and sealing of the leg portions of said grommet on said deflector.

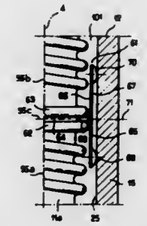


5,050,894

## SEALING DEVICE DESIGNED TO ACHIEVE SEALING BETWEEN TWO PARTS HAVING A POSSIBILITY OF RELATIVE ROTATION TO A LIMITED EXTENT

René Merel, 656 Matagual, Colombes, 92083, and Michel Galard, Tacoignieres, both of France, assignors to EG & G, Maurepas, France

Filed Jan. 17, 1990, Ser. No. 466,532
Claims priority, application France, Jan. 19, 1989, 89 00598
Int. Cl.[5] F16J *3/04, 15/52*
U.S. Cl. 277—182 4 Claims



1. A sealing device designed to achieve sealing between two parts capable of relative rotational motion to a significant but limited extent around an axis, said parts having respective annular zones surrounding said axis and being separated from each other along said axis, wherein said sealing device comprises:

a bellows element substantially coaxially surrounding said axis, said bellows element having two ends joined and sealed to said two annular zones, respectively, and being capable of changing shape under torsion caused by the relative rotation of said two annular zones around said axis to said significant but limited extent; and

guidance means for preventing said bellows element from buckling in the presence of said relative rotation between said zones, wherein said guidance means includes a rigid tubular sleeve coaxially surrounding said bellows element and defining an annular clearance between said sleeve and said bellows element;

means for maintaining said annular clearance between said sleeve and said bellows element, said means being interposed between said bellows element and said sleeve and being in sliding contact with said sleeve; and

means to restrain said means for maintaining said annular clearance from longitudinal movement along said axis with respect to said bellows element.

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5,050,895

## HIGH PRESSURE DYNAMIC SEAL

Mohamed A. Hashish, Kent; John H. Olsen, Vashon Island; Anton H. Bachberger, Renton; Olivier L. Tremoulet, Jr., Andover; Sigurd C. Mordre, Vashon Island, and David K. M. Tan, Seattle, all of Wash., assignors to Flow International Corporation, Kent, Wash.

Filed Apr. 4, 1989, Ser. No. 333,342
Int. Cl.[5] F16J *15/18*
U.S. Cl. 277—188 R 46 Claims

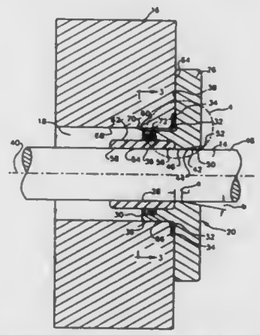
40. A high pressure seal assembly for a cylinder and piston, where the cylinder defines a high pressure chamber and the piston reciprocates in said chamber with a high pressure discharge stroke and a low pressure intake stroke, said seal assembly having a high pressure forward end and a low pressure rear end, said seal assembly comprising:

a. a backup ring having a through opening to receive said piston, said opening being defined by a circumferential inner ring surface;

b. a seal member which fits circumferentially around said piston and has a rear portion which is positioned adjacent to and forward of said through opening of the backup ring;

c. a seal positioning member surrounding at least the rear portion of said seal member, said positioning member being fixedly connected to said backup ring in fluid tight relationship and extending forwardly therefrom, with said positioning member being located between said piston and said cylinder; and

d. a second seal means positioned to form a seal for an interface of said cylinder and said backup ring at a location radially outward of said positioning member; and



e. said seal positioning member having a radially outward surface and a radially inward surface, both of which surfaces are exposed to high pressure in said chamber, said backup ring being arranged relative to said positioning member, and said positioning member being dimensioned, in a manner that radially inward and radially outward pressures exerted on said positioning member are substantially balanced, with rear edge portions of the radially outward and radially inward surfaces of the positioning member terminating at axial locations axially closely adjacent to one another to cause said radially inward and radially outward pressures to substantially balance one another.

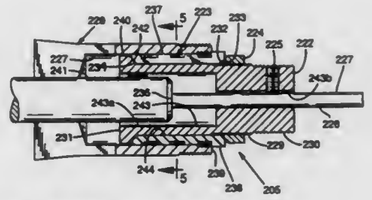
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5,050,896

## COLLET STOP APPARATUS

Donald M. Peterson, Renton, Wash., assignor to James A. Haggerty, Oregon City and Thomas E. Hawkes, Canby, both of, Oreg.

Continuation-in-part of Ser. No. 255,860, Oct. 11, 1988, Pat. No. 4,955,622, which is a continuation-in-part of Ser. No. 180,183, Apr. 11, 1988, abandoned. This application Sep. 10, 1990, Ser. No. 580,201
Int. Cl.[5] B23B *31/20, 13/12*
U.S. Cl. 279—1 S 12 Claims



1. A stop apparatus, comprising:

a body having a central bore and a flanged first end and a second end, the body including an externally threaded portion near the second end;

an expandable tubular sleeve member substantially sur-

rounding the body between the first and second ends of the body;

a nut sized to be threaded to the externally threaded portion of the body, the nut and flanged first end of the body each having inclined surface portions arranged for urging the sleeve away from the body as the nut is threaded in a direction toward the first end of the body; and

a grip attached to the second end of the body and sized to pass through the nut as the nut is removed from the body.

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**5,050,897**

**ARRANGEMENT FOR A CLOSEABLE CARGO HOLDER OF THE CONTAINER TYPE**

**Gunnar Strömberg, 318 NE. 5th Ct., Apt. B, Dania, Fla. 33044**

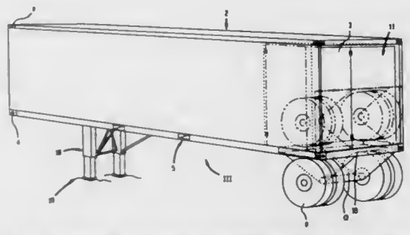
**PCT No. PCT/SE88/00364, § 371 Date Jan. 4, 1990, § 102(e) Date Jan. 4, 1990, PCT Pub. No. WO89/00138, PCT Pub. Date Jan. 12, 1989**

**PCT Filed Jul. 1, 1988, Ser. No. 457,700**

**Claims priority, application Sweden, Jul. 6, 1987, 8702773**

**Int. Cl.[5] B62D *21/18***

**U.S. Cl. 280—43** **15 Claims**



1. A stackable cargo holder for transporting cargo comprising,

a container defining a storage space and having a front end, a rear end and a bottom;

a wheel assembly arranged proximate to said rear end of said container and movably connected thereto for displacement between a storage position above said bottom of said container whereby said bottom of said container can be stacked in contact with a supporting surface and a use position below said bottom of said container, said wheel assembly including at least two wheels, means interconnected with said container for locking said wheel assembly in said use position, means for retaining said wheel assembly in said storage position,

means responsive to vertical movement of said container with respect to said supporting surface for displacing said wheel assembly between said storage and use positions, and

coupling means disposed proximate said front end of said container for releasably connecting said container to a haulage vehicle.

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**5,050,898**

**MOBILE PLATFORM FOR A SNOW PLOW**

**A. Raymond Petrell, Jr., 116 Adams, North Abington, Mass. 02351**

**Filed Apr. 12, 1990, Ser. No. 508,797**

**Int. Cl.[5] B62B *3/10***

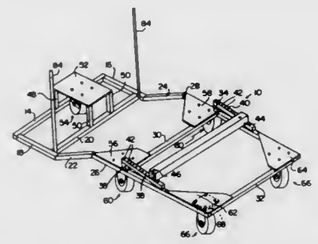
**U.S. Cl. 280—79.11** **13 Claims**

1. A mobile platform for a snow plow, comprising:

a. frame means shaped to hold the bottom of a curved snow plow blade;

b. wheel means mounted on said frame means so that the mobile platform can be moved;

c. support means on said frame means and positioned to support the push frame of a snow plow, the support means including inclined surfaces to which a support bar is removably attached for adjusting the height at which the plow push frame is disposed when the snow plow is on the mobile platform.



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**5,050,899**

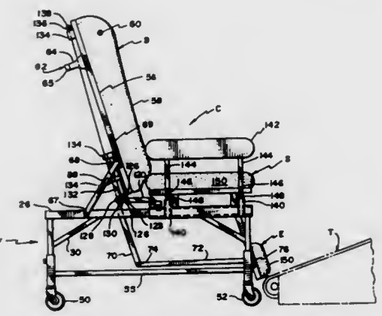
**MEDICAL CRASH-CHAIR AND TREATMENT TABLE**

**Harold F. Stensby, Rt. 4, Box 1075, Berryville, Ak. 72616**

**Filed Jul. 6, 1990, Ser. No. 549,079**

**Int. Cl.[5] B62M *1/14*; A61G *7/10***

**U.S. Cl. 280—250.1** **11 Claims**



1. A convertible wheelchair and treatment table, comprising:

a) supporting means for bearing a person in either a sitting or a supine position;

b) said supporting means having a base frame means and a moveable frame means;

c) said moveable frame means including backrest means pivotably mounted to said base frame means, and seat means supported by said base frame means and slidably mounted with respect thereto;

d) said seat means being slidable from a first position directly above said base frame means to a second position extending outwardly from said base frame means.

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**5,050,900**

**FOLDABLE FRAME STRUCTURE FOR DOUBLE-SEAT BABY CART**

**Fan-Chen Lee, 2 Fl., No. 287, Fu Hsin Rd., San Hsia Chen, Taipei Hsien, Taiwan**

**Filed May 9, 1990, Ser. No. 520,913**

**Int. Cl.[5] B62B *7/06***

**U.S. Cl. 280—642** **1 Claim**

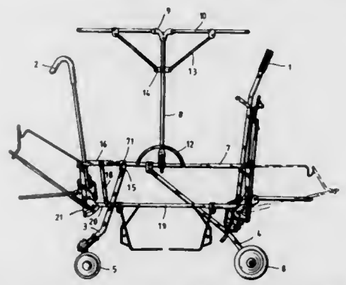
1. A foldable frame structure for a foldable baby cart, comprising:

two symmetrical sub-frame assemblies bilaterally connected together by two foldable fixed foot-pedal levers transversely arranged at two opposite ends thereof, said subassemblies each having a wheel at its two opposite ends, and

a sun shade foldably mounted on and above said two symmetrical sub-frame assemblies at their middle, said sun shade including two parallel canopy fixed vertical tubes movably secured to two arc fixed seats for respectively holding a foldable frame and two canopy active tubes by means of a two-dimension foldable sheet and a canopy active slip part,

wherein said two symmetrical sub-frame assemblies each comprise a plastic connection foldably connecting a front frame to a handle frame, said plastic connection having one end pivoted to said handle frame at a first pivot point and an opposite end pivoted to said front frame at a second pivot point; a foldable link plate foldably connecting a





curved upper connection to said front end of said handle frame, said foldable link plate having its front end pivoted to said first pivot point and its rear end pivoted to a third pivot point on said curved upper connection; a fixed back seat connection tube pivotably connecting said curved upper connection at a fourth pivot point thereon to a seat frame at a fifth pivot point, said seat frame arranged below said handle frame and parallel thereto; said upper curved connection having an end pivoted with a back adjustment sheet at a sixth pivot point, said back adjustment sheet having its lower end pivoted with a curved lower connection at a seventh pivot point, said curved lower connection being respectively connected between said back adjustment sheet at said seventh pivot point and said seat frame at said fifth point.

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**5,050,901**

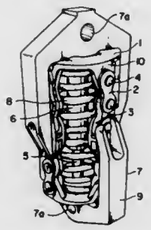
**TWO-WAY SHOCK PROOF AND SHOCK ABSORBING TOWING COUPLING**

**Zhendong Zhao, 25 North Street, Yuetan, Beijing, China**

**Filed Nov. 20, 1989, Ser. No. 438,076**

**Int. Cl.[5] B60D *1/14***

**U.S. Cl. 280—474** **16 Claims**



1. A two-way shock proof and shock absorbing towing coupling, comprising:

two mutually opposing chain holders, each chain holder having at least two pairs of spaced lugs;

at least four parts of chain means, each pair of chain means including two chain sections, first ends of each pair of said chain means being connected to opposite lugs on opposite chain holders by pins, respectively;

two mutually opposing towing frames for connecting adjacent vehicles, each towing frame having at least two arms, each of said arms being pivotally connected with second ends of each chain section in each pair of chain means, wherein the arms of one towing frame are spaced substantially perpendicular relative to the arms of another towing frame; and

at least one shock proof bearing spring provided between said chain holders, said spring being substantially coaxial with said two towing frames, opposing ends of said shock proof bearing spring abutting against and between inner surfaces of said chain holders, respectively;

wherein a pulling action on said mutually opposing towing frames tensions selected ones of said at least four pairs of chain means thereby compressing said planar chain holders and said shock proof bearing spring while remaining ones of said at least four pairs of chain means bend and flex in an absence of tension, and upon an instantaneous change from the pulling action to a pushing action releases compression of said planar chain holders and said shock proof bearing spring and subsequently tensions selected ones of said at least four pairs of said chain means thereby compressing said planar chain holders and said shock proof bearing spring while remaining ones of said at least four pairs of chain means bend and flex in an absence of tension, thereby preventing a disconnecting shock to said towing coupling when either a pulling or pushing action is applied thereto.

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**5,050,902**

**SAFETY SKI BINDING**

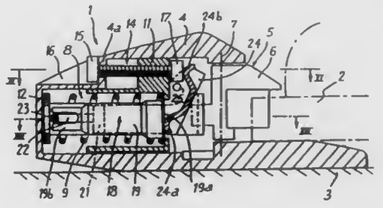
**Jean-Michel Bouque, Cran-Gevrier, and Jean-Claude Brischoux, Annecy-Le-Vieux, both of France, assignors to Salomon S.A., Annecy Cedex, France**

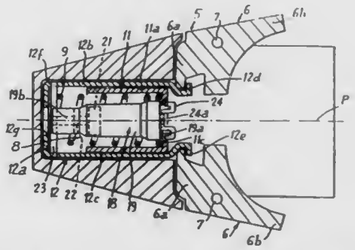
**Filed Feb. 5, 1990, Ser. No. 475,001**

**Claims priority, application France, Feb. 9, 1989, 89 01697**

**Int. Cl.[5] A63C *9/08, 9/22***

**U.S. Cl. 280—629** **23 Claims**





18. A safety ski binding having a front and rear and being adapted to hold a ski boot on a ski, said safety ski binding comprising:

a) a body;

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b) a jaw movably mounted on a rear part of said body, for retaining the ski boot on the ski in a first locked position and releasing the ski boot when in a second released position;
c) a tie rod movable within said body and cooperating with said jaw to allow said jaw to move to said second released position and to return to said first locked position;
d) an adjustment nut movable to different positions relative to said tie rod, a spring located between and cooperating with said tie rod and said adjustment nut to bias said jaw toward said locked position;
e) means for adjusting the position of said adjustment nut;
f) a shock absorber positioned within said spring, said shock absorber having a first and second end, said first end of said shock absorber being connected to said tie rod; and
g) movable linkage means for contacting both the second end of said shock absorber and said means for adjusting so as to transfer displacement of said shock absorber during a violent bias to movement of said means for adjusting to cause additional compression of said spring.

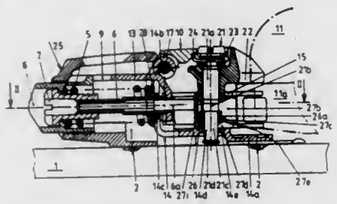
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**5,050,903**

## BUILDING UNIT FOR SAFETY SKI BINDING

**Karl Stritzl, Vienna; Franz Luschnig, Traiskirchen, and Henry Freisinger, Vienna, all of Austria, assignors to TMC Corporation, Baar/Zug, Switzerland**

**PCT No. PCT/EP88/00988, § 371 Date Jun. 21, 1989, § 102(e) Date Jun. 21, 1989, PCT Pub. No. WO89/04195, PCT Pub. Date May 18, 1989**
**PCT Filed Oct. 31, 1988, Ser. No. 382,793**
**Claims priority, applicatioo Austria, Nov. 12, 1987, 2997/87**
**Int. Cl.[5] A63C *9/085***
**U.S. Cl. 280—625** **10 Claims**



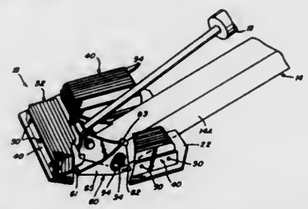
7. A toe holding unit for a safety ski binding, comprising:
a sole hold-down moveable in a substantially vertical direction with respect to an upper surface of a ski, for contacting the sole of a ski boot;
two angle levers disposed in the toe holding unit for exerting lateral holding forces on the sole of a ski boot, said angle levers adapted for pivotal movement toward and away from a ski boot;
a compensating lever connected to an end of said bolt and having a first arm for engagement with said hold-down, and a second arm including two arm sections, each of said arm sections for operative engagement with one of said two angle levers;
spring means for urging said first arm of said compensating lever toward said hold-down to move said hold-down to a sole holding position;
a support part having a sloping surface, said support part being operatively connected to said compensating lever; and
a wedge element having at least one sloping surface for engagement with the sloping surface of the support part, and having a portion for bearing against the sole of a ski boot, said sloped surface of said wedge element for acting against the sloped surface of the support part to thereby urge the compensating lever to a releasing position in response to a force exerted on the wedge element through the sole of a ski boot.

**5,050,904**

## STABILIZER PAD FOR EARTH MOVING APPARATUS

**Andry Lagsdin, 54 King Hill Rd., Hanover, Mass. 02339**

**Continuation-in-part of Ser. No. 386,706, Jul. 31, 1984, abandoned, which is a continuation of Ser. No. 183,844, Apr. 20, 1988, Pat. No. 4,889,362. This application May 29, 1990, Ser. No. 530,028**
**Int. Cl.[5] B60S *9/02***
**U.S. Cl. 280—764.1** **19 Claims**



1. For an earth moving apparatus having at least one support arm, a stabilizer comprising a plate-like piece having alternate surfaces one of which is resilient and the other of which includes a flanged web, support means for pivotably supporting said piece to an end of said support arm, said piece being rotatable relative to said support means between alternate positions wherein either said resilient surface is facing downwardly or said flanged web is engaging the ground, and latch means including a freely slidable latch member adapted to operate under gravitational force to lock said piece in a predetermined position when said support arm is down and to slideably move to disengage from said piece when said support arm is lifted so as to enable manual pad reversal.

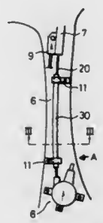
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**5,050,905**

## GUIDE TUBE FOR PASSIVE SEAT BELT SYSTEM

**Yoshihiro Yokote, Yokohama, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 22, 1989, Ser. No. 327,103**
**Claims priority, application Japan, Mar. 23, 1988, 63-38075[U]; Mar. 23, 1988, 63-38076[U]; Mar. 23, 1988, 63-38077[U]**
**Int. Cl.[5] B60R *22/06***
**U.S. Cl. 280—804** **8 Claims**



1. In a guide tube for a passive seat belt system, said guide tube being adapted to be arranged along a vehicle body to guide a slider drive member, the improvement wherein the guide tube comprises a first guide tube member for allowing the slider drive member to extend therethrough and a second guide tube member having higher flexural rigidity than at least the first guide tube member and adapted to be mounted on the vehicle body by means of at least one tube bracket, and the first guide tube member is fitted within the second guide tube member.

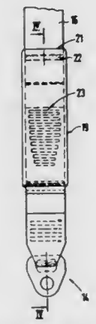


**5,050,906**

## SAFETY BELT SYSTEM, PARTICULARLY FOR MOTOR VEHICLES

**Rainer Kneip, Ditzingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany**

**Filed Jul. 18, 1990, Ser. No. 553,580**
**Claims priority, application Fed. Rep. of Germany, Jul. 21, 1989, 3924149**
**Int. Cl.[5] B60R *22/02***
**U.S. Cl. 280—805** **12 Claims**



1. A safety belt system, particularly for motor vehicles, having a belt strap at which locally an energy absorption member is provided which is formed by a belt strap section which is folded together at least once and is sewn together, the energy absorption member extending inside a belt strap covering, wherein a marking is provided at the belt strap adjacent to the energy absorption member in such a manner that the marking is invisible to an external observer of the seat when the energy absorption member is intact and that the marking is visible to an external observer when the seam of the energy absorption member is at least partially ripped, whereby external observers, such as a vehicle occupant or vehicle repair shop personnel, can detect the condition of the belt strap section without removing the belt strap covering.

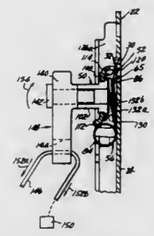
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**5,050,907**

## ADJUSTABLE SEAT BELT ANCHORAGE

**Mohamed Boumarafi, Rochester Hills, and Carl Pondell, Sterling Hgts., both of Mich., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.**

**Continuation of Ser. No. 546,132, Jun. 29, 1990, abandoned. This application Mar. 1, 1991, Ser. No. 664,418**
**Int. Cl.[5] B60R *22/20***
**U.S. Cl. 280—808** **12 Claims**



1. An adjustable seat belt anchorage (**20**) comprising:
a guide rail (**22**) adapted to be secured to a portion of a vehicle (**24**) generally at or above occupant shoulder height, the guide rail (**22**) forming an open channel (**34**), a plurality of pairs of cut-outs (**36**) oppositely positioned in the front walls (**28**) of the guide rail;
a latch plate assembly (**50**) comprising:
a resilient carrier (**52**) slidingly received within the channel (**34**);
a latching mechanism (**54**) biased into the guide rail by the carrier (**52**) and supported by and movable within the carrier (**52**) including a latch bar means (**112**) extending upwardly from the carrier (**52**) for engaging a selected pair of cut-outs (**36**) and an attachment means (**102**) for supporting a D-ring (**140**), wherein the attachment means is located relative to the latch bar means (**112**) in a manner that forces and torques exerted upon the safety belt (**146**) and D-ring (**140**) tend to urge the latch bars means (**112**) into the cut-outs (**36**) in the guide rail (**22**) and
a spring (**56**) to upwardly bias the latch plate assembly comprising a coiled end (**84**) slidably received within a portion of the carrier (**52**) and extendable along the guide rail (**22**) as the carrier is moved therealong including an attachment end (**122**) secured to the guide rail proximate a first stop (**32**) formed therein.

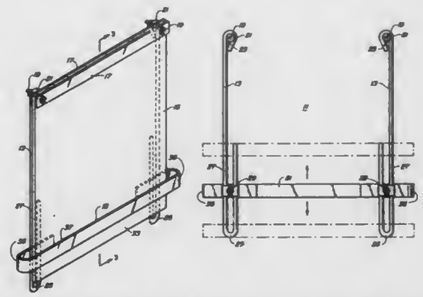
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**5,050,908**

## MUD FLAP ANTI-SAIL BRACKET

**William M. Betts, 27 Sotelo Ave., Piedmont, Calif. 94611**

**Filed Jun. 21, 1990, Ser. No. 542,253**
**Int. Cl.[5] F16M *13/00***
**U.S. Cl. 280—851** **5 Claims**



1. A mud flap anti-sail bracket for a truck mud flap wherein the mud flap is secured to the vehicle by a mounting means disposed along the upper edge thereof, said bracket comprising
a pair of identical depending spring steel support rods having their upper ends formed for engaging the front side of the mud flap mounting means proximate the upper opposite ends or corners of the mud flaps, said support rods

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being formed to allow a cross-member to be detachably secured proximate to the lower ends thereof at variable vertical locations therealong, and

a cross-member formed of flat bar stock having folded back ends which are disposed parallel to the intermediate portion of said cross-member and which are formed for securement to said depending support rods at said lower ends and for at least partially encircling a mud flap in spaced relation thereto proximate its lower ends.

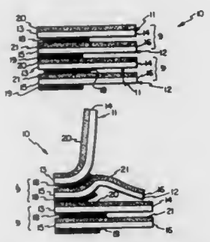
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5,050,909

## STACK OF SHEET ASSEMBLIES

Timothy A. Mertens, Cottage Grove, Minn., and Donn R. Anderson, Clifton Township, Pierce County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 1, 1990, Ser. No. 531,870
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 12 Claims



1. A stack of sheet assemblies, each sheet assembly comprising

first and second sheets each having front and rear major surfaces and first and second opposite edges,

a first layer of adhesive adhering a portion of the rear surface of said first sheet adjacent the first edge of the first sheet to the front surface of said second sheet adjacent the first edge of the second sheet with said first edges generally aligned, said first layer of adhesive extending a first predetermined distance from said first edges toward the second edges of said sheets, and

a second layer of pressure sensitive adhesive on said rear surface of said second sheet, said second layer of pressure sensitive adhesive comprising a first portion adhering the rear surface of the second sheet of the sheet assembly to the front surface of the first sheet on the sheet assembly beneath it in the stack within said first distance from said first edge,

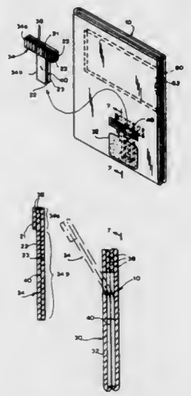
said sheet assemblies including release means for providing first adhesion zones between the front surfaces of the first sheets and the rear surfaces of the second sheets of the sheet assembli in the stack said first adhesion zone extending about said first predetermined distance from the first edges toward the secon edges of said sheets and providing a release force between said first portions of said second layers of adhesive and the front surfaces of the adjacent first sheets in the stack which is lower than the release force of the first layers of adhesive to said first and second sheets to afford easy initiation of peeling of the uppermost sheet assembly from the adjacent sheet assembly in the stack along the first adhesion zone by pulling on the first sheet of the uppermost sheet assembly on the stack.

5,050,910

## FRAGRANCE-RELEASING INSERT FOR A MAGAZINE

Sheldon Schechter, 105 Kingsberry Dr., Somerset, N.J. 08873, and Kevin P. Gatta, 204 Washington Ave., Brooklyn, N.Y. 11205

Filed Jul. 13, 1989, Ser. No. 379,932
Int. Cl.[5] B32B *7/00*; B42D *15/00*
U.S. Cl. 283—105 27 Claims



1. A scent-containing sample comprising:

(A) four at least partially overlapping sheets, including first, second, third and fourth sheets, said first, second and third sheets being at least partially cut through to define a first portion of a removable unit, said second and third sheets being at least partially cut through to define a second portion of a removable unit, said second and third sheets of said second portion being of one piece integral construction with said second and third sheets of said first portion so that said first and second portions are removable from the remainder of said sample as a unit;

(B) means for securing said first, second and third sheets of said first portion together for movement as unit;

(C) means for separable securing said second and third sheets of said second portion together for movement as a unit and for releasing a scent when said second and third sheets of said second portion are separated from each other; and

(D) means for securing together said first, second, third and fourth sheets outside of the periphery of said removable unit.

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5,050,911

## BREAKAWAY COUPLING

Donald L. Morrison, Anaheim, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Foster City, Calif.

Filed Jan. 5, 1990, Ser. No. 461,240
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—2 6 Claims

1. A breakaway coupling for a fluid delivery conduit comprising:

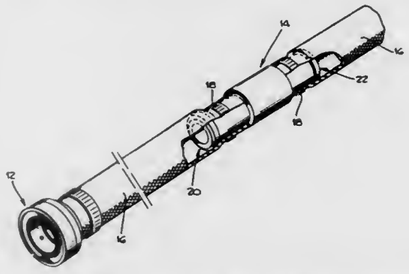
(a) a first coupling element having a conduit receiving portion and a first interconnecting portion;

(b) a second coupling element having a conduit receiving portion and a second interconnecting portion, adapted to telescopically engage said first interconnecting portion;

(c) sealing means retained in a groove n one of said interconnecting portions and adapted to form a fluid tight seal with the other of said interconnecting portions; and

(d) radially flexible, frangible connecting and locking means including a first element for engaging a groove in one of said interconnecting portions and a breakable flange element for engaging a groove in the other of said interconnecting portions, said connecting and locking means adapted to be radially yieldable to permit said first and second coupling elements to telescopically engage one another overriding said connecting and locking means until said grooves of said coupling elements are aligned with said connecting and locking means first element and flange element, respectively,





whereby said flange element is the sole element preventing the separation of the coupling elements and is intended to break if a predetermined pull in a direction non parallel to said flange element is exceeded, thereby releasing said interconnected coupling elements.

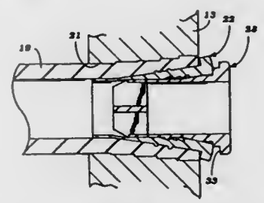
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5,050,912

## REUSABLE VASE CONNECTION FOR A MARINE PROPULSION UNIT

Kenichi Hayasaka, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 25, 1989, Ser. No. 426,876
Claims priority, application Japan, Oct. 25, 1988, 63-269238
Int. Cl.[5] F16L *33/20*
U.S. Cl. 285—222 8 Claims



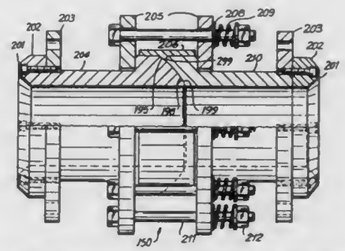
1. A construction for attaching an open end of an elastic hose within an opening extending through a member comprising a first inner member formed as a resilient sleeve and sized to be inserted into the open end the open end of the hose when said hose is received within said member opening, the outer surface of said first inner member having gripping means and being expandable for yieldably engaging the inner surface of said hose for interlocking therewith upon expansion of said first inner member without damaging said hose in a manner to prevent its reuse, a second member inserted into said first inner member from said open end of said hose when said inner member is received in said hose and said hose is received in said opening, and wedging means on said first and said second inner members for expanding said first inner member gripping means into interlocking relationship with said hose and expanding said hose into interlocking relationship with said opening upon axial insertion of said second inner member into said first inner member from said open end without damaging said hose, said hose and said first and said second inner members forming a flow passage when assembled together.

5,050,913

## HIGH PRESSURE, ROTATABLE PIPE JOINTS

Erwin Lenz, 180 Cabrini Blvd., New York, N.Y. 10033

Continuation-in-part of Ser. No. 501,548, Mar. 30, 1990, Pat. No. 4,977,744, which is a division of Ser. No. 294,418, Jan. 9, 1989, Pat. No. 4,934,423. This application Apr. 24, 1990, Ser. No. 513,603
Int. Cl.[5] F16L *27/113*
U.S. Cl. 285—279 5 Claims



1. A sealed pipe swivel joint permitting substantially 360° of rotation between two interconnected fluid-carrying pipe ends and capable of carrying liquids under elevated pressure, the swivel joint comprising mutually rotatable first and second in-line metallic body parts, each having first and second ends, a smooth, externally tapered circumferential, spherical metal surface extending from the first end of the first body part towards the second end of said first body part, such that the external diameter continuously increases in a direction away from the first end to a maximum diameter, and a smooth, internal tapered circumferential spherical metal surface extending from the first end of the second body part towards the second end of said second body part, such that the internal diameter constantly decreases away from such first end to a minimum internal diameter, the two tapered circumferential metal surface mating in concentric, mutual overlapping contact; an external bevel surface at the first end of the second body part, defining an annular concavity together with said external tapered circumferential surface; an annular, slip-fit metal sealing member having an internal circumferential surface in slidable, circumscribing, overlapping contact with the first ends of the two body parts, and concentric with the tapered circumferential metal surfaces, and a wedge-shaped metal annulus integral with and protruding radially inwardly from the internal circumferential metal surface of the sealing member, mating with the annular concavity; compression means resiliently holding the two body parts in contact along the respective tapered circumferential surfaces; and connection means at the second end of each body part, each connected to a pipe, whereby the two pipes are in fluid flow connection and are mutually rotatable, one to the other.

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5,050,914

## UNION JOINT

Tomio Miyashita, Yokohama, Japan, assignor to Sanko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1990, Ser. No. 605,260
Claims priority, application Japan, Apr. 9, 1990, 2-93389
Int. Cl.[5] F16L *17/06*
U.S. Cl. 285—336 3 Claims

1. A union joint comprising:

a first sleeve to be joined hermetically to a first pipe;

a second sleeve to be joined hermetically to a second pipe; each said sleeve having an end surface;

a compressible metallic gasket interposed between said first and second sleeves so as to be compressed between respective opposed end surfaces of said first and second sleeves when said first and second sleeves are drawn

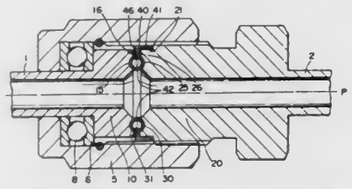
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axially toward each other; one of said sleeves having threads thereon;

a coupling nut combined with one of said sleeves and capable of being threaded on said other sleeve to draw said first and second sleeves axially toward each other;

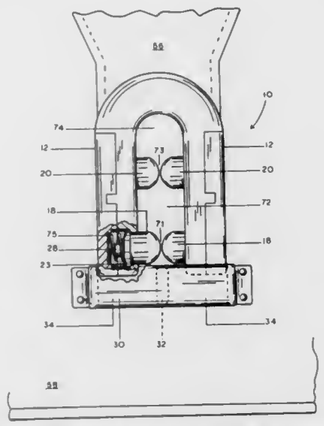
characterized in that grooves having a shape substantially conforming to the external shape of said metallic gasket are formed respectively in said respective end surfaces of said first and second sleeves, said compressible metallic gasket received in said grooves, a retaining member for retaining said metallic gasket in place being detachably



mounted on one of said first or second sleeves, said retaining member having a retaining flange said metallic gasket having a partly open cross section resembling the letter C, said retaining flange of said retaining member being received inside said partly open cross section of said metallic gasket to retain said metallic gasket in place on the corresponding sleeve, and said retaining member having a limiting portion which engages said end surfaces of said first and second sleeves to limit the compression of said metallic gasket when said first and second sleeves are drawn axially toward each other by said coupling nut.

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**5,050,915**
**SPRING ACTUATED FASTENING DEVICE WITH WIDTH/TENSION ADJUSTMENT CAPACITY**
**Luck Nwoko, 1629 Columbia Rd., NW., Apt. 110, Washington, D.C. 20009**
**Filed Oct. 3, 1990, Ser. No. 597,475**
**Int. Cl.[5] E05C** *19/02*
**U.S. Cl. 292—16** **25 Claims**

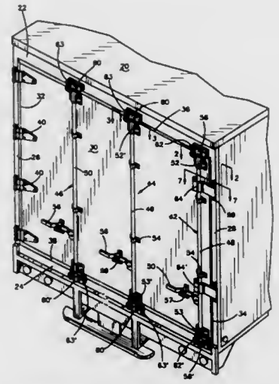


1. A fastening device for bags, luggages and other receptacles comprising:

a bag/luggage fastening device (**10**), made of cast metal, or plastic or any other suitable material having an essentially u-shaped body which consists of an arced posterior portion (**22**) which descends to form two laterally spaced arms (**12**), said arms carrying two projecting pairs of aligned, opposing, compression spring actuated beveled catches (**18**) and (**20**), said catches being smooth and rounded and transversely, moveably mounted and coming together to form restrictive entrants (**71**) and (**73**) which can be substantially, laterally depressed, said opposing, spring actuated catch pairs (**18**) and (**20**) being so located and positioned that said catch members are held in a locking or opening position with respect to a rigid, engaging depressant, and said lateral arms (**12**) at their anterior portion forming an introductory opening (**70**) which, when said fastening device (**10**) is advanced linearly, allows for engagement with said centrally and correctly located depressant, said spring actuated catch pair (**18**) is laterally depressed, via entrant (**71**), allowing for the entrance and registration of said engaging depressant member within the confines of the essentially quadrilateral primary opening (**72**), and upon a subsequent linear advancement of said fastening device (**10**) said rigid depressant is able to repeat its depressing action, via entrant (**73**), against the second pair of opposing spring actuated catches (**20**), thus allowing for the entrance and registration of said depressant within the confines of the essentially arced secondary opening (**74**).

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**5,050,916**
**DOOR AND DOOR CONTROL MECHANISM**
**John V. Pastva, Parma Heights, Ohio, assignor to The Eastern Company, Cleveland, Ohio**
**Filed Oct. 24, 1989, Ser. No. 426,737**
**Int. Cl.[5] E05C** *3/06*
**U.S. Cl. 292—217** **6 Claims**



1. A cargo carrying container comprising,

a) a rectangular substantially vertical access opening at one end, comprising essentially the entire end and defined by a frame structure,

b) a one-panel pivoted door for closing said opening, having a vertical side edge pivotably secured to one side of the frame structure, and

c) first and second door control mechanisms for controlling pivotal movement of the door between a closed position wherein the door closes the opening, and an open position wherein the door is away from the opening, said first door control mechanism being located adjacent a vertical distal side edge of the door and the second being located intermediate the pivoted vertical edge and the first door control mechanism,

d) each said door control mechanisms including a vertical shaft pivotably secured to the door, operating means connected to the shaft for rotating the shaft, cam-type latching members secured to opposite ends of the shaft,

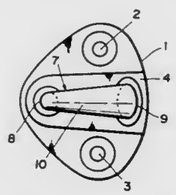


and corresponding keeper members for cooperating engagement with said latching members and secured to upper and lower edges of the frame structure, said latching members including forked portions having tines, the tines of the second door control mechanism being longer than tines of the first, said latching members in operation engaging the keepers before the door is tightly closed and exerting a closing force and having camming surfaces that act against the keepers to exert an aligning force between the door and frame as the door is tightly closed and that inhibit relative shifting of the door within the frame structure when the door is closed and latched, and

e) the first door control mechanism having an additional latch connected to and extending laterally from the shaft member, and positioned intermediate the opposite shaft ends for pivotal movement about an axis substantially parallel with but offset from the axis of the shaft, and a keeper on the frame structure adjacent the distal end of the door when closed, engageable by the additional latch for latching the door in a closed position.

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**5,050,917**
**STRIKER FOR VEHICLE DOOR LOCK**
**Yoshikazu Hamada, Utsumoniya, and Makoto Abekura, Nirasaki, both of Japan, assignors to Mitsui Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Sep. 26, 1990, Ser. No. 588,217**
**Claims priority, application Japan, Sep. 28, 1989, 1-253288**
**Int. Cl.[5] E05C** *3/24*
**U.S. Cl. 292—340** **5 Claims**



1. A striker for a vehicle door lock device, which comprises a metal base plate secured to the construction of the vehicle and a metal-made U-shaped rod consisting of an outside leg fixed to the base plate so as to engage with a latch of the door lock device secured to the door, an inside leg in parallel with said outside leg, and a connecting portion joining ends of the outside leg and the inside leg, wherein said inner leg has a sectional area larger than that of said outside leg and said connecting portion has a shape of wedge increasing at its sectional area toward the inside leg from the outside leg, so that the strength of a joining portion between the inside leg and the connecting portion is larger than that of the joining portion of the outside leg to said connecting portion.

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**5,050,918**
**ACCESSORY FOR HOLDING A CONTACT LENS**
**Alicia A. Kolze, 10195 Sycamore St., Demotte, Ind. 47312**
**Filed May 3, 1990, Ser. No. 518,190**
**Int. Cl.[5] A61F** *9/00*
**U.S. Cl. 294—1.2** **1 Claim**

1. An accessory for holding a contact lens comprising:

A) a concave cup element having an air passage defined therethrough, said cup element having a concave surface which is sized and shaped to match the size and shape of a human cornea, and a convex surface and being adapted to engage and hold a contact lens, said cup element including an outer rim;

B) fluid circuit and support means for moving air through said cup air passage, said fluid circuit and support means including

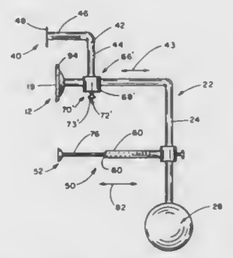
(1) a flexible hollow ball made of material having a material memory so that when the ball is deformed, it will tend to return to an undeformed shape,

(2) an L-shaped air conduit having a short leg connected at one end thereof to said concave cup element, a long leg, with another end of said short leg being connected to one end of said long leg and another end of said long leg being connected to said ball, said air conduit having an air passage defined therethrough and fluidically connecting said cup element air passage to the interior of said ball and conducting air through said air passage out of said air conduit as said ball is collapsed and through said air passage into said conduit as said collapsed ball regains an undistorted configuration; and

C) a guiding means mounted on said air conduit adjacent to said cup element for assisting a user in guiding said cup element into position closely adjacent to that user's cornea, said guiding means including

(1) an L-shaped bracket arm mounted on said air conduit adjacent to said concave cup element, said L-shaped bracket arm including a long leg attached to said air conduit and a short leg extending towards said concave cup element,

(2) a planar magnifying mirror element mounted on said L-shaped bracket arm short leg to be spaced in front of a plane containing the rim of said concave cup element to be located between said cup element rim and the user's cornea,



(3) an expandable support arm having a proximal end and a distal end and having said proximal end mounted on said air conduit and having a face-engaging element on said distal end, said support arm including

(a) a first tubular element which is hollow to include a bore extending along a longitudinal axis thereof, said first tubular element being mounted on said air conduit and having a distal end spaced from said air conduit,

(b) a hole defined through said first tubular element distal end,

(c) a second tubular element slidably received through said first tubular conduit distal end hole and moving into and out of said first tubular element, said second tubular element having a rear end located inside of said first tubular element and a front end,

(d) a spring stop mounted in said first tubular element and spaced from both said first tubular element distal end and from said first tubular element proximal end,

(e) a spring element having one end thereof abutting said spring stop and another end thereof abutting said second tubular element rear end, said spring element biasing said second tubular element out of said first tubular element,

(4) a first clamp element attaching said support arm to said air conduit, and including

(a) a first collar surrounding said air conduit long leg and having a hole defined therethrough,

(b) first screw threads on said collar adjacent to said first collar hole,

(c) a first screw fastener threadably engaged with said first screw threads and having a wing head thereon,

(5) connecting means connecting said L-shaped bracket arm long leg to said L-shaped air conduit short leg, said connecting means including a second clamp element having a second collar surrounding said L-shaped bracket arm short leg and having a hole defined therethrough, second screw threads on said second collar adjacent to said second collar hole, a second screw fastener threadably engaged with said second screw threads and having a wing head thereon,

(6) a concave mirror on said concave cup element, said concave mirror having a target thereon,

(7) an annular mirror on said cup element, said annular mirror circumnavigating said cup element and having an inner rim contacting said cup element outer rim with said cup element being located inside said annular mirror, and

(8) said face-engaging element is mounted on said expandable support arm second tubular element front end.

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**5,050,919**

## HAND APPARATUS FOR HOLDING ARTICLE

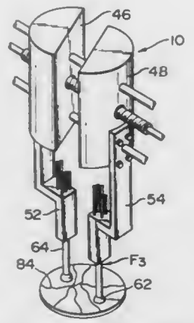
**Takeshi Yakou, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

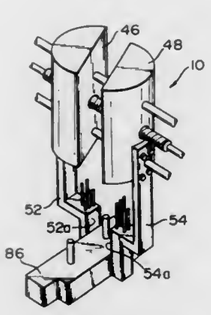
**Continuation of Ser. No. 265,756, Nov. 1, 1988, abandoned. This application Aug. 8, 1990, Ser. No. 564,702**

**Claims priority, application Japan, Nov. 6, 1987, 62-169086[U]**

**Int. Cl.**[5] **B25J** *15/06;* **B66C** *1/42*

**U.S. Cl. 294—2** **10 Claims**




1. An article holding hand apparatus which grips a plurality of types of articles having different gripping modes, said apparatus comprising:

at least two casings having a variable distance therebetween;

first driving means for moving said casings to vary the distance therebetween;

first holding means, attached to each of said casings, for holding a first article, said first holding means comprising at least two first finger members for opening and closing to clamp the first article upon movement of said casings by said first driving means;

second holding means, attached to each of said casings, for holding a second article, said second holding means having second finger members disposed within said first finger members, and slidably guided by said first finger members, with one of said second finger members serving as a pin member capable of gripping a second article which is smaller than the first article, wherein each of said second finger members is formed of a hollow pipe, with one end of said hollow pipe having a suction portion for chucking the second article, and further comprising a suction drive source, connected to the other end of said hollow pipe, for creating a suction force in said suction portion of said hollow pipe; and

second driving means, housed in said casings, for sliding said second finger members within said first members so as to protrude and retract therefrom.

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**5,050,920**

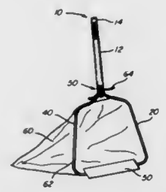
## WASTE PICK-UP DEVICE

**Richard D. Potticary, 203 Lakeridge Village, Ste. 212, Dallas, Tex. 75238**

**Filed Mar. 12, 1990, Ser. No. 492,777**

**Int. Cl.**[5] **B65B** *67/12;* **B65D** *33/06*

**U.S. Cl. 294—55** **5 Claims**




1. A waste pick-up device for use in combination with a disposable bag having a drawstring at a mouth of the bag, comprising:

a handle;

a rim having a lower edge, two sides and two ends which are secured to one end of said handle;

a thin planar plate attached on top of the lower edge of said rim having a leading edge at an inclined angle to serve as a lip for the pick-up of waste and having a trailing edge which extends beyond said rim into the mouth of the disposable bag;

a first plurality of blunt substantially rectangular shaped tabs attached to the sides and below the lower edge of said rim for retaining the mouth of the disposable bag by the drawstring on said rim;

said tabs attached to the sides being rearwardly directed and said tab below the lower edge being forwardly directed; and

a second plurality of blunt tabs, upwardly directed, linearly arranged and rigidly attached relative to said handle and said rim proximate a point where said rim is secured to said handle where each successive tab is located at an incrementally further distance from said rim such that the tension at the mouth of the bag retained around said rim is adjustable through the selection of one tab from said second plurality of tabs for the retaining of the drawstring.

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**5,050,921**

## CLAMP WITH DETACHABLE CAM

**John V. Hultquist, 10500 Westminster #13, Garden Grove, Calif. 92643**

**Filed Nov. 6, 1990, Ser. No. 609,717**

**Int. Cl.**[5] **B66C** *1/48, 1/64*

**U.S. Cl. 294—118** **6 Claims**

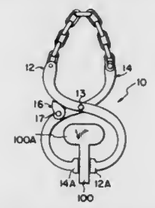
1. In a clamp of the type having first and second clamping members pivotally attached to one another intermediate their ends, wherein the portions of said members to one side of the pivotal attachment comprise arms terminating in facing clamping jaws, and wherein the portions of said members to the other side of the pivotal attachment comprise handle elements, and wherein cam means is pivotally carried by said first clamping member for engagement with the handle element of said second clamping member to hold the clamping jaws in clamped position upon clamping a workpiece therebetween;



wherein the improvement comprises said cam means being detachably mounted on said first clamping member; wherein said first clamping member includes an aperture therethrough; wherein said cam means comprises:

(a) a cam member having a peripheral surface;

(b) mounting means carried by said cam member for pivotally mounting said cam member to said first clamping member; wherein said mounting means further includes (i)




a shank member secured to said cam member, and (ii) a bushing member surrounding said shank member, wherein said bushing member has a circular cross-section; wherein said bushing member includes an annular groove and a split ring carried in said groove; wherein said split ring is capable of being compressed into said groove in order to enable said bushing member to pass through said aperture in said first clamping member.

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**5,050,922**

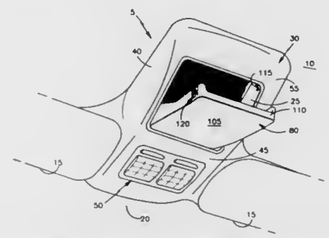
## OVERHEAD CONSOLE HAVING A PIVOTABLE STORAGE SHELF-DOOR

**Monte L. Falcoff, Southfield, Mich., assignor to United Technologies Automotive, Dearborn, Mich.**

**Filed Nov. 30, 1989, Ser. No. 444,482**

**Int. Cl.**[5] **B60R** *7/04*

**U.S. Cl. 296—37.7** **4 Claims**




1. An overhead console for a motor vehicle having a roof and a windshield, said console being mounted to said roof, adjacent said windshield, and comprising a compartment defined by a wall structure for storage of objects therein and characterized by:

said wall structure comprising a generally planar, rearwardly and downwardly facing lower wall having an opening therein;

said console further including a rearwardly and downwardly facing door covering said opening and allowing selective access to an interior of said compartment through said opening;

said door comprising a storage shelf including:

a bottom wall, having a periphery which is maintained in registry with said opening when said door is closed, and

a rim extending upwardly from said bottom wall of said door for inhibiting spillage of small objects therefrom when opened; and

means connected to said door and said wall structure limiting opening movement of said door to a generally horizontal position thereof.

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**5,050,923**

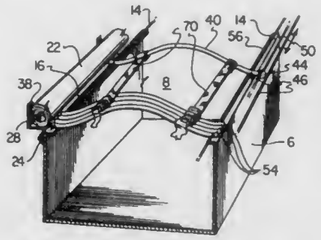
## WATERPROOF SIDE ROLLING TARP SYSTEM

**Brian W. Petelka, Burlington, Canada, assignor to Aero-Kit Industries Inc., Burlington, Canada**

**Filed Feb. 20, 1991, Ser. No. 657,561**

**Int. Cl.**[5] **B60P** *7/04*

**U.S. Cl. 296—98** **9 Claims**




1. In a tarpaulin system for an open top container having first and second parallel elongated side walls and a front wall with upper edges at least partially defining the periphery of the open top of the container, the system comprising an elongated tarpaulin having a longitudinal edge secured to an upper edge of said first of the side walls, a plurality of tarpaulin support means extending from the upper edge of one wall to the upper edge of the other wall across the open top of the container and spaced along its length, means to roll the top laterally into storage position adjacent its secured edge and unroll the tarpaulin transversely on the tarpaulin support means into position covering the top with a free, longitudinal edge of the tarp along an upper edge of the second side wall and means to secure the free longitudinal edge of the tarpaulin to said upper edge of said second of the side walls, the improvement characterized in that the tarpaulin support means comprises a lead bow positioned at one end and a plurality of intermediate bows positioned at regular locations along the length of the container behind the lead bow when in tarpaulin-supporting position, the bows extending transversely in parallel fashion across the open top, the ends of the bows supported on the upper edges of the walls; means secured to the lead bow, when the tarpaulin is in storage position to retract that bow from supporting position at one end of the container to storage position at the other end of the container; strap means, secured to the front wall and to each of the bows so that the intermediate bows are progressively drawn by the lead bow to their respective supporting positions along the length of the container as the lead bow is moved from storage to supporting position; guide means associated with the intermediate bows to cause them to move in aligned fashion progressively to storage position adjacent each other at said other end of the container as the lead bow is retracted from supporting position to storage position.

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**5,050,924**

## EXPANDABLE TARPAULIN ASSEMBLY

**George G. Hansen, 303 Overlook Dr., Boulder Creek, Calif. 95006**

**Filed Jan. 30, 1991, Ser. No. 647,835**

**Int. Cl.**[5] **B60P** *7/02*

**U.S. Cl. 296—100** **20 Claims**

1. An expandable tarpaulin assembly comprising in operative combination:

a) a tarpaulin sheet having a central area and at least one marginal edge;

b) at least one elasticized member disposed in association with the marginal edge of said sheet, each of said members having a retracted length shorter than the length of said marginal edge;

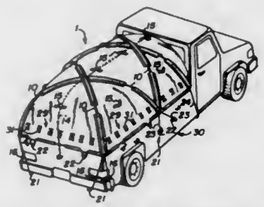
c) a plurality of elasticized reinforcing members attached to said tarpaulin sheet;

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d) said elasticized reinforcing members extending in geometric, non-spider web paths across said tarpaulin sheet to provide reinforcing to said tarpaulin sheet;

e) the retracted length of said elasticized reinforcing members being shorter than the length of the tarpaulin sheet along the paths of attachment to said tarpaulin sheet; and



f) said elasticized members in their natural retracted condition forming gathers in said tarpaulin sheet so that the elasticized members can be stretched to expand the tarpaulin sheet to cover and secure loads of varying size with reduced tendency for wind flap damage to said tarpaulin and wind loss of load material.

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**5,050,925**

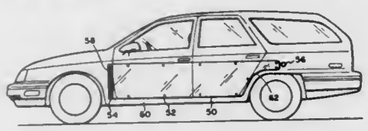
## VEHICLE PROTECTIVE COVER

**Larry E. Brown, 9724 E. 73rd St. South, Apt. 308, Tulsa, Okla. 74133**

**Continuation of Ser. No. 241,591, Sep. 8, 1988, abandoned. This application May 30, 1990, Ser. No. 532,117**

**Int. Cl.[5] B60R** *19/00*

**U.S. Cl. 296—136** **6 Claims**



1. A side protector for an automobile having at least one door having a bottom edge, a front edge and a rear edge, a door window having a bottom edge and a rear wheel well, the side protector comprising:

a portable, integral, clear plastic sheet of material of a length to extend from just in front of the front edge of said door to at least partially across the rear wheel well and having bottom and rear edges contoured to the rear wheel well and of a height which is substantially less than the distance from the bottom edge of the door to the bottom edge of the door window; and

magnet means for holding said integral sheet of plastic material to the automobile.

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**5,050,926**

## PARTITION PLATE FOR AUTOMOTIVE VEHICLE

**Yasuo Tanaka, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan**

**Filed Jan. 15, 1991, Ser. No. 641,297**

**Claims priority, application Japan, Mar. 29, 1990, 2-31837[U]**

**Int. Cl.[5] B60J** *5/00;* **B62D** *43/10*

**U.S. Cl. 296—146** **8 Claims**

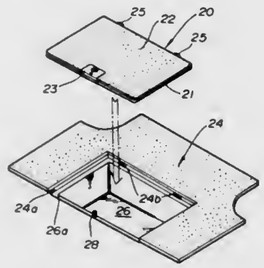
1. A partition plate in use for a vehicle, said partition plate being detachable from a member defining a compartment which member is provided with a projecting pin, said partition plate comprising:

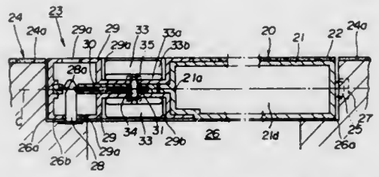
a board section; and

a locking device installed to said board section, said locking device including:

a housing member having a through-hole through which the projection pin passes from one surface to another surface of said housing member when the partition plate is secured to the compartment defining member;

a lock spring disposed in said housing member and lockably engageable with the projecting pin, said lock spring taking one of a first state in which said lock spring lockably engages with the projecting pin and a second state in which a lockable engagement of said lock spring and the projecting pin is released;





a pushing member which is engageable with said lock spring and rotatable to put said lock spring into one of said first and second states; and

a pair of operating levers fixedly connected to said pushing member to rotate said pushing member against a bias of said lock spring, said pair of operating levers being located opposite to each other with respect to a center plane of said board section.

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**5,050,927**

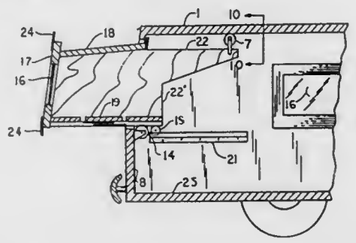
## EXPANSIBLE MOTOR HOME

**Verne Montanari, 208 Nassau Dr., Pittsburgh, Pa. 15239**

**Filed Sep. 4, 1990, Ser. No. 577,193**

**Int. Cl.[5] B60P** *3/34*

**U.S. Cl. 296—165** **2 Claims**



1. A motor home having a rear interior extensible portion, said rear extensible portion comprising sidewall portions, a rearwall portion, a roof portion, a floor portion, a pair of levers each comprising a lever arm integrally extending from a top portion of each sidewall portion, respectively, and integrally extending forwardly of a front edge of each sidewall portion, respectively, upper roller means secured to and extending above forward ends of said lever arms, and lower roller means underneath said floor portion, said motor home further having a roof, side walls, a rear wall, a pair of longitudinal upper rails which are attached to interior sides of said roof and engage said upper roller means, a pair of longitudinal lower rails beneath said floor portion which engage said lower roller means, and a pair of fulcrum rollers mounted on said rear wall of said motor home which engage said pair of longitudinal lower rails; whereby said rear interior extensible portion can be extended rearwardly of said motor home, whereby, at a given extended position of said rear interior extensible portion, a balanced position occurs and an entire weight of said rear interior extensible portion is borne only by said fulcrum rollers and, upon further extension, said entire weight is borne also by a resistive force of said upper roller means against said pair of longitudinal upper rails.



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**5,050,928**

## RIGID COVER FOR THE ROOF OF A VEHICLE

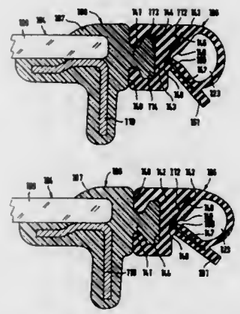
**Horst Böhm, Frankfurt, and Rainer Grimm, Wetzlar, both of Fed. Rep. of Germany, assignors to Rockwell-Golde G.m.b.H., Fed. Rep. of Germany**

**Division of Ser. No. 269,854, Nov. 10, 1988, Pat. No. 4,925,237. This application Feb. 6, 1990, Ser. No. 475,553**

**Claims priority, application Fed. Rep. of Germany, Nov. 12, 1987, 3738400; Aug. 26, 1988, 3828963**

**Int. Cl.[5] B60J** *10/00;* **F16J** *15/00*

**U.S. Cl. 296—216** **6 Claims**



1. A rigid cover assembly for a vehicle roof opening which can be at least partly displaced out of the roof and which fills the roof opening when in a closed position comprising:

a cover plate,

a reinforcement frame supporting a lower peripheral edge of the cover plate,

a plastic frame circumferentially surrounding the cover plate, said plastic frame covering an upper peripheral edge of the cover plate and enclosing said reinforcement frame,

a rib projecting from an outer peripheral edge of said plastic frame and including fixing elements projecting from said rib,

a sealing strip provided on said outer peripheral edge of said plastic frame, said sealing strip having a fixing slot receiving said rib and fixing elements,

a metal gap compensating element embedded in said sealing strip outward of said plastic frame, said metal gap compensating element being capable of being permanently deformed in a transverse direction, and

said sealing strip having a section between said metal gap compensating element and said fixing slot and an outer edge section and said outer edge section is substantially more capable of deformation than said section between said metal gap compensating element and said fixing slot.

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**5,050,929**

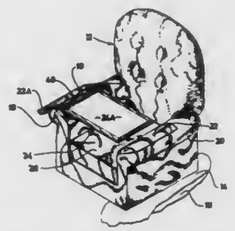
## AUXILIARY FURNITURE TRAY SYSTEM

**John M. Gueringer, 1124 Firestone Ln., North Little Rock, Ark. 72118, and Paul A. Reesnes, 212 Howell Mountain Rd., Rose Bud, Ark. 72137**

**Continuation-in-part of Ser. No. 426,014, Oct. 24, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 632,156**

**Int. Cl.[5] A47C** *7/70*

**U.S. Cl. 297—145** **5 Claims**



1. An auxiliary furniture tray system for chairs, love seats, sofas, or other articles of furniture, said tray system comprising:

frame means for mounting said system within an article of furniture, said frame means comprising:

a pair of rigid, spaced apart sidewalls, each sidewall having a bottom, a top, and inside and outside edges;

a corner strut extending between said sidewalls at the top outside edges thereof; and,

a pivot strut extending between the top inside edges of said sidewalls beneath said corner strut;

a tray discharge slot defined between said corner strut, said pivot strut, and said frame sidewalls;

a generally planar tray slidably disposed within said frame means and yieldably captivated therewithin, said tray adapted to be selectively displaced between a generally vertical rest position concealed within said frame means and a generally horizontal service position extending perpendicularly outwardly of said frame means through said tray discharge slot, said tray having a free end adapted to be grasped by a user, and a yieldably captivated end normally disposed within said frame means;

means associated with said captivated tray end for temporarily mating with said corner strut when said tray is deployed in said service position, said last mentioned means permitting relative slidable displacement between said tray and said frame means, whereby when said tray is disposed horizontally, said tray may be slidably adjusted toward or away from said user; and,

guide track means associated with each sidewall forming a tray receptive guide slot in alignment with said tray discharge slot for controlling said tray within said frame means.

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**5,050,930**

## LORDOSIS-SUPPORT BACKREST FOR A VEHICLE SEAT

**Wilhelm Schuster, Neubauzeile 87, A-4030 Linz, and Wilhelm Schuster, Jr., Zinngiessing 3, A-4210 Gallneukirchen, both of Austria**

**Filed Aug. 3, 1990, Ser. No. 562,088**

**Claims priority, application Austria, Aug. 4, 1989, 1882/89**

**Int. Cl.[5] A47C** *25/00*

**U.S. Cl. 257—284** **20 Claims**

1. A lordosis-support backrest for an automotive vehicle seat, said backrest comprising:

a frame;

a plurality of resiliently yieldable substantially vertically extending tension wires connected to said frame;

a selectively deformable and shiftable back-bracing element

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mounted on said wires for displacement up and down thereon, said back-bracing element comprising:
upper and lower members guided on said wires,
flexible means connected between said upper and lower members for bulging toward a person seated on said seat upon movement of said upper and lower members toward one another,
a first drive mechanism, a rack connected to said back-bracing element and first drive means connected to said rack for displacing said back-bracing element along said guide wires; and
a second drive mechanism including a rack displaceable on said back-bracing element, a rocker lever articulated to said rack and respective substantially rigid links

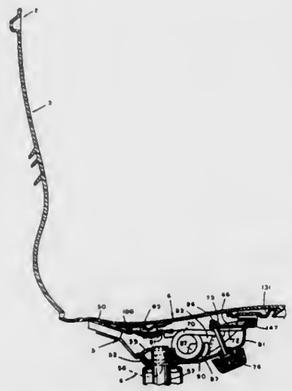


connecting spaced-apart locations on said lever with said upper member and said lower member respectively, and second drive means connected with said rack of said second drive mechanism for displacing the same to move said upper and lower members apart and together,
at least one of said drive means including:
a motor,
a flexible shaft connected to and driven by said motor,
a transmission including a worm and wormwheel driven by said shaft, and
a pinion connected to said transmission and meshing with a respective one of said racks for actuating the respective drive mechanism.

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**5,050,931**
**CONTROLLED DEFLECTION FRONT LIP FOR SEATING**
**Glenn A. Knoblock, Kentwood, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.**
**Filed Apr. 10, 1986, Ser. No. 850,528**
**Int. Cl.[5] A47C *1/034***
**U.S. Cl. 257—311** **30 Claims**

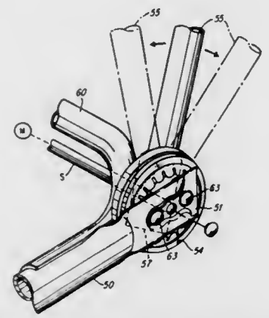
1. A chair, comprising:
a base;
a seat having a rearward portion thereof positioned to contact at least a portion of a buttock area of an adult user, and a forward portion thereof positioned to contact at least a portion of a thigh area of an adult user; said seat including means for permitting the forward portion of said seat to deflect with respect to and substantially independently of the rearward portion of said seat;
means for independently supporting the rearward portion of said seat on said base;
a spring mechanism independently supporting the forward portion of said seat on said base, and deflecting in response to upward and downward movement thereof, whereby body movement of a seated user deflects the forward portion of said seat upwardly and downwardly independently of the rearward portion of said seat to alleviate undesirable pressure at the thigh area of the user; said spring mechanism being preloaded to provide initial support, and relatively constant resilient resistance to the upward and downward movement of the forward portion of said seat throughout its range of travel; and wherein



said spring mechanism includes a stop which positively limits the upward and downward movement of the forward portion of said seat.

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**5,050,932**
**SHAPED JUNCTION PORTIONS OF TUBES OF AN ARTICULATED SEAT FRAME**
**Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin-Etablissements Cousin Freres, Orne, France**
**Continuation-in-part of Ser. No. 164,013, Mar. 4, 1988. This application Oct. 11, 1989, Ser. No. 421,318**
**Claims priority, application France, Mar. 4, 1987, 8702953**
**Int. Cl.[5] A47C *1/024***
**U.S. Cl. 297—355** **13 Claims**

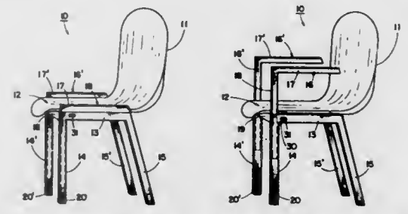


1. In the shaped junction portions of tubes of a seat frame that includes a seat portion and a back portion, with articulation adjusting mechanisms being fixed between ends of said tubes, the improvement wherein:
each of said ends of said tubes of said frame portions, in order to form a junction portion, is provided with a flattened portion that is reinforced via part of flanges of said articulation adjusting mechanisms, and serves as stiffening means, with each of said flattened portions being connected to one of said flanges of said articulation adjusting mechanism, each of which is mounted directly on said frame via said flattened portions, with said articulation adjusting mechanisms being provided with means for effecting positioning thereof; and
said stiffening means of each of said flattened portions is in the form of protruding lips, whereby each of said flattened portions is disposed between two of said lips, the planes of which essentially extend parallel to the plane of said flattened portion.



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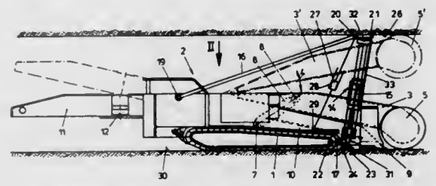
**5,050,933**
**STACKING CHAIR WITH COLLAPSIBLE ARMS**
**Marta Tornero, 6117 Ballinger Rd., Greensboro, N.C. 27410, and Bruce Adams, 813 Cloniger Dr., Thomasville, N.C. 27360**
**Filed Jul. 2, 1990, Ser. No. 546,900**
**Int. Cl.[5] A47G *7/54***
**U.S. Cl. 297—417** **4 Claims**



1. In a stacking chair having a one piece molded seat and back with a tubular seat frame and legs, the improvement comprising: a collapsible arm, said arm defining a lock pin groove, said groove defining a plurality of lock pin openings for receiving a lock pin, said arm telescopically positioned within one of said legs for movement in the vertical direction therein, an arm locking assembly, said locking assembly comprising a slide member, a lock pin, said lock pin joined to said slide member, said locking assembly resiliently mounted within said seat frame for slidably engaging said collapsible arm to lock said arm at a desired height, a spring member, said spring member contained within said leg below said arm for contact therewith to dampen the downward movement thereof when said arm is lowered and for release therefrom when said arm is raised whereby collapsing said arm will allow said chair to be compactly stacked upon similar, said groove further defining a stop ledge for engagement with said lock pin to prevent removal of said arm from said tubular frame when said lock pin is withdrawn from one of said lock pin openings whereby said stop ledge extends perpendicular from the vertical direction of movement of said arm.

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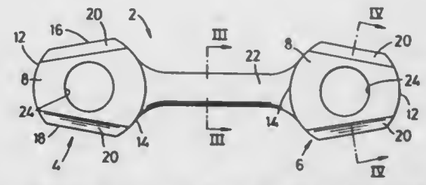
**5,050,934**
**SHEARING MACHINE WITH ROOF-BOLT DRILLING AND SETTING DEVICES**
**Erich Brandl, Grosslobming; Oswald Tutzer, Graz, and Alfred Zitz, Zeltweg, all of Austria, assignors to Voest-Alpine Zeltweg Gesellschaft m.b.H., Linz, Austria**
**Filed May 15, 1990, Ser. No. 523,527**
**Claims priority, application Austria, May 17, 1989, 1188/89**
**Int. Cl.[5] E21D *19/04, 20/00***
**U.S. Cl. 299—33** **13 Claims**



1. A shearing machine having roof-bolt drilling and setting devices, said roof-bolt drilling and setting devices being jointedly connected to the shearing machine and adapted to be hydraulically braced between a roof and a floor of one of a roadway and tunnel,
wherein a plurality of the roof-bolt drilling and setting devices are connected to a common supporting frame, said supporting frame being connected to the shearing machine via guide bars running in a longitudinal direction of the shearing machine.

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**5,050,935**
**SPACER FOR TRACK-ADJUSTABLE WHEEL**
**Terence R. Crowe, Shrewsbury, England, and John Sayer, Bridgnorth, England, assignors to GKN Sankey Limited, Shropshire, England**
**Filed Dec. 14, 1990, Ser. No. 627,262**
**Claims priority, application United Kingdom, Aug. 10, 1990, 9017571**
**Int. Cl.[5] B60B *23/12***
**U.S. Cl. 301—9 TV** **10 Claims**



1. A spacer for use in spacing a disc of a track-adjustable wheel from attachment means of a rim of the wheel to which the disc is bolted, the spacer comprising a first spacing portion, a second spacing portion, and a rigid joining portion rigidly joined to both spacing portions and serving to retain the spacing portions at a constant distance and orientation with respect to each other, each spacing portion having a bolt-receiving passage therethrough and each spacing portion having a first bearing surface which extends around a mouth at one end of the passage and a second bearing surface which extends around a mouth at the opposite end of the passage, wherein the first bearing surfaces of both spacing portions lie in a first plane, the second bearing surfaces of both spacing portions lie in a second plane, and the first and second planes are parallel to one another.

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**5,050,936**
**REGENERATIVE BRAKING SYSTEM FOR CAR**
**Koji Tanaka, and Takashi Shima, both of Toyko, Japan, assignors to Isuzu Motors Limited, Toyko, Japan**
**Filed Oct. 20, 1989, Ser. No. 424,723**
**Claims priority, application Japan, Oct. 27, 1988, 63-271528; Oct. 28, 1988, 63-272750**
**The portion of the term of this patent subsequent to Jun. 18, 2008, has been disclaimed.**
**Int. Cl.[5] B60T *1/10, 8/00***
**U.S. Cl. 303—3** **17 Claims**

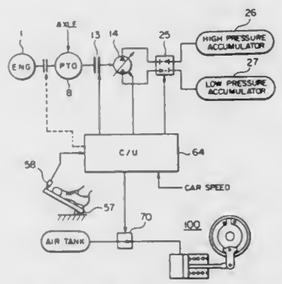
1. A regenerative braking system for a car having a brake pedal, a power take-off unit, and an engine, comprising:
a hydraulic oil circuit formed of:
a high pressure accumulator;
a pump/motor;
a circuit valve coupled to said pump/motor and said high pressure accumulator; and
a low pressure accumulator coupled to said circuit valve;
an electromagnetic clutch, coupled to said pump/motor, for connecting or disconnecting said pump/motor to or from the power take-off unit;
means for sensing the operation of the brake pedal;
an electromagnetic proportional air pressure control valve;

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means for generating air brake power under the control of said electromagnetic proportional air pressure control valve; and

control means for determining overall braking torque required for said pump/motor in a braking mode of the car, for determining a pumping capacity of said pump/motor corresponding to the determined overall braking torque, for decoupling the engine of the car, for closing said




hydraulic oil circuit, for coupling said electromagnetic clutch, for controlling said pump/motor to have a maximum pumping capacity, and for controlling said electromagnetic proportional air pressure control valve to supplement a difference between the maximum pumping capacity and the determined pumping capacity when the determined pumping capacity exceeds the maximum pumping capacity and said sensing means senses the operation of the brake pedal.

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**5,050,937**

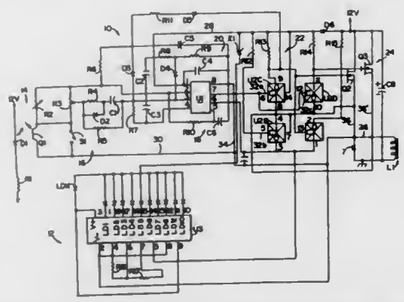
**CONTROLLER FOR ELECTRIC BRAKING SYSTEMS**

**Larry Eccleston, Marshall, Mich., assignor to Tekonsha Engineering Company, Tekonsha, Mich.**

**Filed Aug. 7, 1989, Ser. No. 390,617**

**Int. Cl.[5] B60T *8/16***

**U.S. Cl. 303—7** **32 Claims**



1. An electronic controller for electricallyactuated vehicle brakes driven from the vehicle power supply potential against battery ground, comprising in combination: means for producing control signals which are proportionally representative of the extent of vehicle braking desired; pulse-generation means coupled to receive representations of said control signals as a control input and adapted to produce a pulse train output whose effective magnitude is representative of such control signals; and output power driver means coupled to said pulse-generation means to receive said pulse train and provide corresponding output power pulses having a magnitude and character sufficient to energize and actuate said vehicle brakes, said power driver means comprising at least one power N-channel MOSFET element and said controller including means for supplying a potential to a gate of said N-channel MOSFET element greater than the vehicle power supply potential to thereby enable said MOSFET and actuate said vehicle brakes.

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**5,050,938**

**TRAILER BRAKING IN ELECTRONICALLY CONTROLLED BRAKING SYSTEMS**

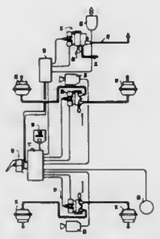
**Malcolm Brearley, Solihull, and Richard B. Moseley, Leamington Spa, both of England, assignors to Lucas Industries public limited company, Birmingham, England**

**Filed Nov. 17, 1989, Ser. No. 437,821**

**Claims priority, application United Kingdom, Nov. 19, 1988, 8827103**

**Int. Cl.[5] B60T *13/68***

**U.S. Cl. 303—7** **7 Claims**



1. An electronic braking system (EBS) for a towing vehicle, having provision for a controlled braking pressure supply for a trailer vehicle having its own braking circuit, comprising:

(a) a driver's braking demand transducer for producing an electrical signal representative of the braking demand level;

(b) at least one pressure control channel adapted to be controlled by the driver's demand signal for controlling the extent of braking of the towing vehicle in proportion to the magnitude of said braking demand signal;

(c) a separate EBS sub-system for providing controlled braking pressure to the braking circuit of the trailer; and

(d) means in said EBS sub-system for the trailer for producing said electrical signal representing the driver's braking demand to generate a pressure speed-up pulse, at least a part of which is of preset fixed duration, which pulse is directed to the trailer to pressurize the trailer braking circuit in advance of the start to the proportional pressure control which follows the braking demand set by the driver.

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**5,050,939**

**FAIL-SAFE WHEEL SERVICE BRAKE SYSTEM**

**Paul J. Middelhoven, Portland, Oreg.; Mark J. Albertson, Vancouver, Wash., and Eric Johnson, Gresham, Oreg., assignors to Atlas Copco Construction and Mining Technique AB, Stockholm, Sweden**

**Division of Ser. No. 155,204, Feb. 12, 1988, Pat. No. 4,893,879. This application Jan. 12, 1990, Ser. No. 465,998**

**Int. Cl.[5] B60T *13/22***

**U.S. Cl. 303—71** **9 Claims**

1. A single vehicle wheel braking system for providing the combined functions of variable services braking during normal vehicle operation, selectable parking braking, and automatic emergency braking on failure of system hydraulics, the braking system comprising:

a brake housing for association with a vehicle wheel, rotatable wheel means extending into the brake housing, braking means within the brake housing and movable into frictional interaction with the wheel means for retarding and stopping wheel rotation,

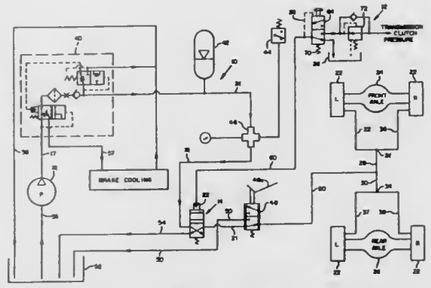
energy storage means within the brake housing for applying a braking force to the b raking means sufficient to move the braking means into frictional interaction with the rotatable wheel means in a zone of frictional contact to stop wheel rotation in the absence of a counteracting force on said braking means, said energy storage means being the sole means for applying a braking force to the braking means,

the braking means comprising a brake piston means and the energy storage means comprising mechanical spring means,

brake release means for applying a variable fluid pressure and thereby a variable brake-releasing force to said braking means in opposition to the braking force applied by the energy storage means to cause said braking means to apply a net braking force and to variably release the braking means from frictional interaction with the rotatable wheel means, thereby to control the speed of rotation of the wheel means and thus vehicle speed, and such that the absence of said fluid pressure causes said energy storage means to apply said braking means to said wheel means with sufficient net braking force to stop rotation of said wheel means,

said brake release means comprising a fluid pressure chamber and including a movable wall portion such that the variable fluid pressure applied to the movable wall portion within the chamber urges the braking means away from the rotational wheel means in opposition to the spring means, and






brake release operating means having a continuously variable manually operable brake valve means movable manually between a normally full-open position and a full-closed position in a brake pressure fluid circuit for reducing partially or entirely the magnitude of fluid pressure within the fluid pressure chamber and thereby causing a partial or full application of net braking force;

such rotatable wheel means, piston means, spring means, fluid pressure chamber and brake release operating means being cooperable and interacting such that (a) with said fluid circuit energized, the progressive manual closing of said valve means reduces progressively the magnitude of fluid pressure in said chamber to increase progressively the net braking force applied by said piston means, (b) with said fluid circuit energized but with said valve means in said open position, maximum fluid pressure in said chamber causes said piston means to apply a minimum net braking force to enable substantially unretarded rotation of said wheel means, and (c) with either the fluid circuit deenergized or a failure of operating pressure within said circuit, said spring means will automatically cause said piston means to apply a maximum net braking force to said wheel means and prevent wheel rotation, whereby said system is intended to provide the only braking system for a vehicle in which said system is installed.

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**5,050,940**

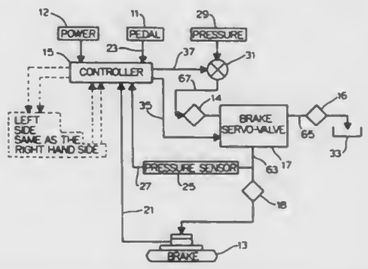
**BRAKE CONTROL AND ANTI-SKID SYSTEM**

**Alan Bedford, South Bend; Curtis L. Carson; David A. Kolberg, both of Granger; David E. Scott, South Bend, and Carol L. Stefano, Granger, all of Ind., assignors to Allied-Signal Inc., Morristown, N.J.**

**Filed Feb. 5, 1990, Ser. No. 475,064**

**Int. Cl.[5] B60T *8/32***

**U.S. Cl. 303—100** **20 Claims**




1. In an aircraft anti-skid control system, a device for providing a pulse train the repetition rate of which is representative of the instantaneous angular velocity of a wheel comprising:

first and second fiber optic light paths from a pair of independent light sources to a location close to the wheel;

third and fourth fiber optic light paths from said location to a further location remote from the wheel;

common means at the location close to the wheel and responsive to wheel rotation for alternately interrupting and completing a first light-passing circuit between the first and third light paths, and a second light-passing circuit between the second and fourth light paths.

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**5,050,941**

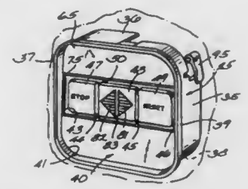
**SWITCH ASSEMBLY AND MOBILE STORAGE UNIT USING THE ASSEMBLY**

**Dean L. Dahnert, Fort Atkinson, and Marvin L. Runge, Edgerton, both of Wis., assignors to Spacesaver Corporation, Fort Atkinson, Wis.**

**Filed Feb. 7, 1990, Ser. No. 476,314**

**Int. Cl.[5] A47B *88/00***

**U.S. Cl. 312—201** **11 Claims**



1. A switch assembly comprising:

a plastic housing including opposite pairs of wall means molded in one piece and arranged to define the boundaries of an opening,

a plastic panel which has a front side and a rear side and spans across said opening so as to overlay part of the area of the opening, said panel being molded integrally with said wall means and having a generally laterally extending slit and a plurality of longitudinally extending slits which intersect with the laterally extending slit to divide a portion of the panel into independent switch operating members which have free edges contiguous with the slits,

one portion of each switch operating member remaining joined with said panel and supported in cantilever fashion

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to provide for deflecting in response to application of a force on said front side of the member and for restoring to undeflected condition when the force is removed.

support means positioned on said rear side of said panel and switch means mounted to said support means in proximity to said switch operating members,

a door and means for mounting the door on said housing for swinging between a closed position wherein the door overlays and closes another part of the area of said opening adjacent said panel and an open position wherein said opening is exposed,

a multiple contact electrical connector mounted to said support means in a position for being concealed when said door is closed and for being visible and accessible when said door is opened.

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**5,050,942**

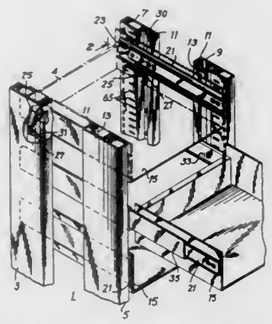
## FILE INTERLOCK SYSTEM

**Martin Frederick, New York City; Michael Glater, and Steven Mavrakis, both of Brooklyn, all of N.Y., assignors to Supreme Equipment and Systems Corp., Brooklyn, N.Y.**

**Continuation-in-part of Ser. No. 84,307, Aug. 11, 1987, abandoned. This application Feb. 1, 1989, Ser. No. 305,452**

**Int. Cl.[5] E05C *65/46***

**U.S. Cl. 312—221** **5 Claims**



1. An interlock mechanism for a multi-drawer filing cabinet utilizing a slide with a stationary and movable section and cradle drawer mounting means, the mechanism comprising:

a) a vertical channel attached to the filing cabinet and having a vertical space of fixed height;

b) a plurality of movable components disposed in the vertical space, the number and vertical dimensions of the movable components being such so as to create a void in the vertical space of a predetermined height;

c) an armature pivotably attached to the stationary slide section;

d) an insertion head fixedly attached to the armature and having a vertical dimension less than the predetermined height of the void and greater than one-half the predetermined height of the void; and

e) insertion-extraction means so disposed in the filing cabinet that it is capable of engaging a drawer of the filing cabinet and the armature;

the vertical channel, armature, insertion head, and insertion-extraction means being so disposed with respect to one another that upon opening of a drawer of the filing cabinet, the insertion head is fully inserted into the vertical space of the channel and upon closing of the drawer the insertion head is extracted from the vertical space.

**5,050,943**

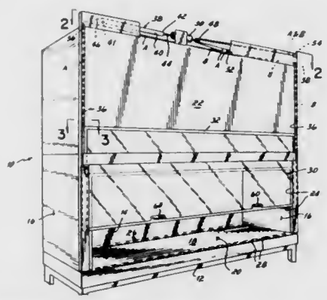
## BIOLOGICAL SAFETY CABINET WITH WINDOW COUNTERBALANCE

**Dale C. Barnett, Marietta, Ohio, assignor to Forma Scientific, Inc., Marietta, Ohio**

**Filed Apr. 24, 1990, Ser. No. 514,848**

**Int. Cl.[5] A47B *95/00***

**U.S. Cl. 312—319** **3 Claims**



1. A laboratory cabinet comprising:

back and side walls defining a work area interiorly of the cabinet;

a front opening extending between the side walls and allowing, access to said work area;

a sliding window including a pair of side edges operable for sliding movement in a vertical direction to selectively open and close said front opening of said cabinet;

at least one constant rate force pneumatic spring including a cylinder member having two ends and a cavity defined therein, a piston reciprocal in said cavity of said cylinder and defining two working chambers within said cavity, a pressurized fluid in said two working chambers, and a piston rod connected at one end to said piston and having an opposite end;

a pulley mounted at said opposite end of said piston rod for sliding movement with movement of said piston rod; and

cable means attached at one end to said cabinet and at its other end to the side edges of said window, said cable means passing over said pulley thereby being operatively connected to said pneumatic spring in turn operatively connecting said window to said pneumatic spring such that said pneumatic spring provides a substantially constant rate spring force to assist in raising and lowering of said window with the application of a substantially equal operator force.

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**5,050,944**

## OVER OR UNDER FLIPPER DOOR MOUNTING

**Nicholas J. Fricano, Grand Haven, Mich., assignor to Haworth, Inc., Holland, Mich.**

**Filed Dec. 19, 1990, Ser. No. 629,832**

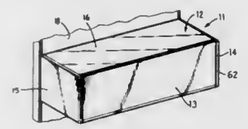
**Int. Cl.[5] A47B *88/00***

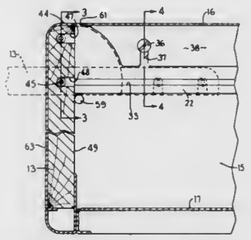
**U.S. Cl. 312—323** **13 Claims**

13. In a storage cabinet having a housing defined by generally parallel horizontally-extending top and bottom walls rigidly joined together by generally parallel vertically-extending side walls, the housing defining therein an interior storage compartment and having an opening in a front side thereof for access to said storage compartment, a door positionable adjacent the front side of the housing when in a closed position for closing off said access opening, and a support arrangement including a pair of gear/rack support mechanisms connected between said door and said side walls for permitting the door to be both swingably moved into an open position wherein the door extends generally horizontally in close proximity to the elevation of the top wall and linearly into a storage position wherein the door and top wall are positioned closely adjacent and substantially directly over one another, the improvement in said support arrangement comprising:

a horizontally elongate rack member fixedly but releasably secured to the respective said side wall adjacent an inner side thereof and in the vicinity of an upper edge thereof, said rack member defining thereon a horizontally elongated toothed rack which extends in the front-to-back direction of the cabinet;

said rack member and said side wall having cooperating means which permit the rack member to be fixedly but releasably mounted on the respective side wall in either a first position wherein the toothed rack faces upwardly or in a second position wherein the toothed rack faces downwardly, said rack member being vertically rotated 180° relative to the side wall to permit selection of said first and second positions;





a gear disposed for meshing and rolling engagement with the toothed rack associated with each said rack member;

mounting means associated with said door in the vicinity of each upper corner thereof for rotatably mounting a said gear thereon so that a pair of said gears are rotatably mounted on said door for rotation about a generally horizontal axis which extends lengthwise of the door in the vicinity of the upper edge thereof with the gears being positioned adjacent opposite side edges of the door; and

cooperating means for mounting the gears and the rotational axis thereof on said door at either of first and second locations which are vertically spaced a predetermined vertical distance apart when the door is in said closed position, said gears being mounted in said first and second locations when said rack members are mounted in said first and second positions, respectively.

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**5,050,945**

## APPARATUS AND METHOD FOR SPLICING LIGHT CONDUCTORS IN A COMPOSITE CABLE

**Asger B. Sørensen, Ølstykke, Denmark, assignor to NKT A/S, Brondby, Denmark**

**PCT No. PCT/DK88/00122, § 371 Date Mar. 12, 1990, § 102(e) Date Mar. 12, 1990, PCT Pub. No. WO89/00783, PCT Pub. Date Jan. 26, 1989**

**PCT Filed Jul. 15, 1988, Ser. No. 458,630**

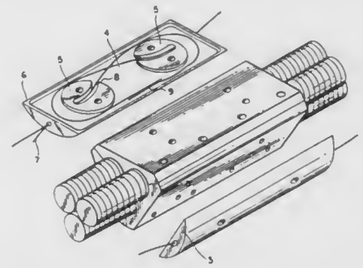
**Claims priority, application Denmark, Jul. 16, 1987, 3706/87**

**Int. Cl.[5] G02B *6/24***

**U.S. Cl. 385—95** **4 Claims**

1. A method of securing a light conductor splice with respect to a composite cable including light conductors and power conductors, the method comprising assembling power conductors in a bundle, disposing a sleeve around the bundle in a direction along the length of the cable, disposing an end from each of two lengths of a light conductor within a recess in a face of a cable section while the section is apart from the sleeve, splicing the two ends together, retaining the resulting splice within the recess, disposing the face of the section against the sleeve, and securing the section to the sleeve.

3. A splice sleeve for use in the splicing of light conductor sections in a composite cable including both light conductors



and power cables, the sleeve comprising core members (2) forming an encircling housing in which power conductors are contained, and a plurality of removable sections (3) evenly distributed around the core members and adapted to contain light conductor splices, external surfaces of the sections (3) together with external surfaces of the core members (2) disposed between adjacent sections defining a substantially cylindrical surface.

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**5,050,946**

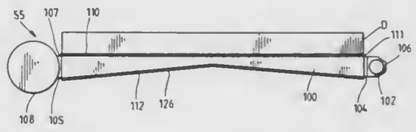
## FACETED LIGHT PIPE

**Kevin J. Hathaway, San Jose, Calif.; Richard M. Knox, Jr., Houston, Tex.; Douglas A. Arego, Spring, Tex., and Gaylon R. Kornfuerhrer, Cypress, Tex., assignors to Compaq Computer Corporation, Houston, Tex.**

**Filed Sep. 27, 1990, Ser. No. 589,325**

**Int. Cl.[5] G02B *6/00***

**U.S. Cl. 385—33** **37 Claims**



1. A system for backlighting a liquid crystal display, comprising:

a light pipe having a generally planar front surface for providing light to the liquid crystal display, having a faceted back surface wherein said back surface includes a plurality of generally planar portions parallel to said front surface and a plurality of facets formed at an angle to said front surface and located connecting said back surface parallel portions, and having at least one end surface for receiving light to be transmitted through said front surface;

light source means located adjacent each said end surface for receiving light of said light pipe for providing light to said light pipe; and

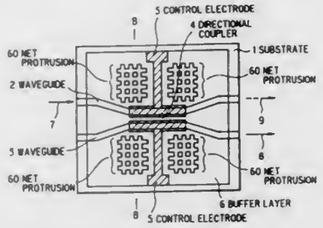
reflector means located adjacent to and generally parallel to said light pipe back surface for reflecting light back through said light pipe.

5,050,947

## OPTICAL WAVEGUIDE CONTROL DEVICE EMPLOYING DIRECTIONAL COUPLER ON SUBSTRATE

Hisao Kawashima, and Hiroshi Nishimoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 20, 1990, Ser. No. 555,014
Claims priority, application Japan, Jul. 20, 1989, 1-186132; Aug. 25, 1989, 1-219014
Int. Cl.[5] G02F *1/01*
U.S. Cl. 385—9 3 Claims



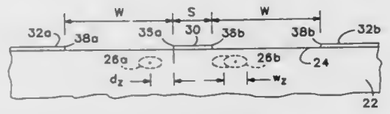

1. An optical control device, comprising:
optical waveguides provided on a substrate having an electrooptic effect, said optical waveguides having a predetermined thickness extending from a surface of said substrate to a predetermined depth thereof;
a coupling portion provided on said substrate by narrowing an interval of said optical waveguides;
a buffer layer provided on said substrate to cover said optical waveguides including said coupling portion;
control electrodes for applying a predetermined voltage across said optical waveguides at said coupling portion, said control electrodes being provided on said buffer layer; and
protrusion and concave means for dispersing distortion locally accumulated in the vicinity of said control electrodes to the whole area of said substrate, said protrusion and concave means being formed on one of surfaces of said substrate and said buffer layer.

5,050,948

## TRAVELING WAVE ELECTRO-OPTIC MODULATOR

Ralph T. Hawkins, II, Aloha; Jeffrey H. Goll, Lake Oswego, and Steven H. Pepper, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Aug. 23, 1990, Ser. No. 571,057
Int. Cl.[5] G02B *6/10*
U.S. Cl. 385—2 9 Claims



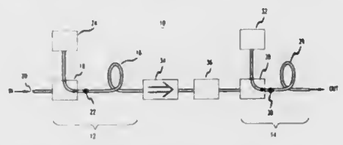

1. An electro-optic device comprising:
a substrate of electro-optic material having at least one optical waveguide formed therein adjacent a main surface thereof for propagating an optical mode, and
a coplanar transmission line formed on the main surface of the substrate and having at least first and second electrodes spaced apart by an electrode gap that is wider than the first electrode, the first electrode being narrower than the second electrode, and the center of the waveguide being within the electrode gap and closer to the first electrode than the second electrode.

5,050,949

## MULTI-STAGE OPTICAL FIBER AMPLIFIER

David J. DiGiovanni, Scotch Plains, and Clinton R. Giles, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 22, 1990, Ser. No. 542,296
Int. Cl.[5] G02B *6/26*
U.S. Cl. 359—341 8 Claims



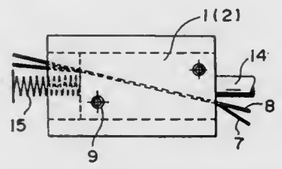
1. A multistage optical amplifier for amplifying a signal of at least two different frequencies comprising
a first stage of amplification for amplifying said signal comprising a core of a first composition within a cladding to form an optical amplifying fiber having an input port and an output port,
a second stage of amplification for amplifying said signal comprising a core of a second composition within a cladding to form an optical amplifying fiber having an input port and an output port, said first composition of said core of said first stage of amplification being different from said second composition of said core of said second stage of amplification,
means for generating a pump signal at a pump wavelength coupled optically to said first and second optical amplifying fibers, and optical mean interposed between the output port of said first stage of amplification and the input port of said second stage of amplification adapted to suppress reflection-induced noise and spontaneous emission from the first stage from causing saturation of the second stage.

5,050,950

## OPTICAL MULTIPLEXING/DEMULTIPLEXING DEVICE OF VARIABLE COUPLING TYPE

Mitsuo Takahashi, Matsudo, Japan, assignor to Seikoh Giken Co., Ltd., Matsudo, Japan

Filed Jun. 7, 1990, Ser. No. 534,263
Claims priority, application Japan, Jan. 26, 1990, 2-16973
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—24 6 Claims




5. An optical multiplexer for coupling input power from a first optical fiber to a second optical fiber, each of said optical fibers having a core and a cladding region surrounding the core, said optical multiplexer comprising
first and second substrates having a common side defining a reference plane, and respective first and second contiguous parallel surfaces extending perpendicular to said reference plane, said first and second contiguous surfaces including respective first and second parallel linear V-shaped grooves therein, said first and second grooves extending along said first and second surfaces at an angle greater than zero degrees and not more than 5 degrees with respect to said reference plane, said grooves receiving portions of said first and second optical fibers respectively from which the cladding has been removed; and
means for translating said first substrate with respect to said second substrate in a direction parallel to said reference plane, whereby the spacing between said first and second optical fibers is changed to control the amount of power transferred from said first optical fiber to said second optical fiber.

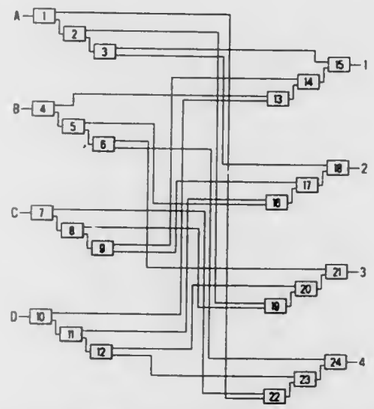


5,050,951

## OPTICAL MATRIX SWITCH WITH LONGITUDINALLY CONFIGURED SWITCH ELEMENTS

Bernard G. Caron, Harrisburg; Dennis R. Leber, Manchester, and Paul R. Reitz, Palmyra, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 8, 1990, Ser. No. 520,350
Int. Cl.[5] G02B *6/28*
U.S. Cl. 385—17 6 Claims



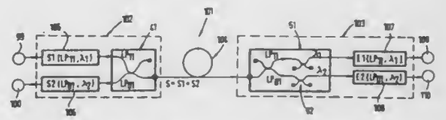

1. An optical matrix switch having N input ports and M output ports where N and M each is an integer comprising:
N×(M−1) number of 1×2 fiber optic switch elements with each number 1/N of the total of such 1×2 switch elements being associated with a respective input port;
M×(N−1) number of 2×1 fiber optic switch elements with each number 1/M of the total number of such 2×1 switch elements being associated with a respective output port;
each said number 1/N of the total of such 1×2 switch elements being arranged longitudinally therefrom said respective input port with each of said 1×2 switch elements connected via a fiber optics transmission line to the input port or to a preceding 1×2 switch element;
each said number 1/M of the total of such 2×1 switch elements being arranged longitudinally therefrom said respective output port with each of said 2×1 switch elements connected via a fiber optics transmission line to the output port or to a preceding 2×1 switch element;
with each said 1×2 fiber optic switch elements connected to at least one of said 2×1 switch elements;
and with each said 2×1 fiber switch elements connected to at least one of the said 1×2 switch elements.

5,050,952

## OPTICAL COMMUNICATIONS SYSTEM FOR DIPLEX OR DUPLEX TRANSMISSION

Kurt Fussgäger, Remseck, Fed. Rep. of Germany, assignor to Alcatel N. V., Amsterdam, Netherlands

Filed Mar. 30, 1990, Ser. No. 503,247
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1989, 3910637
Int. Cl.[5] G02B *6/28*
U.S. Cl. 359—114 15 Claims



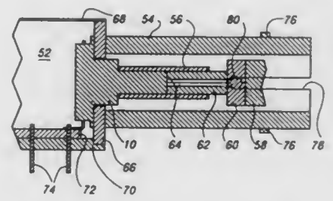
1. Optical communications system for transmission of two optical signals, said system comprising:
a single optical waveguide having an associated cutoff wavelength above which light can only be propagated in the fundamental mode between a first end and a second end,
two optical transmitters for producing two respective optical signals which each have a different wavelength clearly below the cutoff wavelength and which are each transmitted in a different waveguide mode,
two optical receivers, each associated with a respective said optical transmitter for receiving a respective one of said two optical signals, and
two monomode fusion couplers which are each fabricated from two fibers dissimilar in core and mantle diameter for connecting each of the optical transmitters and the optical receivers to said first or second end of said single optical waveguide.

5,050,953

## MULTI-PATH OPTICAL FIBER AND ELECTRO-OPTIC TRANSDUCER CONNECTOR

Keith D. Anderson, Nepean, and Douglas S. Burbidge, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 14, 1990, Ser. No. 582,464
Int. Cl.[5] G02B *6/32*; H01J *5/16*
U.S. Cl. 385—89 20 Claims




1. An electro-optic transducer comprising:
an electro-optic device (**20**) comprising a plurality of electro-optic elements (**32**) arranged in an array;
a lens (**18**);
means (**16**) supporting the lens with an axis (**42**) perpendicular to and aligned with the array, the supporting means having an outer end (**48**) perpendicular to the axis;
the arrangement being such that the array and the outer end are in mutual object and image planes of the lens; and
an optical fiber connector comprising a ferrule (**62**) having a bore (**86**) therein and a plurality of optical fibers (**64**) extending through the bore in an array corresponding to the array of electro-optic elements, the ferrule and fibers being positioned so that ends of the fibers lie in the plane

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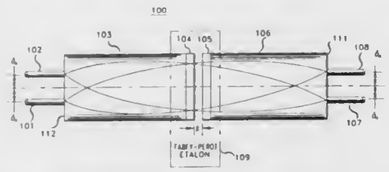
of the outer end of the lens tube whereby light emitted by each of the electro-optic elements is focused by the lens onto a respective one of the fibers.

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**5,050,954**
**MULTIPORT OPTICAL DEVICES**

**William B. Gardner, Duluth; Jane F. Kuhl; Calvin M. Miller, both of Atlanta, all of Ga., and Linn F. Mollenauer, Colts Neck, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Jan. 12, 1990, Ser. No. 463,730**
**Int. Cl.[5] G02B *6/32, 6/26***
**U.S. Cl. 385—16** **35 Claims**




1. An optical multiplexer comprising:
first and second graded index lenses each having first and second surface ends;
first and second transmission elements disposed on the first surface end of said first graded index lens, said first and second transmission elements being positioned such that the second transmission element receives at least a first optical signal from the first transmission element;
a third transmission element disposed on the second surface end of said second graded index lens, the third transmission element being positioned such that the third transmission element receives at least a second optical signal from the first transmission element; and
a Fabry Perot etalon interposed between the second and first surface ends of said first and second graded index lenses, respectively, said Fabry Perot etalon having a transmission characteristic such that the wavelength of said at least first optical signal substantially lies within a transmission peak region of said Fabry Perot etalon for transmitting said at least first optical signal from said first transmission element to said third transmission element and the wavelength of said at least second optical signal substantially lies within a free spectral range region of said Fabry Perot etalon for reflecting said at least second optical signal from said first transmission element to said second transmission element.

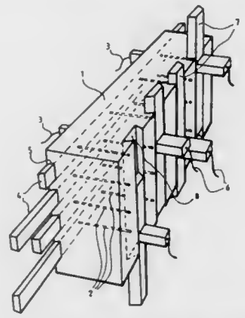
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**5,050,955**
**FIBREOPTIC SWITCH**

**Sven R. Sjölinder, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden**

**Filed Nov. 29, 1990, Ser. No. 619,424**
**Claims priority, application Sweden, Dec. 21, 1989, 8904324**
**Int. Cl.[5] G02B *6/26***
**U.S. Cl. 385—17** **7 Claims**

1. A fiberoptic switch for enabling selective connection of one or more of an n number of incoming optofibers with a respective one of an m number of outgoing optofibers, characterized in that the switch includes a matrix block having light transmission devices which extend in n number of rows and m number of columns between an input side and an output side; in that the incoming optofibers on the input side are each displaceable linearly along a respective row of the rows of light transmission devices; in that the outgoing optofibers on the output side are displaceable linearly along a respective column of the columns of light transmitting devices; and in that a selected incoming optofiber can be displaced along its corresponding row to a desired column of light transmitting devices and an outgoing optofiber in a corresponding column can be



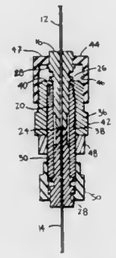
displaced to a corresponding row of light transmitting devices for mutual connection of the selected optofibers.

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**5,050,956**
**OPTICAL FIBER ATTENUATOR AND CONNECTING ELEMENT**

**P. Kevin Carpenter, Wheaton, Md., and Michael J. James, Stirling, Va., assignors to Hunter Associates Laboratory Inc., Va.**

**Filed Sep. 20, 1990, Ser. No. 585,504**
**Int. Cl.[5] G02B *6/38***
**U.S. Cl. 385—140** **17 Claims**



1. Apparatus for adjusting the attenuation of light passing between a pair of optical fibers disposed in spaced end-to-end relation one to the other, comprising:
a pair of elongated, generally cylindrical, ferrules mounting respective optical fibers generally axially therealong with the fibers terminating in end faces substantially adjacent the respective ends of the ferrules;
a sleeve having a throughbore for receiving the ferrules through its opposite ends with the ferrule ends in opposition to one another and the fiber end faces in spaced opposing relation to one another, at least a portion of said sleeve being externally threaded;
an internally threaded adjuster for threaded engagement about one end of said sleeve, said adjuster having an opening at one end for receiving one of said ferrules and an externally threaded portion;
means for retaining the other of said ferrules in the other end of said sleeve;
an internally threaded nut for threaded engagement with the externally threaded portion of said adjuster and having an opening at one end for receiving said one ferrule; and
means cooperable between said one ferrule and at least one of said adjuster and said nut for retaining said one ferrule in said sleeve and responsive to threading action between said adjuster and said sleeve for axially displacing said one ferrule relative to the other ferrule whereby the ends of the ferrules and the end faces of the optical fibers carried thereby are adjustably spaced one from the other.

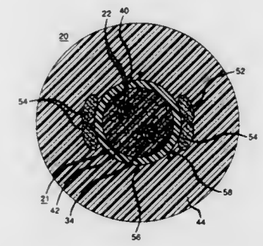


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**5,050,957**
**OPTICAL FIBER SERVICE CABLE**

**Alfred S. Hamilton, Norcross; James R. Holman, Lilburn; Michael D. Kinard, Lawrenceville, and Terry D. Mathis, Lilburn, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Apr. 27, 1990, Ser. No. 515,981**
**Int. Cl.[5] G02B *6/44***
**U.S. Cl. 385—113** **16 Claims**



1. An optical fiber cable, which is suitable for use in a local area network for distribution to individual customers and which has a generally circular configuration in a plane normal to a longitudinal axis of the cable, said cable comprising:
a core which includes at least one optical fiber which includes at least one protective coating;
a tubular member which encloses said at least one optical fiber, said tubular member being made of a first plastic material having a relatively high shearing resistance and having a cross sectional area defined by an inner surface which is equal to the product of at least two and the transverse cross sectional area of optical fiber in said core;
a jacket which encloses said tubular member, said jacket comprising a second plastic material which is characterized by a shearing resistance that is less than that of the plastic material of said tubular member and that is sufficiently low to facilitate cutting of the jacket to access said tubular member, said jacket having a thickness and being made of a material which causes said jacket to have suitable flame retardancy; and
a strength member system which is disposed between said tubular member and an outer surface of said jacket, said strength member system including two portions which are diametrically opposed to each other and which are closely adjacent to a diameter of said cable to cause said cable to have a preferred plane of bending, each said portion of said strength member system being at least in proximate engagement with said tubular member without engaging the optical fiber in said core.

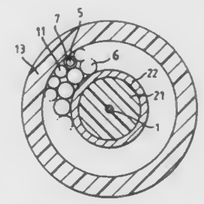
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**5,050,958**
**OPTICAL FIBRE CABLE**

**Lawrence I. Smith, and Philip A. O'Bow-Hove, both of London, England, assignors to Telephone Cables Limited, England**

**Filed Feb. 28, 1990, Ser. No. 486,068**
**Claims priority, application United Kingdom, Mar. 6, 1989, 8905056**
**Int. Cl.[5] G02B *6/44***
**U.S. Cl. 385—102** **11 Claims**

1. An optical fibre cable for underwater use and having a tensile strength, comprising:
(a) a generally non-metallic central core;
(b) a rigid metallic tube encasing the core;
(c) an assembly of longitudinal, non-central, tensile strength members surrounding the metallic tube and including at least one layer of said strength members contacting and supported by the metallic tube, said at least one layer including a plurality of said strength members having interspersed among them at least one longitudinally-welded metallic tube within which is encased at least one optical fibre, said assembly of strength members together having a combined tensile strength that is a major part of the tensile strength of the cable; and
(d) sheathing means surrounding the assembly of strength members.



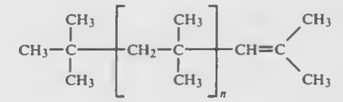
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**5,050,959**
**FIBER OPTIC COMPOSITIONS AND METHOD FOR MAKING THEREOF**

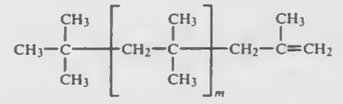
**Sal Randisi, 24 Davinci Dr., Bohemia, N.Y. 11761**

**Continuation of Ser. No. 361,300, Jun. 5, 1989, abandoned, and a continuation-in-part of Ser. No. 768,060, Aug. 22, 1985, abandoned, which is a division of Ser. No. 677,888, Dec. 3, 1984, abandoned, which is a continuation of Ser. No. 649,050, Sep. 10, 1984, abandoned. This application Aug. 13, 1990, Ser. No. 566,877**
**Int. Cl.[5] G02B *6/44; C10M 107/08***
**U.S. Cl. 385—100** **10 Claims**

1. A fiber optic cable comprising a protective jacket carrying a fiber optic element therein and a lubricating composition filling the space around said fiber optic element within said protective jacket, said lubricating composition comprising a stable dispersion of:
a. a polybutene having the formula:



where n is from about 2 to 40, said polybutene having average molecular weight in the range of from about 300 to about 350 and comprising about 90% to about 99% by weight of said composition;
b. a silicon dioxide in the form of finely divided hydrophobic silica powder with particles ranging from about 12 to about 16 millimicrons in size, said silicon dioxide comprising from about 2% to about 10% of said composition;
c. an oily polybutene having the formula:



wherein m is from about 15 to about 35, said polybutene having average molecular weight in the range of from about 1000 to 2000 and comprising from about 0% to about 10% by weight of said composition; and

d. a amine phosphate comprising from about 0% to about 1% by weight of said composition.

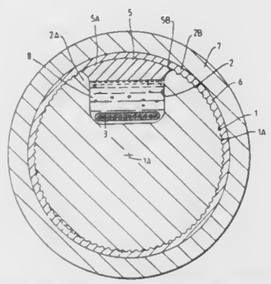
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5,050,960

## AERIAL OPTICAL FIBRE CABLE

Ralph Sutehall, Abertillery, Great Britain, assignor to STC plc, London, England

Filed Oct. 12, 1990, Ser. No. 596,381
Claims priority, application United Kingdom, Oct. 12, 1989, 8922964
Int. Cl.[5] G02B 6/44
U.S. Cl. 385—113 5 Claims



1. An optical fiber cable comprising a dielectric rod-like strength member having a channel which contains an optical conductor, said conductor being protected against longitudinal and transverse stress applied to the strength member, said strength member being encased in an extruded sheath in contact with the surface of the strength member and wherein the surface of the strength member is roughened by moulding an imprint in the surface of the strength member in order to improve the grip between the sheath and the strength member.

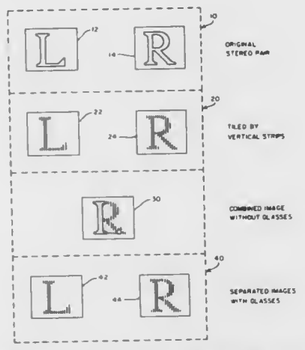
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5,050,961

## POLARIZED MASK STEREOSCOPIC DISPLAY INCLUDING TILING MASKS WITH COMPLEMENTARY TRANSPARENT REGIONS

Daniel S. Venolia, Soquel, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 402,945, Sep. 5, 1989, abandoned. This application Jul. 12, 1990, Ser. No. 551,689
Int. Cl.[5] G02B 27/26
U.S. Cl. 359—465 5 Claims




1. A full-spectrum stereoscopic display system, without requiring color separation between left-eye and right-eye views, for presenting a first and second full-spectrum image of a stereo pair of images to the left and right eyes of a viewer so that the viewer can perceive a three-dimensional image, comprising:

a display image comprising a pattern of alternating first and second regions, said first regions displaying the full-spectrum image from corresponding regions of said first full-spectrum image of said stereo pair, and said second regions displaying the full-spectrum image from corresponding regions of said second full-spectrum image of said stereo pair, said first and second regions selected through transparent regions of a tiling mask and its inverse respectively;

a polarized mask patterned with the same said pattern of alternating first and second regions, said first regions containing a first polarizer of a first orientation, and said second regions containing a second polarizer of a second orientation, said polarized mask positioned between said display image and said viewer and positioned so that said pattern of said polarization mask appears overlayed and aligned to said pattern of said display image; and

polarized viewing glasses, with first and second polarized filter lenses in front of said left and right eyes of said viewer, said first polarized filter lens being in said first orientation and said second polarized filter lens being in said second orientation;

wherein, said first full-spectrum image from said first regions of said display image travels through said first regions of said polarized mask and through said first polarized filter lens of said viewing glasses to reach said left eye, while said second full-spectrum image from said second regions of said display image travels through said second regions of said polarized mask and through said second polarized filter lens of said viewing glasses to reach said right eye.

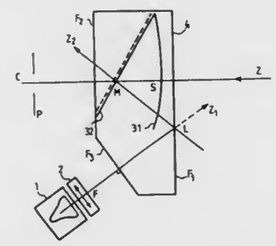
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5,050,962

## DISPLAY DEVICE FOR ERGONOMIC SIGHTS WITH A LARGE FIELD OF OBSERVATION

Laurent Monnier, Bordeaux, and Jean-Pierre Gerbe, Pessac, both of France, assignors to Thomson-CSF, Puteaux, France

Filed Jun. 14, 1990, Ser. No. 537,805
Claims priority, application France, Jun. 14, 1989, 89 07901
Int. Cl.[5] G02B 27/10, 27/14, 5/32
U.S. Cl. 359—13 3 Claims



1. A display device for an ergonomic helmet-mounted sight with a large field of observation, comprising:

a collimation and combination optical unit joined to an image generator located on the same side as an observation point relative to the optical unit, said collimation and combination optical unit comprising a transparent plate having parallel front and rear faces, and a beveled surface exhibiting, relative to said rear face, an inclination such that radiation emerging from the image generator undergoes total reflection on said rear face, wherein said plate comprises:

a first element having a first face forming a portion of said front face of said plate and a planar second face supporting a semitransparent planar mirror;

a second element disposed adjacent to said planar second face of said first element and having a face of spherical configuration which supports a holographic or dichroic mirror;

a third element having a concave first face disposed adjacent to said spherical face of said second element and having a planar second face forming a portion of said rear face of said plate; and

a fourth element formed between remaining portions of said parallel front and rear faces of said plate and said beveled surface.



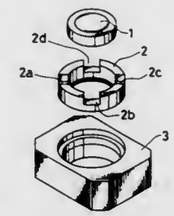
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5,050,963

## METHOD FOR SECURING OPTICAL PARTS TO A SUPPORT MEMBER AND A RING MEMBER FOR USE THEREIN

Kazuo Murakami, Higashihiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 9, 1990, Ser. No. 594,708
Claims priority, application Japan, Oct. 12, 1989, 1-120036[U]
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—808 7 Claims



5. An optical parts holding assembly for securing to one another with adhesive optical parts, a support member whereto the optical parts are fixed and a ring member enclosing the optical parts, which is fixed to the support member, wherein

the ring member is provided therein with at least one groove formed througn a sidewall of the ring member by cutting therein in a direction substantially parallel to an optical axis of the optical parts when secured to the support member; and

the optical parts and the other two members are disposed so that an inner surface of the ring member may contact with a peripheral wall of the optical parts and an outer surface of the ring member may be positioned adjacent an upper surface of the support member, and one portion of the peripheral wall, one portion of the upper surface and the groove are secured to one another with an adhesive.

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5,050,964

## OBJECTIVE LENS SUPPORTING MECHANISM FOR USE IN AN OPTICAL HEAD OF AN OPTICAL DISC APPARATUS

Yasuto Mori, Osaka, Japan, assignor to NEC Home Electronics Ltd., Osaka, Japan

Filed Jun. 16, 1989, Ser. No. 369,203
Claims priority, application Japan, Jun. 27, 1988, 63-157596
Int. Cl.[5] G02B 7/02
U.S. Cl. 359—813 20 Claims

1. An objective lens supporting mechanism for use in an objective lens actuator of an optical head, comprising:

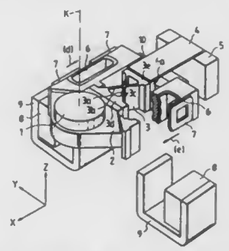
an objective lens having an optical axis;

means for holding said objective lens;

first supporting means for supporting said objective lens holding means in a tracking direction of said objective lens, said first supporting means being substantially cross shaped and comprising at least one spring assembly which includes two similarly shaped leaf springs crossing each other, thereby forming a crossing axis which is parallel to said optical axis of said objective lens, said at least one spring assembly formed monolithically of resin as one unit;

second supporting means for supporting said objective lens holding means in a focusing direction of said objective lens;

first means for actuating said objective lens holding means in



the focusing direction, said first actuating means being provided outside said first and second supporting means;

second means for actuating said objective lens holding means in the tracking direction, said second actuating means being provided outside said first actuating means; and

a magnet provided outside of said second actuating means.

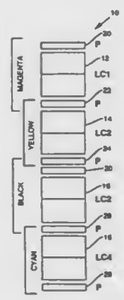
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5,050,965

## COLOR DISPLAY USING SUPERTWISTED NEMATIC LIQUID CRYSTAL MATERIAL

Arlie R. Conner, Portland, and Paul E. Gulick, Tualatin, both of Oreg., assignors to In Focus Systems, Inc., Tualatin, Oreg.

Continuation-in-part of Ser. No. 402,134, Sep. 1, 1989, Pat. No. 4,917,465, and a continuation-in-part of Ser. No. 378,997, Jul. 12, 1989, Pat. No. 4,952,036, and a continuation-in-part of Ser. No. 363,099, Jun. 7, 1989, Pat. No. 4,966,441, and a continuation-in-part of Ser. No. 329,938, Mar. 28, 1989, abandoned. This application Nov. 22, 1989, Ser. No. 445,769
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—53 64 Claims




1. A method of producing a color display comprising:

providing first and second optical assemblies, each assembly including a plurality of independently operable pixels, each of said pixels exhibiting a birefringent effect that varies in response to a signal applied thereto;

stacking said assemblies with a pixel in the first assembly linearly aligned with a corresponding pixel in the second assembly;

interposing a first polarizer between the assemblies and

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sandwiching the stack between a second and a third polarizer wherein said second and third polarizers are colored complementary colors; and

applying a first dynamic signal to the pixels in the first assembly and applying a second dynamic signal to the pixels in the second assembly so as to selectively change the birefringent effect.

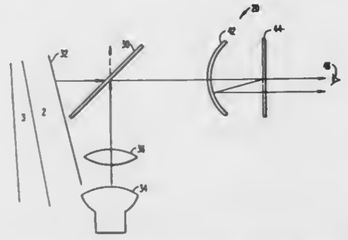
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5,050,966

## OPTICAL COMBINER COLLIMATING APPARATUS

Arthur L. Berman, Milpitas, Calif., assignor to Kaiser Aerospace & Electronics Corporation, Oakland, Calif.

Filed Jul. 6, 1988, Ser. No. 215,668
Int. Cl.[5] G02F *1/13*; G02B *27/14*
U.S. Cl. 359—38 17 Claims



1. An optical combiner for combining a first image incident on said combiner in a first direction with a second image incident on said combiner in a second direction, said combiner comprising:

at least one cholesteric liquid crystal element for transmitting said first image in said first direction and for concurrently reflecting said second image in said first direction.

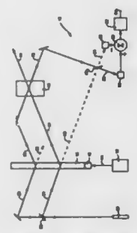
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5,050,967

## ADAPTIVE NOTCH FILTER USING ACOUSTO-OPTICS AND PHOTOREFRACTION

John H. Hong, Moorpark, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 15, 1989, Ser. No. 351,228
Int. Cl.[5] G02F *1/11, 1/03*; G02B *27/42*
U.S. Cl. 359—285 13 Claims



5. An adaptive notch filter, comprising:

an acousto-optic cell for propagating an acoustic wave having broadband and narrowband components corresponding to a received RF signal;

first and second mutually coherent light beams directed to pass through said acousto-optic cell at two different points to produce first and second diffracted light beams;

said first diffracted light beam modulated by said acoustic wave and said second diffracted light beam modulated by said acoustic wave at a predetermined time delay; and

a photorefractive crystal for mixing said first and second diffracted light beams to produce a first mixed beam comprising substantially all of said narrowband components and a second mixed beam consisting essentially of only said broadband components.

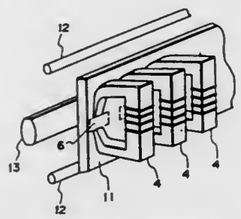
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5,050,968

## OPTICAL SHUTTER USING MAGNETO-OPTICAL MATERIALS

Tetsuo Ohara, Yokohama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1990, Ser. No. 488,176
Claims priority, application Japan, Sep. 22, 1989, 1-246733
Int. Cl.[5] G01R *33/032*; G02F *1/09*; G02B *5/30*
U.S. Cl. 359—281 14 Claims



1. A reflective optical shutter comprising:

magneto-optical material having a light transmissibility and exhibiting a magneto-optical effect;

means for holding said magneto-optical material so as to allow light to propagate through said magneto-optical material;

a pair of polarizing means mounted on respective surfaces of said holding means;

reflector means having a major inner surface area mounted on an outer surface of one of said polarizing means to reflect light back to propagate through the magneto-optical material and having a major outer surface area;

at least one light source provided on a side of said holding means opposite to the side on which said reflector means are mounted for illuminating said magneto-optical material; and

magnetic field applying means having a head with a coil, the head having open ends which are disposed facing the outer major surface area of said reflector means so as to apply a magnetic field in response to current in the coil to said magneto-optical material in a direction perpendicular to that of the light propagating through said magneto-optical material;

whereby the amount of light propagating through said magneto-optical material is regulated by adjusting the intensity of said magnetic field applied to said magneto-optical material.

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5,050,969

## PHOTO-DRIVEN SWITCHING APPARATUS

Kenji Uchino, Yokohama; Kazuyasu Hikita, Chichibu, and Mikiya Ono, Tokorozawa, all of Japan, assignors to Mitsubishi Mining and Cement Company Ltd., Japan

Filed Dec. 26, 1989, Ser. No. 456,970
Claims priority, application Japan, Dec. 26, 1988, 63-325909; Jan. 20, 1989, 1-9959
Int. Cl.[5] G02B *5/30*
U.S. Cl. 359—246 10 Claims

1. A photo-driven switching apparatus in which a light beam is switched or modulated by using only light beam(s), comprising

(a) a dielectric substrate having "photovoltaic effect";

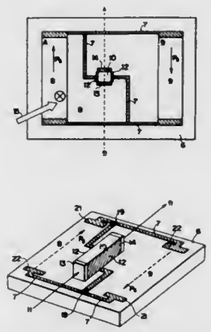
(b) one or more couples of electrodes formed in or on at least portions of the surface(s) of said substrate so as to polarize the portion(s) positioned between said couple(s) of the electrodes thereby;

(c) one or more photo-driving or photo-receiving elements



provided at least in the resulting polarized portion(s) of the surface of said dielectric substrate, having a polarization direction arranged at one certain direction, and having a photovoltaic effect so as to generate photo-voltage between each couple of said electrodes;

(d) a dielectric and electro-optical rotation element comprising a light beam switching passage or modulator having a couple of polarizers, the polarization direction of each of which is perpendicularly crossed or parallel to each other, positioned on the surface of incoming of a light beam to be modulated, and at the outgoing surface of the light beam, and a couple of electrodes formed on a couple of the other



surfaces facing to each other of said rotation element to apply an electric field in said element;

(e) connecting leads connecting electrically each electrode of said couples of electrodes of said photo-driving element(s) respectively to the electrodes of said rotation element; and

(f) a polarizer positioned on the incoming surface of said rotation element, allowing the light beam to be modulated through said polarizer, said switching passage being operated directly by the photovoltage generated by said photo-driving element(s) which can be operated or switched only by illumination of a light beam to the surface of said photo-driving element(s).

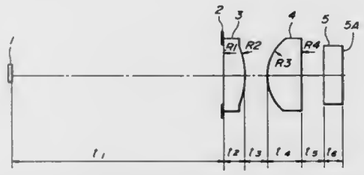
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5,050,970

## LENS SYSTEM FOR USE IN OPTICAL INFORMATION DEVICE

Shigeo Kittaka, Osaka, Japan, assignor to Nippon Sheet Glass Co., Ltd., Japan

Filed Dec. 16, 1988, Ser. No. 285,217
Claims priority, application Japan, Dec. 18, 1987, 62-321055; May 10, 1988, 63-113296
Int. Cl.[5] G02B *3/00*
U.S. Cl. 359—653 13 Claims



1. A lens system for focusing a light beam from a light source on an information recording medium, comprising:

a first lens disposed between said light source and said recording medium and having a flat surface which is symmetric with respect to an optical axis thereof and a convex surface which is symmetric with respect to the optical axis, said first lens having a refractive index varying along the optical axis; and

a second lens disposed between said first lens and said recording medium and having a spherically convex surface on the side of entry of the light beam, said second lens having a positive refracting power as a whole and having a uniform refractive index.

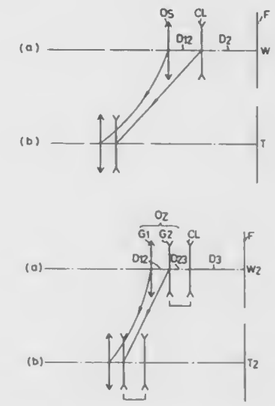
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5,050,971

## VARIABLE FOCAL LENGTH PHOTO-TAKING OPTICAL SYSTEM

Susumu Sato, Chiba; Koichi Wakamiya, Tokyo, and Koichi Ohshita, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Aug. 23, 1989, Ser. No. 405,678
Claims priority, application Japan, Aug. 25, 1988, 63-211180
Int. Cl.[5] G02B *15/02*
U.S. Cl. 359—675 22 Claims



1. A variable focal length photo-taking optical system including:

a photo-taking objective lens; and

a conversion lens removably added to said photo-taking objective lens, at least some lens groups of said objective lens and said conversion lens being movable along an optic axis concurrently in a manner that changes the combined focal length of said photo-taking objective lens and said conversion lens.

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5,050,972

## ZOOM LENS

Hitoshi Mukaiya, Saitama; Nobuyoshi Suzuki; Hiroyuki Hamano, both of Kanagawa; Muneharu Sugiura, Tokyo, and Akihisa Horiuchi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1990, Ser. No. 475,749
Claims priority, application Japan, Feb. 8, 1989, 1-28963; Feb. 8, 1989, 1-28964; Feb. 8, 1989, 1-28965
Int. Cl.[5] G02B *15/00*
U.S. Cl. 359—683 6 Claims

1. A zoom lens comprising:

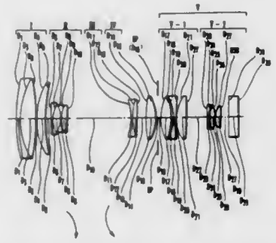
from front to rear,

a first lens group of positive refractive power for focusing;

a second lens group of negative refractive power having a function of varying the image magnification;

a third lens group of negative refractive power for compensating for the shift of an image plane resulting from the variation of the image magnification;

a fourth lens unit of positive refractive power of which both surfaces are convex and of which the rear surface is of strong curvature;
a stop; and
a fifth lens group having the image formign function, said fifth lens group having a front lens sub-group comprising a first lens of which both surfaces are convex, a negative second lens whose front surface is concave and a third lens whose front surface is of strong curvature, and a rear lens sub-group comprising a negative fourth lens whose rear surface is concave, a fifth lens of which both surfaces are convex, and a positive sixth lens whose front surface is of



strong curvature, and said zoom lens satisfying the following conditions:

$3.9 < f4/fw < 4.5$

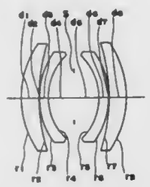
$3.8 < f51/f2 < 4.2$

$1.25 < D51\text{-}52/fw < 1.39$

where f4 is a focal length of said fourth lens gorup, f51 is a focal length of said front lens sub-group, fw is the shortest focal length of the entire lens system, and D51-52 is an axial air separation between said front lens sub-group and said rear lens sub-group.

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**5,050,973**
**SYMMETRICAL LENS SYSTEM FOR USE IN COPYING MACHINE**
**Keijiro Sakamoto, Kaloleni, Kenya, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Filed Jan. 16, 1990, Ser. No. 465,925**
**Claims priority, application Japan, Jan. 18, 1989, 1-10389**
**Int. Cl.[5] G02B** *3/02, 9/36*
**U.S. Cl. 359—708** **5 Claims**



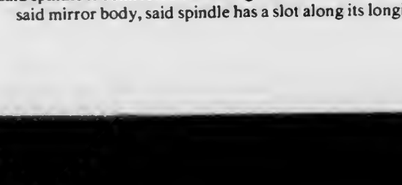
1. A symmetrical lens system comprising, as arranged from the object side toward the image side,
a first lens element in the form of a positive meniscus lens having its convex surface directed toward the object side,
a second lens element in the form of a negative meniscus lens having its convex surface directed toward the object side,
a diaphragm,
a third lens element in the form of a negative meniscus lens symmetrical with the second lens with respect to the diaphragm,
a fourth lens element in the form of a positive meniscus lens symmetrical with the first lens with respect to the diaphragm, and
at least the concave surface of the first lens element and the fourth lens element being constructed to be aspherical in such a manner that the compactness of the lens system is obtained while maintaining a wide angle and a small F number, wherein the lens system fulfills the following conditions:

$\Sigma d/f < 0.3$

$\Sigma d$: the overall length of the entire lens system
f: the focal length of the entire lens system.

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**5,050,974**
**OPTICAL SYSTEM FOR ENDOSCOPES**
**Yoshiharu Takasugi, Iruma, and Hiroyuki Fukuda, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**
**Filed Sep. 11, 1989, Ser. No. 406,383**
**Claims priority, application Japan, Sep. 12, 1988, 63-226531**
**Int. Cl.[5] B29D** *11/00;* **G02B** *17/00, 9/60*
**U.S. Cl. 359—728** **12 Claims**



1. An optical system for endoscopes comprising:
an imaging lens system including a plurality of lens components and having an aperture stop arranged within said lens components, and
a field lens component arranged on an image side of said imaging lens system,
wherein said optical system for endoscopes includes a negative lens component and a positive lens component arranged on an object side of said aperture stop,
wherein lens components arranged on the image side of said aperture stop comprise a substantially telecentric optical system, and said optical system for endoscopes satisfying the following condition (1):

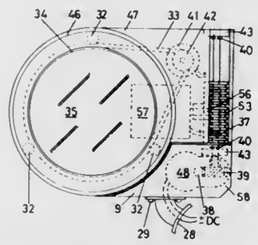
$$f_F < 10f \quad (1)$$

wherein the reference symbol $f_F$ represents focal length of the field lens component and the reference symbol f designates focal length of the optical system as a whole.

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**5,050,975**
**DOUBLE DUTY REARVIEW MIRROR**
**Yu-Ming Tsui, No.16-11, 3 Floor, 189 Lane, Sec.4, Chengkung Rd., Neihu Locality, Taipei, Taiwan**
**Filed Nov. 29, 1990, Ser. No. 620,541**
**Int. Cl.[5] G02B** *7/18*
**U.S. Cl. 359—508** **2 Claims**

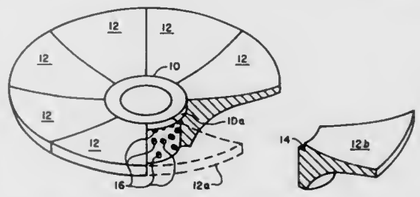
1. A rearview mirror comprising:
a mirror body adapted to be fixed to one side of a car:
a securing frame pivotally connected to said mirror body by hinging a first hinge:
said first hinge composed of an outer sleeve with a large outer diameter mounted therein an inner sleeve with a smaller outer diameter mounted therein a spindle;
said spindle is connected to bearings fixed on the two sides of said mirror body, said spindle has a slot along its longitudinal axis and two bores are provided with suitable distance between each other on the wall of said inner sleeve, two small spindles each mounted with a small roller are installed into said bores and the rotating direction of said small rollers are parallel to the longitudinal axis of said inner sleeve, said small rollers protrude from inner portion of the wall of said inner sleeve into said slot of said spindle so that said spindle can be rotated and said securing frame is capable of being pivoted to match against said mirror body in a first instance and to be held against a door window of said one side in a second instance;
a transparent glass:
a rotatable carrier for mounting said glass therein and is mounted in said securing frame:
a first motor mounted in said securing frame and having a shaft:



a transmitting pulley coaxially mounted on said shaft:
a belt mounted between said pulley and said carrier around the circumferences of said pulley and said carrier:
a second motor mounted in said mirror body and having a gear box with a shaft;
a first helical gear is coaxially fixed to said spindle:
a second helical gear meshing with said first helical gear is mounted on said shaft of said gear box of said second motor so that said first and second instances can be selectively obtained by energizing said second motor to rotate said second helical gear, and then when said securing frame is held against said door window and said first motor is energized, said transparent glass will be rotated and enable a driver to clearly see said mirror body through said door window and said transparent glass in a rainy or snowy day.

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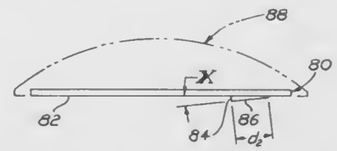
**5,050,976**
**HUB AND PETAL APPARATUS FOR MOSAIC MIRRORS AND MILLIMETER WAVE ANTENNAS**
**Graham W. Flint, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**
**Filed Jun. 28, 1990, Ser. No. 545,247**
**Int. Cl.[5] G02B** *5/10, 7/18;* **H01Q** *15/16*
**U.S. Cl. 359—851** **11 Claims**



1. A hub and petal apparatus for mosaic structures comprises in combination:
a hub having a centrally located axis of rotation, said hub having an outer surface which is parallel to said axis, and a flange which is located at one end of said hub extending radially outward therefrom,
a plurality of petal segments which are substantially identical in shape, each petal segment of said plurality of petal segments including a step which is perpendicular to said axis of said hub and a cylindrical surface which is perpendicular to the face of said step, and,
a plurality of registration pads attached to said hub for the precise adjustment of each petal segment of said plurality of petal segments to provide registration to optical tolerance with respect to other petal segments and said axis of said hub, a predetermined number of registration pads of said plurality of registration pads respectively cooperating with each petal segment of said plurality of petal segments to maintain said registration.

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**5,050,977**
**AUTOMOTIVE VEHICLE MIRROR WITH GAUGING VIEWING MIRROR PORTION**
**George E. Platzer, Jr., 424 Cypress Rd., Rochester Hills, Mich. 48309**
**Division of Ser. No. 281,667, Dec. 9, 1988. This application Apr. 12, 1990, Ser. No. 507,914**
**Int. Cl.[5] B60R** *1/08, 1/06;* **G02B** *7/18*
**U.S. Cl. 359—866** **10 Claims**



1. In combination an automotive vehicle and a remote control mirror assembly carried by said vehicle externally thereof and generally along a side of said vehicle, comprising mirror means selectably positionable by an operator of said vehicle, support means for supporting said mirror means, positioning means operatively connected to said mirror means and effective to rotationally position said mirror means with respect to said support means and said vehicle, control means situated remotely from said mirror means and operatively connected to said positioning means, said control means being adapted for actuation by said operator, wherein said mirror means comprises a main viewing mirror portion having a main reflective surface of flat planar configuration for viewing therein by said operator of existing conditions of traffic, said main viewing mirror portion comprising an outer periphery with first and second peripheral portions, wherein said first peripheral portion is situated relatively closer to said side of said vehicle and wherein said second peripheral portion is situated relatively farther from said side of said vehicle, and a gauging viewing mirror portion having a gauging reflective surface of flat planar configuration for viewing therein by said operator a selected referencing portion of said vehicle carrying said mirror assembly, wherein said gauging viewing mirror portion in its entirety is relatively small compared to said main viewing mirror portion in its entirety, wherein said gauging viewing mirror portion is situated as to be at least close to said first peripheral portion and remotely spaced from said second peripheral portion, and wherein the plane of said main reflective surface and the plane of said gauging reflective surface are inclined with respect to each other so that when said operator of said vehicle actuates said control means to cause said mirror means to be positioned so that said selected referencing portion of said vehicle is viewed in said gauging reflective surface of said gauging viewing mirror portion said main reflective surface of said main viewing mirror portion is simultaneously properly positioned providing a view to said operator which is angularly outward from the view provided to said operator by

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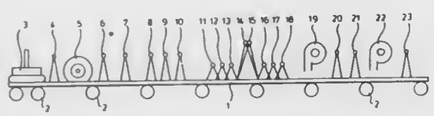
said gauging viewing mirror portion for viewing said existing conditions of traffic in said main viewing mirror portion.

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**5,050,978**
**COPPER MIRRORS AND METHOD OF MANUFACTURING SAME**

**Albert Servais, Gerpinnes, Belgium, assignor to Glaverbel, Brussels, Belgium**

**Division of Ser. No. 210,013, Jun. 22, 1988, Pat. No. 4,981,720. This application Jun. 28, 1990, Ser. No. 547,211**
**Claims priority, application United Kingdom, Jun. 22, 1987, 8714666**
**Int. Cl.[5] G02B *5/08***
**U.S. Cl. 359—884** **7 Claims**



7. A copper mirror having improved resistance to aging as having a factor of luminous reflection which is stable and which, after the copper mirror has been subjected to a CASS Test for 120 hours, is at least 0.9 times what it was before the copper mirror was subjected to the CASS Test, the copper mirror comprising:

a transparent glass sheet bearing a copper reflective layer and at least one protective layer, effective to provide protection from atmospheric corrosion, provided on the copper reflective layer,

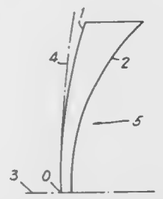
wherein the copper reflective layer is a chemically deposited layer consisting essentially of copper and is deposited in such a manner so as to have an oxygen content effective to provide said stable factor of luminous reflection in that the oxygen content is substantially zero.

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**5,050,979**
**EYEGLASS LENS**

**Toshihide Shinohara, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan**

**Filed Nov. 29, 1989, Ser. No. 443,428**
**Claims priority, application Japan, Nov. 29, 1988, 63-301569; Feb. 17, 1989, 1-37560; Mar. 10, 1989, 1-58918**
**Int. Cl.[5] G02C *7/02*; G02B *3/04***
**U.S. Cl. 351—159** **9 Claims**



1. An eyeglass lens comprising a front refractive surface and a back surface, at least one of said front and back surfaces being a refractive surface having an optical center wherein said at least one of said refractive surfaces is defined by a meridian, curvature of said meridian substantially increasing from the optical center as far as at least 15 mm towards the outer periphery of the lens in all directions;

said at least one refractive surface being further defined by a predetermined point contained thereon and said refractive surface having a rotational symmetry around said predetermined point;

said lens having an axis of symmetry, the curvature of said meridian increasing monotonically within at least 15 mm extending away from the axis of symmetry of said lens;

and the curvature value near said axis of symmetry in said at least one refractive surface is represented by $\rho_0\ m^{-1}$, an equivalent spherical power of the lens is designated by S and a refractive index of a lens material is designated by n, and the following conditions are met:

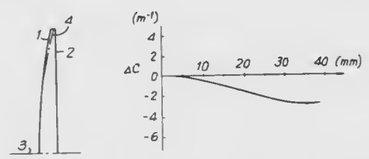
$(n-1)\times\rho_0 \geqq 0.5\times(S+6)+1.5$ when $-6 \geqq S \geqq -2$ and $(n-1)\times\rho_0 \geqq 1.5$ when $S < -6$.

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**5,050,980**
**ASPHERICAL SPECTACLE LENS**

**Toshihide Shinohara, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan**

**Filed Jan. 18, 1990, Ser. No. 466,818**
**Claims priority, application Japan, Jan. 21, 1989, 1-12175; Feb. 17, 1989, 1-37559; Dec. 18, 1989, 1-327613**
**Int. Cl.[5] G02C *7/02***
**U.S. Cl. 351—167** **14 Claims**



1. An aspherical spectacle lens having a positive power comprising a front refractive surface and a rear refractive surface, the front refractive surface being aspherical in shape and convex, the curvature of an arbitrary median passing through a predetermined point on the front refractive surface being a function C(r) of the distance r from the predetermined point, the first-order derivative dC/dr of the function C(r) changing such that it first decreases as the meridian moves away from the predetermined point and then it increases.

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**5,050,981**
**LENS DESIGN METHOD AND RESULTING ASPHERIC LENS**

**Jeffrey H. Roffman, Jacksonville, Fla., assignor to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.**

**Filed Jul. 24, 1990, Ser. No. 557,261**
**Int. Cl.[5] G02C *7/02, 7/04***
**U.S. Cl. 351—177** **6 Claims**

1. A method of constructing a lens for focusing light on the retina of the eye comprising the steps of:

a) constructing a Fourier Transform function model that generates modulation transfer frequencies for the human eye and a preliminary lens, said lens having at least one rotationally symmetric surface defined by the equation:

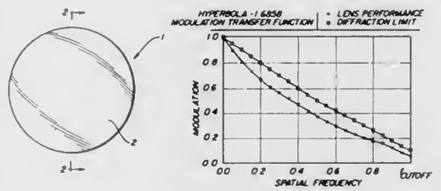
$$X = \frac{Y^2}{r + [r^2 - (\kappa + 1)Y^2]^{\frac{1}{2}}}$$

where X is the aspheric surface point at position Y, r is the central radius, and $\kappa$ is commonly used aspheric constant, wherein the value of $\kappa$ is less than or equal to $-1$,

b) performing an analysis using the model so constructed to trace light ray paths through the lens-eye system,

c) varying the value of the aspheric constant, $\kappa$, for the preliminary lens to achieve a lens-eye system with a trace of light ray paths optimized for sharpest focus by minimizing retinal spot size of said rays.



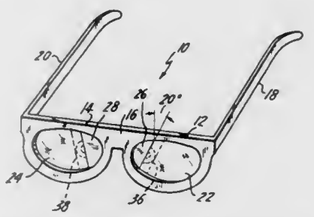



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**5,050,982**
**METHOD AND APPARATUS FOR IMPROVING VISUAL ACUITY**

**Juergen P. Meissner, 551 Rte. 10, Randolph, N.J. 07869**

**Filed Oct. 6, 1989, Ser. No. 418,387**
**Int. Cl.[5] A61B *3/00***
**U.S. Cl. 351—203** **34 Claims**



1. A method for improving visual acuity, comprising the steps of:

increasing the strength of an image on a brain half corresponding to a weaker eye of a person;

subsequently forcing both brain halves to operate at substantially equal visual levels in coordination with each other; and

substantially forcing both brain halves to operate independently of each other at substantially equal visual levels;

each said step of forcing including the step of substantially occluding ambient light to at least one eye in a light restriction area located in an overlapping viewing area of both eyes.

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**5,050,983**
**VISUAL TESTING METHOD AND APPARATUS**

**Chris A. Johnson, and Lionel R. Shapiro, both of Davis, Calif., assignors to The Regents of the University of California, Oakland, Calif.**

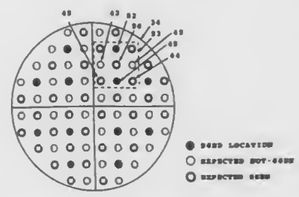
**Filed Apr. 30, 1990, Ser. No. 517,660**
**Int. Cl.[5] A61B *3/02***
**U.S. Cl. 351—226** **15 Claims**

12. Apparatus for testing a subject's threshold response level to a visual stimulus which can be presented to the subject at a selected level and at selected locations in a two-dimensional field, comprising

(a) presenting means for presenting a selected-level stimulus at each of N locations in a two-dimensional visual field array,

(b) recording means for recording the response of the subject to the stimuli presented at locations in the field as "seen" or "not seen," and

(c) a control unit which operates to (1) store, at each of S seed locations in the N location array, a subject's upper and lower boundaries of stimulus detection, (2) calculate, for each of N-S non-seed nearest neighbor locations in the array, the expected threshold value of detection by the subject, based on the values stored in said storing means, (3) present to the subject, at each non-seed location, a visual stimulus which is either a selected level above or below the expected threshold value of detection for that non-seed location, depending on whether that non-seed location has been assigned to a super- or sub-threshold group, respectively, (4) classify the neighbor agreement between each location in the field and its nearest neighbors into a "discrepancy," "low-confidence," or "high-confidence" category, (5) if the pattern of neighbor agreement at any location is in the discrepancy category, retest that location for "seen"/"not-seen" response, and (6) if the pattern of neighbor agreement for non-seed location is in the low-confidence category, adjust the expected threshold of that location to a revised expected threshold value, and retesting the nearest-neighbor agreement between the revised-threshold location and its nearest neighbors.

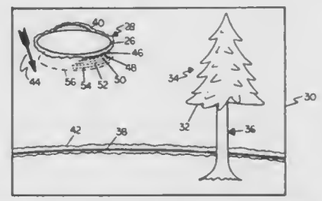



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**5,050,984**
**METHOD FOR COLORIZING FOOTAGE**

**David M. Geshwind, 184-14 Midland Pky., Jamaica, N.Y. 11432**

**Continuation of Ser. No. 601,091, Apr. 20, 1984, which is a continuation-in-part of Ser. No. 492,816, May 9, 1983. This application Jan. 20, 1987, Ser. No. 6,291**
**Int. Cl.[5] G03B *19/18***
**U.S. Cl. 352—38** **53 Claims**



1. A method for colorizing a relatively high information density black & white image comprising the steps of:

[a] generating color information of lower information density than said black & white image for said black & white image; and

[b] combining said low information density color information with said black & white information to produce a full color image of relatively high information density.

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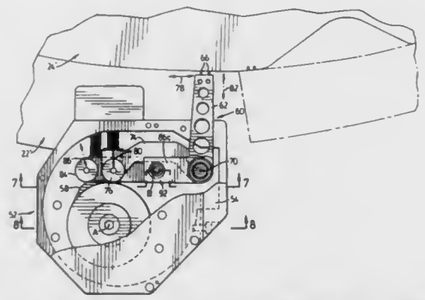


5,050,985

## FILM DECELERATION UNIT

William C. Shaw, Streetsville; Ian Maxwell, Oakville, and Irvine W. Smith, Cooksville, all of Canada, assignors to Imax Systems Corporation, Toronto, Canada

Filed Oct. 30, 1990, Ser. No. 605,319
Int. Cl.[5] G03B 1/00
U.S. Cl. 352—184 10 Claims



1. A projector, camera or like apparatus having a rolling loop film transport mechanism including a stator and a rotor adapted to co-operate to form continuous rolling loops in said film and to cause transportation thereof along a film path which includes an aperture at which successive portions of the film are intermittently held stationary in registration with the aperture;

wherein the improvement comprises means for decelerating the film as it approaches the aperture, comprising:

deceleration pin means engageable in marginal perforations in the film; and,

means for driving said pin means in a cycle of movement in which the pin means is moved: into the film path at a film engaging position in advance of the aperture; in the direction of film travel to a film disengaging position while in engagement with and decelerating the film; out of the film path; and back to said film engaging position while remaining out of the film path; said cycle of movement being synchronized with said film transport mechanism so that each said successive film portion is decelerated as it approaches the aperture for registration.

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5,050,986

## SYNCHRONIZATION SYSTEM FOR CONTROLLING SWITCHES

Anthony J. Gatto, Chandler; Randy L. Dahl, Mesa, and John A. Muir, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1990, Ser. No. 533,308
Int. Cl.[5] G01C 3/08; G01S 13/00
U.S. Cl. 356—5 19 Claims

1. A system for use in connection with target ranging, comprising:

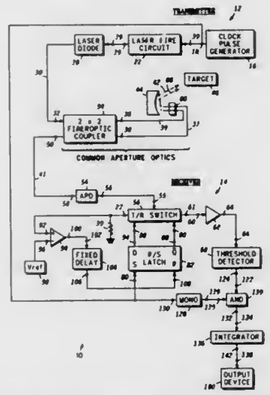
generator means for producing an energy pulse for illuminating a target in response to a trigger signal;

radiator means for directing the illuminating energy pulse produced by the generator means toward the target and receiving a reflected energy pulse from the target;

receiver means for detecting the reflected energy pulse;

energy transfer means having at least three ports, a generator port coupled to the generator means, a radiator port coupled to the radiator means and a receiver port coupled to the receiver means, wherein the energy transfer means transfers illuminating energy from the generator port to the radiator port and reflected energy from the radiator port to the receiver port and a small backscatter portion of the illuminating energy pulse from the generator port to the receiver port substantially time coincident with the illuminating energy pulse;

switching means between the receiver port and the receiver means for transferring energy from the energy transfer means to a dissipative load when in a first state or from the energy transfer means to the receiver means when in a second state;




control means, responsive to the trigger signal and the time coincident backscatter energy, for controlling the switching means so as to maintain the switching means in the first state while significant time coincident backscatter energy exists and thereafter change the switching means to the second state.

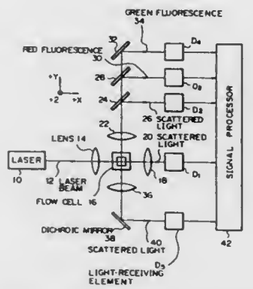
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5,050,987

## PARTICLE ANALYZING APPARATUS AND METHOD FOR DETERMINING NUCLEAR SHIFT INDEX

Tokihiro Kosaka, Hyogo, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Sep. 1, 1989, Ser. No. 402,866
Int. Cl.[5] G01N 33/48, 21/69, 21/64
U.S. Cl. 356—73 12 Claims




1. A particle analyzing apparatus for determining a nuclear shift index of a particle, the apparatus forming a detecting zone by irradiating a zone, in which particles flow substantially in single file, with a laser beam in a direction perpendicular to the direction of particle flow and detecting, at a plurality of locations, an optical change produced in the detecting zone when particles pass through the detecting zone one at a time, thereby obtaining plural types of signals with respect to a single particle, said apparatus comprising:

laser beam means in a laser beam irradiating zone for irradiating a particle with a laser beam to scatter light therefrom conforming to the structure of the particle nucleus, the laser beam formed to be narrower than the diameter of a particle nucleus in the direction of particle flow and wider than the diameter of the particle in a direction perpendicular to the particle flow;

photo-detecting means for detecting two types of particle signals with respect to a single particle by respectively detecting side-scattering light beams produced in directions symmetrical with respect to the optic axis of the laser beam;

first characteristic quantity extracting means for extracting the amount of high-frequency components which are contained in at least one type of particle signal of the two types of particle signals, in order to determine the degree of complexity of the particle nucleus shape; and

second characteristic quantity extracting means for extracting the magnitude of a difference between the two types of particle signals in order to determine the degree of symmetry of the particle nucleus shape.



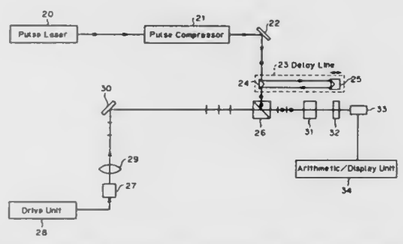
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5,050,988

## MEASURING DEVICE USING OPTICAL BEAM

Tadashi Sugiyama, and Akira Ohte, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 498,167
Claims priority, application Japan, Mar. 30, 1989, 1-80061; Mar. 30, 1989, 1-80066; Mar. 30, 1989, 1-80067; Mar. 31, 1989, 1-80718
Int. Cl.[5] G01J 1/00
U.S. Cl. 356—121 12 Claims




1. A measuring device using an optical beam, said device comprising:

means for generating an object light having a first time width;

optical pulse generating means for generating a reference light having a shorter time width than said first time width, said optical pulse generating means being separate from said means for generating an object light;

delay means for delaying said reference light by a predetermined time;

composing means for composing the delayed reference light and said object light with the reference light and the object light being overlapped on a time axis;

higher harmonic generating means made receptive of the output light from said composing means for generating by a non-linear effect a higher harmonic having an intensity proportional to the product of the intensity of the reference light and the intensity of the object light;

a filter made receptive of the output from said higher harmonic generating means for transmitting only a light of a specified wavelength; and

a light receiving element made receptive of the output light from said filter for converting the optical intensity thereof into electric signals whereby the delay of said delay means is made variable so that the characteristics thereof can be measured.

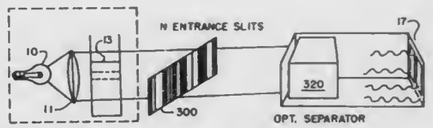
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5,050,989

## SINGLE HADAMARD MASK SPECTROGRAPH SYSTEM

Roger A. Van Tassel, Hollis, N.H., and Wallace K. Wong, Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 21, 1989, Ser. No. 410,388
Int. Cl.[5] G01J 3/06, 3/36
U.S. Cl. 356—310 2 Claims




1. A Hadamard spectrograph that obtains a spectrograph reading that identifies characteristics of a test sample, said Hadamard spectrograph comprising:

a means for illuminating said test sample by illuminated it with a beam of light;

a Hadamard mask which receives said beam of light emitted by said illuminating means after it has propagated through said test sample, said Hadamard mask having a plurality of slits through which said beam of light passes to produce thereby an encoded beam;

a means for dispersing said encoded beam from said Hadamard mask to output a spatially dispersed spectral band in said encoded beam, wherein said dispersing means comprises a monochromator which receives and spatially disperses said encoded beam from said Hadamard mask to isolated narrow portions of received radiation and produce thereby said spatially dispersed spectral band; and

a means for detecting said spectrograph reading in said test sample by receiving and detecting said spatially dispersed spectral band from said dispersing means, wherein said detecting means comprises a photodetector array with n photodiodes, where n is an integer, which are arranged in an array so that they receive and detect said spatially dispersed spectral band from said dispensing means to detect discrete bands of spectral energy dispersed upon the photodetector array's surface and output thereby an electrical detection signal which when multiplied by a matrix gives said spectrograph reading of said test sample, and wherejn said Hadamard mask has at least $2n-1$ slots where n is the integer which indicates the number of photodiodes in the photodetector in the photodetector array, and wherein each of the slots of the Hadamard mask have a width which equals that of one of said photodiodes.

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5,050,990

## VARIABLE DETECTOR GEOMETRY FOR RESOLVING AND SENSING APPARATUS FOR FILTERING AND OTHER APPLICATIONS

Z. Erol Smith, III, and Robert A. Street, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

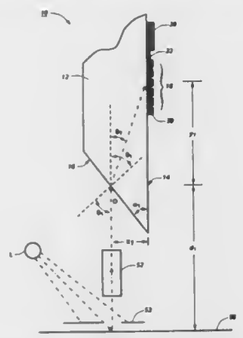
Filed Aug. 24, 1990, Ser. No. 572,918
Int. Cl.[5] G01J 3/14, 3/50
U.S. Cl. 356—326 7 Claims

2. An apparatus for resolving and sensing an electromagnetic signal, the electromagnetic signal comprised of a plurality of wavelength components, the apparatus comprising:

a resolving means which resolves the electromagnetic signal such that the components of the electromagnetic signal having different wavelengths are spatially separated from one another and projected to predetermined locations, each location being a function of each wavelength component; and

a plurality of sensing means positioned at predetermined locations for sensing the presence of selected wavelength

components, each sensing means being of a predetermined shape and size such that a selected filter response is ap-



proximated by the response characteristics of the sensing means.

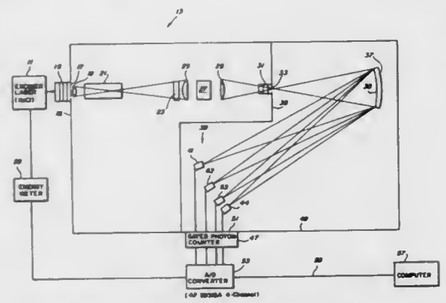
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**5,050,991**

**HIGH OPTICAL DENSITY MEASURING SPECTROMETER**

**Jeanne A. Welch, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Sep. 29, 1989, Ser. No. 415,740**
**Int. Cl.[5] G01J *3/36***
**U.S. Cl. 356—326** **17 Claims**



1. An apparatus for measuring the spectra of a high optical density sample having substantially known optical properties, said apparatus comprising:

means for generating light containing a plurality of preselected wavelength components;

means for optically directing said light through said sample;

dispersion means for spatially separating said light passed through said sample into its plurality of preselected wavelength components;

a plurality of light detectors positioned to respectively convert photons in each of said spatially-separated preselected wavelength components into a plurality of associated photocurrents having amplitudes respectively representative of the numbers of photons in said spatially-separated preselected wavelength components; and

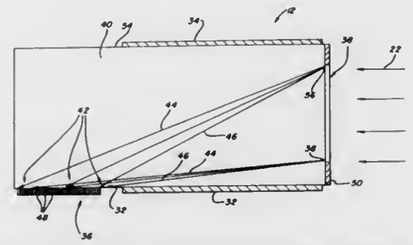
means for respectively converting said plurality of associated photocurrents into a plurality of photon counts corresponding to the transmittance of said sample at the respective said preselected wavelength components of said light passing through said sample.

**5,050,992**

**DISPERSIVE HOLOGRAPHIC SPECTROMETER**

**James E. Drummond, Oceanside, and I-Fu Shih, Los Alamitos, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Apr. 13, 1990, Ser. No. 508,436**
**Int. Cl.[5] G01J *3/36*; G01N *21/35***
**U.S. Cl. 356—328** **23 Claims**



1. A holographic spectrometer for analyzing radiation comprising:

source means for producing radiation;

a piezoelectric block substantially transparent to the radiation from the source means;

holographic lens means attached to an outer face of said block and having a recorded interference pattern therein for receiving said radiation and dispersing said radiation into component wavelengths; and

detector means for detecting said components wavelengths.

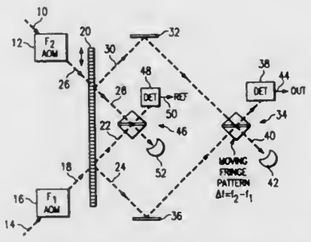
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**5,050,993**

**DIFFRACTION ENCODED POSITION MEASURING APPARATUS**

**Richard J. Tansey, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jun. 14, 1989, Ser. No. 365,990**
**Int. Cl.[5] G01B *9/02***
**U.S. Cl. 356—356** **7 Claims**



1. The method of detecting movement of a grating relative a laser light source comprising the steps of:

passing a first laser beam, of a given first wavelength and modulated at a first frequency, at a first angle through a grating from a first side to an opposite second side, the grating having a pitch which produces a diffracted beam from said first wavelength and where the first laser beam has a component in a first direction parallel to said grating, the first laser beam upon exiting the grating having incident and diffracted components;

redirecting the diffracted component of the first laser beam of said first wavelength to produce a second laser beam aimed at an angle relative to the grating which is the same as said first angle to pass through the grating from said second side to said first side, the second laser beam upon exiting the grating having incident and diffracted components;



passing a third laser beam of a second frequency, which second frequency is slightly offset from said first frequency by an AOM, at a second angle through the grating from the first side to the second side, the grating having a pitch which is sufficient to produce diffracted orders from the wavelength of said second frequency and where the third laser beam has a component in a second direction opposite said first direction and parallel to said grating, the third laser beam upon exiting the grating having incident and diffracted components;

redirecting the diffracted component of the third laser beam of said second frequency to produce a fourth laser beam aimed at an angle relative the grating which is the same as said second angle to pass through the grating from said second side to said first side, the fourth laser beam upon exiting the grating having incident and diffracted components, the angles and frequencies and components previously recited being picked such that a plane defining the incident and diffracted beams is perpendicular to the grating and such that the diffracted component of the fourth laser beam will intersect with the diffracted component of the second laser beam to produce a fringe pattern in a beam splitter which moves at the difference frequency introduced by the AOM's;

generating a reference signal from the incident components of said first laser and third laser beams after passage through the grating;

generating a phase shifted first output signal from the moving fringe pattern; and

detecting the difference in phase between the reference and first output signals to provide a second output signal indicative of the relative position of the grating relative a reference.

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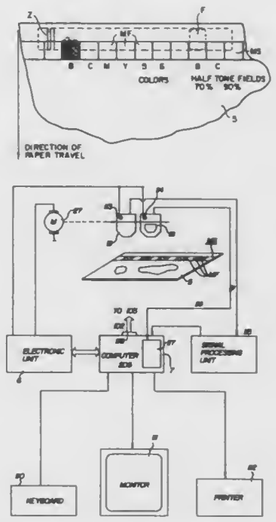
**5,050,994**

**METHOD OF MONITORING AND/OR CONTROLLING DAMPENING-MEDIUM FEED IN AN OFFSET PRINTING MACHINE**

**Helmut Kipphan, Schwetzingen, Fed. Rep. of Germany, and Gerhard Löffler, Walldorf, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany**

**Filed Sep. 11, 1989, Ser. No. 405,639**
**Claims priority, application Fed. Rep. of Germany, Sep. 9, 1988, 3830732**
**Int. Cl.[5] G01N *21/55, 21/47***
**U.S. Cl. 356—445** **32 Claims**

1. Method of monitoring and/or controlling dampening-medium feed in an offset printing machine, which comprises scanning inked and ink-free areas of a printed image by means of an opto-electric transducer and generating corresponding signals of respective values, feeding the signals to a microprocessor and comparing the respective values thereof with corresponding reference values, increasing dampening-medium feed when the scanning-signal values of the ink-free areas deviate from the reference values thereof, and storing a signal for reducing the dampening-medium feed when the



scanning-signal values of the inked areas deviate from the reference values thereof.

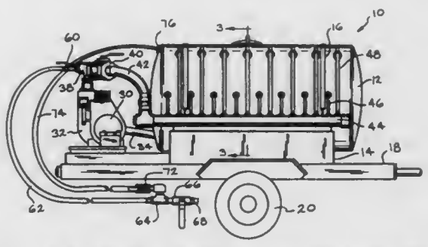
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**5,050,995**

**JET AGITATION SYSTEM**

**James C. Lucore, II, Arlington, Va., assignor to High Pressure Technology Corp., Arlington, Va.**

**Filed Nov. 3, 1989, Ser. No. 431,338**
**Int. Cl.[5] B01F *15/02, 5/18***
**U.S. Cl. 366—136** **19 Claims**



1. In an apparatus for mixing and delivering a fluid-based mixture having a cylindrical mixing tank defining an axis, a pump for recirculating and supplying said fluid based mixture and valves for controlling and fluid conduits for delivering said fluid-based mixture, the improvement comprising:

a manifold extending along at least a portion of the exterior of said tank;

a first plurality of fluid conduits in communication with said manifold and extending into the interior of said tank; and

a second plurality of fluid conduits in communication with said manifold and extending into the interior of said tank;

wherein said conduits have terminal portions for directing fluid flow generally along the wall of said mixing tank to cause circulation within said tank about said axis and said first plurality of conduits extends into said tank at approxi-

VOL 1130 ISS 4 SE 24 1991 UMI



mately the vertical mid-point and said second plurality of conduits extends into said tank adjacent the top.

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**5,050,996**

## PAINT SHAKER APPARATUS POWERED BY A PNEUMATIC SANDING TOOL

**Michael W. Allen, 1387 New Hope Rd., Lawrenceville, Ga. 30245**

**Filed Jul. 24, 1990, Ser. No. 557,374**
**Int. Cl.[5] B01F** *11/00, 3/00*
**U.S. Cl. 366—211** **4 Claims**



1. A paint shaker apparatus used in conjunction with a typically hand held pneumatic random orbital sanding tool, said paint shaker apparatus utilizing said pneumatic random orbital sanding tool as motor and crankshaft, said pneumatic random orbital sanding tool externally mounted and releasably attached to said paint shaker apparatus thereby allowing the tool to be quickly removed and operated normally when released from the apparatus, said pneumatic random orbital sanding tool of the type having a motor, a motor housing, an eccentric driving head, a rotatably mounted sanding pad spindle, and a handle, said paint shaker apparatus comprising:
a. a base housing;
b. attachment means for releasably attaching said pneumatic random orbital sanding tool to said base housing;
c. a vertical shaft having an upper and a lower end, the upper end projecting out of said base housing and extending thereabove, means rotatably mounting said vertical shaft on said base housing;
d. a container cradle assembly to receive a container to be shaken, means mounting said container cradle assembly to the upper end of said vertical shaft for oscillation about a vertical axis;
e. a crank arm having a first end and a second end, the first end secured to the lower end of said vertical shaft;
f. a connecting rod having a first end and a second end, the first end pivotally connected to the second end of said crank arm, the second end being secured to the sanding pad spindle of said pneumatic random orbital sanding tool.

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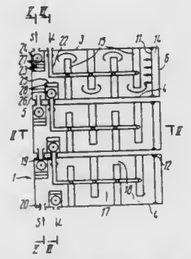
**5,050,997**

## MIXER-SETTLER FOR LIQUID-LIQUID EXTRACTION

**Leonid I. Sklokin, ulitsa Kozlova, 5, kv. 38; Vladimir E. Leif, ulitsa Zinovieva, 8, kv. 34; Jury M. Sednev, ulitsa Dzerzhinskogo, 45, kv. 82; Sofya M. Masloboeva, ulitsa Stroitelei, 41, kv. 41; Vladimir P. Kovalevsky, all of Murmanskaya oblast, Apatity; Genrikh V. Korpusov, Leninsky prospekt, 69, korpus 3, kv. 398, Moscow; Vladimir Y. Stepanov, ulitsa Gorkogo, 6, kv. 8; Boris M. Bobylkov, ulitsa Chkalova, 20, kv. 62, both of Estonskaya SSR, Sillamyae; Vladimir T. Kalinnikov, ulitsa Zinovieva, 10, kv. 65, and Boris M. Stefanovich, ulitsa Festivanaya, 10, kv. 63, both of Murmanskaya oblast, Apatity, all of U.S.S.R.**

**PCT No. PCT/SU87/00149, § 371 Date Aug. 21, 1989, § 102(e) •Date Aug. 21, 1989, PCT Pub. No. WO89/05684, PCT Pub. Date Jun. 29, 1989**
**PCT Filed Dec. 23, 1987, Ser. No. 415,366**
**Int. Cl.[5] B01F** *7/18*
**U.S. Cl. 366—292** **4 Claims**

1. A mixer-settler for liquid-liquid extraction having extraction chambers, each extraction chamber having a casing accommodating a first partition diving an interior of the casing into a mixing zone having arranged therein mixing means and means for conveying light and heavy phases L and S attached to the casing, and a settling zone communicating with the mixing zone and accommodating means for evacuating the light phase (L) comprising a discharge weir attached to the casing, and a means for evacuating the heavy phase (S) comprising a hydraulic seal and a first transporting means communicating therewith, the first partition being disposed lengthwise of a longitudinal axis of the casing above the discharge weir, the mixing means comprising at least one hollow element with walls thereof having holes and outlets, the outlets facing the first partition mounted substantially perpendicularly to the longitudinal axis of the casing and connected to at least the



feeding means of one of the phases, the first partition being provided with a means for controlling the height of the layer of mixture (M) of phases in the mixing zone mounted on this partition at a location longitudinally remote from the means for feeding the phases (L, S) whereas the settling zone is provided with a second transporting means secured to the casing and positioned after the discharge weir downstream of the flow of the light phase (L).

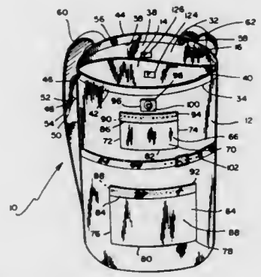
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**5,050,998**

## DUAL LAUNDRY BAG

**Boaz Wachtel, 360 E. 50th St., New York, N.Y. 10022**

**Filed Jul. 16, 1990, Ser. No. 553,547**
**Int. Cl.[5] B65D** *30/22*
**U.S. Cl. 383—6** **19 Claims**



1. A dual laundry bag comprising
a front panel, with said front panel comprising top, bottom and side edges,
a rear panel with said rear panel comprising top, bottom and side edges,
a center panel with said center panel comprising top, bottom and side edges,
a bottom panel with said bottom panel comprising a first portion, a second portion and a center portion,
first connection means connecting said side edges of said front panel to said side edges of said center panel and connecting said bottom edge of said center panel to said center portion of said bottom panel thereby forming a first compartment and connecting said side edges of said rear panel to said side edges of said center panel, thereby forming a second compartment,
first closure means releasably connecting said first portion of said bottom panel and said bottom edge of said front panel,
second closure means releasably connecting said second portion of said bottom panel and said bottom edge of said rear panel.



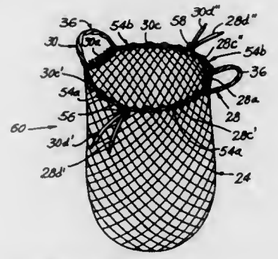
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**5,050,999**

## OPEN-MESH NET BAG AND METHOD OF FORMING THE SAME

**James C. Van Loon, III, E. Hill Rd., Box 480 R.R. #1, Jefferson, N.Y. 12748**

**Filed Jul. 26, 1990, Ser. No. 558,780**
**Int. Cl.[5] B65D** *30/06, 33/12, 33/28*
**U.S. Cl. 383—76** **26 Claims**



1. An open-mesh bag, comprising:
a substantially rectangular piece of open-mesh netting having a pair of opposed first edge regions, each first edge region extending between a respective pair of corner regions, and a pair of opposed second edge regions; and
a pair of elongated flexible cords, each cord having a central length portion interlaced through the meshes of said netting piece along substantially the entire length of a respective one of said first edge regions thereof, a pair of loop-forming length portions intertwined with each other to form a loop along with said central length portion, a pair of intermediate length portions, each of which is interlaced through the meshes of said netting piece from a respective corner region thereof along substantially half the length of a respective one of said second edge regions, and a pair of terminal end portions, each of which is connected to a terminal end portion of the other flexible cord,
said pairs of first and second edge regions of said netting piece forming a mouth of said bag and said loops constituting handles of said bag.

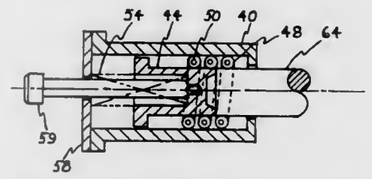
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**5,051,000**

## LINEAR COMPENSATING BEARING

**Robert H. Cadwallader, P.O. Box 418, RR 1, Clinton Corners, N.Y. 12514; Charles P. Coughlin, Spring St., Box 71, Chelsea, N.Y. 12512, and Thomas J. Walsh, 2 Deer Run Rd., Poughkeepsie, N.Y. 12603**

**Filed Nov. 28, 1989, Ser. No. 442,187**
**Int. Cl.[5] F16C** *29/02*
**U.S. Cl. 384—7** **2 Claims**



1. In a bearing, a housing, a shaft received within the housing, and a coil spring surrounding the shaft and so that its coils are in bearing engagement between the shaft and the housing and aligned in the direction of shaft movement, wherein the shaft is essentially contained within the housing and biased to a home position therein, wherein one end of the shaft has an engagement face, and the housing has an opening for exposing the shaft face to engagement with an external element, wherein the shaft engagement face has a centering contour intended to bring an oncoming external element having a complementary contour on its mating face and the shaft into alignment with each other.

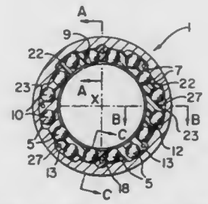
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**5,051,001**

## BALL CIRCULATION UNIT FOR A LINEAR BALL GUIDE

**Werner Jacob, Briandring 29, 6000 Frankfurt/Main 70, Fed. Rep. of Germany**

**Filed Apr. 5, 1990, Ser. No. 505,021**
**Claims priority, application Fed. Rep. of Germany, Apr. 8, 1989, 3911501; Nov. 14, 1989, 3937781**
**Int. Cl.[5] F16C** *29/06*
**U.S. Cl. 384—43** **16 Claims**



1. A ball circulation unit for a linear ball guide, which is movable along a guiding shaft with a circular cross-section, and at least partially embraces it, the unit comprising several continuous rows of balls which are distributed across the cross-section and which are guided in a cage; a carrying portion in which the balls, from the cage, project radially inwardly while resting on the guiding shaft; a returning portion; and deflecting portions connecting the carrying portion and returning portion at their ends, the carrying portion and returning portion each extending parallel to the longitudinal axis of the shaft, and the cage being fixed in the circumferential direction and axially in a basic member,
the cage (7) being made up of several parts, including inner segments (12, 13) which represent guiding means for the carrying portions (9) and returning portions (10), and head pieces (14) attached at the axial ends of the inner segments and comprising the deflecting portions (11), the inner segments (12, 13), in the circumferential direction, on both sides, comprise an axially extending guiding recess (15) of a carrying portion (9) and, therebetween, at least one guiding groove (16) forming at least one returning portion (10), the head pieces (14) and inner segments (12, 13) being centered relative to each other.

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**5,051,002**

## GUIDE SLEEVE, GUIDE POST AND MODIFIED BALL BEARING ASSEMBLY

**Ronald L. Hanaway, 30210 E. Eight Mile Rd., Farmington Hills, Mich. 48236**

**Filed Jan. 25, 1991, Ser. No. 645,745**
**Int. Cl.[5] F16C** *29/04*
**U.S. Cl. 384—49** **8 Claims**

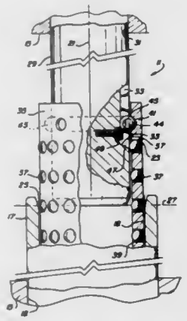
1. In combination, a guide post having a longitudinal axis and a longitudinal slot substantially throughout its length;
a cylindrical ball bearing cage having a co-axial longitudinal axis adjustably receiving said post, and adapted for relative longitudinal and rotary movements thereon;

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said bearing cage mounting a plurality of spaced circularly arranged ball bearings extending substantially the length of said cage and projecting inwardly and outwardly thereof, respectively, there being an internal annular recess in said cage inwardly of one end thereof;

a truncated roller bearing having opposed hemispherical surfaces and opposed flat sides, guidably positioned within said longitudinal slot with the roller bearing maintaining a rolling point contact with the bottom of said slot and with the roller flat sides loosely and slidably registerable with opposed sides of said slot;



said roller being alternately registerable with opposite ends of said longitudinal slot, limiting rectilinear movement of the ball cage relative to said post;

one of the hemispherical portions of said roller being positioned within the cage recess;

said cage including its recess being adapted for rotary sliding movement relative to said roller upon said axis; and

fastener means within said guide post adjacent one end of its longitudinal slot, trapping said roller therein and within said ball cage.

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**5,051,003**

**ROLLING BEARING**

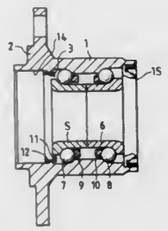
**Masateru Sasayama, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 348,447, May 8, 1989, abandoned. This application Jun. 29, 1990, Ser. No. 545,778**

**Claims priority, application Japan, Sep. 29, 1988, 63-127972**

**Int. Cl.[5] F16C** *33/72*

**U.S. Cl. 384—477** **11 Claims**



1. A roller bearing, comprising:

an outer ring having an inner peripheral surface, a stepped surface spaced radially outward a predetermined distance from said inner peripheral surface, and an inclined surface connecting said inner peripheral surface and said stepped surface, said stepped surface extending from an edge of said outer ring to said inclined surface and having a surface area substantially greater than the surface area of said inner peripheral surface;

a non-resilient metal shield member having a cylindrical body and a flange portion, and being substantially L-shaped in cross-section, said cylindrical portion being press-fittingly engaged with said inner peripheral surface of said outer ring for maintaining a portion of said cylindrical body at said predetermined distance from said stepped surface and for preventing at least a portion of said cylindrical body from contacting said stepped surface.

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**5,051,004**

**RADIAL BALL BEARING HAVING A CURVED CHAMFER BETWEEN A RACEWAY GROOVE AND ITS SHOULDER**

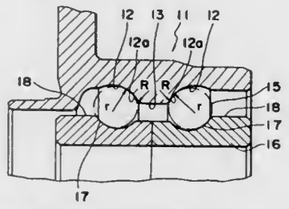
**Masamichi Takeuchi, and Nobuyuki Seo, both of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan**

**Filed Aug. 27, 1990, Ser. No. 573,068**

**Claims priority, application Japan, Sep. 11, 1989, 1-235191**

**Int. Cl.[5] F16C** *33/58*

**U.S. Cl. 384—516** **1 Claim**



1. A radial ball bearing, comprising:

a pair of bearing rings, each said bearing ring having at least one raceway groove with a first radius of curvature and a shoulder, said bearing rings being disposed such that said raceway groove of one said bearing ring is positioned opposite to said raceway groove of the other said bearing ring; and

a plurality of balls disposed rotatably between said raceway grooves positioned opposite to each other;

wherein each said bearing ring further comprises a curved portion having a second radius of curvature, said second radius of curvature being greater than or equal to five times said first radius of curvature;

wherein said curved portion and said raceway groove meet at an inflection point, said curved portion extending smoothly and continuously from said raceway groove; and

wherein said inflection point lies within an ellipse of contact formed between a said ball and said bearing ring by a predetermined axial load.

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**5,051,005**

**VARIABLE PRELOAD BEARING APPARATUS**

**Coleman Duncan, Burlington, Conn., assignor to The Torrington Company, Torrington, Conn.**

**Filed Aug. 17, 1990, Ser. No. 569,012**

**Int. Cl.[5] F16C** *19/08*

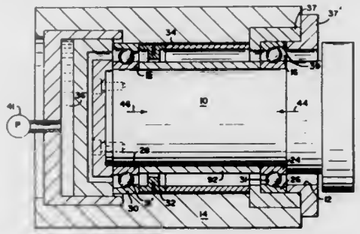
**U.S. Cl. 384—517** **18 Claims**

1. An apparatus comprising:

a shaft;

first and second angular contact bearing means, axially disposed along the shaft, for supporting the shaft in a first and a second axial direction, respectively, the second axial direction being substantially opposite said first direction;

preload means, for exerting a preload force onto the angular contact bearing means, for placing the angular contact bearing means into a maximum preload condition; and



actuator means, acting in opposition to the preload means, for reducing preload from the maximum preload condition to a desired preload condition.

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**5,051,006**

**ROLLER BEARING CAGE**

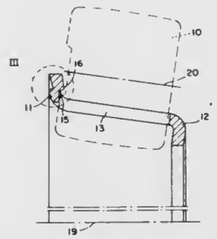
**Joop Van Voorthuijsen, Ochten, Netherlands, assignor to AB SKF, Gothenburg, Sweden**

**Filed Oct. 19, 1989, Ser. No. 423,884**

**Claims priority, application Sweden, Nov. 14, 1988, 8804095**

**Int. Cl.[5] F16C** *33/46*

**U.S. Cl. 384—574** **7 Claims**



7. A cage for a row of rollers (**10**) in a roller bearing comprising first and second closed annular portions (**11,12**) and a plurality of bars (**13**) extending therebetween, said bars defining cage pockets (**14**), wherein the first annular portion (**11**) has a side face (**15**) facing the rollers (**10**) and wherein at least one protrusion (**16**) is provided on said side face (**15**) adjacent a cage pocket, said protrusion extending generally toward the second annular portion (**12**), and having at least one face (**18**) inclined relative to said side face (**15**), characterized in that the protrusion (**16**) extends in a direction away from the bars (**13**) substantially as far as to the radially outer periphery (**17**) of said side face (**15**) whereby said face (**18**) is farther from commonality with said side face (**15**) in a direction radially inwardly from said periphery (**17**).

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**5,051,007**

**LUBRICATION OF A CENTRIFUGAL PUMP BEARING**

**George J. Maddox; Leon K. Stanmore, both of Dallas, Tex., and Terry M. Wold, Mcalester, Okla., assignors to National-Oilwell, Houston, Tex.**

**Filed Oct. 2, 1989, Ser. No. 415,841**

**Int. Cl.[5] F16C** *33/66*

**U.S. Cl. 384—606** **13 Claims**

1. A lubrication system for the lubrication of a bearing mounted on

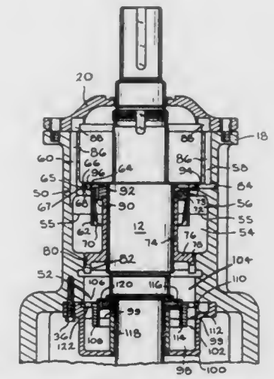
a rotatable vertical shaft, comprising:

a reservoir for holding a quantity of lubricant,

means for withdrawing lubricant from said reservoir,

said withdrawing means including a rotor connected to the shaft, a stator encircling said rotor and extending axially into said reservoir,

a first passageway for communicating lubricant from said reservoir to said bearing,



a second passageway for returning lubricant from said bearing to said reservoir,

whereby said stator minimizes vortexing and churning of the lubricant in said reservoir during rotation of said rotor.

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**5,051,008**

**AUTOMATIC GAP ADJUSTING MECHANISM**

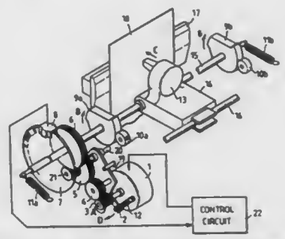
**Yoshito Honda, and Takashi Suzuki, both of Fujisawa, Japan, assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Mar. 23, 1990, Ser. No. 498,173**

**Claims priority, application Japan, Mar. 4, 1989, 1-81582**

**Int. Cl.[5] B41J** *11/20*

**U.S. Cl. 400—59** **3 Claims**




1. In an automatic gap adjusting mechanism which presses a print head against a platen having a printing paper mounted thereon, and thereafter moves back said print head away from said platen thereby to adjust the gap between said platen and said print head,

said automatic gap adjusting mechanism comprising:

a carriage having said print head mounted thereon;

a drive source for generating forward and backward rotational drive forces,

a planet gear coupled with said drive source,

a sun gear coupled with said drive source, through said planet gear, and,

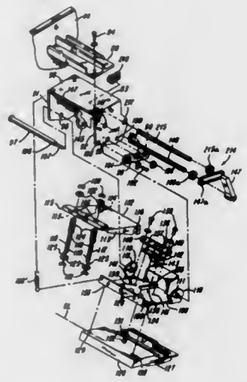
a rotatable shaft carrying a cam mechanism and coupled to said sun gear for supporting said carriage so as to drive said carriage in the direction toward said platen by means of a cam mechanism,

a bias means for providing said bias force to said planet gear so that said planet gear maintains engagement with said drive source in a power transmission state.

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5,051,009
**PRINTHEAD MOUNT & CASSETTE LOCK IN A THERMAL PRINTER**
Ikuzo Sugiura, Sagamihara, Japan; Mitsuo Uchimura, Numazu, Japan; Koulchi Kawamura, Mishima, Japan, assignors to Monarch Marking Systems, Inc., Dayton, Ohio
Division of Ser. No. 885,886, Jul. 15, 1986, Pat. No. 4,776,714.
This application Aug. 15, 1988, Ser. No. 232,207
Int. Cl.[5] B41J *2/32*
U.S. Cl. 400—120 6 Claims

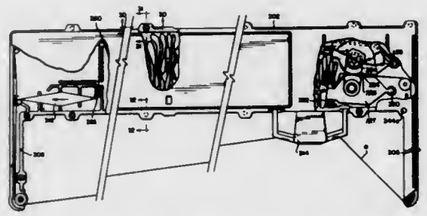


1. A printer, comprising: a thermographic print head and a platen cooperable with the print head, a print head support plate for mounting the print head, a print head mounting plate, means for releasably securing the print head support plate to the print head mounting plate, a pressure plate spaced from the print head mounting plate, means for pivotally mounting the print head mounting plate, means for pivotally mounting the pressure plate, means for urging the print head mounting plate and the pressure plate relatively away from each other, and a cam for moving the pressure plate toward the print head mounting plate to cause the urging means to move the print head mounting plate, the print head support plate and the print head toward the platen.

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5,051,010
**PRINTER AND CARTRIDGE ASSEMBLY THEREFOR**
Fred O. Stephens; Frank A. Ellis, both of Waynesboro, Va.
Division of Ser. No. 400,001, Aug. 29, 1989. This application Jul. 17, 1990, Ser. No. 553,731
Int. Cl.[5] B41J *32/00*
U.S. Cl. 400—194 11 Claims

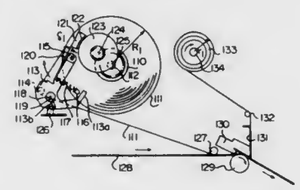
1. A ribbon cartridge for a printer comprising:
a housing including an elongated body having ribbon exit and entrance arms adjacent opposite ends and spaced one from the other;
a ribbon disposed in said housing and extending between said entrance and exit arms;
means carried by said housing for pulling said ribbon in one direction from said housing through said exit arm to said entrance arm and into said housing;
manually operable means coupled to said pulling means for rotation in one rotary direction to pull said ribbon in said one direction;
one-way clutch means interconnecting said manually operable means and said pulling means for preventing movement of said ribbon in said opposite direction upon rotation of said manual means in the opposite rotary direction; and
said housing including upper and lower covers substantially coextensive with said housing, one of said covers including means defining a plurality of slots spaced one from the



other along the edge of said one cover, the other of said covers including a plurality of pins extending therefrom for reception in the slots, said slots being elongated in the direction of elongation of said body a distance greater than their width whereby, upon reception of said pins in said slots in an interference fit, the registering slots and pins provide tight tolerances in the transverse direction and loose tolerances in the longitudinal direction.

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5,051,011
**THERMAL PRINTER WITH SHUTTER RIBBON END DETECTOR**
Mitsuyoshi Satoh, and Genji Oshino, both of Shibata, Japan, assignors to Tohoku Ricoh Co., Ltd., Miyagi, Japan
Filed Nov. 13, 1989, Ser. No. 436,553
Claims priority, application Japan, Dec. 29, 1988, 63-171242[U]; Dec. 29, 1988, 63-334837; Dec. 29, 1988, 63-334838
Int. Cl.[5] B41J *33/40*
U.S. Cl. 400—219 5 Claims

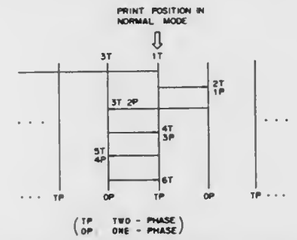


1. A printer having a print ribbon end detecting mechanism comprising:
a supply core;
a print ribbon which is wound onto the supply core;
a paper which is put together with the print ribbon supplied from the supply core;
a print head which is mounted facing a platen and prints on the paper by using the print ribbon when the paper put together with the print ribbon passes between the print head and the platen;
a take-up core which, after printing by the print head, takes up the print ribbon by pulling it off the paper;
a tension member which is in contact with the print ribbon between the supply core and the take-up core and biases the print ribbon in a direction to give tension and which can be rotated in its retracted direction by a ribbon feed force against a biasing force by the tension member when the print ribbon having one end fastened to the supply core runs out;
a shutter member which .s supported by the tension member and maintained at a non-detecting position with the print ribbon when there is a print ribbon between the supply core and the take-up core and which can be moved to a detecting position when the print ribbon runs out; and
a sensor which operates by the shutter member moved to the detecting position, operates with the tension member rotated in the retracted direction, and detects a ribbon end.



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5,051,012
**CARRIAGE POSITIONING FOR MULTIPLE IMPACT PRINTING**
Mutsuo Fukuoka, Yokkaichi, and Norio Kobayashi, Nogoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jun. 23, 1989, Ser. No. 370,638
Claims priority, application Japan, Jun. 24, 1988, 63-157695
Int. Cl.[5] B41J *19/32*
U.S. Cl. 400—279 15 Claims

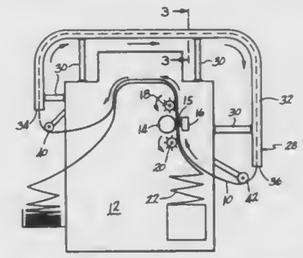



1. A printing device comprising input means for inputting character data, a print head member movable along a print line on a print sheet for executing print operations in response to the inputted character data, and print mode changing means for changing print modes between a normal print mode for executing a print operation in an original form of a character and at least a bold face print mode for executing a print operation in a bold face form, said printing device further comprises:
a step motor for reciprocating said print head member along the print line on the print sheet, said step motor being excited alternately in one or two phases in case that the bold-face print mode is designated by said print mode changing means;
first control means for controlling said step motor, when the bold-face print mode is designated by said print mode changing means, so as to place said print head member at a first stop position corresponding to a certain two-phase exciting position of said step motor for a predetermined period of time without printing, and then to move said print head member to a first print position corresponding to an one-phase exciting position adjacently located to said two-phase exciting position; and
second control means for controlling said print head member so as to execute a first print operation at said first print position.

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5,051,013
**MASKING FILM**
Albert C. Song, 125 Sunflower Ave., Stratford, Conn. 06497
Filed Aug. 24, 1989, Ser. No. 397,868
Int. Cl.[5] B41J *17/00*
U.S. Cl. 400—498 14 Claims

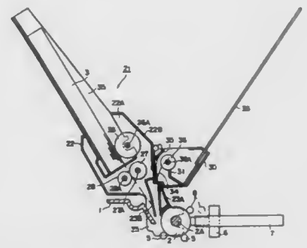
1. A masking film overlay for preventing unwanted printings on a face of multi-carboned paper stock material having a desired pitch which comprises:
a substantially planar piece of material suitable for placement over said face; and
said material being formed as an endless belt of material and having a plurality of sprocket holes along two opposed



edges for enabling it to be advanced with the stock material being printed.

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5,051,014
**SHEET FEEDING APPARATUS**
Kazuhiko Takagi, Nagoya, and Rikuo Sonoda, Nishikasugai, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jun. 19, 1990, Ser. No. 540,194
Claims priority, application Japan, Jun. 21, 1989, 1-158498
Int. Cl.[5] B41J *11/58*
U.S. Cl. 400—625 14 Claims

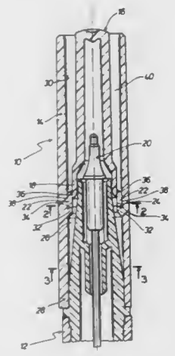


1. A sheet feeding apparatus, comprising:
a hopper member capable of storing a plurality of said cut-type sheets in a stacked state;
feeding means for feeding a topsheet of said stacked sheets in a predetermined direction, said feeding means comprises a feed roller member for feeding said topsheet adapted to be brought into contact with said topsheet and a pair of roller members provided on a downstream side of said feed roller for feeding said topsheet having been fed by said feed roller member therebetween;
another feeding means, provided at a downstream side of said feeding means in said predetermined direction, said another feeding means comprising a platen member provided downstream of said pair of roller members and at least one pinch roller member adapted to be brought into contact with said platen member for further feeding said top sheet having been fed by said feeding means; and
controlling means for controlling said feeding means and said another feeding means in such a manner that the amount of said sheet fed by said another feeding means becomes larger than that fed by said feeding means in case that both said feeding means and said another feeding means feed the sheet, while controlling said feeding means in case said another feeding means is not operated, so as to feed the topsheet a predetermined amount required for flattening any occurring sag between said pair of roller members and said platen member.

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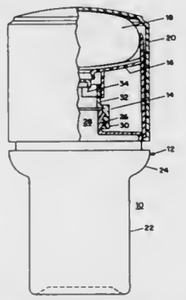
5,051,015
**PROTECTIVE CAP FOR A WRITING, DRAWING OR APPLICATOR IMPLEMENT**
Gerhard Moeck, Kirchebrenbach, Fed. Rep. of Germany, assignor to Schwan-Stabilo Schwanhäusser GmbH & Co., Nuremberg, Fed. Rep. of Germany
Filed Jun. 12, 1989, Ser. No. 364,820
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1988, 3821195
Int. Cl.[5] B43K 5/00
U.S. Cl. 401—202 3 Claims



1. A protective cap for an applicator implement comprising: an outer casing portion; a closure cap portion disposed in the outer casing portion and having a cover portion for sealingly covering an applicator member of said implement; and a plurality of ribs connecting the cap portion and the outer casing portion, the ribs being at least substantially uniformly distributed in the circumferential direction of the cap and defining through openings between them, the through openings between the cap portion and the casing portion providing a total cross-sectional area of at least 5 $mm^2$ in order to reduce the risk of asphyxiation if the cap is inadvertently swallowed and the ribs being provided in the region of the cover portion of the cap portion and being extended in the axial direction over the cover portion wherein a shoulder is integrally formed on the inward surface of the outer casing portion and wherein the ribs are integrally connected to said shoulder at a location spaced apart from said cover portion.

5,051,016
**DEODORANT ANTIPERSPIRANT CAP ACTIVATED WIDE-ROLL-ON**
John A. Bengston, Ridgefield, Conn., assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.
Continuation of Ser. No. 253,256, Oct. 4, 1988, abandoned.
Filed May 15, 1990, Ser. No. 523,834
Int. Cl.[5] A45D 34/04
U.S. Cl. 401—213 6 Claims

1. A roll-on fluid product dispenser, comprising:
a bottle member, including a fluid reservoir and a fluid outlet opening, said fluid outlet opening including a first valve member in fixed relation to said fluid reservoir, said bottle member having a non-circular cross-section in the region adjoining said fluid outlet opening:
an applicator assembly comprising a housing and an elongated roller mounted rotationally in a fixed position with respect to a socket portion of said housing, said socket portion including closed socket walls surrounding a lower portion of said roller and a single fluid inlet passage in communication with the interior of said socket portion and said fluid outlet opening of said bottle member, for receiving fluid therefrom and for conveying said fluid to said roller, said housing including a second valve member in fixed position with respect to said socket portion for operating in cooperation with the first valve member to form a seal between the fluid outlet opening and said single fluid inlet passage in a first position when said applicator assembly is moved toward said fluid reservoir, and to open said seal in a second position when said applicator assembly is moved away from said fluid reservoir,



said applicator assembly including a non-circular skirt surrounding said non-circular region of said bottle for guiding said movement toward and away from said bottle member, and said fluid inlet including an inlet member closely engaging said fluid outlet opening of said bottle to form a closed fluid passage, said inlet member and said fluid outlet opening including interacting ridges for limiting movement of said applicator assembly.

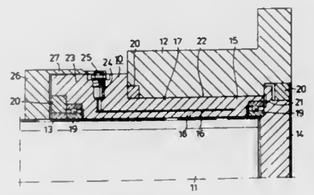
5,051,017
**CLEAR ROLL-ON BOTTLE**
Charles H. Yorks, Natick, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Feb. 5, 1991, Ser. No. 650,958
Int. Cl.[5] A45D 34/04
U.S. Cl. 401—209 17 Claims



1. A method of manufacturing a roll-on applicator containing a product, comprising the steps of:
providing an open top bottle having a necked down portion adjacent the upper end thereof to form a radially outwardly and upwardly extending inner wall surface connecting to an upwardly extending inner wall surface substantially parallel to the axis of the bottle and terminating in the upper edge surface at the bottle opening;
filling the bottle with the product;
locating a spherical rigid ball within the said inner wall surfaces of the bottle;
providing a circular retaining ring having a lower surface for mating engagement with the upper edge surface of the bottle opening;
locating the lower surface of the circular retaining ring in contact with the upper edge surface of the bottle opening; and
welding the circular retaining ring to the bottle opening upper edge by ultrasonic means.

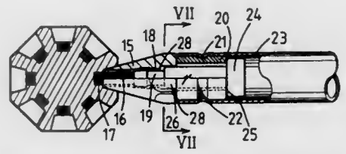


5,051,018
**COUPLING**
Bo Appell, and Curt Falk, both of Hudiksvall, Sweden, assignors to Metalform Safeset AB, Sweden
Filed Sep. 18, 1990, Ser. No. 584,006
Claims priority, application Sweden, Sep. 19, 1989, 8903077
Int. Cl.[5] F16D 9/00
U.S. Cl. 403—5 8 Claims



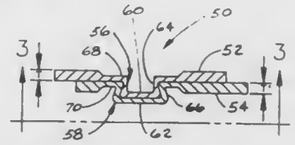
1. A coupling for coupling together a first shaft-like part and a second hub-like part that are coaxially and rotatably disposed with respect to one another, comprising:
a substantially cylindrical coupling member circumscribing said first part and disposed between said first and second parts, said coupling member including:
means for expanding said coupling member both radially inwardly and radially outwardly so as to respectively exert an inward force on said first part and an outward force on said second part, one of said inward force and said outward force being greater than the other of said inward force and said outward force such that said coupling member exerts a greater force on one of said first and second parts on the other of said parts;
means for detecting relative rotational motion between said coupling member and said one part and for eliminating said inward and outward forces when motion is detected, said coupling member being rotatable relative to said other part in response to a torque less than that necessary to produce said relative rotational motion.

5,051,019
**SPACE FRAME ASSEMBLY**
Rainer A. Kohl, Plot 76, Lynnwood Road, The Willows, Pretoria, Transvaal, South Africa
Filed Jan. 17, 1989, Ser. No. 297,390
Int. Cl.[5] F16B 7/00
U.S. Cl. 403—171 6 Claims



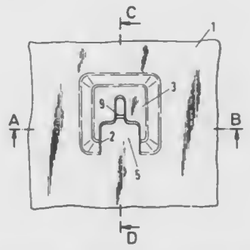
1. A space frame node and connector assembly in which the space frame node has a plurality of connection sockets provided therein in which each connection socket is composed of a female screw-threaded portion located at the distal end and an enlarged socket portion located at the proximal end, and in which the connector member for cooperation therewith has a male screw-threaded portion for cooperation with said female screw-threaded portion and an enlarged spigot portion adapted for co-operation with said enlarged socket portion to firmly anchor the connector member therein in order to provide an additional support to the conneetor member when lateral forces are applied thereto; the enlarged socket portion having complementary conical shape to the enlarged spigot portion of the connector member, and the included angle of the conical shape being less than the friction angle of which the coefficient of friction between the socket portion and the spigot portion is the tangent.

5,051,020
**LEAK PROOF JOINT**
Louis C. Schleicher, Rochester Hills, Mich., assignor to Tech-Line Engineering Co., Warren, Mich.
Filed Nov. 13, 1989, Ser. No. 434,980
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1989, P3941585
Int. Cl.[5] F16B 5/00
U.S. Cl. 403—282 19 Claims



1. A leak proof joint for fastening sheets of deformable material together, said joint comprising:
a first and second sheet of deformable material having overlapping portions with an initial first and second thickness in which are respectively formed first and second cups coaxially nested one within the other and aligned along a common axis, each of said cups having an open top, a central spot and a continuous wall region extending from the central spot to the respective open top, said overlapping portions further being plastically deformed into a substantially flat annular outboard region surrounding each cup open top to reduce the thickness of said sheets to sufficiently deform said cup wall regions into interlocking relation.

5,051,021
**SELECTIVELY SEPARABLE ANCHORING AND RETAINING MEANS**
Peter Pelz, Dieselweg 10, 8192 Geretsried, Fed. Rep. of Germany
Filed Oct. 10, 1990, Ser. No. 597,484
Int. Cl.[5] B25G 3/00
U.S. Cl. 403—406.1 8 Claims



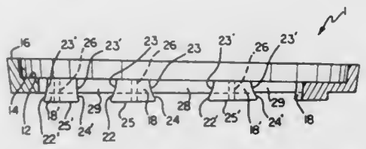
8. A configuration for securing a grasping device comprising:
a workpiece having a substantially planar surface and a an upwardly-arced surface;
said upwardly-arced surface having a tongue-shaped punched-in portion;

said tongue-shaped punched-in portion having a broad part and a narrow part;
said substantially planar surface having a tongue-shaped bottom part including an elevated bar-lock;
said bar-lock disposed transversely along said tongue-shaped bottom part, substantially at a juncture of said broad part and said narrow part of said tongue-shaped punched-in portion; and
said workpiece being adapted to secure a grasping device between said bar-lock and a back of said narrow part of said tongue-shaped punched-in portion.

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5,051,022
## MANHOLE COVER SUPPORT WITH TOPSIDE FLANGE AND INCLINED SEAT

Harold M. Bowman, 18867 N. Valley Dr., Fairview Park, Ohio 44126
Continuation-in-part of Ser. No. 362,277, Jun. 6, 1989, Pat. No. 4,969,770. This application Sep. 10, 1990, Ser. No. 579,828
The portion of the term of this patent subsequent to Nov. 13, 2007, has been disclaimed.
Int. Cl.[5] E02D *29/14*
U.S. Cl. 404—26 29 Claims



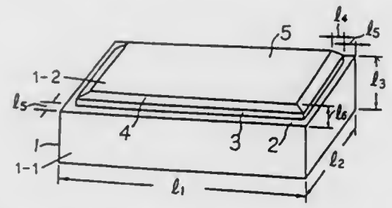
1. A manhole cover support for raising the grade of an existing manhole cover-receiving structure having an upwardly projecting keeper with a rim at its top, the cover support comprising:
a peripheral flange that at least substantially completely covers said rim,
the flange including a bottom, a seat for the manhole cover, and a cover keeper that rises from the outer periphery of the seat, said keeper having an upper edge,
the seat of said flange and the upper edge of the keeper being inclined for holding said manhole cover correspondingly inclined; and
means for anchoring the flange to a fixed part of the existing manhole structure.

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5,051,023
## FRACTURE-FREE LAYERED PAVING BLOCKS

Kinoto Yoshida, Kitamoto; Morizumi Fujii, Nagoya; Tokihiro Tsuda, Kitakatsushika; Shigeo Suda, Osato; Osamu Kodama, Kumagaya; Kazuro Kuroe, Chichibu; Takumi Tanikawa; Michihiko Nishimura, both of Tokoname, and Hideyuki Munakata, Tokyo, all of Japan, assignors to Chichibu Cement Co., Ltd., Tokyo; Inax Corp., Aichi and ILB Co., Ltd., Tokyo, all of, Japan
Division of Ser. No. 360,922, Mar. 14, 1989, Pat. No. 4,995,932.
This application Jan. 3, 1991, Ser. No. 637,049
Claims priority, application Japan, Jul. 14, 1987, 62-175450; Jul. 15, 1987, 62-176623; Jul. 15, 1987, 62-176624
Int. Cl.[5] E01C *5/00, 3/00;* E04C *1/00*
U.S. Cl. 404—39 14 Claims

1. A paving block having a structure comprising a block substrate consisting essentially of inorganic hydraulic cement and aggregate, and a solid top layer bonded to the upper surface of the block substrate, wherein the top layer is selected from a cured cement mortar layer containing fine aggregate firmly bonded to the substrate by its self-adhesive property and a tile layer firmly bonded to the substrate with adhesive cement mortar, the top layer being bonded to the block substrate with lateral margins of the substrate around the top layer of about 1 to 8 mm wide in horizontal distance from the peripheral edges of the substrate, the vertical distance from the surface of the top layer to the peripheral edge of the substrate being about 5 to 50 mm, the vertical distance between the peripheral edge and the bottom of the block substrate being in the range of about 3 cm to 20 cm, and the top layer being

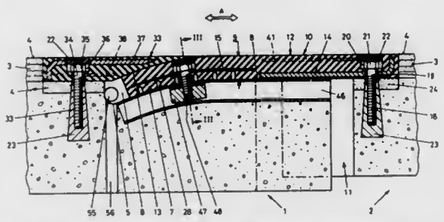


firmly bonded to the block substrate with squeeze-out deposits of cement mortar around the top layer and on the lateral margins; whereby a bonded interface between the top layer and the block substrate is substantially free of voids to increase bonding strength, and the void-free interface and squeeze-out deposits prevent the bonded interface from permeation of water.

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5,051,024
## SLIDING CLOSURES FOR ROADWAY EXPANSION JOINTS

Robert Warthmann, Steinmüri 2, CH-8604 Volketswil, Switzerland
Filed Feb. 6, 1990, Ser. No. 475,508
Claims priority, application Switzerland, Feb. 6, 1989, 402/89
Int. Cl.[5] E04B *1/68;* E01C *11/12*
U.S. Cl. 404—57 14 Claims



1. A sliding closure for an expansion joint between a first part of a roadway and a second part of a roadway wherein a variable gap is formed between the first part and the second part of the roadway, comprising:
a sliding face which is arranged on the first part of the roadway and has a curved segment;
a sliding plate anchored at one end on the second part of the roadway and resting at its other end on the curved segment of the sliding face in a slidable manner;
a tongue plate which is anchored on the first part of the roadway and overlaps the sliding plate;
the sliding plate comprising reinforced, flexible material resting flatly on the sliding face and having at its anchorage end a level section which is flush with the first and second parts of the roadway for bridging the gap between the first part and the second part of the roadway;
the sliding face extending essentially continuously over the width of the roadway and having a level segment which adjoins the curved segment tangentially and runs parallel to the roadway surface;
the reinforcement of the sliding plate comprising at least one level, flexural rigid steel plate cast into the plate material in the level section and a thinner, flexible plate adjoining the rigid plate; and
the sliding plate having at its anchorage end graduated

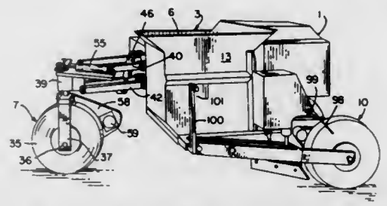


through-holes, through which it is bolted onto the second part of the roadway.

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5,051,025
## SLIP FORM PAVING MACHINE WITH OUTRIGGER WHEEL

Edward J. Taylor, Jr., Norco, Calif., assignor to M-B-W Inc., Slinger, Wis.
Filed May 24, 1990, Ser. No. 528,700
Int. Cl.[5] E01C *11/22*
U.S. Cl. 404—98 36 Claims

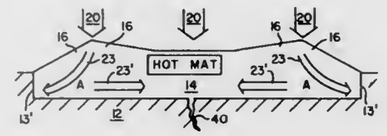


1. A slip form paving machine, comprising a main frame, front wheel means connected to the frame and mounted for movement about a vertical axis, means for pivoting said front wheel means about said axis to steer the machine, first rear wheel means mounted on the frame, second rear wheel means mounted on the frame and spaced laterally from said first rear wheel means, outrigger wheel means pivoted to the frame about a horizontal axis and spaced on the opposite side of said second rear wheel means from said first rear wheel means, a hopper on the frame to receive a paving material, a slip form carried by the frame and communicating with said hopper for discharging said material onto the ground in a desired configuration, and means for raising said second wheel means out of contact with the ground whereby the machine during paving is supported by said front wheel means, said first rear wheel means and said outrigger wheel means.

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5,051,026
## CONTROLLED DENSITY PAVING AND APPARATUS THEREFOR

Robert A. Sovik, Clifton Park, N.Y., assignor to AW-2R, Inc., Clifton Pk., N.Y.
Filed Aug. 15, 1990, Ser. No. 567,930
Int. Cl.[5] E01C *19/22, 11/28, 5/00*
U.S. Cl. 404—118 1 Claim

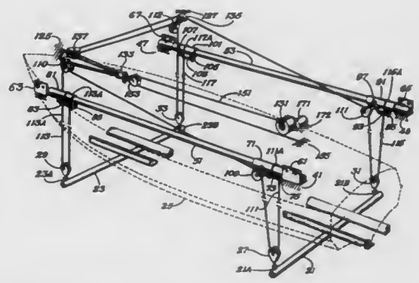



1. A controlled density paving method comprising the steps of:
determining, prior to laying down a plastic compressible mat of asphalt, a mat top surface morphology defined by a plurality of acute angular planes for defining one or more discrete surface planes for receiving thereon and confining a vector compacting force emanating from each discrete plane and transmitting the compacting forces to predetermined locations in the mat proximate and thereover a selected roadbed portion, said determining comprising calculating which provides mat quantities relative to desired control of density to be exercised,
depositing the mat on a roadbed portion while concurrently shaping it during said depositing, said shaping accomplished by selectively top dressing said roadbed portion as defined by the first step with calculated amounts of mat material so as to control the density of a mat resulting from simultaneously compacting the surface planes of the deposited mat; and
compacting said mat after said shaping in order to create and urge various directional vector forces from said surface planes, said forces effecting a controlled density increase in said mat in said predetermined locations as determined by the calculating of said first step and the depositing of said second step.

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5,051,027
## BOAT LIFT

George F. Horton, 3224 Parks Rd., Benton, La. 71006
Filed Dec. 15, 1989, Ser. No. 451,089
Int. Cl.[5] B63C *3/06*
U.S. Cl. 405—3 7 Claims



1. An apparatus for lifting and lowering a boat from and into the water, comprising:
support means for receiving and supporting a boat.
four lower pulleys adapted to be connected to said support means at spaced apart positions sufficient to allow a boat to be received between two pairs of said lower pulleys,
four winding means adapted to be supported above said four lower pulleys respectively each of which is adapted to be rotated in opposite directions,
a ratchet provided for each winding means, each ratchet comprising a ratchet wheel connected to its associated winding means and a pawl for normally allowing its ratchet wheel to rotate in only one direction
four upper pulleys adapted to be supported above said four lower pulleys respectively,
winch means adapted to be supported in place and adapted to be rotated in opposite directions,
four flexible cords, each cord having one end adapted to be connected to one of said winding means with each cord extending downward and around its associated lower pulley, upward around its associated upper pulley, and with its other end adapted to be coupled to said winch means whereby said winch means may raise said support means when rotated in one direction and lower said support means when rotated in an opposite direction,
each of said ratchets being controllable to allow its associated winding means to be rotated in opposite directions to wind or unwind its associated cord around or from its associated winding means to allow said support means to be leveled.

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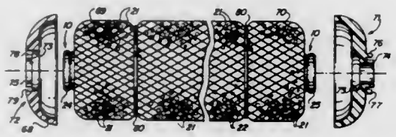


5,051,028

## METHOD AND APPARATUS FOR INSTALLATION OF DRAINAGE FIELD

Randall J. Houck; Michael H. Houck, and Harold J. Houck, all of P.O. Box 867, Pisgah Forest, N.C. 28768

Division of Ser. No. 164,255, Mar. 4, 1988, Pat. No. 5,015,123.
This application Mar. 11, 1991, Ser. No. 667,460
Int. Cl.[5] E02B *11/00*
U.S. Cl. 405—45 3 Claims



1. A method for installing a drainage field, such as for installing a nitrification field employed in a ground absorption sewage treatment and disposal system, comprising:

digging a trench of specified length and width;

placing a plurality of preassembled drainage line units in end-to-end fluid communicating relationship within said trench, each drainage unit comprising a horizontally extending perforated conduit, a loose aggregation of discrete, crush resistant, lightweight elements surrounding said conduit, a perforated sleeve member enveloping said aggregation and bounding the same relative to said conduit to define an aggregate-filled drainage cavity in fluid communication with the perforations of said conduit; said drainage cavity having predetermined minimum dimensions in directions outwardly of said conduit, and providing drainage characteristics similar to those of a cavity of the same dimensions constituted by an aggregation of rock or crushed stone;

interconnecting the ends of adjacent conduits of said units;

placing in the trench under some of the conduit units a preassembled conduit less unit in fluid communicating relationship to each other and to said conduit units, each conduitless unit comprising a loose aggregation of discrete, crush resistant, lightweight bodies of plastic material, and a tube of perforated material closed at its ends enveloping and bounding said aggregation; and

filling in said trench with soil and compacting the same to provide a required minimum spacing between the top of said units and the ground surface.

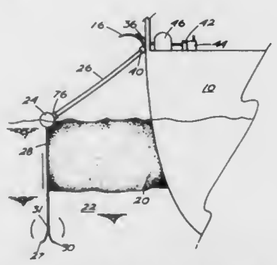
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5,051,029

## MARINE SPILL CONTAINMENT METHOD AND APPARATUS

Clifford G. Ecker, 7837 Wooddale Way, Citrus Heights, Calif. 95610

Filed Aug. 6, 1990, Ser. No. 563,314
Int. Cl.[5] E02B *15/06*
U.S. Cl. 405—68 5 Claims



1. A spill containment apparatus attachable around a structure positioned in water such as a ship, said apparatus for confining spilt material in the water to close proximity to the structure, said apparatus comprising:

a continuous loop of inflatable boom generally made of flexible oil impervious material, said inflatable boom in a deflated and folded condition having a small circumferential diameter, said inflatable boom in an inflated and unfolded condition having a large circumferential diameter substantially larger than said small circumferential diameter;

a plurality of bulkheads placed in said inflatable boom at spaced intervals dividing said inflatable boom into a plurality of compartments;

valve means placed in said bulkheads, said valve means having means for constricting after passage of a predetermined amount of pressurized air so as to prevent continuous escape of large volumes of air from a ruptured compartment of said inflatable boom;

a continuous loop of flexible curtain affixed to said inflatable boom, said flexible curtain generally made of oil impervious material and sized to hang downward a distance below said inflatable boom when in the water for preventing the passage of spilt material under said inflatable boom, said flexible curtain extending circumferentially aligned around said inflatable boom, said flexible curtain being sufficiently flexible to be placed in close proximity to said inflatable boom for storage in a relatively small space, said flexible curtain including means for providing and maintaining downward extended generally vertical positioning of said flexible curtain when in the water;

a plurality of elongated flexible boom support arms each having at least one conduit means therein, a first end of each of said support arms affixed to said inflatable boom at spaced intervals, a first end of each of said at least one conduit means being in communication with at least one of said compartments of said inflatable boom, a second end of each of said support arms anchored by the structure at spaced intervals around the structure, a second end of each of said at least one conduit means connected to a pressurized air source so as to be able to conduct pressurized air from said pressurized air source into said inflatable boom, said support arms having means for stiffening with said pressurized air for providing support to said inflatable boom outward away from the structure when said inflatable boom is deployed in the water;

a protective storage housing affixed to and around an exterior circumference of the structure, said protective storage housing sized for containing said inflatable boom in said deflated and folded condition with said attached flexible curtain in close proximity thereto, said protective storage housing further sized for containing therein said support arms;

single person actuation means for deploying said inflatable boom and said attached flexible curtain from within said protective storage housing into the water, said means for deploying including means for actuating the inflation of said inflatable boom and actuating said means for providing and maintaining downward extended generally vertical positioning of said flexible curtain, said means for deploying further including means for actuating said means for stiffening said support arms.

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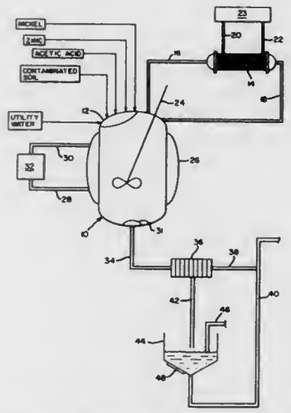
5,051,030

## CHEMICAL DETOXIFICATION PROCESS FOR TREATMENT OF SOILS CONTAMINATED WITH HALOGENATED ORGANIC COMPOUNDS

Anuj K. Saha, Marlton, N.J., and Amitava Sarkar, Downingtown, Pa., assignors to Roy F. Weston, Inc., West Chester, Pa.

Filed Jun. 5, 1990, Ser. No. 533,467
Int. Cl.[5] A62D *3/00;* B01J *8/00*
U.S. Cl. 405—128 20 Claims

1. A method of detoxifying a component of contaminated soil containing a halogenated organic compound comprising contacting said contaminated soil with atomic hydrogen in an amount effective to react with halogen contained in said compound and reacting the hydrogen with the halogenated organic compound to substitute said hydrogen for said halogen.



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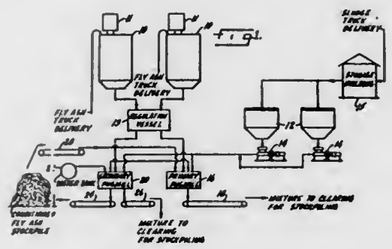


5,051,031

## METHOD OF TREATING MUNICIPAL SEWAGE SLUDGE AND PRODUCT PRODUCED THEREBY

Glenn O. Schumacher, Medina; LaVerne Weber, Elgin; Mitchell Nowicki, Naperville; Alan Dunbar, Plainfield, and Jeffrey M. Douglas, Palos Park, all of Ill., assignors to American Fly Ash Company, Naperville, Ill.

Continuation-in-part of Ser. No. 257,170, Oct. 12, 1989, abandoned, which is a continuation of Ser. No. 921,177, Oct. 20, 1986, abandoned. This application Sep. 11, 1989, Ser. No. 405,437
Int. Cl.[5] B09B *1/00*
U.S. Cl. 405—129 8 Claims



1. A method of stabilizing sewage sludge having substantial amounts of bacteria pathogens comprising:

placing an amount of said sludge in a pug mill;

adding to said sludge an amount of FBCR;

additive to said sludge an amount of fly ash;

mixing said sludge, FBCR, and fly ash to form a mixture, said amounts of FBCR and fly ash being sufficient to cause an exothermic chemical reaction, when mixed with said sludge,

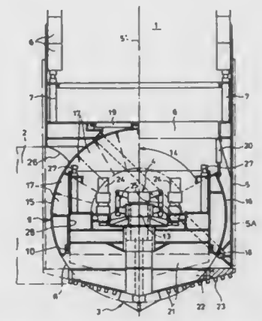
storing said mixture for a predetermined period of time at a predetermined temperature sufficient to cause said pathogens to be effectively eliminated from said mixture by heat generated by said exothermic chemical reaction.

5,051,032

## METHOD AND APPARATUS FOR CONTINUOUSLY EXCAVATING SHAFT AND TUNNEL

Tosbihiko Bessho, Tokyo; Toshimi Ino, Higashikurume; Kenichi Kaneko, Kokubunji; Toshiaki Uehara, Yachiyo, and Hiroyuki Ito, Kawana, all of Japan, assignors to Taisei Corporation and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 10, 1990, Ser. No. 580,273
Claims priority, application Japan, Dec. 13, 1989, 1-323076; Dec. 20, 1989, 1-330346
Int. Cl.[5] F21D *9/06*
U.S. Cl. 405—141 8 Claims



2. An apparatus for continuously excavating a shaft and a tunnel comprising a skin plate for excavation of the shaft on a shield frame and said shield frame having descending jacks for imparting propelling forces, a spherical seal body accommodated in a leading portion of said skin plate, supporting pivots on the skin plate for swingably supporting said spherical seal body about a horizontal line perpendicular to an axis of said skin plate, a peripheral seal member in the skin plate so as to contact an outer periphery of said seal body and a shield excavator supported by said seal body through an inner skin plate section.

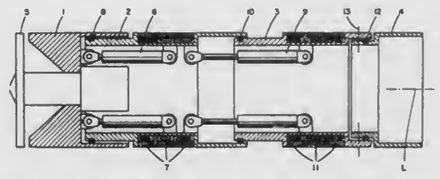
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5,051,033

## BRACING DEVICE FOR A SELF-ADVANCING SHIELD TUNNELLING MACHINE

Heinrich Grotenhofer, Krefeld, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengieberei mbH, Fed. Rep. of Germany

Filed Aug. 15, 1990, Ser. No. 567,637
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1989, 3928342
Int. Cl.[5] E21D *9/06*
U.S. Cl. 405—147 24 Claims



1. A self-advancing shield tunnelling machine, said machine comprising:

at least two bracing shields arranged along a common longitudinal axis, each of said bracing shields having a substantially closed circumferential wall construction;

means connecting said bracing shields to one another for

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causing relative movement between adjacent ones of said bracing shields; and

at least one elastic pressure hose bracing element positioned around the substantially closed circumferential wall construction of each of said bracing shields, said at least one bracing element of one of said bracing shields being independently inflatable of said at least one bracing element of an adjacent one of said bracing shields wherein the bracing shields can be radially braced with a tunnel wall independently of one another.

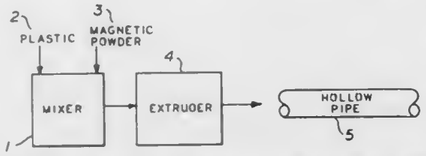
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**5,051,034**

## MAGNETICALLY DETECTABLE PLASTIC PIPE

**William L. Goodman, Mountain View, Calif., assignor to Gas Research Institute**

**Filed Dec. 18, 1989, Ser. No. 452,195**
**Int. Cl.[5] F16L** *1/00, 57/00*
**U.S. Cl. 405—157** **19 Claims**




1. A magnetically detectable plastic pipe for underground use, comprising:

hollow tubular plastic pipe having particles of electrically-nonconductive, highly-magnetized iron oxide or barium ferrite embedded in plastic and secured integrally with the wall of said pipe, said magnetized particles being of a size, shape, distribution and proportion such that the plastic pipe may be easily detected by magnetic detection apparatus on the surface when the plastic pipe is buried at three to five feet or more under the ground.

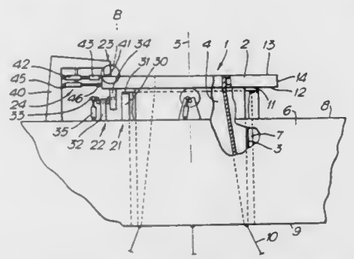
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**5,051,035**

## BEARING SYSTEM FOR A TURNING MEANS

**Torbjorn Glorstad, Fillan, Norway, assignor to Golar-Nor Offshore A/S, Trondheim, Norway**

**Filed May 23, 1990, Ser. No. 528,014**
**Claims priority, application Norway, May 24, 1989, 892078**
**Int. Cl.[5] B63B** *35/44*
**U.S. Cl. 405—195** **10 Claims**




1. A device for use on a vessel of the type used for drilling oil, said vessel including both a hull (**6**) having a hole (**7**) therethrough and a turntable (**1**) of the type having a horizontally extending circular flange portion (**2**) and a cylinder portion (**3**) extending co-axially relative to said flange portion (**2**) and projecting downwards from said flange portion (**2**) into said hole (**7**), said device comprising bearing means (**21, 22, 23, 24**), connected to said hull (**6**) and to said flange portion (**2**), for permitting mutual rotation of said turntable (**1**) and said hull (**6**) about a vertical axis (**5**) and for supporting said turntable (**1**) such that said turntable (**1**) may be moved in a vertical direction between a first lowered position and a second raised position, said bearing means (**21, 22, 23, 24**) having a first bearing means (**21**) for solely and rotatably carrying said turntable (**1**) when said turntable (**1**) is in said first position and further having a second bearing means (**22**) for solely and rotatably carrying said turntable (**1**) when said turntable (**1**) is in said second position.

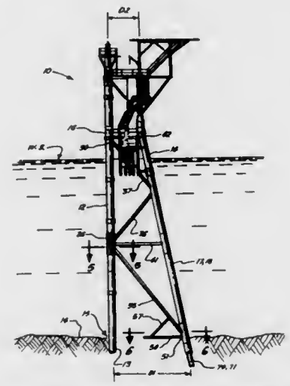
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**5,051,036**

## METHOD OF INSTALLING LEAN-TO WELL PROTECTOR

**Ricardo R. Gomez De Rosas, 3801 Timerview La., and Esteban O. Suarez, 3860 Timerview La, both of, Harvey, La. 70058**

**Continuation of Ser. No. 428,485, Oct. 31, 1989, abandoned, which is a continuation of Ser. No. 236,637, Aug. 25, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 503,134**
**Int. Cl.[5] E02D** *5/00*
**U.S. Cl. 405—227** **6 Claims**



1. A method of installing an offshore oil/gas well with a mobile drilling rig having a lifting device thereon that is transported to an offshore well site, comprising the steps of:

a) installing an upstanding conductor pipe with the drilling rig at the well site in a first well drilling position;

b) transporting a jacket truss to the well site using a floating barge-like vessel, the truss including a pair of elongated hollow legs;

c) preliminarily installing drive piles in each leg of the jacket truss;

d) lifting the jacket truss from the barge using the lifting device on the drilling rig and wherein the drilling rig remains in said first well drilling position;

e) positioning the jacket truss adjacent the conductor pipe using the drilling rig and its lifting device in said first position;

f) securing the jacket truss to the conductor pipe using one or more removable clamps each spaced substantially above the sea bed; and

g) securing the jacket legs to the sea bed by driving the drive piles with the mobile drilling rig.

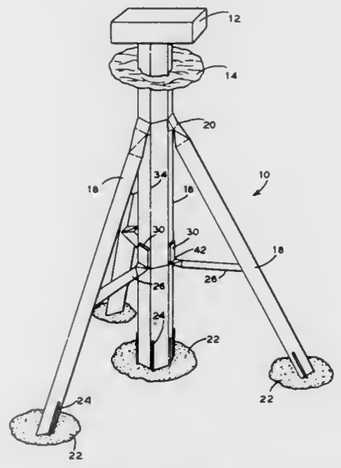


**5,051,037**

## TOWER WITH FOLDING BRACES FOR FIXED OFFSHORE PLATFORM

**James A. Haney, Bellaire, Tex., and Stafford J. Menard, Houma, La., assignors to McDermott International, Inc., New Orleans, La.**

**Filed Sep. 10, 1990, Ser. No. 579,510**
**Int. Cl.[5] E02B** *17/02*
**U.S. Cl. 405—227** **15 Claims**




1. An offshore structure comprising:

a) an elongated central tower extending from the mudline to above the waterline, said tower configured to terminate slightly above said mudline, thereby forming a gap between said tower and said mudline, and comprising skirt piles to anchor said tower to said mudline across said gap;

b) a plurality of perimeter braces each pivotally connected to said tower, said braces extending to said mudline where they are anchored in place;

c) areas alongside said central tower configured to accept said braces therein, said tower and said recessed braces forming a unitary bundle of nearly uniform crosssection when thusly assembled; and,

d) operating means for pivoting said braces from a bundled position generally parallel to said tower to an unbundled position at an angle to said tower.

11. A method of installing an offshore structure comprising the steps of:

a) fabricating, on land, a structure comprising a central tower and at least three perimeter braces that are pivotally secured to said tower and which extend beyond the end of said tower;

b) positioning, on land and prior to loading, said braces alongside said tower thereby forming a single bundled structure having a nearly uniform cross-section along its bundled length;

c) loading said bundled structure onto a launch barge and supporting said structure on said barge upon rows of launch ways positioned to support repetitive portions of said structure along its uniform cross-sectional length;

d) transporting said structure to the installation site;

e) removing said bundled structure from said barge by lifting or launching said structure from said rows of launch ways;

f) unbundling said structure and pivoting said braces outward away from said central tower; and,

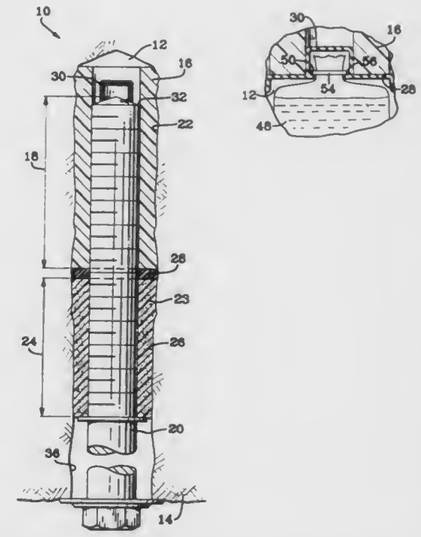
g) installing and securing said structure to the ocean floor.

**5,051,038**

## BARRIER PLUG FOR DYNAMIC ROCK STABILIZING FIXTURE

**Clyde R. Smith, Pittsburgh, Pa., and Clifford A. McCartney, Salem, Va., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed Apr. 6, 1990, Ser. No. 505,398**
**Int. Cl.[5] E21D** *21/02*
**U.S. Cl. 405—261** **34 Claims**




1. An apparatus comprising:

bolt means for insertion into a bore formed in a geological structure, the bore having an outer circumferential wall;

sleeve means for securing a first axial portion of the bolt means to a first portion of the circumferential wall;

grout means for securing a second axial portion of the bolt means to a second portion of the circumferential wall; and

substantially disk shaped plug means for limiting a passage of the grout means between the first axial portion of the bolt means and the first portion of the circumferential wall wherein said plug means further comprises a

retainer means for suspendingly retaining a grout container in the bore prior to insertion of the bolt means into the bore.

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**5,051,039**

## HYDRAULIC STEEL MINE PROP

**Martha-Catharina Heiliger, Hochkoppel 11, D 5166 Kreuzau-Untermaubach, Fed. Rep. of Germany**

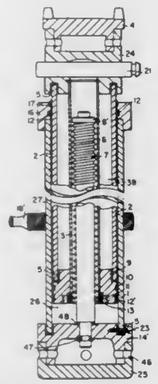
**PCT No. PCT/DE89/00436, § 371 Date Mar. 2, 1990, § 102(e) Date Mar. 2, 1990, PCT Pub. No. WO90/00217, PCT Pub. Date Jan. 11, 1990**
**PCT Filed Jul. 1, 1989, Ser. No. 490,653**
**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1988, 8808519**
**Int. Cl.[5] E21D** *15/44*
**U.S. Cl. 405—290** **28 Claims**

1. A hydraulic steel prop for mines, comprising a first prop section and a second prop section, one of said first and second prop sections having a prop foot (**14, 14'**, **25**) while the other of said first said second prop sections has a prop head (**4, 24**), said

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first and second prop sections having an outer cylindrical tube (1) and an inner cylindrical tube (2) slidingly received in said outer cylindrical tube (1), one of said cylindrical tubes having a foot end secured to said prop foot, a first seal between said foot end and said prop foot, the other of said cylindrical tubes having a head end secured to said prop head, a second seal between said head end and said prop head, a guide collar (16) surrounding said outer cylindrical tube for guiding said inner cylindrical tube in said outer cylindrical tube, a piston (9) secured to said inner cylindrical tube for guiding said inner cylindrical tube inside said outer cylindrical tube, a third seal (10) between said piston and said outer cylindrical tube for sealing a compression chamber (26) in said outer cylindrical tube, a first tension member (3) interconnecting said prop head and said piston (9, 9') for taking up axial tension loads, a second



tension member (7, 7') arranged coaxially inside said cylindrical tubes and slidably passing through said piston, means (47) securing a fixed end of said second tension member (7, 7') to said prop foot (14, 14', 25), a stop (8) at a free end of said second tension member (7, 7'), a compression spring (6) coaxially arranged around said second tension member (7, 7'), said compression spring (6) having one spring end bearing against said stop (8) and another spring end bearing against a support means (11, 40) for taking up an axial force tending to compress said compression spring, whereby said compression spring (6) has a biasing force tending to displace said piston (9) toward said prop foot, a setting and withdrawal valve (21) in said steel prop, and flow conduit means connecting said setting and withdrawal valve (21) to said compression chamber (26) through one of said prop head and said prop foot.

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**5,051,040**

**FLUIDIZED BED COMBUSTION SYSTEM THAT IS CONTROLLABLE UNDER PRESSURE**

**Raimund Croonenbrock, Engelskirchen; Horst Müller, Bergneustadt; Hubert Steven, Gummersbach, and Bernd Sudau, Stade, all of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany**

**Filed May 4, 1990, Ser. No. 518,914**

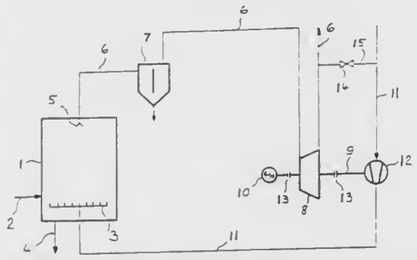
**Int. Cl.[5] B65G *53/46***

**U.S. Cl. 406—63** **8 Claims**

1. In a fluidized bed combustion system that is controllable under pressure and includes a combustion chamber, a flue gas line leading therefrom in which is disposed a dust separator, and an air compressor that is disposed in a line for air for combustion and is connected on the same shaft as an expansion turbine that is disposed in said flue gas line, with at least one controllable return line, for returning a cooled portion of flue gas to said combustion chamber, branching off from said flue gas line downstream of said dust separator, the improvement wherein:

said combustion chamber is free of heat exchangers and heat-transfer surfaces; and

means are provided to control said flue gas return line as a function of the flue gas temperature that exists where said return line branches off, with said flue gas return line



returning cooled flue gas to said combustion chamber via a feed mechanism for air for combustion into which said line for air for combustion opens, with said flue gas being cooled via expansion in said expansion turbine, which is connected on the same shaft as an electrical machine, and/or via heat exchange means.

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**5,051,041**

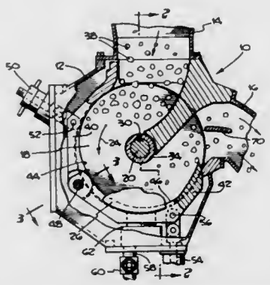
**MULTIPLE-CHOKE APPARATUS FOR TRANSPORTING AND METERING PARTICULATE MATERIAL**

**Donald Firth, Devon, England, assignor to Stamet, Inc., Santa Monica, Calif.**

**Continuation-in-part of Ser. No. 488,314, Mar. 5, 1990, Pat. No. 4,988,239. This application Jan. 11, 1991, Ser. No. 640,284**

**Int. Cl.[5] B65G *31/04***

**U.S. Cl. 406—99** **14 Claims**



1. An apparatus for transporting particulate material under ambient conditions comprising:

a housing having an inlet, an outlet and a duct between said inlet and outlet, said duct being formed between two opposed friction drive walls movable relative to said housing from said inlet towards said outlet and one or more stationary walls fixed relative to said pump housing with respect to movement between said inlet and said outlet, said friction drive walls having a greater surface area for contacting said material than said stationary walls;

first choke means for compacting to bridge said particulate material after introduction into said inlet, said first choke means including a convergence of said friction drive walls and said stationary walls to provide a first portion of said duct having a cross-sectional area which is less than the cross-sectional area of said inlet;

second choke means for disturbing the relationship of said particulate material after said particulate material passes through said first choke means said second choke means



including a divergence of said friction drive walls and said stationary walls to provide a second portion of said duct having a cross-sectional area which is greater than the cross-sectional area of said first portion of said duct, but less than the cross-sectional area of said inlet.

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**5,051,042**

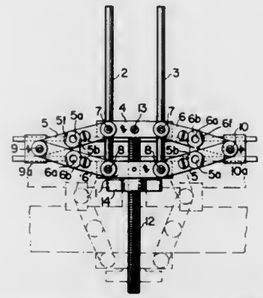
**DUAL DOWELLING JIG**

**Jeremy H. Gibson, Eastlake, Ohio, assignor to Leichtung, Inc., Cleveland, Ohio**

**Filed Mar. 16, 1990, Ser. No. 494,557**

**Int. Cl.[5] B23B *49/04***

**U.S. Cl. 408—72 R** **10 Claims**



1. A dual dowelling jig comprising a first clamp body, guide means extending therefrom, a second clamp body mounted on the guide means to move toward and from the first body, means for moving said at least one clamp body toward the other, a pair of first rigid links connected to the clamp bodies, a pair of second rigid links likewise connected to the clamp bodies, each pair of links including a first and second link pivotally connected at their outer extremities at one end, and pivotally engaged with the clamp bodies at the other end, at points at their ends and at positions on the clamp body spaced from those of the first mentioned pair of links, drill guide openings in each link spaced equi-distantly from the pivotal connections of the extremities, movement of the clamp bodies toward and from one another causing movement of the drill guide openings in uniform paths to facilitate drilling aligned dowel holes in boards gripped by the clamp bodies.

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**5,051,043**

**SPOT WELD DRILL GUIDE**

**Max W. A. Spitznagel, 13207 Warren Ave., Los Angeles, Calif. 90066**

**Filed Nov. 28, 1989, Ser. No. 442,233**

**Int. Cl.[5] B23B *49/00***

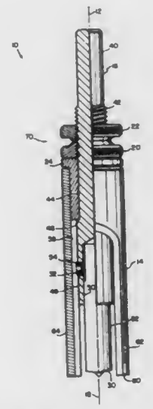
**U.S. Cl. 408—72 R** **8 Claims**

1. A spot weld drill guide comprising:

a guide housing disposed along a central axis with a reference position at one end thereof and a central bore extending therein;

a drill shaft disposed within the central bore of the guide housing with a distal end being adapted to receive and secure a drill bit and an opposite end extending beyond the guide housing for connection to a drill motor, the drill shaft having a flange disposed thereon between the distal and opposite ends thereof and the drill shaft being rotatable with respect to the guide housing and being axially slideable relative to the guide housing;

a locking assembly disposed to limit travel of the drill shaft relative to the guide housing such that a drill bit secured by the drill shaft extends to a selected distance beyond the reference position of the guide housing to limit the depth of a drilled hose relative to a surface being drilled, the locking assembly being fixedly secured to the drill shaft in axially spaced apart relationship to the flange with the axial spacing between the locking assembly and flange being adjustable to thereby enable adjustment of a range of axial motion between the drill shaft and the housing; and



a bearing secured to the guide housing in fixed relationship thereto, the bearing slideably and rotatably receiving the drill shaft and being axially constrained to slide between the flange and the locking assembly.

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**5,051,044**

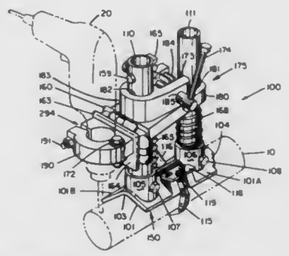
**PIPE DRILLING APPARATUS**

**Harold Allen, 874 Redondo Dr., Anaheim, Calif. 92801**

**Filed Mar. 5, 1990, Ser. No. 487,916**

**Int. Cl.[5] B23B *49/00***

**U.S. Cl. 408—92** **25 Claims**



1. A hole drilling apparatus comprising,

an angulated base member including a pair of plate means joined together to form an interior angle of less than 180°,

a pair of post members which extend from said base member,

a drill mounting plate member which is slidably mounted on said pair of post members,

resilient means mounted on at least one of said pair of post members intermediate said base member and said plate member to selectively urge relative motion therebetween,

first gear means mounted on said plate member,

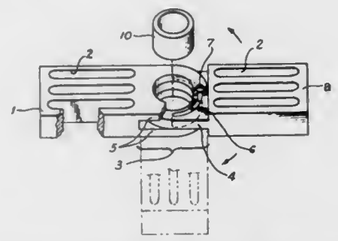
second gear means mounted on one of said post members and interactive with said first gear means whereby said plate member can be moved relative to said pair of post members, and

locking means disposed adjacent to said base member to selectively lock said apparatus to a workpiece.

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5,051,045
**AIRCRAFT REWORK DRILL BAR**
Michael E. Bonde, Apt. 14, 9826 Cedar St., Bellflower, Calif. 90706
Filed Feb. 11, 1991, Ser. No. 653,504
Int. Cl.[5] B23B *47/28*
U.S. Cl. 408—115 R 2 Claims



1. A tool for reworking unsatisfactory fasteners through providing control of the position and rectilinearity of the rework cutting tool bushing, comprising:
a first clamp member, elongated and of rectangular cross section having the groove of a tongue and groove joint at one end, and holddown means along the length of said first clamp member, stopping short both of the groove and of the far end of said first clamp member, said holddown means passing through the narrower dimension of the rectangle, and
a second clamp member, elongated and of rectangular cross section having the tongue of the tongue and groove joint at one end, and
holddown means along the length of said second clamp member stopping short both of the tongue and of the far end of said second clamp member, said holddown means passing through the narrower dimension of the rectangle, and
a drill bushing holder passing perpendicularly through the tongue and groove joint, having an outer diameter which locates both said first and second clamp member while permitting them to form various angles, and
a locking screw adjacent said drill bushing holder to clamp the tongue in the groove, and
a locking screw clearance arcuate slot in the tongue of said second clamp member through which said locking screw freely passes.

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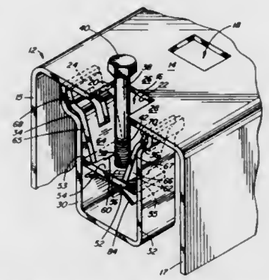
5,051,046
**SEMI TRAILER CONVERTIBLE FOR HAULING AUTOMOBILES**
David D. Oren, St. Paul, Minn., assignor to Transportation Concepts, Inc., Eagan, Minn.
Filed Dec. 14, 1989, Ser. No. 450,417
Int. Cl.[5] B60P *3/08*
U.S. Cl. 410—29.1 11 Claims



1. A system for raising and lowering a deck section of a trailer, comprising:
a) a trailer floor having cutout portions which are sized and configured to correspond to the shape and configuration of said deck section;
b) lift means for raising and lowering the deck section, said lift means being constructed and arranged for movement between a first position at which said deck section is lowered and flush with said trailer floor and a second position at which said lift means is vertically displaced from said trailer floor to support said deck section in a raised position, wherein a continuous flush surface is formed by said trailer floor and said deck section when said deck section is in its first position, and an upper and a lower storage level are formed when said deck section is in its second position; and
c) power means for selectively moving said lift means between the raised and lowered positions.

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5,051,047
**CLAMPING APPARATUS**
Karl Loncaric, 3080 Boucherie Road, Kelowna, British Columbia, Canada V1Z 2G7
Filed Mar. 27, 1990, Ser. No. 500,016
Int. Cl.[5] B63B *25/00*
U.S. Cl. 410—77 21 Claims

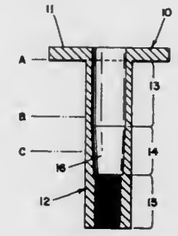


1. A clamping apparatus for clamping an object to a member having an opening therein and marginal portions defining in part said opening, the apparatus comprising:
a) a first member having a stop portion and a first threaded portion, said stop portion being engageable with said object;
b) a base member having first and second opposite side portions and a second threaded portion complementary to said first threaded portion and engageable with said first threaded portion;
c) first and second engaging members, each member having a distal end portion and a proximal end portion, said proximal end portions being pivotally connected to said first and second opposite side portions respectively, said distal end portions having respective contact surfaces for engaging said marginal portions to clamp said marginal portions between said stop portion and said contact surfaces; and
d) limiting means for limiting spreading of said first and second engaging members when under load such that an angle formed between said first and second engaging members is always less than 90 degrees and such that said first and second engaging members are under primarily compressive loading.

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5,051,048
**BLIND FASTENER**
Charles G. Maddox, Kent, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Aug. 31, 1987, Ser. No. 91,140
Int. Cl.[5] F16B *13/04*
U.S. Cl. 411—34 5 Claims

1. An integral one piece expansible hollow fastener for attachment to apertured work by operation from one side only of the work, said fastener comprising a tubular body, a head extending radially outwardly of said body at one end thereof, said tubular body having an upper longitudinally extending portion adjacent said head, said upper portion having a substantial uniform wall thickness, said tubular body having an intermediate longitudinally extending portion, said body having a lower end longitudinally extending portion opposite said head, said lower end portion having an internally threaded bore, and said wall thickness of said

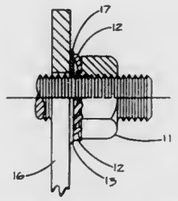


intermediate portion gently increasing in wall thickness from said upper portion to said lower end portion to define a long tapering bore whose wall portion is to be buckled radially outwardly against the apertured work by a pull-up tool insertable through the central bore of said tubular body.

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5,051,049
**STICKY NUT FASTENER**
Kevin P. Wills, 550 E. Main St., Barrington, Ill. 60010
Filed Oct. 29, 1990, Ser. No. 604,202
Int. Cl.[5] F16B *37/08, 39/00*
U.S. Cl. 411—258 15 Claims

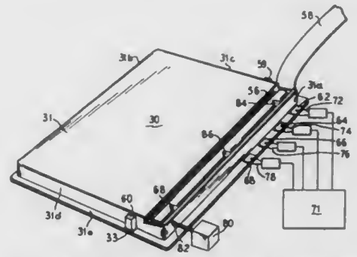


1. An elongated strip of adhesively attached preassembled lock washers and nut assemblies for attachment to threaded shanks of bolts for joining members together, the strip having a strip face provided with a peelable type adhesive, a series of lock nuts each having a star washer in unitary assembly therewith, an adhesive ring with opposite faces each provided with a peelable type adhesive material with one face being retainingly secured by the adhesive to said lock nut and with the other and opposite face being secured by the peelable adhesive to the peelable type adhesive on said strip, the lock nuts being adhesively secured in spaced relation to the strip along the length thereof in readiness for each lock nut to be peeled free of the strip for attachment to a member by the adhesive material for assembly therewith.

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5,051,050
**CARTRIDGE SYSTEM FOR TOOL INSERTION TYPE BINDING MACHINE**
Roger M. Scharer, Des Plaines, Ill., assignor to General Binding Corporation, Northbrook, Ill.
Filed Feb. 20, 1990, Ser. No. 481,857
Int. Cl.[5] B42B *5/10;* B42F *13/10*
U.S. Cl. 412—40 10 Claims

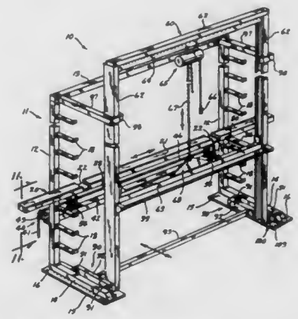
1. A cartridge and ring-type edge binder in combination for use in a binding machine which binds prepunched sheets with a curled-finger ring-type edge binder so as to form booklet-type assembly, wherein the combination includes:
at least one ring-type edge binder which comprises:
an elongated spine; and
a plurality of fingers spaced along said spine, each finger having one end integral with an edge of the spine and a free end which is resiliently biased toward and adjacent said spine; and
a cartridge for carrying a ring binder, said cartridge comprising:
means defining top, bottom, side, front and back walls;
means associated with said bottom wall defining a plurality of spaced rib-like members which extend between the front wall and the back wall, each of said rib-like members having a top surface and a finger receiving recess therebetween so that an edge binder can be carried in the cartridge with the spine resting on the top surface and fingers extending into said finger receiving recess; and



means associated with said cartridge so as to indicate the type of binder in the cartridge for use in instructing a machine in operation.

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5,051,051
**RACK AND DIE MOVER**
Dale L. Grabill, Sioux Rapids, Iowa, assignor to Simonsen Iron Works, Inc., Sioux Rapids, Iowa
Filed May 16, 1990, Ser. No. 524,001
Int. Cl.[5] B65G *1/04*
U.S. Cl. 414—282 5 Claims



1. A rack and die mover comprising:
a die rack including a generally inverted U-shaped die rack frame having foot members disposed on the lower portion of the die rack frame wherein the foot members are secured to mounting plates wherein the upper portion of the die rack frame is provided with outwardly extending stop arms which are equipped with flanges on their outboard end;
storage means attached to said frame for holding a plurality of elongated dies in a substantially horizontal orientation;
lateral translating means attached to said frame for moving dies thereon to one side of said frame, said lateral translat-

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ing means being movable between a first position substantially adjacent to said storage means and a second position wherein a large portion of said lateral translating means is to one side of said frame whereby a die disposed thereon can easily be transferred to or from a machine on which it is used; and

lift means operably attached to said frame for moving dies between positions on the storage means and a position on top of said lateral translating means when said lateral translating means is in said first position thereof; wherein, said left means comprises:

a generally inverted U-shaped lift frame whose upper portion is disposed within the said stop arms and flanges of said die rack frame and whose lower portion is further provided with trolley means mounted on guide flanges which are operatively disposed within the foot members and attached to the mounting plates of said die rack frame; arm means attached to said lift frame for selectively extending under said elongated dies; means attached to said lift frame and to said arm means for selectively raising or lowering said arm means; wherein, the trolley means are provided on said left means for selectively moving said lift frame between a first position wherein said arm means is disposed in the same vertical plane as portions of said storage means and said lateral translating means and a second position wherein said arm means can move up or down without contact with said lateral translating means or without contact with dies on said storage means.

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**5,051,052**

## AIRCRAFT TRACTOR WITHOUT TOW-BAR

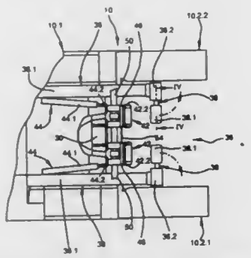
**Wilhelm Franken, Wesel; Dieter Pohé, Gelsenkirchen, and Lars T. Michaelsen, Herdecke, all of Fed. Rep. of Germany, assignors to Man Gutehoffnungshütte Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany**

**Filed Apr. 27, 1990, Ser. No. 515,111**

**Claims priority, application Fed. Rep. of Germany, Apr. 28, 1989, 89107730**

**Int. Cl.[5] B64F *1/22***

**U.S. Cl. 414—428** **6 Claims**



1. An aircraft tractor without tow-bar, comprising:

a divided chassis having a longitudinal axis including a front part and a rear part hingedly connected to said front part about a single transverse articulated axle and having motive means therefor, said rear part defining a recess for receiving the nose wheel landing gear of aircraft; a front transverse wheel axle mounted to said front part; a rear wheel axle mounted to said rear part via rear wheel journals, said rear wheel axle being substantially parallel to said single articulated axle; a lifting platform including motive means and connected to said front part and extending to a front end of said recess, said lifting platform having a support for supporting nose landing gear of the aircraft; first and second tow arms connected to the rear part of said divided chassis extending to a rear end of said recess, one of said first and second tow arms being provided on each side of said rear end of said recess, said tow arms each being moveable forwardly and from a longitudinal position to a transverse position, each reaching behind a nose wheel; first and second nose wheel holders connected to said divided chassis positioned at a front end of said chassis recess, above said lifting platform, and moveable in a rearward direction; rotation means connected to said lifting platform and connected to said front part for providing rotation between said platform and said front part about said longitudinal axis; and, displacement means connected to said tow arms and connected to said nose wheel holder for providing displacement of said tow arms and said nose wheel holders perpendicular to said longitudinal axis.

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**5,051,053**

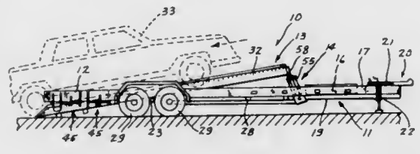
## TILTING BED TRAILER APPARATUS WITH PERIMETER FRAME

**Ronald L. Groeneweg, 232 6th Ave., Sioux Center, Iowa 51250**

**Filed May 17, 1990, Ser. No. 524,660**

**Int. Cl.[5] B60P *1/24***

**U.S. Cl. 414—483** **9 Claims**



1. A trailer apparatus comprising:

a perimeter frame, including a front, rear and intermediate portion thereof;

hitch means attached to the front of said perimeter frame for permitting attachment to a towing vehicle;

wheel means having at least one rotational axis attached to the intermediate portion of said perimeter frame for holding said perimeter frame up off the ground, said wheel means having a front edge and a rear edge where said wheel means contacts the ground;

a tilting bed disposed inside of said perimeter frame, said tilting bed having a front end and a rear end;

pivot means attached to said perimeter frame and said tilting bed for permitting said tilting bed to tilt about a fixed horizontal axis between a substantially horizontal transport position and a tilted loading position, said horizontal axis being located substantially midway between said front and rear edges and above said at least one rotational axis, whereby as cargo is loaded onto said tilting bed from the rear end toward the front end when the tilting bed is in said tilted loading position, said tilting bed will tilt from the tilted loading position to the substantially horizontal transport position approximately when the center of gravity of said cargo passes forward of said horizontal transport position approximately when the center of gravity of said cargo passes forward of said horizontal axis; and,

capturing means disposed on the rear of said perimeter frame for engaging said tilting bed and bearing the weight of the rear end of said tilting bed when the tilting bed is in the horizontal transport position.

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**5,051,054**

## ELEVATING TABLE AND TRANSPORTING METHOD

**Rudolf Wagner, Fontnas, and Hans Hirscher, Ragaz, both of Switzerland, assignors to Balzers Aktiengesellschaft, Balzers, Liechtenstein**

**Filed May 7, 1990, Ser. No. 519,845**

**Claims priority, application Fed. Rep. of Germany, May 8, 1989, 3915039**

**Int. Cl.[5] B65G *49/05*; H01L *21/68***

**U.S. Cl. 414—618** **26 Claims**

1. An elevating table for transporting a disk-shaped workpiece to be moved upwardly and downwardly within a vacuum installation for a surface treatment of the workpiece, the elevating table comprising

a housing;

a column mounted for upward and downward movement to the housing, the column having an axis;

a annular flange fixed to and extending outwardly around the column;

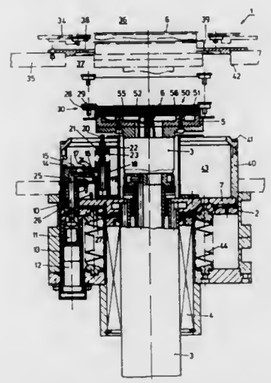
a plurality of first bearing bodies connected to and spaced around the flange;

a shaft rotatably mounted to each first bearing body for rotation about an axis extending parallel to the axis of the column;

a motor connected to each shaft for rotation of each shaft in each first bearing body;

a two-element jib connected to an upper end of each shaft and extending perpendicularly to the axis of each shaft, each jib having an inner element connected to the shaft





and an outer element connected at a pivot axis to the inner element, the pivot axis extending parallel the axis of the shaft;

a second bearing body connected to the outer element of each jib;

a rod mounted for axial movement to each second bearing body in a direction parallel to the axis of the shaft;

a spring engaged with each rod for biasing each rod upwardly with respect to each second bearing body;

a workpiece support extending upwardly from the column for carrying a disk-shaped workpiece thereon, the workpiece support being positioned above the flange and the flange extending outwardly of the workpiece support with respect to the column; and

a holding element at an upper end of each rod for extending upwardly and laterally of the workpiece support for engagement against an edge of a workpiece held on the workpiece support.

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**5,051,055**

## ARTICLE LIFTING DEVICE

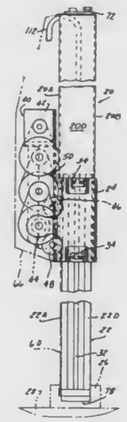
**John A. Blatt, 47 Willison, Grosse Pointe Shores, Mich. 48236, and David Crorey, Utica, Mich., assignors to John A. Blatt, Grosse Pointe Shores, Mich.**

**Filed Dec. 5, 1989, Ser. No. 446,157**

**Int. Cl.[5] B25J *11/00***

**U.S. Cl. 414—626** **5 Claims**

1. An article lifting device comprising first and second vertically elongate hollow tubular members each of a generally rectangular transverse cross section including a front wall, a rear wall and opposed side walls, the transverse dimensions of said second member being substantially less than the corresponding transverse dimensions of said first member, roller means mounted on the opposed side walls of one of said tubular members engaged with track means fixedly mounted on the opposed side walls of the other of said tubular members for guiding said second member in telescopic vertical movement within said first member, means defining an opening in the front wall of said first member adjacent the lower end thereof, a drive gear mounted on said first member for rotation about a horizontal drive axis parallel to and spaced forwardly from said front wall of first member, an upper and a lower idler roll mounted on said front wall of said first member for rotation about respective upper and lower idler axes parallel to and located respectively above and below said drive axis, said idler rolls being horizontally aligned with said opening, an elongate flexible drive belt having upper and lower end sections extending along the front wall of said second member and joined to each other by a bight portion projecting forwardly from said second member through said opening in said front wall of said



first member between said idler rolls and around said drive gear, said belt having teeth means on the rear side thereof meshed with said drive gear, means securing the opposite ends of said belt in tension to said front wall of said second member respectively adjacent the upper and lower ends of said second member, reversible drive means on said first member for driving said drive gear in rotation about said drive axis to drive said belt to shift said second member vertically relative to said first member, first mounting means for fixedly mounting said first member upon a support, second mounting means at the lower end of said second member for coupling an article to be lifted to said second member, and counterbalancing means coupled between the upper end of said first member and the lower end of said second member for counter balancing the weight of said second member.

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**5,051,056**

## PORTABLE BOAT JACKING AND ROTATING APPARATUS

**Robert R. Gibbons, and Dennis Fried, both of Bismarck, N. Dak., assignors to G. F. Equipment, Inc., Baldwin, N. Dak.**

**Filed Jan. 10, 1990, Ser. No. 463,131**

**Int. Cl.[5] B63C *13/00***

**U.S. Cl. 414—678** **25 Claims**

12. An apparatus for use in suspending a boat by its support eyes and rotating the boat about its longitudinal axis between its rear and front end, comprising:

(a) an upstanding rigid front end support member having a generally inverted U-shaped construction and defining a passageway through itself, and slidably carrying in controllable relation an outwardly extending adjustable front end connecting arm;

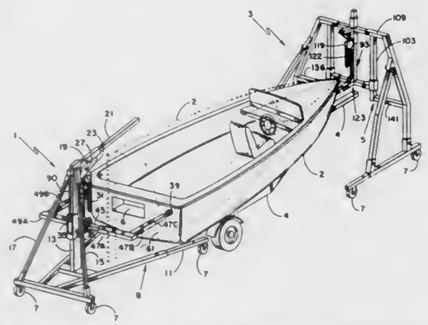
(b) an upstanding rigid rear end support member slidably

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carrying in controllable relation a boat rotating means, said boat rotating means having a pair of outwardly extending adjustable rear end connecting arms;

(c) said connecting arms each having freely rotatable end portions which are constructed and arranged to engage



the support eyes of the boat while remaining freely rotatable; and

(d) said support members and said rotating means being constructed and arranged to hoist, suspend and rotate the boat in either direction about its longitudinal axis.

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**5,051,057**

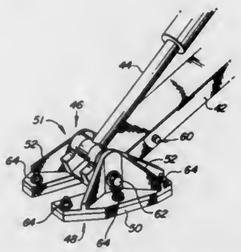
**LATCH FOR A REVERSIBLE STABILIZER FOOT**

**Dennis A. Kremer, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Mar. 27, 1990, Ser. No. 499,911**

**Int. Cl.[5] B60S *9/02***

**U.S. Cl. 414—685** **16 Claims**



1. A stabilizer leg for a backhoe, the leg comprising

a frame;

a reversible stabilizer foot pivotally mounted to the end of the frame, the stabilizer foot having a first ground contacting surface and a second ground contacting surface, both surfaces are adapted to engage the ground depending on the position of the stabilizer foot relative to the frame; and

a latch for holding the stabilizer foot in a first position where the first ground contacting surface engages the ground, the latch is mounted to the frame and is provided with a pin biassed outwardly from the frame by a spring, the pin contacting the stabilizer foot when the stabilizer foot is in its first position for holding the foot in the first position by the spring.

**5,051,058**

**APPARATUS FOR PALLETIZING STACKS OF PAPER SHEETS AND THE LIKE**

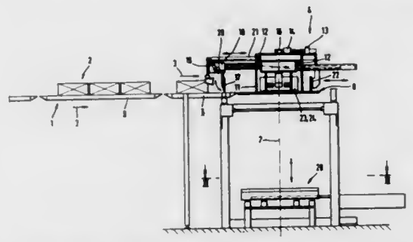
**Oskar Roth, Maihölzlistrasse 5, CH-5620 Zufikon, Switzerland**

**Continuation of Ser. No. 56,010, Jun. 1, 1987, abandoned. This application Sep. 5, 1989, Ser. No. 403,019**

**Claims priority, application Switzerland, Sep. 26, 1986, 3863/86**

**Int. Cl.[5] B65G *57/22***

**U.S. Cl. 414—789.1** **22 Claims**



11. Apparatus for palletizing stacks of sheets, comprising a table providing a substantially horizontal air cushion and having at least one plenum chamber therein movable to and from a predetermined position; means for transporting stacks to said table along a longitudinal feed path; means including pairs of longitudinal and transverse opposing movable stops, each stop selectively actuated toward and away from the opposite stop, for orienting stacks on said table; an elevator for pallets below said table, said elevator comprising means for rotating the pallet thereon about an axis which is normal to said table; means for moving said elevator between raised and lowered positions; and means for moving said chamber to and from said predetermined position at such intervals that the chamber is moved to said predetermined position preparatory to reception of one or more stacks from said transporting means and is moved from said predetermined position upon completed orientation of the stack or stacks thereon and while the elevator with a pallet thereon is maintained in said raised position so that the oriented stack or stacks descend onto the pallet.

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**5,051,059**

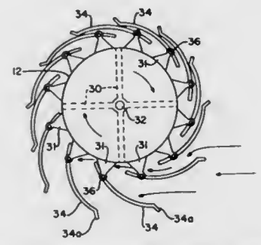
**FLUID POWERED ELECTRIC GENERATOR HAVING HINGED VANE ROTOR**

**T. Peter Rademacher, 5385 River Styx Rd., Medina, Ohio 44256**

**Filed Oct. 13, 1989, Ser. No. 421,350**

**Int. Cl.[5] B63H *1/34***

**U.S. Cl. 415—7** **8 Claims**



1. An improved fluid activated, hinged vane rotor which comprises:

a support means adapted to be positioned in a fluid stream, and including a fairing having smooth configuration to direct the fluid stream in connection therewith, which is characterized by:



a hinged vane current rotor carried by the support means and positioned in the fluid stream which consists of

a cylindrically shaped drum means to rotatably support the rotor at each end in the support means, on a rotational axis substantially perpendicular to the fluid stream, said drum means being capable of filling with water,

a plurality of overlapping vanes pivotally mounted to the drum wherein the pivotal mounting of the vanes is spaced from the outer surface of the drum so as to permit the flow of fluid, through the opening on said pivotal mounting and at a point on the vane defining a first and second leg of each vane, said first leg being movable from its folded overlapped relationship essentially parallel to the surface of the rotor into an open position relative to the surface of the rotor by said fluid stream, and said second leg simultaneously being movable in a direction opposite to that of said first leg and

a means to limit the pivotal relationship of each respective vane wherein the fluid acts in a counterbalancing relationship on the second leg of the vane from the pivotal mount so as to cushion the movement of each vane to its operative position,

and wherein the fluid stream is directed by the support means towards only about one half of the rotor, and

an electric generator and

a means to transmit the rotational energy from the rotor to the electric generator.

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**5,051,060**

**GAS FRICTION PUMP HAVING AN OUTLET-SIDE HELICAL STAGE**

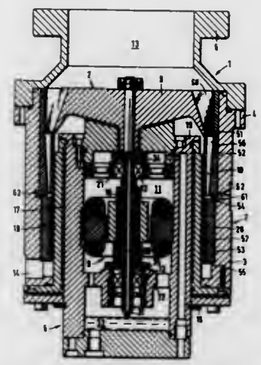
**Frank Fleischmann, Bergheim-Glessen; Hans-Peter Kabelitz, Cologne; Hans Kriechel, Bornheim, and Martin Mühlhoff, Cologe, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany**

**Filed Jul. 19, 1990, Ser. No. 554,721**

**Claims priority, application European Pat. Off., Jul. 20, 1989, 89113318.3**

**Int. Cl.[5] F01D *1/00***

**U.S. Cl. 415—90** **8 Claims**



1. In a gas friction pump having an inlet arranged to be coupled to a vessel to be evacuated; an outlet and an outlet-side pumping stage formed of a helical gas pumping channel, the improvement comprising a scavenging gas inlet means for exposing the channel to a scavenging gas; said scavenging gas inlet means including means defining an inlet port and means defining an annular collecting channel circumferentially surrounding the gas pumping channel and communicating with said inlet port.

**5,051,061**

**MULTI-CYLINDER STEAM TURBINE SET**

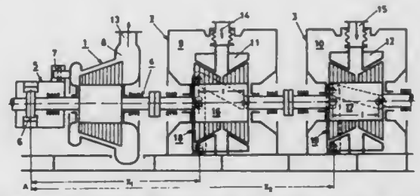
**Pierre Meylan, Neuenhof, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland**

**Filed Dec. 6, 1989, Ser. No. 446,688**

**Claims priority, application Switzerland, Dec. 23, 1988, 4780/88**

**Int. Cl.[5] F01D *3/00***

**U.S. Cl. 415—104** **1 Claim**



1. A multi-cylinder steam turbine set with a high pressure partial turbine, a medium pressure partial turbine (1) and at least one low pressure partial turbine (2, 3), which low pressure partial turbines have a double casing design with an outer casing (9, 10) each and an inner casing (11, 12) each supported within the outer casing and supported so that it can be displaced relative to it, the rotors (16, 17) of all the partial turbines (1, 2, 3) being seated on common shafting (4) which is axially located in both directions at a thrust bearing (6) located between the medium pressure partial turbine (1) and the high pressure partial turbine, wherein a lever pair (18, 19) is provided on each side of the inner casing (11, 12) to maintain the axial clearances between the stator blading and the rotor blading of the partial turbines (2, 3) at operating temperature, the lever pair having a two-arm displacement lever (20, 27) and a single-arm expansion lever (22, 29) hinged on the displacement lever by means of a pin (24), the other end of the displacement lever (20, 27) being hinged on a bearing block (21, 28) fixed relative to the outer casing and the other end of the expansion lever (22, 29) being hinged on a bearing trunnion (23) fixed relative to the inner casing, ann wherein the displacement lever (20, 27) engages between its hinge points on the bearing block (21, 28) and on the expansion lever (22) by means of an elongated hole (25) with a bearing trunnion (26) fixed relative to the inner casing, the axis of this bearing trunnion subdividing the displacement lever into its lever arms (a, b), thus generating a displacement $\Delta x$, by means of the expansion lever (22, 29) and the displacement lever (20, 27), of the inner casing (11, 12) relative to the bearing blocks (21, 28) fixed relative to the outer casing by means of an extension $\Delta l$, caused by the thermal expansion occurring in operation, of the distance (1) between the two bearing trunnions (23, 26) fixed relative to the inner casings.

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**5,051,062**

**RADIAL FLOW TURBINE ROTOR**

**Akio Ando, Kawasaki; Masae Nakanishi, Chigasaki; Syozi Okada, Yokohama, and Koichi Inoue, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Sep. 28, 1982, Ser. No. 425,998**

**Claims priority, application Japan, Nov. 25, 1981, 56-187839**

**The portion of the term of this patent subsequent to Jun. 24, 2004, has been disclaimed.**

**Int. Cl.[5] F01D *5/28***

**U.S. Cl. 416—241 B** **8 Claims**

1. A radial flow turbine rotor made of ceramics, comprising:

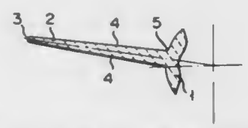
a trunconical shaft; and

a plurality of blades provided on the periphery of the shaft and inclined to the axis of the shaft, the center line of the cross section of each blade, taken along a line perpendicular to the axis of the shaft, passing the axis of the shaft, the profile of the cross section between the tip and base of the

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blade being straight, the tip of the blade being 1.2 to 2.0 mm thick, and the blade growing thicker from the tip toward the base, wherein the root radius of the base of



each blade is 0.5 mm to 2.0 mm and wherein the center line of the cross section of each blade are inclined at 0.5° to 3.0° to the line perpendicular to the axis of the shaft.

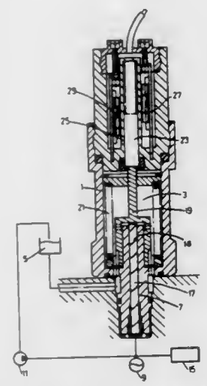
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**5,051,063**

**LEAKAGE-TYPE PRESSURE REGULATOR FOR A HYDRAULIC CIRCUIT**

**Joël Vasselet, Chelles, France, assignor to Bendix Europe Services Techniques, Drancy, France**

**Filed May 24, 1990, Ser. No. 528,648**
**Claims priority, application France, Jun. 14, 1989, 89 07859**
**Int. Cl.[5] F04B** *49/02*
**U.S. Cl. 417—44** **8 Claims**



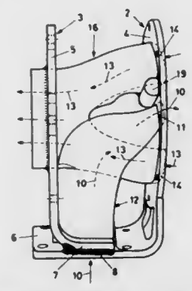
1. A leakage-type pressure regulator for a hydraulic circuit including at least one reservoir of fluid under low pressure, a pump and an accumulator of fluid under high pressure, said leakage-type pressure regulator comprising: a pusher projecting from a chamber connected to said reservoir; at least one sensor detecting the position of a magnetic core sliding under the effect of said pusher in the vicinity of said sensor, so as to control the functioning of said pump; a piston sliding non-sealingly in a bore communicating with said chamber and with an outlet of said accumulator, so as to establish a leakage of the hydraulic fluid between said accumulator and said reservoir, said piston having one end bearing on said pusher; and an elastic means opposing the effect of the pressure of said fluid in said accumulator on said piston, in such a way that the position of said core is a function of the pressure of said fluid in said accumulator.

**5,051,064**

**LIGHTWEIGHT GAS CASING**

**Bernd Konert, Bad Säckingen, Fed. Rep. of Germany, assignor to Compres AG, Baden, Switzerland**

**Filed Jan. 3, 1990, Ser. No. 460,664**
**Claims priority, application Switzerland, Jan. 26, 1989, 250/89**
**Int. Cl.[5] F04F** *11;* **F02B** *33/00;* **F02C** *3/02*
**U.S. Cl. 417—64** **4 Claims**



1. A lightweight gas casing of a pressure-wave supercharger, having a rotor casing flange for connecting the gas casing to a rotor casing of the pressure-wave supercharger, an exit gas flange for connecting the gas casing to an exit gas line of an internal combustion engine and an exhaust gas flange for connecting the gas casing to an exhaust line, each of said flanges being rigidly connected to one another to form a force-absorbing part of the gas casing, said rotor casing flange and said exit gas flange forming two limbs of a first flange plate, said two limbs being at right angles to one another, said exhaust gas flange forming part of a second flange plate, said second flange plate having two rod-shaped limbs at right angles to the exhaust gas flange, wherein the second flange plate is welded along the outer edges of said rod-shaped limbs to two side edges of the exit gas flange, said gas casing further including a hot gas channel for feeding exit gas from said engine into a rotor of the pressure-wave supercharger and an exhaust gas channel for moving the expanded and cooled exit gas from the rotor into the exhaust line, said channels being constructed as sheet metal pressed parts, said hot gas channel and said exhaust gas channel each being welded together out of two deep-drawn half-shells, said hot gas channel being welded at one end to said exit gas flange and at an opposite end to said rotor casing flange, said exhaust gas channel being welded at one end to said exhaust flange and at an opposite end to said rotor casing flange, said hot gas channel being split into two branches starting at a one-piece through-hole in said exit gas flange and ending in two through-holes in the rotor casing flange, said exhaust gas channel being split into two branches starting at a one-piece through-hole in said exhaust gas flange and ending in two through-holes in the rotor casing flange.

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**5,051,065**

**POWER TRANSMISSION**

**Lowell D. Hansen, Jackson, Miss., assignor to Vickers, Incorporated, Troy, Mich.**

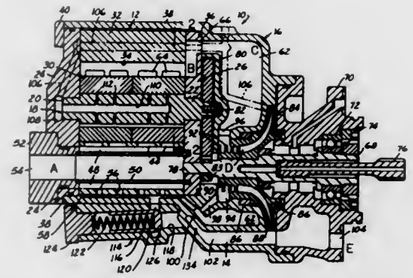
**Division of Ser. No. 334,502, Apr. 7, 1989, Pat. No. 4,925,372. This application Feb. 20, 1990, Ser. No. 481,611**
**Int. Cl.[5] F04B** *23/14*
**U.S. Cl. 417—201** **11 Claims**

1. A two-stage fuel pump for aircraft turbine engine applications comprising:

a housing having a pump drive shaft mounted for rotation about its axis within said housing,

a vane pump stage that includes a rotor coupled to said shaft for continuous rotation within said housing and having a plurality of radially extending peripheral slots, a plurality of vanes individually slidably disposed in said slots, means forming a cam ring within said housing surrounding said rotor and having a radially inwardly directed surface forming a vane track and at least one fluid pressure cavity between said surface and said rotor, and vane pump fluid inlet means and outlet means in said housing,

a centrifugal pump stage that includes an impeller coupled to said shaft for continuous rotation within said housing and having a circumferential array of radially extending passages formed therein, and means for continuously feeding fluid from said vane pump outlet means to the radially inner ends of said impeller passages,



a pump fluid inlet in said housing including means for feeding inlet fluid to said vane pump fluid inlet means, and

a pump fluid outlet including means in said housing for receiving outlet fluid at elevated pressure from the radially outer ends of said impeller passages,

both said vane pump stage and said centrifugal pump stage being operable in all phases of operation of said two-stage pump to pump fluid from said fluid inlet through said vane pump and then through said centrifugal pump to said fluid outlet such that all fluid pumped by said two-stage pump passes through both said vane pump stage and said centrifugal pump stage.

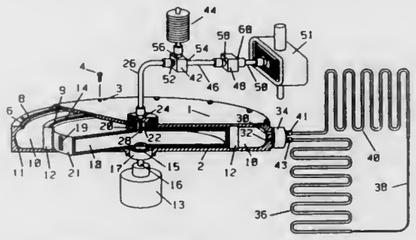
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**5,051,066**

**GAS COMPRESSION BY PULSE AMPLIFICATION**

**Timothy S. Lucas, 4614 River Hill Ct., Glen Allen, Va. 23060**

**Continuation of Ser. No. 342,977, Sep. 25, 1989, abandoned. This application Apr. 30, 1990, Ser. No. 516,708**
**Int. Cl.[5] F04F** *11/00*
**U.S. Cl. 417—207** **12 Claims**



1. A compressor comprising:

a chamber having an inlet and an outlet for receiving a medium to be compressed;

an electromagnetic energy source for generating electromagnetic energy in said chamber, said electromagnetic energy having at least one localized region; and

sweeping means for causing said at least one localized region of said electromagnetic energy to travel through the medium in said chamber at substantially the speed of sound so that at least one high pressure travelling pulse is created in said chamber, said at least one high pressure travelling pulse causing the medium to be alternately compressed and rarefied.

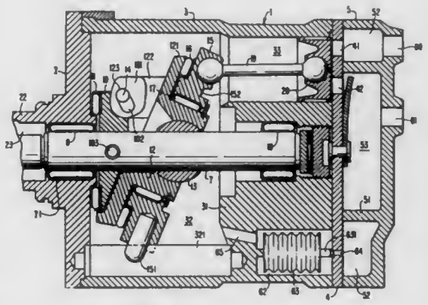
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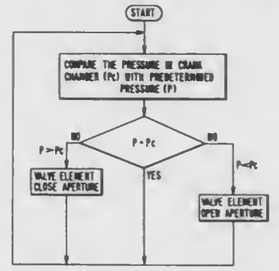
**5,051,067**

**RECIPROCATING PISTON COMPRESSOR WITH VARIABLE CAPACITY MACHANISM**

**Kiyoshi Terauchi, Gunma, Japan, assignor to Sanden Corporation, Japan**

**Continuation of Ser. No. 171,170, Mar. 21, 1988, abandoned, which is a continuation of Ser. No. 918,068, Oct. 14, 1986, abandoned. This application Nov. 7, 1989, Ser. No. 433,417**
**Claims priority, application Japan, Oct. 11, 1985, 60-226395**
**Int. Cl.[5] F04B** *1/26;* **F01B** *3/00, 13/04*
**U.S. Cl. 417—222 R** **20 Claims**






1. A reciprocating piston compressor capable of operating at variable capacity, said compressor comprising:

a compressor housing having a crank chamber and a suction chamber connected by a passageway;

a cylinder block disposed in said compressor housing having a plurality of cylinders disposed therein;

a plurality of pistons, each of said pistons being reciprocatingly disposed in a respective one of said cylinders;

a rotatable drive shaft rotatably supported in said compressor housing;

a rotor fixed on said drive shaft;

a member hingedly connected to said rotor and whose angle may be varied relative to said drive shaft to vary the capacity of the compressor;

coupling means for coupling said member to said pistons to transform the rotational motion of said rotor to reciprocating motion of said pistons; and

capacity varying means for varying the capacity of the compressor by maintaining the crank chamber pressure at substantially a predetermined level and utilizing changes in the suction chamber pressure to vary the angle of said member, said capacity varying means comprising valve means disposed within said cylinder block and within said passageway for opening and closing said passageway, and control means for controlling the operation of said valve

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means to maintain the crank chamber pressure at substantially the predetermined level;

wherein said control means comprises pressure detecting means for detecting the pressure in said crank chamber and comparing means for comparing the detected pressure with a predetermined pressure to open said passageway when the crank chamber pressure exceeds the predetermined pressure and to close said passageway when the predetermined pressure exceeds the crank chamber pressure.

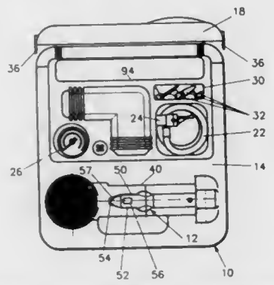
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**5,051,068**

## COMPRESSORS FOR VEHICLE TIRES

**Alex Y. K. Wong, Room 501, Hong Kong Worsted Mills Industrial Building, 31-39 Wo Tong Tsui Street, Kwai Chung, N.T., Hong Kong**

**Filed Aug. 15, 1990, Ser. No. 567,963**
**Int. Cl.[5] F04B** *21/00, 17/00*
**U.S. Cl. 417—234** **6 Claims**



1. A portable compressor of the type comprising:
an electrically powered compressor,
an air hose for the compressor,
a case housing said compressor and air hose,
a portable light fixture comprising a hand-held portion and a head portion housing the light, said hand-held portion including an outlet socket,
a length of electrical cords permanently attached to said light fixture, said length having a free end,
an electrical plug attached to said free end of said cord for connection to the electrical system of a vehicle to draw power therefrom, and
a hinged arm attached to said case and capable of folding flat within the case when the case is to be shut and being upstanding to support said portable light fixture, said hinged arm having a free end comprising an electrical plug capable of being received in said socket of the portable light fixture both to fix and support said light fixture on the end of said arm and to electrically connect said light fixture to said case.

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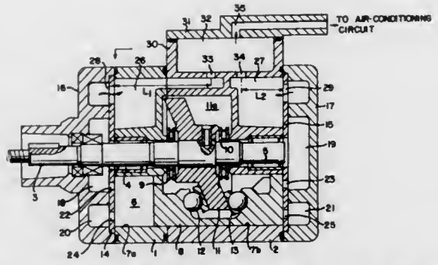
**5,051,069**

## MULTI-CYLINDER REFRIGERANT GAS COMPRESSOR WITH A MUFFLING ARRANGEMENT

**Hayato Ikeda; Tetsuo Yoshida, and Shinji Mizuno, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan**

**Continuation-in-part of Ser. No. 191,018, May 6, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 486,167**
**Claims priority, application Japan, May 13, 1987, 62-070173**
**Int. Cl.[5] F04B** *1/12*
**U.S. Cl. 417—269** **5 Claims**

1. A multi-cylinder swash plate type compressor adapted for use in compressing a refrigerant gas of a cooling circuit comprising:
cylinder block means comprising a front and a rear cylinder block of an unequal axial length having therein a swash-plate operated reciprocative piston mechanism having five front cylinder bores and five rear cylinder bores in alignment with said front cylinder bores, for sucking, compressing and discharging a refrigerant gas;
housing means arranged so as to close axial front and rear ends of the cylinder block means and having therein front and rear suction chambers for the refrigerant gas before compression and front and rear discharge members for the refrigerant gas after compression, said front and rear suction and discharge chambers being in communication with the reciprocative piston mechanism of the cylinder block means;
front and rear delivery passage means arranged in said cylinder block means for delivering first and second flows of the refrigerant in alignment with each other but in opposite directions, after compression from said front and rear discharge chambers of said housing means, respectively;
wall means extending from said cylinder block means, for defining therein a muffling chamber for deadening pulsation in the pressure of the first and second flows of the refrigerant gas after compression delivered from said front and rear delivery passage means of said cylinder block means;
connecting flange means mounted on said wall means for




closing said muffling chamber and sending the compressed refrigerant gas from said muffling chamber to the cooling circuit;
first communicating means for permitting the first flow of the refrigerant gas after compression to enter the muffling chamber from said front delivery passage means;
second communicating means for permitting the second flow of the refrigerant gas after compression to enter the muffling chamber from rear delivery passage means; and
means for causing a differential of pressure between the first and second flows of the compressed refrigerant gas before said first and second flows of the refrigerant gas into said muffling chamber, comprising an arrangement wherein said front delivery passage means has a first refrigerant passage length $L_1$ axially extending between said front discharge chamber and said first communicating means, and said rear delivery passage means has a second refrigerant passage length $L_2$ axially extending between said rear discharge chamber and said communicating means, said first refrigerant passage length $L_1$ and said second refrigerant passage length $L_2$ being selected on condition that $L_1/L_2$ is equal to or larger than 1.5, to thereby further deaden pulsation in the pressure of the refrigerant gas in said muffling chamber.

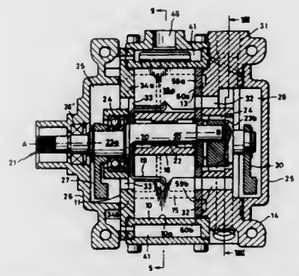


**5,051,070**

## VARIABLE CAPACITY COMPRESSOR

**Kenichi Kazaoka, Nagoya, and Hiroshi Okazaki, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Dec. 29, 1989, Ser. No. 459,378**
**Claims priority, application Japan, Dec. 29, 1988, 53-331387; Dec. 29, 1988, 53-331389**
**Int. Cl.[5] F04B** *49/00;* **F04C** *18/00*
**U.S. Cl. 417—295** **8 Claims**



1. A compressor including a cylinder having a cylindrical inner wall surface; a rotor supported by eccentric means in said cylinder; at least a pair of vanes carried at diametrically opposed positions by said rotor to extend in a radial direction, each of said vanes having a radially outward edge which is in sliding contact with said inner wall surface of said cylinder; end plates secured to said cylinder at axially opposite ends thereof; link means extending between said rotor and at least one of said end plates so that said rotor conducts an orbital movement in response to a rotation of said eccentric means, whereby each vane moves in an angular range of less than 360°; said inner wall surface of the cylinder, said vanes, and axially facing surfaces of said end plates defining working chambers whose volumes are variable in response to said orbital movement of said rotor; inlet and outlet port means for said working chambers; at least one bypass port provided on at least one of said axially facing surfaces and is situated adjacent a respective one of said vanes; and stroke changing means for adjusting the circumferential positional relationship between said at least one bypass port and said angular range of movement of said respective vane, so that in one position of adjustment said at least one bypass port lies outside of said angular range of movement of said respective vane, and in another position of adjustment said at least one bypass port overlaps said angular range of movement of said respective vane to change the effective stroke of the compressor.

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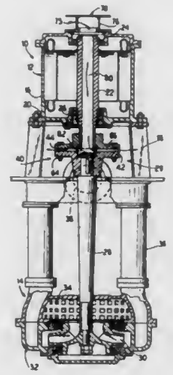
**5,051,071**

## HEAT DISSIPATING COUPLING FOR ROTARY SHAFTS

**Walter D. Haentjens, R.D. #1, Box 566, Sugarloaf, Pa. 18249**

**Filed Feb. 9, 1990, Ser. No. 477,477**
**Int. Cl.[5] F04B** *39/06*
**U.S. Cl. 417—373** **7 Claims**

1. A device of the type including a rotary shaft assembly having first and second shaft sections, said device comprising the following:
coupling means for securing said first and second shaft sections together for co-rotation;
air circulation means, associated with said coupling means, for circulating air through said coupling means and inhibiting heat transfer between said first and second shaft sections;
wherein said first shaft section includes hollow shaft means for supplying air to said air circulation means;
wherein said hollow shaft means includes an intake end remote from said coupling means, and a discharge end adjacent said coupling means;
said coupling means includes a first coupling half secured to said first shaft section, and a second coupling half secured to said second shaft section and to said first coupling half;
said air circulation means comprises a plurality of ducts formed between said first and second coupling halves;
wherein ducts are formed by grooves in said first coupling half and by a planar surface of said second coupling half;



wherein said first coupling half includes an annular cylindrical depression at an inlet end of said ducts; and
said second coupling half includes an axial, cylindrical flange received in said depression, and having a plurality of radial passages therein corresponding in number and location to said ducts.

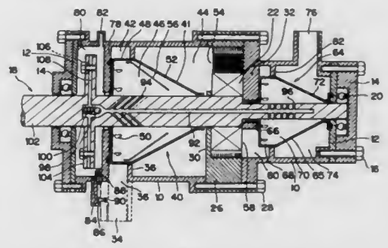
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**5,051,072**

## GAS REMOVABLE PUMP FOR LIQUID

**Hisashi Yano, Yokohama; Junsuke Yabumoto, Atsugi, and Akiharu Kitada, Kawasaki, all of Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, Japan**

**Filed Nov. 21, 1990, Ser. No. 616,645**
**Claims priority, application Japan, Nov. 27, 1989, 1-304592**
**Int. Cl.[5] F04B** *39/00*
**U.S. Cl. 417—435** **25 Claims**



1. A gas removable pump for liquid comprising:
a housing having an inlet for introducing a liquid thereinto and an outlet for feeding the liquid therefrom;
a drive shaft extending into said housing;
pump means disposed within said housing and secured to said shaft for co-rotation therewith, said pump means dividing in a liquid-tight manner the interior space of said housing into a suction side and a delivery side;
a chamber adapted to generate a vortical flow of the liquid introduced therein to thereby separate gas-rich liquid which gathers in an axially central portion of said cham-

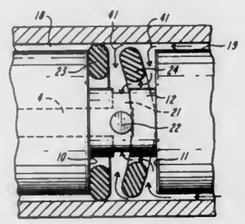
VOL 1130 ISS 4 SE 24 1991 UMI



ber, said chamber being confined within at least one of said suction side and said delivery side of said housing;
means for collecting the liquid containing little gaseous contaminants and provided in said at least one of said suction side and said delivery side which is a space radially outward of said chamber;
means for introducing the liquid from said inlet into said chamber; and
means for discharging said gas-rich liquid outside of said housing.

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**5,051,073**
**BICYCLE PUMP**
Dixon Newbold, 765 Allen's Ave., Providence, R.I. 02905
Filed May 31, 1989, Ser. No. 359,124
Int. Cl.[5] F04B *21/04*
U.S. Cl. 417—526 15 Claims

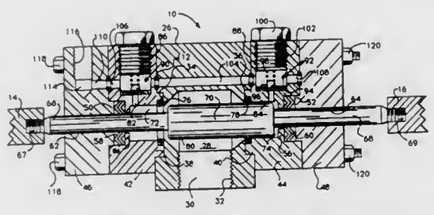


1. An air pump having a cylinder with an inner cylindrical surface and a piston positioned for reciprocal movement within the cylinder and defining a chamber on each side of the piston,
the piston having a tubular piston rod forming an air passage, a piston head with an annular channel formed in the head and an opening in the base of the channel in communication with the air passage,
a pair of O-rings seated in and coaxial with the base of the channel, the O-rings in a non-dynamic state normally engaging the inner surface of the cylinder to seal the chambers from the channel, and
stop means sandwiched between the O-rings that contacts the surface of each of the O-rings at a limited number of arcuate portions about the circumference equalling substantially less than 360 degrees and adapted on relative movement of the piston and cylinder to cause flexing of one of the O-rings about the stop means depending on the direction of the relative movement from contact with the inner surface whereby air may pass from one chamber through the channel into the opening.

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**5,051,074**
**BI-DIRECTIONAL RECIPROCATING PUMP MECHANISM**
Philip L. Cowan, 2302 Fir Grove Dr., Kingwood, Tex. 77339
Filed Feb. 13, 1990, Ser. No. 479,338
Int. Cl.[5] F04B *21/02*
U.S. Cl. 417—535 19 Claims

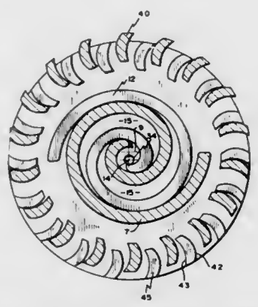
4. A reciprocating piston pump mechanism, comprising:
(a) pump body means forming fluid inlet means which is in communication with an axially elongated fluid inlet chamber, said axially elongated inlet chamber being axially aligned with a pair of opposed, spaced axially aligned piston cavities formed in said pump body means, having opposed piston openings in fluid receiving communication with said fluid inlet chamber, said pump body means defining opposed spaced axially aligned pump shaft passages at least one side thereof extending from one of said piston cavities and opening exteriorly of said pump body means;
(b) pump discharge means being formed by said pump body means and being in communication with each of said piston cavity means;
(c) means permitting undirectional flow of fluid pumped from said piston cavity means to said pump discharge means;
(d) piston means being disposed for reciprocation within said axially elongated inlet chamber and having opposed axially aligned pumping extremities disposed for pumping relation with respective one of said piston cavity means, said piston means defining an axial length such that at one extremity of its stroke one pumping extremity thereof



being disposed in sealed relation within one of said piston cavities and the opposite pumping extremity of said piston being disposed in unsealed relation with the opposite piston cavity;
(e) pump drive shaft means extending from at least one pumping extremity of said piston means through at least one piston cavity means and being in sealed relation with said pump body means, said pump drive shaft means projecting from at least one side of said pump body means and adapted for connection to the output drive shaft of the pump drive motor means.

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**5,051,075**
**GEARING SYSTEM HAVING INTERDIGITED TEETH WITH CONVEX AND CONCAVE SURFACE PORTIONS**
Niels O. Young, Boise, Id., assignor to Arthur D. Little, Inc., Cambridge, Mass.
Filed Feb. 20, 1990, Ser. No. 481,243
Int. Cl.[5] F01C *1/04*; F16D *3/04*
U.S. Cl. 418—55.3 9 Claims



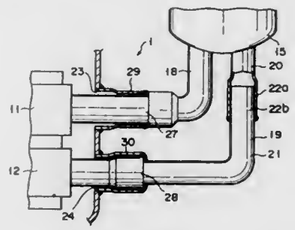
1. A gearing system for use in relative orbiting gear drive systems comprising:
a first gear plate which is rotatable about a first axis, said first gear plate including a plurality of axially extending teeth located on and circumferentially equally spaced about a first pitch circle;
a second gear plate which is rotatable about a second axis, parallel to and laterally spaced by a distance substantially equal to an orbit radius $R_{or}$ from said first axis, said second gear plate including a plurality of axially extending teeth



located on and circumferentially equally spaced about a second pitch circle;
said plurality of teeth on said first plate being arranged to be interdigited with the plurality of teeth on said second plate such that relative angular displacement of one gear plate relative to the other gear plate is prevented while an orbital movement of one gear plate relative to the other gear plate is accommodated;
each tooth on said first and second gear plates including an axially extending convex surface portion and an opposed axially extending concave surface portion such that any one pair of interdigitated teeth have a surface mesh with the convex surface portion of one tooth conforming to and engaging with the concave surface portion of the other tooth.

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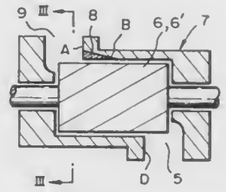
**5,051,076**
**TWO-CYLINDER-TYPE ROTARY COMPRESSOR SYSTEM HAVING IMPROVED SUCTION PIPE COUPLING STRUCTURE**
Kaoru Okoma, Fujinomiya, and Masashi Ohmura, Fuji, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 27, 1989, Ser. No. 427,478
Claims priority, application Japan, Oct. 31, 1988, 63-275585
Int. Cl.[5] F04B *25/00*; F04C *29/08*
U.S. Cl. 418—60 4 Claims



1. A rotary compressor comprising:
a sealed case having first and second housing portions;
a motor section arranged in the first housing portion of said sealed case and having a rotating shaft extending in the second housing portion;
a compression mechanism section arranged in the second housing portion of said sealed case and having first and second cylinders stacked on each other and first and second crack portions which are formed on said rotating shaft in said first and second cylinders, respectively;
an accumulator arranged outside said sealed case so as to substantially oppose an arrangement position of said motor section;
a first suction pipe for connecting said accumulator to said first cylinder of said compression mechanism section; and
a second suction pipe, arranged outwardly from said first suction pipe, for connecting said accumulator to said second cylinder of said compression mechanism section, to said second suction pipe having a first coupling pipe having one end coupled to said second cylinder, a second coupling pipe having one end coupled to said accumulator, and adjustment coupling portions for coupling the other end of each of said first and second coupling pipes so as to freely adjust positions thereof, said adjustment coupling portions including coupling portions allowing one of the other ends of said first and second coupling pipes to be inserted in the other of the other ends and allowing positional adjustment within a predetermined range while allowing a pressure seal to be provided between said first and second coupling pipes at all positions within said predetermined range;
wherein a through-hole formed in said sealed case through which one end of said first coupling pipe to be connected to said second cylinder is inserted in smaller than a through-hole formed in said sealed case through which said first suction pipe is inserted to thereby increase the strength of the sealed case against deformation and cracking due to permanent set upon welding.

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**5,051,077**
**SCREW COMPRESSOR**
Kiyoshi Yanagisawa; Mitsuru Maeda; Yoshiyuki Maruta, and Toshitsugu Sase, all of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan
Filed Dec. 5, 1989, Ser. No. 446,292
Claims priority, application Japan, Dec. 5, 1988, 63-306120
Int. Cl.[5] F04C *18/08, 2/08*
U.S. Cl. 418—201.1 8 Claims

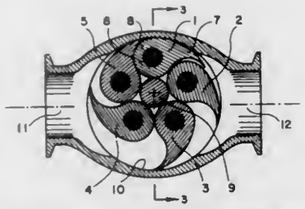


1. A screw compressor for compressing gas, said compressor comprising:
a casing having a first end portion defining a suction opening therethrough and a second end portion defining a discharge opening therethrough,
said casing also defining a generally tapered notch therein open to said discharge opening;
rotors rotatably supported within said casing, said rotors capable of forming at least one seal with said casing at seal lines defined between said rotors and said casing, and said rotors together defining at least one groove therein with said casing,
rotation of said rotors successively increasing and decreasing the volume of said at least one groove to effect a suction intake of gas through the suction opening of the casing and a compression of the suctioned gas within said casing, rotation of said rotors effecting an initial discharge of the compressed gas from one said groove through said discharge opening via said generally tapered notch beginning at a first predetermined point in the rotation of said rotors at which said seal lines become disposed directly over at least a part of said notch, and the rotation of said rotors subsequently effecting a complete discharge of the compressed gas from said one groove through said discharge opening beginning at a second predetermined point in the rotation of said rotors at which said seal lines are no longer disposed directly over any part of said notch so that compressed gas flowing to said discharge opening from said one groove does not flow through said notch, and
a volume ratio $\phi B/\phi A$ of the compressor being within a range of 70% to 90%,
wherein $\phi B$ corresponds to $V_{max}/VB$, $\phi A$ corresponds to $V_{max}/VA$, $V_{max}$ is the maximum volume of said one groove during rotation of said rotors, VB is the volume of said one groove at said first predetermined point in the rotation of said rotors, and VA is the volume of said one groove at said second predetermined point in the rotation of said rotors.

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5,051,078
**ROTARY PUMP-FLOWMETER**
Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005
Filed Jul. 5, 1989, Ser. No. 375,466
Int. Cl.[5] F04C *18/234, 2/234;* G01F *3/08*
U.S. Cl. 418—260 12 Claims

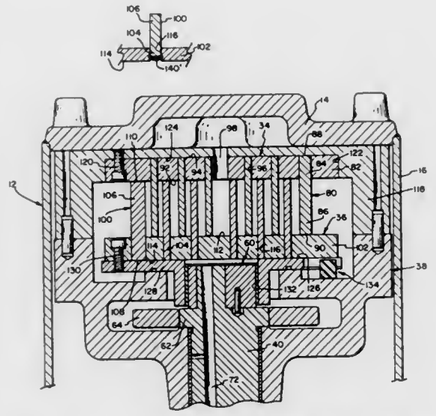


1. A rotary apparatus comprising in combination:
a) a housing including a cylindrical cavity having a smoothly contoured cross section;
b) a rotor assembly including at least one rotary support member disposed within the cylindrical cavity in a rotatable arrangement about an axis of rotation parallel to and off-set from the central axis of the cylindrical cavity, and a plurality of flaps, each of said plurality of flaps having a generally round first edge located adjacent to the axis of rotation and a crescent second edge, disposed within the cylindrical cavity about the axis of rotation and supported by the rotary support member in a pivotable arrangement respectively about axes of pivot respectively coinciding with the centers of radius of the generally round first edges of the plurality of flaps and disposed parallel to and axisymmetrically about the axis of rotation, wherein the plurality of flaps fold into a combination having a generally circular cylindrical peripheral surface;
c) a plurality of cam followers respectively included in the plurality of flaps, wherein each of the plurality of flaps has at least one cam follower disposed eccentrically to the axis of pivot of said each of the plurality of flaps;
d) at least one rotary cam member disposed adjacent and exposed to the cylindrical cavity in a rotatable arrangement about a cam axis parallel to and off-set from the axis of rotation, and including a cam guide guiding the plurality of cam followers following a circular path coaxial to the cam axis for maintaining a close tolerance between the crescent second edges of the plurality of flaps and cylindrical wall of the cylindrical cavity, wherein said rotary cam member includes two stepped diameters comprising a larger diameter section including said cam guide and a smaller diameter section extending axially into and rotatably supported by the housing by means of a rotary bearing;
e) a pair of flow passages respectively open to two halves of the cylindrical cavity respectively located on two opposite sides of a hypothetical plane generally including the axis of rotation and the central axis of the cylindrical cavity; and
f) a rotary motion coupling means for transmitting a rotating motion to and from the rotor assembly.

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5,051,079
**TWO-PIECE SCROLL MEMBER WITH RECESSED WELDED JOINT**
Hubert Richardson, Jr., Brooklyn, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed Jan. 17, 1990, Ser. No. 466,201
Int. Cl.[5] F04C *18/04;* B23K *28/00*
U.S. Cl. 418—55.2 4 Claims

1. A scroll member assembly for use as a fixed or orbiting scroll member in a scroll-type compressor, comprising:
an end plate member having a face surface and a back surface, said plate member including an involute channel extending therethrough and providing communication between said face surface and said back surface;
an involute wrap member extending involutely about a central axis and corresponding in shape to said involute channel of said plate member, said wrap member including an axial end portion having an axial end surface, said axial end portion being disposed within said involute channel such that said axial end surface is proximate said back surface of said plate member;

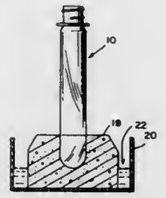


means for retaining said axial end portion of said wrap member within said involute channel of said plate member;
said means for retaining said axial end portion of said wrap member within said involute channel of said plate member comprising a welded joint between said axial end surface of said wrap member and said plate member adjacent said back surface thereof;
said axial end surface of said wrap member and said welded joint are recessed from said back surface of said plate member within said involute channel.

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5,051,080
**PARISON LUBRICATION APPARATUS**
Gary Hill, Kansas City, Mo.; Walter K. Schoch, Peachtree City, Ga., and Michael Warkentien, Independence, Mo., assignors to Sewell Plastics, Inc., Atlanta, Ga.
Continuation of Ser. No. 284,171, Dec. 14, 1988, abandoned.
This application Jul. 13, 1990, Ser. No. 551,658
Int. Cl.[5] B29C *49/42*
U.S. Cl. 425—93 14 Claims

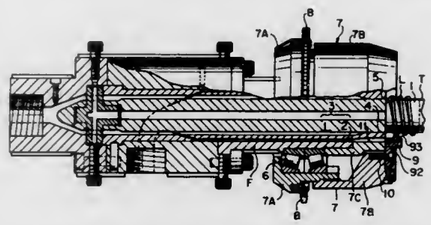
1. The combination of a blow mold, a liquid lubricant and an apparatus for applying a coating of the lubricant to a parison for use in said blow mold comprising:
a source of liquid lubricant,
at least one application pad,
means for supplying the liquid lubricant to the application pad,
means for contacting an outside portion of the parison with the at least one application pad, thereby transfering the liquid lubricant to form a coating on the outside portion of the parison, and



means for transferring the thus coated parison into said blow mold while the lubricant coating is still in a liquid state.

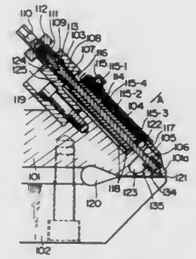


5,051,081
**APPARATUS FOR PRODUCING SPIRAL PIPES WITH RIB**
Wakahiko Kammori, Yao, Japan, assignor to Toyox Co., Ltd., Toyama, Japan
Filed Mar. 2, 1990, Ser. No. 487,278
Claims priority, application Japan, Mar. 3, 1989, 1-51309
Int. Cl.[5] B29C *47/24*
U.S. Cl. 425—131.1 3 Claims



1. An apparatus for producing a plastic tube having an external helical rib which comprises:
an extrusion die formed of an inner tubular die member and an outer tubular die member which define a first tubular flow channel therebetween for thermoplastic resin material and an extrusion nozzle for forming a plastic tube,
a tubular frame positioned around said outer tubular die member to define a second tubular flow channel for thermoplastic resin material between said tubular frame and said outer tubular die member which is coaxial with said first tubular flow channel,
a rotational body positioned around said tubular frame,
bearing means located between said rotational body and said tubular frame to enable said rotational body to rotate around said tubular frame, and
a tubular die element connected to said rotational body to extrude thermoplastic resin material from said second tubular flow channel onto an outer surface of a plastic tube extruded from said extrusion nozzle and provide a helical rib thereon with rotation of said rotational body.

5,051,082
**APPARATUS FOR ADJUSTING DIE LIPS FOR EXTRUSION MOLDING**
Shigeru Hattori, and Susumu Tsuyuki, both of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan
Filed Feb. 9, 1990, Ser. No. 477,413
Claims priority, application Japan, Feb. 17, 1989, 1-36020; Jun. 23, 1989, 1-73680; Aug. 22, 1989, 1-97179; Nov. 30, 1989, 1-138784
Int. Cl.[5] B29C *47/16*
U.S. Cl. 425—141 4 Claims



1. In an apparatus for controlling a plurality of die lips for extrusion molding in the pushing direction as well as in the pulling direction, said die lips being arranged in the direction of width of an extrusion molding die through which molten resin is extruded in the form of a sheet or a film, the improvement comprising;
a plurality of stud bolts each of which has one end fastened to one of said die lips and the other end formed with a flange portion for holding Belleville springs,
a plurality of Belleville springs received below said flange portion of said stud bolt,
a plurality of male-threaded seats each fitted on said stud bolt and threadably engaged with a die casing to compress said Belleville springs,
a plurality of adjustment bolts each having a larger diameter of which inner diameter side is formed with female threads and of which outer diameter side is formed with male threads, a pitch of said female threads being different from a pitch of said male threads, said adjustment bolts being threadably inserted into said die casing from above,
a plurality of other adjustment bolts each having a smaller diameter, each of said other adjustment bolts being threadably engaged with the female threads of the adjustment bolt having a larger diameter and coming in contact with the uppermost end of the stud bolt, said other adjustment bolts being likewise threadably inserted into the die casing from above, and
a plurality of nuts each threadably fitted onto said male threads on the outer diameter side of the adjustment bolt having a larger diameter to be firmly held on said die casing via a retainer plate.

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5,051,083
**PLANT FOR MANUFACTURING A MOLD IN THE FORM OF A MULTIPLE-IMPRESSION PLASTIC PLATE FOR REPRODUCING INTAGLIO PRINTING PLATES**
Antonio Coluzzi, Lurago Marinone, Italy, assignor to De La Rue Giori S.A., Lausanne, Switzerland
Continuation-in-part of Ser. No. 311,534, Feb. 15, 1989, abandoned. This application Mar. 2, 1990, Ser. No. 487,528
Claims priority, application Switzerland, Mar. 28, 1988, 1164/88; European Pat. Off., Feb. 19, 1990, 90810117.3
Int. Cl.[5] B29C *35/08*
U.S. Cl. 425—174.8 R 10 Claims

1. A plant for manufacturing a mold in the form of a multiple-impression plastic plate for reproducing intaglio printing plates, using an original plate (19) made of metal and bearing an

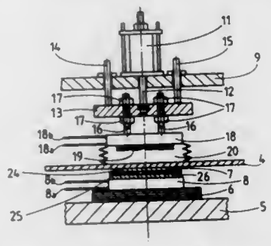
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engraved or embossed design, said plant comprising: a structure (1) provided with an electrode-carrying device (6, 8; 8, 26) for supporting a first plate electrode (7) having an edge, and with a plate-carrying device (13 to 18) for supporting said original plate (19) at a distance from and opposite to said first electrode (7);

said first plate electrode (7) has an outline (7*a*) which corresponds to the periphery (19*a*) of the design (19*b*) of said original plate;

said edge of said first electrode being surrounded by an insulating border (24), with the inside edge of said border having a shape corresponding to the shape of said outline and of a thickness equal to that of said first plate electrode;



said first electrode being carried by an electrode support;

said original plate (19) forming a second plate electrode, first and second electrodes being connected to a high-frequency apparatus (22); a sliding frame (3) arranged between said electrodes and being provided with means (3*a*) for supporting a plastic plate (4) made of deformable material, and having approximately the dimensions of said intaglio printing plate;

means for effecting relative displacement between said sliding frame (3) and said electrodes in two perpendicular horizontal directions (F2 and F3); and

means (11, 12) for changing the distance between said electrode-carrying and plate-carrying devices.

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**5,051,084**

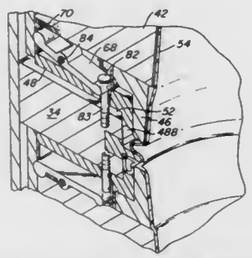
**REVERSE LIP BLOW MOLDING APPARATUS**

**Henry J. Guarriello; Joseph A. Guarriello, and Theodore J. Guarriello, all of 9 Woodland Rd., Newtown, Pa. 18940**

**Continuation-in-part of Ser. No. 265,163, Oct. 31, 1988, Pat. No. 4,972,963. This application Jan. 8, 1990, Ser. No. 462,178**

**Int. Cl.[5] B29C *49/04***

**U.S. Cl. 425—525** **10 Claims**



1. An apparatus for blow molding simultaneously two molded parts, each part having a recessed lip, the apparatus comprising: two plates positioned vertically and facing each other; means for reciprocal movement of the plates toward and away from one another in a horizontal direction; two center members, each center member perpendicularly mounted on a corresponding one of the two plates, the center members projecting along a straight line extending between the plates; two separating members, each separating member mounted on the end of a corresponding one of the center members and opposite said corresponding plate; a mold half mounted on each of the plates, each said mold half including half of an upper and lower mold section; means for reciprocal movement of each said mold section toward and away from the center members; and each mold half section including a first member positioned in proximity to a corresponding one of said center members and defining a wall and a channel, and each mold half section further including a second member slidably mounted within said channel in said first member and biased outwardly from said channel toward said corresponding center member, each said first member and said second member adapted for movement toward said corresponding center member so as to form a deep recessed lip within each molded part.

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**5,051,085**

**APPARATUS FOR MOLDING A PLASTICS CONTAINER**

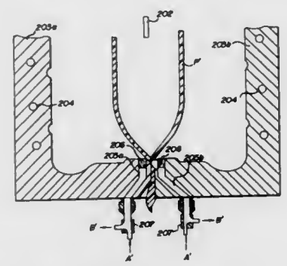
**Kazuhiro Masumoto, Ichihara, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan**

**Division of Ser. No. 301,298, Jan. 25, 1989, Pat. No. 4,946,368, which is a division of Ser. No. 783,591, Oct. 3, 1985, Pat. No. 4,849,154. This application May 18, 1990, Ser. No. 524,933**

**Claims priority, application Japan, Apr. 10, 1984, 59-207101; Dec. 12, 1984, 59-187355; May 22, 1985, 60-75098; May 22, 1985, 60-108249; May 22, 1985, 60-108250**

**Int. Cl.[5] B29C *49/64***

**U.S. Cl. 425—526** **1 Claim**



1. A blow-molding apparatus, comprising:

a die for extruding a molten resin;

a blow nozzle connected to said die;

a split mold having separable mold portions and a pinch-off portion provided in a downstream side of said die, said pinch-off portion having passages passing therethrough;

means for injecting cooling air and for sucking air received in said mold portions by vacuum through said passages passing through said pinch-off portion of said split mold; and

porous members embedded in said passages.

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**5,051,086**

**INSULATED INJECTION MOLDING NOZZLE**

**Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1**

**Filed Sep. 4, 1990, Ser. No. 576,858**

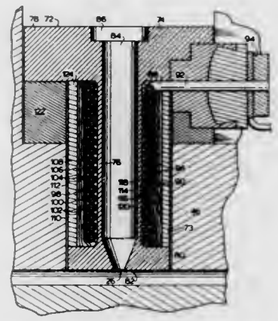
**Claims priority, application Canada, Jul. 27, 1990, 2022124**

**Int. Cl.[5] B29C *45/20***

**U.S. Cl. 425—549** **8 Claims**

1. In an elongated injection molding nozzle to be seated in a bore in a cooled cavity plate, the nozzle having a body with a forward end, a rear end and a melt bore extending therethrough to convey melt from an inlet at the rear end to a gate leading to a cavity, the nozzle having an electrically insulated heating element with a spiral portion having coils which is integrally brazed to extend concentrically around at least a portion of the melt bore, the improvement wherein:

the spiral portion of the heating element is surrounded by a plurality of layers of steel alternating with a plurality of layers of ceramic insulating material, the layers of steel including an outer layer and an inner layer, said inner layer being sprayed over an outer portion of the coils of the spiral portion of the heating element, the layers of steel



other than the inner layer each being sprayed over an inner adjacent one of the layers of insulating material, the layers of insulating material each being sprayed over an inner adjacent one of the layers of steel.



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**5,051,087**

**INJECTION MOLDER WITH TWO MOVABLE MOLDS**

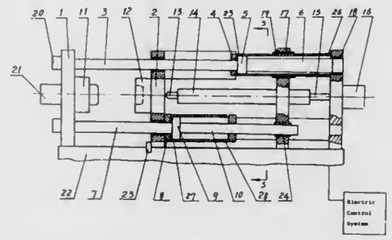
**Buming Huang, Guang Dong Province, China, assignor to The Shunde Plastics General Machine Enterprises Group, Guang Dong Province, China**

**Filed Aug. 2, 1990, Ser. No. 561,582**

**Claims priority, application China, Aug. 11, 1989, 89 1 06465.6**

**Int. Cl.[5] B29C *45/67***

**U.S. Cl. 425—589** **8 Claims**



1. An injection molding apparatus with two movable molds comprising:

a mold-matching device, an injection device, a hydraulic system and an electric control system, said mold matching device comprises two movable mold plates arranged in said mold-matching device, said two movable mold plates comprising a first movable mold plate and a second movable mold plate, said two movable mold plates are slidingly and vertically mounted on a frame guide track and move along the frame guide track reciprocally;

a pair of split molds mounted on facing sides which correspond to said first movable mold plate and said second movable mold plate; a facing side of the first movable mold plate facing the second movable mold plate; a facing side of the second movable mold plate facing the first movable mold plate;

a plurality of tension rods arranged in a parallel relationship on said first movable mold plate and said second movable mold plate; left ends of said tension rods fixed on the first movable mold plate, a right end of a first tension rod being concentrically connected with a left end of a piston in a first general oil cylinder, a right end of a second tension rod concentrically connected with a left end of a piston in a first mold-locking oil cylinder, said tension rods being fixed on the first movable mold plate and passing through the second movable mold plate, said second movable mold plate being fitted with a middle part of the tension rod, said first and second movable mold plates moving relative to each other;

a driving stand being vertically fixed on an end of said frame guide track relative to the first movable mold plate;

an injection stand mounted slidingly and vertically on the frame guide track between the driving stand and the second movable mold plate, said injection stand being movable along the frame guide track;

additional general oil cylinders fixed on a left side of the driving stand between the driving stand and the second movable mold plate, said first and said additional general oil cylinders being slidingly inserted in the injection stand which can move relative to said first and the additional general oil cylinders, each of said first and said additional general oil cylinders arranged axisymmetrically around a center of said movable mold plate; and a rear piston rod of a first piston in said first general oil cylinder passing through the driving stand and sliding in said driving stand;

additional mold-locking oil cylinders fixed on a right side of the second movable mold plate and between the second movable mold plate and the injection stand, said first and said additional mold locking oil cylinders being arranged axisymmetrically around the center of said movable mold plate, said first and said additional mold locking oil cylinders being interlaced with said first and said additional general oil cylinders; and

a rear piston rod of a piston in said first mold-locking oil cylinder passing through the injection stand and sliding in said injection stand;

said injection device comprises a nozzle, a charging cylinder, and screw stem, said charging cylinder is fixed on the injection stand and moves together with said injection stand, said nozzle being fixed on an end of said charging cylinder and oriented toward a pouring head of the second movable mold plate, the screw stem of a screw stem driving device fixed on said driving stand, mounted in said charging cylinder and rotatable, said screw stem sliding in said charging cylinder at a predetermined distance slightly greater than a sum of the stroke of the first movable mold plate, a maximum distance between the mold pouring head and the nozzle and an injection stroke of the screw stem.

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**5,051,088**

**MELT SPINNING MACHINES**

**Richard L. Frank, Charlotte, N.C., assignor to Hoechst Celanese Corporation, Somerville, N.J.**

**Filed Apr. 11, 1988, Ser. No. 179,781**

**Int. Cl.[5] B29C *47/30***

**U.S. Cl. 425—72.2** **20 Claims**

1. In a melt spinning machine of the type having a spin head for forming a molten polymer along a melt spinning axis into filamentary material, and polymer supply means for supplying the molten polymer to said spin head, the improvement wherein said spin head is readily disassembled and includes:

a sleeve member having an elongate open ended interior cavity oriented along the melt spinning axis and containing means for heating said spin head;

a core insert member slidably received within said interior cavity of said sleeve member;

spinneret means coupled to a downstream end of said core insert member and capable of being removed therefrom before separation of said sleeve member from said core member; and

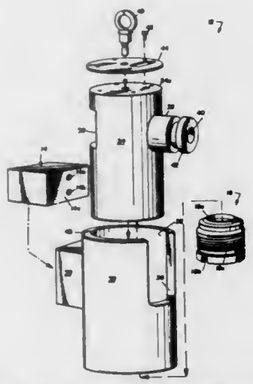
pump means removably received within said sleeve member and having an inlet which receives molten polymer from the polymer supply means and an outlet for providing

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pressurized molten polymer to said spinneret means; wherein

said core insert member contains a supply passageway which



fluid connects said polymer supply means and said inlet of said pump means, and a discharge passageway which fluid connects said outlet of said pump means and said spinneret means.

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**5,051,089**

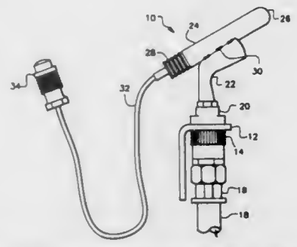
**INTEGRAL PILOT BURNER-GENERATOR**

**M. R. Jayaram, Cypress, Calif., assignor to Honeywell Inc., Minneapolis, Minn.**

**Continuation of Ser. No. 375,115, Jun. 30, 1989, abandoned. This application Mar. 6, 1991, Ser. No. 666,491**

**Int. Cl.[5] F23N *5/10***

**U.S. Cl. 431—80** **5 Claims**



1. An integral pilot burner and generator comprising:

a pilot burner body having means for issuing fuel from an outlet and being supplied form a source of said fuel at an inlet;

a burner head comprising a single "L" shaped integral element attached to said pilot burner body at said outlet, said burner head including a gas passageway, said passageway having a wall;

said burner head deflecting a pilot flame in a predetermined direction;

a generator comprising an elongated body having a longitudinal axis and a flame sensing end sensing the presence of a pilot flame; and

means for fixedly securing said generator to said wall of said gas passageway at a location above the pilot burner body, with said longitudinal axis of said generator approximately parallel to said predetermined direction of said pilot flame, to assure proper positioning of said flame sensing end within said pilot flame.

**5,051,090**

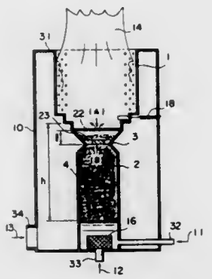
**METHOD AND APPARATUS FOR BURNING LIQUID FUEL**

**Norio Anzawa; Koji Adachi; Tetsuo Futakawa; Koichi Honda; Shigekazu Fujii; Hironari Sato, and Toshiyuki Irita, all of Muroran, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

**Filed Apr. 9, 1990, Ser. No. 506,185**

**Int. Cl.[5] F23D *5/02***

**U.S. Cl. 431—331** **17 Claims**



1. A method for burning liquid fuel comprising the steps of:

foaming liquid fuel with a primary combustion supporting gas;

retaining the foamed fuel for a residence time of 2-10 seconds during which any liquid fuel in the thus foamed fuel is drained therefrom;

supplying secondary combustion supporting gas sufficient for continuous stable combustion of the foamed fuel to the thus retained foamed fuel; and

burning the foamed fuel in a combustion chamber.

3. An apparatus for burning liquid fuel, comprising:

a vertically oriented foam collection cylinder;

means for feeding a liquid fuel into the lower part of said foam collection cylinder for forming a body of liquid fuel in the lower part of said foam collection cylinder; a liquid fuel foamer disposed in a lower part of said foam collection cylinder for feeding a primary combustion supporting gas into a body of fuel in the lower part of said foam collection cylinder;

a combustion chamber; and

an orifice defining means connected between the upper part of said foam collection cylinder and said combustion chamber and defining an orifice between said foam collection cylinder and said combustion chamber, said orifice having a smaller cross-sectional area than the cross-sectional areas of said foam collection cylinder and said combustion chamber.

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**5,051,091**

**SIMPLIFIED DENTAL IMPLANT OPERATION**

**Philip J. Rosenfeld, 7 Edgemont Rd., Glen Rock, N.J. 07452**

**Filed Oct. 17, 1990, Ser. No. 599,028**

**Int. Cl.[5] A61C *8/00, 5/00***

**U.S. Cl. 433—201.1** **7 Claims**

1. A method of embedding a dental implant including the steps of:

extracting a tooth to leave a cavity in the bone underlying the gums;

providing an implant;

forming resorbant material into at least one piece adapted to surround said implant and to hold said implant within said cavity in a proper position so that said implant may later serve as a mechanical support;

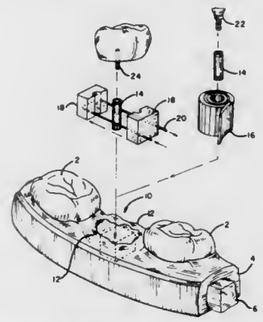
surrounding said implant with said piece;

inserting said implant and said piece into said cavity;

suturing the gums to enclose said implant and said piece within the gums;



waiting for said implant to affix to the bone underlying the gums by ossification and for the gums to heal; whereby



said implant upon affixing may serve to mechanically support a dental prosthesis or device.

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**5,051,092**

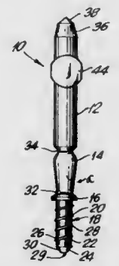
**DENTAL ANCHOR AND A DRILL FOR USE THEREWITH**

**Alan N. Miller, New City, N.Y., assignor to Coltene/Whaledent, Inc., New York, N.Y.**

**Filed Jan. 30, 1989, Ser. No. 303,900**

**Int. Cl.[5] A61C *5/04***

**U.S. Cl. 433—225** **26 Claims**



1. A dental anchor for use in the retention of a superstructure on a tooth stub and insertable into a blind bore formed in the tooth stub, comprising:

an upper retention portion to form retention means for the superstructure formed on the tooth stub;

a lower anchoring portion formed in one-piece with said retention portion and having anchoring means thereon to anchor said dental anchor in the tooth stub,

said anchoring means including a thread for self-threading engagement of said anchoring portion in said bore; and

stop means interconnected between said retention portion and said anchoring portion and limiting depth of insertion of said anchoring portion into said bore,

said retention portion being of smooth configuration, having a non-interrupted external surface and being formed without any sharp corners to thereby substantially minimize stress on the superstructure on said retention portion.

**5,051,093**

**ROOT CANAL FILLING DEVICE INCLUDING RELEASABLY REUSABLE INSERTER TOOL**

**Bernard A. Fitzmorris, 2911 28th Street, N. W., Washington, D.C. 20008**

**Filed Jun. 5, 1989, Ser. No. 361,438**

**Int. Cl.[5] A61C *5/02***

**U.S. Cl. 433—224** **35 Claims**



13. A filling device for refilling a tooth root canal with a canal filling during treatment of the tooth to permit the canal filling to be easily inserted, positioned, and removed, said filling device comprising:

an elongate filler cone having first and second ends and comprising a relatively narrow tip portion formed at said first end, said elongate filler cone being insertable and adjustable within and removable from the tooth root canal;

removable elongate insertion means for inserting, adjusting, repositioning, and removing said elongate filler cone in the root canal, said removable elongate insertion means comprising first and second ends and a handle portion formed at said first end, and said removable elongate insertion means being reusable; and

connection means disposed at said second end of said removable elongate insertion means for releasably connecting said removable elongate insertion means to said second end of said elongate filler cone such that said elongate filler cone can be connected to, removed from, and reconnected to said removable elongate insertion means as required.

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**5,051,094**

**G-FORCE TRAINER**

**Bernhard H. Richter, Holland; Shabbir H. Merchant, Warminster, and Andreas Richter, Holland, all of Pa., assignors to Environmental Tectonics Corporation, Southampton, Pa.**

**Continuation-in-part of Ser. No. 108,951, Oct. 14, 1987, abandoned. This application Jan. 26, 1988, Ser. No. 149,988**

**Int. Cl.[5] G09B *09/08***

**U.S. Cl. 434—30** **39 Claims**

1. G-force trainer including an assembly for rotation about a vertical shaft, the assembly comprising:

a tubular arm secured to the shaft for rotation therewith about an axis of the shaft;

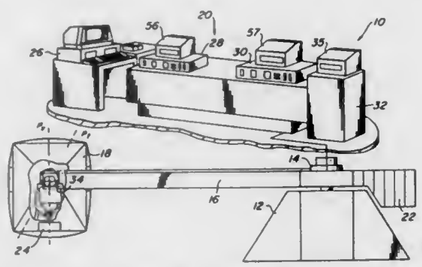
a yoke secured to said arm;

a gondola mounted at said yoke so as to rotate therewith about the shaft axis and to roll freely about a roll axis in proportion to speed of rotation of said arm about the shaft

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axis, the roll axis being, about twenty feet or more from the shaft axis; and



support means within the gondola for receiving a human passenger, the total rotational weight of the assembly being about 10,000 lbs. or less.

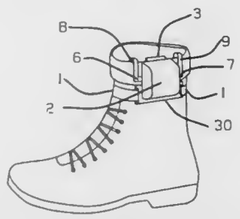
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5,051,095

## MOUNTING BRACKET

Stephen Slenker, 26 Cummings Rd., Tyngsboro, Mass. 01879

Filed Nov. 8, 1990, Ser. No. 610,824
Int. Cl.[5] H01R *33/00*
U.S. Cl. 439—37 3 Claims



1. Means for securing a battery pack to a boot, comprising a bracket shaped to receive and removeably secure a battery pack, a clamp secured to said bracket, said clamp adapted to attach to the top of said boot and secured said bracket, a strap engaging said bracket, said strap adapted to encircle said boot to secure said bracket to the boot and restrict motion of the mounting bracket in relationship to the boot.

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5,051,096

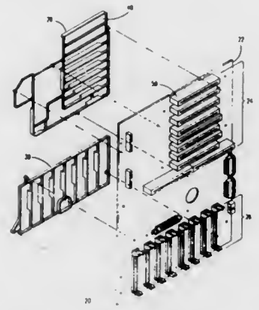
## PLANAR BOARD SUPPORT STRUCTURE

Kevin K. Cooke, Delray Beach; John R. Dewitt, Boca Raton; Paul J. Galinis, Boynton Beach, and Walter B. Koteff, Boca Raton, all of Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 23, 1989, Ser. No. 425,525
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—61 4 Claims

1. A device for supporting a planar board of a personal computer system, the system being housed in an enclosure having an inner surface, said planar board having a plurality of slots, each slot having a connector to receive a circuitry component, said device comprising:

a plurality of interconnected electrically nonconductive connector support frames, each frame extending around the perimeter of and supporting the edge of a corresponding connector on the planar board, said plurality of support frames being interposed between the planar board and the inner surface of the enclosure to prevent the planar board from flexing whenever a circuitry component is inserted into a slot;



fastening means for attaching said plurality of interconnected connector support frames to said planar board.

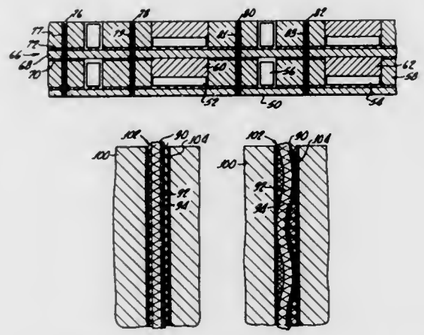
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5,051,097

## SHAPE-MEMORY METAL CORE ELECTRICAL CONTACTOR

Robert S. Miles, Monrovia, and Gustav A. Schmidt, South Pasadena, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 25, 1990, Ser. No. 542,561
Int. Cl.[5] H01R *9/09*
U.S. Cl. 439—75 10 Claims



1. A composite electrical contactor for an electrical assembly comprising:

an elongated core of a material having a shape-memory, and a phase change temperature, said core having a low temperature maximum transverse dimension, below said phase change temperature, that is readily received within an elongated space defined by an elongated boundary having a predetermined transverse dimension, said core having an external configuration, above said phase change temperature, that has a high temperature transverse dimension greater than said low temperature maximum transverse dimension, and

a flexible electrically conductive layer encircling said core, whereby said core and layer may be readily inserted into and removed from said space when temperature of said core is below said phase change temperature, and whereby said layer is pressed transversely outwardly against the boundary of said space when temperature of said core is above said phase change temperature,

wherein said layer comprises a sleeve formed of a plurality of electrically conductive wires wrapped around said core.



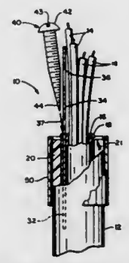
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5,051,098

## SERVICE CABLE GROUND CONNECTOR ASSEMBLY

William T. Auclair, Winsted, and Randolph L. Auclair, New Hartford, both of Conn., assignors to Electric Motion Company, Inc., Winsted, Conn.

Filed Dec. 13, 1990, Ser. No. 626,842
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—99 20 Claims



1. A ground connector assembly for a service cable comprising:

an end portion of a service cable comprising at least one longitudinally extending wire, a shield surrounding said at least one wire and an outer sheath surrounding said shield;

clip means comprising a protective blade portion and an integral terminal portion defining an aperture, said protective blade portion being positioned between a said wire and said shield, and said terminal portion being located exteriorly of said cable end portion; and

a screw disposed between said protective blade portion and said shield so that said clip means is secured to said service cable in force-fit relationship.

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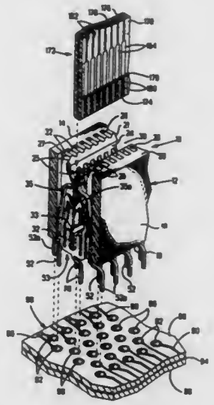
5,051,099

## HIGH SPEED CARD EDGE CONNECTOR

Charles S. Pickles, Hummelstown, and Matthew M. Sucheski, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 458,071, Jan. 10, 1990. This application Oct. 5, 1990, Ser. No. 593,186
The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.
Int. Cl.[5] H01R *4/66*
U.S. Cl. 439—108 3 Claims

1. An electrical connector for use with a circuit card of the type having ground contact means disposed along a leading edge and proximate thereto and signal traces having signal contact means located rearwardly from said ground contact means on each major surface of the circuit card, said connector having a dielectric housing member with a mounting face and an opposed card receiving face, a card receiving cavity extending into said housing from said card receiving face to a card stop means, a plurality of contacts adapted for mating with said card at respective contact locations spaced laterally along said cavity and associated with trace locations along a circuit card received in said cavity, said plurality of contacts including signal contact members arranged in opposed pairs along opposite sides of said card receiving cavity at each said contact location and secured in respective contact receiving cavity, said signal contact members having first contact sections for engaging respective opposed signal traces on opposite major surfaces of said card upon card insertion therebetween, said first signal contact sections being defined on free ends of cantilevered beams extending into said cavity to be deflected outwardly by said card upon card insertion whereupon said first signal contact sections become engaged with respective contact sections of said signal traces upon full card insertion, said signal contact members having second contact sections at least exposed along the mounting face of the housing and adapted to be mated with corresponding signal contact means of another electrical article, and said connector further including a plurality of ground contact members, each said ground contact member being an essentially planar member and including a body section extending from first to second side edges and having a pair of opposed cantilevered beams extending upwardly from said body section proximate said first and second side edges, said housing being adapted to have a pair of said signal contact members secured therein at each said contact location, and a said ground contact member secured between and spaced from said pair of signal contact members in each contact receiving passageway, said cantilevered beams



of said ground contact members extending upwardly into respective ones of said contact receiving passageways and into said card receiving cavity, said beams being deflectable in the plane of said ground contact members by said card upon insertion thereof into said card receiving cavity, said beams of said ground contact numbers including ground contact sections thereon engageable with respective said ground contact means of said card upon full card insertion; said connector further being characterized in that:

said ground contact sections on said beams are spaced both vertically and horizontally from the associated first signal contact sections; whereby

said first signal contact sections will not engage ground means on a circuit card adapted to have a complementary staggered array of signal and ground contact surfaces when said card is received into said card receiving slot.

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5,051,100

## ELECTRICAL CONNECTOR

Tetsuo Kato; Kiyohito Fukuda; Katsuaki Terada, and Naoto Taguchi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 27, 1990, Ser. No. 544,724
Claims priority, application Japan, Jun. 27, 1989, 1-162626
Int. Cl.[5] H01R *13/447*
U.S. Cl. 439—140 5 Claims

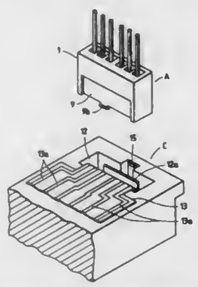
1. An electrical connector comprising:

a connector housing having a terminal-receiving chamber, a detecting space being provided adjacent to said terminal-receiving chamber, wherein a terminal having a resilient contact piece is inserted into said terminal-receiving chamber of said connector housing in such a manner that said resilient contact piece of said terminal is exposed from said terminal-receiving chamber; and

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a protective cover on said connector housing, disposed so as to move slidingly between an open position and a closed position, for protecting said resilient contact piece, said protective cover comprising a cover body, a detecting member, and a connecting lever interconnecting said cover body and said detecting member, said detecting member being received movably in said detecting space;



wherein said electrical connector further comprises a flexible retainer piece for retaining said terminal received in said terminal-receiving chamber said flexible retainer piece being provided displaceably between said terminal-receiving chamber and said detecting space;

such that, when said terminal is inserted imperfectly into said terminal-receiving chamber, said flexible retainer piece prevents said detecting member from advancing.

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**5,051,101**

## MULTI-POLE CONNECTOR

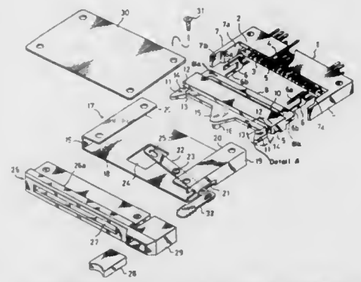
**Yasuhiro Komatsu, Osaka, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan**

**Filed Jul. 24, 1989, Ser. No. 383,445**

**Claims priority, application Japan, Jul. 29, 1988, 63-101220[U]**

**Int. Cl.[5] H01R *13/635***

**U.S. Cl. 439—159** **16 Claims**



1. A multi-pole connector in which a plurality of contact pieces are disposed side by side in a housing of the connector and in which contacts respectively formed on the contact pieces are adapted to resiliently come in contact with external contact pieces formed at the tip of a card, while the contacts are being displaced against spring loads of the contact pieces, said multi-pole connector comprising:

a slider adapted to be moved, by the tip of a card when the same is inserted into said connector, from a first position where said slider supports said contacts, to a second position where said slider is located rearward of said contacts;

contact supporting surfaces formed on said slider in the same levels or substantially in the same levels as those of the external contact pieces of said card, such that, when said slider is moved between said first position and said second position with the tip of the card coming in contact with said slider, such movement causes said contacts to be slidingly transferred from said contact supporting surfaces to said external contact pieces of the card;

an operating lever for card removal, said operating lever having one end connected to the slider and the other end extending transversely to the outside of the card inserting and removing passage, said operating lever being provided at the longitudinal center thereof with a rotation fulcrum.

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**5,051,102**

## ASTERN-AHEAD SWITCHING DEVICE FOR MARINE PROPULSION UNIT

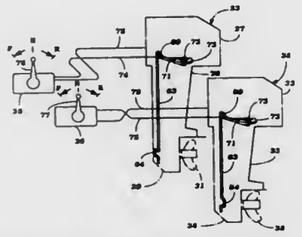
**Akihiro Oooue, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Aug. 30, 1990, Ser. No. 575,284**

**Claims priority, application Japan, Aug. 30, 1989, 1-221633**

**Int. Cl.[5] B63H *21/28***

**U.S. Cl. 440—75** **8 Claims**



1. A shift mechanism for a marine propulsion transmission comprising a housing defining a recess adapted to receive a shift plunger and supporting said shift plunger for reciprocation, said shift plunger being formed with a cam recess adapted to receive a cam, a cam supported for rotation relative to said housing about a fixed axis lying within a first plane and received within said cam recess of said shift plunger, said cam having an eccentric portion and being reversible between a first operative cam position and a second operative cam position, said plunger recess also including a portion for receiving said cam portion and being symmetrical about a second plane perpendicular to said first plane for reversal of said plunger in said recess between first and second operative plunger positions for reversing the direction of reciprocation of said cam about said first axis in the same direction.

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**5,051,103**

## ELECTRICAL COUPLING ASSEMBLY FOR HOT, HIGH PRESSURE SERVICE

**David H. Neuroth, Hamden, Conn., assignor to Hubbell Incorporated, Orange, Conn.**

**Filed Oct. 9, 1990, Ser. No. 594,002**

**Int. Cl.[5] H01R *4/60***

**U.S. Cl. 439—192** **20 Claims**

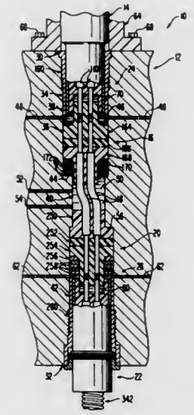
1. An electrical coupling assembly for conducting electricity between areas of different pressures, the combination comprising:

a hollow housing having first and second open ends, and an inner tubular surface, said first and second open ends being located respectively in areas of different pressures;

interconnecting means, located in said housing, for conducting electricity between said first and second open ends of said housing, said interconnecting means having a first connecting end with a first portion located completely in said housing between said first and second open ends, said first portion having a first longitudinal axis, and a second connecting end with a second portion located completely in said housing between said first and second open ends, said second portion having a second longitudinal axis which is offset from said first longitudinal axis, said first and second longitudinal axes being substantially parallel;

first sealing means, located in said housing and engaging said inner surface of said housing, for sealing said housing and said interconnecting means adjacent said first open end of said housing; and





second sealing means, located in said housing and engaging said inner surface of said housing, for sealing said housing and said interconnecting means adjacent said second open end of said housing,

said first portion and said second portion being located between said first and second sealing means.

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**5,051,104**

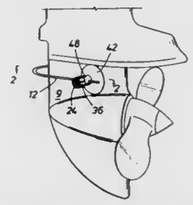
## FLUSHING DEVICE FOR MOTORBOAT ENGINES

**Kjall G. Guhlin, 11727 Sheridan, Houston, Tex. 77050**

**Filed Apr. 19, 1990, Ser. No. 511,192**

**Int. Cl.[5] B08B *9/00***

**U.S. Cl. 440—88** **6 Claims**



1. Apparatus for introducing fresh clean water and lubricant into the cooling system of a motorboat engine that draws cooling water through intakes in the engine housing located below the surface of the water in which the boat is operating comprising,

a U-shaped spring having first and second legs,

first and second cup-shaped seal members constructed of elastomeric material, each of which is mounted on one of the legs of the spring to cover the water inlets of the engine, the first seal member having an inlet through which lubricant can be injected into the water before it enters the engine, the second seal member having threaded connector means for connecting to a water hose to provide the fresh clean water to be drawn into the cooling system ot the engine.

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**5,051,105**

## RESIN RACK BOOT

**Hidemi Sugiura, Aichi, and Miklo Ukai, Nagoya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan**

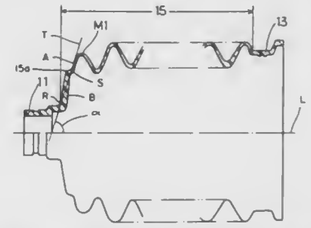
**Continuation of Ser. No. 111,877, Oct. 23, 1987, abandoned.**

**This application Jun. 11, 1990, Ser. No. 536,068**

**Claims priority, application Japan, Dec. 27, 1986, 61-199698**

**Int. Cl.[5] F16D *3/84***

**U.S. Cl. 464—175** **1 Claim**



1. A resin rack boot for installation at a steering rack portion of an automobile comprising:

first and second rings, and

a resin bellows interposed between said two rings and having a slanted wall with a lower portion adjacent said fist ring and an upper portion ending in a crest and wherein said lower portion is thicker than said upper portion,

both of said lower and upper portions being slanted,

said slanted wall having a step from said lower portion toward said second ring at a position dividing said lower and upper portions for permitting said first ring to move axially into said bellows, and wherein there is an angle of 70° to 85° between an axial line of said boot and a straight line which coincides with at least a point on an outer surface of said upper portion and at least a point on an outer surface of said lower portion.

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**5,051,106**

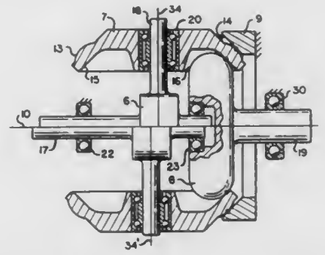
## TRANSVERSE AXIS INFINITELY VARIABLE TRANSMISSION

**Joseph E. Fritsch, 14001 Sherwood, Oak Park, Mich. 48237**

**Filed Jul. 5, 1990, Ser. No. 548,244**

**Int. Cl.[5] F16H *15/50***

**U.S. Cl. 475—192** **31 Claims**



1. A transverse axis transmission comprising:

a main shape having means for rotatably supporting at least one compound-planet;

said compound-plant having a first surface and a second surface for conveying rotational energy;

said compound-plant's first surface for conveying rotational energy engaging a reaction member's surface for conveying rotational energy, whereby said compound-planet rotates about its own axis and simultaneously rotates around said reaction member;

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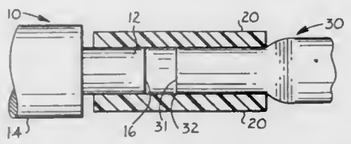
said reaction member having means for restraining rotary motion;
said compound-planet's second surface for conveying rotational energy engaging a rotor's surface for conveying rotational energy, whereby said compound-planet rotates about its own axis and simultaneously rotates around said rotor;
the engagement areas of the first and second surface for conveying rotational energy located on the same side of the axis of said compound-planet;
a rotor shaft rotatable with said rotor.

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**5,051,107**
**SURGICAL NEEDLE-SUTURE ATTACHMENT FOR CONTROLLED SUTURE RELEASE**

**Herbert W. Korthoff, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.**

**Continuation-in-part of Ser. No. 413,240, Sep. 27, 1989. This application Jun. 4, 1990, Ser. No. 532,927**
**Int. Cl.[5] A61B *17/00***
**U.S. Cl. 606—224** **29 Claims**



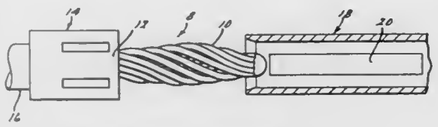

1. A method for attaching a surgical needle to a suture to provide a combined surgical needle-suture device exhibiting a predetermined range of average pull-out force for a suture of given size which comprises:
(a) providing a needle having a shank end of reduced cross-section;
(b) placing a shrinkable tubing around the reduced diameter shank and the suture;
(c) applying energy to the shrinkable tubing to bring the tubing into engagement with the needle shank and suture to couple the same without crimping or swaging;
(d) prestressing the suture with respect to the needle by applying sufficient tension to the suture to move it relative to the needle; and,
(e) releasing the tension when the pull-out force drops to an average value within a predetermined range.

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**5,051,108**
**CONNECTOR**

**Thomas C. Lincoln, South Pasadena, Calif., assignor to Microdot Inc., Chicago, Ill.**

**Continuation of Ser. No. 495,858, Mar. 19, 1990. This application Feb. 21, 1991, Ser. No. 659,601**
**Int. Cl.[5] H01R *13/05***
**U.S. Cl. 439—825** **1 Claim**




1. An electrical connector comprising
a compliant twist pin comprising a plurality of helically twisted wires connected to one another at longitudinally spaced end portions thereof, the wires at an intermediate portion of said twist pin being initially circumferentially spaced from one another and extending radially to a radius R, and
a noncompliant circumferentially closed cylindrical socket having a first plurality of circumferentially spaced longitudinally extending internal surfaces disposed at a radius greater than R and a second plurality of circumferentially spaced longitudinally extending internal surfaces between said first surfaces, respectively, and disposed at a radius less than R whereby the intermediate portions of some of said wires make initial contact with only the second plurality of internal surfaces on said socket and are radially compressed to a diameter less than R thereby to minimize the force required to assemble said pin in said socket yet provide contact pressure between said pin and socket.

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**5,051,109**
**PROTECTOR FOR CATHETER NEEDLE**

**Alexander Z. Simon, 4460 Ammon Rd., South Euclid, Ohio 44143**

**Filed Jul. 16, 1990, Ser. No. 552,934**
**Int. Cl.[5] A61M *5/00, 5/32***
**U.S. Cl. 604—263** **15 Claims**



1. A medical needle apparatus of the catheter type for preventing accidental puncture, said catheter type needle comprising:
a hollow needle having a cutting edge at its proximal ed for effecting a puncture, a handle portion at its distal end and a cylindrical body portion between its ends;
a catheter having a forward end initially adjacent said needle's cutting edge, a hub portion at its distal end initially adjacent said needle's handle portion and a cylindrical body portion between its ends, said catheter slidably receiving said needle's cylindrical body portion;
a hollow protector guard housing having a rearward end initially adjacent said needle's handle, a hollow tubular base portion extending from said rearward end and concentric with said hub portion for initially slidably receiving said hub portion; a closable forward end initially laterally outwardly of said hub portion, and adapted, in its closed position, to cover the forward opening of said tubular base portion; and resilient spring means extending from at least one of said guard housing ends biasing said forward end radially inwardly to its closed position for frictionally maintaining said guard housing on said hub portion initially and subsequently moving said forward end to its closed position; and
tether means secured between said guard housing and said handle portion of said needle permitting said guard housing to remain on said catheter while said needle is withdrawn from said catheter and causing said guard housing to separate from said catheter's hub portion when said needle's cutting end is withdrawn from said catheter's hub to permit said resilient means to automatically spring said forward end of said guard housing to its closed position whereby said cutting edge is irretrievably contained within said base portion while said tether means also prevents said cutting edge from being withdrawn from said guard housing thus preventing accidental puncture from said needle after use.

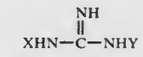


**5,051,110**
**FIBROUS MATERIAL**

**Peter Borrell, Nuneaton, and Timothy J. Ollerenshaw, Coventry, both of United Kingdom, assignors to Courtaulds PLC, United Kingdom**

**Filed Apr. 27, 1990, Ser. No. 515,109**
**Claims priority, application United Kingdom, Apr. 27, 1989, 8909627**
**Int. Cl.[5] D06M *11/00***
**U.S. Cl. 8—115.66** **16 Claims**

1. A process for the preparation of a flame-retardant fibrous material from a fibrous material comprising an acrylonitrile polymer, comprising reacting the acrylonitrile polymer fibrous material with a guanidine compound of the formula



where X and Y each represent hydrogen or an amine group, or with a salt thereof, said reaction being carried out in a substantially water-free polar organic solvent in which said guanidine compound is soluble.

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**5,051,111**
**WHITENER DISPERSION**

**Italo Anceschi, Muttenz; Werner Fringeli, Laufen, both of Switzerland; Martin Jöllenbeck, Solingen, Fed. Rep. of Germany; Georges Mahler, Mulhouse, France, and Willy Schürings, Grenzach-Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Nov. 22, 1988, Ser. No. 275,231**
**Claims priority, application Switzerland, Nov. 27, 1987, 4630/87**
**Int. Cl.[5] C09B *57/00*; C09K *11/04***
**U.S. Cl. 8—648** **23 Claims**

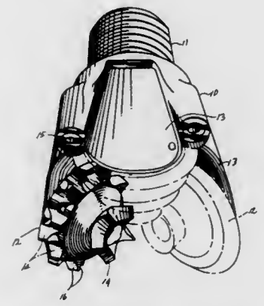
1. An aqueous dispersion comprising at least one water-insoluble or sparingly soluble fluorescent whitening agent, at least one water-soluble fluorescent whitening agent, an optional solubiliser, at least one anionic, cationic or non-ionic dispersant and further optional assistants, which dispersion additionally comprises a copolymer of 2-vinylpyrrolidone and 3-vinylpropionic acid.

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**5,051,112**
**HARD FACING**

**Madapusi K. Keshavan, Fullerton, and Proserfina C. Rey, Laguna Beach, both of Calif., assignors to Smith International, Inc., Houston, Tex.**

**Continuation of Ser. No. 212,867, Jun. 29, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 501,421**
**Int. Cl.[5] B24D *3/02***
**U.S. Cl. 51—309** **9 Claims**



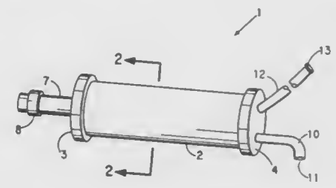
1. A rod for applying hardfacing to a surface comprising:
particles of tungsten carbide; and
a matrix of metal particles selected from the group consisting of low carbon steel and alloy steel, sufficiently sintered together to bind the tungsten carbide particles into a rigid rod, but sintered at less than the melting temperature of the metal.

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**5,051,113**
**AIR-INTAKE SYSTEM FOR MOBILE ENGINES**

**Stuart M. Nemser, Wilmington, Del., assignor to Du Pont Canada Inc., Mississauga, Canada**

**Filed Jun. 13, 1990, Ser. No. 538,058**
**Int. Cl.[5] B01D *53/22, 71/32***
**U.S. Cl. 55—16** **21 Claims**




1. A process for the operation of a mobile combustion engine having a combustion zone and an air intake system for the combustion zone comprising feeding air to a feed side of an oxygen enrichment membrane in the air intake system in a manner that causes an oxygen enriched portion of the air to permeate the membrane to a permeate side of the membrane and then feeding the oxygen enriched air from the permeate side to the combustion zone of the mobile combustion engine, the oxygen enrichment membrane comprising a film or coating of an amorphous polymer of perfluoro-2,2-dimethyl-1,3dioxole on a porous support said membrane exhibiting an oxygen/nitrogen selectivity of at least 1.4:1

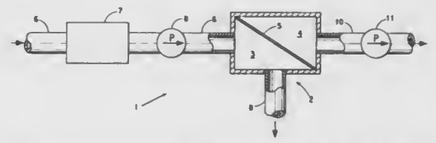
7. An air intake system for a mobile combustion engine, said air intake system comprising a membrane comprising a film or coating of an amorphous polymer of perfluoro-2,2-dimethyl-1,3-dioxole on a porous support, said membrane exhibiting an oxygen/nitrogen selectivity of at least 1.4:1.

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**5,051,114**
**PERFLUORODIOXOLE MEMBRANES**

**Stuart M. Nemser, and Ian C. Roman, both of Wilmington, Del., assignors to Du Pont Canada Inc., Mississauga, Canada**

**Continuation-in-part of Ser. No. 366,400, Jun. 15, 1989, abandoned. This application Jun. 13, 1990, Ser. No. 538,066**
**Int. Cl.[5] B01D *53/22, 71/32***
**U.S. Cl. 55—16** **41 Claims**




1. A method for the enrichment of the amount of a gaseous organic compound in a gaseous admixture of said organic compound and at least one of oxygen and nitrogen, said method comprising:
(a) providing in a membrane separation cell a selectively permeable membrane having a feed side and a permeate side, said membrane being virtually defect-free with an oxygen/nitrogen selectivity of at least 1.4 and formed from an amorphous polymer of perfluoro-2,2-dimethyl-1,3-dioxole, and feeding said admixture to the feed side of

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said membrane, said membrane being at a temperature of less than the glass transition temperature of the polymer; and

(b) removing from the feed side of the membrane, a gaseous admixture of said organic compound that is enriched in the amount of organic compound.

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**5,051,115**

## PRESSURE SWING ADSORPTION PROCESS

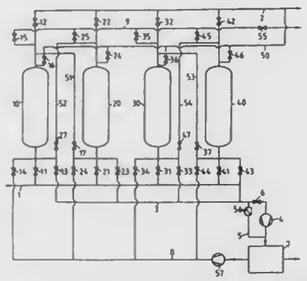
**Paul Leitgeb, Pullach, and Johann Leis, Neufahrn, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany**

**Filed May 20, 1987, Ser. No. 51,563**

**Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3616981; May 21, 1986, 3617036**

**Int. Cl.[5] B01D *53/04***

**U.S. Cl. 55—26** **20 Claims**



1. In a pressure swing adsorption process for the separation of a gaseous mixture containing at least two components having different adsorbabilities, said process comprising passing the gaseous mixture in an adsorption phase through an adsorber so as to adsorb the more adsorbable component; purging residual less adsorbable component remaining in the adsorber after the adsorption phase by passing into the adsorber a gas consisting essentially of the more adsorbable component; recovering the more adsorbable component by drawing a vacuum on the adsorber; and repressurizing the adsorber to adsorption pressure, the improvement comprising

repressurizing the adsorber in a four-phase step comprising a first pressure build-up phase wherein the adsorber is repressurized to an intermediate pressure with a weakly adsorbable gas, said weakly adsorbable gas being unadsorbed gas withdrawn from an adsorber during the adsorption phase; a second pressure build-up phase wherein expansion gas from another adsorber is introduced into the adsorber; a third pressure build-up phase wherein exit purge gas from another adsorber is introduced into the adsorber and a fourth pressure build-up phase wherein the gaseous mixture to be treated is introduced into the adsorber.

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**5,051,116**

## METHOD OF REDUCING PRESSURE DROP DURING THE PASSAGE OF A FLUID, AND A HYDRAULIC SYSTEM RESERVOIR FOR CIRCULATION OF A FLUID

**Karl-Erik Mattsson, Tingsvägen 7, S-141 45, Huddinge, Sweden**

**PCT No. PCT/SE89/00098, § 371 Date Aug. 2, 1990, § 102(e) Date Aug. 2, 1990, PCT Pub. No. WO89/08783, PCT Pub. Date Sep. 21, 1989**

**PCT Filed Mar. 3, 1989, Ser. No. 548,936**

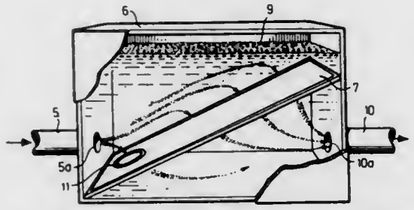
**Claims priority, application Sweden, Mar. 8, 1988, 8800819**

**Int. Cl.[5] B01D *19/00***

**U.S. Cl. 55—52** **12 Claims**

1. A method of reducing pressure drop across a fine-mesh net structure during the passage of a fluid through said net structure, for the purpose of extracting air or gas from the fluid, characterised by conducting part of the fluid flow through a constricted passageway located in or adjacent to the net structure, so as to effect viscosity-dependent shunting of the fluid.

7. A reservoir (**6**) for use in fluid-circulating hydraulic systems and provided with air separator means, said means including a fine-mesh net structure (**7**) which is located in the path of fluid flow and which slopes in relation to the surface of the fluid in said reservoir, said reservoir having a fluid inlet (**5***a*) and a fluid outlet (**10***a*), characterised by a constricted flow passageway (**11, 11'**) located in or adjacent to the net structure, for viscosity-dependent shunting of the fluid (**9**).



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**5,051,117**

## PROCESS FOR REMOVING GASEOUS CONTAMINATING COMPOUNDS FROM CARRIER GASES CONTAINING HALOSILANE COMPOUNDS

**Heleoe Prigge, Unterschleissheim; Robert Rurländer, Halsbach; Harald Hoffman, Burghausen, and Hans-Peter Bortner, Emmerting, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany**

**Continuation of Ser. No. 418,081, Oct. 6, 1989, abandoned. This application Dec. 20, 1990, Ser. No. 631,190**

**Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843313**

**Int. Cl.[5] B01D *53/04***

**U.S. Cl. 55—58** **12 Claims**

1. A process for removing gaseous contamination selected from the group consisting of n-type doping impurities, p-type doping impurities, hydrocarbons, halogenated hydrocarbons, volatile metal halides, from a carrier gas selected from the group consisting of noble gases and hydrogen, containing halosilane compounds, comprising the steps of:

bringing the carrier gas into contact with a zeolite of the composition $M_{2/n}O.Al_2O_3.x\ SiO_2.y\ H_2O$ wherein,

M represents an element from Group I or Group II of the Mendeleyev Periodic Table of elements, or represents $NH_4$;

n corresponds to the valency of M;

x in which the molar ratio $x = SiO_2/Al_2O_3$ is at least 2; and,

y has a value tending toward zero,

said zeolite having an unobstructed pore size of 4–20 Å;

said zeolite being a member selected from the group consisting of zeolite X, zeolite Y, chabazite, pentasil and a combination thereof;

adsorbing, at least partially, the said contamination to the said zeolite; and

recovering the said carrier gas containing halosilane compounds.



**5,051,118**

## METHOD OF FILTRATION

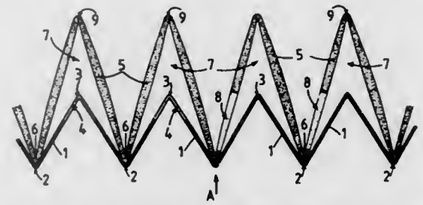
**Robert Andreae, Le Vieux Motty, 1141 Yens, Switzerland**

**Filed Dec. 15, 1989, Ser. No. 455,505**

**Claims priority, application Switzerland, Apr. 26, 1989, 01584/89**

**Int. Cl.[5] B01D *45/00***

**U.S. Cl. 55—97** **3 Claims**



1. Filtration method of a gaseous flow charged with paint particles or paint drops of different sizes, comprising forcing said gaseous flow through an accordion type filter having two walls of different length connected along upstream folds defining chambers between them and having displaced inlet and outlet openings in order to cause a swirling flow projecting the particles of greater size by inertia or centrifugal effect against walls of the chambers, wherein the downstream wall of said filter is porous so that a portion at least of said gaseous flow is evacuated outside said chambers through said porous walls and not through the outlet openings, catching thus the finest particles.

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**5,051,119**

## RAPPING MECHANISM FOR PRECIPITATOR ELECTRODES

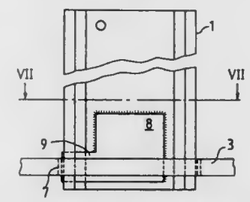
**Leif Lind, Copenhagen, Denmark, assignor to FLS miljo a/s, Denmark**

**Filed Apr. 25, 1990, Ser. No. 514,089**

**Claims priority, application United Kingdom, May 8, 1989, 8910542**

**Int. Cl.[5] B03C *3/76***

**U.S. Cl. 55—112** **8 Claims**



1. A rapping mechanism for rapping a row of electrodes in an electrostatic precipitator, said precipitator having support means for said electrodes, said electrodes consisting of vertical strip plates and being suspended at their upper ends from said support means, said mechanism comprising:

a horizontal rapping bar;

a hammer for striking the bar in its axial direction; and,

connection means connecting said rapping bar with the lower end of each electrode in the row,

said connection means being an elastic connection configured with a predetermined elasticity in the horizontal direction corresponding to said horizontal rapping bar.

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**5,051,120**

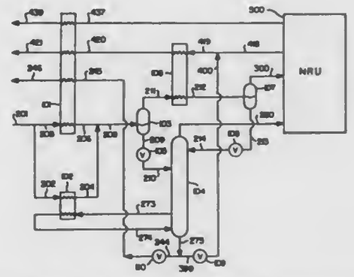
## FEED PROCESSING FOR NITROGEN REJECTION UNIT

**Ravindra F. Pahade, Getzville, and James J. Maloney, Tonawanda, both of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.**

**Filed Jun. 12, 1990, Ser. No. 536,522**

**Int. Cl.[5] F25J *3/02***

**U.S. Cl. 62—24** **11 Claims**




1. Method for cryogenic processing of a feed containing nitrogen and methane comprising:

(A) partially condensing a feed comprising nitrogen and methane to produce a first vapor and a first liquid;

(B) passing first liquid into a stripping column;

(C) partially condensing first vapor to produce a second vapor and a second liquid;

(D) passing second liquid into the stripping column;

(E) passing second vapor into a nitrogen rejection unit for separation into nitrogen-enriched and methane-enriched components;

(F) removing a stream of nitrogen-enriched component from the nitrogen rejection unit; and

(G) removing a stream of methane-enriched component from the nitrogen rejection unit.

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**5,051,121**

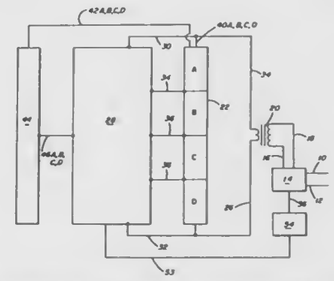
## SEGMENTED BUSHING TEMPERATURE CONTROLLER AND METHOD FOR USING SAME

**Reed H. Grundy, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed May 30, 1990, Ser. No. 530,755**

**Int. Cl.[5] C03B *37/07, 37/09***

**U.S. Cl. 65—1** **24 Claims**



14. An apparatus for controlling temperature of a glass fiber forming bushing having multiple bushing segments comprising:

means to measure the temperature of each bushing segment of a multiple segment bushing;

means to determine the actual average temperature of said bushing;

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means to develop one segment set point temperature based on said measured segment temperatures;
means to compare said actual average bushing temperature to a desired average bushing temperature;
means to adjust current to said bushing in response to said bushing temperature comparison;
means to compare said measured temperature of each of said bushing segments to said segment set point temperature; and
means to vary current to each bushing segment in response to said bushing segment temperature comparison.

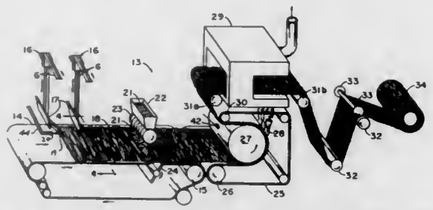
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**5,051,122**

## METHOD AND APPARATUS FOR MANUFACTURING CONTINUOUS FIBER GLASS STRAND REINFORCING MAT

**Walter J. Reese, North Huntington; Anastasia Morfesis, Pittsburgh; George T. Salego, Brackenridge, and David A. Vorp, Apollo, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 460,484, Jan. 3, 1990, abandoned. This application Jul. 2, 1990, Ser. No. 547,369**
**Int. Cl.[5] C03C *25/02***
**U.S. Cl. 65—3.43** **27 Claims**



1. In a method for making a mat of continous fiber glass strand by reciprocating a plurality of strand feeders across the surface of a moving conveyor, each of said feeders drawing at least one strand from a supply source and projecting said strand from said feeder and depositing it onto an upper surface of said conveyor so as to form thereon a loose fiberous mat structure, the improvement comprising the steps of:
distributing resin generally throughout said loose fiberous mat structure;
wrapping said conveyor around a portion of the circumference of a rotating calender roll so as to compact said loose mat structure and resin between said roll and said conveyor; and
heating said roll to a surface temperature sufficient to remove moisture from said mat and melt said resin to bond said individual glass strands forming said mat structure together with one another as said mat is compacted between said roll and conveyor.

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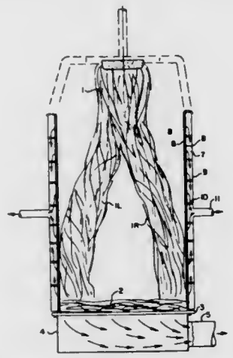
**5,051,123**

## ARRANGEMENT FOR CLEANING SURFACES OF A WOOL CHAMBER IN THE MANUFACTURE OF MINERAL WOOL

**Tom E. E. Nurmi, Pargas, Finland, assignor to Oy Partek AB, Pargas, Finland**

**PCT No. PCT/FI88/00095, § 371 Date Feb. 20, 1990, § 102(e) Date Feb. 20, 1990, PCT Pub. No. WO88/10242, PCT Pub. Date Dec. 29, 1988**
**PCT Filed Jun. 13, 1988, Ser. No. 438,407**
**Claims priority, application Finland, Jun. 18, 1987, 872747**
**Int. Cl.[5] C03B *37/04***
**U.S. Cl. 65—9** **11 Claims**

1. An apparatus for manufacturing fibrous wool from a melt of glass or mineral, in which the melt is streamed into glass or mineral wool fibres from a fibrillation unit opening into a wool chamber having a walls including a roof and side walls, and the fibres are deflected within the wool chamber by means of gas jets which, acting on the fibres, cause the fibres to deposit on a receiving conveyor which forms a floor for the wool chamber,
an improvement for managing build up of the glass or mineral wool fibres on at least one of said walls of the wool chamber, said improvement comprising:
at least one of said walls of said wool chamber being provided as a double-walled construction including an outer wall which is spaced from an inner wall so as to provide at least one internal cavity, said inner wall having an inner surface arranged for exposure within said wool chamber;
a plurality of perforations formed through said inner wall thereby communicating said inner surface with a respective said cavity;
at least one source of suction, each communicated to a respective said cavity for drawing a vacuum through the respective said perforations; and



at least one sheet of lining material removably held facewise on a respective portion of said inner surface by vacuum drawn through respective said perforations by the respective said source of suction, so that, in use of said apparatus, said lining material prevents said glass or mineral wool fibres from depositing directly on the respective portion of said inner surface, and, after said glass or mineral wool fibres have deposited on each said sheet of lining material to a substantial thickness, each sheet of lining material can be easily replaced by temporarily cutting off the respective said source of suction, thereby causing the respective sheet of lining material to detach from the inner wall of the wool chamber, replacing each thereby-detached sheet of lining material with a fresh one, and again turning on the respective source of suction.

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**5,051,124**

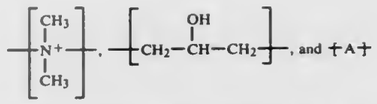
## MICROBICIDAL COMPOSITIONS OF DIMETHYLAMINE-EPICHLOROHYDRIN AMINES

**John D. Pera, Cordova, Tenn., assignor to Buckman Laboratories International, Inc., Memphis, Tenn.**

**Filed Oct. 24, 1989, Ser. No. 425,913**
**Int. Cl.[5] A01N *33/04***
**U.S. Cl. 71—67** **16 Claims**

1. A method of inhibiting the growth and proliferation of microorganisms comprising:
contacting said microorganisms with an amount of a polymeric quaternary ammonium composition that is effective to inhibit the growth and proliferation of a microorganism,
wherein said composition comprises a crosslinked reaction product of dimethylamine, a polyfunctional amine, and epichlorohydrin, said composition containing repeating units of the structures





as a cationic portion of said composition, and $Br^-$ or $Cl^-$ as an anionic portion of said composition;
wherein A is a residue obtained after at least bifunctional epoxy reaction from a polyfunctional amine, and
wherein the amount of said polyfunctional amine is from about 1 percent up to about 15 percent of the total moles of said dimethylene and said polyfunctional amine, and the amount of said epichlorohydrin is from at least about the equimolar quantity of said amines up to the full functional equivalency of said amines; and
wherein the said bromide or chloride ion is present in an amount sufficient to satisfy the anion requirement of the cationic portion of said polymeric quaternary ammonium composition.

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**5,051,125**

## SYNERGISTIC HERBICIDAL COMPOSITION OF CYCLOATE AND CYANAZINE

**Bareld E. Groenwold, Los Altos, and James L. Able, San Jose, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.**

**Continuation of Ser. No. 835,904, Mar. 4, 1986, abandoned. This application Jun. 20, 1990, Ser. No. 540,956**
**Int. Cl.[5] A01N *43/70, 37/22***
**U.S. Cl. 71—93** **28 Claims**

1. A herbicidal composition comprising herbicidally effective amounts of S-ethyl cyclohexylethyl thiocarbamate and 2-chloro-4-(ethylamino)-6-(2-cyanoisopropylamino)-s-triazine, in a weight ratio of about 2:1 to about 4:1.

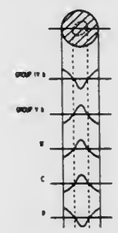
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**5,051,126**

## CERMET FOR TOOL

**Hajime Yasui, Nagoya, and Junichiro Suzuki, Hashima, both of Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan**

**Filed Jan. 12, 1990, Ser. No. 464,040**
**Claims priority, application Japan, Jan. 13, 1989, 1-6791**
**Int. Cl.[5] C22C *29/04***
**U.S. Cl. 75—238** **9 Claims**



1. A cermet for use in tools comprising:
a hard dispersed phase composed of transitional metals selected from the group consisting of the group IVb metals, transitional metals selected from the group consisting of Vb metals, tungsten, carbon, and nitrogen, where the cermet is composed of substantially between 70 to 95 volume percentage of the hard dispersed phase, and
a binder phase composed of at least one metal selected from the group consisting of the iron group metals of the group VIII metals, where the cermet is composed of substantially between 5 to 30 volume percentage of the binder phase;
wherein the hard dispersed phase comprises
Type-I particles, which are single phase particles, and
Type-II particles, which are dual phase particles having a core and at least one outer layer and having a composition varying from the core to the at least one outer layer such that the at least one outer layer is composed of more transitional metals selected from the group consisting of the group IVb metals than the core, and the core is composed of more transitional metals selected from the group consisting of the group Vb metals and tungsten than any outer layer of the Type-II particles.

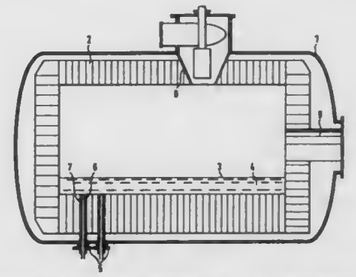
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**5,051,127**

## PROCESS FOR POST COMBUSTION

**Gregory J. Hardie, and John M. Ganser, both of Amberg, Fed. Rep. of Germany, assignors to Klockner CRA Patent GmbH, Duisburg, Fed. Rep. of Germany**

**Filed Feb. 10, 1989, Ser. No. 308,584**
**Claims priority, application Australia, Feb. 12, 1988, PI 6741; Feb. 12, 1988, PI 6745; Jul. 29, 1988, PI 9558**
**Int. Cl.[5] C21B *7/076***
**U.S. Cl. 75—553** **20 Claims**



1. A process for post combustion of reaction gases generated from a molten bath of iron into the space above the surface of the molten bath in a reaction vessel containing said molten bath, said process comprising:
injecting at least one hollow jet of oxidizing gases into said space toward the surface of the molten bath,
whereby the reaction gases are combusted with the oxidizing gases in said space above the surface of the molten bath, and the energy produced by said combustion is transferred to the molten bath.

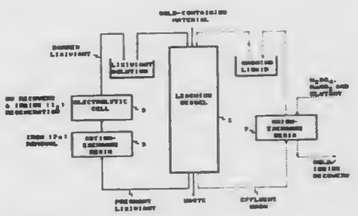
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**5,051,128**

## ELUTION PROCESS FOR GOLD-IODINE COMPLEX FROM ION-EXCHANGE RESINS

**Susumu Kubo, Sapporo, Japan, assignor to Nippon Mining Co., Tokyo, Japan and In-Situ, Inc., Laramie, Wyo.**

**Filed May 1, 1990, Ser. No. 515,497**
**Int. Cl.[5] C22B *11/04***
**U.S. Cl. 75—712** **15 Claims**



1. An elution process for gold-iodine complex from ion-ex-

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change resins comprising the steps of adsorbing a gold-iodine complex on a strongly basic anion-exchange resin, adding sulfuric acid and sodium nitrite to said gold-iodine complex adsorbed on said strongly basic anion-exchange resin, and thereafter adding sodium sulfite thereto as an eluant.

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**5,051,129**

**MASONRY WATER REPELLENT COMPOSITION**

**Robert L. Cuthbert, Bay City, and Edwin P. Plueddemann, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Jun. 25, 1990, Ser. No. 543,981**

**Int. Cl.[5] B05D** *3/02;* **C08F** *283/16;* **C09K** *3/00;* **B32B** *9/04*

**U.S. Cl. 106—2** **18 Claims**

1. A composition comprising an aqueous solution of a water soluble silane coupling agent and an alkyltrialkoxysilane, the alkyltrialkoxysilane being selected from the group consisting of alkyltrialkoxysilanes with $C_1$ to $C_6$ alkyl groups on silicon and a blend of alkyltrialkoxysilanes each with $C_1$ to $C_6$ alkyl groups on silicon, the volatile organic content of the aqueous solution being less than about four hundred grams per liter, the alkyltrialkoxysilane and the silane coupling agent being present in the aqueous solution in the mole ratio of between about 0.5:1.0 to about 3.0:1.0.

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**5,051,130**

**FILLING COMPOSITIONS FOR DENTAL TEMPORARY SEALING**

**Shunichi Futami, Nagareyama; Sueo Saito, and Nobuko Okita, both of Tokyo, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan**

**Filed Sep. 27, 1989, Ser. No. 413,071**

**Claims priority, application Japan, Oct. 11, 1988, 253888**

**Int. Cl.[5] A61K** *6/06;* **C04B** *28/28*

**U.S. Cl. 106—35** **3 Claims**

1. A filling composition for temporary dental sealing comprising:

a component A of putty consistency which contains, as a base agent, a water-insoluble liquid acidic phosphate selected from the group consisting of monoalkyl acid phosphates, monoaryl acid phosphates, dialkyl acid phosphates, diaryl acid phosphates and alkyl aryl acid phosphates and/or a water-insoluble organic carboxylic acid having at least six carbon atoms that is liquid at room temperature and contains 5.0 to 50.0% by weight of finely divided silica having an average particle size of 2 to 2,000 μm and a component B of putty consistency which contains, as a setting agent, a multivalent metal salt and contains 1.0 to 20.0% by weight of at least one finely divided inorganic filler having an average particle size of 2 to 2,000 μm selected from the group consisting of silica, aluminum oxide, titanium oxide, calcium oxide, zirconium oxide, magnesium oxide, aluminum hydroxide, calcium hydroxide, magnesium hydroxide, aluminum silicate, calcium silicate, zirconium silicate, magnesium silicate and barium sulfate.

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**5,051,131**

**AZO DISPERSING AGENTS AND AZO PIGMENT COMPOSITIONS**

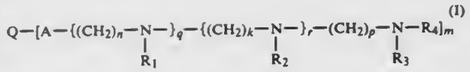
**Takahiro Yuasa, and Kenzi Kitamura, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Dec. 12, 1989, Ser. No. 448,866**

**Int. Cl.[5] C09B** *29/15, 29/33, 67/20;* **C09D** *11/02*

**U.S. Cl. 106—494** **4 Claims**

1. An azo pigment composition formed from a coupling reaction between an aromatic amine as a diazo component and a coupler component comprising at least one member selected from the group consisting of β-naphthol, β-oxynaphthoic acid, Naphthol AS and acetoacetanilides, the diazo or coupler component containing a compound of the formula (1)



(I)

wherein:

Q represents a diazo component selected from aminobenzene and aminonaphthalene or a coupler component selected from β-naphthol, β-oxynaphthoic acid, Naphthol AS and acetoacetanilides,

A represents a divalent bonding substituent selected from the group consisting of —CONR′—, —$SO_2$NR′—, —$CH_2$NH— and —$CH_2$NHCO$CH_2$NH— in which R′ represents hydrogen, alkyl having 1 to 20 carbon atoms or aryl,

$R_1$ to $R_4$ independently represent hydrogen, alkyl having 1 to 20 carbon atoms or alkenyl having 2 to 20 carbon atoms,

n, k and p independently represent an integer of 2 or 3,

m represents an integer of 1 or 2, and q and r independently represent an integer of 0 to 7 provided that q+r represents an integer of 0 to 7,

and provided that when Q represents a diazo component, the amount of the compound of the formula (I) is 0.1 to 30% by weight based on the diazo component, and when Q represents a coupler component, the amount of the compound of the formula (I) is 0.1 to 30% by weight based on the coupler component.

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**5,051,132**

**LYOPHILIZED PREPARATION OF 6-(3-DIMETHYLAMINOPROPIONYL)FORSKOLIN**

**Emiko Yamasaki, Kawaguchi, and Taka'aki Ohkuma, Yono, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan**

**Filed May 30, 1990, Ser. No. 530,355**

**Claims priority, application Japan, Jun. 15, 1989, 1-150595**

**Int. Cl.[5] A01N** *43/08;* **A61K** *31/34*

**U.S. Cl. 127—30** **9 Claims**

1. A lyophilized preparation consisting essentially of 6-(3-dimethylaminopropionyl)forskolin and a buffer agent having a pH value of about 3 to about 6 when dissolved.

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**5,051,133**

**GELATINIZED CEREAL FLOURS AND PROCESS FOR THEIR PRODUCTION**

**Tadashi Nagai, Tokyo, and Yayoi Nademoto, Osaka, both of Japan, assignors to Suntory Limited, Osaka, Japan**

**Filed Dec. 11, 1989, Ser. No. 448,297**

**Claims priority, application Japan, Dec. 12, 1988, 63-313656; Mar. 29, 1989, 1-77913**

**Int. Cl.[5] C08B** *30/00*

**U.S. Cl. 127—65** **1 Claim**

1. A process for producing a gelatinized cereal flour, which process comprises adding water to a cereal flour containing starch as a principal component, wherein water is added in an amount of 200–5,000 parts by weight per 100 parts by weight of the cereal flour heating said flour to gelatinize, adding an alcohol to the gelatinized flour, wherein the alcohol is added in an amount of 5–40 vol% of the volume of water and freeze-drying the same.



**5,051,134**

**PROCESS FOR THE WET-CHEMICAL TREATMENT OF SEMICONDUCTOR SURFACES**

**Anton Schnegg, Burghausen; Laszlo Fabby, Emmerting; Peter Nusstein, Munich, and Gertrud Valouch, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe m.b.H., Burghausen, Fed. Rep. of Germany**

**Filed Dec. 12, 1990, Ser. No. 626,490**

**Claims priority, application Fed. Rep. of Germany, Jan. 26, 1990, 4002327**

**Int. Cl.[5] C23G** *1/02*

**U.S. Cl. 134—3** **10 Claims**

1. A process for the wet-chemical treatment of a semiconductor surface comprising:

contacting said semiconductor surface with an aqueous solution containing hydrofluoric acid, said solution containing at least one additional constituent selected from the group consisting of:

(a) an organic compound capable of forming inclusion compounds and forming ring molecules comprising a cyclodextrin or crown ether

(b) an acid which does not oxidize the semiconductor surface to be treated and has a pKa of less than 3.14, individually or in combination, as a mixture of acids; and

(c) a mixture of (a) and (b).

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**5,051,135**

**CLEANING METHOD USING A SOLVENT WHILE PREVENTING DISCHARGE OF SOLVENT VAPORS TO THE ENVIRONMENT**

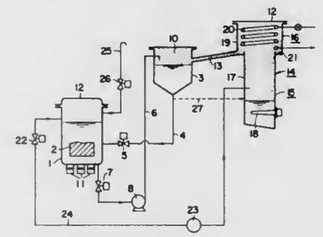
**Masato Tanaka, and Tadayoshi Ichikawa, both of Nagano, Japan, assignors to Kabushiki Kaisha Tiyoda Seisakusbo, Koushoku, Japan**

**Filed Sep. 25, 1989, Ser. No. 412,271**

**Claims priority, application Japan, Jan. 30, 1989, 1-8302[U]; Jan. 30, 1989, 1-17516; Apr. 20, 1989, 1-98910; Apr. 20, 1989, 1-98911; May 29, 1989, 1-132817**

**Int. Cl.[5] B08B** *7/04;* **F26B** *5/04*

**U.S. Cl. 134—10** **7 Claims**



1. A method of cleaning articles with a solvent while preventing discharge of solvent vapor to the environment, comprising the steps of:

closing a cleaning tank after an article to be cleaned is placed within the cleaning tank;

supplying the solvent into the cleaning tank from a solvent storage tank which is isolated from said cleaning tank and is communicatively connected to a solvent condenser.

cleaning the article to be cleaned with the solvent supplied into the cleaning tank;

after the cleaning step, discharging the solvent in liquid state from the cleaning tank into the solvent storage tank to raise the liquid solvent level in the solvent storage tank thereby to force solvent vapor above the level into said solvent condenser so as to condense the solvent vapor in the condenser and then to return the condensed solvent back into the solvent storage tank;

after the cleaning step, discharging vapor of the solvent which remains in the cleaning tank into said solvent condenser and condensing the

returning the condensed solvent, which is derived from within said cleaning tank, from the condenser into the solvent storage tank; and

after the liquid solvent discharging step and the vapor solvent discharging step, sealing off the cleaning tank form the solvent storage tank and the condenser, than re-opening the cleaning tank and taking out the cleaned article.

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**5,051,136**

**PROCEDURE FOR WASHING CIRCUIT BOARDS AND MEANS FOR USE IN SAID PROCEDURE**

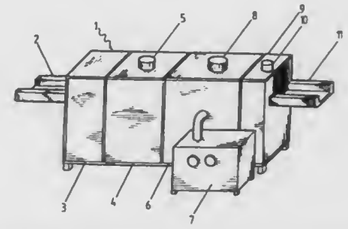
**Aulis Tuominen, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland**

**Filed Jan. 31, 1990, Ser. No. 473,908**

**Claims priority, application Finland, Feb. 2, 1989, 890507**

**Int. Cl.[5] B08B** *1/02, 3/02*

**U.S. Cl. 134—15** **16 Claims**



1. A method for cleaning a circuit board, comprising the step of:

removing from the circuit board flux residues, which form on the circuit board from soldering on the circuit board, by spraying aqueous steam on the circuit board.

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**5,051,137**

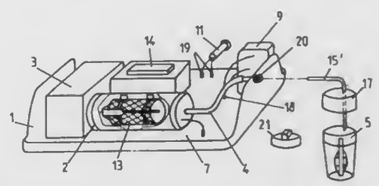
**PROCESS FOR DECONTAMINATION AND CLEANING OF OCULAR PROSTHESES, IN PARTICULAR CONTACT LENSES, AND APPARATUS FOR PRACTICING THIS PROCESS**

**Yves Nold, 9 rue du Parc, 57100 Thionville, France**

**Filed Jun. 13, 1988, Ser. No. 205,842**

**Int. Cl.[5] B08B** *5/00*

**U.S. Cl. 134—42** **5 Claims**



1. Apparatus for decontamination and cleaning of ocular prostheses, comprising a casing enclosing an ionizing tube whose one end is connected to an air pump and whose other end is connected to a conduit for transporting the ozone product, this conduit terminating in a capillary tube, an electrical assembly for controlling the ozonizing tube and the air pump, and a removable receptable having a removable lid, said receptacle having an open top adapted to be closed by said lid, said capillary tube being insertable through and withdrawable from an opening through said lid to and from a position in which a free end of said capillary tube is disposed adjacent the bottom of the receptacle.

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5,051,138
**METHOD OF PRODUCING GRAIN ORIENTED ELECTRICAL STEEL SHEET HAVING HIGH MAGNETIC FLUX**

Isao Iwanaga, and Kenzo Iwayama, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,601
Claims priority, application Japan, Mar. 30, 1989, 1-79988
Int. Cl.[5] C21D *8/02*
U.S. Cl. 148—2 7 Claims

1. A method of producing a grain oriented electrical steel sheet having a high magnetic flux density, comprising steps of continuously rapid quench solidifying a molten steel essentially consisting of 0.03 to 0.10% of C, 2.5 to 4.5% of Si, 0.02 to 0.15% of Mn, 0.01 to 0.04% of Al acid soluble by weight and the remainder substantially Fe, to obtain a thin strip, subjecting said thin strip to a cold rolling one or two or more stages, with an annealing therebetween, without hot rolling prior to cold rolling, decarburization annealing, applying an annealing separator prior to finishing annealing, and finishing annealing, wherein a content of S of 0.01% or less, and a content of N of 0.003% or less is contained in the molten steel, and sulfide and nitride are contained in the annealing separator for the finishing annealing.

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5,051,139
**PROCESS FOR THE MANUFACTURE OF SEMI-FINISHED PRODUCTS OR PREFORMED PARTS MADE OF REFRACTORY METALS AND RESISTANT TO THERMAL CREEP**

Ralf Eck, Reutte/Tirol, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

Filed May 1, 1990, Ser. No. 517,291
Claims priority, application Austria, May 3, 1989, 1059/89
Int. Cl.[5] C22C *27/04;* H01K *1/38*
U.S. Cl. 148—11.5 F 12 Claims

1. A process for the manufacture of semi-finished products or preformed parts each with high thermal creep-resistance and each made from sintered or molten fabricated materials of dispersion strengthened alloys, said alloys being comprised of at least one of the refractory metals selected from the group consisting of a primary metal constituent of vanadium, niobium, tantalum, chromium, molybdenum, and tungsten, and combinations thereof, alone or with other metal components, comprising thermo-mechanically deforming said fabricated materials about two to about four times in succession employing a strain of about 3-25% each time such that the overall strain does not exceed about 75%, said deforming being effected at hot forming temperatures in the range of about 900° C. to about 1600° C. customary for the said respective primary metal constituent, said process being alternated by an intermediate annealing operation for about 1 to 6 hours at temperatures between the respective hot forming temperature and the respective recrystallization temperature for the said primary metal constituent.

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5,051,140
**SURFACE TREATMENT METHOD FOR TITANIUM OR TITANIUM ALLOY**

Moriyuki Mushiake, Kyoto; Kenichi Asano, Kusatsu, and Noriyuki Miyamura, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1990, Ser. No. 489,443
Claims priority, application Japan, Mar. 23, 1989, 1-69171
Int. Cl.[5] C21D *1/56;* C23C *8/06*
U.S. Cl. 148—203 9 Claims

1. A method for treating the surface of titanium or a titanium alloy comprising the steps of:
pre-treating a workpiece comprising titanium or a titanium alloy with an acid to clean said work piece;
heating said pretreated workpiece in an oxidative atmosphere for a predetermined period of time to form a composite layer comprising oxide layers and oxygen-enriched layers on the surface of said workpiece; and
rapidly quenching said workpiece to remove a scale layer formed as an outermost layer of said composite layer on the surface of said workpiece.

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5,051,141
**COMPOSITION AND METHOD FOR SURFACE REFINEMENT OF TITANIUM NICKEL**

Mark D. Michaud, Bristol, and Robert G. Zobbi, Southbury, both of Conn., assignors to Rem Chemicals, Inc., Southington, Conn.

Filed Mar. 30, 1990, Ser. No. 502,515
Int. Cl.[5] C23F *7/06*
U.S. Cl. 148—269 10 Claims

1. An aqueous solution for use in the refinement of metal surfaces, comprising water, 0.04 to 1.17 gram mole per liter of a sulfamic acid compound selected from the group consisting of sulfamic acid and water-soluble derivatives thereof, 3.16 to 0.03 gram mole per liter of fluoride ion, and a 0.02 to 0.60 gram mole per liter of a water-soluble peroxy compound, said solution having a pH of about 1.0 to 4.0.

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5,051,142
**EMULSION EXPLOSIVE CONTAINING NITROSTARCH**

John J. Mullay, Hazleton; Joseph A. Sohara, Walnutport, both of Pa., and Dennis J. Schulz, Sandy, Utah, assignors to Atlas Powder Company, Dallas, Tex.

Filed Jan. 17, 1990, Ser. No. 466,222
Int. Cl.[5] C06G *45/00*
U.S. Cl. 149—2 25 Claims

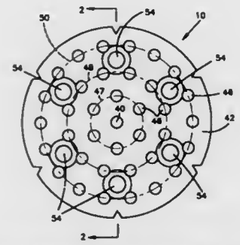
1. A water-in-oil emulsion explosive composition consisting essentially of from about 5% to about 50% nitrostarch based on weight of total composition.

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5,051,143
**WATER BASED COATING FOR GAS GENERATING MATERIAL AND METHOD**

George W. Goetz, Rochester Hills, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Continuation-in-part of Ser. No. 547,623, Jun. 28, 1990. This application Mar. 26, 1991, Ser. No. 675,997
Int. Cl.[5] C06G *45/18*
U.S. Cl. 149—3 24 Claims



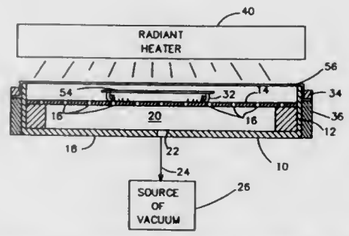

1. A gas generating grain having a particulate booster coating thereon, said coating comprising an alkali metal azide, a water-soluble inorganic oxidizer, said oxidizer being potassium perchlorate, and a water-insoluble metal oxide, said coating being applied to said grain as a slurry and dried.



5,051,144
**METHOD FOR ENCASING A POROUS BODY IN AN ENVELOPE OF PLASTIC MATERIAL**

David R. Kistner, Troy, Mich., assignor to Sota Technology, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 197,595, May 23, 1988, Pat. No. 4,880,680. This application Oct. 24, 1989, Ser. No. 426,323
Int. Cl.[5] B32B *31/26*
U.S. Cl. 156—85 28 Claims



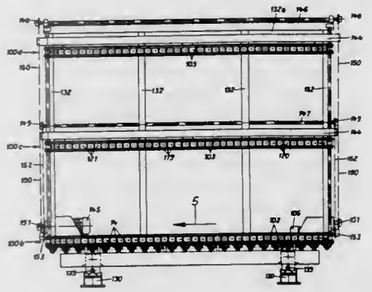

1. A method for enclosing an article in a plastic sheet material that becomes adhesive in the presence of heat, comprising the steps of:
disposing a first sheet of air impervious plastic material adjacent the article, the first sheet being capable of becoming adhesive when heated;
heating the first sheet such that it becomes adhesive;
drawing the first plastic sheet toward the article to become adhesively attached thereto;
cooling the first plastic sheet until it sets;
disposing a second sheet of an air impervious plastic material adjacent the article, the second sheet being capable of becoming adhesive when heated;
heating the second sheet such that it becomes adhesive; and
drawing the second sheet toward the article and the first plastic sheet to become adhesively attached thereto without the use of an adhesive material other than said first and second sheets.

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5,051,145
**APPARATUS FOR A SLIPLESS CONVEYANCE OF TWO PLATES**

Karl Lenhardt, Neuhausen-Hamberg, Fed. Rep. of Germany, assignor to Lenhardt Maschinenbau GmbH, Neuhausen-Hamburg, Fed. Rep. of Germany

Continuation of Ser. No. 925,269, Oct. 31, 1986, Pat. No. 4,911,779. This application Mar. 16, 1990, Ser. No. 494,593
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 3539879
Int. Cl.[5] B32B *17/00*
U.S. Cl. 156—99 21 Claims



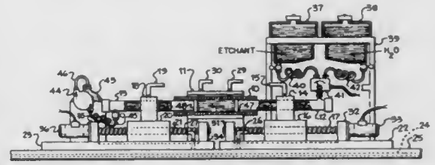
1. In apparatus for a slipless conveyance of two individual coextensive glass plates, which are transversely spaced apart and in register and have respective bottom edges and broadsides which are remote from each other and extend in respective vertical or nearly vertical, parallel planes of travel, comprising
conveying means which are adapted to contact said plates on said broadsides in said planes of travel and operable to sliplessly convey said plates in a predetermined direction of travel, which is parallel to said planes of travel,
the improvement residing in that
said conveying means comprise on each side of the apparatus at least one vacuum-applying conveyor, which is operable to apply a vacuum to and to contact said broadside of one of said plates in the adjacent plane of travel and to sliplessly convey said one plate in said direction of travel,
said conveying means engaging two remote surfaces of said two plates leaving an open space between the engaging surfaces of said conveying means,
said conveying means further comprise drive means for synchronously driving said vacuum-applying conveyors.

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5,051,146
**APPARATUS FOR FABRICATING A GRADED-GROOVE HEAT PIPE**

Michael R. Kapolnek, Sunnyvale; Alexander R. Feild, Mt. View; Robert T. Hartle, Cupertino, and Hillard R. Holmes, Menlo Park, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 549,997, Jul. 9, 1990, Pat. No. 4,989,319, which is a division of Ser. No. 389,238, Sep. 3, 1989, Pat. No. 5,010,951. This application Sep. 25, 1990, Ser. No. 587,888
Int. Cl.[5] C23F *1/00*
U.S. Cl. 156—345 4 Claims




1. An apparatus for fabricating a heat pipe having a longitudinally extending capillary groove on an interior surface thereof, said capillary groove having a transverse cross-sectional dimension that varies with length of said heat pipe, said heat pipe being fabricated from an elongate hollow structure initially having a capillary groove of generally constant transverse cross-sectional dimension on said interior surface thereof, said apparatus comprising:
a) a jig for positoning said elongate hollow structure so as to have a predetermined orientation,
b) first plunger means insertable into said elongate hollow structure through a first end thereof, said first plunger means being adapted for applying chemical etchant to different surface portions of said capillary groove for correspondingly different lengths of time according to a program that causes said different surface portions of said capillary groove to acquire correspondingly different transverse cross-sectional dimensions, and
c) second plunger means insertable into said elongate hollow structure through a second end thereof, said second plunger means being adapted for removing chemical etchant that has reacted with said surface portions of said capillary groove.

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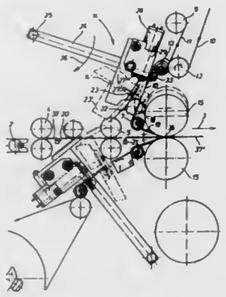


5,051,147

## LAMINATOR FOR CUT-SHEET LAMINATION

Wolfgang Anger, Haus Schosskopf, A-6764 Lech/Arlberg, Austria

Filed Jun. 22, 1989, Ser. No. 370,409
Int. Cl.[5] B30B *31/00*
U.S. Cl. 156—355 14 Claims



1. A laminator for applying cut film to at lest one side of a printed circuit board comprising:
a housing;
first and second laminating rollers mounted opposite to each other in said housing;
means for feeding a series of printed circuit boards to said heated laminating rollers, said means for feeding a series of printed circuit boards comprising first and second pairs of board feed rollers with said first pair advancing the successive boards at a first speed and said second pair of board feed rollers advancing the successive boards at a successive and higher speed to feed the successive printed circuit boards spaced from each other at the second speed with uniform spacing between successive boards;
first and second film rollers, said first and second film rollers being vacuum rollers to hold film there-against for film advance, means to drive both said film rollers at the same speed to prevent film tension therebetween, said second film vacuum roller being positioned to feed film to a printed circuit board adjacent said laminating rollers;
a cutting device located between said film vacuum rollers, said cutting device being mounted to move with the film in the direction of film motion while the film is cut, said cutting device being for cutting the film in accordance with a signal corresponding to the length of the printed circuit board; and
means for sensing the length of the printed circuit board being fed to said laminating rollers.

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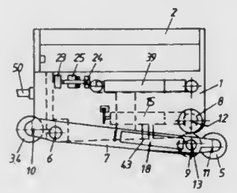
5,051,148

## DEVICE FOR WELDING SYNTHETIC RESIN SHEETING

Wilfried Resch, Spitalgasse 23, A-9300 St. Veit/Glan, Austria

Filed Jun. 20, 1990, Ser. No. 540,691
Claims priority, application Austria, Jun. 29, 1989, 1604/89
Int. Cl.[5] B44C *7/00*; B32B *35/00*
U.S. Cl. 156—358 10 Claims

1. Device for welding lengths of synthetic resin overlapping each other along the margin, by means of a wedge-shaped heated member (**14**) directed toward the gap between welding rollers (**8, 9**) wherein the wegde-shaped heated member (**14**) is arranged on a support (**33**) displaceably guided on a guide means (**34**) said guide means (**34**) being attached to a base member (**1**) of the device, one welding roller (**8**) being supported at the base member (**1**) and the other welding roller (**9**) being supported at a lever (**7**) mounted at the base member (**1**) to be pivotable about an axle (**6**) in parallel to the axes of rotation (**12, 13**) of the welding rollers (**8, 9**), wherein wheels or casters (**3, 4, 5**) are provided at the base member (**1**) and at the pivotably arranged lever (**7**), the device being movable by way of these wheels or casters, and wherein each welding roller (**8, 9**) is coupled with a drive motor (**15, 18**), characterized in that the lever (**7**) carrying one welding roller (**9**) is connected with an arm (**22, 50**) which is preferably perpendicular to this lever; that a pressure sensor (**23**) is arranged between the free end of the arm (**22**) and an adjustable stop (**24, 53**) for sensing the



pressure between said welding rollers (**8, 9**) ; that the wedge-shaped heated member (**14**) is guided on a guide means (**41, 42**) to be displaceable with respect to its support (**33**) by means of a servomotor (**39**); and that a pressure sensor (**43**) is arranged between mutually facing surfaces of the wedge-shaped heated member (**14**) and of the support (**33**) for sensing the contact pressure of the wedge-shaped heated member (**14**) against the synthetic resin.

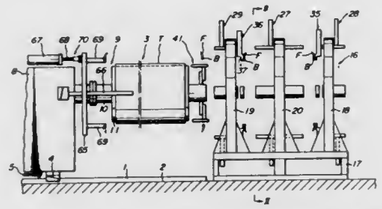
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5,051,149

## TIRE BUILDING APPARATUS INCLUDING BEAD SUPPLY MEANS FOR BEAD SETTERS

Ryutaro Ishii, Higashimurayama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed May 24, 1990, Ser. No. 527,913
Claims priority, application Japan, Jun. 3, 1989, 1-141481
Int. Cl.[5] B29D *30/32*
U.S. Cl. 156—403 3 Claims



1. A tire building apparatus comprising a main shaft having a first end supported by a driving means and a second end, a forming drum rotatably supported by said main shaft between said first and second ends and having an outer circumference around which a tire constituting member is wound, front and rear bead setters for setting beads in position on front and rear portions of the wound tire constituting member, respectively, bead supply means having a holder fixed to said second end of said main shaft of the forming drum and a plurality of circumferentially spaced rasping pawls supported by the holder and radially movable toward and away from an axis of the main shaft in synchronism with each other to be able to grasp a bead on an inside thereof, wherein said bead supply means is adapted to supply said grasped bead to said front bead setter for subsequent setting in position on said front portion of the wound tire constituting member, said front portion being that portion which is located furthest from said first end of said main shaft.



5,051,150

## STABILIZED SYNTHETIC PULP-CELLULOSE BLENDS

Elliott Echt, and Edward J. Engle, III, both of New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 20, 1989, Ser. No. 325,756
Int. Cl.[5] D21H *13/14*
U.S. Cl. 162—146 6 Claims

1. A method of preparing a stabilized polyolefin and wood pulp blend by solution flash spinning comprising:
a) forming a slurry comprising polyolefin and solvent,
b) adding antioxidant that is compatible with the polyolefin to said slurry selected from the group consisting of a thioether antioxidant, a hindered phenolic antioxidant, a phosphite antioxidant, or a mixture thereof, said antioxidant being employed in an amount of from 0.1–1.0% by weight, based on the weight of polyolefin,
c) pressurizing the slurry to 1,800–2,000 psi,
d) heating the slurry containing said antioxidant to form a homogeneous solution of the polyolefin and antioxidant in the solvent,
e) forming the polyolefin solution into a polyolefin pulp by
i) passing the solution to a spurting nozzle or spinneret in which a controlled pressure drop is effected, and
ii) flashing the solution into a chamber to quickly and completely evaporate the solvent to form the polyolefin pulp, and
f) mixing the polyolefin pulp with from about 55 to about 90% by weight, based on the total weight of the blend, of a wood pulp to produce the stabilized pulp blend.

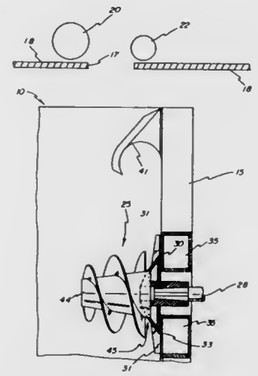
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5,051,151

## SIDE EXTRACTION PULPER WITH SCREW TYPE ROTOR

Joseph P. Constiner, Monroe, and Derald R. Hatton, Middletown, both of Ohio, assignors to The Black Clawson Company, Middletown, Ohio

Filed Feb. 19, 1991, Ser. No. 656,918
Int. Cl.[5] D21B *1/32*; B02C *23/36*
U.S. Cl. 162—264 3 Claims



1. Apparatus for pulping a web of broke advancing downwardly thereto, comprising:
(a) an open tub having a bottom wall, end walls and generally vertical side walls which are substantially straight and are more closely spaced than said end walls to impart an elongated shaped to said tub,
(b) at least one pulping rotor having a maximum axial dimension mounted for rotation on a substantially horizontal axis in one of said side walls,
(c) means for driving each said rotor, and
(d) a screw of an axial length substantially greater than the maximum axial dimension of each said rotor mounted concentrically on each said rotor and extending horizontally therefrom into the interior of said tub to engage a web of broke entering said tub from above and thereby to draw such web into engagement with the associated said rotor and
(e) means on said one side wall forming a canopy extending lengthwise of said wall above each said rotor and projecting outwardly from said one side wall for a predetermined maximum horizontal distance greater than the axial dimension of each said rotor into overhanging relation with each said rotor to intercept liquid impelled upwardly by each said rotor, and further characterized in that said screw mounted on each said rotor is of an axial length greater than said predetermined maximum horizontal projection of said canopy and is structured and arranged such that each said screw will engage a sheet of broke descending in said tub past said canopy.

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5,051,152

## PREPARATION OF URETHANE PREPOLYMERS HAVING LOW LEVELS OF RESIDUAL TOLUENE DIISOCYANATE

Albert J. Siuta, Coopersburg; William E. Starner, Freeland; Bernard A. Toseland, and Reinaldo M. Machado, both of Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 26, 1989, Ser. No. 412,953
Int. Cl.[5] B01D *1/00, 3/00*
U.S. Cl. 203—49 2 Claims

1. In a process for reducing the amount of residual toluene diisocyanate in a polyurethane prepolymer reaction product mixture which comprises passing the prepolymer reaction product mixture through a wiped film evaporation zone, the improvement which consists essentially of passing nitrogen through a quantity of the prepolymer which has passed through the evaporation zone and passing the nitrogen in a countercurrent flow through the evaporation zone such that

$$0.0097 < \frac{\text{mass flow rate } N_2}{\text{mass flow rate prepolymer}} < 0.25$$

to provide a resulting prepolymer product which contains less than about 0.1 wt % residual toluene diisocyanate.

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5,051,153

## SEPARATION OF METHYLENE CHLORIDE FROM METHYLAL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed May 20, 1991, Ser. No. 702,970
Int. Cl.[5] B01D *3/40*; C07C *17/38*
U.S. Cl. 203—60 1 Claim

1. A method for recovering methylal from a mixture of methylal and methylene chloride which comprises distilling a mixture of methylal and methylene chloride in the presence of about one part of an extractive agent per part of methylal-methylene chloride mixture, recovering methylal as overhead product and obtaining the methylene chloride and the extractive agent from the stillpot, wherein said extractive agent consists of one material selected from the group consisting of methyl acetate, ethyl acetate, isopropyl acetate, n-propyl acetate, isobutyl acetate, n-butyl acetate, isoamyl acetate, n-amyl acetate, 3-pentanone, methyl isobutyl ketone, methyl isopropyl ketone, 4-methyl-2-pentanone, 2-pentanone, 3,3-dimethyl-2-butanone, methyl ethyl ketone, methyl propionate, 2,2-methoxyethoxyethyl ether, diisobutyl ether, methyl valerate, ethyl valerate, vinyl n-butyl ether, methyl t-butyl ether and vinyl isobutyl ether.

VOL 1130 ISS 4 SE 24 1991 UMI



5,051,154

## ADDITIVE FOR ACID-COPPER ELECTROPLATING BATHS TO INCREASE THROWING POWER

Roger F. Bernards, Wellesley; Gordon Fisher, Sudbury; Wade Sonnenberg, Foxboro; Edward J. Cerwonka, Woburn, and Stewart Fisher, Sudbury, all of Mass., assignors to Shipley Company Inc., Newton, Mass.

Continuation-in-part of Ser. No. 235,051, Aug. 23, 1988, Pat. No. 4,897,165. This application Jan. 29, 1990, Ser. No. 471,381
The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.
Int. Cl.[5] C25D *3/38*
U.S. Cl. 204—24 60 Claims

1. An aqueous electroplating solution, comprising:
at least one soluble copper salt, an electrolyte,
at least one organic additive capable of modifying the charge transfer overpotential of said solution in an amount sufficient to shift said overpotential by at least 150 millivolts, said shift being independent of solution agitation.

5,051,155

## PROCESSES FOR THE PREPARATION OF ALKALI METAL DICHROMATES AND CHROMIC ACID

Helmut Klotz, Bergisch; Hans D. Pinter, Pulheim; Rainer Weber, Leverkusen; Hans-Dieter Block, Leverkusen, and Norbert Lönhoff, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 393,447, Aug. 14, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 632,417
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1988, 3829122
Int. Cl.[5] C25B *1/00, 1/22*
U.S. Cl. 204—59 R 2 Claims

1. A process for the preparation of alkali metal dichromates and chromic acid in an anode chamber of an electrolytic cell having anode and cathode chambers which are separated by a cation exchanger membrane, said process comprising:
(a) introducing alkali metal monochromate solutions, alkali metal dichromate solutions, or a mixture of alkali metal monochromate and alkali metal dichromate solutions into the anode chamber of the electrolytic cell;
(b) converting the alkali metal monochromate solutions, alkali metal dichromate solutions, or mixture of alkali metal monochromate and alkali metal dichromate solutions in the anode to chamber into alkali metal dichromate solutions or chromic acid in the anode chamber by a selective electrolytic migration of alkali metal ions through the cation exchanger membrane into the cathode chamber; and
(c) continuously introducing a solution containing chromate at a pH of about 3 to 10 into the cathode chamber.

5,051,156

## ELECTROCATALYST FOR THE OXIDATION OF METHANE AND AN ELECTROCATALYTIC PROCESS

Benjamin Scharifker, Santa Eduvigis; Omar Yepez, La Carlota; Juan Carlos De Jesus, and Maria M. Ramirez De Agudelo, both of Los Teques, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Jan. 31, 1990, Ser. No. 472,867
Int. Cl.[5] C23B *3/02*
U.S. Cl. 204—80 33 Claims

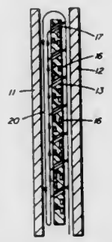
1. An electrocatalytic process for the partial oxidation of a methane containing gas comprises:
(1) providing an electrochemical cell having an electrolytic solution, a cathode and an anode;
(2) preparing said anode in the form of a composite electrocatalyst comprising an electrode having finely dispersed metal particle conducting catalyst material deposited thereon wherein said metal particle has a particle size of between about 0.0001 μm to about 800 μm, said catalyst material consisting essentially of an element selected from the group consisting of Group IB metals, Group VIB metals, Group VIII metals and mixtures thereof; and
(3) contacting said methane containing gas with said composite electrocatalyst in the electrolyte solution in the electrochemical cell under electrochemical conditions at a temperature of up to 200° C. to partially oxidize said methane at said anode.

5,051,157

## SPACER FOR AN ELECTROCHEMICAL APPARATUS

Robert N. O'Brien, Victoria, Canada, and Kalathur S. V. Santhanam, Bombay, India, assignors to University of Victoria, Victoria, Canada

Continuation-in-part of Ser. No. 259,871, Oct. 19, 1988, abandoned. This application May 7, 1990, Ser. No. 519,910
Claims priority, application Canada, Feb. 29, 1988, 560114
Int. Cl.[5] B23H *3/00*
U.S. Cl. 204—129.1 43 Claims




38. A method for electrochemically etching fine units in a circuit board or in an electronic chip which comprises: suitably placing a spacer comprising a perforated or ion-permeable sheet magnet spacer in an electrochemical apparatus, the spacer comprising a perforated or ion-permeable, relatively thin, synthetic plastic material sheet having a plurality of magnets embedded in both opposed faces thereof and including at least four vertically-upwardly slanting slits extending at an upwardly-sloping angle along each of said two opposed faces and also extending transversely through said spacer between said two opposed faces; and causing the electrolyte to mix and flow through said spacer in such electrochemical etching apparatus by the action of the magnetic field derived from said embedded magnets.

5,051,158

## PROCESS FOR PREPARING CONTROLLED MOLECULAR WEIGHT PERFLUOROPOLYETHERS HAVING PERFLUOROALKYL OR PERFLUOROCHLOROALKYL END GROUPS

Giuseppe Marchionni, and Anna Staccione, both of Milan, Italy, assignors to Ausimont S.r.L., Italy

Filed May 2, 1989, Ser. No. 346,479
Claims priority, application Italy, May 2, 1988, 20407 A/88
Int. Cl.[5] C07C *41/01*
U.S. Cl. 204—157.6 5 Claims

1. A process for preparing perfluoropolyethers having perfluoroalkyl or perfluorochloroalkyl end groups, of the formula:

$$T\text{—}O(CF_2CF_2O)_m\left(\begin{matrix}CF_2CFO\\|\\CF_3\end{matrix}\right)_n(CF_2O)_p\left(\begin{matrix}CFO\\|\\CF_3\end{matrix}\right)_q CFRR'$$

where:
T is a perfluoroalkyl group which may optionally contain a chlorine atom, such as $CF_2Y$—, $CF_2YCF_2$—, $YCF_2CF(CF_3)$—, or $YCF(CF_3)CF_2$—, where Y is fluorine or chlorine;
R and R', alike or different from each other, are fluorine or chlorine; and
the indexes m, n, are numbers ranging from 0 to 20, extremes included, p ranges from 0 to 40, extremes included, and q ranges from 0 to 10, extremes included, with the following provisos:
1. when m=0, n ranges from 1 to 20, and

$$\frac{p+q}{n}$$

ranges from 0.01 to 0.05,
2. when n=0,, also q is =0, m ranges from 1 to 20, and p/m ranges from 0.5 to 2, extremes included, and
3. when n and m are other than 0, m+n ranges from 1 to 20 , and (p+q)/(m+n) ranges from 0.01 to 0.05, extremes included;
the process comprising the follwoing steps:
(a) photooxidizing perfluoropropene or tetrafluroethylene or a mixture thereof in a liquid reaction mixture initially consisting essentially of $C_2F_6$,and optionally of chloro fluorocarbon, as a reaction solvent, and of a fully halogenated ethylene with gaseous $O_2$, by irradiating with ultraviolet rays the reaction mixture maintained at a temperature of from −20° C. to 100° C., said fully halogenated ethylene containing 1 to 4 atoms of Cl or Br or I, said fully halogenated ethylene being fed to the reaction mixture in an amount up to 50% by moles with respect to fluoroolefin; and
(b) a fluorination treatment using gaseous fluorine, effected with ultraviolet radiation at a temperature from 100° C. to 250° C. or from 0° to 120° C.

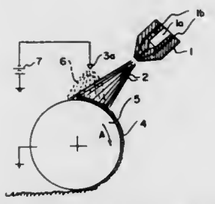


5,051,159

## NON-WOVEN FIBER SHEET AND PROCESS AND APPARATUS FOR ITS PRODUCTION

Ryoichi Togashi, Shiga, and Katsutoshi Ando, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 333,882, Apr. 4, 1989, abandoned, which is a continuation of Ser. No. 47,346, May 8, 1987, abandoned. This application Jul. 19, 1990, Ser. No. 554,774
Claims priority, application Japan, May 9, 1986, 61-104773
Int. Cl.[5] H05F *3/00*
U.S. Cl. 204—165 12 Claims




1. A process for producing a non-woven fiber sheet upon a moving collecting surface, said process comprising the steps of:
preparing heated molten polymer having a volume resistivity of not less than $10^{10}$ Ω·cm.;
spinning said heated molten polymer free from electric charge as spun fibers out of a spinneret upon said moving collecting surface such that said spun fibers accumulate thereupon free from a binder solution;
locating at least one electrode independent of the location of spun fibers emanating from said spinneret, wherein a distance between said at least one electrode and said spinneret prevents an electric field from being formed therebetween;
charging an electric field having a field strength of not less than 1 kv/cm upon at least said accumulating spun fibers, said electric field generated between at least one electrode and said moving collecting surface such that said accumulating spun fibers are strongly adhered upon said moving collecting surface due to said electric charge thereby improving the uniformity and increasing the density of accumulating spun fibers; and
obtaining a non-woven fiber sheet from said accumulated spun fibers.

5,051,160

## POLYMERIC REACTION PRODUCT THAT BECOMES WATER-THINNABLE ON PROTONATION WITH AN ACID

Thomas Schwerzel, Meckenheim, and Hans Schupp, Worms, both of Fed. Rep. of Germany, assignors to BASF Lacke & Farben Aktiengesellschaft, Münster, Fed. Rep. of Germany

Filed Feb. 8, 1990, Ser. No. 476,882
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906144
Int. Cl.[5] C25D *13/06;* C08L *63/02, 9/02*
U.S. Cl. 204—181.4 8 Claims

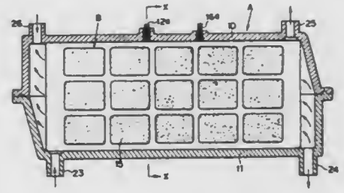
1. A polymeric reaction product that becomes waterthinnable on protonation with an acid and is formed from
A. a butadiene/acrylonitrile copolymer which contains primary and/or secondary amino groups, and
B. an epoxy compound having an average molecular weight of 140–10,000 and containing on average 1.5–3 epoxy groups per molecule,
the amount of (A) being such that 1.05 moles or more of primary and/or secondary amino groups of component (A) are present per mole of epoxy groups of component (B).

5,051,161

## APPARATUS PRODUCING CONTINUOUSLY ELECTROLYZED WATER

Shuji Yamaguchi; Shiroji Misawa, and Giichi Asanuma, all of Saitama, Japan, assignors to Nippon Intek Co., Ltd., Saitama, Japan

Filed Jun. 28, 1990, Ser. No. 545,481
Claims priority, application Japan, Jun. 30, 1989, 1-170789
Int. Cl.[5] C25B *15/02, 15/08, 13/00*
U.S. Cl. 204—229 5 Claims




1. An apparatus producing continuously electrolyzed water, comprising:
an electrolytic cell having a first water supply inlet and a first water intake outlet which each provide fluid communication between an interior of said cell and respective locations external to said cell, and including in said interior thereof a plate electrode serving as one of an anode and a cathode;
a diaphragm box having a diaphragm and disposed in said electrolytic cell, an interior of said diaphragm box being in fluid communication with said electrolytic cell only through the diaphragm, said diaphragm box having a second water supply inlet and a second water intake outlet which each provide fluid communication between said interior of said diaphragm box and respective locations external to said cell, said diaphragm box having in said interior thereof a further plate electrode serving as the other of said anode and cathode;

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voltage applying means for applying a DC voltage between the plate electrode serving as the anode and the plate electrode serving as the cathode; and

water supplements for supplying city water to said electrolytic cell through said first and second water supply inlets, said water supply means including:

an adsorbing treatment device, which adsorbs to remove dirty substances and organic substances contained in the city water by using the adsorbing action of active charcoal;

a microfilter, which filters to remove substances from the water by means of a filtering material;

a healthful reagent adding device for supplying a healthful reagent to the water subjected to the adsorbing and filtering treatments; and

means for supplying the water, to which the healthful reagent is added, to said electrolytic cell through one of said first and second water supplying inlets.

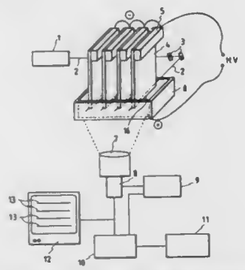
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**5,051,162**

## FLUORESCENCE DETECTION TYPE ELECTROPHORESIS APPARATUS AND ITS SUPPORTING VESSEL

**Hideki Kambara, Hachioji, and Kelichi Nagai, Higashiyamato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 5, 1990, Ser. No. 505,325**
**Claims priority, application Japan, Apr. 12, 1989, 1-90842**
**Int. Cl.[5] G01N *27/26***
**U.S. Cl. 204—299 R** **9 Claims**



1. A fluorescence detection type electrophoresis apparatus comprising:

a plurality of slab gels arranged substantially parallel to each other, said slab gels providing a plurality of migration lanes along which sample fragments labeled with fluorophore migrate from upper ends toward lower ends of the slab gels;

an upper buffer vessel containing a buffer solution in contact with the upper ends of said slab gels;

a lower buffer vessel containing a buffer solution in contact with the lower ends of said slab gels;

means for providing electric potential between said buffer solution in said upper buffer vessel and buffer solution in said lower vessel to provide electrophoretic force to said sample fragments on said migration lanes;

excitation means for exciting the sample fragments labelled with fluorophore and existing in the migration lanes of said slab gels, each migration lane being positioned adjacent to one of said lower ends of said slab gels; and

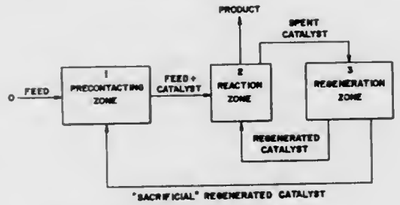
means for individually and simultaneously detecting fluorescent lights emitted from the sample fragments labelled with fluorophore in said migration lanes and emitting from the lower ends of said slab gels.

**5,051,163**

## NITROGEN-TOLERANT CRACKING PROCESS

**Russell R. Krug, Novato, and Jarold A. Meyer, Martinez, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**Filed Jan. 11, 1990, Ser. No. 463,043**
**Int. Cl.[5] C10G *25/00, 13/00***
**U.S. Cl. 208—88** **25 Claims**




1. A catalytic cracking process employing a circulating inventory of acid catalyst, wherein the catalyst is circulated between a catalytic reaction zone and a regeneration zone and the catalyst is regenerated in the regeneration zone, said process comprising:

separating a minor sacrificial portion of the entire circulating catalyst inventory coming from the regeneration zone;

contacting hydrocarbonaceous feed containing a basic contaminants with the sacrificial portion of the entire circulating catalyst inventory in a precontacting zone at a temperature and for a time sufficient to remove some or all of the basic contaminants to the sacrificial portion of the catalyst;

passing the sacrificial portion, the precontacted hydrocarbonaceous feed, and the remainder of the circulating catalyst inventory to the catalytic reaction zone under cracking conditions.

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**5,051,164**

## CRYSTALLINE POROUS SILICATE COMPOSITE AND ITS USE IN CATALYTIC CRACKING

**Joseph A. Herbst, Turnersville, N.J., and Albin Huss, Jr., Chadds Ford, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.**

**Division of Ser. No. 93,279, Sep. 4, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,866**
**Int. Cl.[5] C10G *11/05;* B01J *29/06***
**U.S. Cl. 208—120** **12 Claims**

1. A method for catalytically cracking gas oils, residual oils, and admixtures thereof in a cracking unit to a product comprising increased $C_3$ and $C_4$ olefins and gasoline of an increased octane number, wherein the method comprises in combination subjecting the gas oil to catalytic cracking conditions, in the presence of a cracking catalyst inventory comprising an inorganic oxide matrix bound porous crystalline silicate having a Constraint Index of between about 1 and about 12 and a catalytically active cracking catalyst selected from the group consisting of amorphous silica-alumina, crystalline silica-alumina and large pore crystalline zeolites, wherein said inorganic oxide matrix bound porous crystalline silicate is produced by (a) preparing said silicate from a reaction mixture which comprises a source of silicon and water, (b) thereafter adding to said reaction mixture which contains unincorporated silica and a crystalline silicate, an inorganic oxide matrix precursor comprising a source of inorganic oxide matrix and water and (c) spray drying the resulting mixture to produce an inorganic oxide matrix bound porous crystalline silicate whereby said unincorporated silica is incorporated in said matrix; and (d) subjecting said inorganic oxide matrix bound porous crystalline silicate to steam; producing gasoline of said octane number and $C_3$ and $C_4$ olefins; recovering said $C_3$ and $C_4$ olefins; and passing said steamed silicate to said cracking unit.



**5,051,165**

## QUALITY OF HEAVY MINERAL CONCENTRATES

**William H. Andrews, Waverley, Australia, assignor to Wimmera Industrial Minerals Pty. Ltd., Victoria, Australia**

**Filed Dec. 15, 1989, Ser. No. 451,209**
**Claims priority, application Australia, Dec. 19, 1988, PJ2018**
**Int. Cl.[5] B03D *1/02***
**U.S. Cl. 209—166** **3 Claims**

1. A process for decreasing environmental hazards associated with processing a heavy mineral ore or concentrate containing a radioactive mineral which process comprises conditioning the heavy mineral ore or concentrate with sodium silicate, subjecting the heavy mineral ore or concentrate to a selective flotation procedure to form a single flotation fraction comprising the radioactive mineral and a tailing fraction comprising a heavy mineral ore or concentrate exhibiting reduced radioactivity; subjecting the tailing fraction to further processing steps to recover saleable heavy mineral products; and removing the flotation fraction for disposal or further processing to recover the radioactive mineral, the selective flotation procedure comprising flotation in the presence of a collector for said radioactive mineral comprising a fatty acid.

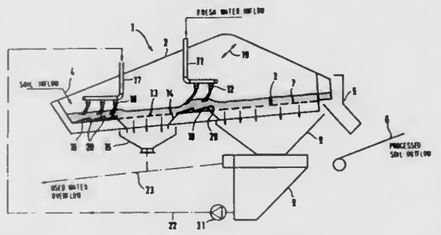
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**5,051,166**

## SOIL RINSING APPARATUS

**Hans-Jürgen Heimhard, Nülheim-Saarn, and Manfred Bräuer, Bensheim, both of Fed. Rep. of Germany, assignors to Klöckner Oecotec GmbH, Fed. Rep. of Germany**

**Filed Oct. 26, 1989, Ser. No. 426,904**
**Claims priority, application Fed. Rep. of Germany, Oct. 27, 1988, 3836627**
**Int. Cl.[5] B07B *1/40***
**U.S. Cl. 209—269** **3 Claims**



1. Soil rinsing apparatus, comprising:

means for rinsing and sieving a flow of soil;

soil supply means at an inlet of the rinsing and sieving means and discharge means at an outlet thereof;

a first sieve region with a used water collector arranged therebelow;

a first water supply region preceding said first sieve region in the direction from said inlet to said outlet, receiving water from a fresh water supply;

a second sieve region coplanar with and preceding said first sieve region and a second water supply region preceding said second sieve region, receiving water from a second water supply;

an outlet of said used water collector connected with said second water supply for supplying used water thereto; and

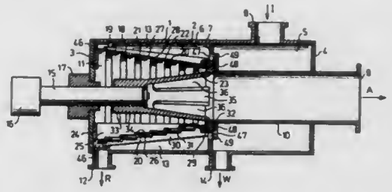
contiguous movable floor means of a predetermined shape, comprising said first and second coplanar sieve regions, the entirety of said floor means rising in the direction of soil movement from said inlet to said outlet, with said first and second water supply regions comprising, in a vertical section extending in the soil transport direction, a plurality of sawtooth-shaped surfaces each having respective small-angled leading edges of the teeth facing the inlet side and steep trailing edges facing the outlet side of the apparatus.

**5,051,167**

## APPARATUS FOR SCREENING A SUSPENSION OF FIBROUS CELLULOSE MATERIAL

**Ronny Höglund, Skoghall, Sweden, assignor to Kamyr AB, Karlstad, Sweden**

**Filed Jan. 4, 1990, Ser. No. 461,098**
**Claims priority, application Sweden, Feb. 22, 1989, 8900608**
**Int. Cl.[5] D21D *5/00;* B07B *1/04***
**U.S. Cl. 209—270** **11 Claims**



1. An apparatus for screening a suspension of fibrous cellulose material containing undigested wood, said apparatus comprising a housing with a shaft rotating therein and an elongate screening means disposed in a screening chamber, said screening means comprising a stationary screening member and a rotation screening member connected to said shaft, each of said screening members comprising a plurality of parallel rings disposed with predetermined axial distance from each other to form circumferential openings, the rings of the stationary screening member and the rotating screening member being arranged to partially close each other's openings between the rings to defined circumferential screening gaps therebetween, said stationary screening member having the form of a unitary body rigidly connected to the housing so that at least circumferential movement is prevented, said rotating screening member having the form a unitary body connected to said shaft for common rotation therewith, said rotating screening member surrounds said stationary screening member, and said screening means separating the screening chamber into an outer screening space, which receives the fiber suspension to be screened, and an inner screening space, which receives the finer portion of the fiber suspension which passes through the screening gaps.

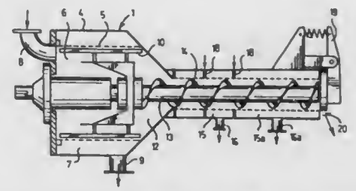
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**5,051,168**

## DEVICE FOR SCREENING AND TREATING PULP

**Jouko Hautala, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland**

**Filed Jul. 14, 1989, Ser. No. 379,998**
**Claims priority, application Finland, Aug. 4, 1988, 88 3649**
**Int. Cl.[5] B07B *1/20***
**U.S. Cl. 209—273** **7 Claims**



1. A device for screening and treating pulp comprising a screening mechanism for separating the pulp into an accepted fraction for discharge from the device and a rejected fraction for discharge into a reject space having a boundary, and means for treating the rejected fraction comprising a screwlike means extending into said reject space for contacting the rejected fraction therein, means for rotating the screwlike means for advancing the contacted rejected fraction therealong and for

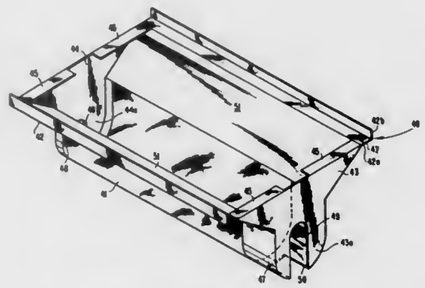
VOL 1130 ISS 4 SE 24 1991 UMI



effecting a radial flow of fine-grained material contained within the rejected fraction outward through a perforated wall surrounding said screwlike means for discharge from the device, said wall beginning at the boundary of said reject space, and discharge means through which the remainder of the rejected fraction advanced along said screwlike means is discharged from said device.

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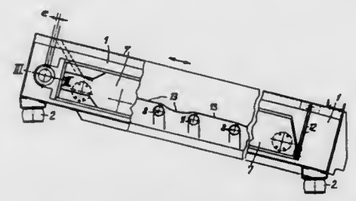
**5,051,169**
**AUGER-TYPE FLOUR SIFTER**
**Donald E. King, Louisville, Ky., assignor to Ayrking Corporation, Louisville, Ky.**
**Continuation of Ser. No. 206,354, Jun. 14, 1988, Pat. No. 4,952,309. This application Jun. 1, 1990, Ser. No. 532,012**
**Int. Cl.[5] B07B** *1/46, 1/52*
**U.S. Cl. 209—274** **7 Claims**





1. A flour sifter for separating doughballs from fine particulate matter in a breading mixture, comprising:
- a hopper for receiving said breading mixture, said hopper including a pair of opposite end walls and a generally semi-cylindrical lower portion having a first longitudinal axis, said lower portion further including a sifting screen along said first longitudinal length, said sifting screen having a plurality of openings sized to allow only said fine particulate matter to pass therethrough, said lower portion also including a slot at one end of said lower portion, said slot being large enough for said doughballs to pass therethrough;
- an auger brush having a second longitudinal axis and including a helical pattern of bristles along said second longitudinal axis, each of said bristles having an end extending generally radially from said longitudinal axis;
- means for rotating said auger brush said hopper, including a drive shaft, whereby as said auger brush rotates, said helical pattern of bristles urges said doughballs toward said slot in said lower portion, while said fine particulate matter passes through said sifting screen; and
- means for rotationally mounting said auger brush within said hopper, including means for axially sliding said auger brush for readily engaging and disengaging said auger brush between one of said end walls of said hopper and said drive shaft.

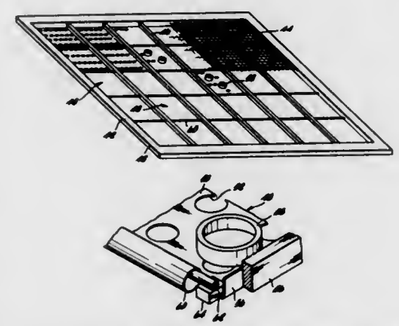
**5,051,170**
**TWO FRAME ELASTIC SCREENING APPARTAUS HAVING SUBSTANTIALLY LINEAR RELATIVE MOVEMENT**
**Leander Ahorner, Waidhofen a.d. Ybbs, Austria, assignor to IFE Industrie- Einrichtungen Fertigungs Aktiengesellschaft, Waidhofen, Austria**
**Filed Sep. 5, 1989, Ser. No. 403,998**
**Claims priority, application Austria, Sep. 5, 1988, A 2178/88**
**Int. Cl.[5] B07B** *1/30, 1/42, 1/49*
**U.S. Cl. 209—310** **7 Claims**



1. Screening apparatus comprising two frame systems which are movable relative to one another, comprising grate bars assigned to each system, the grate bars of each frame system being alternately disposed and connected by means of flexible screen elements which are fastened at the latter, bridge the distance between the bars, and are tensioned and relieved of tension by means of the relative movement of the two systems caused by means of an eccentric shaft which is supported exclusively at the two systems and rotated by means of a drive, wherein the eccentric shaft (3) is arranged at one end of the two frame systems (1, 7), and further comprising means (12) for connecting the two frame systems with one another at a distance from the one end, so as to insure a substantially linear relative movement of the two systems relative to one another.

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**5,051,171**
**SELF-CLEANING SYSTEM FOR VIBRATORY SCREENS**
**Ari M. Hukki, Edgewood, Ky., assignor to Sweco Incorporated, Florence, Ky.**
**Filed Apr. 27, 1990, Ser. No. 515,471**
**Int. Cl.[5] B07B** *1/50*
**U.S. Cl. 209—323** **36 Claims**



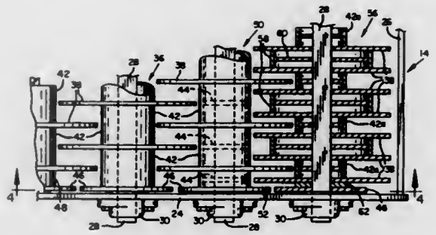
1. A self-cleaning screen assembly for a vibratory screen separator, comprising
- a frame;
- a flow through support surface scanning across said frame, said flow through support surface including a plate with holes therethrough and flanges extending substantially normally from said plate on opposite sides thereof, said flanges being slightly mutually divergent and spaced to fit in interference within said frame;



- screen cloth extending across said frame substantially parallel to and displaced from said support surface;
- cleaning elements positioned between said support surface and said screen cloth;
- a mounting between said support surface and said screen cloth defining a horizontal mounting axis;
- a member mounted eccentrically about said mounting axis of said mounting between and displaced from both said support surface and said screen cloth to move eccentrically in response to vibration of said frame.

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**5,051,172**
**DISC SCREEN FOR MATERIAL SEPARATION**
**Larry J. Gilmore, 17555 SE. Braden, Gladstone, Oreg. 97027**
**Continuation of Ser. No. 141,294, Jan. 5, 1988, abandoned. This application Nov. 3, 1989, Ser. No. 431,690**
**Int. Cl.[5] B07B** *13/05*
**U.S. Cl. 209—672** **4 Claims**

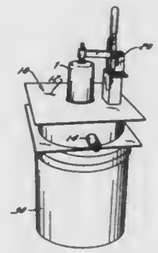


3. A materials, size separating apparatus for separating refuse materials, said apparatus comprising; a disc screen having side and end rails, shafts spanning the spacing between the side rails and rotatably mounted on the side rails for rotation in a common rotative direction, each shaft configured to slidingly receive alternating discs and sleeve section spacers forming disc rows that are rotated with the shaft to induce movement of the materials from one end to the other on the disc screen, and adjacent disc rows arranged to alternate the positions of the discs along the shaft so that the discs of one disc row are interspersed between the discs of an adjacent disc row, said adjacent disc rows being positioned so that outer disc portions of adjacent disc rows overlap and in rotation pass in close proximity to the sleeve section spacers of said adjacent disc rows, and the improvement which comprises;
- each of said disc rows provided with a flat end disc slidingly positioned on and rotatable with the configured shaft, said flat end disc being shaped and in close proximity to the side rail of the disc screen housing while maintaining a minimum clearance therewith to, together with the adjacent disc along the disc row, lift and move the materials thereby inhibiting the jamming and collection of the refuse materials against the side rails, said end discs in alignment and nonoverlapping and thus of smaller diameter than the interspersed discs.

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**5,051,173**
**DEVICE TO REMOVE OIL FROM OIL FILTER**
**Robert J. Hoelzl, 6141 W. Lisbon Ave., Milwaukee, Wis. 53210**
**Filed Apr. 4, 1990, Ser. No. 504,566**
**Int. Cl.[5] B01D** *21/30*
**U.S. Cl. 210—143** **9 Claims**

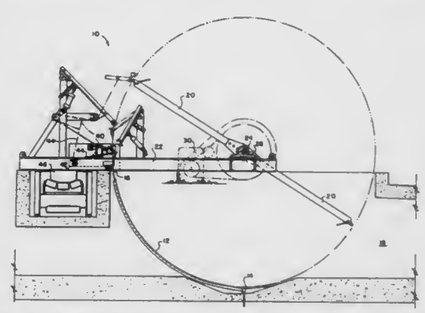
1. An apparatus for removing oil from an oil filter of the type that includes a top surface and an end portion having a central opening and peripheral openings comprising:
- a housing having an upper flat surface for engaging said end portion of said oil filter;
- clamping means on said upper flat surface for securing said oil filter in sealed relation thereto;
- an air outlet projecting out from said upper flat surface so that when said oil filter is engaged on said upper flat surface, said air outlet projects into said central opening of said oil filter, and said air outlet being attachable to a source of high pressure air, said high pressure air being injectable into said central opening and having the effect of forcing oil contained in said oil filter out through said peripheral openings in said oil filter;



- said upper flat surface having oil receiving holes in fluid communication with said peripheral openings in said filter for receiving oil forced out from said peripheral openings; and
- a container below said oil receiving holes for collecting said oil forced out by said high pressure air from said oil filter.

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**5,051,174**
**BAR SCREEN RAKE APPARATUS**
**Patrick G. Nungaray, Baytown, Tex., assignor to G-H Systems, Inc., La Porte, Tex.**
**Filed Sep. 25, 1989, Ser. No. 412,118**
**Int. Cl.[5] B01D** *35/02*
**U.S. Cl. 210—159** **10 Claims**



10. In a bar screen assembly having a semi-cylindrical bar rack interposed across a passageway and further having at least two rake arms radially mounted for rotation about an arm axis, the improvement comprising:
- an apron adjacent and in close proximity to the upper end of the bar rack for receiving debris, said apron being pivotally mounted to a frame for movements about an apron axis that is parallel to and approximately level with the arm axis between receiving and dumping positions;
- said apron including a substantially planar apron surface, with said apron surface in said receiving position being substantially horizontal, and said apron surface in said dumping position being substantially vertical;
- sensing means for sensing movement of the rake arm relative the upper end of the bar rack, said sensing means including a sensing boom pivotally mounted to the frame and having a contact portion for contacting and sensing the location of said rake arm; and,
- actuation means for pivoting said apron from said receiving

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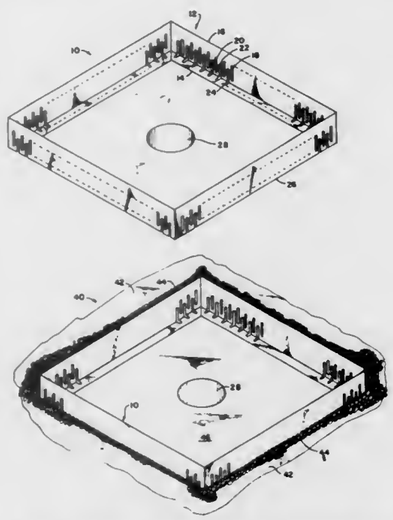
position to said dumping position in response to said sensing means, said actuation means including a cable mounted to said apron at a mounting location spaced from said apron axis and extending to said sensing boom for pivoting said apron.

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**5,051,175**
**DRAIN GUARD**

Thomas W. Walczak, Norfolk, and Robert M. Bennette, Millis, both of Mass., assignors to Roof Accessories, Inc., Norfolk, Mass.

Filed Dec. 20, 1989, Ser. No. 453,508
Int. Cl.[5] B01D *35/02*
U.S. Cl. 210—166 4 Claims

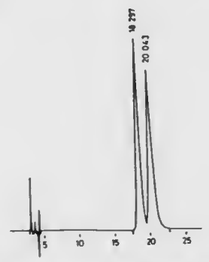


1. A guard for a drain opening, said guard comprising:
an uncovered frame having a substantially L-shaped cross-section formed of an elongated base and an upstanding elongated flat sidewall integral therewith, said upstanding sidewall having a plurality of spaced-apart openings extending therethrough, the openings of a first group of said plurality of spaced-apart openings being vertically offset from the respective openings of a second group of said plurality of spaced openings, and
said frame having a greater perimeter than the perimeter of said drain opening.

**5,051,176**
**PACKING MATERIAL FOR LIQUID CHROMATOGRAPHY**

Sotaro Miyano; Shuichi Oi, and Masayuki Shijo, all of Sendai, Japan, assignors to Tasoh Corporation, Japan

Filed Sep. 25, 1990, Ser. No. 587,942
Claims priority, application Japan, Sep. 25, 1989, 1-246444
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—198.2 6 Claims



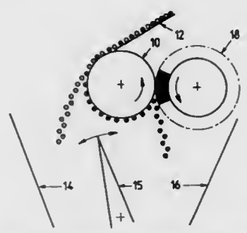

1. A packing material for liquid chromatography comprising (S)-or(R)-1,1'-bianthryl-2,2'-dicarboxylic acid as a stationary phase on a substrate carrier.

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**5,051,177**
**HIGH-INTENSITY MAGNETIC SEPARATOR**

Gilbert Dauchez, Blanc-Mesnil, France, assignor to Fives-Cail Babcock, Montreuil, France

Filed Apr. 24, 1990, Ser. No. 513,908
Claims priority, application France, May 2, 1989, 89 05790
Int. Cl.[5] B03C *1/00*
U.S. Cl. 210—222 5 Claims




1. A high-intensity magnetic separator for separating paramagnetic particles from non-magnetic particles, comprising
(a) a rotor including
(1) a shaft and
(2) a stack of alternating ring-shaped pole pieces and permanent magnets arranged on the shaft, the pole pieces and the permanent magnets having substantially equal diameters, and the permanent magnets being peripherally covered by a layer of ceramic material having a thickness of less than 50 μm.
(b) means for removing the paramagnetic particles from the rotor, and
(c) means for separately collecting the removed paramagnetic particles and the non-magnetic particles.

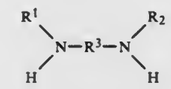


**5,051,178**
**PROCESS OF PRODUCING COMPOSITE SEMIPERMEABLE MEMBRANE**

Tadahiro Uemura, Kyoto; Hideo Fujimaki, Shiga, and Toshihiro Ikeda, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP89/00019, § 371 Date Sep. 7, 1989, § 102(e) Date Sep. 7, 1989, PCT Pub. No. WO89/06153, PCT Pub. Date Jul. 13, 1989
PCT Filed Jan. 10, 1989, Ser. No. 415,347
Claims priority, application Japan, Jan. 11, 1988, 63-4317
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—500.38 6 Claims

1. A process of producing a composite semipermeable membrane comprising the step of forming on a microporous substrate an ultra-thin membrane containing as a major component a crosslinked polyamide obtained by interfacial polycondensation reaction between a polyfunctional aromatic amine having not less than 2 amino groups in a molecule and a polyfunctional acid halide having not less than 2 halogenated carbonyl groups in a molecule, to form a composite semipermeable membrane, wherein the polycondensation reaction is conducted in the presence of a copolymerization component comprising at least one member selected from the group consisting of 1,3,5-trihydroxybenzene, 1,3-dihydroxybenzene and an alkyldiamine of the formula (1):



(1)

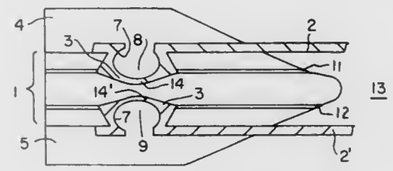
wherein $R^1$ and $R^2$ independently represent $C_1$–$C_3$ alkyl, $C_6$ phenyl or hydrogen, $R^3$ represents $C_1$–$C_7$ straight chain alkyl group which may have one or more side chains or $C_3$–$C_7$ cycloalkyl group which may have one or more side chains, and wherein said copolymerization component is added in the amount of not less than 1% by weight to not more than 20% by weight with respect to the polyfunctional aromatic amine when the interfacial polycondensation reaction is carried out.

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**5,051,179**
**MEMBRANE FILTER PLATE FOR FILTER PRESSES**

Manfred P. Hermann, Nürnberg, Fed. Rep. of Germany, assignor to JV Kunststoffwerk GmbH, Georgensgmünd, Fed. Rep. of Germany

Filed Aug. 29, 1989, Ser. No. 399,933
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1988, 8811071
Int. Cl.[5] B01D *25/12*
U.S. Cl. 210—228 7 Claims



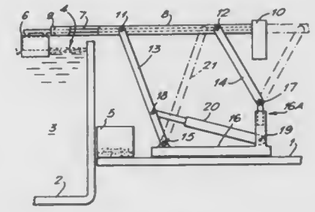

1. In a membrane filter plate for filter presses comprising:
a membrane holding frame having a dovetailed recess; a membrane fastened to the membrane holding frame; a covering frame attached to the membrane; a filter cloth connected to at least one of the membrane and covering frame; wherein the membrane has an edge provided with a dovetailed-shaped projection which engages with the dovetailed recess of the membrane holding frame; and the membrane holding frame and the covering frame together form a frame packet of the membrane filter plate and perforations are provided in one corner region of the frame packet to form a slurry inlet and filtrate outlet, the improvement wherein:
a flute is provided in the dovetailed-shaped projection; and the covering frame is provided with a projection received within said flute.

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**5,051,180**
**DEVICE FOR REMOVING MATERIAL FROM THE FREE SURFACE OF A BODY OF LIQUID USING UNEQUAL LENGTH LINKAGES**

Geoffrey H. Williams, Tetbury, United Kingdom, assignor to Sheppard Ingot Castings Machines Limited, United Kingdom

Filed May 3, 1989, Ser. No. 347,098
Claims priority, application United Kingdom, May 10, 1988, 8811066
Int. Cl.[5] B66C *23/04*
U.S. Cl. 210—241 11 Claims




1. A device for removing material from the free surface of a contained body of liquid, the device comprising a scoop supported from a base member by a first long length link and a second relatively shorter length link that carry a substantially horizontal elongated arm on which the scoop is mounted in such manner that the scoop rotatable about the direction of elongation of the arm, said first and second links solely supporting the arm, there being pivotal connections of each end of each link to the base member and to the arm, respectively, defining four corners of a quadrilateral; first actuating means connected to one of the links at its connection to the one base member to reciprocate the link and the arm so that the one arm thereby moves substantially in a horizontal plane defined by the unequal lengths of the two links; and second actuating means for rotating the scoop about the direction of elongation of the arm.

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**5,051,181**
**DEVICE FOR TAKING UP FLOATING SUBSTANCES FROM A FLUID**

Jim Sandkvist, Partille, Sweden, assignor to AB Sandvik Process Systems, Sweden

PCT No. PCT/SE88/00112, § 371 Date Sep. 26, 1989, § 102(e) Date Sep. 26, 1989, PCT Pub. No. WO88/07000, PCT Pub. Date Sep. 22, 1988
PCT Filed Mar. 9, 1988, Ser. No. 411,477
Claims priority, application Sweden, Sep. 3, 1987, 8700693
Int. Cl.[5] E02B *15/04*
U.S. Cl. 210—242.3 11 Claims

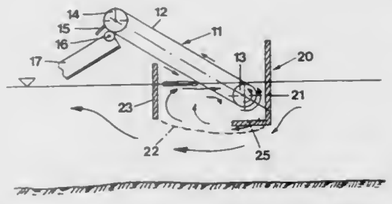
1. A fluid handling system, comprising:
substance removing means for removing a substance which is floating in or on the surface of a fluid, the substance removing means including a portion which is immersed in the fluid, the immersed portion of the substance removing means including a lower edge;
means for providing relative movement between the substance removing means and the fluid such that the fluid

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flows relatively toward the front of the substance removing means; and

deflecting means for creating a protected zone in the fluid around the immersed portion of the substance removing means and for creating a directed rotational flow within the surface of the fluid such that the floating substance flows toward the immersed portion of the substance removing means, the deflecting means including a front obstruction which is located in front of the substance removing means, the front obstruction extending above the floating substance and below the surface of the fluid, the front obstruction having a lower edge and first and




second side edges, the lower edge being at least as low as the lower edge of the immersed portion of the substance removing means, the distance between the side edges being greater than the width of the front of the immersed portion of the substance removing means, the front obstruction being arranged to obstruct the relative flow of the fluid toward the front of the substance removing means and to thereby cause the relative flow of the floating substance to be from a point which is essentially directly in front of the substance removing means, around the first side edge of the front obstruction, and then toward the immersed portion of the substance removing means.

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**5,051,182**

## HYDROPHOBIC MICROPORUS MEMBRANE

**Ying Wang, 59 Cooperwood Square, Scarborough, Ontario, Canada M1V 2C2 , and Hung N. Choi, 22/7, B3, No. 14-22 Kawo St., Aberdeen, Hong Kong**

**Filed Oct. 6, 1989, Ser. No. 418,273**
**Int. Cl.[5] E01D *71/26***
**U.S. Cl. 210—500.27** **11 Claims**




1. A membrane having controlled porosity that is prepared in a water-in-oil dispersion by a process that comprises the steps of:

a) forming a water-in-oil system wherein the oil phase contains a hydrophobic polymer;

b) adding to the system dispersion a pore forming agent and a crosslinking agent or a coagulant for the polymer to form a suspension;

c) coating the thus formed suspension on a substrate;

d) evaporating the water from the suspension coated on the substrate to concentrate and cross link the polymer present while enveloping the pore forming agent with the polymer; and

e) removing the pore forming agent from the coagulated polymer.

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**5,051,183**

## MICROPOROUS POLYOLEFIN MEMBRANE AND METHOD OF PRODUCING SAME

**Kotaro Takita; Koichi Kono; Tatsuya Takashima, and Kenkichi Okamoto, all of Saitama, Japan, assignors to Tonen Corporation, Tokyo, Japan**

**Filed Sep. 20, 1990, Ser. No. 585,461**
**Int. Cl.[5] B01D *67/00, 71/26***
**U.S. Cl. 210—500.36** **10 Claims**

1. A microporous polyolefin membrane made of a polyolefin composition comprising 1 to 90 weight % per 100 weight % of the polyolefin composition of an ultra-high-molecular-weight polyolefin having a weight-average molecular weight of $7\times10^5$ or more and a polyolefin having a weight-average molecular weight of between $1\times10^4$ to less than $7\times10^5$, said polyolefin composition having a weight-average molecular weight/number-average molecular weight ratio of 10–300, said microporous membrane having a thickness of 0.1–25 μm, a porosity of 35–95%, an average pore diameter of 0.001–0.02 μm and a breaking strength of 0.2 kg or more per 15 mm width.

3. A method of producing a microporous polyolefin membrane comprising the steps of:

(a) preparing a solution comprising 10–50 weight % of a polyolefin composition comprising 1 to 90 weight % per 100 weight % of the polyolefin composition of an ultra-high-molecular-weight polyolefin having a weight-average molecular weight of $7\times10^5$ or more and a polyolefin having a weight-average molecular weight of between $1\times10^4$ to less than $7\times10^5$, said polyolefin composition having a weight-average molecular weight/number average molecular weight ratio of 10–300, and 50–90 weight % of a solvent;

(b) extruding said solution through a die;

(c) cooling said extruded solution to form a gel-like article;

(d) stretching said gel-like article at a temperature equal to or lower than a melting point of said polyolefin composition + 10° C.; and

(e) removing the remaining solvent.

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**5,051,184**

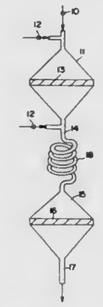
## IMMOBILIZED ENZYME CATALYZED REMOVAL OF AROMATIC COMPOUNDS FROM AQEUOUS SOLUTIONS

**Keith E. Taylor, Windsor, Canada, assignor to Biotech Environmental, Inc., Hamilton, Canada**

**Filed Aug. 28, 1990, Ser. No. 573,790**
**Int. Cl.[5] C02F *1/54***
**U.S. Cl. 210—632** **28 Claims**

1. In the process of removing an aromatic organic compound from an aqueous solution by providing an enzyme and a substrate for said enzyme in the aqueous solution to cause the aromatic organic compound to form a precipitate and optionally by adding a hydroxy- or amine-substituted aromatic compound to the aqueous solution to enhance formation of the precipitate of the aromatic organic compound, the improvement which comprises providing the enzyme immobilized on a surface in the solution, wherein the enzyme is linked to the surface by a precursor to a linking molecule which reacts with the enzyme to immobilize the enzyme.





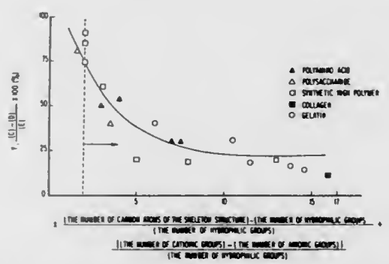

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**5,051,185**

## ABSORBENT OF $\beta_2$-MICROGLOBULIN

**Hiroyuki Watanabe; Tadashi Yokoyama, and Naokuni Yamawaki, all of Shizuoka, Japan, assignors to Asahi Kasei Kogyo K.K., Osaka and Asahi Medical Co., Ltd., Tokyo, both of, Japan**

**Continuation of Ser. No. 266,614, Nov. 3, 1988, abandoned. This application Apr. 19, 1990, Ser. No. 512,629**
**Claims priority, application Japan, Nov. 6, 1987, 62-279376; Aug. 8, 1988, 63-196197; Aug. 18, 1988, 63-203776**
**Int. Cl.[5] B01D *15/08***
**U.S. Cl. 210—635** **26 Claims**




1. An adsorbent for $\beta_2$-microglobulin which comprises a water-insoluble carrier having supported thereon, as a ligand, at least one electrolyte selected from the group consisting of a polyamino acid, a polysaccharide, a synthetic high polymer, collagen having an isoelectric point of 9.5 or more, and gelatin having an isoelectric point of 6.5 or more, wherein said electrolyte contains at least one group exhibiting a positive or negative charge in a neutral electrolytic solution and has a molecular weight of not less than 1,000 and an X value or more than 2.0, wherein X is a relationship regarding the skeleton structure of said electrolyte and is the sum of A and B, wherein A represents (the number of carbon atoms of the skeleton structure)−(the number of hydrophilic groups)/(the number of hydrophilic groups); and B represents |(the number of cationic groups)−(the number of anionic groups)|/(the number of hydrophilic groups).

25. A method for cleaning or regenerating a body fluid derived from patients suffering from renal insufficiency or malignant tumor which comprises contacting said body fluid taken from the body with the adsorbent defined in claim 1, adsorbing and removing $\beta_2$-microglobulin at a high efficiency and with specificity, and then returning the cleaned body fluids into the body.

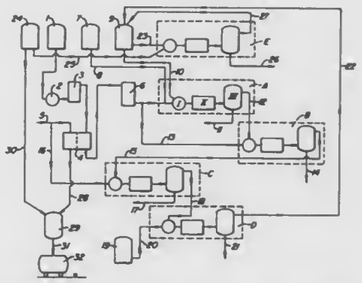
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**5,051,186**

## METHOD OF PROCESSING ACIDIC FE-CONTAINING SOLUTIONS

**Adalbert Prior, Götzis, Austria, assignor to Prior Engineering AG, Zürich, Switzerland**

**Filed Feb. 2, 1990, Ser. No. 474,452**
**Claims priority, application Austria, Feb. 6, 1989, 231/89**
**Int. Cl.[5] B01D *11/04***
**U.S. Cl. 210—638** **6 Claims**



1. A method of processing acidic solutions including Fe and Zn by liquid/liquid extraction, the method comprising:

extracting a first fresh portion of a solution comprising $Fe^{3+}$, $FE^{2+}$, and $Zn^{2+}$ in a first extraction stage with an extractant phase comprising an organic ion exchanger and an organic solvent, thereby obtaining a first organic extract charged with $Fe^{3+}$, $Fe^{2+}$, and $Zn^{2+}$;

extracting a second fresh portion of solution comprising $Fe^{3+}$, $Fe^{2+}$, and $Zn^{2+}$ in a second extraction stage with the first organic extract, whereby the $Fe^{2+}$ content of the first organic extract is exchanged for $Zn^{2+}$ content of the fresh solution, thereby obtaining a second organic extract charged with $Fe^{3+}$ and $Zn^{2+}$; and

stripping the $Zn^{2+}$ from the second organic extract with acid to form a substantially a $Zn^{2+}$-free extract.

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**5,051,187**

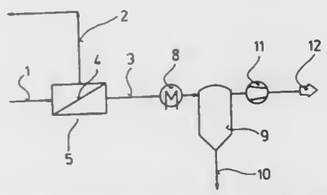
## PROCESS FOR RECOVERING SULFURIC ACID

**Yukiei Matsumoto, and Takanobu Hayashi, both of Kanagawa, Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan**

**Filed Aug. 21, 1990, Ser. No. 570,488**
**Claims priority, application Japan, Aug. 21, 1989, 1-212936**
**Int. Cl.[5] C02F *1/26***
**U.S. Cl. 210—639** **9 Claims**

1. A process for recovering sulfuric acid from an aqueous sulfuric acid solution containing ferrous sulfate, which comprises electrolyzing the aqueous sulfuric acid solution containing ferrous sulfate to thereby oxidize ferrous ion dissolved in the solution to ferric ion, and then removing the ferric ion by solvent extraction using a solvent and an extractant.

5,051,188
**REMOVAL OF WATER FROM A MIXTURE OF WATER, $CO_2$ AND AMINES**
Luise Spiske, Seeheim-Jugenheim; Dietrich Luetzow, Limburgerhof; Christof Herion, Ladenburg; Klaus Kuessner, Frankenthal, and Werner Hefner, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Oct. 31, 1990, Ser. No. 606,325
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1989, 3937796
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—640 7 Claims



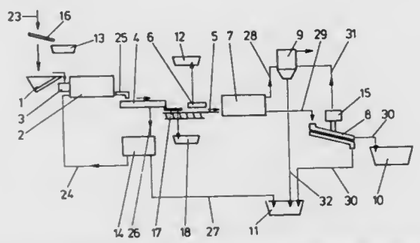

1. A process for removing water from a mixture containing water, $CO_2$ and one or more amines by pervaporation which comprises: bringing the mixture into contact with one side of a membrane and removing the water-containing permeate as a vapor from the other side of the membrane.

5,051,189
**METHOD OF REMOVING AN UNWANTED IMPURITY FROM AN AQUEOUS MATERIAL**
Samuel R. Farrah, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.
Continuation-in-part of Ser. No. 304,130, Jan. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 166,365, Mar. 10, 1988, abandoned, which is a continuation of Ser. No. 868,553, May 30, 1986, abandoned. This application Nov. 27, 1989, Ser. No. 441,518
Int. Cl.[5] B01D *15/00*
U.S. Cl. 210—679 11 Claims



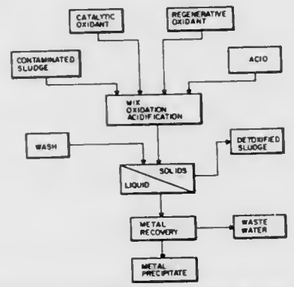

1. In a method of removing an unwanted impurity from an aqueous material by contacting said aqueous material with a surface having an adsorptive capacity for said impurity whereby said impurity is adsorbed by said surface, the improvement wherein the adsorptive characteristics of said surface have been modified by forming a stable association between said surface and a substantially water-insoluble polyvalent metal salt by the in situ precipitation or formation of said polyvalent metal salt in contact with said adsorptive surface by the steps of substantially intimately wetting said adsorptive surface with an aqueous solution of a salt of said polyvalent metal and a first anion, substantially thoroughly drying said wetted adsorptive surface and then contacting said dried adsorptive surface with an aqueous solution containing a second anion which reacts with said polyvalent metal to form said water-insoluble polyvalent metal salt.

5,051,190
**PROCESS AND DEVICE FOR CLEANING SLAG FROM REFUSE INCINERATORS**
Leo Schwyter, Sirnach, Switzerland, assignor to Leo Schwyter AG, Rikon im Tosstal, Switzerland
PCT No. PCT/CH89/00089, § 371 Date Jan. 30, 1990, § 102(e) Date Jan. 30, 1990, PCT Pub. No. WO89/11912, PCT Pub. Date Dec. 14, 1989
PCT Filed May 18, 1989, Ser. No. 459,784
Claims priority, application Switzerland, May 31, 1988, 2070/88
Int. Cl.[5] B01D *21/00*
U.S. Cl. 210—695 21 Claims




21. A process for removing harmful substances and impurities from slag enamating from garbage and waste incinerators, the process comprising the steps of:
quenching the slag with water after the slag leaves the incinerator;
separating any dust component from the slag;
mixing the slag with additional water after the slag is quenched to wash harmful substances from the slag;
separating harmful substances and the wash water from each other;
drying the slag to a maximum water content of 20%; and
separating and removing fine components with a grain size of at most 2 mm from the slag.

5,051,191
**METHOD TO DETOXIFY SEWAGE SLUDGE**
Hans W. Rasmussen, St. George, Utah, and Michael A. Rockandel, Richmond, Canada, assignors to Green Environmental Systems Ltd., Hong Kong, Hong Kong
Filed Oct. 31, 1990, Ser. No. 607,026
Int. Cl.[5] C02F *11/14*
U.S. Cl. 210—721 11 Claims



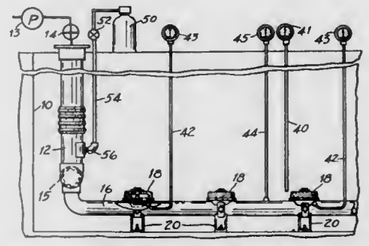

1. A method for detoxification of sewage sludge containing heavy metals, comprising the steps of:
(a) mixing a quantity of sludge, a quantity of at least one catalytic oxidant comprising at least about 0.5 grams per liter of a ferric salt, a quantity of at least one regenerative oxidant and a quantity of acid to form a reacting slurry having a solids fraction and a liquid fraction, said quantities of said oxidants being sufficient to raise said reacting slurry to an oxidation reduction potential to at least +400 millivolts and said quantity of acid being sufficient to lower said reacting slurry to an approximate range of pH between approximately 1.0 and 2.0;
(b) concurrently maintaining said reacting slurry at said oxidation reduction potential and said pH for a period of at least about 10 minutes; and
(c) separating said solids fraction from said liquid fraction to produce an acidic, detoxified sludge and an acidic, metals-laden liquid.



5,051,192
**DISPERSANT COMPOSITIONS FOR TREATING OIL SLICKS**
Alain G. R. Charlier, Overijse, Belgium, assignor to Labofina, S.A., Feluy, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 77,151, Jul. 24, 1987, Pat. No. 4,830,759. This application May 15, 1989, Ser. No. 351,985
Claims priority, application France, Jul. 24, 1986, 86 10742
The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.
Int. Cl.[5] B01D *17/05;* B01F *17/10*
U.S. Cl. 210—749 22 Claims

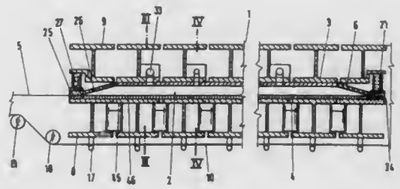
1. A composition for dispersing oil slicks on water comprising a mixture of surface-active agents dissolved in a solvent mixture of about 20–70 weight % water and about 20–70 weight % of a hydrocarbon solvent, wherein said mixture of surface-active agents comprises:
about 55 to 65 wt % emulsifying agents comprising:
a) a blend of sorbitan monooleate and sorbitan monooleate polyoxyethylene adduct, having an HLB of about 8.75 to 9.5, and
b) a blend of sorbitan trioleate and sorbitan monooleate polyoxyethylene adduct, having an HLB of about 8 to 10, wherein the weight ratio of the blend of a) to the blend of b) is within the range of about 0.5:1 and 4:1; and
about 35 to 45 wt % wetting agent comprising at least one water dispersable dialkylsulfosuccinate salt, said percentage being based on dry salt.

5,051,193
**WASTE WATER TREATMENT PROCESS**
Paul W. Cummings, Jr., Worcester, Mass., assignor to Aeration Engineering Resources Corporation, Worcester, Mass.
Continuation of Ser. No. 246,446, Sep. 18, 1988, abandoned, which is a continuation-in-part of Ser. No. 836,947, Mar. 6, 1986, abandoned. This application Jul. 9, 1990, Ser. No. 550,613
Int. Cl.[5] C02F *3/20*
U.S. Cl. 210—752 17 Claims




1. In an aeration sewage treatment process wherein sewage is dispersed in a aqueous pond and is rendered innocuous by passing a treating gas through a distribution system that includes a conventional assembly of above ground and underwater gas feed conduit means that functions to force a treating gas to be released near the bottom of the pond from outlets supported adjacent the bottom of said pond, the outlets taking the form of a plurality of multi-pore diffusion elements submerged in the pond, each of which individual diffuser element is supported over its respective plenum chamber that forms a part of said conduit means, which plurality of porous diffuser elements and their respective plenum chambers are carried by that portion of said gas distribution system that forms a network including piping that is submerged in said aqueous pond; and during the performance of which treating process acid reactive cloggants may form deposits in the pores of and on the surfaces of said diffuser elements the cloggants which form in said pores having a tendency to add to the back pressure of the aqueous pond against said elements and against which the treating gas must be pumped because the cloggants cause a progressive restriction of the flow of treating gas through said diffusion elements and the cloggants which deposit on the surface of the elements possibly causing an additional deterioration of the aeration process, the improvement comprising: rejuvenating said diffusion elements in situ from time to time by removing at least a portion of said cloggants deposited in the pores of and on said elements by reacting them with a dilute liquid aqueous acid solution in order to reduce such restriction to the flow of treating gas through said pores; said cloggant removal reaction being performed with said dilute acid solution; filling the pores of said clogged elements and their plenum chambers and said gas distribution network with said solution; maintaining a pressure behind the acid solution that fills said pores, plenum chambers and gas distribution network at a degree of pressure that is sufficient to slightly over-balance the back pressure of the aqueous pond against the surfaces of said elements in order to force the said acid solution into contact with said cloggants to allow said reaction to proceed; performing said acid-cloggant reaction intermittently on said diffusers from time to time and with such frequency on the cloggants as to rejuvenate said elements whereby to enable said elements to maintain a reasonable volume of a treating gas flow and bubble pattern in the flow of such gas from the diffusers into the pond to properly aerate the sewage dispersed therein; and then reestablishing the flow of treating gas through said gas distribution system to said rejuvenated diffusion elements to flush reaction products and any unreacted dilute acid from said gas distribution system and the pores of said diffusers and from said diffuser surfaces into said aqueous pond in order to continue said aeration sewage treatment process.

5,051,194
**PROCEDURE AND CHAMBER FILTER PRESS FOR DEWATERING SLURRIES AND SIMILAR SUBSTANCES**
Albert Bähr, Am Hungerberg 10, D-6682 Ottweiler 2, Fed. Rep. of Germany
Filed May 8, 1990, Ser. No. 520,896
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915298; Apr. 11, 1990, 4011776
Int. Cl.[5] B30B *9/24*
U.S. Cl. 210—770 41 Claims




1. A method for dewatering slurry and similar substances comprising the steps of:
feeding the slurry by means of a pump under pressure into a slurry chamber including at least one filter surface;

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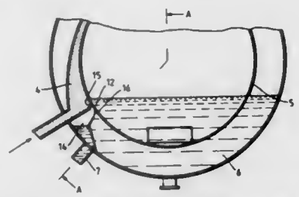
generating a hydrostatic pressure in the slurry chamber by driving the pump to induce the dewatering process;
attaining an adjustable pressure level in the slurry chamber;
isolating the slurry chamber from the pump;
reducing the volume of the slurry chamber; and
producing a mechanical dewatering pressure which is greater than the hydrostatic pressure attained.

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**5,051,195**
**METHOD AND EQUIPMENT FOR FILTRATION OF SUSPENSION**

**Pertti Haapamäki, Montreal, Canada; Aaro Ahlgren, Pori, Finland; Lassi Suoninen, Loviisa, Finland, and Juho Eriksson, Rauma, Finland, assignors to Sunds Defibrator Rauma Oy, Pori, Finland**

**Filed Oct. 13, 1989, Ser. No. 421,192**
**Claims priority, application Finland, Oct. 13, 1988, 884730**
**Int. Cl.[5] B01D** *33/06*
**U.S. Cl. 210—784** **15 Claims**



1. A method of filtering a suspension using an apparatus having a basin, a filter member rotating relative to said basin, a feed part for feeding said suspension toward said filter member, and a removing part for removing pulp from said filter member, comprising the steps of:
catching filtrate passing through said filter member and accumulating said filtrate in said basin in a space partially occupied by said filter member;
dividing said space in a vertically-extending direction into separate portions; and
independently controlling a level of filtrate in respective said portion and removing filtrate from one of said portions at a rate so as to cause, as a result of said level of filtrate in respective said portions, flow of filtrate across a portion of said filter member adjacent said one portion to clean said portion of said filter member, said one portion of said space thereby forming a cleaning point.

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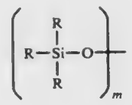
**5,051,196**
**SOFTENING COMPOSITIONS AND METHODS FOR MAKING AND USING SAME**

**Norman Blumenkopf, Fort Lee, N.J.; Jean-Paul Grandmaire, Andrimont, Belgium; Alain Jacques, Blegny, Belgium, and Viviane Tack, Soumagne, Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.**

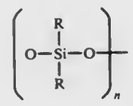
**Continuation of Ser. No. 232,346, Aug. 12, 1988, abandoned. This application Jan. 22, 1990, Ser. No. 469,807**
**Int. Cl.[5] D06M** *13/38;* **C08G** *77/44*
**U.S. Cl. 252—8.8** **7 Claims**

1. A fabric softening composition comprising
(A) a quaternary ammonium salt fabric softening compound, and
(B) a cross-linked polysiloxane represented by a structure containing the following difunctional units D and tri-functional units T; and, optionally, monofunctional units, M:

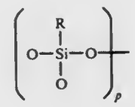
(M unit)



(D unit)



(T unit)



where
R represents alkyl of from 1 to 4 carbon atoms, which may be substituted, or benzyl,
m, n and p are numbers expressing the relative content of the "M", "D" and "T" units, respectively, and (n+p)/m ranges from 100:1 to 10:1 when optional units "M" are present and n/p ranges from 49:1 to 1:4 when optional units "M" are not present, the amount of the tri-functional cross-linking units "T" ranges from about 2 to 80% of the total units, the amount of di-functional units "D" is from about 20 to about 95% of the total units, and the amount of units "M" ranges from 0 to about 5% of the total units, and the weight ratio of (A) to (B) ranges from about 100:1 to 1:10.

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**5,051,197**
**SCALE REMOVAL TREATMENT**

**Leonard J. Kalfayan, Claremont; David R. Watkins, Irvine, and Gregory S. Hewgill, Chino, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.**

**Continuation of Ser. No. 311,378, Feb. 15, 1989, Pat. No. 4,992,182, and a continuation of Ser. No. 77,305, Jul. 24, 1987, abandoned, which is a divisIon of Ser. No. 800,532, Nov. 21, 1985, Pat. No. 4,708,207. This application Oct. 10, 1990, Ser. No. 595,104**
**The portion of the term of this patent subsequent to Feb. 12, 2008, has been disclaimed.**
**Int. Cl.[5] 252** *8.552, 8.553, 389.31, 390*
**U.S. Cl. 252—8.552** **16 Claims**

1. An aqueous solution for scale removal, the solution comprising:
(a) an aminopolycarboxylic compound selected from the group consisting of aminopolycarboxylic acids, aminopolycarboxylic salts, and mixtures thereof, the solution comprising about 0.1 weight percent of the aminopolycarboxylic compound to about the solubility limit of the aminopolycarboxylic compound in the solution and the aminopolycarboxylic compound having a chelating ability and sufficient solubility in water to produce an effective scale removal solution; and
(b) at least about 1.8 weight percent of a water-soluble organosilicon compound.



**5,051,198**
**ANTI-OXIDANT COMPOSITIONS CONTAINING MERCAPTOTHIADIAZOLE OR MERCAPTOBENZOTHIAZOLE DERIVATIVES**

**Mary F. Salomon, Cleveland Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio**

**Continuation of Ser. No. 188,589, Jun. 24, 1988, Pat. No. 4,894,174, which is a continuation of Ser. No. 60,183, Jun. 9, 1987, Pat. No. 4,764,299. This application Jan. 4, 1990, Ser. No. 461,136**
**Int. Cl.[5] C10M** *133/38*
**U.S. Cl. 252—47** **7 Claims**

1. A compound of the formula

$$RS(AS_xAO)_yAs_xASR^1$$

wherein x is 2, y is 0 and R and $R^1$ are hydrocarbyl groups, A is an alkylene group and provided further that one of R and $R^1$ contains at least 5 carbon atoms and is derived from a mercaptothiadiazole or mercaptobenzothiazole.

5. An automatic transmission fluid comprising a suitable base fluid for an automatic transmission and a compound of the formula

$$RS(AS_xAO)_yAS_xASR^1$$

wherein x is 2, y is 0 and R and $R^1$ are hydrocarbyl groups, A is an alkylene group and provided further that one of R and $R^1$ contains at least 5 carbon atoms and is derived from a mercaptothiadiazole or mercaptobenzothiazole.

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**5,051,199**
**FROTH FLOTATION OF MINERAL FINES**

**Christopher H. Barwise, Buddle Hill, United Kingdom, assignor to Fospur Limited, Derbyshire, England**

**Division of Ser. No. 260,615, Oct. 25, 1988, Pat. No. 4,956,077. This application Sep. 20, 1989, Ser. No. 410,051**
**Claims priority, application United Kingdom, Nov. 17, 1987, 8726857**
**Int. Cl.[5] B03D** *1/016*
**U.S. Cl. 252—61** **4 Claims**

1. An additive composition for use in a process for the beneficiation of mixed mineral particles containing a non-carbonceous first mineral and a second mineral in which it is desired to recover said first mineral by froth flotation, said composition comprising a frother present in said composition in an amount sufficient to provide a froth in said froth flotation and a non-water soluble polyvinyl ether present in said composition an amount sufficient to selectively flocculate said first mineral.

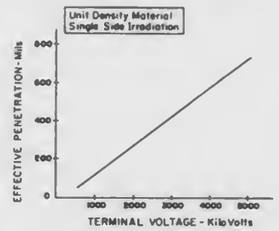
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**5,051,200**
**FLEXIBLE HIGH ENERGY MAGNETIC BLEND COMPOSITIONS BASED ON RARE EARTH MAGNETIC PARTICLES IN HIGHLY SATURATED NITRILE RUBBER**

**Raymond C. Srail, Parma; Richard A. Glover, Brookpark; Tiong H. Kuan, Hudson, and Thomas R. Szczepanski, North Royalton, all of Ohio, assignors to The B. F. Goodrich Company, Brecksville, Ohio**

**Filed Sep. 19, 1989, Ser. No. 409,539**
**Int. Cl.[5] C04B** *35/50;* **C08J** *3/20;* **C08K** *3/08;* **C08L** *9/02*
**U.S. Cl. 252—62.54** **12 Claims**

1. A flexible magnetic blend composition having a maximum energy product of at least 2.5 megagauss-oersteds, a remenance, Br, of at least about 3,400 gauss; a coercive force, Hc of at least about 2900 oersteds; an intrinsic coercivity, $H_{ci}$, of at least about 5,000 oersteds; said composition comprising a mixture of up to 70% by volume of rare earth magnetic particles, and a binder system which comprises a saturated nitrile rubber being at least 85% saturated; said composition after shaping curing by exposure to a high voltage electron beam being able to retain at least about 20 percent tensile elongation at break measured at 23° C. (ASTM D412) after 100 hours of hot air aging at 125° C., and swell less than 5 volume percent in ASTM #1 and #3 oils after 46 hours soak at 23° C., said mixture further being capable of being shaped or formed in an extruded strip or calendared sheet which will hold its shape before and after high voltage electron beam cure.




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**5,051,201**
**PREPARATION OF FINELY DIVIDED HEXAGONAL FERRITE POWDER**

**Michael W. Mueller, Plankstadt; Ekkehard Schwab, Neustadt, and Volker Arndt, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Sep. 11, 1990, Ser. No. 580,861**
**Claims priority, application Fed. Rep. of Germany, Sep. 28, 1989, 3932389**
**Int. Cl.[5] C04B** *35/26*
**U.S. Cl. 252—62.59** **2 Claims**

1. A process for the preparation of a finely divided hexagonal ferrite powder having a mean particle size of from 0.01 to 0.3 μm comprising:
heating in an autoclave an aqueous alkaline suspension containing ferrite - forming metal ions at from 250°-330° C. to form an intermediate ferrite material and subsequently heating said intermediate ferrite material at a temperature of not more than 900° C. to effect the formation of said finely divided hexagonal ferrite powder,
said process being characterized in that hydrated salts of said ferrite-forming metal ions are mixed in proportions for said ferrite, the resultant mixture is heated to form a substantially homogenous salt melt, said salt melt being added to aqueous alkali to form said halkaline suspension and the resultant suspension is subjected to said heating at 250–330° C. in the autoclave.

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**5,051,202**
**PROCESS FOR BLEACHING AND INCREASING THE ION-EXCHANGE CAPABILITY OF SEPIOLITE**

**Antonio A. Berenguer, and Carlos B. Martin, both of Madrid, Spain, assignors to Tolsa, S.A., Madrid, Spain**

**Filed Jul. 1, 1988, Ser. No. 214,320**
**Claims priority, application Spain, Jul. 1, 1987, 8701918**
**Int. Cl.[5] B01J** *37/30*
**U.S. Cl. 252—184** **7 Claims**

1. A process for bleaching and increasing the ion exchange capability of sepiolite, thereby obtaining products with an X-Ray diffractogram different from that of the starting sepiolite, said obtained products being capable of ion-exchange with cations of metals of the groups Ia, IIa, IIIa, IVa, Va, VIa, VIIa, VIIIa, Ib, IIb and IIIb, as well as with $NH^{4+}$ and, $H^+$ cations, comprising treating said sepiolite with aqueous solutions of sodium carbonate or other basic salt, selected from the group consisting of sodium bicarbonate, potassium bicarbonate, tetrasodium pyrophosphate or sodium acetate at a temperature over about 100° C. and at a pressure over about one atmosphere where said solution has a basic salt concentration ranging between about 0.1N and about 10N and a sepiolite concentration between about 1% and about 50% by weight.

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5,051,203

## PROCESS FOR PRODUCING PHOSPHOR

Hitoshi Toki, and Yoshitaka Satoh, both of Mobara, Japan, assignors to Futaba Denshi Kogya K.K., Mobara, Japan

Filed Nov. 23, 1990, Ser. No. 617,088
Claims priority, application Japan, Nov. 24, 1989, 1-303252
Int. Cl.[5] C09K *11/62*
U.S. Cl. 252—301.6 R 9 Claims

1. A process for producing a $ZnO{\cdot}Ga_2O_3$:Li phosphor comprising the steps of:

mixing equimolar amounts of ZnO and $Ga_2O_3$ and a Li compound in an amount which is in excess of that which is to be incorporated into phosphor to prepare a mixture;

calcining said mixture in an air atmosphere at a temperature of no more than 1200° C. for three hours, to thereby form a solid solution;

pulverizing said solid solution;

washing said pulverized solid solution with nitric acid to remove excess Li compound;

calcining said washed solid solution in a $H_2$ and $N_2$ reducing and Zn gas atmosphere at about 1100° C. so as to activate said washed solid solution, to thereby form said $ZnO{\cdot}Ga_2O_3$:Li phosphor; and

classifying said $ZnO{\cdot}Ga_2O_3$:Li phosphor so as to effect a phosphor of uniform particle size.

5,051,204

## MULTI-ELEMENT METAL CHALOCOGENIDE

Yoshinao Ohsawa, and Yoshito Gotoh, both of Tsukuba, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Nov. 28, 1989, Ser. No. 446,548
Claims priority, application Japan, Nov. 30, 1988, 63-303817; Jan. 30, 1989, 1-19977
Int. Cl.[5] C09K *11/08;* H01B *1/10;* C01B *19/00;* H01M *4/58*
U.S. Cl. 252—301.45 3 Claims

1. A chalcogenide having the following general formula (I):

$$X_{(1-a)x}X'_{ax}Y_yZ_z \quad (I)$$

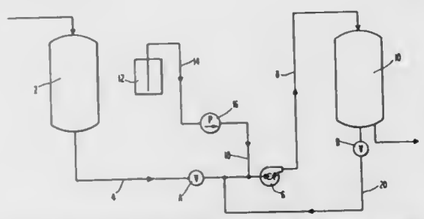
wherein x stands for at least one element selected from Bi, Sb and As, X' stands for at least one element selected from Pb, Sn and Ge, Y stands for at least one element selected from Ti, V, Nb and Ta, Z stands for at least one element selected from S, Se and Te, a is a number of 0.01–0.99, x is a number of 0.8–1.2, y is a number of 0.8–1.2 and z is a number of 2.4–3.6.

5,051,205

## PROCESS OF FORMING A STABLE COLLOIDAL DISPERSION

Thomas H. Overgaard, Redford Township, Wayne County, and Gregory J. Cutting, Allen Park, both of Mich., assignors to Atochem North America, Inc., Philadelphia, Pa.

Filed Apr. 18, 1990, Ser. No. 510,648
Int. Cl.[5] B01J *13/00*
U.S. Cl. 252—314 8 Claims



1. A process for uniformly dispersing an additive amount of a water-insoluble, liquid polyalkylene glycol derivative having a viscosity (100° F. - SUS) of at least about 150 in a substantially nonaqueous, water-soluble alkanolamine, said process comprising feeding under pressure a first proportion of the total additive amount of the polyglycol derivative into a pressurized stream of said alkanolamine and subjecting the mixture to shear stress to form a first dispersion, recycling said first dispersion to the polyglycol derivative feed, feeding under pressure a second proportion of said polyglycol derivative into a pressurized stream of said first dispersion and subjecting the mixture to shear stress to form a second dispersion, whereby a stable, colloidal dispersion of an additive amount of said polyglycol derivative is uniformly dispersed in said alkanolamine.

5,051,206

## BLOWING AGENT COMPOSITION

Raymond J. Bathgate, Royston, England, assignor to Schering Agrochemicals Ltd., United Kingdom

Continuation of Ser. No. 39,798, Apr. 15, 1987, abandoned, which is a continuation of Ser. No. 626,093, Jun. 29, 1984, abandoned. This application Oct. 20, 1988, Ser. No. 262,185
Claims priority, application United Kingdom, Jun. 20, 1983, 8317799
Int. Cl.[5] C09K *3/00;* C01G *9/00*
U.S. Cl. 252—350 9 Claims

1. The non-gaseous reaction product formed by reacting from 2 to 5 molar proportions of urea with one molar proportion of an oxide, carbonate or hydroxide of zinc at a temperature of from 120° C. to 180° C., said reaction product being a composition having an analysis which corresponds to the formula $(NH_3)_nZn(NCO)_2$ where n, which may be fractional, is from 0.5 to 4.

4. An activated chemical blowing agent composition which comprises a thermally decomposable blowing agent selected from the group consisting of azodicarbonamide, sulphonhydrazide and dinitrosopentamethylenetetraamine in combination with the reaction product of claim 1.

5,051,207

## HEAT-RESISTANT AND CORROSION-RESISTANT COMPOSITION

Toshikatsu Ishikawa, Ohta; Katsuya Tokutomi, Yokosuka; Hiroshi Ichikawa, Yokohama; Shiro Mitsuno, Yokohama, and Hideto Nagai, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/01274, § 371 Date Aug. 16, 1989, § 102(e) Date Aug. 16, 1989, PCT Pub. No. WO89/06261, PCT Pub. Date Jul. 13, 1989
PCT Filed Dec. 15, 1988, Ser. No. 397,497
Claims priority, application Japan, Dec. 28, 1987, 62-329724
Int. Cl.[5] C23F *11/00*
U.S. Cl. 252—389.31 7 Claims

1. A heat-resistant, corrosion-resistant composition for coating materials consisting essentially of a metal alcoholate; a curing agent capable of being dehydrated by heating and a filler as solids, and an organic solvent, in which the amounts of the metal alcoholate, the curing agent and the filler are 25 to 70% by weight, 0.1 to 20% by weight and 10 to 60% by weight, respectively, based on 100% by weight of the total solids.

6. A heat-resistant, corrosion-resistant composition for binders for ceramics consisting essentially of a metal alcoholate, a curing agent capable of being dehydrated by heating and a filler as solids, and an organic solvent, in which the amounts of the metal alcoholate, the curing agent and the filler are 25 to 80% by weight, 0.1 to 20% by weight and 20 to 70% by weight, respectively, based on 100% by weight of the total solids.



5,051,208

## SILVER/SILVER CHLORIDE COMPOSITIONS

Richard E. Bowns, Hacienda Heights, and David J. Ouellette, Alta Loma, both of Calif., assignors to Advanced Products Inc., Cheshire, Conn.

Filed Jun. 29, 1990, Ser. No. 546,611
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—511 8 Claims

1. A conductive silver/silver chloride composition consisting essentially of:

(a) about 5 to about 15 parts by weight of a polyester or phenoxy thermoplastic polymer or mixtures thereof;

(b) at least a sufficient amount of an organic solvent capable of dissolving polymer (a);

(c) about 35 to about 60 parts by weight of silver flake; and

(d) about 5 to about 20 parts by weight silver chloride.

5,051,209

## CONDUCTIVE EPOXYPOLYAMIDE COATING COMPOSITION

Mary N. Mirabeau, Glen Mills, Pa., and Frank Rohrbacher, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 27, 1990, Ser. No. 515,401
Int. Cl.[5] H01B *1/06*
U.S. Cl. 252—518 11 Claims

1. A conductive coating composition comprising a film forming binder and pigment in a pigment to binder weight ratio of about 15:100 to 100:100; wherein the binder consists essentially of

(A) 40–70% by weight of an amine component having at least tow reactive amine groups selected from the group consisting of an amine, polyamide, polyamido amine resin or mixtures thereof; and

(B) 30–60% by weight of an epoxy resin having at least two epoxy groups per resin molecule;

wherein the pigment comprises an electrically conductive pigment that comprises silica selected from the group consisting of amorphous silica, a silica containing material or silica coated pigment, said silica being in association with a two-dimensional network of antimony-containing tin oxide crystallites in which the antimony content ranges from about 1–30% by weight of the tin oxide and the composition forms a coating having a surface conductivity of at least 100 Ransburg units.

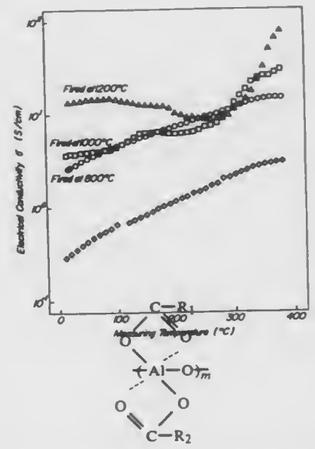
5,051,210

## ALUMINA FIBER AND A METHOD OF PRODUCING THE SAME

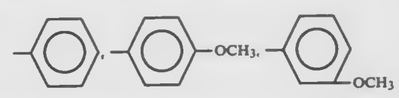
Toshio Kitao, Kyoto; Yoshiharu Kimura, Ohmihachiman; Hideki Yamane, Kyoto, and Koichi Hashimoto, Osaka, all of Japan, assignors to Kyoto Institute of Technology, Kyoto, Japan

Division of Ser. No. 317,490, Mar. 1, 1989. This application Feb. 22, 1990, Ser. No. 483,174
Claims priority, application Japan, Aug. 3, 1988, 63-192792
Int. Cl.[5] H01B *1/06;* B32B *15/00*
U.S. Cl. 252—518 2 Claims

1. An electrically conductive alumina fiber which comprises an aluminum oxide matrix, and a continuous phase of carbon in the aluminum oxide matrix, the continuous phase of carbon providing an electrically conductivity of 2.88–78.3 $S{\cdot}cm^{-1}$ to the alumina fiber, the alumina fiber being obtained by pyrolysis of a precursor fiber of poly[(acryloxy)aloxane] having the formula




wherein, $R_1$ represents $CH_2CH_2OCH_2CH_3$, $R_2$ represents



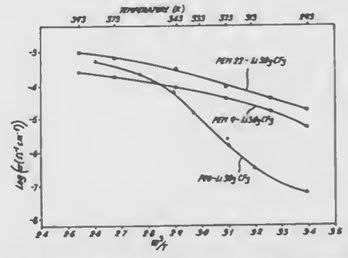

or another substituted aromatic group at 800°–1200° C. in an inert atmosphere.

5,051,211

## POLYMERIC MATERIALS

Ian M. Ward, Leeds; James E. McIntyre, Harrogate, both of England; Dennis J. Bannister, Mount Waverley, Australia; Peter G. Hall, and Geoffrey R. Davies, both of Leeds, England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 761,588, Jul. 16, 1985, abandoned. This application Mar. 23, 1989, Ser. No. 327,993
Claims priority, application United Kingdom, Dec. 9, 1983, 8332953; Nov. 16, 1984, 8428865; Dec. 10, 1984, 8400424
Int. Cl.[5] H01M *6/18;* H01B *1/06*
U.S. Cl. 429—192 19 Claims

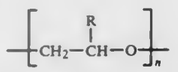



1. An ionically conductive, ion-containing polymeric material prepared from an amorphous copolymer and a source of ions and having a bulk ionic conductivity at 20° C. and 10 kHz greater than $10^{-6}\Omega^{-1}\ cm^{-1}$, wherein the copolymer comprises a polymerized acrylic acid, polymerized methacrylic

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acid or siloxane backbone from which depends at least one residue of the formula:



wherein:
n represents a number greater than 1; and
R represents a hydrogen atom or substituted or unsubstituted alkyl group of 1 to 5 carbon atoms.

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**5,051,212**

## HARD-SURFACE CLEANING COMPOSITIONS CONTAINING IMINODIACETIC ACID DERIVATIVES

**Stephen Culshaw, Le Pecq, France; Eddy Vos, Linden, Belgium, and Frederick E. Hardy, Ponteland, England, assignors to The Procter & Gamble Company, Cincinnati, Ohio**

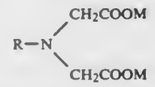
**Filed Nov. 9, 1988, Ser. No. 269,850**

**Claims priority, application United Kingdom, Nov. 13, 1987, 8726673**

**Int. Cl.[5] C11D** *7/32, 7/22, 7/26, 7/00*

**U.S. Cl. 252—546** **10 Claims**

1. A hard-surface cleaning composition containing an organic solvent having a boiling point above 90° C. and a chelating agent of the formula:



wherein R is selected from the group of

$-CH_2CH_2CH_2OH$; $-CH_2CH(OH)CH_3$;

$-CH_2CH(OH)CH_2OH$; $-CH(CH_2OH)_2$;

$-CH_3$; $-CH_2CH_2OCH_3$; $-\overset{\overset{O}{\|}}{C}-CH_3$; $-CH_2-\overset{\overset{O}{\|}}{C}-NH_2$;

$-CH_2CH_2CH_2OCH_3$;

$-C(CH_2OH)_3$

and M is hydrogen or an alkali metal ion.

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**5,051,213**

## METHOD AND APPARATUS FOR MIXING FLUIDS

**John R. Weske, P.O. Box 116, Sandy Spring, Md. 20860**

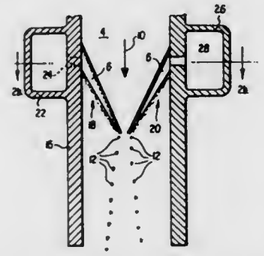
**Continuation of Ser. No. 766,429, Aug. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 752,491, Jul. 8, 1985, abandoned, which is a continuation of Ser. No. 523,796, Aug. 16, 1983, abandoned. This application Feb. 24, 1987, Ser. No. 39,871**

**Int. Cl.[5] B01F** *3/04*

**U.S. Cl. 261—78.2** **33 Claims**

22. A method for mixing a first fluid with a second fluid comprising providing an elongate element, causing said first fluid to flow past said elongate element, and supplying said second fluid, wherein said elongate element comprises a first part for creating a local low pressure area in said first fluid on the lee side of said first part for inducting said second fluid and forming globules of said second fluid, the pressure of said low local pressure area being lower than the pressure in said first fluid adjacent said local low pressure area, said elongate element having a second part for transporting said globules into said first fluid, said elongate element being curved whereby said first part forms a first angle with the direction of flow of said first fluid and said second part forms a second angle with said direction of flow, said second angle being smaller than said first angle, wherein said step of supplying comprises supplying said second fluid to said local low pressure area, and said step of providing comprises arranging said elongate element with respect to said flow of said first fluid so that at least a component of said flow is parallel to said second part whereby said globules are pulled along said second part from said local low pressure area into a higher pressure area in said first fluid and into said flow.

28. Apparatus for mixing a first fluid with a second fluid comprising an elongate element, means for supporting said elongate element to extend into said first fluid to permit relative motion between said first fluid and said elongate element, and supply means for supplying said second fluid, said elongate element comprising a first part for creating a local low pressure area in said first fluid on a downstream side of said first part



when said fluid moves with respect to said elongate element, the pressure of said local low pressure area being lower than the pressure in said first fluid adjacent said local low pressure area, said elongate element further comprising a second part connected to said first part and extending into said first fluid beyond said first part, said elongate element being curved whereby said first part forms a first angle with the direction of flow of said first fluid and said second part forms a second angle with said direction of flow, said second angle being smaller than said first angle, wherein said supply means supplies said second fluid to said local low pressure area to form globules of said second fluid and said globule is pulled along said second part from said low pressure area to a higher pressure area in said first fluid and into said first fluid.

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**5,051,214**

## DOUBLE-DECK DISTRIBUTOR AND METHOD OF LIQUID DISTRIBUTION

**Gilbert K. Chen, Farmers Branch; Adam T. Lee, Richardson; Kuang-Yeu Wu, Plano, and Gary W. Gage, Grand Prairie, all of Tex., assignors to Glitsch, Inc., Dallas, Tex.**

**Continuation of Ser. No. 296,838, Jan. 13, 1989, abandoned. This application Jul. 3, 1990, Ser. No. 547,395**

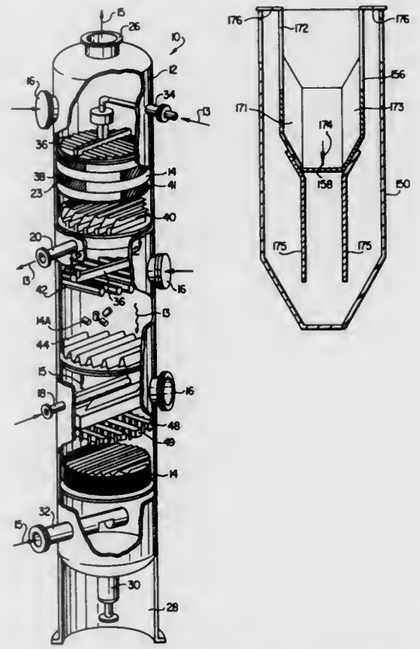
**Int. Cl.[5] B01F** *3/04*

**U.S. Cl. 261—97** **3 Claims**

1. An improved liquid distributor for a process column of the type wherein a plurality of distributor troughs receives liquid flow from a liquid source for establishing a liquid level within said troughs and distributing said flow downwardly to packing beds therebeneath, said improvement comprising:

a primary flow channel disposed within at least one of said distributor troughs in general axial alignment therewith, substantially above the liquid level therein and positioned in flow communication with said liquid source;

said primary flow channel being secured relative to said distributor trough in which it is disposed, substantially above the liquid level therein and constructed for disseminating flow above said liquid level and into said trough from said liquid source for enhanced uniformity at relatively high mass flow volume therealong, and said primary flow channel being integrally formed with said distributor trough and said distributor further including at



least one stilling plate secured to and depending from said flow channel into said trough.

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**5,051,215**

## CURING PRECERAMIC POLYMERS BY EXPOSURE TO NITROGEN DIOXIDE

**James A. Rabe; Jonathan Lipowitz, both of Midland, Mich., and Paul P. Lu, Hacienda Heights, Calif., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Mar. 21, 1990, Ser. No. 496,850**

**Int. Cl.[5] D01F** *9/10, 11/04*

**U.S. Cl. 264—29.2** **16 Claims**

1. A method of infusibilizing a preceramic polymer selected from the group consisting of polycarbosilanes, polysilanes and polysilazanes comprising treating the preceramic polymer with gaseous nitrogen dioxide at a temperature in the range of from about room temperature up to about 300° C. for less than about 2 hours to render the preceramic polymer infusible.



**5,051,216**

## PROCESS FOR PRODUCING CARBON FIBERS OF HIGH TENACITY AND MODULUS OF ELASTICITY

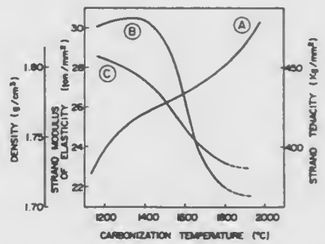
**Munetsugu Nakatani; Yoshitaka Imai; Hiroaki Yoneyama, all of Ohtake, and Yoshiteru Tanuku, Kawasaki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 120,691, Nov. 9, 1987, which is a continuation of Ser. No. 731,950, Apr. 25, 1985, abandoned. This application Sep. 1, 1989, Ser. No. 401,775**

**Claims priority, application Japan, Oct. 13, 1983, 58-191291; Oct. 13, 1983, 58-191292; Oct. 13, 1983, 58-191293; Oct. 13, 1983, 58-191294**

**Int. Cl.[5] D01F** *9/22*

**U.S. Cl. 264—29.2** **7 Claims**




1. A process for producing a carbon fiber of a high tenacity and a high modulus of elasticity having a fiber diameter of 1 to 6 μm, a strand tenacity of 430 kg/mm² or more, a strand modulus of elasticity of 28 ton/mm² or more, and a density of 1.755 g/cm³, which process comprises subjecting an acrylonitrile-type fiber, a precursor, to a flame-resisting treatment in an oxidizing atmosphere at a temperature of 200° to 400° C. while applying an elongation of 3% or more to the fiber until the density of the fiber reaches 1.22 g/cm³, and thereafter substantially suppressing shrinkage of the fibers until the fibers have a density in the range exceeding 1.22 g/cm³ and not more than 1.40 g/cm³, then subjecting the flame-resisting-treated fiber to a heat treatment in an inert atmosphere at a temperature of 300° to 800° C. while applying an elongation of 3% or more to the fiber, and then subject the yarn to a further heat treatment in an inert atmosphere at a temperature of 1300° to 1650° C. while applying a tension to the yarn.

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**5,051,217**

## PROCESS FOR THE PRODUCTION OF BUILDING UNITS FROM AFTERHARDENING MATERIALS

**Tibor Alpár; János Györvári, and Ernö Schmidt, all of Szombathely, Hungary, assignors to Fakombinat Szombathely, Hungary**

**Continuation of Ser. No. 407,430, Sep. 14, 1989, Pat. No. 4,927,573, which is a division of Ser. No. 186,426, Apr. 26, 1988, Pat. No. 4,917,987. This application May 1, 1990, Ser. No. 518,053**

**Claims priority, application Hungary, Mar. 5, 1987, 2251-2004/87**

**The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.**

**Int. Cl.[5] B28B** *3/20;* **B29C** *47/00;* **C04B** *40/00*

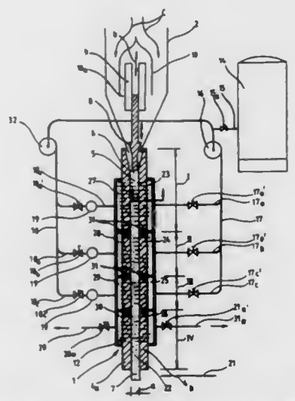
**U.S. Cl. 264—40.1** **8 Claims**

1. Process for the production of building units from an afterhardening mixture containing cement, additives and water as binding material, the process including the steps of feeding the afterhardening mixture into a die which has an inlet port for insertion of the afterhardening mixture and an outlet port for removal of the afterhardening mixture in compacted form, introducing $CO_2$ gas into the afterhardening mixture and bringing about a carbonation reaction with the afterhardening mixture, moving the afterhardening mixture continuously through the die while introducing the $CO_2$ gas into the after-

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hardening mixture under pressure, controlling introduction of the $CO_2$ gas so as to provide a greater amount of the gas flowing through the afterhardening mixture near the inlet port of the die as compared to the amount of the gas flowing through the afterhardening mixture near the outlet port, compacting the afterhardening mixture at the inlet port and faces of the die,



and forming a generally gastight seal between the afterhardening mixture and the die, controlling the introducing of the $CO_2$ gas into the die so that full completion or essentially full completion of the carbonation reaction occurs, and removing the afterhardening mixture in compacted form from the die and separating the afterhardening mixture into the building units.

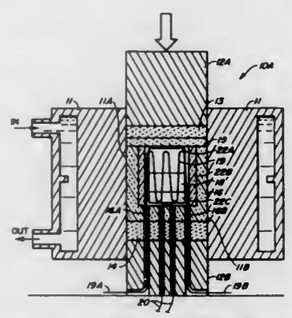
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5,051,218

## METHOD FOR LOCALIZED HEATING AND ISOSTATICALLY PRESSING OF GLASS ENCAPSULATED MATERIALS

M. Dean Matthews, Saratoga, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Feb. 10, 1989, Ser. No. 309,334
Int. Cl.[5] B29C *43/10*; C04B *36/60*
U.S. Cl. 264—40.6 14 Claims



1. A method for consolidating or densifying material sample selected from metal, ceramic or mixtures thereof to form a densified compact article, which process comprises:

(a) arranging the material sample to be consolidated or densified in a general configuration completely surrounded by a pre-glass material which forms a fluid glass at elevated temperature in close proximity and surrounded about at least one diameter, by an electrical heating element means within the pre-glass material and having at lest one temperature measuring device in close proximity to the material sample producing an arrangement all within a shell, wherein said arrangement and shell are in a pressure chamber apparatus having external heating and cooling means and vacuum means;

(b) externally heating the arrangement and shell produced in step (a) at a temperature of between about 200° and 850° C. at a reduced pressure of between about 1 and 0.0001 mm of mercury for a time effective to remove volatiles, and to produce a dried material sample;

(c) heating the dried material sample produced in step (b) to produce fusion of the pre-glass at between about 500° C. to 1600° C. and encapsulation of the sample and encapsulation of the electrical heating element means, and optionally encapsulating the at least one temperature measuring device to produce an encapsulated prearticle having local encapsulated electrical heating element means;

(d) heating the encapsulated prearticle produced in step (c) in the external pressure chamber apparatus, using the encapsulated heating element means, to locally heat the encapsulated prearticle and sample to a temperature of between about 700° C. and 2,200° C., monitoring the sample temperature using the at least one temperature measuring device, and simultaneously applying a pressure to the encapsulated prearticle of between about 50,000 and 275,000 psi for a time effective to densify the dried material sample, wherein the external pressure chamber has a surface temperature in contact with the encapsulated prearticle of not greater than about 500° C.; and

(e) releasing the elevated pressure and decreasing the temperature of the formed densified compact article to a predetermined temperature.

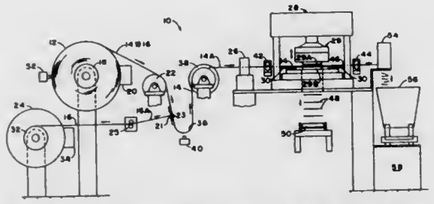
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5,051,219

## AUTOMATIC HANDLING OF GREEN CERAMIC TAPES

James A. Miller, Apollo, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 24, 1989, Ser. No. 383,647
Int. Cl.[5] B28B *11/16*; B29D *7/00*
U.S. Cl. 264—40.7 6 Claims



1. An automated method for making blanks from a fragile, flexible material cast on a supporting strip and rolled to form a composite payoff roll of the fragile material and supporting strip comprising:

unwinding the fragile material and supporting strip from the roll thereof at a rate relative to the rate at which the fragile material is fed to a blanking station such that slack in the fragile material is maintained between said roll and blanking station,

separating the supporting strip from the fragile material before it reaches the blanking station,

winding the supporting strip on a take-up roll,

feeding the fragile material at a controlled rate to the blanking station,

sensing the rate at which the take-up roll receives the supporting strip,

monitoring the slack in said fragile material,

blanking cards from the fragile material at said station, the blanking step leaving a remaining skeleton of fragile material,

collecting said cards,



directing the skeleton material to a location for collecting said material,

collecting material at said location.

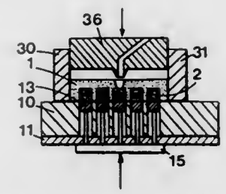
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5,051,220

## METHOD FOR THE MANUFACTURE OF A HEATING ELEMENT

Victor Spreter, 25, chemin de Ruite, 1252 Meinier, Switzerland, and Conrad Zellweger, 5, chemin des Voirons, 1224 Chene-Bougeries, Switzerland

PCT No. PCT/CH86/00165, § 371 Date Sep. 21, 1987, § 102(e) Date Sep. 21, 1987, PCT Pub. No. WO87/03530, PCT Pub. Date Jun. 18, 1987
PCT Filed Nov. 27, 1986, Ser. No. 94,678
Claims priority, application Switzerland, Dec. 6, 1985, 05224/85
Int. Cl.[5] B29C *43/20*
U.S. Cl. 264—113 6 Claims




1. In a method for the production of a heating element which includes a reactive material capable of exothermic reaction, said heating element including a support comprised of an insulating layer of refractory material from which wall portions extend in a perpendicular direction which define a reaction path therebetween and in which reaction path is disposed said reactive material, said method comprising molding said reactive material in the shape of said reaction path and applying said insulating layer thereto,

the improvement comprising contacting a layer of said reactive material with a mold member which includes a mold surface defining a mirror image of the desired reaction path,

pressing said mold surface against said reactive material to form a molded surface thereon,

removing said molded reactive material from contact with said mold surface of said mold member,

forming a layer of said refractory material in encompassing relationship to said molded surface of said reactive material,

said mold surface of said mold member which comprises said mirror image being defined by a hollowed-out portion of a mold,

said mold including compression means within said hollowed-out portion adapted to compress said reactive material within said hollowed-out portion,

subsequently removing said reactive material from said hollowed-out portion by displacement of said compression means and supporting said reactive material thereon subsequent to being removed from said hollowed-out portion,

and forming said layer of refractory material on said removed reactive material while supporting said reactive material upon said compression means.

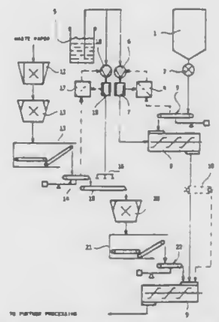
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5,051,221

## METHOD FOR THE MANUFACTURE OF A MOIST MIXTURE FROM PLASTER OF PARIS AND FIBRES

Jörg L. Bold, Kaiserslautern, Fed. Rep. of Germany, assignor to Wurtex Maschinenbau Hofmann GmbH & Co, Fed. Rep. of Germany

Filed Feb. 21, 1990, Ser. No. 482,482
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1989, 3906009
Int. Cl.[5] B28C *5/40*
U.S. Cl. 264—115 17 Claims



1. Method for the manufacture of a moist mixture from plaster of Paris and fibres as an initial product in the manufacture of fibre-reinforced moulded plaster bodies, in which fluid plaster of Paris, fibres and water are mixed homogeneously, wherein before mixing with the fibres, a quantity of water is added to the plaster of Paris which leads to a moisture content of between 5 and 22%.

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5,051,222

## METHOD FOR MAKING EXTRUDABLE POLYVINYL ALCOHOL COMPOSITIONS

F. Lennart Marten, Macungie; Amir Famili, Schnecksville, and James F. Nangeroni, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 1, 1989, Ser. No. 402,167
Int. Cl.[5] B29C *47/80*
U.S. Cl. 264—143 20 Claims

1. In a method for extruding polyvinyl alcohol which is at least partially crystalline, the improvement which comprises

adding at least 0.27 KW hr/kg of specific energy to the polyvinyl alcohol to both melt it and substantially eliminate the crystallinity in the melt by shearing the areas of crystallinity, and

simultaneously removing energy from the melt at a rate sufficient to avoid decomposition of the polyvinyl alcohol.

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5,051,223

## METHOD FOR THE PRODUCTION OF CONCRETE PIPES

Gregor Kern, Bamberger Strasse 16, D-7522 Philippsburg, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 405,560
Int. Cl.[5] B28B *1/16, 3/12, 21/26*
U.S. Cl. 264—256 1 Claim

1. A method for the production of a concrete pipe having an inner wall, which comprises:

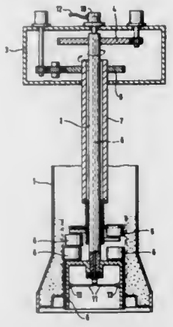
(a) introducing a wet concrete mass into a pipe form to produce a cylindrical mass having an inner wall, the pipe form comprising a cylindrical outer form having a longitudinal axis;

(b) compacting the cylindrical concrete mass by applying pressing rollers to the inner wall;

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(c) introducing a rotating roller head into the pipe form along the longitudinal axis thereof, the roller head comprising the pressing rollers and a smoothing cylinder therebelow, the smoothing cylinder having a circumferentially extending wall, rotation of the roller head causing the cylindrical concrete mass to be first compacted by the pressing rollers and then smoothed by the smoothing cylinder for smoothing the inner wall of the compacted cylindrical concrete mass; and



(d) applying a liquid impregnation medium to the inner wall under pressure after the concrete mass has been compacted, the inner wall has been partially smoothed, and while the concrete mass is still damp, the applying of the impregnation medium to the inner wall being through the smoothing cylinder wall and over the entire circumference of the smoothing cylinder wall with the pressure being sufficient to cause the impregnation medium to permeate the damp concrete mass to a depth of at least 10 mm.

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**5,051,224**

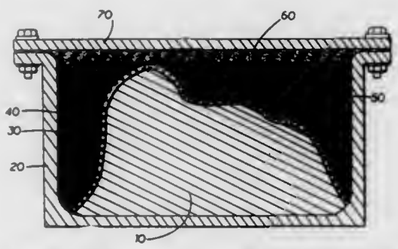
**METHOD FOR MOLDING COMPOSITE ARTICLES**

**Joan M. Donatelli; Godfrey C. Mhah, both of Midland, and Sam A. Brady, Kalamazoo, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Division of Ser. No. 387,513, Jul. 28, 1989, Pat. No. 4,973,642, which is a continuation-in-part of Ser. No. 147,349, Jan. 21, 1988, abandoned. This application Apr. 17, 1990, Ser. No. 510,000**

**Int. Cl.[5] B29C** *43/10*

**U.S. Cl. 264—257** **32 Claims**



1. A method of molding a composite member comprising:

placing a pre-preg over a master tool within an enclosed mold and introducing into said mold, over said pre-preg, a silicone crumb rubber comprising a polymer chain comprising diorganosiloxane units which will expand upon heating and thereby pressurize said pre-preg against said master tool, wherein said silicone crumb rubber comprises at least about 20 mole percent unreacted vinylorganosiloxane units in the silicone crumb rubber polymer chain to prevent depolymerization of the polymer backbone at a temperature of at least 535° C.; heating said tool, pre-preg and said depolymerization-resistant silicone crumb rubber to a temperature of at least 535° C. to form and cure said prepreg into the desired composite member; cooling said tool, said silicone crumb rubber and said composite member and removing said composite member from said mold.

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**5,051,225**

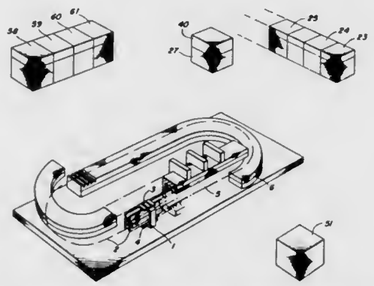
**METHOD OF DRAWING PLASTIC FILM IN A TENTER FRAME**

**William J. Hommes, Hockessin, and John J. Keegan, Jr., Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Jun. 22, 1988, Ser. No. 209,910**

**Int. Cl.[5] B29C** *55/20;* **B65G** *35/08;* **H02K** *41/02*

**U.S. Cl. 264—288.4** **7 Claims**



1. A method of drawing plastic film in a tenter frame, including the steps of:

propelling active carriages with tenter clips attached thereto, in opposed loops, in paired symmetry, at predetermined speeds, in a film processing section of the tenter frame, to draw the film;

forming stacks of carriages; and

propelling the stacks of carriages in carriage collection sections prior to entering the film processing section of the tenter frame

wherein the film is gripped by the tenter clips in the film processing section and

wherein synchronous motors are used to propel the active carriages in the film processing section to draw the film;

wherein at least one passive carriage is positioned between the active carriages in each loop and wherein such passive carriages are unpowered during the film drawing step; and

wherein the tenter clips release the film after the film drawing step and

wherein the active and passive carriages are propelled in and through stack forming sections after the film is released by the tenter clips and into the stacks of carriages using hysteresis motors.

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**5,051,226**

**METHOD OF CURING COMPOSITE PARTS**

**Val G. Brustad; Richard V. Phillips, both of Enumclaw, and William L. Rodman, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sep. 18, 1989, Ser. No. 408,888**

**Int. Cl.[5] B29C** *43/10, 43/12, 43/20*

**U.S. Cl. 264—511** **25 Claims**

1. A method of curing fiber reinforced resin matrix composite materials, comprising the steps of:

providing a form;

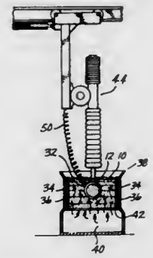
positioning uncured composite material on said form substantially into a desired shape; and



curing said composite material by:

providing a fluid bath heated to a predetermined temperature in a U-tube, said U-tube having first and second open ends;

providing a conveyor and using said conveyor to move said positioned composite material on said form through said fluid bath along a path from said first end to said second end, said conveyor moving at a predetermined rate to allow said positioned composite material on said



form to be immersed in said fluid bath for a predetermined time;

said predetermined time being sufficient to allow said composite material to become cured, and said composite material being heated at a rate sufficient to provide resin flow prior to said composite material becoming cured; and

providing compressive pressure on said composite material while in said fluid bath.

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**5,051,227**

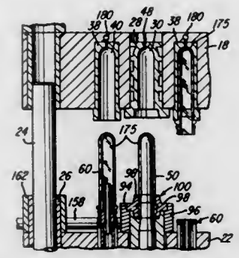
**PRODUCTION OF PREFORMS AND BLOW MOLDED ARTICLES**

**Charles J. Brun, Jr., Xenia, and Anthony F. Newport, Dayton, both of Ohio, assignors to Electra Form, Inc., Vandalia, Ohio**

**Division of Ser. No. 279,662, Dec. 5, 1988, Pat. No. 4,950,152. This application Aug. 20, 1990, Ser. No. 570,015**

**Int. Cl.[5] B29C** *49/06, 49/32*

**U.S. Cl. 264—537** **9 Claims**



1. A method of efficiently producing hollow articles having open end portions, comprising the steps of inserting a plurality of injection cores into corresponding injection cavities within a mold assembly and through corresponding transfer molds defining cavity extensions, injecting a molten plastics material into the injection cavities and cavity extensions and around the injection cores to form a corresponding plurality of hollow articles having open end portions, retracting the injection cores and the transfer molds from the injection cavities to remove the articles from the injection cavities, removing the injection cores from the articles while retaining the open end portions of the articles with the transfer molds, shifting the transfer molds and articles laterally without shifting the injection cores, inserting the articles with the transfer molds into corresponding blow cavities defined by walls within the mold assembly releasing the articles from the transfer molds and returning the transfer molds into alignment with the corresponding injection cavities while the articles are held in the blow cavities, inserting a corresponding plurality of blow cores into the articles within the blow cavities, internally pressurizing the articles within the blow cavities with the blow cores to expand the articles into firm contact with the walls defining the blow cavities while another plurality of articles are molded within the injection cavities, removing the expanded articles from the blow cavities with the blow cores and the other plurality of articles from the injection cavities with the injection cores retracting the blow cores from the expanded articles removed from the blow cavities to release the expanded articles for removal from the mold assembly, retracting the injection cores from the other plurality of articles, and repeating the above steps.

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**5,051,228**

**Patent Not Issued For This Number**

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**5,051,229**

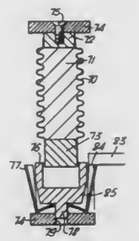
**THERMALLY RESPONSIVE TRIGGER DEVICES AND THEIR USE IN SHUT-DOWN DEVICES FOR NUCLEAR REACTORS**

**James Ford, Liverpool, and John Webb, Wigan, both of England, assignors to United Kingdom Atomic Energy Authority, London, United Kingdom**

**Division of Ser. No. 842,854, Mar. 24, 1986, Pat. No. 4,889,683, which is a continuation of Ser. No. 459,999, Jan. 21, 1983, abandoned. This application Dec. 26, 1989, Ser. No. 456,518**

**Int. Cl.[5] G21C** *7/08*

**U.S. Cl. 376—336** **5 Claims**



1. In a liquid metal cooled reactor having a reactor core and a neutron absorbing element for insertion into said reactor core, said neutron absorbing element being suspended above said reactor core, a thermally responsive trigger device for releasing said suspended neutron absorbing element, said thermally responsive trigger device comprising a closed bellows having a fixed end a free end and located in the reactor so as to be responsive to the temperature of the reactor coolant, liquid metal filling the bellows so as to cause the bellows to change its length in response to sensed temperature change of the reactor coolant, and a trigger for suspending a said neutron absorbing element and responsive to the movement of the free end of the bellows when a temperature threshold is exceeded at said bellows for releasing the neutron absorbing element said trigger comprising a spring cup with a curved base and divergent wall parts disposed so that the free end of the bellows operates to depress the base of the cup which in turn causes the wall parts to take up a less divergent orientation and, in doing so, releases a neutron absorbing element supported against gravity by engagement with a rim of the cup.

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5,051,230

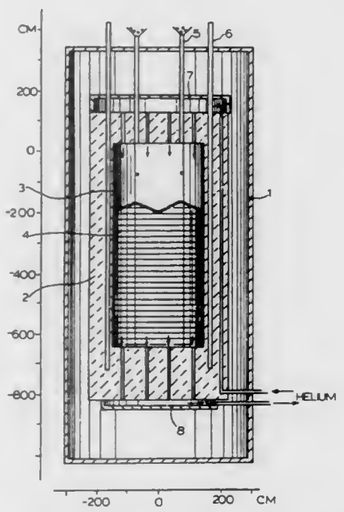
## NUCLEAR REACTOR OF A BALL-BED TYPE FOR BATCH-WISE USE OF CORE FUEL BALLS REPLACED BY A NEW BATCH AT RELATIVELY LONG INTERVALS

Eberhardt Teuchert, Franziskusstr. 2, D-5170 Jülich; Klaus-Arne Haas, Münsterweg 4, D-5160 Düren, and Helmut Gerwin, Otto-Hahn-Str. 3, D-5170 Jülich, all of Fed. Rep. of Germany

Continuation of Ser. No. 279,312, Dec. 1, 1988, abandoned, which is a continuation of Ser. No. 18,406, Feb. 25, 1987, abandoned, which is a division of Ser. No. 777,353, Sep. 18, 1985, Pat. No. 4,695,423. This application Nov. 6, 1989, Ser. No. 432,340

Int. Cl.[5] G21C *19/00*

U.S. Cl. 376—381 29 Claims




6. A ball-bed nuclear reactor of a design for operation with a stationary bed of fuel balls to which fuel balls are added during operation of the reactor, comprising a core chamber enclosed by a reflector structure within a pressure vessel, said reflector and pressure vessel having passage means for facilitating the flow of a cooling gas through said core chamber and having passages within which control rods can be adjustably positioned vertically with respect to said core chamber for control or shut-off of output power of said reactor, said reactor further comprising:

core chamber floor portions of said reflector structure having cavities of substantially spherical curvature for inducing fuel balls, all of the same diameter and loaded into said core chamber from above, to take up stationary positions in said reactor in an ordered array in which those of said fuel balls which are at the same vertical level in said reactor are out of direct contact with each other before they begin to expand in the course of a reaction in said chamber, the upper surface of said floor portion of said reflector, except for said cavities being substantially horizontal,

interior wall portions of said reflector structure rising from said floor portion at an oblique outward angle for at least most of their height and having rounded indentations for accommodating fuel balls of said ordered array and providing restraint of movement of said balls horizontally along said walls out of said ordered array, and

means for adding fuel balls to said chamber while said reactor is in operation.

5,051,231

## METHOD FOR FABRICATION OF SUPERPLASTIC COMPOSITE MATERIAL HAVING METALLIC ALUMINUM REINFORCED WITH SILICON NITRIDE

Tsunemichi Imai, and Mamoru Mabuchi, both of Nagoya, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, Tokyo, both of, Japan

Filed Sep. 14, 1990, Ser. No. 582,337

Claims priority, application Japan, Sep. 20, 1989, 1-244767; Sep. 20, 1989, 1-244768

Int. Cl.[5] B22F *3/24*

U.S. Cl. 419—13 7 Claims



1. A method for the fabrication of a superplastic composite material having metallic aluminum reinforced with silicon nitride, which comprises wetmixing silicon nitride of at least one member selected from the group consisting of powder of under 50 μm and whiskers with metallic aluminum powder of under 50 μm and with with a solvent, then depriving the resultant mixture of said solvent, pressure-sintering the mixture freed of said solvent under a vacuum, further heating and pressing the resultant sintered mixture, hot extrusion-molding the resultant sintered article thereby forming a superplastic composite material having the metallic aluminum reinforced with silicon nitride, and deforming said superplastic composite material in a temperature range in which said material exhibits superplasticity.

5,051,232

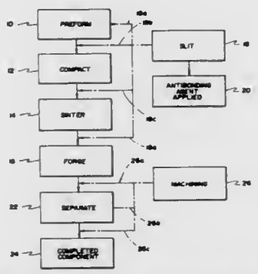
## POWDERED METAL MULTIPLE PIECE COMPONENT MANUFACTURING

Hayward P. Summers, Plymouth, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Jan. 16, 1990, Ser. No. 465,830

Int. Cl.[5] B22F *3/26*

U.S. Cl. 419—27 20 Claims




1. A process for manufacturing a multiple piece powdered metal component, comprising: forming a compacted and sintered powdered metal preform of the component with at least one predetermined slit that separates the pieces of the component along a predetermined nonfractured interface; introducing an antibonding agent into the slit; and forging the preform to the final shape of the component as the antibonding agent prevents complete bonding of the powdered metal pieces to each other to permit separation of the pieces from each other without fracturing the powdered metal pieces except at the predetermined slit.



5,051,233

## STAINLESS WROUGHT AND CAST MATERIALS AND WELDING ADDITIVES FOR STRUCTURAL UNITS EXPOSED TO HOT, CONCENTRATED SULFURIC ACID

Elmar-Manfred Horn, Leverkusen, and Stylianos Savakis, Wuerselen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1990, Ser. No. 463,689

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1989, 3901028

Int. Cl.[5] C22C *38/34*

U.S. Cl. 420—50 6 Claims



1. Stainless wrought and cast materials and welding additives for structural units resistant to hot concentrated sulfuric acid or oleum of 0–10% by weight, comprising an iron-chrome-nickel-silicon alloy containing 13 to 32% by weight Cr, 5 to 25% by weight nickel and 4 to 9% by weight Si and having a structure containing more than 10% delta-ferrite, wherein the material or additive at most contains the following percentages by weight of the indicated component: Mn 8%, Mo 3%, Cu 4%, Ag 2%, Co 20%, W 4%, Nb/Ta together 2% and N 0.2%.

5,051,234

## HIGH CORROSION-RESISTANT ELECTROMAGNETIC STAINLESS STEELS

Susumu Shinagawa, and Yoshinobu Saito, both of Sendai, Japan, assignors to Tohoku Special Steel Works Limited, Sendai, Japan

Filed May 17, 1990, Ser. No. 524,429

Claims priority, application Japan, May 20, 1989, 1-125579

Int. Cl.[5] C22C *38/28*

U.S. Cl. 420—61 4 Claims

1. A high corrosion-resistant electromagnetic stainless steel comprising C: not more than 0.015 wt%, Si: not more than 0.30 wt%, Mn: not more than 0.30 wt%, Cr: 10.0–20.0 wt%, Mo: 0.5–2.0 wt%, Ti: 0.05–0.30 wt%, Cu: 0.3–1.5 wt%, Al: from substantially more than 0.6 wt% to 1.5 wt% and the balance being essentially Fe.

5,051,235

## NOVEL PALLADIUM-BASED ALLOYS CONTAINING INDIUM BISMUTH, SILVER AND COPPER

Jean-Paul Guerlet, Paris, and Dan Weber, Presles, both of France, assignors to Comptoir Lyon-Alemand-Louyot, Societe Anonyme, France

Continuation of Ser. No. 210,393, Jun. 23, 1988, abandoned. This application Jan. 8, 1990, Ser. No. 463,832

Claims priority, application France, Jun. 26, 1987, 87 09082

Int. Cl.[5] C22C *5/04*

U.S. Cl. 420—463 22 Claims

1. A spinneret for contacting molten glass in a glass processing installation, a part of said spinneret that contacts said molten glass being fabricated from a palladium alloy consisting essentially of at least 45.0% by weight palladium and at least one first metal selected from the group consisting of indium, bismuth, copper and silver, wherein the amount of indium or bismuth is 2.0% to 20.0% by weight, the amount of copper is 5.0% to 20.0% by weight, the amount of silver is 5.0% to 30.0% by weight and the molten glass contains no oxides less stable than the least stable oxide of a selected first metal, wherein the part of said spinneret has a resistance to corrosion by the molten glass substantially the same as that of platinum-rhodium 10% alloys.

5,051,236

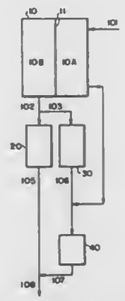
## PROCESS FOR REDUCING THE CONCENTRATION OF VIABLE CELLS IN A FLOWABLE FLUID

Alan S. Michaels, Chestnut Hills, Mass., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 19, 1988, Ser. No. 286,564

Int. Cl.[5] A23L *3/34*

U.S. Cl. 422—1 18 Claims




1. A process for reducing the concentration of viable microbial cells in a flowable fluid comprising the steps of:

a. separating the flowable fluid into a sterile serum and a flowable residue containing viable microbial cells and colloids,

b. separating serum from step (a) into a first portion of serum and a second portion of serum,

c. adjusting the pH of at least part of the second portion of serum by increasing the hydrogen ion concentration therein, thereby reducing the pH, and decreasing the hydrogen ion concentration of at least part of the first portion of serum, thereby increasing the pH,

d. combining flowable residue and the second portion of serum from step (c) having a reduced pH to form a combined mixture,

e. maintaining combined mixture from step (d) at a sufficient temperature and for a sufficient time to reduce the concentration of viable microbial cells therein, and

f. combining serum having an increased pH with combined mixture from step (e) to form a flowable fluid with a reduced concentration of viable microbial cells.

5,051,237

## LIQUID TRANSPORT SYSTEM

Gerd Grenner, Lincoln; Shai Inbar, Boston, and Ernest W. Long, Concord, all of Mass., assignors to P B Diagnostic Systems, Inc., Westwood, Mass.

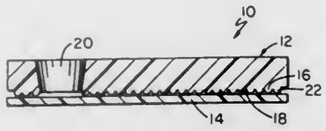
Filed Jun. 23, 1988, Ser. No. 210,732

Int. Cl.[5] G01N *31/22*

U.S. Cl. 422—56 12 Claims

1. A diagnostic assay device comprising a first member and a diagnostic assay element, said first member and said assay element having opposed surfaces which are spaced apart throughout an intended liquid transport zone a distance effective to cause capillary flow of a sample liquid introduced therebetween throughout the intended liquid transport zone

and means to permit introduction of a liquid between the opposed surfaces of said first member and said assay element, said opposed surface of said first member carrying a plurality of discrete noncontinuous projections arranged throughout




said surface in the intended liquid transport zone, each said projection being spaced apart from the others in a predetermined pattern and being in contact or virtual contact with said opposed surface of said assay element.

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**5,051,238**

## AUTOMATIC ANALYZING SYSTEM

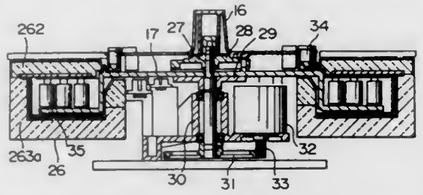
**Hiroshi Umetsu, Katsuta; Hiroshi Hashimoto, Ibaraki; Kyoko Imai, Katsuta; Hajime Betsui, Katsuta, and Tadashi Ohishi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 17, 1988, Ser. No. 272,345**

**Claims priority, application Japan, Nov. 20, 1987, 62-293400; Aug. 26, 1988, 63-210748**

**Int. Cl.[5] G01N** *35/06*

**U.S. Cl. 422—64** **3 Claims**




I. An automatic analyzing system comprising:

a rotatable sample table for supporting a plurality of sample vessels;

a rotatable reagent table disposed coaxially with said sample table and including a substantially annular portion adjacent an outer peripheral edge of said reagent table, said annular portion being designed to support a plurality of reagent vessels arranged thereon in a substantially annular row;

a shaft commonly provided for said sample and reagent tables;

a rotatable reaction table disposed in a side-by-side laterally spaced relationship to said sample and reagent tables and adapted to support a plurality of reaction vessels;

a single pipetting device including a probe movable between said sample table and said reaction table and between said reagent table and said reaction table to remove samples and reagents from selected sample vessels on said sample table and from selected reagent vessels on said reagent table and deliver the samples and reagents to selected reaction vessels on said reaction table;

an annular stationary reagent cold preserving cell capable of housing the annular row of said reagent vessels on said annular portion of said reagent table to keep the reagents in said annular row of reagent vessels at a temperature low enough to prevent degradation of the reagents;

said cold preserving cell including lower, upper, radially inner and outer heat-insulating walls cooperating together to define a substantially annular space accommodating said annular portion of said reagent table and the annular row of reagent vessels thereon such that said annular portion and said annular row of reagent vessels are movable together circumferentially of said reagent table, said radially inner and upper heat-insulating walls respectively having lower and upper surfaces spaced axially of said reagent table to allow said annular portion of said reagent table to extend radially outwardly into said annular space;

said lower and upper surfaces of said reagent table being spaced from upper and lower surfaces of said radially inner and upper heat-insulating walls to cooperate therewith to define first and second gaps; and

at least one annular labyrinth seal provided in one of said first and second gaps.

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**5,051,239**

## FLOW DEVICE FOR USE IN HEMORRHAGING TIME MEASURING APPARATUS AND METHOD OF MEASURING A HEMORRHAGING

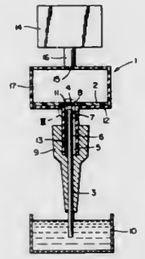
**Volker F. von der Goltz, Michael-Haydn-Weg 1, D-8221 Seeon, Fed. Rep. of Germany**

**Filed Nov. 18, 1988, Ser. No. 272,944**

**Claims priority, application Fed. Rep. of Germany, Nov. 19, 1987, 3739247; European Pat. Off., Oct. 19, 1988, 88117388.4**

**Int. Cl.[5] G01N** *33/86*

**U.S. Cl. 422—73** **21 Claims**



1. A flow device for use in a hemorrhaging time measuring apparatus comprising: a flow housing providing at least one aperture through which blood to be measured flows the housing defining a space air-tightly surrounding the aperture upstream thereof; a receiving means disposed downstream of said aperture to receive the blood which has flowed therethrough; and a suction tube adapted to carry a suction-induced flow of blood towards said aperture and arranged upstream of aperture and projecting into said space around the aperture upstream thereof, the downstream end of the suction tube being disposed in the vicinity of the aperture at such a spacing from the aperture that, with a given suction pressure, thrombus formation occurs in the aperture and including an intermediate space between at least a portion of the peripheral surface of the suction tube, which portion directly adjoins said downstream end of the suction tube, and a wall portion of the housing.

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**5,051,240**

## VOLATILE COMPONENT DETECTOR WITH SOCKET FOR SAMPLE RECEPTACLE

**Takayuki Nakai, and Tadahisa Kono, both of Tokyo, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan**

**Filed Jun. 1, 1990, Ser. No. 531,862**

**Claims priority, application Japan, Jun. 22, 1989, 1-73444; Sep. 27, 1989, 1-113164**

**Int. Cl.[5] G01N** *27/00, 27/07*

**U.S. Cl. 422—83** **2 Claims**

1. A volatile component detector having a sensor platform fixed inside a main body of a volatile component detector comprising:

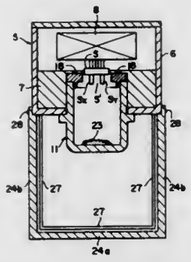
a sample receptacle which is removably securable to a bottom surface of a sensor platform,

said sensor platform having a receptacle support hole for receipt of said sample receptacle when said receptacle is secured to said bottom surface,

an odor sensor mounted on an inner bottom of the receptacle receiving hole and having its detector portion protruding into said hole,

said sample receptacle having a top plate having an opening therethrough which enables the insertion of said protruding detector portion into said sample receptacle through said opening when the sample receptacle is disposed within said receptacle receiving hole, and

a covering box mounted at a lower portion of the sensor platform in an airtight manner so as to enclose said sample receptacle and having an absorption material of activated charcoal fiber on an inner surface thereof.





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**5,051,241**

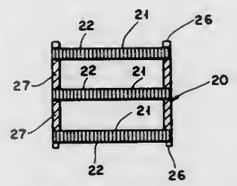
## MICROLITH CATALYTIC REACTION SYSTEM

**William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748**

**Filed Nov. 18, 1988, Ser. No. 273,343**

**Int. Cl.[5] F01N** *3/28*

**U.S. Cl. 422—180** **11 Claims**




1. A catalytic reaction system for the chemical conversion of carbon containing compounds comprising a multiplicity of catalytic elements and having at least one microlith catalytic element having flow channels with flow paths less than about one millimeter and having a ratio of channel length to channel diameter of less than about two to one.

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**5,051,242**

## HEATING COIL FOR USE IN GROWTH OF SINGLE CRYSTAL

**Masataka Watanabe, Niigato, and Katsumi Ichimura, Arai, both of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan**

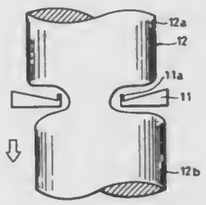
**Filed Apr. 20, 1990, Ser. No. 512,114**

**Claims priority, application Japan, Apr. 26, 1989, 1-107980**

**Int. Cl.[5] H05B** *6/44;* **C30B** *13/20*

**U.S. Cl. 422—250** **2 Claims**

1. An annular single-turn coil for use in growing a single crystal by using a floating zone method, said coil being formed to have a wedge-like configuration in vertical section so that a polycrystal side surface of the annular body of said coil is radially sloped upwards with an elevation angle with respect to a plane perpendicular to the axis of crystal growth around the circumferences of said coil, said coil comprising an annular thin projection which is formed at or near the inner circumference thereof and projects upwards from the polycrystal side




surface of said coil towards the bottom surface of the polycrystalline rod.

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**5,051,243**

## PROCESS FOR INCREASING THE SPECIFIC GRAVITY OF RED MUD SOLIDS

**George D. Fulford, and Anwer M. Khan, both of Kingston, Canada, assignors to Alcan International Limited, Montreal, Canada**

**Filed Dec. 7, 1989, Ser. No. 447,158**

**Int. Cl.[5] B01D** *11/00*

**U.S. Cl. 423—131** **14 Claims**

1. A method for increasing the specific gravity of red mud residue comprising:

mixing a red mud in a solution of sulfur dioxide in water having a pH of between about 1.5 and about 2.5 to form an insoluble red mud residue and a leach liquor;

separating the insoluble red mud residue from the leach liquor; and heating the insoluble red mud residue in a nonreducing atmosphere at a temperature of between about 250° C. and about 700° C. to form a red mud residue having a specific gravity in excess of about 4.0.

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**5,051,244**

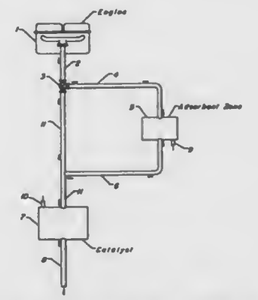
## USE OF A MOLECULAR SIEVE BED TO MINIMIZE EMISSIONS DURING COLD START OF INTERNAL COMBUSTION ENGINES

**Stephen R. Dunne, Bethel, Conn., and Raymond A. Reber, Montrose, N.Y., assignors to UOP, Des Plaines, Ill.**

**Filed Jul. 20, 1990, Ser. No. 556,149**

**Int. Cl.[5] B01D** *53/36*

**U.S. Cl. 423—212** **16 Claims**




1. A process for treating an engine exhaust gas stream containing hydrocarbons and other pollutants comprising directing the engine exhaust gas stream over an adsorbent zone comprising a molecular sieve bed which preferentially adsorbs the hydrocarbons over water, to provide a first exhaust stream, flowing the first exhaust stream over a primary catalyst to convert substantially all the pollutants contained in the first

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exhaust stream to innocuous products, thereby providing a treated exhaust gas stream and discharging the treated exhaust stream into the atmosphere, said process being carried out for a time until the molecular sieve bed temperature is about 150° C., at which time the engine exhaust gas stream is diverted completely away from the adsorbent zone and routed directly over the primary catalyst until such time as the primary catalyst reaches its operating temperature, at which time the engine exhaust gas stream is divided into a major and minor portion, flowing the major portion of the engine exhaust gas stream over the primary catalyst and then discharging the treated exhaust gas stream from the primary catalyst into the atmosphere, flowing the minor portion of the engine exhaust gas stream over the adsorbent zone for a time sufficient to desorb substantially all the hydrocarbons adsorbed on the molecular sieve bed and provide a second exhaust gas stream containing desorbed hydrocarbons, flowing the second exhaust stream over the primary catalyst to provide a treated exhaust stream and discharging the treated exhaust stream to the atmosphere and after such time as necessary to desorb substantially all the hydrocarbons from the molecular sieve bed, the engine exhaust gas stream is completely directed over the primary catalyst to provide a treated exhaust stream and then discharging the treated exhaust stream to the atmosphere; the molecular sieve characterized in that it is selected from the group consisting of molecular sieves which have: 1) a framework Si:Al ratio of at least 2.4; 2) are hydrothermally stable; and 3) have a hydrocarbon selectivity ($^{a}HC—H_2O$) greater than 1 where $^{a}HC—H_2O$ is defined by the following equation:

$$^{a}HC—H_2O = \frac{X_{HC}}{X_{H_2O}} \cdot \frac{[H_2O]}{[HC]}$$

where $^{X}HC$ is the hydrocarbon co-loading on the molecular sieves in equilibrium with the hydrocarbon water vapor mixture in the gas phase over the molecular sieve adsorbent; $^{X}H_2O$ is the water co-loading on the zeolite in equilibrium with the water and hydrocarbon vapor mixture in the gas phase over the molecular sieve adsorbent; $[H_2O]$ is the concentration of water and [HC] is the concentration of hydrocarbon.

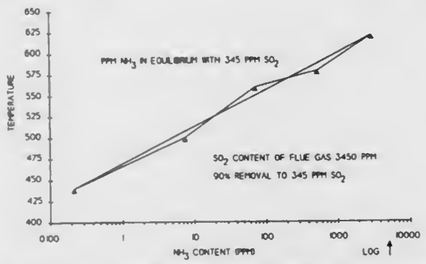
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**5,051,245**

## AMMONIA FOR THE DESULFURIZATION OF SULFUR CONTAINING GASES

**William G. Wilson, Pittsburgh, Pa., and D. Alan R. Kay, Burlington, Canada, assignors to Gas Desulfurization Corp., Pittsburgh, Pa.**

**Filed Jun. 21, 1990, Ser. No. 541,394**
**Int. Cl.[5] C01C *11/24***
**U.S. Cl. 423—242** **18 Claims**




1. A process for the rapid reduction of sulfur oxides from the products of combustion of sulfur containing hydrocarbons with ammonia which results in the formation of an ammonium sulfate compound which is a item of commerce comprising the steps of

(a) removing at least part of the fly ash in the flue gas stream prior to the addition of the reactant necessary for the removal of the sulfur containing oxides, the temperature of said flue gas being in the range of approximately 440° F. to approximately 620° F.

(b) adding gaseous ammonia to the flue gas stream, said ammonia reacting with said sulfur oxides, said ammonia added in at least sufficient quantity to reduce the sulfur oxides to meet the requirements for sulfur emissions form process heaters, said ammonia added in the flue gas stream at a position in the boiler duct work where the products of the reaction do not come in contact with heat exchangers in the duct work downstream of the site of the ammonia addition;

(c) providing heterogeneous nuclei int he flue gas stream to promote the rapid growth of the crystals of the products of reaction; and

(d) removing the products of the reaction of the ammonia and the sulfur oxides from the flue gases after the reaction has gone to completion.

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**5,051,246**

## CRYSTALLINE ALUMINOPHOSPHATE COMPOSITIONS

**David M. Clark, and Ronald J. Dogterom, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed May 15, 1990, Ser. No. 523,677**
**Claims priority, application United Kingdom, Nov. 24, 1989, 8926602**
**Int. Cl.[5] C01B *25/36*; B01J *27/18***
**U.S. Cl. 423—305** **12 Claims**

6. A process for preparing a crystalline aluminophosphate composition comprising in an as-synthesized anhydrous form a chemical composition:

m'R $(Al_qP_x)O_2$, wherein R represents 1,3-diaminopropane, and wherein

m'=0.01–0.33

q=0.30–0.60

x=0.30–0.60

and wherein q+x=1, and having an x-ray diffraction pattern containing at least the lines as given in Table A:

TABLE A

| d (A) | Intensity |
|---|---|
| 11.2 ± 0.2 | vs |
| 7.1 ± 0.2 | w |
| 6.6 ± 0.1 | m |
| 6.1 ± 0.1 | w |
| 4.7 ± 0.1 | w–m |
| 4.02 ± 0.05 | m |
| 3.78 ± 0.05 | m |
| 3.70 ± 0.05 | w–m |
| 3.50 ± 0.03 | m–s |
| 2.94 ± 0.03 | m |
| 2.69 ± 0.03 | w–m |

from a forming solution or gel comprising a source of aluminum, a source of phosphorus and 1,3-diaminopropane, which solution or gel is kept at a temperature between 100° C. and 160° C. for a period of time sufficient to produce said crystalline aluminophosphate composition followed by separating off the crystalline product obtained and drying, wherein said solution of gel has the various components initially present in the following molar ratios:

$R:Al_2O_3$=0.3–3

$P:Al_2O_3$=0.3–1.3

$H_2O:Al_2O_3$=30–500.



**5,051,247**

## SILANE PRODUCTS FROM REACTION OF SILICON MONOXIDE WITH ORGANIC HALIDES

**Gary N. Bokerman; John P. Cannady, both of Madison, Ind., and Charles S. Kuivila, LaGrange, Ky., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Sep. 4, 1990, Ser. No. 576,908**
**Int. Cl.[5] C01B *33/107*; C07F *7/16***
**U.S. Cl. 423—342** **27 Claims**

1. A process for preparing silanes, the process comprising:

(A) contacting silicon monoxide, an organic halide of formula

RX,

where X is a halogen and R is selected from a group consisting of alkyl and alkenyl radicals of one to six carbon atoms, and a catalyst effective in facilitating reaction of the solid silicon monoxide with the organic halide; at a reaction temperature of 200° C. to 1200° C.; and

(B) forming silanes of formula

$H_aR_bSiX_{4-a-b}$

where a is an integer from 0 to 4, b is an integer from 0 to 4, a+b is an integer from 0 to 4, and R and X are as previously described.

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**5,051,248**

## SILANE PRODUCTS FROM REACTION OF SILICON MONOXIDE WITH HYDROGEN HALIDES

**Gary N. Bokerman; John P. Cannady, both of Madison, Ind., and Charles S. Kuivila, LaGrange, Ky., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Aug. 15, 1990, Ser. No. 567,576**
**Int. Cl.[5] C01B *33/107***
**U.S. Cl. 423—347** **21 Claims**

1. A process for preparing silances of the formula

$H_nSiX_{4-n}$,

where n=1 to 4 and X is a halogen, the process comprising contacting solid silicon monoxide with a hydrogen halide of formula

HX,

where X is a halogen; at a reaction temperature of 500° C. to 1200° C.

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**5,051,249**

## METHOD OF NUTRITIONAL THERAPY

**Jack Metcoff, 103 Lake Aluma Dr., Oklahoma City, Okla. 73121**

**Filed Jan. 11, 1990, Ser. No. 463,589**
**The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.**
**Int. Cl.[5] A61K *49/00, 31/40, 31/195***
**U.S. Cl. 424—9** **7 Claims**

1. A method for treating a subject for a nutritional disorder, comprising:

measuring in the subject the rate of a selected intracellular metabolic process;

for the selected intracellular metabolic process, identifying a set of primary nutrients based on a multivariate statistical analysis of a population of normal study subjects analogous to the subject to be treated;

measuring each of the subject's primary nutrients and determining which is present at an abnormal level based on normal levels identified for the study population;

for each of the subject's primary nutrients which is present at an abnormal level, identifying a set of secondary nutrients based on the normal set of secondary nutrients in the study population determined by applying multivariate statistical analysis for each of the primary nutrients in the study population and producing for each secondary nutrient a partial regression coefficient having a positive or negative sign; and

administering to the subject an effective amount of a nutrient composition comprising each of the identified secondary nutrients, wherein the amount of each secondary nutrient is determined according to the following formula:

$$[F]=A[B]+[B]$$

where "[F]" is the final concentration in nanomoles per milliliter of the secondary nutrient in the nutrient composition; where "A" equals the partial regression coefficient of the secondary nutrient divided by the sum of the coefficients of all the secondary nutrients, disregarding their signs, such sum being expressed as a positive number; and where "[B]" is the normal extracellular concentration of the secondary nutrient in the study population expressed in nanomoles per milliliter.

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**5,051,250**

## FIBER CONDITIONING COMPOSITIONS CONTAINING SOLUBILIZED POLY-LOWER ALKYLENE

**Amrit M. Patel, Dayton, and Clarence R. Robbins, Martinsville, both of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.**

**Continuation-in-part of Ser. No. 369,361, Jun. 21, 1989. This application Nov. 7, 1989, Ser. No. 432,644**
**Int. Cl.[5] A61K *7/075***
**U.S. Cl. 424—70** **14 Claims**

1. A hair conditioning composition which comprises a hair conditioning proportion of a quaternary ammonium salt hair conditioning agent, a surface active proportion of an anionic synthetic organic surface active agent, a normally solid water insoluble polyethylene in a proportion sufficient to increase the fiber conditioning effect of the quaternary ammonium salt when the polyethylene is solubilized, so as to be dispersible in water, and a solubilizing proportion of a normally liquid hydrocarbon or a mixture of hydrocarbons which is a solubilizer for the polyethylene and which helps to make it water dispersible in the presence of the quaternary ammonium salt, anionic synthetic organic detergent and water.

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**5,051,251**

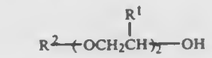
## HAIR COSMETIC COMPOSITION

**Kouzi Morita, Funabashi; Toshie Takahashi, Ichikawa, and Sachio Naito, Ichikai, all of Japan, assignors to Kao Corporation, Tokyo, Japan**

**Filed Jul. 6, 1990, Ser. No. 549,027**
**Claims priority, application Japan, Jul. 7, 1989, 1-176777**
**Int. Cl.[5] D61K *7/08***
**U.S. Cl. 424—70** **3 Claims**

1. A hair cosmetic composition consisting essentially of the following components (A) and (B):

(A) 1.0 to 50.0% by weight, based on the total weight of the composition, of a dialkylene glycol monoalkyl ether represented by the general formula (I):




(I)

wherein $R^1$ represents a hydrogen atom or a methyl group and $R^2$ represents an alkyl group having 1 to 5 carbon atoms; and

(B) 0.01 to 20.0% by weight, based on the total weight of the composition, of one or more cationic surfactants.

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5,051,252

## OXIDIZING MIXTURES FOR HAIR CARE USE

Thomas M. Schultz, Highland Mills, N.Y., and Eva Day, Stamford, Conn., assignors to Shiseido Co. Ltd., Tokyo, Japan

Filed Aug. 3, 1990, Ser. No. 562,611
Int. Cl.[5] A61K *7/09, 7/11;* A45D *7/04*
U.S. Cl. 424—71 23 Claims

1. A composition for application to hair as part of a permanent waving process, said composition comprising:

A. between about 0.001% and 10% by weight of a chlorite salt;

B. between about 0.01% and 20% by weight of an organic or inorganic buffer salt having a pH ranging between about 3.0 and 6.5;

C. between about 0.001% and 10% by weight of a divalent metal ion; and

D. water forming the balance;

whereby the application of said composition to the hair substantially improves the resulting curl retention and condition of the final permanently waved hair.

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5,051,253

## USE OF POLYACRYLATES TO REDUCE PROTEOLYTIC ACTIVITY IN THE HUMAN INTESTINAL TRACT

John G. Lloyd-Jones, Cottingham, and Peter W. Dettmar, Welwick, both of United Kingdom, assignors to Reckitt & Colman Products Limited, United Kingdom

Filed Jul. 7, 1989, Ser. No. 377,115
Claims priority, application United Kingdom, Jul. 16, 1988, 8817015
Int. Cl.[5] A61K *31/78*
U.S. Cl. 424—81 6 Claims

1. A method for the treatment of conditions caused by mucolytic protease activity in the human intestinal tract, by reducing proteolytic activity therein which comprises administering to a patient an effective oral or rectal amount of a polyacrylate as the sole active ingredient.

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5,051,254

## IMMUNOPROPHYLACTIC POLYPEPTIDES FOR SCHISTOSOMIASIS

Mette Strand, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Sep. 30, 1988, Ser. No. 252,075
Int. Cl.[5] A61K *39/395;* C07K *13/00*
U.S. Cl. 424—85.8 7 Claims

2. A preparation comprising a fusion protein which when injected into mice to stimulate an immune response elicits production of antibodies which recognize protein epitopes expressed on the surface of schistosomula of *S. mansoni*, said protein epitopes being common to a 200 kDa and a 38 kDa glycoprotein of *S. mansoni*, said protein epitopes not cross-reacting with antisera against bovine or *C. elegans* myosin.

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5,051,255

## NEMATOCIDAL PREPARATIONS

Premachandran Devidas, Grayslake, and Aldo J. Crovetti, Lake Forest, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 14, 1988, Ser. No. 258,221
Int. Cl.[5] A01N *65/00;* C12N *1/00*
U.S. Cl. 424—195.1 4 Claims

1. A nematocidal composition to prevent plant damage by nematodes which comprises one or more metabolites of the fungus, *Myrothecium verrucaria* and a suitable carrier.

5,051,256

## BIOCIDAL COMPLEX AND DRESSING FORMED THEREFROM

Carl E. Barnes, 482 Trinity Pass, New Canaan, Conn. 06840

Continuation of Ser. No. 155,942, Feb. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 933,856, Aug. 15, 1978, abandoned. This application Nov. 30, 1989, Ser. No. 443,878
Int. Cl.[5] A61K *9/00;* A61F *13/00;* A61L *15/00*
U.S. Cl. 424—402 16 Claims

1. A composition having biocidal activity comprising a complex of polypyrrolidone and iodine.

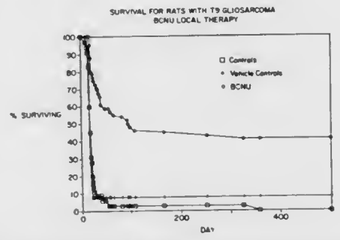
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5,051,257

## ANTINEOPLASTIC SOLUTION AND METHOD FOR TREATING NEOPLASMS

Dennis D. Pietronigro, R.F.D. 2, Box 319, Lakeside Dr., Yorktown Heights, N.Y. 10598

Filed May 9, 1989, Ser. No. 349,410
Int. Cl.[5] A61F *2/00, 9/08, 2/02*
U.S. Cl. 424—423 10 Claims




1. A method for treating neoplastic masses which comprises at least once injecting directly into a neoplastic mass a therapeutically effective volume of an antineoplastic solution consisting essentially of an organic, water miscible solvent vehicle selected from the group consisting of C1 through C4 alcohols having a partition coefficient of at least 0.1 and a chemotherapeutic antineoplastic agent solute, said solute being effectively stable and bioavailable in said solvent vehicle and being present in said solution at a concentration such that the resulting dose thereof in said neoplastic mass is at least two logs greater than the TD50.

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5,051,258

## DIETARY SUPPLEMENT FOR CHILDREN

Billie J. Sahley, San Antonio, Tex., assignor to Natrol, Inc., Chatsworth, Calif.

Continuation-in-part of Ser. No. 421,016, Oct. 13, 1989, Pat. No. 4,980,168. This application Mar. 23, 1990, Ser. No. 497,900
Int. Cl.[5] A61K *9/48*
U.S. Cl. 424—439 3 Claims

1. A dietary composition consisting essentially of the following parts, by weight:

| | |
|---|---|
| GABA | from about 40 to about 45, |
| Passion Flower Extract | from about 25 to about 30, |
| L-Taurine | from about 25 to about 30, |
| Vitamin B6 | from about 2.5 to about 3. |

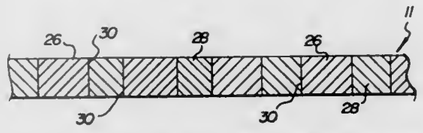


5,051,259

## SKIN BARRIER PRODUCT WITH DISCONTINUOUS ADHESIVE LAYER

Hans Olsen, Bronshoj; Finn Poulsen, Vaerlose, and Peter Samuelsen, Rungsted Kyst, all of Denmark, assignors to Coloplast A/S, Espergerde, Denmark

PCT No. PCT/DK88/00202, § 371 Date Oct. 10, 1989, § 102(e) Date Oct. 10, 1989, PCT Pub. No. WO89/05619, PCT Pub. Date Jun. 29, 1989
PCT Filed Dec. 5, 1988, Ser. No. 382,660
Claims priority, application Denmark, Dec. 15, 1987, 6571/87
Int. Cl.[5] A61F *13/02, 5/443;* B32B *3/10*
U.S. Cl. 424—443 28 Claims




1. In an adhesive, flat skin barrier product having a flat surface adapted to come into contact with the skin and an opposite flat surface, for use as a semimanufacture in the production of dressings, skin-and wound-care devices, electrodes for application to the skin, fastening means for dressings, ostomy equipment, wound drains and catheters, the improvement wherein said product consists of a plurality of alternating zones of at least two different kinds of material, at least one kind of material consisting of a substantially non-allergenic self-adhesive material, the zones of material extending substantially parallelly through the entire thickness of the product in a direction intersecting its flat surfaces wherein within a given zone the composition of said material is substantially uniform.

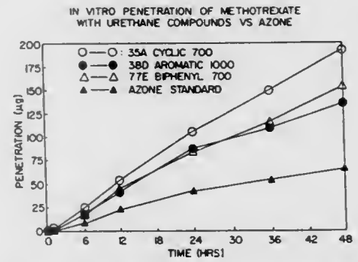
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5,051,260

## METHOD AND COMPOSITION FOR ENHANCING THE CUTANEOUS PENETRATION OF PHARMACOLOGICALLY ACTIVE AGENTS

Samuel Chess, Newport Beach; Jerry L. McCullough, and Gerald D. Weinstein, both of Irvine, all of Calif., assignors to The Regents of the University of California, Alameda, Calif.

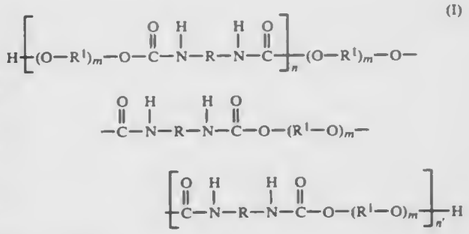
Division of Ser. No. 408,757, Sep. 18, 1989, Pat. No. 4,971,800, which is a continuation-in-part of Ser. No. 216,804, Jul. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 74,262, Jul. 16, 1987, abandoned. This application Sep. 20, 1990, Ser. No. 556,982
Int. Cl.[5] A61K *9/32, 9/70, 7/48*
U.S. Cl. 424—449 8 Claims




1. A method of moisturizing skin, comprising applying to skin surface a composition containing

(a) a locally administrable topical composition containing a topical carrier; and

(b) a hydroxy-terminated urethane compound having the formula:



(I)

wherein:

R is an alkylene or alkenylene radical containing from one to about 20 carbon atoms; or a cycloalkylene or cycloalkenylene radical containing from about 5 to about carbon atoms, or a mononuclear or fused ring arylene radical containing from about 6 to about 10 carbon atoms, unsubstituted or substituted with one or more lower alkyl, lower alkoxy, lower alkoxy-substituted lower alkyl, nitro or amino groups or halogen atoms;

$R^1$ is the same or different alkylene or alkenylene radical;

m is an integer selected so as to provide an ($O—R^1$) moiety having a molecular weight of from about 40 to about 6,000; and

n and n' are the same or a different integer of from 0 to 30, inclusive, correlated with m so as to provide a hydroxy-terminated urethane compound having a molecular weight of from about 220 to about 200,000.

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5,051,261

## METHOD FOR PREPARING A SOLID SUSTAINED RELEASE FORM OF A FUNCTIONALLY ACTIVE COMPOSITION

James W. McGinity, Austin, Tex., and Kuei-Tu Chang, Mountain Lakes, N.J., assignors to FMC Corporation, Philadelphia, Pa.

PCT No. PCT/US88/04208, § 371 Date Apr. 26, 1990, § 102(e) Date Apr. 26, 1990
PCT Filed Nov. 23, 1988
Continuation-in-part of Ser. No. 124,705, Nov. 24, 1987, abandoned. This application Apr. 26, 1990, Ser. No. 499,400
Int. Cl.[5] A61K *3/10, 3/06, 3/07*
U.S. Cl. 424—464 6 Claims

1. A method for preparing a sustained release dosage form comprising blending into a feed formulation a dosage amount of a functionally active ingredient, an excipient and a polymer or copolymer having a glass transition temperature of about 30° C. to about 150° C., said polymer being present in sufficient quantity to provide from 5% to 50% polymer or copolymer, 1% to 90% excipient, and from 5% to 90% of the functionally active ingredient in the dosage form, processing at least part of the feed formulation into a shaped form and maintaining the shaped form at or above the glass transition temperature of the polymer for from 1 to 12 hours to provide a dosage form having controlled, sustained release of the functionally active ingredient when the dosage form is administered.

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5,051,262

## PROCESSES FOR THE PREPARATION OF DELAYED ACTION AND PROGRAMMED RELEASE PHARMACEUTICAL FORMS AND MEDICAMENTS OBTAINED THEREBY

Donald Panoz, Tuckerstown, Bermuda, and Gilbert Corneille, Paris, France, assignors to Elan Corp., P.L.C., Monksland, Ireland

Continuation of Ser. No. 559,431, Dec. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 287,722, Jul. 24, 1981, abandoned. This application Nov. 18, 1986, Ser. No. 933,287
Claims priority, application France, Dec. 7, 1979, 79 30085
Int. Cl.[5] A61K *9/22, 9/26, 9/16*
U.S. Cl. 424—468 16 Claims

1. A sustained release composition comprising:

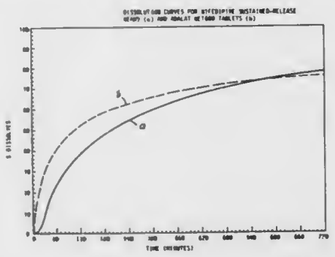
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(a) an excipient or coating selected from a group consisting of polyvinylpyrrolidone, shellac, waxes and syrups; and
(b) at least one adjuster, said pH adjuster being selected from the group consisting of an organic acid, organic acid salt, an organic base, an inorganic base and a basic salt;
wherein said excipient or coating composition surrounds a core comprising a medicament whose solubility varies with pH; and
wherein the pH of said excipient or coating composition is adjusted to a desired pH by said pH adjuster to ensure that the rate of dissolution of said medicament is substantially independent of the pH of the environment in which dissolution occurs.

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**5,051,263**
**CONTROLLED-RELEASE FORMULATIONS**
**Brian W. Barry, 23 Dales Way, Tranmere Park, Guiseley, Leeds LS20 8JN; Boyan Arthur Molley, 10 Yew Tree Avenue, Bradford, West Yorkshire BD8 OAD, and Peter York, 24 Parish Ghyll Rd., Ilkley, Yorkshire, all of Great Britain**
**Filed Oct. 12, 1988, Ser. No. 256,791**
**Claims priority, application United Kingdom, Oct. 12, 1987, 8723896**
**Int. Cl.[5] A61K *9/16***
**U.S. Cl. 424—490** **11 Claims**



1. A controlled-release formulation of a pharmacologically active substance of poor aqueous solubility comprising sufficient granules to provide a predetermined dose or number of doses of the pharmacologically active substance, each of said granules consisting essentially of 100 parts of said pharmacologically active substance and at least 20 parts of carbomer.

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**5,051,264**
**POTENTIATION OF THE THROMBOLYTIC EFFECT OF PROUROKINASE TYPE PLASMINOGEN ACTIVATORS BY STREPTOKINASE**
**Clara M. Ambrus, Buffalo, N.Y., assignor to Collaborative Research, Inc., Bedford, Mass.**
**Filed Nov. 2, 1988, Ser. No. 266,120**
**Int. Cl.[5] A61K *37/54, 37/547;* C12N *9/50, 9/70***
**U.S. Cl. 424—94.2** **10 Claims**

1. A thrombolytically active pharmaceutical composition comprising a combination of streptokinase and a second plasminogen activator which is a prourokinase plasminogen activator.

**5,051,265**
**PREPARATION OF CRUDE CHOCOLATE POWDER AND PRODUCTS THEREFROM**
**Niklaus Meister, Grosshoechstetten, and Hans-Josef Piek, Rossens, both of Switzerland, assignors to Nestec S.A., Vevey, Switzerland**
**Filed Jan. 22, 1990, Ser. No. 467,977**
**Claims priority, application Switzerland, Feb. 14, 1989, 512/89**
**Int. Cl.[5] A23C *9/18;* A23G *1/00***
**U.S. Cl. 426—96** **19 Claims**

1. A process for the production of a crude chocolate powder comprising:
mixing milk and a cocoa mass and sugar to obtain a mixture;
centrifuging the mixture for separating the mixture to collect a fatty phase, an aqueous phase and a residue;
dispersing the collected residue in the collected aqueous phase to obtain a dispersion;
pasteurizing the dispersion to obtain a pasteurized dispersion;
concentrating the pasteurized dispersion to obtain a concentrate;
cooling the concentrate;
inoculating the cooled concentrate with lactose crystals and allowing lactose in the inoculate concentrate to crystallize into a suspension containing crystallized lactose;
pasteurizing the collected fatty phase subsequent to collecting the fatty phase;
mixing the pasteurized fatty phase and the suspension containing the crystallized lactose to obtain a mixed suspension and fatty phase mixture having fats in a free state and lactose in a crystallized state; and
spraying the mixed suspension and fatty phase mixture in a spray drying tower for drying it to obtain a product having fats in a free state and lactose in a crystallized state.

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**5,051,266**
**MEAT-ADHERING MULTILAYER FILM**
**Roger L. Juhl, Countryside; Jeffrey M. Schuetz, Woodridge, and Stanley Lustig, Park Forest, all of Ill., assignors to Viskase Corporation, Chicago, Ill.**
**Filed Dec. 1, 1989, Ser. No. 444,588**
**Int. Cl.[5] B65D *85/00;* B32B *27/00***
**U.S. Cl. 426—129** **38 Claims**

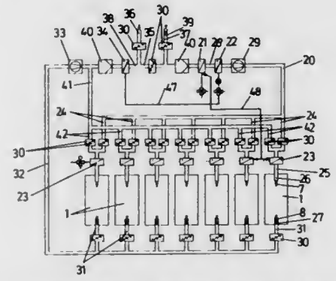
1. In a flexible tube formed of multilayer film comprising an inner layer, a barrier layer as the core with its inner side adhered to the outer side of said inner layer and an outer layer with its inner side adhered to the outer side of said barrier layer, the improvement comprising an inner layer formed of a blend comprising between about 30% and about 75% by weight ethylene vinyl acetate having at least about 3% by weight vinyl acetate, and between about 25% and about 70% by weight of an unneutralized copolymer of an alpha-olefin having the formula $RHC{=}CH_2$ wherein R is H or $C_1$ to $C_8$ alkyl and an alpha, beta-ethylenically unsaturated carboxylic acid, at least said inner layer being irradiated at dosage of at least about 2 MR.

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**5,051,267**
**INSTALLATION FOR AND A METHOD OF DRYING OR RIPENING FOODSTUFFS**
**Karl Handl, A-6551, Pians Nr. 33, and Ortwin Höllrigl, Innsbruck, both of Austria, assignors to Karl Handl, Pians, Austria**
**PCT No. PCT/AT88/00007, § 371 Date Jul. 27, 1989, § 102(e) Date Jul. 27, 1989, PCT Pub. No. WO88/05632, PCT Pub. Date Aug. 11, 1988**
**PCT Filed Aug. 2, 1988, Ser. No. 391,512**
**Claims priority, application Austria, Feb. 9, 1987, 256/87**
**Int. Cl.[5] A23B *4/00***
**U.S. Cl. 426—231** **13 Claims**

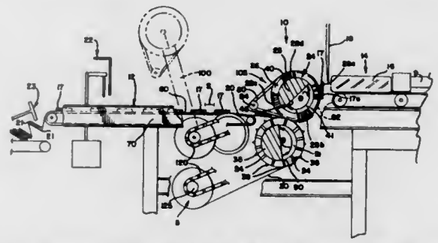
10. A method for the drying or ripening of foodstuffs in a process room, comprising, supplying outside air at a first temperature and first humidity to the process room, removing waste air from the process room, the waste air containing an amount of moisture given off by the foodstuffs in the processed room, cooling the waste air to remove a quantity of heat from the waste air, the cooled waste air having a second temperature and second humidity, comparing the first temperature and first humidity with the second temperature and second humidity to obtain a difference value, changing the temperature of the outside air being supplied to the process room, and mixing part of the waste air, before it is cooled, with the outside air before the outside air is supplied to the process room, the amount of waste air mixed with the outside air being selected as a function of the difference value and to minimize an amount of energy needed to change the temperature of the outside air being supplied to the process room for achieving the removal of a desired amount of moisture from the foodstuffs.





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**5,051,268**
**METHOD AND APPARATUS FOR TRANSFERRING FOOD MATERIAL STRIPS ONTO A SUPPORT WEB**
**Timothy G. Mally, Oregon, Wis., assignor to Oscar Mayer Foods Corporation, Madison, Wis.**
**Filed Jul. 5, 1990, Ser. No. 548,171**
**Int. Cl.[5] A23L *1/00;* B65B *35/00***
**U.S. Cl. 426—420** **50 Claims**



42. A method of transferring material strips from a food material supply to a substrate web, comprising the steps of:
feeding a supply of a food material to a material cutting location;
providing a first roller adjacent to the material cutting location, the first roller having a food material strip engaging portion;
providing a second roller adjacent to said first roller;
feeding a substrate web over the second roller and drawing a vacuum at one area of said second roller to adhere the substrate web to a portion of said second roller;
engaging a food material strip with the first roller after the food material strip is cut from the food material supply by drawing a vacuum at said first roller material strip engaging portion;
rotating said first roller to transfer said food material strip from said food material supply to a material transfer location, and rotating the second roller to advance said substrate web to the material transfer location; and
urging said food material strip off of said first roller and onto said substrate web of said second roller.

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**5,051,269**
**AGGLOMERATION METHOD**
**Philippe Noreille, Beauvais, France, and Athol R. Pot, Worthington, Ohio, assignors to Nestec S.A., Vevey, Switzerland**
**Continuation of Ser. No. 741,456, Jun. 5, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 948,098**
**Int. Cl.[5] A23F *3/30, 5/38, 5/44;* A23G *1/00***
**U.S. Cl. 426—453** **10 Claims**

1. A process for agglomerating particulate water-soluble materials comprising:
heating and moistening particles selected from the group consisting of soluble coffee, soluble tea, soluble cocoa mix and soluble chicory for forming a flowable coating layer on the surfaces of the particles;
conveying the coated particles to a nip between a pair of opposed endless surfaces moving in a downstream direction, the nip having a distance between the endless surfaces which is greater than a mean diameter of the coated particles, for converging, merging and consolidating the particles without applying substantial pressure from the endless surfaces to the particles as the particles pass through the nip for joining and bonding the consolidated particles by their coated surfaces with one another; and
collecting and drying the consolidated, bonded particles.

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**5,051,270**
**HIGH PROTEIN NUTRITIVE FOOD AND PROCESS FOR PREPARING SAME**
**Narichika Ueda, Tokushima, and Akihisa Takaichi, Naruto, both of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan**
**PCT No. PCT/JP89/00102, § 371 Date Oct. 3, 1989, § 102(e) Date Oct. 3, 1989, PCT Pub. No. WO89/06908, PCT Pub. Date Aug. 10, 1989**
**PCT Filed Feb. 1, 1989, Ser. No. 432,779**
**Claims priority, application Japan, Feb. 3, 1988, 63-24704**
**Int. Cl.[5] A23J *1/02, 1/14***
**U.S. Cl. 426—574** **27 Claims**

1. A high protein nutritive food prepared by a process comprising:
(1) Forming and shaping a dough comprising:
(a) a protein ingredient comprising:
(i) vegetable protein, or
(ii) a mixture of vegetable protein and animal protein,
(b) a cereal flour, a potato powder, or a mixture thereof, and
(c) water, and
(2) heating the dough in a vacuum until the dough is dried to a water content of not higher than about 3 wt. % and a protein content of 40 to 85 wt. % based on solids.

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**5,051,271**
**STARCH-DERIVED, FOOD-GRADE, INSOLUBLE BULKING AGENT**
**Radha Iyengar, Belmont; Aleksey Zaks, Brookline, and Akiva Gross, Newton, all of Mass., assignors to Opta Food Ingredients, Inc., Cambridge, Mass.**
**Filed Nov. 22, 1989, Ser. No. 440,585**
**Int. Cl.[5] A23L *1/0522***
**U.S. Cl. 426—658** **10 Claims**

1. A food product containing a food-grade water insoluble material comprising water-soluble crystalline starch microparticles which are substantially free of amorphous regions.

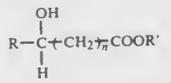
5,051,272

## METHOD FOR IMPROVING THE STORAGE STABILITY OF A POLYMERIC ARTICLE SUSCEPTIBLE TO HYDROLYTIC DEGRADATION AND RESULTING ARTICLE

Matthew E. Hermes, Easton, and Ross R. Muth, Brookfield, both of Conn., assignors to United States Surgical Corporation, Norwalk, Coon.

Filed Jul. 19, 1988, Ser. No. 221,308
Int. Cl.[5] A01N 1/02
U.S. Cl. 427—2 48 Claims

1. A method for improving the storage stability of a polymeric article susceptible to hydrolysis which comprises applying a storage stabilizing amount of a mixture comprising effective amounts of at least one water soluble hygroscopic polyhydroxy compound or ester thereof and at least one compound having the general formula



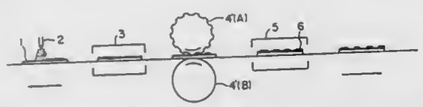
wherein R is hydrogen or methyl, R' is a metal selected from the group consisting of alkali metal and alkaline earth metal and n is 0 or 1 and hydrates thereof, to the polymeric article, as storage stabilizing agent therefor.

5,051,273

## METHOD OF PREPARATION OF A PATTERNED DECORATIVE MATERIAL

Kenzou Maeda, Yokohama, and Haruki Ito, Chigasaki, both of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,403
Int. Cl.[5] B05D 5/00, 1/06, 1/10, 1/24
U.S. Cl. 427—14.1 11 Claims




1. A method of preparation of a patterned decorative material which comprises application of a thermosetting powder coating material comprising a hardener to a base plate, melting of the thermosetting powder coating material by heating, embossing of the coating layer alone while the melted thermosetting powder coating material has a gel proportion formed by a hardening reaction from 15 to 75 weight percent and further heating to form a hardened coating on the base plate.

5,051,274

## ION-BEAM BASED DEPOSITION OF COATINGS FOR ELECTROCHROMIC DEVICES

Ronald B. Goldner, Lexington; Floyd O. Arntz, Newtonville; Bertrand Morel, Arlington; Terry E. Haas, Sudbury, and Kwok-Keung Wong, Watertown, all of Mass., assignors to Tufts University, Medford, Mass.

Filed Sep. 11, 1989, Ser. No. 405,271
Int. Cl.[5] B05D 3/06, 5/12
U.S. Cl. 427—38 7 Claims

1. A method of depositing coatings for electrochromic devices comprising the steps of:

providing a light transmissive substrate; depositing on thermal vapor deposition a first light transmissive electrically-conductive material on said substrate;

depositing of thermal vapor deposition an electrochromic material upon said first electrically-conductive material while subjecting said substrate to an ion beam;

depositing by thermal vapor deposition an electron resistive-ion conductive material on said electrochromic material;

depositing by thermal vapor deposition an ion resistive-electron conductive material on said electron resistive-ion conductive material; and

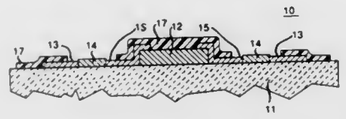
depositing by thermal vapor deposition a second light transmissive electrically-conductive material on said ion resistive-electron conductive material to form an electrochromic device.

5,051,275

## SILICONE RESIN ELECTRONIC DEVICE ENCAPSULANT

Ching P. Wong, Lawrenceville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 9, 1989, Ser. No. 434,052
Int. Cl.[5] B32B 31/26
U.S. Cl. 427—58 7 Claims




1. A method for encapsulating at least part of an electronic device comprising the steps of making a mixture comprising 33 to 39 weight percent of a silicone resin, 51 to 57 weight percent of silicon dioxide and 8 to 12 weight percent of a high boiling point organic solvent;

the silicone resin being selected from the group consisting of (i) polydimethylsiloxane containing a platinum catalyst and having functional components selected from the group consisting of vinyl and hydride functional components, (ii) polymethylphenylsiloxane containing a platinum catalyst and functional components selected from the group consisting of vinyl and hydride functional components and (iii) a mixture of polydimethylsiloxane and polymethylphenylsiloxane, each of which contains a platinum catalyst and functional components selected from the group consisting of vinyl and hydride functional components;

depositing the mixture over an electronic device;

and curing the mixture by heating it at an elevated temperature for a sufficient time to harden the mixture.

5,051,276

## DEVICE FOR GRAPHITIZATION OF THE NECK IN CATHODE-RAY TUBE CONES

Arturo Sbordone, Anagni, Italy, assignor to Videocolor, Montrouge, France

PCT No. PCT/FR88/00509, § 371 Date Jun. 16, 1989, § 102(e) Date Jun. 16, 1989, PCT Pub. No. WO89/03583, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 14, 1988, Ser. No. 381,734
Claims priority, application France, Oct. 16, 1987, 87 14292
Int. Cl.[5] B05C 7/06
U.S. Cl. 427—68 11 Claims

1. A method for applying an internal conductive coating to a surface of a neck of a cathode-ray tube cone along a length extending from a coating plane to a reference plane, the method including the steps of

positioning a base of a cathode-ray tube cone on a supporting table of a coating device,

orienting a collar about the neck of said cone, said collar having a supporting face demarcating a reference plane,

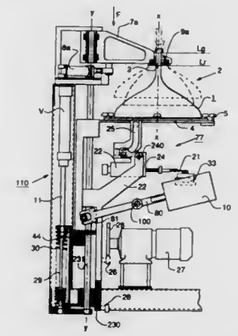
centering said cone in a horizontal plane on said supporting table so that a vertical axis of said collar coincides with a vertical axis of said neck,

raising said supporting table carrying said cone to a position



at which said cone contacts said supporting face of said collar to establish a reference plane relative to said cone,

raising a coating system including an arm having a brush-/motor set pivotably attached thereto by a hinge, said brush/motor set being rotatable from a horizontal position to a vertical position as said arm is raised, a brush of said brush/motor set being disposed within said neck, parallel to and offset with respect to the axis of said neck, at said coating plane,



energizing said brush/motor set to provide rotational motion to said brush to apply a uniform conductive coating to said neck,

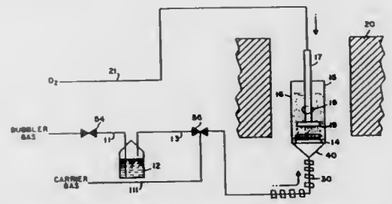
initiating downward motion of the rotating brush from said coating plane to at least said reference plane while retaining said supporting table in the raised position, said downward motion being provided by a second motor having a cam which contacts a post fixedly attached to said arm, said cam driving said arm downward to a point of maximum travel of said cam, thereby lowering said brush of said brush/motor set through said neck of said cone.

5,051,277

## METHOD OF FORMING A PROTECTIVE BI-LAYER COATING ON PHOSPHORE PARTICLES

A. Gary Sigai, Lexington, and Keith A. Klinedinst, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 22, 1990, Ser. No. 468,432
The portion of the term of this patent subsequent to Mar. 12, 2008, has been disclaimed.
Int. Cl.[5] B05D 5/06, 5/12, 7/00
U.S. Cl. 427—69 15 Claims




1. A method for forming a continuous coating in phosphor particles in a fine phosphor powder comprising:

a) vaporizing a silicon containing precursor material selected from the group consisting of tetramethyloxysilane and tetraethyloxysilane into an inert carrier gas to form a carrier gas containing vaporized silicon precursor;

b) passing said carrier gas containing silicon precursor through a mixture of phosphor powder and up to 1 percent fluidizing aid to form a fluidized bed in which the particles are suspended in the carrier gas and to envelope the fluidized particles with vapor of the silicon precursor said fluidized bed being maintained at a nearly isothermal condition and at a temperature above the decomposition temperature of the silicon-containing precursor;

c) passing an oxidizing gas into said fluidized bed separately from said carrier gas containing vaporized silicon precursor and reacting said oxidizing gas with the vaporized silicon precursor on the particles of the phosphor powder to form a continuous coating of silica of predetermined thickness on the phosphor particles;

d) annealing the particles of the phosphor obtained from step (c);

e) vaporizing an aluminum-containing precursor material selected from the group consisting of aluminum isopropoxide and tetramethylaluminum into an inert carrier gas to form a carrier gas containing vaporized aluminum-containing precursor material;

f) passing said carrier gas containing vaporized aluminum precursor material through the phosphor powder having a continuous coating of silica as produced by step (c) to form a fluidized bed in which particles are suspended in the carrier gas containing vaporized aluminum precursor material and to envelope the fluidized particles with vapor of aluminum containing precursor material said fluidized bed being maintained at a nearly isothermal condition, and at a temperature above the decomposition temperature of the aluminum-containing precursor;

g) passing an oxidizing gas into said fluidized bed of step (f) separately from said carrier gas containing vaporized aluminum-containing precursor material and reacting said oxidizing gas with the vaporized aluminum-containing precursor material on the particles of the phosphor powder having a continuous coating of silica to form a continuous coating of alumina of predetermined thickness on the phosphor particles having a continuous coating of silica.

5,051,278

## METHOD OF FORMING METAL FLUORIDE FILMS BY THE DECOMPOSITION OF METALLO-ORGANIC COMPOUNDS IN THE PRESENCE OF A FLUORINATING AGENT

Gustavo R. Paz-Pujalt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 10, 1989, Ser. No. 377,646
Int. Cl.[5] B65D 5/12
U.S. Cl. 427—108 36 Claims

1. A method of forming a film of metal fluoride comprising combining a non-fluorine-containing metallo-organic compound, solvent, and a fluorinating agent to form a casting liquid, forming a coating of said casting liquid on a substrate, and heating said coating and said substrate wherein the metal of said metallo-organic compound comprises at least one of lithium, sodium, potassium, magnesium, calcium, strontium, barium, yttrium, europium, and rare earths.

5,051,279

## HIGH-GRADE THERMAL RECORDING SHEET AND A METHOD OF MAKING THE SAME

Masayuki Murata; Shinichiro Katsuta, and Tomoyuki Unno, all of Fuji, Japan, assignors to Kobjin Co., Ltd., Tokyo, Japan

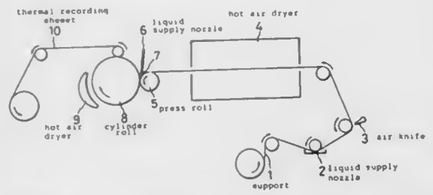
Division of Ser. No. 144,032, Dec. 14, 1987. This application Oct. 23, 1989, Ser. No. 425,233
Claims priority, application Japan, Jun. 12, 1986, 61-134830; Oct. 20, 1986, 61-247631; Oct. 28, 1986, 61-254616; Dec. 29, 1986, 61-313215; Apr. 14, 1987, 62-89820
Int. Cl.[5] B41M 3/12, 5/30
U.S. Cl. 427—150 8 Claims

1. In a method of manufacturing a high-grade thermal recording sheet having on a support an outermost surface layer defining a thermal recording layer adapted for developing

VOL 1130 ISS 4 SE 24 1991 UMI



color when heated, the improvement which comprises bringing said outermost surface layer into contact with the surface




of a smooth body when said layer is in a wet state, drying it and separating it from said surface of said smooth body.

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5,051,280

## LOW TEMPERATURE SYNTHESIS OF ALKALI METAL NIOBATES AND TANTALATES

Yann Hung, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1990, Ser. No. 591,307
Int. Cl.[5] B05D *3/02*; G01G *33/00, 35/00*
U.S. Cl. 427—226 5 Claims

1. A method for making an alkali metal niobate or tantalate, said method comprising the steps of:

a) forming a salt of an alkali metal and a monovalent niobium or tantalum containing complex, said complex comprising niobium or tantalum complexed with three bidentate ligands or two tridentate ligands; and

b) pyrolyzing said salt so as to form said alkali metal niobate or tantalate.

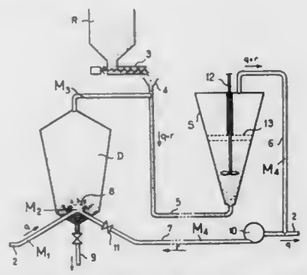
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5,051,281

## PROCESS AND PLANT FOR PROTECTING WATER PIPEWORKS FROM CORROSION

Luc Legrand, 6 Résidence Péguy, Bourg La Reine, 92340, and Pierre Leroy, 1 Rue des Platanes, Choisy Le Roi, 94600 both of France

PCT No. PCT/FR88/00294, § 371 Date Feb. 6, 1989, § 102(e) Date Feb. 6, 1989, PCT Pub. No. WO88/09832, PCT Pub. Date Dec. 15, 1988
PCT Filed Jun. 9, 1988, Ser. No. 328,194
Claims priority, application France, Jun. 12, 1987, 87 08198
Int. Cl.[5] B05D *7/22*; B05C *11/00*
U.S. Cl. 427—230 6 Claims




1. Plant for treating water from a first pipe to protect the internal walls of a pipework, comprising a storage tank (R) for powdered lime, a loop (2) for bleeding water from said first pipe (1), a lime saturator (S( located on the loop (2), means (3, 4, 5) for adding powdered lime from the storage tank (R) into the saturator (S), wherein the loop (2) comprises, upstream of the saturator (S), relative to the direction of water flow, a decarbonator (D) fed with water which is to be treated, and wherein a second pipe (6, 2) which connects the outlet of the saturator (S) with said first pipe (1) comprises a loop (7) for recycling a part of the material from the saturator (S) to the decarbonator (D), and said means for adding powdered lime includes a pipe (5) which receives said powdered lime and which connects the outlet of the decarbonator (D) with the inlet of the saturator (S).

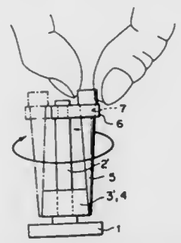
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5,051,282

## METHOD AND APPARATUS FOR WATER-REPELLENT PROCESSING OF TUBE

Sigeru Tezuka, and Keishiro Kido, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 26, 1989, Ser. No. 343,314
Claims priority, application Japan, Apr. 28, 1988, 63-105687; Apr. 28, 1988, 63-105688; May 24, 1988, 63-126548; Jun. 20, 1988, 63-151803
Int. Cl.[5] B05D *1/28, 5/08*; B05C *1/02*
U.S. Cl. 427—260 21 Claims




6. A method for water-repellent processing of a tube comprising the steps of providing a liquid-retainable member having a liquid-retainable outer surface; keeping a water-repellent liquid on said liquid-retainable outer surface; bringing a portion of a tube into contact with said liquid-retainable outer surface, said portion of the tube being located near a tip thereof; and thereby forming a water-repellent surface on said portion of the tube, in which said liquid-retainable member has a truncated cone-like shape, and said liquid-retainable outer surface is formed on a periphery thereof.

16. An apparatus for forming a water-repellent surface on an outer surface of a tube near a tip thereof, comprising a liquid-retainable member having a liquid-retainable outer surface; holding means for holding said tube so that a portion of the tube contacts said liquid-retainable outer surface while said portion of the tube is rotated relative to said liquid-retainable outer surface; and a water-repellent liquid held on said liquid-retainable outer surface, in which said liquid-retainable member has a truncated cone-like shape, and said liquid-retainable outer surface is formed on a periphery thereof.

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5,051,283

## PROCESS FOR ENVIRONMENTALLY SOUND WOOD FINISHING

Bobby E. Beane, Sophia, and Eugen Safta, Winston Salem, both of N.C., assignors to Lilly Industrial Coatings, Inc., Indianapolis, Ind.

Filed Feb. 12, 1991, Ser. No. 654,259
Int. Cl.[5] B05D *7/06*
U.S. Cl. 427—440 31 Claims

1. An environmentally sound water-based wood finishing process for obtaining a high quality finish on a wood surface by eliminating leaching of chromophoric compounds from said surface into applied water-based coatings said process comprising the steps of

applying to the wood surface an effective amount of a composition comprising a water soluble alkali metal salt of a carboxylic acid and a water soluble organic compound bearing one or more salt-forming amine groups and having a molecular weight of about 50 to about 300,000; and thereafter

applying to the wood surface a water-based wood finishing composition.

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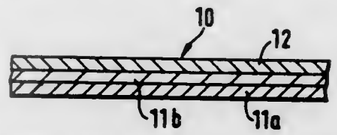


5,051,284

## PROTECTIVE WRAPPING OF FILM

Tor Johansson, Pori, and Per Nyman, Ulvila, both of Finland, assignors to Rosenlew-Pakkaus Oy, Finland

Filed Sep. 23, 1988, Ser. No. 249,368
Claims priority, application Finland, Jan. 27, 1988, 880374
Int. Cl.[5] B65B *53/00*
U.S. Cl. 428—34.9 9 Claims




1. Protective wrapping or film for protecting a product or package, comprising a sheet material having two surface layers,

one surface layer formed of shrinkable plastic material, and the other surface layer formed of amorphous plastic material is selected from at least one of polyamide, polycarbonate, polymethyl methacrylate, polystyrene, polyvinyl chloride, polyisobutene, polypropene amorphous polyethylene terephthalate, polyurethane, acrylic nitrile butadiene styrene, acrylic nitrile styrene acrylate, polyetherimide, polysulfone, and polyacrylate different from said shrinkable plastic material, said other surface layer being the layer which contacts the product or any protective coating covering a bundled package wherein

said amorphous plastic material, when being shrunk, does not adhere to the product being protected or to any protective covering surrounding a bundled package.

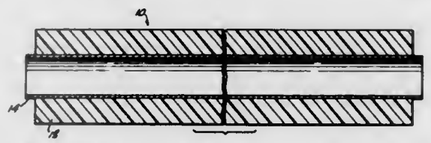
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5,051,285

## PLASTIC PILING

Vartkes Borzakian, Glendale, Calif., assignor to Pillard Products, Inc., Glendale, Calif.

Continuation-in-part of Ser. No. 226,138, Jul. 29, 1988, abandoned. This application Sep. 15, 1989, Ser. No. 407,574
Int. Cl.[5] E02D *5/60*
U.S. Cl. 428—36.4 8 Claims




1. An elongated structural plastic member having an outer diameter of at least 10 inches and an integral core, and suitable for use as a plastic piling, the member being at least 10 feet long and comprising:

(a) an inner elongated core of at least about 3 inches in diameter; and

(b) an outer, extruded, continuous, substantially homogenous plastic layer at least 2 inches thick on substantially the entire length of the core, the plastic layer comprising low density polyethylene, high density polyethylene, polypropylene, foaming agent, and antioxidant,

wherein the plastic layer comprises, based on the weight of the plastic components of the layer, from about 20% to about 25% by weight low density polyethylene, from about 20% to about 50% by weight high density polyethylene, and from about 35% to about 55% by weight polypropylene.

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5,051,286

## HIGHLY EFFECTIVE POLARIZERS

Karl H. A. O. Starzewski, Bad Vilbel, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,944
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1988, 3842967; Feb. 18, 1989, 3905027
Int. Cl.[5] G02B *5/30*; B32B *27/30*
U.S. Cl. 428—500 17 Claims

1. A highly effective polarizer in the form of a stretched film, made from a polymer product containing polyacetylene, whose matrix is a copolymer in which 70 to 90% of all comonomer units are vinyl alcohol units, the said polarizer having a maximum degree of polarization P of at least 95% and a dichroic ratio $Q_E$, where $Q_E$=quotient of the extinction in the blocking position to the extinction in the transmitting position=10 or more over almost the whole wavelength range of visible light from 400 to 800 nm.

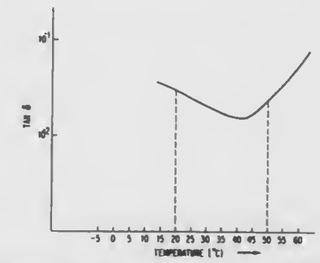
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5,051,287

## MAGNETIC DISK HAVING A MAGNETIC LAYER COMPRISING A BINDER AND FERROMAGNETIC PARTICLES OF SPECIFIED CRYSTALLITE SIZE AND SURFACE AREA AND IN WHICH THE MECHANICAL LOSS TANGENT, TAN DELTA, IS WITHIN A SPECIFIED RANGE

Yasuyuki Yamada; Mikihiko Kato; Yasuhi Endo; Masaya Kojima, and Yasuo Nagashima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 20, 1989, Ser. No. 424,445
Claims priority, application Japan, Oct. 20, 1988, 63-265056
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—64 11 Claims




1. A magnetic disk comprising a nonmagnetic support having provided thereon a magnetic layer comprising particles of a ferromagnetic metal powder and a binder resin, wherein said magnetic layer has a mechanical loss tangent, tan δ, of from $8\times10^{-3}$ to $6\times10^{-2}$, measured at a frequency of 110 Hz in a temperature range of from 20° to 50° C. with a temperature increase rate of 2 deg/min. wherein the particles of the ferromagnetic powder have a specific surface area of 40 $m^2/g$ or more and a crystallite size of 400 Å or less.

VOL 1130 ISS 4 SE 24 1991 UMI

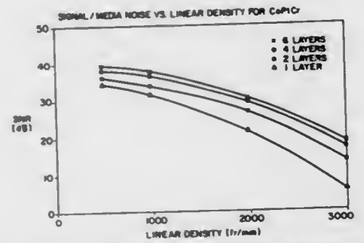


5,051,288

## THIN FILM MAGNETIC RECORDING DISK COMPRISING ALTERNATING LAYERS OF A CoNi OR CoP t ALLOY AND A NON-MAGNETIC SPACER LAYER

Richard H. Ahlert, San Jose; James K. Howard, Morgan Hill; Steven E. Lambert, San Jose, and Ian L. Sanders, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1989, Ser. No. 324,374
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—64 8 Claims




1. A magnetic recording disk for horizontal recording comprising:

a substrate; and

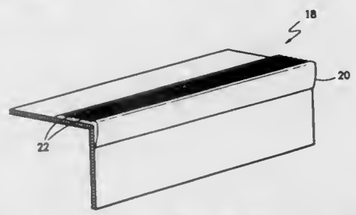
a laminated magnetic layer formed over the substrate, the laminated magnetic layer further comprising alternating films of a magnetic film of a cobalt-based alloy having platinum or nickel present in the alloy and a non-magnetic spacer film, the laminated layer having at least two of said magnetic films and one of said spacer films.

5,051,289

## PREFORMED STAIR RISER TITLE PRODUCT

Dennis L. Riddle, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 263,808, Oct. 28, 1988, Pat. No. 4,985,095.
This application May 7, 1990, Ser. No. 520,316
Int. Cl.[5] B32B *3/14; E04F 11/16*
U.S. Cl. 428—77 4 Claims




1. A preformed stair riser carpet tile product comprising: a carpet tile having a pile surface face and a plastic-like backing, one portion of said tile being bent along a bend line and extending substantially perpendicular to a second portion of said tile, a score line in the face of the carpet tile along the bend line thereof and a nose guard member adhered to said tile over said score line.

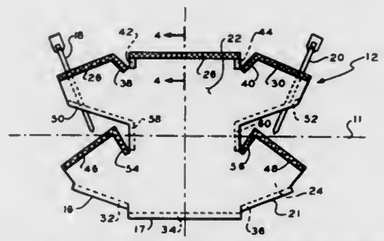
5,051,290

## FIRE BARRIER BLANKET

Donald Stober, Woodcliff Lake, and Bill Williams, Harworth, both of N.J., assignors to Mueller Belting and Specialty Co., Saddle Brook, N.J.

Filed Nov. 29, 1989, Ser. No. 443,119
Int. Cl.[5] B32B *3/06, 3/08*
U.S. Cl. 428—81 7 Claims

1. A fire barrier blanket comprising: an elongate center portion having an elongate axis; axially spaced end portions; axially spaced clamp units for clamping the end portions; said center portion and end portions each having an inner fiberglass layer and a middle foam layer and an outer fiberglass layer; and



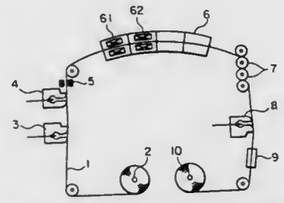
said middle layer being a silicone foam material and said inner layer and outer layer each being a silicone coated fabric cast on the middle layer.

5,051,291

## MAGNETIC RECORDING MEDIUM

Setsuko Kawahara; Yasushi Nakano, and Noboru Koyama, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 12, 1990, Ser. No. 464,344
Claims priority, application Japan, Jan. 17, 1989, 1-9536; Mar. 31, 1989, 1-83191
Int. Cl.[5] G11B *23/00*
U.S. Cl. 428—141 18 Claims



1. A magnetic recording medium comprising a non-magnetic support and, provided thereon in order, a first magnetic layer and a second magnetic layer each containing a magnetic material and a binder, wherein Rmax, a maximum roughness, and Ra, a center line average roughness, of a surface of the support on the magnetic layer side, $d_1$, a thickness of the first magnetic layer, and $d_2$, a thickness of the second magnetic layer, have the following relation,

$$4\times10^{-3}\leqq Ra/d_1\leqq1.8\times10^{-2}$$

$$4\times10^{-2}\leqq Rmax/d_1\leqq4.5\times10^{-1}$$

$$d_2\leqq1.0\mu m$$

5,051,292

## BIAXIALLY ORIENTED FILM OF POLYETHYLENE-2,6-NAPHTHALATE

Hideo Katoh, Kanagawa; Hisashi Hamano, Sagamihara; Masahiro Hosoi, Tokyo, and Tatsuya Ogawa, Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 31, 1990, Ser. No. 473,152
Claims priority, application Japan, Feb. 1, 1989, 1-20861; Feb. 1, 1989, 1-20862
Int. Cl.[5] G11B *5/64*
U.S. Cl. 428—141 5 Claims

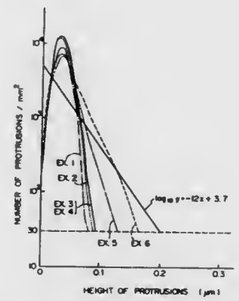
1. A biaxially oriented film of polyethylene-2,6-naphthalate having

a. a thickness of 1 to 25 micrometers,



b. a Young's modulus of at least 650 kg/mm$^2$ in a given direction on the film plane and a direction crossing it at right angles, the difference between the Young's moduli in the two directions being at most 200 kg/mm$^2$, the difference between the thermal shrinkages in the two directions being 0 to 0.1%,

c. a surface roughness (Ra) of at least 0.003 micrometer but less than 0.01 micrometer, the distribution curve representing the relation between the number of protrusions on the film surface and the heights of the protrusions crossing the equation




$$\log_{10}y=12x+3.7$$

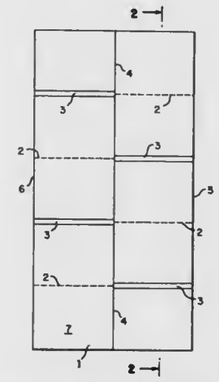
wherein y represents the number of protrusions per mm$^2$, and x is the protrusion height (micrometers), at least in an area where the number of protrusions is 30/mm$^2$ and the protrusion height exceeds the maximum value of the distribution curve, the biaxially oriented film containing 0.005 to 3% by weight of fine particles in which the long diameter/short diameter ratio of the particles is from 1.0 to 1.2, a relative standard deviation of not more than 0.5, and an average particle diameter of 0.005 to 0.6 micrometer.

5,051,293

## FOLDABLE FOAM MAT

Hans-Ulrich Breitscheidel, Siegburg, and Rudolf Kautz, Hennef, both of Fed. Rep. of Germany, assignors to Huels Troisdorf AG, Troisdorf, Fed. Rep. of Germany

Filed Jan. 17, 1991, Ser. No. 642,608
Int. Cl.[5] B32B *3/26*
U.S. Cl. 428—157 4 Claims



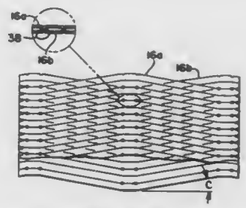
1. A foldable foam mat (1) having several single or double fold lines, comprising a longitudinal fold line (4) extending over the entire length of the foam mat (I), and a plurality of transverse fold lines (2,3) arranged in pairs and extending perpendicularly from the longitudinal fold line (4) over one half of the mat to the two edges (5,6) of the mat, wherein one of each of the transverse fold lines (2,3) is configured as a single fold line (2) and one as a double fold line (3).

5,051,294

## CATALYTIC CONVERTER SUBSTRATE AND ASSEMBLY

Michael J. Lunkas, Otisville, and Matthew W. Spilker, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 15, 1989, Ser. No. 351,618
Int. Cl.[5] B32B *3/28;* B01J *21/04;* B21D *5/14*
U.S. Cl. 428—184 11 Claims




1. An assembly of corrugated metal foil sheets for a substrate comprising:

a stack of corrugated sheets secured together so that a plurality of fluid flow paths are defined between the sheets,

each sheet having a centerline and a plurality of rows of corrugations extending transverse to the centerline, said rows oriented in a chevron pattern with the ridges of adjacent rows alternately extending at an angle of 8 degrees or greater to said centerline in either direction,

the corrugation ridges having peaks which meet at vertices at the boundaries of adjacent rows, the peaks defining planes on opposite sides of each sheet,

each sheet having projections located on at least some of the vertices and extending outwardly from said planes into contact with an adjacent sheet in the stack, and

the sheets being welded together at points of contact between said projections and said adjacent sheet.

3. An assembly of corrugated metal foil sheets for a substrate comprising:

a stack of corrugated sheets secured together so that fluid flow channels are defined between the sheets,

each sheet having a centerline and a plurality of rows of corrugations extending transverse to said centerline, said rows oriented in a chevron pattern with some rows having corrugations extending at an angle of 8 degrees or greater to said centerline in either direction and other rows having corrugations extending parallel to said centerline with the corrugation patterns of adjacent rows having different directions,

the corrugation ridges having peaks which meet at vertices at the boundaries of adjacent rows, the peaks defining planes on opposite sides of each sheet,

each sheet having projections located on at least some of the vertices and extending out of their respective planes into contact with an adjacent sheet in the stack, and

the sheets being welded together at points of contact between said projections and said adjacent sheet.

8. A catalytic converter substrate comprising:

upper and lower half substrates secured together to form a whole substrate,

each half substrate having a stack of corrugated sheets welded together to define flow channels,

each sheet having a median plane and a centerline in the median plane and plurality of rows of corrugations ex-

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tending transverse to said centerline, said rows oriented in a modified chevron pattern with some rows having corrugations extending at an angle of 8 degrees or greater to said centerline in either direction and other rows having corrugations extending parallel to said centerline with the corrugation patterns of adjacent rows extending in different directions,

the corrugation ridges having peaks which meet at vertices at the boundaries of adjacent rows,

each sheet having projections located on at least some of the vertices and extending normal to the median plane into contact with an adjacent sheet in the stack,

the sheets being welded together at points of contact between said projections and said adjacent sheet, and

half-rings conforming to the half substrate contour and attached to each end of each half substrate, the half-rings at each end of the substrate being welded together to secure the complete substrate.

9. A corrugated metal foil substrate for a catalytic converter comprising a plurality of corrugated foil sheets made by the steps of:

forming each of a plurality of corrugated sheets by crimping a plain sheet with rows of angled corrugations to form a chevron pattern with vertices at adjoining rows, the angle between the corrugations at the vertices being 8 degrees or greater to facilitate the formation of outstanding projections normal to the median plane of the sheet,

stacking a plurality of corrugated sheets with the projections of one sheet extending toward and in contact with an adjacent sheet, the stack being bounded by upper and lower sheets, and

the stack being united by passing a pulse of weld current through the stack between the upper and lower sheets to weld the sheets together at the projections.

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5,051,295

## PROTECTIVE FILM FOR PHOTO MASKS AND LITH FILMS

Shigeo Mori, and Atsunori Yaguchi, both of Tokyo, Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

PCT No. PCT/JP88/00546, § 371 Date Mar. 17, 1989, § 102(e) Date Mar. 17, 1989, PCT Pub. No. WO89/01650, PCT Pub. Date Feb. 23, 1989

PCT Filed Jun. 6, 1988, Ser. No. 360,935

Claims priority, application Japan, Aug. 10, 1987, 62-199636

Int. Cl.[5] B32B *9/04*; H01L *21/00*

U.S. Cl. 428—195 11 Claims

1. A durable pattern forming material which comprises a member selected from the group consisting of a photo mask and a lith film having on at least the pattern bearing surface thereof an excellently adherant radiation cured protective film of a curable cyclic phosphazene compound of the formula:

$$-[NP(X)_p(Y)_q]_n- \quad (T)$$

wherein X and Y are identical or different, wherein X or Y is a polymerization curable group or a non-polymerization curable group, wherein at least one of X and Y is a polymerization curable group, p and q are numerals of zero or greater than zero, the sum of p and q is 2, and n is 3 to 4, and wherein said cured film consists essentially of said cyclic phosphazene compound cross linked by reaction of said polymerizable groups.

5,051,296

## NOVEL PRESSURE SENSITIVE ADHESIVE ARTICLES CONTAINING AN ADHESIVE LAYER BASED ON DIENE-ETHOXYLATED ALKYL AMINE STYRENE SULFONATE COPOLYMERS

Pawan K. Agarwal, Bridgewater, and Warren A. Thaler, Flemington, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 287,377, Dec. 21, 1988, abandoned. This application Sep. 27, 1990, Ser. No. 589,287

Int. Cl.[5] B32B *7/02*; C08J *5/02*

U.S. Cl. 428—213 6 Claims

1. In a pressure sensitive adhesive article having a dried pressure sensitive adhesive layer deposited on a substrate, the improvement wherein said dried pressure sensitive adhesive layer comprises a mixture of:

(a) a metal neutralized sulfonated copolymer of at least one conjugated diene having from 4 to 12 carbon atoms and an ethoxylated alkyl amine salt of styrene sulfonate, said neutralized sulfonated copolymer having about 5 to about 125 meq of neutralized sulfonate groups per 100 grams of said neutralized sulfonated copolymer;

(b) an ethoxylated alkyl amine; and

(c) a hydrocarbon tackifier resin based on a petroleum or coat tar distillate.

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5,051,297

## NOVEL FILM COMPOSITIONS

Gary J. Reich, Chippewa Falls, Wis., and Richard L. Partlow, Naperville, Ill., assignors to Rexene Products Company, Odessa, Tex.

Continuation-in-part of Ser. No. 855,972, Apr. 25, 1986, abandoned. This application Apr. 20, 1989, Ser. No. 340,831

Int. Cl.[5] C08J *5/18*; C08L *23/08, 23/20, 33/08*

U.S. Cl. 428—220 6 Claims

1. A soft, pliable, heat-sealable film prepared from a resin composition consisting essentially of (A) from about 30 to about 80 wt. % of an ethylene - methyl acrylate copolymer (EMA), and (B) from about 20 to about 70 percent by weight of a very low density polyethylene (VLDPE) having a density between about 0.902 and about 0.910 gms/cc and being a non-elastomeric copolymer of ethylene and at least one comonomer selected from $C_4$ and $C_{10}$ alphaolefins.

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5,051,298

## FILLED ARCYLATE AND METHACRYLATE FILMS

Christine J. T. Landry, Honeoye Falls, and Bradley K. Coltrain, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 20, 1989, Ser. No. 326,359

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—220 9 Claims



1. A free standing, optically clear, film having a thickness of about 1 to about 500 microns, said film consisting essentially of a poly(acrylate) or poly(methacrylate) polymer, having substantially uniformly dispersed therein, particles of an in situ produced, silicon oxide, said particles having a size less than about 0.1 micron; the concentration of said particles in said film being in the range of from about 10 to about 65 weight percent based on the weight of the polymer; said film being further characterized by having no designed covalent linkage between said silicon oxide and said polymer;



said film having been derived by a process comprising (a) hydrolyzing and condensing a tetra(lower alkyl)orthosilicate (i) in the substantial absence of a polymerizable substance other than said silicate, (ii) using acidic hydrolysis, (iii) and using a stoichiometric or substantially stoichiometric amount of water for hydrolysis, (iv) and in an organic solution of said polymer, the solvent in said solution having a relatively low boiling point, a fairly high volatility, and being substantially inert and miscible with water; and (b) subsequently coating the composition thereby produced on a heated non-sticking surface having a temperature of about 30° to about 35° C.; (c) drying and curing the coat on said surface to produce said film; and (d) subsequently removing said film from said surface.

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5,051,299

## FIBRE REINFORCED BELT

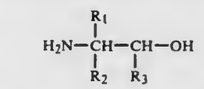
Trevor A. Brown, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed Oct. 13, 1989, Ser. No. 421,097

Int. Cl.[5] B32B *27/36*

U.S. Cl. 428—221 6 Claims

1. A fibre-reinforced belt comprising fibres and vulcanized, oxazinolated hydrogenated nitrile rubber, wherein said oxazinolated hydrogenated nitrile rubber is characterized by having less than 10 mole percent unsaturation and by having oxazoline functionality which produces a characteristic peak at between 1552 $cm^{-1}$ and 1668 $cm^{-1}$ in the infrared spectrum and which has been prepared by reacting a solution of hydrogenated nitrile rubber with an amino alcohol of the formula



where $R_1$ and $R_2$ are independently selected from H and $CH_3$ and $R_3$ is selected from H, a $C_{1\text{-}5}$ alkyl and aryl in the presence of zinc acetate.

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5,051,300

## COMPOSITE MATERIAL WITH CARBON REINFORCING FIBERS AND ITS PRODUCTION PROCESS

Gérard Rousseau, Saint Aubin de Medoc, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris Cedex, France

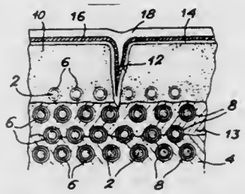
Filed Aug. 15, 1989, Ser. No. 394,020

Claims priority, application France, Aug. 31, 1988, 88 11401

The portion of the term of this patent subsequent to Sep. 5, 2006, has been disclaimed.

Int. Cl.[5] B32B *7/00*

U.S. Cl. 428—245 18 Claims




1. A composite material incorporating a carbon fiber substrate (2) embedded in a binding material (4), an outer silicon carbide layer (10) for covering the substrate and the binding material, an outer oxide coating (18) selected from the group consisting of $ThO_2$, $ZrO_2$, $HfO_2$, $La_2O_3$, $Y_2O_3$, and $Al_2O_3$ and covering the outer layer, and an intermediate coating (16) of a compound substantially nonreactive with the silicon carbide layer and the oxide coating so as to serve as a reaction barrier therebetween.

5,051,301

## COATED FIBER-CONTAINING COMPOSITE

Raj N. Singh, Schenectady, and Achuta R. Gaddipati, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 262,651, Oct. 26, 1988, Pat. No. 4,915,760.

This application Dec. 8, 1989, Ser. No. 448,420

Int. Cl.[5] D04H *1/58*

U.S. Cl. 428—288 25 Claims

1. A composite comprised of a ceramic matrix and a plurality of layers of boron nitride coated fibrous material, said layers of coated fibrous material being separated from each other by said matrix, more than 70% of the surface area of said coated fibrous material being in direct contact with said ceramic matrix, said coated fibrous material comprising at least about 10% by volume of said composite, said matrix having a thermal expansion coefficient which ranges from lower than that of said coated fibrous material to less than about 15% higher than that of said coated fibrous material, said matrix being continuous and interconnecting, said composite having a porosity of less than about 10% by volume.

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5,051,302

## MULTI-USABLE HEAT TRANSFER INK RIBBON

Hiromi Tsuyguchi, Ibaraki; Masao Saisbo, Osaka, and Katsubiro Yoshida, Ibaraki, all of Japan, assignors to Fuji Kagakushi Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 292,179, Dec. 30, 1988, abandoned.

This application Jul. 26, 1990, Ser. No. 559,447

Claims priority, application Japan, Aug. 8, 1988, 63-202421

Int. Cl.[5] B41M *5/62*

U.S. Cl. 428—323 6 Claims

1. A multi-usable heat transfer ink ribbon comprising a foundation, and a heat transfer ink layer provided on one surface of the foundation, said heat transfer ink layer having a melt index of 4 X $10^2$ to 2.5 X $10^3$ g/10 min. at 190° C. and containing (a) a vehicle comprising a thermoplastic resin as its major component in an amount effective to produce said melt index, and (b) 3 X 10 to 6 X 10% by volume based on said ink layer of a non-thermoplastic powder dispersed in a nonagglomerative state in said vehicle, wherein said heat transfer ink layer is capable of being melted or softened to be transferred to a receiving medium in increments relative to the thickness direction of the ink layer upon heating by means of a heating head, said non-thermoplastic powder being present in an amount effective to impart acceptable optical density to images transferred to said receiving medium for more than three images from the same portion of said ink ribbon.

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5,051,303

## MAGNETIC RECORDING MEDIUM

Hitoshi Noguchi; Shinji Saito; Hiroo Inaba, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1989, Ser. No. 424,004

Claims priority, application Japan, Oct. 19, 1988, 63-261576; Oct. 5, 1989, 1-260998

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—329 7 Claims

1. A magnetic recording medium comprising a nonmagnetic support having thereon plural magnetic layers comprising ferromagnetic particles dispersed in a binder, said ferromagnetic particles consisting of an iron oxide or a cobalt-containing iron oxide, said plural magnetic layers comprising at least an upper magnetic layer and a lower magnetic layer, wherein said upper magnetic layer has a coercive force (Hc) of from 650 to 1000 Oe, a crystallite size of the ferromagnetic particles contained in said upper magnetic layer is less than 500 Å as measured by a X-ray diffraction method, an average length in the long axis of the ferromagnetic particles contained in said upper magnetic layer is from 0.1 microns to less than 0.25 microns as measured by a transmission type electron micro-

VOL 1130 ISS 4 SE 24 1991 UMI



scope, said lower magnetic layer has a coercive force (Hc) of from 0.6 to 1.0 times that of said upper magnetic layer, a crystallite size of the ferromagnetic particles contained in said lower magnetic layer is larger than that of said upper magnetic layer and is in the range of 500 Å or less, and an average length in the long axis of the ferromagnetic particles contained in said lower magnetic layer is larger than that of said upper magnetic layer and is in the range of from more than 0.1 microns to less than 0.25 microns.

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5,051,304

## MICROCAPSULES BASED ON GELATIN AND POLYSACCHARIDES AND PROCESS FOR OBTAINING SAME

**Jacky David, Isle Sorgue; Claudine Lefrancois, La Haye du Puits, and Claude Rldoux, Isle sur Sorgue, all of France, assignors to Société Anonyme: Mero Rousselot Satia, Paris, France**

**Filed Dec. 18, 1987, Ser. No. 135,037**
**Claims priority, application France, Dec. 18, 1986, 86 17745**
**Int. Cl.[5] B01J** *13/08;* **A61K** *9/50*
**U.S. Cl. 428—402.2** **22 Claims**

1. A process for preparing microcapsules containing an encapsulated substance comprising a hydrophobic liquid or a water-insoluble solid, comprising the steps of:

(a) emulsifying a hydrophobic liquid or suspending a water-insoluble solid in a gelatin solution,

(b) adding a low molecular weight hydrosoluble anionic polysaccharide to the gelatin solution, wherein said polysaccharide is a chemically depolymerized polysaccharide selected from the group consisting of alginates, carragheenans, pectins, and pectates, carboxymethylcelluloses, carboxymethyl guars and carboxymethyl starches and the viscosity of a 15 g/l aqueous solution of said polysaccharide measured at 75° C. with a rotating Brookfield viscometer of type LVT equipped with a mobile UL at a speed of rotation of 6 rounds/minute is between about 1 and 20 mPa.s, and

(c) encapsulating the hydrophobic liquid or water-insoluble solid within microcapsules by complex coacervation of the gelatin and polysaccharide, with pH adjustment to the extent necessary, isolating the microcapsules, and drying the microcapsules after they are isolated.

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5,051,305

## STABILIZED PERFUME-CONTAINING MICROCAPSULES AND METHOD OF PREPARING THE SAME

**Douglas M. Whitaker, Sr., Chattanooga, Tenn., assignor to Arcade, Inc., Chattanooga, Tenn.**

**Filed Dec. 30, 1988, Ser. No. 292,495**
**Int. Cl.[5] B01J** *13/08, 13/20;* **A61K** *7/46*
**U.S. Cl. 428—402.2** **12 Claims**

1. Perfume-containing microcapsules comprising a central core of a droplet or globule of perfume oil including fragrance components of substantially varying volatilities and containing ethyl cellulose in an amount effective to provide a matrix therein, said droplets or globules being encased by an inert polymeric wall material comprising gelatin and a phase-separation-inducing coacervation agent reaction product.

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5,051,306

## MICROENCAPSULATION PRODUCT AND PROCESS

**Colette Meinard, Marseilles, and Claude Taranta, Aix-en-Provence, both of France, assignors to Roussel Uclaf, Paris, France**

**Filed May 21, 1990, Ser. No. 527,111**
**Claims priority, application France, May 25, 1989, 89 06837**
**Int. Cl.[5] B01J** *13/16*
**U.S. Cl. 428—402.21** **9 Claims**

1. Active principle microencapsulated in an envelope formed by interfacial polymerization of two non-miscible phases A and B, organic phase A comprising at least one water insoluble active principle which do not react with each other, a polyfunctional monomer a which is a diester of phthalic acid and a solvent for the active principle and aqueous phase B comprising a polyfunctional monomer b which is an amino plastic resin and a catalyst.

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5,051,307

## PROCESS FOR PRODUCING UNIFORM PROTECTIVE COATING OF SILVER METAL ON CARBON/CARBON COMPOSITES

**Amarnath P. Divecha, Falls Church; William A. Ferrando, Arlington, both of Va.; Philip W. Hesse, Ellicott City, Md., and Subhash D. Karmarkar, Great Falls, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 3, 1990, Ser. No. 548,332**
**Int. Cl.[5] B32B** *9/00;* **B05D** *3/02*
**U.S. Cl. 428—408** **10 Claims**



5. A process for producing high temperature, oxidation resistant coatings for carbon/carbon composites comprising:

(1) soaking a carbon/carbon composite structure designed for use at high temperatures in an oxidizing atmosphere in a $AgNO_3$ solution;

(2) drying the carbon/carbon composite structure to deposit solid $AgNO_3$ on the surface of the carbon/carbon composite structure;

(3) heating the $AgNO_3$-coated carbon/carbon composite structure at a temperature above the melting point of $AgNO_3$ but below the decomposition temperature of $AgNO_3$ until the $AgNO_3$ melts and forms a uniform coating over the surface of the carbon/carbon composite structure; and

(4) heating the molten $AgNO_3$-coated carbon/carbon composite structure at a temperature in the range of from the decomposition temperature of $AgNO_3$ to about 700° C.

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5,051,308

## ABRASION-RESISTANT PLASTIC ARTICLES

**Clive W. Reed, Scotia; Stefan J. Rzad, Rexford, and John C. Devins, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 336,277, Apr. 11, 1989, Pat. No. 4,927,704.**
**This application Jan. 25, 1990, Ser. No. 469,983**
**Int. Cl.[5] B32B** *27/30, 27/08*
**U.S. Cl. 428—412** **9 Claims**

1. An article comprising a plastic substrate and a coating disposed thereon, wherein said coating is characterized by a gradual transition from a composition consisting essentially of an interfacial material closest to the surface of the substrate to a composition consisting essentially of an abrasion-resistant material on the outer surface of said coating;

said interfacial material being selected from the group consisting of polymerization products of organosilicon, organometallic, acrylic and olefin materials, and said abrasion-resistant material being selected from the group consisting of silicon dioxide, silicon nitride, silicon oxynitride, silicon carbide, silicon carbonitride, boron oxide, boron nitride, aluminum oxide, aluminum nitride, titanium dioxide, tantalum oxide, iron oxide, germanium oxide, germanium carbide and mixtures thereof.



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5,051,309

## ANTI-DAZZLING POLYCARBONATE POLARIZING PLATE

**Takao Kawaki; Ryozo Kawai; Katsushige Hayashi, and Masaki Nagata, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Tokyo, Japan**

**Filed Apr. 20, 1990, Ser. No. 512,182**
**Claims priority, application Japan, Apr. 27, 1989, 1-105853**
**Int. Cl.[5] B32B** *27/36;* **G02B** *27/28, 5/30*
**U.S. Cl. 428—332** **7 Claims**

1. An anti-dazzling polycarbonate polarizing plate comprising a polarizing layer having a thickness of from about 20 to about 120 micrometers comprising a polyvinyl alcohol-type film having a dichroic substance adsorbed on and oriented in the polyvinyl alcohol-type film, and a polycarbonate sheet having a retardation value of at least 2000 nm bonded to one or both surfaces of the polarizing layer.

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5,051,310

## TEXTURED POLYURETHANE MOLDED ARTICLES HAVING MULTIPLE SHEET LAYERS

**Peter Horn, Heidelberg; Erhard Reich, Damme, and Rainer Henning, Muenster, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jun. 14, 1989, Ser. No. 365,972**
**Claims priority, application Fed. Rep. of Germany, Jun. 18, 1988, 3820704**
**Int. Cl.[5] B32B** *27/40*
**U.S. Cl. 428—423.3** **7 Claims**

1. Textured polyurethane molded articles having multiple sheet layers, comprising:

(a) an outer coating layer;

(b) an extensible middle layer of a sheet containing urethane and/or urea groups and having a thickness of from about 10 μm to about 20,000 μm; and

(c) a backing layer made from noncellular or cellular urethane;

wherein the middle layer (b) comprising a sheet containing urethane and/or urea groups is prepared by curing at from 60° to 150° C. a heat curable mixture, storage stable at room temperature, which comprises:

(i) an organic polyisocyanate;

(ii) at least one compound having at least two hydrogen atoms reactive to isocyanate groups and having an average molecular weight of from 250 to 8500,

whereby a room temperature solid organic polyisocyanate (i), in the form of distinct particle shaving a particle diameter of from 0.1 to 150 microns, is deactivated on the particle surface by a chemical reaction with a deactivating agent so that from 0.1 to 20 equivalent percent of the total available isocyanate groups from (i) are reacted with the deactivating agent and the resulting surface modified polyisocyanate is dispersed into at least one compound having two hydrogen atoms reactive to isocyanate groups;

(iii) chain extending agents and/or cross-linking agents having an average molecular weight of from 62 to 500 and having an average functionality of from 2 to 4; and

(iv) catalysts.

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5,051,311

## SILICONE CORROSION PROTECTION COATING HAVING EXTENDED BATH LIFE

**Paul J. Popa, Bay County; Arthur J. Tselepis, and Harold L. Vincent, both of Midland County, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Mar. 1, 1990, Ser. No. 487,329**
**Int. Cl.[5] B32B** *9/04*
**U.S. Cl. 428—447** **28 Claims**

1. A curable composition comprising:

(I) from about 10 to about 90 parts by weight of a liquid organopolysiloxane copolymer, prepared by a method comprising (A) forming a homogeneous mixture having an acid number greater than zero and consisting essentially of (a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of $R_3SiO_{1/2}$ siloxane units and $SiO_{4/2}$ siloxane units wherein the ratio of said $R_3SiO_{1/2}$ units to said $SiO_{4/2}$ units has a value of 0.6:1 to 0.9:1 and each R denotes, independently, a monovalent hydrocarbon radical and (b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a monovalent hydrocarbon radical, there being an average of at least one silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and (B) heating said homogeneous mixture to remove substantially all of said organic solvent therefrom;

(II) from about 90 to about 10 parts by weight of a hydroxy-functional diorganopolysiloxane having the average formula $(HO)R'''_2SiO(R'''_2SiO)_cSiR'''_2(OH)$ wherein R''' is a group selected from alkyl, cycloalkyl, haloalkyl, aromatic or haloaromatic radicals and c has a value sufficient to provide a viscosity of about 1 to about 500 Poise at 25° C. for said diorganopolysiloxane;

(III) from about 1 to about 10 parts by weight, per 100 parts of said component (I) plus component (II), of at least one organosilane having the formula $QSi(OR'''')_3$ wherein the group Q is selected from vinyl, 3-glycidoxypropyl, 3-methacryloxypropyl or 3-(N-styrylmethyl-2-aminoethylamino)-propyl hydrochloride groups and R'''' is selected from alkyl groups having 1 to 4 carbon atoms, alkoxyalkyl groups having a total of up to 5 carbon atoms or an acetyl group;

(IV) from about 1 to about 10 parts by weight, per 100 parts of said component (I) plus component (II), of a trialkyl orthoformate in which the alkyl groups contain 1-3 carbon atoms;

(V) from about 4 to about 10 parts by weight, per 100 parts of said component (I) plus component (II), of an organic titanate selected from the group consisting of $Ti(OR'''')_4$ and $(AcAc)Ti(OR'''')_2$, in which R'''' is an alkyl radical having 3 to 8 carbon atoms and AcAc denotes an acetylacetonate group; and

(VI) a sufficient amount of a condensation catalyst to cure said composition.

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5,051,312

## MODIFICATION OF POLYMER SURFACES

**Klas G. M. Allmér, Stockholm, Sweden, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 29, 1990, Ser. No. 500,830**
**Int. Cl.[5] B32B** *15/08*
**U.S. Cl. 428—458** **37 Claims**

1. A process for modifying polymer surfaces, comprising, exposing an organic modifier to actinic radiation while a polymer surface is in contact with said organic modifier, provided that the oxidation potential of the modifier minus the reduction potential of the polymer minus the excitation energy of the modifier is less than zero, further provided that said actinic radiation is of a wavelength that is absorbed by said modifier, further provided said polymer does not contain ethylenic unsaturation, and further provided that such modifier does not modify the polymer surface in the absence of actinic radiation:

34. The process as recited in claim 1 comprising the further step of metalizing the modified polymer surface.

35. The product of the process of claim 34.

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5,051,313

## HOT ROLL FUSERS COMPRISING POLYARYLENE ELASTOMERS

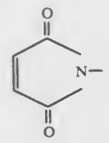
James Economy; James L. Hedrick, Jr., both of San Jose, and Jeffrey W. Labadie, Campbell, all of Calif., assignors to Lexmark International, Inc., Greenwich, Conn.

Continuation of Ser. No. 302,501, Jan. 26, 1989, abandoned. This application Jul. 31, 1990, Ser. No. 561,494

Int. Cl.[5] B32B *7/00, 9/04, 27/00*

U.S. Cl. 428—500 3 Claims

1. A hot roll fuser having a coating on its surface, said coating having a matrix which is an elastomer having a glass transition between 60° C. and 160° C. and a structure represented by the formula X-(-Ar—Y-)-Ar—X wherein Ar is an aromatic ring structure, Y is O, S, C=O, $SO_2$, $C(CH_3)_2$, $C(CF_3)_2$, $CH_2$ or $(CF_2)_n$ and X is —O—C≡N, —C≡CH or



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5,051,314

## LAMINATE FOR PROTECTING OPTICAL RECORDING LAYER

Rinjiro Ichikawa, and Kenji Hashimoto, both of Tokyo, Japan, assignors to Fujimori Kogyo Co., Ltd., Tokyo, Japan

PCT No. PCT/JP88/01285, § 371 Date Aug. 17, 1989, § 102(e) Date Aug. 17, 1989, PCT Pub. No. WO89/06036, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 19, 1988, Ser. No. 400,119

Claims priority, application Japan, Dec. 19, 1987, 62-321657

Int. Cl.[5] B32B *27/30;* G11B *7/24;* B41M *5/26*

U.S. Cl. 428—522 2 Claims

1. A laminate for protecting an optical recording layer, comprising:

an organic solvent-resistant synthetic resin layer comprising a resin selected from the group consisting of phenoxy ether crosslinking resin, polyparabanic acid resin and polyacrylonitrile resin, said layer being formed by casting and disposed on the optical recording layer; and

a transparent and optically isotropic synthetic resin sheet disposed on said organic solvent-resistant synthetic resin layer,

wherein said laminate has a retardation value of not more than 100 nm.

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5,051,315

## COMPACTING SCRAP METAL IN A TUBE FOR RECYCLING

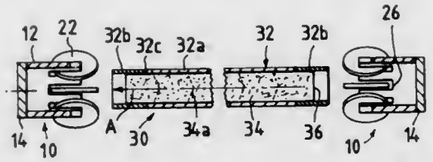
Antonino G. Cacace, Swansea, United Kingdom, assignor to Camborne Industries PLC, Neath, United Kingdom

Filed Sep. 21, 1990, Ser. No. 586,540

Int. Cl.[5] B22F *7/00*

U.S. Cl. 428—549 6 Claims

1. A billet comprising a mass of compressed swarf jacketed in a tubular jacket, wherein adjacent at least one end of the billet a number of substantially similar indentations are formed in the jacket, each of which indentations terminates at a terminal position spaced from the said one end of the billet and




which increases in depth from the terminal position to the said one end of the billet.

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5,051,316

## OVERLAY ALLOY OR PLAIN BEARING

Takashi Suzuki, Shizuoka, Japan, assignor to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed May 24, 1990, Ser. No. 527,984

Claims priority, application Japan, May 25, 1989, 1-130229

Int. Cl.[5] B32B *15/01;* C22C *11/00, 11/08*

U.S. Cl. 428—645 10 Claims

1. A plain bearing comprising a backing, a lining and an overlay layer formed on or over said lining, wherein said overlay layer consists essentially of an alloy consisting of from 3 to 20% by weight of In, from 0.5 to 9% by weight of Sb, and the balance is Pb and unavoidable impurities.

6. A plain bearing comprising a backing, a lining, and an overlay layer formed on said lining, wherein said overlay layer consists essentially of an alloy consisting of from 3 to 20% by weight of In, from 0.5 to 9% by weight of Sb, from 0.1 to 5% by weight of at least one element selected from the group consisting of Ag, Cu, Ni, and Mn, and the balance is Pb and unavoidable impurities.

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5,051,317

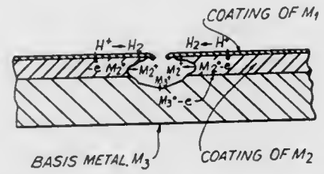
## MULTILAYERED ELECTROPLATING PROCESS UTILIZING FINE GOLD

Hamilton Solidum, Dayton, N.J., assignor to Krementz & Co. Inc., Newark, N.J.

Filed Jan. 3, 1990, Ser. No. 460,359

Int. Cl.[5] B32B *15/01, 15/20;* C25D *5/10, 5/12*

U.S. Cl. 428—671 7 Claims




1. A process for inhibiting corrosion which affects jewelry products wherein a bright nickel layer and a base metal are insulated from each other by first electrodepositing a layer of fine gold upon the base metal, second electrodepositing a layer of bright nickel upon the fine gold electrodeposited layer, and third electrodepositing a layer of fine gold upon the bright nickel layer.

5. An article of jewelry having a substrate of brass, having electroplated upon the substrate metallic layers comprised of:

a) a first layer of fine gold;

b) a second layer of bright nickel;

c) a third layer of fine gold; whereby the electroplating of said layers inhibits the onset of corrosion which affects the article.



5,051,318

## MAGNETIC RECORDING MEDIUM CONTAINING AN ORGANIC SILICONE COMPOUND HAVING BRANCHED CHAW SATURATED HYDROCARBON GROUPS

Yasuo Nishikawa, and Tsutomu Okita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

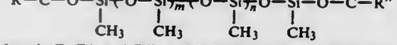
Filed Oct. 18, 1999, Ser. No. 423,289

Claims priority, application Japan, Oct. 18, 1988, 63-260502

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—692 8 Claims

1. A magnetic recording medium comprising a non-magnetic support having thereon a magnetic layer comprising ferromagnetic particles dispersed in a binder, said magnetic layer containing an organic silicone compound represented by formula (I):



(I)

wherein R, R', and R" each is independently selected from the group consisting of $—CH(C_6H_{13})C_8H_{17}$, $—CH(C_7H_{15})C_9H_{19}$, $—CH(C_8H_{17})C_{10}H_{21}$, and $—CH(C_{10}H_{21})C_{12}H_{25}$; m represents an integer of 1 to 100; n represents an integer of 0 to 250; $m+n \leqq 300$; and $m \geqq n/5$.

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5,051,319

## MAGNETIC RECORDING TAPE CONTAINING LOW LEVELS OF COMPOUNDS WITH MOLECULAR WEIGHTS BETWEEN SPECIFIED LIMITS DETERMINED FROM GEL PERMEATION CHROMATOGRAPHY OF TAPE EXTRACT

Sadamu Kuse, Minoo; Kimihiko Kaneno, Nagaokakyo, and Seigi Kawarai, Ashiya, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Feb. 9, 1990, Ser. No. 477,444

Claims priority, application Japan, Feb. 11, 1989, 1-31738

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—694 3 Claims

1. A magnetic recording tape comprising a non-magnetic substrate, a magnetic layer which comprises magnetic powder and a binder resin coated on one surface of said substrate and a back coating layer which comprises non-magnetic powder and a binder resin coated on the opposite surface of said substrate, wherein an amount of compounds having a molecular weight of 1000 to 5000, as converted to a polystyrene molecular weight, extracted with tetrahydrofuran at 23°±2° C. for 24 hours, and converted to a polystyrene extraction amount, per 3 μm thickness from the magnetic layer $W_M$ and per 1 μm thickness from the back coating layer $W_b$, are both less than 200 mg/m$^2$.

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5,051,320

## MAGNETIC RECORDING MEDIUM

Hiroo Inaba; Shinji Saito, and Hiroshi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 13, 1989, Ser. No. 309,580

Claims priority, application Japan, Feb. 12, 1988, 63-30309

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—215 12 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a lower magnetic layer having a thickness of 2.5 μm or higher and an upper magnetic layer having a thickness of 2 μm or lower in this order, wherein both the upper and lower magnetic layers contain ferromagnetic particles, and the lower magnetic layer contains carbon black having an average primary particle diameter of less than 20 mμ in an amount of from 1.0 to 20 parts by weight per 100 parts by weight of the ferromagnetic particles present in the lower magnetic layer, and the upper magnetic layer contains carbon black having an average primary particle diameter of at least 40 mμ but less than 80 mμ in an amount of from 0.1 to 10.0 parts by weight per 100 parts by weight of the ferromagnetic particles present in the upper magnetic, but less than the amount of carbon black used in the lower magnetic layer.

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5,051,321

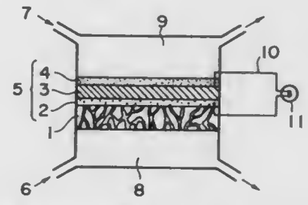
## SOLID OXIDE FUEL CELL AND METHOD OF MANUFACTURING THE SAME

Niroh Kitagawa, and Masayuki Kitoh, both of Tokyo, Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed Jul. 24, 1990, Ser. No. 557,527

Int. Cl.[5] H01M *8/12*

U.S. Cl. 429—30 11 Claims




1. A solid oxide fuel cell comprising:

a substrate, said fuel cell having a fuel electrode layer, an electrolyte layer and an air electrode layer, said layers being superimposed to form an integral unit on said substrate;

a first region filled with air or oxygen; and

a second region filled with a fuel gas, said first and second regions being separated from each other by said fuel cell unit,

said substrate having a coefficient of thermal expansion which is substantially equal to that of said electrolyte layer,

said electrolyte layer having been formed by spray coating which is subsequently subjected to heat treatment.

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5,051,322

## THERMAL INSULATION

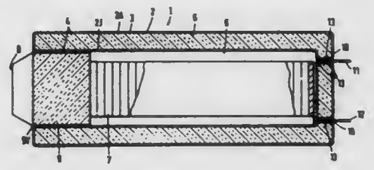
Dieter Hasenauer, Weinheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 884,061

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524706

Int. Cl.[5] H01M *10/50*

U.S. Cl. 429—120 2 Claims

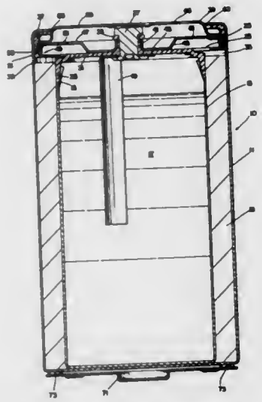


1. Thermal insulation, particularly adapted for enclosing high temperature apparatus and retarding heat loss therefrom, comprising: a double walled housing surrounding an interior space, said double walls spaced apart to form a space which is filled with insulating material and also evacuated, feedthroughs between the interior space of the housing and the outer area of the housing with each feedthrough having a boundary wall mechanically extended only to the housing

walls, in the form of a cylindrical bellows made of a thermally poorly conducting, very thin material connected vacuum tight to the housing walls, and a closure area of the housing free of feedthroughs.

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5,051,323
ROLLBACK INNER COVER
Katherine A. Murphy, Medina, Ohio, assignor to Eveready Battery Company, Inc., St. Louis, Mo.
Filed Apr. 13, 1990, Ser. No. 508,653
Int. Cl.[5] H01M 2/04, 2/06
U.S. Cl. 429—165 19 Claims

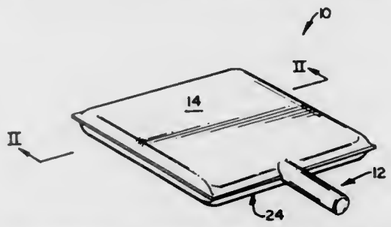


12. An improved galvanic cell comprising:
a container for holding the active components of a galvanic cell and for forming an external electrode for said galvanic cell;
an electrically non-conductive sealing member for one end of said metal container, said sealing member having an upstanding tubular hub portion and an upstanding peripheral skirt portion for contacting the interior of said metal container;
a cover member for sealing said galvanic cell, said cover member having a reverse curved peripheral portion for compressing said upstanding skirt portion of said sealing member against the inner wall of said container and an upstanding annular portion for compressing against said upstanding tubular hub portion on said sealing member; and
a metallic conductive member extending through said tubular hub portion in said seal and said upstanding annular portion of said cover member and being sealed in place by said tubular hub portion of said sealing member and said upstanding annular portion of said cover member, said metallic conductive member forming a second terminal for said galvanic cell.

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5,051,324
ELECTROCHEMICAL CELL
Roger J. Bones, Abingdon; James H. Duncan, Stafford, and Ivor E. Denton, Wantage, all of England, assignors to Lilliwyte Societe Anonyme, Luxembourg, Luxembourg
Filed Apr. 4, 1990, Ser. No. 504,792
Claims priority, application United Kingdom, Apr. 6, 1989, 8907748
Int. Cl.[5] H01M 10/39
U.S. Cl. 429—193 12 Claims

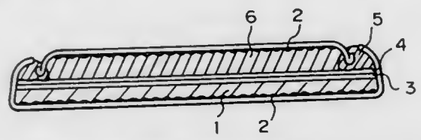
1. A method of making a laterally flattened envelope of solid electrolyte for use as a holder for an electrode in an electrochemical cell, the method comprising the steps of
formulating a mouldable mixture comprising the solid electrolyte or a precursor thereof in particulate form together with a binder having thermoplastic properties and a binder having setting properties;
forming the mixture into sheet material;
forming the sheet material into a laterally flattened envelope having a pair of major faces formed from said sheet material, the major faces being joined to each other along a peripheral edge of the envelope;
placing spacing and reinforcing means between the major faces before they are joined to each other at the peripheral edge of the envelope, the spacing and reinforcing means




being shaped and located to space the major faces apart and to reinforce the envelope against damage caused by forces exerted on said major faces tending to urge them towards each other, and to provide a hollow interior for the envelope;
treating the envelope to cure the setting binder or binders;
heating the cured envelope to volatilize the binder or binders; and
sintering the envelope after the binder or binders have been volatilized to convert the envelope into a sintered refractory artefact.

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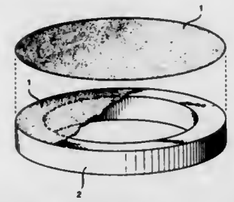
5,051,325
SECONDARY BATTERY
Toshikazu Shishikura; Masataka Takeuchi; Yoshihiko Murakoshi; Hiroshi Konuma, and Mutsumi Kameyama, all of Tokyo, Japan, assignors to Showa Denko K.K. and Hitachi Ltd., both of Tokyo, Japan
Filed Nov. 21, 1988, Ser. No. 274,255
Claims priority, application Japan, Nov. 20, 1987, 62-291804; Dec. 1, 1987, 62-305295; Apr. 21, 1988, 63-98743; Apr. 22, 1988, 63-99614; Jul. 7, 1988, 63-169384
Int. Cl.[5] H01M 10/40
U.S. Cl. 429—197 15 Claims




1. A secondary battery comprising a positive electrode, a negative electrode and a non-aqueous electrolyte, wherein the positive electrode comprises a sodium-cobalt oxide as the main component, the negative electrode is a composite body comprising at least 80% by weight of a sodium alloy, 3 to 20% by weight of a carbon material and 1 to 8% by weight of a binder, and the non-aqueous electrolyte comprises a sodium salt and an ether compound.



5,051,326
X-RAY LITHOGRAPHY MASK AND DEVICES MADE THEREWITH
George K. Celler, New Providence, and Lee E. Trimble, Hillsborough, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed May 26, 1989, Ser. No. 358,312
Int. Cl.[5] G03F 9/00
U.S. Cl. 430—5 5 Claims



1. A process for fabricating an exposure mask suitable for X-ray lithography, said mask comprising a region of X-ray attenuating material on an essentially uninterrupted polycrystalline silicon membrane, said process comprising the steps of 1) forming a body comprising a polycrystalline silicon region on a first surface of a substrate comprising a silicon oxide containing composition, 2) covering a peripheral region of said substrate on the second surface opposing said first surface, 3) subjecting said body to an etchant that selectively etches said silicon oxide containing composition relative to said silicon such that the uncovered region of said substrate is etched to form said membrane and 4) at some point during said process forming said X-ray attenuating region.

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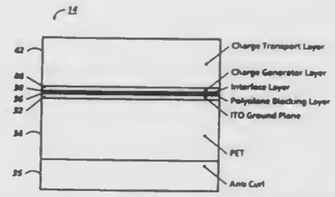
5,051,327
METHOD FOR OIL-DENSENSITIZATION TREATMENT OF LITHOGRAPHIC PRINTING PLATE
Sadao Osawa, Shizuoka; Hiromichi Tachikawa, and Hiroaki Yokoya, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 2, 1989, Ser. No. 318,216
Claims priority, application Japan, Mar. 2, 1988, 63-49353
Int. Cl.[5] G03G 13/26
U.S. Cl. 430—49 6 Claims

1. A method for oil-desensitization treatment of a lithographic printing plate having image areas of toner image formed by an electrophotographic process on a photoconductive layer provided on an electrically conductive substrate, and non-image areas of the electrically conductive substrate, which method comprises treating the plate with an aqueous solution containing a silicate represented by the formula $SiO_2/M_2O$ (wherein M is an alkali metal atom) and a water-soluble resin.

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5,051,328
PHOTOSENSITIVE IMAGING MEMBER WITH A LOW-REFLECTION GROUND PLANE
John R. Andrews, and Yonn K. Simpson, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 15, 1990, Ser. No. 523,639
Int. Cl.[5] G01D 15/14; G03G 15/28, 5/043
U.S. Cl. 430—56 2 Claims

1. A photosensitive imaging member adapted to be exposed by radiation from a coherent light source, said member comprising at least a transparent photoconductive charge transport layer overlying a charged generator layer and a conductive ground plane, said ground plane comprising a transparent low-reflection material, and further including a substrate comprising a dielectric substrate layer with an anti-curl coating on




the bottom surface, the anti-curl coating being adapted to absorb light reflected from the anti-curl layer/air interface.

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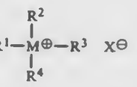
5,051,329
REVERSAL DEVELOPMENT OF LATENT ELECTROSTATIC IMAGES ON XEROPRINTING MASTERS
Edward B. Caruthers, West Chester; Michael L. Levin, Downingtown, both of Pa.; Catharine E. Looney, Centerville, Del.; Steven P. Schmidt, Chester Springs, Pa., and Dana S. Smith, Wilmington, Del., assignors to DXImaging, Lionville, Pa.
Filed Dec. 19, 1989, Ser. No. 452,994
Int. Cl.[5] G03G 13/10
U.S. Cl. 430—100 29 Claims

1. A process for reversal development of a latent electrostatic image in a layer on a conductive support by developing with an electrostatic developer having electrostatically charged toner particles comprising in order
(a) exposing imagewise to generate permanent persistent areas in the layer having different rates of charge decay and/or charge acceptance,
(b) charging the layer,
(c) allowing formation of an electrostatic image corresponding to the exposed imagewise generated areas by differential charge decay and/or charge acceptance,
(d) creating an electrical field to attract toner particles preferentially to the areas of lesser charge, and
(e) developing the areas of lesser charge with electrostatically charged toner particles having the same polarity as that of the charged layer.

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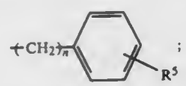
5,051,330
FLUORINATED ONIUM SALTS AS TONER ELECTROSTATIC TRANSFER AGENTS AND CHARGE CONTROL AGENTS
Peter S. Alexandrovich; Douglas E. Bugner, and Lawrence P. DeMejo, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 15, 1989, Ser. No. 450,960
Int. Cl.[5] G03G 9/0979
U.S. Cl. 430—110 11 Claims

1. In a process for increasing the electrostatic transfer efficiency of toner powder from the surface of an element to the surface of a receiver sheet, the improvement which comprises carrying out said transfer in the presence of at least one fluorinated onium salt that is on the surface of the element or incorporated in the toner powder, said fluorinated onium salt having the formula:

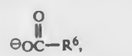


wherein:
M is selected from the group consisting of nitrogen and phosphorous; $R^1$, $R^2$, $R^3$, and $R^4$ are each selected from

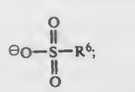
the group consisting of hydrogen, alkyl of 1 through 30 carbon atoms, cycloalkyl of 3 through 30 carbon atoms, fluorinated and perfluorinated alkyl of 1 through 30 carbon atoms, fluorinated and perfluorinated cycloalkyl of 3 through 30 carbon atoms, aryl of 6 through 18 carbon atoms, and alkaryl of the formula:



$R^5$ is selected from the group consisting of hydrogen, alkyl of 1 through 30 carbon atoms, cycloalkyl of 3 through 30 carbon atoms, fluorinated and perfluorinated alkyl of 1 through 30 carbon atoms, and partially fluorinated and perfluorinated cycloalkyl of 3 through 30 carbon atoms;
X is a monovalent anion selected from the group consisting of halide; carboxylate of the formula:



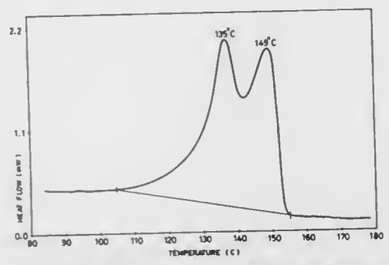
phosphate, borate, sulfate, and sulfonates of the formula:



$R^6$ is selected from the group consisting of alkyl of 1 through 30 carbon atoms, cycloalkyl, cycloalkyl of 3 through 30 carbon atoms, fluorinated and perfluorinated alkyl of 1 through 30 carbon atoms, and fluorinated and perfluorinated cycloalkyl of 3 through 30 carbon atoms; and
n is an integer of 0, 1, or 2;
wherein two or more of $R^1$ and $R^6$ can be interconnected together to form cyclic groups and/or inner salts; provided that at least one of $R^1$ through $R^6$ is selected from the group consisting of partially fluorinated and perfluorinated alkyl of 1 through 30 carbon atoms and partially fluorinated and perfluorinated cycloalkyl of 3 through 30 carbon atoms.

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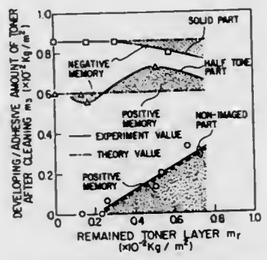
**5,051,331**
**TONER**
**Kiichiro Sakashita, Inagi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Dec. 28, 1989, Ser. No. 458,369**
**Claims priority, application Japan, Dec. 29, 1988, 63-335146; Dec. 8, 1989, 1-317537**
**Int. Cl.[5] G03G *9/00, 5/00***
**U.S. Cl. 430—110** **17 Claims**




1. A toner for developing electrostatic latent images, comprising a binding resin and a low-molecular weight olefin copolymer, said low-molecular weight olefin copolymer having at least two olefin monomer repeating units and having two or more peaks of melting at temperatures ranging between 90° C. and 170° C.

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**5,051,332**
**ELECTROPHOTOGRAPHIC IMAGE FORMING METHOD USING ONE COMPONENT TONER AND SIMULTANEOUS CLEANING AND DEVELOPING**
**Masahiro Hosoya, Okegawa; Mitsunaga Saito, Tokyo; Yoshimitsu Ohtaka, Mishima; Mitsuharu Endo, Susono, and Yukio Futamata, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa and Tokyo Electric Co., Ltd., Tokyo, both of, Japan**
**Filed Mar. 9, 1990, Ser. No. 489,818**
**Claims priority, application Japan, Mar. 10, 1989, 1-59411; Sep. 28, 1989, 1-253070**
**Int. Cl.[5] G03G *13/24, 13/09***
**U.S. Cl. 430—122** **10 Claims**




1. An image forming method, comprising the steps of:
forming a latent image on a latent image holder, the surface of the latent image holder moving at a linear velocity Vp;
forming a developing agent layer including a one component developing agent on a developing agent holder, the surface of the developing agent holder moving at a linear velocity Vd, wherein the developing agent holder is arranged to contact the latent image holder;
developing the latent image on the latent image holder by contacting the developing agent layer on the developing agent holder;
transferring the developed image onto an image supporter and
cleaning a developing agent adhered to a non-image part of the latent image holder after the step of transferring, the cleaning step being simultaneously carried out with the step of the developing,
wherein the linear velocity Vd, the linear velocity Vp and an adhering density m of the developing agent layer are set in the range expressed by the following formula:

$$0.5 \leqq (Vd/Vp) \cdot m \leqq 3.0$$

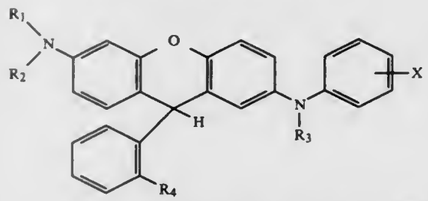
wherein m is expressed in $mg/cm^2$.

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**5,051,333**
**OPTICAL IMAGE-RECORDING MATERIAL**
**Naoto Yanagihara; Ken Iwakura; Tosiaki Endo, and Keiso Saeki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Jun. 21, 1990, Ser. No. 541,865**
**Claims priority, application Japan, Jun. 22, 1989, 1-160155; Mar. 8, 1990, 2-57659**
**Int. Cl.[5] G03C *1/72***
**U.S. Cl. 430—438** **11 Claims**

1. An optical image-recording material comprising:
(a) microcapsules, in which at least one leuco dye capable of forming a color by oxidation and at least one photo-oxidizing agent are enclosed together, and (b) at least one reducing agent not enclosed in said micro-capsules, or
(c) microcapsules, in which at least one reducing agent is enclosed, and (d) both at least one leuco dye capable of forming a color by oxidation and at least one photo-oxidizing agent not enclosed in said microcapsules,
wherein said microcapsules have capsule walls made from a material which lowers its permeability barrier to at least one component selected from said photo-oxidizing agent and said reducing agent when the capsule wall material is heated above its glass transition temperature, and said leuco dye is represented by formula (I):



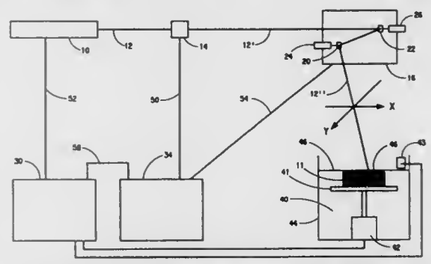


(I)

wherein $R_1$ and $R_2$, which may be the same or different, each represents an alkyl group, an alkenyl group, an alkynyl group or an aryl group, $R_3$ represents an alkyl group, $R_4$ represents an alkyl group, a carbamoyl group, a substituted amino group or —$COOR_5$ (wherein $R_5$ is an alkyl group), and X represents an electron attracting group.

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**5,051,334**
**SOLID IMAGING METHOD USING PHOTOHARDENABLE COMPOSITIONS CONTAINING HOLLOW SPHERES**
**Roxy N. Fan, E. Brunswick, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Filed Apr. 21, 1989, Ser. No. 341,511**
**Int. Cl.[5] G03C *5/00***
**U.S. Cl. 430—269** **8 Claims**



1. A method for accurately fabricating an integral three dimensional object from successive layers of a photohardenable liquid composition comprising the steps of:
(a) forming a layer of a photohardenable liquid;
(b) photohardening at least a portion of the layer of photohardenable liquid by exposure to actinic radiation;
(c) introducing a new layer of photohardenable liquid onto the layer previously exposed to actinic radiation; and
(d) photohardening at least a portion of the new liquid layer by exposure to actinic radiation, with the requirement that the photohardenable composition comprises an ethylenically unsaturated monomer, photoinitiator, and radiation deflecting matter comprising hollow spheres, the deflecting matter having a first index of refraction, the rest of the composition having a second index of refraction, the absolute value of the difference between the first index of refraction and the second index of refraction being different than zero; and
(e) successively repeating steps (c) and (d) until the three dimensional object is complete.

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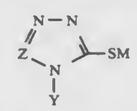
**5,051,335**
**HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL WITH PAPER SUPPORT**
**Masatoshi Kato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Jan. 26, 1989, Ser. No. 301,555**
**Claims priority, application Japan, Jan. 26, 1988, 63-14892**
**Int. Cl.[5] G03C *5/54, 1/87, 5/26, 7/30***
**U.S. Cl. 430—203** **12 Claims**

1. A process for forming an image which comprises imagewise exposing a heat developable light-sensitive material comprising light-sensitive silver halide emulsion layers on a paper support, and thereafter heating the same to develop the image, wherein at least one subbing layer comprising a hydrophilic binder and at least one material capable of inhibiting fog selected from a light-insensitive silver halide, colloidal silver, an organic silver salt, activated carbon powder and a porous silicon dioxide powder is interposed between the undermost layer among said light-sensitive silver halide emulsion layers and said paper support, whereby fog is inhibited.

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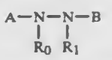
**5,051,336**
**NEGATIVE TYPE SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING IMAGE USING THE SAME**
**Nobuaki Inoue; Senzo Sasaoka, and Tetsuo Yoshida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Continuation of Ser. No. 110,386, Oct. 20, 1987, abandoned. This application May 11, 1990, Ser. No. 522,400**
**Claims priority, application Japan, Oct. 20, 1986, 61-249161**
**Int. Cl.[5] G03C *1/28, 1/10, 1/34, 5/29***
**U.S. Cl. 430—264** **9 Claims**

1. A negative type silver halide photographic material which comprises a support having provided thereon at least one silver halide emulsion layer containing silver halide grains sensitized with gold and sulfur sensitizers, said emulsion layer or at least one other hydrophilic colloid layer containing at least one high contrast-imparting hydrazine derivative and at least one compound represented by the following general formula (I):



(I)

wherein Z represents N or C—X wherein X represents a substituted or unsubstituted alkyl or aryl group, Y represents a substituted or unsubstituted alkyl or aryl group, and M represents a hydrogen atom, a metallic atom, or ammonium which may be substituted; wherein said hydrazine derivative is represented by the general formula (II):



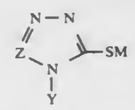
wherein A represents a substituted or unsubstituted aliphatic or aromatic group, B represents a formyl group, an acyl group, an alkysulfonyl group, an arylsulfonyl group, an arylsulfinyl group, a carbomoyl group, a sulfomoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfinamoyl group, an alkoxysulfonyl group, a thioacyl group, a thiocarbamoyl group, or a heterocyclic group; and both $R_0$ and $R_1$ represents hydrogen atoms or one of $R_0$ and $R_1$ represents a hydrogen atom and the other represents a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or a substituted or unsubstituted acyl group; and B, $R_1$ and the nitrogen atom to which they are bonded may form a partial structure —N=C< of hydrazone.

9. A method of forming a superhigh contrast negative image

VOL 1130 ISS 4 SE 24 1991 UMI

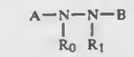


comprising developing an imagewise exposed silver halide photographic material with a developing solution containing sulfite ions in an amount of at least about 0.15 mol per liter and having a pH of 10.5 to 12.3, wherein said silver halide photographic material comprises a support having provided thereon at least one silver halide emulsion layer containing a silver halide which has been subjected to gold sensitization and sulfur sensitization, and said silver halide emulsion layer or at least one other hydrophilic colloid layer contains at least one high contrast-imparting hydrazine derivative and at least one compound represented by the following general formula (I):



(I)

wherein Z represents N or C—X wherein X represents a substituted or unsubstituted alkyl or aryl group, Y represents a substituted or unsubstituted alkyl or aryl group, and M represents a hydrogen atom, a metallic atom, or ammonium which may be substituted; wherein said hydrazine derivative is represented by the general formula (II):



(II)

wherein A represents a substituted or unsubstituted aliphatic or aromatic group, B represents a formyl group, an acyl group, an alkysulfonyl group, an arylsulfonyl group, an arylsulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfinamoyl group, an alkoxysulfonyl group, a thioacyl group, a thiocarbamoyl group, or a heterocyclic group; and both $R_0$ and $R^1$ represents hydrogen atoms or one of $R_0$ and $R_1$ represents a hydrogen atom and the other represents a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, or a substituted or unsubstituted acyl group; and B, $R_1$ and the nitrogen atom to which they are bonded may form a partial structure —N=C< of hydrazone.

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**5,051,337**

## OPTICAL RECORDING MATERIAL

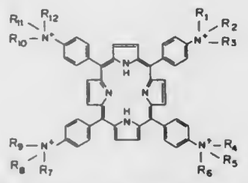
**Kazuaki Sakoda; Kazuhiko Kominami, and Masao Iwamoto, all of Otsu, Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan**

**Continuation of Ser. No. 202,119, Jun. 2, 1988, abandoned. This application Apr. 24, 1990, Ser. No. 517,537**

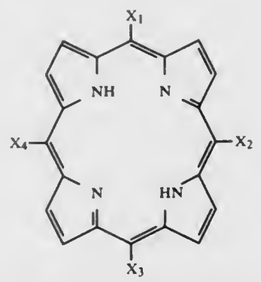
**Claims priority, application Japan, Jun. 10, 1987, 62-143291; Dec. 9, 1987, 62-309448; Dec. 9, 1987, 62-309449**

**Int. Cl.[5] G11C *13/04*; G03C *1/73***

**U.S. Cl. 430—270** **20 Claims**



1. An optical data recording material capable of having an optical memory created by photochemical hole burning, said material being comprised of a composition comprising a guest component dispersed in a host component as main components, wherein the guest component is a porphine derivative having at least one ionic group, represented by the following general formula (I):



(I)

wherein at least one of $X_1$, $X_2$, $X_3$ and $X_4$ is an aryl group having an ionic group or an ionic heterocyclic group having an alkyl group of 1 to 6 carbon atoms, and the other thereof is a hydrogen atom or a non-ionic organic group, and the host component is a polymer selected from the group consisting of water-soluble organic polymers and silica glass.

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**5,051,338**

## METHOD AND APPARATUS FOR FORMING RESIST PATTERN

**Yoshihide Kato, Kawasaki; Kei Kirita, Tokyo; Toshiaki Shinozaki, Yokohama; Fumiaki Shigemitsu, Yokohama; Kinya Usuda, Yokohama, and Takashi Tsuchiya, Urawa, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

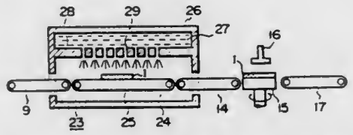
**Continuation of Ser. No. 108,767, Oct. 15, 1987, Pat. No. 4,897,337, which is a continuation of Ser. No. 789,366, Oct. 22, 1985, Pat. No. 4,717,645, which is a continuation of Ser. No. 571,092, Jan. 16, 1984, abandoned. This application Nov. 27, 1989, Ser. No. 441,479**

**Claims priority, application Japan, Jan. 19, 1983, 58-5876; Jan. 19, 1983, 58-5877; Jan. 19, 1983, 58-6984; Jan. 19, 1983, 58-6985**

**The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.**

**Int. Cl.[5] G03C *5/16***

**U.S. Cl. 430—296** **6 Claims**



1. A method for forming a lithographic processed resist pattern for a semiconductor device, comprising the steps of:

applying a resist material selected from the group consisting of a photoresist material, a far ultraviolet sensitive material, an electron beam sensitive resist material, an X-ray sensitive resist material and an ion beam sensitive material to a rigid substrate to form a resist film thereon;

baking said resist film;

cooling said resist film, said cooling being controlled with a cooling means such that an entire area of said resist film is kept at a uniform temperature, said cooling means being a dipping means for dipping said substrate in a cooling liquid;

selectively irradiating a surface of said resist film with at least one member selected from the group consisting of electron beams, light rays, X-rays and ion beams; and

developing said resist film to form a resist pattern.



**5,051,339**

## METHOD AND APPARATUS FOR APPLYING SOLDER TO PRINTED WIRING BOARDS BY IMMERSION

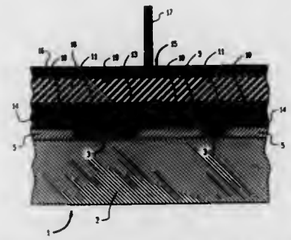
**Dieter Friedrich, and Gitta Friedrich, both of AM Kressenstein 48, D-8500 Nurnberg 90, Fed. Rep. of Germany**

**Filed Mar. 29, 1989, Ser. No. 330,563**

**Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810653**

**Int. Cl.[5] B05D *5/12*; G03C *5/00***

**U.S. Cl. 430—311** **17 Claims**



1. A method for the immersion application of solder to printed wiring boards, comprising the steps of:

a) providing a printed wiring board with electrically conductive regions, which are to be provided with a solder deposit;

b) surrounding said regions with a limiting layer of defined layer thickness for preventing an application of solder, which thickness substantially corresponds to the height of the solder deposit to be produced thus forming voids;

c) immersing the thus-prepared printing wiring board into a soldering bath containing a suitable soldering alloy;

d) covering the voids, filled in the soldering bath with liquid solder and located above the regions to which solder is to be applied, with at least one closure element at a defined contact pressure;

e) removing the covered printed wiring board from the soldering bath;

f) dropping the temperature of the solder trapped in the voids below the setting temperature of the solder alloy;

g) removing the closure element; and

h) optionally, removing the limiting layer.

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**5,051,340**

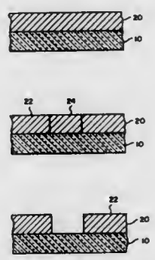
## MASTER FOR OPTICAL ELEMENT REPLICATION

**Yuan S. Tyan, Webster; Kee C. Pan, Pittsford; George R. Olin, Webster, and Thomas Mayer, Honeoye Falls, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 23, 1989, Ser. No. 370,946**

**Int. Cl.[5] G03C *5/00***

**U.S. Cl. 430—321** **2 Claims**



1. A method for forming a stamper for making replicate optical elements, said method comprising the steps of:

a) focusing an information modulated energy beam on a phase-change optical recording layer so as to form a pattern of two different phases in said layer corresponding to said information; and

b) selectively etching away one of said two different phases so as to form a relief pattern corresponding to said information;

c) conductively coating the master produced in step b) and electroplating said conductive coating with nickel; and

d) polishing and peeling the nickel layer formed in step c) from the surface of said master.

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**5,051,341**

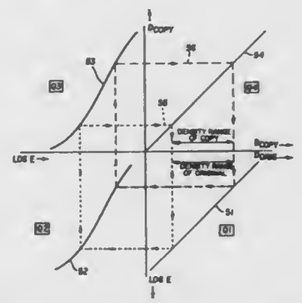
## COLOR IMAGING PROCESS AND APPARATUS

**Annabel A. Muenter, and James C. Owens, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 20, 1989, Ser. No. 424,857**

**Int. Cl.[5] G03C *7/00***

**U.S. Cl. 430—359** **12 Claims**



1. A process for recording a positive or negative continuous tone color copy of a continuous tone original image, comprising the steps of:

providing a photographic element comprising a support having thereon a silver halide emulsion unit capable of forming a yellow image, a silver halide emulsion unit capable of forming a cyan image, and a silver halide emulsion unit capable of forming a magenta image, each image-forming unit having a maximum spectral sensitivity at a different wavelength of radiation, and at least one of the image-forming units having a gamma of greater than about 1.5,

receiving image data representing the densities of the yellow, magenta, and cyan records of the original image,

modifying said image data and using it to control three exposure sources, each emitting radiation in the region of maximum spectral sensitivity for a corresponding one of the image-forming units, so that after exposure, the recorded image density range for at least one of of the yellow, magenta, and cyan image-forming units is substantially the same as the image density range for the corresponding yellow, magenta, and cyan records, respectively, of said original image, and

exposing said photographic element to said exposure sources.

5,051,342

## SILVER HALIDE PHOTOGRAPHIC MATERIALS AND METHOD FOR COLOR DEVELOPMENT THEREOF

Keisuke Shiba; Kazunori Hasebe, and Seiji Ichijima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 326,861, Mar. 22, 1989, abandoned. This application Jul. 5, 1990, Ser. No. 548,433
Claims priority, application Japan, Mar. 22, 1988, 63-67738
Int. Cl.[5] G03C *7/30*
U.S. Cl. 430—383 16 Claims

1. A method of processing a silver halide photographic light-sensitive material having at least one light-sensitive emulsion layer containing surface latent image-type silver halide grains, coated on a reflective support, in which said at least one emulsion layer contains regular crystal grains of silver chloride or silver chlorobromide having a mean silver chloride content of 80 mol % or more on the basis of the total silver halide grains present therein and substantially does not contain silver iodide, and in which a colloidal silver-containing layer is located adjacent to said emulsion layer, wherein at least one of said colloidal silver-containing layer, said emulsion layer and an interlayer therebetween contains at least one mercaptoazole compounds, comprising imagewise exposing said material and then processing said material, with a color developer which does not contain any bromide or sulfite, within 60 seconds.

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5,051,343

## PHOTOGRAPHIC ELEMENTS CONTAINING REMOVABLE COUPLERS

Gregory J. Lestina, Rochester; Jon D. Bass, Webster; John W. Harder, Rochester, and Stephen P. Singer, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 16, 1989, Ser. No. 366,953
Int. Cl.[5] G03C *7/30, 7/32*
U.S. Cl. 430—393 12 Claims

1. A photographic element comprising a support, a silver halide emulsion, and a non-diffusible coupler compound that, during photographic processing is converted to a form that can be removed from the element if it has not reacted with oxidized silver halide color developing agent, the coupler compound having the structure:

COUP-LS-BAL

wherein:

COUP represents a coupler moiety,

LS represents a splittable linking group attached to a coupling position of COUP wherein splitting of the linking group from coupler that has not reacted with oxidized developing agent leaves a residual group on the coupler moiety, and

BAL is a ballast group.

10. A process of forming an image in an imagewise exposed photographic element of claims 1 or 2, which comprises developing the element with a color developing agent to form a visible image and removing from the element coupler compound that has not reacted with oxidized color developing agent.

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5,051,344

## SILVER HALIDE PHOTOGRAPHIC MATERIAL

Koichi Kuno, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 3, 1989, Ser. No. 431,498
Claims priority, application Japan, Nov. 4, 1988, 63-278590
Int. Cl.[5] G03C *5/24*
U.S. Cl. 430—434 11 Claims

1. A silver halide photographic material comprising a support having provided thereon at least one silver halide photosensitive emulsion layer, wherein said silver halide photosensitive emulsion layer contains silver iodobromide grains having a silver iodide content of 0.1 to 4.0 mol %, said grains containing $5\times10^{-9}$ to $1\times10^{-6}$ mole of an iridium compound and $5\times10^{-8}$ to $1\times10^{-3}$ mole of an iron compound per mole of the silver halide in said silver iodobromide grains.

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5,051,345

## SILVER HALIDE REVERSAL PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hideaki Haraga; Masaru Iwagaki, and Atsuo Ezaki, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 208,882, Jun. 20, 1988, abandoned. This application Feb. 8, 1990, Ser. No. 478,709
Claims priority, application Japan, Jun. 21, 1987, 62-153859
Int. Cl.[5] G03C *7/305*
U.S. Cl. 430—505 8 Claims

1. A silver halide reversal photographic light-sensitive material comprising a support having thereon photographic component layers including a first silver halide emulsion layer comprising at least two silver halide emulsion sub-layers which are substantially the same in color sensitivity and different in speed from one another, said first silver halide emulsion layer being red or green sensitive, and

a second silver halide emulsion layer having a color sensitivity different from that of said first silver halide emulsion layer, said second silver halide emulsion layer being a DIR layer which comprises a DIR compound and a silver halide emulsion, said DIR layer not substantially contributing to image formation,

said DIR layer being adjacent, or adjacent with the interposition of an interlayer to said first silver halide emulsion layer, said DIR layer being closer to said support than said first silver halide emulsion layer.

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5,051,346

## LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL COMPRISING LIPOPHILIC COUPLER HYDROPHILIC COUPLER AND DIFFUSION INHIBITOR RELEASING

Mitsuo Fujiwhara, and Takashi Uchida, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 253,875, Oct. 5, 1988, abandoned, which is a continuation of Ser. No. 147,617, Jan. 22, 1988, abandoned, which is a continuation of Ser. No. 35,201, Apr. 6, 1987, abandoned, which is a continuation of Ser. No. 830,639, Feb. 18, 1986, abandoned. This application Aug. 31, 1990, Ser. No. 579,279
Claims priority, application Japan, Feb. 16, 1985, 60-29673
Int. Cl.[5] G03C *7/32, 7/36*
U.S. Cl. 430—544 19 Claims

1. A light-sensitive photographic material, comprising a silver halide emulsion layer containing a first coupler having a lipophilic group and being dispersed in high boiling point organic solvent droplets, a second coupler having at least one sulfonic acid group and being dispersed in an alkaline aqueous solution with the amount of the second coupler relative to the total amount of the first and the second coupler relative to the total amount of the first and the second couplers being 30 mole % or less and a compound capable of releasing a diffusible development inhibiting substance or a precursor thereof in an amount effective to improve sharpness of image when the photographic material is image-wise exposed and then developed of 0.003 to 50 mole % relative to silver.



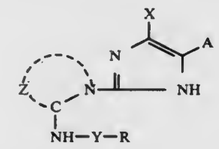
5,051,347

## SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A NOVEL CYAN COUPLER

Takashi Uchida; Toyoaki Masukawa, and Noritaka Nakayama, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 6, 1990, Ser. No. 549,273
Claims priority, application Japan, Jul. 17, 1989, 1-182568
Int. Cl.[5] G03C *7/38*
U.S. Cl. 430—558 19 Claims

1. A silver halide photographic light-sensitive material comprising a support and provided thereon photographic component layers including at least one silver halide light-sensitive emulsion layer containing silver halide grains and a cyan coupler represented by the following Formula I;



wherein A represents an organic group; X represents a hydrogen atom or a group capable of splitting off upon a reaction with an oxidation product of a color developing agent; Z represents a group of atoms capable of forming a five or six-membered heterocyclic ring together with carbon and nitrogen atoms; Y represents a divalent linkage group or a bond; and R represents a hydrogen atom or an organic group.

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5,051,348

## HEAT-DEVELOPABLE COLOR LIGHT-SENSITIVE MATERIAL

Toshiki Taguchi, and Ken Kawata, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

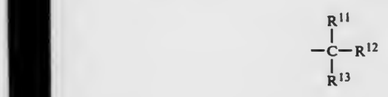
Filed May 25, 1990, Ser. No. 528,382
Claims priority, application Japan, May 25, 1989, 1-131763
Int. Cl.[5] G03C *5/54, 1/34*
U.S. Cl. 430—559 21 Claims

1. A heat-developable color light-sensitive material comprising a support having thereon at least a light-sensitive silver halide, a binder, a dye providing compound capable of releasing or forming a diffusible dye in correspondence or counter-correspondence to a reaction in which silver halide is reduced to silver, a basic metal salt compound which is sparingly soluble in water, and at least one acid precursor compound represented by formula (I):



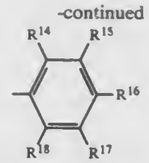
(I)

wherein the total number of carbon atoms included in $R^1$ and $R^2$ is at least 10, and $R^1$ and $R^2$ each represents a group represented by formula (III) or formula (IV):



(III)

-continued



(IV)

wherein $R^{11}$, $R^{12}$, $R^{13}$, $R^{14}$, $R^{15}$, $R^{16}$, $R^{17}$ and $R^{18}$ each represents a substituent, provided that $R^1$ and $R^2$ are selected such that the sum of the aliphatic Taft's constants ($\sigma^*$ value) of the substituents represented by formula (III), the Taft's constants ($\sigma^-$ value) of $R^{14}$ and $R^{18}$, the Hammett's constants ($\sigma_m$ value) of $R^{15}$ and $R^{17}$, and the Hammett's constant ($\sigma_p$ value) of $R^{16}$ is 0 or more.

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5,051,349

## HEAT DEVELOPABLE COLOR PHOTOSENSITIVE MATERIAL WITH SACCHARIDE

Toshiki Taguchi, and Hiroyuki Hirai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1990, Ser. No. 490,199
Claims priority, application Japan, Mar. 9, 1989, 1-57629; Jul. 12, 1989, 1-179667
Int. Cl.[5] G03C *5/54, 1/34*
U.S. Cl. 430—559 13 Claims

1. A heat developable color photographic material comprising a support having thereon at least a photosensitive silver halide, a binder, a base precursor and a dye providing compound capable of releasing or forming a diffusible dye in correspondence or counter-correspondence to reduction of the silver halide to silver, said heat developable color photosensitive material further comprising a compound represented by formula (I):

$$C_{6n}(H_2O)_{5n+1} \quad (I)$$

wherein n represents an integer from 1 to 10.

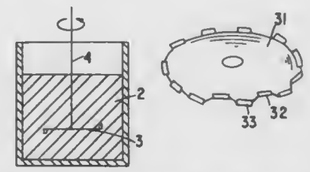
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5,051,350

## PROCESS FOR PREPARING A SILVER HALIDE EMULSION

Fumitaka Terai, Saitama; Hiroyuki Yamagami, Kanagawa; Nobuhiko Uchino, Kanagawa, and Masaki Okazaki, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 12, 1989, Ser. No. 378,931
Claims priority, application Japan, Jul. 12, 1988, 63-171877
Int. Cl.[5] G03C *1/015, 1/38*
U.S. Cl. 430—569 9 Claims




1. A process for preparing a silver halide emulsion, comprising the steps of:

dissolving one or more substantially water-insoluble photographic additives in a heated solution of an organic solvent containing a surfactant having a hydrophillic $-SO_3$ group or $-OSO_3$ group at a temperature of 70° C. to 90° C. to completely dissolve the one or more substantially water-insoluble photographic additives,

cooling the resulting solution to below 40° c. to precipitate crystals,
separating said crystals from the solution,
drying the separated crystals, dispersing said crystals in water, and
adding the resulting dispersion to a silver halide emulsion.

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**5,051,351**

## DYE POLYMERS

**Derrick C. Tabor, Rochester, and Mridula Nair, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 22, 1989, Ser. No. 369,792**
**Int. Cl.[5] G03C** *1/10, 1/12*
**U.S. Cl. 430—570** **7 Claims**

1. A photographic element comprising a support having thereon a silver halide emulsion sensitized with a dye polymer represented by the formula:

$$\leftarrow A_x \leftarrow B_y \leftarrow C_z,$$

B represents a 1 to 100 repeat unit block of amino acid monomer wherein at least 1 of the repeat units in each block are represented by

$$\leftarrow B' \leftarrow \quad | \quad D$$

B' represents an amino acid monomer repeat unit,
C represents a 1 to 100 repeat unit block of an N-substituted amino acid monomer,
D is a dye capable of spectrally sensitizing silver halide,
A represents a 1 to 100 repeat unit block of one or more other monomers,
x represents a mole percent of 0 to 20%,
y represents a mole percent of 1 to 50%,
and z represents a mole percent of 50 to 99%.

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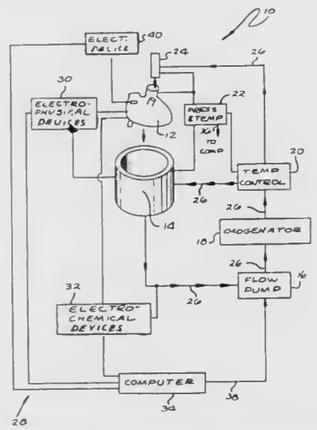
**5,051,352**

## APPARATUS AND METHOD OF PRESERVING THE VIABILITY OF ANIMAL ORGANS

**James G. Martindale, Costa Mesa; Ralph E. Purdy; George L. Stupecky, both of Irvine, and Ronny G. Tidwell, Irvine, all of Calif., assignors to The Regents of the University of California, Alameda, Calif.**

**Filed Oct. 7, 1987, Ser. No. 106,074**
**Int. Cl.[5] A01N** *1/02*
**U.S. Cl. 435—1** **24 Claims**

21. A method for maintaining the viability of animal organs which are supported in a chamber for a period of time sufficient to enable the use of such organs for transplantation and medical research, said method comprising the steps of:
circulating a perfusate through the organ and said chamber;
regulating the perfusate temperature flowing through the organ and said chamber to maintain the perfusate and the organ within desired temperature ranges;
oxygenating the perfusate prior to circulating the perfusate through the organ and said chamber;
monitoring electrochemical characteristics of the organ and the perfusate and maintaining the electrochemical characteristics within predetermined ranges, the electrochemical characteristics comprising
the ratio of intracellular to extracellular concentration of potassium ions,
the extracellular concentration of sodium ions, and
the pH of the perfusate; monitoring electrophysical characteristics of the organ and the perfusate, the electrophysical characteristics comprising
a difference in charge distribution between various portions of the organ,
extraneous electromagnetic stimuli, and
electrical properties of the perfusate selected from the group consisting of perfusate voltage, conductance, impedance and resistance; and




generating and delivering electrical stimulation to the organ, to the perfusate or to both when the measured electrophysical characteristics vary from within predefined limits.

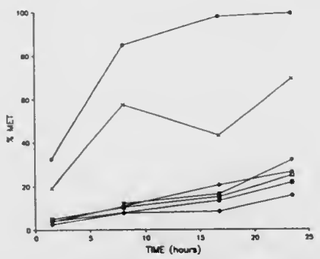
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**5,051,353**

## PRESERVATION AND RESTORATION OF HEMOGLOBIN IN BLOOD SUBSTITUTES

**Lewis P. Stratton, Greenville, S.C.; Martha C. Farmer, Glencoe, Ill., and Alan S. Rudolph, Bowie, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Aug. 9, 1988, Ser. No. 233,303**
**Int. Cl.[5] A01N** *1/00*
**U.S. Cl. 435—2** **11 Claims**




1. A hemoglobin blood substitute preparation including a compound in the aqueous phase of a hemoglobin-containing fluid, said compound selected from the group consisting of glutathione, and nicotinamide adenine dinucleotide (NADH) and mixtures of these and said glutathione being present in said aqueous phase in a concentration of 10 mM to 60 mM.



**5,051,354**

## DETECTION OF ALTERED IGA1 IN FLUID SAMPLES

**Jerry G. Henslee; G. Michael Hass, both of Libertyville; Jay R. Schenck, Waukegan, and Harry G. Rittenhouse, Lake Bluff, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.**

**Filed Apr. 15, 1988, Ser. No. 181,892**
**Int. Cl.[5] G01N** *33/566, 33/574*
**U.S. Cl. 435—7.8** **15 Claims**

1. A method for determining the presence of amount of $IgA_1$ with O-linked oligosaccharides in a fluid sample comprising:
a) contacting the sample with an anti-IgA antibody bound to a solid phase to form an anti-IgA/IgA solid phase complex;
b) contacting said anti-IgA/IgA solid phase complex with a labeled lectin wherein said lectin binds to an O-linked oligosaccharide moiety of unmasked or exposed DGal-Beta(1-3)DGalNAc oligosaccharide structures of $IgA_1$ thereby forming an anti-$IgA/IgA_1$/lectin solid phase complex when $IgA_1$ is present in the sample;
c) determining the presence or amount of label bound to said anti-$IgA/IgA_1$/lectin solid phase complex as a measure of the presence or amount of the $IgA_1$ with O-linked oligosaccharides in the sample.

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**5,051,355**

## ANTI-HUMAN GASTRIC CANCER MONOCLONAL ANTIBODY

**Hajime Yoshida, Sagamihara, Japan; Nobuo Hanai, Mercer Island, Wash., and Akiko Furuya, Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 70,071, Jul. 6, 1987, abandoned. This application Dec. 6, 1989, Ser. No. 445,160**
**Claims priority, application Japan, Jul. 15, 1986, 61-166138**
**Int. Cl.[5] G01N** *33/53, 33/567;* **C07K** *15/14;* **C12N** *15/00*
**U.S. Cl. 435—7.23** **6 Claims**

1. An anti-human gastric cancer monoclonal antibody, produced by hybridoma cell line AMC-462 (ECACC 86050801), which belongs to the class $IgG_1$, reacts with sialylated glycoproteins or glycolipids derived from digestive system cancer-associated antigens and is non-reactive with normal stomach tissue.

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**5,051,356**

## SPECIFIC BINDING COMPOSITION COMPRISING A LOW PI PROTEIN OR CARBOHYDRATE AND A DIAGNOSTIC TEST KIT AND METHOD OF USE

**Harold C. Warren, III, Rush, and Brian A. Snyder, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Jun. 13, 1988, Ser. No. 206,257**
**Int. Cl.[5] G01N** *33/535, 33/543, 33/569*
**U.S. Cl. 435—7.34** **18 Claims**

14. A method for the detection of a target ligand in a biological specimen comprising the steps of:
A. contacting a sample of a biological specimen suspected of containing a target ligand with a specific binding composition comprising an aqueous mixture of:
a specific binding species for said ligand or for its receptor, and one or more water-soluble proteins or carbohydrates, substantially none of which has a pI greater than about 5,
said species being detectably labeled with a label selected from the group consisting of radioisotopes, chemiluminescent moieties, phosphorescent compounds, fluorescent moieties, chromogenic moieties, enzymes, avidin and biotin,
to form a detectably labeled specific binding complex between said ligand and said detectably labeled species, and
B. detecting the presence of said complex as an indication of the presence of said ligand in said specimen.

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**5,051,357**

## METHOD AND ASSAY USING INACTIVATION OF FACTORS VA AND VIIIA BY ACTIVATED PROTEIN C TO DIAGNOSE THROMBIC DISEASE OR ASSAY FOR PROTEIN C AND KIT THEREFOR

**Houria I. Hassouna, Grosse Pointe, Mich., assignor to Board of Trustees operating Michigan State University, East Lansing, Mich.**

**Continuation-in-part of Ser. No. 379,988, Jul. 14, 1989. This application Aug. 21, 1989, Ser. No. 396,234**
**Int. Cl.[5] C12Q** *1/56*
**U.S. Cl. 435—13** **24 Claims**

4. A method for indirectly assaying for Protein C in blood plasma which comprises:
(a) activating Factor V and Factor VIII to Factor Va and Factor VIIIa and activating Protein C to activated Protein C (Protein Ca) in separate containers of a pooled normal plasma (PNP) and of a patient plasma without fibrin formation in the plasmas; and
(b) measuring inactivation of Factor Va and Factor VIIIa for Protein Ca in the patient plasma and in the PNP by an activated partial thromboplastin time assay (APPT).

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**5,051,358**

## DIAGNOSTIC METHODS FOR DETECTING PERIODONTAL DISEASES

**Jonathan J. Witt, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**

**Filed May 7, 1987, Ser. No. 47,239**
**Int. Cl.[5] C12Q** *1/44, 1/00*
**U.S. Cl. 435—19** **4 Claims**

1. A method for determining the presence of or evaluating periodontal disease in humans or lower animals, comprising:
contacting saliva from the human or lower animal being diagnosed with a leukocyte esterase detection reagent,
determining the amount of leukocyte esterase present in the saliva, and
correlating the amount of leukocyte esterase present in the saliva with a standard indicative of the presence or absence of periodontal disease.

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**5,051,359**

## METHOD OF DETERMINING THE QUALITY OF A MEDIUM

**William G. Characklis, Bozeman, Mont., assignor to Research and Development Institution, Inc. at Montana State University, Bozeman, Mont.**

**Filed Jun. 3, 1988, Ser. No. 201,993**
**Int. Cl.[5] C12Q** *1/18*
**U.S. Cl. 435—32** **15 Claims**

1. An in situ method of determining the quality of a medium capable of supporting cellular growth, comprising
(a) obtaining viable cells which are anchored to a substrate;
(b) determining the value of at least one parameter associated with the cells which is proportional by a factor to the number of cells present under conditions which preserve cell viability;
(c) calculating the number of cells $N_{(n-1)}$, wherein $n=1$, present by multiplying the cells' parameter value by the factor;
(d) exposing the cells to the medium by in situ immersing the substrate with the anchored cells in the medium for a period of time and under conditions effective to preserve the viability of the cells and permit cell growth;
(e) withdrawing the substrate with the anchored cells from the medium;
(f) conducting steps (b) and (c) at a time $t_n$, wherein n is $n+1$;
(g) calculating the cell growth rate or the variation in the number of anchored cells per unit time, $t_n$, from the formula

$$\text{cell variation}/t = (N_n - N_o)/t_n; \text{ and}$$

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(h) comparing the cell growth rate or the variation in the number of anchored cells per unit time with a data base comprising average cell variations per unit time for the cells in the medium, wherein the quality of the medium is below a minimum acceptable if the value obtained is higher than a predetermined fraction of the corresponding data base value.

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**5,051,360**

## METHOD FOR DETECTING MICROORGANISM ACTIVITY

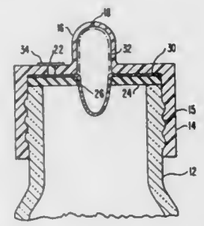
**John R. Waters, Tampa, Fla., assignor to Abo, Inc., Tampa, Fla.**

**Continuation-in-part of Ser. No. 191,197, May 6, 1988, Pat. No. 4,952,498. This application Apr. 24, 1990, Ser. No. 513,864**

**The portion of the term of this patent subsequent to Aug. 28, 2007, has been disclaimed.**

**Int. Cl.[5] C12Q *1/04;* C12M *1/34, 1/24***

**U.S. Cl. 435—34** **2 Claims**



1. A method of detecting activity of microorganisms in a sample comprising the steps of

providing a vessel having substantially rigid walls and having an opening into the interior of the vessel,

providing a closure for closing the opening into the vessel, the closure including a membrane having a central region,

deforming the central portion of the membrane to form a flaccid indicator region which is more movable by differences in pressure across the closure than the remainder of the membrane so that a difference in pressure causes the region to form a bulging dome,

securely fastening the closure across the opening to seal the vessel;

placing a sample of the material to be tested in the vessel;

placing the vessel with the closure and sample in an incubating chamber having a controllable temperature,

incubating the vessel in said incubating chamber for a selected interval of time at a temperature and pressure selected to promote microorganism activity within the vessel and consequent generation or absorption of gas,

following said incubating, changing the pressure within the incubating chamber until the dome assumes a reference position, measuring the incubation chamber pressure at which the dome is in said reference position,

repeating the steps of changing and measuring the chamber pressure, and

comparing the measured pressure with previous measured pressures to evaluate changes in pressure indicating microorganism activity.

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**5,051,361**

## AZT IMMUNOASSAYS, DERIVATIVES, CONJUGATES AND ANTIBODIES

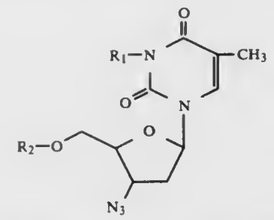
**Kenneth J. Stenglein, St. Louis, and Dennis M. Murray, Eureka, both of Mo., assignors to Sigma Chemical Company, St. Louis, Mo.**

**Filed Oct. 19, 1988, Ser. No. 259,872**

**Int. Cl.[5] G01N *33/533, 33/535***

**U.S. Cl. 435—7.9** **20 Claims**

2. A method for determining AZT in a sample comprising intermixing with said sample a tracer represented by the formula:



where one of $R_1$ and $R_2$ is hydrogen and the other of $R_1$ and $R_2$ comprises R—X, R is a linking group and X is an indicator moiety, and an antibody capable of specifically recognizing AZT and said tracer, and then determining the amount of tracer bound to antibody as a measure of the amount of AZT in the sample by a suitable assay technique.

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**5,051,362**

## ENZYME IMMOBILIZED BY SPRAY-DRYING AND PHOTOCROSSLINKING A POLY(VINYL ALCOHOL) POLYMER

**Tetsuro Suehiro, deceased, late of Tokyo by Keiko Suehiro, executor , and Kunihiro Ichimura, Tsukuba, both of Japan, assignors to Agency of Industrial Science & Technology Ministry of International Trade & Industry, Tokyo, Japan**

**Filed Mar. 13, 1989, Ser. No. 322,724**

**Claims priority, application Japan, Mar. 31, 1988, 63-79676**

**Int. Cl.[5] C12N *11/04, 11/08***

**U.S. Cl. 435—182** **11 Claims**

1. Dry enzyme-occluding polymer particles obtained by a method comprising the steps of:

dissolving an enzyme in a aqueous solution of poly(vinyl alcohol) having a styrylpyridinium group or a styrylquinolinium group;

spray-drying said aqueous solution to form dry particles having an average particles diameter in the range of 0.1 to 10 μm; and

exposing said dry particles to actinic rays, thereby photocrosslinking said dry particles to obtain said dry enzyme-occluding polymer particles.

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**5,051,363**

## METHOD FOR MODIFYING THE TOXICITY OF DNA REACTIVE CROSS-LINKING AGENTS TO CELLS

**Carl Ritter, Clifton Heights, and Robert J. Rutman, Philadelphia, both of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.**

**Filed Jun. 26, 1987, Ser. No. 67,190**

**Int. Cl.[5] C12N *5/00***

**U.S. Cl. 435—240.3** **6 Claims**

1. A method of decreasing the toxicity of nitrogen mustard to cells exposed to nitrogen mustard comprising exposing said cells to an effective amount of one or more materials selected from mitotic inhibitors, regulatory ions, and serum proteins, said material being capable of interfering with cross-linking of DNA.



**5,051,364**

## ANTI-LIPOCORTIN-I AND ANTI-LIPOCORTIN-II MONOCLONAL ANTIBODIES

**Clare M. Isacke, La Jolla; Ian S. Trowbridge, and Tony Hunter, both of San Diego, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.**

**Continuation of Ser. No. 312,342, Feb. 16, 1989, abandoned, which is a continuation of Ser. No. 57,757, Jun. 3, 1987, abandoned. This application Dec. 20, 1989, Ser. No. 453,015**

**Int. Cl.[5] C07K *15/28;* C12N *5/12;* A61K *39/00***

**U.S. Cl. 435—240.27** **12 Claims**

1. A monoclonal antibody that specifically binds one but not both of human lipocortin-I and human lipocortin-II; wherein said antibody is produced by hybridoma D1/274.5, B1/107.36 or 74/3 having ATCC accession numbers HB 9219, HB 9220, and HB 9218, respectively.

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**5,051,365**

## MICROORGANISMS AND METHODS FOR DEGRADING PLANT CELL WALLS AND COMPLEX HYDROCARBONS

**Miriam Polne-Fuller, Santa Barbara, Calif., assignor to The Regents of the University of California, Berkeley, Calif.**

**Filed Apr. 27, 1987, Ser. No. 43,219**

**Int. Cl.[5] C12N *9/14, 1/10, 1/22, 1/26***

**U.S. Cl. 435—264** **11 Claims**

4. A biologically pure multinucleated marine amoeba having the identifying characteristics of ATCC 40319, said amoeba being capable of digesting algal cell walls and having the further capacity to degrade paraffin, wax, polyethylene, polypropylene, polyvinyl chloride polyvinylidene di-chloride and mixtures thereof.

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**5,051,366**

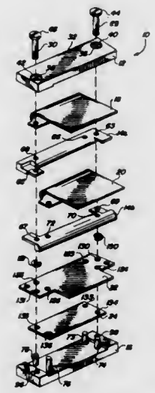
## ELECTRICAL CONNECTOR

**Dale H. Anderson; Don K. Walston, and George G. Zamora, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 1, 1990, Ser. No. 591,159**

**Int. Cl.[5] H01R *9/09***

**U.S. Cl. 436—67** **30 Claims**



1. An electrical connector for connecting two flexible circuits to a circuit device comprising:

a top plate;

a first and a second circuit bar;

a first and a second flexible circuit, the first flexible circuit sandwiched between the top plate and the first circuit bar and wrapped about a longitudinal edge of the first circuit bar, the second flexible circuit sandwiched between the top plate and second circuit bar and wrapped about a longitudinal edge of the second circuit bar;

a circuit device electrically connected to the first and second flexible circuits;

a resilient pad;

a bottom plate, the resilient pad between the circuit device and the bottom plate; and

means for releasably fastening the top plate to the bottom plate.

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**5,051,367**

## ASSAY FOR LITHIUM USING TETRA-SUBSTITUTED ARYL CYCLIC FORMAZAN DYES

**Mary H. Delton, Honeoye Falls, and Shari L. Eiff, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Division of Ser. No. 145,341, Jan. 19, 1988, Pat. No. 4,892,937. This application Aug. 14, 1989, Ser. No. 394,037**

**Int. Cl.[5] G01N *21/78, 33/20***

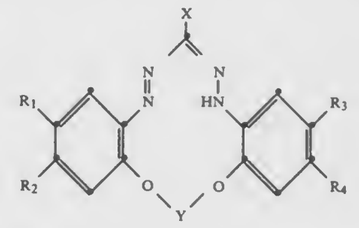
**U.S. Cl. 436—79** **11 Claims**

1. A method for analysis of $Li^+$, comprising the steps of:

(a) preparing a curve which relates $Li^+$ concentration to changes in absorbance, at a specified wavelength of a series of solutions comprising the same concentration of a tetra-substituted aryl cyclic formazan dye, a base and varying known concentrations of $Li^+$;

(b) determining the absorbance, at the specified wavelength of a solution containing the (i) same dye and base concentrations as in step (a) and (ii) an aliquot of an aqueous solution containing an unknown concentration of $Li^+$; and

(c) reading the $Li^+$ concentration from the curve prepared in step (a) corresponding to the absorbance determined in step (b), wherein the dye has the structure according to:



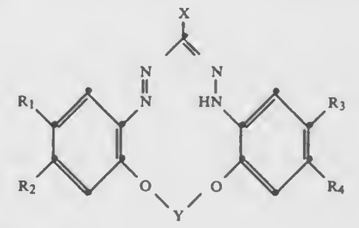
in which

X represents CN or $NO_2$;

Y represents $CH_2CH_2$, $CH_2CH_2CH_2$ or $CH_2CH_2$—O—$CH_2CH_2$; and

$R_1$, $R_2$, $R_3$ and $R_4$ each independently represent butyl, halogen, alkoxy or $NO_2$.

9. An element for the detection of $Li^+$ comprising an absorbent carrier material containing a tetra-substituted aryl cyclic formazan dye and said absorbent material buffered at a pH of 7 to 11, wherein the due has the structure:



in which

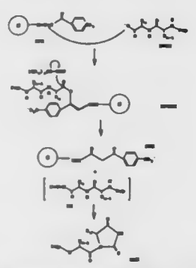
VOL 1130 ISS 4 SE 24 1991 UMI



X represents CN or $NO_2$;
Y represents $CH_2CH_2$, $CH_2CH_2CH_2$ or $CH_2CH_2—O—CH_2CH_2$; and
$R_1$, $R_2$, $R_3$ and $R_4$ each independently represent butyl, halogen, alkoxy or $NO_2$.

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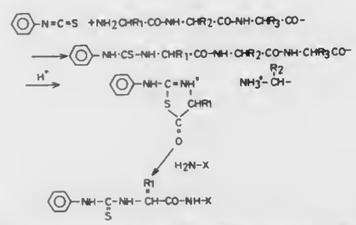
**5,051,368**
**METHOD FOR FORMING AN AMINO ACID THIOHYDANTOIN USING AN N-SUBSTITUTED KETENIMINE ACTIVATOR**
**Victoria L. Boyd, San Carlos; David H. Hawke, Hayward, and Timothy G. Geiser, San Mateo, all of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.**
**Filed Jun. 29, 1990, Ser. No. 546,303**
**Int. Cl.[5] G01N *33/68***
**U.S. Cl. 436—89** **16 Claims**



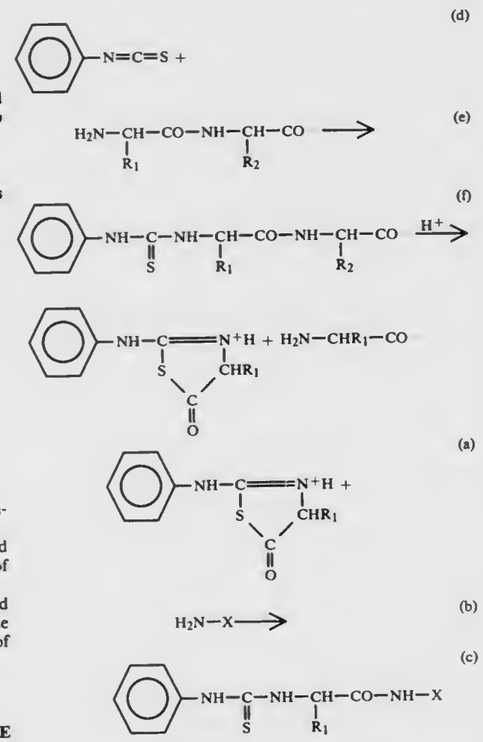
1. A method of forming an amino acid thiohydantoin comprising
activating an N-protected amino acid with an N-substituted ketenimine to form the corresponding activated ester of the amino acid, and
reacting the activated ester with a thiocarbonyl compound selected from the group consisting of a silylisothiocyanate and pyridinium thiocyanate to form the thiohydantoin of the amino acid.

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**5,051,369**
**DETECTION METHOD FOR AMINO ACID DERIVATIVE**
**Akira Tsugita, Kashiwa, and Toyoaki Uchida, Tokyo, both of Japan, assignors to Seiko Instruments Inc., Japan**
**Filed Aug. 2, 1988, Ser. No. 227,184**
**Int. Cl.[5] G01N *21/64, 33/68***
**U.S. Cl. 436—89** **1 Claim**



1. A method for detecting an amino acid derivative, the method comprising the steps of:
A. reacting phenylisothiocyanate (d) with a protein or a peptide (e) to form a phenylthiocarbamylprotein or a phenylthiocarbamylpeptide (f);
B. reacting said phenylthiocarbamylprotein or a phenylthiocarbamylpeptide (f) with an acid in anhydrous condition to effect cyclization and scission and to form a 2-anilino-5-thiazolinone derivative (a);
C. reacting said 2-anilino-5-thiazolinone derivative (a) with an amino compound of fluorescein or an amino compound of rhodamine derivatives (b) to form a phenylthiocarbamyl amino acid derivative (c) according to the following reaction scheme; and
D. detecting said phenylthiocarbamyl amino acid derivative (c):

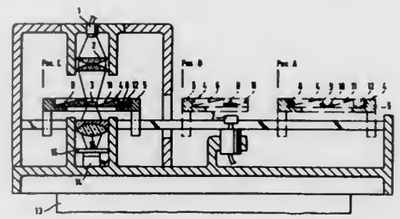



wherein X is a fluorescein or rhodamine derivative and $R_1$ and $R_2$ are amino acid side chains.

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**5,051,370**
**METHOD FOR THE EVALUATION OF AGGLUTINATION REACTIONS**
**Detlef Schulze, Frankfurt am Main, and Rudolf Schmidtberger, Marburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**
**Filed Jun. 11, 1990, Ser. No. 536,501**
**Claims priority, application Fed. Rep. of Germany, Jun. 13, 1989, 3919260**
**Int. Cl.[5] G01N *21/03, 33/543, 33/00***
**U.S. Cl. 436—165** **4 Claims**

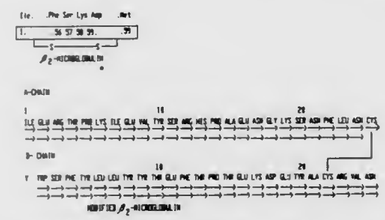
1. A method for the evaluation of agglutination reactions between a reagent and a biological fluid, comprising
mixing the reagent and the biological fluid by agitation employing a tumbling motion;
placing the mixture in the ray path of an optical measuring system;
superimposing a translational motion at right angles to the optical axis of the measuring system while maintaining said tumbling motion;



producing on a focusing screen an image of any agglutinates formed in the mixture; and
evaluating the image with an evaluation unit.

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**5,051,371**
**MODIFIED $\beta_2$-MICROGLOBULIN**
**Mogens H. Nissen, Frederiksberg; Jesper Zeuthen, Virum; Flemming S. Larsen, Vanlose; Lars Thim, Gentofte, and Mogens Christensen, Kobenhavn, all of Denmark, assignors to Novo Nordisk A/S, Denmark**
**Filed Jan. 15, 1987, Ser. No. 3,436**
**Claims priority, application Denmark, Jan. 16, 1986, 215/86**
**Int. Cl.[5] G01N *33/534;* C07K *13/00, 17/00***
**U.S. Cl. 436—545** **5 Claims**



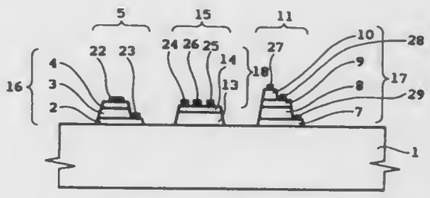
1. Substantially pure modified $\beta_2$-microglobulins of the general formula I

$$\begin{matrix} R_1—Cys—R_2—X \\ | \\ Y—R_3—Cys—R_4 \end{matrix} \quad \text{I}$$

wherein $R_1$ is a 24 amino acid residue with the sequence Ile-Gln- Arg-Thr-Pro-Lys-Ile-Gln-Val-Tyr-Ser-Arg-His-Pro-Ala-Glu-Asn-Gly- Lys-Ser-Asn-Phe-Leu-Asn, $R_2$ is a 30-amino acid residue with the sequence Tyr-Val-Ser-Gly-Phe-His-Pro-Ser-Asp-Ile-Glu-Val-Asp-Leu- Leu-Lys-Asn-Gly-Glu-Arg-Ile-Gly-Lys-Val-Glu-His-Ser-Asp-Leu-Ser, $R_3$ is a 20-amino acid residue with the sequence Trp-Ser-Phe-Tyr-Leu- Leu-Tyr-Tyr-Thr-Glu-Phe-Thr-Pro-Thr-Glu-Lys-Asp-Glu-Tyr-Ala, $R_4$ is a 19-amino acid residue with the sequence Arg-Val-Asn-His-Val-Thr- Leu-Ser-Gln-Pro-Lys-Ile-Val-Lys-Trp-Asp-Arg-Asp-Met, X is Phe, Phe-Ser, or Phe-Ser-Lys, and Y is Asp, Lys-Asp, or Ser-Lys-Asp



**5,051,372**
**METHOD OF MANUFACTURING A SEMICONDUCTOR OPTOELECTRIC INTEGRATED CIRCUIT DEVICE, HAVING A PIN, HEMT, AND HBT, BY SELECTIVE REGROWTH**
**Goro Sasaki, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan**
**Filed Apr. 11, 1990, Ser. No. 507,530**
**Claims priority, application Japan, Apr. 12, 1989, 1-92690; Apr. 12, 1989, 1-92691; Apr. 12, 1989, 1-92692; Apr. 25, 1989, 1-104992; Apr. 25, 1989, 1-104993**
**Int. Cl.[5] H01L *31/18***
**U.S. Cl. 437—5** **12 Claims**



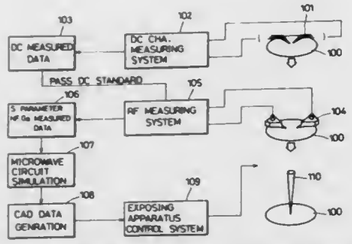

1. A method of manufacturing a semiconductor integrated circuit, comprising:
the first step of growing a first epitaxial crystal on a compound semiconductor substrate, removing an unnecessary region of the first epitaxial crystal to form a residual portion, and covering the residual portion with a selective growth mask;
the second step of growing a second epitaxial crystal on an exposed substrate portion, removing an unnecessary portion of the second epitaxial crystal to form a residual portion of the second epitaxial crystal, and covering the residual portion of the second epitaxial crystal with a selective growth mask; and
the third step of growing a third epitaxial crystal on an exposed substrate portion and removing an unnecessary region of the third epitaxial crystal,
wherein the first to third epitaxial crystal form any one of a pin photodiode crystal, a heterojunction bipolar transistor crystal, and a high electron mobility transistor crystal, and are different from each other.

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**5,051,373**
**METHOD OF FABRICATING MMIC SEMICONDUCTOR INTEGRATED CIRCUITS USING THE RF AND DC MEASUREMENTS OF AN ACTIVE DEVICE ON A SUBSTRATE TO DESIGN THE PASSIVE ELEMENTS, WHICH ARE THEN E-BEAM WRITTEN TO THE SUBSTRATE**
**Takashi Yamada, Kyoto; Akihito Nagamatsu, Osaka; Seiichi Bamba, Kyoto; Tetsuro Sawai, Osaka; Haruo Nakano, Osaka, and Kimihiko Nagami, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**
**Filed Jan. 5, 1990, Ser. No. 461,356**
**Claims priority, application Japan, Feb. 16, 1989, 1-37494; Sep. 20, 1989, 1-245747**
**Int. Cl.[5] H01L *21/66***
**U.S. Cl. 437—8** **20 Claims**

1. A method of fabricating a semiconductor integrated circuit having an active device and a passive circuit device on a substrate, comprising the steps of:
forming said active device on said substrate;
measuring DC characteristics and high frequency characteristics of said active device formed so as to provide results;
simulating a circuit pattern of said passive circuit device so

as to obtain simulated characteristics of said passive circuit on the basis of the results of the step of measuring; and




directly drawing said circuit pattern on said substrate to form said passive circuit device based on said simulated characteristics obtained from the step of simulating.

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**5,051,374**

**METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH IDENTIFICATION PATTERN**

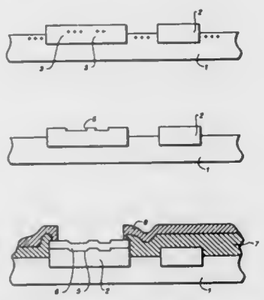
**Takayoshi Kagawa, Nara, and Suehiro Ishikura, Fukuyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Division of Ser. No. 467,334, Jan. 19, 1990, Pat. No. 4,951,116, which is a continuation of Ser. No. 240,393, Aug. 29, 1988, abandoned, which is a continuation of Ser. No. 830,541, Feb. 18, 1986, abandoned. This application Mar. 27, 1990, Ser. No. 499,651**

**Claims priority, application Japan, Mar. 6, 1985, 60-45334**

**Int. Cl.[5] H01L** *21/66*

**U.S. Cl. 437—8** **6 Claims**



1. A method of producing a read-only memory into which data are written by ion implantion, said method comprising the steps of

identifying element areas and non-element areas on a main surface of a semiconductor substrate,

forming a field oxide layer on said non-element areas,

identifying on said field oxide layer a chip identification area and wiring areas,

forming a mask over said field oxide layer, said mask having an identification pattern over said chip identification area, said identification pattern being indicative of the type of said read-only memory,

thereafter implanting impurity ions simultaneously on said main surface of said substrate and through said mask on said field oxide layer inclusive of said chip identification area,

thereafter removing said mask from said field oxide layer, and

thereafter subjecting said ion-implanted surfaces simultaneously to an etching treatment to thereby form protrusions and indentations on said chip identification area of said field oxide layer according to said identification pattern on said mask.

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**5,051,375**

**METHOD OF PRODUCING SEMICONDUCTOR WAFER THROUGH GETTERING USING SPHERICAL ABRASIVES**

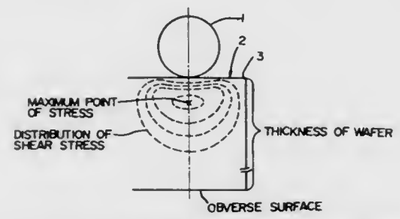
**Sueo Sakata; Yasunori Oka, and Toshio Naritomi, all of Kishima, Japan, assignors to Kyushu Electronic Metal Co., Ltd., Kishima and Osaka Titanium Co., Ltd., Amagasaki, both of, Japan**

**Filed Jul. 10, 1989, Ser. No. 377,276**

**Claims priority, application Japan, Jul. 11, 1988, 63-173145**

**Int. Cl.[5] H01L** *21/30*

**U.S. Cl. 437—10** **4 Claims**




1. A method of producing a semiconductor wafer by gettering comprising

blasting abrasive particles each having a spherical configuration against the back surface of a semiconductor wafer in a manner sufficient to generate shear stress which reaches its maximum point in the interior of said wafer,

whereby damage from said abrasives is produced mainly in the interior of said wafer.

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**5,051,376**

**METHOD FOR PRODUCING SEMICONDUCTOR DEVICE AND SEMICONDUCTOR DEVICE PRODUCED THEREBY**

**Yutaka Yamada; Toshihiko Ibuka; Fumio Orito, all of Tsuchiura; Yuichi Seta, Tokyo, and Sbin-ichiro Kawabata, Tsuchiura, all of Japan, assignors to Mitsubishi Monsanto Chemical Co, Ltd. and Mitsubishi Chemical Industries, Ltd., both of Tokyo, Japan**

**Division of Ser. No. 146,839, Jan. 22, 1988, abandoned. This application Jan. 11, 1990, Ser. No. 463,642**

**Claims priority, application Japan, Jan. 26, 1987, 62-15839; Sep. 9, 1987, 62-225746**

**Int. Cl.[5] H01L** *21/265, 21/324*

**U.S. Cl. 437—22** **4 Claims**

1. A method for producing a semiconductor device comprising steps of:

preparing a $III_b$–$V_b$ group compound single crystalline semiconductor substrate produced by a liquid encapsulated Czochralski method, said single crystalline semiconductor substrate having a carbon concentration of $1\times10^{15}$ $cm^{-3}$ or less,

implanting conductive impurity ions into said single crystalline semiconductor substrate,

annealing at a temperature of about 800° to about 1000° for about 2 to about 15 minutes, and

cooling to 600° C. or less at a cooling rate of 0.29° C./sec.



**5,051,377**

**METHOD FOR FORMING A THIN DIELECTRIC LAYER ON A SUBSTRATE**

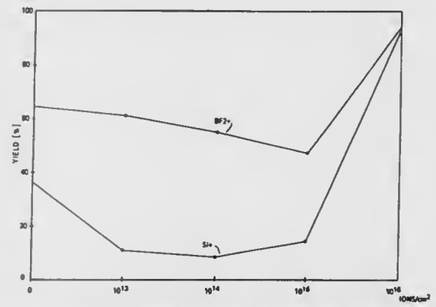
**Wolfgang Euen, Boeblingen; Dieter Hagmann, Wildberg, and Hans-Jurgen Wildau, Berlin, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 29, 1989, Ser. No. 400,300**

**Claims priority, application European Pat. Off., Sep. 1, 1988, 88114239**

**Int. Cl.[5] H01L** *21/265, 21/02*

**U.S. Cl. 437—24** **3 Claims**




1. A method for forming a silicon dioxide gate isolation layer having a thickness of ≦ about 10 nm on a silicon substrate, comprising the steps of: forming said silicon dioxide layer by thermal oxidation, implanting silicon ions into said substrate through said silicon dioxide layer with a dose of ≧ about $10^{16}$ ions/$cm^2$ and annealing said silicon dioxide layer at a temperature of ≧ about 1150° C.

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**5,051,378**

**METHOD OF THINNING A SEMICONDUCTOR WAFER**

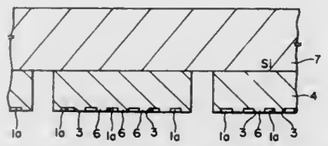
**Atsuo Yagi; Takeshi Matsushita, both of Kanagawa, and Makoto Hashimoto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Nov. 6, 1989, Ser. No. 432,123**

**Claims priority, application Japan, Nov. 9, 1988, 63-284590; Jan. 17, 1989, 1-8300**

**Int. Cl.[5] H01L** *21/304*

**U.S. Cl. 437—225** **5 Claims**




1. A method of thinning a semiconductor wafer to a precisely controlled thickness, comprising the steps of:

forming, on a first surface of a first semiconductor substrate, at least a first recess and a second recess shallower than said first recess;

forming, on said first substrate of said first semiconductor substrate, a layer of hardly polishable material thicker than said recess which is greater than said first recess to serve as a first stopper and said second recess to serve as a second stopper;

flattening said first surface of said first semiconductor substrate;

joining a second semiconductor substrate to said layer of hardly polishable material;

polishing a second surface of said first semiconductor substrate until said first stopper is exposed;

removing at least a portion of said first stopper at said second surface until the thickness of said first stopper become equal to or less than that of said second stopper; and

polishing said semiconductor until said second stopper is exposed.

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**5,051,379**

**METHOD OF PRODUCING MICROMECHANICAL SENSORS FOR THE AFM/STM PROFILOMETRY AND MICROMECHANICAL AFM/STM SENSOR HEAD**

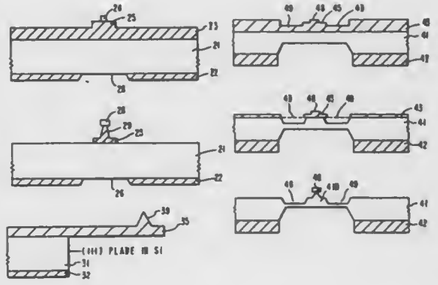
**Thomas Bayer, Sindelfingen; Johann Greschner, Pliezhausen; Georg Kraus, Wildberg; Helga Weiss, Boeblinge, and Olaf Wolter, Aidlingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Aug. 16, 1990, Ser. No. 568,306**

**Claims priority, application European Pat. Off., Aug. 16, 1989, 89115100.3**

**Int. Cl.[5] H01L** *21/302*

**U.S. Cl. 437—225** **20 Claims**




1. Method of producing micromechanical sensors for the AFM/STM profilometry, which consist of a cantilever beam with a tip at its end and a mounting block at the opposite, comprising the following steps:

bilaterally coating a wafer substrate with a layer of inorganic material;

producing a mask for the desired cantilever beam pattern on the top side of the wafer and in the upper part of said layer; and a mask in said layer on the bottom side of the wafer;

planarizing said cantilever beam pattern with photoresist;

producing a mask for the desired tip in the area of the cantilever beam pattern, producing the desired tip using an etching step, and simultaneously transferring the cantilever beam pattern from the upper to the lower part of said layer; and

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removing the supporting wafer material by etching through the bottom side mask.

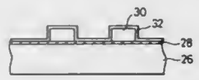
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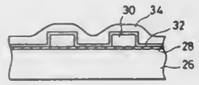
5,051,380

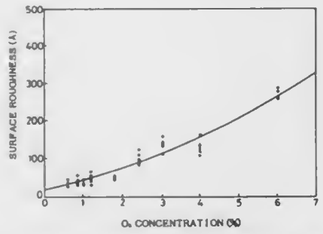
## PROCESS FOR PRODUCING SEMICONDUCTOR DEVICE

Kazuo Maeda; Noboru Tokumasu, and Yuko Nishimoto, all of Tokyo, Japan, assignors to Semiconductor Process Laboratory Co., Ltd. and Alcan-Tech Co., Inc., both of Tokyo, Japan

Filed Dec. 14, 1990, Ser. No. 628,510
Claims priority, application Japan, Dec. 27, 1989, 1-339073
Int. Cl.[5] H01L *21/02*
U.S. Cl. 437—238 2 Claims




1. A process for producing a semiconductor device, comprising depositing a CVD-$SiO_2$ film at a given first $O_3$ concentration according to a TEOS-$O_3$ reaction, and further depositing a CVD-$SiO_2$ film at a second $O_3$ concentration higher than said first $O_3$ concentration according to the TEOS-$O_3$ reaction.

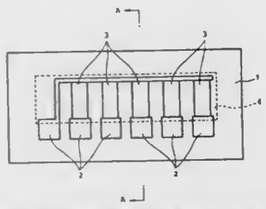
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5,051,381

## POWDERY COATING GLASS MATERIAL, COATING GLASS PASTE USING THE SAME AND COATING GLASS COMPOSITION PREPARED THEREBY

Masahiko Ohji, and Norikazu Fukushima, both of Shiga, Japan, assignors to Nippon Electric Glass Co., Ltd., Otsu, Japan

Filed Apr. 27, 1990, Ser. No. 515,414
Claims priority, application Japan, Apr. 28, 1989, 1-110618
Int. Cl.[5] C03C *8/04, 8/02, 3/062, 3/066*
U.S. Cl. 501—26 5 Claims




1. A powdery coating glass material consisting essentially of $V_2O_5$ 5–35 wt. %, ZnO 33–60 wt. %, $B_2O_3$ 3–25 wt. %, $SiO_2$ 1–15 wt. %, $Al_2O_3$ 0–5 wt. %, and at least one oxide 2–20 wt. % selected from the group consisting of MgO, CaO, SrO, and BaO, having a softening point of 600° C. or less.

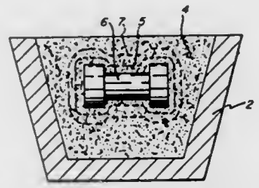
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5,051,382

## INVERSE SHAPE REPLICATION METHOD OF MAKING CERAMIC COMPOSITE ARTICLES AND ARTICLES OBTAINED THEREBY

Marc S. Newkirk; Andrew W. Urquhart, and H. Daniel Lesher, all of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Division of Ser. No. 823,542, Jan. 27, 1986, Pat. No. 4,828,785.
This application Mar. 28, 1989, Ser. No. 329,794
Int. Cl.[5] C04B *35/65*
U.S. Cl. 501—87 10 Claims




1. A self-supporting ceramic composite body comprising a shaped cavity contained within a filler material, said filler material being embedded by a polycrystalline matrix comprising an oxidation reaction product of a molten parent metal and at least one oxidant, whereby said shaped cavity is formed by inverse shape replication of a mold of shaped parent metal, said parent metal being withdrawn from said cavity by formation of said oxidation reaction product of said molten parent metal with said oxidant.

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5,051,383

## METHOD FOR PRODUCING SELF-SUPPORTING CERAMIC BODIES WITH GRADED PROPERTIES

Christopher R. Kennedy; Andrew W. Urquhart, both of Newark, Del.; Danny R. White, Elkton, Md.; Marc S. Newkirk, and Jeffrey R. Ramberg, both of Newark, Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 907,928, Sep. 16, 1986, Pat. No. 4,882,306. This application Mar. 22, 1989, Ser. No. 327,296
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[5] C04B *35/10*
U.S. Cl. 501—127 18 Claims

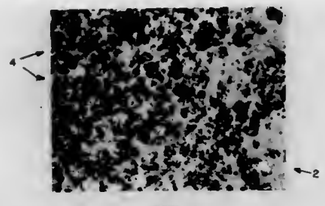



FIG. 1

1. A method for producing a self-supporting ceramic body by oxidation of a parent metal to form an oxidation reaction product, said ceramic body having a microstructure characterized by at least two zones which differ from each other in at least one property, which method comprises the steps of: (a) heating said parent metal in the presence of a first oxidant to form a body of molten metal and reacting said molten metal with said oxidant at a temperature above the melting point of said parent metal but below the melting point of said oxidation reaction products to form said oxidation reaction product, which product is in contact with and extends between said body of molten metal and said first oxidant, (b) at said temperature, transporting said molten metal through said oxidation reaction product towards said first oxidant so that fresh oxidation reaction product continues to form at the interface between said first oxidant and previously formed oxidation reaction product thereby forming a progressively thicker body of oxidation reaction product, (c) altering a process condition during formation of said ceramic body such that said altering is sufficient to form at least two different zones of oxidation reaction product which differ from each other in at least one property, (d) continuing said reaction for a time sufficient to produce said ceramic body, and (e) recovering the resulting ceramic body.



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5,051,384

## METHOD FOR PRETREATING A REFORMING CATALYST

John L. Robbins, Stockton; Elise Marucchi-Soos, Warren; Ming Chow, Three Bridges; William E. Gates, Somerset, and Shun C. Fung, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Mar. 22, 1990, Ser. No. 497,170
Int. Cl.[5] B01J *29/04, 21/14, 23/36, 23/40*
U.S. Cl. 502—62 16 Claims

1. A method for pretreating a reforming catalyst comprising at least one Group VIII noble metal and a support, the method comprising contacting the catalyst with an unsaturated aliphatic hydrocarbon at a temperature from 200° to 500° C.

8. A method according to claim 1 wherein the catalyst comprises a combination of a Group VIII noble metal combined with rhenium, and a support.

10. A method according to claim 1 wherein the support is selected from the group consisting of silica, alumina, amorphous silica-alumina and zeolites.

16. A method according to claim 1 wherein after the catalyst has been contacted with the unsaturated aliphatic hydrocarbon, it is exposed to an inert gas at a temperature from 300° to 550° C. and is then treated with hydrogen at a temperature from 250° to 650° C.

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5,051,385

## MONODISPERSED MESOPOROUS CATALYST MATRICES AND FCC CATALYSTS THEREOF

William A. Wachter, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 215,163, Jul. 5, 1988, abandoned. This application Sep. 21, 1989, Ser. No. 410,558
Int. Cl.[5] B01J *29/06, 21/12*
U.S. Cl. 502—64 31 Claims

14. A catalyst composition of a monodispersed mesoporous aluminosilicate catalyst matrix material comprised of: (i) about 5 to 40% by weight alumina with the balance being silica, which matrix material is characterized (a) as having a pore size distribution from about 200 to about 500 and (b) the substantial absence of an $^{27}Al$ MASNMR peak after steaming at 1400° F. for 16 hours, and (c) no more than 40% of the surface area is lost after steaming at 1400° F. for 16 hours, and (ii) a crystalline aluminosilicate.

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5,051,386

## SILICA-ALUMINA CATALYST CONTAINING PHOSPHORUS

John W. Ward, and Dennis D. Delaney, both of Yorba Linda, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 23, 1990, Ser. No. 516,266
Int. Cl.[5] B01J *21/04, 21/08, 27/182*
U.S. Cl. 502—64 19 Claims

1. A catalyst comprising at least one phosphorus component supported on an amorphous porous dispersion of a silica alumina component in an alumina matrix, said dispersion being essentially free of supported metal components.

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5,051,387

## ZEOLITE L PREPARATION

Wicher T. Koetsier, Mijnsheerenland, and Johannes P. Verduijn, Spijkenisse, both of Netherlands, assignors to Exxon Research & Engineering Company, Linden, N.J.

Division of Ser. No. 175,477, Mar. 31, 1988, abandoned, which is a division of Ser. No. 808,414, Dec. 12, 1985, abandoned. This application Nov. 22, 1989, Ser. No. 440,150
Claims priority, application United Kingdom, Dec. 17, 1984, 8431760
Int. Cl.[5] B01J *29/28, 29/32;* C10B *33/28*
U.S. Cl. 502—74 8 Claims

1. A process for the preparation of zeolite L comprising cylindrical crystallites with an aspect ratio of at least 0.4 , in which an alkaline reaction mixture comprising water, a source of silicon and a source of aluminium with a composition having the following molar ratios (expressed as oxides):

$$2.63\text{–}2.67\ M_{2/n}O{:}Al_2O_3 8.8\text{–}9.7\ SiO_2{:}145\text{–}160\ H_2O$$

(where M is a cation of valence n or a mixture of cations and the molar ratio of $M_{2/n}O/SiO_2$is at least 0.275) is heated to a temperature of at least 75° C. to form the desired zeolite L product.

7. A catalyst comprising a zeolite prepared by a process as claimed in any one of claims 1 to 6 and one or more catalytically-active metals.

8. A catalyst as claimed in claim 7, comprising from 0.1 to 1.5 weight % platinum.

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5,051,388

## SUPPORTED POLYMERIZATION CATALYST

Charles K. Buehler, Naperville, and Douglas D. Klendworth, Wauponsee Twp., Grundy County, both of Ill., assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Mar. 23, 1990, Ser. No. 498,313
Int. Cl.[5] C08F *4/685*
U.S. Cl. 502—113 39 Claims

1. A catalyst component comprising a product produced by the steps of:

(a) treating an inert inorganic support to remove surface hydroxyl groups;

(b) contacting said treated inert inorganic support with a hydrocarbon soluble magnesium compound;

(c) contacting said product of said step (b) with a modifying compound selected from the group consisting of silicon halides, boron halides, aluminum halides, hexaalkyl disilazanes and mixtures thereof;

(d) contacting said product of said step (c) with a vanadium compound having the structural formula $V(O)_sX^1_{4-s}$, where $X^1$ is halogen; and s is 0 or 1; a first titanium-containing compound having the structural formula $Ti(OR^2)_nX^2_m$, where $R^2$ is hydrocarbyl; $X^2$ is halogen; n is an integer of 1 to 4; and m is 0 or an integer of 1 to 3 with the proviso that the sum of n and m is 4; and a second titanium-containing compound having the structural formula $TiX^3_p(OR^3)_q$, where $X^3$ is halogen; $R^3$ is hydrocarbyl; p is an integer of 1 to 4; and q is 0 or an integer of 1 to 3, with the provisos that the sum of p and q are 4 and that said first and said second titanium-containing compounds are not identical.

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5,051,389

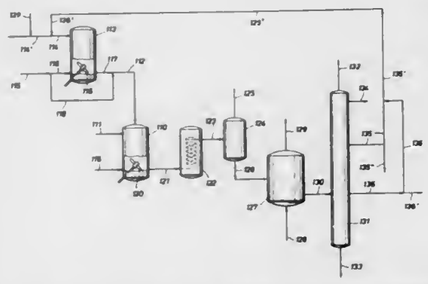
## CATALYST COMPOSITION PREPARED BY VAPOR DEPOSITING ONTO A CARBON SUPPORT

Robert J. Lang, Baytown, Tex.; Claude C. Culross, Baton Rouge, La.; Lonnie W. Vernon, Baytown, Tex., and William E. Winter, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 97,046, Sep. 16, 1987, abandoned. This application Jun. 25, 1990, Ser. No. 542,679

Int. Cl.[5] B01J *21/18, 23/28, 27/051;* C10G *1/06*

U.S. Cl. 502—185 11 Claims



1. A method for preparing a catalyst composition comprising molybdenum and a preformed carbon support, said method comprising the following steps:

(a) vaporizing molybdenum trioxide;

(b) contacting the vapor from step (a) with a preformed carbon support;

(c) cooling said vapor to deposit molybdenum dioxide in an amount within the range from about 1 to about 10 parts by weight, per 100 parts by weight of carbon; and

(d) reoxidizing said molybdenum dioxide to molybdenum trioxide with an oxidizing agent from the group consisting of air at a temperature from about 750° F. to about 900° F., nitric acid and hydrogen peroxide, thereby activating the catalyst composition.

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5,051,390

## CHEMICAL PROCESS AND CATALYST TO BE USED THEREIN

Paul A. Diddams, Walton-on-Thames; Ian R. Little, Hampton Hill, and Steven R. Wade, Chertsey, all of United Kingdom, assignors to The British Petroleum Company, p.l.c., London, England

Filed Oct. 10, 1989, Ser. No. 419,580

Claims priority, application United Kingdom, Oct. 18, 1988, 8824382

Int. Cl.[5] B01J *37/03*

U.S. Cl. 502—234 9 Claims

1. A process for the preparation of a cogel catalyst which comprises preparing an aqueous solution containing (a) a soluble compound of an alkali or alkaline earth metal, (b) a soluble compound of a metal which is thermally decomposable to a metal oxide capable of converting methane into higher hydrocarbons and (c) a hydrolysable silane and thereafter allowing a homogenous cogel to form.

4. A process as claimed in claim 1 wherein said soluble compound of said metal which is thermally decomposable to said metal oxide is a soluble manganese compound.

5,051,391

## CATALYST FILTER AND METHOD FOR MANUFACTURING A CATALYST FILTER FOR TREATING A COMBUSTION EXHAUST GAS

Shigechika Tomisawa; Yukio Iida; Yuji Kaihara; Joji Tonomura; Kazuo Uoya; Kimitoshi Ose; Hiroshi Ogawa; Norihiko Ono; Tatsuo Ishii, and Mamoru Ushiogi, all of Yokohama, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 333,428

Claims priority, application Japan, Apr. 8, 1988, 63-85186; May 23, 1988, 63-123956; Jun. 3, 1988, 63-135649; Jul. 21, 1988, 63-180394

Int. Cl.[5] B01J *21/06, 23/22, 23/30*

U.S. Cl. 502—242 7 Claims

1. A catalyst filter which is characterized in that catalyst particles which are made of titanium oxide and vanadium oxide or titanium oxide, vanadium oxide and tungsten oxide and whose diameters are between 0.01 and 1 μm are carried by a filter made by weaving monofilaments of a glass fiber whose diameters are between 3 and 15 μm so that the filter has a density of 400 to 1000 g/m$^2$.

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5,051,392

## MULTIFUNCTIONAL CATALYST FOR TREATING EXHAUST FUMES FROM INTERNAL COMBUSTION ENGINES, CONTAINING URANIUM, AT LEAST ONE URANIUM PROMOTOR AND AT LEAST ONE PRECIOUS METAL, AND ITS PREPARATION

Gil Mabilon, Saint Germain en Laye; Daniel Durand, Rueil Malmaison; Philippe Courty, Houilles, and Michel Prigent, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed May 24, 1990, Ser. No. 527,769

Claims priority, application France, May 24, 1989, 89 06896

Int. Cl.[5] B01J *23/10, 23/12, 23/58*

U.S. Cl. 502—303 16 Claims

1. A multifunctional catalyst for converting carbon dioxide, hydrocarbons and nitrogen oxides contained in exhaust fumes from internal combustion engines comprising a carrier containing a porous layer which contains a catalytically active phase comprising at least one metal A selected from the group consisting of platinum, rhodium, palladium, ruthenium, iridium and mixtures thereof, characterised in that the porous layer comprises, as a dry weight percentage:

about 50 to about 99.7% of at least one refractory inorganic oxide,

about 0.1 to about 25% of at least one uranium oxide,

about 0.1 to about 35% of at least one oxide of at least one metal P selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, calcium, strontium, barium, lanthanum, praseodymium, neodymium, gadolinium, and yttrium, and

about 0.1 to about 20% of said at least one metal A.

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5,051,393

## VEHICLE EXHAUST GAS CATALYSTS

Philip G. Harrison, Colston Bassett, and Peter J. F. Harris, Wantage, both of Great Britain, assignors to TI Corporate Services Limited, London, England

PCT No. PCT/GB89/00120, § 371 Date Dec. 8, 1989, § 102(e) Date Dec. 8, 1989, PCT Pub. No. WO89/07005, PCT Pub. Date Aug. 10, 1989

PCT Filed Feb. 8, 1989, Ser. No. 399,523

Claims priority, application United Kingdom, Feb. 8, 1988, 8802780

Int. Cl.[5] B01J *21/04, 23/10, 23/14, 23/22, 23/26, 23/72, 23/82, 23/86*

U.S. Cl. 502—304 16 Claims

1. A mixed oxide catalyst composition for the catalytic oxidation of carbon monoxide and unburnt hydrocarbon components of vehicle exhaust gas streams, consisting essentially of:

a) mixed oxides of tin (IV) oxide ($SnO_2$), chromium (VI) oxide ($CrO_3$), and copper (II) oxide (CuO) free from platinum and other noble metals or noble metal oxides;

b) wherein $SnO_2$:$CrO_3$ is provided in a weight ratio in the range 99:1 to 1:99, and CuO is provided at a level from 0.5 to 100% by weight, based on the combined weight of $SnO_2$:$CrO_3$.



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5,051,394

## METHOD FOR PRODUCTION OF ULTRA-FINE GOLD PARTICLE-IMMOBILIZED OXIDES

Masatake Haruta; Tetsuhiko Kobayashi; Susumu Tsubota, and Yoshiko Nakahara, all of Ikeda, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 26, 1990, Ser. No. 484,238

Claims priority, application Japan, Mar. 24, 1989, 1-73603

Int. Cl.[5] B01J *23/52*

U.S. Cl. 502—324 20 Claims

1. A method for the production of an ultra-fine gold particle-immobilized oxide, which method essentially consists of neutralizing an aqueous solution containing as substantially main components thereof a gold compound and a water-soluble metal salt by the addition of an alkali compound thereby giving rise to a coprecipitate, then adding to the resultant coprecipitate-containing aqueous solution at least one carboxylic acid compound selected from the group consisting of carboxylic acids and salts of said carboxylic acids and separating said coprecipitate from said aqueous solution, and heating the separated coprecipitate.

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5,051,395

## ALKYLENE OXIDE CATALYSTS HAVING ENHANCED ACTIVITY AND/OR EFFICIENCY

Scott F. Mitchell, Lawrenceville, N.J.; David M. A. Minahan, Cross Lanes, and Madan M. Bhasin, Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 25, 1989, Ser. No. 410,056

Int. Cl.[5] B01J *23/02, 23/50*

U.S. Cl. 502—348 17 Claims

1. A catalyst for the manufacture of alkylene oxide by the vapor phase epoxidation of alkene containing an impregnated silver metal in an amount of about 6 to 35 percent by weight based on the catalyst on an inert, refractory solid support, and a sufficient amount of scandium component to enhance at least one of catalyst activity and efficiency as compared to a similar catalyst but which does not contain the scandium component, said comparison being under STANDARD ETHYLENE OXIDE PROCESS CONDITIONS.

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5,051,396

## METHOD OF MANUFACTURING SUPERCONDUCTING PATTERNS BY ADDING IMPURITIES

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Division of Ser. No. 239,288, Sep. 1, 1988, which is a continuation-in-part of Ser. No. 176,144, Mar. 31, 1988. This application May 21, 1990, Ser. No. 525,686

Claims priority, application Japan, Sep. 7, 1987, 62-223675; Sep. 16, 1987, 62-231888

Int. Cl.[5] B05D *5/12, 3/06*

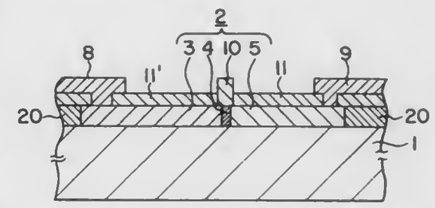
U.S. Cl. 505—1 9 Claims

7. A method of forming a superconducting pattern comprising the steps of:

forming a first ceramic superconducting film on a substrate;

forming a second ceramic superconducting film on said first superconducting film;

converting a portion of said second ceramic superconducting film to a non-superconducting region while maintaining the other portion superconducting, wherein said converting step is implemented by adding impurities into said portion by ion implantation, said impurities being selected from the group consisting of Si, Ge, B, Ga, P, Ta, Mg, Be, Al, Fe, Co, Ni, Cr, Ti, Mn and Zr; and




forming a third ceramic superconducting film on said second superconducting film, wherein said third superconducting film is partially electrically isolated from said superconducting film by said non-superconducting region.

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5,051,397

## JOINED BODY OF HIGH-TEMPERATURE OXIDE SUPERCONDUCTOR AND METHOD OF JOINING OXIDE SUPERCONDUCTORS

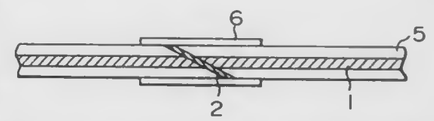
Chie Sato; Masahiko Sakamoto, both of Hitachi; Hisanori Okamura, Ibaraki; Takao Funamoto, Hitachi, and Masahiro Ogihara, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 20, 1989, Ser. No. 438,096

Claims priority, application Japan, Nov. 25, 1988, 63-296069

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 7 Claims




1. A high-temperature oxide superconductor on the surface of which is formed an indium alloy consisting essentially of 0.1–90% by weight of at least one divalent metallic element and the balance of indium; the metallic element being an element of Group IIA or IIB of the Periodic Table or a transition metal and the resistivity behavior of the alloy being the same as that of the oxide superconductor.

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5,051,398

## PROCESS FOR PREPARING A BISMUTH-TYPE SUPERCONDUCTING THIN FILM

Kenjiro Higaki; Keizo Harada; Naoji Fujimori; Hideo Itozaki, and Shuji Yazu, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 28, 1989, Ser. No. 399,739

Claims priority, application Japan, Aug. 29, 1988, 63-214130

Int. Cl.[5] C23C *14/34;* H01L *39/24*

U.S. Cl. 505—1 15 Claims

1. A process for depositing a superconducting thin film of a compound oxide containing at least bismuth and copper on a substrate of MgO in an oxygen-containing atmosphere by a physical vapor deposition technique, characterized in that said thin film is deposited on a {110} plane of the MgO substrate which is heated at a temperature between 670° and 750° C. during the deposition.

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5,051,399

## SUPERCONDUCTIVE RESIN MATERIAL

Motohiko Yoshizumi, and Hideo Arai, both of Saitama, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1988, Ser. No. 250,120
Claims priority, application Japan, Sep. 29, 1987, 62-242467
Int. Cl.[5] H01B *1/06*
U.S. Cl. 505—1 5 Claims

1. In a composition, comprising a resin matrix and a compound metal oxide powder exhibiting the Meissner effect, the improvement being that said metal oxide powder is present in an amount of 70 to 90% by weight based on the total composition, wherein said compound metal oxide exhibiting the Meissner effect is a compound oxide of yttrium, barium and copper.

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5,051,400

## METHOD OF TREATING NAUSEA AND EMESIS RELATED TO MOTION SICKNESS WITH VASOPRESSIN ANTAGONISTS

Lewis B. Kinter, Havertown, Pa., and Randall L. Kohl, Houston, Tex., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Jun. 28, 1990, Ser. No. 545,259
Int. Cl.[5] A61K *37/34;* C07K *7/16*
U.S. Cl. 514—11 10 Claims

1. A method for antagonizing vasopressin mediated emetic responses in a subject in need thereof which comprises administering to said subject an effective, nontoxic quantity of a $V_1$ vasopressin antagonist together with a pharmaceutically acceptable carrier.

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5,051,401

## INHIBITION OF MINERAL DEPOSITION BY PHOSPHORYLATED AND RELATED POLYANIONIC PEPTIDES

C. Steven Sikes, Mobile, Ala., assignor to University of South Alabama, Mobile, Ala.

Filed Apr. 7, 1989, Ser. No. 334,456
Int. Cl.[5] C02F *5/10*
U.S. Cl. 514—7 19 Claims

1. A poly-amino acid compound, which has the structure:

poly $(X)_m(Y)_n$

where
each X independently is aspartate, glutamate, glutamine, asparagine, or anionic derivatives of these amino acids, or phosphoserine, or a mixture thereof,
each Y independently is phosphoserine, phosphohomoserine, phosphotyrosine, phosphoglutamine, phosphoasparagine, phosphothreonine, or a mixture thereof,
m is 2 to 150,
n is 1 to 3,
n+m is>5, and
salts thereof.

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5,051,402

## PHARMACEUTICAL COMPOSITION CONTAINING CYCLOSPORIN IN ADMIXTURE WITH α-CYCLODEXTRIN

Kozo Kurihara, and Masaru Murano, both of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation of Ser. No. 201,579, Jun. 1, 1988, abandoned. This application Sep. 21, 1990, Ser. No. 587,580
Claims priority, application Japan, Jun. 4, 1987, 62-140703
Int. Cl.[5] A61K *37/02*
U.S. Cl. 514—11 33 Claims

19. A method of suppressing the mammalian immune system by administering to a mammal a pharmaceutically effective amount of at least one cyclosporin in association with sufficient α-cyclodextrin or a functional derivative thereof to solubilise said cyclosporin, wherein the α-cyclodextrin derivative is selected from the group consisting of α-cyclodextrin esters, α-cyclodextrin ethers, aminoalkylated derivatives of α-cyclodextrin, salts of α-cyclodextrin with a sulfur-containing acid, carboxyalkylated derivatives of α-cyclodextrin, addition compounds of α-cyclodextrin with a monosaccharide, addition compounds of α-cyclodextrin with a disaccharide, polymers comprising α-cyclodextrin in their main chain and polymers comprising α-cyclodextrin pendant on their main chain.

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5,051,403

## METHOD OF TREATING ISCHEMIA-RELATED NEURONAL DAMAGE

George P. Miljanich, Redwood City; Robert S. Bitner, Mountain View; Stephen S. Bowersox, Menlo Park; James A. Fox, Palo Alto; Karen L. Valentino, San Carlos, and Donald H. Yamashiro, San Francisco, all of Calif., assignors to Neurex Corporation, Menlo Park, Calif.

Filed Nov. 22, 1989, Ser. No. 440,094
Int. Cl.[5] A61K *37/02;* C07K *7/08, 7/10*
U.S. Cl. 514—12 17 Claims




1. A method of treating an ischemic condition in a mammalian subject, comprising
administering a binding/inhibitory omega-conotoxin peptide to the subject in a pharmaceutically effective amount, and
by said administering, reducing neuronal damage related to the ischemic condition.

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5,051,404

## TRIPEPTIDE COMPOUNDS HAVING HYPOTENSIVE ACTIVITY

Alessandro Sisto, Rome; Antonio S. Verdini, Monterotondo; Antonino Virdia, Rome; Giovanna De Luca, Rome; Giovanni Di Stazio, Rome, and Vincenzo Politi, Rome, all of Italy, assignors to Eniricerche, S.p.A., Milan and Polifarma, S.p.A., Rome, both of, Italy

Continuation of Ser. No. 870,163, Jun. 3, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 246,763
Claims priority, application Italy, Jun. 5, 1985, 21042 A/85
Int. Cl.[5] A61K *37/02;* C07K *5/08*
U.S. Cl. 514—18 15 Claims

1. A tripeptide which is L-pyroglutamyl-L-asparaginyl-L-phenylalanine.

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5,051,405

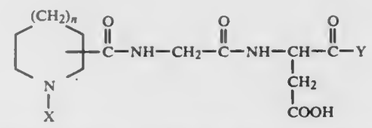
## ANTI-THROMBOTIC PEPTIDES AND PSEUDOPEPTIDES

Scott I. Klein, Audubon; Bruce F. Molino, Hatfield; Mark Czekaj, Holland, and Charles J. Gardner, Royersford, all of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Fort Washington, Pa.

Filed Oct. 10, 1989, Ser. No. 419,305
Int. Cl.[5] A61K *67/00*
U.S. Cl. 514—18 7 Claims

1. A compound of the formula





and pharmaceutically acceptable salts thereof, wherein:
X is H, amidino,



where R is alkyl, aryl or aralkyl;
Y is OH, $OR_1$ or a naturally occurring L-amino acid bonded at the α-amino position selected from the group consisting of
Val
Ser
Gly
Ala
Tyr
Phe
Trp
Thr
Pro
Leu
Arg
Asn
Asp
Cys
Glu
His
Lys and
Met;
$R_1$ is alkyl, aryl, aralkyl or allyl; and
n is 0, 1 or 2.

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5,051,406

## PHARMACEUTICAL COMPOSITION USING ALBUMIN AS A CARRIER AND PROCESS FOR PRODUCING THE SAME

Toshio Satoh, Tokushima, Japan, assignor to Nippon Hypox Laboratories Incorporated, Tokyo, Japan

PCT No. PCT/JP88/00237, § 371 Date Oct. 17, 1988, § 102(e) Date Oct. 17, 1988, PCT Pub. No. WO88/06457, PCT Pub. Date Sep. 7, 1988
Continuation of Ser. No. 265,455, Oct. 17, 1988, abandoned. This PCT application Mar. 4, 1988, Ser. No. 620,394
Claims priority, application Japan, Mar. 4, 1987, 62-49135; Mar. 4, 1987, 62-49136
Int. Cl.[5] A61K *47/42, 37/00, 31/00*
U.S. Cl. 514—21 6 Claims

1. A process for producing a pharmaceutical composition comprising mixing together at high speed in a solvent 1 to 250 parts by weight of a drug capable of binding to protein and 100 parts by weight of albumin, and thereafter
(2) removing the solvent, wherein the drug is nifedipine, aspirin, nalidixic acid, piroxicam, sulindac, phenylbutazone, cefaclor, cefalexin, tetracycline hydrochloride, ampicillin, dexamethasone, dlα-tocopherol, haloperidol, diltazem hydrochloride, defalexin, griseofulvin, vincristine sulfate, cimetidine, ketotifen, glycyrrhizin or tranilast.

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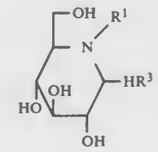
5,051,407

## METHODS FOR TREATING VIRUSES IN PATIENTS BY ADMINISTERING 2-HYDROXYMETHYLENE-3,4,5-TRIHYDROXYPIPERIDINES

Horst Böshagen, Haan; Bodo Junge, Wuppertal; Günther Kinast, Wuppertal; Matthias Schüller, Wuppertal; Jürgen Stoltefuss, and Arnold Paessens, both of Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 19, 1988, Ser. No. 259,932
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1987, 3737523
Int. Cl.[5] A61K *31/445*
U.S. Cl. 514—24 11 Claims

1. A method for treating a viral infection in a human or animal patient comprising administering to said patient an antivirally effective amount of a 2-hydroxymethylene-3,4,5-trihydroxypiperidine or a pharmaceutically acceptable salt thereof of the formula (I)

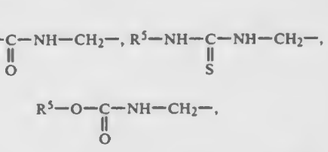


(I)

in which
$R^1$ stands for hydrogen and
$R^3$ stands for an unsubstituted or substituted straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical which is not interrupted or interrupted by heteroatoms selected from the group consisting of N, O and S, an unsubstituted or substituted aromatic radical or an unsubstituted or substituted heterocyclic radical,
or in which
$R^1$ stands for hydrogen or for an unsubstituted or substituted, straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical, or for an unsubstituted or substituted aromatic or heterocyclic radical and
$R^3$ stands for —H, OH, —$OR^5$, —SH, $SR^5$, —$NH_2$, —$NHR^5$,



$NH_2CH_2$—, $NHR^5$—$CH_2$—, $NR^5R^4$—$CH_2$—, —COOH, —$COOR^5$, HO—$CH_2$—, $R^5CO$—$NHCH_2$—, $R^5CO$—$CR^4CH_2$—, $R^5SO_2NHCH_2$—, $R^5SO_2$—$NR^4CH_2$—,



—$SO_3H$, —CN, —$CONH_2$, $CONHR^5$ or $CONR^5R^4$
where
$R^5$ and $R^4$ can assume the meanings previously mentioned for $R^1$,
and where for the case in which $R^3$=H or OH, $R^1$ stands for an unsubstituted or substituted, straight-chain, branched or cyclic, saturated or unsaturated hydrocarbon radical or for an

unsubstituted or substituted aromatic or heterocyclic radical or in which

$R^1$ stands for



wherein

$R^{11}$ denotes hydrogen, —formyl, —$R^{14}$, —$COR^{14}$, $CO_2R^{14}$, $CONH_2$, $CONHR^{14}$, $CONR^{14}R^{15}$, $CSR^{14}$, $CSNH_2$, $CSNHR^{14}$, $CSNR^{14}R^{15}$, $SO_3H$ or $SO_2R^{14}$,

$R^{12}$ denotes hydrogen or $R^{14}$ or

$R^{11}$ and $R^{12}$ together denote the grouping



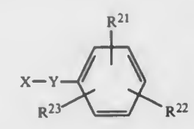
$R^3$ denotes hydrogen, hydroxyl, $OR^{14}$, mercapto, $SR^{14}$, amino, $NHR^{14}$, $NR^{14}R^{15}$, cyano, carboxyl, $CO_2R^{14}$, carboxylamido, $CONHR^{14}$, $CONR^{14}R^{15}$, aminomethyl, $CH_2NHR^{14}$, $CH_2NR^{14}R^{15}$, $CH_2$—$NR^{14}COR^{15}$, $CH_2NR^{14}SO_2R^{15}$, sulpho, hydroxymethyl, $CH_2OR^{14}$ or $CH_2OCOR^{14}$, and

$R^{14}$ and $R^{15}$ independently of one another denote an unsubstituted or substituted, straight-chain, branched or cyclic, saturated or unsaturated aliphatic hydrocarbon radical or an unsubstituted or substituted aromatic or heterocyclic radical, where two radicals $R^{15}$, $R^{17}$ and $R^{18}$ can also be bonded with one another, and

$R^{17}$ and $R^{18}$ independently of one another denote hydrogen or $R^{15}$ or in which

$R^3$ stands for hydrogen and

$R^1$ stands for



wherein

X stands for a straight-chain or branched saturated or unsaturated hydrocarbon radical,

Y stands for oxygen or sulphur and

$R^{21}$, $R^{22}$ and $R^{23}$ are identical or different and independently of one another stand for hydrogen, halogen, alkyl, aryl, alkoxy, aroxy, alkylthio, nitro, amino, hydroxyl, cyano, alkylamino and dialkylamino, acylamino, acyloxy, carboxyl, carbalkoxy, alkylcarbonyl, formyl or an unsubstituted or substituted sulphonamide radical.

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**5,051,408**

## INULIN COMPOSITIONS IN GAMMA POLYMORPHIC FORM

**Peter Dodd Cooper, Monash, Australia, assignor to The Australian National University, Acton, Australia**

**Continuation of Ser. No. 86,634, Aug. 3, 1987, Pat. No. 4,954,622. This application Mar. 30, 1990, Ser. No. 501,752**

**Claims priority, application Australia, Oct. 31, 1985, PH3187**

**Int. Cl.**[5] **A61K** *31/715, 39/02;* **A01N** *65/00;* **C08B** *37/18*

**U.S. Cl. 514—54** **16 Claims**

1. A composition comprising particles of inulin, wherein said particles are in the gamma polymorphic form and are virtually insoluble in aqueous media at 37° C.

5. An immunotherapeutic preparation for activation of the alternate pathway of complement (APC) in a human or animal body, which comprises as the active component thereof particles of inulin in the gamma polymorphic form, wherein said particles are virtually insoluble in aqueous media at 37° C.; and a pharmaceutically acceptable diluent or carrier.

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**5,051,409**

## 2-AMINODECALIN DERIVATIVES AND THEIR USE

**Matthias Zipplies, Hirschberg; Bernhard Zipperer, Dirmstein; Hubert Sauter, Mannheim; Norbert Goetz, Worms; Franz Roehl, Ludwigshafen; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

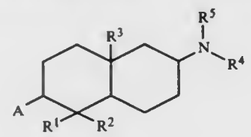
**Filed Nov. 1, 1989, Ser. No. 430,585**

**Claims priority, application Fed. Rep. of Germany, Nov. 15, 1988, 3838631**

**Int. Cl.**[5] **A01N** *33/04;* **C07C** *211/38*

**U.S. Cl. 514—63** **8 Claims**

1. 2-Aminodecalin derivatives of the formula I



I

where

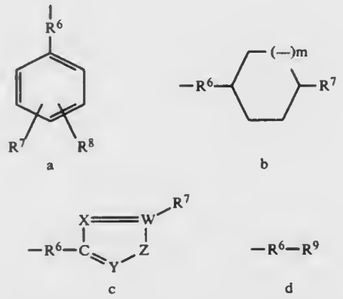
$R^1$, $R^2$ and $R^3$ are identical or different and are each H or methyl,

A is H, OH, O-$C_1$-$C_4$-alkylcarbonyl, O-benzyl or O—$CH_3$,

$R^4$ is H, $C_1$-$C_4$-alkyl, $C_2$-$C_4$-alkenyl, $C_3$-$C_4$-alkynyl or cyclopropyl,

$R^5$ is $C_3$-$C_{18}$-alkyl, $C_3$-$C_{18}$-alkenyl or $C_3$-$C_{18}$-alkynyl which is unsubstituted or monosubstituted to trisubstituted by $C_1$-$C_8$-alkoxy, $C_5$-$C_{12}$-cycloalkyl or $C_5$-$C_{12}$-cycloalkenyl which is unsubstituted or monosubstituted to trisubstituted by $C_3$-$C_8$-alkyl, $C_3$-$C_8$-alkenyl or $C_3$-$C_8$-alkoxy,

or $R^5$ is a radical



where $R^6$ is $C_1$-$C_5$-alkylene or $C_1$-$C_5$-alkenylene,

$R^7$ is $C_3$-$C_8$-alkyl, $C_3$-$C_8$-alkenyl, $C_3$-$C_8$-alkoxy, $C_1$-$C_3$-alkoxy-$C_2$-$C_5$-alkyl, $C_3$-$C_5$-alkylthio or trimethylsilyl,

$R^8$ is H or $CH_3$,

$R^9$ is $C_6$-$C_{10}$-bicycloalkyl or $C_6$-$C_{10}$-bicycloalkenyl which is unsubstituted or substituted by 2 or 3 methyl groups,

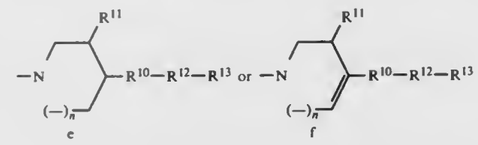
W, X, Y and Z are each a ring atom in an aromatic 5-membered heterocyclic ring, i.e., 1 or 2 radicals from the group consisting of O, S, N, NH, N—$R^7$ and 2 or 3 radicals CH and C—$R^7$,

m is 0, 1 or 2, so that the radical 5b contains a cyclohexyl, cycloheptyl or cyclopentyl radical,

$R^4$ and $R^5$, together with the nitrogen atom on which they



are substituents, may furthermore form a 5-membered or 6-membered ring e or f



where $R^{10}$ is H or $(CH_2)_q$, in which q is 0, 1, 2, 3 or 4 or methyl, ethyl or branched $C_3$-$C_8$-alkyl,

$R^{11}$ is H or $C_1$-$C_5$-alkyl,

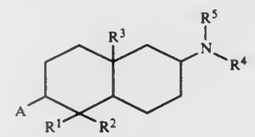
$R^{12}$ is H or phenyl when $R^{10}$ is not H,

$R^{13}$ is $C_3$-$C_6$-alkyl when $R^{12}$ is phenyl,

n is 0 or 1, so that the radical 5e or 5f contains a 6-membered or 5-membered heterocyclic ring,

and their plant-tolerated salts and N-oxides.

8. A process for combating fungi, wherein a fungicidally effective amount of a compound of the formula I



I

where

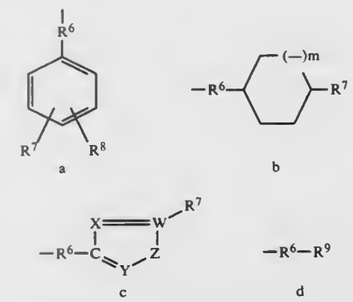
$R^1$, $R^2$ and $R^3$ are identical or different and are each H or methyl,

A is H, OH, O-$C_1$-$C_4$-alkylcarbonyl, O-benzoyl or O—$CH_3$,

$R^4$ is H, $C_1$-$C_4$-alkyl, $C_2$-$C_4$-alkenyl, $C_3$-$C_4$-alkynyl or cyclopropyl,

$R^5$ is $C_3$-$C_{18}$-alkyl, $C_3$-$C_{18}$-alkenyl or $C_3$-$C_{18}$-alkynyl which is unsubstituted or monosubstituted to trisubstituted by $C_1$-$C_8$-alkoxy, $C_5$-$C_{12}$-cycloalkyl or $C_5$-$C_{12}$-cycloalkenyl which is unsubstituted or monosubstituted to trisubstituted by $C_3$-$C_8$-alkyl, $C_3$-$C_8$-alkenyl or $C_3$-$C_8$-alkoxy,

or $R^5$ is a radical



where $R^6$ is $C_1$-$C_5$-alkylene or $C_1$-$C_5$-alkenylene,

$R^7$ is $C_3$-$C_8$-alkyl, $C_3$-$C_8$-alkenyl, $C_3$-$C_8$-alkoxy, $C_1$-$C_3$-alkoxy-$C_2$-$C_5$-alkyl, $C_3$-$C_5$-alkylthio or trimethylsilyl,

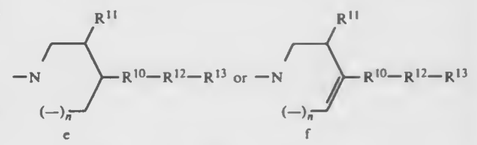
$R^8$ is H or $CH_3$,

$R^9$ is $C_6$-$C_{10}$-bicycloalkyl or $C_6$-$C_{10}$-bicycloalkenyl which is unsubstituted or substituted by 2 or 3 methyl groups,

W, X, Y and Z are each a ring atom in an aromatic 5-membered heterocyclic ring, i.e., 1 or 2 radicals from the group consisting of O, S, N, NH, N—$R^7$ and 2 or 3 radicals CH and C—$R^7$,

m is 0, 1 or 2, so that the radical 5b contains a cyclohexyl, cycloheptyl or cyclopentyl radical,

$R^4$ and $R^5$, together with the nitrogen atom on which they are substituents, may furthermore form a 5-membered or 6-membered ring e or f



where $R^{10}$ is H or $(CH_2)_q$, in which q is 0, 1, 2, 3 or 4 or methyl, ethyl or branched $C_3$-$C_8$-alkyl,

$R^{11}$ is H or $C_1$-$C_5$-alkyl,

$R^{12}$ is H or phenyl when $R^{10}$ is not H,

$R^{13}$ is $C_3$-$C_6$-alkyl when $R^{12}$ is phenyl,

n is 0 or 1, so that the radical 5e or 5f contains a 6-membered or 5-membered heterocyclic ring,

or a plant-tolerated salt or N-oxide thereof, is allowed to act on the fungi, or the materials, areas, plants or seed threatened by fungus attack.

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**5,051,410**

## METHOD AND COMPOSITION FOR ENHANCING THE RELEASE OF NEUROTRANSMITTERS

**Richard J. Wurtman, Boston, and Jan K. Blusztajn, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Sep. 1, 1988, Ser. No. 239,542**

**Int. Cl.**[5] **A61K** *31/685*

**U.S. Cl. 514—78** **11 Claims**

1. A composition for treatment of a neurological disorder, comprising choline or a choline precursor in an amount sufficient to increase blood choline levels in the individual up to about 18 nm/ml and pyritinol.

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**5,051,411**

## A METHOD OF ACHIEVING AN IMMUNOSUPPRESSIVE EFFECT

**Matti Siren, Montagnola/Lugano, Switzerland, assignor to Perstorp AB, Perstorp, Sweden**

**Continuation-in-part of Ser. No. 251,566, Sep. 30, 1988, Pat. No. 5,023,248, and a continuation-in-part of Ser. No. 173,985, Mar. 28, 1988, Pat. No. 5,019,566, which is a continuation-in-part of Ser. No. 38,230, Apr. 14, 1987, abandoned, which is a continuation-in-part of Ser. No. 15,679, Feb. 17, 1987, Pat. No. 4,797,390, which is a continuation-in-part of Ser. No. 788,801, Oct. 18, 1985, Pat. No. 4,735,936. This application Jun. 19, 1989, Ser. No. 367,968**

**Claims priority, application Sweden, Oct. 23, 1984, 8405295-0; Apr. 16, 1986, 8601709-2**

**Int. Cl.**[5] **A01N** *57/00*

**U.S. Cl. 514—103** **2 Claims**

1. A method of achieving an immunosuppressant effect in a mammal comprising administering to a mammal in need thereof a pharmaceutical composition which includes an immunosuppressant effective amount of at least one isomer of inositol triphosphate.

VOL 1130 ISS 4 SE 24 1991 UMI



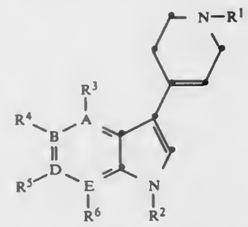
5,051,412

## PHARMACEUTICALLY ACTIVE 3-(1,2,5,6-TETRAHYDROPYRIDYL)-PYRROLOPYRIDINES

John E. Macor, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US89/00231, § 371 Date Sep. 17, 1990, § 102(e) Date Sep. 17, 1990
PCT Filed Jan. 23, 1989, Ser. No. 576,429
Int. Cl.[5] A61K *31/435*; C07D *471/04*
U.S. Cl. 514—300 9 Claims

1. A compound of the formula



I

wherein one of A, B, D and E is N and the remaining three atoms are C;

$R^1$ and $R^2$ are independently selected from hydrogen and $C_1$ to $C_6$ alkyl; and $R^3$, $R^4$, $R^5$ and $R^6$ are independently selected from hydrogen, halogen, hydroxy, $C_1$-$C_6$ alkyl, $C_1$-$C_8$ alkoxy, phenyl-$C_1$-$C_6$ alkoxy, phenoxy, $—NR^7R^8$ wherein $R^7$ and are independently selected from hydrogen, $C_1$-$C_6$ alkyl, $C_1$-$C_6$ alkanoyl, and $COOR^9$ wherein $R^9$ is hydrogen or $C_1$-$C_6$ alkyl, cyano, $COOR^{10}$ wherein $R^{10}$ is hydrogen or $C_1$-$C_6$ alkyl, and $CONR^{11}R^{12}$ where $R^{10}$ and $R^{11}$ are independently selected from hydrogen and $C_1$-$C_6$ alkyl and the pharmaceutically acceptable salts thereof.

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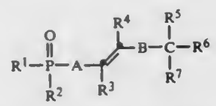
5,051,413

## UNSATURATED AMINO ACIDS

Christof Angst, Menlo Park, Calif.; Derek E. Brundish, Horsham, England; John G. Dingwall, Nuglar; Graham E. Fagg, Riehen, both of Switzerland; Hans Allgeier, Lörrach-Haagen, Fed. Rep. of Germany; Guido Bold, Gipf-Oberfrick, Switzerland; Rudolf Duthaler, Bettingen, Switzerland; Roland Heckendorn, and Antonio Togni, both of Arlesheim, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 226,356, Jul. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 13,766, Feb. 12, 1987, abandoned. This application Dec. 18, 1989, Ser. No. 452,995
Claims priority, application Switzerland, Feb. 13, 1986, 578/86; Aug. 4, 1987, 2986/87
Int. Cl.[5] C07F *9/30, 9/38, 9/40*; A61K *31/66*
U.S. Cl. 514—119 13 Claims

1. A compound of formula I



(I)

in which the carbon double bond is in the trans-configuration in relation to $R^3$ and $R^4$ or to A and B, and wherein $R^1$ represents hydroxy, lower alkoxy or hydroxy-lower alkoxy, $R^2$ represents hydrogen, alkyl, hydroxy, lower alkoxy or hydroxy-lower alkoxy, $R^3$ represents hydrogen, lower alkyl, halo-lower alkyl, lower alkoxy-lower alkyl, hydroxy-lower alkyl, phenyl-lower alkyl that is unsubstituted or substituted in the phenyl moiety, lower alkenyl, halogen, or unsubstituted or substituted phenyl, $R^4$ represents hydrogen, lower alkyl or unsubstituted or substituted phenyl, $R^5$ represents hydrogen or lower alkyl, $R^6$ represents carboxy, alkoxycarbonyl, alkoxycarbonyl substituted in a position higher than the α-position by amino, mono- or di-lower alkylamino, hydroxy or by lower alkanoyloxy, or phenyl-lower alkoxycarbonyl that is unsubstituted or substituted in the phenyl moiety, $R^7$ represents amino, mono- or di-lower alkylamino or lower alkanoylamino, A represents unsubstituted or lower alkylsubstituted α,ω-alkylene having from 1 to 3 carbon atoms, and B represents a bond, wherein the substituents of phenyl are selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, halogen, amino, halo-lower alkyl, hydroxy-lower alkyl, amino-lower alkyl and nitro, or a pharmaceutically acceptable salt thereof.

12. Method of treatment of diseases that respond to a blocking of NMDA-sensitive receptors, wherein a therapeutically effective amount of a compound claimed in claim 1 is administered to a warm-blooded organism in need of such treatment.

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5,051,414

## INHIBITION OF HIV AND OTHER RETROVIRUSES BY POLYOXOANIONS

Peter J. Domaille, Coatesville, Pa., and John W. Blasecki, Newark, Del., assignors to Dupont Merck Pharmaceutical Company, Wilmington, Del.

Filed Aug. 3, 1989, Ser. No. 389,030
Int. Cl.[5] A01N *55/02*; A61K *31/555*; C22C *14/00*
U.S. Cl. 514—184 6 Claims

1. A pharmaceutical composition comprising a suitable pharmaceutical carrier and a retrovirus inhibiting amount of a polyoxoanion selected from the group consisting of: $K_6[BVW_{11}O_{40}]$, $\beta$-$Cs_5[PV_2W_{10}O_{40}]$, $K_6[SiTiW_{11}O_{40}]$, $K_7[PTi_2W_{10}O_{40}]$, $Na_{12}[P_2W_{15}O_{62}]$, and $K_9(NH_4)H_2[(OCe)_3(PW_9O_{34})_2]$.

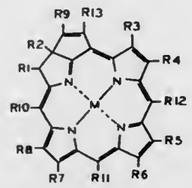
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5,051,415

## PRODUCTION AND USE OF PURPURINS, CHLORINS AND PURPURIN- AND CHLORIN-CONTAINING COMPOSITIONS

Alan R. Morgan; Steven H. Selman, and Martha Kreimer-Birnbaum, all of Toledo, Ohio, assignors to The University of Toledo; Medical College of Ohio and St. Vincent Medical Center, all of Toledo, Ohio, a part interest

Continuation-in-part of Ser. No. 874,097, Jun. 13, 1986, abandoned, and a continuation-in-part of Ser. No. 842,125, Mar. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 815,714, Jan. 2, 1986, abandoned. This application Aug. 2, 1989, Ser. No. 388,643
Int. Cl.[5] A61K *31/40*; C07D *487/22*
U.S. Cl. 514—185 23 Claims



1. A composition consisting essentially of a solution in a solvent of a chlorin, a chlorin metal complex, a purpurin or a purpurin metal complex, the purpurin having the structure of any of FIGS. 7 or 29–38 of the attached drawings, the purpurin metal complex having the structure of any of FIGS. 1, 44–48 or 54–58, of the attached drawings, the chlorin having the structure of any of FIGS. 8 or 38–43 of the attached drawings, and the chlorin metal complex having the structure of any of FIGS. 2 or 49–53, of the attached drawings, wherein each of



R10 through R13 and R16 is hydrogen, and each of R1 through R9, R14 and R16 is:

H or CHO,

an alkyl group other than t-butyl having from 1 to 4 carbon atoms,

an alkylene group having from 2 to 4 carbon atoms,

a group having the formula $R_2N(R_3)_2$ where $R_2$ is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; $R_3$ is hydrogen or an alkyl group having from 1 to 2carbon atoms and the two $R_3$ groups can be the same or different,

a group having the formula $R_2N(R_4)_3A$ where $R_2$ is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon bond is either a single or a double bond, and not more than one is a double bond; is a physiologically acceptable anion; and $R_4$ is an alkyl group having from 1 to 2 carbon atoms and the three $R_4$ groups can be the same or different,

a group having the formula $R_2OH$ were $R_2$ is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond,

an amino acid moiety which is a part of an amide produced by reaction between an amine function of a naturally occurring amino acid and a carboxyl function of the purpurin or chlorin,

$CO_2R'$, $CH_2CO_2R_{40}$ *or* $CH_2CH_2CO_2R'$, where R′ is hydrogen or an alkyl group other than t-butyl having from 1 to 4 carbon atoms,

a monoclonal antibody moiety which is attached to the purpurin or chlorin moiety through a carbonyl which is a part of an amide produced by reaction between an amine function of a monoclonal antibody and a $CO_2R'$ $CH_2CO_2R'$ or $CH_2CH_2CO_2R'$ group of the purpurin or chlorin, and wherein the moiety is of a monoclonal antibody which selectively binds to malignant tumors, or

in the purpurins and purpurin metal complexes of FIGS. 1, 7, 29–38, 44–48 and 54–58 and in the chlorins and chlorin metal complexes of FIGS. 2, 8, 39–43 and 49–53 R1 can be a bivalent aliphatic hydrocarbon radical having from 2 to 4 carbon atoms wherein both of the valences of the radical are attached to the same carbon atom thereof and to a carbon atom of the purpurin, chlorin, or metal complex, and in the purpurins, chlorins and metal complexes of FIGS. 29–33 and of FIGS. 39–53, both R1 and R2 can be bivalent aliphatic hydrocarbon radicals having from 2 to 4 carbon atoms wherein both of the valences of the radical are attached to the same carbon atom thereof and to a carbon atom of the purpurin or metal complex,

M comprises a metal cation that is complexed with two of the nitrogens of the purpurin or chlorin and is Ag, Al, Ce, Co, Cr, Dy, Er, Eu, Fe, Ga, Gd, Hf, Ho, In, La, Lu, Mn, Mo, Nd, Pb, Pd, Pr, Pt, Rh, Sb, Sc, Sm, Sn, Tb, Tc-44m, Th, Ti, Tl, Tm, U, V, Y, Yb, Zn or Zr, with the proviso that not more than one of R1 through R9, R14 and R15 is CHO, a group having the formula $R_2N(R_3)_2$, a group having the formula $R_2N(R_4)_3A$, an amino acid moiety or a monoclonal antibody moiety,

and wherein the solution comprises an organic liquid, and is one which is physiologically acceptable and of a suitable concentration or dilutable to a suitable concentration for intravenous administration.

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5,051,416

## ORAL ANTIBACTERIAL METHOD

Maurizio Foglio; Giovanni Franceschi, and Aurora Sanfilippo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Continuation of Ser. No. 906,275, Sep. 10, 1986, abandoned, which is a division of Ser. No. 567,819, Jan. 3, 1984, abandoned. This application Apr. 3, 1989, Ser. No. 331,853
Claims priority, application United Kingdom, Jan. 6, 1983, 8300295
Int. Cl.[5] H61K *31/43*
U.S. Cl. 514—195 1 Claim

1. A method of treating a warm-blooded animal having a susceptible bacterial infection which comprises administering orally to said animal a non-toxic, antibacterially effective amount of the acetoxymethyl ester of (5R,6S)-2(5R,6S)-2-carbamoyloxymethyl-6-[1(R)-hydroxyethyl]-2-penem-3-carboxylic acid.

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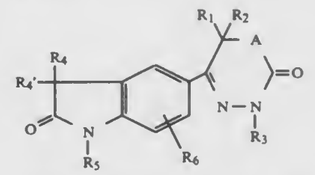
5,051,417

## INDOLYTHIADIAZINES FOR TREATING HEART FAILURE

Guy Nadler; Michel Martin, and Richard Zimmermann, all of Saint Gregoie, France, assignors to Les Laboratoires Beecham S.A., France

Filed Jui. 13, 1989, Ser. No. 379,626
Claims priority, application United Kingdom, Jul. 15, 1988, 8816944
Int. Cl.[5] C07D *285/16*; A61K *31/54*
U.S. Cl. 514—222.5 7 Claims

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof,



(I)

in which $R_1$ is hydrogen or lower alkyl; $R_2$ is hydrogen or lower alkyl; $R_4$ and $R_{4'}$ together form a group =N—Ra, or =CRaRb, where Ra is hydrogen, lower alkyl, aryl, aryloxy, lower alkylcarbonyl, arylcarbonyl, aryloxycarbonyl, lower alkoxy, lower alkoxy carbonyl, lower alkoxy carbonyl alkoxy, lower thioalkoxy, hydroxy, nitrile, pyridyl, thienyl, or imidazolyl, or —NRcRd, where Rc is hydrogen, lower alkyl, cycloalkyl, aryl, aralkyl, lower alkylcarbonyl, arylcarbonyl, aminocarbonyl, aminothiocarbonyl, aminoiminocarbonyl, lower alkoxycarbonyl, lower alkoxythiocarbonyl, aryloxycarbonyl, nitrile, carboxyl, pyridyl, thienyl or imidazolyl or heterocyclylcarbonyl wherein the heterocyclyl moiety is pyridyl, thienyl or imidazolyl, and Rd is hydrogen or lower alkyl; Rb is hydrogen, lower alkyl, aryl, lower alkylcarbonyl, lower alkoxycarbonyl, nitrile or nitro; or $R_4$ is —NH—Ra, in which Ra is as defined above, and $R_4$, is hydrogen or lower alkyl; each of $R_3$ and $R_5$ are hydrogen, lower alkyl, unsubstituted or substituted phenyl, lower alkylcarbonyl, unsubstituted or substituted phenylcarbonyl, unsubstituted or substituted pyridylcarbonyl, thienylcarbonyl or imidazoylcarbonyl, unsubstituted or substituted aminocarbonyl, lower alkoxycarbonyl or unsubstituted or substituted phenyloxycarbonyl, in which the substituents are one or more moieties selected from the group consisting of amino, nitro, hydroxy, lower alkyl, lower alkoxy, halogen, trifluoromethyl, lower alkyl sulphonyl and carboxyl; $R_6$ is hydrogen, lower alkyl or halogen; and A is sulphur; wherein aryl is an unsubstituted or substituted carbocyclic aromatic group having single or fused rings with 6 to 12 ring carbon atoms, the substituents selected from the group consistiong of

amino, nitro, hydroxyl, lower alkyl, lower alkoxy, halogen, trifluoromethyl, lower alkyl sulphonyl and carboxyl.

7. A method of treating congestive heart failure in mammals, which comprises administering an effective amount of a compound of formula (I) as defined in claim 1, or a pharmaceutically acceptable salt thereof, to the mammal.

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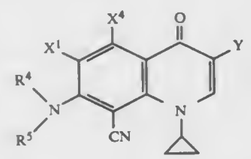
**5,051,418**

## ANTIBACTERIAL 8-CYANO-1-CYCLOPROPYL-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS

**Michael Schriewer; Klaus Grohe, both of Odenthal; Uwe Petersen, Leverkusen; Ingo Haller, Wuppertal; Karl G. Metzger, Wuppertal; Rainer Endermann, Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Division of Ser. No. 144,884, Jan. 14, 1988, Pat. No. 4,908,366.**
**This application Nov. 13, 1989, Ser. No. 434,666**
**Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702393**
**Int. Cl.[5] A61K** *31/54;* **C07D** *417/04*
**U.S. Cl. 514—228.2** **6 Claims**

1. An 8-cyano-1-cyclopropyl-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid derivative of the formula



in which

Y represents carboxyl, nitrile, —COOR[1]—CONR[2] R[3], wherein

R[1] represents alkyl, and

R[2] and R[3] each independently represent hydrogen or alkyl, and

R[3] represents an unsubstituted or substituted phenyl,

X[1] represents hydrogen, nitro, alkyl, or halogen,

X[4] represents hydrogen or halogen or alkyl,

R[4] and R[5], together with the nitrogen atom to which they are bonded, form a 6-membered heterocyclic ring which additionally have the atoms or groups —S—, —SO—, or —$SO_2$—, as a ring member and which is unsubstituted or mono-, di- or trisubstituted on the carbon atoms by identical or different substituents said substituents being $C_1$–$C_4$-alkyl, phenyl and cyclohexyl and said substituents being unsubstituted or mono-, di- or trisubstituted by chlorine, fluorine, bromine, methyl, phenyl, hydroxyl, methoxy, benzyloxy, nitro or piperidino, 2-thienyl, hydroxyl, alkoxy with one to three carbon atoms, amino, methylamino, ethylamino, aminomethyl, methylaminomethyl and ethylaminomethyl; pharmaceutically acceptable hydrates or salts thereof, and their esters.

6. A method of combating bacteria which comprises administering to a patent in need thereof an effective amount of a compound according to claim 1.

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**5,051,419**

## PREVENTION OR ELIMINATION OF MYCOPLASMA CONTAMINATION OF ANIMAL OR PLANT CELL CULTURES

**Shinichi Nakamura, Takatsuki; Yuzo Sakaguchi, Takaishi; Shigeki Kashimoto, Osaka, and Shin-ichi Matsumoto, Ikoma, all of Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan**

**Filed Jun. 27, 1989, Ser. No. 371,974**
**Claims priority, application Japan, Jun. 29, 1988, 63-162918**
**Int. Cl.[5] A61K** *31/535*
**U.S. Cl. 514—235.2** **6 Claims**

1. A method of preventing or eliminating mycoplasma contamination of animal or plant cell cultures, which comprises adding an anti-mycoplasmally effective amount of 5-amino-7-(2-aminomethylmorpholino)-1-cyclopropyl-6,8-difluoro-1,4-dihydro-4-oxoquinoline-3-acid ("compound A" hereafter) or its salt to a culture medium in which animal or plant cells are cultivated.

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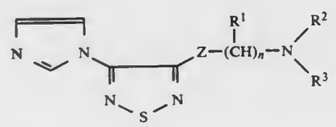
**5,051,420**

## 4-SUBSTITUTED-3-1H-IMIDAZOL-1-,2,5-THIADIAZOLES AS ANTIARRHYTHMIC AGENTS

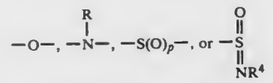
**Mark R. Hellberg, Arlington, Tex., and James R. Shanklin, Jr., Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.**

**Filed Mar. 4, 1991, Ser. No. 664,306**
**Int. Cl.[5] A61K** *31/41, 31/535;* **C07D** *417/04*
**U.S. Cl. 514—236.2** **5 Claims**

1. A compound possessing antiarrhythmic properties of the formula:



wherein Z is



where n is 2–4, p is 0, 1 or 2; R and R[1] are independently H or $C_1$–$C_4$ alkyl; R[2] and R[3] are selected from H, $C_1$–$C_4$ alkyl, aryl, arylalkyl, or R[1] and R[2] are joined to form a saturated 4–6 membered heterocyclic ring or R[2] and R[3] are joined to form a 4–6 membered heterocyclic ring which may contain an additional heteroatom; R[4] is H, $C_1$–$C_6$ alkyl, arylalkyl, $C_1$–$C_4$ alkoxycarbonyl, benzyloxycarbonyl, $C_1$–$C_4$ alkylcarbonyl, $C_1$–$C_4$ alkylaminocarbonyl, or arylaminocarbonyl; or a pharmaceutically acceptable salt thereof.

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**5,051,421**

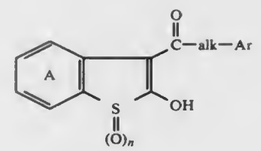
## BENZO-[B]THIOPHENE DERIVATIVES

**Pier G. Ferrini, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

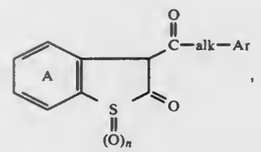
**Division of Ser. No. 324,367, Mar. 15, 1989, abandoned. This application Jan. 18, 1990, Ser. No. 467,088**
**Claims priority, application Switzerland, Mar. 16, 1988, 998/88**
**Int. Cl.[5] C07D** *409/06, 403/06, 237/06, 285/06, 285/14, 277/30;* **A61K** *31/335, 31/38, 31/44, 31/495*
**U.S. Cl. 514—245** **4 Claims**

1. A benzo[b]thiophene derivative of formula





or



respectively, or a salt thereof, in which n is 0, 1 or 2, alk is lower alkylene, Ar is triazinyl which is unsubstituted or is mono- or poly-substituted by lower alkyl, halo-lower alkyl, halogen or nitro, and ring A is unsubstituted or is mono- or poly-substituted by lower alkyl, lower alkoxy, lower alkylthio, lower alkanesulfinyl, lower alkanesulfonyl, halo-lower alkyl, halogen or nitro.

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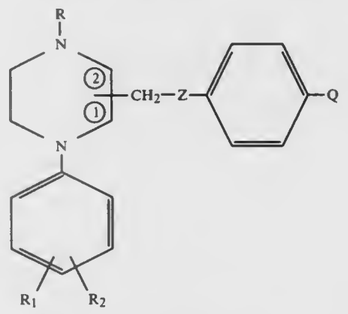
**5,051,422**

## 2-SUBSTITUTED-1(4)-ARYL PIPERAZINES AND THE PROCESS FOR THEIR PREPARATION

**William C. Lumma, Jr., Pennsburg, Pa.; Thomas K. Morgan, Jr., Morris Plains, and Gary B. Phillips, Wharton, both of N.J., assignors to Schering AG, Berlin, Fed. Rep. of Germany**

**Filed Sep. 15, 1989, Ser. No. 408,020**
**Int. Cl.[5] A61K** *31/495;* **C07D** *403/12*
**U.S. Cl. 514—252** **17 Claims**

1. A compound of the following Formula I:

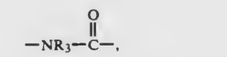


wherein

R is hydrogen, lower alkyl or benzyl;

$R_1$ and $R_2$ are the same or independently hydrogen, lower alkyl, lower alkoxy or halogen;

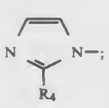
Z is



—$NR_3$—$CH_2$—, —O—$CH_2$—, —$NR_3$—, —O— or —$NR_3SO_2$—;

Q is ($C_1$–$C_4$)—$SO_2$—$NR_4$— or

(I)



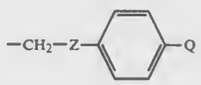
$R_3$ is hydrogen, lower alkyl, allyl, loweralkoxyloweralkyl;

$R_4$ is hydrogen or methyl;

and the pharmaceutically acceptable slats thereof;

(Ia) provided that,

when $R_4$ is methyl then



must be in the (2) position of Formula I.

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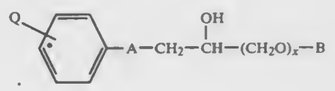
**5,051,423**

## DERIVATIZED ALKANOLAMINES AS CARDIOVASCULAR AGENTS

**Randall E. Lis, Stanhope, N.J.; William C. Lumma, Jr., Pennsburg, Pa.; Thomas K. Morgan, Jr., Morris Plains, N.J.; Klaus Nickisch, Berlin, Fed. Rep. of Germany, and Ronald A. Wohl, Morris Plains, N.J., assignors to Schering AG, Berlin, Fed. Rep. of Germany**

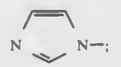
**Filed Jul. 13, 1988, Ser. No. 218,195**
**Int. Cl.[5] A61K** *31/495, 31/415;* **C07D** *403/10, 233/60*
**U.S. Cl. 514—252** **36 Claims**

1.

I 

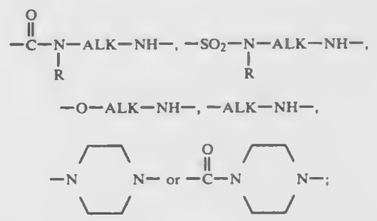
wherein:

Q is ($C_1$–$C_4$)—$SO_2NH$— or

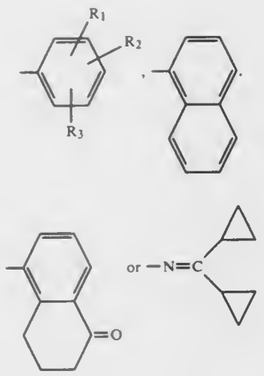


x is the integer 0 or 1;

A is

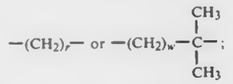


B is



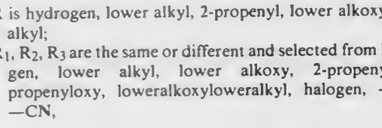


ALK is



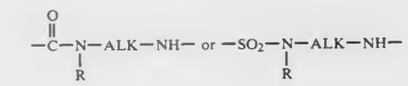
R is hydrogen, lower alkyl, 2-propenyl, lower alkoxylower alkyl;

$R_1$, $R_2$, $R_3$ are the same or different and selected from hydrogen, lower alkyl, lower alkoxy, 2-propenyl, 2-propenyloxy, loweralkoxyloweralkyl, halogen, $-CF_3$, $-CN$,

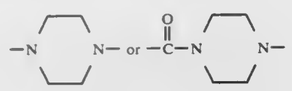




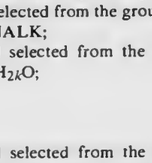
r is an integer of 1–4;
w is an integer of 1–3;
p is an integer of 1–3;
t is an integer of 2–5;
$R_4$ is hydrogen or lower alkyl; or a pharmaceutically acceptable salt thereof;
with the provisos that:
a) when A is



then
Q cannot be $(C_1-C_4)-SO_2NH-$;
b) Q cannot be ortho to the A attachment and when Q is $(C_1-C_4)-SO_2NH-$, it must be para to A;
c) when A is



then x must be the integer 1;
d) when A is —O—ALK—NH—, then r cannot be the integer 1;
e) when x=0 then B cannot be



and

f) when Q is $(C_1-C_4)-SO_2NH-$ and A is ALK then x must be the integer 1.

**35**. The method of treating arrhythmias in a mammalian host which comprises administering to said host a non-toxic effective amount of a compound of claim **1**.

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**5,051,424**

## SUBSTITUTED AROMATIC COMPOUNDS HAVING AN ACTION ON THE CENTRAL NERVOUS SYSTEM

**Johannes H. Wieringa, Heesch, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands**

**Filed Oct. 16, 1989, Ser. No. 422,311**
**Int. Cl.[5] A61K** *31/495;* **C07D** *295/84, 295/88*
**U.S. Cl. 514—255** **5 Claims**

**1**. Aromatic compounds of the formula I comprising:



wherein
$R^1$ is a compound selected from the group consisting of hydrogen, $NO_2$, OH, halogen, $C_1-C_4$ alkyl, $C_1-C_4$ alkoxy, unsubstituted amino and $C_1-C_4$ alkyl substituted amino;
$R^2$ is a compound selected from the group consisting of hydrogen, $NO_2$, OH, halogen, $C_1-C_4$ alkyl, $C_1-C_4$ alkoxy, unsubstituted amino and $C_1-C_4$ alkyl substituted amino;
X is a compound selected from the group consisting of O, S, $CH_2$, NH and NALK;
A is a compound selected from the group consisting of $C_mH_{2m}$ and $C_kH_{2k}O$;
k is 1 to 4;
m is 0 to 2;
n is 0 or 1;
Q is a compound selected from the group consisting of hydrogen, phenyl, substituted phenyl and an ALK group optionally substituted by phenyl or substituted phenyl, where the substituted phenyl is phenyl substituted by OH, halogen, $NO_2$, unsubstituted amino, $C_1-C_4$ alkyl substituted amino, $C_1-C_4$ alkyl or $C_1-C_4$ alkoxy, wherein
ALK is a $C_1-C_4$ aliphatic hydrocarbon;
and when $R^1$ is H, $R^2$ is methoxy, O is phenyl, A is $C_mH_{2m}$, m=0 and n=1, X is selected from the group consisting of S, $CH_2$, NH or NALK; or the acid addition salts thereof.

**5**. A pharmaceutical preparation comprising a pharmaceutically effective amount for the inhibition of monoamine uptake of at least one compound according to claim **1**, in an admixture with a pharmaceutically acceptable carrier or diluent.



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**5,051,425**

## THERAPEUTIC COMPOSITION FOR COMBATTING AIDS

**Masuyo Nakai, 5-8, Hama 2-chome, Amagasaki-shi, Hyogo, Japan**

**Filed Jul. 6, 1988, Ser. No. 215,953**
**Claims priority, application Japan, Aug. 3, 1987, 62-193991**
**Int. Cl.[5] A61K** *31/505, 31/70, 31/66, 31/13*
**U.S. Cl. 514—256** **1 Claim**

**1**. A method of treating AIDS which comprises administering to a subject afflicted with AIDS an anti-AIDS pharmaceutically effective amount of an alkylating agent, wherein said alkylating agent is nimustine-HCl, and a pharmaceutically acceptable carrier.

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**5,051,426**

## METHOD FOR EFFECTING WITHDRAWAL FROM DRUG DEPENDENCY

**Francis W. Parnell, Ross, Calif., assignor to Parnell Pharmaceuticals, Inc., San Rafael, Calif.**

**Filed Mar. 27, 1990, Ser. No. 500,034**
**Int. Cl.[5] A61K** *31/52*
**U.S. Cl. 514—263** **29 Claims**

**1**. A method for the treatment of a drug-dependent individual, which method comprises administering a therapeutically effective amount of (a) a serotonin antagonist selected from the group consisting of ergotamine, ergotamine derivatives, and pharmacologically acceptable salts thereof; and (b) a CNS stimulant selected from the group consisting of xanthine, xanthine derivatives, and pharmacologically acceptable salts thereof.

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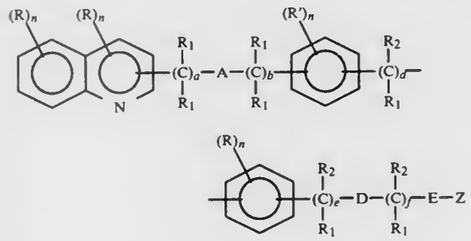
**5,051,427**

## QUINOLINE DERIVATIVES AS ANTAGONISTS OF LEUKOTRIENE $D_4$

**Fu-Chi Huang, Gwynedd; Robert A. Galemmo, Jr., Ambler, and Henry F. Campbell, North Wales, all of Pa., assignors to Rhône-Poulenc Rorer Pharmaceuticals Inc., Fort Washington, Pa.**

**PCT No. PCT/US88/03895, § 371 Date Apr. 20, 1990, § 102(e) Date Apr. 20, 1990, PCT Pub. No. WO89/04303, PCT Pub. Date May 18, 1989**
**Continuation-in-part of Ser. No. 116,428, Nov. 3, 1987, Pat. No. 4,920,133. This PCT application Nov. 1, 1988, Ser. No. 449,957**
**The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.**
**Int. Cl.[5] C07D** *401/12;* **A61K** *31/41*
**U.S. Cl. 514—311** **22 Claims**

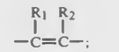
**1**. A compound of the formula



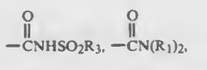
where:
A is O or S;
D is O, S, $NR_1$,



or a chemical bond
E is a chemical bond or



a is 0–2;
b is 0–1;
d is 1–5;
e is 0–4;
f is 0–5;
n is 0–2;
R is independently hydrogen, alkyl, hydroxy, alkoxy, carboxy, carbalkoxy, halo, nitro, haloalkyl, cyano or acyl;
R′ is independently hydrogen, alkyl, hydroxy, alkoxy, halo or haloalkyl;
$R_1$ is independently hydrogen, alkyl or aralkyl;
$R_2$ is $-(CH_2)_x-X$;
x is 0–3;
X is hydrogen, alkyl, alkenyl, cycloalkyl, aryl, aralkyl, hydroxy, alkoxy, aralkoxy, amino, mono-and di-alkylamino, aralkylamino, acylamino, carbamyl, carboxy, carbalkoxy, tetrazolyl or acylsulfonamido;
vicinal $R_2$ groups together may be $-(CH_2)_y-$, where y is 1–4, thus forming a 3–6 membered ring;
geminal $R_1$ and $R_2$ groups may together form a spiro substituent, $-(CH_2)_z-$, where z is 2 to 5;
geminal $R_1$ or $R_1$ and $R_2$ groups may together form an alkylidenyl substituent, $=CHR_1$;
Z is $-COOR_1$, CN,



—$OR_1$, tetrazolyl or substituted tetrazolyl where the substituent may be alkyl, carboxyalkyl or carbalkoxyalkyl;
$R_3$ is hydrogen, alkyl, haloalkyl, phenyl or benzyl; and pharmaceutically acceptable salts thereof.

**21**. A method for the treatment of hypersensitive ailments in humans and mammals comprising administering thereto an effective amount of a compound of the formula according to claim **1**.

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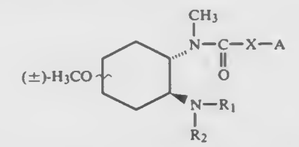
**5,051,428**

## 2-AMINO-4 OR 5-METHOXYCYCLOHEXYL AMIDES USEFUL AS ANALGESICS

**David C. Horwell, and David C. Rees, both of Cambridge, England, assignors to Warner-Lambert Company, Morris Plains, N.J.**

**Continuation of Ser. No. 280,759, Dec. 6, 1988, abandoned. This application Mar. 29, 1990, Ser. No. 503,067**
**Int. Cl.[5] C07D** *207/6;* **A61K** *31/34, 31/38, 31/40*
**U.S. Cl. 514—320** **6 Claims**

**1**. A compound of formula

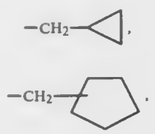


wherein (±)—$H_3CO$— is attached at the 4- or 5-position and wherein the two nitrogen atoms attached to the cyclohexane moiety are trans to one another;
X is $CH_2$ or direct bond,
$R_1$ is methyl,
$R_2$ is selected from the group consisting of:
hydrogen,

VOL 1130 ISS 4 SE 24 1991 UMI

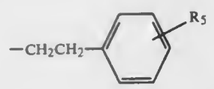


alkyl of from one to six carbon atoms,





$-CH_2CH{=}CH_3R_4$,
$-CH_2C{\equiv}R_3$,
-2- or 3-thienyl, or



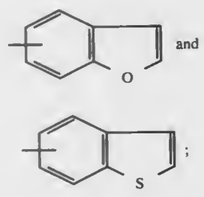
wherein $R_3$ and $R_4$ are each independently hydrogen or methyl,

$R_5$ is selected from the group consisting of:
hydrogen,
fluorine,
chlorine,
bromine,
lower alkyl, and
lower alkoxy;

or $R_1$ and $R_2$ may be taken together with the nitrogen atom to which they are attached to form a ring



wherein n is an integer of from 3 to 8;
A is selected from the group consisting of:

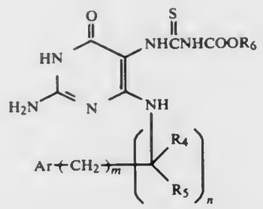


or
a pharmaceutically acceptable acid addition salt thereof.

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**5,051,429**
**"PYRIMIDINE DERIVATIVES"**
**Garry W. Pioter, and Jagadish C. Sircar, both of Ann Arbor, Mich., assignors to Warner-Lambert Co., Morris Plains, N.J.**
**Division of Ser. No. 204,140, Jun. 8, 1988, abandoned, which is a division of Ser. No. 767,202, Aug. 22, 1985, Pat. No. 4,772,606, which is a continuation-in-part of Ser. No. 660,152, Oct. 12, 1984, abandoned. This application Dec. 15, 1989, Ser. No. 452,938**
**Int. Cl.[5] C07D *239/22***
**U.S. Cl. 544—320** **4 Claims**

1. A compound of the formula:



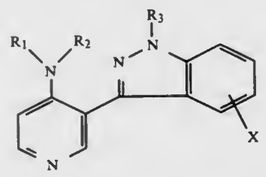
II

wherein $R_6$ is alkyl of one to four carbon atoms; aryl which is phenyl or phenyl substituted by halogen, alkyl of one to four carbon atoms, hydroxy, alkoxy of one to four carbon atoms or trifluoromethyl, arylalkyl wherein aryl is as defined above and alkyl is of one to four carbon atoms;
n is zero or one;
m is zero, one, two or three, with the proviso that m or n is at least one;
$R_4$ and $R_5$ are each independently hydrogen, alkyl or one to four carbon atoms, aryl which is the same as defined above, arylalkyl which is the same as defined above or cycloalkyl of three to six carbon atoms, hydroxyalkyl of one to four carbon atoms, Ar is a five-or six-membered aromatic ring containing one or more hetero atoms selected from N, O and S, unsubstituted or substituted by halogen, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, or $-C{=}C-C{=}C-$ attached to adjacent carbons so as to form a benzo radical.

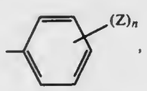
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**5,051,430**
**3-(1H-INDAZOL-3-YL)-4-PYRIDINAMINES**
**Richard C. Effland, and Joseph T. Klein, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals Incorporated, Somerville, N.J.**
**Filed Sep. 10, 1990, Ser. No. 579,751**
**Int. Cl.[5] A61K *31/44*; C07D *401/04***
**U.S. Cl. 514—338** **9 Claims**

1. A compound of the formula



where $R_1$ is hydrogen, loweralkyl, arylalkyl or acyl; $R_2$ is hydrogen, loweralkyl or arylalkyl; $R_3$ is hydrogen, loweralkyl or aryl; X is hydrogen, nitro or amino, the term aryl in each occurrence signifying a phenyl group optionally substituted as defined by the formula



where Z is hydrogen, halogen, loweralkyl, loweralkoxy, trifluoromethyl, nitro and amino, and n is an integer of 1 to 3; the term acyl in each occurrence signifying a substituent having the formula loweralkyl



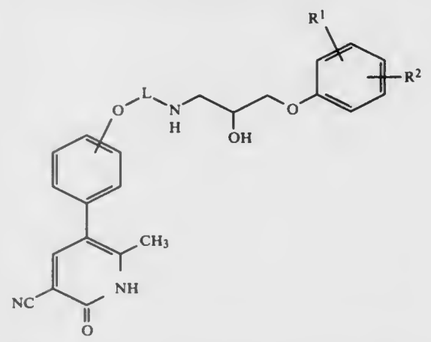


or a pharmaceutically acceptable addition salt thereof, or where applicable a geometrical or optical isomer or racemic mixture thereof.

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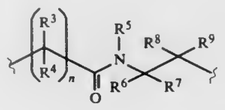
**5,051,431**
**PYRIDONE NITRILES USEFUL IN TREATING CARDIOVASCULAR DISEASE**
**Thomas N. Wheeler, Raleigh; Terrence P. Kenakin, Durham, and Joel E. Shaffer, Chapel Hill, all of N.C., assignors to Glaxo Inc., Research Triangle Park, N.C.**
**Continuation-in-part of Ser. No. 411,065, Sep. 22, 1989, abandoned. This application Aug. 9, 1990, Ser. No. 565,297**
**Int. Cl.[5] C07D *213/64*; A61K *31/44***
**U.S. Cl. 514—344** **13 Claims**

1. A pyridone of the following formula (I):



(I)

wherein:
$R^1$ and $R^2$ represent, independently, hydrogen, lower alkyloxy, morpholino, cyano, halogen, trifluoromethyl, alkyl, alkylsulfonyl, alkyloxyalkyl, cycloalkylalkyloxyalkyl, nitro, hydroxy, alkenyloxy, amino or amino substituted by one or two alkyl groups;
L represents a linking moiety of the following formula (II):



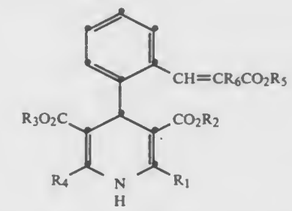
(II)

in which:
$R^3$–$R^9$ represent, independently, hydrogen or lower alkyl;
n represents the integer 1,2 or 3;
or a pharmaceutically acceptable acid addition salt thereof.

12. A pharmaceutical composition comprising a pyridone of claim 1 and a pharmaceutically acceptable diluent or carrier.

**5,051,432**
**HETEROCYCLIC 1,4 DIHYDROPYRIDINE DERIVATIVES**
**Claudio Semeraro, Bresso; Dino Micheli, Carpi; Daniele Pieraccioli; Giovanni Gaviraghi, both of Verona, all of Italy, and Alan D. Borthwick, London, England, assignors to Glaxo, S.p.A., Verona, Italy**
**Continuation of Ser. No. 287,609, Dec. 16, 1988, abandoned, which is a continuation of Ser. No. 16,589, Feb. 19, 1987, abandoned. This application Sep. 19, 1990, Ser. No. 587,159**
**Claims priority, application Italy, Feb. 20, 1986, 19485 A/86**
**Int. Cl.[5] C07D *211/86*; A61K *31/455***
**U.S. Cl. 514—356** **21 Claims**

1. A compound of the formula (I):



or a physiologically acceptable salt thereof, in which
$R_1$ and $R_4$ independently represent a $C_{1-4}$ alkyl group;
$R_2$ represents a group

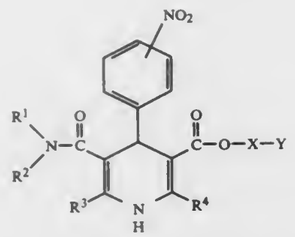


where A is a bond or a methylene group and $R_7$ is a phenyl $C_{1-4}$ alkyl group, or $R_2$ represents the group $CH_2CH_2NR_8R_9$ where $R_8$ is hydrogen or a $C_{1-4}$ alkyl group and $R_9$ is a $C_{1-4}$ alkyl group, a phenyl $C_{1-4}$ alkyl group or a benzoyl $C_{1-4}$ alkyl group, or $R_2$ represents a $C_{1-4}$ alkyl group substituted by nitrile;
$R_3$ represents a $C_{1-6}$ straight or branched chain alkyl or alkoxyalkyl group;
$R_5$ represents a $C_{1-13}$ straight or branched chain alkyl group or a $C_{5-8}$ cycloalkyl group which may be substituted by a $C_{1-3}$ alkyl group; and
$R_6$ represents hydrogen or a halogen.

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**5,051,433**
**PHARMACEUTICALLY ACTIVE BASIC NITRO-PHENYL-DIHYDROPYRIDINE AMIDES**
**Jürgen Stoltefuss, Haan; Eckhard Schwenner, Wuppertal; Rainer Gross, Wuppertal; Siegbert Hebisch, Wuppertal; Matthias Schramm, Cologne; Martin Bechem, Wuppertal; Claudia Hirth, Wuppertal, and Johannes-Peter Stasch, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**
**Filed Sep. 27, 1989, Ser. No. 413,510**
**Claims priority, application Fed. Rep. of Germany, Oct. 5, 1988, 3833893**
**The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.**
**Int. Cl.[5] A61K *31/455***
**U.S. Cl. 514—356** **4 Claims**

1. A method of controlling cardiac arrhythmias in a patient in need thereof which comprises administering to such patient an amount effective therefor of a 4-nitrophenyldihydropyridine amide of the formula



in which
$R^1$ and $R^2$ are identical or different and each represent hydrogen, alkyl with 1 to 4 carbon atoms, cyclopropyl or cyclopentyl,
$R^3$ and $R^4$ represent methyl,
X represents straight-chain or branched alkyl with up to 4 carbon atoms, and
Y represents pyridyl or morpholino or represents a group of the formula $NR^9R^{10}$ in which
$R^9$ and $R^{10}$ are identical or different and represent hydrogen, alky with up to 4 carbon atoms or benzyl.

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**5,051,434**

## INSECTICIDALLY ACTIVE NITRO GUANIDINE COMPOUNDS

**Shiokawa Kozo, Kanagawa; Shinichi Tsuboi, Tokyo; Koichi Moriya, Tokyo; Yumi Hattori, Tokyo; Ikuro Honda, Tokyo, and Katsuhiko Shibuya, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan**

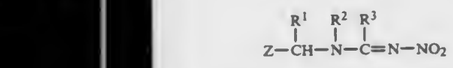
**Filed Nov. 16, 1989, Ser. No. 438,543**

**Claims priority, application Japan, Nov. 29, 1988, 63-299419; Feb. 13, 1989, 1-31145**

**Int. Cl.[5] A01N** *43/40;* **C07D** *213/38*

**U.S. Cl. 514—357** **14 Claims**

1. A novel nitro compound of the formula



wherein
$R^1$ and $R^2$ are hydrogen or $C_{1-4}$ alkyl,
$R^3$ is —S—$R^4$ or



$R^4$ is $C_{1-4}$ alkyl,
$R^5$ and $R^6$ are hydrogen or $C_{1-4}$ alkyl, and
Z is pyridyl, thiazolyl, thiadiazolyl, pyrimidinyl, or isoxazolyl which may be substituted by halogen or $C_{1-4}$-alkyl.

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**5,051,435**

## PHARMACEUTICAL PREPARATIONS

**Henrich H. Paradies, Kuhlowcg, Fed. Rep. of Germany, assignor to Medice Chem.-Pharm. Fabrik Putter GmbH & Co. KG, Fed. Rep. of Germany**

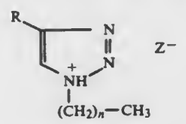
**Continuation of Ser. No. 321,495, Mar. 9, 1989, abandoned. This application Jun. 4, 1990, Ser. No. 533,998**

**Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 36267**

**Int. Cl.[5] C07D** *294/04;* **A61K** *31/41*

**U.S. Cl. 514—359** **2 Claims**

1. Micellar or vesicular assemblies in a solvent having a pH less than or equal to about 7, having critical micelle formation concentration in the range of $1.0\times10^{-7}$M to $1.5\times10^{-4}$M containing a heterocyclic compound having the formula



in which:
R is a member selected from the group consisting of H, $CH_3$ and OH;
Z is a member selected from the group consisting of chloride, bromide, iodide, maleate, formate, acetate, propionate, $HSO_4^-$, malate, fumarate, salicylate, alginate, gluconate, glucoronate, galactoronate, ethylsulfate and $H_2PO_4^-$; and
n is 8 to 20.

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**5,051,436**

## COMPOSITIONS FOR PROTECTING PLANTS AGAINST DISEASE

**Walter Kunz, Oberwil, and Rolf Schurter, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

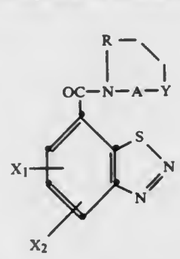
**Filed Feb. 16, 1990, Ser. No. 481,422**

**Claims priority, application Switzerland, Feb. 21, 1989, 617/89**

**Int. Cl.[5] C07D** *285/14, 417/06;* **A01N** *43/82*

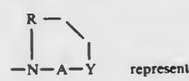
**U.S. Cl. 514—361** **13 Claims**

1. Compounds of formula I

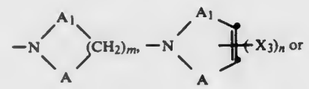


(I)

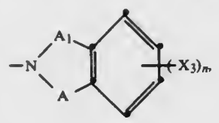
in which $X_1$ and $X_2$ independently of one another are each hydrogen or together 1 to 3 halogen atoms; A is sulfonyl or carbonyl; Y is phenyl or phenyl substituted by $C_1$–$C_2$alkyl, $C_1$–$C_2$alkoxy, halogen, $C_1$–$C_2$haloalkyl, $C_1$–$C_2$alkoxycarbonyl, $C_1$–$C_3$alkanoyloxymethyl, cyano and/or by nitro; R is hydrogen, $C_1$–$C_4$alkyl, $C_1$–$C_4$haloalkyl, $C_3$–$C_5$alkenyl or $C_3$–$C_5$alkynyl; and in which, furthermore, the group



represents



or





wherein $A_1$ is methylene, carbonyl or sulfonyl; $X_3$ is hydrogen, methyl or halogen; m is 2, 3 or 4; and n is zero, 1 or 2.

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**5,051,437**

## THIAZOLYLPHENOXYALKYLISOXAZOLES, RELATED COMPOUNDS, AND THEIR USE AS ANTIVIRAL AGENTS

**Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.**

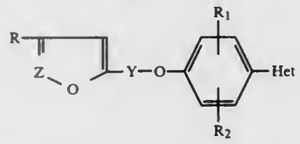
**Filed Aug. 18, 1989, Ser. No. 395,837**

**Claims priority, application Canada, Jun. 24, 1986, 512258**

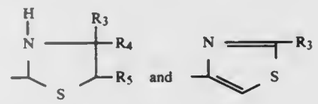
**Int. Cl.[5] A07D** *417/12;* **A01K** *31/425*

**U.S. Cl. 514—365** **9 Claims**

1. A compound of the formula:



wherein:
Y is an alkylene bridge of 3–9 carbon atoms;
Z is N;
R is lower-alkyl of 1–5 carbon atoms;
$R_1$ and $R_2$ are hydrogen, halogen, lower-alkyl, lower-alkoxy, nitro, lower-alkoxycarbonyl or trifluoromethyl; and
Het is selected from the group consisting of:



and



where $R_3$, $R_4$ and $R_5$ are hydrogen or lower-alkyl of 1–5 carbon atoms;
or pharmaceutically acceptable acid-addition salts thereof.

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**5,051,438**

## ALKOXY-SUBSTITUTED DIHYDROBENZOPYRAN-2-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF, COMPOSITIONS AND USE

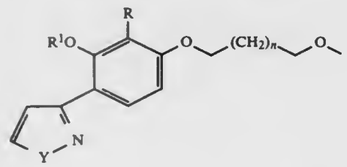
**Stevan W. Djuric, Glenview, and Thomas D. Penning, Elmhurst, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.**

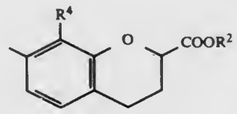
**Filed May 16, 1990, Ser. No. 524,765**

**Int. Cl.[5] A61K** *31/415, 31/42;* **C07D** *405/12, 413/12*

**U.S. Cl. 514—378** **23 Claims**

1. A compound of the formula:





wherein
R represents alkyl having 2 to 6 carbon atoms, alkenyl having 2 to 6 carbon atoms, alkynyl having 2 to 6 carbon atoms, or $—(CH_2)_m—R^3$ wherein $R^3$ represents cycloalkyl of 3 to 5 carbons atoms and m is 1 or 2;
$R^1$ represents alkyl having 1 to 4 carbon atoms;
$R^2$ represents hydrogen or alkyl having 1 to 5 carbon atoms;
$R^4$ represents alkyl having 1 to 6 carbon atoms;
n is an integer from 1 to 5; and
Y represents NH or oxygen; and the stereoisomers and pharmaceutically acceptable salts thereof.

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**5,051,439**

## ALLYLAMINOETHYLTNAZOLES AS FUNGICIDES AND ANTIMYCOTIC AGENTS

**Karl Schermanz, Graz; Gerald Saischek, Lannach; Dietmar Kores, Leonding; Josef Graf, Kleinraming; Gerhard Haas, Niederthalheim, and Kurt Martetschläger, Linz, all of Austria, assignors to Hafslund Nycomed Pharma Aktiengesellschaft, Linz, Austria**

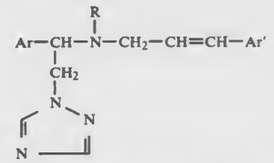
**Division of Ser. No. 378,898, Jul. 12, 1989, Pat. No. 4,965,277. This application Jul. 5, 1990, Ser. No. 548,043**

**Claims priority, application Austria, Jul. 22, 1988, 1875/88**

**Int. Cl.[5] A61K** *31/41;* **C07D** *233/00, 249/14, 249/16*

**U.S. Cl. 514—383** **8 Claims**

1. An allylaminoethyltriazole of the formula:



I

in which R is a hydrogen atom or an alkyl group containing 1 to 5 carbon atoms; each of Ar and Ar' is an unsubstituted phenyl group, a phenyl group substituted by one or more substituents selected from $C_1$–$C_3$ alkyl, $C_1$–$C_3$ alkoxy, nitro and halogen, an unsubstituted thienyl group, or a thienyl group substituted by halogen or naphthyl; or a phytophysiologically or pharmacologically tolerated acid addition salt thereof.

7. A method of combating pathogenic fungi which comprises administering a fungicidally-effective amount of at least one compound of formula I according to claim 1 to said fungi or their environment.

8. A method for the treatment or prevention of a mycotic infection in a patient which comprises administering to the patient an antimycotic-effective amount of at least one compound of formula I according to claim 1.

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**5,051,440**

## NITROGEN-CONTAINING HETEROCYCLIC COMPOUNDS WITH ANTIFUNGAL ACTION, USE AND A COMPOSITION THEREOF

**Giovanni Camaggi, Novara; Lucio Filippini, Saronno; Carlo Garavaglia, Cuggiono; Luigi Mirenna, and Isabella Venturini, both of Milan, all of Italy, assignors to Presidenza Del Consiglio Dei Ministri, Rome, Italy**

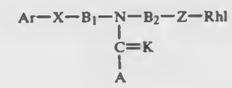
**Filed Jun. 21, 1990, Ser. No. 370,910**

**Claims priority, application Italy, Jun. 23, 1988, 21077 A/88**

**Int. Cl.[5] A01N** *43/50;* **C07D** *233/60*

**U.S. Cl. 514—399** **12 Claims**

1. A compound having the formula:



(I)

wherein:

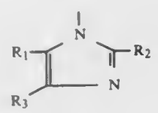
Ar represents a phenyl; a phenyl substituted with one or more halogens, ($C_1$–$C_3$)-alkyls, ($C_1$–$C_3$)-haloalkyls, ($C_2$–$C_4$)-alkenyls, ($C_2$–$C_4$)-haloalkenyls, ($C_1$–$C_3$)-alkoxy groups, ($C_1$–$C_4$)-haloalkoxy groups; a pyridyl, a pyridyl substituted with one or more halogens or with ($C_1$–$C_3$)-haloalkyls;

K, X, Z, are, independently of each other, either O or S;

$B_1$, $B_2$ which may be equal to or different from each other, are linear or branched ($C_1$–$C_6$)-alkylidenes;

Rhl represents a ($C_1$–$C_6$)-haloalkyl containing from 1 to 9 halogen atoms, a ($C_2$–$C_8$)-haloalkenyl containing from 1 to 9 halogen atoms, ($C_3$–$C_8$)-haloalkoxyalkyls, ($C_3$–$C_8$)-haloalkoxyalkenyls;

A represents



wherein:

$R_1$, $R_2$, $R_3$ which may be either equal to, or different from one another, are: H, ($C_1$–$C_6$)-alkyls, ($C_1$–$C_6$)-haloalkyls, ($C_2$–$C_6$)-alkenyls, ($C_2$–$C_6$)-haloalkenyls, ($C_2$–$C_6$)-alkinyls, ($C_2$–$C_6$)-haloalkinyls.

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**5,051,441**

**IMIDAZOLINE DERIVATIVE**

**Kazuo Matsumoto, Ibaraki; Mamoru Suzuki, Toyonaka; Kozo Yamamoto, Takatsuki; Isao Takata, Toyono, and Yoshio Iwasawa, Toyonaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan**

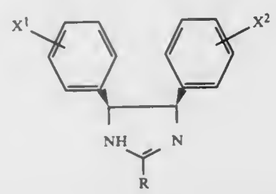
**Filed Oct. 4, 1989, Ser. No. 417,199**

**Claims priority, application Japan, Oct. 6, 1988, 63-253391**

**Int. Cl.[5] C07D** *233/20;* **A61K** *31/415*

**U.S. Cl. 514—401** **4 Claims**

3. A pharmaceutical composition having an immunomodulating effect, which comprises as an active ingredient an effective amount of an imidazoline derivative of the formula:



(I)

wherein R is a halogenophenyl group and $X^1$ and $X^2$ are a hydrogen atom, or a pharmaceutically acceptable salt thereof; in admixture with a pharmaceuticaliy acceptable carrier or diluent.

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**5,051,442**

**3-INDOLYL THIOACETATE DERIVATIVES AND NMDA RECEPTOR ANTAGONISTIC USE THEREOF**

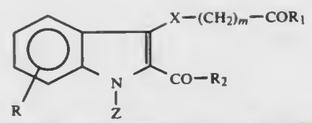
**Francesco G. Salituro, Fairfield, and Bruce M. Baron, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

**Filed Apr. 25, 1990, Ser. No. 514,074**

**Int. Cl.[5] C07D** *209/18;* **A61K** *31/405*

**U.S. Cl. 514—419** **25 Claims**

1. A compound of the formula :



Formula I

in which Z is represented by H, $C_{1-4}$ alkyl, phenyl, substituted phenyl, or an alkylphenyl substituent in which the phenyl ring may be optionally substituted; X is represented by S, SO, or $SO_2$; m is represented by an integer from 1–4; R is represented by hydrogen, halogen, $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, $CF_3$, $OCF_3$, OH, $NO_2$, or CN; $R_1$ and $R_2$ are each independently represented by —OH, —$OR_3$, —$NR_4R_5$, —$OCH_2OR_3$, or —O—$(CH_2)_n$-$NR_6R_7$, in which n is an integer from 1–4; $R_3$ is represented by $C_{1-4}$ alkyl, phenyl, substituted phenyl or an alkylphenyl substituent in which the phenyl ring may be optionally substituted; $R_4$ and $R_5$ are each independently represented by hydrogen or a $C_{1-4}$ alkyl; $R_6$ and $R_7$ are each independently represented by hydrogen Or a $C_{1-4}$ alkyl or $R_6$ and $R_7$ together with the adjacent nitrogen atom form a piperidino, morpholino or pyrrolidino group; and the pharmaceutically acceptable addition salts thereof.

6. A method for antagonizing the effects of excitatory amino acids upon the NMDA receptor complex comprising administering to a patient in need thereof, an antagonistic amount of a compound according to claim 1.

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**5,051,443**

**METHOD FOR ENHANCING HEALING OF CORNEAL ENDOTHELIAL WOUNDS**

**Arthur H. Neufeld, Newton Highlands; Nancy C. Joyce, Sudbury, both of Mass., and Marcia M. Jumblatt, Louisville, Ky., assignors to Eye Research Institute of Retina Foundation, Inc., Boston, Mass.**

**Division of Ser. No. 256,847, Oct. 12, 1988. This application Apr. 13, 1989, Ser. No. 337,459**

**Int. Cl.[5] A61K** *31/40, 31/38, 31/195*

**U.S. Cl. 514—420** **9 Claims**

1. A method for enhancing healing and restoring function of corneal endothelial tissue comprising manipulating migration, elongation, and spreading of corneal endothelial cells by administering to corneal endothelial cells a composition wherein the active agent consists of a non-steroidal anti-inflammatory compound that inhibits the arachidonic acid pathway, wherein said composition is administered in a pharmaceutically acceptable carrier for intraocular administration in an amount producing a concentration at the corneal endothelial cells of between 0.1 and 50 μM non-steroidal anti-inflammatory.

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**5,051,444**

**PYRROLIDINE DERIVATIVES AS ANTI-AMNESIA AGENTS**

**Katsumi Tamoto; Renzo Ohuchi, both of Toyonaka, and Keiichi Ono, Sakai, all of Japan, assignors to Sumitomo Pharmaceuticals Company, Limited, Osaka, Japan**

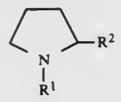
**Division of Ser. No. 25,664, Mar. 13, 1987, Pat. No. 4,880,827. This application Sep. 18, 1989, Ser. No. 408,562**

**Claims priority, application Japan, Mar. 18, 1986, 61-61693; Mar. 20, 1986, 61-63505**

**Int. Cl.[5] A61K** *31/415;* **C07D** *207/00, 403/00, 209/02*

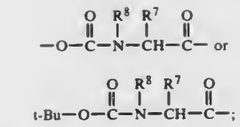
**U.S. Cl. 514—397** **12 Claims**

1. A compound of the formula

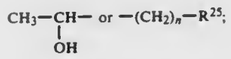


wherein $R^1$ is $C_6H_5CH_2$

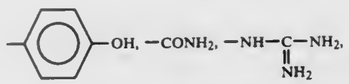




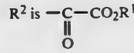
$R^7$ is hydrogen, lower alkyl, benzyl,



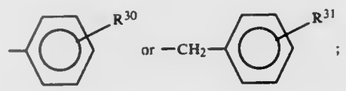
n is an integer from 0 to 4; $R^{25}$ is —OH, —SH, —$NH_2$, —$SCH_3$,



4-imidazolyl, 3-indolyl or —CO2$R^{26}$; $R^{26}$ is hydrogen, lower alkyl or benzoyl; $R^8$ is hydrogen or, when $R^8$ and $R^7$ are taken together with the adjacent nitrogen atom and carbon atom to which they are attached, they represent pyrrolidine;



$R^{11}$ is hydrogen, lower alkyl,



and $R^{30}$ and $R^{31}$ are each independently hydrogen, halogen, lower alkyl or lower alkoxy.

12. A method of treating a patient suffering from, amnesia, comprising administering to the patient a daily dosage of 1 mg to 100 mg/kg of body weight of a compound according to claim 1 one or several times by oral administration or intravenous injection.

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**5,051,445**

**3-AMINO-PROPYLOXYPHENYL DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM**

**William J. Louis, 5 Von Nida Crescent, Rosanna, Victoria, Australia; Max-Peter Seiler, Riehen, and Andre Stoll, Birsfelden, both of Switzerland, assignors to William J. Louis, Victoria, Australia**

**PCT No. PCT/AU85/00063, § 371 Date Nov. 21, 1985, § 102(e) Date Nov. 21, 1985, PCT Pub. No. WO85/04403, PCT Pub. Date Oct. 10, 1985**

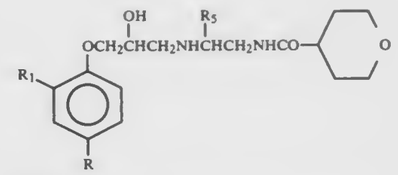
**Continuation of Ser. No. 294,961, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 807,068, Nov. 21, 1985, abandoned. This PCT application Mar. 28, 1985, Ser. No. 536,055**

**Claims priority, application Switzerland, Mar. 28, 1984, 1554/84; Mar. 28, 1984, 1555/84**

**Int. Cl.[5] A61K** *31/35;* **C07D** *309/10*

**U.S. Cl. 514—459** **9 Claims**

1. A compound of Formula I,



I

wherein

A) R is $O(CH_2)_2O$—$R_3$ and

(a) $R_1$ and $R_5$ are hydrogen and $R_3$ is n-propyl, isobutyl, cyclopentylmethyl, benzyl or 2-(p-fluorophenyl)ethyl;

(b) $R_1$ is fluorine and $R_5$ is hydrogen and $R_3$ is n-propyl;

(c) $R_1$ is methyl and $R_5$ is hydrogen and $R_3$ is cyclopropylmethyl;

(d) $R_1$ is cyano and $R_5$ is hydrogen and $R_3$ is n-propyl;

(e) $R_1$ is hydrogen, $R_5$ is methyl and $R_3$ is alkyl of 2 to 5 carbon atoms, cycloalkylmethyl of 5 to 7 carbon atoms in the cycloalkyl part thereof or —$(CH_2)_n$—R' wherein n is 0, 1 or 2 and R' is phenyl or monofluorophenyl; or

B) R is hydroxy, $R_1$ is fluorine and $R_5$ is hydrogen, or a physiologically hydrolysable ester thereof.

7. A pharmaceutical composition characterised in that it comprises a compound of any one of claims 1 or 2 in free form or in a pharmaceutically acceptable salt form, in association with a pharmaceutical carrier or diluent.

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**5,051,446**

**SUBSTITUTED 3-PHENOXY-1-ALKOXYCARBONYLALKYLAMINO-PROPANOL-2-3 HAVING BETA RECEPTOR BLOCKING PROPERTIES**

**Enar I. Carlsson, Västra Frölunda; Bill B. Gustafsson, Bollebygd, and Bo T. Lungren, Frillesas, all of Sweden, assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.**

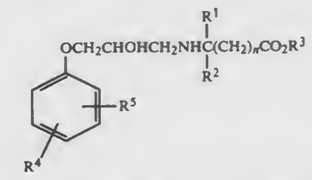
**Continuation of Ser. No. 142,253, Jan. 5, 1988, abandoned, which is a continuation of Ser. No. 885,733, Jul. 21, 1986, abandoned, which is a continuation of Ser. No. 736,520, May 20, 1985, abandoned, which is a continuation of Ser. No. 460,837, Jan. 25, 1983, abandoned, which is a continuation of Ser. No. 262,474, May 11, 1981, abandoned. This application Mar. 13, 1989, Ser. No. 323,194**

**Claims priority, application Sweden, Jun. 2, 1980, 8004088**

**Int. Cl.[5] A61K** *31/275, 31/24;* **C07C** *121/52, 101/78*

**U.S. Cl. 514—522** **5 Claims**

1. A compound of the formula I



wherein $R^1$ and $R^2$ are each severally hydrogen, $R^3$ is alkyl having up to 7 carbon atoms, $R^4$ is selected from the group consisting of hydrogen, lower alkyl having up to 4 carbon atoms, lower alkenyl having up to 4 carbon atoms, lower alkoxy having up to 4 carbon atoms, cyano, —$(0)_n(CH_2)_m$CONH$R^6$, wherein $R^6$ is hydrogen or lower alkyl having up to 7 carbon atoms, n is an integer 0 or 1, and m is an interger 0, 1, 2 or 3, or —$(CH_2)_m$NHCONH$R^6$, wherein $R_6$ and m have the meanings given above, $R^5$ is —$(CH_2)_m$NHCONH$R^6$, wherein $R^6$ and m have the meanings given above, or a therapeutically acceptable salt of such a compound.

2. A pharmaceutical preparation intended for continuous



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intravenous administration for the treatment of acute myocardial infarction in a mammal, which preparation comprises at least one β-receptor blocking phenoxy-hydroxypropylamine compound according to claim 1, in association with a liquid pharmaceutically acceptable carrier, said compound being presented in an amount effective to provide β-receptor blocking activity in said mammal.

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**5,051,447**

## OXIME ETHERS, THEIR PREPARATION AND FUNGICIDES CONTAINING THESE COMPOUNDS

**Bernd Wenderoth, Lampertheim; Franz Schuetz, Ludwigshafen; Siegbert Brand, Weinheim; Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorezn, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Jul. 20, 1989, Ser. No. 382,418**

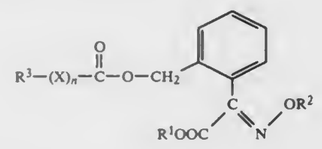
**Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827361**

**Int. Cl.[5] A61K** *31/235*

**U.S. Cl. 514—534** **6 Claims**

2. A process for combating fungi, wherein the fungi, or the materials, plants, seed or the soil to be protected against fungus attack are treated with a fungicidally effective amount of a compound of the formula I

(I)



where

$R^1$ and $R^2$ are each hydrogen or $C_1$–$C_5$-alkyl,

$R^3$ is hydrogen, halogen, aryl or aryloxy, the aromatic ring being unsubstituted or substituted by $C_1$–$C_6$-alkyl, $C_2$–$C_4$-alkenyl, $C_1$–$C_2$-haloalkyl, $C_1$–$C_6$-alkoxy, $C_1$–$C_4$-alkoxy-$C_1$–$C_4$-alkyl, aryl, aryl-$C_1$–$C_2$-alkyl, aryloxy, aryloxy-$C_1$–$C_4$-alkyl, aryloxy-$C_1$–$C_4$-alkoxy, haloaryloxy $C_1$–$C_4$-alkoxy, halogen, halogen-$C_1$–$C_4$-alkoxy, $C_1$–$C_4$-alkylthio or nitro, or $R^3$ is adamantyl, fluorenyl or $C_3$–$C_7$-cycloalkyl or $C_5$–$C_6$-cycloalkenyl, these radicals being unsubstituted or substituted by $C_1$–$C_4$-alkyl, halogen, $C_1$–$C_2$-haloalkyl, $C_3$–$C_4$-alkenyl, acetyl, $C_2$–$C_4$-haloalkenyl, methoxycarbonyl-$C_3$–$C_4$-alkenyl, phenyl, cyclopentylidenemethyl, halophenyl, $C_1$–$C_2$-alkoxyphenyl or $C_1$–$C_4$-alkylphenyl, wherein the aryl portion of aryl, aryloxy, arylalkyl, aryloxyalkyl, aryloxyalkoxy and haloaryloxyalkoxy is phenyl or naphthyl;

X is saturated or unsaturated $C_1$–$C_{12}$-alkylene which is unsubstituted or substituted by halogen or hydroxy, and

n is 0 or 1.

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**5,051,448**

## GABA ESTERS AND GABA ANALOG ESTERS

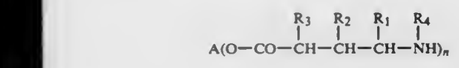
**Victor E. Shashoua, Brookline, Mass., assignor to The McLean Hospital Corporation, Belmont, Mass.**

**Continuation of Ser. No. 767,903, Aug. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 519,361, Aug. 1, 1983, abandoned, and Ser. No. 640,507, Jul. 24, 1984, abandoned. This application May 7, 1990, Ser. No. 518,227**

**Int. Cl.[5] A61K** *31/225, 31/235, 31/24, 31/22*

**U.S. Cl. 514—547** **73 Claims**

1. A compound of the formula:



wherein:

$R_1$, $R_2$, and $R_3$ are the same or different and are selected from:

(a) hydrogen;

(b) lower alkyl groups having one to four carbon atoms;

(c) substituted lower alkyl group shaving one to four carbon atoms;

(d) lower alkenyl groups having one to four carbon atoms;

(e) substituted lower alkenyl groups having one to four carbon atoms;

(f) lower alkynyl groups having one to four carbon atoms;

(g) substituted lower alkynyl groups having one to four carbon atoms;

(h) aryl groups;

(i) substituted aryl groups;

(i) substituted aryl groups;

(j) hydroxyl groups or hydroxy groups protected with lower acyl or aroyl groups;

(k) lower acyl groups;

(l) oxo groups, in which case hydrogen is not present on the carbon atom;

(m) amino groups;

(n) substituted amino groups;

(o) $R_1$ and $R_3$ together forming a carbocyclic ring;

(p) $R_2$ and $R_3$ together forming a carbocyclic ring; $R_4$ is hydrogen or acyl;

n can vary from 1 to the total number of esterifiable OH groups contained in A;

or pharmaceutically acceptable acid addition salts thereof, said ester having a Brain Penetration Index greater than 2%.

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**5,051,449**

## TREATMENT OF CELLULITE WITH RETINOIDS

**Albert M. Kligman, Department of Dermatology University of Pennsylvania Clinical Research Bldg., Room 219, 422 Curie Blvd., Philadelphia, Pa. 19104**

**Filed Feb. 27, 1991, Ser. No. 661,753**

**Int. Cl.[5] A61K** *31/20*

**U.S. Cl. 514—559** **15 Claims**

1. A method for retarding and reversing cellulite, comprising topically applying to human skin a retinoid in an amount and for a period of time effective to retard and reverse cellulite, said amount being insufficient to be excessively irritating.

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**5,051,450**

## DIIODOMETHYLSULFONE INSECTICIDES

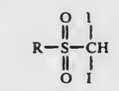
**Aldo J. Crovetti, Lake Forest; Brian E. Melin, Glencoe; Robert A. Smith, Lindenhurst, and Francois M. Hubert Casati, Highland Park, all of Ill., assignors to Angus Chemical Company, Northbrook, Ill.**

**Continuation of Ser. No. 087,495, Aug. 19, 1987, abandoned, and a continuation-in-part of Ser. No. 904,330, Sep. 5, 1986, abandoned. This application Nov. 22, 1989, Ser. No. 441,126**

**Int. Cl.[5] A01N** *33/02, 37/10, 37/18, 41/10*

**U.S. Cl. 514—709** **10 Claims**

1. A method of killing insects from the group consisting of termites, cockroaches and ants, comprising treating said insects with an insecticidal amount of a composition consisting essentially of from about 25 ppm to about 80,000 ppm of a diiodomethylsulfone compound of the formula:



wherein R is $R_1(CH_2)_n$, wherein n is 0 to 4 and $R_1$ is loweralkyl, phenyl, monoloweralkylphenyl, monoalophenyl, nitrophenyl, aminophenyl, acetamido-substituted phenyl, $(CH_2)_mCOOH$ substituted phenyl wherein m is 1 to 3, disubstitutedhalophenyl, (halo)(nitro)phenyl, (nitro)(loweralkyl)-phenyl, (halo)(loweralkyl)phenyl or disubstituted-loweralkylphenyl and a diluent.

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**5,051,451**

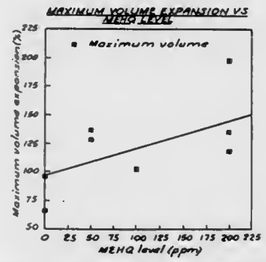
## EXPANDABLE AND EXPANDED PLASTIC MATERIALS AND METHODS FOR CASTING METAL CASTINGS EMPLOYING SUCH EXPANDED CELLULAR PLASTIC MATERIALS

**Norman G. Moll, Sanford, and David R. Johnson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 429,955, Oct. 30, 1989, Pat. No. 4,929,645. This application Feb. 6, 1990, Ser. No. 475,512**

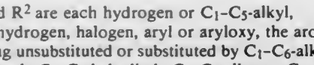
**Int. Cl.[5] C08J** *9/16*

**U.S. Cl. 521—60** **5 Claims**




1. An expanded closed-cell cellular plastic material article comprising:

A) a plastic material, polymerized from one or more monomers, containing a majority, by weight of the plastic material, of monomeric repeat units of the formula:



wherein R is selected from the group consisting of alkanes having 1–4 carbon atoms (C), hydroxy alkanes having 1–4 C and cycloalkanes having 3–6 C, and R' is selected from the group consisting of $CH_3$ and $C_2H_5$;

and

B) a volatile blowing agent entrapped in the expanded closed-cell cellular plastic material;

wherein the expanded closed-cell cellular plastic material article after expansion from an expandable plastic material particle has (i) a volume increase by a factor of at least 20 after a period of 5 minutes from the start of expansion conditions; (ii) a maximum volume expansion of at least 60; and (iii) maintains a volume expansion of at least 60 for an additional period of 30 minutes under expansion conditions after reaching the volume expansion of 60; all wherein the expansion of the expandable plastic material particle article into the expanded closed-cell cellular plastic material article occurs at ambient pressure with hot air in an oven at a temperature of 25° C. above the glass transition temperature of the plastic material.

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**5,051,452**

## PROCESS FOR PREPARING FOAMED VINYLAROMATIC POLYMER PRODUCTS

**Floyd E. Romesberg, St. Louisville, Ohio, assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Feb. 13, 1990, Ser. No. 479,918**

**Int. Cl.[5] C08L** *25/18, 27/08*

**U.S. Cl. 521—139** **14 Claims**

1. Polymeric composition of matter having reduced oxygen permeability comprising at least one vinylaromatic polymer, from 1014 55% by weight of at least one polyvinylidene chloride polymer, and at least one blowing agent, wherein the amount of said polyvinylidene chloride polymer is based on the total weight of the polymer.

**5,051,453**

## CEMENT COMPOSITION

**Minahiro Okabayashi, Yokohama; Hideki Ohno, Fujisawa, and Koshi Kusumoto, Kamakura, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan**

**Filed Jan. 31, 1989, Ser. No. 304,200**

**Claims priority, application Japan, Feb. 8, 1988, 63-25744**

**Int. Cl.[5] C08L** *7/00*

**U.S. Cl. 523—116** **15 Claims**

1. A cement composition comprising poly(unsaturated carboxylic acid) and an alkaline earth metal aluminofluorosilicate glass, wherein the alkaline earth metal aluminofluorosilicate glass comprises (a) 50 to 95% by weight of coarse particles having a spherical shape and an F/Si ratio of at least 0.1 but lower than 0.6 and having a particle size larger than 3 μm but not larger than 50 μm and (b) 5 to 50% by weight of finely pulverized particles having an F/Si ratio of 0.6 to 5 and a particle size of up to 3 μm.

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**5,051,454**

## PHENOLIC RESIN COMPOSITIONS

**Peter H. R. B. Lemon, Romsey; James G. King, Sholing, both of England; Graham Murray, Edinburgh, Scotland; Henry Leoni, Southampton, England, and Arthur H. Gerber, Louisville, Ky., assignors to Borden, Inc., Columbus, Ohio**

**Filed Dec. 15, 1989, Ser. No. 450,989**

**Claims priority, application United Kingdom, Dec. 22, 1988, GB 8829984.7**

**Int. Cl.[5] B22C** *1/22;* **C08L** *61/10;* **C08G** *8/28, 14/12*

**U.S. Cl. 523—146** **45 Claims**

1. A method of making a cured phenolic resin composition with comprises reacting

(1) an esterified phenolic compound containing one or more phenolic hydroxyl groups and/or one .or more esterified phenolic hydroxyl groups and further containing one or more esterified methylol groups positioned ortho and/or para to a phenolic hydroxyl group or esterified phenolic hydroxyl group,

(2) an unesterified phenolic resole resin composition, and

(3) a base, in the presence of water and/or other polar solvent.

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**5,051,455**

## ADHESION OF SILICONE SEALANTS

**Hsien-Kun Chu, Wethersfield, Conn.; Russell P. Kamis, and Loren D. Lower, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Jan. 16, 1990, Ser. No. 466,121**

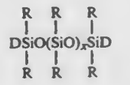
**Int. Cl.[5] C08K** *9/06*

**U.S. Cl. 523—212** **8 Claims**

1. A process of producing silicone sealants containing polydiorganosiloxane having alkoxy endblocking, alkoxy functional chain extender, and titanium catalyst, wherein the method consists essentially of

(A) first mixing in the absence of moisture

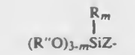
(1) 100 parts by weight of a polymer mixture of the average formula



where each R is free of aliphatic unsaturation and is selected from the group consisting of monovalent hydrocarbon, monovalent halohydrocarbon, and monovalent cyanoalkyl radicals of 1 to 18 inclusive carbon atoms, each D is selected from the group consisting of vinyl radical and radicals of the formula

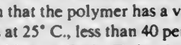
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where each R'' is selected from the group consisting of methyl, ethyl, propyl, and butyl, Z is a divalent hydrocarbon radical or a combination of divalent hydrocarbon radicals and siloxane radicals, m is 0 or 1, and x is of a value such that the polymer has a viscosity of from 0.5 to 3000 Pa.s at 25° C., less than 40 percent of the total of the endblocking radicals D in the polymer mixture being vinyl radicals,

(2) from 0.1 to 14 parts by weight of a trialkoxysilane of the formula



where each R' is selected from the group consisting of methyl, ethyl, propyl, butyl, phenyl, and vinyl, R'' is as defined above, and

(3) from 0.2 to 6.0 parts by weight of beta-dicarbonyl titanium catalyst, and then

(B) adding after the above are mixed,

(4) from 10 to 200 parts by weight of precipitated calcium carbonate filler, having a fatty acid surface treatment and a surface area equal to or greater than 22 $m^2/g$, then

(C) storing the mixture in the absence of moisture,

to give a sealant which is stable in the absence of moisture, and has adhesion to a variety of substrates.

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**5,051,456**

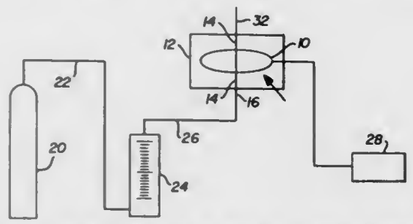
## PROCESS FOR REMOVING DIENES FROM ETHYLENE PROPYLENE DIENE MONOMER RESINS

**Robert J. N. Bernier, Flemington, N.J.; David N. Edwards, Charleston, and Richard W. Wegman, So. Charleston, both of W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.**

**Filed Mar. 30, 1990, Ser. No. 501,780**

**Int. Cl.[5] C08J** *3/28;* **C08K** *3/04*

**U.S. Cl. 523—300** **11 Claims**




1. A process for reducing the amount of dienes present in EPDM resins, which comprises:

(1) incorporating onto or admixing with said EPDM resin a dielectric material capable of absorbing electromagnetic energy and conducting heat to said EPDM resin;

(2) subjecting said EPDM resin containing said dielectric material to microwave energy in an amount and for a time sufficient to evolve diene vapors from said EPDM resin without causing any physical or chemical change in the EPDM resin; and

(3) simultaneously passing a gas through said resin to remove said evolved diene vapors from said resin and to prevent sintering of said resin.

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**5,051,457**

## ASPHALT-BLOCK COPOLYMER ROOFING COMPOSITION

**Richard Gelles, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.**

**Filed Jul. 16, 1990, Ser. No. 553,042**

**Int. Cl.[5] C08L** *95/00*

**U.S. Cl. 524—68** **2 Claims**

1. A composition for use in roll roofing membrane applications which comprises:

(a) from about 93 to about 87 parts per hundred of a bituminous component having a penetration of less than about 125 (decamillimeters) at 25° C. and

(b) from about 7 to about 13 parts per hundred of a hydrogenated block copolymer of a monoalkenyl aromatic hydrocarbon and a conjugated diolefin having a contour arm molecular weight before hydrogenation of from about 105,000 to about 140,000 and a monoalkenyl aromatic hydrocarbon content of from about 25% to about 37%.

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**5,051,458**

## UV STABILIZERS FOR ORGANIC POLYMERS

**Silvestro Costanzi; Luigi Cassar; Carlo Bosetto; Carlo Neri, and Damiano Gussoni, all of Milan, Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy**

**Filed May 17, 1989, Ser. No. 353,097**

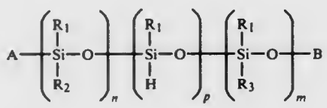
**Claims priority, application Italy, May 27, 1988, 20762 A/88**

**Int. Cl.[5] C08K** *5/34*

**U.S. Cl. 524—99** **30 Claims**

1. A polymeric stabilizer compound definable by the following general formula:

(I)

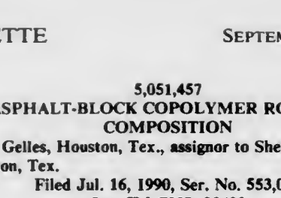


where:

$R_1$ and $R_3$, which can be the same or different, are linear or branched $C_1$–$C_{10}$ alkyl radicals or $C_5$–$C_{11}$ cycloaliphatic radicals or phenyl radicals;

$R_2$ is a radical chosen from those corresponding to the following formula:

(II)



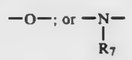
in which:

$R_4$ is hydrogen or methyl or benzyl;

$R_5$ is a linear or branched $C_1$–$C_7$ alkyl radical;

$R_6$ is hydrogen or methyl;

Z is a group chosen from



where $R_7$ is a linear or branched $C_1$–$C_5$ alkyl group or hydrogen;

q is zero or one;

n is a whole number other than zero;

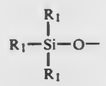
m and p, which can be the same or different, are zero or whole



numbers, with the condition that n+p+m is less than or equal to 50;

A is a group corresponding to the formula:

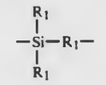
(III)



where $R_1$ has the aforesaid meaning;

B is a group corresponding to the formula:

(IV)



where $R_1$ has the aforesaid meaning; or A and B jointly represent a direct bond which represents a cyclic structure.

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**5,051,459**

## N-TRIAZINYLOXALAMIDES

**Mario Slongo, Tafers; Jean-Luc Birbaum, Fribourg, both of Switzerland, and Andreas Valet, Eimeldingen, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Mar. 8, 1990, Ser. No. 490,816**

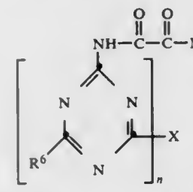
**Claims priority, application Switzerland, Mar. 17, 1989, 996/89**

**Int. Cl.[5] C08K** *5/3492*

**U.S. Cl. 524—100** **10 Claims**

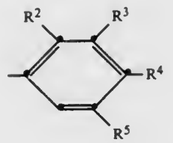
1. A compound of formula I

I

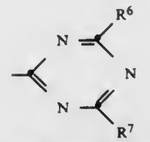


wherein n is an integer from 1 to 4 $R^1$ is a group of formula II or III

II

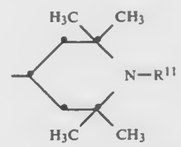


III

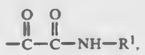


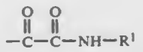
$R^2$, $R^3$, $R^4$, and $R^5$ independently of the others are hydrogen, $C_1$–$C_{18}$ alkyl, $C_5$–$C_{12}$ cycloalkyl, $C_7$–$C_9$ phenylalkyl, hydroxyl, $C_1$–$C_{12}$ alkoxy, phenoxy, phenoxy substituted by $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkoxy, halogen or hydroxyl, $C_2$—$C_{18}$ alkoxycarbonyl, $C_2$–$C_{18}$ alkylaminocarbonyl, a group —CO—O—$R^{10}$, $C_3$–$C_6$ alkenyl, $C_3$–$C_6$ alkynyl, $C_2$–$C_{12}$ alkanoyl, benzoyl, $C_1$–$C_8$ perfuoroalkyl chlorine, fluorine or bromine, with the proviso that the group of formula II contains no more than three hydroxyl groups, $R^6$ and $R^7$ independently of the other are $C_1$—$C_{12}$ alkoxy, $C_3$–$C_{12}$ cycloalkoxy, phenoxy, phenoxy substituted by $C_1$–$C_{12}$ alkyl, $C_3$–$C_5$ alkenyloxy, phenyl, pyridyl, phenyl substituted by hydroxyl, $C_1$–$C_{12}$ alkyl, $C_1$–$C_{12}$ alkoxy, $C_1$–$C_{12}$ alkylthio or $C_1$–$C_{12}$ monoalkylamino or dialkylamino, or a group —$N(R^8)(R^9)$, wherein $R^8$ and $R^9$ independently of the other are hydrogen, $C_1$–$C_{18}$ alkyl, $C_3$–$C_{18}$ alkyl interrupted by one or more —O—, $C_3$–$C_5$ alkenyl, $C_2$–$C_4$ hydroxyalkyl or a group of formula IV

IV

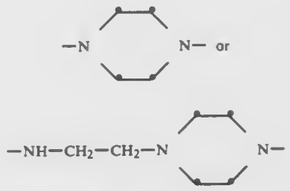


wherein $R^{11}$ is hydrogen, $C_1$–$C_4$ alkyl, $C_3$–$C_5$ alkenyl, $C_7$–$C_9$ phenylalkyl, $C_2$–$C_{12}$ alkanoyl, hydroxyl, $C_1$–$C_{12}$ alkoxy, $C_5$–$C_{12}$ cycloalkoxy or $C_2$–$C_{18}$ alkanoyloxy, or $R^8$ and $R^9$ together are $C_4$–$C_9$ alkylene which can be interrupted by —O—, and in the case where $R^8$ is hydrogen, $R^9$ can also be a group

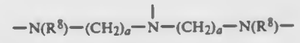




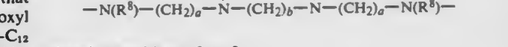
$R^{10}$ is a group of formula IV and X in the case where n=1 is as defined for $R^6$, in the case where n=2 is a group —$N(R^8)$—$R^{12}$—$N(R^8)$—,



wherein $R^{12}$ is $C_2$–$C_{12}$ alkylene or $C_4$–$C_{12}$ alkylene interrupted by one or more —O—, in the case where n=3 is a group



in the case where n=4 is a group



wherein a and b are 2 or 3.

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5,051,460

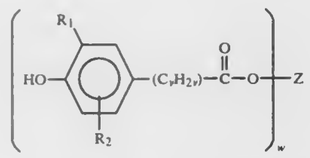
## STABILIZED HALOPOLYMER COMPOSITIONS

Sheldon J. Kirsch, Rockaway, and Chii-Shu Chen, Parsippany, both of N.J., assignors to Ausimont, U.S.A., Inc., Morristown, N.J.

Filed Sep. 18, 1989, Ser. No. 408,922
Int. Cl.[5] C08K *5/526*
U.S. Cl. 524—114 19 Claims

1. The composition comprising a halopolymer an ethylene/-chlorotrifluoroethylene copolymer thermal stabilizing amount of:

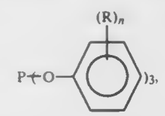
(a) an ester of a (4-hydroxy-5-alkylphenyl) alkanoic acid, said ester being of the formula:



wherein $R_1$ is methyl, ethyl, or an alpha-branched alkyl group of from 3 to 10 carbon atoms; v has a value of from 1 to 6; w has a value of from 2 to 6; Z is an aliphatic hydrocarbon of the formula:

$C_yH_{2y+2-w}$ in which y has a value of from 2 to 18 when w is 2, and a value of 3 to 6 when w is greater than 2, the value of y in all cases being equal to or greater than that of w;

(b) at least one phosphite of the formula:



wherein R is an alkyl or cycloalkyl group having from 1 to about 18 carbon atoms, and n is at least 1; and

(c) a thioester.

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5,051,461

## PRESSURE SENSITIVE ADHESIVES FROM DIENE-ETHOXYLATED AMINE STYRENE SULFONATE

Pawan K. Agarwal, Bridgewater, and Warren A. Thaler, Flemington, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 380,407, Jul. 17, 1989, abandoned, which is a division of Ser. No. 287,377, Dec. 21, 1988, abandoned. This application Sep. 27, 1990, Ser. No. 589,284
Int. Cl.[5] C08K *5/17*
U.S. Cl. 524—243 4 Claims

1. A water based emulsion comprising:

(a) water;

(b) an ethoxylated alkylamine; and

(c) a metal neutralized sulfonated copolymer of a conjugated diene having from 4 to 12 carbon atoms and an ethoxylated alkylamine salt of styrene sulfonate, the copolymer having from about 5 to about 125 meq of metal neutralized sulfonate groups per 100 grams of copolymer.

5,051,462

## HALOGEN-CONTAINING THERMOPLASTIC RESIN COMPOSITION

Hiroshi Takida, Takatsuki; Takamasa Moriyama, Suita; Yoshimi Akamatu, Amagasaki, and Makoto Kunieda, Hirakata, all of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 11, 1988, Ser. No. 230,819
Claims priority, application Japan, Aug. 14, 1987, 62-203264; Dec. 20, 1987, 62-323328
Int. Cl.[5] C08K *5/04*
U.S. Cl. 524—394 6 Claims

1. A halogen-containing thermoplastic resin composition comprising a halogen-containing thermoplastic resin (A), a metallic soap (B) and an ash- and alkali metal-lean ethylene-vinyl acetate copolymer hydrolysate (C) having an ethylene content of 20 to 75 mole percent, a degree of saponification not less than 50 mole percent, an ash content not exceeding 300 ppm and an alkali metal content not exceeding 200 ppm, the proportions of (B) and (C) based on 100 parts by weight of (A) being 0.1 to 5 parts by weight and 0.1 to 5 parts by weight, respectively.

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5,051,463

## CURABLE POLYMER COMPOSITION

Sadao Yukimoto; Hiroshi Wakabayashi, and Katsuhiko Isayama, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Filed Oct. 4, 1989, Ser. No. 417,133
Claims priority, application Japan, Oct. 7, 1988, 63-253996
Int. Cl.[5] C08K *5/10;* C08L *83/00*
U.S. Cl. 524—306 11 Claims

1. A curable polymer composition comprising:

(A) A rubbery organic polymer having at least one silicon-containing hydrolyzable group bonded to the rubbery organic polymer, said silicon-containing hydrolyzable group being cross linkable through formation of a siloxane bond in a molecule,

(B) 10 to 500 parts by weight of a vinyl chloride base resin based on 100 parts by weight of the rubbery organic polymer, and

(C) 1 to 150 parts by weight of a polymeric plasticizer based on 100 parts by weight of the rubbery organic polymer, wherein said polymeric plasticizer has a number average molecular weight of 500 to 15,000 and is at least one member selected from the group consisting of polyesters, polyethers, polystyrenes, polybutadiene and polybutene.

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5,051,464

## WATERBORNE ACRYLOURETHANE PIGMENT DISPERSANT POLYMER

Jeffery W. Johnson; Robert D. Prottas, both of Wilmington, Del., and Clifford H. Strolle, Springfield, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 1, 1989, Ser. No. 401,870
Int. Cl.[5] C08J *00/00;* C08F *8/00*
U.S. Cl. 524—555 6 Claims

1. An aqueous dispersion comprising an aqueous carrier and about 10–70% by weight of an acrylourethane pigment dispersing polymer; wherein the acrylourethane polymer consists essentially of about 90–98% by weight, based on the weight of the acrylourethane polymer, of a hydroxyl and carboxyl functional acrylic polyol having a hydroxyl no. of about 50–170 and an acid no. of about 30–120 chain extended with about 1–9% by weight, based on the weight of the acrylourethane polymer, of an aliphatic, cycloaliphatic or aromatic diisocyanate in the presence of about 0.5–1% by weight, based on the weight of the acrylourethane polymer, of monohydric alcohol; wherein the acrylourethane polymer has a weight average molecular weight of about 10,000–40,000 and the carboxyl groups are neutralized with ammonia or an amine and wherein the acrylic polyol consists essentially of polymerized monomers of alkyl methacrylate, alkyl acrylate wherein the alkyl groups have 1–12 carbon atoms, hydroxy alkyl acrylate or methacrylate wherein the alkyl groups have 1–8 carbon atoms and an alpha-beta ethylenically unsaturated monocarboxylic acid.



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5,051,465

## SILICONE RUBBER COMPOSITION

Takeo Yoshida, and Masaharu Takahashi, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Nov. 2, 1989, Ser. No. 430,465
Claims priority, application Japan, Nov. 2, 1988, 63-278381
Int. Cl.[5] C08L *83/00*
U.S. Cl. 524—588 13 Claims

1. A silicone rubber composition which comprises:

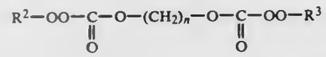
100 parts by weight of an organopolysiloxane of the following general average unit formula

$$(R^1)_aSiO_{(4-a)/2}$$

wherein $R^1$'s independently represent an unsubstituted or substituted monovalent hydrocarbon group and a is a positive value of from 1.90 to 2.05;

from 5 to 100 parts by weight of a finely divided silica filler; and

from 0.1 to 5 parts by weight of an organic peroxide of the following general formula (I)



n is an integer of from 2 to 8, and $R^2$ and $R^3$ are independently a monovalent hydrocarbon group having from 3 to 10 carbon atoms or a group of the formula, $-Si(R^4)_3$, wherein $R^4$ represents a group selected from a methyl group, an ethyl group or a phenyl group.

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5,051,466

## INTERNAL MOLD RELEASE COMPOSITIONS

Louis W. Meyer, Livingston, Tex.; J. Alan Vanderhider, Fruthwilen, Switzerland, and Robert Carswell, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 570,141, Jan. 12, 1984, Pat. No. 4,876,019, which is a continuation-in-part of Ser. No. 466,826, Feb. 16, 1983, abandoned. This application Oct. 23, 1989, Ser. No. 425,774
Int. Cl.[5] C08K *5/51, 3/10;* C08J *9/00*
U.S. Cl. 524—711 9 Claims

1. A process for preparing polymeric products which process comprises mixing and injecting into a suitable mold an "A-side" component comprising a polyisocyanate and/or polyisothiocyanate and a "B-side" component comprising at least one material containing at least one primary and/or secondary amine groups per molecule or a mixture of such materials and a metal salt of an organic material containing at least one phosphorus-containing acid group; wherein said metal is selected from Groups II-A and II-B of the Periodic Table of the Elements, Cu, Al, Fe, Co, Ni and wherein said organic material contains at least one terminal or pendant saturated or unsaturated aliphatic hydrocarbon chain containing at least about 7 carbon atoms.

5,051,467

## SILICONE RUBBER COMPOSITIONS

Hiroshige Okinoshima, and Tsutomu Kashiwagi, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1989, Ser. No. 441,555
Claims priority, application Japan, Nov. 28, 1988, 63-300327
Int. Cl.[5] C08K *5/24*
U.S. Cl. 524—731 9 Claims

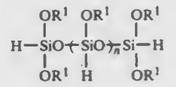
1. A silicone rubber composition comprising

(I) a vinyl-containing diorganopolysiloxane having at least two $CH_2=CH—Si\equiv$ bonds per molecule,

(II) an organohydrogenpolysiloxane having at least two hydrogen atoms directly attached to silicon atoms per molecule,

(III) platinum or a platinum compound,

(IV) an ester siloxane compound free of a silicon-to-carbon bond having the general formula:



(1)

wherein $R^1$ is a monovalent hydrocarbon group having 1 to 10 carbon atoms and free of an aliphatic unsaturated bond, and letter n is 0 or a positive integer of 1 to 20, and

(V) an epoxy-containing polysiloxane compound having at least one epoxy group linked to a silicon atom via a carbon atom directly attached to the silicon atom per molecule.

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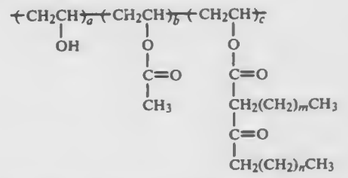
5,051,468

## POLYMERS COMPRISED OF FULLY AND PARTIALLY HYDROLYZED POLY(VINYL ACETATE) AND ALKYL KETENE DIMER REPEATING UNITS AND AQUEOUS SOLUTIONS CONTAINING SUCH POLYMERS

Paquita E. Barnum, Newark, Del., assignor to Aqualon Company, Wilmington, Del.

Filed Dec. 30, 1988, Ser. No. 291,939
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—59 14 Claims

1. A nonionic, water-soluble polymer having the general idealized structure:



wherein a, b and c represent the number of monomer units of each respective monomer, the sum of a and b is 200 to 5000, b is the product of a multiplied by 0 though 0.25, $c/(a+b)=0.0001$ to 0.006, m is 5 to 21, and the sum of m and n is 10 to 42.

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5,051,469

## RUBBER MODIFIED REACTION MOLDED NYLON-6 BLOCK COPOLYMERS

Kishore Udipi, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 57,583, Jun. 2, 1987, Pat. No. 4,882,382, which is a continuation-in-part of Ser. No. 808,782, Dec. 13, 1985, abandoned, and a continuation-in-part of Ser. No. 808,790, Dec. 13, 1985, abandoned. This application May 4, 1989, Ser. No. 347,536

Int. Cl.[5] C08L *77/00*

U.S. Cl. 525—63 15 Claims

1. A substantially colloidal dispersion of a core-shell polymer in a solution of telechelic polymer in caprolactam; wherein the core-shell polymer comprises a crosslinked elastomer core and a hard thermoplastic polymer shell; wherein the weight ratio of elastomer core to caprolactam and the weight ratio of telechelic polymer to caprolactam are independently in the range of about 1:99 to about 40:60; and wherein the telechelic polymer is of number average molecular weight in the range of about 700 to about 10000, is capped on average with at least two lactam polymerization initiator groups or precursors thereof per molecule, and is capable of providing soft segments in a nylon-6 block copolymer.

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5,051,470

## EPOXY-ACRYLIC GRAFT POLYMERS

James T. K. Woo, Medina, and Richard M. Marcinko, North Royalton, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 859,421, May 5, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 104,062

Int. Cl.[5] C08G *59/14*

U.S. Cl. 523—411 12 Claims

1. A self-curing epoxy-acrylic graft copolymer comprising unsaturated monomer chains grafted by carbon-to-carbon graft to the epoxy resin backbone by in-situ copolymerization of said monomers in the presence of said epoxy resin, said epoxy resin being a phenoxy terminated epoxy comprising excess equivalents of bisphenol reacted with lesser equivalents of epoxide and having a number average molecular weight between 4,000 and 40,000, the ethylenically unsaturated monomers comprising between 1% and 25% by weight alkylated alkylol acrylamide monomer and the remaining being other ethylenic monomers including functional monomer, said graft copolymer produced in the absence of water by in-situ polymerization of said ethylenically unsaturated monomers in the presence of at least 3% by weight of peroxide initiator based on the weight of said ethylenically unsaturated monomers copolymerized, the polymerized monomers comprising between 10 and 100 weight parts per 100 weight parts of epoxy resin, where the Acid No. of the epoxy-acrylic graft copolymer is below 30, and said epoxy-acrylic graft copolymer is dispersed into water by adding amine and water to the epoxy-acrylic graft copolymer.

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5,051,471

## BLENDS OF LINEAR LOW DENSITY ETHYLENE COPOLYMERS

Pradeep P. Shirodkar, Somerset, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 295,430, Jan. 10, 1989, Pat. No. 4,957,969. This application Apr. 20, 1990, Ser. No. 512,239

The portion of the term of this patent subsequent to Sep. 18, 2007, has been disclaimed.

Int. Cl.[5] C08L *23/18, 23/20, 51/04*

U.S. Cl. 525—86 19 Claims

1. A film forming polymer blend comprising, as the polymeric components, at least 50 wt. % of a linear low density copolymer of ethylene wherein said ethylene copolymer has a density of 0.89 to 0.94, a melting point of about 105° C. to 135° C., and a melt index of about 0.1 to 10 with an olefin containing 4 to 10 carbon atoms, and about 1 to 25 wt. % in an amount to improve antiblocking properties of an ABS resin, based on the total polymer content of the blend.

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5,051,472

## METHOD FOR FORMING A CROSSLINKABLE PRESSURE-SENSITIVE ADHESIVE CONSTRUCTION CONTAINING AN AMINOXYSILICON COMPOUND AND AN AMIDOSILICON COMPOUND

John D. Blizzard, and Terence J. Swihart, both of Bay County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 303,783, Jan. 30, 1989, abandoned. This application May 21, 1990, Ser. No. 527,690

Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 7 Claims

1. A method for forming a crosslinkable pressure-sensitive adhesive construction comprising: contacting a first component comprising

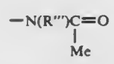
(I) a pressure-sensitive adhesive selected from the group consisting of those based on acrylic, styrene-butadiene, acrylonitrile-butadiene, polyisobutylene, isoprene, chloroprene, polyvinylether, chlorinated and polyurethane rubber; and

(II) an aminoxysilicon compound having from 1 to 100 silicon atoms per molecule, from 3 to 10 aminoxy groups per molecule and at least one radical selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals per silicon atom, said aminoxy group having a general formula —OX, wherein X is selected from the group consisting of $-NR_2$ and a heterocyclic amine, R being a monovalent hydrocarbon radical, with a second component comprising

(III) a further portion of said pressure-sensitive adhesive; and

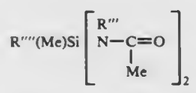
(IV) an amidosilicon compound selected from the group consisting of

(a) a polymer consisting essentially of siloxane units selected from the group consisting of alkylmethylsiloxane units having 1 to 8 carbon atoms in the alkyl radical thereof and phenylmethylsiloxane units, said polymer having at least two amido groups of the formula



in its molecule, wherein R''' represents an organic radical selected from the group consisting of methyl, ethyl and phenyl and Me denotes a methyl radical, and

(b) an amidosilane having the general formula



wherein R'''' is an organic radical selected from the group consisting of methyl, vinyl and phenyl and R''' and Me have been previously defined.



5,051,473

## AUTOMOTIVE COATING COMPOSITIONS

Ichiro Tabuchi, Atsugi; Noboru Nakai, Hiratsuka; Osamu Isozaki, Yokohama; Takao Matoba, Hiratsuka, and Shinji Sugiura, Fujisawa, all of Japan, assignors to Kansai Paint Company, Limited, Amagasaki, Japan

Filed Aug. 28, 1989, Ser. No. 399,136

Claims priority, application Japan, Sep. 5, 1988, 63-222146; Sep. 9, 1988, 63-227094

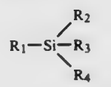
Int. Cl.[5] C08F *8/00*

U.S. Cl. 525—100 9 Claims

1. An automotive coating composition comprising

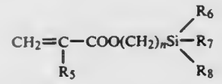
(i) 100 parts by weight of a basal resin which is either

(a) a copolymer containing a polysiloxane macromonomer having two or more functional groups selected from the class consisting of hydroxyl and alkoxy groups per molecule and a number average molecular weight of 400 to 100,000 prepared by reacting 70 to 99.999 mole percent of a compound (A) of the formula:



[(1)]

wherein $R_1$ is an aliphatic hydrocarbon group of 1 to 8 carbon atoms or a phenyl group; $R_2$, $R_3$ and $R_4$ independently represent an alkoxy group of 1 to 4 carbon atoms or a hydroxyl group with 30 to 0.001 mole percent of a compound (B) of the formula:



[(2)]

wherein $R_5$ is a hydrogen atom or a methyl group; $R_6$, $R_7$ and $R_8$ independently represent a hydroxyl group, an alkoxy group of 1 to 4 carbon atoms or an aliphatic hydrocarbon group of 1 to 8 carbon atoms; provided, however, that all of $R_6$, $R_7$ and $R_8$ are not aliphatic hydrocarbon groups of 1 to 8 carbon atoms; n is an integer equal to 1to 6, inclusive, and an oxirane group-containing vinyl monomer as comonomer units or

(b) a mixture of a polymer (I) containing said polysiloxane macromonomer as an essential monomer unit and a polymer (II) containing an oxirane group-containing vinyl monomer as an essential monomer unit;

(ii) 0.1 to 30 parts by weight of a chelate compound selected from the class consisting of aluminum chelate compounds, titanium chelate compounds and zirconium chelate compounds; and

(iii) 5 to 60 parts by weight, based on 100 parts by weight of said basin resin, of a low molecular weight compound with at least two oxirane groups per molecule and having a number average molecular weight of not more than 2,000.

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5,051,474

## THERMOPLASTIC ELASTOMER ADHESIVE

Patrick A. Warren, Erie; Marvin C. Hill, Fairview; Nicholas J. Gervase, Erie; Helmut W. Kucera, West Springfield, all of Pa., and Ernest B. Troughton, Jr., Cary, N.C., assignors to Lord Corporation, Erie, Pa.

Filed Apr. 11, 1990, Ser. No. 508,387

Int. Cl.[5] C08L *75/06*

U.S. Cl. 525—131 14 Claims

1. A chemical formulation comprising a linear polyester polyurethane, a halogenated polyolefin, a phenolic resin, and a cross-linker.

5,051,475

## POLYESTER-BASED FILM

Kenji Tsunashima, Kyoto; Takashi Mimura; Takashi Sumiya, both of Ootsu, and Hiroshi Kuboyama, Ootsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 168,944, Mar. 16, 1988, Pat. No. 4,908,277. This application Dec. 20, 1989, Ser. No. 453,715

Claims priority, application Japan, Mar. 16, 1987, 62-59009; Aug. 18, 1987, 62-204809

Int. Cl.[5] C08L *67/02, 25/18*

U.S. Cl. 525—175 6 Claims

1. A polyester film comprising at least in its surface portion oriented styrenesulfonic acid groups and/or salts thereof with an orientation degree of 5–100, wherein the oriented styrenesulfonic acid groups and/or salts thereof are provided by styrenesulfonic acid polymer or copolymer incorporated in the film.

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5,051,476

## MOUTH GUARD COMPOSITIONS

Toshiyasu Uji, Kumamoto; Shunichi Futami, Nagareyama, and Kimihiko Sato, Ageo, all of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan

Filed Mar. 23, 1990, Ser. No. 497,694

Claims priority, application Japan, Apr. 7, 1989, 1-86976

Int. Cl.[5] C08L *67/04, 31/04*

U.S. Cl. 525—186 5 Claims

1. A mouth guard composition comprising an ethylene/vinyl acetate copolymer and 4 to 50% by weight of a thermoplastic polycaprolactone having a molecular weight of 10,000–100,000.

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5,051,477

## DYNAMICALLY CURED THERMOPLASTIC OLEFIN POLYMERS AND PROCESS FOR PRODUCING THE SAME

Thomas C. Yu, Chatham; Robert C. Puydak, Cranbury, and Charles W. Degener, Toms River, all of N.J., assignors to Advanced Elastomer Systems, L. P., St. Louis, Mo.

Filed May 4, 1990, Ser. No. 519,041

Int. Cl.[5] C08L *23/26, 23/28, 15/02, 23/36, 25/16*

U.S. Cl. 525—194 43 Claims

1. A thermoplastic composition comprising a dynamically vulcanized polymer blend of (I) a polyolefin resin, (II) a halogenated elastomeric copolymer selected from the group consisting of a halogenated copolymer of a $C_4$ to $C_7$ isomonoolefin and a $C_4$ to $C_{14}$ multiolefin, a halogenated copolymer of a $C_4$ to $C_7$ isomonoolefin and a para-alkylstyrene, and mixtures thereof, and (III) a halogenated polyethylene.

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5,051,478

## ETHYLENE COPOLYMER - MODIFIED DYNAMICALLY VULCANIZED ALLOYS

Robert C. Puydak, Cranbury, and Donald R. Hazelton, Chatham, both of N.J., assignors to Advanced Elastomer Systems, L. P., St. Louis, Mo.

Filed Jul. 26, 1990, Ser. No. 558,695

Int. Cl.[5] C08L *9/00, 15/02, 23/26, 33/04*

U.S. Cl. 525—195 26 Claims

1. A dynamically vulcanized composition comprising:

(a) a cured elastomer selected from the group consisting of a copolymer of a $C_4$ to $C_7$ isomonoolefin and $C_4$ to $C_{14}$ multiolefin, a halogenated copolymer of a $C_4$ to $C_7$ isomonoolefin and a $C_4$ to $C_{14}$ multiolefin, a halogenated copolymer of a $C_4$ to $C_7$ isomonoolefin and a para-alkylstyrene, ethylene-propylene-diene rubber, polyisoprene polychloroprene, styrene-butadiene rubber, nitrile rubber, chlorosulfonated polyethylene, and mixtures thereof;

(b) a thermoplastic polyolefin resin other than (c);

(c) an ethylene copolymer resin selected from the group consisting of a copolymer of ethylene and vinyl acetate, a copolymer of ethylene and an alkyl ester of an alpha, beta

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monoethylenically unsaturated monocarboxylic acid, a copolymer of ethylene and an alpha, beta monoethylenically unsaturated monocarboxylic acid and mixtures thereof, at least a major portion of said ethylene copolymer resin being present in said thermoplastic polyolefin resin, said ethylene copolymer resin having been added to the dynamically vulcanized mixture of said elastomer and said polyolefin resin after said elastomer had been sufficiently cured to prevent penetration of a major portion of said ethylene copolymer resin into said elastomer.

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**5,051,479**

## MELT PROCESSABLE TFE COPOLYMERS WITH IMPROVED PROCESSABILITY

**Anestis L. Logothetis, Wilmington, and Charles W. Stewart, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Apr. 3, 1989, Ser. No. 332,030**
**Int. Cl.[5] C08L** *27/18*
**U.S. Cl. 525—197** **13 Claims**

1. A melt processable thermoplastic composition consisting essentially of a blend of:

(a) at least one melt processable fluorocarbon polymer; and

(b) about 0.05 to about 0.5 percent by weight of at least one elastomeric copolymer of about from 57 to 75 mole percent tetrafluoroethylene and about from 25 to 40 mole percent of a perfluoro(alkyl vinyl ether) wherein the alkyl group contains 1 to 5 carbon atoms.

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**5,051,480**

## ELASTOMERIC BLENDS

**Aubert Y. Coran, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 16, 1989, Ser. No. 421,431**
**Int. Cl.[5] C08L** *9/02, 13/00, 15/02*
**U.S. Cl. 525—227** **19 Claims**

1. An elastomeric blend comprising 10–90 parts by weight of (A) an elastomeric polymer from one or more alkyl acrylate monomers which polymer contains no crosslinking sites other than acrylate ester sites and, correspondingly, 90–10 parts by weight of (B) another elastomeric polymer which is nitrile rubber, hydrogenated nitrile rubber, or a fluoroelastomer.

12. A method for preparing a millable, vulcanizable elastomeric composition by the steps of:

i) forming a mixture comprising 10–90 parts by weight of (A) one or more elastomeric polymers from alkyl acrylate monomer which polymers contain no crosslinking sites other than acrylate ester sites, and, correspondingly,90–10 parts by weight of (B) another elastomeric polymer which is nitrile rubber, hydrogenated nitrile rubber, a fluoroelastomer, a silicone rubber or a fluorosilicone rubber and, ii) masticating the mixture at a temperature between 140° and 240° C. in the presence of a diol for a time sufficient to achieve at least partial vulcanization of (A).

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**5,051,481**

## LOW-TEMPERATURE HEAT-SHRINKABLE FILM

**Toshio Taka; Takuo Okubo, both of Kawasaki; Keiitsu Kobayashi, Niihari; Takehiko Asano, Niibari; Yoshio Kawasaki, Niihari, and Kiyotaka Osanai, Niihari, all of Japan, assignors to Showa Denko K. K. and Taisei Polymer Co., both of Tokyo, Japan**

**Filed Jul. 12, 1989, Ser. No. 378,873**
**Claims priority, application Japan, Jul. 12, 1988, 63-172978**
**Int. Cl.[5] C08J** *5/18;* **C08L** *23/18, 23/16, 23/08*
**U.S. Cl. 525—240** **7 Claims**

1. A low-temperature heat-shrinkable film comprising a stretched film made of a composition comprising (a) a linear ethylene polymer containing short-chain branches and having a density not larger than 0.940 g/cm$^3$ and (b) an ethylene/propylene random copolymer containing about 4 to 10% by weight, based on the weight of the random copolymer, of units derived from ethylene, wherein the proportion of the ethylene/propylene random copolymer in the composition is 15 to 50% by weight; said stretched film having a haze value of not larger than 8%, a heat shrinkability in the machine direction at a temperature of 90° C. of at least 30%, and a shrinkage stress of at least 300 g/mm$^2$.

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**5,051,482**

## METHOD AND APPARATUS FOR PREPARING A SELF-CURING TWO-COMPONENT POWDER LIQUID BONE CEMENT

**Slobodan Tepic, Davos, Switzerland, assignor to Laboratorium für experimentelle Chirurgie, Davos, Switzerland**

**PCT No. PCT/EP86/00669, § 371 Date Jun. 23, 1988, § 102(e) Date Jun. 23, 1988, PCT Pub. No. WO88/03811, PCT Pub. Date Jun. 2, 1988**
**PCT Filed Nov. 19, 1986, Ser. No. 251,209**
**Int. Cl.[5] C08F** *265/06;* **A61M** *5/32;* **A61B** *19/00*
**U.S. Cl. 525—309** **11 Claims**

1. The method of preparing a self-curing two-component powder liquid bone cement comprising a powder component consisting of particles (1) containing a polymerization catalyst (2), and a liquid component (3) containing a polymerizable monomer, prepolymer or mixtures thereof, characterized by the following steps:

A) filling an evacuated, inflexible chamber (4) essentially completely with the particles (1) of the powder component such that the interspaces between the particles are substantially evacuated, the particles (1) consisting of a material soluble in the liquid component (3) and containing the polymerization catalyst (2) distributed throughout the particles (1);

B) by the action of the vacuum in the interspaces between the same powder particles (1), flooding the interspaces essentially completely and wetting the powder particles completely by the liquid component (3) so that at least a surface layer (9) of said particles (1) is dissolved and the corresponding polymerization catalyst (2) contained in a portion of the particles initiates the polymerization process in the flooded cement mixture (7);

wherein steps A) and B) are conducted under conditions wherein said powder component is tightly confined by the walls of said chamber while at the same time maintaining interspaces between the particles in an evacuated condition.

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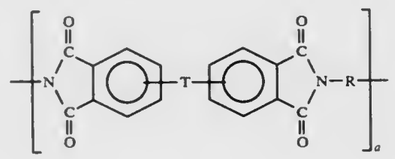
**5,051,483**

## FLAME RESISTANT POLYETHERIMIDE RESIN BLENDS

**John A. Rock, Becket, Mass.; L. Joseph Male, Old Chatham, N.Y., and Norman E. Durfee, Jr., Lansboro, Mass., assignors to General Electric Company, Pittsfield, Mass.**

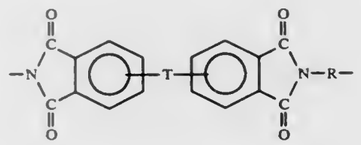
**Continuation of Ser. No. 271,380, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 925,915, Nov. 3, 1986, abandoned. This application Feb. 26, 1990, Ser. No. 484,485**
**Int. Cl.[5] C08L** *69/00, 79/08*
**U.S. Cl. 525—425** **19 Claims**

1. A polymer blend which comprises from about 20% by wt. to about 93% by wt. of a polyetherimide, from about 2 wt. % to about 40 wt. % of a siloxane polyetherimide copolymer, and from about 5% by wt. to about 40% by wt. of a polycarbonate, wherein the polyetherimide contains repeating units of the formula

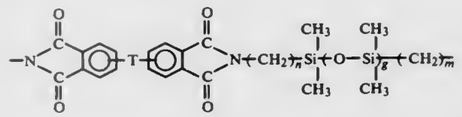




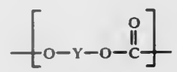
the siloxane polyetherimide copolymer consists essentially of repeating units of the formula



and repeating units of the formula



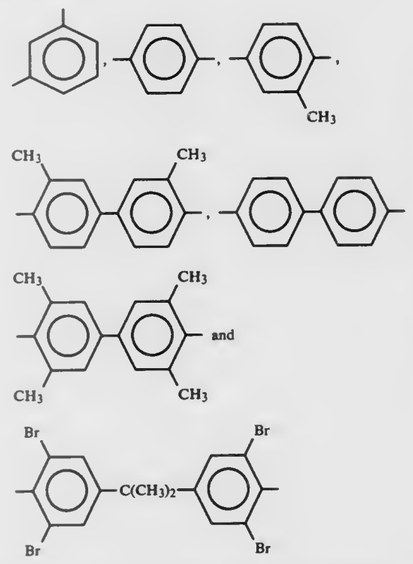
and the polycarbonate contains repeating units of the formula



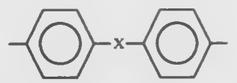
where "a" is an integer greater than 1; T is —O— or a group of the formula



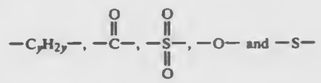
wherein the divalent bonds of the —O— or the —O—Z—O— group are in the 3,3', 3,4', 4,3' or 4,4' positions; Z is a member of the class consisting of (A):



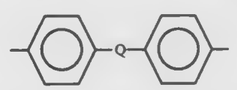
and (B) divalent organic radicals of the general formula



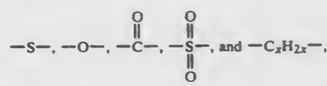
where X is a member selected from the group consisting of divalent radicals of the formulas



where Y is an integer from 1 to about 5; and R is a divalent organic radical selected from the group consisting of (a) aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, and (c) divalent radicals of the general formula



Where Q is a member selected from the group consisting of



and X is an integer from 1 to about 5; n and m independently are integers from 1 to about 10 and g is an integer from 5 to about 40 and Y is a divalent aromatic radical.

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**5,051,484**

## PROCESS FOR PRODUCING GRANULAR THERMOPLASTIC ELASTOMER AND GRANULAR ELASTOMER

**Toshio Sasaki; Takeshi Ebara; Hiroyuki Kora, all of Ichihara; Kiyoshi Kawai; Mituharu Yamasaki, both of Chiba, and Syozo Kawamata, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Division of Ser. No. 167,003, Mar. 11, 1988, Pat. No. 4,900,706. This application Dec. 4, 1989, Ser. No. 445,792**
**Claims priority, application Japan, Mar. 17, 1987, 62-63094; May 20, 1987, 62-124321; Aug. 4, 1987, 62-195531; Oct. 9, 1987, 62-256015**
**Int. Cl.[5] C08F** *2/34, 4/02, 297/08*
**U.S. Cl. 526—151** **5 Claims**

1. A process for producing a granular thermoplastic elastomer and a granular elastomer which comprises polymerizing an α-olefin or copolymerizing α-olefins by the use of a catalyst system comprising

a solid catalyst component (A) containing a transition metal composition made from a titanium compound represented by the general formula $Ti(OR^1)_aX_b$, wherein $R^1$ represents a hydrocarbon residue having 1 to 20 carbon atoms, X represents halogen and a and b represent numbers satisfying $0 \leqq a \leqq 4$, $0 \leqq b \leqq 4$, and $a+b=3$ or 4, and a magnesium compound selected from Grignard compounds, dialkyl- or diaryl-magnesium compounds, which are impregnated into an organic porous polymer carrier selected from the group consisting of polystyrene, polyacrylicester, polyacrylonitrile, polyvinylchloride and polyolefin of porous polymer beads having a mean particle diameter of

5 to 1,000 μm and a pore volume of 0.1 ml/g or above at a pore radius of 100 to 5,000 Å and
an organoaluminum compound (B).

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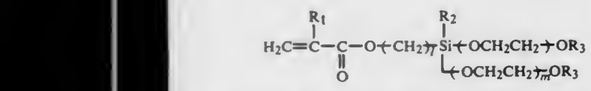
5,051,485
METHOD FOR PRODUCING TACKIFIER RESINS
John J. Schmid, and James W. Booth, both of Panama City, Fla., assignors to Arizona Chemical Company, Panama City, Fla.
Filed Dec. 18, 1989, Ser. No. 452,200
Int. Cl.[5] C08F 4/14
U.S. Cl. 526—208 15 Claims

1. A method for the polymerization of a monomer selected from the group consisting of C-10 terpenes, vinyl aromatics and C-5 dienes comprising:
complexing an organic ketone with a Lewis acid at a mole ratio of from about 0.75 to about 1.25 and producing a catalyst complex;
adding said monomer to said catalyst complex producing a reaction mixture;
maintaining said reaction mixture at from about 10° C. to about 60° C. until the reaction is completed; quenching said reaction mixture with water; and recovering a polymerized resin from the reaction mixture.

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5,051,486
PREPARATION OF POLYMERS USEFUL AS POLYMERIC SOLID ELECTROLYTES AND COMPATIBILIZERS
Nobuyuki Kuroda; Hiroshi Kobayashi, both of Yokohama, and Kazuo Matsuura, Tokyo, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 399,332, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 252,524, Oct. 3, 1988, abandoned. This application Aug. 29, 1990, Ser. No. 576,152
Claims priority, application Japan, Oct. 7, 1987, 62-251593
Int. Cl.[5] C08F 30/08
U.S. Cl. 526—279 6 Claims

1. In the making of a uncross-linked comb-like graft polymer uesful for compatibilizers or polymeric solid electrolytes, the process comprising:
(a) dissolving in an organic solvent a macromer having a polyether moiety in a side chain thereof, the macromer being of general form:



where, $R_1$ is H, or an alkyl group of 1-5 carbon atoms,
$R_2$ is $R_1$ or $-(OCH_2CH_2)_pOR_4$, p being an integer from 1 to 30,
$R_3$ and $R_4$ being alkyl groups having 1-10 carbon atoms each,
l is an integer from 1-10, and
m is an integer from 1-30; and
(b) initiating polymerization of the step (a) macromer by reacting it slowly in the absence of oxygen with a conventional radical polymerization initiator to obtain said polymer.

5,051,487
HYDROPHOBIC CATIONIC TERPOLYMERS FROM ACRYLAMIDE, DIMETHYLAMINOETHYLACRYLATE METHYL CHLORIDE OR SULFATE AND VINYL ACETATE
Bhupati R. Bhattacharyya, Downers Grove, and Michael R. St. John, Chicago, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.
Filed Mar. 20, 1989, Ser. No. 325,841
Int. Cl.[5] C08F 228/02, 226/02
U.S. Cl. 526—287 9 Claims

1. A hydrophobic cationic terpolymer resulting from the polymerization of a mixture of monomers of (a) at least one member selected from the group consisting of acrylamide and methacrylamide, (b) at least one member selected from the group consisting of dimethylaminoethylacrylate methyl chloride and dimethylaminoethylacrylate methyl sulfate, and (c) vinyl acetate, the mole % of said (a), (b), and (c) monomers being in the range of from about 4 to about 84 for the (a) monomer, from about 10 to about 90 for the (b) monomer, and from about 6 to about 26 for the (c) monomer.

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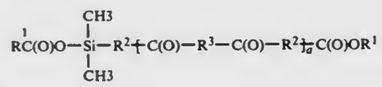
5,051,488
ORGANIC GLASS WITH HIGH REFRACTIVE INDEX
Yoshiharu Fujio, Itami, and Kanemasa Matsukuma, Amagasaki, both of Japan, assignors to Daiso Co., Ltd., Osaka, Japan
Filed Apr. 6, 1990, Ser. No. 505,487
Claims priority, application Japan, Apr. 12, 1989, 1-93597
Int. Cl.[5] C08F 18/16
U.S. Cl. 526—322 7 Claims

1. An organic glass with a high refractive index which comprises a copolymer of
(a) a diallyl isophalate monomer,
(b) a monomer of allyl or methallyl benzoate in which the benzene ring is unsubstituted or substituted by a straight chain or branched chain alkyl group having 1 to 6 carbon atoms or a straight chain or branched chain alkoxy group having 1 to 6 carbon atoms, and
(c) a diester of maleic acid and/or diester of fumaric acid monomer.

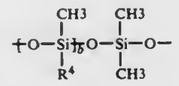
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5,051,489
NOVEL SILANOL WAXES
Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.
Filed Jan. 25, 1990, Ser. No. 470,224
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—26 8 Claims

1. A silanol ester compound which conforms to the following structure;



$R^2$ is

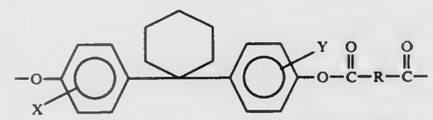


$R^1$ is alkyl having 6 to 30 carbon atoms;
$R^3$ is selected from $-(CH_2)_c-$, or $-(CH_2)_d-CH=CH-(CH_2)_e-$;
a is an integer from 0 to 20;
b is an integer from 1 to 200;
c, d and e are independently integers from 1 to 10;
$R^4$ is alkyl having 1 to 18 carbon atoms or aromatic C6H5.



5,051,490
THERMOPLASTIC POLYARYLATE COMPOSITIONS HAVING IMPROVED OXYGEN BARRIER PROPERTIES
Richard P. Joyce, East Nassau; John C. Schmidhauser, Schenectady, and Kathryn L. Longley, Saratoga Springs, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Continuation of Ser. No. 375,106, Jul. 3, 1989, abandoned. This application Sep. 25, 1990, Ser. No. 588,504
Int. Cl.[5] C08G 63/02, 63/18
U.S. Cl. 528—190 12 Claims

1. As an article of manufacture, a food or beverage item contained in a formed container or film wrap having oxygen barrier properties and comprising a thermoplastic polyarylate composition comprising recurring structural units of the general formula


(I)

wherein R is an aromatic group, two or more aromatic groups connected through non-aromatic or divalent aliphatic-aromatic linkages, or a divalent aliphatic-aromatic group; and X and Y are each independently selected from the group consisting of hydrogen, an alkyl group having 1 to about 5 carbon atoms, a cycloalkyl group having about 5 to about 7 carbon atoms, a monovalent aromatic group, and a halogen; the molar proportion of said units of formula I being in the range of about 50–100 mole percent of total structural units.

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5,051,491
PROCESS FOR THE PREPARATION OF A LINEAR POLYAMIDE HAVING ETHER BRIDGES IN THE POLYMER CHAIN
Gunter Pipper, Bad Duerkheim, and Eckhard M. Koch, Fussgoenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Mar. 29, 1990, Ser. No. 500,949
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1989, 3912769
Int. Cl.[5] C08G 69/28
U.S. Cl. 528—335 6 Claims

1. A process for the continuous preparation of a linear polyamide having ether bridges in the polymer chain, in which
a) an aqueous solution of a salt of a diamine and an equimolar amount of a dicarboxylic acid, with or without a lactam or the corresponding amino-carboxylic acid, from 1 to 80% of the polyamide-forming units, based on the total polyamide-forming units, being selected from the group consisting of diamine units, dicarboxylic acid units or mixtures thereof which, after removal of the amine groups of carboxyl groups, having radicals of formula I

$$-R^1O-[R^2-O_n]R^3- \quad \text{I,}$$

in which $R^1$, $R^2$ and $R^3$ are the same or different and denote unsubstituted alkylene radicals of from 2 to 6 carbon atoms, or alkylene units containing alkyl radicals of from 1 to 3 carbon atoms as substituents, and n is an integer from 1 to 60, is passed through a tubular precondensation zone equipped with baffles over a period of from 1 to 10 minutes and is heated over the first third of said zone to a temperature of from 250° to 290° C. under a pressure of from 1 to 10 bar, with evaporation of water, to give a mixture substantially comprising a vapor phase and molten prepolymer, which vapor phase and prepolymer are brought into intimate contact with each other over the subsequent two-thirds of said precondensation zone,
b) the molten prepolymer is separated from the vapor phase in a separation zone,
c) the prepolymer s condensed in a condensation zone under a pressure of from 1 to 10 bar and at a temperature of from 250° C. to 290° C. during a residence time of from 5 to 30 minutes,
d) the polymer is removed from the condensation zone through a discharge zone with removal of the residual water to give a polymer capable of being granulated,
e) which polymer is further condensed in the solid phase to the desired viscosity, under a blanket of inert gas at elevated temperature,
f) the vapor phase obtained in stage b) is separated, in a column, into steam and an aqueous solution containing diamine and the said aqueous solution is recycled to stage a).

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5,051,492
POLYETHER RESINS AND PROCESS FOR PREPARING THE SAME
Olivier L. P. Andre, and Henricus P. H. Scholten, both of Ottignies-Louvain-la-Neuve, Belgium, assignors to Shell Oil Company, Houston, Tex.
Filed Jun. 19, 1990, Ser. No. 540,422
Int. Cl.[5] C08G 65/22
U.S. Cl. 528—361 16 Claims

1. A process for the preparation of a polyether resin having an epoxy group content of less than 0.2 meq/g and containing on average from n/3−0.5 to n/3+2.5 primary hydroxyl groups, the process comprising contacting a glycidyl ester of a $C_{9-11}$ branched aliphatic acid with an aliphatic primary polyhydric alcohol containing n primary hydroxyl groups and 5 to 16 carbon atoms, wherein n is a value of 3 to 6, in the presence of an etherification catalyst selected from the group consisting of tin, zinc and iron salts.

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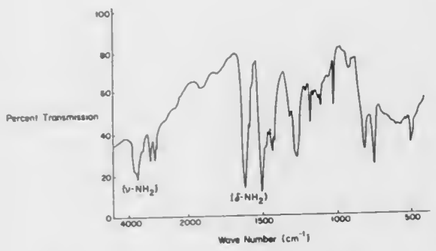
5,051,493
METAL PHTHALOCYANINES AS CATALYSTS FOR CURING PHTHALONITRILE PREPOLYMERS
Theodore R. Walton, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 31, 1990, Ser. No. 531,423
Int. Cl.[5] C08G 83/00
U.S. Cl. 528—362 18 Claims

1. A method of curing a bis-phthalonitrile resin comprising the steps of:
mixing a bis-phthalonitrile resin with an ionic metal phthalocyanine in an amount effective to accelerate the cure of said bis-phthalonitrile;
melting said mixture;
subjecting said melted mixture to polymerization temperatures until said mixture has polymerized to provide a polymer having the desired degree of polymerization.

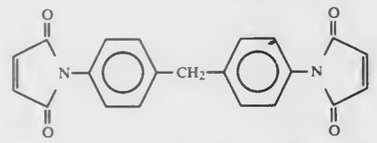
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5,051,494
THERMOSETTING RESIN COMPOSITION COMPRISING AN AROMATIC AMINE
Keizaburo Yamaguchi, Kawasaki; Yoshimitsu Tanabe; Tatshuiro Urakami, both of Yokohama; Akihiro Yamaguchi, Kamakura; Norimasa Yamaya, and Masahiro Ohta, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
Division of Ser. No. 254,701, Oct. 7, 1988, Pat. No. 4,937,318. This application Apr. 19, 1990, Ser. No. 511,235
Claims priority, application Japan, Oct. 8, 1987, 62-252517; Nov. 10, 1987, 62-282048; Dec. 9, 1987, 62-309426
Int. Cl.[5] C08G 73/10; C08L 33/24
U.S. Cl. 528—422 7 Claims

1. A thermosetting resin composition comprising about 100 parts by weight of N,N'-4,4'-diphenylmethanebismaleimide represented by formula (e):

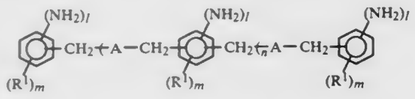



(e)



and from about 5 to about 100 parts by weight of an aromatic amine resin comprising a mixture of aromatic amine compounds represented by the formula (a):

(a)



wherein A represented a phenylene, alkyl-substituted phenylene, diphenylene, diphenyl ether or napthylenyl group, $R^1$ represents a halogen atom, a hydroxyl group, a $C_1$–$C_4$ alkoxy or a $C_1$–$C_5$ lkyl group, l is 1 or 2, m is 0, 1, 2 or 3, n is an integer from 0 to 300 and when m is 2 or 3 and said $R^1$ groups are thes ame or different and two $R^1$ groups may join to form a 5- or 6-membered alicyclic moiety.

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**5,051,495**

## PRODUCTION AND/OR HANDLING OF ARYL POLYETHERS AND THIOETHERS POLYMERS

**Philip Staniland, Middlesbrough; Arthur H. Gilbert, Stockton on Tees, and Ian R. M. Henderson, Stokesley, all of England, assignors to Imperial Chemical Industries PLC, London, England**

**Filed May 18, 1988, Ser. No. 195,610**

**Claims priority, application United Kingdom, May 18, 1987, 8711685; May 18, 1987, 8711686**

**Int. Cl.[5] C08G *65/40, 75/00***

**U.S. Cl. 528—499** **12 Claims**

1. In a process for producing an aryl polyether or polythioether by polycondensing (a) at least one dihalobenzenoid compound with at least one dihydric phenol, dihydric thiophenol or hydroxyphenyl mercaptan in the presence of at least one basic alkali metal compound, or with an alkali metal sulphide; or (b) at least one halophenol or halothiophenol in the presence of at least one basic alkali metal compound whereby alkali halide is formed as a co-product, and separating the aikali halide from the resulting polymer phase by contacting said phase with water, the improvement which comprises (a) providing said phase in liquid form; (b) adjusting the composition and temperature so that water dissolves therein to the extent of at least 0.5% by weight on the total of said phase and other materials present after said adjustment; and (c) contacting the resulting adjusted liquid phase with water.

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**5,051,496**

## PEPTIDES RELATED TO HUMAN IMMUNODEFICIENCY VIRUS II (HIV-2)

**Marc Alizon, Paris; Luc Montagnier, Le Plessy Robinson; Denise Guetard, Paris, all of France; Francois Clavel, Rockville, Md.; Pierre Sonigo, and Mireille Guyader, both of Paris, France, assignors to Institut Pasteur, Paris, France**

**Continuation-in-part of Ser. No. 933,184, Nov. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 916,080, Oct. 6, 1986, abandoned, and Ser. No. 835,228, Mar. 3, 1986, Pat. No. 4,839,288. This application Jan. 16, 1987, Ser. No. 3,764**

**Claims priority, application France, Jan. 22, 1986, 86 00910; Jan. 22, 1986, 86 00911; Feb. 6, 1986, 86 01635; Feb. 13, 1986, 86 01985**

**Int. Cl.[5] C07K *15/04, 7/08, 7/10***

**U.S. Cl. 530—324** **13 Claims**

1. A peptide selecdted from the group consisting of env1, env2, env3, env4, env5, env6, env7, env8, env9, env10, env11 and gag1 of HIV-2, wherein said peptide comprises an amino acid sequence that is encoded by a DNA fragment comprising a nucleotide sequence as follows:

env1 (1735–1809)

Val Thr Ala Ile Glu Lys Tyr Leu Glu Asp Gln Ala
GTCACTGCTATAGAGAAGTAGCTACAGGACCAGGCG

Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg Gln Val
CGCCTAAATTCATGGGGATGTGCGTTTAGACAAGTC
1800

Cys
TGC

env2 (1912–1983)

Ser Lys Ser Leu Glu Gln Ala Gln Ile Gln Gln Glu
AGTAAAAGTTTAGAACAGGCACAAATTCAGCAAGAG
1940

Lys Asn Met Tyr Glu Leu Gln Lys Leu Asn Ser Trp
AAAAATATGTATGAACTACAAAAATTAAATAGCTGG

env3 (1482–1530)

Pro Thr Lys Glu Lys Arg Tyr Ser Ser Ala His Gly
CCTACAAAAGAAAAAAGATACTCCTCTGCTCACGGG
1500

Arg His Thr Arg
AGACATACAAGA

env4 (55–129)

Cys Thr Gln Tyr Val Thr Val Phe Tyr Gly Val Pro
TGCACCCAATATGTAACTGTTTTCTATGGCGTACCC

Thr Trp Lys Asn Ala Thr Ile Pro Leu Phe Cys Ala
ACGTGGAAAAATGCAACCATTCCCCTGTTTTGTGCA
100

Thr
ACC

env5 (175–231)

Asp Asp Tyr Gln Glu Ile Thr Leu Asn Val Thr Glu
GATGATTATCAGGAAATAACTTTGAATGTAACAGAG
200

Ala Phe Asp Ala Trp Asn Asn
GCTTTTGATGCATGGAATAAT



-continued

env6 (274–330)

Glu Thr Ser Ile Lys Pro Cys Val Lys Leu Thr Pro
GAGACATCAATAAAACCATGTGTGAAACTAACACCT
300

Leu Cys Val Ala Met Lys Cys
TTATGTGTAGCAATGAAATGC

env7 (607–660)

Asn His Cys Asn Thr Ser Val Ile Thr Glu Ser Cys
AACCATTGCAACACATCAGTCATCACAGAATCATGT
610

Asp Lys His Tyr Trp Asp
GACAAGCACTATTGGGAT

env8 (661–720)

Ala Ile Arg Phe Arg Tyr Cys Ala Pro Pro Gly Tyr
GCTATAAGGTTTAGATACTGTGCACCACGGGGTTAT

Ala Leu Leu Arg Cys Asn Asp Thr
GCCCTATTAAGATGTAATGATACC
700

env9 (997–1044)

Lys Arg Pro Arg Gln Ala Trp Cys Trp Phe Lys Gly
AAAAGACCCAGACAAGCATGGTGCTGGTTCAAAGGC
1000

Lys Trp Lys Asp
AAATGGAAAGAC

env10 (1132–1215)

Lys Gly Ser Asp Pro Glu Val Ala Tyr Met Trp Thr
AAAGGCTCAGACCCAGAAGTAGCATACATGTGGACT

Asa Cys Arg Gly Glu Phe Leu Tyr Cys Asn Met Thr
AACTGCAGAGGAGAGTTTCTCTACTGCAACATGACT
1200

Trp Phe Leu Asn
TGGTTCCTCAAT

env11 (1237–1305)

Arg Asn Tyr Ala Pro Cys His Ile Lys Gln Ile Ile
CGCAATTATGCACCGTGCCATATAAAGCAAATAATT

Asn Thr Trp His Lys Val Gly Arg Asn Val Tyr
AACACATGGCATAAGGTAGGGAGAAATGTATAT
1300

gag1 (991–1053)

Asp Cys Lys Leu Val Leu Lys Gly Leu Gly Met Asn
GACTGTAAATTAGTGCTAAAAGGACTAGGGATGAAC
1000

Pro Thr Leu Glu Glu Met Leu Thr Ala
CCTACCTTAGAAGAGATGCTGACCGCC

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**5,051,497**

## METHOD FOR THE SOLUBILIZATION OF AN OTHERWISE INSOLUBLE PROTEIN

**Ellen Fanning, Munich; Adolf Höss, Hausham, and Avril Arthur, Munich, all of Fed. Rep. of Germany, assignors to Consortium fur elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany**

**Filed Jan. 19, 1989, Ser. No. 298,683**

**Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802045; European Pat. Off., Sep. 27, 1988, 88115908**

**Int. Cl.[5] C07K *3/22***

**U.S. Cl. 530—416** **10 Claims**

1. A process for the solubilization of a protein comprising the steps of:

contacting an insoluble protein expressed by cultivated cells in the form of inclusion bodies with an ion exchanger; and

separating said protein from the ion exchanger in a solubilized form whereby in the steps of contacting and separating the use of denaturing agents and detergents is excluded.

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**5,051,498**

## LIPOPHILIC 2', 3'-DIDEOXYNUCLEOSIDE PRODRUG DERIVATIVES FOR THE INHIBITION OF REPLICATION OF THE AIDS VIRUS AND OTHER RETROVIRUSES

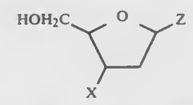
**Thomas I. Kalman, East Amherst, N.Y., assignor to The Research Foundation of State University of NY, Albany, N.Y.**

**Filed Nov. 3, 1989, Ser. No. 431,286**

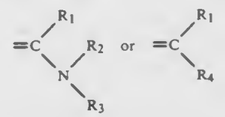
**Int. Cl.[5] C07H *19/00***

**U.S. Cl. 536—23** **7 Claims**

1. A compound of the formula



wherein X is hydrogen or fluorine and wherein Z is a pyrimidin-1-yl or a purin-9-yl base selected from the group consisting of cytosine, adenine and guanine, wherein divalently attached to the exocylic amino group on said base is a substituted methylene group having the formula



wherein $R_1$ is selected from the group consisting of hydrogen or a $C_1$–$C_{20}$ linear or branched chain alkyl, alkenyl, or alkynyl group and wherein $R_2$ and $R_3$ may be the same or different and each is selected from the group consisting of a $C_1$–$C_{20}$ linear or branched chain alkyl, alkenyl or alkynyl group or a $C_3$–$C_6$ cycloalkyl group or an aralkyl group and wherein $R_4$ is selected from the group consisting of pyrrolidines, piperidines or morpholines having the nitrogen divalently attached to the methylene group, and salts thereof.

VOL 1130 ISS 4 SE 24 1991 UMI



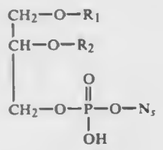
**5,051,499**

## NOVEL NUCLEOSIDE-PHOSPHOLIPID CONJUGATE

Satoshi Shuto; Hiromichi Itoh; Kiyofumi Fukukawa, and Masatoshi Tsujino, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Division of Ser. No. 102,043, Sep. 28, 1987, Pat. No. 4,921,951.
This application Nov. 28, 1989, Ser. No. 445,965
Claims priority, application Japan, Sep. 27, 1986, 61-229203; Sep. 27, 1986, 61-229204
The portion of the term of this patent subsequent to Jan. 10, 2006, has been disclaimed.
Int. Cl.[5] C07H *19/10, 19/20;* C07D *473/00*
U.S. Cl. 536—29 2 Claims

1. A compound of the formula



wherein $R_1$ is $C_{14-24}$ long chain aliphatic acyl, $R_2$ is $C_{2-10}$ aliphatic acyl and $N_s$ is 5-fluorouridine-5'-yl; and pharmacologically acceptable salts thereof.

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**5,051,500**

## METHOD OF PREPARING A RANDOMLY-BONDED POLYSACCHARIDE

Roy O. Elmore, Atwood, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Aug. 11, 1989, Ser. No. 392,735
Int. Cl.[5] C08B *37/00;* A23L *1/308*
U.S. Cl. 536—50 7 Claims

1. A continuous method of preparing a randomly-bonded polysaccharide comprising:

feeding ingredients comprising a reducing saccharide, said reducing saccharide being selected from the group consisting of glucose and maltose, and an edible carboxylic acid, each as a separate stream in solid particulate form, into a vented chamber having means for conveying said ingredients longitudinally through said chamber with lateral mixing of said ingredients and minimal longitudinal mixing of said ingredients,

melting and laterally mixing said ingredients in a first zone of said chamber to form a melt,

conveying said melt within said chamber by said means for conveying to a second zone of said chamber,

reacting said melt in said second zone of said chamber to form a randomly-bonded polysaccharide in said melt,

conveying said melt through said second zone by said means for conveying, and

subjecting said melt while in said second zone to reduced pressure and agitating said melt to remove water from said melt.

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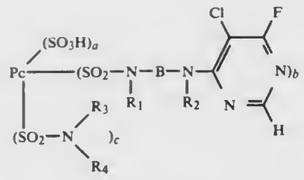
**5,051,501**

## REACTIVE PHTHALOCYANINE DYESTUFFS CONTAINING A FLUOROCHLOROPYRIMIDINYL GROUP

Karl H. Schündehütte; Manfred Groll, both of Leverkusen, and Josef W. Stawitz, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 6, 1989, Ser. No. 431,969
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1988, 3840164
Int. Cl.[5] C09B *62/26;* D06P *1/382*
U.S. Cl. 540—125 4 Claims

1. A reactive dyestuff of the formula



(I)

wherein

Pc = radical of a Cu-phthalocyanine,

$R_1$, $R_2$ = H or $C_1$-$C_4$-alkyl

B = phenylene

$R_3$, $R_4$ = H, $C_1$-$C_4$-alkyl or together $C_2$-alkylene,

a = 1.0 to 2.7,

b = 0.8 to 1.2, and

c = 0.5 to 1.5, where a+b+c = 3 to 4.

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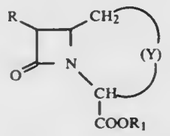
**5,051,502**

## RHODIUM CATALYZED CYCLIZATION PROCESS FOR BICYCLIC β-LACTAMS

Marvin J. Miller, South Bend, and Matthew A. Williams, Mishawaka, both of Ind., assignors to University of Notre Dame du Lac, Notre Dame, Ind.

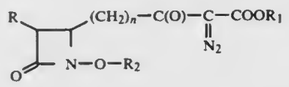
Filed Jun. 6, 1990, Ser. No. 534,073
Int. Cl.[5] C07D *205/085, 205/08, 487/04*
U.S. Cl. 540—205 14 Claims

1. The process for preparing a β-lactam compound of the formula



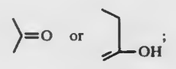
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which comprises mixing in an inert solvent at a temperature between about 15° C. and about 85° C. a diazo ester of the formula



A

with a catalytic amount of a rhodium $C_2$-$C_{10}$ carboxylate where, in the above formulae, R is hydrogen, amino, protected amino, ethyl or hydroxyethyl; $R_1$ is a carboxy protecting group; $R_2$ is $C_1$-$C_6$ alkyl or $C_1$-$C_6$ substituted alkyl substituted by a member of the group of phenyl, carboxy, protected carboxy, hydroxy, fluoro, chloro, bromo, cyano or $C_1$-$C_3$ alkoxy; n is 1 or 2; and Y is a divalent group of the formula



provided that, when n is 2, R is amino or protected amino.



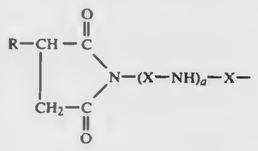
**5,051,503**

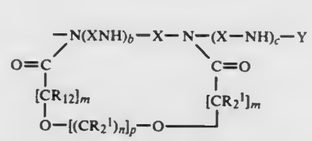
## POLYGLYCOL DICARBOXYLIC ACID AMIDE LUBRICANT AND FUEL ADDITIVES

Raymond C. Schlight, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 30, 1990, Ser. No. 516,377
Int. Cl.[5] C07D *413/12, 14/06*
U.S. Cl. 540—454 17 Claims

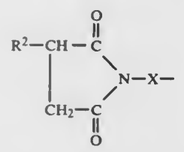
1. A polyglycol diacid amide lubricant or fuel additive represented by the formula:



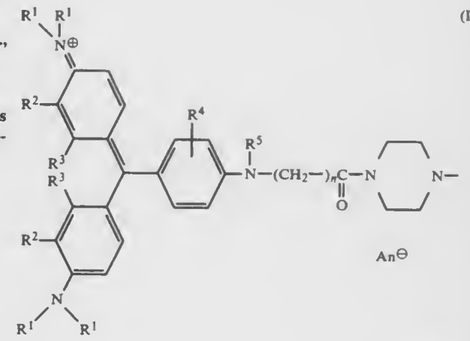


wherein R is a ($C_{25}$-$C_{500}$) hydrocarbyl radical; X is a ($C_2$-$C_6$) divalent alkylene radical; $R^1$ is H or a ($C_1$-$C_{20}$) allkyl radical; a = 0–4; b = 0–4; c = 0–4 and $a+b+c$ = 0–12; m = 1–12; n = 2–10; p = 1–50;

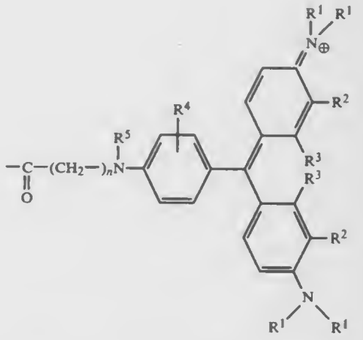
Y is H or a hydrocarbyl substituted succinimido-alkyl radical having the formula



in which $R^2$ is a ($C_8C_{500}$) hydrocarbyl radical; a is a number ranging from 0–4; b is a number ranging from 0–4; c is a number ranging from 0 to 4 and the sum of $a+b+c$ = 0 to 12; $R^1$ is H or a ($C_1$-$C_{20}$) alkyl group; m is a number ranging from 1 to 10 and n is a number ranging from 2 to 10; p is a number ranging from 1 to 50; or $R^1$ is a combination of one hydrogen atom and one alkyl group on at one or more of the "n" carbon atoms.



(I)



where each

$R^1$ is identical of different, being independently of the others hydrogen, $C_1$-$C_6$- alkyl, or $C_1$-$C_6$-alkanoyloxy, $C_1$-$C_4$-alkoxycarbonyl, cyano, chlorine acetyl, acetylamino or phenyl, or two $R^1$ radicals together with the nitrogen atom joining them form a saturated 5- or 6-membered heterocyclic raidcal selected from the group consisting of pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino and N-($C_1$-$C_4$-alkyl)piperazino,

$R^2$ and $R^5$ is identical or different, being independenlty of the others hydrogen or $C_1$-$C_4$-alkyl,

$R^3$ and $R^4$ is identical or different, being independently of the others hydrogen, $C_1$-$C_4$-alkyl, $C_1$-$C_4$-alkoxy or halogen,

$An^{\ominus}$ is one equivalent of an anion, and

n is identical or different, being 1 or 2.

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**5,051,504**

## DOUBLED TRIPHENYLMETHANE DYES HAVING BIS ACYLPIPERAZINE LINKAGE

Erwin Hahn, Heidelberg; Walter Breitschaft, Mannheim; Udo Mayer, Frankenthal, and Gunter-Rudolf Schroeder, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,382
Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917601
Int. Cl.[5] C09B *11/20;* D21H *21/28*
U.S. Cl. 544—58.6 2 Claims

1. A triphenylmethane dye of the formula I

**5,051,505**

## PROCESS FOR PREPARING PIPERAZINYL QUINOLONE DERIVATIVES

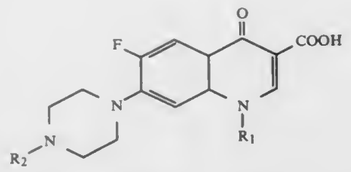
Sang W. Park; You S. Kim, and Jin H. Lee, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Aug. 2, 1990, Ser. No. 561,811
Claims priority, application Rep. of Korea, Mar. 27, 1990, 4115/1990[U]
Iot. Cl.[5] C07D *413/14, 401/04*
U.S. Cl. 544—101 2 Claims

1. A process for preparing piperazinyl quinolone derivatives of the formula (I):

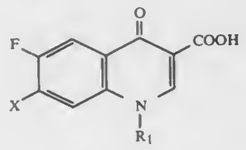
VOL 1130 ISS 4 SE 24 1991 UMI



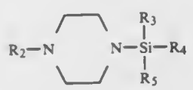


(I)

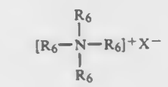
wherein $R_1$ is $C_{1-6}$ lower alkyl cyclopropyl, or 3-oxo-2-propanyl, provided that oxygen atom in 3-oxo-2-propanyl is added to the position 8 is quinolone of the formula (I) to form a cyclic compound, and $R_2$ represents hydrogen, methyl or ethyl, which comprises reacting dihaloquinolones of the formula (II) with piperazine derivatives of the formula (III) in the presence of a polar solvent and a tetraalkyl ammonium halide of the formula (IV) at 60° C. to 80° C. for 2 to 3 hours.



(II)



(III)



(IV)

wherein
$R_1$ is the same as defined for $R_1$ in the formula (I),
X represents chloro or fluoro,
$R_2$ is hydrogen, methyl or ethyl,
$R_3$, $R_4$ and $R_5$ are the same or different $C_{1-6}$ lower alkyl groups selected from a group consisting of methyl, ethyl and t-butyl,
$R_6$ is methyl, ethyl or butyl, and
X is chloro or fluoro.

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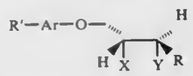
**5,051,506**

**FERROELECTRIC LIQUID CRYSTAL COMPOUNDS CONTAINING CHIRAL HALOALKYOXY TAIL UNITS AND COMPOSITIONS CONTAINING THEM**

**Michael D. Wand, and David M. Walba, both of Boulder, Colo., assignors to Displaytech, Inc., Boulder, Colo.**

**Filed Mar. 4, 1988, Ser. No. 164,233**
**Int. Cl.[5] C07D** *239/72;* **C09K** *19/52*
**U.S. Cl. 544—289** **21 Claims**

1. A chiral nonracemic compound of the formula:



and enantiomers thereof wherein:
X and Y are halogens,
R is an alkyl group containing one to fifteen carbon atoms,
Ar is an achiral core selected from the group consisting of 4,4'-substituted phenylbenzoate, 4,4'-substituted biphenylbenzoate, 5,4-substituted 2-phenylpyrimidine and 4,4'-substituted biphenyl,
when Ar is 4,4'-substituted phenylbenzoate, 4,4'-substituted biphenylbenzoate or 4,4'-substituted biphenyl, R' is an alkyl or alkoxy group containing from three to fifteen carbon atoms, and
when Ar is 5,4-substituted 2-phenylpyrimidine, R' is an alkyl group containing from three to fifteen carbon atoms.

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**5,051,507**

**PROCESS FOR THE PREPARATION OF 4,5,6-TRICHLOROPYRIMIDINE**

**Karl-Heinz Schündehütte; Gunther Beck, both of Leverkusen; Kurt Findeisen, Odenthal, and Hermann Henk, Colonge, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 11, 1990, Ser. No. 463,648**
**Claims priority, application Fed. Rep. of Germany, Jan. 13, 1989, 3900917**
**Int. Cl.[5] C07D** *239/30*
**U.S. Cl. 544—334** **3 Claims**

1. Process for the preparation of 4,5,6-trichloropyrimidine, characterized in that a protonated dialkylaminopropionitrile of formula



(I)

wherein
R is H or $C_1$–$C_4$-alkyl and
$X^{\ominus}$ is an anion
is treated with chlorine in the presence of organic catalysts selected from:
open chain or cyclic carboxamides,
N-$C_1$–$C_{12}$-alkylpyrrolidones,
N-$C_1$–$C_{12}$-alkylcaprolactams,
trialkylphosphites,
triarylphosphites,
triarylphosphine oxides and
triphenylphosphine
or $PCl_5$ or $PCl_3$
or mixtures of these catalyst compounds
and in the presence of phosphorus oxychloride as a solvent.

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**5,051,508**

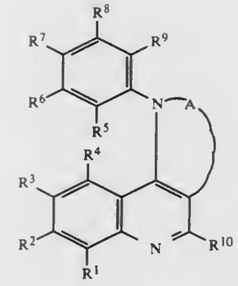
**DIHYDROPYRROLO QUINOLINE DERIVATIVES**

**Thomas H. Brown, Tewin; Robert J. Ife, and Colin A. Leach, both of Stevenage, all of England, assignors to SmithKline Beckman Intercredit B.V., Rotterdam, Netherlands**

**Continuation of Ser. No. 218,757, Jul. 13, 1988, abandoned. This application Jun. 19, 1990, Ser. No. 540,394**
**Claims priority, application United Kingdom, Jul. 24, 1987, 8717644**
**Int. Cl.[5] C07D** *471/04*
**U.S. Cl. 546—84** **21 Claims**

1. A compound of structure (I)





(I)

in which
$R^1$ to $R^4$ are the same or different and are each hydrogen, $C_{1-4}$alkyl, $C_{1-6}$alkoxy, phenyl, $C_{1-6}$alkylthio, $C_{1-4}$alkanoyl, amino, $C_{1-6}$alkylamino, di$C_{1-6}$alkylamino, halogen, trifluoromethyl or nitro, provided that at least two of $R^1$ to $R^4$ are hydrogen.
$R^5$ to $R^9$ are the same or different and are each hydrogen, $C_{1-6}$alkyl, $C_{1-6}$alkoxy, $C_{1-6}$alkylthio, halogen, cyano, amino, hydroxy, carbamoyl, carboxy, $C_{1-6}$alkanoyl, trifluoromethyl or nitro, provided that at least two of $R^5$ to $R^9$ are hydrogen;
$R^{10}$ is hydrogen, $C_{1-6}$alkyl, $C_{1-6}$alkoxy, halogen, hydroxy, $—CH_2OH$, $C_{1-6}$alkylthio, $NH(CH_2)_nOH$ in which n is 0 to 4 or a group $—NR^{11}R^{12}$ in which $R^{11}$ and $R^{12}$ are the same or different and are each hydrogen or $C_{1-6}$alkyl; and
A is $—(CH_2)_2—$, $—(CH_2)_3—$ or $—CH=CH—$; provided that
(1) when $R^1$ to $R^6$ and $R^8$ and $R^9$ are each hydrogen, $R^7$ is hydroxy and $R^{10}$ is methyl, A is $—(CH_2)_3—$ or $—CH=CH—$;
(2) when $R^1$ to $R^9$ are each hydrogen and $R^{10}$ is chlorine, A is $—(CH_2)_3—$;
(3) when $R^1$ to $R^{10}$ are each hydrogen, A is $—(CH_2)_3—$;
(4) when $R^1$ and $R^2$ and $R^4$ to $R^{10}$ are each hydrogen and $R^3$ is methoxy, A is $—(CH_2)_2—$ or $—(CH_2)_3—$;
(5) when A is $—(CH_2)_2—$, and $R^5$ or $R^9$ is chloro, or when A is $—(CH_2)_2—$, and $R^7$ is methoxy or methyl, two of the following conditions are present;
(i) one other of $R^5$ to $R^9$ is other than H;
(ii) one of $R^2$ to $R^4$ is other than H;
(iii) $R^1$ is other than OH, $OCH_3$ or H; or
(iv) $R^{10}$ is other than methyl;
(6) when A is $—(CH_2)_2—$ and one of $R^5$, $R^6$, $R^8$ or $R^9$ is methyl or methoxy, or when A is $—(CH_2)_2—$ and $R^6$, $R^7$ or $R^8$ are chloro, one of the following conditions is present;
(i) one other of $R^5$ to $R^9$ are other than H;
(ii) one of $R^2$ to $R^4$ is other than H;
(iii) $R^1$ is other than OH, $OCH_3$ or H; or
(iv) $R^{10}$ is other than methyl;
(7) when A is $—(CH_2)_2—$ and one of $R^7$ is ethyl or ethoxy, or when A is $—(CH_2)_2—$ and $R^5$ or $R^9$ are fluoro or bromo, one of the following conditions is present;
(i) one other of $R^5$ to $R^9$ are other than H;
(ii) one of $R^2$ to $R^4$ is other than H;
(iii) $R^1$ is other than OH, $OCH_3$ or H;
(iv) $R^{10}$ is other than methyl;
or a pharmaceutically acceptable salt thereof.

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**5,051,509**

**NOVEL QUINOLONECARBOXYLIC ACID DERIVATIVES**

**Hiroyuki Nagano, Saitama; Takeshi Yokota, Chiba, and Yasuyuki Katoh, Shizuoka, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan**

**Filed May 22, 1989, Ser. No. 354,962**
**Claims priority, application Japan, Dec. 8, 1988, 63-310418**
**Int. Cl.[5] C07D** *401/04;* **A61K** *31/47*
**U.S. Cl. 546—156** **2 Claims**

1. 1-cyclopropyl-6-fluoro-1,4-dihydro-8-methoxy-7-(3-methylaminopiperidin-1-yl)-4-oxoquinoline-3-carboxylic acid.
2. 5-Amino-1-cyclopropyl-6-fluoro-1,4-dihydro-8-methoxy-7-(3-methylaminopiperidin-1-yl)-4-oxoquinoline-3-carboxylic acid.

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**5,051,510**

**PIPERIDINE DERIVATIVES AS ANTIHISTAMINICS**

**Aurelio O. Venero, and Antonio T. Avello, both of Vizcaya, Spain, assignors to Fabrica Espanola de Productos Quimicos y Farmeceuti-Cos S.A. (FAES), Vizcaya, Spain**

**Filed Feb. 28, 1990, Ser. No. 486,097**
**Claims priority, application European Pat. Off., Feb. 28, 1989, 89500022.2**
**Int. Cl.[5] C07D** *401/12*
**U.S. Cl. 546—200** **8 Claims**

1. A compound of structural formula I:



I

wherein the substituent $R^1$ represents a phenyl-alkylene grouping Ar—$CH_2$ or Ar—$CH_2$—$CH_2$, in which Ar is a benzene ring substituted by from one to two of the substituents selected from the group consisting of:
F, Cl, Br, I, $CH_3$, $C_2H_5$, OH, $OCH_3$, $OCOCH_3$, $CF_3$, $NH_2$, $NHCOCH_3$, $NHSO_2CH_3$, $NO_2$ and COOH, n=0, 1 or 2, m=1 or 2, $R^2$ is H or OH, $R^3$ represents an isoindole ring-system, selected from the group consisting of 1H-2-isoindolyl-1,3(2H)-dioxo, 1H-2-(isoindolyl-1,3(2H)-dioxo-4,4a,5,6,7,7a-hexahydro, 1H-2-isoindolyl-1,3(2H)-dioxo-4,4a,7,7a-tetrahydro, 1H-2-isoindolyl-1,3(2H)-dioxo-4-nitro, and 1H-2-isoindolyl-1,3(2H)-dioxo-4-nitro, and 1H-2-isoindolyl-1,3(2H)-dioxo-4-amino or a pharmacologically acceptable salt thereof.

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**5,051,511**

**PEROXIDE FREE RADICAL INITIATORS CONTAINING HINDERED AMINE MOIETIES WITH LOW BASICITY**

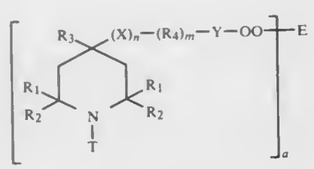
**Raymond Seltzer, New City; Roland A. E. Winter, Armonk, both of N.Y., and Peter J. Schirmann, Fairfield, Conn., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 326,353, Mar. 21, 1989, abandoned. This application Feb. 14, 1990, Ser. No. 479,910**
**Int. Cl.[5] C07D** *211/36*
**U.S. Cl. 546—242** **6 Claims**

1. A compound which is a free radical initiator which also contains a hindered amine light stabilizing moiety having low basicity, which compound has the formula

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(I)

a is 1 or 2,

n and m are independently 0 and 1,

$R_1$ and $R_2$ are independently alkyl of 1 to 4 carbon atoms, or $R_1$ and $R_2$ together are pentamethylene,

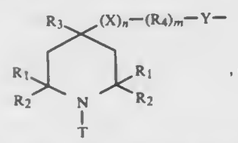
$R_3$ is hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, alkoxy of 1 to 8 carbon atoms, alkoxycarbonyl of 2 to 7 carbon atoms, aryl of 6 to 10 carbon atoms, aralkyl of 7 to 15 carbon atoms, alkanoyl of 1 to 8 carbon atoms, aroyl of 7 to 16 carbon atoms, alkanoyloxy of 1 to 7 carbon atoms, or aroyloxy of 6 to 10 carbon atoms, or $R_3$ together with $R_4$ form a cyclic structure of 5 to 7 atoms,

X is —O—, —S—, —NG—, —CO—, —SO—, —$SO_2$—, —OCO—, —OSO—, —$OSO_2$—, —NG—CO—, —NHCONH— or —OCO—O— where G is hydrogen, alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, alkynyl of 2 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, aryl of 6 to 10 carbon atoms, alkanoyl of 1 to 8 carbon atoms or G and $R_4$ together form a cyclic structure of 5 to 7 carbon atoms,

$R_4$ is a diradical which is alkylene of 1 to 20 carbon atoms, arylene of 6 to 10 carbon atoms, cycloalkylene of 3 to 10 carbon atoms, aralkylene of 7 to 20 carbon atoms, alkynylene of 2 to 10 carbon atoms, alkadiynylene of 4 to 10 carbon atoms, alkenylene of 3 to 11 carbon atoms, alkadienylene of 5 to 11 carbon atoms, or said diradical interrupted by one or more oxygen, sulfur or nitrogen atoms,

Y is —CO—, —$SO_2$—, —$CR_5R_6$—, —OCOE—, —NG—CO—E— or —OCO—CO, where $R_5$ and $R_6$ are independently alkyl of 1 to 10 carbon atoms, aryl of 6 to 10 carbon atoms, alkynyl of 2 to 10 carbon atoms, alkenyl of 2 to 8 carbon atoms or cycloalkyl of 5 to 6 carbon atoms, or $R_5$ and $R_6$ together are alkylene of 4 to 9 carbon atoms, and when E is tert-alkyl, tert-cycloalkyl or tert-aralkyl, $R_6$ is also —O—O—E,

E, when a is 1, is hydrogen, alkanoyl of 2 to 20 carbon atoms, aroyl of 7 to 20 carbon atoms, tert-alkyl of 4 to 12 carbon atoms, tert-cycloalkyl of 4 to 12 carbon atoms, tert-aralkyl of 9 to 15 carbon atoms, alkoxycarbonyl of 2 to 20 carbon atoms, carbamoyl, phenylcarbamoyl, alkylcarbamoyl of 2 to 13 carbon atoms, cycloalkylcarbamoyl of 4 to 13 carbon atoms, alpha-hydroxyalkyl of 2 to 10 carbon atoms, alpha-hydroxycycloalkyl of 3 to 10 carbon atoms, alkylsulfonyl of 4 to 20 carbon atoms, cycloalkylsulfonyl of 3 to 12 carbon atoms, tert-alkoxyalkyl of 4 to 20 carbon atoms, tert-alkoxycycloalkyl of 4 to 20 carbon atoms, monovalent organometal, or the radical of formula II



(II)

, or

E, when a is 2, is di-tert-alkylene of 7 to 15 carbon atoms, di-tert-alkenylene of 8 to 16 carbon atoms, di-tert-alkynylene of 8 to 16 carbon atoms, di-tert-aralkylene of 12 to 20 carbon atoms, alkanedioyl of 3 to 12 carbon atoms, aryldicarbonyl of 8 to 16 carbon atoms or aralkyldicarbonyl of 9 to 18 carbon atoms, and

$T_1$ is formyl, —O—$T_1$ or —OCO—$T_2$, where

$T_1$ is alkyl of 1 to 36 carbon atoms, alkenyl of 2 to 18 carbon atoms, alkynyl of 2 to 18 carbon atoms, aralkyl of 7 to 15 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, cycloalkenyl of 5 to 12 carbon atoms, a radical of a saturated or unsaturated bicyclic or tricyclic hydrocarbon of 7 to 12 carbon atoms, or aryl of 6 to 10 carbon atoms or said aryl substituted by alkyl, and

$T_2$ is alkyl of 1 to 18 carbon atoms, alkoxy of 1 to 18 carbon atoms, phenyl or said phenyl substituted by hydroxy, alkyl or alkoxy; or amino or said amino mono- or disubstituted by alkyl or phenyl.

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**5,051,512**

## PROCESS FOR PREPARATION OF FLUOROMETHYL-SUBSTITUTED PIPERIDINE CARBODITHIOATES

**Sherrol L. Baysdon, Chesterfield; Mitchell J. Pulwer, St. Louis, and Helen L. Janoski, St. Peters, all of Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Mar. 19, 1990, Ser. No. 495,172**

**Int. Cl.[5] C07D** *211/40*

**U.S. Cl. 546—243** **3 Claims**

1. A process for preparing 4-(lower alkyl)-2,6-bis(trifluoromethyl)-2,6-dihydroxy-3,5-piperidinedicarbothioic acid, S,S-dimethyl ester comprising the steps of:

a) bringing into reactive contact at a temperature below about 30° C. in a lower alkylnitrile solvent trifluoroacetoacetate acid thiomethyl ester and ammonia to form the ammonium compound having the structural formula



$F_3CCH{=}CHCSCH_3\ NH_4^+$;

b) thereafter bringing the reaction mixture of step (a) into reactive contact at a temperature below about 30° C. with a lower alkyl aldehyde; and

c) heating the reaction mixture of step (b) to produce 4-(lower alkyl)-2,6-bis(trifluoromethyl)-2,6-dihydroxy-3,5-piperidinedicarbothioic acid, S,S-dimethyl ester.

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**5,051,513**

## PREPARATION OF CHLORINATED NICOTINALDEHYDES

**Klaus Jelich, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

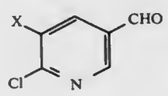
**Filed Jul. 10, 1990, Ser. No. 551,814**

**Claims priority, application Fed. Rep. of Germany, Jul. 26, 1989, 3924682**

**Int. Cl.[5] C07D** *213/48*

**U.S. Cl. 546—315** **9 Claims**

1. A process for the preparation of a chlorinated nicotinaldehyde of the formula

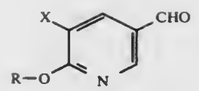


(I)

in which

X is hydrogen or chlorine, which comprises in a first step reacting a 6-alkoxynicotinaldehyde of the formula

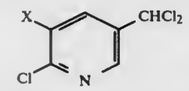




(II)

in which

R is alkyl, with a chlorinating agent select from the group consisting of phosphorous (V) chloride, phosphorous (III) chloride, phosphoryl chloride, thionyl chloride and phosgene at a temperature from about 0° C. to 200° C. to form a dichloromethylpyridine of the formula



(III)

and then in a second step reacting the dichloromethylpyridine with water at a temperature from about 0° C. to 110° C.

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**5,051,514**

## PROCESS AND INTERMEDIATES FOR PREPARING FUNGICIDAL IMIDAZOLE DIPHENYLALIPHATICBORANES AND DERIVATIVES THEREOF

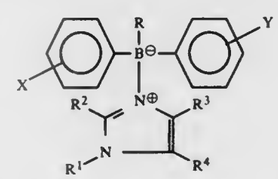
**Tsze H. Tsang, El Cerrito, and Patricia Pomidor, Orinda, both of Calif., assignors to Chevron Research and Technology Company, San Francisco, Calif.**

**Division of Ser. No. 450,872, Dec. 14, 1989, Pat. No. 4,983,589. This application Sep. 25, 1990, Ser. No. 587,819**

**Int. Cl.[5] C07F** *5/02*

**U.S. Cl. 548—110** **20 Claims**

1. A process for preparing a compound having the formula



(I)

wherein:

R is alkyl having 1 through 4 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; alkenyl having 2 through 6 carbon atoms; haloalkyl having 1 through 4 halo substituents independently selected from the group of fluoro, chloro and bromo; or haloalkenyl having 3 through 6 carbon atoms and 1 through 4 halo atoms independently selected from the group of fluoro, chloro, and bromo;

$R^1$ is hydrogen; alkyl having 1 through 12 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; lower alkenyl having 2 through 6 carbon atoms; haloalkyl having 1 through 4 carbon atoms and 1 through 3 halo atoms independently selected from the group of fluoro, chloro, bromo, and iodo; haloalkenyl having 2 through 6 carbon atoms and 1 though 3 halo atoms independently selected from the group of fluoro, chloro, bromo, and iodo; cyanoalkyl wherein the alkyl moiety has 1 through 4 carbon atoms; hydroxyalkyl having 1 through 6 carbon atoms and 1 hydroxy group; lower alkoxyalkyl having 1 through 3 carbon atoms in the alkoxy moiety and 1 through 3 carbon atoms in the alkyl moiety; lower alkoxycarbonylalkyl having 1 through 3 carbon atoms in the alkoxy moiety and 1 through 3 carbon atoms in the alkyl moiety; phenyl; substituted phenyl having 1 through 4 substituents independently selected from the group of fluoro, chloro, bromo, iodo, lower alkyl having 1 through 6 carbon atoms and nitro with the proviso that said substituted phenyl has no more than two nitro substituents; aralkyl having 1 through 4 carbon atoms in the alkyl moiety and wherein the aryl moiety is phenyl; substituted benzyl having 1 through 4 substituents on the phenyl moiety independently selected from the group of fluoro, chloro, bromo, iodo, lower alkyl having 1 through 6 carbon atoms and nitro with the proviso the said phenyl moiety can have no more than 2 nitro substituents; and 1,3-dioxolan-2-yl-alkyl in which the alkyl moiety has 1 through 4 carbon atoms;

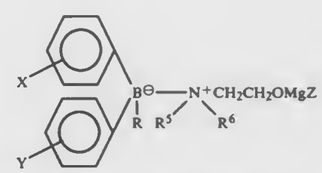
$R^2$ is hydrogen; lower alkyl having 1 through 6 carbon atoms; phenyl, benzyl, or substituted benzyl having 1 though 4 substituents on the phenyl ring independently selected from the group of fluoro, chloro, bromo, iodo and alkyl, having 1 through 6 carbon atoms;

$R^3$ is hydrogen or alkyl having 1 through 6 carbon atoms with the proviso that when $R^4$ is other than alkyl then $R^3$ is hydrogen;

$R^4$ is hydrogen, alkyl having 1 through 6 carbon atoms, phenyl, or phenalkyl in which the alkyl moiety has 1 through 4 carbon atoms; with the proviso that at least two of $R^1$, $R^2$, $R^3$ and $R^4$ are hydrogen and with the further proviso that when $R^3$ is alkyl, then $R^4$ is the identical parallel alkyl group; and

X and Y are independently hydrogen; alkyl having 1 through 4 carbon atoms; fluoro; chloro; alkoxy having 1 through 4 carbon atoms; alkylthio having 1 through 4 carbon atoms; or haloalkyl having 1 through 4 carbon atoms and 1 through 3 halo substituents independently selected from the group of fluoro, chloro, and bromo; and may be located at any available position of the respective phenyl rings;

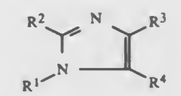
which comprises contacting a compound having the formula



(II)

wherein R, X and Y are as defined in claim 1; $R^5$ and $R^6$ are independently hydrogen or lower alkyl; and Z is chloride, bromide or iodide;

with a compound having the formula



(C)

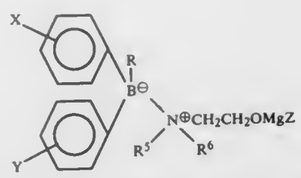
wherein $R^1$, $R^2$, $R^3$ and $R^4$ are as defined hereinabove; under reactive conditions at temperatures in the range of about 20° C. to 35° C.

11. A compound having the formula

VOL 1130 ISS 4 SE 24 1991 UMI



II



wherein R is alkyl having 1 through 4 carbon atoms; cycloalkyl having 3 through 6 carbon atoms; alkenyl having 2 through 6 carbon atoms; haloalkyl having 1 through 4 halo substituents independently selected from the group of fluoro, chloro and bromo; or haloalkenyl having 3 through 6 carbon atoms and 1 through 4 halo atoms independently selected from the group of fluoro, chloro, and bromo;

$R^5$ and $R^6$ are independently hydrogen or lower alkyl having 1 through 6 carbon atoms; and

X and Y are independently hydrogen; alkyl having 1 through 4 carbon atoms; fluoro; chloro; alkoxy having 1 through 4 carbon atoms; alkylthio having 1 through 4 carbon atoms; or haloalkyl having 1 through 4 carbon atoms and 1 through 3 halo substituents independently selected from the group of fluoro, chloro, and bromo; and may be located at any available position of the respective phenyl rings.

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**5,051,515**

## NOVEL GENERATION OF HETEROARYL THIO, SULFOXY, OR SULFONYL ALKYL AZOLES

**Mohsen Daneshtalab, Edmonton; Ronald G. Micetich, Sherwood Park; Dai Q. Nguyen, Edmonton; Chan M. Ha, Edmonton, and Hiep T. Luu, Edmonton, all of Canada, assignors to SynPhar Laboratories Incorporated, Alberta, Canada**

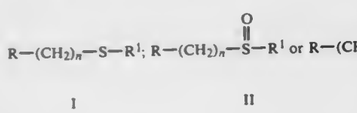
**Filed Mar. 27, 1989, Ser. No. 329,040**

**Claims priority, application United Kingdom, Mar. 26, 1988, 8807275**

**Int. Cl.[5] C07D *285/12***

**U.S. Cl. 548—136** **16 Claims**

1. Compounds having the formulae



I II III

wherein

R is 3-methylisoxazol-5-yl;

n is 5, 6, 7 or 8; and

$R^1$ is a substituted, fused or non-fused azole moiety.

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**5,051,516**

## BENZODIAZEPINE COMPOUNDS AND THEIR USE AS PHARMACEUTICALS

**Jiban K. Chakrabarti, Camberley, and Terrence M. Hotten, Farnborough, both of England, assignors to Lilly Industries Limited, Basingstoke, England**

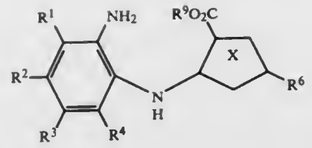
**Filed Aug. 2, 1990, Ser. No. 562,055**

**Claims priority, application United Kingdom, Aug. 11, 1988, 8819059**

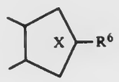
**Int. Cl.[5] C07D *277/56***

**U.S. Cl. 548—194** **6 Claims**

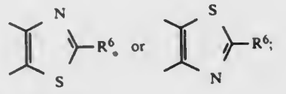
1. An intermediate compound of the formula



in which $R^1$, $R^2$, $R^3$ and $R^4$ are independently hydrogen, $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, halogen, $C_{1-4}$ haloalkyl, nitro, $C_{1-4}$ alkoxy, $C_{1-4}$ haloalkoxy, $C_{1-4}$ alkylthio or phenylsulphonyl; $R^6$ is hydrogen, $C_{1-10}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{3-7}$ cycloalkyl $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, $C_{1-4}$ alkoxy or $C_{1-4}$ alkylthio; and in which

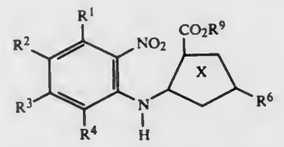


represents a thiazole ring selected from

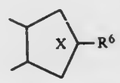


and $R^9$ is an ester group.

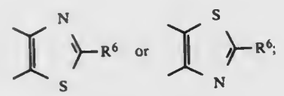
4. An intermediate compound of the formula



in which $R^1$, $R^2$, $R^3$ and $R^4$ are independently hydrogen, $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl, halogen, $C_{1-4}$ haloalkyl, nitro, $C_{1-4}$ alkoxy, $C_{1-4}$ haloalkoxy, $C_{1-4}$ alkylthio or phenylsulphonyl; $R^6$ is hydrogen, $C_{1-10}$ alkyl, $C_{3-7}$ cycloalkyl, $C_{3-7}$ cycloalkyl $C_{1-4}$ alkyl, $C_{1-4}$ haloalkyl, $C_{1-4}$ alkoxy or $C_{1-4}$ alkylthio; and in which



represents a thiazole ring selected from



and $R^9$ is an ester group.



**5,051,517**

## PROCESS FOR THE PREPARATION OF HERBICIDALLY ACTIVE 3-AMINO-5-AMINOCARBONYL-1,2,4-TRIAZOLES

**Kurt Findeisen, Odenthal, and Markus Lindig, Hilden, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

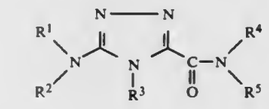
**Filed May 7, 1990, Ser. No. 520,338**

**Claims priority, application Fed. Rep. of Germany, May 20, 1989, 3916430**

**Int. Cl.[5] C07D *401/04, 401/12, 403/02, 413/02***

**U.S. Cl. 548—265.6** **7 Claims**

1. A process for the preparation of a 3-amino-5-aminocarbonyl- 1,2,4-triazole of the formula



in which

$R^1$ and $R^2$ independently of one another each represent hydrogen; alkyl having 1 to 8 carbon atoms; alkenyl having 2 to 8 carbon atoms; alkinyl having 2 to 8 carbon atoms; halgenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms; halogenoalkenyl having 2 to 8 carbon atoms and 1 and 15 identical or different halogen atoms; halogenoalkinyl having 2 to 8 carbon atoms and 1 to 13 identical or different halogen atoms; alkoxyalkyl having 1 to 6 carbon atoms in the individual alkyl moieties; cycloalkyl having 3 to 7 carbon atoms; cycloalkylalkyl having 3 to 7 carbon atoms in the cycloalkyl moiety and 1 to 6 carbon atoms in the alkyl moiety; aralkyl which has 6 to 10 carbon atoms in the aryl moiety and 1 to 6 carbon atoms in the straight-chain or branched alkyl moiety and which is unsubstituted or substituted by identical or different substituents; aryl which has 6 to 10 carbon atoms and which is unsubstituted or substituted by identical or different substituents; or represents heteroaryl which has 2 to 9 carbon atoms and 1 and 3 identical or different nitrogen, oxygen and sulfur atoms and which is unsubstituted or substituted by identical or different substituents; and aralkyl, aryl and heteroaryl substituents being selected from the group consisting of halogen, cyano, nitro, and alkyl, alkoxy and alkylthio having in each case 1 to 4 carbon atoms, and halogenoalkyl, halogenoalkoxy, and halogenoalkylthio having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms; or

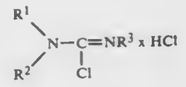
$R^1$ and $R^2$ together with the nitrogen atom to which they are bonded also represents a five- to ten-membered heterocycle which optionally contains 1 to 2 further identical or different nitrogen, oxygen and sulphur atoms and which is unsubstituted or substituted by identical of different substituents selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, 1 or 2 oxo groups, or 1 or 2 thiono groups;

$R^3$ represents alkyl having 1 to 8 carbon atoms; alkenyl having 2 to 8 carbon atoms; alkinyl having 2 to 8 carbon atoms; halogenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms; halogenoalkenyl having 2 to 8 carbon atoms and 1 to 15 identical or different halogen atoms; halogenoalkinyl having 2 to 8 carbon atoms and 1 and 13 identical or different halogen atoms; alkoxyalkyl having 1 to 6 carbon atoms in the individual alkyl moieties; cycloalkyl having 3 to 7 carbon atoms; cycloalkylalkyl having 3 to 7 carbon atoms in the cycloalkyl moiety and 1 and 6 carbon atoms in the alkyl moiety; aralkyl which has 6 to 10 carbon atoms in the aryl moiety and 1 to 6 carbon atoms in the alkyl moiety and which is unsubstituted or substituted by identical or different substituents; aryl which has 6 to 10 carbon atoms and which is unsubstituted or substituted by identical or different substituents; said aralkyl and aryl substituents being selected from the group consisting of halogen, cyano, nitro, and alkyl, alkoxy and alkylthio having in each case 1 to 4 carbon atoms, and halogenoalkyl, halogenoalkoxy, and halogenoalkylthio having in each case 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms;

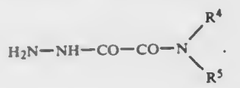
$R^4$ and $R^5$ independently of one another each represent hydrogen; alkyl having 1 to 18 carbon atoms; alkenyl having 2 to 8 carbon atoms; alkinyl having 2 to 8 carbon atoms; halgenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms; halogenoalkenyl having 2 to 8 carbon atoms and 1 to 15 identical or different halogen atoms; halogenoalkinyl having 2 to 8 carbon atoms and 1 to 13 identical or different halogen atoms; cyanoalkyl having 1 to 8 carbon atoms; hydroxyalkyl having 1 to 8 carbon atoms and 1 to 6 hydroxyl groups; alkoxyalkyl, alkoximinoalkyl, alkoxycarbonylalkyl, or alkoxycarbonylalkenyl in each case having up to 6 carbon atoms in the individual alkyl or alkenyl moieties; alkylaminoalkyl or dialkylamino in each case having 1 to 6 carbon atoms in the individual alkyl moieties; cycloalkyl having 3 to 8 carbon atoms and which is unsubstituted or substituted by identical or different substituents; cycloalkylalkyl having 3 to 8 carbon atoms in the cycloalkyl moiety and 1 to 6 carbon atoms in the alkyl moiety and which is unsubstituted or substituted by identical or different substituents; cycloalkenyl having 3 to 8 carbon atoms and which is unsubstituted or substituted by identical or different substituents; or cycloalkenylalkyl having 3 to 8 carbon atoms in the cycloalkenyl moiety and 1 to 6 carbon atoms in the alkyl moiety and which is unsubstituted or substituted by identical or different substituents; said cycloalkyl, cycloalkylalkyl, cycloalkenyl, and cycloalkenylalkyl substituents being selected from the group consisting of halogen, cyano, alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, double-linked alkanediyl having up to 4 carbon atoms, and double-linked alkenediyl having up to 4 carbon atoms; heterocyclylalkyl having 1 to 6 carbon atoms in the alkyl moiety and 1 to 9 carbon atoms and 1 to 3 hetero atoms in the heterocyclyl moiety and which is unsubstituted or substituted in the heterocyclyl moiety by identical or different substituents selected from the group consisting of halogen, cyano, nitro, and alkyl, alkoxy, alkylthio, and alkoxycarbonyl having in each case 1 to 5 carbon atoms, and halogenoalkyl, halogenoalkoxy, and halogenoalkylthio having in each case 1 to 5 carbon atoms and 1 to 9 identical or different halogen atoms; aralkyl having 6 to 10 carbon atoms in the aryl moiety and 1 to 8 carbon atoms in the alkyl moiety and which is unsubstituted or substituted in the aryl and alkyl moieties by identical or different substituents; aroyl or aryl each of which has 6 to 10 carbon atoms in the aryl moiety and which is unsubstituted or substituted in the aryl moiety by identical or different substituents; said aryl moiety substituents being selected from the group consisting of halogen, cyano, nitro, and alkyl, alkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, alkanoyl or alkoxycarbonyl having in each case 1 to 6 carbon atoms and halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulphinyl and halogenoalkylsulphonyl having in each case 1 to 6 carbon atoms and 1 to 9 identical or different halogen atoms, and cycloalkyl having 3 to 6 carbon atoms, and phenoxy; and said alkyl moiety substituents being selected from the group consisting of halogen and cyano; or

$R^4$ and $R^5$ together with the nitrogen atom to which they are bonded also represent a five- to ten-membered heterocycle which optionally contains 1 to 2 further hetero atoms and which is unsubstituted or substituted by identical or different substituents selected from the group consisting of halogen, alkyl having 1 to 4 carbon atoms, halogenoalkyl

having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, 1 or 2 oxo groups, or 1 or 2 thiono groups; comprising reaction a chloroformidine hydrochloride of the formula



with an oxamohydrazide of the formula



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**5,051,518**

**PHARMACOLOGICALLY ACTIVE 2- AND 3-SUBSTITUTED (1',5'-DIARYL-3-PYRAZOLYL)-N-HYDROXYPROPANAMIDES**

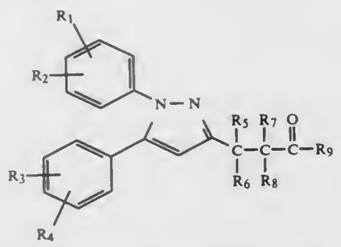
**William V. Murray, Belle Mead, and Michael P. Wachter, Bloomsbury, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.**

**Continuation of Ser. No. 181,035, Apr. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 55,806, May 29, 1987, abandoned. This application Jun. 4, 1990, Ser. No. 534,325**

**Int. Cl.[5] C07D *231/12***

**U.S. Cl. 548—373** **3 Claims**

1. A compound of the formula



wherein $R_1$, $R_2$, $R_3$ and $R_4$ are the same or different and are individually selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, amino, acetamido, phenyl, halo, hydroxy, lower alkylsulfonyl, lower alkylthio, nitro, trifluoromethyl, ω-trifluoromethyl lower alkoxy, or $R_1$ $R_2$ or $R_3R_4$ taken together with the phenyl group to which they are attached, form a naphthyl or substituted naphtyl group wherein the substituent is halo, lower alkyl or lower alkoxy; $R_5$, and $R_7$ are the same or different and are individually selected from the group consisting of hydrogen, lower alkyl; $R_6$ and $R_8$ taken together are part of a ring selected from the group consisting of a cyclohexyl, cyclohexenyl and a 7-oxobicyclo [2.2.1] heptenyl ring, $R_9$ is selected from hydroxy, $—OR_{10}$ or $—N(OH)R_{10}$ wherein $R_{10}$ is lower alkyl; and the pharmaceutically acceptable salts thereof.

**5,051,519**

**NOVEL ANTIVIRAL AND ANTITUMOR TERPENE HYDROQUINONES AND METHODS OF USE**

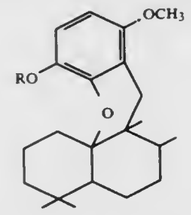
**Amy E. Wright; Sue S. Cross, both of Ft. Pierce, Fla.; Neal Burres, Highland Park, Ill., and Frank Koehn, Ft. Pierce, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla.**

**Filed Feb. 16, 1990, Ser. No. 480,996**

**Int. Cl.[5] C07D *311/78***

**U.S. Cl. 549—384** **7 Claims**

1. A compound having the following structure:



wherein R is selected from the group consisting of H, acetyl, $CH_3$, p-bromobenzoyl, tosyl, and mesyl.

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**5,051,520**

**9,9-BIS(PERFLURORALKYL)XANTHENE, 9-ARYL-9-PERFLURORALKYLXANTHENE**

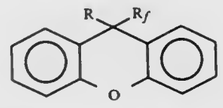
**Swiatoslaw Trofimenko, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 23, 1990, Ser. No. 527,740**

**Int. Cl.[5] C07D *311/82*; C08G *63/02***

**U.S. Cl. 549—388** **3 Claims**

1. A composition of matter of the formula



wherein R is selected from the group consisting of phenyl, substituted phenyl and perfluoroalkyl of 1 to 16 carbon atoms; and $R_f$ is perfluoroalkyl of 1 to 16 carbon atoms.

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**5,051,521**

**NOVEL TIN (IV) COMPOUNDS**

**Jean-Marie Frances, Villeurbanne; Veronique Gouron, Talence; Bernard Jousseaume, Talence, and Michel Pereyre, Talence, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France**

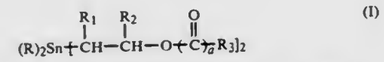
**Filed Apr. 21, 1989, Ser. No. 341,633**

**Claims priority, application France, Apr. 21, 1988, 88 05554**

**Int. Cl.[5] C07F *7/22***

**U.S. Cl. 556—94** **5 Claims**

1. A tetracoordinated compound of tin (IV) having the general formula (I):



(I)

in which the radicals R, which may be the same or different, are each a linear or branched chain $C_1$–$C_{20}$ alkyl radical, a mononuclear aryl radical, or an aralkyl or alkaryl radical, the alkyl moieties of which having from 1 to 6 carbon atoms; the radicals $R_1$ and $R_2$, which may be the same or different, are each a hydrogen atom, a cyano radical, a $C_1$–$C_6$ alkyl radical,



or an alkoxycarbonyl radical, the alkyl moiety of which having from 1 to 6 carbon atoms, with the proviso that $R_1$ and $R_2$ may together form a saturated hydrocarbon ring member having from 5 to 8 carbon atoms; the radical $R_3$ is a hydrogen atom, a linear or branched chain $C_1$–$C_{20}$ alkyl radical, a linear or branched chain $C_1$–$C_{20}$ alkoxy radical, a mononuclear aryl radical or a mononuclear aryloxy radical; and a is 0 or 1.

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**5,051,522**

**COMPLEX COMPOUND OF RHODIUM-CONTAINING SULFONATED TRIPHENYLPHOSPHANE**

**Werner Konkol, Oberhausen; Helmut Bahrmann, Hamminkeln; Wolfgang Herrmann, Giggenhausen, and Jürgen Kulpe, Frankfurt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Dec. 21, 1990, Ser. No. 632,469**

**Claims priority, application Fed. Rep. of Germany, Dec. 23, 1989, 3942789**

**Int. Cl.[5] C07F *15/00***

**U.S. Cl. 556—136** **5 Claims**

1. Bis{($\mu$-hydroxy)bis[tris(sodium m-sulfonatophenyl)-phosphane]rhodium(I)} dodecahydrate.

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**5,051,523**

**PROCESS FOR THE PREPARATION OF COMPLEX COMPOUNDS**

**Heinrich H. Peter, Binningen, and Théophile Moerker, Füllinsdorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Filed Jan. 13, 1989, Ser. No. 296,561**

**Claims priority, application Switzerland, Jan. 20, 1988, 184/88**

**Int. Cl.[5] C07F *5/00, 13/00, 15/00***

**U.S. Cl. 556—148** **14 Claims**

1. A process for the preparation of a complex of a metal ion and a chelating agent, said metal ion being able to be complexed by a $\beta$-dicarbonyl compound, which comprises transcomplexing a complex of a $\beta$-dicarbonyl compound and said metal ion, which complex is readily soluble in an organic solvent that is not miscible in all proportions with water, with a stoichiometric amount or a less than equivalent amount of a chelating agent whose binding affinity for the metal ion is greater than that of the $\beta$-dicarbonyl compound, or of a salt of such a chelating agent containing at least one salt-forming group.

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**5,051,524**

**SUBSTITUTED PROPANE-PHOSPHINIC ACID COMPOUNDS**

**Eric K. Baylis, Stockport, England; Helmut Bittiger, Freiburg, Fed. Rep. of Germany; Wolfgang Fröstl, Basle, Switzerland; Roger G. Hall, Flixton, England; Ludwig Maier, Arlesheim, Switzerland; Stuart J. Mickel, Lausen, Switzerland, and Hans-Rudolf Olpe, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

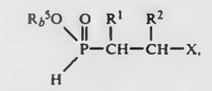
**Continuation-in-part of Ser. No. 378,887, Jul. 12, 1989, which is a continuation-in-part of Ser. No. 275,882, Nov. 25, 1988, abandoned. This application Feb. 26, 1990, Ser. No. 484,716**

**Claims priority, application United Kingdom, Dec. 4, 1987, 8728483**

**Int. Cl.[5] C07F *9/48***

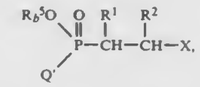
**U.S. Cl. 558—145** **1 Claim**

1. A novel process for the manufacture of compounds of the formula



(XV)

wherein $R^5b$ denotes a $C_1$–$C_4$ alkyl radical, X denotes cyano, carbamoyl or a group of the formulae $—CH(R^3)—Z^o$(XVa) or $—C(R^3)=Y$ (XVb) in which $Z^o$ denotes an acylamino or nitro group, Y denotes an oxo group or an acetalised, thioacetalised, ketalised or thioketalised oxo group, one of $R^1$, $R^2$ and $R^3$ is hydrogen; hydroxy, $C_1$–$C_8$-alkyl, $C_3$–$C_6$-cycloalkyl, phenyl or phenyl substituted by halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy and/or trifluoromethyl or $C_7$–$C_{10}$-phenylalkyl or $C_7$–$C_{10}$-phenylalkyl substituted in the phenyl moiety by halogen, $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy and/or trifluoromethyl, characterised in that a compound of the formula



(XIV)

wherein $R^1$, $R^2$, $R^5$ and X are defined hereinabove and Q' denotes a group of the formula $—C(R^8)—C(OR^9)(OR^{10})$(XIVa) in which $R^8$ denotes hydrogen or lower alkyl and $R^9$ and $R^{10}$, independently of one another, represent lower alkyl or together represent lower alkylene, is treated with an anhydrous protic medium.

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**5,051,525**

**N-ACYL-2-AMINO ACID AMIDES CONTAINING PHOSPHINIC ESTERS, PROCESS FOR THEIR PREPARATION, AND N-ACYL-2-AMINO ACIDS NITRILES AS PRECURSORS**

**Lothar Willms, Hillscheid, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

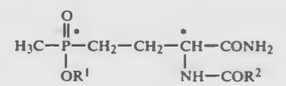
**Filed Feb. 2, 1990, Ser. No. 474,148**

**Claims priority, application Fed. Rep. of Germany, Feb. 6, 1989, 3903446; May 20, 1989, 3916551**

**Int. Cl.[5] C07F *9/02*; C07C *231/00***

**U.S. Cl. 558—145** **11 Claims**

1. An N-acyl-2-amino acid amide of the formula (I)



(I)

where

$R^1$ is $C_1$–$C_{14}$-alkyl which is branched or unbranched and unsubstituted or monosubstituted or polysubstituted by halogen or $C_1$–$C_6$-alkoxy, or is benzyl or phenyl, benzyl or phenyl being unsubstituted or monosubstituted or polysubstituted in the phenyl ring by $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, nitro or trifluoromethyl, or is $C_3$–$C_{10}$-cycloalkyl, and

$R^2$ is hydrogen, $C_1$–$C_{14}$-alkyl which is unsubstituted or monosubstituted or polysubstituted by halogen or $C_1$–$C_4$-alkoxy, or is a radical of the formula $—(CH_2)_n$-phenyl which is unsubstituted or monosubstituted to trisubstituted in the phenyl ring by $C_1$–$C_4$-alkyl, $C_1$–$C_4$-alkoxy, halogen, nitro or trifluoromethyl and in which n is 0, 1, 2 or 3,

with the proviso that $R^1$ is not ethyl when $R^2$ is methyl.

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**5,051,526**

**BENZHYDRYLAMINE DERIVATIVES**

**Susumu Funakoshi, Kyoto, and Elgoro Murayama, Shizuoka, both of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan**

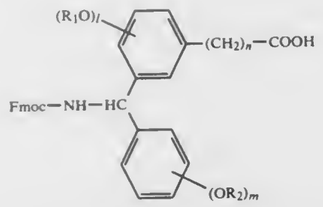
**Division of Ser. No. 316,167, Feb. 27, 1989, Pat. No. 4,965,405. This application May 24, 1990, Ser. No. 527,806**

**Claims priority, application Japan, Feb. 29, 1988, 1-46710**

**Int. Cl.[5] C07C *271/22***

**U.S. Cl. 560—27** **1 Claim**

1. A benzhydrylamine derivative of the formula:



where $R_1$ and $R_2$ each independently represents a $C_{1-3}$ lower alkyl; n is an integer of 1–4; l is 1 or 2; m is 1 or 2; and Fmoc is a 9-fluorenylmethyloxycarbonyl group.

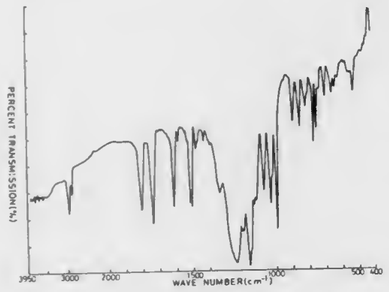
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5,051,527

## LIQUID CRYSTAL COMPOUNDS HAVING FLUOROALKYL RADICAL

**Yoshiichi Suzuki; Takashi Hagiwara, and Hiroyuki Mogamiya, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan**

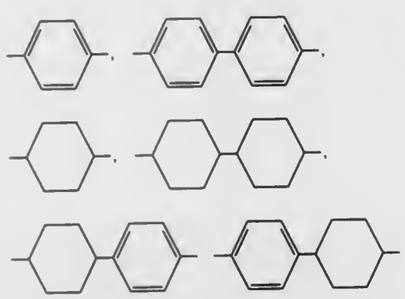
**Filed Feb. 28, 1989, Ser. No. 316,831**
**Claims priority, application Japan, Feb. 29, 1988, 63-44577**
**Int. Cl.[5] C07C** *69/76, 249/00;* **C09K** *19/52*
**U.S. Cl. 560—51** **9 Claims**



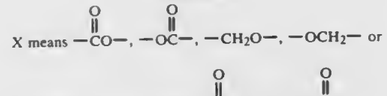

1. Liquid crystal compounds having fluoroalkyl radical represented by the general formula (I)

R—(A)—X—(B)—Y—Rf (I)

in which R means an alkyl, alkoy, alkyloxycarbonyl, alkanoyl or alkanoyloxy group having 1–20 carbon atoms; Rf means an optically active perfluoroalkoxyalkyl group; (A) and (B) respectively means



-continued



X means —CO—, —OC—, —$CH_2$O—, —O$CH_2$— or —CH=N—; and Y means —$COCH_2$—, —OC—, or —O—$CH_2$—.

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5,051,528

## RECOVERY PROCESS FOR ETHYLENE GLYCOL AND DIMETHYLTEREPHTHALATE

**Andrius A. Naujokas, Webster, and Kevin M. Ryan, Brockport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Filed Apr. 24, 1990, Ser. No. 521,070**
**Int. Cl.[5] C07C** *67/60, 27/26*
**U.S. Cl. 560—78** **5 Claims**

1. A method of recovering ethylene glycol and dimethylterephthalate from polyethyleneterephthalate polyesters which comprises dissolving scrap polyester in oligomers of ethylene glycol and terephthalic acid or dimethyl terephthalate, passing super-heated methanol through the solution and recovering the ethylene glycol and dimethylterephthalate.

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5,051,529

## METHOD FOR FUNCTIONALIZATION OF NUCLEOPHILES

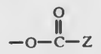
**J. Stewart Witzeman, and W. Dell Nottingham, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 484,595, Feb. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 283,353, Dec. 12, 1988, abandoned. This application Nov. 30, 1990, Ser. No. 620,388**
**Int. Cl.[5] C08F** *8/00*
**U.S. Cl. 560—178** **25 Claims**

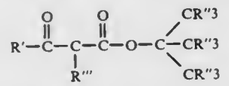
1. Method for the functionalization of nucleophiles having the structural formula:

HY—R$_X$

wherein
Y is selected from nitrogen, oxygen or sulfur;
R is selected from the group consisting of $C_1$ up to $C_{12}$ hydrocarbyl radical substituted with 0 up to 3 formyl, nitro, chlorine atoms, bromine atoms, ester moieties of the structure:



wherein Z is a hydrocarbyl moiety having in the range of 1 up to 6 carbon atoms, or alkoxy moieties of the structure, —OZ, wherein Z is as defined above; and wherein R can also be H when Y is N; and
x is 1 when Y is 0 or S, and x is 2 when Y is N;
said process comprising contacting said nucleophile with a B-Ketoestee compound having the structure



wherein
R′ is a $C_1$ up to $C_8$ alkyl, aryl or halide substituted alkyl or aryl moiety,



each R″ is independently selected from H, a $C_1$ up to $C_8$ alkyl moiety, or a halogen, and
R‴‴ is selected from H, $C_1$ up to $C_4$ alkyl moieties, $C_4$ up to $C_{10}$ aromatic, heteroaromatic and substituted aromatic moieties, or halogens; wherein said contacting is carried out in the essential absence of a tetraalkyl titanate and at a temperature and for a time sufficient to produce the desired transesterification and/or transamification product.

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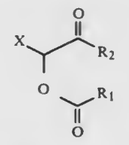
5,051,530

## ESTER DERIVATIVES AND PROCESS FOR PRODUCTION THEREOF

**MoonHo Chang; Han-Young Kang; HunYeong Koh; YongSeo Cho, and SangChul Shim, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea**

**Filed Jan. 16, 1990, Ser. No. 465,765**
**Claims priority, application Rep. of Korea, Oct. 16, 1989, 14873/1989**
**Int. Cl.[5] C07C** *69/66*
**U.S. Cl. 560—184** **10 Claims**

1. Ester derivatives of the following formula



wherein, $R_1$ is methyl, ethyl, isopropyl, or t-butyl, $R_2$ represents methoxy, ethoxy, or isopropanoxy, and X represents Br.

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5,051,531

## ANTIOXIDANT-PEROXIDES

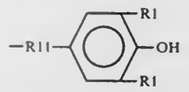
**Jose Sanchez, Grand Island, N.Y., assignor to Atochem North America, Inc., Philadelphia, Pa.**

**Filed May 31, 1988, Ser. No. 200,340**
**Int. Cl.[5] C07C** *331/00, 409/00, 381/00*
**U.S. Cl. 560—302** **6 Claims**

1. An antioxidant-peroxide compound having the structure A:

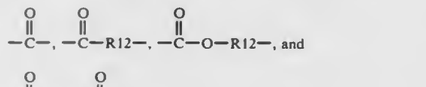
(Y—{—R—OO—X)$_x$—An]$_y$ (A)

where x and y are 1 or 2, but when x is 2, y can only be 1, and when y is 2, x can only be and with the following provisos (I), (II) and (III):
(I) when x is 1 and y is 1,
An is an antioxidant monoradical having a structure selected from the following structures (1), (2) and (3):

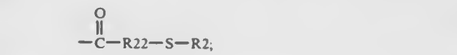


(1)

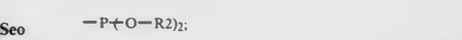
where R1 is a t-alkyl radical of 4 to 8 carbons;
R11 is a structure selected from the group consisting of



where R12 is selected from the group consisting of an alkylene diradical of 1 to 6 carbons and an alkenylene diradical of 2 to 6 carbons, and
where R13 is selected from the group consisting of an alkylene diradical of 1 to 3 carbons, an unsubstituted 1,2-phenylene diradical, and a substituted 1,2-phenylene diradical, the substituents being selected from the group consisting of one or more lower alkyl radicals of 1 to 4 carbons, chloro, bromo, fluoro, carboxy and nitro; or



(2)



(3)

where R2 is selected from the group consisting of an alkyl radical of 1 to 18 carbons and an aryl radical of 6 to 12 carbons, and
R22 is selected from the group consisting of an alkylene diradical of 1 to 6 carbons and an alkenylene diradical of 2 to 6 carbons;
Y is nothing;
R is selected from the group consisting of a t-alkyl radical of 4 to 10 carbons, a taralkyl radical of 9 to 13 carbons, an acyl radical of 2 to 13 carbons, an aroyl radical of 7 to 11 carbons, an alkoxycarbonyl radical of 2 to 13 carbons and the radical



and
X is selected from the group consisting of a direct bond and a diradical



where the —(*)—shows the point of attachment of the —OO—grouping to the —X—diradical, the other end of the —X—diradical being attached to the An radical,
where
R3 is a lower alkyl radical of 1 to 4 carbons,
R4 is selected from the group consisting of an unsubstituted alkylene diradical of 2 to 4 carbons and a lower alkyl substituted alkylene diradical of 2 to 4 carbons,
R5 is selected from the group consisting of an unsubstituted 1,3-phenylene diradical, an unsubstituted 1,4-phenylene diradical, a substituted 1,3-phenylene diradical and a substituted 1,4-phenylene diradical, the substituted R5 diradicals having substituents selected from the group consisting of lower alkyl, chloro or bromo,
—Z—is the diradical

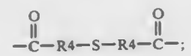
—NH—R6—NH—,

where R6 is selected from the group consisting of nothing, an unsubstituted alkylene diradical of 2 to 10 carbons, an unsubstituted 1,2-phenylene diradical, an unsubstituted 1,3-phenylene diradical, an unsubstituted 1,4-phenylene diradical, a substituted 1,2-phenylene diradical, a substituted 1,3-phenylene diradical and a substituted 1,4-phenylene diradical, the R6 substituted diradicals having substit-

uents selected from the group consisting of lower alkyl, chloro and bromo, and
z is 0 or 1;
(II) when x is 1 and y is 2,
An is the same as when x is 1 and y is 1;
Y is selected from the group consisting of an alkylene diradical of 2 to 4 carbons and an ethynylene diradical;
X is nothing; and
R is the alkylidene diradical



and
(III) when x is 2 and y is 1,
An is an antioxidant diradical having the structure .



Y is nothing;
R is selected from the group consisting of a t-alkyl radical of 4 to 10 carbons, a t-aralkyl radical of 9 to 13 carbons, an acyl radical of 2 to 13 carbons, an aroyl radical of 7 to 11 carbons, and an alkoxycarbonyl radical of 2 to 13 carbons; and
X is the same as when x is 1 and y is 1.

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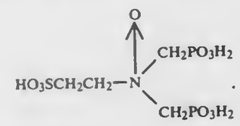
**5,051,532**

## N,N-BIS-PHOSPHONOMETHYL TAURINE N-OXIDE AND WATER-SOLUBLE SALTS THEREOF

**Chih M. Hwa, Palatine; John A. Kelly, Drystal Lake, both of Ill.; Janet Neton, West Chester, Ohio; Patricia M. Scanlon, Arlington, Mass., and Roger R. Gaudette, Hudson, N.H., assignors to W. R. Grace & Co.-Conn., New York, N.Y.**

**Filed Dec. 15, 1989, Ser. No. 451,670**
**Int. Cl.[5] C07F *9/38***
**U.S. Cl. 562—12** **2 Claims**

1. A compound of the formula



and water soluble salts thereof.

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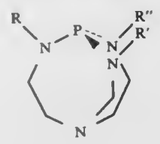
**5,051,533**

## PROPHOSPHATRANE COMPOUNDS AS PROTON ABSTRACTING REAGENTS

**John G. Verkade, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa**

**Filed Apr. 18, 1990, Ser. No. 510,620**
**Int. Cl.[5] C07F *9/6524***
**U.S. Cl. 564—13** **11 Claims**

1. A prophosphatrane compound of the formula:



wherein R, R' and R'' are selected from the group of hydrogen, and $C_1$ to $C_8$ alkyl.

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**5,051,534**

## NOVEL CYCLOPROPYL SQUALENE DERIVATIVES AND THEIR USE AS INHIBITORS OF CHOLESTEROL SYNTHESIS

**Michael R. Angelastro, Loveland; Norton P. Peet, and Philippe Bey, both of Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio**

**Filed Mar. 22, 1990, Ser. No. 497,477**
**Int. Cl.[5] C07C *43/18, 43/15, 43/188;* A61K *31/56***
**U.S. Cl. 568—579** **5 Claims**

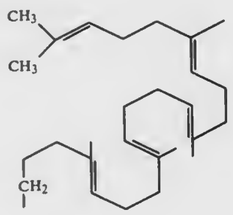
1. A compound of the formula:

FORMULA I

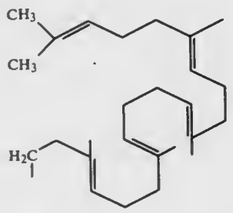


wherein Z is a radical selected from the group consisting of the radicals represented by Formula II, Formula III, Formula IV, and Formula V below:

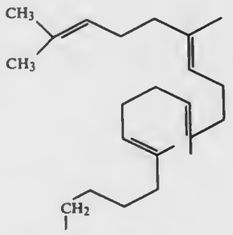
FORMULA II



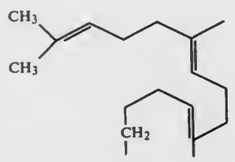
FORMULA III



FORMULA IV



FORMULA V





and wherein all unsaturated bonds are trans.

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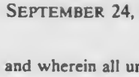
**5,051,535**

## PROCESS FOR THE PREPARATION OF EXTENSIVELY FLUORINATED ALIPHATIC HYDROCARBONS HAVING 1 OR 2 BROMINE OR CHLORINE ATOMS IN THE MOLECULE

**Konrad von Werner, Garching, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Feb. 14, 1991, Ser. No. 655,305**
**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1990, 4004783**
**Int. Cl.[5] C07C *17/20, 41/00***
**U.S. Cl. 570—170** **6 Claims**

1. A process for the preparation of extensively fluorinated aliphatic hydrocarbons having 1 or 2 bromine or chlorine atoms in the molecule, from the corresponding extensively fluorinated aliphatic hydrocarbons having 1 or 2 primary or 1 or 2 secondary iodine atoms in the molecule, by reacting 1 mol of bound iodine atom in the iodine compound with 1 to 4 mol of bromide or chloride ions present as salts with at least one of the following cations: Li, Na, K, Mg, Ca, Mn or substituted ammonium, in at least one dipolar aprotic solvent at 20° to 140° C. under normal atmospheric pressure or under the autogenous pressure of the reaction mixture, which comprises carrying out the reaction in the presence of a metal complex compound which contains chromium, nickel, cobalt or rhodium as the central atom and contains, per central atom, 1, 2 or 3 bromine atoms in the case of the preparation of the extensively fluorinated aliphatic bromides, or 1, 2 or 3 chlorine atoms in the case of the preparation of the extensively fluorinated aliphatic chlorides, and, as additional ligands, at least one ligand of the following formulae:



wherein $R^1$, $R^2$ and $R^3$, which are identical or different, are alkyl having 1 to 8 carbon atoms, alkoxy having 1 to 8 carbon atoms, phenyl or phenoxy, which can be substituted by alkyl, alkoxy, phenyl or phenoxy groups and has 6 to 14 carbon atoms, or

$$(phenyl)_2P—R^4—P(phenyl)_2$$

wherein R is an alkylene radical having 1 to 6 carbon atoms.

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**5,051,536**

## METHOD FOR ISOMERIZING 1,2-DICHLOROETHENE

**Earl M. Gorton, Sulphur; John D. Driskill, and Randall M. Hall, both of Lake Charles, all of La., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation-in-part of Ser. No. 211,617, Jun. 27, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 435,098**
**Int. Cl.[5] C07C *17/00, 21/073***
**U.S. Cl. 570—236** **56 Claims**

1. A method comprising isomerizing one stereoisomer of 1,2-dichloroethene to the other stereoisomer of 1,2-dichloroethene in the liquid phase and in the presence of organic free radical initiator.

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**5,051,537**

## GAS-PHASE FLUORINATION

**Leo E. Manzer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation of Ser. No. 355,868, May 19, 1989, abandoned, which is a continuation of Ser. No. 156,484, Feb. 12, 1988, abandoned. This application May 4, 1990, Ser. No. 519,328**
**Int. Cl.[5] C07C *17/20, 19/02***
**U.S. Cl. 570—168** **12 Claims**

1. A process for the preparation of 1,1,1,2-tetrafluoroethane by fluorination of 1,1,1-trifluorochloroethane, which process comprises
contacting in the gaseous phase at about 300° C. to about 500° C. said 1,1,1-trifluorochloroethane with HF and a catalyst comprising at least one metal on aluminum fluoride,
said HF and 1,1,1-trifluorochloroethane present at a mol ratio of about 3/1 to about 20/1,
said metal selected from the group consisting of cobalt, manganese, nickel, palladium, silver and ruthenium,
said contacting occurring in the presence of molecular oxygen,
said contacting producing an amount of chlorine such that the combined molar yield of $CF_3CHClF$ and $CF_3CHF_2$ is less than 7% and producing a product stream containing 1,1,1,2-tetrafluoroethane and, thereafter,
separating the 1,1,1,2-tetrafluoroethane from the product stream.

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**5,051,538**

## PROCESS FOR 1,1-DICHLORO-1-FLUOROETHANE

**William H. Gumprecht, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.**

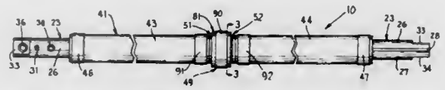
**Continuation of Ser. No. 225,808, Jul. 29, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 438,209**
**Int. Cl.[5] C07C *17/08***
**U.S. Cl. 570—168** **9 Claims**

1. A process for preparing 1,1-dichloro-1-fluoroethane comprising contacting 1,1-dichloroethylene and anhydrous hydrogen fluoride, in the vapor phase, with an aluminum fluoride catalyst at a reaction temperature from about 55° C. to about 95° C. to produce a product stream and, thereafter, recovering 1,1-dichloro-1-fluorethane from the product stream.

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**5,051,539**
**SWIVEL JOINT FOR COVER OF FLUID-COOLED WELDING CABLE**
**Susan Leathers-Wiessner, Portage, Mich., assignor to Dave A. Leathers, Scotts, Mich., a part interest**
**Filed Jun. 7, 1990, Ser. No. 534,434**
**Int. Cl.[5] H01B** *7/34*
**U.S. Cl. 174—15.7** **17 Claims**



**11**. A swivel mechanism, comprising: first and second tubular swivel parts supported for rotation relative to each other about an axis, and holding means for preventing relative axial movement of said swivel parts; said holding means including a holding part, and cooperating rib and groove means for limiting axial movement of each said swivel part relative to said holding part, said rib and groove means including first and second axially spaced ribs which respectively slidably engage first and second circumferentially extending grooves, one of said first rib and first groove being provided on said first swivel part and the other thereof on said holding part, and one of said second rib and second groove being provided on said second swivel part and the other thereof on said holding part; wherein each of said swivel parts has thereon an annular sealing surface concentric to said axis, said sealing surfaces facing each other; including an annular seal disposed between and sealingly engaging each of said sealing surfaces; and wherein each of said swivel parts is tubular and has at an axial end remote from the other thereof a portion with axially spaced, circumferentially extending, radially outwardly projecting ribs of saw-tooth shape.

**16**. A welding cable comprising: an elongate electrical conductor; a cover having axially spaced first and second tubular cover portions, said conductor extending through said tubular cover portions; and tubular swivel means disposed between and coupled to each of said tubular cover portions for facilitating rotation of said tubular cover portions relative to each other about a lengthwise axis of said cable, said conductor extending through said tubular swivel means; wherein said swivel means includes first and second tubular swivel parts supported for rotation relative to each other and each secured to a respective one of said first and second tubular cover portions; wherein said first and second swivel parts each have a portion which is tightly inserted in an end of a respective one of said tubular cover portions and which has a radially outwardly projecting annular rib; and including two clamping straps which each extend tightly around an end of a respective one of said tubular cover portions adjacent said swivel means.

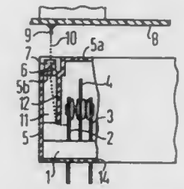
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**5,051,540**
**HOUSING FOR AN ELECTROMECHANICAL COMPONENT**
**Harry Schröeder, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**
**Filed Apr. 11, 1990, Ser. No. 507,460**
**Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 8905080**
**Int. Cl.[5] H05K** *5/06;* **H01H** *9/30*
**U.S. Cl. 174—52.3** **20 Claims**

**1**. A housing for enclosing an electromechanical or electromagnetic relay having metal parts, comprising:

a housing wall tightly enclosing a hollow interior, said housing wall having means adapted for forming an outwardly open aeration opening discharging into an insulating path contained within the interior of said housing; and

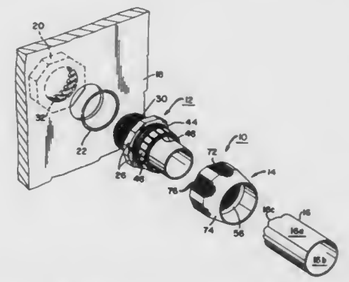
an insulating wall separating said insulating path from the metal parts of the electromechanical or electromagnetic relay, said insulating wall extending from an interior side of said housing wall into said hollow interior and being open to the interior of the housing at least at an end of said



insulating path lying opposite said means adapted for forming the aeration opening.

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**5,051,541**
**PLASTIC ELECTRICAL CONNECTOR FOR LIQUIDTIGHT CONDUIT**
**Jaspal S. Bawa, Neshanic Station; Luis R. Couto, Hillside, and Giacomo F. Mancini, Piscataway, all of N.J., assignors to Thomas & Betts Corporation, Bridgewater, N.J.**
**Filed Mar. 23, 1990, Ser. No. 498,295**
**Int. Cl.[5] F16L** *33/22*
**U.S. Cl. 174—65 SS** **19 Claims**



**1**. An electrical connector for connecting liquidtight electrical conduit to an electrical component, comprising:

a gland nut having a centrally located bore therethrough, said gland nut including internal threads and engagement means on the interior of said gland nut; and

a body including a component connecting portion, a flange portion and a conduit connecting portion and a bore extending axially therethrough, said component connecting portion projecting axially from said flange portion in one direction and comprising external thread means for connecting said body to said electrical component, said conduit connecting portion projecting axially from said flange portion in a direction opposite said component connecting portion, said conduit connecting portion including an elongate internal tubular ferrule through which said body bore extends and an outer cylindrical ring, said ferrule being adapted to receive a liquidtight conduit thereon and being radially spaced from said ring and defining thereby a cavity therebetween, said ring including external threads engageable with the internal threads on said gland nut and a plurality of flexible fingers projecting axially therefrom, said flexible fingers comprising means responsive to the engagement means on said gland nut upon tightening said gland nut on said body for compressively engaging said conduit and for axially moving said conduit along said ferrule into said cavity, whereby said conduit and said body are secured in a liquidtight connection, said means responsive to the engagement means comprising a conduit engaging member disposed at a free end of flexible fingers, said means responsive to the engagement means further comprising a deformable sec-

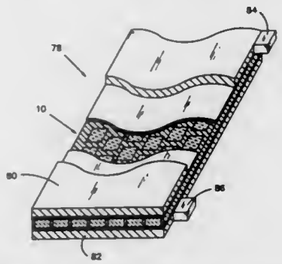
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tion on said flexible fingers between said ring and said conduit engaging members, said deformable section being bendable at plural, discrete locations.

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**5,051,542**
**LOW IMPEDANCE BUS BAR**
**Jorge M. Hernandez, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.**
**Continuation-in-part of Ser. No. 226,619, Aug. 1, 1988. This application Dec. 29, 1988, Ser. No. 291,514**
**The portion of the term of this patent subsequent to Mar. 13, 2007, has been disclaimed.**
**Int. Cl.[5] H01B** *7/00*
U.S. Cl. 174—72 B **8 Claims**

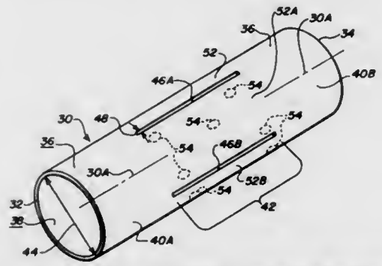



1. A bus bar comprising:
an array of spaced high dielectric chips arranged in a single layer, each of said chips having side, top and bottom surfaces and each chip having a dielectric constant of at least 10,000;
a flexible polymeric binder between said side surfaces of said chips and binding said chips to define a cohesive sheet having opposed first and second planar surfaces with said top and bottom surfaces of said chips being exposed on said respective first and second surfaces, said binder being selected from the group consisting of flexible thermoplastic polymers and flexibilized thermoset polymers;
a first metallized layer on said first planar surface;
a second metallized layer on said second planar surface;
a first conductive layer having at least one first conductive tab extending therefrom, said first conductive layer being electrically and mechanically connected to said first metallized layer; and
a second conductive layer having at least one second conductive tab extending therefrom, said second conductive layer being electrically and mechanically connected to said second metallized layer.

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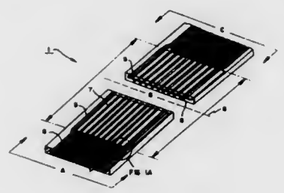
**5,051,543**
**SLOTTED GROUNDING FERRULE**
**David E. McGuire, Yorkhaven, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**
**Filed Sep. 22, 1989, Ser. No. 411,358**
**Int. Cl.[5] H02G** *15/08*
U.S. Cl. 174—78 **1 Claim**

1. A grounding ferrule for connecting in common the shields of a plurality of cables, the ferrule comprising:
a generally cylindrical hollow conductive member having a substantially constant wall thickness throughout its axial length, the member having a first and a second axial end thereon with a bore of a predetermined diameter extending therethrough, the bore being sized such that the conductive member is able to recieve and to surround all of the cables being connected, at least three equiangularly circumferentially spaced axially extending slots provided therein, the slots extending for generally the same axial distance intermediate the first and second axial ends of the ferrule thereby to define a plurality of circumferentially adjacent webs, each of the webs having an inner surface thereon, at least one radially inwardly extendly protrusion being disposed on the inner surface of each web.
the ferrule being able to respond to a radially inwardly directed crimping force applied circumferentially to the exterior surface of the webs by deflecting radially inwardly to define a constricted central region having a diameter less than the diameter of the member in the uncrimped state, in the crimped state the protrusions on the inner surface of each web being disposed in electrically conducting contact with the sheilds of some of the cables surrounded by the hollow conductive member.




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**5,051,544**
**TRANSMISSION CABLE WITH REDUCED PREPARATION TIME TERMINATION SECTION**
**Wayne Harris, Wallingford, Conn., assignor to Amphenol Corporation, Wallingford, Conn.**
**Filed May 1, 1990, Ser. No. 517,336**
**Int. Cl.[5] H01B** *7/08*
U.S. Cl. 174—117 F **14 Claims**

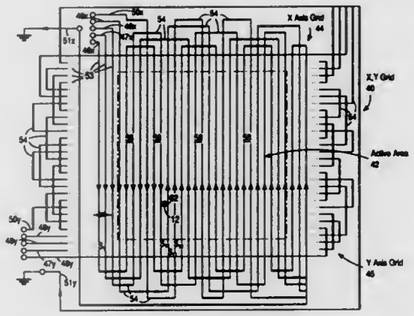


1. A flat cable comprising:
a plurality of wires enclosed within an insulating material, said plurality of wires including two groups of wires; and
means including separator members placed between said two groups of wires at predetermined intervals along the length of the cable for causing said two groups of wires to be respectively located in separate planes at said predetermined intervals along the length of the cable, and in substantially the same plane elsewhere along the cable.

6. A method of manufacturing a cable, comprising the steps of: separately guiding two groups of wires to a station; merging said two groups of wires at said station into a single group of spaced wires located in substantially the same plane; at predetermined intervals, inserting separator members between said two groups of wires to cause said two groups of wires to be located in separate planes rather than merged into a single plane; and applying insulation to both said merged and separated groups of wires to form a cable.



**5,051,545**
**DIGITIZER WITH SERPENTINE CONDUCTOR GRID HAVING NON-UNIFORM REPEAT INCREMENT**
**Robert M. McDermott, Weston, Conn., assignor to Summagraphics Corporation, Seymour, Conn.**
**Filed Apr. 6, 1990, Ser. No. 505,944**
**Int. Cl.[5] G08C** *21/00*
U.S. Cl. 178—19 **66 Claims**

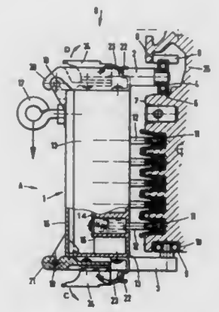



1. A conductor structure for a position-determining device which includes a movable element and determines the location of said movable element relative to said conductor structure; said conductor structure comprising;
at least first, second and third conductors each of which includes at least three active portions extending substantially in a first direction substantially in or adjacent a common plane substantially parallel to each other, said conductors each having repeat increments which space adjacent active portions of the same conductor; and
means for coupling the spaced active portions of same conductors in series;
said conductors being arranged in a pattern such that:
(a) each of said active portions of all of said conductors or spaces therebetween may be uniquely identified by a unique binary number, respective binary digits of each of said unique binary numbers corresponding to respective conductors, whereby upon interaction between said movable element and respective conductors binary logic signals may be obtained corresponding to said binary digits which are indicative of the location of said movable element relative to said conductor structure; and
(b) the repeat increment of at least one of said conductors is non-uniform.

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**5,051,546**
**TROLLEY CARRIAGE**
**Uwe Bormann, Rümmingen, and Dieter Goerner, Hausen i.W., both of Fed. Rep. of Germany, assignors to Wampfler GmbH, Fed. Rep. of Germany**
**Filed Feb. 21, 1990, Ser. No. 482,503**
**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 8902224[U]**
**Int. Cl.[5] B60L** *13/02, 5/36*
U.S. Cl. 191—57 **10 Claims**

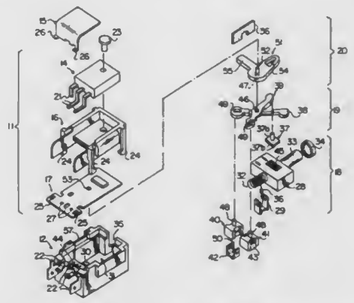
1. A trolley carriage comprising:
an upper roller support carrying first rollers having vertical axes of rotation and second rollers having horizontal axes of rotation,
a lower roller support carrying third rollers having vertical axes of rotation,
a housing having a top and an underside,
sliding contacts for engaging line rails supported one below the other by said housing between said top and said underside, and



quick couplings detachably connecting each of said upper roller support and said lower roller support to said housing.

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**5,051,547**
**SWITCH MECHANISM FOR AN ELECTRIC POWER TOOL**
**Kunio Nagata, Otokuni, and Masatsugu Yamashita, Neyagawa, both of Japan, assignors to Omron Corporation, Kyoto, Japan**
**Filed Dec. 22, 1989, Ser. No. 454,291**
**Claims priority, application Japan, Dec. 23, 1988, 63-326439; May 24, 1989, 1-131206; May 26, 1989, 1-134269**
**Int. Cl.[5] H01H** *9/00*
U.S. Cl. 200—1 V **6 Claims**



1. A reversing switch mechanism for an electric power tool, comprising:
a linear slider received in a switch case so as to be slidable in a first direction along a wall surface of said switch case;
a return spring for urging said linear slider in said first direction;
manual actuating means for manually moving said linear slider against a spring force of said return spring;
an actuating pin carried by said linear slider so as to be moveable along a second direction perpendicular to said first direction;
a pair of direction converting levers crossed in the manner of a pair of scissors by a pivot pin mounted in said switch case, said actuating pin being located adjacent to first ends of said direction converting levers;
a pair of lateral sliders engaged by second ends of said direction converting levers and allowed to move in said second direction along another wall surface of said switch case;
a first contact set including contacts carried by said linear slider and said wall surface of said switch case for mutual

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cooperation as said linear slider is moved in said first direction; and

a second contact set including contacts carried by said lateral sliders and said another wall surface of said switch case for mutual cooperation as said lateral sliders are moved in said second direction;

said actuating pin being moveable between said first ends of said direction converting levers so as to selectively actuate one of said direction converting levers and the associated one of the lateral sliders through movement of said linear slider along said first direction via an engagement between said actuating pin and the first end of the associated one of said direction converting levers.

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**5,051,548**

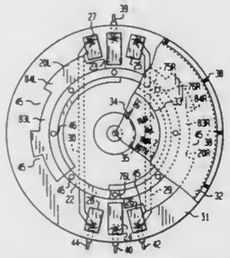
## DUAL INPUT-DUAL OUTPUT ELECTRIC SWITCH

**Joseph W. T. Underwood, IV, and Eugene F. Rockafeller, both of Jacksonville, Fla., assignors to Wood 'n rock, a Florida Partnership, Jacksonville, Fla.**

**Continuation-in-part of Ser. No. 348,908, May 8, 1989, Pat. No. 4,959,554. This application Sep. 11, 1990, Ser. No. 580,484**

**Int. Cl.[5] H01H** *19/58*

**U.S. Cl. 200—11 D** **9 Claims**



1. An electric vapor-proof, spark-proof switch receiving two separate current inputs and providing two separate current outputs, comprising two pairs of stationary current input terminals and two separate stationary current output terminals, a vapor-proof, electrically nonconductive housing enclosing a rotatable insulated disc having two current conductive plates attached thereto and insulated from each other, each said pair of stationary current input terminals selectively engageable or disengageable with one of said conductive plates respectively, in selected rotational positions of said disc; and the terminals of each said pair of stationary current input terminals being electrically conductively connected to each other and insulated from the other said pair of stationary current input terminals, one said terminal of each said pair of stationary current input terminals adapted to receive said current input, said two stationary current output terminals each being continuously engageable with one of said conductive plates respectively, an indicator outside of said housing to identify positions of said disc wherein selected input terminals are electrically connected to one of said output terminals, and a means outside of said housing for rotating said disc to any of said positions; where each of said conductive plates has a pair of depending conductive legs, one of said pair of conductive legs having a continuous arcuate foot, the other of said pair of conductive legs having a discontinuous arcuate foot shaped with cut-out portions.

**5,051,549**

## SLIDE SWITCH

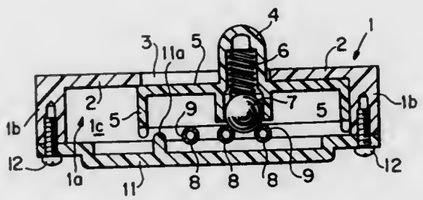
**Tsunesuke Takano, Tokyo, Japan, assignor to Kabushiki Kaisha T AN T, Tokyo, Japan**

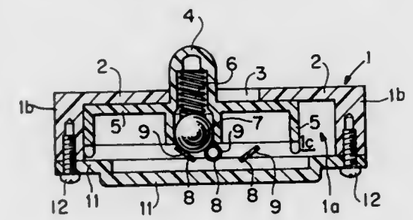
**Filed Oct. 26, 1990, Ser. No. 603,449**

**Claims priority, application Japan, Dec. 22, 1989, 1-334215; May 9, 1990, 2-119517**

**Int. Cl.[5] H01H** *15/00*

**U.S. Cl. 200—16 C** **5 Claims**





1. A slide switch comprising:

an electrically insulated support housing having opposing pairs of end and side walls which establish an interior cavity, an upper wall joined to an upper edge of said opposed pairs of said end and side walls to close an upper end of said interior cavity, said upper wall defining an opening in communication with said interior cavity;

an electrically insulated slide body which is slidably disposed within said interior cavity of said support housing so as to be movable reciprocally between first and second positions therewithin, said slide body having a knob which projects through said opening defined in said upper wall of said support housing to allow manual movement of said slide body between said first and second positions;

at least one pair of fixed elongate conductors each having opposing ends fixed to said opposed pair of side walls of said housing so that said pair of fixed conductors extend parallel to one another but are positioned in spaced relationship transversely relative to said reciprocal movement of said slide body; wherein

said slide body also including a movable conductor sized and configured to be in contact with said pair elongate fixed conductors when said slide body is in said first position so as to make and electrical circuit therebetween, and to be disengaged from at least one of said fixed conductors when said slide body is in said second position so as to break electrical contact therebetween; and wherein

said housing body further includes a retaining plate fixedly attached to a lower edge of said opposed pairs of end and side walls to close a lower end of said interior cavity such that said fixed conductors are in spaced relationship to said retaining plate.



**5,051,550**

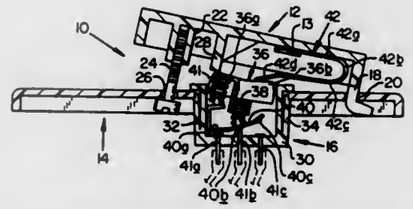
## CONTROL MECHANISM FOR AN ON-OFF SWITCH

**Timothy S. Harris, Fort Wayne, Ind., assignor to Kransco, San Francisco, Calif.**

**Continuation of Ser. No. 331,501, Mar. 31, 1989, abandoned. This application Jul. 25, 1990, Ser. No. 560,219**

**Int. Cl.[5] H01H** *21/24*

**U.S. Cl. 200—330** **13 Claims**



1. A control mechanism operable for selectively moving an off-on switch into its on and off positions comprising:

in combination with a switch having opposed, first and second ends simultaneously movable in opposite directions, the switch achieving one switching state by movement of the first end in one of said directions and a second switching state by movement of the second end in said one of said directions;

actuating means disposed adjacent the switch selectively movable for engaging the first end of the switch and urging the first end in said one direction to produce said one switching state, this movement being accomplished by movement of the second end of the switch in the opposite direction;

said switch including return means for engaging the first end of the switch and normally urgin the first end in said opposite direct and the second end in said one direction to produce the second switching state; and

biasing means disposed adjacent the switch and externally thereof engaging the second end of the switch and continuosly urging the second end of the switch in said one direction to produce said second switching state, said biasing means thus complementing the urging of said return means and yieldably resisting movement of the actuating means.

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**5,051,551**

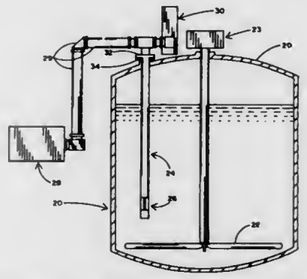
## IMMERSION PROBE FOR INFRARED INTERNAL REFLECTANCE SPECTROSCOPY

**Walter M. Doyle, Laguna Beach, Calif., assignor to Axiom Analytical, Inc., Laguna Beach, Calif.**

**Continuation-in-part of Ser. No. 353,969, May 18, 1989, abandoned. This application Oct. 12, 1990, Ser. No. 596,469**

**Int. Cl.[5] G01N** *21/35, 21/85*

**U.S. Cl. 250—341** **32 Claims**



1. An internal reflection spectroscopy system for in-situ mid-infrared spectral analysis of sample material confined in a container, comprising:

a source of mid-infrared analytical radiation which is directed toward the sample;

a detector which receives sample-altered mid-infrared radiation from the sample;

an elongated probe extending from the top of the container a substantial distance toward the bottom of the container, and into the sample material;

a first hollow internally reflecting light pipe located inside the probe and extending substantially the full length of the probe, said first light pipe receiving radiation from the source;

a second hollow internally reflecting light pipe located inside the probe and extending substantially the full length of the probe, said second light pipe transmitting radiation to the detector;

an ATR internal reflectance element located near the lower end of the tube and exposed to the sample material;

radiation from the source entering the internal reflectance element after traveling in one direction in the first light pipe;

radiation to the detector exiting the internal reflectance element in order to travel in the opposite direction in the second light pipe; and

radiation direction reversing means at the lower end of the probe for reversing the direction of the radiation, so that it travels along substantially parallel paths in the respective light pipes, causing source-supplied, sample-attenuated radiation to reach the detector.

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**5,051,552**

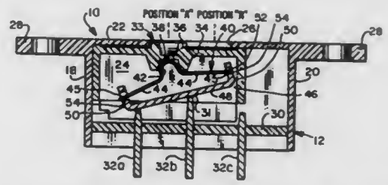
## SLIDE SELECTOR SWITCH MECHANISM

**Sheng-Nan Hou, Kaoshiung, Taiwan, and Joseph Spedale, Chicago, Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.**

**Filed Jul. 16, 1990, Ser. No. 552,486**

**Int. Cl.[5] H01H** *15/06*

**U.S. Cl. 200—549** **17 Claims**



16. A slide selector switch mechanism for use in miniature slide switches, comprising:

base means having fixed therein spaced, substantially aligned first, second and third terminal contact elements with said second terminal contact element being interposed between said first and third terminal contact elements and having a height dimension which is substantially greater than respective height dimensions of said first and third terminal contact elements;

movable contactor means overlying said terminal contact elements and being pivotally movable, upon said second terminal contact element having said greater height dimension which serves as a first pivotable fulcrum for said movable contactor means, between a first position at which said movable contactor means is in electrically bridging engagement with said first and second terminal contact elements but in spaced disengagement with respect to said third terminal contact element, and a second position at which said movable contactor means is in electrically bridging engagement with said second and third terminal contact elements but in spaced disengagement with respect to said first terminal contact element;

actuating means, having a pocket recess defined within a

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substantially central portion thereof, slidably movable with respect to said base means and said terminal contact elements fixedly mounted therein; and

a spring element interconnecting said movable contactor means and said actuating means, and comprising a substantially U-shaped portion at a substantially central portion thereof for disposition within said pocket recess of said actuating means so as to define therewith a second pivotable fulcrum for pivotably mounting said movable contactor means upon said actuating means such that when said actuating means is slidably moved to a first position, said spring element will pivot about said second pivotable fulcrum and resiliently bias said movable contactor means about said first pivotable fulcrum defined by means of said second terminal contact element having said greater height dimension and to said first position at which said movable contactor means electrically bridges said first and second terminal contact elements, while when said actuating means is slidably moved to a second position, said spring element will pivot about said second pivotable fulcrum and resiliently bias said movable contactor means about said first pivotable fulcrum defined by means of said second terminal contact element having said greater height dimension and to said second position at which said movable contactor means electrically bridges said second and third terminal contact elements.

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**5,051,553**

## APPARATUS FOR DETECTING A FAILURE IN AUTOMATIC WIRE EXTENSION

**Hiroshi Kinoshita, Oshino, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan**

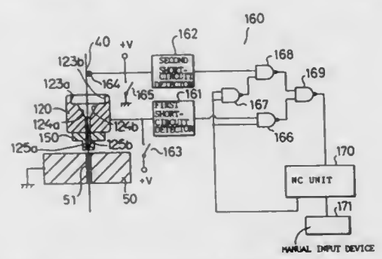
**PCT No. PCT/JP89/01020, § 371 Date May 22, 1990, § 102(e) Date May 22, 1990, PCT Pub. No. WO90/03863, PCT Pub. Date Apr. 19, 1990**

**PCT Filed Oct. 4, 1989, Ser. No. 490,608**

**Claims priority, application Japan, Oct. 8, 1988, 1-252894**

**Int. Cl.[5] B23H** *7/02, 7/10*

**U.S. Cl. 219—69.12** **6 Claims**




1. An apparatus for detecting a failure in automatic wire extension, installed in a wire cut electric discharge machine, comprising:

a short-circuit detecting circuit for generating a predetermined detection output when a short circuit occurs between a wire electrode and a main nozzle during execution of wire extension through a machining initial hole having a small diameter by use of a subnozzle mounted to the main nozzle and electrically insulated therefrom;

disabling means for disabling the short-circuit detecting circuit to render the predetermined detection output therefrom ineffective after the start of the wire extension until the wire electrode reaches a predetermined delivery position; and

discrimination means for determining that the wire extension ended in failure when the predetermined detection output is generated by the short-circuit detecting circuit after the short-circuit detecting circuit is released from a disabled state.

**5,051,554**

## ELECTRIC DISCHARGE MACHINE

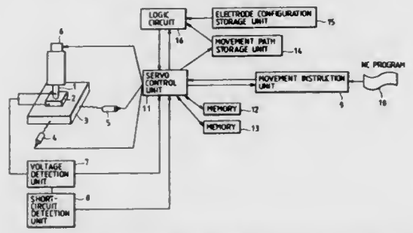
**Atsuko Tsukamoto, c/o Mitsubishi Denki Kabushiki Kaisha, Nagoya Works, No. 1-14, Yadaminami 5-chome, Higashi-ku, Nagoya-shi, Aichi, Japan**

**Filed Jul. 27, 1990, Ser. No. 558,359**

**Claims priority, application Japan, Aug. 4, 1989, 1-201433**

**Int. Cl.[5] B23H** *7/16, 7/18*

**U.S. Cl. 219—69.19** **4 Claims**




1. An electric discharge machine in which a workpiece is machined by an electric discharge generated between said workpiece and an electrode comprising:

a plurality of motors for moving a workpiece and an electrode during a machining operation;

a control means for controlling said plural motors to control movement of said electrode relative to said workpiece according to an NC program ;

a storage means for storing a configuration of said electrode and positions of said electrode during the machining operation, a movement path of said electrode;

means for detecting an occurrence of shortcircuit between said electrode and workpiece with reference to variation in an interelectrode gap voltage appearing therebetween; and

means for calculating an amount of movement and an optimal movement direction along which said electrode moves backward with respect to said workpiece upon the occurrence of shortcircuit between said electrode and workpiece, based on at least data as to an electrode configuration stored in said storage means,

said control means controlling said plural motors in response to an output of said calculating means.

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**5,051,555**

## HOT-BAR SUSPENSION SYSTEM

**Richard F. Porterfield, Binghamton, N.Y.; Thomas M. Alunni, Jessup, Pa.; Frank Ksionzyk, Port Crane, and Michael D. Snyder, Binghamton, both of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.**

**Filed Feb. 26, 1990, Ser. No. 484,571**

**Int. Cl.[5] B23K** *3/04*

**U.S. Cl. 219—85.16** **8 Claims**

3. A floating support for a soldering device, said device having at least two heating bars situated on opposite sides of a Z-axis with working surfaces of said bars defining a working plane, said floating support providing for tilting of said working plane into conformity with a work plane, said support comprising:

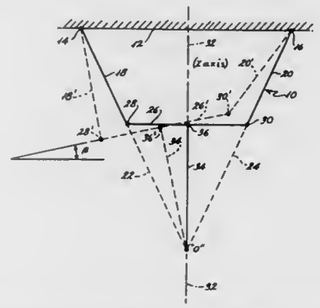
a mounting plate;

a first frame attached to said mounting plate and spaced therefrom along said Z-axis via a first pair of quadrilateral linkage systems, said first pair being spaced apart in a Y-axis direction, with linkage of each system defining and being pivotal in a corresponding X-Z plane;

a second frame attached to said first frame and spaced therefrom via a second pair of quadrilateral linkage systems, said second pair being spaced apart in an X-axis direction, with linkage of each said second linkage system defining and being pivotal in a corresponding Y-Z plane; and



brake means for selectively retaining at least one of said frames and pair of linkage systems corresponding thereto




in a position at which said working plane is in conformity with said work plane.

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**5,051,556**

## CHARGED PARTICLE BEAM LITHOGRAPHY SYSTEM AND A METHOD THEREOF

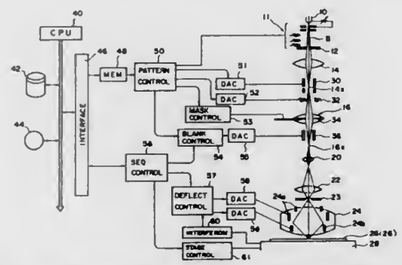
**Kiichi Sakamoto, Tokyo; Hiroshi Yasuda, Yokohama, and Akio Yamada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Oct. 31, 1989, Ser. No. 429,500**

**Claims priority, application Japan, Oct. 31, 1988, 63-275336; Mar. 20, 1989, 1-68308; Jul. 14, 1989, 1-182151**

**Int. Cl.[5] B23K** *15/00*

**U.S. Cl. 219—121.25** **19 Claims**




1. A charged particle beam lithography system for drawing a pattern on an object by a charged particle beam, comprising:

beam source means for producing and directing said charged particle beam such that the beam travels along a predetermined optical axis toward the object;

beam shaping means provided on a path of a travelling charged particle beam for providing a predetermined cross section to said charged particle beam;

first focusing means provided between the beam shaping means and the object for focusing the charged particle beam supplied from the beam shaping means on a first crossover point located on the optical axis;

second focusing means provided between the first crossover point and the object for focusing the charged particle beam previously focused on the first crossover point, on a second crossover point located on the optical axis;

beam deflection means for deflecting the charged particle beam focused by the second focusing means such that the beam is moved over the object;

stage means for supporting the object;

mask means provided in a vicinity of said first focusing means so as to extend substantially perpendicularly to the optical axis for interrupting the charged particle beam, said mask means carrying a plurality of apertures for providing a predetermined shape to the charged particle beam when the charged particle beam is passed therethrough; and

addressing means for selectively deflecting the charged particle beam such that the charged particle beam is passed through a selected one of the apertures on the mask means, said addressing means comprising an electrostatic deflector for deflecting the charged particle beam such that the charged particle beam is passed through a predetermined aperture in the mask means for variable shaping of the charged particle beam, and at least one electromagnetic deflector for deflecting the charged particle beam for an angle at least larger than that cased by the electrostatic deflector such that the charged particle beam is selectively passed through said selected one of the apertures, said addressing means determining the position of the charged particle beam on the mask means by said electrostatic deflector and said electromagnetic deflector.

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**5,051,557**

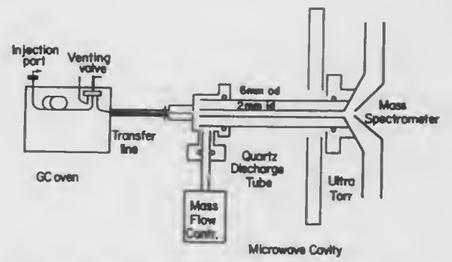
## MICROWAVE INDUCED PLASMA TORCH WITH TANTALUM INJECTOR PROBE

**R. Duane Satzger, West Chester, Ohio, assignor to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.**

**Filed Jun. 7, 1989, Ser. No. 362,357**

**Int. Cl.[5] B23K** *9/00*

**U.S. Cl. 219—121.52** **12 Claims**




1. A microwave induced plasma torch, comprising:

a body member formed about a longitudinal axis and having a bore formed therein;

a containment tube received within and extending from the bore of said body member;

means for introducing plasma gas into said containment tube to establish a tangential gas flow in the interior of said containment tube, said gas introducing means including an insert received within the bore and having a plurality of adjacent threads opening into said containment tube;

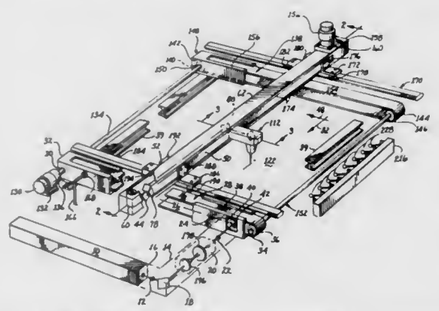
means for supplying plasma gas to the adjacent threads of said insert for introducing the plasma gas into said containment tube; and

a metallic injector tube extending along the longitudinal axis and terminating at a selected position within the containment tube downstream of a resonant cavity coupling microwave energy to the introduced plasma gas, said injector tube having an outside diameter less than that of the inside diameter of said containment tube and connectable to a source of analyte, said metallic injector tube shielding the analyte from the plasma and introducing the analyte at a point beyond the central maxima of the plasma region.

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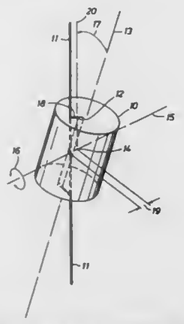


5,051,558
**LASER MATERIAL PROCESSING APPARATUS AND METHOD THEREFORE**
Yefim P. Sukhman, 4558 E. Evans Rd., Phoenix, Ariz. 85032
Filed Mar. 20, 1989, Ser. No. 326,013
Int. Cl.[5] B23K *26/16*
U.S. Cl. 219—121.68 21 Claims



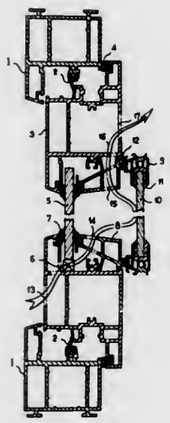
1. A laser material processor for processing a workpiece, comprising:
a lens that has a focal plane where said workpiece is disposed;
means for moving said lens in accordance with a material processing program;
means for propagating a collimated coherent light beam of a know duration within an enclosed passageway to said lens in response to a known displacement; and
beam shaper means coupled too said light beam for receiving said light beam and for altering the diameter of said light beam.

5,051,559
**NOZZLE FABRICATION TECHNIQUE**
Dennis L. Wells, League City, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Division of Ser. No. 176,587, Apr. 1, 1988, Pat. No. 4,852,232.
This application May 26, 1989, Ser. No. 358,029
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.72 18 Claims



1. A method for cutting away a selected portion of a body of selected material comprising the steps of:
positioning a selected portion of the body which is to be cut away into cutting proximity of a longitudinally extending cylindrical material removal device, cutting tool, designed to remove the selected material contiguous to its longitudinal surface;
moving the body relative to the longitudinal axis of the material removal device from a first position where a selected axis of the body is parallel to the longitudinal axis of the material removal device to at least a second position where the selected body axis is skewed in relation to the longitudinal axis of the material removal device for producing a cut into the selected body portion that is skewed in relation to the selected body axis; and
while the body is retained in its said second position, moving the material removal device relative to the body to a selected position within the body; and while the material removal device is in its said selected position, revolving the body about the selected body axis for cutting an approximately-hyperbolic surface of revolution on the selected body portion.

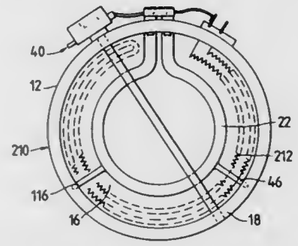
5,051,560
**HEATED SECOND WINDOW IN A DOUBLE GLAZING SYSTEM**
Jacques Fremaux, Bougival, and Roland Brechot, Bry-Sur-Marne, both of France, assignors to Saint-Gobain Vitrage International, Courbevoie and Acome, Paris, both of, France
Filed Mar. 23, 1990, Ser. No. 497,676
Claims priority, application France, Mar. 23, 1989, 8903809
Int. Cl.[5] H05B *3/10;* E06B *7/12*
U.S. Cl. 219—213 9 Claims



1. A window comprising:
a window frame in a wall of a room;
a sash fitted in said window frame;
an outer glazing mounted in said sash;
a second glazing mounted to one of said frame, said sash and said outer glazing, and at position interior to said outer glazing, so as to form an air circulation space between said second and outer glazings;
means for heating said second glazing; and
apertures in at least said sash and positioned for forming an air circulation path from outside said outer glazing, through said air circulation space and into the room,
wherein said apertures comprise at least one lower aperture in a bottom crosspiece of said sash and at least one upper aperture in a top crosspiece of said sash, and
wherein said at least one lower aperture comprises a single aperture extending substantially the width of the outer glazing and connecting said air circulation space with the outside,
whereby fresh air circulating into the room is heated by said heating means.

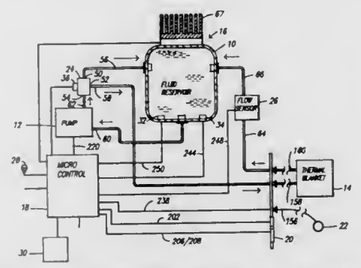


5,051,561
**RADIANT ELECTRIC HEATERS**
Kevin F. McWilliams, Stratford-Upon-Avon, and George A. Higgins, West Midlands, both of England, assignors to Ceramaspeed Limited, Droitwich, United Kingdom
Filed May 26, 1989, Ser. No. 358,328
Claims priority, application United Kingdom, May 27, 1988, 8812600; Sep. 20, 1988, 8822119; Dec. 23, 1988, 8830118; Jan. 13, 1989, 8900777
Int. Cl.[5] H05B *3/74*
U.S. Cl. 219—467 20 Claims



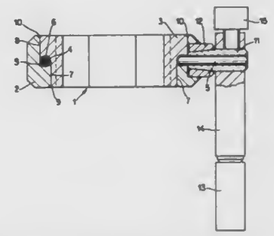
1. A radiant electric heater for cooking or heating appliances comprising:
a container;
a layer of electrical and thermal insulating material disposed in the container;
at least one infra-red source means having an envelope which has ends and which is transmissive of infra-red radiation, said source means being supported against shock-induced displacement in said container at least in part by at least one elongate protrusion extending from said envelope intermediate the ends of said envelope; and
a coiled wire heating element having a straight portion adjacent said at least one protrusion.

5,051,562
**TEMPERATURE CONTROLLED FLUID CIRCULATING SYSTEM**
David F. Bailey, and John T. Ray, both of Hillsborough County, Fla., assignors to Hollister, Inc., Libertyville, Ill.
Filed Feb. 8, 1990, Ser. No. 477,340
Int. Cl.[5] H05B *1/02*
U.S. Cl. 219—506 18 Claims



1. A temperature controlled fluid circulating system for use with a fluid circulating system including a circulating pump and means to generate a pump operating signal together with at least one thermal module operate in a heating or cooling state to monitor and control the temperature and flow of fluid circulated through a remote liquid circulation manifold comprising a display/control panel to select the system operating parameters and provide a visual indication of the system status including fluid flow and a micro control including logic circuitry to receive input signals from said display/control panel and fluid circulating system and to generate system control signals to control the operation of the fluid circulating system and system indicator signals to provide visual indication of system operations, said display/control panel including an obstructed flow indicator lamp coupled to said micro control and the fluid circulating system includes a fluid flow sensor including means to sense the flow of fluid therethrough and to generate an obstructed signal when there is no fluid flow therethrough, said micro control including a fluid flow sensor indicator control means to receive said pump operating signal and said obstructed signal to generate a first signal to illuminate said obstructed flow indicator lamp when said fluid flow sensor generates said obstructed signal and said pump generates said pump signal.

5,051,563
**SURFACE HEATING ELEMENT FOR COMPONENTS OF TOOLS AND MACHINES**
Walter Müller, Battenberg/Eder, Fed. Rep. of Germany, assignor to EWIKON Entwicklung und Konstruktion GmbH & Co. KG., Kirchlengern, Fed. Rep. of Germany
PCT No. PCT/DE88/00376, § 371 Date May 17, 1989, § 102(e) Date May 17, 1989, PCT Pub. No. WO89/00803, PCT Pub. Date Jan. 26, 1989
PCT Filed Jun. 23, 1988, Ser. No. 331,661
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1987, 3724088
Int. Cl.[5] H05B *3/58*
U.S. Cl. 219—535 8 Claims



1. A surface heating device for external mounting on parts of machines and tools, comprising a first substantially ring-shaped member; a second substantially ring-shaped member surrounding said first member and defining therewith a single annular space disposed in a single plane, each of said members defining substantially one-half of said space; a single ring-shaped electric resistance heat radiating element in said space; an electrically insulating element surrounding said heat radiating element in said space, said elements completely filling and being fixedly held in said space and said members having abutting stepped surfaces which gas- and liquid-tightly seal said space from the atmosphere, said heat radiating element having a portion extending from said space; and means for gas- and liquid-tightly sealing said portion of said space from the atmosphere around said portion of said heat radiating element.

5,051,564
**METHOD AND APPARATUS FOR CONTROLLING A MACHINE**
Alfred C. Schmidt, 201 Branch Brook Rd., Wilton, Conn. 06897
Filed Jan. 3, 1989, Ser. No. 292,847
Int. Cl.[5] G06F *7/06;* G03G *15/00*
U.S. Cl. 235—381 10 Claims

1. A machine control and accounting arrangement for controlling the usage of a machine external to said arrangement, comprising:
a) a secure housing;
b) a control system within said housing;
c) first and second interfaces coupled to said control system

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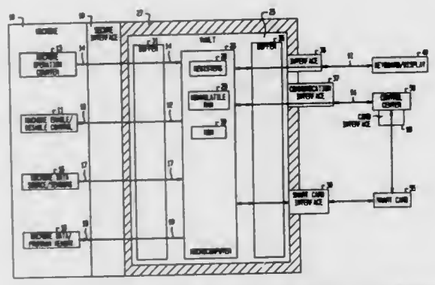


to permit communication between said control system and devices external of said housing;

d) said first interface comprising means for transmitting data representative of operational characteristics of said machine, said data including a count signal, from said machine to said control system in a secure manner, and means for transmitting an enable signal from said control system to said machine in a secure manner;

e) said second interface comprising means for transmitting control signals from a device external to said housing to said control system; and,

f) said control system further comprising:



f1) means responsive to said count signal for comparing a cumulative function of the count signal with a stored authorization count, and only if said comparison is satisfied transmitting said enable signal to said machine to enable operation of said machine;

f2) means responsive to said control signals for decrypting said control signals to produce a decrypted signal and for modifying said authorization count in response to a valid decryption signal; and

f3) means responsive to said data for modifying future operational characteristics of said machine as a function of said data.

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**5,051,565**

**BAGGAGE AND PASSENGER MATCHING METHOD AND SYSTEM**

**John R. Wolfram, Cocoa Beach, Fla., assignor to Johnson Service Company, Milwaukee, Wis.**

**Filed Feb. 26, 1990, Ser. No. 485,322**

**Int. Cl.[5] G07B *15/02***

**U.S. Cl. 235—384** **3 Claims**

1. A system for matching the identity of a passenger boarding a public transport with check-in luggage comprising:

a transport boarding pass;

at least one luggage tag for attachment to luggage to be checked;

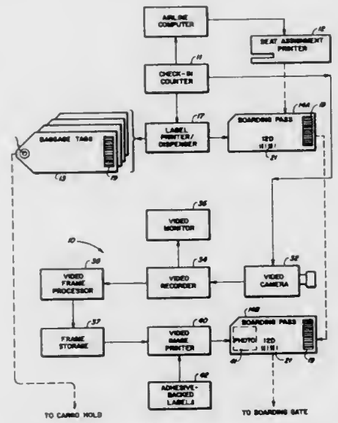
at least two labels, each having the same unique machine readable code imprinted thereon, one of said labels attached to said boarding pass, and the other one attached to said luggage tag;

first scanning and storing means at a transport loading point for scanning the machine readable code of said boarding pass as the passenger boards, and storing said pass code;

second scanning and storing means at a transport baggage loading point for scanning the machine readable code of said luggage tag, and storing said tag code;

means for comparing and attempting to match the stored boarding pass code with the stored luggage tag code;

means for indicating presence of a lack of a stored boarding pass code with the same code as a stored luggage tag code; and



a video photograph identification system for producing a paper photographic print of a passenger for attachment to said boarding pass.

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**5,051,566**

**IC CARD READER**

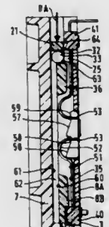
**Michel Pernet, Doubs, France, assignor to Alcatel Cit, Paris, France**

**Filed Dec. 19, 1989, Ser. No. 452,437**

**Claims priority, application France, Dec. 20, 1988, 88 16819**

**Int. Cl.[5] G06K *07/06***

**U.S. Cl. 235—441** **11 Claims**



1. In an IC card reader including card positioning and guide means, including a contact frame carrying contact elements which provide electrical contact with conducting areas of an IC card and via which circuits are established with the apparatus in which the IC card reader is incorporated, said card positioning and guide means including a fixed slot and fixed guideways for guiding said card along a fixed axis, said reader further including a moving carriage (8) mounted on said frame and moveable relative to the contact frame (3), having a rest position occupied by the carriage under the influence of return means (9) and in the absence of any card in the reader, and an actuated position into which said carriage is thrust by said IC card (100) inserted into the reader, said carriage (8) operatively engaging said contact elements such that when in said rest position, the carriage (8) causes the contact elements to be maintained in a rest position in which they are spaced from the insertion part (62) of said card, and when in the actuated position, the carriage (8) causes said contact elements to bear against the contact portions of the card, the improvement



wherein said carriage (8) includes a ramp (56) engaging at least one shoulder (54, 55) of a respective one of said contact elements close to the end (53) of the contact element (35, 36) and said ramp (56) being formed in a flank of a slot in the carriage (8) in which a corresponding one of said contact elements is disposed, thereby overcoming carriage release of the contacts upon full insertion of the card in said card reader frame.

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**5,051,567**

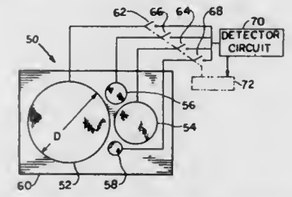
**BAR CODE READER TO READ DIFFERENT BAR CODE FORMATS**

**Jack Tedesco, Manhatten Beach, Calif., assignor to RJS, Inc., Monrovia, Calif.**

**Filed Jun. 13, 1989, Ser. No. 365,544**

**Int. Cl.[5] G06K *7/12***

**U.S. Cl. 235—462** **9 Claims**



1. In a bar code reader for reading bar codes having dark and light bar shaped elements of different densities, wherein some bar code formats have bars of different widths than those of other bar code formats, which includes a detector assembly that detects light incident thereon, optic means for forming an image of a portion of a bar code lying at a particular position onto said detector assembly and where the image moves relative to the detector assembly, and a detector circuit for indicating the presence of different bar code elements, the improvement wherein:

said detector assembly defines a plurality of photocell devices each having a photosensitive region of predetermined area, each photocell device generating an electrical signal of a magnitude dependent upon the amount of light incident on its photosensitive region;

switch means for connecting a selected one, but not other, of said photocell devices to said detector circuit, which optimizes reading of a particular bar code format, during the entire reading of at least one bar code having a plurality of said elements;

said photocell devices having photosensitive regions of different areas, and said optic means being constructed to form an image of said bar code portion onto all of said photocell devices during said relative movement.

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**5,051,568**

**Patent Not Issued For This Number**

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**5,051,569**

**METHOD FOR RECORDING DATA ONTO OPTICAL DATA RECORDING CARDS INCLUDING DATA REGIONS AND SYNC REGIONS**

**Yoshiaki Tsuruoka, Funabashi; Yorihiko Sakai, Tokyo, and Wataru Kuramochi, Kawagoe, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan**

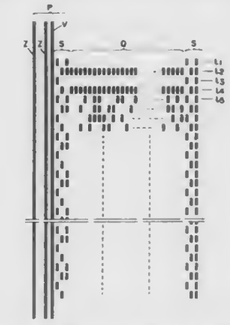
**Division of Ser. No. 6,560, Dec. 18, 1986, abandoned. This application May 31, 1989, Ser. No. 359,370**

**Claims priority, application Japan, Apr. 23, 1985, 60-87180; Apr. 23, 1985, 60-87181; Apr. 23, 1985, 60-87182; Apr. 23, 1985, 60-87183; Apr. 23, 1985, 60-87184; Dec. 3, 1985, 60-272296; Dec. 3, 1985, 60-272297; Dec. 3, 1985, 60-272298; Dec. 19, 1985, 60-286561**

**Int. Cl.[5] G06K *7/10, 19/06***

**U.S. Cl. 235—494** **2 Claims**

1. A recording method for recording data on an optical data recording card in such a way that each data to be recorded is stored in the form of an array unit which comprises a plurality of tracks arranged parallel with each other, comprising providing first and third tracks with no pits while providing second and fourth tracks with all pits, and recording data in fifth and



succeeding tracks as data bits, wherein a repetition period of said data bits and a repetition period of said fifth and succeeding tracks are defined by information obtained from said first to fourth tracks.

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**5,051,570**

**LIQUID CRYSTAL LIGHT VALVE SHOWING AN IMPROVED DISPLAY CONTRAST**

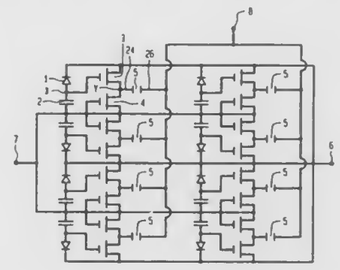
**Susumu Tsujikawa, and Fujio Okumura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

**Filed Jan. 19, 1990, Ser. No. 467,168**

**Claims priority, application Japan, Jan. 20, 1989, 1-12373; Apr. 24, 1989, 1-105307; Jun. 21, 1989, 1-156829**

**Int. Cl.[5] G02F *1/13;* G01D *5/34***

**U.S. Cl. 250—201.1** **6 Claims**



1. A liquid crystal light valve comprising a first transparent insulating substrate provided with a plurality of light switching elements respectively connected to pixel electrodes, a second transparent insulating substrate provided with transparent electrodes, and a liquid crystal sandwiched between the first substrate and the second substrate, each of said light switching elements including a photo-detector circuit and a transistor drive circuit respectively connected between a high voltage terminal and a low voltage terminal, each of said photo-detector circuits comprising a photodiode and a capacitor element serially connected to each other, a cathode of said photodiode being connected to said high voltage terminal, an input terminal of said transistor drive circuit being connected to a node connecting said photodiode and said capacitor element, and an output terminal of said transistor drive circuit being connected to said pixel electrodes.

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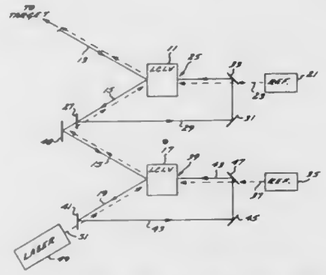


5,051,571

## CASCADED ADAPTIVE OPTICS SYSTEM

Wilbur P. Brown, Jr., Bell Canyon; Thomas R. O'Meara; David M. Pepper, both of Malibu; Uzi Efron, Los Angeles, and Bernard H. Soffer, Pacific Palisades, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 2, 1986, Ser. No. 947,569
Int. Cl.[5] G01J *1/20;* G02F *1/13*
U.S. Cl. 250—201.9 24 Claims



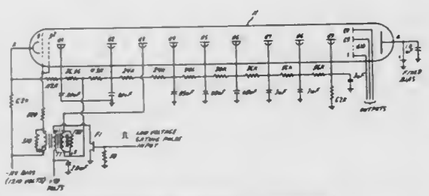
1. A cascaded adaptive optics system comprising:
a first spatial light modulator (SLM) disposed to receive an aberrated reference light beam and operative to provide a first reflected beam in response thereto;
first error means, operative to provide, at an error input of the first SLM, a first error signal indicative of any aberration in the first reflected beam, said first SLM being responsive to the first error signal to compensate for the aberration in the reference beam by inducing in the first reflected beam aberration that is a conjugate of the aberration in the reference beam;
at least one additional SLM, disposed to receive the first reflected beam and operative to provide another reflected beam in response thereto; and
additional error means, operative to provide, at an error input of the additional SLM, an error signal indicative of any aberration in the additional reflected beam, said additional SLM being responsive to the second error signal to compensate for the aberration in the first reflected beam by inducing in the additional reflected beam aberration that is a conjugate of the aberration in the first reflected beam.

5,051,572

## PHOTOMULTIPLIER GATING CIRCUIT

Alan A. Joseph, Huntington Beach; Russell W. Johnston, Santa Monica, and John F. Takacs, Long Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 6, 1990, Ser. No. 505,578
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—207 80 Claims



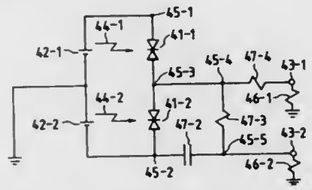
1. a photomultiplier tube system comprising:
a photomultiplier tube having a cathode for receiving a negative high voltage potential, an anode, at least three dynodes, namely a first and a second photoemissive dynode and a third non-photoemissive dynode and at least one grid; and,
trigger means, connected to said at least three dynodes, said cathode and said at least one grid of said photomultiplier tube, for receiving a gating pulse input and for changing the voltage potential of said at least one grid, and said third dynode, simultaneously .

5,051,573

## OPTICAL LOGIC OPERATION SYSTEM

Yoshihiko Mizushima; Kazutoshi Nakajima; Toru Hirohata; Takashi Iida; Yoshihisa Warashina; Kenichi Sugimoto, and Hirofumi Kan, all of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki kaisha, Shizuoka, Japan

Filed Nov. 14, 1989, Ser. No. 435,739
Claims priority, application Japan, Mar. 29, 1989, 77332
Int. Cl.[5] H01J *31/50*
U.S. Cl. 250—213 A 6 Claims



1. An optical logic operation system comprising:
two light receiving elements connected at a first output-side connection point, said two light receiving elements being responsive to respective two input optical pulse signals for producing two respective electrical signals, each of said two light receiving elements comprising two Schottky electrodes formed on a semiconductor substrate with a predetermined gap therebetween and with a substantially symmetrical arrangement;
two power sources for providing bias voltages of opposite polarity to said two light receiving elements at terminals opposite to said first output-side connection point;
a SUM output terminal connected to said first output-side connection point and a CARRY output terminal connected to said first output-side connection point;
a passive circuit connected to said CARRY output terminal, said passive circuit comprising resistors and capacitors; wherein
a SUM output signal and CARRY output signal appear at said SUM output terminal and CARRY output terminal, respectively, each of said SUM output signal and carry output signal comprising a superposition of said two electrical signals and representing a half-adder operation with respect to said two input optical pulse signals.

5,051,574

## OPTICAL COORDINATE DETECTION APPARATUS

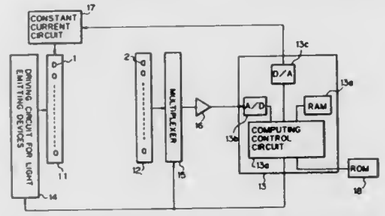
Shigeo Yoshida, and Isamu Fujimoto, both of Chiba, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1990, Ser. No. 545,559
Claims priority, application Japan, Jun. 30, 1989, 1-168570
Int. Cl.[5] G01V *904*
U.S. Cl. 250—221 6 Claims

1. An optical detection apparatus having plural pairs of light emitting devices and having photodetectors arranged with each pair of the light emitting devices, the photodetectors being spaced apart from each other and adapted to detect an object which interrupts light emitted from the light emitting devices and detected by the photodetectors, the optical detection apparatus comprising:
a constant current circuit for supplying a driving current to the light emitting devices for light emission;



a measuring means for measuring an individual light reception value (Wn) received by the photodetectors in one scanning of the light emitting devices when a driving amount for light emission of the light emitting devices is controlled to be a constant value (I) and the light is not interrupted by an object;
a computing means for computing an individual driving amount for light emission for each light emitting device by equation In=I·W/n in accordance with the individual light reception value Wn measured by the measuring means so that the individual light reception value received



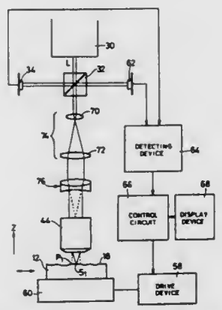
by the photodetectors may be kept at a constant value (W);
a memory means for storing the individual driving amount for light emission for each of the light emitting devices as computed by the computing means; and
a control means for driving the constant current circuit in accordance with the individual driving amount for light emission computed as above, whereby the light emitting devices are driven for light emission in accordance with the driving current corresponding to the individual driving amount (In).

5,051,575

## OPTICAL SURFACE ROUGHNESS MEASURING APPARATUS USING DOUBLE-FOCUS LENS FOR PRODUCING PARALLEL AND CONVERGED BEAMS FOR MEASUREMENT

Motohito Hino, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed May 3, 1990, Ser. No. 518,432
Claims priority, application Japan, May 16, 1989, 1-56385[U]
Int. Cl.[5] G02F *1/01;* H01J *40/14*
U.S. Cl. 250—225 14 Claims



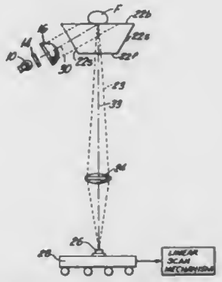
1. An optical surface roughness measuring apparatus for measuring roughness of a surface of a subject, by irradiating the surface with two linearly polarized beams of light which have orthogonal planes of polarization and different frequencies, and detecting a change in a beat frequency of said two beams reflected by said surface, comprising:
a laser device for producing two linearly polarized laser beams as said two linearly polarized beams; and
an optical device having a single optical path between said laser device and said surface of the subject, so that said two linearly polarized laser beams are propagated from said laser device toward said surface along said single optical path, said optical device including a double-focus lens and being operable for converging one of said two laser beams so as to irradiate a reading spot on the surface of said subject, and converting the other of said two laser beams into parallel rays of light for irradiating an area on said surface, said area being aligned with said reading spot and having a diameter larger than said reading spot.

5,051,576

## FINGER SURFACE IMAGE ENHANCEMENT HAVING A LIQUID LAYER ON THE FINGER TOUCHING SURFACE OF THE PLATEN

Michael Schiller, 4435 Douglas Ave., Riverdale, N.Y. 10471

Filed Jul. 31, 1990, Ser. No. 561,340
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.11 12 Claims



1. In an optical fingerprint imaging system having at least one interrogating light beam for illuminating a finger placed against a finger touching surface of a platen to provide a modulated light beam, the system having an imaging segment for imaging the modulated beam onto a photo-electric transducer, the improvement comprising:
a layer of liquid on the finger touching surface of the platen, said layer of liquid being thick enough so that a liquid-to-air interface is formed in the valley zones.
the interrogating light beam having an axis at the finger touching surface such that the angle of said axis is greater than the critical angle,
the axis of said imaging segment being positioned in a zone between said axis of said interrogating light beam and the mirror axis of said interrogating light beam,
the photo-electric transducer receiving scattered light from the ridges of a finger placed against the liquid covered touching surface of the platen and receiving substantially none of the light reflected along said mirror axis.

5,051,577

## FARADAY EFFECT CURRENT SENSOR HAVING TWO POLARIZING FIBERS AT AN ACUTE ANGLE

Dale R. Lutz; Grieg A. Olson, and Gary B. Forsberg, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 20, 1990, Ser. No. 496,291
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.17 13 Claims

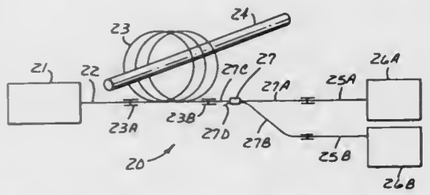
1. A Faraday effect current sensor comprising (a) a polarizer, (b) a coil of field-sensitive optical fiber, (c) means for optically connecting the input of the polarizer to a source of light and its output to the input of the field-sensitive optical fibers, and (d) means for opticaly connecting the output of the

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field-sensitive optical fiber to a polarization measuring device, said current sensor being characterized by the features that

the polarizer is a first polarizing optical fiber which is spliced to the input end of the optical fiber coil, and




said polarization measuring device comprises a second polarizing optical fiber spliced to the exit end of the optical fiber coil, and the polarization axes of the two polarizing fibers form an acute angle.

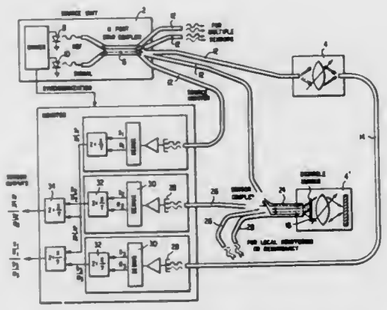
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**5,051,578**

**SELF CALIBRATING FIBER OPTIC SENSOR SYSTEM WITH OPTIMIZED THROUGHPUT**

**Charles S. Slemon, 1130 Island View La., Encinitas, Calif. 92024; William M. Lafferty, 571 D Hygeia Ave., Leucadia, Calif. 92024, and Clark C. Guest, 11524 Alkaid Dr., San Diego, Calif. 92126**

**Filed Nov. 15, 1989, Ser. No. 436,765**
**Int. Cl.[5] H01J** *5/16, 40/14*
**U.S. Cl. 250—227.23** **9 Claims**



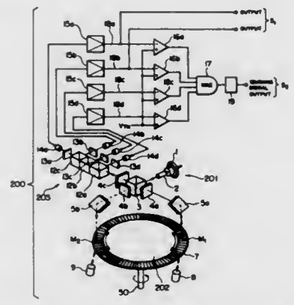
1. A fiber optic monitoring system comprising first fiber means for transmitting a first light beam, transducer means optically connected to said first fiber means for measuring a selected parameter and for causing a measurable change in said first light beam as a function of said parameter, wherein the optical throughput of said transducer means is larger than the optical throughput of said first fiber means whereby excess throughput is provided by said transducer means, means for connecting said first fiber means to a first light source and a first detector for determining said measurable change in said first light beam, and monitor means comprising second fiber means having an optical throughput equal to or less than said excess throughput optically coupled to said transducer means for transmitting a second light beam and port means connected to said second fiber means for receiving connector means for transmitting said second light beam into said second fiber means and for detecting changes in said second light beam caused by said transducer means.

**5,051,579**

**OPTICAL SCALE ENCODER WITH LIGHT INTENSITY ALARM**

**Masaaki Tsukiji, Tokyo; Tetsuharu Nishimura, Kawasaki; Koh Ishizuka, Urawa, and Satoshi Ishii, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 176,273, Mar. 31, 1988, abandoned. This application Jun. 1, 1990, Ser. No. 532,108**
**Claims priority, application Japan, Mar. 25, 1988, 63-71112; Apr. 3, 1987, 62-82248**
**Int. Cl.[5] G01D** *5/34*
**U.S. Cl. 250—231.16** **9 Claims**



1. A measuring system for detecting the moving condition of an object, comprising:

an optical scale connected to said object;

illumination means for applying light to said optical scale;

light receiving means for receiving light from said optical scale and for producing output signals with different phases in accordance with the movement of the object;

alarm signal forming means for detecting a variation in intensity of the light received by said light receiving means and for generating a predetermined alarm signal, wherein said alarm signal forming means includes comparison means for comparing each of the levels of the output signals from said light receiving means with a predetermined reference level and generating means for generating the predetermined alarm signal when at least one of levels of at least one of the output signals is less than the predetermined reference levels;

a diffraction grating arranged on said optical scale along a moving direction of the object, wherein said illumination means applies light to said diffraction grating to generate first and second diffracted light, and wherein said light receiving means photoelectrically converts an interference fringe formed by effecting interference between the first diffracted light and the second diffracted light generated by said diffraction grating into electrical signals.

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**5,051,580**

**NEUTRAL PARTICLE BEAM VELOCITY VECTOR SENSING SYSTEM**

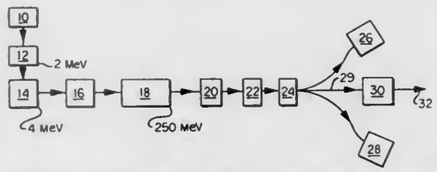
**Stanley Schneider, Rancho Palos Verdes, and Theodore D. Fay, Mission Viejo, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.**

**Filed Jul. 23, 1990, Ser. No. 557,412**
**Int. Cl.[5] H01S** *1/00, 3/00;* **H05H** *3/02*
**U.S. Cl. 250—251** **20 Claims**

1. A system for steering the direction of a relativistic neutral particle beam relative to the system fiducial axis comprising:

means for passively collecting the spectral lines from the spontaneous emissions of photons from excited particles in the beam at a predetermined angle relative to the fiducial axis at diametrically opposite sides of the known beam center line;

means for combining the collected spectral lines from the opposite sides of the beam onto a sensor such that, if the actual beam center line is coincident with a desired angle referenced to the fiducial axis in the plane defined by the predetermined angles, the combined spectral lines will coincide; and




means to deflect the beam in the plane if the combined spectral lines do not coincide initially, such that coincidence of the combined spectral lines on the sensor will be achieved thereby indicating coincidence of the actual beam centerline with the desired angle.

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**5,051,581**

**METHOD AND APPARATUS FOR EPITHERMAL NEUTRON POROSITY WELL LOGGING**

**Russell C. Hertzog, Missouri City, Tex.; William A. Loomis, Ridgefield, Conn., and Peter Wraight, Missouri City, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.**

**Filed May 1, 1990, Ser. No. 517,268**
**Int. Cl.[5] G01V** *5/10*
**U.S. Cl. 250—266** **18 Claims**



1. A method for investigating the porosity of a subsurface earth formation surrounding a borehole comprising:

repetitively irradiating the borehole and earth formation with discrete bursts of high energy neutrons from a neutron source, which neutrons interact with nuclei of the materials in the borehole and the formation to produce therein populations of epithermal neutrons;

detecting the populations of epithermal neutrons at near and far locations in the borehole spaced apart longitudinally by different distances from the neutron source;

generating count signals indicative of the magnitudes of the detected epithermal neutron populations at the respective near and far locations;

detecting the decay of the epithermal neutron populations following the neutron bursts at least at one location in the borehole and generating signals representative thereof;

deriving from said decay signals a signal indicative of the slowing down time of epithermal neutrons in the formation at said at least one location; and

deriving from the near and far count signals and the slowing down time signal a measurement signal representative of the porosity of the formation surrounding the borehole inherently compensated for the effects of tool standoff on the responses of the logging tool.

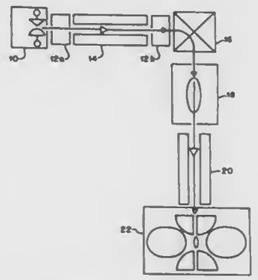
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**5,051,582**

**METHOD FOR THE PRODUCTION OF SIZE, STRUCTURE AND COMPOSITION OF SPECIFIC-CLUSTER IONS**

**John T. Bahns, DeWitt, and William C. Stwalley, Iowa City, both of Iowa, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Sep. 6, 1989, Ser. No. 407,388**
**Int. Cl.[5] B01D** *59/44*
**U.S. Cl. 250—283** **8 Claims**



1. A method of producing coated cluster ions which comprise:

a) generating cluster ions of a selected element,

b) selecting only cluster ions having a first predetermined velocity,

c) sorting said cluster ions according to a predetermined mass,

d) selecting said cluster ions according to a second predetermined velocity,

e) passing the beam of said cluster ions through a magnetic field to change its direction,

f) passing the beam of said cluster ions through a drift tube which contains a gaseous neutral vapor,

g) growing a coat of said vapor on said cluster ions to produce coated cluster ions,

h) passing said coated cluster ions through a quadrupole mass filter to mass select said coated cluster ions and to produce a beam of size, structure and composition specific coated cluster ions, and

i) trapping said coated cluster ions in an ion trap.

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**5,051,583**

**ATMOSPHERIC PRESSURE IONIZATION TYPE MASS SPECTROMETER**

**Tadao Mimura, and Fumihiko Nakajima, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

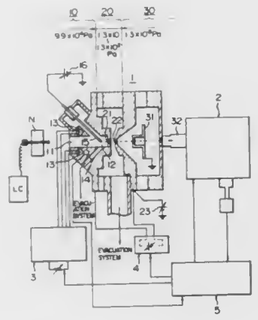
**Filed Sep. 27, 1990, Ser. No. 589,592**
**Claims priority, application Japan, Sep. 29, 1989, 1-251924**
**Int. Cl.[5] B01D** *59/44;* **H01J** *49/30*
**U.S. Cl. 250—288** **3 Claims**

1. An atmospheric pressure ionization type mass spectrometer comprising:

an ionization section opened to the atmosphere, said ionization section including a desolvation chamber and an ionization chamber;

means provided in said ionization section for ionizing sample to be measured in said ionization chamber;

means for heating an interior of said desolvation chamber;
a mass analysis section including a mass spectrometry, in which mass spectrum of said sample is measured;
an intermediate pressure section through which cluster ions of said sample pass from said ionizing chamber towards said mass analysis section;



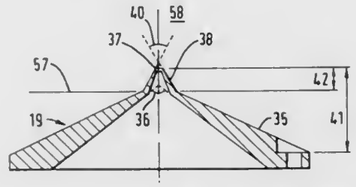
means for calibrating a mass marker of said mass spectrometry by means of using water cluster ions;
means for accelerating said cluster ions in said intermediate pressure section;
means for controlling said heating means and said accelerating means so as to adjust a temperature in said desolvation chamber and an acceleration of said cluster ions.

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**5,051,584**
**PLASMA MASS SPECTROMETER**
**Alan L. Gray, Farnham; Neil E. Sanderson, Sandiway, and Neil Bradshaw, Heaton Mersey, all of United Kingdom, assignors to VG Instruments Group Limited, Haywards Heath, England**
**PCT No. PCT/GB90/00131, § 371 Date Jul. 20, 1990, § 102(e) Date Jul. 20, 1990, PCT Pub. No. WO90/09031, PCT Pub. Date Aug. 9, 1990**
**PCT Filed Jan. 30, 1990, Ser. No. 543,750**
**Claims priority, application United Kingdom, Jan. 30, 1989, 8901975**
**Int. Cl.[5] H01J** *49/04*
**U.S. Cl. 250—288** **19 Claims**

1. A mass spectrometer comprising a mass analyzer, means for generating a plasma in a flow of gas, means for introducing a sample into said plasma, a sampling member adjacent to said plasma comprising a first orifice through which at least some ions characteristic of said sample may pass into a first evacuated region, and a hollow tapered member disposed with its narrowest end closest to said sampling member and comprising in said narrowest end a second orifice through which at least some of said ions may pass from said first evacuated region to a second evacuated region and subsequently to said mass analyzer, said hollow tapered member comprising at least a portion both externally and internally tapered with an interior included angle greater than 60°.

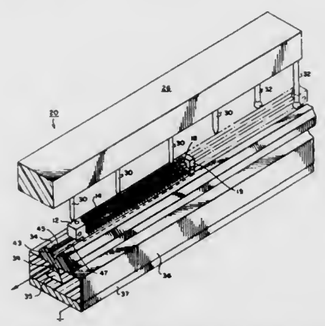
**5,051,585**
**APPARATUS AND METHOD OF PATTERN DETECTION BASED ON A SCANNING TRANSMISSION ELECTRON MICROSCOPE**
**Hiroya Koshishiba; Satoru Fushimi, both of Yokohama; Yasuo Nakagawa, and Kozo Nakahata, both of Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Jun. 28, 1989, Ser. No. 373,223**
**Claims priority, application Japan, Jul. 1, 1988, 63-162527**
**Int. Cl.[5] H01J** *37/28*
**U.S. Cl. 250—306** **23 Claims**



1. A method for detecting the pattern of a sample by an electron image signal y(t) detected by an image detection system of a scanning electron microscope the method comprising the steps of:
scanning an electron beam on the sample;
obtaining a restoration waveform image signal x(t) by processing said electron image signal y(t) obtained by reflected electrons, secondary electrons, or transmitted electrons from the sample in accordance with an equation h(t) resulting from an inverse Laplace transformation for an inverse function H(s) of a transfer function G(s), which approximates the response delay characteristics of said image detection system so as to recovery the deterioration of the detected electron image signal y(t) provided by the image detection system; and,
recognizing the pattern of the sample by the restoration waveform image signal x(t).

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**5,051,586**
**CORONA CHARGING OF PLASTIC AND APPARATUS THEREFOR**
**Scott R. Sabreen, 7804 Vienna Dr., Plano, Tex. 75025**
**Filed Apr. 18, 1990, Ser. No. 510,607**
**Int. Cl.[5] H01T** *19/04*
**U.S. Cl. 250—324** **19 Claims**

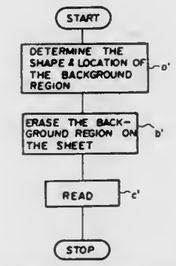


1. A method of corona treatment for a three dimensional first surface disposed relatively isolated within an article having a generally exposed second surface from which the depth of the first surface extends; said method comprising the steps of:
providing a corona electrode capable when energized of emitting corona in a narrowly focused path of relatively concentrated emission;
supporting said article with at least said first surface supported in said emission path; and
energizing said electrode for applying a corona charge into at least said first surface.

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**5,051,587**
**RADIATION IMAGE READ-OUT METHOD**
**Shoji Hara; Satoshi Arakawa, and Masamitsu Ishida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan**
**Filed Mar. 12, 1990, Ser. No. 492,034**
**Claims priority, application Japan, Mar. 13, 1989, 1-60158; Mar. 13, 1989, 1-60159**
**Int. Cl.[5] G01N** *23/04*
**U.S. Cl. 250—327.2** **17 Claims**

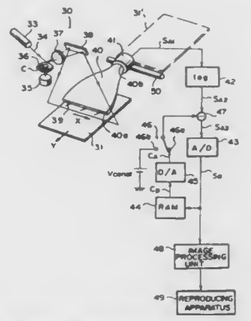



6. A radiation image read-out method for exposing a stimulable phosphor sheet, on which a radiation image having a background region has been stored, to stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, and detecting the emitted light in order to obtain an image signal representing the radiation image,
said radiation image read-out method comprising the steps of:
i) determining the shape and location of said background region,
ii) erasing said background region from said radiation image stored on said stimulable phosphor sheet, and thereafter
iii) exposing said stimulable phosphor sheet to stimulating rays, and detecting light emitted by said stimulable phosphor sheet in order to obtain an image signal.

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**5,051,588**
**RADIATION IMAGE READ-OUT APPARATUS**
**Toshitaka Agano, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Nov. 14, 1990, Ser. No. 612,362**
**Claims priority, application Japan, Nov. 14, 1989, 1-295625**
**Int. Cl.[5] G03B** *42/02*
**U.S. Cl. 250—327.2** **6 Claims**

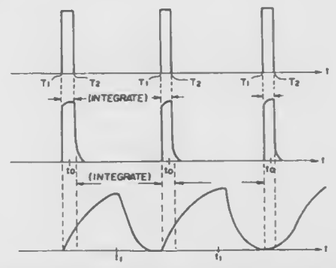
1. A radiation image read-out apparatus wherein a stimulable phosphor sheet, on which a radiation image has been stored, is exposed to stimulating rays, which cause the stimulable phosphor sheet to emit light in proportion to the amount of energy stored thereon during its exposure to radiation, and the emitted light is photoelectrically detected and converted into an image signal representing the radiation image,
wherein the improvement comprises the provision of an ultraviolet lamp, which produces ultraviolet rays such that energy from the ultraviolet rays is approximately



uniformly stored on the entire surface of a stimulable phosphor sheet.

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**5,051,589**
**STIMULABLE PHOSPHOR SHEET AND ENERGY SUBTRACTION PROCESSING METHOD USING THE SAME**
**Satoshi Arakawa, Kanagawa, Japan, assignor to Fuji Pboto Film Co., Ltd., Kanagawa, Japan**
**Filed Apr. 18, 1990, Ser. No. 510,914**
**Claims priority, application Japan, Apr. 20, 1989, 1-101345**
**Int. Cl.[5] G01T** *1/16;* **G03C** *5/17*
**U.S. Cl. 250—327.2** **9 Claims**




1. A stimulable phosphor sheet, comprising a plurality of stimulable phosphors which are mixed together or which take on the form of layers, the plurality of said stimulable phosphors include at least a first stimulable phosphor represented by the formula $GdOCl:Ce^{3+}$ and a second stimulable phosphor represented by the formula $SrFCl:Eu^{2+}$, the plurality of said stimulable phosphors having different response speeds, with which light emission from said stimulable phosphors responds to stimulating rays which cause them to emit light in proportion to the amounts of radiation stored thereon during exposure to radiation, and having different radiation absorption characteristics which represent absorptivity with respect to energy levels of the radiation.

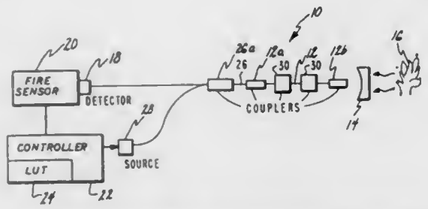
VOL 1130 ISS 4 SE 24 1991 UMI



**5,051,590**
**FIBER OPTIC FLAME DETECTION AND TEMPERATURE MEASUREMENT SYSTEM HAVING ONE OR MORE IN-LINE TEMPERATURE DEPENDENT OPTICAL FILTERS**

**Mark T. Kern, Goleta; Kenneth A. Shamordola, Santa Barbara; Gregory L. Tangonan, Oxnard, and John M. Wetzork, Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.**

**Filed Dec. 6, 1989, Ser. No. 447,494**
**Int. Cl.[5] G01J *1/00***
**U.S. Cl. 250—339** **20 Claims**




1. A fire detection system having a fiber optic conductor for conveying radiation at least from a distal end to a proximal end thereof, said system comprising:

first means, optically coupled to said proximal end of said fiber optic conductor, for detecting within a first and a second spectral band the radiation conveyed from said distal end of said fiber optic conductor;

second means, serially coupled within said fiber optic conductor, for transmitting therethrough substantially unattenuated radiation within at least one of said first or said second spectral bands, said second means further absorbing radiation within a third spectral band, the amount of absorbance being a function fo the temperature of said second means; and

third means, optically coupled to said second means through said fiber optic conductor at a location between said proximal end and said second means, for generating radiation within either said first or said second spectral band and also within said third spectral band, wherein said first means further detects radiation within said first and said second spectral bands and also within said third spectral band, and wherein said system further comprises

fourth means, coupled to said first means and responsive thereto, for indicating a temperature of said first or second spectral bands in conjunction with an amount of radiation detected within said third spectral band.

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**5,051,591**
**REFLECTIVE CHOPPER FOR INFRARED IMAGING SYSTEMS**

**Patrick A. Trotta, Plano, and Samuel R. McKenney, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 387,456, Jul. 28, 1989, abandoned. This application Jan. 10, 1991, Ser. No. 639,401**
**Int. Cl.[5] G01J *5/08***
**U.S. Cl. 250—351** **27 Claims**

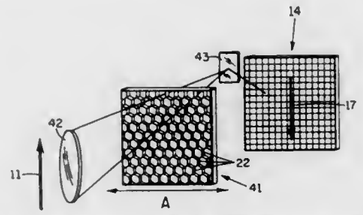
1. A method for producing an image of a scene, using an infrared imaging system, comprising the steps of:

detecting the actual infrared radiation from said scene to form a biased signal representing the radiances of objects within said scene;

scattering the infrared radiation emitted by said scene by placing an array of tubes having reflective inner surfaces across said actual radiation, such that rays of said radiation pass through said tubes at angles that are deviated from their normal path by said reflective inner surfaces;

detecting said scattered radiation to form a reference signal;

subtracting said reference signal from said biased signal to obtain an unbiased signal representing radiance differences emitted by said scene; and



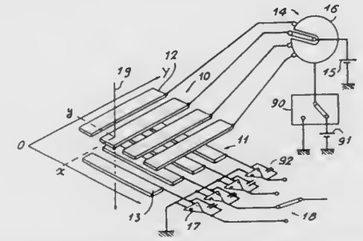

displaying an image generated in response to said unbiased signal.

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**5,051,592**
**PHOTOCONDUCTIVE DETECTORS OF IONIZING RADIATION, AND METHODS OF IMPLEMENTATION**

**Jacques Trotel, Palaiseau, France, assignor to General Electric CGR SA, Issy les Moulineaux, France**

**Filed Apr. 27, 1990, Ser. No. 515,865**
**Claims priority, application France, Apr. 28, 1989, 89 05667**
**Int. Cl.[5] G01T *1/185***
**U.S. Cl. 250—387** **5 Claims**




1. A photoconductive detector of ionizing radiation, the detector comprising:

a first grid of fixed electrodes disposed in a plane perpendicular to the direction of propagation of the radiation in an upstream position relative to said direction of propagation, and means for connecting said first electrode grid sequentially either to a potential close to ground potential or slightly positive, or else to a high potential $V_p$;

a second grid of electrodes disposed downstream from the first grid in a plane perpendicular to the direction of propagation of the ionizing radiation, said second grid being connected to read circuits; and

photoconductive material disposed between the first and second grids,

Wherein said photoconductive material is selected to respond to the ionizing radiation by providing electrons of high mobility and positive ions of low mobility; and

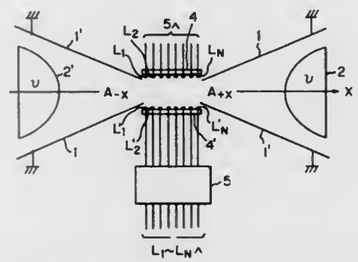
Wherein said means for connecting said first grid of electrodes to high positive potential $V_p$ is connected at least during the period of irradiation in order to capture the majority of the electrons, thereby avoiding recombination of said electrons with the positive ions.



**5,051,593**
**ELECTROSTATIC MULTIPOLE LENS FOR CHARGED-PARTICLE BEAM**

**Morio Ishihara, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan**

**Filed Nov. 21, 1990, Ser. No. 616,626**
**Claims priority, application Japan, Nov. 22, 1989, 1-303920**
**Int. Cl.[5] H01J *49/42***
**U.S. Cl. 250—396 R** **8 Claims**




1. An electrostatic multipole lens for acting on a beam of charged particles traveling along the Z axis of an X-Y-Z rectangular coordinate system, the lens producing an electrostatic n-pole field in a lens region which contains the Z axis and said field located between planes given by $y=\pm(\tan(\pi/n))x$, where y distance along the Y axis, x=distance from X axis and n=the number of poles in the n pole field, said planes intersecting each other at the Z axis, said electrostatic multipole lens comprising:

flat electrodes each of which takes the form of a flat plate and which are arranged along an equipotential plane of said electrostatic n-pole field in or near said planes given by $y=\pm(\tan(\pi/n))x$, the electrodes being cut out in the vicinity of the Z axis;

a pair of rod-like electrodes approximating in shape to a second equipotential surface in the electrostatic n-pole field to be produced in said lens region, the rod-like electrodes being located on the X axis spaced from said Z axis; and

means for applying those electrical potentials to the flat electrodes and the rod-like electrodes which correspond to said equipotential planes and surfaces associated with the n-pole field.

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**5,051,594**
**FINE POSITIONING DEVICE, AS FOR THE STAGE OF A SCANNING TUNNELING MICROSCOPE**

**Nobuhiro Tsuda; Hirofumi Yamada, both of Tsukuba; Fumihiko Ishida, Kawasaki, and Masayuki Miyashita, Warabi, all of Japan, assignors to Japan Ministry of International Trade and Industry, Tokyo; Toshiba Corporation, Kanagawa and Nikon Corporation, Tokyo, all of, Japan**

**Continuation of Ser. No. 453,221, Dec. 21, 1989, abandoned, which is a continuation of Ser. No. 238,242, Aug. 30, 1988, abandoned. This application Jun. 12, 1990, Ser. No. 512,905**
**Claims priority, application Japan, Feb. 29, 1988, 63-44547**
**Int. Cl.[5] G21K *5/10***
**U.S. Cl. 250—442.1** **23 Claims**

1. A fine positioning device comprising:

a) a spring structure including

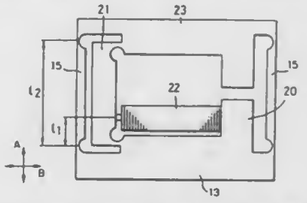
a base member,

a moving member spaced from said base member along a first of two perpendicular axes,

a pair of parallel leaf spring members spaced apart along a second of said axes and connecting said base member and said moving member for resilient relative fine displacement along said second axis, and

a movable column member positioned between said base member and said moving member and having one end connected to said base member and another end connected to said moving member; and

b) an actuator provided between said base member and said



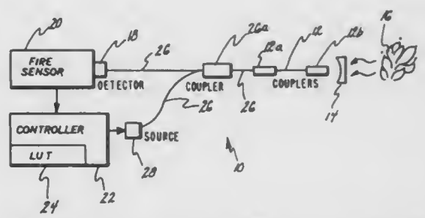

movable column member, said actuator acting to move said movable column member to effect fine displacement of said moving member relative to said base member along said second axis through said movable column member.

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**5,051,595**
**FIBER OPTIC FLAME DETECTION AND TEMPERATURE MEASUREMENT SYSTEM EMPLOYING DOPED OPTICAL FIBER**

**Mark T. Kern, Goleta; Kenneth A. Shamordola, Santa Barbara; Gregory L. Tangonan, Oxnard, and John M. Wetzork, Goleta, all of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.**

**Filed Dec. 6, 1989, Ser. No. 446,953**
**Int. Cl.[5] G01K *11/20*; G01J *1/58***
**U.S. Cl. 250—458.1** **17 Claims**




1. A fire detection system having a fiber optic conductor for conveying radiation from a distal end to a proximal end thereof, said system comprising:

first means, optically coupled to said proximal end of said fiber optic conductor, for detecting within a first and within a second spectral band the radiation conveyed from said distal end of said fiber optic conductor;

second means, distributed throughout a length of said fiber optic conductor, for emitting radiation within a third spectral band, said emitted radiation having at least one characteristic which is a function of a temperature of said second means; and

third means, optically coupled to said second means through said fiber optic conductor, for generating radiation for inducing said second means to emit the radiation within said third spectral band.

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**5,051,596**
**AUTOGRAPHY MARKING TAPE**

**Daniel Perlman, Arlington, Mass., assignor to Brandeis University, Waltham, Mass.**

**Filed Jul. 5, 1990, Ser. No. 548,057**
**Int. Cl.[5] G03C *5/16***
**U.S. Cl. 250—458.1** **14 Claims**

1. Marking tape adapted for use in autography, comprising:

a substrate having an upper surface,

a phosphorescent coating applied to said upper surface, said coating including phosphor powder grains, said grains

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phosphorescing with light at a wavelength between 400 and 600 nm upon exposure to UV or visible light, said phosphorescing occurring for a period of at least 5 minutes after said exposure, the concentration of said grains being sufficient to emit sufficient photons and thereby cause X-ray film having a sensitivity of 2000 El to darken to an optical density of between 0.2 and 3.0.

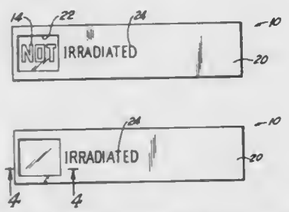
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**5,051,597**

## RADIATION DOSAGE INDICATOR

**David F. Lewis, Monroe, Conn.; Carl A. Listl, New Hyde Park, N.Y.; Mark L. Moskowitz, Sarasota, Fla.; Anthony Pilato, Lodi, and Robert D. Schenfele, Caldwell, both of N.J., assignors to GAF Chemicals Corporation, Wayne, N.J.**

**Filed Feb. 9, 1990, Ser. No. 477,585**
**Int. Cl.[5] G01T *1/00***
**U.S. Cl. 250—474.1** **24 Claims**




1. A multi-ply radiation dosage indicator comprising:
a first ply having visible indicia thereon;
a second ply having a radiation sensitive zone overlying the indicia of said first ply;
said radiation sensitive zone being capable of changing opacity in response to exposure to a radiation dosage exceeding a predetermined threshold so as to change the visibility of the indicia; and
a third ply overlying said second ply and having a viewing zone through which the visible indicia of said first ply is exposed to view, said third ply having visible indicia thereon positioned adjacent to said viewing zone, the indicia of said first ply and the indicia of said third ply together providing a visual indication as to whether said indicator has been exposed to a radiation dosage exceeding the predetermined threshold.

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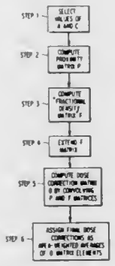
**5,051,598**

## METHOD FOR CORRECTING PROXIMITY EFFECTS IN ELECTRON BEAM LITHOGRAPHY

**Christopher J. Ashton, Harrison; Porter D. Gerber, White Plains; Dieter P. Kern, Amawalk; Walter W. Molzen, Jr., Holmes; Stephen A. Rishton, Yorktown Heights, all of N.Y.; Michael G. Rosenfield, Ridgefield, Conn., and Raman G. Viswanathan, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Sep. 12, 1990, Ser. No. 580,979**
**Int. Cl.[5] H01J *37/302***
**U.S. Cl. 250—492.2** **6 Claims**

1. A backscatter correction method for electron beam lithography suitable for high voltages and small feature sizes and/or very dense patterns so as to make an exposure pattern less sensitive to proximity effects, the exposure pattern consisting of a plurality of shapes, said method comprising the steps of:
superimposing on said pattern a mesh of square cells $C_{ij}$;
computing a proximity matrix P with elements $P_{kl}$ (k = −n, . . . , n; l = −n, . . . , n), where k and l label the surrounding cells such that the term $P_{kl}$ refers to the interaction of cell $C_{ij}$ with cell $C_{i+k,j+l}$;
computing a fractional density matrix F, such that cells $F_{ij}$ of matrix F are a fractional shape coverage in cells $C_{ij}$;
extending the F matrix by adding a rectangular collar of n elements around the F matrix representing empty space surrounding the pattern;



computing a dose correction matrix D by convolving the P and F matrices as:

$$D_{ij} = \sum_{k=-n}^{n} \sum_{l=-n}^{n} P_{kl} F_{i+k,j+l}$$
$$(i = 1, 2, \ldots, M; j = 1, 2, \ldots, N);$$

assigning a dose correction $d_i$ to each shape as a function of the dose correction matrix; and
computing final doses from the dose corrections $d_i$ and modifying the exposure pattern according to these final doses.

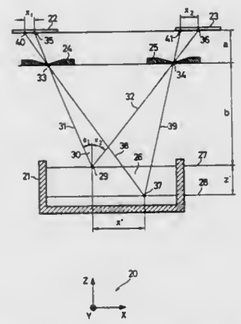
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**5,051,599**

## DEVICE FOR RECOGNIZING THE IMPACT SITE OF A CHARGE CARRIER BEAM ON A TARGET

**Ewald Benes, Biedermannsdorf; Martin Gröschl; Michael Schmid, both of Wien, all of Austria; Hans-Joachim Siegmund, Babenhausen, Fed. Rep. of Germany; Friedrich-Werner Thomas, Gelnhausen, Fed. Rep. of Germany, and Gernot Thorn, Hanau, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jan. 26, 1990, Ser. No. 470,857**
**Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 3902274**
**Int. Cl.[5] G01N *23/225***
**U.S. Cl. 250—491.1** **26 Claims**



1. Device for recognizing an impact site of a charge carrier beam on a target wherein X-rays emitted by the impact site are recognized, said device comprising: a first position-sensitive detector located at a first site; a first imaging system which detects all positions which the impact site can assume and produces a first image indicative of the impact site on a detector surface of said first position-sensitive detector, wherein the coordinates of said first image form a monotonic functional connection with the surface coordinates of the impact site and said first position-sensitive detector produces output signals which in turn depend monotonically on the surface coordinates of said first image of the impact site; a second position-sensitive detector (23) located a given distance from said first position-sensitive detector (22); a second imaging system which detects all positions which the impact site can assume and produces a second image indicative of the impact site on a detector surface of said second position-sensitive detector, wherein the surface coordinates of said second image form a monotonic functional connection with the surface coordinates of the impact site and said second position-sensitive detector produces output signals which in turn depend monotonically on the coordinates of said second image of the impact site; and an evaluation device to which the output signals of said first position-sensitive detector and said second position-sensitive detector are connected and which determines therefrom all three spatial coordinates of the impact site of the charge carrier beam.



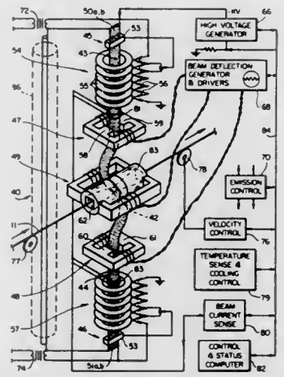
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**5,051,600**

## PARTICLE BEAM GENERATOR

**Marlin N. Schuetz, Raleigh, N.C., and David A. Vroom, Palo Alto, Calif., assignors to Raychem Corporation, Menlo Park, Calif.**

**Filed Aug. 17, 1990, Ser. No. 569,329**
**Int. Cl.[5] H01J *37/00***
**U.S. Cl. 250—492.3** **58 Claims**
**MICROFICHE APPENDIX INCLUDED**
**(1 Microfiche, 20 Pages)**




1. A method for generating a charged particle beam for irradiating a workpiece, the method comprising the steps of:
generating at least one charged particle beam in a vacuum chamber by particle emission from an emitter means,
accelerating the charged particle beam toward a window means transversely mounted across the chamber and having an active area of predetermined length and width,
deflecting the charged particle ribbon beam periodically back and forth in a sweep pattern in accordance with a predetermined deflection driving signal in order to define a sweep field which includes the active area of the window means,
dynamically converging the deflected charged particle beam onto and through the active area of the window means in accordance with a convergence driving signal which is phase related to the deflection driving signal, so that the charged particle ribbon beam continuously impinges upon and sweeps approximately perpendicularly over the active area of the window means, and
positioning the workpiece adjacent to the active area of the window means as the charged particle beam sweeps thereover thereby to cause electron bombardment of the workpiece.

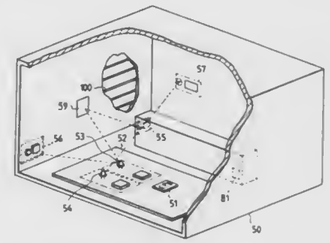
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**5,051,601**

## ELECTRONIC APPARATUS WITH LIGHT COMMUNICATION

**Hiroshi Atobe, Yokohama; Akio Noguchi, Ebina; Yukihide Ushio, Tokyo; Yoji Serizawa, Yokohama; Seiji Uchiyama, Tokyo; Kazuro Yamada, and Makoto Takeuchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 17, 1989, Ser. No. 395,060**
**Claims priority, application Japan, Aug. 23, 1988, 63-207357; Jul. 25, 1989, 1-193100**
**Int. Cl.[5] G02B *27/00***
**U.S. Cl. 250—551** **49 Claims**



1. An electronic apparatus comprising:
control means;
first light-emitting means for emitting a light in response to a control signal generated by said control means; and
plural operation means each of which comprises reception means for receiving the light emitted by said light-emitting means and second light emitting means for emitting a light in accordance with a state of said operation means,
wherein said operation means functions according to the result of the reception by said reception means;
said control means generates the control signal such that the lights to said respective operation means are sequentially emitted by said first light-emitting means, and
said control means controls said plural operation means on the basis of light emission of said second light-emitting means.

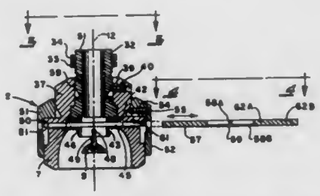
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**5,051,602**

## OPTICAL SYSTEM AND METHOD FOR SAMPLE ANALYZATION

**Donald W. Sting, New Canaan; Robert G. Messerschmidt, Westport, and John A. Reffner, Stamford, all of Conn., assignors to Spectra-Tech, Inc., Stamford, Conn.**

**Division of Ser. No. 487,550, Mar. 2, 1990. This application Dec. 14, 1990, Ser. No. 627,730**
**Int. Cl.[5] G01N *21/86***
**U.S. Cl. 250—571** **4 Claims**



1. An objective system for selectively controlling an aperture of a radiant energy optical path passing therethrough both

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to and from a sample being analyzed at a sample plane comprising:

a connecting tube adapted to be removably secured to a sample analysis instrument;

a guide holder means at least partially surrounding the connecting tube and being supported thereby, the guide holder means having a guide slot therein;

a secondary optic of a Cassegrain mirror objective supported along the center line of the optical path by the guide holder means;

an outer ring supported by the guide holder means;

a primary optic of a Cassegrain mirror objective supported by the outer ring concentrically about the centerline of the optic path and optically cooperating with the secondary optic;

a slide means slidably received in the guide slot and having at least one receptacle means therein;

removable mask means at least partially received in the slide receptacle means and being positioned in the optical path at a Fourier plane thereof adjacent the Cassegrain mirror objective when the slide means is properly positioned in the guide slot, the mask means having inlet and outlet apertures, passing radiant energy therethrough at selected radial positions in the Fourier plane to control the incident angle of the radiant energy onto the sample after passage through the objective, the outlet apertures passing radiant energy therethrough at selected radial positions in the Fourier plane to control the angle of reflected or emitted energy travelling from the sample through the objective and outlet apertures to a detector.

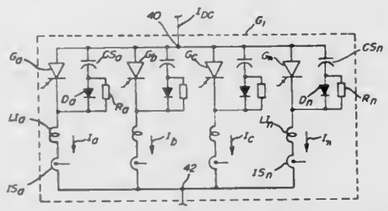
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**5,051,603**

## METHOD AND APPARATUS FOR MATCHING TURN-OFF TIMES OF PARALLEL CONNECTED SEMICONDUCTOR SWITCHING DEVICES

**Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.**

**Filed Aug. 14, 1990, Ser. No. 567,227**
**Int. Cl.[5] H02J *5/00*; H03K *17/732***
**U.S. Cl. 307—73** **26 Claims**



1. In a power switching system of the type employing a plurality of switching devices connected in parallel between two electrical power sources, said devices configured to be simultaneously conductive or simultaneously non-conductive and being rendered individually non-conductive in response to the application of respective turn-off control signals, a method of controlling turn-off of said devices to produce a time of turn-off balance within said switching devices comprising the steps:

(a) generating individual current signals respectively representative of the current magnitude within each switching device;

(b) generating an additional current signal representing a total current within said plurality;

(c) generating an individual time signal when the magnitude of said individual current signals indicate that a respective device has turned off;

(d) generating a total time signal when a magnitude of said additional current signal indicates that all devices have turned off;

(e) generating a difference signal at an occurrence of a turn-off control signal for said switching device as a function of a difference in time between one of said individual time signals and said total time signal; and

(f) varying the time of application of the turn-off control signal for a next conduction cycle of said plurality of switching devices as a function of said difference signal.

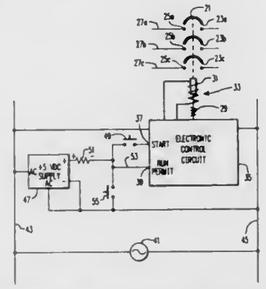
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**5,051,604**

## ELECTRICALLY NORMALLY CLOSED SWITCH DEVICE

**Ricky A. Hurley, Fletcher, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 11, 1989, Ser. No. 350,268**
**Int. Cl.[5] H01H *47/00***
**U.S. Cl. 307—115** **4 Claims**



1. An electrically normally closed switch device for controlling the flow of current from a low voltage power source to an input of a low voltage high input impedance load, said device, comprising:

an input impedance connected in series between the low voltage power source and the input to said low voltage high impedance load; and

a mechanically normally open low voltage switch connected between said input to said low voltage high input impedance load and ground, said mechanically normally open low voltage switch providing a normally closed switch function when mechanically open by permitting current to flow from said low voltage power source into the input to said low voltage high impedance load and providing an open switch function by pulling the input to said low voltage high input impedance load down to ground thereby terminating the flow of current into said low voltage high input impedance load when mechanically closed.

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**5,051,605**

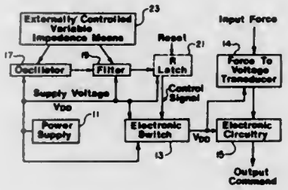
## SWITCH FOR ELECTRONIC SPORTS EQUIPMENT

**Nicholas F. D'Antonio, Liverpool, N.Y.; Ehrenfried Andra, Farchant, and Lorenz Stempfhuber, Oberau, both of Fed. Rep. of Germany, assignors to Marker International, Salt Lake City, Utah**

**Continuation-in-part of Ser. No. 38,491, Apr. 15, 1987, abandoned, which is a continuation of Ser. No. 586,103, Mar. 5, 1984, abandoned, which is a continuation of Ser. No. 367,580, Apr. 12, 1982, abandoned. This application Jan. 19, 1989, Ser. No. 299,970**
**Int. Cl.[5] A63C *9/08***
**U.S. Cl. 307—116** **6 Claims**

1. In an electronic ski binding which includes a power supply, a transducer for measuring forces applied thereto, electronic processing circuitry for processing signals received from said transducer, and means acting in response to said processed signals, the improvement comprising the incorporation in said electronic ski binding of electronic switching means that is continuously supplied with power from said power supply, said switching means including an electronic switch and electronic switch control means, wherein said electronic switch comprises only stationary parts and said switch control means controls the open/closed state of said switch, and wherein said switch control means closes said switch in response to a predetermined, non-invasive external influence, thereby providing power from said power supply to said transducer and to said processing circuitry, thus activating the transducer and processing circuitry to perform their design function, said switch control means comprising a filter including an environmentally variable impedance means for changing a cut-off frequency of said filter in response to the application of said external influence, and latch means for maintaining a connection between said power supply and said circuitry when said external influence changes.





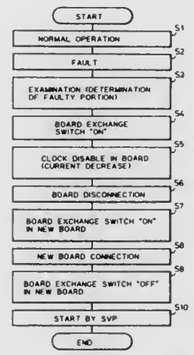

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**5,051,606**

## METHOD OF CONNECTING AND DISCONNECTING A BOARD IN A HOT STATE

**Shohei Ikehara, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 13, 1989, Ser. No. 434,754**
**Claims priority, application Japan, Nov. 19, 1988, 63-293191**
**Int. Cl.[5] G06F *13/40***
**U.S. Cl. 307—134** **3 Claims**




1. A method of connecting and disconnecting a board in a hot state using a device comprising a board, a mother-board to which the board is connected, and connector means for connecting the board to the mother-board, the board including dynamic elements through which an electric current flows upon a reception of clock signals, and the board includes a clock signal enable or disable means by which the clock signals are supplied to the dynamic elements; the method comprising steps of:

setting the clock signal enable or disable means on said board to a disable state while maintaining power thereto;

disconnecting the board from the mother-board;

connecting an operative board, in which the clock enable or disable means is preset to the disable state, to the mother-board through the connector means; and

changing the state of the clock signal enable or disable means on said board from a disabled state to an enable state.

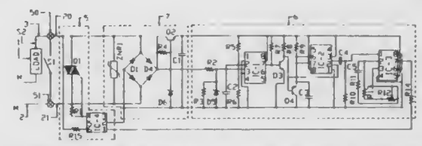
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**5,051,607**

## SWITCH TIME DELAY APPARATUS

**John E. Dalton, 489-22.25 Rd., Grand Junction, Colo. 81503**

**Filed Jul. 5, 1990, Ser. No. 548,563**
**Int. Cl.[5] H01H *43/02*; H05B *39/00***
**U.S. Cl. 307—141** **28 Claims**



1. Time delay apparatus for use with a switch controlling supply of electrical power to an electrical load connected to the switch, said apparatus selectively continuing operation of the load for a predetermined time delay period after opening of the switch, comprising electrically controlled switching means adapted to be connected electrically in parallel with a switch controlling operation of a load; and control means for providing a control output signal to the electrically controlled switching means to cause operation thereof for a predetermined time delay period if the switch is closed to initiate operation of the load and then opened within a predetermined trigger window period, whereby when the switch is opened during the trigger window period, the electrically controlled switching means will maintain operation of the load for the time delay period in response to the presence of the control signal, but if the switch is not opened during the trigger window period, operation of the load ceases with opening of the switch.

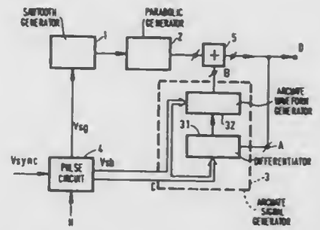
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**5,051,608**

## CIRCUIT ARRANGEMENT FOR SUPPLYING A PERIODIC, SUBSTANTIALLY PARABOLIC SIGNAL

**Hendrik Ten Pierick; Kar B. Chan, and Steven J. Koelewijn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Apr. 10, 1990, Ser. No. 507,946**
**Claims priority, application Netherlands, May 8, 1989, 8901147**
**Int. Cl.[5] H03K *5/00, 5/12*; G06G *7/12*; G09G *1/04***
**U.S. Cl. 307—261** **6 Claims**




1. A circuit arrangement for supplying a periodic, substantially parabolic signal to an output terminal, said circuit arrangement including a sawtooth generator for supplying a periodic sawtooth signal having a period with a trace time and a retract time, said sawtooth generator having a control input for receiving a control signal for triggering starting instants of said trace time and said retrace time, a parabolic generator having an input for receiving the sawtooth signal and an output for supplying the substantially parabolic signal to the output

terminal during the trace time, and an arcuate signal generator for supplying an arcuate signal to the output terminal during the retrace time of the sawtooth signal, wherein at a start of a retrace time; the arcuate signal and a derivative with respect to time of the arcuate signal are given respective values which are substantially equal to corresponding values of the substantially parabolic signal and a derivative with respect to time of the substantially parabolic signal, respectively, at an end of a preceding trace time, characterized in that said circuit arrangement further comprises a pulse circuit for generating the control signal for said sawtooth generator and for generating switching pulses, a predetermined number of said switching pulses occurring during said retrace time, and the arcuate signal generator comprises means for generating the arcuate signal in response to said parabolic signal and said switching pulses, whereby at an end of the retrace time, the arcuate signal and the derivative with respect to time of the arcuate signal have respective values which are substantially equal to corresponding values of the substantially parabolic signal and the derivative with respect to time of the substantially parabolic signal, respectively, at a start of a following trace time.

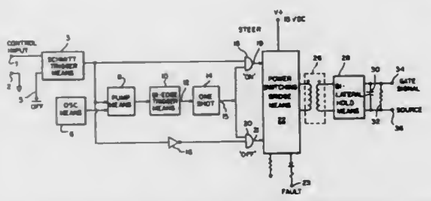
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**5,051,609**

## SIMPLIFIED DRIVER CIRCUIT FOR SOLID-STATE POWER SWITCHES

**Gerald L. Smith, Torrance, Calif., assignor to Teledyne Inet, Torrance, Calif.**

**Filed Oct. 2, 1990, Ser. No. 591,681**
**Int. Cl.[5] H03K** *3/01*
**U.S. Cl. 307—270** **8 Claims**




1. A driver circuit for driving the gates of solid-state power switches, including field-effect-transistors (FETs), bi-polar transistors and silicon-controlled-rectifiers (SCR's), comprising in combination:

(a) a main circuit, comprising

an input terminal connected to the output of a control signal source;

a signal shaping circuit including a Schmitt trigger means receiving the signal at said input terminal, an oscillator means, a pump means, a bi-edge trigger means, and a one-shot monostable vibrator, all connected in series;

a steering circuit including a first AND gate, an inverter and a second AND gate; said first AND gate having its inputs connected to said Schmitt trigger means output and to said one-shot output; said inverter and second AND gate being connected in series, inverter output to gate input; said inverter input being connected to said Schmitt trigger output; said second AND gate other input being connected to said one-shot output; said first AND gate producing an output 'ON' signal and said second AND gate producing an output 'OFF' signal;

a power switching bridge means for producing switched voltage and current pulses; said switching bridge means input being connected to the outputs of said first and second AND gates; and

an isolation transformer for providing high voltage isolation between said power switching bridge and an output circuit of said main circuit;

an output circuit which is connected to the secondaries of said isolation transformer and comprising a bi-lateral hold means, a capacitor and resistor; said bi-lateral hold means for extending the width of the voltage pulses which are passed by said transformer;

said main circuit accepting a control signal input from said control signal source to its input terminal and processing said control signal through said signal shaping circuit, through said steering circuit, through said power switching bridge means, through said isolation transformer, and through said output circuit, producing a gate-to-source signal capable of energizing the gate to source terminals of a field-effect-transistor or IGBT; and

(b) an adaptor circuit for connection to output terminals of said main circuit, for the purpose of driving the gate of a bi-polar transistor; said adaptor circuit comprising:

an N-channel field-effect transistor (FET);

a first diode connected between a drain and source of said FET acting as a bypass for said FET;

a first resistor connecting a drain of said FET to a collector of said bi-polar transistor, providing a bias voltage between the collector of said bi-polar transistor and a gate of said FET; and

a second resistor and second diode in series connection, connecting a source of said FET to an emitter of said bi-polar transistor, providing a termination between the gate of said FET and the emitter of said bi-polar transistor and also reverse current blocking protection;

said FET source also being connected to a base of said bi-polar transistor and to a source input terminal of said adaptor circuit; said FET gate being connected to a gate input terminal of said adaptor circuit; said adaptor circuit input terminals, when connected to the output of said main circuit, receiving a square wave voltage control signal and current pulses and applying said voltage signal and pulse across the gate and source of said FET, switching it ON; said FET ON state permitting current flow from the collector of said bi-polar transistor through said first resistor and said FET and into the base of said bi-polar transistor, switching it ON.

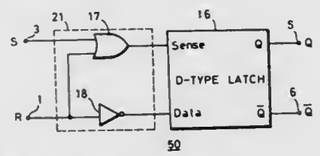
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**5,051,610**

## SR LATCH CIRCUIT

**Hideyuki Terane, and Hiroyuki Kawai, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 26, 1989, Ser. No. 456,335**
**Claims priority, application Japan, Feb. 21, 1989, 1-42490; Sep. 26, 1989, 1-249625**
**Int. Cl.[5] H03K** *3/284, 3/26*
**U.S. Cl. 307—272.1** **15 Claims**




1. An SR latch circuit, comprising:

a D-type latch having data and sense inputs and Q and $\overline{Q}$ outputs, said Q and $\overline{Q}$ outputs being connected to Q and $\overline{Q}$ output terminals of said SR latch circuit; and

a logic circuit connected between said inputs of said D-type latch and set and reset input terminals of said SR latch circuit;

wherein, when signals applied to said set and reset input terminals are expressed as S and R, said logic circuit establishes logic levels of signals applied to said data and sense inputs of said D-type latch such that said SR latch circuit is placed in a set state when S=1 and R=0, said SR latch circuit is placed in a reset state when S=0 and R=1, said SR latch circuit is placed in a hold state when S=R=0, and said SR latch circuit is placed in a predetermined one of said set, reset and hold states when S=R=1.



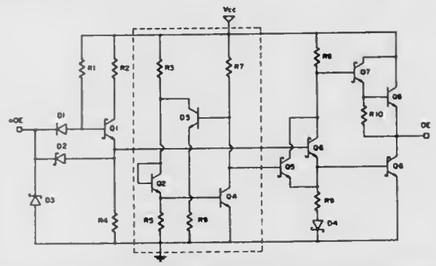
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**5,051,611**

## POWER-UP CIRCUIT WITH HYSTERESIS FOR AN OUTPUT BUFFER

**Anthony Kantz, Portland, Me., assignor to Quadic Systems, Inc., Gorham, Me.**

**Filed Dec. 20, 1989, Ser. No. 454,064**
**Int. Cl.[5] H03K** *5/153, 3/284*
**U.S. Cl. 307—272.3** **11 Claims**




1. A power-up circuit with hysteresis to be used in combination with an output enabling gate as one of a plurality of such combinations each exercising control over an individual output buffer in a multi-chip logic circuit so as to guard said logic circuit against transients during power-up and power-down of a common power supply voltage $V_{cc}$ used to energize said logic circuit, where said power-up circuit controls said output enabling gate during power-up so as to maintain said output buffer in a disabled state until said common power supply voltage $V_{cc}$ has attained a level $V_{ccU}$ and where said power-up circuit seizes control so as to disable said output buffers during said power-down once said common power supply voltage $V_{cc}$ has fallen to $V_{ccD}$, where $V_{ccU} > V_{ccD}$, thereby establishing said hysteresis, said power-up circuit comprising:

(a) a coupling means for energizing said power-up circuit by said common power supply voltage $V_{cc}$;

(b) hysteretic transistor-resistor means, wherein said hysteretic transistor-resistor means comprises:

(i) a threshold transistor, wherein a collector of said threshold transistor is coupled to said common power supply voltage $V_{cc}$ through a first resistor means, wherein an emitter of said threshold transistor is coupled directly to ground, wherein a base of said threshold transistor is coupled to ground through a second resistor means, and wherein a plurality of series-connected diode-connected transistors coupled in series with a third resistor means couples said base of said threshold transistor to said common power supply voltage $V_{cc}$; and

(ii) a feedback transistor, wherein said collector of said threshold transistor is coupled directly to a base of said feedback transistor, wherein a collector of said feedback transistor is coupled to said common power supply voltage $V_{cc}$ through a third resistor means, and wherein an emitter of said feedback transistor is coupled to ground through a fourth resistor means; and

(c) an output coupling means operatively coupled to said hysteretic transistor-resistor means for applying to said output enabling gate an output voltage signal $V_{OUT}$ generated by said power-up circuit;

wherein said hysteretic transistor-resistor means is constructed and arranged so that:

(i) said output voltage signal $V_{OUT}$ is at a binary logic one level throughout a determinable range of said common power supply voltage $V_{cc}$ during said power-up;

(ii) at a certain power-up threshold level $V_{ccU}$ of said common power supply voltage $V_{cc}$ said output voltage signal $V_{OUT}$ abruptly changes to a binary logic zero level;

(iii) at a certain power-down threshold value $V_{ccD}$ of said common power supply voltage $V_{cc}$ said output voltage signal $V_{OUT}$ abruptly changes from a binary logic zero level to a binary logic one level;

(iv) said power-up threshold value $V_{ccU}$ is greater than said power-down threshold value $V_{ccD}$ by an increment depending on said resistor means of said power-up circuit and;

(v) said output voltage signal $V_{OUT}$ of said power-up circuit switches between binary logic zero level and binary logic one level at a rate which is extremely fast and is independent of the rate with which said common power supply voltage $V_{cc}$ is changing during said power-up and said power-down.

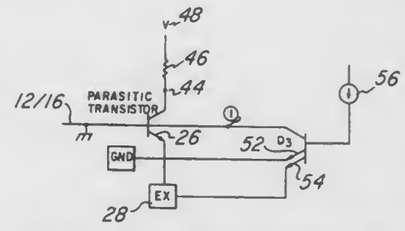
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**5,051,612**

## PREVENTION OF PARASITIC MECHANISMS IN JUNCTION ISOLATED DEVICES

**Dan Agiman, Lewisville, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Feb. 10, 1989, Ser. No. 309,514**
**Int. Cl.[5] H03K** *3/01, 3/26*
**U.S. Cl. 307—296.2** **24 Claims**




1. A device for preventing parasitic mechanisms in junction isolated semiconductor devices, comprising:

an isolating biasing element operatively connected to an isolation region between said semiconductor devices and operatively connected to a voltage potential available to said semiconductor device for biasing said junction isolation to the voltage potential available to said semiconductor device, said biasing element also having a control terminal for receiving a control signal.

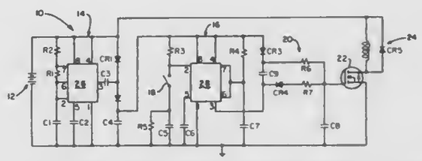
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**5,051,613**

## LOW VOLTAGE DC ONE-SHOT CIRCUIT

**John M. Houser, Jr., Stow, and Oliver G. Loughner, Cleveland, both of Ohio, assignors to Lucerne Products, Inc., Hudson, Ohio**

**Filed Jun. 4, 1990, Ser. No. 533,100**
**Int. Cl.[5] H03K** *3/02, 3/355, 17/687, 3/033*
**U.S. Cl. 307—296.3** **15 Claims**




1. A low voltage DC one-shot circuit for applying power to a load, comprising:

a DC voltage source presenting a voltage of a first level;

a charge pump connected to said DC voltage source and

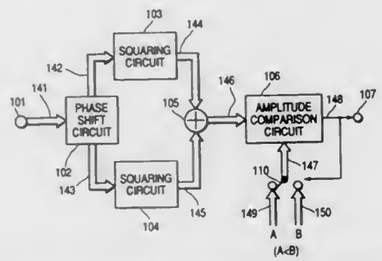
VOL 1130 ISS 4 SE 24 1991 UMI



generating a DC output voltage of a second level, said second level being greater than said first level;
a pulse generator connected to said charge pump and powered by said DC output voltage;
a power gate control device connected to the load; and
biasing means interconnected between said pulse generator and said power gate control device, biasing an input to said power gate control device to a predetermined level, said pulse generator presenting an output signal to said power gate control device through said biasing means.

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**5,051,614**
**DROPOUT DETECTING APPARATUS**
**Haruo Ohta, Yawata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**
**Filed May 23, 1989, Ser. No. 356,322**
**Claims priority, application Japan, May 26, 1988, 63-128940**
**Int. Cl.[5] H03K** *5/00, 5/153*
**U.S. Cl. 307—350** **4 Claims**

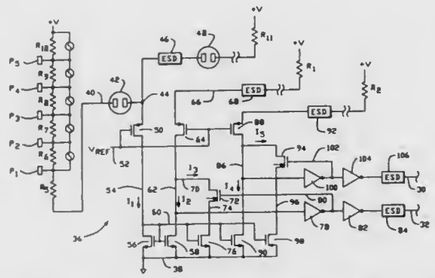



1. A dropout detecting apparatus for detecting a dropout of an input signal, comprising:
a phase conversion means for converting the input signal into first and second signals which are the same in amplitude and different in phase by $\pi/2$ from each other;
a first squaring means for squaring said first signal to obtain a first squared signal;
a second squaring means for squaring said second signal to obtain a second squared signal;
an addition means for adding said first and second squared signals to obtain a squared sum signal;
an amplitude comparison means for comparing an amplitude of said squared sum signal with a predetermined reference value to produce a dropout detection signal when the amplitude of said squared sum signal is smaller than said reference value; and
a reference value varying means for varying said reference value according to an output signal of said amplitude comparison means.

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**5,051,615**
**MONOLITHIC RESISTOR COMPARATOR CIRCUIT**
**Bruce D. Rosenthal, Los Gatos, Calif., assignor to Teledyne Industries, Mountain View, Calif.**
**Filed Jul. 20, 1989, Ser. No. 382,847**
**Int. Cl.[5] H03K** *5/24;* **G01K** *7/16*
**U.S. Cl. 307—350** **13 Claims**

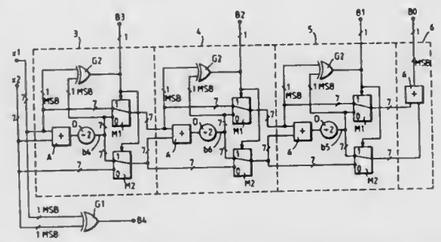
1. A resistor comparator comprising:
a) a monolithic substrate;
b) first means, at least partially formed in said monolithic substrate, for providing a resistance value that is dependent on the temperature of said first means;
c) second means, at least partially formed in said monolithic substrate, for providing a second resistance value that is independent of the temperature of said second means; and
d) generating means, formed in said monolithic substrate and coupled to said first and second means, for providing a signal whose value corresponds to the difference in resistance value between said first and second means;
wherein said generating means comprises:
a) means for providing a reference voltage;
b) means for conducting respective currents having a predetermined relation through said first and second means, said conducting means providing an output voltage proportional to the current level through said second means; and



c) level shifter means, coupled between said first and second means and said conducting means, for constraining said output voltage to within a predetermined voltage range inclusive of said reference voltage; and
d) output means, responsive to said output voltage, for providing said signal.

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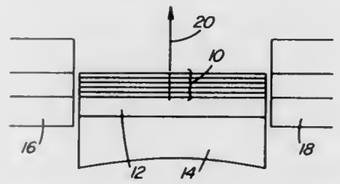
**5,051,616**
**ZERO CROSSING DETECTOR ARRANGEMENTS**
**Ian K. Stuchbury, Cheam, England, assignor to U.S. Philips Corporation, New York, N.Y.**
**Filed May 24, 1990, Ser. No. 528,659**
**Claims priority, application United Kingdom, May 31, 1989, 8912459**
**Int. Cl.[5] H03K** *5/153*
**U.S. Cl. 307—354** **24 Claims**



1. A zero crossing detector arrangement which is operable on digitized successive samples of an analogue signal, characterised by means for affording a first output corresponding to the average of two digitized successive samples, means for affording a first estimate as to the location of a zero crossing in dependence upon the relative signs of one of said digitized successive samples and said first output, means for affording a second output corresponding to the average of said first output and a selected one of said digitized successive samples, and means for affording a second estimate as to the location of the zero crossing in dependence upon the relative signs of said second output and a selected one of either said one of said digitized successive samples or said first output, said first and second estimates being used to substantially locate the position of said zero crossing.



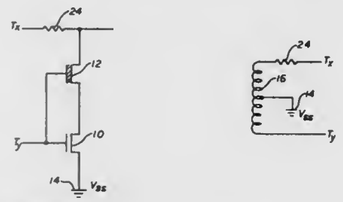
**5,051,617**
**MULTILAYER SEMICONDUCTOR WAVEGUIDE DEVICE FOR SUM FREQUENCY GENERATION FROM CONTRA-PROPAGATING BEAMS**
**Richard J. F. Normandin; Francoise Chatenoud, both of Ottawa, and Robin L. Williams, Orleans, all of Canada, assignors to National Research Council Canada, Ottawa, Canada**
**Filed Jun. 29, 1990, Ser. No. 545,497**
**Int. Cl.[5] H03F** *7/00*
**U.S. Cl. 359—328** **20 Claims**




1. A semiconductor coherent light source, comprising:
an optical waveguide means for propagating a light in one dimension under a guiding condition,
coherent light injection means for injecting into the said waveguide means along said dimension contra-propagating coherent lights of fundamental wavelengths,
the said waveguide means having a multilayer means for producing and enhancing a secondary light at the sum frequency of said contra-propagating lights in a direction different from the said dimension and determined by the mutual relationship of said contra-propagating lights,
said multilayer means comprising a plurality of layers of at lest one optically non-linear semiconductor material, said plurality of layers being parallel to the said dimension and having a predetermined thickness and periodicity determined by the refractive indices of said layers and by the sum frequency such that the said secondary light produced in the said multilayer means is enhanced as it leaves said waveguide means in said direction.

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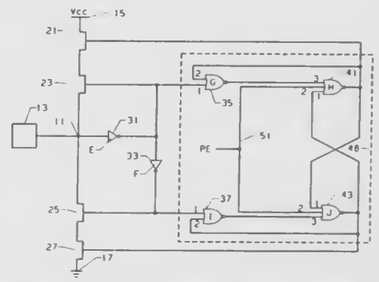
**5,051,618**
**HIGH VOLTAGE SYSTEM USING ENHANCEMENT AND DEPLETION FIELD EFFECT TRANSISTORS**
**Perry W. Lou, Carlsbad, Calif., assignor to Idesco Oy, Oulu, Finland**
**Continuation of Ser. No. 208,761, Jun. 20, 1988, abandoned.**
**This application Jan. 23, 1990, Ser. No. 468,917**
**Int. Cl.[5] H03K** *17/16, 19/003*
**U.S. Cl. 307—443** **8 Claims**




1. In combination:
an enhancement mode field effect transistor,
a depletion mode field effect transistor, and
means for providing an alternating voltage,
the depletion mode field effect transistor and the enhancement mode field effect transistor being connected to the alternating voltage means to obtain a flow of a current through the transistors in first alternate half cycles of the alternating voltage and a cut-off of such current through the transistors in the other alternate half cycles of the alternating voltage and to provide for a protection of the enhancement mode field effect transistor against voltage breakdowns after the enhancement mode field effect transistor becomes cut off
each of the transistors having a source, a drain and a gate, the source of the depletion mode field effect transistor and the drain of the enhance mode field effect transistor being common,
the alternating voltage being applied in one phase to the drain of the depletion mode field effect transistor and being applied in an opposite phase to the gates of the transistors, and
means for applying a reference voltage to the source of the enhancement mode field effect transistor.

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**5,051,619**
**PREDRIVE CIRCUIT HAVING LEVEL SENSING CONTROL**
**Ben Camplone, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.**
**Filed Sep. 7, 1989, Ser. No. 403,865**
**Int. Cl.[5] H03K** *19/003, 19/094, 19/20, 17/687*
**U.S. Cl. 307—443** **11 Claims**




1. A circuit device for predriving a signal conductor, which is switched between first and second voltage levels in the course of operation of a circuit to which said signal conductor is coupled, to a third voltage level lying between said first and second voltage levels, so as to enhance the switching operation of said signal conductor between said first and second voltage levels comprising:
a first terminal for receiving a first reference potential, corresponding to said first voltage level;
a second terminal for receiving a second reference potential, corresponding to said second voltage level;
a third terminal to which the signal conductor to be predriven is coupled;
first means, coupled in circuit between said first and second terminals and said third terminal, for receiving a predrive enabling signal and, in response thereto, controllably providing a first current flow path between said third terminal and one of said first and second terminals, while preventing a second current flow path between said third terminal and the other of said first and second terminals, until the voltage level of said third terminal reaches said third voltage level, said third voltage level being independent of the level of said enabling signal, and thereupon interrupting said first current flow path, while continuing to prevent said second current flow path between said third terminal and the other of said first and second terminals.

VOL 1130 ISS 4 SE 24 1991 UMI

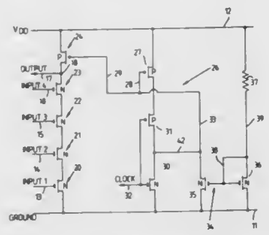


5,051,620

## PRECHARGED LOGIC SYSTEMS WITH PROTECTION AGAINST CURRENT LEAKAGE

Kenneth N. Burgin, The Pike Lock House, Eastington, Stonehouse, Gloucestershire, United Kingdom

Filed Jul. 31, 1990, Ser. No. 560,151
Int. Cl.[5] H03K *19/16, 19/95*
U.S. Cl. 307—452 13 Claims



1. A method of operating a CMOS logic circuit in which an output node is controlled by a plurality of transistors of a first type forming a logic array and precharged by a precharging transistor of a second type, said method including

supplying a sequence of clock pulses of alternate first and second levels to said precharging transistor, clock pulses of said first level switching on the precharging transistor to precharge the output node and clock pulses of said second type substantially reducing current flow through the precharging transistor without switching off fully the precharging transistor,

whereby precharge obtained during one clock pulse of said first level is not leaked away in the event of delay in receiving a next clock pulse of said first level.

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5,051,621

## AREA-EFFICIENT LOW-POWER BIPOLAR CURRENT-MODE LOGIC

Michael E. Wright, Berkeley, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

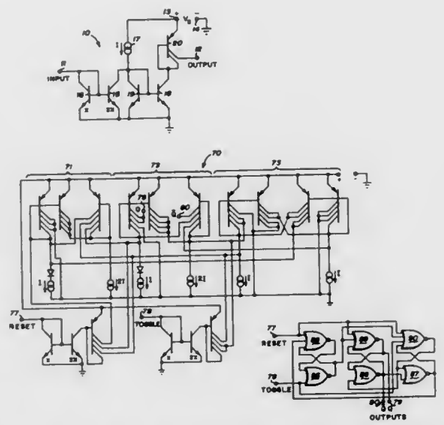
Filed May 4, 1990, Ser. No. 519,385
Int. Cl.[5] H03K *19/086, 19/082, 19/013, 19/003*
U.S. Cl. 307—455 9 Claims

1. A current mode logic circuit for use in conjunction with linear integrated circuits which employ silicon epitaxial monolithic PN junction isolated construction, operable from first and second power supply terminals, said circuit comprising:

lateral PNP transistor means, connected to said first power supply terminal, to act as current source means that will provide said circuit output means;

vertical NPN transistor means connected, into current mirror configurations, to said second power supply terminal to act as current sink means that will provide said circuit input means;

means for coupling said PNP and said NPN transistor means together to perform a desired logic function; and



means for applying controlled currents to said circuit to determine the current logic state levels.

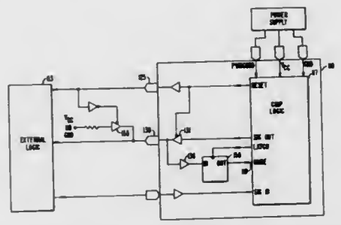
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5,051,622

## POWER-ON STRAP INPUTS

Robert M. Pleva, Livermore, Calif., assignor to Chips and Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 433,476, Nov. 8, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 607,206
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 8 Claims



1. In an integrated circuit device with internal circuitry having a portion responsive to a mode select signal at a control input, and a portion coupled to a signal pin, the improvement comprising:

a latch having a data input coupled to the signal pin, a data output coupled to the control input, and a clock input; and

means for providing a clock signal to said clock input of said latch during a power-on reset interval, said means being operative to maintain said latch in its latched state beyond the reset interval.

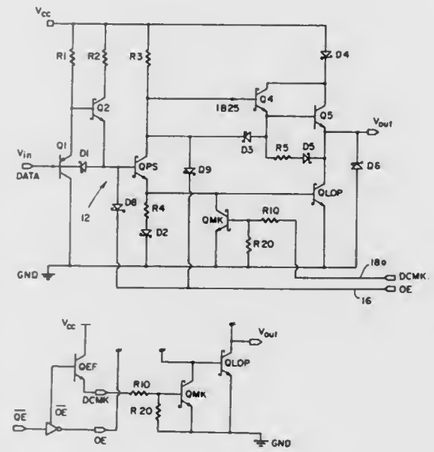


5,051,623

## TTL TRISTATE CIRCUIT FOR OUTPUT PULLDOWN TRANSISTOR

Roy L. Yarbrough, Hiram, and Julio R. Estrada, South Portland, both of Me., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 16, 1990, Ser. No. 537,903
Int. Cl.[5] H03K *19/02, 19/088*
U.S. Cl. 307—473 11 Claims





1. A DC Miller killer circuit for a TTL tristate output device having a data signal output ($V_{OUT}$) for transmitting data signals at high and low potential levels, a pulldown transistor element (QLOP) coupled to the data signal output for sinking current from the output to a low potential power rail, and an enable signal input circuit for receiving an OE signal and for establishing a high impedance third state at the data signal output comprising:

an $\overline{OE}$ signal input circuit for receiving an $\overline{OE}$ signal;

an emitter follower transistor element (QEF) having a base node coupled to the $\overline{OE}$ signal input circuit and an emitter node forming a DCMK signal output providing a DCMK signal in phase with the $\overline{OE}$ signal;

a Miller killer transistor element (QMK) having collector and emitter nodes coupled between a base node of the pulldown transistor element (QLOP) and the low potential power rail;

an a voltage divider circuit comprising first and second voltage drop components (R10,R20), separate from the Miller killer transistor element (QMK), coupled in series between the emitter follower transistor element (QEF) and the low potential power rail, with a common node between the first and second voltage drop components coupled to a base node of the Miller killer transistor element, said second voltage drop component (R20) having a voltage drop parameter value greater than a corresponding voltage drop parameter value of the first voltage drop component (R10) by a specified amount to provide required base drive current to the Miller killer transistor element (QMK) during the high impedance third state.

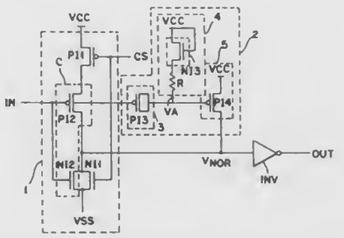
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5,051,624

## HIGH SPEED LEVEL CONVERTER TO CONVERT A TTL LOGIC SIGNAL TO A CMOS LOGIC SIGNAL

Yong-Bo Park, Busan, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suweon, Rep. of Korea

Filed Feb. 22, 1990, Ser. No. 484,120
Claims priority, application Rep. of Korea, Oct. 26, 1989, 89-15443[U]
Int. Cl.[5] H03K *5/12*
U.S. Cl. 307—475 5 Claims



1. A level converter comprising:

NOR gate means including a PMOS transistor (PI1) and a NMOS transistor (NI1) both of which are controlled by a control signal (CS), and a CMOS transistor pair (PI2, NI2) to the gates of which are provided a TTL signal;

inverter means connected to said NOR gate means for inverting an output signal from said NOR gate means; and

speed control means including a coupling part (3) for coupling with the TTL signal, said coupling part having an output node, a constant voltage part (4) for establishing a reference voltage (VA) and coupling it to said output node, and a speed control part (5) connected in parallel with said NOR gate means to said inverter means and responsive to the voltage at said output node for controlling a conversion speed of the converter.

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5,051,625

## OUTPUT BUFFER CIRCUITS FOR REDUCING NOISE

Hiroshi Ikeda, Yokohama; Takashi Kimura, Zushi, and Norio Fujiki, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 27, 1989, Ser. No. 427,337
Claims priority, application Japan, Oct. 28, 1988, 63-272462; Mar. 6, 1989, 1-53315; Apr. 7, 1989, 1-88636
Int. Cl.[5] H03K *19/092, 19/003, 19/094, 17/16*
U.S. Cl. 307—475 12 Claims

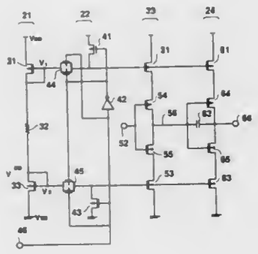
1. An output buffer circuit, comprising:

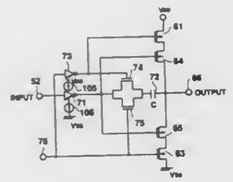
a pair of current sources connected to positive and negative power sources;

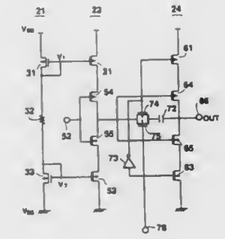
a first inverter having input and output terminals, coupled between the positive and negative power sources;

a second inverter having input and output terminals, coupled between the current sources and connected to the output

terminal of the first inverter, the second inverter including at least one of P-channel and N-channel MOSFETs; and







a capacitor connected between the input and output terminals of the second inverter.

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**5,051,626**

**BUFFER CIRCUIT FOR LOGIC LEVEL CONVERSION**

**Kiyoshi Kajii, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 397,833, Aug. 24, 1989, abandoned. This application Nov. 9, 1990, Ser. No. 610,461**

**Claims priority, application Japan, Aug. 30, 1988, 63-216732**

**Int. Cl.[5] H03K** *19/0175*

**U.S. Cl. 307—475** **7 Claims**

1. An input buffer circuit for converting the logic level of an input logic signal, comprising:

an input terminal to which said input signal is applied,

an output terminal;

an inversion circuit supplied with the input logic signal for inverting the logic level thereof, said inversion circuit comprising:

a first voltage source for supplying a first predetermined voltage,

a second voltage source for supplying a second predetermined voltage having a level lower than that of said first predetermined voltage,

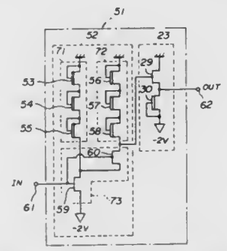
first resistance means having a first end connected to the first voltage source and a second end,

a first enhancement type field effect transistor having a drain connected to the second end of the first resistance means, a source connected to said second voltage source and a gate connected to said input terminal,

second resistance means having a first end connected to the first voltage source and a second end, and

a second enhancement type field effect transistor having a drain connected to the second end of the second resistance means, a source connected to the drain of said first enhancement type field effect transistor and a gate connected to the gate of the first enhancement type field effect transistor; and

level shift means, connected between the drain of the second enhancement type field effect transistor of said inversion circuit and the output terminal, for shifting the level of the signal produced at the drain of the second enhancement type field effect transistor and thereby producing and supplying to the output terminal an output logic signal having a converted logic level, relative to the input signal.



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**5,051,627**

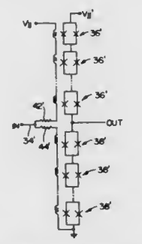
**SUPERCONDUCTING NONHYSTERETIC LOGIC DESIGN**

**Neal J. Schneier, Rancho Palos Verdes; Gerald R. Fischer, Playa Del Rey; Roger A. Davidheiser, Manhattan Beach, and George E. Avera, Camarillo, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.**

**Filed Dec. 29, 1989, Ser. No. 459,220**

**Int. Cl.[5] H03K** *19/95*

**U.S. Cl. 307—476** **24 Claims**



1. A superconducting nonhysteretic logic circuit, comprising:

an output circuit;

at least one pull-up nonhysteretic SQUID, connected to selectively couple the output circuit to a first power supply line having a first voltage state;

at least one pull-down nonhysteretic SQUID, connected to selectively couple the output circuit to a second power supply line having a second voltage state; and

at least one input circuit, connected to the pull-up and pull-down SQUIDs, to control switching of the SQUIDs between a superconducting state and resistive state, wherein the voltage on the output circuit is pulled to the first or second voltage state, depending on the states of signals applied to the input circuit;

and wherein

the pull-up SQUID has a control inductor with one terminal connected to the first power supply line and the other terminal connected to the input circuit;

the pull-down SQUID has a control inductor with one terminal connected to the second power supply line and the other terminal connected to the input circuit; and

the voltage state of the input circuit determines which of the SQUIDs becomes superconductive, which determines the voltage state of the output circuit, whereby the logic circuit functions as a non-inverting buffer.



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**5,051,628**

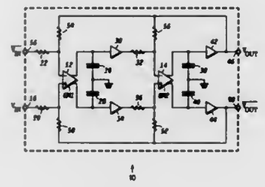
**INTEGRATED FILTER CIRCUIT**

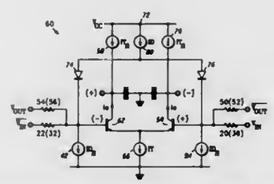
**John E. Hanna, Mesa, Ariz., assignor to Motorola, Inc., Tempe, Ariz.**

**Filed Jan. 2, 1990, Ser. No. 459,843**

**Int. Cl.[5] H03H** *11/12;* **H03K** *5/00*

**U.S. Cl. 307—520** **9 Claims**





1. An integrated filter including a pair of cascaded transconductance amplifiers wherein the improvement comprises:

the pair of cascaded amplifiers being operated in a differential mode and each having first and second inputs and outputs;

first and second resistors coupled respectively between first and second inputs of the filter and said first and second inputs of the first one of the pair of amplifiers;

first integrating means coupled between said first and second outputs of said first one of said pair of amplifiers;

third and fourth resistors coupled respectively between said first and second outputs of said first one of the pair of amplifiers and said first and second inputs of the second one of said pair of amplifiers;

second integrating means coupled between said first and second outputs of said second one of the pair of amplifiers and said first and second outputs being coupled respectively to first and second outputs of the filter;

a first feedback circuit coupled between said first output of the filter and said first inputs of the pair of amplifiers; and

a second feedback circuit coupled between said second output of the filter and said second inputs of the pair of amplifiers.

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**5,051,629**

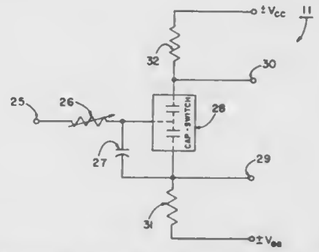
**SIGNAL DELAY AND REPRODUCTION DEVICE AND METHOD**

**Michael C. Hopkins, Rte. #1, Box 225M, Stokesdale, N.C. 27357**

**Continuation of Ser. No. 208,658, Jun. 20, 1988, abandoned. This application Aug. 1, 1990, Ser. No. 561,185**

**Int. Cl.[5] H03K** *5/159*

**U.S. Cl. 307—603** **20 Claims**



1. An adjustable signal delay device for use in electrical circuits comprising: a variable AC signal control means, external capacitating means, a power source, a dual state diode junction controlled capacitor-switch, said power source joined to said capacitor-switch, said AC signal control means electrically connected to said external capacitating means, said AC signal control means directly connected to said capacitor-switch, input circuitry, said input circuitry joined to said AC signal control means, an electrical output, said output joined to said capacitor-switch whereby a signal entering said input circuitry is exactly reproduced with the output pulse width identical to the input pulse width and adjustably delayed prior to exiting said output.

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**5,051,630**

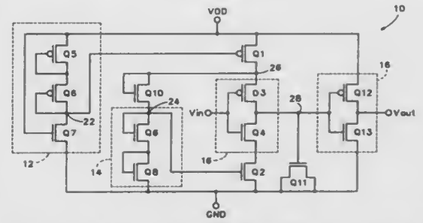
**ACCURATE DELAY GENERATOR HAVING A COMPENSATION FEATURE FOR POWER SUPPLY VOLTAGE AND SEMICONDUCTOR PROCESS VARIATIONS**

**Grigory Kogan, Portland, and David J. McKinney, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.**

**Filed Mar. 12, 1990, Ser. No. 491,790**

**Int. Cl.[5] H03K** *5/159, 19/094, 3/01*

**U.S. Cl. 307—603** **41 Claims**



1. An accurate delay generator for delaying the rising and falling edge of an input signal comprising:

(a) a current switch having an input for receiving the input signal, first and second current inputs, and a current output;

(b) means for charging having a control terminal, a first controlled terminal coupled to a first source of supply voltage, and a second controlled terminal coupled to the first current input of the current switch;

(c) means coupled to the control terminal of the charging means for generating a first multiple threshold voltage

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with respect to the first source of voltage, wherein the value of the first multiple threshold voltage is equal to N times a first threshold voltage of the first multiple threshold voltage generating means, where N is an integer greater than one;

(d) means for discharging having a control terminal, a first controlled terminal coupled to a second source of supply voltage, and a second controlled terminal coupled to the second current input of the current switch;

(e) means coupled to the control terminal of the discharging means for generating a second multiple threshold voltage with respect to the second source of voltage, wherein the value of the second multiple threshold voltage is equal to N times a second threshold voltage of the second multiple threshold voltage generating means, where N is an integer greater than one;

(f) means for storing charge coupled to the current output of the current switch; and

(g) an output inverter stage having an input coupled to the current output of the current switch and an output for providing a delayed version of the input signal.

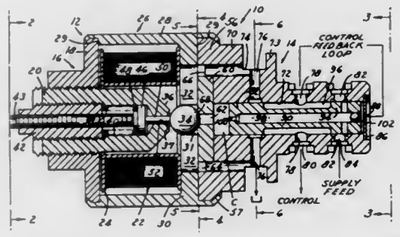
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**5,051,631**

## ELECTROMAGNETIC SOLENOID VALVE WITH VARIABLE FORCE MOTOR

**David L. Anderson, Muskegon, Mich., assignor to SPX Corporation, Muskegon, Mich.**

**Filed Jul. 16, 1990, Ser. No. 553,893**
**Int. Cl.[5] F16K** *31/06*
**U.S. Cl. 310—14** **8 Claims**




1. An electromagnetic variable force motor circuit comprising:

a solenoid including

a coil,

a pole piece associated with said coil,

a ball armature,

means defining a first seat,

spring means urging said ball armature toward said first seat and away from said pole piece,

means defining a fluid chamber adjacent said first seat,

said ball armature and said first seat defining a first orifice extending between said ball armature and said fluid chamber,

first passage means for providing supply pressure to said fluid chamber,

means defining a fixed second orifice associated with said first passage means,

a valve device including a movable member spaced from and out of contact with said ball armature at all times and positioned adjacent the fluid chamber so that it is responsive to fluid pressure in said fluid chamber,

second passage means for providing supply pressure to said valve device urging said movable member toward said fluid chamber,

third passage means for providing control flow from said valve device,

fourth passage means for providing exhaust flow from said fluid chamber when said ball armature is moved away from said first seat such that said ball armature controls flow through said first orifice to said fourth passage means upon excitation of said coil,

said device being operable to variably restrict flow in said second and third passage means.

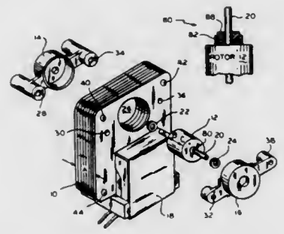
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**5,051,632**

## ASSEMBLING ELECTRIC MOTORS WITH REDUCED END-PLAY

**Max Lautner, Myrtle Beach, S.C.; Fred Hoffman, Chicago, and Edward Melnikov, Des Plaines, both of Ill., assignors to Uppco Incorporated, Chicago, Ill.**

**Continuation of Ser. No. 343,004, Apr. 25, 1989, abandoned, which is a division of Ser. No. 246,364, Sep. 20, 1988, abandoned.**
**This application Jul. 10, 1990, Ser. No. 550,806**
**Int. Cl.[5] H02K** *15/16, 5/26*
**U.S. Cl. 310—42** **4 Claims**




1. A custom made electric motor with limited end-play, said motor comprising stator means having a hole formed therein and at least one coil associated therewith, said stator being subject to widely varying manufacturing tolerances whereby the thickness of a plurality of said stators vary over a range which is greater than can be accepted, rotor/shaft assembly means passing through said hole in said stator, end caps for providing end-bearing supports for said rotor/shaft assembly means, said end caps being secured to opposite sides of said stator whereby the distance between said end-bearing support is fixed by the thickness of said stator, and a compressible means for fixing an effective length of said rotor/shaft, said compressible means being mounted on at least one end of said rotor/shaft assembly means, said compressible means being compressed with reference to the actual thickness of a specific one stator in order to custom fit the axial length of a specific one rotor/shaft assembly means to match the length of said specific rotor/shaft assembly to the thickness of said specific stator, whereby said specific rotor/shaft and specific stator may be put together to make one custom fitted motor.

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**5,051,633**

## MULTIPOLAR STEPPING MOTOR

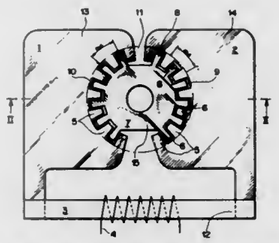
**Mai X. Tu, Chavannes, and Michel Schwab, Bienne, both of Switzerland, assignors to Matthias Scholer, Huttwil, Switzerland**

**Filed Aug. 9, 1989, Ser. No. 390,989**
**Claims priority, application Switzerland, Aug. 25, 1988, 3162/88**
**Int. Cl.[5] H02K** *37/00*
**U.S. Cl. 310—49 R** **9 Claims**

1. A multipolar stepping motor of the type having a central axis, a permanently magnetized rotor with N pairs of poles distributed about said central axis and magnetized in a direction parallel thereto, and a magnetic stator circuit comprising a core, a winding mounted on said core, and two main pole pieces facing one another in the same plane perpendicular to said axis, each of said pole pieces being connected to a respective end of said core and having a concave rim provided with pole teeth distributed about said axis, and said rotor being



situated in a plane parallel to that of said pole pieces, wherein the improvement comprises:



an intermediate pole piece disposed between said main pole pieces and including intermediate teeth situated opposite said pole teeth and meshing therewith.

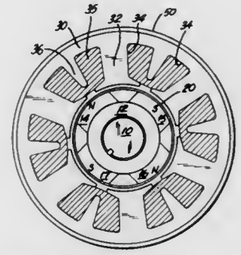
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**5,051,634**

## MOTOR STATOR HEAT SPIKE

**Bernard P. Overton, Blacksburg, Va., assignor to Kollmorgen Corporation, Simsbury, Conn.**

**Filed Jun. 29, 1989, Ser. No. 373,387**
**Int. Cl.[5] H02K** *5/18*
**U.S. Cl. 310—64** **3 Claims**



1. An electric motor comprising:

a stator being a stationary wound member; a rotor being a movable field member, the magnetic field of said rotor interacting with energized windings of said stator, causing said rotor to move relative to said stator;

a plurality of stator slots, each stator slot having one elongated solid heat spike of thermal conductive material said heat spikes each extended radially inward from the stator adjacent to said windings to at least the midpoint of the stator slot area, each heat spike substantially centered around the midpoint of slot arc along the stator shell, such that said heat spikes are widest when farther away from said rotor and said heat spikes are narrowest when closer to said rotor; and support means for maintaining an air gap between said stator and said rotor.

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**5,051,635**

## BALL-SPLINED SHAFT ASSEMBLY

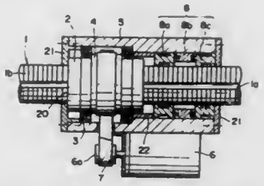
**Shin Kasahara, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan**

**Filed Dec. 27, 1989, Ser. No. 457,450**
**Claims priority, application Japan, Dec. 28, 1988, 63-329006**
**Int. Cl.[5] H02K** *7/06*
**U.S. Cl. 310—80** **13 Claims**

1. A ball-splined shaft assembly comprising:

a shaft extending straight over a predetermined length, said shaft being formed with a plurality of circumferential grooves spaced apart from one another and at least one longitudinal groove extending in parallel with a central axis of said shaft;

first holding means for holding said shaft such that said shaft may be moved longitudinally relative to said first holding means in a first mode of operation along said at least one longitudinal groove, said first holding means being rotatable together with said shaft around the center axis of said shaft in a second mode of operation;



second holding means for rotatably holding said first holding means, said second holding means including a housing;

first driving means fixedly mounted with respect to said housing for driving and rotating said first holding means around the center axis of said shaft; and

second driving means mounted with respect to said housing for driving and moving said shaft in its longitudinal direction relative to said first holding means without rotation of said shaft.

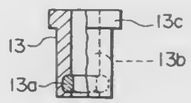
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**5,051,636**

## DYNAMIC ELECTRIC MACHINE

**Noriyuki Ishimoto, Aichi, and Hirofumi Iida, Obu, both of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan**

**Filed Apr. 30, 1990, Ser. No. 516,630**
**Int. Cl.[5] F16H** *33/10*
**U.S. Cl. 310—90** **2 Claims**




1. A dynamic electric machine having an end bracket having a plurality of seats to which a cover is fixed, comprising:

a plurality of generally cylindrical rubber bushings, each said bushing having

a bore extending therethrough,

a nut entirely embedded there inside near one end of the bore, and

an outer peripheral flange portion formed at another end of the bore, said cover being placed on said flange portions; and

bolts driven into said nuts from an outer side of said cover so as to fix said cover to said seats through said rubber bushings.

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**5,051,637**

## FLUX CONTROL TECHNIQUES FOR MAGNETIC BEARING

**Tim Harris; Gordon Brailean; Theodor Bardas; Cal Oleksuk, all of Calgary, and Vaclav Kulle, Blind Bay, all of Canada, assignors to Nova Corporation of Alberta, Calgary, Canada**

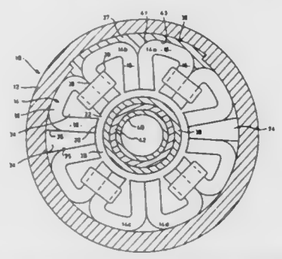
**Filed Mar. 20, 1990, Ser. No. 495,913**
**Int. Cl.[5] H02K** *1/14;* **F16C** *32/04*
**U.S. Cl. 310—90.5** **19 Claims**

1. A magnetic bearing comprising a stator assembly and a rotor assembly separated by an air gap, one of said assemblies

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having a plurality of discrete pole pieces, facing each other with opposed flanks, each having a pair of poles and being arranged in seriatim about the axis of rotation of said rotor assembly, coil means associated with the pole pieces to generate a magnetic flux in said pole pieces and establish a magnetic



circuit through said pole pieces between said rotor and stator assemblies, at least one insert of non-magnetic material being interposed between opposed flanks of a pair of adjacent pole pieces thereby to inhibit migration of flux between said adjacent pole pieces.

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**5,051,638**

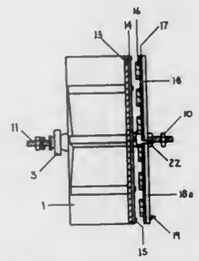
**MAGNETICALLY VARIABLE AIR RESISTANCE WHEEL FOR EXERCISE DEVICES**

**Nathan Pyles, 640 Peck Rd., Hilton, N.Y. 14468**

**Filed Dec. 19, 1989, Ser. No. 452,637**

**Int. Cl.[5] H02K** *49/00;* **A63B** *21/00, 23/04*

**U.S. Cl. 310—105** **14 Claims**



1. A load applying system for an exercise device, including:
a manually operable rotor including an integral fan wheel and a first load disc;
a non-rotatable second load disc mounted adjacent to said first load disc;
one of said load discs including a ferromagnetic layer and a nonmagnetic conductive layer; and
the other of said load discs including a plurality of magnets;
whereby the rotation of said rotor is effective to generate a fan load on said rotor and a corresponding air movement from said fan wheel for cooling of operator and equipment, and to induce an eddy current load on said rotor.

**5,051,639**

**Y-DELTA CONVERSION SWITCHES ON DUAL STATOR INDUCTION MOTOR**

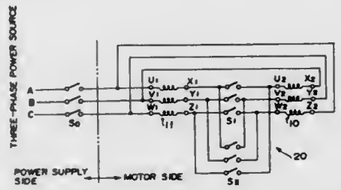
**Toshihiko Satake, Higashihiroshima, and Yukio Onogi, Hiroshima, both of Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan**

**Filed Sep. 26, 1990, Ser. No. 588,587**

**Claims priority, application Japan, Sep. 27, 1989, 1-252662**

**Int. Cl.[5] H02P** *1/32, 5/28, 8/00, 13/06*

**U.S. Cl. 310—112** **7 Claims**




1. An induction motor including a single motor formed in one piece having a first rotor core and a second rotor core axially mounted on a common axis with an airspace or a nonmagnetic portion being provided between said first and second rotor cores having on said first and second rotor cores a plurality of rotor conductive members extending therethrough; a first and a second stator disposed side by side and surroundingly facing respective ones of said rotor cores, said first and second stators having a first stator core and a second stator core on which a plurality of windings of polyphase are wound; and a phase changing means for varying the phase difference between the rotational magnetic fields around said first rotor core generated by said first stator and the rotational magnetic fields around said second rotor core generated by said second stator, said phase changing means comprising:
a first-connection changing switch, disposed between the stator windings of said first stator and the stator windings of said second stator;
a second-connection changing switch, disposed between the stator windings of said first stator and the stator windings of said second stator;
said first-connection changing switch and said second-connection changing switch being for making the interconnection of said respective stator windings:
a series Δ-connection in which said phase difference is 0° when said first-connection switch is in its closed state and said second-connection switch is in its open state,
a parallel Y-connection in which said phase difference is 60° when said first-connection switch is in its closed state and said second-connection switch is in its closed state, and
a series Δ-connection in which said phase difference is 120° when said first-connection switch is in its open state and said second-connection switch is in its closed state;
at least one of said first-switch and said second-switch being adapted to be always closed during the motor operation.

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**5,051,640**

**HETEROPOLAR EXCITED SYNCHRONOUS MACHINE**

**Werner Freise, Kaiserslautern, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich**

**Filed Apr. 27, 1990, Ser. No. 516,063**

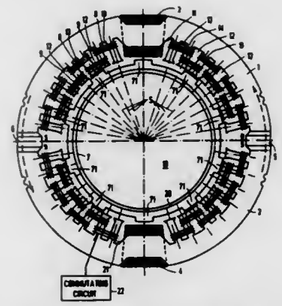
**Claims priority, application European Pat. Off., Apr. 27, 1989, 89107629.1**

**Int. Cl.[5] H02K** *19/00*

**U.S. Cl. 310—162** **34 Claims**

1. A synchronous machine excited via heteropolarization comprising:
a) a stator having a plurality of stator teeth, said stator teeth forming stator slots therebetween, said stator being subdivided into a plurality of stator sectors;
b) a toothed, laminated rotor arranged in the inner circumference of the stator, the rotor teeth and the stator teeth forming an air-gap therebetween;
c) at least one excitation winding coupled with the stator for generating an excitation magnetic field;
d) a power winding formed around at least one of the stator's teeth;
e) permanent magnets coupled with the stator generating permanent magnetic fields; and





f) said plurality of stator sectors including one of said at least one excitation windings wound around each of said plurality of stator sectors, respectively, said permanent magnets being located between the stator sectors arranged tangentially to the inner circumference and having the permanent magnetic fields oppositely directed to the excitation magnetic fields of the excitation windings.

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**5,051,641**

**TRANSVERSAL FLOW MACHINE IN ACCUMULATOR ARRANGEMENT**

**Herbert Weh, Braunschweig, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany**

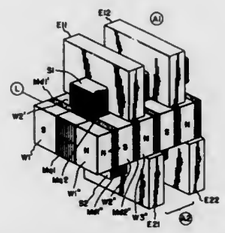
**PCT No. PCT/EP88/00086, § 371 Date Aug. 11, 1989, § 102(e) Date Aug. 11, 1989, PCT Pub. No. WO88/06375, PCT Pub. Date Aug. 25, 1988**

**PCT Filed Feb. 5, 1988, Ser. No. 397,477**

**Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3705089**

**Int. Cl.[5] H02K** *21/12, 41/03, 29/00*

**U.S. Cl. 310—163** **16 Claims**



1. An alternating current motor comprising:
a rotor having an exciter part arranged therein, said rotor rotatable in a given direction, and
a stator with two fixed armature coils running in the direction of rotation,
wherein each of the armature coils is surrounded on three sides by a plurality of substantially U-shaped soft iron elements arranged transversely in each case to the appertaining armature coil,
the mean spacing of two successive soft iron elements corresponds in each case to two pole divisions, the free ends forming the stator poles of the soft iron elements of the one armature coil bound defining one side of an air gap and the free ends forming the stator poles of the soft iron elements of the other armature coil defining the other side of the air gap,
the free ends of the soft iron elements on both sides of the gap are shifted by one pole division against one another in the direction of rotation,
the exciter part comprises in the gap toward both sides of the gap and opposite the stator poles a permanent-magnetically excited series of soft iron blocks forming a series of exciter poles with the polarity of the poles alternating along the direction of rotation, characterized in that:
between the soft iron blocks of the rotor exciter part in the gap plane along and/or transverse to the direction of rotation there are arranged permanent magnets magnetized with alternating polarity,
and that the face surface of the permanent magnets lying opposite the soft iron blocks is greater than half the face surface of the exciter poles formed by the soft iron blocks on the air gap.

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**5,051,642**

**APPARATUS FOR FIXING THE WINDING ENDS OF A STATOR WINDING IN A DYNAMO-ELECTRICAL MACHINE**

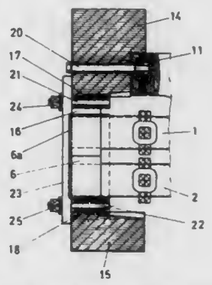
**Daniel Hediger, Othmarsingen, and Hans-Werner Stankowski, Nenenhof, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland**

**Filed Aug. 15, 1990, Ser. No. 567,790**

**Claims priority, application Switzerland, Sep. 20, 1989, 3426/89**

**Int. Cl.[5] H02K** *3/46*

**U.S. Cl. 310—260** **15 Claims**

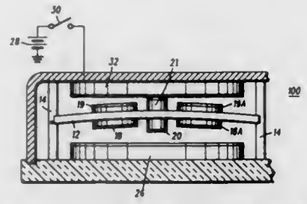


1. An apparatus for fixing winding ends of a stator winding in a dynamoelectrical machine, in which the winding ends have inner and outer layers, which are mechanically and electrically connected to each other at an axially outer end, comprising:
an outer support ring;
an inner support ring;
means for connecting two inner and outer support rings to each other;
means for bracing the inner and outer support rings and said winding ends; and
means for fastening the outer support ring to an end face of a stator laminated core;
wherein said means for bracing includes filling pieces inserted between two neighboring winding ends in the circumferential direction, said filling pieces being substantially trapezoidal in radial cross-section; and
wherein said means for bracing further includes wedges movable in the axial direction to radially brace assigned ones of said filling pieces in the radial direction from at least one of said inner and outer support rings by means of retightenable wedges.

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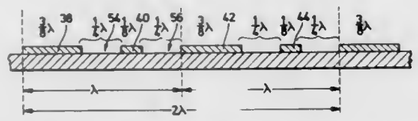


**5,051,643**
**ELECTROSTATICALLY SWITCHED INTEGRATED RELAY AND CAPACITOR**
Lawrence Dworsky, Northbrook, and Marc K. Chason, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 30, 1990, Ser. No. 575,092
Int. Cl.[5] H02N *1/00*
U.S. Cl. 310—309 25 Claims



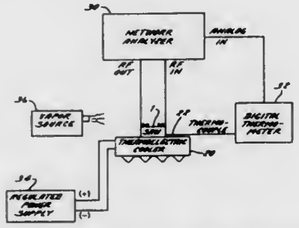
1. An electrostatically operated relay having an armature and stator and contacts that are closed by electrostatic forces existing between the armature and the contacts comprised of:
deflectable beam means, having at least first and second sides, fixed to a substrate at at least one point, for supporting at least first and second electrodes coupled to said first side of deflectable beam means, both said first and second electrodes having contact surfaces and having first and second thickness respectively, said first thickness being greater than said second thickness, said first and second electrodes respectively carrying first and second electrical signals, said deflectable beam means having a first non-deflected position and at least a second deflected position; and
third electrode means, fixed to said substrate, for establishing an electric field between said third electrode and said second electrode and for electrically coupling signals from said first electrode to said third electrode, said third electrode being separated from said contact surfaces by a first separation distance when said deflectable beam means is in said first non-deflected position, said third electrode being at an electric reference potential for signals carried on said first and second electrodes such that an electric field established between said second electrode and said third electrode causes said deflectable beam means to deflect to said second deflected position whereat an electrical coupling is established between said first and third electrodes.

**5,051,644**
**ELECTRODE STRUCTURE WITH CONSTANT VELOCITY AND PREDETERMINED REFLECTIVITY**
Peter Wright, Dallas, Tex., assignor to R. F. Monolithics, Inc., Dallas, Tex.
Filed Apr. 19, 1990, Ser. No. 510,964
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 B 24 Claims



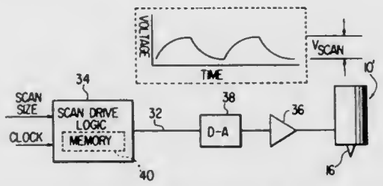
1. An electrode structure for use in transducers and gratings in a surface acoustic wave device, said structure having no reflections and having the velocity of a uniform two electrode per wavelength structure and comprising:
a piezo-electric substrate;
only four spaced electrodes on said substrate for each 2λ distance of electrode structure;
the first two electrodes having identical widths and a center-to-center spacing of 3λ/4 to cause wave cancellation between the first two electrodes; and
the second two electrodes having identical widths and a center-to-center spacing of λ/4 to cause wave cancellation between the second two electrodes so as to create an electrode structure having the velocity of a uniform two electrode per wave length structure and no reflections.

**5,051,645**
**ACOUSTIC WAVE $H_2O$ PHASE-CHANGE SENSOR CAPABLE OF SELF-CLEANING AND DISTINGUISHING AIR, WATER, DEW, FROST AND ICE**
John G. Brace, Brown Deer, and Thomas S. Sanfelippo, Milwaukee, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.
Filed Jan. 30, 1990, Ser. No. 472,125
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—313 D 22 Claims



1. A surface acoustic wave $H_2O$ phase-change sensor comprising:
(a) a piezoelectric substrate;
(b) metallization patterns fabricated on said piezoelectric substrate to form an input interdigitated transducer and an output interdigitated transducer;
(c) electrical connectors connected to said metallization patterns;
(d) a hydrophobic surface treatment covering said metallization patterns to form a sensing surface; and
(e) means for detecting and discriminating between at least water, frost and ice on said sensing surface, said means including said piezoelectric substrate configured to have a thickness to acoustical wavelength ration of 9 or higher.

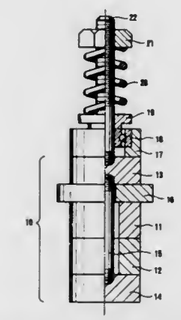
**5,051,646**
**METHOD OF DRIVING A PIEZOELECTRIC SCANNER LINEARLY WITH TIME**
Virgil B. Elings, and John A. Gurley, both of Santa Barbara, Calif., assignors to Digital Instruments, Inc., Santa Barbara, Calif.
Continuation of Ser. No. 7/344,750, Apr. 28, 1989, abandoned. This application Nov. 29, 1990, Ser. No. 622,353
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—317 26 Claims



1. In a method of scanning a nonlinear piezoelectric scanner having an attached end and a free end to produce a cyclic lateral scanning motion of the free end over a distance d by the application of a changing scan voltage to electrodes carried by the piezoelectric scanner, the improvement by which the scanning motion of the free end is made linear with time, comprising the steps of:
producing a nonlinear driving voltage which is a predetermined function of the nonlinearity of the particular piezoelectric scanner being employed, said predetermined function at least including a term which varies as a function of position of the free end within a scan; and operating in an open-loop mode by applying the nonlinear driving voltage to the electrodes of the scanner.



**5,051,647**
**ULTRASONIC MOTOR**
Tadao Uchikawa; Osamu Ohnishi; Osamu Myohga, and Takeshi Inoue, all of Tokyo, Japan, assignors to NEC Corporation, Japan
Filed Jul. 5, 1990, Ser. No. 548,574
Claims priority, application Japan, Jul. 6, 1989, 1-176511; Jul. 6, 1989, 1-176512; Jul. 10, 1989, 1-178553; Jul. 10, 1989, 1-178554; Jul. 10, 1989, 1-178555
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—323 20 Claims

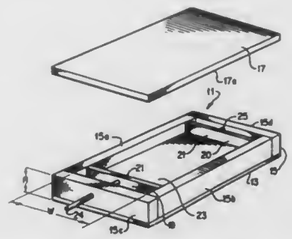


1. An ultrasonic motor comprising a rotor and a stator, the stator being urged against the rotor and including first and second blocks and a longitudinal-torsional composite vibrator in which longitudinal and torsional piezoelectric elements are sandwiched between said blocks, wherein said first block is located nearer the rotor than the second block and includes a piezoelectric side portion and a rotor side portion, the inertial mass of the piezoelectric side portion being larger with respect to torsional vibration than that of said rotor side portion.

**5,051,648**
**FLAT TYPE LOW PRESSURE GAS DISCHARGE LAMP**
Katsubide Misono, and Hisashi Honda, both of Kanagawa, Japan, assignors to Toshiba Lighting & Technology Corporation, Tokyo, Japan
Filed Mar. 16, 1990, Ser. No. 494,537
Claims priority, application Japan, Mar. 17, 1989, 1-065722
Int. Cl.[5] H01J *61/24, 7/24*
U.S. Cl. 313—13 11 Claims

1. A flat type low pressure gas discharge lamp for radiating light comprising:
a lamp body which defines an internal gas discharge space having a substantially rectangular cross section orthogonal to the direction of discharge of width W and height H;
first and second electrode means disposed in the lamp body and arranged for generating an alternating gas discharge therebetween when a potential is applied thereto; and
a fill gas including argon at a pressure P (torr) in the discharge space, the pressure P satisfying the following relationship:
(i) when the aspect ratio F defined as the ratio W/H is equal to or greater than four (4) and is equal to or less than eight (8),

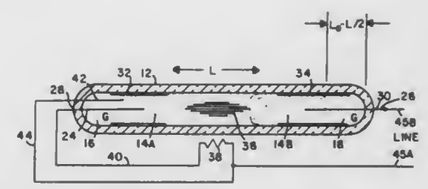
$10 \leqq P \leqq -5/2(F-4)+40$ and



(ii) when the aspect ratio F is equal to or greater than eight (8) and is equal to or less than eighteen (18),

$10 \leqq P \leqq 30$.

**5,051,649**
**ARC DISCHARGE LAMP WITH LIQUID METAL AND HEATING MEANS**
John F. Waymouth, Marblehead, Mass., assignor to John F. Waymouth Intellectual Property and Education Trust, Marblehead, Mass.
Filed Sep. 8, 1989, Ser. No. 405,209
Int. Cl.[5] H01J *61/20, 61/60, 7/30, 7/24*
U.S. Cl. 313—15 14 Claims



1. A high pressure discharge device comprising:
a hermetically sealed arc tube member having two ends disposed in said device;
a determined quantity of a vaporizable liquid metal disposed in said arc tube and having a volume less than that of the volume of the arc tube member whereby to leave a space at at least one end of the arc tube;
a resistance means for heating the liquid metal;
a first principal electrode sealed adjacent one end of said arc tube member, said first electrode extending sufficiently thereinto to achieve contact with said liquid metal;
a second principal electrode sealed adjacent the other end of said arc tube member, said second electrode extending sufficiently thereinto to achieve contact with said liquid metal during operation of said device;
a third electrode having one end connected in series with said resistance means and the other end sealed in said arc tube member and connected in parallel with the second electrode;
said third electrode extending sufficiently into said arc tube member to achieve contact with a segment of the liquid metal at all times;
an inert gas disposed in the sections of the arc tube not filled with liquid metal and in contact with the liquid metal;
said inert gas being at sufficient pressure to force the liquid metal away from said first electrode; and wherein said

resistance means heats a portion of the liquid metal in the section between the first and second electrodes to a sufficient temperature to vaporize a portion of the liquid metal to provide a vapor pressure of said liquid metal sufficiently greater than the pressure of the inert gas in the inert gas sections whereby the liquid metal is separated into two sub-columns by the vaporized metal;

said vaporized metal forming a vapor contact arc between the separated liquid metal sub-columns.

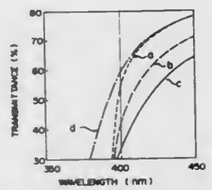
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**5,051,650**

## ULTRAVIOLET-SUPPRESSED LIGHT SOURCE, COATING AGENT USED IN THE SAME, AND METHOD FOR MANUFACTURING THE SAME

**Akira Taya, Kawasaki; Keiji Hatakeyama, Yokohama; Kanehiro Saito, Chiba; Mitsumasa Saito, and Kazuhiko Osada, both of Narashino, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Sumitomo Cement Co., Ltd., Tokyo, both of, Japan**

Filed Feb. 14, 1990, Ser. No. 480,127
Claims priority, application Japan, Feb. 17, 1989, 1-37686
Int. Cl.[5] H01J *5/16, 61/40*
U.S. Cl. 313—112 23 Claims




1. An ultraviolet-suppressed light source, wherein a film consisting of a fine powder of zinc oxide and titanium oxide and a binder is formed on an outer surface of a glass tube constituting said light source.

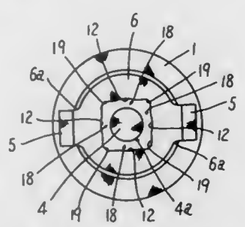
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**5,051,651**

## IGNITION PLUG WITH A HOLLOW CYLINDRICAL GROUND ELECTRODE AND AN IGNITION PROCESS BY THE USE THEREOF

**Ryohei Kashiwara, Sakai; Hideaki Kashiwara, Kyoto; Hidehiko Noguchi, and Takeaki Kashiwara, both of Osaka, all of Japan, assignors to Tadaharu Fujiwara, Osaka, Japan**

Filed Sep. 19, 1989, Ser. No. 409,347
Claims priority, application Japan, Nov. 24, 1988, 63-296924; Feb. 8, 1989, 1-29174
Int. Cl.[5] H01T *13/32*
U.S. Cl. 313—139 19 Claims




1. An ignition plug for an internal combustion engine comprising a housing; a cylindrical high-tension center electrode extending axially from said housing and having a substantially flat outer axial face and a radial face; a substantially annular ground electrode having a central axis, an inner annular surface and a first and second substantially flat axial face; wherein said ground electrode is axially spaced from said housing by a pair of legs extending axially from said housing, and is coaxial with said center electrode, said first axial face of said ground electrode disposed in a plane substantially the same as a plane of said axial end of the center electrode, wherein said annular inner surface of said ground electrode defines four substantially truncated triangular-shaped recesses equally spaced apart thereby defining a fuel ignition area and the annular inner surface between said recesses define a spark gap between the center electrode and the ground electrode.

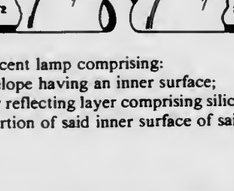
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**5,051,652**

## PANEL WITH ANTI-REFLECTIVE MULTI-LAYERED FILM THEREON

**Toshiaki Isomura, Yokohama, and Tsunemitsu Koizumi, Isehara, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan**

Filed Dec. 4, 1989, Ser. No. 445,026
Claims priority, application Japan, Dec. 6, 1988, 63-306818; Jun. 20, 1989, 1-71228[U]
Int. Cl.[3] H01J *31/00;* H04N *5/72*
U.S. Cl. 313—479 11 Claims




1. A panel with an anti-reflective multi-layered film thereon which comprises

a glass substrate,

an electricity collector for leading static electricity which is formed by baking an electric conductive frit paste on the glass substrate,

an anti-reflective multi-layered film formed on the glass substrate except the electricity collector, which has an inner electric conductive layer to provide antistatic effect, and

a lead terminal for earth formed on the electricity collector, whereby static electricity produced on the glass substrate with the anti-reflective multi-layered film is collected at the electricity collector through the electric conductive layer so that the static electricity is led to the outside through the lead terminal for earth via the electricity collector.

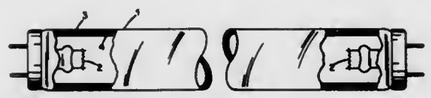
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**5,051,653**

## SILICON DIOXIDE SELECTIVELY REFLECTING LAYER FOR MERCURY VAPOR DISCHARGE LAMPS

**Barry G. DeBoer, Georgetown, and Sharon B. Rutfield, Chelmsford, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.**

**Continuation-in-part of Ser. No. 62,262, Jun. 12, 1987, abandoned. This application Jun. 2, 1988, Ser. No. 199,152**
Int. Cl.[5] H01J *1/70*
U.S. Cl. 313—489 3 Claims



1. A fluorescent lamp comprising:

a lamp envelope having an inner surface;

a selectively reflecting layer comprising silica disposed on at least a portion of said inner surface of said envelope at a coating weight from about 0.1 to about 4 mg/cm$^2$, said selectively reflecting layer comprising at least about 80 weight percent silica having a primary particle size from about 5 to about 100 nm with at least about 50 weight percent of said silica having a primary particle size from about 17 to about 80 nm;

a phosphor coating disposed over said selectively reflecting layer and on any uncoated portion of said inner surface of said lamp; and

said selectively reflecting layer contains greater than or equal to 1.0 mg/cm$^2$ of silica.



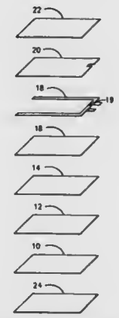
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**5,051,654**

## ELECTROLUMINESCENT LAMP AND METHOD OF MANUFACTURE

**Larry A. Nativi, Rocky Hill, Conn.; Robert H. Marion, Lebanon, and Tahsin A. Ashour, Amherst, both of N.H., assignors to Loctite Luminescent Systems, Inc., Lebanon, N.H.**

**Continuation of Ser. No. 285,796, Dec. 16, 1988, abandoned. This application Jun. 27, 1990, Ser. No. 544,761**
Int. Cl.[5] H05B *33/04*
U.S. Cl. 313—506 17 Claims




1. An improved electroluminescent lamp assembly comprising (a) an electroluminescent lamp comprising, in order, a base electrode layer, an electroluminescent phosphor layer, a transparent or translucent electrode layer and a busbar in contact with said transparent or translucent electrode layer and (b) a moisture barrier encasing said electroluminescent lamp (a), wherein the improvement comprises the presence of at least one desiccant layer in said electroluminescent lamp (a), said desiccant layer comprising a cured, patterned, hygroscopic film which has been prepared by applying a liquid film of a curable film-forming hygroscopic coating material, in a pattern, to at least one of the other layers in said electroluminescent lamp (a) and thereafter curing the same in-situ.

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**5,051,655**

## ELECTRODES FOR SINGLE ENDED ARC DISCHARGE TUBES

**Emmett H. Wiley, Chesterland, Ohio, assignor to Venture Lighting International, Inc., Solon, Ohio**

Filed Jan. 28, 1987, Ser. No. 7,618
Int. Cl.[5] H01J *61/04*
U.S. Cl. 313—631 11 Claims

1. In a single ended arc discharge tube comprising:

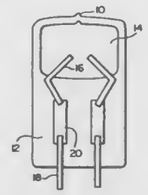
an envelope closed at one end with an exhaust tip-off and closed at the other end with a pinch seal;

a pair of spaced parallel ribbons embedded in said pinch seal;

a pair of spaced lead-in wires electrically connected one each to said ribbons within said pinch seal and extending out of said pinch seal for connection to a source of electrical power; and

a pair of electrodes connected one each to said ribbons within said pinch seal and extending out of said pinch seal into said envelope,

the improvement wherein said electrodes diverge within said pinch seal commencing at the connection to said ribbons so as to exit said pinch seal spaced apart a distance significantly greater than the distance between said ribbons and greater than the distance therebetween at any point within said envelope.




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**5,051,656**

## TRAVELLING-WAVE TUBE WITH THERMALLY CONDUCTIVE MECHANICAL SUPPORT COMPRISING RESILIENTLY BIASED SPRINGS

**Sunder S. Rajan, Anaheim; Roger S. Hollister, Torrance, and Thomas P. Carlisle, Rolling Hills Estates, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.**

Filed Sep. 5, 1989, Ser. No. 402,723
Int. Cl.[5] H01J *23/24*
U.S. Cl. 315—3.5 13 Claims




4. In a travelling wave-tube having an axis, and in which a substantially cylindrically-shaped circuit section is axially supported by a thermally conductive support within a tubular-configured vacuum wall, the improvement comprising:

means defining grooves in the circuit section extending in a direction along and positioned about the axis; and

springs disposed in respective ones of said groove means and resiliently biased in intimate mechanical and thermal contact between said groove means and the vacuum wall in which said springs comprise helical springs.

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**5,051,657**

## SAFETY FILAMENT ASSEMBLY FOR DOUBLE-ENVELOPED ARC DISCHARGE LAMP

**Simone P. Bazio, Bedford, and Martin E. Muzeroll, Merrimack, both of N.H., assignors to GTE Products Corp., Danvers, Mass.**

Filed Jun. 15, 1990, Ser. No. 538,562
Int. Cl.[5] H01J *7/44, 13/46, 17/34, 19/78*
U.S. Cl. 315—73 14 Claims

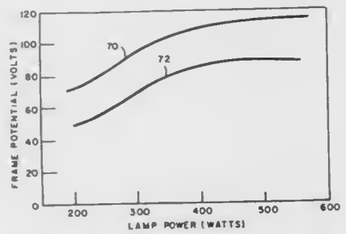
1. An electric lamp assembly comprising:

a sealed outer envelope;

a lamp capsule mounted within said outer envelope for generating light upon application of electrical energy, said lamp capsule containing a fill material including an alkali metal or an alkali metal compound;

means for coupling electrical energy through said outer

envelope to said lamp capsule, said coupling means including a safety filament within said outer envelope for extinguishing said lamp capsule within a predetermined time after the outer envelope is broken and the safety filament is exposed to air, said safety filament being connected in series with said lamp capsule;




an electrically insulating sleeve disposed around said safety filament; and

means for mounting said safety filament and said sleeve within said outer envelope, said mounting means including means for positioning said safety filament in said sleeve without contact between said safety filament and said sleeve.

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**5,051,658**

**ELECTRIC HIGH-PRESSURE DISCHARGE LAMP FOR USE AS A MOTOR VEHICLE HEADLAMP**

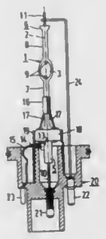
**Dirk Van Pijkeren, Corning, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 2, 1990, Ser. No. 591,575**

**Claims priority, application Netherlands, Nov. 21, 1989, 8902866**

**Int. Cl.[5] B60Q *1/04***

**U.S. Cl. 315—82** **2 Claims**



1. An electric high-pressure discharge lamp for use as a motor vehicle headlamp, comprising

a discharge vessel defining a lamp axis and enclosing a discharge space between, said discharge vessel having first and second portion end portions each comprising a respective seal adjoining said discharge space, a pair of electrodes and a gas filling in said discharge space, and current supply conductors of the pair of electrodes extending from each electrode through a respective seal to the exterior of said discharge vessel,

a holder body of insulating material in which said first end portion of said discharge vessel is indetachably secured, said holder body having electrical contacts connected to respective said current supply conductors,

characterized in that:

a light-receiving window of a photoelectric element is positioned inside said holder body and aimed at said first end portion of said discharge vessel.

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**5,051,659**

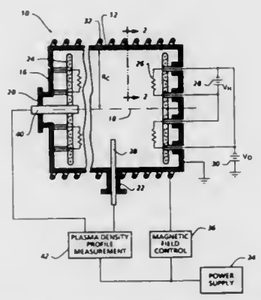
**BULK PLASMA GENERATION**

**Han S. Uhm, Potomac; Joel D. Miller, Laurel; Ralph F. Schneider, Burtonsville, and Daniel J. Weidman, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jan. 30, 1991, Ser. No. 647,903**

**Int. Cl.[5] H05H *1/02***

**U.S. Cl. 315—111.41** **10 Claims**




1. In a device for generating steady state plasma, including a housing having opposite axial ends between which an axis extends longitudinally through a body of gas ionized by electrons, electron repelling grids positioned within the housing adjacent the axial ends thereof and magnetic coil means positioned externally on the housing for producing a magnetic field confining the electrons in cooperation with the electron repelling grids to form an electron confinement region within the housing, the improvement residing in confinement of the plasma to said region within the housing between said opposite axial ends thereof and means mounted in operative relation to the repelling grids and the magnetic coil means for emitting the electrons producing said steady state plasma with a density that is uniform along said axis within the electron confinement region.

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**5,051,660**

**CIRCUIT ARRANGEMENT FOR OPERATING A GAS DISCHARGE LAMP ON A DIRECT-CURRENT SOURCE**

**Helmut Domann, Leonberg, and Hartmann Rupp, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

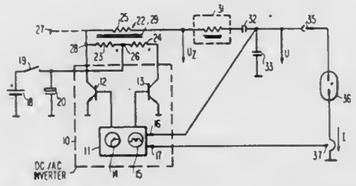
**PCT No. PCT/DE88/00264, § 371 Date Oct. 27, 1989, § 102(e) Date Oct. 27, 1989, PCT Pub. No. WO88/09108, PCT Pub. Date Nov. 17, 1988**

**PCT Filed May 5, 1988, Ser. No. 432,737**

**Claims priority, application Fed. Rep. of Germany, May 7, 1987, 3715162**

**Int. Cl.[5] H05B *37/00***

**U.S. Cl. 315—219** **17 Claims**




1. Circuit arrangement for operating a gas-discharge lamp on a direct-current source, particularly in a motor vehicle, comprising a direct-current/alternating-current inverter having control inputs and an output; a transformer connected to the inverter output to produce a stepped up supply voltage for the lamp; means for deriving control signals from the lamp voltage (U) and from the lamp current (I) and for applying the control signals to the control inputs of the inverter to supply the gas-discharge lamp with substantially constant power in continuous operation; the inverter being constructed as a push-pull inverter with control elements (12, 13) whose inputs are supplied with power-output-proportional signals generated in a power regulator for regulating the angle of flow of opposite primary current of the transformer (22) according to the actual values of the lamp current (I) and lamp voltage (U); the inputs of the control elements (12, 13) of the inverter being fed with pulses of constant frequency and variable width; the power generator including a pulse generator (15), which supplies timing pulses for igniting the gas-discharge lamp (36) at the resonant frequency of a series resonant circuit (31, 32, 33) arranged in series with the gas-discharge lamp, wherein the ignition frequency is a multiple of the operating frequency of the gas-discharge lamp (36).



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**5,051,661**

**PROTECTIVE CIRCUIT FOR FLUORESCENT LAMP STABILIZER**

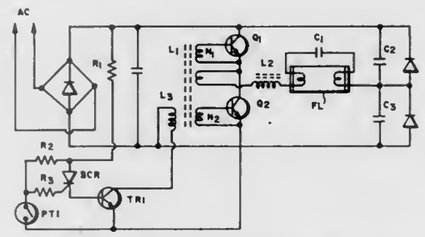
**Sang-Woo Lee, 187-90 Yeonhee-Dong, Seodaemoon-Ku, Seoul, Rep. of Korea**

**Filed Apr. 30, 1990, Ser. No. 516,764**

**Claims priority, application Rep. of Korea, Jan. 15, 1989, 16869**

**Int. Cl.[5] H05B *37/02***

**U.S. Cl. 315—225** **6 Claims**




1. A protective circuit for a stabilizing circuit for a fluorescent lamp, comprising:

a d.c. power source;

first and second transistors connected in series across said power source;

an inductor and a first capacitor connected in series between a first connection point between said first and second transistors and a second connector point;

a fluorescent lamp connected across said first capacitor and having one end thereof connected to said second connector point;

second and third capacitors connected in series across said power source and having a junction point connected to said second connector point;

a transformer having first and second windings connected to base electrodes of said first and second transistors, respectively, to apply voltages thereto, whereby said transistors are alternately switched on and off;

blocking means connected to block the voltages applied to at least one of the base electrodes of said transistors;

a thyristor connected to said blocking means to control the operation thereof; and

trigger means responsive to predetermined conditions to activate said thyristor.

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**5,051,662**

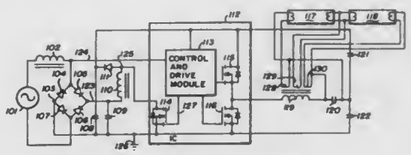
**FLUORESCENT LAMP SYSTEM**

**Richard C. Counts, Dallas, Tex., assignor to USI Lighting, Inc., San Leandro, Calif.**

**Filed Mar. 27, 1990, Ser. No. 500,008**

**Int. Cl.[5] H05B *41/14***

**U.S. Cl. 315—247** **11 Claims**




1. A fluorescent lamp system comprising:

a power source;

a reference voltage;

a fluorescent lamp;

a resonant circuit, coupled to the fluorescent lamp, the resonant circuit having a first end and a second end;

a first capacitance coupled between the first end of the resonant circuit and the reference voltage;

a second capacitance coupled between the first end of the resonant circuit and the power source;

a first switch coupled between the second end of the resonant circuit and the reference voltage;

a second switch coupled between the second end of the resonant circuit and the power source;

control means, coupled to the first switch and the second switch, for operating the first switch and the second switch so that the resonant circuit operates at near resonant frequency; and wherein the control means, the first switch and the second switch are all integrated on a single integrated circuit.

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**5,051,663**

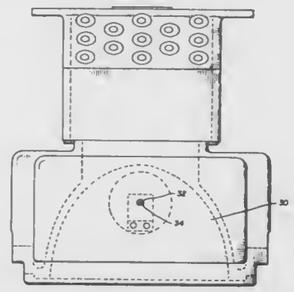
**ELECTRODELESS LAMP WITH IMPROVED BULB MOUNTING ARRANGEMENT**

**Michael G. Ury, Bethesda; John B. Gunter, Catonsville; Wayne H. Johnson, Rockville, and Donald E. Kuechle, Gaithersburg, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.**

**Filed Mar. 26, 1990, Ser. No. 498,578**

**Int. Cl.[5] H05B *41/16***

**U.S. Cl. 315—248** **14 Claims**



1. An electrodeless lamp having a removable bulb, comprising,

a microwave cavity which includes spatially opposed side wall portions, at least part of said cavity comprising a mesh for transmitting radiation out of the cavity,

an electrodeless lamp bulb having a pair of mounting projections extending therefrom,

VOL 1130 ISS 4 SE 24 1991 UMI

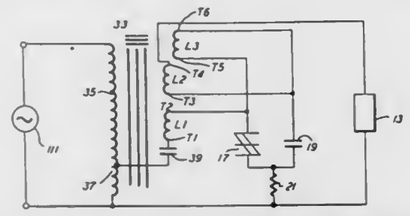


microwave energy generating means,
means for coupling the generated microwave energy to said microwave cavity, and
means at least at the ends of the lamp bulb projections and at the opposed side wall portions for cooperating with each other to secure said mounting projections to said side wall portions so that the bulb is removably mounted in the cavity in such manner it cannot substantially rotate.

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**5,051,664**
**IGNITOR CIRCUIT FOR DISCHARGE LAMPS WITH NOVEL BALLAST**

**Joseph S. Droho, 2708 N. Mulligan, Chicago, Ill. 60639**
**Division of Ser. No. 133,705, Dec. 16, 1987, which is a division of Ser. No. 506,393, May 7, 1990. This application Jan. 3, 1991, Ser. No. 637,248**
**Int. Cl.[5] H05B *41/16***
**U.S. Cl. 315—278** **5 Claims**

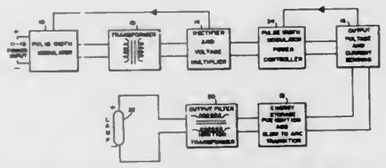



1. An autotransformer with a primary winding and a secondary winding connected to said primary winding, said secondary winding including a coil with first, second and third coil segments, each with a number of windings, said first and second coil segments having a substantial number of more windings than said third coil segment, each coil segment with two end wire means, one end wire means of said third coil segment being connected to one end wire means of said first coil segment, the other end wire means of said third coil segment being connected to one end wire means of said second coil segment, the other end wire means of said first and second coil segments being provided for connection to said primary winding and to a discharge lamp, respectively.

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**5,051,665**
**FAST WARM-UP BALLAST FOR ARC DISCHARGE LAMP**

**Robert L. Garrison, Henniker, N.H., and Harold L. Rothwell, Georgetown, Mass., assignors to GTE Products Corporation, Danvers, Mass.**
**Filed Jun. 21, 1990, Ser. No. 541,878**
**Int. Cl.[5] H05B *41/24***
**U.S. Cl. 315—287** **20 Claims**

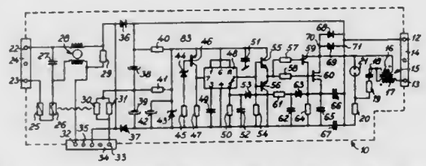


1. A ballast for operating an arc discharge lamp in a dc mode, said ballast comprising:
first and second direct current input terminals;
first pulse width modulator means coupled to said first and second direct current input terminals and including high frequency generating means and semiconductor switch means, said high frequency generating means developing a signal means for driving said semiconductor switch means;
first transformer means having primary and secondary windings, said primary winding being coupled to said semiconductor switch means;
rectifier and voltage multiplier means coupled to said secondary winding of said first transformer means for conversion of the voltage across said secondary winding of said first transformer means to a direct current output voltage having a predetermined value;
first energy storage means coupled to said rectifier and voltage multiplier means for storing energy for generating a high voltage spike sufficient for initiating a glow condition in said lamp;
second transformer means coupled to said first energy storage means for applying said high voltage spike to said lamp;
second energy storage means coupled to said rectifier and voltage multiplier means for storing energy for application to said lamp, said second energy storage means being effective in causing a glow-to-arc transition in said lamp;
means for operating said lamp at an elevated power level for a predetermined amount of time during starting;
control means in series with said lamp for controlling lamp power; and
voltage and current sensing means for developing a control signal and means for coupling said control signal to said second pulse width modulator means.

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**5,051,666**
**CIRCUIT FOR STARTING AND OPERATING A GAS DISCHARGE LAMP**

**Kaj Jensen, Kaerparken 4, 2800 Lyngby, Denmark**
**PCT No. PCT/NO89/00036, § 371 Date Aug. 16, 1990, § 102(e) Date Aug. 16, 1990, PCT Pub. No. WO89/07877, PCT Pub. Date Aug. 24, 1989**
**PCT Filed Feb. 17, 1989, Ser. No. 555,470**
**Claims priority, application Denmark, Feb. 19, 1988, 893/88**
**Int. Cl.[5] H05B *41/14***
**U.S. Cl. 315—307** **9 Claims**



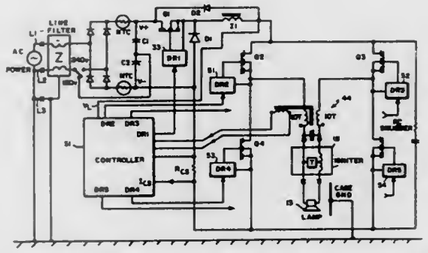
1. A circuit for starting and operating a gas discharge lamp having a pair of terminals, said circuit comprising:
a DC power supply means including a pair of DC power supply terminals and generating a DC power supply voltage across said pair of DC power supply terminals,
a high voltage generator means connected to said pair of DC power supply terminals and to said pair of terminals of said gas discharge lamp and generating a high DC starting voltage from said DC power supply voltage, provided no current is flowing through said gas discharge lamp, which high DC starting voltage is supplied to said pair of terminals of said gas discharge lamp so as to bring about a current flow through said gas discharge lamp,
an inductor means connected in a closed loop circuit together with said gas discharge lamp in which closed loop circuit power is transmitted from said inductor means to said gas discharge lamp, while current is flowing through said gas discharge lamp,
a sensor means connected to said closed loop circuit and detecting said transmission of power from said inductor means to said gas discharge lamp, and
a power switching means interconnecting said DC power supply means and said closed loop circuit and switchable between a conducting state in which said power switching means induces power into said inductor means from said DC power supply means and a non-conducting state in which no power is induced into said inductor means from said DC power supply means through said power switching means, which power switching means is controlled by said sensor means so as to switch said power switching means from its conducting state to its non-conducting state and vice versa for maintaining said current flow through said gas discharge lamp in said closed loop circuit.



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**5,051,667**
**ARC INTERRUPTING LAMP BALLAST**

**Richard M. Dunham, Salisbury, N.H., assignor to Walker Power, Inc., Warner, N.H.**
**Filed Jan. 24, 1990, Ser. No. 469,261**
**Int. Cl.[5] H05B *41/36***
**U.S. Cl. 315—307** **7 Claims**

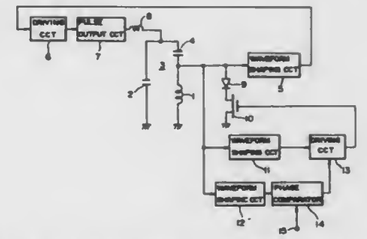



1. Apparatus for operating a lamp of a type in which a discharge is energized through a pair of leads and which requires ballasting, said apparatus comprising:
supply means for generating a d.c. voltage at a level suitable for energizing the lamp;
means including a series semiconductor switch and an inductor for maintaining current flow when said switch is off for pulse width modulating at relatively high frequency the current flow to the lamp from said supply means as a function of the current drawn by said lamp;
a common mode choke between said supply and the lamp, said choke having a pair of matched windings connected to said leads to provide a series inductance opposing rapid common mode changes in the currents flowing through said leads;
a differential transformer including a winding inductively linked to the currents flowing in said leads for generating a control signal having an amplitude which is a function of any difference in the currents flowing in said leads;
semiconductor switch means interposed between said inductor and the lamp for selectively interrupting current flow to the lamp; and
control means responsive to said control signal for opening said interrupting switch means when the current difference in said leads rises above a preselectable level indicating an arcing condition.

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**5,051,668**
**SINE WAVE DEFLECTING CIRCUIT**

**Seiji Kawaberi; Junzo Watanabe, and Hitoshi Suzuki, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan**
**Filed Aug. 1, 1990, Ser. No. 561,738**
**Claims priority, application Japan, Aug. 11, 1989, 1-208537**
**Int. Cl.[5] G09G *1/04*; H01J *29/70***
**U.S. Cl. 315—408** **4 Claims**

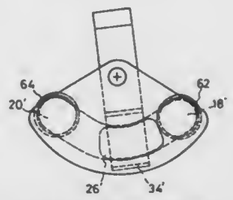



1. A sine wave deflecting circuit comprising: a resonant circuit comprising a deflecting coil and a resonant capacitor and producing a signal waveform; and a circuit for detecting said signal waveform of said resonant circuit to produce a detection signal and for driving said resonant circuit in accordance with the detection signal; wherein said deflecting coil is driven with sine waves generated by self oscillation;
said deflecting circuit further comprising means for setting a deflection interruption time during a time when said deflecting coil is being driven with said sine waves, wherein said sine waves have a driving frequency that is controlled by controlling the length of said interruption time.

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**5,051,669**
**VOICE COIL MOTOR**

**Yen-Yuan Hsiao; Nan-Yang Wu, and Sheng-Fang Cheng, all of Hsin-chu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan**
**Filed Apr. 11, 1990, Ser. No. 507,518**
**Int. Cl.[5] H02K *33/00***
**U.S. Cl. 318—119** **1 Claim**




1. A voice coil motor including an upper yoke having a lower surface; a lower yoke having an upper surface; two upper side yokes attached to said lower surface of said upper yoke respectively at laterally opposite end positions on said lower surface of said upper yoke; two lower side yokes attached to said upper surface of said lower yoke respectively at laterally opposite end positions on said upper surface of said lower yoke; a central yoke having two distal end portions respectively sandwiched between said upper side yokes and said lower side yokes; an upper magnet attached to said lower surface of said upper yoke and located above said central yoke; a lower magnet attached to said upper surface of said lower yoke and located beneath said central yoke; and a rotary arm pivotally mounted on said upper yoke, said rotary arm having a coil wound around said central yoke with a spacing being maintained therebetween so that said rotary arm is allowed to pivot along said central yoke; the voice coil motor being char-

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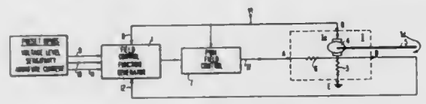
acterized in that the motor includes at least one shorted turn fitted around one of said side yokes.

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5,051,670
## AIRCRAFT DC STARTER-GENERATOR TORQUE CONTROLLER

**Frank J. De Piola, Glen Cove, N.Y., assignor to Aircraft Parts Corp., Farmingdale, N.Y.**

**Filed Jul. 30, 1990, Ser. No. 559,908**
**Int. Cl.[5] H02P *7/00***
**U.S. Cl. 318—434** **5 Claims**



1. Torque controlling apparatus for a DC shunt motor having an armature with a plurality of poles, including a positive and negative pole, a motor drive shaft coupled to and rotating with said armature, a compensating winding connecting with armature to ground, a field winding input terminal, a shunt field winding connecting said field winding input terminal to common to said compensating winding and to ground, an armature current input terminal connected to the positive pole of said armature, an armature current measuring output terminal connected in common to an other pole of said armature and to said compensating winding, and an air gap flux density, said torque controlling apparatus comprising

a source of terminal voltage connected to said armature current input terminal of said motor whereby armature current is supplied to said armature; and

monitoring means for monitoring said terminal voltage and said armature current in a determined manner and for varying the shunt field current in a manner whereby the air gap flux density of said motor is varied to control the torque of said motor drive shaft, said monitoring means comprising field control function generator means for controlling the developed torque on said motor drive shaft by varying the field current in a predetermined manner as the terminal voltage increases and decreases, said function generator means having a motor terminal voltage input connected to said armature current input terminal, a feedback signal input, a voltage level input supplying a preset voltage level signal, a sensitivity input supplying a preset sensitivity signal and an armature current input supplying a preset armature current signal and an output.

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5,051,671
## PROXIMITY SENSOR AND CONTROL

**Grant W. Crider, Bremen, and Nathan J. Smith, Addison, both of Ala., assignors to Hired Hand Manufacturing, Inc., Bremen, Ala.**

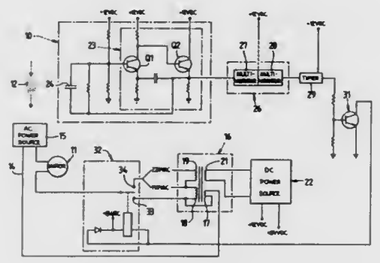
**Filed Oct. 1, 1990, Ser. No. 590,965**
**Int. Cl.[5] H02P *1/00***
**U.S. Cl. 318—466** **5 Claims**

1. Apparatus for sensing the presence of feed material in a hopper wherein said feed material is converged to said hopper by a motor driven conveyor and said motor is connected to a source of alternating current electricity, comprising in combination therewith:

(a) a primary transformer winding in series connection with said motor and said source, said primary transformer winding having a high inductance relative to said motor;

(b) a takeoff transformer winding in series connection with said source and said motor, said takeoff winding having a low impedance relative to said motor;

(c) a secondary transformer winding electromagnetically coupled to said primary transform winding and said takeoff transformer winding to receive electrical energy therefrom to provide a source of electrical energy at all times;



(d) electrically powered means operatively connected to said secondary transformer winding and receiving electrical energy therefrom at all times, for controlling said electrically operated relay responsive to the presence of feed material in said hopper; and

(e) an electrically operated relay providing selective series connection between said motor and said primary transformer winding and between said motor and said takeoff transformer winding such that series connection of said motor and said primary transformer winding prevents operation of said motor and that series connection of said motor and said takeoff transformer winding enables operating of said motor, said motor remaining securely connected with said AC power source at substantially all times.

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5,051,672
## AUTOMATIC WINDOW/DOOR SYSTEM

**Osamu Yaguchi, Kasbiwazaki, Japan, assignor to Kabushiki Kaisha Riken, Tokyo, Japan**

**Filed Apr. 23, 1990, Ser. No. 512,825**
**Claims priority, application Japan, Apr. 28, 1989, 1-110355; May 24, 1989, 1-132470; Jul. 6, 1989, 1-175071; Jul. 26, 1989, 1-193708; Jan. 12, 1990, 2-5401; Mar. 7, 1990, 2-55995**
**Int. Cl.[5] E05F *15/08*; H02P *1/22***
**U.S. Cl. 318—469** **1 Claim**

1. A motor-driven window/door system comprising:

a pressure responsive sensor arranged in association with a window or door;

detector circuit means coupled to said pressure responsive sensor for detecting a squeezed object caught in the way of said window or door;

an electric motor for driving said window or door to open/close said window or door; and

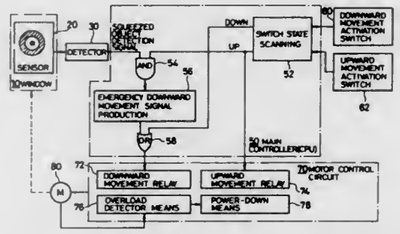
control circuit means for controlling said motor;



wherein said pressure responsive sensor comprises a coaxial sensor having an inner electrode, an outer electrode and a pressure responsive element interposed between said inner and outer electrodes and having a variable resistance responsive to pressure on said pressure responsive sensor;

said detector circuit means comprises pressure detector means coupled to said pressure responsive sensor for generating a signal indicative of a pressure on said pressure responsive sensor, and differentiation means coupled to said pressure detector means for generating a signal indicative of a rate of change of said pressure; and

said control circuit means comprises direction control means coupled to said detector circuit means for controlling said motor in response to the squeezed object to release said



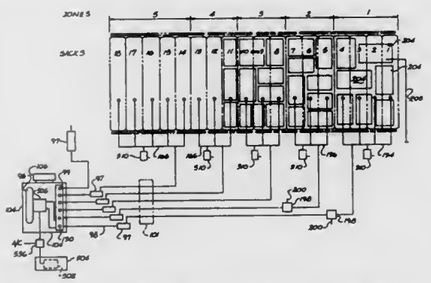
object from said window or door, overload detector means coupled to said motor for detecting an overload condition of said motor including means for repeatedly interrupting the power supplied to said motor, electromotive force detector means for detecting a voltage appearing across said motor upon interruption by said interrupting means and having a magnitude essentially proportional to the rotational speed of said motor, and comparator means coupled to said electromotive force detector means, for comparing the voltage with a predetermined reference voltage and power-down means including deenergizing means, coupled to said comparator means, for deenergizing said motor in response to a signal from said overload detector means indicative of an overload of said motor.

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5,051,673
## PATIENT SUPPORT STRUCTURE

**Vernon L. Goodwin, 7917 Douglas Dr., Charlotte, N.C. 28208**

**Division of Ser. No. 81,702, Aug. 3, 1987, Pat. No. 4,949,413, which is a continuation-in-part of Ser. No. 814,610, Dec. 30, 1985, Pat. No. 4,745,647, and a continuation-in-part of Ser. No. 912,774, Sep. 26, 1986, Pat. No. 4,768,249. This application Mar. 21, 1990, Ser. No. 497,119**
**Int. Cl.[5] A47C *27/10***
**U.S. Cl. 318—481** **5 Claims**



1. An improved patient support structure, comprising:

(a) a frame;

(b) a plurality of elongated inflatable sacks atop said frame;

(c) means for supplying as to said sacks, said gas supply means being in communication with said sacks and including:

i) a blower for generating gas flow for supplying gas to said sacks,

ii) a brushless direct current motor connected to said blower for powering same, and

iii) means for transforming alternating electric current from an AC electric power source to DC power for providing a DC power source for powering said brushless DC motor; and

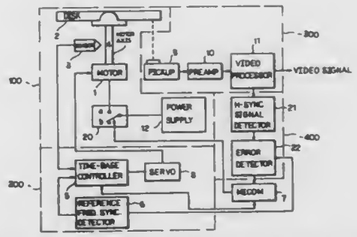
(d) control means associated with said gas supply means and said sacks, for controlling supply of gas to each of said sacks according to a predetermined pressure profile across said plurality of sacks and according to a plurality of predetermined combinations of said sacks, each said combination of sacks defining a separate support zone.

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5,051,674
## APPARATUS FOR PREVENTING AN OVERRUN OF A SPINDLE MOTOR

**Young-Han Kim, Suweon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea**

**Filed May 3, 1990, Ser. No. 518,574**
**Claims priority, application Rep. of Korea, Oct. 13, 1989, 89-14668**
**Int. Cl.[5] G11B *19/24***
**U.S. Cl. 318—561** **2 Claims**



1. A spindle motor controlling apparatus having means for driving a spindle motor, means for controlling rotating speed of said spindle motor, processing means for applying a first control signal to said motor speed controlling means, image processing means for providing an image signal by picking up a data signal of a disk mounted on said spindle motor, horizontal synchronization comparing means for detecting a horizontal synchronization signal from said image processing means and for providing a compared signal by comparing the detected synchronization signal with a reference synchronization signal and for applying the compared signal to said processing means, comprising:

said processing means providing a second control signal based on said compared signal; and

switching means for controlling the supply of power to said spindle motor according to the second control signal of said processing means, whereby the spindle motor can be protected from the overrun.

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5,051,675
## DIRECT TEACHING TYPE ROBOT

**Hiroshi Okumura; Yutaka Kimura, and Eizi Matumoto, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

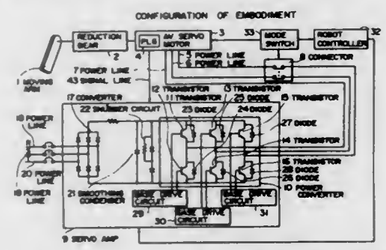
**Filed Mar. 27, 1990, Ser. No. 500,066**
**Claims priority, application Japan, Apr. 3, 1989, 1-81561**
**Int. Cl.[5] G05B *19/42***
**U.S. Cl. 318—568.10** **2 Claims**

1. A direct teaching robot capable of being operated in a

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direct teaching mode and a robot mode comprising: a moving arm, an electric motor connected to the moving arm through a reduction gear, detection means for generating a signal corresponding to a position and/or speed of the moving arm in accordance with rotation of the electric motor, a servo-amplifier having an output for driving the electric motor, a robot controller for controlling the electric motor through the servo-amplifier, said moving arm being directly moved in said




teaching mode to pre-store data corresponding to the movement of the moving arm in the robot controller and, when operated in the robot mode, the moving arm being operated on the basis of said pre-stored data, and a power line connecting the electric motor and the output of the servo-amplifier, means for disconnecting the power line between said electrical motor and servo-amplifier in said teaching mode in which movement positions of the moving arm are taught so as to avoid the loading of the motor on the moving arm.

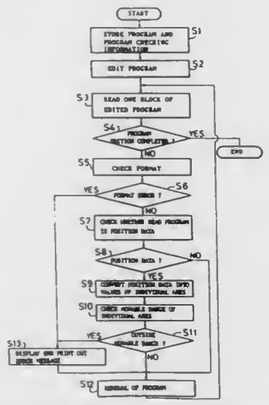
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5,051,676

## ROBOT PROGRAM CHECKING METHOD

Masaki Seki, Tokyo, and Takeshi Arakaki, Yamanashi, both of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP89/01018, § 371 Date May 30, 1990, § 102(e) Date May 30, 1990, PCT Pub. No. WO90/04222, PCT Pub. Date Apr. 19, 1990
PCT Filed Oct. 4, 1989, Ser. No. 476,410
Claims priority, application Japan, Oct. 8, 1988, 63-252891
Int. Cl.[5] G05B *19/42*
U.S. Cl. 318—568.24 5 Claims




1. A robot program checking method, comprising the steps of:

(a) storing beforehand a format suitable for a controller of the robot;

(b) storing beforehand a movable range of an operating section of a body of the robot;

(c) reading out an edit program;

(d) determining whether or not the thus read edit program is stated in accordance with the format suitable for the controller of the robot to which said edit program is to be applied;

(e) when a read block contains data indicative of a target operating position of the operating section of the robot body, determining whether or not said data falls within the movable range of the operating section of the robot body of the robot to which said edit program is to be applied; and

(f) generating an alarm when results of determination in said steps (d) and (e) indicate that the format of the edit program is not suitable for the controller to which the edit program is to be applied, or the position data contained in the edit program falls outside the movable range of the robot body.

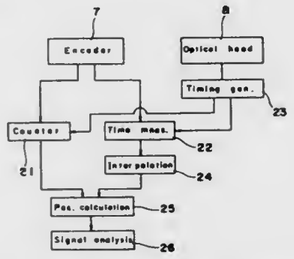
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5,051,677

## APPARATUS FOR PROCESSING ROTARY MEMBER

Norio Okutani, Neyagawa, and Koichi Nakazawa, Amagasaki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 27, 1990, Ser. No. 634,551
Claims priority, application Japan, Dec. 29, 1989, 1-341534
Int. Cl.[5] G05B *19/25*
U.S. Cl. 318—573 4 Claims




1. An apparatus for controlling a rotary member, comprising:

a rotational drive means for driving the rotary member so as to rotate the rotary member about an axis of the rotary member;

an encoder for detecting a rotational position of said rotational drive means;

a control means for controlling, in response to an output signal of said encoder, said rotational drive means so as to rotate said rotational drive means at a uniform speed;

a processing means for processing an arbitrary position of the rotary member rotating at the uniform speed;

a position detecting means for detecting, on the basis of the output signal of said encoder, a rotational position of the rotary member by raising a resolution of the output signal of said encoder; and

a processing control means for controlling said processing means on the basis of the rotational position of the rotary member detected by said position detecting means.

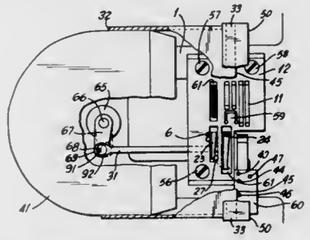


5,051,678

## DRIVE DEVICE FOR A RECIPROCATING PART

Gunter Rohr, Hemmingen; Wolfgang Norz, Schwieberdingen, and Horst Pordzik, Gerlingen, all of Fed. Rep. of Germany, assignors to 501 Union Special G.m.b.H., Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 268,817, Nov. 8, 1988, Pat. No. 4,967,674. This application Mar. 8, 1990, Ser. No. 490,780
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743281; May 20, 1989, 3744852
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 5 Claims



1. A drive assembly for a feed dog of a sewing machine, comprising:

a stepping motor for driving said feed dog equipped for reciprocating motion between a first position and a second position;

means for reciprocating said stepping motor between said first and second positions; and

transmission elements for transmitting motion of said stepping motor to said feed dog to cause reciprocating lateral motion in said feed dog.

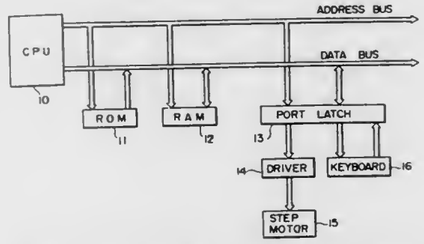
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5,051,679

## STEP MOTOR CONTROL DEVICE

Naohisa Kaneko, Toyokawa, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Mar. 27, 1990, Ser. No. 499,804
Claims priority, application Japan, Mar. 30, 1989, 1-78962
Int. Cl.[5] H02P *8/00*
U.S. Cl. 318—696 9 Claims




1. A step motor control device for receiving a number of steps, and for driving a step motor which is capable of performing in accelerated, constant, and decelerated conditions in accordance with the inputted number of steps, said device comprising:

setting means for setting an upper-limit speed of said motor when the number of steps to be performed by said motor is inputted, said upper-limit speed being increased under a first predetermined condition when a number of additional steps to be performed by said motor is inputted after said motor started moving; and

control means for driving said motor in such a fashion that said motor is driven in accelerated condition if the speed of said motor is lower than said upper-limit speed, that said motor is driven in decelerated condition if the number of the remaining steps to be performed by said motor is less than or equal to the number of steps necessary to stop said motor when being driven at said upper-limit speed, otherwise, that said motor is driven in the constant condition at said upper-limit speed.

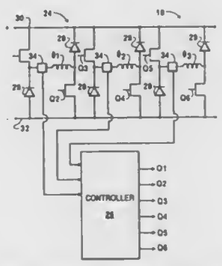
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5,051,680

## SIMPLE STARTING SEQUENCE FOR VARIABLE RELUCTANCE MOTORS WITHOUT ROTOR POSITION SENSOR

David J. Belanger, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 8, 1989, Ser. No. 448,207
Int. Cl.[5] H02K *29/06*
U.S. Cl. 318—701 11 Claims




1. A rotor position sensing system for a variable reluctance motor having a plurality of phases with each phase having a phase winding wound on stator poles and first and second switches each having a first terminal, a control terminal, and a second terminal, the control terminal of each switch having a control signal applied thereto to switch the switch between on and off states, the first terminal of the first switch being coupled to a first power source potential, the second terminal of the first switch being coupled to the phase winding, the first terminal of the second switch being coupled to a second power source potential and the second terminal being coupled to the phase winding which senses rotor position prior to activation of the phase windings to start rotation of the rotor comprising:

a current sensor, coupled to each phase winding, for producing an output signal of a magnitude of current flowing in the winding; and

a controller, coupled to each current sensor and to each control terminal of the switches, for applying control signals to the switches to cause current to flow between the power source potentials through the phase windings and in response to the sensed magnitude of the current flow through the phase windings determining prior to starting rotation of the rotor the position of the rotor with respect to the stator by determination of relative magnitude of the current flow through the phase windings prior to activation of the phase windings to start rotation of the rotor.

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5,051,681

## ELECTRONIC CIRCUIT FOR A SINGLE PHASE INDUCTION MOTOR STARTING

Marcos G. Schwarz, Joinville, Brazil, assignor to Empresa Brasileira de Compressores S/A Embarco, Joinville SC, Brazil

Filed Nov. 19, 1990, Ser. No. 615,579
Claims priority, application Brazil, Nov. 28, 1989, PI8906225
Int. Cl.[5] H02P *1/44*
U.S. Cl. 318—786 12 Claims

1. An electronic circuit for starting a single phase induction motor of the type having a cage type rotor and a stator with at

VOL 1130 ISS 4 SE 24 1991 UMI



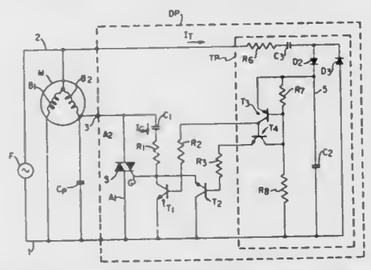
least a main winding and a starting winding for operating on alternating current supplied from a source comprising,

a permanent capacitor connected in series with the starting winding; and

first and second circuit terminals for connecting the main winding in series with the alternating current source, said permanent capacitor and the starting winding being connected in parallel to said circuit terminals,

a TRIAC having a first terminal connected to the first circuit terminal of the alternating current source, a second terminal connected to the starting winding and to the permanent capacitor, and a GATE terminal;

a TRIAC trigger circuit formed by a first capacitor having one terminal connected to the second terminal of the



TRIAC and another terminal connected to the GATE terminal of TRIAC through a first resistor;

a bilateral switch connected between the GATE terminal and the first terminal of the TRIAC, said switch having control terminals; and

a timer circuit connected to the control terminals of the bilateral switch and to the first and second circuit terminals of the alternating current source,

said timer circuit defining the time elapsed from the motor powering up until the interruption of the TRIAC conduction caused by turning on the bilateral switch,

the TRIAC trigger circuit repeatedly triggering the TRIAC to a turn on condition at the beginning of each current half-cycle while the bilateral switch remains cut off by the timer circuit.

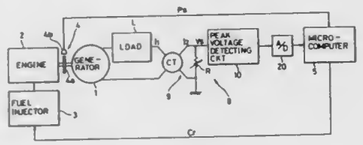
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**5,051,682**

**SYSTEM FOR DETECTING LOAD ON GENERATOR**

**Akira Sekiguchi, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Filed Oct. 30, 1989, Ser. No. 429,074**
**Claims priority, application Japan, Nov. 7, 1988, 63-280923**
**Int. Cl.[5] H02K *11/00*; H02P *9/00*; G01R *19/04***
**U.S. Cl. 322—99** **9 Claims**



1. A system for detecting a load on a generator, comprising:

(a) means for generating a waveform voltage signal from an alternating current passing through the load connected to the generator, said waveform voltage signal corresponding to the magnitude of the load;

(b) peak hold means for detecting a peak voltage of said waveform voltage signal and for holding said peak voltage;

(c) reset means for outputting a reset signal to said peak hold means to reset the same during a time period between a point after the peak of said waveform voltage signal and a point before a subsequent peak of said waveform voltage signal;

(d) sampling instruction means for outputting a sampling instruction signal during a time period between the point after the peak of said waveform voltage signal and a point before said peak hold means is reset by said reset signal; and

(e) sample-and-hold means responsive to said sampling instruction signal so as to operate in a sampling mode to sample the peak voltage outputted from said peak hold means, said sample-and-hold means being kept in a hold mode to hold the sampled peak voltage when said sampling instruction signal ceases to be fed to said sample-and-hold means.

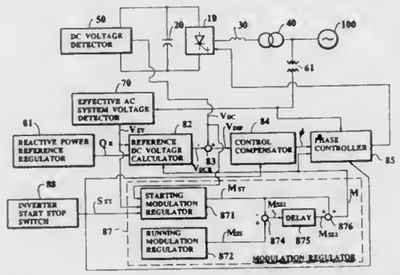
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**5,051,683**

**REACTIVE POWER CONTROLLER WITHOUT INITIAL ABRUPT DISTURBANCE ON POWER SOURCE**

**Syunichi Hirose, Tokyo, and Takeshi Furuhashi, Nagoya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Continuation-in-part of Ser. No. 269,292, Nov. 10, 1988, abandoned. This application Jun. 26, 1990, Ser. No. 543,426**
**Claims priority, application Japan, Nov. 12, 1987, 62-284216**
**Int. Cl.[5] G05F *1/70***
**U.S. Cl. 323—207** **6 Claims**



1. A reactive power controller, comprising:

self-commutated inverter means, including controllable rectifier elements and diodes, for generating a reactive power;

a DC voltage capacitor connected in parallel to the self-commutated inverter means;

a coupling reactor connected between the self-commutated inverter means and an AC system power source;

producing means for producing a modulation control signal indicating amounts to be adjusted of an amplitude and a phase of an output AC voltage of the self-commutated inverter means, in accordance with a DC voltage across the DC voltage capacitor and an AC voltage from the AC system power source; and

adjusting means for adjusting the amplitude and the phase of the output AC voltage of the self-commutated inverter means in accordance with the modulation control signal from the producing means such that reactive power from the self-commutated inverter means at a starting moment of operation of the reactive power controller is suppressed.



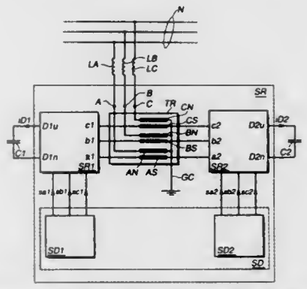
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**5,051,684**

**THREE-PHASE VOLTAGE STIFF CONVERTOR**

**Lennart Ängquist, Enköping, Sweden, assignor to Asea Brown Boveri AB, Västeras, Sweden**

**Filed Jan. 7, 1991, Ser. No. 638,329**
**Claims priority, application Sweden, Jan. 5, 1990, 9000041**
**Int. Cl.[5] G05F *1/70***
**U.S. Cl. 323—207** **17 Claims**



1. A three-phase voltage stiff convertor comprising a first and a second six-pulse convertor, each partial convertor having alternating voltage terminals and direct voltage terminals in which the partial convertors operate phase-displaced in relation to each other, the alternating voltage terminals of the partial convertors are connected to a transformer for forming the alternating voltages of the convertor by combination of the alternating voltages of the partial convertors, and the direct voltage terminals of each partial convertor are connected to a direct voltage source wherein the convertor has two separate direct voltage sources, each one connected to the direct voltage terminals of one of the partial convertors, and wherein the convertor is provided with control members adapted to control the partial converters such that the phase displacement between the two partial convertors constantly alternates between positive and negative values.

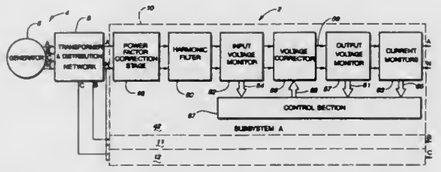
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**5,051,685**

**WAVEFORM CORRECTOR**

**John D. Sink, Yorba Linda, Calif., assignor to MagneTek, Inc., Los Angeles, Calif.**

**Filed Aug. 22, 1990, Ser. No. 570,823**
**Int. Cl.[5] G05F *1/70***
**U.S. Cl. 323—208** **19 Claims**



1. In an electrical power system of the type providing AC voltage from a supply network to a load through a cable having a predetermined complex impedance, the improvement in combination therewith comprising:

(a) monitoring means for monitoring current at a head end of cable; and

(b) control means responsive to said monitoring means for adjusting a waveform of the AC voltage at said head end by an amount corresponding to a real-time product of the complex impedance and the current such that the waveform of voltage at a load end of the cable is substantially a sine wave.

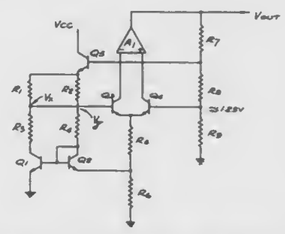
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**5,051,686**

**BANDGAP VOLTAGE REFERENCE**

**Gregory L. Schaffer, Cupertino, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.**

**Filed Oct. 26, 1990, Ser. No. 604,742**
**Int. Cl.[5] G05F *3/22***
**U.S. Cl. 323—313** **14 Claims**



1. An integrated circuit bandgap voltage reference comprising:

first, second, third, fourth and fifth transistors, all of the same conductivity type and each having an emitter, a base and a collector;

first, second, third, fourth, fifth, sixth and seventh resistors, each having first and second ends;

said first and second transistors having their emitters coupled together;

said first resistor having its first end coupled to a first power supply terminal and its second end coupled to the first end of said second resistor, said second resistor having its second end coupled to the emitters of said first and second transistors;

said third resistor having its first end coupled to said first power supply terminal and its second end coupled to the first end of said fourth resistor, said fourth resistor having its second end coupled to said output terminal, the junction between said third and fourth resistors being coupled to the base of said second transistor;

an operational amplifier having one input thereof coupled to the collector of said first transistor, a second input thereof coupled to the collector of said second transistor, and the output thereof coupled to said output terminal;

said third transistor having its emitter coupled to said first power supply terminal and its base coupled to said base and said collector of said fourth transistor;

said fourth transistor having its emitter coupled to the junction between said first and second resistors;

said fifth transistor having its collector coupled to a second power supply terminal, its base coupled to the second end of said fourth resistor and its emitter coupled to the collector of said fourth transistor through said fifth resistor;

said sixth resistor having its first end coupled to the collector of said third transistor and its second end coupled to the base of said first transistor;

said seventh resistor having its first end coupled to the second end of said sixth resistor and its second end coupled to the emitter of said fifth transistor;

said third transistor having a substantially higher current density therein than said fourth transistor when the differential input to said amplifier is substantially zero.

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**5,051,687**

**TRANSIMPEDANCE CIRCUIT**

**Eddy So, Gloucester, Canada, assignor to National Research Council of Canada/Conseil National de Recherches du Canada, Ottawa, Canada**

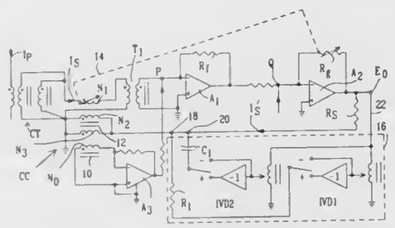
**Filed Oct. 29, 1990, Ser. No. 606,737**
**Int. Cl.[5] G01R *19/00*; H01F *40/06***
**U.S. Cl. 323—357** **10 Claims**

1. A transimpedance circuit for generating an output voltage

that is an accurate replica, in both amplitude and phase, of an input alternating current $I_p$, said circuit comprising

(a) a current comparator having first and second magnetic core means, a pair of ratio windings electromagnetically coupled with both said core means, and detection winding means electromagnetically coupled with the first core means but not with the second core means;

(b) means for passing a current $I_s$ proportional to said input current $I_p$ through a first of said ratio windings;



(c) means for generating a voltage replica $E_o$ of said current $I_s$;

(d) means for passing a current replica $I_s'$ of said voltage replica through the second of said ratio windings;

(e) means connected to said detection winding means for generating a correction signal proportional to an ampere-turns imbalance in the ratio windings; and

(f) means receiving said correction signal for modifying said voltage replica to become the desired accurate output voltage.

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**5,051,688**

## CROSSED COIL METER DRIVING DEVICE HAVING A PLURALITY OF INPUT PARAMETERS

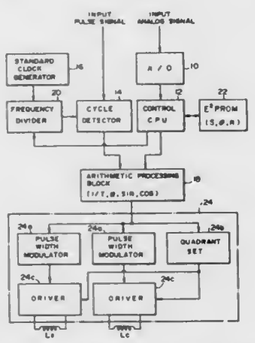
**Hiroshi Murase, Kyoto; Keizi Ishizuka, Omiya; Masakazu Kobayashi, Omiya, and Masanori Narita, Omiya, all of Japan, assignors to Rohm Co., Ltd., Kyoto and Kanto Seiki Co., Ltd., Saitama, both of, Japan**

**Filed Dec. 11, 1990, Ser. No. 625,927**

**Claims priority, application Japan, Dec. 20, 1989, 1-332280; Dec. 20, 1989, 1-332281; Dec. 20, 1989, 1-332282**

**Int. Cl.[5] G01R *11/36;* G01P *3/48***

**U.S. Cl. 324—143** **6 Claims**




1. A meter driving device for driving a cross coil meter which indicates angular directions corresponding to input values, comprising:

(a) a clock generating means for generating basic clock signals;

(b) a frequency calculating means for calculating input pulse signal frequency which provides the input value for indicating the angular direction;

(c) a memory means for memorizing, as parameters, a plurality of input values Sm (m=1, 2, . . . ), angular directions θm corresponding to the input values Sm, and coefficients Rm representative of the grades of the change in angular direction depending on the change between adjacent two input values Sm and Sm+1 among the plurality of input values;

(d) a calculating means for calculating the angular direction corresponding to the input value, on the basis of the input pulse signal frequency obtained by said frequency calculating means and of the parameters read out from said memory means, and for outputting an angular direction signal;

(e) a driving means, having a power source, for energizing a first and a second mutually crossed coils based on the outputted angular direction signal.

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**5,051,689**

## TEST HEAD WITH IMPROVED SHIELDING

**Kiyoyasu Hiwada, Tokyo, and Toshio Tamamura, Hachioji, both of Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.**

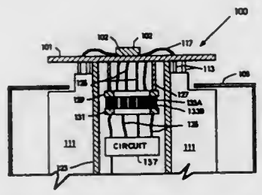
**Division of Ser. No. 238,711, Aug. 30, 1988, Pat. No. 4,975,639.**

**This application Apr. 19, 1990, Ser. No. 510,927**

**Claims priority, application Japan, Nov. 14, 1987, 62-288199**

**Int. Cl.[5] G01R *31/02, 1/06***

**U.S. Cl. 324—158 F** **6 Claims**




1. A test head for applying analog and digital test input signals to a device under test, and for transferring resulting output signals from a device under test, comprising:

digital signal leads providing a plurality of first electrically conductive paths for transmission of digital signals to be connected with said device under test,

analog signal leads providing a plurality of second electrically conductive paths for transmission of analog signals to be connected with said device under test,

an electrically conductive shield member located between the digital signal leads and the analog signal leads, preventing interference between the digital signals and the analog signals, and

support means for supporting and making electrical connections to the device under test, releasably attached to one end of the electrically conductive shield members, and electrically connected to the digital signal leads and to the analog signal leads.



**5,051,690**

## APPARATUS AND METHOD FOR DETECTING VERTICALLY PROPAGATED DEFECTS IN INTEGRATED CIRCUITS

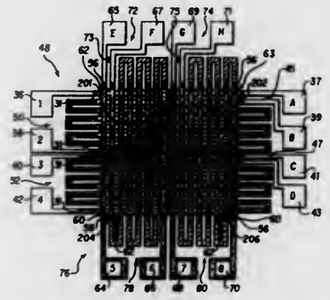
**Wojciech Maly, Pittsburgh, Pa., and Michael E. Thomas, Milpitas, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Continuation-in-part of Ser. No. 11,729, Feb. 6, 1987, Pat. No. 4,835,466. This application May 26, 1989, Ser. No. 357,546**

**The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.**

**Int. Cl.[5] G01R *31/02***

**U.S. Cl. 324—158 R** **22 Claims**



1. An apparatus for detecting defects arising as a result of integrated circuit processing, said apparatus comprising:

(a) a substrate;

(b) a first meander formed on or in said substrate, said first meander comprising a high electrical resistivity material having a predetermined number of intermediate segments, the ends of which are interconnected by folded segments such that an electrical circuit, having an predetermined electrical resistance, is formed between the ends of the first meander;

(c) a second meander electrically insulated from said first meander, said second meander comprising a high electrical resistivity material having a predetermined number of intermediate segments, the ends of which are interconnected by folded segments such that an electrical circuit, having a predetermined electrical resistance, is formed between the ends of the second meander;

(d) a first set of strips comprising a predetermined number of strips of high electrical conductivity material, electrically insulated from said first and second meanders, the ends of each strip being electrically connected to the ends of a corresponding intermediate segment of said first meander; and

(e) a second set of strips comprising a predetermined number of strips of high electrical conductivity material which are electrically insulated from said first set of strips, said first meander and said second meander, the ends of each strip of said second set being electrically connected to the ends of a corresponding intermediate segment of said second meander, and a least a portion of said second set of strips overlying a least a portion of said first set of strips.

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**5,051,691**

## ZERO POWER DISSIPATION LASER FUSE SIGNATURE CIRCUIT FOR REDUNDANCY IN VLSI DESIGN

**Chen Y. Wang, San Jose, Calif., assignor to Samsung Semiconductor, Inc., San Jose, Calif.**

**Filed Sep. 13, 1990, Ser. No. 582,455**

**Int. Cl.[5] G01R *31/02;* G06F *11/00***

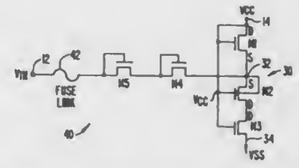
**U.S. Cl. 324—158 R** **3 Claims**

1. In an integrated circuit having input, power, and ground pins, where signals having an operating voltage level are applied to the input pin during normal operating conditions, a fuse signature circuit for testing whether a fuse-link connecting a selected input pin to other circuitry on the integrated circuit is connected or disconnected, where a test signal having a test voltage level greater than the operating voltage level is applied to the selected input pin during fuse signature testing, said circuit for fuse signature testing comprising:

a first transistor, of a first conductivity type, having first, second, and control terminals, with its first and control terminals coupled to the power pin and its second terminal coupled to a first node;

a second transistor, of a second conductivity type, having first, second, and control terminals, with its first terminal coupled to said first node and its control terminal coupled to the power pin;

a third transistor, of the first conductivity type, having a first terminal coupled to the second terminal of said second transistor, its control terminal coupled to the power pin,




and its second terminal coupled to the ground pin, where said first, second, and third transistors serially connect power and ground pins;

a series diode circuit, comprising at least one diode connected transistor of the first conductivity type, said series diode circuit serially connecting the fuse to said first node to reduce the voltage level applied to the input pin by the sum of the threshold voltages of said diode connected transistors included in said series diode circuit and with the magnitude of said sum sufficient to prevent said second transistor from turning on when a signal having the operating voltage level is applied to the input pin during normal operation and where said first and third transistors are turned off so that no current flows through said circuit for testing when the power and ground pins are grounded and a voltage signal is applied to the input pin to test the integrated circuit for a short circuit or leakage current.

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**5,051,692**

## PROCESSING APPARATUS FOR MEASURING THE SPEED OF A ROTATING BODY

**Norio Okutani, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Aug. 4, 1989, Ser. No. 389,439**

**Claims priority, application Japan, Aug. 8, 1988, 63-197425**

**Int. Cl.[5] G01P *3/36***

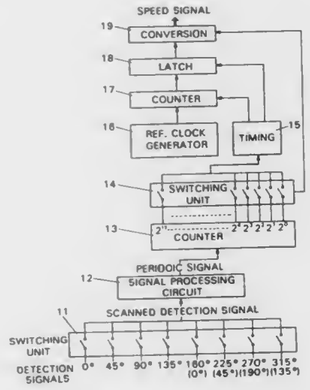
**U.S. Cl. 324—175** **5 Claims**

1. An apparatus for measuring the speed of a rotating body comprising:

an encoder for generating detection signals of different phases;

a switching means for sequentially scanning said detection signals at the frequency of a predetermined scanning

period and for periodically generating a scanned detection signal; and




a period detecting means for detecting the period of said scanned detection signal.

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**5,051,693**

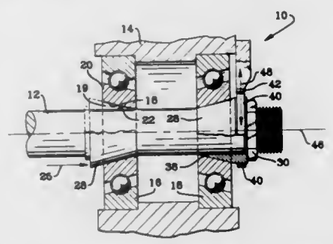
**BEARING SEAT ENCODER MOUNT FOR ROTATIONAL PARAMETER SENSOR APPARATUS**

**Michael C. Brauer, Burlington, Conn., assignor to The Torrington Company, Torrington, Conn.**

**Filed Sep. 7, 1990, Ser. No. 578,404**

**Int. Cl.[5] G01P** *3/42;* **G01B** *7/30;* **F16C** *32/00*

**U.S. Cl. 324—207.22** **25 Claims**




1. An apparatus for sensing rotational parameters of a shaft relative to a member comprising:

a bearing having an inner race with an inner diameter greater than the diameter of the shaft, an annular space being formed between the inner diameter and the shaft;

a bearing seat disposed within the annular space, the bearing seat being fixed to the shaft;

an annular encoder fixed to the bearing seat; and

a sensor located in close proximity to the annular encoder, the sensor being fixed to the member.

**5,051,694**

**DEVICE HAVING OPPOSITELY SPACED COILS FOR DETERMINING A SHAPE OF SCREW PARTS**

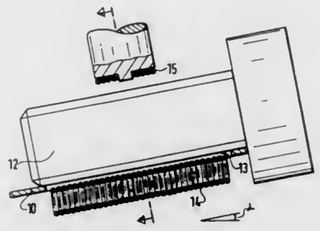
**Klaus Dobler, Gerlingen, and Hansjoerg Hachtel, Weissach, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Jan. 10, 1990, Ser. No. 463,154**

**Claims priority, application Fed. Rep. of Germany, Feb. 24, 1989, 3905744**

**Int. Cl.[5] G01R** *33/12;* **G01N** *27/82;* **G01B** *7/28;* **B07C** *5/00*

**U.S. Cl. 324—232** **6 Claims**




1. A device for determining a shape of screw parts, comprising a first coil supplied with alternating current for determining substantially a thread profile of screw parts and for generating a first signal representative of the thread profile of a screw part; a second coil spaced from said first coil and located opposite to said first coil, said second coil being supplied with alternating current for determining substantially a diameter of the screw part and for generating a second signal representative of the diameter of the screw part; and guide means extending between said first and second coils transversely thereto for guiding screw parts past said coils, said guide means and said first coil being arranged such that when screw parts of different diameters are moved along said guide means past said coils, said first coil is spaced the same constant distance from the screw part irrespective of the diameters thereof, the screw part being considered defective if at least one of the first and second signals deviates from a predetermined nominal value thereof by a predetermined amount.

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**5,051,695**

**THIN FILM VECTOR MAGNETOMETER**

**Paul Hunter, Burtonsville, and Leonard J. Schwee, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

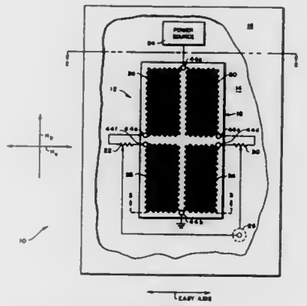
**Division of Ser. No. 456,231, Dec. 26, 1989, Pat. No. 4,954,216, which is a continuation of Ser. No. 623,893, Jun. 25, 1984, abandoned. This application May 16, 1990, Ser. No. 523,198**

**Int. Cl.[5] G01R** *33/02;* **B44C** *1/22;* **C23F** *1/02*

**U.S. Cl. 324—249** **4 Claims**

1. In a magnetometer sensitive to components of an external field to be measured relative to an easy axis of a magnetic film layer and a hard axis of a bias field, said film layer establishing a planar bridge circuit formed by a plurality of magnetoresistors having a predetermined angular relationship to the easy and hard axes, the improvement residing in a substrate supporting the film layer, an insulating layer supported by the substrate in overlying relation to the magnetoresistors and electrical connecting means extending form the film layer through the insulating layer for electrically interconnecting the magnetoresistors of the bridge circuit, said film layer being restricted to a geometric pattern conforming to each of the magnetoresistors and including a plurality of parallel spaced current conducting tracks establishing said predetermined angular relationship to the easy and hard axes.





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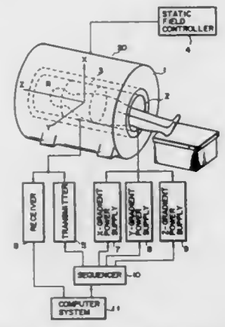


5,051,699

## MAGNETIC RESONANCE IMAGING SYSTEM

Masatoshi Hanawa, and Kazuto Nakabayashi, both of Ootawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 29, 1989, Ser. No. 400,059
Claims priority, application Japan, Aug. 31, 1988, 63-214919; Sep. 20, 1988, 63-235324
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 14 Claims




1. A magnetic resonance imaging system comprising:
static magnetic field generating means for generating a homogeneous static magnetic field in a predetermined imaging volume in which an object to be examined is placed;
gradient magnetic field applying means for applying a gradient magnetic field to the imaging volume;
RF pulse applying means for applying an RF pulse to the imaging volume;
sequence control means for controlling said gradient magnetic field applying means and said RF pulse applying means in accordance with a predetermined sequence so as to cause said gradient magnetic field applying means and said RF pulse applying means to respectively apply a predetermined gradient magnetic field and RF pulses to the imaging volume, thereby causing a magnetic resonance phenomenon in the imaging volume;
receiving means for receiving a magnetic resonance signal generated in the imaging volume by the magnetic resonance phenomenon;
imaging processing means for obtaining a magnetic resonance image by performing predetermined processing including image reconstruction processing for the magnetic resonance signal received by said receiving means,
said sequence control means including first means for driving said RF pulse applying means to cause magnetic resonance excitation, second means for driving at least one of said RF pulse applying means and said gradient magnetic field applying means to produce a magnetic resonance echo, third means for driving said gradient magentic field applying means during reception of the magnetic resonance echo to apply a read gradient field to the imaging volume, sand fourth means for driving said gradient magnetic field applying means to generate at least one additional magnetic resonance echo by inverting the read gradient field at least once, thereby applying an inverted gradient field to the imaging volume,
said receiving means including echo processing means for processing data of a plurality of magnetic resonance echoes;
wherein said echo processing means includes adding means for adding and averaging the data of the plurality of magnetic resonance echoes; and
wherein said adding means includes means for inverting magnetic resonance echo data produced by the inverted read gradient field on a frequency axis to add the magnetic resonance echo data.

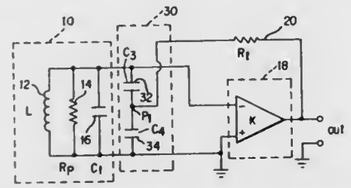
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5,051,700

## FEEDBACK CIRCUIT FOR NOISELESS DAMPING OF THE Q OF AN MRI RECEIVER COIL ANTENNA

Timothy R. Fox, Chicago, Ill., assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 19, 1990, Ser. No. 495,760
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—322 12 Claims




1. A feedback circuit for a magnetic resonance imaging (MRI) or spectroscopy device comprising:
resonant circuit means, including an MRI receiver antenna, for generating output voltages in response to nuclear magnetic resonance magnetization signals received by said antenna;
amplifying means, coupled to said resonant circuit means, for amplifying said output voltages;
means for providing a resistive feedback path from an output of said amplifying means to said resonant circuit means, said feedback path carrying first feedback current; and
capacitive current divider means having a tap point to which said first feedback path is connected, for diverting a first portion of said first feedback current away from said resonant circuit means and for directing a second portion of said first feedback current to said resonant circuit means.

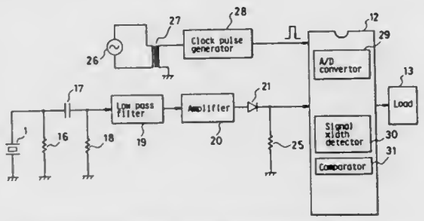
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5,051,701

## PYROELECTRIC SENSING APPARATUS SUBSTANTIALLY INDEPENDENT OF NOISE OUTPUT CAUSED BY MECHANICAL SHOCK OR ELECTRICAL SHOCK

Takashi Kashimoto, Nara; Koji Yoshino, Souraku; Kimiaki Yamaguchi, and Isao Kasai, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 31, 1989, Ser. No. 429,286
Claims priority, application Japan, Oct. 31, 1988, 63-274836
Int. Cl.[5] G01K *7/00;* H03K *5/22;* H01L *31/00;* H05B *1/02*
U.S. Cl. 328—3 4 Claims




1. A pyroelectric sensing apparatus comprising:
a pyroelectric element which issues a succession of pulses in response to a contact by steam on a sensing face of said pyroelectric element,
detection means for detecting pulses from said pyroelectric element that are above a predetermined level, by sampling at a predetermined sampling timing,
succession period detection means, receiving pulses from said detection means that are above said predetermined level, for detecting a time period of said pulses, and
comparison means for comparing said time period detected by said succession period detection means with a predetermined reference time period and issuing a control output signal only when said detected time period is longer than said reference time period.



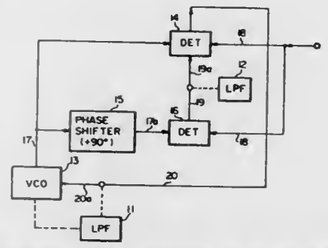
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5,051,702

## AUTOMATIC PHASE CONTROLLING CIRCUIT

Kiyoshi Iwasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 12, 1989, Ser. No. 406,359
Claims priority, application Japan, Sep. 26, 1988, 63-241405
Int. Cl.[5] H03K *5/13;* H03L *7/00*
U.S. Cl. 328—155 12 Claims




1. An automatic phase controlling circuit for matching a variable-phase signal with a reference signal comprising
a) a main signal loop having a main detector for producing a control signal representative of a first difference in phase between said variable-phase signal and said reference signal, and a voltage-controlled oscillator responsive to said control signal and producing said variable-phase signal, and
b) a sensitivity modifying unit having a phase shifter operative to change said variable-phase signal in phase by a predetermined value to produce a modified variable-phase signal, and an auxiliary detector for producing a sensitizing signal representative of a second difference in phase between the modified variable-phase signal and said reference signal, in which said sensitizing signal is supplied to said main detector so that a sensitivity thereof is minimized around the first difference of about zero degree, but is increased by increasing the first difference in phase.

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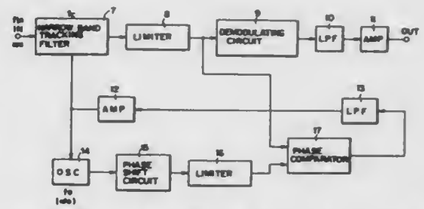
5,051,703

## FM DEMODULATOR WITH TRACKING FILTER

Kazuhiro Idogawa, and Kiyoshi Amazawa, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1990, Ser. No. 538,124
Claims priority, application Japan, Jun. 30, 1989, 1-170788
Int. Cl.[5] H04B *1/10*
U.S. Cl. 329—319 6 Claims

1. An FM demodulating circuit comprising:
a tracking filter, whose central frequency follows an input FM signal;
demodulating means for obtaining a demodulated output by detecting the signal through the tracking filter;
control means for comparing the phase of the signal through said tracking filter with another input to generate a frequency control signal applied to the control terminal of said tracking filter;
an oscillator, whose oscillation is controlled by the control signal; and




a phase shift circuit for shifting the phase of the output signal of said oscillator by a predetermined amount to obtain said another input applied to said control means.

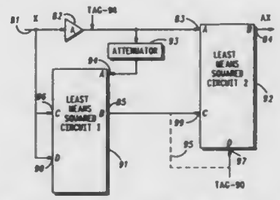
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5,051,704

## FEEDFORWARD DISTORTION CANCELLATION CIRCUIT

Ronald H. Chapman, Carol Stream, and William J. Turney, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 6, 1990, Ser. No. 479,498
Int. Cl.[5] H03F *1/32*
U.S. Cl. 330—52 4 Claims




1. A feedforward cancellation circuit having an input signal and an output signal, the circuit comprising:
a gain device having an input and an output,
a first and second least means squared circuit, each circuit having an input port, an output port, a cancellation port, and a reference port,
said feedforward cancellation circuit input signal coupled to said gain device input and to said first least means squared circuit cancellation and reference ports,
said gain device output coupled to said first least means squared circuit input port and to said second least means squared circuit input port,
said first least means squared circuit output port coupled to said second least means squared circuit cancellation port,
said second least means squared circuit output port coupled to said feedforward cancellation circuit output signal, and
a pilot signal or "TAG" coupled to said first least means squared circuit input port and to said second least means squared circuit input port and to said second least means squared circuit reference port,
said second least means squared circuit reference port being electrically isolated from said second least means squared circuit cancellation port.

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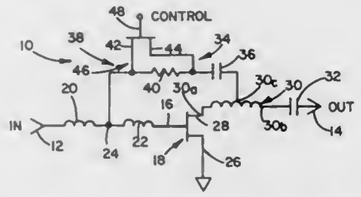


5,051,705

## GAIN-TILT AMPLIFIER

Sanjay B. Moghe, Hoffman Estate, Ill.; Ravi Ramachandran, San Jose, Calif.; Finbarr J. McGrath, Burlington, Mass., and Robert D. Genin, San Jose, Calif., assignors to Pacific Monolithics, Sunnyvale, Calif.

Filed Jul. 10, 1990, Ser. No. 551,426
Int. Cl.[5] H03F 1/34
U.S. Cl. 330—277 1 Claim




1. A gain-tilt amplifier circuit responsive to a control signal for varying the slope of gain applied to an input signal over a predetermined frequency range, the circuit comprising:
an input terminal for receiving the input signal;
an output terminal for transmitting the amplified input signal;
first field-effect-transistor (FET) means for amplifying the input signal, the first FET means having a gate, a common source, and a drain;
first and second inductor means connected in series between the input terminal and the gate of the first FET means, the first and second inductor means being connected together at a node;
inductor coil means having a first end connected to the drain of the first FET means and a second end coupled to the output terminal;
capacitor means;
second FET means having a gate for receiving the control signal, and a source and drain;
resistor means connected between the source and drain of the second FET means;
the capacitor means and resistor means being connected in series between the node between the first and second inductor means and the coil means at a point intermediate the ends of the coil means, whereby a portion of the coil means, the capacitor means, the second FET means and the resistor means form a feedback path having an impedance that is higher at higher input signal frequencies and produces a gain in the input signal that varies over the predetermined frequency range with a slope determined by the control signal.

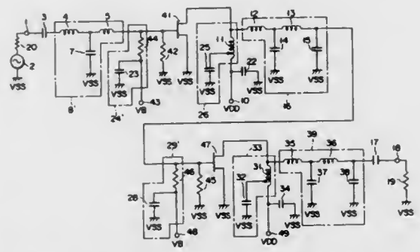
5,051,706

## HIGH FREQUENCY POWER AMPLIFIER CIRCUIT

Takaji Zushi, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 9, 1989, Ser. No. 433,914
Claims priority, application Japan, Nov. 9, 1988, 63-283184
Int. Cl.[5] H03F 3/191
U.S. Cl. 330—277 9 Claims

5. A high frequency power amplifier apparatus comprising:
a first capacitor whose first electrode is connected to an input node;
a first impedance matching circuit whose input node is connected to a second electrode of said first capacitor;
a second capacitor whose first electrode is connected to an output node;
at least to power amplifying circuits connected in series between an output node f said first impedance matching circuit and a second electrode of said second capacitor, wherein each of said power amplifying circuits comprises:
a high frequency amplifying transistor connected at a source to a first potential source;
a first load element connected between a gate of said high frequency amplifying transistor and the first potential source;
a second load element connected between the gate of said high frequency amplifying transistor and a gate bias terminal;
a first inductor connected between a drain of said high frequency amplifying transistor and a second potential source;
a third capacitor connected between said gate bias terminal and said first potential source;



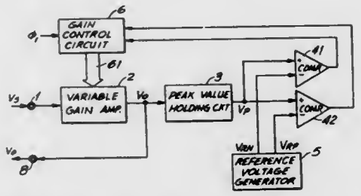
a fourth capacitor connected between said first potential source and a mid-point of said first inductor, and constituting a series resonance circuit together with said first inductor, said series resonance circuit having a ½ resonance frequency with respect to the frequency of a signal input into said high frequency amplifying transistor; and
a second impedance matching circuit whose input node is connected to the drain of said high frequency amplifying transistor;
wherein the output node of the first power amplifying circuit is connected to the input node of the second power amplifying circuit.

5,051,707

## GAIN CONTROL CIRCUIT FOR AMPLIFIER HAVING STEPWISE VARIABLE GAIN

Tsuneo Fujita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 19, 1989, Ser. No. 300,070
Claims priority, application Japan, Jan. 19, 1988, 63-11360
Int. Cl.[5] H03G 3/30
U.S. Cl. 330—279 17 Claims




1. An amplifier circuit comprising an amplifier having a stepwise variable gain and amplifying an input voltage with a gain designated by a gain control data, a peak value holding circuit for detecting a peak value of an output voltage derived from said amplifier and holding said peak value when said peak value is greater than a previously held peak value, means for generating a first reference voltage and a second reference voltage having a value different from said first reference voltage, comparison means for comparing the peak value held by said peak value holding circuit with said first reference voltage and said second reference voltage, control means responsive to a comparison output of said comparison means for controlling said gain control data such that the peak value held by said peak value holding circuit exists between said first and second reference voltages, whereby the gain of said amplifier is fixed as long as the peak value currently held by said peak value holding circuit is between said first and second reference voltages irrespective of a change in an amplitude of said input voltage.

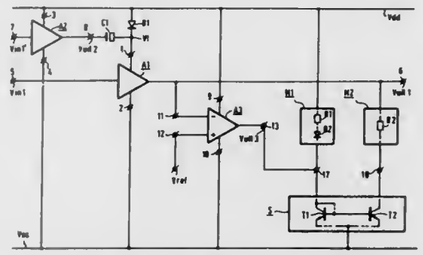


5,051,708

## AMPLIFIER ARRANGEMENT WITH OUTPUT POWER BOOSTING

Hendrik Boezen; Pieter Buitendijk, and Rudolf W. Mathijssen, all of Nijmegen, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Jun. 18, 1990, Ser. No. 540,016
Claims priority, application Netherlands, Jul. 14, 1989, 8901824
Int. Cl.[5] H03F 3/04
U.S. Cl. 330—297 6 Claims



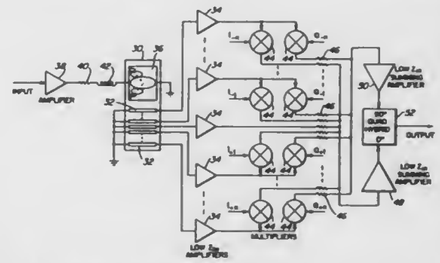
1. An amplifier arrangement comprising a first amplifier for amplifying an input signal, the first amplifier comprising a first terminal for receiving a boosting voltage, which terminal is coupled to a first supply voltage terminal via a unidirectional element to receive a first supply voltage, a second terminal, which is coupled to a second supply voltage terminal to receive a second supply voltage, a first input terminal for receiving the input signal, and a first output terminal for supplying a first output signal superimposed on a specific direct voltage level, and a second amplifier for varying the boosting voltage on the first terminal as a function of the input signal, the second amplifier comprising a third and a fourth terminal, which are coupled to the first and the second supply voltage terminal, respectively, a second input terminal for receiving a measure of the input signal and a second output terminal for supplying a second output signal, which output terminal is coupled to the first terminal by means of a capacitor, characterized in that the amplifier arrangement further comprises a signal-follower circuit for establishing the direct voltage level on the first output terminal and a third amplifier for driving the signal-follower circuit depending upon a comparison between the first output signal and a reference signal, the third amplifier comprising a third input terminal for receiving a third input signal, which input terminal is coupled to the first output terminal, and a third output terminal for supplying a third output signal, which output terminal is coupled to the signal-follower circuit.

5,051,709

## SAW DEVICE TAPPED DELAY LINE AND EQUALIZER

Alexander N. Birkett, Ottawa, Canada; Paul A. Kennard, Fremont, Calif.; Thomas P. Cameron, Kanata, Canada; Barry A. Syrett, Ottawa, Canada; Stephen G. Barber, Nepean, Canada, and Mark S. Suthers, Lanark, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 20, 1989, Ser. No. 382,921
Int. Cl.[5] H04B 3/14; H03H 9/42
U.S. Cl. 333—28 R 10 Claims



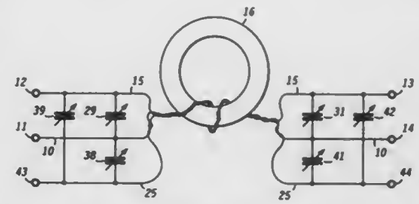
1. An equalizer comprising:
a SAW (surface acoustic wave) device tapped delay line including a SAW device having a first IDT (inter-digital transducer) for generating a SAW in response to an input signal applied thereto and a plurality of second IDTs substantially identical to each other, arranged adjacent one another so as to have a predetermined pitch therebetween, with one of the plurality of second IDTs adjacent the first IDT for sequential propagation of the SAW from the first IDT to each of the second IDTs with respective propagation delays;
a plurality of buffer amplifiers, each buffer amplifier having an input with a low impedance coupled to a respective one of the second IDTs, the low impedance on the order of 10 ohms;
means for coupling an input signal to the first IDT;
means for weighting outputs of the buffer amplifiers to produce respective weighted signals in dependence upon a respective one of a set of equalizer coefficients; and
means for summing the weighted signals to produce an output signal so as to function as an equalizer.

5,051,710

## VARIABLE $Z_o$ TRANSMISSION LINE TRANSFORMER

Robert S. Kaltenecker, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 25, 1990, Ser. No. 543,505
Int. Cl.[5] H03H 7/38; H01P 5/02
U.S. Cl. 333—32 10 Claims



1. A variable characteristic impedance transmission line transformer, comprising:
at least one pair of electrical conductors having an electrical length of less than one quarter wave length at the highest operating frequency of the transformer, the at least one

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pair of electrical conductors being wound on a magnetic medium, each conductor having a first end and a second end; and

a first capacitor and a second capacitor for each pair of conductors, the first capacitor coupling between the first ends of the conductors of the pair, the second capacitor coupling between the second ends of the conductors of the pair.

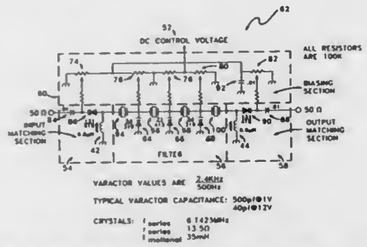
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**5,051,711**

## VARIABLE BANDWIDTH CRYSTAL FILTER WITH VARACTOR DIODES

**Lee J. Jones, Dandridge, Tenn., assignor to Ten-Tec, Inc., Sevierville, Tenn.**

**Filed Apr. 27, 1989, Ser. No. 344,277**
**Int. Cl.[5] H03H** *9/58*
**U.S. Cl. 333—188** **1 Claim**




1. A variable passband crystal filter comprising:

a. a plurality of crystals, each crystal having the seam resonant frequency, electrically coupled in series to form a plurality of junctions between adjacent crystals;

b. a plurality of varactor diodes, wherein a different one of said plurality of varactor diodes is connected between a different one of said plurality of said junctions between adjacent crystals, and ground;

c. input matching section means and output matching section means respectively connected to crystals located at ends of said plurality of crystals in series,

said input section means and said output section means each comprises a series coupling of a terminal, a capacitor, and a varactor diode, and further comprising an indicator connected from said varactor to ground, each said varactor diode is connected to respective end crystals of said plurality of crystals in series; and,

d. a plurality of biasing resistor means, a different one of said plurality of resistors is connected between each of said plurality of junctions between said adjacent crystals, and between respective junctions of said varactor diode and said capacitor of said input matching section and said output matching section, said biasing resistors also connected to a DC control voltage.

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**5,051,712**

## LC FILTER

**Yasuyuki Naito; Takeshi Azumi; Horishi Morii, and Yoshiaki Kohno, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan**

**Filed Mar. 21, 1990, Ser. No. 497,078**
**Claims priority, application Japan, Mar. 23, 1989, 1-73570**
**Int. Cl.[5] H03H** *7/01*
**U.S. Cl. 333—185** **5 Claims**

1. A $\pi$-type LC filter comprising:

a laminate of a middle layer of magnetic material, an upper layer of dielectric material disposed over an upper surface of said middle layer, and a lower layer of dielectric material disposed over a lower surface of said middle layer opposite said upper surface thereof,

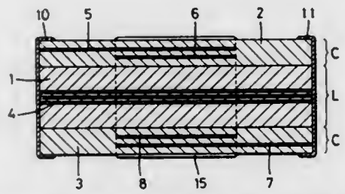
the laminate constituting a filter body having opposite ends and opposite sides extending between said ends;

external end electrodes disposed over the ends of said filter body, respectively;

at least one external intermediate electrode disposed over a portion of said filter body intermediate said ends thereof;

at least one line of electrically conductive material extending within said layer of magnetic material and electrically connected to said external end electrodes, whereby said layer of magnetic material and said at least one line of electrically conductive material extending therein form an inductor of the $\pi$-type LC filter;

a first pair of capacitor electrodes extending within said upper layer of dielectric material parallel to one another, one of the electrodes of said first pair being remote from said layer of magnetic material and electrically connected to one of said external end electrodes, and the other of the




electrodes of said first pair being disposed adjacent said layer of magnetic material and electrically connected to said at least one external intermediate electrode, whereby said first pair of capacitor electrodes and said upper layer of dielectric material form a capacitor of the $\pi$-type LC filter; and

a second pair of capacitor electrodes extending within said lower layer of dielectric material parallel to one another, one of the electrodes of said second pair being remote from said layer of magnetic material and electrically connected to the other of said external end electrodes, and the other of the electrodes of said second pair being adjacent said layer of magnetic material and electrically connected to said at least one external intermediate electrode, whereby said second pairs of capacitor electrodes and said lower layer of dielectric material form another capacitor of the $\pi$-type LC filter.

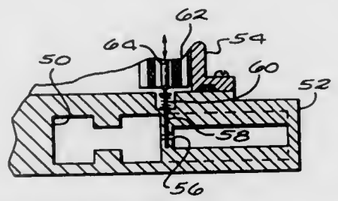
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**5,051,713**

## WAVEGUIDE FILTER WITH COUPLED RESONATORS SWITCHABLY COUPLED THERETO

**Shigetoshi Yokota, Thousand Oaks, Calif., assignor to Transco Products, Inc., Camarillo, Calif.**

**Filed Dec. 30, 1988, Ser. No. 292,091**
**Int. Cl.[5] H01P** *1/10, 1/209*
**U.S. Cl. 333—212** **34 Claims**




21. A waveguide filter, including

a waveguide transmission path, formed by a plurality of wall members, for propagating electrical energy,

at least one resonator filter positioned in parallel with the electrical energy along the transmission path and extending from one of the wall members,



at least one coupling aperture extending through the one wall member in the waveguide for coupling a corresponding at least one resonator to the waveguide and wherein each coupling aperture is defined by at least one width dimension, two height dimensions perpendicular to the width dimension and two thickness dimensions of the one wall member,

each of the at least one coupling aperture including at least two sections and with one section having a greater height dimension and lesser wall thickness dimension relative to another section of lesser height dimension and greater wall thickness dimension to reduce any second order resonances, and

a sliding member physically positioned across the lesser height dimension of the coupling aperture to slide between an open retracted position and a closed position to provide switching of the resonator.

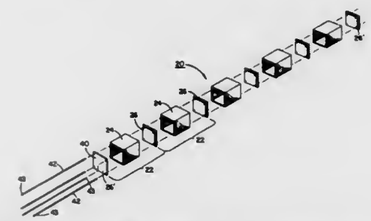
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**5,051,714**

## MODULAR RESONANT CAVITY, MODULAR DIELECTRIC NOTCH RESONATOR AND MODULAR DIELECTRIC NOTCH FILTER

**Salvatore Bentivenga, Manalapan, and Gregory J. Lamont, Englishtown, both of N.J., assignors to Alcatel NA, Inc., Hickory, N.C.**

**Filed Mar. 8, 1990, Ser. No. 490,933**
**Int. Cl.[5] H01P** *7/06, 1/208*
**U.S. Cl. 333—227** **38 Claims**



1. N modular resonant cavities for electromagnetic energy, where N is an integer greater than one, comprising:

(A) N multi-sided shells each defining an aperture passing therethrough, the aperture terminating t each end of the shell with an aperture perimeter formed by the shell;

(B) two solid end closure plates each having means for interfitting with one aperture perimeter of one multi-sided shell;

(C) N – 1 solid divider closure plates each having means for interfitting with two adjacent multi-sided shells about a corresponding aperture perimeter thereof; and

(D) means for securing the two end closure plates and the N – 1 divider closure plates to the N multi-sided shells.

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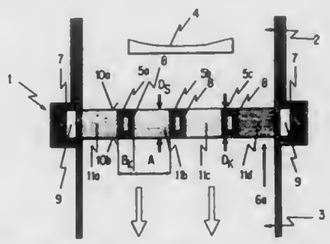
**5,051,715**

## COUPLING-OUT WINDOW FOR LINEARLY POLARIZED MICROWAVES

**Giorgio Agosti, Wettingen; Bernd Jödicke, Unterehrendingen; Hans-Günter Mathews, Oberehrendingen, and Oskar Schafheitle, Oetwil, all of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland**

**Filed Jun. 15, 1990, Ser. No. 538,669**
**Claims priority, application Switzerland, Jun. 21, 1989, 2314/89**
**Int. Cl.[5] H01P** *1/08*
**U.S. Cl. 333—252** **9 Claims**

1. In a waveguide, a coupling-out window for linearly polarized high-power microwaves, having at least one plate which is situated in a plate plane and is transparent to microwaves, which coupling-out window exhibits cooling fins which are disposed in the plate plane perpendicular to the direction of polarization of the microwaves and are in heat-conducting and pressure-locking contact with the at least one plate, wherein



the cooling fins are accommodated in groove-like recesses penetrating from a main surface into the plate.

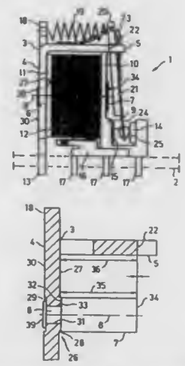
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**5,051,716**

## METHOD OF MANUFACTURING OF AN ELECTROMAGNETIC RELAY AND RELAY OBTAINED THEREBY

**Hans P. Stribel, Nürtingen, Fed. Rep. of Germany, assignor to Stribel GmbH, Frickenhausen, Fed. Rep. of Germany**

**Filed Dec. 20, 1989, Ser. No. 453,868**
**Claims priority, application Fed. Rep. of Germany, Dec. 20, 1988, 3842815**
**Int. Cl.[5] H01F** *3/00, 7/08*
**U.S. Cl. 335—281** **8 Claims**



3. In an electromagnetic relay, particularly an armature relay (1), comprising a yoke (3) made of a ferromagnetic material, said yoke having a yoke wall (4) with an inner surface (27) and an outer surface (30) and said yoke wall having a projection (28) extending in an axial direction from the inner surface (27) of the yoke wall (4), the projection (28) being provided with a hole (31) having an inner diameter; and a ferromagnetic coil core (7), said coil core having a shoulder (32) and a neck portion (6) and being mountable with the neck portion (6) engaging in the hole (31), so that the coil core (7) is displaced axially a predetermined distance for a tolerance compensation, the improvement comprising a support (26) on the yoke wall (4) for the coil core (7), said support (26) including the projection (28) and being provided with a recess (29) in the outer surface (30) of the yoke wall (4) on an opposite side of the yoke wall (4) from the projection on the inner surface (27), the projection (28) extending from the inner surface of the yoke wall toward the shoulder (32) of the coil core (7), the neck portion (6) of the coil core (7) extending through the hole (31) into the recess (29) and a rivet (39) for fastening the neck portion (6) in the recess (29) of the support (26), wherein the

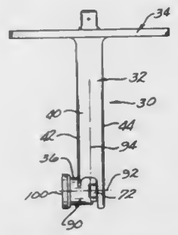
VOL 1130 ISS 4 SE 24 1991 UMI



recess (29) and the projection (28) are of an approximately equal size.

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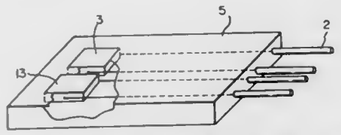
5,051,717
**HIGH LIMIT THERMOSTAT APPARATUS**
Kenneth L. Hayden, Bardstown, N.Y., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 20, 1990, Ser. No. 630,677
Int. Cl.[5] H01H *37/04, 37/52*
U.S. Cl. 337—380 7 Claims




1. A fluid flow temperature control comprising an integral, elongated housing formed of electrically insulative material having a mounting plate with first and second spaced, parallel slots extending therethrough, the housing having front, rear and side walls extending from the mounting plate to an open distal end, the front wall having a cut out portion at its distal end, a thermostatic switch received in the cut out portion, the thermostatic switch having first and second spaced terminals extending toward the rear wall and being adjacent respective side walls, first and second control terminals having an elongated main body portion and each having a quick connect blade formed at a first end of the control terminal which is offset from the main body portion by a double ninety degree bend, the control terminals having a second end, each control terminal received in a respective slot of the mounting plate with the blade extending outwardly from the mounting plate and the main portion received in the housing extending along the side walls, the second end of the control terminals being welded to the respective terminals of the thermostatic switch, the double ninety degree bend forming a laterally extending portion which extends parallel and contiguous to the mounting panel for a selected distance whereby the thermostat is held in place in the cut out portion of the front wall by the laterally extending portions which extend parallel to the mounting panel without the use of any fasteners.

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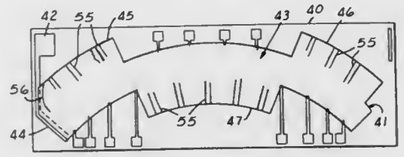
5,051,718
**THERMISTOR ELEMENT AND GAS SENSOR USING THE SAME**
Kazuko Satake, Yokohama, and Ai Kobayashi, Kamakura, both of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan
Filed Sep. 18, 1990, Ser. No. 584,175
Claims priority, application Japan, Sep. 18, 1989, 1-240106
Int. Cl.[5] H01C *7/00, 7/10*
U.S. Cl. 338—34 8 Claims




1. A thermistor element consisting essentially of a vanadium-containing titania having dissolved therein 0.01 to 10 at. %, based on titanium, of vanadium and optionally 10 at. % or less, based on titanium, of at least one element selected from the group consisting of cobalt, copper, manganese, iron, nickel, bismus, strontium, barium, lead and zinc.

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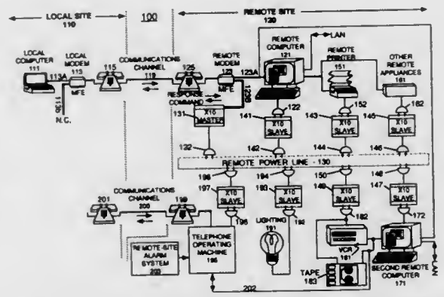
5,051,719
**THICK-FILM NON-STEP RESISTOR WITH ACCURATE RESISTANCE CHARACTERISTIC**
Robert D. Gaston, Dearborn Heights, Mich., and Daxesh K. Patel, Hatfield, Pa., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jun. 11, 1990, Ser. No. 536,362
Int. Cl.[5] H01C *10/32*
U.S. Cl. 338—162 25 Claims




1. A variable resistor comprising:
a substrate;
a generally arcuate-shaped film resistor disposed on said substrate for providing an arcuate wiper track, said film resistor including a plurality of angularly offset extension areas extending radially from said wiper track, said extension areas including a plurality of trim cuts extending substantially radially toward but not entering said wiper track, said trim cuts arranged to provide a predetermined resistance characteristic along said wiper track;
a first end pad disposed on said substrate and electrically connected to one end of said wiper track for providing a first electrical connection for said variable resistor; and
wiper contact means for slidably engaging said wiper track and for providing a second electrical connection for said variable resistor.

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5,051,720
**REMOTE CONTROL SYSTEM USING POWER LINE OF REMOTE SITE**
Kitti Kittirutsunetorn, Sunnyvale, Calif., assignor to Secure Telecom, Inc., Sunnyvale, Calif.
Filed Nov. 13, 1989, Ser. No. 435,644
Int. Cl.[5] H04M *11/04*
U.S. Cl. 340—310 R 23 Claims



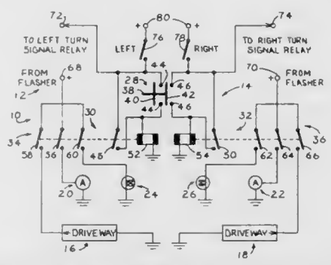

14. A remote control system where a remote site is coupled to a local site by an inter-site communications channel,
the remote control system being for selectively applying power at the remote site to one or more remote-site devices in accordance with power control messages transmitted from the local site, the system comprising at the remote site:



an AC power line for supplying alternating current power at the remote site;
a master power-control unit coupled to the AC power line;
one or more power-control slave units coupled to the AC power line;
a multi-channel modem, coupling the remote-site end of the inter-site communications channel to the master power-control unit and to the one or more remote-site devices, the multi-channel modem having one channel dedicated to transmitting control signals between the master power-control unit and the local site and a second channel dedicated to transmitting other signals between the one or more remote-site devices and the local site.

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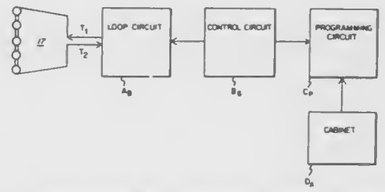
5,051,721
**SUPPLEMENTAL TURN SIGNAL APPARATUS FOR VEHICLES**
Frank Harrison, P. O. Box 1824, Kansas City, Mo. 64141
Filed Sep. 11, 1989, Ser. No. 405,644
Int. Cl.[5] B60Q *1/38*
U.S. Cl. 340—475 4 Claims




1. A supplemental turn signal apparatus for a vehicle having an electrical turn signal system including at least one manually actuatable system switch shiftable between an open position and a closed position, at least one signal lamp and means for energizing the lamp, the supplemental apparatus comprising:
at least one signal display conspicuously mounted on the vehicle;
selectively activatable connection means for selectively electrically connecting the system switch to said signal display when the system switch is shifted to the closed position thereof, said connection means including structure for selectively coupling the system switch and signal display in order to simultaneously energize the signal lamp and said signal display,
said coupling structure comprising button switch means for selectively electrically coupling the signal display with the system switch, said button switch means including moveable structure moveable between an activated position and a neutral position, said moveable structure being biased to the neutral position,
said connection means including maintenance means operably connected to the system switch for maintaining current flow from said system switch to said signal display during the time when said system switch is in the closed position thereof and said button switch means is momentarily moved to said activated position and thereafter returns to the neutral position.

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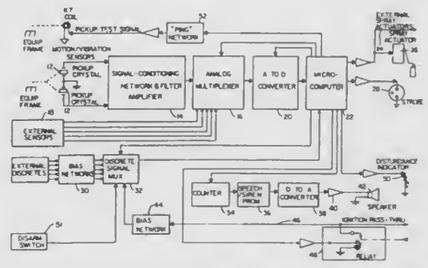
5,051,722
**CENTRAL ADDRESS AND PROGRAMMING UNIT FOR FIRE ALARM DETECTOR**
Emile Hugon, 21 Ave. Montaigne, Paris 75800, France
Filed Apr. 28, 1989, Ser. No. 344,899
Claims priority, application France, Sep. 8, 1988, 88 11721
Int. Cl.[5] G08B *25/00*
U.S. Cl. 340—524 10 Claims




1. A central address and programming unit for a plurality of fire alarm detectors connected to a logic unit, said logic unit comprising a plurality of pickups, said central address and programming unit comprising:
a. an electronic control circuit for controlling said central address and programming unit, said electronic control circuit comprising a data bus, an integrated circuit $IC_{21}$, a clock $Y_1$ for controlling integrated circuits $IC_{21}$, defect control means for controlling defects in the clock and a multiplexer for connecting integrated circuit $IC_{21}$ to the data bus;
b. a loop circuit for interfacing the electronic control circuit to the fire alarm detectors, said loop circuit comprising an integrated circuit and external memories coupled to said integrated circuit;
c. a programming circuit for pilotting the operations of said electronic control circuit, said electronic programming circuit comprising a multiplexing circuit for controlling the display of data, and for driving said programming circuit, a keyboard, said keyboard having a plurality of transfer relays that represent control keys; and
d. a control and dialogue panel for operating the programming circuit and showing and printing data of address information.

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5,051,723
**SIGNALLING SYSTEM WITH AMBIENT CONDITION REFERENCE MONITORING**
George E. Long, 11821 - 219th Ave., SE., Monroe, Wash. 98272; Daniel R. Asmussen, Kirkland, and Martin J. Kenney, Redmond, both of Wash., assignors to George E. Long, Monroe, Wash.
Filed Sep. 29, 1989, Ser. No. 414,701
Int. Cl.[5] G08B *13/02*
U.S. Cl. 340—566 15 Claims




1. An alarm system for generating an alarm signal responsive to a sensed condition under surveillance wherein said sensed

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condition is compared to a reference condition for determining if an alarm signal is to be generated, said system comprising in combination,

(a) alarm signal generating means,

(b) ambient condition monitoring means including first sensing means for monitoring at least one given ambient condition and for generating a reference signal representing said ambient condition,

(c) second sensing means for generating a surveillance signal responsive to said sensed condition under surveillance,

(d) and signal comparing means for comparing said reference signal and said surveillance signal, said alarm signal generating means being actuated by a sensed condition signal if said surveillance signal exceeds said reference signal by a predetermined amount,

whereby the alarm system is activated when a sensed condition occurs which is outside the ambient envelope, thereby providing an alarm system with a reference signal which is constantly changed in response to constantly changing ambient conditions.

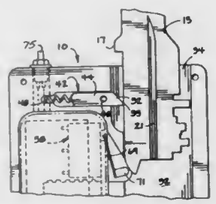
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**5,051,724**

## KEY SECURITY DEVICE

**Carl R. Morrow, Longview, and G. Jeff Maestretti, Walla Walla, both of Wash., assignors to Carl R. Morrow, Longview and G. Jeff Maestretti, Walla Walla, both of, Wash.**

**Filed May 31, 1990, Ser. No. 531,020**
**Int. Cl.[5] G08B *13/14***
**U.S. Cl. 340—568** **17 Claims**



1. A key security device for releasably holding a key having an elongated blade extending from a bow end, a shoulder on one longitudinal edge of the blade, and a ward groove extending longitudinally along a side surface of the blade, the device comprising:

a housing;

an elongated keyway formed in the housing with an open end for receiving the key blade longitudinally;

a bar in the housing for holding the key blade against lateral movement within the keyway;

a latch on the housing selectively operable between a locking position in engagement with the key to releasably lock the key to the housing and a release position allowing the key to be withdrawn from the keyway; and

an alert device within the housing responsive to insertion and removal of the key from the housing for producing an identifiable alert signal after a selected time interval initiated in response to removal of the key from the keyway, and for resetting the selected time interval and cancelling the alert signal responsive to reception of the key in the keyway.

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**5,051,725**

## SECURITY CONTAINER

**Michael F. Caccitolo, Chicago, Ill., assignor to SOA Systems, Inc., Chicago, Ill.**

**Filed Jun. 18, 1990, Ser. No. 539,920**
**Int. Cl.[5] G08B *13/14***
**U.S. Cl. 340—571** **16 Claims**

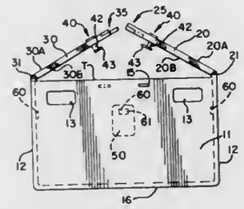
1. A security container comprising:

a storage container having walls and a bottom, each said wall having a top, and a cover comprising at least one lid hingedly connected to one of said walls, said cover being movable between an open and a closed position;

means for locking said cover in said closed position to prevent improper entry into said storage container;

means within said storage container for detecting a greater-than-threshold amount of motion of said container;

means within said storage container for emitting an alarm signal when a greater-than-threshold amount of motion has been detected;



cooperating quick-release fasteners for mounting said detecting means and alarm signal means in any one of a plurality of locations within said storage container, one said fastener secured to said detection means and said alarm means and a plurality of fasteners secured to said storage container for selectively cooperating with said fastener secured to said detection means and said alarm signal means; and,

means for permitting said alarm signal to emanate from said storage container.

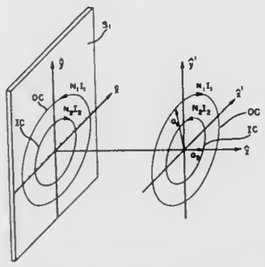
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**5,051,726**

## ELECTRONIC ARTICLE SURVEILLANCE SYSTEM WITH ANTENNA ARRAY FOR ENHANCED FIELD FALLOFF

**Richard L. Copeland, Boca Raton, and Markus B. Kopp, Pompano Beach, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.**

**Filed Aug. 14, 1990, Ser. No. 567,260**
**Int. Cl.[5] G08B *13/24***
**U.S. Cl. 340—572** **16 Claims**



1. A system for use in detecting the presence of an electronic article surveillance tag in an area subject to surveillance, said system comprising:

(a) first and second antenna means disposed on opposed sides of said area, each said antenna means incorporating therein at least first and second antennas circumscribing a common center thereof at respective different distances from said common center;

(b) excitation means for exciting each said first antenna at a greater level than each said second antenna, said excitation of said first and second antennas by said exciting means being of respective opposite phasing.

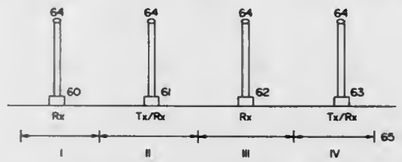


**5,051,727**

## SHOPLIFTING DETECTION SYSTEM OF THE TRANSMISSION TYPE

**Tallienco W. H. Fockens, Eibergen, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands**

**Filed Mar. 16, 1990, Ser. No. 495,030**
**Claims priority, application Netherlands, Mar. 17, 1989, 8900658**
**Int. Cl.[5] G08B *13/18***
**U.S. Cl. 340—572** **14 Claims**



1. A shoplifting detection system of the transmission type, suitable in particular for the use of high frequency interrogating signals, in which system an electronic label provided with a resonance circuit can effect an electromagnetic coupling between at least two antenna coils, at least one of which is a transmitting antenna coil which, in operation, is fed with an A.C interrogating signal from a transmitter circuit, and at least one other of which is a receiving antenna coil which supplies a received signal to a receiver circuit, characterized in that said receiver circuit comprises a phase-sensitive synchronous detector to which the received signal is supplied, and to which a reference signal is supplied of such a phase that a component in the received signal, caused by an electronic label, provides a maximum output signal of said synchronous detector, and a signal phase-shifted through 90° relatively to said component provides a minimum output signal of said synchronous detector.

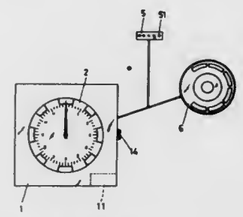
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**5,051,728**

## MUSIC POSTER

**Frank Y. Wang, 2Fl. No. 30, Lane 545, Tun Hua S. Rd., Taipei, Taiwan**

**Filed Feb. 26, 1990, Ser. No. 484,895**
**Int. Cl.[5] G08B *23/00***
**U.S. Cl. 340—573** **1 Claim**



1. A music poster having a battery powered sound generation system for providing simultaneous audio and visual effects, comprising:

a. control means for actuating both said audio and visual effects, said control means including (1) printed circuit board assembly having a plurality of electrically conductive regions formed thereon and separated one from another by a plurality of electrically non-conductive regions, and (2) an electrically conductive member rotatively driven by a timepiece mechanism, whereby said conductive member alternately contacts said conductive and non-conductive regions of said printed circuit board assembly for periodically generating an actuation signal;

b. sound generation means electrically coupled to said control means for generating acoustic signals responsive to said actuation signal; and

c. lamp flashing means coupled to said control means for alternately energizing one or more of a plurality of lamps in synchronism with said acoustic signals responsive to said actuation signal.

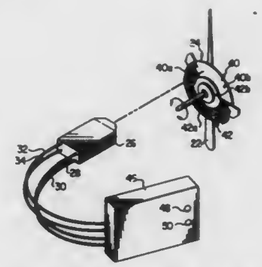
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**5,051,729**

## PRESSURE RESPONSIVE ENCODER

**Tommy L. Gray, Dallas, Tex., assignor to Span Instruments, Inc., Plano, Tex.**

**Filed Feb. 22, 1988, Ser. No. 158,850**
**Int. Cl.[5] G08B *21/00***
**U.S. Cl. 340—626** **14 Claims**



1. A pressure responsive controller optically coupled to a pressure responsive device, comprising:

a first light source/light detector pair,

a second light source/light detector pair,

a first fiber optic cable for transmitting light from the first light source to the pressure responsive device,

a second fiber optic cable for transmitting light reflected at the pressure device from the light source to the light detector of the first pair,

a third fiber optic cable for transmitting light from the light source of the second pair to the pressure responsive device,

a fourth fiber optic cable for transmitting light reflected at the pressure device from the light source to the light detector of the second pair,

an encoded disc movable in response to a pressure change at the pressure responsive device and having a first pattern to selectively reflect light from the light source to the light detector of the first pair and a different second pattern to selectively reflect light from the light source to the light detector of the second pair,

a first control circuit connected to the light detector of the first pair and responsive to the output thereof only at a first adjustable preselected pressure to generate an indication of the first adjustable preselected pressure applied to the pressure responsive device, and

a second control circuit connected to the light detector of the second pair and responsive to the output thereof only at a second adjustable preselected pressure to generate an indication of the second adjustable preselected pressure applied to the pressure responsive device.

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5,051,730

## CIRCUIT ARRANGEMENT FOR CHARGING RECTIFIERS FOR DC ENERGY STORAGE DEVICES IN TELECOMMUNICATIONS SYSTEMS, PARTICULARLY TELEPHONE SWITCHING SYSTEMS

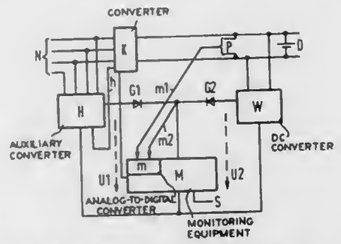
Ernst Kulzer, Pullach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich

Filed May 29, 1990, Ser. No. 529,382

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1989, 3928222

Int. Cl.[5] G08B 21/00

U.S. Cl. 340—635 2 Claims




1. A circuit arrangement for a charging rectifier for a DC energy storage device, in particular a storage battery in telecommunications equipment,

comprising: a first converter connected to and supplied by an AC voltage supply network and connected to and operable to charge said DC energy storage device;

an auxiliary converter connected to the AC voltage supply network;

a DC converter connected to and supplied with energy by said DC energy storage device,

first and second crystal diodes respectively connected to said auxiliary converter and to said DC converter and connected together to a common point decoupling said auxiliary converter and said DC converter from one another, said auxiliary converter and said DC converter each providing a DC voltage to the common point via the respective crystal diode, with a DC voltage offered by said DC converter being set higher than the DC voltage offered by said auxiliary converter; and

monitoring equipment connected to said DC energy storage device and to the common point for monitoring the magnitude of the voltage at the common point, said monitoring equipment responsive to the receipt of only a DC voltage of a magnitude that is normally provided from said auxiliary converter to check for the presence of DC voltage provided to said DC voltage converter by said DC energy storage device, and operable in response to such presence to produce an alarm signal indicating a malfunction of said DC converter.

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5,051,731

## BLOWN CIRCUIT BREAKER INDICATOR WITH LIGHT EMITTING DIODE

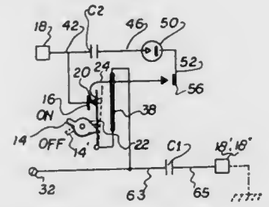
Raul Guim, and Aurelio R. Guim, both of 834 Venetia, Coral Gables, Fla. 33134

Filed Jan. 16, 1990, Ser. No. 464,537

Int. Cl.[5] G08B 21/00

U.S. Cl. 340—638 14 Claims

1. In a circuit breaker having a blown circuit indicator circuit, said circuit breaker having a first fixed contact connected to a line circuit, a first movable contact, a contact carrier having said first movable contact mounted thereon, an operating mechanism including a handle for manually moving said movable contact carrier so that said first movable contact may be brought into electrical contact with said first fixed contact, a load circuit terminal for connection to a load circuit, said load circuit terminal electrically connected to said first movable contact through a tripping mechanism including an overload circuit responsive member between said first movable contact and said load circuit terminal, said overload circuit responsive member for moving said contact carrier to separate said first fixed contact and said first movable contact thereby interrupting said load circuit in response to an overload condition through said overload responsive member, said blown circuit indicator circuit being connected at one end to said line circuit and at the other end to said load circuit terminal, said blown circuit indicator circuit comprising in series a light emitting diode, a second fixed contact, and a second movable contact, said second fixed contact and said second movable contact held in spaced, non-electrically conducting position by said overload responsive member until said overload responsive member is actuated to a load circuit interrupting position simultaneously moving said second movable contact into contact with said second fixed contact, thereby completing an electrical path from said line circuit to said load circuit terminal, the improvement comprising:




(a) an electrical path from said load circuit terminal through an impedence member electrically connected to a ground contact electrically connected to ground,

whereby, when said overload responsive member is moved to a load circuit interrupting position in response to a load overload, said light emitting diode will become lit through a current path from said line circuit through said light emitting diode and said second movable and said second fixed contacts to said load circuit terminal, where said current path to ground is completed either through said load circuit or through said electrical path from said load circuit terminal through said impedence member and said ground contact to ground, so that said light emitting diode will be lit when said overload responsive member is moved to a load interrupting position regardless of the condition of said load circuit.

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5,051,732

## POWER OUTLET GROUND INTEGRITY AND WRISTSTRAP MONITOR CIRCUIT

James M. Robitaille, Cleveland, Ohio, assignor to Ericson Manufacturing Company, Willoughby, Ohio

Filed Aug. 29, 1988, Ser. No. 239,198

Int. Cl.[5] G08B 21/00

U.S. Cl. 340—650 18 Claims

1. A self-contained wriststrap detector circuit comprising:

a housing containing the circuit;

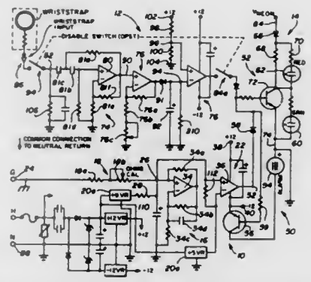
hot, neutral and ground input terminals connected to and extending from said housing for insertion in a power outlet;

means on said housing for removably connecting a wriststrap to said circuit;

an impedance in said housing coupling said wriststrap connecting means to said ground input terminal for developing a predetermined voltage only when a user of the wriststrap is electrostatically grounded and when the housing input terminals are properly connected to said power outlet;

means coupled to said impedance for detecting said predetermined voltage and generating a first output signal representing a safe condition only when said wriststrap is properly connected to said circuit and said user, and a second output signal representing an unsafe condition only when said wriststrap is improperly connected either to said circuit or said user;

indicator means in said housing for indicating the safe and unsafe conditions to said user;




means coupled between said signal generating means and said indicator means for activating the safe and unsafe condition indication in response to said first and second output signals; and

a low frequency band pass filter for removing unwanted signals, said band pass filter having an input connected to said wriststrap impedance means and an output coupled to said signal generating means.

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5,051,733

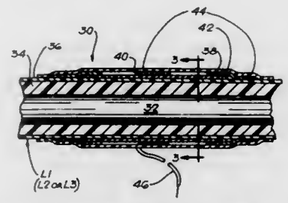
## HIGH VOLTAGE INDICATOR DEVICE

Donald Neuhouser, Grove City, Ohio, assignor to Service Machine Company, Huntington, W. Va.

Filed May 23, 1990, Ser. No. 528,734

Int. Cl.[5] G08B 21/00

U.S. Cl. 340—660 8 Claims




1. Apparatus for indicating a live voltage condition in an insulated electrical conductor consisting of a central conductor wire with insulation thereon, said apparatus comprising:

a layer of flexible semi-conducting tape wrapped continuously around the outer surface of the insulation;

a flexible electrically conductive sheath wrapped continuously around the outer surface of the semi-conducting tape;

a layer of flexible capacitive stress-relieving tape wrapped continuously around each end of the semi-conducting tape;

an outer layer of flexible electrical insulating tape wrapped continuously around and completely covering the previously-described tape layers and the electrically conductive sheath; and

electrical indicator means connected between said electrically conductive sheath and ground to provide an electrical signal when said central conductor wire is electrically energized.



5,051,734

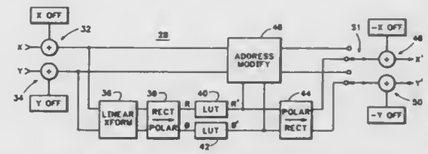
## SPECIAL EFFECTS USING POLAR IMAGE COORDINATES

David E. Lake, Jr., Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Jan. 11, 1990, Ser. No. 463,702

Int. Cl.[5] G09G 1/00

U.S. Cl. 340—700 19 Claims




9. A digital picture manipulation apparatus comprising:

a video frame store having a video input and first and second address inputs, one of which is a write address input and the other of which is a read address input, and a manipulated video output;

first and second address generators each having a sync input and an address output, the address output of each address generator having an X part and a Y part, the address output of the first address generator being coupled to the first address input of the video frame store; and

a mapping function circuit having an X input coupled to the X part of the address output of the second address generator, a Y input coupled to the Y part of the address output of the second address generator, and an address output that has an X' part and a Y' part and is coupled to the second address input of the video frame store, the mapping function circuit comprising:

means for converting rectangular coordinate values X,Y representing an address generated by the second address generator into corresponding polar coordinate values R,$\phi$;

means for manipulating the polar R,$\phi$ values to produce modified polar coordinate values R',$\phi$' according to a desired effect; and

means for deriving modified rectangular coordinate values X',Y' representing the desired effect from the modified polar coordinate values R', $\phi$'.

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5,051,735

## HEADS-UP DISPLAY SYSTEM FOR A ROAD VEHICLE

Yoshimi Furukawa, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1988, Ser. No. 248,881

Claims priority, application Japan, Sep. 25, 1987, 62-240110

Int. Cl.[5] G09G 3/02

U.S. Cl. 340—705 11 Claims

1. A heads-up display system for a road vehicle, comprising:

a sensor for detecting motion-related information on the vehicle while the vehicle is being driven along a road;

computing means for predicting the future course of motion of the vehicle according to the motion-related information detected by said sensor and parameters associated with the vehicle;

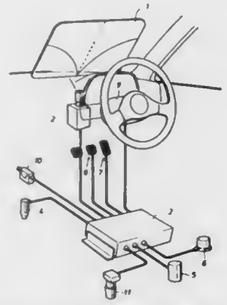
display means for displaying the information within the normal road view of a driver of the vehicle, the information including a limit turning trajectory which gives rise to a certain limit lateral acceleration when the vehicle moved along the limit turning trajectory at a current speed of the vehicle; and

conversion means for converting the predicted motion of the

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vehicle into an image display on said display means so as to permit the driver to see said image display in a certain



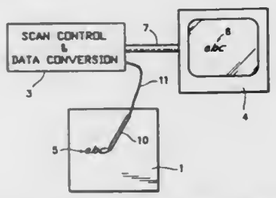
relationship with his view of the actual road ahead of said vehicle.

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**5,051,736**
**OPTICAL STYLUS AND PASSIVE DIGITIZING TABLET DATA INPUT SYSTEM**

**William E. Bennett; Stephen J. Boies, both of Mahopac, N.Y.; Anthony R. Davies, Romsey, England; Karl-Friedrich Etzold, Briarcliff Manor, and Todd K. Rodgers, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 28, 1989, Ser. No. 373,298**
**Int. Cl.[5] G09G** *1/28;* **G08C** *21/00;* **G06K** *9/00*
**U.S. Cl. 340—707** **15 Claims**

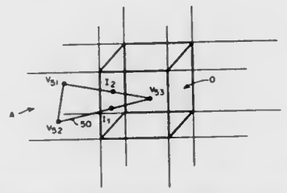



1. A stylus locator and data input system for use in conjunction with an electronic computer system comprising in combination:
an optical stylus including an illumination source and a pick up means for detecting absolute binary location data from a passive digitizing tablet when said stylus is passed over the surface thereof,
a passive locator tablet for use with said optical stylus member having permanently recorded thereon and distributed throughout the surface thereof a plurality of discrete sets of tablet address cells (TACs) each TAC comprising a digitally encoded X-Y coordinate pair which defines the absolute location of the TAC on the surface of said tablet,
means on said tablet for unambiguously demarking the boundaries of individual TACs, the density of the TACs being at least 250,000 per square inch and;
means for periodically sampling TAC data picked up by said stylus as the stylus is passed over the surface of the tablet, and
data generating means for producing a complete TAC data pair (X-Y coordinates) from each sampled unit of TAC data, said sampling rate being at least 125 per second.

**5,051,737**
**EFFICIENT GRAPHICS PROCESS FOR CLIPPING POLYGONS**

**Kurt Akeley, Mountain View, and Carl P. Korobkin, Palo Alto, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.**

**Filed Feb. 23, 1989, Ser. No. 314,554**
**Int. Cl.[5] G09G** *1/14*
**U.S. Cl. 340—747** **26 Claims**



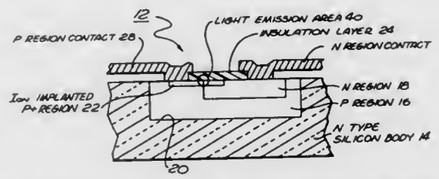

1. A system for displaying graphic images comprising:
preselected clipping planes;
particular subspaces defined by said preselected clipping planes;
polygons containing vertices;
clipping means for clipping said polygons against said preselected clipping planes by operating on the vertices of each of said polygons rather than the edges of each of said polygons;
determining means for determining when the vertices of one of said polygons all lie within one of a number of said particular subspaces defined by said preselected clipping planes; and
disabling means for disabling the clipping means so long as all vertices of one of said polygons lie in a same subspace of said particular subspaces.

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**5,051,738**
**IMAGING SYSTEM**

**Aram Tanielian, Rancho Palos Verdes, and W. Edward Naugler, Jr., Seal Beach, both of Calif., assignors to Revtek Inc., Torrance, Calif.**

**Filed Feb. 27, 1989, Ser. No. 315,486**
**Int. Cl.[5] G09G** *3/32*
**U.S. Cl. 340—782** **32 Claims**



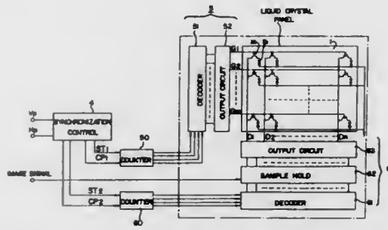

1. In combination for providing a display of a visual image,
a plurality of diodes disposed in contiguous relationships to define an array, each of the diodes constituting a semi-conductor having n and p layers disposed relative to each other to define a junction, each of the semi-conductors being constructed to emit light at the jnction between the n and p layers when a particular voltage is applied between the n and p layers in the semi-conductor to reverse bias the diode, and
means for applying the particular voltage between the n and p layers in individual ones of the diodes in the array to reverse bias the individual diodes in accordance with the visual image to be displayed on the array.



**5,051,739**
**DRIVING CIRCUIT FOR AN IMAGE DISPLAY APPARATUS WITH IMPROVED YIELD AND PERFORMANCE**

**Toshiaki Hayashida, Hirakata; Hajime Takesada, and Mitsuhiro Yamasaki, both of Kobe, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan**

**PCT No. PCT/JP87/00294, § 371 Date Dec. 16, 1987, § 102(e) Date Dec. 16, 1987, PCT Pub. No. WO87/07067, PCT Pub. Date Dec. 19, 1987**
**Continuation of Ser. No. 143,556, Dec. 16, 1987, abandoned.**
**This PCT application May 12, 1987, Ser. No. 411,234**
**Claims priority, application Japan, May 13, 1986, 61-108969; May 20, 1986, 61-115076; May 20, 1986, 61-115077; May 20, 1986, 61-115078; May 20, 1986, 61-115079; May 20, 1986, 61-115080; Sep. 17, 1986, 61-219982**
**Int. Cl.[5] G09G** *3/36*
**U.S. Cl. 340—784** **6 Claims**




2. A driving circuit for an image display apparatus of an active matrix panel, with a plurality of picture elements being disposed in matrix shape, respective rows and columns of said active matrix panel are respectively selected by a clock pulse of a given frequency to drive each of said picture elements, the driving circuit comprising:
a counter counting said clock pulses and outputting binary count values and inverted binary count values for said respective rows and columns;
a decoder decoding the binary and inverted binary count value from the counter to simultaneously generate a pair of pulses opposite in polarity, said pair of pulses sequentially shifting in a synchronous relation to said clock pulses in each of said respective rows and/or respective columns; and
an output circuit including first and second FETs being connected in series, a pair of pulses opposite in polarity being applied respectively upon each gate of each FET, output signals amplified from connection points of both FETs being output to said active matrix panel.

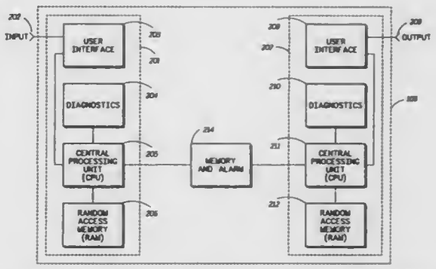
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**5,051,740**
**PAGING TERMINAL**

**William M. Barr, Lake Worth, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Aug. 18, 1989, Ser. No. 395,685**
**Int. Cl.[5] H04B** *7/00*
**U.S. Cl. 340—825.44** **11 Claims**

11. A paging terminal comprising:
terminal input means for accepting pages;
memory means coupled to the terminal input means for storing the pages;
terminal output means coupled to the memory means for relaying the pages to at least one of a plurality of pagers;
monitor means coupled to the output means for monitoring the status of the terminal output means;
control means coupled to the terminal input means, the memory means, and the monitor means, for continuing to accept and store the pages when the status of the terminal output means inhibits relaying the pages, and further for subsequently relaying the pages that were previously accepted and stored when the status of the terminal output means does not inhibit relaying the pages;
first information means coupled to the terminal input means and to the monitor means for providing notification of the status of the terminal output means inhibiting the relaying of the pages;
second information means coupled to the memory means and to the monitor means for adding page delay information to the pages stored while the terminal output means inhibits relaying the pages; and



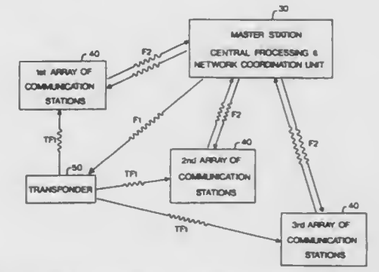

programmable timer means coupled to the first information means, to the second information means, and to the monitor means for providing notification of the status of the terminal output means inhibiting the relaying of the pages for a predetermined time interval, and for adding page delay information to the pages stored while the terminal output means inhibits relaying the pages for a predetermined time interval.

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**5,051,741**
**LOCATING SYSTEM**

**Philip B. Wesby, Kolk 14 2611 KD, Delft, Netherlands**

**Filed Mar. 28, 1990, Ser. No. 501,091**
**Int. Cl.[5] H04B** *7/00*
**U.S. Cl. 340—825.49** **41 Claims**




1. A system for locating moveable elements within a total area comprising:
a plurality of transponders, each carried by one of said moveable elements and each being responsive to an associated identification code;
means for paging said area with one of said identification codes;
a network of communication stations spaced throughout said area, each including means for receiving response signals sent from within a detection area associated with the communication station and means for communicating with a master station;
said master station including means for priming said network of communication stations by providing each communication station with said one of said identification codes;

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each of said communication stations including means for comparing said one of said identification codes with said response signals that are received, wherein said master station locates a moveable element to within the intersection of the detection areas of the communication stations which received a response signal that matched said one of said identification codes.

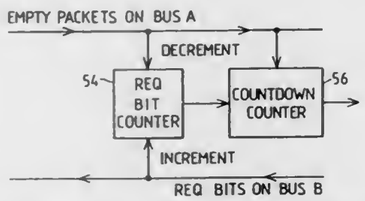
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5,051,742

## QUEUEING PROTOCOL

John L. Hullett, Daglish, and Robert M. Newman, Duncraig, both of Australia, assignors to Robert M. Newman, Duncraig; John L. Hullett, Daglish and University of Western Australia, Nedlands, all of, Australia

Continuation of Ser. No. 899,223, Jul. 11, 1986, Pat. No. 4,922,244. This application Mar. 8, 1990, Ser. No. 490,478
Claims priority, application Australia, Dec. 3, 1984, PG8394
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] H04Q 9/00
U.S. Cl. 340—825.5 31 Claims




1. A method of controlling the order of transmissions of data packets from access units in a network having first and second oppositely directed unidirectional buses with a plurality of access units coupled between the buses, said access units producing request flags on the buses when they have data packets for transmission thereon, said method including the steps of:
monitoring at said access units request flags and empty or available data packets on said buses;
performing logical steps at the access units in response to received request flags and empty or available data packets; and
transmitting data packets from the respective access units in accordance with the results of said logical steps.

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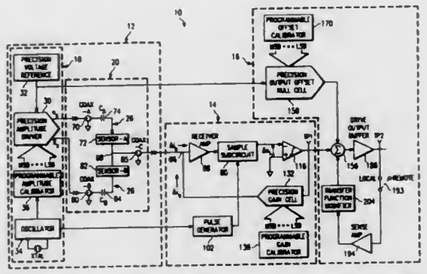
5,051,743

## HIGH PRECISION, HIGH FREQUENCY CURRENT SENSING AND ANALOG SIGNAL DECODING NETWORK

James H. Orszulak, Nederland, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed May 31, 1989, Ser. No. 359,408
Int. Cl.[5] G08C 19/10, 19/22
U.S. Cl. 340—870.04 27 Claims

1. A network employing current sensing and analog signal decoding to measure a desired parameter, said network comprising:
first means for sensing the desired parameter and outputting a first current signal related to a unit measure of the desired parameter, said first means including a first sensor for producing a first sensor signal, a second sensor for producing a second sensor signal, and drive means for providing said first sensor with a first drive signal having a predetermined carrier frequency and said second sensor with a second drive signal having said predetermined carrier frequency; and
second means, responsive to said first current signal, for demodulating said first current signal to obtain a demodulated signal having a component that reflects the unit measure of the desired parameter, said second means including feedback means for generating an offset signal having a component proportional to said component of said demodulated signal and combining said offset signal



with said first current signal to provide a resultant signal having a component that reflects the unit measure of changes in the desired parameter.

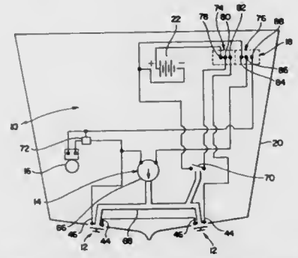
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5,051,744

## BOAT ALARM SYSTEM

Mark N. Ewart, 12 Horizon Dr., Tiverton, R.I. 02878

Filed Feb. 6, 1990, Ser. No. 475,846
Int. Cl.[5] G08B 23/00
U.S. Cl. 340—984 7 Claims



1. An alarm system for a boat, said boat including a hull having a waterline, said alarm system comprising a housing adapted to be secured to an exterior surface of said boat below the waterline thereof, said housing having an open cylinder formed therein, displaceable means cooperating with said cylinder to define an air-tight compressible chamber, said displaceable means being responsive to increased water pressure on the exterior of said boat hull for movement from a nondisplaced position wherein said chamber has a first volume to a displaced position wherein said chamber has a reduced second volume; means for resiliently resisting movement of said displaceable means from said nondisplaced position thereof toward said displaced position thereof and signalling means responsive to movement of said displaceable means from said nondisplaced position thereof to said displaced position thereof for alerting an attendant of said boat.

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5,051,745

## STRING SEARCHER, AND COMPRESSOR USING SAME

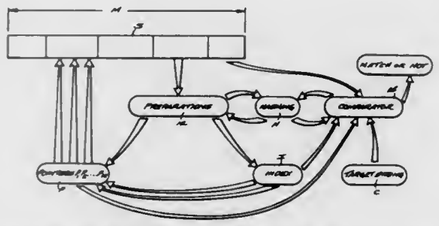
Phillip W. Katz, Glendale, Wis., assignor to PKWare, Inc., Brown Deer, Wis.

Filed Aug. 21, 1990, Ser. No. 570,433
Int. Cl.[5] H03M 7/30; G06F 15/40
U.S. Cl. 341—51 12 Claims

1. A method for searching a vector of symbols for a predetermined target string, comprising:



generating a pointer array having one pointer for each of the symbols in the vector;
calculating, by means of a hashing function, the hashing value of each of the symbols, and arranging the pointer array in order of hashing value of the respective symbol, the hashing function being chosen so that there are fewer hashing values than there are pointers in the pointer array;
generating an index of the pointers in the pointer array, that index having only as many entries as there are possible hashing values, and therefore substantially fewer entries than the pointer array;



applying the hashing function to the target string, to generate a target hashing value; and
if the target hashing value is not defined or is null, sending a response that the target string does not appear in the vector;
if the target hashing value is defined and not null, using the index to determine those pointers to symbols having hashing values which are equal to the target hashing value, and sequentially comparing the target string to each of the locations in the vector pointed to by each of the corresponding pointers, to determine whether each location contains a match to the target string.

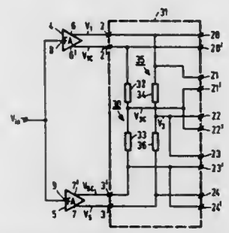
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5,051,746

## INTERPOLATION CIRCUIT FOR USE IN AN A/D CONVERTER

Robert E. J. van de Grift, and Martien van der Veen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 131,145, Dec. 10, 1987, Pat. No. 4,912,469. This application Mar. 22, 1990, Ser. No. 497,285
Claims priority, application Netherlands, Aug. 3, 1987, 8701816
The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.
Int. Cl.[5] H03M 1/36
U.S. Cl. 341—159 8 Claims



1. An interpolation circuit comprising: a first and a second pair of inputs with each pair of inputs receiving two complementary input signals having edges with finite slopes, at least three pairs of outputs with each of at least two pairs of said outputs supplying two output signals which are substantially complementary to one another, the first pair of outputs being connected to the first pair of inputs and the second pair of outputs being connected to the second pair of inputs, means connecting a first output of the third pair of outputs to a circuit node other than one of the inputs of the first pair of inputs, and means connecting a second output of the third pair of outputs to a first input of the first pair of inputs.

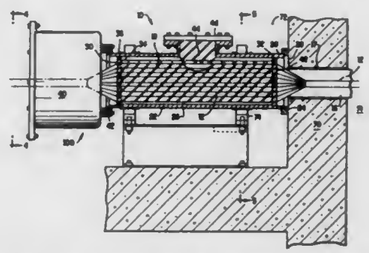
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5,051,747

## INTERFACE FOR CABLES

Mark W. Harshman, Allison Park, and Stephen H. Black, Lower Burrell, both of Pa., assignors to Contraves Goerz Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1990, Ser. No. 485,433
Int. Cl.[5] H05K 9/00
U.S. Cl. 342—1 23 Claims



1. An anechoic chamber interface through which cables are introduced into an anechoic chamber comprising:
a housing made of a conductive material; and
a lossy material disposed inside and filling essentially the housing through which the cables extend, said cables having an insulation layer throughout the housing that the cables extend.

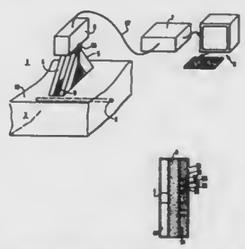
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5,051,748

## DEVICE FOR TRANSMITTING AND RECEIVING MICROWAVE RADIATION, FOR FORMING IMAGES OF BURIED OBJECTS

Christian Pichot, Saint-Germain-en-Laye; Luc Chommeloux, Versailles; Dominique Picard, Bagneux, and Jean-Charles Bolomey, Paris, all of France, assignors to Centre National de la Recherche Scientifique and Etat-Francais-Laboratoire Central Ponts et Chaussees, both of Paris, France

Filed Aug. 3, 1989, Ser. No. 388,945
Claims priority, application France, Aug. 3, 1988, 88 10479
Int. Cl.[5] G01S 13/04; G01V 3/12
U.S. Cl. 342—22 9 Claims



1. A device, disposed in a first medium, for transmitting and receiving radiation and for forming an image of an object buried in a second medium, comprising:
a micro-wave source,
at least one transmitting antenna connected to the source and having a radiating opening substantially in the form of a

VOL 1130 ISS 4 SE 24 1991 UMI



rectangular wave-guide, applied against a surface which separates the first medium from the second medium,

at least one receiving antenna having a collecting opening substantially in the form of a rectangular wave-guide applied against the separation surface and disposed so that a large side of said radiating opening and a large side of said collecting opening are side by side, said receiving antenna comprising a line of pinpoint antennae disposed in said collecting opening and an output delivering a collected micro-wave signal,

means for modulating the impedance of each of said pinpoint antennae successively by a low frequency signal, and

means for forming said image of an object buried in the second medium in response to said collected micro-wave signal at the position of each of said pinpoint antennae and said low frequency signal.

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**5,051,749**

## SYNTHETIC APERTURE RADAR ASSEMBLY AND A METHOD OF CREATING A RADAR IMAGE OF A PLANET SURFACE USING SUCH AN ASSEMBLY

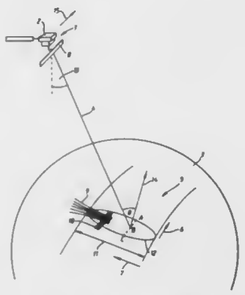
**Peter N. R. Stoyle, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England**

**Filed Mar. 8, 1990, Ser. No. 489,185**

**Claims priority, application United Kingdom, Mar. 21, 1989, 8906520**

**Int. Cl.[5] G01S** *13/90, 13/22*

**U.S. Cl. 342—25** **10 Claims**



1. A synthetic aperture radar assembly locatable on a satellite for radar imaging of a planet surface in swaths, comprising:

means for transmitting pulses of electromagnetic radiation towards the planet surface to be imaged in widths of swaths to be imaged,

timing means, coupled to said transmitting means, for randomly varying the frequency of transmission of said pulses to increase the width of swath imageable;

means for receiving echoes of said pulses returned by said planet surface, and

means for creating an image of a swath of said planet surface from said returned echoes.

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**5,051,750**

## WINDS ALOFT ESTIMATION THROUGH RADAR OBSERVATION OF AIRCRAFT

**Walter M. Hollister, Lincoln, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 360,245, Jun. 2, 1989, abandoned. This application Oct. 3, 1990, Ser. No. 592,110**

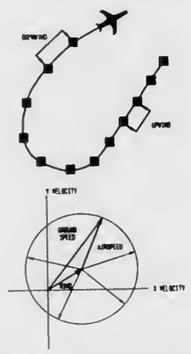
**Int. Cl.[5] G01S** *13/95*

**U.S. Cl. 342—26** **14 Claims**

1. A method for determining wind velocity in a region in which a turn is being executed by an aircraft, the method comprising:

(a) using a positional detection system to obtain positional data pertaining to the aircraft during execution of the turn;

(b) calculating the ground speed vector of the aircraft at a plurality of data points around the turn; and




(c) determining the wind vector that best fits the ground speed vector data.

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**5,051,751**

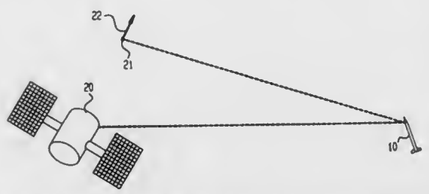
## METHOD OF KALMAN FILTERING FOR ESTIMATING THE POSITION AND VELOCITY OF A TRACKED OBJECT

**Roger L. Gray, King George, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 12, 1991, Ser. No. 654,111**

**Int. Cl.[5] G01S** *9/22*

**U.S. Cl. 342—107** **8 Claims**




1. In a tracking system having a sensor mounted on a vehicle for sensing the presence of an object, a method of Kalman filtering for estimating the position and velocity of the object, comprising the steps of:

a. initializing a Kalman filter with at least position and velocity error states;

b. providing trajectory models of the vehicle and object;

c. establishing a measurement frame of reference for the vehicle and object using the trajectory models wherein the measurement frame is defined as having one axis pointing towards the estimated relative position of the object;

d. receiving sensor measurements to develop at least a measured line-of-sight vector to the object;

e. transforming the sensor measurements into the measurement frame;

f. updating the Kalman filter with the transformed sensor measurements for estimating the position and velocity of the tracked object;

g. correcting the trajectory models based on the estimated position and velocity;

h. resetting the position and velocity error states to zero;

j. propagating the trajectory models and the filter's covariance matrix to the next time step; and



k. performing steps (c) through (j) as an iterative Kalman filter process.

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**5,051,752**

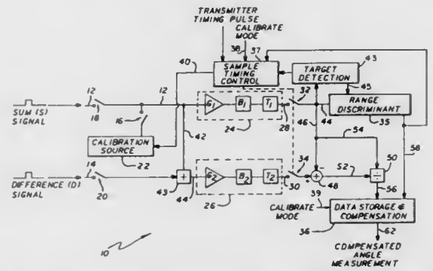
## ANGLE MEASUREMENT COMPENSATION TECHNIQUE FOR AMPLITUDE COMPARISON MONOPULSE RECEIVER

**Richard L. Woolley, Canoga Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Nov. 5, 1990, Ser. No. 609,334**

**Int. Cl.[5] G01S** *7/40, 13/44*

**U.S. Cl. 342—151** **9 Claims**




1. A compensated amplitude comparison monopulse receiver for determining the angular location a first object under surveillance by processing a sum and difference signal received therefrom, comprising:

a first receiver channel for impressing a first output voltage on a first output port thereof in response to said sum signal;

a second receiver channel for impressing a second output voltage on a second output port thereof in response to said sum and difference signals;

calibration source means for providing at least one calibration pulse to said first and second channels wherein said calibration pulse is substantially similar to the sum signal which would be received from a second object under surveillance located a known range from said receiver;

sample gate means for sampling said first and second output voltages and for sampling first and second calibration voltages respectively impressed on said first and second output ports when said first and second channels are driven by said calibration pulse; and

compensation means for calculating said angular location from said sampled first and second output voltages and for adjusting said calculated angular location on the basis of said sampled calibration voltages.

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**5,051,753**

## ARRAY ANTENNA SYSTEM WITH DIRECTION FINDING CAPABILITY

**Tetsuo Haruyama; Shigeo Udagawa, and Kuniaki Shiramatsu, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 19, 1989, Ser. No. 423,892**

**Claims priority, application Japan, Oct. 20, 1988, 63-264334**

**Int. Cl.[5] G01S** *13/00*

**U.S. Cl. 342—158** **14 Claims**

1. An array antenna system for scanning a predetermined region by an antenna beam, comprising:

a transmitter;

a receiver;

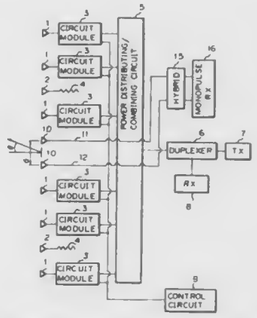
a first plurality of excited antenna elements;

phase shift means connecting said excited antenna elements to said transmitter and said receiver;

a second plurality of antenna elements each having terminating means coupled to the output thereof;

a third plurality of antenna elements capable of receiving an incident electric wave; and

means, connected to each of said third plurality of antenna elements, for determining the directional approach of the incident electric wave,




wherein said excited antenna elements, said second plurality of antenna elements, and said third plurality of antenna elements are selected to produce a desired density tapering of said antenna elements on an aperture of the array antenna system, thereby establishing a desired distribution of electric current on the aperture.

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**5,051,754**

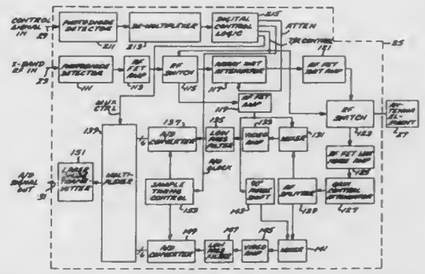
## OPTOELECTRONIC WIDE BANDWIDTH PHOTONIC BEAMSTEERING PHASED ARRAY

**Irwin L. Newberg, Northridge, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.**

**Filed Aug. 15, 1990, Ser. No. 567,848**

**Int. Cl.[5] H01Q** *3/22*

**U.S. Cl. 342—375** **10 Claims**



1. In a phased array radar system having a radar processor and a plurality of antenna elements, a transmit/receive circuit for each of the antenna elements comprising:

an optical fiber true time delay circuit responsive to an electrical RF signal for providing an optical signal having a controlled time delay relative to the outputs of the optical fiber true time delay circuits of the other transmit/-receive circuits in the array;

optical means for propagating said true time delay controlled optical signal;

optical detection means responsive to the propagated true time delay controlled optical signal for providing a true time delay controlled electrical signal;

transmit means responsive to said true time delay controlled electrical signal for providing a transmit signal based on said true time delay controlled electrical signal to the associated antenna element;

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receive means responsive to said true time delay controlled electrical signal and the signal received by the associated antenna element for providing a baseband received signal, said true time delay controlled electrical signal being utilized as the local oscillator signal to provide the correct phase for steering the array;

true time delay processing means responsive to said baseband received signal for providing a digital received signal that is properly aligned relative to the digital received signals provided by the receive means of the other transmit/receive circuits of the array;

first switching means for coupling said true time delay controlled electrical signal to said transmit means during transmit times, and to said receive means during receive times; and

second switching means for coupling the associated antenna element to said transmit means during transmit times, and to said receive means during receive times.

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**5,051,755**

## THERMAL PRINTING APPARATUS

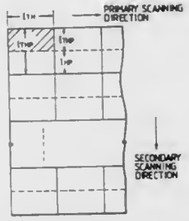
**Toshinori Takahashi, Kawasaki; Itsuo Takanashi, Kamakura; Hideshi Tanaka, Yokohama; Terumi Ohara, Yokohama; Kenichi Miyazaki, Yokohama; Hiroki Kitamura, Tokyo; Toru Nibe, Yokosuka; Tadao Shinya; Yutaka Mizoguchi, both of Yokohama, and Katsuhiko Terada, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Japan**

**Filed Jul. 11, 1989, Ser. No. 377,999**

**Claims priority, application Japan, Jul. 12, 1988, 63-173545; Sep. 29, 1988, 63-244779**

**Int. Cl.[5] G01D** *15/10*

**U.S. Cl. 346—76 PH** **4 Claims**




1. A thermal printing apparatus for printing input gradational images, characters and figures by using multilevel density, said printing apparatus comprising:

a linear thermal head having n resistors arranged in a row for emitting heat;

density controlling means for regulating multilevel durations for energizing said resistors in accordance with n gradational printing data each corresponding to a respective one of said resistors; and

data conversion means for receiving as printing data a set of n original data for each of a plurality of lines, which are respectively parallel with said row of n resistors, and for producing p sets of n data for p split lines on the basis of said n original data, where p is an integer equal to or greater than two, each of said p split lines being disposed in an area in which the line corresponding to said printing data should be printed, in parallel with said row of n resistors, said p sets of n data being sequentially supplied to said density controlling means set by set to print an original line corresponding to said printing data by printing the split lines corresponding to the original line split line by split line by shifting said linear thermal head in a direction perpendicular to said row of n resistors every time each of the split lines is printed, so that each of said n printing data is represented by p dots,

wherein values of p data produced on the basis of each of the original data, which values indicate the durations for energizing each of said resistors, are fixed such that said durations are separately shorter than a duration indicated by each of the original data.

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**5,051,756**

## THERMAL PRINTER

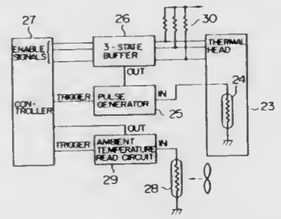
**Yoshikazu Nomura, Osaka; Ryuji Nishiyama, Katano; Yoshikazu Tsuru, and Taichi Itoh, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Continuation of Ser. No. 155,100, Feb. 11, 1988, abandoned. This application Apr. 2, 1990, Ser. No. 503,141**

**Claims priority, application Japan, Feb. 18, 1987, 62-35025; Feb. 18, 1987, 62-35031; Feb. 18, 1987, 62-35038**

**Int. Cl.[5] G01D** *15/10*

**U.S. Cl. 346—76 PH** **3 Claims**




1. A thermal line printer comprising a thermal head including a plurality of heating elements in the form of heating resistors which are arranged in line on an insulating substrate and which are electrically divided into N units of M heating elements, said heating elements being selectively powered to heat said heating resistors for printing; means for applying normal print data and compensation data to said thermal head; means for producing enable signals for determining an amount of heating energy to be supplied to said heating elements of said thermal head; a head temperature detection sensor for detecting the temperature of said thermal head; first control means responsive to an output signal from said head temperature detection sensor for controlling the pulse width of said enable signals; an ambient temperature detection sensor for detecting ambient temperature at a point apart from said thermal head, and a second control means responsive to an output signal from said ambient temperature detection sensor for controlling, in parallel with the controlling operation of said first control means, the pulse width of said enable signals to change said pulse width by a predetermined amount in accordance with the ambient temperature, and without being affected by an output signal from said head temperature detection sensor.

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**5,051,757**

## OPTICAL SCANNING WITH CYLINDRICAL LENS AND BEAM SLIT

**Hirofumi Hasegawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 489,833, Mar. 2, 1990, abandoned, which is a continuation of Ser. No. 159,109, Feb. 23, 1988, abandoned. This application Aug. 6, 1990, Ser. No. 563,864**

**Claims priority, application Japan, Feb. 23, 1987, 62-39394**

**Int. Cl.[5] G01D** *15/16;* **H04N** *1/21*

**U.S. Cl. 346—108** **19 Claims**

1. An optical scanning image forming apparatus comprising:

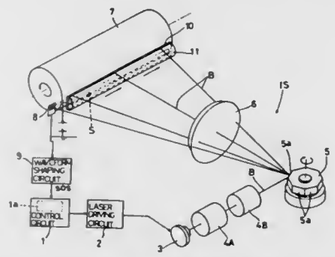
a photoreceptor member;

a laser beam generating unit which generates a laser beam which is modulated according to image information;

scanning means for scanning the laser beam across the photoreceptor member;

a mask member extending along a length of the photoreceptor member with a slit disposed adjacent to the photoreceptor member in a path of the laser beam, said slit being arranged along a scanning direction of the laser beam and having a width slightly smaller than the diameter of the laser beam so as to limit the laser beam which reaches the photoreceptor member by blocking any deviated portion of the laser beam relative to the dimension of the slit, and






a cylindrical lens having a positive power in a direction perpendicular to the scanning direction and disposed adjacent to and along the length of the mask member, the power of said cylindrical lens converging the laser beam so as to compensate for any beam spreading caused by the slit.

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**5,051,758**

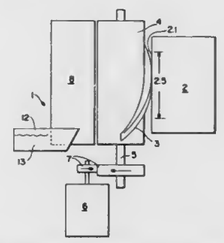
## CLEAN PRINTHEAD CLEANER

**Roger G. Markham, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed May 25, 1990, Ser. No. 528,765**

**Int. Cl.[5] B41J** *2/165*

**U.S. Cl. 346—140 R** **41 Claims**



1. A printhead nozzle cleaning device comprising:

a supporting member having a length and an outer circumferential surface;

an elongate wiping blade member attached to and extending radially outward from said outer circumferential surface of said supporting member and extending along substantially the entire length of said supporting member;

a wet washing blade member attached to and extending radially outward from said outer circumferential surface of said supporting member and extending along substantially the entire length of said supporting member along a path substantially parallel to said elongate wiping blade member; and

rotation means for rotating said supporting member.

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**5,051,759**

## INK JET CARTRIDGE AND INK TANK

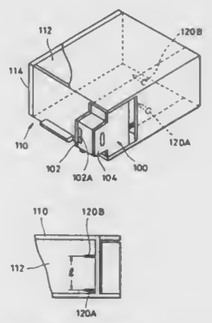
**Seiichiro Karita, and Masami Ikeda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 10, 1990, Ser. No. 463,311**

**Claims priority, application Japan, Jan. 13, 1989, 1-7408**

**Int. Cl.[5] B41J** *2/175*

**U.S. Cl. 346—140 R** **28 Claims**




1. An ink jet cartridge comprising:

an ink jet unit having a discharge port for discharging ink;

an ink tank integral with said ink jet unit and accommodating an ink absorption member which is disposed to be impregnated with ink for discharge from said discharge port; and

at least one electrode in contact with said ink absorption member for detecting the quantity of ink remaining in said ink tank.

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**5,051,760**

## DIRECT IMAGE RECORDING APPARATUS USING TONER

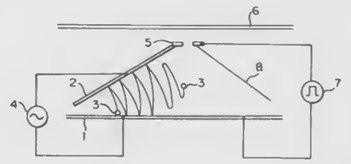
**Hisashi Shoji, Kawasaki; Makoto Ohu, Yokohama; Hidetoshi Yano, Yokohama; Shinsuke Kikui, Yokohama; Junichi Terai, and Tomoko Ogawa, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jul. 30, 1990, Ser. No. 559,210**

**Claims priority, application Japan, Jul. 31, 1989, 1-196773**

**Int. Cl.[5] B41J** *2/01, 2/175*

**U.S. Cl. 346—140 R** **6 Claims**



1. An image recording apparatus for recording an image directly on a recording medium by use of a developer, comprising:

developer carrying means for transporting the developer in a predetermined direction while carrying said developer thereon;

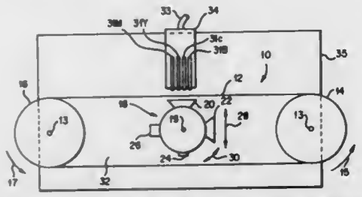
a flat electrode located in close proximity to said developer carrying means and extending away from said developer carrying means in said predetermined direction; and

a control electrode provided on said flat electrode at a position where said flat electrode is remotest from said developer carrying means, and electrically insulated from said flat electrode;

said flat electrode comprising a number of recording electrodes arranged side by side perpendicularly to said predetermined direction, said number of recording electrodes having an opening though which a part of the developer for recording an image may fly toward the recording medium.

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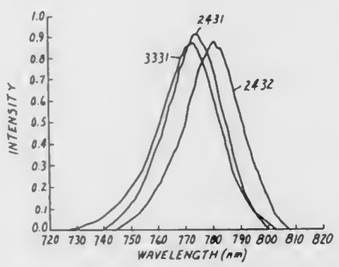
**5,051,761**
**INK JET PRINTER HAVING A PAPER HANDLING AND MAINTENANCE STATION ASSEMBLY**
**Almon P. Fisher, and Herman H. Hermanson, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.**
**Filed May 9, 1990, Ser. No. 520,740**
**Int. Cl.[5] B41J** *2/165*
**U.S. Cl. 346—140 R** **20 Claims**



1. A paper handling and maintenance station assembly for use with an ink jet printhead, said assembly comprising:
a paper-conveying means including a paper-handling loop, said loop defining an area substantially enclosed by said loop;
a maintenance station movably positioned within said area enclosed by said loop, said maintenance station including at least two members selected from a printhead priming station, a capping-spitting station, a nozzle wiping blade and a sliding single-jet priming station, each member being positioned about a circumference of said maintenance station; and
at least one opening in said loop, said opening providing periodic access by said maintenance station to a printhead adapted to be positioned exterior to said loop-enclosed area.

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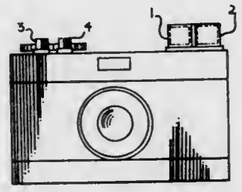
**5,051,762**
**PRODUCTION OF IMAGES USING AN ARRAY OF LIGHT EMITTING DIODES**
**Michael C. Lea, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Oct. 12, 1990, Ser. No. 596,851**
**Int. Cl.[5] G03B** *41/00*
**U.S. Cl. 354—4** **5 Claims**




1. A method of calibrating an exposure apparatus comprising an array of light emitting diodes to a photosensitive material to be imaged, which method comprises making separate energy measurements of each light emitting diode with a detector through a coloured filter, so that the spectral response of the detector and filter combination matches that of the photosensitive material in the wavelength region of the emission of the light emitting diode and using said energy measurements to modulate each exposure level of the array of light emitting diodes.

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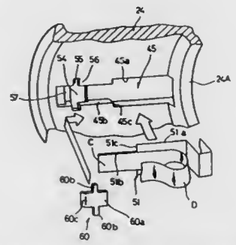
**5,051,763**
**CAMERA WITH ORIENTING FLASH**
**John P. Yukevich, Jr., 308 Church Ln., Sewickley, Pa. 15143**
**Filed Oct. 23, 1990, Ser. No. 602,115**
**Int. Cl.[5] G03B** *15/05*
**U.S. Cl. 354—132** **7 Claims**



1. In photographic devices for recording still pictures with artificial illumination which include means for providing an electronically generated flash of light for in synchrony with the opening and closing of the shutter and the exposure of photographic film and means for indicating that an electronic flash unit is capable of generating a flash or successive flashes of electronically generated light, the improvement comprising:
means for providing an orienting flash of light to enhance the ability of the photographer to attract the attention of a human subject or human subjects and orient the gaze of said subject or subjects toward the photographer and the camera; and
means for consistently insuring generation of another electronically generated flash of light in synchrony with the opening and closing of the shutter and the exposure of photographic film immediately in time subsequent to the emission of said orienting flash of light.

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**5,051,764**
**MOUNTING APPARATUS OF FLEXIBLE PRINTED CIRCUIT BOARD OF LENS**
**Hiroshi Nomura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed May 21, 1990, Ser. No. 525,740**
**Claims priority, application Japan, May 22, 1989, 1-58839[U]**
**Int. Cl.[5] G03B** *1/18, 17/00*
**U.S. Cl. 354—195.1** **13 Claims**



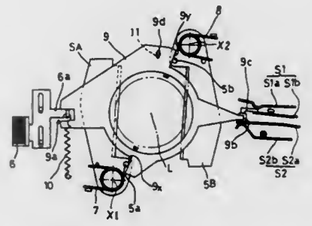
1. A mounting apparatus for a flexible printed circuit board of a lens which moves in an optical axis direction and which includes a shutter unit, a flexible printed circuit board connected at one end to said shutter unit and at the other end to a control circuit provided on a camera body, said flexible printed circuit board bent at least twice to be able to connect said shutter unit and said control circuit, wherein:



a part of said flexible printed circuit board is received in an axially extending receiving groove which extends in a direction parallel to the optical axis direction and which is formed in an annular member of said lens,
one of said bent portions of said flexible printed circuit board is located in said receiving groove, and,
a securing member, secured to said annular member, to hold said bent portion of said flexible printed circuit board located in said receiving groove.

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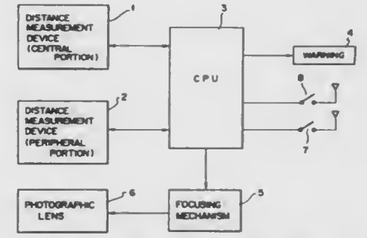
**5,051,765**
**CAMERA**
**Akira Yoshizaki; Masataka Kashima; Akira Yamanaka, and Haruo Kobayashi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**
**Continuation of Ser. No. 145,239, Jan. 19, 1988, abandoned. This application Dec. 20, 1989, Ser. No. 453,254**
**Claims priority, application Japan, Jan. 20, 1987, 62-11132**
**Int. Cl.[5] G03B** *17/04*
**U.S. Cl. 354—187** **7 Claims**



1. A camera comprising:
a photographic optical system;
a lens barrel housing at least part of said optical system and being movable relative to a camera body in a direction of an optical axis for adjusting the focal length of said optical system;
selecting means for selecting the focal length of said optical system;
setting means for setting the focal length which is selected by said selecting means by moving said lens barrel in the direction of the optical axis of said optical system and thereby determining an axial position of said optical system;
a lens barrier which is provided on said camera body, said lens barrier being positioned at a position adjacent a front end of said lens barrel when said lens barrel is at an axial position retracted into the camera body and positioned at a position retracted from the front end of said lens barrel when said lens barrel is at an axial position projected from the camera body, said lens barrier being movable between a closed position and an open position for covering and uncovering a front face of said lens barrel thereby covering the front face when said lens barrel is at the retracted position;
urging means for resiliently urging said lens barrier to move to its closed position; and
means for starting movement of said lens barrier to the closed position by an urging force of said urging means and for correspondingly starting movement of said lens barrel to its retracted position such that said lens barrier is temporarily stopped against the urging force of said urging means by said lens barrel until the front end of said lens barrel is retracted from said lens barrier when said lens barrier comes into contact with said lens barrel during the closing movement of said lens barrel.

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**5,051,766**
**AUTOMATIC FOCUSING CAMERA WITH MULTIPLE DISTANCE MEASURING FUNCTION**
**Osamu Nonaka, Sagamihara; Yasuyuki Kawabe, Nagano; Atushi Maruyama, Yokohama, and Tatsuji Higuchi, Akikawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**
**Filed Apr. 4, 1990, Ser. No. 504,540**
**Claims priority, application Japan, Apr. 14, 1989, 1-94381**
**Int. Cl.[5] G03B** *13/36*
**U.S. Cl. 354—400** **20 Claims**




1. An automatic focusing camera, comprising:
first distance measurement means for measuring a first distance to an object located at a central portion of a frame of a camera, said camera having a shortest photographing distance at which an object can be focused by a photographing lens of the camera;
second distance measurement means for measuring a second distance to another object located at a peripheral portion of said frame;
arithmetic circuit means including
means for comparing the first and the second distances with the shortest photographing distance of said camera;
first selection means for, when the first distance is shorter than the shortest photographing distance, selecting the shortest photographing distance as an object distance for the object located at the central portion of said frame;
second selection means for, when the first distance is not shorter than the shortest photographing distance and the second distance is shorter than the shortest photographing distance, selecting the first distance as the object distance; and
third selection means for, when the first and the second distances are not shorter than the shortest photographing distance, selecting one of the first and the second distances as the object distance; and
means coupled to said arithmetic circuit means for focusing the photographing lens on the basis of the object distance selected by one of said first to third selection means to enable the camera to carry out an exposure sequence.

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**5,051,767**
**DISTANCE MEASURING DEVICE**
**Akira Honma, Yokohama, and Satoshi Takami, Saitama, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed May 8, 1990, Ser. No. 520,525**
**Claims priority, application Japan, May 9, 1989, 1-115297**
**Int. Cl.[5] G03B** *13/36*
**U.S. Cl. 354—406** **41 Claims**

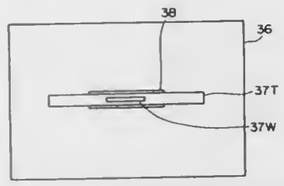
1. A distance measuring device for measuring object distance in a camera which is provided with a finder and a photographic lens, the focal length of said photographic lens being variable, said distance measuring device comprising:
a pair of optical elements provided at the front side of said camera, optical axes of said pair of optical elements being different from the optical axis of said finder;

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line sensor means having a pair of image-receiving areas, each of said image-receiving areas receiving an image of an object to be photographed through said pair of optical elements, said image receiving areas each having a range where light can be received; and




control means for varying the effective range of each of said image-receiving areas of said line sensor means, depending upon the focal length of said photographic lens.

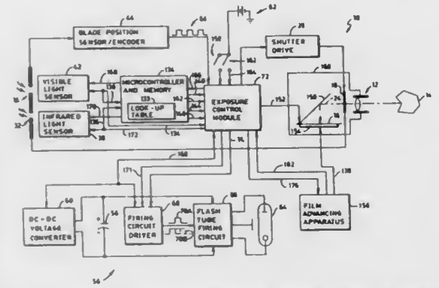
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**5,051,768**

## ELECTRONIC FLASH APPARATUS FOR REDUCING THE INCIDENCE OF HUMAN EYELID CLOSURES DURING EXPOSURE

**George C. Harrison, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Mar. 26, 1990, Ser. No. 498,767**
**Int. Cl.[5] G03B** *7/00*
**U.S. Cl. 354—415** **8 Claims**




1. An exposure control system for photographic apparatus comprising:

an electronic flash for illuminating a human subject within a scene to be photographed with light having at least visible light components;

a blade mechanism that defines an exposure aperture, said blade mechanism being mounted for movement between a blocking arrangement in which said blade mechanism is in light blocking relation with respect to an optical path so as to preclude scene light from being transmitted along the optical path to a film plane and an unblocking arrangement in which said blade mechanism is in light unblocking relation with respect to the optical path so as to allow the passage of scene light to the film plane through said exposure aperture when said blade mechanism is actuated between its said light blocking and unblocking arrangements to produce an exposure interval; and

control means for actuating said blade mechanism to generate said exposure interval and for actuating said electronic flash to illuminate the subject immediately prior to the exposure interval in order to evaluate certain subject characteristics, said pre-exposure illumination occurring totally within a period of time that is of a sufficiently short duration to render the subject's eyelids unable to blink in response thereto during the subsequent exposure interval.

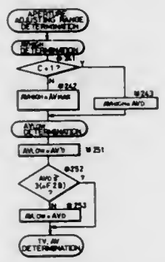
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**5,051,769**

## FLASH SYSTEM

**Kohtaro Hayashi; Toshihiko Karasaki; Yasuteru Yamano, and Koji Hata, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed May 15, 1989, Ser. No. 351,809**
**Claims priority, application Japan, May 16, 1988, 63-118622; Jul. 30, 1988, 63-190784**
**Int. Cl.[5] G03B** *15/05*
**U.S. Cl. 354—419** **2 Claims**



1. A flash system comprising:

means for emitting flash light;

means for measuring brightness of an object;

a focal plane shutter;

means for inputting data of focal length of a taking lens;

means for detecting a limiting shutter speed preventing blurring derived from a camera shake based on the data of focal length;

means for determining a reference value based on a slower one of a flash synchronized shutter speed of said focal plane shutter and the limiting shutter speed; and

means, respective to the operation of said focal plane shutter, for making said emitting means emit the flash light when the measured brightness is lower than the reference value.

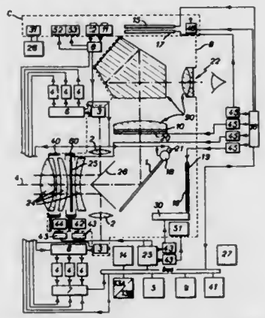
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**5,051,770**

## IMAGE PROCESSING DEVICE FOR CONTROLLING THE TRANSFER FUNCTION OF AN OPTICAL SYSTEM

**Georges Cornuejols, Garches, France, assignor to Scanera S.C., Garches, France**

**Continuation of Ser. No. 105,305, filed as PCT FR87/00020 on Jan. 20, 1987, published as WO87/04530 on Jul. 30, 1987, abandoned. This application Apr. 30, 1990, Ser. No. 515,348**
**Claims priority, application France, Jan. 20, 1986, 86 00710; Feb. 4, 1986, 86 01552; Sep. 26, 1986, 86 13433**
**Int. Cl.[5] G03B** *7/091, 7/28, 17/20*
**U.S. Cl. 354—432** **24 Claims**



1. An image processing device of scene light from an object, comprising an image sensor and a flat image transfer screen both arranged to receive scene light from the same object, an



image receiving surface placed optically downstream of the flat transfer screen, said image sensor comprising a first network of image points or pixels, said image sensor being adapted to generate for each of the pixels of the first network a signal representative of an optical parameter of the scene light, said first network being connected to a processing means and for delivering thereto said representative signals, said flat screen comprising a second network of image point or pixels, said processing means generating state control signals as a function of said representative signals, memory means connected to said processing means for storing the state control signals generated by said processing means, said processing means also being connected to said second network for transferring said state control signals from said memory to corresponding ones of said pixels of said second flat screen, and said flat screen defining means for modulating the scene light for optical transfer to said receiving surface.

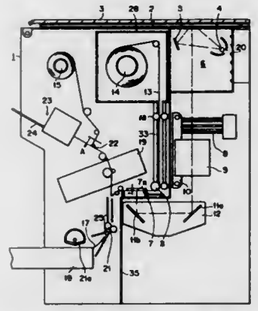
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**5,051,771**

## IMAGE FORMING APPARATUS HAVING CONTROL UNIT FOR CONTROLLING REWINDING OPERATION OF RECORDING MEDIUM

**Hiroaki Kimura, Nagoya, and Naoyuki Hatta, Gamagori, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan**

**Filed Oct. 23, 1990, Ser. No. 601,359**
**Claims priority, application Japan, Oct. 31, 1989, 1-283488**
**Int. Cl.[5] G03B** *27/32, 27/52*
**U.S. Cl. 355—27** **5 Claims**



1. An image forming apparatus using an elongated photosensitive recording medium for performing a series of image forming processes while feeding the elongated photosensitive recording medium along a medium feeding path, comprising:

exposing means, located along said medium feeding path, for exposing the photosensitive recording medium to light in an exposure process to form a latent image thereon;

developing means, disposed downstream of said exposing means with respect to the medium feeding path, for developing the latent image into a visible image in a developing process;

medium feeding means for feeding the photosensitive recording medium through said exposing means over said developing means along the medium feeding path;

medium rewinding means for rewinding the photosensitive recording medium after the developing process to feed the photosensitive recording medium to a predetermined position in the medium feeding path, thereby performing a medium rewinding operation; and

control means for controlling driving of said exposing means, said developing means, said medium feeding means and said medium rewinding means to perform the series of image forming processes; and

selecting means having at least two image forming modes for allowing said control means to selectively cease only the medium rewinding operation of said medium rewinding means during the series of image forming processes when one of said image forming modes is selected.

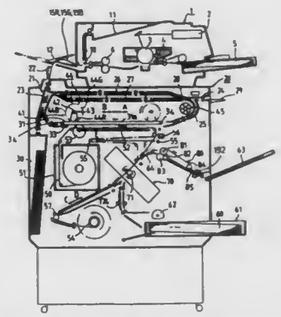
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**5,051,772**

## COLOR IMAGE RECORDING APPARATUS

**Tomoaki Hattori, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan**

**Filed Oct. 3, 1990, Ser. No. 592,958**
**Claims priority, application Japan, Oct. 20, 1989, 1-274357**
**Int. Cl.[5] G03B** *27/32*
**U.S. Cl. 355—32** **17 Claims**



1. A color image recording apparatus comprising;

exposing means for exposing an unexposed photosensitive recording medium to light through a succession of mask members prepared based on colored image information to record an image on the unexposed photosensitive recording medium to form an exposed photosensitive recording medium in an image recording operation;

photosensitive recording medium changing means for changing the exposed photosensitive recording medium for an unexposed photosensitive recording medium;

stop signal input means for inputting a stop signal to interrupt the image recording operation of the exposing means;

mask member ejecting means responsive to the stop signal input means for ejecting all the mask members from the exposing means in response to the stop signal from the stop signal input means; and

photosensitive recording medium changing controlling means responsive to the stop signal input means for actuating said photosensitive recording medium changing means to change the photosensitive recording medium if the image recording operation of the exposing means is actuated before the stop signal is provided by the stop signal input means.

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**5,051,773**

## METHOD AND APPARATUS FOR STORING INFORMATION ABOUT IMAGES

**Harold H. Davis, 128 N. Craig St., Pittsburgh, Pa. 15213**

**Filed Jul. 24, 1989, Ser. No. 384,634**
**Int. Cl.[5] G03B** *27/52*
**U.S. Cl. 355—40** **9 Claims**

1. An apparatus for storing information about photographic images comprising:

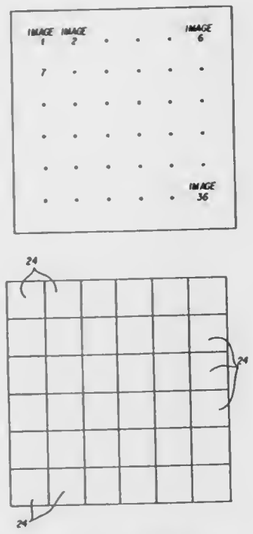
a sheet of photographic paper having a first side and a second side, said sheet retaining a plurality of photographic images on the first side of the sheet; and

a grid pattern disposed on the second side of the sheet for placing information about the images on the second side of

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the sheet such that the location of information placed in the grid pattern on the second side of the sheet corresponds to the location of the image on the first side of the sheet which the information is about.




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**5,051,774**

**MICROFILM CAMERA**

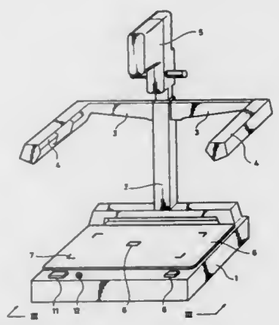
**Hajime Otsuki, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 318,236, Mar. 3, 1989, abandoned. This application Sep. 28, 1990, Ser. No. 590,332**

**Claims priority, application Japan, Mar. 4, 1988, 63-50734; Mar. 4, 1988, 63-50735; Mar. 4, 1988, 63-50736**

**Int. Cl.[5] G03B** *27/32, 27/52*

**U.S. Cl. 355—64** **19 Claims**



1. A microfilm camera comprising:

a document platen on which an original is to be placed in a prescribed photographing position,

means for photographing the original on said document platen onto a microfilm,

detecting means for determining whether or not said original is in said photographing position,

input means for issuing an instruction to photograph said original, and

display means responsive to outputs of both said detecting means and said input means for indicating whether or not said original has been photographed, said display means having a first displaying condition for indicating that the original has been photographed and a second displaying condition for indicating that the original is not photographed.

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**5,051,775**

**IMAGE FORMING APPARATUS PROVIDED WITH A DEVICE FOR COVERING AND UNCOVERING A SHEET MAGAZINE**

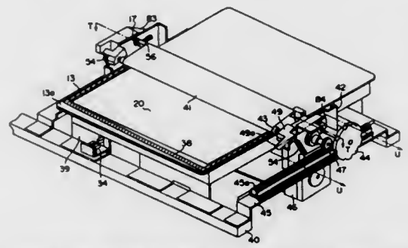
**Yukiyoshi Yamakoshi, Isehara; Hiroshi Tomita, Sagamihara; Hajime Takei, Machida; Fuminori Moro, Machida; Naoyuki Matsuda, Machida, and Homare Sano, Machida, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Nov. 9, 1990, Ser. No. 612,077**

**Claims priority, application Japan, Nov. 10, 1989, 1-293067**

**Int. Cl.[5] G03B** *27/58, 17/26*

**U.S. Cl. 355—72** **12 Claims**



1. An image forming apparatus provided with a magazine in which sheets are stacked, said image forming apparatus comprising:

a flexible cover member for the magazine, which cover member is capable of adhering to and separating from a flange of the magazine;

means for removing the cover member from the flange of the magazine while moving in one direction along the flange of the magazine; and

means for sticking the cover member on the flange of the magazine while moving in a direction reverse to the direction in which the cover removing means moves.

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**5,051,776**

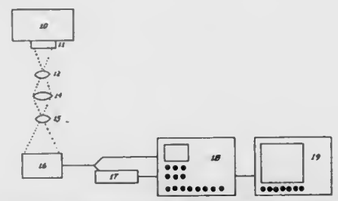
**CALIBRATION METHOD FOR COLOR PHOTOGRAPHIC PRINTING**

**Philip J. Mancino, Box 19A, Squankum-Yellowbrook Rd., Farmingdale, N.J. 07727**

**Filed Mar. 8, 1990, Ser. No. 490,283**

**Int. Cl.[5] G03B** *27/80, 27/32*

**U.S. Cl. 355—77** **6 Claims**



1. A method for calibrating a color photographic enlarger to conform to the characteristics of the paper on which photographic prints are to be made and subsequently adjusting such



enlarger to minimize color error in the prints made from each transparency placed therein, with the result of optimizing color reproduction in the prints resulting from the use of such method, comprising: making a test print using conventional means, according to the filtration values recommended by the manufacturer for the printing paper to be used, of a standard transparency commonly used for calibration purposes; substitution of a camera capable of producing a video image on a cathode ray tube or similar device, for the printing paper, the output of said camera further connected to a color video monitor and the vertical input of an oscilloscope whose horizontal input is determined by a sweep of sufficiently high frequency to enable the resulting waveform to appear as solid lines along the length of the trace on the screen of the oscilloscope; adjustment of the input to said camera until the color as viewed on the screen of said video monitor matches the color on the test print previously made; adjustment of the color filtration levels on the enlarger until the resulting image on the video monitor screen appears to show correct color values; substitution of the transparency to be printed for the standard transparency that was in place within the enlarger during the preceeding steps; adjustment of the filtration levels on the enlarger while inspecting the trace on the oscilloscope to maximize the sharpness of the lines of said trace; further adjustment of the filtration levels on said enlarger until the colors in the image on the video monitor appear to the operator to be optimized; substitution of printing paper in the enlarger for the camera herein described and making of prints from said transparency in the conventional manner.

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**5,051,777**

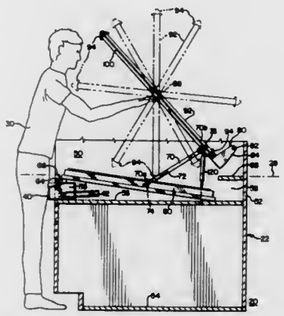
**GRAPHIC ARTS APPARATUS**

**Charles J. Leonhart, Schaumburg, Ill., assignor to nuArc Company, Inc., Niles, Ill.**

**Filed Jul. 5, 1990, Ser. No. 548,088**

**Int. Cl.[5] G03B** *27/20*

**U.S. Cl. 355—93** **16 Claims**



1. Graphic arts apparatus for exposing a copy sheet to light from a light source passed through an image sheet, comprising:

light source means for directing light toward said image and copy sheets;

glass frame means including a sheet of transparent material having a planar surface against which said image and copy sheets are pressed during an exposure cycle;

vacuum blanket means for biasing said image and copy sheets against said planar surface;

support means for supporting said glass frame means between said vacuum blanket means and said light source means in a first, closed position for exposing said copy sheet to light from said light source means passing through said transparent sheet and said image sheet, and a second, open position for permitting the removal and placement of said image and copy sheets between said glass frame means spaced apart from said vacuum blanket means;

said support means including first means for pivoting said glass frame means to selectively expose opposite faces thereof in a forward facing direction while said support means is in said second open position,

said support means including second means for pivoting said vacuum blanket means between a first position for biasing said copy sheet and said image sheet toward contact with said surface of said sheet of transparent material when said support means is in said first position and a second position spaced apart from said glass frame means when said support means is in said second position; and

linkage means for interconnecting said glass frame means and said vacuum frame means to move said vacuum frame means into said second position when said glass frame means is moved into said second position.

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**5,051,778**

**ELECTROPHOTOGRAPHIC COPYING MACHINE WHICH INTEGRATES COMPONENTS HAVING SUBSTANTIALLY EQUAL SERVICE LIVES INTO RESPECTIVE DETACHABLE UNITS FORMED OF A DEVELOPING UNIT, A PHOTORECEPTOR UNIT AND A TONER CARTRIDGE UNIT**

**Hisao Watanabe, and Jiro Fukasawa, both of Yamanashi, Japan, assignors to Shindeogen Electric Manufacturing Co., Ltd., Tokyo and Yamanashi Electronics Co., Ltd., Yamanashi, both of, Japan**

**Filed Dec. 15, 1989, Ser. No. 451,137**

**Claims priority, application Japan, Dec. 22, 1988, 63-321947**

**Int. Cl.[5] G03G** *15/00*

**U.S. Cl. 355—200** **2 Claims**

1. An electrophotographic copying machine comprising: a main body; and electrophotographic component parts divided into three units consisting essentially of a developing unit A, a photoreceptor unit B and a toner cartridge unit C,

wherein the developing unit A includes a magnetic brush, a toner storing case, a toner stirring mechanism and a doctor blade,

the photoreceptor unit B includes a photosensitive drum and a charging device,

the toner cartridge C includes a toner cartridge,

each of said units is capable of being detached from and reattached to said main body while maintaining the required relative positions,

the service lives of said units are set in such a manner that the ratio therebetween is represented as a ratio among integers, and the relationship therebetween in magnitude satisfies the relationship of the service life of said developing unit A≧the service life of said photoreceptor unit B≧the service life of said toner cartridge unit C, and

the time for replacement of said developing unit A and said photoreceptor unit B is determined by the frequency of replacement of said toner cartridge unit C and the time for replacement of said developing unit A is further determined by the frequency of replacement of said photoreceptor unit B.

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**5,051,779**

**JOB CONTROL SHEET FOR IMAGE PROCESSING SYSTEM**

**Yuji Hikawa, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan**

**Filed Oct. 10, 1990, Ser. No. 595,856**

**Int. Cl.[5] G03G** *15/00*

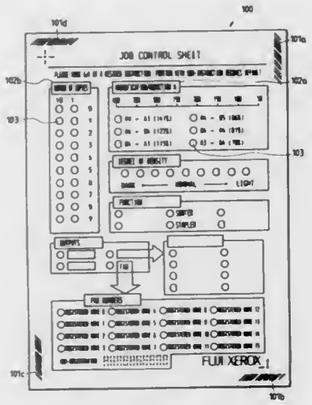
**U.S. Cl. 355—200** **3 Claims**

1. An image processing system in which input image information is specified by a special mark or pattern printed on a job control sheet so that a selected one of various image processing is executed in accordance with said special mark or pattern to thereby obtain output image information, each of said special

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marks or patterns being line drawings drawn so as to have a certain low correlative angle to longitudinal and transverse




directions of an image provided with said special mark or pattern.

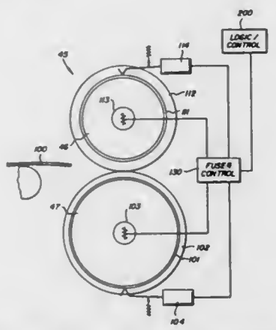
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5,051,780

## FUSING TEMPERATURE CONTROL DEVICE FOR A PRINTER OR SIMILAR APPARATUS

Eric C. Stelter; Allan R. Amering, and Michael G. Beyerlein, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 24, 1990, Ser. No. 602,541
Int. Cl.[5] G03G *21/00, 15/20*
U.S. Cl. 355—208 3 Claims




1. A toner image forming apparatus comprising:

means for forming unfixed toner images on either one side of a receiving sheet or on both sides of a receiving sheet, and for feeding said sheets at a constant rate to a fuser, which constant rate when said sheets have images on both sides is approximately one-half the rate when the sheets have images on only one side,

a fuser for receiving said sheets and applying heat and pressure to said images to fix said images to said sheets, said fuser including first and second heated rollers,

control means for sensing the temperature associated with each of said first and second heated rollers for controlling the surface temperature of said rollers in response to the temperature sensed,

said control means having separate standby set points controlling the temperature of each roller when no images are being formed and separate run set points higher than said standby set points for controlling said temperature of each of said rollers when images are being formed, said first roller having first and second run set points, the first run set point being used when sheets are being fed having images on one side and the second run set point being used when sheets are being fed having unfixed images on both sides, said first run set point being higher than said second run set point,

means for creating a signal indicative of a temporary interruption in said constant rate of sheets being received at said fuser, and

means for adjusting the set point on said first roller to its second run set point in response to a first interruption signal and to its standby set point in response to a second interruption signal.

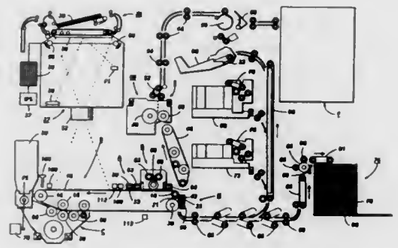
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5,051,781

## XEROGRAPHIC SETUP AND OPERATING SYSTEM FOR ELECTROSTATOGRAPHIC REPRODUCTION MACHINES

Daniel C. Roehrs, 255 Volk Rd., Webster, N.Y. 14580; Angelo T. Caruso, 366 Oxford St., Apt. 6, Rochester, N.Y. 14607; Robert E. Grace, 24 Crescent Rd.; Robert M. Mara, 5971 Pittsford-Palmyra Rd., both of Fairport, N.Y. 14450; John G. Elliot, 263 Hillary Ln., Penfield, N.Y. 14526; Patricia J. Saraceno, 840 East Ave., Apt. #3, Rochester, N.Y. 14607, and James M. Pacer, 659 Finchingfield Ln., Webster, N.Y. 14580

Division of Ser. No. 344,774, Apr. 27, 1989. This application Jun. 6, 1990, Ser. No. 534,612
Int. Cl.[5] G03G *15/08*
U.S. Cl. 355—208 5 Claims



1. Process for adjusting for optimum toner concentration in an electrostatographic reproduction machine having a photoreceptor, corona means for charging said photoreceptor in preparation for imaging, exposure means for exposing said charged photoreceptor to produce latent electrostatic images on said photoreceptor, developer means for developing said latent electrostatic image, interdocument erase lamp means for exposing said photoreceptor to erase unwanted images prior to development by said developer means, and toner dispensing means for supplying fresh toner to said developer means, comprising the steps of:

a) operating said erase lamp means to selectively expose portions of said photoreceptor to create latent electrostatic images on exposed portions of said photoreceptor;

b) developing said latent electrostatic images to provide developed images on said photoreceptor;

c) from said developed images, determining the current toner concentration;

d) where said current toner concentration is below said optimum toner concentration, actuating said toner dispensing means to add toner to said developer means while continuing steps a–c until said toner concentration is above said optimum toner concentration;

e) inactivating said toner dispensing means to terminate the addition of toner to said developer means; and

f) continuing steps a–d until said toner concentration is substantially equal to said optimum toner concentration.



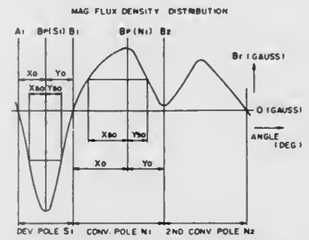
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5,051,782

## ELECTROSTATIC LATENT IMAGE DEVELOPING APPARATUS

Masaaki Yamaji, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1990, Ser. No. 531,161
Claims priority, application Japan, May 31, 1989, 1-138776
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 11 Claims




1. A developing apparatus for developing an electrostatic latent image formed on an image bearing member, comprising:

a developer container for containing a developer comprising magnetic material;

a rotatable developer carrying member for being supplied with the developer from said developer container and for carrying the developer through a developing zone where said developer carrying member is disposed facing said image bearing member;

a magnetic stationarily disposed in said developer carrying member, wherein said magnet has a first magnetic pole for forming a magnetic field in the developing zone, a second magnetic pole being disposed downstream of said first magnetic pole with respect to a rotational direction of said developer carrying member and having a magnetic polarity opposite to that of said first magnetic pole, and a third magnetic pole disposed downstream of said second magnetic pole with respect to the direction and disposed adjacent to said second magnetic pole,

wherein said second magnetic pole has a magnetic flux density satisfying

$$(X50/X0) > (Y50/Y0)$$

where X0 is a distance from a position $B_p$ of a maximum magnetic flux density of a one pole to a boundary between the one pole and the upstream adjacent magnetic pole, measured along the circumference of said developer carrying member; Y0 is a distance from the position $B_p$ to a boundary between the one magnetic pole and the downward adjacent magnetic pole, measured along the circumferential periphery of said developer carrying member; X50 and Y50 are distances from the position $B_p$ to the upstream and downstream positions where the magnetic flux density by the one magnetic pole is one half the maximum magnetic flux density, measured along the circumferential periphery of said developer carrying member.

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5,051,783

## CAM FOR SHIFTING A TRANSFER DEVICE AND A CLEANING DEVICE

Kenji Sato, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jul. 24, 1990, Ser. No. 557,380
Claims priority, application Japan, Jul. 29, 1989, 1-89554; Oct. 13, 1989, 1-267284
Int. Cl.[5] G03G *15/14, 21/00*
U.S. Cl. 355—271 4 Claims

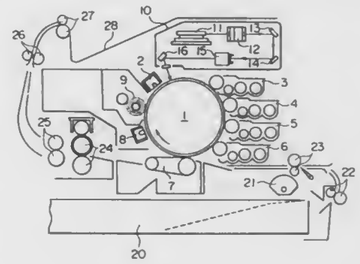
1. An electrophotographic apparatus comprising:

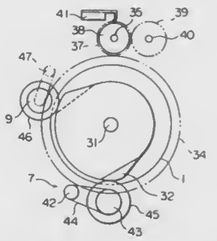
a photoreceptor drum which rotates around an axis in a rotation direction;

developing means for developing a toner image on the surface of the photoreceptor drum;

transfer means, located at the periphery of the photoreceptor drum, for transferring the toner image from the surface onto a recording sheet, disposed at a transfer position in contact with the surface to transfer the toner image during a transfer time interval, and disposed at a non-transfer position separated from the surface during a non-transfer time interval;

cleaning means, located downstream of the transfer means in the rotation direction, for removing residual toner left on the surface of the photoreceptor drum after the toner image has been transferred, disposed at a cleaning position in contact with the surface to remove the residual toner





during a cleaning time interval, and disposed at a non-cleaning position separated from the surface during a non-cleaning time interval; and

cam means for shifting the transfer means and the cleaning means, including

a cam rotatable around the axis of said photoreceptor drum, and

cam follower means engaged by the cam, wherein the cam follower means, in response to rotation of said cam, shifts the transfer means to the transfer position during the transfer time interval and to the non-transfer position during the non-transfer time interval, and shifts the cleaning means to the cleaning position during the cleaning time interval and to the non-cleaning position during the non-cleaning time interval.

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5,051,784

## IMAGE FIXING APPARATUS WITH ROUGHENED FILM IN SLIDING CONTACT WITH HEATER

Akira Yamamoto, Tokyo; Shigeo Kumura, Yokohama; Kensaku Kusaka, Kawasaki; Hidekazu Maruta, Hachiohji, and Hiroyuki Adachi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1990, Ser. No. 542,064
Claims priority, application Japan, Jun. 22, 1989, 1-160275
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 12 Claims

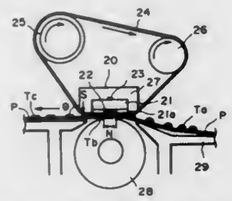
1. An image fixing apparatus, comprising:

a heater which is stationary in use; and

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a film movable in sliding contact with said heater at one side thereof and movable in contact with a recording material at the other side,




wherein said one side of said film has a surface roughness of 0.5–7 microns.

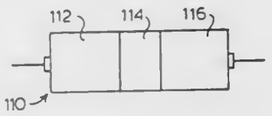
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5,051,785

## N-TYPE SEMICONDUCTING DIAMOND, AND METHOD OF MAKING THE SAME

Charles P. Beetz, Jr., New Milford; Douglas C. Gordon, Cornwall, and Duncan W. Brown, Wilton, all of Conn., assignors to Advanced Technology Materials, Inc., Danbury, Conn.

Filed Jun. 22, 1989, Ser. No. 369,763
Int. Cl.[5] H01L *29/280, 29/720, 49/020, 21/205*
U.S. Cl. 357—4 8 Claims




4. N-type semiconducting diamond, comprising scandium dopant atoms.

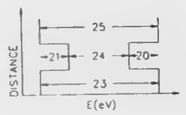
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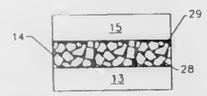
5,051,786

## PASSIVATED POLYCRYSTALLINE SEMICONDUCTORS QUANTUM WELL/SUPERLATTICE STRUCTURES FABRICATED THEREOF

Edward H. Nicollian, Charlotte; Arnold Reiman, Releigh, and Raphael Tsu, High Point, all of N.C., assignors to MCNC, Research Triangle Park, N.C.

Filed Oct. 24, 1989, Ser. No. 426,571
Int. Cl.[5] H01L *27/12, 45/00, 49/02*
U.S. Cl. 357—4 13 Claims




1. A quantum well structure for a semiconductor device comprising:
first and second barrier layers; and
a passivated polycrystalline semiconductor well layer formed between said first and said second barrier layers, said passivated polycrystalline semiconductor well layer and said first and second barrier layers having a band-edge offset therebetween; said passivated polycrystalline semiconductor well layer comprising a plurality of crystalline grains having internal grain boundaries therebetween, said internal grain boundaries having dangling bonds thereat, and an amorphous passivating agent in said grain boundaries for bonding to said dangling bonds, wherein said plurality of crystalline grains comprise silicon grains and wherein said amorphous passivating agent comprises at least one of amorphous-silicon dioxide, amorphous-phosphorous, amorphous-phosphorous oxide, and amorphous-silicon germanium oxide.

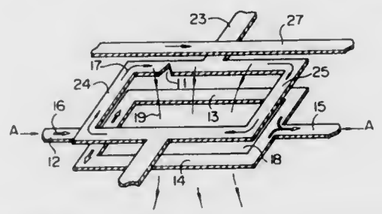
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5,051,787

## SUPERCONDUCTOR STORAGE DEVICE AND MEMORY USING SUPERCONDUCTOR STORAGE DEVICES AS MEMORY CELLS

Shuji Hasegawa, Chiba, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1990, Ser. No. 525,546
Claims priority, application Japan, May 22, 1989, 1-126587
Int. Cl.[5] H01L *39/22*
U.S. Cl. 357—5 24 Claims




1. A storage device comprising:
information write-in means for generating and annihilating a predetermined magnetic flux in accordance with information to be stored;
information retaining means for retaining said magnetic flux therein; and
information read-out means for detecting the retained magnetic flux, said information read-out means including magnetic flux detecting means placed to be subject to the influence of the magnetic flux retained in said information retaining means for splitting a material wave having charges into a plurality of material waves, allowing said plurality of material waves to travel, and allowing said plurality of material waves to superimpose and interfere with each other.

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5,051,788

## LIGHT-EMITTING APPARATUS

Yukio Tanaka, Yokohama, Japan, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 4, 1990, Ser. No. 576,873
Claims priority, application Japan, Mar. 22, 1990, 2-75097
Int. Cl.[5] H01L *33/00, 49/02*
U.S. Cl. 357—17 1 Claim




1. A light-emitting apparatus comprising:
a light-emitting element having a P-N junction light-emitting section;
an optical filter including a tinted rod-shaped lens disposed on a light path between the light-emitting element and a photosensitive member which receives light from the lens and in which the change in the transmissivity T of the filter relative to light of wavelength λ emitted by the light-emitting element satisfies $dT/d\lambda \geqq 0$; and
the filter being configured to transmit light above a particular wavelength but not transmit light below a particular wavelength so that the intensity of the emitted light can be maintained at a more or less constant level regardless of changes in the temperature of the light-emitting section.



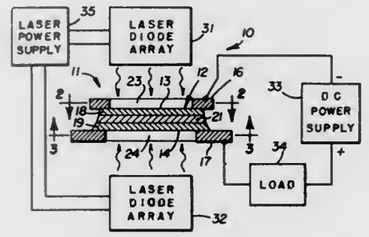
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5,051,789

## DEVICE HAVING TWO OPTICAL PORTS FOR SWITCHING APPLICATIONS

Ayre Rosen, Cherry Hill, N.J., and Paul J. Stabile, Langeborne, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 11, 1990, Ser. No. 595,528
Int. Cl.[5] H01L *31/12*
U.S. Cl. 357—19 19 Claims




1. A light-activatable device comprising:
a semiconductor device having high electrical conductance in the presence of illumination by light of sufficient energy and intensity and having low conductance in the absence of illumination by such light, said semiconductor device having two opposed surfaces,
a first conductor in electrical contact with one of said opposed surfaces of said semiconductor device, said first conductor having an optical port therethrough exposing said one surface for illumination thereof,
a second conductor in electrical contact with the other of said opposed surface of said semiconductors device, said second conductor having an optical port therethrough exposing said other surface for illumination thereof.

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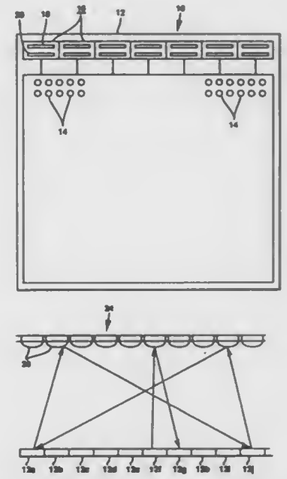
5,051,790

## OPTOELECTRONIC INTERCONNECTIONS FOR INTEGRATED CIRCUITS

Jacob M. Hammer, Princeton, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed Dec. 22, 1989, Ser. No. 455,194
Int. Cl.[5] H01L *31/00, 33/00*
U.S. Cl. 357—19 18 Claims

1. An integrated circuit comprising:
a body of a semiconductor material;
electrical components in said body and electrically connected together in a desired electrical circuit;
a termination on said body, said termination including an optical transmitting section and an optical receiving section;
said transmitting section including means for converting an output electrical signal of the circuit to an output optical signal, means for emitting the optical signal as a beam from the transmitting section out of the body and means for varying the angle that the beam of light is emitted from the transmitting section; and
said receiving section including means for receiving an input optical signal from outside the body in the form of a light




beam and means for converting the input optical signal to an input electrical signal which is fed to the circuit.

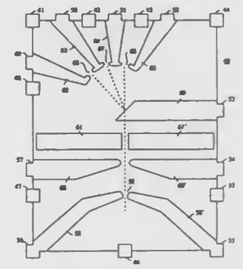
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5,051,791

## APPARATUS COMPRISING REFRACTIVE MEANS FOR ELECTIONS

Kirk W. Baldwin, Springfield; Loren N. Pfeiffer, Morristown; Joseph Spector, High Bridge; Horst L. Stormer, Summit, and Kenneth W. West, Mendham, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 12, 1990, Ser. No. 492,525
Int. Cl.[5] H01L *29/50*
U.S. Cl. 357—22 8 Claims



1. Apparatus comprising an electronic device that comprises
(a) a semiconductor body comprising a 2-dimensional electron gas (2 DEG);
(b) emission means of ballistic 2 DEG electrons;
(c) collection means of 2 DEG electrons, the collection means spaced apart from the emission means;
(d) control means of ballistic 2 DEG electrons, the control means comprising conductor means disposed between the emission means and the collection means; and
(e) means for making electrical contact to the emission means, the control means, and the collection means; wherein
(f) the control means are adapted for changing the electrostatic potential in a portion of the semiconductor body

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that underlies the conductor means and wherein the conductor means are situated such that ballistic 2 DEG electrons that travel from the emission means to the collection means pass through said portion of the semiconductor body, such that the trajectory of said ballistic 2 DEG electrons is a function of a voltage applied to the control means.

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5,051,792

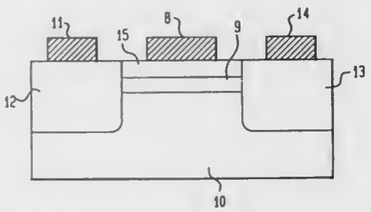
## EPITAXIAL INTERMETALLIC CONTACT FOR COMPOUND FOR COMPOUND SEMICONDUCTORS

**Timothy D. Sands, Cranbury, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.**

**Division of Ser. No. 267,073, Nov. 4, 1988, and a continuation-in-part of Ser. No. 110,332, Oct. 20, 1987, abandoned. This application Jun. 14, 1990, Ser. No. 537,681**

**Int. Cl.[5] H01L** *23/48, 27/02, 29/161*

**U.S. Cl. 357—22** **1 Claim**




1. Epitaxial gate field effect transistor comprising:
(a) a gate contact comprising an epitaxial layer of a transition metal aluminide, said aluminide comprising a 1:1 atomic ratio of aluminum to transition metal,
(b) a single crystal III-V semiconductor substrate on which the transition metal aluminide is deposited, said III-V substrate containing a conducting channel below the gate contact,
(c) source ohmic contact making contact to the conductive channel on one side of the gate contact and separated from the gate contact, and
(d) drain ohmic contact to the conductive channel on the side of the gate contact opposite the source ohmic contact, said drain contact being separated from the gate contact.

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5,051,793

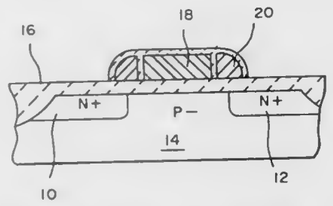
## COPLANAR FLASH EPROM CELL AND METHOD OF MAKING SAME

**Samuel T. Wang, San Jose, Calif., assignor to ICT International CMOS Technology, Inc., San Jose, Calif.**

**Filed Mar. 27, 1989, Ser. No. 328,964**

**Int. Cl.[5] H01L** *29/78, 27/10;* **G11C** *11/40*

**U.S. Cl. 357—23.5** **6 Claims**




1. A flash EPROM transistor cell comprising:
a semiconductor body having a surface region of one conductivity type,
first and second doped regions of opposite conductivity type formed in said surface region, said first and second regions being spaced and forming source and drain regions of said transistor cell with the surface region therebetween forming the channel region of said transistor.
an insulative layer over said channel region,
a control gate positioned on said insulative layer between said source and drain regions, said control gate being formed from a first doped polycrystalline silicon layer (Poly 1) and
a floating gate positioned on said insulative layer between said source and drain regions and adjacent to opposing sides of said control gate, with said floating gate surrounding the periphery of said control gate, said floating gate being formed from a second doped polycrystalline silicon layer (Poly 2) said floating gate being spaced and electrically isolated from and generally coplanar with said control gate and overlapping both of said source and drain regions whereby said cell is programmed and erased by charge injection through said insulative layer between said floating gate contact and one of said source and drain regions.

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5,051,794

## NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR MANUFACTURING THE SAME

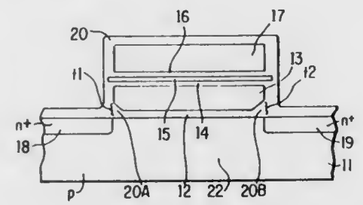
**Seiichi Mori, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan**

**Filed Jul. 3, 1989, Ser. No. 374,788**

**Claims priority, application Japan, Jul. 5, 1988, 63-167608**

**Int. Cl.[5] H01L** *29/68*

**U.S. Cl. 357—235** **7 Claims**




1. A non-volatile semiconductor memory device comprising:
a semiconductor substrate of one conductivity type;
first and second regions of opposite conductivity type with respect to said substrate and spaced apart from each other in said substrate;
a channel region between said first and second regions;
a first insulating layer including a first portion adjacent to said first region, a second portion adjacent to said second region and a third portion between said first and second portions, the thickness of said first portion being thicker than that of said third portion, and the thickness of said second portion being thicker than that of said first portion;
a floating gate on said first insulating layer including said first, second and third portions;
a second insulating layer on said floating gate; and
a control gate on said second insulating layer.

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5,051,795

## EEPROM WITH TRENCH-ISOLATED BITLINES

**Manzur Gill, Arcola; Sebastiano D'Arrigo, Houston, and David J. McElroy, Rosenberg, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Nov. 21, 1989, Ser. No. 439,766**

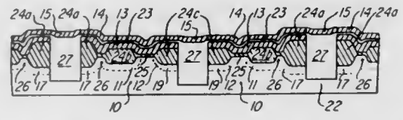
**Int. Cl.[5] H01L** *29/78*

**U.S. Cl. 357—23.5** **20 Claims**

1. A nonvolatile memory array, comprising:
first and second thermal oxide regions overlying source column lines formed in a face of a semiconductor body,



said source column lines being doped regions of conductivity-type opposite that of the underlying material of said body, and said source column lines including sources of individual memory cells;
third thermal oxide regions overlying drain column lines formed in said face of said semiconductor body parallel to and spaced from said source column lines, said drain column lines being doped regions of conductivity-type opposite that of the underlying material of said body, and said drain column lines including drains of said individual memory cells;
each said source and each said drain of each said individual memory cell being spaced from each other on said face by a channel area,
each said memory cell having a floating gate layer over at least a part of said channel area and extending onto at least




said first and second thermal oxide regions, said floating gate layer being separated from said channel area by a gate insulator; and
each said memory cell having a control gate extending along said face over said floating gate layer, said control gate being separated from said floating gate layer by an insulator layer;
wherein a column of cells is separated from a first adjacent column of cells by a trench extending through one of said first thermal oxide regions and through one of said source column lines, and said columnn of cells is separated from a second adjacent column of cells by a trench extending through one of said third thermal oxide regions and through one of said drain column lines; and
wherein each said cell has a tunnel area between one of said first thermal oxide regions and one of said second thermal oxide regions.

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5,051,796

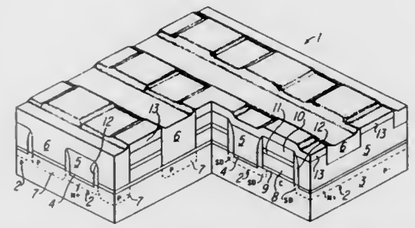
## CROSS-POINT CONTACT-FREE ARRAY WITH A HIGH-DENSITY FLOATING-GATE STRUCTURE

**Manzur Gill, Rosharon, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 269,837, Nov. 10, 1988, abandoned. This application Sep. 1, 1989, Ser. No. 403,065**

**Int. Cl.[5] H01L** *29/68, 29/78*

**U.S. Cl. 357—23.5** **22 Claims**




1. A non-volatile memory cell array, comprising:
a plurality of conductors including source-drain regions formed in a face of a semiconductor substrate, each of said conductors being a heavily-doped region of a second conductivity-type opposite that of a first conductivity-type of the underlying material of said semiconductor substrate, each of said conductors being buried under a relatively thick first insulating oxide strip on said face, each of said source-drain regions being spaced from at least one other source-drain region on said face by a channel region;
for each cell, a channel area consisting of a portion of one of said channel regions, said channel area extending between adjacent ones of said source/drain regions;
a floating gate over each said channel area, floating gate being separated from said channel area of said face by a gate oxide layer;
for each cell, a control gate over said floating gate of said cell, each control gate being separated from a respective floating gate by an inter-level dielectric layer, each control gate having an upper surface;
a plurality of elongated, spaced-apart wordlines, each extending over selected ones of said control gates and over said first insulating oxide strips in a direction substantially at right angles from said conductors, a lower surface of each wordline in direct contact with the upper surface of said selected ones of the control gates; and
doped isolation regions of the same conductivity-type as that of the underlying material of said semiconductor substrate, said doped isolation regions located in the face of said semiconductor substrate between each pair of said conductors and between each pair of said channel areas;
wherein each of said conductors including said source-drain regions also includes a silicided region.

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5,051,797

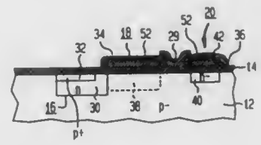
## CHARGE-COUPLED DEVICE (CCD) IMAGER AND METHOD OF OPERATION

**Herbert J. Erhardt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sep. 5, 1989, Ser. No. 402,311**

**Int. Cl.[5] H01L** *29/78, 27/14, 31/00*

**U.S. Cl. 357—24** **20 Claims**




1. A charge-coupled imager comprising:
a substrate of a semiconductor material having a major surface;
a photodetector in said substrate at said major surface, said photodetector being in a completely depleted condition during integration so as to form a depletion well of uniform depth in which charge carriers are generated when radiation is incident upon the photodetector;
an accumulation region at said major surface contiguous with one side of said photodetector, said accumulation region including means for collecting and storing the charge carriers generated in the photodetector by said radiation and for maintaining said photodetector in said completely depleted condition during integration;
a shift register at said major surface along a side of said accumulation region;
means for selectively transferring charge carriers from the accumulation region into the shift register; and
an anti-blooming drain in said substrate along another side of said accumulation region.

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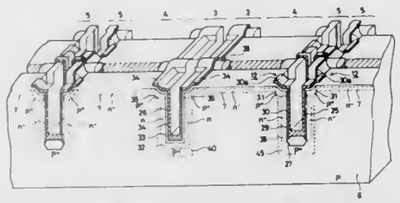


5,051,798

## SOLID STATE IMAGE SENSING DEVICE HAVING AN OVERFLOW DRAIN STRUCTURE

Mikihiro Kimura, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1990, Ser. No. 505,387
Claims priority, application Japan, Apr. 7, 1989, 1-89341
Int. Cl.[5] H01L *29/78, 27/14, 29/06*
U.S. Cl. 357—24 9 Claims



1. A solid-state image sensing device having an overflow drain structure for purging superfluous charges generated when light exceeding a predetermined quantity enters photoelectric conversion elements, comprising:

a semiconductor substrate of a first conduction type having a main surface and including grooves extending in a predetermined direction on said main surface, each of said grooves having opposite side surfaces spaced from each other and a bottom surface interconnecting said side surfaces,

a first array of photoelectric conversion elements including a plurality of first impurity regions of a second conduction type formed on the main surface of said semiconductor substrate adjacent one of said side surfaces of each groove and aligned in a direction in which said grooves extend,

a second array of photoelectric conversion elements including a plurality of second impurity regions of the second conduction type formed on the main surface of said semiconductor substrate adjacent the other side surface of each groove and aligned in the direction in which said grooves extend,

channel regions formed on the respective side surfaces of each groove to be independent of each other,

drain regions of the second conduction type each separated from said first impurity regions and said second impurity regions by each of said channel regions and contacting one of said bottom surface and said side surfaces of each groove, and

gate electrodes each formed over said channel regions and each of said drain regions through an insulating film.

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5,051,799

## DIGITAL OUTPUT TRANSDUCER

Jon D. Paul, 2800 Third St., San Francisco, Calif. 94107; Mark D. Clayton, Box 541, RD 4, New Windsor, N.Y. 12550, and Anthony M. Agnello, 407 Prospect Ave., Princeton, N.J. 08540

Filed Feb. 17, 1989, Ser. No. 313,069
Int. Cl.[5] H04B *14/04;* H04R *19/04*
U.S. Cl. 375—25 20 Claims

1. A transducer system for communicating varying energy by digital means, comprising:

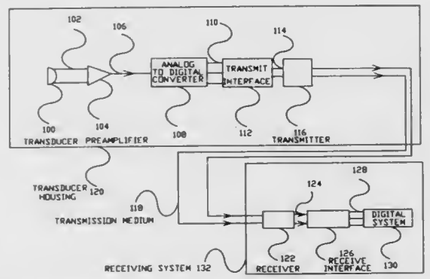
(a) a housing,

(b) transducer means within said housing for converting varying input energy supplied to said transducer means into an analog electrical output signal,

(c) analog-to-digital converter means within said housing for sampling said analog electrical output signal from said transducer periodically, and for converting the resultant periodic samples of said analog electrical signal into a sequence of groups of digital bits which represent the values of said analog electrical signal at (the) each respective periodic (times) (of) sampling time,

(d) transmission means in said housing for transmitting said sequence of digital bits to a location remote from said housing,

(e) reception means at said remote location for receiving the transmitted sequence of said groups of digital bits, and




(f) a digital system at said remote location connected to said reception means for utilizing said received sequence of digital bits,

whereby said varying input energy will be converted into said sequence of digital bits, transmitted to said remote receiver in digital form, and utilized in digital form by said digital system located at said remote location so as to be able to transmit said varying input energy faithfully.

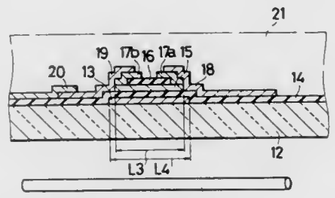
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5,051,800

## THIN FILM SEMICONDUCTOR DEVICE AND LIQUID CRYSTAL DISPLAY APPARATUS USING THEREOF

Hajime Shoji, 1-2-43, Wakaehigashimachi, Higashiosaka-shi, Osaka; Noriko Watanabe, 5-8, Sanjo-soekawa-cho, Nara-shi, Nara-ken; Hiroshi Hamada, 177, Aoyama 7-chome, Nara-shi, Nara-ken; Hiroaki Kato, 9-4, Tezukayama 1-chome, Nara-shi, Nara-ken; Toshio Takemoto, 134-5, Fujiwaradai, Nara-shi, Nara-ken, and Toshihiko Hirobe, 2-20-604, Ohama-nakamachi 1-cho, Sakai-shi, Osaka-fu, all of Japan

Filed Apr. 28, 1989, Ser. No. 344,609
Claims priority, application Japan, Apr. 30, 1988, 63-108697; Jul. 7, 1988, 63-169792
Int. Cl.[5] H01L *27/14*
U.S. Cl. 357—30 4 Claims




1. A thin film semiconductor device comprising:

an electrically insulating substrate;

a conductor layer formed on a portion of a first surface of said insulating substrate;

a first insulator layer formed on said conductor layer and said insulating substrate;

a first semiconductor layer formed on a portion of said first insulator layer having a first width;

a second insulator layer formed on a portion of said first semiconductor layer having a second width less than said first width;



a second semiconductor layer formed on a portion of said second insulator layer having said first width; and

a pair of electrodes formed over the surface of the device having a third width greater than said first and second widths.

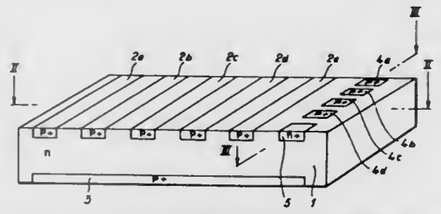
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5,051,801

## POSITION-SENSITIVE RADIATION DETECTOR

Carel W. E. Van Eijk, and Eric M. Schooneveld, both of Delft, Netherlands, assignors to Technische Universiteit Delft, Delft, Netherlands

Filed Feb. 12, 1990, Ser. No. 478,265
Claims priority, application Netherlands, Feb. 13, 1989, 8900343
Int. Cl.[5] H01L *27/14, 29/06, 31/00*
U.S. Cl. 357—30 12 Claims




1. Position-sensitive radiation detector provided with a semiconductor structure comprising:

a wafer of semiconductor material of a first conductivity type having two principal surfaces situated at relatively short distances from each other, having a length and width which are of sufficient magnitude so the wafer may enclose the desired radiation detection surface,

an electrode structure composed of one or more strip-type electrode regions of a second conductivity type in the first principal surface and at least one electrode region of the second conductivity type in an oppositely situated part of the second principal surface, voltages being applied, during operation, to electrodes of the electrode structure which are such that the part of the semiconductor wafer between the electrodes of the electrode structure is completely depleted and a drift field is generated in said depleted part of the electrode structure,

a detection electrode region of the first conductivity type, provided in one of the principal surfaces, a voltage applied to which during operation is such that charge carriers generated by incoming radiation can be attracted to the detection electrode region by the drift field,

a detector/amplifier circuit connected to the at least one electrode region in the oppositely situated part of the principal surface being designed to generate, during operation, a start signal indicating the generation of charge carriers at an instant at which charge carriers are generated in the depleted part of the structure as a consequence of incident radiation or incident elementary particles, and a detector/amplifier circuit connected to the detection electrode region being designed to emit, during operation, a stop signal at the instant when charge carriers reach the detection electrode region via the drift field, characterized in that the semiconductor structure further comprises:

at least one further electrode structure composed of one or more electrode regions of the second conductivity type in the first principal surface and at least one electrode region of the second conductivity type in the oppositely situated part of the second principal surface, voltages being applied, during operation, to the electrodes of the further electrode structure, which voltages are such that the part of the semiconductor wafer material between the electrodes of the further electrode structure is completely depleted and a further drift field is generated in said depleted part of the structure, the two drift fields making a predetermined angle with each other and the further electrode structure being positioned with respect to the first mentioned electrode structure and with respect to the detection electrode region in a manner such that charge carriers originating from the drift field within the first mentioned electrode structure will be intercepted in the drift field within the further electrode structure and will be able to reach the detection electrode region via said further drift field.

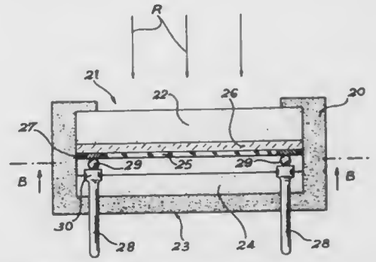
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5,051,802

## COMPACT IMAGE SENSOR

Roger Prost, and Jean Chabbal, both of St. Egreve, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 298,903, Jan. 19, 1989, abandoned. This application Aug. 6, 1990, Ser. No. 563,826
Claims priority, application France, Jan. 22, 1988, 88 00679
Int. Cl.[5] H01L *27/14, 23/28, 23/02*
U.S. Cl. 357—30 7 Claims




1. A compact arrayed image sensor, comprising:

an imperviously sealed package made of an electrically insulating material, said package having a front face provided with a transparent window;

an insulating support interposed between said front and rear face;

an array of photosensitive elements on a monocrystalline semiconductor substrate, wherein said semiconductor substrate is interposed between said window and said insulating support, said semiconductor substrate facing said window, and said array of photosensitive elements facing said insulating support, oriented such that said photosensitive elements receive light rays that have gone through the window and through the substrate;

electrical contacts for connection with said photosensitive elements, said contacts being located on said semiconductor substrate;

connection terminals which go through the insulating support and through the rear face of the package, said connection terminals having respective ends, an internal end located on the inside, and an external end located on the outside of said impervious package.

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5,051,803

## DIODE AND PRODUCING METHOD THEREOF AND CONTACT IMAGE SENSOR DEVICE COMPRISING THE SAME

Koichi Kitamura; Hidenori Mimura; Kazuo Yamamoto; Yasumitsu Ohta; Kazuyoshi Sai; Kazuhiko Kawamura, and Noboru Otani, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 25, 1990, Ser. No. 543,108
Claims priority, application Japan, Jun. 30, 1989, 1-169049
Int. Cl.[5] H01L *45/00, 27/14, 31/00, 29/12*
U.S. Cl. 357—30 20 Claims

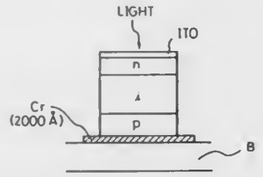
1. A photoelectric conversion element comprising:

an i-type semiconductor layer of amorphous silicon; and

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an incident n-type semiconductor layer of amorphous silicon provided on said i-type semiconductor layer, said n-type




semiconductor layer including 1 to 10% microcrystallized silicon.

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**5,051,804**

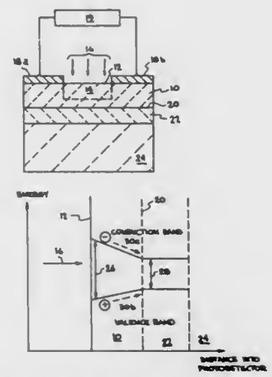
**PHOTODETECTOR HAVING HIGH SPEED AND SENSITIVITY**

**Jeffrey D. Morse, Martinez, and Raymond P. Mariella, Jr., Danville, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Dec. 1, 1989, Ser. No. 444,339**

**Int. Cl.[5] H01L** *27/14, 29/161, 29/205*

**U.S. Cl. 357—30** **20 Claims**




1. A photodetector for detecting electromagnetic radiation, said photodetector comprising:

an active layer having a surface for coupling electromagnetic radiation into the active layer, said active layer comprising a semiconductor having a graded bandgap;

a pair of electrodes electrically connected to said active layer, said electrodes being positioned to apply a voltage across the active layer;

a recombination layer comprising a semiconductor material having defects for recombining carriers including electrons and holes, said recombination layer being positioned adjacent to the active layer so that the carriers formed in the active layer can flow across an interface between the active layer and the recombination layer;

said active layer having a bandgap graded so that carriers from the active layer tend to be swept into the recombination layer.

**5,051,805**

**SUB-MICRON BIPOLAR DEVICES WITH SUB-MICRON CONTACTS**

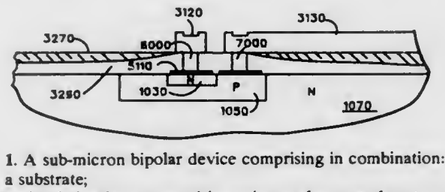
**Frank Z. Custode, Norco, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Division of Ser. No. 73,591, Jul. 15, 1987. This application May 25, 1990, Ser. No. 529,020**

**The portion of the term of this patent subsequent to Aug. 7, 2007, has been disclaimed.**

**Int. Cl.[5] H01L** *29/72*

**U.S. Cl. 357—34** **3 Claims**




1. A sub-micron bipolar device comprising in combination:

a substrate;

an insulation layer comprising spin on glass over low temperature oxide on a surface of the substrate with openings therethrough to the substrate;

an active region in the substrate below said openings;

a base and an emitter in the active region with the base and emitter oppositely doped;

said insulation embedding the tops of the base and emitter;

doped polysilicon electrodes extending upwardly from the tops of the base and emitter, respectively via said openings in the insulation layer, and said electrodes each having a top;

the tops of said electrodes comprising contacts, each with a cross section having maximum dimensions in the range approximately 0.1 to 1.0 microns,

silicide electrode enlarging layers respectively disposed solely on the base between the base and its doped polysilicon electrode and solely on the emitter between the emitter and its doped polysilicon electrode, and each enlarging layer being much larger than the cross sectional areas for the respective electrodes in order that a much larger number of atoms will be available under said electrodes to supply electrons for current to each electrode for making the current available at its contact thereby establishing increased current capacity; and,

metal interconnect conductors extending over the insulation to the tops of the electrodes respectively.

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**5,051,806**

**GATE TURN-OFF THYRISTOR OF MULTI-EMITTER TYPE**

**Toshihide Ujihara, Hitachi; Shuroku Sakurada, Katsuta; Tadashi Sakaue, and Shuji Musha, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 71,153, Jul. 8, 1987, Pat. No. 4,868,625. This application Jul. 27, 1989, Ser. No. 385,378**

**Claims priority, application Japan, Jul. 8, 1986, 61-158815**

**The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.**

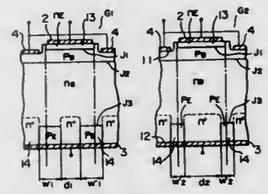
**Int. Cl.[5] H01L** *29/74, 29/00, 29/72*

**U.S. Cl. 357—38** **6 Claims**

1. A gate turn-off thyristor comprising:

a semiconductor substrate of disc shape having a pair of main surfaces on opposite sides thereof, said semiconductor substrate comprising, between said pair of main surfaces, a first emitter layer of a first conductivity type adjacent to one of said main surfaces, a first base layer of a second conductivity type adjacent to said one main surface and said first emitter layer, a second base layer of the first conductivity type adjacent to said first base layer and the other of said main surfaces and a second emitter layer of the second conductivity type adjacent to said second base layer and said other main surface, said first emitter layer including a plurality of strip-like regions disposed in a multi-ring configuration wherein each said strip-like region has a length disposed in a direction aligned with the radial direction of said disc-shaped semiconductor substrate and said regions being respectively separated by said first base layer, said second emitter layer including a plurality of spaced-apart strip-like regions which extend to said other main surface so as to expose an associated area for contact and wherein said strip-like regions within each pair of strip-like regions of said second emitter layer are separated from one another by a respective portion of said second base layer, and said strip-like regions of said first and second emitter layers are disposed such that when both said first and second emitter layers are orthogonally projected on said other main surface respective strip-like regions of both said first and second emitter layers become lengthwise aligned along said radial direction and overlap each other;

a first main electrode ohmic-contacted to said first emitter layer on said one main surface of said semiconductor substrate;



a second main electrode ohmic-contacted to said second emitter layer and said second base layer on said other main surface of said semiconductor substrate;

a gate electrode ohmic-contacted to said first base layer on said one main surface of said semiconductor substrate and surrounding each of said strip-like regions of said first emitter layer and separated therefrom with a constant space;

a gate terminal disposed on a predetermined area of said disc-shaped semiconductor substrate and at a desired location on said gate electrode electrically connected to said gate electrode;

wherein said strip-like regions are disposed on said disc-shaped substrate such that, when both said first and second emitter layers are orthogonally projected on said other main surface, a single strip-like region of said first emitter layer overlaps a respective pair of strip-like regions of said second emitter layer; and

wherein the strip-like regions of said second emitter layer associated with each pair of strip-like regions have a distance therebetween which is greater for those strip-like region pairs located further away from said gate terminal than for those closer to said gate terminal.

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**5,051,807**

**INTEGRATED SEMICONDUCTOR STRUCTURE WITH INCORPORATED ALIGNMENT MARKINGS**

**Yukio Morozumi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan**

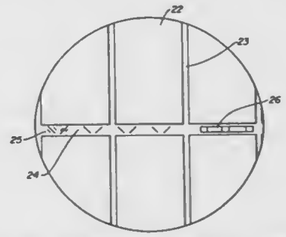
**Continuation of Ser. No. 564,705, Aug. 9, 1990, abandoned, which is a continuation of Ser. No. 178,136, Apr. 6, 1988, abandoned. This application Jan. 14, 1991, Ser. No. 642,121**

**Claims priority, application Japan, Apr. 7, 1987, 62-85151**

**Int. Cl.[5] H01L** *27/02, 29/06*

**U.S. Cl. 357—40** **7 Claims**

1. A semiconductor integrated circuit structure formed on a substrate and composed of a plurality of groups of integrated circuit chips which are to be separated from one another after manufacture, each chip being in the form of an elongated strip having a short dimension and a long dimension which is markedly longer than the short dimension, the chips of each group being manufactured so that adjacent chips of each group are spaced from one another by linear scribe lines along which the substrate is to be cut to separate the chips, the scribe lines including a plurality of mutually parallel first linear scribe lines extending parallel to the long dimension of said chips, each said first linear scribe line having a width perpendicular to the long




dimension of said chips, and at least one second linear scribe line extending parallel to the short dimension of said chips and being located between adjacent chips of the respective group, said second linear line having a width perpendicular to the short dimension of said chips, wherein the width of said at least one second linear scribe line is greater than the width of at least one of said first linear scribe lines, said structure further including at least one of an alignment mark and a process monitor transistor within said second linear scribe line.

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**5,051,808**

**SEMICONDUCTOR DEVICE WITH LOW INDUCTANCE OF WIRINGS CONNECTING INDIVIDUAL ELEMENTS OF THE DEVICE**

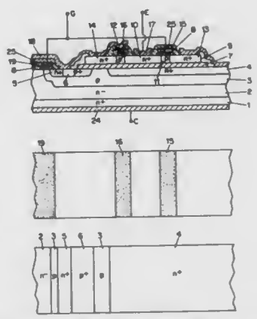
**Akira Saito, and Naoki Kumagai, both of Yokosuka, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan**

**Filed May 29, 1990, Ser. No. 529,853**

**Claims priority, application Japan, Jul. 24, 1989, 1-134407; Jul. 24, 1989, 1-191091**

**Int. Cl.[5] H01L** *27/02*

**U.S. Cl. 357—41** **18 Claims**



1. A semiconductor device comprising:

a transistor device having a first surface including portions of emitter, base and collector regions, said base and collector surface portions connecting to base and collector region layers lying below an emitter region layer, said surface additionally including base contact and source regions within said base surface portion;

an insulating film disposed on surface portions of said emitter, base and base contact regions;

first and second MOSFET devices disposed on said insulat-

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ing film comprising a first MOSFET drain region connected by deposited wiring to the emitter region of said transistor device, and a second MOSFET drain region connected to the source and the base contact regions of said transistor device by deposited wiring; and

a third MOSFET device formed on a gate-insulation film over said base and collector surface portions and said source region;

whereby said semiconductor device is usable as a switching circuit characterized by low inductance of said deposited wiring connections.

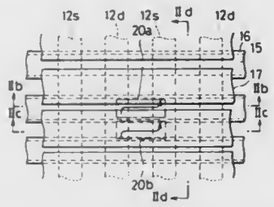
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**5,051,809**

## MEMORY CELL ARRAY OF PLANAR CELL STRUCTURE

**Masao Kiyohara, Takarazuka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Jun. 12, 1990, Ser. No. 536,705**
**Claims priority, application Japan, Jun. 17, 1989, 1-155481**
**Int. Cl.[5] H01L** *27/10, 23/48, 29/04;* **G11C** *11/34*
**U.S. Cl. 357—45** **4 Claims**




1. A memory cell array comprising:

a continuous diffusion region for source regions of a plurality of memory transistors;

a continuous diffusion region for drain regions of the pluarlity of memory transistors;

both of said continuous diffusion regions being formed in a substrate in parallel to each other; and

word lines electrically insulated from both of said continuous diffusion regions and formed in a direction crossing both of said continuous diffusion regions;

said word lines being composed of a plurality of polycrystalline silicon films which are alternately arranged in first and second levels which are electrically insulated from each other.

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**5,051,810**

## SEMICONDUCTOR DEVICE OPERATING IN HIGH FREQUENCY RANGE

**Takayuki Katoh, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 81,709, Aug. 3, 1987, Pat. No. 4,926,234. This application Oct. 26, 1989, Ser. No. 426,926**
**Claims priority, application Japan, Aug. 6, 1986, 61-185715**
**The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.**
**Int. Cl.[5] H01L** *23/14, 23/48, 21/66, 21/60*
**U.S. Cl. 357—68** **2 Claims**

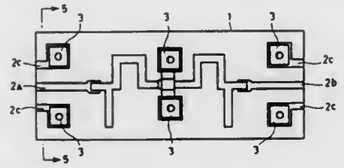
1. A semiconductor device operating in a high frequency range, comprising:

a semiconductor substrate having a first major surface and including integrated circuits mounted thereon;

input electrode pad means formed on said major surface of said semiconductor substrate and connected with said integrated circuits;

output electrode pad means formed on said major surface of said semiconductor substrate and connected with said integrated circuits; and

grounding electrode pad means formed on said major surface of said semiconductor substrate, adjacent to said input electrode pad means and said output electrode pad means, for grounding said semiconductor substrate in a




high frequency characteristic test, said grounding electrode pad being located away from said integrated circuits so as to be isolated therefrom.

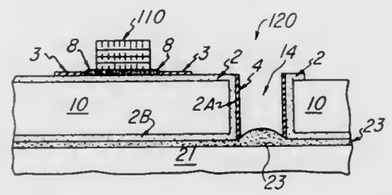
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**5,051,811**

## SOLDER OR BRAZING BARRIER

**Ralph E. Williams, Richardson; David B. Rhine, Denton; John Bedinger, Garland, and Larry G. Barnett, Wylie, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 91,807, Aug. 31, 1987, Pat. No. 4,827,610. This application Jan. 27, 1989, Ser. No. 302,852**
**Int. Cl.[5] H01L** *23/50, 23/34*
**U.S. Cl. 357—68** **23 Claims**




1. A semiconductor structure resistive to cracking about vias, comprising:

a semiconductor layer having first and second opposing surfaces and a via extending therethrough, said semiconductor layer including a wall portion along the via, said wall portion defining a first opening along the first surface and a second opening along the second surface;

a first conductive layer positioned on said first semiconductor surface and extending over the via;

a mounting block;

a second conductive layer positioned along the semiconductor wall portion and in ohmic contact with said first conductive layer, said second conductive layer extending toward said second semiconductor surface;

a layer of material resistive to the bonding of solder covering at least a portion of the second conductive layer in the via; and

a solder layer positioned between said semiconductor layer and the mounting block and providing an ohmic connection between the mounting block and the second conductive layer.

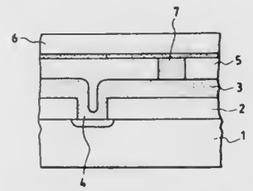


**5,051,812**

## SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

**Jin Onuki; Masayasu Nihei, both of Hitachi; Yasushi Koubuchi, Kodaira; Motoo Suwa; Shinichi Fukada, both of Hitachi; Katsuhiko Shiota, Tohkai; Kunio Miyazaki, Hitachi; Tatsuo Itagaki, Hinode, and Jun Sugiura, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 12, 1990, Ser. No. 551,852**
**Claims priority, application Japan, Jul. 14, 1989, 1-180348**
**Int. Cl.[5] H01L** *29/46, 23/54*
**U.S. Cl. 357—71** **20 Claims**




1. A semiconductor device comprising a semiconductor substrate; a first insulator film formed on said semiconductor substrate; a first wiring conductor film disposed on said first insulator film for interconnection and electrically connected to said semiconductor substrate through a contact hole, having a specific resistance of 5~15 μΩcm and an allowable current density of $1\times10^6\sim1\times10^8$ A/cm$^2$; a second insulator film formed on said first wiring conductor film; a plug composed of a refractory and low resistance material filling a through hole formed in said second insulating film with substantially the same thickness as said second insulating film, electrically connected to said first wiring conductor film; and a second wiring conductor film disposed on said second insulation film and said plug for interconnection, electrically connected to said plug, having a laminated layer structure comprising a layer of an electrically conductive material disposed on a layer of a refractory and low resistance material.

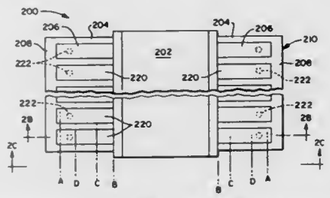
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**5,051,813**

## PLASTIC-PACKAGED SEMICONDUCTOR DEVICE HAVING LEAD SUPPORT AND ALIGNMENT STRUCTURE

**Mark R. Schneider, and Michael J. Steidl, both of San Jose, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.**

**Continuation-in-part of Ser. No. 454,752, Dec. 19, 1989. This application Nov. 27, 1990, Ser. No. 619,108**
**Int. Cl.[5] H01L** *23/48, 23/28, 23/02, 39/02*
**U.S. Cl. 357—72** **4 Claims**




2. A semiconductor device for mounting to a wiring layer on a printed circuit board, comprising:

a semiconductor chip;

a plurality of conductive leads having inner and outer ends;

means for connecting the chip to the inner ends of the leads;

a plastic body formed about the chip and the inner ends of the leads; and

means for maintaining the outer ends of the leads in alignment with one another;

wherein:

the means for maintaining the leads in alignment with one another is a plastic web between adjacent leads;

further comprising:

means for maintaining the outer ends of the leads in alignment with conductors of wiring patterns on a printed circuit board;

wherein:

the means for maintaining the outer ends of the leads in alignment with wiring patterns on a printed circuit board are bumps formed at outer ends of the webs, and the bumps are formed of the same plastic material as the body and the webs.

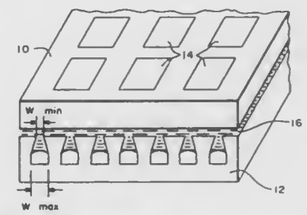
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**5,051,814**

## METHOD OF PROVIDING STRESS-FREE THERMALLY-CONDUCTING ATTACHMENT OF TWO BODIES

**Adam F. Paal, Stanford, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.**

**Continuation of Ser. No. 38,514, Apr. 15, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 303,049**
**Int. Cl.[5] H01L** *23/40*
**U.S. Cl. 357—81** **11 Claims**




1. A heat sink comprising

a body of thermally conductive material, said body having a major surface,

a layer of a polymer material on said major surface, said polymer material having a plurality of grooves formed therein, and

a continuous layer of metal on said polymer material and in said grooves, said layer of metal providing a thermal conductive pathway in said grooves to said body of thermally conductive material and mechanical strength for said layer of polymer material.

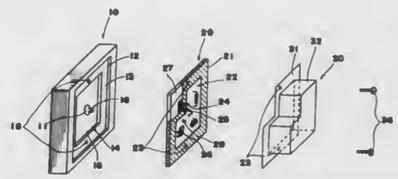
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**5,051,815**

## LASER BEAM EMITTING UNIT WITH HIGH FREQUENCY NOISE SHUTOFF

**Shinobu Hidaka, Sagamihara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 29, 1990, Ser. No. 605,994**
**Claims priority, application Japan, Oct. 30, 1989, 1-283627**
**Int. Cl.[5] H01L** *25/04*
**U.S. Cl. 357—84** **6 Claims**




1. A laser beam emitting unit with high frequency noise shutoff, comprising:

a laser diode;

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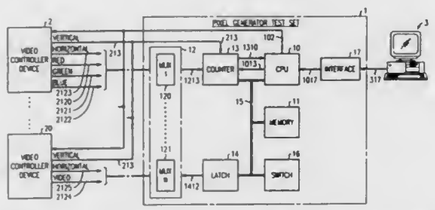
a drive circuit for driving said laser diode by a drive current containing a high-frequency pulse;
a connector terminal to electrically connect said drive circuit with exterior;
a circuit board having said drive circuit and connector terminal;
a grounding pattern disposed so as to encompass said drive circuit portion excluding said connector terminal on said circuit board;
a conductive support member to support said circuit board so as to shield the entire rear face of said circuit board; and
a conductive cover to shield the drive circuit portion of the front face of said circuit board and which is electrically connected to the aforesaid grounding pattern.

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5,051,816
## PIXEL GENERATOR TEST SET

**Gordon L. Harrison, Alexander, and Thomas P. Parker, Little Rock, both of Ark., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Oct. 29, 1990, Ser. No. 605,602**
**Int. Cl.[5] H04N *17/02, 17/04***
**U.S. Cl. 358—10** **17 Claims**




1. Apparatus for testing video controller devices used with a monitor terminal to generate display configurations on the terminal monitor comprising

means for prerecording a count of pixel transitions within a test pattern display intended for use in testing the video controller devices, and

means for applying data representing said test pattern display to a video controller device and comparing a count of pixel transitions generated by the video controller device in response to said applied test pattern data with said prerecorded test pattern pixel transition count to determine performance of the video controller device.

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5,051,817
## SUPERIMPOSING SYSTEM

**Toshiki Takano, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan**

**Filed Nov. 16, 1989, Ser. No. 437,426**
**Claims priority, application Japan, Nov. 18, 1988, 63-292641; Nov. 30, 1988, 63-304995; Sep. 29, 1989, 1-256437; Oct. 18, 1989, 1-272053**
**Int. Cl.[5] H04N *9/76***
**U.S. Cl. 358—22** **12 Claims**

1. A superimposing system comprising:

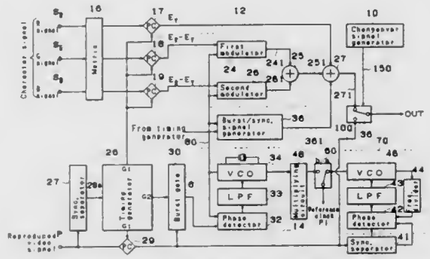
a first oscillation circuit for generating a free-running oscillation output when a burst signal of a video signal is not fed, and generating an oscillation output, when the burst signal of the video signal is fed, phase-locked to the burst signal,

a second oscillation circuit for generating an output where a frequency divided signal of the output is phase-locked to a horizontal synchronizing signal of the video signal,

a modulator for modulating an added signal, using the output of the first oscillation circuit as a color subcarrier,

reference clock selecting means for selecting the output of the second oscillation circuit as a reference clock when adding an information signal to the video signal, and selecting the output of the first oscillation circuit as the reference clock when not adding an information signal to the video signal,

a foundation signal generating circuit for generating a burst signal, a horizontal synchronizing signal and a vertical synchronizing signal on the basis of the free-running oscillation output of the first oscillation circuit when displaying only the added signal on a display means,




a display timing circuit for controlling the display position of the added signal on the basis of the reference clock, and

means for changing over the modulated added signal and the video signal.

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5,051,818
## VIDEO SIGNAL PROCESSING APPARATUS

**Hidetoshi Mishima, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Nov. 2, 1989, Ser. No. 430,415**
**Claims priority, application Japan, Nov. 4, 1988, 63-279570**
**Int. Cl.[5] H04N *9/78***
**U.S. Cl. 358—31** **6 Claims**

1. A video signal processing device which comprises:

a filtering means for removing a low frequency component of an input video signal;

a delay signal synthesizing means for formulating three signals S(i−T), S(i) and S(i+T) (wherein i represents a current timing) by delaying the signal, whose low frequency component has been removed, at intervals of a unitary time T set in a predetermined period within one horizontal scanning period, n horizontal scanning period (n-representing an integer greater than 1), n-field period or n-frame period;

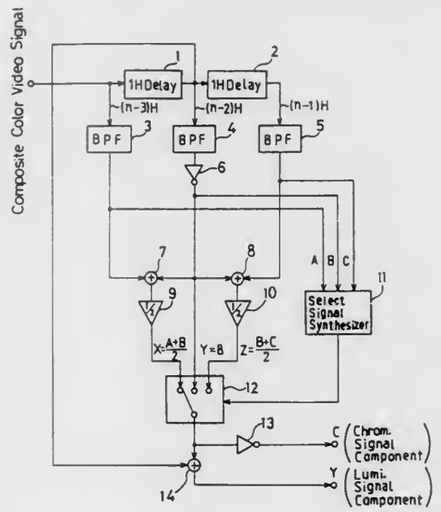
a difference signal synthesizing means for formulating signals {S(i)−S(i−T)}/2 and {S(i)−S(i+T)}/2;

an absolute value calculating means for calculating respective absolute values of {S(i)+S(i−T)} and {S(i+T)+S(i)};

a sign discriminating means for determining respective signs SGN of {S(i)+S(i−T)} and {S(i+T)+S(i)};

a correlation detecting means for determining conditions of the following equations descriptive of output characteristics:






S(i): Signal appearing at the timing i and from which the low frequency component has been removed;

SGN: Function of outputting the positive and negative signs;

ABS: Function of outputting the absolute value;

R(i) Output signal appearing at the timing i; and,

a selecting means for selecting and outputting an output signal R(i) according to the equations descriptive of the output characteristics and o the basis of a result of detection performed by the correlation detecting means.

$$R(i) = \left\{ \begin{array}{l} S(i); \quad \left( \begin{array}{l} \text{When } SGN\{S(i)+S(i-T)\} \\ \quad \neq SGN\{S(i+T)+S(i)\} \end{array} \right) \\ \dfrac{S(i)-S(i+T)}{2}; \left\{ \begin{array}{l} \text{When } SGN\{S(i)+S(i-T)\} \\ \quad = SGN\{S(i+T)+S(i)\} \\ \text{and} \\ ABS\{S(i)+S(i-T)\} \\ \quad > ABS\{S(i+T)+S(i)\} \end{array} \right. \end{array} \right\}$$

$$\left\{ \begin{array}{l} \dfrac{S(i)-S(i-T)}{2}; \left\{ \begin{array}{l} \text{When } SGN\{S(i)+S(i-T)\} \\ \quad = SGN\{S(i+T)+S(i)\} \\ \text{and} \\ ABS\{S(i)+S(i-T)\} \\ \quad \leqq ABS\{S(i+T)+S(i)\} \end{array} \right. \end{array} \right\}$$

or

$$R(i) = \left\{ \begin{array}{l} S(i); \quad \left( \begin{array}{l} \text{When } SGN\{S(i)+S(i-T)\} \\ \quad \neq SGN\{S(i+T)+S(i)\} \end{array} \right) \\ \dfrac{S(i)-S(i+T)}{2}; \left\{ \begin{array}{l} \text{When } SGN\{S(i)+S(i-T)\} \\ \quad = SGN\{S(i+T)+S(i)\} \\ \text{and} \\ ABS\{S(i)+S(i-T)\} \\ \quad \geqq ABS\{S(i+T)+S(i)\} \end{array} \right. \end{array} \right\}$$

$$\left\{ \begin{array}{l} \dfrac{S(i)-S(i-T)}{2}; \left\{ \begin{array}{l} \text{When } SGN\{S(i)+S(i-T)\} \\ \quad = SGN\{S(i+T)+S(i)\} \\ \text{and} \\ ABS\{S(i)+S(i-T)\} \\ \quad < ABS\{S(i+T)+S(i)\} \end{array} \right. \end{array} \right\}$$

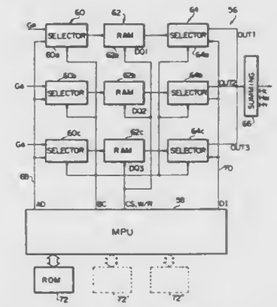
wherein:

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5,051,819
## COLORED IMAGE READING APPARATUS

**Shigeru Moriya, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Oct. 20, 1988, Ser. No. 260,121**
**Claims priority, application Japan, Oct. 21, 1987, 62-267144; Oct. 21, 1987, 62-267145; Oct. 21, 1987, 62-267146**
**Int. Cl.[5] H04N *1/46***
**U.S. Cl. 358—76** **13 Claims**




1. A colored image reading apparatus for use in reproducing multi-color images with toning materials of different colors and having different properties, comprising:

(a) a color image sensor to be driven for movement with respect to a document to read images on the document and produce light-intensity signals respectively variable with the red, green and blue components of said images,

(b) masking means for converting said light-intensity signals into data dictated by the properties of the toning materials with which said images are to be reproduced, said masking means comprising random access memory means for sequentially storing data respectively corresponding to various values of said intensity signals and summing means for summing signals representative of the data output from said memory means,

(c) said random access memory means having stored sequentially therein quantity of ink data for each of at least three toning material colors, said quantity of ink data being logarithmic values of the multiplication of values respectively corresponding to said light-intensity signals and predetermined parameters specific to the properties of said toning materials, the memory means being operative to sequentially output to said summing means the quantity of ink data for each of said at least three toning material colors, and

(d) output means for outputting signals representing the data produced by said masking means for reproducing said multi-color images.

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5,051,820

## COLOR IMAGE RECORDING APPARATUS CAPABLE OF RECORDING COLOR GRADATION PATTERN

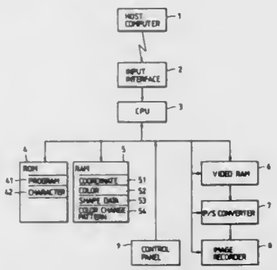
Ichiro Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 26, 1989, Ser. No. 385,058

Claims priority, application Japan, Jul. 26, 1988, 63-185876; Oct. 24, 1988, 63-267789

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—80 4 Claims




1. A color image recording apparatus for recording a color image based on color image data supplied from an external source, comprising:

memory means for storing an image color change pattern as a function of a recording position;

processing means for calculating an image color at a recording position according to said function; and

recording means for recording a color image on a recording medium in the calculated image color at the recording position, wherein said memory means stores a color change pattern on a background free of color image data, said processing means including means for calculating a background color based on the color change pattern on the background which is stored in said memory means.

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5,051,821

## LOW LIGHT LEVEL COLOR IMAGE TELEVISION SYSTEM INCLUDING ELECTRONIC CONTRAST ENHANCEMENT SYSTEM

Michel Vittot, Villecresne, and Michèle Fouassier, Yerres, both of France, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 563,736, Aug. 3, 1990, abandoned, which is a continuation of Ser. No. 369,565, Jun. 2, 1989, abandoned. This application Feb. 26, 1991, Ser. No. 662,386

Claims priority, application France, Jun. 24, 1988, 88 08505

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—81 9 Claims



1. A low light level television system having a first channel which detects the nocturnal light reflected by objects in the visible spectrum and in the near infrared (400 nm to approximately 1000 nm) and a second channel which detects another part of the spectrum, each channel including a low light level picture pick-up or detector tube and an input lens adapted to the range of the detected wavelength, the sensitivity range of the first channel being determined by the sensitivity of the photocathode of the detector tube, the signals of the two channels being combined to produce an image on a television monitor, characterized in that the second channel also detects the light reflected from the objects in a wavelength range formed by the visible part (400 nm to approximately 700 nm) of the spectrum of the first channel, this sensitivity range of the second channel included in the sensitivity range of the first channel rendering it possible to improve the contrast and the noise of the image, the two tubes being positioned side-by-side so as to have the two images coincide and being provided with two electronic control and synchronous output circuits, the monitor being a colour television monitor, the first and second channels each acting on one of the colour input channels of the monitor to recover their information components via different combined colours in accordance with a single coloured image.

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5,051,822

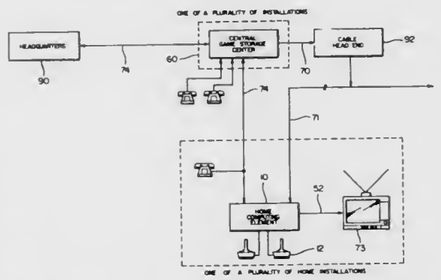
## TELEPHONE ACCESS VIDEO GAME DISTRIBUTION CENTER

Donald E. Rhoades, Miami, Fla., assignor to Interactive Television Systems, Inc., Miami Beach, Fla.

Filed Oct. 19, 1989, Ser. No. 423,946

Int. Cl.[5] H04H *1/02*

U.S. Cl. 358—86 7 Claims




1. A bi-directional, interactive communications system for transmitting in a digital format, programs including video games to a plurality of subscriber locations on demand, said system comprising:

a remote storage center for storing software programs,

a television broadcast facility for unidirectionally transmitting programs,

a home computing assembly disposed at each subscriber location and connected bidirectionally by telephone lines to the remote storage center,

said home computing assembly also being linked to the television broadcast facility,

said home computing assembly being structured to receive individually addressed programs over telephone lines from the remote storage center and to cause transfer of digital streams of data from the remote storage center to the television broadcast facility and transfer of the digital streams of data from the television broadcast facility to said home computing assembly for interaction with said individually addressed programs in said home computing assembly as received from said remote storage center, and said home computing assembly including decoder means tuned to a television broadcast channel for monitoring digital streams of data as transmitted from the television broadcast facility, said remote storage center including detection means for detecting proper identification codes of requesting subscribers,

said home computing assembly including digital processing means for receiving the digital streams of data by the requesting ones of home computing assemblies, and

said home computing assembly further including distributed computer processing means for invoking the programs to perform a task associated with said programs and means to interact with said programs as received from the television broadcast facility.



5,051,823

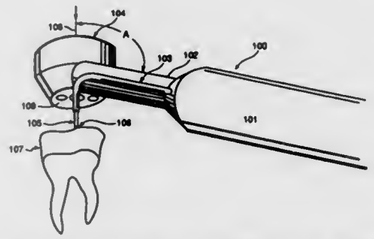
## DENTAL INSTRUMENT INCLUDING LASER DEVICE AND ELECTRONIC VIDEO DENTAL CAMERA

David H. Cooper, Saratoga, and Charles S. Bush, Los Gatos, both of Calif., assignors to Fuji Optical Systems, Inc., Los Gatos, Calif.

Continuation-in-part of Ser. No. 149,521, Jan. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 22,171, Mar. 5, 1987, Pat. No. 4,727,416. This application Jan. 18, 1990, Ser. No. 467,517

Int. Cl.[5] A61B *1/04, 1/06*

U.S. Cl. 358—98 30 Claims




1. A dental instrument for use in displaying an image from inside the mouth onto a monitor comprising an electronic video endoscope comprising:

a handle;

means for emitting laser energy, located at the distal end of said handle; and

a camera head located at the distal end of said handle including a means for receiving an image, such that said image includes the area of the mouth to which said laser energy is directed.

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5,051,824

## ELECTRONIC SCOPE HAVING DETACHABLE FRAME TO WHICH SOLID STATE IMAGING DEVICE IS FASTENED

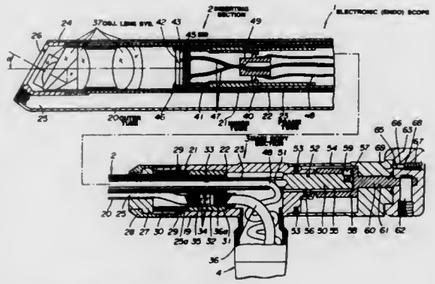
Shinichi Nishigaki, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1990, Ser. No. 593,913

Claims priority, application Japan, Oct. 30, 1989, 1-283496; Jul. 30, 1990, 2-204887

Int. Cl.[5] H04N *1/04, 1/06*

U.S. Cl. 358—98 25 Claims



1. An electronic scope comprising:

an elongated inserting section;

a main body section to which the end portion of said inserting section is fastened;

an objective lens system fastened to the front portion of said inserting section and arranged to form an optical image;

a light guide allowed to pass through said inserting section and arranged to transmit illuminating light so as to emit it through the end portion thereof;

a frame body the base portion of which is fastened to said main body section and the tail end portion of which is inserted into said inserting section until it reaches a position in the vicinity of the focal position of said objective lens;

a solid state imaging device fastened to said tail end portion of said frame body, said solid state imaging device having a photoelectric transfer function; and

securing means for detachably securing at least either said inserting section except for said frame body or said base portion of said frame body to said main body section.

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5,051,825

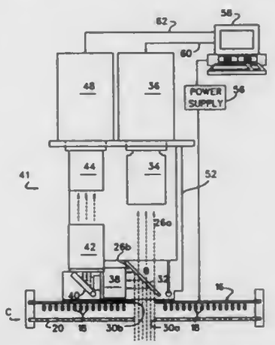
## DUAL IMAGE VIDEO INSPECTION APPARATUS

Don W. Cochran, Mayfield Village, and James R. Austin, Mentor On the Lake, both of Ohio, assignors to Pressco, Inc., Solon, Ohio

Continuation-in-part of Ser. No. 336,642, Apr. 7, 1989, Pat. No. 4,882,498, which is a continuation-in-part of Ser. No. 107,265, Oct. 9, 1987, abandoned. This application Sep. 19, 1989, Ser. No. 409,148

Int. Cl.[5] H04N *7/18, 7/00*

U.S. Cl. 358—106 17 Claims




1. A video inspection apparatus comprising:

means for receiving light from an associated specimen;

first and second video camera means for generating image data from light directed thereto;

apportioning means for providing a first portion of the light to the first video camera means;

the apportioning means including means for providing a second portion of the light to the second video camera means;

data processor means for generating alignment data from image data input thereto;

means for communicating first image data from the first video camera means to the data processor means;

the processor means including means for isolating a selected portion of image data of the second video camera means in accordance with alignment data generated from the first image data, whereby an isolated image data portion is formed; and

means for generating second image data from the selected portion of image data of the second video camera means.

VOL 1130 ISS 4 SE 24 1991 UMI

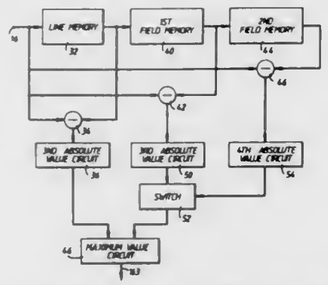


5,051,826

## VERTICAL EDGE DETECTION CIRCUIT FOR A TELEVISION IMAGE MOTION ADAPTIVE PROGRESSIVE SCANNING CONVERSION CIRCUIT

Satoyuki Ishii, and Susumu Komatsu, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 28, 1990, Ser. No. 486,433
Claims priority, application Japan, Feb. 28, 1989, 1-49033
Int. Cl.[5] H04N *7/01*
U.S. Cl. 358—140 5 Claims



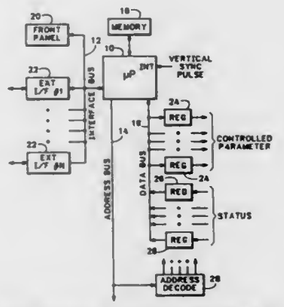

1. A vertical edge detection circuit for a progressive scanning conversion circuit comprising:
means for receiving an interlaced scanning television signal;
means for generating an intra-field difference signal from the interlaced scanning television signal;
means for generating an inter-field difference signal from the interlaced scanning television signal;
means for generating an inter-frame difference signal from the interlaced scanning television signal; and
means for selectively outputting a maximum of the intra-field and inter-field difference signals when the inter-frame difference signal is less than a predetermined value and for outputting said intra-field difference signal when said inter-frame difference signal is greater than said predetermined value.

5,051,827

## TELEVISION SIGNAL ENCODER/DECODER CONFIGURATION CONTROL

Jon Fairhurst, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Jan. 29, 1990, Ser. No. 471,561
Int. Cl.[5] H04N *7/04*
U.S. Cl. 358—141 8 Claims



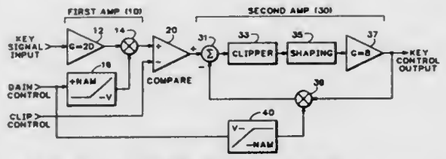

1. A television signal equipment controller for modifying configuration parameters of television signal equipment comprising:
a microprocessor having an interface bus, an address bus, a data bus and associated memory;
means for communicating with the microprocessor over the interface bus to modify configuration parameters;
means for transferring the modified configuration parameters from the microprocessor to circuitry within the television signal equipment to present a selected configuration for the television signal equipment;
means for storing the configuration parameters representing the selected configuration in the associated memory for subsequent recall to set up the television signal equipment in the selected configuration; and
means for allowing an operator to select a preset configuration within the means for storing.

5,051,828

## KEYER WITH VARIABLE SHAPING

Daniel J. Chaplin, Nevada City, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Apr. 27, 1990, Ser. No. 515,920
Int. Cl.[5] H04N *5/53*
U.S. Cl. 358—183 11 Claims




1. A keyer with variable shaping comprising:
a variable gain amplifier having a key signal input and producing a variable gain output, the gain of the variable gain amplifier being determined by a gain control signal;
means for comparing the variable gain output with a clip control signal to provide a comparator output signal; and
means for variably shaping the signal derived from the comparator output as a function of the gain control signal to produce a key control signal.

5,051,829

## METHOD FOR AUTOMATICALLY CONTROLLING OPTIMAL TUNING POINT FOR RECEIVING TELETEXT

Dong H. Chang, Gumi, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Apr. 20, 1990, Ser. No. 512,123
Claims priority, application Rep. of Korea, Apr. 28, 1989, 5672/1989
Int. Cl.[5] H04N *7/087*
U.S. Cl. 358—191.1 1 Claim



1. A method of controlling a teletext processor to adjust the optimal tuning point for receiving a teletext signal, the method using a system including a key matrix, a microprocessor, a teletext processor, a tuner, an image processor, and image signal switching sections, the method comprising the steps of:
a) checking whether or not a signal input is from the key matrix for storing automatically the optimal teletext tuning point, and if said signal is for receiving automatically said optimal teletext tuning point, then the current channel tuning frequency is stored to a register B and '0' is stored to a register A, and a counter of the system is made clear;
b) waiting for a predetermined time (T), so that thereafter, the number of byte error is received from teletext processor and stored to a stack, and the counter is increased by "1", wherein said number of byte errors is counted for said time (T) during the execution of a check program for checking the teletext receiving rate;
checking whether or not register A is '0' so that if A is not '0', then the current tuning frequency is decreased by a predetermined frequency;
d) checking whether or not the decreased current tuning frequency is less than the predetermined lower boundary frequency so that if less than the predetermined lower boundary frequency, after then the numbers of byte error stored in said stacks are compared with each other, the minimum number of byte errors is selected and the tuning frequency corresponding to said minimum number of byte errors is transmitted to the teletext processor and if not less than the predetermined lower boundary frequency, then the step (B) is returned;
e) if said register A is '0', then the current tuning frequency is increased by said predetermined frequency;
f) checking whether or not said increased current frequency is larger than the predetermined upper boundary frequency so that if larger, then '1' is stored to said register A and the current tuning frequency becomes the value of said register B, otherwise '0' is stored to register A and step b is returned to.

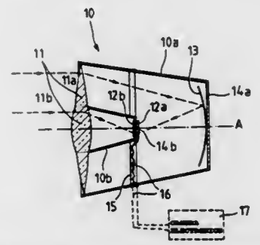


5,051,830

## DUAL LENS SYSTEM FOR ELECTRONIC CAMERA

Wolfgang von Hoessle, Hohenbrunn-Riemerling, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Aug. 6, 1990, Ser. No. 562,929
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1989, 3927334
Int. Cl.[5] H04N *5/30*
U.S. Cl. 358—209 15 Claims



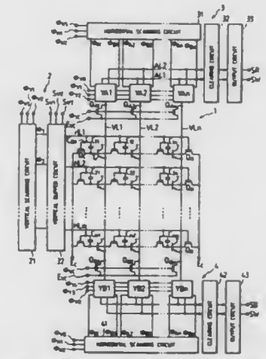

1. A device for the real-time picture transmission in the guided missile (FK) which is connected with a ground guiding station by way of a beam waveguide, wherein the picture transmission takes place by means of a camera arranged on a platform and having objectives of different focal lengths, wherein the camera is constructed as a double focal length camera in which partial lens systems for a short focal length and a long focal length form a single structural double lens system member, the lens part for the short focal length being integrated in the center of the lens part for the long focal length, wherein picture arrays assigned to each focal length are arranged on a common support, the overall length of the long focal length being shortened, by means of a reflecting mirror, and wherein only one electronic camera system for both picture arrays is arranged with an electronic change-over to the respective required focal length.

5,051,831

## SOLID STATE IMAGE PICKUP APPARATUS FOR ACCUMULATING AND READING OUT OPTICAL INFORMATION USING MULTI-PHASE SCANNING PULSES

Seiji Hashimoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 266,158, Nov. 2, 1988, Pat. No. 4,959,723. This application Jul. 19, 1990, Ser. No. 554,389
Claims priority, application Japan, Nov. 6, 1987, 62-279390; Dec. 21, 1987, 62-321423
Int. Cl.[5] H04N *3/14*
U.S. Cl. 358—213.11 14 Claims



1. A solid state image pickup apparatus comprising:
a plurality of temporary accumulation capacitors; and
a plurality of photoelectric converting elements for accumulating optical information to be read out to the outside by multi-phase scanning pulses,
wherein said multi-phase scanning pulses scan said temporary accumulation capacitors to read out to the outside the optical information accumulated therein, and
wherein said plurality of temporary accumulation capacitors are connected to said plurality of photoelectric converting elements so that the optical information read out from each photoelectric converting element is selectively accumulated in any one of said plurality of temporary accumulation capacitors.

5,051,832

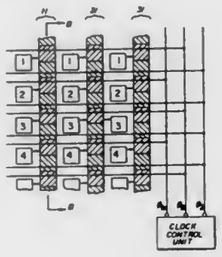
## SELECTIVE OPERATION IN INTERLACED AND NON-INTERLACED MODES OF INTERLINE TRANSFER CCD IMAGE SENSING DEVICE

David L. Losee, Fairport; Bruce C. Burkey, Rochester, and Teh-Hsuang Lee, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1990, Ser. No. 478,857
Int. Cl.[5] H04N *3/14, 5/335;* H01L *29/78*
U.S. Cl. 358—213.29 1 Claim

1. In an interline transfer type area image sensor having rows and columns of spaced pixels and which can selectively be operated in either an interlaced or a non-interlaced read-out mode, the improvement comprising voltage clocks, a plurality of vertical two-phase CCD shift registers, with each shift register having ion implanted transfer barrier or storage regions such that only one layer of gate electrodes is required by each voltage clock line, and means for selectively applying

voltages to the clock lines for either alternate rows of the vertical shift register electrodes for interlace mode of all of the




rows of the vertical shift register electrodes for non-interlace mode.

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**5,051,833**

**CAMERA APPARATUS CAPABLE OF FREELY SETTING OBJECTIVE AREA WITHIN VIEWED SUBJECT**

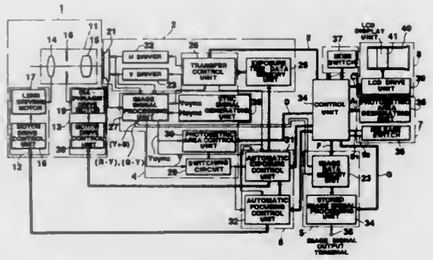
**Akio Tsuji, Akishima, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan**

**Filed Apr. 19, 1990, Ser. No. 510,962**

**Claims priority, application Japan, Apr. 28, 1989, 1-110111; May 9, 1989, 1-115484**

**Int. Cl.[5] H04N** *5/232*

**U.S. Cl. 358—227** **13 Claims**



1. A camera apparatus comprising:

optical image forming means for forming an optical image;

image sensing means having a photoelectric converting area comprised of a plurality of frame areas, for producing electric signals in response to said optical image formed by said optical image forming means;

area designating means for designating a desired frame area from said plurality of frame area;

selecting means for selecting from the electric signals produced by the whole electric converting area, electric signals produced by said desired frame area designated by said area designated means; and,

producing means for producing a video signal based on said electric signals produced by said image sensing means and said selecting means.

**5,051,834**

**PROJECTION-TYPE DISPLAY APPARATUS UTILIZING BOTH ZERO-ORDER AND FIRST-ORDER DIFFRACTED BEAMS**

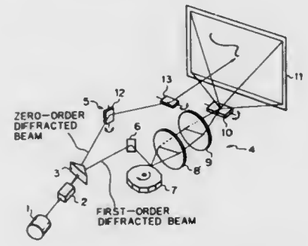
**Fumio Matui; Yasushi Murata, and Satoru Tanaka, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Mar. 22, 1990, Ser. No. 497,029**

**Claims priority, application Japan, Oct. 4, 1989, 1-260625**

**Int. Cl.[5] H04N** *5/74, 9/12, 3/10*

**U.S. Cl. 358—231** **2 Claims**




1. A projection-type display apparatus comprising:

a screen;

an acoustooptic modulator for modulating an intensity of a light beam applied thereto with a modulating signal;

a light source directing said light beam to said acoustooptic modulator;

scanning means for two-dimensionally scanning said screen with a first-order diffracted beam emitted from said acoustooptic modulator; and

deflecting means provided separately from said scanning means for two-dimensionally deflecting a zero-order diffracted beam emitted from said acoustooptic modulator independently from said scanning means and for projecting the two-dimensionally deflected zero-order diffracted beam onto said screen.

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**5,051,835**

**DIGITAL PROCESSING OF THEATRICAL FILM**

**Thomas L. Bruehl, Burbank; Daniel R. Brewer, La Canada; Clifford C. Hay, Burbank, and William H. Childers, Los Angeles, all of Calif., assignors to Paramount Pictures Corporation, Hollywood, Calif.**

**Filed Nov. 1, 1989, Ser. No. 430,557**

**Int. Cl.[5] H04N** *9/79*

**U.S. Cl. 358—311** **3 Claims**

1. A method for producing visual effects on theatrical film, comprising the steps of

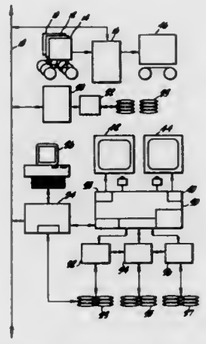
digitizing into multiple additive color images a theatrical quality film on a frame-by-frame basis;

separately storing each additive color image in digitized form;

separately processing for visual effects the additive color images in digitized form;



separately storing the additive color images in digitized form;



printing the processed and stored additive color images in superposition on theatrical film.

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**5,051,836**

**OPTICAL DISC WITH PREGROOVES AND RECORDING METHOD AND APPARATUS USING AN OPTICAL DISC OF THAT TYPE**

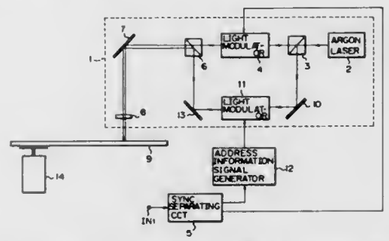
**Fumihiko Yokogawa, and Yoshihiro Utsumi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Jun. 26, 1989, Ser. No. 371,007**

**Claims priority, application Japan, Dec. 5, 1988, 63-307151**

**Int. Cl.[5] G11B** *7/007, 7/095*

**U.S. Cl. 358—342** **20 Claims**




6. A system for recording an information format signal upon a recording medium having a pre-recorded horizontal sync signal, said system comprising:

means for supplying said information format signal as an input information format signal including an input horizontal sync signal;

means for deriving said pre-recorded horizontal sync signal from said recording medium; and

means, responsive to said means for supplying and said means for deriving, for recording said input information format signal upon said recording medium in accordance with a transfer characteristic controlled in response to a phase difference between said input horizontal sync signal and said pre-recorded horizontal sync signal.

**5,051,837**

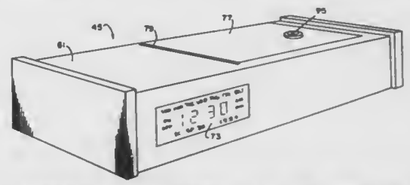
**HOME ENTERTAINMENT EQUIPMENT CONTROL APPARATUS**

**Thomas N. McJunkin, 1509 Chaston Rd., Charleston, W. Va. 25314**

**Filed Jun. 6, 1990, Ser. No. 533,783**

**Int. Cl.[5] H04N** *7/167*

**U.S. Cl. 358—349** **23 Claims**



1. Apparatus for recording and controlling the use of home entertainment equipment, comprising a housing means with a locking door for enclosing and restricting access to a compartment within said housing means, the compartment containing programming and power control components, the programming components comprising buttons for inputting operation time parameters, the buttons comprising a first button for setting a mode that allows for either time duration, or time duration and time period, to be controlled, a second button for inputting time parameters, and a third button for setting the time parameters into play, and the power control component comprising an override switch for circumventing any control functions of the apparatus, and a multi-purpose display for indicating programmed parameters, cumulative operation time for recording total time of appliance use since last set, individual operation time durations, and allowed operation time periods, the display, the control buttons and the override switch all being connected to operation control circuitry within the housing, comprising a power supply with battery backup, the power supply being connected to a power switch which is accessible from an external surface of the housing, the power supply also connected to the override switch within the enclosed compartment, and also connected to a switch controlled by a solenoid, which in turn is connected to and controlled by a microprocessor via electrical signals from a RAM/IO chip, the RAM/IO chip and microprocessor both being connected to a display interface as well, thereby transmitting electrical signals that are converted by the display interface into legible matter appearing on the multi-purpose display.

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**5,051,838**

**PORTABLE ELECTRONIC COPYING MACHINE**

**Michio Cho; Ko Aosaki, and Tokuji Sato, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Filed Jun. 22, 1989, Ser. No. 370,321**

**Claims priority, application Japan, Jun. 22, 1988, 63-154023; Jul. 15, 1988, 63-93786**

**Int. Cl.[5] H04N** *1/40*

**U.S. Cl. 358—401** **11 Claims**

1. A portable electronic copying machine for making a hard copy of a surface remote from said machine, comprising:

a thin substantially parallelepipedal housing having a front-to-rear depth substantially greater than its side-to-side width;

image pick-up means disposed in an upper portion of said housing for forming an image of a remote surface and converting said image into image signals, said image pick-up means having an axis extending in a lengthwise direction from front to rear of said upper portion of said housing;

a power supply unit including at least a power transformer disposed in the bottom of said housing; and

an image printing unit including a printing head disposed

between said image pick-up means and said power supply unit, said printing head being driven according to said

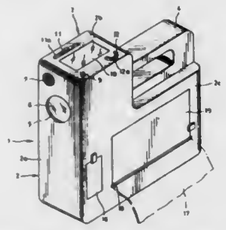
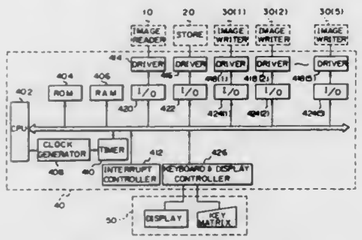


image signals to print an image of said remote surface on paper.

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**5,051,839**
**DIGITAL COPIER**
**Kazuyuki Nakahara, Tokyo, and Tetsuo Sakurai, Sagamihara, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan**
**Filed Aug. 10, 1989, Ser. No. 391,921**
**Claims priority, application Japan, Sep. 12, 1988, 63-226362; Sep. 16, 1988, 63-230121; May 11, 1989, 1-116168**
**Int. Cl.[5] H04M *1/00***
**U.S. Cl. 358—401** **7 Claims**

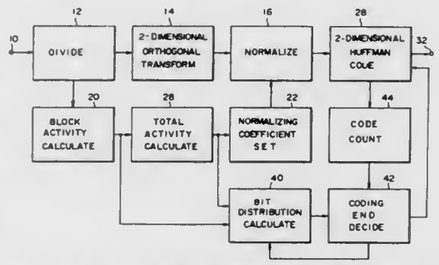


1. A digital copier comprising:
reading means for outputting image data representative of a document by reading said document;
storing means for storing the image data fed from said reading means;
a plurality of writing means each for writing an image on a recording medium on the basis of the image data stored in said storing means, each of said plurality of writing means outputting status data representative of a status of said writing means;
control means for controlling said plurality of writing means to select and designate, in response to the image data from said reading means and the status data from said plurality of writing means, any of said plurality of writing available for use, while outputting a write command; and
commanding means for delivering commands to said control means.

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**5,051,840**
**DEVICE FOR CODING A PICTURE SIGNAL BY COMPRESSION**
**Mikio Watanabe, and Kenji Moronaga, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Dec. 12, 1989, Ser. No. 448,811**
**Claims priority, application Japan, Dec. 14, 1988, 63-313840; Feb. 8, 1989, 1-27499**
**Int. Cl.[5] H04N *1/415***
**U.S. Cl. 358—433** **6 Claims**

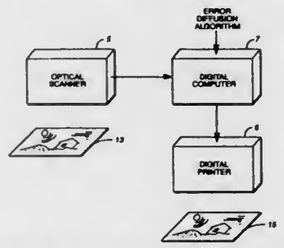
1. A picture signal compression coding device for dividing digital picture data representative of a single picture into a plurality of blocks and coding said plurality of blocks of digital picture data by a two-dimensional orthogonal transform, said device comprising:
orthogonal transforming means for subjecting each of the plurality of blocks of digital picture data to the two-dimensional orthogonal transform;
normalizing means for normalizing the digital picture data transformed by said orthogonal transforming means;
coding means for coding the data normalized by said normalizing means;
block activity calculating means for calculating an activity of the picture data block by block;
activity adding means for producing a total activity by summing up the activities of the individual blocks calculated by said block activity calculating means;



distributing means for calculating amounts of data to be distributed to the individual blocks on the basis of a ratio of the block-by-block activity calculated by said block activity calculating means to the total activity calculated by said activity adding means; and
control means for restricting an amount of data to be outputted by said coding means in response to an output of said distributing means;
said control means comparing the amount of data to be allocated to any of the blocks of interest with the amount of data of said block being actually outputted by said coding means, and restricting the amount of data to be outputted by said coding means such that said amount of data from said coding means fails to exceed said amount of data allocated to said block.

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**5,051,841**
**PROCESS FOR PROVIDING DIGITAL HALFTONE IMAGES WITH RANDOM ERROR DIFFUSION**
**Harry Bowers, Berkeley, and John S. Bowers, San Francisco, both of Calif., assignors to Bowers Imaging Technologies, Inc., South San Francisco, Calif.**
**Filed Oct. 16, 1989, Ser. No. 421,931**
**Int. Cl.[5] H04N *1/40***
**U.S. Cl. 358—447** **15 Claims**



1. A digital halftoning process with random error diffusion for reducing visually apparent artifacts in images that are produced by digital halftone printing, comprising the steps of:
scanning an image to detect intensity values at selected pixel locations;
encoding selected ones of the pixel locations as one binary value when the detected intensity value at a location is less than a predetermined threshold value, and calculating error values for such pixel locations that equal the detected intensity values;
encoding selected other ones of the pixel locations as a second binary value when the detected intensity values at those locations are greater than the predetermined threshold value, and calculating error values for those locations that equal the detected intensity values less the upper limit of the intensity scale;
for selected pixel neighbors of the ith pixel in an image, diffusing the calculated error value, $E_i$, of the ith pixel location to its selected neighbors as follows:

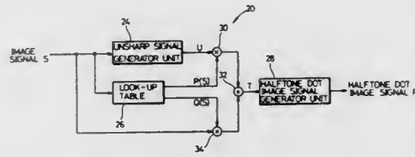
$$e_j=(w_j)E_i$$

$e_j$ is the error value diffused to the jth pixel neighbor from the ith pixel location, where the jth pixel neighbor is randomly determined from a predetermined set of pixels neighboring the ith pixel, and where $w_j$ is a weighting factor determined for the jth pixel location;
continuing the error diffusion process for the other pixel neighbors of the ith pixel location;
continuing the error diffusion process for the (i+1)th pixel location and so forth, such that coding errors are diffused from substantially all of the pixel locations in a scanned image; and
printing images by digital halftone printing based upon intensity values of pixel locations that have been modified by error diffusion.



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**5,051,842**
**IMAGE PROCESSING APPARATUS FOR MIXING WEIGHTED CONTINUOUS-TONE AND UNSHARP IMAGE SIGNALS TO REDUCE VISIBLE NOISE IN REPRODUCED IMAGES**
**Osamu Shimazaki, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan**
**Filed Apr. 17, 1990, Ser. No. 509,840**
**Claims priority, application Japan, Apr. 19, 1989, 1-99763**
**Int. Cl.[5] H04N *1/40***
**U.S. Cl. 358—447** **6 Claims**



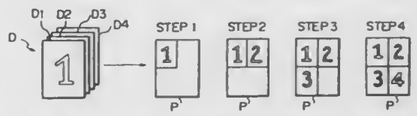
1. An image processing apparatus, comprising:
unsharp signal generating means for processing a plurality of image signals obtained from continuous-tone images by averaging said image signals so as to generate an unsharp signal;
weighted parameter generating means for generating weighted parameters P and Q according to a level of each of said image signals or a level of said unsharp signal; and
image signal producing means for producing a new image signal T in accordance with the following equation:

$$T=P\cdot U+Q\cdot S$$

where
S is an image signal
U is an unsharp signal
P and Q are weighted parameters.

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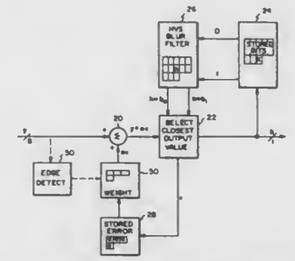
**5,051,843**
**DIGITAL COPIER**
**Masayuki Hayashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**
**Filed Dec. 28, 1988, Ser. No. 291,044**
**Claims priority, application Japan, Dec. 28, 1987, 62-332987**
**Int. Cl.[5] H04N *1/387, 1/40***
**U.S. Cl. 358—450** **4 Claims**



1. A digital copier for reading images printed on a plurality of documents by use of document reading means and reproducing the read images in a desired arrangement on a single paper sheet which is transported by way of registering means, comprising:
data processing means for determining, in the event of a scanning movement of said document reading means, a period of time needed for said document reading means to move from a home position of said document reading means to a predetermined position and holding data representative of the determined period of time;
wherein said determination is first made upon the initial turn-on of power to said document scanning means by operation of a test scan and wherein said held data is adjusted by said data processing means based upon an averaging from subsequent scans; and
correcting means for correcting a variation in a scanning timing of said document reading means on the basis of the held data.

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**5,051,844**
**DIGITAL HALFTONING WITH ERROR DIFFUSION**
**James R. Sullivan, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**
**Filed Jan. 30, 1989, Ser. No. 303,205**
**Int. Cl.[5] H04N *1/40***
**U.S. Cl. 358—456** **9 Claims**



1. An improved error diffusion method for producing a halftone image from a continuous-tone image having pixels which have been digitized as grey scale values, and including the steps of selecting for each continuous-tone input pixel a binary output pixel(s) according to an error criterion, determining an error between an input pixel value and an output pixel(s) value and distributing the error to a neighborhood of adjacent input pixels, for use in the error criterion, wherein the improvement comprises:
employing a neighborhood of previously selected output pixels and a currently selected pixel, all weighted by a

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human visual system filter as the output pixel value employed in the error determining step.

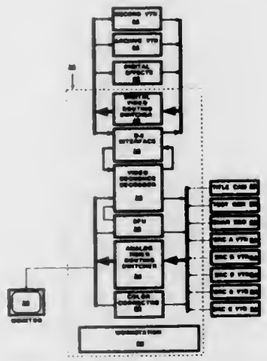
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5,051,845

## CLOSED-LOOP POST PRODUCTION PROCESS

**Larry J. Gardner, 1632 Pricewood La., Apex, N.C. 27511, and David H. Scoggins, 6100 Donny Brook Dr., Raleigh, N.C. 27606**

**Filed Apr. 27, 1989, Ser. No. 344,097**
**Int. Cl.[5] G11B** *27/028, 27/00*
**U.S. Cl. 360—14.1** **10 Claims**



6. A post production system for editing pre-existing source materials into a master program in a series of jobs comprising:
(a) at least one source machine for playing unedited video source material;
(b) means for editing video source material during each job to create a new program segment;
(c) means for recording the new program segment onto a master program media;
(d) a temporary video storage media having at separate record and playback sections;
(e) means for recording the new program segment into the record section of the temporary video storage media simultaneously with the recording of the new program segment into the master program media;
(f) means for playing back a previously recorded program segment from the playback section of the temporary video storage media and presenting the previously recorded program segment to the editing means while simultaneously recording the new program segment so that it is available as source material for creating the new program segment;
(g) means for switching the record and playback sections of the temporary video storage media at the completion of a job so that the new program segment recorded during a job is played back during a subsequent job.

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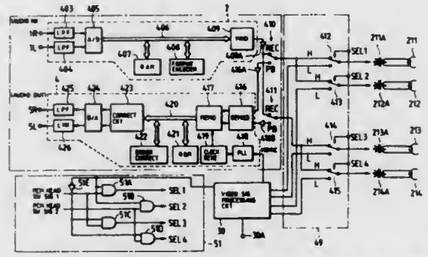
5,051,846

## MAGNETIC VIDEO TAPE RECORDING AND REPRODUCING APPARATUS

**Takuya Tsushima, Ayase; Akira Hirota, Chigasaki; Naomichi Nishimoto, Tokyo, and Takashi Uchimi, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan**

**Filed Oct. 5, 1988, Ser. No. 253,868**
**Claims priority, application Japan, Oct. 13, 1987, 62-256365; Oct. 13, 1987, 62-256368; Oct. 13, 1987, 62-256369**
**Int. Cl.[5] H04N** *5/782*
**U.S. Cl. 360—19.1** **12 Claims**

1. An apparatus comprising:
(a) a rotary drum on which a magnetic tape is wound through a predetermined angular range greater than a standard tape winding angle, the predetermined angular range having a first portion corresponding to the standard tape winding angle and a second portion extending outward of the standard tape winding angle;
(b) first means for recording a main information signal forming a main information recording track on the magnetic tape, the main information recording track extending in a region corresponding to the first portion of the predetermined angular range;
(c) second means for recording a sub information signal



forming a sub information recording track on the magnetic tape, the sub information recording track extending along an extension line of the main information recording track and extending in a region corresponding to the second portion of the predetermined angular range;
wherein the second recording means comprises a plurality of magnetic heads having different track widths respectively and mounted on the rotary drum, and means for enabling the magnetic heads to form a plurality of respective paths which together constitute the sub information signal recording track.

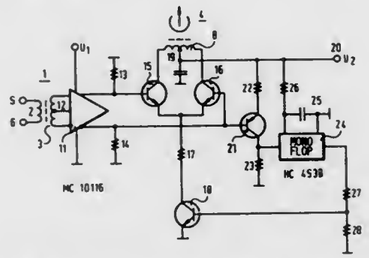
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5,051,847

## MAGNETIC HEAD DRIVER AMPLIFIER FOR OBLIQUE TRACK RECORDING TAPE

**Michael Philipps, Darmstadt, Fed. Rep. of Germany, assignor to BTS Broadcast Television Systems GmbH, Darmstadt, Fed. Rep. of Germany**

**Filed Mar. 23, 1989, Ser. No. 328,002**
**Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3811327**
**Int. Cl.[5] G11B** *5/09, 15/14, 5/02*
**U.S. Cl. 360—46** **6 Claims**




1. A digital magnetic recording circuit for a recording/reproducing apparatus which records signals on a magnetic tape on oblique tracks, said recording/reproducing apparatus comprising
a rotary drum having a plurality of magnetic heads distributed around its periphery for recording the digital signals on the magnetic tape while it is guided in a loop around the drum;
rotary transformers (1) which, respectively, are connected to each of said magnetic heads for supplying the digital signals thereto, each of said rotary transformers having a rotor (3) mounted for rotation with said drum and a stator (2) mounted independently of said drum;
a recording amplifier connected to each said rotor (3) and to a corresponding magnetic head, each said amplifier comprising a current source (17) for supplying a constant current and switching means (15, 16) for selectively applying the constant current of said current source (17) in a forward and in a reverse direction to the corresponding magnetic head in response to the digital signals;
said recording circuit being characterized in that each said amplifier further comprises:
a switching element (18) inserted in the path of said constant current for controllably interrupting all flow of current in said current source (17) and
control means (9; 21 to 26) for controlling the switching element (18) interrupt all flow of current in said current source (17) during the absence of digital signal transmission through a corresponding one of said rotary transformers (1).



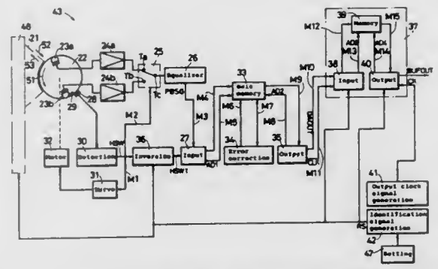
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5,051,848

## METHOD AND APPARATUS FOR REPRODUCING MAGNETIC TAPE USING ROTARY DRUM HEADS

**Toshiji Ishii, and Kengo Sudoh, both of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed May 9, 1989, Ser. No. 350,841**
**Claims priority, application Japan, May 9, 1988, 63-113288**
**Int. Cl.[5] G11B** *15/14, 5/09*
**U.S. Cl. 360—64** **7 Claims**



1. A method for reproducing a magnetic tape using rotary drum heads comprising the steps of:
forming a frame on a magnetic tape, the frame including a pair of tracks, one track being formed by a magnetic head, mounted on a rotary drum with a predetermined azimuth angle, and the other track being formed by a second magnetic head, mounted on the rotary drum at a circumferential spacing from the first magnetic head, with a different azimuth angle;
reading contents from one track by the magnetic head having a predetermined azimuth angle, and reading contents from the other track by the other magnetic head having a different azimuth angle;
generating a track identification signal, during reproduction in a first direction, which is one of a high level and a low level during reproduction of one track and is a different one of the high level and low level during reproduction of the other track;
sending out the contents read from one track and the contents read from the other track, for each frame, rearranged in a predetermined sequence, in response to the generated track identification signal; and
inverting the track identification signal, during reproduction in a second direction, reverse of the first direction, selecting two tracks composing one frame in response to this inverted track identification signal, and sending out the contents read from the selected two tracks, rearranged in a sequence reverse to the sequence during reproduction in the first direction.

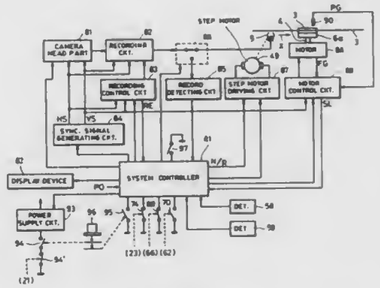
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5,051,849

## RECORDING APPARATUS INCLUDING A PRE-RECORDING POSITIONING FUNCTION

**Nobuo Fukushima; Masaya Maeda, both of Yokohama, and Nobuo Tezuka, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 930,752, Nov. 14, 1986, abandoned. This application Dec. 28, 1990, Ser. No. 633,173**
**Claims priority, application Japan, Nov. 28, 1985, 60-267912; Nov. 28, 1985, 60-267913**
**Int. Cl.[5] G11B** *19/02, 21/02*
**U.S. Cl. 360—69** **59 Claims**



44. A recording apparatus comprising:
means for loading an exchangeable recording medium;
means for supplying electrical power to said apparatus to perform a recording operation;
first detection means for detecting the unloading of the exchangeable recording medium;
a moveable recording head;
second detection means for detecting a position of said movable recording head; and
control means for moving said movable recording head into a predetermined initial recording position, when said first detection means detects the unloading of the exchangeable recording medium, at the start of electrical power supply to the recording apparatus by said supplying means.

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5,051,850

## DISC UNIT HAVING A CENTRAL CONTROL FOR CONTROL PLURAL DISC DRIVES

**Kazushi Takahashi, Yokoze, Japan, assignor to Canon Denshi Kabushiki Kaisha, Chichibu, Japan**

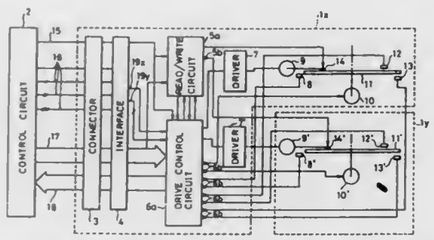
**Filed Feb. 16, 1989, Ser. No. 311,822**
**Claims priority, application Japan, Feb. 18, 1988, 63-19322**
**Int. Cl.[5] G11B** *15/46*
**U.S. Cl. 360—73.03** **4 Claims**

1. A disc unit comprising:
a first disc drive mechanism for driving a disc, said first disc drive mechanism being integrally fixed to said disc unit;
means for connecting to said disc unit, when necessary, a second disc for driving a disc; and
a control circuit for commonly controlling said first disc drive mechanism and said second disc drive mechanism, if it is connected to said disc unit by said means for connecting, so as to selectively read data from or write data onto one disc at a time,
wherein each of said first and second disc drive mechanism includes a spindle motor for driving said disc, a head for writing data into and/or reading data from the flat surface

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of the disc, and a head driving motor for moving said head, and




wherein said control circuit controls the rotation of said spindle motors of said first and second disc drive mechanisms and the rotation of the head driving motors of said first and second disc drive mechanisms.

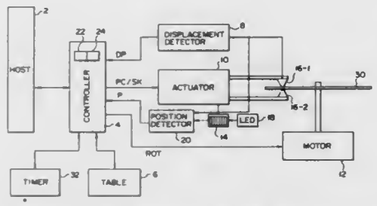
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**5,051,851**

## METHOD AND APPARATUS FOR POSITIONING HEAD ON THE BASIS OF PREMEASURED AMOUNT OF DISPLACEMENT

**Tetsuji Sakurai, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Nov. 30, 1989, Ser. No. 443,216**
**Claims priority, application Japan, Nov. 30, 1988, 63-300910**
**Int. Cl.[5] G11B *5/596***
**U.S. Cl. 360—77.06** **18 Claims**



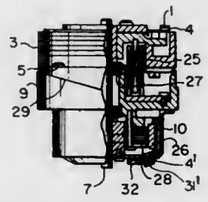

1. A magnetic disk apparatus having improved tracking performance, comprising:
a head for accessing a magnetic disk, the magnetic disk being rotated;
displacement detection means for detecting an amount of displacement of said head from a designated track of the magnetic disk, based on a signal through said head from servo data associated with the designated track and generating displacement data from the displacement amount;
head position control means for controlling a position of said head in a radial direction of the magnetic disk in response to an input position control instruction;
table for storing a plurality of disk-dependent displacement data; and
control means for reading out disk-dependent displacement data from said table in accordance with the designated track and outputting the position control instruction to said head position control means in accordance with the displacement data from said displacement detection means and the disk-dependent displacement data.

**5,051,852**

## MECHANISM FOR BALANCING A ROTARY MAGNETIC HEAD APPARATUS

**Takashi Kohno; Osami Matsushita, both of Ibaraki; Takao Terayama, Ushiku; Mashanori Kohchi, Katsuta; Hideo Tomizawa, Katsuta; Kouji Satoh, Katsuta, and Hiroyuki Ono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 27, 1989, Ser. No. 343,749**
**Claims priority, application Japan, Apr. 28, 1988, 63-103927**
**Int. Cl.[5] G11B *5/027***
**U.S. Cl. 360—84** **9 Claims**



1. A magnetic head apparatus comprising:
a fixed cylinder for supporting a rotary shaft by bearings;
a rotary cylinder secured to one end of said rotary shaft and having magnetic heads;
a motor rotor directly coupled with an opposite end of said rotary shaft;
first balancer means provided in said rotary cylinder; and
second balancer means provided in said motor rotor, whereby said first balancer means and said second balancer means compensate for an unbalance of a rotary body composed of said rotary cylinder, said rotary shaft, and said motor rotor.

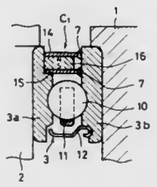
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**5,051,853**

## MAGNETIC DISC DEVICE

**Masachi Hosoya, Kanagawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 26, 1989, Ser. No. 344,070**
**Int. Cl.[5] G11B *17/28***
**U.S. Cl. 360—99.08** **10 Claims**



1. A magnetic disc device comprising:
a seal member consisting of two ring-shaped pole pieces fixed to the end surfaces of an axially polarized ring magnet;
a housing incorporating a shaft having bearings with rolling members therein to allow for a relative rotation of the shaft;
a disc fixed to said shaft or said housing; and
electroconductive magnetic fluid;
wherein inner peripheral ends of the ring-shaped pole pieces of said seal member is fixed to the shaft side, and said electroconductive magnetic fluid is magnetically kept in a gap between outer peripheral ends of the ring-shaped pole pieces of said seal member and said housing.

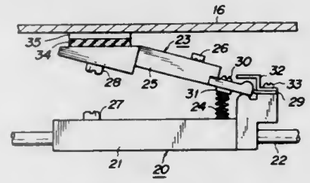


**5,051,854**

## MAGNETIC HEAD DEVICE

**Atsushi Iwanaga, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 823,665, Jan. 29, 1986, abandoned. This application Apr. 5, 1990, Ser. No. 506,502**
**Claims priority, application Japan, Jan. 29, 1985, 60-10794**
**Int. Cl.[5] G11B *5/54, 21/22***
**U.S. Cl. 360—105** **1 Claim**



1. A magnetic head device having:
a chassis having an upper wall and lower base;
a carriage movably mounted on said base and supporting a lower magnetic head on an upper surface thereof;
an upper arm supporting an upper magnetic head on a lower surface thereof which is pivotably mounted to said carriage such that when said upper arm is lowered toward said carriage, said upper head becomes opposed to said lower head for recording and reproducing on a magnetic disk interposed therebetween; and
biasing means for biasing said upper arm toward said carriage;
wherein the improvement comprises a shock absorbing member provided on an upper surface of said upper arm facing said upper wall such that when said upper arm is lifted away from said carriage in an upward direction toward said upper wall of said chassis, said shock absorbing member becomes interposed between said upper arm and said upper wall so as to absorb the shock of any collision therebetween; and
wherein said two layered shock absorbing member includes a soft sponge member attached on said upper surface of said upper arm and a substantially coextensive harder rubber member laminated on said sponge member, whereby only said rubber member contacts said upper wall when said upper arm is lifted away from said chassis, to prevent slippage and/or bouncing, thereby providing superior cushioning.

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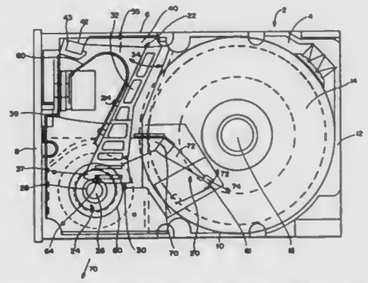
**5,051,855**

## ROTARY ACTUATOR

**Sanjoy Ghose, Santa Cruz County; Enrique J. Klein; Efim Bronshvatch, both of Santa Clara County; Bernhard M. Seeger, Santa Cruz County; Donald J. Macleod, Santa Cruz County; Gunter K. Heine, Santa Cruz County; Oswald Kuwert, Santa Cruz County, and Ramgopal Battu, Los Angeles County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.**

**Continuation of Ser. No. 263,997, Oct. 25, 1988, abandoned, which is a continuation of Ser. No. 115,691, Nov. 2, 1987, Pat. No. 4,881,140, which is a continuation of Ser. No. 914,690, Oct. 2, 1986, abandoned. This application Feb. 2, 1990, Ser. No. 474,222**
**Int. Cl.[5] G11B *5/55***
**U.S. Cl. 360—106** **8 Claims**

1. A disc drive comprising a housing for supporting and enclosing the elements of the disc drive including
a disc which rotates about a fixed axis and carries a multiplicity of concentric data tracks,
a spindle motor supported by said housing whose output shaft supports said disc for rotation,
a transducer which moves generally along one radius of said disc to access data on one of said tracks,
an arm assembly supporting said transducer for movement over said tracks, such assembly including an actuator arm, said transducer being affixed to one end of a support arm which is attached to the side of said actuator arm, and at least approximately perpendicular to the elongate direction of said actuator arm, said arm assembly being moveable for positioning the transducer and support arm,



a leaf spring having a first and second ends, a first end being supported on said housing, an end of said actuator arm being attached and supported by said second end of said spring, and
motor means mounted in the housing and coupled to a driven end of said actuator arm distal from said attachment point between the leaf spring and said actuator arm for positioning the transducer selectively over tracks on the disc, the spring force of said leaf spring extending along said actuator arm to maintain coupling between said actuator arm and said motor means.

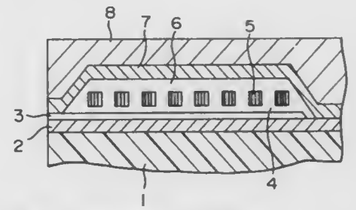
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**5,051,856**

## THIN FILM MAGNETIC HEAD WITH MIXED CRYSTAL STRUCTURES

**Shioji Narishige, Mito; Katsuya Mitsuoka, Hitachi; Takao Imagawa, Sendai; Kouichi Nishioka, Hitachi; Akira Kumagai, Hitachi; Masaaki Sano, Hitachi; Yutaka Sugita, Hitachi; Reiko Arai, Mito; Tetsuo Kobayashi, Kanagawa; Toshihiro Yoshida, Odawara; Yokuo Saitoh, Kanagawa; Yoshikazu Tsuji, Kanagawa, and Masaaki Hayashi, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 12, 1989, Ser. No. 420,478**
**Claims priority, application Japan, Oct. 14, 1988, 63-257199; May 17, 1989, 1-121549**
**Int. Cl.[5] C11B *5/147***
**U.S. Cl. 360—126** **13 Claims**



1. A thin film magnetic head comprising
a lower magnetic film formed on a substrate,
an upper magnetic film formed on said lower magnetic film, one end of said upper magnetic film contacting with one end of said lower magnetic film and the other end of said upper magnetic film being disposed on a magnetic gap on the side thereof opposite to the other end of said lower

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magnetic film with said magnetic gap disposed between two said other ends to form a magnetic circuit,

conductive films forming a coil having a predetermined winding number, passing between said lower magnetic film and said upper magnetic film and crossing said magnetic circuit, and

insulating films electrically insulating between said conductive films, between said conductive film and said lower magnetic film and between said conductive film and said upper magnetic film,

characterized in that at least one of said lower magnetic film and said upper magnetic film has a mixed crystal structure of face-centered cubic crystals and body-centered tetragonal crystals.

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**5,051,857**

## DISC CARTRIDGE HAVING A SLIDINGLY MOVABLE SHUTTER

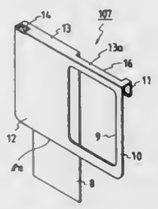
**Noboru Akiyama, Kyoto, Japan, assignor to Dai Nippon Insatsu K.K., Tokyo, Japan**

**Filed Jun. 28, 1989, Ser. No. 373,020**

**Claims priority, application Japan, Jun. 29, 1988, 63-85103[U]; Jun. 29, 1988, 63-85106[U]; Jun. 29, 1988, 63-85107[U]; Jun. 29, 1988, 63-85109[U]; Jun. 29, 1988, 63085108[U]**

Int. Cl.[5] G11B *23/03*

U.S. Cl. 360—133 **18 Claims**



1. A disc cartridge for accommodating a disc therein, which comprises:

a) a spindle hole into which a spindle is inserted to rotate the disc;

b) a head insertion hole into which a read and/or write head is inserted and which is located adjacent to the spindle hole; and

c) a shutter for closing and opening the spindle hole and the head insertion hole at the same time, which is slidingly moved along a guide portion formed at a front end of the cartridge, opposed to a recording and reproducing apparatus, which is urged by an elastic member in the direction where the spindle hole and the head insertion hole are closed, and which is formed in a manner that a single sheet of plate material is bent to provide a pair of closing plates opposite to each other, at least one of the two closing plates closing the spindle hole and the head insertion hole at the same time, a bent portion between the two closing plates forming a slide portion for engaging with the guide portion, the slide portion having an elongated arm projected from front portions of the closing plates in the longitudinal direction of the bent portion, one end of the elastic member being fixed to a rear end of the slide portion and an other end of the elastic member engaging the cartridge, a pair of guide groove engagement portions for engaging with at least one guide groove formed on the guide portion and being formed at a front end of the elongated arm and at a rear end of at least one closing plate, respectively, and the guide portion having a recess into which a drive pin is dropped when the drive pin completely opens the shutter and the guide groove for guiding the guide groove engagement portion of the elongated arm on both sides of the head insertion hole, the guide groove being formed at a position deeper that that of the bottom of the recess without crossing the recess.

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**5,051,858**

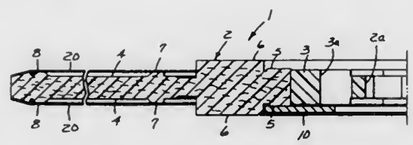
## RECORDING DISK HAVING IMPROVED CENTERING HUB AND MAGNETIC YOKE ARRANGEMENT

**Robert S. Jackson, Saint Paul, Minn., and Toshio Aizawa, Miyagi, Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn. and Sony Corporation, Tokyo, Japan**

**Filed Mar. 16, 1990, Ser. No. 494,446**

Int. Cl.[5] G11B *5/82*

U.S. Cl. 360—135 **4 Claims**



1. A recording disk comprising an annular main body having a datum surface located closer to the center than the recording surface; a hub located at the center of the main body and having a center hole; and a magnetic yoke plate, on which recording disk:

A. there is a yoke plate adherend to which the yoke plate is attached, located on one side of the main body radially closer to the center of the recording disk than the datum surface and adjacent to the hub;

B. there is an axial spacing between the yoke plate and the hub; and

C. the datum surface on said one side of the main body is spaced axially further from the cross section center line of the recording disk than the surface of the yoke plate which faces away from the yoke plate adherend.

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**5,051,859**

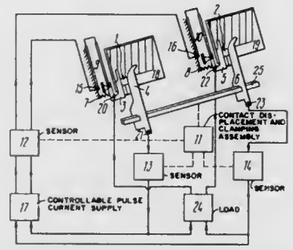
## CURRENT-LIMITING LOAD CUTOUT

**Igor M. Kruglyansky, ulitsa Marshala Sokolovskogo, 2, kv. 22, Moscow, U.S.S.R.**

**Filed Oct. 24, 1988, Ser. No. 283,487**

Int. Cl.[5] H02H *3/00*

U.S. Cl. 361—2 **4 Claims**




1. A current-limiting cutout comprising at least one contact pair (1,2) having a pair of contacts (3,4;5,6); an electrodynamic current limiter (9,10) having a terminal (15,16), one contact (3,5) being linked to said electrodynamic current limiter; biassing means for normally pressing the contacts of each contact pair into abutting contact against each other; a controllable pulse current supply (17) electrically connected to said electrodynamic current limiter (9,10); at least one emergency state sensor (12,13,14); a contact displacement and clamping assembly (11) kinematically linked to said at least one emergency state sensor (12,13,14), said contact displacement and clamping assembly (11) also being kinematically linked to the other contact (4,6) of said at least one contact pair (1,2); a device (18,19) for extinguishing arcs arising between contacts (3,4,5,6), each contact pair (1,2) having a pair of power terminals (20,21; 22,23) with one terminal (20,21) connected to said other contact (4,6) and the other power terminal (20,22) being connected to said one contact (3,5), said terminal (15,16) of said electrodynamic current limiter being connected to said controllable pulse current supply (17) by way of said at least one emergency state sensor (12,13,14).



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**5,051,860**

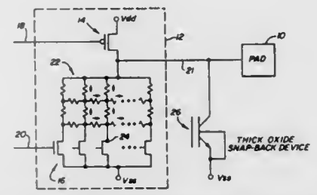
## ELECTRO-STATIC DISCHARGE PROTECTION CIRCUIT WITH BIMODAL RESISTANCE CHARACTERISTICS

**Kowk Fai V. Lee; Alan Lee, both of Irvine; Melvin L. Marmet, San Clemente, and Kenneth W. Ouyang, Huntington Beach, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.**

**Filed May 12, 1989, Ser. No. 351,670**

Int. Cl.[5] H02H *9/04*

U.S. Cl. 361—58 **10 Claims**




1. An improved complementary metal oxide semiconductor integrated circuit chip having a semiconductor substrate and a plurality of semiconductor devices formed thereon, and a plurality of input/output electrical contact pads for making electrical contact between external devices and respective ones of said plurality of semiconductor devices, the improvement comprising:

transistor means for providing a selective electrical coupling between at least one of said electrical contact pads and said respective ones of said plurality of semiconductor devices, wherein said transistor means is subject to breakdown conduction in response to externally generated voltage surges applied to said pad; and

resistive means, electrically coupled in series between said pad and said transistor means and integrally formed with said transistor means, for providing an extended bimodal resistive path between said path and said transistor means, said extended bimodal resistive path having a first relatively low resistance path during normal integrated circuit operation and a second higher resistance path during said breakdown conduction operation of said transistor means.

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**5,051,861**

## MULTIPLE CIRCUIT INTERRUPTER ADDRESS IDENTIFICATION SYSTEM

**Indrajit Purkayastha, Weatogue, Conn., and Clinton K. Martin, West Burlington, Iowa, assignors to General Electric Company, New York, N.Y.**

**Filed Jan. 9, 1990, Ser. No. 462,386**

Int. Cl.[5] H02H *3/04*

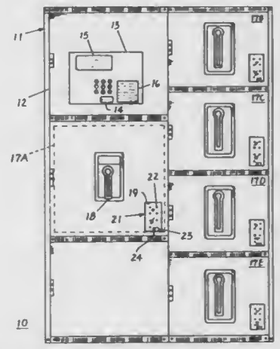
U.S. Cl. 361—96 **8 Claims**

1. Electric distribution equipment comprising in combination:

a field programming unit including data entry means, a display and a central microprocessor;

a plurality of circuit interrupters connected with said programming unit, each said circuit interrupter including circuit current sensing means, and separable contacts, each said circuit interrupter further including overcurrent and time delay data for interrupting circuit current through a multi-phase power distribution circuit; and

indicating means associated with each said circuit interrupter to indicate the occurrence of an overcurrent condition through said distribution circuit and to indicate which of said circuit interrupters is addressed by said central



microprocessor, said indicating means flashing ON and OFF at a first frequency upon occurrence of an overcurrent condition, said indicating means flashing ON and OFF at a second frequency when said circuit interrupter is addressed by said central microprocessor and said indicating means remaining ON when said distribution circuit is interrupted.

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**5,051,862**

## METALLIZED FLEXIBLE DIELECTRIC FILM CAPACITOR AND METHOD FOR MAKING SUCH A CAPACITOR

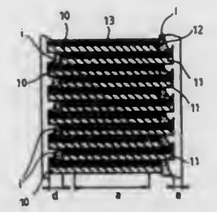
**Michel Pageaud, and Thierry Feral, both of Seurre, France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevole, France**

**Filed Feb. 28, 1991, Ser. No. 662,474**

**Claims priority, application France, Mar. 9, 1990, 90 03035**

Int. Cl.[5] H01G *1/13, 7/00*

U.S. Cl. 361—308 **10 Claims**



1. A stacked or coiled type of metallized flexible dielectric film capacitor, made by the direct superimposition of at least two metallized films, laterally offset with respect to one another so as to form alternating even-order and odd-order layers, designed to be connected to one another by lateral electrical connections, wherein one of the faces of the films is entirely metallized and wherein the gap between two same-order layers is filled with an insulator material covered by the lateral electrical connections.

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5,051,863

## SOLID DIELECTRIC CAPACITOR AND METHOD OF MANUFACTURE

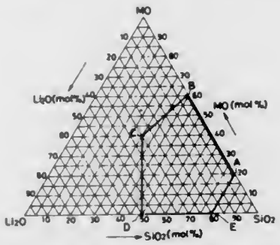
Hirokazu Chazono, Takasaki; Hiroshi Saito, Harunamachi; Mutsumi Honda; Hisamitsu Shizuno, both of Takasaki, and Hiroshi Kishi, Fujioka, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1990, Ser. No. 601,945

Claims priority, application Japan, Oct. 31, 1989, 1-283708; Oct. 31, 1989, 1-283709

Int. Cl.[5] H01G *4/10, 7/00;* C04B *35/46*

U.S. Cl. 361—321 11 Claims




1. A solid dielectric capacitor comprising a dielectric ceramic body and at least two electrodes in contact therewith, the dielectric ceramic body consisting essentially of:

(a) 100 parts by weight of a major ingredient expressed by the formula,

$$(Ba_{k-x}M_x)O_kTiO_2$$

where

M is at least either of magnesium and zinc;

K is a numeral in the range of 1.00 to 1.05; and

X is a numeral in the range of 0.01 to 0.10;

(b) from 0.01 to 3.00 parts by weight of a first additive ingredient of at least either of dichromium trioxide and aluminum oxide; and

(c) from 0.2 to 5.0 parts by weight of a second additive ingredient of at least one member selected from the group consisting of boric oxide, lithium oxide, silicon dioxide, barium oxide, strontium oxide, calcium oxide, magnesium oxide and zinc oxide.

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5,051,864

## SOLID DIELECTRIC CAPACITOR AND METHOD OF MANUFACTURE

Hirokazu Chazono, Takasaki; Hiroshi Saito, Harunamachi; Mutsumi Honda; Hisamitsu Shizuno, both of Takasaki, and Hiroshi Kishi, Fujioka, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1990, Ser. No. 602,105

Claims priority, application Japan, Oct. 31, 1989, 1-283710; Nov. 16, 1989, 1-298136

Int. Cl.[5] H01G *4/10, 7/00;* C04B *35/46*

U.S. Cl. 361—321 11 Claims

1. A solid dielectric capacitor comprising a dielectric ceramic body and at least two electrodes in contact therewith, the dielectric ceramic body consisting essentially of:

(a) 100 parts by weight of a major ingredient expressed by the formula,

$$(Ba_{k-x}M_x)O_kTiO_2$$

where

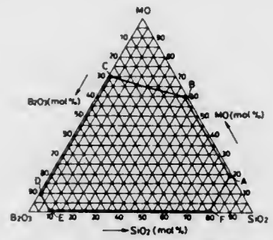
M is at least either of calcium and strontium;

K is a numeral in the range of 1.00 to 1.05; and

X is a numeral in the range of 0.01 to 0.05;

(b) from 0.01 to 3.00 parts by weight of a first additive ingredient of at least either of dichromium trioxide and aluminum oxide; and

(c) from 0.2 to 5.0 parts by weight of a second additive




ingredient of at least one member selected from the group consisting of boric oxide, lithium oxide, silicon dioxide, barium oxide, strontium oxide, calcium oxide, magnesium oxide and zinc oxide.

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5,051,865

## MULTI-LAYER SEMICONDUCTOR DEVICE

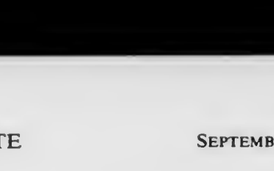
Takashi Kato, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaka, Japan

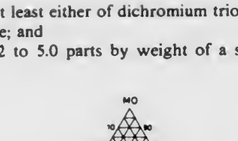
Continuation of Ser. No. 443,070, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 222,341, Jul. 20, 1988, abandoned, which is a continuation of Ser. No. 874,852, Jun. 16, 1986, abandoned. This application Mar. 11, 1991, Ser. No. 667,257

Claims priority, application Japan, Jun. 17, 1985, 60-131009

Int. Cl.[5] H01L *23/34*

U.S. Cl. 361—386 8 Claims




1. A multi-layer semiconductor device comprising:

a stacked wafer body having polished vertically sliced side surfaces, including:

a plurality of sets of two semiconductor wafers having an integrated element formed on each of said semiconductor wafers;

an insulating layer formed on said semiconductor wafer;

transistors directly formed on exposed semiconductor wafers in one of the polished vertically sliced side surfaces of said stacked wafer body for controlling the response of said integrated element on each of said semiconductor wafers; and

a plurality of heat sink plates formed between and contacting said sets of two semiconductor wafers, one back side of each of said semiconductor wafers being formed on and having its entire surface in contact with said heat sink plates, an element-formed side of each of said semiconductor wafers having said insulating layer formed thereon, an end of said heat sink plate of each of said sets of two semiconductor wafers being exposed and projecting from at least one of said surfaces of said stacked wafer body; and

an intermediate connecting circuit, connected to said stacked wafer body, for connecting circuits in each of said sets or two semiconductor wafers, said intermediate connecting circuit being provided on at least one side surface other than the surface at which the ends of said heat sink plates are exposed.



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5,051,866

## POWER CIRCUIT DEVICE FOR AN IMAGE-FORMING APPARATUS

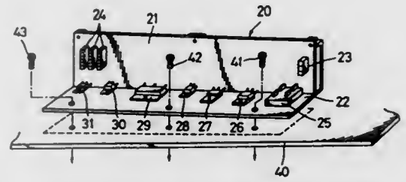
Haruya Osaka, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 27, 1989, Ser. No. 441,288

Claims priority, application Japan, Nov. 28, 1988, 63-154603

Int. Cl.[5] H05K *7/20;* G03B *27/52*

U.S. Cl. 361—388 4 Claims




1. In an image-forming apparatus including a housing body; a plurality of image-forming and processing mechanisms positioned within the housing body with elongated narrow spaces therebetween; and a power circuit device for providing power to the image-forming and processing mechanisms, the power circuit device including an input unit a plurality of heating emitting elements, an output unit, a printed circuit board having the input unit and the output unit mounted thereon, and a radiator plate, the improvement wherein:

said printed circuit board comprises an elongated, slender, flat board member;

said radiator plate comprises an elongated, slender, flat radiator member having a length substantially equal to the length of said board member and mounted with one longitudinal edge of said radiator member adjacent one longitudinal edge of said board member and with said flat radiator member extending at substantially a right angle to said flat board member to form an elongated, slender power circuit device positioned within one of the elongated, narrow spaces; and

said heat emitting elements are mounted on said radiator member for radiating heat emitted by the heat emitting elements,

whereby the power circuit device is provided in the housing body without enlarging the housing body substantially beyond the size required to house the image-forming and processing mechanisms.

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5,051,867

## TRANSFORMER ASSEMBLY WITH EXPOSED LAMINATIONS AND HOLLOW HOUSINGS

Peter H. Burgher, Captiva, Fla., and John Boomer, Howell, Mich., assignors to Marelco Power Systems, Inc., Howell, Mich.

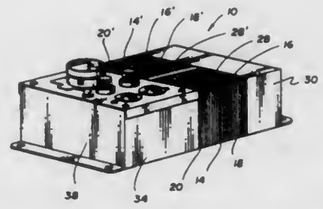
Continuation-in-part of Ser. No. 349,705, May 10, 1989, Pat. No. 4,956,745. This application Jun. 19, 1990, Ser. No. 540,198

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—383 25 Claims

1. A transformer assembly for providing a source of auxiliary electrical power independent of a main power supply, the transformer assembly comprising:

a plurality of transformers, each transformer having a core including a first side and a second side opposite thereto, and a coil including a first portion protruding outwardly from the first side of the core and a second portion protruding outwardly from the second side of the core, each core including lateral side edges extending between the first and second sides thereof for facilitating the removal of heat generated by the transformers;




a first hollow housing coupled, to the first side of at least one of the plurality of cores; and

a second hollow housing coupled to the second side of at least one of the plurality of cores.

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5,051,868

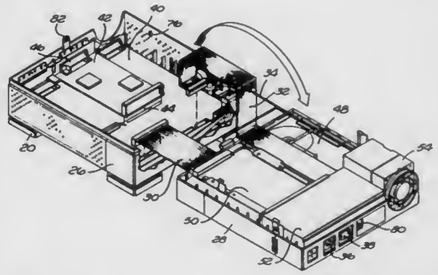
## COMPUTER CONSTRUCTION

Craig M. Leverault, Mountain View, and Peter C. D. Ta, Newark, bothof, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 25, 1990, Ser. No. 558,078

Int. Cl.[5] H05K *5/00;* G06F *1/00*

U.S. Cl. 361—395 24 Claims




1. A computer comprising:

first and second housing assemblies, each having an open face, for cooperatively defining a computer enclosure when said open faces are disposed adjacent each other;

a CPU board coupled within said first housing assembly so as to be accessible from the open face of said first housing assembly;

a power supply coupled within said second housing assembly;

at least one device peripheral to said CPU board supported on a rigid frame also coupled within said second housing assembly adjacent said power supply when viewed through said open face of said second housing assembly;

coupling means operatively connected to said first and second housing assemblies for releasably coupling said first and second housing assemblies together when said open faces are disposed adjacent each other, said coupling means being constructed to allow said second housing assembly to separate from said first housing assembly when said coupling means are released, separation of said housing assemblies further allowing said housings to be positioned such that said CPU board, said power supply and said at least one device peripheral to said CPU board are exposed;

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flexible electrical connection means electrically intercoupling said CPU board, said power supply and said at least one device peripheral to said CPU board, said flexible electrical connection means being constructed such that said CPU board, power supply and device peripheral to said CPU board can be trouble shooted and serviced when said housing assemblies are separated and said CPU board, power supply and device peripheral to said CPU board are exposed; and,

at least one of said housing assemblies providing access for electrical connectors for making external electrical connection to said computer.

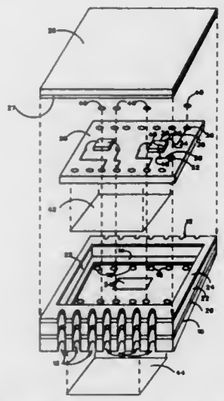
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**5,051,869**

## ADVANCED CO-FIRED MULTICHIP/HYBRID PACKAGE

**Harold Goldfarb, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed May 10, 1990, Ser. No. 521,783**
**Int. Cl.[5] H05K** *5/02, 5/06, 7/02*
**U.S. Cl. 361—399** **6 Claims**



1. An article of manufacture, comprising, in combination:

(a) a package, comprising:

(1) a base having a perimeter and a plurality of electrically conductive castellations around the perimeter;

(2) a plurality of traces, each trace extending on an upper surface of the base to a pad on the upper surface of the base;

(3) a wall extending upward from the perimeter of the base over the traces, the base and the wall forming a cavity, the pads remaining exposed, and an upper surface of the wall being adapted to receive a lid; and

(b) a board of electronic components, the board being containing within the cavity, the board having a plurality of vias extending therethrough, each via being in registration with a respective pad, and each via being electrically and mechanically connected to its respective pad by solder.

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**5,051,870**

## ELECTRONIC SOCKET ATTACHMENT METHOD AND IDENTIFICATION SYSTEM

**John A. Companion, 20 A Curtis La., Hampton, Va. 23669**

**Filed Jun. 11, 1990, Ser. No. 536,499**
**Int. Cl.[5] H01R** *9/00;* **H05K** *3/30*
**U.S. Cl. 361—405** **11 Claims**

1. An identification label system for a combination integrated circuit, integrated circuit socket and a prototype circuit board comprising:

an adhesively backed top sticker having a length and width substantially equal to that of the top surface of a multi-pin integrated circuit;

said top sticker being provided with numerical indicia thereon equal in number to and spaced at intervals to correspond to the number of contact pins leading from the integrated circuit;

color coded indicia on said adhesively backed top sticker to indicate at a glance the number of contact pins provided in the integrated circuit;

an integrated circuit socket having a top surface and a bottom surface and including a number of open sockets on said top surface for receiving the contact pins of said integrated circuit and leading to an equal number of depending contact pins on said bottom surface and in electrical connection with said open sockets;

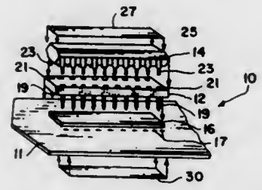
a prototype circuit board receiving said contact pins of said integrated circuit socket therethrough;

a second adhesively backed sticker having a length and width substantially equal to that of the spacing between said contact pins extending from said integrated circuit socket;

said second sticker being provided with numerical indicia thereon arranged in mirror image position relative to that of the indicia on said top sticker and secured to said circuit board between the pins of said integrated circuit socket extending through said circuit board; and

a circuit sticker means formed of a doubled backed adhesive tape securing said integrated circuit socket and said integrated electronic circuit to said circuit board.

3. A method of locating and identifying individual integrated circuits and their pins and for securing the attachment sockets therefor to an electronic circuit board, comprising:



providing a printed circuit board having a plurality of spaced openings therein to receive the contact pins from one or more integrated circuit sockets,

providing at least one integrated circuit socket unit having a number of open sockets on the top surface thereof and an equal number of depending contact pins in electrical connection with the open sockets and depending from the bottom surface of the integrated circuit socket unit,

providing a double backed adhesive tape strip and securing one side thereof to the bottom surface of the at least one integrated circuit socket unit and between the depending pins thereon,

positioning the at least one integrated circuit socket unit onto the printed circuit board with the depending contact pins of the socket unit extending through the printed circuit board,

adhesively bonding the other surface of the double backed adhesive tape strip to the top of the printed circuit board to thereby bond the integrated circuit socket unit to the printed circuit board,

providing an integrated electronic circuit having a substantially flat top surface and a number of depending contact pins extending from the bottom surface thereof equal in number to and spaced to connect with the open sockets provided in the top surface of the at least one integrated circuit socket unit,

inserting the depending contact pins from the integrated electronic circuit into the open sockets of the integrated circuit socket unit to provide electrical contact therebetween,



providing a top identification label having substantially the same length and width dimensions as the top surface of each integrated circuit, the top identifying label having numerical and color coded indicia on one surface thereof to identify the number of depending contact pins extending from the bottom of the integrated circuit and having an adhesive backing on the other surface thereof,

adhesively securing the adhesively backed top identification label to the substantially flat top surface of the integrated circuit,

providing, and adhesively applying, a substantially mirror image of the top identification label to the underside of the printed circuit board between the depending contact pins extending from the integrated circuit socket and through the printed circuit board to thereby provide visual indication of the number of contact pins on the integrated circuit positioned on the printed circuit board.

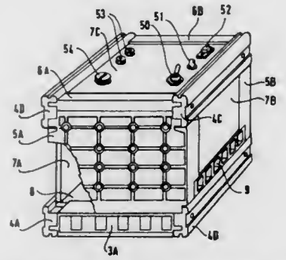
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**5,051,871**

## MODULAR FUNCTIONAL BLOCK FOR MOUNTING AT LEAST ONE CIRCUIT CARD ON A SUPPORT, AND COMPONENT PARTS THEREOF

**Jean-Paul Heng, Lyons; Marcel Jusseau, Villeurbanne; Jean-Marc Planel, Villeurbanne, and François Boiston, Villeurbanne, all of France, assignors to Cgee Alsthom, Levallois-Perret, France**

**Filed Jun. 28, 1984, Ser. No. 625,478**
**Claims priority, application France, Jun. 30, 1983, 83 10893**
**Int. Cl.[5] H05K** *7/14*
**U.S. Cl. 361—415** **23 Claims**



1. A modular functional block mounting at least one circuit card (8), said functional block comprising: two identical fixing bases (34), each said base being approximately rectangular in shape and having an enlongated upper face (11), aligned first positioning snap-fixing means (12*a*–12*e*) on said upper face, each said base further having two end faces (14*a*, 14*b*) symmetrically provided with respective second positioning snap-fixing means constituted by tongues (15*a*, 15*b*) and parallel cylindrical elements (16*a*, 16*b*) for retaining strips (4A, 4B); and two identical retaining strips (4A, 4B), each retaining strip having an internal face and third positioning snap-fixing means constituted by cylindrical elements (18*a*, 18*b*) and retaining grooves (20*a*, 20*b*) on said internal face, said third positioning snap-fixing means being complementary to said second positioning snap-fixing means and snap-engaged therewith, one of said retaining grooves engaging said second positioning snap-fixing means and the other retaining groove retaining one of two opposite edges of said circuit card (8) mounted in said functional block between the said two retaining strips (4A, 4B).

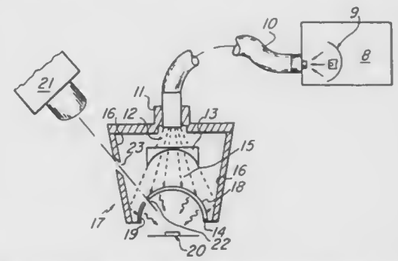
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**5,051,872**

## HEMISPHERICAL NON-GLARE ILLUMINATOR

**Charles H. Anderson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 221,159, Jul. 19, 1988, abandoned. This application May 15, 1990, Ser. No. 524,684**
**Int. Cl.[5] F21V** *7/04*
**U.S. Cl. 362—32** **26 Claims**



1. A diffuser assembly for shadowless illumination of an object comprising:

a translucent diffuser having a substantially hemispherical, concave surface;

a diverging lens spaced from, shaping and directing light onto said diffuser

a light source positioned to direct light rays through said diverging lens and into the optical medium of said diffuser;

wherein substantially all of the light rays incident at the center of the curvature of the concave surface pass through the translucent diffuser.

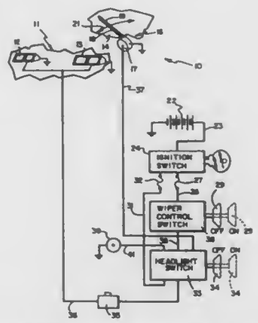
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**5,051,873**

## COMBINED HEADLIGHT AND WINDSHIELD WIPER CONTROL

**Lewis L. Ruter, 919 W. Broadway, Minneapolis, Minn. 55411**

**Filed Nov. 6, 1990, Ser. No. 615,355**
**Int. Cl.[5] B60Q** *1/00*
**U.S. Cl. 362—61** **23 Claims**



1. A control apparatus for connecting a power source to vehicle headlights and to motor means to operate the windshield wipers of the vehicle comprising: a first switch means operable to control the operation of the motor means to operate the windshield wipers, first conductor means connecting the first switch means to the power source, a second switch means operable to selectively turn the headlights ON and OFF, second conductor means connecting the first and second switch means, third conductor means connecting the second switch means to the power source, fourth conductor means connecting the second switch means to the motor means to operate the windshield wipers, fifth conductor means connect-

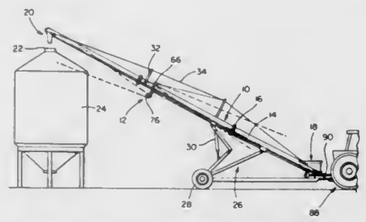
VOL 1130 ISS 4 SE 24 1991 UMI



ing the second switch means to the headlights, said second switch means including a first switch moveable between open and closed positions to selectively connect and disconnect the power source to the headlights, a second switch moveable between open and closed positions to selectively connect and disconnect the power source to the motor means to operate the windshield wipers, and actuator means movable to a first position to concurrently close both the first and second switches whereby the windshield wipers are operated during the time that the headlights are ON when the first switch means is ON.

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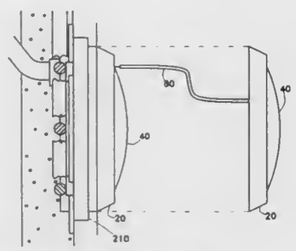
**5,051,874**
**LIGHTING SYSTEM FOR GRAIN AUGER**
**Mitchell E. Guss, RR 1, Box 120, Willow City, N. Dak. 58384**
**Filed Aug. 3, 1990, Ser. No. 562,279**
**Int. Cl.[5] F21V** *33/00*
**U.S. Cl. 362—89** **13 Claims**



1. A lighting system for a grain auger used in loading a grain bin by transferring grain loaded into the auger at a hopper end adjacent ground level to a discharge elevated end associated with an open area of a grain bin to enable the grain auger to be used at night by illuminating both ends of the grain auger, said lighting system comprising light means positioned intermediate the ends of the grain auger, support means stationarily mounting the light means on said auger intermediate the ends thereof, said light means including a light unit directed toward and illuminating the hopper end of the grain auger and a light unit directed toward and illuminating the discharge end of the grain auger.

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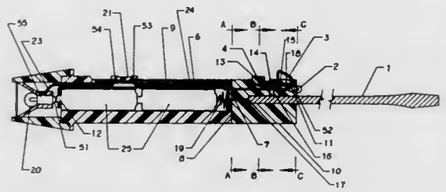
**5,051,875**
**UNDERWATER POOL LIGHT**
**Bruce R. Johnson, Sebastopol, Calif., assignor to KDI American Products, Inc., Moorpark, Calif.**
**Filed Jun. 1, 1990, Ser. No. 531,578**
**Int. Cl.[5] F21V** *33/00, 25/10, 29/00*
**U.S. Cl. 362—101** **10 Claims**



1. An underwater light comprising:
a mounting assembly that fits flush with a wall of a water pool for attaching the underwater light without having to make a niche in the wall;
a housing having front and rear faces and removably attached by its rear face to the mounting assembly, to facilitate repair and maintenance of the light, and having a generally cylindrical internal wall that defines, in part, a light source cavity;
a one-piece reflector attached to the housing and used to direct light out from the housing;
a light source placed in front of the one-piece reflector in the housing;
a temperature sensor placed in the housing next to the light source to detect overheating;
a lens sealably attached to the front face of the housing and in front of the light source for directing the light and sealing the light source cavity; and
means for cooling the light source by allowing the liquid in the pool to circulate behind the light source cavity through openings in the housing, and around the circumference of the housing, which is spaced from the pool wall by the mounting assembly;
and wherein the housing contains a power cord storage area surrounding the generally cylindrical internal wall that defines the light source cavity, to facilitate removal of the housing for repair and maintenance at a remote location without disconnection of the power cord, and without having to provide a wall niche for cord storage.

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**5,051,876**
**COMPOUND HAND TOOL WITH A SCREWDRIVER**
**Keith Norman, 2220 Pierce St., Flint, Mich. 48503**
**Filed Aug. 9, 1990, Ser. No. 565,618**
**Int. Cl.[5] F21V** *33/00;* **B25B** *23/18*
**U.S. Cl. 362—120** **4 Claims**

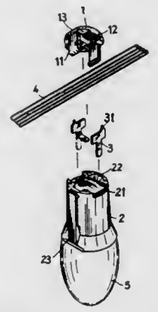


1. A compound hand tool suitable for attachment to a flashlight comprising:
a) a cylinderical block of nonconductive material, shaped and sized so as to be able to be held in one hand by a person, which comprises;
b) a means of mechanically fastening one end of said cylinderical block to the nonilluminating end of a suitable flashlight;
c) a metal shaft fastened into said nonconductive material block so said shaft projects from the center of the other end of said cylinderical block at right angles to said cylinder end with the other end of said metal shaft shaped into a useful tool selected from the group consisting of a screwdriver, a nutdriver, an awl, and a socket holder;
d) an illuminating lamp which illuminates the end of said metal shaft which is shaped into said useful tool;
e) a conductive strip;
f) a lamp receptacle to which said illuminating lamp is detachably mounted and to which said conductive strip is permanently affixed so as to be in mechanical and electrical contact with the side of said receptacle and to project outwards from said cylinderical block;
g) a switch which will turn said illuminating lamp off and on;
h) a means of electrically connecting the center terminal of said illuminating lamp to one terminal of the power supply in said flashlight;
i) a means of electrically connecting said contact strip, which is electrically connected to said lamp receptacle which in turn is electrically connected to the side terminal of said illuminating lamp, to one terminal of said switch, and;
j) a means of electrically connecting the other terminal of said switch to said metal shaft and to a second terminal on said power supply;
whereby when said device is attached to a suitable flashlight, said device functions as a flashlight, a useful tool, a light to illuminate the work, and an electrical circuit continuity tester.



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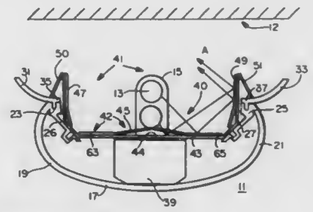
**5,051,877**
**MINIATURE LIGHT SET**
**Nan W. Liao, No. 18, Tzu Yu Road, Hsinchu, Taiwan**
**Filed Nov. 5, 1990, Ser. No. 609,154**
**Int. Cl.[5] F21V** *21/00*
**U.S. Cl. 362—249** **3 Claims**



1. An improved miniature light set, comprising:
base member defined by housing having a substantially cylindrical shaped outer wall and having an open first end for receiving a light bulb in an interior space defined by said outer wall, said base member first end having a substantially circular cross-sectional contour truncated by a pair of flat surface portions substantially symmetrically formed on opposing sides thereof, whereby said base member can be transported and assembled automatic equipment, said base member having an opposing closed second end having a recess formed therein, said second end further having a pair of slotted through opening formed within said recess and in open communication with said interior space for receiving a respective pair of electrical conductors, said second end having an opposing pair of apertures formed within said recess and disposed in a direction substantially perpendicular to said slotted through openings;
a seat defined by a substantially circular disk shaped member having an pair of flat surface portions substantially symmetrically disposed on opposing edges of said disk shaped member, whereby said seat can be transported and assembled by automatic equipment, said seat including (1) a pair of hooks depending from a bottom surface of said disk shaped member for respective engagement within said pair of apertures of said base member, and (2) a plurality of arcuate grooves formed on said bottom surface of said disk shaped member for engaging a plurality of wires within said recess of said base member; and,
each of said pair of electrical conductors being formed with a wire piercing peak disposed in a predetermined location for making electrical contact with a selected one of said plurality of wires.

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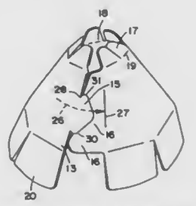
**5,051,878**
**LUMINAIRE HAVING A LENSED REFLECTOR SYSTEM FOR IMPROVED LIGHT DISTRIBUTION CONTROL**
**Peter Y. Y. Ngai, Danville, Calif., assignor to Peerless Lighting Corporation, Berkeley, Calif.**
**Continuation-in-part of Ser. No. 260,404, Oct. 20, 1988, abandoned. This application Jul. 28, 1989, Ser. No. 387,127**
**Int. Cl.[5] F21V** *7/00*
**U.S. Cl. 362—299** **29 Claims**



1. A luminaire comprising
a housing,
a source of light within said housing, and
a lensed reflector system disposed in a reflector plane within said housing, said lensed reflector system being situated proximate said light source for reflecting source light therefrom at angles within a range of light reflection angles above said reflector plane, and being comprised of a front lens portion formed to produce specular reflection therefrom within at least one specular beam of reflected light within said range of light reflection angles, and a reflector substrate which governs the reflection characteristics of said lensed reflector system over the remaining reflection angles within said range of light reflection angles.

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**5,051,879**
**BLANK FOR ASSEMBLY INTO DECORATIVE ARTICLE**
**Hilary D. Bunger, deceased, late of 40 Little Fox La., Weston, Conn. 06880 by Gregory J. Bunger**
**Filed Dec. 1, 1989, Ser. No. 444,395**
**Int. Cl.[5] F21V** *1/00*
**U.S. Cl. 362—351** **8 Claims**

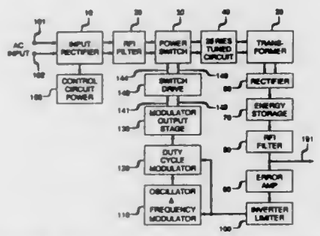


1. A substantially flat blank for assembly into a decorative article, comprising:
a sheet formed from flexible resilient material, said sheet being in a general shape of a major segment of a circle having a center, a peripheral portion extending generally around the circumference of the circle, and opposed end portions spaced from each other where said segment is less than a full circle, said major segment also being formed with a central aperture extending from the center of the circle outwardly toward said peripheral portion,
locking means formed at said opposed end portions, so that when said opposed end portions are brought into juxtaposed relationship, said flexible blank bends to form a continuous, generally frusto-conical decorative article, and
a plurality of flexible fingers formed in said major segment

and extending into said centrally located aperture and adapted for supportably engaging a light bulb therein.

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**5,051,880**
**MIXED MODE REGULATION CONTROLLER FOR A RESONANT POWER CONVERTER**
**Charles E. Harm, Dallas, and Kenneth J. Timm, Rockwall, both of Tex., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**
**Filed Dec. 29, 1989, Ser. No. 459,038**
**Int. Cl.[5] H02M** *7/517*
**U.S. Cl. 363—49** **3 Claims**




2. A resonant power converter, comprising:
an input and an output;
a power switch for coupling energy between the input and the output;
a sensing circuit for quantifying a deviation of a voltage at the output from a regulation value and generating an error signal;
drive circuitry for driving the power switch, including;
a frequency modulator generating a periodic waveform responsive to the error signal of the sensing circuit;
a duty cycle modulator responsive to the error signal of the sensing circuit to generate a signal level and to the periodic waveform of the frequency modulator;
means for combining the outputs of the frequency modulator and the duty cycle modulator to generate a power switch drive signal which is simultaneously frequency and duty cycle modulated by adjusting the signal level relative to the periodic waveform, and
control circuitry for establishing a frequency of operation and a specified duty cycle at start up of the resonant power converter including a limiter circuit operative for inverting the error signal output of the sensing circuit.

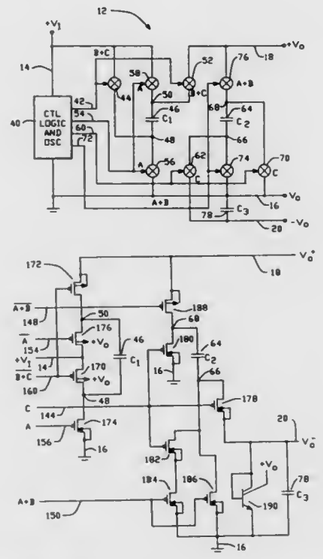
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**5,051,881**
**VOLTAGE MULTIPLIER**
**Barry W. Herold, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.**
**Filed Jul. 5, 1990, Ser. No. 548,479**
**Int. Cl.[5] H02M** *3/107*
**U.S. Cl. 363—60** **7 Claims**

1. A voltage multiplier, comprising:
an input for receiving an input voltage potential from a voltage source;
first switching means, coupled to the input, for selectively coupling the input voltage potential to an energy storage means in response to a first control means coupled to the voltage source;
second switching means, coupled to the first energy storage means, for selectively serially coupling the voltage source and the energy storage means to provide an intermediate voltage potential, and for selectively coupling the intermediate voltage potential to a second energy storage means in response to a second control means coupled to the intermediate voltage potential, the second energy storage means having an output voltage potential greater than the input voltage potential.

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**5,051,882**
**THREE RESERVOIR CAPACITOR CHARGE PUMP CIRCUIT**
**Michael A. Grimm, Boulder Creek, and Paul Hildebrant, San Jose, both of Calif., assignors to Teledyne Industries, Mountain View, Calif.**
**Continuation of Ser. No. 302,429, Jan. 27, 1989, Pat. No. 4,888,677. This application Aug. 15, 1989, Ser. No. 394,223**
**The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.**
**Int. Cl.[5] H02M** *7/25*
**U.S. Cl. 363—60** **22 Claims**



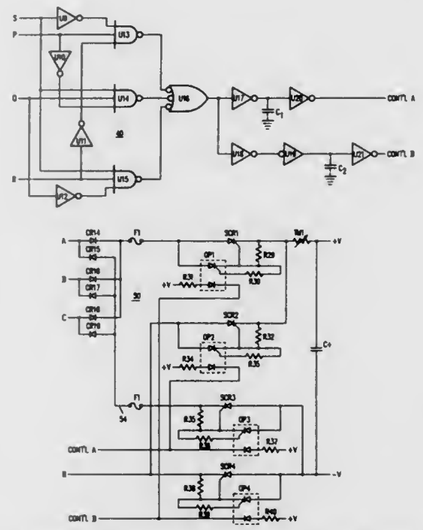

1. A switched capacitor network for producing a plurality of output potentials from an input potential, said network comprising:
a) switching means, responsive to a control signal, for conductively interconnecting a plurality of charge reservoir nodes, an input node, a reference node and first and second output nodes in a plurality of charge transfer configurations including:



a first configuration wherein a first charge reservoir node is connected to said input node and a second charge reservoir node is connected to said reference node, whereby a first charge reservoir capacitor connectable between said first and second charge reservoir nodes accumulates charge from said input node;
a second configuration wherein said second charge reservoir node is connected to said input node and said first charge reservoir node is connected to said first output node and a third charge reservoir node is connected to said first output node and a fourth charge reservoir node is connected to said reference node, whereby said first charge reservoir capacitor transfers charge to a second charge reservoir capacitor connectable between said third and fourth charge reservoir nodes; and
a third configuration wherein said third charge reservoir node is connected to said reference node and said fourth charge reservoir node is connected to said second output node and a fifth charge reservoir node is connected to said second output node and a sixth charge reservoir node is connected to said reference node, whereby said second charge reservoir capacitor transfers charge to a third charge reservoir capacitor connectable between said fifth and sixth charge reservoir nodes; and
b) control means for controlling said switching means by providing said control signal to select said first, second or third configuration.

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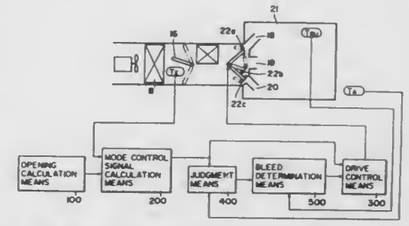
**5,051,883**
**METHOD AND AN APPARATUS FOR FULL WAVE RECTIFICATION OF A THREE-PHASE SIGNAL OPERATING IN A WYE CONFIGURATION**
**Chin Y. Cheng, 10451 Scenic Cir., Cupertino, Calif. 95014**
**Filed Jul. 25, 1990, Ser. No. 557,908**
**Int. Cl.[5] H02M** *7/145*
**U.S. Cl. 363—89** **9 Claims**




1. A full wave rectifier for use with a multi-phase signal each phase being an alternating current signal with respect to a neutral, said rectifier comprising:
means for receiving said neutral and said multi-phase signal and for generating a first control signal oscillating between a first voltage and a second voltage and a second control signal oscillating between said first voltage and said second voltage out of phase with respect to the first control signal, in response thereto; and
means for rectifying each phase of said multi-phase signal based upon said first and second control signals.

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**5,051,884**
**CONTROL APPARATUS FOR AUTOMOBILE AIR-CONDITIONERS**
**Katsumi Iida, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan**
**Filed Apr. 28, 1989, Ser. No. 344,394**
**Claims priority, application Japan, May 16, 1988, 63-118883**
**Int. Cl.[5] B60H** *1/00*
**U.S. Cl. 364—148** **3 Claims**




1. An apparatus for controlling the operation of an automobile air-conditioner, comprising:
(a) an opening calculation means for calculating a target opening of an air-mix door according to a thermal load in a vehicle compartment;
(b) a mode control signal calculation means for calculating a mode control signal based on said target opening and at least one of a temperature of an evaporator and a temperature of air passing through said evaporator, thereby determining relative quantities of air to be discharged from a vent outlet and air to be discharged from a heat outlet;
(c) a judgment means for making a determination as to whether said mode control signal corresponds to a signal for setting up a heat mode and whether the temperature outside a vehicle compartment is lower than a predetermined value and hence a defrosting is needed;
(d) a bleed determination means for determining the amount of air to be bled to a defrost outlet according to the temperature of an upper part of the vehicle compartment if the determination by said judgment means indicates that defrosting is necessary; and
(e) a drive control means for controlling at least one mode door based on a result of a calculation by said mode control signal calculation means and a result of the determination of said bleed determination means.

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**5,051,885**
**DATA PROCESSING SYSTEM FOR CONCURRENT DISPATCH OF INSTRUCTIONS TO MULTIPLE FUNCTIONAL UNITS**
**John S. Yates, Jr.; Stephen J. Ciavaglia, both of Nashua, N.H.; John Manton, Marlboro, Mass.; Michael Kahaiyan, East Bridgewater, Mass.; Richard G. Bahr, Cambridge, Mass., and Barry J. Flahive, Westford, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.**
**Filed Oct. 7, 1988, Ser. No. 255,105**
**Int. Cl.[5] G06F** *9/28, 9/302, 12/04, 15/16*
**U.S. Cl. 364—200** **10 Claims**

1. Apparatus for concurrent dispatch of instructions to multiple functional units, said apparatus comprising:
means for providing an instruction word that includes at least one portion selected from the group consisting of integer instructions and floating point instructions;
an instruction, cache for receiving said instruction word

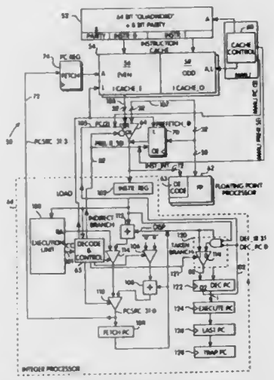
VOL 1130 ISS 4 SE 24 1991 UMI



including an integer instruction area for delivering an instruction directly to an integer processor and a floating point instruction area for delivering an instruction directly to a floating point processor;

an integer processor for receiving an integer instruction from said instruction cache, and for processing data provided to said integer processor; and

a floating point processor for receiving a floating point instruction from said instruction cache, said floating point instruction being received simultaneously with the receipt of said integer instruction by said integer processor, for processing data provided to said floating point processor,



wherein said means for providing includes:

a program counter register with a high order portion that indexes cache lines within said instruction cache, and a low order portion that identifies an appropriate starting point for each instruction within each cache line; and

means for incrementing said high order portion of said program counter of said cache, said means for incrementing being ignored by said high order portion of said program counter upon a transfer of an instruction from said prefetch register to a receiving processor.

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5,051,886

## SYSTEM FOR CHARACTER STREAM SEARCH USING FINITE STATE AUTOMATON TECHNIQUE

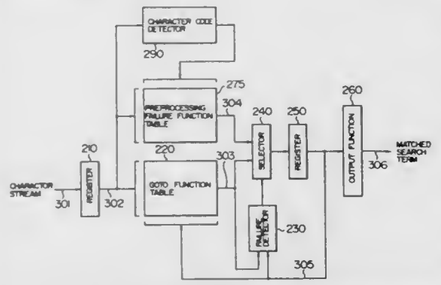
**Hisamitsu Kawaguchi, Hachioji; Kanji Kato; Hiromichi Fujisawa, both of Tokorozawa; Masaaki Fujinawa, Tokyo, and Atsushi Hatakeyama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 13, 1988, Ser. No. 205,923**

**Claims priority, application Japan, Jun. 15, 1987, 62-147041**

**Int. Cl.[5] G06F** *7/22, 7/06*

**U.S. Cl. 364—200** **14 Claims**



1. A character stream search apparatus using a finite state automaton for determining at a time whether or not a plurality of character streams functioning as search objects exist in a search character stream which undergoes a search operation and which comprises a plurality of characters expressed in codes, said apparatus including:

character input means for inputting a search character from among a plurality of search characters which are to undergo a search operation and for storing and outputting said character as a search character which is to undergo the search operation;

goto function table store means for storing a goto function table so as to repeatedly effect a failure processing up to a maximum number of times corresponding to a predetermined count, said failure processing effecting, at a collation between the search character which is to undergo the search operation and a search object character code, a collation between the search character which is to undergo the search operation and the search object character code in a state predetermined for a current state, said goto function table including a state number of a transition destination related to a current state number and said search object character code;

means for storing numbers of states effected by an occurrence of a failure for storing a state number for which said failure processing is to be achieved in correspondence with the current state number;

failure detect means for detecting an unmatching condition at a collation between the search character and the search object character code based on a transition state number and a current state number outputted from said goto function table store means and for causing a new input operation of said character input means to enter a wait state;

transition destination select means for receiving as inputs to said transition destination select means an output from said goto function table store means and an output from said means for storing numbers of states effected by an occurrence of a failure so as to select and to output one of said outputs depending on an output from said failure detect means;

read means for temporarily storing an output from said transition destination select means so as to output said output of said transition destination select means as a current state number and for reading out a transition state number from said goto function table store means based on said current state number and said search object character code; and

character stream identify means for outputting, in a case where a state number outputted from said read means is a transition state number associated with a final character code of the search character stream, an identification number of the search character stream.

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5,051,887

## MAINTAINING DUPLEX-PAIRED STORAGE DEVICES DURING GAP PROCESSING USING OF A DUAL COPY FUNCTION

**Blaine H. Berger, and Bret P. Smith, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Continuation of Ser. No. 89,151, Aug. 25, 1987, abandoned. This application Nov. 19, 1990, Ser. No. 614,983**

**Int. Cl.[5] G06F** *13/00, 12/00, 12/16, 11/14*

**U.S. Cl. 364—200** **7 Claims**

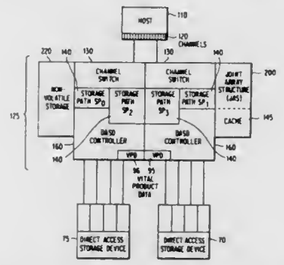
1. In a data processing system of the type comprising a host computer having a plurality of input/output channels, a direct access storage device controller connected to input/output channels of said host computer, and two strings of direct access storage devices connected to said direct access storage device controller, said direct access storage device controller having a memory and channel switches and storage paths, said channel switches and storage paths establishing paths between said connected input/output channels and said direct access storage devices, each direct access storage device in each of said strings having rotating recording media characterized by having a plurality of tracks on which are recorded a plurality of records, each record containing a count field and a plurality of additional fields, said fields being separated by small gaps, each record being identified by a cell number which designates an exact location of the count field for that record on a track, said direct access storage devices further including a head positioned by an actuator responsive to said direct access storage device controller for reading and writing data of said records in response to requests from said host computer, the improvement in said direct access storage device control whereby duplex-paired storage devices are maintained during gap processing by a dual copy function performed by said direct access storage device controller transparently to said host computer, said direct access storage device further comprising:

means for selecting two of said direct access storage devices as said duplex-paired storage devices, a first one of said direct access storage devices being designated as a primary storage device and a second one of said direct access storage devices being designated as a secondary storage device, said primary and secondary storage devices being physically separated but substantially identical in configuration and type;

means for synchronizing said secondary storage device with said primary storage device;

a plurality of bits of each of said cell numbers of records on said primary storage device being designated to indicate a status of a corresponding one of said count field and said





plurality of fields which comprise each of said records as modified or unmodified as a result of a write operation to a record on said primary storage device;

means for setting the corresponding one of said plurality of bits to indicate a modified status when one of said count field or said plurality of fields which comprise a record is modified by a write operation to said record on said primary storage device;

means for storing modified records in said memory;

said head accessing the records on said primary storage device in sequence and means responsive to records accessed by said head for searching for a count field for each of said records;

when a count field for a record is encountered by said means for searching, said means for searching further saving in said memory the cell number from the count field for the record;

means for identifying by cell number saved in memory each record on said primary storage device containing a field that has been modified as indicated by one of said plurality of bits having been set, said step of identifying being performed during time periods corresponding to said gaps between fields; and

means for transferring from said memory to said secondary storage device only those fields updated on said primary storage device in said identifying step thereby maintaining on said secondary storage device an exact duplicate of records stored on said first storage device without degrading the performance of said data processing system.

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5,051,888

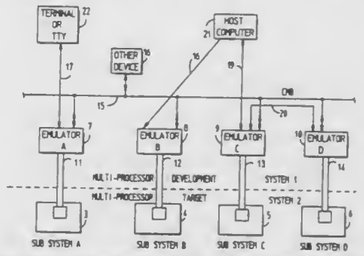
## DATA PROCESSING SYSTEMS FOR COORDINATING MEASUREMENT ACTIVITY UPON A PLURALITY OF EMULATORS

**John D. Hansen; Arnold S. Berger; Lewis S. Kootstra; Beth V. Jones; Stan W. Bowlin, and William Fleck, all of Colorado Springs, Colo., assignors to Hewlett Packard Company**

**Filed Dec. 30, 1988, Ser. No. 292,590**

**Int. Cl.[5] G06F** *9/06, 15/16, 9/455, 13/12*

**U.S. Cl. 364—200** **2 Claims**



1. A method of simultaneously breaking a plurality of emulators running user code, the method performed by an electronic device and comprising the steps of:

(a) connecting a Synchronization Signal Terminal on each emulator to a common conductor;

(b) connecting at least one pull-up resistance between the common conductor and a voltage $V_f$ representing a logically true condition;

(c) instructing each emulator to allow its Synchronization Signal Terminal to float to the voltage $V_f$;

(d) running user code on each emulator in response to the presence of the voltage $V_f$ at the Synchronization Signal Terminals of the emulators;

(e) detecting within one of the emulators a condition preselected to cause a break;

(f) within the emulator detecting the condition preselected to cause a break, grounding that emulator's Synchronization Signal Terminal until such time as that emulator is instructed to resume running use code, thereby forcing false the logical value of the Synchronization Signal Terminals at each of the remaining emulators;

(g) detecting, within each remaining emulator, the logically false value of its Synchronization Signal Terminal; and

(h) initiating a break in each of the remaining emulators in response to step (g).

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5,051,889

## PAGE INTERLEAVED MEMORY ACCESS

**Michael G. Fung, San Jose, and Justin Wang, Saratoga, both of Calif., assignors to Chips and Technologies, Incorporated, San Jose, Calif.**

**Continuation of Ser. No. 112,863, Oct. 23, 1987, Pat. No. 4,924,375. This application Mar. 7, 1990, Ser. No. 490,023**

**Int. Cl.[5] G06F** *12/06*

**U.S. Cl. 364—200** **2 Claims**

1. A memory controller for providing address and timing signals to at least two banks of DRAM memory chips, each of said DRAM memory chips being one of a predetermined, limited range of sizes, comprising:

an input address bus including a plurality of bit lines forming a bank address, column address, a row address and at least one page select address bit input connected at a less significant bit than the least significant bit of said row address for a smallest one of said DRAM chip sizes;

a first last row register having inputs coupled to said row address bit lines of said input address bus;

a second last row register having inputs coupled to said row address bit lines of said address bus;

first comparator means having a first input coupled to said

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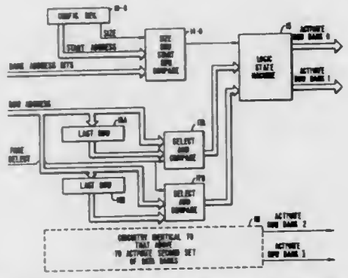


row address bit lines of said input address bus and a second input coupled to an output of said first register;

second comparator means having a first input coupled to said row address bit liens of said input address and a second input coupled to an output of said second register;

a page select address bit line coupled between said page select bit input and an enabling input of each of said first and second comparator means, such that only one of said comparator means is activated in response to a bit on said page select address bit line;

logic state machine means having an input coupled to comparator outputs of said first and second comparator means for producing a first timing cycle with a row address pulse and then a column address pulse responsive to a first state of said comparator outputs and for producing a second timing cycle with only a column address pulse in response to a second state of said comparator outputs when a current row address matches a last row address, said second timing cycle being shorter in duration than said first timing cycle, said timing cycles being provided to a first one of said banks responsive to said output of said first comparator means and to a second one of said banks responsive to said output of said second comparator means, such that interleaving between said banks is controlled by said page select address bit enabling one of said comparator means;



a configuration register for indicating the location of said banks of memory in a memory address space; and

address comparison means, having a first input coupled to said configuration register and a second input coupled to said input address bus, for comparing bank address bits of said input address bus to said location of said banks of memory and providing an enable signal to said logic state machine means when said input address is within said location.

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**5,051,890**

**PROGRAM/DATA MEMORY EMPLOYED IN MICROCOMPUTER SYSTEM**

**Kazunori Nagasaki, and Kazubiro Takeuchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan**

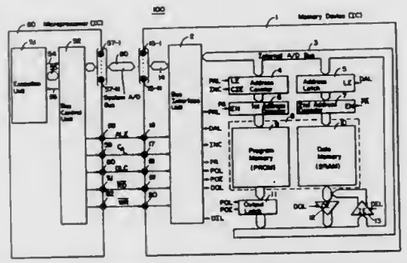
**Filed Sep. 29, 1989, Ser. No. 414,248**

**Claims priority, application Japan, Sep. 29, 1988, 63-244945**

**Int. Cl.[5] G06F *12/02***

**U.S. Cl. 364—200** **9 Claims**

1. A semiconductor memory device comprising a set of address/data terminals, a first terminal supplied with an address latch-enable signal, a second terminal supplied with a data selection signal for selecting one of first and second modes, a third terminal supplied with an updating control signal, an address counter, an address register, first means for coupling said set of address/data terminals to said address counter and said address register, second means coupled to said first and second terminals for producing a first latch signal in response to said address latch-enable signal and said first mode selected by said data selection signal and for producing a second latch signal in response to said address latchenable signal and said second mode selected by said data selection signal, third means coupled to said second and third terminals for producing a count updating signal in response to said updating control signal and said first mode selected by said data selection signal, fourth means for supplying said first latch signal and said count updating signal to said address counter, fifth means for supplying said second latch signal to said address register, said address counter fetching address information at said set of address/data terminals in response to said first latch signal and updating the fetched address information in response to said count updating signal, said address register



fetching addres information at said set of address/data terminals in response to said second latch signal, a memory portion having a plurality of addressable memory locations, sixth means responsive to the address information from said address counter for accessing said memory portion to read out data therefrom, seventh means responsive to the address information from said address register for accessing said memory portion to read out data therefrom, and eighth means coupled between said memory portion and said set of address/data terminals for transferring the data from said memory portion to said set of address/data terminals.

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**5,051,891**

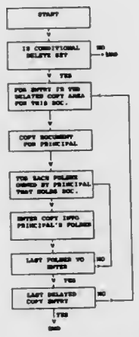
**METHOD TO MANAGE TRANSFER OF OWNERSHIP OF ELECTRONIC DOCUMENTS STORED IN AN INTERACTIVE INFORMATION HANDLING SYSTEM**

**Margaret G. MacPbail, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 23, 1987, Ser. No. 138,537**

**Int. Cl.[5] G06F *15/40***

**U.S. Cl. 364—200** **9 Claims**



1. In a multi-user interactive information handling system which maintains a relatively large plurality of electronic documents in storage for users of said system, in which each electronic document of said plurality is assigned at a time said electronic document is stored, an ownership label, a document label that identifies said electronic document by document type, said criteria that is used by said system to automatically delete said electronic document from said system at some future time, said criteria including first and second expiration dates, said system periodically processing said criteria of said electronic documents relative to a current date to cause said system to automatically delete a specific electronic document if a pre-established relationship exists among said current date and said first and second expiration dates assigned to said specific electronic document, a method to selectively provide a stored electronic copy of a first said electronic document owned by a first user to a second user in response to servicing a Delayed Copy Request from said second user at a time said first electronic document is to be automatically deleted from said system, said method comprising the following steps in combination,

A) assigning to said first electronic document said ownership label, said document label, and said criteria including said first and second expiration dates at the time said first electronic document is stored in said system including the interactive entry of at least one of said labels by said first user,

B) entering into said system interactively by said second user a Delayed Copy Request for said first electronic document.

C) periodically processing said criteria of said stored documents to determine if said pre-established relationship exists for said first electronic document.

D) servicing said Request with said system only at the time said first electronic document as determined in Step C) is to be automatically deleted from said system, including the step of selectively honoring said Delayed Copy Request, and

E) automatically deleting said first electronic document after said step of servicing is completed.

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**5,051,892**

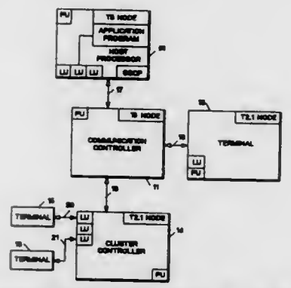
**FULL DUPLEX CONVERSATION BETWEEN TRANSACTION PROGRAMS**

**Marsha E. Ferree, Raleigh; James P. Gray; Mark Pozefsky, both of Chapel Hill, and John F. Wilder, Raleigh, all of N.C., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Feb. 9, 1989, Ser. No. 308,292**

**Int. Cl.[5] G06F *1/00***

**U.S. Cl. 364—200** **5 Claims**



1. A method of operating a full duplex conversation between first and second transaction programs (TPs) over a communication network which includes at least first and second logical units LUs) connected, respectively, to the said first and second TPs and to each other by at least one communication session over which electronic signals representing both data and control are exchanged under control of said TPs, said method comprising the following steps:

at one of said TPs issuing a first unique input to the connected LU requesting the allocation of a conversation with the said other TP;



said LU generating and sending a unique first message indicating the requested conversation to the said other LU;

said other LU receiving said unique first message and generating and sending a unique second input to the said connected TP indicating an attach to complete establishment of the requested conversation;

at either or both of said TPs concurrently issuing one or more unique inputs for the purpose of sending and/or receiving data as required;

as required at a said one TP generating and sending a unique third input to the said connected LU requesting confirmation of previously transmitted data and thereafter inhibiting the sending of data pending receipt from the connected LU indicating confirmation from the partner TP;

receiving at the LU connected to the said one TP the said third input from the connected TP and generating and transmitting a unique second message indicating the requested confirmation via said session to the other LU;

receiving at the other LU the said unique second message and generating and second a unique fourth input indicating the requested confirmation to the TP connected thereto; and

receiving the said unique fourth input at the said other TP and inhibiting the further receipt of data pending generating and sending of a unique fifth confirmation reply input to the connected LU.

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**5,051,893**

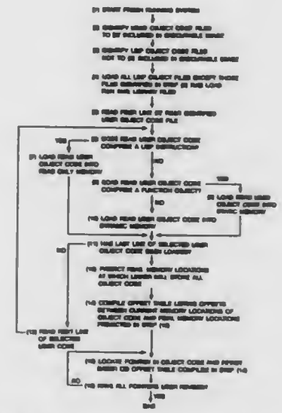
**SYSTEM FOR PROCESSING DATA TO FACILITATE THE CREATION OF EXECUTABLE IMAGES**

**J. David Teany, Harvard; Jeff Piazza, Waltham; Gary L. Brown, Harvard; Paul C. Anagnostropoulos, Stow; Bruce A. Foster, Groton; Beryl E. Nelson, Acton, and Walter van Roggen, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.**

**Filed Jul. 11, 1988, Ser. No. 217,322**

**Int. Cl.[5] G06F *15/00***

**U.S. Cl. 364—200** **8 Claims**



1. A system for processing code contained in one or more selected files, before said code is linked to form an executable image, said system comprising:

means for determining the memory locations in memory where said code will be stored in memory after said code is linked; and

means for revising said code in accordance with said memory locations determined by said means for determining.

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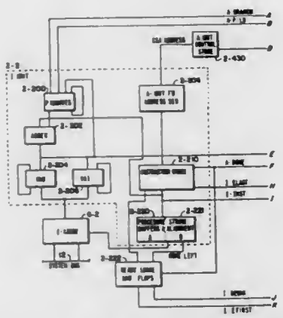


5,051,894

## APPARATUS AND METHOD FOR ADDRESS TRANSLATION OF NON-ALIGNED DOUBLE WORD VIRTUAL ADDRESSES

Forrest M. Phillips, North Chelmsford; Thomas F. Joyce, Westford, and Ming T. Miu, Chelmsford, all of Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Jan. 5, 1989, Ser. No. 294,528
Int. Cl.[5] G06F *9/26, 12/04*
U.S. Cl. 364—200 16 Claims



1. A data processing unit, said data processing unit identifying each double word operand by a virtual address, said virtual address including a ring number identifying attributes of said each double word operand, said virtual address including a segment number identifying a group of addresses, said data processing unit comprising:

a execution unit for processing requested and aligned double word operands;

a cache memory unit for storing double word operands, wherein said cache memory unit can store an unaligned double word operand, an unaligned double word operand including a first word in a first double word operand and including a second word in a second double word operand;

a virtual memory unit including:

identification means for identifying by means of a first virtual address that a requested and aligned double word operand is stored as an unaligned double word operand, said first virtual address identifying a first double word operand having a first word of said requested and aligned double word operand;

address generation means responsive to said identification means for calculating a second virtual address from said first virtual address, said second virtual address identifying a second double word operand having a second word of said requested and aligned double word operand;

security means for comparing execution attributes of said first virtual address with attributes of said second virtual address, said execution attributes being determined by a segment number of each virtual address, wherein said security means initiates a special procedure when a comparison of said execution attributes associated with said first and said second virtual address is false; and

memory means responsive to said first virtual address for providing a first real address of said first double word operand when said comparison of execution attributes is positive, said memory means responsive to said second virtual address for providing a second real address of said second double word operand when said comparison of execution attributes is positive;

cache means storing double word operands at read addresses, said cache means for retrieving said first double word operand having said first word in response to said first real address, said cache means for retrieving said second double word operand having said second word in response to said second real address; and

alignment means responsive to control signals and to said first and second double word operands retrieved from cache means for providing said requested and aligned double word operand.

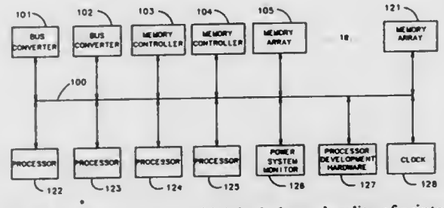
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5,051,895

## APPARATUS AND METHOD FOR TRACKING AND IDENTIFYING PRINTED CIRCUIT ASSEMBLIES

Donald L. Rogers, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 98,595, Sep. 17, 1987, abandoned. This application Sep. 22, 1989, Ser. No. 412,542
Int. Cl.[5] G06F *15/16*
U.S. Cl. 364—200 2 Claims



1. In a computer system which includes a plurality of printed circuit assemblies, an apparatus for allowing the electronic storage and retrieving of service information about each printed circuit assembly facilitating the tracking and identification of the plurality of printed circuit assemblies by service agents, the apparatus comprising:

non-volatile random access memory within each printed circuit assembly, each non-volatile random access memory storing service information about a printed circuit assembly within which the non-volatile random access memory resides; and,

retrieval and storage means, coupled to each printed circuit assembly, for electronically retrieving service information from each non-volatile random access memory within a printed circuit assembly and making the service information available to the service agents, and for enabling the service agents to electronically change the service information stored in the non-volatile random access memory without physically accessing the printed circuit assembly, wherein the retrieval and storage means comprises a bus coupled to each printed circuit assembly and wholly dedicated to the electronic storage and assembly of information about each printed circuit assembly, and wherein a first printed circuit assembly from the plurality of printed circuit assemblies controls all data transactions which occur on the bus.

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5,051,896

## APPARATUS AND METHOD FOR NULLIFYING DELAYED SLOT INSTRUCTIONS IN A PIPELINED COMPUTER SYSTEM

Ruby B. Lee, Cupertino, and Allen J. Baum, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 750,625, Jun. 28, 1985. This application Mar. 21, 1988, Ser. No. 170,520
Int. Cl.[5] G06F *9/38, 9/30*
U.S. Cl. 364—200 3 Claims

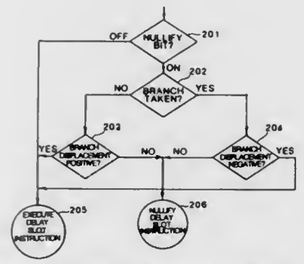
1. In a computer system having memory and an instruction pipeline and in which results of an operation are not stored until after performance of the operation, a method for determining when to prevent the computer system from storing any results, errors, traps and interrupts which are generated by the performance of the operation, the method comprising the steps of:

(a) fetching a first instruction from memory into the instruction pipeline, the first instruction having a nullification field;

(b) fetching only a single instruction, which is a second instruction, from memory into the instruction pipeline;

(c) performing a first operation indicated by the first instruction;





(d) performing a second operation indicated by the second instruction;

(e) storing the results of the first operation, including the state of the nullification field; and

(f) conditional on the state of the nullification field of the first instruction, preventing any results, errors, traps or interrupts generated by performing the second operation indicated by the second instruction from being stored in the computer system.

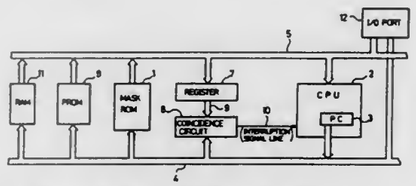
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5,051,897

## SINGLE-CHIP MICROCOMPUTER WITH MEMORY PATCHING CAPABILITY

Masafumi Yamaguchi; Kazuo Hayashi, and Junji Kuroki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1988, Ser. No. 288,504
Claims priority, application Japan, Mar. 11, 1988, 63-58572
Int. Cl.[5] G06F *9/06, 12/00;* G11C *17/10*
U.S. Cl. 364—200 4 Claims



1. A single-chip microcomputer comprising:

a data bus and an address bus;

a first memory, connected to said data bus and said address bus, in which data necessary for data processing are set in a process of integrated circuit manufacture;

a central processing unit, connected to said data bus and said address bus, for performing operations and control;

a programmable counter, as part of said central processing unit, having an output connected to said address bus, for generating address data for accessing said first memory;

a second memory, connected to said data bus and said address bus, capable of being electrically rewritten;

a register with an input and an output, with said register input connected to said data bus, for setting a plurality of address data of said second memory in lieu of a plurality of address data of said first memory; and

a coincidence circuit with a first input connected to said register output, a second input connected to said address bus, and an output connected to said central processing unit, for providing an interruption to said central processing unit upon detection of a coincidence between said register output and said programmable counter output;

an I/O port, coupled to said address bus and to said data bus, for inputting data to be re-written to said second memory; and

said central processing unit functioning to access an address of said second memory as a destination of said interruption upon provision thereof.

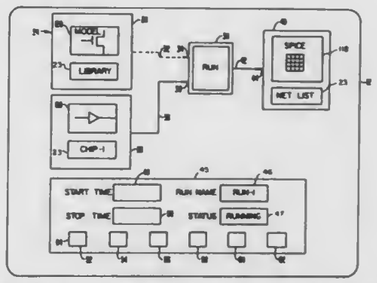
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5,051,898

## METHOD FOR SPECIFYING AND CONTROLLING THE INVOCATION OF A COMPUTER PROGRAM

John H. Wright, Scotts Valley, and Stephen P. Tomas, Sunnyvale, both of Calif., assignors to EDA Systems, Inc., Santa Clara, Calif.

Filed Jun. 13, 1988, Ser. No. 205,981
Int. Cl.[5] G06F *15/02, 15/18, 15/40*
U.S. Cl. 364—200 11 Claims



1. A system for controlling an invocation of a plurality of tools on an interactive digital computer system, each of the plurality of tools comprising a computer program having a plurality of options, including input parameters, output parameters, and modes of operation, said system comprising:

a tool template, defined in the interactive computer system, for each of the plurality of tools, each said tool template including a description of information relevant to invocation of a particular one of said plurality of tools, including input data format, output data format, command line parameters and execution options to allow a user to control, by use of said interactive computer system, said particular tool as it is executed;

data base management means for managing of respective information used in the course of invoking and executing each of said respective tools; and

computer means interactive with said data base management means and said respective tool templates for encapsulating said plurality of tools such that information regarding invoking of each respective tool can be communicated between the user and said data base management means, through a respective tool template of a respective invoked tool, to provide a consistent user interface for interactively invoking each of said plurality of tools.

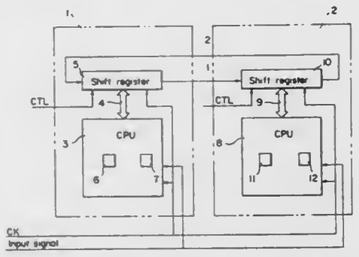
VOL 1130 ISS 4 SE 24 1991 UMI



## 5,051,899
## DATA TRANSMISSION ERROR DETECTION IN AN ELECTRONIC CASH REGISTER SYSTEM

Keiichi Ikoma; Shuuzi Katayama; Shizuo Nakai, and Kenji Miwa, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 312,329, Feb. 16, 1989, abandoned, which is a continuation of Ser. No. 932,946, Nov. 20, 1986, abandoned. This application Feb. 2, 1990, Ser. No. 474,218
Claims priority, application Japan, Nov. 22, 1985, 60-263124
Int. Cl.[5] G07G *1/12*; H04L *1/14*
U.S. Cl. 364—405 3 Claims




1. Data error-checking apparatus for a digital transfer system, comprising:

a first and a second data utilization unit, each utilization unit including a multi-bit shift register and a central processing unit coupled to said shift register via a bi-directional multi-bit parallel data bus, each of said central processing units further including a multi-bit memory having a capacity at least equal to that of said shift register whereby multi-bits of data defining a character are transferred in parallel between said memory and said shift register;

a first serial data line coupled from an output of the shift register of the first utilization unit to an input of the shift register of the second utilization unit; and

a second serial data line coupled from an output of the shift register of the second utilization unit to an input of the shift register of the second utilization unit, and

wherein in a data error checking cycle, the bits of a first multi-bit data character are initially serially transferred from the shift register of said first utilization unit to the shift register of said second utilization unit,

the bits of said first data character are also initially transferred to said memory of the central processing unit of said first utilization unit, and

thereafter when a second multi-bit data character is serially transferred from the shift register of said first utilization unit to the shift register of said second utilization unit, said shift register simultaneously serially transfers said first data character back to the shift register of said first utilization unit, the starting time of the transfer of the first data character back to the first utilization unit being the same as that of the transfer of the second data character from said first utilization unit to the second utilization unit,

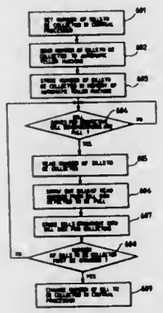
wherein the central processing unit of said first utilization unit then compares said first data character stored in the memory of the central processing unit of said first utilization unit with said first data character transferred back to the shift register of said first utilization unit from the shift register of said second utilization unit, and

wherein said central processing unit of the first utilization unit further determines whether or not the bits of the compared characters match and said central processing unit thereafter generates a first type output status signal when the compared characters are identical and generates a second type status signal when the compared characters are not identical.

## 5,051,900
## AUTOMATIC BILL COLLECTING METHOD IN AUTOMATIC TELLER MACHINE

Michiro Ito, Seto, and Naoki Kimizu, Owariasahi, both of Japan, assignors to Hitachi, Ltd., Tokyo and Chuba Hitachi Electric Co., Ltd., Aich, both of, Japan

Filed Sep. 18, 1989, Ser. No. 408,257
Claims priority, application Japan, Sep. 19, 1988, 63-234442
Int. Cl.[5] G06F *15/30*
U.S. Cl. 364—408 10 Claims



1. An automatic bill collecting method in an automatic teller machine comprising first bill boxes for respective bill denominations, detecting means for detecting whether each of said first bill boxes is full of a predetermined number of bills, a second bill box for storing bills to be collected from said first bill boxes into said second bill box, and a memory means for storing the number of bills to be collected from said first bill boxes into said second bill box, said method comprising the steps of storing in said memory means a value equivalent to said number of bills to be collected set in a central processor, changing the number of bills to be collected in the central processor based upon information relating to bills received and paid in said automatic teller machine, communicating a new number equivalent to said changed number of bills to be collected from the central processor to the automatic teller machine, storing the new number in said memory means, detecting that one of said first bill boxes is full of the predetermined number of bills, and transferring the stored number of bills to be collected from the one of said first bill boxes detected to be full of bills to said second bill box.

## 5,051,901
## METHOD FOR JUDGING ERRORS IN APPLYING LIQUID SAMPLES DURING BIOCHEMICAL ANALYSIS

Hirotoshi Endo, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 20, 1990, Ser. No. 570,078
Claims priority, application Japan, Aug. 21, 1989, 1-214463
Int. Cl.[5] G06F *15/00*
U.S. Cl. 364—413.11 4 Claims

1. A method for judging errors in applying a liquid sample during a biochemical analysis wherein a droplet of liquid sample is applied to an analysis medium containing a reagent, which chemically reacts with a specific constituent in the liquid sample, the analysis medium is then incubated, the optical densities of the analysis medium are determined, and concentration of the specific constituent in the liquid sample is determined from the optical densities of the analysis medium thus determined,

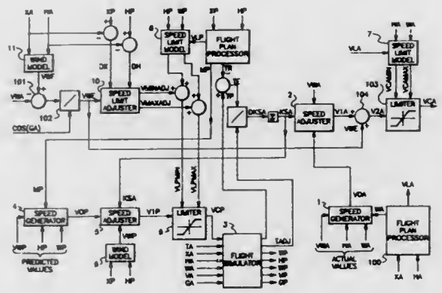
the method for judging errors in applying a liquid sample during a biochemical analysis comprising the steps of:

i) determining the optical density of said analysis medium plural times with the passage of time while said analysis medium is being incubated,



ii) calculating the difference between the maximum value and the minimum value of the optical densities thus determined for said analysis medium,

iii) comparing said difference with a predetermined threshold value, and

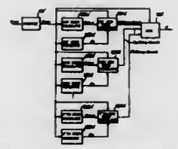



iv) in cases said difference is smaller than said threshold value, judging that errors occurred in applying a liquid sample to said analysis medium.

## 5,051,902
## METHOD AND APPARATUS FOR RADIATION IMAGE PROCESSING AND X-RAY IMAGE PROCESSING, INCLUDING SPATIAL FREQUENCY FILTERING TO IMPROVE GRAININESS

Kazuhiro Hishinuma, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1988, Ser. No. 259,814
Claims priority, application Japan, Oct. 20, 1987, 62-265011; Oct. 20, 1987, 62-265016; Oct. 20, 1987, 62-265017; Oct. 20, 1987, 62-265018; Mar. 19, 1988, 63-66751; Mar. 19, 1988, 63-66752
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.13 36 Claims



35. An X-ray image processing apparatus for processing a signal representing an original image density, which has been read out at each scanning point on an original photograph obtained by exposure of a photographic film to X-rays, by an operation device, and reproducing said X-ray image as a visible image on a copy photograph or the like by use of the signal representing the processed image density,

wherein the improvement comprises constituting said operation device for:

i) obtaining an unsharp mask by averaging original image densities within a predetermined range surrounding each scanning point, and denoting a density of said unsharp mask by Dus,

ii) denoting a coefficient corresponding to said unsharp mask by $\beta$,

iii) adjusting said coefficient $\beta$ to be a function shifting from $\beta<0$ to $\beta>0$ as a dose of said X rays irradiated to each point on said coefficient $\beta$ to be a function shifting from $\beta<0$ to $\beta>0$ as a dose of said X-rays irradiated to each point on said photographic film increases, and

iv) carrying out an operation represented by a formula

$$D' = Dorg + \beta(Dorg - Dus)$$

where Dorg denotes said original image density, and D' denotes an image density obtained by the operation processing, by use of said coefficient $\beta$.

36. An X-ray image processing apparatus for processing a signal representing an original image density, which has been read out at each scanning point on an original photograph obtained by exposure of a photographic film to X-rays, by an operation device, and reproducing said X-ray image as a visible image on a copy photograph or the like by use of the signal representing the processed image density,

wherein said operation device comprises:

i) means for obtaining a single unsharp mask by averaging original image densities within a predetermined range surrounding each scanning point or averaging image densities obtained by carrying out intermediate processing of signals representing the original image densities, or obtaining a plurality of unsharp masks by changing said predetermined range, and denoting densities of said unsharp masks by Dus.k, where k=1, 2, . . . , n, wherein n denotes an integer representing the number of said unsharp masks,

ii) means for denoting a single coefficient corresponding to single said unsharp mask or denoting a plurality of coefficients corresponding to a plurality of said unsharp masks by $\beta k$ where k=1, 2, . . . , n,

iii) means for adjusting at least a single coefficient $\beta l$, where l denotes an integer within the range of 1 to n, among step ii's said single coefficient or coefficients $\beta k$, where k=1, 2, . . . , n, to be a function shifting from $\beta l<0$ to $\beta l>0$ as a dose of said X-rays irradiated to each point on said photographic film increases, and

iv) means for carrying out an operation represented by a formula

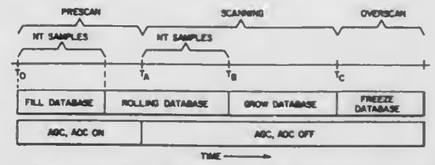
$$D' = Db1 + \sum_{k=1}^{n} \beta k(Db2 - Dus \cdot k)$$

where Db1 and Db2 each denote said original image density or an image density obtained by carrying out intermediate processing of a signal representing said original image density, and D' denotes an image density obtained by the operation processing, by use of said coefficient $\beta l$.

## 5,051,903
## METHOD AND APPARATUS FOR PREDICTING VALUES OF A VARYING PERIODIC PHENOMENON

Norbert J. Pelc, and Stephen W. Flax, both of Wauwatosa, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Aug. 14, 1989, Ser. No. 393,376
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—413.13 13 Claims




1. A method of associating a sampled value $y(t_i)$ of a substantially periodic signal y(t), with an element $G_j(i)$ in a set $G_j$, such that the sampled value $y(t_i)$ has a predetermined relationship to the order of the element $G_j$ within the set, comprising the steps of:

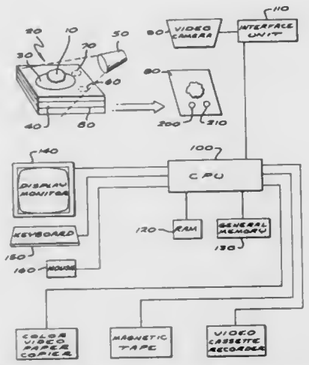
VOL 1130 ISS 4 SE 24 1991 UMI



(a) acquiring a database of $N_f$ samples of the substantially periodic signal y(t);
(b) growing the database by adding the sampled value $y(t_i)$ to the database without removing another sample from the database;
(c) evaluating the relative probability of the values of the substantially periodic function y(t) from the samples in the growing database; and
(d) assigning the value $y(t_i)$ to an element $G_y(i)$, using the evaluated relative probability, so as to maximize the probability that subsequent values of y(t) may be assigned the remaining elements of set $G_y$ according the predetermined relationship.

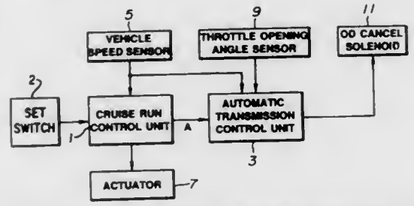
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**5,051,904**
**COMPUTERIZED DYNAMIC TOMOGRAPHY SYSTEM**
**Lionell K. Griffith, Acton, Calif., assignor to Olganix Corporation, Sherman Oaks, Calif.**
**Filed Mar. 24, 1988, Ser. No. 172,609**
**Int. Cl.[5] G06F *15/42, 15/62***
**U.S. Cl. 364—413.16** **22 Claims**




1. A method for representing the internal structure of an object, comprising the steps of:
exposing said object and at least one reference marker to penetrating radiation from a plurality of angles;
obtaining a separate radiological image for each said exposure;
digitizing each said radiological image to supply pixel values thereof to a computer;
locating a center of said at least one reference marker on each said digitized image;
determining an error of rotation from at least one of said centers;
registering each said digitized image, said registering step comprising rotation of said pixel values;
displacing selected pixel values relative to other pixel values; and
combining said selectively displaced pixel values to display at least one selected image of the internal structure of said object.

**5,051,905**
**SYSTEM AND METHOD FOR AUTOMATICALLY CONTROLLING VEHICLE SPEED TO DESIRED CRUISE SPEED**
**Kiyoshi Yoshida, Kanagawa, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan**
**Filed Feb. 15, 1989, Ser. No. 310,564**
**Claims priority, application Japan, Feb. 16, 1988, 63-31913**
**Int. Cl.[5] B60K *41/08, 41/18***
**U.S. Cl. 364—424.1** **9 Claims**

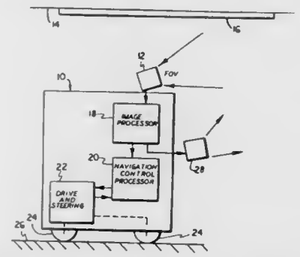



1. A system for automatically controlling vehicle speed so as to make said vehicle speed conform to a desired cruise speed, comprising:
means for detecting a vehicle speed;
means for detecting an operating variable of an engine driving force adjusting mechanism;
means for automatically controlling a gear position in an automatic transmission according to preset boundary lines wherein said boundary lines are defined by preset values associated with the operating variable of the engine driving force adjusting mechanism and vehicle speed;
means for setting the vehicle speed at which the vehicle is desired to cruise and outputting a set command according to the set vehicle speed; and
means for controlling the operating variable of the engine driving force adjusting mechanism so that the vehicle speed is maintained at the set vehicle speed in response to the set command and
for changing at least one of said preset boundary lines in such a way that a shift pattern characteristic of a vehicular transmission when making a down shift is transferred toward a lower gear side and that when making an up shift is transferred toward a higher gear side during the control of the operating variable.

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**5,051,906**
**MOBILE ROBOT NAVIGATION EMPLOYING RETROREFLECTIVE CEILING FEATURES**
**John M. Evans, Jr., Brookfield; Steven J. King, Woodbury, and Carl F. R. Weiman, Westport, all of Conn., assignors to Transitions Research Corporation, Danbury, Conn.**
**Filed Jun. 7, 1989, Ser. No. 363,601**
**Int. Cl.[5] G06F *15/50***
**U.S. Cl. 364—424.02** **25 Claims**

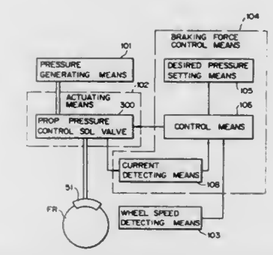
1. Navigation apparatus for generating navigation related information for a vehicle, comprising:
means for obtaining an image of a surface which overlies a vehicle or a projected path of the vehicle, the surface having one or more retroreflective features disposed thereon;
means for illuminating the retroreflective features;
means, coupled to said obtaining means, for detecting a location within the image of the one or more retroreflective features; and
means, coupled to said detecting means, for generating, from the detected feature location or locations, at least vehicle position and orientation information, wherein
said image obtaining means comprises means for forming a two-dimensional image comprised of a plurality of image pixels,
wherein said detecting means comprises means, coupled to said two-dimensional image forming means, for identifying pixels which correspond to two opposing edges of the retroreflective feature, and




wherein said generating means comprises means, coupled to said pixel identifying means, for projecting a line from the pixels that correspond to each of the opposing edges of the feature, an intersection of the projected lines defining a vanishing point.

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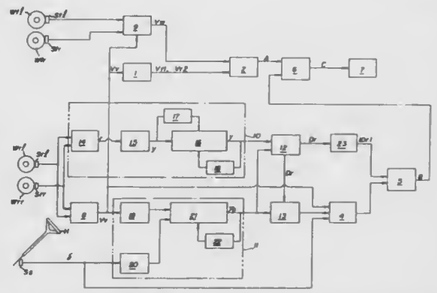
**5,051,907**
**ANTI-SKID CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE**
**Kazutaka Kuwana, Toyota; Yasuo Noda; Daiju Nomura, both of Kariya, and Tsuyoshi Yoshida, Oobu, all of Japan, assignors to Aisin Seiki K.K., Aichi, Japan**
**Filed Dec. 21, 1989, Ser. No. 454,586**
**Claims priority, application Japan, Dec. 24, 1988, 63-327425**
**Int. Cl.[5] B60T *8/60***
**U.S. Cl. 364—426.02** **8 Claims**




1. An anti-skid control system for an automotive vehicle for installation in a vehicle braking system having a wheel brake cylinder for applying a braking force to a road wheel and pressure generating means for supplying a hydraulic braking pressure to said wheel brake cylinder, comprising:
actuating means disposed in a hydraulic circuit between said pressure generating means and said wheel brake cylinder for controlling said hydraulic braking pressure supplied to said wheel brake cylinder;
wheel speed detecting means for detecting a rotational speed of said road wheel; and
braking force control means for controlling said braking force applied to said road wheel in response to at least an output of said wheel speed detecting means, wherein said braking force control means includes control means for operating said actuating means and desired hydraulic pressure for said control means, and wherein said control means operates said actuating means to control said hydraulic braking pressure supplied to said wheel brake cylinder to said desired hydraulic pressure,
wherein said actuating means comprises a proportional pressure control solenoid valve for controlling said hydraulic braking pressure in substantially linear proportion to a current fed thereto, and wherein said braking force control means comprises current detecting means for detecting said current and providing an output thereof to said control means, said desired hydraulic pressure setting means setting said desired hydraulic pressure in response to said output of said current detecting means.

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**5,051,908**
**DRIVING WHEEL TORQUE CONTROL DEVICE FOR VEHICLE**
**Shuji Shiraishi, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**
**Filed Apr. 21, 1989, Ser. No. 341,187**
**Claims priority, application Japan, Apr. 22, 1988, 63-099879; Apr. 22, 1988, 63-099880**
**Int. Cl.[5] B60T *8/32*; B60K *31/00***
**U.S. Cl. 364—426.02** **4 Claims**



1. A driving wheel slip control device for a vehicle during acceleration of the vehicle, comprising:
first setting means for setting a first driving wheel torque reduction control quantity according to a slip condition of a driving wheel of the vehicle with respect to a driving direction;
means for detecting a yaw motion condition of the vehicle;
means for generating a reference value for said yaw motion condition of the vehicle;
second setting means for setting a second driving wheel torque reduction control quantity according to said yaw motion condition and said reference value of said yaw motion condition; and
means for determining a final driving wheel torque reduction control quantity according to said first and second driving wheel torque reduction control quantities generated from said first and second setting means, respectively.

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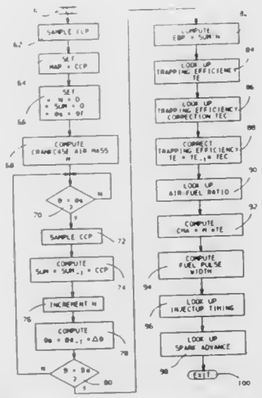
**5,051,909**
**METHOD AND MEANS FOR DETERMINING EXHAUST BACKPRESSURE IN A CRANKCASE SCAVENGED TWO-STOKE ENGINE**
**Aparicio J. Gomez, Birmingham; Douglas E. Trombley, Warren, and Dennis W. Montville, Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**
**Filed Sep. 15, 1989, Ser. No. 407,984**
**Int. Cl.[5] F02M *49/00***
**U.S. Cl. 364—431.05** **6 Claims**

1. In a crankcase scavenged two-stroke engine having a separate crankcase chamber associated with each engine cylinder, inlet and exhaust ports in the wall of each cylinder that are simultaneously open during an overlap interval in each engine cycle, and an engine control system of the type in which the mass of air trapped in a cylinder is determined by the amount of air inducted into the cylinder crankcase compensated as a function of backpressure at the exhaust port of the cylinder; a method for obtaining an indication of the backpressure at a cylinder exhaust port comprising the steps of:

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deriving an indication of the air pressure within the crankcase chamber associated with the cylinder, during a predetermined portion of the overlap interval, when an airflow



passage is established between the crankcase chamber and the cylinder exhaust port;

averaging the indicated crankcase air pressure to obtain an indication of the backpressure at the exhaust port.

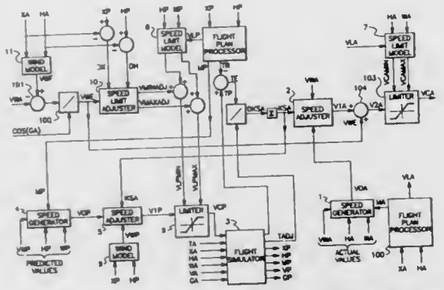
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**5,051,910**

## WIND FORECAST ERROR COMPENSATION FOR 4-D GUIDANCE IN A AIRCRAFT FLIGHT MANAGEMENT SYSTEM

**Sam P. Liden, Phoenix, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Oct. 16, 1989, Ser. No. 422,340**
**Int. Cl.[5] G06F *15/50*; G05D *1/00***
**U.S. Cl. 364—446** **10 Claims**



1. An apparatus for an aircraft for improving arrival-time performance of said aircraft, wherein said aircraft flies according to a flight plan, having a flight profile which includes a climb portion, a cruise portion and a descent portion, whereby the aircraft gets from a first point and a descent portion, whereby the aircraft gets from a first point to a second point, the first point being the starting point located on the ground and the second point being a predetermined 4-D waypoint along said flight plan, said aircraft being given a required time of arrival (RTA) at said second point, said apparatus comprising:

a) means for simulating a flight of said aircraft, the simulated flight of the aircraft following the flight plan being flown, and including input parameters which include gross weight of said aircraft, mode parameters, forecast winds along the flight plan, thereby determining a predicted time of arrival (TP) at the second point, the simulating of the flight being repeated on a predetermined time period during the entire flight;

b) means for generating a speed adjustment coefficient (KSA), said means for generating being coupled to said means for simulating, the speed adjustment coefficient being generated in response to the simulating of the flight on the predetermined time period, from the actual aircraft position to the second point; and

c) means for calculating a final command speed (VCA) utilizing said speed adjustment coefficient, whereby the difference between the required time of arrival and the predicted time of arrival is minimized.

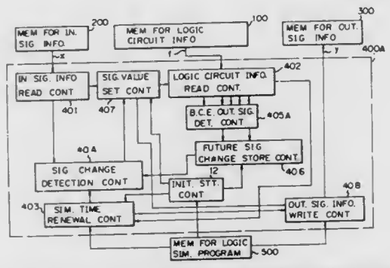
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**5,051,911**

## APPARATUS FOR EFFECTING SIMULATION OF A LOGIC CIRCUIT AND METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE USING THE SIMULATION APPROACH

**Masaharu Kimura, Kawasaki, and Yoshihiro Tada, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Nov. 27, 1989, Ser. No. 441,944**
**Claims priority, application Japan, Nov. 25, 1988, 63-298915**
**Int. Cl.[5] G06F *11/22***
**U.S. Cl. 364—468** **31 Claims**



27. A method for producing a semiconductor device using a logic simulation approach, said method comprising the steps of:

determining an input side signal delay value and an output side signal delay value with respect to each of circuit elements constituting a designed logic circuit which is a simulation object;

comparing the determined input side signal delay value with the determined output side signal delay value;

determining an output signal value of the simulation object circuit element based on a result of said comparing and then verifying a function of said designed logic circuit; and

effecting a patterning of the designed logic circuit on a semiconductor wafer to produce a semiconductor device.

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**5,051,912**

## VECTORING/ORBITING CONTROL UNIT FOR ELECTRICAL DISCHARGE MACHINING

**Lars Johanson, Cedar Grove; Frank J. Bonavita, Carlstadt, both of N.J., and Ralpb E. Rudnick, Chester, Va., assignors to Hurco Acquisition Corporation, Indianapolis, Ind.**

**Filed Feb. 7, 1989, Ser. No. 306,970**
**Int. Cl.[5] G06F *15/46*; G05B *9/02***
**U.S. Cl. 364—474.04** **19 Claims**

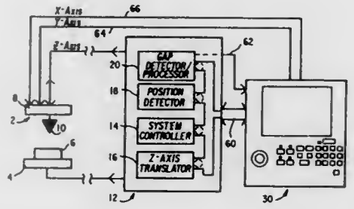
1. A vectoring and orbiting control unit for an electrical discharge machine (EDM) system, the EDM system including (a) an electrode/workpiece support system for mechanically supporting and moving an electrode with respect to a workpiece in z- x-, and y- axes, and (b) an electrical power supply/control system for providing electrical machining power to,

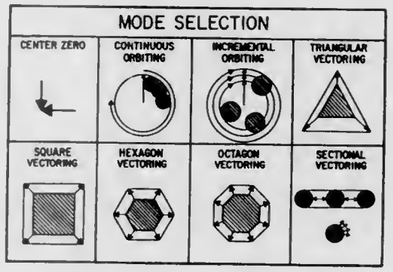


and controlling the movement of, the electrode/workpiece support system, the electrical power supply/control system including a gap voltage detector/processor for detecting a voltage across the gap formed by the electrode and workpiece and producing a gap condition signal indicative thereof, a position detector for detecting the position of the electrode with respect to the workpiece, a z-axis translator for moving the electrode and workpiece relative to each other in a z-axis direction, and a system controller for controlling the gap voltage and z-axis translator in accordance with the gap condition signal, wherein the vectoring and orbiting control unit comprises:

video display means for displaying (a) a graphics menu of vectoring/orbiting machining modes, (b) selected input data values, and (c) data values representative of the position of the electrode;

manual input means for selecting a particular vectoring/orbiting mode from the menu of predetermined vectoring-/orbiting modes and for selecting input values in response to prompts including graphical illustration of said particu-




lar vectoring/orbiting mode, said prompts appearing on said display means in response to selection of a particular vectoring/orbiting mode;

translating means connected with the electrode/workpiece support system for controlling the movement of the electrode with respect to the workpiece in an x-axis and y-axis direction;

communication linking means connected with the electrical power supply/control system for providing command data to the system controller; and

processing means for processing and converting data from the manual input means and for providing x-axis and y-axis control data to said translating means and for providing z-axis command data to said communication linking means, whereby the translating means controls the movement of the electrode with respect to the workpiece along the x-axis and y-axis and the electrical power supply/control system controls the movement of the electrode with respect to the workpiece along the z-axis in accordance with the z-axis command data.

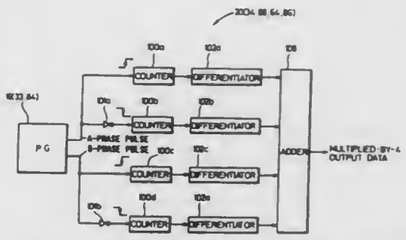
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**5,051,913**

## SYNCHRONOUS OPERATION CONTROL SYSTEM FOR NUMERICALLY CONTROLLED MACHINE

**Masao Kume, and Takeshi Masaki, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Feb. 16, 1989, Ser. No. 311,636**
**Claims priority, application Japan, Feb. 22, 1988, 63-39163; Dec. 2, 1988, 63-306511**
**Int. Cl.[5] G06F *15/00***
**U.S. Cl. 364—474.28** **14 Claims**




1. A synchronous operation control system for a numerically controlled machine, comprising:

a master shaft with a tool mounted thereon;

a first motor for rotating said master shaft;

a slave shaft;

a second motor for rotating said slave shaft;

a workpiece shaft operatively coupled to said slave shaft for supporting a workpiece which is to be machined by said tool;

first and second encoders coupled respectively to said master and slave shafts;

processing means for differentiating output signals from said first and second encoders with respect to time and thereafter calculating at least positional errors between said master, slave, and workpiece shafts; and

means for adding and subtracting output signals from said processing means and applying an output signal to said second motor.

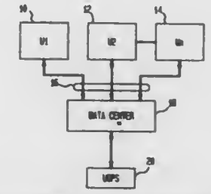
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**5,051,914**

## OPTIMIZING MAIL DELIVERY SYSTEMS BY MERGING MAILINGS

**Ronald P. Sansone, Weston, and Karl H. Schumacher, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.**

**Filed Oct. 3, 1989, Ser. No. 416,733**
**Int. Cl.[5] G06F *15/21*; G07B *17/02***
**U.S. Cl. 364—478** **32 Claims**




1. An article processing system comprising:

(a) a plurality of user batch stations each having means for assembling article batches and determining article parameters of said batches and computer means for storing said determined article parameters;

(b) a data center having computer means;

(c) a shipping station for receiving batch articles and for processing same for delivery to article addressees, said

shipping station offering discounts for submitted article batches that comply with certain regulations and are properly documented;

(d) a communications data link connecting the user station computers and the data center computer;

(e) said data center comprising:

(i) means for collecting from multiple user stations via said data link data representing article parameters of article batches assembled or to be assembled to be forwarded to the shipping station,

(ii) means for processing said article parameters data for determining ways for merging some or parts or all of said article batches such that a merged batch will qualify for discounts when delivered to said shipping station.

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**5,051,915**

## FREQUENCY MEASURING APPARATUS

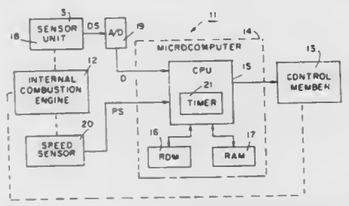
**Hiromi Kono, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 332,371, Mar. 31, 1989, abandoned, which is a continuation of Ser. No. 870,785, Jun. 5, 1986, abandoned. This application Jul. 24, 1990, Ser. No. 559,390**

**Claims priority, application Japan, Jun. 11, 1985, 60-125237**

**Int. Cl.[5] G01R** *23/00*

**U.S. Cl. 364—484** **6 Claims**




1. A frequency measuring and engine control system for measuring a frequency of a pulse signal at regular intervals, in which said system is constituted by the use of a microcomputer to which a pulse signal being measured is input and the microcomputer is adapted to execute an interruption operation when a prescribed condition occurs in the pulse signal, said system comprising:

a timer means for outputting time data representing a timing when requested;

an interruption means responsive to the pulse signal for obtaining a time data from said timer means, the time data representing a time of an occurrence of the prescribed condition of the pulse signal;

a period calculating means responsive to a series of two time data for calculating a period of the pulse signal during the interruption operation;

a frequency calculating means responsive to a result of said period calculating means for calculating the frequency of said pulse signal at the regular intervals;

a masking means for inhibiting the microcomputer from carrying out the interruption operation; and

a control means for controlling said masking means so as to be rendered operative in response to the completion of the execution of the period calculation by said period calculation means and so as to be rendered operative in response to the completion of the execution of the frequency calculation by said frequency calculating means.

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**5,051,916**

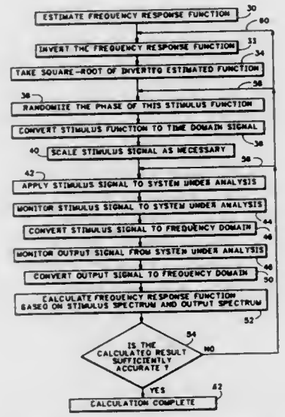
## STIMULUS SIGNAL GENERATION METHOD TO MAXIMIZE DYNAMIC RANGE IN FREQUENCY RESPONSE FUNCTION CALCULATIONS

**Richard A. Benson, Saratoga, Calif., assignor to Tektronix, Inc., Beaverton, Oreg.**

**Filed Jan. 12, 1990, Ser. No. 464,486**

**Int. Cl.[5] G06F** *15/20*

**U.S. Cl. 364—484** **19 Claims**




1. A method for determining the frequency response function of a system under analysis, the method comprising the steps of:

(a) estimating the frequency response function of the system under analysis;

(b) inverting the estimated frequency response function to obtain an inverse estimated frequency response function;

(c) taking the square-root of the inverse estimated frequency response function to obtain a stimulus spectrum;

(d) converting the stimulus spectrum from a frequency domain to a time domain to obtain a time domain stimulus signal;

(e) applying the time domain stimulus signal to the system under analysis;

(f) monitoring an output signal from the system under analysis;

(g) converting the monitored output signal from the time domain to the frequency domain to obtain an output spectrum; and

(h) calculating an improved estimated frequency response function from the output spectrum and the stimulus spectrum.

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**5,051,917**

## METHOD OF COMBINING GATE ARRAY AND STANDARD CELL CIRCUITS ON A COMMON SEMICONDUCTOR CHIP

**Elliot L. Gould, Colchester; Douglas W. Kemerer, Essex Junction; Lance A. McAllister, Williston; Ronald A. Piro, South Burlington; Guy R. Richardson, Milton, and Deborah A. Wellburn, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 18,239, Feb. 24, 1987, Pat. No. 4,786,613. This application Mar. 18, 1988, Ser. No. 169,908**

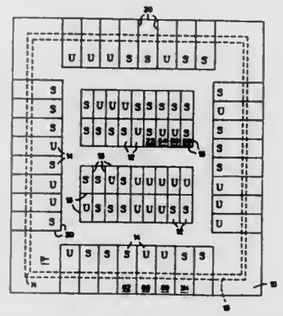
**Int. Cl.[5] H01L** *21/70;* **G06F** *15/60*

**U.S. Cl. 364—489** **7 Claims**

1. A logic structure formed on a substrate divided into a plurality of cell locations, a plurality of standard cell circuits formed within respective ones of said plurality of cell locations, and a plurality of gate array circuits formed within



remaining ones of said plurality of cell locations, said standard cell and gate array circuits being intermixed on said substrate,



such that at least one gate array or standard cell circuit is not adjacent to any other gate array or standard cell circuit, respectively.

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**5,051,918**

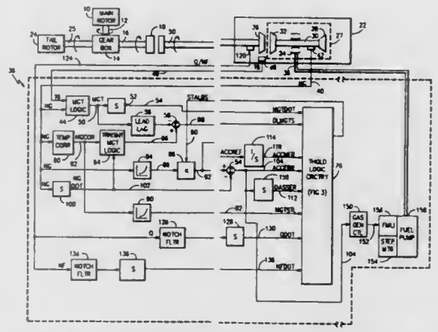
## GAS TURBINE STALL/SURGE IDENTIFICATION AND RECOVERY

**Douglas A. Parsons, Enfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.**

**Filed Sep. 15, 1989, Ser. No. 407,985**

**Int. Cl.[5] G05B** *15/00;* **F01D** *17/02*

**U.S. Cl. 364—494** **20 Claims**



1. Apparatus for detecting a compressor stall in a gas turbine engine having a plurality of parameters, each of the parameters being associated with a corresponding operational characteristic of the engine and having a magnitude associated therewith, comprising:

sensing means, for sensing the magnitude of each of the plurality of engine parameters, and for providing sensed parameter signals indicative thereof;

signal processing means, responsive to said sensed parameter signals, for processing each of said sensed parameter signals to derive information therefrom as to further operational characteristics of the engine, and for providing associated information signals indicative thereof, each of said information signals having a magnitude associated therewith; and

threshold means, responsive to said information signals, for comparing in a subroutine the magnitude of said information signals for exceedence of a magnitude of a corresponding plurality of threshold signals and for incrementing a counter value upon any exceedence, the magnitude of each of said threshold signals being indicative of a corresponding magnitude of incipiency of compressor stall, said counter value being incremented upon any exceedence by an amount corresponding to the ability of each of said information signals to indicate the incipiency of stall, said threshold means indicating a stall when said counter value meets or exceeds a certain amount.

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**5,051,919**

## TESTING OF POLES

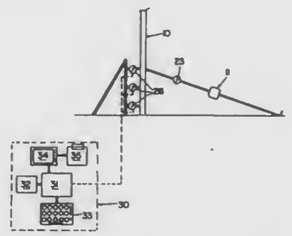
**Krzysztof J. Deusr, 17 Henderson Road, Burpengary, Queensland, 4505, Australia**

**Continuation-in-part of Ser. No. 396,089, Aug. 21, 1989, abandoned, which is a continuation of Ser. No. 272,477, Nov. 17, 1988, abandoned, which is a continuation of Ser. No. 96,482, Sep. 15, 1987, abandoned. This application Jul. 2, 1990, Ser. No. 546,744**

**Claims priority, application Australia, Apr. 22, 1987, 71869/87; Jul. 31, 1989, 39091/89**

**Int. Cl.[5] G01N** *3/20*

**U.S. Cl. 364—508** **17 Claims**



1. A method for the non-destructive testing of the residual strength of a pole comprising the steps of:

applying a load to the pole by pushing or pulling the pole above ground level to cause the pole to undergo a preset displacement;

measuring the load applied to the pole;

measuring the displacement of the pole in both deflection and rotation about its vertical axis using displacement gauges mounted on a reference frame.

2. A method for the non-destructive testing of the residual strength of a pole including the steps of:

applying a preset load to the pole by pushing or pulling the pole above ground level;

measuring the displacement of the pole under the load in both deflection and rotation about its vertical axis by displacement gauges mounted on a reference frame; and

from the applied load and the displacement, calculating the residual strength of the pole from predetermined formula (e) or by a programmed calculator or computer.

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**5,051,920**

## FLOW-METER DATA COLLECTION AND PROCESSING SYSTEM

**Barry A. Reams, Schaumburg, and Lyle W. Clem, Algonquin, both of Ill., assignors to Accurate Metering Systems, Inc., Schaumburg, Ill.**

**Filed Aug. 4, 1989, Ser. No. 389,840**

**Int. Cl.[5] G06F** *15/20*

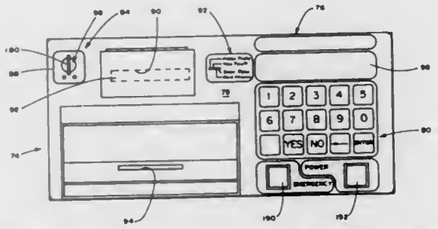
**U.S. Cl. 364—509** **25 Claims**

1. A flow-meter data collection and processing system for use in the collection of liquid at different times and/or locations including: a flow meter; means coupled to said flow meter for supplying liquid to said flow meter; electrical circuitry coupled to said flow meter for operating said flow meter; and control circuit means for controlling said electrical circuitry, said control circuit means including processing means, coded actuating means including at least one separate, detachable

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memory device with identification data therein for controlling actuation of said processing means, means coupled to said processing means for reading the separate, detachable memory



device, and data collection means for collecting flow meter data, operator data and operator inputted data from said processing means; and said electrical circuitry including liquid temperature sensing means.

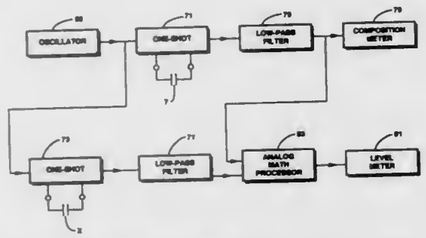
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**5,051,921**

## METHOD AND APPARATUS FOR DETECTING LIQUID COMPOSITION AND ACTUAL LIQUID LEVEL

**Robert W. Paglione, Mercer, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.**

**Filed Nov. 30, 1989, Ser. No. 443,527**
**Int. Cl.[5] G01F *23/26*; G01R *27/00***
**U.S. Cl. 364—509** **19 Claims**



3. A liquid level and composition sensor, for sensing and indicating a level of a liquid in a tank and composition of said liquid relative to its dielectric constant, comprising:
- first transducer means mounted within said tank for producing a liquid level signal having a level corresponding to height of said liquid in said tank;
- second transducer means mounted within said tank for producing a composition signal having a level corresponding to the dielectric constant of said liquid; and
- signal processing means responsive to said liquid level and composition signals for multiplying said signals together to produce an output level signal having a magnitude indicative of the actual level of liquid in said tank regardless of the composition of said liquid.

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**5,051,922**

## METHOD AND APPARATUS FOR THE MEASUREMENT OF GAS/LIQUID FLOW

**Haluk Toral, 11 Delaware Mansions, Delaware Road, Maida Vale, London W.9., and Tarek Darwich, London, both of England, assignors to Haluk Toral, London, England**

**Filed Jul. 21, 1989, Ser. No. 382,980**
**Claims priority, application United Kingdom, Jul. 21, 1988, 8817348**
**Int. Cl.[5] G01F *1/74***
**U.S. Cl. 364—510** **14 Claims**

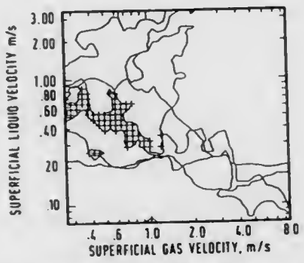
1. A method of determining flowrates of individual phases of a flowing multiphase medium, comprising the steps of:

monitoring an electrical output signal from a detector which produces said output signal in response to one or more flow-related characteristics of said flowing multiphase medium;

deriving from said output signal a plurality of derived parameters selected from amplitude parameters, frequency parameters, or both amplitude and frequency parameters;

comparing each of said derived parameters with a corresponding calibration map relating that derived parameter to a range of possible flowrates of component phases of said flowing multiphase medium; and,

determining as a measure of flowrates of component phases of said flowing multiphase medium, a unique flowrate, common to all of a plurality of calibration maps, which is uniquely related to said derived parameters, said unique




flowrate representing a flowrate of an individual phase of said flowing multiphase medium.

8. A method as claimed in claim 1 further including the following steps for obtaining a calibration map

(a) detecting a turbulence record of flow,

(b) reducing said turbulence record to a set of parameters by a mathematical model which characterize properties of said turbulence record in frequency and amplitude domains, and

(c) assembling a superficial velocity contour map of each parameter.

9. A method as claimed in claim 8 wherein said mathematical model in step (b) comprises a mathematical algorithm.

10. A method as claimed in claim 9 wherein said mathematical algorithm includes a speech-recognition-type algorithm.

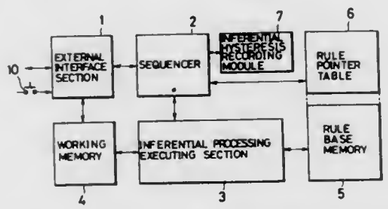
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**5,051,923**

## KNOWLEDGE INFERENTIAL PROCESSING APPARATUS

**Toshihiro Tsukagoshi, Itami, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Aug. 1, 1989, Ser. No. 388,564**
**Claims priority, application Japan, Aug. 8, 1988, 63-197331**
**Int. Cl.[5] G06F *15/46, 15/62***
**U.S. Cl. 364—513** **8 Claims**




1. A knowledge inferential processing apparatus comprising:

an external interface section for interfacing with an exterior having inputting means for inputting fact data;

a rule base memory for storing a plurality of rules under rule pointers, each rule having a premise condition and a conclusion to be executed if the premise condition is satisfied;

a rule pointer table for storing a rule pointer group indicative of a sequence for applying the rules within said rule base memory to said fact data;

a reading out section coupled to said rule base memory for sequentially reading out said rules from said rule base memory in accordance with said rule pointer group;

an inferential processing section coupled to said reading out section for judging whether or not said fact data match with the premise condition in each of the read out rules and executing the conclusion in each of the read out rules if the fact data match with the premise condition in each of the read out rules;

a sending out section coupled to said inferential processing section for sending out a rule pointer of a matched rule in which the fact data match with the premise condition therein;

an inferential hysteresis recording section coupled to said sending out section for recording a rule pointer of the matched rule in a matched sequence to allow a check of a history of an inference.



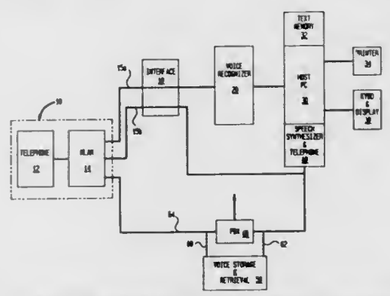
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**5,051,924**

## METHOD AND APPARATUS FOR THE GENERATION OF REPORTS

**Larry E. Bergeron, 72 Coventry La., Trumbull, Conn. 06611; David B. Chamberlin, 11 Hunter Ridge Rd., Monroe, Conn. 06468; Emil F. Jachmann, 34 Harbor View Pl., Stratford, Conn. 06497; Jy-Hong J. Su, 14 Hunters La., Norwalk, Conn. 06850, and Daniel F. Daly, 194 Barn Hill Rd., Monroe, Conn. 06468**

**Filed Mar. 31, 1988, Ser. No. 175,900**
**Int. Cl.[5] G10L *5/00***
**U.S. Cl. 364—513.5** **16 Claims**



1. Apparatus for generation of verbal reports comprising:

(a) input means for inputting voice signals;

(b) recognition means for recognizing predetermined ones of said input voice signals as trigger phrases;

(c) synthesis means for synthesizing speech signals from text messages and for outputting said synthesized speech signals;

(d) text memory means for storing predetermined text messages;

(e) storage and retrieval means for storing said synthesized speech signals for later retrieval of identified speech signals, by authorized users, from remote locations; and

(f) control means, connected to said recognition means, said synthesis means, and said text memory means, for:

(f1) responding to said trigger phrases to select particular ones of said text messages from said text memory means;

(f2) establishing a signal path between said synthesis means and said storage and retrieval means; and

(f3) inputting said selected text messages to said synthesis means and controlling said synthesis means to output synthesized speech signals corresponding to said input text messages for storage by said storage and retrieval means.

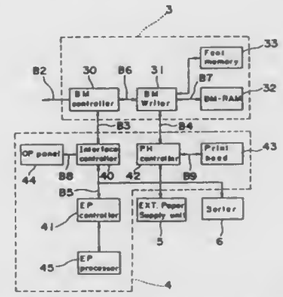
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**5,051,925**

## PRINTER FOR CONVERTING CHARACTER CODES INTO BIT IMAGES

**Takashi Kadono; Yoshikazu Ikenoue, and Takashi Morikawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Mar. 8, 1989, Ser. No. 320,572**
**Claims priority, application Japan, Mar. 9, 1988, 63-57270**
**Int. Cl.[5] G06F *15/20, 3/12***
**U.S. Cl. 364—519** **10 Claims**



1. A printer for converting character code data received from an external apparatus into bit images of a character corresponding to the received character code data using font data so as to print the bit images onto a printing paper, comprising:
- a communication means for receiving the character code data and the font data from said external apparatus;
- a font memory means for storing the font data, said font memory means including a first memory for which a refreshing operation is unnecessary, and a second memory for which a refreshing operation is necessary;
- a writing means for storing the font data received by said communication means into said second memory;
- a transfer means for transferring a set of font data to be used for printing from said second memory to said first memory;
- a converting means for converting character code data received by said communication means into bit images corresponding to the received character code data using the font data stored by said first memory; and
- a print means for printing the bit images converted by said converting means onto a printing paper.

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**5,051,926**

## SYSTEM WIDE LOCAL COPY MANAGEMENT OF SCREEN COPY PRINTING

**John D. Stevens, Endicott; Bruce M. Walk, Endwell, and John S. Wunder, Apalachin, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.**

**Filed Mar. 25, 1991, Ser. No. 674,006**
**Int. Cl.[5] G06K *15/00***
**U.S. Cl. 364—519** **7 Claims**

1. A computer system comprising:

a main processor,

an I/O processor,

a plurality of control units attached to said I/O processor,

a printer attached at least one of said control units,

a plurality of display stations attached to another of said control units,

means for reading a display station's screen data and for formatting said screen data into a print job and for routing the print job data to said printer, characterized by

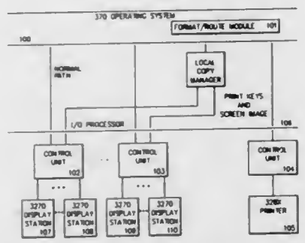
a local copy manager I/O processor microcode means for

emulating a display system, said local copy manager I/O microcode means including:

means for monitoring the activity of each display station coupled to said I/O processor, and

means for intercepting all print keys for each display computer system, and

means for capturing screen data for each terminal station, and



means for interrupting said system main processor with a request for print job service;

said local copy manager I/O microcode means maintaining a personal unique channel and device address with said main system processor, whereby terminal stations print screen requests are routed by said local copy manager I/O microcode means to the said printer.

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**5,051,927**

**IMAGE EDITING APPARATUS FOR TRANSFERRING A PARTIAL IMAGE FROM ONE LOCALE TO ANOTHER**

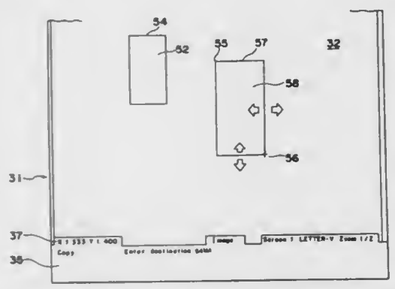
**Kaoru Tada, and Masamichi Sugiura, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Continuation of Ser. No. 163,867, Mar. 3, 1988, abandoned. This application Feb. 1, 1990, Ser. No. 472,406**

**Claims priority, application Japan, Mar. 3, 1987, 62-47923**

**Int. Cl.[5] G06F *15/62***

**U.S. Cl. 364—521** **20 Claims**



1. An image editing apparatus for performing an editing operation, comprising:

display means for displaying an image on a scope thereof,

means operably connected to said display means for editing the image displayed on the scope, said editing means including means for manually designating both first and second areas of the scope and means for transferring the image in the first area to the second area on the scope, and

means operably connected to said display means and said editing means for indicating on the scope numerical information regarding the editing operation by the editing means.

**5,051,928**

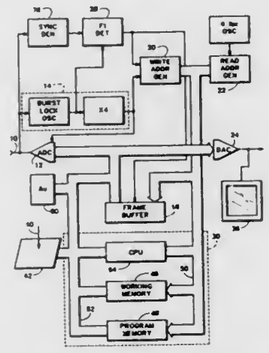
**COLOR CORRECTION FOR VIDEO GRAPHICS SYSTEM**

**Michael S. Gruters, East Moriches, N.Y., assignor to Dubner Computer Systems, Inc., Paramus, N.J.**

**Filed Dec. 28, 1987, Ser. No. 138,170**

**Int. Cl.[5] G06F *3/14***

**U.S. Cl. 364—521** **11 Claims**



1. A method for correcting the color of a target object within a color video picture having a plurality of picture elements comprising the steps of:

defining automatically from a specified variable physical area of the target object a region of color space which encompasses the range of colors of the target object; and

color correcting each picture element which lies within the defined region to a desired color,

and wherein the color correcting step comprises:

converting each picture element to corresponding digitized color parameters;

comparing each color parameter of each picture element with the range of colors of the defined region to determine if the picture element is within the defined region; and

changing a color parameter of each picture element determined to be within the defined region to achieve the desired color.

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**5,051,929**

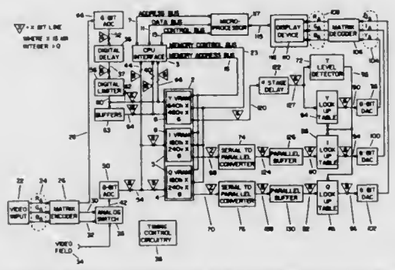
**ELECTRONIC MEMORY STATE REALLOCATION SYSTEM FOR IMPROVING THE RESOLUTION OF COLOR CODING VIDEO SYSTEMS**

**Timothy T. Tutt; Wayne D. Jung, both of Skokie, and Raphael K. Tam, Glenview, all of Ill., assignors to Interand Corporation, Chicago, Ill.**

**Filed Oct. 19, 1987, Ser. No. 109,951**

**Int. Cl.[5] G09G *1/28*; G06F *15/20***

**U.S. Cl. 364—521** **49 Claims**



1. An apparatus for inserting high resolution color graphic elements into a digitized color video image for display on a



display device, wherein the color video image is stored in a memory as luminance data and corresponding chrominance data, comprising:

(a) limiting means connected to the memory for limiting the luminance data stored in the memory to values less than or equal to a predetermined threshold value;

(b) memory writing means connected to the memory for selectively writing to the memory substitute luminance data for certain of the stored luminance data, wherein the values of the substitute luminance data are greater than the predetermined threshold value; and

(c) lookup table means connected to the memory for sequentially receiving from the memory the luminance data and corresponding chrominance data and for generating luminance data and corresponding chrominance data for display on the display device, wherein the luminance data and corresponding chrominance data generated by the lookup table means are equal to the luminance data and corresponding chrominance data received from the memory for luminance data received from the memory that are less than or equal to the predetermined threshold value and wherein the luminance data and corresponding chrominance data generated by the lookup table means are equal to luminance data and corresponding chrominance data representing high resolution color graphic elements for luminance data received from the memory that are greater than the predetermined threshold value.

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**5,051,930**

**METHOD AND APPARATUS FOR EDITING DOCUMENTS INCLUDING A PLURALITY OF DATA OF DIFFERENT TYPES**

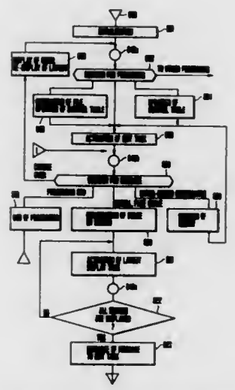
**Tadashi Kuwabara; Hiroyuki Koreeda; Naomichi Nonaka, and Keiichi Nakane, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Mar. 15, 1989, Ser. No. 323,808**

**Claims priority, application Japan, Mar. 16, 1988, 63-60337**

**Int. Cl.[5] G06F *3/14***

**U.S. Cl. 364—523** **13 Claims**



1. A computer aided document editing system comprising:

storage means for storing document data including various types of data which respectively correspond to different edition programs, said document data having a document structure including at least one document page and said at least one document page being partitioned into regions in accordance with at least one of said edition programs;

display means for displaying said document data as images in accordance with a display program;

management program executing means for executing a management program which manages addresses of said regions;

designating means for designating coordinates to be edited of said at least one document page, said at least one document page being displayed by said display means;

comparing means for comparing said designated coordinates with coordinates located within said partition regions of said at least one document page;

first determining means for determining a region of said at least one document page which includes said designated coordinates;

second determining means for determining a data type which can be accepted by said determined region by looking up a table indicating a relationship between the partitioned regions of said at least one document page and various data types;

third determining means for determining an edition program which corresponds to said determined data type by looking up a table indicating a relationship between the various data types and the edition programs;

starting means for starting up said determined edition program;

waiting means for waiting for a message from said determined edition program; and

repeating means for repeating the functions of said designating means, said comparing means, said first, second and third means, said starting means and said waiting means when said message from said determined edition program consists of coordinate data;

edition program executing means for executing said determined edition program;

display means for displaying a command corresponding to data to be edited by said determined edition program; and

checking means for checking inputted coordinates for producing a first message to provide information pertaining to said designated coordinates to be edited and for completing the method performed by said determined edition program when the inputted coordinates are outside a region including said designated coordinates to be edited;

display program executing means for executing said display program; and

message transfer means for transferring messages between said edition program executing means and said management program executing means, wherein said first message is transferred to said management program executing means and said management program executing means responds to reception of said first message by activating an edition program relevant to a region including the coordinates outside the region which includes the designated coordinates to be edited.

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**5,051,931**

**METHOD AND APPARATUS FOR EXERCISING THE EYES**

**Richard A. Cheu, Fair Haven, N.J.; Joel A. Dancyger, New York, and Glenn A. Seifert, South Hampton, both of N.Y., assignors to DynaVision, Inc., Red Bank, N.J.**

**Filed Jul. 25, 1989, Ser. No. 384,818**

**Int. Cl.[5] A61B *13/00***

**U.S. Cl. 364—550** **34 Claims**

**MICROFICHE APPENDIX INCLUDED**

**(58 Microfiche, 1 Pages)**

31. An interactive progressive method of exercising the eye muscles of a user of a computer connected to a computer display terminal having a screen, comprising the steps of:

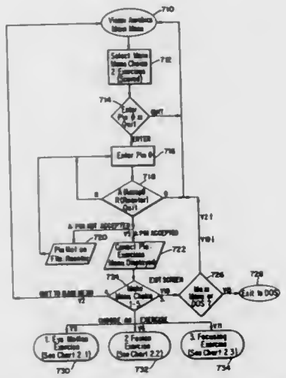
providing a plurality of choices of background on the screen of progressive difficulty such that require varying levels of eye concentration, for the eyes to perceive an object displayed against the background;

providing a plurality of choices of a given number of different objects to be projected against the background on the screen in the exercise;

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providing a plurality of choices of the length of time the objects will be displayed;
selecting a background, a given number of different objects, and length of time the objects are to be displayed from the pluralities of choices;
displaying a background on the screen corresponding to that selected from said plurality of background choices;
displaying on the screen one of a number of objects corresponding to that selected from said given number of different objects and for a length of time corresponding to that selected from said plurality of choices of the length of time the object will be displayed to require the eyes to concentrate to find the object against the background and to stimulate the eye muscles of the user to move the eyes to the location of the object on the screen;
removing the displayed object from the screen;
requesting a response corresponding to the object displayed on the screen within a first time period;
sensing any user response identifying the object perceived on the screen;
recording any identifying response to the user entered within the first time period;
comparing the identified object of the user sensed in the user response to the object displayed;
placing a first-colored lens over one eye and a second lens of a color different from the first-colored lens over the other eye;



displaying in a first stage of the exercise, a first object of the color of the first lens and a second object of the color of the second lens in a side-by-side relationship, partially overlapping each other on the computer screen, so that they appear as one object to the user to stimulate the eye muscles of the user to move the eyes to locate and view the overlapping objects as a single object;
providing a plurality of choices of speeds at which said first and second objects can be moved away from each other in the same horizontal plane;
selecting a speed from said plurality of choices of speed;
moving aid first and second objects away from each other in the same horizontal plane at a speed corresponding to the speed selected in said selecting stop, in response to a first signal initiated by the user while stimulating the eyes to continue to view the separating first and second objects as a single object;
halting movement of said first and second objects, in response to a second signal initiated by the user once the user can no longer reconcile said first and second objects into a single object;
displaying on the screen, in a second stage of the exercise, the first and the second object in a reverse side-by-side relationship to that initially displayed, partially overlapping each other, to stimulate the eye muscles of the user to move the eyes to locate and view said first and second objects as a single object;
moving said first and second objects away from each other in the same horizontal plane at a speed corresponding to the speed selected in said selecting step, in response to a third signal by the user while the eye muscles continue to view the object as a single object;
halting movement of said first and second objects in response to a fourth signal by the user, once the user can no longer reconcile the two objects into a single object;
displaying text on the screen for a first predetermined time interval to stimulate the eye muscles of the user to focus the eyes on the text on the screen;
removing the text from the screen;
directing the user to stimulate the eye muscles of the user to focus his eyes on an object at a second distance away from the screen sufficient to cause the user to refocus his eyes for a second pre-determined time interval;
providing an audio signal at the end of the second pre-determined time interval to direct the user to again view the screen to stimulate the muscles of the eyes of the user to refocus his eyes on the screen.

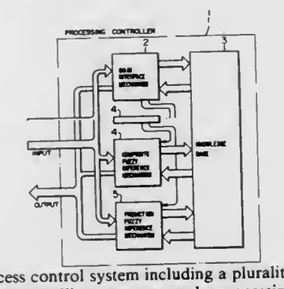
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**5,051,932**

## METHOD AND SYSTEM FOR PROCESS CONTROL WITH COMPLEX INFERENCE MECHANISM

**Haruki Inoue, Katsuta; Motohisa Funabashi, Sagamihara; Masakazu Yahiro, and Yoshiyuki Satoh, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan**

**Filed Mar. 24, 1989, Ser. No. 328,520**
**Claims priority, application Japan, Mar. 25, 1988, 63-69577**
**Int. Cl.[5] G06F** *15/00*
**U.S. Cl. 364—550** **6 Claims**




1. A process control system including a plurality of control effectors for controlling a process, and a processing device for operating and controlling said control effectors, said processing device comprising:
(a) a knowledge base storing predetermined membership functions and production rules based on empirical information;
(b) quantitative operation means for determining predicted values of states respectively for a plurality of control objective items by operating on input process information, based on a mathematical model identifying said process;
(c) first inference means for receiving said input process information as its input and for operating on predicted values of states of said plurality of control objective items, based on membership functions predetermined with fuzzy quantities for each input process information;
(d) second inference means, (i) supplied with said input process information, (ii) each predicted value obtained from said quantitative operation means and (iii) each predicted value obtained from said first inference mans as its inputs, for determining the behavior of said process, based on one of said production rules, by diagnosing whether or not the process exhibits a linear behavior, selecting a predicted value from said quantitative operation means when the determination result indicates a linear behavior and selecting a predicted value from said first inference means when the determination result does not indicate a linear behavior; and
(e) third inference means supplied with each predicted value selected by said second inference means, for operating on a satisfaction grade collectively evaluating said plurality of control objective items to thereby determine a combination of control quantities for said control effectors in which the satisfaction grade as a result of said operation is maximum, thereby providing at least one of (i) different types of control effectors and (ii) said plurality of control effectors with an optimal combination of control quantities depending on the behavior of the process.



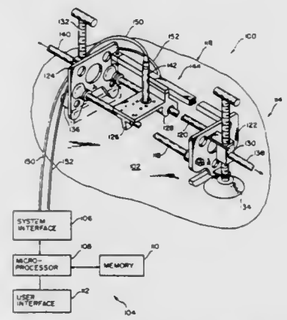
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**5,051,933**

## METHOD AND APPARATUS FOR MEASURING THE WAVINESS OF AN AERODYNAMIC SURFACE

**Dennis P. Sarr, Kent, and Joey J. H. Mullen, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Filed May 20, 1988, Ser. No. 196,502**
**Int. Cl.[5] G01B** *5/28*
**U.S. Cl. 364—551.01** **18 Claims**




16. Apparatus for measuring the waviness of an aerodynamic surface comprising:
sensor means for providing a plurality of data points at predetermined horizontal intervals wherein each data point represents the vertical deflection Z of the surface at the horizontal position where the data point was taken Z(n);
memory means for storing the plurality of data points such that each point can be identified with the horizontal position at which the point was taken; and
data processing means for processing the plurality of data points to identify each wave of the surface and thereafter to determine the waviness characteristics of the wave, said data processing means including means for defining tangent line segments by identifying each convex data point along the surface, identifying a plurality of adjacent convex data point sets wherein each set includes the set of convex data points which are also adjacent data points, defining a subject line segment as a line segment which intercepts two subject convex data points that are members of two subject sets of adjacent convex data points, determining whether each convex data point in the two subject sets of adjacent data points is below the subject line segment and, if so, identifying the subject line segment as a tangent line segment thereby to identify each wave that is tangent to the surface, said data processing means being further configured to record waviness characteristics of the waves in said memory means.

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**5,051,934**

## ANCILLARY ARRANGEMENT FOR INCLUSION IN A DISTANCE MEASURING INSTRUMENT

**Klas R. Wiklnnd, Täby, Sweden, assignor to Geotronics AB, Danderyd, Sweden**

**Filed Dec. 22, 1988, Ser. No. 288,161**
**Claims priority, application Sweden, Dec. 22, 1987, 8705123**
**Int. Cl.[5] G06F** *15/20*
**U.S. Cl. 364—561** **11 Claims**




1. An ancillary arrangement for application with a distance measuring instrument means when setting out boundary marks, the distance measuring instrument being of a type which includes an electronic distance meter, a vertical angle meter (18) and a horizontal angle meter (19), a signal processing and computing unit (16, 16') which computes a position of a measuring reflector (12) in relation to the instrument, and input means (17) for input of the desired boundary settings of an area of ground into a memory location of a memory store in said computing unit prior to setting out said boundary, wherein the distance measuring instrument is adapted to be held directed towards the reflector and to carry out repeated measurements thereon; wherein the computing unit (16) is constructed to ascertain with each measuring operation whether measuring data obtained coincides or deviates from setting-out data within a predetermined acceptable tolerance range, and when deviation is observed to compute the direction or directions in which the reflector must be moved in order to be positioned in a location determined by said setting-out data and to provide movement direction signals; and comprising an indicator which is steered by said movement direction signals produced by the computing unit so as to produce continuously on the basis of said signals a clearly discernible indication of a code which can be readily understood during a working procedure by a person placed adjacent the reflector and which indicates whether the position of the reflector is to be moved, and if so, in which direction.

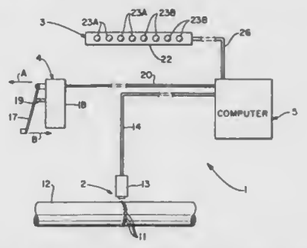
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**5,051,935**

## DRAG RACE ANALYZER

**Richard D. Matty, 16078 Fulton Rd., Marshallville, Ohio 44645**

**Filed May 25, 1989, Ser. No. 356,845**
**Int. Cl.[5] G01C** *22/00;* **G06F** *15/50*
**U.S. Cl. 364—569** **7 Claims**




1. An apparatus for automatically and continuously projecting an elapsed time in which a vehicle traveling over a course of a certain distance will complete the course, and for continuously displaying to a driver of the vehicle during a race a

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difference between the projected elapsed time and a predicted time for the vehicle to complete the course, so that the driver can adjust a speed of the vehicle accordingly for approximating the predicted time, said apparatus including:

a) measurement means for measuring the distance traveled by the vehicle over the course;

b) indicator means for indicating a difference between the projected elapsed time and the predicted time;

c) a motion switch comprising an actuating arm for actuating a limit switch plunger when the vehicle moves in a forward direction; and

d) a computer electrically connected to the measurement means, the indicator means and the motion switch, whereby the actuation of the limit switch plunger of said motion switch sends an electrical signal to the computer for automatically actuating the computer upon movement of the vehicle in a forward direction, and wherein said actuated computer collects distance data from the measurement means and correlates said distance data to predetermined time intervals, continuously compares said distance and time data to predicted distance and time data previously stored in a calibration table in the computer based on a trial run of the vehicle over the course, to generate the projected elapsed time for the vehicle to complete the course, and further continuously calculates a difference between the projected elapsed time and the predicted time, so that said difference is indicated to the driver of the vehicle by the indicator means.

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**5,051,936**

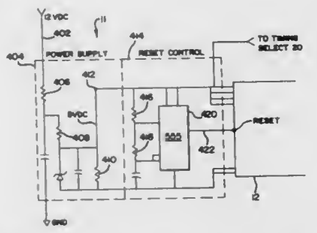
## MICROPROCESSOR-BASED CONTROLLER WITH SYNCHRONOUS RESET

**Henry A. Gleason, III, Johnson Creek, and J. Scott Jamieson, Watertown, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.**

**Continuation-in-part of Ser. No. 135,418, Dec. 21, 1987, Pat. No. 4,931,975. This application Oct. 31, 1989, Ser. No. 429,708**

**Int. Cl.[5] G06F** *15/20*

**U.S. Cl. 364—570** **3 Claims**




1. An apparatus for controlling a process comprising:

a processing means for processing information, said processing means having an input means for receiving an input signal and an output means for providing an output signal, said input signal conveying information about said process, said output signal controlling at least one parameter related to said process; and

reset means for applying a reset signal to a reset terminal of said processing means, said reset means receiving a substantially constant supply signal, said reset means being responsive to reception of said supply signal to generate said reset signal, said reset signal having succeeding repetitive first and second signal levels;

said processing means being responsive to said reset signal to assume an active state when said reset signal is at said first signal level and to assume an inactive state when said reset signal is at said second signal level, said processing means executing succeeding portions of a program employing said input signal program in synchrony with succeeding first signal levels of said reset signal to generate said output signal, thereby controlling said process.

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**5,051,937**

## LOW COST HIGH PRECISION SENSOR

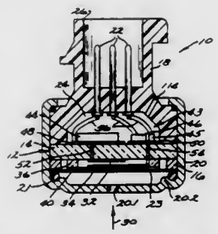
**Keith W. Kawate, Attleboro Falls, Mass., and Anthony J. Sabetti, Greenville, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 432,024, Nov. 6, 1989, Pat. No. 4,982,351, which is a continuation of Ser. No. 859,561, May 5, 1986, abandoned. This application Dec. 3, 1990, Ser. No. 621,000**

**The portion of the term of this patent subsequent to Jan. 1, 2008, has been disclaimed.**

**Int. Cl.[5] G06F** *15/20;* **G01L** *9/12*

**U.S. Cl. 364—571.01** **1 Claim**



1. A low-cost high-precision sensor comprising a separate condition-responsive means including a condition-responsive element movable in response to occurrence of selected conditions in a zone to be monitored for providing initial electrical signals, a separate integrated circuit signal-conditioning means for conditioning the initial electrical signals to provide electrical output signals for performing control functions, and a common support means mounting the separate condition-responsive means and signal-conditioning means together and means mounted on the support for calibrating the sensor, the condition-responsive means being mounted on a support for providing initial electrical signals in response to the occurrence of selected conditions in the zone to be monitored, the signal-conditioning means being mounted on the support to respond to said initial electrical signals for providing electrical output signals from the sensor, and the calibration means being mounted on the support and electrically actuable after mounting on the common support to adjust the conditioning-responsive means and signal-conditioning means on the common support relative to each other after mounting on the support for calibrating the sensor to provide said output signals to perform said control functions in precise response to occurrence of said selected conditions.

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**5,051,938**

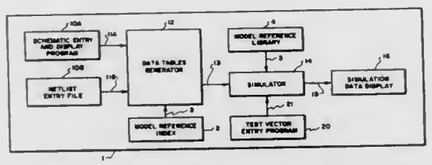
## SIMULATION OF SELECTED LOGIC CIRCUIT DESIGNS

**Stanley M. Hyduke, 3525 Old Conejo Rd., Ste. #111, Newbury Park, Calif. 91320**

**Filed Jun. 23, 1989, Ser. No. 370,896**

**Int. Cl.[5] G06G** *7/48;* **G06F** *11/00*

**U.S. Cl. 364—578** **17 Claims**




1. A logic circuit design simulation system comprising;

data table generating means for generating incrementally modifiable design elements table and incrementally modifiable connectivity table;

logic circuit design entry means for entering logic circuit design data into said data table generating means;

integrated circuit model input means for entering integrated circuit model data into said data table generating means;

simulating means including;

test vector signal entry means for entering test vectors;

design simulation program generating means for generating an executable design simulation program from said modifiable design elements table, said modifiable connectivity table and selected test vectors entered into said simulating means; and

executing means for executing said design simulation program;

whereby one or more selected values in either or both of said modifiable design elements table and said modifiable connectivity table may be incrementally modified with logic circuit design data for quick simulation of a logic circuit design.



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**5,051,939**

## VECTOR DATA RETRIEVAL APPARATUS

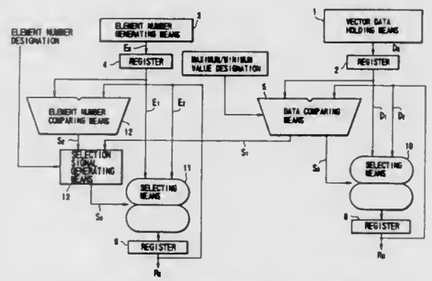
**Toshihiko Nakamura, Koufu, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 19, 1990, Ser. No. 540,239**

**Claims priority, application Japan, Jun. 19, 1989, 1-154708**

**Int. Cl.[5] G06F** *7/38*

**U.S. Cl. 364—715.06** **1 Claim**




1. A vector data retrieval apparatus comprising:

a first register in which vector data to be retrieved are sequentially set;

a second register in which element numbers corresponding to the vector data set in said first register are sequentially set;

a third register in which selected vector data is set;

a fourth register in which a selected element number is set;

first selecting means for receiving the data set in said first and third registers, outputting one of the selected data in accordance with a selection signal, and setting the output data in said third register;

data comparing means for comparing the data set in said first and third registers with each other, outputting a selection signal for causing said first selecting means to select data having a larger value when maximum value retrieval is designated, and outputting a selection signal for causing said first selecting means to select data having a smaller value when minimum value retrieval is designated, while outputting a comparison data signal representing a comparison state of the respective data;

second selecting means for receiving the element numbers set in said second and fourth registers, outputting one of the selected element numbers in accordance with a selection signal, and setting the output element number in said fourth register;

element number comparing means for comparing the element numbers set in said second and fourth registers with each other, and outputting a comparison data signal representing a relationship in magnitude between values of the element numbers; and

selection signal generating means for receiving the comparison data signal from said data comparing means and said element number comparing means, outputting a selection signal for causing said second selecting means to select an element number corresponding to data selected by said first selecting means when the respective data compared by said data comparing means are not equal in value, and, when the respective data compared by said data comparing means are equal in value, outputting a selection signal for causing said second selecting means to select an element number having a larger value if largest element number designation is performed, and outputting a selection signal for causing said second selecting means to select an element number having a smaller value if smallest element number designation is performed.

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**5,051,940**

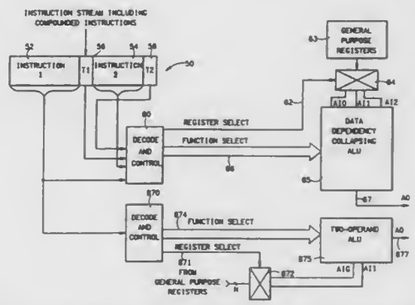
## DATA DEPENDENCY COLLAPSING HARDWARE APPARATUS

**Stamatis Vassiliadis, Vestal; James E. Phillips, Binghamton, and Bartholomew Blaner, Newark Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 4, 1990, Ser. No. 504,910**

**Int. Cl.[5] G06F** *7/38*

**U.S. Cl. 364—736** **24 Claims**




1. In a computer architected for serial execution of a sequence of single scalar instructions in a succession of execution cycles, an apparatus for supporting parallel execution of a plurality of scalar instructions in a single execution cycle, the apparatus comprising:

an instruction means for receiving a plurality of scalar instructions, a first of the scalar instructions producing a result used as an operand by a second of the scalar instructions;

an operand means for substantially simultaneously providing a plurality of operands, at least two of said operands being used by the first and second scalar instructions;

a control means connected to the instruction means for generating control signals to indicate operations which execute the plurality of scalar instructions; and

an execution means connected to the operand means and to the control means and responsive to the control signals and to a plurality of operands including the two operands for producing, in a single execution cycle, a single result corresponding to the performance of said operations on said plurality of operands.

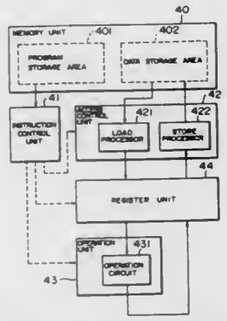
VOL 1130 ISS 4 SE 24 1991 UMI



## 5,051,941
## METHOD AND APPARATUS FOR LOGICAL SIMULATION

Yoshio Takamine, Kokubunji; Shunsuke Miyamoto; Takayuki Nakagawa, both of Tokyo; Yoshiharu Kazama, and Yoshiaki Kinoshita, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 101,023, Sep. 25, 1987, abandoned. This application Feb. 12, 1990, Ser. No. 478,511
Claims priority, application Japan, Sep. 26, 1986, 61-225937
Int. Cl.[5] G06F *15/20, 9/44*
U.S. Cl. 364—578 14 Claims




8. A simulation system for simulating operation of a logic circuit which includes a plurality of circuit elements, comprising:

memory means for storing a logic table which includes a plurality of records, wherein conversion elements are correspondingly associated with circuit elements of a predetermined type to connect input signal values to be inputted to a circuit element of a predetermined type by an associated conversion element into output signal values which are inputted to said circuit element of said predetermined type as said input signal values, each record corresponding to one of said plurality of circuit elements or one of said conversion elements, each record including information representing operation results of a corresponding circuit element or a corresponding conversion element and associating said each record with other records to represent in said logic table the connections of said circuit elements and said conversion elements; and

simulation means for referring to said plurality of records in accordance with said connections for simulation of the operation of said logic circuit, said simulation means including producing means for producing output signal values of a conversion element associated with a predetermined type of circuit element when a record being referred to corresponds to said predetermined type of circuit element and when input signal values to be inputted to said circuit element of said predetermined type are clock signals.

## 5,051,942
## METHOD AND APPARATUS FOR CALCULATING FILTER FACTORS

Masaharu Matsumoto; Seiichi Ishikawa, and Katsuaki Satoh, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 15, 1988, Ser. No. 285,606
Claims priority, application Japan, Dec. 18, 1987, 62-322436
Int. Cl.[5] G06F *15/31*
U.S. Cl. 364—724.01 10 Claims

1. A filter factor calculator for a FIR digital filter receiving an audio signal from an audio signal producing device, comprising:

first transfer function means for calculating a first transfer function from an amplitude characteristic and a phase characteristic set therein;

means for setting a desired phase characteristic in the first transfer function means;

first inverse Fourier transform means for performing first inverse Fourier transform of the first transfer function;

means for forcedly setting an imaginary part of a result of the first inverse Fourier transform to zero and thereby converting the result of the first inverse Fourier transform into a first converted result;

first Fourier transform means for converting Fourier transform of the first converted result;

means for calculating an amplitude value from a result of the Fourier transform;

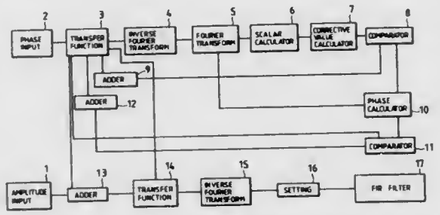
means for calculating an amplitude corrective value from the calculated amplitude value;

means for comparing the amplitude corrective value with a first reference;

means for, when the amplitude corrective value is greater than the first reference, adding the amplitude corrective value to an amplitude value of the amplitude characteristic set in the first transfer function means and thereby deriving a corrective amplitude characteristic;

means for setting the corrective amplitude characteristic in the first transfer function means in place of the previously set amplitude characteristic;

means for calculating a phase characteristic from the result of the Fourier transform;




means for calculating a difference between the calculated phase characteristic and the phase characteristic set in the first transfer function means;

means for comparing the phase difference with a second reference;

means for, when the phase difference is greater than the second reference, adding the phase difference to the phase characteristic set in the first transfer function means and thereby deriving a corrective phase characteristic;

means for setting the corrective phase characteristic in the first transfer function means in place of the previously set phase characteristic;

means for setting a primary desired amplitude characteristic;

means for correcting the primary desired amplitude characteristic in accordance with the corrective amplitude characteristic and thereby deriving a final desired amplitude characteristic;

second transfer function means for calculating a second transfer function from the final desired amplitude characteristic and the corrective phase characteristic;

second inverse Fourier transform means for performing second inverse Fourier transform of the second transfer function;

means for calculating filter factors from a real part of result of the second inverse Fourier transform; and

means for setting the calculated filter factors in the FIR filter;

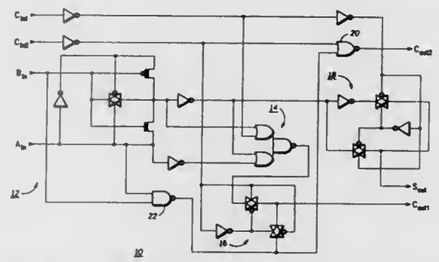
said FIR filter changing characteristics of said received audio signal in accordance with said calculated filter factors.



## 5,051,943
## ADDER CIRCUIT WITH AN ENCODED CARRY

J. Greg Viot; James L. Broseghini; Eytan Hartung, and John P. Dunn, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1990, Ser. No. 622,078
Int. Cl.[5] G06F *7/50*
U.S. Cl. 364—786 15 Claims




1. An encoded carry input adder circuit, comprising:

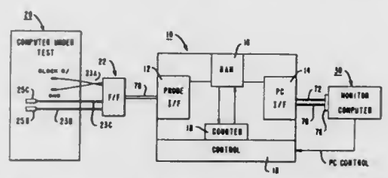
first logic means having a first input for receiving a first input signal, and a second input for receiving a second input signal, the first logic means providing an output by performing a predetermined logic function on the first and second inputs; and

second logic means coupled to the output of the first logic means and receiving both a third input signal and a fourth input signal, the fourth input signal being selectively weighted to have a different value from the first, second and third input signals, the adder circuit providing an output sum of the first, second and third input signals in response to the fourth input signal having a first logic value and being weighted to have a first predetermined value, and provides a summation of the first and second input signals with the fourth input signal which is weighted to have a second predetermined value when the fourth input signal has a second logic value.

## 5,051,944
## COMPUTER ADDRESS ANALYZER HAVING A COUNTER AND MEMORY LOCATIONS EACH STORING COUNT VALUE INDICATING OCCURRENCE OF CORRESPONDING MEMORY ADDRESS

David T. Fetterolf; John R. Kim, and Clifford A. Lindroth, Jr., all of San Diego, Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 17, 1986, Ser. No. 853,259
Int. Cl.[5] G06F *11/34*
U.S. Cl. 364—900 12 Claims




1. A computer address analyzer for determining the thoroughness of a computer testing procedure comprising:

a probe means coupled to an address bus of a computer under test for receiving and holding the address signals appearing on the address bus;

an addressable memory means having a memory location for each valid address respectively that will appear on the address bus of the computer under test connected to said probe means, each memory location accessibly storing signals indicative of a count;

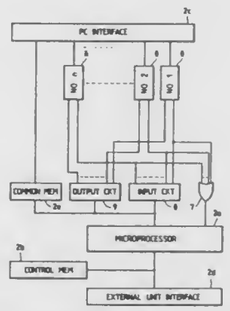
a counter mans coupled to said addressable memory means for receiving the count stored in a memory location each time said memory location is addressed by the computer under test and for incrementing said count by one and for returning the incremented count back to the same memory location; and

a means coupled to said addressable memory means, for reading out of said addressable memory means the count stored in each memory location for determining the magnitude of the count corresponding to the address signals received by each memory location respectively.

## 5,051,945
## SPECIAL FUNCTION UNIT WITH INTERRUPT LATCHES FOR PROGRAMMABLE CONTROLLER

Takehiko Hayashi, Aichi, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

Filed Mar. 29, 1989, Ser. No. 330,321
Claims priority, application Japan, Mar. 29, 1988, 63-75042
Int. Cl.[5] G06F *9/00*
U.S. Cl. 364—900 5 Claims




1. A special function unit for a programmable controller, which controls external equipments in response to at least one controller output signal from said programmable controller, said special function unit comprising:

plural flip-flop means, each for latching a respective one of said controller output signals from said programmable controller and providing a respective latch output signal;

OR circuit means for generating an interruption input signal in response to each of said latch output signals from said flip-flop means;

an input circuit for distinquishing among said controller output signals latched in said flip-flop means;

an output circuit for resetting said flip-flop means;

a microprocessor for performing an interruption processing according to said interruption input signal and an output of said input circuit in order to control said external equipments through an external equipment interface, and after the interruption processing, said microprocessor generating a reset control signal to said output circuit to reset said flip-flop means.

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5,051,946

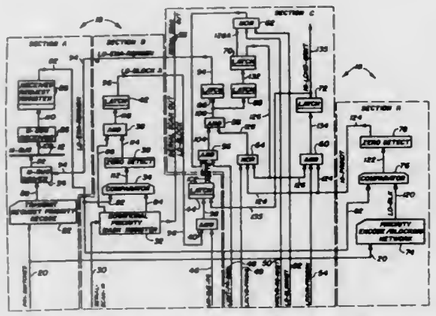
## INTEGRATED SCANNABLE ROTATIONAL PRIORITY NETWORK APPARATUS

**Ladislaw D. Cubranich, Lansdale, and Inder Singh, Audubon, both of Pa., assignors to Unisys Corporation, Blue Bell, Pa.**

**Continuation-in-part of Ser. No. 882,118, Jul. 3, 1986. This application Sep. 13, 1988, Ser. No. 244,189**

**Int. Cl.**[5] **G06F** *13/368*

**U.S. Cl. 364—900** **10 Claims**



1. An integrated priority network for a bus architecture computing system, comprising:

a main M-Bus,

a plurality of functional elements connected to said M-Bus for transmitting data to and for receiving data from said M-Bus,

means for raising a priority request for access to said M-Bus in each said functional element,

a plurality of integrated priority resolution network (IPRN) units, one said unit being associated with each functional element and being coupled to receive priority requests from the functional elements on the M-Bus and for generating a request granted signal to its associated functional element,

each said network unit comprising a rotational priority circuit and a pre-emptive priority circuit connected in parallel and operable to receive said priority requests independently in an integrated priority network so that either circuit may generate said request granted signal, and

logic means in each said rotational priority circuit of said network units for determining when its associated IPRN unit will grant its associated functional element's request for access to said M-Bus and if granted for blocking future requests by its associated function element from being transmitted to said M-Bus until all other pending priority requests in the rotational priority circuit are granted.

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5,051,947

## HIGH-SPEED SINGLE-PASS TEXTUAL SEARCH PROCESSOR FOR LOCATING EXACT AND INEXACT MATCHES OF A SEARCH PATTERN IN A TEXTUAL STREAM

**Charles H. Messenger, and Robert E. Heiss, Jr., both of Redondo Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.**

**Filed Dec. 10, 1985, Ser. No. 807,903**

**The portion of the term of this patent subsequent to Jul. 26, 2005, has been disclaimed.**

**Int. Cl.**[5] **G06F** *15/40*

**U.S. Cl. 364—900** **38 Claims**

1. A special-purpose search processor, comprising:

a plurality of serially-connected cells, each cell including

a pattern register for storing a character of a pattern to be searched for,

a character register for storing a character of a data stream to be searched,

match logic, including a comparator for generating a cell match signal by comparing the character stored in the character register with the character stored in the pattern register, and

a match register for storing a match value indicative of a match between a search pattern and the data stream, and for registering any mismatch indicated by the cell match signal;

means for connecting the character registers of the plurality of cells serially together to form a character line;

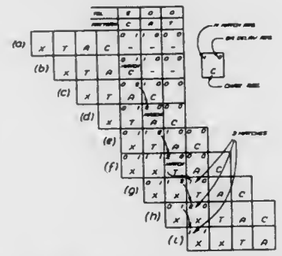
means for connecting the match registers of the plurality of cells serially together to form a match line;

means for initializing the cells to contain the search pattern; and

clock means for gating the data stream from cell to cell through the character line such that the search pattern and the data stream are oppositely oriented, and a first character of the search pattern is first encountered by a first character in the data stream;

and wherein characters in the search pattern are compared with characters in the data stream in a sequential manner, and match values are propagated along the match line in synchronism with movement of the data stream along the character line, to indicate exact and inexact matches between the search pattern and strings of characters in the data stream, and wherein inexact matches involve incorrect, missing or extra characters;

and wherein the match logic includes



means for loading a tolerance value onto the match line, at a selected cell position in the search pattern, for transmission onto the match line as an initial match value,

a delay match register connected to receive input from the match register and to provide output on the match line to a next cell in series, wherein the presence of the delay match register synchronizes movement of match values from cell to cell with movement of the data stream through successive potentially matching positions with respect to the search pattern,

means interposed between the match register and the delay match register, for selectively decrementing the match value as it is transmitted to the delay match register, whenever a non-match is detected in a cell, wherein presence of a non-zero match value on the match line is indicative of a match,

means for detecting missing characters in the data stream and adjusting the match value to record a degree of mismatch with the search pattern, wherein the means for detecting missing characters generates a first alternate match value based on an assumption that a character is missing from the data stream, and discards the first alternate match if the original match value is greater, and

means for detecting extra characters in the data stream and adjusting the match value to record a degree of mismatch with the search pattern, wherein the means for detecting extra characters generates a second alternate match value based on an assumption that there is an extra character in the data stream, and discards the second alternate match if the original match value is greater.



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5,051,948

## CONTENT ADDRESSABLE MEMORY DEVICE

**Kiyoto Watabe; Hirofumi Shinohara; Takahisa Eimori; Hideaki Arima; Natsuo Ajika; Yuichi Nakashima, and Shinichi Satoh, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

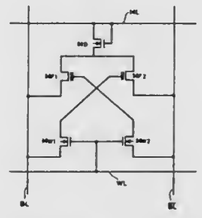
**PCT No. PCT/JP89/00179, § 371 Date Oct. 20, 1989, § 102(e) Date Oct. 20, 1989, PCT Pub. No. WO89/08314, PCT Pub. Date Sep. 8, 1989**

**PCT Filed Feb. 22, 1989, Ser. No. 434,692**

**Claims priority, application Japan, Feb. 23, 1988, 63-40009; Feb. 23, 1988, 63-40011; Feb. 23, 1988, 63-40012; Jun. 13, 1988, 63-145176; Feb. 15, 1989, 1-35428**

**Int. Cl.**[5] **G11C** *15/00*

**U.S. Cl. 365—49** **21 Claims**



1. A content addressable memory cell including:

a first insulated gate field effect transistor having a first conducting terminal connected to a first bit line of a bit line pair, a control terminal connected to a word line, and a second conducting terminal,

a second insulated gate field effect transistor having a first conducting terminal connected to a second bit line of said bit line pair, a control terminal connected to the word line, and a second conducting terminal,

a first non-volatile memory transistor having a first conducting terminal connected to said first bit line, a control terminal connected to said second conducting terminal of said second insulated gate field effect transistor, and a second conducting terminal,

a second non-volatile memory transistor having a first conducting terminal connected to said second bit line, a control terminal connected to said second conducting terminal of said first insulated gate field effect transistor, and a second conducting terminal, and

a third insulated gate field effect transistor having a first conducting terminal commonly connected to respective said second conducting terminals of said first and second non-volatile memory transistors, and a control terminal and a second conducting terminal commonly connected to a match line.

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5,051,949

## CONTENT ADDRESSABLE MEMORY DEVICE

**William R. Young, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.**

**Filed Nov. 15, 1989, Ser. No. 437,472**

**Int. Cl.**[5] **G11C** *15/04*

**U.S. Cl. 365—49** **40 Claims**

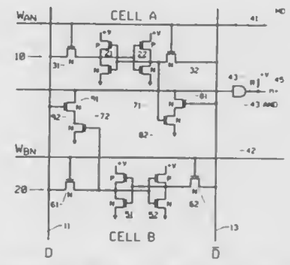
12. A content addressable memory device comprising:

first and second complementary bit lines by way of which complementary bit values are applied to said memory device;

first and second word enable lines;

an output line;

first and second multibit memory cells, respectively coupled to said first and second word enable lines and to each of said bit lines, for controllably storing complementary bits that have been placed on said bit lines in accordance with first and second word enable signals applied to said first and second word enable lines, respectively; and



means, coupled to said first and second memory cells, to each of said bit lines and to said output line, for controllably coupling a prescribed potential to said output line in accordance with the contents of said first and second memory cells and the complementary bits applied to said bit lines.

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5,051,950

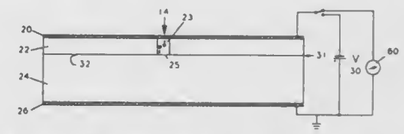
## READ/WRITE OPTICAL MEMORY

**Joseph T. Evans, Jr., and Jeff A. Bullington, both of Albuquerque, N. Mex., assignors to Radiant Technologies, Albuquerque, N. Mex.**

**Filed Jul. 31, 1989, Ser. No. 387,938**

**Int. Cl.**[5] **G11C** *11/22, 11/42*

**U.S. Cl. 365—109** **10 Claims**



1. A read/write optical memory comprising

storage means comprising a substantially planar layer of ferroelectric material, said ferroelectric material having first and second polarization states in the same phase thereof, said first polarization state resulting from the application of a first electric field to said ferroelectric material and said second polarization state resulting from the application of a second electric field to said ferroelectric material, the magnitude of the polarization of said ferroelectric material in said first state being different from the magnitude of the polarization of said ferroelectric material in said second state;

optical addressing means comprising a substantially planar layer of optically active material bonded to said layer of ferroelectric material, said optically active material conducting electricity in the presence of light having a wavelength less than a first predetermined wave length and substantially being an electrical insulator in the absence of said light, the dielectric constant of said material being substantially less than that of said ferroelectric material;

top electrode means comprising a conducting coating bonded to the surface of said layer of optically active material on the surface thereof which is not bonded to said ferroelectric material;

bottom electrode means comprising a conducting coating bonded to the surface of said layer of ferroelectric material on the surface thereof which is not bonded to said

optically active material, wherein at least one of said top and bottom electrodes is transparent to light of said first predetermined wavelength;

means for directing a light beam of said first predetermined wavelength to a localized area on said optical addressing means; and

means for applying first and second potential differences between said top and bottom electrodes, said first potential difference being of a magnitude and direction such that said first potential difference would generate said first electric field in said layer of ferroelectric material if applied across said layer of ferroelectric material and said second potential difference being of a magnitude and direction such that said second potential difference would generate said second electric field in said layer of ferroelectric material if applied across said layer of ferroelectric material.

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**5,051,951**

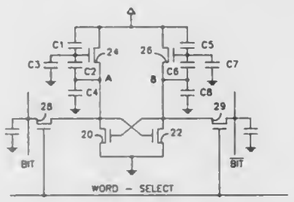
## STATIC RAM MEMORY CELL USING N-CHANNEL MOS TRANSISTORS

**Wojciech Maly, and Pranab K. Nag, both of Pittsburgh, Pa., assignors to Carnegie Mellon University, Pittsburgh, Pa.**

**Continuation of Ser. No. 431,756, Nov. 6, 1989, abandoned. This application Feb. 8, 1991, Ser. No. 653,859**

**Int. Cl.[5] G11C *11/412, 11/24***

**U.S. Cl. 365—150** **6 Claims**




1. A static memory cell comprising

first and second MOS transistors each having a source, a drain, and a control gate,

third and fourth MOS transistors each having a source, a drain, and a control gate, the control gates of said third and fourth MOS transistors having no galvanic connections, said third and fourth transistors each having control gate capacitances associated with said source, said drain, and one of said voltage storing potentials, the gate-source capacitance being larger than the gate-drain capacitance, said capacitances storing electrical charge for determining the conductance of said third and fourth transistors,

means serially connecting said first and third MOS transistors serially between two voltage potentials with said first and third transistors having a first common node,

means serially connecting said second and fourth MOS transistors serially between said two voltage potentials with said second and fourth MOS transistors having a second common node,

means connecting said first common node to said control gate of said second transistor,

means connecting said second common node to said control gate of said first transistor,

first and second bit lines,

a fifth MOS transistor having a source, a drain, and a control gate connecting said first bit line to said first common node,

a sixth MOS transistor having a source, a drain, and a gate connecting said second bit line to said second common node, and

a word select line connected to said control gates of said fifth and sixth transistors.

**5,051,952**

## SEMICONDUCTOR MEMORY DEVICE HAVING CAPACITORS THROUGH WHICH DATA READ/WRITE IS CARRIED OUT

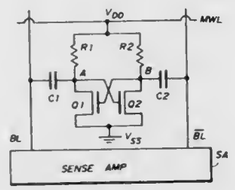
**Hiroshi Gotou, Niiza, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Sep. 25, 1990, Ser. No. 588,629**

**Claims priority, application Japan, Sep. 29, 1989, 1-252072**

**Int. Cl.[5] G11C *11/40***

**U.S. Cl. 365—154** **29 Claims**




18. A semiconductor memory device comprising:

a plurality of memory cells each having first and second nodes and divided into a plurality of groups, each of said groups including a predetermined number of said memory cells;

a pair of main bit lines coupled to said memory cells;

a plurality of first power lines which are respectively coupled to said memory cells for supplying a first power source voltage;

a plurality of second power lines which are respectively coupled to said memory cells for supplying a second power source voltage;

a plurality of sub bit line pairs respectively connected to said memory cells, each of said sub bit line pairs being connected to a corresponding one of said groups;

a plurality of sub word lines provided in correspondence with said groups; and

transfer gate means coupled to said sub word lines for connecting one of said sub bit line pairs to said main bit lines responsive to signals on said sub word lines,

each of said memory cells including a first transistor connected between one first power line and said first node, a second transistor connected between said first node and one second power line, a third transistor connected between said one first power line and said second node, a fourth transistor connected between said second node and said one second power line, a first capacitor connected between one of said bit lines and said first node, and a second capacitor connected between the other of said bit lines and said second node,

said second transistor having a gate which is connected to said second node,

said fourth transistor having a gate which is connected to said first node,

one of said one first power line and said one second power line being used in common as a main word line.

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**5,051,953**

## EEPROM DEVICE INCLUDING READ, WRITE, AND ERASE VOLTAGE SWITCHING CIRCUITS

**Shooji Kitazawa, and Takashi Ono, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 205,093, Jun. 10, 1988, abandoned. This application Dec. 18, 1989, Ser. No. 453,073**

**Claims priority, application Japan, Jun. 11, 1987, 62-144033**

**Int. Cl.[5] G11C *16/06***

**U.S. Cl. 365—185** **7 Claims**

1. An electrically erasable programmable read only memory device comprising:

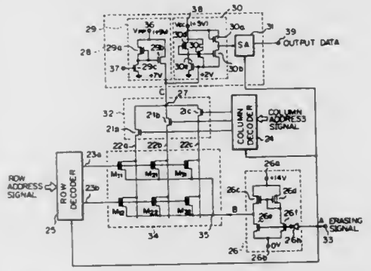
(a) a semiconductor substrate;



(b) a memory matrix array formed on said semiconductor substrate, comprising a plurality of MOS memory elements, each having a floating gate, and a plurality of word lines arranged in rows and a plurality of data lines arranged in columns, each of said word lines being associated with a plurality of MOS memory elements, and each of said data lines being associated with a plurality of MOS memory elements, and each of said MOS memory elements having a control gate electrode connected to an associated word line, a first region connected to an associated data line and a second region connected to a third line;

(c) a word line decoder connected to said plurality of word lines for selecting one of said word lines and for applying a first voltage to the control gate electrode of a selected MOS memory element connected to the selected word lines during an erasing operation;

(d) a switching circuit connected to said data lines for providing a second voltage to a selected one of said data lines to generate an avalanche current which flows from a first region of the selected MOS memory element toward said substrate, thus performing an erasing operation by neutralizing electric charges of a floating gate of the selected MOS memory element, said second voltage being slightly smaller than a breakdown voltage of the selected MOS memory element;




(e) a reading and writing circuit connected to said switching circuit for providing said second voltage to said switching circuit; and

(f) a means connected to said third line for providing a third voltage to said second region of said selected MOS memory element which is higher than a substrate voltage generated due to the avalanche current flowing from the first region of said selected MOS memory element toward said substrate so as to suppress a breakdown effect of said selected MOS memory element during an erasing operation.

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**5,051,954**

## SEMICONDUCTOR MEMORY DEVICE

**Haruki Toda, Yokohama; Shigeo Ohshima, Tokyo, and Tatsuo Ikawa, Mitaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Sep. 11, 1989, Ser. No. 406,420**

**Claims priority, application Japan, Sep. 13, 1988, 63-229409**

**Int. Cl.[5] G11C *7/00***

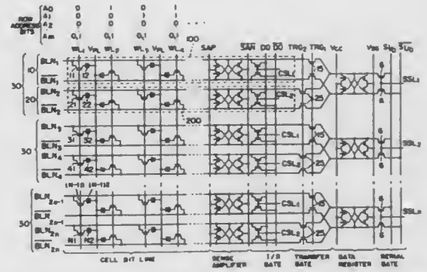
**U.S. Cl. 365—189.02** **18 Claims**

1. A dynamic address multiplexed semiconductor memory deice, accessed by multiplexed row and column addresses, said memory device comprising:

a plurality of memory cell blocks in a row direction, each of said blocks having n memory cell columns, where n is a positive integer greater than or equal to 2, each of said memory cell columns having a plurality of memory cells in a column direction and a sense amplifier to sense data stored in a selected memory cell, wherein

each of said memory cell rows is selected by row addresses, each of said memory cell rows having a plurality of said memory cells in said row direction,

n memory cell columns in the same memory cell block are selected by column addresses, and



each of said memory cell blocks includes first gate means for selecting one of said n memory cells selected by said row and column addresses to enable data transfer to and from said selected memory cell such that said first gate means operates after operation of said sense amplifier.

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**5,051,955**

## SEMICONDUCTOR MEMORY HAVING IMPROVED DATA READOUT SCHEME

**Yasuo Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan**

**Filed Jun. 26, 1990, Ser. No. 543,526**

**Claims priority, application Japan, Jun. 26, 1989, 1-163521**

**Int. Cl.[5] G11C *7/06***

**U.S. Cl. 365—189.02** **5 Claims**

1. A semiconductor memory comprising:

a plurality of memory cells;

means for receiving address information;

a sense amplifier having an input end, an output end, a first voltage terminal receiving a first voltage and a second voltage terminal receiving a second voltage;

a selection circuit responsive to said address information for selecting one of said memory cells to thereby apply a data signal from the selected memory cell to said input end of said sense amplifier, said sense amplifier generating a sense output signal of a level approximating that of one of said first and second voltages at the output end thereof in response to said data signal in a first state and isolating said output end thereof from both of said first and second voltage terminals thereby to set said output end thereof at a high impedance state in a second state;

a latch circuit having an input end coupled to the output end of said sense amplifier and holding said sense output signal generated by said sense amplifier at an output end thereof;

an output circuit having an input end and an output signal at the output end thereof;

a switch circuit providing a signal path between the output end of said latch circuit and the input end of said output circuit in an enables state and isolating herebetween in a disabled state;

a circuit connection directly coupling the output end of said sense amplifier to the input end of said output circuit independent of said switch; and

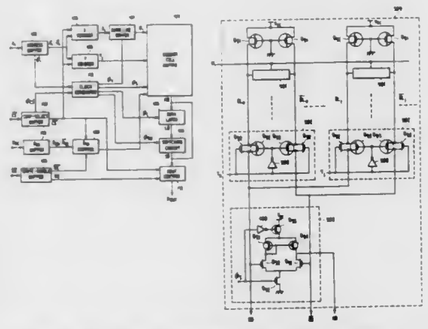
a control circuit for controlling said sense amplifier and said switch circuit in such a manner that after one of said memory cells is selected, said sense amplifier is set as said first state under the disabled state of said switch circuit thereby to directly transfer the sense output signal to the input end of said output circuit, and after the transfer of said sense output signal to the output circuit the switch

circuit is shifted to the enabled state thereby to apply the sense output signal held by said latch circuit to the input

gate and the substrate, wherein the substrate is electrically connected to the source;

a switching transistor for enabling the control gate during a nonvolatile write operation, wherein the switching transistor is electrically coupled between the control gate and the first node and the second node is electrically coupled to the source; and

means for maintaining the control gate and the substrate at approximately the same potential during volatile operation of the bistable latch, said means comprising a transistor and being electrically coupled between the control gate and the substrate, wherein during volatile operation of the bistable latch the switching transistor is off and the maintaining means transistor is on.



end of said output circuit, and said sense amplifier circuit is shifted from said first state to said second state.

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**5,051,956**

## MEMORY CELL HAVING MEANS FOR MAINTAINING THE GATE AND SUBSTRATE AT THE SAME POTENTIAL

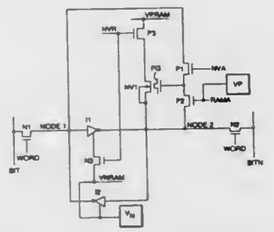
**Daniel Burns, Zurich, Switzerland, assignor to Hughes Microelectronics Limited, Glenrothes, United Kingdom**

**Filed Mar. 23, 1989, Ser. No. 327,639**

**Claims priority, application United Kingdom, Mar. 25, 1988, 8807225**

**Int. Cl.[5] G11C *11/00, 11/40***

**U.S. Cl. 365—185** **5 Claims**



1. A memory cell, comprising:

a bistable latch having first and second nodes;

a nonvolatile transistor having a source, a drain, a control gate, a substrate and a floating gate between the control

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**5,051,957**

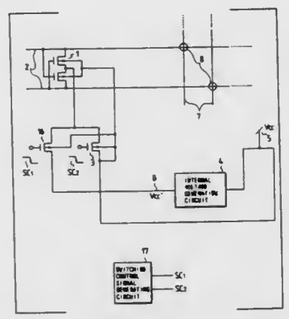
## SENSE AMPLIFIER CIRCUIT FOR LARGE-CAPACITY SEMICONDUCTOR MEMORY

**Hiroyuki Yamauchi, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed Jan. 3, 1990, Ser. No. 462,538**

**Int. Cl.[5] G11C *11/40***

**U.S. Cl. 365—190** **9 Claims**



1. In a semiconductor memory, the sense amplifier including a pair of transistors respectively coupled to a pair of bit lines for amplifying a differential voltage appearing between the bit lines, the transistors being mutually coupled at a common node, the improvement comprising:

at least a first switching element coupled between a first DC supply voltage and the common node, and a second switching element coupled between a second DC supply voltage and the common node, the first DC supply voltage having a greater absolute magnitude than the second DC supply voltage; and

means for generating first and second switching control signals for respectively controlling the first and second switching elements subsequent to initiation of a read operation of the semiconductor memory, to successively apply the first and second DC supply voltages to the common node.



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**5,051,958**

## NONVOLATILE STATIC MEMORY DEVICE UTILIZING SEPARATE POWER SUPPLIES

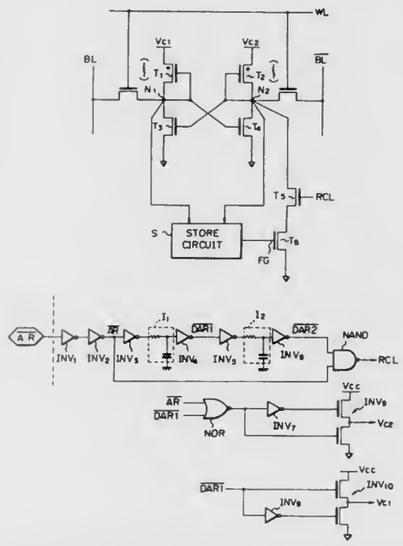
**Hideki Arakawa, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 411,266, Sep. 25, 1989, abandoned, which is a continuation of Ser. No. 154,509, Feb. 5, 1988, abandoned, which is a continuation of Ser. No. 796,453, Nov. 12, 1985, abandoned. This application Jul. 3, 1990, Ser. No. 547,525**

**Claims priority, application Japan, Nov. 13, 1984, 59-237435**

**Int. Cl.[5] G11C *14/00***

**U.S. Cl. 365—228** **6 Claims**



1. A semiconductor nonvolatile memory device comprising:

a first power source line;

a second power source line;

a static type random-access memory cell constituted by a flip-flop circuit having first and second input/output nodes, a first load connected between the first power source line and the first input/output node, and a second load connected between the second power source line and the second input/output node;

an electrically erasable programmable read-only memory cell constituted by a nonvolatile memory transistor and a recall transistor connected in series between the second input/output node and a ground potential, said ground potential being applied to the second input/output node during a recall period when the nonvolatile memory transistor and recall transistor are turned ON; and

a voltage/recall signal generating circuit, connected to the first and second power source lines and the recall transistor, said voltage/recall signal generating circuit receiving an array recall signal and an external power source voltage, the voltage/recall signal generating circuit generating a recall signal in response to the array recall signal, said array recall signal defining the recall period to turn the recall transistor ON, and said voltage/recall signal generating circuit controlling a supply timing of the first and second power source lines during the recall period by pulling a voltage of the first power source line up to a predetermined voltage after the voltage of the second power source line is pulled up to the predetermined voltage, therein setting the flip flop circuit selectively to one of two states corresponding to a value stored in the nonvolatile memory cell, wherein said voltage/recall signal generating circuit includes

a first delay circuit which generates a first delayed array recall signal delaying the array recall signal,

a second delay circuit which generates a second delayed array recall signal delaying the first delayed array recall signal,

a gate circuit, which generates the recall signal having a predetermined pulse width, said gate circuit receiving the array recall signal and the second delayed array recall signal,

a first voltage supply circuit, which receives said first delayed recall signal, for supplying the external power source voltage to the first power source line, and

a second voltage supply circuit, which supplies the external power source voltage to the second power source line before the first voltage supply circuit supplies the external power source voltage to the first power source line, said second voltage supply circuit receiving the first delayed array recall signal and the array recall signal.

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**5,051,959**

## COMPLEMENTARY SEMICONDUCTOR MEMORY DEVICE INCLUDING CELL ACCESS TRANSISTOR AND WORD LINE DRIVING TRANSISTOR HAVING CHANNELS OF DIFFERENT CONDUCTIVITY TYPE

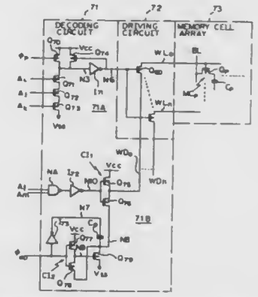
**Tomio Nakano, Kawasaki, and Yoshihiro Takemae, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 304,876, Feb. 1, 1989, abandoned, which is a continuation of Ser. No. 896,284, Aug. 17, 1986, abandoned. This application Nov. 1, 1989, Ser. No. 430,968**

**Claims priority, application Japan, Aug. 14, 1985, 60-178959**

**Int. Cl.[5] G11C *11/407***

**U.S. Cl. 365—230.06** **7 Claims**



1. A complementary semiconductor memory device comprising:

a plurality of word lines;

a memory cell array including a plurality of memory cells, each memory cell connected respectively to one of said plurality of word lines and having a first MIS transistor of a P-channel type operating as an access gate;

a decoding circuit for receiving and decoding an address signal input, and accordingly, generating a selecting signal;

a driving circuit having a second MIS transistor of an N-channel type operating as a word line driver, said second MIS transistor having a source for receiving a word drive signal which is pulled down to a negative potential below that of a circuit ground potential under a predetermined condition, having a gate connected to said decoding circuit for receiving the selecting signal, and having a drain connected to a specified one of said word lines which is connected to a gate of an associated first MIS transistor, a threshold voltage of said second MIS transistor being

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selected to be greater than an absolute value of a threshold voltage of said associated first MIS transistor, and selected such that said second MIS transistor can substantially cut off the word drive signal pulled down to the negative potential from being transmitted to said specified one of said word lines when the selecting signal applied to the gate of said second MIS transistor is a logically low level indicating non-selection, whereby said word drive signal pulled down to the negative potential is transmitted to said specified one of said word lines only in a selection state.

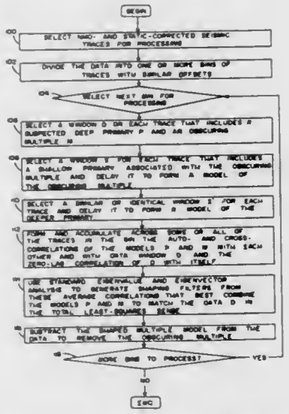
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**5,051,960**

## METHOD OF REMOVING RECORDS OF MULTIPLE REFLECTION EVENTS FROM SEISMIC DATA

**Stewart A. Levin, Carrollton, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.**

**Filed Jul. 16, 1990, Ser. No. 553,061**
**Int. Cl.[5] G01V *1/36, 1/38***
**U.S. Cl. 367—24** **5 Claims**




1. A method of removing records of multiple reflection events from a collection of normal moveout corrected seismic data traces, said traces consisting of signals recorded by detectors responsive to seismic energy transmitted into the structure of the earth by seismic energy sources, comprising the steps of:

(a) selecting a first, unobscured primary reflection appearing on some or all of the seismic traces, and determining its total traveltime between source and detector;

(b) identifying a second primary reflection at least partially obscured on some or all of the traces by a multiple reflection of the first primary reflection, and determining its total traveltime between source and detector;

(c) selecting a third, unobscured primary reflection appearing on some or all of the seismic traces that generally conforms t the partially obscured second primary reflection, and determining its total traveltime between source and detector;

(d) computing, from pre-existing static corrections, a static delay equal to the additional transit time of a seismic signal up and back down through the near-surface weathered zone at each source-to-receiver midpoint;

(e)

(i) determining the difference in traveltime between the first and second reflections, and using the third primary reflection, delayed according to the difference in traveltime between the first and second reflections, as a model of the second primary reflection; and

(ii) using the first primary reflection, delayed effectively according to (1) the additional static delays computed in step (d), (2) the traveltime of the first primary reflection, and (3) the differences in normal moveout velocities and offsets of the first and second primary reflections, as a model of the obscuring multiple,

(f) estimating from the models of the second primary reflection and obscuring multiple reflection the actual contribution of the second primary reflection and obscuring multiple to the seismic traces, and

(g) subtracting the estimated contribution of the multiple reflection from the traces.

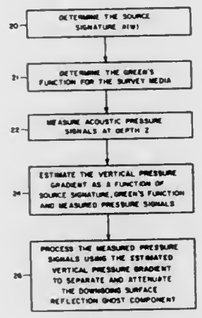
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**5,051,961**

## METHOD AND APPARATUS FOR SEISMIC SURVEY INCLUDING USING VERTICAL GRADIENT ESTIMATION TO SEPARATE DOWNGOING SEISMIC WAVEFIELD

**Dennis Corrigan, Plano; Arthur B. Weglein, Grapevine, and David D. Thompson, Plano, all of, assignors to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Oct. 26, 1989, Ser. No. 427,691**
**Int. Cl.[5] G01V *1/36, 1/38***
**U.S. Cl. 367—24** **33 Claims**




1. A seismic surveying method comprising:

determining the source signature of a seismic source;

determining the impulse response of the medium into which signals from the seismic source are input, by using Green's function for the medium;

detecting seismic signals at a location below the medium surface from said seismic source;

estimating the vertical seismic signal gradient for a location below the medium surface using said source signature, said impulse response and said detected seismic signals; and

separating ghost seismic signals from the detected seismic signals using said estimated vertical seismic signal gradient.

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**5,051,962**

## COMPUTERIZED TRUCK INSTRUMENTATION SYSTEM

**Francis M. Eaton, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.**

**Continuation of Ser. No. 23,986, Mar. 11, 1987, abandoned, which is a continuation of Ser. No. 574,191, Jan. 25, 1984, abandoned, which is a continuation of Ser. No. 187,365, Sep. 15, 1980, abandoned, which is a continuation of Ser. No. 961,340, Nov. 16, 1978, abandoned, which is a continuation of Ser. No. 356,250, May 1, 1973, abandoned. This application Mar. 13, 1989, Ser. No. 323,188**
**Claims priority, application United Kingdom, May 14, 1972, 20846/72**
**Int. Cl.[5] G01V *1/38*; E21B *49/00***
**U.S. Cl. 367—33** **41 Claims**

1. A well exploration system for acquiring, processing and



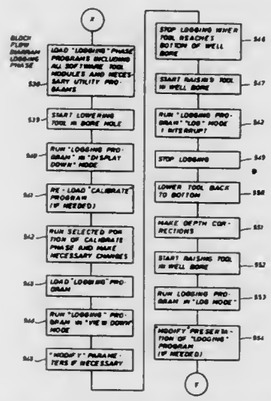
storing well data representative of measurements obtained by a well tool adapted for investigating at least one selected characteristic of earth formations around a well bore comprising;

a surface unit;

a cable operatively connected at one end thereof to said surface unit;

a well tool adapted for movement through a well bore and suspended in the well bore at the other end of said cable;

first measuring means, supported by said well tool, for acquiring well data relating to said characteristic in response to control signals from said surface unit, said measuring




means further providing output signals representative of said acquired well data;

second measuring means for providing an output including an indication of the position of said tool in said well; and

processing means, supported by said surface unit and in communication with said measuring means via said cable, for processing well data according to selected first sequences of operating steps and for providing said control signals to said first measuring means, said control signals being generated in response to the output of said second measuring means.

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**5,051,963**

## PROCESS FOR CANCELLING STATIONARY SINUSOIDAL NOISE IN SEISMIC DATA

**Andrew F. Linville, Jr., Dallas, and Robert A. Meek, Sanger, both of Tex., assignors to Mobil Oil Corporation**

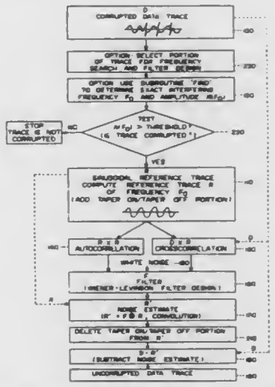
**Filed Jul. 9, 1990, Ser. No. 550,006**
**Int. Cl.[5] G01V *1/36***
**U.S. Cl. 367—46** **18 Claims**

1. A method of removing stationary sinusoidal noise corrupting a seismic data trace from the trace, comprising the steps of:

determining the precise frequency $F_o$ of the stationary sinusoidal noise;

computing a reference sinusoidal trace R of frequency $F_o$;

designing a filter F for shaping the reference sinusoidal trace to correspond precisely to the sinusoidal noise corrupting the data, wherein the amplitude and phase of the reference trace are adjusted to precisely match those of the sinusoid corrupting the data trace;




convolving the filter F thus designed with the reference trace to yield a noise estimate R'; and

subtracting the noise estimate R' from the data trace.

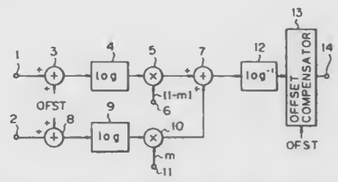
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**5,051,964**

## VIRTUAL MICROPHONE APPARATUS AND METHOD

**Tooru Sasaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Aug. 21, 1990, Ser. No. 570,602**
**Claims priority, application Japan, Aug. 25, 1989, 1-219968**
**Int. Cl.[5] H04B *1/06***
**U.S. Cl. 367—135** **7 Claims**




1. An apparatus for producing an output signal representing a sound pressure at a predetermined position, comprising:

first microphone means for producing a first output signal representing a sound pressure $P_0$ at a first position;

second microphone means for producing a second output signal representing a sound pressure $P_1$ at a second position; and

signal processing means for producing said output signal based upon said first output signal and said second output signal;

said signal processing means being operative to produce said output signal proportional to:

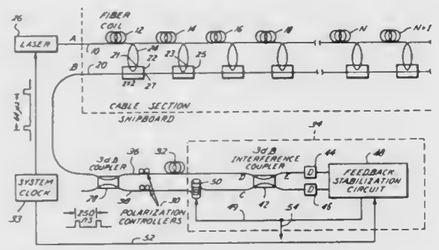
(i) a power function of said second output signal based on an exponent m corresponding to a distance between said first microphone means and said predetermined position, multiplied by

(ii) a power function of said first output signal based on an exponent representing a value obtained by subtracting at least said exponent m from 1.

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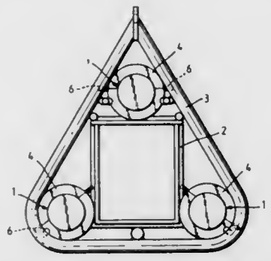
5,051,965
**ACOUSTO-OPTICAL MARINE SENSOR ARRAY**
**Thomas J. Poorman, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.**
**Filed Apr. 19, 1985, Ser. No. 724,884**
**Int. Cl.[5] H04R** *1/02*
**U.S. Cl. 367—149** **12 Claims**




1. An acousto-optical seismic sensor array, comprising:
first and second elongated optical fibers;
a plurality of directional optical couplers;
a plurality of separated portions of said first optical fiber being wound as multi-turn pressure-sensing coils;
said first optical fiber being coupled to said second optical fiber by said directional optical couplers at a plurality of points along said first optical fiber, the points being intermediate said separated pressure-sensing coils;
a source means for launching a substantially monochromatic radiation pulse into one end of said first optical fiber;
a beam splitter coupled to said second optical fiber for equally dividing radiation pulses between first and second optical branches of said second optical fiber;
a delay line coupled into said first optical branch to retard in time a radiation pulse propagating along said first optical branch by an amount equal to the radiation-pulse propagation delay time between any two consecutive pressure-sensing coils; and
demodulator means coupled to said first and second branches of said second optical fiber for measuring the relative phase shift between a received radiation pulse that propagated through any one pressure-sensing coil and the same radiation pulse received after having propagated through the immediately preceding pressure-sensing coil;
said beam splitter and said delay line being located between said plurality of directional optical couplers and said demodulator means.

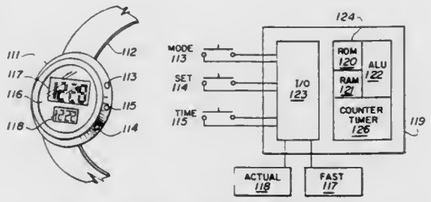
5,051,966
**FASTENING MEANS FOR SEISMIC EQUIPMENT**
**Einar Gjestrum, Sandvika; Lars Knudsen, and Tormod Skifjeld, both of Drammen, all of Norway, assignors to Geco A.S., Sandvika, Norway**
**Filed Nov. 13, 1989, Ser. No. 435,330**
**Claims priority, application Norway, Nov. 11, 1988, 885044**
**Int. Cl.[5] H04R** *23/00*
**U.S. Cl. 367—153** **22 Claims**

1. A fastening means for fixing circular seismic devices in mutually spaced relationship, each seismic device having a high strain region, comprising:
a frame;
an outwardly projecting ring member positioned concentrically around and attached to said high strain region of each seismic device;
at least two rigid annular split first clamps mounted in fixed spaced relationship on said frame for receiving said seismic devices therein;
a substantially annular void in each first clamp open inwardly toward the seismic device in said first clamp, said ring member on a respective seismic device being received in said void;
two shock absorbing members in said void for engaging a seismic device in said first clamp, one of said shock absorbing members being on each side of said ring member; and



at least two additional second clamps mounted on said frame in fixed spaced relationship with respect to each other and with respect to said first clamps, respectively, for receiving therein a region of a respective seismic device spaced from said high strain region thereof.

5,051,967
**RANDOMLY SELF-ADVANCING TIMEPIECE**
**Samuel R. Dismond, III, 366 California Ave., Ste. 24, Palo Alto, Calif. 94306**
**Filed Dec. 13, 1990, Ser. No. 626,978**
**Int. Cl.[5] G04C** *19/00, 17/00*
**U.S. Cl. 368—62** **20 Claims**

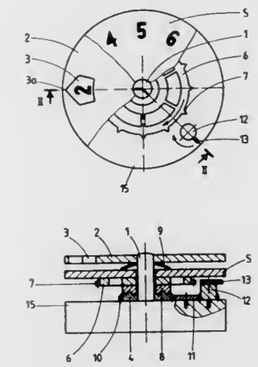



1. A timepiece, the improvements therein comprising:
a time standard;
an actual time specifying means for specifying the actual time;
a data storage means for storing data representing a range of time intervals;
a time interval specifying means for specifying a range of time intervals;
a microprocessing means operably associated with said time standard, said actual time specifying means, said data storage means, and said time interval specifying means for continuously calculating the actual time, and calculating a fast time equal to the actual time plus a randomly retrieved time interval from within the range of time intervals stored as data in said data storage means;
a microprocessor function specifying means operably associated with said microprocessing means for specifying the operating function of the microprocessor;



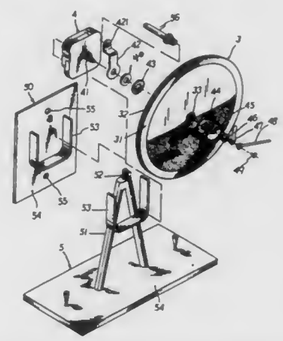
a continuous time displaying means operably associated with said microprocessing means for displaying a fast time;
a second displaying means operably associated with said microprocessing means for momentarily displaying information to know the actual time;
a display activating means operably associated with said microprocessing means for activating said second displaying means;
a time base means operable within said microprocessing means for timing a period after which said microprocessing means causes said continuous time displaying means to display a new fast time equal to the actual time plus a new and different time interval retrieved from the range of stored intervals, whereby said continuous time displaying means displays a time that is fast and varies within the time interval range stored in said data storage means, and varies within a period determined by said time base means.

5,051,968
**DIGITAL-ANALOG DISPLAY DEVICE FOR TIMEPIECE**
**Vincent Calabrese, Lausanne, Switzerland, assignor to Pinko S.r.l., Fidenza, Italy**
**Filed Mar. 28, 1990, Ser. No. 500,708**
**Claims priority, application European Pat. Off., Mar. 30, 1989, 89810237.1**
**Int. Cl.[5] G04B** *19/00, 19/20*
**U.S. Cl. 368—76** **6 Claims**



1. A digital-analog display device for timepieces, comprising:
a rotatable cannon pinion;
means for rotating said cannon pinion;
an analog disk attached to said cannon pinion, said analog disk having a window:
a rotatable digital disk located adjacent to said analog disk;
at least one digit located on said digital disk;
means for rotating said digital disk relative to said analog disk, said rotating means being responsive at a predetermined point of each revolution of said analog disk, said rotating means including a toothed wheel coaxially attached to said digital disk and a moveable eccentric element which is located at a point adjacent to said toothed wheel;
means for moving said eccentric element so that said toothed wheel rotates said digital disk at said predetermined point; and
means for selectively aligning said at least one digit of said digital disk with respect to said window in response to said rotation of said digital disk relative to said analog disk.

5,051,969
**DECORATIVE CLOCK WITH ROTATABLE SAND PICTURE**
**Chen- Sung Huang, Changhua Hsien, Taiwan, assignor to Chien Hua Glass Co., Ltd., Changhua Hsien, Taiwan**
**Filed Nov. 29, 1989, Ser. No. 442,867**
**Int. Cl.[5] G04B** *19/02*
**U.S. Cl. 368—223** **2 Claims**



1. A decorative clock with rotatable sand picture comprising:
a sand picture having a through hole formed at the center thereof;
a clock gear set housing having a projecting fixing shaft for receiving a hanging plate;
said plate having a preformed hanging hole, a first washer, and a first elastic washer;
said shaft passing through said through hole at the center of said sand picture, and
said shaft receiving a second elastic washer and a second washer after it has passed said center hold on said picture;
a nut screwed into said shaft for holding together said gear set housing, said hanging plate, said first washer, said first elastic washer said sand picture, said second elastic washer, and said second washer; such that said sand picture is rotatable
an hour hand an a minute hand secured to said shaft with a fixing bolt at the front of said sand picture;
a seat provided with a pair of supports there on;
a U-shaped receiving set formed to receive said gear set housing; and
a hanger provided at the top portion of said supports for receiving said hanging plate.

5,051,970
**MAGNETO-OPTIC RECORDING SYSTEM WITH OVERWRITE CAPABILITY**
**Osamu Ishii; Koutaron Nonaka; Iwao Hatakeyama, all of Ibaragi, and Tetsuo Iijima, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan**
**Filed May 2, 1988, Ser. No. 188,876**
**Claims priority, application Japan, May 8, 1987, 62-110864; Sep. 11, 1987, 62-226658; Oct. 13, 1987, 62-256386; Feb. 5, 1988, 63-23948; Apr. 4, 1988, 63-81232; Apr. 6, 1988, 63-83032**
**Int. Cl.[5] G11B** *13/04*
**U.S. Cl. 369—13** **36 Claims**

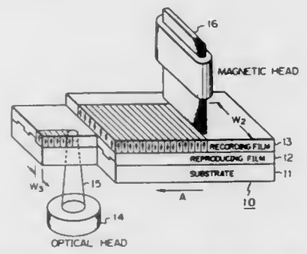
1. A magneto-optic recording system comprising:
a magneto-optic recording medium comprising a substrate having a plurality of data tracks, said substrate being provided with a first recording magnetic film with a predetermined first Curie temperature and a predetermined first coercive force, and a second reproducing magnetic film with a predetermined second Curie temperature and a predetermined second coercive force, said first Curie

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temperature being higher than said second Curie temperature, and said first coercive force being lower than said second coercive force, said recording medium is magnetically recorded with sector information extended in a perpendicular direction to and across the direction of a data track, said sector information provides a clock signal for showing a start point of the recording signal for use in synchronization between a recorded signal and a reproduced signal,

a magnetic head positioned close to said magneto-optic recording medium, having a core and a coil wound on the core, to magnetically record a magnetic pattern signal applied to said coil onto the first magnetic film, said magnetic head generates a magnetic field which is higher than said first coercive force and is lower than said second coercive force;




heating means located downstream along a relative moving path of said recording medium from said magnetic head, said heating means for selectively heating said recording medium to a temperature which is higher than said second Curie temperature and lower than said first Curie temperature, in order to transfer said recorded magnetic pattern recorded on said first magnetic film to said second magnetic film; and

an optical head having at least a laser source and a laser sensor, located close to the recording medium, and downstream along a relative moving path of said medium from said magnetic head for reproducing signals transferred on said second magnetic film by irradiating said second magnetic film with a coherent laser beam and sensing the polarized angle of the reflected beam from said medium which is dependent upon the signals transferred on the second magnetic film.

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**5,051,971**

## PROGRAM EDITING METHOD AND APPARATUS FOR AN INFORMATION RECORDING MEDIUM PLAYING APPARATUS

**Koji Yamagishi; Naoki Masaki, and Nobuaki Hisamatsu, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Dec. 21, 1989, Ser. No. 452,827**

**Claims priority, application Japan, Dec. 23, 1988, 63-327351; Dec. 19, 1989, 1-329137**

**Int. Cl.[5] G11B** *7/00*

**U.S. Cl. 369—32** **28 Claims**

1. A program editing method for an information recording medium playing apparatus for playing back a plurality of music pieces recorded on an information recording medium, said method comprising the steps of:

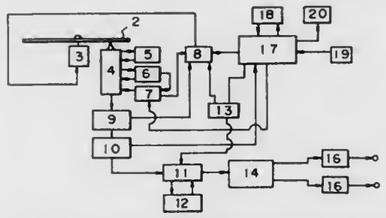
retrieving playing time information of said plurality of music pieces from the information recording medium, said playing time information representing playing time required for playing each of said plurality of music pieces;

providing a designated time period within which playback of at least some of said plurality of music pieces is desired;

generating a provisional combination of said music pieces for playback comprising a subset of said plurality of music pieces whose total playing time does not exceed said designated time period;

deriving a playback combination of the music pieces whose total playing time is nearest to but shorter than the designated time period by exchanging each of the music pieces in the provisional combination with each music piece not included in the provisional combination; and

determining the playback combination to be a playing program of the music pieces.




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**5,051,972**

## TRACK ACCESSING CONTROL APPARATUS HAVING A HIGH-PASS FILTER FOR EXTRACTING A TRACKING SIGNAL

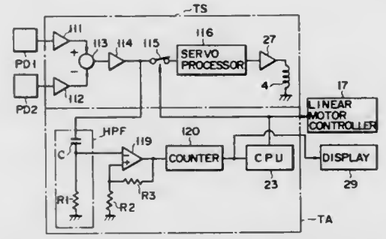
**Mikio Yamamuro, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Jun. 28, 1988, Ser. No. 212,551**

**Claims priority, application Japan, Jun. 30, 1987, 62-163088**

**Int. Cl.[5] G11B** *7/085*

**U.S. Cl. 369—32** **5 Claims**




1. A track accessing apparatus for a light beam for an optical disk having an information recording track, comprising:

means for directing the light beam onto the optical disk, said directing means including an objective lens driving coil having an inherent vibrating frequency;

means for detecting a reflection of the light beam from the optical disk and for generating a tracking signal including a track detection alternating signal and a low frequency component having a frequency lower than that of the track detection alternating signal, the alternations of said track detection alternating signal being representative of the frequency at which tracks are traversed by the light beam;

high-pass filter means for removing the low frequency component of the tracking signal, said high-pass filter means having a cut-off frequency than said inherent vibrating frequency and lower than a frequency at which tracks are traversed by the light beam;

means for counting a number of alternation of the track detection alternating signal; and

means for moving the light beam directing means across the tracks according to the number of alternations counted by said counting means.



**5,051,973**

## METHOD FOR PLAYING BACK MUSIC PIECES RECORDED ON RECORDING MEDIA

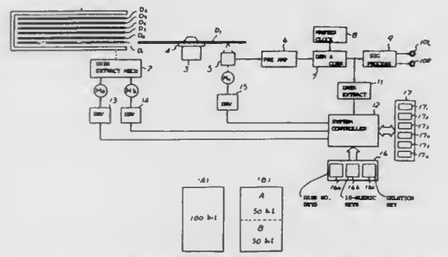
**Takahumi Shiba, and Kunio Matsumoto, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Sep. 16, 1988, Ser. No. 245,221**

**Claims priority, application Japan, Dec. 19, 1987, 62-322506**

**Int. Cl.[5] G11B** *17/22*

**U.S. Cl. 369—36** **6 Claims**



1. A method of selecting playbacks from a plurality of pieces of music recorded on recording media the method comprising the steps of selecting said playbacks from among a plurality of pieces of music having identification numbers other than playback-inhibition identification numbers and playback-completion identification numbers stored in a memory, wherein:

said memory is provided with a first region for storing both the playback-inhibition identification numbers and the playback-completion identification numbers, and a second region for storing only the playback-inhibition identification numbers;

immediately before producing randomly-selected playbacks, the playback-inhibition identification numbers stored in said second region of said memory are transferred to said first region of said memory so as to be stored therein; and

said piece of music to be subsequently played back is randomly selected from a plurality of pieces of music having identification numbers other than those stored in said first region of said memory.

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**5,051,974**

## OPTICAL HEAD DEVICE HAVING A LIGHT SPLITTER WITH A DIFFRACTION GRATING STRUCTURE

**Naosato Taniguchi, Atsugi; Kiyonobu Endo; Tetsuro Kuwayama, both of Yokohama; Hiroaki Hoshi, Kawasaki; Hiroshi Osawa, Atsugi; Koyo Hasegawa, Tokyo, and Masakuni Yamamoto, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 940,351, Dec. 11, 1986, abandoned. This application Sep. 8, 1989, Ser. No. 405,061**

**Claims priority, application Japan, Dec. 16, 1985, 60-282205**

**Int. Cl.[5] G11B** *7/00*

**U.S. Cl. 369—44.12** **11 Claims**

1. An optical head device comprising:

a light source;

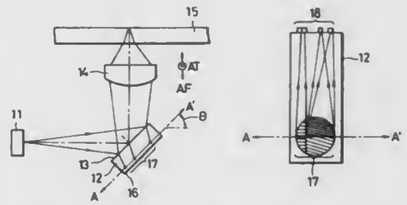
a photo-detector for detecting light from an information recording medium;

an objective optical system for focusing the light onto the information recording medium; and

a plate-like splitter diagonally arranged in a light path from said light source to said objective optical system, said light splitter having a first plane for reflecting at least a portion of the light emitted from said light source to direct the reflected light to said objective optical system and transmitting at least a portion of the light from the information recording medium, and a second plane having a diffraction grating structure mounted thereon,

said diffraction grating structure diffracting light transmitted through said first plane to direct the diffracted light to said photo-detector,

said diffraction grating structure being formed in such a manner that each of a light path to said splitter from said light source, a light path to said objective optical system from said splitter and a light path to said photo-detector from said splitter are perpendicular to the other two light paths.




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**5,051,975**

## OPTICAL RECORDING AND/OR REPRODUCING APPARATUS HAVING A TEMPERATURE ADJUSTING DEVICE

**Michihiro Tadokoro; Hitoshi Imai, and Kazuo Okada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

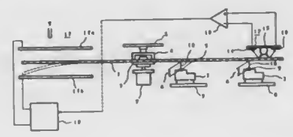
**Continuation-in-part of Ser. No. 185,052, Apr. 22, 1988, Pat. No. 4,881,204. This application Feb. 2, 1989, Ser. No. 305,931**

**Claims priority, application Japan, Feb. 15, 1988, 63-30910**

**The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.**

**Int. Cl.[5] G11B** *7/08*

**U.S. Cl. 369—44.39** **16 Claims**



1. An optical recording and/or reproducing apparatus, comprising;

an optical head irradiating a beam to a sheet-shaped data carrier capable of recording and/or reproducing information optically,

a detecting means for detecting an angle between an optical axis of said beam and a surface of said data carrier,

a temperature adjusting device which brings about a difference in temperature between both surfaces of said data carrier, and

a control means for controlling said temperature adjusting device in according with a result detected by said detecting means so that said optical axis of the beam is vertical to the surface of said data carrier.

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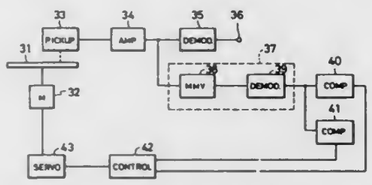


5,051,976

## DISK RECORDING AND REPRODUCING APPARATUS WITH SPEED COMPENSATION FOR CAV AND CLV DISKS IN ACCORDANCE WITH SIGNALS RECORDED ON THE DISKS

Eisaku Kawano, and Masahiro Nakajima, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 6, 1988, Ser. No. 190,853
Claims priority, application Japan, May 15, 1987, 62-118538
Int. Cl.[5] H04N 5/92; G11B 19/28
U.S. Cl. 369—50 6 Claims




1. A disk recording and reproducing apparatus comprising:
means for rotating a disk on which at least a frequency modulated video signal is recorded;
pickup means for reproducing at least the frequency modulated video signal recorded on the disk;
means for detecting at least the frequency modulated video signal reproduced by said pickup means, said detecting means including means for demodulating at least said frequency modulated video signal, said detecting means providing a demodulated video signal level accordingly;
means for comparing the demodulated video signal level with at least a first reference value and providing a comparison output; and
means for selectively accelerating and decelerating said rotating means in accordance with the comparison output.

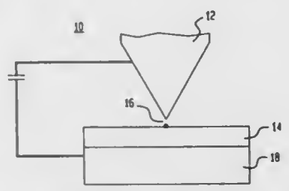
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5,051,977

## SCANNING TUNNELING MICROSCOPE MEMORY UTILIZING OPTICAL FLUORESCENCE OF SUBSTRATE FOR READING

Harris A. Goldberg, Colonia, N.J., assignor to Hoechst Celanese Corp., Somerville, N.J.

Filed Aug. 30, 1989, Ser. No. 400,840
Int. Cl.[5] G11C 11/00, 13/00; G11B 9/00
U.S. Cl. 369—126 26 Claims



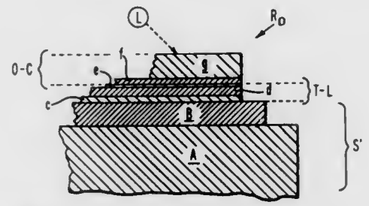

1. A method of reading information contained in an information medium, wherein the method comprises
providing an information medium comprised of an information layer which contains a track of information bits and a substrate layer which fluoresces when high energy electrons pass into contact therewith,
passing the tip of a scanning tunneling microscope over the information layer, and
measuring the resulting fluorescence.

5,051,978

## COATED MEDIA FOR OPTICAL RECORDING

Thomas Mayer; James D. Rancourt, and Norman L. Boling, all of Santa Rosa, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 30, 1982, Ser. No. 445,554
Int. Cl.[5] G11B 7/00
U.S. Cl. 369—275.5 31 Claims




1. A radiation-recording element comprising:
a support means having a prescribed carrier surface;
a radiation-sensitive recording structure disposed on said surface; and, laid over this surface,
a "soft pad" overcoating comprised of a "weakly-polymerized" fluoropolymer.

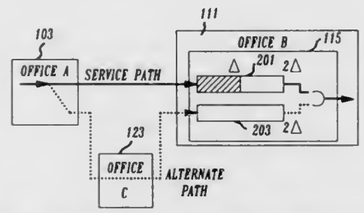
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5,051,979

## METHOD AND APPARATUS FOR ERRORLESS SWITCHING

S. Chaudhuri, East Brunswick, and A. Maione, Parlin, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 28, 1990, Ser. No. 545,226
Int. Cl.[5] H04J 1/16, 3/14; H04L 1/02
U.S. Cl. 370—16 18 Claims




1. In a receiver, a method for errorless switching from a first digital signal comprising a first series of frames in which a first series of payloads is being transported in a first channel, to a second digital signal comprising a second series of frames in which a second series of payloads identical to said first series of payloads is being transported in a second channel, said second series of frames having starting locations, for particular ones of said second series of payloads, that can be different from starting locations of identical particular payloads, in said first series of frames, comprising the steps of:
preprovisioning a first delay on said first channel such that said first channel has a total delay including said first delay greater than an actual delay of said second channel;
aligning each frame of said first digital signal to a corresponding frame of said second digital signal so that each of said corresponding frames has a starting location for an identical particular payload from each of said first and second series of payloads;
aligning said starting location and any subsequent locations of particular ones of said second series of payloads within said second series of frames to the starting location and any subsequent locations of identical particular ones of said first series of payloads within said first series of frames;



making a determination to switch from said first digital signal to said second digital signal; and
switching in response to said determination from said first digital signal to said second digital signal without loss of a single bit.

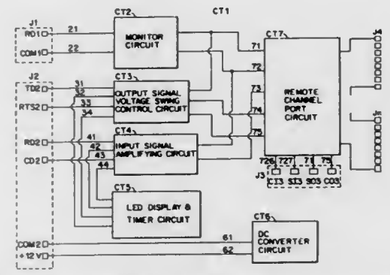
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5,051,980

## DATA COMMUNICATION INTERFACE DEVICE

Stewart L. Olsen, El Paso, Tex., assignor to El Paso Natural Gas Company, El Paso, Tex.

Continuation of Ser. No. 231,373, Aug. 11, 1988, abandoned. This application Jul. 12, 1990, Ser. No. 551,640
Int. Cl.[5] H04J 3/00
U.S. Cl. 370—32.1 15 Claims



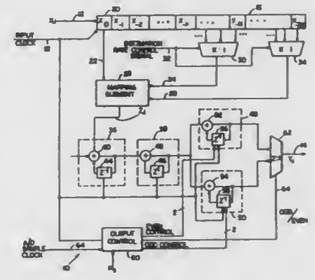

1. A Data Communication Interface Device for extended range communication between a first external signal source and receiver, and a second external signal source and receiver, said device comprising:
input signal processing means comprising a differential mode operational amplifier for processing at least one input signal from said second external signal source wherein said input signal processing means electrically connects said second external signal source to said first external signal receiver;
means including a common ground terminal in said second external signal source and receiver, said common ground terminal being connected to one input of said differential mode amplifier for giving the appearance of a pseudo-current loop between said input signal processing means and said second external signal source and receiver;
a remote channel port;
output signal processing means for providing extended range communications between the first external signal source and the second external signal receiver, said output signal processing means including means for controlling voltage swings of at least one output signal from said first external signal source such that the output signal voltage swing control means electrically connects the first external signal source to the remote channel port,
wherein said voltage swing control means includes at least one operational amplifier electrically connected to receive said first external signal source output signal and to transmit a first voltage swing controlled output signal; and at least one slew rate control circuit electrically connected to receive said first voltage swing controlled output signal from said first external signal source output signal receiving operational amplifier and to transmit a second voltage swing controlled output signal to said remote channel port.

5,051,981

## DIGITAL FILTERING

Richard B. Kline, East Walpole, Mass., assignor to Codex Corporation, Mansfield, Mass.

Continuation of Ser. No. 146,328, Jan. 21, 1988, abandoned. This application Jan. 29, 1990, Ser. No. 471,700
Int. Cl.[5] H04J 3/00
U.S. Cl. 370—32.1 16 Claims



1. A digital decimation filter for receiving a stream of input digital samples at an input sample rate, and for delivering a corresponding stream of output digital samples at a different output sample rate, comprising
a set of storage elements for storing a plurality of said input digital samples,
circuitry for deriving samples of said output stream from said stored input digital samples, said circuitry including means for making an output sample available for inclusion in said output stream at all times, whereby said output sample may be provided with a selectable phase, said circuitry comprising a pair of integrate and dump circuits operated so that as one circuit is integrating, the sample most recently generated by the other integrate and dump circuit is available for inclusion in said output stream.

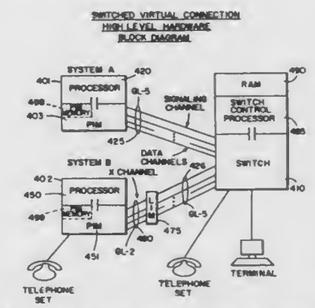
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5,051,982

## METHODS AND APPARATUS FOR IMPLEMENTING SWITCHED VIRTUAL CONNECTIONS (SVCS) IN A DIGITAL COMMUNICATIONS SWITCHING SYSTEM

David K. Brown, Lewisville, and Richard L. Christensen, Richardson, both of Tex., assignors to Data General Corporation, Westboro, Mass.

Filed Jul. 27, 1989, Ser. No. 385,902
Int. Cl.[5] H04Q 11/04; H04J 3/12
U.S. Cl. 370—58.2 19 Claims




1. Apparatus for making switched virtual connections in a digital communication system utilizing the same control and distribution equipment used for voice and data communications in said system, comprising:

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(a) a central equipment module, including a circuit switch and a switch control processor, for controlling the definition and activation of switched virtual connections;
(b) a plurality of station devices each of which is connected to said circuit switch and said switch control processor, wherein each station device is capable of transmitting bearer channel information to and through said circuit switch under the control of said switch control processor and further wherein each station device is capable of communicating signal channel information with said switch control processor over at least one signal channel;
(c) transmission means for coupling said bearer channel information from each of said plurality of station devices to said circuit switch and for coupling said signal channel information between said plurality of station devices and said switch control processor;
(d) first memory means, coupled to said switch control processor, for storing at least system configuration information, current switched virtual connection definitions, a list of station device Bid requests and global channel group configuration information;
(e) second memory means, associated with each of said plurality of station devices, for storing at least the station device address, the channel group configuration information for each station, and a list of local connection identifiers for use in naming defined switched virtual connections;
(f) means for registering a station device with said switch control processor;
(g) means, responsive to requests from said station devices, for defining switched virtual connections for a given device under control of said switch control processor;
(h) means for activating switched virtual connections upon request from a station device, under control of said switch control processor, based on the real time availability of connection resources; and
(i) timer means, associated with each of said station devices, for controlling the amount of time a given station can utilize a switched virtual connection.

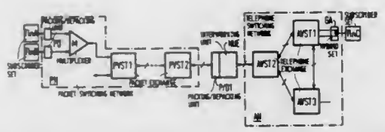
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**5,051,983**

## METHOD AND CIRCUITRY FOR TRANSMISSION OF SPEECH SIGNALS IN A BROAD-BAND COMMUNICATIONS NETWORK

**Anton Kammerl, Groebenzell, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany**

**Filed Sep. 5, 1989, Ser. No. 403,528**
**Claims priority, application European Pat. Off., Sep. 23, 1988, 88115727**
**Int. Cl.[5] H04Q** *1/04*
**U.S. Cl. 370—60** **6 Claims**



1. A method for transmission of speech signals following dial connections between subscriber sets of broad-band-communications network which includes at least one packet switching network with at least one packet exchange for transmission of communications signals of different services in packets of a fixed length and at least one telephone switching network with at least one telephone exchange for connection of analog telephone subscriber's sets, whereby at least one interworking unit is provided for a network interworking between said packet switching network and said telephone switching network, said interworking unit being connected by a trunk group with a plurality of individual lines to said telephone switching network and by at least one first packing/depacking unit connected to a transmission line of said packet switching network and whereby subscriber sets of said packet switching network are each connected to one of second packing/depacking units comprising the steps of:
delivering a control signal by said interworking unit upon the occurrence of a request signal calling for a dial connection on one of the individual lines of said trunk group or on said transmission line; and
receiving said control signal by said first packing/depacking unit and by one of the second packing/depacking units involved in the dial connection to be established by means of which control signal said first packing/depacking unit and said one of the second packing/depacking units are controlled following establishing of the dial connection such that after establishing of the dial connection the packets of a fixed length provided for transmission of speech signals are packed and depacked in accordance with a reduced degree of packet filling.

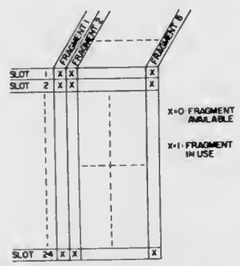
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**5,051,984**

## METHODS FOR FLEXIBLY ALLOCATING BANDWIDTH FOR A POINT-TO-POINT SERIAL, BIDIRECTIONAL COMMUNICATION PATH

**Asghar D. Mostafa, Silver Spring, and Kirk H. Berry, Gaithersburg, both of Md., assignors to Data General Corporation, Westboro, Mass.**

**Continuation of Ser. No. 308,355, Feb. 9, 1989, Pat. No. 4,965,798. This application Jul. 30, 1990, Ser. No. 561,817**
**The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.**
**Int. Cl.[5] H04J** *3/16*
**U.S. Cl. 370—79** **19 Claims**




1. A method of allocating bandwidth on each of a plurality of data paths in a digital communication switching system that has a switching granularity of "x" bits per second, wherein each of said data paths has a bandwidth divided into "m" slots, the slots each being subdivided into "n" fragments, each x bits per second wide, comprising the steps of:
(a) inputting a bandwidth allocation parameter, to bandwidth allocation control means, to specify a particular fragment allocation rule predefined to correspond to said bandwidth allocation parameter; and
(b) allocating bandwidth, via said bandwidth allocation control means, in integer multiples of x bits per second in accordance with the predefined allocation rule specified by said bandwidth allocation parameter.

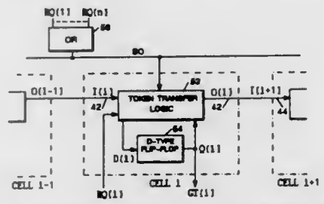


**5,051,985**

## CONTENTION RESOLUTION IN A COMMUNICATIONS RING

**Israel Cidon, New York, N.Y., and Inder S. Gopal, Fort Lee, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Division of Ser. No. 264,402, Oct. 28, 1988, Pat. No. 4,991,172. This application Aug. 30, 1990, Ser. No. 575,258**
**Int. Cl.[5] H04J** *3/02*
**U.S. Cl. 370—85.005** **3 Claims**




1. An apparatus for resolving contention among a plurality of adapters for access to a communication bus, comprising:
a) a plurality of cells arranged in a ring formation with an output of an i-th cell being an input of an (i+1)-th cell, with each i-th cell being associated with an i-th adapter of said plurality of adapters, each i-th cell comprising:
i) storing means for storing a token indicating that an associated adapter of said adapters has access to said bus, said storing means to store said token when said token has been previously stored therein, and either there are no requests from any of said adapters for access to said communications bus or there is a request from said i-th adapter for access to said communications bus, said storing means also storing said token when an (i-1)-th cell is currently transmitting said token and said i-th adapter has a request to gain access to said communications bus,
ii) a token transfer logic circuit means responsive to said token for transmitting said token to one of said cells corresponding to one of said adapters requesting access to said bus, said circuit means transmitting said token if said i-th adapter has no request to gain access to said communications bus, and either said (i-1)-th cell is currently transmitting said token or said i-th cell has said token in said storage means;
wherein a cell having said token stored in said storing means signals a corresponding one of said adapters that it may gain access to said bus, and wherein each of said cells arranged in said ring format can transmit said token onto an adjacent cell without having to wait for a clock pulse when said each cell corresponds to an adapter having no request to gain access to said bus, thereby allowing in one clock cycle the token to pass through a number of said cells to a cell corresponding to an adapter requesting to gain access to said bus.

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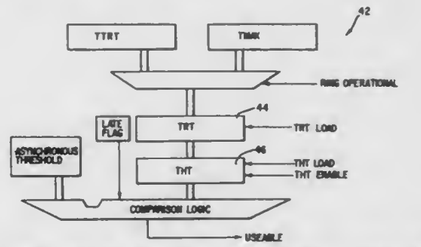
**5,051,986**

## ASYNCHRONOUS PRIORITY SELECT LOGIC

**Robert M. Grow, San Diego, Calif., and Perry S. Stultz, Gorham, Me., assignors to National Semiconductor Corporation, Santa Clara, Calif.**

**Filed Dec. 1, 1989, Ser. No. 444,628**
**Int. Cl.[5] H04J** *03/02*
**U.S. Cl. 370—85.5** **8 Claims**

1. In a station which is one of a plurality of stations interconnected by a communications medium in a token ring communications system configuration wherein the station gains the right to transmit on the communications medium by capturing a token, asynchronous priority select logic for allocating the token to the station for asynchronous transmission for a specified time period, the asynchronous priority select logic comprising:
(a) a token holding timer that provides a count value represented by a first binary data character that consists of a first plurality of binary data bits;
(b) means for generating an asynchronous threshold value represented by a second binary data character that consists of a second plurality of binary data bits that differs in number from the first plurality of binary data bits;
(c) conversion means for converting the asynchronous threshold value to a conversion value represented by a third binary data character that consists of a number of




binary data bits that equals the first plurality of binary data bits;
(d) comparison means for comparing the first binary data character and the third binary data character to determine whether the conversion value is greater than the count value;
(e) allocation means for allcoating the token to the station for asynchronous communication for the specified time period if the conversion value is greater than the count value.

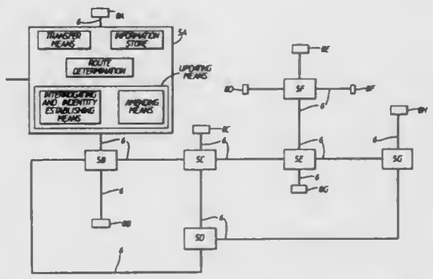
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**5,051,987**

## INFORMATION TRANSMISSION NETWORK INCLUDING A PLURALITY OF NODES INTERCONNECTED BY LINKS AND METHODS FOR THE TRANSMISSION OF INFORMATION THROUGH A NETWORK INCLUDING A PLURALITY OF NODES INTERCONNECTED BY LINKS

**Tom E. Conlon, Reading, England, assignor to Racal-Milgo Limited, Bracknell, England**

**Filed Jul. 18, 1989, Ser. No. 381,269**
**Claims priority, application United Kingdom, Jul. 20, 1988, 8817288**
**Int. Cl.[5] H04J** *3/24*
**U.S. Cl. 370—94.1** **6 Claims**




1. An information transmission network, comprising a plurality of nodes interconnected by links and at least some of which are also connected to input/output units,
each node including means responsive to an information message that has been received by the node, and is to be transmitted to another destination, and routing the received information message through the network, to said another destination, and each node being distinguishable

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from the other nodes in the network by a respective index that identifies the node,

each node including means for storing information concerning the topology of the network and the interconnections of the plurality of nodes, means responsive to the stored information to determine the route for the information message through the network and updating means for maintaining the stored topology information and for updating the stored topology information in accordance with dynamic changes in the topology of the network,

wherein each node has at any time a particular state dependent on the distance from it of the nodes whose indices it has successfully identified, and

the updating means of each node including means for automatically and repeatedly identifying and indices of progressively more distant nodes by interrogating each of the immediately neighbouring nodes to identify the index of the immediately neighbouring node and the indices of nodes whose distance from said immediately neighbouring nodes is dependent on said state of the interrogating node.

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**5,051,988**

**TRANSMISSION LINE ENCODING/DECODING SYSTEM**

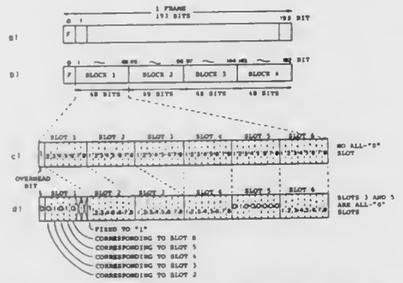
**Haruko Kawahigashi; Shuji Ito; Takane Kakuno; Sakae Nakano, and Mikio Yoshioka, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 30, 1989, Ser. No. 429,302**

**Claims priority, application Japan, Nov. 2, 1988, 63-277791; Mar. 9, 1989, 1-56962; Mar. 15, 1989, 1-62391**

**Int. Cl.[5] H04J** *3/12*

**U.S. Cl. 370—99** **9 Claims**



1. A transmission line encoding system comprising:

means for setting an overhead bit indicating whether or not there is at least one all-"0" slot, which is a slot all the bits of which are "0" bits, among a plurality of slots constituting in combination one block having a predetermined data length in said block; and

means for setting, when there is at least one all-"0" slot, a slot information bit indicating the position of at least one all-"0" slot and deleting at least one all-"0" slot the position of which is indicated by said slot information bit.

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**5,051,989**

**SWITCHING ARRANGEMENT CAPABLE OF SWITCHING BURST TIME PLAN TABLES/CHANNEL ASSIGNMENT PATTERN TABLES OF A SPECIFIC TERRESTRIAL STATION**

**Takeshi Negishi, Tokyo, Japan, assignor to NEC Corporation, Japan**

**Filed Feb. 28, 1989, Ser. No. 316,698**

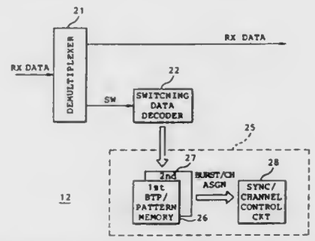
**Claims priority, application Japan, Mar. 1, 1988, 63-47903**

**Int. Cl.[5] H04J** *3/06*

**U.S. Cl. 370—104.1** **4 Claims**

1. In a time division multiple access network comprising a standard earth station and a plurality of terrestrial stations, each of which has an address preassigned thereto and can communicate with said standard earth station in accordance with a table determined between said standard earth station and each terrestrial station, said table including a burst time plan table and a channel assignment pattern table, the improvement for updating the table in at least one of said terrestrial stations, wherein said standard earth station comprises:

address producing means for producing a station address signal representative of the address which is assigned to a particular terrestrial station in which said table is to be updated;




switching signal producing means for producing a switching signal representative of updating said table; and

transferring means coupled to said address producing means and said switching signal producing means for successively transferring said station address signal and said switching signal to at least said particular terrestrial station, to selectively update only the table of said particular terrestrial station.

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**5,051,990**

**PHASE ADJUSTMENT CIRCUIT**

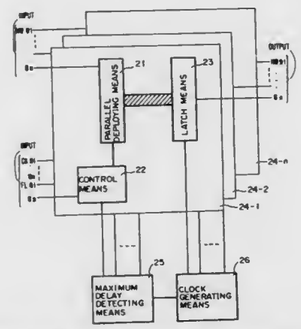
**Tsuguo Kato, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Jan. 22, 1990, Ser. No. 468,284**

**Claims priority, application Japan, Jan. 20, 1989, 1-009906**

**Int. Cl.[5] H04J** *3/06*

**U.S. Cl. 370—105.3** **11 Claims**




2. A phase adjustment circuit using a broad band circuit for adjusting phases of data with each other on a plurality of time divisional high speed highways having different phases, said data including a plurality of frames each of which comprises m bits, m being an integer greater than 1, and having respective frame pulses, said phase adjustment circuit comprising:

parallel deploying means for converting k bits, equal to a maximum phase difference between the time divisional high speed highways, into a parallel signal, k being an integer greater than or equal to 1;

control means for receiving a clock and a frame pulse from respective ones of the time divisional high speed highways and producing a clock necessary for said parallel deploying means based on the clock and frame pulse;

latch means for receiving said parallel signal from said parallel deploying means;

maximum delay detecting means for receiving the clock and frame pulse from said control means and selecting the clock and frame pulse having the greatest phase delay, for detecting a time divisional highway having a phase having the greatest delay and outputting the selected clock and frame pulse as the master clock and master frame pulse, respectively; and

clock generating means for generating a clock enabling said latch means to receive said parallel signal from said parallel deploying means based on the master clock and master frame pulses output from said maximum delay detecting means and for applying said clock to said latch means.



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**5,051,991**

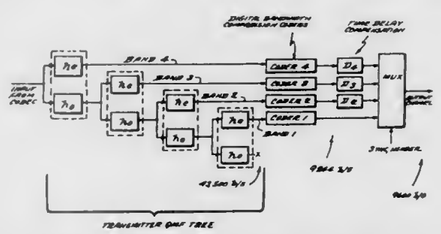
**METHOD AND APPARATUS FOR EFFICIENT DIGITAL TIME DELAY COMPENSATION IN COMPRESSED BANDWIDTH SIGNAL PROCESSING**

**Craig F. Szczutkowski, Forest, Va., assignor to Ericsson GE Mobile Communications Inc., Lynchburg, Va.**

**Filed Oct. 17, 1984, Ser. No. 661,740**

**Int. Cl.[5] H04J** *3/06;* **H04B** *1/66*

**U.S. Cl. 370—108** **13 Claims**



1. A digital time delay compensated subband signal processor comprising:

filter means for separating a digitized input signal into plural subband channels of digital signals having different respective time delays therein and representing corresponding subbands of signal frequency components;

digital coding means connected to said plural subband channels for separately coding the digital signals in each subband channel in a digitally compressed form to provide compressed coded digital signals in each of said subband channels;

time delay compensation means connected to at least one of said subband channels for time delaying said compressed coded digital signals in said at least one subband channel for a predetermined time period to provide substantially time synchronous coded compressed digital signals at a predetermined point in each of said subband channels; and

multiplex means connected to said plural subband channels for combining said substantially time synchronous coded compressed digital signals into an output stream of coded compressed digital signals.

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**5,051,992**

**DATA LINK CONTROL METHOD AND SYSTEM FOR INTEGRATED SERVICES DIGITAL NETWORK**

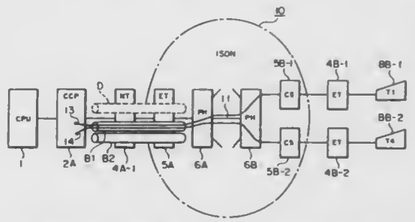
**Hidenobu Taniguchi, Machida; Satoshi Miyazaki, Sagamihara; Sinichi Kouyama, Hiratsuka; Tatsuo Kawatobi, Yokohama, and Keizou Mizuguchi, Kanagawa, Kazuo Yagyu, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Nov. 8, 1989, Ser. No. 433,198**

**Claims priority, application Japan, Nov. 11, 1988, 63-283599**

**Int. Cl.[5] H04J** *3/12, 3/24*

**U.S. Cl. 370—110.1** **6 Claims**




1. A data link control method for communication control means connected through at least one subscriber's line to an integrated services digital network (ISDN) for providing at least one control channel and a plurality of information channels to each subscriber's line, comprising:

a first step of finding, when a call request from a data processor connected to the communication control means or an incoming call request from one of a plurality of terminal means connected to the ISDN is input to the communication control means, an information channel which satisfies such conditions that a data link connection has already been established between the communication control means and the ISDN and a call multiplicity in the information channel is equal to or less than a predetermined threshold value from among a plurality of information channels on the subscribers' lines connecting the communication control means and the ISDN, and setting the call into said information channel thus found;

a second step of finding, when an information channel which satisfies the conditions in said first step is not found, an information channel in which no data link connection is established yet from among the plurality of information channels, and setting the call in said information channel thus found after a data link connection between said communication control means and said ISDN is established in said information channel; and

a third step of updating the value of the call multiplicity of the information channel in proportion to a number of calls sharing the information channel.

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**5,051,993**

**MIXED MODULATION LEVEL COMMUNICATION SYSTEM**

**Michael J. DeLuca, Boca Raton; David F. Willard, Plantation, and Robert J. Schwendeman, Pompano Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 30, 1989, Ser. No. 330,837**

**Int. Cl.[5] H04J** *3/04;* **G08B** *5/22*

**U.S. Cl. 370—112** **25 Claims**

1. A transmitting means comprising:

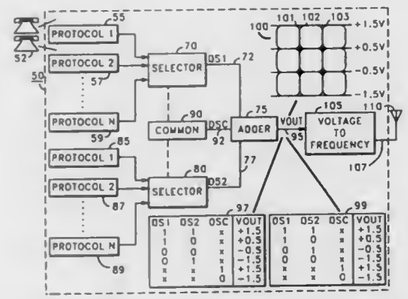
first data stream means for generating a first data stream having a plurality of binary bits;

second data stream means for generating a second data stream having a plurality of binary bits;

common data stream means for generating a common data stream having a plurality of bits, wherein said common data stream inactivates said first and second data stream means in order to generate the common data stream;

combining means for combining the first data stream and the

second data stream to form a combined data stream including a plurality of symbols in response to said common data stream not inactivating said first and second data stream means, each of said plurality of symbols defined in response to a bit from the first data stream and a coinci-




dent bit from the second data stream and for generating the plurality of symbols each of said plurality of symbols defined in response to a bit from the common data stream means in response to the common data stream inactivating said first and second data stream means;

modulating means for transmitting the plurality of symbols.

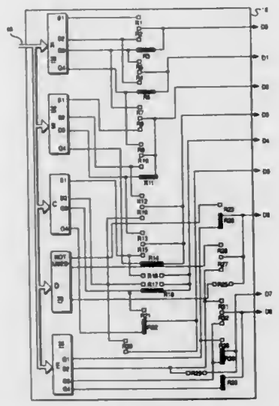
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**5,051,994**

**COMPUTER MEMORY MODULE**

**Robert G. Bluethman, Austin, and Donald J. Willson, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Apr. 28, 1989, Ser. No. 345,323**
**Int. Cl.[5] G11C *17/00*; G06F *11/20***
**U.S. Cl. 371—11.1** **9 Claims**



1. For use in constructing a computer memory unit of predetermined storage capacity from a plurality of partially good memory modules of known storage capacity, a memory unit wiring substrate including:

circuitry for conducting data outputs from partially good memory modules mounted on the substrate;

memory unit data output lines; and

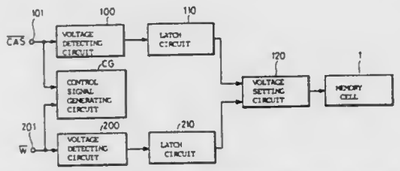
means for selectively coupling said circuitry for conducting to said memory unit data output lines.

**5,051,995**

**SEMICONDUCTOR MEMORY DEVICE HAVING A TEST MODE SETTING CIRCUIT**

**Yoichi Tobita, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 26, 1989, Ser. No. 302,034**
**Claims priority, application Japan, Mar. 14, 1988, 63-61436**
**Int. Cl.[5] G11C *29/00***
**U.S. Cl. 371—21.1** **8 Claims**




1. A semiconductor memory device having a test mode setting circuit, comprising:

a plurality of memory cells (1) each formed of an insulating gate type filed effect transistor and a capacitance;

external input means to which a control signal is externally applied;

constant voltage generating means connected to one electrode of said capacitance; and

control means for controlling, when a signal voltage applied to said external input means is out of a predetermined operation range, a voltage generated by said constant voltage generating means.

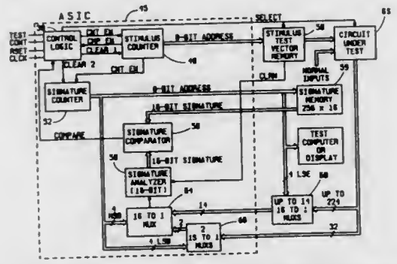
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**5,051,996**

**BUILT-IN-TEST BY SIGNATURE INSPECTION (BITSI)**

**Gary C. Bergeson, and Richard A. Morneau, both of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Mar. 27, 1989, Ser. No. 328,917**
**Int. Cl.[5] G06F *11/00***
**U.S. Cl. 371—22.4** **16 Claims**




1. A system for fault detection in a digital circuit having input and test points, said system for fault detection comprising:

control logic means coupled to the circuit under test where said control logic means is capable of controlling the overall test by responding to a signature inspection logic means when said signature inspection logic means detects a fault in the circuit by comparing the response of a test generated signal with an expected signal response,

a stimulus generator coupled to the input of the circuit and said control logic means which is responsive to said control logic means and is capable of sending stimulus vector signals to the input of the circuit where said stimulus generator includes: a stimulus counter linked to a stimulus test vector memory,

a data input multiplexer means coupled to the test points on the circuit,



signature inspection logic means coupled and responsive to said data input multiplexer, said signature inspection logic means capable of comparing a signal received from said data input multiplexer to an expected signal where said signature inspection logic means includes: a signature analyzer coupled and responsive to said data input multiplexer means and said stimulus test vector memory, a signature counter coupled and responsive to said control logic means and said stimulus counter, a signature memory coupled and responsive to said signature counter, said signature memory capable of storing expected signals associated with each test point of the circuit, and a signature comparator coupled and responsive to said signature analyzer and said signature memory, said signature comparator capable of sending a signal to said control logic means upon detection of a signal from said signal analyzer that does not match an expected signal from said signature memory.

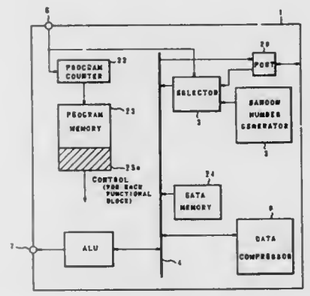
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**5,051,997**

**SEMICONDUCTOR INTEGRATED CIRCUIT WITH SELF-TEST FUNCTION**

**Narumi Sakasbita, and Yukihiko Shimazu, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

**Continuation of Ser. No. 276,499, Nov. 23, 1988, abandoned. This application Dec. 3, 1990, Ser. No. 622,316**
**Claims priority, application Japan, Dec. 17, 1987, 62-322133**
**Int. Cl.[5] G06F *11/00***
**U.S. Cl. 371—22.4** **5 Claims**




1. A semiconductor integrated circuit with a port for receiving data from and outputting data to an outside source and having a self-test function for testing functional internal blocks contained in the semiconductor integrated circuit without the need to input data from an outside source, comprising:

an internal data bus;

a memory for storing a self-test program and prediction value data for testing each internal functional block;

random number generating means for generating test data;

data selecting means having a first input coupled to said port and a second input coupled to said random number generating means and an output coupled to said internal data bus for outputting the test data generated by said random number generating means to said data bus in place of data input from the outside source via said port when said self-test program is executed;

self-test initiating means for initiating said self-test program in response to an external signal, wherein the self-test program tests each functional block using the test data output from said data selecting means and outputs a test result to the data bus; and

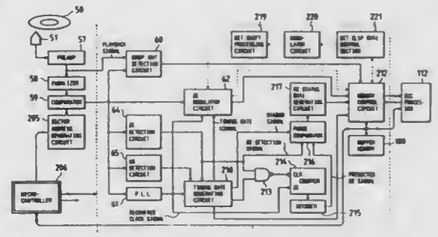
comparison means coupled to the data bus for comparing the test result output to said data bus by executing said self-test program with said prediction value data and outputting a compared result to the outside source.

**5,051,998**

**DATA BLOCK DEINTERLEAVING AND ERROR CORRECTION SYSTEM**

**Katsumi Murai, Osaka; Yuzuru Kuroki, Sapporo, and Isao Satoh, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan**

**Filed Jun. 28, 1989, Ser. No. 372,585**
**Claims priority, application Japan, Jun. 28, 1988, 63-160083**
**Int. Cl.[5] G06F *11/10***
**U.S. Cl. 371—39.1** **9 Claims**



9. In an apparatus for recovering data symbols from an input data signal, including means for deriving a recovered clock signal from said input data signal and demodulation means utilizing said recovered clock signal for demodulating said input data signal to obtain said data symbols, a system for deinterleaving and error correction of data symbols of a block of data formed as a plurality of interleaved error correction code words, said block being divided into a plurality of successive frames each comprising an identical number of data symbols, the frames being respectively preceded by fixed-duration resynchronizing signals, the system comprising:

resynchronizing detection means responsive to said resynchronizing signals for generating corresponding resynchronizing detection signals;

resynchronizing prediction means responsive to each of said resynchronizing detection signals for deriving a time of subsequent occurrence of a predicted resynchronizing signal, based on a number of pulses of said recovered clock signal produced during a frame which succeeds said each resynchronizing detection signal;

first comparison means for comparing respective time-axis positions of each of said resynchronizing detection signals and a corresponding predicted resynchronizing signal, and for producing an indication signal if said time-axis positions differ by less than a predetermined amount;

memory means;

first counter means for counting successive ones of said data symbols to produce, for each of said data symbols, a corresponding symbol count value representing a corresponding one of the code words and a position of said each data symbol within the corresponding code word, and means for writing said each data symbol into said memory means at an address of said memory means that is determined by said symbol count value;

means for detecting a signal quality deterioration condition of said input data signal which indicates occurrence of a symbol error and for producing a drop-out pulse in synchronism with each of said data symbols which coincides with said condition;

second counter means comprising a set of reversible counters respectively corresponding to said code words, controlled by said symbol count value from said first counter means for counting successive ones of said drop-out pulses to produce respective error symbol count values corresponding to said code words;

third counter means comprising a linear feedback counter responsive to successive ones of said data symbols for multiplying a count value held therein by a fixed amount, to obtain count values expressing respective positions within a Galois field index region of said data symbols

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which coincide with said signal quality deterioration condition, and means for writing into said memory means, in response to each of said drop-out pulses, a corresponding count value from the third counter means as an error position value, said corresponding count value being written into an address of said memory means that is determined by a corresponding one of said error symbol count values;

fourth counter means for counting successive ones of said drop-out pulses during each of said frames, beginning from a fixed initial count value at the start of each frame;

means for detecting when a count value in said fourth counter means exceeds a predetermined error count value, and producing an output signal in response to said detection;

first latch means responsive to said output signal from the count value detection means for producing an output signal which continues until the end of a frame in which said error count value was exceeded;

control means responsive to said first latch means output signal for incrementing said second counter means in response to successive ones of said data symbols;

second latch means for storing a symbol count value from said first counter means corresponding to a symbol position at which said error count value was exceeded;

second comparison means functioning during a frame immediately succeeding said frame in which the error count value was exceeded, for detecting when an error count value of said first counter means coincides with said symbol count value held in said second latch means;

control means responsive to said indication signal from said first comparison means, when coincidence is detected by said second comparison means, for decrementing said second counter means in response to successive ones of said data symbols until the end of said immediately succeeding frame;

means functioning after a final data symbol of said block has been supplied, for writing final ones of said error symbol count values into predetermined addresses of said memory means; and

error correction means, functioning after said final error symbol count values have been written in the memory means, for operating on said data symbols, said error position values and said error symbol count values, to execute error correction processing.

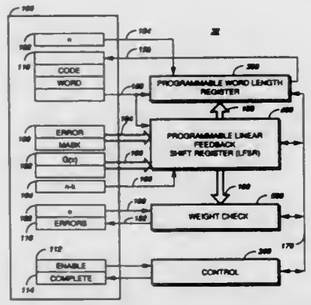
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**5,051,999**

## PROGRAMMABLE ERROR CORRECTING APPARATUS WITHIN A PAGING RECEIVER

**Richard A. Erhart, Boynton Beach; Joan S. DeLuca, Boca Raton, and Kevin T. McLaughlin, Lake Worth, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.**

**Filed Mar. 13, 1989, Ser. No. 322,437**
**Int. Cl.[5] G06F *11/10***
**U.S. Cl. 371—41** **16 Claims**




1. An error correcting means for correcting two bit errors in data within a code words structure, the code word structure having n total bits, k information bits and n−k parity bits, the parity bits generated by multiplying the k information bits by a generator polynomial g(x), and the data having two bit errors separated by more than k−n bits, said error correcting means comprising:

memory means for storing the data, said memory means capable of shifting the data, said memory means having a first correcting means for complementing n−k locations within said memory means and a second correcting means for complementing a single predetermined bit location;

linear feedback shift register means having a length of n−k and programmed with a feedback value corresponding to g(x) of the code word structure, wherein said linear feedback shift register receives the data and calculates a first syndrome, further wherein each shift of the linear feedback register calculates a subsequent syndrome;

subtracting means for producing a masked syndrome by subtracting a predetermined value from said first and subsequent syndromes;

weight check means for generating a correct signal in response to said masked syndrome having a weight of one, thereby having a single logical one and n−k−1 logical zeros in the masked syndrome; and

control means responsive to said weight check means for causing shifting of said memory means and said linear feedback shift register means and for causing the first correcting means to complement one bit in said memory means corresponding to the location of the logical one within the masked syndrome and for causing the second correcting means to complement the single predetermined bit in response to the correct signal.

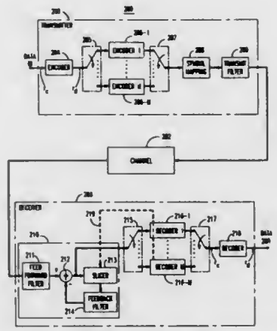
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**5,052,000**

## TECHNIQUE FOR IMPROVING THE OPERATION OF DECISION FEEDBACK EQUALIZERS IN COMMUNICATIONS SYSTEMS UTILIZING ERROR CORRECTION

**Jin-Der Wang, Eatontown, and Jean-Jacques Werner, Holmdel, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Jun. 9, 1989, Ser. No. 363,793**
**Int. Cl.[5] G06F *11/10***
**U.S. Cl. 371—43** **14 Claims**




1. Receiver apparatus for use in a communications system comprising

a decision feedback equalizer having an output;

a plurality of first decoders connected to said decision feedback equalizer; and

means for coupling data from said decision feedback equalizer output to said plurality of first decoders such that successive signals from said decision feedback equalizer output are coupled to a different first decoder in said plurality.

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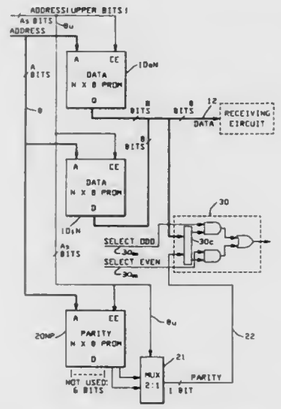


**5,052,001**

## MULTIPLE MEMORY BANK PARITY CHECKING SYSTEM

**James H. Jeppesen, III, El Toro, and Bruce E. Whittaker, Mission Viejo, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.**

**Filed Nov. 22, 1989, Ser. No. 440,558**
**Int. Cl.[5] G06F *11/10***
**U.S. Cl. 371—49.3** **19 Claims**




10. An in-depth memory structure of uniform type ROM memory chips comprising:

(a) a plurality of "k" ROM memory data chips where each chip stores N data words of n bits each, and each chip provides accessed output data to an output-word bus means of n bits, and wherein each said ROM chips is a duplicate of the other in size and type;

(b) a single auxiliary ROM memory parity chip, duplicating the same type and size with N data words of n bits each, for storing a predetermined parity bit for each data word in said memory structure, and providing "k" parity output lines to a parity bit selection means;

(c) addressing means for addressing a specific data word in any one of said "k" ROM memory data chips and for enabling output of said specific data word onto said output word bus means;

(d) said output-word bus means for transmitting accessed output data to a receiver and also to a parity checking logic means;

(e) said parity bit selection means for selecting a predetermined parity bit associated with each addressed word and designated as the related parity bit, in said single auxiliary ROM memory parity chip, which relates to the accessed data word;

(f) parity checking logic means for calculating the parity bit value of an addressed data word and comparing said related parity bit with the said calculated parity bit value of said accessed data word.

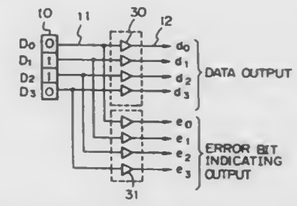
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**5,052,002**

## METHOD OF DETECTING AND INDICATING ERRORS IN A MEMORY DEVICE

**Kouzi Tanagawa, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 245,296, Sep. 16, 1988, Pat. No. 4,967,415.**
**This application Aug. 20, 1990, Ser. No. 569,601**
**Claims priority, application Japan, Sep. 18, 1987, 62-232526**
**The portion of the term of this patent subsequent to Oct. 30, 2007, has been disclaimed.**
**Int. Cl.[5] G06F *11/10***
**U.S. Cl. 371—51.1** **15 Claims**




1. A method of detecting and indicating errors in a memory device comprising: a plurality of word lines; a plurality of sense lines; a plurality of MOS memory cells connected separately to said word lines and said sense lines; a plurality of bit lines connected separately to said MOS memory cells and a plurality of read circuits connected separately to said plurality of bit lines for reading and outputting data stored in said MOS memory cells; said method comprising the steps of:

measuring the potential at each of said bit lines so as to detect an intermediate state of any of said MOS memory cells other than writing and erasing states of MOS said memory cells, said intermediate state corresponding to an error;

outputting an error bit indicating signal upon detecting an intermediate state of one of said MOS memory cells.

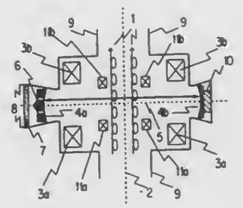
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**5,052,003**

## QUASI-OPTICAL GYROTRON

**Hans-Günter Mathews, Oberehrendingen, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland**

**Filed May 31, 1990, Ser. No. 531,104**
**Claims priority, application Switzerland, Jun. 23, 1989, 2349/89**
**Int. Cl.[5] H01S *3/00***
**U.S. Cl. 372—2** **10 Claims**



1. A quasi-optical gyrotron for generating electromagnetic radiation in the millimeter and submillimeter range, comprising:

an electron gun generating electrons passing along an electron beam axis;

coil means for generating a static magnetic field aligned parallel to the electron beam axis such that the electrons are forced into gyration;

a quasi-optical resonator, which comprises two mirrors arranged opposite to one another on a resonator axis aligned perpendicular to the electron beam axis in which

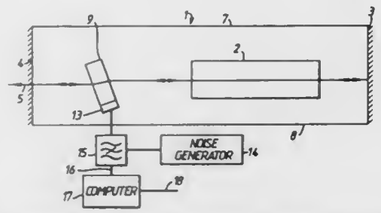
VOL 1130 ISS 4 SE 24 1991 UMI



resonator the gyrating electrons excite an alternating electromagnetic field and generate electromagnetic radiation which is coupled out of the resonator;
the mirrors of the quasi-optical resonator separated by a distance which is much greater than one half wavelength of the electromagnetic radiation; and
means for varying the distance between the mirrors by at least one half wavelength of the electromagnetic radiation.

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**5,052,004**
**TUNABLE LASERS**
**Stephen C. Gratze, Chelmsford; John M. Bagshaw, and Terence F. Willats, both of Great Baddow, all of United Kingdom, assignors to The General Electric Company p.l.c., London, United Kingdom**
**Filed Jan. 23, 1990, Ser. No. 468,729**
**Int. Cl.[5] H01S *3/106***
**U.S. Cl. 372—20** **12 Claims**

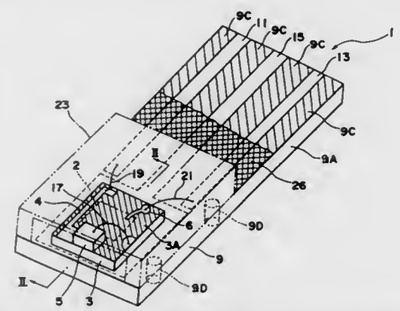



1. A tunable laser for producing light having a selected light frequency, comprising:
a laser cavity having first and second reflective surfaces and an optical path joining said first and second reflective surfaces such that light can be repeatedly reflected backwards and forwards between said surfaces;
a multi-frequency laser amplifying element disposed within the cavity and situated in said optical path;
first means for increasing the population inversion in said laser amplifying element so as to stimulate emission of a beam of light from said laser amplifying element;
an acousto-optic tunable filter which includes a Bragg cell arranged in said optical path;
second means for applying to said Bragg cell acoustic frequencies corresponding to light frequencies not selected so that, in operation, only the selected light frequency passes through said Bragg cell without Bragg deflection so as to be returned to said laser amplifying element and all the frequencies not selected are subjected to Bragg deflection and are not returned to the laser amplifying element; and
third means for varying the acoustic frequencies supplied to said Bragg cell to enable different light frequencies to be selected for return to said laser amplifying element so as to tune the laser.

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**5,052,005**
**METHOD OF MOUNTING A LASER DIODE UNIT**
**Haruo Tanaka, Shiga, and Naotaro Nakata, Kyoto, both of Japan, assignors to Rohm Co., Ltd., Kyoto, Japan**
**Filed Dec. 19, 1989, Ser. No. 452,418**
**Claims priority, application Japan, Dec. 19, 1988, 63-319857**
**Int. Cl.[5] H01S *3/04***
**U.S. Cl. 372—36** **3 Claims**

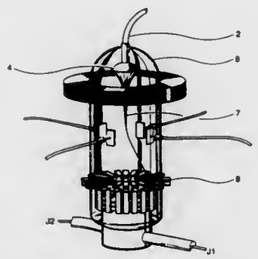
1. In an optical pick-up arranged to detect information recorded on an optical disk by causing laser light projected onto the reflected from a signal surface of said optical disk disposed within an optical system, to be received by a light receiving element provided in said optical system, a method of mounting a laser diode unit including metallic substrate having a first side face in a thickness direction, a laser diode, a photo-diode, a current feeding lead portion to the laser diode and a current output lead portion from the photo-diode, respectively onto the optical pick-up at said first side face in the thickness direction of said metallic substrate for emitting the laser light, said laser diode unit positioned and fixed at a predetermined position of said optical system through a mounting member,
said mounting method of the laser diode unit comprising the steps of:



(a) setting a second side face opposite to said first side face in the thickness direction of said substrate and said mounting member in a desired positional relation for contact with each other; and
(b) subsequently welding a plurality of contact places therebetween simultaneously be laser light for combining said laser diode unit and said optical pick-up into one unit.

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**5,052,006**
**SCANNER BEAM SEMICONDUCTOR SWITCHING APPARATUS**
**Chester C. Phillips, Columbia, Md., and Shiow-Hwa Lin, San Diego, Calif., assignors to Thermo Electron Technologies Corp., San Diego, Calif.**
**Continuation-in-part of Ser. No. 452,002, Dec. 18, 1990. This application Aug. 23, 1990, Ser. No. 571,493**
**Int. Cl.[5] H01S *3/19***
**U.S. Cl. 372—44** **8 Claims**



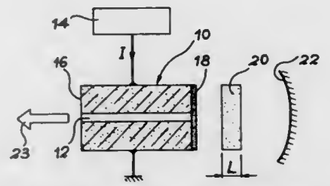
1. A high speed semi-conductor switching apparatus comprising:
a plurality of semi-conductor switches each of which is comprised of
a first lead,
a second lead and
semi-conductor material separating said first lead and said second lead,
a beam means for producing a beam of radiation for radiating said semi-conductor material to generate electron-hole pairs thereby permitting said switches to conduct electrical current closing electrically said switches,
a beam directing means for directing said beam of radiation



to said semi-conductor switches one at a time in a continuous sequence in order to achieve switching of said plurality of switches in sequence at a rapid rate.

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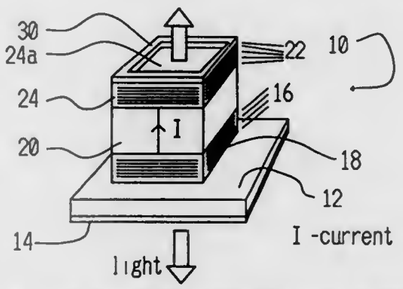
**5,052,007**
**WAVELENGTH-STABILIZED SEMICONDUCTOR LASER**
**Francois Auzel, Le Mesnil St. Denis, France, assignor to French State, represented by the Minister of Post, Telecommunications, Le Mesnil St. Denis, France**
**Filed May 30, 1990, Ser. No. 530,789**
**Claims priority, application France, Jun. 8, 1989, 89 07595**
**Int. Cl.[5] H01S *3/19***
**U.S. Cl. 372—45** **11 Claims**



1. A wavelength-stabilized semiconductor laser comprising a substrate having mounted thereon a semiconductor heterostructure with an active layer, said active layer having a spontaneous emission band, a current source including electrode means connected to said current source, at least one mirror, and a crystal doped with rare earth ions having a transition falling within the spontaneous emission band of said active layer, said crystal being disposed between said mirror and said active layer, the laser transmitting on a wavelength corresponding to the transition of the rare earth ion.

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**5,052,008**
**CURRENT INJECTION LASER**
**Peter C. Kemeny, Camberwell, Australia, assignor to Australian Telecommunications Corporation, Victoria, Australia**
**Filed Sep. 6, 1989, Ser. No. 403,534**
**Int. Cl.[5] H01S *3/19***
**U.S. Cl. 372—45** **49 Claims**




1. A current injection laser comprising structure defining a single crystal substrate, having a refractive index, and, positioned on said substrate, in succession,
an inner reflector formed by a first set of epitaxial single crystal layers,
a resonator layer, and
an outside reflector formed by a second set of epitaxial single crystal layers,
at least a first set of elements of at least one of said inner reflector, said substrate and said resonator layer being electrically conductive, and
at least a second set of elements of at least one of said outside reflector and said resonator layer being electrically conductive,
one said set of elements being of p-type conductivity and the other said set of elements being of n-type conductivity,
said structure further including first and second electrically conductive means making ohmic contact respectively to said first set of elements and said second set of elements whereby to enable, by application of electrical potential to said electrically conductive means, an electrical current to flow through said structure to cause it to generate coherent light by laser action, said layers comprising the reflectors being such that a compositional periodicity having optical thickness of $\lambda/2$ ) or an odd multiple thereof is achieved, where $\lambda$ is the wavelength of light so generated, the thickness of the resonator layer being defined by the following relationships:

$$\frac{2\pi N_r(I_t)d}{\lambda_m} - \frac{\phi_1 + \phi_2}{2} = m\pi$$

$m = 0, 1, 2 \ldots$

where $\lambda_m$ is a possible operating wavelength, $N_r(I_t)$ is the refractive index of the resonator layer at current $I_t$, being the current through the laser at the threshold of lasing, and $\phi_1$ and $\phi_2$ are defined by the following relationships:

$$r_i = r_1 \exp(j\phi_1)$$

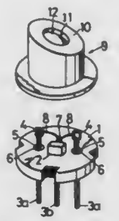
where $r_1$ is the magnitude of reflectance of layers comprised in the inner reflector, and $\phi_1$ is the phase shift on such reflectance,

$$r_0 = r_2 \exp(\phi_2)$$

where $r_2$ is the magnitude of reflectance of layers in the outer reflector, and $\phi_2$ is the phase shift on such reflectance, the laser being characterized in that m has a value in the range 0 to 10.

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**5,052,009**
**SEMICONDUCTOR LASER DEVICE AND PROCESS OF ASSEMBLING THE SAME**
**Kunio Tsuboi, Saitama, and Hiroshi Ishiyama, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan**
**Filed Aug. 17, 1990, Ser. No. 568,768**
**Claims priority, application Japan, Aug. 18, 1989, 1-212822**
**Int. Cl.[5] H01S *3/04*; H01L *23/02, 33/00***
**U.S. Cl. 372—36** **5 Claims**



1. A semiconductor laser device, comprising a stem having a lead mounting hole perforated therein, a semiconductor laser element fixed to a face of said stem, a lead having an end connected to said semiconductor element and extending through said lead mounting hole of said stem, and an electrically insulating resin element press fitted in said lead mounting hole of said stem for fixing said lead in an electrically isolated condition to said stem.

5,052,010

## SOLID STATE LASER

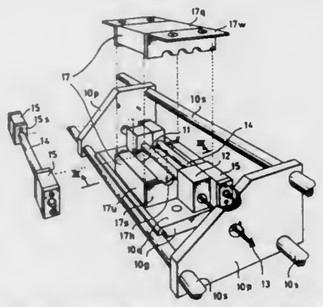
Martin Blumentritt, Königsbronn; Peter Greve, Essingen, and Reiner Kohler, Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Mar. 15, 1990, Ser. No. 493,770

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 8903388[U]

Int. Cl.[5] H01S *3/03*

U.S. Cl. 372—65 16 Claims



1. A solid state laser apparatus having an optical axis, the laser apparatus comprising:

a lower part and an upper part mounted on said lower part to conjointly define a pump chamber therewith;

a laser rod mounted in said chamber and defining said optical axis;

said upper part being seated on said lower part so as to be removable therefrom in a direction transverse to said optical axis to clear said lower part so as to permit access to said lower part from above;

at least one elongated pump source defining a longitudinal pump source axis and having respective end portions;

two holding parts for holding said pump source and being mounted at respective ones of said end portions, said holding parts and said pump source conjointly defining a pump source assembly movable relative to said lower part when placed on said lower part while said upper part is removed;

said holding parts being separated a predetermined distance from each other and extending outwardly beyond said pump source in a direction transverse to said pump source axis for coacting with said lower part to permit said pump source to be seated in said pump chamber in a predetermined reproducible position relative to said lower part in the direction of said pump source axis; and,

locating means provided in said lower part for receiving and locating said pump source in a predetermined and reproducible position relative to said laser rod when said pump source assembly is lowered and placed on said lower part of said chamber.

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5,052,011

## EXPLOSIVELY PUMPED LASER LIGHT

Martin S. Piltch, and Roy A. Michelotti, both of Los Alamos, N. Mex., assignors to United States Department of Energy, Washington, D.C.

Filed Jan. 16, 1991, Ser. No. 641,821

Int. Cl.[5] H01S *3/091*

U.S. Cl. 372—77 25 Claims

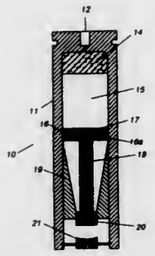
1. An explosively pumped laser comprising:

a casing having proximal and distal ends and a detonation well in said proximal end;

an explosive material packed into said proximal end of said casing adjacent to said detonation well for producing high pressure within said casing;

a transparent window mounted vertically inside said casing, spaced apart from said explosive material;

a luminescing gas confined between said explosive material and said transparent window for luminescing in response to said high pressure produced by detonation of said explosive material;



a rod of lasing material having proximal and distal ends mounted coaxially within said casing, having a total reflector attached to its proximal end; wherein said proximal end and attached reflector are secured in said recess in said transparent window; and

a partially reflecting mirror mounted at said distal end of said casing, coaxial with said rod of lasing material for outputting laser light.

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5,052,012

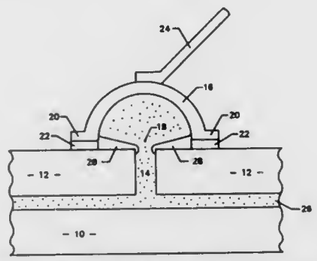
## LASER CATHODE

Gordon S. Norvell, Huntington Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 10, 1990, Ser. No. 580,031

Int. Cl.[5] H01S *3/097*

U.S. Cl. 372—87 18 Claims



1. A method for making a laser cathode, comprising:

placing a concave conductor over an exterior surface of a side of a lasing cavity, the side defining the exterior surface and a hole from the exterior surface to the lasing cavity, the exterior surface being other than a surface of the conductor itself, and the concave portion of the conductor facing the exterior surface; and

sputtering a layer of conductive material from the conductor onto a portion of the exterior surface facing the concave portion of the conductor, the material layer being in electrical contact with the conductor.



5,052,013

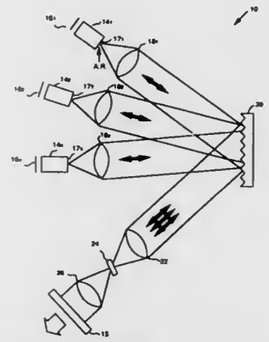
## PULSED LASER

Roger S. Putnam, 1047-B Walnut St., Newton Highlands, Mass. 02161

Filed Apr. 20, 1990, Ser. No. 511,287

Int. Cl.[5] H01S *3/098*

U.S. Cl. 372—97 4 Claims



1. A pulsed laser comprising:

(a) a plurality of pumped laser gain cells, each gain cell emitting amplified light within a different respective frequency range in first and second opposite directions;

(b) a corresponding plurality of first mirrors, each mirror disposed to receive the light emitted from or passed through the corresponding gain cell in the first direction, and reflecting the light back through the gain cell;

(c) a common second mirror, positioned to receive the light emitted by or passed through all of the gain cells in the second direction, reflecting a fraction of the light back to the gain cells and transmitting a fraction thereof;

(d) a light-dispersing device optically coupling between said common second mirror and each cell said light within the respective frequency range; and

(e) a mode locker interposed in the path of the light reflected by the common mirror and preferentially transmitting the phases of the respective frequencies that periodically reinforce to produce a high-amplitude pulse,

whereby the light transmitted by the common second mirror consists of pulses when the individual gain cells operate continuously.

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5,052,014

## GAS LASER TUBE WITH MASK

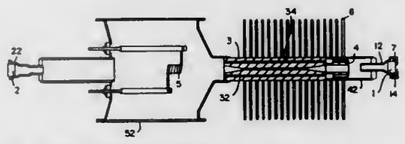
Masaaki Hiroshima, and Yoshio Nakazawa, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Feb. 27, 1990, Ser. No. 485,528

Claims priority, application Japan, Feb. 27, 1989, 22620[U]

Int. Cl.[5] H01S *3/08*

U.S. Cl. 372—103 6 Claims



1. A gas laser tube comprising:

an outer envelope having a pair of mirrors at both ends thereof to form an optical resonator, one of the mirrors being an output mirror which has an outer surface and through which a laser beam having a diameter and an optical axis is emitted;

a discharge gas sealed within the outer envelope,

a pair of electrodes disposed within the outer envelope for exciting the discharge gas;

a laser capillary tube extending between the electrodes; and

a mask rotatably mounted around the outer surface of the output mirror, said mask having a central axis, a surface substantially perpendicular to the optical axis of the laser beam, and a window in the surface for passing the laser beam therethrough, wherein the window has an edge, a central axis which is positioned away from the central axis of the mask, a maximum dimension which is five times the diameter of the laser beam at said output mirror, and a minimum dimension between the central axis of the mask and the edge of the window which is equal to the diameter of the laser beam, thereby reducing the amount of incoherent light output by the gas laser tube and enhancing the quality of the emitted beam.

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5,052,015

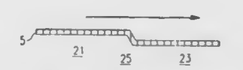
## PHASE SHIFTED DISTRIBUTED FEEDBACK LASER

David A. Ackerman, Hopewell; Philip J. Anthony, Bridgewater; Leonard J.-P. Ketelsen, Fanwood, all of N.J., and Venkataraman Swaminathan, Macungie, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 13, 1990, Ser. No. 581,870

Int. Cl.[5] H01S *3/10*

U.S. Cl. 372—96 8 Claims





1. In a semiconductor laser, an arrangement comprising:

an active region having a longitudinal axis;

first and second cladding layers on opposed major surfaces of said active region;

distributed feedback means comprising a grating optically coupled to said active region, said grating having left and right sections and at least one bending section between said right and said left sections, said left and right sections being displaced from each other in a direction perpendicular to said longitudinal axis of said active region thereby producing a phase slip.

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5,052,016

## RESONANT-PERIODIC-GAIN DISTRIBUTED-FEEDBACK SURFACE-EMITTING SEMICONDUCTOR LASER

Mohammad Mahbobzadeh, and Marek A. Osinski, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed May 18, 1990, Ser. No. 526,083

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—96 15 Claims

1. An electromagnetic wave amplifying semiconductor device comprising a distributed feedback resonant periodic gain medium for receiving pumping energy, said medium comprising:

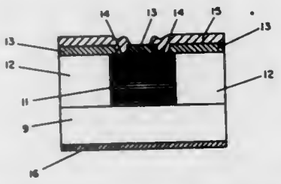
a. a plurality of thin semiconductor bodies disposed along a line essentially parallel to the direction of propagation of the electromagnetic wave, each said thin body acting as part of said gain medium, said thin bodies having a first

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predetermined refractive index with respect to the electromagnetic wave to be amplified in said device, each of said bodies being located in coincidence with an antinode of said electromagnetic wave;

b. a plurality of thick spacer body means disposed along said line and separating said thin bodies from each other, each of said spacer body means comprising first and second adjacent layers of material and each of said spacer body layers having a thickness approximately equal to one quarter the wavelength of said electromagnetic wave and much greater than the thickness of each of said thin bodies, the material of said first layer having with respect to



said electromagnetic wave a second predetermined refractive index different from said first predetermined refractive index and the material of said second layer having with respect to said electromagnetic wave a third predetermined refractive index different from said first and second predetermined refractive indices, whereby each of the said spacer body means feeds back a portion of the electromagnetic wave, each of said spacer body means combined with its adjacent thin body gain medium thereby contributing a portion of the distributed feedback so that resonant periodic gain is produced in said medium responsive to the reception of the pumping energy.

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**5,052,017**

## HIGH POWER LASER WITH FOCUSING MIRROR SETS

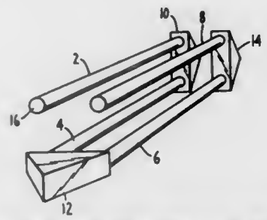
**James L. Hobart, Los Altos Hills; Michael W. Sassett, Los Altos; Wayne S. Mefferd, Los Altos Hills, all of Calif., and Peter N. Allen, Starbridge, Mass., assignors to Coherent, Inc., Palo Alto, Calif.**

**Continuation of Ser. No. 278,665, Dec. 1, 1988, Pat. No. 5,023,886. This application Jun. 8, 1990, Ser. No. 535,185**

**The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.**

**Int. Cl.[5] H01S *3/08***

**U.S. Cl. 372—99** **19 Claims**



1. A laser system producing a high power laser beam, and including:

an optical resonator cavity enclosing a lasing medium through which the laser beam propagates, wherein the laser beam propagates along a first path within the cavity, and wherein the laser then emerges from the cavity and propagates along a second path outside the cavity; and

a first mirror set positioned along a first portion of the first path within the cavity, said first set having effective focal length providing sufficient focal power to compensate for distributed thermally-induced lensing in the lasing medium and to maintain substantially constant laser beam diameter along a region of the first path adjacent said first set.

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**5,052,018**

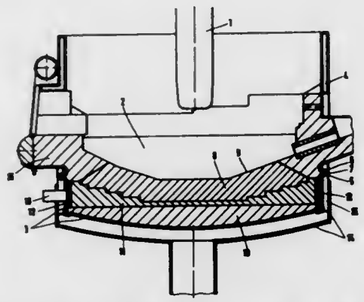
## ANODE FOR A DIRECT CURRENT ARC FURNACE

**Dane Meredith, Brandon, Fla., assignor to Deutsche Voest-Alpine Industrieanlagen GmbH, Dusseldorf, Fed. Rep. of Germany**

**Filed Oct. 12, 1989, Ser. No. 420,290**

**Int. Cl.[5] F27D *1/00***

**U.S. Cl. 373—72** **25 Claims**



1. A direct current arc furnace comprising a base including an upstanding perimetral wall, an anode including an electrically conductive refractory lining having a radially outer surface inside the perimetral wall and situated above the base to define, at least in part, a pool for containing a melt of molten metal, a cathode extending downward into the pool, and a substantially continuous cylindrical metal conductor situated inside the perimetral wall and around and contacting the radially outer surface of the electrically conductive refractory lining below the pool to ensure a uniform temperature distribution in the melt.

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**5,052,019**

## PULSE-GENERATING SENSOR UNIT FOR REMOTE SENSING SYSTEM

**Horst Ziegler, Paderborn, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany**

**Filed Mar. 23, 1988, Ser. No. 172,702**

**Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713956**

**Int. Cl.[5] H03K *07/04, 09/04***

**U.S. Cl. 375—23** **10 Claims**

1. Sensing unit **10-*i*** for a parameter measurement system **(10, 12, 14, 16)** which unit, after each receipt of a start pulse, generates a measurement pulse, the time interval between said start and measurement pulses representing the instantaneous value of a parameter being measured, having

a digital sensor **(30)** which generates, at its output, measurement pulses ($m_i$) at a frequency corresponding to the instantaneous value of said parameter being sensed;

a first frequency divider **(38–42)**, having an input connected to said output of the digital sensor **(30)**, and including a counter **(38; 76)**; and

a gating circuit **(36)** between digital sensor **(30)** and said first frequency divider **(38–42)**, said gating circuit **(36)** alternately blocking output pulses from said sensor **(30)** and becoming conductive in response to a start pulse (s),

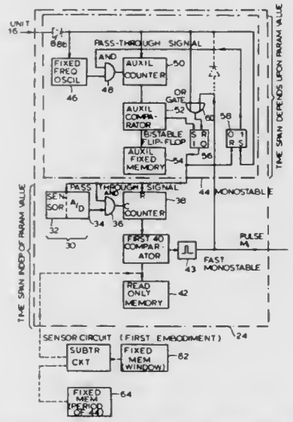
further comprising

a fixed-frequency oscillator **(46; 70)** having an output connected to an input of said counter, whose output pulses are combined in said counter **(38; 76)** for sensing-unit-sensitivity-adjustment purposes with the output measurement



pulses of said digital sensor **(30)** in such a way that a deviation range,

of the position of the measurement pulse ($m_i$) about a middle position value ($t_o+d_i$), which value is the sum of a time value $t_o$ corresponding to a parameter value



centered in a possible range of said parameter and a staggering delay interval characteristic of a respective sensing unit **(10-*i*)** in said measurement system is smaller than a predefined standard time window ($f_i-D$) for each sensing unit's measurement.

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**5,052,020**

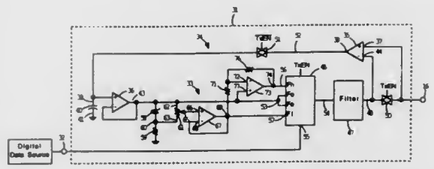
## METHOD OF AND APPARATUS FOR CONTROLLING MODULATION OF DIGITAL SIGNALS IN FREQUENCY-MODULATED TRANSMISSIONS

**Steven E. Koenck, and Ronald L. Mahany, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa**

**Filed Jan. 18, 1990, Ser. No. 467,096**

**Int. Cl.[5] H04L *27/12***

**U.S. Cl. 375—62** **25 Claims**



17. A method of frequency modulating a radio frequency transmitter with binary data having a first data signal level and a second data signal level, the transmitter having a modulator that is responsive to a modulator signal, to maintain the transmitter within a predetermined frequency deviation above and below the transmitter carrier frequency, comprising the steps of:

sampling the level of said modulator signal between transmissions of said binary data over said transmitter to provide a quiescent signal level that corresponds to the carrier frequency of said transmitter;

generating a first modulator signal level that is less than said quiescent signal level by a predetermined amount to represent said first binary data level;

generating a second modulator signal level that is greater than said quiescent signal level by said predetermined amount to represent said second binary data level;

applying said first modulator signal level to said transmitter modulator when said binary data is at said first binary data level to cause a first frequency deviation of predetermined frequency shift in one direction from said carrier frequency; and

applying said second modulator signal level to said transmitter modulator when said binary data is at said second binary data level to cause a second frequency deviation of said predetermined frequency shift in the other direction from said carrier frequency.

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**5,052,021**

## DIGITAL SIGNAL DECODING CIRCUIT AND DECODING METHOD

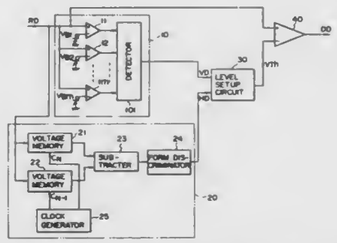
**Tadamasa Goto, Hino; Kazuo Yamamoto, Hachioji; Takahisa Hayashi, Hino, and Shunsuke Koike, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan**

**Filed Mar. 13, 1990, Ser. No. 492,947**

**Claims priority, application Japan, May 19, 1989, 1-125918; May 19, 1989, 1-125919; May 19, 1989, 1-125920; May 19, 1989, 1-125928; Dec. 14, 1989, 1-322714**

**Int. Cl.[5] H04L *25/06***

**U.S. Cl. 375—76** **13 Claims**



1. A digital signal decoding circuit comprising:

detection means for detecting data indicative of a DC level of a received digital signal in each bit of interest of the received digital signal;

means for determining a change form of the received digital signal, and determining when said change form indicates a maximum signal to produce a first indication, and a maximum signal to produce a second indication;

reference signal generation means for generating a reference signal having a signal value according to the data associated with the DC level detected by said detection means at a time of said first or second indications; and

discrimination means for comparing a signal value of the received digital signal with the signal value of the reference signal generated by said reference signal generation means to discriminate a code of the each bit of interest.

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**5,052,022**

## REPEATER AND PLL CIRCUIT

**Shigeo Nishita, Kokubunji; Ryozo Yoshino, and Masato Hirai, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jul. 11, 1989, Ser. No. 378,281**

**Claims priority, application Japan, Jul. 15, 1988, 63-175091**

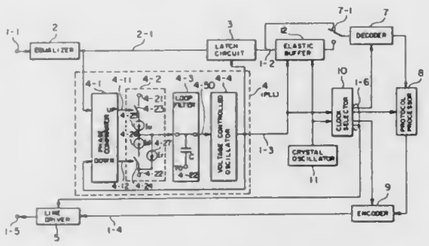
**Int. Cl.[5] H04L *25/52***

**U.S. Cl. 375—4** **15 Claims**

1. A PLL circuit responsive to a multi-frequency AC input signal including at least two signal portions having different frequencies, comprising:

first means for generating an AC output signal synchronized with said AC input signal, said AC output signal including at least two signal portions having different frequencies corresponding to said signal portions of said AC input signal and having different phase offsets depending on the

frequencies of said signal portions in said AC input signal, said different phase offsets constituting jitter in said AC output signal; and



second means connected with said first means for varying at least one of said phase offsets depending on a frequency of said AC input signal to suppress said jitter.

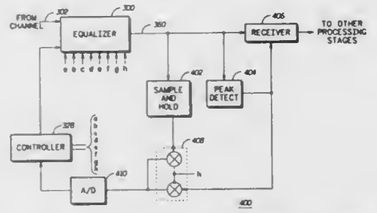
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5,052,023

## METHOD AND APPARATUS FOR RECEIVED SIGNAL EQUALIZATION

Richard A. Beichler, Madison; Steven Blackwell, and David P. Nelson, both of Huntsville, all of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 20, 1990, Ser. No. 556,237
Int. Cl.[5] H03H 7/30
U.S. Cl. 375—12 17 Claims



1. A method of equalizing a bipolar return-to-zero signal received from a communication channel, comprising the steps of:

(a) equalizing said signal with an equalizing means based on a current operational parameter setting thereof to provide an equalized signal;

(b) sampling the equalized signal at a plurality of zero-crossing times to provide corresponding signal samples;

(c) processing the plurality of signal samples to determine signal variation information based on said current operational parameter setting of said equalizing means;

(d) repeating steps (a), (b) and (c) for each of a plurality of different operational parameter settings to determine a corresponding plurality of signal variation informations; and

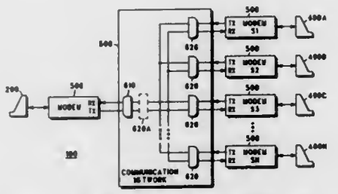
(e) selecting an operational parameter setting of said plurality for use in equalizing said signal based on the determined signal variation informations of all said settings.

5,052,024

## OFFSET FREQUENCY MULTIPOINT MODEM AND COMMUNICATIONS NETWORK

John L. Moran, III, Millville; Manickam R. Sridhar, Norton, and Rodney Hess, Somerville, all of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 23, 1990, Ser. No. 528,629
Int. Cl.[5] H04B 1/38
U.S. Cl. 375—7 15 Claims



6. A multipoint data transmission system that exchanges digital information between at least one central DTE device and a plurality of addressable remote DTE devices over a plurality of analog communications channels said central and remote DTE devices being local DTE devices to modems coupling said devices to said communications channels, said central DTE broadcasting message to remote DTE devices, said remote DTE devices sending information to the central DTE device in response to polls from the central DTE, each communications channel having different frequency transmission characteristics, said data transmission comprised of:

central modem means for exchanging digital information between a central DTE device and at least one analog communications channel, said central modem means coupling digital information from a DTE device onto said at least one analog communications channel by transmitting an analog signal representing said digital information to a communications channel by modulating said digital information by a first analog carrier frequency, $f_c$, said central modem means coupling analog information from a communications channel representing digital information for a DTE by demodulating analog signals by said $f_c$;

remote modem means for exchanging digital information between an addressable remote DTE device and at least one analog communications channel, upon receipt of a message addressed to said addressable remote DTE device from said central DTE device, said remote modem means coupling digital information from a remote DTE device onto said at least one analog communications channel by transmitting an analog signal representing said digital information to a communications channel by modulating said digital information by a first analog carrier frequency, $f_c$, said remote modem means coupling analog information from a communications channel representing digital information for a remote DTE by demodulating analog signals by said $f_c$;

communications channel means, having first and second ends, for carrying group band multiplexed signals between said central modem means at said first end and said remote modem means at said second end, said communications channel means including:

first and second frequency shifting means at said first and second ends respectively for frequency shifting signals on said communications channel means by a first reference signal amount, $f_r$, said first and second frequency shifting means up-shifting signals from a local DTE device by $f_r$ and down-shifting signals from the communications channel to be sent to a local DTE by $f_r$, said first frequency shifting means having first source of $f_r$, $f_{r1}$, said second second frequency shifting means having a second source of $f_r$, $f_{r2}$, both $f_{r1}$ and $f_{r2}$ being substantially identical to, but capable of deviating from $f_r$ by unknown amounts $f_{\Delta 1}$ and $f_{\Delta 2}$, said $f_{\Delta 1}$ and $f_{\Delta 2}$ in $f_{r1}$ and $f_{r2}$ inducing an undesirable frequency offset shift in $f_c$ by said up-shifting and down-shifting that impedes the accurate detection of digital information signals by said central and remote modem means; and

correction signal means for adding a correction factor signal amount to the frequency of $f_c$ at said remote modem means that is substantially equal to said undesireable frequency offset shift in $f_c$;

whereby the amount of the correction added to $f_c$ by said correction factor means compensates for undesireable frequency offset shift in said $f_c$ introduced by said communications channel means so that said that central modem means receives signals on $f_c$.

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5,052,025

## SYNCHRONOUS DIGITAL SIGNAL TO ASYNCHRONOUS DIGITAL SIGNAL DESYNCHRONIZER

Donald G. Duff, Lincroft, N.J.; Donald A. Lane, Salem, N.H., and Ricardo Mediavilla, Eatontown, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 24, 1990, Ser. No. 572,740
Int. Cl.[5] H04L 7/04
U.S. Cl. 375—118 12 Claims



1. Apparatus for desynchronizing an incoming digital signal at an incoming digital clock rate to obtain an outgoing digital signal at an outgoing digital clock rate different from the incoming digital clock rate, the apparatus comprising:

a source of an incoming digital signal;

a source of an incoming clock signal and incoming frame sync signal;

means for detecting occurrences of pointer adjustments in said incoming digital signal and for generating a first control signal representative of the occurrence and direction of said pointer adjustments, each of said pointer adjustments including a predetermined number of bits;

means for obtaining a gapped data signal from said incoming digital signal;

means for obtaining a gapped clock signal from said incoming clock signal;

means supplied with said frame sync signal and being responsive to said first control signal for adaptively generating an estimate of an interval between said bits in said pointer adjustment and for generating a second control signal at said estimated interval;

means responsive to said first and second control signals for generating a third control signal indicative of a bit adjustment;

a digital phase lock loop for generating an output clock signal, said digital phase lock loop being responsive to a phase adjustment signal;

means for comparing said third control signal and a write address for obtaining said phase adjustment signal; and

elastic store means supplied with said gapped data signal, said gapped clock signal and said output clock signal for supplying as an output a smooth data signal synchronized to said output clock signal, said elastic store including means responsive to said gapped clock signal for generating said write address.

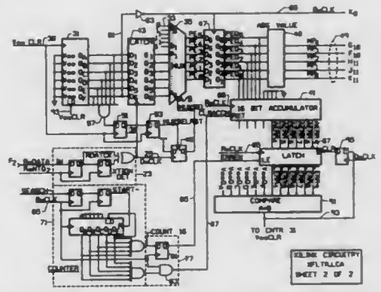


5,052,026

## BIT SYNCHRONIZER FOR SHORT DURATION BURST COMMUNICATIONS

George M. Walley, Indianlantic, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Feb. 7, 1989, Ser. No. 307,046
Int. Cl.[5] H03D 3/24
U.S. Cl. 375—119 29 Claims



1. An apparatus for generating a timing signal in synchronism with transitions of an input signal comprising:

first means coupled to receive clock signals and generating therefrom first signals at the frequency of said input signal;

second means, coupled to receive said first signals and said input signal, for generating second signals representative of respective time differentials between transitions in said input signal and said first signals;

third means, coupled to said first and second means, for measuring the average of a plurality of the time differential representative second signals for a prescribed number of said first signals and generating a third signal representative of said average; and

fourth means, coupled to said first and third means, for adjusting the phase of said first signals in accordance with said third signal, the resultant phase-adjusted first signals forming said timing signal.

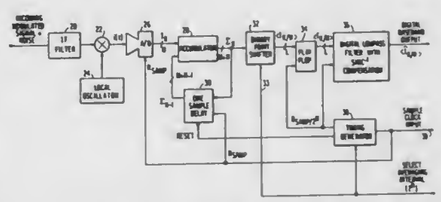
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5,052,027

## PROGRAMMABLE NOISE BANDWIDTH REDUCTION BY MEANS OF DIGITAL AVERAGING

John J. Poklemba, Frederick; Chester J. Wolejsza, and James R. Thomas, both of Montgomery, all of Md., assignors to Comsat Laboratories, Clarksburg, Md.

Filed Dec. 22, 1989, Ser. No. 457,027
Int. Cl.[5] H04B 1/10
U.S. Cl. 375—103 20 Claims



1. A pre-averager for reducing the noise bandwidth of a modulated signal which has a symbol period which may be variable, prior to signal detection comprising:

analog to digital conversion means for sampling an incoming analog signal at a first sampling rate and to digitize the signal samples;

accumulator means, responsive to said digitized signal samples, for accumulating the digitized samples over a prede-

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termined interval, said predetermined interval being not greater than the symbol period of the signal to be detected, to produce an accumulated sample for the digitized signal samples occurring over said predetermined interval; and

means, responsive to said accumulated sample, for outputting said accumulated sample at a second sampling rate.

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**5,052,028**

## METHOD FOR SYNCHRONIZING THE PHASE OF CLOCK SIGNALS OF TWO CLOCK GENERATORS IN COMMUNICATIONS NETWORKS

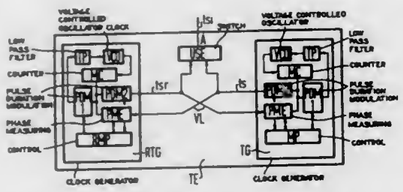
**Eduard Zwack, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Mar. 27, 1990, Ser. No. 499,770**

**Claims priority, application European Pat. Off., Mar. 31, 1989, 89105713.5**

**Int. Cl.[5] H03B *19/00***

**U.S. Cl. 375—109** **29 Claims**



1. A method for synchronizing the phase of digital oscillator clock signals that are formed in an oscillator clock means of a clock generator means with digital reference oscillator clock signals that are formed in a reference oscillator clock means of a reference clock generator means, comprising the steps of:

deriving reference clock signals or clock signals having a lower frequency than a frequency of the reference oscillator clock signals or the oscillator clock signals, respectively in the reference clock means or in the clock generator means, respectively, from the reference oscillator clock signals or oscillator clock signals, respectively, using a respective phase locked loop means and a respective processor means, respectively, whereby defined signal edges represent the phase relation of the reference oscillator clock signals or oscillator clock signals, respectively;

in the clock generator means synchronizing the phase of the oscillator clock signals with the reference clock signals communicated to the clock generator means using a phase locked loop formed by a phase measuring means and by a control means;

measuring phase deviations between the reference clock signals and the clock signals that are communicated to the reference clock generator means via at least one connecting line, and forming control information in the reference clock generator means using a control loop formed by a second delay means and a control means, said control means being formed of a controller and a phase measuring means;

controlling with the control information at least one first delay means that is controllable in terms of its delay time and that is inserted into at least one connecting line for communicating the reference clock signals or clock signals such that the phase deviations between the reference clock signals and the clock signals correspond to an n-fold period duration of the reference oscillator clock signals, where n is a whole number;

forming correction information measured in n period durations and representing a phase deviation between the reference clock signals and the clock signals measured within the nth period duration in the control means of the reference clock generator means and forwarding the correction information to the clock generator means; and

correcting the phase relations of the reference clock signals and the clock signals in the clock generator means using the control means in the clock generator means according to the communicated correction information.

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**5,052,029**

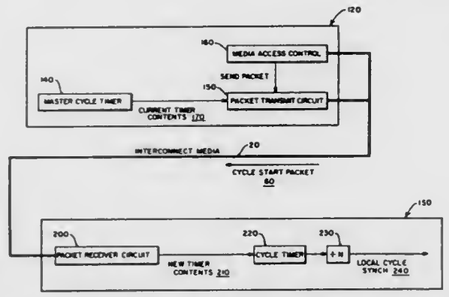
## SELF-CORRECTING SYNCHRONIZATION SIGNAL METHOD AND APPARATUS

**David V. James, Palo Alto, and Michael D. Teener, Santa Cruz, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.**

**Filed Apr. 5, 1990, Ser. No. 505,334**

**Int. Cl.[5] H04L *7/06***

**U.S. Cl. 375—107** **8 Claims**



1. A method of providing a self-correcting synchronization signal on a communication interconnect which connects multiple units, said method comprising the steps of:

waiting a predetermined period of time (nominal cycle period);

after said predetermined period of time, waiting a further period of time for the absence of communications on said interconnect among any of said units, and forming a count of the passage of time during this further period of time (start delay);

forming a synchronization signal including said count of said further period of time; and

sending said synchronization signal on said interconnect.

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**5,052,030**

## METHOD FOR SYNCHRONIZING A CLOCK, GENERATED WITH THE ASSISTANCE OF A COUNTER, TO A REFERENCE CLOCK

**Wolfram Ernst, and Gerhard Uhlig, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Apr. 2, 1990, Ser. No. 502,931**

**Claims priority, application Fed. Rep. of Germany, May 31, 1989, 3917712**

**Int. Cl.[5] H03K *5/135***

**U.S. Cl. 375—108** **5 Claims**

1. A method of synchronizing a clock to a reference clock supplied on a reference line, comprising the steps of:

defining a time window with respect to the clock;

synchronizing the clock to the reference clock when a defined edge of the reference clock appears within the time window;

resynchronizing the clock to the reference clock after counting a predetermined number of defined edges which appear outside of the time window; and



detecting the outage of the reference clock and preventing resynchronization in response to interference pulses on the reference line which have such defined edges outside of the time window.

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**5,052,031**

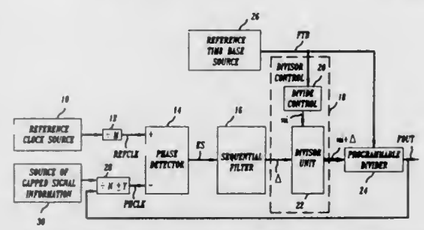
## PHASE LOCKED LOOP INCLUDING NON-INTEGER MULTIPLE FREQUENCY REFERENCE SIGNAL

**Nicholas J. Molloy, Haverhill, Mass., assignor to AT&T Bell Laboratories, Murray Hill, N.J.**

**Filed Aug. 14, 1990, Ser. No. 567,490**

**Int. Cl.[5] H03L *7/06***

**U.S. Cl. 375—120** **16 Claims**



1. A digital phase locked loop for generating an output clock signal having a prescribed frequency comprising:

a source of a first reference clock signal;

means supplied with said output clock signal for generating a phase clock signal;

phase detector means responsive to said first reference clock signal and said phase clock signal for generating an error signal;

means supplied with said error signal for generating a control signal representative of a filtered version of said error signal;

a source of a reference signal having a frequency which is a non-integer multiple of said output clock signal frequency;

programmable divider means responsive to a divisor control signal for dividing said reference signal to obtain said output clock signal having said prescribed frequency; and

means supplied with said reference signal and said contol signal for generating said divisor control signal.

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**5,052,032**

## CLOCK FORMATION CIRCUIT

**Gohji Uchikoshi, Higashimurayama, Japan, assignor to Nakamichi Corporation, Kodaira, Japan**

**Filed Jul. 16, 1990, Ser. No. 552,986**

**Claims priority, application Japan, Jul. 18, 1989, 1-185718**

**Int. Cl.[5] H03D *3/24***

**U.S. Cl. 375—120** **6 Claims**

1. A clock formation circuit for forming from a digital data signal a formation clock signal corresponding to a data clock signal controlling an inversion timing of said digital data signal comprising:

means to compare a phase of said digital data signal with a phase of said formation clock signal and to provide a phase difference information signal having a sawtooth period waveform when a frequency of said data clock signal is different from a frequency of said formation clock signal, said phase difference information signal having a level varying in accordance with a phase difference between said digital data signal and said information clock signal;

a current limitation circuit including a capacitor to input said phase difference information signal and to limit the maximum values of currents introduced into and flowing out of said capacitor, a terminal voltage across said capacitor varies in accordance with said phase difference information signal by its being charged and discharged;

means to output an integrated information signal of said terminal voltage;

and output means to output said formation clock signal having a frequency controlled based at least on said integrated information signal.

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**5,052,033**

## REFLECTION TYPE MASK

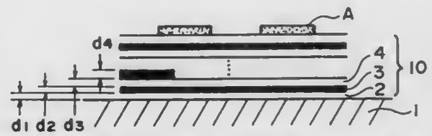
**Tsutomu Ikeda; Yutaka Watanabe; Masayuki Suzuki; Masami Hayashida, all of Atsugi; Yasuaki Fukuda, Hadano; Shigetaro Ogura, Tama; Takashi Iizuka, and Masahito Niibe, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 156,934, Feb. 17, 1988, abandoned. This application Dec. 28, 1990, Ser. No. 633,181**

**Claims priority, application Japan, Feb. 18, 1987, 62-33523; Dec. 29, 1987, 62-335220; Dec. 29, 1987, 62-335221; Dec. 29, 1987, 62-335222; Dec. 29, 1987, 62-335223; Jan. 22, 1988, 63-12136**

**Int. Cl.[5] G21K *5/00***

**U.S. Cl. 378—35** **30 Claims**




1. A reflection type mask usable in an exposure apparatus for transferring a pattern of the mask onto a workpiece coated with a sensitive material, by use of radiation such as soft X-rays or vacuum ultraviolet rays, said mask comprising:

a reflective portion formed by a multilayered film; and

a non-reflective portion formed on said reflective portion to provide a pattern, wherein said non-reflective portion is provided by an anti-reflection film having a multilayered structure.

**5,052,034**

## X-RAY GENERATOR

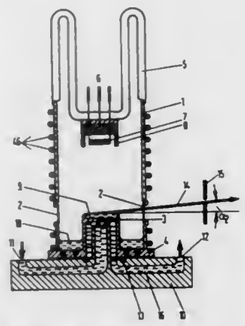
**Manfred Schuster, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany**

**Filed Oct. 29, 1990, Ser. No. 604,951**

**Claims priority, application European Pat. Off., Oct. 30, 1989, 89120143.6**

**Int. Cl.[5] H01J** *35/00, 35/14, 35/10*

**U.S. Cl. 378—121** **14 Claims**



1. An x-ray generator comprising:
a cathode disposed in an evacuated housing;
an anti-cathode consisting of an electrically conductive fluid;
means for focusing particles emitted by said cathode onto said anti-cathode to generate x-rays emerging from a surface of said anti-cathode, with $\alpha_{2C}$ being the critical angle of total reflection at said surface; and means for defining a tap angle $\alpha_2$ of said x-rays satisfying the condition

$$\alpha_{2C} < \alpha_2 < 3\alpha_{2C}.$$

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**5,052,035**

## IMAGE LOCATION MARKING DEVICES FOR RADIOGRAPHS, METHOD OF MAKING AND METHODS OF USE

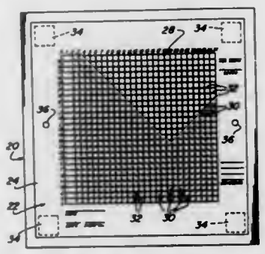
**Steven B. Krupnick, Philadelphia, Pa., assignor to Webb Research II Corporation, Philadelphia, Pa.**

**Filed Nov. 2, 1989, Ser. No. 430,994**

**The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.**

**Int. Cl.[5] H05G** *1/28;* **A61B** *6/08*

**U.S. Cl. 378—163** **17 Claims**



1. A device for producing plural linear indicia on a film bearing a radiographic image of a portion of the body of a being over which said device is disposed to facilitate the location of a part of the being's body within said image by reference to said indicia, said device comprising a flexible substrate having indicia producing means located thereon, said indicia producing means producing said desired indicia when said film is exposed to radiation and developed to produce said radiographic image, said indicia producing means comprising carrier means having very fine particles of a radio-opaque material disposed therein, said carrier means with said particles therein being applied on said substrate in a first group of plural rows of lines, with the spacing between said lines of said first group being preselected, said substrate including portions located at preselected locations on said lines through which at least one visible indicia mark may be applied onto the portion of the body of the being disposed thereunder, said portions located at preselected locations being free of cut openings but being sufficiently porous for permitting said at least one visible indicia mark applied to an upper surface of the substrate at said portions located at preselected locations to wick through the substrate.

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**5,052,036**

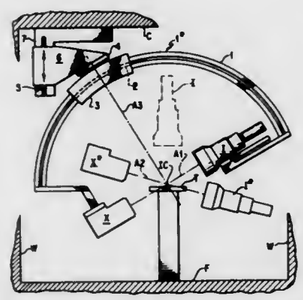
## X-RAY STAND WITH LATERALLY INCLINED ROTATION AXIS

**John K. Grady, XRE Corporation, 300 Foster St., Littleton, Mass. 01460**

**Filed Apr. 2, 1990, Ser. No. 503,255**

**Int. Cl.[5] H05G** *1/02*

**U.S. Cl. 378—197** **13 Claims**



1. An X-ray stand for installation on the ceiling surface, floor surface or side wall surface of a hospital room of finite dimensions for examination of a patient comprising:
a fixture for attachment to one of the surfaces;
a support connected to the fixture holding a bearing with a rotational axis;
a circular track mounted on the bearing for rotation on the axis;
an arcuate carriage received in the track so as to slide on a circular path between end positions on the track; and
a primary set of a radiation source and a radiation receptor disposed at the ends of the carriage and aligned on a primary radiation axis through a fixed isocenter at the patient position;
wherein the rotational axis of the bearing is fixed at an inclination significantly more than zero and less than ninety degree to the fixture and surface to which the fixture is attached, so that the arcuate carriage in its end positions can be rotated with the track to substantially different angles of the radiation axis through the fixed isocenter at the patient position, while maximizing the radius of the arcuate carriage with respect to the finite dimensions of the room between the ceiling and floor walls and providing substantial change in the radiation angle through the patient by rotation about the bearing axis with one carriage end adjacent the bearing axis.



**5,052,037**

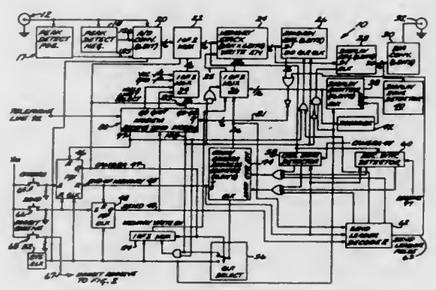
## VIDEO TELEPHONE EMPLOYING PULSE WIDTH MODULATION FOR DATA TRANSMISSION

**Frank M. Perelman, 4450 Alla Rd., Los Angeles, Calif. 90066**

**Continuation-in-part of Ser. No. 137,620, Dec. 24, 1987, abandoned. This application Jun. 26, 1989, Ser. No. 371,040**

**Int. Cl.[5] H04M** *11/00;* **H04N** *7/14*

**U.S. Cl. 379—53** **9 Claims**



1. An apparatus for a video telephone that comprises:
a means for receiving video data and synchronization signals from a video source;
a means for converting said video data and synchronization signals into digital video data and synchronization signals;
a means for digital information storage;
a means for storing digital video data and synchronization signals into said means for digital information storage;
a means for reading digital video data and synchronization signals stored in said means for digital information storage;
a means for converting said digital video data and synchronization signals read from said means for digital information storage into pulse width modulation signals for transmission; and
a means for transmitting to a receiver said pulse width modulation signals for transmission.

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**5,052,038**

## APPARATUS AND METHOD FOR OBTAINING INFORMATION IN A WIDE-AREA TELEPHONE SYSTEM WITH DIGITAL DATA TRANSMISSION BETWEEN A LOCAL EXCHANGE AND AN INFORMATION STORAGE SITE

**David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Stamford, Conn.**

**Continuation of Ser. No. 229,557, Aug. 5, 1988, abandoned, which is a division of Ser. No. 69,828, Jul. 6, 1987, Pat. No. 4,782,509, which is a continuation of Ser. No. 644,811, Aug. 27, 1984, abandoned. This application Apr. 12, 1990, Ser. No. 508,961**

**The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.**

**Int. Cl.[5] H04M** *3/50, 7/00, 11/00*

**U.S. Cl. 379—88** **2 Claims**

1. The method of obtaining information stored in alphanumeric code in at least one location in a geographical region by operating a telephone in a telephone system of the kind including a plurality of local exchanges located remotely from each other in said geographical region with each local exchange being connectable by respective voice-grade channels to any of a corresponding set of telephones associated with that local exchange, said telephones including keying means for producing decimal signals, said keying means comprising a set of touch-type push-buttons which when pressed produce a respective distinctive signal of decimal character, each push-button designating a group of alphabetic letters and an associated numeral so that the decimal signals produced by each of said set of push-buttons can be used to represent the corresponding alphabetic group or the associated numeral; said keying means being operable with said telephone system to effect voice-transmitting connection between any one of said telephones associated with any of said local exchanges to any other of said telephones; the telephone system further including a non-voice-grade digital data transmission network connecting all of said local exchanges to said one location where said alphanumerically coded information is stored;

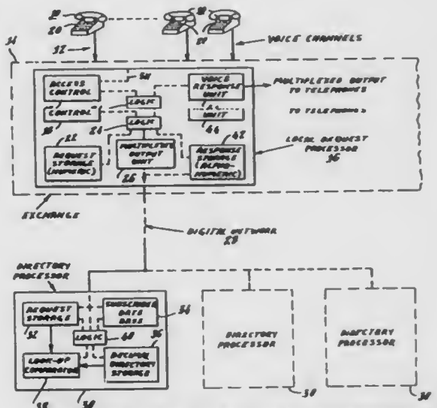
said method comprising the steps of:

operating said push-buttons at any one of said telephones of any of said sets of telephones to produce a request signal in the form of a plurality of decimal signals representing a corresponding sequence of alphanumeric characterist identifying the information desired from that stored in said one location;

directing said decimal signals through the respective voice-grade channel from said one telephone to the corresponding local exchange;

storing said decimal signals of said request signal at a request processor at said corresponding local exchange;

directing signals corresponding to said request signal in digital decimal signal format through said digital data transmission network to an information retrieval processor at said one location, said information retrieval processor including storage means storing alphanumerically-coded data identifying information of potential interest;



storing said decimal-signals request signal in a request storage unit at said information retrieval processor;

carrying out a look-up of said stored information at said information retrieval processor to locate the alphanumerically-coded data desired as identified by the decimal signals stored in said request storage unit;

directing back through said digital data transmission network, from said information retrieval processor to said corresponding local exchange, digital alphanumeric signals representing said particular information;

storing in a response storage unit at said request processor at said corresponding local exchange alphanumeric reply signals corresponding to said alphanumeric signals sent back through said digital data transmission network;

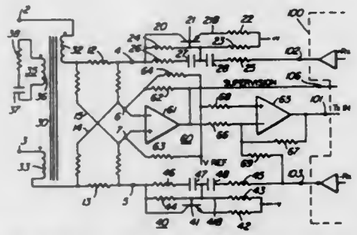
operating a multiplexed voice-response unit at said corresponding local exchange in accordance with said stored alphanumeric reply signals to develop multiplexed speech signals identifying said particular information; and

directing said developed multiplexed speech signals through said respective voice-grade channel back to said one telephone to furnish the requested information to the person operating said one telephone.

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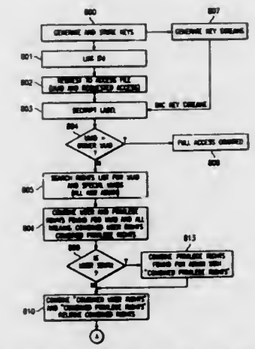
5,052,039
## LINE INTERFACE CIRCUIT
Mihail S. Moisin, Lake Forest, Ill., assignor to Northern Telecom Limited, Montreal, Canada
Filed Jan. 16, 1990, Ser. No. 464,140
Int. Cl.[5] H04M 1/00
U.S. Cl. 379—402 8 Claims



1. A line interface circuit for coupling differential alternating current signals between a telephone facility and tip and ring leads of a two wire communications line, to the substantial exclusion of longitudinal signals of about a predetermined frequency, the line interface circuit comprising:
- tip and ring amplifiers each having an output, and an input for receiving alternating current signals destined for the communications line;
- tip and ring terminals for connection to the tip and ring leads respectively;
- a transformer including a secondary winding, having an inductance, and tip and ring windings being similar with respect to each other, the tip winding being connected in series between the tip terminal and the output of the tip amplifier, and the ring winding being connected in series between the ring terminal and the output of the ring amplifier, the tip and ring windings being arranged in flux reinforcing configuration with respect to any longitudinal signal current at the tip and ring terminals;
- a capacitive component and a resistive component being connected in series across the secondary winding for providing a series resonant circuit having a resonant frequency of about said predetermined frequency, whereby longitudinal signals of about said resonant frequency are impeded, and an ohmic value of the resistive component being of a value whereby longitudinal signals of up to about a second harmonic of said resonant frequency are impeded, albeit to a lesser degree than the first mentioned longitudinal signals.

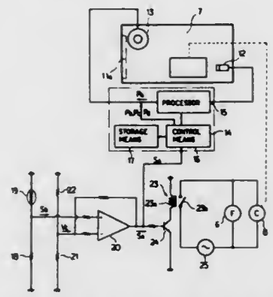
5,052,040
## MULTIPLE USER STORED DATA CRYPTOGRAPHIC LABELING SYSTEM AND METHOD
Harold W. Preston, Carrollton, and Jeffrey R. Rush, Richardson, both of Tex., assignors to Micronyx, Inc., Richardson, Tex.
Filed May 25, 1990, Ser. No. 529,107
Int. Cl.[5] H04L 9/32
U.S. Cl. 380—4 19 Claims

1. A method of cryptographically labeling a data file of electronically stored data comprising the steps of:
- generating a file label comprising a first field containing control variables for encrypting and decrypting said data file;
- generating at least one other field of said label, said field having portions to identify individual users and portions to identify the rights unique to each said user;
- prefixing said label to the file;
- encrypting the file in accordance with the control variables in said first field; and



- allowing access to said file for any user only in accordance with said rights preidentified in a field of said file identified with said user.

5,052,041
## SILENCER
Keiji Nakanishi, Takatsuki, and Yasuyuki Sekiguchi, Ibaraki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 27, 1990, Ser. No. 485,563
Claims priority, application Japan, Feb. 27, 1989, 1-46111
Int. Cl.[5] G10K 11/16
U.S. Cl. 381—71 12 Claims

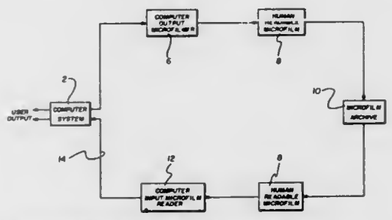


1. A silencer for refrigeration system including an outer cabinet having a compartment, and evaporator for evaporating a refrigerant, a compressor disposed in the compartment for compressing the refrigerant discharged from the evaporator, the compressor being driven by a motor enclosed therein, and a condenser for condensing the high pressurized refrigerant gas discharged from the compressor, the silencer comprising:
- A) a noise deadening section comprising:
  - a) noise detecting means for detecting noise produced by the compressor and converting the noise to a corresponding electrical signal;
  - b) signal converting means for converting the electrical signal generated by the noise detecting means to a corresponding sound wave signal suitable for deadening the noise from the compressor by the effect of the sound wave interference; and
  - c) a sound producer driven in response to the sound wave signal generated by the signal converting means such that the sound is directed to the interior of the compartment;



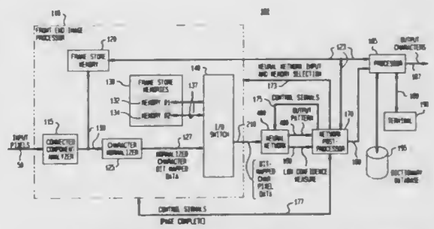
- B) an abnormal condition determining section comprising:
  - a) storage means for previously storing compressor noise pattern data indicative of compressor noise when the refrigeration system is operating abnormally as reference patterns; and
  - b) recognition means for comparing the electrical signal generated by the noise detecting means with previously stored data stored in the storage means, thereby recognizing abnormal operation of the refrigeration system;
- C) means for generating a drive signal indicating that the compressor is in operation;
- D) first means for monitoring the condition of the refrigeration system while being supplied with the drive signal; and
- E) second means for maintaining operation of the noise deadening section while it is determined by the first means that the refrigeration system is operating normally, the second means activating the abnormal condition determining section when it is determined by the first means that the refrigeration system is operating in an abnormal manner.

5,052,042
## METHOD AND APPARATUS FOR USING MICROFILM FOR DATA INPUT INTO A COMPUTER
Roger R. A. Morton, Penfield; Wesley J. Micket, Rochester, and Wayne K. Shaffer, Churchville, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Continuation of Ser. No. 296,116, Jan. 12, 1989, abandoned. This application Apr. 17, 1991, Ser. No. 686,832
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 7 Claims



1. An information data retrieval system comprising:
- a computer system accessible to provide information to a user;
- a computer output microfilmer for converting computer data into human readable characters and printing said characters on microfilm in a known font and format;
- archival means for storing microfilm images generated by said computer output microfilmer and information identifying addresses of the images in said archival means;
- means for retrieving a selected image on request from said archival means;
- a computer input microfilmer including an optical character recognition algorithm for converting human readable characters on microfilm into computer codes wherein said optical character recognition algorithm is optimized to detect characters written in said known font and format; and
- computer interface means for receiving said computer codes to said computer system.

5,052,043
## NEURAL NETWORK WITH BACK PROPAGATION CONTROLLED THROUGH AN OUTPUT CONFIDENCE MEASURE
Roger S. Gaborski, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 7, 1990, Ser. No. 520,334
Int. Cl.[5] G06K 9/66
U.S. Cl. 382—14 36 Claims



1. Apparatus for recognizing the existence of a plurality of patterns in unknown input data comprising:
- network means, responsive to unknown input data, for producing a plurality of output values that collectively identifies one of said patterns existing in said unknown input data, said network means having a plurality of numeric weights associated therewith;
- means, responsive to a control signal and to said plurality of output values and pre-defined output target values associated therewith for said one pattern, for determining changes in the value of each of said numeric weights and, in response thereto, for adjusting a value of each of said weights while said unknown input data is applied to said network means so as to reduce error arising between said output values and said output target values for the unknown input data;
- means, responsive to said plurality of output values, for determining a confidence measure associated therewith; and
- means, responsive to said confidence measure, for generating said control signal so as to enable said determining and adjusting means during pattern recognition to determine said changes and adjust the values of said weights when said confidence measure has a numeric value lying within a pre-defined numeric range so that network training does not occur during pattern recognition whenenver the confidence measure associated with the output values produced for said one pattern is either greater or less than said numeric range whereby said network means is trained to recognize said pattern in the event the pattern deviates from a pre-defined pattern.

5,052,044
## CORRELATED MASKING PROCESS FOR DESKEWING, FILTERING AND RECOGNITION OF VERTICALLY SEGMENTED CHARACTERS
Roger S. Gaborski, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 2, 1990, Ser. No. 474,606
Int. Cl.[5] G06K 9/74
U.S. Cl. 382—32 20 Claims

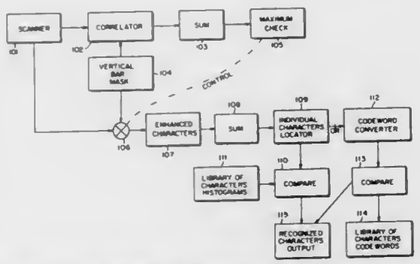
1. An optical character recognition system for reading vertically segmented characters in a document image of parallel horizontal rows and vertical columns of pixels, said system comprising:
- means for defining a mask image comprising a plurality of parallel vertical lines;
- incremental mask stepping means for positioning said mask image at one of a plurality of incremental steps with respect to said document image;

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means for generating a product image by multiplying together corresponding pixels pairs of said document image an said mask image;

means for determining which one of said steps corresponds to a maximum correlation between said document and mask images;




means for generating a histogram of said product image corresponding to an incremental step having maximum correlation between said document and mask images; and

means for determining from said histogram the identity of individual characters in said document image.

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**5,052,045**

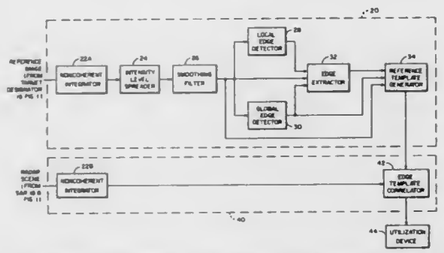
**CONFIRMED BOUNDARY PATTERN MATCHING**

**Theodore J. Peregrim, Bedford; Albert H. Long, Framingham; Stephen L. Richter, Harvard; Harold J. Geller, Framingham; Irving Kanter, Lexington, and Gordon Kettering, Bedford, all of Mass., assignors to Raytheon Company, Lexington, Mass.**

**Filed Aug. 29, 1988, Ser. No. 237,931**

**Int. Cl.[5] G06K** *9/48*

**U.S. Cl. 382—30** **2 Claims**




1. A method of aligning two images of the same scene, each of such images comprising an array of pixels, comprising the steps of:

(a) forming a first map of a portion of the first image, the first map comprising an array of pixels, each of said pixels in the first map having a value indicating whether the pixels in the first image corresponding to the pixels in a local window surrounding the pixel in the first map form an edge;

(b) forming a second map of the portion of the first image, the second map comprising an array of pixels, each of said pixels in the second map having a value indicating whether the pixel in the first image corresponding to the pixel in the second map has a value exceeding a threshold;

(c) combining the first map and the second map to form a third map comprising an array of pixels, each pixel in the third map having a value indicating whether the corresponding pixel in the portion of the first image represents the edge of an object in the image;

(d) successively comparing the third map to portions of the second image and computing a score for each portion of the second image, said score indicating the likelihood that pixels in the portion of the second image corresponding to pixels in the third map having values indicative of edges in the first map are also edges in the second image; and

(e) selecting the portion of the second image producing the highest score to correspond to the portion of the first image.

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**5,052,046**

**IMAGE PROCESSING METHOD AND APPARATUS THEREFOR**

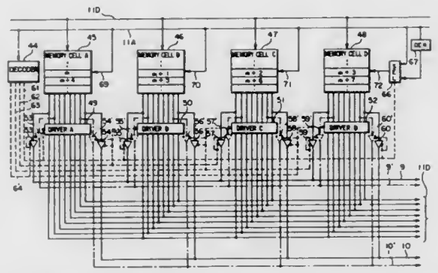
**Kouji Fukuda, Kawasaki; Masatoshi Hino, Sagamihara, and Tetsuo Machida, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 17, 1989, Ser. No. 353,037**

**Claims priority, application Japan, May 19, 1988, 63-120477**

**Int. Cl.[5] G06K** *9/00*

**U.S. Cl. 382—41** **14 Claims**




1. An image processing apparatus for image processing image data consecutive in column and row directions and determining an output value of an objective pixel to be image processed by processing the value of the objective pixel and the values of pixels adjacent to the objective pixel in the column and row directions necessary for a neighborhood operation with respect to the objective pixel, comprising:

an image memory for storing said image data consecutive in the column and row directions;

reading means, in response to one address access, for reading from said image memory a series of pixels within one column at one row and at least one pixel adjacent to said one row in the column direction necessary for said image processing as one group of pixels at a time;

a temporary memory for sequentially storing said one group of pixels read from said reading means, by an amount corresponding to a number of groups of pixels adjacent in the row direction that are necessary for said image processing, as one unit of said groups of pixels; and

operation means for reading the value of said objective pixel and the values of pixels adjacent to said objective pixel necessary for said neighborhood operation of said objective pixel from said temporary memory, and subjecting the value of said objective pixel and the values of said adjacent pixels to said neighborhood operation to determine the output value of said objective pixel, said operation means performing said neighborhood operation for each pixel of said series of pixels, stored in said temporary memory, at one row as said objective pixel within one address access period.



**5,052,047**

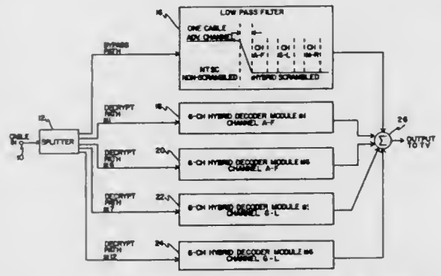
**MODULATOR-REMODULATOR WITH COMMON LOCAL OSCILATOR**

**Leif W. Otto, Niles, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.**

**Filed Apr. 10, 1990, Ser. No. 507,345**

**Int. Cl.[5] H04N** *7/167*

**U.S. Cl. 455—1** **7 Claims**




1. In a video processor of the type having an input RF television signal converter, an output RF television signal converter and means for generating a local oscillator heterodyning signal, and for applying said heterodyning signal to said input RF converter for demodulating a selected TV channel to a fixed frequency IF signal, the improvement comprising:

means for coupling said local oscillator heterodyning signal to said output converter for remodulating said fixed frequency IF signal and outputting said selected TV channel.

7. A cable converter system comprising:

means for receiving a plurality of television signals, including at least one encrypted television signal;

means for passing all of said television signals, except said encrypted television signal, to an output;

module means for receiving said encrypted television signal and for providing a corresponding decrypted television signal to said output, said module means including a local oscillator for tuning said encrypted television signal and converting said encrypted television signal to a fixed frequency IF signal, means for decrypting said fixed frequency IF signal, and means for remodulating said decrypted fixed frequency IF signal to produce said one television signal in decrypted form.

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**5,052,048**

**CRIME DETERRENT SYSTEM**

**Robert G. Heinrich, 8303 Chianti Ct., San Jose, Calif. 95135**

**Filed Aug. 30, 1989, Ser. No. 400,692**

**Int. Cl.[5] H04B** *7/00*

**U.S. Cl. 455—66** **4 Claims**

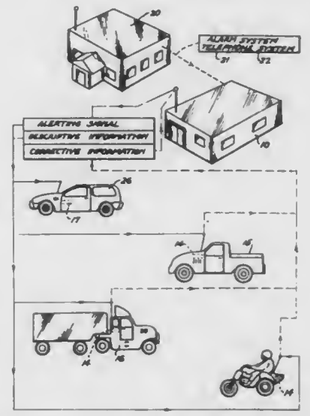
1. A crime deterrent system for monitoring passive pursuit of a subject randomly movable within an area which comprises:

means within the area for providing preliminary information to a central control station relative to the moving subject, its location and its direction of movement;

a plurality of radio frequency receivers, each of which is operable by a person randomly located within the area and is tunable to at least one of any available AM, FM and TV frequency for receiving an alerting signal from the central control station upon receipt of the preliminary information and descriptive information relative to the subject from the central control station when tuned to a first selected FM audio frequency;

radio transmitting means associated with each radio frequency receiver and operable by the person, the radio transmitting means being tunable to only a second selected FM audio frequency for transmitting corrective information to the central control station, upon sighting the subject, for relating any change in location and direction of movement of the subject that is different from the descriptive information first received by the central control station; and

radio transceiver means associated with the central control station for receiving the preliminary information, the descriptive information and the corrective information from at least one person via the providing means, the radio




frequency receivers and the radio transmitting means and for transmitting the alerting signal, upon receipt of the preliminary information, via at least one of the available AM, FM and TV frequencies and the first-received descriptive information followed by the corrective information via the first selected FM audio frequency, thereby monitoring for passive pursuit the exact location and direction of movement of the subject.

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**5,052,049**

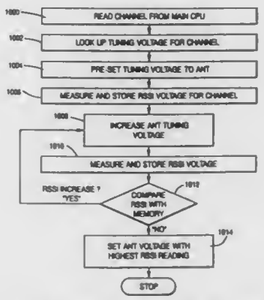
**PAGING RECEIVER WITH CONTINUOUSLY TUNABLE ANTENNA**

**Andrew A. Andros, Spring, Tex., and Thomas J. Campana, Jr., Chicago, Ill., assignors to Telefind Corporation, Coral Gables, Fla.**

**Continuation-in-part of Ser. No. 110,514, Oct. 20, 1987, Pat. No. 4,851,830. This application Jul. 18, 1989, Ser. No. 381,527**

**Int. Cl.[5] H04B** *1/18*

**U.S. Cl. 455—186** **70 Claims**




1. A RF receiver which is tunable to at least one specified channel having a signal strength which varies as a result of variable antenna gain comprising:

a tunable antenna which is tunable in response to an antenna

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tuning signal to vary antenna gain for the specified channel;

a RF tuner, coupled to the tunable antenna, for receiving the specified channel in response to an applied channel tuning signal specifying reception of the specified channel;

an intermediate frequency circuit, coupled to the RF tuner, for producing an intermediate frequency signal and a received signal strength indicator which is proportional to a level of the intermediate frequency signal;

an antenna tuning circuit, responsive to the received signal strength indicator and to a fixed magnitude stored antenna tuning signal which is a function of the channel being received and which was stored prior to receiving the specified channel, for generating the antenna tuning signal which produces maximum antenna gain for the received channel; and

a controller controlling generation of the applied channel tuning signal to cause the RF tuner to be tuned to receive the specified channel.

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**5,052,050**

## DIRECT CONVERSION FM RECEIVER

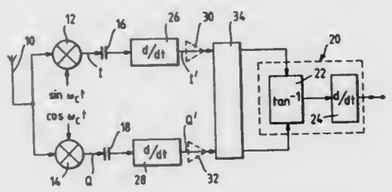
**Christopher J. Collier, Carshalton Beeches; Robert A. Brown, Canbridge, both of England, and Monique G. M. Sommer, Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.**

**Filed Mar. 14, 1989, Ser. No. 323,465**

**Claims priority, application United Kingdom, Mar. 16, 1988, 8806202**

**Int. Cl.[5] H04B *1/10, 1/26***

**U.S. Cl. 455—296** **9 Claims**




1. A direct conversion receiver comprising an input for an FM signal, means coupled to the input for producing frequency down-converted quadrature related I and Q signals at baseband frequencies on respective first and second outputs, demodulating means having first and second inputs for receiving the I and Q signals and demodulating the information in the FM signal by obtaining the differential with respect to time of the arctan of the I and Q signals, and first and second differentiating means, said first and second outputs being coupled to the first and second differentiating means, respectively, and said first and second differentiating means having outputs coupled respectively, to said first and second inputs of the demodulating means.

**5,052,051**

## HETERODYNE RECEIVER FOR COHERENT OPTICAL COMMUNICATION

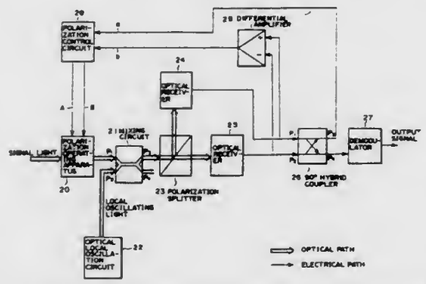
**Takao Naito, Kawasaki; Terumi Chikama, Machida; Shigeki Watanabe, Kawasaki; Tetsuya Kiyonaga, Kawasaki, and Yoshihito Onoda, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Oct. 20, 1989, Ser. No. 424,732**

**Claims priority, application Japan, Oct. 20, 1988, 63-262943**

**Int. Cl.[5] H04B *10/06***

**U.S. Cl. 455—619** **33 Claims**




1. A heterodyne receiver for coherent optical communication comprising:

an optical local oscillating circuit for producing a local oscillation light;

a polarization operating apparatus for varying a polarization state of a signal light transmitted through a light transmission path;

a mixing circuit responsive to said optical local oscillating circuit and said polarization operating apparatus for mixing the signal light, with the local oscillation light, said mixing circuit outputting at least one output light;

a polarization splitter responsive to said mixing circuit for separating an output light from said mixing circuit into polarization components;

a plurality of optical receivers responsive to said polarization splitter for detecting signals with respect to polarization components obtained by said polarization splitter to provide intermediate frequency signals;

a 90-degree hybrid coupler responsive to said optical receivers for delaying the phase of the intermediate frequency signals by 90 degrees to produce first and second delayed signals, for adding the first delayed signal to one intermediate frequency signal to produce a first sum and for adding the second delayed signal to another intermediate frequency signal to produce a second sum;

a demodulator responsive to said 90-degree hybrid coupler for demodulating the second sum outputted from said 90-degree hybrid coupler; and

a polarization control circuit for controlling the polarization state of an output of said heterodyne receiver, by driving said polarization operating apparatus based on the intermediate frequency signals output from said optical receivers and the first sum output of said 90-degree hybrid coupler.

# DESIGN PATENTS

## GRANTED SEP. 24, 1991

### ERRATA

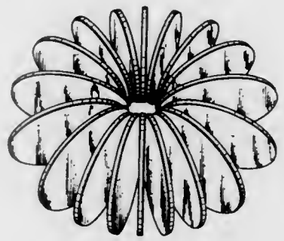
| For CLASS | See PATENT NO. |
|---|---|
| D007-395 | 320,125 |

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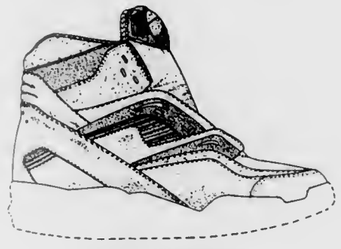
# DESIGNS

SEPTEMBER 24, 1991

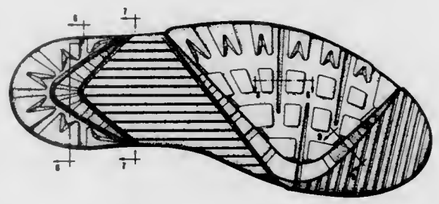
320,106
**VEGETABLE GARNISH**
Gyula Padi, 3508 Nolina Cir., Lancaster, Calif. 93536
Filed May 18, 1989, Ser. No. 353,510
Term of patent 14 years
U.S. Cl. D1—120



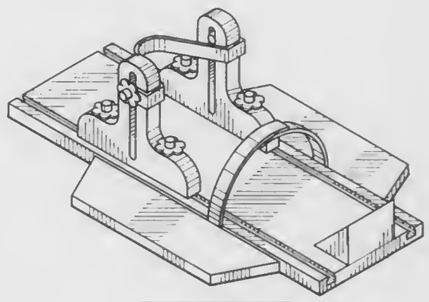
320,107
**SHOE UPPER**
Charles Legassie, Canton; David E. Miller, Carver, both of Mass., and James I. Agnew, Terrace, Calif., assignors to Reebok International Ltd., Stoughton, Mass.
Filed Mar. 26, 1990, Ser. No. 483,435
Term of patent 14 years
U.S. Cl. D2—314



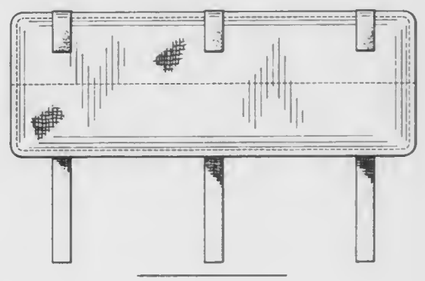
320,108
**CUP SHAPED SOLE**
Tinker L. Hatfield, and Wilson W. Smith, both of Portland, Oreg., assignors to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jun. 13, 1990, Ser. No. 537,104
Term of patent 14 years
U.S. Cl. D2—320



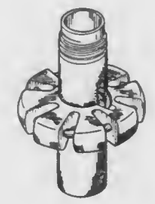
320,109
**BOOT PULLER**
Joseph A. Chew, 143 Ames St., Brockton, Mass. 02402
Filed Dec. 9, 1988, Ser. No. 281,828
Term of patent 14 years
U.S. Cl. D2—642



320,110
**SEAT BELT COVER**
Jeffrey Hawkins, 7139 Scott Trail, Riverdale, Ga. 30296
Filed Dec. 6, 1988, Ser. No. 280,729
Term of patent 14 years
U.S. Cl. D2—639



320,111
**NOTCH FOR AN UMBRELLA**
Mark J. S. Ma, 12th Floor, 578 Kwang Fu South Road, Taipei, Taiwan
Filed May 15, 1989, Ser. No. 351,551
Term of patent 14 years
U.S. Cl. D3—10



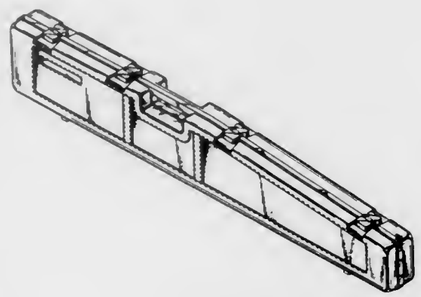
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320,112
SKI CARRIER
John G. Wirth, RD #2, Box 140 F, Landenberg, Pa. 19350
Filed Aug. 14, 1989, Ser. No. 396,451
Term of patent 14 years
U.S. Cl. D3—36



320,113
GUN CASE
Ralph VanSkiver, Arlington, Tex., assignor to Doskocil Mfg. Co., Inc., Arlington, Tex.
Filed Apr. 6, 1989, Ser. No. 334,225
Term of patent 14 years
U.S. Cl. D3—38



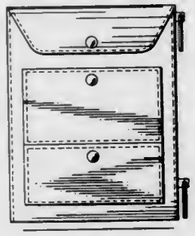
320,114
KEY HOLDER
James R. Stillwagon, 890 Gatehouse La., Worthington, Ohio 43235, and Scott H. Lee, R.R. #2, Putnam, Conn. 06260
Division of Ser. No. 295,582, Jan. 11, 1989, Pat. No. D. 310,753.
This application Sep. 6, 1990, Ser. No. 578,135
Term of patent 14 years
U.S. Cl. D3—61



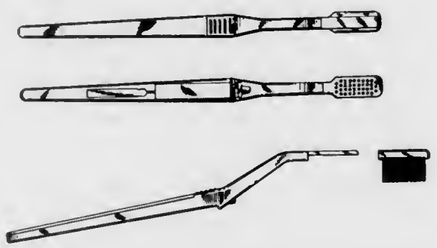
320,115
GARMENT BAG
William L. King, Denver, Colo., assignor to Samsonite Corporation, Denver, Colo.
Division of Ser. No. 101,331, Sep. 25, 1987. This application Oct. 2, 1990, Ser. No. 592,056
Term of patent 14 years
U.S. Cl. D3—71



320,116
CASE FOR EMERGENCY APPARATUS OR THE LIKE
Guy J. Levesque, 33 Roger St., Sudbury, Ontario P3B 3R5, Canada
Filed Oct. 11, 1988, Ser. No. 256,380
Term of patent 14 years
U.S. Cl. D3—106

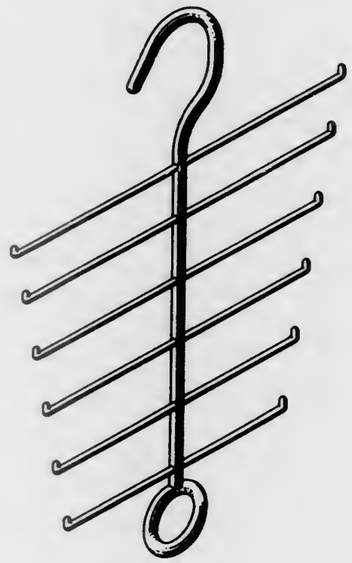


320,117
TOOTHBRUSH
Ram Shalvi, Hong Kong, Hong Kong, assignor to Solar Wide Industrial Limited, Kowloon, Hong Kong
Filed May 24, 1989, Ser. No. 356,925
Claims priority, application United Kingdom, Feb. 21, 1989, 1057329
Term of patent 14 years
U.S. Cl. D4—104





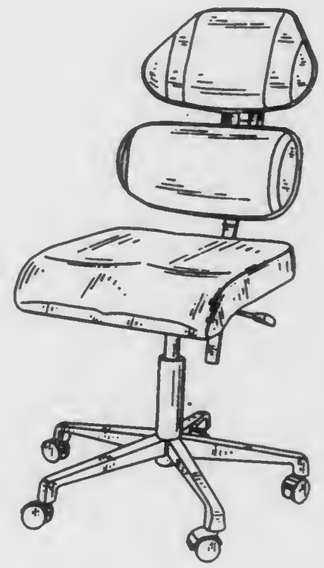
320,118
COMBINED SCARF, TIE, AND BELT HANGER
Emily Testa, Burnaby, Canada, assignor to Emily Testa Marketing Ltd., Burnaby, Canada
Filed Oct. 30, 1989, Ser. No. 428,664
Claims priority, application Canada, Jul. 7, 1989, 07-07-89-7
Term of patent 14 years
U.S. Cl. D6—317



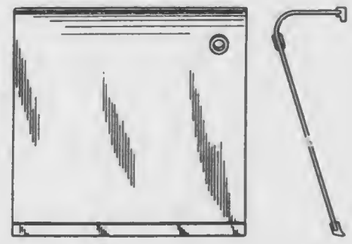
320,119
HOOK
John P. Chap, Lemont, and Dorothy Greenberg, Oak Park, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Aug. 12, 1988, Ser. No. 231,236
Term of patent 14 years
U.S. Cl. D6—323



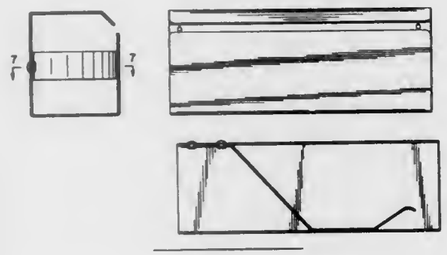
320,120
CHAIR
Arne Samuelsson, Bergvägen 7, S-776 00 Hedemora, Sweden
Filed Jun. 16, 1988, Ser. No. 208,004
Term of patent 14 years
U.S. Cl. D6—366



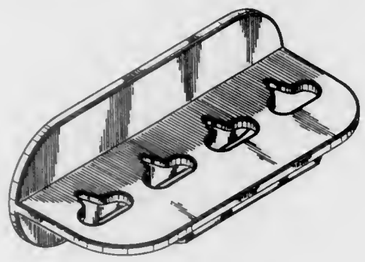
320,121
DESK EASEL
Wallace A. Krapf, 1933 O'Neill Rd., Macedon, N.Y. 14502
Filed Aug. 5, 1988, Ser. No. 228,564
Term of patent 14 years
U.S. Cl. D6—420



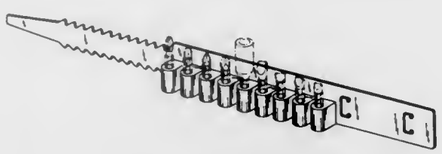
320,122
PAPER TOWEL DISPENSER
Francis J. Filipowicz, 5700 W. Grace St., Richmond, Va. 23226
Filed Apr. 20, 1989, Ser. No. 340,598
Term of patent 14 years
U.S. Cl. D6—522



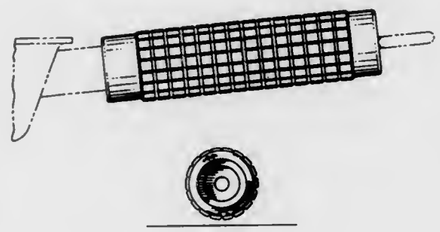
320,123
COMBINED TOOTHPASTE TUBE AND TOOTHBRUSH HOLDER
Thomas H. Wolf, Buffalo Grove, and Andy L. Berger, Grayslake, both of Ill., assignors to Superwares, Inc., Hodgkins, Ill.
Filed Oct. 24, 1989, Ser. No. 426,088
Term of patent 14 years
U.S. Cl. D6—528



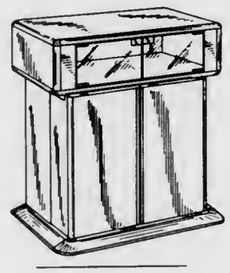
320,124
DRILL BIT HOLDER
Ved P. Gakhar, and James M. Luebbers, both of Louisville, Ky., assignors to Vermont American Corporation, Louisville, Ky.
Filed Jul. 5, 1988, Ser. No. 215,429
Term of patent 14 years
U.S. Cl. D6—553



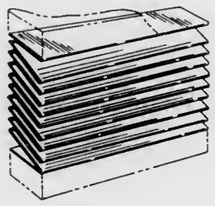
320,125
HANDLE FOR COOKWARE OR THE LIKE
Terry F. Hacker, Manitowoc, Wis., assignor to Newell Co., Freeport, Ill.
Filed Dec. 6, 1988, Ser. No. 280,476
Term of patent 14 years
U.S. Cl. D7—395



320,126
COMBINED TELEVISION STAND AND VIDEO ACCESSORY STORAGE
Joseph E. Miller, Greensboro, N.C., assignor to Bush Industries, Inc., Jamestown, N.Y.
Filed Dec. 18, 1990, Ser. No. 629,210
Term of patent 14 years
U.S. Cl. D6—436

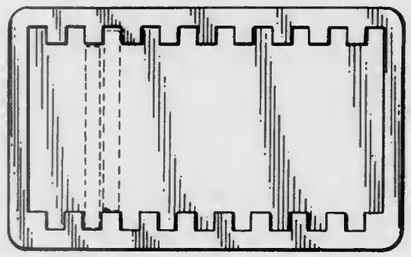


320,127
WINDOW SHADE OR SIMILAR ARTICLE
David R. Schopp, 1720 N. Waukegan Rd., Lake Forest, Ill. 60045
Filed May 26, 1988, Ser. No. 198,919
Term of patent 14 years
U.S. Cl. D6—575



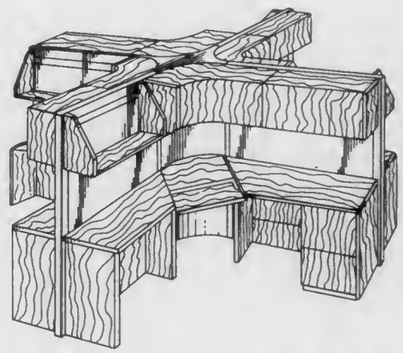


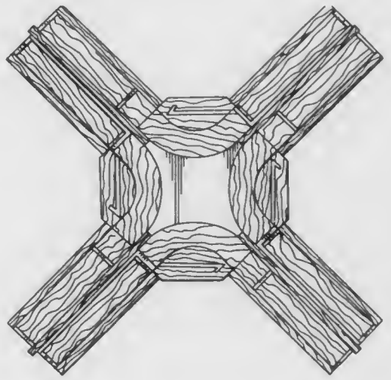
320,128
COMPACT DISC STORAGE UNIT
Gregory P. Fithian, 1318 Valley St., Hayward, Calif. 94541
Filed Jan. 25, 1988, Ser. No. 148,223
Term of patent 14 years
U.S. Cl. D6—407





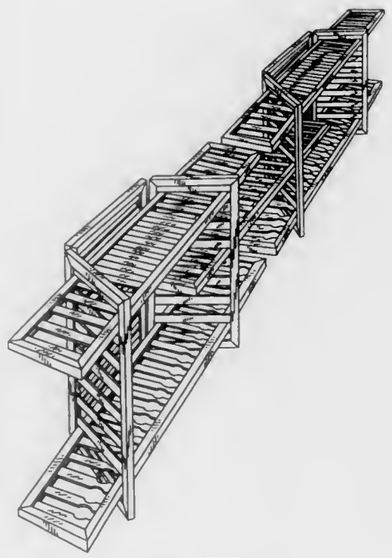
320,129
MULTIPLE STATION DESK
Gina M. Perrego, New Windsor; Richard A. Bayles, Cornwall on Hudson; John J. Higgins, III, Newburgh; William F. Matchler, Middletown, and John Brandon, Attica, all of N.Y., assignors to Dennison Manufacturing Company, Framingham, Mass.
Continuation-in-part of Ser. No. 51,569, May 18, 1987, abandoned. This application Mar. 8, 1988, Ser. No. 200,087
Term of patent 14 years
U.S. Cl. D6—423





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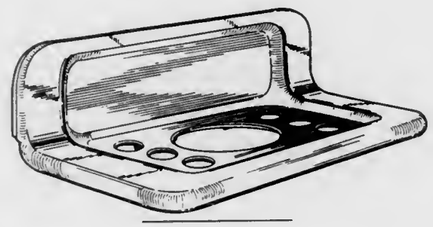
320,130
SHELF UNIT
Robert B. Sutherland, 3344 NE. 131st St., Portland, Oreg. 97230
Filed Jul. 26, 1989, Ser. No. 385,913
Term of patent 14 years
U.S. Cl. D6—465



320,131
JEWELRY ORGANIZER
Aileen Pereyra, and Jorge A. Pereyra, both of 2682 Tuers Rd., San Jose, Calif. 95121
Filed Sep. 19, 1988, Ser. No. 249,431
Term of patent 14 years
U.S. Cl. D6—513



320,132
COMBINED TOOTHBRUSH AND TUMBLER RACK
Paul S. Huxtable, Holden Hill, Australia, assignor to Caroma Industries Limited, Brisbane, Australia
Filed May 16, 1989, Ser. No. 352,381
Claims priority, application Australia, Nov. 30, 1988, 4067/88
Term of patent 14 years
U.S. Cl. D6—531

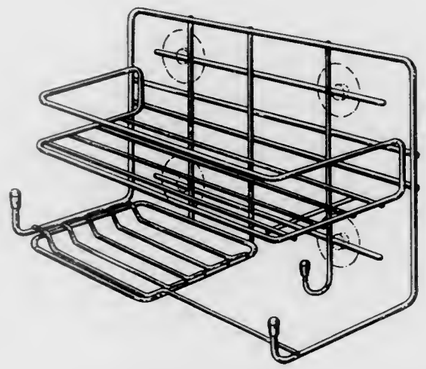


320,133
COVER FOR A FACIAL TISSUE BOX
Victor Carranza, Mexico City, Mexico, assignor to Godinger Silver Art Co., Ltd., New York, N.Y.
Filed Nov. 8, 1988, Ser. No. 269,000
Term of patent 14 years
U.S. Cl. D6—518

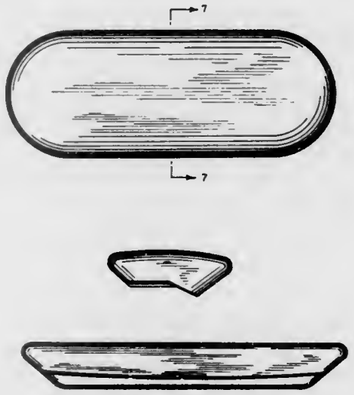




320,134
SHOWER AND TUB CADDY
William W. Emery, Berkeley Heights, N.J., assignor to Better Sleep Manufacturing Co., Berkeley Heights, N.J.
Filed Nov. 6, 1989, Ser. No. 431,977
Term of patent 14 years
U.S. Cl. D6—525



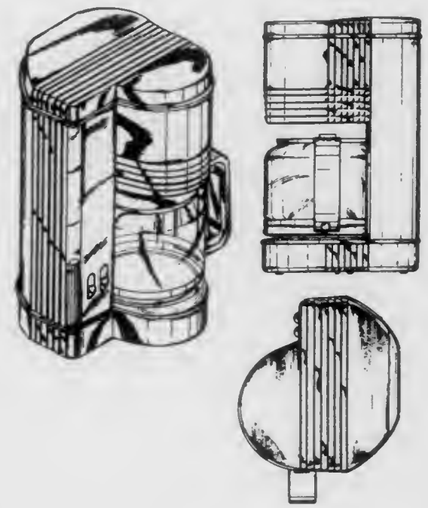
320,135
HEADREST FOR USE IN A BATHTUB OR THE LIKE
Maurice Y. Magnin, Par Bornel, France, and Mary J. Reid, Sheboygan, Wis., assignors to Jacob Delafon, Paris, France
Filed Oct. 31, 1989, Ser. No. 429,906
Term of patent 14 years
U.S. Cl. D6—601




320,136
DRINKING ATTACHMENT FOR BOTTLE EMPLOYING VENTILATING MEANS
Jason E. Adcock, 6001 E. Kathleen Rd., Scottsdale, Ariz. 85254, and William N. Coleman, 4329 E. Hearn Rd., Phoenix, Ariz. 85032
Filed Jul. 10, 1989, Ser. No. 377,207
Term of patent 14 years
U.S. Cl. D7—300.2



320,137
ELECTRIC COFFEE MAKER
Jean-Louis Barrault, Boulogne-Billancourt, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France
Filed Mar. 28, 1988, Ser. No. 174,026
Claims priority, application France, Sep. 28, 1987, 875640
Term of patent 14 years
U.S. Cl. D7—309

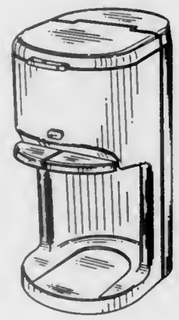


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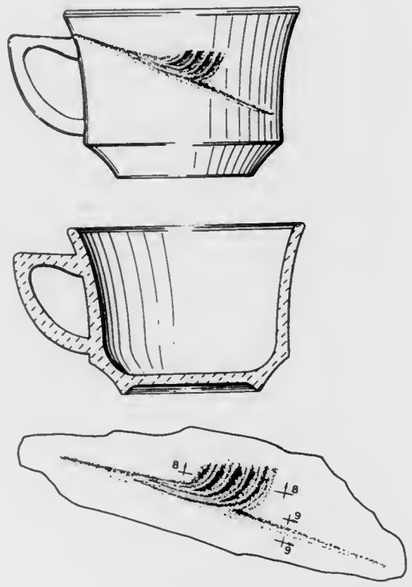
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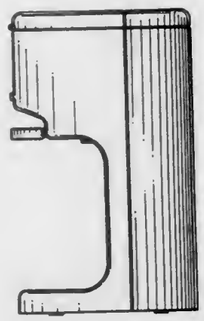
320,138
COMBINED LIQUID HEATER AND DISPENSER FOR BEVERAGES OR THE LIKE
Norman A. Steinkamp, 6676 Silver Beach North, Cedar Grove, Wis. 53013
Filed Jan. 23, 1989, Ser. No. 300,680
Term of patent 14 years
U.S. Cl. D7—309

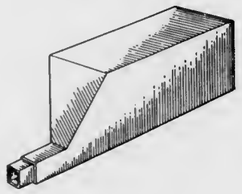


320,139
CUP
Edwin C. Wonder, Wales, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Apr. 30, 1989, Ser. No. 332,215
Term of patent 14 years
U.S. Cl. D7—536



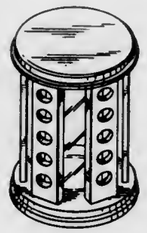
320,140
COFFEE BEAN DISPENSER
Ian J. Bersten, 105 Roseville Avenue, Roseville, New South Wales 2069, Australia
Filed Apr. 27, 1989, Ser. No. 344,290
Term of patent 14 years
U.S. Cl. D7—589



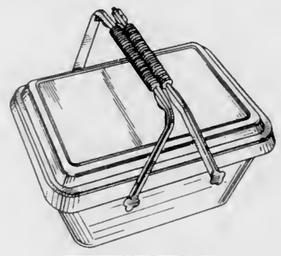




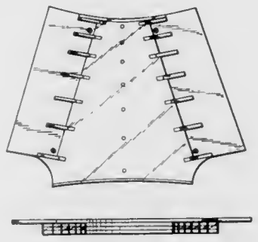
320,141
SPICE RACK
Kenneth L. Farrell, 1415 N. Van Wig Ave., LaPuente, Calif. 91744
Filed May 10, 1989, Ser. No. 350,681
Term of patent 14 years
U.S. Cl. D7—616



320,142
PICNIC BOX
Lam P. Kin, Tsuen Wan, Hong Kong, assignor to Kinllex Industrial Ltd., Hong Kong
Filed Apr. 17, 1989, Ser. No. 339,434
Claims priority, application United Kingdom, Dec. 20, 1988, 1055829
Term of patent 14 years
U.S. Cl. D7—626

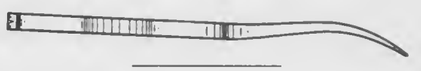


320,143
KNIFE HOLDER OR SIMILAR ARTICLE
Lawrence M. Fenwick, 514 Northeast St., Kewanee, Ill. 61443
Filed Jan. 25, 1989, Ser. No. 301,744
Term of patent 14 years
U.S. Cl. D7—637

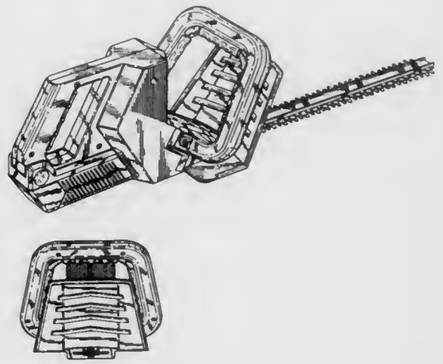


320,144
ORANGE PEELER
Joseph Ban-Dak, POB 14, Kiryat Atta 28000, Israel
Filed Mar. 8, 1989, Ser. No. 320,370
Term of patent 14 years
U.S. Cl. D7—693





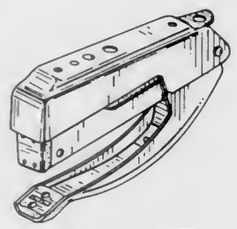
320,145
HEDGE-SHEARS
Franco Clivio, Zürich, Switzerland, assignor to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany
Filed Dec. 12, 1989, Ser. No. 450,009
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1989, M8904724.9
Term of patent 14 years
U.S. Cl. D8—8



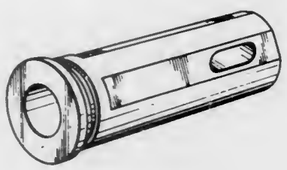
320,146
BRANCHING TOOL FOR COPPER PIPES
Kauno L. J. Koskinen, Rantatie 5, SF-19600 Hartola, Finland
Filed Dec. 4, 1987, Ser. No. 129,103
Term of patent 14 years
U.S. Cl. D8—14



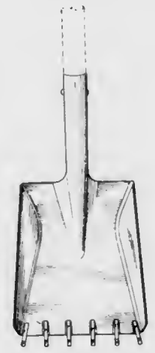
320,147
PLIER STAPLER
Anthony A. Mayo, Bethpage, N.Y., and William S. Carvell, Mt. Prospect, Ill., assignors to Swingline Inc., Long Island City, N.Y.
Filed Feb. 8, 1989, Ser. No. 307,857
Term of patent 14 years
U.S. Cl. D8—50



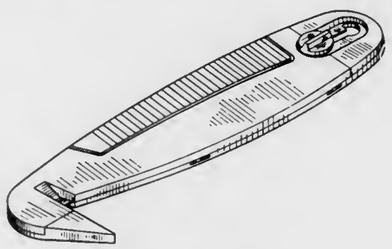
320,148
DRILL SOCKET
Edward A. Andrews, 379 Executive Dr., Troy, Mich. 48083
Filed Dec. 30, 1988, Ser. No. 292,629
Term of patent 14 years
U.S. Cl. D8—70



320,149
HEAD FOR SHINGLE REMOVING TOOL
Glen R. Owens, 3210 E. Main Rd., El Dorado, Ark. 71730
Filed Jun. 6, 1988, Ser. No. 202,921
Term of patent 14 years
U.S. Cl. D8—89



320,150
STRETCH FILM CUTTER
Harrison Huang, No. 23, Lin Tsuo Rd., Shenkang, Taichung, Taiwan
Filed Sep. 28, 1988, Ser. No. 250,819
Term of patent 14 years
U.S. Cl. D8—98

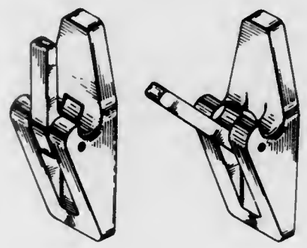


320,151
BRACKET OR THE LIKE
Mary J. Reid, and William C. McKeone, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Division of Ser. No. 263,128, Oct. 12, 1988, Pat. No. Des. 318,607. This application Mar. 20, 1991, Ser. No. 674,712
Term of patent 14 years
U.S. Cl. D8—363





320,152
SELF-RELEASING WALL MOUNTED HOOK
Randall C. Schreib, 3921 S. 322nd St., Auburn, Wash. 98001
Filed Dec. 4, 1989, Ser. No. 445,330
Term of patent 14 years
U.S. Cl. D8—367



320,153
BEVERAGE CAN
Gino H. Cassai, Brooklyn, N.Y., and Henry J. Cassai, 163-47 85th St., Howard Beach, N.Y. 11414, assignors to Henry J. Cassai, Howard Beach, N.Y.
Division of Ser. No. 733,322, May 13, 1985, Pat. No. Des. 302,116. This application Jul. 24, 1989, Ser. No. 383,988
Term of patent 14 years
U.S. Cl. D9—355



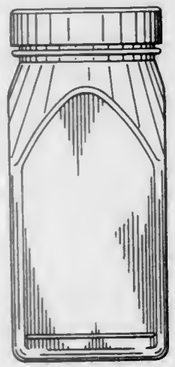
320,154
BOTTLE
Alfred C. Alberghini, Dunwoody; David A. Brunson, Marietta; Steve R. Lynn, Douglasville; Marc W. Roth, College Park, and Sterling L. Steward, Douglasville, all of Ga., assignors to Sewell Plastics, Inc., Atlanta, Ga.
Filed Sep. 26, 1988, Ser. No. 249,086
Term of patent 14 years
U.S. Cl. D9—370



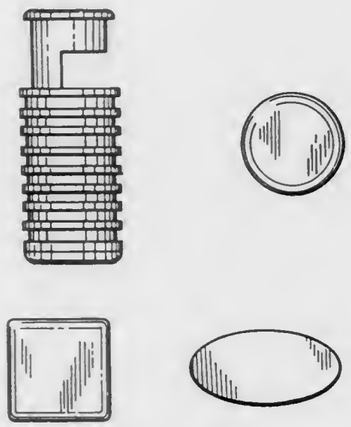




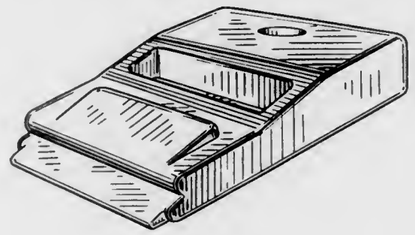
320,155
BOTTLE OR SIMILAR ARTICLE
Carl M. Plochman, III, Winnetka, and Daniel W. Vallarta, Lake Bluff, both of Ill., assignors to Plochman, Inc., Chicago, Ill.
Filed Sep. 30, 1988, Ser. No. 252,432
Term of patent 14 years
U.S. Cl. D9—370



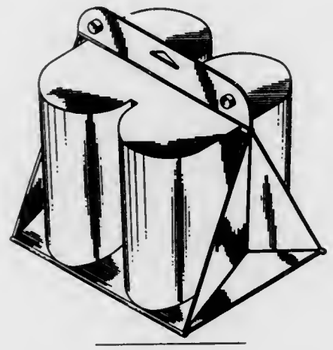
320,156
PILL DISPENSER
Norbert Leopoldi, Chicago, and William P. Heinrich, McHenry, both of Ill., assignors to The Cloverline, Inc., Chicago, Ill.
Filed Feb. 27, 1989, Ser. No. 315,698
Term of patent 14 years
U.S. Cl. D9—339



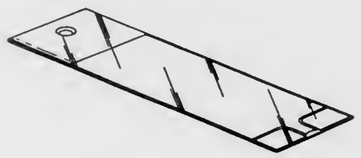
320,157
FLUID SUPPLY CONTAINER
John R. Nobile, Fairfield, and William A. Ross, Darien, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.
Filed May 19, 1989, Ser. No. 355,247
Term of patent 14 years
U.S. Cl. D9—414



320,158
SHIPPING AND DISPLAY PACKAGE FOR BEVERAGEWARE
Frederic L. Contino, Lancaster, Ohio, assignor to Newell Co., Freeport, Ill.
Filed Aug. 18, 1989, Ser. No. 395,945
Term of patent 14 years
U.S. Cl. D9—415

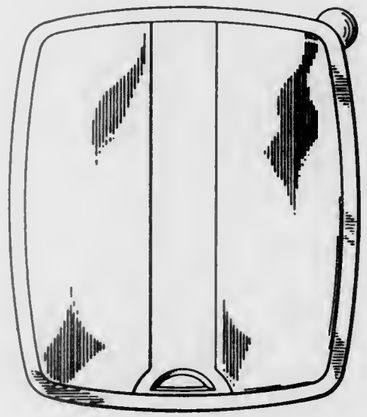


320,159
DISPLAY PACKAGE FOR DRILL BIT
Mark Wallach, Markham, Canada, assignor to Canadian Flexi Drills, Markham, Canada
Filed Jul. 20, 1989, Ser. No. 383,344
Term of patent 14 years
U.S. Cl. D9—415





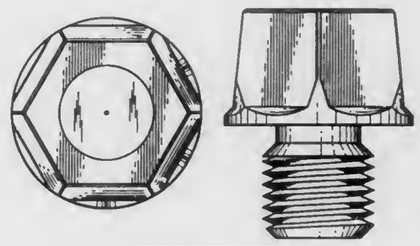
320,160
FOOD CONTAINER
Chester Brown, Woodland Hills, Calif., assignor to Hartin International, Chatsworth, Calif.
Filed Oct. 29, 1990, Ser. No. 604,412
Term of patent 14 years
U.S. Cl. D9—416



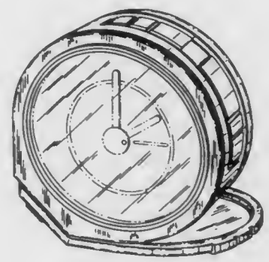
320,161
PACKAGING CONTAINER
Per Nylander, Jönköping, Sweden, assignor to Roby Teknik AB, Lund, Sweden
Division of Ser. No. 143,614, Jan. 13, 1988. This application Nov. 26, 1990, Ser. No. 618,101
Claims priority, application Sweden, Jul. 13, 1987, 871584; Jul. 13, 1987, 871585; Jul. 13, 1987, 871586; Jul. 13, 1987, 871587; Jul. 13, 1987, 871588; Jul. 13, 1987, 871589; Jul. 13, 1987, 871590; Jul. 13, 1987, 871591; Jul. 13, 1987, 871592; Jul. 13, 1987, 871593
Term of patent 14 years
U.S. Cl. D9—417



320,162
ATOMIZER NOZZLE
J. Frank Sorenson, Redlands, Calif., assignor to Baumac International, Mentone, Calif.
Filed Jan. 25, 1989, Ser. No. 302,208
Term of patent 14 years
U.S. Cl. D9—448



320,163
TRAVEL ALARM CLOCK
Saskia H. P. M. Dingelstad, Breda, and Maarten W. van Lelyveld, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 18, 1989, Ser. No. 381,626
Claims priority, application Hague, Jan. 30, 1989, DM/012.708
Term of patent 14 years
U.S. Cl. D10—18



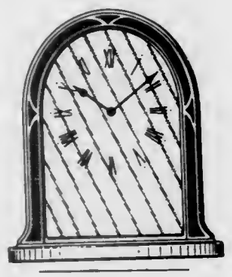
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320,164
CLOCK
Yoshimi Endo, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Oct. 3, 1988, Ser. No. 252,867
Claims priority, application Japan, Apr. 5, 1988, 63-13652
Term of patent 14 years
U.S. Cl. D10—23



320,165
CLOCK
Hisako Sugano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Jan. 30, 1989, Ser. No. 304,331
Term of patent 14 years
U.S. Cl. D10—28



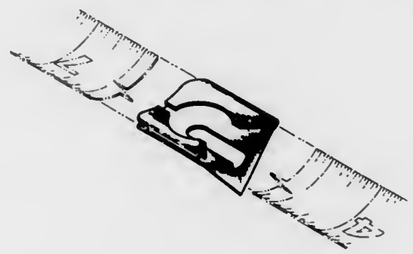
320,166
WRISTWATCH
Jason Shell, No. 13, War Yor Road, Tain Dong Tseng Yen Chang Shang, Yun Lin Shien, Taiwan
Filed Jan. 5, 1989, Ser. No. 293,872
Term of patent 14 years
U.S. Cl. D10—32



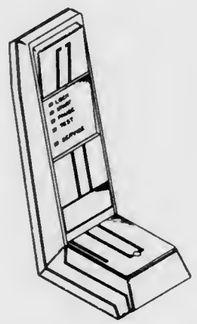
320,167
TIMER
Tokiko Imai, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 19, 1988, Ser. No. 246,529
Claims priority, application Japan, Apr. 13, 1988, 63-14965
Term of patent 14 years
U.S. Cl. D10—40



320,168
SLIDING MARKER FOR MEASURING TAPE
Danny Archer, HC 71, Box 278, Mountain View, Ark. 72560
Filed Sep. 6, 1988, Ser. No. 240,850
Term of patent 14 years
U.S. Cl. D10—74



320,169
HANDSET FOR IN-VEHICLE ALCOHOL TESTER AND INTERLOCK SYSTEM
Achille M. Bigliardi, Woodside, and Terry R. Jablonski, San Jose, both of Calif., assignors to Sencion Corporation, Woodside, Calif.
Filed Jun. 7, 1989, Ser. No. 363,178
Term of patent 14 years
U.S. Cl. D10—81

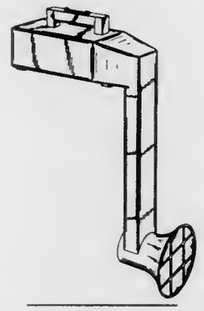




320,170
TIRE PRESSURE GAUGE
Tian-Ding Hwang, No. 35, Sec. 4, Ting Tsao Rd., Lu Kang, Chang Huah, Taiwan
Filed Jun. 13, 1989, Ser. No. 366,379
Term of patent 14 years
U.S. Cl. D10—86



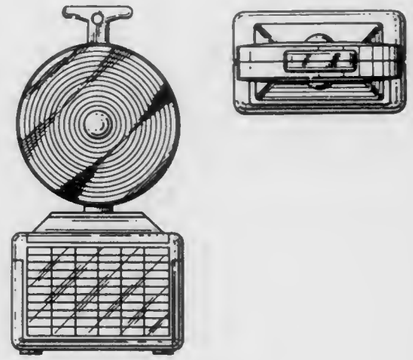
320,171
SWIMMING POOL ALARM
Klaus-Peter Kolbatz, Langenauer Weg 21, D-1000 Berlin 27, Fed. Rep. of Germany
Filed Jul. 11, 1989, Ser. No. 378,278
Term of patent 14 years
U.S. Cl. D10—106



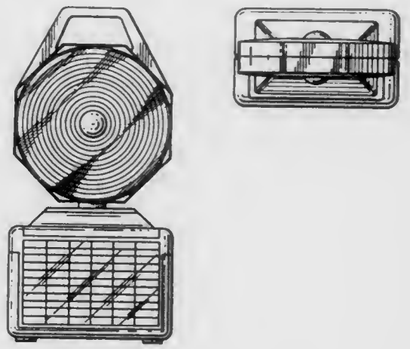
320,172
SAFETY ROAD CHANNELIZER
Kurt W. Thurston, 475 Hill St., Reno, Nev. 89501
Continuation of Ser. No. 183,381, Apr. 13, 1988, abandoned, and a continuation of Ser. No. 40,627, Apr. 21, 1987, Pat. No. Des. 317,580. This application Nov. 1, 1990, Ser. No. 608,184
Term of patent 14 years
U.S. Cl. D10—113



320,173
SOLAR POWERED WARNING LIGHT
John Se-Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Hong Kong
Filed Mar. 15, 1989, Ser. No. 323,986
Claims priority, application United Kingdom, Sep. 23, 1988, 1053753
Term of patent 14 years
U.S. Cl. D10—114



320,174
SOLAR POWERED WARNING LIGHT
John Se-Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Hong Kong
Filed Mar. 17, 1989, Ser. No. 324,624
Claims priority, application United Kingdom, Sep. 23, 1988, 1053754
Term of patent 14 years
U.S. Cl. D10—114



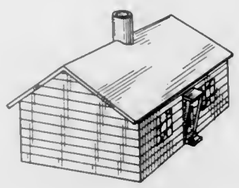
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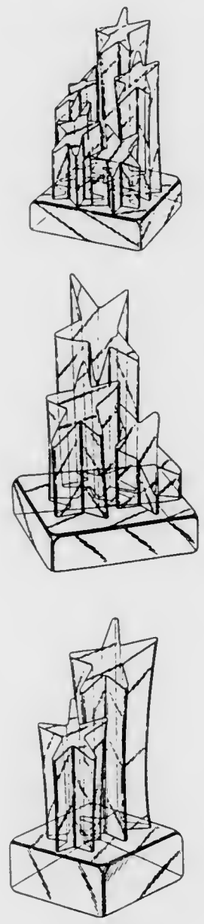
320,175
JEWELRY CHAIN
Hiroshi Shiina, 1-10-5 Honcho, Ageo, Saitama, Japan 362 , and Asaichi Watanabe, 1-305 Mamada, Oyama, Tochigi, Japan 329-02
Filed Mar. 15, 1989, Ser. No. 324,332
Term of patent 14 years
U.S. Cl. D11—13




320,176
TREE STAND
Clifford A. Miller, 665 Brittany Dr., Grayslake, Ill. 60030
Filed Oct. 19, 1989, Ser. No. 423,861
Term of patent 14 years
U.S. Cl. D11—130.1

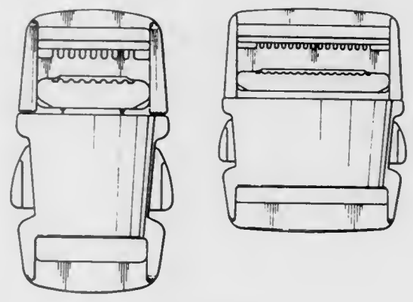


320,177
TROPHY
Gilbert F. Meekins, Alexandria, Va., assignor to United Way of America, Alexandria, Va.
Filed Sep. 23, 1988, Ser. No. 248,409
Term of patent 14 years
U.S. Cl. D11—157

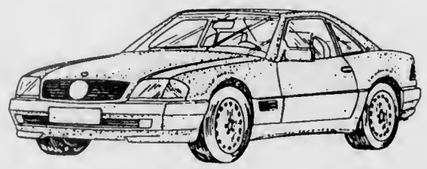




320,178
BUCKLE
Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Oct. 12, 1989, Ser. No. 420,515
Term of patent 14 years
U.S. Cl. D11—218



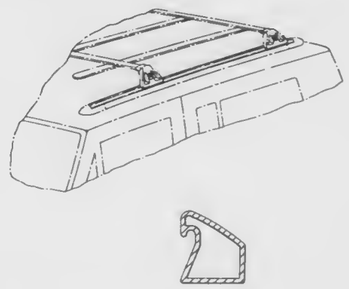
320,179
AUTOMOBILE
Rudolf Hörnig, Esslingen-St.Bernhard; Friedrich Van Winsen, Kirchheim; Bruno Sacco, and Joseph Gallitzendörfer, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft
Filed Apr. 28, 1987, Ser. No. 43,299
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 6161
Term of patent 14 years
U.S. Cl. D12—92



320,180
TIRE OR SIMILAR ARTICLE
Franz Diensthuber, Schönau, Austria, assignor to Semperit Reifen Aktiengesellschaft, Traiskirchen, Austria
Filed Aug. 8, 1988, Ser. No. 230,441
Claims priority, application Austria, Feb. 24, 1988, 6832
The portion of the term of this patent subsequent to Jul. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



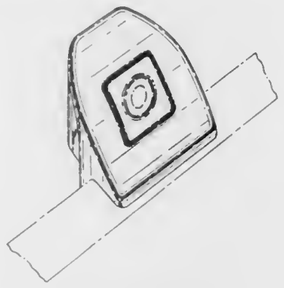
320,181
SIDERAIL FOR AN ARTICLE CARRIER
Jon D. Sparham, Pontiac; Alan D. Lusky, Warren; Ralph J. Mandarino, Grosse Pointe Farms, and Thomas C. Nanney, Warren, all of Mich., assignors to Hurron/St. Clair Incorporated, Taylor, Mich.
Continuation-in-part of Ser. No. 250,705, Sep. 28, 1988. This application Aug. 1, 1989, Ser. No. 388,226
Term of patent 14 years
U.S. Cl. D12—157



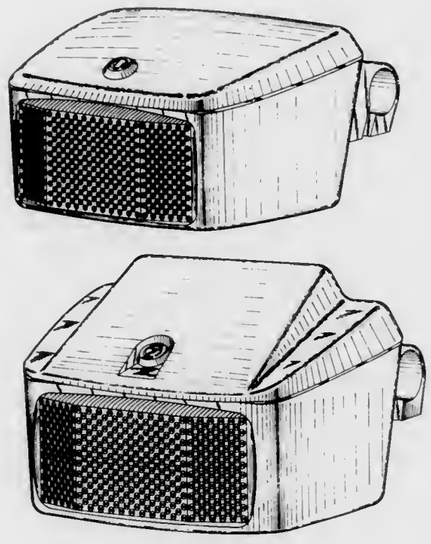
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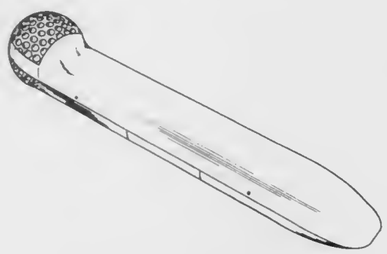


320,182
TIE DOWN MEMBER FOR AN ARTICLE CARRIER
Jon D. Sparham, Pontiac; Alan D. Lusky, and Thomas C. Nanney, both of Warren, all of Mich., assignors to Huron/St. Clair Incorporated, Taylor, Mich.
Continuation-in-part of Ser. No. 250,705, Sep. 28, 1988. This application Aug. 1, 1989, Ser. No. 388,220
Term of patent 14 years
U.S. Cl. D12—157

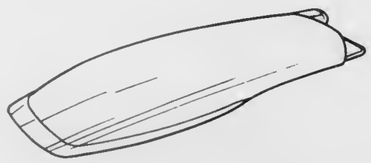


320,183
TRANSPORT BOX TO BE USED ON VEHICLES
Leif Jacobsson, and Claes Brant, both of Göteborg, Sweden, assignors to KB Drive Line, Göteborg, Fed. Rep. of Germany
Filed Sep. 5, 1989, Ser. No. 402,928
Claims priority, application Sweden, Mar. 7, 1989, 890578; Mar. 7, 1989, 890579
Term of patent 14 years
U.S. Cl. D12—157





320,184
LUGGAGE CARRIER SUPPORT STANCHION
Craig A. Stapleton, Port Huron, Mich., assignor to Huron/St. Clair Incorporated, Port Huron, Mich.
Division of Ser. No. 362,643, Jun. 7, 1989, abandoned. This application Mar. 27, 1990, Ser. No. 501,623
Term of patent 14 years
U.S. Cl. D12—157



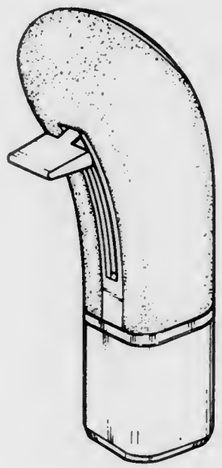
320,185
COMBINED ARTICLE CARRIER AND REFLECTOR FOR BICYCLES AND MOTORCYCLES
Rainer Müller, Im Hasenkamp 2, D-5882 Meinerzhagen, Fed. Rep. of Germany
Filed Jul. 19, 1988, Ser. No. 221,191
Term of patent 14 years
U.S. Cl. D12—158

320,186
AUTOMOBILE BUMPER
Kazuhiro Ichinose, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 8, 1989, Ser. No. 391,362
Claims priority, application Japan, Feb. 8, 1989, 1-4412
Term of patent 14 years
U.S. Cl. D12—169





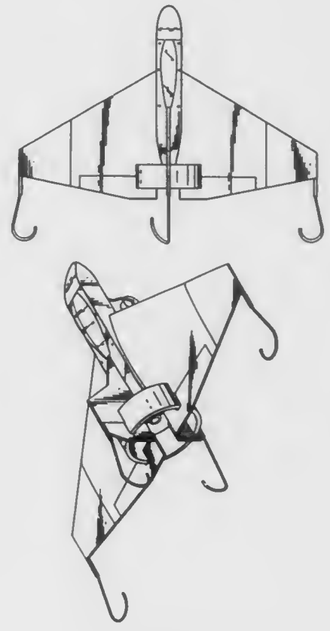
320,187
VEHICLE TRANSMISSION GEAR RANGE SELECTOR HANDLE
Curtis J. Bailey, Birmingham; Charles E. Allen, Jr., Rochester Hills, and Dennis A. Kline, Troy, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Mar. 5, 1989, Ser. No. 488,788
Term of patent 14 years
U.S. Cl. D12—179



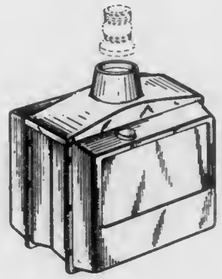
320,188
HOOD ORNAMENT PROTECTOR
Albert A. Rice, Jr., and Erin G. J. Dixon, both of 658 Worden, Grand Rapids, both of Mich. 49507
Filed Mar. 21, 1989, Ser. No. 326,252
Term of patent 14 years
U.S. Cl. D12—197



320,189
AIRCRAFT
David F. Thompson, Prospect Park, and Craig D. Thompson, Media, both of Pa., assignors to Advance Ratio Design Company, Inc., Chester, Pa.
Filed Oct. 31, 1989, Ser. No. 429,333
Term of patent 14 years
U.S. Cl. D12—326



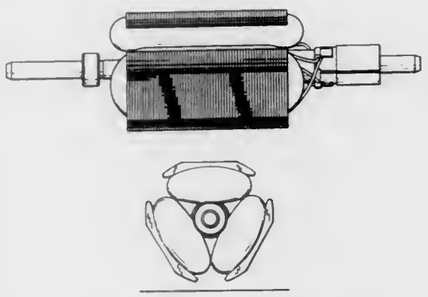
320,190
METAL-AIR FUEL CELL FOR LAMP
Robert P. Hamlen, Bernardsville, N.J., assignor to Alupower, Inc., Bernardsville, N.J.
Filed Sep. 26, 1986, Ser. No. 912,809
Term of patent 14 years
U.S. Cl. D13—103



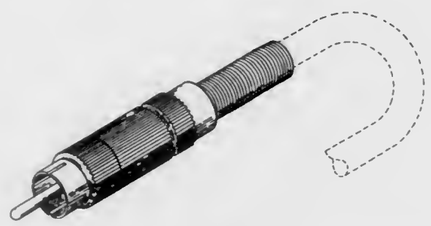
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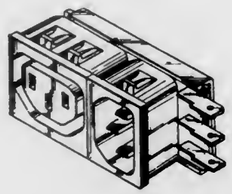
320,191
ROTOR OF AN ELECTRIC MOTOR
Akihiko Yamaguchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Chiba, Japan
Filed Nov. 30, 1988, Ser. No. 278,158
Term of patent 14 years
U.S. Cl. D13—112



320,192
AUDIO/VIDEO CABLE CONNECTOR
Jonathan R. Sisk, Lexington, Ky., assignor to Audio Authority Corporation, Lexington, Ky.
Filed Sep. 26, 1988, Ser. No. 248,572
Term of patent 14 years
U.S. Cl. D13—133



320,193
ELECTRICAL CONNECTOR FOR APPLIANCES
Peter E. Bender, Oberdorfstrasse 26, CH-8820 Wädenswil, Switzerland
Filed Jan. 13, 1989, Ser. No. 296,753
Claims priority, application Switzerland, Jul. 20, 1988, 116 874
Term of patent 14 years
U.S. Cl. D13—146



320,194
PORTABLE COMPUTER
Hiroaki Sakai, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Nov. 16, 1989, Ser. No. 438,362
Claims priority, application Japan, May 16, 1989, 1-17662
Term of patent 14 years
U.S. Cl. D14—106



320,195
PERSONAL COMPUTER
Kihachiro Koike, and Shuji Hara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Nov. 29, 1989, Ser. No. 443,639
Claims priority, application Japan, May 29, 1989, 1-19788
Term of patent 14 years
U.S. Cl. D14—106

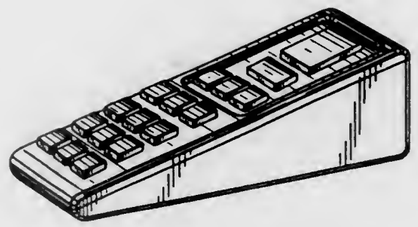


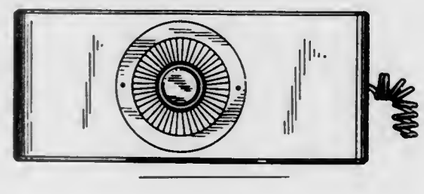
320,196
PORTABLE COMPUTER DOCKING STATION
R. Richard Carter, Cypress; Thomas Mitchell, and Douglas C. Bushman, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Oct. 17, 1988, Ser. No. 258,972
Term of patent 14 years
U.S. Cl. D14—107



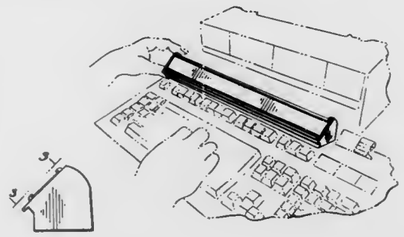


320,197
MOUSE WITH TELEPHONE DIAL PADS
Edward W. Weber, Norwalk, Conn., assignor to Contel IPC, Inc., Stamford, Conn.
Filed Jun. 23, 1988, Ser. No. 210,645
Term of patent 14 years
U.S. Cl. D14—114

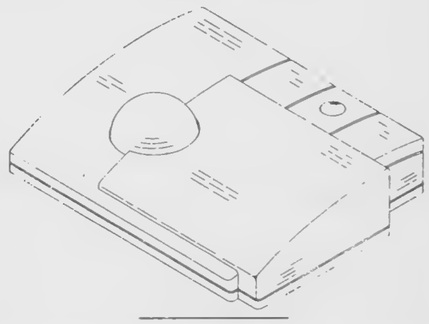




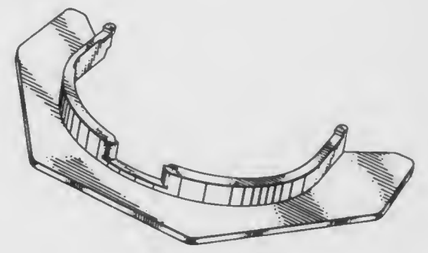
320,198
COMPUTER KEYBOARD SOFTWARE KEY GUIDE HOLDER
Ridley C. Ward, 2221 Stickney Point Rd., Sarasota, Fla. 34231
Filed Mar. 15, 1989, Ser. No. 323,953
Term of patent 14 years
U.S. Cl. D14—114



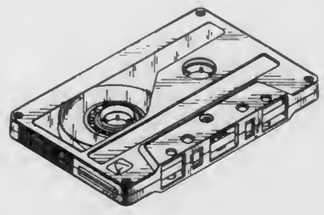
320,199
TRACKBALL
Kanae Koh, San Francisco, and Josef Bismanovsky, Mountain View, both of Calif., assignors to Logitech, Inc., Fremont, Calif.
Filed Dec. 8, 1989, Ser. No. 447,701
Term of patent 14 years
U.S. Cl. D14—114



320,200
SNAP GUIDE FOR A HAND HELD OPTICAL SCANNER
Bruce L. Kirwan, Concord, and Thomas W. Petrie, Oakland, both of Calif., assignors to Thunderware, Inc., Orinda, Calif.
Filed Nov. 5, 1990, Ser. No. 609,225
Term of patent 14 years
U.S. Cl. D14—116



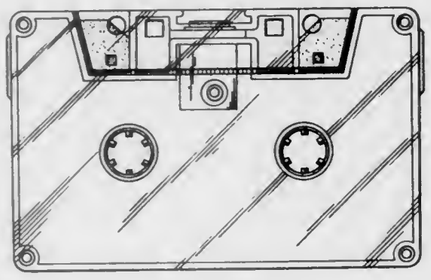
320,201
AUDIO TAPE CASSETTE
Makoto Isozaki, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 2, 1989, Ser. No. 318,141
Claims priority, application Japan, Sep. 9, 1988, 63-35694
Term of patent 14 years
U.S. Cl. D14—121



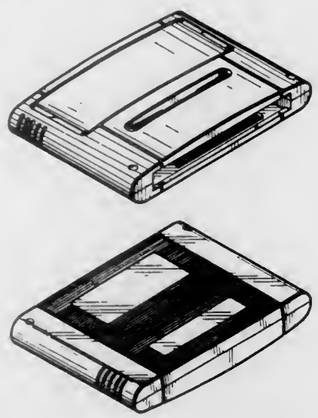
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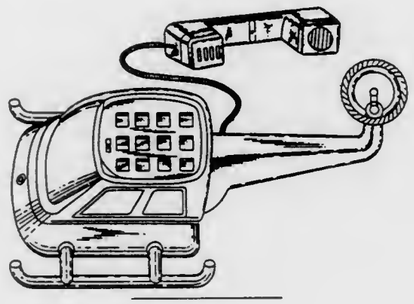
320,202
**CASSETTE HEAD CLEANER**
Lee S. Eng, 27 Jalan Bunga Melur 9, Taman Muda, Cheras, 56100, Kuala Lumpur, Malaysia
Filed Jun. 14, 1989, Ser. No. 366,025
Term of patent 14 years
U.S. Cl. D14—121



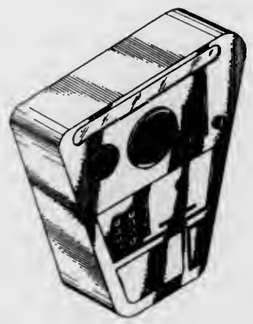
320,203
**CARTRIDGE FOR GAME MACHINE**
Ken'ichiro Ashida, Kyoto, Japan, assignor to Nintendo Company Limited, Kyoto, Japan
Filed Dec. 15, 1989, Ser. No. 450,309
Claims priority, application Japan, Jun. 19, 1989, 1-22580
Term of patent 14 years
U.S. Cl. D14—121



320,204
**TELEPHONE SET**
Ping K. Ng, Flat 1506, Block N, Korshill, 14 Hong On Street, Quarry Bay, Hong Kong
Filed Feb. 23, 1990, Ser. No. 484,073
Term of patent 14 years
U.S. Cl. D14—143

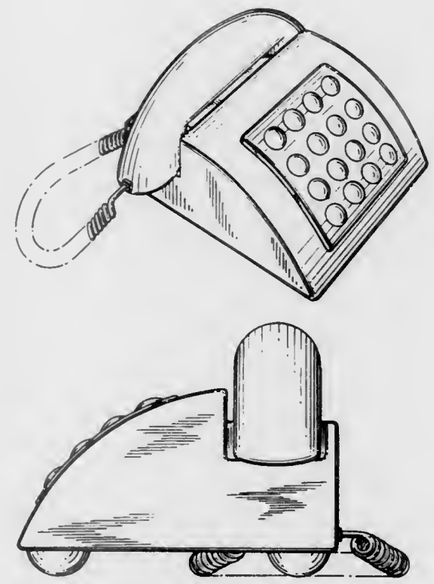


320,205
**PAY-TYPE TELEPHONE**
Erifredo Martinez, 449 Monroe Ave., Elizabeth, N.J. 07201
Filed Aug. 24, 1990, Ser. No. 572,027
Term of patent 14 years
U.S. Cl. D14—146

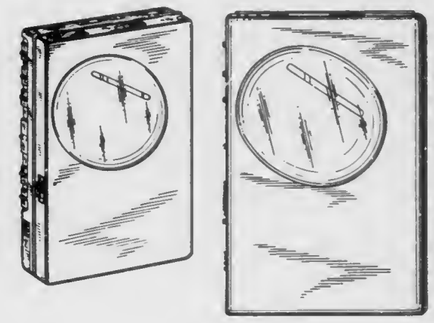




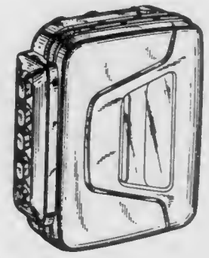
320,206
**TELEPHONE**
Michael Graves, and Alexander T. F. Lee, both of Princeton, N.J., assignors to Michael Graves, Architect, P.A., Princeton, N.J.
Filed Jul. 27, 1990, Ser. No. 560,972
Term of patent 14 years
U.S. Cl. D14—150



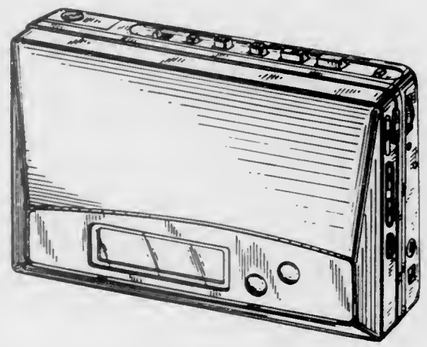
320,207
**COMBINED TAPE PLAYER AND RADIO TUNER**
Kazuo Ichikawa, Glen Rock, N.J., assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 17, 1988, Ser. No. 233,058
Claims priority, application Japan, Feb. 19, 1988, 63-6653
Term of patent 14 years
U.S. Cl. D14—163



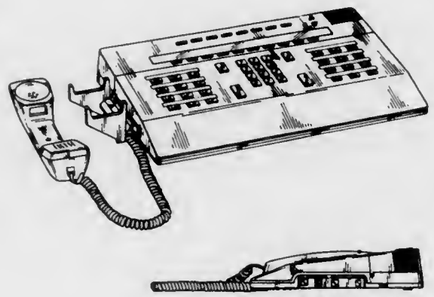
320,208
**COMBINED TAPE PLAYER AND RADIO TUNER**
Etsuro Ikeyama, and Masayoshi Tsuchiya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Aug. 23, 1989, Ser. No. 397,311
Claims priority, application Japan, Feb. 23, 1989, 1-6826
Term of patent 14 years
U.S. Cl. D14—163



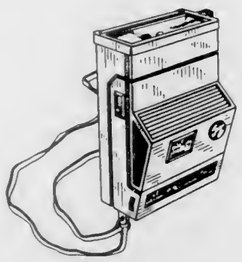
320,209
COMBINED TAPE PLAYER AND RADIO TUNER
Ryuta Kanno, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 27, 1989, Ser. No. 427,357
Claims priority, application Japan, May 17, 1989, 1-17997
Term of patent 14 years
U.S. Cl. D14—163



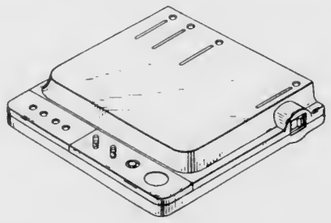
320,211
TELEPHONE TRANSFERRING SWITCHBOARD
Takaharu Ando, Ryugasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 11, 1990, Ser. No. 536,120
Claims priority, application Japan, Dec. 12, 1989, 1-44937
Term of patent 14 years
U.S. Cl. D14—241



320,210
COMBINED RADIO, COMPASS, FLASHLIGHT AND PERSONAL ALARM
David G. Mbuthia, 188 Lower Sheep Pasture Rd., East Setauket, N.Y. 11733
Filed Sep. 15, 1989, Ser. No. 407,781
Term of patent 14 years
U.S. Cl. D14—168

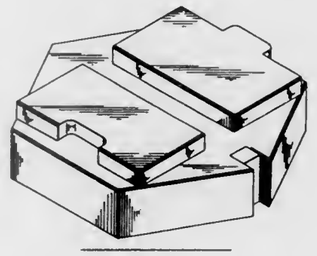


320,212
ADAPTER FOR TELEPHONE DATA COMMUNICATION EQUIPMENT
Tamaki Someya, Urawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Oct. 5, 1989, Ser. No. 417,668
Claims priority, application Japan, Apr. 11, 1989, 1-13343
Term of patent 14 years
U.S. Cl. D14—242

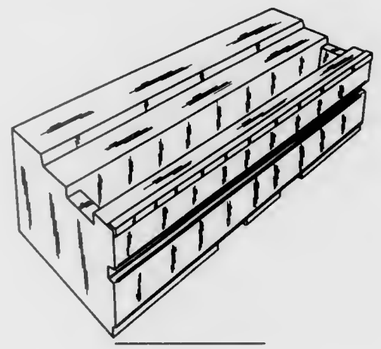




320,213
LAP BLANK FOR USE IN OPTICAL LENS MAKING
David J. Logan, Glastonbury, and Jeffrey Murray, Ellington, both of Conn., assignors to Gerber Optical, Inc., South Windsor, Conn.
Filed Oct. 21, 1988, Ser. No. 260,895
Term of patent 14 years
U.S. Cl. D15—126



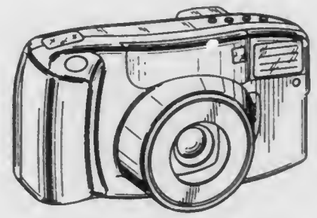
320,214
BASE MEMBER FOR THE MOUNTING OF MACHINE COMPONENTS
Raymond A. Massaccesi, and Gordon E. Hines, both of Ann Arbor, Mich., assignors to Hines Industries, Inc., Ann Arbor, Mich.
Filed Jun. 15, 1988, Ser. No. 207,307
Term of patent 14 years
U.S. Cl. D15—141

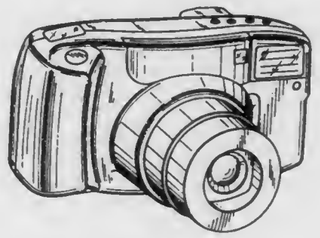


320,215
PAIR OF EYEGLASSES
André Danloup, St. Mihiel, France, assignor to Essilor International (Compagnie Generale d'Optique), Creteil, France
Filed Jul. 12, 1988, Ser. No. 217,791
Claims priority, application France, Jan. 12, 1988, 88 0135
Term of patent 14 years
U.S. Cl. D16—102

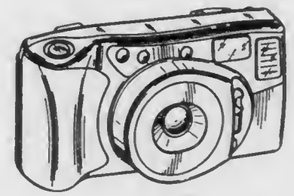


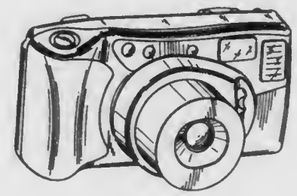
320,216
CAMERA
Minoru Shiiba; Eiichi Okamoto, and Kazuhisa Horikiri, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 1, 1989, Ser. No. 304,827
Claims priority, application Japan, Aug. 1, 1988, 63-30794
Term of patent 14 years
U.S. Cl. D16—209





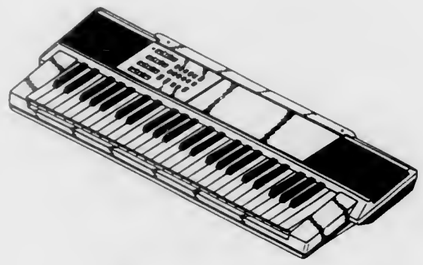
320,217
CAMERA
Minoru Shiiba; Eiichi Okamoto, and Kazuhisa Horikiri, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Feb. 1, 1989, Ser. No. 304,828
Claims priority, application Japan, Aug. 1, 1988, 63-30795
Term of patent 14 years
U.S. Cl. D16—209





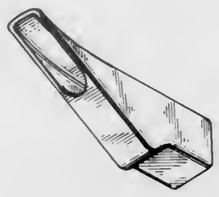
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320,218
ELECTRONIC MUSICAL KEYBOARD
Hiroyuki Kitazume, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Sep. 29, 1989, Ser. No. 414,939
Claims priority, application Japan, Jun. 15, 1989, 1-22184; Jun. 15, 1989, 1-22185
Term of patent 14 years
U.S. Cl. D17—1

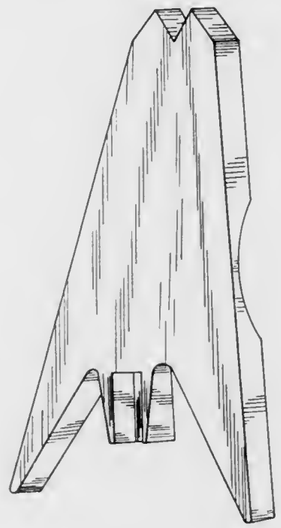




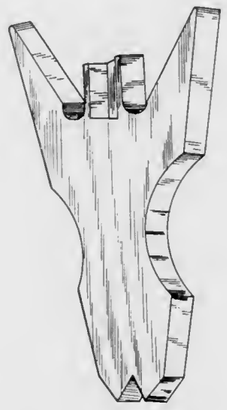
320,219
WOODWIND MOUTHPIECE
William P. Disera, 555 Westminster St., Joliet, Ill. 60433
Division of Ser. No. 38,343, Apr. 14, 1987. This application Feb. 12, 1990, Ser. No. 478,769
Term of patent 14 years
U.S. Cl. D17—13



320,220
GUITAR BODY
Angelo Tornese, 8521 Oakford Dr., Springfield, Va. 22152
Filed May 1, 1989, Ser. No. 345,500
Term of patent 14 years
U.S. Cl. D17—20

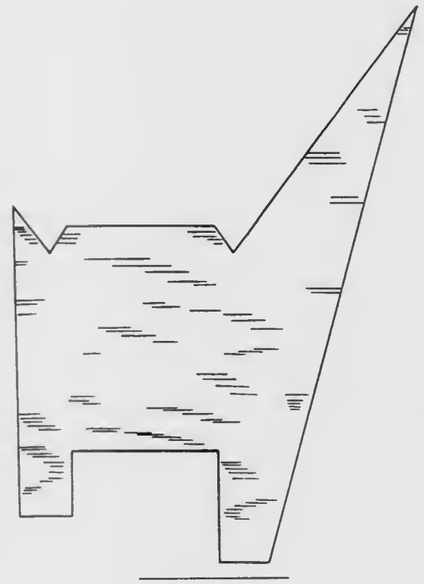


320,221
GUITAR BODY
Angelo Tornese, 8521 Oakford Dr., Springfield, Va. 22152
Filed May 1, 1989, Ser. No. 345,501
Term of patent 14 years
U.S. Cl. D17—20

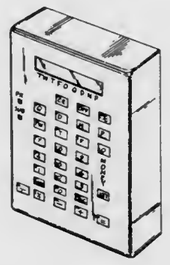




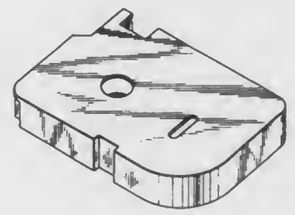
320,222
PICKGUARD FOR A GUITAR
Angelo Tornese, 8521 Oakford Dr., Springfield, Va. 22152
Filed May 1, 1989. Ser. No. 345,553
Term of patent 14 years
U.S. Cl. D17—20



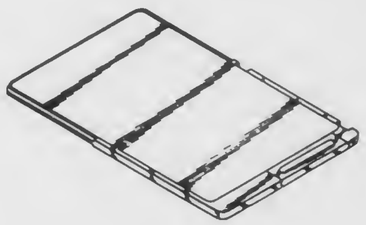
320,223
MONEY CALCULATOR
Claudia Taylor, R.D. #5, Box 40-A, Five Points Rd., Freehold, N.J. 07728
Filed May 15, 1989, Ser. No. 351,559
Term of patent 14 years
U.S. Cl. D18—7



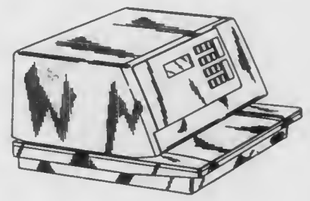
320,224
INK RIBBON CASSETTE FOR ELECTRONIC TYPEWRITER
Fumiya Matsuoka, Kawasaki, and Toshiyuki Ohnishi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 8, 1988, Ser. No. 165,573
Claims priority, application Japan, Sep. 9, 1987, 62-37056
Term of patent 14 years
U.S. Cl. D18—12



320,225
MEMORY CARD FOR ELECTRONIC CALCULATOR
Yukinori Ido, and Masanori Haneda, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Nov. 15, 1989, Ser. No. 436,918
Claims priority, application Japan, Aug. 11, 1989, 1-29654
Term of patent 14 years
U.S. Cl. D18—12



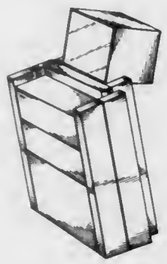
320,226
DOCUMENT/PASSBOOK PRINTER
Thomas L. Hermann, Springfield; Dale L. Placke, and Joey E. Hughes, both of Dayton, all of Ohio, assignors to NCR Corporation, Dayton, Ohio
Filed Dec. 11, 1989, Ser. No. 448,390
Term of patent 14 years
U.S. Cl. D18—13



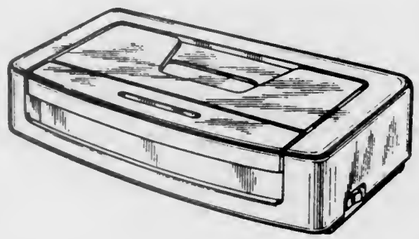
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320,227
CABINET FOR AN INKJETPRINTER AND RELATED COMPUTER HARDWARE
Wolfram J. P. Peters, Leiden, Netherlands, assignor to Stork X-Cel B.V., Boxmeer, Netherlands
Filed Aug. 8, 1988, Ser. No. 229,484
Claims priority, application Int'l Pat. Institute, Mar. 17, 1988, DM/010532
Term of patent 14 years
U.S. Cl. D18—23



320,228
PAPER BINDER
Masataka Isomoto, Kawasaki, and Mitsuru Sakurai, Musashino, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 10, 1989, Ser. No. 418,466
Claims priority, application Japan, Apr. 13, 1989, 1-13770
Term of patent 14 years
U.S. Cl. D18—34



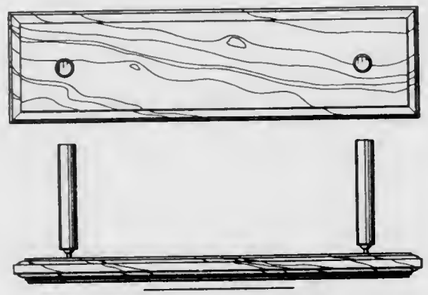
320,229
ERASER
Thomas G. Frazier, Waterside Industrial Park, Box B113, R.D. 2, New Hope, Pa. 18938
Filed Jun. 16, 1988, Ser. No. 207,440
Term of patent 14 years
U.S. Cl. D19—53



320,230
HAND-HELD MOTOR-DRIVEN ERASER
Jason Chen, Taipei, Taiwan, assignor to Arile Industrial Co., Ltd., Taiwan
Filed May 9, 1989, Ser. No. 349,783
Term of patent 14 years
U.S. Cl. D19—53



320,231
WRITING IMPLEMENT HOLDER
Mel Evenson, San Pedro, Calif., assignor to Eldon Industries, Inc., Inglewood, Calif.
Division of Ser. No. 259,628, Oct. 20, 1988. This application Feb. 28, 1991, Ser. No. 661,643
Term of patent 14 years
U.S. Cl. D19—85



320,232
PAPERWEIGHT OR SIMILAR ARTICLE
Serge Pascal, Hermonville, France, assignor to Les Metalliers Champenois Corp., Passaic, N.J.
Filed Jul. 11, 1988, Ser. No. 217,275
Term of patent 14 years
U.S. Cl. D19—97

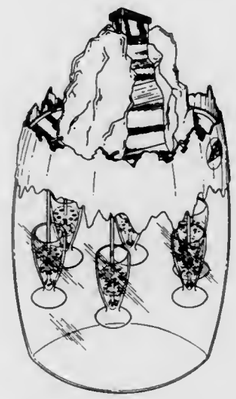




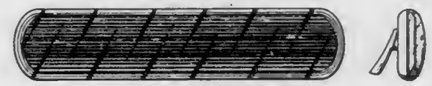
320,233
FRONT PANEL FOR A VENDING MACHINE
Frank B. Golley, Decatur, and Phillip B. Groover, Woodstock, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed May 13, 1988, Ser. No. 193,850
Term of patent 14 years
U.S. Cl. D20—8



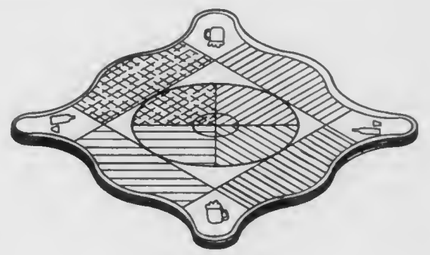
320,234
ADVERTISING SIGN
Samuel G. Garrett, 2141 Bluebell Ave., Greeley, Colo. 80631
Filed Nov. 17, 1988, Ser. No. 272,292
Term of patent 14 years
U.S. Cl. D20—10



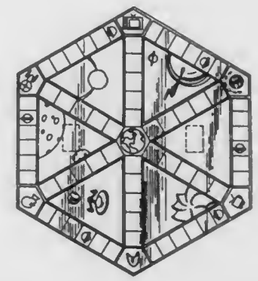
320,235
COMBINED SIGN AND SUPPORT STAND FOR WALLS OR DESKS
James Hofman, Lake Bluff, Ill., assignor to Eldon Industries, Inc., Inglewood, Calif.
Filed Feb. 23, 1989, Ser. No. 312,813
Term of patent 14 years
U.S. Cl. D20—10



320,236
GAME BOARD
Leonard T. Melfi, 8302 Crestmont Cir., Springfield, Va. 22153
Filed May 9, 1989, Ser. No. 349,794
Term of patent 14 years
U.S. Cl. D21—32



320,237
GAME BOARD
Glen Turner, 415 Charlotte Ave., Rocky Mount, N.C. 27804, and Danny Walters, Rte. 1, Box 322, Wingate, N.C. 28174
Filed Jun. 21, 1989, Ser. No. 369,279
Term of patent 14 years
U.S. Cl. D21—33



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320,238
TOY VEHICLE
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Oct. 31, 1989, Ser. No. 429,351
Claims priority, application Japan, May 9, 1989, 1-17046
Term of patent 14 years
U.S. Cl. D21—76





320,239
TOY VEHICLE
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan
Filed Oct. 31, 1989, Ser. No. 429,349
Claims priority, application Japan, May 9, 1989, 1-17045
Term of patent 14 years
U.S. Cl. D21—76





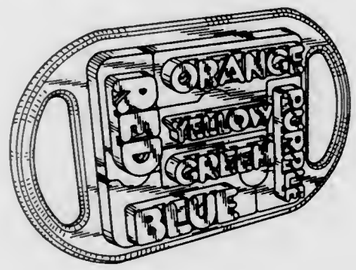
320,240
SPINNING TOY
Tom Stefanou, 2779 W. 33rd Avenue, Vancouver, B.C., Canada V6M 2E9
Filed Dec. 3, 1987, Ser. No. 128,518
Term of patent 14 years
U.S. Cl. D21—95



320,241
LIGHTED HOOP
Donald Moore, 4704 Quail Ridge, Plainsboro, N.J. 08536
Filed Sep. 29, 1988, Ser. No. 250,488
Term of patent 14 years
U.S. Cl. D21—101



320,242
PUZZLE TOY
Nancy D. Slayton, Cumberland, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Jul. 31, 1989, Ser. No. 387,687
Term of patent 14 years
U.S. Cl. D21—107





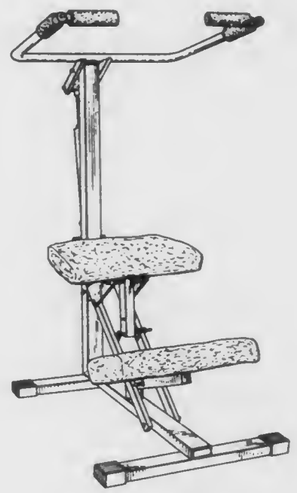

320,243
MULTI-FACED DOLL
Claire A. Mattson, 1075 Sagenish, Hastings, Mich. 49058
Filed Aug. 15, 1988, Ser. No. 232,367
Term of patent 14 years
U.S. Cl. D21—149



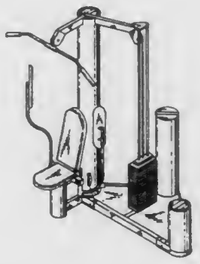
320,244
DOLL
Robin R. Kahn, 10314 Thornbush La., Bethesda, Md. 20814
Filed May 2, 1989, Ser. No. 347,279
Term of patent 14 years
U.S. Cl. D21—171



320,245
EXERCISE STAND
Patrick C. Fitzpatrick, 82 Calle Pensamiento, El Paraiso Baja, Estepona, Marbella, Spain
Filed Nov. 21, 1989, Ser. No. 439,863
Claims priority, application United Kingdom, Jun. 3, 1989, 1059937
Term of patent 14 years
U.S. Cl. D21—191



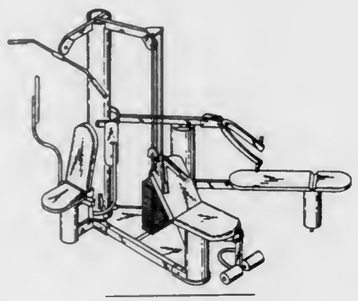
320,246
PHYSICAL EXERCISER
Arthur B. Ish, III, Redmond; Loyd C. Moore, Bellevue, and Jeffrey B. Johnson, Redmond, all of Wash., assignors to Vectra Fitness, Inc., Redmond, Wash.
Filed Sep. 16, 1988, Ser. No. 246,162
Term of patent 14 years
U.S. Cl. D21—195



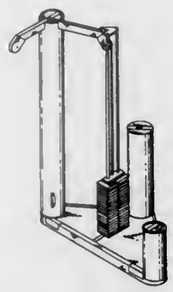
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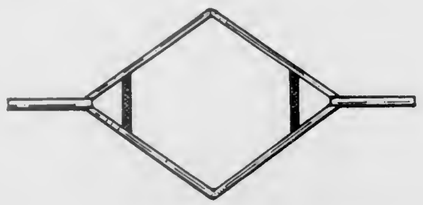
320,247
PHYSICAL EXERCISER
Jeffrey B. Johnson; Arthur B. Ish, III, both of Redmond; Loyd C. Moore; Robert A. Rasmussen, both of Bellevue, and William D. MacLean, Issaquah, all of Wash., assignors to Vectra Fitness, Inc., Redmond, Wash.
Filed Sep. 16, 1988, Ser. No. 246,165
Term of patent 14 years
U.S. Cl. D21—195



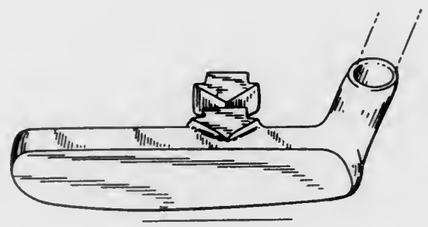
320,248
PHYSICAL EXERCISER
Loyd C. Moore, Bellevue, and William D. MacLean, Issaquah, both of Wash., assignors to Vectra Fitness, Inc., Redmond, Wash.
Filed Sep. 16, 1988, Ser. No. 246,166
Term of patent 14 years
U.S. Cl. D21—196



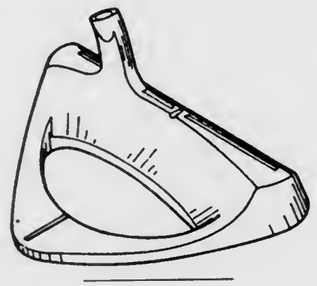
320,249
WEIGHT LIFTING BAR
Al P. Gerard, 207 Holyoke Dr., Washington, N.C. 27889
Filed Nov. 15, 1989, Ser. No. 436,810
Term of patent 14 years
U.S. Cl. D21—197



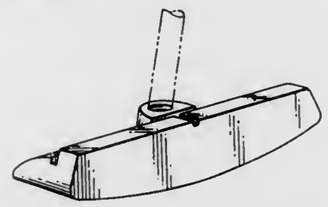
320,250
DOUBLE ARROW PUTTER HEAD
Richard L. Hughes, P.O. Box 1267, Columbia, N.J. 07832
Filed Jul. 2, 1987, Ser. No. 69,591
Term of patent 14 years
U.S. Cl. D21—219



320,251
GOLF CLUB PUTTER HEAD
Jean F. Mermillod, Grand Bornand, France, assignor to 501 Salomon S.A., France
Filed May 2, 1988, Ser. No. 189,676
Claims priority, application France, Apr. 2, 1988, 880705
Term of patent 14 years
U.S. Cl. D21—219

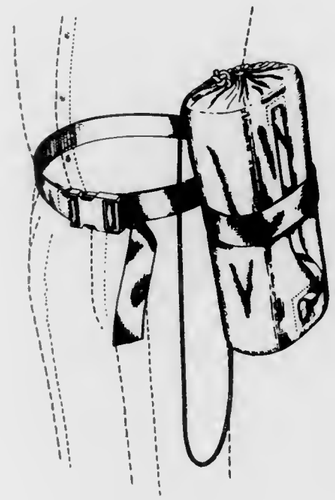


320,252
GOLF PUTTER HEAD
Charles Tesori, 432 Lillian Ave., Syracuse, N.Y. 13206
Filed Mar. 9, 1989, Ser. No. 321,533
Term of patent 14 years
U.S. Cl. D21—219





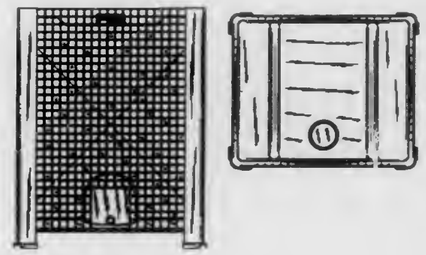
320,253
FLOAT
Richard J. Huint, 1968 de Beaurivage, Montreal, Quebec, Canada H1L 5V5
Filed Dec. 22, 1989, Ser. No. 454,847
Claims priority, application Canada, Jun. 22, 1989, 220689
Term of patent 14 years
U.S. Cl. D21—238



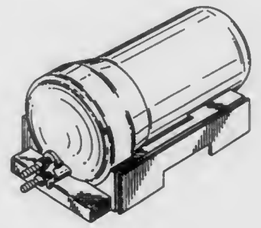
320,254
GRIP FOR A BOW STRING RELEASE
Paul L. Peck, Fond du Lac, Wis., assignor to Tru-Fire Corporation, Fond du Lac, Wis.
Filed Nov. 15, 1989, Ser. No. 437,494
Term of patent 14 years
U.S. Cl. D22—107



320,255
PORTABLE BULK STORAGE TANK
David L. Waltke, and Larry D. Thomas, both of Beatrice, Nebr., assignors to Hoover Group, Inc., Alpharetta, Ga.
Filed Mar. 31, 1989, Ser. No. 330,888
Term of patent 14 years
U.S. Cl. D23—202



320,256
COMBINED WATER FILTER AND STAND THEREFOR OR SIMILAR ARTICLE
Edward C. Giordano, Glastonbury, and Raymond M. Petrucci, Middlebury, both of Conn., assignors to Cuno, Incorporated, Meriden, Conn.
Filed Oct. 4, 1989, Ser. No. 417,007
Term of patent 14 years
U.S. Cl. D23—209



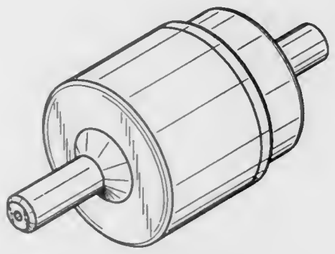
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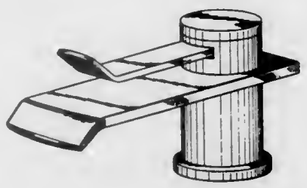
320,257
ROTARY SPOOL VALVE
George K. Austin, Jr., Newberg, and Charles A. Nelson, Jr., Tigard, both of Oreg., assignors to A-Dec, Inc., Newberg, Oreg.
Filed Jan. 23, 1989, Ser. No. 299,740
Term of patent 14 years
U.S. Cl. D23—233



320,258
VALVE
Sören N. Henriksson, Kallered, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Continuation of Ser. No. 828,290, Feb. 11, 1986, abandoned.
This application Nov 2, 1990, Ser. No. 609,086
Claims priority, application Sweden, Aug. 15, 1985, 851926
Term of patent 14 years
U.S. Cl. D23—233



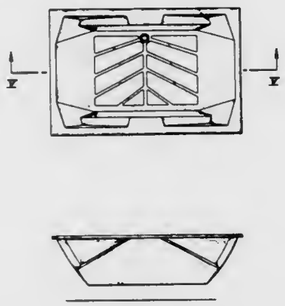
320,259
FAUCET
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Apr. 19, 1988, Ser. No. 183,165
Claims priority, application Hague, Nov. 2, 1987, DM/009602
Term of patent 14 years
U.S. Cl. D23—238



320,260
COUPLING FOR BUNG ADAPTER
Brook J. Beaston, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.
Filed Aug. 4, 1988, Ser. No. 229,098
The portion of the term of this patent subsequent to Jul. 23, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—262



320,261
BATHTUB
Rik Cuttriss, Fillmore, and Scott Lenahan, Castaic, both of Calif., assignors to Gruber Systems, Inc., Valencia, Calif.
Filed Dec. 11, 1989, Ser. No. 448,594
Term of patent 14 years
U.S. Cl. D23—281

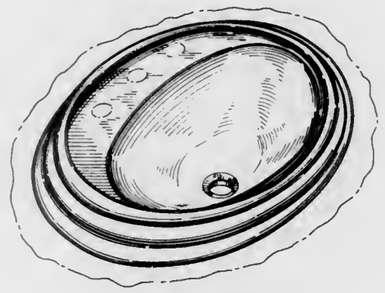


320,262
LAVATORY
Rik Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Dec. 11, 1989, Ser. No. 448,595
Term of patent 14 years
U.S. Cl. D23—294

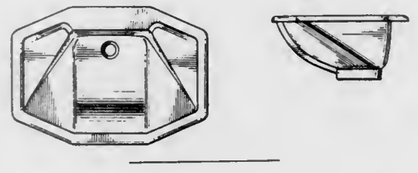




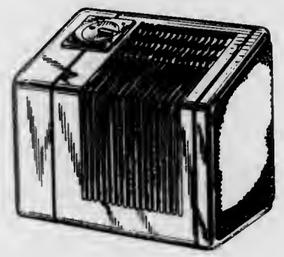
320,263
LAVATORY
Herbert V. Kohler, Jr., Kohler, and William C. McKeone, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Nov. 7, 1989, Ser. No. 432,694
Term of patent 14 years
U.S. Cl. D23—294



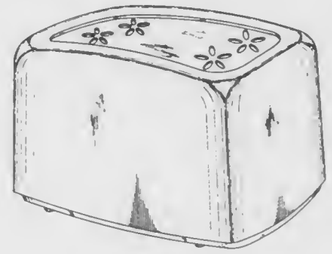
320,264
LAVATORY
Scott Lenahan, Castaic, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Jan. 12, 1990, Ser. No. 463,980
Term of patent 14 years
U.S. Cl. D23—294



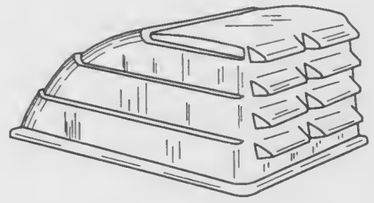
320,265
AIR CLEANER
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Dec. 21, 1989, Ser. No. 456,131
Term of patent 14 years
U.S. Cl. D23—364



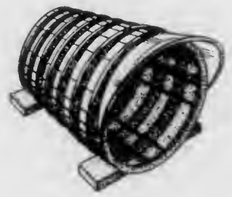
320,266
AIR FRAGRANCE DISPENSER
Walter A. Kunze, Southington, Conn., assignor to Waterbury Companies Inc., Waterbury, Conn.
Filed Jan. 23, 1989, Ser. No. 300,393
Term of patent 14 years
U.S. Cl. D23—366



320,267
VENT CAP COVER
Allen C. Thomas, 4510 W. Alva St., Tampa, Fla. 33614
Continuation of Ser. No. 458,975, Dec. 27, 1989, abandoned.
This application Nov. 27, 1990, Ser. No. 618,784
Term of patent 14 years
U.S. Cl. D23—371



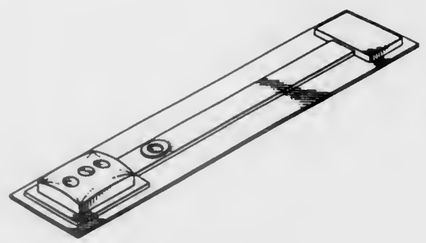
320,268
STACKABLE FIREWOOD STORAGE TUBE
John E. Thies, 2 Lynnebrooke Estates, Mohrsville, Pa. 19541
Filed Feb. 23, 1990, Ser. No. 484,202
Term of patent 14 years
U.S. Cl. D23—410



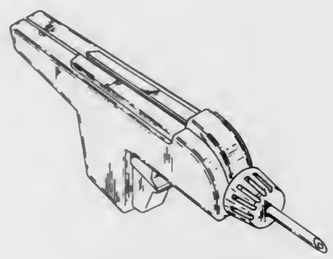
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320,269
TEST STRIP
John M. Hammond, Wantage, England, assignor to CMB Food Can Plc., England
Filed Jun. 10, 1988, Ser. No. 206,169
Claims priority, application United Kingdom, Dec. 10, 1987, 1046995
Term of patent 14 years
U.S. Cl. D24—225



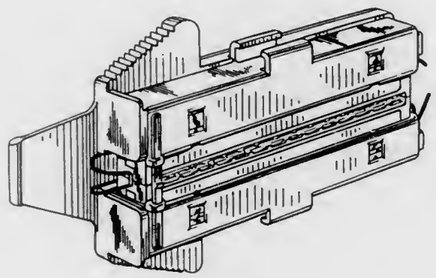
320,270
IMPLANT GUN
Keith V. Ball, Burwood, and Karl-Heinz Halblander, Hampton Park, both of Australia, assignors to Schering Agrochemicals Limited, Saffron Walden, Great Britain
Filed Mar. 21, 1988, Ser. No. 171,292
Claims priority, application Australia, Sep. 21, 1987, 3463/87
Term of patent 14 years
U.S. Cl. D24—113



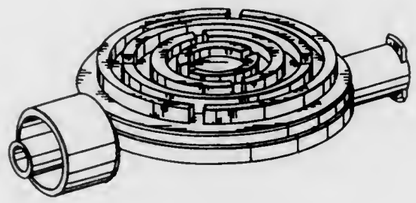
320,271
ELECTROLYSIS PEN
Michael H. Jones, Cheltenham, England, assignor to E. A. Ellison & Co. Ltd., Exhall, England
Filed May 13, 1988, Ser. No. 193,721
Claims priority, application United Kingdom, Nov. 14, 1987, 1046348
Term of patent 14 years
U.S. Cl. D24—144



320,272
SURGICAL STAPLE CARTRIDGE
David T. Green, Westport, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed May 18, 1988, Ser. No. 195,506
Term of patent 14 years
U.S. Cl. D24—145



320,273
MEDICAL FILTER HOUSING
James J. Heiden, Clinton, Mich., assignor to Gelman Sciences, Inc., Ann Arbor, Mich.
Filed Jan. 23, 1989, Ser. No. 300,556
Term of patent 14 years
U.S. Cl. D24—162

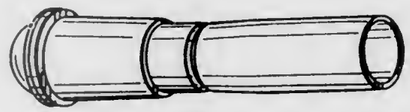


320,274
FEMALE SANITARY PROTECTION PAD
Jean Douglas, 8000 Rodney St., Philadelphia, Pa. 19150
Continuation of Ser. No. 200,780, Jun. 1, 1988, abandoned. This application May 29, 1990, Ser. No. 530,721
Term of patent 14 years
U.S. Cl. D24—125





320,275
MEDICAL APPLICATOR
Masaru Wada; Junji Kimura, both of Tokyo, and Zensho Kanda, Yamanashi, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 9, 1989, Ser. No. 295,159
Claims priority, application Japan, Jul. 15, 1988, 63-28024
Term of patent 14 years
U.S. Cl. D24—119



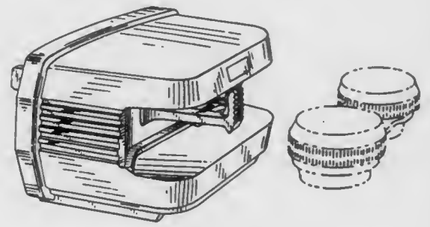
320,276
SYRINGE FOR ADMINISTATION OF CONTRAST MEDIA
Thomas M. Baum, Raleigh, N.C., assignor to Coeur Laboratories, Inc., Raleigh, N.C.
Filed Feb. 22, 1989, Ser. No. 314,209
Term of patent 14 years
U.S. Cl. D24—113



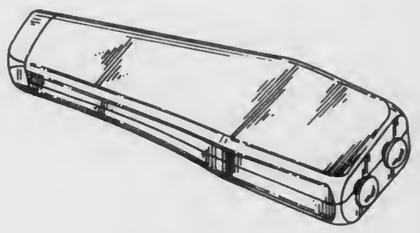
320,277
NEEDLE SHIELD OR THE LIKE
Sandor Gyure, West Orange, and Niall Sweeney, E. Rutherford, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Mar. 30, 1989, Ser. No. 332,676
Term of patent 14 years
U.S. Cl. D24—130



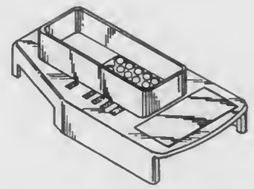
320,278
CONTACT LENS DISINFECTOR
Francis E. Ryder, Arab; Rowland W. Kanner, Guntersville, and Fred E. Williams, Arab, all of Ala., assignors to Ryder International Corporation, Arab, Ala.
Continuation-in-part of Ser. No. 221,283, Jul. 19, 1988, Pat. No. 4,873,424. This application Mar. 9, 1989, Ser. No. 321,469
Term of patent 14 years
U.S. Cl. D24—218



320,279
FACIAL TONER
Rita E. McQueen, 3741 Countryside La., Long Beach, Calif. 90806
Filed Mar. 20, 1989, Ser. No. 325,497
Term of patent 14 years
U.S. Cl. D24—215



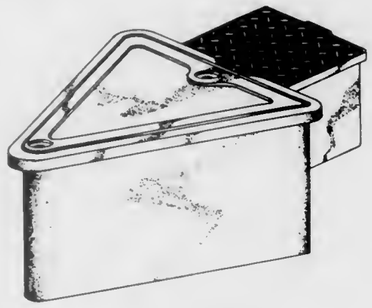
320,280
SAMPLE TEST CARD FOR A BIOLOGICAL ANALYZER
James T. Holen, Mundelein, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.
Filed Feb. 24, 1989, Ser. No. 316,107
Term of patent 14 years
U.S. Cl. D24—224



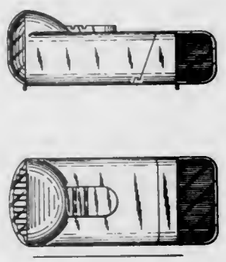
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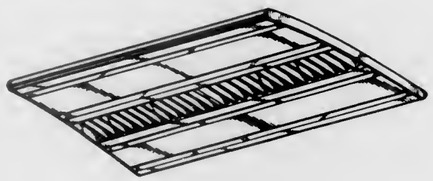
320,281
UNDERGROUND SERVICE VAULT
Martin C. Pettesch, Roselle, N.J., assignor to Universal Valve Co., Inc., Elizabeth, N.J.
Filed Nov. 9, 1988, Ser. No. 269,256
Term of patent 14 years
U.S. Cl. D25—36



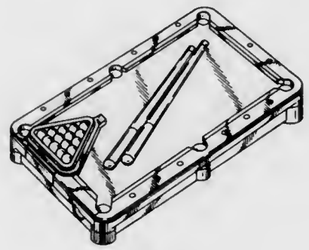
320,282
BICYCLE LAMP OR SIMILAR ARTICLE
Hermann Schieferstein, Detmold, Fed. Rep. of Germany, assignor to Union Sils, Van de Loo & Co. GmbH, Frondenberg, Fed. Rep. of Germany
Filed Dec. 2, 1988, Ser. No. 280,647
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1988, MR 205
Term of patent 14 years
U.S. Cl. D26—35



320,283
FLUORESCENT LIGHTING FIXTURE GRILL
Jack Burkarth, Dallas, Tex., assignor to Gulton Industries, Inc., Plano, Tex.
Filed Aug. 8, 1989, Ser. No. 391,496
Term of patent 14 years
U.S. Cl. D26—121



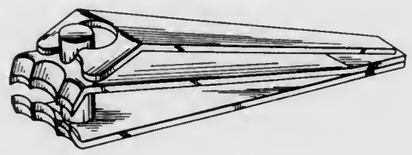
320,284
LIGHTER
Richard F. M. Peersmann, Scheveningen, Netherlands, assignor to Pollyflame International B.V., Roelofarendsveen, Netherlands
Filed Dec. 15, 1989, Ser. No. 451,029
Claims priority, application Benelux, Jun. 16, 1989, 64405-00
Term of patent 14 years
U.S. Cl. D27—148



320,285
NAIL CLIPPER
Abbas Husain, Merchantville, N.J., assignor to Ennovation Corporation, Merchantville, N.J.
Filed Aug. 1, 1989, Ser. No. 388,621
The portion of the term of this patent subsequent to Sep. 24, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—60



320,286
NAIL CLIPPER
Abbas Husain, Merchantville, N.J., assignor to Ennovation Corporation, Merchantville, N.J.
Filed Aug. 1, 1989, Ser. No. 388,622
The portion of the term of this patent subsequent to Sep. 24, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—60





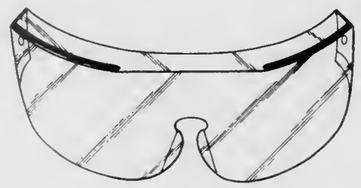
320,287
NAIL CLIPPER
Abbas Husain, Merchantville, N.J., assignor to Ennovation Corporation, Merchantville, N.J.
Filed Aug. 1, 1989, Ser. No. 388,623
The portion of the term of this patent subsequent to Sep. 24, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D28—60



320,288
LIPSTICK CASE OR SIMILAR ARTICLE
Ching-Chun Chen, No. 48, Ta-Wei Rd., Ta-Li Hsiang, Taichung Hsien, Taiwan
Filed Aug. 21, 1989, Ser. No. 396,610
Term of patent 14 years
U.S. Cl. D28—87



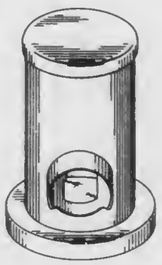
320,289
PROTECTIVE EYE WEAR SHIELD OR THE LIKE
Joshua Blackstone, Fort Collins, Colo., assignor to Action Eyewear, Inc., Fort Collins, Colo.
Filed Apr. 25, 1988, Ser. No. 185,943
Term of patent 14 years
U.S. Cl. D29—13



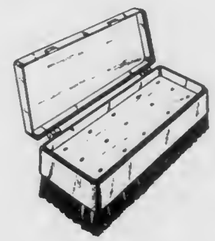
320,290
BIRD FEEDER BASE
Peter Kilham, Mill Rd., Foster, R.I. 02825
Filed Sep. 25, 1989, Ser. No. 411,587
Term of patent 14 years
U.S. Cl. D30—127



320,291
PET FEEDER
Leonard H. Dalton, Jr., Campti, La., assignor to Richard Norris Fletcher, Dallas, Tex.
Filed Jun. 8, 1989, Ser. No. 363,108
Term of patent 14 years
U.S. Cl. D30—121



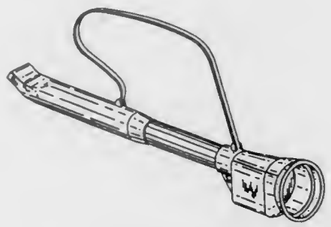
320,292
COMBINED CONTAINER AND BRUSH
George R. Bartlett, P.O. Box 870, Florence, Oreg. 97435
Filed Apr. 28, 1988, Ser. No. 187,410
Term of patent 14 years
U.S. Cl. D30—158



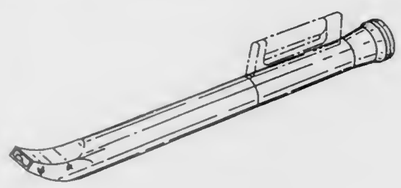
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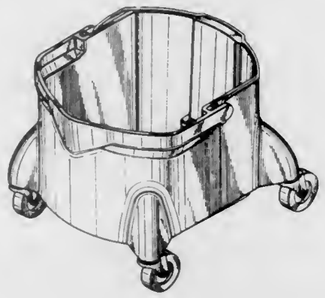
320,293
PORTABLE BLOWER
Martin P. Gierke; Robert P. Straub, both of Baltimore, and Jonathan L. Miner, Timonium, all of Md., assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 13, 1987, Ser. No. 119,998
Term of patent 14 years
U.S. Cl. D32—15



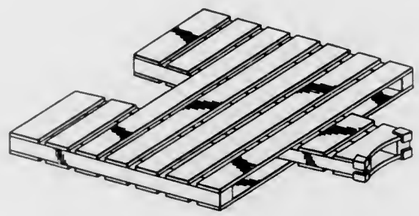
320,294
PORTABLE BLOWER
Jonathan L. Miner, Timonium, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Nov. 13, 1987, Ser. No. 120,002
The portion of the term of this patent subsequent to Aug. 13, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—15



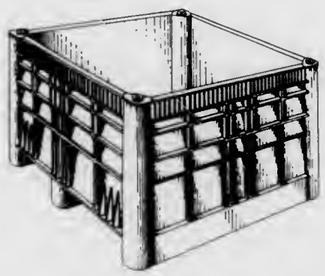
320,295
MOP BUCKET
Paul E. Delmerico, Winchester, Va., assignor to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Feb. 23, 1989, Ser. No. 314,204
Term of patent 14 years
U.S. Cl. D32—53



320,296
PALLET
Robert T. Kraus, Akron, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio
Filed Mar. 10, 1989, Ser. No. 322,815
Term of patent 14 years
U.S. Cl. D34—38

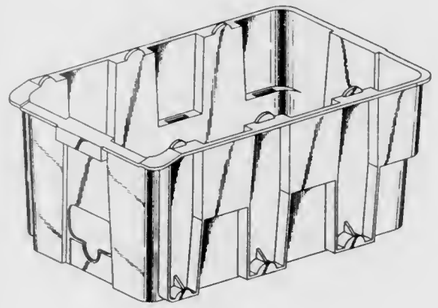


320,297
STORAGE CASE
Hagai Hadashi, Kubbutz Dvir, Israel, assignor to Dolav Dvir-Lahav Plastic Products, Israel
Filed May 12, 1989, Ser. No. 351,671
Term of patent 14 years
U.S. Cl. D34—40

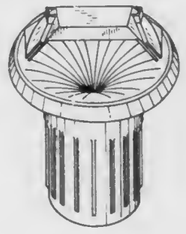




320,298
STACKABLE AND NESTABLE BOX
William P. Apps, Anaheim; Arne Lang-Ree, Manhattan Beach, both of Calif., and W. Joseph Yelder, Peeksville, N.Y., assignors to Pepsi-Cola Company, Somers, N.Y. and Rehrig-Pacific Company, Los Angeles, Calif.
Filed Dec. 11, 1989, Ser. No. 448,580
Term of patent 14 years
U.S. Cl. D34—40



320,299
COIN COLLECTOR
Larry J. Beiter, Pittsburgh, and Raymond C. Hoffman, Elwood City, both of Pa.
Filed Oct. 25, 1988, Ser. No. 262,013
Term of patent 14 years
U.S. Cl. D99—34



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# LIST OF PATENTEES

TO WHOM

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Agano, Toshitaka, to Fuji Photo Film Co., Ltd. Radiation image read-out apparatus. 5,051,588, Cl. 250-327.200.
Agarwal, Pawan K.; and Thaler, Warren A., to Exxon Research and Engineering Company. Novel pressure sensitive adhesive articles containing an adhesive layer based on diene-ethoxylated alkyl amine styrene sulfonate copolymers. 5,051,296, Cl. 428-213.000.
Agarwal, Pawan K.; and Thaler, Warren A., to Exxon Research and Engineering Company. Novel pressure sensitive adhesives from diene-ethoxylated amine styrene sulfonate. 5,051,461, Cl. 524-243.000.
Agency of Industrial Science & Technology: *See—*
Haruta, Masatake; Kobayashi, Tetsuhiko; Tsubota, Susumu; and Nakahara, Yoshiko, 5,051,394, Cl. 502-324.000.
Imai, Tsunemichi; and Mabuchi, Mamoru, 5,051,231, Cl. 419-13.000.
Agency of Industrial Science & Technology Ministry of International Trade & Industry: *See—*
Suehiro, Tetsuro, deceased; and Ichimura, Kunihiro, 5,051,362, Cl. 435-182.000.
Agiman, Dan, to Texas Instruments Incorporated. Prevention of parasitic mechanisms in junction isolated devices. 5,051,612, Cl. 307-296.200.
Agnello, Anthony M.: *See—*
Paul, Jon D.; Clayton, Mark D.; and Agnello, Anthony M., 5,051,799, Cl. 375-25.000.
Agosti, Giorgio; Jodicke, Bernd; Mathews, Hans-Gunter; and Schafheitle, Oskar, to Asea Brown Boveri Ltd. Coupling-out window for linearly polarized microwaves. 5,051,715, Cl. 333-252.000.
Ahle, James L.: *See—*
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Aichi Kikai Kogyo Kabushiki Kaisha: *See—*
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Akamatu, Yoshimi: *See—*
Takida, Hiroshi; Moriyama, Takamasa; Akamatu, Yoshimi; and Kunieda, Makoto, 5,051,462, Cl. 524-394.000.
Akeley, Kurt; and Korobkin, Carl P., to Silicon Graphics, Inc. Efficient graphics process for clipping polygons. 5,051,737, Cl. 340-747.000.
Akerlund & Rausing Licens Aktiebolag: *See—*
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Akesaka, Toshio, to Kabushikikaisha Isekikaihatsu Koki. Conveying method and conveyor apparatus. 5,050,727, Cl. 198-626.100.
Akiyama, Noboru, to Dai Nippon Insatsu K.K. Disc cartridge having a slidingly movable shutter. 5,051,857, Cl. 360-133.000.
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Allegrucci, Jean-Pierre, to Kihn S.a.r.l. Rail fastening for points of railway tracks. 5,050,797, Cl. 238-336.000.

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Almond, James; Wooldridge, Wayne; Davis, Robert E.; and Wooldridge, Ralph, to Arkansas Patents, Inc. Fluid heating apparatus and process particularly suitable for a deep fat fryer. 5,050,582, Cl. 126-391.000.

Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno , to Fakombinat Szombathely. Process for the production of building units from afterhardening materials. 5,051,217, Cl. 264-40.100.

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Anderson, David A.; Whitney, Lowell T.; and Young, David C., to Golden Technologies Company, Inc. Flow control apparatus. 5,050,806, Cl. 222-464.000.

Anderson, David L., to SPX Corporation. Electromagnetic solenoid valve with variable force motor. 5,051,631, Cl. 310-14.000.

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Anderson, Robert E., to Grumman Aerospace Corporation. Interlocking structural members employing triple interfitting wedge. 5,050,820, Cl. 244-131.000.

Ando, Akio; Nakanishi, Masae; Okada, Syozi; and Inoue, Koichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Radial flow turbine rotor. 5,051,062, Cl. 416-241.00B.

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Andrews, William H., to Wimmera Industrial Minerals Pty. Ltd. Quality of heavy mineral concentrates. 5,051,165, Cl. 209-166.000.

Andros, Andrew A.; and Campana, Thomas J., Jr., to Telefind Corporation. Paging receiver with continuously tunable antenna. 5,052,049, Cl. 455-186.000.

Anesa, Francesco; Azzoni, Alessandro; Guerini, Giuseppe; and Vergani, Marco, to Ismes S.p.A. Telecoordinometer. 5,050,424, Cl. 73-1.00D.

Angelastro, Michael R.; Peet, Norton P.; and Bey, Philippe, to Merrell Dow Pharmaceuticals Inc. Novel cyclopropyl squalene derivatives and their use as inhibitors of cholesterol synthesis. 5,051,534, Cl. 568-579.000.

Anger, Wolfgang. Laminator for cut-sheet lamination. 5,051,147, Cl. 156-355.000.

Angquist, Lennart, to Asea Brown Boveri AB. Three-phase voltage stiff convertor. 5,051,684, Cl. 323-207.000.

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Appell, Bo; and Falk, Curt, to Metalform Safeset AB. Coupling. 5,051,018, Cl. 403-5.000.

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Brown, Thomas L.; and Roe, Andrew F. Wrench socket retainer. 5,050,467, Cl. 81-466.000.

Brown, Trevor A., to Polysar Limited. Fibre reinforced belt. 5,051,299, Cl. 428-221.000.

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Browne, John, to Dayco Products Canada, Inc. Display indicator and reed switch. 5,050,325, Cl. 40-447.000.

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Bruce, Hans, to Pallet-Cooler KB. Method and container for storing and distribution of foodstuffs. 5,050,387, Cl. 62-60.000.

Bruehl, Thomas L.; Brewer, Daniel R.; Hay, Clifford C.; and Childers, William H., to Paramount Pictures Corporation. Digital processing of theatrical film. 5,051,835, Cl. 358-311.000.

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Brunel, Andre; Duplat, Gerard; and Leblanc, Jean. Fuel injection pump for internal-combustion engines. 5,050,558, Cl. 123-453.000.

Brusasco, Enzo, to Roltra, Morse S.p.A.; and Du Pont de Nemors Italiana S.p.A. Vehicle door. 5,050,347, Cl. 49-348.000.

Brustad, Val G.; Phillips, Richard V.; and Rodman, William L., to Boeing Company, The. Method of curing composite parts. 5,051,226, Cl. 264-511.000.

Bryant, Ralph S., to Inter-City Products Corporation (U.S.A.). Refrigeration system with saturation sensor. 5,050,393, Cl. 62-115.000.

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Buchser, William J., to Whirlpool Corporation. Ice dispenser conveying apparatus having a rotating blade auger that operates in connection with a baffle opening to prevent wedging of ice bodies therebetween. 5,050,777, Cl. 222-146.600.

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Bumpus, Hershel. Dowell rod cutting apparatus. 5,050,652, Cl. 144-286.00R.

Bunger, Hilary D. Blank for assembly into decorative article. 5,051,879, Cl. 362-351.000.

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Burgdorf, Jochen; Reinartz, Hans-Dieter; and Steffes, Helmut, to ALfred Teves GmbH. Tandem master cylinder for hydraulic brake systems. 5,050,382, Cl. 60-589.000.

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Burgin, Kenneth N. Precharged logic systems with protection against current leakage. 5,051,620, Cl. 307-452.000.

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Burkhalter, Randall W. Cleaning apparatus for a pistol. 5,050,331, Cl. 42-95.000.

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Gotou, Hiroshi, to Fujitsu Limited. Semiconductor memory device having capacitors through which data read/write is carried out. 5,051,952, Cl. 365-154.000.
Gould, Elliot L.; Kemerer, Douglas W.; McAllister, Lance A.; Piro, Ronald A.; Richardson, Guy R.; and Wellburn, Deborah A., to International Business Machines Corporation. Method of combining gate array and standard cell circuits on a common semiconductor chip. 5,051,917, Cl. 364-489.000.
Gouron, Veronique: *See—*
Frances, Jean-Marie; Gouron, Veronique; Jousseaume, Bernard; and Pereyre, Michel, 5,051,521, Cl. 556-94.000.
Graaff GmbH: *See—*
Graaff, Wolfgang, 5,050,402, Cl. 62-457.900.
Graaff, Wolfgang, to Graaff GmbH. Container for temperature-controlled and environmentally controlled transport of perishable goods. 5,050,402, Cl. 62-457.900.
Grabill, Dale L., to Simonsen Iron Works, Inc. Rack and die mover. 5,051,051, Cl. 414-282.000.
Grace, Robert E.: *See—*
Roehrs, Daniel C.; Caruso, Angelo T.; Grace, Robert E.; Mara, Robert M.; Elliot, John G.; Saraceno, Patricia J.; and Pacer, James M., 5,051,781, Cl. 355-208.000.
Grady, John K. X-ray stand with laterally inclined rotation axis. 5,052,036, Cl. 378-197.000.
Graf, Josef: *See—*
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 5,051,439, Cl. 514-383.000.
Graff, Alfred; Schlawne, Friedhelm; Wachter, Michael; and Bottger, Wolfgang, to Mannesmann Aktiengesellschaft. Electrodynamic transducer head. 5,050,703, Cl. 181-106.000.
Graham, Andrew S., Jr. System for interconnecting panels. 5,050,793, Cl. 229-125.230.
Grandmaire, Jean-Paul: *See—*
Blumenkopf, Norman; Grandmaire, Jean-Paul; Jacques, Alain; and Tack, Viviane, 5,051,196, Cl. 252-8.800.
GRAPHA-Holding AG: *See—*
Eugster, Albert, 5,050,851, Cl. 270-55.000.
Grass Valley Group, Inc., The: *See—*
Chaplin, Daniel J., 5,051,828, Cl. 358-183.000.
Fairhurst, Jon, 5,051,827, Cl. 358-141.000.
Lake, David E., Jr., 5,051,734, Cl. 340-700.000.
Gratze, Stephen C.; Bagshaw, John M.; and Willats, Terence F., to General Electric Company p.l.c., The. Tunable lasers. 5,052,004, Cl. 372-20.000.
Gray, Alan L.; Sanderson, Neil E.; and Bradshaw, Neil, to VG Instruments Group Limited. Plasma mass spectrometer. 5,051,584, Cl. 250-288.000.
Gray, James P.: *See—*
Ferree, Marsha E.; Gray, James P.; Pozefsky, Mark; and Wilder, John F., 5,051,892, Cl. 364-200.000.
Gray, Roger L., to United States of America, Navy. Method of Kalman filtering for estimating the position and velocity of a tracked object. 5,051,751, Cl. 342-107.000.
Gray, Tommy L., to Span Instruments, Inc. Pressure responsive encoder. 5,051,729, Cl. 340-626.000.
Great Eastern (Bermuda) Ltd.: *See—*
Ripley, Ian; and Needham, Anthony H., 5,050,628, Cl. 137-15.000.
Green Environmental Systems Ltd.: *See—*
Rasmussen, Hans W.; and Rockandel, Michael A., 5,051,191, Cl. 210-721.000.
Greene, Thomas F. Method for removing flashing from blow molded bottles. 5,050,787, Cl. 225-1.000.
Grenner, Gerd; Inbar, Shai; and Long, Ernest W., to P B Diagnostic Systems, Inc. Liquid transport system. 5,051,237, Cl. 422-56.000.
Greschner, Johann: *See—*
Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,051,379, Cl. 437-225.000.
Greve, Peter: *See—*
Blumentritt, Martin; Greve, Peter; and Kohler, Reiner, 5,052,010, Cl. 372-65.000.
Grey, Richard; and Ford, Frank C. High energy ultrasonic lens assembly with mounting facets. 5,050,588, Cl. 128-24.0AA.
Grieg, Colin C.: *See—*
Creighton, David E.; and Grieg, Colin C., 5,050,621, Cl. 131-331.000.
Griesbach, Ray H.; and Hustad, Gerald O., to Oscar Mayer Foods Corporation. Reclosable package. 5,050,736, Cl. 206-484.000.
Griffith, Lionell K., to Olganix Corporation. Computerized dynamic tomography system. 5,051,904, Cl. 364-413.160.
Grimm, Michael A.; and Hildebrant, Paul, to Teledyne Industries. Three reservoir capacitor charge pump circuit. 5,051,882, Cl. 363-60.000.
Grimm, Rainer: *See—*
Bohm, Horst; and Grimm, Rainer, 5,050,928, Cl. 296-216.000.
Groeneweg, Ronald L. Tilting bed trailer apparatus with perimeter frame. 5,051,053, Cl. 414-483.000.
Groenwold, Bareld E.; and Ahle, James L., to ICI Americas Inc. Synergistic herbicidal composition of cycloate and cyanazine. 5,051,125, Cl. 71-93.000.
Groh, Gregory I. Collapsible ice chest. 5,050,766, Cl. 220-412.000.
Grohe, Klaus: *See—*
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,051,418, Cl. 514-228.200.
Groll, Manfred: *See—*
Schundehutte, Karl H.; Groll, Manfred; and Stawitz, Josef W., 5,051,501, Cl. 540-125.000.
Groschl, Martin: *See—*
Benes, Ewald; Groschl, Martin; Schmid, Michael; Siegmund, Hans-Joachim; Thomas, Friedrich-Werner; and Thorn, Gernot, 5,051,599, Cl. 250-491.100.
Gross, Akiva: *See—*
Iyengar, Radha; Zaks, Aleksey; and Gross, Akiva, 5,051,271, Cl. 426-658.000.
Gross, Rainer: *See—*
Stoltefuss, Jurgen; Schwenner, Eckhard; Gross, Rainer; Hebisch, Siegbert; Schramm, Matthias; Bechem, Martin; Hirth, Claudia; and Stasch, Johannes-Peter, 5,051,433, Cl. 514-356.000.
Grotenhofer, Heinrich, to Gebr. Eickhoff Maschinenfabrik und Eisengieberei mbH. Bracing device for a self-advancing shield tunnelling machine. 5,051,033, Cl. 405-147.000.

Grotepass, Johann, to SMS Schloemann Siemag Aktiengesellschaft. Bar steel rolling mill with a cooling segment for thermomechanical finish rolling. 5,050,418, Cl. 72-201.000.

Grow, Robert M.; and Stultz, Perry S., to National Semiconductor Corporation. Asynchronous priority select logic. 5,051,986, Cl. 370-85.500.

Gruber Systems, Inc: *See—*
Cuttriss, Rik, 5,050,252, Cl. 4-576.000.

Grumman Aerospace Corporation: *See—*
Anderson, Robert E., 5,050,820, Cl. 244-131.000.
Aronne, Armand J., 5,050,278, Cl. 24-653.000.

Grundy, Reed H., to PPG Industries, Inc. Segmented bushing temperature controller and method for using same. 5,051,121, Cl. 65-1.000.

Gruters, Michael S., to Dubner Computer Systems, Inc. Color correction for video graphics system. 5,051,928, Cl. 364-521.000.

Gruv-A-Swing, Inc.: *See—*
Fitch, Robert E., 5,050,874, Cl. 272-136.000.

GTE Laboratories Incorporated: *See—*
—Sigai, A. Gary; and Klinedinst, Keith A., 5,051,277, Cl. 427-69.000.

GTE Products Corp.: *See—*
—Bazin, Simone P.; and Muzeroll, Martin E., 5,051,657, Cl. 315-73.000.
—DeBoer, Barry G.; and Rutfield, Sharon B., 5,051,653, Cl. 313-489.000.
—Garrison, Robert L.; and Rothwell, Harold L., 5,051,665, Cl. 315-287.000.

Guarriello, Henry J.; Guarriello, Joseph A.; and Guarriello, Theodore J. Reverse lip blow molding apparatus. 5,051,084, Cl. 425-525.000.

Guarriello, Joseph A.: *See—*
Guarriello, Henry J.; Guarriello, Joseph A.; and Guarriello, Theodore J., 5,051,084, Cl. 425-525.000.

Guarriello, Theodore J.: *See—*
Guarriello, Henry J.; Guarriello, Joseph A.; and Guarriello, Theodore J., 5,051,084, Cl. 425-525.000.

Gueringer, John M.; and Reesnes, Paul A. Auxiliary furniture tray system. 5,050,929, Cl. 297-145.000.

Guerini, Giuseppe: *See—*
Anesa, Francesco; Azzoni, Alessandro; Guerini, Giuseppe; and Vergani, Marco, 5,050,424, Cl. 73-1.00D.

Guerlet, Jean-Paul; and Weber, Dan, to Comptoir Lyon-Alemand-Louyot, Societe Anonyme. Novel palladium-based alloys containing indium bismuth, silver and copper. 5,051,235, Cl. 420-463.000.

Guest, Clark C.: *See—*
Slemon, Charles S.; Lafferty, William M.; and Guest, Clark C., 5,051,578, Cl. 250-227.230.

Guetard, Denise: *See—*
Alizon, Marc; Montagnier, Luc; Guetard, Denise; Clavel, Francois; Sonigo, Pierre; and Guyader, Mireille, 5,051,496, Cl. 530-324.000.

Guhlin, Kjall G. Flushing device for motorboat engines. 5,051,104, Cl. 440-88.000.

Guim, Aurelio R.: *See—*
Guim, Raul; and Guim, Aurelio R., 5,051,731, Cl. 340-638.000.

Guim, Raul; and Guim, Aurelio R. Blown circuit breaker indicator with light emitting diode. 5,051,731, Cl. 340-638.000.

Gulick, Paul E.: *See—*
Conner, Arlie R.; and Gulick, Paul E., 5,050,965, Cl. 359-53.000.

Gumprecht, William H., to Du Pont de Nemours, E. I., and Company. Process for 1,1-dichloro-1-fluoroethane. 5,051,538, Cl. 570-168.000.

Gunderson, Richard W.: *See—*
Svendsen, John M.; Steinberg, Timothy D.; and Gunderson, Richard W., 5,050,804, Cl. 239-296.000.

Gunter, John B.: *See—*
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Gurley, John A.: *See—*
Elings, Virgil B.; and Gurley, John A., 5,051,646, Cl. 310-317.000.

Gurski, John A., Jr. Break-away pet collar. 5,050,538, Cl. 119-106.000.

Guss, Mitchell E. Lighting system for grain auger. 5,051,874, Cl. 362-89.000.

Gussoni, Damiano: *See—*
Costanzi, Silvestro; Cassar, Luigi; Bosetto, Carlo; Neri, Carlo; and Gussoni, Damiano, 5,051,458, Cl. 524-99.000.

Gustafsson, Bill B.: *See—*
Carlsson, Enar I.; Gustafsson, Bill B.; and Lungren, Bo T., 5,051,446, Cl. 514-522.000.

Guy, Barry L.: *See—*
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Guyader, Mireille: *See—*
Alizon, Marc; Montagnier, Luc; Guetard, Denise; Clavel, Francois; Sonigo, Pierre; and Guyader, Mireille, 5,051,496, Cl. 530-324.000.

Gyorvari, Janos: *See—*
Alpar, Tibor; Gyorvari, Janos; and Schmidt, Erno , 5,051,217, Cl. 264-40.100.

H-C Industries, Inc.: *See—*
Trump, Hubert D.; McBride, Stephen W.; and Smeyak, Lawrence M., 5,050,753, Cl. 215-252.000.

Ha, Chan M.: *See—*
Daneshtalab, Mohsen; Micetich, Ronald G.; Nguyen, Dai Q.; Ha, Chan M.; and Luu, Hiep T., 5,051,515, Cl. 548-136.000.

Haapamaki, Pertti; Ahlgren, Aaro; Suoninen, Lassi; and Eriksson, Juho, to Sunds Defibrator Rauma Oy. Method and equipment for filtration of suspension. 5,051,195, Cl. 210-784.000.

Haas, Gerhard: *See—*
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 5,051,439, Cl. 514-383.000.

Haas, Klaus-Arne: *See—*
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Haas, Terry E.: *See—*
Goldner, Ronald B.; Arntz, Floyd O.; Morel, Bertrand; Haas, Terry E.; and Wong, Kwok-Keung, 5,051,274, Cl. 427-38.000.

Habuchi, Ryoji: *See—*
Itoh, Hiroshi; Morisawa, Kunio; Habuchi, Ryoji; Sugaya, Masami; and Soga, Yoshinobu, 5,050,715, Cl. 192-3.300.

Hachtel, Hansjoerg: *See—*
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Hadden, Leonard D.: *See—*
Zirbes, Glen L.; Hadden, Leonard D.; and Troyk, Philip R., 5,050,292, Cl. 29-605.000.

Haentjens, Walter D. Heat dissipating coupling for rotary shafts. 5,051,071, Cl. 417-373.000.

Hafslund Nycomed Pharma Aktiengesellschaft: *See—*
Schermanz, Karl; Saischek, Gerald; Kores, Dietmar; Graf, Josef; Haas, Gerhard; and Martetschlager, Kurt, 5,051,439, Cl. 514-383.000.

Hagiwara, Takashi: *See—*
Suzuki, Yoshiichi; Hagiwara, Takashi; and Mogamiya, Hiroyuki, 5,051,527, Cl. 560-51.000.

Hagmann, Dieter: *See—*
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Hahn, Erwin; Breitschaft, Walter; Mayer, Udo; and Schroeder, Gunter-Rudolf, to BASF Aktiengesellschaft. Doubled triphenylmethane dyes having bis acylpiperazine linkage. 5,051,504, Cl. 544-58.600.

Hakim, Gilad: *See—*
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Hakim, Haim: *See—*
Tal, Danny; Hakim, Gilad; and Hakim, Haim, 5,050,362, Cl. 52-588.000.

Hall, Lawrence. Detachable golf scorecard holder. 5,050,830, Cl. 248-205.200.

Hall, Peter G.: *See—*
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Hall, Randall M.: *See—*
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Hall, Roger G.: *See—*
Baylis, Eric K.; Bittiger, Helmut; Frostl, Wolfgang; Hall, Roger G.; Maier, Ludwig; Mickel, Stuart J.; and Olpe, Hans-Rudolf, 5,051,524, Cl. 558-145.000.

Haller, Ingo: *See—*
Schriewer, Michael; Grohe, Klaus; Petersen, Uwe; Haller, Ingo; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,051,418, Cl. 514-228.200.

Hallett, Douglas J.; and Campbell, Kelvin R., to 655901 Ontario Inc. Process for the destruction of organic waste material. 5,050,511, Cl. 110-346.000.

Halliburton Company: *See—*
Baldridge, Morris G., 5,050,673, Cl. 166-70.000.
Skinner, Neal G., 5,050,681, Cl. 166-374.000.
Soliman, Mohamed Y., 5,050,674, Cl. 166-250.000.

Hallsten, John, to Hallsten Supply Company. Deck structure. 5,050,361, Cl. 52-581.000.

Hallsten Supply Company: *See—*
Hallsten, John, 5,050,361, Cl. 52-581.000.

Hamada, Hiroshi: *See—*
Shoji, Hajime; Watanabe, Noriko; Hamada, Hiroshi; Kato, Hiroaki; Takemoto, Toshio; and Hirobe, Toshihiko, 5,051,800, Cl. 357-30.000.

Hamada, Masaaki; Iida, Yoshio; Katayama, Motohiro; and Sasaki, Ikuo, to Tokai Rubber Industries, Ld. Muffler holding member. 5,050,837, Cl. 248-610.000.

Hamada, Yoshikazu; and Abekura, Makoto, to Mitsui Kinzoku Kogyo Kabushiki Kaisha. Striker for vehicle door lock. 5,050,917, Cl. 292-340.000.

Hamamatsu Photonics Kabushiki kaisha: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; and Kan, Hirofumi, 5,051,573, Cl. 250-213.00A.

Hamano, Hiroyuki: *See—*
Mukaiya, Hitoshi; Suzuki, Nobuyoshi; Hamano, Hiroyuki; Sugiura, Muncharu; and Horiuchi, Akihis- 5,050,972, Cl. 359-683.000.

Hamano, Hisashi: *See—*
Katoh, Hideo; Hamano, Hisas- Hosoi, Masahiro; and Ogawa, Tatsuya, 5,051,292, Cl. 428-1 .000.

Hamilton, Alfred S.; Holman, James R.; Kinard, Michael D.; and Mathis, Terry D., to AT&T Bell Laboratories. Optical fiber service cable. 5,050,957, Cl. 385-113.000.

Hamm, Andre: *See—*
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Hammer Corporation: *See—*
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Hammer, Jacob M., to David Sarnoff Research Center, Inc. Optoelectronic interconnections for integrated circuits. 5,051,790, Cl. 357-19.000.

Hampton, Olifton G.: *See—*
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Hanai, Nobuo: *See—*
Yoshida, Hajime; Hanai, Nobuo; and Furuya, Akiko, 5,051,355, Cl. 435-7.230.

Hanawa, Masatoshi; and Nakabayashi, Kazuto, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 5,051,699, Cl. 324-309.000.

Hanaway, Ronald L. Guide sleeve, guide post and modified ball bearing assembly. 5,051,002, Cl. 384-49.000.

Handl, Karl; and Hollrigl, Ortwin, to Handl, Karl. Installation for and a method of drying or ripening foodstuffs. 5,051,267, Cl. 426-231.000.

Haney, James A.; and Menard, Stafford J., to McDermott International, Inc. Tower with folding braces for fixed offshore platform. 5,051,037, Cl. 405-227.000.

Hanna, John E., to Motorola, Inc. Integrated filter circuit. 5,051,628, Cl. 307-520.000.

Hannan, Paul J.; and Stevens, Gerard T., to Manrex Australia Pty. Ltd. Disposable foldable medication card. 5,050,739, Cl. 206-531.000.

Hansen, George G. Expandable tarpaulin assembly. 5,050,924, Cl. 296-100.000.

Hansen, John D.; Berger, Arnold S.; Kootstra, Lewis S.; Jones, Beth V.; Bowlin, Stan W.; and Fleck, William, to Hewlett Packard Company. Data processing systems for coordinating measurement activity upon a plurality of emulators. 5,051,888, Cl. 364-200.000.

Hansen, Lowell D., to Vickers, Incorporated. Power transmission. 5,051,065, Cl. 417-201.000.

Hanson, Lowell D.; and Schafer, John R., to Field Control Systems, Inc. Repeatable pattern field spraying control. 5,050,771, Cl. 222-1.000.

Hara, Shoji; Arakawa, Satoshi; and Ishida, Masamitsu, to Fuji Photo Film Co. Ltd. Radiation image read-out method. 5,051,587, Cl. 250-327.200.

Hara, Toshiro: *See—*
Shimomura, Setsuhiro; Hara, Toshiro; Inada, Masanori; and Kiguchi, Sakae, 5,050,428, Cl. 73-118.200.

Harada, Keizo: *See—*
Higaki, Kenjiro; Harada, Keizo; Fujimori, Naoji; Itozaki, Hideo; and Yazu, Shuji, 5,051,398, Cl. 505-1.000.

Haraga, Hideaki; Iwagaki, Masaru; and Ezaki, Atsuo, to Konica Corporation. Silver halide reversal photographic light-sensitive material. 5,051,345, Cl. 430-505.000.

Harbor Branch Oceanographic Institution, Inc.: *See—*
Wright, Amy E.; Cross, Sue S.; Burres, Neal; and Koehn, Frank, 5,051,519, Cl. 549-384.000.

Harder, John W.: *See—*
Lestina, Gregory J.; Bass, Jon D.; Harder, John W.; and Singer, Stephen P., 5,051,343, Cl. 430-393.000.

Hardie, Gregory J.; and Ganser, John M., to Klockner CRA Patent GmbH. Apparatus for post combustion. 5,050,848, Cl. 266-81.000.

Hardie, Gregory J.; and Ganser, John M., to Klockner CRA Patent GmbH. Process for post combustion. 5,051,127, Cl. 75-553.000.

Hardy, Frederick E.: *See—*
Culshaw, Stephen; Vos, Eddy; and Hardy, Frederick E., 5,051,212, Cl. 252-546.000.

Hardy, James A.: *See—*
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Harfst, Michael D.: *See—*
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Harlow, James L.: *See—*
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Harm, Charles E.; and Timm, Kenneth J., to AT&T Bell Laboratories. Mixed mode regulation controller for a resonant power converter. 5,051,880, Cl. 363-49.000.

Harris Corporation: *See—*
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Walley, George M., 5,052,026, Cl. 375-119.000.
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Harris, Peter J. F.: *See—*
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Harris, Tim; Brailean, Gordon; Bardas, Theodor; Oleksuk, Cal; and Kulle, Vaclav, to Nova Corporation of Alberta. Flux control techniques for magnetic bearing. 5,051,637, Cl. 310-90.500.

Harris, Timothy S., to Kransco. Control mechanism for an on-off switch. 5,051,550, Cl. 200-330.000.

Harris, Wayne, to Amphenol Corporation. Transmission cable with reduced preparation time termination section. 5,051,544, Cl. 174-117.00F.

Harrison, Frank. Supplemental turn signal apparatus for vehicles. 5,051,721, Cl. 340-475.000.

Harrison, George C., to Polaroid Corporation. Electronic flash apparatus for reducing the incidence of human eyelid closures during exposure. 5,051,768, Cl. 354-415.000.

Harrison, Gordon L.; and Parker, Thomas P., to AT&T Bell Laboratories. Pixel generator test set. 5,051,816, Cl. 358-10.000.

Harrison, H. Page, to University of Alberta, The Governors of the. Split bentleg plow. 5,050,685, Cl. 172-699.000.

Harrison, Philip G.; and Harris, Peter J. F., to TI Corporate Services Limited. Vehicle exhaust gas catalysts. 5,051,393, Cl. 502-304.000.

Harshman, Mark W.; and Black, Stephen H., to Contraves Goerz Corporation. Interface for cables. 5,051,747, Cl. 342-1.000.

Hartkorn, Hans; Vaisnys, Romuald; and Vroomen, albert, to Gebruder Sucker and Franz Muller GmbH & Co. Emerizing apparatus with multiple beater blades. 5,050,280, Cl. 26-28.000.

Hartle, Robert T.: *See—*
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Hartung, Eytan: *See—*
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Haruta, Masatake; Kobayashi, Tetsuhiko; Tsubota, Susumu; and Nakahara, Yoshiko, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for production of ultra-fine gold particle-immobilized oxides. 5,051,394, Cl. 502-324.000.

Haruyama, Tetsuo; Udagawa, Shigeo; and Shiramatsu, Kuniaki, to Mitsubishi Denki Kabushiki Kaisha. Array antenna system with direction finding capability. 5,051,753, Cl. 342-158.000.

Hasebe, Kazunori: *See—*
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Hasegawa, Hirofumi, to Minolta Camera Kabushiki Kaisha. Optical scanning with cylindrical lens and beam slit. 5,051,757, Cl. 346-108.000.

Hasegawa, Koyo: *See—*
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Hasegawa, Norihisa: *See—*
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Hasegawa, Shuji, to Hitachi, Ltd. Superconductor storage device and memory using superconductor storage devices as memory cells. 5,051,787, Cl. 357-5.000.

Hasenauer, Dieter, to Brown, Boveri & Cie AG. Thermal insulation. 5,051,322, Cl. 429-120.000.

Hashimoto, Hiroshi: *See—*
Umetsu, Hiroshi; Hashimoto, Hiroshi; Imai, Kyoko; Betsui, Hajime; and Ohishi, Tadashi, 5,051,238, Cl. 422-64.000.

Hashimoto, Kenji: *See—*
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Hoegnelid, Kurt, to Siemens Aktiengesellschaft. Implantable medical device for detecting events occurring with respect to a physiological function with variable sensitivity and a method for the operation of such a device. 5,050,599, Cl. 128-419.0PG.
Hoelzl, Robert J. Device to remove oil from oil filter. 5,051,173, Cl. 210-143.000.
Hofacker, Roland J. Angularly adjustable adapter for paint rollers. 5,050,261, Cl. 15-144.00R.
Hoffman, Fred: *See—*
Lautner, Max; Hoffman, Fred; and Melnikov, Edward, 5,051,632, Cl. 310-42.000.
Hoffman, Harald: *See—*
Prigge, Helene; Rurlander, Robert; Hoffman, Harald; and Bortner, Hans-Peter, 5,051,117, Cl. 55-58.000.
Hoglund, Ronny, to Kamyr AB. Apparatus for screening a suspension of fibrous cellulose material. 5,051,167, Cl. 209-270.000.
Hogue, Aaron G.; and Hogue, Patrick L., to Hogue Grips. Two-piece handgrip for hand gun. 5,050,329, Cl. 42-71.020.
Hogue Grips: *See—*
Hogue, Aaron G.; and Hogue, Patrick L., 5,050,329, Cl. 42-71.020.
Hogue, Patrick L.: *See—*
Hogue, Aaron G.; and Hogue, Patrick L., 5,050,329, Cl. 42-71.020.
Hoh, Quah T.: *See—*
Engstrom, Scott M.; Gilmore: Pete B.; and Hoh, Quah T., 5,050,269, Cl. 16-118.000.
Holcomb, Gregory W.; and Holcomb, Samuel R., to Holcomb, Gregory W. Axial lead electrical component feeder. 5,050,650, Cl. 140-105.000.
Holcomb, Samuel R.: *See—*
Holcomb, Gregory W.; and Holcomb, Samuel R., 5,050,650, Cl. 140-105.000.
Hollister, Inc.: *See—*
Bailey, David F.; and Ray, John T., 5,051,562, Cl. 219-506.000.
Hollister, Roger S.: *See—*
Rajan, Sunder S.; Hollister, Roger S.; and Carlisle, Thomas P., 5,051,656, Cl. 315-3.500.
Hollister, Walter M., to Massachusetts Institute of Technology. Winds aloft estimation through radar observation of aircraft. 5,051,750, Cl. 342-26.000.
Hollrigl, Ortwin: *See—*
Handl, Karl; and Hollrigl, Ortwin, 5,051,267, Cl. 426-231.000.
Holman, James R.: *See—*
Hamilton, Alfred S.; Holman, James R.; Kinard, Michael D.; and Mathis, Terry D., 5,050,957, Cl. 385-113.000.
Holmes, Hillard R.: *See—*
Kapolnek, Michael R.; Feild, Alexander R.; Hartle, Robert T.; and Holmes, Hillard R., 5,051,146, Cl. 156-345.000.
Hommes, William J.; and Keegan, John J., Jr., to Du Pont de Nemours, E. I., and Company. Method of drawing plastic film in a tenter frame. 5,051,225, Cl. 264-288.400.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Furukawa, Yoshimi, 5,051,735, Cl. 340-705.000.
Konno, Mitsuo; Kawada, Masaki; Machida, Mamoru; and Noro, Hisashi, 5,050,631, Cl. 137-270.000.
Kume, Masao; and Masaki, Takeshi, 5,051,913, Cl. 364-474.280.
Shiraishi, Shuji, 5,051,908, Cl. 364-426.020.
Honda, Hisashi: *See—*
Misono, Katsuhide; and Honda, Hisashi, 5,051,648, Cl. 313-13.000.
Honda, Ikuro: *See—*
Kozo, Shiokawa; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,051,434, Cl. 514-357.000.
Honda, Koichi: *See—*
Anzawa, Norio; Adachi, Koji; Futakawa, Tetsuo; Honda, Koichi; Fujii, Shigekazu; Sato, Hironari; and Irita, Toshiyuki, 5,051,090, Cl. 431-331.000.
Honda, Mutsumi: *See—*
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,051,863, Cl. 361-321.000.
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,051,864, Cl. 361-321.000.
Honda, Yoshito; and Suzuki, Takashi, to International Business Machines Corp. Automatic gap adjusting mechanism. 5,051,008, Cl. 400-59.000.
Honeycutt, Thomas E.: *See—*
McKnight, William B.; Honeycutt, Thomas E.; and Jennings, Walter B., Jr., 5,050,476, Cl. 89-1.110.
Honeywell Inc.: *See—*
—Jayaram, M. R., 5,051,089, Cl. 431-80.000.
—Liden, Sam P., 5,051,910, Cl. 364-446.000.
Hong, John H., to Rockwell International Corporation. Adaptive notch filter using acousto-optics and photorefraction. 5,050,967, Cl. 359-285.000.
Hongo, Hironobu: *See—*
Takamizawa, Kinya; Hirama, Makoto; and Hongo, Hironobu, 5,050,611, Cl. 128-661.090.
Honma, Akira; and Takami, Satoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Distance measuring device. 5,051,767, Cl. 354-406.000.
Hoogewijs, Robert: *See—*
Gobin, Guy; De Doncker, Geert; Colpaert, Alex; Van Wassenhove, Norbert; Hoogewijs, Robert; Fiermans, Lucien; De Gryse, Roger; and Vennik, Joost, 5,050,416, Cl. 72-38.000.
Hook, Cynthia R.: *See—*
Sikkema, Arthur L.; and Hook, Cynthia R., 5,050,661, Cl. 160-84.100.
Hooper, Albert A.: *See—*
Hess, Ronald; Hooper, Albert A.; Morrow, Steven R.; Walker, Dianne J.; and Zimmerman, Erich, 5,050,676, Cl. 166-267.000.
Hopkins, Michael C. Signal delay and reproduction device and method. 5,051,629, Cl. 307-603.000.
Hopkins, Terry W.: *See—*
Howard, Stephen F.; and Hopkins, Terry W., 5,050,284, Cl. 29-243.540.
Horiuchi, Akihisa: *See—*
Mukaiya, Hitoshi; Suzuki, Nobuyoshi; Hamano, Hiroyuki; Sugiura, Muneharu; and Horiuchi, Akihisa, 5,050,972, Cl. 359-683.000.
Horn, Elmar-Manfred; and Savakis, Stylianos, to Bayer Aktiengesellschaft. Stainless wrought and cast materials and welding additives for structural units exposed to hot, concentrated sulfuric acid. 5,051,233, Cl. 420-50.000.
Horn, Peter; Reich, Erhard; and Henning, Rainer, to BASF Aktiengesellschaft. Textured polyurethane molded articles having multiple sheet layers. 5,051,310, Cl. 428-423.300.
Horton, George F. Boat lift. 5,051,027, Cl. 405-3.000.
Horwell, David C.; and Rees, David C., to Warner-Lambert Company. 2-amino-4 or 5-methoxycyclohexyl amides useful as analgesics. 5,051,428, Cl. 514-320.000.
Hosaka, Yukio: *See—*
Satake, Toshihiko; Satake, Satoru; and Hosaka, Yukio, 5,050,808, Cl. 241-37.000.
Hosel, Fritz, to Trutzschler GmbH & Co. KG. Rotation and standstill responsive locking device for an access door of a textile machine. 5,050,271, Cl. 19-98.000.
Hoshi, Hiroaki: *See—*
Taniguchi, Naosato; Endo, Kiyonobu; Kuwayama, Tetsuro; Hoshi, Hiroaki; Osawa, Hiroshi; Hasegawa, Koyo; and Yamamoto, Masakuni, 5,051,974, Cl. 369-44.120.
Hoshiyama, Hidetoshi: *See—*
Sawada, Tetsuya; Hoshiyama, Hidetoshi; Yoshimoto, Ikuo; and Sogo, Shinichi, 5,050,852, Cl. 271-11.000.
Hosiden Electronics Co., Ltd.: *See—*
Komatsu, Yasuhiro, 5,051,101, Cl. 439-159.000.
Hosoi, Masahiro: *See—*
Katoh, Hideo; Hamano, Hisashi; Hosoi, Masahiro; and Ogawa, Tatsuya, 5,051,292, Cl. 428-141.000.
Hosokai, Tetsushi: *See—*
Ishihara, Toshihiro; Hosokai, Tetsushi; Takaba, Tetsuro; and Kobayashi, Hideki, 5,050,565, Cl. 123-494.000.
Hosoya, Masachi, to Nippon Seiko Kabushiki Kaisha. Magnetic disc device. 5,051,853, Cl. 360-99.080.
Hosoya, Masahiro; Saito, Mitsunaga; Ohtaka, Yoshimitsu; Endo, Mitsuharu; and Futamata, Yukio, to Kabushiki Kaisha Toshiba; and Tokyo Electric Co., Ltd. Electrophotographic image forming method using one component toner and simultaneous cleaning and developing. 5,051,332, Cl. 430-122.000.
Hoss, Adolf: *See—*
Fanning, Ellen; Hoss, Adolf; and Arthur, Avril, 5,051,497, Cl. 530-416.000.
Hotten, Terrence M.: *See—*
Chakrabarti, Jiban K.; and Hotten, Terrence M., 5,051,516, Cl. 548-194.000.
Hou, Sheng-Nan; and Spedale, Joseph, to Ilinois Tool Works Inc. Slide selector switch mechanism. 5,051,552, Cl. 200-549.000.
Houck, Harold J.: *See—*
Houck, Randall J.; Houck, Michael H.; and Houck, Harold J., 5,051,028, Cl. 405-45.000.
Houck, Michael H.: *See—*
Houck, Randall J.; Houck, Michael H.; and Houck, Harold J., 5,051,028, Cl. 405-45.000.
Houck, Randall J.; Houck, Michael H.; and Houck, Harold J. Method and apparatus for installation of drainage field. 5,051,028, Cl. 405-45.000.
Hoult, David P., to Massachusetts Institute of Technology. Cushioning of piston sidethrust in gas lubricated engine. 5,050,485, Cl. 92-126.000.
Houser, John M., Jr.; and Loughner, Oliver G., to Lucerne Products, Inc. Low voltage DC one-shot circuit. 5,051,613, Cl. 307-296.300.
Houston Industries Incorporated: *See—*
Johnson, Mark S.; and French, Gordon T., Jr., 5,050,356, Cl. 52-295.000.
Howard, James K.: *See—*
Ahlert, Richard H.; Howard, James K.; Lambert, Steven E.; and Sanders, Ian L., 5,051,288, Cl. 428-64.000.
Howard, Stephen F.; and Hopkins, Terry W., to Avco Corporation. Rivet setting apparatus and method of setting a rivet. 5,050,284, Cl. 29-243.540.
Howell, James K.; and Howell, Rae E. Umbrella table cover. 5,050,654, Cl. 150-158.000.
Howell, Rae E.: *See—*
Howell, James K.; and Howell, Rae E., 5,050,654, Cl. 150-158.000.
Howell, Randolph W. Container plant stand. 5,050,339, Cl. 47-39.000.
Hromas, Joe C.: *See—*
Huber, Klaus B.; Hromas, Joe C.; and Edwards, Arnold G., 5,050,682, Cl. 166-377.000.
Hsiao, Yen-Yuan; Wu, Nan-Yang; and Cheng, Sheng-Fang, to Industrial Technology Research Institute. Voice coil motor. 5,051,669, Cl. 318-119.000.
Hsu, Frederick D. Drain valve and lift rod connection. 5,050,247, Cl. 4-203.000.



Huang, Buming, to Shunde Plastics General Machine Enterprises Group, The. Injection molder with two movable molds. 5,051,087, Cl. 425-589.000.
Huang, Chen- Sung, to Chien Hua Glass Co., Ltd. Decorative clock with rotatable sand picture. 5,051,969, Cl. 368-223.000.
Huang, Fu-Chi; Galemmo, Robert A., Jr.; and Campbell, Henry F., to Rhone-Poulenc Rorer Pharmaceuticals Inc. Quinoline derivatives as antagonists of leukotriene $D_4$. 5,051,427, Cl. 514-311.000.
Huang, Yu-Hwei. Structure of key-ring assembly. 5,050,414, Cl. 70-456.00R.
Hubbard, George R., to Hubbard, George R. Secure support pipe fastener. 5,050,824, Cl. 248-57.000.
Hubbell Incorporated: *See—*
Neuroth, David H., 5,051,103, Cl. 439-192.000.
Huber, Klaus B.; Edwards, A. Glen; Hill, William M.; and Miszewski, Antoni, to Schlumberger Technology Corporation. Pump apparatus including a firing head for use with a perforating gun on a tubing string. 5,050,672, Cl. 166-55.000.
Huber, Klaus B.; Hromas, Joe C.; and Edwards, Arnold G., to Schlumberger Technology Corporation. Coupling apparatus for a tubing and wireline conveyed method and apparatus. 5,050,682, Cl. 166-377.000.
Hubert Casati, Francois M.: *See—*
Crovetti, Aldo J.; Melin, Brian E.; Smith, Robert A.; and Hubert Casati, Francois M., 5,051,450, Cl. 514-709.000.
Huels Troisdorf AG: *See—*
Breitscheidel, Hans-Ulrich; and Kautz, Rudolf, 5,051,293, Cl. 428-157.000.
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Hughes Aircraft Company: *See—*
Brown, Wilbur P., Jr.; O'Meara, Thomas R.; Pepper, David M.; Efron, Uzi; and Soffer, Bernard H., 5,051,571, Cl. 250-201.900.
Drummond, James E.; and Shih, I-Fu, 5,050,992, Cl. 356-328.000.
Miles, Robert S.; and Schmidt, Gustav A., 5,051,097, Cl. 439-75.000.
Newberg, Irwin L., 5,051,754, Cl. 342-375.000.
Rajan, Sunder S.; Hollister, Roger S.; and Carlisle, Thomas P., 5,051,656, Cl. 315-3.500.
Woolley, Richard L., 5,051,752, Cl. 342-151.000.
Hughes Microelectronics Limited: *See—*
Burns, Daniel, 5,051,956, Cl. 365-185.000.
Hugon, Emile. Central address and programming unit for fire alarm detector. 5,051,722, Cl. 340-524.000.
Hukki, Ari M., to Sweco Incorporated. Self-cleaning system for vibratory screens. 5,051,171, Cl. 209-323.000.
Hullett, John L.; and Newman, Robert M., to Newman, Robert M.; Hullett, John L.; and University of Western Australia. Queueing protocol. 5,051,742, Cl. 340-825.500.
Hultquist, John V. Clamp with detachable cam. 5,050,921, Cl. 294-118.000.
Hundt & Weber Schaltgerate GmbH: *See—*
Ruppert, Klaus, 5,050,532, Cl. 118-663.000.
Hung, Yann, to Eastman Kodak Company. Low temperature synthesis of alkali metal niobates and tantalates. 5,051,280, Cl. 427-226.000.
Hunsicker, Harry E., Jr. Packaging for components having flexible leads. 5,050,732, Cl. 206-332.000.
Hunter Associates Laboratory Inc.: *See—*
Carpenter, P. Kevin; and James, Michael J., 5,050,956, Cl. 385-140.000.
Hunter, John. Gasification/combustion system. 5,050,374, Cl. 60-39.020.
Hunter, Paul; and Schwee, Leonard J., to United States of America, Navy. Thin film vector magnetometer. 5,051,695, Cl. 324-249.000.
Hunter, Ronald L. Hosiery applier. 5,050,783, Cl. 223-112.000.
Hunter, Tony: *See—*
Isacke, Clare M.; Trowbridge, Ian S.; and Hunter, Tony, 5,051,364, Cl. 435-240.270.
Hunting World, Incorporated: *See—*
Lee, Robert M., 5,050,713, Cl. 190-108.000.
Huntington Medical Research Institutes: *See—*
Bradley, William G.; and Jones, Lawrence W., 5,050,607, Cl. 128-653.00A.
Huntoon, Howard H. Faucet extended nut. 5,050,246, Cl. 4-192.000.
Hurco Acquisition Corporation: *See—*
Johanson, Lars; Bonavita, Frank J.; and Rudnick, Ralph E., 5,051,912, Cl. 364-474.040.
Hurley, Ricky A., to Westinghouse Electric Corp. Electrically normally closed switch device. 5,051,604, Cl. 307-115.000.
Hurtig, Carl R., to Encor Limited. Multi-surface wrench. 5,050,464, Cl. 81-90.100.
Huss, Albin, Jr.: *See—*
Herbst, Joseph A.; and Huss, Albin, Jr., 5,051,164, Cl. 208-120.000.
Hussain, Syed F., to Eaton Corporation. Transmission lubricant temperature/viscosity determination method/apparatus. 5,050,451, Cl. 74-844.000.
Hustad, Gerald O.: *See—*
Griesbach, Ray H.; and Hustad, Gerald O., 5,050,736, Cl. 206-484.000.
Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., to W. R. Grace & Co.-Conn. N,N-bis-phosphonomethyl taurine N-oxide and water-soluble salts thereof. 5,051,532, Cl. 562-12.000.
Hyduke, Stanley M. Simulation of selected logic circuit designs. 5,051,938, Cl. 364-578.000.
IAP Research, Inc.: *See—*
Juston, John M.; and Barber, John P., 5,050,478, Cl. 89-8.000.
Ibuka, Toshihiko: *See—*
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Ichijima, Seiji: *See—*
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Ichikawa, Akira, to Nippondenso Co., Ltd. Ignition timing control apparatus for engines. 5,050,554, Cl. 123-419.000.
Ichikawa, Hiroshi: *See—*
Ishikawa, Toshikatsu; Tokutomi, Katsuya; Ichikawa, Hiroshi; Mitsuno, Shiro; and Nagai, Hideto, 5,051,207, Cl. 252-389.310.
Ichikawa, Rinjiro; and Hashimoto, Kenji, to Fujimori Kogyo Co., Ltd. Laminate for protecting optical recording layer. 5,051,314, Cl. 428-522.000.
Ichikawa, Tadayoshi: *See—*
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Ichimura, Katsumi: *See—*
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Ichimura, Kunihiro: *See—*
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ICI Americas Inc.: *See—*
Groenwold, Bareld E.; and Ahle, James L., 5,051,125, Cl. 71-93.000.
ICT International CMOS Technology, Inc.: *See—*
Wang, Samuel T., 5,051,793, Cl. 357-23.500.
Idemitsu Petrochemical Company Limited: *See—*
Mori, Shigeo; and Yaguchi, Atsunori, 5,051,295, Cl. 428-195.000.
Idesco Oy: *See—*
Lou, Perry W., 5,051,618, Cl. 307-443.000.
Idogawa, Kazuhiro; and Amazawa, Kiyoshi, to Clarion Co., Ltd. FM demodulator with tracking filter. 5,051,703, Cl. 329-319.000.
IFE Industrie- Einrichtungen Fertigungs Aktiengesellschaft: *See—*
Ahorner, Leander, 5,051,170, Cl. 209-310.000.
Ife, Robert J.: *See—*
Brown, Thomas H.; Ife, Robert J.; and Leach, Colin A., 5,051,508, Cl. 546-84.000.
Iida, Hirofumi: *See—*
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Iida, Katsumi, to Diesel Kiki Co., Ltd. Control apparatus for automobile air-conditioners. 5,051,884, Cl. 364-148.000.
Iida, Takashi: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; and Kan, Hirofumi, 5,051,573, Cl. 250-213.00A.
Iida, Yoshio: *See—*
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Iida, Yukio: *See—*
Tomisawa, Shigechika; Iida, Yukio; Kaihara, Yuji; Tonomura, Joji; Uoya, Kazuo; Ose, Kimitoshi; Ogawa, Hiroshi; Ono, Norihiko; Ishii, Tatsuo; and Ushiogi, Mamoru, 5,051,391, Cl. 502-242.000.
Iijima, Tetsuo: *See—*
Ishii, Osamu; Nonaka, Koutarou; Hatakeyama, Iwao; and Iijima, Tetsuo, 5,051,970, Cl. 369-13.000.
Iizuka, Nobuyuki: *See—*
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Iizuka, Takashi: *See—*
Ikeda, Tsutomu; Watanabe, Yutaka; Suzuki, Masayuki; Hayashida, Masami; Fukuda, Yasuaki; Ogura, Shigetaro; Iizuka, Takashi; and Niibe, Masahito, 5,052,033, Cl. 378-35.000.
Ikawa, Tatsuo: *See—*
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Ikeda Bussan Co., Ltd.: *See—*
Tanaka, Yasuo, 5,050,926, Cl. 296-146.000.
Ikeda, Hayato; Yoshida, Tetsuo; and Mizuno, Shinji, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Multi-cylinder refrigerant gas compressor with a muffling arrangement. 5,051,069, Cl. 417-269.000.
Ikeda, Hayato: *See—*
Kawai, Katsunori; Ikeda, Hayato; Yokomachi, Naoya; and Tanikawa, Kazuhiro, 5,050,892, Cl. 277-168.000.
Ikeda, Hiroshi; Kimura, Takashi; and Fujiki, Norio, to Nissan Motor Co., Ltd. Output buffer circuits for reducing noise. 5,051,625, Cl. 307-475.000.
Ikeda, Masami: *See—*
Karita, Seiichiro; and Ikeda, Masami, 5,051,759, Cl. 346-140.00R.
Ikeda, Toshihiro: *See—*
Uemura, Tadahiro; Fujimaki, Hideo; and Ikeda, Toshihiro, 5,051,178, Cl. 210-500.380.
Ikeda, Tsutomu; Watanabe, Yutaka; Suzuki, Masayuki; Hayashida, Masami; Fukuda, Yasuaki; Ogura, Shigetaro; Iizuka, Takashi; and Niibe, Masahito, to Canon Kabushiki Kaisha. Reflection type mask. 5,052,033, Cl. 378-35.000.
Ikeda, Yukio: *See—*
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Ikehara, Shohei, to Fujitsu Limited. Method of connecting and disconnecting a board in a hot state. 5,051,606, Cl. 307-134.000.
Ikenoue, Yoshikazu: *See—*
Kadono, Takashi; Ikenoue, Yoshikazu; and Morikawa, Takashi, 5,051,925, Cl. 364-519.000.

Ikoma, Keiichi; Katayama, Shuuzi; Nakai, Shizuo; and Miwa, Kenji, to Sharp Kabushiki Kaisha. Data transmission error detection in an electronic cash register system. 5,051,899, Cl. 364-405.000.
ILB Co., Ltd.: *See*—
Yoshida, Kinoto; Fujii, Morizumi; Tsuda, Tokihiro; Suda, Shigeo; Kodama, Osamu; Kuroe, Kazuro; Tanikawa, Takumi; Nishimura, Michihiko; and Munakata, Hideyuki, 5,051,023, Cl. 404-39.000.
Ilinois Tool Works Inc.: *See*—
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Imaeda, Hirofumi: *See*—
Onoue, Akihiro; and Imaeda, Hirofumi, 5,050,461, Cl. 74-872.000.
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Narishige, Shinji; Mitsuoka, Katsuya; Imagawa, Takao; Nishioka, Kouichi; Kumagai, Akira; Sano, Masaaki; Sugita, Yutaka; Arai, Reiko; Kobayashi, Tetsuo; Yoshida, Toshihiro; Saitoh, Yokuo; Tsuji, Yoshikazu; and Hayashi, Masaaki, 5,051,856, Cl. 360-126.000.
Imai, Hitoshi: *See*—
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Imai, Kyoko: *See*—
Umetsu, Hiroshi; Hashimoto, Hiroshi; Imai, Kyoko; Betsui, Hajime; and Ohishi, Tadashi, 5,051,238, Cl. 422-64.000.
Imai, Tsunemichi; and Mabuchi, Mamoru, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for fabrication of superplastic composite material having metallic aluminum reinforced with silicon nitride. 5,051,231, Cl. 419-13.000.
Imai, Yoshitaka: *See*—
Nakatani, Munetsugu; Imai, Yoshitaka; Yoneyama, Hiroaki; and Tanuku, Yoshiteru, 5,051,216, Cl. 264-29.200.
Imax Systems Corporation: *See*—
Shaw, William C.; Maxwell, Ian; and Smith, Irvine W., 5,050,985, Cl. 352-184.000.
Imex Corporation: *See*—
Newman, Dennis; Steffenson, Gary G.; Willenbring, Angela G.; Jones, David C.; Self, George E.; Wing, Scott N.; and Schmitz, Alan R., 5,050,613, Cl. 128-670.000.
Imperial Chemical Industries PLC: *See*—
Staniland, Philip; Gilbert, Arthur H.; and Henderson, Ian R. M., 5,051,495, Cl. 528-499.000.
In Focus Systems, Inc.: *See*—
Conner, Arlie R.; and Gulick, Paul E., 5,050,965, Cl. 359-53.000.
In-Situ, Inc.: *See*—
Kubo, Susumu, 5,051,128, Cl. 75-712.000.
Inaba, Hiroo; Saito, Shinji; and Ogawa, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 5,051,320, Cl. 428-215.000.
Inaba, Hiroo: *See*—
Noguchi, Hitoshi; Saito, Shinji; Inaba, Hiroo; and Ogawa, Hiroshi, 5,051,303, Cl. 428-329.000.
Inada, Masanori: *See*—
Shimomura, Setsuhiro; Hara, Toshiro; Inada, Masanori; and Kiguchi, Sakae, 5,050,428, Cl. 73-118.200.
Inamoto Manufacturing Co., Ltd.: *See*—
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Kemp, Douglas W. Traffic simulation board game apparatus. 5,050,887, Cl. 273-237.000.

Kenakin, Terrence P.: *See*—
Wheeler, Thomas N.; Kenakin, Terrence P.; and Shaffer, Joel E., 5,051,431, Cl. 514-344.000.

Kennard, Paul A.: *See*—
Birkett, Alexander N.; Kennard, Paul A.; Cameron, Thomas P.; Syrett, Barry A.; Barber, Stephen G.; and Suthers, Mark S., 5,051,709, Cl. 333-28.00R.

Kennedy, Christopher R.; Urquhart, Andrew W.; White, Danny R.; Newkirk, Marc S.; and Ramberg, Jeffrey R., to Lanxide Technology Company, LP. Method for producing self-supporting ceramic bodies with graded properties. 5,051,383, Cl. 501-127.000.

Kenney, Martin J.: *See*—
Long, George E.; Asmussen, Daniel R.; and Kenney, Martin J., 5,051,723, Cl. 340-566.000.

Kern, Dieter P.: *See*—
Ashton, Christopher J.; Gerber, Porter D.; Kern, Dieter P.; Molzen, Walter W., Jr.; Rishton, Stephen A.; Rosenfield, Michael G.; and Viswanathan, Raman G., 5,051,598, Cl. 250-492.200.

Kern, Gregor. Method for the production of concrete pipes. 5,051,223, Cl. 264-256.000.

Kern, Mark T.; Shamordola, Kenneth A.; Tangonan, Gregory L.; and Wetzork, John M., to Santa Barbara Research Center. Fiber optic flame detection and temperature measurement system having one or more in-line temperature dependent optical filters. 5,051,590, Cl. 250-339.000.

Kern, Mark T.; Shamordola, Kenneth A.; Tangonan, Gregory L.; and Wetzork, John M., to Santa Barbara Research Center. Fiber optic flame detection and temperature measurement system employing doped optical fiber. 5,051,595, Cl. 250-458.100.

Kerstein, Lothar; Riess, Manfred; and Weydandt, Juergen, to Erno GmbH. Modular payload transport and operating device for space vehicle. 5,050,821, Cl. 244-158.00R.

Keshavan, Madapusi K.; and Rey, Proserfina C., to Smith International, Inc. Hard facing. 5,051,112, Cl. 51-309.000.

Kessel, Stephan; and Evertz, Karlheinz, to Uniroyal Englebert Reifen GmbH. Pneumatic vehicle tire. 5,050,658, Cl. 152-540.000.

Ketelsen, Leonard J.-P.: *See*—
Ackerman, David A.; Anthony, Philip J.; Ketelsen, Leonard J.-P.; and Swaminathan, Venkataraman, 5,052,015, Cl. 372-96.000.

Kettering, Gordon: *See*—
Peregrim, Theodore J.; Long, Albert H.; Richter, Stephen L.; Geller, Harold J.; Kanter, Irving; and Kettering, Gordon, 5,052,045, Cl. 382-30.000.



Kezik, Vitold A.: *See*—
Prokhorov, Ivan A.; Kezik, Vitold A.; Agafonov, Igor S.; Kolgan, Jury N.; Goldshtein, Boris G.; and Nikolaev, Igor V., 5,050,687, Cl. 173-133.000.

Khan, Anwer M.: *See*—
Fulford, George D.; and Khan, Anwer M., 5,051,243, Cl. 423-131.000.

Kido, Keishiro: *See*—
Tezuka, Sigeru; and Kido, Keishiro, 5,051,282, Cl. 427-260.000.

Kiguchi, Sakae: *See*—
Shimomura, Setsuhiro; Hara, Toshiro; Inada, Masanori; and Kiguchi, Sakae, 5,050,428, Cl. 73-118.200.

Kihn S.a.r.l.: *See*—
Allegrucci, Jean-Pierre, 5,050,797, Cl. 238-336.000.

Kikui, Shinsuke: *See*—
Shoji, Hisashi; Obu, Makoto; Yano, Hidetoshi; Kikui, Shinsuke; Terai, Junichi; and Ogawa, Tomoko, 5,051,760, Cl. 346-140.00R.

Kikuti, Yusiti: *See*—
Kunii, Yutaka; and Kikuti, Yusiti, 5,050,436, Cl. 73-644.000.

Killion, Darryl B. Disk launcher. 5,050,575, Cl. 124-8.000.

Kim, In-Keun, to Daewoo Heavy Industries Ltd. Safety apparatus for a skid-steer loader. 5,050,700, Cl. 180-268.000.

Kim, John R.: *See*—
Fetterolf, David T.; Kim, John R.; and Lindroth, Clifford A., Jr., 5,051,944, Cl. 364-900.000.

Kim, Myun H. Container with wide tear strip opening feature. 5,050,741, Cl. 206-606.000.

Kim, You S.: *See*—
Park, Sang W.; Kim, You S.; and Lee, Jin H., 5,051,505, Cl. 544-101.000.

Kim, Young-Han, to SamSung Electronics Co., Ltd. Apparatus for preventing an overrun of a spindle motor. 5,051,674, Cl. 318-561.000.

Kimizu, Naoki: *See*—
Ito, Michiro; and Kimizu, Naoki, 5,051,900, Cl. 364-408.000.

Kimura, Hiroaki; and Hatta, Naoyuki, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus having control unit for controlling rewinding operation of recording medium. 5,051,771, Cl. 355-27.000.

Kimura, Masaharu; and Tada, Yoshihiro, to Fujitsu Limited. Apparatus for effecting simulation of a logic circuit and method for producing a semiconductor device using the simulation approach. 5,051,911, Cl. 364-468.000.

Kimura, Mikihiro, to Mitsubishi Denki Kabushiki Kaisha. Solid state image sensing device having an overflow drain structure. 5,051,798, Cl. 357-24.000.

Kimura, Takashi: *See*—
Ikeda, Hiroshi; Kimura, Takashi; and Fujiki, Norio, 5,051,625, Cl. 307-475.000.

Kimura, Yoshiharu: *See*—
Kitao, Toshio; Kimura, Yoshiharu; Yamane, Hideki; and Hashimoto, Koichi, 5,051,210, Cl. 252-518.000.

Kimura, Yutaka: *See*—
Okumura, Hiroshi; Kimura, Yutaka; and Matumoto, Eizi, 5,051,675, Cl. 318-568.100.

Kinard, Michael D.: *See*—
Hamilton, Alfred S.; Holman, James R.; Kinard, Michael D.; and Mathis, Terry D., 5,050,957, Cl. 385-113.000.

Kinast, Gunther: *See*—
Boshagen, Horst; Junge, Bodo; Kinast, Gunther; Schuller, Matthias; Stoltefuss, Jurgen; and Paessens, Arnold, 5,051,407, Cl. 514-24.000.

King, Donald E., to Ayrking Corporation. Auger-type flour sifter. 5,051,169, Cl. 209-274.000.

King, James G.: *See*—
Lemon, Peter H. R. B.; King, James G.; Murray, Graham; Leoni, Henry; and Gerber, Arthur H., 5,051,454, Cl. 523-146.000.

King, Patrick D., to Flo-Con Systems, Inc. Staged valve multi-hole injection block and method. 5,050,847, Cl. 266-44.000.

King, Steven J.: *See*—
Evans, John M., Jr.; King, Steven J.; and Weiman, Carl F. R., 5,051,906, Cl. 364-424.020.

Kinoshita, Hiroshi, to Fanuc Ltd. Apparatus for detecting a failure in automatic wire extension. 5,051,553, Cl. 219-69.120.

Kinoshita, Yoshiaki: *See*—
Takamine, Yoshio; Miyamoto, Shunsuke; Nakagawa, Takayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 5,051,941, Cl. 364-578.000.

Kinter, Lewis B.; and Kohl, Randall L., to SmithKline Beecham Corporation. Method of treating nausea and emesis related to motion sickness with vasopressin antagonists. 5,051,400, Cl. 514-11.000.

Kipphan, Helmut; and Loffler, Gerhard, to Heidelberger Druckmaschinen AG. Method of monitoring and/or controlling dampening-medium feed in an offset printing machine. 5,050,994, Cl. 356-445.000.

Kirin Beer Kabushiki Kaisha: *See*—
Nakai, Takayuki; and Kono, Tadahisa, 5,051,240, Cl. 422-83.000.

Kirita, Kei: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 5,051,338, Cl. 430-296.000.

Kirsch, Sheldon J.; and Chen, Chii-Shu, to Ausimont, U.S.A., Inc. Stabilized halopolymer compositions. 5,051,460, Cl. 524-114.000.

Kishi, Hiroshi: *See*—
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,051,863, Cl. 361-321.000.
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,051,864, Cl. 361-321.000.

Kistner, David R., to Sota Technology, Inc. Method for encasing a porous body in an envelope of plastic material. 5,051,144, Cl. 156-85.000.

Kitada, Akiharu: *See*—
Yano, Hisashi; Yabumoto, Junsuke; and Kitada, Akiharu, 5,051,072, Cl. 417-435.000.

Kitagawa, Niroh; and Kitoh, Masayuki, to Onoda Cement Company, Ltd. Solid oxide fuel cell and method of manufacturing the same. 5,051,321, Cl. 429-30.000.

Kitajima, Kazuo: *See*—
Tsubaki, Yasuhiro; Kitajima, Kazuo; Ishihara Hidetoshi; Hayashi, Shoichi; Ueda, Atsushi; Yagami, Kenichi; and Yamada, Shuji, 5,050,259, Cl. 8-159.000.

Kitamura, Hiroki: *See*—
Takahashi, Toshinori; Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Kitamura, Hiroki; Nibe, Toru; Shinya, Tadao; Mizoguchi, Yutaka; and Terada, Katsuhiko, 5,051,755, Cl. 346-76.0PH.

Kitamura, Kenzi: *See*—
Yuasa, Takahiro; and Kitamura, Kenzi, 5,051,131, Cl. 106-494.000.

Kitamura, Koichi; Mimura, Hidenori; Yamamoto, Kazuo; Ohta, Yasumitsu; Sai, Kazuyoshi; Kawamura, Kazuhiko; and Otani, Noboru, to Nippon Steel Corporation. Diode and producing method thereof and contact image sensor device comprising the same. 5,051,803, Cl. 357-30.000.

Kitao, Toshio; Kimura, Yoshiharu; Yamane, Hideki; and Hashimoto, Koichi, to Kyoto Institute of Technology. Alumina fiber and a method of producing the same. 5,051,210, Cl. 252-518.000.

Kitazawa, Shooji; and Ono, Takashi, to Oki Electric Industry Co., Ltd. EEPROM device including read, write, and erase voltage switching circuits. 5,051,953, Cl. 365-185.000.

Kitoh, Masayuki: *See*—
Kitagawa, Niroh; and Kitoh, Masayuki, 5,051,321, Cl. 429-30.000.

Kittaka, Shigeo, to Nippon Sheet Glass Co., Ltd. Lens system for use in optical information device. 5,050,970, Cl. 359-653.000.

Kittirutsunetorn, Kitti, to Secure Telecom, Inc. Remote control system using power line of remote site. 5,051,720, Cl. 340-310.00R.

Kiyohara, Masao, to Ricoh Company, Ltd. Memory cell array of planar cell structure. 5,051,809, Cl. 357-45.000.

Kiyonaga, Tetsuya: *See*—
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; and Onoda, Yoshihito, 5,052,051, Cl. 455-619.000.

Klappert, Willi: *See*—
Ballard, Donald E.; and Klappert, Willi, 5,050,294, Cl. 29-609.000.

Klein, Enrique J.: *See*—
Ghose, Sanjoy; Klein, Enrique J.; Bronshvatch, Efim; Seeger, Bernhard M.; Macleod, Donald J.; Heine, Gunter K.; Kuwert, Oswald; and Battu, Ramgopal, 5,051,855, Cl. 360-106.000.

Klein, Joseph T.: *See*—
Effland, Richard C.; and Klein, Joseph T., 5,051,430, Cl. 514-338.000.

Klein, Scott I.; Molino, Bruce F.; Czekaj, Mark; and Gardner, Charles J., to Rhone-Poulenc Rorer Pharmaceuticals Inc. Anti-thrombotic peptides and pseudopeptides. 5,051,405, Cl. 514-18.000.

Kleinman, H. Leonard. Firefighter's trousers with a selectively foldable torso section. 5,050,244, Cl. 2-227.000.

Kleinwolterink, Henry, Jr. Power attachment for wheelchair. 5,050,695, Cl. 180-13.000.

Klemm, Gerhard, to Gerhard Klemm Maschinenfabrik GmbH & Co. Screen printing machine with a moving screen and a moving squeegee for printing a web. 5,050,496, Cl. 101-123.000.

Klemm, Gerhard, to Gerhard Klemm Maschinenfabrik GmbH & Co. Screen printing machine with a moving screen and stationary squeegee for printing a web. 5,050,497, Cl. 101-124.000.

Klendworth, Douglas D.: *See*—
Buehler, Charles K.; and Klendworth, Douglas D., 5,051,388, Cl. 502-113.000.

Kligman, Albert M. Treatment of cellulite with retinoids. 5,051,449, Cl. 514-559.000.

Kline, Richard B., to Codex Corporation. Digital filtering. 5,051,981, Cl. 370-32.100.

Klinedinst, Keith A.: *See*—
Sigai, A. Gary; and Klinedinst, Keith A., 5,051,277, Cl. 427-69.000.

Klockner CRA Patent GmbH: *See*—
Hardie, Gregory J.; and Ganser, John M., 5,050,848, Cl. 266-81.000.
Hardie, Gregory J.; and Ganser, John M., 5,051,127, Cl. 75-553.000.

Klockner Oecotec GmbH: *See*—
Heimhard, Hans-Jurgen; and Brauer, Manfred, 5,051,166, Cl. 209-269.000.

Klotz, Helmut; Pinter, Hans D.; Weber, Rainer; Block, Hans-Dieter; and Lonhoff, Norbert, to Bayer Aktiengesellschaft. Processes for the preparation of alkali metal dichromates and chromic acid. 5,051,155, Cl. 204-59.00R.

Kneip, Rainer, to Dr. Ing. h.c.F. Porsche AG. Safety belt system, particularly for motor vehicles. 5,050,906, Cl. 280-805.000.

Kniarmco Inc.: *See*—
Knight, C. Reed, Jr.; and Stoner, Eugene M., 5,050,480, Cl. 89-147.000.
Knight, C. Reed, Jr.; and Stoner, Eugene M., 5,050,481, Cl. 89-147.000.

Knickerbocker, Michael G., to Calmar Inc. Dispenser having child-resistant nozzle assembly. 5,050,779, Cl. 222-153.000.

Knight, C. Reed, Jr.; and Stoner, Eugene M., to Kniarmco Inc. Trigger assembly for a firearm. 5,050,480, Cl. 89-147.000.

Knight, C. Reed, Jr.; and Stoner, Eugene M., to Kniarmco Inc. Rolling supports for trigger and firing pin assemblies in a firearm. 5,050,481, Cl. 89-147.000.

Knittel, Otto, to Hella KG Hueck & Co. Process and apparatus for regulating an interior temperature of a motor vehicle. 5,050,795, Cl. 236-13.000.

Knoblock, Glenn A., to Steelcase Inc. Controlled deflection front lip for seating. 5,050,931, Cl. 257-311.000.

Knox, Richard M., Jr.: *See—*
Hathaway, Kevin J.; Knox, Richard M., Jr.; Arego, Douglas A.; and Kornfuerhrer, Gaylon R., 5,050,946, Cl. 385-33.000.

Knudsen, Lars: *See—*
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Kobayashi, Ai: *See—*
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Kobayashi, Atsuko: *See—*
Ishikawa, Takeshi; and Kobayashi, Atsuko, 5,050,813, Cl. 242-85.100.

Kobayashi, Haruo: *See—*
Yoshizaki, Akira; Kashima, Masataka; Yamanaka, Akira; and Kobayashi, Haruo, 5,051,765, Cl. 354-187.000.

Kobayashi, Hideki: *See—*
Ishihara, Toshihiro; Hosokai, Tetsushi; Takaba, Tetsuro; and Kobayashi, Hideki, 5,050,565, Cl. 123-494.000.

Kobayashi, Hiroshi; Ueda, Yoshiharu; Tou, Keiryo; and Yamamoto, Masamichi, to Hirakawa Iron Works, Ltd. Boiler equipped with water tubes. 5,050,541, Cl. 122-235.230.

Kobayashi, Hiroshi: *See—*
Kuroda, Nobuyuki; Kobayashi, Hiroshi; and Matsuura, Kazuo, 5,051,486, Cl. 526-279.000.

Kobayashi, Keiitsu: *See—*
Taka, Toshio; Okubo, Takuo; Kobayashi, Keiitsu; Asano, Takchiko; Kawasaki, Yoshio; and Osanai, Kiyotaka, 5,051,481, Cl. 525-240.000.

Kobayashi, Manabu: *See—*
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Kobayashi, Masakazu: *See—*
Murase, Hiroshi; Ishizuka, Keizi; Kobayashi, Masakazu; and Narita, Masanori, 5,051,688, Cl. 324-143.000.

Kobayashi, Noboru, to Yamaha Hatsudoke Kabushiki Kaisha. Small sized jet propulsion boat. 5,050,517, Cl. 114-123.000.

Kobayashi, Norio: *See—*
Fukuoka, Mutsuo; and Kobayashi, Norio, 5,051,012, Cl. 400-279.000.

Kobayashi, Takahiro: *See—*
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Kobayashi, Tetsuhiko: *See—*
Haruta, Masatake; Kobayashi, Tetsuhiko; Tsubota, Susumu; and Nakahara, Yoshiko, 5,051,394, Cl. 502-324.000.

Kobayashi, Tetsuo: *See—*
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Kobayashi, Yasuo, to NEC Corporation. Semiconductor memory having improved data readout scheme. 5,051,955, Cl. 365-189.020.

Kobe, Brian: *See—*
Kobe, Vivian; and Kobe, Brian, 5,050,624, Cl. 132-319.000.

Kobe, Vivian; and Kobe, Brian. Disposable eye makeup shield. 5,050,624, Cl. 132-319.000.

Koch, Boris: *See—*
Goldbach, Hubert; and Koch, Boris, 5,050,351, Cl. 49-502.000.

Koch, Eckhard M.: *See—*
Pipper, Gunter; and Koch, Eckhard M., 5,051,491, Cl. 528-335.000.

Kodama, Osamu: *See—*
Yoshida, Kinoto; Fujii, Morizumi; Tsuda, Tokihiro; Suda, Shigeo; Kodama, Osamu; Kuroe, Kazuro; Tanikawa, Takumi; Nishimura, Michihiko; and Munakata, Hideyuki, 5,051,023, Cl. 404-39.000.

Koehn, Frank: *See—*
Wright, Amy E.; Cross, Sue S.; Burres, Neal; and Koehn, Frank, 5,051,519, Cl. 549-384.000.

Koelewijn, Steven J.: *See—*
Ten Pierick, Hendrik; Chan, Kar B.; and Koelewijn, Steven J., 5,051,608, Cl. 307-261.000.

Koenck, Steven E.; and Mahany, Ronald L., to Norand Corporation. Method of and apparatus for controlling modulation of digital signals in frequency-modulated transmissions. 5,052,020, Cl. 375-62.000.

Koenig & Bauer Aktiengesellschaft: *See—*
Spiess, Wolfgang C. J., 5,050,500, Cl. 101-420.000.

Koenig, Melissa M.: *See—*
Vukovich, William J.; Koenig, Melissa M.; and Yu, Tsunlock A., 5,050,458, Cl. 74-866.000.

Koetsier, Wicher T.; and Verduijn, Johannes P., to Exxon Research & Engineering Company. Zeolite L preparation. 5,051,387, Cl. 502-74.000.

Kogan, Grigory; and McKinney, David J., to Tektronix, Inc. Accurate delay generator having a compensation feature for power supply voltage and semiconductor process variations. 5,051,630, Cl. 307-603.000.

Koh, HunYeong: *See—*
Chang, MoonHo; Kang, Han-Young; Koh, HunYeong; Cho, YongSeo; and Shim, SangChul, 5,051,530, Cl. 560-184.000.

Kohchi, Mashanori: *See—*
Kohno, Takashi; Matsushita, Osami; Terayama, Takao; Kohchi, Mashanori; Tomizawa, Hideo; Satoh, Kouji; and Ono, Hiroyuki, 5,051,852, Cl. 360-84.000.

Kohjin Co., Ltd.: *See—*
Murata, Masayuki; Katsuta, Shinichiro; and Unno, Tomoyuki, 5,051,279, Cl. 427-150.000.

Kohl, Rainer A. Space frame assembly. 5,051,019, Cl. 403-171.000.

Kohl, Randall L.: *See—*
Kinter, Lewis B.; and Kohl, Randall L., 5,051,400, Cl. 514-11.000.

Kohler, Reiner: *See—*
Blumentritt, Martin; Greve, Peter; and Kohler, Reiner, 5,052,010, Cl. 372-65.000.

Kohler, Rolf, to Robert Bosch GmbH. Mixture control system for an internal combustion engine. 5,050,563, Cl. 123-489.000.

Kohno, Takashi; Matsushita, Osami; Terayama, Takao; Kohchi, Mashanori; Tomizawa, Hideo; Satoh, Kouji; and Ono, Hiroyuki, to Hitachi, Ltd. Mechanism for balancing a rotary magnetic head apparatus. 5,051,852, Cl. 360-84.000.

Kohno, Yoshiaki: *See—*
Naito, Yasuyuki; Azumi, Takeshi; Morii, Horishi; and Kohno, Yoshiaki, 5,051,712, Cl. 333-185.000.

Koike, Shunsuke: *See—*
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Koizumi, Tsunemitsu: *See—*
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Kojima, Masaya: *See—*
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Kolberg, David A.: *See—*
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Kolgan, Jury N.: *See—*
Prokhorov, Ivan A.; Kezik, Vitold A.; Agafonov, Igor S.; Kolgan, Jury N.; Goldshtein, Boris G.; and Nikolaev, Igor V., 5,050,687, Cl. 173-133.000.

Kollmorgen Corporation: *See—*
Overton, Bernard P., 5,051,634, Cl. 310-64.000.

Kolmer, John. Bullet casing deburring tool. 5,050,475, Cl. 86-23.000.

Kolze, Alicia A. Accessory for holding a contact lens. 5,050,918, Cl. 294-1.200.

Komatsu, Susumu: *See—*
Ishii, Satoyuki; and Komatsu, Susumu, 5,051,826, Cl. 358-140.000.

Komatsu, Yasuhiro, to Hosiden Electronics Co., Ltd. Multi-pole connector. 5,051,101, Cl. 439-159.000.

Komatsu Zenoah Company: *See—*
Asatsuma, Kinpei, 5,050,373, Cl. 56-17.600.
Nomoto, Shigeki, 5,050,546, Cl. 123-182.000.

Kominami, Kazuhiko: *See—*
Sakoda, Kazuaki; Kominami, Kazuhiko; and Iwamoto, Masao, 5,051,337, Cl. 430-270.000.

Kondo, Yusuke; and Nakamura, Shinji, to Sanmeidenki Kabushikikaisha. Electromagnet for solenoid valves and method of manufacturing same. 5,050,840, Cl. 251-129.150.

Konert, Bernd, to Compres AG. Lightweight gas casing. 5,051,064, Cl. 417-64.000.

Konica Corporation: *See—*
Haraga, Hideaki; Iwagaki, Masaru; and Ezaki, Atsuo, 5,051,345, Cl. 430-505.000.
Kawahara, Setsuko; Nakano, Yasushi; and Koyama, Noboru, 5,051,291, Cl. 428-141.000.
Sato, Kenji, 5,051,783, Cl. 355-271.000.
Uchida, Takashi; Masukawa, Toyoaki; and Nakayama, Noritaka, 5,051,347, Cl. 430-558.000.

Koning, Richard W.: *See—*
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Konishiroku Photo Industry Co., Ltd.: *See—*
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Konkol, Werner; Bahrmann, Helmut; Herrmann, Wolfgang; and Kulpe, Jurgen, to Hoechst Aktiengesellschaft. Complex compound of rhodium-containing sulfonated triphenylphosphane. 5,051,522, Cl. 556-136.000.

Konno, Mitsuo; Kawada, Masaki; Machida, Mamoru; and Noro, Hisashi, to Honda Giken Kogyo Kabushiki Kaisha. Fluid diverging system. 5,050,631, Cl. 137-270.000.

Konno, Sunao, to Tomy Company, Ltd. Radio control device for track-travelling toy. 5,050,505, Cl. 104-295.000.

Kono, Hiromi, to Diesel Kiki Co., Ltd. Frequency measuring apparatus. 5,051,915, Cl. 364-484.000.

Kono, Koichi: *See—*
Takita, Kotaro; Kono, Koichi; Takashima, Tatsuya; and Okamoto, Kenkichi, 5,051,183, Cl. 210-500.360.

Kono, Tadahisa: *See—*
Nakai, Takayuki; and Kono, Tadahisa, 5,051,240, Cl. 422-83.000.

Konuma, Hiroshi: *See—*
Shishikura, Toshikazu; Takeuchi, Masataka; Murakoshi, Yoshihiko; Konuma, Hiroshi; and Kameyama, Mutsumi, 5,051,325, Cl. 429-197.000.

Kootstra, Lewis S.: *See—*
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Kopp, Markus B.: *See—*
Copeland, Richard L.; and Kopp, Markus B., 5,051,726, Cl. 340-572.000.

Koppenwallner, Georg: *See—*
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Murray, Graham: *See*—
Lemon, Peter H. R. B.; King, James G.; Murray, Graham; Leoni, Henry; and Gerber, Arthur H., 5,051,454, Cl. 523-146.000.
Murray, William V.; and Wachter, Michael P., to Ortho Pharmaceutical Corporation. Pharmacologically active 2- and 3-substituted (1',5'-diaryl-3-pyrazolyl)-N-hydroxypropanamides. 5,051,518, Cl. 548-373.000.
Musha, Shuji: *See*—
Ujihara, Toshihide; Sakurada, Shuroku; Sakaue, Tadashi; and Musha, Shuji, 5,051,806, Cl. 357-38.000.
Mushiake, Moriyuki; Asano, Kenichi; and Miyamura, Noriyuki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Surface treatment method for titanium or titanium alloy. 5,051,140, Cl. 148-203.000.
Muskegon Automation Equipment, Inc.: *See*—
Johnson, Bruce R., 5,050,417, Cl. 72-60.000.
Muth, Ross R.: *See*—
Hermes, Matthew E.; and Muth, Ross R., 5,051,272, Cl. 427-2.000.
Muzeroll, Martin E.: *See*—
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Myohga, Osamu: *See*—
Uchikawa, Tadao; Ohnishi, Osamu; Myohga, Osamu; and Inoue, Takeshi, 5,051,647, Cl. 310-323.000.
Nademoto, Yayoi: *See*—
Nagai, Tadashi; and Nademoto, Yayoi, 5,051,133, Cl. 127-65.000.
Nadler, Guy; Martin, Michel; and Zimmermann, Richard, to Les Laboratoires Beecham S.A. Indolythiadiazines for treating heart failure. 5,051,417, Cl. 514-222.500.
Nag, Pranab K.: *See*—
Maly, Wojciech; and Nag, Pranab K., 5,051,951, Cl. 365-150.000.
Nagai, Hideto: *See*—
Ishikawa, Toshikatsu; Tokutomi, Katsuya; Ichikawa, Hiroshi; Mitsuno, Shiro; and Nagai, Hideto, 5,051,207, Cl. 252-389.310.
Nagai, Katsumi; Nishimyou, Teruyuki; Osawa, Masataka; and Ban, Hitoshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Displacement of a variable displacemet hydraulic pump and speed of an engine driving the pump controlled based on demand. 5,050,379, Cl. 60-368.000.
Nagai, Keiichi: *See*—
Kambara, Hideki; and Nagai, Keiichi, 5,051,162, Cl. 204-299.00R.
Nagai, Tadashi; and Nademoto, Yayoi, to Suntory Limited. Gelatinized cereal flours and process for their production. 5,051,133, Cl. 127-65.000.
Nagamatsu, Akihito: *See*—
Yamada, Takashi; Nagamatsu, Akihito; Bamba, Seiichi; Sawai, Tetsuro; Nakano, Haruo; and Nagami, Kimihiko, 5,051,373, Cl. 437-8.000.
Nagami, Goro: *See*—
Yamada, Shuri; and Nagami, Goro, 5,050,528, Cl. 118-19.000.
Nagami, Kimihiko: *See*—
Yamada, Takashi; Nagamatsu, Akihito; Bamba, Seiichi; Sawai, Tetsuro; Nakano, Haruo; and Nagami, Kimihiko, 5,051,373, Cl. 437-8.000.
Nagano, Hiroyuki; Yokota, Takeshi; and Katoh, Yasuyuki, to Chugai Seiyaku Kabushiki Kaisha. Novel quinolonecarboxylic acid derivatives. 5,051,509, Cl. 546-156.000.
Nagao, Yuji, to Sigma, Incorporated. Slot machine. 5,050,881, Cl. 273-143.00R.
Nagasaki, Kazunori; and Takeuchi, Kazuhiro, to NEC Corporation. Program/data memory employed in microcomputer system. 5,051,890, Cl. 364-200.000.
Nagashima, Yasuo: *See*—
Yamada, Yasuyuki; Kato, Mikihiko; Endo, Yasuhi; Kojima, Masaya; and Nagashima, Yasuo, 5,051,287, Cl. 428-64.000.
Nagata, Kunio; and Yamashita, Masatsugu, to Omron Corporation. Switch mechanism for an electric power tool. 5,051,547, Cl. 200-1.00V.
Nagata, Masaki: *See*—
Kawaki, Takao; Kawai, Ryozo; Hayashi, Katsushige; and Nagata, Masaki, 5,051,309, Cl. 428-332.000.
Nair, Mridula: *See*—
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Naito, Sachio: *See*—
Morita, Kouzi; Takahashi, Toshie; and Naito, Sachio, 5,051,251, Cl. 424-70.000.
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; and Onoda, Yoshihito, to Fujitsu Limited. Heterodyne receiver for coherent optical communication. 5,052,051, Cl. 455-619.000.
Naito, Yasuyuki; Azumi, Takeshi; Morii, Horishi; and Kohno, Yoshiaki, to Murata Manufacturing Co., Ltd. LC filter. 5,051,712, Cl. 333-185.000.
Nakabayashi, Kazuto: *See*—
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Nakagawa, Takayuki: *See*—
Takamine, Yoshio; Miyamoto, Shunsuke; Nakagawa, Takayuki; Kazama, Yoshiharu; and Kinoshita, Yoshiaki, 5,051,941, Cl. 364-578.000.
Nakagawa, Yasuo: *See*—
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Nakahara, Kazuyuki; and Sakurai, Tetsuo, to Ricoh Company, Ltd. Digital copier. 5,051,839, Cl. 358-401.000.
Nakahara, Yoshiko: *See*—
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Nakaharai, Ken, to Nippon Air Brake Co., Ltd. Hydraulic pressure control valve. 5,050,383, Cl. 60-589.000.
Nakahata, Kozo: *See*—
Koshishiba, Hiroya; Fushimi, Satoru; Nakagawa, Yasuo; and Nakahata, Kozo, 5,051,585, Cl. 250-306.000.
Nakai, Masuyo. Therapeutic composition for combatting AIDS. 5,051,425, Cl. 514-256.000.
Nakai, Noboru: *See*—
Tabuchi, Ichiro; Nakai, Noboru; Isozaki, Osamu; Matoba, Takao; and Sugiura, Shinji, 5,051,473, Cl. 525-100.000.
Nakai, Shizuo: *See*—
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Nakai, Souichi: *See*—
Takegawa, Yujiro; and Nakai, Souichi, 5,050,643, Cl. 139-1.00R.
Nakai, Takayuki; and Kono, Tadahisa, to Kirin Beer Kabushiki Kaisha. Volatile component detector with socket for sample receptacle. 5,051,240, Cl. 422-83.000.
Nakajima, Fumihiko: *See*—
Mimura, Tadao; and Nakajima, Fumihiko, 5,051,583, Cl. 250-288.000.
Nakajima, Kazutoshi: *See*—
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; and Kan, Hirofumi, 5,051,573, Cl. 250-213.00A.
Nakajima, Masahiro: *See*—
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Nakamichi Corporation: *See*—
Uchikoshi, Gohji, 5,052,032, Cl. 375-120.000.
Nakamura, Satoru, to Kabushiki Kaisha Kobe Seiko Sho. Wrist mechanism for industrial robot or the like. 5,050,450, Cl. 74-665.00M.
Nakamura, Shinichi; Sakaguchi, Yuzo; Kashimoto, Shigeki; and Matsumoto, Shin-ichi, to Dainippon Pharmaceutical Co., Ltd. Prevention or elimination of mycoplasma contamination of animal or plant cell cultures. 5,051,419, Cl. 514-235.200.
Nakamura, Shinji: *See*—
Kondo, Yusuke; and Nakamura, Shinji, 5,050,840, Cl. 251-129.150.



Nakamura, Tadashi, to Alps Electric Co., Ltd. Sheet feed control method. 5,050,858, Cl. 271-265.000.
Nakamura, Toshihiko, to NEC Corporation. Vector data retrieval apparatus. 5,051,939, Cl. 364-715.060.
Nakane, Keiichi: *See*—
Kuwabara, Tadashi; Koreeda, Hiroyuki; Nonaka, Naomichi; and Nakane, Keiichi, 5,051,930, Cl. 364-523.000.
Nakanishi Engineering Co., Ltd.: *See*—
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Nakanishi, Keiji; and Sekiguchi, Yasuyuki, to Kabushiki Kaisha Toshiba. Silencer. 5,052,041, Cl. 381-71.000.
Nakanishi, Masae: *See*—
Ando, Akio; Nakanishi, Masae; Okada, Syozi; and Inoue, Koichi, 5,051,062, Cl. 416-241.00B.
Nakanishi, Yoshikazu, to Nakanishi Engineering Co., Ltd. Window. 5,050,345, Cl. 49-279.000.
Nakano, Haruo: *See*—
Yamada, Takashi; Nagamatsu, Akihito; Bamba, Seiichi; Sawai, Tetsuro; Nakano, Haruo; and Nagami, Kimihiko, 5,051,373, Cl. 437-8.000.
Nakano, Sakae: *See*—
Kawahigashi, Haruko; Ito, Shuji; Kakuno, Takane; Nakano, Sakae; and Yoshioka, Mikio, 5,051,988, Cl. 370-99.000.
Nakano, Tomio; and Takemae, Yoshihiro, to Fujitsu Limited. Complementary semiconductor memory device including cell access transistor and word line driving transistor having channels of different conductivity type. 5,051,959, Cl. 365-230.060.
Nakano, Yasushi: *See*—
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Nakashima, Yuichi: *See*—
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Nakata, Akihiro: *See*—
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Nakata, Naotaro: *See*—
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Nakatani, Munetsugu; Imai, Yoshitaka; Yoneyama, Hiroaki; and Tanuku, Yoshiteru, to Mitsubishi Rayon Co., Ltd. Process for producing carbon fibers of high tenacity and modulus of elasticity. 5,051,216, Cl. 264-29.200.
Nakayama, Noritaka: *See*—
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Nakazawa, Koichi: *See*—
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Nakazawa, Shinsuke: *See*—
Yamaguchi, Hiroshi; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; and Nakazawa, Shinsuke, 5,050,454, Cl. 74-858.000.
Nakazawa, Yoshio: *See*—
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Nalco Chemical Company: *See*—
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Namco Ltd.: *See*—
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Nangeroni, James F.: *See*—
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Narayan, Surendra D.: *See*—
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Narishige, Shinji; Mitsuoka, Katsuya; Imagawa, Takao; Nishioka, Kouichi; Kumagai, Akira; Sano, Masaaki; Sugita, Yutaka; Arai, Reiko; Kobayashi, Tetsuo; Yoshida, Toshihiro; Saitoh, Yokuo; Tsuji, Yoshikazu; and Hayashi, Masaaki, to Hitachi, Ltd. Thin film magnetic head with mixed crystal structures. 5,051,856, Cl. 360-126.000.
Narita, Masanori: *See*—
Murase, Hiroshi; Ishizuka, Keizi; Kobayashi, Masakazu; and Narita, Masanori, 5,051,688, Cl. 324-143.000.
Naritomi, Toshio: *See*—
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Nason, Jeff M.: *See*—
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National-Oilwell: *See*—
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National Research Council Canada: *See*—
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National Research Council of Canada/Conseil National de Recherches du Canada: *See*—
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National Research Development Corporation: *See*—
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Ward, Ian M.; McIntyre, James E.; Bannister, Dennis J.; Hall, Peter G.; and Davies, Geoffrey R., 5,051,211, Cl. 429-192.000.
National Semiconductor Corporation: *See*—
Grow, Robert M.; and Stultz, Perry S., 5,051,986, Cl. 370-85.500.
Maly, Wojciech; and Thomas, Michael E., 5,051,690, Cl. 324-158.00R.
Wright, Michael E., 5,051,621, Cl. 307-455.000.
Yarbrough, Roy L.; and Estrada, Julio R., 5,051,623, Cl. 307-473.000.
Nativi, Larry A.; Marion, Robert H.; and Ashour, Tahsin A., to Loctite Luminescent Systems, Inc. Electroluminescent lamp and method of manufacture. 5,051,654, Cl. 313-506.000.
Natrol, Inc.: *See*—
Sahley, Billie J., 5,051,258, Cl. 424-439.000.
Natwick, Peter J. Roof creeper kit apparatus. 5,050,705, Cl. 182-45.000.
Naugler, W. Edward, Jr.: *See*—
Tanielian, Aram; and Naugler, W. Edward, Jr., 5,051,738, Cl. 340-782.000.
Naujokas, Andrius A.; and Ryan, Kevin M., to Eastman Kodak Company. Recovery process for ethylene glycol and dimethylterephthalate. 5,051,528, Cl. 560-78.000.
NCR Corporation: *See*—
Fetterolf, David T.; Kim, John R.; and Lindroth, Clifford A., Jr., 5,051,944, Cl. 364-900.000.
Nearhood, David L. Cephalic tool for construction of a ceiling. 5,050,245, Cl. 2-410.000.
NEC Corporation: *See*—
Fujita, Tsuneo, 5,051,707, Cl. 330-279.000.
Hiroshima, Masaaki; and Nakazawa, Yoshio, 5,052,014, Cl. 372-103.000.
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Kawashima, Hisao; and Nishimoto, Hiroshi, 5,050,947, Cl. 385-9.000.
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Nagasaki, Kazunori; and Takeuchi, Kazuhiro, 5,051,890, Cl. 364-200.000.
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Negishi, Takeshi, 5,051,989, Cl. 370-104.100.
Tsujikawa, Susumu; and Okumura, Fujio, 5,051,570, Cl. 250-201.100.
Uchikawa, Tadao; Ohnishi, Osamu; Myohga, Osamu; and Inoue, Takeshi, 5,051,647, Cl. 310-323.000.
NEC Home Electronics Ltd.: *See*—
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Needham, Anthony H.: *See*—
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Negishi, Takeshi, to NEC Corporation. Switching arrangement capable of switching burst time plan tables/channel assignment pattern tables of a specific terrestrial station. 5,051,989, Cl. 370-104.100.
Nelle, Guenther, to Dr. Johannes Heidenhain GmbH. Length or angle measuring apparatus. 5,050,311, Cl. 33-704.000.
Nelle, Ulrich: *See*—
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Nelson, Beryl E.: *See*—
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Nelson, David P.: *See*—
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Nelson, Lee N.; and Powers, James J., III. Boat attachment. 5,050,526, Cl. 114-364.000.
Nemazi, John E.; Burton, Ralph M.; and Chandrupatla, Tirupathi R., to Snap Fast Industries. Snap fastener. 5,050,279, Cl. 24-662.000.
Nemser, Stuart M., to Du Pont Canada Inc. Air-intake system for mobile engines. 5,051,113, Cl. 55-16.000.
Nemser, Stuart M.; and Roman, Ian C., to Du Pont Canada Inc. Perfluorodioxole membranes. 5,051,114, Cl. 55-16.000.
Nenstiel, Kurt F.; and Adams, Mark A., to York International Corporation. Tube support. 5,050,669, Cl. 165-162.000.
Neri, Carlo: *See*—
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Nestec S.A.: *See*—
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Neton, Janet: *See*—
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Neufeld, Arthur H.; Joyce, Nancy C.; and Jumblatt, Marcia M., to Eye Research Institute of Retina Foundation, Inc. Method for enhancing healing of corneal endothelial wounds. 5,051,443, Cl. 514-420.000.
Neuhouser, Donald, to Service Machine Company. High voltage indicator device. 5,051,733, Cl. 340-660.000.
Neurex Corporation: *See*—
Miljanich, George P.; Bitner, Robert S.; Bowersox, Stephen S.; Fox, James A.; Valentino, Karen L.; and Yamashiro, Donald H., 5,051,403, Cl. 514-12.000.
Neuroth, David H., to Hubbell Incorporated. Electrical coupling assembly for hot, high pressure service. 5,051,103, Cl. 439-192.000.
Newberg, Irwin L., to Hughes Aircraft Company. Optoelectronic wide bandwidth photonic beamsteering phased array. 5,051,754, Cl. 342-375.000.
Newbold, Dixon. Bicycle pump. 5,051,073, Cl. 417-526.000.
Newell, Arthur B.; and Gipson, Dwain M., to Label-Aire Inc. Feed-screw system and methodology. 5,050,725, Cl. 198-444.000.
Newkirk, Marc S.; Urquhart, Andrew W.; and Lesher, H. Daniel, to Lanxide Technology Company, LP. Inverse shape replication method of making ceramic composite articles and articles obtained thereby. 5,051,382, Cl. 501-87.000.

Newkirk, Marc S.: *See—*
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Newman, Dennis; Steffenson, Gary G.; Willenbring, Angela G.; Jones, David C.; Self, George E.; Wing, Scott N.; and Schmitz, Alan R., to Imex Corporation. Method and apparatus for vascular testing. 5,050,613, Cl. 128-670.000.
Newman, Robert M.: *See—*
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Newport, Anthony F.: *See—*
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Ngai, Peter Y. Y., to Peerless Lighting Corporation. Luminaire having a lensed reflector system for improved light distribution control. 5,051,878, Cl. 362-299.000.
NGK Spark Plug Co., Ltd.: *See—*
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Nicholas, Robert W.: *See—*
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Nicollian, Edward H.; Reiman, Arnold; and Tsu, Raphael, to MCNC. Passivated polycrystalline semiconductors quantum well/superlattice structures fabricated thereof. 5,051,786, Cl. 357-4.000.
Niederer, Kurt W., to Belmont Textile Machinery Co., Inc. Strand tension controller. 5,050,816, Cl. 242-149.000.
Niederkorn, Clare J. Satin stitch presser foot having thread and fabric guides. 5,050,514, Cl. 112-235.000.
Nielsen, Ove, to Enkotec A/S. Tool ring, a method of making it, and a holding tool for use in the performance of the method. 5,050,260, Cl. 10-52.000.
Niemann, Helmut, to Korber AG. Apparatus for supporting and guiding cigarette rods and the like. 5,050,471, Cl. 83-310.000.
Nihei, Masayasu: *See—*
Onuki, Jin; Nihei, Masayasu; Koubuchi, Yasushi; Suwa, Motoo; Fukada, Shinichi; Shiota, Katsuhiko; Miyazaki, Kunio; Itagaki, Tatsuo; and Sugiura, Jun, 5,051,812, Cl. 357-71.000.
Nihon Tokushu Noyaku Seizo K.K.: *See—*
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Niibe, Masahito: *See—*
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Nikon Corporation: *See—*
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Tsuda, Nobuhiro; Yamada, Hirofumi; Ishida, Fumihiko; and Miyashita, Masayuki, 5,051,594, Cl. 250-442.100.
Nippon Air Brake Co., Ltd.: *See—*
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Nippon Electric Glass Co., Ltd.: *See—*
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Nippon Ferrofluidice Corporation: *See—*
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Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
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Nippon Intek Co., Ltd.: *See—*
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Nippon Kayaku Kabushiki Kaisha: *See—*
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Nippon Oil Co., Ltd.: *See—*
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Nippon Oil and Fats Company, Limited: *See—*
Maeda, Kenzou; and Ito, Haruki, 5,051,273, Cl. 427-14.100.
Nippon Seiko Kabushiki Kaisha: *See—*
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Nippon Sheet Glass Co., Ltd.: *See—*
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Pohe, Dieter: *See*—
Franken, Wilhelm; Pohe, Dieter; and Michaelsen, Lars T., 5,051,052, Cl. 414-428.000.
Poklemba, John J.; Wolejsza, Chester J.; and Thomas, James R., to Comsat Laboratories. Programmable noise bandwidth reduction by means of digital averaging. 5,052,027, Cl. 375-103.000.
Polaris Industries L.P.: *See*—
Kurosu, Shinichi; Chonan, Mitsugi; Tachibana, Fusao; Suzuki, Kazuo; and Yuzuriha, Yoshiki, 5,050,559, Cl. 123-478.000.
Suzuki, Kazuo; Tachibana, Fusao; Kurosu, Shinichi; and Chonan, Mitsugi, 5,050,564, Cl. 123-492.000.
Polaroid Corporation: *See*—
Harrison, George C., 5,051,768, Cl. 354-415.000.
Polifarma, S.p.A.: *See*—
Sisto, Alessandro; Verdini, Antonio S.; Virdia, Antonino; De Luca, Giovanna; Di Stazio, Giovanni; and Politi, Vincenzo, 5,051,404, Cl. 514-18.000.
Politechnika Poznanska: *See*—
Dobry, Marian W.; Cempel, Czeslaw; and Garbatowski, Wieslaw, 5,050,689, Cl. 173-162.002.
Politi, Vincenzo: *See*—
Sisto, Alessandro; Verdini, Antonio S.; Virdia, Antonino; De Luca, Giovanna; Di Stazio, Giovanni; and Politi, Vincenzo, 5,051,404, Cl. 514-18.000.
Pollock, Todd E. Water filled excercise weight. 5,050,870, Cl. 272-119.000.
Polne-Fuller, Miriam, to University of California, The Regents of the. Microorganisms and methods for degrading plant cell walls and complex hydrocarbons. 5,051,365, Cl. 435-264.000.
Polygal: *See*—
Tal, Danny; Hakim, Gilad; and Hakim, Haim, 5,050,362, Cl. 52-588.000.
Polysar Limited: *See*—
Brown, Trevor A., 5,051,299, Cl. 428-221.000.
Pomidor, Patricia: *See*—
Tsang, Tsze H.; and Pomidor, Patricia, 5,051,514, Cl. 548-110.000.
Pondell, Carl: *See*—
Boumarafi, Mohamed; and Pondell, Carl, 5,050,907, Cl. 280-808.000.
Poon, Chi-Sang, to Massachusetts Institute of Technology. Respirator triggering mechanism. 5,050,593, Cl. 128-204.230.
Poorman, Thomas J., to Western Atlas International, Inc. Acousto-optical marine sensor array. 5,051,965, Cl. 367-149.000.
Popa, Paul J.; Tselepis, Arthur J.; and Vincent, Harold L., to Dow Corning Corporation. Silicone corrosion protection coating having extended bath life. 5,051,311, Cl. 428-447.000.
Pordzik, Horst: *See*—
Rohr, Gunter; Norz, Wolfgang; and Pordzik, Horst, 5,051,678, Cl. 318-696.000.
Porombka, Burkhard: *See*—
Albers, Jurgen; Engel, Georg; and Porombka, Burkhard, 5,050,415, Cl. 72-12.000.
Porte, Johannes J.: *See*—
Columbus, Richard L.; and Porte, Johannes J., 5,050,617, Cl. 128-763.000.
Porterfield, Richard F.; Alunni, Thomas M.; Ksionzyk, Frank; and Snyder, Michael D., to Universal Instruments Corporation. Hot-bar suspension system. 5,051,555, Cl. 219-85.160.
Pot, Athol R.: *See*—
Noreille, Philippe; and Pot, Athol R., 5,051,269, Cl. 426-453.000.
Potticary, Richard D. Waste pick-up device. 5,050,920, Cl. 294-55.000.
Potzsch, Rolf, to Albrecht Baumer KG. Contour cutting machine. 5,050,472, Cl. 83-424.000.
Poulsen, Finn: *See*—
Olsen, Hans; Poulsen, Finn; and Samuelsen, Peter, 5,051,259, Cl. 424-443.000.
Powers, James J., III: *See*—
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Pozefsky, Mark: *See*—
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Pozzebon, Robert M.: *See*—
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PPG Industries, Inc.: *See*—
Gorton, Earl M.; Driskill, John D.; and Hall, Randall M., 5,051,536, Cl. 570-236.000.
Grundy, Reed H., 5,051,121, Cl. 65-1.000.
Reese, Walter J.; Morfesis, Anastasia; Salego, George T.; and Vorp, David A., 5,051,122, Cl. 65-3.430.
Preisetanz, Johann: *See*—
Kade, Werner; Preisetanz, Johann; and Kugler, Geor, 5,050,317, Cl. 34-117.000.
Presidenza Del Consiglio Dei Ministri: *See*—
Camaggi, Giovanni; Filippini, Lucio; Garavaglia, Carlo; Mirenna, Luigi; and Venturini, Isabella, 5,051,440, Cl. 514-399.000.
Pressco, Inc.: *See*—
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Pressey, Garry K.: *See*—
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Preston, Harold W.; and Rush, Jeffrey R., to Micronyx, Inc. Multiple user stored data cryptographic labeling system and method. 5,052,040, Cl. 380-4.000.
Price, William F.: *See*—
Breezer, Harlon W.; and Price, William F., 5,050,341, Cl. 47-59.000.
Pride, John T. Apparatus for converting a bathtub into a sauna. 5,050,251, Cl. 4-534.000.
Prigent, Michel: *See*—
Mabilon, Gil; Durand, Daniel; Courty, Philippe; and Prigent, Michel, 5,051,392, Cl. 502-303.000.
Prigge, Helene; Rurlander, Robert; Hoffman, Harald; and Bortner, Hans-Peter, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for removing gaseous contaminating compounds from carrier gases containing halosilane compounds. 5,051,117, Cl. 55-58.000.
Prior, Adalbert, to Prior Engineering AG. Method of processing acidic Fe-containing solutions. 5,051,186, Cl. 210-638.000.
Prior Engineering AG: *See*—
Prior, Adalbert, 5,051,186, Cl. 210-638.000.
Prizio, Joseph; Ritt, Alexander; Mower, Timothy E.; and Rodine, Lonn, to United States of America, Interior. Bi-directionally draining pore fluid extraction vessel. 5,050,493, Cl. 100-106.000.
Procter & Gamble Company, The: *See*—
Culshaw, Stephen; Vos, Eddy; and Hardy, Frederick E., 5,051,212, Cl. 252-546.000.
Muckenfuhs, Delmar R., 5,050,742, Cl. 206-610.000.
Witt, Jonathan J., 5,051,358, Cl. 435-19.000.
Prokhorov, Ivan A.; Kezik, Vitold A.; Agafonov, Igor S.; Kolgan, Jury N.; Goldshtein, Boris G.; and Nikolaev, Igor V. Compression-vacuum action percussive machine. 5,050,687, Cl. 173-133.000.
Prost, Roger; and Chabbal, Jean, to Thomson-CSF. Compact image sensor. 5,051,802, Cl. 357-30.000.
Prottas, Robert D.: *See*—
Johnson, Jeffery W.; Prottas, Robert D.; and Strolle, Clifford H., 5,051,464, Cl. 524-555.000.
Prufrex-Elektro-Apparatebau Inh. Helga Muller, geb. Dutschke: *See*—
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Public Service Marine, Inc.: *See*—
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Pulwer, Mitchell J.: *See*—
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Purdy, Ralph E.: *See*—
Martindale, James G.; Purdy, Ralph E.; Stupecky, George L.; and Tidwell, Ronny G., 5,051,352, Cl. 435-1.000.
Purkayastha, Indrajit; and Martin, Clinton K., to General Electric Company. Multiple circuit interrupter address identification system. 5,051,861, Cl. 361-96.000.
Purolator Products Company: *See*—
Giometti, Paul F., 5,050,441, Cl. 74-7.00C.
Putnam, Roger S. Pulsed laser. 5,052,013, Cl. 372-97.000.
Puydak, Robert C.; and Hazelton, Donald R., to Advanced Elastomer Systems, L. P. Ethylene copolymer - modified dynamically vulcanized alloys. 5,051,478, Cl. 525-195.000.
Puydak, Robert C.: *See*—
Yu, Thomas C.; Puydak, Robert C.; and Degener, Charles W., 5,051,477, Cl. 525-194.000.
Pyles, Nathan. Magnetically variable air resistance wheel for exercise devices. 5,051,638, Cl. 310-105.000.
Quadic Systems, Inc.: *See*—
Kantz, Anthony, 5,051,611, Cl. 307-272.300.
Quantum Chemical Corporation: *See*—
Buehler, Charles K.; and Klendworth, Douglas D., 5,051,388, Cl. 502-113.000.
Quebedeaux, Larry J.: *See*—
Gaidry, John E.; Quebedeaux, Larry J.; Donovan, Joseph F.; and Ashton, Jefferson P., 5,050,678, Cl. 166-278.000.
Quest, Thomas A. Electrical cable access grommet. 5,050,267, Cl. 16-2.000.
Quick, Harry C.; Schooley, Robert M.; Stephens, Fred O.; Ellis, Frank A.; Harlow, James L.; Boulanger, Ken A.; Snyder, Paul W.; McAlister, John P.; Rogel, Thomas A.; and Morris, Paul J., to Genicom Corporation. Printer and cartridge assembly therefor. 5,051,010, Cl. 400-194.000.
R. D. Werner Co., Inc.: *See*—
Cole, Paul E.; Guy, Barry L.; and Wasser, Jay S., 5,050,706, Cl. 182-78.000.
R. F. Monolithics, Inc.: *See*—
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R. J. Reynolds Tobacco Company: *See—*
Raker, Mark L.; and Robinson, Amy L., 5,050,622, Cl. 131-365.000.
Rabe, James A.; Lipowitz, Jonathan; and Lu, Paul P., to Dow Corning Corporation. Curing preceramic polymers by exposure to nitrogen dioxide. 5,051,215, Cl. 264-29.200.
Racal-Milgo Limited: *See—*
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Rademacher, T. Peter. Fluid powered electric generator having hinged vane rotor. 5,051,059, Cl. 415-7.000.
Radiant Technologies: *See—*
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Raethel, Dieter; Schumacher, Christof; Renovanz, Wilfried; and Umlauf, Bernhard, to Webasto AG Fahrzeugtechnik. Fuel preheating device for a heater. 5,050,796, Cl. 237-12.30C.
Raffelsiefer, Kurt: *See—*
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Rafferty, James H.: *See—*
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Rainville, Gilles A., to Rockwell International Corporation. Process for producing a cap flange structure. 5,050,299, Cl. 29-897.320.
Rajan, Sunder S.; Hollister, Roger S.; and Carlisle, Thomas P., to Hughes Aircraft Company. Travelling-wave tube with thermally conductive mechanical support comprising resiliently biased springs. 5,051,656, Cl. 315-3.500.
Raker, Mark L.; and Robinson, Amy L., to R. J. Reynolds Tobacco Company. Cigarette. 5,050,622, Cl. 131-365.000.
Ramachandran, Ravi: *See—*
Moghe, Sanjay B.; Ramachandran, Ravi; McGrath, Finbarr J.; and Genin, Robert D., 5,051,705, Cl. 330-277.000.
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Kennedy, Christopher R.; Urquhart, Andrew W.; White, Danny R.; Newkirk, Marc S.; and Ramberg, Jeffrey R., 5,051,383, Cl. 501-127.000.
Ramirez, Aubrey. Baseball pitching machine. 5,050,574, Cl. 124-3.000.
Ramirez De Agudelo, Maria M.: *See—*
Scharifker, Benjamin; Yepez, Omar; Carlos De Jesus, Juan; and Ramirez De Agudelo, Maria M., 5,051,156, Cl. 204-80.000.
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Rand, Delbert B.; and Lindahl, Thomas G., to Rand, Delbert B. Portable protective cage for athletic equipment. 5,050,867, Cl. 272-101.000.
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Randisi, Sal. Fiber optic compositions and method for making thereof. 5,050,959, Cl. 385-100.000.
Rankin, Sam A., Jr.: *See—*
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Ray, John T.: *See—*
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Raychem Corporation: *See—*
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Reams, Barry A.; and Clem, Lyle W., to Accurate Metering Systems, Inc. Flow-meter data collection and processing system. 5,051,920, Cl. 364-509.000.
Reber, Raymond A.: *See—*
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Reckitt & Colman Products Limited: *See—*
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Reed, Clive W.; Rzad, Stefan J.; and Devins, John C., to General Electric Company. Abrasion-resistant plastic articles. 5,051,308, Cl. 428-412.000.
Reed, Glenn R., to General Motors Corporation. Windshield wiper with excess load relief. 5,050,442, Cl. 74-42.000.
Rees, David C.: *See—*
Horwell, David C.; and Rees, David C., 5,051,428, Cl. 514-320.000.
Reese, Walter J.; Morfesis, Anastasia; Salego, George T.; and Vorp, David A., to PPG Industries, Inc. Method and apparatus for manufacturing continuous fiber glass strand reinforcing mat. 5,051,122, Cl. 65-3.430.
Reesnes, Paul A.: *See—*
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Reffner, John A.: *See—*
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Reich, Erhard: *See—*
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Reinartz, Hans-Dieter: *See—*
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Reitz, Paul R.: *See—*
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Remington Products, Inc.: *See—*
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Renaud, Fredric T. Wallpaper border marker/cutter device. 5,050,306, Cl. 30-293.000.
Rengo Co. Ltd.: *See—*
Sawada, Tetsuya; Hoshiyama, Hidetoshi; Yoshimoto, Ikuo; and Sogo, Shinichi, 5,050,852, Cl. 271-11.000.
Renovanz, Wilfried: *See—*
Raethel, Dieter; Schumacher, Christof; Renovanz, Wilfried; and Umlauf, Bernhard, 5,050,796, Cl. 237-12.30C.
Resch, Wilfried. Device for welding synthetic resin sheeting. 5,051,148, Cl. 156-358.000.
Research and Development Institution, Inc. at Montana State University: *See—*
Characklis, William G., 5,051,359, Cl. 435-32.000.
Research Foundation of State University of NY, The: *See—*
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Reshef, Israel; and Erez, Mordechai. Apparatus and method for monitoring the health condition of a subject. 5,050,604, Cl. 128-632.000.
Revtek Inc.: *See—*
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Rexene Products Company: *See—*
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Rey, Proserfina C.: *See—*
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Reznik, David. Apparatus for solvent recovery from induction heated coated drums. 5,050,315, Cl. 34-60.000.
Rheinmetall GmbH: *See—*
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Rhine, David B.: *See—*
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Rhoades, Donald E., to Interactive Television Systems, Inc. Telephone access video game distribution center. 5,051,822, Cl. 358-86.000.
Rhoads, Barbra D.; DeBolt, Michael A.; and Dickie, Ray A., to Ford Motor Company. Folding hinge and weather seal for a folding window. 5,050,663, Cl. 160-231.200.
Rhone-Poulenc Chimie: *See—*
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Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See—*
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Richardson, Guy R.: *See—*
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Richter, Bernhard H.; Merchant, Shabbir H.; and Richter, Andreas, to Environmental Tectonics Corporation. G-force trainer. 5,051,094, Cl. 434-30.000.
Richter, Stephen L.: *See—*
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Ricoh Company, Ltd.: *See—*
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Shoji, Hisashi; Obu, Makoto; Yano, Hidetoshi; Kikui, Shinsuke; Terai, Junichi; and Ogawa, Tomoko, 5,051,760, Cl. 346-140.00R.
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Riddle, Dennis L., to Milliken Research Corporation. Preformed stair riser title product. 5,051,289, Cl. 428-77.000.
Ridoux, Claude: *See—*
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Riehemann, Thomas, to Robert Bosch GmbH. System for electronically controlling the power of an internal combustion engine of a motor vehicle. 5,050,552, Cl. 123-361.000.
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Ripley, Ian; and Needham, Anthony H., to Great Eastern (Bermuda) Ltd. Tank entry procedure and apparatus. 5,050,628, Cl. 137-15.000.
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Ritt, Alexander: *See—*
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Rittenhouse, Harry G.: *See—*
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Ritter, Carl; and Rutman, Robert J., to University of Pennsylvania. Method for modifying the toxicity of DNA reactive cross-linking agents to cells. 5,051,363, Cl. 435-240.300.
RJP International Limited: *See—*
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RJS, Inc.: *See—*
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RKK, Limited: *See—*
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Robbins, Clarence R.: *See—*
Patel, Amrit M.; and Robbins, Clarence R., 5,051,250, Cl. 424-70.000.
Robbins, Gary A., to University of Connecticut. Apparatus and method for measuring volatile constituents in earth samples. 5,050,425, Cl. 73-19.100.
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Robert Bosch GmbH: *See—*
Berger, Joachim, 5,050,395, Cl. 62-133.000.
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Meinders, Horst; and Nelle, Ulrich, 5,050,573, Cl. 123-644.000.
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Robinson, Steven R.; and Hampton, Olifton G., to Anago, Inc. Closure member for an ice bag. 5,050,272, Cl. 24-30.50R.
Robitaille, James M., to Ericson Manufacturing Company. Power outlet ground integrity and wriststrap monitor circuit. 5,051,732, Cl. 340-650.000.
Rock, John A.; Male, L. Joseph; and Durfee, Norman E., Jr., to General Electric Company. Flame resistant polyetherimide resin blends. 5,051,483, Cl. 525-425.000.
Rock-Tenn Company: *See—*
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Rockline, Inc.: *See—*
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Rockwell Automotive Body Systems S.A.: *See—*
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Rockwell-Golde G.m.b.H.: *See—*
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Rockwell International Corporation: *See—*
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Hong, John H., 5,050,967, Cl. 359-285.000.
Norvell, Gordon S., 5,052,012, Cl. 372-87.000.
Rainville, Gilles A., 5,050,299, Cl. 29-897.320.
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Roe, Andrew F.: *See—*
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Shern Diau Enterprise Co., Ltd.: *See*—
Chen, Shun-Teng, 5,050,734, Cl. 206-444.000.
Shiba, Keisuke; Hasebe, Kazunori; and Ichijima, Seiji, to Fuji Photo Film Co., Ltd. Silver halide photographic materials and method for color development thereof. 5,051,342, Cl. 430-383.000.
Shiba, Takahumi; and Matsumoto, Kunio, to Pioneer Electronic Corporation. Method for playing back music pieces recorded on recording media. 5,051,973, Cl. 369-36.000.
Shibayama, Takashi, to Nissan Motor Co., Ltd. Temperature responsive lock-up control for motor vehicle with automatic transmission. 5,050,717, Cl. 192-0.052.
Shibazaki, Mitsuhiro; and Takahashi, Tsutao, to Kajima Corporation; and Chemical Grouting Co., Ltd. Multi-shaft kneading auger system. 5,050,320, Cl. 37-81.000.
Shibuya, Katsuhiko: *See*—
Kozo, Shiokawa; Tsuboi, Shinichi; Moriya, Koichi; Hattori, Yumi; Honda, Ikuro; and Shibuya, Katsuhiko, 5,051,434, Cl. 514-357.000.
Shigemitsu, Fumiaki: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 5,051,338, Cl. 430-296.000.
Shih, I-Fu: *See*—
Drummond, James E.; and Shih, I-Fu, 5,050,992, Cl. 356-328.000.
Shijo, Masayuki: *See*—
Miyano, Sotaro; Oi, Shuichi; and Shijo, Masayuki, 5,051,176, Cl. 210-198.200.
Shim, SangChul: *See*—
Chang, MoonHo; Kang, Han-Young; Koh, HunYeong; Cho, YongSeo; and Shim, SangChul, 5,051,530, Cl. 560-184.000.
Shima, Takashi: *See*—
Tanaka, Koji; and Shima, Takashi, 5,050,936, Cl. 303-3.000.
Shimada, Yasunori: *See*—
Maeda, Takenori; Ikeda, Yukio; and Shimada, Yasunori, 5,050,698, Cl. 180-175.000.
Shimanaka, Shigeki: *See*—
Yamaguchi, Hiroshi; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; and Nakazawa, Shinsuke, 5,050,454, Cl. 74-858.000.
Shimazaki, Osamu, to Fuji Photo Film Co., Ltd. Image processing apparatus for mixing weighted continuous-tone and unsharp image signals to reduce visible noise in reproduced images. 5,051,842, Cl. 358-447.000.
Shimazu, Yukihiko: *See*—
Sakashita, Narumi; and Shimazu, Yukihiko, 5,051,997, Cl. 371-22.400.
Shimbashi, Masatoshi: *See*—
Wakaeya, Shinji; Shionome, Shozo; Ohta, Moritaka; and Shimbashi, Masatoshi, 5,050,313, Cl. 34-27.000.
Shimizu, Kazuo, to Sanden Corporation. Coin receiving apparatus for a vending machine. 5,050,719, Cl. 194-202.000.
Shimomura, Setsuhiro; Hara, Toshiro; Inada, Masanori; and Kiguchi, Sakae, to Mitsubishi Denki K.K. Apparatus for measuring air flow intake of internal combustion engine. 5,050,428, Cl. 73-118.200.
Shin-Etsu Chemical Co., Ltd.: *See*—
Okinoshima, Hiroshige; and Kashiwagi, Tsutomu, 5,051,467, Cl. 524-731.000.
Yoshida, Takeo; and Takahashi, Masaharu, 5,051,465, Cl. 524-588.000.
Shin-Etsu Handotai Co., Ltd.: *See*—
Watanabe, Masataka; and Ichimura, Katsumi, 5,051,242, Cl. 422-250.000.
Shinagawa, Susumu; and Saito, Yoshinobu, to Tohoku Special Steel Works Limited. High corrosion-resistant electromagnetic stainless steels. 5,051,234, Cl. 420-61.000.
Shindengen Electric Manufacturing Co., Ltd.: *See*—
Watanabe, Hisao; and Fukasawa, Jiro, 5,051,778, Cl. 355-200.000.
Shinohara, Hirofumi: *See*—
Watabe, Kiyoto; Shinohara, Hirofumi; Eimori, Takahisa; Arima, Hideaki; Ajika, Natsuo; Nakashima, Yuichi; and Satoh, Shinichi, 5,051,948, Cl. 365-49.000.
Shinohara, Toshihide, to Seiko Epson Corporation. Eyeglass lens. 5,050,979, Cl. 351-159.000.
Shinohara, Toshihide, to Seiko Epson Corporation. Aspherical spectacle lens. 5,050,980, Cl. 351-167.000.
Shinozaki, Toshiaki: *See*—
Kato, Yoshihide; Kirita, Kei; Shinozaki, Toshiaki; Shigemitsu, Fumiaki; Usuda, Kinya; and Tsuchiya, Takashi, 5,051,338, Cl. 430-296.000.
Shinya, Tadao: *See*—
Takahashi, Toshinori; Takanashi, Itsuo; Tanaka, Hideshi; Ohara, Terumi; Miyazaki, Kenichi; Kitamura, Hiroki; Nibe, Toru; Shinya, Tadao; Mizoguchi, Yutaka; and Terada, Katsuhiko, 5,051,755, Cl. 346-76.0PH.
Shionome, Shozo: *See*—
Wakaeya, Shinji; Shionome, Shozo; Ohta, Moritaka; and Shimbashi, Masatoshi, 5,050,313, Cl. 34-27.000.
Shiota, Katsuhiko: *See*—
Onuki, Jin; Nihei, Masayasu; Koubuchi, Yasushi; Suwa, Motoo; Fukada, Shinichi; Shiota, Katsuhiko; Miyazaki, Kunio; Itagaki, Tatsuo; and Sugiura, Jun, 5,051,812, Cl. 357-71.000.
Shipley Company Inc.: *See*—
Bernards, Roger F.; Fisher, Gordon; Sonnenberg, Wade; Cerwonka, Edward J.; and Fisher, Stewart, 5,051,154, Cl. 204-24.000.
Ship'n Out Company: *See*—
Goodman, Charles S.; and Whalen, Richard P., 5,050,846, Cl. 256-1.000.
Shirai, Ryoichi: *See*—
Hayakawa, Youichi; and Shirai, Ryoichi, 5,050,447, Cl. 74-606.00R.
Shiraishi, Shuji, to Honda Giken Kogyo Kabushiki Kaisha. Driving wheel torque control device for vehicle. 5,051,908, Cl. 364-426.020.
Shiramatsu, Kuniaki: *See*—
Haruyama, Tetsuo; Udagawa, Shigeo; and Shiramatsu, Kuniaki, 5,051,753, Cl. 342-158.000.
Shirata, Akihiro; Koshizawa, Toshifumi; Koyama, Yuichi; and Kurabayashi, Ken, to Isuzu Motors, Ltd. Engine preheating system. 5,050,545, Cl. 123-179.00H.
Shirodkar, Pradeep P., to Mobil Oil Corporation. Blends of linear low density ethylene copolymers. 5,051,471, Cl. 525-86.000.
Shiseido Co. Ltd.: *See*—
Schultz, Thomas M.; and Day, Eva, 5,051,252, Cl. 424-71.000.
Shishikura, Toshikazu; Takeuchi, Masataka; Murakoshi, Yoshihiko; Konuma, Hiroshi; and Kameyama, Mutsumi, to Showa Denko K.K.; and Hitachi Ltd. Secondary battery. 5,051,325, Cl. 429-197.000.
Shizuno, Hisamitsu: *See*—
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,051,863, Cl. 361-321.000.
Chazono, Hirokazu; Saito, Hiroshi; Honda, Mutsumi; Shizuno, Hisamitsu; and Kishi, Hiroshi, 5,051,864, Cl. 361-321.000.
Shoji, Hajime; Watanabe, Noriko; Hamada, Hiroshi; Kato, Hiroaki; Takemoto, Toshio; and Hirobe, Toshihiko. Thin film semiconductor device and liquid crystal display apparatus using thereof. 5,051,800, Cl. 357-30.000.
Shoji, Hisashi; Obu, Makoto; Yano, Hidetoshi; Kikui, Shinsuke; Terai, Junichi; and Ogawa, Tomoko, to Ricoh Company, Ltd. Direct image recording apparatus using toner. 5,051,760, Cl. 346-140.00R.
Showa Denko K. K.: *See*—
Taka, Toshio; Okubo, Takuo; Kobayashi, Keiitsu; Asano, Takehiko; Kawasaki, Yoshio; and Osanai, Kiyotaka, 5,051,481, Cl. 525-240.000.
Showa Denko K.K.: *See*—
Shishikura, Toshikazu; Takeuchi, Masataka; Murakoshi, Yoshihiko; Konuma, Hiroshi; and Kameyama, Mutsumi, 5,051,325, Cl. 429-197.000.
Showa Shell Sekiyu K.K.: *See*—
Suzuki, Yoshiichi; Hagiwara, Takashi; and Mogamiya, Hiroyuki, 5,051,527, Cl. 560-51.000.
Shoyat, Leslie, to Lindsay Concrete Products Co., Inc. Vault door and mix for casting same. 5,050,507, Cl. 109-83.000.
Shunde Plastics General Machine Enterprises Group, The: *See*—
Huang, Buming, 5,051,087, Cl. 425-589.000.
Shuto, Satoshi; Itoh, Hiromichi; Fukukawa, Kiyofumi; and Tsujino, Masatoshi, to Toyo Jozo Kabushiki Kaisha. Novel nucleoside-phospholipid conjugate. 5,051,499, Cl. 536-29.000.
Shwu-Fen, Sheu. Photoelectric single handle faucet. 5,050,641, Cl. 137-607.000.
Siecor Corporation: *See*—
Mills, Gregory A., 5,050,302, Cl. 30-90.800.
Siegmund, Hans-Joachim: *See*—
Benes, Ewald; Groschl, Martin; Schmid, Michael; Siegmund, Hans-Joachim; Thomas, Friedrich-Werner; and Thorn, Gernot, 5,051,599, Cl. 250-491.100.
Siekmann, John D., to Plastisonics, Inc. Dental floss threading device. 5,050,625, Cl. 132-323.000.
Siemens Aktiengesellschaft: *See*—
Ernst, Wolfram; and Uhlig, Gerhard, 5,052,030, Cl. 375-108.000.
Freise, Werner, 5,051,640, Cl. 310-162.000.
Hoegnelid, Kurt, 5,050,599, Cl. 128-419.0PG.
Kammerl, Anton, 5,051,983, Cl. 370-60.000.
Kulzer, Ernst, 5,051,730, Cl. 340-635.000.
Schroder, Harry, 5,051,540, Cl. 174-52.300.
Schuster, Manfred, 5,052,034, Cl. 378-121.000.
Tratz, Herbert; and Losel, Georg, 5,050,512, Cl. 110-346.000.
Zwack, Eduard, 5,052,028, Cl. 375-109.000.
Siemens Automotive L.P.: *See*—
Bright, John S., 5,050,642, Cl. 137-625.650.
Siemens Automotive Limited: *See*—
Cook, John E., 5,050,568, Cl. 123-521.000.
Sigai, A. Gary; and Klinedinst, Keith A., to GTE Laboratories Incorporated. Method of forming a protective bi-layer coating on phosphore particles. 5,051,277, Cl. 427-69.000.
Sigma Chemical Company: *See*—
Stenglein, Kenneth J.; and Murray, Dennis M., 5,051,361, Cl. 435-7.900.



Sigma, Incorporated: *See*—
Nagao, Yuji, 5,050,881, Cl. 273-143.00R.
Sikes, C. Steven, to University of South Alabama. Inhibition of mineral deposition by phosphorylated and related polyanionic peptides. 5,051,401, Cl. 514-7.000.
Sikkema, Arthur L.; and Hook, Cynthia R. Blind for rounded window section. 5,050,661, Cl. 160-84.100.
Silicon Graphics, Inc.: *See*—
Akeley, Kurt; and Korobkin, Carl P., 5,051,737, Cl. 340-747.000.
Siltech Inc.: *See*—
O'Lenick, Anthony J., Jr., 5,051,489, Cl. 528-26.000.
Simon, Alexander Z. Protector for catheter needle. 5,051,109, Cl. 604-263.000.
Simonsen Iron Works, Inc.: *See*—
Grabill, Dale L., 5,051,051, Cl. 414-282.000.
Simpson, Yonn K.: *See*—
Andrews, John R.; and Simpson, Yonn K., 5,051,328, Cl. 430-56.000.
Sinclair, James B.; Pink, Paul W.; Harfst, Michael D.; and Plumbley, Robin A., to Blount, Inc. Chain saw bar fluid passage system. 5,050,303, Cl. 30-123.400.
Singer, Igor: *See*—
Kupersmith, Joel; and Singer, Igor, 5,050,601, Cl. 128-419.00D.
Singer, Stephen P.: *See*—
Lestina, Gregory J.; Bass, Jon D.; Harder, John W.; and Singer, Stephen P., 5,051,343, Cl. 430-393.000.
Singh, Inder: *See*—
Cubranich, Ladislaw D.; and Singh, Inder, 5,051,946, Cl. 364-900.000.
Singh, Raj N.; and Gaddipati, Achuta R., to General Electric Company. Coated fiber-containing composite. 5,051,301, Cl. 428-288.000.
Sink, John D., to MagneTek, Inc. Waveform corrector. 5,051,685, Cl. 323-208.000.
Sircar, Jagadish C.: *See*—
Pinter, Garry W.; and Sircar, Jagadish C., 5,051,429, Cl. 544-320.000.
Siren, Matti, to Perstorp AB. A method of achieving an immunosuppressive effect. 5,051,411, Cl. 514-103.000.
Sisto, Alessandro; Verdini, Antonio S.; Virdia, Antonino; De Luca, Giovanna; Di Stazio, Giovanni; and Politi, Vincenzo, to Eniricerche, S.p.A.; and Polifarma, S.p.A. Tripeptide compounds having hypotensive activity. 5,051,404, Cl. 514-18.000.
Siuta, Albert J.; Starner, William E.; Toseland, Bernard A.; and Machado, Reinaldo M., to Air Products and Chemicals, Inc. Preparation of urethane prepolymers having low levels of residual toluene diisocyanate. 5,051,152, Cl. 203-49.000.
Sjolinder, Sven R., to Telefonaktiebolaget L M Ericsson. Fibreoptic switch. 5,050,955, Cl. 385-17.000.
Skeem, Wayne B. Gate opening device. 5,050,344, Cl. 49-237.000.
Skifjeld, Tormod: *See*—
Gjestrum, Einar; Knudsen, Lars; and Skifjeld, Tormod, 5,051,966, Cl. 367-153.000.
Skinner, Neal G., to Halliburton Company. Hydraulic system for electronically controlled pressure activated downhole testing tool. 5,050,681, Cl. 166-374.000.
Sklokin, Leonid I.; Leif, Vladimir E.; Sednev, Jury M.; Masloboeva, Sofya M.; Kovalevsky, Vladimir P.; Korpusov, Genrikh V.; Stepanov, Vladimir Y.; Bobylkov, Boris M.; Kalinnikov, Vladimir T.; and Stefanovich, Boris M. Mixer-settler for liquid-liquid extraction. 5,050,997, Cl. 366-292.000.
Slade, Frank A.: *See*—
Luebke, Clement J.; Sank, Gerald W.; and Slade, Frank A., 5,050,578, Cl. 126-21.00A.
Slemon, Charles S.; Lafferty, William M.; and Guest, Clark C. Self calibrating fiber optic sensor system with optimized throughput. 5,051,578, Cl. 250-227.230.
Slenker, Stephen. Mounting bracket. 5,051,095, Cl. 439-37.000.
Sloan, Randy. Random distribution machine. 5,050,880, Cl. 273-144.00B.
Slongo, Mario; Birbaum, Jean-Luc; and Valet, Andreas, to Ciba-Geigy Corporation. N-Triazinyloxalamides. 5,051,459, Cl. 524-100.000.
Slumberland PLC: *See*—
Woodcock, Ashley, 5,050,256, Cl. 5-448.000.
Smeyak, Lawrence M.: *See*—
Trump, Hubert D.; McBride, Stephen W.; and Smeyak, Lawrence M., 5,050,753, Cl. 215-252.000.
Smiley, Gordon D. Method and apparatus for delivering particulate material. 5,050,770, Cl. 222-1.000.
Smith, Bret P.: *See*—
Berger, Blaine H.; and Smith, Bret P., 5,051,887, Cl. 364-200.000.
Smith, Clyde R.; and McCartney, Clifford A., to Ingersoll-Rand Company. Barrier plug for dynamic rock stabilizing fixture. 5,051,038, Cl. 405-261.000.
Smith, Dana S.: *See*—
Caruthers, Edward B.; Levin, Michael L.; Looney, Catharine E.; Schmidt, Steven P.; and Smith, Dana S., 5,051,329, Cl. 430-100.000.
Smith, Gerald L., to Teledyne Inet. Simplified driver circuit for solid-state power switches. 5,051,609, Cl. 307-270.000.
Smith International, Inc.: *See*—
Keshavan, Madapusi K.; and Rey, Proserfina C., 5,051,112, Cl. 51-309.000.
Smith, Irvine W.: *See*—
Shaw, William C.; Maxwell, Ian; and Smith, Irvine W., 5,050,985, Cl. 352-184.000.
Smith, John C., to Union Oil Company of California. In-situ stress measurement method and device. 5,050,690, Cl. 175-50.000.
Smith, Kenneth, to Adams Industries, Inc. Hand tool for fastening a terminal in an insulator. 5,050,421, Cl. 72-409.000.
Smith, Lawrence I.; and O'Bow-Hove, Philip A., to Telephone Cables Limited. Optical fibre cable. 5,050,958, Cl. 385-102.000.
Smith, Michael S. Stencil manufacturing and printing process and apparatus. 5,050,498, Cl. 101-127.100.
Smith, Nathan J.: *See*—
Crider, Grant W.; and Smith, Nathan J., 5,051,671, Cl. 318-466.000.
Smith, Robert A.: *See*—
Crovetti, Aldo J.; Melin, Brian E.; Smith, Robert A.; and Hubert Casati, Francois M., 5,051,450, Cl. 514-709.000.
Smith, Z. Erol, III; and Street, Robert A., to Xerox Corporation. Variable detector geometry for resolving and sensing apparatus for filtering and other applications. 5,050,990, Cl. 356-326.000.
SmithKline Beckman Intercredit B.V.: *See*—
Brown, Thomas H.; Ife, Robert J.; and Leach, Colin A., 5,051,508, Cl. 546-84.000.
SmithKline Beecham Corporation: *See*—
Kinter, Lewis B.; and Kohl, Randall L., 5,051,400, Cl. 514-11.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Albers, Jurgen; Engel, Georg; and Porombka, Burkhard, 5,050,415, Cl. 72-12.000.
Grotepass, Johann, 5,050,418, Cl. 72-201.000.
Snap Fast Industries: *See*—
Nemazi, John E.; Burton, Ralph M.; and Chandrupatla, Tirupathi R., 5,050,279, Cl. 24-662.000.
Snelling, Peter J., to Vinidex Tubemakers Pty. Limited. Cutting of plastic sheet. 5,050,469, Cl. 83-16.000.
Snyder, Brian A.: *See*—
Warren, Harold C., III; and Snyder, Brian A., 5,051,356, Cl. 435-7.340.
Snyder, Michael D.: *See*—
Porterfield, Richard F.; Alunni, Thomas M.; Ksionzyk, Frank; and Snyder, Michael D., 5,051,555, Cl. 219-85.160.
Snyder, Paul W.: *See*—
Quick, Harry C.; Schooley, Robert M.; Stephens, Fred O.; Ellis, Frank A.; Harlow, James L.; Boulanger, Ken A.; Snyder, Paul W.; McAlister, John P.; Rogel, Thomas A.; and Morris, Paul J., 5,051,010, Cl. 400-194.000.
So, Eddy, to National Research Council of Canada/Conseil National de Recherches du Canada. Transimpedance circuit. 5,051,687, Cl. 323-357.000.
SOA Systems, Inc.: *See*—
Caccitolo, Michael F., 5,051,725, Cl. 340-571.000.
Societe Anonyme: Mero Rousselot Satia: *See*—
David, Jacky; Lefrancois, Claudine; and Ridoux, Claude, 5,051,304, Cl. 428-402.200.
Societe ECA: *See*—
Falcou, Gerard; Vigne, Christian M. J.; Serindat, Henri; and Sorin, Claude J. G., 5,050,449, Cl. 74-625.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Rousseau, Gerard, 5,051,300, Cl. 428-245.000.
Soffer, Bernard H.: *See*—
Brown, Wilbur P., Jr.; O'Meara, Thomas R.; Pepper, David M.; Efron, Uzi; and Soffer, Bernard H., 5,051,571, Cl. 250-201.900.
Soga, Yoshinobu: *See*—
Itoh, Hiroshi; Morisawa, Kunio; Habuchi, Ryoji; Sugaya, Masami; and Soga, Yoshinobu, 5,050,715, Cl. 192-3.300.
Sogo, Shinichi: *See*—
Sawada, Tetsuya; Hoshiyama, Hidetoshi; Yoshimoto, Ikuo; and Sogo, Shinichi, 5,050,852, Cl. 271-11.000.
Sohara, Joseph A.: *See*—
Mullay, John J.; Sohara, Joseph A.; and Schulz, Dennis J., 5,051,142, Cl. 149-2.000.
Solidum, Hamilton, to Krementz & Co. Inc. Multilayered electroplating process utilizing fine gold. 5,051,317, Cl. 428-671.000.
Soliman, Mohamed Y., to Halliburton Company. Method for determining fracture closure pressure and fracture volume of a subsurface formation. 5,050,674, Cl. 166-250.000.
Sommer, Monique G. M.: *See*—
Collier, Christopher J.; Brown, Robert A.; and Sommer, Monique G. M., 5,052,050, Cl. 455-296.000.
Song, Albert C. Masking film. 5,051,013, Cl. 400-498.000.
Sonigo, Pierre: *See*—
Alizon, Marc; Montagnier, Luc; Guetard, Denise; Clavel, Francois; Sonigo, Pierre; and Guyader, Mireille, 5,051,496, Cl. 530-324.000.
Sonnenberg, Wade: *See*—
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Sonoda, Rikuo: *See*—
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Sony Corporation: *See*—
Jackson, Robert S.; and Aizawa, Toshio, 5,051,858, Cl. 360-135.000.
Kawaberi, Seiji; Watanabe, Junzo; and Suzuki, Hitoshi, 5,051,668, Cl. 315-408.000.
Sasaki, Tooru, 5,051,964, Cl. 367-135.000.
Tsuboi, Kunio; and Ishiyama, Hiroshi, 5,052,009, Cl. 372-36.000.
Yagi, Atsuo; Matsushita, Takeshi; and Hashimoto, Makoto, 5,051,378, Cl. 437-225.000.
Sorensen, Asger B., to NKT A/S. Apparatus and method for splicing light conductors in a composite cable. 5,050,945, Cl. 385-95.000.

Sorensen, Emil A. Overfill protecting arrangement for a liquid storage tank. 5,050,639, Cl. 137-587.000.
Sorin, Claude J. G.: *See—*
Falcou, Gerard; Vigne, Christian M. J.; Serindat, Henri; and Sorin, Claude J. G., 5,050,449, Cl. 74-625.000.
Sota Technology, Inc.: *See—*
Kistner, David R., 5,051,144, Cl. 156-85.000.
Sotralentz S.A.: *See—*
Roser, Georges; Pfeiffer, Pierre; and Hamm, Andre, 5,050,765, Cl. 220-401.000.
Soudan, Robert A., Jr., to Soudan, Robert A., Jr. Windsurfer hand harness. 5,050,516, Cl. 114-39.200.
Sovik, Robert A., to AW-2R, Inc. Controlled density paving and apparatus therefor. 5,051,026, Cl. 404-118.000.
Sowle, James M.: *See—*
Schwemin, John A.; Baker, Richard H.; Sowle, James M.; and Jordan, Stephen A., 5,050,523, Cl. 114-259.000.
SpaceLabs, Inc.: *See—*
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Spacesaver Corporation: *See—*
Dahnert, Dean L.; and Runge, Marvin L., 5,050,941, Cl. 312-201.000.
Span Instruments, Inc.: *See—*
Gray, Tommy L., 5,051,729, Cl. 340-626.000.
Spang & Brands Maschinenfabrik GmbH & Co.: *See—*
Stederoth, Wolfgang, 5,050,370, Cl. 53-502.000.
Specialty Equipment Companies, Inc.: *See—*
Lane, Robert C.; and Lee, Joseph M., 5,050,398, Cl. 62-183.000.
Specian, Roseamrie T.: *See—*
Zoltan, Bart J.; Specian, Roseamrie T.; and Walker, Linda A., 5,050,752, Cl. 215-206.000.
Spector, Joseph: *See—*
Baldwin, Kirk W.; Pfeiffer, Loren N.; Spector, Joseph; Stormer, Horst L.; and West, Kenneth W., 5,051,791, Cl. 357-22.000.
Spectra-Tech, Inc.: *See—*
Sting, Donald W.; Messerschmidt, Robert G.; and Reffner, John A., 5,051,602, Cl. 250-571.000.
Spedale, Joseph: *See—*
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Speed Queen Company: *See—*
Wild, Daniel J., 5,050,407, Cl. 68-12.060.
Speranza, Donald: *See—*
Cote, William F.; and Speranza, Donald, 5,050,427, Cl. 73-118.100.
Spiess, Wolfgang C. J., to Koenig & Bauer Aktiengesellschaft. Sheet transfer web. 5,050,500, Cl. 101-420.000.
Spilker, Matthew W.: *See—*
Lunkas, Michael J.; and Spilker, Matthew W., 5,051,294, Cl. 428-184.000.
Spiske, Luise; Luetzow, Dietrich; Herion, Christof; Kuessner, Klaus; and Hefner, Werner, to BASF Aktiengesellschaft. Removal of water from a mixture of water, $CO_2$ and amines. 5,051,188, Cl. 210-640.000.
Spitznagel, Max W. A. Spot weld drill guide. 5,051,043, Cl. 408-72.00R.
Spreter, Victor; and Zellweger, Conrad. Method for the manufacture of a heating element. 5,051,220, Cl. 264-113.000.
SPX Corporation: *See—*
Anderson, David L., 5,051,631, Cl. 310-14.000.
Srail, Raymond C.; Glover, Richard A.; Kuan, Tiong H.; and Szczepanski, Thomas R., to B. F. Goodrich Company, The. Flexible high energy magnetic blend compositions based on rare earth magnetic particles in highly saturated nitrile rubber. 5,051,200, Cl. 252-62.540.
Sridhar, Manickam R.: *See—*
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SSMC Inc.: *See—*
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Stabile, Paul J.: *See—*
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Staccione, Anna: *See—*
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Cutler, Luann J., 5,050,761, Cl. 220-200.000.
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Van Tassel, Roger A.; and Wong, Wallace K., 5,050,989, Cl. 356-310.000.
Army: *See—*
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Bergeson, Gary C.; and Morneau, Richard A., 5,051,996, Cl. 371-22.400.
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Piltch, Martin S.; and Michelotti, Roy A., 5,052,011, Cl. 372-77.000.
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Health and Human Services: *See—*
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National Aeronautics and Space Administration: *See—*
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Navy: *See—*
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Falcoff, Monte L., 5,050,922, Cl. 296-37.700.
United Technologies Corporation: *See—*
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Johnson, Chris A.; and Shapiro, Lionel R., 5,050,983, Cl. 351-226.000.
Martindale, James G.; Purdy, Ralph E.; Stupecky, George L.; and Tidwell, Ronny G., 5,051,352, Cl. 435-1.000.
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Upchurch, James M., to Schlumberger Technology Corporation. Perforating and testing apparatus including a microprocessor implemented control system responsive to an output from an inductive coupler or other input stimulus. 5,050,675, Cl. 166-250.000.
Uppco Incorporated: *See—*
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Urakama, Tatshuiro: *See—*
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Ury, Michael G.; Gunter, John B.; Johnson, Wayne H.; and Kuechle, Donald E., to Fusion Systems Corporation. Electrodeless lamp with improved bulb mounting arrangement. 5,051,663, Cl. 315-248.000.
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Usner, Daniel C. Angled roller device for multiple garment hanger rope-sling. 5,050,833, Cl. 248-340.000.
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van de Grift, Robert E. J.; and van der Veen, Martien, to U.S. Philips Corporation. Interpolation circuit for use in an A/D converter. 5,051,746, Cl. 341-159.000.
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Van Eijk, Carel W. E.; and Schooneveld, Eric M., to Technische Universiteit Delft. Position-sensitive radiation detector. 5,051,801, Cl. 357-30.000.
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Van Loon, James C., III. Open-mesh net bag and method of forming the same. 5,050,999, Cl. 383-76.000.
Van Pijkeren, Dirk, to U.S. Philips Corporation. Electric high-pressure discharge lamp for use as a motor vehicle headlamp. 5,051,658, Cl. 315-82.000.
van Roggen, Walter: *See—*
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Van Tassel, Roger A.; and Wong, Wallace K., to United States of America, Air Force. Single Hadamard mask spectrograph system. 5,050,989, Cl. 356-310.000.
Van Voorthuijsen, Joop, to AB SKF. Roller bearing cage. 5,051,006, Cl. 384-574.000.
Van Wassenhove, Norbert: *See—*
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Vassiliadis, Stamatis; Phillips, James E.; and Blaner, Bartholomew, to International Business Machines Corporation. Data dependency collapsing hardware apparatus. 5,051,940, Cl. 364-736.000.
VBM Corporation: *See—*
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Venero, Aurelio O.; and Avello, Antonio T., to Fabrica Espanola de Productos Quimicos y Farmeceuti-Cos S.A. (FAES). Piperidine derivatives as antihistaminics. 5,051,510, Cl. 546-200.000.
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Viot, J. Greg; Broseghini, James L.; Hartung, Eytan; and Dunn, John P., to Motorola, Inc. Adder circuit with an encoded carry. 5,051,943, Cl. 364-786.000.
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Vittot, Michel; and Fouassier, Michele, to U.S. Philips Corp. Low light level color image television system including electronic contrast enhancement system. 5,051,821, Cl. 358-81.000.
Vladislavic, Neven I. Structural members and building frames. 5,050,358, Cl. 52-334.000.
Vlietstra, Sietse: *See—*
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von der Goltz, Volker F. Flow device for use in hemorrhaging time measuring apparatus and method of measuring a hemorrhaging. 5,051,239, Cl. 422-73.000.
von Hoessle, Wolfgang, to Messerschmitt-Bolkow-Blohm GmbH. Dual lens system for electronic camera. 5,051,830, Cl. 358-209.000.
von Werner, Konrad, to Hoechst Aktiengesellschaft. Process for the preparation of extensively fluorinated aliphatic hydrocarbons having 1 or 2 bromine or chlorine atoms in the molecule. 5,051,535, Cl. 570-170.000.
Vorp, David A.: *See—*
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Vukovich, William J.; Koenig, Melissa M.; and Yu, Tsunlock A., to General Motors Corporation. Double transition upshift control for an automatic transmission. 5,050,458, Cl. 74-866.000.
W. C. Heraeus GmbH: *See—*
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Wachter, William A., to Exxon Research and Engineering Company. Monodispersed mesoporous catalyst matrices and FCC catalysts thereof. 5,051,385, Cl. 502-64.000.
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Wagner, Rudolf; and Hirscher, Hans, to Balzers Aktiengesellschaft. Elevating table and transporting method. 5,051,054, Cl. 414-618.000.
Wagner Spray Tech Corporation: *See—*
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Wakaeya, Shinji; Shionome, Shozo; Ohta, Moritaka; and Shimbashi, Masatoshi, to Fuji Electric Co., Ltd.; Inamoto Manufacturing Co., Ltd.; and Toyo Menka Kaisha, Ltd. Dryer and method for controlling the operation thereof. 5,050,313, Cl. 34-27.000.
Wakahara, Tatsuo: *See—*
Yamaguchi, Hiroshi; Kato, Yuji; Wakahara, Tatsuo; Shimanaka, Shigeki; Asano, Hiroshi; and Nakazawa, Shinsuke, 5,050,454, Cl. 74-858.000.
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Wakeman, Thomas G.; Clayton, Thomas S.; and Wagenknecht, Conrad D., to General Electric Company. Actuation system for positioning a vectoring exhaust nozzle. 5,050,803, Cl. 239-265.350.
Walasek, Steven P.; and Walasek, Stuart J., to Packaging Electronics & Devices Corp. Reusable and microwavable hot or cold therapy mitt and method of manufacture. 5,050,596, Cl. 128-381.000.
Walasek, Stuart J.: *See—*
Walasek, Steven P.; and Walasek, Stuart J., 5,050,596, Cl. 128-381.000.
Walba, David M.: *See—*
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Wales, Alan. Warm-up weight for softball bat. 5,050,877, Cl. 273-26.00B.
Walk, Bruce M.: *See—*
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Walker, Loren H., to General Electric Company. Method and apparatus for matching turn-off times of parallel connected semiconductor switching devices. 5,051,603, Cl. 307-73.000.
Walker Power, Inc.: *See—*
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Walston, Don K.: *See—*
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Walton, Theodore R., to United States of America, Navy. Metal phthalocyanines as catalysts for curing phthalonitrile prepolymers. 5,051,493, Cl. 528-362.000.
Wampfler GmbH: *See—*
Bormann, Uwe; and Goerner, Dieter, 5,051,546, Cl. 191-57.000.
Wand, Michael D.; and Walba, David M., to Displaytech, Inc. Ferroelectric liquid crystal compounds containing chiral haloalkyoxy tail units and compositions containing them. 5,051,506, Cl. 544-289.000.
Wang, Chen Y., to Samsung Semiconductor, Inc. Zero power dissipation laser fuse signature circuit for redundancy in vlsi design. 5,051,691, Cl. 324-158.00R.
Wang, Frank Y. Music poster. 5,051,728, Cl. 340-573.000.
Wang, Jin-Der; and Werner, Jean-Jacques, to AT&T Bell Laboratories. Technique for improving the operation of decision feedback equalizers in communications systems utilizing error correction. 5,052,000, Cl. 371-43.000.
Wang, Justin: *See—*
Fung, Michael G.; and Wang, Justin, 5,051,889, Cl. 364-200.000.
Wang, Samuel T., to ICT International CMOS Technology, Inc. Coplanar flash EPROM cell and method of making same. 5,051,793, Cl. 357-23.500.
Wang, Wei. Rolling ruler having a retractable and rotatable pivot pin. 5,050,309, Cl. 33-449.000.
Wang, Ying; and Choi, Hung N. Hydrophobic microporus membrane. 5,051,182, Cl. 210-500.270.
Warashina, Yoshihisa: *See—*
Mizushima, Yoshihiko; Nakajima, Kazutoshi; Hirohata, Toru; Iida, Takashi; Warashina, Yoshihisa; Sugimoto, Kenichi; and Kan, Hirofumi, 5,051,573, Cl. 250-213.00A.
Ward, Ian M.; McIntyre, James E.; Bannister, Dennis J.; Hall, Peter G.; and Davies, Geoffrey R., to National Research Development Corporation. Polymeric materials. 5,051,211, Cl. 429-192.000.
Ward, John L. Receiver for specimens from cryogenic microtome. 5,050,470, Cl. 83-167.000.
Ward, John W.; and Delaney, Dennis D., to Union Oil Company of California. Silica-alumina catalyst containing phosphorus. 5,051,386, Cl. 502-64.000.
Warkentien, Michael: *See—*
Hill, Gary; Schoch, Walter K.; and Warkentien, Michael, 5,051,080, Cl. 425-93.000.
Warner-Lambert Company: *See—*
Horwell, David C.; and Rees, David C., 5,051,428, Cl. 514-320.000.
Pinter, Garry W.; and Sircar, Jagadish C., 5,051,429, Cl. 544-320.000.
Warren, Harold C., III; and Snyder, Brian A., to Eastman Kodak Company. Specific binding composition comprising a low pI protein or carbohydrate and a diagnostic test kit and method of use. 5,051,356, Cl. 435-7.340.
Warren, Patrick A.; Hill, Marvin C.; Gervase, Nicholas J.; Kucera, Helmut W.; and Troughton, Ernest B., Jr., to Lord Corporation. Thermoplastic elastomer adhesive. 5,051,474, Cl. 525-131.000.
Warthmann, Robert. Sliding closures for roadway expansion joints. 5,051,024, Cl. 404-57.000.
Wasek, Gregory A. Adjustable vanity. 5,050,253, Cl. 4-645.000.
Washington, Robert G.: *See—*
Wotton, Phillip J.; Liebelt, Glynn F.; and Washington, Robert G., 5,050,492, Cl. 99-638.000.
Wasser, Jay S.: *See—*
Cole, Paul E.; Guy, Barry L.; and Wasser, Jay S., 5,050,706, Cl. 182-78.000.
Watabe, Kiyoto; Shinohara, Hirofumi; Eimori, Takahisa; Arima, Hideaki; Ajika, Natsuo; Nakashima, Yuichi; and Satoh, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Content addressable memory device. 5,051,948, Cl. 365-49.000.
Watanabe, Eiju; Manaka, Shinya; and Kosugi, Yukio, to Medirand, Inc. System for indicating a position to be operated in a patient's body. 5,050,608, Cl. 128-653.00R.
Watanabe, Hiroyuki; Yokoyama, Tadashi; and Yamawaki, Naokuni, to Asahi Kasei Kogyo K.K.; and Asahi Medical Co., Ltd. Absorbent of $\beta_2$-microglobulin. 5,051,185, Cl. 210-635.000.
Watanabe, Hisao; and Fukasawa, Jiro, to Shindengen Electric Manufacturing Co., Ltd.; and Yamanashi Electronics Co., Ltd. Electrophotographic copying machine which integrates components having substantially equal service lives into respective detachable units formed of a developing unit, a photoreceptor unit and a toner cartridge unit. 5,051,778, Cl. 355-200.000.
Watanabe, Junzo: *See—*
Kawaberi, Seiji; Watanabe, Junzo; and Suzuki, Hitoshi, 5,051,668, Cl. 315-408.000.
Watanabe, Masami: *See—*
Kawachi, Tomonori; Morikawa, Minoru; Suzuki, Noriyuki; Watanabe, Masami; Yasuhara, Nobuyoshi; and Sato, Yoshitaka, 5,050,411, Cl. 70-248.000.
Watanabe, Masataka; and Ichimura, Katsumi, to Shin-Etsu Handotai Co., Ltd. Heating coil for use in growth of single crystal. 5,051,242, Cl. 422-250.000.
Watanabe, Mikio; and Moronaga, Kenji, to Fuji Photo Film Co., Ltd. Device for coding a picture signal by compression. 5,051,840, Cl. 358-433.000.
Watanabe, Noriko: *See—*
Shoji, Hajime; Watanabe, Noriko; Hamada, Hiroshi; Kato, Hiroaki; Takemoto, Toshio; and Hirobe, Toshihiko, 5,051,800, Cl. 357-30.000.

Watanabe, Shigeki: *See*—
Naito, Takao; Chikama, Terumi; Watanabe, Shigeki; Kiyonaga, Tetsuya; and Onoda, Yoshihito, 5,052,051, Cl. 455-619.000.

Watanabe, Yutaka: *See*—
Ikeda, Tsutomu; Watanabe, Yutaka; Suzuki, Masayuki; Hayashida, Masami; Fukuda, Yasuaki; Ogura, Shigetaro; Iizuka, Takashi; and Niibe, Masahito, 5,052,033, Cl. 378-35.000.

Waters, John R., to Abo, Inc. Method for detecting microorganism activity. 5,051,360, Cl. 435-34.000.

Waters, Peter D.: *See*—
Wigmore, David B.; Lentz, John C.; Blain, Edward S.; and Waters, Peter D., 5,050,389, Cl. 62-84.000.

Watkins, David R.: *See*—
Kalfayan, Leonard J.; Watkins, David R.; and Hewgill, Gregory S., 5,051,197, Cl. 252-8.552.

Waymouth, John F., to John F. Waymouth Intellectual Property and Education Trust. Arc discharge lamp with liquid metal and heating means. 5,051,649, Cl. 313-15.000.

Webasto AG Fahrzeugtechnik: *See*—
Raethel, Dieter; Schumacher, Christof; Renovanz, Wilfried; and Umlauf, Bernhard, 5,050,796, Cl. 237-12.30C.

Webb, John: *See*—
Ford, James; and Webb, John, 5,051,229, Cl. 376-336.000.

Webb, John D.: *See*—
Douglas, D. Scott; and Webb, John D., 5,050,871, Cl. 272-128.000.

Webb Research II Corporation: *See*—
Krupnick, Steven B., 5,052,035, Cl. 378-163.000.

Weber, Dan: *See*—
Guerlet, Jean-Paul; and Weber, Dan, 5,051,235, Cl. 420-463.000.

Weber, LaVerne: *See*—
Schumacher, Glenn O.; Weber, LaVerne; Nowicki, Mitchell; Dunbar, Alan; and Douglas, Jeffrey M., 5,051,031, Cl. 405-129.000.

Weber, Rainer: *See*—
Klotz, Helmut; Pinter, Hans D.; Weber, Rainer; Block, Hans-Dieter; and Lonhoff, Norbert, 5,051,155, Cl. 204-59.00R.

Weglein, Arthur B.: *See*—
Corrigan, Dennis; Weglein, Arthur B.; and Thompson, David D., 5,051,961, Cl. 367-24.000.

Wegman, Richard W.: *See*—
Bernier, Robert J. N.; Edwards, David N.; and Wegman, Richard W., 5,051,456, Cl. 523-300.000.

Weh, Herbert, to J. M. Voith GmbH. Transversal flow machine in accumulator arrangement. 5,051,641, Cl. 310-163.000.

Wei, Linda J.: *See*—
Cheng, David H., 5,050,782, Cl. 222-309.000.

Weidman, Daniel J.: *See*—
Uhm, Han S.; Miller, Joel D.; Schneider, Ralph F.; and Weidman, Daniel J., 5,051,659, Cl. 315-111.410.

Weiman, Carl F. R.: *See*—
Evans, John M., Jr.; King, Steven J.; and Weiman, Carl F. R., 5,051,906, Cl. 364-424.020.

Weinstein, Gerald D.: *See*—
Chess, Samuel; McCullough, Jerry L.; and Weinstein, Gerald D., 5,051,260, Cl. 424-449.000.

Weiss, Helga: *See*—
Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,051,379, Cl. 437-225.000.

Welbilt Corporation: *See*—
Luebke, Clement J.; Sank, Gerald W.; and Slade, Frank A., 5,050,578, Cl. 126-21.00A.

Welch, Jeanne A., to United States of America, Navy. High optical density measuring spectrometer. 5,050,991, Cl. 356-326.000.

Wellburn, Deborah A.: *See*—
Gould, Elliot L.; Kemerer, Douglas W.; McAllister, Lance A.; Piro, Ronald A.; Richardson, Guy R.; and Wellburn, Deborah A., 5,051,917, Cl. 364-489.000.

Wells, Dennis L., to United States of America, National Aeronautics and Space Administration. Nozzle fabrication technique. 5,051,559, Cl. 219-121.720.

Wenderoth, Bernd; Schuetz, Franz; Brand, Siegbert; Sauter, Hubert; Ammermann, Eberhard; and Lorezn, Gisela, to BASF Aktiengesellschaft. Oxime ethers, their preparation and fungicides containing these compounds. 5,051,447, Cl. 514-534.000.

Werner, Jean-Jacques: *See*—
Wang, Jin-Der; and Werner, Jean-Jacques, 5,052,000, Cl. 371-43.000.

Wesby, Philip B. Locating system. 5,051,741, Cl. 340-825.490.

Weske, John R. Method and apparatus for mixing fluids. 5,051,213, Cl. 261-78.200.

West Company Incorporated, The: *See*—
Beswick, Frank, 5,050,722, Cl. 198-392.000.

West, Kenneth W.: *See*—
Baldwin, Kirk W.; Pfeiffer, Loren N.; Spector, Joseph; Stormer, Horst L.; and West, Kenneth W., 5,051,791, Cl. 357-22.000.

West Penn Plastics, Inc.: *See*—
Marino, Michael, 5,050,754, Cl. 215-256.000.

Western Atlas International, Inc.: *See*—
Poorman, Thomas J., 5,051,965, Cl. 367-149.000.

Western Digital Corporation: *See*—
Lee, Kowk Fai V.; Lee, Alan; Marmet, Melvin L.; and Ouyang, Kenneth W., 5,051,860, Cl. 361-58.000.

Westinghouse Electric Corp.: *See*—
Hurley, Ricky A., 5,051,604, Cl. 307-115.000.

Westland plc: *See*—
Cowdery, Roy L.; and Schofield, James W., 5,050,477, Cl. 89-1.802.

Wetzork, John M.: *See*—
Kern, Mark T.; Shamordola, Kenneth A.; Tangonan, Gregory L.; and Wetzork, John M., 5,051,590, Cl. 250-339.000.
Kern, Mark T.; Shamordola, Kenneth A.; Tangonan, Gregory L.; and Wetzork, John M., 5,051,595, Cl. 250-458.100.

Weydandt, Juergen: *See*—
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Whalen, Richard P.: *See*—
Goodman, Charles S.; and Whalen, Richard P., 5,050,846, Cl. 256-1.000.

Wheeler, Thomas N.; Kenakin, Terrence P.; and Shaffer, Joel E., to Glaxo Inc. Pyridone nitriles useful in treating cardiovascular disease. 5,051,431, Cl. 514-344.000.

Whirlpool Corporation: *See*—
Buchser, William J., 5,050,777, Cl. 222-146.600.

Whitaker, Douglas M., Sr., to Arcade, Inc. Stabilized perfume-containing microcapsules and method of preparing the same. 5,051,305, Cl. 428-402.200.

White, Danny R.: *See*—
Kennedy, Christopher R.; Urquhart, Andrew W.; White, Danny R.; Newkirk, Marc S.; and Ramberg, Jeffrey R., 5,051,383, Cl. 501-127.000.

Whitehouse, Ian R.; and Chu, James K., to British Aerospace Public Limited Company. Wing flap aerodynamic noise suppression. 5,050,822, Cl. 244-215.000.

Whitney, Lowell T.: *See*—
Anderson, David A.; Whitney, Lowell T.; and Young, David C., 5,050,806, Cl. 222-464.000.

Whittaker, Bruce E.: *See*—
Jeppesen, James H., III; and Whittaker, Bruce E., 5,052,001, Cl. 371-49.300.

Wieringa, Johannes H., to Akzo N.V. Substituted aromatic compounds having an action on the central nervous system. 5,051,424, Cl. 514-255.000.

Wigmore, David B.; Lentz, John C.; Blain, Edward S.; and Waters, Peter D., to Sundstrand Corporation. Refrigeration system with oiless compressor supported by hydrodynamic bearings with multiple operation modes and method of operation. 5,050,389, Cl. 62-84.000.

Wiklund, Klas R., to Geotronics AB. Ancillary arrangement for inclusion in a distance measuring instrument. 5,051,934, Cl. 364-561.000.

Wild, Daniel J., to Speed Queen Company. Combination unbalanced load and lid switch assembly. 5,050,407, Cl. 68-12.060.

Wildau, Hans-Jurgen: *See*—
Euen, Wolfgang; Hagmann, Dieter; and Wildau, Hans-Jurgen, 5,051,377, Cl. 437-24.000.

Wilder, John F.: *See*—
Ferree, Marsha E.; Gray, James P.; Pozefsky, Mark; and Wilder, John F., 5,051,892, Cl. 364-200.000.

Wilen Manufacturing Co., Inc.: *See*—
Studebaker, Roy D.; and Studebaker, Todd L., 5,050,530, Cl. 118-264.000.

Wiley, Emmett H., to Venture Lighting International, Inc. Electrodes for single ended arc discharge tubes. 5,051,655, Cl. 313-631.000.

Wilhelmsen, Arne. Automatic oiling device. 5,050,707, Cl. 184-87.000.

Willard, David F.: *See*—
DeLuca, Michael J.; Willard, David F.; and Schwendeman, Robert J., 5,051,993, Cl. 370-112.000.

Willats, Terence F.: *See*—
Gratze, Stephen C.; Bagshaw, John M.; and Willats, Terence F., 5,052,004, Cl. 372-20.000.

Willenbring, Angela G.: *See*—
Newman, Dennis; Steffenson, Gary G.; Willenbring, Angela G.; Jones, David C.; Self, George E.; Wing, Scott N.; and Schmitz, Alan R., 5,050,613, Cl. 128-670.000.

Williams, Bill: *See*—
Stober, Donald; and Williams, Bill, 5,051,290, Cl. 428-81.000.

Williams, David; Bryers, David K.; and Nutton, David, to Lucas Industries Public Limited Company. Control system for an internal combustion engine. 5,050,556, Cl. 123-425.000.

Williams, Geoffrey H., to Sheppard Ingot Castings Machines Limited. Device for removing material from the free surface of a body of liquid using unequal length linkages. 5,051,180, Cl. 210-241.000.

Williams, Matthew A.: *See*—
Miller, Marvin J.; and Williams, Matthew A., 5,051,502, Cl. 540-205.000.

Williams, Ralph E.; Rhine, David B.; Bedinger, John; and Barnett, Larry G., to Texas Instruments Incorporated. Solder or brazing barrier. 5,051,811, Cl. 357-68.000.

Williams, Robin L.: *See*—
Normandin, Richard J. F.; Chatenoud, Francoise; and Williams, Robin L., 5,051,617, Cl. 359-328.000.

Willms, Lothar, to Hoechst Aktiengesellschaft. N-acyl-2-amino acid amides containing phosphinic esters, process for their preparation, and N-acyl-2-amino acids nitriles as precursors. 5,051,525, Cl. 558-145.000.

Willoughby, Morris T. Earthquake shutoff valve. 5,050,629, Cl. 137-38.000.

Wills, Kevin P. Sticky nut fastener. 5,051,049, Cl. 411-258.000.

Willson, Donald J.: *See*—
Bluethman, Robert G.; and Willson, Donald J., 5,051,994, Cl. 371-11.100.

Wilson, Paul, to HCR. System for the incineration of refuse and the treatment of the incineration exhaust gasses. 5,050,508, Cl. 110-235.000.



Wilson, William G.; and Kay, D. Alan R., to Gas Desulfurization Corp. Ammonia for the desulfurization of sulfur containing gases. 5,051,245, Cl. 423-242.000.

Wilt, Brian L.: *See*—
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Wimmera Industrial Minerals Pty. Ltd.: *See*—
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Wing, Scott N.: *See*—
Newman, Dennis; Steffenson, Gary G.; Willenbring, Angela G.; Jones, David C.; Self, George E.; Wing, Scott N.; and Schmitz, Alan R., 5,050,613, Cl. 128-670.000.

Winter, Roland A. E.: *See*—
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Winter, William E.: *See*—
Lang, Robert J.; Culross, Claude C.; Vernon, Lonnie W.; and Winter, William E., 5,051,389, Cl. 502-185.000.

Wirth Gallo Messtechnik AG: *See*—
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Wirth, Johannes; and Gallo, Mario, to Wirth Gallo Messtechnik AG. Balance and process for calibrating and operating the balance. 5,050,693, Cl. 177-200.000.

Wischusen, Henry, III, to Rock-Tenn Company. Tamper-resistant leakproof container. 5,050,794, Cl. 229-125.260.

Wiseman, Timothy R., Sr.: *See*—
Flowers, Danny S.; and Wiseman, Timothy R., Sr., 5,050,241, Cl. 2-81.000.

Witt, Jonathan J., to Procter & Gamble Company, The. Diagnostic methods for detecting periodontal diseases. 5,051,358, Cl. 435-19.000.

Witzel, Karlheinz: *See*—
Arold, Klaus; Koukal, Heinz; Trube, Hans; Witzel, Karlheinz; and Volz, Wolfgang, 5,050,487, Cl. 98-2.110.

Witzeman, J. Stewart; and Nottingham, W. Dell, to Eastman Kodak Company. Method for functionalization of nucleophiles. 5,051,529, Cl. 560-178.000.

Wohl, Ronald A.: *See*—
Lis, Randall E.; Lumma, William C., Jr.; Morgan, Thomas K., Jr.; Nickisch, Klaus; and Wohl, Ronald A., 5,051,423, Cl. 514-252.000.

Wold, Terry M.: *See*—
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Wolejsza, Chester J.: *See*—
Poklemba, John J.; Wolejsza, Chester J.; and Thomas, James R., 5,052,027, Cl. 375-103.000.

Wolff, Andy; and Davis, Ronald L., to United States of America, Health and Human Services. Universal collector for submandibular-sublingual saliva. 5,050,616, Cl. 128-760.000.

Wolff, Curtis E. Removable sign post assembly. 5,050,828, Cl. 248-156.000.

Wolff, Steven D.: *See*—
Balaban, Robert S.; and Wolff, Steven D., 5,050,609, Cl. 128-653.0CA.

Wolfram, John R., to Johnson Service Company. Baggage and passenger matching method and system. 5,051,565, Cl. 235-384.000.

Wolter, Olaf: *See*—
Bayer, Thomas; Greschner, Johann; Kraus, Georg; Weiss, Helga; and Wolter, Olaf, 5,051,379, Cl. 437-225.000.

Woltman, Henry L., to Minnesota Mining and Manufacturing Company. Retroreflective sign having improved legibility. 5,050,327, Cl. 40-582.000.

Wong, Alex Y. K. Compressors for vehicle tires. 5,051,068, Cl. 417-234.000.

Wong, Ching P., to AT&T Bell Laboratories. Silicone resin electronic device encapsulant. 5,051,275, Cl. 427-58.000.

Wong, Keith: *See*—
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Wong, Kwok-Keung: *See*—
Goldner, Ronald B.; Arntz, Floyd O.; Morel, Bertrand; Haas, Terry E.; and Wong, Kwok-Keung, 5,051,274, Cl. 427-38.000.

Wong, Wallace K.: *See*—
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Woo, James T. K.; and Marcinko, Richard M., to Glidden Company, The. Epoxy-acrylic graft polymers. 5,051,470, Cl. 523-411.000.

Wood, Gregg D. Wheelchair transfer mechanism. 5,050,708, Cl. 187-12.000.

Wood Manufacturing Co., Inc.: *See*—
Stone, Wayne B., 5,050,780, Cl. 222-188.000.

Wood 'n rock, a Florida Partnership: *See*—
Underwood, Joseph W. T., IV; and Rockafeller, Eugene F., 5,051,548, Cl. 200-11.00D.

Woodcock, Ashley, to Slumberland PLC. Allergen proof bedding system with cover permeable to water vapor. 5,050,256, Cl. 5-448.000.

Woods, Quentin T., to Boeing Company, The. Dynamic dimensional control matrix system. 5,050,288, Cl. 29-407.000.

Wooldridge, Ralph: *See*—
Almond, James; Wooldridge, Wayne; Davis, Robert E.; and Wooldridge, Ralph, 5,050,582, Cl. 126-391.000.

Wooldridge, Wayne: *See*—
Almond, James; Wooldridge, Wayne; Davis, Robert E.; and Wooldridge, Ralph, 5,050,582, Cl. 126-391.000.

Woolley, Richard L., to Hughes Aircraft Company. Angle measurement compensation technique for amplitude comparison monopulse receiver. 5,051,752, Cl. 342-151.000.

Wotton, Phillip J.; Liebelt, Glynn F.; and Washington, Robert G., to Belt-Ton Grading Pty. Ltd. Cherry splitter. 5,050,492, Cl. 99-638.000.

Wrage, Brian L. Hydraulic tool for disassembly of universal joints. 5,050,285, Cl. 29-252.000.

Wraight, Peter: *See*—
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Wright, Amy E.; Cross, Sue S.; Burres, Neal; and Koehn, Frank, to Harbor Branch Oceanographic Institution, Inc. Novel antiviral and antitumor terpene hydroquinones and methods of use. 5,051,519, Cl. 549-384.000.

Wright, John H.; and Tomas, Stephen P., to EDA Systems, Inc. Method for specifying and controlling the invocation of a computer program. 5,051,898, Cl. 364-200.000.

Wright, Michael E., to National Semiconductor Corporation. Area-efficient low-power bipolar current-mode logic. 5,051,621, Cl. 307-455.000.

Wright, Peter, to R. F. Monolithics, Inc. Electrode structure with constant velocity and predetermined reflectivity. 5,051,644, Cl. 310-313.00B.

Wu, Kuang-Yeu: *See*—
Chen, Gilbert K.; Lee, Adam T.; Wu, Kuang-Yeu; and Gage, Gary W., 5,051,214, Cl. 261-97.000.

Wu, Nan-Yang: *See*—
Hsiao, Yen-Yuan; Wu, Nan-Yang; and Cheng, Sheng-Fang, 5,051,669, Cl. 318-119.000.

Wu, Sheng J. Print wheel setting mechanism. 5,050,495, Cl. 101-91.000.

Wunder, John S.: *See*—
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Wurtex Maschinenbau Hofmann GmbH & Co: *See*—
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Wurtman, Richard J.; and Blusztajn, Jan K., to Massachusetts Institute of Technology. Method and composition for enhancing the release of neurotransmitters. 5,051,410, Cl. 514-78.000.

Xerox Corporation: *See*—
Andrews, John R.; and Simpson, Yonn K., 5,051,328, Cl. 430-56.000.
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Markham, Roger G., 5,051,758, Cl. 346-140.00R.
Smith, Z. Erol, III; and Street, Robert A., 5,050,990, Cl. 356-326.000.

Yabumoto, Junsuke: *See*—
Yano, Hisashi; Yabumoto, Junsuke; and Kitada, Akiharu, 5,051,072, Cl. 417-435.000.

Yacoboski, Anton. Exercise chair for use in swimming pool. 5,050,863, Cl. 272-71.000.

Yagami, Kenichi: *See*—
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Yagi, Atsuo; Matsushita, Takeshi; and Hashimoto, Makoto, to Sony Corporation. Method of thinning a semiconductor wafer. 5,051,378, Cl. 437-225.000.

Yaguchi, Atsunori: *See*—
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Yaguchi, Osamu, to Kabushiki Kaisha Riken. Automatic window/door system. 5,051,672, Cl. 318-469.000.

Yahav, Shimon; and Daar, Yair, to Lancet S.A. Domestic food cooking apparatus. 5,050,490, Cl. 99-348.000.

Yahiro, Masakazu: *See*—
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Yajima, Shigeru: *See*—
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Yakou, Takeshi, to Canon Kabushiki Kaisha. Hand apparatus for holding article. 5,050,919, Cl. 294-2.000.

Yamada, Akio: *See*—
Sakamoto, Kiichi; Yasuda, Hiroshi; and Yamada, Akio, 5,051,556, Cl. 219-121.250.

Yamada, Hirofumi: *See*—
Tsuda, Nobuhiro; Yamada, Hirofumi; Ishida, Fumihiko; and Miyashita, Masayuki, 5,051,594, Cl. 250-442.100.

Yamada, Kazuro: *See*—
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Yamada, Shuri; and Nagami, Goro, to Freund Industrial Co., Ltd. Rotary drum granulating and coating apparatus. 5,050,528, Cl. 118-19.000.

Yamada, Takashi; Nagamatsu, Akihito; Bamba, Seiichi; Sawai, Tetsuro; Nakano, Haruo; and Nagami, Kimihiko, to Sanyo Electric Co., Ltd. Method of fabricating MMIC semiconductor integrated circuits using the RF and DC measurements of an active device on a substrate to design the passive elements, which are then E-beam written to the substrate. 5,051,373, Cl. 437-8.000.

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Gelsdorf, Gunter; Leupold, Hermann; and Schellberg, Franc, Re. 33,700, Cl. 428-472.000.
Stevenson, Andrew, to Paton Corporation, The. Composite spring. Re. 33,696, Cl. 267-33.000.
Triquet, Fred, to Arco Industries Corporation. Steering column boot. Re. 33,701, Cl. 464-173.000.
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Fendley, James R., Re. 33,698, Cl. 313-407.000.

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CERTIFICATES WERE ISSUED

De Mayo, John F., to Sensonics, Inc. Tapping device for generating periodic mechanical pulses. B1 3,863,114, 9-24-91, Cl. 361-139.000.
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De Mayo, John F., B1 3,863,114, Cl. 361-139.000.

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Holen, James T., 320,280, Cl. D24-224.000.
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Blackstone, Joshua, 320,289, Cl. D29-13.000.
Adcock, Jason E.; and Coleman, William N. Drinking attachment for bottle employing ventilating means. 320,136, 9-24-91, Cl. D7-300.200.
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Anderson, Bruce O.; and Miller, Joseph E., to Bush Industries, Inc. Combined television stand and video accessory storage. 320,126, 9-24-91, Cl. D6-436.000.
Ando, Takaharu, to Kabushiki Kaisha Toshiba. Telephone transferring switchboard. 320,211, 9-24-91, Cl. D14-241.000.
Andrews, Edward A. Drill socket. 320,148, 9-24-91, Cl. D8-70.000.
Apps, William P.; Lang-Ree, Arne; and Yelder, W. Joseph, to Pepsi-Cola Company; and Rehrig-Pacific Company. Stackable and nestable box. 320,298, 9-24-91, Cl. D34-40.000.
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Ban-Dak, Joseph. Orange peeler. 320,144, 9-24-91, Cl. D7-693.000.
Barrault, Jean-Louis, to Moulinex (Societe Anonyme). Electric coffee maker. 320,137, 9-24-91, Cl. D7-309.000.
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Baum, Thomas M., to Coeur Laboratories, Inc. Syringe for administation of contrast media. 320,276, 9-24-91, Cl. D24-113.000.
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Bender, Peter E. Electrical connector for appliances. 320,193, 9-24-91, Cl. D13-146.000.
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Disera, William P. Woodwind mouthpiece. 320,219, 9-24-91, Cl. D17-13.000.
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Walters, Danny: *See—*
Turner, Glen; and Walters, Danny, 320,237, Cl. D21-33.000.
Waltke, David L.; and Thomas, Larry D., to Hoover Group, Inc. Portable bulk storage tank. 320,255, 9-24-91, Cl. D23-202.000.
Ward, Ridley C. Computer keyboard software key guide holder. 320,198, 9-24-91, Cl. D14-114.000.
Watanabe, Asaichi: *See—*
Shiina, Hiroshi; and Watanabe, Asaichi, 320,175, Cl. D11-13.000.
Waterbury Companies Inc.: *See—*
Kunze, Walter A., 320,266, Cl. D23-366.000.
Weber, Edward W., to Contel IPC, Inc. Mouse with telephone dial pads. 320,197, 9-24-91, Cl. D14-114.000.
Williams, Fred E.: *See—*
Ryder, Francis E.; Kanner, Rowland W.; and Williams, Fred E., 320,278, Cl. D24-218.000.
Wirth, John G. Ski carrier. 320,112, 9-24-91, Cl. D3-36.000.
Wolf, Thomas H.; and Berger, Andy L., to Superwares, Inc. Combined toothpaste tube and toothbrush holder. 320,123, 9-24-91, Cl. D6-528.000.
Wonder, Edwin C., to Oneida Ltd. Cup. 320,139, 9-24-91, Cl. D7-536.000.
Yamaguchi, Akihiko, to Mabuchi Motor Co., Ltd. Rotor of an electric motor. 320,191, 9-24-91, Cl. D13-112.000.
Yelder, W. Joseph: *See—*
Apps, William P.; Lang-Ree, Arne; and Yelder, W. Joseph, 320,298, Cl. D34-40.000.
Yoshida Kogyo K.K.: *See—*
Kasai, Kazumi, 320,178, Cl. D11-218.000.
Yuen, John Se-Kit, to John Manufacturing Limited. Solar powered warning light. 320,173, 9-24-91, Cl. D10-114.000.
Yuen, John Se-Kit, to John Manufacturing Limited. Solar powered warning light. 320,174, 9-24-91, Cl. D10-114.000.
501 Salomon S.A.: *See—*
Mermillod, Jean F., 320,251, Cl. D21-219.000.


# LIST OF PLANT PATENTEES


Craig, Richard; and Hanniford, Glenn G., to Research Corporation Technologies, Inc. Regal pelargonium '315-(83-48-1)'. 7,656, 9-24-91, Cl. 68.000.
Deroose, Reginald: *See—*
Kuipers, Nico J., 7,657, Cl. 88.000.
Hanniford, Glenn G.: *See—*
Craig, Richard; and Hanniford, Glenn G., 7,656, Cl. 68.000.
Kuipers, Nico J., to Deroose, Reginald. Spathiphyllum plant named Gigant. 7,657, 9-24-91, Cl. 88.000.
Research Corporation Technologies, Inc.: *See—*
Craig, Richard; and Hanniford, Glenn G., 7,656, Cl. 68.000.
Wandell, Willet N. *Acer*×freemani named 'DTR 102'. 7,655, 9-24-91, Cl. 51.000.

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# CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 24, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

**CLASS 2**

| | |
|---|---|
| 6 | 5,050,240 |
| 81 | 5,050,241 |
| 114 | 5,050,242 |
| | 5,050,243 |
| 227 | 5,050,244 |
| 410 | 5,050,245 |

**CLASS 4**

| | |
|---|---|
| 192 | 5,050,246 |
| 203 | 5,050,247 |
| 341 | 5,050,248 |
| 443 | 5,050,249 |
| 492 | 5,050,250 |
| 534 | 5,050,251 |
| 576 | 5,050,252 |
| 645 | 5,050,253 |

**CLASS 5**

| | |
|---|---|
| 82 R | 5,050,254 |
| 417 | 5,050,255 |
| 448 | 5,050,256 |
| 450 | 5,050,257 |

**CLASS 8**

| | |
|---|---|
| 115.66 | 5,051,110 |
| 151 | 5,050,258 |
| 159 | 5,050,259 |
| 648 | 5,051,111 |

**CLASS 10**

| | |
|---|---|
| 52 | 5,050,260 |

**CLASS 15**

| | |
|---|---|
| 144 R | 5,050,261 |
| 180 | 5,050,262 |
| 250.32 | 5,050,263 |
| 327.1 | 5,050,264 |
| 340.1 | 5,050,265 |
| 421 | 5,050,266 |

**CLASS 16**

| | |
|---|---|
| 2 | 5,050,267 |
| 53 | 5,050,268 |
| 118 | 5,050,269 |
| 298 | 5,050,270 |

**CLASS 19**

| | |
|---|---|
| 98 | 5,050,271 |

**CLASS 24**

| | |
|---|---|
| 30.5 R | 5,050,272 |
| 136 R | 5,050,273 |
| 171 | 5,050,274 |
| 283 | 5,050,275 |
| 303 | 5,050,276 |
| 633 | 5,050,277 |
| 653 | 5,050,278 |
| 662 | 5,050,279 |

**CLASS 26**

| | |
|---|---|
| 28 | 5,050,280 |

**CLASS 29**

| | |
|---|---|
| 227 | 5,050,281 |
| 235 | 5,050,282 |
| 240 | 5,050,283 |
| 243.54 | 5,050,284 |
| 252 | 5,050,285 |
| 275 | 5,050,286 |
| 281.5 | 5,050,287 |
| 407 | 5,050,288 |
| 450 | 5,050,289 |
| 455.1 | 5,050,290 |
| 560 | 5,050,291 |
| 605 | 5,050,292 |
| | 5,050,293 |
| 609 | 5,050,294 |
| 830 | 5,050,295 |
| 845 | 5,050,296 |
| 855 | 5,050,297 |
| 888.3 | 5,050,298 |
| 897.32 | 5,050,299 |

**CLASS 30**

| | |
|---|---|
| 34.1 | 5,050,300 |
| 87 | 5,050,301 |
| 90.8 | 5,050,302 |
| 123.4 | 5,050,303 |
| 196 | 5,050,304 |
| 201 | 5,050,305 |
| 293 | 5,050,306 |
| 392 | 5,050,307 |

**CLASS 33**

| | |
|---|---|
| 430 | 5,050,308 |
| 449 | 5,050,309 |
| 550 | 5,050,310 |
| 700 | 5,050,312 |
| 704 | 5,050,311 |

**CLASS 34**

| | |
|---|---|
| 27 | 5,050,313 |
| 34 | 5,050,314 |
| 58 | 5,050,316 |
| 60 | 5,050,315 |
| 117 | 5,050,317 |
| 217 | 5,050,318 |

**CLASS 36**

| | |
|---|---|
| 117 | 5,050,319 |

**CLASS 37**

| | |
|---|---|
| 81 | 5,050,320 |
| 232 | 5,050,321 |
| 270 | 5,050,322 |

**CLASS 40**

| | |
|---|---|
| 1.5 | 5,050,323 |
| 152 | 5,050,324 |
| 447 | 5,050,325 |
| 538 | 5,050,326 |
| 582 | 5,050,327 |

**CLASS 42**

| | |
|---|---|
| 70 | 5,050,328 |
| 71.02 | 5,050,329 |
| 94 | 5,050,330 |
| 95 | 5,050,331 |

**CLASS 43**

| | |
|---|---|
| 15 | 5,050,332 |
| 17 | 5,050,333 |
| 42.13 | 5,050,334 |
| 55 | 5,050,335 |
| 61 | 5,050,336 |
| 97 | 5,050,337 |
| 132.1 | 5,050,338 |

**CLASS 47**

| | |
|---|---|
| 39 | 5,050,339 |
| 48.5 | 5,050,340 |
| 59 | 5,050,341 |
| 66 | 5,050,342 |
| 79 | 5,050,343 |

**CLASS 49**

| | |
|---|---|
| 237 | 5,050,344 |
| 279 | 5,050,345 |
| 280 | 5,050,346 |
| 348 | 5,050,347 |
| 351 | 5,050,348 |
| 488 | 5,050,349 |
| 502 | 5,050,350 |
| | 5,050,351 |

**CLASS 51**

| | |
|---|---|
| 309 | 5,051,112 |
| 330 | 5,050,352 |

**CLASS 52**

| | |
|---|---|
| 8 | 5,050,353 |
| 80 | 5,050,354 |
| 163 | 5,050,355 |
| 295 | 5,050,356 |
| 314 | 5,050,357 |
| 334 | 5,050,358 |
| 456 | 5,050,359 |
| 488 | 5,050,360 |
| 581 | 5,050,361 |
| 588 | 5,050,362 |
| 656 | 5,050,363 |
| 705 | 5,050,364 |
| 713 | 5,050,365 |
| 730 | 5,050,366 |

**CLASS 53**

| | |
|---|---|
| 72 | 5,050,367 |
| 442 | 5,050,368 |
| 471 | 5,050,369 |
| 502 | 5,050,370 |

**CLASS 55**

| | |
|---|---|
| 16 | 5,051,113 |
| | 5,051,114 |
| 26 | 5,051,115 |
| 52 | 5,051,116 |
| 58 | 5,051,117 |
| 97 | 5,051,118 |
| 112 | 5,051,119 |

**CLASS 56**

| | |
|---|---|
| 10.5 | 5,050,371 |
| 12.7 | 5,050,372 |
| 17.6 | 5,050,373 |

**CLASS 60**

| | |
|---|---|
| 39.02 | 5,050,374 |
| 39.12 | 5,050,375 |
| 274 | 5,050,376 |
| 275 | 5,050,377 |
| 313 | 5,050,378 |
| 368 | 5,050,379 |
| 413 | 5,050,380 |
| 584 | 5,050,381 |
| 589 | 5,050,382 |
| | 5,050,383 |
| 605.1 | 5,050,384 |
| 757 | 5,050,385 |

**CLASS 62**

| | |
|---|---|
| 24 | 5,051,120 |
| 45.1 | 5,050,386 |
| 60 | 5,050,387 |
| 77 | 5,050,388 |
| 84 | 5,050,389 |
| 94 | 5,050,390 |
| | 5,050,391 |
| 114 | 5,050,392 |
| 115 | 5,050,393 |
| | 5,050,394 |
| 133 | 5,050,395 |
| 160 | 5,050,396 |
| 175 | 5,050,397 |
| 183 | 5,050,398 |
| 244 | 5,050,399 |
| 278 | 5,050,400 |
| 292 | 5,050,401 |
| 457.9 | 5,050,402 |
| 480 | 5,050,403 |

**CLASS 63**

| | |
|---|---|
| 13 | 5,050,404 |

**CLASS 65**

| | |
|---|---|
| 1 | 5,051,121 |
| 3.43 | 5,051,122 |
| 9 | 5,051,123 |

**CLASS 66**

| | |
|---|---|
| 132 R | 5,050,405 |
| 177 | 5,050,406 |

**CLASS 68**

| | |
|---|---|
| 12.06 | 5,050,407 |
| 241 | 5,050,408 |

**CLASS 69**

| | |
|---|---|
| 33 | 5,050,409 |

**CLASS 70**

| | |
|---|---|
| 237 | 5,050,410 |
| 248 | 5,050,411 |
| 358 | 5,050,412 |
| 386 | 5,050,413 |
| 456 R | 5,050,414 |

**CLASS 71**

| | |
|---|---|
| 67 | 5,051,124 |
| 93 | 5,051,125 |

**CLASS 72**

| | |
|---|---|
| 12 | 5,050,415 |
| 38 | 5,050,416 |
| 60 | 5,050,417 |
| 201 | 5,050,418 |
| 306 | 5,050,419 |
| 391.4 | 5,050,420 |
| 409 | 5,050,421 |
| 450 | 5,050,422 |

**CLASS 73**

| | |
|---|---|
| 1 D | 5,050,424 |
| 4 R | 5,050,423 |
| 19.1 | 5,050,425 |
| 45.5 | 5,050,426 |
| 118.1 | 5,050,427 |
| 118.2 | 5,050,428 |
| 204.26 | 5,050,429 |
| 292 | 5,050,430 |
| 304 C | 5,050,431 |
| 309 | 5,050,432 |
| 313 | 5,050,433 |
| 336.5 | 5,050,434 |
| 517 B | 5,050,435 |
| 644 | 5,050,436 |
| 830 | 5,050,437 |
| 861 | 5,050,438 |
| 861.38 | 5,050,439 |
| 863.83 | 5,050,440 |

**CLASS 74**

| | |
|---|---|
| 7 C | 5,050,441 |
| 42 | 5,050,442 |
| 492 | 5,050,443 |
| 502.2 | 5,050,444 |
| 502.5 | 5,050,445 |
| 574 | 5,050,446 |
| 606 R | 5,050,447 |
| | 5,050,448 |
| 625 | 5,050,449 |
| 665 M | 5,050,450 |
| 844 | 5,050,451 |
| 858 | 5,050,452 |
| | 5,050,453 |
| | 5,050,454 |
| 866 | 5,050,455 |
| | 5,050,456 |
| | 5,050,457 |
| | 5,050,458 |
| 867 | 5,050,459 |
| | 5,050,460 |
| 872 | 5,050,461 |

**CLASS 75**

| | |
|---|---|
| 238 | 5,051,126 |
| 553 | 5,051,127 |
| 712 | 5,051,128 |

**CLASS 76**

| | |
|---|---|
| 110 | 5,050,462 |

**CLASS 81**

| | |
|---|---|
| 63 | 5,050,463 |
| 90.1 | 5,050,464 |
| 126 | 5,050,465 |
| 419 | 5,050,466 |
| 466 | 5,050,467 |

**CLASS 82**

| | |
|---|---|
| 1.11 | 5,050,468 |

**CLASS 83**

| | |
|---|---|
| 16 | 5,050,469 |
| 167 | 5,050,470 |
| 310 | 5,050,471 |
| 424 | 5,050,472 |
| 454 | 5,050,473 |

**CLASS 84**

| | |
|---|---|
| 603 | 5,050,474 |

**CLASS 86**

| | |
|---|---|
| 23 | 5,050,475 |

**CLASS 89**

| | |
|---|---|
| 1.11 | 5,050,476 |
| 1.802 | 5,050,477 |
| 8 | 5,050,478 |
| 46 | 5,050,479 |
| 147 | 5,050,480 |
| | 5,050,481 |

**CLASS 91**

| | |
|---|---|
| 304 | 5,050,482 |
| 442 | 5,050,483 |

**CLASS 92**

| | |
|---|---|
| 5 L | 5,050,484 |
| 126 | 5,050,485 |

**CLASS 98**

| | |
|---|---|
| 2.08 | 5,050,486 |
| 2.11 | 5,050,487 |
| 34.6 | 5,050,488 |
| 42.21 | 5,050,489 |

**CLASS 99**

| | |
|---|---|
| 348 | 5,050,490 |
| 483 | 5,050,491 |
| 638 | 5,050,492 |

**CLASS 100**

| | |
|---|---|
| 106 | 5,050,493 |

**CLASS 101**

| | |
|---|---|
| 76 | 5,050,494 |
| 91 | 5,050,495 |
| 123 | 5,050,496 |
| 124 | 5,050,497 |
| 127.1 | 5,050,498 |
| 183 | 5,050,499 |
| 420 | 5,050,500 |

**CLASS 102**

| | |
|---|---|
| 293 | 5,050,501 |
| 430 | 5,050,502 |
| 475 | 5,050,503 |

**CLASS 104**

| | |
|---|---|
| 242 | 5,050,504 |
| 295 | 5,050,505 |

**CLASS 106**

| | |
|---|---|
| 2 | 5,051,129 |
| 35 | 5,051,130 |
| 494 | 5,051,131 |

**CLASS 108**

| | |
|---|---|
| 51.1 | 5,050,506 |

**CLASS 109**

| | |
|---|---|
| 83 | 5,050,507 |

**CLASS 110**

| | |
|---|---|
| 235 | 5,050,508 |
| | 5,050,509 |
| 257 | 5,050,510 |
| 346 | 5,050,511 |
| | 5,050,512 |

**CLASS 112**

| | |
|---|---|
| 121.11 | 5,050,513 |
| 235 | 5,050,514 |
| 240 | 5,050,515 |

**CLASS 114**

| | |
|---|---|
| 39.2 | 5,050,516 |
| 123 | 5,050,517 |
| 144 A | 5,050,518 |
| 144 E | 5,050,519 |
| 211 | 5,050,520 |
| 230 | 5,050,521 |
| 244 | 5,050,525 |
| 249 | 5,050,522 |
| 259 | 5,050,523 |
| 263 | 5,050,524 |
| 364 | 5,050,526 |

**CLASS 116**

| | |
|---|---|
| 334 | 5,050,527 |

**CLASS 118**

| | |
|---|---|
| 19 | 5,050,528 |
| 40 | 5,050,529 |
| 264 | 5,050,530 |
| 621 | 5,050,531 |
| 663 | 5,050,532 |
| 667 | 5,050,533 |
| 733 | 5,050,534 |

**CLASS 119**

| | |
|---|---|
| 3 | 5,050,535 |
| 15 | 5,050,536 |
| 51.02 | 5,050,537 |
| 106 | 5,050,538 |
| 159 | 5,050,539 |

**CLASS 122**

| | |
|---|---|
| 4 R | 5,050,540 |
| 235.23 | 5,050,541 |
| | 5,050,542 |

**CLASS 123**

| | |
|---|---|
| 52 M | 5,050,566 |
| 90.11 | 5,050,543 |
| 90.27 | 5,050,544 |
| 179 H | 5,050,545 |
| 182 | 5,050,546 |
| 193 C | 5,050,547 |
| 198 D | 5,050,548 |
| 198 E | 5,050,549 |
| 275 | 5,050,550 |
| 305 | 5,050,551 |
| 361 | 5,050,552 |
| 418 | 5,050,553 |
| 419 | 5,050,554 |
| 422 | 5,050,555 |
| 425 | 5,050,556 |
| 432 | 5,050,557 |
| 453 | 5,050,558 |
| 478 | 5,050,559 |
| 488 | 5,050,560 |
| 489 | 5,050,561 |
| | 5,050,562 |
| | 5,050,563 |
| 492 | 5,050,564 |
| 494 | 5,050,565 |
| 514 | 5,050,567 |
| 521 | 5,050,568 |
| 523 | 5,050,603 |
| 549 | 5,050,569 |
| 556 | 5,050,570 |
| 557 | 5,050,571 |
| 564 | 5,050,572 |
| 644 | 5,050,573 |

**CLASS 124**

| | |
|---|---|
| 3 | 5,050,574 |
| 8 | 5,050,575 |
| 87 | 5,050,576 |

**CLASS 126**

| | |
|---|---|
| 9 R | 5,050,577 |
| 21 A | 5,050,578 |
| 77 | 5,050,579 |
| | 5,050,580 |
| 299 D | 5,050,581 |
| 391 | 5,050,582 |
| 500 | 5,050,583 |

**CLASS 127**

| | |
|---|---|
| 30 | 5,051,132 |
| 65 | 5,051,133 |

**CLASS 128**

| | |
|---|---|
| 4 | 5,050,584 |
| | 5,050,585 |
| 12 | 5,050,586 |
| 24 AA | 5,050,587 |
| | 5,050,588 |
| 25 R | 5,050,589 |
| | 5,050,590 |
| 65 | 5,050,591 |
| 79 | 5,050,592 |
| 80 H | 5,050,620 |
| 204.23 | 5,050,593 |
| 206.24 | 5,050,594 |
| 379 | 5,050,595 |
| 381 | 5,050,596 |
| 395 | 5,050,597 |
| 403 | 5,050,598 |
| 419 D | 5,050,601 |
| 419 P | 5,050,600 |
| | 5,050,602 |
| 419.0 PG | 5,050,599 |
| 632 | 5,050,604 |
| 637 | 5,050,606 |
| 653 A | 5,050,607 |
| 653 CA | 5,050,609 |
| 653 OSC | 5,050,605 |
| 653 R | 5,050,608 |
| 660.01 | 5,050,610 |
| 661.09 | 5,050,611 |
| 670 | 5,050,612 |
| | 5,050,613 |
| 716 | 5,050,614 |
| 719 | 5,050,615 |
| 760 | 5,050,616 |
| 763 | 5,050,617 |
| 774 | 5,050,618 |
| 844 | 5,050,619 |

**CLASS 131**

| | |
|---|---|
| 331 | 5,050,621 |
| 365 | 5,050,622 |

**CLASS 132**

| | |
|---|---|
| 301 | 5,050,623 |
| 319 | 5,050,624 |
| 323 | 5,050,625 |

**CLASS 134**

| | |
|---|---|
| 3 | 5,051,134 |
| 10 | 5,051,135 |
| 15 | 5,051,136 |
| 42 | 5,051,137 |
| 138 | 5,050,626 |

**CLASS 135**

| | |
|---|---|
| 23 | 5,050,627 |

**CLASS 137**

| | |
|---|---|
| 15 | 5,050,628 |
| 38 | 5,050,629 |
| 68.1 | 5,050,630 |

270 5,050,631
360 5,050,632
454.5 5,050,633
486 5,050,634
489 5,050,635
494 5,050,636
529 5,050,637
553 5,050,638
587 5,050,639
606 5,050,640
607 5,050,641
625.65 5,050,642

**CLASS 139**

1 R 5,050,643
88 5,050,644
170.3 5,050,645
383 A 5,050,646
450 5,050,647
5,050,648

**CLASS 140**

93 A 5,050,649
105 5,050,650

**CLASS 141**

314 5,050,651

**CLASS 144**

286 R 5,050,652
351 5,050,653

**CLASS 148**

2 5,051,138
11.5 F 5,051,139
203 5,051,140
269 5,051,141

**CLASS 149**

2 5,051,142
3 5,051,143

**CLASS 150**

158 5,050,654
160 5,050,655

**CLASS 152**

11 5,050,656
527 5,050,657
540 5,050,658

**CLASS 156**

85 5,051,144
99 5,051,145
345 5,051,146
355 5,051,147
358 5,051,148
403 5,051,149

**CLASS 157**

1.24 5,050,659

**CLASS 160**

84.1 5,050,661
113 5,050,660
168.1 5,050,662
231.2 5,050,663
236 5,050,664

**CLASS 162**

146 5,051,150
264 5,051,151

**CLASS 164**

137 5,050,665
416 5,050,666

**CLASS 165**

4 5,050,667
81 5,050,668
162 5,050,669
163 5,050,670
166 5,050,671

**CLASS 166**

55 5,050,672
70 5,050,673
250 5,050,674
5,050,675
267 5,050,676
278 5,050,677
5,050,678
285 5,050,679
356 5,050,680
374 5,050,681
377 5,050,682

**CLASS 169**

46 5,050,683

**CLASS 172**

272 5,050,684
699 5,050,685

**CLASS 173**

93 5,050,686
122.002 5,050,687

**CLASS 174**

15.7 5,051,539
52.3 5,051,540
65 SS 5,051,541
72 B 5,051,542
78 5,051,543
117 F 5,051,544

**CLASS 175**

50 5,050,690
57 5,050,691
61 5,050,692

**CLASS 177**

200 5,050,693
262 5,050,694

**CLASS 178**

19 5,051,545

**CLASS 180**

13 5,050,695
133 5,050,696
141 5,050,697
175 5,050,698
219 5,050,699
268 5,050,700
297 5,050,701
300 5,050,702

**CLASS 181**

106 5,050,703

**CLASS 182**

9 5,050,704
45 5,050,705
78 5,050,706

**CLASS 184**

87 5,050,707

**CLASS 187**

12 5,050,708
116 5,050,709

**CLASS 188**

71.6 5,050,710
164 5,050,711
287 5,050,712

**CLASS 190**

108 5,050,713

**CLASS 191**

57 5,051,546

**CLASS 192**

0.032 5,050,714
0.052 5,050,717
3.23 5,050,716
3.3 5,050,715

**CLASS 193**

35 R 5,050,718

**CLASS 194**

202 5,050,719

**CLASS 198**

328 5,050,721
392 5,050,722
395 5,050,723
407 5,050,724
444 5,050,725
467.1 5,050,720
475.1 5,050,726
626.1 5,050,727
844.2 5,050,728

**CLASS 200**

1 V 5,051,547
11 D 5,051,548
16 C 5,051,549
330 5,051,550
549 5,051,552

**CLASS 203**

49 5,051,152
60 5,051,153

**CLASS 204**

24 5,051,154
59 R 5,051,155
80 5,051,156
129.1 5,051,157
157.6 5,051,158
165 5,051,159
181.4 5,051,160
229 5,051,161
299 R 5,051,162

**CLASS 206**

83 5,050,729
315.4 5,050,730
320 5,050,731
335 5,050,732
352 5,050,733
422 5,050,734
484 5,050,736
494 5,050,737
497 5,050,738
531 5,050,739
579 5,050,740
606 5,050,741
610 5,050,742

**CLASS 208**

88 5,051,163
120 5,051,164

**CLASS 209**

166 5,051,165
269 5,051,166
270 5,051,167
273 5,051,168
274 5,051,169
310 5,051,170
323 5,051,171
672 5,051,172

**CLASS 210**

143 5,051,173
159 5,051,174
166 5,051,175
198.2 5,051,176
222 5,051,177
228 5,051,179
241 5,051,180
242.3 5,051,181
500.27 5,051,182
500.36 5,051,183
500.38 5,051,178
632 5,051,184
635 5,051,185
638 5,051,186
639 5,051,187
640 5,051,188
679 5,051,189
695 5,051,190
721 5,051,191
749 5,051,192
752 5,051,193
770 5,051,194
784 5,051,195

**CLASS 211**

12 5,050,743
13 5,050,744
5,050,745
34 5,050,746
50 5,050,747
59.2 5,050,748
70.7 5,050,749
123 5,050,750

**CLASS 213**

111 5,050,751

**CLASS 215**

206 5,050,752
252 5,050,753
256 5,050,754

**CLASS 219**

69.12 5,051,553
69.19 5,051,554
85.16 5,051,555
121.25 5,051,556
121.52 5,051,557
121.68 5,051,558
121.72 5,051,559
213 5,051,560
467 5,051,561
506 5,051,562
535 5,051,563

**CLASS 220**

23.4 5,050,756
23.83 5,050,757
90.4 5,050,758
5,050,759
94 R 5,050,760
200 5,050,761
281 5,050,762
355 5,050,763
378 5,050,764
401 5,050,765
412 5,050,766
480 5,050,767
551 5,050,768

**CLASS 221**

001 5,050,769

**CLASS 222**

1 5,050,770
5,050,771
63 5,050,773
80 5,050,774
93 5,050,775
146.5 5,050,776
146.6 5,050,777
153 5,050,778
188 5,050,780
305 5,050,781
309 5,050,782
464 5,050,806

**CLASS 223**

112 5,050,783
114 5,050,784

**CLASS 224**

42.045 R 5,050,785
253 5,050,786

**CLASS 225**

1 5,050,787
25 5,050,788

**CLASS 228**

107 5,050,789
181 5,050,790

**CLASS 229**

2.5 R 5,050,791
68 R 5,050,792
125.23 5,050,793
125.26 5,050,794

**CLASS 232**

20 5,050,772

**CLASS 235**

381 5,051,564
384 5,051,565
441 5,051,566
462 5,051,567
494 5,051,569

**CLASS 236**

13 5,050,795

**CLASS 237**

12.3 C 5,050,796

**CLASS 238**

336 5,050,797

**CLASS 239**

58 5,050,798
124 5,050,799
201 5,050,800
211 5,050,801
224 5,050,802
265.35 5,050,803
296 5,050,804
424 5,050,805

**CLASS 241**

37 5,050,808
86.1 5,050,809
101 R 5,050,807
293 5,050,810

**CLASS 242**

18 R 5,050,811
58.1 5,050,812
85.1 5,050,813
107 5,050,814
107.4 A 5,050,815
149 5,050,816

**CLASS 244**

2 5,050,817
3.15 5,050,818
75 R 5,050,819
131 5,050,820
158 R 5,050,821
215 5,050,822

**CLASS 246**

5 5,050,823

**CLASS 248**

57 5,050,824
97 5,050,825
118.3 5,050,826
125 5,050,827
156 5,050,828
188.8 5,050,829
205.2 5,050,830
208 5,050,831
225.2 5,050,832
340 5,050,833
467 5,050,834
550 5,050,835
553 5,050,836
610 5,050,837

**CLASS 250**

201.1 5,051,570
201.9 5,051,571
207 5,051,572
213 A 5,051,573
221 5,051,574
225 5,051,575
227.13 5,051,576
227.15 5,051,577
227.16 5,051,578
5,051,579
283 5,051,582
288 5,051,583
5,051,584
306 5,051,585
324 5,051,586
327.2 5,051,587
5,051,588
5,051,589
339 5,051,590
341 5,051,551
351 5,051,591
387 5,051,592
396 R 5,051,593
442.1 5,051,594
458.1 5,051,595
5,051,596
474.1 5,051,597
491.1 5,051,599
492.2 5,051,598
492.3 5,051,600
551 5,051,601
571 5,051,602

**CLASS 251**

11 5,050,838
58 5,050,839
129.15 5,050,840
149.9 5,050,841
176 5,050,842
214 5,050,843

**CLASS 252**

8.552 5,051,197
8.8 5,051,196
47 5,051,198
61 5,051,199
62.54 5,051,200
62.59 5,051,201
184 5,051,202
301.45 5,051,204
301.6 R 5,051,203
314 5,051,205
350 5,051,206
389.31 5,051,207
511 5,051,208
518 5,051,209
5,051,210
546 5,051,212

**CLASS 254**

89 H 5,050,844
419 5,050,845

**CLASS 256**

1 5,050,846

**CLASS 257**

284 5,050,930
311 5,050,931

**CLASS 261**

78.2 5,051,213
97 5,051,214

**CLASS 264**

29.2 5,051,215
5,051,216
40.1 5,051,217
40.6 5,051,218
40.7 5,051,219
113 5,051,220
115 5,051,221
143 5,051,222
256 5,051,223
257 5,051,224
288.4 5,051,225
511 5,051,226
537 5,051,227

**CLASS 266**

44 5,050,847
81 5,050,848

**CLASS 267**

33 Re.33,696
136 5,050,849
140.1 5,050,850

**CLASS 270**

55 5,050,851

**CLASS 271**

11 5,050,852
98 5,050,853
122 5,050,854
132 5,050,855
182 5,050,856
227 5,050,857
265 5,050,858
270 5,050,859
293 5,050,860

**CLASS 272**

70 5,050,861
70.3 5,050,862
71 5,050,863
75 5,050,864
78 5,050,866
101 5,050,867
117 5,050,868
5,050,869
119 5,050,870
128 5,050,871
134 5,050,872
5,050,873
136 5,050,874
137 5,050,875

**CLASS 273**

26 B 5,050,877
67 A 5,050,878
80 A 5,050,879
143 R 5,050,881
144 B 5,050,880
5,050,882
153 R 5,050,883
162 R 5,050,884
183 B 5,050,885
220 5,050,886
237 5,050,887
248 5,050,888
402 5,050,889
408 5,050,890
456 5,050,876

**CLASS 277**

80 5,050,891
168 5,050,892
178 5,050,893
182 5,050,894
188 R 5,050,895

**CLASS 279**

1 S 5,050,896

**CLASS 280**

43 5,050,897
79.11 5,050,898
250.1 5,050,899
474 5,050,901
625 5,050,903
629 5,050,902
642 5,050,900
764.1 5,050,904
804 5,050,905
805 5,050,906
808 5,050,907
851 5,050,908

**CLASS 283**

81 5,050,909
105 5,050,910

**CLASS 285**

2 5,050,911
222 5,050,912
279 5,050,913
336 5,050,914

**CLASS 292**

16 5,050,915
217 5,050,916
340 5,050,917

**CLASS 294**

1.2 5,050,918
2 5,050,919
55 5,050,920
118 5,050,921

**CLASS 296**

37.7 5,050,922
98 5,050,923
100 5,050,924
136 5,050,925
146 5,050,926
165 5,050,927
216 5,050,928

**CLASS 297**

145 5,050,929
355 5,050,932
417 5,050,933

**CLASS 299**

33 5,050,934

**CLASS 301**

9 TV 5,050,935

**CLASS 303**

3 5,050,936
7 Re.33,697
5,050,937
5,050,938
5,050,939
100 5,050,940

**CLASS 307**

73 5,051,603
116 5,051,604
124 5,051,605
134 5,051,607
241 5,051,606



270 5,051,609
272.1 5,051,610
272.3 5,051,611
296.2 5,051,612
296.3 5,051,613
350 5,051,614
5,051,615
354 5,051,616
443 5,051,618
5,051,619
452 5,051,620
455 5,051,621
465 5,051,622
475 5,051,623
475 5,051,624
5,051,625
5,051,626
476 5,051,627
520 5,051,628
603 5,051,629
5,051,630

**CLASS 310**

14 5,051,631
42 5,051,632
49 R 5,051,633
64 5,051,634
80 5,051,635
90 5,051,636
90.5 5,051,637
105 5,051,638
112 5,051,639
162 5,051,640
163 5,051,641
260 5,051,642
309 5,051,643
313 B 5,051,644
313 D 5,051,645
317 5,051,646
323 5,051,647

**CLASS 312**

201 5,050,941
221 5,050,942
319 5,050,943
323 5,050,944

**CLASS 313**

13 5,051,648
15 5,051,649
112 5,051,650
139 5,051,651
407 Re.33,698
479 5,051,652
489 5,051,653
506 5,051,654
631 5,051,655

**CLASS 315**

3.5 5,051,656
73 5,051,657
82 5,051,658
111.41 5,051,659
219 5,051,660
225 5,051,661
247 5,051,662
248 5,051,663
278 5,051,664
287 5,051,665
307 5,051,666
5,051,667
408 5,051,668

**CLASS 318**

119 5,051,669
434 5,051,670
466 5,051,671
469 5,051,672
481 5,051,673
561 5,051,674
568.10 5,051,675
568.24 5,051,676
573 5,051,677
696 5,051,678
5,051,679
701 5,051,680
786 5,051,681

**CLASS 320**

23.4 5,050,755

**CLASS 322**

99 5,051,682

**CLASS 323**

207 5,051,683
5,051,684
208 5,051,685
313 5,051,686
357 5,051,687

**CLASS 324**

143 5,051,688
158 F 5,051,689
158 R 5,051,690
5,051,691
175 5,051,692
207.22 5,051,693
232 5,051,694
249 5,051,695
262 5,051,696
306 5,051,697
309 5,051,698
5,051,699
322 5,051,700

**CLASS 328**

3 5,051,701
155 5,051,702

**CLASS 329**

319 5,051,703

**CLASS 330**

52 5,051,704
277 5,051,705
5,051,706
5,051,707
279 5,051,707
297 5,051,708

**CLASS 333**

28 R 5,051,709
32 5,051,710
185 5,051,712
188 5,051,711
212 5,051,713
227 5,051,714
252 5,051,715

**CLASS 335**

281 5,051,716

**CLASS 337**

380 5,051,717

**CLASS 338**

34 5,051,718
162 5,051,719

**CLASS 340**

310 R 5,051,720
475 5,051,721
524 5,051,722
566 5,051,723
568 5,051,724
571 5,051,725
572 5,051,726
5,051,727
573 5,051,728
626 5,051,729
635 5,051,730
638 5,051,731
650 5,051,732
660 5,051,733
700 5,051,734
705 5,051,735
707 5,051,736
747 5,051,737
782 5,051,738
784 5,051,739
825.44 5,051,740
825.49 5,051,741
825.5 5,051,742
870.04 5,051,743
984 5,051,744

**CLASS 341**

51 5,051,745
159 5,051,746

**CLASS 342**

1 5,051,747
22 5,051,748
25 5,051,749
26 5,051,750
107 5,051,751
151 5,051,752
158 5,051,753
375 5,051,754

**CLASS 346**

76 PH 5,051,755
5,051,756
108 5,051,757
140 R 5,051,758
5,051,759
5,051,760
5,051,761

**CLASS 351**

159 5,050,979
167 5,050,980
177 5,050,981
203 5,050,982
226 5,050,983

**CLASS 352**

38 5,050,984
184 5,050,985

**CLASS 354**

4 5,051,762
122 5,051,763
195.1 5,051,764
420 5,051,765
406 5,051,767
415 5,051,768
419 5,051,769
432 5,051,770

**CLASS 355**

27 5,051,771
32 5,051,772
40 5,051,773
64 5,051,774
72 5,051,775
77 5,051,776
93 5,051,777
200 5,051,778
5,051,779
208 5,051,780
5,051,781
251 5,051,782
271 5,051,783
285 5,051,784

**CLASS 356**

5 5,050,986
73 5,050,987
121 5,050,988
310 5,050,989
326 5,050,990
5,050,991
328 5,050,992
356 5,050,993
445 5,050,994

**CLASS 357**

4 5,051,785
5,051,786
5 5,051,787
17 5,051,788
19 5,051,789
5,051,790
22 5,051,791
5,051,792
23.5 5,051,793
5,051,795
5,051,796
24 5,051,797
5,051,798
30 5,051,800
5,051,801
5,051,802
5,051,803
5,051,804
34 5,051,805
5,051,806
40 5,051,807
41 5,051,808
45 5,051,809
68 5,051,810
5,051,811
71 5,051,812
72 5,051,813
81 5,051,814
84 5,051,815
235 5,051,794

**CLASS 358**

10 5,051,816
22 5,051,817
31 5,051,818
76 5,051,819
80 5,051,820
81 5,051,821
86 5,051,822
98 5,051,823
5,051,824
5,051,825
106 5,051,826
140 5,051,827
141 5,051,828
183 5,051,829
191.1 5,051,830
209 5,051,831
213.11 5,051,832
213.29 5,051,833
227 5,051,834
231 5,051,835
311 5,051,836
342 5,051,837
349 5,051,838
401 5,051,839
5,051,840
433 5,051,841
447 5,051,842
5,051,843
450 5,051,844
456 5,051,844

**CLASS 359**

13 5,050,962
38 5,050,966
53 5,050,965
114 5,050,952
246 5,050,969
281 5,050,968
291 5,050,967
328 5,051,617
341 5,050,970
425 5,050,971
508 5,050,975
550 5,051,931
5,051,932
551.01 5,051,933
561 5,051,934
569 5,051,935
570 5,051,936
571.01 5,051,937
578 5,051,938
5,051,941
715.06 5,051,939
724.01 5,051,942
736 5,051,940
786 5,051,943
900 5,051,944
5,051,945
5,051,946
5,051,947

**CLASS 365**

49 5,051,948
5,051,949
109 5,051,950
150 5,051,951
154 5,051,952
185 5,051,953
5,051,956
189.02 5,051,954
5,051,955
190 5,051,957
228 5,051,958
230.06 5,051,959

**CLASS 366**

136 5,050,995
211 5,050,996
292 5,050,997

**CLASS 367**

24 5,051,960
5,051,961
33 5,051,962
46 5,051,963
135 5,051,964
149 5,051,965
153 5,051,966

**CLASS 368**

62 5,051,967
76 5,051,968
223 5,051,969

**CLASS 369**

13 5,051,970
32 5,051,971
5,051,972
36 5,051,973
44.12 5,051,974
44.39 5,051,975
50 5,051,976
126 5,051,977
275.5 5,051,978

**CLASS 370**

16 5,051,979
32.1 5,051,980
5,051,981
58.2 5,051,982
60 5,051,983
79 5,051,984
85.005 5,051,985
85.5 5,051,986
94.1 5,051,987
99 5,051,988
104.1 5,051,989
105.3 5,051,990
108 5,051,991
110.1 5,051,992
112 5,051,993

**CLASS 371**

11.1 5,051,994
21.1 5,051,995
22.4 5,051,996
5,051,997
39.1 5,051,998
41 5,051,999
43 5,052,000
49.3 5,052,001
51.1 5,052,002

**CLASS 372**

2 5,052,003
20 5,052,004
36 5,052,005
5,052,009
44 5,052,006
45 5,052,007
5,052,008
65 5,052,010
77 5,052,011
87 5,052,012
96 5,052,015
5,052,016
5,052,013
97 5,052,017
103 5,052,014

**CLASS 373**

72 5,052,018

**CLASS 375**

4 5,052,022
7 5,052,024
12 5,052,023
23 5,052,019
25 5,051,799
62 5,052,020
76 5,052,021
103 5,052,027
107 5,052,029
108 5,052,030
109 5,052,028
118 5,052,023
119 5,052,026
120 5,052,031
5,052,032

**CLASS 376**

336 5,051,229
381 5,051,230

**CLASS 378**

35 5,052,033
121 5,052,034
163 5,052,035
197 5,052,036

**CLASS 379**

53 5,052,037
88 5,052,038
402 5,052,039

**CLASS 380**

4 5,052,040

**CLASS 381**

71 5,052,041

**CLASS 382**

1 5,052,042
14 5,052,043
30 5,052,045
32 5,052,044
41 5,052,046

**CLASS 383**

6 5,050,998
76 5,050,999

**CLASS 384**

7 5,051,000
43 5,051,001
49 5,051,002
477 5,051,003
516 5,051,004
517 5,051,005
574 5,051,006
606 5,051,007

**CLASS 385**

2 5,050,948
9 5,050,947
16 5,050,954
17 5,050,951
5,050,955
24 5,050,950
33 5,050,946
89 5,050,953
95 5,050,945
100 5,050,959
102 5,050,958
113 5,050,957
5,050,960
140 5,050,956

**CLASS 400**

59 5,051,008
120 5,051,009
194 5,051,010
219 5,051,011
279 5,051,012
498 5,051,013
625 5,051,014

**CLASS 401**

202 5,051,015
209 5,051,017
213 5,051,016

**CLASS 403**

5 5,051,018
171 5,051,019
282 5,051,020
406.1 5,051,021

**CLASS 404**

26 5,051,022
39 5,051,023
57 5,051,024
98 5,051,025
118 5,051,026

**CLASS 405**

3 5,051,027

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| | |
|---|---|
| 45 | 5,051,028 |
| 68 | 5,051,029 |
| 128 | 5,051,030 |
| 129 | 5,051,031 |
| 141 | 5,051,032 |
| 147 | 5,051,033 |
| 157 | 5,051,034 |
| 195 | 5,051,035 |
| 227 | 5,051,036 |
| | 5,051,037 |
| 261 | 5,051,038 |
| 290 | 5,051,039 |
| **CLASS 406** | |
| 63 | 5,051,040 |
| 99 | 5,051,041 |
| **CLASS 408** | |
| 72 R | 5,051,042 |
| | 5,051,043 |
| 92 | 5,051,044 |
| 115 R | 5,051,045 |
| **CLASS 410** | |
| 29.1 | 5,051,046 |
| 77 | 5,051,047 |
| **CLASS 411** | |
| 34 | 5,051,048 |
| 258 | 5,051,049 |
| **CLASS 412** | |
| 40 | 5,051,050 |
| **CLASS 414** | |
| 282 | 5,051,051 |
| 428 | 5,051,052 |
| 483 | 5,051,053 |
| 618 | 5,051,054 |
| 626 | 5,051,055 |
| 678 | 5,051,056 |
| 685 | 5,051,057 |
| 789.1 | 5,051,058 |
| **CLASS 415** | |
| 7 | 5,051,059 |
| 90 | 5,051,060 |
| 104 | 5,051,061 |
| **CLASS 416** | |
| 241 B | 5,051,062 |
| **CLASS 417** | |
| 44 | 5,051,063 |
| 64 | 5,051,064 |
| 201 | 5,051,065 |
| 207 | 5,051,066 |
| 222 R | 5,051,067 |
| 234 | 5,051,068 |
| 269 | 5,051,069 |
| 295 | 5,051,070 |
| 373 | 5,051,071 |
| 435 | 5,051,072 |
| 526 | 5,051,073 |
| 535 | 5,051,074 |
| **CLASS 418** | |
| 55.2 | 5,051,079 |
| 55.3 | 5,051,075 |
| 60 | 5,051,076 |
| 201.1 | 5,051,077 |
| 260 | 5,051,078 |
| **CLASS 419** | |
| 13 | 5,051,231 |
| 27 | 5,051,232 |
| **CLASS 420** | |
| 50 | 5,051,233 |
| 61 | 5,051,234 |
| 463 | 5,051,235 |
| **CLASS 422** | |
| 1 | 5,051,236 |
| 56 | 5,051,237 |
| 64 | 5,051,238 |
| 73 | 5,051,239 |
| 83 | 5,051,240 |
| 180 | 5,051,241 |
| 250 | 5,051,242 |
| **CLASS 423** | |
| 131 | 5,051,243 |
| 212 | 5,051,244 |
| 242 | 5,051,245 |
| 305 | 5,051,246 |
| 342 | 5,051,247 |
| 347 | 5,051,248 |
| **CLASS 424** | |
| 9 | 5,051,249 |
| 70 | 5,051,250 |
| | 5,051,251 |
| 71 | 5,051,252 |
| 81 | 5,051,253 |
| 85.8 | 5,051,254 |
| 94.2 | 5,051,264 |
| 195.1 | 5,051,255 |
| 402 | 5,051,256 |
| 422 | Re.33,699 |
| 423 | 5,051,257 |
| 439 | 5,051,258 |
| 443 | 5,051,259 |
| 449 | 5,051,260 |
| 464 | 5,051,261 |
| 468 | 5,051,262 |
| 490 | 5,051,263 |
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| 72.2 | 5,051,088 |
| 93 | 5,051,080 |
| 131.1 | 5,051,081 |
| 141 | 5,051,082 |
| 174.8 R | 5,051,083 |
| 525 | 5,051,084 |
| 526 | 5,051,085 |
| 549 | 5,051,086 |
| 589 | 5,051,087 |
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| 96 | 5,051,265 |
| 129 | 5,051,266 |
| 231 | 5,051,267 |
| 420 | 5,051,268 |
| 453 | 5,051,269 |
| 574 | 5,051,270 |
| 658 | 5,051,271 |
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| 2 | 5,051,272 |
| 14.1 | 5,051,273 |
| 38 | 5,051,274 |
| 58 | 5,051,275 |
| 68 | 5,051,276 |
| 69 | 5,051,277 |
| 108 | 5,051,278 |
| 150 | 5,051,279 |
| 226 | 5,051,280 |
| 230 | 5,051,281 |
| 260 | 5,051,282 |
| 440 | 5,051,283 |
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| 34.9 | 5,051,284 |
| 36.4 | 5,051,285 |
| 64 | 5,051,287 |
| | 5,051,288 |
| 77 | 5,051,289 |
| 81 | 5,051,290 |
| 141 | 5,051,291 |
| | 5,051,292 |
| 157 | 5,051,293 |
| 184 | 5,051,294 |
| 195 | 5,051,295 |
| 213 | 5,051,296 |
| 215 | 5,051,320 |
| 220 | 5,051,297 |
| | 5,051,298 |
| 221 | 5,051,299 |
| 245 | 5,051,300 |
| 288 | 5,051,301 |
| 323 | 5,051,302 |
| 329 | 5,051,303 |
| 332 | 5,051,309 |
| 402.2 | 5,051,304 |
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| 408 | 5,051,307 |
| 412 | 5,051,308 |
| 423.3 | 5,051,310 |
| 447 | 5,051,311 |
| 458 | 5,051,312 |
| 472 | Re.33,700 |
| 500 | 5,051,286 |
| | 5,051,313 |
| 522 | 5,051,314 |
| 549 | 5,051,315 |
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| 692 | 5,051,318 |
| 694 | 5,051,319 |
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| 120 | 5,051,322 |
| 165 | 5,051,323 |
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| 49 | 5,051,327 |
| 56 | 5,051,328 |
| 100 | 5,051,329 |
| 110 | 5,051,330 |
| | 5,051,331 |
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| 544 | 5,051,346 |
| 558 | 5,051,347 |
| 559 | 5,051,348 |
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| 569 | 5,051,350 |
| 570 | 5,051,351 |
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| 80 | 5,051,089 |
| 331 | 5,051,090 |
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| 201.1 | 5,051,091 |
| 224 | 5,051,093 |
| 225 | 5,051,092 |
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| 30 | 5,051,094 |
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| 1 | 5,051,352 |
| 2 | 5,051,353 |
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| 7.34 | 5,051,356 |
| 7.8 | 5,051,354 |
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| 13 | 5,051,357 |
| 19 | 5,051,358 |
| 32 | 5,051,359 |
| 34 | 5,051,360 |
| 182 | 5,051,362 |
| 240.27 | 5,051,364 |
| 240.3 | 5,051,363 |
| 264 | 5,051,365 |
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| 79 | 5,051,367 |
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| | 5,051,369 |
| 165 | 5,051,370 |
| 545 | 5,051,371 |
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| 5 | 5,051,372 |
| 8 | 5,051,373 |
| | 5,051,374 |
| 10 | 5,051,375 |
| 22 | 5,051,376 |
| 24 | 5,051,377 |
| 225 | 5,051,378 |
| | 5,051,379 |
| 238 | 5,051,380 |
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| 37 | 5,051,095 |
| 61 | 5,051,096 |
| 75 | 5,051,097 |
| 99 | 5,051,098 |
| 108 | 5,051,099 |
| 140 | 5,051,100 |
| 159 | 5,051,101 |
| 192 | 5,051,103 |
| 825 | 5,051,108 |
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| 75 | 5,051,102 |
| 88 | 5,051,104 |
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| 66 | 5,052,048 |
| 186 | 5,052,049 |
| 296 | 5,052,050 |
| 619 | 5,052,051 |
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| 87 | 5,051,382 |
| 127 | 5,051,383 |
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| 64 | 5,051,385 |
| | 5,051,386 |
| 74 | 5,051,387 |
| 113 | 5,051,388 |
| 185 | 5,051,389 |
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| 242 | 5,051,391 |
| 303 | 5,051,392 |
| 304 | 5,051,393 |
| 324 | 5,051,394 |
| 348 | 5,051,395 |
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| 1 | 5,051,396 |
| | 5,051,397 |
| | 5,051,398 |
| | 5,051,399 |
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| 11 | 5,051,400 |
| | 5,051,402 |
| 12 | 5,051,403 |
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| 21 | 5,051,406 |
| 24 | 5,051,407 |
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| 252 | 5,051,422 |
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| 256 | 5,051,425 |
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| 547 | 5,051,448 |
| 559 | 5,051,449 |
| 709 | 5,051,450 |
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| 60 | 5,051,451 |
| 139 | 5,051,452 |
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| 116 | 5,051,453 |
| 146 | 5,051,454 |
| 212 | 5,051,455 |
| 300 | 5,051,456 |
| 411 | 5,051,470 |
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| 68 | 5,051,457 |
| 99 | 5,051,458 |
| 100 | 5,051,459 |
| 114 | 5,051,460 |
| 243 | 5,051,461 |
| 306 | 5,051,463 |
| 394 | 5,051,462 |
| 555 | 5,051,464 |
| 588 | 5,051,465 |
| 711 | 5,051,466 |
| 731 | 5,051,467 |
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| 59 | 5,051,468 |
| 63 | 5,051,469 |
| 86 | 5,051,471 |
| 100 | 5,051,472 |
| | 5,051,473 |
| 131 | 5,051,474 |
| 175 | 5,051,475 |
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| 194 | 5,051,477 |
| 195 | 5,051,478 |
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| 227 | 5,051,480 |
| 240 | 5,051,481 |
| 309 | 5,051,482 |
| 425 | 5,051,483 |
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| 151 | 5,051,484 |
| 208 | 5,051,485 |
| 279 | 5,051,486 |
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| 322 | 5,051,488 |
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| 26 | 5,051,489 |
| 190 | 5,051,490 |
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| 361 | 5,051,492 |
| 362 | 5,051,493 |
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| 416 | 5,051,497 |
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| 29 | 5,051,499 |
| 50 | 5,051,500 |
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| 205 | 5,051,502 |
| 454 | 5,051,503 |
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| 101 | 5,051,505 |
| 289 | 5,051,506 |
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| 373 | 5,051,518 |
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| D1— | 120 | 320,106 | | 536 | 320,139 | | 113 | 320,172 | | 143 | 320,204 | D21— | 32 | 320,236 | | 410 | 320,268 |
| D2— | 314 | 320,107 | | 589 | 320,140 | | 114 | 320,173 | | 146 | 320,205 | | 33 | 320,237 | D24— | 113 | 320,270 |
| | 320 | 320,108 | | 616 | 320,141 | | | 320,174 | | 150 | 320,206 | | 76 | 320,238 | | | 320,276 |
| | 639 | 320,110 | | 626 | 320,142 | D11— | 13 | 320,175 | | 163 | 320,207 | | | 320,239 | | 119 | 320,275 |
| | 642 | 320,109 | | 637 | 320,143 | | 130.1 | 320,176 | | | 320,208 | | 95 | 320,240 | | 125 | 320,274 |
| D3— | 10 | 320,111 | | 693 | 320,144 | | 157 | 320,177 | | | 320,209 | | 101 | 320,241 | | 130 | 320,277 |
| | 36 | 320,112 | D8— | 8 | 320,145 | | 218 | 320,178 | | 168 | 320,210 | | 107 | 320,242 | | 144 | 320,271 |
| | 38 | 320,113 | | 14 | 320,146 | D12— | 92 | 320,179 | | 241 | 320,211 | | 149 | 320,243 | | 145 | 320,272 |
| | 61 | 320,114 | | 50 | 320,147 | | 147 | 320,180 | | 242 | 320,212 | | 171 | 320,244 | | 162 | 320,273 |
| | 71 | 320,115 | | 70 | 320,148 | | 157 | 320,181 | D15— | 126 | 320,213 | | 191 | 320,245 | | 215 | 320,279 |
| | 106 | 320,116 | | 89 | 320,149 | | | 320,182 | | 141 | 320,214 | | 195 | 320,246 | | 218 | 320,278 |
| D4— | 104 | 320,117 | | 98 | 320,150 | | | 320,183 | D16— | 102 | 320,215 | | | 320,247 | | 224 | 320,280 |
| D6— | 317 | 320,118 | | 363 | 320,151 | | | 320,184 | | 209 | 320,216 | | 196 | 320,248 | | 225 | 320,269 |
| | 323 | 320,119 | | 367 | 320,152 | | 158 | 320,185 | | | 320,217 | | 197 | 320,249 | D25— | 36 | 320,281 |
| | 366 | 320,120 | D9— | 339 | 320,156 | | 169 | 320,186 | D17— | 1 | 320,218 | | 219 | 320,250 | D26— | 35 | 320,282 |
| | 407 | 320,128 | | 355 | 320,153 | | 179 | 320,187 | | 13 | 320,219 | | | 320,251 | | 121 | 320,283 |
| | 420 | 320,121 | | 370 | 320,154 | | 197 | 320,188 | | 20 | 320,220 | | | 320,252 | D27— | 148 | 320,284 |
| | 423 | 320,129 | | | 320,155 | | 326 | 320,189 | | | 320,221 | | 238 | 320,253 | D28— | 60 | 320,285 |
| | 436 | 320,126 | | 414 | 320,157 | D13— | 103 | 320,190 | | | 320,222 | D22— | 107 | 320,254 | | | 320,286 |
| | 465 | 320,130 | | 415 | 320,158 | | 112 | 320,191 | D18— | 7 | 320,223 | D23— | 202 | 320,255 | | | 320,287 |
| | 513 | 320,131 | | | 320,159 | | 133 | 320,192 | | 12 | 320,224 | | 209 | 320,256 | | 87 | 320,288 |
| | 518 | 320,133 | | 416 | 320,160 | | 146 | 320,193 | | | 320,225 | | 233 | 320,257 | D29— | 13 | 320,289 |
| | 522 | 320,122 | | 417 | 320,161 | D14— | 106 | 320,194 | | 13 | 320,226 | | | 320,258 | D30— | 121 | 320,291 |
| | 525 | 320,134 | | 448 | 320,162 | | | 320,195 | | 23 | 320,227 | | 238 | 320,259 | | 127 | 320,290 |
| | 528 | 320,123 | D10— | 18 | 320,163 | | 107 | 320,196 | | 34 | 320,228 | | 262 | 320,260 | | 158 | 320,292 |
| | 531 | 320,132 | | 23 | 320,164 | | 114 | 320,197 | D19— | 53 | 320,229 | | 281 | 320,261 | D32— | 15 | 320,293 |
| | 553 | 320,124 | | 28 | 320,165 | | | 320,198 | | | 320,230 | | 294 | 320,262 | | | 320,294 |
| | 575 | 320,127 | | 32 | 320,166 | | | 320,199 | | 85 | 320,231 | | | 320,263 | | 53 | 320,295 |
| | 601 | 320,135 | | 40 | 320,167 | | 116 | 320,200 | | 97 | 320,232 | | | 320,264 | D34— | 38 | 320,296 |
| D7— | 300.2 | 320,136 | | 74 | 320,168 | | 121 | 320,201 | D20— | 8 | 320,233 | | 364 | 320,265 | | 40 | 320,297 |
| | 309 | 320,137 | | 81 | 320,169 | | | 320,202 | | 10 | 320,234 | | 366 | 320,266 | | | 320,298 |
| | | 320,138 | | 86 | 320,170 | | | 320,203 | | | 320,235 | | 371 | 320,267 | D99— | 34 | 320,299 |
| | 395 | 320,125 | | 106 | 320,171 | | | | | | | | | | | | |

## CLASSIFICATION OF PLANTS

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| P.— | 51 | 7,655 | | 68 | 7,656 | | 88 | 7,657 | | | |

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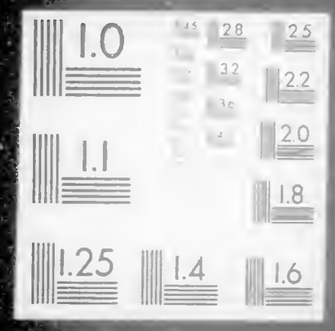
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